In the matter of the
Commissions Of Inquiry Act 1950

Commission of Inquiry Order (No. 1) 2011

QUEENSLAND FLOODS COMMISSION OF INQUIRY

Supplementary Witness Statement of Natalie Plumbe

Planner - Ipswich City Council

Volume 1 of 4

Supplementary Witness Statement and Annexures NP-15 - NP-41

QFCI

Date: 19/10/11 JM

Exhibit Number: 860

Statement of Natalie Plumbe - Citiswich Site

This written statement is provided in response to a Requirement, dated 27 September 2011, pursuant to section 5(1)(d) of the *Commissions of Inquiry Act 1950* (Qld) to provide a written statement, under oath or affirmation, to the Queensland Floods Commission of Inquiry.

I, Natalie Plumbe (nee Handyside), Planner of [redacted] Roderick Street, Ipswich, in the State of Queensland swear as follows:

Introduction

1. I am employed by Ipswich City Council (**ICC**) as the Team Co-ordinator - Development (**Central Team**) for the City of Ipswich. I commenced employment with ICC as a Senior Development Planner in October 2002 and for a period of approximately 6 years prior to November 2010 I was the Team Co-ordinator - Development (**East Team**).

2. My qualifications, antecedents and responsibilities are set out in my Statement to the Commission dated 7 October 2011 and are not repeated here.

3. This statement concerns a Requirement by the Commission to provide a statement in relation to the development site known as Citiswich. In particular the Commission has requested:

   (a) a brief chronology of the development of the Citiswich site, commencing with preliminary approval 3356/02/CA; and

   (b) certain additional information regarding 23 specific development applications listed in the Commission Requirement notice.

4. The Commission has also sought information as to any other development applications that affected site levels, stormwater run off or flood risk regarding the Citiswich site.

5. In my role as Team Co-ordinator - Development (**Central Team**) and in my previous role as Team Co-ordinator - Development (**East Team**) the Citiswich site falls within my geographic area of responsibility.

6. Prior to my assuming the role of Team Co-ordinator - Development (**East Team**) in late 2004, and at the time of the Council's consideration of application 3356/02, the Team Co-ordinator for the Eastern Development Team was [redacted]. At that time the ICC Development Manager was Mr Brendan Nelson and the ICC Planning and Development Manager was Mr Gary White.

[redacted]

[redacted]

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7. Between 2002 and 30 June 2011 the Citiswich site has been the subject of some 47 applications to Council. Some of those applications have been substantive and material. However, many, including a considerable number of the 23 specific applications listed in the Commission Requirement notice have, in the context of flooding and stormwater related issues, been relatively minor or immaterial, primarily because:

(a) the site level, flooding and stormwater issues relevant to the application have been considered and addressed in another related application; or

(b) the application does not give rise to any material or relevant flooding or stormwater related issues, the area the subject of the application lying well beyond the 1 in 100 flood level and well beyond the range of the 2011 flood.

8. The 23 specific applications the subject of the Commission's Requirement fall into two broad categories:

(a) 11 applications which concern **material change of use (MCU)** or **reconfiguring a lot (RAL)** proposals; and

(b) 12 applications which concern operational works (**OW**) proposals.

9. So as to best assist the Commission in understanding the development application history of the Citiswich site, and the flood and stormwater related matters that are of particular relevance, my statement will be structured in the following way:

(a) firstly I will provide a brief overview of the Citiswich site;

(b) secondly, I will provide a chronology of the 47 applications which have been received and considered by ICC in relation to the Citiswich site;

(c) thirdly, in respect of the 23 specific applications the subject of the Commission Requirement (11 MCU or RAL applications and 12 OW applications) I will identify whether the application was in the nature of a substantive and material proposal or concerned, in the context of flooding and stormwater related issues, a relatively minor or immaterial proposal;

(d) for those applications that were material, and are in the nature of an MCU or RAL, I will address the Commission's specific questions concerning the application;

(e) for the 12 applications the subject of the Commission's Requirement that are in the nature of operational works applications, I will identify the applications as being either material and substantive, or relatively minor and immaterial. However, the Commission's specific questions in relation to these applications will be addressed

in a statement to be provided to the Commission by the Council's Engineering and Environmental Manager, Mr Gary Ellis; and

(f) finally, where in the chronology I identify a material MCU or RAL application that has not been included in the Commission's specific list of 11 MCU or RAL applications, I will address the Commission's specific questions in relation to that application.

10. I expect that by approaching the statement in this manner the Commission will have the benefit of an understanding of both the overall history of the Citiswich project and of the substantive applications concerning the project that are material to the flooding and stormwater issues of particular interest to the Commission.

11. The sources of information for the matters set out in this statement are:

(a) my personal knowledge and recollection of relevant events; and

(b) my review of the relevant ICC development application files, many of which I understand have been produced to the Commission pursuant to Requirement notices dated 5 August 2011 and 10 August 2011.

Section 1 - Overview of the Citiswich Site

12. The Citiswich development is a large 315 hectare (approximately) site located approximately twenty five (25) kilometres to the west of the Brisbane CBD and about seven (7) kilometres to the east of the Ipswich CBD. The land had historically been used for pastoral production with some industrial uses on part of the site.

13. The land is bounded by the Bremer River to the north, Brisbane Road to the south and the Dinmore and Bundamba residential areas to the east and west respectively. The land is transected by the Warrego Highway in a south-east to north-west direction.

14. The site is mapped as a "regionally significant business enterprise and industry area" under the Ipswich Planning Scheme and is identified as an "enterprise opportunity" under the South East Queensland Regional Plan.

15. Annexed to my statement and marked **NP-15** is a plan identifying the Citiswich site and surrounding landmarks (for ease of reference for the Commission, the numbering of the annexures to this statement follow on from the annexure numbering in my earlier statement dated 7 October 2011). As can be observed from this plan, the site includes an area toward Brisbane Road with a long narrow "handle" extending toward the north and linking this area to the Warrego Highway. This area was formerly occupied by Australian Hardboards and Hume

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Master Panel and was not included in the original application over the Citiswich site. Hume Master Panel still operates from this location, however Australian Hardboards has recently closed and this area is likely to be developed in conjunction with the Citiswich site in the future.

16. At the time of lodgement of the first application in relation to the land in September 2002, the applicant was Wingate Properties Pty Ltd and the proposed development was known as the Bremer Business Park. In about 2006 the site was acquired by Walker Corporation Pty Ltd and the development subsequently became known as Citiswich Industrial Estate (**Citiswich**).

17. The first application in relation to the site was Application No. 3356/02 for a preliminary approval to override the planning scheme in accordance with section 3.1.6 of the *Integrated Planning Act* 1997 (Qld) (**IPA**) and reconfiguring a lot. This application, which is discussed in more detail in the following sections of my statement, sought development in accordance with a Plan of Development including seven (7) sub-areas.

18. At the time of this initial application, lodged under the Ipswich Planning Scheme 1999, relevant site details included:

- **Strategic Plan Designation:** Part Major Industrial and part Urban Development;
- **Zone:** Particular Development 70 (Development in accordance with the Eastern Corridor Structure Plan);
- **Precinct:** Part Business and Industry Minimal - Low Impact (**ILI**) Precinct, part Business and Industry Medium Impact (**IMI**) Precinct, part Environmental Protection (**OE**) Precinct, part Residential Low Density (**RL3**) Precinct and part Special Opportunity - Bundamba (**SA7**) Precinct.

19. Under the current 2006 Ipswich Planning Scheme the zoning is part Regional Business and Industry (**RB2M**) - Bundamba/Riverview - Medium Impact Business and Industry Zone, part Regional Business and Industry (**RB2L**)-Bundamba/Riverview - Low Impact Business and Industry Zone, part Regional Business and Industry Buffer Zone (**RBB**), part Residential Low Density (**RL2**) Zone and part Large Lot Residential Zone.

20. The original Preliminary Approval was in accordance with a Plan of Development comprising 7 sub-areas:

    (a) the "Core Sub-Area" comprising an area of approximately 55 hectares, and intended to cater for a wide range of medium to large scale industrial and business activities;

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(b) the "Frame Sub-Area" comprising an area of approximately 50 hectares located between the Core Sub-Area and surrounding sensitive land area, and intended as a transition from the Core Sub-Area activities to the Residential Sub-Area;

(c) the "Community and Commercial Sub-Area", comprising an area of approximately 5 hectares adjacent to Brisbane Road and the Ebbw Vale Railway Station;

(d) the "Highways Sub-Area" comprising an area of approximately 37 hectares and providing a transition from the highly intensive industrial character of the Core Sub-Area and the Warrego Highway;

(e) the "Riverside Sub-Area" located north of the Warrego Highway and providing a transition between the industrial activities to the south and the Bremer River corridor and the rural residential settlements on the northern side of the Bremer River;

(f) the "Residential Sub-Area" comprising an area of approximately 17 hectares and located in close proximity to the existing residential area of Bundamba; and

(g) the "Open Space Sub-Area" comprising approximately 100 hectares located throughout the subject land.

Annexed to my statement and marked **NP-16** is a plan identifying the Bremer Business Park Sub-Areas.

21. As the project has progressed, the developer had identified seven (7) stages for the project. Annexed to my statement and marked **NP-17** is a copy of the Citiswich Staging Plan. This plan has not been formally endorsed by Council. The proposed stages are identified by different colours on the staging plan as follows:

1. Stage 1 (Salmon)
2. Stage 2 (Pink)
3. Stage 3 (Purple)
4. Stage 4 (Red)
5. Stage 5 (Brown)
6. Stage 6 (Orange)
7. Stage 7 (Blue)

Open Space Areas are shaded in Green and areas of existing ownership within the site area appear in White. Annexed to my statement and marked **NP-18** is a document which describes the predominant uses proposed for each of the seven (7) stages.

Citiswich - Flood Impact

22. According to Council records the site was partially inundated in the 1974 flood.

23. Ground levels within Citiswich range from approximately RL0m to RL54m. The site therefore falls partially within the 1 in 20 development line: 13.3m AHD and partially within the 1 in 100 flood line: 16.2m AHD. Annexed to my statement and marked **NP-19** is a plan of the site marking the location of the 1 in 20 development (red line) and the 1 in 100 flood line (blue line) for the site.

24. Annexed to my statement and marked **NP-20** is a photograph of the site on which the 1 in 20 development line (yellow line) and the 1 in 100 flood line (blue line) are marked.

25. In the January 2011 flood event, slightly over half of the site received some level of inundation. The areas of the site occupied by stages 1 and 7 received substantial inundation and the areas occupied by stages 2, 3 and 4 sustained some slight inundation. No inundation was experienced in the areas occupied by stages 5 and 6. Most of the areas occupied by stages 2 and 3 also remained free of inundation, and approximately half of the area occupied by stage 4 remained free of inundation.

26. The 2011 flood level was approximately 18.7m AHD. Annexed to my statement and marked **NP-21** is a plan of the site on which the extent of the flooding experienced in January 2011 is shaded in red.

27. Annexed to my statement and marked **NP-22** is a composite plan of the site on which:

    (a) the site boundary is marked in black;

    (b) the area within the 1 in 20 development line is shaded in yellow;

    (c) the area between the 1 in 20 development line and the 1 in 100 flood line is shaded in blue; and

    (d) the area above the 1 in 100 flood line which experienced inundation in January 2011 is shaded in red.

Solicitor

Sections 2 and 3

Chronology of Citiswich Development Applications, including identification of which of the 23 specific applications the subject of the Commission Requirement notice dated 27 September 2011 constitute material development applications.

1 - Application No. 3356/02

28. This is an application lodged on 5 September 2002 for preliminary approval to override the planning scheme in accordance with section 3.1.6 of the IPA and for preliminary approval for reconfiguring a lot (16 lots into 34 lots). The preliminary approval to override the planning scheme was to establish a framework for the subsequent development the subject site, as previously detailed in paragraph 20 of my statement.

29. Fundamentally it was the Preliminary Approval the subject of this application which, by overriding the Planning Scheme, set up the planning framework for the Citiswich site by "calling up" all of the outcomes being sought in the correlating zones in the Planning Scheme (**IPA Scheme**) as well as the assessment tables for those zones. It should be noted that approval of this application did not authorise any development to occur, but only set up the framework and mechanism against which future applications for the development of the site would be assessed.

30. The application was determined at full Council and was approved by negotiated decision notice dated 30 June 2004. The reconfiguring a lot component of the application has since lapsed.

31. The Commission has sought additional information in relation to this application (Requirement Notice 5(f)). It is a relevant application and is discussed in further detail in section 4 of my statement below.

2 - Application No. 309/03/MCU

32. This is an application lodged on 22 January 2003 for a material change of use and environmentally relevant activity in connection with the establishment of the premises occupied by Capral. The application was approved by negotiated decision notice on 4 April 2003.

33. The site is located toward the south-east of the Citiswich land, abutting the Warrego Highway (southern side) and Hoepner Road (western side). It does not appear as one of the stages on the Citiswich Staging Plan (annexure NP-17) as at the time of production of that plan the site had been developed. The site is shaded "white" on that plan.

34. The Capral facility has been constructed and is operational. The site did not flood in 2011. The Commission has not sought information in relation to this application and in the context of the Citiswich flood and stormwater related issues it is an immaterial application.

3 - Application No. 314/03/RAL

35. This is an application lodged on 22 January 2003 for the reconfiguration of one lot into 2 lots for purposes associated with creating the Capral lot. The application was approved on 14 March 2003 and the lots have been registered.

36. This application is related to application No. 2 above. The Capral site did not flood in 2011. The Commission has not sought information in relation to this application and in the context of the Citiswich flood and stormwater related issues it is an immaterial application.

4 - Application No. 309/03/OW

37. This is an application for operational works lodged on 4 February 2003 for internal works (**bulk earthworks**) in relation to the Capral site. The application was determined on 6 February 2003, the plan approved and the works have been constructed.

38. This application is related to applications No. 2 and No. 3 above. The Capral site did not flood in 2011. The Commission has not sought information in relation to this application and in the context of the Citiswich flood and stormwater related issues it is an immaterial application.

5 - Application No. 7333/06/OW - Stage Figure 1A

39. This is an operational works application lodged on 1 November 2006 for internal works (**bulk earthworks**) for Stage 1A. The application was determined on 23 March 2007, the plan approved and the works have been constructed.

40. The levels on the approved bulk earthworks plans indicate the site ranges from RL15.6m to RL17m. The site flooded in 2011. The Commission has sought additional information in relation to this application (Requirement Notice paragraph 5(i)). It is a relevant application and is discussed in further detail in the statement of Mr Ellis.

6 - Application No. 1837/07/RAL - Stages 1A, B and C

41. This is an application lodged on 12 March 2007 for the reconfiguration of 3 lots into 28 lots comprising Stages 1A, B and C. It is these sites upon which, among other developments, the Reject Shop and API facility were constructed. The application was approved by negotiated decision notice on 8 July 2008. A number of the lots have been registered.

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42. The levels on the approved Bulk Earthworks plans associated with the reconfiguration of lot application indicate the site ranges from RL15.3m to RL19m. The site flooded in 2011.

43. The Commission has not sought information in relation to this application but I do consider it to be relevant in the context of the Citiswich flood and stormwater related issues and it is discussed in further detail in section 4 of my statement below.

7 - Application No. 4264/07/OW - Stages 1B, C and D

44. This is an operational works application lodged on 6 June 2007 for internal works (**bulk earthworks**) for Stages 1B, C and D. This application is related to application No. 6 above. The application was determined on 26 November 2007, the plan approved and the works have been constructed.

45. The site flooded in 2011. The Commission has sought additional information in relation to this application (Requirement Notice paragraph (j)). It is a relevant application and is discussed in further detail in the statement of Mr Ellis.

8 - Application No. 4820/07/OW - Stage 5

46. This is an operational works application lodged on 19 June 2007 for internal works, being a landscaping amenity mound in the buffer zone boarding the existing residential strip adjoining Stage 5. The application was approved on 3 August 2007.

47. The site did not flood in 2011. The Commission has sought information in relation to this application (Requirement Notice paragraph 5(v)), but in the context of the Citiswich flood and stormwater related issues it is an immaterial application. However, as it has been referred to by the Commission, and being an operational works application, it is addressed briefly in the statement of Mr Ellis.

9 - Application No. 5614/07/OW - Stage 1

48. This is an operational works application lodged on 25 July 2007 for municipal works excluding stormwater quality and landscaping works for Stage 1. The application was determined on 8 July 2008, the plan approved and the works have been constructed.

49. The earthworks associated with this site are the subject of application 4264/07 (No.7 above). The assessment undertaken in relation to this application is largely technical in nature, rather than substantive. The application is of marginal relevance. However, it is an application in relation to which the Commission has sought additional information (Requirement notice paragraph 5(w)) and, being an operational works application, it is addressed briefly in the statement of Mr Ellis.

10 - Application No. 6847/07/RAL - Stages 2B and 2C

50. This is an application for RAL for the reconfiguration of 2 lots into 7 industrial lots and a balance lot (park) over part of the area known as Stages 2B and 2C. The application was approved on 29 September 2008 but no lots have been registered.

51. The area of the site where the industrial lots were to be created was not affected by the 2011 flood. The Commission has sought additional information in relation to the application (Requirement notice paragraph 5(l)) but the area the subject of the application is not relevant to flood or stormwater related issues and the application file does not contain any reports or studies relevant to flood or stormwater issues. Unless there is some particular aspect of this application with which I can assist the Commission it appears to be an immaterial application and I do not propose to address it in any further detail in this statement.

11 - Application No. 9070/07/OW - Hoepner Road

52. This is an operational works application lodged on 4 August 2008 for municipal works in connection with the development of Hoepner Road, which is a road located to the east of the site, bisecting the site between Brisbane Road and the Warrego Highway. It was the subject of partial approvals on 18 August 2008, 1 October 2008 and 29 May 2009, and the works have been constructed.

53. The area the subject of the application did not flood in 2011. The Commission has sought information in relation to this application (Requirement notice paragraph 5(m)) but in the context of the Citiswich flood and stormwater related issues it is an immaterial application. However, as it has been referred to by the Commission, and being an operational works application, it is addressed briefly in the statement of Mr Ellis.

12 - Application No. 3739/08/RAL - Stage 1

54. This is an application lodged on 19 May 2008 for the reconfiguration of 3 lots into 3 lots between the Capral site and Stage 1. It was in effect an application for realignment of boundaries. The application was approved on 3 October 2008.

55. The realignment has not proceeded and the area the subject of the application did not flood in 2011. The Commission has not sought information in relation to this application and in the context of the Citiswich flood and stormwater related issues it is an immaterial application.

13 - Application No. 4078/08/RAL - Stage 1D

56. This is an application lodged on 29 May 2008 for the reconfiguration of 3 lots into 20 lots in Stage 1D. The application was approved on 27 May 2010 but no lots have yet been registered.

57. Levels on the approved bulk earthworks plans associated with the reconfiguration of lot application indicate the site ranges from RL15.3m to RL25.5m. The site the subject of the application was partially flooded in 2011.

58. The Commission has not sought information in relation to this application. The bulk earthworks for Stages 1B, C and D are the subject of application 4264/07 (No. 8) above which is an application in relation to which the Commission has sought information and is being addressed by Mr Ellis in his statement. There is nothing on application file 4078/08/RAL that I consider will materially add to the matters to be addressed by Mr Ellis in relation to the Stage 1D.

14 - Application No. 4210/08/RAL - Stage 7

59. This is an application lodged on 3 June 2008 for the reconfiguration of 4 lots into 48 lots in Stage 7. Stage 7 comprises a considerable area of relatively low-lying land between the Warrego Highway and the Bremer River. The application has not yet been determined, as there are unresolved access, cultural heritage, contaminated land, mining, earthworks, water and sewer, stormwater quality and quantity, flooding, buffering and layout issues in relation to Stage 7.

60. The area the subject of this application sustained considerable inundation in 2011. The Commission has not sought information in relation to this application. However, the Commission has sought additional information in relation to applications 5426/10/OW (No.40 below) and 7540/10/OW (No. 43 below) which are the operational works bulk earthworks applications in relation to Stage 7. Mr Ellis will be addressing these operational works bulk earthworks applications in his statement. There is nothing on application file 4210/08/RAL that I consider will materially add to the matters being addressed by Mr Ellis in relation to the Stage 7 earthworks.

15 - Application No. 4673/08/MCU - Stage 1

61. This is an application lodged on 12 June 2008 for a material change of use in connection with a services trades use (warehouse/storage), being the establishment of an office building and warehouse on Stage 1. The application was determined on 13 November 2008 but the approved use has not been constructed.

62. The area the subject of the approval flooded in 2011. The Commission has not sought information in relation to this application. However, the Citiswich flood and stormwater related issues in relation to the development of Stage 1 are being addressed by Mr Ellis in his statement (applications 7333/06 - Stage 1A and 4264/07 - Stages 1B, C and D).

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16 - Application No. 5242/08/RAL - Stage 2

63. This is an application lodged on 3 July 2008 for the reconfiguration of a lot, being the creation of an easement over Stage 2. The application was determined on 7 November 2008 but the approved easement has not been registered.

64. The area the subject of the application did not flood in 2011. The Commission has sought information in relation to this application (Requirement notice paragraph 6(n)) but the application and the area the subject of the application are not relevant to any Citiswich flood or stormwater related issues. Unless there is some aspect of this application with which I can assist the Commission it appears to be an immaterial application and I do not propose to address it in any further detail in this statement.

17 - Application No. 6568/08/OW - Stage 1

65. This is an operational works application lodged on 15 August 2008 for earthworks in connection with Stage 1 - Archer Street Park area. The application was not determined as it was withdrawn.

66. The lowest point of the site the subject of the application abuts the Bremer River and the highest point of the site is approximately RL16.22. The area the subject of the application flooded in 2011. As it relates to a park area the application appears to be of marginal relevance. However, it is an application in relation to which the Commission has sought additional information (Requirement notice paragraph 5(c)) and being an operational works application, is addressed briefly in the statement of Mr Ellis.

18 - Application No. 7186/08/MCU - Stage 1

67. This is an application lodged on 11 September 2008 for a material change of use in connection with a services/trades use (warehouse/storage) and advertising devices on Stage 1, being the establishment of the Reject Shop. The application was determined on 30 January 2009 and the approved use, the Reject Shop has been constructed.

68. The area the subject of the approval flooded in 2011. The Commission has not sought information in relation to this application. However, the Citiswich flood and stormwater related issues in relation to the development of Stage 1 are being addressed by Mr Ellis in his statement (applications 7333/06 - Stage 1A and 4264/07 - Stages 1B, C and D).

19 - Application No. 8973/08/RAL - Warrego Highway

69. This is an application lodged on 28 November 2008 for the reconfiguration of 2 lots into 3 lots so as to allow for road widening on the southern side of the Warrego Highway. The application was determined on 12 March 2009.

70. The area the subject of the application flooded in 2011. However, the Commission has not sought information in relation to this application and in the context of the Citiswich flood and stormwater related issues it is an immaterial application.

20 - Application No. 9411/08/MCU - Stage 1

71. This is an application lodged on 18 December 2008 for a material change of use in connection with service/trades use (warehouse/storage) and internal works (stormwater drainage works, earthworks, car park and landscaping) on Stage 1, being the establishment of the Australian Pharmaceutical Industries (API) facility. The application was determined on 30 January 2009 and the proposed use, the API facility has been constructed.

72. The area the subject of the application flooded in 2011. The Commission has sought additional information in relation to this application (Requirement notice paragraph 5(d)). It is a relevant application and is discussed in further detail in section 4 of my statement below.

21 - Application No. 9502/08/OW - Stages 2 and 5

73. This is an operational works application lodged on 19 December 2008 for municipal works - roadworks, constituting Link Road, traversing between Stage 2 and Stage 5. The application was determined on 22 October 2010.

74. The area the subject of the application did not flood in 2011. The Commission has sought information in relation to this application (Requirement notice paragraph 5(o)), but in the context of the Citiswich flood and stormwater related issues it is an immaterial application. However, as it has been referred to by the Commission, and being an operational works application, it is addressed briefly in the statement of Mr Ellis.

22 - Application No. 9535/08/MCU - Stage 1

75. This is an application lodged on 23 December 2008 for material change of use and environmentally relevant activity (ERA) in connection with general industry truck depot and ERA 21 (motor vehicle workshop operation) on Stage 1, being the establishment of the Andrew Print Transport (APT). The application is related to the establishment of the API facility (Application 20 above). The application was determined on 12 May 2009 but the use the subject of the approval has not been constructed.

76. The area the subject of the application flooded in 2011. The Commission has not sought information in relation to this application. The flood and stormwater related issues in relation to the development of Stage 1 are being addressed by Mr Ellis in his statement (applications 7333/06 - Stage 1A and 4264/07 - Stages 1B, C and D) and the MCU application in relation to the API facility (application 9411/08) is being further addressed by me in section 4 of my statement below. Accordingly, unless there is some other aspect of this particular application in relation to which I can assist the Commission I do not propose to address it in any further detail in this statement.

23 - Application No. 1227/09/MCU - Stage 1

77. This is an application for material change of use and operational works in connection with a temporary sales office and internal works on Stage 1, being the establishment of a temporary sales office. The application was determined on 9 November 2009 but the approved use has not been constructed.

78. The area within Stage 1 that is the subject of this application did not flood in 2011. The Commission has not sought information in relation to this application and in the context of the Citiswich flooding and stormwater related issues it is an immaterial application.

24 - Application No. 2900/09/RAL - Warrego Highway

79. This is an application lodged on 18 May 2009 for the reconfiguration of 3 lots into 2 lots so as to allow for road resumption on the northern side of the Warrego Highway. This application is the compensatory application to be considered in conjunction with the Warrego Highway road widening application addressed previously (application 9873/08-RAL). The application was determined on 22 July 2010.

80. The area the subject of the application flooded in 2011. However, the Commission has not sought information in relation to this application and in the context of the Citiswich flood and stormwater related issues, it is an immaterial application.

25 - Application No. 3644/09/OW - Stage 1

81. This is an operational works application lodged on 18 June 2009 for internal works (roadworks, drainage works, landscaping, stormwater, water, sewer) in connection with the APT facility - Stage 1 (application 9535/08/MCU).

82. The application has not been determined and has lapsed.

83. The area the subject of the application flooded in 2011. The application not having been determined and having lapsed, is of limited relevance. However, as it is an application in

relation to which the Commission has sought additional information (Requirement notice paragraph 5(b)), and being an operational works application, it is addressed briefly in the statement of Mr Ellis.

26 - Application No. 4319/09/RAL - Stage 2B

84. This is an application lodged on 15 July 2009 for the reconfiguration of 3 lots into 8 industrial lots and a balance lot in Stage 2B. The application was approved on 30 November 2009 for 3 lots into 4 industrial lots and a drainage and balance lot. To date only one lot has been registered from this development permit.

85. The area the subject of this application did not flood in 2011. The Commission has sought additional information in relation to the application (Requirement notice paragraph 5(r)) but the application and the area the subject of the application are not relevant to any Citiswich flood or stormwater related issues. Unless there is some aspect of this application with which I can assist the Commission it appears to be an immaterial application and I do not propose to address it in any further detail in this statement.

27 - Application No. 4496/09/RAL - Stage 2C

86. This is an application lodged on 23 July 2009 for the reconfiguration of 3 lots into 4 lots in Stage 2C for industrial purposes. The application has not been determined and has lapsed.

87. The area the subject of the application did not flood in 2011. The Commission has not sought information in relation to this application and in the context of the Citiswich flood and stormwater related issues it is an immaterial application.

28 - Application No. 5062/09/RAL - Stage 2 - Hoepner Road

88. This is an application lodged 18 on August 2009 for the reconfiguration of a lot for the creation of a road (Stage 2 Hoepner Road). The application was determined on 18 May 2010 and Hoepner Road was constructed.

89. The Hoepner Road area the subject of this application did not flood in 2011. Annexed to my statement and marked **NP-23** is a plan showing the location of the road construction and a 2011 flood map indicating the area of inundation shaded in red. The Commission has sought additional information in relation to this application (Requirement notice paragraph 5(s)) but the application and the area the subject of the application are not relevant to any Citiswich flood or stormwater related issues. Unless there is some aspect of this application with which I can assist the Commission it appears to be an immaterial application and I do not propose to address it in any further detail in this statement.

29 - Application No. 5415/09/CA - Stage 6

90. This is a combined application lodged on 4 September 2009 for reconfiguration of a lot, material change of use and building work. The proposed development relates to the reconfiguration of 4 lots into 122 lots, single residential on a lot not less than 450m², and preliminary approval for building work.

91. The application relates to the residential stage. It was determined on 24 February 2010 and operational works in the nature of sewerage, water, roadworks and earthworks are currently being undertaken. The application relates to an area that did not flood in 2011 and which is located well outside of the 1 in 100 flood line.

92. The Commission has not sought information in relation to this application and in the context of the Citiswich flood and stormwater related issues, it is an immaterial application.

30 - Application No. 7024/09 – Stage 2

93. This is an application lodged on 6 November 2009 for Preliminary Approval in accordance with section 3.1.6 of the IPA and reconfiguring a lot. The Preliminary Approval fundamentally sought to extend the land under the original Bremer Business Park Preliminary Approval (Application 3356/02) for Frame industrial purposes and Community and Commercial purposes into part of the Open Space Sub-Area and to amend the boundary between the Frame Sub-Area and the Community and Commercial Sub-Area to increase the land available for community and commercial purposes.

94. The application was withdrawn on 20 May 2011 and was not determined.

95. The only part of the area the subject of this application to have sustained any inundation in 2011 is an area located within the "green" zone area, which sustained only very slight inundation, limited to the north-east corner of the application area. Annexed to my statement and marked **NP-24** is a location map and 2011 flood map identifying the site the subject of the application and the portion of the site (shaded in red) which sustained inundation in 2011.

96. The Commission has sought information in relation to this application (Requirement notice paragraph 5(p)). However, the application having been withdrawn and the only area the subject of the application to have sustained any inundation in 2011 being located in the Open Space (green) Sub-Area (and then only very minimal inundation), the application and the area the subject of the application are of very limited relevance to any flooding or stormwater related issues. Unless there is some aspect of this application with which I can assist the Commission it appears to be an immaterial application and I do not propose to address it in any further detail in this statement.

31 - Application No. 7509/09/RAL – Stage 2 – Hoepner Road

97. This is an application lodged on 25 November 2009 for the reconfiguration of a lot for the creation of a road (Stage 2 – Hoepner Road). The application was determined on 15 February 2010.

98. As noted in paragraphs 88 and 89 above, and annexure NP-23, the Hoepner Road area did not flood in 2011. The Commission has not sought additional information in relation to this application and in the context of the Citiswich flood and stormwater related issues, it is an immaterial application.

32 - Application No. 7936/09/MCU – Stage 1

99. This is an application lodged on 10 December 2009 for material change of use, environmentally relevant activity and operational works (ERA) in connection with business use (service station), ERA 8 (chemical storage) and internal works on Stage 1, being the establishment of a Caltex Service Station. The application was determined on 31 March 2010 and the proposed use, the Caltex Service Station, has been constructed.

100. The area the subject of the approval flooded in 2011. The Commission has not sought information in relation to this application. However, the Citiswich flood and stormwater related issues in relation to the development of Stage 1, are being addressed by Mr Ellis in his statement (applications 7333/06 – Stage 1A and 4264/07 – Stages 1B, C and D).

33 - Application No. 1261/10/RAL – Stage 1B

101. This is an application lodged on 25 February 2010 for the reconfiguration of a lot, being a subdivision by lease in relation to an area of the Citiswich development known as Stage 1B. The lease area related to a service trades use (warehouse/storage) and was approved by Council on 31 March 2010.

102. At the time of the approval of this application, the building was constructed and occupied by the Reject Shop Distribution Warehouse. The land containing the building and associated car parking manoeuvring and landscaping areas were to be leased to the Reject Shop Distribution Warehouse for a period in excess of 10 years. Due to the nature of the application, stormwater and flooding issues were not considered in the assessment of the application.

103. The area the subject of the application was flooded in 2011 and the Commission has sought additional information in relation to this application (Requirement Notice paragraph 5(a)). However, as noted above, because of the nature of the application, no flooding or stormwater issues were considered in relation to it. Unless there is some aspect of this application with

which I can assist the Commission, it appears to be an immaterial application and I do not propose to address it in any further detail in this statement.

34 - Application No. 1294/10/CA – Stages 6C and 6D

104. This is an application lodged on 26 February 2010 for preliminary approval to affect the planning scheme in accordance with section 242 of the SPA, reconfiguration of a lot and material change of use. The proposal concerns Stages 6C and 6D, within the residential area. It is a proposal for development in accordance with the Residential Density (RL2) Zone of the Ipswich Planning Scheme, the reconfiguration of 3 lots into 110 lots and material change of use being single residential on a lot less than $450m^2$.

105. The application is currently in the information and referral stage of IDAS.

106. The area the subject of the application did not flood in 2011 and is located well outside of the 1 in 100 flood line. The Commission has not sought information in relation to the application and in the context of Citiswich flood and stormwater related issues, it is an immaterial application.

35 - Application No. 1333/10/MCU – Stage 1

107. This is an application lodged on 1 March 2010 for material change of use in connection with general industry (pump assembly/servicing/repair) being the establishment of a pump assembly and repair facility on Stage 1. The application was approved on 1 June 2010 and the proposed use has been constructed.

108. The area the subject of the approval flooded in 2011. The Commission has not sought information in relation to this application. However, the Citiswich flood and stormwater related issues in relation to the development of Stage 1 are being addressed by Mr Ellis in his statement (applications 7333/06 – Stage 1A and 4264/07 – Stages 1B, C and D).

36 - Application No. 2414/10/MCU – Stage 1

109. This is an application lodged on 14 April 2010 for material change of use in connection with general industry (manufacture of cleaning machines), being the establishment of a facility on Stage 1 for the manufacture of cleaning machines. The application was approved on 25 June 2010 and the proposed use has been constructed.

110. The area the subject of the approval flooded in 2011. The Commission has not sought information in relation to this application. However, the Citiswich flood and stormwater related issues in relation to the development of Stage 1 are being addressed by Mr Ellis in his statement (applications 7333/06 – Stage 1A and 4264/07 – Stages 1B, C and D).

37 - Application No. 2560/10 – Stage 4

111. This is an application lodged on 21 April 2010 for preliminary approval to affect the planning scheme in accordance with section 242 of the SPA and for reconfiguring a lot. The proposal concerns Stage 4 and the interface of that stage with the adjoining "green" zone. It in effect seeks approval to override the planning scheme so as to encroach the Frame Sub-Area into the Open Space Sub-Area in accordance with section 242 of SPA, and for the reconfiguration of 3 lots into 17 lots plus parkland.

112. The application is in the information and referral stage of IDAS and has not been determined.

113. Part of the area the subject of the application flooded in 2011. The lowest point of the subject site is approximately RL16.22m AHD. The 2011 flood peaked at approximately RL18.7m AHD.

114. The operational works application for the bulk earthworks for Stage 4 (application 3823/10/OW) is related to this application and is the subject of application No. 38 addressed below. Application 3823/10/OW is an application which respect to which the Commission has sought additional information, and is to be addressed in the statement of Mr Ellis.

115. The Commission has not sought information in relation to this application. It has potential relevance in the context of flood and stormwater related issues. However, it is still in the early stages of consideration and the flooding and stormwater related issues in connection with the development of Stage 4 will be addressed by Mr Ellis. For completeness, I have reviewed the application file and, apart from a supporting "Stormwater Management and Flooding Assessment" by Cardo dated March 2011, a copy of which is annexed to my statement and marked **NP-24A**, it does not contain any flood or stormwater studies specific to this application, or any other information specific to flood or stormwater related issues, additional to that to be addressed by Mr Ellis, that I consider would be of assistance to the Commission.

38 - Application No. 3823/10/OW – Stage 4

116. As noted above, this is an operational works application, lodged on 15 June 2010 for bulk earthworks in connection with Stage 4. The application was determined on 23 July 2010, the plan approved and the works constructed.

117. The site the subject of the application was partially flooded in 2011. The lowest point of the site is approximately RL16.22m and the 2011 flood level was approximately 18.7m. The Commission has sought additional information in relation to this application (Requirement Notice paragraph 5(h)). It is a relevant application and is discussed in further detail in the statement of Mr Ellis.

39 - Application No. 5134/10/RAL – Stage 3

118. This is an application lodged on 5 August 2010 for the reconfiguration of 1 lot into 4 lots plus a balance lot adjoining Bognuda Street in Stage 3A. The application was determined on 2 December 2010 but the lots have not yet been registered.

119. Whilst most of the area the subject of this application is located outside of the area that was flooded in 2011, a small portion of the site, toward the northern end, was flooded, and falls within the 1 in 100 flood line.

120. The Commission has not sought information in relation to this application. At the time of any application for material change of use, following registration of the reconfigured lots, and prior to any development of the lots, relevant conditions as to flooding and stormwater issues will need to be considered for at least the small portion of the site that is potentially flood affected. Annexed to my statement and marked **NP-25** is a plan showing the location of the area the subject of application 5134/10 with the portion of the site which sustained inundation in 2011 shaded in red.

121. However, this application is only of very marginal relevance in the context of the Citiswitch flood and stormwater related issues, and unless there is some aspect of the application in relation to which I can assist the Commission, I do not propose to address it in any further detail in this application.

40 - Application No. 5426/10/OW – Stage 7

122. This is an operational works application, lodged on 13 August 2010 for bulk earthworks in connection with Stage 7. The application was determined on 30 May 2011.

123. The estimated site levels for the area the subject of Stage 7 range from approximately RL0m to RL29m. A substantial proportion of the area was inundated in 2011.

124. The approval of this application included conditions:

(a) precluding fill below the Q20 flood level;

(b) requiring provision of compensatory flood storage volume to be provided for any filling situated between the Q20 development line and Q100 flood level; and

(c) requiring a flood model and detailed drawings to be submitted to Council for approval prior to any earthworks on site detailing the compensatory storage volume.

Solicitor

125. The Commission has sought additional information in relation to this application (Requirement notice paragraph 5(k)). It is a relevant application and is discussed in further detail in the statement of Mr Ellis.

41 - Application No. 5450/10/RAL – Stages 1, 4 and 7

126. This is an application lodged on 16 August 2010 for the reconfiguration of 1 lot into 2 management lots. The subject lot traversed the Warrego Highway. The purpose of the proposed reconfiguration was to convert the lot into 2 lots located on either side of the highway, so that a subsequent application could be made for one of the (new) lots to be removed from the Contaminated Lands Register.

127. The application was approved on 2 February 2011 although the lots have not yet been registered. The site the subject of the application bisected parts of Stages 1, 4 and 7 and was flooded in 2011. However, the application was purely administrative in nature. The Commission has not sought information in relation to this application and in the context of the Citiswitch flood and stormwater related issues, it is an immaterial application.

42 - Application No. 7282/10/OW – Stage 6

128. This is an operational works application lodged on 25 October 2010 for roadworks, stormwater, water infrastructure, drainage works, earthworks, sewerage infrastructure and landscaping in connection with the proposed residential estate in Stage 6. The application was determined on 10 February 2011 and the operational works are currently in progress.

129. The area the subject of the application did not flood in 2011 and is located well outside of the 1 in 100 flood line. The Commission has sought information in relation to this application (Requirement notice paragraph 5(g)), but in the context of Citiswitch flood and stormwater related issues, it is an immaterial application. However, as it has been referred to by the Commission, and being an operational works application, it is addressed briefly in the statement of Mr Ellis.

43 - Application No. 7540/10/OW – Stage 7

130. This is an operational works application lodged on 4 November 2010 for bulk earthworks in relation to Stage 7. The application has not been determined and is in abeyance pending submission by the applicant of a revised flood study.

131. A substantial proportion of the area the subject of Stage 7 flooded in 2011. The Commission has sought additional information in relation to this application (Requirement notice paragraph 5(e)). It is a relevant application and is discussed in further detail in the statement of Mr Ellis.

44 - No. 7606/10/MCU – Stage 1

132. This is an application lodged on 9 November 2010 for material change of use and operational works in connection with services/trades use (6 tenancies), business use – café (1 tenancy), business use – office (1 tenancy) and advertising devices. It essentially concerns an application for warehouse/café/office uses in Stage 1. The application was approved on 25 May 2011 but the proposed use has not yet been constructed.

133. The area the subject of the approval flooded in 2011. The Commission has not sought information in relation to this application. However, it is an application for MCU within a flood affected area approved by Council since January 2011. I consider it may be of assistance to the Commission to provide further information in relation to the application and approval, and the matter is further addressed in section 4 of my statement below.

45 - Application No. 7782/10/MCU – Stage 1

134. This is an application lodged on 16 November 2010 for material change of use and operational works in connection with services/trades use (warehouse/storage) and advertising devices. The application is for the development of a warehouse/storage facility on Stage 1 for use by OneSteel. The application remains in the decision stage and has not yet been determined.

135. The area the subject of the approval flooded in 2011. The Commission has not sought information in relation to this application. However, the Citiswitch flood and stormwater related issues in relation to the development of Stage 1 are being addressed by Mr Ellis in his statement (applications 7333/06 – Stage 1A and 4264/07 – Stages 1B, C and D).

46 - Application No. 8886/10/CA – Stage 2

136. This is an application lodged on 23 December 2010 for preliminary approval to affect the planning scheme in accordance with section 242 of the SPA and for reconfiguring a lot. The proposal in effect involves a preliminary approval to override the planning scheme and reconfigure three (3) lots into seven (7) industrial lots plus two (2) balance lots within Stage 2 of the Citiswitch development, so as to extend the land under the original Bremer Business Park Preliminary Approval (3356/02) for Frame industrial purposes into part of the Open Space (green zone) to increase the land available for industrial purposes.

137. The application remains in the decision stage and has not been determined.

138. A small area the subject of the application sustained some minor inundation in 2011. Attached to my statement and marked **NP-26** is a map identifying the site the subject of the application and showing the small area in the north east portion of the site, shaded in red, that sustained inundation in 2011. There has been no earthworks approval for this part of the Citiswitch

development, and the applicant has only very recently lodged a bulk earthworks application (5478/11) which shows levels ranging between approximately RL16m to RL47m for the Stage 2 area.

139. The Commission has sought additional information in relation to this application (Requirement Notice paragraph 5(t)). It is a relevant application and is discussed in further detail in section 4 of my statement below.

47 - Application No. 3171/11/MCU – Stage 2

140. This is an application lodged on 14 June 2011 for material change of use in connection with business use home improvements store containing bulky goods sales, café, garden centre and shop and services trades use (key cutting) within Stage 2. It relates to the establishment of a Masters Home Improvement Centre.

141. The application remains under consideration and has not been determined.

142. The site the subject of the application did not flood in 2011 and is located well outside of the 1 in 100 flood line. The Commission has sought information in relation to the application (Requirement notice paragraph 5(u)) but the application and the area the subject of the application are not relevant to any Citiswich flood or stormwater related issues. Unless there is some aspect of this application with which I can assist the Commission it appears to be an immaterial application and I do not propose to address it in any further detail in this statement.

Sections 2 and 3 - Conclusion

143. In this section of my statement I have listed a chronology of the applications received by ICC in relation to the Citiswitch site from 2002 up to June 2011. In doing so, I have excluded:

(a) applications merely for advertising devices; and

(b) lapsed or withdrawn applications except as otherwise noted in the chronology.

144. I address in further detail in section 4 of my statement below:

(a) application No. 3356/02 – Commission requirement paragraph 5(f);

(b) application No. 1837/07 – not requested by the Commission;

(c) application No. 9411/08 – Commission requirement paragraph 5(d);

(d) application No. 7606/10 – not requested by the Commission; and

(e) application No. 8866/10 – Commission requirement paragraph 5(t).

145. In the above chronology I have also addressed within my description of each application the remaining MCU and RAL applications referred to in the Commission's requirement notice. Mr Ellis will address in his statement the material operational works applications. These applications concern in particular the applications for bulk earthworks approvals in relation to Stage 1A, Stages 1B, C and D; Stage 4 and Stage 7.

Section 4

Application No. 3356/02

Application Overview

146. I have provided an overview of this application at paragraphs 17-20 and 28-30 of this statement and do not repeat those matters here. The application was lodged on 5 September 2002 and approved by negotiated decision notice on 30 June 2004.

147. The preliminary approval of 30 June 2004 to override the planning scheme established a framework against which future applications for the development of the site would be assessed. At the time of determination of the application the Ipswich Planning Scheme 2004 had just come into effect. However, this application was lodged under the former 1999 planning scheme (non IPA).

148. Attached to my statement are copies of the following documents in relation to this application:

NP-27: Bremer Business Park Development Application - Section F - Engineering Studies - September 2002;

NP-28: ICC Acknowledgement Notice dated 20 September 2002;

NP-29: ICC Information Request dated 23 October 2002;

NP-30: Letter Department of Local Government and Planning to Applicant - Referral Coordination Information Request - 23 October 2002

NP-31: Letter Sinclair Knight Merz (**SKM**) to ICC dated 3 December 2002 and enclosed SKM response to information request;

NP-32: Letter ICC to applicant requesting additional information 11 June 2003;

NP-33: Letter SKM to ICC dated 1 October 2003 in response to additional information request;

NP-34: SKM Open Space Master Plan;

NP-35: SKM Concept Master Plan for Stormwater Quality Management;

NP-36: Letter SKM to ICC dated 19 November 2003 and enclosures.

NP-37: Memorandum Senior Development Engineer to Development Team Coordinator dated 2 April 2004;

NP-38: Memorandum Development Manager to Planning and Development Manager dated 14 April 2004;

NP-39: ICC Development application decision notice dated 30 April 2004;

NP-40: Memorandum Planning & Development Manager to Development Manager dated 15 June 2004;

NP-41: ICC Development application negotiated decision notice dated 6 July 2004.

Question 1(c): The known site levels at the time of the application

149. Council's records indicate that the RL's for the site range from approximately RL1m AHD to approximately RL54m AHD.

Question 1(d): What assessment process was followed specific to flood impacts and stormwater run-off impacts?

150. Under the Council's assessment regime, the development engineers were responsible for the assessment of such matters as flood impacts and stormwater run-off for this application. The development engineer reviewed the application and provided comments to the development planner for the purposes of the assessment.

151. The application required "referral coordination" to the former Department of Local Government and Planning **(DLGP)** in accordance with section 6.1.35C of the IPA. Referral coordination was triggered as the subject land shares a common boundary with the boundary of the Bremer River (i.e. an area of permanent, periodic or intermittent inundation, whether natural or artificial, with water that is static or flowing, fresh, brackish or salt (Item 5, Part 3, Schedule 7 of the IPA).

152. Consequently, an information request was collated by the former DLGP. Additional information was also sought by Council on 23 October 2002 in relation to both issues of flooding and stormwater quality and quantity. In relation to the issue of stormwater, the following information was requested:

Stormwater Information Request dated 23 October 2002

(a) A copy of the relevant data files associated with any flood modelling over the subject sites shall be submitted to Council to assist in the assessment of the application.

(b) Additional information is required for the proposed detention basin/lake strategies as follows:

- Ownership (Council/private);
- Sizing of the detention basin/lake including preliminary hydraulic calculations;
- Location of detention basins with respect to the backwater/primary flow associated with the Q100/Q50 flood event;
- Master plan detailing the timing of the detention basin/lake strategies for various stages of the development;
- Compliance with relevant legislation (e.g. Water Act 2000),
- Maintenance strategies (should encompass an economic analysis).

(c) A demarcation between the primary flow path/back water associated with the Q100/Q50 storm for the Bremer River, Brisbane River and combined flood events shall be established over the site. In addition, the overland flow paths associated with the Q100/Q50 storm shall be shown on the development plan.

(d) The development of the land would impact on the Warrego Highway that is under the jurisdiction of the Department of Main Roads. To this end an assessment of flooding/drainage impacts on the highway shall be undertaken and the outcomes of such an assessment shall be satisfactory to the DMR.

(e) Bulk earthworks (including excavation and filling) within primary flow paths and backwater areas shall be clearly identified on the development plan. All proposed earthworks within floodable areas shall be assessed via hydraulic modelling to determine any detrimental affects to upstream, downstream and adjacent properties.

(f) A flood/drainage master study shall be undertaken of the entire development and shall clearly detail how each proposed stage of the development will link and integrate with further stages.

(g) A detailed water quality assessment (see Stormwater Quality below) shall be undertaken for the entire development which shall clearly identify water quality objectives and proposed mechanisms to achieve these objectives. The assessment shall clearly detail how each proposed stage of the development will link and integrate with future stages.

(h) Supporting information including plans, cross sections and assumptions shall be submitted with the studies/assessments.

153. The Applicant responded to this request on 3 December 2002. The response did not sufficiently address all of Council's issues and following a meeting with the applicant further information was requested by Council in a letter to the applicant dated 11 June 2003.

154. On 1 October 2003, the applicant responded to this request. The response included provision of a SKM Concept Plan for Stormwater Quality Management. Additional information was provided by the applicant on 19 November 2003.

155. On 14 April 2004 an impact assessment report was prepared by the Development Manager, informed by an engineering assessment report dated 2 April 2004, which assessed the proposal against the Planning Scheme Policy for Flood Liable or Drainage Problem Land. The engineering report recommended a number of conditions to be included to address the issues of flooding and stormwater.

156. On 30 April 2004 Council approved the application subject to conditions. Condition 18 specifically addressed Stormwater, as detailed below:

Stormwater Conditions of Approval

157. Stormwater

(a) The developer shall provide all necessary stormwater drainage (both internal and external to the development) and such drainage works (except for roofwater systems) shall be designed and constructed in accordance with QUDM such that the overall drainage system caters for a storm event with an ARI of 100 years.

Overland flow paths shall be suitably designed to cater for the water from a storm event with an ARI of 100 years. In the case where the piped system is carrying part of the flow, the overland flow paths shall be designed to cater for that volume which is represented by the difference between the predicted volume from the storm event with an ARI of 100 years and the capacity of the pipe system, noting the requirements of QUDM.

Solicitor

(b) All stormwater flows within and adjacent to the Bremer Business Park Area, other than inter-allotment drainage, shall be confined to dedicated roads, drainage reserves, registered drainage easements or within parkland. The registered drainage easements, if related to piped drainage, shall be centrally located over such underground pipe system and shall be not less than 4.0 m wide, except for drainage easements required for side boundaries which may be 3.0 m wide where approved by the Senior Development Engineer. In addition, the easements shall be of suitable width to contain the predicted overland flow from the storm event with an ARI of 100 years in that location.

(c) No ponding or redirection of stormwater shall occur onto adjoining land unless specifically approved by Council in consultation with the owner of the adjoining land.

(d) Due consideration shall be given in these and future designs and construction of the development in relation to the effect of the developed catchment flows on the downstream discharge receival areas. Suitable stormwater control devices are to be provided to ensure that there is no increase in flows in watercourses. Such control devices are to be designed so as to integrate the landscaping, recreational, infrastructural and drainage roles of watercourses.

(e) Each proposed residential, commercial and/or industrial allotment shall be designed to comply with QUDM, Council's standards and the New Ipswich City Planning Scheme, including unimpeded access to a road system which is also above the design flood level.

(f) There shall be no filling or removal of material in the flood area below the flood level associated with an ARI of 100 years without the approval of the Senior Development Engineer. There shall be minimal disturbance to vegetation in the flood area, unless prior written approval is obtained from Council.

(g) Filling in proposed Lots, which are adjacent to the watercourse shown on the proposal plan, shall not be undertaken without the written approval of Council.

158. On 6 July 2004 Council approved a negotiated decision notice for the application. The issues of stormwater and flooding were not the subject of the request for a negotiated decision.

Question 2: Known Q100 and Q20 flood levels of surrounding, upstream, downstream and opposite properties:

(a) at around the time of the development application;

(b) at the present day.

159. The known flood levels of surrounding properties, located upstream, downstream or on the opposite side of the Bremer River to the Citiswich Site, by reference to the Council's flood regulation levels, both at around the time of this application and as at today are:

(a) 1 in 20 development line: 13.3m AHD as at the time of the application and as at today;

(b) 1 in 100 flood line: 18.3m AHD as at the time of the application and 16.2m AHD as at today.

Question 3: What consideration was given to:

(a) proximity of the Citiswich site to the Bremer River;

(b) the site's flood risk or the potential impact of flooding on the proposed use;

(c) the frequency of past flooding at the site and surrounding properties, including Karalee;

(d) the potential for surrounding, upstream, downstream or opposite properties to be at greater risk of flooding due to:

(i) land filling or excavation at Citiswich;

(ii) the impact of any stormwater or overland flow management facilities servicing Citiswich.

(a) Proximity of the site to the Bremer River

160. Consideration was given to the site's proximity to the Bremer River and to the Brisbane River. The site is immediately adjacent to the Bremer River. It can also be impacted by backwater flooding from the Brisbane River.

161. As to a Brisbane River flood, the site floods when water levels in the Brisbane River rise and back up into the Bremer River. This creates higher water levels as the Bremer River acts as a backwater and forms a standing pool.

162. As to a Bremer River flood, the site may flood when the Brisbane River is not in flood. This creates lower flood levels as the floodwater is free to discharge out of the Bremer River system and is not backed up. However, a Bremer River flood has higher velocities and is dependant on the conveyance of the river channel to pass the flood to the Brisbane River confluence.

(b) The site's flood risk or the potential impact of flooding on the proposed use

163. The site's flood risk and the potential impact of floods on the proposed use was addressed by Council as detailed in my response to Question 1(d) above.

(c) The frequency of past flooding at the site and surrounding properties, including Karalee

164. It is my understanding that the frequency with which flooding has occurred at this site in the past was a policy consideration in the formulation of the 1-in-100 flood line. This flood line, as it relates to the site, was applied in considering the application. Historical river heights in relation to the site and surrounding properties, including at the suburb of Karalee, were not obtained for the purpose of considering the application, the relevant policy consideration for those purposes being the location of the 1 in 100 flood line.

(d) The potential for surrounding, upstream, downstream or opposite properties to be at greater risk of flooding due to:

(i) land filling or excavation at Citiswich

(ii) the impact of any stormwater or overland flow management facilities servicing Citiswich.

165. The application detailed that all earthworks on the site would be compensatory. However, approval of this application did not authorise any development to occur, and actual approvals for land filling or excavation works would be considered in the subsequent reconfiguring a lot/operational works development permit approval stages of the development.

166. The application and supporting Concept Master Plan for Stormwater Quality Management proposed achievement of a "no worsening" affect in terms of stormwater and that developed conditions flows be mitigated to existing conditions flows for each subcatchment by the placement of detention basins at various locations.

Question 4:

(a) Was the application assessed against the earthworks code contained within the Ipswich Planning Scheme and if so, how;

Solicitor

(b) **Were any measures proposed to mitigate the potential for flooding at the Citiswich site and, if so, briefly describe these measures;**

(c) **What expert reports were obtained or received by Council for the purpose of assessing the potential impact of flooding at the Citiswich site and on surrounding properties, how did Council assess the adequacy of these reports and what reliance was placed on them;**

(d) **Did Council seek additional information from the applicant about the potential flood and/or stormwater run-off impacts of the proposed development;**

(e) **What conditions were imposed on the development to address the impacts of flooding.**

(a) **Was the application assessed against the earthworks code**

167. The application was not assessed against the earthworks code. The application was lodged prior to the commencement of the IPA scheme which included the earthworks code referred to. In addition, no earthworks were applied for as part of the application. Notwithstanding this, the preliminary approval document called up the tables from the IPA Planning Scheme to allow future development, where relevant, to be assessed against the earthworks code. Preliminary earthworks concepts were submitted as part of the application, as discussed in my response to Question 4(c) below.

(b) **Were any measures proposed to mitigate the potential for flooding at the Citiswich site and, if so, briefly describe these measures**

168. At the time this application was being considered, the following measures were proposed to mitigate the potential for flooding at the Citiswich Site:

- no earthworks below the 1 in 100 flood line and all earthworks on the site would be compensatory; and
- the placement of "off-stream" detention basins.

(c) **What expert reports were obtained or received by Council for the purpose of assessing the potential impact of flooding at the Citiswich site and on surrounding properties, how did Council assess the adequacy of these reports and what reliance was placed on them**

169. The following reports have been identified in Council's records management system in relation to the application:

(a) "Development Application Volume F: Engineering Studies – Flooding", dated September 2002 and prepared by SKM.

- This report was prepared on behalf of the applicant and formed part of the initial application material.
- This report details that no earthworks were proposed below the 1 in 100 flood line and that all earthworks on the site would be compensatory.
- This report details to achieve a "no worsening" affect in terms of stormwater as a result of ultimate development that 'offstream' detention basins are supported.
- Section 3.2.1 Brisbane River Flood states "The Brisbane River flood backs up through the site. The water ponds and is very slow moving. To ensure that this flood level is not increased, the development must not fill areas of the floodplain without providing complimentary areas of excavation." Further the report states "there is more volume available on the floodplain in the developed case than the existing case.....On this basis , the development should not increase flood levels generated by the Brisbane River flood mechanism".
- Section 3.2.2 Bremer River Flood states "The Bremer River design flood events produce lower flood levels than the Brisbane River floods however, the flow has higher velocity and relies on the conveyance of the channel and floodplain. To ensure that the development has no impact of flood levels, the cross sectional area of the channel and flood plain should not be reduced by development. If encroachment occurs, it should be limited and tested to find potential for increasing flood levels within the site and in adjacent land." The report concludes that the development is not likely to cause detrimental impacts on the flood levels and will provide adequate flood immunity for the proposed land use.

(b) "Response to Council Issues – Concept Master Plan for Stormwater Quality Management", dated September 2003 and prepared by SKM.

- This report was prepared on behalf of the applicant and formed of a further response to Council issues during the assessment process.

- This report provided a framework for stormwater management (for both quality and quantity) for the site.
- This report concludes:
  - Developed conditions flows can be mitigated to existing conditions flows for each sub-catchment by placement of detention basins at various locations.
  - Detention basin sizes and locations presented in this report are preliminary and should be considered indicative. The construction of the detention basins identified is considered to be feasible based on the data available at this stage of the site's development. Final detention basin sizing's and locations should be undertaken as part of the detailed design.

170. Council relied on the content of these reports as part of its assessment of the application and consideration of conditions to be imposed in relation to the application. A detailed review of the reports was undertaken by the Council's development engineer and it is as a result of this review that conditions were formulated for the purposes of the Council's decision notice. However, I defer to the knowledge and experience of the Council's development engineers as to Council's assessment of the adequacy of the expert reports.

(d) Did Council seek additional information from the applicant about the potential flood and/or stormwater run-off impacts of the proposed development

171. Council did seek additional information from the applicant about the potential flood and stormwater run-off impacts of the proposed development, as detailed in my response to Question 1(d) above. Further information was requested as the site was affected by the 1 in 20 development line, 1 in 100 flood line, was located adjacent to the Bremer River and was of a large scale.

(e) What conditions were imposed on the development to address the impacts of flooding

172. As previously noted this approval did not authorise any development to occur, only setting a mechanism against which future development would be assessed. This mechanism called up the assessment tables from Council's IPA Planning Scheme. Additionally, some general conditions were also imposed in relation to stormwater, as detailed in my response to Question 1(d) above.

Solicitor

Application No. 1837/07

Application Overview

173. I have provided an overview of this application at paragraphs 41-42 of this statement. The application was lodged on 12 March 2007 for the reconfiguration of a lot (3) lots into (28) industrial lots plus balance lot in four sub-stages over the area of land known as Stage 1 of the Citiswitch development.

174. The application was approved subject to conditions on 28 April 2008, and was then subject to a negotiated decision notice on 3 July 2008. The Council approved 25 lots and a balance lot, with a condition imposed to amalgamate three of the proposed lots (lots 15, 16 and 17) to provide for the future overpass from this site to the northern side of the Warrego Highway. Attached to my statement and marked **NP-42** is a copy of the approved plan for application 1837/07.

175. Attached to my statement are copies of the following documents in relation to this application:

NP-43: Cardno - Bremer Business Park Master Plan - Flooding Investigation (included with application) - March 2007;

NP-44: ICC Information Request to applicant dated 25 May 2007;

NP-45: Department of Local Government, Planning, Sport and Recreation to Walker Corporation (Referral Coordination Information Request) - 13 July 2007;

NP-46: Planning Initiatives (on behalf of the applicant) letter to ICC dated 3 August 2007 in response to Information Request;

NP-47: Cardno Bremer Business Park - Stage 1 - Stormwater Management Strategy Report - August 2007;

NP-48: Letter Department of Natural Resources and Water to ICC dated 10 August 2007 - Referring Agency response;

NP-49: Engineering Department Assessment Memorandum dated 15 April 2008;

NP-50: Memorandum Acting Assistance Development Manager to Acting Development Manager - 21 April 2008;

NP-51: ICC Assessment Checklist - Code Assessable Assessment;

NP-52: Development Application Decision Notice dated 22 April 2008;

NP-53: Memorandum Assistant Development Planner to Development Team Coordinator re Negotiated Decision Notice request dated 3 June 2008;

NP-54: ICC Negotiated Decision Notice dated 8 July 2008.

Question 1(c): The known site levels at the time of the application

176. The levels on the approved bulk earthworks plans associated with the reconfiguring a lot application indicate the site levels ranged from RL15.3m AHD to RL19m AHD.

Question 1(d): What assessment process was followed specific to flood impacts and stormwater run-off impacts

177. In accordance with ICC's standard development application assessment process, as detailed in the statement of Ms Joanne Pocock dated 7 October 2011, the issues of flood and stormwater run-off impacts were referred to the Council's Development Engineer for assessment.

178. On 25 May 2007 ICC issued an Information Request to the applicant seeking, among other matters, additional information as to Earthworks, Flooding and Stormwater Quality and Quantity issues. The specific matters raised by the Council Information Request were:

Council's Information Request

179. Earthworks

The Applicant is requested to provide details of the proposed earthworks for the subject property including cut/fill depths, batter slopes, retaining walls, typical cross section (particularly where adjoining roads) etc.

The Applicant shall note the following:

(i) fill shall not exceed a maximum height of 2.0 metres;

(ii) retaining walls shall not exceed a maximum height of 1.2 metres with 1 : 4 batters from the top and toe of the wall, unless it can be demonstrated to the Council's Senior Development Engineer's reasonable satisfaction that a greater height is acceptable; and

(iii) there shall be no fill under the 1:20 development line.

180. Flooding

(a) The flood investigation report prepared by Cardno Lawson Treloar dated March 2007 appears to not adequately address the impact on flood levels by the proposed development. The Applicant is requested to submit a subsequent flood investigation report which addresses the following:

(i) calibration for the hydrologic model WBNM and justification of the model's design flow results;

(ii) the hydrologic modelling 'pre-development' or existing scenario assumed that the entire external catchments are fully developed, however this is not the case. The Applicant is requested to identify the effect up to the time the entire external catchment is fully developed; and

(iii) the flooding investigation report has indicated that there is no impact on the flood levels for surrounding properties, however there are concerns that this information is not accurate considering the significant amount of fill proposed on the site without any compensatory earth works. The proposed filling is expected to reduce the conveyance of the river and is expected to have significant afflux to the Bremer River only flood as well as Brisbane River flood by back water. There are existing properties located on the northern side of the Bremer River opposite the subject site, which are affected by the regional Q20 floods. The Applicant is requested to provide detailed justification of the findings of the flood investigation report.

(b) The Applicant is also requested to demonstrate that the proposed fill does not compromise the existing flood immunity of the Warrego Highway.

181. Stormwater Quality and Quantity

(a) It is understood, further to discussions held between Hamish Pressland of Walker Corporation, the Healthy Waterways Partnership and Ipswich City Council with respect to the development of the Memorandum of Understanding (MOU), it was agreed in principle that a professional review of stormwater treatment reports is to be undertaken at the expense of the Partnership. The Applicant is requested to

confirm that the relevant reports have been sent to the Partnership for review. A copy of the response is requested to be lodged prior to the decision making period.

(b) The Applicant is requested to provide a schedule which outlines the implementation timing of the regional water quality treatment measures associated with each stage as conceptually outlined in the Stormwater Management Strategy Overall Site Master Plan.

(c) The Applicant is requested to provide an individual stage detailed stormwater management plan in accordance with the Stormwater Management Strategy Overall Site Master Plan. The plan shall address the following:

(i) treatment of both public and private land with separate treatment trains for each use;

(ii) detailed design options which clarify the extent of treatment required (e.g. size of bioretention cells) relative to each industrial site; and

(iii) a range of options consistent with the Fact Sheet 3: WSUD in Industrial Areas (Healthy Waterways 2007).

Note: Sufficient detail should be provided so that further stormwater plans are not required for individual industrial lots unless the future Applicants of those lots wish to depart from the strategy outlined. This requirement should be outlined in the report.

A copy of the MUSIC sqz. file is requested for ease of assessment for both the Stormwater Management Strategy Overall Site Master Plan and for each of the stage-based reports.

182. Buffering to Warrego Highway

(a) The Applicant is requested to demonstrate (via Building Location Envelopes) the developable portion of the lots adjacent to the Warrego Highway taking into account setbacks and landscape buffers from the highway and the internal road.

(b) The Applicant is requested to provide a cross section of the Warrego Highway, the landscape buffer, the lots and the internal road.

183. As the application involved three or more concurrence agencies, it also required "referral coordination" by the former Department of Local Government and Planning (DLGP) in accordance with the IPA. As a result an Information Request was collated by the former DLGP and issued to the applicant on 13 July 2007. This request included the additional information sought by ICC.

184. By letter dated 2 August 2007 the applicant (by its consultants) responded to the Information Request. This response included updated information as to the flooding and stormwater quality and quantity issues, and included a Cardno Bremer Business Park - Stage 1 Stormwater Management Strategy to Support ROL Development Application dated August 2007.

185. By Memorandum dated 21 April 2008 I, as the Acting Assistant Development Manager - Planning provided the Acting Development Manager with a Code Assessment report in relation to the application, informed by an ICC Engineering Assessment which assessed the application against the Ipswich Planning Scheme 2006. This memorandum included the completed ICC assessment checklist - code assessable development for the application.

186. On 22 April 2008 Council approved the application subject to Stormwater Quantity and Erosion and Silt Management conditions. Subsequently, on 8 July 2008 Council approved a negotiated decision notice for the application, but the original conditions for the Stormwater Quantity and Erosion and Silt Management remained unchanged.

Question 2: Known Q100 and Q20 flood levels of surrounding, upstream, downstream and opposite properties:

(a) **at around the time of the development application;**

(b) **at the present day.**

187. The known flood levels of surrounding properties, located upstream, downstream or on the opposite side of the Bremer River to the Citiswich site, by reference to the Council's flood regulation levels, both at around the time of this application and as at today are:

(a) 1 in 20 development line: 13.3m AHD

(b) 1 in 100 flood line: 16.2m AHD.

Question 3: What consideration was given to:

(a) **proximity of the Citiswich site to the Bremer River;**

(b) **the site's flood risk or the potential impact of flooding on the proposed use;**

(c) **the frequency of past flooding at the site and surrounding properties, including Karalee;**

(d) **the potential for surrounding, upstream, downstream or opposite properties to be at greater risk of flooding due to:'**

(i) **land filling or excavation at Citiswich;**

(ii) **the impact of any stormwater or overland flow management facilities servicing Citiswich.**

(a) **Proximity of the site to the Bremer River**

188. Consideration was given to the site's proximity to the Bremer River as detailed in the flooding and stormwater management reports obtained in connection with the application. Following consideration of these reports, conditions were imposed in relation to stormwater quantity and erosion and silt management so as to ensure no adverse impact from the proposed development on the Bremer River.

(b) **The site's flood risk or the potential impact of floods on the proposed use**

189. Consideration was given to the site's flood risk or the potential impact of flooding on the proposed use. It was proposed by the applicant that lots would be filled where applicable to achieve immunity above the 1 in 100 flood line. Notwithstanding this proposal the issue of fill was assessed and approved as part of a subsequent operational works application for this site.

(c) **The frequency of past flooding at the site and surrounding properties including Karalee**

190. It is my understanding that the frequency with which flooding has occurred at this site in the past was a policy consideration in the formulation of the 1 in 100 flood line. This flood line, as it relates to the site, was applied in considering the application. Historical river heights in relation to the site and surrounding properties, including at the suburb of Karalee, were not obtained for the purpose of considering the application, the relevant policy consideration for those purposes being the location of the 1 in 100 flood line.

(d) **The potential for surrounding, upstream, downstream or opposite properties to be at greater risk of flooding due to:**

(i) **land filling or excavation at Citiswich**

(ii) **the impact of any stormwater or overland flow management facilities servicing Citiswich.**

Solicitor

191. Although as a reconfiguration of a lot application this application did not actually approve any earthworks (this was the subject of subsequent operational works applications), reporting was submitted to Council in support of undertaking earthworks and stormwater works to achieve flood immunity for lots from the 1 in 100 flood event and from stormwater run-off from proposed development. The expert reporting detailed that the proposed works would not have any flooding impact outside of the site.

Question 4:

(a) Was the application assessed against the earthworks code contained within the Ipswich Planning Scheme and if so, how;

(b) Were any measures proposed to mitigate the potential for flooding at the Citiswich site and, if so, briefly describe these measures;

(c) What expert reports were obtained or received by Council for the purpose of assessing the potential impact of flooding at the Citiswich site and on surrounding properties, how did Council assess the adequacy of these reports and what reliance was placed on them;

(d) Did Council seek additional information from the applicant about the potential flood and/or stormwater run-off impacts of the proposed development;

(e) What conditions were imposed on the development to address the impacts of flooding

(a) Was the application assessed against the earthworks code

192. The engineering report obtained in relation to the application does not identify that the application was assessed against the earthworks code. I understand this is because the actual earthworks in relation to this site were the subject of a subsequent application.

(b) Were any measures proposed to mitigate the potential for flooding at the Citiswich site and, if so, briefly describe these measures

193. It was proposed by the applicant that lots would be filled where applicable to achieve immunity above the 1 in 100 flood line. Notwithstanding this proposal, the fill was actually approved as part of subsequent operational works applications. In addition, stormwater management reports detailed measures to be imposed to ensure that there were no impacts outside of the site as a result of the proposed development.

(c) **What expert reports were obtained or received by Council for the purpose of assessing the potential impact of flooding at the Citiswich site and on surrounding properties, how did Council assess the adequacy of these reports and what reliance was placed on them**

194. Council obtained or received the following expert reports:

(a) "Bremer Business Park Masterplan – Flooding Investigation", dated March 2007 and prepared by Cardno Lawson Treloar.

(i) This report was prepared on behalf of the applicant and formed part of the initial application made to Council.

(ii) This report provided details on a masterplan flood assessment for the proposed Bremer Business Park in support of the overall proposed development. It was proposed to fill some lots to achieve ARI 100 year flood immunity during a major river flood event. It was proposed to maintain existing natural gullies on site and provide any appropriate detention and stabilisation works to ensure no averse impacts occur.

(iii) This report concludes the influence of filling in the floodplain will have no adverse flood impacts external to the site and will not increase peak flows into the Bremer River.

(b) "Bremer Business Park –Stage 1 – Stormwater Management Strategy to Support RAL Development Application", dated August 2007 and prepared by Cardno Lawson Treloar.

(i) This report was prepared on behalf of the applicant and formed part of the applicant's response to Council's information request.

(ii) This report provided details on a stormwater management strategy , including local flooding for Stage 1 for the Bremer Business Park. This report refines the assessment of the above report and provides additional details for the proposed stormwater management requirements specifically relating to Stage 1.

(iii) The report details that this report is the first instalment of the planned stage by stage reports for the site and as the site development progresses, it is planned that individual stage by stage (or series of stages combined) reports will be prepared as part of the detailed design to support subsequent applications.

(iv) This report concludes the local hydraulic and hydrologic assessment has indicated that within the western tributary the proposed Stage 1 development will cause a minor increase in the predicted peak flows. This predicted increase in flows causes an increase in the flood levels within the tributary. These increases are within the site and below the proposed fill level for the development pad.

195. These reports were provided by the applicant firstly in support of the application (March 2007 report) and subsequently in response to issues raised by Council and the former DLGP in the Information Requests issued to the applicant (August 2007 report). Council relied on the content of these reports as part of its assessment of the application and consideration of conditions to be imposed in relation to the application. A detailed review of the reports was undertaken by the Council's development engineer and it is as a result of this review that conditions were formulated for the purposes of the Council's decision notice.

196. The expert reports were provided by Cardno Lawson Treloar, who are experienced and reputable consultants. To the best of my knowledge the report is authored, reviewed and approved by RPEQ's who are suitably qualified and experienced. However, I defer to the knowledge and experience of the Council's Development Engineers as to how Council assess the adequacy of the expert reports.

(d) Did Council seek additional information from the applicant about the potential flood and/or stormwater run-off impacts of the proposed development

197. Council did seek additional information from the applicant about the potential flood and stormwater run-off impacts of the proposed development, as detailed in my response to question 1(d) above.

(e) What conditions were imposed on the development to address the impacts of flooding

198. The following conditions were imposed on the development to address the impacts of stormwater quantity and erosion & silt management:

Conditions from Council's Decision Notice

199. Plan of Survey

(a) Easements required for discharge of stormwater over adjacent land shall be agreed to in writing by the owner of the subject land prior to construction work commencing.

(b) Easements shall be centrally located over the alignment of stormwater paths and be of a width sufficient to encompass the overland flow from a storm event with an ARI of 100 years.

(c) Easements shall be of sufficient width to contain any fitting, access chamber etc located on stormwater drains, water mains, and sewerage rising mains.

(d) Land required for detention basins or equivalent are to be dedicated as drainage reserve in favour of Council and not included within parkland dedication unless approved as parkland by Council.

200. Stormwater Quantity

(a) The developer shall provide all necessary stormwater drainage (both internal and external to the development) and such drainage works (except for roofwater systems) shall be designed and constructed in accordance with QUDM such that the overall drainage system caters for a storm event with an ARI of 100 years.

Overland flow paths shall be suitably designed to cater for the water from a storm event with an ARI of 100 years. In the case where the piped system is carrying part of the flow, the overland flow paths shall be designed to cater for that volume which is represented by the difference between the predicted volume from the storm event with an ARI of 100 years and the capacity of the pipe system, noting the requirements of QUDM.

(b) All stormwater flows within and adjacent to the Citiswich Area, other than inter-allotment drainage, shall be confined to dedicated roads, drainage reserves, registered drainage easements or within parkland. The registered drainage easements, if related to piped drainage, shall be centrally located over such underground pipe system and shall be not less than 4.0 m wide, except for drainage easements required for side boundaries which may be 3.0 m wide where approved by the Senior Development Engineer. In addition, the easements shall be of suitable width to contain the predicted overland flow from the storm event with an ARI of 100 years in that location.

(c) No ponding, concentration or redirection of stormwater shall occur onto adjoining land unless specifically approved by Council in consultation with the owner of the adjoining land.

Solicitor

(d) Due consideration shall be given in these and future designs and construction of the development in relation to the effect of the developed catchment flows on the downstream discharge receival areas. Suitable stormwater control devices are to be provided to ensure that there is no increase in flows in watercourses. Such control devices are to be designed so as to integrate the landscaping, recreational, infrastructural and drainage roles of watercourses. Notably the development shall limit the post-development peak one-year Average Recurrence Interval (ARI) event discharge to the receiving waterway to the pre-development peak one-year ARI discharge. Analysis of pre-development catchment hydrology shall assume current level of development rather than fully developed upstream catchment.

(e) There shall be no filling or removal of material in the flood area below the development flood line associated with an ARI of 20 years. There shall be minimal disturbance to vegetation in the flood area, unless prior written approval is obtained from Council.

(f) Filling in proposed Lots, which are adjacent to the watercourse shown on the proposal plan, shall not be undertaken without the written approval of Council.

(g) A suitable roofwater system shall be designed in accordance with QUDM, for allotments that do not have adequate fall from within the allotment to the design invert level of the kerb and channel or access to lawful discharge point. The design is to be to a minimum Level V in QUDM.

201. Erosion & Silt Management

(a) The Developer shall prepare an Erosion and Sediment Control Plan (ESCP). The ESCP is to incorporate detailed drawings and a management plan which are to be continually revised subject to Council instruction, site conditions and different development stages particularly during the earthworks stage. Where any amendments are required further approval shall be received from Council. The Developer shall be responsible for the installation and maintenance of silt management facilities from the time of commencement of construction until the development has been released "Off Maintenance". All silt management facilities are to be in accordance with the document "Soil Erosion and Sediment Control" published by the Institution of Engineers Australia, or equivalent.

(b) A completed copy of the Brisbane City Council Erosion Hazard Assessment Checklist shall be submitted and used as the basis for determining appropriate erosion and sediment control measures.

(c) The design of sediment basins shall be in accordance with the current version of the Brisbane City Council Sediment Basin Design Construction and Maintenance Guidelines. The Developer shall lodge the detailed calculations as required by steps 1-16 of Section 2 - *Design Procedure* along with detailed drawings.

(d) A Water Quality Testing strategy including the testing of baseline shall be undertaken as part of the ESCP.

(e) The ESCP shall be a flexible document which is designed to adapt to the staging of construction works.

(f) Suitable permanent stabilisation works will be required at stormwater outlets, above and below the culvert. Dumped rock will need to be pocket planted and a layer of geofabric laid below the rocks.

(g) Particular attention should be paid to batters around culverts and stormwater outlets with the aim to minimise to the greatest possible extent the slope of adjacent batters.

(h) All lots shall be 90% grassed prior to civil works being accepted off-maintenance and prior to signing the plan of survey.

(i) Silt traps shall be sited upstream from any park or reserve area discharge point preferably on land comprising future allotments, such that no silt impinges on the park or reserve areas. The silt trap areas may be phased out after the development work is complete and adequate grass cover is obtained.

(j) Diversion drains and ponds, as necessary, shall be installed on the site before any other work is undertaken on site to ensure that "dirty water" is contained and/or isolated.

(k) A procedure shall be submitted with the engineering drawings for approval for maintaining the facilities, setting out the frequency of attention, with inspections to be made after each significant rainfall event.

Solicitor

(l) Council reserves the right to enter the site for the purpose of rectifying any silt management facilities which it deems to be inadequate, improperly maintained or not operating in a satisfactory manner.

(m) The Developer shall lodge a $10, 000 siltation and erosion performance bond with Council, prior to the commencement of works, which shall only be released by Council at the termination of the maintenance period. Where Council determines that a draw-down of the bond is required, the Developer shall restore the bond to its full amount within 10 days of a notice from Council to that effect. Such bond shall guarantee adequate performance in the circumstances (i) and (ii) below:

(i) In the event that instructions issued to the Consulting Engineer by the Senior Development Engineer for the installation of erosion control measures, are not complied with within 24 hours, Council will call upon the bond to the extent required to carry out the necessary works.

(ii) If the Senior Development Engineer determines that silt damage has occurred on the site, or the downstream drainage system has become silted, the Developer shall be responsible for restoration. Such restoration shall be completed in the time determined by the Senior Development Engineer.

Should the Developer fail to complete the works determined by the Senior Development Engineer within the specified time, Council shall complete the work and recover all costs from the Developer associated with that work.

Application 9411 of 08

Application overview

202. I have provided an overview of this application at paragraph 71 of my statement. The application was lodged on 18 December 2008 and approved on 30 January 2009. The application was for a material change of use (development permit) for a service trades use (warehouse) and associated operational works (development permit) for stormwater, drainage works, earthworks, car park and landscaping. The total building area for the development is approximately 19,000m2. The development is known as "Australian Pharmaceutical Industries (**API**) and is located within a part of an area known as Stage 1C of the Citiswich site.

203. Attached to my statement are copies of the following documents in relation to this application:

NP-55: Martin Cosgrove & Associates Stormwater Management Report dated 17 December 2008;

NP-56: Assessment Manager Acknowledgement Notice dated 23 December 2008;

NP-57: Letter Walker Corporation Pty Ltd to ICC dated 20 January 2009;

NP-58: Martin Cosgrove & Associates Pty Ltd Stormwater Management Report dated 19 January 2009;

NP-59: Memorandum from Engineering & Environment Manager dated 22 January 2009 and attached engineering conditions dated 23 January 2009;

NP-60: Memorandum assistant planner (development) to Development Team Coordinator dated 28 January 2009;

NP-61: ICC Assessment Checklist – code assessable development dated 30 January 2009;

NP-62: ICC Decision Notice dated 30 January 2009.

Question 1c: The known site levels at the time of the application

204. Council's records indicate that RL's for this site range from approximately RL16.90m AHD to approximately RL17.50m AHD.

Question 1d: Did Council seek additional information from the applicant about the potential flood and/or stormwater run-off impacts of the proposed development.

205. As previously discussed, Council's development engineers were responsible for the assessment of such matters as flood impacts and stormwater run-off.

206. Following receipt of the application, a non-statutory information request was made by Council on 16 January 2009 requesting further information with respect to:

- cross sections of proposed earthworks; and
- detailed hydraulic calculations that support the applicant's stormwater design drawings. Council requested that the design and calculations be adjusted to allow for 300mm of extended detention and not 400mm.

207. The applicant responded to the information request on 20 January 2009 and included as part of its response a revised Stormwater Management Report dated 19 January 2009.

solicitor

208. On 28 January 2009, a report was prepared by the assistant planner (development) for the development team coordinator in relation to the proposal, informed by an engineering assessment report dated 22 January 2009 which assessed the application against the Ipswich Planning Scheme 2006 and related engineering conditions.

209. On 30 January 2009, Council approved the application subject to stormwater and erosion and silt management conditions and required that development occur in accordance with the proposed earthworks plans and stormwater management report.

Question 2: The known Q100 and Q20 flood levels

210. The known flood levels of surrounding properties, located upstream, downstream or on the opposite side of the Bremer River to the Citiswich site, by reference to the Council's flood regulation levels both at around the time of this application and as at today are:

(a) 1 in 20 development line: 13.3m AHD;

(b) 1 in 100 flood line: 16.2m AHD.

Question 3: What consideration was given to:

(a) proximity of the Citiswich site to the Bremer River;

(b) the site's flood risk or the potential impact of flooding on the proposed use;

(c) the frequency of past flooding at the site and surrounding properties, including Karalee;

(d) the potential for surrounding, upstream, downstream or opposite properties to be at greater risk of flooding due to:

(i) land filling or excavation at Citiswich;

(ii) the impact of any stormwater or overland flow management facilities servicing Citiswich.

(a) Proximity of the site to the Bremer River

211. As part of the assessment of this application, no significant consideration was given to the site's proximity to the Bremer River, as the site was located above the 1 in 100 flood line and was not considered to be at risk of impacts from flooding. Standard conditions were imposed with respect to stormwater and sediment and erosion control to ensure no adverse impacts on the river.

Solicitor

(b) The site's flood risk or the potential impact of floods on the proposed use

212. As part of this assessment, no significant consideration was given to the site's flood risk or the potential impact of flooding on the proposed use on the basis that the lot was located above the 1 in 100 flood line and was not considered to be at risk of impacts from flooding. Standard conditions were imposed in respect to stormwater and sediment and erosion control to ensure no adverse impacts on the river.

(c) The frequency of past flooding at the site and surrounding properties including Karalee

213. As previously discussed, historical river heights in relation to the site and surrounding properties, including the suburb of Karalee, were not obtained for the purpose of considering the application, the relevant policy consideration for those purposes being the location of the 1 in 100 flood line and the lot the subject of the application being located above that flood line.

(d) The potential for surrounding, upstream, downstream or opposite properties to be at greater risk of flooding due to

214. The proposal only involved limited earthworks in the nature of excavation, associated with levelling the site. These earthworks were not considered to have any adverse impacts on the site, surrounding properties, located upstream, downstream or on the opposite side of the Bremer River. In addition, conditions were imposed in respect to stormwater so as to ensure no such adverse impacts.

Question 4:

(a) Was the application assessed against the earthworks code contained within the Ipswich Planning Scheme and if so, how;

(b) Were any measures proposed to mitigate the potential for flooding at the Citiswich site and, if so, briefly describe these measures;

(c) What expert reports were obtained or received by Council for the purpose of assessing the potential impact of flooding at the Citiswich site and on surrounding properties, how did Council assess the adequacy of these reports and what reliance was placed on them;

(d) Did Council seek additional information from the applicant about the potential flood and/or stormwater run-off impacts of the proposed development;

(e) What conditions were imposed on the development to address the impacts of flooding.

Solicitor

(a) **Was the application assessed again the earthworks code**

215. The engineering report in relation to this application does not specifically identify that the application was assessed against the earthworks code. However I understand proposed earthworks were above the 1 in 100 flood line, of a minor nature formalising finished floor levels and unlikely to have any flooding impact.

(b) **Were any measures proposed to mitigate the potential for flooding at the Citiswich site and, if so, briefly describe these measures**

216. As mentioned previously the site was located above the 1 in 100 flood line and accordingly flooding was not considered an issue for the assessment of this application. Conditions were imposed in respect to stormwater for the proposed development.

(c) **What expert reports were obtained or received by Council for the purpose of assessing the potential impact of flooding at the Citiswich site and on surrounding properties, how did Council assess the adequacy of these reports and what reliance was placed on them**

Council obtained or received the following expert reports:

(a) "Stormwater Management Report for Proposed Warehouse/Office Development Lot 23 Ashburn Road, Bremer", dated 17 December 2008 and prepared by Martin Cosgrove and Associates Pty Ltd Consulting Structural and Civil Engineers.

- This report was prepared on behalf of the applicant and formed part of the initial application made to Council.
- This report provided details on stormwater management (for both quality and quantity) for the site to ensure that post-development flows are at or below pre-development flows.
- This report concludes the development including proposed stormwater measures will result in a net reduction in stormwater flows off the site.

(b) "Stormwater Management Report for Proposed Warehouse/Office Development Lot 23 Ashburn Road, Bremer", dated 19 January 2009 and prepared by Martin Cosgrove and Associates Pty Ltd Consulting Structural and Civil Engineers.

- This report was prepared on behalf of the applicant and formed part of the applicant's response to Council's non-statutory information request.
- This report provided details on stormwater management (for both quality and quantity) for the site to ensure that post-development flows are at or below pre-development flows.

[redacted] [redacted] solicitor

- This report concludes the development including proposed stormwater measures will result in a net reduction in stormwater flows off the site.

217. As previously discussed, Council relied on the content of these reports as part of its assessment of the application and consideration of conditions to be imposed in relation to the application. The reports were reviewed by Council's development engineers, and I defer to the knowledge and expertise of the Council's development engineers as to Council's assessment of the adequacy of the expert reports.

(d) Did Council seek additional information from the applicant about the potential flood and/or stormwater run-off impacts of the proposed development

218. As noted in my response to question 1(d) above, Council sought a revised stormwater management plan and earthworks cross sections from the applicant to ensure an adequate assessment could be undertaken in relation to stormwater management issues in accordance with the requirements of the Ipswich Planning Scheme 2006.

(e) What conditions were imposed on the development to address the impacts of flooding

219. Conditions were imposed with respect to stormwater as outlined below:

Stormwater Quantity

(a) Stormwater quantity management shall be undertaken generally in accordance with the Stormwater Management Plan dated 17 December 2008 and prepared by Martin Cosgrove and Associates Pty Ltd subject to conditions of this approval.

(b) The Developer shall provide an allotment drainage system designed in accordance with QUDM 2007. The drainage system shall be minimum level IV in QUDM .

(c) No ponding, concentration or redirection of stormwater shall occur onto adjoining land unless specifically approved by Council in consultation with the owner of the adjoining land.

Application No. 7606/10

Application overview

220. I have provided an overview of this application at paragraphs 132 and 133 of this statement. The application was lodged on 9 November 2010 and approved on 25 May 2011.

221. The application proposed to establish an 8 tenancy building, including both industrial and commercial tenancies over part of the area known as Stage 1C in the Citiswich development. As at the time of my statement, the proposed use has not yet been commenced.

222. This application was determined subsequent to the January 2011 flood event but prior to the Ipswich Temporary Local Planning Instrument coming into effect.

223. Attached to my statement are copies of the following documents in relation to this application:

NP-63: Martin Cosgrove & Associates stormwater management plan dated 25 October 2010

NP-64: ICC Information request dated 23 November 2010

NP-65: Walker Corporation Pty Ltd response to information request dated 8 March 2011

NP-66: Martin Cosgrove & Associates stormwater management report dated 3 March 2011

NP-67: Memorandum senior engineering officer dated 4 May 2011

NP-68: Memorandum senior planner to team coordinator dated 20 May 2011

NP-69: ICC assessment checklist – code assessable development

NP-70: Letter ICC to Walker corporation dated 8 September 2011 – updated decision notice and conditions.

Question 1c: The known site levels at the time of the application

224. Council's records indicate that RL's for the site range from approximately RL16.30m AHD to approximately RL16.70m AHD.

Question 1d: Did Council seek additional information from the applicant about the potential flood and/or stormwater run-off impacts of the proposed development

225. The development application assessment process in relation to this application was as previously described in my statement. The Council development engineers were responsible for the assessment of such matters as flood impacts and stormwater run off.

226. An information request was made by Council on 23 November 2010 requesting further information in relation to stormwater quality. This request sought the following information:

227. Council's Information Request dated 23 November 2010 - Stormwater Quantity

(a) The Stormwater Management Plan (SMP) submitted (prepared by Martin Cosgrove and Associates Pty Ltd and dated 25 October 2010) includes a stormwater quantity analysis for a 1 in 50 year Average Recurrence Interval (ARI) stormwater event and

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an extended detention depth of 0.6m over the bio retention basin filter media for on-site detention purposes. The applicant is requested to submit an amended SMP prepared by an RPEQ with a stormwater quantity analysis for a stormwater event with an ARI of up to 1 in 100 years pursuant to the Queensland Urban Drainage Manual 2007 (QUDM) and Council's Planning Scheme Policy 3 – General Works. The extended detention depth for the bio retention basin is to be 0.3m for optimum plant health and the proposed detention storage is requested to be amended.

(b) The stormwater discharge from the proposed development must be maintained at pre-development flows for a stormwater event with an ARI of up to 1 in 100 years. The applicant should identify the proposed method of stormwater detention and clearly identify any stormwater detention structures on the development plan. The applicant is requested to demonstrate that there is sufficient area of land available within the development to provide for the on-site detention system.

228. The applicant responded to the information request on 8 March 2001 with a revised stormwater management report from the applicant's consultant engineers.

229. On 20 May 2011 the senior planner prepared a report informed by an engineering assessment report dated 4 May 2011 which assessed the application against the Ipswich Planning Scheme 2006.

230. On 25 May 2011, Council approved the application subject to the following flooding, stormwater and erosion and silt management conditions:

231. Council's Decision Notice dated 25 May 2011– Flooding, Stormwater Quantity and Erosion and Silt Management

Flooding

(a) Expensive plant and equipment and stock must be located in the area of the site or building with the greatest flood immunity. The developer is to undertake a risk assessment to determine the floor level which maximises flood immunity having regard to this.

(b) The building materials and surface treatments used below RL 21m AHD are to be resistant to water damage and must not include wall cavities that may be susceptible to the intrusion of water and sediment. Flood resistant materials such as core filled concrete block are to be used as alternatives to materials such as plasterboard or particle board to minimise replacement/repair and provide for ease of cleaning in the event of a flood.

(c) Electrical installations must be sited in the area of greatest flood immunity.

(d) Electrical switchboards, main data servers and the like must be positioned above RL 21m AHD with all electrical and data installations below this level designed and constructed to withstand submergence in flood water.

(e) Access routes must be designed or alternative emergency evacuation routes provided so that in a flood event occupants can escape to a safe and secure area.

(f) All buildings must be designed to be capable of withstanding the static and dynamic loads, including debris loads, applicable to a flood event equivalent to the RL 21m AHD.

(g) Materials stored on site must -

(i) be limited to those that are readily able to be moved in a flood event;

(ii) not be hazardous or noxious, or comprise materials that may cause a deleterious effect on the environment if discharged in a flood event; and

(iii) where capable of creating a safety hazard by being shifted by flood waters, be contained in order to minimise movement in times of flood.

(h) The development is not permitted to increase the flood hazard (e.g. by way of increased depth, duration or velocity of flood waters or a reduction in warning times) for other properties.

Stormwater Quantity

(a) The developer must provide all necessary internal and external stormwater drainage to service the development. Such drainage works (except for building gutters and downpipes) must be designed and constructed in accordance with QUDM such that the overall drainage system caters for a storm event with an ARI of 100 years.

(b) No ponding, concentration or redirection of stormwater may occur onto adjoining land unless specifically approved by Council in consultation with the owner of the adjoining land.

(c) All stormwater runoff from the development must be discharged in a manner and to a point to be approved by the assessment manager. In this instance, stormwater

[redacted] [redacted] Solicitor

discharge from all impervious areas must be directed to the existing stormwater infrastructure in Hawkins Crescent.

(d) The developer must provide a stormwater detention basin/s (or equivalent) on the subject land, which must be designed and constructed in accordance with QUDM 2007. The detention basin (or equivalent) must be constructed to ensure that flows at any point downstream in the catchment are not increased by the development for any combination of frequency and duration from the storm event with an ARI of one (1) year up to and including the storm event with an ARI of 100 years.

(e) An amended stormwater management plan must be submitted for approval at the operational works stage demonstrating compliance with subsection (d) above.

(f) Stormwater drainage plans and calculations must be submitted for approval by the assessment manager, as part of the operational works application.

Erosion & Silt Management

(a) As part of the application for operational works, the developer must submit an Erosion and Silt Management Plan designed in accordance with 'Best Practice Erosion and Sediment Control' published by the International Erosion Control Association (Australasia) November 2008, or equivalent.

(b) The developer must install silt management facilities at the commencement of construction and maintain these facilities until the development has been completed.

(c) Diversion drains and ponds, as necessary, must be installed on the site before any other work is undertaken on site to ensure that water containing silt, clay, solids or contaminants is contained and/or isolated.

(d) A procedure must be submitted with the engineering drawings for approval for maintaining the facilities, setting out the frequency of attention, with inspections to be made after each significant rainfall event.

(e) If the assessment manager determines that silt damage has occurred as a result of this development, the developer shall be responsible for restoration of any damage. Such restoration must be completed within a time to be advised by the assessment manager. Should the developer fail to complete the works determined by the assessment manager within the specified time, Council may elect to complete the works and recover all costs associated with that work from the developer.

(f) For this purpose, the developer must lodge a $10,000 performance bond with Council, prior to the commencement of work, which shall only be released by Council at the completion of construction. Where Council determines that a draw-down of the bond is required, the developer must restore the bond to its full amount within 10 days of a notice from Council to that effect.

232. On 8 September 2011 Council approved a minor alteration to the decision notice to amend the flooding condition as follows:

(a) The building materials and surface treatments used below RL 21m AHD are to be resistant to water damage and must not include wall cavities that may be susceptible to the intrusion of water and sediment. Flood resistant materials such as core filled concrete block **or pre-cast concrete** are to be used as alternatives to materials such as plasterboard or particle board to minimise replacement/repair and provide for ease of cleaning in the event of a flood.

(b) Electrical switchboards, main data servers and the like must be positioned above RL 21m AHD ~~with all electrical and data installations below this level designed and constructed to withstand submergence in flood water~~, however, where circumstances prevent compliance with a height above RL 21m AHD, the height is to be to the satisfaction of the assessment manager. All electrical and data installations below RL 21m AHD are to be accompanied by a sign with minimum dimensions of 300mm x 300mm containing the following wording:

(c) The following actions should be undertaken in the event of a flood:

- Switch off electrical instillations and equipment.
- Do not operate equipment which is in water or whilst standing in water.
- Keep away from any live equipment submerged in water.
- Have any installations or electrical equipment which has been flood damaged checked by an approved electrical contractor before being put back into use.
- Contact the electricity supplier if one has any concerns about the supply from the electricity meter and backwards.

Question 2: The known Q100 and Q20 flood levels

233. The known flood levels of surrounding properties, located upstream, downstream or on the opposite side of the Bremer River to the Citiswich site, by reference to the Council's flood regulation levels, both at around the time of this application and as at today:

(a) 1 in 20 development line: 13.3m AHD;

(b) 1 in 100 flood line: 16.2m AHD.

Question 3: What consideration was given to:

(a) proximity of the Citiswich site to the Bremer River;

(b) the site's flood risk or the potential impact of flooding on the proposed use;

(c) the frequency of past flooding at the site and surrounding properties, including Karalee;

(d) the potential for surrounding, upstream, downstream or opposite properties to be at greater risk of flooding due to:

(i) land filling or excavation at Citiswich;

(ii) the impact of any stormwater or overland flow management facilities servicing Citiswich.

(a) Proximity of the site to the Bremer River

234. As part of the assessment of this application, and having regard to the determination of the application subsequent to the January 2011, consideration was given to the site's proximity to the Bremer River notwithstanding the site was located outside of the 1 in 100 flood line. Reasonable and relevant conditions were imposed in respect of flooding, stormwater and erosion and silt management. The flooding condition imposed requirements in relation to:

(a) location of plant, equipment and stock;

(b) floor levels to maximise flood immunity;

(c) location of electrical installations, switchboards, main data servers and the like;

(d) emergency evacuation routes;

(e) design of buildings;

(f) materials stored on site;

(g) development not increasing flood hazard for other properties.

(b) The site's flood risk or the potential impact of floods on the proposed use

235. Consideration was given to the site's flood risk or the potential impact of flooding on the proposed use, as detailed in my response to question 3(a) above.

(c) The frequency of past flooding at the site and surrounding properties including Karalee

236. Historical river heights in relation to the site and surrounding properties, including at the suburb of Karalee, were not obtained for the purpose of considering the application, the relevant policy consideration for those purposes being the location of the 1 in 100 flood line. At the time of determination of this application, the Ipswich TLPI had not taken effect.

(d) The potential for surrounding upstream/downstream properties etc

237. The proposed development only involved limited cut to fill earthworks located above the 1 in 100 flood level and associated with levelling the site to enable a finished floor level of 16.55m AHD and was not considered to have any adverse impacts on the site, surrounding properties located upstream, downstream or on the opposite side of the Bremer River. Conditions were imposed in respect to stormwater and flooding so as to ensure no such adverse impacts.

Question 4:

(a) Was the application assessed against the earthworks code contained within the Ipswich Planning Scheme and if so, how;

(b) Were any measures proposed to mitigate the potential for flooding at the Citiswich site and, if so, briefly describe these measures;

(c) What expert reports were obtained or received by Council for the purpose of assessing the potential impact of flooding at the Citiswich site and on surrounding properties, how did Council assess the adequacy of these reports and what reliance was placed on them;

(d) Did Council seek additional information from the applicant about the potential flood and/or stormwater run-off impacts of the proposed development;

(e) What conditions were imposed on the development to address the impacts of flooding.

(a) Was the application assessed against the earthworks code

238. The Council engineering report specifies that the application was assessed against the Ipswich Planning Scheme Part 12, Div 15 – Earthworks Code (including lot filling).

(b) **Were any measures proposed to mitigate the potential for flooding**

239. As detailed in my response to question 3(a) above, measures were proposed to mitigate the potential for flooding at the site.

(c) **In relation to expert reports**

240. Council obtained or received the following expert reports:

(a) "Stormwater Management Report for Proposed Warehouse/Office Development Lot 18 Ashburn Road, Bremer", dated 25 October 2010 and prepared by Martin Cosgrove and Associates Pty Ltd Consulting Structural and Civil Engineers.

- This report was prepared on behalf of the applicant and formed part of the initial application made to Council.
- This report provided details on stormwater management (for both quality and quantity) for the site to ensure that post-development flows are at or below pre-development flows.
- This report concludes the development including proposed stormwater measures will result in a net reduction in stormwater flows off the site.

(b) "Stormwater Management Report for Proposed Warehouse/Office Development Lot 18 Ashburn Road, Bremer", dated 3 March 2011 and prepared by Martin Cosgrove and Associates Pty Ltd Consulting Structural and Civil Engineers.

- This report was prepared on behalf of the applicant and formed part of the applicant's response to Council's information request.
- This report provided details on stormwater management (for both quality and quantity) for the site to ensure that post-development flows are at or below pre-development flows.
- This report concludes the development including proposed stormwater measures will result in a net reduction in stormwater flows off the site.

241. Council relied on the content of these reports as part of its assessment of the application and consideration of conditions to be imposed in relation to the application. However, I defer to the knowledge and experience of the Council's development engineers as to Council's assessment of the adequacy of the expert reports.

(d) Did Council seek additional information from the applicant

242. As previously discussed, a revised stormwater management plan was sought from the applicant to ensure an adequate assessment could be undertaken in accordance with the requirements of the Ipswich Planning Scheme 2006.

(e) What conditions were imposed on the development to address the impacts of flooding

243. The following conditions were imposed in respect to flooding and stormwater as part of Council's minor alterations to the decision notice dated 8 September 2011:

244. Council's Minor Alteration dated 8 September 2011– Flooding, Stormwater Quantity and Erosion and Silt Management

Flooding

(a) Expensive plant and equipment and stock must be located in the area of the site or building with the greatest flood immunity. The developer is to undertake a risk assessment to determine the floor level which maximises flood immunity having regard to this.

(b) The building materials and surface treatments used below RL 21m AHD are to be resistant to water damage and must not include wall cavities that may be susceptible to the intrusion of water and sediment. Flood resistant materials such as core filled concrete block or pre-cast concrete are to be used as alternatives to materials such as plasterboard or particle board to minimise replacement/repair and provide for ease of cleaning in the event of a flood.

(c) Electrical installations must be sited in the area of greatest flood immunity.

(d) Electrical switchboards, main data servers and the like must be positioned above RL 21m AHD, however, where circumstances prevent compliance with a height above RL 21m AHD, the height is to be to the satisfaction of the assessment manager. All electrical and data installations below RL 21m AHD are to be accompanied by a sign with minimum dimensions of 300mm x 300mm containing the following wording:

The following actions should be undertaken in the event of a flood:

- Switch off electrical instillations and equipment.
- Do not operate equipment which is in water or whilst standing in water.
- Keep away from any live equipment submerged in water.

[redacted] [redacted] Solicitor

- Have any installations or electrical equipment which has been flood damaged checked by an approved electrical contractor before being put back into use.

- Contact the electricity supplier if one has any concerns about the supply from the electricity meter and backwards.

(e) Access routes must be designed or alternative emergency evacuation routes provided so that in a flood event occupants can escape to a safe and secure area.

(f) All buildings must be designed to be capable of withstanding the static and dynamic loads, including debris loads, applicable to a flood event equivalent to the RL 21m AHD.

(g) Materials stored on site must -

(i) be limited to those that are readily able to be moved in a flood event;

(ii) not be hazardous or noxious, or comprise materials that may cause a deleterious effect on the environment if discharged in a flood event; and

(iii) where capable of creating a safety hazard by being shifted by flood waters, be contained in order to minimise movement in times of flood.

(h) The development is not permitted to increase the flood hazard (e.g. by way of increased depth, duration or velocity of flood waters or a reduction in warning times) for other properties.

Stormwater Quantity

(a) The developer must provide all necessary internal and external stormwater drainage to service the development. Such drainage works (except for building gutters and downpipes) must be designed and constructed in accordance with QUDM such that the overall drainage system caters for a storm event with an ARI of 100 years.

(b) No ponding, concentration or redirection of stormwater may occur onto adjoining land unless specifically approved by Council in consultation with the owner of the adjoining land.

(c) All stormwater runoff from the development must be discharged in a manner and to a point to be approved by the assessment manager. In this instance, stormwater discharge from all impervious areas must be directed to the existing stormwater infrastructure in Hawkins Crescent.

(d) The developer must provide a stormwater detention basin/s (or equivalent) on the subject land, which must be designed and constructed in accordance with QUDM 2007. The detention basin (or equivalent) must be constructed to ensure that flows at any point downstream in the catchment are not increased by the development for any combination of frequency and duration from the storm event with an ARI of one (1) year up to and including the storm event with an ARI of 100 years.

(e) An amended stormwater management plan must be submitted for approval at the operational works stage demonstrating compliance with subsection (d) above.

(f) Stormwater drainage plans and calculations must be submitted for approval by the assessment manager, as part of the operational works application.

Erosion & Silt Management

(a) As part of the application for operational works, the developer must submit an Erosion and Silt Management Plan designed in accordance with 'Best Practice Erosion and Sediment Control' published by the International Erosion Control Association (Australasia) November 2008, or equivalent.

(b) Developer must install silt management facilities at the commencement of construction and maintain these facilities until the development has been completed.

(c) Diversion drains and ponds, as necessary, must be installed on the site before any other work is undertaken on site to ensure that water containing silt, clay, solids or contaminants is contained and/or isolated.

(d) A procedure must be submitted with the engineering drawings for approval for maintaining the facilities, setting out the frequency of attention, with inspections to be made after each significant rainfall event.

(e) If the assessment manager determines that silt damage has occurred as a result of this development, the developer shall be responsible for restoration of any damage.

[redacted] [redacted] Solicitor

Such restoration must be completed within a time to be advised by the assessment manager. Should the developer fail to complete the works determined by the assessment manager within the specified time, Council may elect to complete the works and recover all costs associated with that work from the developer.

For this purpose, the developer must lodge a $10,000 performance bond with Council, prior to the commencement of work, which shall only be released by Council at the completion of construction. Where Council determines that a draw-down of the bond is required, the developer must restore the bond to its full amount within 10 days of a notice from Council to that effect.

Application 8866/10 Application overview

Application Overview

245. I have provided an overview of this application at paragraphs 136-138 of this statement. The application was lodged on 23 December 2010 and remains in the decision stage.

246. The application seeks a preliminary approval to override the planning scheme over the area of land known as stage 2 of the Citiswich development. The preliminary approval in effect seeks to extend the land under the original Bremer Business Park preliminary approval for Frame industrial purposes into part of the Open Space Sub-Area so as to increase the land for industrial purposes.

247. The subject area sustained some minor inundation in January 2011 as identified in attachment NP-26 to my statement.

248. Attached to my statement are copies of the following documents in relation to this application:

NP-71: Application Plans

NP-72: Cardno Citiswich Estate – Stage 2 Stormwater Management Strategy December 2010

NP-73: ICC amended acknowledgement notice dated 17 February 2011

NP-74: ICC information request dated 17 February 2011

NP-75: ICC further information request dated 17 May 2011

NP-76: ICC further information request dated 6 October 2011

Question 1c: The known site levels at the time of the application

249. Council's records indicate that RL's for the site range from approximately RL16.5m AHD to approximately RL54 AHD.

Question 1d: Did Council seek additional information from the applicant about the potential flood and/or stormwater run-off impacts of the proposed development.

250. The assessment process to be followed in relation to this application is as previously described in my statement Assessment in respect of flooding and stormwater matters will be undertaken by Council's development engineers.

251. The application is yet to be determined. An initial stormwater and flooding report was submitted with the application. Council issued an information request to the applicant dated 17 February 2011 and has sought further information on 17 May 2011 and 6 October 2011. Part of the additional information requested arises following the introduction of the Temporary Local Planning Instrument so as to enable the application to be assessed by reference to the new policy document.

Question 2: The known Q100 and Q20 flood levels

252. The known flood levels of surrounding properties, located upstream, downstream or on the opposite side of the Bremer River to the Citiswich site, by reference to the Council's flood regulation levels, both at around the time of this application and as at today are:

(a) 1 in 20 development line: 13.3m AHD;

(b) 1 in 100 flood line: 16.2m AHD.

Question 3: What consideration was given to:

(a) proximity of the Citiswich site to the Bremer River;

(b) the site's flood risk or the potential impact of flooding on the proposed use;

(c) the frequency of past flooding at the site and surrounding properties, including Karalee;

(d) the potential for surrounding, upstream, downstream or opposite properties to be at greater risk of flooding due to:

(i) land filling or excavation at Citiswich;

(ii) the impact of any stormwater or overland flow management facilities servicing Citiswich.

(a) Proximity of the site to the Bremer River

253. The application is yet to be determined. Consideration in the assessment process will have regard to the recently adopted Temporary Local Planning Instrument which policy takes account of potential flood risks from the Bremer River.

(b) The site's flood risk or the potential impact of floods on the proposed use

254. In assessing the application by reference to the Temporary Local Planning Instrument, regard will be had to the site's flood risk or the potential impact of flooding on the site. In addition, consideration is being given to the potential flood risk and site impact of the local tributary running through the eastern portion of the site.

(c) The frequency of past flooding at the site and surrounding properties including Karalee

255. Historical river heights in relation to the site and surrounding properties, including the suburb of Karalee will not, so far as I understand it, be obtained for the purpose of considering the application. However, it is my understanding that historical flooding in relation to the site was a policy consideration in the formulation of the TLPI regulated flood line.

(d) The potential for surrounding, upstream, downstream or opposite properties to be at greater risk of flooding due to:

(i) land filling or excavation at Citiswich;

(ii) the impact of any stormwater or overland flow management facilities servicing Citiswich.

256. The potential for surrounding properties to be at a greater risk of flooding will be a relevant consideration in the assessment and determination of the application. In that regard, Council has recently, on 6 October 2011, requested further information in relation to these matters in the context of the TLPI.

Question 4:

(a) Was the application assessed against the earthworks code contained within the Ipswich Planning Scheme and if so, how;

(b) Were any measures proposed to mitigate the potential for flooding at the Citiswich site and, if so, briefly describe these measures;

(c) What expert reports were obtained or received by Council for the purpose of assessing the potential impact of flooding at the Citiswich site and on surrounding properties, how did Council assess the adequacy of these reports and what reliance was placed on them;

(d) **Did Council seek additional information from the applicant about the potential flood and/or stormwater run-off impacts of the proposed development;**

(e) **What conditions were imposed on the development to address the impacts of flooding.**

(a) The application will not be assessed against the earthworks code as the earthworks code is not an applicable code for the assessment, as no earthworks have been applied for.

257. The applicant has very recently lodged a bulk earthworks application (5478/11) in relation to the stage 2 area, and the issue of earthworks will be addressed in Council's consideration of that application.

(b) Were any measures proposed to mitigate the potential for flooding?

258. No measures have thus far been imposed as the application is yet to be determined.

(c) In relation to expert reports

259. Council has obtained or received the following expert report:

(a) "Citiswich Estate –Stage 2: Stormwater Management Strategy to Support Development Application for Reconfiguring a lot and Preliminary Approval to Vary Effect of a Planning Scheme", dated December 2010 and prepared by Cardno Lawson Treloar.

- This report was prepared on behalf of the applicant and formed part of the initial application made to Council.
  - This report provided details on flooding and stormwater management (for both quality and quantity) and provides conceptual details of:
  - Existing site conditions;
  - Proposed site conditions;
  - Management of stormwater quality for the civil construction and operational stages;
  - Management of stormwater quantity; and
  - Administration of the stormwater management strategy.

- This report concludes the strategy complies with the provisions of the Ipswich Planning Scheme and that the local tributary flood assessment indicates that the proposed works will contain the ultimate catchment flows through Stage 2. Further, development pads will be filled to above the 100 year ARI flood levels and that modifications to the existing Capral site detention basin impacted by the Stage 2 earthworks still ensure pre-development peak flows off the Capral site are maintained.

260. This report will be relied upon by Council's development engineers as part of Council's assessment of the application, as will any additional expert reports produced by the Applicant. However, I defer to the knowledge and experience of the Council's development engineers as to Council's assessment of the adequacy of the expert reports.

(d) Did Council seek additional information

261. In Council's request for further information dated 6 October 2011 the applicant has been requested to submit amended hydraulic modelling and associated reporting demonstrating how the development complies with the requirements of the TLPI. Council has required that the amended modelling take account of the Adopted Flood Regulation line and what Council understands to be unapproved earthworks which have taken place on land located within Stage 2 and situated between the 1 in 20 Development Line and the Adopted Flood Regulation. Further, the applicant has been required to demonstrate that the earthworks undertaken on the subject site do not result in a net loss of flood storage volume on the site.

(e) What conditions were imposed

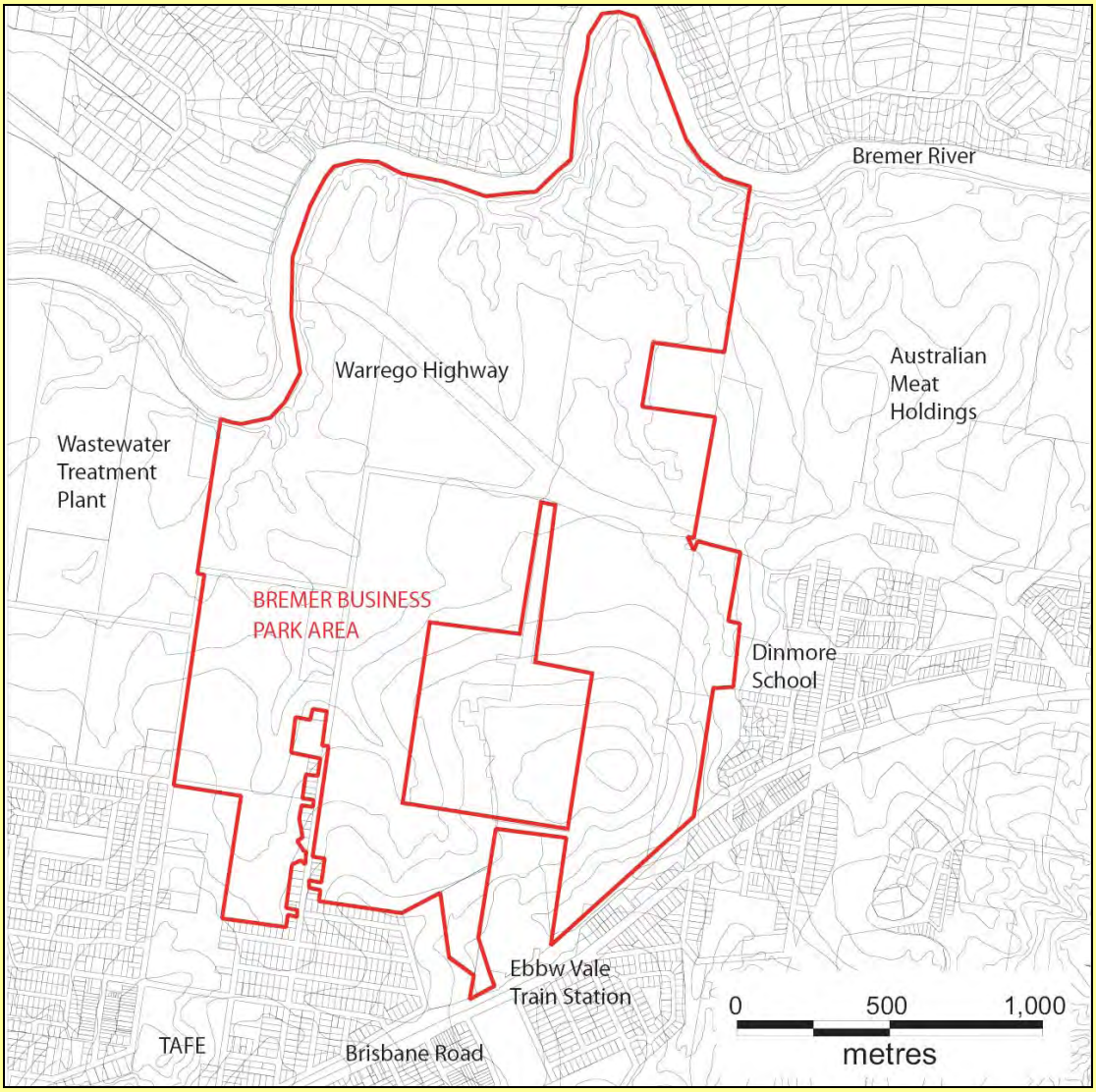
262. The application is yet to be determined.

I make this statement conscientiously believing the same to be true, and by virtue of the provisions of the *Oaths Act 1867* (Qld).

Signed and declared by Natalie Plumbe at Ipswich in the State of Queensland this 12th day of October 2011 before me:

..... [redacted] .....
Deponent

[redacted] .....
Witness [redacted] SOLICITOR



Citiswich Site

Approved Plan

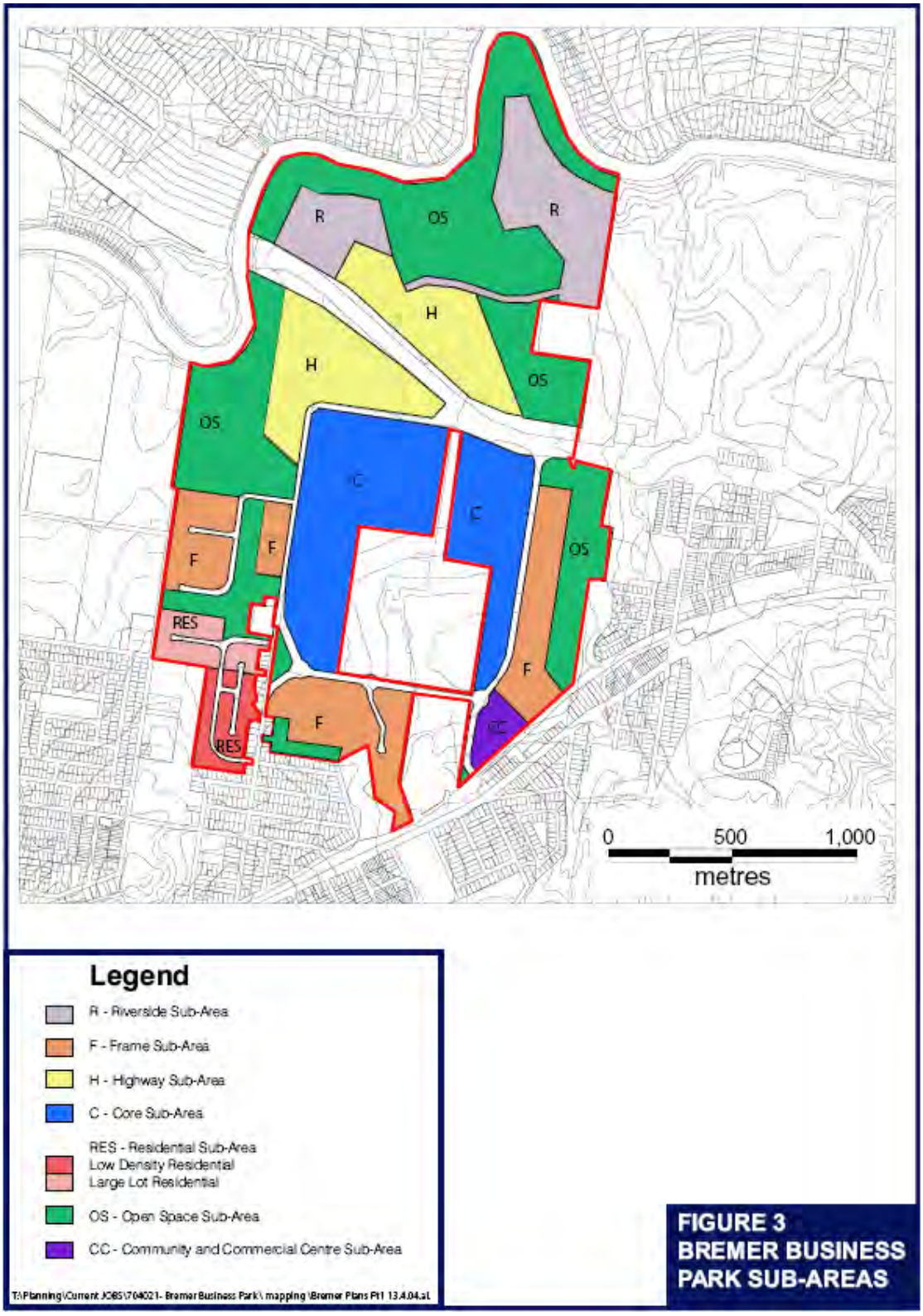
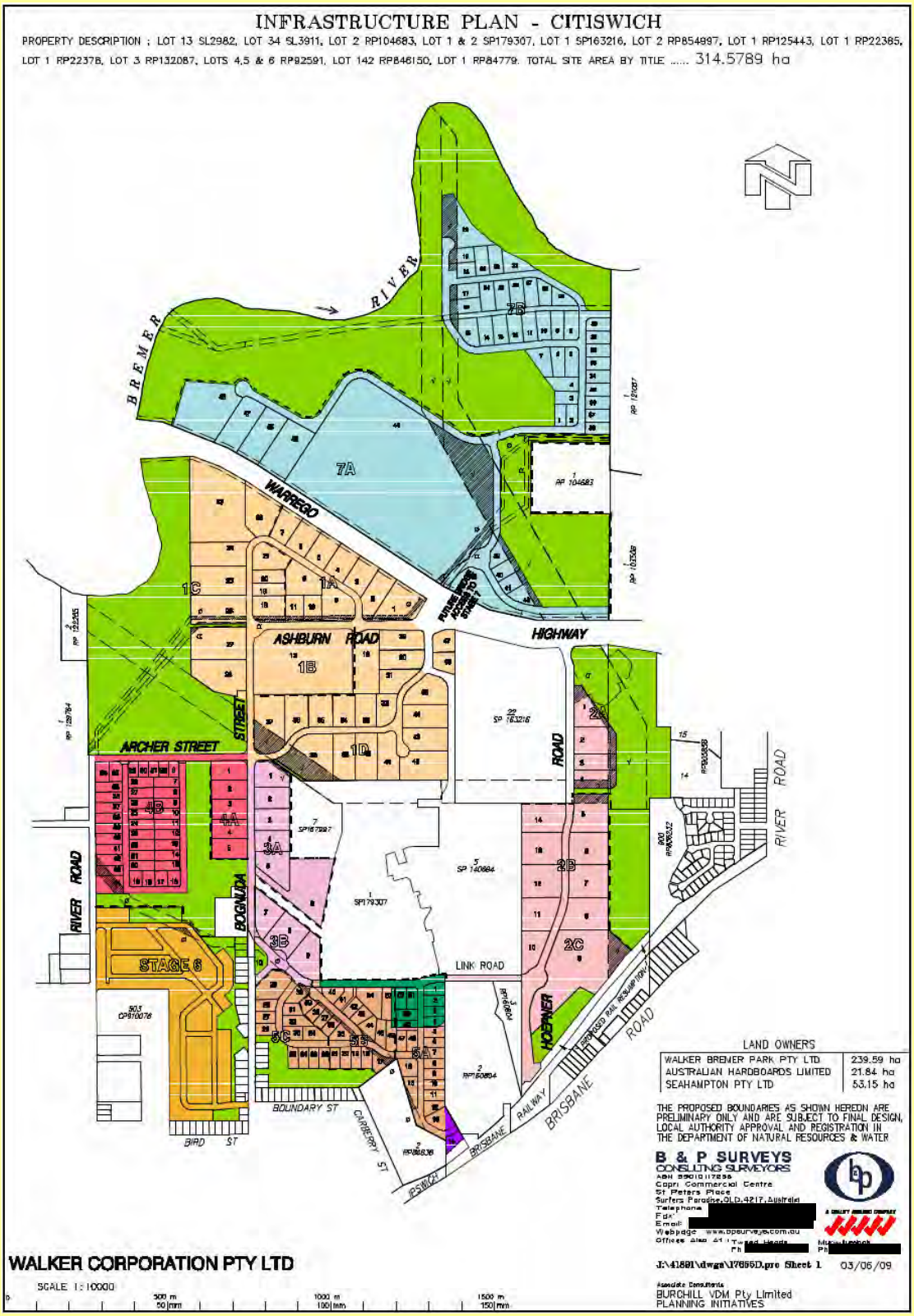
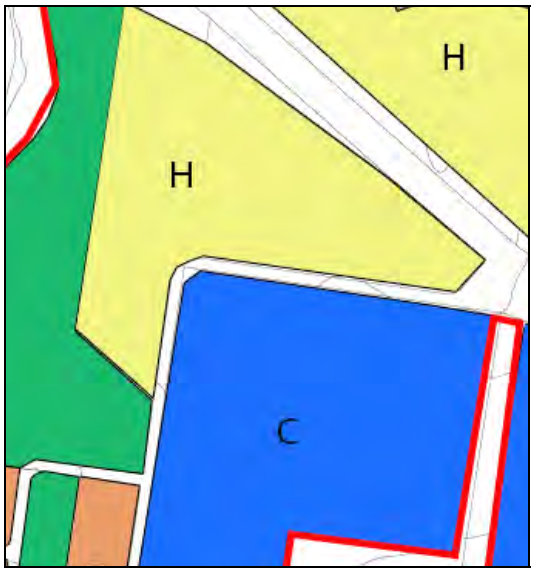


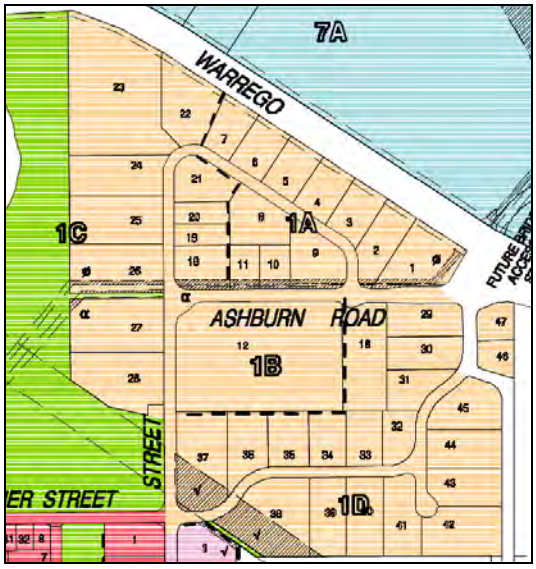
FIGURE 3
BREMER BUSINESS PARK SUB-AREAS



Citiswich Staging Plan (not formally endorsed and subject to change)

Stage 1 – Highway Sub Area, Core Business Sub Area and Open Space Sub-Area





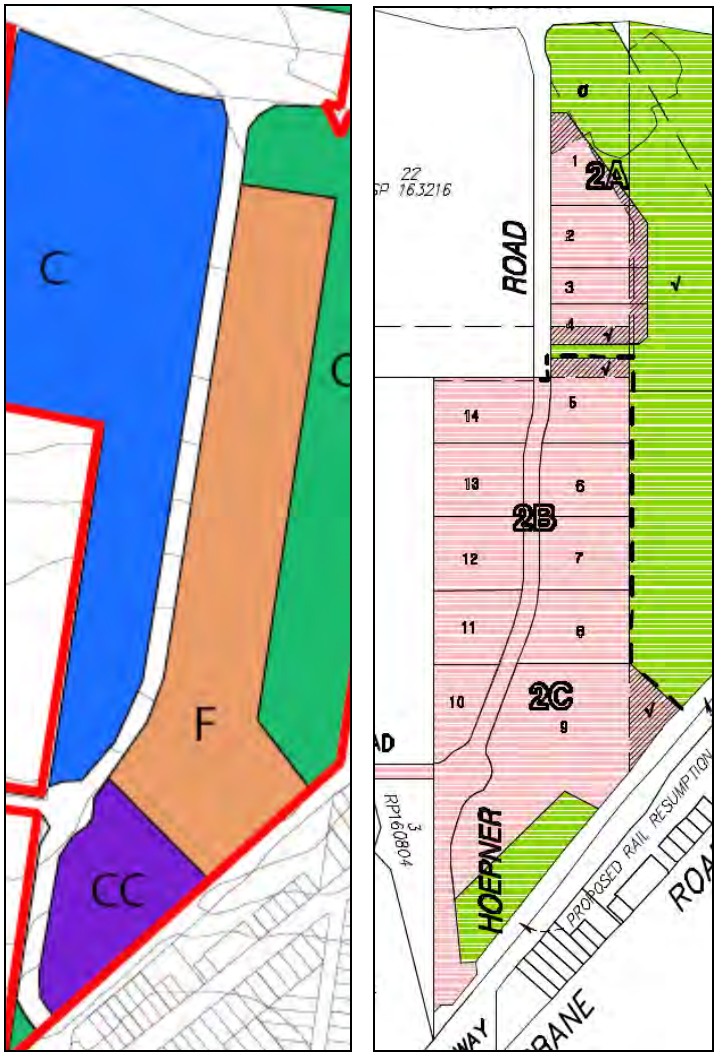
The stage 1 area is contained partly within the Highway Sub-Area, partly within the Core Sub-Area and partly within the Open Space Sub-Area.

The Highway Sub-Area is to consist of light industry and commercial activities, such as highway service centres, commercial premises for corporate headquarters and storage, and distribution facilities that rely on and maximise the benefits of their accessibility to the Warrego Highway. The wholesaling and retailing of on-site manufactured goods within buildings is encouraged, where the wholesale and/or retail component of the use is minor and ancillary to the principle use of on-site manufacturing.

The Core Sub-Area is to consist of a wide range of medium to large scale industrial and business activities primarily associated with manufacturing, processing, treating or otherwise modifying goods and secondary activities associated with the packaging, storage, wholesaling and distribution.

The Open Space Sub-Area is to be used for both active and passive recreation opportunities within parks, linear/riparian corridors as open space links, private and public sporting and recreation facilities, buffer and screening effects and securing or riparian and other wildlife corridors.

Stage 2 – Core Sub-Area, Frame Sub-Area, Community and Commercial Sub-Area and Open Space Sub-Area



The stage 2 area is partly contained within the Core Sub-Area, partly within the Frame Sub-Area, partly within the Community and Commercial Sub-Area and partly within the Open Space Sub-Area..

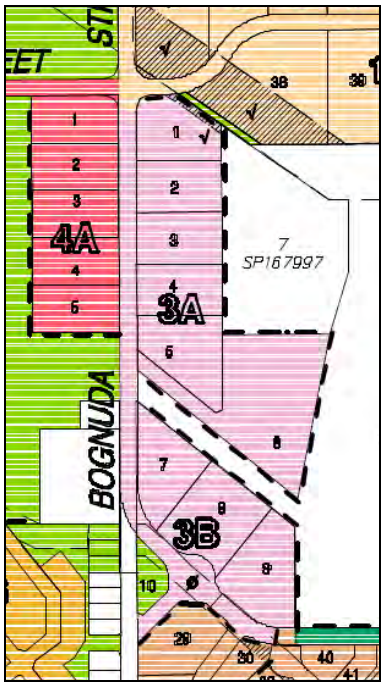
The Core Sub-Area is to consist of a wide range of medium to large scale industrial and business activities primarily associated with manufacturing, processing, treating or otherwise modifying goods and secondary activities associated with the packaging, storage, wholesaling and distribution of goods.

The Frame Sub-Area is to provide a diverse mix of low impact industrial and commercial activities, maximising the Sub-Area's high accessibility to transport opportunities. Land uses are to include warehousing, storage and small scale distribution, research and laboratories, service trades, equipment hire, appliances and household goods assembly, storage and distribution, and small scale commercial offices and factories for start up business and the like.

The Community and Commercial Sub-Area is to provide for a range of community facilities and services for the Bremer Business Park workforce and the nearby residential communities, including child care, health care, counselling and welfare services and business uses such as convenience retailing and dining facilities.

The Open Space Sub-Area is to be used for both active and passive recreation opportunities within parks, linear/riparian corridors as open space links, private and public sporting and recreation facilities, buffer and screening effects and securing or riparian and other wildlife corridors.

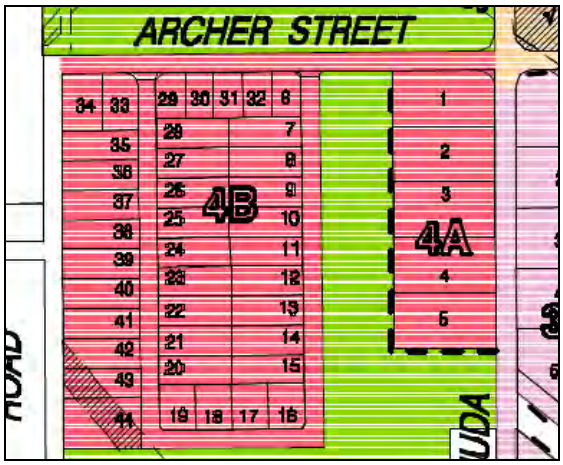
Stage 3 – Core Sub-Area



The stage 3 area is contained within the Core Sub-Area.

The Core Sub-Area is to consist of a wide range of medium to large scale industrial and business activities primarily associated with manufacturing, processing, treating or otherwise modifying goods and secondary activities associated with the packaging, storage, wholesaling and distribution of goods.

Stage 4 – Frame Sub-Area and Open Space Sub-Area

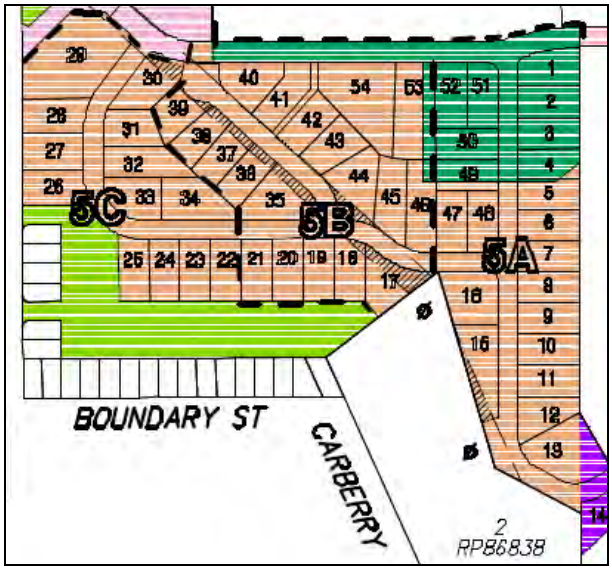


The stage 4 area is contained partly within the Frame Sub-Area and partly within the Open Space Sub-Area..

The Frame Sub-Area is to provide a diverse mix of low impact industrial and commercial activities, maximising the Sub-Area's high accessibility to transport opportunities. Land uses are to include warehousing, storage and small scale distribution, research and laboratories, service trades, equipment hire, appliances and household goods assembly, storage and distribution, and small scale commercial offices and factories for start up business and the like.

The Open Space Sub-Area is to be used for both active and passive recreation opportunities within parks, linear/riparian corridors as open space links, private and public sporting and recreation facilities, buffer and screening effects and securing or riparian and other wildlife corridors.

Stage 5 – Frame Sub-Area and Open Space Sub-Area

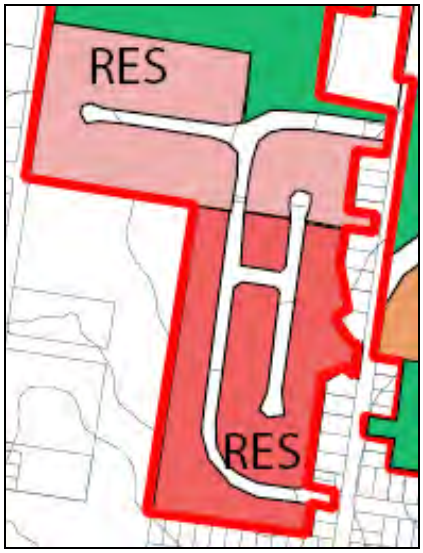


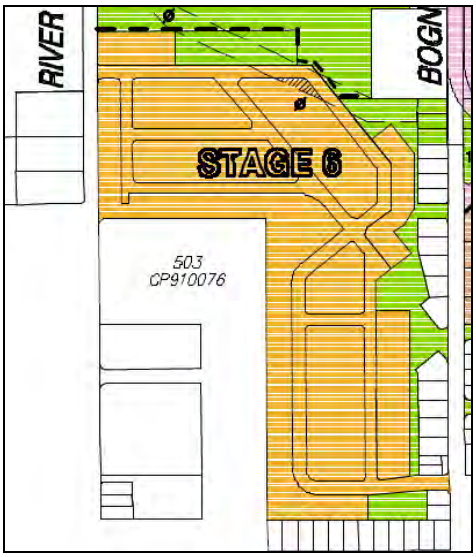
The stage 5 area is contained partly within the Frame Sub-Area and partly within the Open Space Sub-Area.

The Frame Sub-Area is to provide a diverse mix of low impact industrial and commercial activities, maximising the Sub-Area's high accessibility to transport opportunities. Land uses are to include warehousing, storage and small scale distribution, research and laboratories, service trades, equipment hire, appliances and household goods assembly, storage and distribution, and small scale commercial offices and factories for start up business and the like.

The Open Space Sub-Area is to be used for both active and passive recreation opportunities within parks, linear/riparian corridors as open space links, private and public sporting and recreation facilities, buffer and screening effects and securing or riparian and other wildlife corridors.

Stage 6 – Residential Sub-Area and Open Space Sub-Area



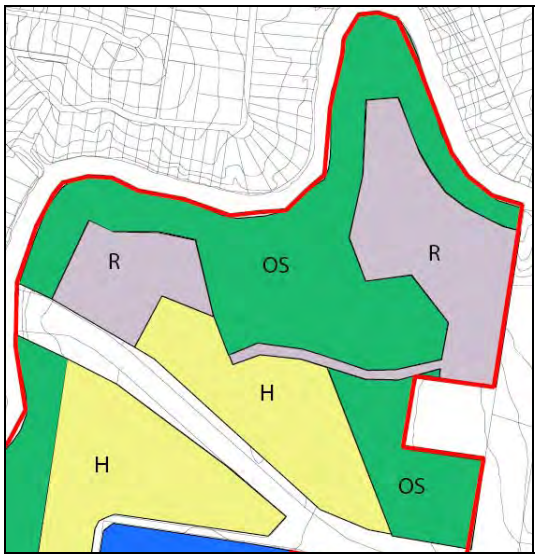


The stage 6 area is contained partly within the Residential Sub-Area and partly within the Open Space Sub-Area..

The Residential Sub-Area is to provide for a range of housing choices at a residential density consistent with the existing surrounding residential density, which is between 10 to 15 dwellings per hectare.

The Open Space Sub-Area is to be used for both active and passive recreation opportunities within parks, linear/riparian corridors as open space links, private and public sporting and recreation facilities, buffer and screening effects and securing or riparian and other wildlife corridors.

Stage 7 – Highway Sub-Area, Riverside Sub-Area and Open Space Sub-Area

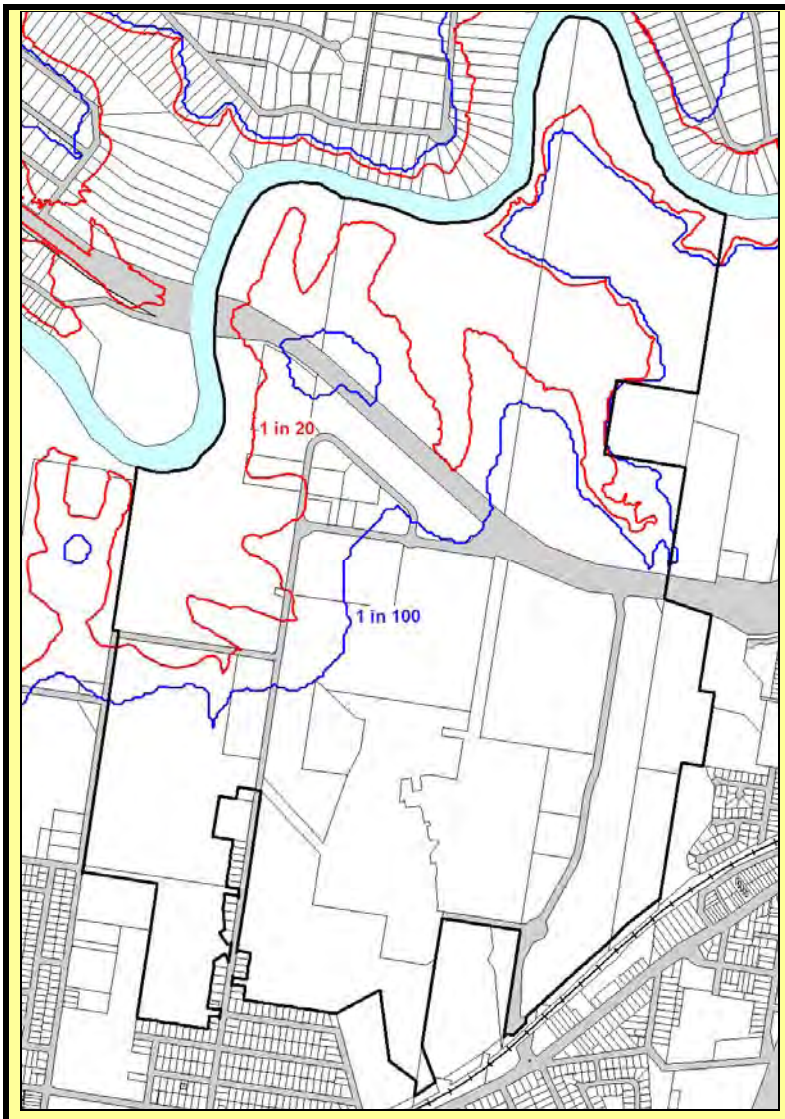


The stage 7 area is partly contained within the Highway Sub-Area, partly within the Riverside Sub-Area and partly within the Open Space Sub-Area.

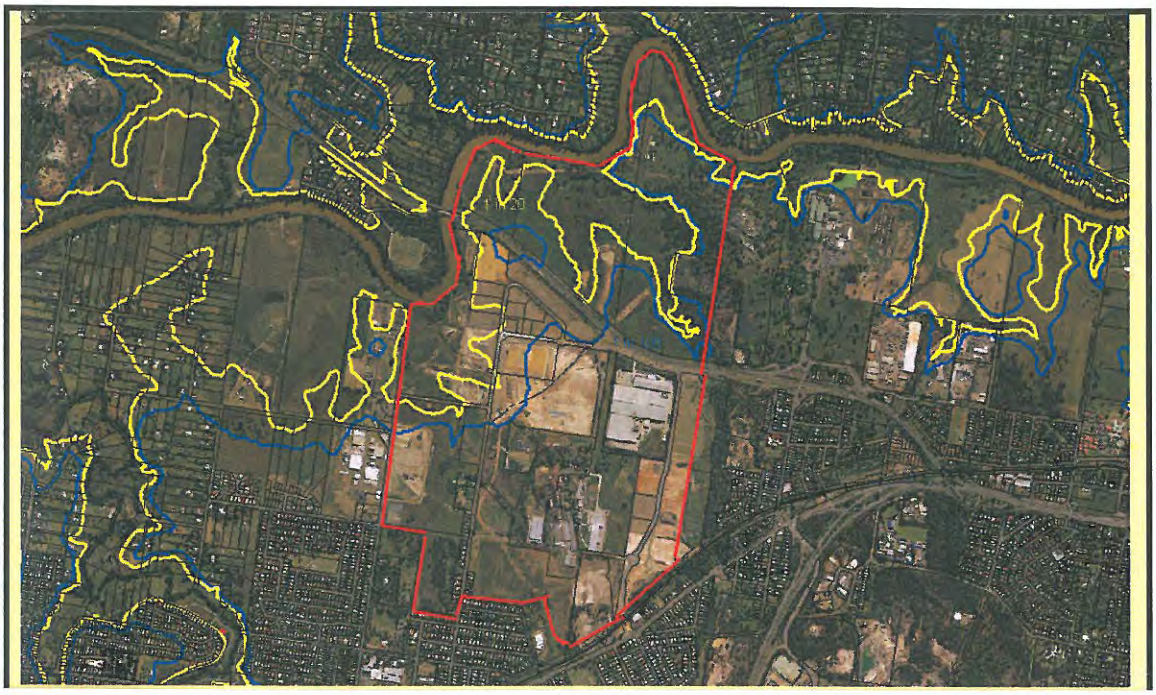
The Highway Sub-Area is to consist of light industry and commercial activities, such as highway service centres, commercial premises for corporate headquarters and storage, and distribution facilities that rely on and maximise the benefits of their accessibility to the Warrego Highway. The wholesaling and retailing of on-site manufactured goods within buildings is encouraged, where the wholesale and/or retail component of the use is minor and ancillary to the principle use of on-site manufacturing.

The Riverside Sub-Area is to include low intensity industrial and related activities including research, technology, education and some limited service industries.

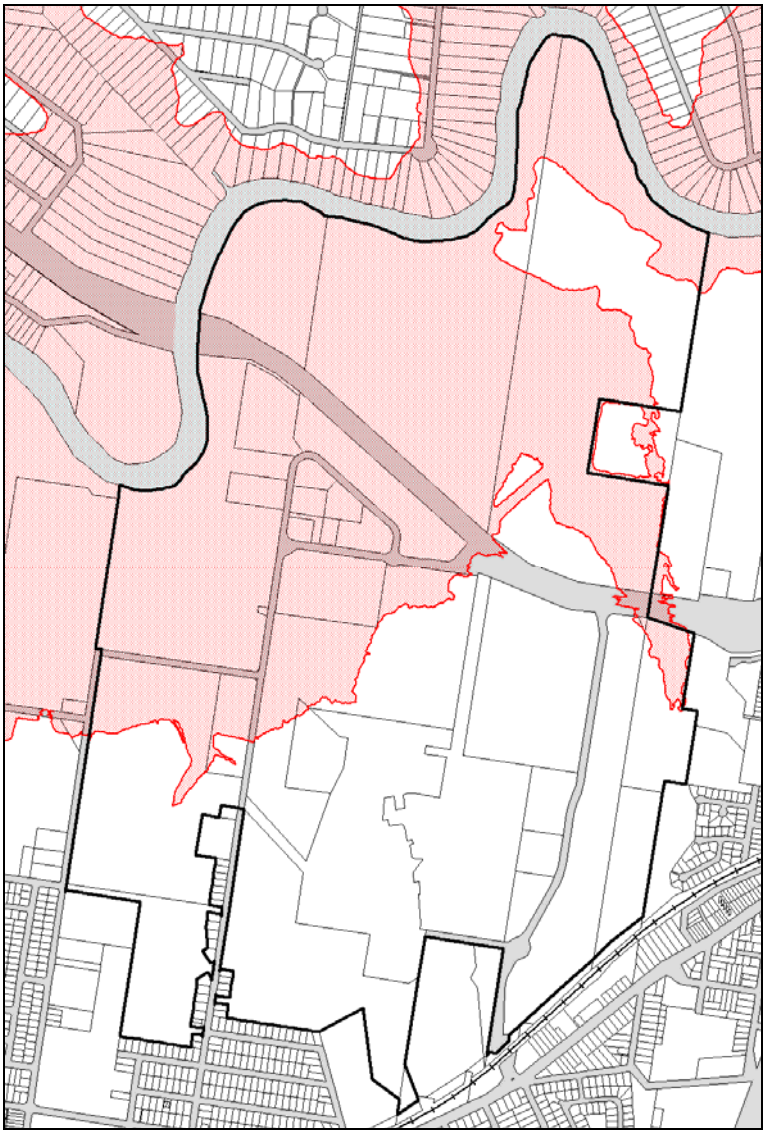
The Open Space Sub-Area is to be used for both active and passive recreation opportunities within parks, linear/riparian corridors as open space links, private and public sporting and recreation facilities, buffer and screening effects and securing or riparian and other wildlife corridors.



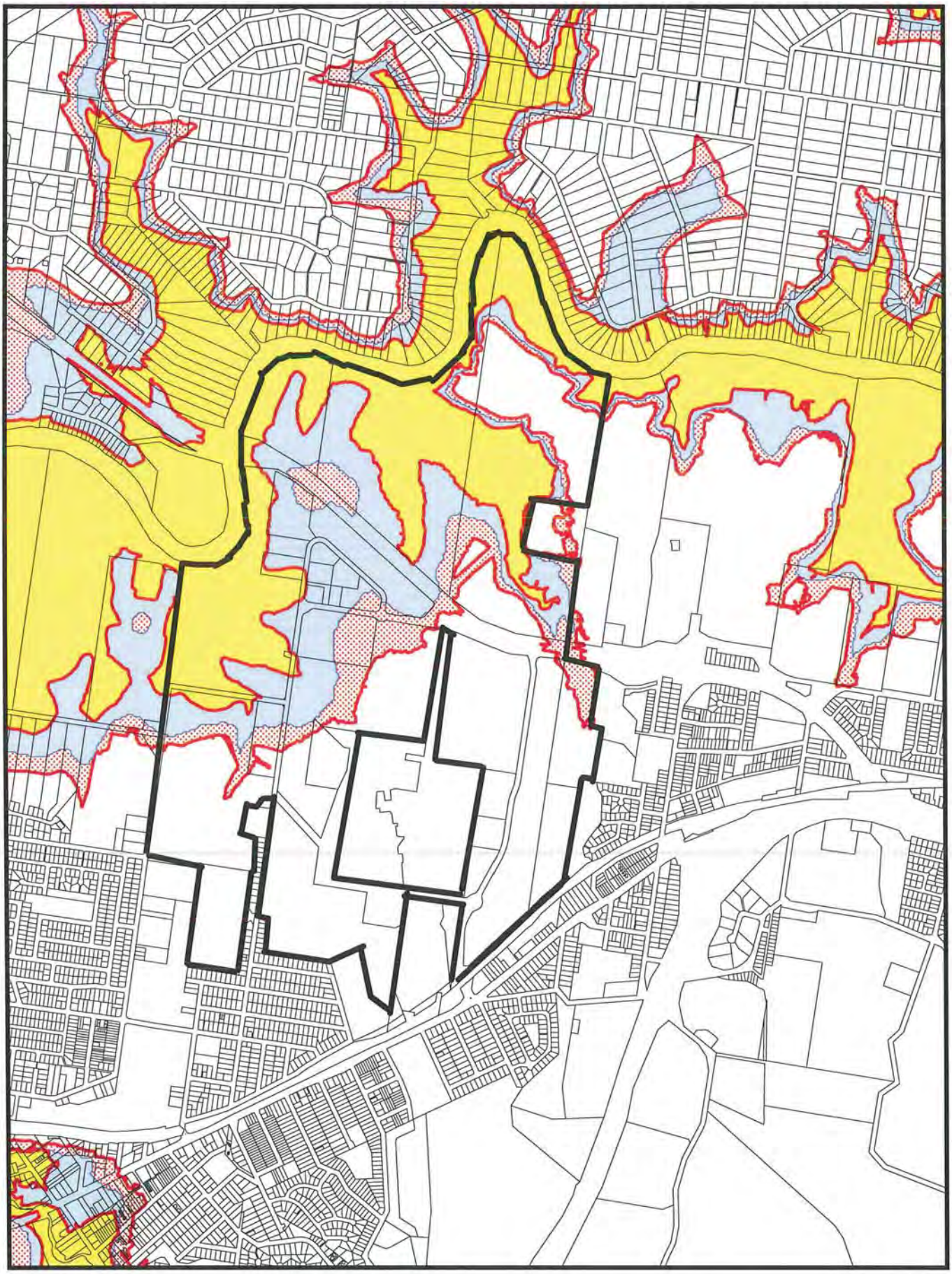
Current 1 in 20 development line (red) and 1 in 100 flood line (blue)



January 2011 Flood Map



City of Ipswich



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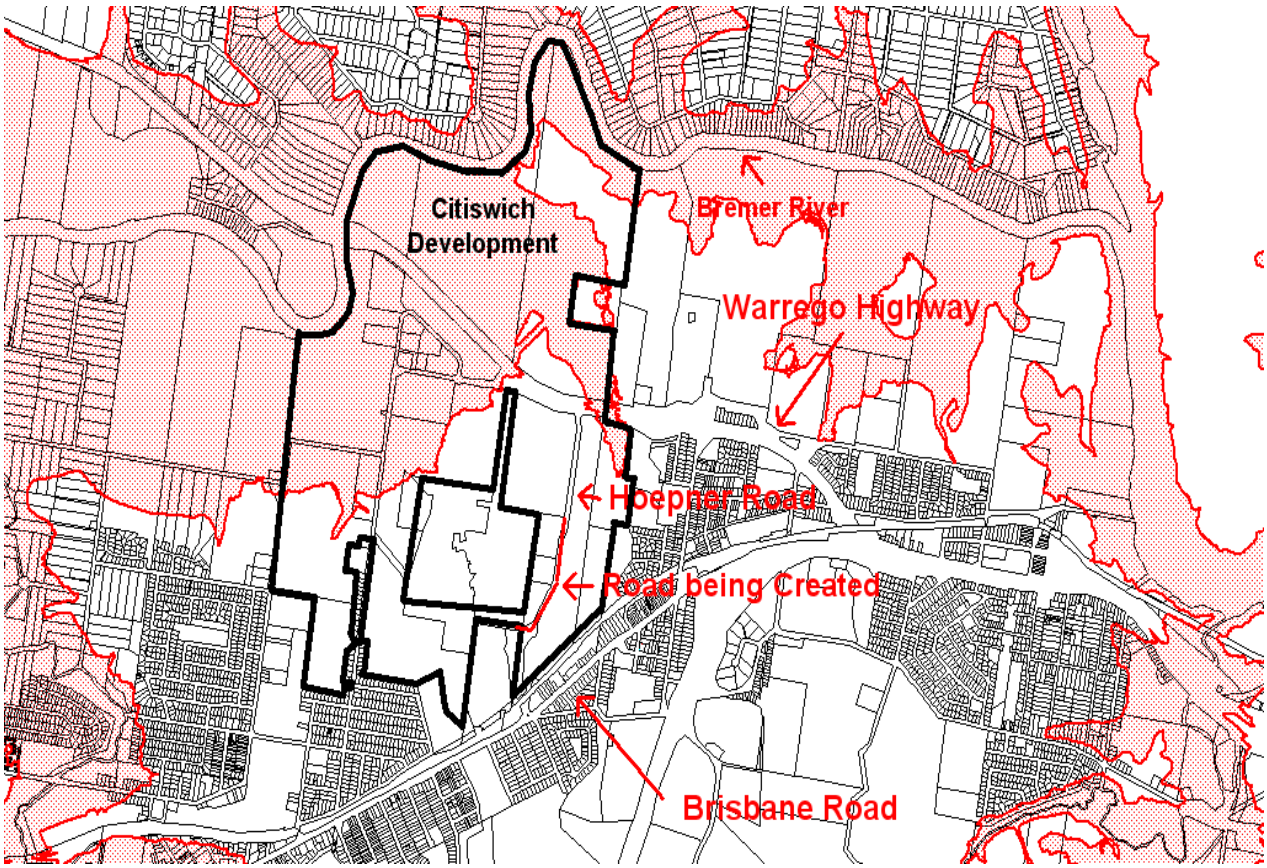
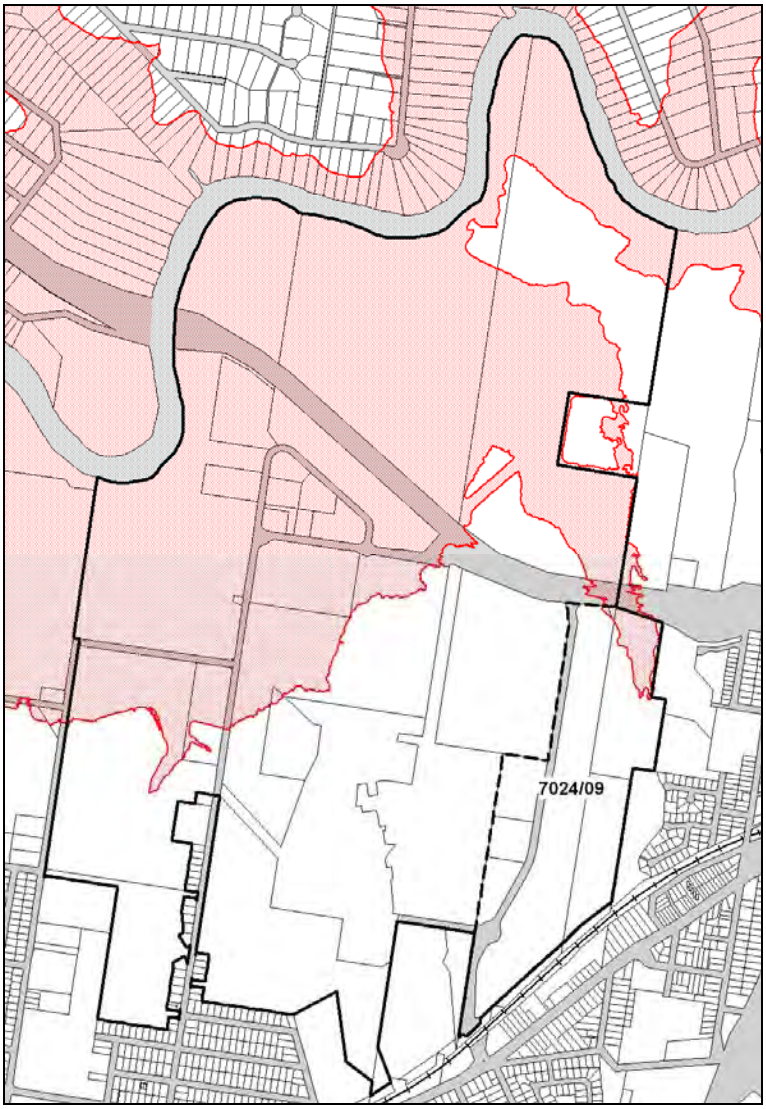

Citiswich
Development
Bremer River
Warrego Highway
Hoepner Road
Road being Created
Brisbane Road

Flood Map



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Document Control

Version	Date	Author		Reviewer	
LJ8714/R12	17/09/2010	[redacted]	[redacted]	[redacted]	[redacted]
LJ8714/R12V2	17/03/2011				

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Walker Corporation Proposed Reconfiguration Citiswich Stage 4 (WLK25_Stge 4 Rev P_001)
Acor Baseline Consultants Stage 4 Bulk Earthworks (BR090084-DA1-00 to 06)
Cardno Archer St Parklands Earthworks (7902.44.01-300 to 306)

Annexures

Annex A Individual Lot (BCC) Sediment & Erosion Guidelines
Annex B Detailed WBNM Results
Annex C Detailed SOBEK Results

1 INTRODUCTION

This Stormwater Management Strategy (SWMS) has been prepared by Cardno Lawson Treloar (CLT), specialist stormwater consultants, for Stage 4 of the Citiswich Industrial Development located off the Warrego Highway at Bundamba in Ipswich City. This report has been completed for Walker Corporation Pty Limited (WCL), the project managers of the proposed development, in response Ipswich City Council's (ICC) information request dated 18 June 2010 (ref: 2560/2010/CA), to support a Re-Configuration of Lot (ROL) Application.

Council's information request in brief required:

- Hydrology and hydraulic modelling (including flood conveyance) for the proposed drainage channel;
- Minimum 4.5 metre access maintenance berm on both sides of the open channel. If the maintenance berm is located within the channel, the berm is to be benched above the 1 in 1 year ARI flow.
- Cross-sections and assumptions for the drainage channel to be similar to Stage 6 ROL DA 5415/09.
- A stormwater management strategy complying with the planning scheme water quality outcomes, waterways stability and runoff water quality objectives for TN, TP, TSS and gross pollutants.
- Strategy to include MUSIC modelling and provision of relevant sqz file, and to be in accordance with current master planned stormwater management document.

Stage 4 of the Citiswich site is located west of Bognuda Street. The Citiswich Masterplan and Stage 4 extents are shown on Figure 1. The proposed layout for Stage 4 is shown on Drawing No: WLK25_Stge 4 Rev P_001 included in the reference drawing section of this report.

This SWMS details the specific flooding and stormwater quality management requirements for Stage 4 and has been completed in accordance to the following masterplan reports:

- '*Citiswich – Masterplan Stormwater Management Strategy (Response to Stage 1 Healthy Waterways Review)*' dated February 2009 (ref: LJ8714/R4/V3);
- '*Citiswich Masterplan Local Flooding Investigation*' dated June 2008 (ref: LJ8714/R6);
- '*Bremer Business Park Masterplan – Flooding Investigation*' dated August 2007 (ref: LJ8714/R3/V2).

The first of these dealt with water quality, the second dealt with local tributary flooding and the third dealt with regional Bremer River flooding.

2 STAGE 4 EXISTING SITE & PROPOSED DEVELOPMENT

2.1 Existing Site Description

Stage 4 of the Citiswich Estate is approximately 25.5ha in area and is bound by Bognuda Street to the east, River Road to the west, Archer Street Parkland to the north and Stage 6 of the Citiswich site to the south. The majority of the site is cleared land, with a few stands of vegetation at the southern stage extent.

Stage 4 is located within the Bremer River Catchment, which forms part of the regional Brisbane River Catchment. A tributary of the Bremer River flows through the Stage 4, originating around Bird Street to the south and flows through the site in a local gully, draining under Archer Street and ultimately into the Bremer River, effectively splitting Stage 4 in two. A minor drainage path, originating east of Bognuda Street (in Stage 3), joins the tributary approximately 250m upstream of Archer Street. In addition, flows from Stage 1 to the east converge into the tributary approximately 150m upstream from the Bremer River, within the future Archer Street parklands.

2.2 The Proposed Development

The proposed Stage 4 development is comprised of industrial allotments ranging in size from approximately 0.4ha to 3.0ha. Access to Stage 4 of the Citiswich site will be from Bognuda Street. A new road is proposed to provide access through Stage 4. Details of the Stage 4 layout are shown on Drawing No WLK25_Stge 4 Rev P_001, included in the reference drawings section of this report.

The following drainage infrastructure is proposed to be constructed to support the development of Stage 4:

- Bio-Retention systems, including end-of-line systems to treat the road reserve runoff and a local individual lot systems;
- Realignment of tributary through Stage 4; and
- Upgrade of Bognuda Street and Archer Street crossings.

It is proposed to realign the existing tributary through Stage 4. The minor drainage path originating east of Bognuda St (in Stage 3) will be modified to join this central tributary approximately 100m further upstream than its existing location. The tributary will be re-profiled under Archer Street, through the proposed open space / parkland, to the discharge point at the Bremer River.

The proposed drainage works modify the gully to provide a smooth interface between the future fill of Stage 4 and the drainage channel. Typically the profile will have base width of 12m, which includes a low flow channel, with 1 in 4 batters to a width 24m at the top of the channel. Due to the fill at the northern end of the site being dominated by the regional Brisbane River flood level a drop structure is proposed downstream of Archer Street to contain the local flows back to the existing gully level.

Local drainage will comprise a combination of overland flow and stormwater network systems which will discharge runoff into the tributary. The proposed tributary modification and overland flow paths within Stage 4 are shown on Figure 2.

For full details of proposed drainage works refer to Section 8.1.2.

3 DATA

The flooding and water quality assessments detailed in this report have been based on:

- Detailed site survey data provided by Walker Corporation Pty Ltd and Bennett & Bennett Pty Ltd;
- Laser Survey of the area surrounding the Citiswich site supplied by Terranean Mapping Technologies;
- 1m Contour information, digital orthophotos and property data supplied by ICC;
- Stage 4 layout detailed on Walker Drawing No: WLK25_Stge 4 Rev P_001;
- Stage 4 bulk earthworks detailed on Acor Baseline Consultants – Drawing Nos: BR090084-DA1-00 to 06;
- Archer Street Parkland earthworks detailed on Cardno (Qld) Pty Ltd – Drawing Nos: 7902.44.01-300 to 306;
- 1:25,000 scale topographic maps, supplied by SUNMAP; and
- Rainfall and evaporation data for Ipswich supplied by the Bureau of Meteorology.

4 STORMWATER QUALITY OBJECTIVES

4.1 Environmental Values (EVs)

The site drains to the Bremer River, which forms part of the Brisbane River Catchment. Considering the importance of the receiving waters and the current poor rating of the system, this SWMS has been framed to ensure no detriment to the downstream environment is caused by development of Stage 4. To this end, water quality objectives (WQO's) have been nominated for the project based on existing and potential environmental values (EV's) associated with the current condition of the Bremer River and advice from ICC.

The EVs and WQOs for the site are based on CLT's *'Citiswich Masterplan Stormwater Management Strategy (Response to Stage 1 Healthy Waterway Review)'* dated February 2009 (ref: LJ8714/R4/V3), and are as follows:

Table 4.1 Environmental Values for Protection: Lower Bremer River

Environmental Value	Description
Aquatic Ecosystems	The intrinsic value of aquatic ecosystems (e.g. plants, animals and their ecological interactions).
Wildlife Habitat	Riparian wildlife and their habitat, food and drinking water (e.g. key species such as turtles, platypus, seagrass and dugongs).
Secondary Recreation	Health of humans during recreation which involves indirect contact and a low probability of water being swallowed (e.g. wading, boating, rowing and fishing).
Visual Recreation	Amenity of waterways for recreation which does not involve any contact with water (e.g. walking and picnicking adjacent to a waterway).
Cultural Heritage	Indigenous and non-indigenous cultural heritage (e.g. custodial, spiritual, cultural and traditional heritage, hunting, gathering and ritual responsibilities; symbols, landmarks and icons (such as waterways, turtles and frogs); and lifestyles (such as agriculture and fishing)).

4.2 Water Quality Objectives (WQOs)

With the established EVs in mind, long term WQOs proposed in accordance with the Ipswich Planning Scheme, are as follows:

Table 4.2 Long-term Water Quality Objectives (Operational Phase)

Indicator	Water Quality Objective
pH	6.5 to 8.5
Dissolved Oxygen	80-105% saturation
Total Phosphorous	< 0.07 mg/L
Total Nitrogen	< 0.65 mg/L
Turbidity	< 20 NTU
Suspended Solids	< 15mg/L
Faecal Coliforms	150 organisms/100mL (minimum of 5 samples taken at regular intervals not exceeding one month, with 4 to 5 not exceeding 600 organisms/100mL)
Oils & Grease	No visible films or odour
Litter/Gross Pollutants	No anthropogenic (man-made) material greater than 5mm in any dimension

These WQOs are long-term objectives for a fully stabilised catchment with fully established water quality improvement devices throughout. In the long term, discharges from the operational site should conform to the above WQOs.

The proposed development is premised on the basis it will achieve the following load reduction targets:

- ≥ 80% reduction in Total Suspended Solids;
- ≥ 60% reduction in Total Phosphorus;
- ≥ 45% reduction in Total Nitrogen; and
- ≥ 90% reduction in gross pollutants.

During the construction period of the subdivision works the following water quality objectives have been nominated to be immediately achievable for the release criteria which will ensure the EVs are maintained. A sediment and erosion control plan is to be submitted with an operational works application demonstrating how this will be achieved in accordance with the latest *'Best Practices Erosion and Sediment Control'* (IECA, 2008).

Table 4.3 Water Quality Objectives – Construction Phase

Indicator	Water Quality Objective
pH	6.5 to 8.5
Suspended Solids	<50mg/L
Oils & Grease	No visible films or odour
Litter/Gross Pollutants	No visible litter washed from the site

5 STORMWATER MANAGEMENT STRATEGIES

5.1 Civil Construction Phase Stormwater Quality Management

The primary pollutants that are to be managed during the construction phase include litter and sediment. During the construction phase the management of stormwater runoff from the exposed earthworks surfaces will be based on containment, diversion and retention.

The earthworks will be undertaken on a staged basis to limit the extent of disturbance to a confined area. The management of this area will be in accordance with the current '*Best Practise Erosion and Sediment Control*' (IECA, 2008) Manual. Management will include:

Plate 5.1 – Typical Catch Drain

Plate 5.2 – Typical Sediment Fences

- Erosion controls such as sediment fences surrounding stripped earth;
- Sediment fences surrounding stockpiles of soil and debris;
- Construction of perimeter bunds at the toe and/or top of the earthworks batters;
- Catch drains, including check dams, through the site to catch and direct runoff;
- Gully Pit protection at all gully pits downstream of construction works; and
- Specific construction of site sediment basins prior to site discharge into the Bremer River (if required).

Plate 5.3 – Typical Sediment Basin

An Erosion and Sediment Control Plan to Council specifications is to be submitted to Council and approved prior to any construction activity taking place. At all stages of the construction process current building practice standards will be adhered to.

5.2 Stormwater Quality Treatment Device Construction

The indicative location of bio-retention systems is shown on Figure 2. Bio-retention systems will improve the water quality by removing:

- Suspended Solids;
- Nutrients; and
- Metals.

The inlet zones of the bio-retention system will include a flow velocity dissipater and sediment forebay to provide protection for the bio-retention basin. Construction of the bio-retention systems will be in accordance with Healthy Waterways' '*Construction and Establishment Guidelines*' dated February 2009.

Plate 5.4 – Typical Bio-Retention System

5.3 Lot Construction Management

Appropriate sediment and erosion control is to be maintained during the redevelopment of individual lots. Evidence of this is to be submitted under separate cover with each operational works application. Annex A contains detailed guidelines prepared by Brisbane City Council (BCC) for appropriate lot management.

In the event that the disturbed lot area exceeds 1ha local lot sediment basins are recommended. Construction and landscaping of the individual lot bio-retention system should occur at the completion of all other lot works to protect the filter media.

5.4 Operational Phase Management

Upon completion of all the bulk earthworks, roads, services, buildings and establishment of the landscaping and water quality treatment zones, the site is considered in its ultimate operation phase.

The pollutants of concern for the operational phase of the Citiswich development include:

- Litter;
- Metals and oils;
- Sediment; and
- Nutrients (Nitrogen and Phosphorous).

The operational phase Stage 4 SWMS is shown on Figure 2 and considers 3 main treatment areas as follows:

- Industrial Lot Areas;
- Archer Street, Bognuda Street and Adjacent Access Roads (including road reserve); and
- Open Space.

5.5 Industrial Areas

As detailed in the Masterplan SWMS (CLT, 2009) each individual lot will treat its own stormwater runoff. This treatment zone will be incorporated into the lot landscaping to provide effective use of space and at source treatment.

The proposed treatment train for a typical lot will include collection and re-use of roof water in rainwater tanks, vegetated buffers on hardstand areas with all site runoff passing through an in-lot bio-retention system. Conceptual details are shown on Figure 3.

5.6 Roads Reserves

Archer Street, Bognuda Street and the adjacent access roads will be treated with end-of-line bio-retention systems where possible.

The run-off from Bogunda Street will discharge to the bio-retention system located in the Archer Street parklands between Stage 1 and Stage 4. This system has been sized, as part of Stage 1, to treat catchment the Bognuda Street that drains to this location from both Stage 1 and Stage 4.

Following discussions with Council the bio-retention basin within Stage 6 has been sized to treat run-off from the entire upstream catchment, including the existing residential development external to the site. The basin size has been sized to capture the required load to match the requirements for Stage 6, the southern portion of the Stage 2 Hoepner Road, and the Stages 3, 4 and 5 roads.

Therefore the internal access roads and Archer Street will be treated in the bio-retention system between Stage 4 and Stage 6. This bio-retention system has been design to treat the external untreated catchments to ensure that the overall load reductions from Stage 4 and the Citiswich site meet Council's requirements prior to discharge from the Citiswich Site.

The details of this assessment is contained in the Stage 6A and 6B Operational Works Approval (DA7282/10) as detailed in CLT's '*Citiswich - Stage 6 Stormwater Management Strategy to Support Operational Works Application*' dated October 2010 (ref LJ8714/R15).

5.7 Open Space Areas

The open space areas will be, where possible, landscaped and re-vegetated using species and techniques that do not require excessive fertilisation and watering.

6 Stormwater Quality Assessment

6.1 Individual Industrial Lot Assessment

The Citiswich Stage 4 SWMS includes individual lot treatment devices (rainwater tanks, vegetated buffers and bio-retention system). The Masterplan analysis indicates the individual lot bio-retention systems are required to be sized to be a minimum of 2% of the total lot area.

As individual lots are redeveloped more detailed sizing requirements for individual lots will be implemented based on the Healthy Waterways '*Water Sensitive Urban Design Deemed to Comply Solutions for South East Queensland*' (2009) report or LJ8714/R9. The location and relative size of the individual lot Bio-retention systems is shown on Figure 2.

6.2 Archer St, Bognuda St and Adjacent Access Roads

6.2.1 Approach

CLT has carried out detailed pollutant export analysis using MUSIC Version 3.01 to assess the possible pollutant loads from development of Stage 4. The pollutant impact analysis has been carried out in accordance with the latest South East Queensland pollutant guidelines and data, detailed in:

- CRC for Catchment Hydrology, 2005, '*Model for Urban Stormwater Improvement Conceptualisation Version 3.01 User Manual*';
- FAWB, June 2009, '*Guidelines for Soil Filter Media in Bio-Retention Systems (Version 3.01)*'
- Gold Coast City Council (GCCC), 2006, '*MUSIC Modelling Guidelines*';
- Healthy Waterways, 2006, '*Water Sensitive Urban Design Technical Design Guidelines for South East Queensland*'; and
- ICC, April 2004, '*Ipswich Planning Scheme*'.

CLT has considered the following modelled catchment conditions:

- **Post-Development Case** – Post-development catchment conditions without treatment; and
- **Mitigated Case** – Post-development catchment conditions with treatment.

As discussed in Section 5.6 Archer Street and the internal roads will be treated by the Stage 6 bio-basin located between Stage 4 and 6. To simplify the water quality analysis the road catchment has been separated out and treated by a nominal bio-retention basin which meets the load reduction levels as per the Stage 6 bio-retention basin.

Table 6.1 summarises the catchment areas and land uses assumed in the MUSIC assessment. The catchments and land uses are also presented on Figure 2. While open space in the form of balance lots 100 and 101 and road reserve along River Road is proposed to be incorporated into Stage 4 development, the development areas have been modelled with an industrial land use in order to be conservative with pollutant concentrations.

Table 6.1 MUSIC Model Post-Development Adopted Land Uses

Catchment Label	Modelled Land Use	Sub Area (ha)
ST4-Archer-W*	Industrial	1.240
ST4-IND-W	Industrial	14.940
ST4-IND-E	Industrial	7.830
ST4-Newroad	Industrial	0.260
ST4-Archer-E	Industrial	0.180
ST1-BOG**	Industrial	1.458

* Archer and internal road catchment
** Bognuda Street Catchment from Stage 1

Over 20 years of continuous rainfall data for Amberley (Station Number 40004) was obtained from the Bureau of Meteorology for the period 01/05/1980 to 30/11/2004. Table 6.2 below presents the statistical assessment of the annual rainfall totals from the Amberley Station.

Table 6.2 Statistical Results for the Daily Rainfall at Amberley

Statistical Parameter	Annual Rainfall (mm)
Average	768
Median	773
10th Percentile (dry)	487
90th Percentile (wet)	1043

The adopted 10 year period considered in the MUSIC modelling for Stage 4 of the Citiswich analysis was from January 1985 to December 1994. This period included an average rainfall over the 10 years of 768mm. It also contained a wet year (1989 – 1047mm), a dry year (1994 – 470mm) and an average year (1985 – 732mm).

The potential evaporation details were obtained from the Bureau of Meteorology using the co-ordinates of the Amberley Station.

The stormwater quality improvement devices assessed in the MUSIC model include a combination of the following at source treatments as discussed in Section 5.4 and shown on Figure 2.

- In-lot Bio-retention Systems;
- An end-of-line bio-retention basin located within the open space area between Stage 1 and Stage 4; and
- A regional bio-basin between Stage 4 and Stage 6.

The following assumptions were made in the modelling:

- A 6 minute time step was adopted to ensure accurate assessment of the proposed treatment devices;
- The pollutant generation parameters are adopted from Gold Coast City Council's (GCCC) *'MUSIC Modelling Guidelines'* (2006), with a break down into macro scale parameters (i.e. roof water, roads and ground);
- Industrial lots were modelled using the Industrial source node detailed in the GCCC *'MUSIC Modelling Guidelines'* (2006);

- Where catchments included multiple lots, catchment areas and treatment device areas were combined into a single node area to reduce run times and memory space;
- No flow routing was assumed, which provides a conservative estimate of treatment device efficiency;
- A factor of safety of 2 was assumed, as detailed in the FAWB *'Bio-retention Filter Media Guidelines (Version 3.01)'* dated June 2009. The filter media saturated hydraulic conductivity for all bio-retention systems was modelled as 90mm/hr. The hydraulic conductivity to be specified for construction will be 180mm/hr;
- The surface area of the individual in-lot bio-retention systems has been optimised to achieve the load based objectives for South East Queensland (80%, 60% and 45% for suspended solids, total phosphorus and total nitrogen respectively). Each in-lot bio-retention system should have a minimum filter media surface area of 1% of the lot area. Other details used include filter media depth of 800mm (excluding the 100mm transition and 200mm drainage layers), extended detention depth of 300mm and hydraulic conductivity of 180mm/hr;
- Archer Street will be treated with two separate end-of-line bio-retention systems (ST4-Archer and ST1-BOG). The two basins have been modelled with a filter media surface area of 100m^2 and 290m^2 for the ST4-Archer and ST1-BOG basins respectively. Other details used include filter media depth of 800mm (excluding the 100mm transition and 200mm drainage layers), extended detention depth of 300mm and hydraulic conductivity of 180mm/hr;
- Runoff from the individual industrial lots that enter the stormwater pipe networks and discharge to end-of-line bio-retention basins were modelled separately in MUSIC to avoid double treatment of the lot runoff. The individual lot run off was assumed to flow from the in-lot bio-retention systems off-site to the Bremer River;
- Default MUSIC pollutant removal efficiencies were adopted for all other treatment devices; and
- Total Impervious Area (TIA) was converted to Effective Impervious Area (EIA) by calibrating the post development model to the expected Annual Volumetric Runoff Coefficients (AVRC) based on GCCC (2006) recommendations for different land uses. Table 6.3 below details the expected AVRC for Stage 4 of the Citiswich site.

Table 6.3 Expected AVRC

Land Use	AVRC	Area (ha)	AVRC x Area	Expected AVRC
Industrial (Roads)	0.57	1.68	0.96	$\frac{\Sigma \text{ (ARVC x Area)}}{\text{Total Area}}$
Industrial	0.57	24.23	13.81	
Total		25.908	14.77	0.570

6.2.2 Results

A comparison of the flow from the post development case to the expected Annual Volumetric Runoff Coefficient (AVRC) for Stage 4 of the Citiswich development is provided in Table 5.4. This demonstrates the adopted rainfall runoff parameters for each land use is appropriate and provides a good calibration to the AVRCs.

Table 6.4 Runoff and AVRC Calibration

AVRC	Post Development
MUSIC Annual Flow (ML/year)	114
Modelled Area (ha)	25.908
Average Rainfall (mm/year)	763
AVRC	**0.577**
Expected AVRC	**0.570**

The annual average pollutant loads discharged from the proposed Stage 4 of the Citiswich development are shown in Table 6.5 for the post-development and mitigated cases. The required reductions are 80%, 60% and 45% for TSS, TP and TN respectively.

Table 6.5 10 Year Predicted Annual Pollutant Loads

Case	Annual Load (kg/yr)						Reduction – Mitigated to Unmitigated (%)			Reductions Met?
	Developed			Mitigated						
	TSS	TP	TN	TSS	TP	TN	TSS	TP	TN	
Whole of Catchment	18700	43.8	261	2220	10.5	135	-88.1	-76.0	-48.3	Yes
ST4-Archer-W, ST4-IND-W (Node 1)	10600	26.1	163	1340	6.47	85.2	-87.4	-75.2	-47.8	Yes
ST4-IND-E, ST4-Newroad, ST4-Archer-E, ST1-BOG (Node 2)	8130	17.8	98.2	883	4.06	49.9	-89.1	-77.1	-49.2	Yes
ST1-BOG	3540	5.56	18.8	301	0.98	8.56	-91.5	-82.4	-54.4	Yes
ST4-Archer	2300	3.64	12.7	331	0.87	6.99	-85.6	-76.1	-44.9	Yes
Bio-Ret-W (in-lot)	8310	22.4	150	1010	5.6	78.2	-87.8	-75	-48	Yes
Bio-Ret-E (in lot)	4590	12.2	79.5	581	3.08	41.4	-87.3	-74.7	-47.9	Yes

Table 6.5 shows that the proposed mitigation measures lead to a reduction in loads from Stage 4 of the Citiswich site. The reductions of the loads meet the operational phase performance criteria. With suitable operation and maintenance of the treatment devices it is expected that the treatment devices will meet the performance shown above.

7 HYDROLOGIC ASSESSMENT

7.1 Model Setup

A detailed hydrologic analysis has been undertaken using the Watershed Bounded Network Model (WBNM) 2007 Version 104. WBNM has been used in accordance with Council's *'Planning Scheme'* (2004), *'Queensland Urban Drainage Manual'* (2008) and *'Australian Rainfall and Runoff'* (1998).

A hydrologic model has been set up to include the site and external catchments. The total catchment and sub-catchment extents were determined from the supplied aerial survey and the 1:25000 topographic maps, produced by the Queensland Department of Lands. The WBNM model layout and sub-catchment boundaries for pre and post development conditions are shown in Figure 4 and Figure 5.

The WBNM model was used to assess the impacts of the proposed Citiswich development on the peak flows discharging from the site for a full range of Average Recurrence Intervals (ARI) (1 in 1 to 1 in 100 years) and for a range of storm durations (10 to 360 minutes).

The hydrologic assessment considers the following scenarios for the Citiswich development catchment:

- **Pre-Development:** This scenario assumes the Citiswich site extents in their existing development state with the catchments external to the Citiswich site in their ultimate developed state. Existing land usage was derived from topographical maps and satellite imagery from Google Earth with ultimate developed land usage derived from Council's Planning Scheme. Figure 4 shows the pre-development catchment layout.
- **Post-Development:** This scenario assumes the Citiswich site extents in their ultimate development state in accordance with the Citiswich Masterplan and Stage 4 Development Layouts with the catchments external to the Citiswich site in their ultimate developed state. Figure 5 shows the post-development catchment layout.

The adopted fraction impervious and C_{10} value for each land use is listed in Table 7.1. The fraction impervious and C_{10} values were adopted from QUDM (2008).

Table 7.1 Runoff Coefficient and Fraction Impervious for Land Uses

Land Use Category	C_{10}	Fraction Impervious (%)
Open space	0.70	5
Business and Industry	0.89	95
Residential Rural	0.71	20
Residential Medium Density	0.78	70
Residential Low Density	0.74	50
Special Use	0.89	95

The initial and continuing losses adopted for the WBNM model are shown in Table 7.2. A catchment lag of m = 1.3 was adopted for all ARI events.

Table 7.2 Adopted WBNM Initial and Continual Loss Parameters

ARI	Pervious Loss		Impervious Loss	
(years)	Initial	Continuing (mm/hr)	Initial (mm)	Continuing (mm/hr)
1, 2, 5	5	2.5	0	0
10, 20	2.5	2.5	0	0
50, 100	0	2	0	0

The pre-development model was validated against the Rational Method Calculation at the confluence of the tributary with the Bremer River as defined by the parameters detailed in Table 7.3.

Table 7.3 Adopted Rational Method Parameters

Parameter	Catchment (RPWest)
Area (ha)	213.32
C_{10}	0.71
Time of Concentration (min)	50

7.2 Results

Table 7.4 details the results of the WBNM hydrologic assessment for the western tributary discharging at node RPWEST.

Table 7.4 WBNM Predicted Peak Flows (Node RPWEST)

ARI (Years)	Pre-Developed			Post-Developed			Impact (Exist to Prop) (m^3/s)
	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	
1	13.38	60	55	22.32	60	36	8.94
2	18.86	60	53	29.86	60	35	11.00
5	27.13	60	50	40.99	60	35	13.86
10	33.51	60	49	48.59	60	35	15.08
20	40.91	60	47	58.20	60	35	17.29
50	51.71	60	46	69.73	60	35	18.03
100	60.00	60	45	80.09	60	35	20.09

The results in Table 7.4 indicate that without mitigation the proposed Citiswich Stage 4 development is predicted to cause an increase in peak flows entering the Bremer River from the western tributary. These increases will not affect peak flooding in the Bremer River as this is dominated by the regional Brisbane River event, some 10m higher.

The hydrographs generated from the hydrologic model were used as the boundary conditions for the hydraulic model. Further details are provided in Section 8 with detailed WBNM results presented in Annexure B.

8 LOCAL HYDRAULIC ASSESSMENT

8.1 Model Setup

This section details the hydraulic assessment of the Citiswich development using the Deltares one dimensional (1D) fully dynamic hydraulic modelling package, SOBEK (Version 2.11.002c). The assessment includes discussion of the hydraulic model set up, mitigation options proposed within the Citiswich development and a full summary of the hydraulic results.

The assessment considers the following modelling scenarios:

- **Pre-development Case:** This case models the western tributary that passes through the site and assumes Stage 4 and the remainder of the site in its existing condition. The model incorporates the pre-development hydrologic flows as described in Section 7 with the layout shown on Figure 6.
- **Post-development Case:** This case modifies the pre-development case to include Stage 4 development plans. The model incorporates the post-development hydrologic flows as described in Section 7 with the layout shown on Figure 7.

8.1.1 Pre-Development Setup

The pre-developed hydraulic model cross-sections and culvert details were based on detailed aerial and ground surveys. The pre-developed SOBEK model layout is shown on Figure 6 and is based on the SOBEK model established for the Masterplan assessment.

The SOBEK model adopts a tailwater level of RL 2.623mAHD at the Bremer River, which is the level of the Bremer River (18 hour) 2 year ARI event. This level is based on the SOBEK 2D modelling reported in CLT's '*Bremer Business Park Masterplan Flood Investigation*' dated August 2007 (ref: LJ8714/R3/V2). Considering the extents of Stage 4 and the Bremer River, the results from this assessment will not be impacted by the adopted tailwater level.

Based on the aerial photography and a site inspection, a Manning's 'n' roughness value of 0.05 has been adopted for the existing tributary, with the exception of cross sections within the existing lots on Bird Street where a Manning's 'n' roughness of 0.15 has been adopted due to the existing dwellings, fences and gardens.

8.1.2 Post-Development Setup

The post-developed hydraulic model is based on Acor Baseline Consultants' Stage 4 bulk earthworks (Dwg No BR090084-DA1-00 to 06), included in the reference drawings. Minor modifications to these levels have been undertaken to ensure hydraulic criteria are met. The post-developed SOBEK model layout is shown on Figure 7.

The re-profiled Stage 4 channels upstream of Archer Street (i.e. between cross-sections RCH_1_DEV_01 to 03) are proposed to be grassed-lined with a low flow channel along the invert, and hence a roughness value of 0.04 has been adopted. The concrete drop structure proposed immediately downstream of Archer Street, as detailed below, adopts a roughness of 0.013. Some sections of the proceeding channel through Archer Street Parklands are assumed to be rock-lined, hence a roughness of 0.02 was adopted. Manning's 'n' roughness value beyond the site extents has remained unchanged.

8.1.2.1 Channel Re-alignment

The existing flow paths through the site have been modified to provide suitable conveyance. Figure 7 demonstrates the developed SOBEK model re-alignment and typical channel profiles. A channel invert level of RL19.5m and RL14.7m was adopted for cross-sections RCH_1_DEV_01 and 03 respectively, resulting with a constant grade of approx 1.2% through Stage 4. The Bognuda St reach was graded from RL20.2m at RCH_2_DEV_03 to join the main channel at approximately RL18.75m.

Downstream of Archer Street, a series of drop structures are proposed to safely convey flows through the Archer St Parklands and discharge into the Bremer River. These structures are subject to detailed design, and will be finalised as part of future development applications associated with the Archer Parklands.

As discussed with Council on the 6 January 2010, the channel has been sized to carry the ultimate catchment flows through the site, hence no further mitigation measures are proposed.

8.1.2.2 Crossing Upgrades

As part of the works associated with the channel re-alignments, both the Bognuda and Archer Street crossings will be upgraded to convey up to the ultimate 100 year ARI flood flows. Details are provided on Figure 7. A sensitivity assessment assuming 50% blockage has also been considered.

8.2 Hydraulic Results

A comparison between the pre- and post-developed 100 year ARI predicted flood levels for Stage 4 is shown in Table 8.1 for cross-section locations shown on Figure 7. The peak flood results for water surface levels, depths, flows and velocities for all ARIs are presented in Annex C.

Table 8.1 Pre vs. Post Development 100 Year ARI Predicted Peak Flood Levels, Discharge and Velocity

SOBEK XS ID	Peak Flood Level (mAHD)			Peak Discharge (m^3/s)			Peak Velocity (m/s)		
	Pre	Post	Impact	Pre	Post	Impact	Pre	Post	Impact
Reach 1 Western Tributary									
RCH_1_DEV_01	20.24	20.30	0.06	-	27.24	-	-	2.28	-
RCH_1_DEV_02	18.66	19.68	1.02	-	49.74	-	-	2.50	-
RCH_1_DEV_03	17.45	16.34	-1.11	-	52.79	-	-	1.93	-
Archer St									
RCH_1_DEV_04	-	15.85	-	-	52.79	-	-	2.96	-
Reach 2 Western Tributary									
RCH_2_DEV_02	-	22.63	-	-	23.32	-	-	1.36	-
Bognuda St									
RCH_2_DEV_03	-	21.33	-	-	23.28	-	-	2.34	-
RCH_2_DEV_04	-	19.91	-	-	23.24	-	-	1.33	-

The modelling results indicate the flood flow will be contained within the channel within acceptable velocities for a grassed lined channel. Downstream of Archer Street flood flows do increase but the channel is address as part of the Archer Street Parklands works.

In the table 8.2 below are the 100 year ARI results for the proposed crossings at Bognuda and Archer Streets as part of the Stage 4 works. Results for the 50% blockage scenario are also detailed. This indicates that the culverts have been adequately sized. Typical outlet protection is required downstream of these culverts.

The blockage scenarios indicate that in the event that the culvert does become blocked a release over the road will occur. The impact has been predicted to be a local increase in the flooding over the road, though depths are not excessive.

Table 8.2 100 Year ARI Stage 4 Crossing Results

Scenario		Post-Developed		50% Blockage	
Crossing		**Bognuda**	**Archer**	**Bognuda**	**Archer**
Water Level (RL m)	**U/S**	22.68	16.16	22.96	16.76
	D/S	21.36	14.82	21.37	14.82
Outlet Velocity (m/s)		3.55	2.72	4.10	3.46
Depth over Road (m)		0.08	0.00	0.36	0.56

8.3 Discussion

An investigation has been conducted on the potential for flooding of the tributary that runs through Stage 4 as a consequence of development within the proposed Stage 4. Full results for all ARIs are presented in Annex C. The hydraulic assessment indicates an increase in flood flow within the tributary as a consequent of development of Stage 4, however these impacts are predicted to be contained within the proposed channels through Stage 4 and the remainder of the Citiswich site. The development of Stage 4 will need to be above the predicted local tributary 100 year ARI flood levels presented in Annex C, and the regional Brisbane River level of RL 16.22mAHD.

The results indicate Bognuda Street crossing over Reach 2 will overtop during the 100 year ARI event, however depths are below the 300mm trafficable level. Results from the 50% blockage sensitivity case which is an extreme scenario indicate depths of up to 0.56m over Archer Street. Local outlet scour protection measures will be required immediately downstream of Bognuda Street culverts.

The re-profiled drainage channel proposed through Stage 4 is to be turf-lined, and results indicate that velocities will remain below 2.5m/s during the 100 year ARI event, in accordance with ICC requirements. The results also indicate that the conceptualised channel within the Archer Street Parkland will require scour protection measures due to the relatively high velocities, however this will be further addressed as part of future submissions to Council.

9 RESPONSE TO INFORMATION REQUEST

Ipswich City Council provided an information request dated 18 June 2010 & (ref 2560/2010/CA) for DA 2560/10, which proposed a subdivision of the site and or preliminary approval to vary the effects of the Ipswich Planning Scheme. This report has been prepared to specifically address the stormwater items raised in the information request.

2. <u>*Stormwater*</u>

(a) *The applicant is requested to provide flood conveyance hydrology and hydraulic modelling for the purposed drainage channel in accordance with the following:*

(i) *Minimum 4.5m access maintenance berm shall be provided on both sides of the open channel. Where the maintenance berm is proposed to be located within the channel, the berm is to be benched above the 1 in 1 year ARI flow.*

Details of hydrologic and hydraulic modelling are contained in Sections 7 and 8 respectively. The channel profile has been revised to allow access along the channel or batters, as required above.

(ii) *Similar cross-sections and assumptions should be taken from the Stage 6 (application number 5415/09) drainage channel. Include in the submission all relevant typical cross-sections.*

Figure 7 illustrates typical cross-sections of the proposed drainage channels. These cross-sections and assumptions are similar to those assumed in the Stage 6 application.

(b) *The applicant is requested to provide a detailed stormwater management strategy demonstrating compliance for the proposed development with council planning scheme water quality outcomes, specifically waterways stability and runoff water quality objectives concerning TN, TP, TSS and gross pollutants. This demonstration should include MUSIC modelling and provision of relevant sqz file. This strategy document should support current master planned stormwater management document.*

Sections 4, 5 and 6 of this report, detail the proposed stormwater management strategy for Stage 4.

10 ADMINISTRATION OF THE SWMS

10.1 Responsible Persons

Unless stated otherwise the person(s) and/or companies specifically responsible for the SWMS implementation are:

- **Contractor:** The Contractor's Site Manager. This person or his representative will be notified to Council upon assignment.
- **Civil Engineer:** This person/ company and/or a nominated representative will be notified to Council upon assignment.
- **Environmental Consultant:** This person/ company and/or a nominated representative will be notified to Council upon assignment.

10.2 Amendments

It is likely that as the development proceeds amendments to the SWMS will be required to reflect knowledge gained during the course of the operation.

Amendments shall be made by application in writing to Ipswich City Council stating clearly and in detail:

- The SWMS provision to be amended
- The reasons for the amendment, and
- How the new amendment better serves the environmental management of the development and its surroundings.

10.3 Treatment Device Certification

An Environmental Consultant shall be responsible for the treatment device certification. This certification shall be provided for each of the treatment measures proposed, including the individual lot systems.

The Environmental Consultant shall ensure that all elements of the design are implemented on-site.

Bio-retention certification shall be in accordance with the Bio-Retention Basin Construction and Establishment Sign-Off Forms contained within Chapter 3 of Healthy Waterways, 2009, '*Construction and Establishment Guidelines: Swales, Bio-Retention Systems and Wetlands*'.

Two separate bio-retention certifications are required; 1) Civil Certification (Forms A-F) and 2) Landscape Certification (Forms G and H).

A certification letter including the check list shall be provided prior to Council accepting the device as off maintenance.

11 CONCLUSION

This report provides a Stormwater Management Strategy and flood conveyance and hydraulic modelling to support the Re-Configuration of Lot Development Application for Stage 4 of Citiswich. A response to all relevant items within ICC's Information Request dated 18 June 2010 (ref: 2560/2010/CA), is also provided. This report provides details of:

- existing site conditions;
- proposed site conditions;
- management of stormwater quality for the civil construction and operational stages;
- management of stormwater quantity; and
- administration of the stormwater management strategy.

The strategy complies with the provisions of the Planning Scheme.

Both the adopted individual industrial lot 'at-source' and the 'end-of-line' roadway water quality treatment methods will achieve the proposed discharge criteria associated with the load based assessment method.

The local tributary flood assessment has indicated that the proposed works will contain the ultimate catchment flows through Stage 4. Appropriate fill will be required to ensure all proposed lots are above the regional 100 year flood level of RL 16.22mAHD.

12 REFERENCES

Australian Institute of Engineers, 1998, *'Australian Rainfall & Runoff'*

Cardno Lawson Treloar, 2007, *'Bremer Business Park, Masterplan Flooding Investigation'*.

Cardno Lawson Treloar, 2008, *'Citiswich Masterplan Local Flooding Investigation'*.

Cardno Lawson Treloar, 2009, *'Citiswich – Masterplan Stormwater Management Strategy (Response to Stage 1 Healthy Waterways Review)'*.

Department of Natural Resources & Water, 2008 *'Queensland Urban Drainage Manual'*

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IECA, 2008, *'Best Practise Erosion and Sediment Control'*.

Ipswich City Council, April 2004, *'Ipswich Planning Scheme'*.

13 QUALIFICATIONS

This report has been prepared by Cardno Lawson Treloar (CLT) specifically for Walker Corporation Pty Ltd and specifically to provide advice on Stormwater Management Planning for Stage 4 of the proposed industrial development of Citiswich.

Our analysis and overall approach has been specifically catered for the particular requirements of Walker Corporation Pty Ltd, and may not be applicable beyond this scope. For this reason any other third parties other than Council are not authorised to utilise this report without further input and advice from CLT.

CLT has relied on the following information provided by others:

- Detailed site survey data provided by Walker Corporation Pty Ltd and Bennett & Bennett Pty Ltd;
- Laser Survey of the area surrounding the Citiswich site supplied by Terranean Mapping Technologies;
- 1m Contour information, digital orthophotos and property data supplied by ICC;
- Stage 4 layout detailed on Drawing No: WLK25_Stge 4 Rev P_001;
- Stage 4 bulk earthworks detailed on Acor Baseline Consultants – Drawing Nos: BR090084-DA1-00 to 06;
- Archer Street Parkland earthworks detailed on Cardno (Qld) Pty Ltd – Drawing Nos: 7902.44.01-020 to 026;
- 1:25,000 scale topographic maps, supplied by SUNMAP; and
- Rainfall and evaporation data for Ipswich supplied by the Bureau of Meteorology.

The accuracy of the report is dependent upon the accuracy of this information.

While CLT's report accurately assesses peak flows from design storms, it is an ungauged catchment and consequently future observed flows may vary from that predicted.

Pollutant assessments, provided in this report, have been based on published typical land use parameters and are therefore indicative only. Monitoring would be required to accurately assess pollutant impacts of this development. It is for this reason that the SWMS should remain a living document throughout the construction and operational phases of this development and updated accordingly as further information becomes available.

Figures

Cardno Lawson Treloar

0.5 0 0.5 1.0 1.5 2.0 2.5km
1:50,000

50 0 50 100 150 200 250m
1:5000

Scale 1:5,000 (A3)

FIGURE 1

SITE LOCATION & STAGE 4 SITE EXTENTS

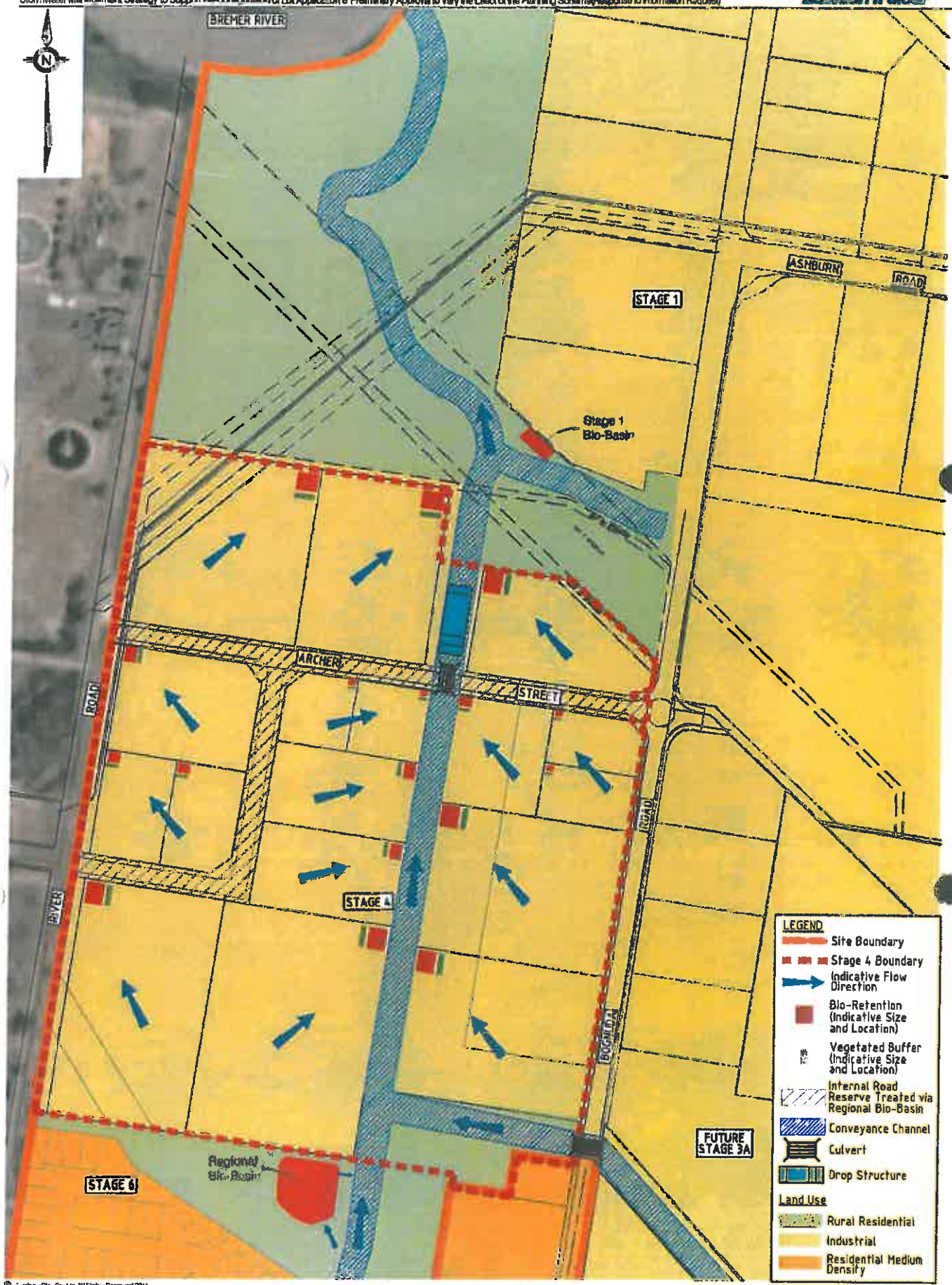
Project No.: LJ8714

Rev 0 Date: March 2011

Walker Corporation Pty Ltd

Citiswich - Stage 4
Stormwater Management Strategy to Support Re-Configuration of Lot Application & Preliminary Approval to Vary the Effect of the Planning Scheme(Response to Information Request)

Cardno Lawson Treloar



Scale 1:3,000 (A3)

FIGURE 2
STAGE 4 CONCEPTUAL OPERATIONAL STORMWATER MANAGEMENT STRATEGY

Rev: 0 Date: March 2011

Project No.: LJ8714

Walker Corporation Pty Ltd

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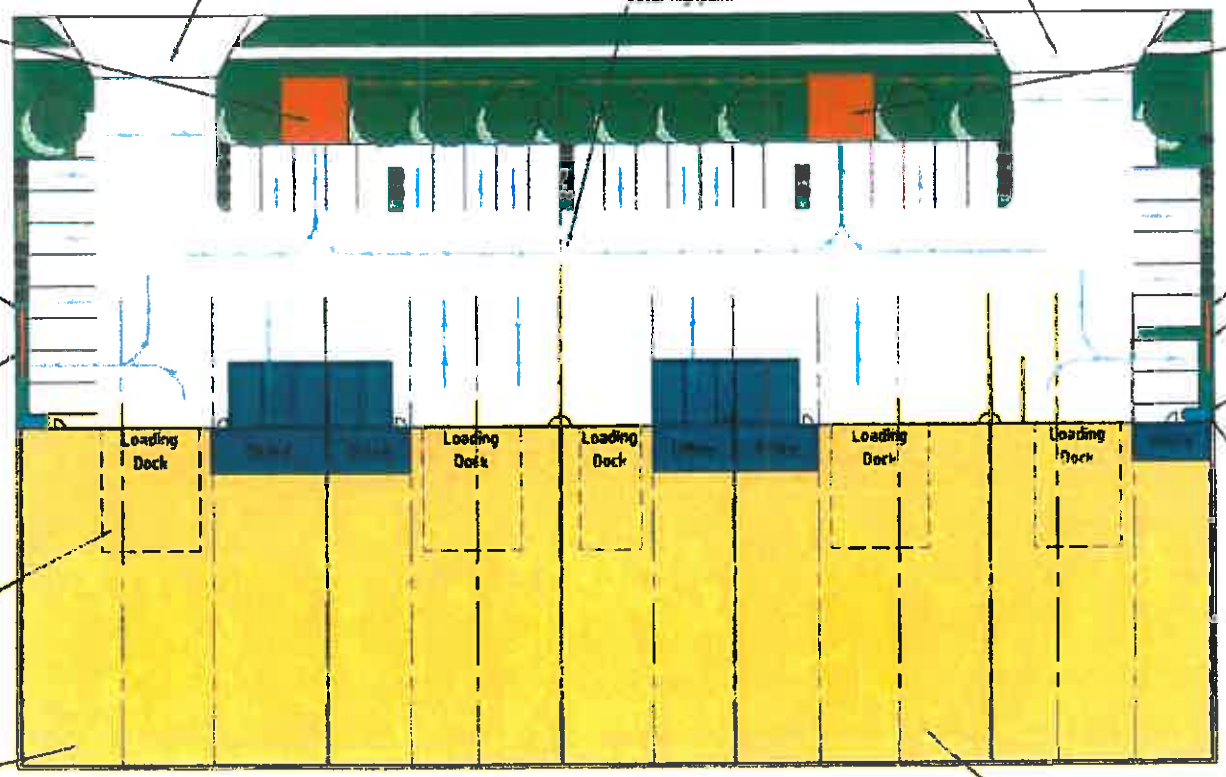

Due to flat site landscape area is located adjacent to building to allow roof runoff/tank overflow to be treated at surface in bioretention systems before it enters underground pipes

Bioretention system located in local depression

Rainwater tanks harvest roof water and are used to supply water for toilet flushing and landscape irrigation

Loading dock areas enclosed under roof

Roof extended to site boundary to prevent uncovered work activities/material storage

Internal areas drain to internal sump and not to carpark. Sump is periodically purged to sewer under local government/EPA license.

LEGEND
- Bioretention System
- Vegetated Swale Flow Path
- Stormwater Flow Path

Scale 1:400(A3)

4 3 4 8 12 16 20m 1:400

FIGURE 3

INDIVIDUAL INDUSTRIAL LOT CONCEPTUAL OPERATIONAL STORMWATER MANAGEMENT STRATEGY

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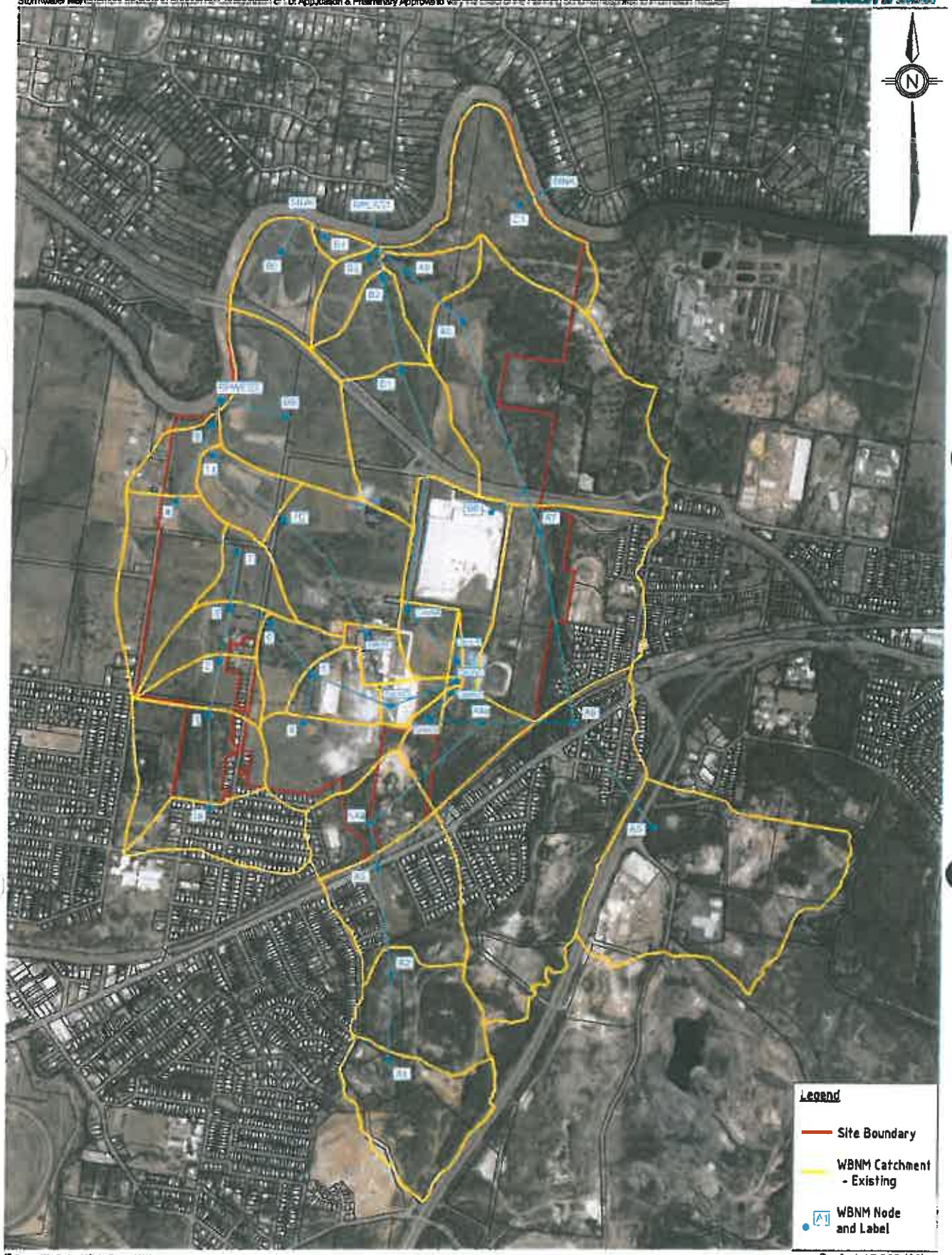
Rev: Orig. Date: March 2011

Walker Corporation Pty Ltd

Project No.: LJ8714

Cliswich - Stage 4
Stormwater Management Strategy to Support Re-Configuration of Lot Application & Preliminary Approval to Vary the Effect of the Planning Scheme/Response to Information Request



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150 0 150 300 450 600 750m
1:15,000

Scale 1:15,000 (A3)

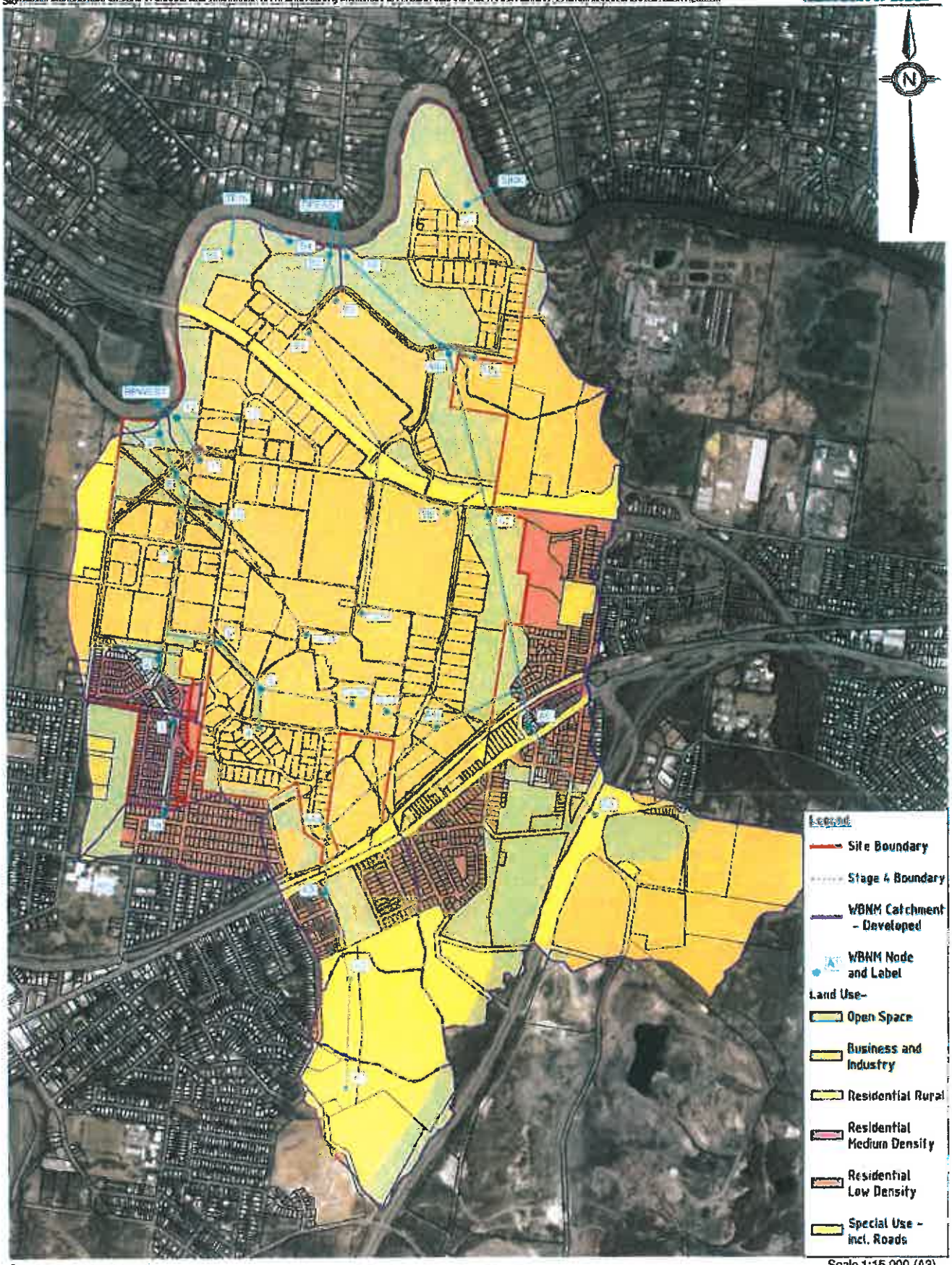
FIGURE 4
PRE-DEVELOPED WBNM MODEL LAYOUT

Rev: Orig Date: March 2011

Project No.: LJ8714

Walker Corporation Pty Ltd.

Oldwich - Stage 4
Stormwater Management Strategy to Support Re-Configuration of Lot Application & Preliminary Approval to Vary the Effect of the Planning Scheme/Response to Information Request



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Rev: Orig. Date: March 2011

Walker Corporation Pty Ltd.

150 0 150 300 450 600 750m
1:15,000

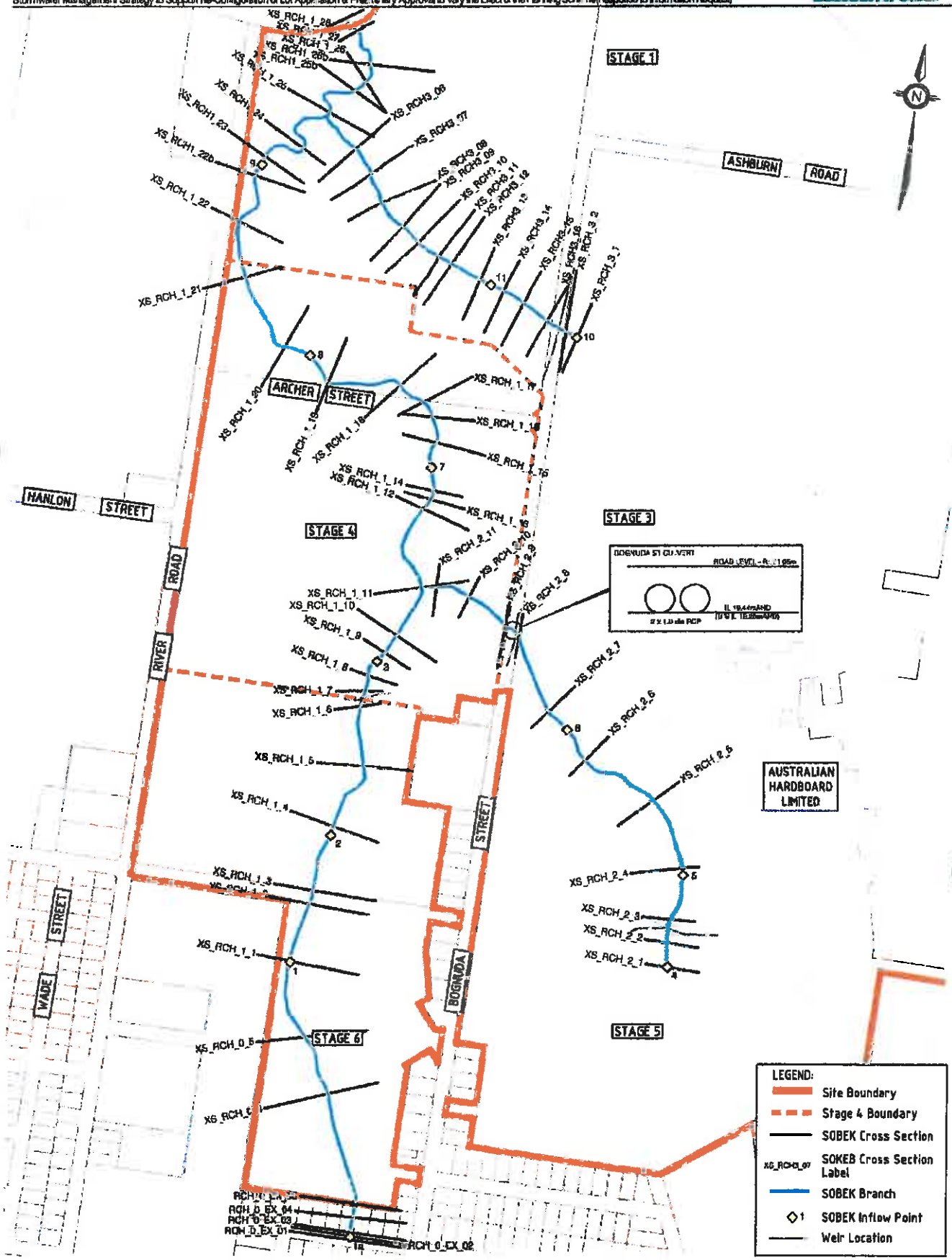
Scale 1:15,000 (A3)

FIGURE 5

POST-DEVELOPED WBNM MODEL LAYOUT

Project No.: LJ8714

Cardno Lawson Treloar



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Rev: Orig. Date: March 2011

Walker Corporation Pty Ltd

50 0 50 100 150 200 250m
1:5000

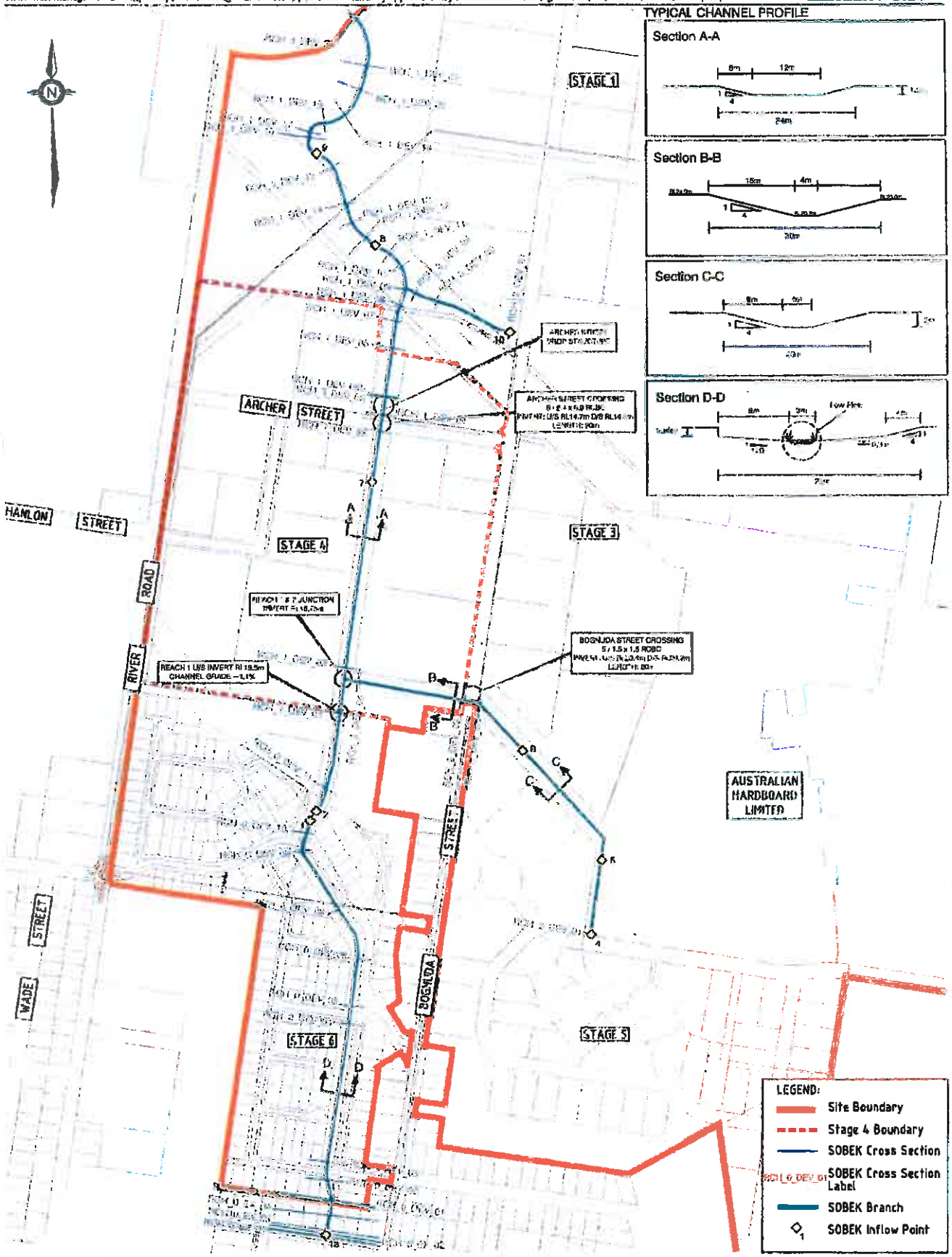
Scale 1:5000 (A3)

FIGURE 6

SOBEK PRE-DEVELOPED MODEL LAYOUT

Project No.: LJ8714

Cardno Lawson Treloar



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50 0 50 100 150 200 250m
1:5000

Scale 1:5000 (A3)

FIGURE 7

SOBEK POST-DEVELOPED MODEL LAYOUT

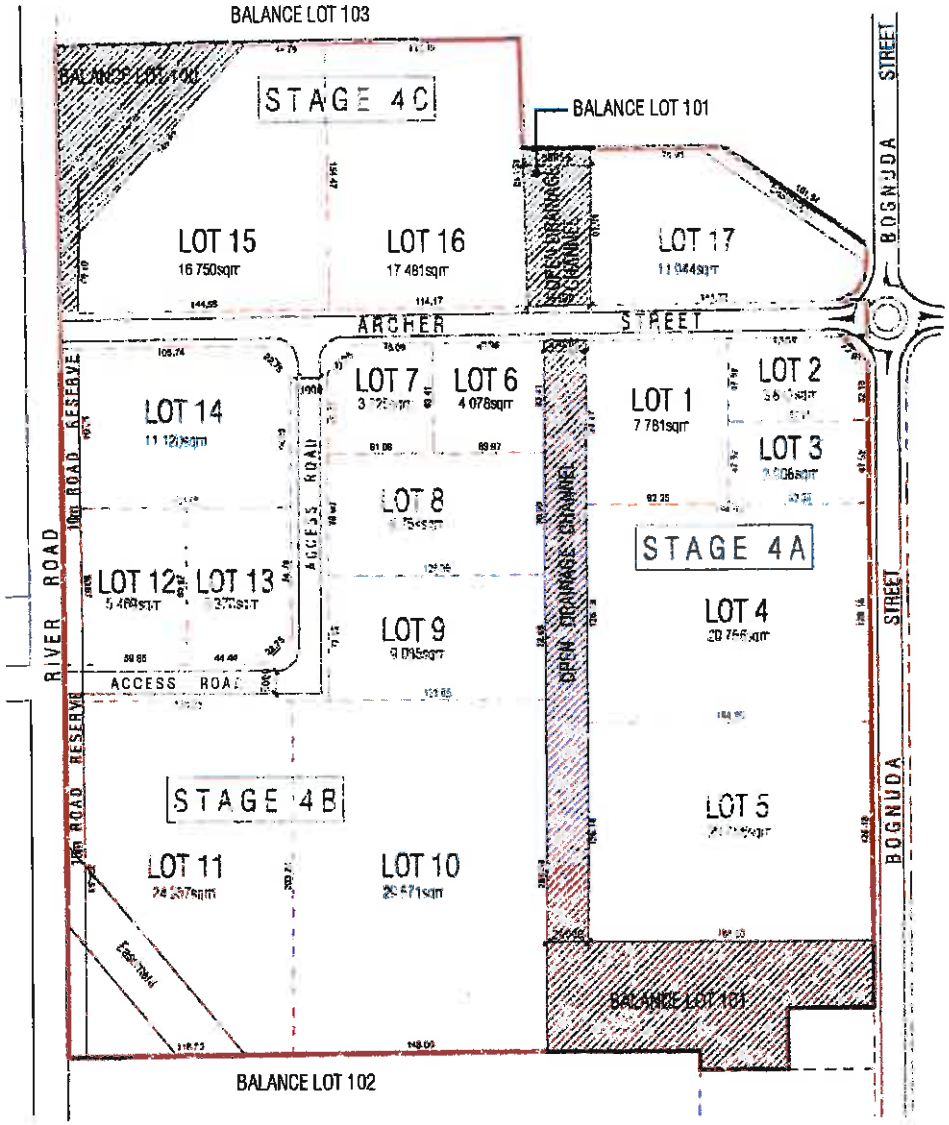
Rev: Orig. Date: March 2011

Project No.: LJ8714

Walker Corporation Pty Ltd

Reference Drawings

PROPOSED RECONFIGURATION CITISWICH STAGE 4



STAGE 4A	
LOT 1 AREA	7 781 m²
LOT 2 AREA	3 812 m²
LOT 3 AREA	3 908 m²
LOT 4 AREA	20 756 m²
LOT 5 AREA	20 756 m²
SUB TOTAL AREA	57 013 m²
STAGE 4B	
LOT 6 AREA	4 078 m²
LOT 7 AREA	3 725 m²
LOT 8 AREA	8 754 m²
LOT 9 AREA	9 065 m²
LOT 10 AREA	29 571 m²
LOT 11 AREA	24 357 m²
LOT 12 AREA	5 469 m²
LOT 13 AREA	5 870 m²
LOT 14 AREA	11 120 m²
SUB TOTAL AREA	101 529 m²
STAGE 4C	
LOT 15 AREA	18 750 m²
LOT 16 AREA	17 481 m²
LOT 17 AREA	11 944 m²
SUB TOTAL AREA	48 175 m²
TOTAL STAGE 4	
TOTAL DEVELOPABLE LAND AREA	204 717 m²

STAGE 4 BOUNDARY = 25 50 Hectares

SUB STAGE BOUNDARY

BALANCE LOTS

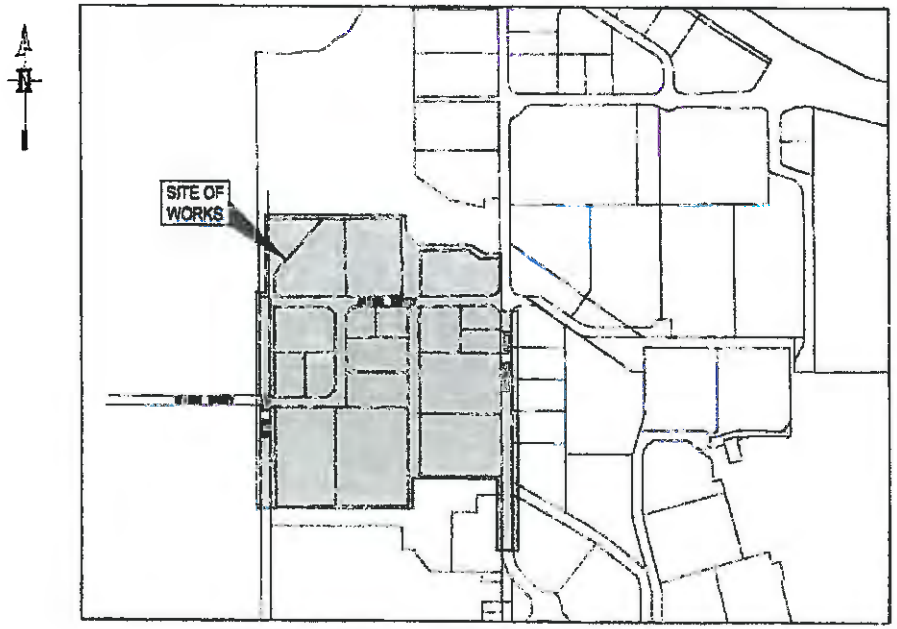
BALANCE LOT 100 = 7 034m²
BALANCE LOT 101 = 22 837m²
ROAD RESERVATION = 3 895m²

CITISWICH BUSINESS PARK - STAGE 4

BREMER BUSINESS PARK
CITISWICH
STAGE 4

FOR

Walker



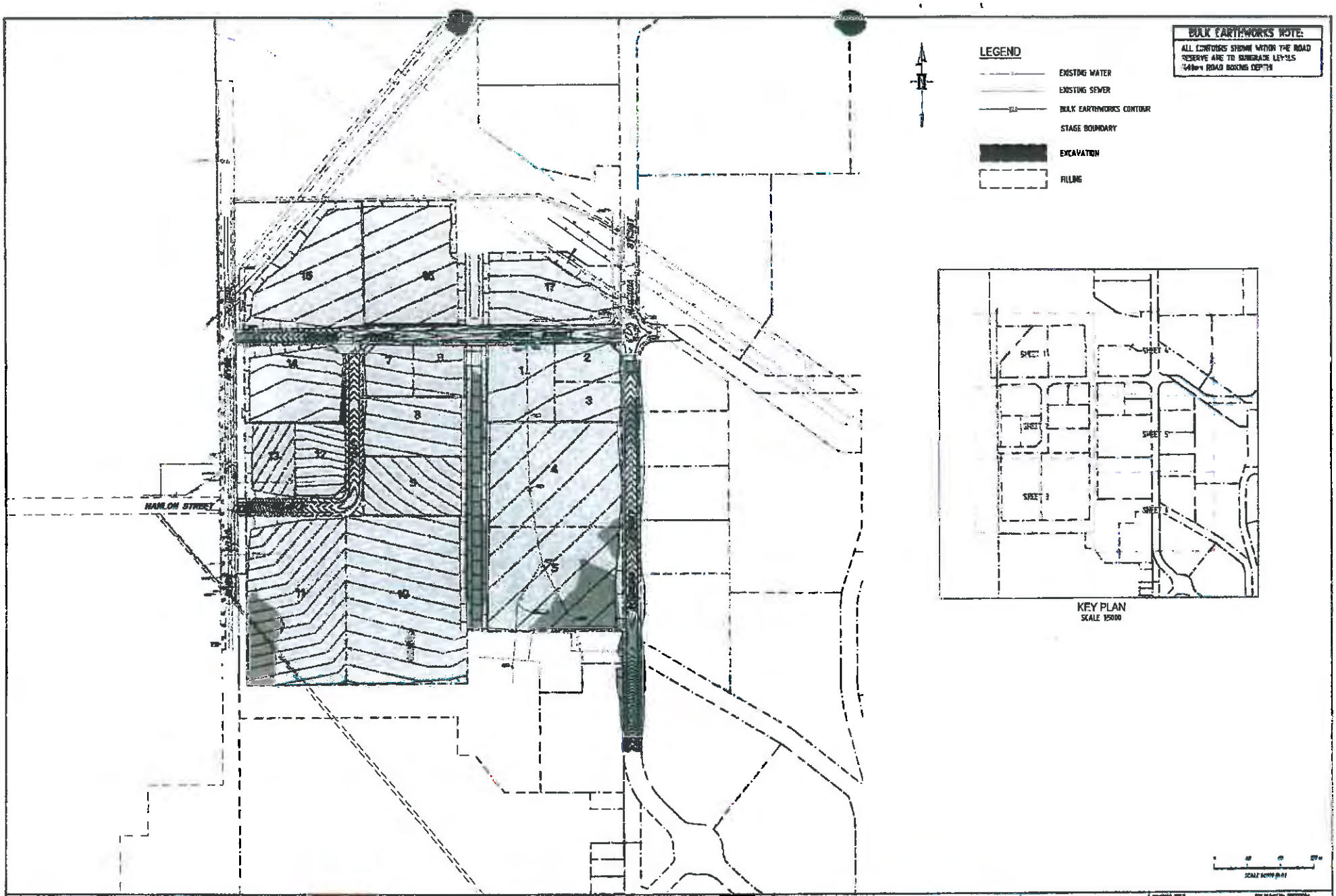
LOCALITY
SCALE 1:5000 (A3)

SCHEDULE OF DRAWINGS

DRG No	REV	DESCRIPTION
BR090084-DA-0-01	A	COVER SHEET
BR090084-DA-1-00	A	OVERALL BULK EARTHWORKS PLAN
BR090084-DA-1-01	A	PRELIMINARY BULK EARTHWORKS PLAN SHEET 1
BR090084-DA-1-02	A	PRELIMINARY BULK EARTHWORKS PLAN SHEET 2
BR090084-DA-1-03	A	PRELIMINARY BULK EARTHWORKS PLAN SHEET 3
BR090084-DA-1-04	A	PRELIMINARY BULK EARTHWORKS PLAN SHEET 4
BR090084-DA-1-05	A	PRELIMINARY BULK EARTHWORKS PLAN SHEET 5
BR090084-DA-1-06	A	PRELIMINARY BULK EARTHWORKS PLAN SHEET 6
BR090084-DA-2-00	A	OVERALL STORMWATER DRAINAGE & SEWERAGE RETICULATION PLAN
BR090084-DA-2-01	A	PRELIMINARY STORMWATER DRAINAGE LAYOUT PLAN SHEET 1
BR090084-DA-2-02	A	PRELIMINARY STORMWATER DRAINAGE LAYOUT PLAN SHEET 2
BR090084-DA-2-03	A	PRELIMINARY STORMWATER DRAINAGE LAYOUT PLAN SHEET 3
BR090084-DA-2-04	A	PRELIMINARY STORMWATER DRAINAGE LAYOUT PLAN SHEET 4
BR090084-DA-2-05	A	PRELIMINARY STORMWATER DRAINAGE LAYOUT PLAN SHEET 5
BR090084-DA-2-06	A	PRELIMINARY STORMWATER DRAINAGE LAYOUT PLAN SHEET 6
BR090084-DA-2-07	A	OVERALL SEWERAGE RETICULATION PLAN
BR090084-DA-2-08	A	PRELIMINARY SEWERAGE RETICULATION LAYOUT PLAN SHEET 1
BR090084-DA-2-09	A	PRELIMINARY SEWERAGE RETICULATION LAYOUT PLAN SHEET 2
BR090084-DA-2-10	A	PRELIMINARY SEWERAGE RETICULATION LAYOUT PLAN SHEET 3
BR090084-DA-2-11	A	PRELIMINARY SEWERAGE RETICULATION LAYOUT PLAN SHEET 4
BR090084-DA-2-12	A	PRELIMINARY SEWERAGE RETICULATION LAYOUT PLAN SHEET 5
BR090084-DA-2-13	A	PRELIMINARY SEWERAGE RETICULATION LAYOUT PLAN SHEET 6
BR090084-DA-3-00	A	OVERALL WATER RETICULATION PLAN
BR090084-DA-3-01	A	PRELIMINARY WATER RETICULATION LAYOUT PLAN SHEET 1
BR090084-DA-3-02	A	PRELIMINARY WATER RETICULATION LAYOUT PLAN SHEET 2
BR090084-DA-3-03	A	PRELIMINARY WATER RETICULATION LAYOUT PLAN SHEET 3
BR090084-DA-3-04	A	PRELIMINARY WATER RETICULATION LAYOUT PLAN SHEET 4
BR090084-DA-3-05	A	PRELIMINARY WATER RETICULATION LAYOUT PLAN SHEET 5
BR090084-DA-3-06	A	PRELIMINARY WATER RETICULATION LAYOUT PLAN SHEET 6

ACOR BASELINE CONSULTANTS PTY LTD
Development Consultants and Engineers
A.C.N. 128 011 697
86 Victoria Street West End Q 4101 PO Box 3835 South Brisbane Q 4101
Facsimile [redacted] Telephone [redacted] Email [redacted]

DRG N° BR090084-DA-0-01 REV A



No.	REVISION	DATE	DRAWN
A	ISSUED FOR APPROVAL	14/03/11	BSP

B & P SURVEYS
CONSULTING SURVEYORS & TOWN PLANNERS

ACOR

[redacted]

Walker

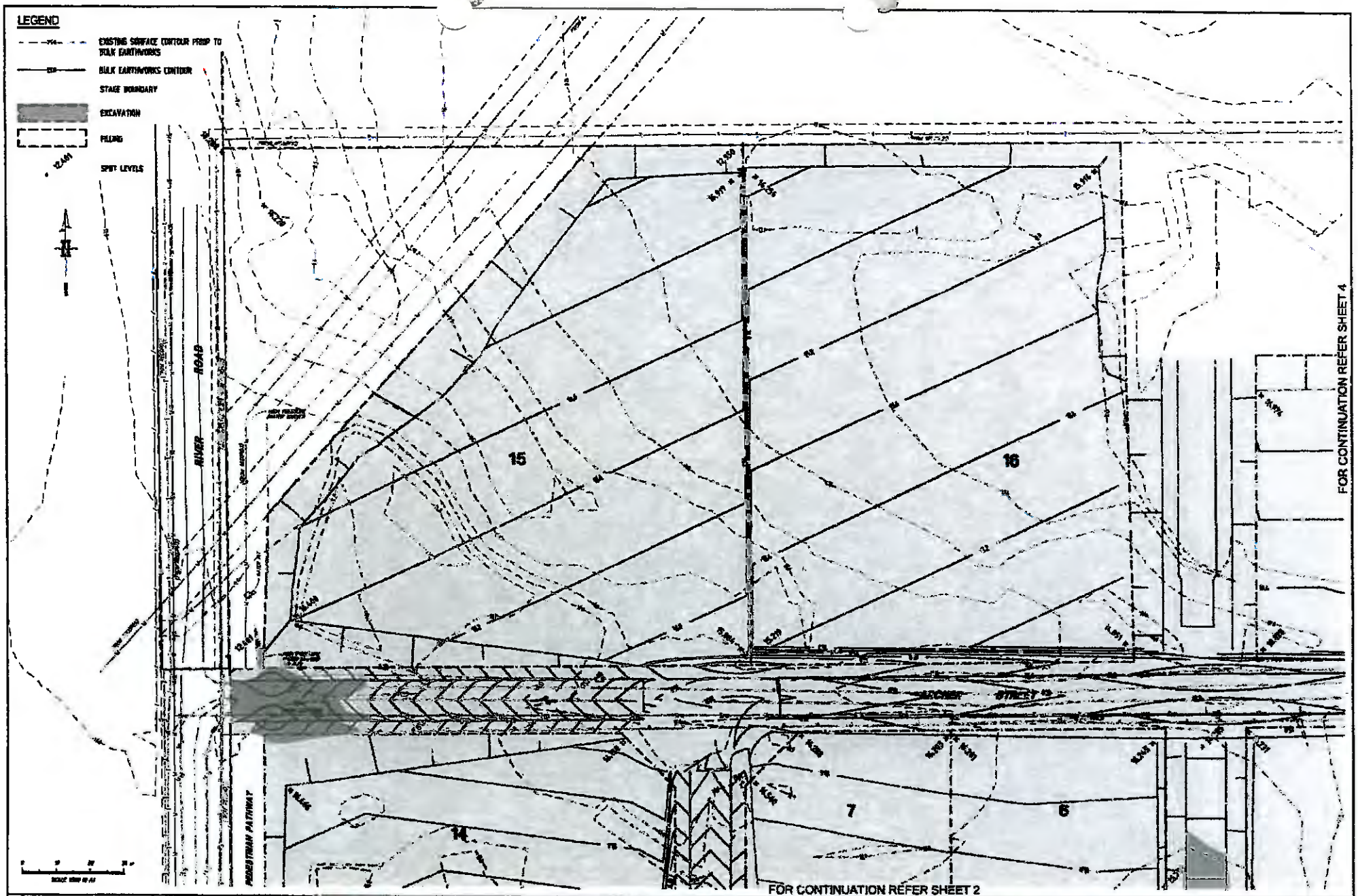
BREMER BUSINESS PARK (CITIZENCH)

STAGE 4

OVERALL
BULK EARTHWORKS PLAN

BR090084-DA-1-00

REV. A



B & P SURVEYS
CONSULTING SURVEYORS & TOWN PLANNERS

ACOR BASELINE CONSULTANTS PTY LTD

Walker

BREMER BUSINESS PARK (CITYWICH)

STAGE 4

PRELIMINARY
BULK EARTHWORKS PLAN
SHEET 1

DRAWING NO. BR090084-DA-1-01

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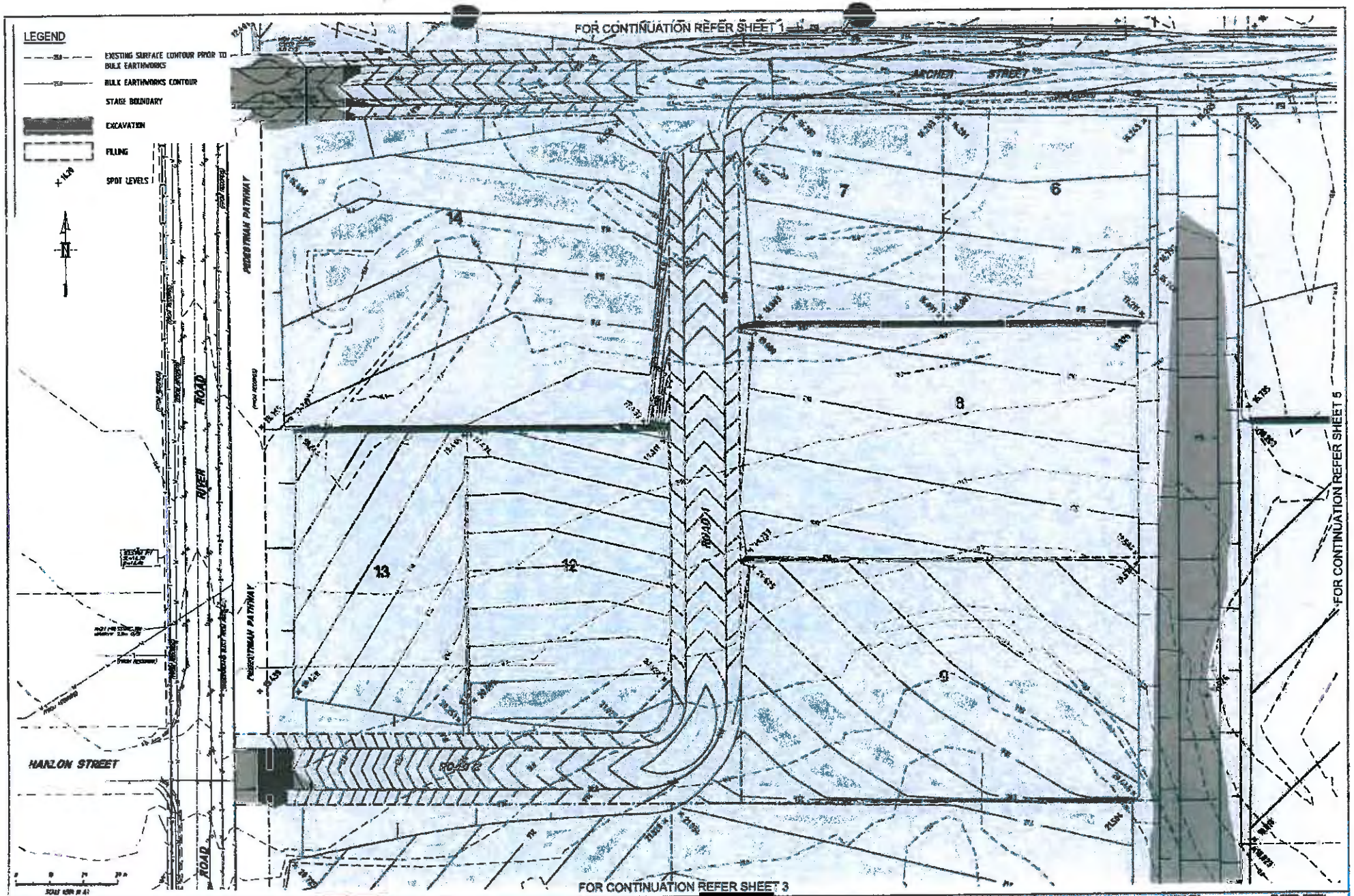

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No.	REVISION	DATE	CHKD

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& TOWN PLANNERS

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BREMER BUSINESS PARK
(CITIZENSHIP)

STAGE 4

PRELIMINARY
BULK EARTHWORKS PLAN
SHEET 2

BR090084-DA-1-02

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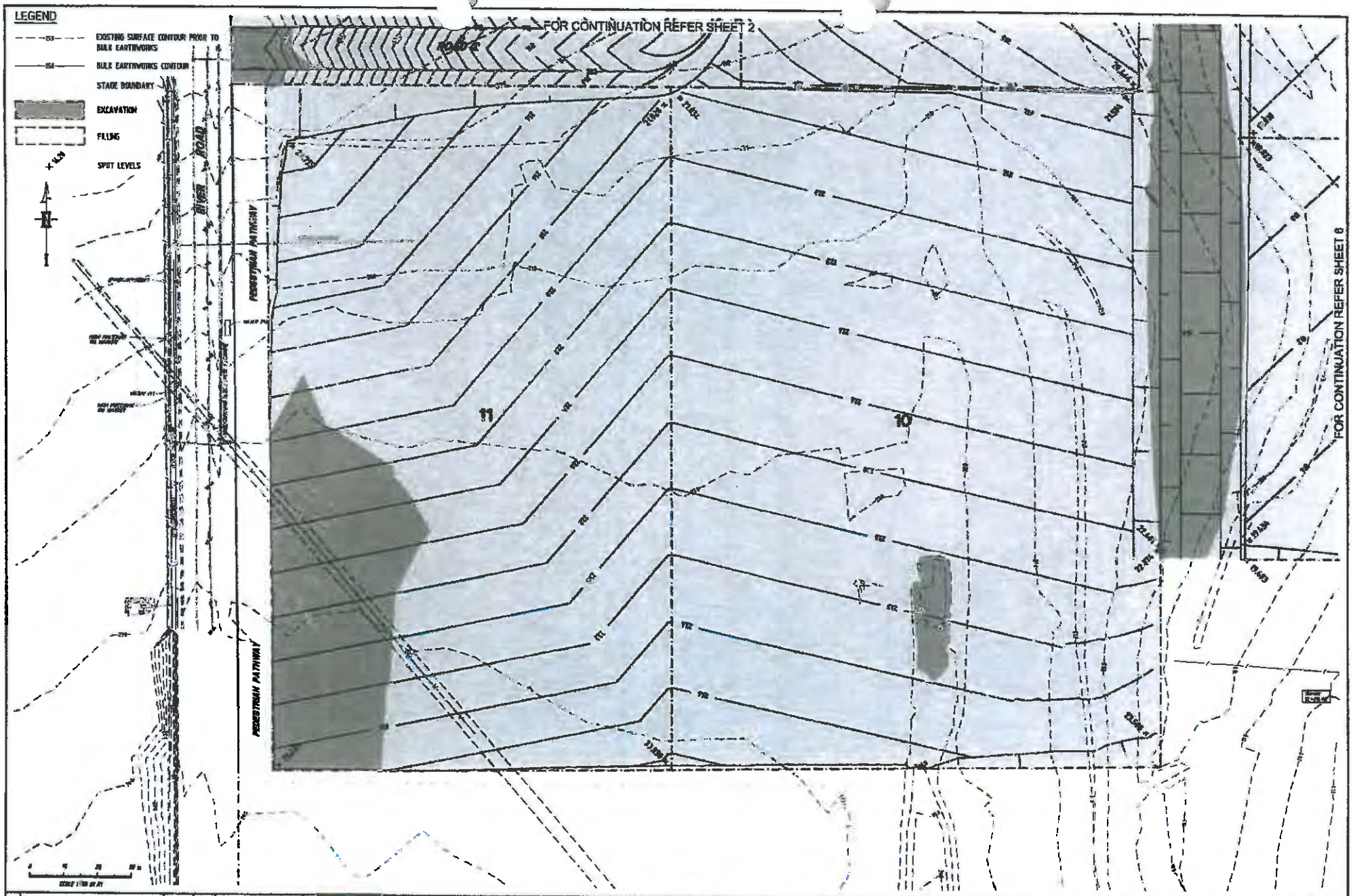

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No.	REVISION	DATE	DRAWN

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BRENER BUSINESS PARK (CITYSWICH)

STAGE 4

DRAWING TITLE
PRELIMINARY
BULK EARTHWORKS PLAN
SHEET 3

DRAWING NO. BR090084-DA-1-03

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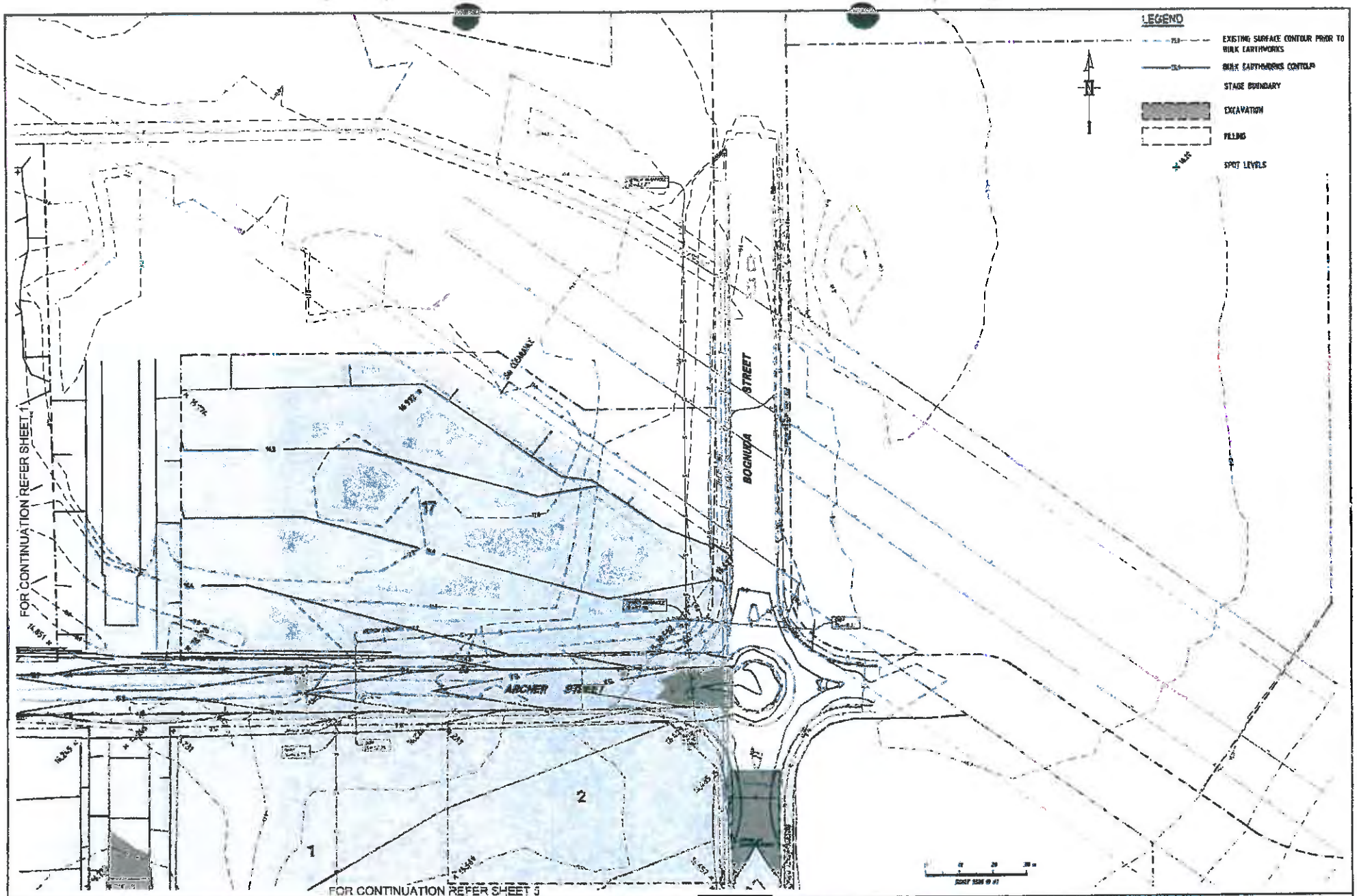

No.	REVISION	DATE	DRAWN
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B & P SURVEYS
CONSULTING SURVEYERS & TOWN PLANNERS

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PREMIER BUSINESS PARK (CITIZENS)

STAGE 4

PRELIMINARY
BULK EARTHWORKS PLAN
SHEET 4

DRAWING NO. BR090084-DA-1-04

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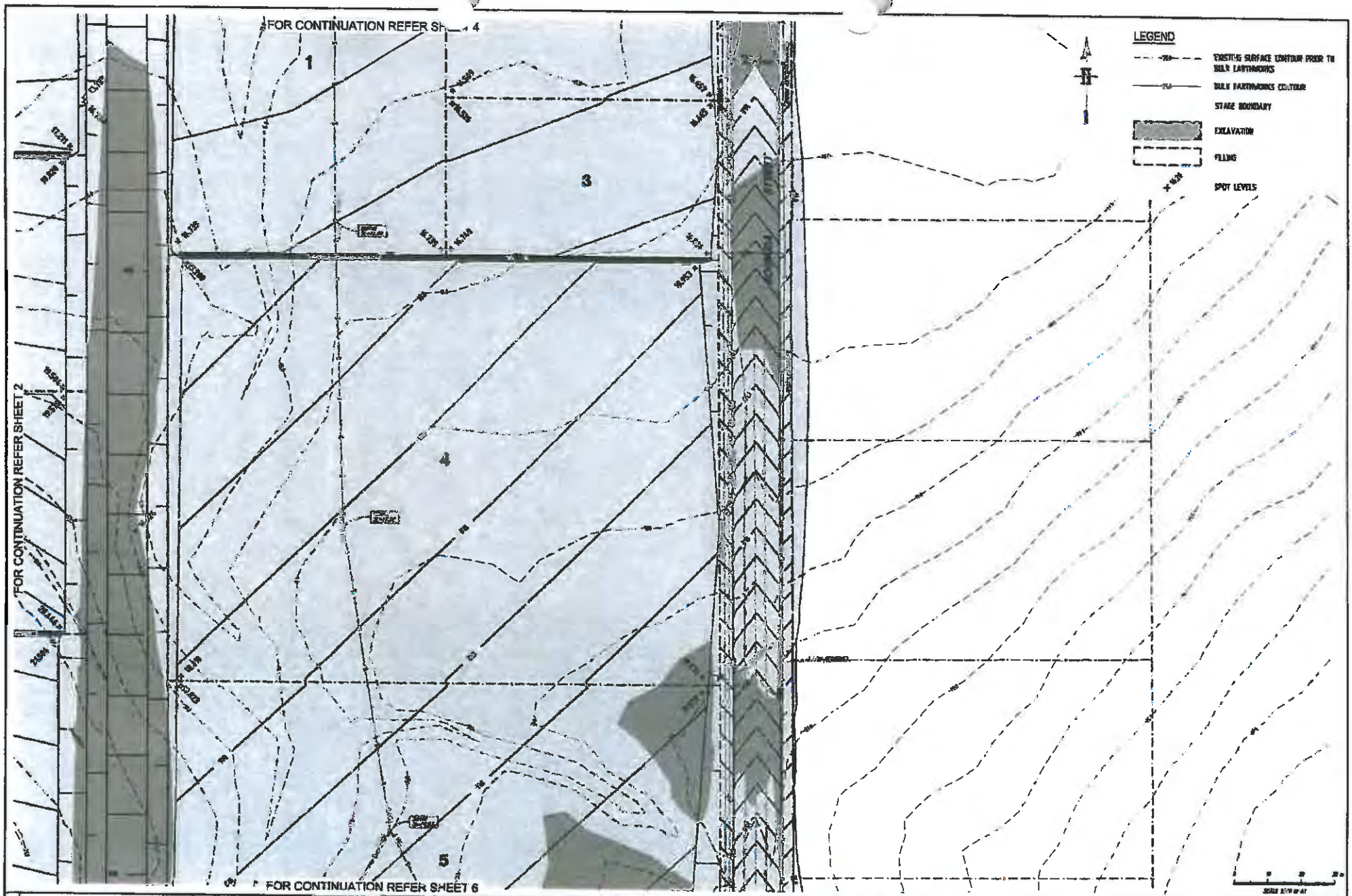

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CONSULTING SURVEYORS
& TOWN PLANNERS

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BREKER BUSINESS PARK
(CITYWICH)

STAGE 4

PRELIMINARY
BULK EARTHWORKS PLAN
SHEET 5

BR090084-DA-1-05

REV A

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No.	REVISION	DATE	DRAWN

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BREMER BUSINESS PARK
(CITYSWICH)

STAGE 4

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PRELIMINARY
BULK EARTHWORKS PLAN
SHEET 6

DRAWING NO. BR090084-DA-1-06

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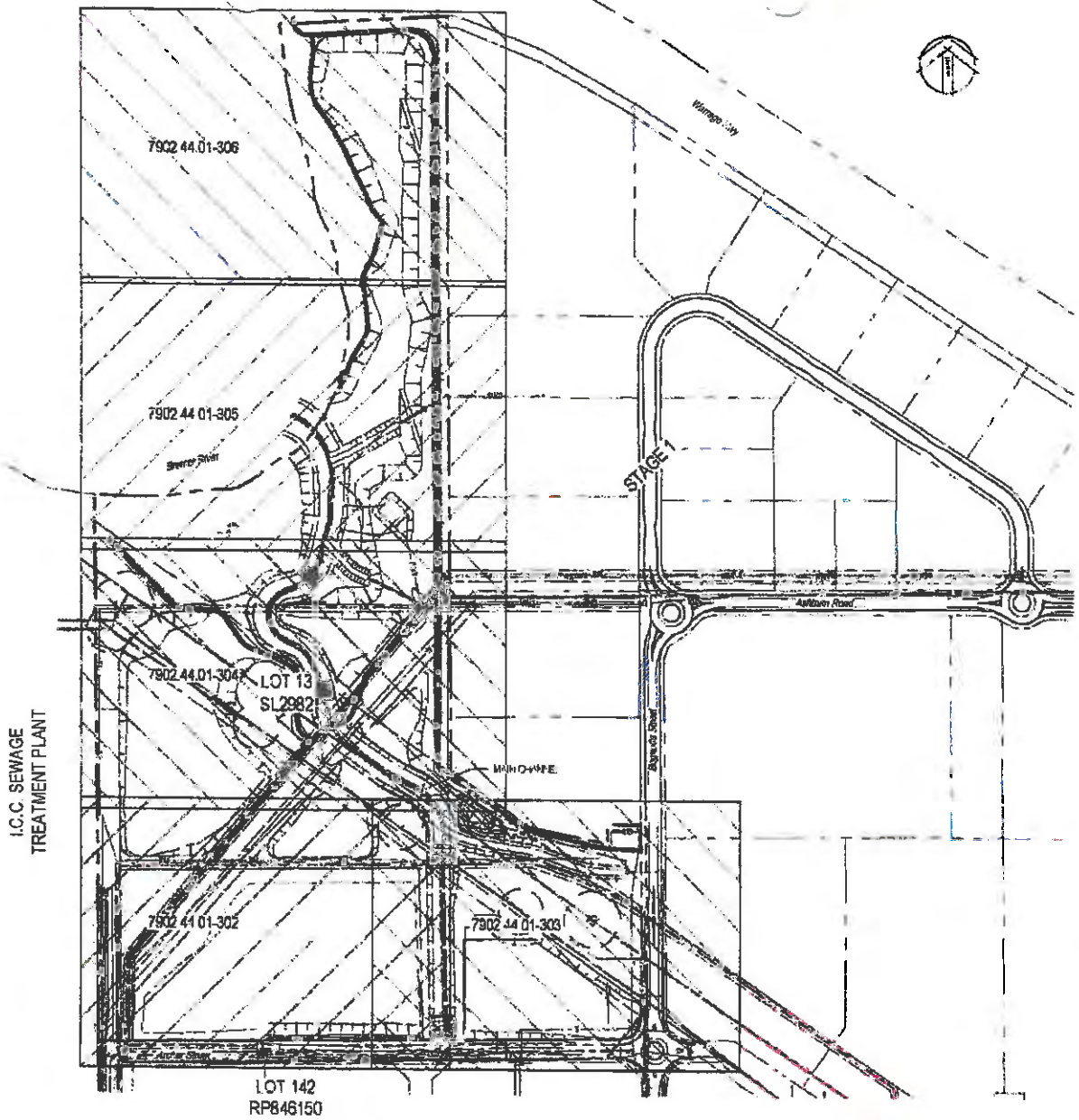

LEGEND

- PROJECT BOUNDARY
- EXTENT OF WORKS
- EXISTING BLOCK LIMITS
- EXISTING EASEMENT
- EXISTING STORMWATER DRAINAGE
- EXISTING SEWERAGE
- EXISTING SEWERAGE RYING MAIN
- EXISTING WATER MAIN
- EXISTING RECYCLED WATER MAIN
- EXISTING BURIED COMMUNICATIONS
- EXISTING OVERHEAD HIGH VOLTAGE LINE
- EXISTING BURIED ELECTRICAL LINE
- EXISTING ROAD CENTRE LINE
- EXISTING EDGE OF BITUMEN
- EXISTING MAJOR CONTOUR (1.0m)
- EXISTING MINOR CONTOUR (0.5m)
- EXISTING TOP OF BATTER
- EXISTING BOTTOM OF BATTER
- PROPOSED MAJOR CONTOUR (1.0m)
- PROPOSED MINOR CONTOUR (0.5m)
- PROPOSED TOP OF BATTER
- PROPOSED BOTTOM OF BATTER

NOTES

1. [illegible] AT JUNCTIONS WITH [illegible] MAY BE [illegible] REQUIRED TO ACHIEVE A [illegible] OF [illegible] AND THE [illegible] SEEMED NOT [illegible] THE RELEVANT [illegible] TRIM
2. THE LOCATION OF EXISTING SERVICES AS SHOWN ON THE PLAN IS INDICATIVE ONLY AND THE CONTRACTOR MUST ASCERTAIN THE LOCATION OF ALL SERVICES BEFORE EXCAVATION TRENCHING OR OTHER COMMENCEMENT OF CONSTRUCTION. ALL EXISTING SERVICES AND OTHER STRUCTURES ARE TO BE MAINTAINED IN POSITION FOR THE DURATION OF THE CONTRACT AND WHERE RELOCATION IS REQUIRED REFER SPECIFICATION
3. NOT WITHSTANDING THE LIMITS OF EARTHWORKS SHOWN ON THE DRAWINGS, THE ACTUAL LIMITS SHALL BE DETERMINED ON SITE BY THE SUPERINTENDENT
4. FILL WITHIN ALLOTMENTS TO BE COMPACTED TO FORM STANDARD DENSITY ACCORDING TO AND TRIMMED TO REFER DRAWING ALL ALLOTMENTS FILL SHALL BE SUPERVISED BY A GEOTECHNICAL TESTING AUTHORITY. FILL LEVEL REQUIREMENTS IN ACCORDANCE WITH AS 3798. FOUNDATION SYSTEMS PROPOSED FOR INDIVIDUAL STRUCTURES SHALL BE DESIGNED BY A REGISTERED PROFESSIONAL ENGINEER WITH EXPERIENCE IN STRUCTURAL DESIGN
5. THE CONTRACTOR IS TO PROVIDE, DESIGN AND SUPPLY EROSION CONTROL DEVICES DURING THE CONSTRUCTION PERIOD GENERALLY IN ACCORDANCE WITH THE SEDIMENT AND EROSION CONTROL PLAN
   CONTRACTOR TO SUBMIT FOR DESIGN TESTING PROVISIONS AND IDENTIFICATION IN ACCORDANCE WITH ISO [illegible] SCHEME COVERING MINIMUM FREQUENCY OF TESTING FOR LARGE SCALE EXCAVATION TO BE OPERATED ON
   (a) [illegible] PER 500m DISTRIBUTED REASONABLY EVENLY THROUGHOUT ALL DEPTHS AND AREAS ETC
   (b) [illegible] PER UNIT PER MATERIAL TYPE PER [illegible] UP TO [illegible] PER 2500m³
   (c) [illegible] PER LOT

0 5 10 40 60 80 100m
1:1000 A1 1:2000 A3

PRELIMINARY
Date: 22 October 2010

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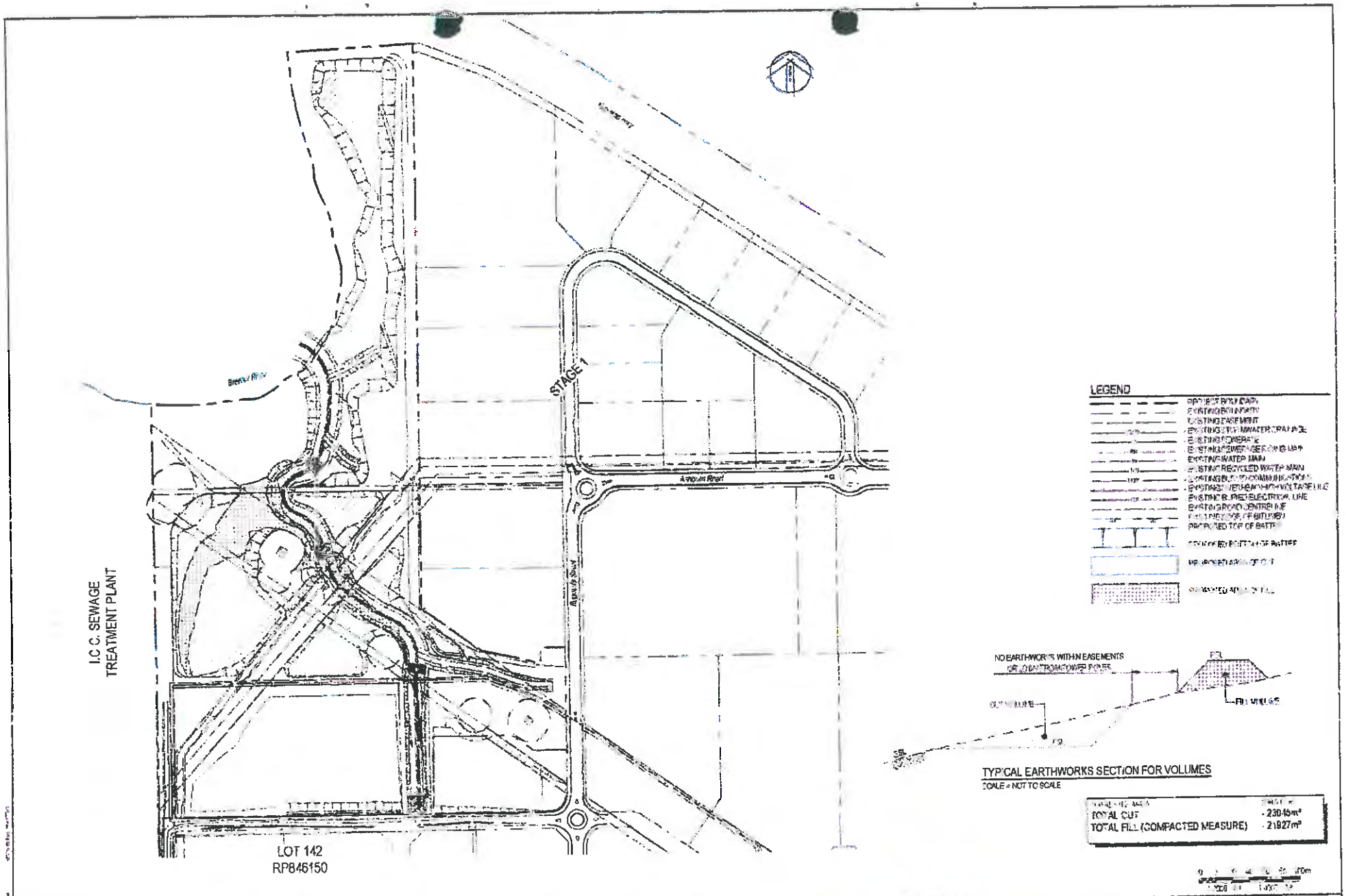
[redacted] A1 DATUM AHD

Cardno
Cardno (QLD) Pty Ltd

Walker

WALKER CORPORATION PTY LTD
CITISWICH - ARCHER STREET PARKLANDS
EARTHWORKS
OVERALL EARTHWORKS PLAN

7902.44.01-300



PRELIMINARY

Date 29 October 2010

A1 DATUM AHD

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Cardno (Qld) Pty Ltd

WALKER CORPORATION PTY LTD

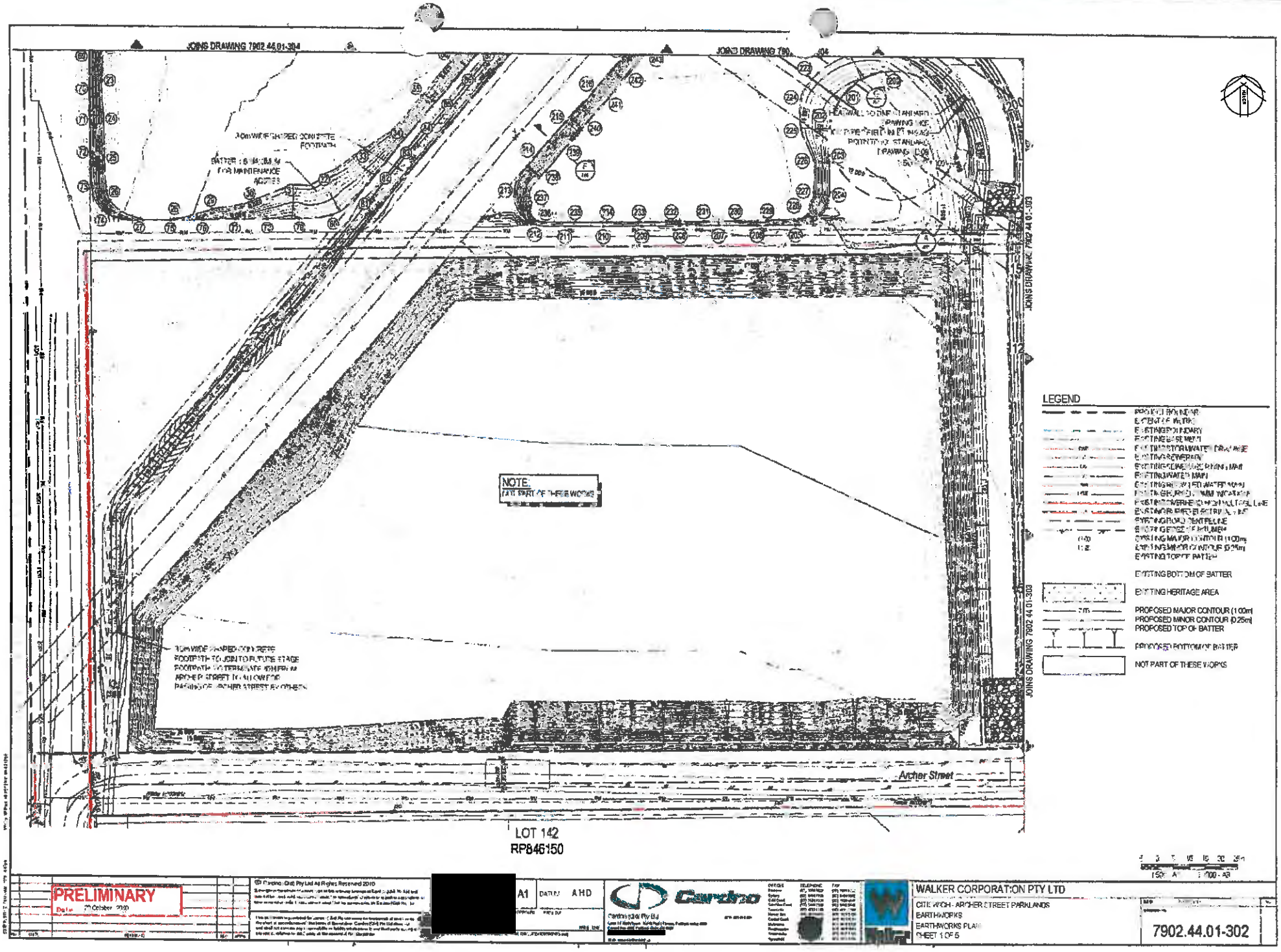
CITISWICH - ARCHER STREET PARKLANDS

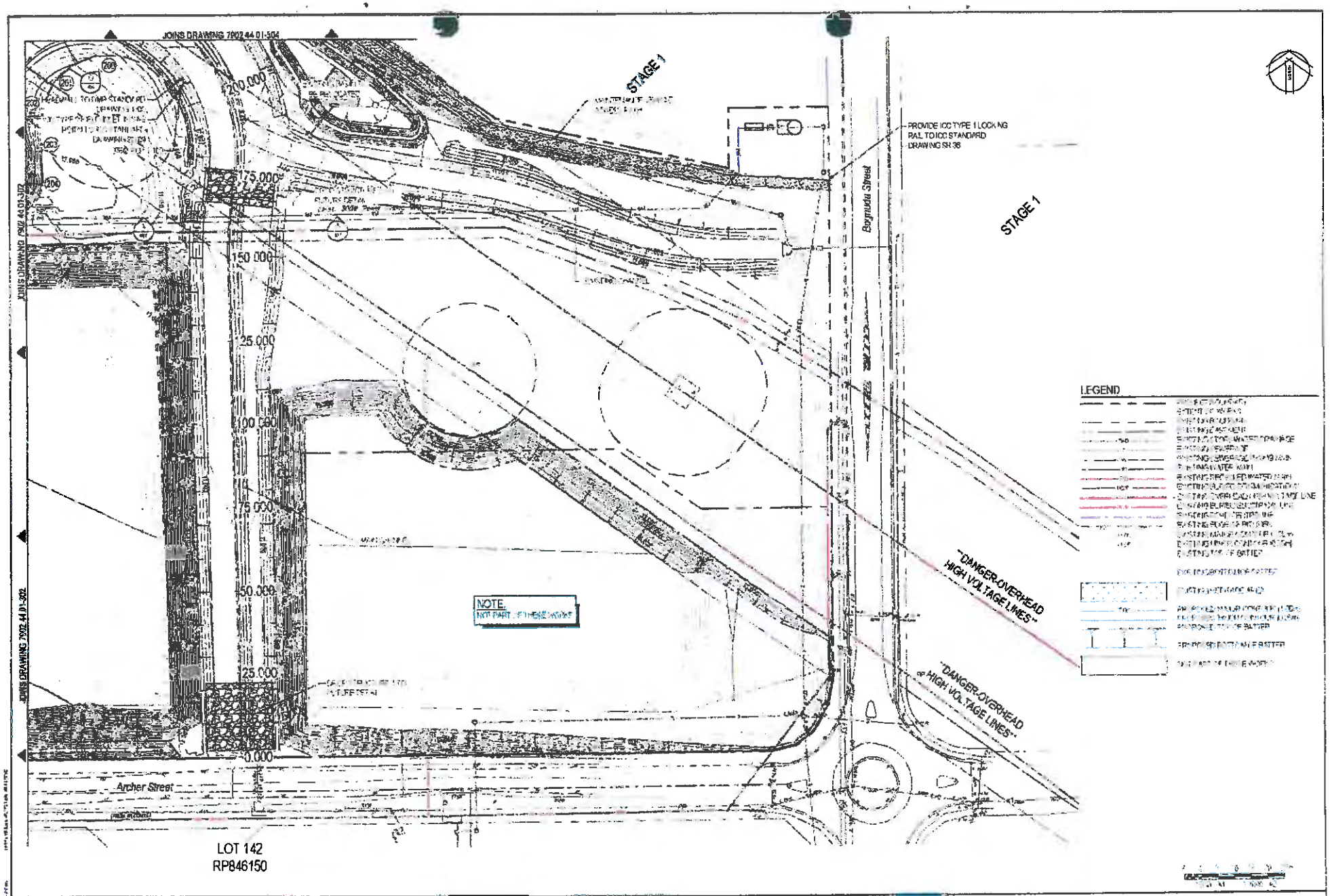
EARTHWORKS

OVERALL EARTHWORKS CUT

FILL PLAN

7902.44.01-301


JOINS DRAWING 7902.44.01-304
JOINS DRAWING 7902.44.01-303
NOTE:
NOT PART OF THESE WORKS
Archer Street
LOT 142
RP846150
LEGEND
EXISTING BOTTOM OF BATTER
EXISTING HERITAGE AREA
PROPOSED MAJOR CONTOUR (1.00m)
PROPOSED MINOR CONTOUR (0.25m)
PROPOSED TOP OF BATTER
PROPOSED BOTTOM OF BATTER
NOT PART OF THESE WORKS
PRELIMINARY
A1
AHD
Cardno
WALKER CORPORATION PTY LTD
CITE WICH - ARCHER STREET PARKLANDS
EARTHWORKS
EARTHWORKS PLAN
SHEET 1 OF 5
7902.44.01-302



PRELIMINARY
Date 29 October 2010

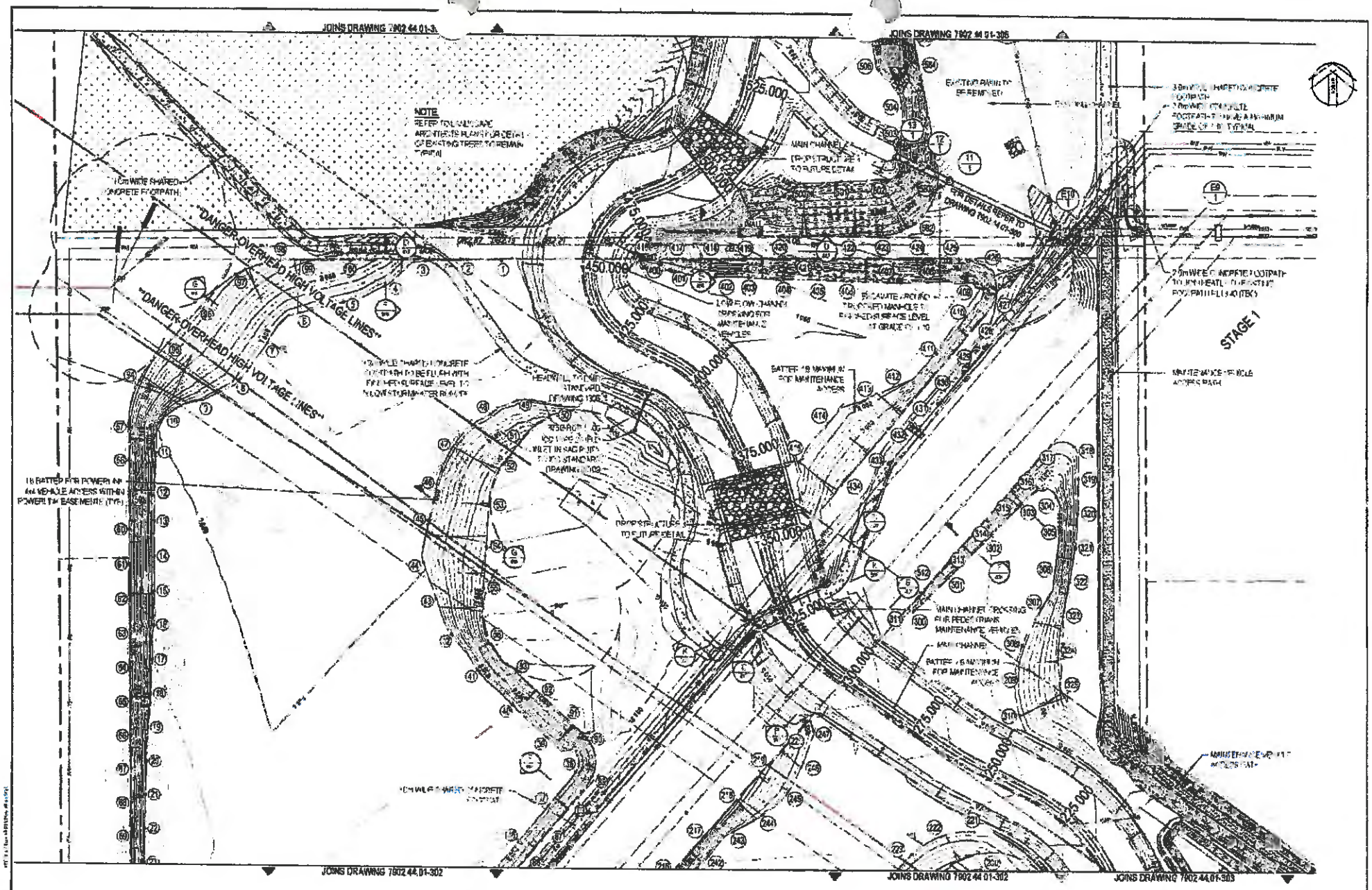
A1 DATUM A.H.D

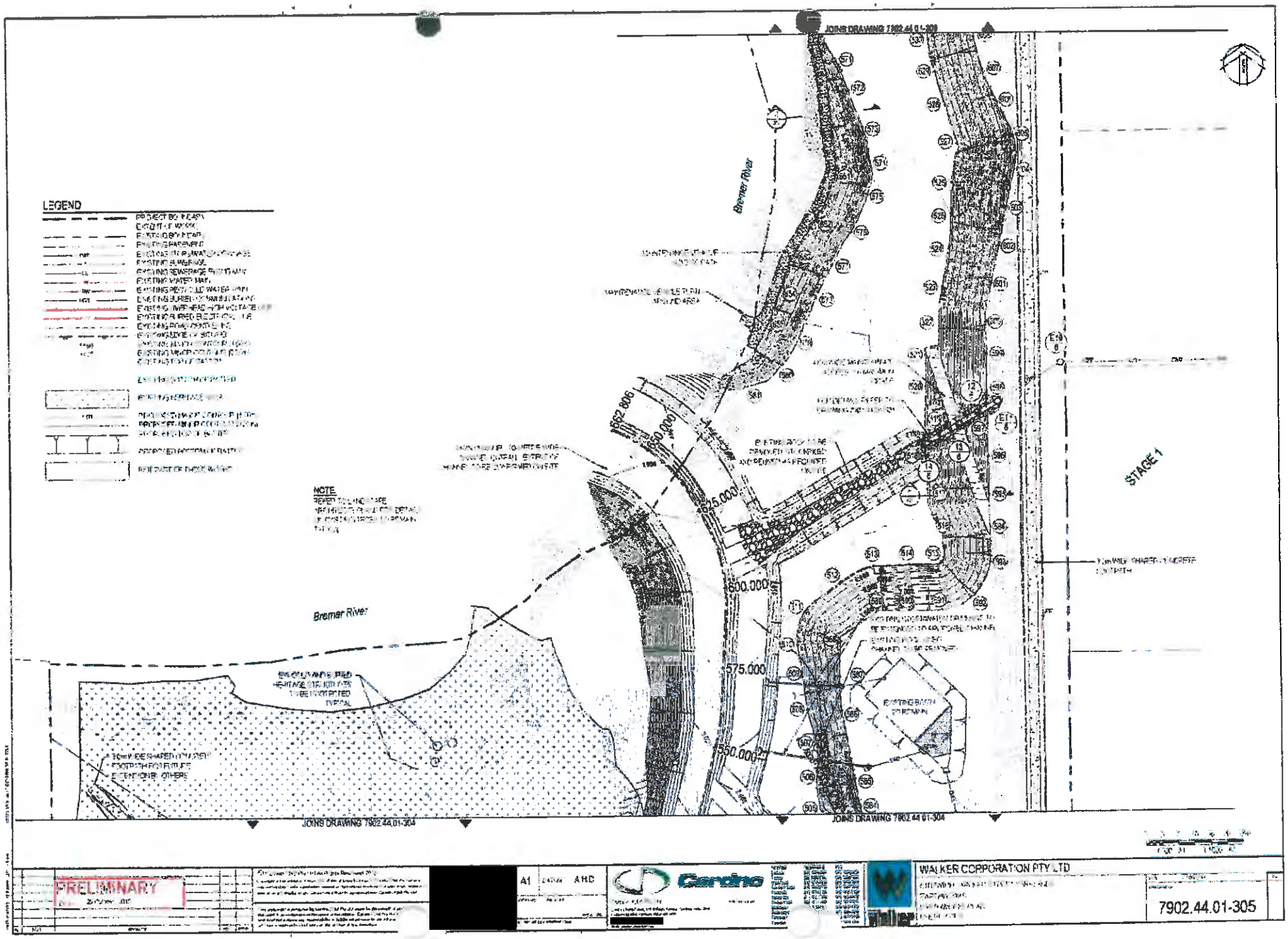
Cardno

Cardno (Qld) Pty Ltd

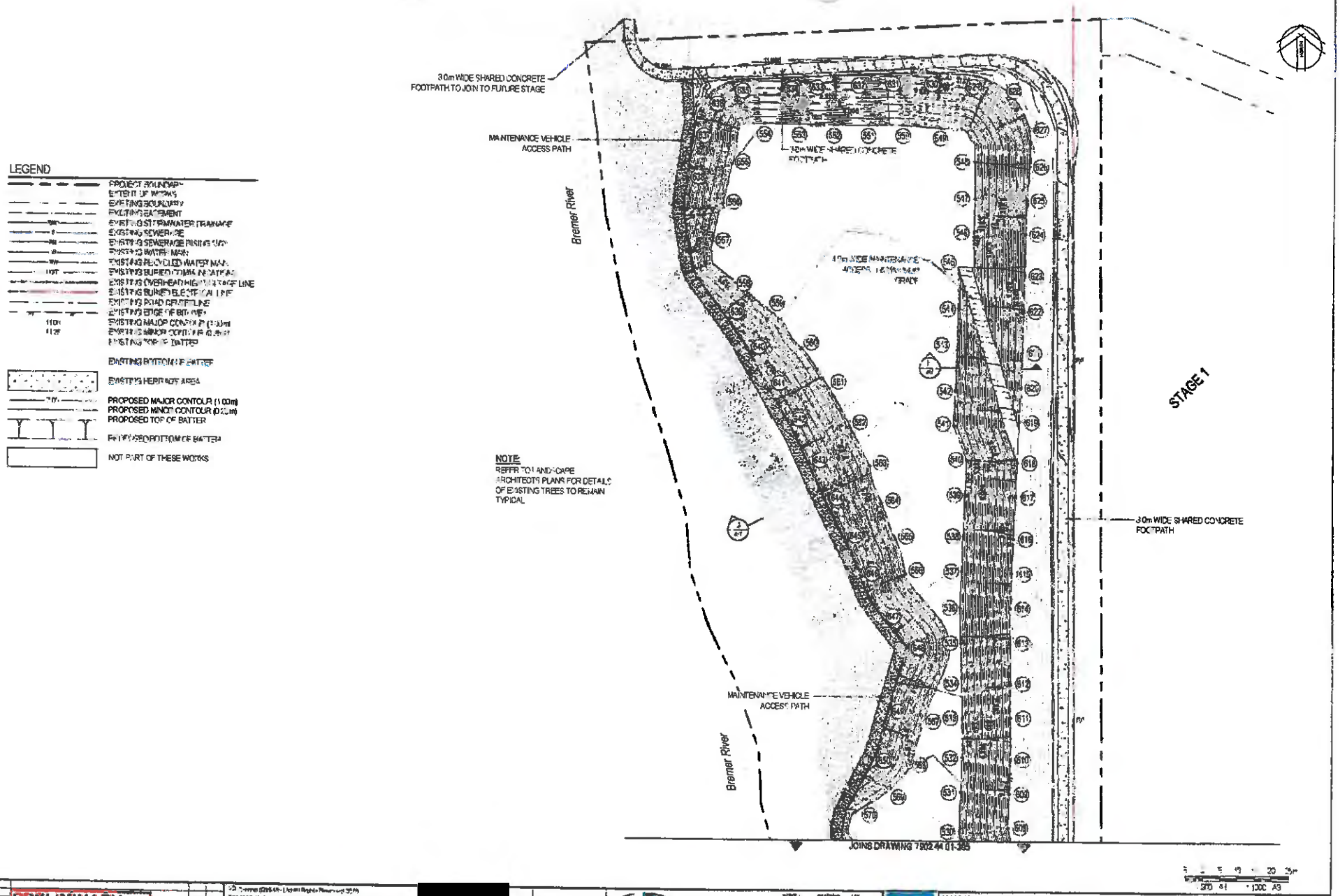
WALKER CORPORATION PTY LTD
CITISWICH - ARCHER STREET PARKLANDS
EARTHWORKS
EARTHWORKS PLAN -
SHEET 2 OF 5

7902.44.01-303


JOINS DRAWING 7902.44.01-302
JOINS DRAWING 7902.44.01-303
JOINS DRAWING 7902.44.01-305
NOTE
"DANGER-OVERHEAD HIGH VOLTAGE LINES"
"DANGER-OVERHEAD HIGH VOLTAGE LINES"
STAGE 1
MAIN CHANNEL
FOR DETAILS REFER TO DRAWING 7902.44.01-300
FOR LEGEND REFER TO DRAWING 7902.44.01-023
PRELIMINARY
A1
A.H.D
Cardno
WALKER CORPORATION PTY LTD
CITISWICH - ARCHER STREET PARKLANDS
EARTHWORKS
EARTHWORKS PLAN -
SHEET 3 OF 5
7902.44.01-304



LEGEND
NOTE
Bremer River
Bremer River
STAGE 1
JOINS DRAWING 7902.44.01-304
JOINS DRAWING 7902.44.01-304
JOINS DRAWING 7902.44.01-304
662.806
650.000
625.000
600.000
575.000
550.000
PRELIMINARY
A1
ARC
Cardno
WALKER CORPORATION PTY LTD
7902.44.01-305



PRELIMINARY

[redacted]

A1 DATUM AHD

Cardno

WALKER CORPORATION PTY LTD

CITISWICH - ARCHER STREET PARKLANDS

EARTHWORKS

EARTHWORKS PLAN -

SHEET 5 OF 5

7902.44.01-306

Annex A

Individual Lot (BCC) Sediment & Erosion Guidelines

What are the impacts? SEE FACT SHEET 1

Soil erosion, sediment and litter from building sites can be major sources of stormwater pollution, and can cause:

- significant harm to the environment of Moreton Bay through the loss of valuable seagrass habitat for marine creatures
- weed infestation of waterways by sediment settling on the creek beds and transporting nutrients
- loss of valuable topsoil
- significant public safety problems when washed onto roads and intersections
- blocked drains creating flooding and increased maintenance costs
- the potential to effect the bay's recreational and commercial fishing industry.

Mud and dirt which has been tracked out onto road

Sediment moving out of Moreton Bay into the ocean through Jumpinpin

Erosion and sediment control on residential building sites SEE FACT SHEET 1

Principles of effective stormwater pollution control include:

- sensible site planning
- diversion of up-slope water (where appropriate)
- stabilised site entry/exit point
- minimisation of site disturbance and duration of disturbance
- installation of sediment controls along the lower edge of the site
- appropriate location and protection of stockpiles
- early connection of roofwater downpipes
- trap on-site run-off from tool, paint and concrete washing and brick, tile and concrete cutting
- continual monitoring and maintenance of all control measures
- compaction of backfilled trenches
- revegetation and stabilisation of the site
- development and implementation of Erosion and Sediment Control Management Plans when appropriate.

Control measures in place on a residential building site

SITE PLANNING

When planning the site layout, building location and earthworks, it is possible to minimise the number of control devices, and their interference with the building process, with a little forward thinking. Suggestions are to:

- minimise the reshaping of the land
- direct stormwater to flow around the building area and any unstable batters
- allow room for a sediment barrier, eg. sediment fence, to be located along the lower side of the disturbance
- design the home to suit the property type, eg. construct pole homes on steep properties
- avoid the permanent use of long, steep and unstable driveways
- avoid the use of exposed aggregate concrete surfaces in areas where the wash-off cannot be contained.

Good site planning

Poor site planning – stockpile outside the sediment fence and building waste not placed in skip

Environmental law

FACT SHEET 1

The *Environmental Protection Act 1994*, *Environmental Protection (Water) Policy 1997* and the *Integrated Planning Act 1997* are important pieces of legislation which control the way in which soil erosion and sediment are dealt with on building and development sites.

PENALTIES

Breaches of the *Environmental Protection (Water) Policy 1997* may result in:

- on-the-spot fines under the *Environmental Protection (Water) Policy 1997* (ranging from $300 to $600)
- prosecutions under the *Integrated Planning Act 1997* or the *Environmental Protection Act 1994* (fines of thousands of dollars or prison sentences for serious offences)
- the prosecution of individuals and/or companies.

Council officer explaining the *Environmental Protection (Water) Policy 1997*

Erosion controls

SITE FACT SHEET 2

MINIMISE DISTURBANCE

- Earthworks should be kept to a minimum, and should only be commenced immediately prior to building.
- Maintain as much soil coverage as possible with the use of grass, leaf litter, mulch, gravel or erosion control blanket (ECB) or matting.
- Vegetation located down-slope of the work site assists in filtering out sediment. Where practicable, maintain kerb vegetation in a healthy state during the building process.

Stockpiles without protection

STOCKPILES

- Stockpiles and building materials are generally not allowed to be stored on the footpath or within the road reserve without permission from your Council.
- Minimise stockpile losses with the use of covers.
- All stockpiles and building materials should be located within the sediment control zone, for example behind a sediment fence.
- Stockpiles should not be located within an overland flow path.

SERVICE TRENCHES

Backfill service trenches, cap with topsoil, and compact to a level at least 75-100 mm above the adjoining ground level (either manually or with a small machine). This allows for some subsidence of the fill material, and ensures the fill is sufficiently compacted to avoid erosion at a later time. (Note that trenches must be backfilled in accordance with AS3500).

EROSION CONTROL BLANKETS OR MATTING

Erosion control blankets or matting can be used to minimise soil erosion and stormwater pollution from sites by:

- containing high erosion risk soils
- stabilising steep slopes.

SITE REHABILITATION

All areas disturbed by building activities should be promptly and progressively stabilised, using techniques such as revegetation and landscaping, so they no longer act as sources of sediment.

MULCHING AND GARDEN BEDS

To minimise soil loss, mulch should be applied to open garden beds at a depth of 75-100 mm.

This will assist in plant establishment, minimise water loss and help to control weeds.

Rehabilitate the site promptly to reduce the chances of further erosion

Sediment control

STABILISED ENTRY/EXIT POINT (RUMBLE PAD)

Stabilised gravel entry/exit point (rumble pad)

- Manage entry/exit point (rumble pad) so that sediment is not tracked off the site.
- Restrict site access to one stabilised location.
- Recommended construction method for stabilising access points is a 150-200 mm deep pad of minimum 40 mm crushed rock.
- The pad should be at least 2 metres wide and 5 metres long.
- The pad should extend from the kerb to the building slab.
- Where the entry/exit pad slopes towards the road, a 200 mm high bund (hump) should be installed across the pad to deflect stormwater run-off to the side where it can be filtered by a sediment fence.

Note: The location of the permanent driveway may not be an appropriate location for the construction entrance.

SEDIMENT BARRIERS/FENCES

Sediment fence

- Install barriers and fences along the lower side of the soil disturbance.
- The most efficient sediment barrier for building sites is specially-manufactured geotextile sediment fencing.
- Sediment fences on building sites are usually wire-tied to steel posts (wire-tied sediment fences have the advantage of being more readily unhooked from their support posts during working hours).
- The support posts are spaced no greater than 2 metres apart and the sediment fence buried to a depth of 200 mm.
- For public safety and sediment control efficiency, sediment barriers should not be located outside property boundaries without Council approval.
- Sediment barriers should only be placed on the road as a last resort.
- Sediment barriers placed in front of roadside stormwater inlets are rarely effective and at best usually result in the sediment being washed down the street and into the nearest open gully inlet.
- Don't use filter cloth or shade cloth.

USE OF SIGNS

Public signs that warn of the need for proper sediment control devices and maintenance are becoming more widely used. Contact Brisbane City Council on [redacted] for information on how to obtain an information sign.

Sediment control information signage

MAINTENANCE OF CONTROL MEASURES

All erosion, sediment and drainage control measures need to be regularly checked and maintained in good working order. Best practice includes anticipation of potential risks and being prepared for abnormal circumstances and emergencies. These measures include:

- Stockpile extra sediment fence fabric and posts on-site to facilitate emergency repairs.
- Reapply crushed rock to the entry/exit pad (rumble pad) if excessive sediment build-up occurs.
- Repair eroded drainage channels with rock, turf or erosion control blankets or matting.
- Ensure built-up sediment is removed at regular intervals from sediment barriers.
- Check daily and replace barriers daily if they are ripped, damaged or no longer anchored.

All measures require regular inspection

Excessive sediment deposits must be removed from entry/exit point (rumble pad)

Drainage control SEE FACT SHEET 4

DIVERSION OF UP-SLOPE WATER

- Where practicable, divert up-slope water around the disturbed area.
- Stormwater can be diverted with the use of small turf or geotextile lined catch drains, or with the use of diversion banks.
- Diverted stormwater should be discharged onto stable ground (for example turfed areas) and should not be diverted into neighbouring properties unless written permission is obtained from the land owner(s).

Temporary roof water connection

EARLY ROOF WATER CONNECTION

- Temporary or permanent downpipes should be installed as soon as practicable after the roof is laid.
- Early connection of roof water to the stormwater system will reduce site wetness and the generation of on-site mud. This has been shown to reduce downtime following storm events and decrease the average building construction time.

Temporary roof water connection

Building operations

Prior to commencing building work

- Obtain all necessary permits, licences and approvals.
- Avoid clearing vegetation and excavating until ready to build.
- Where necessary in new estates, temporary revegetation may be required.

Points to consider as part of building operations

- Tool and paint washing, brick, tile or masonry cutting and water-cooled cutting activities should be done within the property boundaries.
- All waste water should be contained on-site where possible.
- Activities should be carried out on a permeable surface or up-slope of an infiltration trench.
- Vehicles should not be parked on the footpath area or verge where they can damage essential vegetation and transport dirt onto the road.

LITTER AND BUILDING WASTE

All hard waste should be stored on-site in a way that prevents material loss caused by wind or water. Smaller materials such as litter should be contained in covered bins or litter traps formed on three sides by a geotextile wind break or similar device.

One way to properly store litter and building waste

Poor litter and building waste storage

SITE CLEAN-UP

Remove accidental spills of soil or other materials from the road, gutter or any location outside the control of the primary sediment barrier:

- immediately if it's raining or likely to rain during the day
- at least upon completion of the day's work (even if rainfall is unlikely during the night)
- use a broom and shovel instead of hosing to clean hard surfaces.

Following storms, the road reserve and sediment barriers should be inspected and all excessive sediment residue removed.

Undertake regular site clean-ups

CONCRETE MIXER CLEAN-UP

Fully contain concrete waste washed from trucks and mixer units on-site and store where it cannot be washed from the site, harming the environment.

EXPOSED AGGREGATE CONCRETE SURFACES

- Builders need to demonstrate how they intend to prepare exposed aggregate surfaces without allowing cement residue to flow into stormwater drains or waterways.
- Where practicable, wash cement residue onto pervious surfaces or fully contain it within temporary sediment dams created from tightly stacked sand bags.
- When suitably dry, shovel cement residue into a waste disposal bin.
- At no time should cement residue or wastewater run-off enter the roadside gutter.

This may make it impractical on some sites for exposed aggregate driveways to be constructed. In such cases, an alternative driveway finish must be used.

Storage of materials on hard surfaces SEE FACT SHEET 6

Whenever possible, materials should be stockpiled within the sediment control envelope and, where necessary, covered with waterproof sheeting.

Materials may be temporarily stored on hard surfaces where it is necessary to place erodible material on hard surfaces to undertake work and no other reasonable options are available.

Don't store stockpiles on hard surfaces without suitable protection

Grouped building lots SEE FACT SHEET 7

When one builder controls more than one building lot, combined-lot sediment control structures may be placed down-slope if:

- the combined sediment control measures provide a level of protection at least equal to that provided by individual lot protection
- suitable drainage and erosion controls measures are applied to each building lot
- a suitable sign is placed in a prominent location outside each lot and/or at the entrance of the estate indicating such controls are in place.

Erosion and Sediment Control Management Plans

SEE FACT SHEET 9

Where appropriate, discuss the submission of a management plan with the appropriate building control body. These plans need to communicate to all - builders, subcontractors, private certifiers, home owners and regulators involved in the building – how stormwater pollution will be controlled on the site.

EROSION AND SEDIMENT CONTROL INSTALLATION SEQUENCE

1. Establish a single stabilised entry/exit point (rumble pad).
2. Install sediment fence(s) along the low side of the site.
3. Divert up-slope water around the work site and appropriately stabilise any drainage channels.
4. Clear only the areas necessary (maintaining vegetation on footpath).
5. Stockpile topsoil within the sediment controlled zone.
6. Stabilise exposed earth banks (for example, vegetation or erosion control blankets).
7. Install on-site waste receptacles (mini-skips, bins, wind-proof litter receptors).
8. Install roof downpipes as soon as practicable after the roof is laid.
9. Ensure that all control measures are maintained in good working order.
10. Revegetate or otherwise stabilise the site.

- *Stockpile is located behind the sediment fence*
- *Good site planning*
- *Turf strip well maintained*
- *Sediment fence well constructed and in correct location*

- *Stockpile has not been placed behind the sediment fence*
- *Building waste and litter has not been placed in the skip*
- *Poor site planning and management*

Erosion and sediment control daily site check list

SEE FACT SHEET 8

An erosion and sediment control check list has been developed to assist builders and site supervisors managing the task of control measure maintenance.

For further information on erosion and sediment control, contact Brisbane City Council on [redacted] or Gold Coast City Council on [redacted].

Note: Diagrams and selected photos courtesy of Catchments & Creeks Pty Ltd.

Annex B

Detailed WBNM Results

Flow Comparison

ARI (Years)	Left1a - T						
	Pre-Developed			Post-Developed			Impact (m^3/s)
	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	
1	3.07	25	15	3.07	25	15	0.00
2	4.10	25	15	4.10	25	15	0.00
5	5.51	25	15	5.51	25	15	0.00
10	6.54	25	15	6.54	25	15	0.00
20	7.73	25	15	7.73	25	15	0.00
50	8.65	25	15	8.65	25	15	0.00
100	9.82	25	15	9.82	25	15	0.00

Flow Comparison

ARI (Years)	Left1 - T						
	Pre-Developed			Post-Developed			Impact (Pre v Post) (m^3/s)
	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	
1	3.77	60	35	4.24	60	25	0.48
2	5.17	60	35	5.79	60	25	0.62
5	7.23	60	35	8.08	60	25	0.85
10	8.78	60	31	9.81	60	25	1.04
20	10.60	60	30	11.81	60	25	1.21
50	12.88	60	30	14.13	60	25	1.25
100	14.84	60	30	16.25	60	25	1.41

Flow Comparison

ARI (Years)	Left2 - T						
	Pre-Developed			Post-Developed			Impact (Pre v Post) (m3/s)
	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	
1	4.22	60	40	4.81	60	35	0.58
2	5.86	60	39	6.61	60	35	0.75
5	8.30	60	37	9.28	60	35	0.98
10	10.18	60	36	11.25	60	35	1.07
20	12.33	60	35	13.54	60	35	1.21
50	15.14	60	35	16.46	60	35	1.33
100	17.46	60	35	18.92	60	35	1.46

Flow Comparison

ARI (Years)	Left4 - T						
	Pre-Development			Masterplan Development			Impact (Pre v Post) (m^3/s)
	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	
1	2.40	25	15	4.10	25	15	**1.70**
2	3.28	25	15	5.32	25	15	**2.04**
5	4.50	25	15	6.95	25	15	**2.45**
10	5.45	25	15	8.00	25	15	**2.56**
20	6.49	25	15	9.35	25	15	**2.86**
50	7.43	60	25	10.21	25	15	**2.78**
100	8.50	60	25	11.51	25	15	**3.01**

Flow Comparison

ARI (Years)	Left5 - T						
	Pre-Developed			Post-Developed			Impact (Pre v Post) (m3/s)
	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	
1	2.57	25	15	2.70	25	15	**0.14**
2	3.39	25	15	3.52	25	15	**0.13**
5	4.51	25	15	4.62	25	15	**0.10**
10	5.28	25	15	5.31	25	15	**0.03**
20	6.22	25	15	6.22	25	15	**0.00**
50	6.91	25	15	6.81	25	15	-0.10
100	7.84	25	15	7.70	25	15	-0.14

Flow Comparison

ARI (Years)	Left6 - T						
	Pre-Developed			Post-Developed			Impact (Pre v Post) (m3/s)
	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	
1	4.40	60	35	5.82	60	31	**1.42**
2	5.98	60	34	7.64	60	30	**1.66**
5	8.29	60	33	10.28	60	30	**1.99**
10	9.99	60	32	12.00	60	30	**2.01**
20	11.98	60	32	14.22	60	30	**2.24**
50	14.35	60	32	16.58	60	30	**2.23**
100	16.45	60	32	18.89	60	30	**2.44**

Flow Comparison							
ARI (Years)	Left7 - T						
	Pre-Developed			Post-Developed			Impact (Pre v Post) (m3/s)
	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	
1	8.82	60	49	10.75	60	39	1.93
2	12.27	60	47	14.58	60	37	2.32
5	17.40	60	45	20.33	60	36	2.93
10	21.25	60	44	24.42	60	35	3.17
20	25.72	60	43	29.45	60	35	3.73
50	31.66	60	42	35.70	60	35	4.05
100	36.51	60	41	41.15	60	35	4.64

Flow Comparison							
ARI (Years)	Left10 - T						
	Pre-Developed			Post-Developed			Impact (Pre v Post) (m3/s)
	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	
1	3.44	60	25	8.39	25	15	4.95
2	4.75	60	25	10.86	25	15	6.11
5	6.69	60	25	14.19	25	15	7.50
10	8.19	60	25	16.31	25	15	8.11
20	9.88	60	25	19.06	25	15	9.18
50	11.87	60	25	20.90	25	15	9.03
100	13.66	60	25	23.59	25	15	9.93

Flow Comparison							
ARI (Years)	Left11 - T						
	Pre-Developed			Post-Developed			Impact (Pre v Post) (m3/s)
	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	
1	3.85	60	37	5.92	25	15	2.07
2	5.37	60	35	7.62	25	15	2.25
5	7.61	60	35	9.89	25	15	2.28
10	9.30	60	35	11.30	25	15	2.00
20	11.21	60	35	13.16	25	15	1.95
50	13.68	60	35	14.31	25	15	0.63
100	15.74	60	34	16.11	25	15	0.36

Flow Comparison							
ARI (Years)	Left9						
	Pre-Developed			Post-Developed			Impact (Pre v Post) (m3/s)
	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	
1	11.72	60	58	16.11	60	42	4.39
2	16.52	60	55	21.73	60	41	5.21
5	23.70	60	53	30.06	60	40	6.36
10	29.24	60	51	35.83	60	40	6.59
20	35.66	60	50	43.09	60	39	7.43
50	44.93	60	49	52.08	60	39	7.15
100	52.08	60	48	59.94	60	38	7.86

Flow Comparison							
ARI (Years)	RPWest						
	Pre-Developed			Post-Developed			Impact (Pre v Post) (m3/s)
	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	
1	13.38	60	55	22.32	60	36	8.94
2	18.86	60	53	29.86	60	35	11.00
5	27.13	60	50	40.99	60	35	13.86
10	33.51	60	49	48.59	60	35	15.08
20	40.91	60	47	58.20	60	35	17.29
50	51.71	60	46	69.73	60	35	18.03
100	60.00	60	45	80.09	60	35	20.09

Annex C

Detailed SOBEK Results

Cardno Lawson Treloar

Pre-Development Case: EX06a
Post-Development Case: DE16a

SOBEK Cross-ID	Peak Water Level (m AHD)																				
	100 Year ARI			50 Year ARI			20 Year ARI			10 Year ARI			5 Year ARI			2 Year ARI			1 Year ARI		
	Ex.	Dev.	Impact	Ex	Dev.	Impact	Ex.	Dev.	Impact	Ex.	Dev.	Impact	Ex.	Dev.	Impact	Ex.	Dev.	Impact	Ex.	Dev.	Impact
Reach 1 Western Tributary																					
RCH_0_EX_01	35.50	35.50		35.49	35.48	-0.01	35.47	35.47		35.45	35.45		35.43	35.43		35.40	35.40		35.37	35.37	
RCH_0_EX_02	35.24	35.23	-0.01	35.20	35.20		35.17	35.17		35.13	35.13		35.08	35.08		34.99	34.98	-0.01	34.76	34.76	
RCH_0_EX_03	35.24	35.23	-0.01	35.20	35.20		35.17	35.17		35.13	35.13		35.08	35.08		35.00	35.00		34.93	34.84	-0.09
RCH_0_EX_04	34.60	34.59	-0.01	34.57	34.56	-0.01	34.54	34.53	-0.01	34.50	34.49	-0.01	34.45	34.44	-0.01	34.34	34.34		34.25	34.18	-0.07
RCH_0_EX_05	34.19	34.14	-0.05	34.17	34.12	-0.05	34.15	34.10	-0.05	34.12	34.07	-0.05	34.08	34.04	-0.04	34.00	33.98	-0.02	33.94	33.90	-0.04
Site Boundary																					
RCH_0_DEV_01	34.05	32.61	-1.44	34.03	32.53	-1.50	34.01	32.47	-1.54	33.99	32.38	-1.61	33.96	32.30	-1.66	33.90	32.18	-1.72	33.85	32.12	-1.73
RCH_0_DEV_02	32.75	32.44	-0.31	32.69	32.36	-0.33	32.63	32.29	-0.34	32.56	32.21	-0.35	32.48	32.13	-0.35	32.36	32.00	-0.36	32.29	31.94	-0.35
Crossing 1																					
RCH_0_DEV_03	32.57	32.05	-0.52	32.51	32.00	-0.51	32.46	31.95	-0.51	32.39	31.90	-0.49	32.32	31.84	-0.48	32.20	31.75	-0.45	32.14	31.71	-0.43
RCH_0_DEV_04	31.30	30.74	-0.56	31.26	30.68	-0.58	31.21	30.62	-0.59	31.16	30.55	-0.61	31.11	30.48	-0.63	31.04	30.38	-0.66	31.00	30.32	-0.68
Crossing 2																					
RCH_0_DEV_05	30.19	30.44	0.25	30.17	30.39	0.22	30.14	30.35	0.21	30.11	30.30	0.19	30.07	30.25	0.18	30.02	30.18	0.16	29.99	30.14	0.15
RCH_0_DEV_06	29.18	29.76	0.58	29.15	29.73	0.58	29.11	29.70	0.59	29.07	29.67	0.60	29.04	29.64	0.60	28.98	29.59	0.61	28.95	29.56	0.61
RCH_0_DEV_08	26.37	27.19	0.82	26.35	27.17	0.82	26.32	27.16	0.84	26.30	27.15	0.85	26.27	27.13	0.86	26.24	27.11	0.87	26.21	27.10	0.89
RCH_0_DEV_09	24.60	22.81	-1.79	24.58	22.76	-1.82	24.56	22.70	-1.86	24.54	22.64	-1.90	24.51	22.58	-1.93	24.48	22.50	-1.98	24.45	22.45	-2.00
Crossing 3																					
RCH_0_DEV_10	23.89	22.61	-1.28	23.87	22.54	-1.33	23.84	22.47	-1.37	23.82	22.40	-1.42	23.78	22.33	-1.45	23.72	22.23	-1.49	23.68	22.17	-1.51
RCH_0_DEV_11	22.27	22.26	-0.01	22.24	22.19	-0.05	22.21	22.11	-0.10	22.18	22.04	-0.14	22.14	21.98	-0.16	22.10	21.87	-0.23	22.07	21.79	-0.28
RCH_1_DEV_01	20.23	20.26	0.03	20.18	20.20	0.02	20.13	20.14	0.01	20.08	20.08		20.02	20.02		19.94	19.94		19.88	19.87	-0.01
RCH_1_DEV_02	18.64	19.65	1.01	18.59	19.58	0.99	18.53	19.52	0.99	18.47	19.46	0.99	18.41	19.41	1.00	18.33	19.34	1.01	18.27	19.28	1.01
RCH_1_DEV_03	17.43	16.14	-1.29	17.40	16.00	-1.40	17.35	15.87	-1.48	17.31	15.76	-1.55	17.27	15.67	-1.60	17.23	15.57	-1.66	17.20	15.51	-1.69
Archer St																					
RCH_1_DEV_04	-	14.73	-	-	14.72	-	-	14.70	-	-	14.69	-	-	14.67	-	-	14.66	-	-	14.64	-
RCH_1_DEV_05	-	11.76	-	-	11.75	-	-	11.76	-	-	11.76	-	-	11.75	-	-	11.75	-	-	11.75	-
Reach 2 Western Tributary																					
RCH_2_DEV_01	-	29.72	-	-	29.68	-	-	29.65	-	-	29.60	-	-	29.56	-	-	29.48	-	-	29.42	-
RCH_2_DEV_02	-	22.65	-	-	22.56	-	-	22.45	-	-	22.33	-	-	22.24	-	-	22.09	-	-	21.99	-
Bognuda St																					
RCH_2_DEV_03	-	21.34	-	-	21.31	-	-	21.28	-	-	21.26	-	-	21.23	-	-	21.20	-	-	21.17	-
RCH_2_DEV_04	-	19.88	-	-	19.83	-	-	19.77	-	-	19.71	-	-	19.67	-	-	19.60	-	-	19.55	-
Reach 3 Western Tributary																					
RCH_3_DEV_01	-	12.34	-	-	12.27	-	-	12.22	-	-	12.14	-	-	12.07	-	-	11.95	-	-	11.85	-
RCH_3_DEV_02	-	11.41	-	-	11.35	-	-	11.30	-	-	11.24	-	-	11.18	-	-	11.09	-	-	11.00	-
RCH_3_DEV_04	-	10.75	-	-	10.70	-	-	10.66	-	-	10.60	-	-	10.56	-	-	10.48	-	-	10.41	-

Pre-Development Case: EX06a
Post-Development Case: DE16a

SOBEK Cross-ID	Peak Water Depth (m)																				
	100 Year ARI			50 Year ARI			20 Year ARI			10 Year ARI			5 Year ARI			2 Year ARI			1 Year ARI		
	Ex.	Dev.	Impact	Ex.	Dev.	Impact	Ex	Dev.	Impact	Ex.	Dev.	Impact	Ex.	Dev	Impact	Ex.	Dev.	Impact	Ex.	Dev.	Impact
Reach 1 Western Tributary																					
RCH_0_EX_01	0.28	0.28		0.27	0.27		0.25	0.25		0.23	0.23		0.21	0.21		0.18	0.18		0.15	0.15	
RCH_0_EX_02	0.89	0.89		0.86	0.85	-0.01	0.83	0.82	-0.01	0.79	0.78	-0.01	0.74	0.73	-0.01	0.65	0.64	-0.01	0.42	0.42	
RCH_0_EX_03	0.40	0.39	-0.01	0.36	0.36		0.33	0.33		0.29	0.28	-0.01	0.24	0.24		0.16	0.16		0.09	0.00	-0.09
RCH_0_EX_04	0.42	0.41	-0.01	0.39	0.38	-0.01	0.36	0.35	-0.01	0.32	0.31	-0.01	0.27	0.26	-0.01	0.16	0.16		0.06	0.00	-0.06
RCH_0_EX_05	0.29	0.24	-0.05	0.27	0.22	-0.05	0.25	0.20	-0.05	0.21	0.17	-0.04	0.18	0.14	-0.04	0.10	0.08	-0.02	0.04	0.00	-0.04
Site Boundary																					
RCH_0_DEV_01	0.24	1.17	0.93	0.22	1.08	0.86	0.20	1.02	0.82	0.18	0.93	0.75	0.15	0.85	0.70	0.09	0.73	0.64	0.04	0.67	0.63
RCH_0_DEV_02	1.31	1.19	-0.12	1.25	1.11	-0.14	1.19	1.05	-0.14	1.11	0.96	-0.15	1.04	0.88	-0.16	0.92	0.75	-0.17	0.85	0.69	-0.16
Crossing 1																					
RCH_0_DEV_03	1.24	0.98	-0.26	1.18	0.93	-0.25	1.13	0.89	-0.24	1.06	0.83	-0.23	0.99	0.77	-0.22	0.87	0.68	-0.19	0.81	0.64	-0.17
RCH_0_DEV_04	0.85	1.02	0.17	0.81	0.96	0.15	0.76	0.90	0.14	0.71	0.83	0.12	0.66	0.76	0.10	0.59	0.66	0.07	0.55	0.60	0.05
Crossing 2																					
RCH_0_DEV_05	0.57	0.90	0.33	0.55	0.85	0.30	0.52	0.81	0.29	0.49	0.76	0.27	0.45	0.71	0.26	0.40	0.64	0.24	0.37	0.60	0.23
RCH_0_DEV_06	0.60	0.68	0.08	0.57	0.65	0.08	0.52	0.62	0.10	0.49	0.59	0.10	0.45	0.56	0.11	0.40	0.51	0.11	0.36	0.48	0.12
RCH_0_DEV_08	0.39	0.49	0.10	0.37	0.47	0.10	0.35	0.46	0.11	0.32	0.45	0.13	0.30	0.43	0.13	0.26	0.41	0.15	0.24	0.40	0.16
RCH_0_DEV_09	0.42	0.91	0.49	0.40	0.86	0.46	0.38	0.80	0.42	0.35	0.74	0.39	0.33	0.68	0.35	0.29	0.60	0.31	0.27	0.55	0.28
Crossing 3																					
RCH_0_DEV_10	0.61	0.81	0.20	0.59	0.74	0.15	0.56	0.67	0.11	0.54	0.60	0.06	0.49	0.53	0.04	0.44	0.43	-0.01	0.40	0.37	-0.03
RCH_0_DEV_11	0.45	0.90	0.45	0.42	0.83	0.41	0.39	0.75	0.36	0.35	0.68	0.33	0.32	0.62	0.30	0.27	0.51	0.24	0.24	0.43	0.19
RCH_1_DEV_01	0.80	0.76	-0.04	0.75	0.70	-0.05	0.70	0.64	-0.06	0.65	0.58	-0.07	0.59	0.52	-0.07	0.51	0.44	-0.07	0.45	0.37	-0.08
RCH_1_DEV_02	0.70	1.15	0.45	0.65	1.08	0.43	0.58	1.02	0.44	0.52	0.96	0.44	0.47	0.91	0.44	0.39	0.84	0.45	0.33	0.78	0.45
RCH_1_DEV_03	0.85	1.44	0.59	0.81	1.30	0.49	0.76	1.17	0.41	0.72	1.06	0.34	0.69	0.97	0.28	0.64	0.87	0.23	0.61	0.81	0.20
Archer St																					
RCH_1_DEV_04	-	0.23	-	-	0.22	-	-	0.20	-	-	0.19	-	-	0.17	-	-	0.16	-	-	0.14	-
RCH_1_DEV_05	-	0.76	-	-	0.75	-	-	0.76	-	-	0.76	-	-	0.75	-	-	0.75	-	-	0.75	-
Reach 2 Western Tributary																					
RCH_2_DEV_01	-	0.72	-	-	0.68	-	-	0.65	-	-	0.60	-	-	0.56	-	-	0.48	-	-	0.42	-
RCH_2_DEV_02	-	2.25	-	-	2.16	-	-	2.05	-	-	1.93	-	-	1.84	-	-	1.69	-	-	1.59	-
Bermuda St																					
RCH_2_DEV_03	-	1.14	-	-	1.11	-	-	1.08	-	-	1.06	-	-	1.03	-	-	1.00	-	-	0.97	-
RCH_2_DEV_04	-	1.13	-	-	1.08	-	-	1.02	-	-	0.96	-	-	0.92	-	-	0.85	-	-	0.80	-
Reach 3 Western Tributary																					
RCH_3_DEV_01	-	1.20	-	-	1.13	-	-	1.06	-	-	1.00	-	-	0.93	-	-	0.82	-	-	0.71	-
RCH_3_DEV_02	-	0.95	-	-	0.90	-	-	0.85	-	-	0.78	-	-	0.73	-	-	0.63	-	-	0.55	-
RCH_3_DEV_04	-	0.83	-	-	0.78	-	-	0.74	-	-	0.68	-	-	0.64	-	-	0.56	-	-	0.49	-

Cardno Lawson Treloar

Pre-Development Case: EX06a
Post-Development Case: DE16a

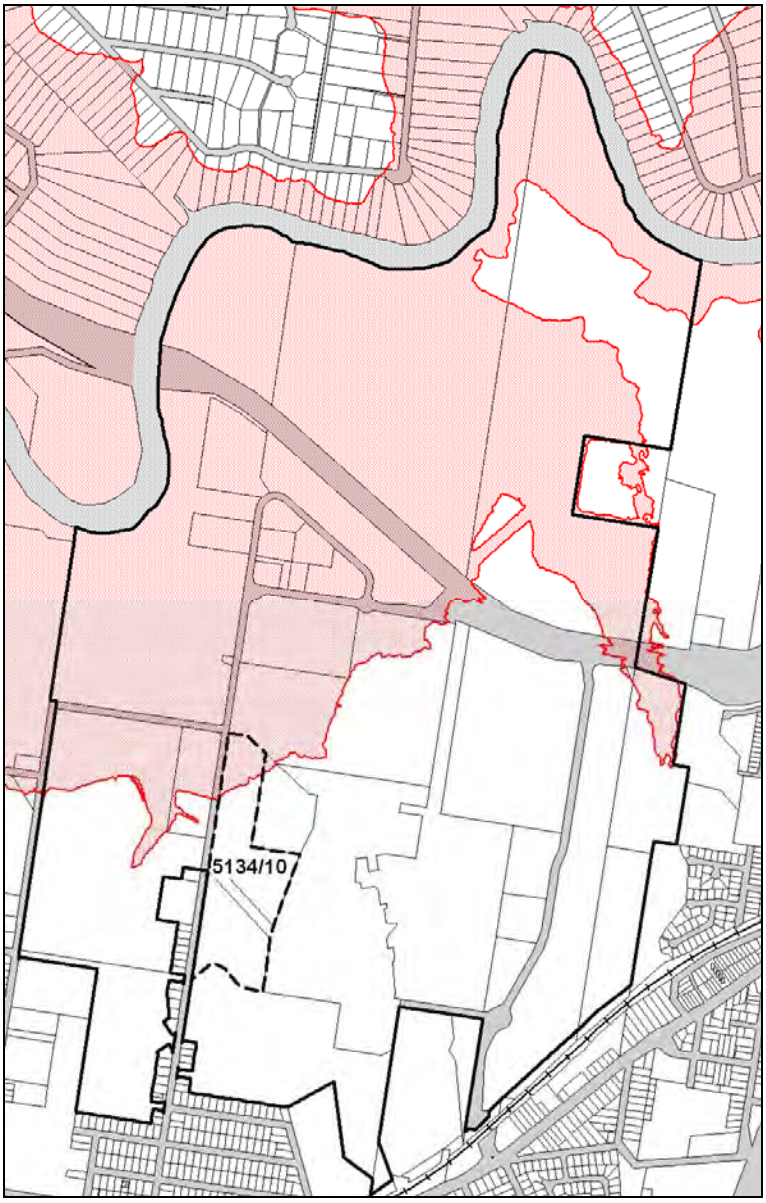
SOBEK Cross-ID	Peak Water Flow (m3/s)																				
	100 Year ARI			50 Year ARI			20 Year ARI			10 Year ARI			5 Year ARI			2 Year ARI			1 Year ARI		
	Ex.	Dev.	Impact	Ex.	Dev.	Impact	Ex.	Dev.	Impact	Ex.	Dev	Impact	Ex.	Dev.	Impact	Ex.	Dev.	Impact	Ex.	Dev.	Impact
	Reach 1 Western Tributary																				
RCH_0_EX_01	9.82	9.82		8.65	8.65		7.73	7.73		6.54	6.54		5.51	5.51		4.10	4.10		3.07	3.07	
RCH_0_EX_02	9.79	9.79		8.61	8.61		7.70	7.70		6.51	6.51		5.49	5.49		4.08	4.08		3.05	3.05	
RCH_0_EX_03	6.30	6.15	-0.15	5.12	4.96	-0.16	4.16	4.05	-0.11	2.96	2.89	-0.07	1.95	1.92	-0.03	0.61	0.60	-0.01	0.11	0.00	-0.11
RCH_0_EX_04	6.25	6.10	-0.15	5.09	4.94	-0.15	4.13	4.00	-0.13	2.94	2.87	-0.07	1.85	1.83	-0.02	0.47	0.47		0.05	0.00	-0.05
RCH_0_EX_05	6.25	6.10	-0.15	5.08	4.93	-0.15	4.10	4.00	-0.10	2.89	2.85	-0.04	1.82	1.79	-0.03	0.44	0.46	0.02	0.04	0.00	-0.04
Bird St Pipe	3.28	3.34	0.06	3.28	3.33	0.05	3.28	3.32	0.04	3.26	3.29	0.03	3.25	3.25		3.19	3.18	-0.01	2.96	2.96	
Site Boundary																					
RCH_0_DEV_01	-	9.32	-	-	8.17	-	-	7.26	-	-	6.07	-	-	5.02	-	-	3.60	-	-	2.93	-
RCH_0_DEV_02	-	9.26	-	-	8.12	-	-	7.20	-	-	6.03	-	-	5.03	-	-	3.58	-	-	2.94	-
Crossing 1																					
RCH_0_DEV_03	-	9.19	-	-	8.09	-	-	7.18	-	-	6.05	-	-	5.01	-	-	3.59	-	-	2.94	-
RCH_0_DEV_04	-	8.98	-	-	7.89	-	-	6.93	-	-	5.82	-	-	4.82	-	-	3.51	-	-	2.80	-
Crossing 2																					
RCH_0_DEV_05	-	8.94	-	-	7.85	-	-	6.91	-	-	5.82	-	-	4.79	-	-	3.51	-	-	2.79	-
RCH_0_DEV_06	-	8.94	-	-	7.86	-	-	6.91	-	-	5.76	-	-	4.79	-	-	3.49	-	-	2.77	-
RCH_0_DEV_08	-	8.94	-	-	7.84	-	-	6.87	-	-	5.78	-	-	4.76	-	-	3.49	-	-	2.75	-
RCH_0_DEV_09	-	8.89	-	-	7.83	-	-	6.87	-	-	5.72	-	-	4.76	-	-	3.48	-	-	2.73	-
Crossing 3																					
RCH_0_DEV_10	-	8.93	-	-	7.85	-	-	6.88	-	-	5.76	-	-	4.76	-	-	3.48	-	-	2.72	-
RCH_0_DEV_11	-	24.27	-	-	21.14	-	-	17.73	-	-	14.79	-	-	12.43	-	-	9.11	-	-	6.78	-
RCH_1_DEV_01	-	24.21	-	-	21.12	-	-	17.72	-	-	14.76	-	-	12.42	-	-	9.06	-	-	6.79	-
RCH_1_DEV_02	-	47.42	-	-	42.90	-	-	38.46	-	-	34.40	-	-	31.17	-	-	26.76	-	-	23.45	-
RCH_1_DEV_03	-	50.59	-	-	46.23	-	-	41.80	-	-	37.73	-	-	34.45	-	-	30.11	-	-	26.81	-
Archer St																					
RCH_1_DEV_04	-	50.59	-	-	46.22	-	-	41.80	-	-	37.74	-	-	34.48	-	-	30.12	-	-	26.81	-
RCH_1_DEV_05	-	50.59	-	-	46.22	-	-	41.80	-	-	37.74	-	-	34.48	-	-	30.12	-	-	26.81	-
	Reach 2 Western Tributary																				
RCH_2_DEV_01	-	11.48	-	-	10.17	-	-	9.32	-	-	7.97	-	-	6.93	-	-	5.29	-	-	4.08	-
RCH_2_DEV_02	-	23.67	-	-	22.21	-	-	21.21	-	-	20.13	-	-	19.29	-	-	17.95	-	-	16.99	-
Bognuda St																					
RCH_2_DEV_03	-	23.65	-	-	22.18	-	-	21.18	-	-	20.12	-	-	19.28	-	-	17.95	-	-	17.00	-
RCH_2_DEV_04	-	23.53	-	-	22.10	-	-	21.10	-	-	20.03	-	-	19.20	-	-	17.83	-	-	16.87	-
	Reach 3 Western Tributary																				
RCH_3_DEV_01	-	23.47	-	-	20.78	-	-	18.94	-	-	16.20	-	-	14.10	-	-	10.78	-	-	8.32	-
RCH_3_DEV_02	-	22.70	-	-	20.11	-	-	18.24	-	-	15.63	-	-	13.62	-	-	10.44	-	-	8.08	-
RCH_3_DEV_04	-	22.77	-	-	20.18	-	-	18.33	-	-	15.72	-	-	13.69	-	-	10.49	-	-	8.10	-

Cardno Lawson Treloar

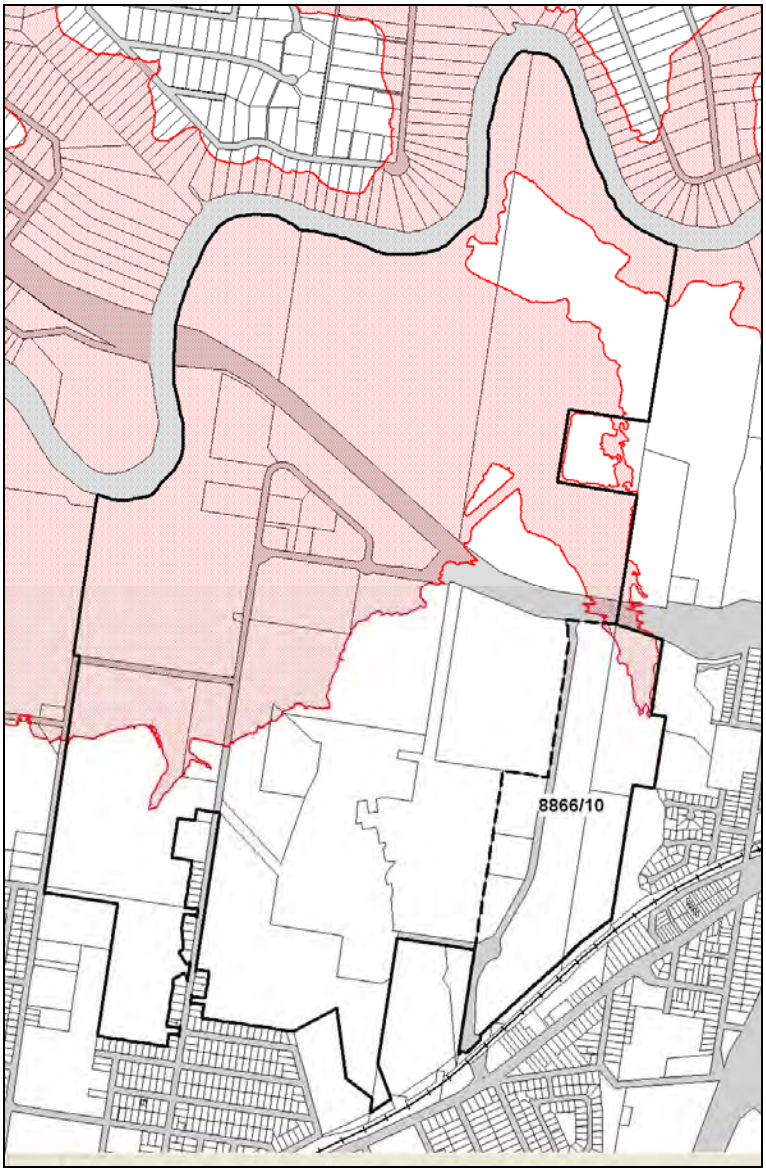
Pre-Development Case: EX06a
Post-Development Case: DE16a

SOBEK Cross-ID	Peak Water Velocities (m/s)																				
	100 Year ARI			50 Year ARI			20 Year ARI			10 Year ARI			5 Year ARI			2 Year ARI			1 Year ARI		
	Ex.	Dev.	Impact	Ex.	Dev.	Impact	Ex.	Dev.	Impact	Ex.	Dev.	Impact	Ex.	Dev.	Impact	Ex.	Dev.	Impact	Ex.	Dev.	Impact
Reach 1 Western Tributary																					
RCH_0_EX_01	1.03	1.04	0.01	1.02	1.02		1.03	1.03		1.01	1.01		1.01	1.01		1.00	1.00		1.00	1.00	
RCH_0_EX_02	1.76	1.77	0.01	1.74	1.75	0.01	1.74	1.74		1.73	1.73		1.72	1.72		1.72	1.72		1.72	1.72	
RCH_0_EX_03	0.43	0.43		0.40	0.40		0.38	0.38		0.35	0.34	-0.01	0.31	0.31		0.32	0.31	-0.01	0.18	0.00	-0.18
RCH_0_EX_04	0.39	0.40	0.01	0.36	0.37	0.01	0.34	0.34		0.30	0.31	0.01	0.26	0.26		0.17	0.18	0.01	0.10	0.00	-0.10
Bird St Pipe	3.84	3.89	0.05	3.82	3.89	0.07	3.81	3.89	0.08	3.80	3.86	0.06	3.80	3.82	0.02	3.75	3.74	-0.01	3.51	3.51	
Site Boundary																					
RCH_0_DEV_01	-	0.92	-	-	0.91	-	-	0.89	-	-	0.86	-	-	0.83	-	-	0.77	-	-	0.73	-
RCH_0_DEV_02	-	1.81	-	-	1.78	-	-	1.73	-	-	1.66	-	-	1.58	-	-	1.45	-	-	1.37	-
Crossing 1																					
RCH_0_DEV_03	-	1.43	-	-	1.37	-	-	1.31	-	-	1.24	-	-	1.16	-	-	1.03	-	-	0.96	-
RCH_0_DEV_04	-	1.16	-	-	1.13	-	-	1.11	-	-	1.07	-	-	1.02	-	-	0.96	-	-	0.91	-
Crossing 2																					
RCH_0_DEV_05	-	1.30	-	-	1.24	-	-	1.19	-	-	1.11	-	-	1.04	-	-	0.92	-	-	0.84	-
RCH_0_DEV_06	-	2.04	-	-	1.95	-	-	1.86	-	-	1.75	-	-	1.64	-	-	1.46	-	-	1.34	-
RCH_0_DEV_08	-	2.88	-	-	2.76	-	-	2.63	-	-	2.48	-	-	2.45	-	-	2.47	-	-	2.47	-
RCH_0_DEV_09	-	1.45	-	-	1.64	-	-	1.35	-	-	1.35	-	-	1.35	-	-	1.32	-	-	1.36	-
Crossing 3																					
RCH_0_DEV_10	-	1.04	-	-	1.01	-	-	0.99	-	-	0.95	-	-	0.91	-	-	0.84	-	-	0.78	-
RCH_0_DEV_11	-	2.25	-	-	2.17	-	-	2.07	-	-	1.96	-	-	1.86	-	-	1.70	-	-	1.56	-
RCH_1_DEV_01	-	2.14	-	-	2.04	-	-	1.94	-	-	1.83	-	-	1.73	-	-	1.53	-	-	1.36	-
RCH_1_DEV_02	-	2.47	-	-	2.39	-	-	2.31	-	-	2.23	-	-	2.16	-	-	2.06	-	-	1.98	-
RCH_1_DEV_03	-	2.27	-	-	2.26	-	-	2.26	-	-	2.25	-	-	2.24	-	-	2.17	-	-	2.11	-
Archer St																					
RCH_1_DEV_04	-	8.61	-	-	8.27	-	-	7.91	-	-	7.54	-	-	7.22	-	-	6.75	-	-	6.36	-
RCH_1_DEV_05	-	6.98	-	-	6.61	-	-	6.21	-	-	5.82	-	-	5.48	-	-	4.99	-	-	4.57	-
Reach 2 Western Tributary																					
RCH_2_DEV_01	-	2.31	-	-	2.23	-	-	2.18	-	-	2.08	-	-	2.00	-	-	1.85	-	-	1.71	-
RCH_2_DEV_02	-	1.36	-	-	1.37	-	-	1.29	-	-	1.29	-	-	1.28	-	-	1.28	-	-	1.28	-
Bognuda St																					
RCH_2_DEV_03	-	2.35	-	-	2.30	-	-	2.27	-	-	2.24	-	-	2.21	-	-	2.16	-	-	2.13	-
RCH_2_DEV_04	-	1.36	-	-	1.37	-	-	1.41	-	-	1.42	-	-	1.44	-	-	1.45	-	-	1.42	-
Reach 3 Western Tributary																					
RCH_3_DEV_01	-	1.79	-	-	1.73	-	-	1.69	-	-	1.61	-	-	1.55	-	-	1.43	-	-	1.32	-
RCH_3_DEV_02	-	2.46	-	-	2.37	-	-	2.31	-	-	2.20	-	-	2.11	-	-	1.94	-	-	1.79	-
RCH_3_DEV_04	-	2.99	-	-	2.89	-	-	2.81	-	-	2.67	-	-	2.54	-	-	2.30	-	-	2.08	-

Flood Map



Flood Map



BREMER BUSINESS PARK

Development Application

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Development Application

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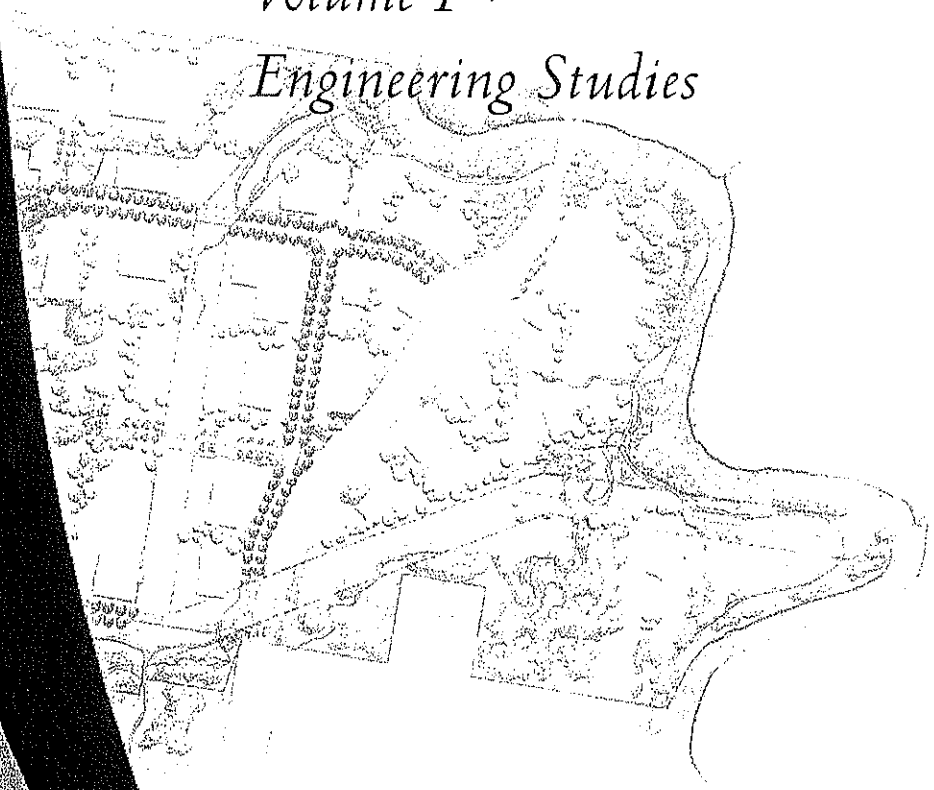

- Flooding

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1. Introduction

A large area of the site for the proposed Bremer Business Park (BBP) is susceptible to flooding from the Bremer River. The worst flooding that is experienced in the Bremer River at the BBP occurs when the Brisbane River backs up.

The BBP site itself shall experience a substantial change in land use due to the proposed development. These changes have the potential to increase the peak runoff from the site. At the same time, the change I land use has the potential to change the quality of stormwater discharged from the site.

This report discusses these issues and describes the management techniques that will be applies to ensure that the BBP site will not have adverse impacts on flooding or water quality in the Bremer River.

2. Existing Case Flooding and Drainage

There are two flooding mechanisms that will impact the Bremer Business Park (BBP) site, being river flooding and local rainfall runoff.

2.1 Local Drainage

Local drainage issues are not a major problem on the existing site when compared to the problems caused by river flooding. The site is currently undeveloped apart from the Australian Hardwoods development.

The factories irrigate the site with production effluent via a series of settlement and treatment ponds. Run off from the site is intercepted by contour banks and catch drains that concentrate flow into dams adjacent to the Bremer River.

All effluent captured in these dams is returned to the settlement ponds at the top of the irrigation system and recycled.

Three major tributaries dominate local drainage. **Figure 2-1** shows the location of these tributaries. For the purpose of this report, the tributaries are labelled as Tributary 'A', 'B' and 'C'.

Key details of the catchments of Tributaries 'A', 'B' and 'C' are summarised in **Table 2-1**.

- Table 2-1 Local Catchment Details

Catchment	Total Area (ha)	Portion (ha) covered by Bremer Business Park
A	446	100 (22%)
B	75	75 (100%)
C	190	147 (77%)
TOTAL	**711**	**322 (45%)**

A hydrologic model (DRAINS) was been established for the catchments of Tributary 'A' and 'B' as part of a previous study undertaken by Sinclair Knight Merz. This information was used to estimate stormwater discharges for the existing land use conditions within the catchment.

- Table 2-2 Q2 Existing Discharges

Location	Existing Discharge (m^3/s)
A1 Bremer River	48
A4 Warrego Highway	42
B1 Bremer River	7
B3 Warrego Highway	4
C1 Bremer River	24

- *A Q2 flood has a 50% probability of occurring in any year (ie 1 in 2years)*

- Table 2-3 Q100 Existing Discharges

Location	Existing Discharge (m^3/s)
A1 Bremer River	199
A4 Warrego Highway	169
B1 Bremer River	32
B3 Warrego Highway	17
C1 Bremer River	85

- *A Q100 flood has a 1% probability of occurring in any year (ie 1 in 100years)*

2.1.1 Tributary 'A'

Catchment 'A' is the largest catchment but is largely independent from the BBP site. It is expected that future development within the BBP will have less of a hydrologic impact within Tributary 'A' compared to Tributaries 'B' and 'C'.

The majority of the tributary downstream of the Warrego Highway is well below the 100 ARI flood level in the Bremer River and it is likely that river flooding will dominate the hydraulics in the area.

Upstream of the highway the tributary mainly lies outside the BBP development. The creek has natural levees that isolate the flow from the BBP site. A basic assessment of the hydraulics found that the natural levee may overtop in major flood events. However, it is likely that flows created by the natural levee overtopping would not spread beyond the electricity transmission easement east of BBP.

Downstream of the highway, the tributary spreads across low-lying terrain. Flow is controlled by a system of contour banks and catch-drains.

- Figure 2-1 Bremer Business Park Local Drainage

Replace this page with figure 2-1

2.1.2 Tributary 'B'

Tributary 'B' is a local depression downstream of the Warrego highway. It meets with Tributary 'A' immediately before discharging into the Bremer River. The river flood will dominate the flooding in Tributary 'B' as the Warrego Highway isolates that tributary from its local catchment. There is no existing drainage under the Warrego Highway to transfer flow to the downstream side.

Under existing conditions, a large catch drain and dam captures runoff from Tributary 'B' and recycles the water through the site's irrigation system.

2.1.3 Tributary 'C'

Tributary 'C' drains the western side of the BBP into the Bremer River immediately upstream of the Warrego Highway bridge. River flooding will be the dominant flooding mechanism at the downstream end of the tributary.

2.2 River Flooding

The site has a history of river flooding. The worst recorded flood occurred in 1893. In 1974, a flood reached 20.4m AHD in the Bremer River and inundated the majority of the BBP site on the river side of the Warrego Highway and up into southern side of the highway.

A flood study of the Bremer River was completed by Sinclair Knight Merz in 2000. The study involved the development of a calibrated one-dimensional hydraulic model using MIKE11 software. The model includes the Bremer Business Park site. It was calibrated to numerous recorded flood events and was used to predict flood levels for design flood events including the 100 year and 20 year Annual Recurrence Interval (ARI).

Two mechanisms dictate flooding events at the BBP site. Those being, the Brisbane River Flood and the Bremer River Flood.

2.2.1 Brisbane River Flood

The Brisbane River flood occurs when water levels in the Brisbane River rise and back up into the Bremer River. This creates the higher water levels of the two flood mechanisms as the Bremer River acts as a backwater and forms a standing pool.

Therefore, the Brisbane River flood is storage dependent. That is, to avoid adverse impacts through the BBP development, the site layout would have to ensure that there is at least a similar amount of storage available to the flood as in the existing case.

The existing MIKE11 model predicts flood levels through the BBP site as shown in **Table** 2-4.

- Table 2-4 BBP Brisbane River Flood Levels

Brisbane Flood	Flood Level (m AHD)
Q100	18.30

Brisbane Flood	Flood Level (m AHD)
Q50	16.23
Q20	13.54

2.2.2 Bremer River Flood

The Bremer River flood scenario assumes that the Brisbane River is not in flood. This produces lower flood levels as the flood water is free to discharge out of the Bremer system and is not backed up. However, this flood has much higher velocities and is dependent on the conveyance of the river channel to pass the flood to the Brisbane River confluence.

The Bremer River flood is therefore conveyance dependant. That is, the BBP development cannot encroach on the existing Bremer River channel too closely as it will cause local rises in the Bremer River Flood levels. These rises could extend upstream and downstream of the site if not adequately addressed.

For the purpose of this study, the existing MIKE11 model was truncated from upstream of the BBP site, downstream to the Brisbane River confluence. The inflows to the model were in accordance with the original MIKE11 model results. The outflow from the model was in accordance with the geometry of the Bremer River channel at the Brisbane River confluence.

The model was upgraded to the latest version of MIKE11 (Ver 2001b). Minor increases were observed in the calculated flood levels. A sensitivity analysis showed that the model was not sensitive to the downstream boundary condition. The truncated model was supplemented with additional cross sections from the terrain model of the BBP site. This added definition to the model for the analysis.

Table 2-5 shows the comparison between the Q100 flood levels from the original MIKE11 model and the new truncated model. The truncated model was adopted as a conservative tool for this assessment.

- Table 2-5 Compare New and Old MIKE11 Models – Bremer Flood

Chainage	Original Model (mAHD)	Truncated Model (mAHD)	Difference	Comments
BREM 1021460.00	15.18	15.32	0.14	Model Inflow
BREM 1022300.00	14.83	14.99	0.17	
BREM 1022683.00		14.81		
BREM 1022950.00	14.68	14.79	0.11	
BREM 1023177.00		14.71		Start BBP Site
BREM 1023463.00		14.57		
BREM 1023490.00	14.41	14.49	0.07	Warrego H'way
BREM 1023510.00	14.19	14.26	0.07	

Chainage	Original Model (mAHD)	Truncated Model (mAHD)	Difference	Comments
BREM 1023561.00		14.29		
BREM 1023739.00		14.22		
BREM 1023870.00	14.04	14.13	0.09	
BREM 1024146.00		13.97		
BREM 1024220.00	13.69	13.81	0.12	
BREM 1024285.00		13.74		
BREM 1024476.00		13.72		
BREM 1024520.00	13.56	13.69	0.13	
BREM 1024744.00		13.48		
BREM 1024750.00	13.39	13.51	0.12	
BREM 1024882.00		13.37		
BREM 1025154.00		13.16		
BREM 1025300.00	13.03	13.08	0.05	
BREM 1025565.00		12.81		End BBP Site
BREM 1025670.00	12.74	12.76	0.02	
BREM 1025920.00	12.48	12.49	0.02	
BREM 1026150.00	12.29	12.32	0.03	
BREM 1026225.00		12.22		
BREM 1026560.00	11.86	11.86	0.00	
BREM 1026843.00		11.49		
BREM 1027100.00	11.14	11.14	-0.01	
BREM 1027640.00	10.34	10.33	-0.01	
BREM 1027840.00	9.95	9.94	-0.01	
BREM 1028190.00	8.97	8.97	0.00	
BREM 1028490.00	8.11	8.11	0.00	Brisbane R

3. Developed Case Flooding and Drainage

3.1 Local Drainage

The local catchments will be considerably altered by the Bremer Business Park development. Peak flow discharges will increase and a detention strategy is proposed so that peak discharges from the site do not exceed that of the existing conditions.

Discharge points into the Bremer River were tested for this criteria (ie Sites A1 and B1). Also, non-worsening of stormwater discharge at the existing Warrego Highway crossing (ie Sites A4) has also been assumed. This is to ensure the existing flood immunity of the highway is not impacted by future BBP development. These objectives are considered to be 'good practice' based on Queensland Urban Drainage Manual guidelines.

The DRAINS model was modified to represent the likely future changes in landuse associated with the BPP. This has been based on the preliminary concepts of the extent and pattern of future landuse within the BPP.

A comparison between existing and likely future stormwater discharges are provided below for Q2 and Q100 storms.

- Table 3-1 Q2 Future Discharges

Location	Future Discharge (m^3/s)	% Increase
A1 Bremer River	58	21
A4 Warrego Highway	50	19
B1 Bremer River	16	130
B3 Warrego Highway	9	125
C1 Bremer River	39	63

- Table 3-2 Q100 Future Discharges

Location	Future Discharge (m^3/s)	% Increase
A1 Bremer River	209	5
A4 Warrego Highway	177	5
B1 Bremer River	44	38
B3 Warrego Highway	24.5	44
C1 Bremer River	104	22

As expected, the future increases in stormwater discharge within Tributary 'A' are significantly less than those predicted in Tributary 'B'.

3.1.1 Tributary 'A' Detention Strategy

In major Q100 storms, the future landuse within the BPP is not predicted to substantially increase peak discharges at the Warrego Highway and at the point of discharge into the

Bremer River. During minor Q2 storms, the expected increase in peak discharge is of the order of 20%.

To achieve the desired outcome of non-worsening at the Warrego Highway, any detention strategy would involve the use of detention basins or similar works sited upstream of this point. As the BBP boundary is typically outside of Tributary A in this area, the opportunity for 'onstream' detention basins are limited. On this basis, a detention strategy using 'offstream' basins (ie basins located within the proposed lots (onsite) prior to discharge into the creek)has been investigated.

The most appropriate location for the offstream basins is considered to be near the eastern proposed lot boundary, close to Tributary A. Indicative locations for two basins (A4 and A5) are shown on the attached Figure 2-1.

The DRAINS model was used to determine the approximate detention storage that would be required to ensure there would be no increase in Q100 discharge at the Warrego Highway. Assuming a storage depth of 2m, the storage volume and land area (including 30% allowance for batters etc) at Basins A4 and A5 are given in **Table 3-3**.

Table 3-3 Two Basin Strategy – Basins A4 and A5

Basin	Storage Volume (m3)	Land area (m²)
Basin A4	6400	4000
Basin A5	4400	3200
TOTAL	1080	7200

Both Basins A4 and A5 would be required to reduce future Q100 discharges at Warrego Highway to match existing flows. The effect of the basins would also reduce the peak discharge into the Bremer River (at A1) and hence minimal, if any, additional stormwater detention would be needed downstream of the Warrego Highway.

Offstream basins at A4 and A5 also have the potential to be 'wet' basins that would be capable of capturing stormwater for on-site reuse or for wetland treatment of run off.

It is possible for future road works downstream of the Warrego Highway to have adverse impacts on the Warrego Highway if water is allowed to back up behind downstream structures. The road design for the site Triburary 'A' crossing would include bridges and/or culverts and a road level of a similar standard to those of the Warrego Highway. This will ensure that the structures do not cause detrimental afflux.

The final design layout will be developed to ensure that no additional flow is transferred from adjacent catchments into Tributary 'A'.

3.1.2 Tributary 'B' Detention Strategy

As indicated in **Table 3-4** and **Table 3-5**, the predicted increase in stormwater discharge along Tributary 'B' associated with future landuse change is more significant than Tributary 'A'. For minor storms (Q2) the peak discharge more than doubles and for major storms (Q100), the increase in peak discharge is of the order of 40%.

As was the case for Tributary 'A', to achieve the desired outcome of non-worsening at the Warrego Highway, any detention strategy would involve the use of detention basins sited upstream of this point. In this regard, two strategies were investigated as follows:

- Single 'onstream' basin just upstream of the Warrego Highway (at B3)
- A series of three smaller basins incorporating the Warrego Highway 'on-stream' basin (B3) and two 'offstream' basins further upstream (at B4 and B5).

The locations of Basins B3, B4 and B5 are shown on **Figure 2-1**.

The DRAINS model was used to determine the approximate detention storage that would be required to ensure there would be no increase in Q100 discharge at the Warrego Highway. The storage volume and land area (including 30% allowance for batters etc) associated with the single basin strategy and the three basin strategy are given below.

Table 3-4 Single Basin Strategy – Basin B3

Basin	Storage Volume (m3)	Land area (m²)
Basin B3	15 000	9800

Table 3-5 Three Basin Strategy – Basins B3, B4 and B5

Basin	Storage Volume (m3)	Land area (m²)
Basin B3	10 200	6300
Basin B4	2400	2000
Basin B5	900	1000
TOTAL	13 500	9300

By comparison between **Table 3-4** and **Table 3-5** and the three basin strategy is marginally more efficient in terms of storage and land area requirements compared to a single basin at B3. Both strategies should be investigated further as part of master planning of the BBP site.

Both strategies reduce Tributary B stormwater discharges at the Warrego Highway. Under the developed condition, the flow exiting Tributary 'B' upstream of the highway will not reach the outfall at the Bremer River as there are no structures to carry the flow under the highway. This flow will follow existing highway drainage and enter the Bremer River upstream of the highway adjacent to the Bremer River Bridge.

No additional stormwater detention downstream of the Highway is expected to be needed.

Please note that the detention strategies have been based on selecting basin locations that are expected to give the best hydrologic performance. During the master planning process, alternative basin sites may arise that take into account other factors such as open space planning.

3.1.3 Tributary 'C' Detention Strategy

The future 2 year ARI and 100 year ARI discharges were modelled at various locations. The future development included the AHL site development as well as development associated with the Bremer Business Park.

Numerous detention basin options were considered with the aim of reducing future discharges into the Bremer River (ie C1) to existing discharges. The strategy options included:

- A single detention basin at C1
- A single basin at C5
- A basin at C4 and a basin at C7

The hydrologic assessment of the strategy basin options found that the following detention storage volumes (and corresponding landtake area) would be required:

Basin	Storage Volume (m3)	Land area (m^2)
Basin C1	43 000	28 000
Basin C5	28 000	18 000
Basin C4 + C7	18 400	12 000

A detention basin at C7 was investigated in more detail, as well as a basin further upstream at C8. Basin C7 included a pond in the basin for the purpose of collecting stormwater for potential reuse by AHL.

The proposed layout of the BBP has significant excavation in the area of Basin C1. This area has the potential to be developed into a lake, detention basin and wetland system if required under the final development configuration.

3.2 River Flooding

The impact of the proposed development was tested for both of the flooding mechanisms identified previously. The final site layout was developed in an iterative approach to ensure that the development would not impact on flood levels through the site or non adjoining landholders properties.

3.2.1 Brisbane River Flood

The Brisbane River flood backs up through the BBP site. The water ponds and is very slow moving. To ensure that this flood level is not increased, the development must not fill areas of the floodplain without providing complimentary areas of excavation.

This criteria was tested by comparing the volume available to the flood before and after the proposed development. **Figure 3-1** shows the comparison of these volumes.

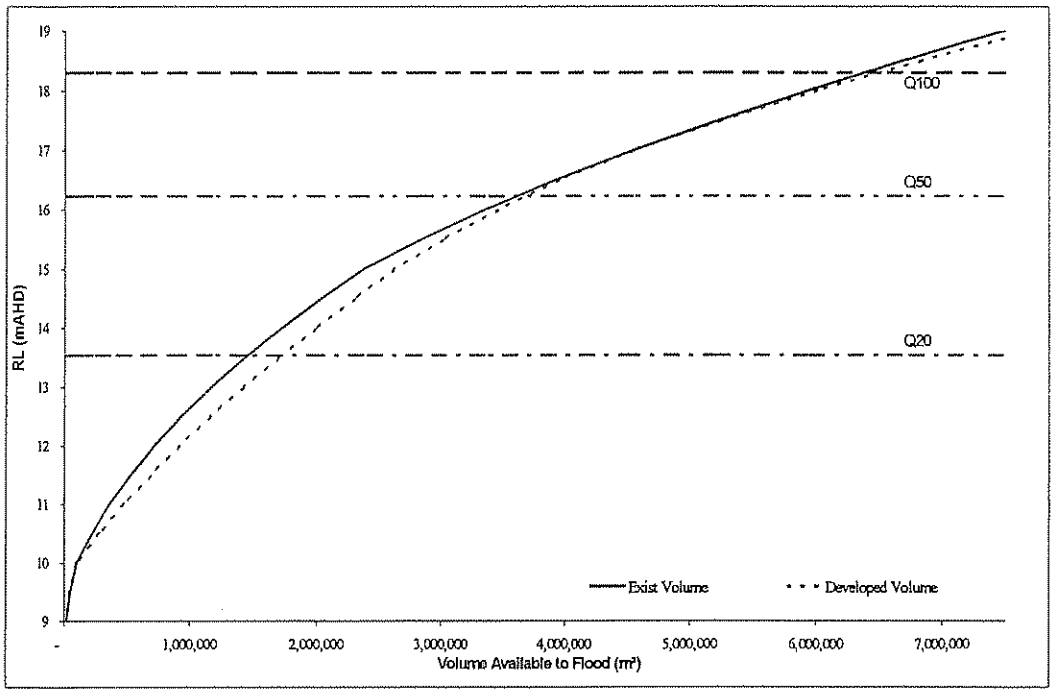


Figure 3-1 Floodplain Volume Assessment

From **Figure 2-1** it can be seen that there is more volume available on the floodplain in the developed case than the existing case. This is true throughout the entire depth range from 0m AHD to above the highest terrain in the development.

On this basis, the development should not increase flood levels generated by the Brisbane River flood mechanism.

The development layout was established to provide appropriate flood immunity to the individual blocks. The majority of developed benches are provided 50 year ARI flood immunity. Blocks below Q50 are all provided Q20 immunity and are designated as hard stand areas.

3.2.2 Bremer River Flood

The Bremer River design flood events produce lower flood levels than the Brisbane River floods however, the flow has higher velocity and relies on the conveyance of the channel and floodplain. To ensure that the BBP development has no impact on flood levels, the cross sectional area of the channel and floodplain should not be reduced by development. If encroachment occurs, it should be limited and tested to find the potential for increasing flood levels within the site and in adjacent land.

The MIKE 11 hydraulic model was modified to represent the developed condition. Cross sections in the model were changed to represent the proposed batters and benches. The model was run to test the Q100 flood event.

Minor changes occurred to the flood levels in the Q100 event. Table 3-6shows the modelled changes in flood levels due to the development.

On this basis, it is considered that the development can be constructed without impacting on flood levels under the Bremer River flooding mechanism.

Some developed benches are below the Q100 Bremer Flood level however, all of these areas are above the Q50 Brisbane River flood level and are proposed for hard stand areas only. Therefore, these areas are not likely to cause detrimental impacts on flood levels and provide adequate flood immunity for the proposed land use.

- Table 3-6 MIKE 11 Developed Case Model Results

Chainage	Existing Case Q100 WSL (mAHD)	Developed Case Q100 WSL (mAHD)	Difference	Comments
BREM 1021460.00	15.32	15.44	0.12	Model Inflow
BREM 1022300.00	14.99	15.07	0.07	
BREM 1022683.00	14.81	14.87	0.06	
BREM 1022950.00	14.79	14.79	0.00	
BREM 1023177.00	14.71	14.70	-0.01	Start BBP Site
BREM 1023463.00	14.57	14.55	-0.01	
BREM 1023490.00	14.49	14.47	-0.01	Warrego H'way
BREM 1023510.00	14.26	14.25	-0.01	
BREM 1023561.00	14.29	14.28	-0.01	
BREM 1023739.00	14.22	14.20	-0.02	
BREM 1023870.00	14.13	14.17	0.04	
BREM 1024146.00	13.97	13.96	0.00	
BREM 1024220.00	13.81	13.81	-0.01	
BREM 1024285.00	13.74	13.76	0.02	
BREM 1024476.00	13.72	13.73	0.00	
BREM 1024520.00	13.69	13.70	0.01	
BREM 1024744.00	13.48	13.49	0.01	
BREM 1024750.00	13.51	13.50	-0.01	
BREM 1024882.00	13.37	13.37	0.00	
BREM 1025154.00	13.16	13.16	0.00	
BREM 1025300.00	13.08	13.15	0.07	
BREM 1025565.00	12.81	12.87	0.06	End BBP Site
BREM 1025670.00	12.76	12.80	0.04	
BREM 1025920.00	12.49	12.56	0.06	
BREM 1026150.00	12.32	12.35	0.03	
BREM 1026225.00	12.22	12.28	0.06	
BREM 1026560.00	11.86	11.93	0.06	
BREM 1026843.00	11.49	11.55	0.05	
BREM 1027100.00	11.14	11.17	0.03	

Chainage	Existing Case Q100 WSL (mAHD)	Developed Case Q100 WSL (mAHD)	Difference	Comments
BREM 1027640.00	10.33	10.35	0.02	
BREM 1027840.00	9.94	9.96	0.02	
BREM 1028190.00	8.97	8.98	0.02	
BREM 1028490.00	8.11	8.12	0.01	Brisbane R

4. Stormwater Quality

The existing land use of the BBP is irrigated pasture. This has the potential for major impacts of water quality however runoff from the site is intercepted by contour banks and dams in the attempt to contain and re-use the water on the site. Local discharge from the site would only occur under major rainfall events when the flow volume in the Bremer River is likely to be high and able to dilute pollutants.

The arrangement of the Bremer Business Park includes very large industrial blocks. These have the potential to be developed by various land uses and each individual land use will have varying degrees of potential impact on stormwater quality. It is not appropriate to provide a detailed assessment of potential water quality impacts on a "whole of development" basis until the final land uses are determined.

It is recommended that each site be assessed for its potential water quality impacts at the time of individual development application. Appropriate stormwater quality measures can be adopted at that stage and can be site specific and the maintenance of the water quality devices can remain the responsibility of the individual developers.

It is proposed to incorporate numerous detention basins within the development to control stormwater discharges. There is the potential to have any of these sites as "wet" basins with the incorporation of constructed wetland elements. Therefore, if Council considers that "whole of development" quality measures should be adopted, these wetlands can be constructed to further enhance the quality of run off from the BBP.

It is proposed that any "whole of development" measures would include current best management practices for water sensitive design to reduce the impacts of road and subdivision development both during and after construction.

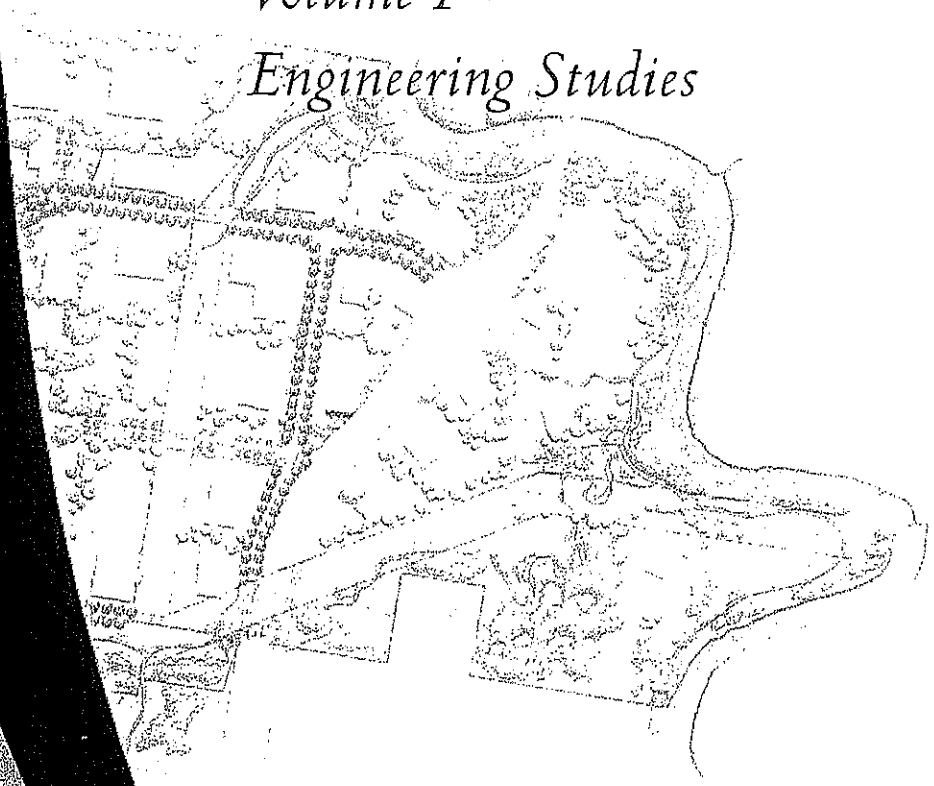
Development of the BBP will require large areas of the site to be cleared of vegetation during construction. Best management practices for erosion and sediment control should be adopted during construction to minimise the impact of erosion due to local rainfall runoff.

There is always a risk of a river flood occurring during construction. The construction shall have to account for this when considering the staging and timing of development in the floodplain. The construction should minimise the amount of time that the site is uncompacted and clear of vegetation. Special consideration should be made towards stabilising batters below the Q20 flood line as soon as possible after construction.

BREMER
BUSINESS PARK

Development Application

Volume F - Engineering Studies



- Infrastructure & Bulk Earthworks

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1. Infrastructure

1.1 Introduction

This report details the engineering services for the proposed development including bulk earthworks, stormwater drainage, water reticulation, sewerage reticulation, electrical and telecommunications services.

1.2 Precincts

The development precincts have been selected to show separable parts of the development which can be serviced and developed in isolation to the other parts and do not relate to staging.

Precinct 1: Central. Development of the area adjacent and to the west of the Australian Hardboard site.

Precinct 2: West. Development of the land west of Bognuda Road.

Precinct 3: East. Development of the area adjacent and to the east of the Humes site. This precinct includes most of the steeper land of the site.

Precinct 4: North. This area, north of the Warrego Highway, is completely separated from the rest of the site and can be developed at any time.

The precincts are shown on Drawing No. 7154-C-001.

1.3 Bulk Earthworks

A preliminary bulk earthworks strategy has been formulated based on development of most of the site above the 100 year flood level. In some locations adjacent to the river, filling to the Q_{100} level is considered to be not economically viable. In these areas, a building pad with a minimum depth of 75m has been provided above the Q50 flood level. Beyond the building pad, earthworks will be constructed to ensure a maximum grade of 2% with flood immunity exceeding the Q_{20} flood level.

Generally the strategy is to source all fill required from within the development site. The site is divided by the Warrego Highway. Cut and fill is balanced in each of these two areas avoiding the need to cross the Warrego Highway during the bulk earthworks phase. The preliminary estimate is 350,000m3 cut to fill north of the Highway and 650,000 cut to fill south of the highway.

The bulk earthworks plan shows preliminary finished surface levels which indicate an option for a balanced earthworks solution. Finished surface levels throughout the development will be confirmed during detailed design.

Precinct 1: Central

Filling is generally required to those lots adjacent to the river, and in other locations requiring reshaping to limit grades and regrading for drainage purposes. Filling will be obtained from the proposed "wetland" on the western boundary of the site, from industrial lots in cut. Generally cut and fill is balanced within Precinct 1.

Industrial land within this precinct will be regraded to a maximum grade of 2%.

Generally frame industrial/commercial and technology land within this precinct will be contoured as required during detailed design of those areas.

Precinct 2: West

Filling is generally required on the northern most lot adjacent to the river. This fill will be obtained from Precinct 1, from the proposed "wetland" on the western boundary of the site.

Generally frame industrial/commercial and residential land within this precinct will be contoured as required during detailed design of those areas.

Precinct 3: East

Industrial land within this precinct will be regraded to a maximum grade of 2%.

Generally frame industrial/commercial land within this precinct will be contoured as required during detailed design of those areas.

Generally cut and fill is balanced within Precinct 3.

Precinct 4: North

Filling is generally required to those lots adjacent to the river, and in other location requiring reshaping to limit grades and regrading for drainage purposes. This fill will be obtained from the proposed "wetland" within the precinct and from the most northern "high' lot within the precinct.

Land within this precinct will be regraded to a maximum grade of 2%.

Generally cut and fill is balanced within Precinct 4.

Flood Storage

The effect on "Flood Storage" will be monitored during the earthworks process to ensure the storage characteristics of the development remain constant. Earthworks operations will be programmed to ensure no adverse effects on flood storage.

The bulk earthworks is presented in Drawing No. 7154-C-002. The quantities quoted are preliminary estimates, which will require confirmation with detailed survey.

1.4 Roads

The proposed configuration of the internal roads is detailed on Drawing No. 7154-C-003.

Roads external to the site boundary and related intersections are addressed in the Traffic and Transport Section of this report.

1.5 Water Supply

The existing water supply network adjacent to the proposed Bremer Business Park development site consists of 450 dia main which truncates the southwest corner from Bognuda Street, a 300 dia main located along the frontage at Brisbane Road and a 1000 dia. supply main to the east of the site. There is minimal water supply infrastructure located to the north of the Warrego Highway to service future development in this area.

Ipswich City Council have given preliminary advice, subject to development supply demands, that the capacity of the existing water supply network would require augmentation to service the proposed development. Preliminary investigations indicate a duplication of the existing 450 dia. main along Bognuda Street to the south west of the site will be required to service the development, and ultimately a storage contribution would be required to the Ipswich City Council, Child Street reservoir, or the construction of the reservoir, and the construction of a 450 dia. main from the reservoir to the eastern boundary of the development site at Ashburn Street.

The order of construction and priority will depend on the staging of the development.

The sizes of the watermains have been assessed based on typical water usage demands related to the land uses shown on the masterplan. The final sizing and headworks requirements will depend on the water usage requirements of the specific developments proposed for this subdivision.

The proposed works are detailed on Drawing No. 7154-C-004.

1.6 Sewerage

The Bundamba Waste Water Treatment Plant is located directly adjacent to the proposed development site on the western boundary of the development immediately south of the Bremer River. A system of existing trunk mains is located along the Brisbane Road frontage and the eastern boundary of the development site.

An existing sewage pump station is located towards the eastern boundary of the site at the Warrego Highway, which services a catchment to the north and east of this development. The existing 300 dia. rising main from this pump station is aligned along the Warrego Highway, Ashburn Road and through an easement in Lot 13 on SL2982, and discharges at the Bundamba Waste Water Plant. The capacity of this pump station and rising main will be assessed during the detailed design phase to determine whether it can be upgraded to cater for the additional catchment resulting from this development. If not feasible an additional pump station and rising main will be required.

The south catchment facing Brisbane Road is to be serviced by a pump station and rising main at this stage. However, the possibility of discharging this additional catchment to the existing gravity sewerage system adjacent to Brisbane Road will be investigated during detailed design.

Ipswich City Council has advised an upgrade to the Bundamba Waste Water Plant is planned however this additional capacity is reserved for increasing demands from existing developing catchments and to reduce the load on the existing Tivoli Waste Water Plant. An additional upgrade to the capacity of the Bundamba Waste Water Plant would be required to service the proposed development subject to actual development demands.

The sizes of the gravity mains and rising mains have been assessed based on typical effluent production related to the land uses shown on the masterplan.. The final sizing will depend on the specific developments proposed for this subdivision.

The proposed works are detailed on Drawing No. 7154-C-005.

1.7 Electrical

An existing Powerlink easement and series of over head lines pass through the site from south to north on the eastern boundary of the development site. This currently consists of duplicate towers and lines, with a planned upgrade to three to satisfy increasing regional demand.

An east /west easement is proposed for future power augmentation and is also shown on the drawings.

The nominated power demands for individual developments, will be made available by existing suppliers or on-site generation.

The existing services are detailed on Drawing No. 7154-C-006.

1.8 Telecommunications

The nearest telephone exchange is at Taylor St, Bundamba. Fibre optic cable currently exists within 900m of the site and would be extended into the development based on the demand for services. Currently if a single service application was received copper cable would be extended from the Bundamba exchange and since the total cable distance would be less than 3.5 km all normal services and broadband ADSL would be available.

It is anticipated that once a major user submits a request for an optic fibre service, the cable would be extended to the site within approximately 3 months.

A Telstra trunk line is located within the development site and passes through to the north-western side of the site. The feasibility and costs associated with relocation will be assessed at design stage.

The existing services are detailed on Drawing No. 7154-C-006.

1.9 Gas

A gas supply easement is located through the development site the north of the Warrego Highway. The potential to connect to this infrastructure will require consultation with the gas authority at the detailed design stage.

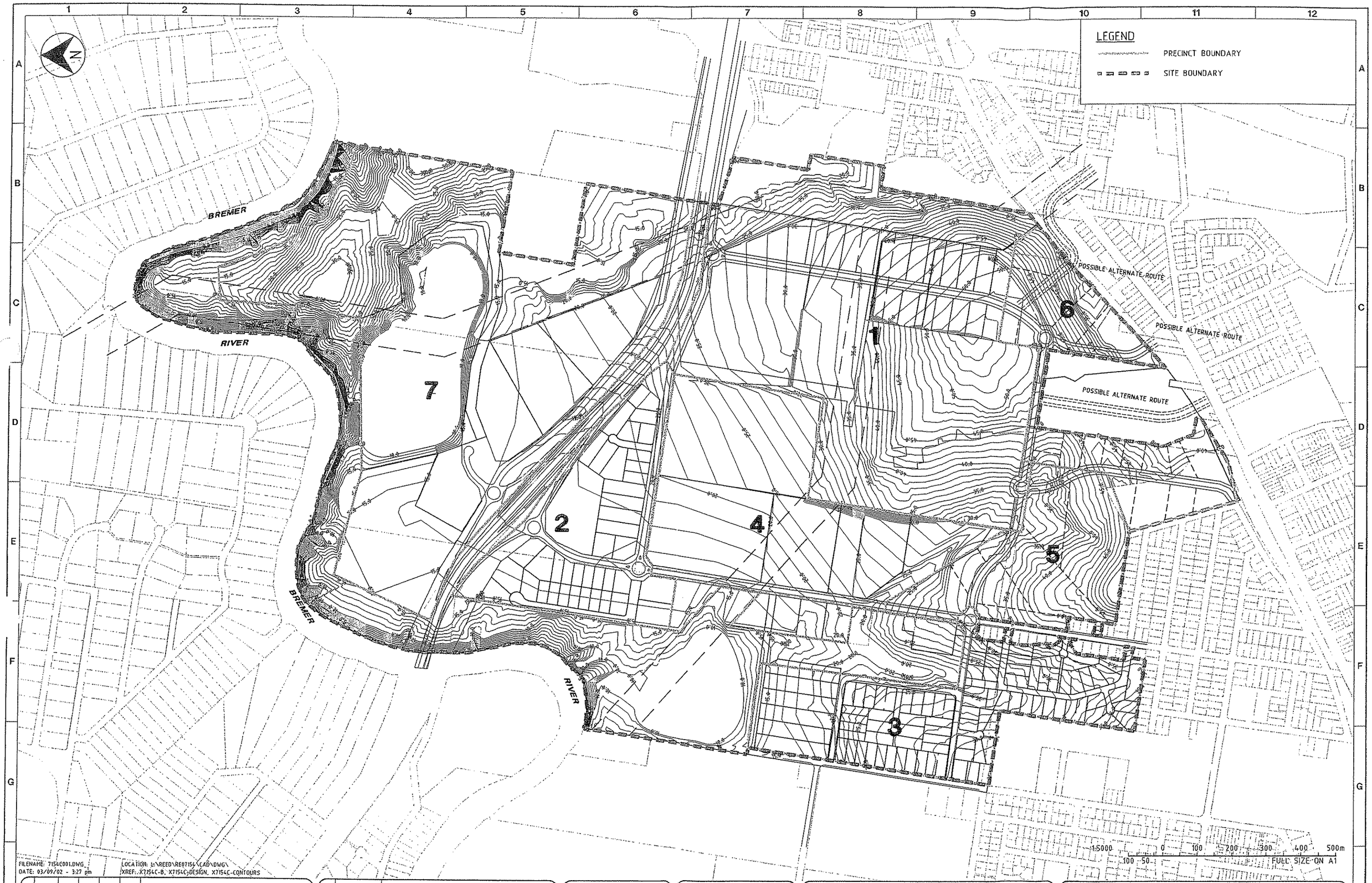
The existing services are detailed on Drawing No. 7154-C-006.

1.10 Infrastructure Charging

The existing infrastructure operated by the Ipswich City Council does not allow for servicing of this development and does not come under any infrastructure charging schemes. The matter of the costs associated with the provision of headworks and upgrading of the existing infrastructure will require negotiation with the Council to establish responsibility for the costs. This negotiation can only be undertaken when landuse for the proposed development is finally established.

1.11 Drawings

See overleaf.



FILENAME: 7154C001.DWG
DATE: 03/09/02 - 3:27 pm
LOCATION: L:\REED\RE07154\CAD\DWG\
XREF: X7154C-B, X7154C-DESIGN, X7154C-CONTOURS

No	DATE	DRAFTING CHECK	DESIGN REVIEW	REV'D P.MGR	APP'D P.DIR	AMENDMENT
C	03.09.02	[redacted]				MASTER PLAN AMENDED
B	18/07/[redacted]					MASTER PLAN AMENDED
A						

No	DRAWING NUMBER	REFERENCE DRAWING TITLE

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SINCLAIR KNIGHT MERZ
Sinclair Knight Merz Pty Ltd
A.C.N. 001 024 095
369 Ann Street
Brisbane QLD 4000 Australia
Telephone [redacted]
Facsimile

CLIENT

PROJECT
BREMER BUSINESS PARK

DRAFTER	DRAFTING CHECK	REVIEWED PROJECT MANAGER	APPROVED PROJECT DIRECTOR
MJO			
DESIGNED	DESIGN REVIEW		SIGNED FOR AND ON BEHALF OF SINCLAIR KNIGHT MERZ PTY. LTD. APPROVED PROJECT

TITLE
SITE PLAN AND PRECINCT DESCRIPTIONS

SCALE	SKM PROJECT No	DRAWING No	AMDT
AS SHOWN	RE07154	7154-C-001	C

A1

Sent to "L" JW

Ipswich
City Council
Quality Lifestyle

Your Reference:
Our Reference: 3356/2002/CA IJW
Contact Officer: [redacted]
Telephone No.:

20 September 2002

INTEGRATED PLANNING ACT 1997

ASSESSMENT MANAGER ACKNOWLEDGMENT NOTICE

Application Details

Appn No:	3356/2002/CA
Assessment Manager:	Ipswich City Council PO Box 191 IPSWICH QLD 4305 Ph: [redacted] Fax: [redacted]
Real Property Description:	Refer to Appendix 2
Property Location:	Archer Street, Ashburn Road, Bognuda Street, Carberry Street, River Road West and Vale Street BUNDAMBA

Wingate Properties Pty Ltd
48 Wharf Street
KANGAROO POINT QLD 4169

Please Address All Correspondence to:
Chief Executive Officer
Ipswich City Council
A.B.N. 61 461 981 077
PO Box 191 Ipswich Qld 4305
Telephone: [redacted]
Facsimile: [redacted]
Email: [redacted]
Website: www.ipswich.qld.gov.au

It is advised that the following matters relate to the above application.

1. **Development Approval**
The following development approval is being sought.

Proposal	Development	Approval Type
Preliminary Approval for Material Change of Use pursuant to s.3.1.6 of the *Integrated Planning Act*	Carrying out building work	N/A.
	Carrying out plumbing or drainage work	N/A.
	Carrying out operational work	N/A.
Reconfiguration of Land into 54 Lots	Reconfiguring a lot	Development Permit.
	Making a material change of use of premises	Preliminary Approval

2. **Referral Agencies**

The following are Agencies for this application:-

Concurrence Agencies

(a) Contaminated Land Unit
Environmental Protection Agency
P O Box 2771
BRISBANE QLD 4001

(b) IPA Licencing Unit
Environmental Protection Agency
Southern Region
G P O Box 2771
BRISBANE QLD 4001

(c) District Director
Metropolitan District Office
Department of Main Roads
P O Box 70
SPRINGHILL QLD 4004

(d) Vegetation Management Officer
Department of Natural Resources
P O Box 1164
BEENLEIGH QLD 4207

3. **Code Assessment**

It is determined that an aspect of the development applied for requires Code Assessment.

4. Impact Assessment

It is determined that an aspect of the development applied for requires Impact Assessment. The requirements for notification to the public are attached to this notice.

5. Information Request

Council and other agencies may require further information to be submitted. If so, these requirements will be notified by the Chief Executive of the Department of Local Government and Planning pursuant to 3.3.7(1) of the *Integrated Planning Act.*

6. Referral Co-Ordination

The application does require referral coordination. The names and addresses of the Concurrence Agencies are listed above.

As the application requires referral coordination, it is advised that the applicant is required to give the chief executive the following:

(a) A copy of the application; and
(b) A copy of the acknowledgment notice; and
(c) The fee prescribed under a regulation.
(d) Written notice of the day the applicant complied with Section 3.3.3(1) for each referral agency.

The above information should be forwarded to:-

Chief Executive
Department of Local Government and Planning
PO Box 187
BRISBANE ALBERT STREET QLD 4002

Yours faithfully

James Wheeler
TEAM CO-ORDINATOR - EAST

APPENDIX 1

Your application has been received and has been registered within Council's processing systems. As part of this, your application has been directed to one of Council's two assessment teams. The team and officers which are dealing with your application are:-

East Team

[redacted] Town Planning assessment up to the time Council determines the application

[redacted] Engineering assessment of the application.
Review of engineering design of works.
Acceptance of municipal works constructed under the approval

Please Note: Consideration of this application will involve Officers from a number of Council Departments. A more comprehensive list of Council contacts will be forwarded shortly.

Appendix 2

Lot 4 SP140694
Lot 6 SP140694
Lot 2 RP854997
Lot 1 RP22385
Lot 1 RP125443
Lot 2 RP104683
Lot 1 RP86838
Lot 1 RP22378
Lot 34 SL3911
Lot 1 RP84779
Lot 142 RP846150
Lot 4 RP92591
Lot 5 RP92591
Lot 6 RP92591
Lot 3 RP132087
Lot 13 SL2982
Lot 2 RP86838

IPSWICH CITY COUNCIL

FACSIMILE COVER SHEET

50 South Street
PO Box 191
IPSWICH QLD 4305

To: Mr[redacted]
Company: Wingate Properties
Phone:
Fax: [redacted]

From: [redacted]
Position: Team Coordinator
Phone: [redacted]
Fax:
E-mail:
Mobile Phone: [redacted]

Date: ~~19~~ 20 September 2002

Pages including this cover page: 6

Comments:

[redacted]

Please find attached an amended acknowledgment notice – only changes to info request times.
Apologies for any inconvenience.

Regards

[redacted]

Important Notice

This facsimile contains information that is intended for use only by the addressee. If you have received this facsimile in error, you are advised that copying, distributing, disclosing or otherwise acting in reliance on this facsimile is expressly prohibited. If you have received this document in error, please let us know by telephone, and then return it to us by post. Your reasonable costs in complying with this request will be refunded.

RCU 923
3356/2002/CA
[redacted]

23 October 2002

Dear [redacted]

Re: **Referral Coordination - Request for Comments**
"Bremer Business Park"
Ashburn Road and others Bundamba

I refer to your correspondence of 26 September 2002 requesting details of any further information required by Council to assess the application. In response you advised that information is required in respect of the following matters.

Infrastructure

- Prior to formal consideration of the application Council will need to be informed of the specific administrative/legal mechanisms to ensure that lots will be provided with appropriate urban services.
- The proposal raises the possibility of the application being supported by an infrastructure agreement. The application, however, does not nominate the matters to be addressed in an Infrastructure Agreement or the general approach proposed.
- Given that an Infrastructure Agreement represents one possible means of servicing the land, if this approach is agreed to by Council, the agreement would need to have been finalised prior to approval of the application.
- Any proposed Infrastructure Agreements would obviously need to fully detail the mechanisms for application to Bremer Business Park throughout the various stages of the development including infrastructure contribution/credit arrangements. Infrastructure contributions would need to comply with the provisions outlined in Council's current roads, water and sewerage Infrastructure Contribution policies. The formulation of any Infrastructure agreements should obviously be undertaken in consultation with the relevant Departments of Council.

Ms [redacted]
Planning Services
Level 14, 41 George Street
BRISBANE QLD 4000

Development Standards

- It is recognised that there are very sound planning reasons for promulgation of area specific codes to provide for particular development themes and to best match development standards to the characteristics of the site and the range of land uses proposed. No fundamental concerns are held with the issues that are addressed in the report and the approach taken *per se.*

- However major concerns are held regarding any "across the board" proposal for the development standards contained in the *Design Intent Guidelines* and *Precinct Guidelines* to override development standards of Council's Planning Scheme (in particular Development Codes). Preliminary assessment suggests that many issues addressed in Council's current planning regime for the land are inadequately addressed. Furthermore the rationale underlying the standards specified in *Plan of Development* is inadequately described.

- It is accepted that it is appropriate that under specific circumstances it may be desirable that development standards override the provisions of Council's Scheme. In order to place Council in a position to consider overriding provisions the applicant must clearly delineate the limits of the "override" (ie specify the Scheme provisions which no longer apply). Furthermore the underlying rationale is to be comprehensively addressed.

- Furthermore it is accepted that it is appropriate that under specific circumstances additional development standards supplement the provisions of Council's Scheme. In order to place Council in a position to consider any such supplementary provisions their underlying rationale is to be comprehensively addressed.

- The guidelines should note that any standards specified for embellishment of public areas (eg street furniture) are not applicable to Council unless otherwise agreed.

Flooding

- A copy of the relevant data files associated with any flood modelling over the subject sites shall be submitted to Council to assist in the assessment of the application.

- Additional information is required for the proposed detention basin/lake strategies as follows:

  - Ownership (Council/private);
  - Sizing of the detention basin/lake including preliminary hydraulic calculations;
  - Location of detention basins with respect to the backwater/primary flow associated with the Q100/Q50 flood event;
  - Master plan detailing the timing of the detention basin/lake strategies for various stages of the development;

- Compliance with relevant legislation (eg Water Act 2000),
- Maintenance strategies (should encompass an economic analysis).

- A demarcation between the primary flow path/back water associated with the Q100/Q50 storm for the Bremer River, Brisbane River and combined flood events shall be established over the site. In addition, the overland flow paths associated with the Q100/Q50 storm shall be shown on the development plan.

- The development of the land would impact on the Warrego Highway that is under the jurisdiction of the Department of Main Roads. To this end an assessment of flooding/drainage impacts on the highway shall be undertaken and the outcomes of such an assessment shall be satisfactory to the DMR.

- Bulk earthworks (including excavation and filling) within primary flow paths and backwater areas shall be clearly identified on the development plan. All proposed earthworks within floodable areas shall be assessed via hydraulic modelling to determine any detrimental affects to upstream, downstream and adjacent properties.

- A flood/drainage master study shall be undertaken of the entire development and shall clearly detail how each proposed stage of the development will link and integrate with further stages.

- A detailed water quality assessment (see *Stormwater Quality* below) shall be undertaken for the entire development which shall clearly identify water quality objectives and proposed mechanisms to achieve these objectives. The assessment shall clearly detail how each proposed stage of the development will link and integrate with future stages.

- Supporting information including plans, cross sections and assumptions shall be submitted with the studies/assessments.

Geotechnical/Mining

- A comprehensive geotechnical report shall be undertaken for the ultimate development of the land as proposed. The report is to be prepared by a RPEQ experienced in mining and geotechnical assessments and include the following:

  - extent of underground mine workings;
  - extent of influence lines as a result of underground workings;
  - the suitability of the proposed development with respect to potential ground subsidence;
  - recommendations for proposed development within influence areas.

Traffic/Roads

- The proposal includes scope for creating a potentially significant increase in heavy vehicle traffic on River Road. Resolution of current uncertainty regarding connectivity of the site to Brisbane Road/Cunningham Highway is critical to Ipswich City Council support for the proposal.

- The Ipswich Eastern Corridor Structure Plan Figure 2.3 identifies a proposed Major Inter-suburban link from the Cunningham Highway across Brisbane Road connecting to the Warrego Highway. This link follows the electricity easement on the eastern side of the site. To this end further analysis in the form of a traffic study shall be undertaken to assess the likely impact of this road on the proposed development layout together with recommendations to maintain the integrity of this link with comments on various stages of the development. Council's Traffic Planning Branch should be consulted during the study for background information and guidance on the expected traffic outcomes.

- Local Area Traffic Management (LATM) schemes shall be addressed in detail on the existing local road network to reduce increased commercial/industrial vehicle usage. The report should provide details as to the types and location of the signs and LATM schemes which would be considered effective in limiting such usage and the contribution to these LATM schemes to be made by the BBP.

- Further analysis shall be undertaken preferably with the traffic modelling software SIDRA to determine the impacts of the proposed development of the land on intersections both within the proposed road network and the existing road network based on anticipated land use for the ultimate development. The assessment should detail the affect on the existing road network for the various stages of development together with recommendations for intersection upgrades, LATM treatments and cycle/pedestrian movements for specific threshold volumes.

- The proposed development of the land impacts on road networks under the jurisdiction of the DMR in particular Brisbane Road, Cunningham Highway and Warrego Highway. Further consultation and approvals are required from DMR in relation to the proposed connection points to these road networks.

- The provision of Public Transport and pedestrian/cycle movements through both the development and external road network shall be addressed in detail both for the ultimate development and at various stage of the development.

- Council's current road requirements for industrial/commercial and residential streets shall be complied with for this development and the plan of development altered to suit.

Water/Sewerage

- A detailed report shall be submitted to Council identifying the water and sewerage infrastructure works required, or need to be brought forward, to service the development taking into consideration the overall needs of the system. The scope of the report should be determined in consultation with Ipswich Water.

- Once the required infrastructure has been identified and agreed upon with Ipswich Water, the Developer may prepare a draft infrastructure agreement that addresses the requirements referred to in Section 12.2 of the Planning Scheme Policy for Water and Sewerage Infrastructure Contributions. The final form of the infrastructure agreement shall be undertaken in liaison with Ipswich Water prior to any approvals being granted.

Other Infrastructure Matters

- Other items which will need to be addressed include the following:

  - Water mains are to be provided on both sides of the street, unless otherwise agreed by Ipswich Water.
  - Residential development is proposed over the existing 500mm trunk water main. The trunk water main will need to be relocated within road reserve or alternatively the layout could be amended.
  - Provision will need to be made for a future water pump station along Bognuda Street near the existing 500mm trunk water main.

Utilities

- The proposed development of the land impacts on electricity supply easements, telecommunication and major gas mains throughout the site. Further consultation and approvals are required from the relevant utility owner to determine the most appropriate form of the development.

Stormwater Quality

- The applicant is to supply a **Master Stormwater Quality Management Plan (the "Master SQMP")**. This Master SQMP must include, but is not limited to, an **Operational Phase Conceptual Design Stormwater Quality Management Plan (the "Conceptual Design SQMP")**, prepared by a suitably qualified and experienced professional. The Conceptual Design SQMP must demonstrate, through appropriate pollutant export modelling (eg AQUALM or MUSIC), that the pollutant levels in the stormwater discharged from the site comply with the key pollutant levels identified in Set A of Table 1 attached.

- Note: *The key pollutants for this development are those that are highlighted. The format of the Conceptual Design SQMP should be as detailed in* *Site Based Stormwater Management Plan Case Study – High Risk Commercial Subdivision, August 2000, BCC.*

- The Master SQMP must include, but is not limited to, the development of a clear framework to address the matters of Water Sensitive Urban Design (WSUD) and Water Quality. It is expected that the Precinct Codes and Design Guidelines will identify the performance criteria of Water Sensitive Urban Design (WSUD) and Water Quality and set clear, unambiguous acceptable solutions for future development.

TABLE 1

	SET A Environmental Values (Evs)	**SET B Evs**	**SET C Evs**	**SET D Evs**
Indicator	Modified ecosystem, wildlife, cultural heritage, secondary & visual recreation, industry, stock and irrigation	Human consumer	Primary contact	Raw water & farm supply
pH [1]	6.5 to 8.5			
Dissolved oxygen [1]	80 to 105 percent saturation			
Organic matter	NR			
Total Phosphorus [1]	70 ug/L			
Total Nitrogen [1]	650 ug/L			
Chlorophyll-a [1]	8 ug/L			
Turbidity [1]	20 NTU			
Secchi depth [1]	> 0.2m		> 1.2m	
Suspended solids	15mg/L for combined wet and dry periods [1] 90% ile < 100mg/L for wet weather periods [2]			
Total aluminium [3]	5 ug/L if pH < 6.5 or 100 ug/L if pH > 6.5			
Total iron [4]	300 to 1000 ug/l (depending upon Fe (II) concentration*)			
Total arsenic [3]	50 ug/L			
Total cadmium [3]	0.2 to 2 ug/L (depending upon hardness)			
Total chromium [3]	10 ug/L (if it is all chromium (VI)*)			
Total copper [3]	2 to 5 ug/L (depending upon hardness)	1.0 ug/L (tainting)		
Total Nickel [3]	15 to 150 ug/L			
Total lead [3]	1 to 5 ug/L (depending upon hardness)			
Total zinc [3]	5 to 50 ug/L (if iron not present as Fe (11))	5.0 ug/L (tainting)		
TPH [5, 6]	NR			
Oils and grease [3]	no visible films or odour			
PAH [3]	< 3ug/L			

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]			
[illegible]	[illegible]			
[illegible]	[illegible]			

- Levels are upper limits for median values or ranges in which medians should lie, unless otherwise stated.
- If a parameter relevant to a particular activity is not given in the above table please refer to the latest Australian Water Quality Guidelines for Fresh and Marine Waters (ANZECC).
- Dependencies on hardness iron and chromium shown in brackets are difficult to quantify. They may be ignored initially but subsequently considered if the pollutant level range is exceeded. For more information refer to the latest Australian Water Quality Guidelines for Fresh and Marine Waters (ANZECC).
- NR: No pollutant level can be recommended at this stage.
- Derived from the Draft Queensland Water Quality Guidelines (EPA, 1998)

1. Derived from local and interstate information. A wet weather period is defined as "any period where stormwater runoff leaves the site".
2. Taken from Australian Water Quality Guidelines for Fresh and Marine Waters (ANZECC, 1992).
3. Derived from Canadian Water Quality Guidelines (1991), Australian Water Quality Guidelines for Fresh and Marine Waters (ANZECC, 1992) and Draft Water Quality Guidelines for Fresh and Marine Waters (ANZECC/ARMCANZ, 1999).
4. Taken from Draft Water Quality Guidelines for Fresh and Marine Waters (ANZECC/ARMCANZ, 1999).
5. Taken from Report on Chlorinated Discharges to Urban Stormwater (Brisbane City Council, 1999)
6. A BCC interpretation of what is acceptable to the community in terms of visual impact. Litter definition derived from information provided by the CRC for Catchment Hydrology.

Noise

- The applicant is to supply an amended noise impact assessment report, prepared by an independent and appropriately qualified Acoustic Consultant, which does the following;

  - Clearly demonstrates that noise monitoring was conducted in accordance with accepted Australian Standards.
  - Details how the traffic volumes for each of the roads assessed were predicted and where deemed necessary by Council conduct a reassessment of the traffic noise impact (As there has been no agreement between ICC, MRD and the applicant re the future road network - particularly in relation to any connections to the Warrego Hwy or the Cunningham Hwy).

- Supplies the raw data from the monitoring. Average Ambient L_{A10}, L_{A90}, L_{A1}, L_{Aeq}, $L_{Aeq24hr}$, $L_{Amax, adj}$ for each of the monitoring sites in each of the time periods must be presented in tabular form so that an accurate picture of the environment can be presented.
- Describes the dominant events in the monitoring periods.
- Ensures that the development of the area does not increase the background noise level at the sensitive receiving environments.

- The location of Central Industry uses in the eastern and southern section of the area is of significant concern and it is considered that the buffer area will do little to alleviate noise problems from such industry. Council considers that the plan of development must be amended to remove Central Industry Uses from those areas.

- The proposed Codes and Design Guidelines provide no clear criteria in relation to acceptable noise levels and acceptable building design/location to mitigate noise impacts. Council considers that the Codes should stipulate noise impact assessment methodologies and/or criteria, while the Design Guidelines should address such matters as building location, orientation of building openings and the positioning of outdoor activities and plant/equipment.

Air Quality

- The submitted application does not make an acceptable assessment of the air quality in the area. Of particular concern is the potential impact of odour from existing facilities upon proposed residential areas. Potentially significant odour sources in the vicinity include the nearby Sewage Treatment Plant, Australian Hardboards factory, Abattoir and soil conditioner operations.

- It is considered that the applicant must supply an air quality impact assessment report, prepared by an independent and appropriately qualified Air Quality Consultant, which demonstrates that the proposed residents will not be subject to unacceptable odours.
- The air quality impact assessment report must demonstrate, using an acceptable air quality modelling program and in accordance with AS/NZS 4323.3:2001, that the hourly average design odour level for 99.5 percent of the time in any year must not exceed 5.0 odour units at the proposed residential area.

Hazards

- Council does not consider the storage of bulk Dangerous Goods below the Q100 level as acceptable. Therefore, the positioning of Service Stations, Fuel Depots and other uses associated with the bulk storage of Dangerous Goods on the subject land will not be permitted and the proposed tables of development and development Codes must be amended to reflect this.

- The development Codes do not adequately deal with the assessment of hazard. As such, if the proposed development Codes are meant to replace the Town Plan, then the Codes must be

significantly amended to include the hazard and risk assessment provisions detailed under the Town Plan.

Contaminated Land

- Given the liabilities associated with accepting contaminated land, Council considers that the applicant be advised that all land, that is to become Council asset, shall be removed from the EMR & CLR prior to the sealing of the survey plan.

- Furthermore, the applicant must supply a geotechnical assessment report, prepared by an independent, registered and appropriately qualified geotechnical engineer, which demonstrates that the land that is to become Council asset will not be affected by subsidence.

Open Space

- More detailed master planning inputs are required. This should include an Open Space Master Plan which addresses as a minimum the existing Structure Plan, Subdivision Code, Ipswich Open Space and Recreational Development Plan, embellishment responsibilities, timing, etc.

- Measures for the integration of water quality infrastructure and open space need to be clearly detailed.

- Evidence is required to the effect that any future open space will not be subject to future subsidence and have all remediation undertaken that allows all future open space to be taken of relevant contaminated land registers.

- Detailed advice is required on how the recommendations of the flora and fauna study have been integrated into the open space master plan.

- Detailed advice is required on long term remediation and implications of the previous waste water disposal for the soil profile.

If you have any questions concerning this matter please do not hesitate to contact me at the above number.

Yours faithfully

[redacted]

Team Coordinator - Eastern Development Team

Our Reference: RCU 923
Enquiries: [redacted]
Extension: [redacted]
E-mail address: [redacted]

Queensland Government

PLANNING SERVICES

Department of
Local Government and Planning

23 October 2002

Wingate Properties Pty Ltd
C/- Sinclair Knight Merz
PO Box 246
SPRING HILL QLD 4004

Attention: [redacted]

RE: RE: REFERRAL COORDINATION — *INFORMATION REQUEST*

Dear Sir,

I refer to your letter dated 23 September 2002 and received in this office on 26 September 2002, requesting referral coordination under the *Integrated Planning Act 1997* (IPA) for the following application —

APPLICANT:	**Wingate Properties Pty Ltd c/- [redacted], Sinclair Knight Merz**
REFERRAL COORDINATION TRIGGER/S:	**3+ Concurrence Agencies, Sch 6 (Body of water), Sch 7 Part 1 (Filling below the floodline)**
LOCATION:	**Ashburn Road Bundamba QLD, described as lot 1 on RP 22385 and lot 1 on RP 125443 and lot 2 on RP 104683 and lot 1 on RP 22378 and lot 1 on RP 84779 and lot 142 on RP 846150 and lot 4,5 and 6 on RP 92591 and lot 3 on RP 132087 and lot 1 and 2 on RP 86838 and lot 2 on RP 854997 and lot 4 and 6 on SP 140694 and lot 34 on SL 3911 and lot 13 on SL 2982**
LOCAL GOVERNMENT:	**Ipswich City Council**

I wish to advise that after preliminary assessment of your application additional information is required to fully assess the proposal. Details of the information requested are contained in pages 3 – 25 attached to this letter.

The following agencies were consulted in the preparation of this information request —

- Ipswich City Council (Assessment Manager)
- Environmental Protection Agency (Concurrence agency)
- Department of Natural Resources and Mines (Concurrence agency)
- Department of Main Roads (Concurrence agency)
- Department of Primary Industries (Third Party)

Level 14 Mineral House
41 George Street Brisbane
PO Box 31
Brisbane Albert Street
Queensland 4002 Australia
Telephone [redacted]
Facsimile [redacted]
Website www.dlgp.qld.gov.au
ABN 61 331 950 314

The Act requires the applicant to provide a copy of the response to the information request to the Assessment Manager and any IDAS concurrence or advice agency. It is also recommended that copies of your information response be forwarded to the third parties listed above.

Please note, you have 12 months to respond to this information request. The response must be made in one of the following three ways —

- Provide all the information requested; or
- Provide part of the information requested together with a notice asking the assessment manager and each IDAS referral agency to proceed with the assessment of the application; or
- Provide a notice —
  - (i) Stating that the applicant does not intend to supply any of the information requested; and
  - (ii) Asking the assessment manager and each IDAS referral agency to proceed with the assessment of the application.

It should be noted that in the event of an appeal against a decision on a development application, costs may be awarded against an applicant if the court considers the applicant did not give all information reasonably requested in the information request (s4.1.23(2)(g) of the IPA).

Further information or assistance may be obtained by contacting the above contact officer by telephone or e-mail.

Yours sincerely

A/Manager
SOUTH EAST QUEENSLAND PLANNING DIVISION

MATTERS OF INTEREST TO THE ASSESSMENT MANAGER

The Ipswich City Council, as assessment manager for the application requests the following additional information —

INFORMATION REQUESTED

Infrastructure

- Prior to formal consideration of the application Council will need to be informed of the specific administrative/legal mechanisms to ensure that lots will be provided with appropriate urban services.

- The proposal raises the possibility of the application being supported by an infrastructure agreement. The application, however, does not nominate the matters to be addressed in an Infrastructure Agreement or the general approach proposed.

- Given that an Infrastructure Agreement represents one possible means of servicing the land, if this approach is agreed to by Council, the agreement would need to have been finalised prior to approval of the application.

- Any proposed Infrastructure Agreements would obviously need to fully detail the mechanisms for application to Bremer Business Park throughout the various stages of the development including infrastructure contribution/credit arrangements. Infrastructure contributions would need to comply with the provisions outlined in Council's current roads, water and sewerage Infrastructure Contribution policies. The formulation of any Infrastructure agreements should obviously be undertaken in consultation with the relevant Departments of Council.

Development Standards

- It is recognised that there are very sound planning reasons for promulgation of area specific codes to provide for particular development themes and to best match development standards to the characteristics of the site and the range of land uses proposed. No fundamental concerns are held with the issues that are addressed in the report and the approach taken *per se.*

- However major concerns are held regarding any "across the board" proposal for the development standards contained in the *Design Intent Guidelines* and *Precinct Guidelines* to override development standards of Council's Planning Scheme (in particular Development Codes). Preliminary assessment suggests that many issues addressed in Council's current planning regime for the land are inadequately addressed. Furthermore the rationale underlying the standards specified in *Plan of Development* is inadequately described.

- It is accepted that it is appropriate that under specific circumstances it may be desirable that development standards override the provisions of Council's Scheme. In order to place Council in a position to consider overriding provisions the applicant must clearly delineate the limits of the "override" (ie specify the Scheme provisions which no longer apply). Furthermore the underlying rationale is to be comprehensively addressed.

- Furthermore it is accepted that it is appropriate that under specific circumstances additional development standards supplement the provisions of Council's Scheme. In order to place Council in a position to consider any such supplementary provisions their underlying rationale is to be comprehensively addressed.

- The guidelines should note that any standards specified for embellishment of public areas (eg street furniture) are not applicable to Council unless otherwise agreed.

Flooding

- A copy of the relevant data files associated with any flood modelling over the subject sites shall be submitted to Council to assist in the assessment of the application.

- Additional information is required for the proposed detention basin/lake strategies as follows:

  - Ownership (Council/private);
  - Sizing of the detention basin/lake including preliminary hydraulic calculations;
  - Location of detention basins with respect to the backwater/primary flow associated with the Q100/Q50 flood event;
  - Master plan detailing the timing of the detention basin/lake strategies for various stages of the development;
  - Compliance with relevant legislation (eg Water Act 2000),
  - Maintenance strategies (should encompass an economic analysis).

- A demarcation between the primary flow path/back water associated with the Q100/Q50 storm for the Bremer River, Brisbane River and combined flood events shall be established over the site. In addition, the overland flow paths associated with the Q100/Q50 storm shall be shown on the development plan.

- The development of the land would impact on the Warrego Highway that is under the jurisdiction of the Department of Main Roads. To this end an assessment of flooding/drainage impacts on the highway shall be undertaken and the outcomes of such an assessment shall be satisfactory to the DMR.

- Bulk earthworks (including excavation and filling) within primary flow paths and backwater areas shall be clearly identified on the development plan. All proposed earthworks within floodable areas shall be assessed via hydraulic modelling to determine any detrimental affects to upstream, downstream and adjacent properties.

- A flood/drainage master study shall be undertaken of the entire development and shall clearly detail how each proposed stage of the development will link and integrate with further stages.

- A detailed water quality assessment (see *Stormwater Quality* below) shall be undertaken for the entire development which shall clearly identify water quality objectives and proposed mechanisms to achieve these objectives. The assessment shall clearly detail how each proposed stage of the development will link and integrate with future stages.

- Supporting information including plans, cross sections and assumptions shall be submitted with the studies/assessments.

Geotechnical/Mining

- A comprehensive geotechnical report shall be undertaken for the ultimate development of the land as proposed. The report is to be prepared by a RPEQ experienced in mining and geotechnical assessments and include the following:

  - extent of underground mine workings;
  - extent of influence lines as a result of underground workings;
  - the suitability of the proposed development with respect to potential ground subsidence;
  - recommendations for proposed development within influence areas.

Traffic/Roads

- The proposal includes scope for creating a potentially significant increase in heavy vehicle traffic on River Road. Resolution of current uncertainty regarding connectivity of the site to Brisbane Road/Cunningham Highway is critical to Ipswich City Council support for the proposal.

- The Ipswich Eastern Corridor Structure Plan Figure 2.3 identifies a proposed Major Inter-suburban link from the Cunningham Highway across Brisbane Road connecting to the Warrego Highway. This link follows the electricity easement on the eastern side of the site. To this end further analysis in the form of a traffic study shall be undertaken to assess the likely impact of this road on the proposed development layout together with recommendations to maintain the integrity of this link with comments on various stages of the development. Council's Traffic Planning Branch should be consulted during the study for background information and guidance on the expected traffic outcomes.

- Local Area Traffic Management (LATM) schemes shall be addressed in detail on the existing local road network to reduce increased commercial/industrial vehicle usage. The report should provide details as to the types and location of the signs and LATM schemes which would be considered effective in limiting such usage and the contribution to these LATM schemes to be made by the BBP.

- Further analysis shall be undertaken preferably with the traffic modelling software SIDRA to determine the impacts of the proposed development of the land on intersections both within the proposed road network and the existing road network based on anticipated land use for the ultimate development. The assessment should detail the affect on the existing road network for the various stages of development together with recommendations for intersection upgrades, LATM treatments and cycle/pedestrian movements for specific threshold volumes.

- The proposed development of the land impacts on road networks under the jurisdiction of the DMR in particular Brisbane Road, Cunningham Highway and Warrego Highway. Further consultation and approvals are required from DMR in relation to the proposed connection points to these road networks.

- The provision of Public Transport and pedestrian/cycle movements through both the development and external road network shall be addressed in detail both for the ultimate development and at various stage of the development.

- Council's current road requirements for industrial/commercial and residential streets shall be complied with for this development and the plan of development altered to suit.

Water/Sewerage

- A detailed report shall be submitted to Council identifying the water and sewerage infrastructure works required, or need to be brought forward, to service the development taking into consideration the overall needs of the system. The scope of the report should be determined in consultation with Ipswich Water.

- Once the required infrastructure has been identified and agreed upon with Ipswich Water, the Developer may prepare a draft infrastructure agreement that addresses the requirements referred to in Section 12.2 of the Planning Scheme Policy for Water and Sewerage Infrastructure Contributions. The final form of the infrastructure agreement shall be undertaken in liaison with Ipswich Water prior to any approvals being granted.

Other Infrastructure Matters

- Other items which will need to be addressed include the following:

  - Water mains are to be provided on both sides of the street, unless otherwise agreed by Ipswich Water.
  - Residential development is proposed over the existing 500mm trunk water main. The trunk water main will need to be relocated within road reserve or alternatively the layout could be amended.
  - Provision will need to be made for a future water pump station along Bognuda Street near the existing 500mm trunk water main.

Utilities

- The proposed development of the land impacts on electricity supply easements, telecommunication and major gas mains throughout the site. Further consultation and approvals are required from the relevant utility owner to determine the most appropriate form of the development.

Stormwater Quality

- The applicant is to supply a **Master Stormwater Quality Management Plan (the "Master SQMP")**. This Master SQMP must include, but is not limited to, an **Operational Phase Conceptual Design Stormwater Quality Management Plan (the "Conceptual Design SQMP")**, prepared by a suitably qualified and experienced professional. The Conceptual Design SQMP must demonstrate, through appropriate pollutant export modelling (eg AQUALM or MUSIC), that the pollutant levels in the stormwater discharged from the site comply with the key pollutant levels identified in Set A of Table 1 attached.

- Note: *The key pollutants for this development are those that are highlighted. The format of the Conceptual Design SQMP should be as detailed in* *Site Based Stormwater Management Plan Case Study – High Risk Commercial Subdivision, August 2000, BCC.*

- The Master SQMP must include, but is not limited to, the development of a clear framework to address the matters of Water Sensitive Urban Design (WSUD) and Water Quality. It is expected that the Precinct Codes and Design Guidelines will identify the performance criteria of Water Sensitive Urban Design (WSUD) and Water Quality and set clear, unambiguous acceptable solutions for future development.

TABLE 1

	SET A Environmental Values (Evs)	**SET B Evs**	**SET C Evs**	**SET D Evs**
Indicator	Modified ecosystem, wildlife, cultural heritage, secondary & visual recreation, industry, stock and irrigation	Human consumer	Primary contact	Raw water & farm supply
pH (1)	6.5 to 8.5			
Dissolved oxygen (1)	80 to 105 percent saturation			
Organic matter	NR			
Total Phosphorus (1)	70 ug/L			
Total Nitrogen (1)	650 ug/L			
Chlorophyll-a (1)	8 ug/L			
Turbidity (1)	20 NTU			
Secchi depth (1)	> 0.2m		> 1.2m	
Suspended solids	15mg/L for combined wet and dry periods (1) 90% ile < 100mg/L for wet weather periods (2)			
Total	5 ug/L if pH < 6.5 or 100 ug/L			
Total iron (4)	300 to 1000 ug/l (depending upon Fe (II) concentration*)			
Total arsenic (3)	50 ug/L			
Total cadmium (3)	0.2 to 2 ug/L (depending upon hardness)			
Total chromium (3)	10 ug/L (if it is all chromium (VI)*)			
Total copper (3)	2 to 5 ug/L (depending upon hardness)	1.0 ug/L (tainting)		
Total Nickel (3)	15 to 150 ug/L			

Total lead [3]	1 to 5 ug/L (depending upon			
Total zinc [3]	5 to 50 ug/L (if iron not present as Fe (11))	5.0 ug/L (tainting)		
TPH [5, 6]	NR			
Oils and grease [3]	no visible films or odour			
PAH [3]	< 3ug/L			
Faecal coliforms [3]	1000 organisms/100ml (minimum of 5 samples taken at regular intervals not exceeding one month, with 4 of 5 not exceeding 4000 organisms/100ml		150 organisms/100ml (minimum of 5 samples taken at regular	No sample should contain any organisms/100ml
Total chlorine	0.03mg/L			
Litter/gross pollutants [7]	No anthropogenic (man-made) material greater than 5mm in			
Riparian vegetation & habitat	Protect & restore consistent with Council policy and plans			
Cultural heritage	Protect & restore consistent with Council policy and plans			

- Levels are upper limits for median values or ranges in which medians should lie, unless otherwise stated.
- If a parameter relevant to a particular activity is not given in the above table please refer to the latest Australian Water Quality Guidelines for Fresh and Marine Waters (ANZECC).
- Dependencies on hardness iron and chromium shown in brackets are difficult to quantify. They may be ignored initially but subsequently considered if the pollutant level range is exceeded. For more information refer to the latest Australian Water Quality Guidelines for Fresh and Marine Waters (ANZECC).
- NR: No pollutant level can be recommended at this stage.
- Derived from the Draft Queensland Water Quality Guidelines (EPA, 1998)

1. Derived from local and interstate information. A wet weather period is defined as "any period where stormwater runoff leaves the site".
2. Taken from Australian Water Quality Guidelines for Fresh and Marine Waters (ANZECC, 1992).
3. Derived from Canadian Water Quality Guidelines (1991), Australian Water Quality Guidelines for Fresh and Marine Waters (ANZECC, 1992) and Draft Water Quality Guidelines for Fresh and Marine Waters (ANZECC/ARMCANZ, 1999).
4. Taken from Draft Water Quality Guidelines for Fresh and Marine Waters (ANZECC/ARMCANZ, 1999).
5. Taken from Report on Chlorinated Discharges to Urban Stormwater (Brisbane City Council, 1999)

6. A BCC interpretation of what is acceptable to the community in terms of visual impact. Litter definition derived from information provided by the CRC for Catchment Hydrology.

Noise

- The applicant is to supply an amended noise impact assessment report, prepared by an independent and appropriately qualified Acoustic Consultant, which does the following;

  - Clearly demonstrates that noise monitoring was conducted in accordance with accepted Australian Standards.
  - Details how the traffic volumes for each of the roads assessed were predicted and where deemed necessary by Council conduct a reassessment of the traffic noise impact (As there has been no agreement between ICC, MRD and the applicant re the future road network - particularly in relation to any connections to the Warrego Hwy or the Cunningham Hwy).
  - Supplies the raw data from the monitoring. Average Ambient L_{A10}, L_{A90}, L_{A1}, L_{Aeq}, $L_{Aeq24hr}$, $L_{Amax,\ adj}$ for each of the monitoring sites in each of the time periods must be presented in tabular form so that an accurate picture of the environment can be presented.
  - Describes the dominant events in the monitoring periods.
  - Ensures that the development of the area does not increase the background noise level at the sensitive receiving environments.

- The location of Central Industry uses in the eastern and southern section of the area is of significant concern and it is considered that the buffer area will do little to alleviate noise problems from such industry. Council considers that the plan of development must be amended to remove Central Industry Uses from those areas.

- The proposed Codes and Design Guidelines provide no clear criteria in relation to acceptable noise levels and acceptable building design/location to mitigate noise impacts. Council considers that the Codes should stipulate noise impact assessment methodologies and/or criteria, while the Design Guidelines should address such matters as building location, orientation of building openings and the positioning of outdoor activities and plant/equipment.

Air Quality

- The submitted application does not make an acceptable assessment of the air quality in the area. Of particular concern is the potential impact of odour from existing facilities upon proposed residential areas. Potentially significant odour sources in the vicinity include the nearby Sewage Treatment Plant, Australian Hardboards factory, Abattoir and soil conditioner operations.

- It is considered that the applicant must supply an air quality impact assessment report, prepared by an independent and appropriately qualified Air Quality Consultant, which demonstrates that the proposed residents will not be subject to unacceptable odours.

- The air quality impact assessment report must demonstrate, using an acceptable air quality modelling program and in accordance with AS/NZS 4323.3:2001, that the hourly average design odour level for 99.5 percent of the time in any year must not exceed 5.0 odour units at the proposed residential area.

Hazards

- Council does not consider the storage of bulk Dangerous Goods below the Q100 level as acceptable. Therefore, the positioning of Service Stations, Fuel Depots and other uses associated with the bulk storage of Dangerous Goods on the subject land will not be permitted and the proposed tables of development and development Codes must be amended to reflect this.

- The development Codes do not adequately deal with the assessment of hazard. As such, if the proposed development Codes are meant to replace the Town Plan, then the Codes must be significantly amended to include the hazard and risk assessment provisions detailed under the Town Plan.

Contaminated Land

- Given the liabilities associated with accepting contaminated land, Council considers that the applicant be advised that all land, that is to become Council asset, shall be removed from the EMR & CLR prior to the sealing of the survey plan.

- Furthermore, the applicant must supply a geotechnical assessment report, prepared by an independent, registered and appropriately qualified geotechnical engineer, which demonstrates that the land that is to become Council asset will not be affected by subsidence.

Open Space

- More detailed master planning inputs are required. This should include an Open Space Master Plan which addresses as a minimum the existing Structure Plan, Subdivision Code, Ipswich Open Space and Recreational Development Plan, embellishment responsibilities, timing, etc.

- Measures for the integration of water quality infrastructure and open space need to be clearly detailed.

- Evidence is required to the effect that any future open space will not be subject to future subsidence and have all remediation undertaken that allows all future open space to be taken off relevant contaminated land registers.

- Detailed advice is required on how the recommendations of the flora and fauna study have been integrated into the open space master plan.

- Detailed advice is required on long term remediation and implications of the previous waste water disposal for the soil profile.

If you require further information in relation to the Ipswich City Council information request please contact Mr [redacted] on [redacted]

A copy of your response to the ICC information request can be forwarded to:

Mr [redacted]
Ipswich City Council
PO Box 191
IPSWICH QLD 4305

MATTERS OF INTEREST TO ENVIRONMENTAL PROTECTION AGENCY

The Environmental Protection Agency (EPA) as a concurrence agency for the application raises the following matters of concern and requests the following additional information —

Contaminated Lands Unit

INFORMATION REQUESTED

Sufficient information provided in accordance with the *Environmental Protection Act 1994* and the *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland* (DEH, 1998) to enable the Environmental Protection Agency (EPA) Contaminated Land Unit (CLU) to determine that Lot 13 on SL2982, Lot 1 on RP84779, Lot 142 on RP846150, Lot 4, 5 and 6 on RP92591, Lot 3 on RP132087, Lot 34 on SL3911, Lot 1 and 2 on RP86838, Lot 1 on RP22378, Lot 2 on RP104683, Lot 1 on RP22385, Lot 2 on RP854997, Lot 1 on RP125443, Lot 4 on SP140694, Lot 6 on SP140694, Lot 2 and 3 on RP106804, Lot 1 on RP22383, are suitable for the intended use.

The EPA acknowledges that a Stage 1 preliminary Contaminated Site Investigation has been prepared by Sinclair Knight Mertz for the above site and submitted to the EPA for assessment. In order for the EPA to consider this report, make a decision about the suitability of this site for specific uses, and if required amend the listing of these sites on the Environmental Management Register, this report is required to be submitted in accordance with the *Environmental Protection Act 1994* and the *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland* (DEH, 1998).

To enable the EPA to determine whether this land is suitable for the intended use this information must identify and adequately investigate all potentially contaminating activities (including Notifiable Activities) previously conducted on this site. Please note that there is a statutory application fee (currently $900) for the assessment of site investigation and / or validation reports.

The *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland* may be obtained from the Environmental Protection Agency's internet site at www.env.qld.gov.au or by contacting the Environmental Protection Agency (EPA) (Contaminated Land Unit). Please ensure that the appropriate statutory fee is included with this application for the assessment of the site investigation and / or validation reports.

Contact [redacted] Environmental Officer on [redacted]

Biodiversity

INFORMATION REQUESTED

- Provide a map identifying all natural watercourses, regional ecosystems and vegetation associations overlaid by the plan of development;

- Identify whether the endangered regional ecosystem 12.3.3 northwest of the Australian Hardboards Limited facility will be retained in the Open Space Precinct;

- Should the intention of the applicant be to clear the regional ecosystem 12.3.3, further information should be provided as to how this clearing will be mitigated and/or compensated;

- Identify the extent to which the *C. tessallaris / E. tereticornis* woodland and the regional ecosystem 12.9/10.2 will be cleared;

- Identify what regional ecosystem the *C. tessellaris / E. tereticornis* woodland correlates to;

- Undertake a fauna survey in any vegetated area to be cleared, particularly of the *C. tessellaris / E. tereticornis* woodland given the report indicates 'ample roosting and nesting sites, hollow branches and stumps'.

MATTERS OF CONCERN

Overview

- Generally the performance criteria and acceptable solutions within the Code Provisions do not provide sufficient guidance over and above the broader 'outcomes' sought in each of the precinct plans. This is particularly evident for matters relating to environmental management.

Open Space Precinct

- The endangered regional ecosystem 12.3.3 (south eastern remnant) has been placed in the Open Space Precinct. Whilst this is supported, the Open Space Precinct does not identify, as an outcome, the need to protect the endangered remnant nor does it identify the most appropriate (or inappropriate) open space uses that can be undertaken while protecting the remnant's values. Uses such as equestrian and coursing sports, retirement community, sports complexes and some forms of outdoor recreation may be inappropriate activities in this regional ecosystem particularly if the remnant is being retained because of its endangered conservation status. It is recommended the precinct plan identify the outcomes sought for the endangered regional ecosystem and the desired land uses to occur in and adjacent to the remnant.

- It is stated that a desired outcome of the Open Space Precinct is the buffering of industrial and commercial activities and residential areas within the Park. It is therefore of concern that a retirement community is identified as a possible code assessable use in the Open Space Precinct given the above desired outcome. It is recommended the reference to the retirement community be deleted.

- It is acknowledged that the regional ecosystem 12.3.3 located north west of the Australian Hardboards Limited facility is not mapped as remnant vegetation by the Queensland Herbarium and therefore is exempt under the *Vegetation Management Act 1999*. However, the retention and protection of endangered regional ecosystems is considered as best practice. It is recommended that this regional ecosystem be retained in the Open Space Precinct (and in consideration of the above comments). Should this not occur, the applicant should explore how this loss may be mitigated. It is

recommended that a 'no net loss' approach be explored in conjunction with Ipswich City Council.

Contact [redacted] Senior Biodiversity Planning Officer on [redacted].

Environmental Planning

INFORMATION REQUESTED

Noise Impacts

A Noise Report containing the following information:

1. A model of the current noise environment showing the influences from Australian Hardboard Limited, Hume Masterpanels Pty Ltd and the sewerage treatment plant.

2. A prediction model for the Bremer Business Park and the surrounding area representing a worst case scenario (fully developed) using land uses contained in the land use plan contained on page 18 of the executive summary.

3. A background noise survey. This survey should include data from measuring points both on and off the Bremer Business Park site and be carried out over a continuous 7 day period. In particular, the survey should contain background data from the surrounding residential land uses, including those to the north and on the other side of the Bremer River.

4. How the applicant intends to prevent background creep at both the surrounding residential land uses and also on the Bremer Business Park site as a result of the cumulative effects of development within the Bremer Business Park. This may require amendments or prescription within the precinct codes or the formulation of noise conditions within a Development Control Plan for the estate.

Any modelling must show representative levels for a full 24 hour period, with a specific focus on activities likely to be occurring during the night-time (10:00pm – 7:00am) in precincts such as the highway and central industry precincts, where 24 hour activity may be allowed to occur.

MATTERS OF CONCERN

The proposed development of the Bremer Business Park will significantly increase the number of potential noise sources in the area. With the large number of residential dwellings surrounding the site and relatively low background noise levels previously measured in the area, the EPA has concerns about the impact of noise on not only surrounding residential land uses but also on commercial and industrial land uses within the Bremer Business Park site.

Environmental Management Plan

INFORMATION REQUESTED

- Prepare an environmental management (EM) plan for the site to describe the ongoing environmental management and monitoring activities during both the construction and operational phases of the development. The EM plan should include, but not be limited to the following elements:
  - Stormwater management;
  - Erosion mitigation and Sediment Control;
  - Dust control;
  - Waste management.

- The operational stormwater management plan should take a master plan design approach and should consider the following:
  - pollutants of concern;
  - receiving water quality;
  - water quality objectives;
  - operational controls;
  - design and efficiency of storm water quality improvement devices;
  - stormwater management assessment;
  - monitoring and maintenance programs;
  - investigation indicators; and
  - responsibilities and timing.

The following documents should be considered along with the receiving water quality:

- *South East Queensland Regional Water Quality Management Strategy September 2001*; and
- The *Australian New Zealand Guideline for Fresh and Marine Water Quality 2000.*

MATTERS OF CONCERN

The development of the Bremer Business Park will require a significant change from cleared land to an urban landscape where commercial and industrial businesses will be established. This change has the potential to significantly impact on the quantity and quality of stormwater coming from the site, and suitable measures should be implemented to limit any impact on the surrounding waters.

Contact [redacted], Senior Environmental Planner on [redacted]

Cultural Heritage

INFORMATION REQUESTED

The Application contains a summary of a Cultural Heritage desktop study that identifies numerous historic sites and historic archaeological sites and places, along with a very high level of Indigenous community interest and a high likelihood of Indigenous archaeological sites within the proposal area.

The cultural heritage report recommends that a full cultural heritage investigation and assessment of the Indigenous and historic cultural heritage sites, places and cultural heritage values be undertaken. Such a study is essential to fully assess this development application.

This study should be undertaken by a professional heritage consultant holding a permit under the Cultural Record (Landscapes Queensland and Queensland Estate) Act 1987. The study should account for Aboriginal, archaeological and historic sites, items and places.

ADVICE

The applicant is advised that Aboriginal, archaeological or historic sites, items or places are protected under the *Cultural Record (Landscapes Queensland and Queensland Estate) Act 1987* and may be identified, located or exposed during the course of development. In such an event all operations should cease and the Environmental Protection Agency contacted on [redacted] to determine an appropriate course of action.

Contact [redacted] Principal Conservation Officer on ([redacted]

Erosion Prone Areas

MATTERS OF CONCERN

Beach Protection Act 1968
The Beach Protection Authority has no requirements under the *Integrated Planning Act 1997*. However, the subject land lies partially within the designated erosion prone area and is therefore subject to the provisions of the *Beach Protection Act 1968*. The erosion prone area for this section of **Bremer River** extends 40 metres inland from the plan position of Mean High Water Spring tide. Until the provisions of the *Beach Protection Act 1968* are incorporated into the integrated planning approval process, the Beach Protection Authority has been advised that the approval provisions under the *Beach Protection Act 1968* will continue to apply.

Section 45 of the *Beach Protection Act 1968* provides that a person shall not open a road or subdivide land in a Coastal Management Control District or an erosion prone area without the consent of the Governor in Council or contrary to the terms and conditions pursuant to which the consent was given. When granting such consent, the Governor in Council may include a condition requiring the surrender to the State of all or any land situated within the erosion prone area.

Section 41B of the *Beach Protection Act 1968* provides that a local government is required to obtain the views of the Beach Protection Authority in relation to a proposed town planning scheme or any proposed amendment to an existing scheme in respect of land situated in a coastal management control district or erosion prone area.

In determining the applicability of this provision to applications under the *Integrated Planning Act 1997*, you should ascertain whether the proposal would have required a rezoning from **Ipswich City Council** prior to the *Integrated Planning Act 1997*. Should the proposal have required a rezoning, Council will need to obtain the views of the Beach Protection Authority under section 41B of the *Beach Protection Act 1968*.

Contact [redacted] Engineer, Coasts Wetlands and Waterways Unit on [redacted]

If you require further information with regards to the EPA information request please contact [redacted] on (07) [redacted]

A copy of your response to the EPA information request can be forwarded to:

[redacted]
Principal Inspector
Southern Region
GPO Box 2771
Brisbane QLD 4001

MATTERS OF INTEREST TO DEPARTMENT OF NATURAL RESOURCES AND MINES

The Department of Natural Resources and Mines (DNRM) as a concurrence agency for the application raises the following matters of concern —

IMPORTANT INFORMATION

Clearing of Native Vegetation on freehold land:

NR&M advise receipt of the above clearing application, but are unable to accept it as a properly made application (as defined under section 3.2.1 of the *Integrated Planning Act 1997*) for the following reason(s):

1. The application does not contain a correctly completed Form 1 part A and/or J. (The form is available from your local Department of Natural Resources and Mines office or at the website address www.dcilgp.qld.gov.au/ipa/forms.html).

2. The application does not contain an accurate property description for the land that is the subject of the application.

3. The application does not include a property vegetation management plan as required under section 21 of the *Vegetation Management Act 1999.*

Until the application is complete as per the requirements of the *Integrated Planning Act 1997* section 3.2.1 and the *Vegetation Management Act 1999*, the assessment process cannot begin.

Zoning- current zoning on a map in a current planning scheme:

Property description	**Zoning**	
Lot 4 on SP 140694	Environmental protection	Non-urban
Lot 2 on RP 854997	Medium low impact business/ industrial	Urban
Lot 1 on RP 125443	Medium low impact business/ industrial	Urban
Lot 1 on RP 86838	*No match	
Lot 34 on SL 3911	Medium low impact business/ industrial	Urban
Lot 142 on RP 846150	Medium low impact business/ industrial	Urban
Lots 4, 5 and 6 on RP 92591	*No match	
Lot 13 on SL 2982	Medium low impact business/ industrial	Urban
Lot 6 on SP 140694	Environmental protection	Non-urban
Lot 1 on RP 22385	Medium low impact business/ industrial	Urban
Lot 2 on RP 104683	Medium low impact business/ industrial	Urban
Lot 1 on RP 22378	Medium low impact business/ industrial	Urban
Lot 1 on RP 84779	Medium low impact business/ industrial	Urban
Lot 49 on RP 92591	*No match	
Lot 3 on RP 132087	Medium low impact business/ industrial	Urban
Lot 2 on RP 86838	Environmental protection	Non-urban

*As provided by planning section in Ipswich City Council on 2 October 2002

Based on the information provided above: Operational works would be the clearing of native vegetation in **any** remnant regional ecosystem in areas zoned as "Environmental Protection (non-urban) and in a remnant **endangered** regional ecosystem in areas zoned as "Medium low impact business/ industrial" (urban).

Please note that data was not available on the current zoning of 5 of the above Lot Plans at the time of enquiry. Please follow this up with Council to determine the current zoning on a map in a current Planning scheme (not on a Strategic Plan or other plan).

Site extent and location of proposed clearing:

The site extent shown on page 2 of the Cultural Heritage Section Figure 1-2 and in Figure 3-1 of the Flora and Fauna Section page 8, shows 9 Lot on Plans as the extent of the site, whereas Form A of the Development application and the attached owners consent forms indicate some 18 Lot on Plans (as listed in the heading of this letter).

As there is an anomaly in the site extent and there is no Property Vegetation Management Plan (PVMP) and Form J indicating where operational works that is the clearing of native vegetation in a remnant regional ecosystem on freehold land, the application cannot be assessed under the State Code for the Clearing of native vegetation.

If you need to discuss this matter further, please contact [redacted] on telephone number [redacted] direct quoting the above reference (Bremer Business Park proposal) or relevant Lot on Plan numbers.

Water Management:

The main drainage feature in the north eastern section of the development was inspected 16 October 2002 and determined to be a watercourse for the purposes of the *Water Act 2000.*

It appears that there are no works proposed which would affect this watercourse, therefore NR&M have no concerns, however:

- If any works are carried out within this watercourse then they will require a licence and/or permit under the Act. (Refer to the K series IPA Application forms)
- Any interfering (impounding, diverting) of water from the watercourse will require a licence. (Water managers consent is required before IPA application can be lodged)
- Any long term taking of water from the watercourse will require licence. (Water managers consent required before IPA application can be lodged)
- Any short term taking of water (eg. by a water tanker for construction) will require a permit. (non-IPA)

- Any destruction of vegetation, excavation or filling will require a riverine protection permit. (non-IPA)

Particular attention should be given to the sediment and erosion control (ESC) plan because some components such as detention ponds and check dams may be proposed within the watercourse and thus require a riverine protection permit. If any such structures are proposed, information will be required to fully demonstrate that an offstream component was unavoidable or not feasible.

Some approvals are issued under the *Water Act 2000* and are outside of the time limits imposed by IPA. These approvals may take significant time ie. several weeks and adequate lead times should be allowed for by the applicant. No other watercourses lakes or springs were observed on the development site. For any assistance in this matter or clarification that may be required please contac[redacted] NR&M Brisbane on phone [redacted]

If you require further information in relation to the DNRM information request please contac[redacted]n ([redacted]

A copy of your response to the DNRM information request can be forwarded to:

[redacted]
Moreton Region
Department of Natural Resources and Mines
PO Box 864
IPSWICH QLD 4305

MATTERS OF INTEREST TO THE DEPARTMENT OF MAIN ROADS

The Department of Main Roads (DMR) as a concurrence agency for the application raises the following matters of concern and request the following additional information —

INFORMATION REQUESTED

A comprehensive traffic report that addresses the following issues:

(a) The proposed staging of the development (including timeframe);

(b) An analysis of the existing road network and analyses incorporating any proposed enhancements for each stage;

(c) For each stage of development, a plan shall be provided depicting the extent of the road network that has a minimum of 5% or greater loading of development generated traffic impact;

(d) For each stage, the traffic analysis is to address how the applicant intends to mitigate the adverse impact of the development on the State controlled road network without seeking any contribution from the State or assumptions regarding enhancement of the network by others;

(e) In particular, the following should be analysed in detail for each stage:
- River Road Interchange
- Byrne/Brisbane Road intersection
- Warrego Highway access to Australian Hardboards Ltd.

(f) If the new intersections are proposed on any State-controlled road, then the precise location and conceptual layout of the intersection are to be identified. Such new intersections are to be analysed in detail for each successive stage of the development;

(g) Provide details of the proposed consultation program that the applicant proposes to carry out.

MATTERS OF CONCERN

In considering the above, the applicant is to be aware of the following;

- Given the size of development and the complexity of issues, it is considered that an ultimate solution/outcome would be best achieved through an iterative and consultative process, in which milestones are agreed upon by relevant stakeholders, including Main Roads and Ipswich City Council.

- Main Roads will not contribute to any proposed enhancements.

- Main Roads has concerns as to whether a new intersection(s) with Brisbane Road can be practically achieved. This needs to be investigated with some thoroughness.

- Main Roads has doubts as to whether a new interchange can be accommodated on the Warrego Highway without closing the access to Australian Hardboards Ltd.

If you require further information with regards to the DMR information request please contact [redacted] on [redacted].

A copy of your response to the DMR information request can be forwarded to:

[redacted]
Metropolitan District
PO Box 70
SPRING HILL QLD 4000

MATTERS OF INTEREST TO DEPARTMENT OF PRIMARY INDUSTRIES

The Department of Primary Industries (DPI) as a third party for the application provides the following advice and requests the following additional information —

INFORMATION REQUESTED

Plans

Plans (at an appropriate scale) showing, in relation to property boundaries and the proposed works, the location of:

1. Any *aquatic features* within or adjacent the site (including wetlands, waterways, drainage channels, intermittent water features, dams, man-made channels etc.);
2. *Tidal lands* within and adjacent to the site, showing the levels of Highest Astronomical Tide, Mean High Water Spring Tide, and Low Water Spring Tide;
3. Any protected *marine plants* (see below) within and adjacent to the site; and
4. Any *disturbances* to marine plants or tidal lands, and if appropriate, show the purpose of that disturbance (ie. provision of stormwater outlets and other infrastructure, etc).

Information

5. Description and nature of (ie. saline/brackish/fresh) any aquatic features within or adjacent the site (including wetlands, waterways, drainage channels, intermittent water features, dams, man-made channels etc.). Describe their connectivity to other aquatic features;
6. Description of any proposed disturbance of marine plants and/or disturbances to tidal lands, within and adjacent to the site, including details of such disturbance, area (length by breadth), purpose etc.;
7. Description of any disturbances on, or to, any non-tidal wetlands, waterways, drainage channels, intermittent water features, detailing the purpose of that disturbance; and
8. Description of the proposed stormwater treatment strategy, in particular any requirements to disturb natural waterways or wetlands (including drainage paths), including for the provision of outlets.

Discussions

Provide discussion of the:

9. Possible alternatives to any disturbances to marine plants and any lands below the level of Highest Astronomical Tide, and reasons for the preferred options;
10. Possible alternatives to any disturbances on, or to, any non-tidal wetlands, waterways, drainage channels, intermittent water features etc;
11. Suitability and effectiveness of the proposed stormwater management strategy, in terms of filtration and water treatment, to preserve water quality and habitat within adjacent aquatic features; and
12. Any other measures proposed to mitigate any potential adverse impacts on adjacent fisheries resources.

NB. For the purposes of this information request, the following terminology should be noted:

Aquatic features – water features be they fresh, brackish, or saline.

Tidal Lands – includes reefs, shoals and other land permanently or periodically submerged by water subject to tidal influence (Commonly recognised as those lands below the level of Highest Astronomical Tide).

Wetlands - areas of permanent or periodic/intermittent inundation, whether natural or artificial, static or flowing, fresh, brackish or saline. Included in this definition are drainage channels, dams, and other aquatic features.

MATTERS OF CONCERN

Marine Plants

The applicant should be advised that if it is proposed to disturb any protected marine plants, an application must be submitted for consideration by DPI. Section 8 of the *Fisheries Act 1994* describes Marine Plants. Permits are not issued automatically upon application, as all applications are considered on an individual basis, subject to departmental policy and protocol.

Marine plants include:

- a plant (a tidal plant) that usually grows, on, or adjacent to, tidal land, whether it is living or dead, standing or fallen;
- material of a tidal plant, or other plant material on tidal land and a plant; or
- material of a plant prescribed under a management plan or regulation to be a marine plant.

Included in this definition are mangroves, saltcouch and samphire vegetation species. A marine plant does not include a declared plant under the *Rural lands Protection Act 1985.*

Buffer requirements

DPI normally supports retention of a buffer between development and tidal lands or fresh waterways or wetlands. This buffer allows for:

- an ecological filter between tenure activities and tidal lands or fresh waterways.
- reduction of the direct pressure for alteration of tidal lands or fresh waterways from impacts associated with both coastal processes and the tenure activities.
- reduction of ongoing bordering impacts and management problems, in particular health and nuisance issues from biting insect pests.

DPI's policy recommends a minimum buffer of 50m of established natural vegetation between developments and freshwater waterways and a 100m of established vegetation between developments and tidal lands. Please note that the final buffer widths are determined on a case-by-case basis and that recommended widths may be inappropriate in some instances. Additional information and details need to be provided on the capacity of any proposed buffer to protect the fisheries resource values of adjacent waterways and tidal lands. Without this information, a departure from DPI policy to decrease or increase the buffer width cannot be considered.

Waterway Barrier Works (Maintenance of fish passage)

Waterway barrier works relates to the construction of new, or the raising/lowering of existing, weirs/dams/water-pipes/other barriers across waterways (freshwater and marine), including temporary structures. Approval is required under the *Fisheries Act 1994* for any waterway barrier works.

DPI's interest in these structures is in their impacts on fish habitat and fish access to habitat, as a physical barrier, through alterations in flow patterns, and by habitat loss (eg. through permanent inundation). Installation of a fishway may be required as part of the approval, to ensure fish passage across the barrier. Your local DPI Planning and Environment Officer will direct you to your Regional Fisheries Office, should an application for an approval be required.

The interest in fish ways is to ensure that inappropriate designs are not used for fishways in Queensland. This allows DPI to evaluate proposed fishways and prevent the construction of fishways that do not work. Where a barrier exists and there is a proposal to retrofit a fishway onto the barrier, a permit is required from DPI. This allows DPI to ensure that only fishways that are designed and operated appropriate to the needs and swimming abilities of Queensland fish are built. In addition, there is a key consideration of providing appropriate environmental flows to sustain downstream fish habitats and fish communities.

Water quality

DPI acknowledges the lead agency role of the Environmental Protection Agency (EPA) with respect to water quality issues. Accordingly, this Department is willing to accept the advice of the EPA as to, the suitability of the proposed stormwater management, requirements for additional information, and appropriate conditioning of any development approvals, relating to water quality management.

Please be advised that the basis of DPI's comments lies within the jurisdiction of the *Fisheries Act 1994*, and that a site inspection was not undertaken for the purposes of these comments.

If you require further information in relation to the DPI information request please contact [redacted]

A copy of your response the DPI information request can be forwarded to:

[redacted]
South East Region
PO Box 5165 SCMC
NAMBOUR QLD 4560

SINCLAIR KNIGHT MERZ

Sinclair Knight Merz Pty Limited
ACN 001 024 095
ABN 37 001 024 095
PO Box 246
Spring Hill QLD 4004
369 Ann Street
Brisbane QLD 4000
Australia
Telephone: [redacted]
Facsimile: [redacted]

3356/02.

COPY SENT TO

DIV 4

Ipswich City Council [redacted]

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Doc. No. 500708

Chief Executive Officer
Ipswich City Council
PO Box 191
IPSWICH QLD 4305

3 December, 2002
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Attention: [redacted]

Dear [redacted]

BREMER BUSINESS PARK DEVELOPMENT APPLICATION INFORMATION RESPONSE

Please accept the attached material as the information provided in response to the information request received from the Department of Local Government and Planning on 24 October 2002. The information does not include the Cultural Heritage Management Plan which is still be prepared in consultation with the indigenous communities with an interest in the land.

For the purposes of notification of the development application, the information submitted now is the information provided in response to the information request. Copies of this material have been forwarded to the State agencies referred to in the information request today.

Please call me if any further material or clarification of any response is required.

Yours faithfully

[redacted]

[redacted]
Principal,
Environmental Planning

Phone [redacted]
Fax: 3
E-mai

BREMER BUSINESS PARK
INFORMATION REQUEST – ISSUES & RESPONSES

1. Changes to Development Application

In response to the matters raised in the Information Request, a number of minor changes to the development application are proposed. They are:

(i) Local traffic calming measures are proposed in Bognuda Street, such that it is to be re-aligned to intersect, at a roundabout, with the proposed internal ring road at right angles in the vicinity of the proposed community centre. Consequently, a changed proposal plan for the reconfiguration is provided and attached to this response.

(ii) The proposed new residential lots on the eastern side of Bognuda Street are to be deleted and replaced with open space and private open space or buffers to the Frame industrial activity (refer to changed proposal plan for reconfiguration).

(iii) The existing access to Ashburn Road from the Warrego Highway is to be closed in favour of a safer access, accepting 'left-in, left-out traffic flows to Bognuda Street extended to intersect with a roundabout on the highway off-ramps (refer to changed master plan).

(iv) Minor changes have been made to the Plan of Development to clarify the role between it and the Planning Scheme for the City of Ipswich, including the Eastern Corridor Structure Plan, Planning Scheme Policies and other relevant codes and provisions of the Planning Scheme (refer to changed Plan of Development).

(v) Minor changes have been made to the Design Guidelines to address separations between residential and industrial uses and to address site cover requirements for the same reason.

Under the *Integrated Planning Act 1997*, a changed application resulting from an information request is not affected by section 3.2.9 of the Act. Consequently, the processing of this application, including the changes referred to above and reflected in the attachments, can continue through the IDAS process.

2. Approach to Information Request

The response to the Information Request is presented, in tabular form, in the order of appearance in the document received by facsimile on 24 October 2003. Some material is presented as attachments to the response.

Agency	Issue	Specific Issues	Response
Ipswich City Council	**Infrastructure**	Details for providing, administering provision of infrastructure	An Infrastructure Agreement (IA) is to be struck between the Applicant and the Ipswich City Council. The IA is to address: ▪ The indicative staging for Bremer Business Park (see attached **Staging Plan**); ▪ Services to be provided and works to be undertaken by the developer for each stage; ▪ Services to be provided and works to be undertaken by the Council for each stage; ▪ Headworks or infrastructure payments to be made by the developer for each stage; ▪ Open space to be transferred to the Council and the staging of the transfer; ▪ Protocols for clearance of sites within the open space from the Contaminated Land Register and respective responsibilities; and ▪ Novation of responsibilities under the IA to the purchaser in the event of a sale of land.
		Infrastructure Agreement to be finalised prior to approval	The **Preliminary Approval (material change of use)** could be conditional, subject to the completion of a satisfactory IA. Subsequent applications are required for development permits for material change of use for most land uses. The **Development Permit (reconfiguration)** also could be conditional, subject to the completion of a satisfactory IA. If agreement could not be reached then the condition requiring the IA will not have been satisfied.

1 PCP.

Will [illegible] as Developer?

[redacted]

[redacted]

Agency	Issue	Specific Issues	Preliminary Response
Ipswich City Council (cont'd)	**Infrastructure** (cont'd)	Infrastructure Agreement to fully detail staging, crediting and contributions	The staging will be indicative only because the actual sequence of development will be driven by market circumstances. Consequently, the IA and the staging plan will identify parcels of work required for each stage.
	Development Standards	No fundamental concerns with Plan of Development approach	Noted
		Major concerns with Design Guidelines if they are to apply across the board Raises Merz questions as to the purpose of the Study	The Design Guidelines in the Plan of Development are indicative and are intended to illustrate how the provisions of the Planning Scheme and the Planning Scheme Policies might be met. To the extent there is any conflict between the Planning Scheme and the Design Guidelines, the Planning Scheme should prevail. This approach will be reflected in the Plan of Development and the Design Guidelines. (see **Attachment F - Plan of Development**).
		Need to identify supplementary development standards	The Design Guidelines are indicative only of the approach to be taken in the design, siting and landscaping of sites within Bremer Business Park.
	Flooding	Provide copy of relevant files for flood modelling	See attached **Flood Data Files**.(CD – MIKE11 flood model)
		Additional information for detention basin or lake	See the attached comments in relation to water quality management (**Attachment D – Water Quality Strategy**).

Agency	Issue	Specific Issues	Preliminary Response
Ipswich City Council (cont'd)	**Flooding** (cont'd)	Demarcation of flood events in Bremer R and Brisbane R to be established	Flooding modelling, to the extent relevant for the site and the project, has been undertaken and is reflected in the report submitted with the development application (refer to **Volume F** – Flooding). The flood modelling data relied upon for the conclusions reached in the report are attached.
		Flooding impacts on the Warrego Highway	
		Bulk earthworks to be clearly identified on the development plan	Refer to the development concepts submitted with the application (**Volume F** – Infrastructure & Bulk Earthworks, dwg 7154-C-002)
		Flood & drainage master study to be undertaken for the eutire development	Refer to the development concepts submitted with the application (refer to **Volume F** – Flooding).
		Provide supporting information, cross-sections & assumptions	Refer to to **Volume F** – Flooding and the attached flood modelling data.
	Geotechnical, Mining	Provide comprehensive geotechnical report to include: – Extent of underground mining – Extent of influence of underground workings; – The suitability of the site due to subsidence; – Recommendations for development of the site.	Refer to **Attachment E – Mining & Geotechnical Response**.

Agency	Issue	Specific Issues	Preliminary Response
Ipswich City Council (cont'd)	**Traffic & Roads**	Connectivity of site to Brisbane Rd, Cunningham Highway is critical for Council support	This connection is a Planning Scheme requirement. The development application makes provision for the road connection with a 30 m wide corridor and a road constructed to a standard suitable for the local traffic needs of Bremer Business Park.
		Assess the impact of the 'major inter-suburban link' from Cunningham H'way across Brisbane Rd to Warrego H'way.	
		Local area Traffic Management (LATM) for existing local road network – advise on signs, types, locations and contributions to be made by Bremer Business Park	See **Attachment C – Traffic Response**
		Further SIDRA analysis required to detail impacts on intersections within proposed road network and existing road network	
		Consultation required with DMR regarding impacts on Brisbane Rd, and Warrego and Cunningham Highways.	
		Need to address public transport & pedestrian and cycle movements through the site	
	Water / Sewerage	Detailed report on water, sewer infrastructure needs	See **Attachment A – Infrastructure Response.**
		Address sect 12.2 Planing Scheme Policy for Water & Sewerage Contributions	
		Water mains to be provided on both sides of the street	
		Relocate 500mm dia water main in residential area + provide for future pump station in Bognuda St	
	Utilities	Note that further approvals are required from relevant utilities	

[redacted]

Agency	Issue	Specific Issues	Preliminary Response
Ipswich City Council (cont'd)	**Stormwater**	Prepare a 'Master Stormwater Quality Management Plan' including operational design stormwater quality management plan according to specific parameters, including BCC parameters.	The development application has assumed that, with 'best practice' water quality management achieved on a site by site basis, the need for a Master Stormwater Quality Management Plan did not arise. The application also indicated that water quality performance could not be reasonably addressed until the final land uses become known. It should be noted that the application is for a preliminary approval only for material change of use. Subsequent development applications will be required to establish industrial activities on any site created within Bremer Business Park. On this basis, the preferred approach is for the adoption of the water quality parameters set out in the Information Request (Table 1 – copy attached) for the assessment of subsequent development applications.

[redacted]

Agency	Issue	Specific Issues	Preliminary Response
Ipswich City Council (cont'd)	**Noise**	Prepare amended noise impact assessment including: Monitoring in accordance with AS; – Supplies monitoring raw data; – Based on traffic volumes (see reports); – Buffers to central industry precinct; – Provide clear criteria in Design guidelines.	The development application has assumed the adoption of 'best practice' environmental management to minimise and mitigate acoustic impacts. The master plan and the Plan of Development have adopted a 'bulls eye' approach to managing land use impacts, where the high impact activities are located in the centre of the site and the lower impact activities are located to the edges of the site. Where residential uses are proximate, the Plan of Development directs quiet activities such as warehousing or technology and commercial activities, separated from existing dwellings by extensive landscaped buffers. The application also indicated that acoustic performance could not be reasonably assessed until the uses of each site are determined. Each site will become the subject of a development application except for low impact activities (eg open space, animal husbandry, outdoor recreation not involving building work or operational work). Subsequent development applications ought to be subject to conditions establishing AS acoustic parameters for site-specific uses.

Agency	Issue	Specific Issues	Preliminary Response
Ipswich City Council (cont'd)	**Air Quality**	Need to make an assessment of air quality in the area, including impact of existing activities (STP, AHL, AMH) using acceptable air quality modelling program; Residents are not to be subject to unacceptable odours.	The Information Request raises the issue of 'reverse impact' from the proposed residential development upon existing uses (eg AHL, sewage treatment plant, meatworks). The development application proposes to create two (2) master lots for subsequent residential developmeut between Bognuda Street and River Road (west). The future residential lots closest to the sewage treatment plan are at least 300 metres to the south-east, out of the direction of the prevailing winds. These lots also are approximately 1 ha in area. The closest future standard residential lot is approximately 550-600 meters to the south-east of the sewage treatment plant. This should be more than adequate to offset the risk of odour nuisance based ou previous studies conducted by SKM, the literature and accepted criteria. These are substantial buffers for the purpose of limiting impacts from STP odours. The possible residential lots to the east of Bognuda Street are deleted in recognition of the Council's concern regarding impacts on proximate industrial uses. For the prosposed industrial uses, the development application has assumed that, with 'best practice' air quality management achieved on a site by site basis. The application also indicated that air quality performance could not be reasonably addressed until the final land uses become known. On this basis, the preferred approach is for the adoption of the air quality parameters set out for the assessment of subsequent development applications.

Agency	Issue	Specific Issues	Preliminary Response
Ipswich City Council (cont'd)	**Hazards**	No bulk dangerous goods below Q100 (no service stations, fuel depots) therefore amend table of development	The Highway precinct will be filled to achieve immunity from a Q100 flood event – (refer to **Volume F** – Flooding and dwg 7154-C-02)
		Design guidelines need to address hazards, or, refer to the existing Planning Scheme codes	The Plan of Development states that the provisions of the Planning Scheme and the Planning Scheme Policies are effective where the precinct codes and other provisions of the Plan of Development are either silent or not present. The provisions relating to hazard assessment and risk minimisation in the Planning Scheme would apply therefore.
	Contaminated Land	All land to become a Council asset is to be removed from the EMR & CLR prior to sealing the survey plan	An alternative approach to site remediation prior to sealing survery plans would be to bond or take some form of security against the performance of such works within a reasonable timeframe.
		Provide a geotechnical report on land subsidence risk for land to be transferred to Council	See mining report referred to above

Agency	Issue	Specific Issues	Preliminary Response
Ipswich City Council (cont'd)	**Open Space**	Prepare an Open Space master plan addressing: – ICC Structure Plan; – Subdivision Code; – Ipswich Open Space & Recreational Development Plan; – Embellishment responsibilities	The provision of Open Space is to be coutrolled through the Infrastructure Agreement referred to above. A master plan for the overall project provides for a riparian open space system extending along the Bremer River and the minor ephemeral drainage paths passing through the site to the river. The master plan indicates a possible route for a pedestrian and cycle path through the open space system. More detailed planning for the open space to be transferred to the Council is not reasonably required for this application and is not required by the Subdivision Code. Embellishment of the open space system is addressed in the Infrastructure Agreement and will be funded through subsequent contributions imposed on subsequent development applications for material change of use.
		Need to detail integration of open space and water quality management structures	The master plan submitted with the development application provides an indication of the intended integration of water quality control ponds in the open space system. Other water quality control measures are to be provided within individual sites to achieve water quality standards at the site boundary. Specific details as to the design or characteristics of water quality management structures is premature for this application and are more appropriately provided with the application for operational works.

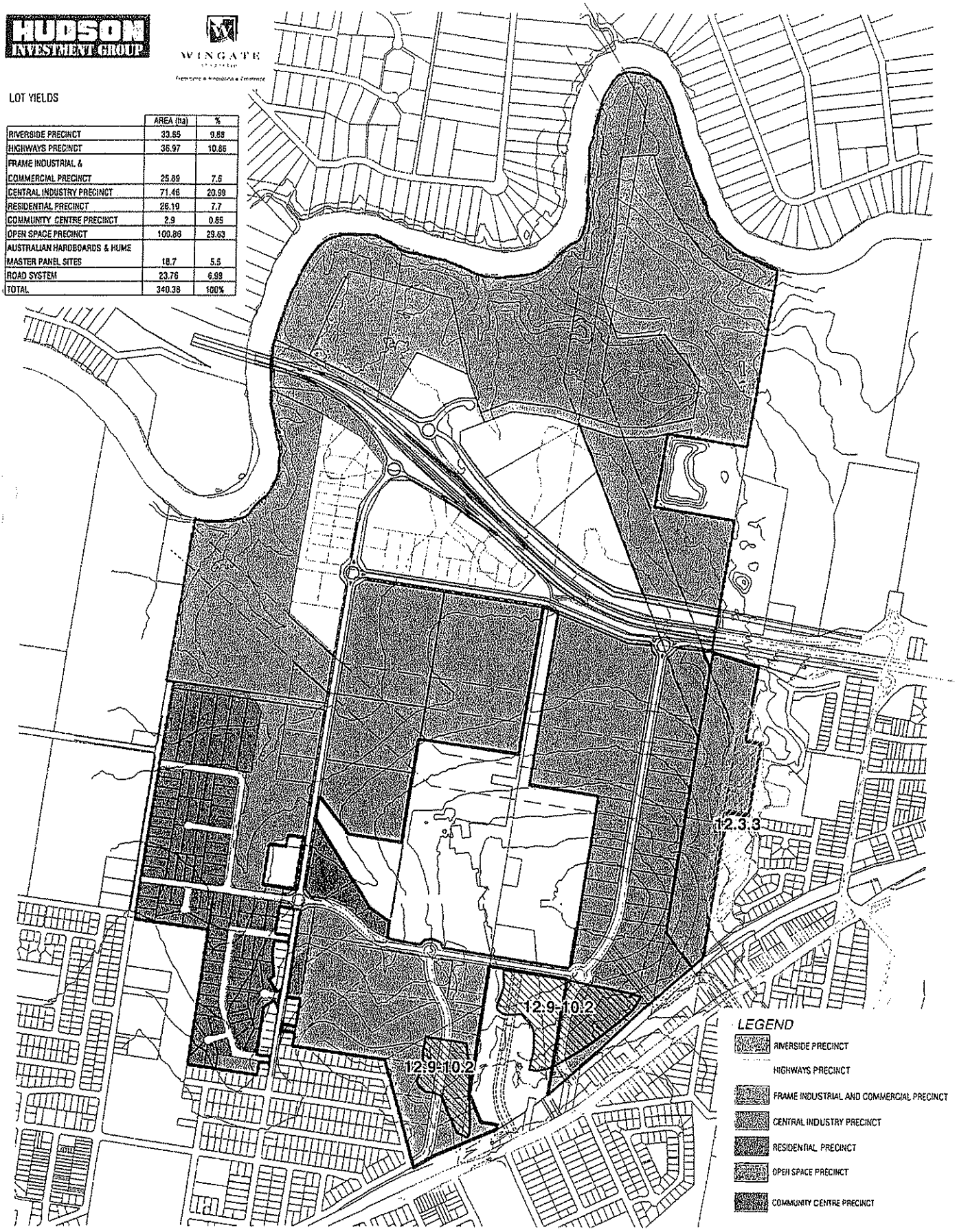
Agency	Issue	Specific Issues	Preliminary Response
Ipswich City Council (cont'd)	**Open Space** (cont'd)	Detail how flora, fauna studies have been integrated into open space master plan	The open space system to be provided through this development application accommodates and protects the floristic community of known habitat value (ie the remnant vegetation along the eastern boundary of the site). The open space system also accommodates and protects the riparian vegetation of the Bremer River, the eucalypt regrowth to the west of Bognuda Street, and open timber along the low ridge adjacent to Australian Meat Holdings. Other vegetation in the south-east corner of the site is 'not of concern' in terms of regional ecosystems values and will be retained, where possible, only in the road reserves and in private open space within newly created sites.

HUDSON INVESTMENT GROUP

WINGATE

LOT YIELDS

	AREA (Ha)	%
RIVERSIDE PRECINCT	33.65	9.89
HIGHWAYS PRECINCT	36.97	10.86
FRAME INDUSTRIAL & COMMERCIAL PRECINCT	25.89	7.6
CENTRAL INDUSTRY PRECINCT	71.46	20.99
RESIDENTIAL PRECINCT	26.19	7.7
COMMUNITY CENTRE PRECINCT	2.9	0.85
OPEN SPACE PRECINCT	100.86	29.63
AUSTRALIAN HARDBOARDS & HUME MASTER PANEL SITES	18.7	5.5
ROAD SYSTEM	23.76	6.99
TOTAL	340.38	100%



LAND USE PLAN

BREMER BUSINESS PARK

0 50 150 250 500

SEPTEMBER 2002
SCALE 1:9000 on A1

Legend

Endangered

Not Of Concern

Agency	Issue	Specific Issues	Preliminary Response
Ipswich City Council (cont'd)	**Open Space** (cont'd)	Detail long term remediation of previous waster water disposal for soil profile	The soil contamination investigations undertaken for the development application specifically addressed the issue of potential impact of irrigation of 'hardboards' effluent over parts of the site.(refer to **Volume E** – Environmental Assessment, Site Contamination, section 4.2). The conclusions reached with regards the long-term impact of irrigation are: ▪ There are elevated levels of managanese in some areas; ▪ The levels of phenols were elevated in some areas, but that phenols are bio-degradable with a half life ranging between 2 and 20 days; ▪ The lower effluent ponds was found to have elevated levels of TPH; and ▪ No OC or OP pesticide residues were detected. On this evidence, there is no need for site remediation arising from irrigation. There is a need for remediation for specific sites already listed in the EMR and the CLR. This work will be undertaken in accordance with a site management plan to be approved by the EPA at the appropriate time (ie prior to the sealing of any subdivision plan transferring those sites to the Council for open space).

SUMMARY OF STATE AGENCY ISSUES

Issue	Main Roads	EPA	DNRM	DPI
Infrastructure				
. highway connections	■			
. public transport				
. roads	■			
. urban infrastructure				
. open space				
Water Quality & Water Management			■	
Noise . model existing; . predictive model; . background survey; . background creep		■		
Contaminated Land		■		
Cultural Heritage		■		
Biodiversity . regional ecosystems . fauna survey		■	■	
Environmental Management Plan . construction phase . operational phase		■		
Erosion Prone Areas . 40m inland, Bremer R.				■ tidal lands, marine plants, aquatic features 50m buffers and 100m buffers
Clearing Native Vegetation			■ remnant vegetation, regional ecosystems	

Agency	Issue	Specific Issues	Preliminary Response
Environmental Protection Agency	**Contaminated Land**	Sufficient information is required for nominated lots within the site to determine their suitability for the intended use.	A Stage 1 Preliminary Contaminated Site Investigation was prepared and submitted with the development application (acknowledged by the EPA). The report is now required to be submitted in accordance with the draft guidelines. Further work is being progressed to address specific locations within the site. However, the use of part of the land for industrial purposes will only commence after the remediation of specific locations in accordance with a Remediation Action Plan to be prepared and submitted in accordance with conditions of approval. The proposed residential areas of the site are not affected with major contamination constraints. Again, the use of part of the land for residential purposes will only commence after the remediation of specific locations in accordance with a Remediation Action Plan to be prepared and submitted in accordance with conditions of approval. Similarly, the Ipswich City Council will not accept sites on the CLR onto the open space register. These actions can and should be undertaken in accordance with a condition(s) of approval. There is no reason to delay the consideration of the development application at this time.

Agency	Issue	Specific Issues	Preliminary Response
Environmental Protection Agency (cont'd)	**Biodiversity** Information Requested	Identify all natural watercourses, regional ecosystems and vegetation associations on the Plan of Development.	These natural systems were fully identified in the report accompanying the development application (refer to **Volume E** – Environmental Assessment, Flora & Fauna). The regional ecosystems mapping identifies only two regional ecosystems, namely: ▪ 12.3.3 – *E. tereticornis* woodland to open forest on alluvial plains; and ▪ 12.0/10.9 – Open Forest or woodland of *Corymbia citriodora* usually with *E. crebra*. Under the Vegetation Management Act, 12.3.3 is an endangered regional ecosystem, whereas 12.9/10.9 is not of concern. It is not intended to clear any vegetation mapped as the endangered *E. tereticornis* woodland within the site. An overlay on the Plan of Development is attached.
		Endangered regional ecosystem 12.3.3 north-east of the AHL site	The endangered regional ecosystem 12.3.3 is to be retained in an open space corridor connecting through the site to the Bremer River.
		Identify the extent of clearing of the woodland (*C. tessallaris, E. tereticornis*) and the regional ecosystem 12.9/10.2 will be cleared.	In response to the issues raised by local residents, the clearing of the woodland (*C. tessallaris, E. tereticornis*) west of Bognuda Street will be limited to land not included in the open space corridor. The regional ecosystem 12.9/10.2 is 'not of concern', is situated in the Central Industry precinct and will be cleared to prepare sites and construct roads. Where possible, detailed site planning could retain some individual trees or small stands of trees.

Agency	Issue	Specific Issues	Preliminary Response
Environmental Protection Agency (cont'd)	**Biodiversity** Information Requested	Conduct a fauna survey in the woodland (*C. tessallaris, E. tereticornis*) to be cleared.	With the retention of a corridor of woodland along the drainage path (Tributary C) connecting with the Bremer River riaparian corridor, and the small area of woodland presently on the site (west of Bognuda Street), there is no need for a fauna survey. The woodland does not provide critical habitat but is likely to perform a corridor function. This function is maintained in the open space corridor.
	Biodiversity Matters of Concern	The Open Space precinct plan needs to ensure the protection of the endangered regional ecosystem and to identify appropriate and inappropriate uses.	The Plan of Development and the Design Guidelines, in relation to the Open Space precinct, both emphasise the need to protect the biodiversity and habitat values of the site.. The Plan of Development (section7.2) refers to the open space system providing *areas of habitat value (wetlands, refuges, remnant vegetation and rehabilitated vegetation).* The only land uses able to establish in the Open Space precinct as self-assessable development are: ▪ Environmental Facility not involving building work or operational work; and ▪ Open Space. All other material change of use proposals will require development assessment in subsequent applications.
		Retirement community is a code assessable use in the Open Space precinct.	The Plan of Development has been amended to require impact assessment for Retirement community in the Open Space precinct.
		Regional ecosystem 12.3.3 north-west of the AHL facility	The *E. tereticornis* woodland around the Australian Hardboards site is not mapped as endangered. The proposed reconfiguration of the site will retain much of the regional ecosystem 12.3.3 within the AHL allotment.

Agency	Issue	Specific Issues	Preliminary Response
Environmental Protection Agency (cont'd)	**Environmental Planning** Information Requested	Provide a Noise Report addressing: ▪ A model of the current noise environment; ▪ A prediction model for BBP; ▪ A background noise survey; and ▪ Details of how 'background creep' is to be prevented.	The Ipswich City Council has previously determined that the land and the locality is suitable for industrial development and have designated the land accordingly in the Eastern Corridor Structure Plan. Consequently, there is no need, nor is it appropriate to re-assess the Council's planning decision. The Ipswich City Council, acting on the advice of the EPA will have the opportunity to impose particular noise performance criteria as conditions of approval on subsequent development applications.

Agency	Issue	Specific Issues	Preliminary Response
Environmental Protection Agency (cont'd)	**Environmental Planning** Matters of Concern	Concerns with the increase in the number of potential noise sources for nearby residential and industrial uses within BBP.	The existing industries (Australian Hardboards, Humes Master Panels) are not included in the development application. The proposed residential lots to the east of Bognuda Street have been deleted and the land now designated as an open space buffer of 70-80 metres width to the adjacent residences. The designation of the site for industrial activity has alerted the community to the character of future land uses. Present and future residents are fully aware of the intended land uses for the site. Similarly, industrial activities establishing in BBP will be grouped into precincts according to their likely impacts, including acoustic impacts. With site-specific controls imposed on subsequent development applications, the interference with other uses can be avoided or maintained to levels commensurate with industrial settings.

Agency	Issue	Specific Issues	Preliminary Response
Environmental Protection Agency (continued)	**Environmental Management Plan** Information Requested	Prepare an environmental management plan (EMP) to describe the environmental management and monitoring activities for the construction and operational phases of development.	A generic EMP for Bremer Business Park can be prepared in response to a condition of approval of this application, providing a guide for site-specific developments to be the subject of later applications. An EMP for site works will be required for the bulk earthworks and will be linked to the Remediation Action Plan dealing with site contamination issues.
	Environmental Management Plan Matters of Concern	Quantity and quality of stormwater	The Ipswich City Council has requested a master stormwater quality management plan. With the provision of on-site management measures and water quality ponds in the open space system, the issue of stormwater is more appropriately addressed with subsequent development applications.
	Cultural Heritage Information Requested	Requiring a full cultural heritage investigation of the indigenous and historic heritage sites	The documentation supporting the application included a comprehensive report on the historical heritage values of the site (refer to **Volume E** – Environmental Assessment, Cultural Heritage). Subsequent to that report, a Cultural Heritage Management Plan is being prepared in close consultation with the four indigenous communities with an interest in the area. This report is being prepared by the University of Queensland (Prangnell et al).
	Erosion Prone Areas Matters of Concern	The erosion prone area extends up the Bremer River to include an area 40 metres inland from the plan position of mean high water spring tide. No subdivision is permitted or new road is to be opened within the erosion prone area without the consent of the Governor-in-Council.	The proposal entails the subdivision of land to provide an open space buffer to the Bremer River. The buffer width exceeds 50 meters in all locations and will include the erosion prone area. The buffer is intended to be transferred into public ownership for open space purposes.

Agency	Issue	Specific Issues	Preliminary Response
Dept of Natural Resources & Mines	**Clearing of native vegetation on freehold land**	The application is not properly made because it does not contain a fully completed Form 1, does not contain an accurate property description, and does not include a property vegetation management plan.	**Application for the Clearing of Native Vegetation** The development application, as made, does not seek approval for the clearing of native vegetation. Legal advice obtained indicates that an application for clearing of native vegetation is not required to be made at the same time as the material change of use DA. **Inaccurate Property Description** The property description presented in the Information Request does not reflect that set out in the development application (ie the application does not include a Lot 49 on RP92591). Lots for which the Department states there is no match are: ▪ Lot 1 RP86838, owned by AH Bremer Park Pty Ltd, situated to the east of Carberry St; ▪ Lots 4, 5 and 6 on RP92591, owned by AH Bremer Park Pty Ltd, situated on Bognuda Street. **Property Vegetation Management Plan** There is no need for a property vegetation management plan for this development application. A PVMP will be required to accompany an application for operational works and an application to clear native vegetation. Neither of those has been made at this time.

Agency	Issue	Specific Issues	Preliminary Response
Dept of Natural Resources & Mines (cont'd)	**Water Management** (cont'd)	The drainage feature in the north eastern section of the site is determined to be a watercourse under the *Water Act 2000*. There are no works proposed therefore DNRM have no concerns.	Ultimately, a development application (operational works) will be required for the Bremer Business Park project. The operational works will include detention ponds and water quality control ponds in the watercourse identified by the Department. Prior to such works commencing, it is recognised that applications for licenses under the *Water Act 2000* will be required.
		Any works carried out in a watercourse require a license. Detention ponds and check dams in a watercourse require a riverine protection permit.	As noted above, license applications will need to be made at the appropriate time (ie prior to the commencement of operational works in a watercourse). Similarly, an application for a riverine protection permit will also be required for any destruction of vegetation, excavation or filling in a watercourse.
Department of Main Roads	**Information Requested**	A comprehensive traffic report addressing: ▪ proposed staging; ▪ analysis of the existing road network; ▪ traffic loads for each stage; ▪ detailed analyses for River Rd interchange, Byrne/Brisbane Rd intersection & Warrego H'way access to Australian Hardboards; ▪ the location & conceptual layout of access to any State-controlled road. Details of the consultation program are also sought.	See **Attachment C – Traffic Response**.

Agency	Issue	Specific Issues	Preliminary Response
Department of Main Roads (cont'd)	**Matters of Concern**	DMR looking for an iterative and consultative approach between the applicant, the department and ICC. DMR will not contribute to any proposed enhancements. Doubts as to whether a new intersection with Brisbane Rd can be achieved. Doubts as to a new interchange on Warrego H'wqay without closing AHL access	See **Attachment C – Traffic Response**.
Department of Primary Industries (Advice agency)	**Information Requested**	Detailed plans showing: ▪ Aquatic features within the site; ▪ Tidal lands within and adjacent to the site (including HAT, MHWS, LWS); ▪ Identify any protected marine plants; and ▪ Identify any proposed disturbances to marine plants.	

Agency	Issue	Specific Issues	Preliminary Response
Department of Primary Industries (Advice agency)	**Information Requested**	Information requested includes a description of: ▪ any aquatic features within or adjacent to the site; ▪ proposed disturbance to marine plants or tidal lands; ▪ disturbance to non-tidal wetlands, waterways, drainage channels etc; ▪ proposed stormwater treatment strategy.	**Aquatic Features** DNRM advise that the drainage path in the north eastern section of the site is a 'watercourse' under the Water Act. There is presently no standing water in this drainage path. It has the appearance of an ephemeral drainage system. **Marine Plants, Tidal Lands** This application does not propose any disturbance to marine plants or tidal lands. The extent of tidal influence is within the banks of the Bremer River, which in abutting the site, are steep and high. **Non-tidal Lands, Waterways** This application is for a Preliminary Approval for material change of use and a development permit for reconfiguration of the site into master lots and several small industrial lots well removed from non-tidal lands and waterways. Any disturbance of non-tidal lands and waterways will be dealt with under a subsequent development application for operational works. **Stormwater Treatment Strategy** The stormwater treatment strategy is for each development to achieve the parameters set down by the Ipswich City Council prior to release to the natural drainage system (ie within each lot). There is a preference for stormwater re-use for irrigation if practical and feasible in the larger sites. The drainage paths through the site (Tributaries A, B and C) will convey treated stormwater to the Bremer River via detention ponds and water quality treatment basins. The design performance of these features is to be resolved through the Operational Works application.

Agency	Issue	Specific Issues	Preliminary Response
Department of Primary Industries (Advice agency)	**Information Requested**	Discussions sought include: ▪ alternatives to disturbance of marine plants; ▪ alternatives to disturbance of non-tidal wetlands or waterways etc; ▪ effectiveness of stormwater strategy; ▪ other mitigation measures for fisheries impacts.	There are no alternatives proposed because, in this application, there is no intended disturbance to marine plants, nor is there any intended disturbance of non-tidal wetlands or waterways. The stormwater management strategy is anticipated to be highly effective because it focuses on site-specific sources of potential pollution. Each site will be developed to achieve ICC water quality parameters at the site boundary, with drainage waters then being further enhanced through water quality control measures provided in the open space system under a separate development application (operational works).
		Buffers to tidal waterways or wetlands	The proposal includes an open space buffer ranges in width from 80 metres to well in excess of 100 metres width across most of the site frontage to the Bremer River. The Bremer River is the only tidal waterway adjacent to the site. The tidal range is contained within the banks of the river .
		Approval is required under the *Fisheries Act* for waterbarrier works (fishways) across waterways (freshwater or marine).	Noting that DNRM have identified the drainage path in the north eastern corner of the site as a watercourse under the *Water Act*, there will be a need for an approval under the *Fisheries Act* for any detention pond or water quality control proposed in a development application (operational works). There is no need for that approval to be sought at this time.

ATTACHMENT A – INFRASTRUCTURE RESPONSE

1. Staging

The application includes a staging plan for the creation of master stages for development. Sub-stages within each stage will be created subsequently in separate development applications. The **Staging Plan** (SKM dwg no 7154-C-019) is attached.

It is intended that Stage 1(a) be commenced indendently of the Infrastructure Agreement, based on the provision of infrastructure services required only for that stage. To the extent that the provision of infrastructure involves works not required by the development, or the stage, then the Infrastructure Agreement will incorporate a provision through which cost savings, or credits, can be achieved by the developer. Such savings or credits might be achieved through the regional network planning to be undertaken by the Ipswich City Council (refer to sections 2 and 3 of this report) over the next 3 – 6 months (commencing January 2003).

2. Water Supply

The water supply infrastructure works required, or need to be brought forward, to service the development, and with consideration to the overall needs of the water supply network will be determined from an analysis of the water supply network model. This investigation will be completed in consultation with Ipswich Water and their nominated consultant by incorporating the estimated demands and timing of the Bremer Business Park within the existing water network model. The outcome of this investigation will be to determine the impacts on the existing water supply infrastructure, and determine what modifications to the currently planned network may be required and further identify the additional infrastructure that will be required to adequately service the proposed development.

Ipswich Water's nominated consultant is currently preparing the brief outlining the requirements and methodology to complete this investigation.

The outcomes of this investigation will also provide the basis for establishing an infrastructure agreement between the developer and Ipswich City Council.

For the purposes of establishing timing and demand requirements for infrastructure provision, an anticipated sequence of development has been prepared and shown on the preliminary staging plan of precincts Figure ??.

As indicated on the staging plan, the most likely precinct to develop first is located directly adjacent to the road accesses from Ashburn Road and the Warrego Highway. To enable the development of the first stage of the Bremer Business Park to process with minimal delay, we propose that the development application be approved with the water supply infrastructure identified for the first stage only. The infrastructure requirements and agreement for the balance of the development shall be finalised following the completion of the water supply network analysis.

The demand for Stage 1(a) based on the proposed land development use and density is estimated at 1425 EP, with the total development site estimated at 5500 EP. The existing Australian Hardboards operations are not included in these rates.

To strategy to service Stage 1(a) of the proposed development is to establish a connection from the existing 500mm dia trunk main located in Bognuda Street supply Stage 1(a) from

this point with a 300mm dia supply main and 150mm dia reticulation mains. Refer to the Water Reticulation Layout Plan Drg No. 7154-C-004 for details.

The requirement for duplication of the existing 500mm dia trunk main, and the provision of the future water pump station along Bognuda Street should be determined by Ipswich Water on the basis of existing capacity and development impacts.

The requirement for reticulation water mains to be provided on both side of the street has been noted, and this recent design standard will be incorporated into the design during the operational works phase.

3. Sewerage

Similarly with the water supply infrastructure, the sewerage infrastructure works required, or need to be brought forward, to service the development, has been assessed on establishing the infrastructure required to enable the development of the first stage of the Bremer Business Park.

The demands for Stage 1(a) and the total development are as detailed above.

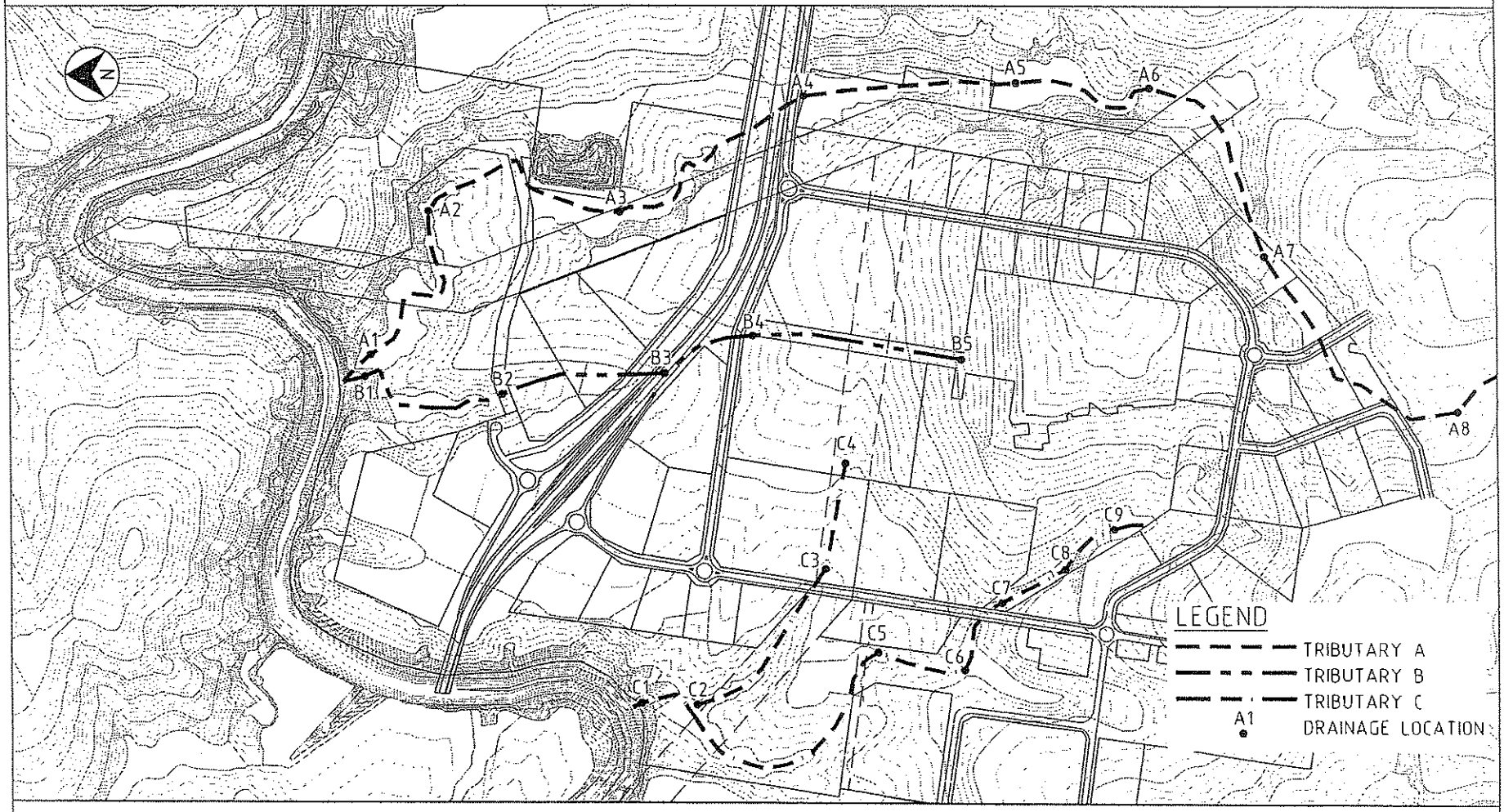
The strategy to service Stage 1(a) of the proposed development is to provide a system of 150mm dia mains and trunk mains by gravitating to the existing Bundamba Waste Water Centre to the west of the site. Please refer to the Sewerage Reticulation Layout Plan Drg No. 7154-C-005 for details of this layout.

For the section of Stage 1(a) that cannot be directly gravitated to the BWWC, this area will be serviced by discharging to the existing sewage pumping station (B24) located in Ashburn Road to the east of the development. An upgrade to this sewage pump station is anticipated with a duplication to upgrade the existing rising main.

SINCLAIR KNIGHT MERZ

FIGURE 2.1
LOCAL DRAINAGE

BREMER BUSINESS PARK



FILENAME: FIG 2.1.DWG
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ATTACHMENT B – FLOODING RESPONSE

See attaced DR – MIKE 11 flood model.

ATTACHMENT C – TRAFFIC RESPONSE

1. Basis of Response

It is considered that some of the items in the Information Requests from both Council and DMR are premature at this stage of the planning process. This response is therefore based on providing suitable information at this stage, with more detailed information to be provided at a later stage.

The requests are quoted in this response together with the assessment which has been undertaken at this time.

2. Ipswich City Council Requests

- *The proposal includes scope for creating a potentially significant increase in heavy vehicle traffic on River Road. Resolution of current uncertainty regarding connectivity of the site to Brisbane Road/Cunningham Highway is critical to Ipswich City Council support for the proposal.*

It has already been demonstrated in the Development Application traffic assessment that the increase in heavy vehicle traffic on River Road will be small compared to the existing problem. **Figures 2.1** and **2.2** show the forecast 2016 daily commercial vehicle flows without and with the development. It can be seen that the development would add only about 20% to the heavy vehicle flows on River Road. The existing problem needs to be addressed by a suitable connection between the Warrego Highway, Brisbane Road and the Cunningham Highway (such as the Major Intersuburban Link discussed below). The eastern road through the Business Park could be used as the basis for this link, representing an appropriate contribution by the developer.

- *The Ipswich Eastern Corridor Structure Plan Figure 2.3 identifies a proposed Major Intersuburban link from the Cunningham Highway across Brisbane Road connecting to the Warrego Highway. This link follows the electricity casement on the eastern side of the site. To this end further analysis in the form of a traffic study shall be undertaken to assess the likely impact of this road on the proposed development layout together with recommendations to maintain the integrity of this link with comments on various stages of the development. Council's Traffic Planning Branch should be consulted during the study for background information and guidance on the expected traffic outcomes.*

Such a link has been allowed for in later stages of the development. Transport modelling (in Emme/2) of the ultimate development with this link has been undertaken using Council's 2016 Emme/2 model. **Figures 2.3** and **2.4** show the forecast 2016 daily total vehicle flows without and with the development. It can be seen that without the development, this link would attract 478 vpd , increasing with the development by 1 000 vpd to a total flow of 1 478 vpd. It should be noted that this model run assumes a simple connection off Ashburn Road. To increase this flow would require remodelling of the Warrego Highway/River Road interchange, which is not necessary for the purposes of the development.

The design of the road within the development will be such that it can be simply modified to carry out the role of the Intersuburban Link. It should be noted that the main criteria for this road are that it be direct, not front residential or other sensitive land uses and that it be designed to accommodate large vehicles. Capacity and design speed are not critical aspects.

- *Local Area Traffic Management (LATM) schemes shall be addressed in detail on the existing local road network to reduce increased commercial/industrial vehicle usage. The report should provide details as to the types and location of the signs and LATM schemes which would be considered effective in limiting such usage and the contribution to these LATM schemes to be made by the BBP.*

While it is considered appropriate that an LATM study for the area to the south west of the site be carried out in association with this development, it is considered that it is too early in the process for this to be "in detail". The intention of LATM will be to exclude heavy vehicles, limit car use to those streets which have the least private dwellings and to limit car speeds along those streets. It is likely that this will be through horizontal displacement devices and threshold treatments. A connection to Vale Street will minimise the number of dwellings affected by development traffic.

- *Further analysis shall be undertaken preferably with the traffic modelling software SIDRA to determine the impacts of the proposed development of the land on intersections both within the proposed road network and the existing road network based on anticipated land use for the ultimate development. The assessment should detail the affect on the existing road network for the various stages of development together with recommendations for intersection upgrades, LATM treatments and cycle/pedestrian movements for specific threshold volumes.*

This request is generally appropriate. However, staging is still flexible so it is proposed to analyse two scenarios, an early development scenario and an ultimate development scenario. The date for the ultimate scenario will be based on the forecast completion of the development plus a design period, to be agreed with DMR and ICC. It should be noted that some SIDRA analysis has already been carried out. The further SIDRA analysis will be carried out after the major road context for the development is agreed.

- *The proposed development of the land impacts on road networks under the jurisdiction of the DMR in particular Brisbane Road, Cunningham Highway and Warrego Highway. Further consultation and approvals are required from DMR in relation to the proposed connection points to these road networks.*

Addressed in Chapter 3 of this response.

- *The provision of Public Transport and pedestrian/cycle movements through both the development and external road network shall be addressed in detail both for the ultimate development and at various stage of the development.*

It is considered that it is too early in the process for public transport and pedestrian/cycle planning to be "in detail". The proposed road network will enable good penetration of the development by bus routes. The increased public transport demand due to the development will also increase the viability of providing bus services through the Byrne Street/Bognuda Street residential area. Cycle links to the planned or existing Ipswich City Council bicycle path network will be provided. Appropriate pedestrian facilities will be provided within the development, including those to facilitate walking between the residential and other areas and providing access to bus stops.

- *Council's current road requirements for industrial/commercial and residential streets shall be complied with for this development and the plan of development altered to suit.*

This is addressed in the civil design elements of the response.

3. DMR Information Request

The Department of Main Roads (DMR) as a concurrence agency for the application raises the following matters of concern and request the following additional information

INFORMATION REQUESTED - DMR
A comprehensive traffic report that addresses the following issues:

(a) The proposed staging of the development (including timeframe);

As noted in section 2, the staging is still flexible. This response addresses the ultimate situation, with a nominal 2016 date.

(b) An analysis of the existing road network and analyses incorporating any proposed enhancements for each stage;

Forecast traffic flows have been provided in **Figures 2.1** to **2.4**. **Figures 3.1** and **3.2** show the V/D ratios for the proposed road network.

(c) For each stage of development, a plan shall be provided depicting the extent of the road network that has a minimum of 5% or greater loading of development generated traffic impact;

This information is provided in Figure 3.3.

(d) For each stage, the traffic analysis is to address how the applicant intends to mitigate the adverse impact of the development on the State controlled road network without seeking any contribution from the State or assumptions regarding enhancement of the network by others;

It is not considered reasonable for DMR to ignore the existing problems on the network (eg the lack of an adequate connection between the Warrego and Cunningham Highway) or the problems that will be caused by growth in traffic not associated with the subject development. Enhancement by others of the network, where appropriate, has therefore been assumed to distinguish the impacts of this development.

(e) In particular, the following should be analysed in detail for each stage:
- *River Road Interchange*
- *Byrne/Brisbane Road intersection*
- *Warrego Highway access to Australian Hardboards Ltd.*

This will be carried out when the major road context is agreed.

(f) If the new intersections are proposed on any State-controlled road, then the precise location and conceptual layout of the intersection are to be identified. Such new intersections are to be analysed in detail for each successive stage of the development;

A new left in-left out interchange is proposed near the western end of the development, replacing the existing access to Australian Hardboards Ltd. The intersections will be analysed when the major road network context (especially the Intersuburban link) is agreed.

(g) *Provide details of the proposed consultation program that the applicant proposes to carry out.*

Addressed elsewhere in the response.

MATTERS OF CONCERN – DMR
In considering the above, the applicant is to be aware of the following:

- *Given the size of development and the complexity of issues, it is considered that an ultimate solution/outcome would be best achieved through an iterative and consultative process, in which milestones are agreed upon by relevant stakeholders, including Main Roads and Ipswich City Council.*

It is agreed that there should be ongoing liaison as the proposals are refined.

- *Main Roads will not contribute to any proposed enhancements.*

As noted above, it is not considered reasonable for the developer to have to pay in full to address problems which are not of its making or are only partly of its making. It is considered that a connection between the Warrego and Cunningham Highways should be a Main Roads issue.

- *Main Roads has concerns as to whether a new intersection(s) with Brisbane Road can be practically achieved. This needs to be investigated with some thoroughness.*

This issue and the need for such an intersection is also of concern from a traffic viewpoint but the current proposal is understood not to include such an intersection and no allowance has therefore been made to investigate it.

- *Main Roads has doubts as to whether a new interchange can be accommodated on the Warrego Highway without closing the access to Australian Hardboards Ltd.*

This comment is accepted.

ATTACHMENT D – WATER QUALITY RESPONSE

WATER QUALITY MANAGEMENT STRATEGY

1. Pollutants of Concern

The anticipated key range of pollutants of significance that may be generated by a characteristic combined residential and industrial development are shown below.

- Litter
- Sediment
- Nutrients
- Oxygen demanding substances
- Pathogens/Faecal coliforms
- Hydrocarbons
- Heavy Metals
- Surfactants

The key pollutants that will be targeted by best management practices are:

- Litter
- Sediment
- Nutrients (Phosphorus and Nitrogen)

2. Water Quality Objectives

The water quality objectives adopted for this management strategy are based on target annual mean concentrations (AMC) (mg/L) of pollutants regarded as significant for discharge of run-off to receiving water bodies in freshwater creeks, streams and lakes.

Table 1.1 – Target Annual Mean Concentrations (AMC) (mg/L)

Suspended Solids (SS)	Total Nitrogen (TN)	Total Phosphorus (TP)	Litter
15	0.65	0.07	No material > 5mm

Source: (Guidelines on Identifying and Applying Water Quality Objectives 2000, Brisbane City Council)

3. Water Quality Modelling

The water quality modelling methodology adopted for this investigation was based estimating the runoff pollutant concentrations by hydrological calculations adopting a time series method of analysis. This method was utilised to estimate the runoff characteristics of the catchment during long-term flows. The time step adopted for this analysis was one year.

Annual Average Runoff Volume

An estimate of the annual average runoff volume (ARV) was determined by the relationship of catchment area, average annual rainfall and the annual volumetric runoff coefficient. The

Annual Volumetric Runoff Coefficient (ARVC) represents the nett yield percentage runoff from the catchment over a one-year period.

The Annual Volumetric Runoff Coefficients (ARVC) adopted for this analysis is shown tabulated in Table 6.2.

Table 1.2 – Annual Volumetric Runoff Coefficient

Type of Land Use	AVRC
Industrial	0.57
Urban	0.38
Rural	0.24
Open Space	0.15

Source: (Guidelines for Pollutant Modelling in Brisbane October 2000, Brisbane City Council)

The average annual rainfall at this site has been adopted for this analysis as 1200mm/year.

4. Pollutant Export Rates

The stormwater pollutant loads for this analysis have been predicted for the catchment by applying assumed average annual pollutant export rates for each land use composition and catchment area. The pollutant export rates adopted for this analysis are shown tabulated in Table 6.3.

Table 1.3 – Pollutant Export Rates (kg/ha/yr)

Type of Land Use	SS	TN	TP
Industrial	658	12.76	2.049
Urban	471	8.56	1.203
Rural	107	5.66	0.698
Open Space	27	0.89	0.038

Source: (Guidelines for Pollutant Modelling in Brisbane October 2000, Brisbane City Council)

5. Pollutant Retention

The required retention of pollutants necessary to achieve the adopted water quality objectives has been estimated by calculating the difference between the target AMC (mg/L) to the catchment runoff AMC (mg/L). The required pollutant retention is expressed as a percentage of this difference and the runoff AMC.

Pollutant Retention (%) = (Runoff AMC – Target AMC) / Runoff AMC

6. Existing Catchment Scenario

The existing catchment has been modelled to determine the extent of existing pollutant concentrations in the runoff.

The estimated annual mean pollutant concentrations for the total existing catchment and existing development site are summarised below.

Table 1.4 – Pollutant Concentrations (AMC) (mg/L)

Catchment	SS	TN	TP
Total Existing Catchment	48.2	1.95	0.25

7. Developed Site Scenario

The developed site scenario has been modelled to determine the extent of pollutant concentrations in the runoff.

The estimated annual mean pollutant concentrations for the developed site scenario are summarised below.

Table 1.5 – Pollutant Concentrations (AMC) (mg/L)

Catchment	SS	TN	TP
Developed Site	88.50	1.72	0.27

8. Pollutant Reduction Strategy

9. Pollutant Reduction Requirements

The required reduction in pollutant concentrations for the proposed development site is based on the target water quality objectives previously detailed Table 1.1. These reductions are summarised below.

Table 1.6 – Pollutant Reduction Requirements (%)

Catchment	SS	TN	TP
Developed Site	83.1	62.2	73.6

The proposed pollutant reduction strategy to reduce the levels of pollutants and meet the water quality objectives as described above is for each ultimate developed site to incorporate b best management practices and introduce stormwater quality improvements devices (SQIDS) during the detailed design documentation of each allotment development.

The outcomes of this strategy can be achieved by enforcing the water quality discharge requirements at the source for each building development application submitted for approval.

If Council considers that the introduction of regional water quality devices (eg wetlands) is desirable to be incorporated into the open space precincts, the balance of the pollutant reduction requirements can be enforced on developed parcels.

POLLUTANT EXPORT MODEL BREMER BUSINESS PARK

EXISTING CATCHMENT SCENARIO - TOTAL EXISTING

RAINFALL	1200	AREA	AVRC	ARV	SS		TN		TP	
CATCHMENT	USE TYPE	ha		ML	load rate (kg/ha)	load (kg)	load rate (kg/ha)	load (kg)	load rate (kg/ha)	load (kg)
Undeveloped land	Rural	305.76	0.24	880.59	107	32716.32	5.66	1730.60	0.698	213.42
Aust Hardboards	Industrial	18.7	0.57	127.91	658	12304.60	12.76	238.61	2.049	38.32
Roads	Urban	10	0.38	45.60	471	4710.00	8.56	85.60	1.203	12.03
TOTAL		334.46		1054.10		49730.92		2054.81		263.77

POLLUTANT (AMC) AND RETENTION PERFORMANCE

RUNOFF (AMC) (mg/L)			47.18		1.95		0.25	
TARGET (AMC) (mg/L)			15		0.65		0.07	
REDUCTION REQUIRED (%)			68.2%		66.7%		72.0%	

POLLUTANT EXPORT MODEL - BREMER BUSINESS PARK
DEVELOPED SITE SCENARIO – DEVELOPED SITE

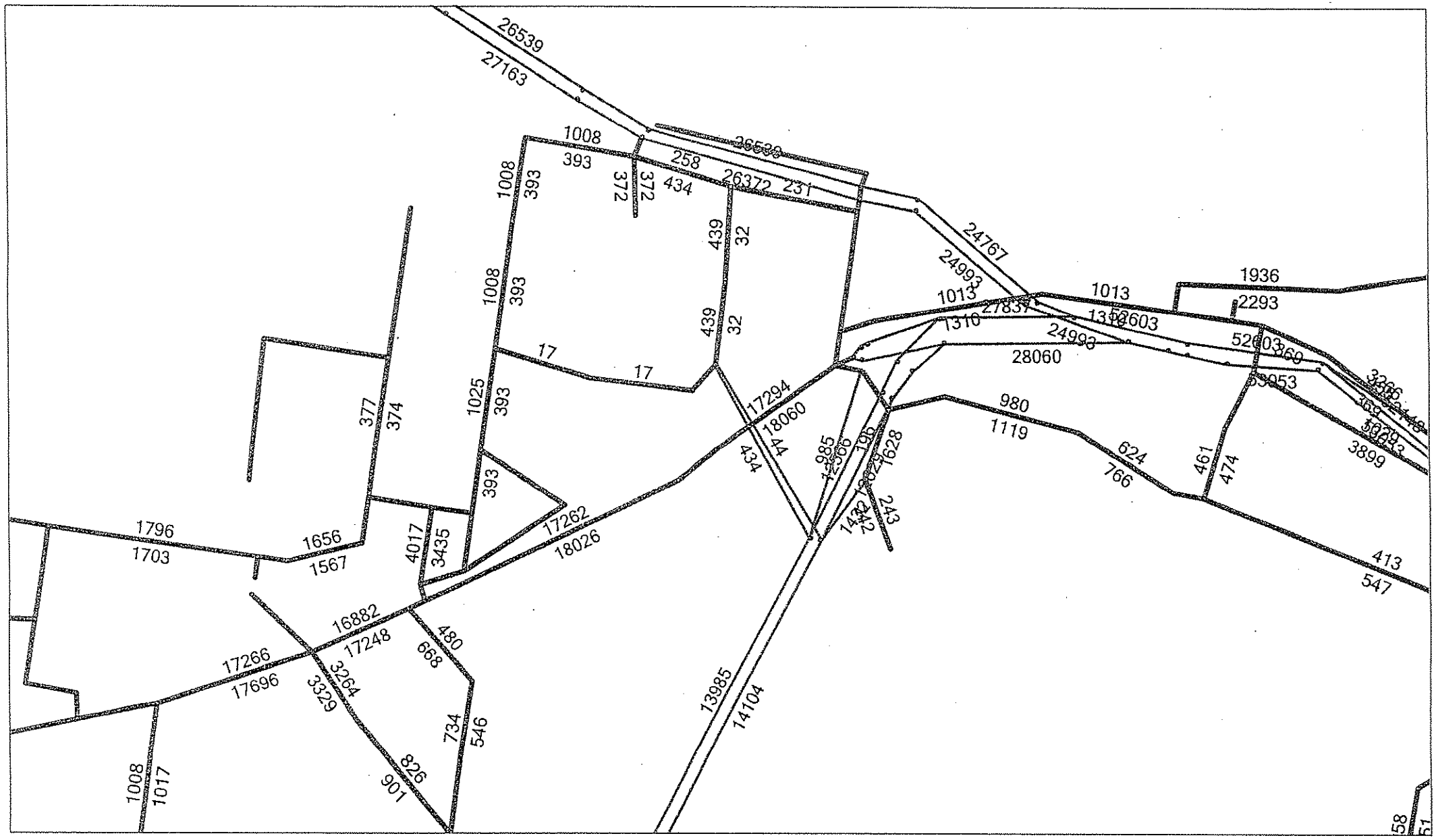
RAINFALL	1200	AREA	AVRC	ARV	SS		TN		TP	
CATCHMENT	USE TYPE	ha		ML	load rate (kg/ha)	load (kg)	load rate (kg/ha)	load (kg)	load rate (kg/ha)	load (kg)
Developed land	Industrial	170.87	0.57	1168.75	658	112432.46	12.76	2180.30	2.049	350.11
Aust Hardboards	Industrial	18.7	0.57	127.91	658	12304.60	12.76	238.61	2.049	38.32
Residential	Urban	26.19	0.38	119.43	471	12335.49	8.56	224.19	1.203	31.51
Roads	Urban	23.76	0.38	108.35	471	11190.96	8.56	203.39	1.203	28.58
Open Space	Open Space	100.86	0.15	181.55	27	2723.22	0.89	89.77	0.038	3.83
TOTAL		340.38		1705.98		150986.73		2936.25		452.35

POLLUTANT (AMC) AND RETENTION PERFORMANCE

RUNOFF (AMC) (mg/L)			88.50		1.72		0.27	
TARGET (AMC) (mg/L)			15		0.65		0.07	
REDUCTION REQUIRED (%)			83.1%		62.2%		73.6%	

Figure 2.1 2 b daily total volumes without development

Auto volumes [@vol24]



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Scenario 4000: 2016 IPSWICH 24Hr ROAD NETWORK

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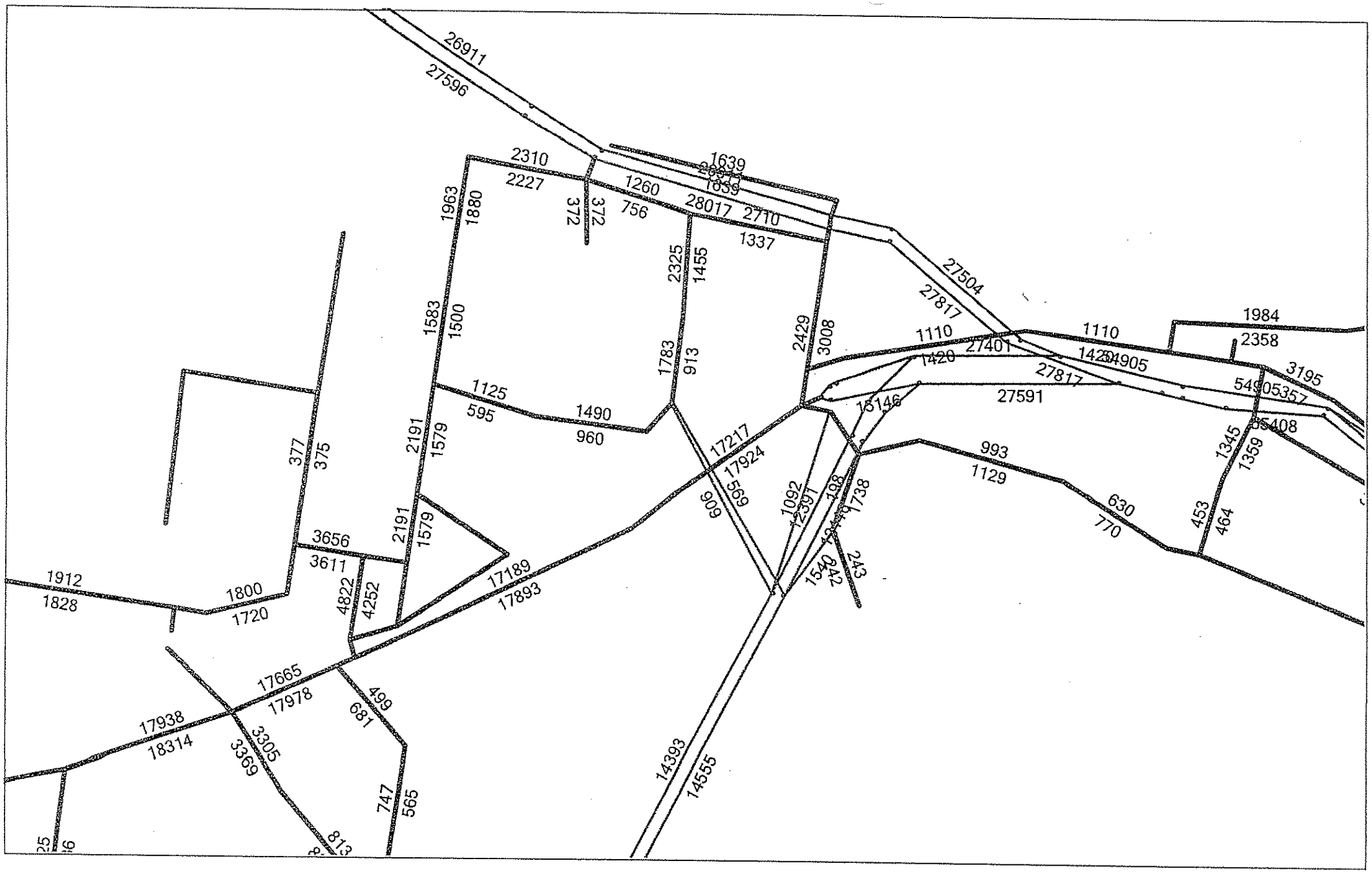

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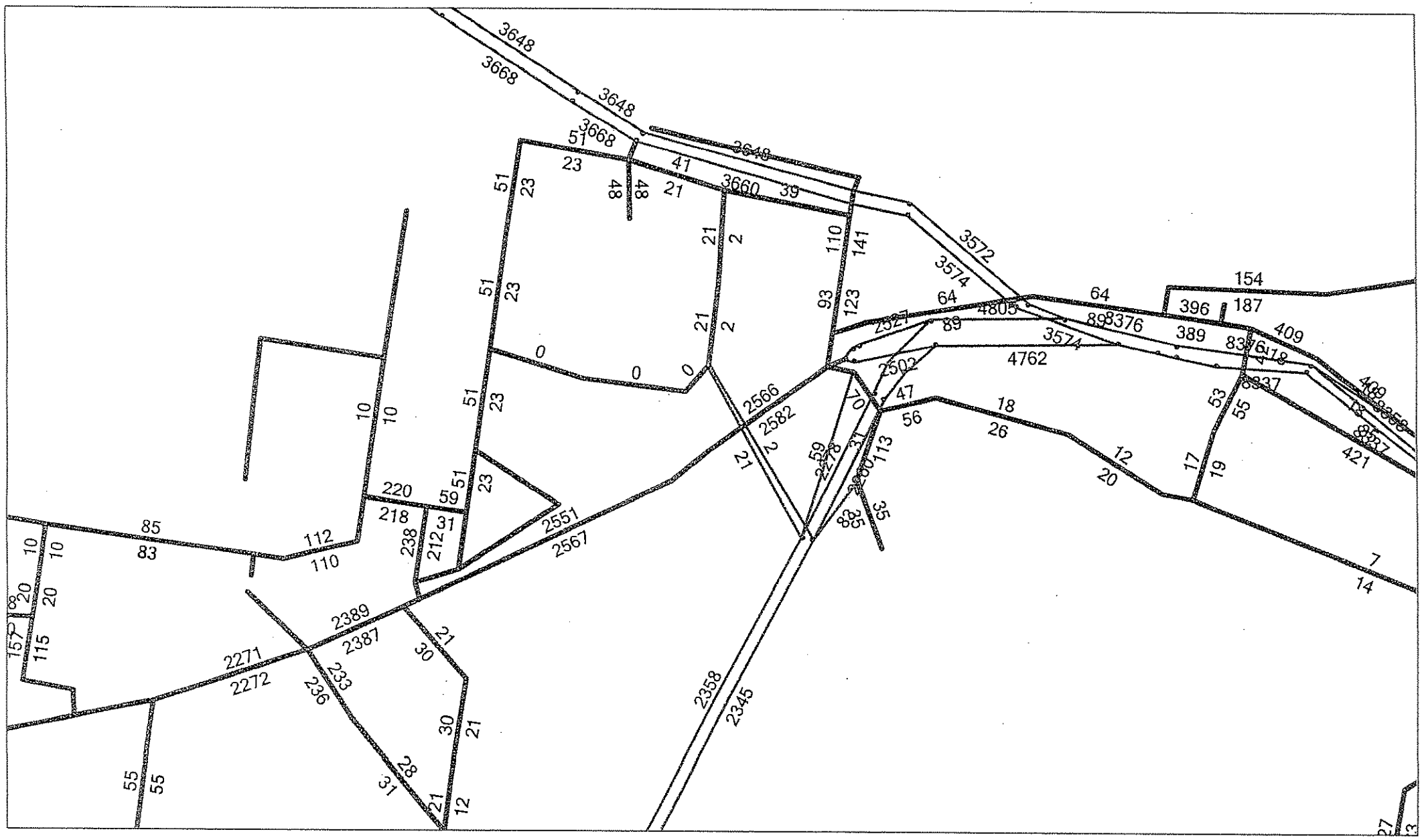
Figure 2.3 2. 5 daily CV volumes without development

Auto volumes [@cv24]



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Scenario 4000: 2016 IPSWICH 24Hr ROAD NETWORK

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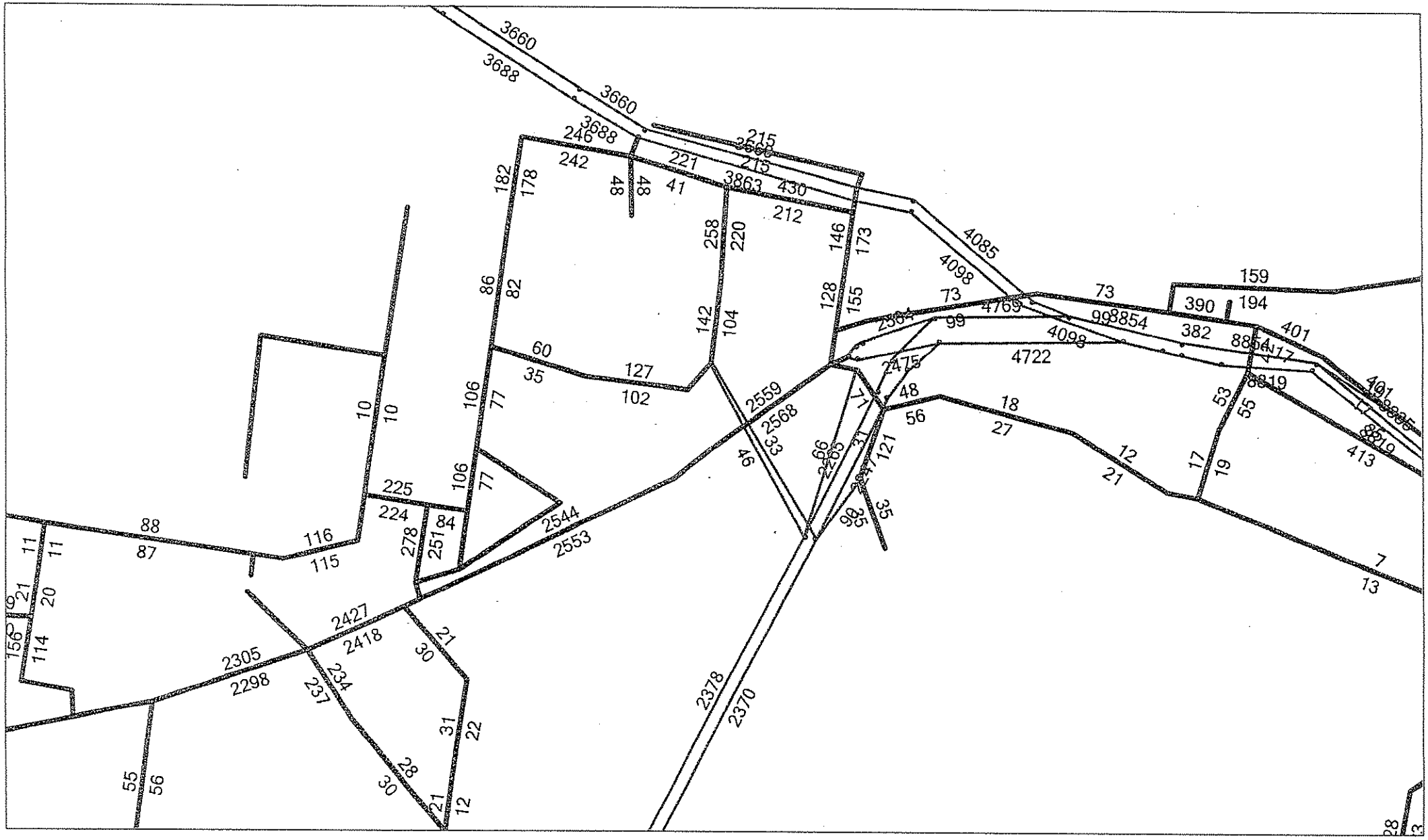
mwhatley

Figure 2.4 2 5 daily CV volumes with deve nment

Auto volumes [@cv24]



EMME/2 IPSWICH MODEL DATA BANK
Scenario 4000: 2016 IPSWICH 24Hr ROAD NETWORK

2002-11-26 16:05
mwhatley

Ipswich
City Council

Your Reference:
Our Reference: 3356/2002 JJW
Contact Officer: [redacted]
Telephone No.:

11 June 2003

Dear Sir

Re: Application for Preliminary Approval for Material Change of Use and Reconfiguration
Bognuda Street Bundamba
Bremer Business Park

I refer to the above matter and advise the following.

At a meeting on 5 June 2003 between Officers of Sinclair Knight Merz and Council, a range of matters were discussed including the current status of the Bremer Business Park application. At this meeting an outline was provided of the matters which need to be addressed prior to Council being in a position in which it could consider approval of the Bremer Business Park application. Please note that all these matters have been previously raised and with only minor exceptions, all issues are matters for which information was sought at the statutory information request stage. For your information the relevant matters are outlined below.

Open Space

The application indicates 100 ha + of open space with limited residential catchment and the application gives no indication as to how the proposed parkland fits in with the objectives for provision of urban parkland in Council's *Subdivision Code* and associated planning documents including the *Ipswich Open Space and Recreation Plan.* A considerable proportion of the areas indicated is affected by potential "problem" factors including electricity easements, drainage problems, undermining and possible site contamination. Furthermore the implications of the need to provide for urban stormwater systems in proposed open space areas have not been adequately considered.

An Open Space Master Plan needs to be provided which addresses the location and future use of open space areas. In particular the study needs to make clear how the proposal relates to Councils objectives

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48 Wharf Street
KANGAROO POINT QLD 4169

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Chief Executive Officer
Ipswich City Council
A.B.N. 61 461 981 077
PO Box 191 Ipswich Qld 4305
Telephone: [redacted]
Facsimile: [redacted]
Email: [redacted]
Website: www.ipswich.qld.gov.au

for provision of urban parkland in Council's subdivision manual and, amongst other factors needs to address the following:

- Quantum
- Location
- Quality (including site constraints and remediation)
- Ownership
- Management
- Interrelationship with water quality/quantity management systems.
- Access.

The report should clearly enunciate why the parkland is required and being within what is an industrial estate what benefit it will be to the residents of Ipswich.

Stormwater Quality

A Master Plan for Stormwater Quality (Conceptual Design Only) is required. The plan is required in order to clearly articulate, display and demonstrate, the overall approach to be taken to quality issues and clearly delineate responsibilities for management. The Conceptual Plan will establish a framework for future development which also includes the residential land and common areas such as roads. Timing of infrastructure in terms of each stage should be addressed.

By way of general comment, each industrial/commercial property needs to be able to treat stormwater on site to the required quality. For off site treatment (ie the residential area and common areas eg. roads) the associated sites need to be identified and means shown by which the required water quality will be achieved. Significant concerns are held with any proposal for treatment of stormwater from industrial etc. sites by way of major wetlands/lakes/ponds within common areas and any other proposal for Council to enter into a cost sharing agreement for control of pollutants from the land. Timing of infrastructure in terms of each stage should be addressed.

Stormwater Quantity

Stormwater management quantity issues need to be addressed in terms of the overall development with infrastructure requirements to be defined at the various stages of the development. A hydraulic study, addressing these issues, should be submitted to support the application. Timing of infrastructure in terms of each stage should be addressed.

Noise Impact Assessment

At this stage Council has insufficient detail regarding potential noise impacts of the proposal for industrial, etc. development of the land. Such information is required in order to identify any particular sensitive areas and to identify approaches at the broad estate level which can be adopted to minimise disturbance to potentially affected areas. Such measures could include recommendations for building design and positioning in critical areas, location of particular uses, etc.

A study is therefore required that thoroughly identifies current background noise levels and types and should include sampling times, additional monitoring points and a wider variety of noise level parameters. A strategy is then required by the applicant which builds upon the study and provides a development approach/assessment framework that prevents or minimises 'background creep' and complies with the intent of the acoustic quality objective. It should be noted that significant concerns

are held regarding the area on the eastern side of the development marked for central industry which is adjacent to the transmission lines and close to residents.

Air Quality

Reverse amenity issues associated with odour need to be properly assessed in respect to the proposed residential development of the land. Sources to be considered include the existing hardboards plant, the abattoir and Council's wastewater treatment plant. As stated below, and contrary to your development application, Council is unlikely to support development within the buffer of the Bundamba wastewater treatment plant. Consideration could be given to non-residential, etc development of this land.

Geotech Assessment

The preliminary geotechnical report submitted needs to be more comprehensive to define the extent of the underground mining impacts over the site.

Total Water Cycle Management

Ipswich Water has advised that a Master Plan for water and wastewater, as it relates to recycling, will need to be implemented. In particular it is suggested that the study should consider new innovations including dual reticulation, wastewater for fire fighting purposes etc.

Water

There has been no in depth water analysis undertaken for the full development. An analysis is required to consider the infrastructure required at the various stages of the development. Since the meeting Ipswich Water has accepted Sinclair Knight Merz's request for Ipswich Water to contribute 50% towards the costs of undertaking the Water Supply Study for the Bremer Business Park. Sinclair Knight Merz has commissioned John Wilson and Partners to commence this study.

Sewerage

The Developer will need to undertake a sewerage analysis to determine the sewerage infrastructure required to service the development, its impact on Council's system, how the infrastructure is provided and proposed to be funded. This information will be used in preparing a draft infrastructure agreement. Ipswich Water is not aware if Sinclair Knight Merz have commenced works in this respect.

Road Network

It is understood that the Department of Main Roads are actively considering their options in respect of the proposal and envisage forwarding their response shortly. Obviously their response may make redundant any views expressed at this stage however issues which have been raised previously include:

- The application relies on specific linkages to State Controlled road networks. Areas of concern are:-
  - Brisbane Road – across the railway;
  - Ashburn Road to the Warrego Highway;
  - River Road East (intersection with the Warrego Highway and Brisbane Road).

  There has been limited information supplied to support these linkages especially the feasibility of the connection proposed from the site to Brisbane Road.

- Notwithstanding the issue of heavy vehicle traffic particular concerns are held concerning the implications of increased commuter and light commercial traffic for the local area network to the southwest of the land (ie Byrne St, Law St, etc).
- Further traffic analysis needs to be undertaken to determine the feasibility of the connection alternatives to Brisbane Road. Please note, that Council has undertaken an assessment of the options proposed for the linkages from the Development to Brisbane Road. Based on this assessment it is considered that the option adjacent to the Ebbw Vale railway station is the preferred option for access. This option should be investigated further by the Developer as a linkage to Brisbane Road.
- Timing of infrastructure in terms of each stage should be addressed.
- More information is required regarding public transport, pedestrian access and cycleways. Also connections to railways and other key transport nodes.

Need for Commercial Development

The application has provided no economic data supporting the establishment of the proposed commercial area.

Buffering from the Warrego Highway

Council's Planning Scheme indicates a 100 metre wide buffer along the Warrego Highway. Any proposed reduction in this buffer will need justification and in particular be able to clearly demonstrate that visual quality can be retained from the Highway. Amongst other matters consideration will need to be given to treatment of changes in elevation between development sites and the highway.

Codes

It is not clear that the submitted codes will form a practical alternative to the provisions of Council's codes for industrial development. Given that these documents will be the framework for all future development of the land it is essential that they be readily useable by all parties. As one option it is suggested that Council's codes be used as a "base" code for development of the land and for this to be supplemented with additional requirements only where required to match specific objectives/needs for each precinct in the land.

In summary it is recognised that there is likely to be need for further discussion in relation to preparation of the material outlined above. Officers welcome any opportunity to discuss these matters. Please refer any enquiries to [redacted] or Natalie Handyside on [redacted]

Yours faithfully

Brendan Nelson
DEVELOPMENT MANAGER

Sinclair Knight Merz
369 Ann Street, Brisbane 4000
PO Box 246
Spring Hill QLD 4004 Australia

Tel: [redacted]
Fax: [redacted]
Web: www.skmconsulting.com

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Ipswich City Council [redacted]

RECEIVED
- 3 OCT 2003
Doc. No. 687839
cc DIV 11
cc [redacted]
cc B. Nelson

Development Manager
Ipswich City Council
50 South Street
Ipswich QLD 4305
Attention: Brendan Nelson

01/10/2003

L_Response to Issues.doc
RE07154

Dear Brendan

Bremer Business Park – Response to Council Issues

In response to letter dated 11 June 2003, please see the attached information which addresses the issues raised by Council.

A number of changes to the development proposal have occurred as a direct consequence of concurrence agency and Council directions. These changes are:

a) the Land Use Plan is changed to provide Frame Industrial and Commercial Precinct areas adjacent to Dinmore and Bundamba residential areas as a transition and as a means of addressing acoustic and other impacts;

b) Landscaped buffers are proposed along the Warrego Highway and the south-west boundaries adjacent to the existing residential areas;

c) Access to the Warrego Highway vis Bognuda Street has been deleted to address the Department of Main Roads requirement to preserve a possible highway connection including a slip lane onto the Warrego Highway;

d) A corridor for possible future State and regional road connections is provided along the eastern side of the site, to the west of the existing electricity transmission lines; and

e) The area of proposed residential land is reduced to address Council and Environmental Protection Agency concerns over the operations of the Bundamba sewerage treatment plant.

These changes have all been made in good faith as outcomes of extensive consultation and negotiation with the Council and concurrence agencies. These changes arise from directions from the Council and the concurrence agencies, we submit that the application need not be considered as a 'changed application' returning to the Acknowledgment stage of IDAS. Your concurrence and action on this point is sought.

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From the issues raised by Council the following information is submitted for Council's consideration.

Open Space
An Open Space Master Plan has been prepared for Council's consideration.

Stormwater Quality and Stormwater Quantity
A Stormwater Quality Master Plan has been prepared for the Bremer Business Park.

Noise Impact Assessment
No further information is submitted in regards to the potential noise impact of the Bremer Business Park.

Sinclair Knight Merz on behalf of the Applicant, in discussion with Council and the Environmental Protection Agency have amended the Bremer Business Park Land Use Plan as follows:

- a reduction in the amount of residential land uses in the south west section of Bremer Business Park and included that land in the Frame Industrial and Commercial Precinct, and
- converted the Central Industry Precinct in the south east section to Frame Industrial and Commercial (refer to attached Land Use Plan).

There have also been some minor changes to the Assessment Tables in the Plan of Development. These changes have been made, consistent with discussions with the Council and the Environmental Protection Agency to ensure that those uses which are considered to be high noise generators will be subject to impact assessment procedures.

Also included for Council's consideration are a set of draft conditions which were drawn up by Sinclair Knight Merz and amended by the Environmental Protection Agency to satisfy their issues in regards to noise. We understand these 'amended' conditions will now be acceptable to the Environmental Protection Agency.

Air Quality
The draft conditions that were drafted in conjunction with the Environmental Protection Agency also address concerns relating to air quality. Air quality objectives are inherent in the draft conditions. We submit that the conditions, together with site specific air quality measures, provide the most objective means of managing impacts and maintaining acceptable air quality. We also submit that, through the Plan of Development, those uses impacting on air quality will be subject to impact assessment. In these circumstances any further monitoring is not warranted at this stage.

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Geotechnical Assessment

The preliminary geotechnical report submitted previously to Council, together with the Council's investigations undertaken as part of the preparation of the new planning scheme are more than adequate for the purpose of identifying potential risk areas for mine subsidence. Further and more detailed investigations would be undertaken as part of the Material Change of Use applications which will be required for each individual site.

Water and Sewerage

Preparation of Water and Sewerage Infrastructure Plans are currently being prepared these will be forwarded to Council as soon as they are available.

Road Network

We refer you to the lengthy negotiations held by the applicant, the Council and the Department of Main Roads in relation to the highway connections (Warrego Highway – Cunningham Highway) and local connections (Warrego Highway – Brisbane Road). We make the following points:

a) there is no need for a connection between the Warrego highway and the Cunningham Highway arising from this application and there is no need for such a connection to pass through Bremer Business Park;

b) Wingate Properties is prepared to set aside land for a period of 12months from the approval of this Development Applications, to enable Department of Main Roads to investigate both the need and possible alignment of a possible future highway connection;

c) there is no need for a connection between the Warrego Highway or Ashburn Road, and Brisbane Road as a consequence of this development;

d) Wingate Properties is prepared to contribute towards the cost of constructing a connection of a standard industrial road providing it can access the road and providing further that such contribution is not required until stages 1 and 2(a) are completed (see attached Staging Plan and letter to the Department of Main Roads).

e) Wingate Properties has explored options for gaining access for the road mentioned in (c) and (d) to Brisbane Road. A potential solution exists involving the use of State land.

A traffic report has been prepared in response to the issues raised by Council. In particular this report examines the local traffic requirements, in particular Local Area Traffic Management (LATM), likely to be needed as a result of the Bremer Business Park.

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Need for Commercial Development

A commercial needs assessment report has been prepared and is attached for Council's consideration.

Buffering from the Warrego Highway

A buffer has been indicated on the Land Use Plan for the buffer to the Warrego Highway. The width of the buffer varies and should be subject to further detailed design in the context of subsequent development applications. To assist Council, the proposed subdivision is amended to convert the highway lots into large 'superlots' for subsequent and more detailed assessment.

The buffer as indicated in the Planning Scheme is nominally 100m and is subject to further investigation. The allotments fronting the highway will incorporate a densely planted landscape buffer say of 20m width, to the highway.

Densely planted vegetation and mounding and other landscape treatments, will adequately limit the views into BBP from Warrego Highway. Views into the Bremer Business Park from the Highway through the landscaped buffer would be limited and filtered to high quality industrial development.

Other contributing factors in the provision of a landscape buffer include the uncertainty surrounding the location of the proposed road to link the Warrego and Cunningham Highways and the potential upgrade or re-routing of the Warrego Highway. A subset of these issues is that the location of the on and off ramps has the potential to impact on the Bremer Business Park layout.

Codes

The Plan of Development has been amended to ensure the Bremer Business Park Development Codes give reference to Council's planning scheme codes. Where the codes overlap the provisions of the Planning Scheme Codes will prevail.

The above information is considered satisfactory in response to the issues raised by Council in regards tot he processing of the Bremer Business Park Development Application, it is requested that the assessment of the application continue.

A Contaminated Site Assessment Report for the Cattle Dip on Lot 13 on SL2982 was recently submitted by Sinclair Knight Merz to the Environmental Protection Agency. This report has been assessed by the Environmental Protection Agency with the decision to record the

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particulars of the land on the Environmental Management Register. A similar report was submitted by Earth Tech Engineering to the Environmental Protection Agency for the KSB Ajax pumps site, described as Lot 2 on RP86838. The Environmental Protection Agency have assessed this report with the decision for the site to remain on the Environmental Management Register. The Environmental Protection Agency have advised that no further work is required at this stage for either of these sites. Copies of the Environmental Protection Agency's responses are included for Council's information.

With regards to the issue of cultural heritage, of concern to the Environmental Protection Agency, we are actively seeking to arrange further meetings with the indigenous groups who have expressed an interest in the site. As discussed with the Council at our last co-ordination meeting (4 September 2003), the preparation of a Cultural Heritage Management Plan could be required as a condition of approval.

Should there be any questions with the above information please don't hesitate in contacting either myself on phone [redacted] or email [redacted] or in my absence Sue [redacted] on phone [redacted] or email [redacted]

Yours faithfully

[redacted]

[redacted]

Principal,
Environmental Planning
Phone: [redacted]
Fax:
E-mail:

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1. Introduction

The Open Space Master Plan for Bremer Business Park addresses the planning, delivery and management strategies necessary for the successful creation of a wide range of open space settings and recreation opportunities available in Bremer Business Park for the residents of Dinmore, Bundamba and Ebbw Vale.

The open space to be created as part of the Bremer Business Park project will serve multiple functions including:

- higher order open space and recreation functions within the City, with the creation of a riparian linear park along the Bremer River and the creation of suburban playing and sports fields, all linked by walkways, cycle paths and equestrian trails
- local open space and recreation functions for local and neighbourhood residents through the provision of picnic and play areas, paths and trails, playing fields, remnant and revegetated bushland, riparian corridors, and water-based recreation along the Bremer River;
- water management, including stormwater quality management, and local flood conveyance and management.

The Open Space Master Plan has been prepared in response to the Ipswich City Council and the requirements of the existing Planning Scheme (*Subdivision Code*) and the draft IPA Planning Scheme (*Planning Scheme Policy 3 – General Works – Standards and Design of Parks*) presently on public display.

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2. Purpose of the Master Plan

The Bremer Business Park Open Space Master Plan provides the mechanism for the staged delivery of:

- an economic open space system appropriate for the location and community needs;
- a range of recreational settings and experiences suitable for the site and linked through a path system based on the natural corridors in and beyond the site;
- a development and maintenance regime appropriate for the multiple settings and benefits intended.

The intention of the open space master plan is to ensure the timely and staged transfer of land within Bremer Business Park to the Crown, with the health and Ipswich City Council acting as trustee.

2.1 Context

The Bremer Business Park is a proposal for the development of an integrated business and industry complex over approximately 319.09 hectares situated strategically in the Eastern Corridor of Ipswich. Bremer Business Park will create a significant employment in the City in the range of 2500 – 5120 new jobs arising over the anticipated 15 year period to 'build out'.

The Bremer Business Park is highly accessible to the State highway network with frontage to the Warrego Highway and close proximity to the Cunningham Highway. The site is also well connected to the local road network.

The Bremer Business Park is situated along a meandering section of the Bremer River, not far upstream of its confluence with the Brisbane River. Across the river to the north is the rural residential area of Karalee. The residential areas of Dinmore, Bundamba and Ebbw Vale are adjacent to the site on its eastern, western and southern sides, respectively.

2.2 Need for Open Space

There is an existing future need for a range of recreation opportunities, provided in a diverse range of open space and other settings, arising from the existing population and the possible additional residential population. According to the 2001 census of housing and population, the estimated residential population in the locality was 7260, see **Table 2-1** below.

- Table 2-1 – 2001 Estimated Residential Population

Suburb	Population
Bundamba	5729
Ebbw Vale	574
Dinmore	957
Total	**7260**

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The population trends suggest the local population is stable and unlikely to grow without further development or re-development.

There will also be a future need for recreation opportunities arising from the health and well-being' programmes necessary to support and sustain the workforce of the Bremer Business Park.

As part of its strategic planning intentions for the areas, the Ipswich City Council requires the dedication of land along the Bremer River corridor, and other drainage corridors, for open space purposes.

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3. Open Space Settings

The Bremer Business Park open space system is comprised of diverse land types, offering a range of open space settings, including:

- riparian corridors along the Bremer River offering views of and access to the Bremer River for canoeing, walking and cycling, picnicking and, under appropriate management, horse-riding.
- local watercourses offering opportunities for walking and cycling, picnicking, possibly water play in controlled circumstances, landscape enhancement, and water quality management, habitat enhancement and wildlife corridor development;
- a small, remnant, regionally significant ecosystem situated along the eastern boundary, contiguous with the Dinmore residential area west of River Road requiring protection from development in Bremer Business Park and providing a strong landscaped buffer and opportunities for limited contact to the residents of Dinmore;
- open woodland on gently sloping land offering opportunities for walking and cycling, horse-riding under appropriate management, picnicking and nature appreciation; and
- open rural land previously cleared and used for grazing and effluent irrigation, providing extensive opportunities for developed open space for active recreation, sports and informal recreation, as well as opportunities for floodplain storage and water quality management.

The open space to be provided with the development of Bremer Business Park is comprised as follows in **Table 3-1**:

- Table 3-1 – Open Space Settings

Setting	Area (ha)
Riparian corridor (Bremer River)	34.200
Local watercourses	36.325
Regionally significant ecosystem	2.125
Open woodland	5.800
Open rural land	24.825
Total	**103.275**

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4. Master Plan Objectives

The principal objective for the Open Space Master Plan for Bremer Business Park is:

> ***To provide a mechanism for the staged delivery of high quality public open space offering a range of recreational experiences to the residents of Bundamba, Dinmore, Ebbw Vale and North Booval.***

Secondary objectives for the Open Space Master Plan for Bremer Business Park are:

- *To protect and ultimately enhance the riparian corridor as an ecological, landscape and recreational resource for the residents of the City;*
- *To protect remnant vegetation of regional significance for the benefit of future generations and for its habitat and biodiversity values;*
- *To protect and enhance the cultural heritage, landscape and aesthetic values of the open space for the enjoyment of present and future generations;*
- *To provide an effective buffer to existing and possible future residential areas from the impacts of industrial and business activity in Bremer Business Park; and*
- *To provide for urban water management and flood storage for the Bremer River catchment within the site in appropriately landscaped settings*

SKM

5. Open Space Categories

5.1 Distribution

The Open Space Master Plan for Bremer Business Park proposes four different categories of open space, as described in the draft IPA Planning Scheme Policy 3 – General Works (*Standards for the Design of Parks*). The distribution of open space is as follows in **Table 5-1**:

Table 5-1 – Open Space Categories

Categories	Area (ha)
Suburban Sports Ground (level 3)	13.975
Play & Picnic Park (level 3)	1.750
Waterside Parkland (level 2)	7.850
Linear Parkland (level 3)	79.700
Total	**103.275**

5.2

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5.3 Suburban Sports Ground

5.3.1 Location & Accessibility

The suburban sports ground is to be sited in a large area designed and constructed for flood storage off the Bremer River, along the western edge of Bremer Business Park. Access to the sports ground is available off Bognuda Street and River Road (West).

Linkages are to be provided via a proposed multi-modal pathway extending into the proposed Bremer River linear parkland, the nearby play and picnic park proposed on Bognuda Street, the adjacent residential areas of Bundamba to the south, and the internal pedestrian and cycle path system of Bremer Business Park.

Vehicular access through the precinct will be provided to service maintenance requirements and to provide short-term access to the canoe launching and other facilities in the waterside parkland. The standard of construction should facilitate all weather access, erosion control and meet anticipated traffic flows.

5.3.2 Recreation Range & Opportunities

The suburban sports ground is intended to provide:

- two constructed full sports fields suitable for cricket, all football codes and other field sports (eg hockey, athletics);
- facilities including changing rooms and toilets suitable for club use, public toilets, and car parking;
- an open but unconstructed area for informal golf practice, and possibly for organised field activities such as archery;
- a constructed mountain bike and BMX track with surface treatments to extend only to compacted earth mounds and limited surface drainage.

5.3.3 Facilities & Infrastructure Requirements

The suburban sports ground will be supported by changing rooms, publicly accessible toilets and constructed car parking areas. Any additional facilities will be provided by sporting clubs or other lessees of the sports ground and facilities. Joint user arrangements and cost-sharing arrangements should be considered.

Security lighting will be provided at any buildings. Night lighting will not be provided by the developer but may be provided in time by other parties (the Council, lessees).

The suburban sports ground should be profiled to aid drainage to maximise the potential for year-round activity. Irrigation and sub-surface drainage will not be provided.

Cricket pitches will be either turfed and maintained by clubs and other lessees, or, will be constructed of a durable artificial surface.

The informal golf practice area will be graded for improved utility and drainage. It will also be grassed but will not be irrigated or serviced with sub-surface drainage. Short-term vehicular access from the canoe access road will be provided.

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The mountain bike and BMX area will be an unstructured facility with a number of trails able to be made over the spoil material deposited on the site. Some compaction of the spoil piles is required for durability and for drainage. Surface drainage has the potential to be turbid and will be passed through a sedimentation pond before release to the Bremer River. Drainage waters may be used for dust suppression or for recreational purposed.

The mountain bike and BMX area is for non-motorised activities only.

5.3.4 Landscape Character

The landscape character for the suburban sports ground is determined by the openess required for active sporting activities. Definition of the space will be provided by themed planting along the path system and around the perimeter of the playing fields. Detailed landscaping of the batter slopes along the southern edge of the precinct will provide for grassed seating areas for viewing sporting activities, as well as low maintenance, native ground covers for erosion control and durability.

The landscape character will provide a definite edge to the Bundamba wastewater treatment plant to the west and the future business and industry land to the south and east.

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5.4 Play & Picnic Park

5.4.1 Location & Access

The play and picnic park is to be located on the western side of Bognuda Street. It will be in the vicinity of the proposed community centre and proximate to the existing and proposed residential areas to the south.

The play and picnic park will be directly accessible from Bognuda Street and will be provided with off-street car parking. The park will also be directly accessible from the multi-modal pathway system in Bognuda Street and from the west.

5.4.2 Recreation Range & Opportunities

The play and picnic park is intended to provide:

- opportunities for family or small community gatherings and picnicking purposes;
- a 'kick-around' area with a minimum dimension of 30 metres; and
- an imaginative play area, which is to be the subject of detailed design, including opportunities for climbing, hiding, spatial awareness, water play and construction.

5.4.3 Facilities & Infrastructure Requirements

The play and picnic park will include a constructed, sealed car park with access from Bognuda Street. The car park will include one enlarged bay for the parking and use of a mobile kiosk or vendor (eg ice cream, coffee, food).

The play and picnic park will include shelters, BBQs and publicly accessible toilets. Consequently, a reticulated water supply, sewerage and electricity will be extended to the park.

Security lighting will be provided for the toilets and some lighting will be provided for the BBQ and picnic areas for extended hours use. Lighting will be complementary to the theme of the park and will be suitable for park use.

There will be a connection with the multi-modal pathway in Bognuda Street and also with the pathway in the linear park to the west.

The park will be well drained, with drainage flowing towards the overland flow path adjacent to the pathway in the linear park to the west.

5.4.4 Landscape Character

The landscape character of the play and picnic park will be linked to the theme of the imaginative play area (eg extensive use of climbing trees – *Ficus sp*). The surface treatment could include the effective use of mounding in key areas such as the imaginative play area, providing public safety and adequate levels of surveillance can be achieved.

The themed street planting in Bognuda Street will provide a formal edge to the park.

The kick around area will provide an openness and an identity for the park. It will be ringed by theme trees and will be grassed and maintained to a level suitable for this use.

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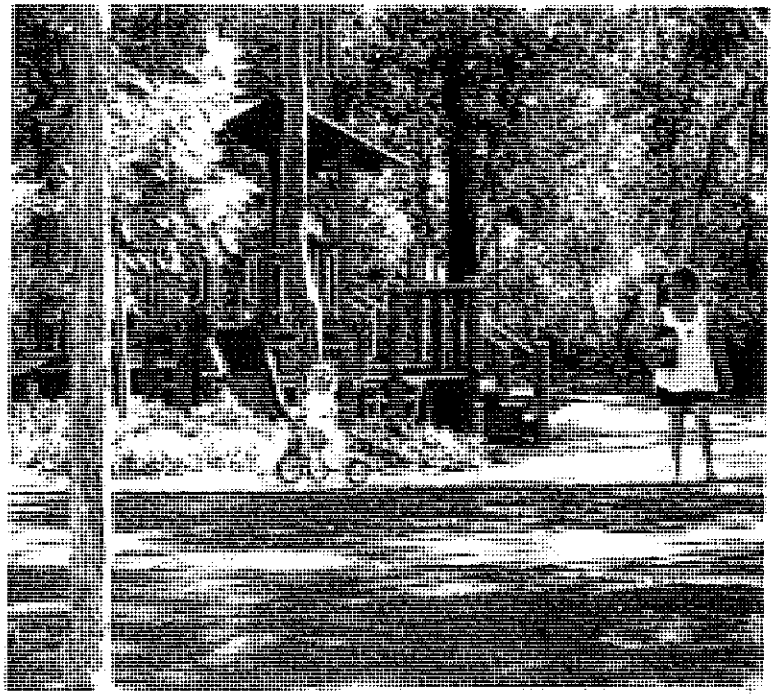
Landscaping will include screen landscaping to the southern boundary adjoining the existing residential and trucking business. Other landscaping will allow permeable views of the park, for casual surveillance from Bognuda Street and from the pathway system in the linear park forming the western boundary of the park.



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5.5 Waterside Parkland

5.5.1 Location & Access

The waterside parkland is located in the north-west corner of Bremer Business Park. It is bounded by the Bremer River and the Warrego Highway and on its western side, shares a boundary with the Bundamba wastewater treatment plan. The southern edge of the waterside parkland is formed by the suburban sports ground. The informal golf practice area and the mountain bike and BMX area define the southern boundary.

Access to the waterside parkland will be from the pathway system in the linear park following the Bremer River and also the path in the suburban sports ground.

5.5.2 Recreation Range & Opportunities

The waterside park is intended to provide:

- opportunities for river-based recreation such as fishing and canoeing – a canoe trail can be established along this section of the Bremer River;
- opportunities for nature appreciation, walking and cycling along the Bremer River; and
- opportunities for informal picnicking along the Bremer River.

5.5.3 Facilities & Infrastructure Requirements

The waterside park will provide a canoe launching facility, most likely taking the form of a river access ramp constructed with a non-slip, corrugated concrete surface. A short-term wash-down area and short-term stowage racks will also be provided for canoes. The wash-down area will be constructed with a well-drained, porous surface, which could be subsequently upgraded to concrete or bitumen if high usage requires.

The canoe access facility will be supplied with water but not with sewerage. Toilets and changing rooms can be shared with the suburban sports ground in the short to medium term. If high usage or club usage of the canoe facility is established, separate toilets and change rooms could be provided.

Short-term vehicle access will be provided to aid in the transportation of canoes but no parking will be provided. Car and trailer parking will be shared at the centrally located car park at the suburban sports ground. Vehicle access to the canoe launching facility will be constructed to a gravel road standard only, or to a similar resilient surface lending to the rural and informal theme of the park.

Security lighting will only be provided in the long term and only if club facilities are established at the canoe launching facility.

Pathways will be extended through the waterside park as part of the overall pathway system in Bremer Business Park. Pathways will recognise the potential for future extensions along the Bremer River to the west.

Some high-use picnic areas, supported with fireplaces and sheltered tables, will be provided at vantage points along the Bremer River (ie adjacent to the Warrego Highway ramparts and the canoe launching facility.

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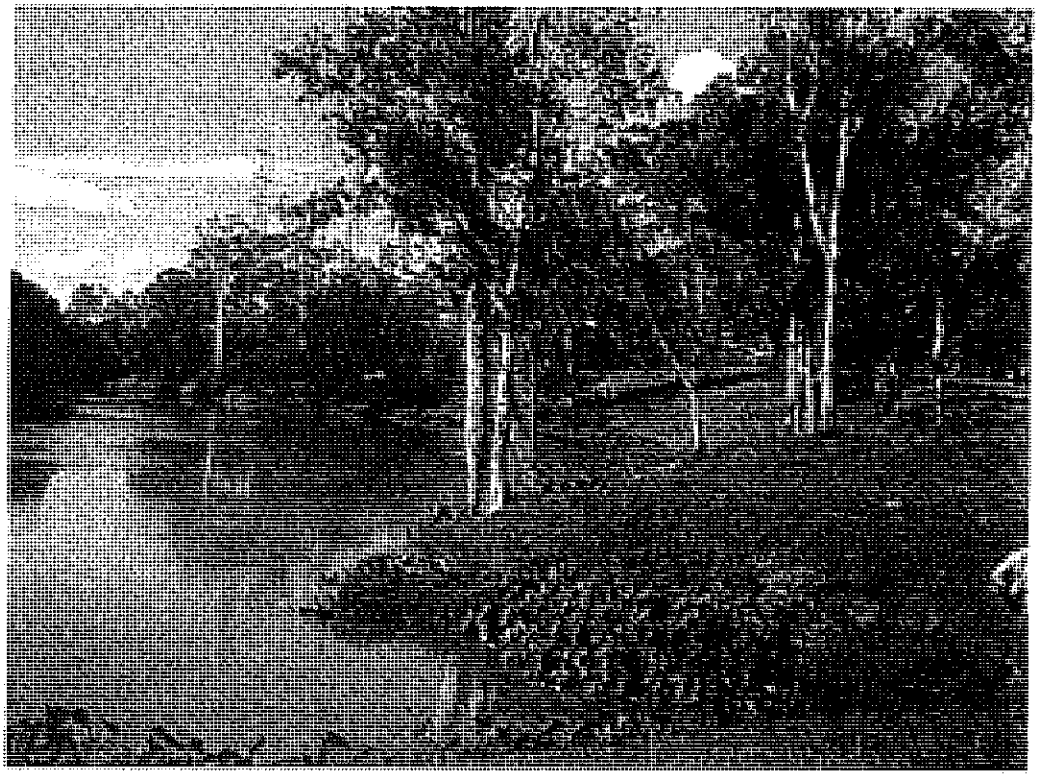
5.5.4 Landscape Character

The landscape character of the waterside park will be based on the riparian theme. The landscaping will reinforce the remnant vegetation with some themed plantings to define the pathways through the park. Some cleared areas will be provide to yield views along the river, to provide opportunities for informal picnicking and to ensure an adequate level of casual surveillance is available for key activity areas.

Additional plantings will not be high density to provide for natural regeneration of the riparian vegetation and to maintain an openness necessary for public safety, comfort and amenity.



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5.6 Linear Parkland

5.6.1 Location & Access

The linear parkland is the most extensive form of open space to be provided in Bremer Business Park. The parkland commences in the south-east corner of Bremer Business Park adjacent to the railway and the residential areas of Dinmore, and follows the ephemeral stream through the regionally significant eucalypt woodland across the Warrego Highway to its confluence with the Bremer River.

The linear parkland then extends both upstream and downstream along the Bremer River to provide an extensive riparian open space system. Upstream, this system joins with the waterside park and the suburban sports ground. The linear parkland then extends further south into Bremer Business Park on a line parallel with Bognuda Street to link with the play and picnic park and the residential areas of Bundamba.

Access to the linear parkland will be available from the residential area of Dinmore and from the residential areas of Bundamba via Bognuda Street. Access to the linear parkland north of the Warrego Highway will be provided, in step with the development of an internal road system in that part of Bremer Business Park.

The linear parkland will enjoy high-level regional access from the Warrego Highway.

5.6.2 Recreation Range & Opportunities

The linear parkland will provide:

- opportunities for walking, jogging and cycling along a network of constructed paths;
- opportunities for horse-riding along separate, marked equestrian trails along the Bremer River, through the linear parkland and on the dry flood storage basin to be constructed north of the Warrego Highway;
- opportunities for nature appreciation in the remnant woodland and regenerated bushland along the drainage system and along the Bremer River;
- opportunities for informal picnicking at the many vantage points along the Bremer River, acessible from the pathway system;
- opportunities for river-based recreation (canoeing, fishing) from the Bremer River canoe trail and the potential landing points along the river frontage;
- landscaped buffers to the existing residential areas of Dinmore and Bundamba, the rural residential areas of Karalee, the industrial areas of Dinmore (AMH), and the possible future research and technology-based activities of Bremer Business Park;
- water quality management through the reinstatement of the watercourse of the ephemeral stream and the construction of waster quality control ponds (also suitable for model boats); and
- flood storage capacity in dry detention basins suitable for a range of recreational uses (eg horse-riding, model aeroplanes away from horses and transmission lines).

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5.6.3 Facilities & Infrastructure Requirements

The linear parkland will provide an extensive network of pathways suitable for walking, jogging, cycling. Construction standards will be appropriate for the level of use, with a base standard of compacted gravel, possibly with a cracker dust, or similar, surface. Drainage will be incorporated into pathway construction to avoid scouring and surface erosion.

Because the linear parkland is intended to achieve a rural or semi-natural experience, there will be no lighting and no safety barriers along the pathway system. There will be warning signs erected in advance of corners and at locations where the crossfall gradient might increase the potential for accidents. There will also be warning signs advising users of the trail experience erected at all trail heads.

Equestrian trails, separate from the pedestrian and cycle pathways, offering a range of experiences, will be provided. The standard of construction will be compacted gravel with a boxed, loose surface material. Trail drainage will be provided to avoid scouring and surface erosion. The equestrian trails will meander through the existing and regenerated bushland, and will combine with the 'open paddock galloping' areas in the dry flood storage basin to provide a diverse and extensive area for informal horse-riding.

Publicly accessible toilets and a car and trailer parking area will be provided at the western entrance to the 'horse paddock' situated north of the Warrego Highway.

With increased use in the longer term, equestrian club facilities could be provided, including stabling, meeting room and other club facilities. The flood storage basin could be used, on a temporary basis, for equestrian events, providing surface conditions are suitable and meet the standards necessary for such events.

Informal activity areas for viewing, nature appreciation and picnics will be provided along the Bremer River pathway section. An interpretative board will be placed adjacent to the place of cultural heritage significance (old coal loader) north of the Warrego Highway. A number of interpretative boards will be placed along the pathway system explaining the indigenous interests and cultural values of the Bremer River and its environs. This work will be undertaken in consultation with representatives of the local indigenous groups in the Ipswich area who have an interest in the land.

In the longer term, two additional canoe landing places may be provided along the Bremer River, downstream from the Warrego Highway crossing. These landing places would be small, constructed ramps, suitable only for short-term use and visitation to the linear park. No vehicular access would be provided to these landing places.

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5.6.4 Landscape Character

The landscape character of the linear park is predominantly bushland, based on the regionally significant eucalypt ecosystem in Dinmore, and the regeneration of the eucalypt woodland to the north of the Warrego Highway. The bushland theme will extend to the regeneration of the riparian corridor.

Supplementary planting of endemic species in the linear park will enhance the open space buffer to the existing residential areas of Dinmore and Bundamba.

Open areas in the linear parkland will be planted with native grasses suited to the soils and climate.

The 'horse paddock', being the dry flood storage basin north of the Warrego Highway, will be open and grassed to maintain its primary hyrdological function.

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6. Implementation Mechanisms

6.1 Overview

The implementation of the Open Space Master Plan for Bremer Business Park is the responsibility of the Ipswich City Council. Compliance with the master plan will be achieved through a combination of:

- conditions on development approvals made for sites in Bremer Business Park;
- administration of the Council's works program for the open space; and
- community involvement by sporting clubs, recreation associations, nature and conservation groups and other broad-based community interests.

Some areas of land within the proposed open space are included on the Environmental Management Register and the Contaminated Land Register held by the Environmental Protection Agency. The master plan proposes a strategy for delivering this land, free of constraint, to the Council as suitable, public open space.

6.2 Staging

The intended staging of the delivery and development of the open space in Bremer Business Park is presented in **Table 6-1**. The staging for delivery of the Bremer Business Park Open Space network is directly related to the stages for development of the park as a whole, refer to the attached Staging Plan (JD2322-00-054).

Table 6-1 – Staging of Open Space

Open Space Component	Stage	Area (ha)
Linear Parkland (east – Dinmore)	1	14.825
Linear Parkland (west – Bognuda Street)	2	6.625
Play & Picnic Park		
Suburban Sports Ground	3	23.325
Waterside Park		
Linear Parkland (north-west – Ashburn Road)		
Linear Parkland (balance area)	4	58.500
Total Area (ha)		**103.275**

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6.3 Delivery of Open Space

The staged delivery of open space in Bremer Business Park will be in accordance with the schedule set out in **Table 6-2**.

- Table 6-2

Stage	Open Space Components	Actions	Responsibility
1	Linear Parkland (east)	▪ Transfer of land to Crown	Developer
		▪ Construction of pathways & water quality management features	
		▪ Supplementary landscaping	
		▪ Acceptance & use of open space	Council
2	Linear Parkland (west @ Bognuda St)	▪ Transfer of land to Crown	Developer
		▪ Construction of pathways	
		▪ Landscaping	
		▪ Acceptance & use of open space	Council
	Play & Picnic Park (@ Bognuda St)	▪ Transfer of land to Crown	Developer
		▪ Construction of car parking, facilities, extension of infrastructure, pathways	
		▪ Landscaping (planting, drainage)	
		▪ Acceptance & use of open space	Council
3	Suburban Sports Ground (@ Bognuda St)	▪ Remove site from EMR / CLR – site investigations & remedial works	Developer
		▪ Transfer of land to Crown	
		▪ Completion of bulk earthworks for dry flood storage basin off Bognuda Street, including profiling of playing fields	
		▪ Construction of car parking, facilities, lighting, extension of infrastructure, pathways	
		▪ Landscaping (planting, drainage)	
		▪ Acceptance & use of open space	Council

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Stage	Open Space Components	Actions	Responsibility
	Waterside Park (@ Ashburn Rd)	▪ Remove site from EMR / CLR – site investigations & remedial works	Developer
		▪ Transfer of land to Crown	
		▪ Construction of vehicle access, canoe access ramp, facilities, extension of infrastructure, pathways	
		▪ Landscaping (planting, drainage)	
		▪ Acceptance & use of open space	Council
	Linear Parkland (north-west @ Ashburn Rd)	▪ Remove site from EMR / CLR – site investigations & remedial works	Developer
		▪ Transfer of land to Crown	
		▪ Construction of pathways	
		▪ Landscaping (planting, drainage)	
		▪ Acceptance & use of open space	Council
4	Linear Parkland (balance area)	▪ Remove site from EMR / CLR – site investigations & remedial works	Developer
		▪ Transfer of land to Crown	
		▪ Construction of activity area facilities, interpretative signage, pathways, equestrian trails, horse paddock facilities and car parking	
		▪ Landscaping (planting, drainage)	
		▪ Acceptance & use of open space	Council

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6.4 Works & Embellishments in Open Space

To achieve the multiple open space and recreation functions intended for each of the open space areas in Bremer Business Park, a range of works is proposed, including:

- Earthworks and others forms of site preparation;
- Landscaping, revegetation and rehabilitation;
- Embellishment with facilities (toilets, play equipment, shelter and seating, barbeques, pathways and trails, canoe launching, car parking etc).

Set out below is a schedule of works and embellishments proposed for Bremer Business Park.

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Table 6-3Bremer Business Park – Open Space Costing

Bremer Business Park - Open Space Costing

Stage 1

Item	Description	Quantity	Unit	Rate ($)	Cost ($)
1	Gravel Bike Path	1,200	m	40	$48,000
2	Culvert Crossing	1	item	10,000	$10,000
Total Stage 1					**$58,000**

Stage 2

Item	Description	Quantity	Unit	Rate ($)	Cost ($)
1	Concrete Bike Path	1,450	m	53	$76,850
2	Culvert Crossings	2	item	10,000	$20,000
3	Toilet Block	1	item	50,000	$50,000
4	Childrens Play Ground	1	item	25,000	$25,000
5	Picnic Electric BBQ	2	BBQ	5,000	$10,000
6	Picnic Setting (seating, bins, tables)	1	item	20,000	$20,000
7	Picnic Shelter	1	item	25,000	$25,000
8	Picnic Ground Car Park	20	space	3,150	$63,000
9	Formal Landscaping	6	ha	24,000	$132,000
10	Bush Revegetation	6	ha	23,000	$126,500
Total Stage 2					**$548,350**

Stage 3

Item	Description	Quantity	Unit	Rate ($)	Cost ($)
1	Gravel Bike Path	1,000	m	40	$40,000
2	Gravel Bike Path/Vehicle Access	650	m	80	$52,000
2	Culvert Crossings	3	item	10,000	$30,000
3	Canoe Launch	1	item	40,000	$40,000
4	Sports Ground Carpark	20	space	3,150	$63,000
5	Sports Ground Clubhouse *	1	item	0	$0
6	Sports Ground BMX Track	1	item	20,000	$20,000
7	Formal Landscaping	1	ha	24,000	$31,200
8	Bush Revegetation	8	ha	23,000	$186,300
9	Sports Field #		item	0	$0
Total Stage 3					**$462,500**

Stage 4

Item	Description	Quantity	Unit	Rate ($)	Cost ($)
1	Gravel Bike Path	5,850	m	40	$234,000
2	Horse Track *	5,400	m	0	$0
3	Culvert Crossings	3	item	10,000	$30,000
4	Sadling and Grooming Enclosure *	1	item	0	$0
5	Picnic Shelter (tables, seating, bins)	1	item	45,000	$45,000
6	Canoe Landing	1	item	20,000	$20,000
7	Bush Revegetation	28	ha	23,000	$640,550
Total Stage 4					**$969,550**

Grand Total					**$2,038,400**

Notes: * = Item is to be provided by others.
= Included as part of the bulk earthworks

BREMER BUSINESS PARK

Open Space Master Plan

Site Identification

Legend

Site

WINGATE

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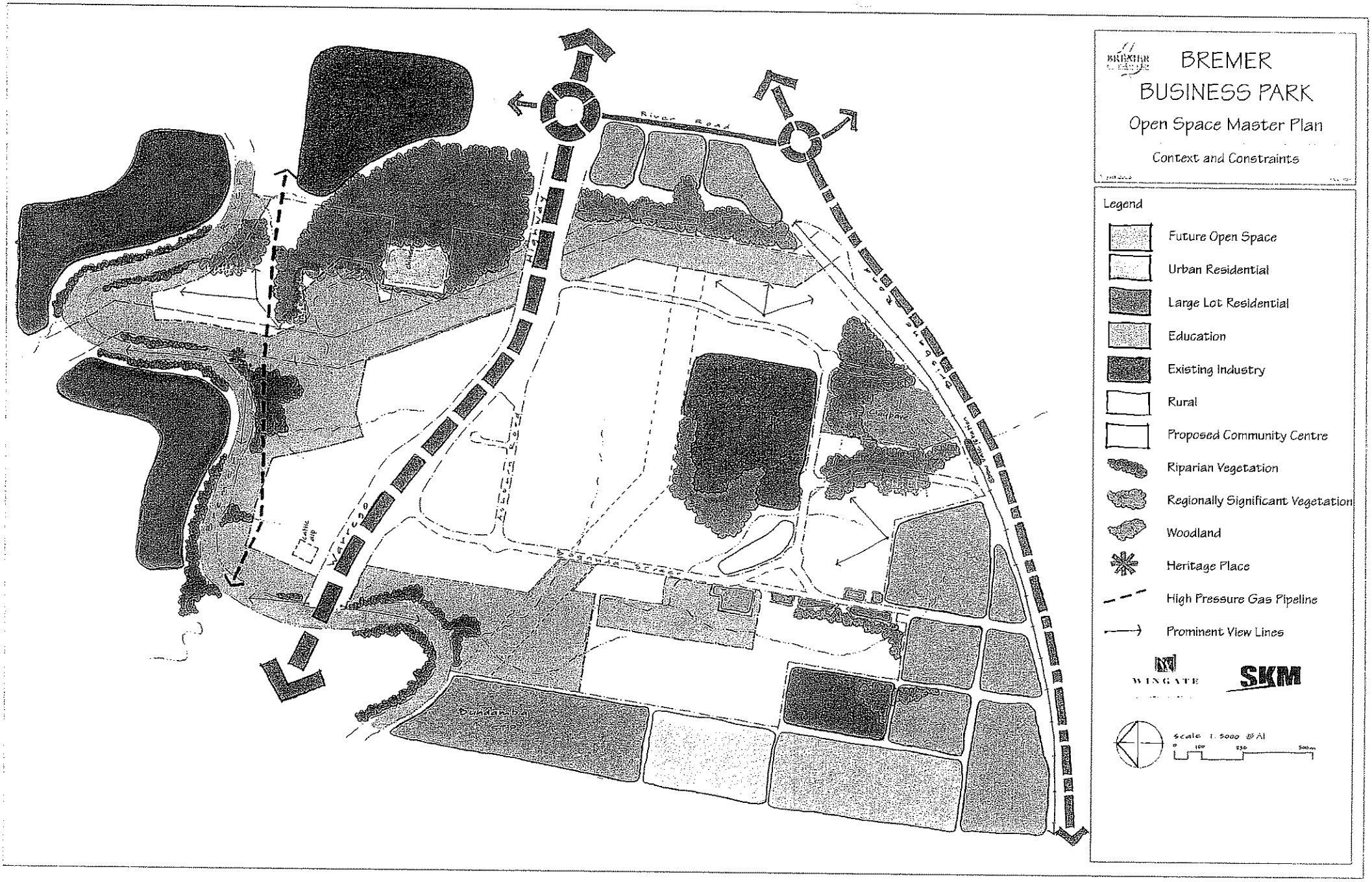
Scale 1:5000 @ A1

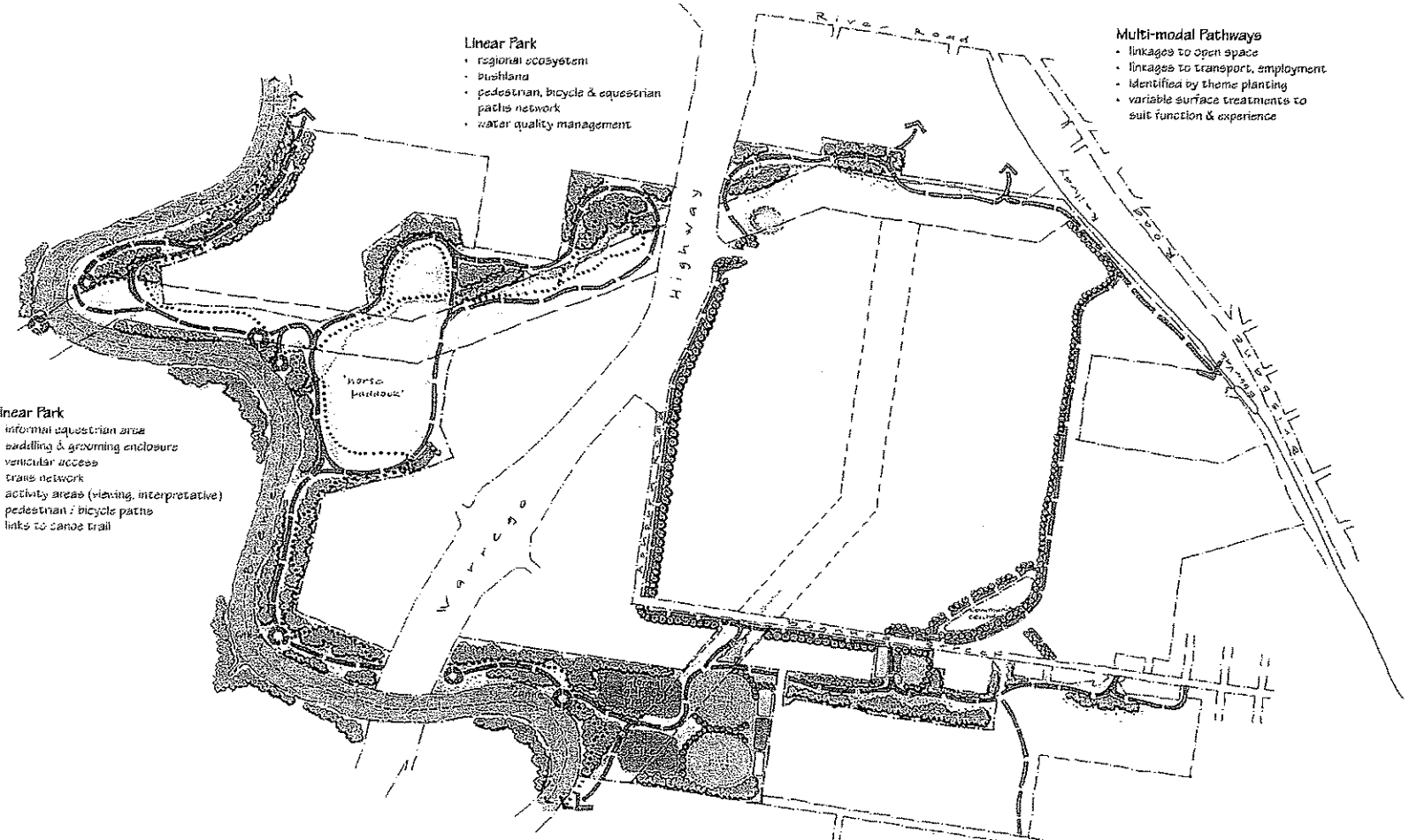
0 125 250 500m


BREMER
BUSINESS PARK
Open Space Master Plan
Context and Constraints
Legend
Future Open Space
Urban Residential
Large Lot Residential
Education
Existing Industry
Rural
Proposed Community Centre
Riparian Vegetation
Regionally Significant Vegetation
Woodland
Heritage Place
High Pressure Gas Pipeline
Prominent View Lines
WINGATE
SKM
Scale 1:5000 @ A1
0
100
250
500m
River Road
Warrego
Bundamba
Cattle Pulp

BREMER BUSINESS PARK

Open Space Master Plan

Illustrative Master Plan



Legend

- Open Space
- Recreation
- Facilities
- Activity Focus
- Muli-modal Pathway
- Equestrian Trail
- Theme Planting
- Bushland Revegetation
- Canoe Trail

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Scale 1:5000 @ A1

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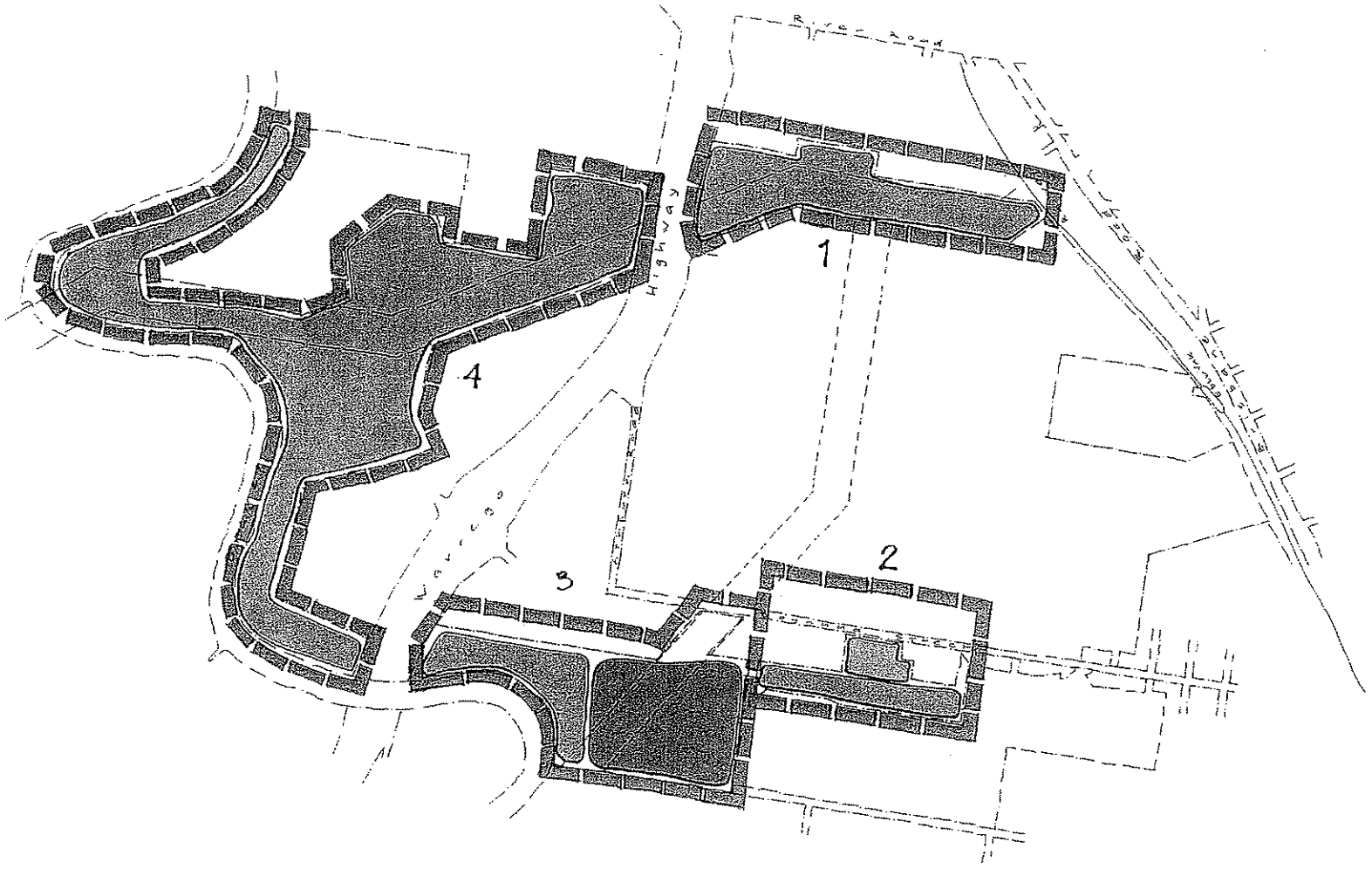

BREMER BUSINESS PARK

Open Space Master Plan

Open Space Categories and Staging Plan

Legend

- Suburban Sporting Ground (Level 3)
- Play & Picnic Parks (Level 3)
- Waterslide Pasrkland (Level 2)
- Linear Parkland (Level 3)
- 3 Stage/Number

WINGATE

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Scale 1:5000 @ A1

0 100 250 500m

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1. Overview

1.1 Report Outline

This report has been prepared to respond to stormwater-related issues identified by Ipswich City Council (ICC letter, 11 June 2003) associated with the proposed Bremer Business Park.

This report provides a framework for stormwater management, both in terms of quality and quantity, within the Bremer Business Park (BBP) site. This document outlines the overall approach and management responsibilities for stormwater in the form of a concept master plan. It recognises that:

- Council has a preference that stormwater runoff from industrial and commercial areas is to be treated onsite, rather than by major wetlands etc located offsite within open space drainage corridors.
- That some types of stormwater pollutants such as litter, oil and greases and other contaminants are more effectively managed onsite than intercepted in a more diluted form further downstream. (For the purpose of this report, "onsite" refers to management within private lots, "offsite" refers to management within public land)
- That some form of stormwater detention is required to reduce the impacts of increased stormwater discharges from the proposed development. A preliminary strategy for the provision of detention basins is provided in Section 2 of this report.
- Opportunities to reuse stormwater should be encouraged.
- Detailed stormwater management planning would be undertaken from a broad catchment scale and progressively to more detailed planning of works at the scale of individual lots. Water quality and quantity management should be integrated at all levels of planning

This report provides an outline of the concepts and principles that will be employed to undertake planning of stormwater management infrastructure within the Bremer Business Park. As such, it is a Conceptual Plan (in accordance with Council's Stormwater Quality request) that establishes an overall approach to be taken to quality issues and management responsibilities.

1.2 Conclusions

Based on the concept stormwater management master plan presented in this document, the following conclusions can be reached:

- Developed Conditions flows can be mitigated to existing conditions flows for each subcatchment by placement of detention basins at various locations.

- Detention basin sizes and locations presented in this report are preliminary and should be considered indicative. The construction of the detention basins identified is considered to be feasible based on the data available at this stage of the BBP development. Final detention basin sizings and locations should be undertaken as part of the detailed design.
- Detention basins will be an integral part of the water quality treatment train identified for each subcatchment.
- That the Water Quality Targets adopted in this report of Suspended Solids 15 mg/L, Nitrogen 0.65 mg/L and Phosphorus 0.7 mg/L are in accordance with Council's requirements.
- A progressive water quality treatment train employing education, street sweeping, GPT's, vegetated channels and filter strips should be adopted.
- It has been demonstrated that using a progressive treatment train approach, water quality targets can be met for litter, suspended solids and nitrogen. The water quality target for phosphorus is within 5% of meeting the target.
- Each lot developer must prepare and submit a Site Based Stormwater Management Plan. Each of these plans must meet Council specifications and be approved by Council. All pollutants are best treated at their source.

2. Stormwater Quantity Management

2.1 Background

Stormwater Quantity Management has been based on a Catchment Scale approach as presented in Bremer Business Park Development Application. This work identified the main catchments associated with the Bremer Business Park site, estimated stormwater discharges at key locations and evaluated broad strategies for the siting of stormwater detention basins.

The existing drainage systems within the BBP site are shown on **Figure 1**. For the purpose of this report, these can be referred to as Tributary A, B and C.

The purpose of the proposed stormwater quantity management for the BBP site is to ensure non-worsening of peak discharges at key locations, including:

- Outlet A - Bremer River
- Outlet A4 - Warrego Highway
- Outlet B - Bremer River
- Outlet C - Bremer River

Estimates of 2 year ARI (or Q2) and 100 year ARI (or Q100) peak discharges at these key locations have been previously made using DRAINS. This analysis is documented in the Bremer Business Park Development Application.

2.2 Council Requirements

The Council requirements for Stormwater Management for the BBP are summarised below.

- To ensure that developed catchment flows are equal to or lower than flows discharging from the site for existing conditions.
- Stormwater management quantity issues need to be addressed in terms of the overall development with infrastructure requirements to be defined at the various stages of the development. A hydraulic study, addressing these issues, should be submitted to support the application. Timing of infrastructure in terms of each stage should be addressed.

2.3 Methodology

As previously stated, a preliminary detention basin sizing was undertaken as part of the Bremer Business Park Development Application. For this report, no additional modelling was undertaken however detention basin sizings were scaled according to catchment size and previous work based on the proposed development layout and anticipated finished levels. While this is not an exact sizing, it will provide a preliminary estimate of the volume required for each of the detention basins, consistent with the overall status of the planning for the development.

During detailed design some of these basin locations and sizes may change due to the final layout however detailed sizing of each detention basin will be undertaken at this time.

2.4 Preliminary Basin Sizing

Indicative basin sizes are provided in **Table 1**. These are approximate storage volumes that will be refined as each stage of development occurs.

- **Table 1 Indicative Detention Basin Storages for Bremer Business Park**

Basin	Storage Volume (m^3)
A4	8500
B3	8600
C3	7000
C5	12000
C7	9800

Each of the above detention basins will mitigate flood flows for the developed catchment to ensure a non worsening effect of run-off conditions downstream of the site. The location of these basins are shown on **Figure 1**.

In addition to stormwater discharge reduction, the basin sites also provide the following benefits:

- The detention basins should be grassed and will assist in the water quality treatment via incorporation of filter strips.
- The basins are in closer proximity to industrial areas thus providing an opportunity for stormwater reuse practices eg process water, makeup water, irrigation of green space.
- The basins represent lawful points of discharge that provide a drainage point to the staged development that would occur within each basin subcatchment.
- The basins also could provide the function of sediment capture during the construction phase and also act to contain any accidental spillage of contaminants

It is proposed that final siting and design of the basins be undertaken in conjunction with the staging of development. The timing of this work would commence with the start of planned development within each of the basin subcatchments. It is expected that the size and capacity of each basin would be governed by the final landform within each subcatchment, intended land uses and demand for stormwater reuse.

At this concept stage of planning, there is some scope and flexibility in the siting and sizing of the detention basins.

3. Stormwater Quality Management

3.1 Overview

The purpose of stormwater quality management is to control water quality impacts from urban runoff to acceptable limits. Council has a stated preference that this outcome is achieved close to the source of pollution for runoff from industrial/commercial areas (ie source control rather than 'end of pipe' control). Measures to address stormwater pollution also need to be integrated with systems to manage stormwater quantity.

3.2 Council Requirements

A Master Plan for Stormwater Quality (Conceptual Design Only) is required. The plan is required in order to clearly articulate, display and demonstrate, the overall approach to be taken to quality issues and clearly delineate responsibilities for management. The Conceptual Plan will establish a framework for future development which also includes the residential land and common areas such as roads. Timing of infrastructure in terms of each stage should be addressed.

By way of general comment, each industrial/commercial property needs to be able to treat stormwater on site to the required quality. For off site treatment (ie the residential area and common areas, e.g. roads) the associated sites need to be identified and means shown by which the required water quality will be achieved. Significant concerns are held with any proposal for treatment of stormwater from industrial etc. sites by way of major wetlands/lakes/ponds within common areas and any other proposal for Council to enter into a cost sharing agreement for control of pollutants from the land. Timing of infrastructure in terms of each stage should be addressed.

3.3 Potential Pollutant Sources

The anticipated sources of significant pollutants that could be expected from a combined residential/industrial development are as follows.

- Litter
- Sediment
- Nutrients – phosphorus (P) and nitrogen (N).
- Oxygen demanding substances – organic and chemical matter
- Pathogens/Faecal coliforms – bacteria and viruses
- Hydrocarbons – oil, grease, etc.
- Heavy Metals – often associated fine sediment
- Surfactants – detergents
- Pesticides/Herbicides

- Thermal Pollution – such as heat generation
- PH altering substances

The common pollutants for all areas within the development are:

- Litter
- Sediment, and
- Nutrients (P and N).

The common pollutants should be treated on a sub-catchment wide basis as they are common to all land uses within the development area.

The remainder of the pollutants should be treated on a lot specific basis as these pollutants may not be common to all land uses within the development area. Furthermore, some of these pollutants may not be present within the development. Lot specific stormwater quality will be discussed further in **Section 3.8.2** of this report.

3.4 Water Quality Objectives – Common Pollutants

The water quality objectives for this management plan are based on target annual mean concentrations (AMC) (mg/L) of pollutants. Targets specified by Ipswich City Council are presented in **Table 2**.

- **Table 2 Target Annual Mean Concentrations (AMC) (mg/L)**

Suspended Solids (SS) (mg/L)	Total Nitrogen (TN) (mg/L)	Total Phosphorus (TP) (mg/L)	Litter
15	0.65	0.07	No material > 5mm

It is desirable that pollutants carried in the discharge from the site to receiving waters meet the target concentrations.

3.5 Water Quality Methodology and Parameters

The water quality methodology adopted for this master plan was based on estimating the run-off pollutant concentrations by hydrological and pollutant load calculations.

3.5.1 Annual Average Runoff Volume

An estimate of the annual average runoff volume (ARV) was determined by the relationship of catchment area, average annual rainfall and the annual volumetric runoff coefficient. The Annual Volumetric Runoff Coefficient (ARVC) represents the net yield percentage run-off from a catchment over a one-year period. This co-efficient will vary based on land use.

The Annual Volumetric Runoff Coefficients (ARVC) adopted for this analysis is shown tabulated in **Table 3**.

- Table 3 Annual Volumetric Runoff Coefficient

Type of Land Use	AVRC
Industrial	0.57
Urban	0.38
Rural	0.24
Open Space	0.15

Source: (Guidelines for Pollutant Modelling in Brisbane October 2000, Brisbane City Council)

The average annual rainfall, at this site, adopted for this analysis was 1200 mm/year.

3.5.2 Pollutant Export Rates

The stormwater pollutant loads for this analysis have been predicted for the catchment by applying assumed average annual pollutant export rates for each land use composition and catchment area. The pollutant export rates adopted for this analysis are presented in **Table 4**.

- Table 4 Pollutant Export Rates (kg/ha/yr)

Type of Land Use	Suspended Solids (SS)	Total Nitrogen (TN)	Total Phosphorus (TP)
Industrial	658	12.76	2.049
Urban	471	8.56	1.203
Rural	107	5.66	0.698
Open Space	27	0.89	0.038

Source: (Guidelines for Pollutant Modelling in Brisbane October 2000, Brisbane City Council)

3.5.3 Pollutant Reduction

The required reduction of pollutants necessary to achieve the adopted water quality objectives has been estimated by calculating the difference between the target AMC (mg/L) and the catchment runoff AMC (mg/L). The required pollutant reduction is expressed as a percentage of this difference and the runoff AMC.

Pollutant Reduction (%) = (Runoff AMC – Target AMC) / Runoff AMC x 100

3.6 Existing Site Conditions

The proposed developed area is approximately 340 ha and is predominantly rural land. There is however some industrial and urban land uses within the development area.. A break down of the existing land use areas is presented in **Table 5**.

- **Table 5 Existing Conditions Land Uses within the Proposed Development Area**

Land Use	Area (ha)
Rural	310
Industrial	20
Urban	10

Pollutant concentrations for the existing conditions catchment have been calculated assuming there are no current water quality treatment devices in place. The estimated annual mean pollutant concentrations for the total existing catchment are summarised in **Table 6**.

- **Table 6 Pollutant Concentrations (AMC) (mg/L) – Existing Conditions**

Catchment	SS	TN	TP
Total Existing Catchment	48.2	1.95	0.25

A comparison between target pollutant concentrations and existing conditions run-off concentrations are presented in **Table 7**.

- **Table 7 Pollutant Reduction required for Existing Conditions**

Catchment	SS	TN	TP
Existing AMC	48.2	1.95	0.25
Water Quality Target AMC	15	0.65	0.07
% Reduction	69%	67%	72%

Table 7 shows that runoff from the exisiting catchment does not meet target AMC for SS, TP and TN.

Further results for existing conditions are presented in **Appendix A**.

3.7 Developed Site Conditions

The proposed development is approximately 340 ha and the land uses and corresponding areas are presented in **Table 8**.

- **Table 8 Developed Conditions Land Uses within the Proposed Development Area**

Land Use	Area (ha)
Residential	26
Industrial	190
Roads	24
Open Space	100

The estimated annual mean pollutant concentrations for the total existing catchment are summarised in **Table 9**.

- **Table 9 Pollutant Concentrations (AMC) (mg/L) – Developed Conditions**

Catchment	SS	TN	TP
Total Existing Catchment	88.5	1.72	.27

A comparison between target pollutant concentrations and existing conditions runoff concentrations and the results are presented in **Table 10**.

- **Table 10 Pollutant Reduction required for Developed Conditions**

Catchment	SS	TN	TP
Developed AMC	88.5	1.72	.27
Water Quality Target AMC	15	0.65	0.07
% Reduction	83%	62%	74%

Further results for developed conditions are presented in **Appendix A**.

Table 10 shows that runoff from the developed catchment does not meet the water quality targets. It is therefore necessary to employ Stormwater Quality Best Management Practice to reduce pollutant loads.

3.8 Pollutant Reduction Strategy

Calculations have shown that for developed conditions (without a management strategy), water quality targets will not be met. Council have expressed a desire to treat stormwater runoff at the source where possible. A table of Pollutant Reduction Efficiencies for Different Stormwater Quality Best Management Practices is presented in **Appendix B**.

3.8.1 Reduction Strategy for Litter, Suspended Solids and Nutrients

A treatment train approach has been adopted for the reduction of litter, suspended solids and nutrients. This provides progressive treatment as stormwater flows from individual lots to existing drainage paths and through detention basins. It is recommended that the following be implemented to meet specific water quality targets:

- Education – A public education program should be implemented for industry and residents to reduce the amount of pollutants being introduced to the development area. Education can reduce pollutant loads by between 10% and 30%.
- Street Sweeping – Street sweeping reduces litter by between 50% to 75% and reduces course sediment by 30% to 50%. This will also remove the need for litter baskets or end of pipe GPT's for public roads.
- GPT's – Each lot must install an in ground GPT capable of removing litter, suspended solids and nutrient. At least one GPT must also be located in each residential area. One large unit or a series of smaller units may be installed however this should be determined during detailed design. GPT's remove between 75% and 100% of litter, 50% to 70% of course sediment and 10% to 30% of fine sediment and nutrients.
- Runoff directed to existing Drainage Paths – stormwater outlets should be directed to existing drainage paths. Vegetation in these drainage paths will act as a grass swale and reduce litter by 20% to 40%, course sediment by 40% to 65%, fine sediment by 30% to 50%, nutrients by 20% to 40%.
- Grassed Detention Basins – within detention basins, a grass filter strip should be constructed. Filter strips remove between 30% to 50% of litter and fine sediment, 50% to 75% of course sediment and 20% to 40% of nutrients.

Using the above best management Practices, an average reduction has been determined for each of the treatments. These average reductions are presented in **Table 11**.

- **Table 11 Pollutant Reduction Matrix for Litter, Suspended Solids and Nutrients**

Treatment	Litter	Suspended Solids	Nutrients
Education	20%	20%	20%
Street Sweeping	62,5%	40%	None
Lot based GPT	87.5%	40%	20%
Vegetated Drainage Path	30%	50%	30%
Grass lined Detention Basin	40%	60%	30%

In an attempt to determine the reductions associated with the proposed treatment train, it was assumed that 100 kg be passed through the system. At each stage of the treatment train, the average reduction shown in **Table 11** was applied to the 100 kg of each pollutant until a total reduction was achieved. For example, for litter the initial load was assumed to be 100 kg however through education, the load is reduced by 20%. This means that the litter load is now 80 kg (100-100x20%). Street sweeping reduces the load by a further 62.5% which reduces the load to 30 kg (80-80x62.5%). This continues for the remainder of the treatment train as presented in **Table 12**.

Table 12 Pollutant Reduction using the Proposed Treatment Training and Best Management Practices

Treatment	Litter	Suspended Solids	Nutrients
Assumed 100kg of pollutant	100	100	100
Education	80	80	80
Street Sweeping	30	48	80
Lot based GPT	4	29	64
Vegetated Drainage Path	2.6	14.4	45
Grass lined Detention Basin	1.6	5.8	31
TOTAL REDUCTION	98%	94%	69%

Table 12 shows that litter is reduced by 98%, suspended solids are reduced by 94% and nutrients are reduced by 69%. To meet the water quality targets specified by Ipswich City Council for the development site, reductions for suspended solids, nitrogen and phosphorus had to be reduced by 83%, 62% and 74% respectively.

The proposed treatment train therefore meets the pollutant requirements for suspended solids and nitrogen and the reduction of phosphorus is within 5% of the specified target.

3.8.2 Reduction Strategy for Other Pollutants

Each of the individual lot developers must submit a Site Based Stormwater Management Plan. Each of these Site Based Stormwater Management Plans must:

- Be prepared by the developer of each lot.
- Provide a GPT that reduces pollutants such as litter, suspended solids and nutrients.
- Aim to achieve the water quality targets specified by Council. These targets represent the contribution to be made by onsite measures, which combined with the offsite measures, aim to achieve the downstream water quality goals.
- Aim to encourage measures other than treatment. These measures include onsite stormwater reuse, infiltration, reduction of hardstand areas and similar Water Sensitive Urban Design measures.
- Provide a maintenance plan for stormwater treatment infrastructure.

It is anticipated that:

- Contaminants from industrial sites shall be managed by source controls within the site. For example, fuel and chemical storage areas are to be adequately bunded and overflow collection devices installed. Oil and grit separators would be required in washdown areas and potential spill locations. Source control of stormwater pollutants within industrial/commercial areas such as litter, oil, grease, chemicals and hydrocarbons would be given a high priority.
- Litter would also be controlled by source controls rather by interception by gross pollutant traps that are located offsite.
- Site based Stormwater Management Plans would not be required for individual residential lots due to their small size relative to the industrial and commercial properties.
- The Site based Stormwater Management Plans would also document erosion and sediment control practices during construction.

The onsite measures required to achieve the stormwater quality targets defined at the discharge point from the lot are anticipated to vary considerably from site to site. The measures are expected to involve measures such as:

- Preventing contamination of stormwater by bunding, treatment of washdown areas, covered storage of chemicals etc
- Capture and reuse of stormwater onsite and reuse for irrigation, washdown and process water
- Litter baskets within internal stormwater gully pits
- Stormwater quality improvement devices (SQIDs such as Humeceptor, CDS Units)

- Regular hardstand pavement sweeping and cleaning
- Non structural measures such as employee education and awareness programs
- Infiltration systems

In assessing the performance of these and other practices, reference will be made to available guidelines including:

- Draft Australian Runoff Quality Manual
- Brisbane City Council Water Quality Management Guidelines
- Other guidelines prescribed by Ipswich City Council

Appendix A Water Quality Results

SKM

POLLUTANT EXPORT MODEL BREMER BUSINESS PARK

EXISTING CATCHMENT SCENARIO - TOTAL EXISTING

RAINFALL	1200	AREA	AVRC	ARV	SS		TN		TP	
CATCHMENT	USE TYPE	ha		ML	load rate (kg/ha)	load (kg)	load rate (kg/ha)	load (kg)	load rate (kg/ha)	load (kg)
Undeveloped land	Rural	305.76	0.24	880.59	107	32716.32	5.66	1730.60	0.698	213.42
Aust Hardboards	Industrial	18.7	0.57	127.91	658	12304.60	12.76	238.61	2.049	38.32
Roads	Urban	10	0.38	45.60	471	4710.00	8.56	85.60	1.203	12.03
TOTAL		334.46		1054.10		49730.92		2054.81		263.77

POLLUTANT (AMC) AND RETENTION PERFORMANCE

RUNOFF (AMC) (mg/L)			47.18		1.95		0.25	
TARGET (AMC) (mg/L)			15		0.65		0.07	
REDUCTION REQUIRED (%)			68.2%		66.7%		72.0%	

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POLLUTANT EXPORT MODEL - BREMER BUSINESS PARK
DEVELOPED SITE SCENARIO – DEVELOPED SITE

RAINFALL	1200	AREA	AVRC	ARV	SS		TN		TP	
CATCHMENT	USE TYPE	ha		ML	load rate (kg/ha)	load (kg)	load rate (kg/ha)	load (kg)	load rate (kg/ha)	load (kg)
Developed land	Industrial	170.87	0.57	1168.75	658	112432.46	12.76	2180.30	2.049	350.11
Aust Hardboards	Industrial	18.7	0.57	127.91	658	12304.60	12.76	238.61	2.049	38.32
Residential	Urban	26.19	0.38	119.43	471	12335.49	8.56	224.19	1.203	31.51
Roads	Urban	23.76	0.38	108.35	471	11190.96	8.56	203.39	1.203	28.58
Open Space	Open Space	100.86	0.15	181.55	27	2723.22	0.89	89.77	0.038	3.83
TOTAL		340.38		1705.98		150986.73		2936.25		452.35

POLLUTANT (AMC) AND RETENTION PERFORMANCE

RUNOFF (AMC) (mg/L)			88.50		1.72		0.27	
TARGET (AMC) (mg/L)			15		0.65		0.07	
REDUCTION REQUIRED (%)			83.1%		62.2%		73.6%	

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Appendix B Pollutant Reduction Efficiencies for Different Stormwater Quality Best Management Practices

Table C4.3: Pollutant Reduction Efficiencies for Different Stormwater Quality Best Management Practices

Stormwater Quality Best Management Practice	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Source Controls								
Street Sweeping	[illegible]	[illegible]	-	-	L (S)	-	-	L
Rubbish Bins	[illegible]	-	-	-	L (S)	-	-	-
Education*	L	L	L	L	L	L	L	L
Primary Treatments								
Small Scale Devices								
Liner Baskets	L-M	-	-	-	L	-	-	-
Grates and Entrance Screens	L	-	-	-	-	-	-	-
Side Entry Pit Traps	L-M	L	-	-	L	-	-	-
Baffle Pits	L	L-M	L	-	L	-	-	L
Catch Pits	L	L-M	L	-	L	-	-	L
Oil and Grit Separators	L	L-M	L	-	L	L-M	L	L
Nets	[illegible]	-	-	-	-	-	-	-
Medium Scale Devices								
Litter and Trash Racks	[illegible]	L	-	-	L	-	-	-
Downwardly inclined screens	[illegible]	-	-	-	-	-	-	-
Floating Litter Booms	L-M	-	-	-	-	-	-	-
In-ground GPTs	[illegible]	[illegible]	L	L	L-M	L	-	L
In-line Separators	[illegible]	L-M	-	-	-	-	-	-
Large Scale Devices								
Open Gross Pollutant Traps	[illegible]	[illegible]	L	L	L	L	L	L
Sediment Traps	L	[illegible]	L	L	L	L	L	L
Hydraulically Operated Trash Racks	H	L-M	-	-	-	-	-	-
Secondary Treatments								
Filter Strips	[illegible]	[illegible]	[illegible]	L-M	L	L (S)	[illegible]	L
Grass Swales	L-M	[illegible]	[illegible]	L-M	L	L	[illegible]	[illegible]
Sand Filters	-	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Infiltration Trench / Basin	-	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Porous Pavements	-	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Extended Detention Basins	-	[illegible]	L-M	L	L	L	[illegible]	L
Tertiary Treatments								
Water Quality Ponds (with pre-treatment)	[illegible]	[illegible]	L-M	L-M	L	L	L	L-M
Constructed Wetlands (with pre-treatment)	[illegible]	[illegible]	[illegible]	[illegible]	L	[illegible]	[illegible]	H

Legend:
- = Negligible benefit.
VH = 75-100% Pollution reduction efficiency.
L = 10-30% Pollutant reduction efficiency.
S = Secondary benefits.
M = 30-50% Pollutant reduction efficiency.
Shading = better performing SQBMPs for the target pollutant.
H = 50-75% Pollution reduction efficiency.

40%

63%

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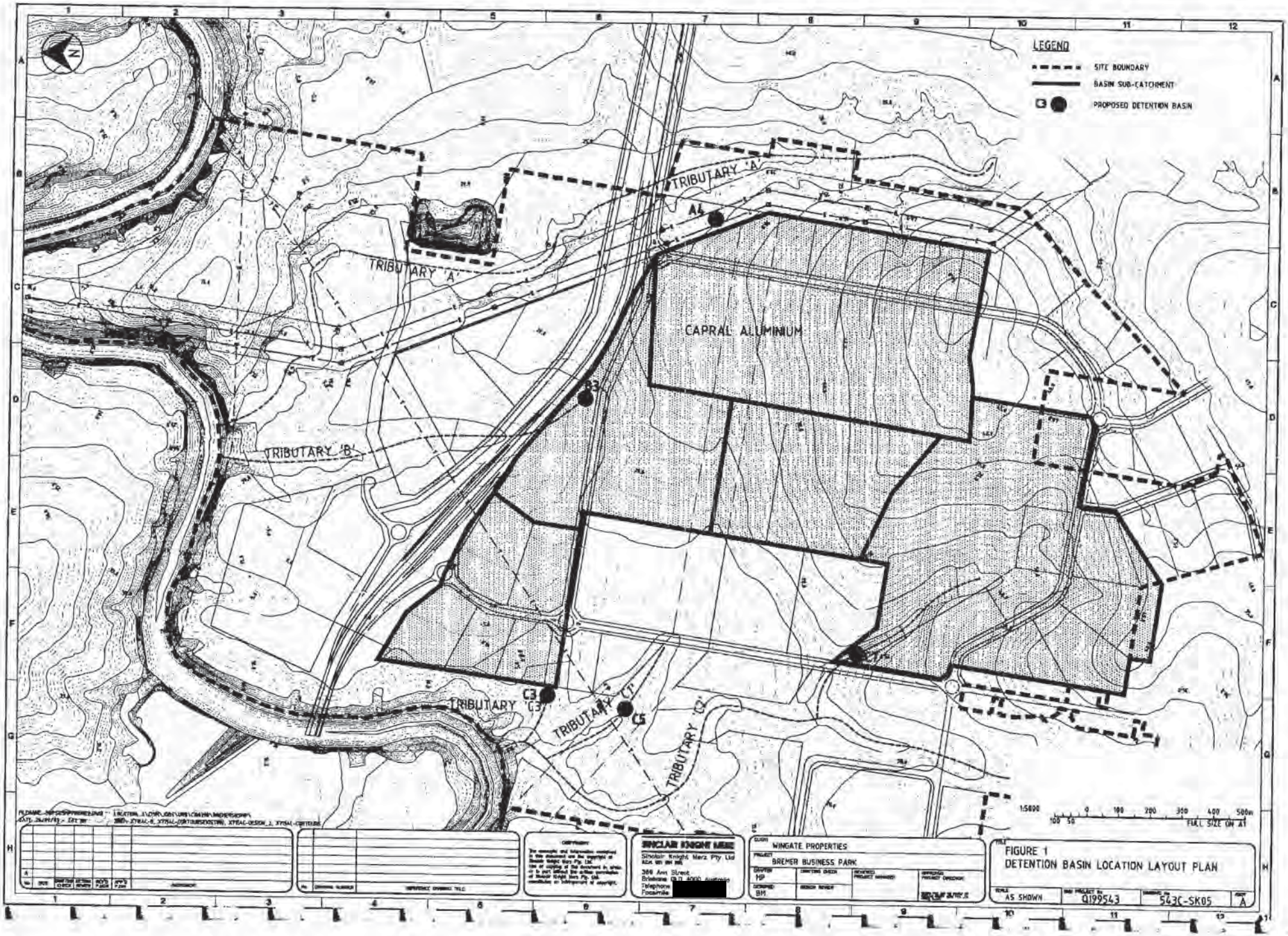

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Ipswich QLD 4304

19/11/2003

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Dear [redacted]

BREMER BUSINESS PARK – CLARIFICAITON OF INFORMATION

Further to the meeting held between, the applicant, SKM and Ipswich Council Officers on 28 October 2003, we now provide you with the following information to clarify concerns raised by Council in this meeting.

Brisbane Road Connection

The negotiations between the applicant and Queensland Rail are progressing to the extent that there is an in principal agreement between both parties that the use of this land to connect the Bremer Business Park with Brisbane Road is acceptable. The most recent information from the Department of Natural Resources and Mines identifies the allotment to be part of Lot 30 on SP130150, the intersection is to be on the western side of Zest recreation centre (Lot 1 on RP177275).

Local Area Traffic Management

It was noted by Council that the Land Use Plan figure used in the LATM was not the most current. The report has been updated to include the latest figure. The use of the revised figure has not resulted in any changes to the outcomes of the LATM.

Pedestrian/ Cycle Access to Ebbw Vale Railway Station

The Open Space Master Plan indicates that there is the provision of a multi-modal path which connects Bremer Business Park Precincts to the Ebbw Vale Railway Station. Refer to the Open Space Illustrative Master Plan.

Water Supply

We have been advised that the report being undertaken by John Wilson and Partners has been finalised, but still requires sign off from Ipswich Water. The finalisation of this document will allow SKM to complete the infrastructure requirements. These reports will be submitted to Council as soon as they are available.

SKM

Sensitive Uses

The Plan of Development has been amended to ensure that uses are well separated from residential areas and the Bundamba STP. Refer to the Land Use Plan submitted previously (1 October 2003) and to the attached assessment tables for the Frame Industrial and Commercial Precinct and the Open Space Precinct.

Works

The application seeks a Preliminary Approval for the MCU component because the nature of the final mix of development is not known. For individual sites there will be a requirement for development applications to be lodged in accordance with the Plan of Development with Council. This will give Council the opportunity to critically assess the proposed uses and the ability to have more detailed input. Of note is that all sites will have a requirement for on-site treatment of stormwater prior to release to the stormwater system.

Clarification has been undertaken in regards to the size of the basin A4. Our investigations have found that the basin is of acceptable size for the catchment it serves.

Brisbane Road Connection

Council had concerns with the trigger for the construction of the Brisbane Road connection. The letter forwarded to Council (dated 19 September 2003) indicates the applicant's preference for the connection to be in place upon completion of development of 50% of the Bremer Business Park (ie. upon completion of Stages 1 and 2a). The Department of Main Roads prefer a condition which states that the connection should be provided upon development of 40% of the Bremer Business Park. The approval should set to an acceptable trigger either based in time or development.

Plan of Development

The assessment tables for the Frame Industrial and Commercial Precinct as well as the Open space precinct have been amended to ensure that sensitive uses are well separated from the Bundamba Sewerage Treatment Plant.

Council have sought advice regarding the definitions used in the Plan of Development being consistent with the Use Definitions proposed in the Draft Planning Scheme. Attached is a table that lists the definitions used in the Plan of Development along with equivalent definition from the draft scheme. The translation of definitions from the existing Planning Scheme to the draft is not direct. Our Client prefers the former definitions only because they provide greater clarity of the intended uses in each precinct. Council should confirm its preference and offer suggestions for those definitions which do not have one stated in the draft scheme.

SKM

We trust that this information satisfies Council, and assessment of the application is able to proceed. Should you have any questions please don't hesitate in contacting either myself on [redacted] or [redacted]

Yours faithfully

[redacted]

[redacted]
Principal,
Environmental Planning
Phone: [redacted]
Fax:
E-mail:

ENC.

4.2 Frame Industry & Commercial Precinct Assessment Framework

The assessment framework refers only to material changes of use, and if necessarily associated with the use, operational works and building works. Otherwise, section 1.5.4 prevails with regards building work and operational work.

Material Change of Use

(and associated building work and operational work)

Where a material change of use is not listed in the following table then that land use is impact assessable development.

Self Assessment	Code Assessment	Applicable Codes
▪ Environmental Facility (not involving building work or operational work) ▪ Open Space ▪ Local Utility	▪ Auction Depot ▪ Bulk Stores < 5000m² GFA[A] ▪ Caretaker's Residence[B] ▪ Commercial Premises[B] ▪ Community Building[B] ▪ Freight Depot[A] ▪ Funeral Premises[A] ▪ Garden Centre[A] ▪ Heavy Vehicle Parking[A] ▪ Landscape Supply Depot[A] ▪ Landscape Supply Outlet[A] ▪ Light Industry[A] ▪ Mini Storage Complex ▪ Medical Centre[B] ▪ Plant Nursery (wholesale)[A] ▪ Plant Sales & Hire Yard[A] ▪ Public Utility[A] ▪ Repair Station[A] ▪ Research & Associated Technology Activities[A] ▪ Storage Yard[A] ▪ Temporary Sales Office[B] ▪ Truck Depot[A] ▪ Veterinary Hospital[A] ▪ Warehouse[A]	Planning Scheme Codes ▪ Regionally Significant Business and Industry Areas Code ▪ Development Constraints Overlays Code ▪ Commercial and Industrial Code ▪ Parking Code Plan of Development ▪ Bremer Business Park General Development Code

Self Assessment	Code Assessment	Applicable Codes
	If part of the community centre on Bognuda Street: ▪ Hotel[C] ▪ Licensed Club[C] ▪ Late Night Store[C] ▪ Local Shopping Centre[C] ▪ General Store[C] ▪ Child Care Centre[C] ▪ Fast Food Premises[C]	

Notes:
A – If greater than 100m from Residential uses
B – If greater than 300m from Bundamba Sewerage Treatment Plant
C – If in Bognuda Street Community Centre.

4.3 Frame Industry & Commercial Precinct Code

(1) Purpose

The purpose of the FIC Precinct Code is to facilitate development in the precinct by:

(i) establishing low impact activities in high quality landscape settings as intended in section 4.3.1 Overall Outcomes and section 4.3.2 Specific Outcomes of this Precinct Plan;

(ii) maximising the land use potential of the precinct arising from the high level of accessibility to the transport network and the proximity to major activities in the Central Industry Precinct;

(iii) adopting the Design Guidelines to:

(a) maintain the residential amenity for the existing residential areas and to achieve high levels of residential amenity for dwellings in the Residential Precinct;

(b) achieve high levels of visual integration of development within the landscaped settings of Bremer Business Park; and

(c) minimise the visual impact of buildings and other development in the FIC Precinct upon adjoining land uses; and

(iv) adopting effective urban water management measures in accommodating stormwater flows and minimising the release of pollutants to the environment.

(2) Code Provisions

Development for a material change of use (assessable) will comply with the development outcomes set out in the code.

5.2 Central Industry Precinct Assessment Framework

The assessment framework refers only to material changes of use, and if necessarily associated with the use, operational works and building works. Otherwise, section 1.5.4 prevails with regards building work and operational work.

Material Change of Use (and associated building work and operational work)
Where a material change of use is not listed in following table then that land use is impact assessable development.

Self Assessment	Code Assessment	Applicable Codes
▪ Environmental Facility (not involving building work or operational work) ▪ Open Space ▪ Heavy Vehicle parking ▪ Local Utility	▪ Auction Depot ▪ Bulk Stores ▪ Caretaker's Residence ▪ Commercial Premises if ancillary to an industry ▪ Fast Food Premises if <150m² GFA & serving the needs of the workforce ▪ Freight Depot ▪ Landscape Supply Depot ▪ Light Industry ▪ Mini Storage Complex ▪ Plant Sales & Hire Yard ▪ Public Utility ▪ Repair Station ▪ Research & Associated Technology Activities ▪ Storage Yard ▪ Temporary Sales Office ▪ Truck Depot ▪ Veterinary Hospital ▪ Warehouse	Planning Scheme Codes ▪ Regionally Significant Business and Industry Areas Code ▪ Development Constraints Overlays Code ▪ Commercial and Industrial Code ▪ Parking Code Plan of Development ▪ Bremer Business Park General Development Code

5.3 Central Industry Precinct Code

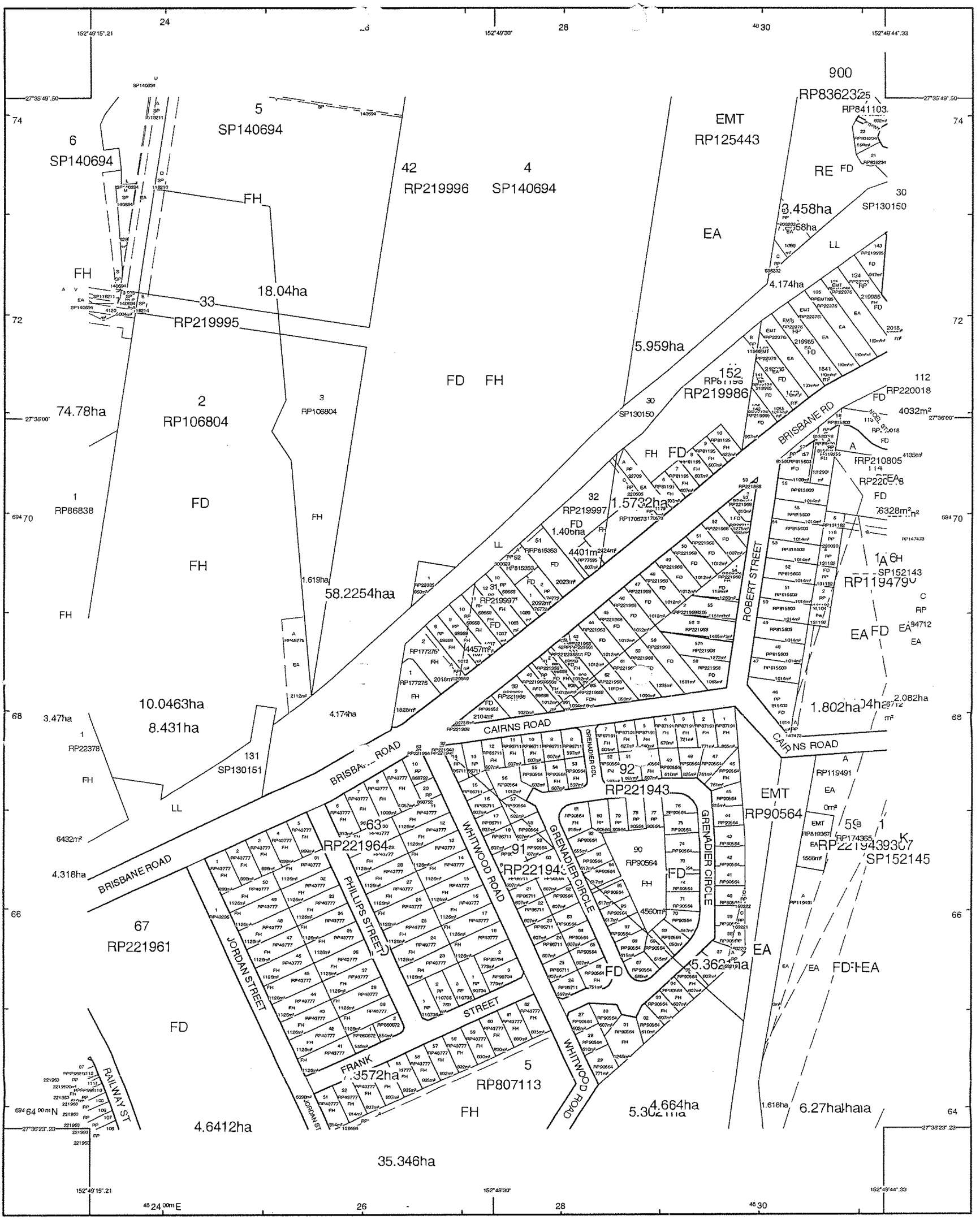
(1) Purpose

The purpose of the Central Industry Precinct Code is to facilitate development in the precinct by:

(i) establishing industrial and business activities in high quality landscape settings as intended in section 5.3.1 Overall Outcomes and section 5.3.2 Specific Outcomes of this Precinct Plan;

Schedule of Uses

Current Scheme Definition	IPA Scheme Definition
Agriculture	Agriculture
Animal Husbandry	Animal Husbandry
Auction Depot	Business Use
Bulk Stores	Service/ Trades Use
Car Park	Car Park
Car Wash	Service/Trades Use
Caretaker's Residence	Caretaker Residential
Child Care Centre	Community Use
Commercial Premises	Business Use
Community Building	Community Use
Detached House	Single Residential
Dual Occupancy Dwelling	Dual Occupancy
Educational Establishment	Community Use
Emergency Services Depot	Community Use
Environmental Facility	Park
Equestrian and Coursing Sports	Recreation Use
Family Day Care	Dual Occupancy
Fast Food Premises	Business Use
Freight Depot	General Industry
Funeral Premises	Business Use
Garden Centre	Business Use
General Store	General Store
Heavy Vehicle parking	Heavy Vehicle Parking
Home Occupation	Home Based Activity
Horse Training Establishment	Intensive Animal Husbandry
Hotel	Business Use
Landscape Supply Outlet	General Industry
Late Night Store	General Store
Licensed Club	Entertainment Use
Light Industry	Service Trades Use
Local Shopping Centre	Business Use
Local Utility	Minor Utility
Medical Centre	Business Use
Mini Storage Complex	Service/ Trades Use
Motel	Temporary Accommodation
Night Court	Night Court
Open Space	Park
Outdoor Recreation	Recreation Use
Pastoral Production	Intensive Animal Husbandry
Plant Nursery (wholesale)	Plant Nursery (Wholesale)
Plant Sales & Hire Yard	Service/ Trades Use
Public Utility	Major Utility
Repair Station	Service/Trades Use
Research & Associated Technology Activities	No definition
Retirement Community	Multiple Residential
Riding School	Intensive Animal Husbandry
Service Station	Business Use
Sports Complex	Recreation Use
Stable	Intensive Animal Husbandry
Storage Yard	Service/Trades Use
Temporary Sales Office	Temporary Sales Office
Tourist Facility	Tourist Facility
Truck Depot	General Industry
Turf Farm	Agriculture
Vehicle Sales Office	Business Use
Veterinary Hospital	Business Use
Warehouse	Service/Trades Use



STANDARD MAP NUMBER
9442-14234

MAP WINDOW POSITION & NEAREST LOCALITY

0 70 140 210 280 350 m

HORIZONTAL DATUM - GDA94 SCALE 1 : 3500

SUBJECT PARCEL DESCRIPTION

DCDB

Lot/Plan	11/RP88668
Area/Volume	1037m²
Tenure	FREEHOLD
Local Government	IPSWICH CITY
Locality	EDBW VALE
Parish	GOODNA
County	STANLEY
Parcel/Segment	25/46831

CLIENT SERVICE STANDARDS

PRINTED (dd/mm/yyyy) 13/11/2003
(Important Notice: The information hereon is NOT an OFFICIAL RECORD and its ACCURACY is NOT GUARANTEED)
DCDB 12/11/2003
For symbology see the BLIN Abbreviations Sheet.

LEGEND

SmartMap

An External Product of the Basic Land Information Network

Based upon an extraction from the Digital Cadastral Data Base

Queensland Government
Natural Resources and Mines

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3356/2002/MCU/RAL
[redacted]

02 April, 2004

MEMORANDUM

TO: DEVELOPMENT TEAM CO-ORDINATOR - EAST

FROM: SENIOR DEVELOPMENT ENGINEER [redacted]

RE: DEVELOPMENT APPLICATION
***INTEGRATED PLANNING ACT 1997* - SECTION 3.2.1(1)**
ENGINEERING ASSESSMENT REPORT

Appn No: 3356/2002/MCU

Applicant: Wingate Property Group

Property Location: 70 Bognuda Street, Lot 6 Bognuda Street, 99999 Bognuda Street, and 1 Carberry Street, Bundamba, Queensland, 4304

Proposal	Development	Approval Type
Bremer Business Park Development	Carrying out building work	N/A.
	Carrying out plumbing or drainage work	N/A.
	Carrying out operational work	N/A.
	Making a material change of use of premises	Preliminary Approval.
	Reconfiguring a lot (17 into 54 lots)	Preliminary Approval.

Date Received: 05 September, 2002

The following comments are made in respect of the above proposed development.

1. APPLICABLE CODES

This application has been assessed against the following codes:-

(a) Ipswich Eastern Corridor Structure Plan;
(b) Subdivision Code;
(c) Residential Development Code;
(d) Commercial and Industrial Development Code;
(e) Parking Code;
(f) Planning Scheme Policy for Water Supply and Sewerage Infrastructure Contributions;
(g) Planning Scheme Policy for Ipswich Roadworks Infrastructure Contributions;
(h) Planning Scheme Policy for Ipswich Drainage Contributions;
(i) Planning Scheme Policy for Flood Liable or Drainage Problem Land;

(j) Ipswich City Council Engineering Works Manual;
(k) Queensland Urban Drainage Manual;
(l) Australian Rainfall and Runoff (The Institution of Engineers, Australia);
(m) Queensland Streets;
(n) Austroads Guide to Traffic Engineering Practice - Intersections at Grade;
(o) Ipswich City Council Standards Drawings;
(p) Manual of Uniform Traffic Control Devices (Department of Main Roads);
(q) Australian Standard 2890.1 - Off-Street Car Parking;
(r) Guidelines for Planning and Design of Urban Water Supply Schemes (Water Resources);
(s) Guidelines for Planning and Design of Sewerage Schemes (Water Resources);
(t) Policy Guidelines for Earthworks (including allotment filling);
(u) Sewerage and Water Supply Act;

The proposal generally complies with or has been conditioned to comply with the above codes.

2. EXISTING CONDITIONS AND COMMENTS

(a) Background

There is no significant history to this site from an engineering point of view. Generally the allotments have had a pastoral use with some residential and industrial uses in certain portions of the area.

(b) Outstanding Matters Relating to Previous Approvals

There are outstanding engineering matters relating to previous approvals. The development of the Capral Aluminum plant is under construction, together with the associated access roads, sewer and watermain extensions and services supplies.

(c) Allotments

[Information]

(d) Roads/Traffic/Parking

(i) External

Ashburn Road, Carberry and Bognuda Street, together with the Warrego Highway and Brisbane Road, service the general development area.

Ashburn Road is an approximately 6.5m wide bituminous carriageway without concrete kerb and channel on either side. Part of this road is currently under upgrading construction for the Capral Aluminium Plant access.
Bognuda Street is an approximately 6.5m wide bituminous carriageway without concrete kerb and channel on either side.
Carberry Street is an approximately 6.5m wide bituminous carriageway without concrete kerb and channel on either side.

Some upgrading of the intersection from Ashburn Road directly on and off the Warrego Highway is also currently under construction due to the Capral Aluminium Plant development access.

There are no constructed footpaths around the development site.

(ii) Internal

Not applicable

Not applicable.

(iii) Access

The principal access will be retained via Ashburn from the Warrego Highway, Bognuda and Brisbane Roads to the South of the Warrego Highway.

(iv) Future Road System

Based on the Ipswich City Road Transportation Study, it is probable that part of the developable land will be required for future road network systems.

(v) Pathways

Not applicable.

(e) Stormwater

Part of the site was inundated in the 1974 flood and is subject to Q100 flooding, the site is not below the ARI of 20 years flood level except along the banks of the Bremer River, and is subject to an ARI of 20 years overland flow along some of the watercourses.

(f) Sewerage

The property is in a limited sewered area. Any additional development will require the installation of additional pump stations and infrastructure to service proposed developments. Additional pipeline corridors are required for the transportation of trunk sewers and processed sewage effluent for use in industrial areas initially in the Swanbank area.

(g) Water Supply

The property is in a limited water reticulated area. Any additional development will require the installation of additional infrastructure to service proposed developments

(h) Energex and Street Lighting

Limited reticulated electrical supplies are available to the area with easements for the high voltage national grid reticulation passing through the site.

(i) **Mining**

Council records indicate that parts of the subject site are located within areas that may be affected by mining.

A geotechnical report was prepared by [Geotechnical Engineering Company Name] titled [Report Title], dated [Date], as part of this application. The Developer is required to design and construct the proposed [Development] in accordance with the recommendations as outlined in the geotechnical report.

(j) **Others**

(i) Easements

National Grid high voltage easements traverse the site.

(ii) Oil/Gas Pipelines

Roma Gas lines traverse the Northern portion of the site near the Bremer River.

(iii) Service Corridors

Not applicable.

(k) **General**

The whole site is divided by the existing East/West portion of the Warrego Highway – access to the Northern portions of the site remain a problem.

3. CONTRIBUTIONS

(a) [Water & Sewerage]
(b) [Road]

4. OTHER DEVELOPMENT APPROVALS REQUIRED

From an engineering perspective, further Development Permits, as required by the *Integrated Planning Act 1997,* shall be obtained in respect of any Operational Works in relation to this approval before any such works are commenced.

RECOMMENDATION

A. MATERIAL CHANGE OF USE:

Based on engineering grounds only, it is recommended that the application for Impact Assessment - Preliminary Approval - Material Change Of Use of land at 70 Bognuda Street, Lot 6 Bognuda Street, 99999 Bognuda Street, and 1 Carberry Street, Bundamba, Queensland, 4304 as proposed by Wingate Property Group and detailed on plan number [Plan No.], dated [Date], be approved, subject to the following terms and conditions being completed by the Developer, to the satisfaction of the Senior Development Engineer:

1. Terms

(a) RPEQ - A Registered Professional Engineer of Queensland, suitably qualified and experienced in the particular area of expertise required. Furthermore, the RPEQ required for the analysis and reporting for mining shall be experienced in the analysis of underground and surface mining within the Ipswich area.

(b) QUDM - The Queensland Urban Drainage Manual, produced by the Queensland Department of Primary Industries.

(c) Queensland Streets - The Design Guidelines for Subdivisional Street Works, prepared for the Institute of Municipal Engineers of Australia (QLD).

(d) AMCORD - The Australian Model Code of Residential Development produced by the Commonwealth Department of Housing and Regional Development.

(e) DMR - Department of Main Road.

(f) MUTCD - The Manual of Uniform Traffic Control Devices, published by DMR.

(g) Ipswich Water - Commercial Business Unit of Ipswich City Council providing water and sewerage services.

(h) DNRM - Department of Natural Resources and Mines.

2. An Infrastructure Agreement is to be struck between the Developer and Council regarding the apportionment of costs and works and the amounts of works that will accepted as included within the Headworks Infrastructure.

3. Development Plan

The proposed development of the site shall be undertaken generally in accordance with Plan Number [Plan No.] dated [Date] with the following amendments and clarifications:-

[Alpha Character & Amendments]

An amended development plan shall be submitted and approved by the Development Manager[Prior To]. Such plan shall include, amongst other items, the following:-

[Alpha Character & Amendments]

3. Mining

(a) The proposed development shall be designed and constructed in accordance with the approved recommendations as outlined in the geotechnical report by [Geotechnical Engineering Company Name] titled [Report Title], dated [Report Date].

Prior to the approval of any application for building works, the Developer shall submit to Council a Structural Engineer's Certificate certifying that the proposed structures have been designed in accordance with the abovementioned geotechnical report.

4. Roadworks

(a) The roads shall be constructed with concrete kerb and channel and asphaltic concrete surfacing, together with associated works for the full length of all property frontages. Kerb ramps in accordance with Council's Standard Drawing SR.18 shall be provided at all intersections.

(b) Roadworks shall be designed and constructed in accordance with Council's Standards, Queensland Streets, Austroads Publications, AMCORD, the relevant and appropriate roadworks design standards and guidelines, and any other documentation deemed appropriate by Council. Such design and construction shall ensure that road carriageway widths are consistent with the road function and position in the road hierarchy and are in accordance with the relevant design speed environment.

(c) The pavement designs shall be in accordance with the Ipswich City Council's Engineering Works Manual, Chapter 5 - Roadworks. All roads shall have two way crossfalls in accordance with Council's adopted standards.

The minimum dedicated road widths, pavement widths and footpath requirements shall be in accordance with Ipswich City Council's Subdivision Code as set out below:

Road Type	Dedication Width	Pavement Width	Footpath	Path Width
Access place	15.0 m	6.5 m	1 Path	1.5 m
Access street	15.0 m	6.5 m	1 Path	1.5 m
Collector	17.0 m	8.5 m	1 Path	1.5 m
Trunk collector	20.0 m	9.0 m	2 Cycleway	2.0 m
		or 2 x 5.0 m	or 1 Path +	1.5 m
			1 Cycleway	2.0 m

(d) The road pavement widths and geometric layout shall be sufficient to make adequate provision for Council's refuse collection vehicles and public transport movements.

(e) A vehicle turning area shall be provided at the end of all "No through" roads and cul-de-sacs. Circular cul-de-sac turning heads, based on a minimum turning circle of 9.0 m radius, are preferred . "T" and "Y" shaped turning heads are generally not to be used.

(f) Traffic slow down devices shall be provided generally in accordance with Queensland Streets in any residential areas.

(g) "No Through Road" signs shall be erected at the entries to cul-de-sacs and terminating roads.

(h) All traffic signs and delineation shall be installed in accordance with MUTCD.

(i) The Developer shall provide minimum 1.5 m wide concrete footpaths on one side of all the streets.

The construction of footpaths shall be in accordance with Council's Standard Drawing SR.19. The concrete footpaths shall be on the same side as the street lights, and the maximum longitudinal grade shall not exceed 1:8.

([Alpha Character]) The Developer shall provide a concrete footpath/cycleway, with a minimum width of 2.0 m, on one side of [Road Name], and a minimum 1.5 m wide concrete footpath on the other side.

The construction of footpaths/cycleways shall be in accordance with Council's Standard Drawing SR.19. The concrete footpath/cycleway shall be on the same side as the street lights, and the maximum longitudinal grade shall not exceed 1:8.

(k) Kerb ramps are to be constructed in accordance with Council's Standard Drawing SR.18 at all intersections and at additional locations where required to connect the concrete pathways and cycleways. Generally at "T" intersections, 4 kerb ramps are required.

(l) Any terminating roads, that are to be constructed as a part of any latter stage, shall be provided with an all-weather gravel surfaced turn-around area of sufficient size to enable Council's refuse vehicle to negotiate a clear turn. Hazard markers and delineator posts shall be erected at the ends of the turnarounds.

(m) Bus stops (including indented bus bays) shall be located on arterial, sub arterial, trunk collector and collector roads, in accordance with Council's Subdivision Code.

Where bus bays front any allotment on a collector road, a driveway is to be constructed for each affected allotment. Such driveway shall not be constructed within the bus set down area but constructed within the tapers of the bus bay or outside the bus bay area.

(n) The Developer shall provide concrete kerb and channel generally on a 4.25m alignment (or to match the alignment of any existing kerbing in that road) plus gravel pavement infill with asphaltic concrete overlay or full depth asphaltic concrete pavement between the new kerb and channel and the existing pavement in the existing roads as detailed below. The extent to which the widening intrudes into the existing pavement shall be determined on site by the Senior Development Engineer. The asphaltic concrete overlay shall extend over the existing pavement where longitudinal and cross sectional profiles warrant.

(i) Bognuda Street shall be constructed/upgraded with asphaltic concrete surfacing to a width of 8.5m, from Boundary Road to lot 1 RP 101430 (Number 64, Bognuda Street) together with concrete kerbing and channelling, associated works and stormwater drainage.

(ii) Bognuda Street shall be constructed/upgraded with asphaltic concrete surfacing to a width of 14.0m, from to lot 1 RP 101430 (64, Bognuda Street) to the intersection with Ashburn Road, together with concrete kerbing and channelling, associated works and stormwater drainage.

(iii) Bognuda Street is to be cut within the frontage to lot 1 RP 101430 (64, Bognuda Street) area (while maintaining access to that lot) as soon as the connection to Brisbane Road has been completed and opened to traffic to the rest of the development.

(iv)Ashburn Road shall be constructed/upgraded with asphaltic concrete surfacing to a width of 14.0m, from the intersection with Bognuda Street to the existing westbound on-ramp to the Warrego highway from River Road, together with concrete kerbing and channelling, associated works and stormwater drainage.

(v) Carberry Street shall be constructed/upgraded with asphaltic concrete surfacing to a width of [Width] m, from [From] to [To] together with concrete kerbing and channelling, associated works and stormwater drainage.

(vi)[Road Name] shall be constructed from [From] to [To]. The construction shall be a [Width] m wide formation with a minimum gravel pavement 200 mm deep and [Width] m wide, as well as the provision of any cross road drainage, in accordance with Council's Subdivisional Code.

(o) The Developer shall upgrade the intersection of Ashburn Road and the access to the Warrego highway opposite the Australian Hardboards entrance in the initial stages until the ultimate/permanent on- and off-ramps to the Warrego Highway have been constructed and are operational.

(p) The Developer shall complete construction of the connection road between Ashburn and Brisbane Roads PRIOR TO THE AVAILABILITY or use of 40% of the development area South of the Warrego highway in this application, or 5 years from this approval, whichever is the sooner. (possibly this should be restricted to 40% of the industrial and commercial areas development, as this is the primary source of the loading on the road)
This road is to be constructed with the cross-section of an arterial road and should also have a design speed of 80km/h, no direct property access (except at Capral which has already been approved) and be able to cater for B-Doubles. It is also envisaged that to provide access into individual lots, several east-west trunk collectors will also be required. These must be able to cater for heavy vehicle movements.
Access to Brisbane Road is to be effected through Lots 2 and 7 on RP22379 as per DMR requirements: This is only to be approved once the owners agreement has been received in writing, together with Queensland Rail's agreement and conditions.

(q) The access to the area on the Northern side of the Warrego Highway is to be established prior to the commencement of any works on this portion of the estate's development and will be **EITHER** :

(i) via a service road connecting the round-a-bout at River Road fly-over through allotments from whose owners the necessary lands have been obtained to the area to be serviced, together with the necessary upgrading of the on- and off-ramps to the Warrego Highway there, together with the necessary upgrades to the River road bridge and other round-a-bout and Asburn Road near the fly-over;

(j) **OR** a new fly-over is to be constructed over the Warrego Highway as an extension of Bognuda Street to connect the Northern and Southern portions of the estate, together with the necessary accompanying on- and off-ramps to the Warrego Highway.

(r) Provision shall be made for minimum 6m, three chord truncations at intersections. The 6.0m distance is measured along each frontage from the property corner.

5. Access/Parking

(a) Vehicular access from the roadways to all allotments shall be capable of being provided. Any requirements of the Department of Main Roads shall be met.

(b) Vehicular access from the roadway shall be provided as a shared accessway for any allotments located to the rear of other lots with limited access to a Council Maintained road. Any requirements of the Department of Main Roads shall be met.

(c) Design and construction of all access and parking shall be in accordance with the provisions of the Ipswich City Council Parking Code and the Australian Standards (2890 series) (applicable to a vehicle to suit the proposed development).

(d) Parking and manoeuvring areas shall accommodate the largest anticipated vehicle to use the site.

(e) Adequate facilities for servicing the development shall be provided on site to ensure loading and/or unloading activities do not occur on-street.

(f) Provision shall be made for all vehicles to enter and exit the sites/lots in forward gear.

(g) All parking, access and manoeuvring areas shall be constructed of concrete, bitumen or pavers and shall be linemarked in accordance with the relevant Australian Standard.

(h) A concrete layback and driveway slab [Width] m wide, from the layback to the property boundary, shall be constructed for access to [Lot/Development] in accordance with Council's Standard Drawings SR.12, SR.13 and SR.14.

(i) A concrete driveway shall be constructed from the existing layback or new kerb and channel for any proposed hatchet lots to the property boundary in accordance with Council's Standard Drawings SR.12, SR.13 and SR.14.

(j) The access driveway to hatchet shaped lots shall be constructed from the property boundary for the full length of the access strip with the following design criteria:

(i) the maximum longitudinal grade shall be 1:6 and the maximum crossfall shall be 1:20, except that the Senior Development Engineer may allow a longitudinal grade of 1:4 for a distance not exceeding 60 m in total in special circumstances.

(ii) a drainage system shall be provided so that no part of the driveway shall be inundated in the runoff resulting from a storm event with an ARI of 2 years, and the runoff from the driveway shall be discharged to the satisfaction of the Senior Development Engineer.

(iii) The driveway construction within the access strip to the hatchet shaped lots shall be either:

- a 3.0 m wide compacted gravel pavement not less than 100 mm deep and either sealed with 25 mm of asphaltic concrete or hot sprayed bitumen consisting of a prime and two seal coats, or provided with an approved paved surface; or

- reinforced concrete not less than 100 mm deep and 2.7 m wide.

OR

(iv) The driveway construction in proposed hatchet shaped lots shall be reinforced concrete not less than 100 mm deep and 2.7 m wide.

(v) Reciprocal easement rights shall be placed over the access strip in proposed hatchet shaped lots to allow for the provision of utility services and access.

(vi) The water services for the allotments, together with stormwater pipes and conduits for electricity and telephone, shall be installed for the full length of all access strips.

(k) The Developer shall demonstrate that a safe ingress and egress point can be provided for all lots in accordance with Australian Standard AS2890.1, and the Austroads Publication "Guide to Traffic Engineering Practice, Part 5, Intersections at Grade".

(l) The temporary car parking area shall be constructed with a compacted gravel base and overlay of blue metal stone, similar material or paving blocks on a sand base.

(m) No vehicle access is to be taken from individual lots to the Warrego Highway, nor any future connection between the Warrego and Cunningham Highways, nor from the new road connecting Ashburn and Brisbane Roads, in relation to the approved use, except via approved access roads, or unless as approved by the Senior Development Engineer and DMR.

(n) Concrete paths, 100 mm deep, shall be provided within pathway areas between blocks in accordance with Council's Standard Drawing SR.30, and shall commence at the kerb and channel and extend for the full length of the pathway area. Where these pathways are to act as overland flow routes, appropriate kerbing may be required. The width of the concrete paths shall be a minimum of 4.0 m for pedestrian only paths. The maximum longitudinal grade shall not exceed 1:8.

6. Traffic

([Alpha Character]) The Developer shall provide a traffic report, prepared by a RPEQ, in relation to access to the proposed development.

([Alpha Character]) The Developer shall provide a traffic study, prepared by a RPEQ, nominating the proposed location of the roads specified in Condition [Condition No.]. Amongst other matters, the study shall address the following:

(i) road hierarchy for the study area, including connection points to the external road network;

(ii) generalised land use, including commercial, etc., nodes;

(iii) public transport needs;

(iv) staging of the proposed works; and

(v) effects on existing road networks.

The study shall be submitted prior to the submission of engineering drawings.

([Alpha Character]) The Developer shall provide a traffic study, prepared by a RPEQ. Amongst other matters, the study shall address the following:

(i) a review of the traffic generated by the proposal;

(ii) recommendation of specific measures to be undertaken to improve the alignment, sight distances, and signage of [Road] which will result in safe movements of light and heavy vehicles, and reduce delays and queuing distances; and

(iii) recommendation of specific measures to be undertaken to define and improve the intersection of [Road] and [Road].

The study shall be submitted prior to the submission of engineering drawings.

([Roman Character]) The Developer shall undertake any works deemed necessary by the Senior Development Engineer, to comply with the requirements of the traffic study.

7. Sewerage

(a) The Developer shall provide a sewerage reticulation system with appropriate service connection branches, designed so as to command the whole of each of the proposed allotments.

(b) The Developer shall pay the full cost for Council to provide a suitable connection into the existing sewerage reticulation systems. All works on live sewers are to be carried out by Council at the Developer's expense, unless arranged otherwise with Ipswich Water.

(c) The Developer shall demonstrate that the proposed pipe sizes (new pipes and any pipe upgrades) and connection points are adequate for the total upstream catchment and the proposed development.

(d) The Developer shall demonstrate that the proposed pump stations or the pump station upgrades are adequate to service the total upstream catchment and the proposed development. Pump station numbers are to be minimised as far as possible to the satisfaction of Ipswich Water and the Senior Development Engineer.

(e) No work on the sewerage reticulation system shall commence prior to the approval of the Operational Works application.

(f)

8. Non-Potable Water (Recycled sewage effluent)

(a) A recycled water reticulation system is to be provided in the Industrial and Commercial precincts of the estate, including a trunk main for the conveyance of the processed sewage effluent from the Bundamba Sewage Treatment Plant, through the development and ultimately for use in the Swanbank and other regions of the city. The sizing of the mains is to be established by an RPEQ in conjunction with discussions and projected demands anticipated by Ipswich Water and the Engineering consultant.

8. Water

(a) The Developer shall provide a reticulated water supply system together with valves and fire hydrants, in accordance with the "Guidelines for Planning and Design of Urban Water Supply Systems", which connects into Council's existing reticulation system. This system is to be generally in accordance with the development proposals as preliminarily approved.

(b) A blue, bi-directional raised reflective pavement marker (RRPM) shall be provided to all hydrants. The marker shall be installed in accordance with the Department of Main Roads Fire Hydrant Indication System Technical Guideline.

(c) The Developer shall demonstrate that the pipe sizes proposed and the available pressure head complies with the requirements of Ipswich Water's "Water Supply Planning Guidelines", and the "Guidelines for Planning and Design of Urban Water Supply Systems" and are adequate to cater for the proposed development. Such demonstration is to cover as a minimum:

(i) available pressure during maximum hour;

(ii) available pressure and flows for fire fighting and other purposes, and any recommendations pertaining thereto; and

(iii) comments regarding the situation at various stages of the development.

Note:
Details regarding available pressure heads at various points in the existing water reticulation network for use in the calculations to be produced for such demonstration may be obtained from the Senior Development Engineer on submission of completed application forms and payment of the relevant fees.

(d) All works on live water mains are to be carried out by Council in accordance with Council's policy, and at the Developer's expense.

(e) Where concrete footpaths are to be constructed, the Developer shall provide 100mm diameter conduits under the footpath and in line with the conduits under the road, for future ease of installing the individual water services. The letter "W" shall be embossed in the concrete to mark the location of the conduit.

(f) The Developer shall lodge a private works request on the prescribed Council form, for Council to supply a cost estimate to:

(i) provide a suitable metered water connection for each proposed residential allotment;

(ii) amend the existing connection if necessary; and

(iii) seal off any existing water connections if necessary.

The appropriate fees are to be paid prior to Council signing any plan of survey.

(g) Wherever possible, the water main shall be constructed on the opposite side to the concrete footpaths. Where the water main is under a concrete footpath, the Developer shall provide a water connection (up to, but excluding the provision of meters) to each allotment, including the provision of approved pre-cast concrete or cast iron boxes over the stop cock.

(h) Where the water reticulation network is serving in excess of 20 allotments in any one stage, the site shall be served from two directions and shall not be in the form of a single dead end supply. All other mains shall be looped around the cul-de-sac head to join back on to itself.

(i) Sufficient stop valves shall be installed so that in the event of any break in the supply, the maximum number of allotments to be without water is 20.

(k) In the Industrial areas 150mm diameter watermains (minimum) will be required on each side of the roads.

(l) An additional 500mm diameter trunk watermain is to be constructed through the development site in a location to be finalised during discussions with Ipswich Water. Payment for this work will be off-set against the Headworks charges for water for the development.

(m)

9. Stormwater

(a) The Developer shall provide all necessary stormwater drainage (both internal and external to the development) and such drainage works (except for roofwater systems) shall be designed and constructed in accordance with QUDM such that the overall drainage system caters for a storm event with an ARI of 100 years.

Overland flow paths shall be suitably designed to cater for the water from a storm event with an ARI of 100 years. In the case where the piped system is carrying part of the flow, the overland flow paths shall be designed to cater for that volume which is represented by the difference between the predicted volume from the storm event with an ARI of 100 years and the capacity of the pipe system, noting the requirements of QUDM.

(b) A suitable roofwater system shall be designed in accordance with QUDM, for allotments that do not have adequate fall from within the allotment to the design invert level of the kerb and channel. The design is to be to a minimum Level II in QUDM.

(c) All stormwater flows within and adjacent to the development, other than inter-allotment drainage, shall be confined to dedicated roads, drainage reserves, registered drainage easements or within parkland. The registered drainage easements, if related to piped drainage, shall be centrally located over such underground pipe system and shall be not less than 4.0 m wide, except for drainage easements required for side boundaries which may be 3.0 m wide where approved by the Senior Development Engineer. In addition, the easements shall be of suitable width to contain the predicted overland flow from the storm event with an ARI of 100 years in that location.

(d) No ponding or redirection of stormwater shall occur onto adjoining land unless specifically approved by Council in consultation with the owner of the adjoining land.

(e) Due consideration shall be given in the design and construction of the development in relation to the effect of the developed catchment flows on the downstream discharge receival areas. Suitable stormwater control devices are to be provided to ensure that there is no increase in velocity in watercourses. Such control devices are to be designed so as to integrate the landscaping, recreational, infrastructural and drainage roles of watercourses.

(f) All stormwater runoff from the development shall be discharged in a manner and to a point to be approved by the Senior Development Engineer. Stormwater outlet(s) shall be constructed in accordance with Queensland Transport's Standard Drawing Nos. 1304, 1305 and 1306.

(g) Stormwater drainage plans are to be submitted and approved by the Senior Development Engineer, in conjunction with the submission of an Operational Works application.

(h) The Developer shall provide a stormwater detention basin (or equivalent) on the subject land, which shall be designed and constructed in accordance with QUDM. The detention basin(s) (or equivalent) shall be constructed to ensure that flows, at any point downstream in the catchment, are not increased by the development for any combination of frequency and duration from the storm event with an ARI of 2 years up to and including the storm event with an ARI of 100 years.

(i) Each proposed allotment shall contain an area of at least 400 m^2 above the design flood/stormwater level from a storm event with an ARI of 100 years, which is suitable for a building platform and has unimpeded access to a road system which is also above the design flood level.

(j) The Developer shall have prepared a report by a RPEQ defining the area affected by a storm event with an ARI of 100 years, associated with the flows along the Bremer River banks and the overland flow paths in the inundation areas of the proposed developed site. Areas affected by a storm event with an ARI of 100 years shall be external to any proposed residential allotments. This report is to take account of any proposed cut and filling of the site(s) in order to show there will be no impact on the river and creek systems due to these proposed bulk earthworks.

(k) Appropriate works shall be carried out to ensure that stormwater drainage from the new kerb and channel discharges suitably into the drainage systems.

(l) If it is proposed that temporary drainage works will be constructed and such works will not form part of the final drainage system, then the Developer shall contribute on a pro-rata basis towards the cost of the final drainage works. The contribution payable shall be determined by the Development Manager following lodgement of construction details and estimates from the Developer. The construction details and estimates shall be based on the fully developed catchment and all final drainage structures and/or works.

(m) Development of the property with buildings or other structures below the flood level associated with an ARI of 100 years will not be permitted.

(n) There shall be no filling or removal of material in the flood area below the flood level associated with an ARI of 20 years without the approval of the Senior Development Engineer. There shall be minimal disturbance to vegetation in the flood area, unless prior written approval is obtained from Council.

(o) Filling in proposed Lots, which are adjacent to the watercourse shown on the proposal plan, shall not be undertaken without the written approval of Council.

(p) Pollutant control devices shall be installed in the stormwater system. Locations and types of the devices shall be approved by the Senior Development Engineer.

There shall be minimal disturbance to vegetation in the gully areas, unless prior written approval is obtained from Council. Stormwater drainage outlets shall be the subject of detailed design in the preparation of plans for each stage of the development.

The Stormwater Management Plan required by conditions contained in [Contained In] shall be developed in accordance with the stormwater works as shown on Plan Number [Plan Number]. Should supplementary or additional works be required as a result of the formulation of a Stormwater Management Plan, such works shall require the submission of an amended plan.

10. Public Utilities

(a) Adequate provision shall be made in all proposed dedicated roads, access strips and easements, to cater for the public utility services that would normally serve the development.

(b) The Developer shall provide appropriate road crossing conduits in accordance with Council's Standard Drawings SR.22 and SR.23. Where concrete footpaths are to be constructed, the conduits shall be extended to the property boundaries.

(c) Street and intersection lighting shall be installed by the Developer in accordance with the Australian Standard 1158.3.1 Table 1.1. All street lighting associated with the development shall be certified by a RPEQ. Street lighting shall be installed on the same side as concrete footpaths (where applicable).

(d) The Developer shall provide underground electricity/telecommunications within the development, constructed in the approved allocation as detailed in Council's Standard Drawings SR.22 and SR.23. Electricity/telecommunication drawings shall be co-ordinated with the civil engineering design documents, to ensure that service clashes are avoided. Where allotments front an existing overhead electricity/telecommunication service, these allotments may connect to such service subject to the approval and requirements of the service provider.

(e) The Developer shall provide an Energex approved electrical reticulation layout plan. The electricity layout shall also be shown on the water reticulation layout plans.

(f) The Developer shall provide each allotment with an electricity supply and access to a telephone network.

11. Erosion & Silt Management

(a) The Developer shall be responsible for the installation and maintenance of silt management facilities from the time of commencement of construction until the site has been stabilised against erosion. All silt management facilities are to be in accordance with the document "Soil Erosion and Sediment Control" published by the Institution of Engineers Australia, or equivalent and better to the satisfaction of the Senior Development Engineer.

(d) Sediment and Erosion Control Programs shall be submitted for each application with the engineering drawings for approval for maintaining the facilities, setting out the frequency of attention, with inspections to be made after each significant rainfall event, and any other actions necessary during the life of the construction works.

(e) The Developer shall lodge a $5 000 siltation and erosion performance bond with Council (for each construction stage of the development), prior to the commencement of works, which shall only be released by Council at the termination of the maintenance period. Where Council determines that a draw-down of the bond is required, the Developer shall restore the bond to its full amount within 10 days of a notice from Council to that effect. Such bond shall guarantee adequate performance in the circumstances (i) and (ii) below:

(i) In the event that instructions issued to the Consulting Engineer by the Senior Development Engineer for the installation of erosion control measures, are not complied with within 24 hours, Council will call upon the bond to the extent required to carry out the necessary works.

(ii) If the Senior Development Engineer determines that silt damage has occurred on the site, or the downstream drainage system has become silted, the Developer shall be responsible for restoration. Such restoration shall be completed in the time determined by the Senior Development Engineer.

Should the Developer fail to complete the works determined by the Senior Development Engineer within the specified time, Council shall complete the work and recover all costs from the Developer associated with that work.

12. Operational Works – Municipal Works
(ie Works being handed over to Council)

(a) Plans relating to all civil engineering works shall be prepared and submitted for review by Council under the cover of Form 1 - Part A (Common details for all applications) and Form 1 - Part E (Planning Scheme Works). The plans shall show full construction details, layout dimensions, and finished surface levels and shall be submitted together with the appropriate fees for Council approval, prior to the commencement of construction on site.

(b) The Developer shall comply with the requirements of the documents entitled "Engineering Works Manual", "Standard Drawings" and the current Ipswich Planning Scheme.

(c) Prior to the commencement of any municipal works associated with developments other than the subdivision of land, Council shall require the provision of a bond equivalent to not less than 10% (minimum of $1,000.00) of the value of the works as security for the performance of the various construction obligations (including the provision of engineering

certification and "As Constructed" information). The bond shall be reduced to an amount of not less than 5% of the value of the works upon formal acceptance of the works "On Maintenance" and shall be retained by Council during the maintenance period as security for the performance of the maintenance obligations. The bond shall be returned upon formal acceptance of the works "Off Maintenance".

13. Operational Works – Internal Works
(ie Works not being handed over to Council)

(a) Plans relating to all civil engineering works shall be prepared and submitted for review by Council under the cover of Form 1 - Part A (Common details for all applications) and Form 1 - Part E (Planning Scheme Works). The plans shall show full construction details, layout dimensions, and finished surface levels and shall be submitted together with the appropriate fees for Council approval, prior to the commencement of construction on site.

(b) The Developer shall comply with the requirements of the documents entitled "Engineering Works Manual", "Standard Drawings" and the current Ipswich Planning Scheme.

14. Plan of Survey

(a) No access shall be permitted along the common boundary of all proposed allotments and proposed arterial and trunk collector roads. The means of achieving this shall be to the satisfaction of the Development Manager.

(b) Land shall be dedicated for future road purposes, free of cost to or compensation payable by Council, in order to provide a [Width] m road widening over the [Length] frontage of the site.

(c) The Developer shall grant, free of cost to or compensation payable by Council, minimum 4.0 m wide easements located centrally over existing and proposed stormwater drains, water mains and sewerage rising mains, where they are located within private property.

The documentation associated with these easements may be prepared by the Developer in a form satisfactory to Council's City Solicitor, or the Developer may submit easement plans, only where Council is party to the easements, to Council for the preparation of easement documents at the Developer's expense.

(d) Easements required for discharge of stormwater over adjacent land shall be agreed to in writing by the owner of the subject land prior to construction work commencing.

(e) Easements shall be centrally located over the alignment of stormwater paths and be of a width sufficient to encompass the overland flow from a storm event with an ARI of 100 years.

(f) Easements shall be of sufficient width to contain any fitting, access chamber etc located on stormwater drains, water mains, and sewerage rising mains.

(g) All pre-existing easements crossing the site shall be pegged where they cross each property boundary and at every change of direction.

(h) All land (excluding that contained within approved parkland) below the design [Which Level] level from a storm event with an ARI of [Storm Event] years shall be subject to an easement for drainage purposes to be granted in favour of, and at no cost to or compensation payable by Council.

(i) The Developer shall transfer free of cost to or compensation payable by Council for drainage purposes that part of the site below the level of the storm event with an ARI of 20 years (approximately RL[Level] m).

(j) All land (excluding that contained within approved parkland) below the flood level associated with an ARI of 10 years shall be dedicated as Drainage Reserve at no cost to Council. Land below this level shall not be considered as parkland contribution.

(k) The Developer shall grant, free of cost to or compensation payable by Council, a suitable easement to permit access to the land described in the above condition for the purpose of Council maintaining that land.

(l) Adequate permanent survey marks shall be installed. The Developer shall submit a certificate signed by a licensed surveyor, stating that after the completion of all works associated with the development, permanent survey marks are in their correct position, in accordance with the plan of survey.

(m) Land required for detention basins or equivalent is to be dedicated as drainage reserve in favour of Council and not included within parkland dedication unless approved as parkland by Council.

15. Contributions

(a) In accordance with the current Council Policies in relation to headworks contributions, the Developer shall pay, [When], the following monies to Council:

(i)	Water headworks	= [WaterHead]
(ii)	Sewerage headworks	= [SewerageHead]
(iii)	Road contribution	= [RoadContribution]
(iv)	Drainage contribution	= $

Calculations of headworks and contributions are based on the infrastructure contribution rates applicable at the date the development application was lodged with Council. The contributions above shall be applicable for a period of twelve months from the date of the development approval, and thereafter shall be based on the infrastructure contribution rates applicable at the date when payment is made.

([Alpha Character]) The Developer shall pay a contribution of $[Amount] towards [Works]. Such money shall be held in trust by Council until the works are programmed for construction.

16. General

(a) All disturbed verge areas and allotments shall be graded, grassed and left in a mowable condition. The grass cover shall be obtained as early as possible during the development and an acceptable grass cover shall be achieved before the development can be accepted "Off Maintenance".

(b) Street name signs shall be manufactured to Council specifications and shall be erected in accordance with Council's Standard Drawing SR.26 at each intersection.

(c) With reference to any works, on land under other private ownership, written permission for the works shall be obtained and forwarded to Council. Similarly, written clearances shall be obtained after the works are completed, unless otherwise accepted by the Senior Development Engineer.

(d) All works required for this development shall take due regard of any and all existing services and, if considered necessary by the relevant authority or the Senior Development Engineer, such works shall be altered at the cost of the Developer.

(e) Any allotment filling for a greater depth than 800 mm to provide for building platforms shall be conducted in accordance with Australian Standard 3798. Test results as required by Australian Standard 3798, and a certificate of quality and uniformity of fill shall be provided by a RPEQ. The level of responsibility shall be Level 1.

(f) A certificate from a RPEQ shall be issued to Council certifying that any retaining wall greater than 800 mm in height is structurally sound and capable of withstanding any likely surcharge loads. Retaining walls greater than 1.0 m in height are to be provided with railings or other barriers to provide pedestrian safety.

(g) Retaining walls shall be designed so that there are no imposed loads placed upon Council's underground services. This may include extending the footing to a level 300 mm below the invert of the pipe.

(h) Filling of gully areas if permitted shall be carried out strictly in accordance with Australian Standard 3798. Test results as required by Australian Standard 3798 and a certificate of quality and uniformity of fill, shall be provided by the Supervising RPEQ for all filled areas.

(i) All imported and exported materials shall be transported only on routes approved by the Senior Development Engineer.

(k) For batters resulting from cutting and filling of the site and producing slopes greater than 1:6, Council requires a RPEQ to certify that they are stable and properly drained.

([Alpha Character]) A hydraulic study and a ground stability study shall be undertaken in regard to the site by a RPEQ. Such studies shall be comprehensive studies taking into account all matters relating to the site and shall include, but shall not be limited to, the following:

- Geology of the site and any related problems;
- Instability features such as slips, soil creep etc;
- Effects of existing vegetation and of any possible removal and or modification of same;

- Effects of any fill material and the types of fill material recommended;
- Water eg: ground water; scour potential in flood situations including the effects of turbulence; effects of rapid draw down of water level.

Such studies shall include any necessary recommendations in regard to the proposed development to ensure long term stability.

(m) Approval of the Senior Development Engineer is required for any fill intended to be placed over Council's underground services.

(n) If, after the preparation of detailed design plans for the various roads, it is found necessary to provide any additional dedicated road area, or modify the proposed dedicated roads to enable the full requirements of Council's standards, Queensland Streets, AMCORD and Austroads documents to be incorporated in any way (but particularly in the production of the required speed environment or because of longitudinal and cross sectional constraints) then the estate layout plan shall be altered accordingly.

(o) The Developer shall construct 3 m wide emergency/maintenance accessways on both sides of the watercourse in parkland adjacent to adjoining residential premises for the full length of the parkland corridors. The accessways shall have a minimum depth of 150 mm of approved gravel, compacted to 95% Modified Maximum Dry Density (MMDD).

(p) Stick raking of the development is not a Council requirement for acceptance of the work "On Maintenance". Should the Developer wish to have the development stick raked on completion of the works, then stick raking shall be carried out in conjunction with watering, prior to and during the stick raking operation, so that no dust is produced.

Stick raking shall cease immediately if there is dust evident and/or if ordered to cease by the Senior Development Engineer. Stick raking shall not recommence until such time as the area has been adequately watered and is considered acceptable by the Senior Development Engineer for recommencement.

17. Compliance with conditions

Condition numbers [Condition Numbers] shall be completed prior to [When].

B. RECONFIGURATION OF A LOT:

Based on engineering grounds only, it is recommended that the application for Impact Assessment - Preliminary Approval – Reconfiguration of Lots of land at 70 Bognuda Street, Lot 6 Bognuda Street, 99999 Bognuda Street, and 1 Carberry Street, Bundamba, Queensland, 4304 as proposed by Wingate Property Group and detailed on plan number [Plan No.], dated [Date], be approved, subject to the following terms and conditions being completed by the Developer, to the satisfaction of the Senior Development Engineer:

1. Terms

(a) RPEQ - A Registered Professional Engineer of Queensland, suitably qualified and experienced in the particular area of expertise required. Furthermore, the RPEQ required

for the analysis and reporting for mining shall be experienced in the analysis of underground and surface mining within the Ipswich area.

(b) QUDM - The Queensland Urban Drainage Manual, produced by the Queensland Department of Primary Industries.

(c) Queensland Streets - The Design Guidelines for Subdivisional Street Works, prepared for the Institute of Municipal Engineers of Australia (QLD).

(d) AMCORD - The Australian Model Code of Residential Development produced by the Commonwealth Department of Housing and Regional Development.

(e) DMR - Department of Main Road.

(f) MUTCD - The Manual of Uniform Traffic Control Devices, published by DMR.

(g) Ipswich Water - Commercial Business Unit of Ipswich City Council providing water and sewerage services.

(h) DNRM - Department of Natural Resources and Mines.

2. Development Plan

The proposed development of the site shall be undertaken generally in accordance with Plan Number [Plan No.] dated [Date] with the following amendments and clarifications:-

[Alpha Character & Amendments]

An amended development plan shall be submitted and approved by the Development Manager[Prior To]. Such plan shall include, amongst other items, the following:-

[Alpha Character & Amendments]

3. Roadworks

(a) The roads shall be constructed with concrete kerb and channel and asphaltic concrete surfacing, together with associated works for the full length of all property frontages. Kerb ramps in accordance with Council's Standard Drawing SR.18 shall be provided at all intersections.

(b) Roadworks shall be designed and constructed in accordance with Council's Standards, Queensland Streets, Austroads Publications, AMCORD, the relevant and appropriate roadworks design standards and guidelines, and any other documentation deemed appropriate by Council. Such design and construction shall ensure that road carriageway widths are consistent with the road function and position in the road hierarchy and are in accordance with the relevant design speed environment.

(c) The pavement designs shall be in accordance with the Ipswich City Council's Engineering Works Manual, Chapter 5 - Roadworks. All roads shall have two way crossfalls in accordance with Council's adopted standards.

The minimum dedicated road widths, pavement widths and footpath requirements shall be in accordance with Ipswich City Council's Subdivision Code as set out below:

Road Type	Dedication Width	Pavement Width	Footpath	Path Width
Access place	15.0 m	6.5 m	1 Path	1.5 m
Access street	15.0 m	6.5 m	1 Path	1.5 m
Collector	17.0 m	8.5 m	1 Path	1.5 m
Trunk collector	20.0 m	9.0 m	2 Cycleway	2.0 m
		or 2 x 5.0 m	or 1 Path +	1.5 m
			1 Cycleway	2.0 m

MAY NEED TO EXTEND THE TABLE AND ADD IN FOR INDUSTRIAL ACCESS PLACE, ACCESS ROAD AND COLLECTOR ROADS

(d) The road pavement widths and geometric layout shall be sufficient to make adequate provision for Council's refuse collection vehicles and public transport movements.

(e) A vehicle turning area shall be provided at the end of all "No through" roads and cul-de-sacs. Circular cul-de-sac turning heads, based on a minimum turning circle of 9.0 m radius, are preferred . "T" and "Y" shaped turning heads are generally not to be used.

(f) Traffic slow down devices shall be provided generally in accordance with Queensland Streets in any residential areas.

(g) "No Through Road" signs shall be erected at the entries to cul-de-sacs and terminating roads.

(h) All traffic signs and delineation shall be installed in accordance with MUTCD.

(i) The Developer shall provide minimum 1.5 m wide concrete footpaths on one side of all the streets.

The construction of footpaths shall be in accordance with Council's Standard Drawing SR.19. The concrete footpaths shall be on the same side as the street lights, and the maximum longitudinal grade shall not exceed 1:8.

([Alpha Character]) The Developer shall provide a concrete footpath/cycleway, with a minimum width of 2.0 m, on one side of [Road Name], and a minimum 1.5 m wide concrete footpath on the other side.

The construction of footpaths/cycleways shall be in accordance with Council's Standard Drawing SR.19. The concrete footpath/cycleway shall be on the same side as the street lights, and the maximum longitudinal grade shall not exceed 1:8.

(k) Kerb ramps are to be constructed in accordance with Council's Standard Drawing SR.18 at all intersections and at additional locations where required to connect the concrete pathways and cycleways. Generally at "T" intersections, 4 kerb ramps are required.

(l) Any terminating roads, that are to be constructed as a part of any latter stage, shall be provided with an all-weather gravel surfaced turn-around area of sufficient size to enable Council's refuse vehicle to negotiate a clear turn. Hazard markers and delineator posts shall be erected at the ends of the turnarounds.

(m) Bus stops (including indented bus bays) shall be located on arterial, sub arterial, trunk collector and collector roads, in accordance with Council's Subdivision Code.

Where bus bays front any allotment on a collector road, a driveway is to be constructed for each affected allotment. Such driveway shall not be constructed within the bus set down area but constructed within the tapers of the bus bay or outside the bus bay area.

([Alpha Character]) The Developer shall provide concrete kerb and channel on a [Alignment] m alignment plus gravel pavement infill with asphaltic concrete overlay or full depth asphaltic concrete pavement between the new kerb and channel and the existing pavement. The extent to which the widening intrudes into the existing pavement shall be determined on site by the Senior Development Engineer. The asphaltic concrete overlay shall extend over the existing pavement where longitudinal and cross sectional profiles warrant. The work shall extend from [From] to [To] and shall include the appropriate transitions back to the existing bituminous pavement.

([Alpha Character]) Bognuda Street shall be constructed/upgraded with asphaltic concrete surfacing to a width of 8.5m, from Boundary Road to lot 1 RP 101430 (Number 64, Bognuda Street) together with concrete kerbing and channelling, associated works and stormwater drainage.

([Alpha Character]) Bognuda Street shall be constructed/upgraded with asphaltic concrete surfacing to a width of 14.0m, from to lot 1 RP 101430 (Number 64, Bognuda Street) to the intersection with Ashburn Road, together with concrete kerbing and channelling, associated works and stormwater drainage.

([Alpha Character]) Bognuda Street is to be cut within the frontage to lot 1 RP 101430 (Number 64, Bognuda Street) area (while maintaining access to that lot) as soon as the connection to Brisbane Road has been completed and opened to traffic to the rest of the development.

([Alpha Character]) Ashburn Road shall be constructed/upgraded with asphaltic concrete surfacing to a width of 14.0m, from the intersection with Bognuda Street to the existing westbound on-ramp to the Warrego highway from River Road, together with concrete kerbing and channelling, associated works and stormwater drainage.

([Alpha Character]) Carberry Street shall be constructed/upgraded with asphaltic concrete surfacing to a width of [Width] m, from [From] to [To] together with concrete kerbing and channelling, associated works and stormwater drainage.

([Alpha Character]) [Road Name] shall be constructed from [From] to [To]. The construction shall be a [Width] m wide formation with a minimum gravel pavement 200 mm deep and [Width] m wide, as well as the provision of any cross road drainage, in accordance with Council's Subdivisional Code.

([Alpha Character]) The Developer shall upgrade the intersection of Ashburn Road and the access to the Warrego highway opposite the Australian Hardboards entrance in accordance with Drawing Number [Drawing No] dated [Date] in accordance with the AUSTROADS Publication "Guide to Traffic Engineering Practice, Part 5, Intersections at Grade". Any requirements of the Department of Main Roads shall be met.

([Alpha Character]) The Developer shall complete construction of the connection road between Ashburn and Brisbane Roads PRIOR TO THE AVAILABILITY or use of 40% of the development area South of the Warrego highway in this application, or 5 years from this approval, whichever is the sooner. (possibly this should be restricted to 40% of the industrial and commercial areas development, as this is the primary source of the loading on the road)
This road is to be constructed with the cross-section of an arterial road and should also have a design speed of 80km/h, no direct property access (except at Capral which has already been approved) and be able to cater for B-Doubles. It is also envisaged that to provide access into indivudual lots, several east-west trunk collectors will also be required. These must be able to cater for heavy vehicle movements.
Access to Brisbane Road is to be effected through Lots 2 and 7 on RP22379 as per DMR requirements: This is only to be approved once the owners agreement has been received in writing, together with Queensland Rail's agreement and conditions.

([Alpha Character]) Provision shall be made for 6 m, three chord truncations at intersections. The 6.0m distance is measured along each frontage from the property corner.

5. Access/Parking

(a) Vehicular access from the roadways to all allotments shall be capable of being provided. Any requirements of the Department of Main Roads shall be met.

(b) Design and construction of all access and parking shall be in accordance with the provisions of the Ipswich City Council Parking Code and the Australian Standards (2890 series) (applicable to a Semi-trailers and B-Doubles for the General Industy areas).

(c) Parking and manoeuvring areas shall accommodate the largest anticipated vehicle to use the site.

(d) Adequate facilities for servicing the development shall be provided on site to ensure loading and/or unloading activities do not occur on-street.

(e) Provision shall be made for all vehicles to enter and exit the site in forward gear.

(f) All parking, access and manoeuvring areas shall be constructed of concrete, bitumen or pavers and shall be linemarked in accordance with the relevant Australian Standard.

(g) No vehicle access is to be taken from individual lots to the Warrego Highway, nor any future connection between the Warrego and Cunningham Highways, nor from the new road

connecting Ashburn and Brisbane Roads, in relation to the approved use, except via approved access roads, or unless as approved by the Senior Development Engineer.

([Alpha Character]) Concrete paths, 100 mm deep, shall be provided within pathway areas between blocks in accordance with Council's Standard Drawing SR.30, and shall commence at the kerb and channel and extend for the full length of the pathway area. Where these pathways are to act as overland flow routes, appropriate kerbing may be required. The width of the concrete paths shall be a minimum of 4.0 m for pedestrian only paths. The maximum longitudinal grade shall not exceed 1:8.

([Alpha Character]) The pathways (shown as [Describe] on the proposal plan) shall be constructed with concrete to a minimum of 100 mm deep and [Width] m wide. The maximum longitudinal grade shall not exceed 1:8.

6. Traffic

([Alpha Character]) The Developer shall provide a traffic report, prepared by a RPEQ, in relation to access to the proposed development in relation to the details design for the intersection onto Brisbane Road.

([Alpha Character]) The Developer shall provide a traffic study, prepared by a RPEQ, nominating the proposed location of the roads specified in Condition [Condition No.]. Amongst other matters, the study shall address the following:

(i) road hierarchy for the study area, including connection points to the external road network;

(ii) generalised land use, including commercial, etc., nodes;

(iii) public transport needs;

(iv) staging of the proposed works; and

(v) effects on existing road networks.

The study shall be submitted prior to the submission of engineering drawings.

([Alpha Character]) The Developer shall provide a traffic study, prepared by a RPEQ. Amongst other matters, the study shall address the following:

(i) a review of the traffic generated by the proposal;

(ii) recommendation of specific measures to be undertaken to improve the alignment, sight distances, and signage of [Road] which will result in safe movements of light and heavy vehicles, and reduce delays and queuing distances; and

(iii) recommendation of specific measures to be undertaken to define and improve the intersection of [Road] and [Road].

The study shall be submitted prior to the submission of engineering drawings.

([Roman Character]) The Developer shall undertake any works deemed necessary by the Senior Development Engineer, to comply with the requirements of the traffic study.

7. Sewerage

(a) The Developer shall provide a sewerage reticulation system with appropriate service connection branches, designed so as to command the whole of each of the proposed allotments.

(d) The Developer shall pay the full cost for Council to provide a suitable connection into the existing sewerage reticulation systems. All works on live sewers are to be carried out by Council at the Developer's expense, unless arranged otherwise with Ipswich Water.

(g) The Developer shall demonstrate that the proposed pipe sizes (new pipes and any pipe upgrades) and connection points are adequate for the total upstream catchment and the proposed development.

(h) The Developer shall demonstrate that the proposed pump stations or the pump station upgrades are adequate to service the total upstream catchment and the proposed development. Pump station numbers are to be minimised as far as possible to the satisfaction of Ipswich Water and the Senior Development Engineer.

(f) No work on the sewerage reticulation system shall commence prior to the approval of the Operational Works application.

8. Water

(a) The Developer shall provide a reticulated water supply system together with valves and fire hydrants, in accordance with the "Guidelines for Planning and Design of Urban Water Supply Systems", which connects into Council's existing reticulation system. This system is to be generally in accordance with the development proposals as preliminarily approved.

(b) A blue, bi-directional raised reflective pavement marker (RRPM) shall be provided to all hydrants. The marker shall be installed in accordance with the Department of Main Roads Fire Hydrant Indication System Technical Guideline.

(c) The Developer shall demonstrate that the pipe sizes proposed and the available pressure head complies with the requirements of Ipswich Water's "Water Supply Planning Guidelines", and the "Guidelines for Planning and Design of Urban Water Supply Systems" and are adequate to cater for the proposed development. Such demonstration is to cover as a minimum:

(i) available pressure during maximum hour;

(ii) available pressure and flows for fire fighting and other purposes, and any recommendations pertaining thereto; and

(iii) comments regarding the situation at various stages of the development.

Note:

Details regarding available pressure heads at various points in the existing water reticulation network for use in the calculations to be produced for such demonstration may be obtained from the Senior Development Engineer on submission of completed application forms and payment of the relevant fees.

(d) All works on live water mains are to be carried out by Council in accordance with Council's policy, and at the Developer's expense.

(e) Where concrete footpaths are to be constructed, the Developer shall provide 100 mm diameter conduits under the footpath and in line with the conduits under the road, for future ease of installing the individual water services. The letter "W" shall be embossed in the concrete to mark the location of the conduit.

(f) The Developer shall lodge a private works request on the prescribed Council form, for Council to supply a cost estimate to:

(i) provide a suitable metered water connection for each proposed residential allotment;

(ii) amend the existing connection if necessary; and

(iii) seal off any existing water connections if necessary.

The appropriate fees are to be paid prior to Council signing any plan of survey.

(g) Wherever possible, the water main shall be constructed on the opposite side to the concrete footpaths. Where the water main is under a concrete footpath, the Developer shall provide a water connection (up to, but excluding the provision of meters) to each allotment, including the provision of approved pre-cast concrete or cast iron boxes over the stop cock.

(h) Where the water reticulation network is serving in excess of 20 allotments in any one stage, the site shall be served from two directions and shall not be in the form of a single dead end supply. All other mains shall be looped around the cul-de-sac head to join back on to itself.

(i) Sufficient stop valves shall be installed so that in the event of any break in the supply, the maximum number of allotments to be without water is 20.

9. Stormwater

(a) The Developer shall provide all necessary stormwater drainage (both internal and external to the development) and such drainage works (except for roofwater systems) shall be designed and constructed in accordance with QUDM such that the overall drainage system caters for a storm event with an ARI of 100 years.

Overland flow paths shall be suitably designed to cater for the water from a storm event with an ARI of 100 years. In the case where the piped system is carrying part of the flow, the overland flow paths shall be designed to cater for that volume which is represented by the difference between the predicted volume from the storm event with an ARI of 100 years and the capacity of the pipe system, noting the requirements of QUDM.

(b) A suitable roofwater system shall be designed in accordance with QUDM, for allotments that do not have adequate fall from within the allotment to the design invert level of the kerb and channel. The design is to be to a minimum Level II in QUDM.

(c) All stormwater flows within and adjacent to the development, other than inter-allotment drainage, shall be confined to dedicated roads, drainage reserves, registered drainage easements or within parkland. The registered drainage easements, if related to piped drainage, shall be centrally located over such underground pipe system and shall be not less than 4.0 m wide, except for drainage easements required for side boundaries which may be 3.0 m wide where approved by the Senior Development Engineer. In addition, the easements shall be of suitable width to contain the predicted overland flow from the storm event with an ARI of 100 years in that location.

(d) No ponding or redirection of stormwater shall occur onto adjoining land unless specifically approved by Council in consultation with the owner of the adjoining land.

(e) Due consideration shall be given in the design and construction of the development in relation to the effect of the developed catchment flows on the downstream discharge receival areas. Suitable stormwater control devices are to be provided to ensure that there is no increase in flows in watercourses. Such control devices are to be designed so as to integrate the landscaping, recreational, infrastructural and drainage roles of watercourses.

(g) Stormwater drainage plans are to be submitted and approved by the Senior Development Engineer, in conjunction with the submission of an Operational Works application.

(h) The Developer shall provide a stormwater detention basins (or equivalent) on the subject lands, which shall be designed and constructed in accordance with QUDM. The detention basins (or equivalent) shall be constructed to ensure that flows, at any point downstream in the catchment, are not increased by the development for any combination of frequency and duration from the storm event with an ARI of 2 years up to and including the storm event with an ARI of 100 years. The location of these basins are to be generally in accordance with the locations shown on the approved plans.

(i) Each proposed residential allotment shall contain an area of at least 400 m^2 above the design flood/stormwater level from a storm event with an ARI of 100 years, which is suitable for a building platform and has unimpeded access to a road system which is also above the design flood level.

(j) The Developer shall have prepared a report by a RPEQ defining the area affected by a storm event with an ARI of 100 years, associated with the flows in [Location] and the overland flow path in the [Location] of the site. Areas affected by a storm event with an ARI of 100 years shall be external to any proposed residential allotments. This report is to take account of any proposed cut and filling of the site(s) in order to show there will be no impact on the river and creek systems due to these proposed bulk earthworks.

(k) Appropriate works shall be carried out to ensure that stormwater drainage from the new kerb and channel discharges suitably into the existing drainage system.

(l) If it is proposed that temporary drainage works will be constructed and such works will not form part of the final drainage system, then the Developer shall contribute on a pro-rata

basis towards the cost of the final drainage works. The contribution payable shall be determined by the Development Manager following lodgement of construction details and estimates from the Developer. The construction details and estimates shall be based on the fully developed catchment and all final drainage structures and/or works.

(m) Development of the property with buildings or other structures below the flood level associated with an ARI of 100 years will not be permitted.

(n) There shall be no filling or removal of material in the flood area below the flood level associated with an ARI of 100 years without the approval of the Senior Development Engineer and supported by a suitable flood study. There shall be minimal disturbance to vegetation in the flood area, unless prior written approval is obtained from Council.

(p) Pollutant control devices shall be installed in the stormwater system. Locations and types of the devices shall be approved by the Senior Development Engineer.

There shall be minimal disturbance to vegetation in the gully areas, unless prior written approval is obtained from Council. Stormwater drainage outlets shall be the subject of detailed design in the preparation of plans for each stage of the development.

The Stormwater Management Plan required by conditions contained in [Contained In] shall be developed in accordance with the stormwater works as shown on Plan Number [Plan Number]. Should supplementary or additional works be required as a result of the formulation of a Stormwater Management Plan, such works shall require the submission of an amended plan.

10. Public Utilities

(a) Adequate provision shall be made in all proposed dedicated roads, access strips and easements, to cater for the public utility services that would normally serve the development.

(b) The Developer shall provide appropriate road crossing conduits in accordance with Council's Standard Drawings SR.22 and SR.23. Where concrete footpaths are to be constructed, the conduits shall be extended to the property boundaries.

(c) Street lighting shall be installed by the Developer in accordance with the Australian Standard 1158.3.1 Table 1.1. All street lighting associated with the development shall be certified by a RPEQ. Street lighting shall be installed on the same side as concrete footpaths (where applicable).

(d) The Developer shall provide underground electricity/telecommunications within the development, constructed in the approved allocation as detailed in Council's Standard Drawings SR.22 and SR.23. Electricity/telecommunication drawings shall be co-ordinated with the civil engineering design documents, to ensure that service clashes are avoided. Where allotments front an existing overhead electricity/telecommunication service, these allotments may connect to such service subject to the approval and requirements of the service provider.

(e) The Developer shall provide an Energex approved electrical reticulation layout plan. The electricity layout shall also be shown on the water reticulation layout plans.

(f) The Developer shall provide each allotment with an electricity supply.

([Alpha Character]) Prior to the [When], the Developer shall provide Council with a copy of an agreement with Energex for the supply of electricity to the development.

([Alpha Character]) Telephone and cable services may be laid in a combined trench with electricity cables, subject to the approval of Energex and the authorised telephone/cable service provider.

([Alpha Character]) The Developer shall make suitable arrangements for the provision of telephone and (where applicable) cable services to all proposed lots within the development. Documentary evidence that discussions have commenced with any authorised telephone/cable service provider, on the provision of telephone/cable services, shall be provided prior to the signing of the plan of survey by Council.

([Alpha Character]) Street lighting shall be installed in accordance with the Australian Standard Code of practice for public lighting, AS1158, with the exception of light spacing. M50 mercury lights, or suitable approved alternatives, are to be fitted at each intersection, at the end of cul-de-sacs and dead-ends, and at any problem areas as determined by the Senior Development Engineer, or at 120 m intervals. All street lighting shall be certified by a RPEQ, with the exception of the light spacing. Street lighting shall be installed on the same side as concrete footpaths (where applicable).

11. Erosion & Silt Management

(a) The Developer shall be responsible for the installation and maintenance of silt management facilities from the time of commencement of construction until the site has been stabilised against erosion. All silt management facilities are to be in accordance with the document "Soil Erosion and Sediment Control" published by the Institution of Engineers Australia, or equivalent and better.

(b) Silt traps shall be sited upstream from any park or reserve area discharge point preferably on land comprising future allotments, such that no silt impinges on the park or reserve areas. The silt trap areas may be phased out after the development work is complete and adequate grass cover is obtained.

(c) Diversion drains and ponds, as necessary, shall be installed on the site before any other work is undertaken on site to ensure that "dirty water" is contained and/or isolated.

(d) A procedure shall be submitted with the engineering drawings for approval for maintaining the facilities, setting out the frequency of attention, with inspections to be made after each significant rainfall event.

(e) The Developer shall lodge a $5 000 siltation and erosion performance bond with Council (for each construction stage of the development), prior to the commencement of works, which shall only be released by Council at the termination of the maintenance period. Where Council determines that a draw-down of the bond is required, the Developer shall restore the bond to its full amount within 10 days of a notice from Council to that effect. Such bond shall guarantee adequate performance in the circumstances (i) and (ii) below:

(i) In the event that instructions issued to the Consulting Engineer by the Senior Development Engineer for the installation of erosion control measures, are not complied with within 24 hours, Council will call upon the bond to the extent required to carry out the necessary works.

(ii) If the Senior Development Engineer determines that silt damage has occurred on the site, or the downstream drainage system has become silted, the Developer shall be responsible for restoration. Such restoration shall be completed in the time determined by the Senior Development Engineer.

Should the Developer fail to complete the works determined by the Senior Development Engineer within the specified time, Council shall complete the work and recover all costs from the Developer associated with that work.

12. Operational Works – Municipal Works
(ie Works being handed over to Council)

(a) Plans relating to all civil engineering works shall be prepared and submitted for review by Council under the cover of Form 1 - Part A (Common details for all applications) and Form 1 - Part E (Planning Scheme Works). The plans shall show full construction details, layout dimensions, and finished surface levels and shall be submitted together with the appropriate fees for Council approval, prior to the commencement of construction on site.

(b) The Developer shall comply with the requirements of the documents entitled "Engineering Works Manual" and "Standard Drawings".

(c) All engineering drawings submitted to Council shall be in accordance with Council's Engineering Works Manual and Standard Drawings, and shall include as a minimum the following:

(i) Engineering drawings shall be marked as confirmation that they have been checked and approved by a RPEQ;

(ii) The drawings shall be submitted as three A3 size sets and one full size set; and

(iii) A "Certificate of Design" shall be submitted by a RPEQ, certifying that the design is in accordance with all relevant engineering standards, Council's requirements and standards, relevant development conditions of approval, and sound engineering practice.

(d) Municipal works shall require a detailed design certified by a RPEQ, the design approved by Council Engineers with appropriate fees payable, a works pre-start meeting on-site and various detailed construction and audit inspections by Council Officers. A twelve month maintenance period is applicable for the works as well as the payment of a maintenance security deposit.

(e) All works shall be supervised by a RPEQ competent in civil works and shall be undertaken by a nominated principal contractor experienced in the construction of municipal works. Council reserves the right to request evidence of the principal contractor's competency. Should it be deemed by the Senior Development Engineer that the contractor does not have

the necessary competency or has constructed substandard works for Council in the past, Council reserves the right to reject the nominated contractor.

(f) Municipal works shall be accepted "On Maintenance" prior to commencement of use. A maintenance bond equal to 5% of the construction cost (minimum of $1,000.00) shall be retained by Council for a minimum period of twelve months, or until such time as the works are accepted "Off Maintenance" by Council.

(g) "As Constructed" plans for municipal works shall be submitted to Council and approved prior to the formal acceptance of the works "On Maintenance".

(h) On completion of the works a certificate shall be submitted to Council by a RPEQ certifying that the works have been constructed in accordance with Council's construction standards and in compliance with the approved plans and specification. It is expected that the RPEQ will undertake the necessary inspections to make this certification.

(i) Council reserves the right to require further amendments and/or additions at a later date, should design errors or omissions become apparent in regard to the works relevant to the Operational Works approval.

(j) Prior to the commencement of any municipal works associated with developments other than the subdivision of land, Council shall require the provision of a bond equivalent to not less than 10% (minimum of $1,000.00) of the value of the works as security for the performance of the various construction obligations (including the provision of engineering certification and "As Constructed" information). The bond shall be reduced to an amount of not less than 5% of the value of the works upon formal acceptance of the works "On Maintenance" and shall be retained by Council during the maintenance period as security for the performance of the maintenance obligations. The bond shall be returned upon formal acceptance of the works "Off Maintenance".

13. Operational Works – Internal Works
(ie Works not being handed over to Council)

(a) Plans relating to all civil engineering works shall be prepared and submitted for review by Council under the cover of Form 1 - Part A (Common details for all applications) and Form 1 - Part E (Planning Scheme Works). The plans shall show full construction details, layout dimensions, and finished surface levels and shall be submitted together with the appropriate fees for Council approval, prior to the commencement of construction on site.

(b) Engineering drawings shall be marked as confirmation that they have been checked and approved by a RPEQ.

(c) The drawings shall be submitted as three A3 size sets and one full size set. Where municipal works are also being undertaken, it is usually appropriate to make a combined submission.

(d) A "Certificate of Design" shall be submitted by a RPEQ, certifying that the design is in accordance with all relevant engineering standards, Council's requirements and standards, relevant development conditions of approval, and sound engineering practice.

(e) Council reserves the right to require further amendments and/or additions at a later date, should design errors or omissions become apparent.

(f) A certificate shall be submitted to Council by a RPEQ certifying that the completed works have been constructed in accordance with Council's requirements and standards and in compliance with the approved plans and specification. It is expected that the RPEQ will undertake the necessary inspections to make this certification.

14. Plan of Survey

(a) No access shall be permitted along the common boundary of all proposed allotments and proposed arterial and trunk collector roads. The means of achieving this shall be to the satisfaction of the Development Manager.

(b) Land shall be dedicated for future road purposes, free of cost to or compensation payable by Council, in order to provide a [Width] m road widening over the [Length] frontage of the site.

(c) The Developer shall grant, free of cost to or compensation payable by Council, minimum 4.0 m wide easements located centrally over existing and proposed stormwater drains, water mains and sewerage rising mains, where they are located within private property.

The documentation associated with these easements may be prepared by the Developer in a form satisfactory to Council's City Solicitor, or the Developer may submit easement plans, only where Council is party to the easements, to Council for the preparation of easement documents at the Developer's expense.

(d) Easements required for discharge of stormwater over adjacent land shall be agreed to in writing by the owner of the subject land prior to construction work commencing.

(e) Easements shall be centrally located over the alignment of stormwater paths and be of a width sufficient to encompass the overland flow from a storm event with an ARI of 100 years.

(f) Easements shall be of sufficient width to contain any fitting, access chamber etc located on stormwater drains, water mains, and sewerage rising mains.

(g) All pre-existing easements crossing the site shall be pegged where they cross each property boundary and at every change of direction.

(h) All land (excluding that contained within approved parkland) below the design [Which Level] level from a storm event with an ARI of [Storm Event] years shall be subject to an easement for drainage purposes to be granted in favour of, and at no cost to or compensation payable by Council.

(i) The Developer shall transfer free of cost to or compensation payable by Council for drainage purposes that part of the site below the level of the storm event with an ARI of 20 years (approximately RL[Level] m).

(j) All land (excluding that contained within approved parkland) below the flood level associated with an ARI of 10 years shall be dedicated as Drainage Reserve at no cost to Council. Land below this level shall not be considered as parkland contribution.

(k) The Developer shall grant, free of cost to or compensation payable by Council, a suitable easement to permit access to the land described in the above condition for the purpose of Council maintaining that land.

(l) Adequate permanent survey marks shall be installed. The Developer shall submit a certificate signed by a licensed surveyor, stating that after the completion of all works associated with the development, permanent survey marks are in their correct position, in accordance with the plan of survey.

(m) Land required for detention basins or equivalent is to be dedicated as drainage reserve in favour of Council and not included within parkland dedication unless approved as parkland by Council.

15. Contributions

(a) In accordance with the current Council Policies in relation to headworks contributions, the Developer shall pay, [When], the following monies to Council:

(i)	Water headworks	= [WaterHead]
(ii)	Sewerage headworks	= [SewerageHead]
(iii)	Road contribution	= [RoadContribution]
(iv)	Drainage contribution	= $

Calculations of headworks and contributions are based on the infrastructure contribution rates applicable at the date the development application was lodged with Council. The contributions above shall be applicable for a period of twelve months from the date of the development approval, and thereafter shall be based on the infrastructure contribution rates applicable at the date when payment is made.

([Alpha Character]) The Developer shall pay a contribution of $[Amount] towards [Works]. Such money shall be held in trust by Council until the works are programmed for construction.

16. General

(a) All disturbed verge areas and allotments shall be graded, grassed and left in a mowable condition. The grass cover shall be obtained as early as possible during the development and an acceptable grass cover shall be achieved before the development can be accepted "Off Maintenance".

(b) Street name signs shall be manufactured to Council specifications and shall be erected in accordance with Council's Standard Drawing SR.26 at each intersection.

(c) With reference to any works, on land under other private ownership, written permission for the works shall be obtained and forwarded to Council. Similarly, written clearances shall be obtained after the works are completed, unless otherwise accepted by the Senior Development Engineer.

(d) All works required for this development shall take due regard of any and all existing services and, if considered necessary by the relevant authority or the Senior Development Engineer, such works shall be altered at the cost of the Developer.

(e) Any allotment filling for a greater depth than 800 mm to provide for building platforms shall be conducted in accordance with Australian Standard 3798. Test results as required by Australian Standard 3798, and a certificate of quality and uniformity of fill shall be provided by a RPEQ. The level of responsibility shall be Level 1.

(f) A certificate from a RPEQ shall be issued to Council certifying that any retaining wall greater than 800 mm in height is structurally sound and capable of withstanding any likely surcharge loads. Retaining walls greater than 1.0 m in height are to be provided with railings or other barriers to provide pedestrian safety.

(g) Retaining walls shall be designed so that there are no imposed loads placed upon Council's underground services. This may include extending the footing to a level 300 mm below the invert of the pipe.

(h) Filling of gully areas if permitted shall be carried out strictly in accordance with Australian Standard 3798. Test results as required by Australian Standard 3798 and a certificate of quality and uniformity of fill, shall be provided by the Supervising RPEQ for all filled areas.

(i) All imported and exported materials shall be transported only on routes approved by the Senior Development Engineer.

(k) For batters resulting from cutting and filling of the site and producing slopes greater than 1:6, Council requires a RPEQ to certify that they are stable and properly drained.

([Alpha Character]) A hydraulic study and a ground stability study shall be undertaken in regard to the site by a RPEQ. Such studies shall be comprehensive studies taking into account all matters relating to the site and shall include, but shall not be limited to, the following:

- Geology of the site and any related problems;
- Instability features such as slips, soil creep etc;
- Effects of existing vegetation and of any possible removal and or modification of same;
- Effects of any fill material and the types of fill material recommended;
- Water eg: ground water; scour potential in flood situations including the effects of turbulence; effects of rapid draw down of water level.

Such studies shall include any necessary recommendations in regard to the proposed development to ensure long term stability.

(m) Approval of the Senior Development Engineer is required for any fill intended to be placed over Council's underground services.

(n) If, after the preparation of detailed design plans for the various roads, it is found necessary to provide any additional dedicated road area, or modify the proposed dedicated roads to enable the full requirements of Council's standards, Queensland Streets, AMCORD and Austroads documents to be incorporated in any way (but particularly in the production of the required speed environment or because of longitudinal and cross sectional constraints) then the estate layout plan shall be altered accordingly.

(o) The Developer shall construct 3 m wide emergency/maintenance accessways on both sides of the watercourse in parkland adjacent to adjoining residential premises for the full length of the parkland corridors. The accessways shall have a minimum depth of 150 mm of approved gravel, compacted to 95% Modified Maximum Dry Density (MMDD).

(p) Stick raking of the development is not a Council requirement for acceptance of the work "On Maintenance". Should the Developer wish to have the development stick raked on completion of the works, then stick raking shall be carried out in conjunction with watering, prior to and during the stick raking operation, so that no dust is produced.

Stick raking shall cease immediately if there is dust evident and/or if ordered to cease by the Senior Development Engineer. Stick raking shall not recommence until such time as the area has been adequately watered and is considered acceptable by the Senior Development Engineer for recommencement.

17. Compliance with conditions

Condition numbers [Condition Numbers] shall be completed prior to [When].

C Further Advice

Portable Long Service Leave

From 1 January 2000, the Building and Construction Industry (Portable Long Service Leave) Levy must be paid prior to the issue of a development permit where one is required for the 'Building and Construction Industry'. This applies to Building Works, Operational Works and Plumbing and Drainage Works applications, as defined under the *Integrated Planning Act 1997*, where the works are $80 000 or more and matching the definition of 'Building and Construction Industry' under the *Building and Construction Industry (Portable Long Service Leave) Act 1991*.

Council will not be able to issue a Decision Notice without receipt of details that the Levy has been paid. Should you require clarification in regard to the amendments to the *Building and Construction Industry (Portable Long Service Leave) Act 1991*, you should contact QLeave on 1800 803 481 (free call) or [redacted].

C. That the applicant be advised that from an engineering perspective, further Development Permits, as required by the *Integrated Planning Act 1997,* shall be obtained in respect of any Operational Works in relation to this approval before any such works are commenced.

[redacted]
SENIOR DEVELOPMENT ENGINEER

F. 3356/02 NH
h:dataworks/2002_3356 Bremer Business Park Council Report – 20 April

Planning, Development & Environment Meeting	
Mtg Date: 20/04/04	OAR: YES
Authorisation: Gary White	
Committee to prepare letter: No	
Program No: 02	

14 April 2004

MEMORANDUM

TO: PLANNING AND DEVELOPMENT MANAGER

FROM: DEVELOPMENT MANAGER

RE: **DEVELOPMENT APPLICATION - IMPACT ASSESSMENT**
***INTEGRATED PLANNING ACT 1997* - SECTION 3.2.1(1)**

INTRODUCTION:

This is a report by the Development Manager dated 14 April 2004 regarding a combined development application (Appl. No. 3356/02 known as Bremer Business Park) for a preliminary approval to override the planning scheme for a material change of use and a preliminary approval for reconfiguring a lot (16 lots into 34 lots).

Appl No:	3356/02
Applicant:	Wingate Properties Pty Ltd
Real Property Description:	Lot 4 SP140694, Lot 6 SP140694, Lot 2 RP854997, Lot 1 RP22385, Lot 1 RP125443, Lot 2 RP104683, Lot 1 RP86838, Lot 1 RP22378, Lot 34 SL3911, Lot 1 RP84779, Lot 142 RP846150, Lot 4 RP92591, Lot 5 RP92591, Lot 6 RP92591, Lot 3 RP132087, Lot 13 SL2982
Property Location:	55 and 99999 Bognuda Street, 42 Brisbane Road, 242A Warrego Highway, Bundamba
Division:	4

Field Code Changed

Proposal	Development	Approval Type Requested
Development in accordance with a Plan of Development, including eight (8) Sub-Areas: Riverside Sub-Area, Highways Sub-Area, Frame Industrial and Commercial Sub-Area, Central Industry Sub-Area, Residential Sub-Area, Open Space Sub-Area, Community Centre Sub-Area and Business and Industry Buffer Sub-Area	Making a material change of use of premises	Preliminary Approval
16 lots into 34 lots	Reconfiguring of a Lot	Preliminary Approval

Date Received: 5 September 2002

Start Date for Decision Stage: 7 April 2004

Stat. Date for Determination: 12 May 2004

Site Area: 315 ha (approx)

Former Planning Scheme (Note: application lodged under former scheme)

Strategic Plan Designation: Part Major Industrial and Part Urban Development

Zone: Particular Development 70 (Development in accordance with the Eastern Corridor Structure Plan)

Precinct: Part Business and Industry Minimal – Low Impact (ILI) Precinct, Part Business and Industry Medium Impact (IMI) Precinct, Part Environmental Protection (OE) Precinct, Part Residential Low Density (RL3) Precinct and Part Special Opportunity -Bundamba (SA7) Precinct

Current Planning Scheme

IPA Planning Scheme: Part Regional Business and Industry (RB2M) – Bundamba/ Riverview – Medium Impact Business and Industry Zone, Part Regional Business and Industry (RB2L) – Bundamba/ Riverview – Low Impact Business and Industry Zone, Part Regional Business and Industry Buffer Zone (RBB), Part Residential Low Density Zone and Part Large Lot Residential Zone

Field Code Changed

SITE LOCALITY:

SUMMARY

The Bremer Business Park proposal involves a combined application for a preliminary approval for reconfiguring of a lot (16 lots into 34 lots) and a preliminary approval for a material change of use. The later preliminary approval seeks to establish a planning framework to over-ride the Ipswich Planning Scheme to the extent of its provisions for the subsequent development of seven (7) Sub-Areas over the subject site including the Riverside Sub-Area, Highway Sub-Area, Frame Sub-Area, Core Sub-Area, Residential Sub-Area, Open Space Sub-Area and Community and Commercial Sub-Area.

Fundamentally, the preliminary approval to override the planning scheme 'calls up' all of the outcomes being sought in the correlating zones in the planning scheme as well as the assessment tables for those zones. In addition, the preliminary approval has some minor exceptions to the scheme outcomes but primarily sets up additional outcomes for the Bremer Business Park Area as a whole and each Sub-Area.

It should be noted that the application triggered a referral to the Environmental Protection Agency (EPA) and the Department of Main Roads (DMR). The EPA is a concurrence agency for the purpose of the application as the site is listed on the Environmental Management Register (for contamination). DMR is a concurrence agency for the application due to the site's proximity to the Warrego Highway (a main road).

Environmental Protection Agency's Contaminated Lands Unit response dated 10 September 2003 attaches conditions requiring the further investigation of the contamination to determine

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if the land is suitable for the intended use. Department of Main Roads' response dated 24 September 2003 attaches conditions requiring the northern part of the land (ie. north of Warrego Highway) and a corridor on the eastern side of the land to be quarantined from development for a period of 12 months from the date of this approval with the option to extend the quarantine for a further period of 12 months.

It should be noted that the preliminary approval has been established in a such a way that if the Department of Main Roads quarantine period lapses or the Department of Main Roads determines that the quarantine is no longer required, then the preliminary approval may take effect in accordance with the underlying Sub-Areas.

The application also required Referral Coordination to the former Department of Local Government and Planning (DLGP) in accordance with Section 6.1.35C of the *Integrated Planning Act 1997*. Referral Coordination was triggered as the subject land shares a common boundary with the boundary of the Bremer River (ie. an area of permanent, periodic or intermittent inundation, whether natural or artificial, with water that is static or flowing, fresh, brackish or salt (Item 5, Part 3, Schedule 7 of the Integrated Planning Regulation 1998). As a result, the application was referred to the Department of Primary Industries and Department of Natural Resources and Mines (in addition to the concurrence agencies) for comment. Both agencies advised that the proposal was generally acceptable.

The proposal generally complies with the former Ipswich Planning Scheme under which the application was lodged and the current IPA Planning Scheme. Further applications (Development Permits) will be required prior to the establishment of new uses in the Bremer Business Park Area in accordance with Council's IPA Planning Scheme (ie. the preliminary approval does not authorise any development to occur).

It is proposed to attach a number of conditions to the approval (applicable to both components of the application) including:

- Further studies in respect to traffic, water, sewerage, stormwater (quality and quantity), mining and contamination. Generally, the reports are to be approved by Council and then implemented by the developer (see conditions for further details);
- Payment of contributions to ensure all currently 'unserviced' industrial land has a 'serviced' headworks contribution deemed credit;
- The documentation of places/locations or structures of cultural heritage significance within the Bremer Business Park Area and acknowledgment of such items on the site through the installation of appropriately located and detailed interpretive works and signage; and
- Dedication of parkland included in the Open Space Sub-Area.

Written notice has been received from the applicant confirming public notification of the proposal correctly identified the application and included publishing a notice in the Queensland Times on 11 December 2002. Such notice confirmed that the actual notification period of 39 business days complies with Section 3.4.6 of the *Integrated Planning Act 1997* which states that the notification period for the application is 30 business days. The public notification of the proposal has been carried out in accordance with the *Integrated Planning Act 1997* and 231 submissions and 2 petitions (signed by 40 and 79 persons respectively) have been received. All submissions offer an objection to the proposal based upon the following summarised grounds:

- loss of property values;

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- environmental management including impacts associated with air, water quality, dust, noise, light, contamination and buffering;
- impacts on visual amenity vegetation/open space and City image;
- impacts associated with hydrology/flooding and hazard and risk;
- impacts on infrastructure including roads/traffic; water and electricity; and
- planning assessment and process (zoning, need and consultation).

Where appropriate, matters raised in submissions have been addressed in conditions and/or the Bremer Business Park Preliminary Approval.

In summary, it is considered that the preliminary approval to override the planning scheme and preliminary approval for reconfiguring of a lot (16 lots into 34 lots) are suitable for the subject site and should be approved, subject to the conditions detailed in the recommendation of this report.

A. BACKGROUND

The land has been used for pastoral production with some residential and industrial uses on parts of the site.

Recent Approvals

12 March 2003 - Council approved two (2) development applications over land at 70 Bognuda Street, Bundamba (Lot 4 on SP140694) – a 'Material Change of Use' application for General Industry (Aluminium Extrusion Plant) and a 'Reconfiguring of a Lot' (1 into 2 lots) application. Council approved both applications, subject to conditions, and subsequently issued a Negotiated Decision Notice for the 'Material Change of Use' application on **4 April 2003**.

The 'reconfiguring of a lot' application involved the 'subdivision' of the 42.93 hectare site (Lot 4 on SP140694) into two (2) allotments of 16.8 hectares and 26.13 hectares in area. This then provided for a 'material change of use' application to be made only over the new lot (16.8 hectares in area). It should be noted, the 'material change of use' application is not related to the 26.13 hectare lot created as part of the 'reconfiguring of a lot' application.

B. SITE

The subject land is approximately twenty-five (25) kilometres to the west of the Brisbane CBD and about seven (7) kilometres to the east of the Ipswich CBD.

The 315 hectares (approximately) of land is bound by the Bremer River to the north, Brisbane Road to the south and the Dinmore and Bundamba residential areas to the east and west respectively. The land is transected by the Warrego Highway in a south-east to north-west direction.

C. APPLICATION

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1. Proposal

The Bremer Business Park proposal involves a combined application for a preliminary approval for reconfiguring of a lot (16 lots into 34 lots) and a preliminary approval for a material change of use to over-ride the planning scheme. Specifically, the application seeks the following:

(a) A preliminary approval for reconfiguring of a lot (16 lots into 34 lots) in stages; and

(b) A preliminary approval for a material change of use to over-ride the Ipswich Planning Scheme in accordance with section 3.1.6 of the *Integrated Planning Act 1997*. The applicant's Bremer Business Park Preliminary Approval seeks to approve development in accordance with a 'Plan of Development', including eight (8) Sub-Areas: Riverside Sub-Area, Highways Sub-Area, Frame Industrial and Commercial Sub-Area, Central Industry Sub-Area, Residential Sub-Area, Open Space Sub-Area, Community Centre Sub-Area and Business and Industry Buffer Sub-Area. The preliminary approval intends to facilitate future development of the land by establishing an intent and character for each Sub-Area and the level of assessment for particular land uses. In most cases, the preliminary approval establishes exceptions and additions to the outcomes being sought in Council's IPA Planning Scheme. In terms of levels of assessment, the preliminary approval calls up the Tables of Development from the scheme and outlines any proposed changes. The Sub-Areas are as follows:

(i) The Central Industry Sub-Area has been renamed the Core Sub-Area by Council, and as its name subjects, is located at the core of the subject land on an area of 55 hectares approximately. The Core Sub-Area is intended to cater for a wide range of medium to large scale industrial and business activities primarily associated with manufacturing, processing, treating or otherwise modifying goods, secondary activities associated with the packaging, storage, wholesaling and distribution. Established activities/land uses will utilise 'best practice' on-site management of waste, including wastewater and stormwater drainage to minimise environmental impacts.

The outcomes being sought for this Sub-Area are consistent with that of the Regional Business and Industry Zone of Council's IPA Planning Scheme with some additional criteria in respect to building design and articulation, building material and location of hardstand areas.

The assessment categories and assessment criteria development in this Sub-Area defaults to the Regional Business and Industry (Medium Impact) Zone tables as set out under Council's IPA Planning Scheme, with no exceptions.

(ii) The Frame Industrial and Commercial Sub-Area has been renamed the Frame Sub-Area and is located between the Core Sub-Area and surrounding sensitive land uses and has an area of 50 hectares approximately. The intent of this Sub-Area is a transition from the Core Sub-Area activities to the Residential Sub-Area and the existing residential and rural areas extending beyond the boundaries of the Bremer Business Park Area.

The Sub-Area includes a diverse mix of low impact industrial and commercial activities, maximising the Sub-Area's high accessibility to transport opportunities

Field Code Changed

and providing services to the Central Industry Sub-Area and those enterprises beyond the Bremer Business Park Area.

Land uses in this Sub-Area include warehousing, storage and small scale distribution, research and laboratories, service trades, equipment hire, appliances and household goods assembly, storage and distribution, and small scale commercial offices and factories for start-up businesses and the like.

The outcomes being sought for this Sub-Area are consistent with that of the Regional Business and Industry Zone of Council's IPA Planning Scheme with some additional criteria in respect to building setbacks, building design and articulation, building material and location of hardstand areas.

The assessment categories and assessment criteria development in this Sub-Area defaults to the Regional Business and Industry (Low Impact) Zone tables as set out under Council's IPA Planning Scheme, with no exceptions.

(iii) The Community Centre Sub-Area, has been renamed the Community and Commercial Sub-Area by Council and has been re-located from Bognuda Street to adjacent to Brisbane Road and the Ebbw Vale Railway Station. The Sub-Area has an area of 5 hectares approximately. The Community and Commercial Sub-Area provides a range of community facilities and services for the Bremer Business Park workforce and the residential communities to the south and west of the Bremer Business Park.

The Sub-Area includes a range of community uses such as child care, health care, counselling and welfare services and business uses such as supermarket-based convenience retailing and dining facilities. The retail component of this Sub-Area has a total gross floor area of no greater than $500m^2$.

The outcomes being sought for this Sub-Area are consistent with that of the Local Retail and Commercial (LC2) Zone of Council's IPA Planning Scheme with no additional criteria.

The assessment categories and assessment criteria development in this Sub-Area defaults to the Local Retail and Commercial (LC2) Zone tables as set out under Council's IPA Planning Scheme, with no exceptions.

(iv) The Highways Sub-Area, has been renamed the Highway Sub-Area and as its name suggests is located adjacent to the Warrego Highway. The Highway Sub- Area has an area of approximately 37 hectares and provides a transition from the highly intensive industrial character of the Core Sub-Area to the Warrego Highway.

The Sub-Area primarily consists of light industry and commercial activities, such as highway service centres, commercial premises for corporate headquarters and storage, and distribution facilities, that rely on and maximise the benefits of their accessibility to the Warrego Highway.

The outcomes being sought for this Sub-Area are consistent with that of the Regional Business and Industry Zone of Council's IPA Planning Scheme with some additional criteria in respect to building setbacks, building design and articulation, fences and landscaping, signage and location of car parking and hardstand areas.

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The assessment categories and assessment criteria development in this Sub-Area defaults to the Regional Business and Industry (Medium Impact) Zone tables as set out under Council's IPA Planning Scheme, with no exceptions.

(v) The Riverside Sub-Area is located north of the Warrego Highway and provides a transition between the industrial activities to south and the Bremer River corridor and the rural residential settlements on the northern side of the Bremer River.

The Riverside Sub-Area includes low intensity industrial and related activities including research, technology, education, and some limited service industries.

The outcomes being sought for this Sub-Area are consistent with that of the Regional Business and Industry Zone of Council's IPA Planning Scheme with some additional criteria in respect to building setbacks, building design and articulation, fences and landscaping, location of car parking and hardstand areas and buffers.

The assessment categories and assessment criteria development in this Sub-Area defaults to the Regional Business and Industry (Low Impact) Zone tables as set out under Council's IPA Planning Scheme, with no exceptions.

(vi) The Residential Sub-Area is located in close proximity to the existing residential area of Bundamba and has an area of 17 hectares approximately. The Residential Sub-Area provides a range of housing choices with access to a range of employment opportunities, community facilities and open space.

Residential development is at a density consistent with that of the existing residential development and includes a mix of residential low density lots and student accommodation. Residential development within the Bundamba Wastewater Centre Buffer is at a lower density (i.e. large lots).

The outcomes being sought for this Sub-Area are consistent with that of the Residential Low Density (RL2) Zone and the Large Lot Residential Zone of Council's IPA Planning Scheme respectively with minimal additional criteria.

The assessment categories and assessment criteria development in this Sub-Area defaults to the Residential Low Density (RL2) Zone and the Large Lot Residential Zone tables as set out under Council's IPA Planning Scheme respectively, with no exceptions.

(vii) The Open Space Sub-Area located throughout the subject land and comprises approximately 100 hectares. The Open Space Sub-Area is intended to be a high quality open space network, fulfilling multiple roles for the Bremer Business Park, that is, to meet environmental management, recreation and leisure, habitat and biodiversity, and community aspirations.

The Open Space Sub-Area is to provide an extensive open space network for recreation, conserving habitat and landscape value, buffers between industrial and commercial activities and residential areas and environmental management such as water management. This includes an expansive riverside park and other areas of public open space for casual recreation by the local community and the Bremer Business Park workforce.

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The outcomes being sought for this Sub-Area are consistent with that of the Recreation Zone of Council's IPA Planning Scheme with some additional criteria in respect to building setbacks, car parking, vegetation and pedestrian and cycle links.

The assessment categories and assessment criteria development in this Sub-Area defaults to the Recreation Zone tables as set out under Council's IPA Planning Scheme, with no exceptions.

(viii) The Business and Industry Buffer Sub-Area has been deleted and incorporated into the adjoining Sub-Area as appropriate.

Further to the changes outlined above, Council has amended the applicant's preliminary approval to:

- A format consistent with Council's IPA Planning Scheme;
- Extend the Frame Sub-Area into the Core Sub-Area in an area on the eastern side of the new Capral road and adjacent to land in the Open Space Sub-Area containing the transmission line easement/s. The Frame sub-Area is considered a more appropriate transition use to the Dinmore School and the residential area;
- Alter a number of the applicant's proposed levels of assessment (eg. the applicant proposed that General Industry be included in the assessment tables as exempt development. This would mean that a General Industry could establish without complying with the scheme or the preliminary approval. Accordingly, such uses with the potential to adversely impact on adjoining land uses have been made code assessable);
- Extend the Open Space Sub-Area along the rear of the residential properties in Bird and Bognuda Streets to act as a buffer between the existing residential land use and the Frame Sub-Area.

2. Supporting Material Lodged with the Application

The following supporting material was submitted with this application:

(a) IDAS application forms A, D, F and the Referrals Checklist;
(b) Planning Report;
(c) Plan of Development;
(d) Environmental Assessment; and
(e) Engineering Studies (water, sewerage, traffic).

D. INFORMATION AND REFERRALS

1. Information Request

The application required Referral Coordination to the former Department of Local Government and Planning (DLGP) in accordance with Section 6.1.35C of the *Integrated Planning Act 1997*. Referral Coordination was triggered as the subject land shares a common boundary with the boundary of the Bremer River (ie. an area of permanent, periodic or intermittent inundation, whether natural or artificial, with

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water that is static or flowing, fresh, brackish or salt (Item 5, Part 3, Schedule 7 of the Integrated Planning Regulation 1998).

Consequently, an information request was collated by the former DLGP. Additional information was sought from Council, Department of Main Roads, Environmental Protection Agency (Contaminated Land Unit and IPA Compliance Unit), Department of Natural Resources and Mines and the Department of Primary Industries. Additionally, it should be noted that Council referred the application to Powerlink for third party advice.

Council's information request related to provision of general infrastructure, development standards, flooding, mining, traffic/ roads, water/sewerage, stormwater quality and quantity, noise, air quality, hazards, contaminated land and open space.

The applicant's response to the information request did not deal with all of the requested items satisfactorily. However, the applicant nominated to proceed with the public notification of the application. It is considered that the items of Council's information request not adequately addressed in the applicant's response can be reasonably and relevantly conditioned as outlined in the recommendation below.

2. Referral Agencies

The following concurrence agencies are applicable to this application:-

(a) Environmental Protection Agency (Contaminated Land Unit); and

The proposed development triggers referral to the Environmental Protection Agency as the subject site is listed on the Environmental Management Register or the Contaminated Land Register.

Environmental Protection Agency's Contaminated Lands Unit response dated 10 September 2003 attaches conditions requiring the further investigation of the contamination to determine if the land is suitable for the intended use.

(b) Department of Main Roads.

The proposed development triggers referral to the Department of Mains Roads due to its proximity to the Warrego Highway.

Department of Main Roads' response dated 24 September 2003 attaches conditions requiring the northern part of the land (ie. north of Warrego Highway) and a corridor on the eastern side of the land to be quarantined from development for a period of 12 months from the date of this approval with the option to extend the quarantine for a further period of 12 months.

It should e noted that if the Department of Main Roads quarantine period lapses or the Department of Main Roads determines that the quarantine is no longer required, then the preliminary approval has been set up so that the part of the Bremer Business Park Area affected by the quarantine develops in accordance with the underlying Sub-Areas.

Third party advice comments regarding the application were received from the Department of Primary Industries, Department of Natural Resources and Mines,

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Environmental Protection Agency and Powerlink and where appropriate such comments have been included in the preliminary approval document, report and/or attached as conditions to this approval.

E. EVALUATION OF PROPOSAL

1. State Planning Policies

There are no statements of State Planning Policy that are specifically relevant to this application. SPP1/03 (Mitigating the Adverse Impacts of Flood, Bushfire and Landslide) did not take effect until after the lodgement of the subject application and as such is not applicable to the application.

2. Former Planning Scheme (Note: application lodged under former scheme)

(a) Strategic Plan:

Council's Strategic Plan anticipates the establishment of industrial development on the part of land proposed to be used for industrial purposes through the land's inclusion in the Business and Industry Land of Regional Significance preferred dominant land use and more specifically Bundamba/Dinmore Major Industrial Area.

The strategic plan recognises that this land will have a major role to play in providing low to medium impact business and industry activities, including-

- Service industry, trades and other commercial uses appropriate to the area;
- Business Parks; and
- Manufacturing uses which are not incompatible with the surrounding land uses.

Council's Strategic Plan anticipates the establishment of residential development on the part of land proposed to be used for residential purposes through the land's inclusion in the Urban Development Areas preferred dominant land use. Urban Development Areas indicates that urban development will occur or substantially commence during the period up to 2011. The term Urban Development, amongst other things, includes residential development.

The proposed development is therefore generally in accordance with the intent of the Strategic Plan.

Zone:
The subject site is zoned Particular Development 70 Zone – Development in accordance with the Ipswich Eastern Corridor Structure Plan. Assessment against this structure plan is detailed in (b) below.

(b) Ipswich Eastern Corridor Structure Plan

The subject land is included the Business and Industry – Minimal – Low Impact (ILI) Precinct, Business and Industry – Medium Impact (IMI) Precinct, Environmental Protection (OE) Precinct, Residential Low Density (RL3) Precinct and Special Opportunity -Bundamba (SA7) Precinct under the Eastern Corridor Structure Plan. Further, Figure 3.2 of the Structure Plan depicts the industrial portion of the subject land as Unserviced Business and Industry Lands.

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Business and Industry – Minimal – Low Impact (ILI) Precinct
A large portion of the site proposed to be developed for industrial purposes is included in the Business and Industry: Minimal – Low Impact (ILI) Precinct. This precinct is intended to accommodate a mix of small to medium sized business and industry activities which do not generate:

- high volumes of heavy or articulated traffic;
- movement and handling of materials outside normal business hours; or
- emissions/impacts and safety risks unacceptable in an area close to residential development or other sensitive land uses.

Notwithstanding, the Structure Plan also recognises that land within this precinct is likely to be developed for a diverse range of business and industry activities, including manufacturing industries which demonstrate appropriate environmental outcomes with minimal to low impact on the surrounding area. Such development will be required to provide effective buffering and screening to nearby residential precincts to maintain residential privacy and amenity. This includes uses which are predominantly conducted in buildings with suitable noise/emissions attenuation and which are sited, designed and finished to minimise the adverse impacts on the amenity of nearby land. This will include orienting emissions generating activities and outdoor storage areas away from nearby residential precincts.

Comment: *The proposed development is considered to be consistent with the intent of this precinct. Further, the proposed development is considered appropriate as the preliminary approval 'calls up' provisions from Council's IPA Planning Scheme to ensure such issues are adequately addressed.*

Business and Industry – Medium Impact (IMI) Precinct
A large portion of the site proposed to be developed for industrial purposes is included in the Business and Industry – Medium Impact (IMI) Precinct. This precinct is intended to provide for a wide variety of medium to larger scale industrial activities associated with manufacturing, processing, treating, destroying, finishing, repairing, packaging, storing, distributing and wholesaling products such as wood, metal, plastic, textiles, food, construction materials, minerals and wastes. Further, developments should generally occur in enclosed, noise-attenuated structures and minimise outdoor activities.

Comment: *The proposed development is considered to be consistent with the intent of this precinct. Further, the proposed development is considered appropriate as the preliminary approval 'calls up' provisions from Council's IPA Planning Scheme to ensure such issues are adequately addressed.*

Unserviced Business and Industry Lands
Some of the lands designated for business and industry activities under the structure plan are currently without basic urban services such as water supply, sewerage, power, telecommunications and sealed roads. The subject land is depicted as being Unserviced Business and Industry Lands in Figure 3.2 of the structure plan.

Comment: *It is proposed to attach a condition to any approval requiring that contributions be payed in respect to water, sewerage and roadworks. The contributions will establish a standard industrial credit on the land.*

Environmental Protection (OE) Precinct

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A number of areas across the site are included in the Environmental Protection (OE) Precinct. It is intended that this precinct be retained as open space and protected for its environmental and cultural heritage significance. Recreational activities should be located and designed to minimise impacts on environmental values. Land within this precinct falls within three broad designations:

- conservation;
- linear waterway open space; and
- urban bushland.

Comment: *The land subject to this precinct classification has been included in the Open Space Sub-Area under the Bremer Business Park Preliminary Approval. The Open Space Sub-Area generally has a similar intent to this precinct. As such, the proposal is considered to be consistent.*

Residential Low Density (RL3) Precinct

A portion of the site proposed to be developed for residential purposes is included within the Residential Low Density (RL3) Precinct. The RL3 Precinct is intended to provide serviced residential home sites at a density of 10 – 12 dwellings per hectare.

Comment: *The land subject to this precinct classification has been included in the Residential (Residential Low Density) Sub-Area under the Bremer Business Park Preliminary Approval. The Residential (Residential Low Density) Sub-Area has a similar intent to this precinct and 'calls up' the Residential Development Code and Residential Low Density Zone assessment tables of Council's IPA Planning Scheme. As such, the proposal is considered to be consistent.*

Special Opportunity - Bundamba (SA7) Precinct

A portion of the site proposed to be developed for residential purposes is included within the Special Opportunity - Bundamba (SA7) Precinct. The Special Opportunity - Bundamba (SA7) Precinct is the area of Bundamba west of Bognuda Street flanking Archer Street and River Road to the north of Nelson Street. The precinct recognises that any development should be mindful of the land proximity to:

(a) the Bundamba Waste Water Treatment Plant;

(b) the Bundamba Business and Industry - Medium Impact Precinct.

Comment: *The land subject to this precinct classification has been included in the Residential (Large Lot Residential) Sub-Area under the Bremer Business Park Preliminary Approval. The Residential (Large Lot Residential) Sub-Area addresses such matters. The Residential (Large Lot Residential) Sub-Area 'calls up' the Residential Development Code and Large Lot Residential Zone assessment tables of Council's IPA Planning Scheme. Note: this land has been included in the Large Lot Residential Zone under Council's IPA Planning Scheme. As such, the proposal is considered to be consistent.*

Industrial development within the abovementioned precincts is to comply with the requirements of the Commercial and Industrial Development Code, the Parking Code and the Landscaping and Fencing Code. Assessment against these codes is detailed below.

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Residential development within the abovementioned precincts is to comply with the requirements of the Residential Development Code. Assessment against this code is detailed below.

3. IPA Planning Scheme

The subject land is included the Regional Business and Industry (RB2M) – Bundamba/ Riverview – Medium Impact Business and Industry Zone, Regional Business and Industry (RB2L) – Bundamba/ Riverview – Low Impact Business and Industry Zone, Regional Business and Industry Buffer Zone (RBB), Residential Low Density (RL2) Zone and Large Lot Residential Zone.

Comment: *The Bremer Business Park Preliminary Approval Sub-Areas 'call up' the outcomes being sought and assessment tables of the correlating zones from Council's IPA Planning Scheme as outlined in the table below. The preliminary approval establishes (in most cases) additional criteria for each Sub-Area and does not change the levels of assessment for any development from the scheme.*

Preliminary Approval Sub-Area	**IPA Planning Scheme Zoning Outcomes and Assessment Tables 'Called Up'**
Frame Sub-Area	Regional Business and Industry (Low Impact) Zone
Core Sub-Area	Regional Business and Industry (Medium Impact) Zone
Community and Commercial Sub-Area	Local Retail and Commercial (LC2) Zone
Highway Sub-Area	Regional Business and Industry (Medium Impact) Zone
Riverside Sub-Area	Regional Business and Industry (Low Impact) Zone
Residential Sub-Area	Residential Low Density (RL2) Zone and Large Lot Residential Zone
Ope Space Sub-area	Recreation Zone

As such, the proposal is considered to be consistent with Council's IPA Planning Scheme.

4. Applicable Codes

(i) Commercial and Industrial Development Code;
(ii) Landscaping and Fencing Code;
(iii) Car parking Code;
(iv) Residential Development Code;

The abovementioned codes are referenced as 'relevant assessment criteria' in the assessment tables 'called up' for each Sub-Area under the preliminary approval. As such, such matters will be addressed at the time a development permit is sought for development.

(v) Subdivision Code;

The proposed reconfiguring a lot component of the application generally complies with the minimum subdivision size recommended for industrial areas in the

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Subdivision Code being 2000m^2. The proposed reconfiguring a lot component of the application is primarily for management purposes at this time.

In terms of the residential land, the preliminary approval for the reconfiguration relates to two (2) large management lots. Detailed assessment will occur against the Subdivision Code at the time a development permit is being sought.

(vi) Planning Scheme Policy for Flood Liable or Drainage Problem Land;
(vii) Planning Scheme Policy for Flood Liable or Drainage Problem Land;
(viii) Ipswich City Council Engineering Works Manual;
(ix) Ipswich City Council Standards Drawings;
(x) Manual of Uniform Traffic Control Devices (Department of Main Roads);
(xi) Australian Standard 2890.1 - Off-Street Car Parking;
(xii) Australian Standard 2890.2 - Commercial Vehicle Facilities;
(xii) Guidelines for Planning and Design of Urban Water Supply Schemes (Water Resources);
(xiii) Guidelines for Planning and Design of Sewerage Schemes (Water Resources);
(xiv) Building of Permanent Structures over Underground Sewerage Infrastructure Policy;
(xv) Sewerage and Water Supply Act;

The proposal generally complies with or has been conditioned to comply with the above codes.

5. Other Matters

Stormwater

Part of the subject land was inundated in the 1974 flood and is below the 1 in 100 and 1 in 20 Development Lines. Land below the 1 in 20 Development Line is proposed to be included in the Open Space Sub-Area. The preliminary approval refers any development to the Development Constraints Overlays of Council's Planning Scheme in respect to development below the 1 in 20 and 1 in 100 Development Line. Generally, development below the 1 in 20 Development line is not supported by Council's Planning Scheme.

Sewerage

The land is in a limited sewered area. Any development of the subject land requires the installation of additional pump stations and infrastructure to service the proposed development. As part of the application, the applicant prepared and submitted the Sinclair Knight Merz Sewerage Planning Report dated December 2003 to Council to address such issues. Notwithstanding, the report lacks sufficient detail for Ipswich Water to undertake a proper assessment of the issues. Specifically, the equivalent populations and staging used in the report varies from the water planning report. Further, there are no calculations contained within the report to support the infrastructure sizing recommended. The report also fails to address what impact the development may have on Council's existing infrastructure eg. pump stations, mains and wastewater centre.

Accordingly, it is proposed to attach a condition to any approval requiring the developer to submit a sewerage planning report to Council for approval. The scope of the report should be determined in consultation with Ipswich Water. The report shall address, but not limited to, the sewerage works required to service the proposed

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development, the timing of infrastructure and the impacts the proposed development has on the existing (including the Bundamba Wastewater Centre) and planned infrastructure of Council. It will also be conditioned that the developer is to undertake all works identified within the approved sewerage planning report. This includes all aspects of the works including, but not limited to, the design, construction, supervision, land acquisition, testing, survey and preparation of as-constructed drawings.

Water Supply

The subject land is in a limited water reticulated area. Any additional development will require the installation of additional infrastructure to service proposed development. It has also been determined that additional trunk water mains are required to be constructed through the land to service areas to the south of Brisbane Road.

As such, Ipswich Water and the applicant agreed to equally share the cost in preparing a water supply planning report for the Bremer Business Park. The applicant submitted a draft copy of the water supply report prepared by John Wilson and Partners dated November 2003 to Council. Ipswich Water has provided the applicant and John Wilson and Partners comments. Ipswich Water was generally satisfied with the report subject to a number of amendments and clarifications prior to the finalisation of the document.

It should be noted that Ipswich Water is currently in discussions with SEQWater, the Queensland Department of Natural Resources, Mines and Energy and a number of other Local Authorities on the provision of a new supply main from Mt Crosby to the Greenbank, to service the South-East Queensland Region, particularly the Gold Coast area. In addition, Ipswich Water is reviewing its bulk water distribution system. The outcomes of these discussions and investigations are likely to have an impact on how the Bundamba Water Supply Zone is supplied. This will subsequently impact on the external works required to service this development and to a lesser extent the internal works.

Therefore, it is recommended that prior to undertaking any water supply infrastructure works identified within the John Wilson and Partners report that the planning report be reviewed in light of the above. Given the changes are external to the development it would seem reasonable for Council to bear the costs of undertaking such a review. Notwithstanding, the developer is still to submit a final report.

It is proposed to attach a condition to any approval requiring the developer to submit a water supply planning report to Council for approval. The scope of the report should be determined in consultation with Ipswich Water. The report shall address, but not be limited to, the water supply works required to service the proposed development, the timing of infrastructure and the impacts the proposed development has on the existing and planned infrastructure of Council. The developer will be required to undertake all works identified within the approved water supply planning report. This includes all aspects of the works including, but not limited to, the design, construction, supervision, land acquisition, testing, survey and preparation of as-constructed drawings.

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Existing 500mm Central Trunk Water Main

An existing 500mm central trunk water main is located between River Road and Bognuda Street. The preliminary approval indicates that the water main affects the Frame and Residential Sub-Areas. As such, it is proposed to attach a condition to any approval requiring the developer to construct a new water main to replace the existing main. The developer will be advised by Council as to, but not limited to, the extent of works that needs to be undertaken on the existing main (whether the main needs to be removed and/or relinquishment of the existing easement/s), the timing of the works (new main has to be constructed before the existing main has been taken off line), the alignment of the new main (open space, water and wastewater corridor) and the size of the main.

Recycled Water

Ipswich Water is currently undertaking a planning study into the provision of a variety of water products (ie. Potable, Class A recycled and reverse osmosis processed water) reticulated to industry within the Bremer Business Park. As such, the preliminary approval has incorporated criteria to ensure that the developer allows sufficient service corridors to accommodate these mains and is aware that they will be required to provide this infrastructure in accordance with the findings of the report. The corridors will vary in width depending on the infrastructure that is to be constructed within them. The corridors are to have a minimum width of 20 metres and are expected to have an average width of 25 metres.

The developer shall endeavour to locate the corridors in open space, verge widths and in the set backs of private properties, in this order. If the corridors under the current proposal are not located within any of the abovementioned areas the Developer should amend the proposed layout to ensure that it does, unless otherwise approved by Council.

Electricity and Street Lighting

Limited reticulated electrical supplies are available to the area with easements for the high voltage national grid reticulation passing through the site. Further, Powerlink is currently undertaking an Environmental Impact Study to identify a preferred location of a Sub-Station within the site. Development requirements related to these issues have been incorporated into the preliminary approval as a Development Constraint Overlay.

Gas Pipeline

Roma Gas lines traverse the northern portion of the site. Development requirements related to this issue have been incorporated into the preliminary approval as a Development Constraints Overlay.

Roads/Traffic

Ashburn Road, Carberry and Bognuda Streets, together with the Warrego Highway and Brisbane Road, service the site. Ashburn Road is approximately a 6.5m wide bituminous carriageway without concrete kerb and channel on either side. Part of this road is currently being upgraded in association with the Capral Aluminium Extrusion Plant access. Bognuda Street (for the frontage of the site) is approximately

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a 6.5m wide bituminous carriageway without concrete kerb and channel on either side. Carberry Street is approximately a 6.5m wide bituminous carriageway without concrete kerb and channel on either side. Some upgrading of the intersection from Ashburn Road directly on and off the Warrego Highway is also currently being undertaken in association with the Capral Aluminium Extrusion Plant access.

The roads in the locality are in reasonable condition for existing traffic demands, however the primary access roads to the site are not adequately constructed for major traffic and industrial road loadings.

There are no constructed footpaths around the site. However, a 1.5m wide footpath are required to be constructed in Ashburn Road for the frontage to the Capral site and the access road area for the Capral site.

The principal access to the site will be retained via Ashburn from the Warrego Highway, Bognuda and Brisbane Roads to the South of the Warrego Highway. Traffic volumes for the industrial area are to be restricted through the residential areas of Dinmore and Bundamba.

As discussed above, it should also be noted that the Department of Main Roads has quarantined the land on the northern part of the site (ie. north of Warrego Highway) and a corridor on the eastern side of the site from development for a period of 12 months from the date of this approval with the option to extend the quarantine for a further period of 12 months.

In order to address the abovementioned issues, the following roadworks will be required. The extent of such works shall be determined by a traffic report to be submitted to and approved by Council:

- Bognuda, Ashburn and Carberry Streets are to be upgraded in pavement widths and quality together with stormwater management;

- a road connection road between Ashburn Road and Brisbane Road. The road shall be designed with the cross-section of an arterial road, design speed of 80km/h and be able to cater for B-Doubles. No direct property access (except where previously approved) is permitted to the road.

- the access to the area on the northern side of the Warrego Highway is to be established by either a service road connecting the northern round-a-bout at the River Road fly-over, together with the necessary upgrading of the on and off ramps to the Warrego Highway and any necessary upgrades to the River Road bridge, both round-a-bouts, and Ashburn Road near the fly-over; or by a new fly-over to be constructed over the Warrego Highway as an extension of Bognuda Street, together with the necessary accompanying on and off ramps to the Warrego Highway. Note: such works require the approval of the Department of Main Roads and/or private property owners. Development of the northern side of the land cannot occur until this access issue is resolved.

Public Transport

The Bremer Business Park is located in close proximity to the Ebbw Vale Railway Station. Pedestrian and cyclist paths from all Sub-Areas to the station are

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recommended to form part of the preliminary approval to provide connectivity, pedestrian/ cycle and vehicular linkages to all parts of the Bremer Business Park development.

Pedestrians and Cyclists

The preliminary approval has incorporated criteria to ensure that pedestrian and cyclist connections are provided between parkland; residential areas; businesses and industry premises; Ebbw Vale Railway Station; the Bremer TAFE; and the Community and Commercial Centre.

Mining

Council records indicate that parts of the subject site are located within areas that may be affected by mining.

Geotechnical assessment of the site prepared by Earthtech Consultants has identified that areas of the site are affected by undermining. The preliminary assessment identifies areas of the land that are at risk of subsidence. It is noted that some of the High, Moderate or Unknown Risk areas are within areas nominated as the Core Sub-Area, Open Space Sub-Area and road. It is considered that private lots be subject to a registrable covenant and all lots/land (including road and park) will need a detailed geotechnical assessment prior to uses and/ore works commencing.

Contaminated Land

A significant portion of the site is listed on the Environmental Management Register (EMR) and/or the Contaminated Land Register (CLR). It should be noted that if the land, that would become a Council asset (ie. parks, road, stormwater/sewer easements), is not removed from the Environmental Management Register (EMR) and/or the Contaminated Land Register (CLR), then Council will be accepting the following types of liabilities:

- Ongoing monitoring of the land and groundwater contamination;
- Maintaining the land to ensure the contamination is contained;
- Restricted current and future usage of the site;
- Restricted or costly work practices relating to maintaining services on the land;
- The risk of legal action by members of the community for effects allegedly associated with the contamination.

Given the significant environmental and financial liabilities associated with accepting contaminated land, it is proposed to attach a condition to any approval requiring all land that is to become a Council asset (eg. parks, road, stormwater/sewer easements), be removed from the EMR and CLR prior to the Sealing of the Survey Plan or acceptance by Council.

Organic Carbon

The Environmental Protection Agency in a letter dated 20 August 2003 and the Lower Bremer River Audit: Implications for Management Report (October 2003) identify that the Bremer River contains high levels of organic carbon and

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recommend that management actions be put in place to reduce inputs of carbon, nitrogen and phosphorus at the source.

The report also identified that Australian Hardboards Limited has irrigated to much of the subject site. As such, it is considered that the site, through the discharge of wastewater, has the potential to contaminate surface waters through stormwater runoff contaminated with organic carbon.

As such, it is proposed to attach a condition to any approval requiring comprehensive management of the site during the construction and operational phases of the development. If best practice management of the site is to be achieved, it will be necessary to determine the distribution and concentration of organic carbon on the site as a whole (ie. it will be necessary to undertake a comprehensive site investigation). Once distribution and concentration of organic carbon is known, suitable measures such as stormwater management including detention ponds proposed for the open space areas should be implemented. Also, during the construction phases, which may occur over an extended period with the development of specific lots, selective use of excavated material should be carried out so that soil containing organic carbon is not exposed to stormwater runoff.

Stormwater Quality

The application details that it is intended for the development to adopt best practice stormwater quality management and water sensitive urban design. Notwithstanding, this is not adequately addressed in the submitted Concept Master Plan for Stormwater Quality Management. The submitted document takes a separate approach whereby pollutants such as litter, sediment and nutrients from the entire development area are treated off-site. The pollutant export modelling performed for the Concept Master Plan is not adequate as:

- it does not acknowledge that there are separate sub-catchments within the development area discharging to the Bremer River and hence the modelling is not accurate;
- it assumes source control measures such as education and sweeping, which are too variable when considering treatments for each individual lot;
- it does not use realistic parameters (eg. it includes such parameters as street sweeping that has a good pollutant removal efficiency. However, such parameters are not realistic based upon the frequency of the sweeping program and the fact that the current street sweeping program cannot adequately accommodate the existing program).

It is proposed to attach a condition to any approval requiring the preparation of a conceptual /master stormwater management plan prior to any development of the site. This will ensure that all stages of the Bremer Business Park have an integrated stormwater management system and will also assist in achieving the best outcomes for water quality, stormwater infrastructure design and costs of stormwater management.

It should be noted that the Bremer Business Park site has factors such as topography that may limit the available stormwater quality management techniques used to achieve the required water quality objectives. Furthermore, due to commercial interests, the developer may wish to optimise the area of developable land that may

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further restrict the stormwater quality management techniques available. As such, it is important that this matter be addressed up front.

Bundamba Wastewater Centre

Part of the land proposed for residential purposes (ie. large lot residential) is affected by the Bundamba Wastewater Centre Buffer. The preliminary approval 'calls up' the Development Constraints Overlay from Council's IPA Planning Scheme in respect to this issue. As such, it is considered that this will allow such issues as amenity, air quality and noise associated with the centre to be addressed.

Open Space

In general the proposal notes that the development and embellishment of the open space network is the responsibility of Council with a deferment of cost to the developers of each stage of the application.

Certainly the area associated with the river and major re-entrant gully are important open space linkages and will form part of the City recreational trails in future years, however, areas noted in the report as 'linear' are not required for open space particularly within an industrial estate.

Cultural Heritage Values

Two (2) items of local significance are located on land. They are:

(i) Westfalen Colliery No 2 (Historic Mining Complex); and
(ii) Bremer Mills (Historic Industrial Site).

Both of these items are listed as 'Identified Places of Interest' under Council's Planning Scheme (Schedule 3). The scheme encourages the conservation of places that are 'Identified Places of Interest' but does not compel their conservation or retention. As such, it is proposed to attach a condition to any approval requiring the installation of appropriately located and detailed signage describing the history and cultural significance of the relevant items located throughout the site.

Additionally, it should be noted that the Cultural Heritage Branch of the Environmental Protection Agency advised Council in a letter dated 10 April 2003 that three (3) Queensland Estate sites were destroyed on land within the Bremer Business Park Area through site works associated with the establishment of the Capral Aluminium development. Queensland Estate sites are protected under the *Cultural Record (Landscape Queensland and Queensland Estate) Act 1987*. The Act states that it is offence under section 56(2) to '...take, destroy, damage, deface, excavate, expose, conceal or interfere with an item of Queensland Estate', unless a person does so under the authority of the Act.

To assist the developer in complying with the obligations of the Act, it is proposed to attach to any approval and advice reminding the developer of the previous offence/s and responsibilities under the Act.

Urban Design

Field Code Changed

The land is located on a major gateway to the City of Ipswich. The land is bounded by the Bremer River to the north and the Railway line and Brisbane Road to the south and is transected by the Warrego Highway. As such, the land is a highly visible and uses and/or works need to be well designed and articulated.

Key urban design issues relate to entry treatments, location and design of signage, location and design of car parks, building design and boulevard design of streets/roads. These issues have been addressed in the preliminary approval.

6. Infrastructure Contributions

It is proposed to attach a condition to any approval requiring the developer to establish a 'serviced' headworks contribution credit for the land proposed for industrial purposes. To this end, the developer will be required to pay headworks contributions at the level of 22.5 equivalent persons (ep) per hectare for sewerage and water and 30 non-residential credit units (nrcu) per hectare roadworks in accordance with Council's policies. Notwithstanding, it is proposed to give the developer the ability to seek an alternative agreement in respect to water supply and sewerage infrastructure contributions. Note, the developer will also be advised that recycled water infrastructure contributions may be applicable.

Additionally, Council will also have the ability to charge further contributions, if applicable, at the time a development permit is sought for development.

F. PUBLIC NOTIFICATION AND SUBMITTERS

Written notice has been received from the applicant confirming public notification of the proposal correctly identified the application and included publishing a notice in the Queensland Times on 11 December 2002. Such notice confirmed that the actual notification period of 39 business days complies with Section 3.4.6 of the *Integrated Planning Act 1997* which states that the notification period for the application is 30 business days. The public notification of the proposal has been carried out in accordance with the *Integrated Planning Act 1997* and 231 submissions and 2 petitions (signed by 40 and 79 persons respectively) have been received.

The representations raised in the submissions are outlines below. The representations have been grouped to reflect the prominent and recurrent concerns raised by the submitters.

Submission Comments	Response
Property Values • The proposal will cause a decrease in residential property values in the area. • Loss of visual quality - replacement of view-lines across rural pasture etc to background hills will cause significant loss of residential amenity which will be reflected in land value.	• A possible impact on the value of individual properties is not in itself relevant criteria for consideration in assessment of a Town Planning application. Factors which may possibly impact on valuations such as amenity and environmental quality are relevant and have been given appropriate consideration in assessment of this application (for more detail refer to section 3.4 of the Preliminary Approval Document). • There is no principle of "ownership of

Field Code Changed

Submission Comments	Response
	a view" recognised in Queensland law however visual quality of the Bremer Business Park Area is relevant to questions of amenity. The overall approach taken in the preliminary approval is to provide adequate buffering between residential areas and industrial structures and to provide for a high quality built environment across the estate. Furthermore, the design and siting of buildings provides for appropriate transitions between residential and other land uses.

Environment
• Without being specific as to the type of pollution a number of submissions state that the estate will cause pollution.
• Health impacts due to pollution in general are also raised.
	• In addition to the statutory regime in respect of noise, air and water pollution the Preliminary Approval provides for effective management of:
	  • stormwater quality through requirement for submission of overall master plan prior to commencement of development and supporting concept and development plans prior to development of each site (ref 3.4 - *Environmental Management and Infrastructure Efficiency- Specific Outcomes* of the Preliminary Approval); and
	  • the noise environment through buffering and standards for built form of industrial premises (ref 3.4 - *Residential Amenity - Specific Outcomes* of the Preliminary Approval).
	• Whilst Council's Health and Environmental Protection Department have reviewed the application "in principle", this preliminary approval establishes land uses and assessment criteria and does not consider specific land uses. To this end, the impacts of individual uses and tenancies will be considered as a part of further development permits for such.

Management of Environmental Impacts • One submitter states that there has been a reluctance by relevant agencies to administer regulations re existing industry in the area – namely AMH	• There are a range of mechanisms by which this type of allegation can be addressed. For the purposes of this application it must be assumed that statutory responsibilities will be appropriately met by all relevant

Field Code Changed

Submission Comments	Response
	authorities. • This development, unlike the AMH site, is based upon the establishment of fresh use rights. Through the assessment of individual Code and Impact Assessable Development Applications at a later stage, the impacts of individual uses and tenancies can be considered and conditions imposed relating to, amongst other matters, the potential environmental impacts of such proposals.
Air • Noxious emissions. • Odour Emissions. • *Projections available* [not say where from] *indicate that contaminating/polluting atmospheric emissions could well exceed maximum permitted quantities on a regular basis and thereby cause serious health ailments for people and livestock and damage to property /infrastructure* • Potential for combinant/recombinant chemical combinations is high and probably not controllable. • The combined airsheds between of the Brisbane River Catchment form a natural trap for airborne particles.	• All development on the estate must conform with relevant statutory standards. • *Residential Amenity - Specific Outcomes* (ref 3.4 of the Preliminary Approval) establishes a 300 metre buffer within the estate in order to buffer "difficult to locate industries" away from adjoining sensitive uses. • By way of the relevant criteria for each sub area and the buffer area set down by the Preliminary Approval it is envisaged that few if any higher emission industries would seek to locate in the estate. • It is not clear that the proposal will have any significant proportional impact on the regional air shed or that there is any identifiable health risk. • An application of this type (ie. Preliminary Approval) cannot assess specifically the impacts on air pollution the estate may or may not have on the basis that final uses (in terms of tenancies and activities) is not certain. Accordingly, this will be assessed at Development Permit stage for individual use rights and tenancies.
Dust • A number of submissions raised concerns regarding potential for dust generation during construction.	• Construction noise and dust nuisance is covered by the nuisance policies contained within the Environmental Protection Regulation 1998 and as such any complaints would be investigated and acted upon the Environmental Protection Agency (State Government).
Noise	• Any use of land within the estate will

Field Code Changed

Submission Comments	Response

• The application does not show how noise disturbance is to be minimised/prevented
• Noise will *destroy the quality of life of residents surrounding the estate.*
• One submission points to a *fear of noise and general industrial pollution in the future* arising from an apprehension that there will be further applications for heavy industry and 24 hour operations.
• There will be significant noise in the vicinity of Bognuda, Boundary and Carberry streets arising from forklifts trucks etc
• The Community Centre will generate significant volumes of traffic and will increase the traffic noise beyond that which would be created by the industrial uses alone.
• Traffic noise from the Supermarkets Distribution Centre will include forklifts and reverse beepers. Furthermore semitrailers will be entering and leaving the premises 24 hours a day – ie air brakes and idling engines.
• Noise disturbance created during construction including actual works and heavy vehicles entering and leaving the area
• The site will be Ipswich's largest employment generator and there will be significant noise disturbance caused by over 6000 people entering and leaving the area each day
	need to be undertaken in accordance with the provisions of the *Environmental Protection Act 1994* which, amongst other matters, sets standards for noise levels at receiving premises.
	• The Preliminary Approval (ref 3.4 - *Residential Amenity - Specific Outcomes*) sets specific outcomes for noise as follows:
	(a) *Noise generating activities and outdoor storage areas are designed and orientated away from residential and open space areas.*
	(b) *A 300m air, odour, and noise buffer restricts the location of difficult to locate industries away from adjoining sensitive uses. ...*
	(c) *Buffers may be reduced where uses are designed, located and operated with no discernible impact on nearby residential areas to the east, south and south-west.*
	• The location of land use precincts within the Bremer Business Park Area indicates that intensive development and uses (ie. those uses with potential higher impacts) are located within the core areas of the estate.
	• The assessment of future development permits for the development of the estate will consist of a twofold process which includes:
	  • consideration of the potential noise impacts of the use on existing and proposed residential areas; and
	  • the imposition of conditions regarding compliance with said limits;
	• It is likely that conditions regarding hours of operation will be imposed with the issue of Development Permits for development within the Bremer Business Park Area.
	• It is envisaged that a connection between Ashburn Street and the

Field Code Changed

Submission Comments	Response
	Cunningham Highway will be provided to act as a primary haul route. This route is anticipated to remove heavy vehicle traffic from River Road. • The Local Area Traffic management regime (ref 3.4 - Residential Streets - Specific Outcomes) provided for in the Preliminary Approval will seek to ensure that there is a minimal increase in the amount of industrial traffic on residential streets. • Construction noise and dust nuisance is covered by the nuisance policies contained within the Environmental Protection Regulation 1998 and as such any complaints would be investigated and acted upon the Environmental Protection Agency (State Government).
Water Pollution Principle issues raised were as follows: • A number of submissions refer to concerns re the operation of the Australian Meat Holdings (AMH) plant to the north of River Road, Dinmore. • One submission raises concern re the EPA allowing AMH to "self monitor" environmental impacts of the site suggesting amendments to the Environmental Protection Act so that ICC will control environmental impacts within the City boundaries. • The application does not show how water pollution is to be prevented. • Water Quality impacts on the Bremer/Brisbane River system and Moreton Bay have not been considered. • Ground water impacts have not been considered. • The flood plain area has implications for *aggregation of water – borne contaminant /pollutants and air borne contaminants/pollutants* • Water soluble and suspended materials/chemicals will aggregate at times of heavy rainfall in the wetlands – at times of light rain will form	• Operations at the AMH plant are subject to the requirements of the *Environmental Protection Act 1994*. Whilst the specific arrangements re the AMH plant are not known it is understood that it is not uncommon for organisations to be required to undertake sampling rather than all sampling being conducted by statutory authorities. Any fraud in the collection or presentation of data would be subject to relevant sanctions. The AMH site is subject to annual licensing by the EPA for all of the Environmentally Relevant Activities (ERA's) occurring on-site. This licensing process provides for the annual review of conditions on the site to maintain compliance with the *Environmental Protection Act 1994*, the *Environmental Protection Regulation 1998* and any other relevant legislation. It is likely that individual tenancies/uses on-site will be subject to a similar process either prescribed by the EPA or devolved for assessment by Council. • Specific outcomes for site contamination in 11.3 of the Preliminary Approval require that a

Field Code Changed

Submission Comments	Response
damaging chemical solutions and at other times will settle as atmospheric dust • Earthworks in the floodplain will flush existing carbon contamination of the land disposal area for the hardboards plant and sediments into the Bremer River • Bremer River is the worst polluted river in the region and the business park can only make pollution worse.	management plan be prepared to address the carbon loading issues on the site. • Given the nature of the specific uses proposed, with the exception of the carbon loading issues discussed above, it is not clear that there are any particular groundwater issues arising from the proposal. • A water quality management plan for the overall area and specific concept and detailed plans are required for each site (ref 3.4 - *Environmental Management and Infrastructure Efficiency- Specific Outcomes* of the Prelininary Approval). • Development of the estate pursuant to the water quality and carbon loading management regimes set down in the Preliminary Approval would be unlikely to worsen water quality of the Bremer River.
Light Spillage • A number of submitters raised light spillage as a matter of concern.	• There can be no doubt that a developed industrial estate will create greater levels of ambient light that at present. Whilst this is not considered in detail as a part of this application, the light spill of individual land uses and tenancies will be considered in the assessment of further Development Applications. To this end both the Australian Standards and Council's requirements with regard to light spill and illumination levels will be applied.
Visual Amenity • A number of submitters raised *ugliness* and *bulk* of buildings as relevant concerns.	• The utilisation of a preliminary approval process allows for greater focus to be given to the visual quality of the built environment. The Preliminary Approval nominates specific criteria for visual quality of development in each sub area. Such criteria will need to be further fulfilled in the making of individual development permits.
Native Vegetation • The proposal does not adequately take into account the ecological and wildlife values of the Bremer River floodplain, the degraded state of existing vegetation in this area and	• Clause 10.2 of the Preliminary Approval requires retention, and where necessary, enhancement of native vegetation in the Open Space Sub- Area. The development will be required to remain consistent with

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Submission Comments	Response
the need to replant the Bremer River to provide habitat for wildlife	this clause.

Hydrology
• Increased Run off.
• The site is currently a flood plain and the effects on flood hydrology of the Bremer River have not been adequately addressed.
• The stormwater studies submitted are flawed in that they are based on average storm water flows and not maximum or peak flows.
	• Clause 3.4 - *Environmental Management and Infrastructure Efficiency- Specific Outcomes* of the Preliminary Approval sets up a regime by which stormwater quantity and quality issues can be integrated into development of the estate. This will entail submission of new master plans for the overall estate and concept and detailed design plans for each site. Such master plans consider anticipated stormwater flows. It is considered appropriate to base stormwater calculations on anticipated flood and stormwater events.
	• Clause 11.4.7 of the Ipswich Planning Scheme sets up a comprehensive regime to manage flood impacts on (and from) development. Relevant specific outcomes include:
	  • Reconfiguration approvals will not create industrial premises on land below Q20 which are *effected by significant flood flows* (11.4.7 (1)(a)(ii));
	  • Development on industrial sites between Q20 and Q100 should not increase the flood hazard (eg. by way of increased depth, duration or velocity of floodwaters or a reduction in warning times) for other properties within a flood plain (11.4.7(1)(d)(vii) and balance cut and fill will only be permitted where it can be shown that such works *will not detrimentally affect flood storage capacity or flood conveyance characteristics* (11.4.7 (2)(d)).

Safety • Increased risk of accidents involving dangerous substances on road and rail transport. • Risk of accidents from accidents, accidental release of substances, etc. • A number of submissions referred to risk of terrorist attack on facilities.	• The land is not proposed for development for inherently dangerous activities. • The Local Area Traffic management regime (ref 3.4 - Residential Streets - Specific Outcomes) provided for in the Preliminary Approval will seek to ensure that there is a minimal increase

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Submission Comments	Response
	in the amount of industrial traffic on residential streets. • For the purposes of the application it must be assumed that all operators will comply with relevant statutory standards. Any breach must be addressed on its merits at that time. • There is no evidence that the subject site would present more of a terrorist risk than other private/ public facilities in the area. There are no significantly hazardous processing or storage facilities that would be likely to increase the risk of a terrorist attack.
Roads – Ipswich Knights Field (St Helen's Park) Proposal Grounds of objection to the proposal to connect to the Cunningham Highway by crossing Brisbane Road and proceeding tbrough the Ipswich Knights Field (formerly St Helen's) included: • Loss of heritage • The proposed road will devalue properties • Will create a noise and pollution problem in local areas • Loss of green belt and loss of necessary public facilities • The road is unnecessary and more preferable alternative accesses are available • This road may be best for the developer but will at great cost to the local community • The public purse should not have to cover any of the costs of the proposed road • Robert Street area to be caught between a set of arterial roads	• There is no longer any proposal to connect through the St Helen's soccer fields.
Roads – Other Network Issues • A lack of information available to the public regarding access to the site. • Access to the estate is inadequate and will cause congestion and create a nuisance for the community. • Traffic will need to cross the Warrego Highway to get into/from the Park – the Mt Crosby and Riverview Overpasses are overused therefore another access road is required.	• Critical issues of access from Brisbane Road to the estate and possible inter-highway connection through the land have been resolved since the lodgement of the application. • The requirement that an access point be constructed from Brisbane Road into the site will satisfactorily address access issues (ref.3.4 *Transport and Access - Specific Outcomes* of the

Field Code Changed

Submission Comments	Response
	Preliminary Approval. • Main Roads Department has not indicated any concern that the River Road interchange has insufficient capacity to accommodate traffic accessing the site from the west along the Warrego Highway. • It is likely that a regional transport solution in the form of a connection road between the Warrego Highway and the Cunningham Highway will be required as a part of the proposal. This teamed with the preparation of a Local Area Traffic Management Plan is intended to minimise the traffic impacts on the inter and intra-suburban network.
Roads – Local Traffic Management • A bikeway and walkway should be provided along the southern bank of the river. • The current and proposed local road hierarchy will not accommodate additional vehicles. • The proposed access point to Vale/Carberry Streets will severely impact on residents in this area. • The traffic light controlled intersection at the corner of Brisbane Road and Byrne Street will not accommodate the additional traffic generated. • The local road network in the Vale/Carberry Streets area does not have footpaths and additional traffic will cause safety concerns. • The area between Brisbane Road and the site is inadequate in terms of capacity, intersection, k&c footpaths to accommodate additional traffic generated by the proposal.	• Bikeway/pedestrian linkages are required in the open space adjacent to Bremer River (ref 10.3 *Specific Outcomes for the Open Space Sub-Area* of the Preliminary Approval). • The proposal for through traffic into the estate from Vale/Carberry Streets has been deleted. • New premises on Vale/Carberry Streets will need to connect into the internal road network. • Minimisation of traffic onto residential streets is a key focus of the Preliminary Approval (ref 3.4 *Residential Streets - Specific Outcomes*). • A new linkage is required to connect the site to Brisbane Road (ref 3.4 - *Transport and Access - Specific Outcomes* of the Preliminary Approval). • The Local Area Traffic management regime (ref 3.4 - Residential Streets - Specific Outcomes) provided for in the Preliminary Approval will seek to ensure that there is a minimal increase in the amount of industrial traffic on residential streets.
Contamination Grounds included: • The subject site is contaminated and development could create long term litigation against Council and a debt burden to residents.	• The Preliminary Approval (ref 11.3 - *Contamination - Specific Outcomes*) notes that before uses and works can occur, the Environmental Protection Agency (EPA) has required scientific investigation into the level of

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Submission Comments	Response
• As a result of discharge being drained on the land for many years there are *black stinking patches* which need to be removed prior to any earthworks taking place. • The removal of toxic substances *both during and after construction could have short and long term health problems for the larger community.* • The CSR trenches adjacent to Warrego Highway are contaminated – use of this land will be unsafe for workers involved with building and running an industrial park – ie this will represent a breach of the *Workplace Health and Safety Act 1995.*	contamination on Lot 13 on SL 2982, Lot 2 on RP 86838 and Lot 2 on RP 104683. The investigations undertaken will determine management and remediation measures required for the land and establish the suitability of the land for the intended uses; • The preliminary approval (also ref 11.3 - *Contamination - Specific Outcomes*) also addresses the need for remediation of the carbon loading on the site.
Buffers - General • There is insufficient buffer between the proposed development and the Bremer River (and residential areas on the opposite side of Bremer River). • … one submission requests that this buffer be widened to 1km • Another suggests the Murray Darling Basin Commission standard for depth of buffer should be used (being one fifth of the total frontage – ie 1/5 x 2000 m = 400m). • Extensive areas should be planted along the riverbank as early as possible so that by the time development takes place there will be adequate buffering. • There should be no light, general or heavy industry in the Riverside Precinct (in keeping with the developer's intention that more intense activity be restricted to the Central Industry Precinct). • There is no buffer along the railway line. • Burnie board provided a large buffer yet the subject proposal contains only a small and in places *non-existent* buffer – specifically *the area from Ebbw Vale railway station towards Dinmore School* • The proposal will result in a loss of the existing visual and noise buffer	*North* • The open space corridor along the Bremer River will be between 40-140 metres width. • The Preliminary Approval (clause 8.2) states that the Riverside Sub-Area will for a transition between residential areas to the north and envisages *low intensity industrial and related activities including research, technology, education, and some limited service industries.* • Furthermore given the need for flood storage etc it is likely that a considerable proportion of the Riverside Sub-Area will remain substantially undeveloped. *Railway Line* • There is no need for a buffer to the Railway line in this area given that the uses proposed adjacent to the railway line are commercial and industrial in nature and therefore not likely to be significantly impacted upon by noise from this corridor.

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Submission Comments	Response
with destruction of hundreds of trees which have been planted for buffering purposes • Loss of vegetation will result in loss of the existing native bird population and replacement by crows scavenging waste containers etc. Inadequate buffering is proposed from residential areas to the south (ie Roberts Street area).	
Buffers – Bognuda Street - General A petition from residents of on the eastern side of Bognuda Street and the southern side of Boundary street has raised the following: • The development of the part of the land between the estate and residential premises on the eastern side of Bognuda street and the southern side of Boundary street as a buffer will lead to poor security and lack of privacy for residents • It was always assumed that this area would remain a buffer from the hardboards plant. • The residents would be satisfied with an 80 m wide buffer part of which would include addition of 40m deep areas of the ownership of each lot. All fencing to be constructed by the developer in consultation with the residents. • Traffic calming should be undertaken in Bognuda Street	• It is understood that there have been discussions between the landholders and the developer regarding transfer of ownership of part of the buffer to the landholders. As such, this land has been included in the Open Space Sub-Area and nominated for dedication to Council. • These discussions have not formed part of the application process but would not be inconsistent with the intent of the Preliminary Approval. • This section of Bognuda Street will form part of the relevant area of the Local Area Traffic Management Plan (ref 3.4 - *Residential Streets - Specific Outcomes*). • The proposal incoporates transitional land uses (ie. those with lower impacts) adjacent to existing and proposed residential areas. Furthermore, the preliminary approval sets the regime within which future uses can be assessed. In the vicinity of Residential Uses, the impacts of noise, odour, dust and light (amongst other matters) will be considered. It should be noted that some forms of development within the estate may still require Impact Assessment, at which time further public notification will be required.
Buffers – Bognuda/Boundary Street Existing Residential The part of Lot 6 SP140694 (appears to be for future dedication as road including truncations) has historically been the access to their premises. • The premises were originally built by Australian Hardboards. • Development of the buffer as a park	• Any use of the land to the rear of these premises for private access has been by arrangement between the landholders. • There are no grounds for Council to maintain these arrangements through the development approval process.

Field Code Changed

Submission Comments	Response
would deprive them of access to their premises or would lead to greater vehicle use of this area by vehicles accessing the buffer area. • It is requested that easements be granted over the land to maintain existing access arrangements. • Access be restricted from this area to the parkland.	
Open Space • Concern that Council can guarantee that the Council can require full plans and a form of security to ensure parkland is established as indicated.	• Parkland will be required to be dedicated as specific conditions of reconfiguration approvals as per standard practice.
Need • There is no need for industrial development of this area which should be developed for sporting fields, botanic gardens and for future expansion of the Bundamba TAFE.	• A fundamental underpinning of the 1999 and 2004 Ipswich Planning Schemes has been for employment opportunities to be available for the rapidly increasing local population. • The site has been identified as a regionally significant industrial site at the State and regional levels. • Previous investigations into open space needs (eg *Ipswich Open Space and Recreation Development Plan* (1996)) have not identified a need for sporting fields and/or botanic gardens in this area.

Planning
• The proposal conflicts with the current zoning of the land.
	• The proposal is generally consistent with the intent of the 1999 and 2004 Town Planning Schemes in respect of the land and is included within Industrial Designations as follows:
	  • The land was predominantly included in the ILI (low impact Regional Business and Industry) and RB2M (medium impact Regional Business and Industry) Precincts of the Eastern Corridor Structure Plan (1999 Town Planning Scheme).
	  • The land is predominantly included in the RB2L (low impact Business and Industry) and RB2M (Medium Impact Business and Industry) Zones of the IPA Planning Scheme.

Services *Water* • The proposal will reduce existing	• Any approval of the application will

Field Code Changed

Submission Comments	Response
weak water pressure in the area.	be subject to conditions requiring further studies being conducted into infrastructure needs and the undertaking of relevant works.
Electricity • One submitter has stated that the local electricity supply network is inadequate – *we experience lights dimming when the sub-station is overloaded and much more power would b e required for these industries.*	• Powerlink is proposing a new substation within the park to service the demands of the estate.
Concerns re Specific Uses • An aluminium plant is entirely unsuitable for the estate on the grounds of the close proximity of residential areas, schools etc in particular on the grounds that it is gas powered. • Concern that AMH will be permitted to lease some of the estate.	• The application does not specifically provide for establishment of an aluminium plant. • Council approved an application 14 March 2003 for establishment of an aluminium plant on part of the land pursuant to land use rights under the Ipswich Eastern Corridor Structure Plan (314/03). • The current proposal does not provide for the undertaking of abattoir related activities however food processing may well meet the criteria set by the Preliminary Approval for a number of sub-areas of the Park and subject to compliance with all relevant Council and EPA requirements.
Consultation • A number of submissions state that the consultation which has been undertaken relates to warehousing and light industry but that no consultation has been made re heavy industry – was misleading when considered re Capral Plant. • No objection held to warehousing and light industry but strong objections are held to industry such as Capral in particular in relation to health impacts on children in the area.	• In addition to undertaking public notification procedures as required by the *Integrated Planning Act* the applicant has been involved in a non-statutory public consultation process. • A number of concerns have been expressed relating to the nature and potential impacts of the Capral application (314/2004). The Capral development, however, is not consistent with heavy industry and minimal impacts have been identified.
Process • There has not been an Environmental Impact Statement prepared in respect of the proposal. • Council should only approve *specifically designated industries ...*	• Notwithstanding that there has been no specific Environmental Impact Statement prepared in respect of the proposal, development of the land in accordance with the criteria set down in the Preliminary Approval and

Field Code Changed

Submission Comments	Response
as the project stands we could have anything laid at our doorstep. • The proposal allows industries to be established with little or no investigation. • The proposal does not provide for further public comment on applications to establish industries within the estate. • Industries qualified as Defence related and foreign investment could be exempt from relevant safety and security standards.	relevant statutory requirements (eg the *Environmental Protection Act*) will meet/exceed all relevant environmental standards. • The approval process set down in the Preliminary Approval provides for an additional set of requirements over those applying through the Planning Scheme. • Further development applications will be required for establishment of industrial uses on all sites in the estate. • There is currently no exemption from the City Planning Scheme for defence (other than Federal government facilities) or foreign investment industries.
City Image Issues raised include: • The proposal is a *continuation of the culture that Ipswich is a dumping ground for noxious industries in the name of jobs.* • The proposal is not consistent with a *clean green* image for the City. • Complete loss of rural character in the area.	• A fundamental underpinning of Council's 1999 and 2004 Town Planning Schemes has been for employment opportunities to be available for the rapidly increasing local population. • The Preliminary Approval does not provide for establishment of noxious industries in the estate but cannot preclude submission of an application which must be considered on its merits. • Noxious industries (*Special Industry* under the 2004 City Planning Scheme) in the estate would represent impact assessable development (ie further public notification required). • The Preliminary approval sets down a development regime through which a quality built environment can be provided in a form that maximises opportunities for public access to the natural setting provided by the Bremer River.
Need • There is currently no need for the proposed community centre – the area is well catered for in respect of community/retail facilities.	• Need and demand for the community centre was assessed in a report submitted September 2003.
Staging • One submitter has requested that *the clean up of the land on the Highway, riverside and Open Space Precincts*	• Dedication of parkland will be undertaken in two stages: • Land to the south of the highway will be dedicated prior to

Field Code Changed

Submission Comments	Response
be followed by the full development of the Open Space Precinct before the Highway and Riverside Precincts in order to *allow growth of a buffer zone*	development south of the highway; and • Land to the south of the highway will be dedicated prior to development south of the highway. • The Preliminary Approval requires that prior to dedication all remediation etc issues will have been resolved. • Reconfiguration of land approvals will be subject to standard conditions relating to dedication of parkland.

G. CONCLUSION

In summary, it is considered that the preliminary approval to override the planning scheme for a material change of use and preliminary approval for reconfiguring of a lot is suitable for the subject site and should be approved, subject to the conditions detailed in the recommendation of this report.

RECOMMENDATION

A. That the Developer be advised that Development Application No. 3356/02 is determined as outlined in the table below and is subject to the conditions specified below.

Proposal	Development	Decision	Approval Type
Development in accordance with a Plan of Development, including seven (7) Sub-Areas: Riverside Sub-Area, Highway Sub-Area, Frame Sub-Area, Core Sub-Area, Residential Sub-Area, Open Space Sub-Area and Community and Commercial Sub-Area.	Making a material change of use of premises (Preliminary Approval to override the Planning Scheme Section 3.1.6 of the *Integrated Planning Act 1997*)	Approved	Preliminary Approval
16 lots into 34 lots	Reconfiguring of a Lot	Approved	Preliminary Approval

Further Development Permits, as required by the *Integrated Planning Act 1997,* shall be obtained in respect of any Material Change of Use, Reconfiguration of a Lot Operational Works, Building Works and Plumbing and Drainage Works in relation to this approval before any such works are commenced.

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Conditions of Assessment Manager (Ipswich City Council)

Preliminary Approval for Material Change of Use of Premises – Bremer Business Park Preliminary Approval

1. Site Development

The proposed development of the Bremer Business Park Area shall be undertaken in accordance with the Bremer Business Park Preliminary Approval (see Attachment A).

2. Self-Assessable Development

The developer is required to notify Council in writing of the commencement of any self-assessable use to be undertaken in accordance with the Bremer Business Park Preliminary Approval.

3. Code Assessable Development

Any code assessable development to be undertaken in accordance with the Bremer Business Park Preliminary Approval shall demonstrate compliance with the Bremer Business Park Preliminary Approval and the relevant Development Codes and Planning Scheme Policies contained within the Ipswich Planning Scheme unless specified otherwise in the Bremer Business Park Preliminary Approval.

4. Contributions

(a) The developer shall establish a 'serviced' headworks contribution credit for the land included in the Core Sub-Area, Frame Sub-Area, Highway Sub-Area, Riverside Sub-Area and Community and Commercial Sub-Area under the Bremer Business Park Preliminary Approval. To this end, the developer shall pay headworks contributions at the level of 22.5 equivalent persons (ep) per hectare for water supply and sewerage and 30 non-residential credit units (nrcu) per hectare roadworks; and

(b) The developer shall pay a recycled water infrastructure and streetscape contributions (where applicable); and

(c) The developer shall pay contributions towards the provision of water, sewerage, roadworks, social amenity and open space (parks) headworks (where applicable) in accordance with the relevant Council Policies for development above the established headworks contribution credit; and

The contributions must be paid at the rates applicable at the time of payment. Payment is required prior to the issuing of a Development Permit for Building Works and/or prior to the issuing of a Development Permit for Reconfiguring a Lot and/or as per conditions of a further Development Permit for a Material Change of Use (Code or Impact or Self-Assessable (if applicable)); or

(d) The developer may seek an alternative agreement in respect to water supply and sewerage infrastructure contributions. The agreement shall be prepared and approved by Council prior to the issuing of a Development Permit for Building Works and/or prior to the issuing of a Development Permit for Reconfiguring a Lot

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and/or as per conditions of a further Development Permit for a Material Change of Use (Code or Impact or Self-Assessable (if applicable)).

5. Hours of Construction

Unless otherwise approved in writing by the Development Manager hours of construction shall be:

Monday to Saturday 6.30 a.m. to 6.30 p.m.

Work or business shall not be conducted from or on the premises outside the above hours or on Sundays or public holidays.

6. Road Naming Plan

The developer shall submit to and for approval by Council a list of names and name meanings for each new road to be opened. The proposed names shall be submitted to Council as part of any further application for a development permit for reconfiguring of a lot over the land.

7. Locality References

(a) Any place name or estate name used by the developer (excluding a reference to a building, structure or the like and excluding minor, subsidiary signage within a development) shall make reference to the relevant, approved place name under the *Place Names Act 1994*.

(b) Any reference to the regional location of the site or the development shall not refer to the place or estate as being located in Brisbane or a Brisbane suburb or in the metropolitan area or in the western suburbs (excluding the western suburbs of Ipswich as determined by Council in writing from time to time).

8. Cultural Heritage Identification

(a) The developer shall prepare a schedule of places/locations or structures of cultural heritage significance within the Bremer Business Park Area for identification. This list is to be approved by the Development Manager and such identified places/locations or structures are to be acknowledged on the specific site through the installation of appropriately located and detailed interpretive works and signage describing the history and cultural significance of relevant item/s.

(b) The developer is to engage an appropriately qualified person to photograph and document (with measured drawings) the places/locations or structures in their existing condition, all items that are proposed to be demolished, removed or adaptively reused.

Four (4) copies of a report, including photographs and documentation shall be submitted to the Development Manager for approval. Once approved, two (2) copies of the report shall be held by the Planning and Development Department with the other two (2) copies being forwarded to the Ipswich City Council Library and John Oxley Library.

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(c) Such work shall be completed prior to the issuing of a Development Permit for Building Works and/or prior to the issuing of a Development Permit for Reconfiguring a Lot and/or as per conditions of a further Development Permit for a Material Change of Use (Code or Impact or Self-Assessable (if applicable)).

9. Engineering Requirements

The following engineering requirements, detailed in Conditions 10 – 18, shall be completed to the satisfaction of the Senior Development Engineer.

10. Mining

(a) The developer shall prepare a detailed mining and geological assessment and recommendations report for those areas of the Bremer Business Park Area where there is evidence of previous mining activity or mining influence.

(b) The proposed development shall be designed and constructed in accordance with the approved recommendations as outlined in the geotechnical report and any required amendments.

(c) Prior to the approval of any application for building works, the Developer shall submit to Council a Structural Engineer's Certificate certifying that the proposed structures have been designed in accordance with the abovementioned geotechnical report(s).

(d) The developer shall prepare and register a Covenant with the Register of Titles for each of the affected lots as identified in the abovementioned report, prior to the issuing of a Development Permit for Building Works and/or prior to the issuing of a Development Permit for Reconfiguring a Lot and/or as per conditions of a further Development Permit for a Material Change of Use (Code or Impact or Self-Assessable (if applicable)). The covenant shall be to the satisfaction of the Development Manager and advise that:

(i) All building structures shall be designed and constructed in accordance with the recommendations as outlined in the geotechnical report;

(ii) Any application for Building Works shall be accompanied by a Structural Engineer's Certificate certifying that the proposed structures have been designed in accordance with the abovementioned geotechnical reports.

(e) The Developer shall pay all costs concerning the preparation and execution of the covenant and any registration fees and duty (if any).

11. Roadworks/Traffic

(a) The developer shall provide an updated and detailed traffic study and recommendations, prepared by a RPEQ for the Bremer Business Park Area. Amongst other matters, the study shall address, but not be limited to, the following:

(i) a review of the traffic generated by the Bremer Business Park Area;

(ii) road hierarchy for the Bremer Business Park Area, including connection points to the external road network;

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(iii) generalised land use;

(iv) public transport needs;

(v) staging and timing of the proposed works;

(vi) effects on existing road networks;

(vi) recommendation of specific measures to be undertaken to improve the alignment, sight distances, and signage of all roads which will result in safe movements of light and heavy vehicles, and reduce delays and queuing distances, including the connectivity of all transport systems available to the regions north and south of the Warrego Highway.

The access to the area on the northern side of the Warrego Highway is to be established prior to the commencement of any works on this portion of the Bremer Business Park Area and will be either via a service road connecting the northern round-a-bout at the River Road fly-over to the Warrego Highway, together with the necessary upgrading of the on and off-ramps to the Warrego Highway and with the necessary upgrades to the River Road bridge, both round-a-bouts, and Ashburn Road near the fly-over. Alternatively, this access may be achieved via a new fly-over over the Warrego Highway as an extension of Bognuda Street, together with the necessary accompanying on and off-ramps to the Warrego Highway.

It should be noted that both option for this northern connection require the approval of the Department of Main Roads and Council. Additionally, if any land is under other private ownership, written permission for the connection shall be obtained and forwarded to Council.

(vii) recommendation of specific measures to be undertaken to upgrade Bognuda, Ashburn, Carberry and Bird Streets in terms of pavement widths and quality and stormwater management. It is noted that the developer has made specific commitments to the community in respect to the provision of works in Bird Street;

(viii) recommendation of specific measures to be undertaken to define and improve the intersections of and to Brisbane Road, River Road and Ashburn Road and Warrego Highway;

(ix) recommendation of specific measures to be undertaken to isolate or distinctly separate all industrial traffic from residential traffic on Bognuda Road;

(x) recommendation of specific measures for the construction of a new connection road between Ashburn and Brisbane Roads.

This road shall be constructed with the cross-section of an arterial road, a design speed of 80km/h and be able to cater for B-Doubles. No direct property access (except at the Capral site which has already been approved) shall be permitted.

The road is to be established prior to the commencement of any works on this portion of the Bremer Business Park Area and will access Brisbane Road through Lots 2 and 7 on RP22379. Additionally, if any land is under other private ownership, written permission for the connection shall be obtained and forwarded to Council.

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(b) The study shall be submitted to and approved by the Development Manager prior to the issuing of a Development Permit for Building Works and/or prior to the issuing of a Development Permit for Reconfiguring a Lot and/or Development Permit for a Material Change of Use (Code or Impact or Self-Assessable (if applicable)).

(c) The Developer shall undertake any works deemed necessary by the Senior Development Engineer, to comply with the requirements of the traffic study.

12. Local Area Traffic Management Scheme

(a) The developer shall implement an integrated local area traffic management (LATM) scheme in the existing residential areas to the south-west of the Bremer Business Park Area, as follows:

(i) The LATM scheme shall be designed in accordance with the requirements of Council and approved by the Works Manager prior to the issuing of a Development Permit for Building Works and/or prior to the issuing of a Development Permit for Reconfiguring a Lot and/or Development Permit for a Material Change of Use (Code or Impact or Self-Assessable (if applicable));

(ii) The LATM scheme shall include a comprehensive public consultation component in which the developer must prepare and submit a communication plan for approval by the Works Manager prior to the issuing of a Development Permit for Building Works and/or prior to the issuing of a Development Permit for Reconfiguring a Lot and/or Development Permit for a Material Change of Use (Code or Impact or Self-Assessable (if applicable));

(iii) Initial design guidelines (to be finalised after public consultation) for the LATM scheme are:

- Direction signs on Brisbane Road, Jacaranda Street and Wattle Street to advise motorists (particularly heavy vehicle drivers) of alternative routes to Bremer Business Park. The type, size, layout and location of the direction signs requires approval from Council before implementation;

- Traffic control devices on Bryne Street (south of Law Street), Bognuda Street (north & south of Law Street) and Vale Street (east of Bognuda Street). These devices are to be either or a combination of angled slow points, deflected T-intersection devices or speed platforms. They shall be spaced at appropriate intervals so as to achieve a 50km/h speed environment and designed to provide adequate deflection for general traffic but still be able to accommodate buses and other large vehicles;

- Roundabouts at the intersections of:

  - Law Street - Byrne Street;
  - Bognuda Street - Law Street; and
  - Boundary Street - Bognuda Street - proposed Residential Access Street.

  Adequate design and approach widening will be required at these roundabouts in order to accommodate turning vehicles, including turning articulated vehicles that are required to use the Law Street - Byrne Street and Bognuda Street - Law Street intersections from time to time. The central roundabout islands may need to be fully mountable, however the approach splitter islands should be of semi-mountable kerb

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and accommodate appropriate signage to provide sufficient prominence and control vehicle movements;

- Entry thresholds (consisting of kerb build-outs, central islands and raised & coloured pavement treatments) to signify entry to the residential area at:

  - the southern approach from the Bremer Business Park (just after the proposed roundabout at the intersection of the new east-west internal road and the realigned Bognuda Street – refer item 6(b) above);
  - Byrne Street (north of Vale Street); and
  - Vale Street (east of Byrne Street).

- The closure of Bognuda Street in the vicinity of 44 Bognuda Street (Lot 1 on RP102431);

(b) The LATM scheme shall be fully completed within one (1) year from the date of approval of this development application;

(c) Council may by agreement extend the period by which the LATM scheme has to be completed; and

(d) Design and construction of this LATM scheme shall be at no cost to Council;

(e) In lieu of (a) to (d) above (ie. implementation of the LATM scheme), the developer may:

(i) Design and construct a roundabout at the intersection of Boundary Street, Bognuda Street and the proposed Residential Access Street in accordance with Council requirements; and

(ii) Provide Council a monetary contribution of $600,000 (equal to the value of the consultation, planning, design and construction of the LATM scheme outlined (a) to (d) above).

This contribution shall be applicable for a period of twelve months and thereafter shall be calculated from the date of development approval to the date when payment is made in accordance with the CPI.

13. Sewerage

(a) The developer shall submit a sewerage planning report to and for approval by the Ipswich Water Manager. The scope of the report should be determined in consultation with Ipswich Water. The report shall address, but not be limited to, the sewerage works required to service the Bremer Business Park Area, the timing of infrastructure and the impacts the proposed Bremer Business Park Area has on the existing (including the Bundamba Wastewater Centre) and planned infrastructure of Council.

(b) This sewerage planning report shall be submitted prior to the issuing of a Development Permit for Building Works and/or prior to the issuing of a Development Permit for Reconfiguring a Lot and/or Development Permit for a Material Change of Use (Code or Impact or Self-Assessable (if applicable)).

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(c) The developer shall review and update, if necessary, the report as determined by Council. Council may request the developer to review and update the report where the assumptions used in the report vary from what is being proposed by the developer. This may occur where the anticipated demands or timing of development have been amended/altered.

(d) The developer shall undertake all works identified within the approved report. This includes all aspects of the works including, but not limited to, the design, construction, supervision, land acquisition, testing, survey and preparation of as-constructed drawings.

14. Non-Potable Water (Recycled Sewage Effluent)

(a) The developer shall provide a recycled water reticulation system in the Bremer Business Park Area in accordance with Council's requirements. Such a system may include a trunk main for the conveyance of the processed sewage effluent from the Bundamba Sewage Treatment Plant. The sizing of the main is to be established by an RPEQ in conjunction with discussions and projected demands anticipated by Ipswich Water;

(b) The Developer shall make provision for a recycled water main on both sides of the road. An approved route for the location of the trunk water, sewage and recycled water mains is to be established prior to the issuing of a Development Permit for Building Works and/or prior to the issuing of a Development Permit for Reconfiguring a Lot and/or Development Permit for a Material Change of Use (Code or Impact or Self-Assessable (if applicable)).

15. Water

(a) The developer shall submit a water supply planning report to and for approval by the Ipswich Water Manager. The scope of the report shall be determined in consultation with Ipswich Water. The report shall address, but not be limited to, the water supply works required to service the Bremer Business Park Area, the timing of infrastructure and the impacts the proposed development has on the existing and planned infrastructure of Council.

(b) The report shall be approved by the Ipswich Water Manager prior to the issuing of a Development Permit for Building Works and/or prior to the issuing of a Development Permit for Reconfiguring a Lot and/or Development Permit for a Material Change of Use (Code or Impact or Self-Assessable (if applicable)).

(c) The developer shall review and update, if necessary, the report as determined by Council. This may be as a result of the development amending/altering anticipated demands or timing.

(d) The developer shall undertake all works identified within the approved report. This includes all aspects of the works including, but not limited to, the design, construction, supervision, land acquisition, testing, survey and preparation of as-constructed drawings.

(e) The developer shall provide water mains on both sides of the road, unless otherwise agreed to by Ipswich Water.

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(f) The developer shall construct a new water main in the Bremer Business Park Area to replace the existing 500mm central trunk water main located between River Road and Bognuda Street. The developer shall contact Council to determine its requirements. The developer will be advised by Council as to, but not limited to, the extent of works that needs to be undertaken on the existing main (whether the main needs to be removed or the existing easement/s relinquished), the timing of the works (new main has to be constructed before the existing main has been taken off line), the alignment of the new main (open space, water and wastewater corridor) and the size of the main.

(g) The developer shall contact Council prior to the issuing of a Development Permit for Building Works and/or prior to the issuing of a Development Permit for Reconfiguring a Lot and/or Development Permit for a Material Change of Use (Code or Impact or Self-Assessable (if applicable)) to determine if Council has any requirements in respect to the works that will be carried out within or in vicinity of the water and wastewater corridors. Council may request that the developer undertake works to ensure the water and wastewater pipelines that are proposed within the corridor are not adversely impacted by the developer's proposed works. The developer shall incorporate Council's requirements. Any works requested by Council shall be undertaken at the expense of Council. Council would be responsible for the full costs of the main crossings.

16. Water and Wastewater Corridors

(a) The developer shall provide water and wastewater purpose corridors through the Bremer Business Park Area on the alignments generally indicated in the Bremer Business Park Preliminary Approval.

(b) The corridors will vary in width depending on the infrastructure that is to be constructed within them. The corridors are to have a minimum width of 20 metres and are expected to have an average width of 25 metres.

(c) The developer shall locate the corridors in open space, verge widths and in backs of private properties, in this order. If required, the developer shall amend the proposed layout to ensure that this is achieved, unless otherwise approved by Council.

(d) The developer shall provide an easement in favour of Council for water and wastewater purposes where the corridors are located in private property.

(e) The developer shall provide an access easement in favour of Council to the water and wastewater easement where it no direct frontage is available to any public areas.

(f) The developer shall contact Council prior to undertaking any works within the designated corridors to ascertain Council's requirements. This includes works relating to fencing, landscaping and driveways.

17. Road Reserves – Service Alignments

The developer shall provide a plan detailing the road reserve widths required within the Bremer Business Park Area. This plan should detail the services to be contained within each road reserve, their alignments and expected time for construction. The plan should provide adequate cross sections, with details of the existing infrastructure, for Council to determine if the road reserves proposed are sufficient.

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18. Stormwater

(a) The developer shall provide all necessary stormwater drainage (both internal and external to the development) and such drainage works (except for roofwater systems) shall be designed and constructed in accordance with QUDM such that the overall drainage system caters for a storm event with an ARI of 100 years.

Overland flow paths shall be suitably designed to cater for the water from a storm event with an ARI of 100 years. In the case where the piped system is carrying part of the flow, the overland flow paths shall be designed to cater for that volume which is represented by the difference between the predicted volume from the storm event with an ARI of 100 years and the capacity of the pipe system, noting the requirements of QUDM.

(b) All stormwater flows within and adjacent to the Bremer Business Park Area, other than inter-allotment drainage, shall be confined to dedicated roads, drainage reserves, registered drainage easements or within parkland. The registered drainage easements, if related to piped drainage, shall be centrally located over such underground pipe system and shall be not less than 4.0 m wide, except for drainage easements required for side boundaries which may be 3.0 m wide where approved by the Senior Development Engineer. In addition, the easements shall be of suitable width to contain the predicted overland flow from the storm event with an ARI of 100 years in that location.

(c) No ponding or redirection of stormwater shall occur onto adjoining land unless specifically approved by Council in consultation with the owner of the adjoining land.

(d) Due consideration shall be given in these and future designs and construction of the development in relation to the effect of the developed catchment flows on the downstream discharge receival areas. Suitable stormwater control devices are to be provided to ensure that there is no increase in flows in watercourses. Such control devices are to be designed so as to integrate the landscaping, recreational, infrastructural and drainage roles of watercourses.

(e) Each proposed residential, commercial and/or industrial allotment shall be designed to comply with QUDM, Council's standards and the New Ipswich City Planning Scheme, including unimpeded access to a road system which is also above the design flood level.

(f) There shall be no filling or removal of material in the flood area below the flood level associated with an ARI of 100 years without the approval of the Senior Development Engineer. There shall be minimal disturbance to vegetation in the flood area, unless prior written approval is obtained from Council.

(g) Filling in proposed Lots, which are adjacent to the watercourse shown on the proposal plan, shall not be undertaken without the written approval of Council.

19. Health and Environmental Protection Requirements

Conditions 20 – 21, unless otherwise stated, shall be completed to the satisfaction of the Chief Environmental Health Officer.

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20. Contaminated Land

The developer shall ensure all land to be dedicated to Council is not listed on either the Contaminated Land Register or the Environmental Management Register prior to dedication. In this regard the developer shall be responsible for all works associated with the removal of any land to be dedicated to Council from these registers. The developer shall provide details to Council demonstrating that the requirements of this condition have been met prior to the issuing of a Development Permit for Building Works and/or prior to the issuing of a Development Permit for Reconfiguring a Lot and/or Development Permit for a Material Change of Use (Code or Impact or Self-Assessable (if applicable)).

21. Stormwater Quality

The developer shall submit to and receive approval from the Health and Environmental Protection Manager for a Master Stormwater Quality Management Plan for the Bremer Business Park Area (the Master SQMP) prior to the issuing of a Development Permit for Building Works and/or prior to the issuing of a Development Permit for Reconfiguring a Lot and/or Development Permit for a Material Change of Use (Code or Impact or Self-Assessable (if applicable)). A suitably qualified and experienced professional must prepare the Master SQMP. The Master SQMP must:

(i) Provide a management approach that ensures:

- Stormwater quality management measures for the Bremer Business Park Area consist of physical treatment measures to ensure that the stormwater discharged from a land use type complies with the pollutant levels identified in Table 1 below;

- Stormwater quality management measures for residential areas and roads consist of physical treatment measures to ensure that the stormwater discharged from these areas comply with the pollutant levels identified in Table 1 below;

- The matters of water sensitive urban design (WSUD), stormwater management and stormwater quality will be addressed throughout the Bremer Business Park Area in an integrated approach, and

- A refined Conceptual Design Stormwater Quality Management Plan (the Conceptual Design SQMP) is supplied for each development site prior to the issuing of a Development Permit for Building Works and/or prior to the issuing of a Development Permit for Reconfiguring a Lot and/or Development Permit for a Material Change of Use (Code or Impact or Self-Assessable (if applicable)) and then a Detailed Design Stormwater Quality Management Plan (the Detailed Design SQMP) is supplied for each development site prior to the issuing of a Development Permit for Operational Works.

(ii) Demonstrate, through appropriate pollutant export modelling (eg AQUALM or MUSIC), that the pollutant levels in the stormwater discharged from the Bremer Business Park Area comply with the pollutant levels identified in Table 1 below.

TABLE 1

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Indicator	Modified ecosystem, wildlife, cultural heritage, secondary & visual recreation, industry, stock and irrigation
Total Phosphorus	70 ug/L
Total Nitrogen	650 ug/L
Suspended solids	15mg/L for combined wet and dry periods 90% ile < 100mg/L for wet weather periods
Oils and grease	no visible films or odour
Organic Carbon	As determined through the investigations into organic carbon on the site.
Litter/gross pollutants	No anthropogenic (man-made) material greater than 5mm in any dimension
Riparian vegetation & habitat	Protect & restore consistent with Council policy and plans
Cultural heritage	Protect & restore consistent with Council policy and plans

- Levels are upper limits for median values or ranges in which medians should lie, unless otherwise stated.
- Dependencies on hardness iron and chromium shown in brackets are difficult to quantify. They may be ignored initially but subsequently considered if the pollutant level range is exceeded. For more information refer to the latest Australian Water Quality Guidelines for Fresh and Marine Waters (ANZECC).
- A wet weather period is defined as "any period where stormwater runoff leaves the site".

22. Conservation, Parks and Sport Requirements

Conditions 23 – 26, unless otherwise stated, shall be completed to the satisfaction of the Conservation, Parks and Sport Manager.

23. Parkland Dedication

The area included in the Open Space Sub-Area under the Bremer Business Park Preliminary Approval shall be dedicated, free of cost to and compensation by Council, in fee simple. The developer is to submit a staging plan to and for approval by the Development Manager, indicating the timing of dedication, prior to the issuing of a Development Permit for Building Works and/or prior to the issuing of a Development Permit for Reconfiguring a Lot and/or Development Permit for a Material Change of Use (Code or Impact or Self-Assessable (if applicable)).

24. Clearing/Disturbance within Proposed Parkland

(a) No clearing shall be undertaken in proposed parkland without the prior approval of the Conservation, Parks and Sport Manager.

(b) All areas of disturbance within parkland including areas of erosion and bare ground shall be rehabilitated. All batters and banks shall be fully stabilised and vegetated to the satisfaction of the Conservation, Parks and Sport Manager.

25. Quality of Park Dedication

Land to be dedicated for park purposes shall be upgraded to the satisfaction of the Conservation, Parks and Sport Manager as follows:

(a) declared plants, environmental weeds and rubbish shall be removed;

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(b) dead trees shall be removed and dangerous trees made safe within 10 m of proposed house blocks or proposed pathways or playgrounds;

(c) open areas shall be grassed and left in mowable condition;

(d) open areas shall be free of rocks, stumps, humps and hollows;

(e) disturbed areas shall be revegetated using indigenous plant species;

(f) a cleared 4m wide mowable strip shall be formed behind proposed house blocks;

(g) all rubbish shall be removed from parkland;

(h) parkland shall be freely and safely drained;

(i) all playground equipment and park furniture shall meet Australian Standards both in supply and installation;

(j) no overburden or spoil shall be pushed or deposited into parkland;

(k) water, sewer and power service shall be provided to the proposed park; and

(l) there shall be no removal of soil or filling around trees.

26. Naming of Parkland

(a) The developer shall submit to and for approval by Council a list of at least three names and their name meanings for each new park. The proposed names shall be submitted as part of the Operational Works application. Should a theme be considered appropriate, the theme should be submitted to Council at the time of submitting the road names.

(b) The developer shall erect a suitable park name sign to the satisfaction of the Development Manager.

27. Department of Main Roads

The Bremer Business Park Preliminary Approval excludes the areas identified for quarantine in the Department of Main Road's Concurrence Agency response dated 24 September 2003 until such time as the quarantine period lapses or the Department of Main Roads determines that the quarantine is no longer required.

28. When Preliminary Approval Takes Effect

This preliminary approval has effect in accordance with the provisions of Section 3.5.19 of the *Integrated Planning Act 1997* as follows:

(a) If the applicant does not appeal the decision to the court - when the submitter's appeal period ends; or

(b) If an appeal is made to the court - subject to the decision of the court, when the appeal is finally decided.

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29. When Preliminary Approval Lapses

(a) This preliminary approval lapses:

(i) At the end of the currency period, unless the change of use happens before the end of the currency period. The currency period for this approval is 4 years starting the day the approval takes effect; and

(ii) Where the change of use of any premises established pursuant to the development approval has ceased for a period of at least 12 months.

(b) An extended currency period may be agreed upon, pursuant to Section 3.5.22 of the *Integrated Planning Act 1997*, provided a written notice to Council is made before the end of the currency period. Such written notice is to be on Council's approved form, accompanied by the owner's consent and the prescribed fee in Council's Register of General Charges.

(c) All of the development the subject of this approval shall be completed within the periods stated in Condition (a)(i) above. This approval shall lapse for any part of the development of the site that has not commenced within the currency period stated in Condition (a)(i) above.

Preliminary Approval for Reconfiguring of a Lot

1. Basis of Approval

Subject to these conditions, the facts and circumstances set out in the application and all relevant Council Local Laws and/or Planning Scheme Policies shall be adhered to.

2. Minor Alterations

Notwithstanding the requirements detailed in this approval, any other minor alterations and/or modifications acceptable to the Development Manager will suffice.

3. Development Plan

An amended development plan and staging plan, generally in accordance with Plan Number JD 2322-00-069 (Attachment B), dated 14 April 2004 and prepared by Keilar Fox and McGhie and Plan Number JD 2322-00-070 (Attachment C), dated 14 April 2004 and prepared by Keilar Fox and McGhie, shall be submitted to and approved by the Development Manager prior to Council issuing a development permit for reconfiguring of a lot over the land. Such plan shall include, amongst other items, the following:-

(i) approved locations, widths and paths for the trunk water, sewer and recycled water mains and any sewer rising mains with the Bremer Business Park Area (Refer to Conditions 9, 10, 11 and 12 from the abovementioned Preliminary Approval for Material Change of Use of Premises);

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(ii) trafficable connections for the Bremer Business Park Area(Refer to Condition 8 from the abovementioned Preliminary Approval for Material Change of Use of Premises);

4. Rates in Arrears

In accordance with the provisions of the *Integrated Planning Act 1997*, all rates and other expenses as a charge against the land shall not be in arrears at the date of signing of the plan of survey.

5. Compliance with Conditions

(a) Conditions 1 to 27 from the abovementioned Preliminary Approval for Material Change of Use of Premises shall be completed prior to signing of the relevant plan of survey or as determined by the Development Manager.

(b) Unless otherwise stated all conditions from this Preliminary Approval for Reconfiguring of a Lot shall be completed prior to signing of the relevant plan of survey or as determined by the Development Manager.

(c) All conditions shall be completed to the satisfaction of the Development Manager.

6. When this Approval Takes Effect

This approval has effect in accordance with the provisions of Section 3.5.19 of the *Integrated Planning Act 1997* as follows:

(a) If the applicant does not appeal the decision to the court - from the time the decision notice is given (or if a negotiated decision notice is given, from the time the negotiated decision notice is given); or

(b) If an appeal is made to the court - subject to the decision of the court, when the appeal is finally decided.

7. When Approval Lapses

(a) The currency period for this approval is 4 years starting the day the approval takes effect. The Developer is required to submit to Council an accurate plan of survey before the end of the currency period, otherwise the approval will lapse.

(b) An extended currency period may be agreed upon, pursuant to Section 3.5.22 of the *Integrated Planning Act 1997*, provided a written notice to Council is made before the end of the currency period. Such written notice is to be on Council's approved form, accompanied by the owner's consent and the prescribed fee in Council's Register of General Charges.

B. Conditions of Concurrence Agencies

1. The Environmental Protection Agency (Contaminated Land Unit) is a concurrence agency with regard to this development approval. The attached concurrence agency response, dated 10 September 2003 forms part of this Decision Notice (Attachment D).

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2. The Department of Main Roads is a concurrence agency with regard to this development approval. The attached concurrence agency response, dated 24 September 2003 forms part of this Decision Notice (Attachment E).

C. Advice

The Developer be further advised of the following advice:-

1. Fire Ants

In accordance with the *Plant Protection Act 1989* and the Plant Protection Regulation 1990, a quarantine notice has been issued for the State of Queensland to prevent the spread of the Red Imported Fire Ant (ant species Solenopsis invicta) and to eradicate it from the State.

It is the legal obligation of the land owner or any consultant or contractor employed by the land owner to report the presence or suspicion of Fire Ants to the Queensland Department of Primary Industries on 132523 within 24 hours of becoming aware of the presence or suspicion, and to advise in writing within seven days to:

Director General
Department of Primary Industries
GPO Box 46, Brisbane QLD 4001

It should be noted that the movement of Fire Ants is prohibited, unless under the conditions of a Department of Primary Industries Inspectors Approval. More information can be obtained from the Queensland Department of Primary Industries website www.dpi.qld.gov.au.

The development approved herein, by its very nature, includes activities considered to be "high risk" in respect of controlling the spread of Fire Ants. The following lists show high risk activities and some precautions should be considered for implementation.

(a) High risk activities can include:

(i) Earthworks of a minor or major scale;

(ii) Revegetation or rehabilitation;

(iii) Import of fill onto a site;

(iv) Export of fill or other materials such as soils, gravel, mulch and plants; and

(v) Export off or import on to a site of construction and demolition waste and materials or green waste.

(b) Precautions for implementation

(i) Checking for ants regularly;

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(ii) Checking all soil, fill and waste materials (construction and green waste) for ants;

(iii) Asking questions about the quality and source of soil, fill and waste materials (construction and green waste);

(iv) Keeping records of all movements of soil, fill and waste materials (construction and green waste);

(v) Cleaning of all earthmoving or other soiled vehicles prior to exit from the site; and

(vi) Informing staff and contractors about these precautions.

2. Portable Long Service Leave

From 1 January 2001, the Building and Construction Industry (Portable Long Service Leave) Levy must be paid prior to the issue of a development permit where one is required for the 'Building and Construction Industry'. This applies to Building Works, Operational Works and Plumbing and Drainage Works applications, as defined under the *Integrated Planning Act 1997*, where the works are $80 000 or more and matching the definition of 'Building and Construction Industry' under the *Building and Construction Industry (Portable Long Service Leave) Act 1991*.

Council will not be able to issue a decision notice without receipt of details that the levy has been paid. Should you require clarification in regard to the amendments to the *Building and Construction Industry (Portable Long Service Leave) Act 1991*, you should contact QLeave on 1800 803 481 (free call) or [redacted].

3. Cultural Heritage

The Cultural Heritage Branch of the Environmental Protection Agency advised Council in a letter dated 10 April 2003 that three (3) Queensland Estate sites were destroyed on land within the Bremer Business Park Area through site works associated with the establishment of the Capral Aluminium Extrusion Plant. Queensland Estate sites are protected under the *Cultural Record (Landscape Queensland and Queensland Estate) Act 1987*. The Act states that it is offence under section 56(2) to '...take, destroy, damage, deface, excavate, expose, conceal or interfere with an item of Queensland Estate', unless a person does so under the authority of the Act. As such, the developer is reminded of its responsibilities under the Act.

4. Mining

The land to which this approval relates may have been worked by underground coal mining operations. Council, and its servants and agents, accept no liability or responsibility for any loss or damage to person or property of whatever nature or however caused as the direct or indirect consequence of the g ranting of the approval herein contained. Such approval has been granted at the request of the developer and in reliance of information submitted by the developer in support thereof.

D. Copy of Decision Notices

A copy of this decision be forwarded to the following referral agencies:

Field Code Changed

1. Department of Local Government and Planning
   Planning Services
   PO Box 31
   BRISBANE ALBERT STREET QLD 4002

2. District Director
   Department of Main Roads
   Metropolitan District
   PO Box 70
   SPRING HILL QLD 4004

3. Environmental Protection Agency
   Contaminated Land Unit
   Southern Regional Office (Brisbane)
   GPO Box 2771
   BRISBANE QLD 4001

E. The Planning Manager be advised to amend the alignment of the major inter-suburban link as identified on Strategy Map 4B in Council's Planning Scheme to reflect this approval.

F. That the Decision Notice advise the developer that there were 233 properly made submissions received with respect to this application.

"ATTACHMENT A" "ATTACHMENT B" "ATTACHMENT C" "ATTACHMENT D" "ATTACHMENT E"

Brendan Nelson
DEVELOPMENT MANAGER

I concur with the recommendations contained in this report.

Gary White
PLANNING AND DEVELOPMENT MANAGER

Date:

Field Code Changed

Ipswich
City Council

Your Reference:
Our Reference: 3356/02 NH:KGR
Contact Officer: [redacted]
Telephone No.: [redacted]

30 April 2004

INTEGRATED PLANNING ACT 1997

DEVELOPMENT APPLICATION DECISION NOTICE

Application Details

Application No:	3356/02
Real Property Description:	Lot 4 SP140694, Lot 6 SP140694, Lot 2 RP854997, Lot 1 RP22385, Lot 1 RP125443, Lot 2 RP104683, Lot 1 RP86838, Lot 1 RP22378, Lot 34 SL3911, Lot 1 RP84779, Lot 142 RP846150, Lot 4 RP92591, Lot 5 RP92591, Lot 6 RP92591, Lot 3 RP132087, Lot 13 SL2982
Property Location:	55 and 99999 Bognuda Street, 42 Brisbane Road, 242A Warrego Highway, Bundamba
Names and Addresses of all Referral Agencies:	Department of Local Government and Planning Planning Services PO Box 31 BRISBANE ALBERT STREET QLD 4002 District Director Department of Main Roads Metropolitan District PO Box 70 SPRING HILL QLD 4004 Environmental Protection Agency Contaminated Land Unit Southern Regional Office (Brisbane) GPO Box 2771 BRISBANE QLD 4001

Wingate Properties Pty Ltd
48 Wharf Street
KANGAROO POINT QLD 4169

Please Address All Correspondence to:
Chief Executive Officer
Ipswich City Council
A.B.N. 61 461 981 077
PO Box 191 Ipswich Qld 4305
Telephone: [redacted]
Facsimile: [redacted]
Email: [redacted]
Website: www.ipswich.qld.gov.au

Decision Date: 28 April 2004

Decision: Approved subject to the conditions detailed below.

Decision Authority: Full Council Meeting

Approval Details:

Proposal	Development	Decision	Approval Type
Development in accordance with a Plan of Development, including seven (7) Sub-Areas: Riverside Sub-Area, Highway Sub-Area, Frame Sub-Area, Core Sub-Area, Residential Sub-Area, Open Space Sub-Area and Community and Commercial Sub-Area	Making a material change of use of premises (Preliminary Approval to override the Planning Scheme Section 3.1.6 of the *Integrated Planning Act 1997*)	Approved	Preliminary Approval
16 lots into 34 lots	Reconfiguring a Lot	Approved	Preliminary Approval

Further Development Permits, as required by the *Integrated Planning Act 1997,* shall be obtained in respect of any Material Change of Use, Reconfiguration of a Lot Operational Works, Building Works and Plumbing and Drainage Works in relation to this approval before any such works are commenced.

Conditions

Assessment Manager (Ipswich City Council)

Conditions applicable to this approval under Integrated Planning Act:

Preliminary Approval for Material Change of Use of Premises – Bremer Business Park Preliminary Approval

1. Site Development

The proposed development of the Bremer Business Park Area shall be undertaken in accordance with the Bremer Business Park Preliminary Approval (see Attachment A).

2. Self-Assessable Development

The developer is required to notify Council in writing of the commencement of any self-assessable use to be undertaken in accordance with the Bremer Business Park Preliminary Approval.

3. Code Assessable Development

Any code assessable development to be undertaken in accordance with the Bremer Business Park Preliminary Approval shall demonstrate compliance with the Bremer Business Park Preliminary Approval, relevant assessment criteria and Planning Scheme Policies contained

within the Ipswich Planning Scheme unless specified otherwise in the Bremer Business Park Preliminary Approval.

4. Contributions

(a) The developer shall establish a 'serviced' headworks contribution credit for the land included in the Core Sub-Area, Frame Sub-Area, Highway Sub-Area, Riverside Sub-Area and Community and Commercial Sub-Area under the Bremer Business Park Preliminary Approval. To this end, the developer shall pay headworks contributions for the Core Sub-Area, Frame Sub-Area, Highway Sub-Area and Riverside Sub-Area at the level of 22.5 equivalent persons (ep) per hectare for water supply and sewerage and 46.5 equivalent persons (ep) per hectare for roadworks and for the Community and Commercial Sub-Area at the level of 22.5 equivalent persons (ep) per hectare for water supply and sewerage and 133 equivalent persons (ep) per hectare for roadworks; and

NB: These contributions established a minimum deemed credit for the land included in the abovementioned Sub-Areas. Where establishing/commencing uses and/or works create a demand greater than the deemed credit, further contributions may be applicable in accordance with the relevant Council Policies.

(b) The developer shall pay a recycled water infrastructure and streetscape contributions (where applicable); and

(c) The developer shall pay contributions towards the provision of water, sewerage, roadworks, social amenity and open space (parks) headworks for the land included in the Residential Sub-Area in accordance with the relevant Council Policies prior to the issuing of a Development Permit for Building works and/or prior to the issuing of a Development Permit for Reconfiguring a Lot and/or prior to the issuing of a Development Permit for a Material Change of Use (Code or Impact or Self-Assessable (if applicable)); and

The contributions must be paid at the rates applicable at the time of payment. Payment is required prior to the issuing of a Development Permit for Building Works and/or prior to the issuing of a Development Permit for Reconfiguring a Lot and/or as per conditions of a further Development Permit for a Material Change of Use (Code or Impact or Self-Assessable (if applicable)); or

(d) The developer may seek an alternative agreement in respect to water supply and sewerage infrastructure contributions. The agreement shall be prepared and approved by Council prior to the issuing of a Development Permit for Building Works and/or prior to the issuing of a Development Permit for Reconfiguring a Lot and/or prior to the issuing of a Development Permit for a Material Change of Use (Code or Impact or Self-Assessable (if applicable)).

5. Hours of Construction

Unless otherwise approved in writing by the Development Manager hours of construction shall be:

Monday to Saturday 6.30 a.m. to 6.30 p.m.

Work or business shall not be conducted from or on the premises outside the above hours or on Sundays or public holidays.

6. Road Naming Plan

The developer shall submit to and for approval by Council a list of names and name meanings for each new road to be opened. The proposed names shall be submitted to Council as part of any further application for a development permit for reconfiguring of a lot over the land.

7. Locality References

(a) Any place name or estate name used by the developer (excluding a reference to a building, structure or the like and excluding minor, subsidiary signage within a development) shall make reference to the relevant, approved place name under the *Place Names Act 1994*.

(b) Any reference to the regional location of the site or the development shall not refer to the place or estate as being located in Brisbane or a Brisbane suburb or in the metropolitan area or in the western suburbs (excluding the western suburbs of Ipswich as determined by Council in writing from time to time).

8. Cultural Heritage Identification

(a) The developer shall prepare a schedule of places/locations or structures of cultural heritage significance within the Bremer Business Park Area for identification. This list is to be approved by the Development Manager and such identified places/locations or structures are to be acknowledged on the specific site through the installation of appropriately located and detailed interpretive works and signage describing the history and cultural significance of relevant item/s.

(b) The developer is to engage an appropriately qualified person to photograph and document (with measured drawings) the places/locations or structures in their existing condition, all items that are proposed to be demolished, removed or adaptively reused.

Four (4) copies of a report, including photographs and documentation shall be submitted to the Development Manager for approval. Once approved, two (2) copies of the report shall be held by the Planning and Development Department with the other two (2) copies being forwarded to the Ipswich City Council Library and John Oxley Library.

(c) Such work shall be completed prior to the issuing of a Development Permit for Building Works and/or prior to the issuing of a Development Permit for Reconfiguring a Lot and/or as per conditions of a further Development Permit for a Material Change of Use (Code or Impact or Self-Assessable (if applicable)).

9. Engineering Requirements

The following engineering requirements, detailed in Conditions 10 – 18, shall be completed to the satisfaction of the Senior Development Engineer and in accordance with Council's Planning Scheme Policy 3 – General Workis..

10. Mining

(a) The developer shall prepare a detailed mining and geological assessment and recommendations report for those areas of the Bremer Business Park Area where there is evidence of previous mining activity or mining influence.

(b) The proposed development shall be designed and constructed in accordance with the approved recommendations as outlined in the geotechnical report and any required amendments.

(c) Prior to the approval of any application for building works, the Developer shall submit to Council a Structural Engineer's Certificate certifying that the proposed structures have been designed in accordance with the abovementioned geotechnical report(s).

(d) The developer shall prepare and register a Covenant with the Register of Titles for each of the affected lots as identified in the abovementioned report, prior to the issuing of a Development Permit for Building Works and/or prior to the issuing of a Development Permit for Reconfiguring a Lot and/or as per conditions of a further Development Permit for a Material Change of Use (Code or Impact or Self-Assessable (if applicable)). The covenant shall be to the satisfaction of the Development Manager and advise that:

(i) All building structures shall be designed and constructed in accordance with the recommendations as outlined in the geotechnical report;

(ii) Any application for Building Works shall be accompanied by a Structural Engineer's Certificate certifying that the proposed structures have been designed in accordance with the abovementioned geotechnical reports.

(e) The Developer shall pay all costs concerning the preparation and execution of the covenant and any registration fees and duty (if any).

11. Roadworks/Traffic

(a) The developer shall provide an updated and detailed traffic study and recommendations, prepared by a RPEQ for the Bremer Business Park Area. Amongst other matters, the study shall address, but not be limited to, the following:

(i) a review of the traffic generated by the Bremer Business Park Area;

(ii) road hierarchy for the Bremer Business Park Area, including connection points to the external road network;

(iii) generalised land use;

(iv) public transport needs;

(v) staging and timing of the proposed works;

(vi) effects on existing road networks;

(vii) recommendation of specific measures to be undertaken to improve the alignment, sight distances, and signage of all roads which will result in safe movements of light and heavy vehicles, and reduce delays and queuing distances, including the connectivity of all transport systems available to the regions north and south of the Warrego Highway.

The access to the area on the northern side of the Warrego Highway is to be established prior to the commencement of any works on this portion of the Bremer Business Park Area and will be either via a service road connecting the northern round-a-bout at the River Road fly-over to the Warrego Highway, together with the necessary upgrading of the on and off-ramps to the Warrego Highway and with the necessary upgrades to the River Road bridge, both round-a-bouts, and Ashburn Road near the fly-over. Alternatively, this access may be achieved via a new fly-over over the Warrego Highway as an extension of Bognuda Street, together with the necessary accompanying on and off-ramps to the Warrego Highway.

It should be noted that both option for this northern connection require the approval of the Department of Main Roads and Council. Additionally, if any land is under other private ownership, written permission for the connection shall be obtained and forwarded to Council.

(viii) recommendation of specific measures to be undertaken to upgrade Bognuda, Ashburn, Carberry and Bird Streets in terms of pavement widths and quality footpaths and stormwater management. It is noted that the developer has made specific commitments to the community in respect to the provision of works in Bird Street. To this end, the developer shall provide kerb and channel on both sides of Bird Street and drainage works and pavement infill as determined necessary by the Senior Development Engineer;

(ix) recommendation of specific measures to be undertaken to define and improve the intersections of and to Brisbane Road, River Road and Ashburn Road and Warrego Highway;

(x) recommendation of specific measures to be undertaken to isolate or distinctly separate all industrial traffic from residential traffic on Bognuda Street;

(xi) recommendation of specific measures for the construction of a new connection road between Ashburn and Brisbane Roads.

This road shall be constructed with the cross-section of an arterial road, a design speed of 80km/h and be able to cater for B-Doubles. No direct property access (except at the Capral site which has already been approved) shall be permitted.

The road is to be established prior to the commencement of any works on this portion of the Bremer Business Park Area and will access Brisbane Road through Lots 2 and 7 on RP22379. Additionally, if any land is under other private ownership, written permission for the connection shall be obtained and forwarded to Council.

(b) The study shall be submitted to and approved by the Development Manager prior to the issuing of a Development Permit for Building Works and/or prior to the issuing of a Development Permit for Reconfiguring a Lot and/or Development Permit for a Material Change of Use (Code or Impact or Self-Assessable (if applicable)).

The Developer shall undertake any works deemed necessary by the Senior Development Engineer, to comply with the requirements of the traffic study.

12. Local Area Traffic Management Scheme

(a) The developer shall implement an integrated local area traffic management (LATM) scheme in the existing residential areas to the south and south-west of the Bremer Business Park Area, as follows:

(i) The LATM scheme shall be designed in accordance with the requirements of Council and approved by the Works Manager prior to the issuing of a Development Permit for Building Works and/or prior to the issuing of a Development Permit for Reconfiguring a Lot and/or Development Permit for a Material Change of Use (Code or Impact or Self-Assessable (if applicable));

(i) The LATM scheme shall include a comprehensive public consultation component in which the developer must prepare and submit a communication plan for approval by the Works Manager prior to the issuing of a Development Permit for Building Works and/or prior to the issuing of a Development Permit for Reconfiguring a Lot and/or Development Permit for a Material Change of Use (Code or Impact or Self-Assessable (if applicable));

(ii) Initial design guidelines (to be finalised after public consultation) for the LATM scheme are:

- Direction signs on Brisbane Road, Jacaranda Street and Wattle Street to advise motorists (particularly heavy vehicle drivers) of alternative routes to Bremer Business Park. The type, size, layout and location of the direction signs requires approval from Council before implementation;

- Traffic control devices on Bryne Street (south of Law Street), Bognuda Street (north & south of Law Street) and Vale Street (east of Bognuda Street). These devices are to be either or a combination of angled slow points, deflected T-intersection devices or speed platforms. They shall be spaced at appropriate intervals so as to achieve a 50km/h speed environment and designed to provide adequate deflection for general traffic but still be able to accommodate buses and other large vehicles;

- Roundabouts at the intersections of:

  - Law Street - Byrne Street;
  - Bognuda Street - Law Street; and
  - Boundary Street - Bognuda Street - proposed Residential Access Street.

  Adequate design and approach widening will be required at these roundabouts in order to accommodate turning vehicles, including turning articulated vehicles that are required to use the Law Street - Byrne Street and Bognuda Street - Law Street intersections from time to time. The central roundabout islands may need to be fully mountable, however the approach splitter islands should be of semi-mountable kerb and accommodate appropriate signage to provide sufficient prominence and control vehicle movements;

- Entry thresholds (consisting of kerb build-outs, central islands and raised & coloured pavement treatments) to signify entry to the residential area at:

  - the southern approach from the Bremer Business Park (just after the proposed roundabout at the intersection of the new east-west internal road and the realigned Bognuda Street – refer item 6(b) above);

- Byrne Street (north of Vale Street); and
- Vale Street (east of Byrne Street).

- The closure of Bognuda Street in the vicinity of 44 Bognuda Street (Lot 1 on RP102431);

(b) The LATM scheme shall be fully completed within one (1) year from the date of approval of this development application;

(c) Council may by agreement extend the period by which the LATM scheme has to be completed; and

(d) Design and construction of this LATM scheme shall be at no cost to Council;

(e) In lieu of (a) to (d) above (ie. implementation of the LATM scheme), the developer may:

(i) Design and construct a roundabout at the intersection of Boundary Street, Bognuda Street and the proposed Residential Access Street in accordance with Council requirements; and

(ii) Provide Council a monetary contribution of $600,000 (equal to the value of the consultation, planning, design and construction of the LATM scheme outlined (a) to (d) above).

This contribution shall be applicable for a period of twelve months and thereafter shall be calculated from the date of development approval to the date when payment is made in accordance with the CPI.

13. Sewerage

(a) The developer shall submit a sewerage planning report to and for approval by the Ipswich Water Manager. The scope of the report should be determined in consultation with Ipswich Water. The report shall address, but not be limited to, the sewerage works required to service the Bremer Business Park Area, the timing of infrastructure and the impacts the proposed Bremer Business Park Area has on the existing (including the Bundamba Wastewater Centre) and planned infrastructure of Council.

(b) This sewerage planning report shall be submitted prior to the issuing of a Development Permit for Building Works and/or prior to the issuing of a Development Permit for Reconfiguring a Lot and/or Development Permit for a Material Change of Use (Code or Impact or Self-Assessable (if applicable)).

(c) The developer shall review and update, if necessary, the report as determined by Council. Council may request the developer to review and update the report where the assumptions used in the report vary from what is being proposed by the developer. This may occur where the anticipated demands or timing of development have been amended/altered.

(d) The developer shall undertake all works identified within the approved report. This includes all aspects of the works including, but not limited to, the design, construction, supervision, land acquisition, testing, survey and preparation of as-constructed drawings.

14. Non-Potable Water (Recycled Sewage Effluent)

(a) The developer shall provide a recycled water reticulation system in the Bremer Business Park Area in accordance with Council's requirements. Such a system may include a trunk main for the conveyance of the processed sewage effluent from the Bundamba Sewage Treatment Plant. The sizing of the main is to be established by an RPEQ in conjunction with discussions and projected demands anticipated by Ipswich Water;

(b) The Developer shall make provision for a recycled water main on both sides of each applicable road. An approved route for the location of the trunk water, sewage and recycled water mains is to be established prior to the issuing of a Development Permit for Building Works and/or prior to the issuing of a Development Permit for Reconfiguring a Lot and/or Development Permit for a Material Change of Use (Code or Impact or Self-Assessable (if applicable)).

15. Water

(a) The developer shall submit a water supply planning report to and for approval by the Ipswich Water Manager. The scope of the report shall be determined in consultation with Ipswich Water. The report shall address, but not be limited to, the water supply works required to service the Bremer Business Park Area, the timing of infrastructure and the impacts the proposed development has on the existing and planned infrastructure of Council.

(b) The report shall be approved by the Ipswich Water Manager prior to the issuing of a Development Permit for Building Works and/or prior to the issuing of a Development Permit for Reconfiguring a Lot and/or Development Permit for a Material Change of Use (Code or Impact or Self-Assessable (if applicable)).

(c) The developer shall review and update, if necessary, the report as determined by Council. This may be as a result of the development amending/altering anticipated demands or timing.

(d) The developer shall undertake all works identified within the approved report. This includes all aspects of the works including, but not limited to, the design, construction, supervision, land acquisition, testing, survey and preparation of as-constructed drawings.

(e) The developer shall provide water mains on both sides of each applicable road, unless otherwise agreed to by Ipswich Water.

(f) The developer shall construct a new water main in the Bremer Business Park Area to replace the existing 500mm central trunk water main located between River Road and Bognuda Street. The developer shall contact Council to determine its requirements. The developer will be advised by Council as to, but not limited to, the extent of works that needs to be undertaken on the existing main (whether the main needs to be removed or the existing easement/s relinquished), the timing of the works (new main has to be constructed before the existing main has been taken off line), the alignment of the new main (open space, water and wastewater corridor) and the size of the main.

(g) The developer shall contact Council prior to the issuing of a Development Permit for Building Works and/or prior to the issuing of a Development Permit for Reconfiguring a Lot and/or Development Permit for a Material Change of Use (Code or Impact or Self-Assessable (if applicable)) to determine if Council has any requirements in respect to the works that will be carried out within or in vicinity of the water and wastewater corridors. Council may request

that the developer undertake works to ensure the water and wastewater pipelines that are proposed within the corridor are not adversely impacted by the developer's proposed works. The developer shall incorporate Council's requirements. Any works requested by Council shall be undertaken at the expense of Council. Council would be responsible for the full costs of the main crossings.

16. Water and Wastewater Corridors

(a) The developer shall provide water and wastewater purpose corridors through the Bremer Business Park Area on the alignments generally indicated in the Bremer Business Park Preliminary Approval.

(b) The corridors will vary in width depending on the infrastructure that is to be constructed within them. The corridors are to have a minimum width of 20 metres and are expected to have an average width of 25 metres.

(c) The developer shall locate the corridors in open space, verge widths and in front setbacks of private properties, in this order. If required, the developer shall amend the proposed layout to ensure that this is achieved, unless otherwise approved by Council.

(d) The developer shall provide an easement in favour of Council for water and wastewater purposes where the corridors are located in private property.

(e) The developer shall provide an access easement in favour of Council to the water and wastewater easement where no direct frontage is available to any public areas.

(f) The developer shall contact Council prior to undertaking any works within the designated corridors to ascertain Council's requirements. This includes works relating to fencing, landscaping and driveways.

17. Road Reserves – Service Alignments

The developer shall provide a plan detailing the road reserve widths required within the Bremer Business Park Area. This plan should detail the services to be contained within each road reserve, their alignments and expected time for construction. The plan should provide adequate cross sections, with details of the existing infrastructure, for Council to determine if the road reserves proposed are sufficient.

18. Stormwater

(a) The developer shall provide all necessary stormwater drainage (both internal and external to the development) and such drainage works (except for roofwater systems) shall be designed and constructed in accordance with QUDM such that the overall drainage system caters for a storm event with an ARI of 100 years.

Overland flow paths shall be suitably designed to cater for the water from a storm event with an ARI of 100 years. In the case where the piped system is carrying part of the flow, the overland flow paths shall be designed to cater for that volume which is represented by the difference between the predicted volume from the storm event with an ARI of 100 years and the capacity of the pipe system, noting the requirements of QUDM.

(b) All stormwater flows within and adjacent to the Bremer Business Park Area, other than inter-allotment drainage, shall be confined to dedicated roads, drainage reserves, registered drainage easements or within parkland. The registered drainage easements, if related to piped drainage, shall be centrally located over such underground pipe system and shall be not less than 4.0 m wide, except for drainage easements required for side boundaries which may be 3.0 m wide where approved by the Senior Development Engineer. In addition, the easements shall be of suitable width to contain the predicted overland flow from the storm event with an ARI of 100 years in that location.

(c) No ponding or redirection of stormwater shall occur onto adjoining land unless specifically approved by Council in consultation with the owner of the adjoining land.

(d) Due consideration shall be given in these and future designs and construction of the development in relation to the effect of the developed catchment flows on the downstream discharge receival areas. Suitable stormwater control devices are to be provided to ensure that there is no increase in flows in watercourses. Such control devices are to be designed so as to integrate the landscaping, recreational, infrastructural and drainage roles of watercourses.

(e) Each proposed residential, commercial and/or industrial allotment shall be designed to comply with QUDM, Council's standards and the New Ipswich City Planning Scheme, including unimpeded access to a road system which is also above the design flood level.

(f) There shall be no filling or removal of material in the flood area below the flood level associated with an ARI of 100 years without the approval of the Senior Development Engineer. There shall be minimal disturbance to vegetation in the flood area, unless prior written approval is obtained from Council.

(g) Filling in proposed Lots, which are adjacent to the watercourse shown on the proposal plan, shall not be undertaken without the written approval of Council.

19. Health and Environmental Protection Requirements

Conditions 20 – 21, unless otherwise stated, shall be completed to the satisfaction of the Chief Environmental Health Officer.

20. Contaminated Land

The developer shall ensure all land to be dedicated to Council is not listed on either the Contaminated Land Register or the Environmental Management Register prior to dedication. In this regard the developer shall be responsible for all works associated with the removal of any land to be dedicated to Council from these registers. The developer shall provide details to Council demonstrating that the requirements of this condition have been met prior to the issuing of a Development Permit for Building Works and/or prior to the issuing of a Development Permit for Reconfiguring a Lot and/or Development Permit for a Material Change of Use (Code or Impact or Self-Assessable (if applicable)).

21. Stormwater Quality

The developer shall submit to and receive approval from the Health and Environmental Protection Manager for a Master Stormwater Quality Management Plan for the Bremer Business Park Area (the Master SQMP) prior to the issuing of a Development Permit for

Building Works and/or prior to the issuing of a Development Permit for Reconfiguring a Lot and/or Development Permit for a Material Change of Use (Code or Impact or Self-Assessable (if applicable)). A suitably qualified and experienced professional must prepare the Master SQMP. The Master SQMP must:

(i) Provide a management approach that ensures:

- Stormwater quality management measures for the Bremer Business Park Area consist of physical treatment measures to ensure that the stormwater discharged from a land use type complies with the pollutant levels identified in Table 1 below;

- Stormwater quality management measures for residential areas and roads consist of physical treatment measures to ensure that the stormwater discharged from these areas comply with the pollutant levels identified in Table 1 below;

- The matters of water sensitive urban design (WSUD), stormwater management and stormwater quality will be addressed throughout the Bremer Business Park Area in an integrated approach, and

- A refined Conceptual Design Stormwater Quality Management Plan (the Conceptual Design SQMP) is supplied for each development site prior to the issuing of a Development Permit for Building Works and/or prior to the issuing of a Development Permit for Reconfiguring a Lot and/or Development Permit for a Material Change of Use (Code or Impact or Self-Assessable (if applicable)) and then a Detailed Design Stormwater Quality Management Plan (the Detailed Design SQMP) is supplied for each development site prior to the issuing of a Development Permit for Operational Works.

(ii) Demonstrate, through appropriate pollutant export modelling (eg AQUALM or MUSIC), that the pollutant levels in the stormwater discharged from the Bremer Business Park Area comply with the pollutant levels identified in Table 1 below.

TABLE 1

Indicator	Modified ecosystem, wildlife, cultural heritage, secondary & visual recreation, industry, stock and
Total Phosphorus	70 ug/L
Total Nitrogen	650 ug/L
Suspended solids	15mg/L for combined wet and dry periods 90% ile < 100mg/L for wet weather periods
Oils and grease	no visible films or odour
Organic Carbon	As determined through the investigations into organic carbon on
Litter/gross pollutants	No anthropogenic (man-made) material greater than 5mm in any
Riparian vegetation & habitat	Protect & restore consistent with Council policy and plans
Cultural heritage	Protect & restore consistent with Council policy and plans

- Levels are upper limits for median values or ranges in which medians should lie, unless otherwise stated.

- Dependencies on hardness iron and chromium shown in brackets are difficult to quantify. They may be ignored initially but subsequently considered if the pollutant level range is exceeded. For more information refer to the latest Australian Water Quality Guidelines for Fresh and Marine Waters (ANZECC).
- A wet weather period is defined as "any period where stormwater runoff leaves the site".

22. Conservation, Parks and Sport Requirements

Conditions 23 – 26, unless otherwise stated, shall be completed to the satisfaction of the Conservation, Parks and Sport Manager.

23. Parkland Dedication/Requirements

The area included in the Open Space Sub-Area under the Bremer Business Park Preliminary Approval shall be dedicated, free of cost to and compensation by Council, in fee simple. The developer is to submit a staging plan to and for approval by the Development Manager, indicating the timing of dedication, construction of footpaths and dense planting/mounding in Landscaped Buffer Areas indicated in Figure 12 Residential Amenity of the Bremer Business Park Preliminary Approval, prior to the issuing of a Development Permit for Building Works and/or prior to the issuing of a Development Permit for Reconfiguring a Lot and/or Development Permit for a Material Change of Use (Code or Impact or Self-Assessable (if applicable)).

24. Clearing/Disturbance within Proposed Parkland

(a) No clearing shall be undertaken in proposed parkland without the prior approval of the Conservation, Parks and Sport Manager.

(b) All areas of disturbance within parkland including areas of erosion and bare ground shall be rehabilitated. All batters and banks shall be fully stabilised and vegetated to the satisfaction of the Conservation, Parks and Sport Manager.

25. Quality of Park Dedication

Land to be dedicated for park purposes shall be upgraded to the satisfaction of the Conservation, Parks and Sport Manager as follows:

(a) declared plants, environmental weeds and rubbish shall be removed;

(b) dead trees shall be removed and dangerous trees made safe within 10 m of proposed house blocks or proposed pathways or playgrounds;

(c) open areas shall be grassed and left in mowable condition;

(d) open areas shall be free of rocks, stumps, humps and hollows;

(e) disturbed areas shall be revegetated using indigenous plant species;

(f) a cleared 4m wide mowable strip shall be formed behind proposed house blocks;

(g) all rubbish shall be removed from parkland;

(h) parkland shall be freely and safely drained;

(i) all playground equipment and park furniture shall meet Australian Standards both in supply and installation;

(j) no overburden or spoil shall be pushed or deposited into parkland;

(k) water, sewer and power service shall be provided to the proposed park; and

(l) there shall be no removal of soil or filling around trees.

26. Naming of Parkland

(a) The developer shall submit to and for approval by Council a list of at least three names and their name meanings for each new park. The proposed names shall be submitted as part of the Operational Works application. Should a theme be considered appropriate, the theme should be submitted to Council at the time of submitting the road names.

(b) The developer shall erect a suitable park name sign to the satisfaction of the Development Manager.

27. Department of Main Roads

The Bremer Business Park Preliminary Approval excludes the areas identified for quarantine in the Department of Main Road's Concurrence Agency response dated 24 September 2003 until such time as the quarantine period lapses or the Department of Main Roads determines that the quarantine is no longer required.

28. When Preliminary Approval Takes Effect

This preliminary approval has effect in accordance with the provisions of Section 3.5.19 of the *Integrated Planning Act 1997* as follows:

(a) If the applicant does not appeal the decision to the court - when the submitter's appeal period ends; or

(b) If an appeal is made to the court - subject to the decision of the court, when the appeal is finally decided.

29. When Preliminary Approval Lapses

(a) This preliminary approval lapses:

(i) At the end of the currency period, unless the change of use happens before the end of the currency period. The currency period for this approval is 4 years starting the day the approval takes effect; and

(ii) Where the change of use of any premises established pursuant to the development approval has ceased for a period of at least 12 months.

(b) An extended currency period may be agreed upon, pursuant to Section 3.5.22 of the *Integrated Planning Act 1997*, provided a written notice to Council is made before the end of the currency period. Such written notice is to be on Council's approved form, accompanied by the owner's consent and the prescribed fee in Council's Register of General Charges.

(c) All of the development the subject of this approval shall be completed within the periods stated in Condition (a)(i) above. This approval shall lapse for any part of the development of the site that has not commenced within the currency period stated in Condition (a)(i) above.

Preliminary Approval for Reconfiguring of a Lot

1. Basis of Approval

Subject to these conditions, the facts and circumstances set out in the application and all relevant Council Local Laws and/or Planning Scheme Policies shall be adhered to.

2. Minor Alterations

Notwithstanding the requirements detailed in this approval, any other minor alterations and/or modifications acceptable to the Development Manager will suffice.

3. Development Plan

An amended development plan and staging plan, generally in accordance with Plan Number JD 2322-00-069 (Attachment B), dated 14 April 2004 and prepared by Keilar Fox and McGhie and Plan Number JD 2322-00-070 (Attachment C), dated 14 April 2004 and prepared by Keilar Fox and McGhie, shall be submitted to and approved by the Development Manager prior to Council issuing a development permit for reconfiguring of a lot over the land. Such plan shall include, amongst other items, the following:-

(i) approved locations, widths and paths for the trunk water, sewer and recycled water mains and any sewer rising mains with the Bremer Business Park Area (Refer to Conditions 9, 10, 11 and 12 from the abovementioned Preliminary Approval for Material Change of Use of Premises);

(ii) trafficable connections for the Bremer Business Park Area(Refer to Condition 8 from the abovementioned Preliminary Approval for Material Change of Use of Premises);

4. Rates in Arrears

In accordance with the provisions of the *Integrated Planning Act 1997*, all rates and other expenses as a charge against the land shall not be in arrears at the date of signing of the plan of survey.

5. Compliance with Conditions

(a) Conditions 1 to 27 from the abovementioned Preliminary Approval for Material Change of Use of Premises shall be completed prior to signing of the relevant plan of survey or as determined by the Development Manager.

(b) Unless otherwise stated all conditions from this Preliminary Approval for Reconfiguring of a Lot shall be completed prior to signing of the relevant plan of survey or as determined by the Development Manager.

(c) All conditions shall be completed to the satisfaction of the Development Manager.

6. When this Approval Takes Effect

This approval has effect in accordance with the provisions of Section 3.5.19 of the *Integrated Planning Act 1997* as follows:

(a) If the applicant does not appeal the decision to the court - from the time the decision notice is given (or if a negotiated decision notice is given, from the time the negotiated decision notice is given); or

(b) If an appeal is made to the court - subject to the decision of the court, when the appeal is finally decided.

7. When Approval Lapses

(a) The currency period for this approval is 4 years starting the day the approval takes effect. The Developer is required to submit to Council an accurate plan of survey before the end of the currency period, otherwise the approval will lapse.

(b) An extended currency period may be agreed upon, pursuant to Section 3.5.22 of the *Integrated Planning Act 1997*, provided a written notice to Council is made before the end of the currency period. Such written notice is to be on Council's approved form, accompanied by the owner's consent and the prescribed fee in Council's Register of General Charges.

Concurrence Agency

Conditions applicable to this approval imposed by the following Concurrence Agencies:

1. The Environmental Protection Agency (Contaminated Land Unit) is a concurrence agency with regard to this development approval. The attached concurrence agency response, dated 10 September 2003 forms part of this Decision Notice (Attachment D).

2. The Department of Main Roads is a concurrence agency with regard to this development approval. The attached concurrence agency response, dated 24 September 2003 forms part of this Decision Notice (Attachment E).

Advice

The following advices are offered for your information only and should not be viewed as mandatory conditions of this approval.

Assessment Manager (Ipswich City Council)

1. Fire Ants

In accordance with the *Plant Protection Act 1989* and the Plant Protection Regulation 1990, a quarantine notice has been issued for the State of Queensland to prevent the spread of the Red Imported Fire Ant (ant species Solenopsis invicta) and to eradicate it from the State.

It is the legal obligation of the land owner or any consultant or contractor employed by the land owner to report the presence or suspicion of Fire Ants to the Queensland Department of Primary Industries on 132523 within 24 hours of becoming aware of the presence or suspicion, and to advise in writing within seven days to:

Director General
Department of Primary Industries
GPO Box 46, Brisbane QLD 4001

It should be noted that the movement of Fire Ants is prohibited, unless under the conditions of a Department of Primary Industries Inspectors Approval. More information can be obtained from the Queensland Department of Primary Industries website www.dpi.qld.gov.au.

The development approved herein, by its very nature, includes activities considered to be "high risk" in respect of controlling the spread of Fire Ants. The following lists show high risk activities and some precautions should be considered for implementation.

(a) High risk activities can include:

(i) Earthworks of a minor or major scale;

(ii) Revegetation or rehabilitation;

(iii) Import of fill onto a site;

(iv) Export of fill or other materials such as soils, gravel, mulch and plants; and

(v) Export off or import on to a site of construction and demolition waste and materials or green waste.

(b) Precautions for implementation

(i) Checking for ants regularly;

(ii) Checking all soil, fill and waste materials (construction and green waste) for ants;

(iii) Asking questions about the quality and source of soil, fill and waste materials (construction and green waste);

(iv) Keeping records of all movements of soil, fill and waste materials (construction and green waste);

(v) Cleaning of all earthmoving or other soiled vehicles prior to exit from the site; and

(vi) Informing staff and contractors about these precautions.

2. Portable Long Service Leave

From 1 January 2001, the Building and Construction Industry (Portable Long Service Leave) Levy must be paid prior to the issue of a development permit where one is required for the 'Building and Construction Industry'. This applies to Building Works, Operational Works

and Plumbing and Drainage Works applications, as defined under the *Integrated Planning Act 1997*, where the works are $80 000 or more and matching the definition of 'Building and Construction Industry' under the *Building and Construction Industry (Portable Long Service Leave) Act 1991*.

Council will not be able to issue a decision notice without receipt of details that the levy has been paid. Should you require clarification in regard to the amendments to the *Building and Construction Industry (Portable Long Service Leave) Act 1991*, you should contact QLeave on 1800 803 481 (free call) or (07[redacted]

3. Cultural Heritage

The Cultural Heritage Branch of the Environmental Protection Agency advised Council in a letter dated 10 April 2003 that three (3) Queensland Estate sites were destroyed on land within the Bremer Business Park Area through site works associated with the establishment of the Capral Aluminium Extrusion Plant. Queensland Estate sites are protected under the *Cultural Record (Landscape Queensland and Queensland Estate) Act 1987*. The Act states that it is offence under section 56(2) to '...take, destroy, damage, deface, excavate, expose, conceal or interfere with an item of Queensland Estate', unless a person does so under the authority of the Act. As such, the developer is reminded of its responsibilities under the Act.

4. Mining

The land to which this approval relates may have been worked by underground coal mining operations. Council, and its servants and agents, accept no liability or responsibility for any loss or damage to person or property of whatever nature or however caused as the direct or indirect consequence of the g ranting of the approval herein contained. Such approval has been granted at the request of the developer and in reliance of information submitted by the developer in support thereof.

You are further advised that there were properly made submissions received with respect to this application.

Furthermore, Council is committed to and supportive of our continued involvement in the Bremer Business Park Community Reference Group.

Pursuant to the provisions of the *Integrated Planning Act 1997*, I also enclose herewith a copy of Section 4.1.27 concerning the institution of an appeal.

Yours faithfully

[redacted]

Brendan Nelson
DEVELOPMENT MANAGER

F. 3356/02 NH:KGR

Planning, Development & Environment	
Mtg Date: 22/6/04	OAR: YES
Authorisation: Gary White	
Committee to prepare letter: No	
Program No: 02	

15 June 2004

MEMORANDUM

TO: PLANNING AND DEVELOPMENT MANAGER

FROM: DEVELOPMENT MANAGER

RE: NEGOTIATED DECISION NOTICE REQUEST - CODE ASSESSMENT BREMER BUSINESS PARK
***INTEGRATED PLANNING ACT 1997* - SECTION 3.5.16**

INTRODUCTION:

This is a report by the Development Manager dated 15 June 2004 regarding a request for a negotiated decision notice for a combined development application (Appl. No. 3356/02 known as Bremer Business Park) for a preliminary approval to override the planning scheme for a material change of use and a preliminary approval for reconfiguring a lot (16 lots into 34 lots).

Appl No:	3356/02
Applicant:	Wingate Properties Pty Ltd
Real Property Description:	Lot 4 SP140694, Lot 6 SP140694, Lot 2 RP854997, Lot 1 RP22385, Lot 1 RP125443, Lot 2 RP104683, Lot 1 RP86838, Lot 1 RP22378, Lot 34 SL3911, Lot 1 RP84779, Lot 142 RP846150, Lot 4 RP92591, Lot 5 RP92591, Lot 6 RP92591, Lot 3 RP132087, Lot 13 SL2982
Property Location:	55 and 99999 Bognuda Street, 42 Brisbane Road, 242A Warrego Highway, Bundamba
Division:	4

Proposal	Development	Approval Type Requested
Development in accordance with a Plan of Development, including seven (7) Sub-Areas: Riverside Sub-Area, Highways Sub-Area, Frame Industrial and Commercial Sub-Area, Central Industry Sub-Area, Residential Sub-Area, Open Space Sub-Area, Community Centre Sub-Area and Business and Industry Buffer Sub-Area	Making a material change of use of premises	Preliminary Approval
16 lots into 34 lots	Reconfiguring of a Lot	Preliminary Approval

Date Original Decision Notice Issued: 30 April 2004

Date Received: 9 June 2004

Site Area: 315 ha (approx)

Former Planning Scheme (Note: application lodged under former scheme)

Strategic Plan Designation: Part Major Industrial and Part Urban Development

Zone: Particular Development 70 (Development in accordance with the Eastern Corridor Structure Plan)

Precinct: Part Business and Industry Minimal – Low Impact (ILI) Precinct, Part Business and Industry Medium Impact (IMI) Precinct, Part Environmental Protection (OE) Precinct, Part Residential Low Density (RL3) Precinct and Part Special Opportunity -Bundamba (SA7) Precinct

Current Planning Scheme

IPA Planning Scheme: Part Regional Business and Industry (RB2M) – Bundamba/ Riverview – Medium Impact Business and Industry Zone, Part Regional Business and Industry (RB2L) – Bundamba/ Riverview – Low Impact Business and Industry Zone, Part Regional Business and Industry Buffer Zone (RBB), Part Residential Low Density Zone and Part Large Lot Residential Zone

SUMMARY

The negotiated decision notice request relates to an application known as the Bremer Business Park proposal. Council approved the combined application for a preliminary approval for reconfiguring of a lot (16 lots into 34 lots) and a preliminary approval for a material change of use, subject to conditions, on 28 April 2004.

The later preliminary approval seeks to establish a planning framework to over-ride the Ipswich Planning Scheme to the extent of its provisions for the subsequent development of seven (7) Sub-Areas over the subject site including the Riverside Sub-Area, Highway Sub-Area, Frame Sub-Area, Core Sub-Area, Residential Sub-Area, Open Space Sub-Area and Community and Commercial Sub-Area.

Fundamentally, the preliminary approval to override the planning scheme 'calls up' all of the outcomes being sought in the correlating zones in the planning scheme as well as the assessment tables for those zones. In addition, the preliminary approval has some minor exceptions to the scheme outcomes but primarily sets up additional outcomes for the Bremer Business Park Area as a whole and each Sub-Area.

The applicant has requested negotiation in respect to the following conditions:

- Condition 11: Roadworks/Traffic;
- Condition 12: Local Area Traffic Management Scheme; and
- Condition 16: Water and Waste Water Corridors.

Additionally, the applicant has requested negotiations in respect to the following aspects of the Bremer Business Park Preliminary Approval document.

- Section 3.2: Compliance with the Bremer Business Park Area Code;
- Section 3.4: Specific Outcomes for the Bremer Business Park Area, as a whole;
- Section 6.3: Specific Outcomes for the Community and Commercial Sub-Area, as a whole;
- Section 6.4: Assessment Categories and Relevant Assessment Criteria for the Community and Commercial Sub-Area;
- Section 7.2: Overall Outcomes for the Highway Sub-Area; and
- Figure 3: Bremer Business Park Sub-Areas.

The majority of the requested negotiations are of a minor nature and are seeking clarification and/or additional flexibility in relation to the condition/requirement. Of noteworthy mention are negotiations requested in respect to the Community and Commercial Sub-Area. The applicant has requested that Figure 3 be amended to enlarge the area allocated for the Sub-Area due to site constraints (ie. topography of the land in the vicinity of the connector road between Brisbane Road and Ashburn Road). This request is considered generally acceptable.

Further, the applicant has also requested that the Community and Commercial Sub-Area be amended to 'call-up' the Specific Outcomes of the Local Retail and Commercial Zone, LC1 Sub-Area as opposed to the LC2 Sub-Area of the Ipswich Planning Scheme. This request is not considered acceptable on the basis that Map 3 Commercial and Community Centres and Business and Industry Lands of the Ipswich Planning Scheme identifies the centre in this area as a Local Neighbourhood Centre (ie LC2). Notwithstanding, it is proposed to amend the assessment categories and assessment criteria for a 'Shopping Centre' in the Community and Commercial Sub-Area to only require impact assessment if the use exceeds 4000m^2 of gross floor area (as opposed to 2000m^2) and otherwise require code assessment. Further it is also proposed not to identify a Shopping Centre greater than 2000m^2 as an inconsistent use.

In summary, it is considered that the negotiated decision notice request to amend the approval of 28 April 2004 for a preliminary approval to override the planning scheme and preliminary approval for reconfiguring of a lot (16 lots into 34 lots) is suitable for the subject site and should be approved, subject to the conditions detailed in the recommendation of this report.

Nature of Change

Condition 11 (a) (x) and (xi): Roadworks/ Traffic, Condition 12 (a) (iii) and (b): Local Area Traffic Management Scheme, Condition 16 (b): Water and Waste Water Corridors and Sections 3.2, 3.4, 6.3, 7.2 and Figure 3 of the Bremer Business Park Preliminary Approval document have been amended as indicated in *italics* and strike-through below.

A. BACKGROUND

The land has been used for pastoral production with some residential and industrial uses on parts of the site.

Recent Approvals

12 March 2003 - Council approved two (2) development applications over land at 70 Bognuda Street, Bundamba (Lot 4 on SP140694) – a material change of use

application for General Industry (Aluminium Extrusion Plant) and a reconfiguring of a lot (1 into 2 lots) application. Council approved both applications, subject to conditions, and subsequently issued a negotiated decision notice for the material change of use application on **4 April 2003**.

The reconfiguring of a lot application involved the subdivision of the 42.93 hectare site (Lot 4 on SP140694) into two (2) allotments of 16.8 hectares and 26.13 hectares in area. This then provided for a material change of use application to be made only over the new lot (16.8 hectares in area). It should be noted, the material change of use application is not related to the 26.13 hectare lot created as part of the reconfiguring of a lot application.

28 April 2004 – Council approved, subject to conditions, a combined application for a preliminary approval for reconfiguring of a lot (16 lots into 34 lots) and a preliminary approval for a material change of use (subject application).

B. EVALUATION OF PROPOSED DEVELOPMENT

The applicant requested a negotiation of the following conditions of the development permit (approved 28 April 2004).

1. Condition 11(a) (x): Roadworks/ Traffic

11. Roadworks/Traffic

(a) The developer shall provide an updated and detailed traffic study and recommendations, prepared by a RPEQ for the Bremer Business Park Area. Amongst other matters, the study shall address, but not be limited to, the following:

(x) recommendation of specific measures to be undertaken to isolate or distinctly separate all industrial traffic from residential traffic on Bognuda Street;

Applicant's Comments:

Condition 11 (a) (x) states that the developer shall provide an updated and detailed traffic study and recommendations, prepared by a RPEQ for the Bremer Business Park Area addressing specific measures to be undertaken to isolate or distinctly separate all industrial traffic from residential traffic on Bognuda Street.

The applicant has advised that where Bognuda Street leads into the residential areas in the south-western portion of Bremer Business Park area it is not possible to 'isolate or distinctly separate all industrial traffic from residential traffic'. Further, the applicant suggested that while the proposed road network and traffic control works will significantly limit industrial traffic in this part of Bognuda Street, there still will be a need for some industrial traffic movement in this part of Bognuda Street so as to facilitate access to industries to the west of the Bremer TAFE.

The applicant is seeking that the condition be modified by the addition of words such as 'to the extent that is reasonably possible having regard to the need to facilitate industrial traffic movement to industries located to the west of Bremer Business Park'.

Discussion:

The applicant's representations are generally accepted and the condition is proposed to be amended as indicated in italics below:

(x) recommendation of specific measures to be undertaken to isolate or distinctly separate all industrial traffic from residential traffic on Bognuda Street *(where practical)*;

2. <u>Condition 11 (a) (xi): Roadworks/ Traffic</u>

11. <u>Roadworks/Traffic</u>

(a) The developer shall provide an updated and detailed traffic study and recommendations, prepared by a RPEQ for the Bremer Business Park Area. Amongst other matters, the study shall address, but not be limited to, the following:

(xi) recommendation of specific measures for the construction of a new connection road between Ashburn and Brisbane Roads.

This road shall be constructed with the cross-section of an arterial road, a design speed of 80km/h and be able to cater for B-Doubles. No direct property access (except at the Capral site which has already been approved) shall be permitted.

The road is to be established prior to the commencement of any works on this portion of the Bremer Business Park Area and will access Brisbane Road through Lots 2 and 7 on RP22379. Additionally, if any land is under other private ownership, written permission for the connection shall be obtained and forwarded to Council.

Applicant's Comments:

Condition 11 (a) (xi) states that the developer shall provide an updated and detailed traffic study and recommendations, prepared by a RPEQ for the Bremer Business Park Area addressing specific measures for the construction of a new connection road between Ashburn and Brisbane Roads.

This road shall be constructed with the cross-section of an arterial road, a design speed of 80km/h and be able to cater for B-Doubles. No direct property access (except at the Capral site which has already been approved) shall be permitted.

The road is to be established prior to the commencement of any works on this portion of the Bremer Business Park Area and will access Brisbane Road through Lots 2 and 7 on RP22379. Additionally, if any land is under other private ownership, written permission for the connection shall be obtained and forwarded to Council.

The applicant has identified that the Bremer Business Park Preliminary Approval document outlines a design speed of 70km/hr while the subject condition outlines a design speed of 80km/hr. The applicant is requesting that the condition be amended to 70km/hr.

Further, the applicant is requesting that the requirement for no direct property access (except at the Capral site) to be deleted.

Discussion:

The applicant's representations are generally accepted and the condition is proposed to be amended as indicated in italics/strike-through below:

(xi) recommendation of specific measures for the construction of a new connection road between Ashburn and Brisbane Roads.

This road shall be constructed with the cross-section of an arterial road, a design speed of ~~80km/h~~ *70km/h* and be able to cater for B-Doubles. ~~No direct property access (except at the Capral site which has already been approved) shall be permitted.~~

The road is to be established prior to the commencement of any works on this portion of the Bremer Business Park Area and will access Brisbane Road through Lots 2 and 7 on RP22379. Additionally, if any land is under other private ownership, written permission for the connection shall be obtained and forwarded to Council.

3. <u>Condition 12 (a) (iii): Local Area Traffic Management Scheme</u>

12. <u>Local Area Traffic Management Scheme</u>

(a) The developer shall implement an integrated local area traffic management (LATM) scheme in the existing residential areas to the south and south-west of the Bremer Business Park Area, as follows:

(iii) Initial design guidelines (to be finalised after public consultation) for the LATM scheme are:

- *the southern approach from the Bremer Business Park (just after the proposed roundabout at the intersection of the new east-west internal road and the realigned Bognuda Street – refer item 6(b) above);*
- *Byrne Street (north of Vale Street); and*
- *Vale Street (east of Byrne Street).*

Applicant's Comments:

The condition makes a reference 'refer item 6(b) above'. The applicant has identified that the reference is incorrect and has requested that the reference be amended or deleted.

Discussion:

The applicant's representations are generally accepted (ie. the reference is no longer relevant) and the condition is proposed to be amended as indicated in strike-through below:

- the southern approach from the Bremer Business Park (just after the proposed roundabout at the intersection of the new east-west internal road and the realigned Bognuda Street ~~– refer item 6(b) above~~);

4. <u>Condition 12 (b): Local Area Traffic Management Scheme</u>

12. *Local Area Traffic Management Scheme*

(b) *The LATM scheme shall be fully completed within one (1) year from the date of approval of this development application;*

Applicant's Comments:

Condition 12 (b) requires that the LATM scheme shall be fully completed within one (1) year from the date of approval of this development application. The applicant is requesting that the condition be amended to allow the LATM scheme to be fully completed within two (2) years from the date of approval.

Discussion:
The applicant's representations are generally accepted and the condition is proposed to be amended as indicated in italics/strike-through below:

(b) The LATM scheme shall be fully completed within ~~one (1) year~~ *two (2) years* from the date of approval of this development application;

5. Condition 16 (b): Water and Waste Water Corridors

16. *Water and Wastewater Corridors*

(a) *The corridors will vary in width depending on the infrastructure that is to be constructed within them. The corridors are to have a minimum width of 20 metres and are expected to have an average width of 25 metres.*

Applicant's Comments:

Condition 16 (b) outlines that the corridors will vary in width depending on the infrastructure that is to be constructed within them. Further, the condition requires that the corridors are to have a minimum width of 20 metres and are expected to have an average width of 25 metres. The applicant is requesting that the condition be amended to allow some discretion in relation to the minimum width of 20 metres for the corridors and suggests that the words 'or as considered reasonable by the Assessment Manager' be included in the condition.

Discussion:

The applicant's representations are generally accepted and the condition is proposed to be amended as indicated in italics below:

(b) The corridors will vary in width depending on the infrastructure that is to be constructed within them. The corridors are to have a minimum width of 20 metres and are expected to have an average width of 25 metres, *unless otherwise approved by the Development Manager.*

6. Bremer Business Park Preliminary Approval: Section 3.2: Compliance with the Bremer Business Park Area Code

Applicant's Comments:

Section 3.2 of the Bremer Business Park Preliminary Approval document states:

3.2 Compliance with Bremer Business Park Area Code

Development that in the local government's opinion, is consistent with specific outcomes for the Bremer Business Park Area, as a whole and the specific outcomes for the relevant sub-area, complies with the Bremer Business Park Area Code.

The applicant has suggested that 'local government's opinion' should be replaced with 'assessment manager's opinion'.

Discussion:

The applicant's representations are generally accepted and the Bremer Business Park Preliminary Approval document is proposed to be amended as indicated in italics below:

3.3 Compliance with Bremer Business Park Area Code

Development that in the ~~local government's~~ *assessment manager's* opinion, is consistent with specific outcomes for the Bremer Business Park Area, as a whole and the specific outcomes for the relevant sub-area, complies with the Bremer Business Park Area Code.

7. <u>Bremer Business Park Preliminary Approval: Section 3.4: Specific Outcomes for the Bremer Business Park Area, as a whole (Environmental Sustainability - Specific Outcomes)</u>

Applicant's Comments:

Section 3.4 of the Bremer Business Park Preliminary Approval document states:

Environmental Sustainability - Specific Outcomes

(a) Bremer Business Park Area achieves sustained economic growth, good design and ecological sustainability, through -

- *the development of appropriately located transport orientated activities such as warehousing, distribution, and wholesaling;*
- *the creation of a connection road between the Warrego Highway and the Cunningham Highway along the eastern boundary of the Bremer Business Park Area that provides an opportunity to locate businesses that desire higher levels of access;*

The applicant has requested that 'manufacturing' be added to the uses that are mentioned and that the reference to the creation of a connection road between the Warrego Highway and the Cunningham Highway along the eastern boundary of the Bremer Business Park area should be amended so that it is not an absolute statement.

Discussion:

The applicant's representations are generally accepted and the Bremer Business Park Preliminary Approval document is proposed to be amended as indicated in italics below:

Environmental Sustainability - Specific Outcomes

(b) Bremer Business Park Area achieves sustained economic growth, good design and ecological sustainability, through -

- the development of appropriately located transport orientated activities such as warehousing, distribution, and wholesaling *which are supported by co-located manufacturing businesses and industries*;

- the *possible* creation of a connection road between the Warrego Highway and the Cunningham Highway along the eastern boundary of the Bremer Business Park Area that provides an opportunity to locate businesses that desire higher levels of access;

8. <u>Bremer Business Park Preliminary Approval: Section 3.4: Specific Outcomes for the Bremer Business Park Area, as a whole (Transport and Access - Specific Outcomes) (c)</u>

Applicant's Comments:

Section 3.4 of the Bremer Business Park Preliminary Approval document states:

Transport and Access - Specific Outcomes

(c) The Bremer Business Park Area has a road network and hierarchy that accommodates heavy vehicles, refer to Figure 6. The road network includes the following features –

- *a Brisbane Road to Ashburn Road connection road located, designed and constructed to feature the following –*
  - *70 km/h design speed;*
  - *30 metre road reserve;*
  - *19 metre pavement (consisting of 2 x 3.5m through lanes, 2 x 4.0m parking/cycle lanes and 1 x 4.0m central two-way right-turn lane);*
  - *2 x 5.5m verges (minimum) consisting of a 1.5m footpath on the eastern side and 2.5m shared path on the western side;*
  - *efficient and safe movement of all forms of heavy vehicles including B-Doubles and those with a Higher Mass Limit. This includes appropriate intersection treatments;*

The applicant has outlined that the initial portion of Brisbane Road to Ashburn Road connection has been constructed as part of the Capral Aluminium Extrusion Plant with a 14 wide pavement. As such, the applicant is requesting that the abovementioned requirements be amended to allow the continuation of the new road to be 14 metres wide to the proposed roundabout linking the road to the east-west connector road to Bognuda Street and then be 19 metre wide pavement for the remaining section to Brisbane Road.

Discussion:

As part of the Capral proposal, Council required the developer to construct and dedicate a 22 metre road reserve with a 14 metre pavement and two 4 metre verges. On this basis, it is considered reasonable to transition the pavement width from the already constructed 14 metres to the required 19 metres. Notwithstanding, it is proposed for this to occur as far north as practical (ie. at the end of the constructed pavement and not at the proposed roundabout). It is also considered appropriate to

reduce the required verge width from 5.5 metres to 4 metres to allow the road alignment of the western side (ie. Capral frontage) to remain as constructed. Further, at the time that land is developed on the eastern side of the road with the 14 metre pavement, road widening works would be conditioned to achieve the ultimate design. As such, the Bremer Business Park Preliminary Approval document is proposed to be amended as indicated in italics below:

(c) The Bremer Business Park Area has a road network and hierarchy that accommodates heavy vehicles, refer to Figure 6. The road network includes the following features –

- a Brisbane Road to Ashburn Road connection road located, designed and constructed to feature the following –
  - 70 km/h design speed;
  - ~~30~~ *27* metre road reserve;
  - 19 metre pavement (consisting of 2 x 3.5m through lanes, 2 x 4.0m parking/cycle lanes and 1 x 4.0m central two-way right-turn lane);
  - 2 x ~~5.5m~~ *4m* verges (minimum) consisting of a 1.5m footpath on the eastern side and 2.5m shared path on the western side;
  - efficient and safe movement of all forms of heavy vehicles including B-Doubles and those with a Higher Mass Limit. This includes appropriate intersection treatments;

Note: The portion of this road that has been constructed for the frontage of the Capral proposal is required to be constructed to the abovementioned standard at such time as the land to the east of the constructed road develops.

9. <u>Bremer Business Park Preliminary Approval: Section 3.4: Specific Outcomes for the Bremer Business Park Area, as a whole (Signage - Specific Outcomes)</u>

Applicant's Comments:

Section 3.4 of the Bremer Business Park Preliminary Approval document states:

Signage - Specific Outcomes

(a) All signage within the Bremer Business Park Area does not detract from the overall setting. This is achieved by-

- *compliance with the Advertising Devices Code, as contained in Division 14 of Part 12 of the Ipswich Planning Scheme;*
- *minimising signage along the Warrego Highway, Brisbane Road, the railway line and other major thoroughfares and circulation roads;*
- *locating an entry sign to the Bremer Business Park Area at either an entry roundabout or central median;*
- *integrating all business signage into the design of the buildings or locating it within the landscape buffer at the front boundary; and*
- *preparing a signage master plan that reinforces the intent and character of the Bremer Business Park Area. The masterplan should address the elements of architecture, public realms and entry statements.*

Refer to photos in Figure 11 for examples of acceptable solutions.

The applicant has advised that it is accepted that signage should be minimised along the Warrego Highway, Brisbane Road, the railway line and other major thoroughfares and circulation roads, however has requested that the abovementioned outcomes acknowledge that major signs identifying the overall Bremer Business Park Estate will be encouraged at appropriate locations to the satisfaction of the Assessment Manager.

Discussion:

It is considered appropriate to incorporate further flexibility in terms of the location of signage. As such, the Bremer Business Park Preliminary Approval document is proposed to be amended as indicated in italics below:

- locating an entry sign to the Bremer Business Park Area at either an entry roundabout or central median *or as otherwise approved by the Development Manager*;

10. <u>Bremer Business Park Preliminary Approval: Section 6.3: Specific Outcomes for the Community and Commercial Sub-Area, as a whole and Section 6.4 Assessment Categories and Relevant Assessment Criteria for the Community and Commercial Sub-Area</u>

Applicant's Comments:

Section 6.3 and 6.4 of the Bremer Business Park Preliminary Approval document states:

6.3 Specific Outcomes for the Community and Commercial Sub-Area, as a whole

Uses and works in the Community and Commercial Sub-Area are to comply with the Specific Outcomes of the Local Retail and Commercial Zone, LC2 Sub-Area, as per Division 10, Part 4 of the Ipswich Planning Scheme.

6.4 Assessment Categories and Relevant Assessment Criteria for the Community and Commercial Sub-Area

The assessment categories and assessment criteria as set out in Tables 4.10.1 and 4.10.2 of the Local Retail and Commercial Zone (LC2) Sub-Area of the Ipswich Planning Scheme apply to the Bremer Business Park – Community and Commercial Sub-Area;

The Bremer Business Park Area Code and the Community and Commercial Sub-Area Code also apply as relevant assessment criteria.

The applicant is requesting that the Bremer Business Park Preliminary Approval document be amended to require that uses and works in the Community and Commercial Sub-Area, comply with the Specific Outcomes of the Local Retail and Commercial Zone, LC1 Sub-Area. The applicant has advised that there will be ultimately about 5,000 people employed within Bremer Business Park. This employment population, when combined with the immediately surrounding suburbs or Dinmore, Ebbw Vale and Bundamba will warrant the development of a range of community and commercial facilities.

Discussion:

The applicant's representations are not considered to entirely acceptable on the basis that Map 3 Commercial and Community Centres and Business and Industry Lands of the Ipswich Planning Scheme identifies the centre in this area as a Local Neighbourhood Centre (ie LC2).

Notwithstanding, it is proposed to amend the assessment categories and assessment criteria as set out in Tables 4.10.1 of the Local Retail and Commercial Zone (LC2) Sub-Area of the Ipswich Planning Scheme in respect to 'Shopping Centre'. It is proposed to require impact assessment if the use exceeds 4000m^2 of gross floor area (as opposed to 2000m^2) and otherwise require code assessment. Further it is proposed to identify a Shopping Centre greater than 6000m^2 as an inconsistent use (as opposed to greater than 2000m^2).

11. Bremer Business Park Preliminary Approval: Section 7.2: Overall Outcomes for the Highway Sub-Area

Applicant's Comments:

Section 7.2 of the Bremer Business Park Preliminary Approval document states:

Overall Vision

The Highway Sub-Area provides a transition from the highly intensive industrial character of the Core Sub-Area to the Warrego Highway. The Sub-Area primarily consists of light industry and commercial activities, such as highway service centres, commercial premises for corporate headquarters and storage, and distribution facilities that rely on and maximise the benefits of their accessibility to the Warrego Highway.

The applicant has requested that the overall vision be amended to acknowledge that encouragement will be given to the wholesaling and retailing of on-site manufactured goods where the wholesale and retail area, within the premises, will not exceed 50% of the total floor area of the premises. The applicant has advised that this form of activity will be ideally suited to this sub-area given its unique position adjacent to the Warrego Highway.

Further, the applicant has requested that Table 6.1 be amended to include this form of use as an exempt and/or code assessable use.

Discussion:

It is considered appropriate to incorporate the wholesale and retail of on-site manufactured goods, within the premises. Notwithstanding, this would only be encouraged as a minor component of the use. As such, the Bremer Business Park Preliminary Approval document is proposed to be amended as indicated in italics below:

Overall Vision

The Highway Sub-Area provides a transition from the highly intensive industrial character of the Core Sub-Area to the Warrego Highway. The Sub-Area primarily

consists of light industry and commercial activities, such as highway service centres, commercial premises for corporate headquarters and storage, and distribution facilities that rely on and maximise the benefits of their accessibility to the Warrego Highway. *The wholesaling and retailing of on-site manufactured goods within buildings is encouraged, where the wholesale and/ or retail component of the use is minor and ancillary to the principle use of on-site manufacturing.*

It is not considered necessary to amend Table 6.1, where the use is only a minor component it would be considered ancillary to the primary use.

12. **Bremer Business Park Preliminary Approval: Figure 3: Bremer Business Park Sub-Areas**

Applicant's Comments:

The applicant has requested that Figure 3: Bremer Business Park Sub-Areas be amended by enlarging the Community and Commercial Sub-Area. The applicant has advised that due to the topography of the land in the vicinity of the connector road between Brisbane Road and Ashburn Road, it will be necessary to designate a larger area than originally identified.

Discussion:

The applicant's representations have been considered. The applicant's representations request a 100% increase in the area allocated for the Community and Commercial Sub-Area. This is considered to be excessive in light of current planning. It is proposed to permit approximately a 50% increase in the area. This is considered acceptable based on the assessment categories and assessment criteria outlined above.

RECOMMENDATION

A. That the Developer be advised that the request to negotiate Development Application No. 3356/02, as detailed in Decision Notice dated 30 April 2004 (approved 28 April 2004) is determined as follows:

Nature of Change: Condition 11 (a) (x) and (xi): Roadworks/ Traffic, Condition 12 (a) (iii) and (b): Local Area Traffic Management Scheme, Condition 16 (b): Water and Waste Water Corridors and Sections 3.2, 3.4, 6.3, 7.2 and Figure 3 of the Bremer Business Park Preliminary Approval document have been amended as indicated in *italics* and strike-through below.

Approval Details:

Proposal	Development	Decision	Approval Type
Development in accordance with a Plan of Development, including seven (7) Sub-Areas: Riverside Sub-Area, Highways Sub-Area, Frame Industrial and Commercial Sub-Area, Central Industry Sub-Area, Residential Sub-Area, Open Space Sub-Area, Community Centre Sub-Area and Business and Industry Buffer Sub-Area	Making a material change of use of premises	Approved	Preliminary Approval
16 lots into 34 lots	Reconfiguring of a Lot	Approved	Preliminary Approval

Further Development Permits Required

Further Development Permits, as required by the *Integrated Planning Act 1997,* shall be obtained in respect of any Operational Works in relation to this approval before any such works are commenced.

Preliminary Approval for Material Change of Use of Premises – Bremer Business Park Preliminary Approval

1. Site Development

The proposed development of the Bremer Business Park Area shall be undertaken in accordance with the Bremer Business Park Preliminary Approval (see Attachment A).

2. Self-Assessable Development

The developer is required to notify Council in writing of the commencement of any self-assessable use to be undertaken in accordance with the Bremer Business Park Preliminary Approval.

3. Code Assessable Development

Any code assessable development to be undertaken in accordance with the Bremer Business Park Preliminary Approval shall demonstrate compliance with the Bremer Business Park Preliminary Approval, relevant assessment criteria and Planning Scheme Policies contained within the Ipswich Planning Scheme unless specified otherwise in the Bremer Business Park Preliminary Approval.

4. Contributions

(a) The developer shall establish a 'serviced' headworks contribution credit for the land included in the Core Sub-Area, Frame Sub-Area, Highway Sub-Area, Riverside Sub-Area and Community and Commercial Sub-Area under the Bremer Business

Park Preliminary Approval. To this end, the developer shall pay headworks contributions for the Core Sub-Area, Frame Sub-Area, Highway Sub-Area and Riverside Sub-Area at the level of 22.5 equivalent persons (ep) per hectare for water supply and sewerage and 46.5 equivalent persons (ep) per hectare for roadworks and for the Community and Commercial Sub-Area at the level of 22.5 equivalent persons (ep) per hectare for water supply and sewerage and 133 equivalent persons (ep) per hectare for roadworks; and

NB: These contributions established a minimum deemed credit for the land included in the abovementioned Sub-Areas. Where establishing/commencing uses and/or works create a demand greater than the deemed credit, further contributions may be applicable in accordance with the relevant Council Policies.

(b) The developer shall pay a recycled water infrastructure and streetscape contributions (where applicable); and

(c) The developer shall pay contributions towards the provision of water, sewerage, roadworks, social amenity and open space (parks) headworks for the land included in the Residential Sub-Area in accordance with the relevant Council Policies prior to the issuing of a Development Permit for Building works and/or prior to the issuing of a Development Permit for Reconfiguring a Lot and/or prior to the issuing of a Development Permit for a Material Change of Use (Code or Impact or Self-Assessable (if applicable)); and

The contributions must be paid at the rates applicable at the time of payment. Payment is required prior to the issuing of a Development Permit for Building Works and/or prior to the issuing of a Development Permit for Reconfiguring a Lot and/or as per conditions of a further Development Permit for a Material Change of Use (Code or Impact or Self-Assessable (if applicable)); or

(d) The developer may seek an alternative agreement in respect to water supply and sewerage infrastructure contributions. The agreement shall be prepared and approved by Council prior to the issuing of a Development Permit for Building Works and/or prior to the issuing of a Development Permit for Reconfiguring a Lot and/or prior to the issuing of a Development Permit for a Material Change of Use (Code or Impact or Self-Assessable (if applicable)).

5. Hours of Construction

Unless otherwise approved in writing by the Development Manager hours of construction shall be:

Monday to Saturday 6.30 a.m. to 6.30 p.m.

Work or business shall not be conducted from or on the premises outside the above hours or on Sundays or public holidays.

6. Road Naming Plan

The developer shall submit to and for approval by Council a list of names and name meanings for each new road to be opened. The proposed names shall be submitted to Council as part of any further application for a development permit for reconfiguring of a lot over the land.

7. Locality References

(a) Any place name or estate name used by the developer (excluding a reference to a building, structure or the like and excluding minor, subsidiary signage within a development) shall make reference to the relevant, approved place name under the *Place Names Act 1994*.

(b) Any reference to the regional location of the site or the development shall not refer to the place or estate as being located in Brisbane or a Brisbane suburb or in the metropolitan area or in the western suburbs (excluding the western suburbs of Ipswich as determined by Council in writing from time to time).

8. Cultural Heritage Identification

(a) The developer shall prepare a schedule of places/locations or structures of cultural heritage significance within the Bremer Business Park Area for identification. This list is to be approved by the Development Manager and such identified places/locations or structures are to be acknowledged on the specific site through the installation of appropriately located and detailed interpretive works and signage describing the history and cultural significance of relevant item/s.

(b) The developer is to engage an appropriately qualified person to photograph and document (with measured drawings) the places/locations or structures in their existing condition, all items that are proposed to be demolished, removed or adaptively reused.

Four (4) copies of a report, including photographs and documentation shall be submitted to the Development Manager for approval. Once approved, two (2) copies of the report shall be held by the Planning and Development Department with the other two (2) copies being forwarded to the Ipswich City Council Library and John Oxley Library.

(c) Such work shall be completed prior to the issuing of a Development Permit for Building Works and/or prior to the issuing of a Development Permit for Reconfiguring a Lot and/or as per conditions of a further Development Permit for a Material Change of Use (Code or Impact or Self-Assessable (if applicable)).

9. Engineering Requirements

The following engineering requirements, detailed in Conditions 10 – 18, shall be completed to the satisfaction of the Senior Development Engineer and in accordance with Council's Planning Scheme Policy 3 – General Workis..

10. Mining

(a) The developer shall prepare a detailed mining and geological assessment and recommendations report for those areas of the Bremer Business Park Area where there is evidence of previous mining activity or mining influence.

(b) The proposed development shall be designed and constructed in accordance with the approved recommendations as outlined in the geotechnical report and any required amendments.

(c) Prior to the approval of any application for building works, the Developer shall submit to Council a Structural Engineer's Certificate certifying that the proposed structures have been designed in accordance with the abovementioned geotechnical report(s).

(d) The developer shall prepare and register a Covenant with the Register of Titles for each of the affected lots as identified in the abovementioned report, prior to the issuing of a Development Permit for Building Works and/or prior to the issuing of a Development Permit for Reconfiguring a Lot and/or as per conditions of a further Development Permit for a Material Change of Use (Code or Impact or Self-Assessable (if applicable)). The covenant shall be to the satisfaction of the Development Manager and advise that:

(i) All building structures shall be designed and constructed in accordance with the recommendations as outlined in the geotechnical report;

(ii) Any application for Building Works shall be accompanied by a Structural Engineer's Certificate certifying that the proposed structures have been designed in accordance with the abovementioned geotechnical reports.

(e) The Developer shall pay all costs concerning the preparation and execution of the covenant and any registration fees and duty (if any).

11. Roadworks/Traffic

(a) The developer shall provide an updated and detailed traffic study and recommendations, prepared by a RPEQ for the Bremer Business Park Area. Amongst other matters, the study shall address, but not be limited to, the following:

(i) a review of the traffic generated by the Bremer Business Park Area;

(ii) road hierarchy for the Bremer Business Park Area, including connection points to the external road network;

(iii) generalised land use;

(iv) public transport needs;

(v) staging and timing of the proposed works;

(vi) effects on existing road networks;

(vii) recommendation of specific measures to be undertaken to improve the alignment, sight distances, and signage of all roads which will result in safe movements of light and heavy vehicles, and reduce delays and queuing distances, including the connectivity of all transport systems available to the regions north and south of the Warrego Highway.

The access to the area on the northern side of the Warrego Highway is to be established prior to the commencement of any works on this portion of the Bremer Business Park Area and will be either via a service road connecting the northern round-a-bout at the River Road fly-over to the Warrego Highway, together with the necessary upgrading of the on and off-ramps to the Warrego Highway and with the necessary upgrades to the River Road bridge, both round-a-bouts, and Ashburn Road

near the fly-over. Alternatively, this access may be achieved via a new fly-over over the Warrego Highway as an extension of Bognuda Street, together with the necessary accompanying on and off-ramps to the Warrego Highway.

It should be noted that both option for this northern connection require the approval of the Department of Main Roads and Council. Additionally, if any land is under other private ownership, written permission for the connection shall be obtained and forwarded to Council.

(viii) recommendation of specific measures to be undertaken to upgrade Bognuda, Ashburn, Carberry and Bird Streets in terms of pavement widths and quality footpaths and stormwater management. It is noted that the developer has made specific commitments to the community in respect to the provision of works in Bird Street. To this end, the developer shall provide kerb and channel on both sides of Bird Street and drainage works and pavement infill as determined necessary by the Senior Development Engineer;

(ix) recommendation of specific measures to be undertaken to define and improve the intersections of and to Brisbane Road, River Road and Ashburn Road and Warrego Highway;

(x) recommendation of specific measures to be undertaken to isolate or distinctly separate all industrial traffic from residential traffic on Bognuda Street *(where practical)*;

(xi) recommendation of specific measures for the construction of a new connection road between Ashburn and Brisbane Roads.

This road shall be constructed with the cross-section of an arterial road, a design speed of ~~80km/h~~ *70km/h* and be able to cater for B-Doubles. ~~No direct property access (except at the Capral site which has already been approved) shall be permitted~~.

The road is to be established prior to the commencement of any works on this portion of the Bremer Business Park Area and will access Brisbane Road through Lots 2 and 7 on RP22379. Additionally, if any land is under other private ownership, written permission for the connection shall be obtained and forwarded to Council.

(b) The study shall be submitted to and approved by the Development Manager prior to the issuing of a Development Permit for Building Works and/or prior to the issuing of a Development Permit for Reconfiguring a Lot and/or Development Permit for a Material Change of Use (Code or Impact or Self-Assessable (if applicable)).

The Developer shall undertake any works deemed necessary by the Senior Development Engineer, to comply with the requirements of the traffic study.

12. <u>Local Area Traffic Management Scheme</u>

(a) The developer shall implement an integrated local area traffic management (LATM) scheme in the existing residential areas to the south and south-west of the Bremer Business Park Area, as follows:

(i) The LATM scheme shall be designed in accordance with the requirements of Council and approved by the Works Manager prior to the issuing of a Development Permit for Building Works and/or prior to the issuing of a Development Permit for Reconfiguring a Lot and/or Development Permit for a Material Change of Use (Code or Impact or Self-Assessable (if applicable));

(ii) The LATM scheme shall include a comprehensive public consultation component in which the developer must prepare and submit a communication plan for approval by the Works Manager prior to the issuing of a Development Permit for Building Works and/or prior to the issuing of a Development Permit for Reconfiguring a Lot and/or Development Permit for a Material Change of Use (Code or Impact or Self-Assessable (if applicable));

(iii) Initial design guidelines (to be finalised after public consultation) for the LATM scheme are:

- Direction signs on Brisbane Road, Jacaranda Street and Wattle Street to advise motorists (particularly heavy vehicle drivers) of alternative routes to Bremer Business Park. The type, size, layout and location of the direction signs requires approval from Council before implementation;

- Traffic control devices on Bryne Street (south of Law Street), Bognuda Street (north & south of Law Street) and Vale Street (east of Bognuda Street). These devices are to be either or a combination of angled slow points, deflected T-intersection devices or speed platforms. They shall be spaced at appropriate intervals so as to achieve a 50km/h speed environment and designed to provide adequate deflection for general traffic but still be able to accommodate buses and other large vehicles;

- Roundabouts at the intersections of:

  - Law Street - Byrne Street;
  - Bognuda Street - Law Street; and
  - Boundary Street - Bognuda Street - proposed Residential Access Street.

  Adequate design and approach widening will be required at these roundabouts in order to accommodate turning vehicles, including turning articulated vehicles that are required to use the Law Street - Byrne Street and Bognuda Street - Law Street intersections from time to time. The central roundabout islands may need to be fully mountable, however the approach splitter islands should be of semi-mountable kerb and accommodate appropriate signage to provide sufficient prominence and control vehicle movements;

- Entry thresholds (consisting of kerb build-outs, central islands and raised & coloured pavement treatments) to signify entry to the residential area at:

- the southern approach from the Bremer Business Park (just after the proposed roundabout at the intersection of the new east-west internal road and the realigned Bognuda Street ~~– refer item 6(b) above~~);
  - Byrne Street (north of Vale Street); and
  - Vale Street (east of Byrne Street).

- The closure of Bognuda Street in the vicinity of 44 Bognuda Street (Lot 1 on RP102431);

(b) The LATM scheme shall be fully completed within ~~one (1) year~~ *two (2) years* from the date of approval of this development application;

(c) Council may by agreement extend the period by which the LATM scheme has to be completed; and

(d) Design and construction of this LATM scheme shall be at no cost to Council;

(e) In lieu of (a) to (d) above (ie. implementation of the LATM scheme), the developer may:

(i) Design and construct a roundabout at the intersection of Boundary Street, Bognuda Street and the proposed Residential Access Street in accordance with Council requirements; and

(ii) Provide Council a monetary contribution of $600,000 (equal to the value of the consultation, planning, design and construction of the LATM scheme outlined (a) to (d) above).

This contribution shall be applicable for a period of twelve months and thereafter shall be calculated from the date of development approval to the date when payment is made in accordance with the CPI.

13. Sewerage

(a) The developer shall submit a sewerage planning report to and for approval by the Ipswich Water Manager. The scope of the report should be determined in consultation with Ipswich Water. The report shall address, but not be limited to, the sewerage works required to service the Bremer Business Park Area, the timing of infrastructure and the impacts the proposed Bremer Business Park Area has on the existing (including the Bundamba Wastewater Centre) and planned infrastructure of Council.

(b) This sewerage planning report shall be submitted prior to the issuing of a Development Permit for Building Works and/or prior to the issuing of a Development Permit for Reconfiguring a Lot and/or Development Permit for a Material Change of Use (Code or Impact or Self-Assessable (if applicable)).

(c) The developer shall review and update, if necessary, the report as determined by Council. Council may request the developer to review and update the report where the assumptions used in the report vary from what is being proposed by the developer. This may occur where the anticipated demands or timing of development have been amended/altered.

(d) The developer shall undertake all works identified within the approved report. This includes all aspects of the works including, but not limited to, the design, construction, supervision, land acquisition, testing, survey and preparation of as-constructed drawings.

14. Non-Potable Water (Recycled Sewage Effluent)

(a) The developer shall provide a recycled water reticulation system in the Bremer Business Park Area in accordance with Council's requirements. Such a system may include a trunk main for the conveyance of the processed sewage effluent from the

Bundamba Sewage Treatment Plant. The sizing of the main is to be established by an RPEQ in conjunction with discussions and projected demands anticipated by Ipswich Water;

(b) The Developer shall make provision for a recycled water main on both sides of each applicable road. An approved route for the location of the trunk water, sewage and recycled water mains is to be established prior to the issuing of a Development Permit for Building Works and/or prior to the issuing of a Development Permit for Reconfiguring a Lot and/or Development Permit for a Material Change of Use (Code or Impact or Self-Assessable (if applicable)).

15. Water

(a) The developer shall submit a water supply planning report to and for approval by the Ipswich Water Manager. The scope of the report shall be determined in consultation with Ipswich Water. The report shall address, but not be limited to, the water supply works required to service the Bremer Business Park Area, the timing of infrastructure and the impacts the proposed development has on the existing and planned infrastructure of Council.

(b) The report shall be approved by the Ipswich Water Manager prior to the issuing of a Development Permit for Building Works and/or prior to the issuing of a Development Permit for Reconfiguring a Lot and/or Development Permit for a Material Change of Use (Code or Impact or Self-Assessable (if applicable)).

(c) The developer shall review and update, if necessary, the report as determined by Council. This may be as a result of the development amending/altering anticipated demands or timing.

(d) The developer shall undertake all works identified within the approved report. This includes all aspects of the works including, but not limited to, the design, construction, supervision, land acquisition, testing, survey and preparation of as-constructed drawings.

(e) The developer shall provide water mains on both sides of each applicable road, unless otherwise agreed to by Ipswich Water.

(f) The developer shall construct a new water main in the Bremer Business Park Area to replace the existing 500mm central trunk water main located between River Road and Bognuda Street. The developer shall contact Council to determine its requirements. The developer will be advised by Council as to, but not limited to, the extent of works that needs to be undertaken on the existing main (whether the main needs to be removed or the existing easement/s relinquished), the timing of the works (new main has to be constructed before the existing main has been taken off line), the alignment of the new main (open space, water and wastewater corridor) and the size of the main.

(g) The developer shall contact Council prior to the issuing of a Development Permit for Building Works and/or prior to the issuing of a Development Permit for Reconfiguring a Lot and/or Development Permit for a Material Change of Use (Code or Impact or Self-Assessable (if applicable)) to determine if Council has any requirements in respect to the works that will be carried out within or in vicinity of the water and wastewater corridors. Council may request that the developer undertake works to ensure the water and wastewater pipelines that are proposed

within the corridor are not adversely impacted by the developer's proposed works. The developer shall incorporate Council's requirements. Any works requested by Council shall be undertaken at the expense of Council. Council would be responsible for the full costs of the main crossings.

16. Water and Wastewater Corridors

(b) The developer shall provide water and wastewater purpose corridors through the Bremer Business Park Area on the alignments generally indicated in the Bremer Business Park Preliminary Approval.

(c) The corridors will vary in width depending on the infrastructure that is to be constructed within them. The corridors are to have a minimum width of 20 metres and are expected to have an average width of 25 metres, *unless otherwise approved by the Development Manager*.

(d) The developer shall locate the corridors in open space, verge widths and in front setbacks of private properties, in this order. If required, the developer shall amend the proposed layout to ensure that this is achieved, unless otherwise approved by Council.

(e) The developer shall provide an easement in favour of Council for water and wastewater purposes where the corridors are located in private property.

(f) The developer shall provide an access easement in favour of Council to the water and wastewater easement where no direct frontage is available to any public areas.

(g) The developer shall contact Council prior to undertaking any works within the designated corridors to ascertain Council's requirements. This includes works relating to fencing, landscaping and driveways.

17. Road Reserves – Service Alignments

The developer shall provide a plan detailing the road reserve widths required within the Bremer Business Park Area. This plan should detail the services to be contained within each road reserve, their alignments and expected time for construction. The plan should provide adequate cross sections, with details of the existing infrastructure, for Council to determine if the road reserves proposed are sufficient.

18. Stormwater

(a) The developer shall provide all necessary stormwater drainage (both internal and external to the development) and such drainage works (except for roofwater systems) shall be designed and constructed in accordance with QUDM such that the overall drainage system caters for a storm event with an ARI of 100 years.

Overland flow paths shall be suitably designed to cater for the water from a storm event with an ARI of 100 years. In the case where the piped system is carrying part of the flow, the overland flow paths shall be designed to cater for that volume which is represented by the difference between the predicted volume from the storm event with an ARI of 100 years and the capacity of the pipe system, noting the requirements of QUDM.

(b) All stormwater flows within and adjacent to the Bremer Business Park Area, other than inter-allotment drainage, shall be confined to dedicated roads, drainage reserves, registered drainage easements or within parkland. The registered drainage easements, if related to piped drainage, shall be centrally located over such underground pipe system and shall be not less than 4.0 m wide, except for drainage easements required for side boundaries which may be 3.0 m wide where approved by the Senior Development Engineer. In addition, the easements shall be of suitable width to contain the predicted overland flow from the storm event with an ARI of 100 years in that location.

(c) No ponding or redirection of stormwater shall occur onto adjoining land unless specifically approved by Council in consultation with the owner of the adjoining land.

(d) Due consideration shall be given in these and future designs and construction of the development in relation to the effect of the developed catchment flows on the downstream discharge receival areas. Suitable stormwater control devices are to be provided to ensure that there is no increase in flows in watercourses. Such control devices are to be designed so as to integrate the landscaping, recreational, infrastructural and drainage roles of watercourses.

(e) Each proposed residential, commercial and/or industrial allotment shall be designed to comply with QUDM, Council's standards and the New Ipswich City Planning Scheme, including unimpeded access to a road system which is also above the design flood level.

(f) There shall be no filling or removal of material in the flood area below the flood level associated with an ARI of 100 years without the approval of the Senior Development Engineer. There shall be minimal disturbance to vegetation in the flood area, unless prior written approval is obtained from Council.

(h) Filling in proposed Lots, which are adjacent to the watercourse shown on the proposal plan, shall not be undertaken without the written approval of Council.

19. Health and Environmental Protection Requirements

Conditions 20 – 21, unless otherwise stated, shall be completed to the satisfaction of the Chief Environmental Health Officer.

20. Contaminated Land

The developer shall ensure all land to be dedicated to Council is not listed on either the Contaminated Land Register or the Environmental Management Register prior to dedication. In this regard the developer shall be responsible for all works associated with the removal of any land to be dedicated to Council from these registers. The developer shall provide details to Council demonstrating that the requirements of this condition have been met prior to the issuing of a Development Permit for Building Works and/or prior to the issuing of a Development Permit for Reconfiguring a Lot and/or Development Permit for a Material Change of Use (Code or Impact or Self-Assessable (if applicable)).

21. Stormwater Quality

The developer shall submit to and receive approval from the Health and Environmental Protection Manager for a Master Stormwater Quality Management Plan for the Bremer Business Park Area (the Master SQMP) prior to the issuing of a Development Permit for Building Works and/or prior to the issuing of a Development Permit for Reconfiguring a Lot and/or Development Permit for a Material Change of Use (Code or Impact or Self-Assessable (if applicable)). A suitably qualified and experienced professional must prepare the Master SQMP. The Master SQMP must:

(i) Provide a management approach that ensures:

- Stormwater quality management measures for the Bremer Business Park Area consist of physical treatment measures to ensure that the stormwater discharged from a land use type complies with the pollutant levels identified in Table 1 below;

- Stormwater quality management measures for residential areas and roads consist of physical treatment measures to ensure that the stormwater discharged from these areas comply with the pollutant levels identified in Table 1 below;

- The matters of water sensitive urban design (WSUD), stormwater management and stormwater quality will be addressed throughout the Bremer Business Park Area in an integrated approach, and

- A refined Conceptual Design Stormwater Quality Management Plan (the Conceptual Design SQMP) is supplied for each development site prior to the issuing of a Development Permit for Building Works and/or prior to the issuing of a Development Permit for Reconfiguring a Lot and/or Development Permit for a Material Change of Use (Code or Impact or Self-Assessable (if applicable)) and then a Detailed Design Stormwater Quality Management Plan (the Detailed Design SQMP) is supplied for each development site prior to the issuing of a Development Permit for Operational Works.

(ii) Demonstrate, through appropriate pollutant export modelling (eg AQUALM or MUSIC), that the pollutant levels in the stormwater discharged from the Bremer Business Park Area comply with the pollutant levels identified in Table 1 below.

TABLE 1

Indicator	Modified ecosystem, wildlife, cultural heritage, secondary & visual recreation, industry, stock and irrigation
Total Phosphorus	70 ug/L
Total Nitrogen	650 ug/L
Suspended solids	15mg/L for combined wet and dry periods 90% ile < 100mg/L for wet weather periods
Oils and grease	no visible films or odour
Organic Carbon	As determined through the investigations into organic carbon on the site.
Litter/gross pollutants	No anthropogenic (man-made) material greater than 5mm in any dimension
Riparian vegetation & habitat	Protect & restore consistent with Council policy and plans
Cultural heritage	Protect & restore consistent with Council policy and plans

- Levels are upper limits for median values or ranges in which medians should lie, unless otherwise stated.

- Dependencies on hardness iron and chromium shown in brackets are difficult to quantify. They may be ignored initially but subsequently considered if the pollutant level range is exceeded. For more information refer to the latest Australian Water Quality Guidelines for Fresh and Marine Waters (ANZECC).
- A wet weather period is defined as "any period where stormwater runoff leaves the site".

22. Conservation, Parks and Sport Requirements

Conditions 23 – 26, unless otherwise stated, shall be completed to the satisfaction of the Conservation, Parks and Sport Manager.

23. Parkland Dedication/Requirements

The area included in the Open Space Sub-Area under the Bremer Business Park Preliminary Approval shall be dedicated, free of cost to and compensation by Council, in fee simple. The developer is to submit a staging plan to and for approval by the Development Manager, indicating the timing of dedication, construction of footpaths and dense planting/mounding in Landscaped Buffer Areas indicated in Figure 12 Residential Amenity of the Bremer Business Park Preliminary Approval, prior to the issuing of a Development Permit for Building Works and/or prior to the issuing of a Development Permit for Reconfiguring a Lot and/or Development Permit for a Material Change of Use (Code or Impact or Self-Assessable (if applicable)).

24. Clearing/Disturbance within Proposed Parkland

(a) No clearing shall be undertaken in proposed parkland without the prior approval of the Conservation, Parks and Sport Manager.

(b) All areas of disturbance within parkland including areas of erosion and bare ground shall be rehabilitated. All batters and banks shall be fully stabilised and vegetated to the satisfaction of the Conservation, Parks and Sport Manager.

25. Quality of Park Dedication

Land to be dedicated for park purposes shall be upgraded to the satisfaction of the Conservation, Parks and Sport Manager as follows:

(a) declared plants, environmental weeds and rubbish shall be removed;

(b) dead trees shall be removed and dangerous trees made safe within 10 m of proposed house blocks or proposed pathways or playgrounds;

(c) open areas shall be grassed and left in mowable condition;

(d) open areas shall be free of rocks, stumps, humps and hollows;

(e) disturbed areas shall be revegetated using indigenous plant species;

(f) a cleared 4m wide mowable strip shall be formed behind proposed house blocks;

(g) all rubbish shall be removed from parkland;

(h) parkland shall be freely and safely drained;

(i) all playground equipment and park furniture shall meet Australian Standards both in supply and installation;

(j) no overburden or spoil shall be pushed or deposited into parkland;

(k) water, sewer and power service shall be provided to the proposed park; and

(l) there shall be no removal of soil or filling around trees.

26. Naming of Parkland

(a) The developer shall submit to and for approval by Council a list of at least three names and their name meanings for each new park. The proposed names shall be submitted as part of the Operational Works application. Should a theme be considered appropriate, the theme should be submitted to Council at the time of submitting the road names.

(b) The developer shall erect a suitable park name sign to the satisfaction of the Development Manager.

27. Department of Main Roads

The Bremer Business Park Preliminary Approval excludes the areas identified for quarantine in the Department of Main Road's Concurrence Agency response dated 24 September 2003 until such time as the quarantine period lapses or the Department of Main Roads determines that the quarantine is no longer required.

28. When Preliminary Approval Takes Effect

This preliminary approval has effect in accordance with the provisions of Section 3.5.19 of the *Integrated Planning Act 1997* as follows:

(a) If the applicant does not appeal the decision to the court - when the submitter's appeal period ends; or

(b) If an appeal is made to the court - subject to the decision of the court, when the appeal is finally decided.

29. When Preliminary Approval Lapses

(a) This preliminary approval lapses:

(i) At the end of the currency period, unless the change of use happens before the end of the currency period. The currency period for this approval is 4 years starting the day the approval takes effect; and

(ii) Where the change of use of any premises established pursuant to the development approval has ceased for a period of at least 12 months.

(b) An extended currency period may be agreed upon, pursuant to Section 3.5.22 of the *Integrated Planning Act 1997*, provided a written notice to Council is made before the end of the currency period. Such written notice is to be on Council's approved form, accompanied by the owner's consent and the prescribed fee in Council's Register of General Charges.

(c) All of the development the subject of this approval shall be completed within the periods stated in Condition (a)(i) above. This approval shall lapse for any part of the development of the site that has not commenced within the currency period stated in Condition (a)(i) above.

Preliminary Approval for Reconfiguring of a Lot

1. Basis of Approval

Subject to these conditions, the facts and circumstances set out in the application and all relevant Council Local Laws and/or Planning Scheme Policies shall be adhered to.

2. Minor Alterations

Notwithstanding the requirements detailed in this approval, any other minor alterations and/or modifications acceptable to the Development Manager will suffice.

3. Development Plan

An amended development plan and staging plan, generally in accordance with Plan Number JD 2322-00-069 (Attachment B), dated 14 April 2004 and prepared by Keilar Fox and McGhie and Plan Number JD 2322-00-070 (Attachment C), dated 14 April 2004 and prepared by Keilar Fox and McGhie, shall be submitted to and approved by the Development Manager prior to Council issuing a development permit for reconfiguring of a lot over the land. Such plan shall include, amongst other items, the following:-

(i) approved locations, widths and paths for the trunk water, sewer and recycled water mains and any sewer rising mains with the Bremer Business Park Area (Refer to Conditions 9, 10, 11 and 12 from the abovementioned Preliminary Approval for Material Change of Use of Premises);

(ii) trafficable connections for the Bremer Business Park Area(Refer to Condition 8 from the abovementioned Preliminary Approval for Material Change of Use of Premises);

4. Rates in Arrears

In accordance with the provisions of the *Integrated Planning Act 1997*, all rates and other expenses as a charge against the land shall not be in arrears at the date of signing of the plan of survey.

5. Compliance with Conditions

(a) Conditions 1 to 27 from the abovementioned Preliminary Approval for Material Change of Use of Premises shall be completed prior to signing of the relevant plan of survey or as determined by the Development Manager.

(b) Unless otherwise stated all conditions from this Preliminary Approval for Reconfiguring of a Lot shall be completed prior to signing of the relevant plan of survey or as determined by the Development Manager.

(c) All conditions shall be completed to the satisfaction of the Development Manager.

6. When this Approval Takes Effect

This approval has effect in accordance with the provisions of Section 3.5.19 of the *Integrated Planning Act 1997* as follows:

(a) If the applicant does not appeal the decision to the court - from the time the decision notice is given (or if a negotiated decision notice is given, from the time the negotiated decision notice is given); or

(b) If an appeal is made to the court - subject to the decision of the court, when the appeal is finally decided.

7. When Approval Lapses

(a) The currency period for this approval is 4 years starting the day the approval takes effect. The Developer is required to submit to Council an accurate plan of survey before the end of the currency period, otherwise the approval will lapse.

(b) An extended currency period may be agreed upon, pursuant to Section 3.5.22 of the *Integrated Planning Act 1997*, provided a written notice to Council is made before the end of the currency period. Such written notice is to be on Council's approved form, accompanied by the owner's consent and the prescribed fee in Council's Register of General Charges.

B. Conditions of Concurrence Agencies

1. The Environmental Protection Agency (Contaminated Land Unit) is a concurrence agency with regard to this development approval. The attached concurrence agency response, dated 10 September 2003 forms part of this Decision Notice (Attachment D).

2. The Department of Main Roads is a concurrence agency with regard to this development approval. The attached concurrence agency response, dated 24 September 2003 forms part of this Decision Notice (Attachment E).

C. The Developer be further advised of the following:-

1. Fire Ants

In accordance with the *Plant Protection Act 1989* and the Plant Protection Regulation 1990, a quarantine notice has been issued for the State of Queensland to prevent the spread of the Red Imported Fire Ant (ant species Solenopsis invicta) and to eradicate it from the State.

It is the legal obligation of the land owner or any consultant or contractor employed by the land owner to report the presence or suspicion of Fire Ants to the Queensland Department of Primary Industries on 132523 within 24 hours of becoming aware of the presence or suspicion, and to advise in writing within seven days to:

Director General
Department of Primary Industries

GPO Box 46, Brisbane QLD 4001

It should be noted that the movement of Fire Ants is prohibited, unless under the conditions of a Department of Primary Industries Inspectors Approval. More information can be obtained from the Queensland Department of Primary Industries website www.dpi.qld.gov.au.

The development approved herein, by its very nature, includes activities considered to be "high risk" in respect of controlling the spread of Fire Ants. The following lists show high risk activities and some precautions should be considered for implementation.

(a) High risk activities can include:

(i) Earthworks of a minor or major scale;

(ii) Revegetation or rehabilitation;

(iii) Import of fill onto a site;

(iv) Export of fill or other materials such as soils, gravel, mulch and plants; and

(v) Export off or import on to a site of construction and demolition waste and materials or green waste.

(b) Precautions for implementation

(i) Checking for ants regularly;

(ii) Checking all soil, fill and waste materials (construction and green waste) for ants;

(iii) Asking questions about the quality and source of soil, fill and waste materials (construction and green waste);

(iv) Keeping records of all movements of soil, fill and waste materials (construction and green waste);

(v) Cleaning of all earthmoving or other soiled vehicles prior to exit from the site; and

(vi) Informing staff and contractors about these precautions.

2. Portable Long Service Leave

From 1 January 2001, the Building and Construction Industry (Portable Long Service Leave) Levy must be paid prior to the issue of a development permit where one is required for the 'Building and Construction Industry'. This applies to Building Works, Operational Works and Plumbing and Drainage Works applications, as defined under the *Integrated Planning Act 1997*, where the works are $80 000 or more and matching the definition of 'Building and Construction Industry' under the *Building and Construction Industry (Portable Long Service Leave) Act 1991*.

Council will not be able to issue a decision notice without receipt of details that the levy has been paid. Should you require clarification in regard to the amendments to

the *Building and Construction Industry (Portable Long Service Leave) Act 1991*, you should contact QLeave on 1800 803 481 (free call) or [redacted].

3. Cultural Heritage

The Cultural Heritage Branch of the Environmental Protection Agency advised Council in a letter dated 10 April 2003 that three (3) Queensland Estate sites were destroyed on land within the Bremer Business Park Area through site works associated with the establishment of the Capral Aluminium Extrusion Plant. Queensland Estate sites are protected under the *Cultural Record (Landscape Queensland and Queensland Estate) Act 1987*. The Act states that it is offence under section 56(2) to '...take, destroy, damage, deface, excavate, expose, conceal or interfere with an item of Queensland Estate', unless a person does so under the authority of the Act. As such, the developer is reminded of its responsibilities under the Act.

4. Mining

The land to which this approval relates may have been worked by underground coal mining operations. Council, and its servants and agents, accept no liability or responsibility for any loss or damage to person or property of whatever nature or however caused as the direct or indirect consequence of the g ranting of the approval herein contained. Such approval has been granted at the request of the developer and in reliance of information submitted by the developer in support thereof.

D. Copy of Decision Notices

A copy of this decision be forwarded to the following referral agencies:

1. Department of Local Government and Planning
Planning Services
PO Box 31
BRISBANE ALBERT STREET QLD 4002

2. District Director
Department of Main Roads
Metropolitan District
PO Box 70
SPRING HILL QLD 4004

3. Environmental Protection Agency
Contaminated Land Unit
Southern Regional Office (Brisbane)
GPO Box 2771
BRISBANE QLD 4001

Brendan Nelson
DEVELOPMENT MANAGER

I concur with the recommendations contained in this report.

Gary White
PLANNING AND DEVELOPMENT MANAGER

"ATTACHMENT A" "ATTACHMENT B" "ATTACHMENT C" "ATTACHMENT D" "ATTACHMENT E"

Ipswich
City Council

Your Reference:
Our Reference: 3356/02 NH:KGR
Contact Officer: [redacted]
Telephone No: [redacted]

6 July 2004

INTEGRATED PLANNING ACT 1997
DEVELOPMENT APPLICATION NEGOTIATED DECISION NOTICE
Note: This Negotiated Decision Notice replaces Council's previous Decision Notice dated 30 April 2004
Application Details

Appn No:	3356/02
Real Property Description:	Lot 4 SP140694, Lot 6 SP140694, Lot 2 RP854997, Lot 1 RP22385, Lot 1 RP125443, Lot 2 RP104683, Lot 1 RP86838, Lot 1 RP22378, Lot 34 SL3911, Lot 1 RP84779, Lot 142 RP846150, Lot 4 RP92591, Lot 5 RP92591, Lot 6 RP92591, Lot 3 RP132087, Lot 13 SL2982.
Property Location:	55 and 99999 Bognuda Street, 42 Brisbane Road, 242A Warrego Highway, Bundamba
Names and Addresses of all Referral Agencies:	1. Department of Local Government and Planning Planning Services PO Box 31 BRISBANE ALBERT STREET QLD 4002 2. District Director Department of Main Roads Metropolitan District PO Box 70 SPRING HILL QLD 4004 3. Environmental Protection Agency Contaminated Land Unit Southern Regional Office (Brisbane) GPO Box 2771 BRISBANE QLD 4001
Negotiated Decision Date:	30 June 2004
Decision:	Approved subject to the conditions detailed below.

Wingate Properties Pty Ltd
48 Wharf Street
KANGAROO POINT QLD 4169

Please Address All Correspondence to:
Chief Executive Officer
Ipswich City Council
A.B.N. 61 461 981 077
PO Box 191 Ipswich Qld 4305
Telephone: [redacted]
Facsimile: [redacted]
Email: [redacted]
Website: www.ipswich.qld.gov.au

Decision Authority: Full Council Meeting

Nature of Change: Condition 11 (a) (x) and (xi): Roadworks/ Traffic, Condition 12 (a) (iii) and (b): Local Area Traffic Management Scheme, Condition 16 (b): Water and Waste Water Corridors and Sections 3.2, 3.4, 6.3, 7.2 and Figure 3 of the Bremer Business Park Preliminary Approval document have been amended below.

Approval Details:

Proposal	Development	Decision	Approval Type
Development in accordance with a Plan of Development, including seven (7) Sub-Areas: Riverside Sub-Area, Highways Sub-Area, Frame Industrial and Commercial Sub-Area, Central Industry Sub-Area, Residential Sub-Area, Open Space Sub-Area, Community Centre Sub-Area and Business and Industry Buffer Sub-Area	Making a material change of use of premises	Approved	Preliminary Approval
16 lots into 34 lots	Reconfiguring of a Lot	Approved	Preliminary Approval

Further Development Permits Required

Further Development Permits, as required by the *Integrated Planning Act 1997*, shall be obtained in respect of any Operational Works in relation to this approval before any such works are commenced.

Conditions

Assessment Manager (Ipswich City Council)

Conditions applicable to this approval under Integrated Planning Act:

Preliminary Approval for Material Change of Use of Premises – Bremer Business Park Preliminary Approval

1. Site Development

The proposed development of the Bremer Business Park Area shall be undertaken in accordance with the Bremer Business Park Preliminary Approval (see Attachment A).

2. Self-Assessable Development

The developer is required to notify Council in writing of the commencement of any self-assessable use to be undertaken in accordance with the Bremer Business Park Preliminary Approval.

3. Code Assessable Development

Any code assessable development to be undertaken in accordance with the Bremer Business Park Preliminary Approval shall demonstrate compliance with the Bremer Business Park Preliminary Approval, relevant assessment criteria and Planning Scheme Policies contained within the Ipswich Planning Scheme unless specified otherwise in the Bremer Business Park Preliminary Approval.

4. Contributions

(a) The developer shall establish a 'serviced' headworks contribution credit for the land included in the Core Sub-Area, Frame Sub-Area, Highway Sub-Area, Riverside Sub-Area and Community and Commercial Sub-Area under the Bremer Business Park Preliminary Approval. To this end, the developer shall pay headworks contributions for the Core Sub-Area, Frame Sub-Area, Highway Sub-Area and Riverside Sub-Area at the level of 22.5 equivalent persons (ep) per hectare for water supply and sewerage and 46.5 equivalent persons (ep) per hectare for roadworks and for the Community and Commercial Sub-Area at the level of 22.5 equivalent persons (ep) per hectare for water supply and sewerage and 133 equivalent persons (ep) per hectare for roadworks; and

NB: These contributions established a minimum deemed credit for the land included in the abovementioned Sub-Areas. Where establishing/commencing uses and/or works create a demand greater than the deemed credit, further contributions may be applicable in accordance with the relevant Council Policies.

(b) The developer shall pay a recycled water infrastructure and streetscape contributions (where applicable); and

(c) The developer shall pay contributions towards the provision of water, sewerage, roadworks, social amenity and open space (parks) headworks for the land included in the Residential Sub-Area in accordance with the relevant Council Policies prior to the issuing of a Development Permit for Building works and/or prior to the issuing of a Development Permit for Reconfiguring a Lot and/or prior to the issuing of a Development Permit for a Material Change of Use (Code or Impact or Self-Assessable (if applicable)); and

The contributions must be paid at the rates applicable at the time of payment. Payment is required prior to the issuing of a Development Permit for Building Works and/or prior to the issuing of a Development Permit for Reconfiguring a Lot and/or as per conditions of a further Development Permit for a Material Change of Use (Code or Impact or Self-Assessable (if applicable)); or

(d) The developer may seek an alternative agreement in respect to water supply and sewerage infrastructure contributions. The agreement shall be prepared and approved by Council prior to the issuing of a Development Permit for Building Works and/or prior to the issuing of a Development Permit for Reconfiguring a Lot and/or prior to the issuing of a Development Permit for a Material Change of Use (Code or Impact or Self-Assessable (if applicable)).

5. Hours of Construction

Unless otherwise approved in writing by the Development Manager hours of construction shall be:

Monday to Saturday 6.30 a.m. to 6.30 p.m.

Work or business shall not be conducted from or on the premises outside the above hours or on Sundays or public holidays.

6. Road Naming Plan

The developer shall submit to and for approval by Council a list of names and name meanings for each new road to be opened. The proposed names shall be submitted to Council as part of any further application for a development permit for reconfiguring of a lot over the land.

7. Locality References

(a) Any place name or estate name used by the developer (excluding a reference to a building, structure or the like and excluding minor, subsidiary signage within a development) shall make reference to the relevant, approved place name under the *Place Names Act 1994*.

(b) Any reference to the regional location of the site or the development shall not refer to the place or estate as being located in Brisbane or a Brisbane suburb or in the metropolitan area or in the western suburbs (excluding the western suburbs of Ipswich as determined by Council in writing from time to time).

8. Cultural Heritage Identification

(a) The developer shall prepare a schedule of places/locations or structures of cultural heritage significance within the Bremer Business Park Area for identification. This list is to be approved by the Development Manager and such identified places/locations or structures are to be acknowledged on the specific site through the installation of appropriately located and detailed interpretive works and signage describing the history and cultural significance of relevant item/s.

(b) The developer is to engage an appropriately qualified person to photograph and document (with measured drawings) the places/locations or structures in their existing condition, all items that are proposed to be demolished, removed or adaptively reused.

Four (4) copies of a report, including photographs and documentation shall be submitted to the Development Manager for approval. Once approved, two (2) copies of the report shall be held by the Planning and Development Department with the other two (2) copies being forwarded to the Ipswich City Council Library and John Oxley Library.

(c) Such work shall be completed prior to the issuing of a Development Permit for Building Works and/or prior to the issuing of a Development Permit for Reconfiguring a Lot and/or as per conditions of a further Development Permit for a Material Change of Use (Code or Impact or Self-Assessable (if applicable)).

9. Engineering Requirements

The following engineering requirements, detailed in Conditions 10 – 18, shall be completed to the satisfaction of the Senior Development Engineer and in accordance with Council's Planning Scheme Policy 3 – General Works.

10. Mining

(a) The developer shall prepare a detailed mining and geological assessment and recommendations report for those areas of the Bremer Business Park Area where there is evidence of previous mining activity or mining influence.

(b) The proposed development shall be designed and constructed in accordance with the approved recommendations as outlined in the geotechnical report and any required amendments.

(c) Prior to the approval of any application for building works, the Developer shall submit to Council a Structural Engineer's Certificate certifying that the proposed structures have been designed in accordance with the abovementioned geotechnical report(s).

(d) The developer shall prepare and register a Covenant with the Register of Titles for each of the affected lots as identified in the abovementioned report, prior to the issuing of a Development Permit for Building Works and/or prior to the issuing of a Development Permit for Reconfiguring a Lot and/or as per conditions of a further Development Permit for a Material Change of Use (Code or Impact or Self-Assessable (if applicable)). The covenant shall be to the satisfaction of the Development Manager and advise that:

(i) All building structures shall be designed and constructed in accordance with the recommendations as outlined in the geotechnical report;

(ii) Any application for Building Works shall be accompanied by a Structural Engineer's Certificate certifying that the proposed structures have been designed in accordance with the abovementioned geotechnical reports.

(e) The Developer shall pay all costs concerning the preparation and execution of the covenant and any registration fees and duty (if any).

11. Roadworks/Traffic

(a) The developer shall provide an updated and detailed traffic study and recommendations, prepared by a RPEQ for the Bremer Business Park Area. Amongst other matters, the study shall address, but not be limited to, the following:

(i) a review of the traffic generated by the Bremer Business Park Area;

(ii) road hierarchy for the Bremer Business Park Area, including connection points to the external road network;

(iii) generalised land use;

(iv) public transport needs;

(v) staging and timing of the proposed works;

(vi) effects on existing road networks;

(vii) recommendation of specific measures to be undertaken to improve the alignment, sight distances, and signage of all roads which will result in safe movements of light and heavy vehicles, and reduce delays and queuing distances, including the connectivity of all transport systems available to the regions north and south of the Warrego Highway.

The access to the area on the northern side of the Warrego Highway is to be established prior to the commencement of any works on this portion of the Bremer Business Park Area and will be either via a service road connecting the northern round-a-bout at the River Road fly-over to the Warrego Highway, together with the necessary upgrading of the on and off-ramps to the Warrego Highway and with the necessary upgrades to the River Road bridge, both round-a-bouts, and Ashburn Road near the fly-over. Alternatively, this access may be achieved via a new fly-over over the Warrego Highway as an extension of Bognuda Street, together with the necessary accompanying on and off-ramps to the Warrego Highway.

It should be noted that both option for this northern connection require the approval of the Department of Main Roads and Council. Additionally, if any land is under other private ownership, written permission for the connection shall be obtained and forwarded to Council.

(viii) recommendation of specific measures to be undertaken to upgrade Bognuda, Ashburn, Carberry and Bird Streets in terms of pavement widths and quality footpaths and stormwater management. It is noted that the developer has made specific commitments to the community in respect to the provision of works in Bird Street. To this end, the developer shall provide kerb and channel on both sides of Bird Street and drainage works and pavement infill as determined necessary by the Senior Development Engineer;

(ix) recommendation of specific measures to be undertaken to define and improve the intersections of and to Brisbane Road, River Road and Ashburn Road and Warrego Highway;

(x) recommendation of specific measures to be undertaken to isolate or distinctly separate all industrial traffic from residential traffic on Bognuda Street (where practical);

(xi) recommendation of specific measures for the construction of a new connection road between Ashburn and Brisbane Roads.

This road shall be constructed with the cross-section of an arterial road, a design speed of 70km/h and be able to cater for B-Doubles. .

The road is to be established prior to the commencement of any works on this portion of the Bremer Business Park Area and will access Brisbane Road through Lots 2 and 7 on RP22379. Additionally, if any land is under other private ownership, written permission for the connection shall be obtained and forwarded to Council.

(b) The study shall be submitted to and approved by the Development Manager prior to the issuing of a Development Permit for Building Works and/or prior to the issuing of a Development Permit for Reconfiguring a Lot and/or Development Permit for a Material Change of Use (Code or Impact or Self-Assessable (if applicable)).

The Developer shall undertake any works deemed necessary by the Senior Development Engineer, to comply with the requirements of the traffic study.

12. Local Area Traffic Management Scheme

(a) The developer shall implement an integrated local area traffic management (LATM) scheme in the existing residential areas to the south and south-west of the Bremer Business Park Area, as follows:

(i) The LATM scheme shall be designed in accordance with the requirements of Council and approved by the Works Manager prior to the issuing of a Development Permit for Building Works and/or prior to the issuing of a Development Permit for Reconfiguring a Lot and/or Development Permit for a Material Change of Use (Code or Impact or Self-Assessable (if applicable));

(ii) The LATM scheme shall include a comprehensive public consultation component in which the developer must prepare and submit a communication plan for approval by the Works Manager prior to the issuing of a Development Permit for Building Works and/or prior to the issuing of a Development Permit for Reconfiguring a Lot and/or Development Permit for a Material Change of Use (Code or Impact or Self-Assessable (if applicable));

(iii) Initial design guidelines (to be finalised after public consultation) for the LATM scheme are:

- Direction signs on Brisbane Road, Jacaranda Street and Wattle Street to advise motorists (particularly heavy vehicle drivers) of alternative routes to Bremer Business Park. The type, size, layout and location of the direction signs requires approval from Council before implementation;

- Traffic control devices on Bryne Street (south of Law Street), Bognuda Street (north & south of Law Street) and Vale Street (east of Bognuda Street). These devices are to be either or a combination of angled slow points, deflected T-intersection devices or speed platforms. They shall be spaced at appropriate intervals so as to achieve a 50km/h speed environment and designed to provide adequate deflection for general traffic but still be able to accommodate buses and other large vehicles;

- Roundabouts at the intersections of:

  - Law Street - Byrne Street;
  - Bognuda Street - Law Street; and
  - Boundary Street - Bognuda Street - proposed Residential Access Street.

Adequate design and approach widening will be required at these roundabouts in order to accommodate turning vehicles, including turning articulated vehicles that are required to use the Law Street - Byrne Street and Bognuda Street - Law Street intersections from time to time. The central roundabout islands may need to be fully mountable, however the approach splitter islands should be of semi-mountable kerb and accommodate appropriate signage to provide sufficient prominence and control vehicle movements;

- Entry thresholds (consisting of kerb build-outs, central islands and raised & coloured pavement treatments) to signify entry to the residential area at:

  - the southern approach from the Bremer Business Park (just after the proposed roundabout at the intersection of the new east-west internal road and the realigned Bognuda Street;
  - Byrne Street (north of Vale Street); and
  - Vale Street (east of Byrne Street).

- The closure of Bognuda Street in the vicinity of 44 Bognuda Street (Lot 1 on RP102431);

(b) The LATM scheme shall be fully completed within *two (2) years* from the date of approval of this development application;

(a) Council may by agreement extend the period by which the LATM scheme has to be completed; and

(b) Design and construction of this LATM scheme shall be at no cost to Council;

(c) In lieu of (a) to (d) above (ie. implementation of the LATM scheme), the developer may:

(i) Design and construct a roundabout at the intersection of Boundary Street, Bognuda Street and the proposed Residential Access Street in accordance with Council requirements; and

(ii) Provide Council a monetary contribution of $600,000 (equal to the value of the consultation, planning, design and construction of the LATM scheme outlined (a) to (d) above).

This contribution shall be applicable for a period of twelve months and thereafter shall be calculated from the date of development approval to the date when payment is made in accordance with the CPI.

13. Sewerage

(a) The developer shall submit a sewerage planning report to and for approval by the Ipswich Water Manager. The scope of the report should be determined in consultation with Ipswich Water. The report shall address, but not be limited to, the sewerage works required to service the Bremer Business Park Area, the timing of infrastructure and the impacts the proposed Bremer Business Park Area has on the existing (including the Bundamba Wastewater Centre) and planned infrastructure of Council.

(b) This sewerage planning report shall be submitted prior to the issuing of a Development Permit for Building Works and/or prior to the issuing of a Development Permit for Reconfiguring a Lot and/or Development Permit for a Material Change of Use (Code or Impact or Self-Assessable (if applicable)).

(c) The developer shall review and update, if necessary, the report as determined by Council. Council may request the developer to review and update the report where the assumptions used in the report vary from what is being proposed by the developer. This may occur where the anticipated demands or timing of development have been amended/altered.

(d) The developer shall undertake all works identified within the approved report. This includes all aspects of the works including, but not limited to, the design, construction, supervision, land acquisition, testing, survey and preparation of as-constructed drawings.

14. Non-Potable Water (Recycled Sewage Effluent)

(a) The developer shall provide a recycled water reticulation system in the Bremer Business Park Area in accordance with Council's requirements. Such a system may include a trunk main for the conveyance of the processed sewage effluent from the Bundamba Sewage Treatment Plant. The sizing of the main is to be established by an RPEQ in conjunction with discussions and projected demands anticipated by Ipswich Water;

(b) The Developer shall make provision for a recycled water main on both sides of each applicable road. An approved route for the location of the trunk water, sewage and recycled water mains is to be established prior to the issuing of a Development Permit for Building Works and/or prior to the issuing of a Development Permit for Reconfiguring a Lot and/or Development Permit for a Material Change of Use (Code or Impact or Self-Assessable (if applicable)).

15. Water

(a) The developer shall submit a water supply planning report to and for approval by the Ipswich Water Manager. The scope of the report shall be determined in consultation with Ipswich Water. The report shall address, but not be limited to, the water supply works required to service the Bremer Business Park Area, the timing of infrastructure and the impacts the proposed development has on the existing and planned infrastructure of Council.

(b) The report shall be approved by the Ipswich Water Manager prior to the issuing of a Development Permit for Building Works and/or prior to the issuing of a Development Permit for Reconfiguring a Lot and/or Development Permit for a Material Change of Use (Code or Impact or Self-Assessable (if applicable)).

(c) The developer shall review and update, if necessary, the report as determined by Council. This may be as a result of the development amending/altering anticipated demands or timing.

(d) The developer shall undertake all works identified within the approved report. This includes all aspects of the works including, but not limited to, the design, construction, supervision, land acquisition, testing, survey and preparation of as-constructed drawings.

(e) The developer shall provide water mains on both sides of each applicable road, unless otherwise agreed to by Ipswich Water.

(f) The developer shall construct a new water main in the Bremer Business Park Area to replace the existing 500mm central trunk water main located between River Road and Bognuda Street. The developer shall contact Council to determine its requirements. The developer will be advised by Council as to, but not limited to, the extent of works that needs to be undertaken on the existing main (whether the main needs to be removed or the existing easement/s relinquished), the timing of the works (new main has to be constructed before the existing main has been taken off line), the alignment of the new main (open space, water and wastewater corridor) and the size of the main.

(g) The developer shall contact Council prior to the issuing of a Development Permit for Building Works and/or prior to the issuing of a Development Permit for Reconfiguring a Lot and/or Development Permit for a Material Change of Use (Code or Impact or Self-Assessable (if applicable)) to determine if Council has any requirements in respect to the works that will be carried out within or in vicinity of the water and wastewater corridors. Council may request that the developer undertake works to ensure the water and wastewater pipelines that are proposed within the corridor are not adversely impacted by the developer's proposed works. The developer shall incorporate Council's requirements. Any works requested by Council shall be undertaken at the expense of Council. Council would be responsible for the full costs of the main crossings.

16. Water and Wastewater Corridors

(a) The developer shall provide water and wastewater purpose corridors through the Bremer Business Park Area on the alignments generally indicated in the Bremer Business Park Preliminary Approval.

(b) The corridors will vary in width depending on the infrastructure that is to be constructed within them. The corridors are to have a minimum width of 20 metres and are expected to have an average width of 25 metres, unless otherwise approved by the Development Manager.

(c) The developer shall locate the corridors in open space, verge widths and in front setbacks of private properties, in this order. If required, the developer shall amend the proposed layout to ensure that this is achieved, unless otherwise approved by Council.

(d) The developer shall provide an easement in favour of Council for water and wastewater purposes where the corridors are located in private property.

(e) The developer shall provide an access easement in favour of Council to the water and wastewater easement where no direct frontage is available to any public areas.

(f) The developer shall contact Council prior to undertaking any works within the designated corridors to ascertain Council's requirements. This includes works relating to fencing, landscaping and driveways.

17. Road Reserves – Service Alignments

The developer shall provide a plan detailing the road reserve widths required within the Bremer Business Park Area. This plan should detail the services to be contained within each road reserve, their alignments and expected time for construction. The plan should provide

adequate cross sections, with details of the existing infrastructure, for Council to determine if the road reserves proposed are sufficient.

18. Stormwater

(a) The developer shall provide all necessary stormwater drainage (both internal and external to the development) and such drainage works (except for roofwater systems) shall be designed and constructed in accordance with QUDM such that the overall drainage system caters for a storm event with an ARI of 100 years.

Overland flow paths shall be suitably designed to cater for the water from a storm event with an ARI of 100 years. In the case where the piped system is carrying part of the flow, the overland flow paths shall be designed to cater for that volume which is represented by the difference between the predicted volume from the storm event with an ARI of 100 years and the capacity of the pipe system, noting the requirements of QUDM.

(b) All stormwater flows within and adjacent to the Bremer Business Park Area, other than inter-allotment drainage, shall be confined to dedicated roads, drainage reserves, registered drainage easements or within parkland. The registered drainage easements, if related to piped drainage, shall be centrally located over such underground pipe system and shall be not less than 4.0 m wide, except for drainage easements required for side boundaries which may be 3.0 m wide where approved by the Senior Development Engineer. In addition, the easements shall be of suitable width to contain the predicted overland flow from the storm event with an ARI of 100 years in that location.

(c) No ponding or redirection of stormwater shall occur onto adjoining land unless specifically approved by Council in consultation with the owner of the adjoining land.

(d) Due consideration shall be given in these and future designs and construction of the development in relation to the effect of the developed catchment flows on the downstream discharge receival areas. Suitable stormwater control devices are to be provided to ensure that there is no increase in flows in watercourses. Such control devices are to be designed so as to integrate the landscaping, recreational, infrastructural and drainage roles of watercourses.

(e) Each proposed residential, commercial and/or industrial allotment shall be designed to comply with QUDM, Council's standards and the New Ipswich City Planning Scheme, including unimpeded access to a road system which is also above the design flood level.

(f) There shall be no filling or removal of material in the flood area below the flood level associated with an ARI of 100 years without the approval of the Senior Development Engineer. There shall be minimal disturbance to vegetation in the flood area, unless prior written approval is obtained from Council.

(g) Filling in proposed Lots, which are adjacent to the watercourse shown on the proposal plan, shall not be undertaken without the written approval of Council.

19. Health and Environmental Protection Requirements

Conditions 20 – 21, unless otherwise stated, shall be completed to the satisfaction of the Chief Environmental Health Officer.

20. Contaminated Land

The developer shall ensure all land to be dedicated to Council is not listed on either the Contaminated Land Register or the Environmental Management Register prior to dedication. In this regard the developer shall be responsible for all works associated with the removal of any land to be dedicated to Council from these registers. The developer shall provide details to Council demonstrating that the requirements of this condition have been met prior to the issuing of a Development Permit for Building Works and/or prior to the issuing of a Development Permit for Reconfiguring a Lot and/or Development Permit for a Material Change of Use (Code or Impact or Self-Assessable (if applicable)).

21. Stormwater Quality

The developer shall submit to and receive approval from the Health and Environmental Protection Manager for a Master Stormwater Quality Management Plan for the Bremer Business Park Area (the Master SQMP) prior to the issuing of a Development Permit for Building Works and/or prior to the issuing of a Development Permit for Reconfiguring a Lot and/or Development Permit for a Material Change of Use (Code or Impact or Self-Assessable (if applicable)). A suitably qualified and experienced professional must prepare the Master SQMP. The Master SQMP must:

(i) Provide a management approach that ensures:

- Stormwater quality management measures for the Bremer Business Park Area consist of physical treatment measures to ensure that the stormwater discharged from a land use type complies with the pollutant levels identified in Table 1 below;

- Stormwater quality management measures for residential areas and roads consist of physical treatment measures to ensure that the stormwater discharged from these areas comply with the pollutant levels identified in Table 1 below;

- The matters of water sensitive urban design (WSUD), stormwater management and stormwater quality will be addressed throughout the Bremer Business Park Area in an integrated approach, and

- A refined Conceptual Design Stormwater Quality Management Plan (the Conceptual Design SQMP) is supplied for each development site prior to the issuing of a Development Permit for Building Works and/or prior to the issuing of a Development Permit for Reconfiguring a Lot and/or Development Permit for a Material Change of Use (Code or Impact or Self-Assessable (if applicable)) and then a Detailed Design Stormwater Quality Management Plan (the Detailed Design SQMP) is supplied for each development site prior to the issuing of a Development Permit for Operational Works.

(ii) Demonstrate, through appropriate pollutant export modelling (eg AQUALM or MUSIC), that the pollutant levels in the stormwater discharged from the Bremer Business Park Area comply with the pollutant levels identified in Table 1 below.

TABLE 1

Indicator	Modified ecosystem, wildlife, cultural heritage, secondary & visual recreation, industry, stock and irrigation
Total Phosphorus	70 ug/L
Total Nitrogen	650 ug/L
Suspended solids	15mg/L for combined wet and dry periods 90% ile < 100mg/L for wet weather periods
Oils and grease	no visible films or odour
Organic Carbon	As determined through the investigations into organic carbon on the site.
Litter/gross pollutants	No anthropogenic (man-made) material greater than 5mm in any dimension
Riparian vegetation & habitat	Protect & restore consistent with Council policy and plans
Cultural heritage	Protect & restore consistent with Council policy and plans

- Levels are upper limits for median values or ranges in which medians should lie, unless otherwise stated.
- Dependencies on hardness iron and chromium shown in brackets are difficult to quantify. They may be ignored initially but subsequently considered if the pollutant level range is exceeded. For more information refer to the latest Australian Water Quality Guidelines for Fresh and Marine Waters (ANZECC).
- A wet weather period is defined as "any period where stormwater runoff leaves the site".

22. Conservation, Parks and Sport Requirements

Conditions 23 – 26, unless otherwise stated, shall be completed to the satisfaction of the Conservation, Parks and Sport Manager.

23. Parkland Dedication/Requirements

The area included in the Open Space Sub-Area under the Bremer Business Park Preliminary Approval shall be dedicated, free of cost to and compensation by Council, in fee simple. The developer is to submit a staging plan to and for approval by the Development Manager, indicating the timing of dedication, construction of footpaths and dense planting/mounding in Landscaped Buffer Areas indicated in Figure 12 Residential Amenity of the Bremer Business Park Preliminary Approval, prior to the issuing of a Development Permit for Building Works and/or prior to the issuing of a Development Permit for Reconfiguring a Lot and/or Development Permit for a Material Change of Use (Code or Impact or Self-Assessable (if applicable)).

24. Clearing/Disturbance within Proposed Parkland

(a) No clearing shall be undertaken in proposed parkland without the prior approval of the Conservation, Parks and Sport Manager.

(b) All areas of disturbance within parkland including areas of erosion and bare ground shall be rehabilitated. All batters and banks shall be fully stabilised and vegetated to the satisfaction of the Conservation, Parks and Sport Manager.

25. Quality of Park Dedication

Land to be dedicated for park purposes shall be upgraded to the satisfaction of the Conservation, Parks and Sport Manager as follows:

(a) declared plants, environmental weeds and rubbish shall be removed;

(b) dead trees shall be removed and dangerous trees made safe within 10 m of proposed house blocks or proposed pathways or playgrounds;

(c) open areas shall be grassed and left in mowable condition;

(d) open areas shall be free of rocks, stumps, humps and hollows;

(e) disturbed areas shall be revegetated using indigenous plant species;

(f) a cleared 4m wide mowable strip shall be formed behind proposed house blocks;

(g) all rubbish shall be removed from parkland;

(h) parkland shall be freely and safely drained;

(i) all playground equipment and park furniture shall meet Australian Standards both in supply and installation;

(j) no overburden or spoil shall be pushed or deposited into parkland;

(k) water, sewer and power service shall be provided to the proposed park; and

(l) there shall be no removal of soil or filling around trees.

26. Naming of Parkland

(a) The developer shall submit to and for approval by Council a list of at least three names and their name meanings for each new park. The proposed names shall be submitted as part of the Operational Works application. Should a theme be considered appropriate, the theme should be submitted to Council at the time of submitting the road names.

(b) The developer shall erect a suitable park name sign to the satisfaction of the Development Manager.

27. Department of Main Roads

The Bremer Business Park Preliminary Approval excludes the areas identified for quarantine in the Department of Main Road's Concurrence Agency response dated 24 September 2003 until such time as the quarantine period lapses or the Department of Main Roads determines that the quarantine is no longer required.

28. When Preliminary Approval Takes Effect

This preliminary approval has effect in accordance with the provisions of Section 3.5.19 of the *Integrated Planning Act 1997* as follows:

(a) If the applicant does not appeal the decision to the court - when the submitter's appeal period ends; or

(b) If an appeal is made to the court - subject to the decision of the court, when the appeal is finally decided.

29. When Preliminary Approval Lapses

(a) This preliminary approval lapses:

(i) At the end of the currency period, unless the change of use happens before the end of the currency period. The currency period for this approval is 4 years starting the day the approval takes effect; and

(ii) Where the change of use of any premises established pursuant to the development approval has ceased for a period of at least 12 months.

(b) An extended currency period may be agreed upon, pursuant to Section 3.5.22 of the *Integrated Planning Act 1997*, provided a written notice to Council is made before the end of the currency period. Such written notice is to be on Council's approved form, accompanied by the owner's consent and the prescribed fee in Council's Register of General Charges.

(c) All of the development the subject of this approval shall be completed within the periods stated in Condition (a)(i) above. This approval shall lapse for any part of the development of the site that has not commenced within the currency period stated in Condition (a)(i) above.

Preliminary Approval for Reconfiguring of a Lot

1. Basis of Approval

Subject to these conditions, the facts and circumstances set out in the application and all relevant Council Local Laws and/or Planning Scheme Policies shall be adhered to.

2. Minor Alterations

Notwithstanding the requirements detailed in this approval, any other minor alterations and/or modifications acceptable to the Development Manager will suffice.

3. Development Plan

An amended development plan and staging plan, generally in accordance with Plan Number JD 2322-00-069 (Attachment B), dated 14 April 2004 and prepared by Keilar Fox and McGhie and Plan Number JD 2322-00-070 (Attachment C), dated 14 April 2004 and prepared by Keilar Fox and McGhie, shall be submitted to and approved by the Development Manager

prior to Council issuing a development permit for reconfiguring of a lot over the land. Such plan shall include, amongst other items, the following:-

(i) approved locations, widths and paths for the trunk water, sewer and recycled water mains and any sewer rising mains with the Bremer Business Park Area (Refer to Conditions 9, 10, 11 and 12 from the abovementioned Preliminary Approval for Material Change of Use of Premises);

(ii) trafficable connections for the Bremer Business Park Area(Refer to Condition 8 from the abovementioned Preliminary Approval for Material Change of Use of Premises);

4. Rates in Arrears

In accordance with the provisions of the *Integrated Planning Act 1997*, all rates and other expenses as a charge against the land shall not be in arrears at the date of signing of the plan of survey.

5. Compliance with Conditions

(a) Conditions 1 to 27 from the abovementioned Preliminary Approval for Material Change of Use of Premises shall be completed prior to signing of the relevant plan of survey or as determined by the Development Manager.

(b) Unless otherwise stated all conditions from this Preliminary Approval for Reconfiguring of a Lot shall be completed prior to signing of the relevant plan of survey or as determined by the Development Manager.

(c) All conditions shall be completed to the satisfaction of the Development Manager.

6. When this Approval Takes Effect

This approval has effect in accordance with the provisions of Section 3.5.19 of the *Integrated Planning Act 1997* as follows:

(a) If the applicant does not appeal the decision to the court - from the time the decision notice is given (or if a negotiated decision notice is given, from the time the negotiated decision notice is given); or

(b) If an appeal is made to the court - subject to the decision of the court, when the appeal is finally decided.

7. When Approval Lapses

(a) The currency period for this approval is 4 years starting the day the approval takes effect. The Developer is required to submit to Council an accurate plan of survey before the end of the currency period, otherwise the approval will lapse.

(b) An extended currency period may be agreed upon, pursuant to Section 3.5.22 of the *Integrated Planning Act 1997*, provided a written notice to Council is made before the end of the currency period. Such written notice is to be on Council's approved form, accompanied by the owner's consent and the prescribed fee in Council's Register of General Charges.

8. Conditions of Concurrence Agencies

(a) The Environmental Protection Agency (Contaminated Land Unit) is a concurrence agency with regard to this development approval. The attached concurrence agency response, dated 10 September 2003 forms part of this Decision Notice as per Attachment D to the report by the Development Manager dated 15 June 2004.(

(b) The Department of Main Roads is a concurrence agency with regard to this development approval. The attached concurrence agency response, dated 24 September 2003 forms part of this Decision Notice as per Attachment E to the report by the Development Manager dated 15 June 2004.

Advice

The following advices are offered for your information only and should not be viewed as mandatory conditions of this approval.

Assessment Manager (Ipswich City Council)

1. Fire Ants

In accordance with the *Plant Protection Act 1989* and the Plant Protection Regulation 1990, a quarantine notice has been issued for the State of Queensland to prevent the spread of the Red Imported Fire Ant (ant species Solenopsis invicta) and to eradicate it from the State.

It is the legal obligation of the land owner or any consultant or contractor employed by the land owner to report the presence or suspicion of Fire Ants to the Queensland Department of Primary Industries on 132523 within 24 hours of becoming aware of the presence or suspicion, and to advise in writing within seven days to:

Director General
Department of Primary Industries
GPO Box 46, Brisbane QLD 4001

It should be noted that the movement of Fire Ants is prohibited, unless under the conditions of a Department of Primary Industries Inspectors Approval. More information can be obtained from the Queensland Department of Primary Industries website www.dpi.qld.gov.au.

The development approved herein, by its very nature, includes activities considered to be "high risk" in respect of controlling the spread of Fire Ants. The following lists show high risk activities and some precautions should be considered for implementation.

(a) High risk activities can include:

(i) Earthworks of a minor or major scale;

(ii) Revegetation or rehabilitation;

(iii) Import of fill onto a site;

(iv) Export of fill or other materials such as soils, gravel, mulch and plants; and

(v) Export off or import on to a site of construction and demolition waste and materials or green waste.

(b) Precautions for implementation

(i) Checking for ants regularly;

(ii) Checking all soil, fill and waste materials (construction and green waste) for ants;

(iii) Asking questions about the quality and source of soil, fill and waste materials (construction and green waste);

(iv) Keeping records of all movements of soil, fill and waste materials (construction and green waste);

(v) Cleaning of all earthmoving or other soiled vehicles prior to exit from the site; and

(vi) Informing staff and contractors about these precautions.

2. Portable Long Service Leave

From 1 January 2001, the Building and Construction Industry (Portable Long Service Leave) Levy must be paid prior to the issue of a development permit where one is required for the 'Building and Construction Industry'. This applies to Building Works, Operational Works and Plumbing and Drainage Works applications, as defined under the *Integrated Planning Act 1997*, where the works are $80 000 or more and matching the definition of 'Building and Construction Industry' under the *Building and Construction Industry (Portable Long Service Leave) Act 1991*.

Council will not be able to issue a decision notice without receipt of details that the levy has been paid. Should you require clarification in regard to the amendments to the *Building and Construction Industry (Portable Long Service Leave) Act 1991*, you should contact QLeave on 1800 803 481 (free call) or [redacted].

3. Cultural Heritage

The Cultural Heritage Branch of the Environmental Protection Agency advised Council in a letter dated 10 April 2003 that three (3) Queensland Estate sites were destroyed on land within the Bremer Business Park Area through site works associated with the establishment of the Capral Aluminium Extrusion Plant. Queensland Estate sites are protected under the *Cultural Record (Landscape Queensland and Queensland Estate) Act 1987*. The Act states that it is offence under section 56(2) to '...take, destroy, damage, deface, excavate, expose, conceal or interfere with an item of Queensland Estate', unless a person does so under the authority of the Act. As such, the developer is reminded of its responsibilities under the Act.

4. Mining

The land to which this approval relates may have been worked by underground coal mining operations. Council, and its servants and agents, accept no liability or responsibility for any loss or damage to person or property of whatever nature or however caused as the direct or indirect consequence of the g ranting of the approval herein contained. Such approval has

been granted at the request of the developer and in reliance of information submitted by the developer in support thereof.

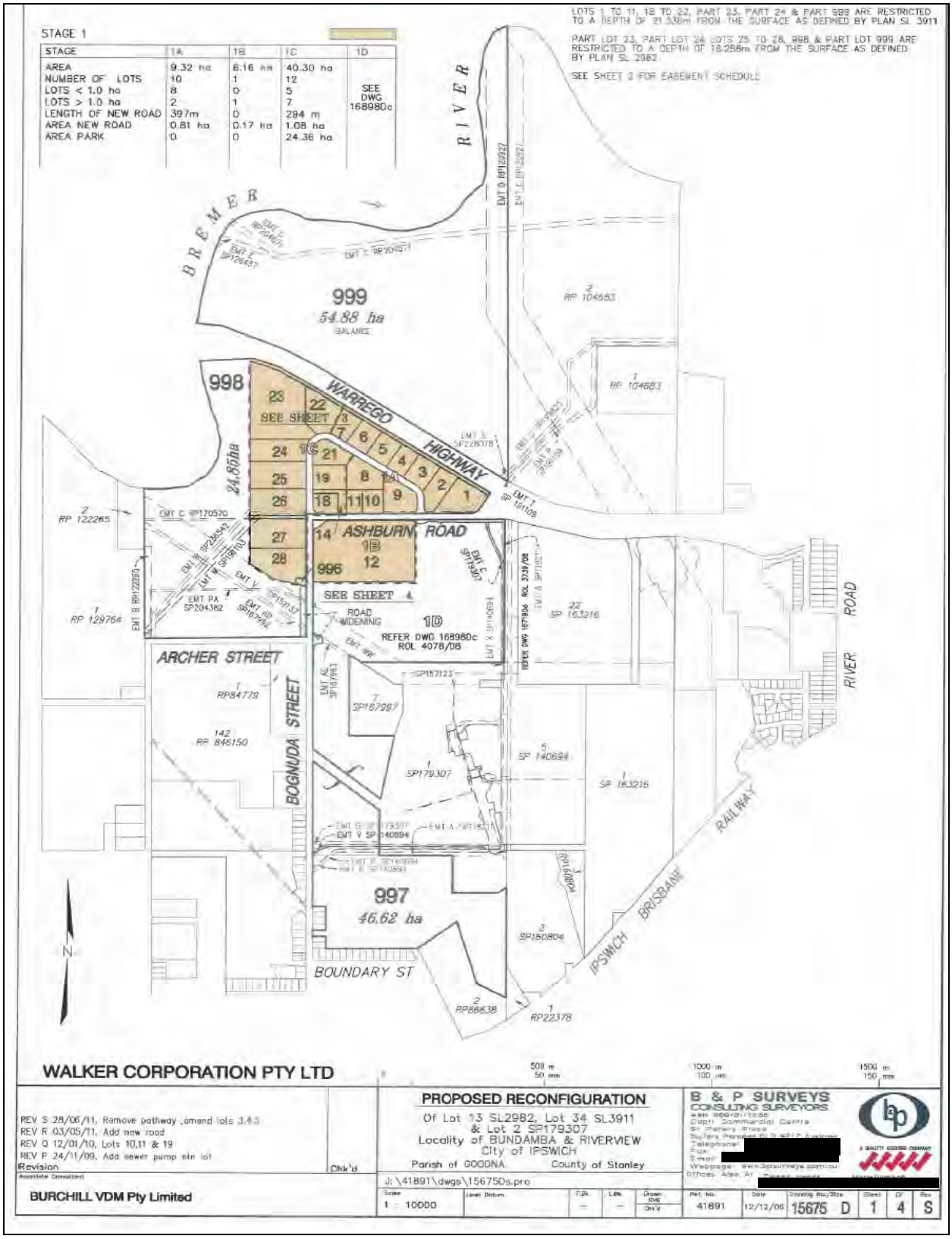
There were properly made submissions received with respect to this application

Pursuant to the provisions of the *Integrated Planning Act 1997*, I also enclose herewith a copy of Section 4.1.27 concerning the institution of an appeal.

Yours faithfully

Brendan Nelson
DEVELOPMENT MANAGER

Approved Plan (as per minor alteration dated 26 July 2011)



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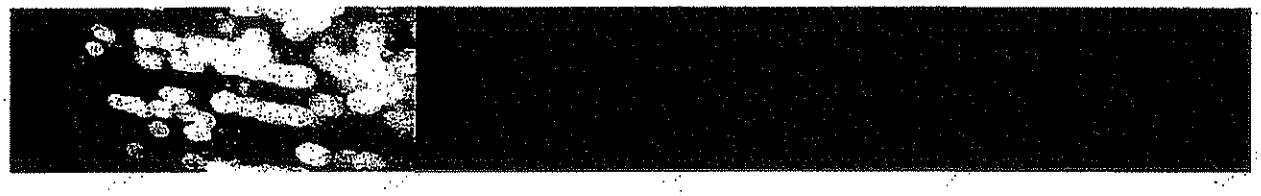
Shaping the Future



BREMER BUSINESS PARK MASTERPLAN

Flooding Investigation

March 2007
Job No. J8714/R3

Walker Corporation Pty Limited

DataWorks Document Number: 2349971

Cardno LawsonTreloar

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Version	Date	Author		Reviewer		Approved	
		Name	Initials	Name	Initials	Name	Initials
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1. INTRODUCTION

This master plan flooding report has been prepared by Cardno Lawson Treloar (CLT), specialist hydrologic and hydraulic consultants, for the overall master plan of the proposed Bremer Business Park located off the Warrego Highway at Bundamba in Ipswich City. This report has been completed for Walker Corporation Pty Limited (WCL), the project managers of the proposed development. The report provides advice in relation to flood management, including identification and management of key constraints for the development.

The site is located on both sides of the Warrego Highway downstream of the highway crossing of the Bremer River. The Real Property description of the Site includes Lot 13 on SL2982, Lot 34 on SL3911, Lot 1 on RP22378, Lot 1 on RP22385, Lot 1 on RP84779, Lot3 on RP86838, Lots 1, 4, 5 and 6 on RP101430. Lot 1 on RP 125443, Lot 3 on RP132087, Lot 1 on RP854996, Lot 2 on RP854997, Lots 1 and 142 on RP846150, Lot 5 on SP140694, Lots 1 and 22 on SP163216 and Lots 7 and 8 on SP167997. The site location and extents are shown on Figure 1.

This overall development received preliminary approval for a Material Change of Use from Ipswich City Council on 6 July 2004. The overall site Concept Master Plan for Stormwater Quality Management was prepared by Sinclair Knight Merz (12/09/03), in support of the preliminary MCU application.

The current overall site staging plan has been prepared by Burchhill VDM and is included as a reference drawing to this report.

This report details the masterplan flood assessment of the proposed Bremer Business Park in accordance with Ipswich City Council's (ICC's) 'Ipswich Planning Scheme' (April 2004) in support of the overall proposed development. As part of future applications additional flood assessments will be provided to Council ensure that the Planning Scheme, Conditions of Development and the Memorandum of Understanding are achieved.

2. THE EXISTING SITE AND PROPOSED DEVELOPMENT

2.1 Existing Site Description

The overall site is approximately 374ha in area and is bordered by the Bremer River to the north, the Ipswich Railway line and Brisbane Road to the south, River Road to the west and existing residential. The majority of the site is currently cleared, and was until recently used for cattle grazing over a portion with a separate potion used for effluent disposal for the Australian Hardboards Limited (AHL) operations. The site also encompasses the Bundamba substation and the AHL factories. Details are shown on Figure 1.

As part of the Australian Hardboards effluent disposal the site also includes a number of existing dam and drainage channels. These have been recently decommissioned with the installation of an effluent treatment plant for the Australian Hardboards effluent.

There are two main gullies that traverse the site, along the western and eastern boundaries of the site. Both gullies drain under the highway and flow to the Bremer River located at the sites boundary. The site has with a gentle ridge running south-east to north-west. Figure 2 shows the local catchment details.

There are several significant external local catchments draining through the site. Back-up flooding from the Brisbane River dominates design flood levels.

2.2 The Proposed Development

The proposed development comprises a mix of industrial allotments ranging in size from around 2000m^2 to about 120,000 m^2, including new roadway to be constructed. It is also proposed to develop additional residential lots within the south west corner of the site.

Access to the site will be from Brisbane Road to the south, Warrego Highway and Bognuda Street.

Some filling is required to achieve ARI 100 year flood immunity for the lots during the major river flood event. It is proposed to maintain the existing natural gullies on site and provide any appropriate detention and stabilisation works to ensure no adverse impact occurs.

3. DATA

The flood assessment has been based on:

- Detailed Site survey data provided by Walker Corporation Pty Limited.
- Laser Survey of the surrounding the site supplied by Terranean Mapping Technologies;
- 1m Contour information, digital orthophotos and property data supplied by Ipswich City Council;
- Masterplan layout supplied by Burchill VDM; and
- Sinclair Knight Merz (SKM) one-dimensional MIKE 11 (Danish Hydraulic Institutes (DHI's) dynamic model of the major creeks and rivers within the Ipswich City Council district.

4. PREVIOUS FLOOD INVESTIGATIONS

ICC commissioned SKM to carry out a hydraulic investigation of the major creeks and rivers within the Ipswich City Council district. The hydraulic assessment was undertaken using DHI's dynamic one-dimensional MIKE 11 model (version 1999b). Both existing and ultimate flow cases were modelled with calibration of the model to historic data. It also investigated both local and regional (Brisbane River) flooding.

Details of the modelling are presented in the report prepared by SKM *'Ipswich Rivers Flood Studies Phase One and Phase Two'* (July 2000). Since the release of this report ICC has recommended that the 50 year ARI discharge and levels presented in the report be adopted as the 100 year ARI, due to updates in the Brisbane River assessment also completed by SKM for Brisbane City Council (BCC).

From the MIKE11 Model, the Brisbane River flooding dominates the 100 year ARI flood levels in the Bremer River and Bundamba Creek within the site extent. The design 100 year ARI flood level for the site is RL16.22mAHD.. Fill levels will be greater than this to ensure appropriate freeboard is maintained.

5. APPROACH

5.1 Local Hydrologic Assessment

The hydrologic analysis has been undertaken using the Watershed Bounded Network Model (WBNM) 2003 Version 103. WBNM is a non-linear runoff routing software package produced by the University of Wollongong in New South Wales. WBNM has been used in accordance with Council's *'Planning Scheme'* (2004), *'Queensland Urban Drainage Manual'* (1994) and *'Australian Rainfall and Runoff'* (1998).

A hydrologic model has been set up to include the site and external catchments. The total catchment and sub-catchment extents were determined from the supplied aerial survey and the 1:25000 topographic maps, produced by the Queensland Department of Lands. The WBNM model layout and sub-catchment boundaries are shown in Figure 3.

The WBNM model was used to assess the impacts of the proposed Bremer Business Park development on the peak flows discharging from the site for a full range of Average Recurrence Intervals (ARIs) (2 to 100 years) and for a range of durations.

The hydrologic modelling considers the following scenarios:

- **Pre-Development:** This scenario assumes that the catchments external to the site are fully developed as allowed in Council's Planning Scheme, with no mitigation of flows. The site catchments were assumed to be undeveloped.
- **Post-Development:** External catchments were assumed to have the same development as for pre-development scenario. The site land use was modified to include the proposed development and catchment boundaries modified to account for the proposed site drainage. Details are shown in Figure 4.
- **Mitigation:** This scenario is based on the post-development scenario, and includes detention basins sized to attenuate the increase in flows resulting from the site development.

The initial and continuing losses adopted for the WBNM model are shown in Table 9-1. A catchment lag of m = 1.8 was adopted for all ARI events.

Table 5-1 Adopted WBNM Parameters

ARI (years)	Pervious		Impervious	
	Initial Loss (mm)	Continuing Loss (mm/hr)	Initial Loss (mm)	Continuing Loss (mm/hr)
2, 5	5	2.5	0	0
10, 20	5	2.5	0	0
50, 100	2	2.5	0	0

Developed site catchment boundaries are shown on Figure 2. The adopted fraction imperviousness and C_{10} value for each land use is listed in Table 5-2. The fraction impervious and C_{10} values were adopted from QUDM.

Table 5-2 Runoff Coefficient and Fraction Impervious for WBNM Land Uses

Land Use Category	C_{10}	Fraction Impervious (%)
Open space	0.7	5
Business and Industry	0.88	95
Regional Business and Industrial Investigation	0.86	80
Residential High Density	0.86	75
Residential Medium Density	0.83	50
Residential Low Density	0.79	30
Special Use	0.88	95

5.2 Regional Hydraulic Assessment

Hydraulic analysis has been performed to determine peak flood levels for the site and to ensure development on the site will remain flood free and not adversely impact on other properties in accordance with the appropriate Local Authority design standards.

The hydraulic assessment has been undertaken using WL| Delft Hydraulics SOBEK 1D/2D (Version 2.10.03) flood model. SOBEK has been used in accordance with ICC's '*Ipswich Planning Scheme*' (April 2004), and '*Queensland Urban Drainage Manual*' (1994).

Two flood events have been tested to assess the potential impact of the proposed master plan development, these cases are:

- Bremer River Flooding; and
- Brisbane River Flooding.

Both cases were tested with the following scenarios:

- **Existing Case:** This case models the site and surrounds in its existing condition. Figure 4 presents the model extent and the existing case topography.
- **Master Plan Developed Case:** This case is based on the Existing Case and includes filling for the proposed Bremer Business Park Development above the 100 year ARI event. Figure 5 presents the master plan topography.

The upstream and downstream boundaries for the SOBEK model have been taken from the SKM's MIKE11 Model (version 1999b) of the Bremer River area. Table 5-3 below presents the corresponding MIKE11 cross-section to the SOBEK boundary. Details of the boundary locations are shown on Figure 4.

Table 5-3Boundary Locations and Peak Values

SOBEK 2D Boundary ID	MIKE11 Cross-section chainage	Type of Boundary	Peak Value from MIKE11 Model (100Ultimate)	
			Brisbane River Flood	Bremer River Flood
SCH	SCH 13055	Discharge	$62m^3/s$	$34m^3/s$
BREM	BREM 1018565	Discharge	$2781m^3/s$	$2556m^3/s$
BUND	BUND 38501.25	Discharge	$243m^3/s$	$240m^3/s$
Tailwater	BREM 1028190	Water Surface Level	16.215mAHD	8.501mAHD

The roughness maps for both Existing and Masterplan Developed cases were based on aerial photographs supplied by Ipswich City Council.

The existing case was calibrated to the results presented in the report prepared by SKM *'Ipswich Rivers Flood Studies Phase One and Phase Two'* (July 2000).

The 5 to 100 year ARI 18 hour duration was run for the Bremer River Flood Assessment and 10 to 100 year ARI 30 hour duration was run for the Brisbane River Flood Assessment. This was in accordance with the ARI and durations completed as part of the SKM assessments.

6. RESULTS

6.1 Local Hydrologic Assessment

6.1.1 WBNM Predicted Peak Flows

The predicted peak flows discharging into the Bremer River for the pre-development, post-development and mitigation scenarios are presented in Tables 6-1 and 6-2.

Table 6-1 WBNM Predicted Peak Flows Western Tributary

ARI (Years)	Western Tributary (Node B12)										
	Pre-Developed			Post-Developed			Mitigated			Impact (Exist to Prop) (m^3/s)	Impact (Exist to Mit) (m^3/s)
	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)		
1	13.98	60	52	24.46	60	39	13.85	60	65	10.48	-0.13
2	19.72	60	50	32.68	60	38	18.67	60	64	12.96	-1.06
5	28.31	60	48	44.81	60	37	25.70	60	62	16.51	-2.61
10	33.88	60	47	52.57	60	36	28.95	60	63	18.69	-4.92
20	41.51	60	46	63.02	60	36	33.01	60	63	21.51	-8.50
50	52.65	60	45	75.61	60	36	38.51	60	64	22.96	-14.14
100	61.17	60	45	86.89	60	35	42.83	60	65	25.72	-18.34

The discharge estimates into the Bremer River from the western catchment indicate that the proposed development is predicted to increase the flows; hence a mitigation basin is required. Details of the mitigation basin are included below in Section 6.1.2. The modelling indicates with the proposed basin the peak flows are predicted to not increase into the Bremer River.

As part of the detailed design a detailed hydraulic model and sediment analysis will determine the stability of the creek. This will identify areas that require stabilisation or reshaping or detention basins or a combination of each.

Table 6-2 WBNM Predicted Peak Flows Eastern Tributary

ARI (Years)	Eastern Tributary (Node A9)										
	Pre-Developed			Post-Developed			Mitigated			Impact (Exist to Prop) (m^3/s)	Impact (Exist to Mit) (m^3/s)
	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)		
1	14.27	120	107	14.14	120	105	14.14	120	105	-0.13	-0.13
2	19.63	120	102	19.44	120	98	19.44	120	98	-0.20	-0.20
5	27.80	120	97	27.51	120	96	27.51	120	96	-0.29	-0.29
10	33.15	90	86	32.72	120	95	32.72	120	95	-0.42	-0.42
20	40.48	90	85	39.94	90	83	39.94	90	83	-0.54	-0.54
50	51.29	90	84	50.69	90	82	50.69	90	82	-0.60	-0.60
100	59.64	90	83	58.97	90	81	58.97	90	81	-0.67	-0.67

The predicted peak flows discharging into the Bremer River from the eastern catchment indicate that the proposed development is not anticipated to increase the peak flows within the tributary. This is due to a change in the timing of the hydrographs.

Hence a basin is not proposed within this catchment, however stabilisation works will be undertaken to meet the requirements of the Memorandum of Understanding to ensure the banks are stable and no impact will occur. These works will be fully contained within the creek systems and details of the works will be part of future applications. Additional analysis and detailed hydraulic and bed shear assessment will be undertake to ensure this design requirement is obtained for all subsequent stage applications.

6.1.2 Basin Details

For the masterplan assessment a single basin, located at the downstream extents of the site, has been assumed. This presents an engineered masterplan solution, as the detail design continues within the site, and it is proposed to break up the storage of the basin throughout the catchment. The possible future basin locations are presented on Figure 3 and will be analysed as part of the detailed design for future stages. The storage volume requirement to mitigate the peak flows is listed in Table 6-3.

Table 6-3 Required Stage Storage Relationship

ARI (yrs)	Depth (m)	Volume (m^3)
2	0.80	46600
5	0.98	61000
10	1.05	70700
20	1.14	84900
50	1.25	105000
100	1.34	121400

6.2 Regional Hydraulic Assessment

Figure 6 shows the reporting points within the SOBEK 2D model to assess the impact of the proposed masterplan development.

Both the Bremer River Flood and Brisbane River Flood Existing Case Water Surface levels are similar to those presented in SKM's flooding report for ICC; with a maximum difference of 5mm. Thus the SOBEK 2D model is a suitable to assess the proposed changes to the site.

Table 6-4 details the predicted peak water surface levels and impacts associated with the proposed masterplan development for Bremer Brisbane River Flood Case.

Table 6-4 Predicted Peak 100 year ARI Water Surface Levels – Brisbane River Flood

SOBEK 2D Reporting ID	Water Surface Level (mAHD)		Impact (cm)
	Existing Case	Masterplan Developed Case	
A	16.22	16.22	0
B	16.22	16.22	0
C	16.22	16.22	0
D	16.22	16.22	0

Appendix A contains plots of the predicted Brisbane River peak water surface levels and depths for the Existing Case. Appendix B contains plots of the predicted Brisbane River peak water surface levels and depths associated with the proposed master plan. Appendix C contains the impact plots figures for each ARI for the Brisbane River event.

Table 6-4 details the predicted peak water surface levels and impacts associated with the proposed masterplan development for Brisbane River Flood Case.

Table 6-5 Predicted Peak 100 year ARI Water Surface Levels – Bremer River Flood

SOBEK 2D Reporting ID	Water Surface Level (mAHD)		Impact (cm)
	Existing Case	Masterplan Developed Case	
A	11.97	11.97	0
B	12.76	12.76	0
C	10.99	10.99	0
D	8.63	8.63	0

Appendix D contains plots of the predicted Bremer River peak water surface levels and depths for the Existing Case. Appendix E contains plots of the predicted Bremer River peak water surface levels and depths associated with the proposed master plan. Appendix F contains impact plots figures for each ARI for the Bremer River event.

The results presented in this report indicate that the proposed master plan filling will not adversely impact on the flood levels external to the site.

7. FLOOD COMPLIANCE

7.1 Ipswich City Council Planning Scheme

7.1.1 Section 11.4.7.(1)

(b) Land Situated Below the 1 in 20 Development Line - Commercial, Industrial and Other Non Residential Uses

(i) Where possible, the design and layout of buildings provides for-

(A) parking, or other low intensive, or non habitable uses at ground level; and

(B) retail, commercial and work areas above the parking areas, to increase flood immunity.

(ii) Expensive plant and equipment and stock are located in the area of the site or building with the greatest flood immunity.

(iii) Building materials used below the 1 in 20 development line are resistant to water damage.

(iv) Electrical installations are sited in the area of greatest flood immunity.

(v) Electrical installations below the 1 in 20 development line are designed and constructed to withstand submergence in flood water.

(vi) Access routes are designed or alternative emergency evacuation routes are provided so that in the event of a serious incident occupants can escape to a safe and secure area.

(vii) The concentration of people in flood affected areas, particularly within areas affected by significant flood flows (i.e. one metre or more in depth), is minimised.

(viii) Buildings are located to avoid areas affected by significant flood flows (i.e. one metre or more in depth), or alternatively, buildings are designed to be capable of withstanding the static and dynamic loads, including debris loads, applicable to a flood event of 1 in 100 Average Recurrence Interval (ARI).

(ix) Materials stored on-site-

(A) are those that are readily able to be moved in a flood event;

(B) are not hazardous or noxious, or comprise materials that may cause a deleterious effect on the environment if discharged in a flood event; and

(C) where capable of creating a safety hazard by being shifted by flood waters, are contained in order to minimise movement in times of flood.

(x) The development does not increase the flood hazard (e.g. by way of increased depth, duration or velocity of flood waters or a reduction in warning times) for other properties within a flood plain.

(xi) Filling of land below the 1 in 20 development line and the clearing of native vegetation within the stream banks are avoided.

(d) Land Situated Between the 1 in 20 Development Line and the 1 in 100 Flood Line - Commercial, Industrial and Other Non Residential Uses

(i) Where possible, the design and layout of buildings provides for-

(A) parking, or other low intensive, or non habitable uses at ground level; and

(B) retail, commercial and work areas above the parking areas, to increase flood immunity.

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(ii) Expensive plant and equipment and stock are located in the area of the site or building with the greatest flood immunity.

(iii) Building materials used below the adopted flood level are resistant to water damage.

(iv) Access routes are designed or alternative emergency evacuation routes are provided so that in the event of a serious incident occupants can escape to a safe and secure area.

(v) Buildings are located to avoid areas affected by significant flood flows (i.e. one metre or more in depth), or alternatively, buildings are designed to be capable of withstanding the static and dynamic loads, including debris loads, applicable to a flood event of 1 in 100 Average Recurrence Interval (ARI).

(vi) Materials stored on-site-

(A) are those that are readily able to be moved in a flood event;

(B) are not hazardous or noxious, or comprise materials that may cause a deleterious effect on the environment if discharged in a flood event; and

(C) where capable of creating a safety hazard by being shifted by flood waters, are contained in order to minimise movement in times of flood.

(vii) The development does not increase the flood hazard (e.g. by way of increased depth, duration or velocity of flood waters or a reduction in warning times) for other properties within a flood plain.

(viii) Filling of land below the 1 in 100 flood level and the clearing of native vegetation within the stream banks are avoided.

The proposed Bremer Business Park will be filled to be above the 100 year ARI. The flood assessment has considered the influence of filling in the floodplain and the results presented in Section 6.2 and the appendices above indicate that no adverse flood impacts external to the site will occur.

7.1.2 Section 12.15.3

***(2)** The overall outcomes sought for the Earthworks Code are the following-*

(a) Earthworks ensure-

(i) there is no adverse impact to adjoining properties;

(ii) there is no adverse impact on flooding of upstream, downstream and adjoining land;

(iii) the visual character and amenity of the site and the surrounding area is not adversely affected;

(iv) there is no adverse impact to infrastructure or public utilities easements;

(v) natural landforms and drainage lines are maintained, where possible;

(vi) that land or water is not contaminated;

(vii) that the site is stable;

(viii) appropriate site access is provided from the road reserve to existing or future building envelopes; and

(ix) there is no environmental harm or nuisance created by way of the release of air pollutants, noise or removal of significant vegetation.

8) Specific Outcomes

(a) Earthworks are avoided below the adopted flood level.

(b) Earthworks -

(i) do not cause any increase in flooding or drainage problems;

(ii) do not cause an impediment to flood waters; or

(iii) do not adversely impact adjoining, upstream or down stream properties.

(c) Earthworks are avoided in natural gullies and overland flow paths.

The flood assessment has considered the influence of filling the floodplain and the results presented in Section 6.2 above indicate that no adverse flood impact external to the site will occur.

In general the natural flow paths will be maintained. Any minor modifications will maintain flood conveyance. Appropriate works will be undertaken with the gullies to ensure they are stable. Details of these works will be provided in future staged applications.

7.1.3 Planning Policy 2

Flooding and Stormwater Flow Paths

(8) if an application involving land which is subject to flooding or major stormwater flows, information and an assessment which identifies—

(a) the likely probability, depth, volume and velocity of flows (including the submission of relevant computer software model data files which are compatible with the Local Government's software to enable checking of data) across the site;

(b) the likely impact of the proposed development, including any associated earth works, both upstream and downstream from the site, particularly in terms of changes to the depth, duration or velocity of flood waters and the duration of warning time;

(c) likely impacts in terms of watercourse bank stability;

(d) preferred areas and non-preferred areas on site for various activities, based on the probability of inundation and the volume and velocity of flows;

(e) recommendations for—

(i) the use of flood resistant materials and construction techniques able to withstand relevant debris loads;

(ii) the location and height of means of ingress and egress, including possible flood escape routes;

(iii) the location and height of buildings, particularly habitable floor areas;

(iv) structural design, including the design of footings and foundations to take account of static and dynamic loads (including debris loads and any reduced bearing capacity owing to submerged soils);

(v) the location and design of plant and equipment, including electrical fittings;

(vi) the storage of materials which are likely to cause environmental harm if released as a result of inundation or stormwater flows;

(vii) the appropriate treatment of water supply and sanitation systems and other relevant infrastructure; and

(viii) relevant management practices, including flood warning and evacuation measures;

A detailed flood assessment has been completed and is detailed in the above report. This assessment indicates that the proposed filling associated with the Bremer Business Park will not cause any adverse impacts external to the site within the flood prone areas.

7.1.4 Planning Policy 3

All flood assessments have been undertaken in accordance with the provisions detailed in Planning Policy 3.

7.2 Development Application Negotiated Decision Notice

Ipswich City Council issued a development application negotiated decision notice on the 6 July 2004. The relevant details relating to the master plan flood assessments are as follows

18. *Stormwater*

(a) *The developer shall provide all necessary stormwater drainage (both internal and external to the development) and such drainage works (except for roofwater systems) shall be designed and constructed in accordance with QUDM such that the overall drainage system caters for a storm event with an ARI of 100 years.*

Overland flow paths shall be suitably designed to cater for the water from a storm event with an ARI of 100 years. In the case where the piped system is carrying part of the flow, the overland flow paths shall be designed to cater for that volume which is represented by the difference between the predicted volume from the storm event with an ARI of 100 years and the capacity of the pipe system, noting the requirements of QUDM.

This analysis will be met as part of the detailed engineering design as part of each stage.

(b) *All stormwater flows within and adjacent to the Bremer Business Park Area, other than inter-allotment drainage, shall be confined to dedicated roads, drainage reserves, registered drainage easements or within parkland. The registered drainage easements, if related to piped drainage, shall be centrally located over such underground pipe system and shall be not less than 4.0m wide, except for drainage easements required for side boundaries which may be 3.0m wide where approved by the Senior Development Engineer. In addition, the easements shall be of suitable width to contain the predicted overland flow from the storm event with an ARI of 100 years in that location.*

All stormwater up to the 100 year ARI is contained within the local drainage paths. Additional detailed will be provided as part of the detailed engineering design for each stage.

(c) *No ponding or redirection of stormwater shall occur onto adjoining land unless specifically approved by Council in consultation with the owner of the adjoining land.*

The flood assessment indicates no external adverse impact due to the proposed development.

(d) *Due consideration shall be given in these and future designs and construction of the development in relation to the effect of the developed catchment flows on*

the downstream discharge receival areas. Suitable stormwater control devices are to be provided to ensure that there is no increase in flows in watercourses. Such control devices are to be designed so as to integrate the landscaping, recreational, infrastructural and drainage roles of watercourses.

The modelling has assumed the upstream catchments are designed to the ultimate planning scheme without any mitigation. This ensures all drainage paths through the site that convey external catchments will convey the ultimate flow.

The predicted increases from the proposed development are proposed to be mitigated to existing conditions as detailed in Section 6. These will be fully integrated into the design as part of the future stage applications.

(e) *Each proposed residential, commercial and/or industrial allotment shall be designed to comply with QUDM, Council's standards and the New Ipswich City Planning Scheme, including unimpeded access to a road system which is also above the design flood level.*

The flood modelling has assumed that the proposed Bremer Business Park will be located above the 100 year ARI. The proposed filling to achieve this immunity is predicted to cause no adverse impact external to the site.

(f) *There shall be no filling or removal of material in the flood area below the flood level associated with an ARI of 100 years without the approval of the Senior Development Engineer. There shall be minimal disturbance to vegetation in the flood area, unless prior written approval is obtained from Council.*

It is proposed to include filling in the flood area below the flood level associated with an ARI 100 year event. Details of the predicted impacts are presented in this report for approval of the Senior Development Engineer.

(a) *Filling in proposed Lots, which are adjacent to the watercourse shown on the proposal plan, shall not be undertaken without the written approval of Council.*

It is proposed to include filling in the flood area below the flood level associated with an ARI 100 year event. Details of the predicted impacts are presented in this report for approval of the Senior Development Engineer.

7.3 Memorandum of Understanding

A 'Memorandum of Understanding' currently in DRAFT form is proposed to be signed between Walker Corporation Pty Ltd, Healthy Waterways, Ipswich City council and South East Queensland Catchments.

As part of this understanding the flood assessment has been undertaken to demonstrate to Council that the flood management will ensure that the watercourses remain stable or are stabilised and no adverse impact external to the site will occur.

8. CONCLUSIONS

Cardno Lawson Treloar (CLT) completed a full assessment of the flooding relating to the Bremer Business Park. This assessment has demonstrated for the master plan that an appropriate strategy has been adopted to ensure that the Council's Planning Scheme, the Development Approval Conditions and the Memorandum of understanding are achieved.

CLT have developed a local hydrologic flood model to detail the flood storage requirements to ensure no increase in peak flows into the Bremer River.

CLT has also developed a full 2D model, which is a sub-model of Ipswich City Council's full river system MIKE 11 model. The modelling indicates that impacts due to the proposed Bremer Business Park overall masterplan on peak flood levels are negligible.

9. REFERENCES

Ipswich City Council, April 2004, '*Ipswich Planning Scheme*'.

Neville Jones & Associates, 1994, '*Queensland Urban Drainage Manual*'.

Sinclair Knight Merz, July 2000, '*Ipswich Rivers Flood Studies Phase One and Phase Two*' Prepared for Ipswich City Council

10. QUALIFICATIONS

This report has been prepared by Cardno Lawson Treloar (CLT) specifically for Walker Corporation Pty Ltd and specifically to provide advice on Stormwater Management Planning for the overall masterplan of the proposed industrial development of Bremer Park.

Our analysis and overall approach has been specifically catered for the particular requirements of Walker Corporation Pty Ltd, and may not be applicable beyond this scope. For this reason any other third parties are not authorised to utilise this report without further input and advice from CLT.

CLT has relied on the following information provided by others:

- Detailed Site survey data provided by Walker Corporation Pty Limited.
- Laser Survey of the surrounding the site supplied by Terranean Mapping Technologies.
- 1m Contour information, digital orthophotos and property data supplied by Ipswich City Council.
- Masterplan layout supplied by Burchill VDM
- Sinclair Knight Merz (SKM) one-dimensional MIKE 11 (Danish Hydraulic Institutes (DHI's) dynamic) model of the major creeks and rivers within the Ipswich City Council district.

The accuracy of the report is dependent upon the accuracy of this information.

While CLT's report accurately assesses peak flows from design storms in accordance with current industry design standards and guidelines. The flow data used in this assessment is based on the information provided by the Ipswich City Council. It is recognised that these design flows are based on limited historic calibrations in the vicinity of the site. As such, future flood levels may vary from those predicted.

FIGURES

Figure 1 Site Location

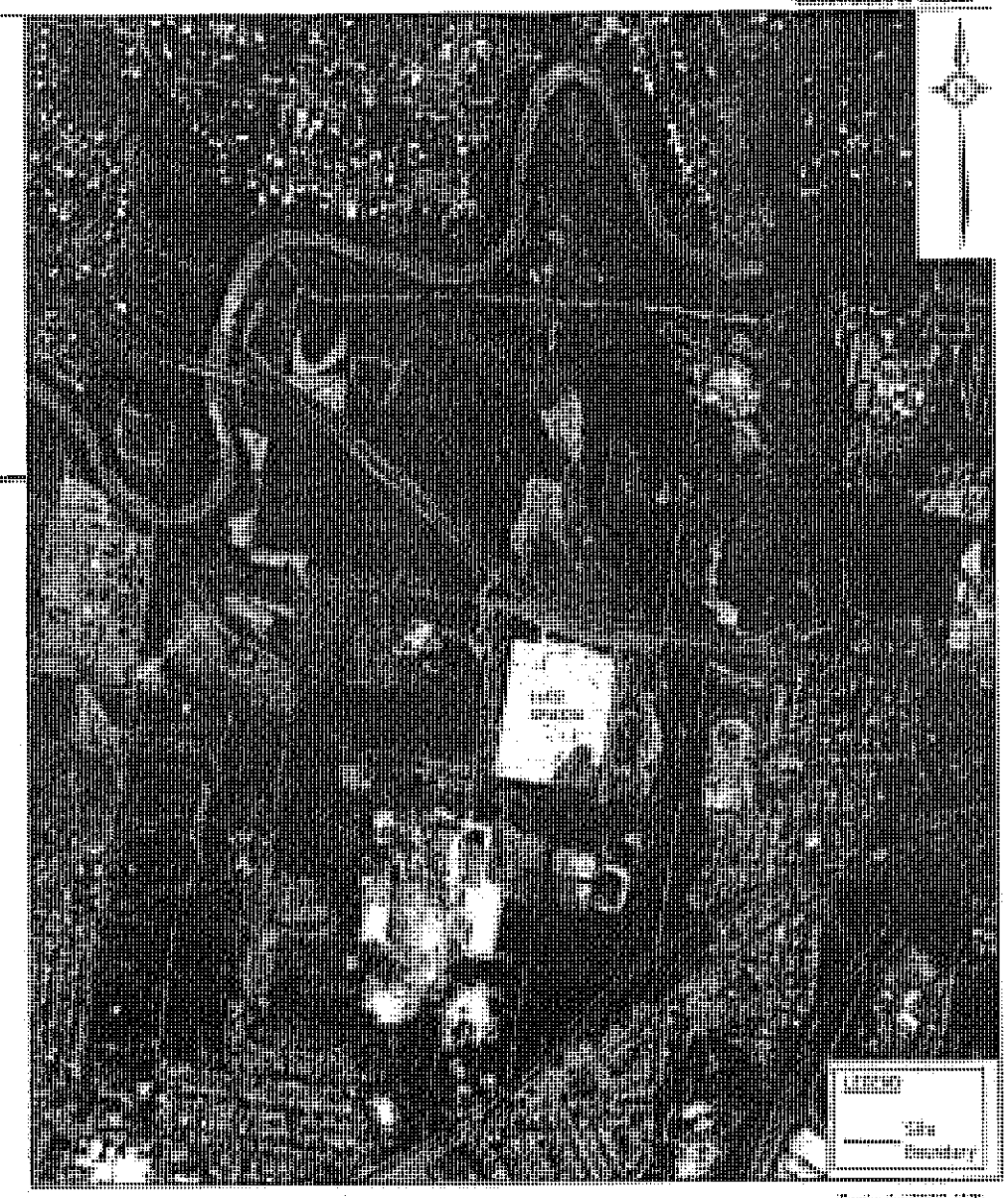
Figure 2 Pre-Developed WBNM Catchment Delineation

Figure 3 Post-Developed WBNM Catchment Delineation

Figure 4 SOBEK 2D Model Extent and Existing Topography

Figure 5 SOBEK 2D Masterplan Developed Topography

Figure 6 SOBEK 2D Reporting Points



0.5 0 0.5 1.0 1.5 2.0 2.5km
1:50,000

150 0 150 300 450 600 750m
1:15,000

Scale 1:15000 (A3)

FIGURE 1
SITE LOCATION

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Rev: 0 Date: February 2007

Walker Corporation Pty Limited

DataWorks Document Number: 2349971

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Rev: Orig. Date: March 2007

Walker Corporation Pty Limited

CAD FILE: O:\WorkLAT\J8714\Figures\WBNM\WBNMFigure.dwg
XREF's: J632-01-SKMA; xr-Cont-Ins

150 0 150 300 450 600 750m
1:15,000

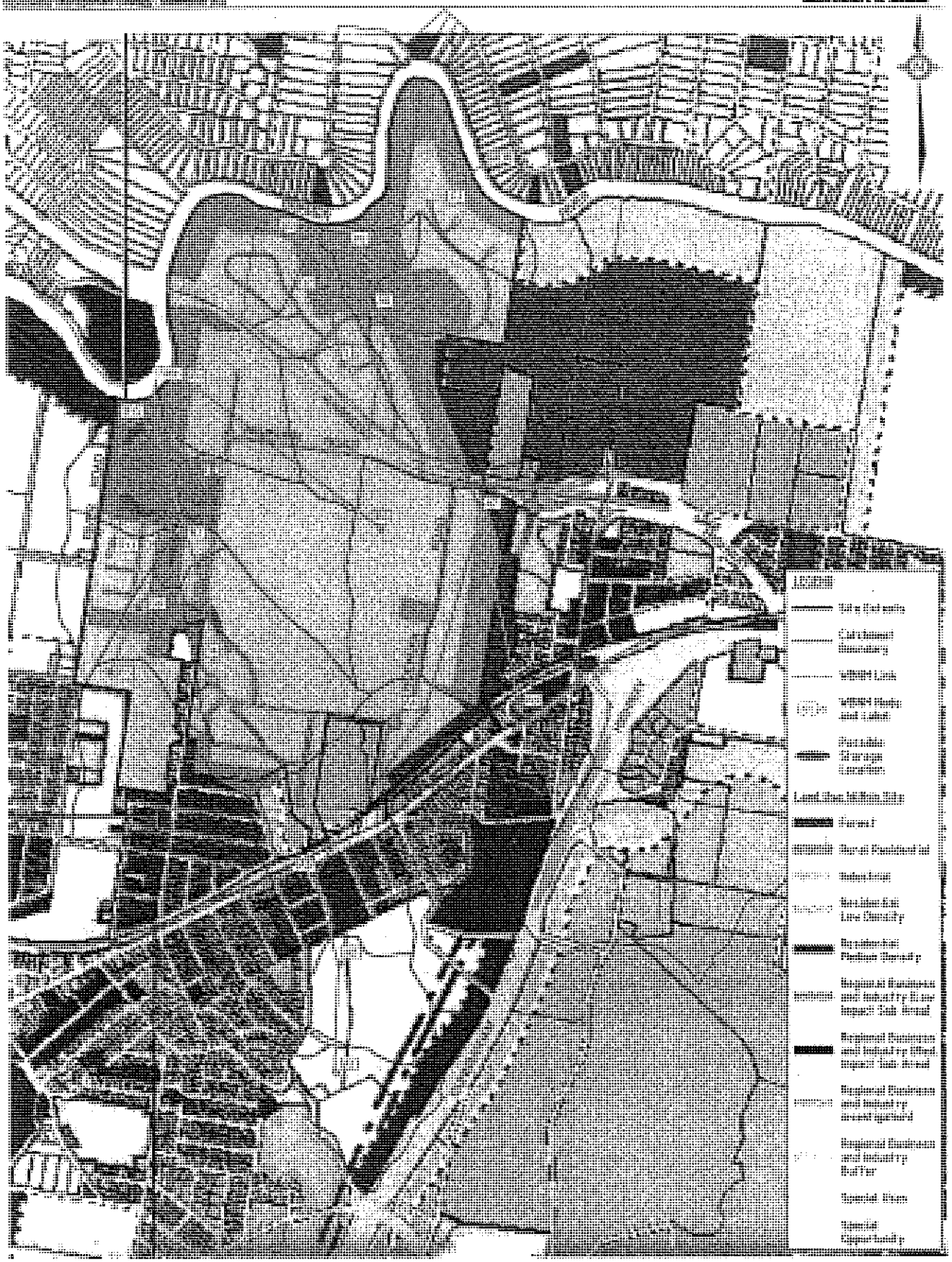
Scale 1:15000 (A3)

FIGURE 2

PRE DEVELOPED WBNM MODEL CATCHMENT DELINEATION

Project No.: J8714

PRINT DATE: 26 March, 2007 - 1:15pm



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150 0 150 300 450 600 750m
1:15,000

Scale 1:15000 (A3)

FIGURE 3

POST - DEVELOPED WBNM MODEL CATCHMENT DELINIATION

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Project No.: J8714

Walker Corporation Pty Limited

Cardno Lawson Treloar

LEGEND

Site Boundary

SCH SOBEK Boundary Locations

ELEVATION (mAHD)

- Above 20.00
- 17.00 to 20.00
- 16.00 to 17.00
- 15.00 to 16.00
- 14.00 to 15.00
- 13.00 to 14.00
- 12.00 to 13.00
- 11.00 to 12.00
- 10.00 to 11.00
- 7.50 to 10.00
- 5.00 to 7.50
- 0.00 to 5.00
- -5.00 to 0.00
- Below -5.00

250 0 250 500 750 1000 1250m
1:25,000

Scale 1:25000 (A3)

FIGURE 4

SOBEK 2D MODEL EXTENT AND EXISTING TOPOGRAPHY (CASE E02e)

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Rev: 0 Date: February 2007

Walker Corporation Pty Ltd

Project No.: J8714

PRINT DATE: 16 March, 2007 - 9:31pm

DataWorks Document Number: 2349971

Bremer Business Park
Flooding Investigation - Masterplan (R3)

Cardno Lawson Treloar

LEGEND

Site Boundary

Fill Extent Boundary

A Reporting Points

ELEVATION (mAHD)

- Above 20.00
- 17.00 to 20.00
- 16.00 to 17.00
- 15.00 to 16.00
- 14.00 to 15.00
- 13.00 to 14.00
- 12.00 to 13.00
- 11.00 to 12.00
- 10.00 to 11.00
- 7.50 to 10.00
- 5.00 to 7.50
- 0.00 to 5.00
- -5.00 to 0.00
- Below -5.00

150 0 150 300 450 600 750m 1:15,000

Scale 1:15000 (A3)

FIGURE 5

SOBEK 2D MASTERPLAN DEVELOPED TOPOGRAPHY

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Rev: 0 Date: February 2007

Walker Corporation Pty Ltd

Project No.: J6714

PRINT DATE 28 March, 2007 - 2:32pm

DataWorks Document Number: 2349971

Bremer Business Park
Flooding Investigation - Masterplan (R3)

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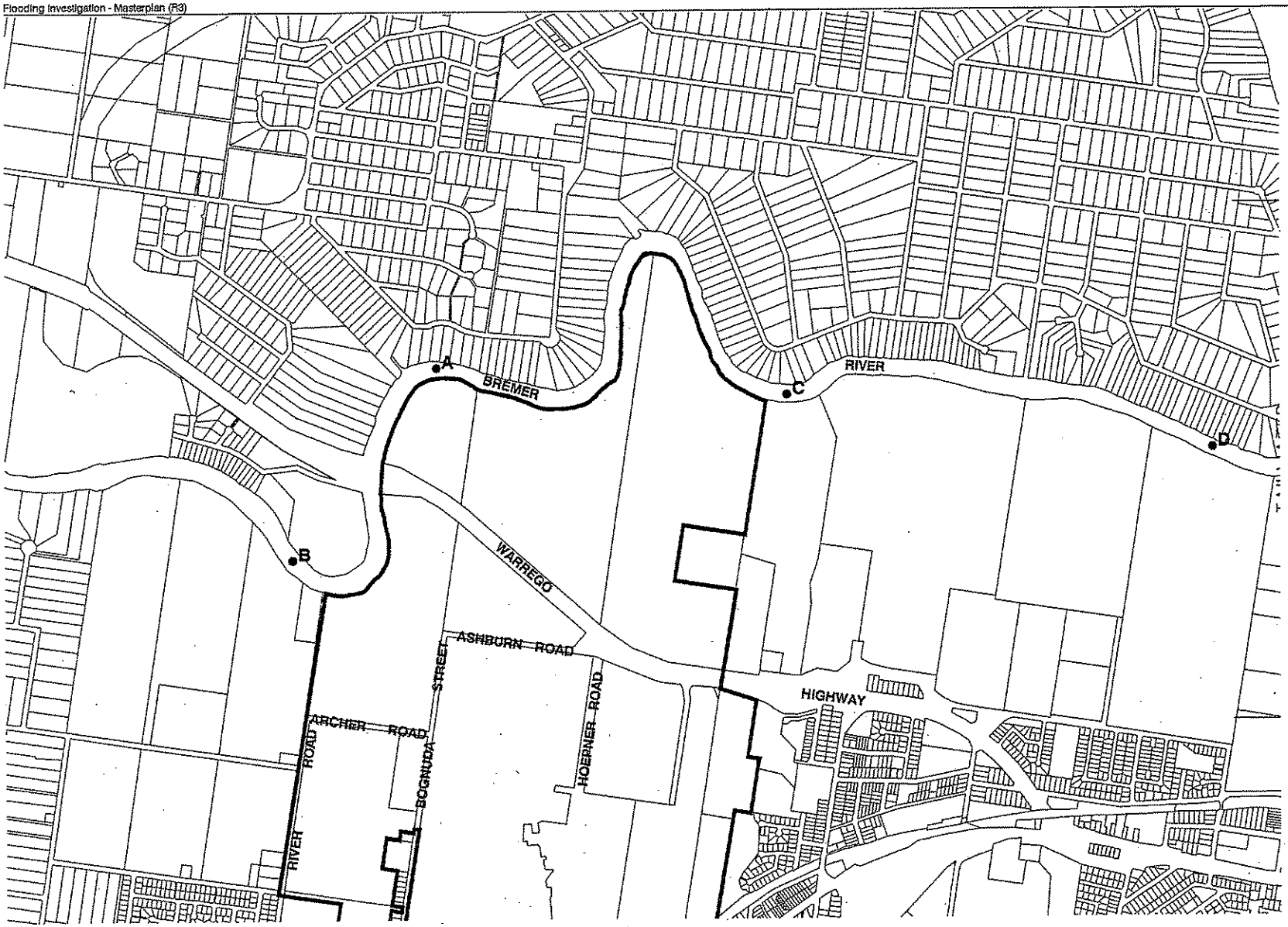

LEGEND

Site Boundary

A Reporting Points

150 0 150 300 450 600 750m 1:15,000

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Scale 1:15000 (A3)

FIGURE 6

SOBEK 2D REPORTING POINTS

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Project No.: J8714

Walker Corporation Pty Ltd

DataWorks Document Number: 2349971

REFERENCE DRAWINGS

DataWorks Document Number: 2349971

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STORMWATER DRAINAGE MANAGEMENT SCHEMATIC

SCALE 50 0 50 100 150 200 250 (metres)
1 : 5000 (FULL SIZE)

A ● PROPOSED WATER QUALITY MONITORING LOCATIONS

THIS DRAWING HAS BEEN PREPARED FOR PRELIMINARY PLANNING AND DISCUSSION PURPOSES ONLY, AND IS SUBJECT TO SURVEY, GEOTECHNICAL INVESTIGATION, AUTHORITY APPROVALS AND DETAILED DESIGN.

Prepared for

Walker

Walker Corporation Pty Limited

PROPOSED SUBDIVISION AT BREMER INDUSTRIAL PARK - IPSWICH

PRELIMINARY CONCEPT - DECEMBER 2006

DWG No. C3632:00:Sk.18A

BURCHILL VDM PTY LIMITED
ACN 010 140 466
CIVIL & STRUCTURAL CONSULTING ENGINEERS & PLANNERS
Evandale Place, 142 Blundell Road
Surfers Paradise, Qld. 4217
Phone
Fax
Email
Member of the VDM GROUP

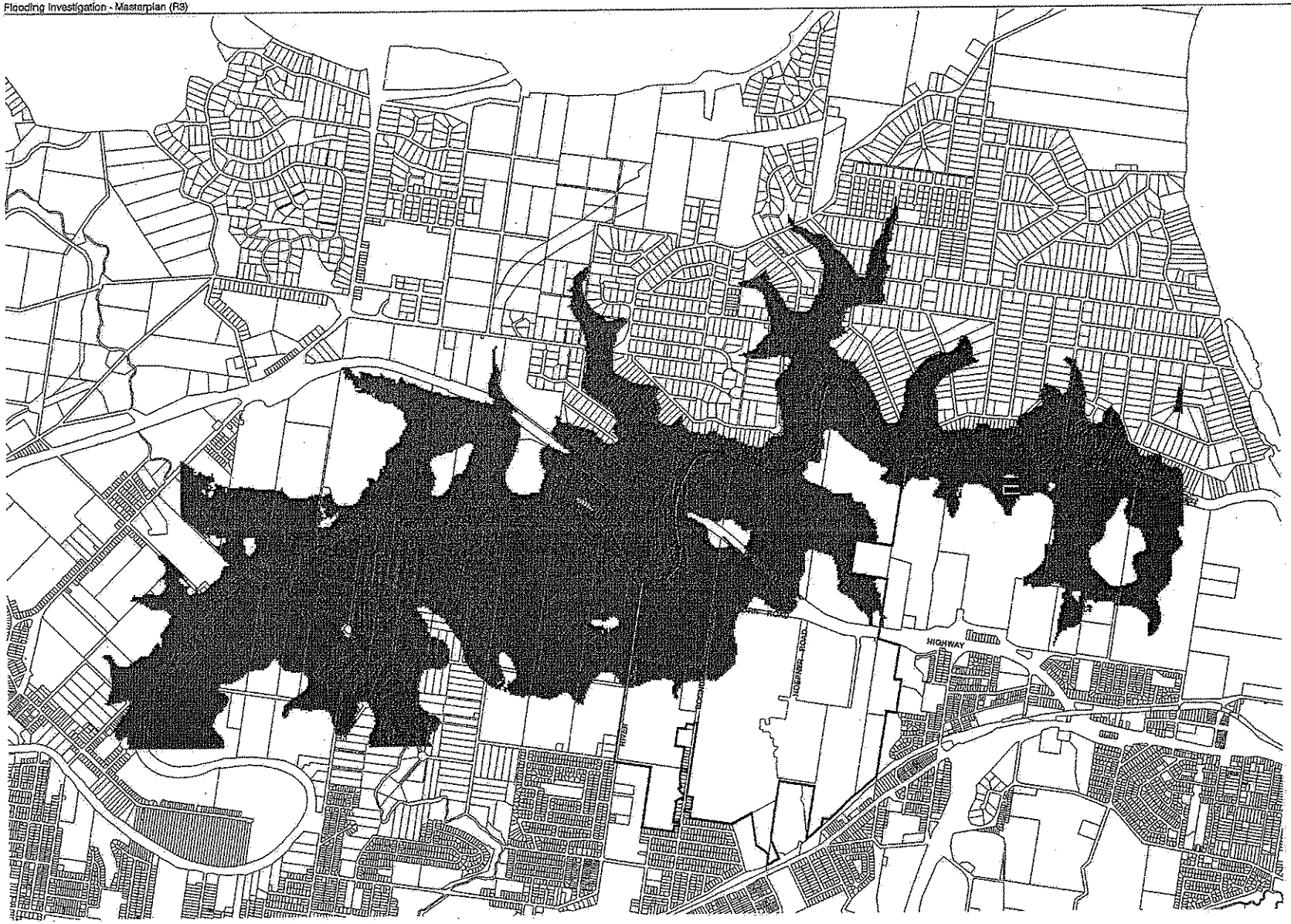
DataWorks Document Number: 2349971

APPENDIX A

Brisbane River Flood SOBEK 2D Existing Case Results

Bremer Business Park
Flooding Investigation - Masterplan (R3)

Cardno Lawson Treloar



LEGEND

Site Boundary

VELOCITIES

1m/s

WATER SURFACE LEVELS (mAHD)

- Above 17.80
- 17.60 to 17.80
- 17.40 to 17.60
- 17.20 to 17.40
- 17.00 to 17.20
- 16.80 to 17.00
- 16.60 to 16.80
- 16.40 to 16.60
- 16.20 to 16.40
- 16.00 to 16.20
- 5.00 to 16.00
- 0.00 to 5.00
- -5.00 to 0.00
- Below -5.00

250 0 250 500 750 1000 1250m
1:25,000

Scale 1:25000 (A3)

FIGURE A.1

BRISBANE RIVER FLOODING - EXISTING CASE - 100 YEAR ARI WATER SURFACE LEVELS (CASE E02e)

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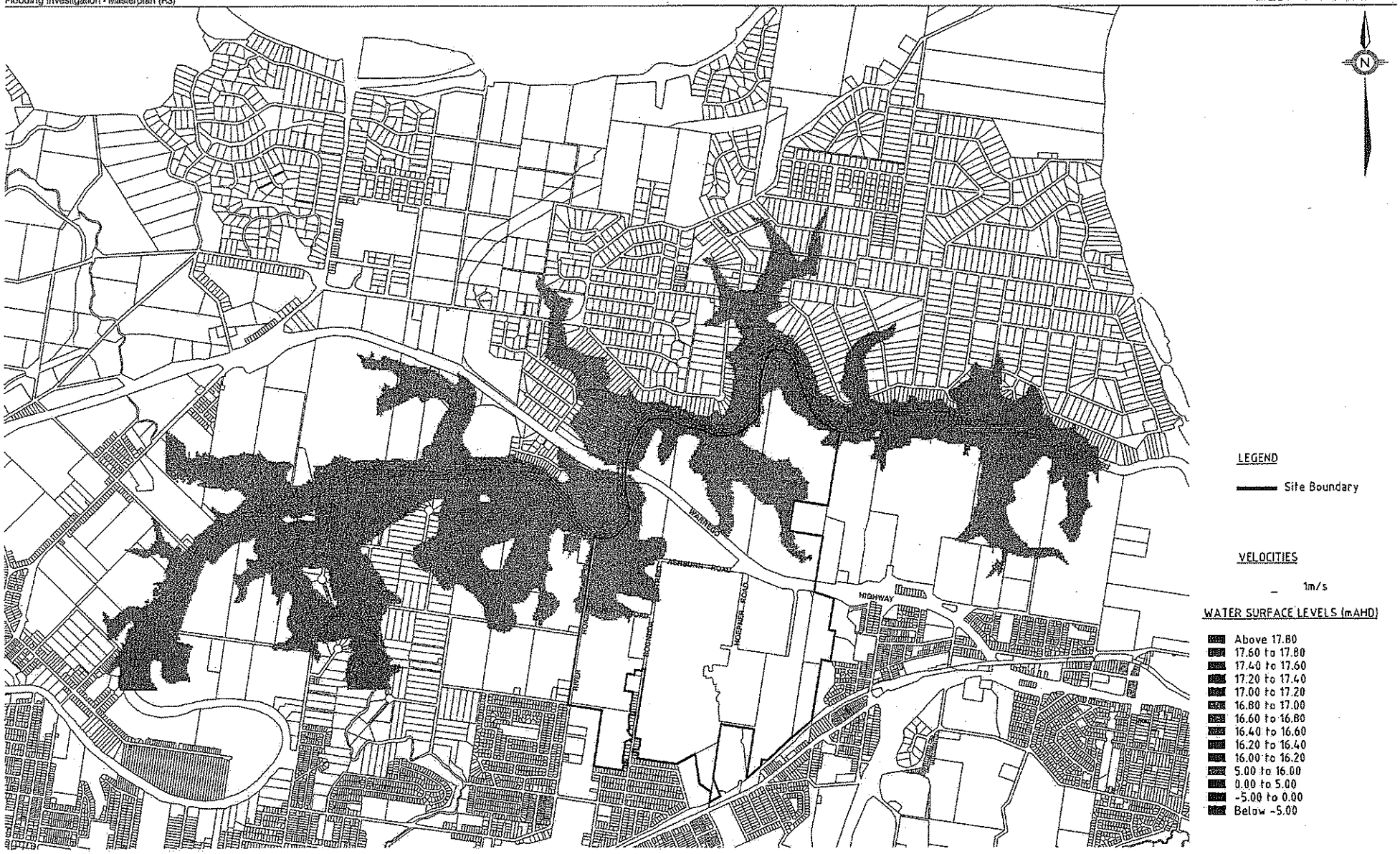

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Scale 1:25000 (A3)

FIGURE A.2

BRISBANE RIVER FLOODING - EXISTING CASE - 50 YEAR ARI WATER SURFACE LEVELS (CASE E02e)

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DataWorks Document Number: 2349971

Bremer Business Park
Flooding Investigation - Masterplan (R3)

Cardno Lawson Treloar

Scale 1:25000 (A3)

FIGURE A.3

BRISBANE RIVER FLOODING - EXISTING CASE - 20 YEAR ARI WATER SURFACE LEVELS (CASE E02e)

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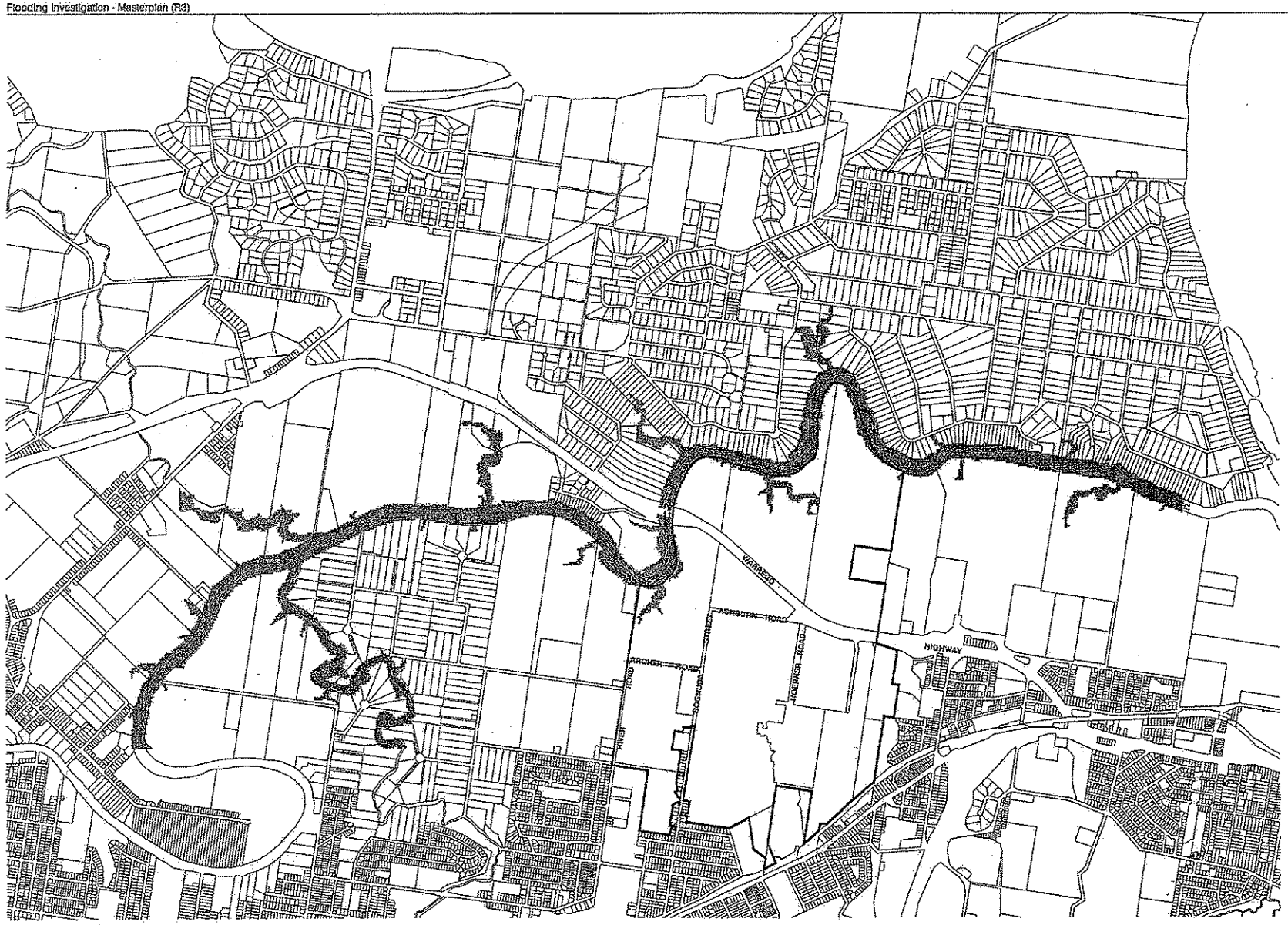
Project No.: J8714

Walker Corporation Pty Ltd

DataWorks Document Number: 2349971

Bremer Business Park
Flooding Investigation - Masterplan (R3)

Cardno Lawson Treloar



LEGEND

Site Boundary

VELOCITIES

1m/s

WATER SURFACE LEVELS (mAHD)

- Above 17.80
- 17.60 to 17.80
- 17.40 to 17.60
- 17.20 to 17.40
- 17.00 to 17.20
- 16.80 to 17.00
- 16.60 to 16.80
- 16.40 to 16.60
- 16.20 to 16.40
- 16.00 to 16.20
- 5.00 to 16.00
- 0.00 to 5.00
- -5.00 to 0.00
- Below -5.00

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250 0 250 500 750 1000 1250m
1:25,000

Scale 1:25000 (A3)

FIGURE A.4

BRISBANE RIVER FLOODING - EXISTING CASE - 10 YEAR ARI WATER SURFACE LEVELS (CASE E02e)

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Project No.: J8714

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250 0 250 500 750 1000 1250m
1:25,000

Scale 1:25000 (A3)

FIGURE A.5

BRISBANE RIVER FLOODING - EXISTING CASE - 100 YEAR ARI DEPTH (CASE E02e)

Project No.: J8714

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250 0 250 500 750 1000 1250m
1:25,000

Scale 1:25000 (A3)

FIGURE A.6

BRISBANE RIVER FLOODING - EXISTING CASE - 50 YEAR ARI DEPTH (CASE E02e)

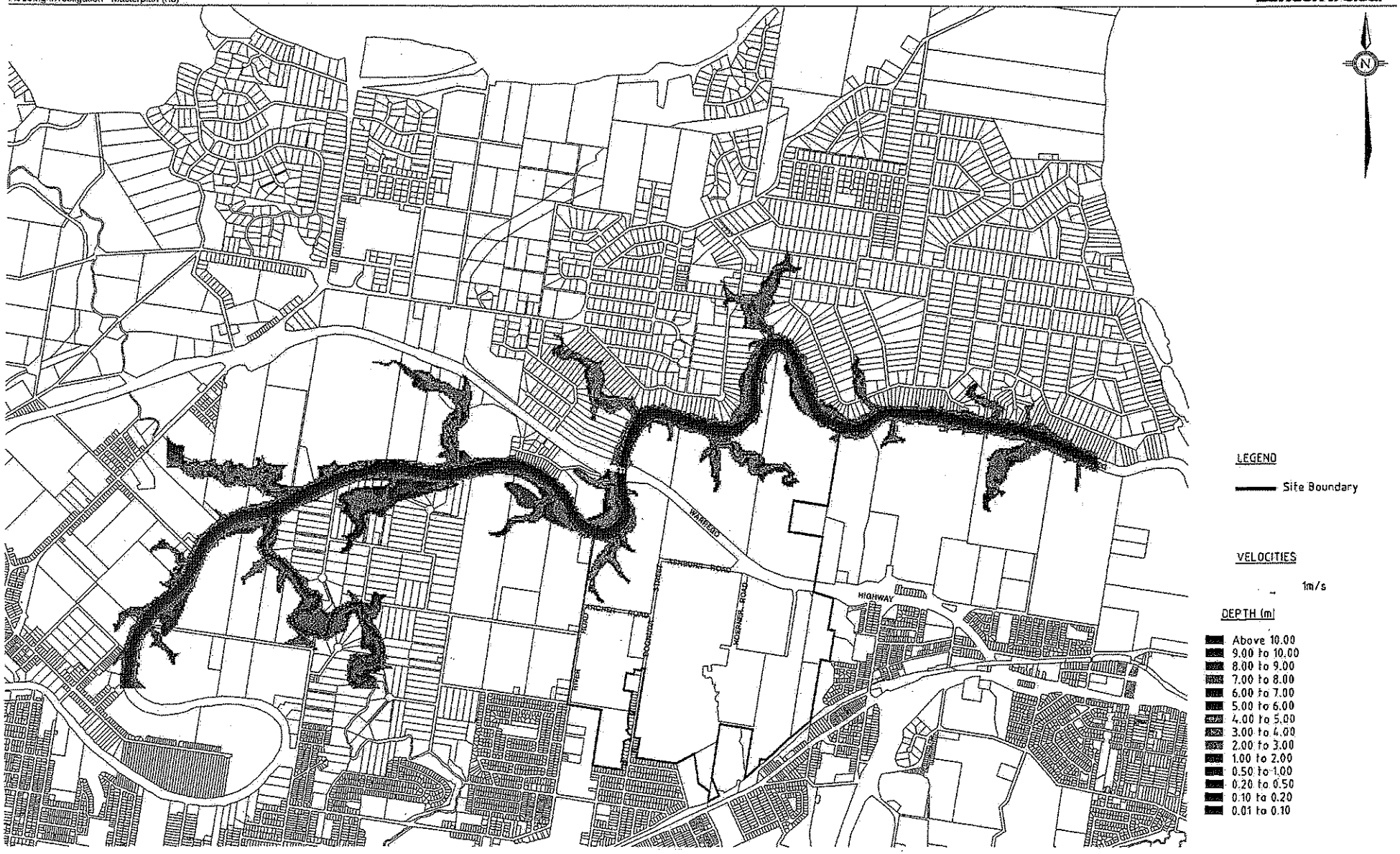
Rev: 0 Date: February 2007

Project No.: J8714

Walker Corporation Pty Ltd

DataWorks Document Number: 2349971

Cardno Lawson Treloar



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Scale 1:25000 (A3)

FIGURE A.7

BRISBANE RIVER FLOODING - EXISTING CASE - 20 YEAR ARI DEPTH (CASE E02e)

Rev: 0 Date: February 2007

Project No.: J8714

Walker Corporation Pty Ltd

DataWorks Document Number: 2349971

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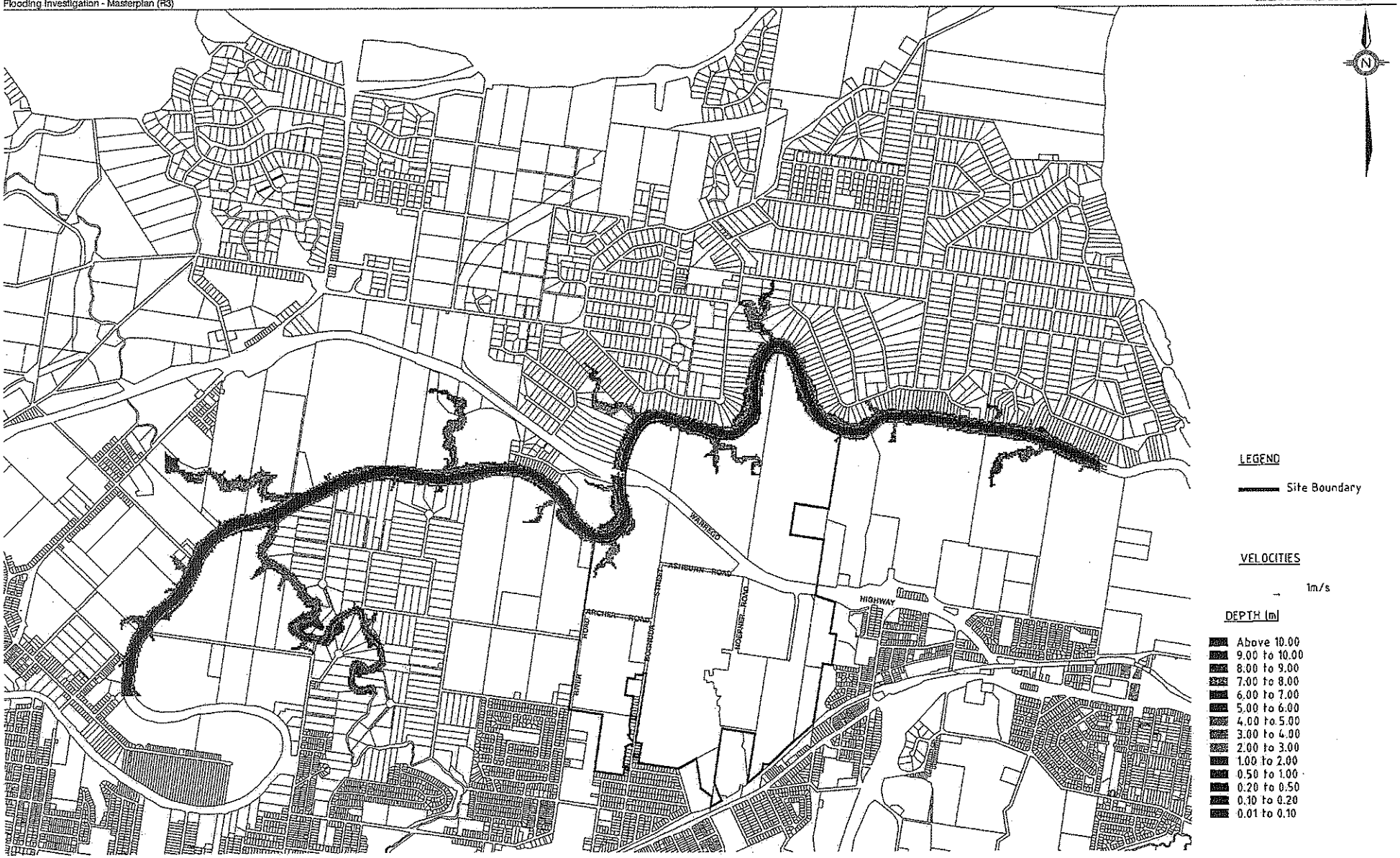

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Scale 1:25000 (A3)

FIGURE A.8

BRISBANE RIVER FLOODING - EXISTING CASE - 10 YEAR ARI DEPTH (CASE E02e)

Rev: 0 Date: February 2007

Project No.: J8714

Hope Island Resort

DataWorks Document Number: 2349971

APPENDIX B

Brisbane River Flood SOBEK 2D Masterplan Case Results

Bremer Business Park
Flooding Investigation - Masterplan (R3)

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FIGURE B.1

BRISBANE RIVER FLOODING - MASTERPLAN CASE - 100 YEAR ARI WATER SURFACE LEVELS (CASE D03b)

Rev: 0 Date: February 2007

Project No.: J8714

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PRINT DATE: 08 March, 2007 - 3:03pm

DataWorks Document Number: 2349971

Bremer Business Park
Flooding Investigation - Masterplan (R3)

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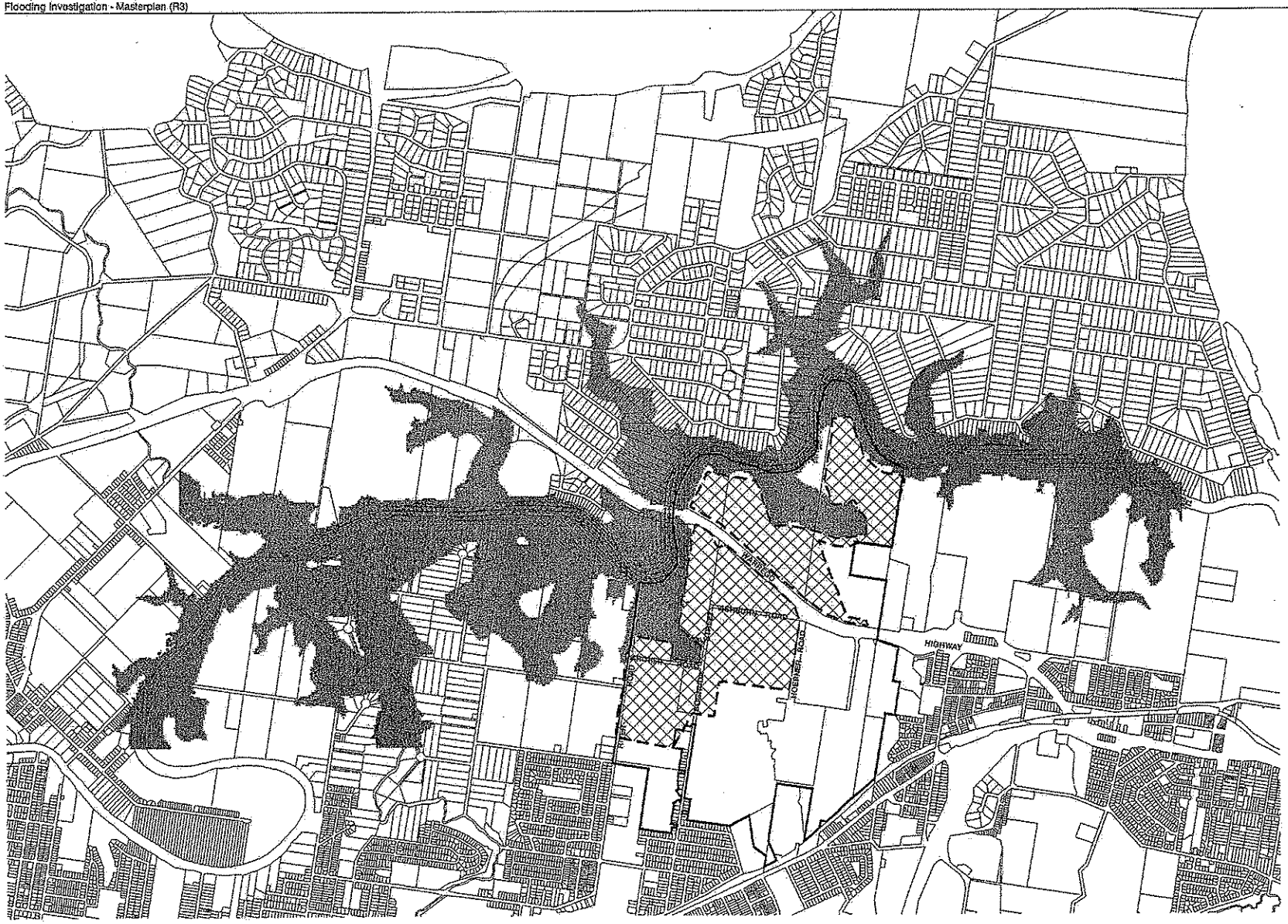

LEGEND

Site Boundary

Fill Extent Boundary

VELOCITIES

1m/s

WATER SURFACE LEVELS (mAHD)

- Above 17.80
- 17.60 to 17.80
- 17.40 to 17.60
- 17.20 to 17.40
- 17.00 to 17.20
- 16.80 to 17.00
- 16.60 to 16.80
- 16.40 to 16.60
- 16.20 to 16.40
- 16.00 to 16.20
- 5.00 to 16.00
- 0.00 to 5.00
- -5.00 to 0.00
- Below -5.00

250 0 250 500 750 1000 1250m 1:25,000

Scale 1:25000 (A3)

FIGURE B.2

BRISBANE RIVER FLOODING - MASTERPLAN CASE - 50 YEAR ARI WATER SURFACE LEVELS (CASE D03b)

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Bremer Business Park
Flooding Investigation - Masterplan (R3)

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250 0 250 500 750 1000 1250m
1:25,000

Scale 1:25000 (A3)

FIGURE B.3

BRISBANE RIVER FLOODING - MASTERPLAN CASE - 20 YEAR ARI WATER SURFACE LEVELS (CASE D03b)

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Project No.: J8714

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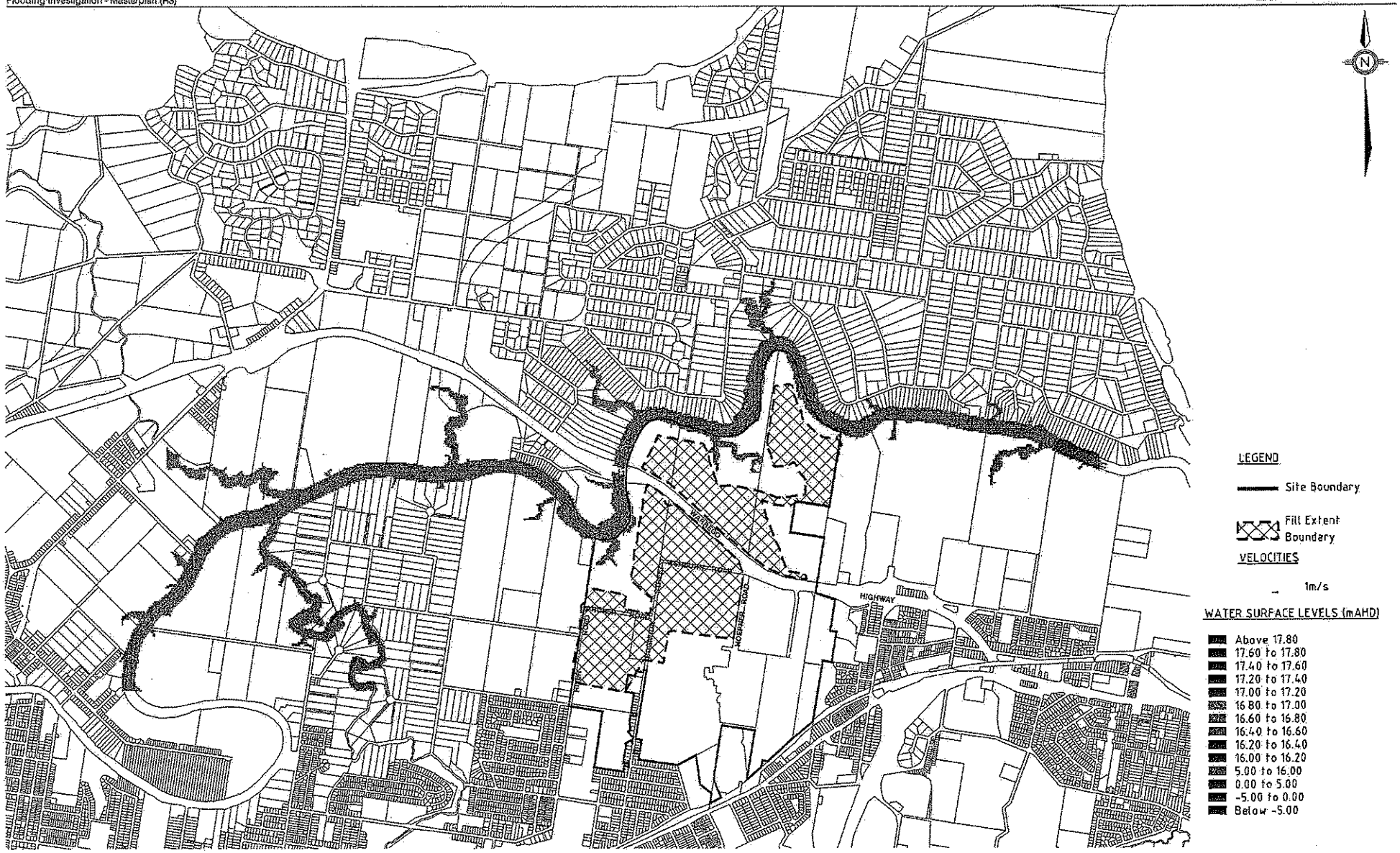
DataWorks Document Number: 2349971

Bremer Business Park
Flooding Investigation - Masterplan (R3)

Cardno Lawson Treloar



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250 0 250 500 750 1000 1250m
1:25,000

Scale 1:25000 (A3)

FIGURE B.4

BRISBANE RIVER FLOODING - MASTERPLAN CASE - 10 YEAR ARI WATER SURFACE LEVELS (CASE D03b)

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Scale 1:25000 (A3)

FIGURE B.5

BRISBANE RIVER FLOODING - MASTERPLAN CASE - 100 YEAR ARI DEPTH (CASE D03b)

Rev: 0 Date: February 2007

Project No.: J8714

Walker Corporation Pty Ltd

DataWorks Document Number: 2349971

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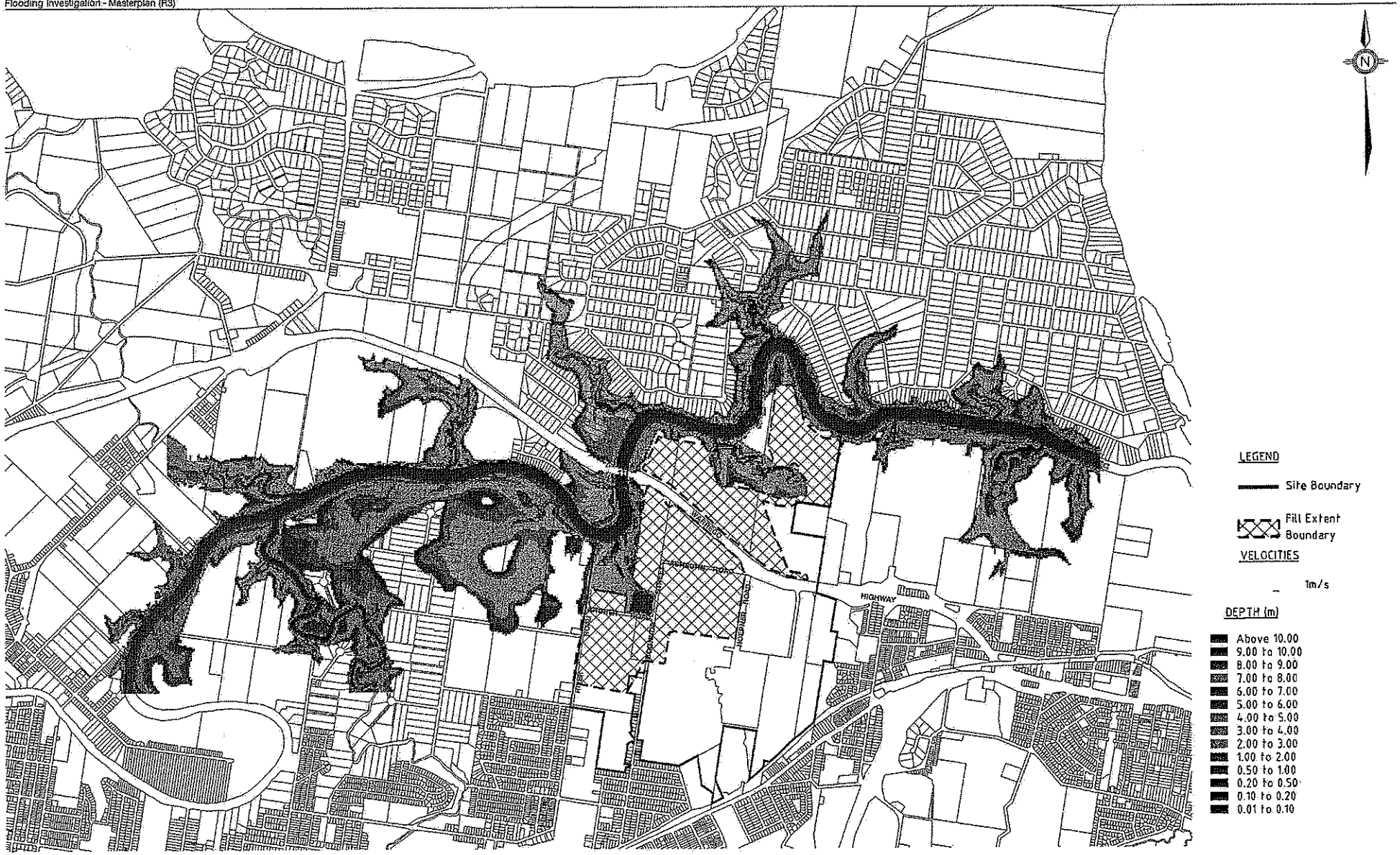

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Scale 1:25000 (A3)

FIGURE B.6

BRISBANE RIVER FLOODING - MASTERPLAN CASE - 50 YEAR ARI DEPTH (CASE D03b)

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Walker Corporation Pty Ltd

Project No.: J8714

DataWorks Document Number: 2349971

Bremer Business Park
Flooding Investigation - Masterplan (R3)

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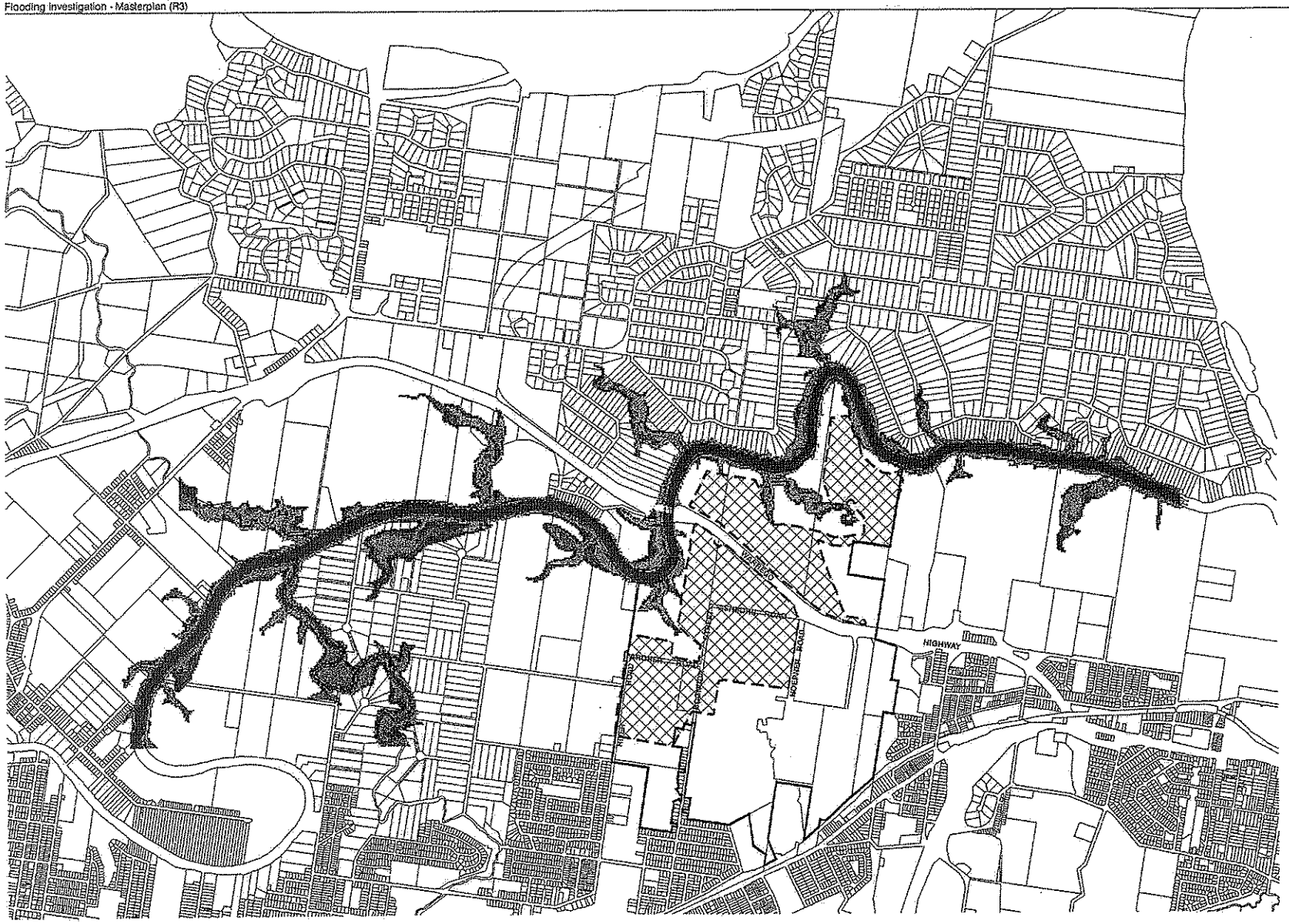

LEGEND

Site Boundary

Fill Extent Boundary

VELOCITIES

1m/s

DEPTH (m)

- Above 10.00
- 9.00 to 10.00
- 8.00 to 9.00
- 7.00 to 8.00
- 6.00 to 7.00
- 5.00 to 6.00
- 4.00 to 5.00
- 3.00 to 4.00
- 2.00 to 3.00
- 1.00 to 2.00
- 0.50 to 1.00
- 0.20 to 0.50
- 0.10 to 0.20
- 0.01 to 0.10

250 0 250 500 750 1000 1250m
1:25,000

Scale 1:25000 (A3)

FIGURE B.7

BRISBANE RIVER FLOODING - MASTERPLAN CASE - 20 YEAR ARI DEPTH (CASE D03b)

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Project No.: J8714

PRINT DATE: 30 March 2007 - 3:04pm

DataWorks Document Number: 2349971

Bremer Business Park
Flooding Investigation - Masterplan (R3)

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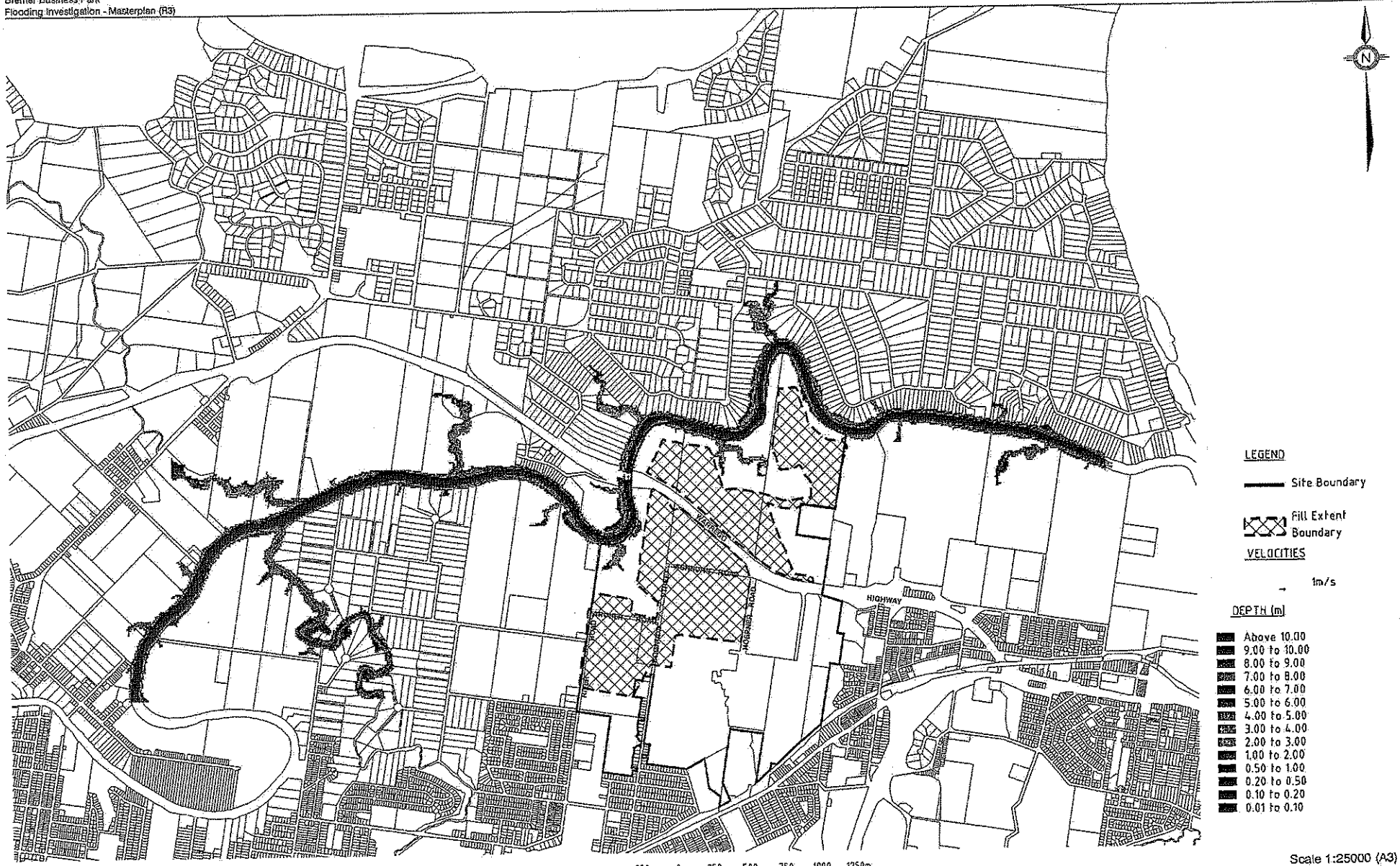

Scale 1:25000 (A3)

FIGURE B.8

BRISBANE RIVER FLOODING - MASTERPLAN CASE - 10 YEAR ARI DEPTH (CASE D03b)

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Project No.: J8714

DataWorks Document Number: 2349971

APPENDIX C

Brisbane River Flood SOBEK 2D Impact Plots

DataWorks Document Number: 2349971

Bremer Business Park
Flooding Investigation - Masterplan (R3)

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250 0 250 500 750 1000 1250m
1:25,000

Scale 1:25000 (A3)

FIGURE C.1

BRISBANE RIVER FLOODING - MASTERPLAN CASE - 100 YEAR ARI IMPACT (CASE E03b)

Rev: 0 Date: February 2007

Project No.: J8714

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APPENDIX D

Bremer River Flood SOBEK 2D Existing Case Results

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Scale 1:25000 (A3)

FIGURE D.1

BREMER RIVER FLOODING - EXISTING CASE - 100 YEAR ARI WATER SURFACE LEVELS (CASE E02e)

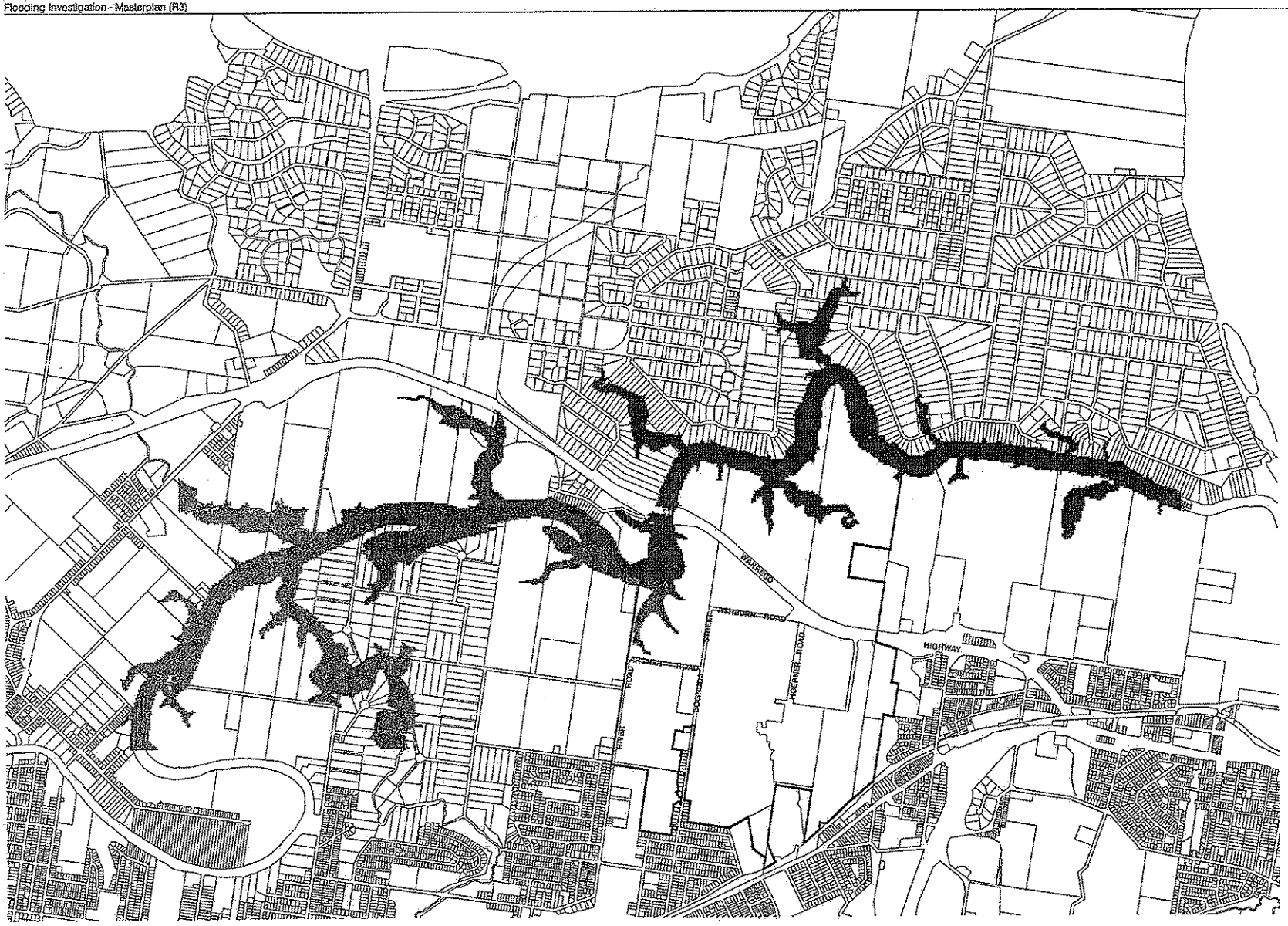
Rev: 0 Date: February 2007

Project No.: J8714

Walker Corporation Pty Ltd

DataWorks Document Number: 2349971

Cardno Lawson Treloar



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Scale 1:25000 (A3)

FIGURE D.2

BREMER RIVER FLOODING - EXISTING CASE - 50 YEAR ARI WATER SURFACE LEVELS (CASE E02e)

Rev: 0 Date: February 2007

Project No.: J8714

Walker Corporation Pty Ltd

DataWorks Document Number: 2349971

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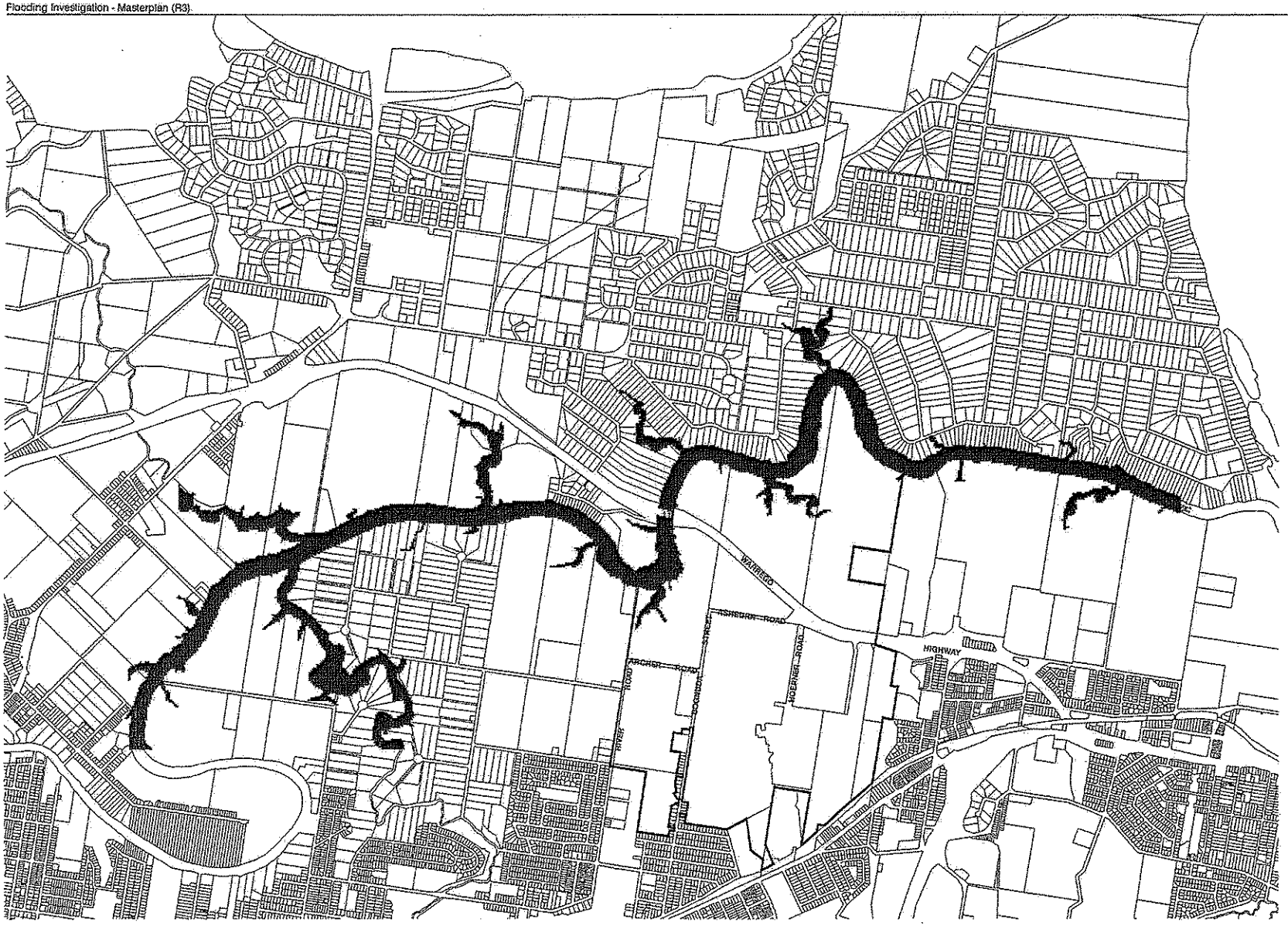

LEGEND

Site Boundary

VELOCITIES

1m/s

WATER SURFACE LEVELS (mAHD)

- Above 15.50
- 15.00 to 15.50
- 14.50 to 15.00
- 14.00 to 14.50
- 13.50 to 14.00
- 13.00 to 13.50
- 12.50 to 13.00
- 12.00 to 12.50
- 11.50 to 12.00
- 11.00 to 11.50
- 10.50 to 11.00
- 10.00 to 10.50
- 9.50 to 10.00
- Below 9.50

250 0 250 500 750 1000 1250m
1:25,000

Scale 1:25000 (A3)

FIGURE D.3

BREMER RIVER FLOODING - EXISTING CASE - 20 YEAR ARI WATER SURFACE LEVELS (CASE E02e)

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Rev: 0 Date: February 2007

Project No.: J8714

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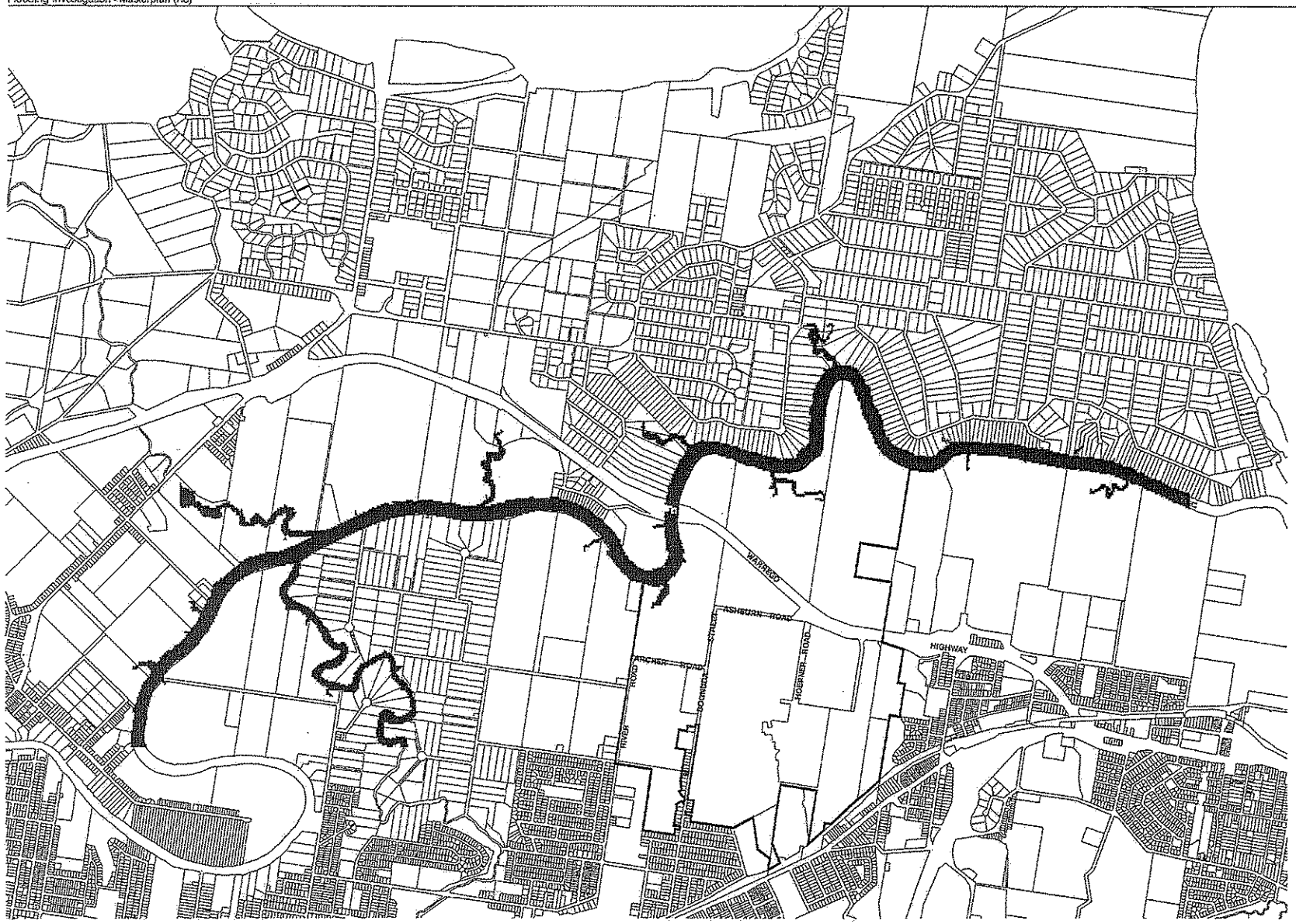

LEGEND

Site Boundary

VELOCITIES

1m/s

WATER SURFACE LEVELS (mAHD)

- Above 15.50
- 15.00 to 15.50
- 14.50 to 15.00
- 14.00 to 14.50
- 13.50 to 14.00
- 13.00 to 13.50
- 12.50 to 13.00
- 12.00 to 12.50
- 11.50 to 12.00
- 11.00 to 11.50
- 10.50 to 11.00
- 10.00 to 10.50
- 9.50 to 10.00
- Below 9.50

250 0 250 500 750 1000 1250m
1:25,000

Scale 1:25000 (A3)

FIGURE D.4

BREMER RIVER FLOODING - EXISTING CASE - 10 YEAR ARI WATER SURFACE LEVELS (CASE E02e)

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PRINT DATE 08 March 2007 - 2:34pm

DataWorks Document Number: 2349971

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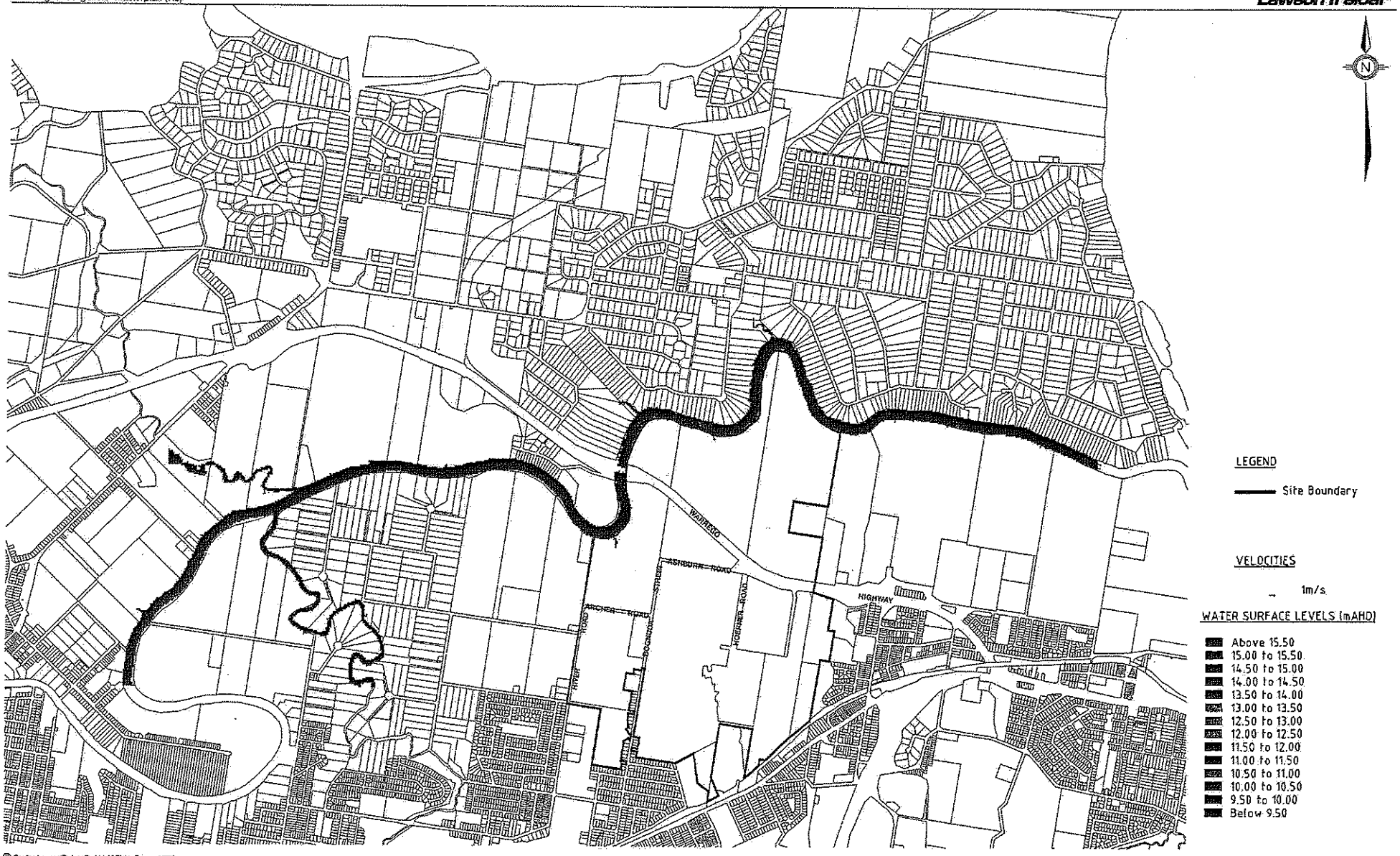

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250 0 250 500 750 1000 1250m
1:25,000

Scale 1:25000 (A3)

FIGURE D.5

BREMER RIVER FLOODING - EXISTING CASE - 5 YEAR ARI WATER SURFACE LEVELS (CASE E02e)

Rev: 0 Date: February 2007

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PRINT DATE: 16 March, 2007 - 3:18pm

DataWorks Document Number: 2349971

Bremer Business Park
Flooding Investigation - Masterplan (R3)

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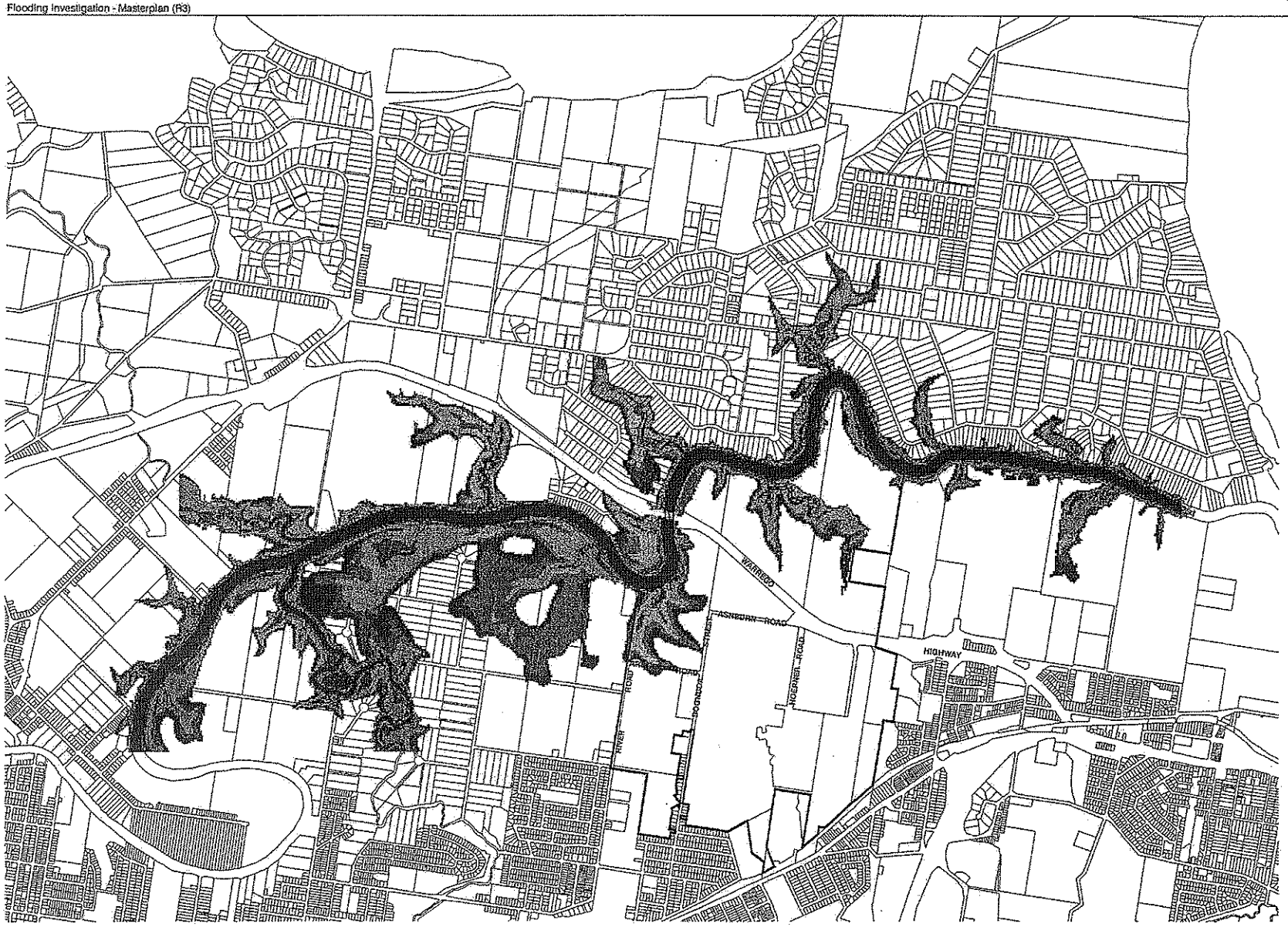

LEGEND

Site Boundary

VELOCITIES

1m/s

DEPTH (m)

- Above 10.00
- 9.00 to 10.00
- 8.00 to 9.00
- 7.00 to 8.00
- 6.00 to 7.00
- 5.00 to 6.00
- 4.00 to 5.00
- 3.00 to 4.00
- 2.00 to 3.00
- 1.00 to 2.00
- 0.50 to 1.00
- 0.20 to 0.50
- 0.10 to 0.20
- 0.01 to 0.10

250 0 250 500 750 1000 1250m
1:25,000

Scale 1:25000 (A3)

FIGURE D.6

BREMER RIVER FLOODING - EXISTING CASE - 100 YEAR ARI DEPTH (CASE E02e)

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DataWorks Document Number: 2349971

Bremer Business Park
Flooding Investigation - Masterplan (R3)

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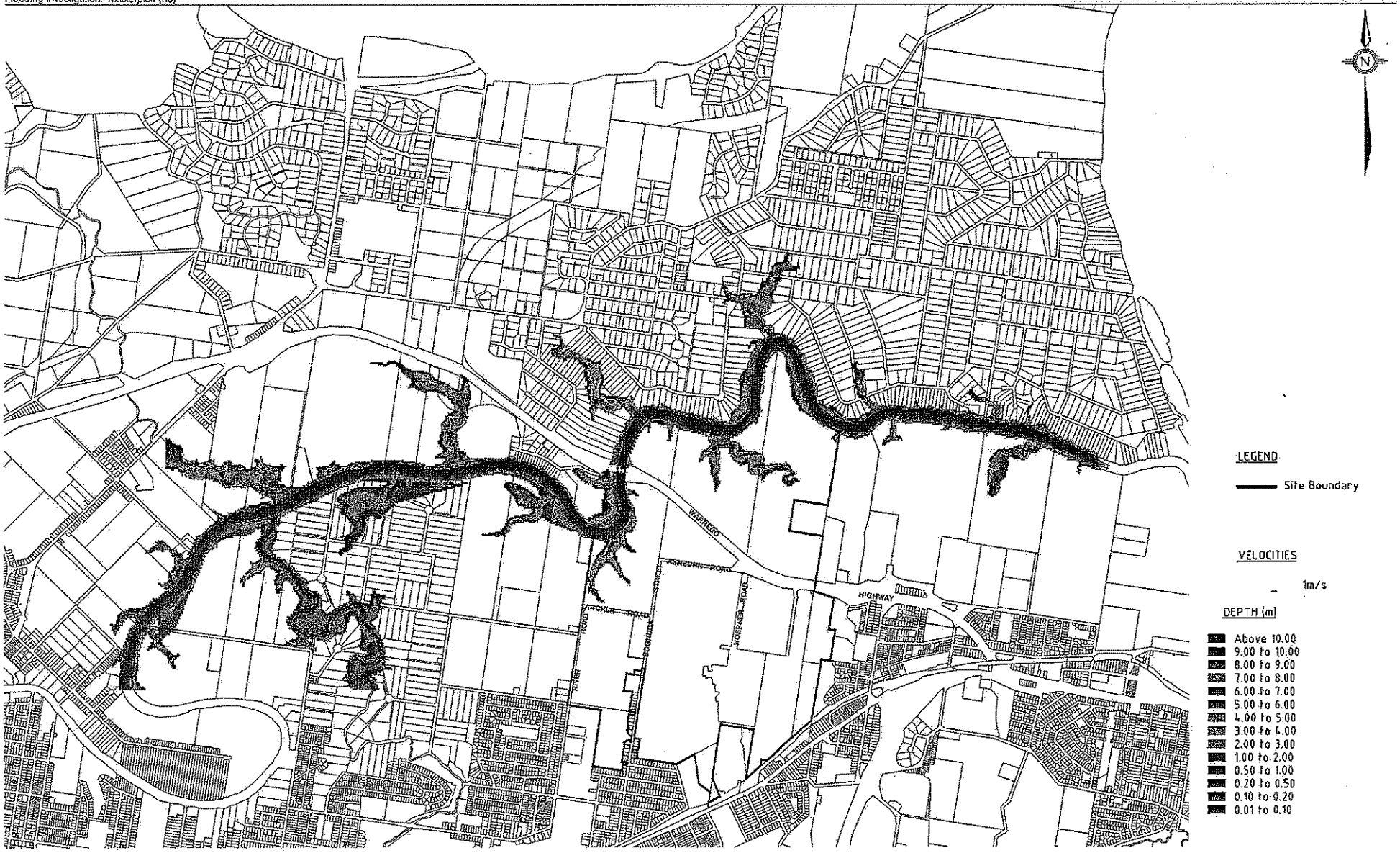

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250 0 250 500 750 1000 1250m
1:25,000

Scale 1:25000 (A3)

FIGURE D.7

BREMER RIVER FLOODING - EXISTING CASE - 50 YEAR ARI DEPTH (CASE E02e)

Rev: 0 Date: February 2007

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Project No.: J8714

PRINT DATE: 14 March, 2007 - 3:56pm

DataWorks Document Number: 2349971

Bremer Business Park
Flooding Investigation - Masterplan (R3)

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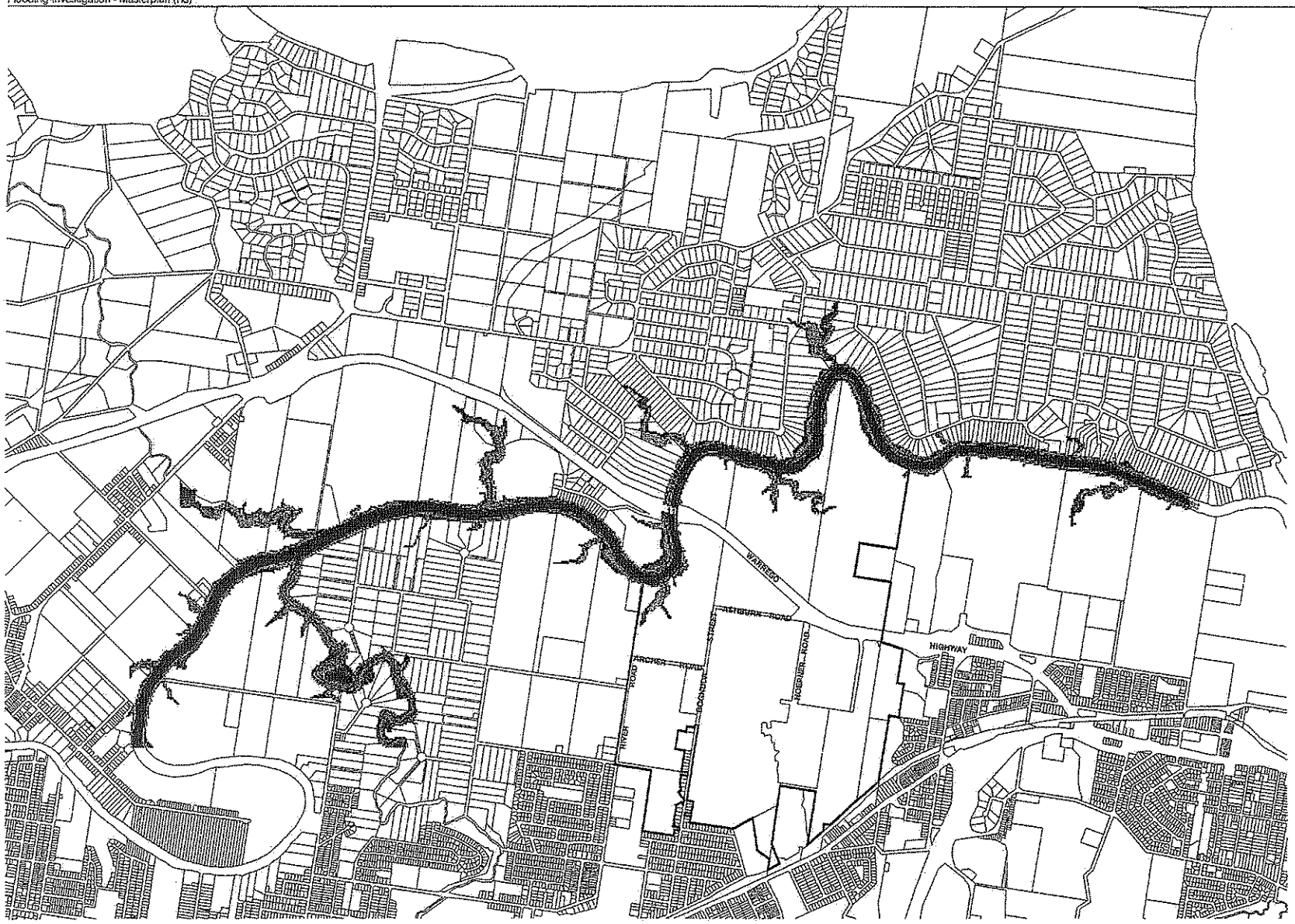

LEGEND

Site Boundary

VELOCITIES

1m/s

DEPTH (m)

- Above 10.00
- 9.00 to 10.00
- 8.00 to 9.00
- 7.00 to 8.00
- 6.00 to 7.00
- 5.00 to 6.00
- 4.00 to 5.00
- 3.00 to 4.00
- 2.00 to 3.00
- 1.00 to 2.00
- 0.50 to 1.00
- 0.20 to 0.50
- 0.10 to 0.20
- 0.01 to 0.10

250 0 250 500 750 1000 1250m
1:25,000

Scale 1:25000 (A3)

FIGURE D.8

BREMER RIVER FLOODING - EXISTING CASE - 20 YEAR ARI DEPTH (CASE E02e)

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Rev: 0 Date: February 2007

Walker Corporation Pty Ltd

Project No.: J8714

DataWorks Document Number: 2349971

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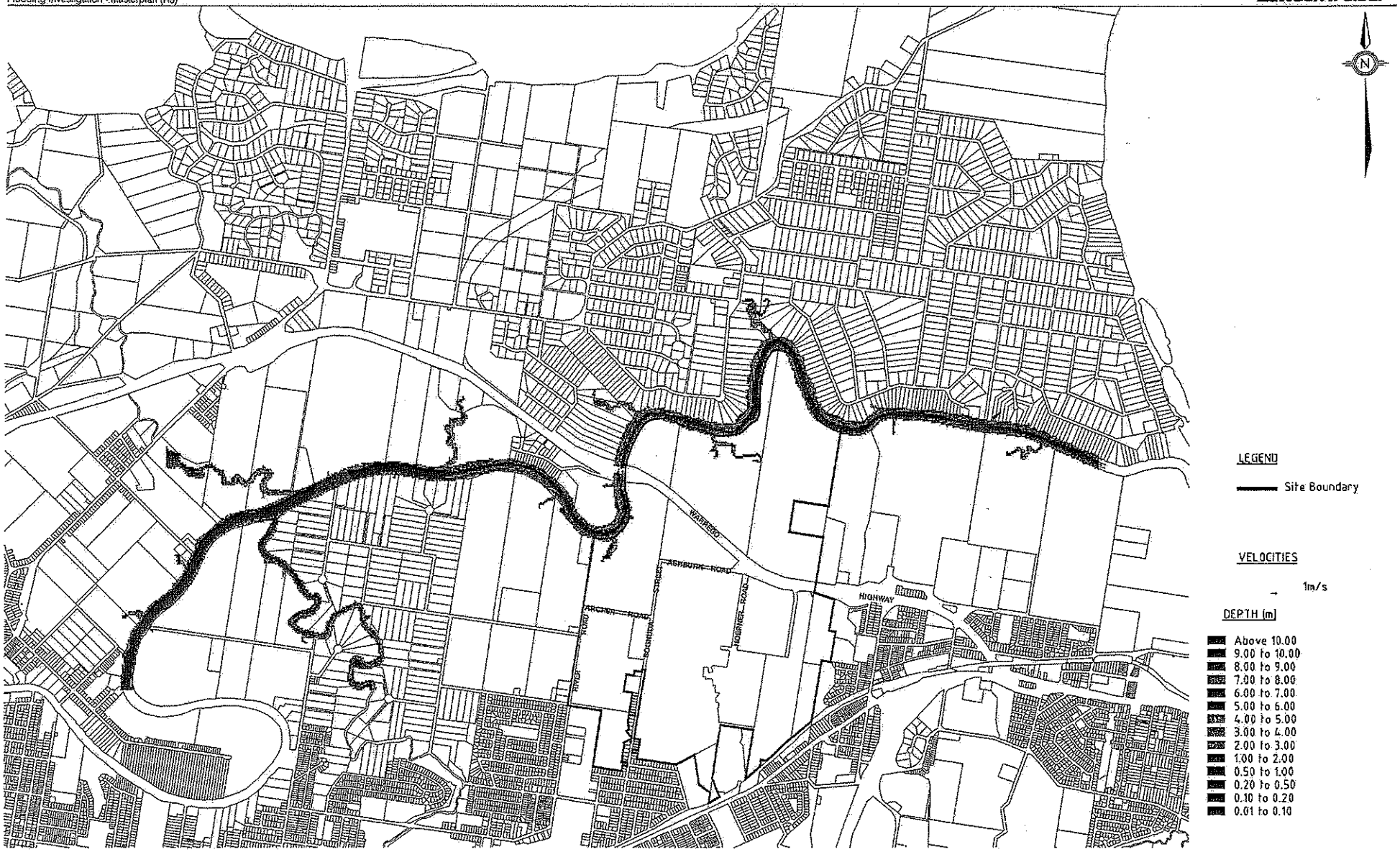

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250 0 250 500 750 1000 1250m
1:25,000

Scale 1:25000 (A3)

FIGURE D.9

BREMER RIVER FLOODING - EXISTING CASE - 10 YEAR ARI DEPTH (CASE E02e)

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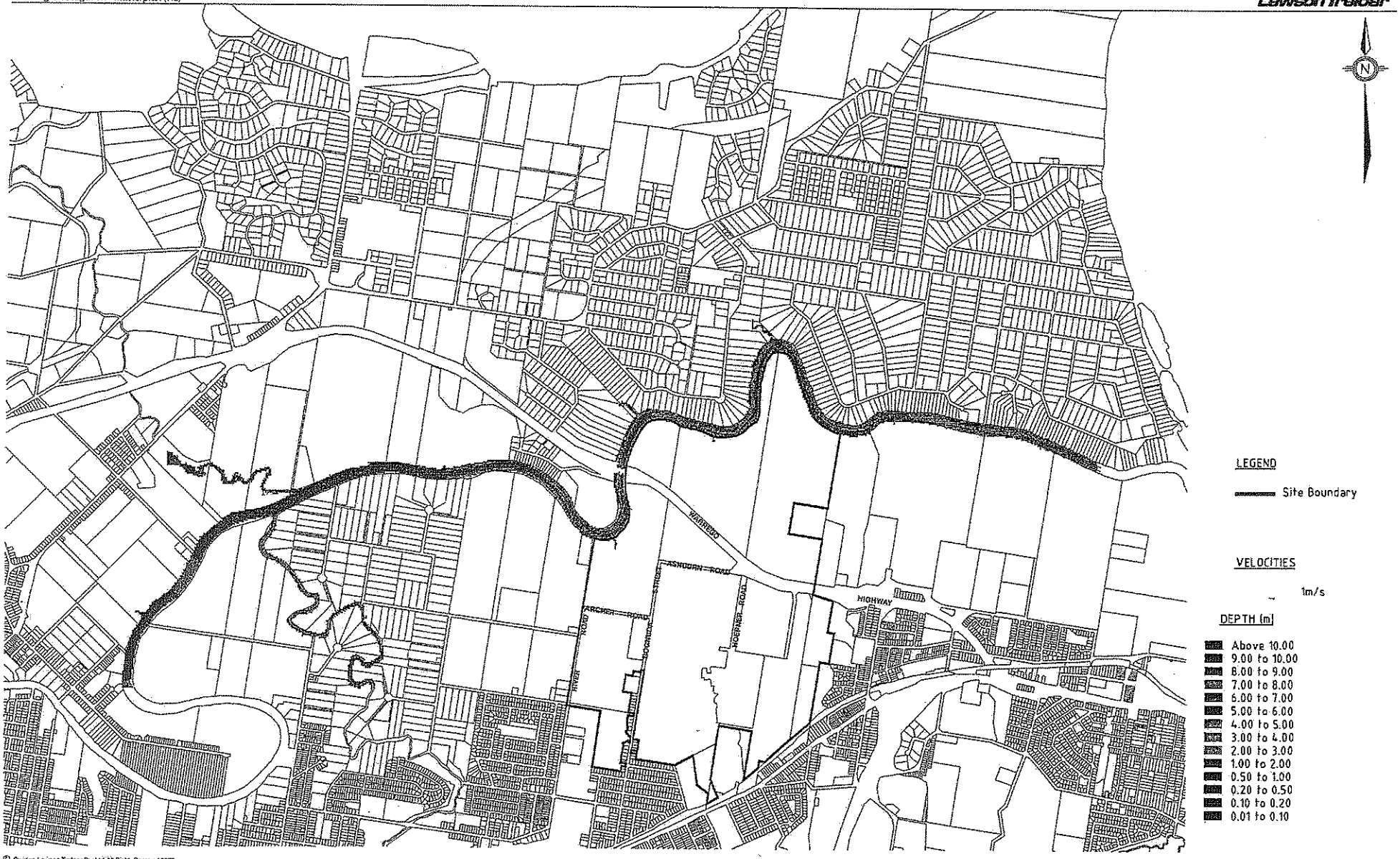
Project No.: J8714

Walker Corporation Pty Ltd

DataWorks Document Number: 2349971

Bremer Business Park
Flooding Investigation - Masterplan (R3)

Cardno Lawson Treloar



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Scale 1:25000 (A3)

FIGURE D.10

BREMER RIVER FLOODING - EXISTING CASE - 5 YEAR ARI DEPTH (CASE E02e)

Rev: 0 Date: February 2007

Project No.: J8714

Walker Corporation Pty Ltd

PRINT DATE: 18 March, 2007 - 3:03pm

DataWorks Document Number: 2349971

APPENDIX E

Bremer River Flood SOBEK 2D Masterplan Case Results

Cardno Lawson Treloar

LEGEND

Site Boundary

Fill Extent Boundary

VELOCITIES

1m/s

WATER SURFACE LEVELS (mAHD)

- Above 15.50
- 15.00 to 15.50
- 14.50 to 15.00
- 14.00 to 14.50
- 13.50 to 14.00
- 13.00 to 13.50
- 12.50 to 13.00
- 12.00 to 12.50
- 11.50 to 12.00
- 11.00 to 11.50
- 10.50 to 11.00
- 10.00 to 10.50
- 9.50 to 10.00
- Below 9.50

250 0 250 500 750 1000 1250m
1:25,000

Scale 1:25000 (A3)

FIGURE E.1

BREMER RIVER FLOODING - MASTERPLAN CASE - 100 YEAR ARI WATER SURFACE LEVELS (CASE DO3b)

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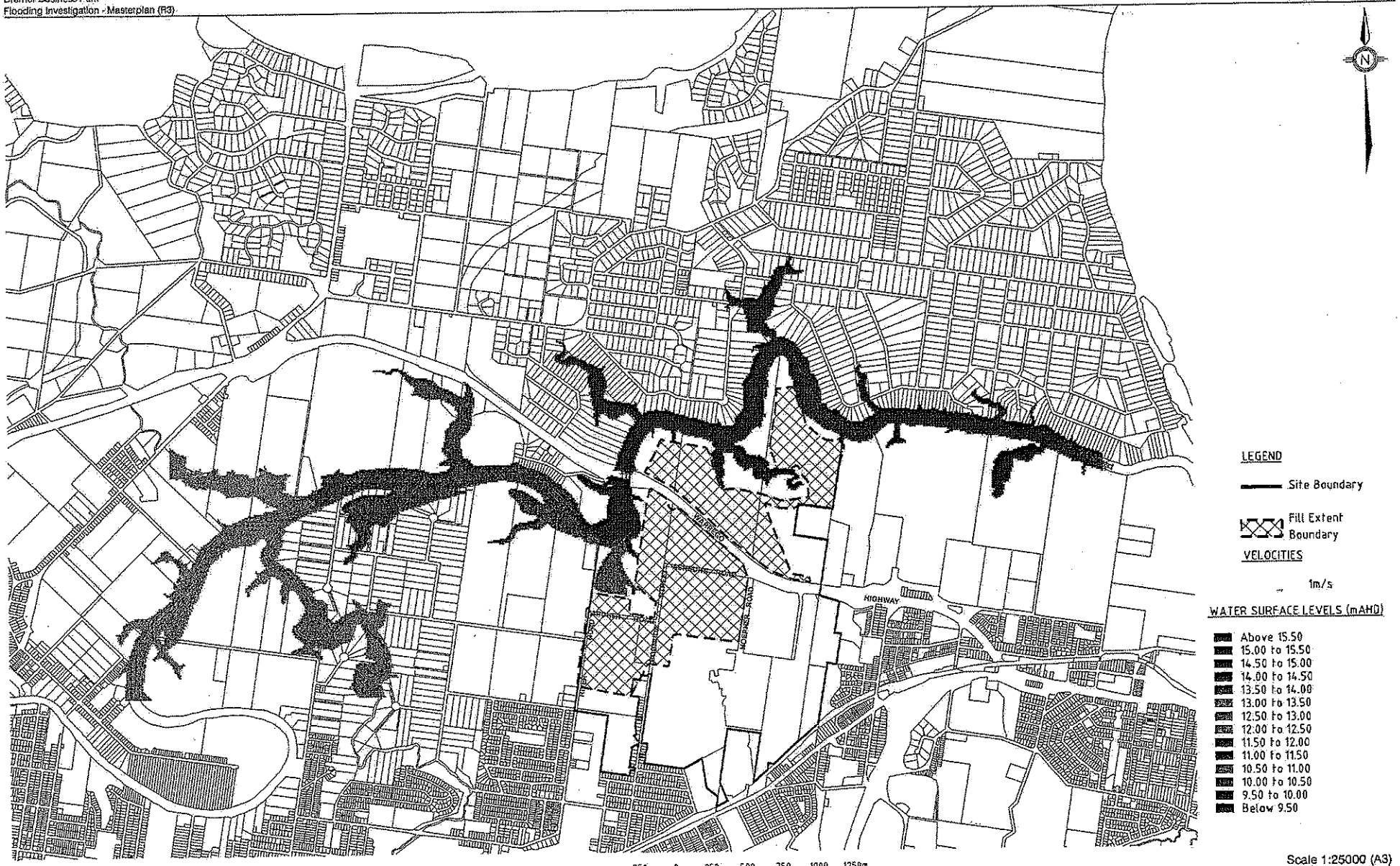
PRINT DATE: 16 March, 2007 - 3:19pm

DataWorks Document Number: 2349971

Bremer Business Park
Flooding Investigation - Masterplan (R3)

Cardno Lawson Treloar



250 0 250 500 750 1000 1250m 1:25,000

Scale 1:25000 (A3)

FIGURE E.2

BREMER RIVER FLOODING - MASTERPLAN CASE - 50 YEAR ARI WATER SURFACE LEVELS (CASE DO3b)

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Bremer Business Park
Flooding Investigation - Masterplan (R3)

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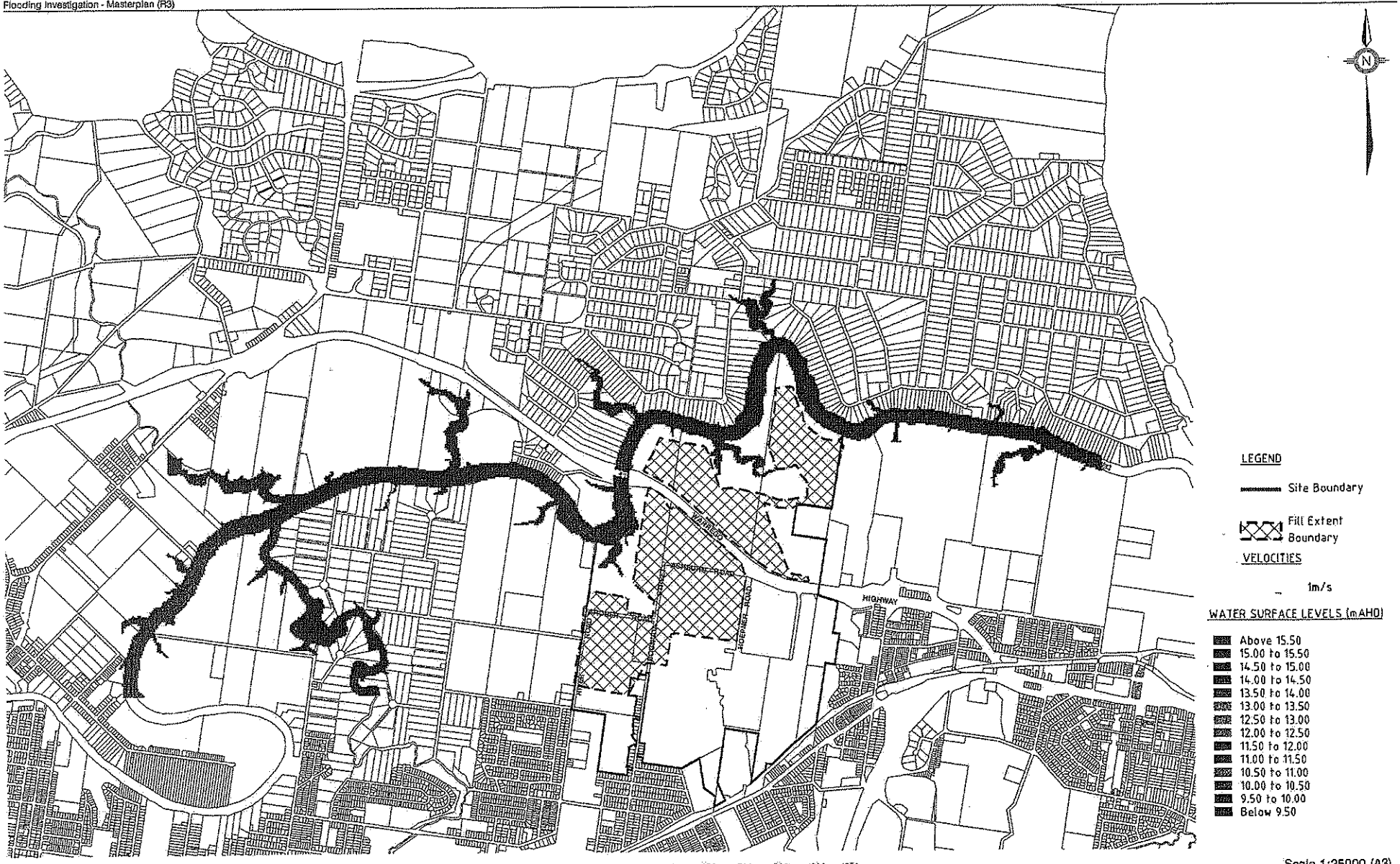

Scale 1:25000 (A3)

FIGURE E.3

BREMER RIVER FLOODING - MASTERPLAN CASE - 20 YEAR ARI WATER SURFACE LEVELS (CASE DO3b)

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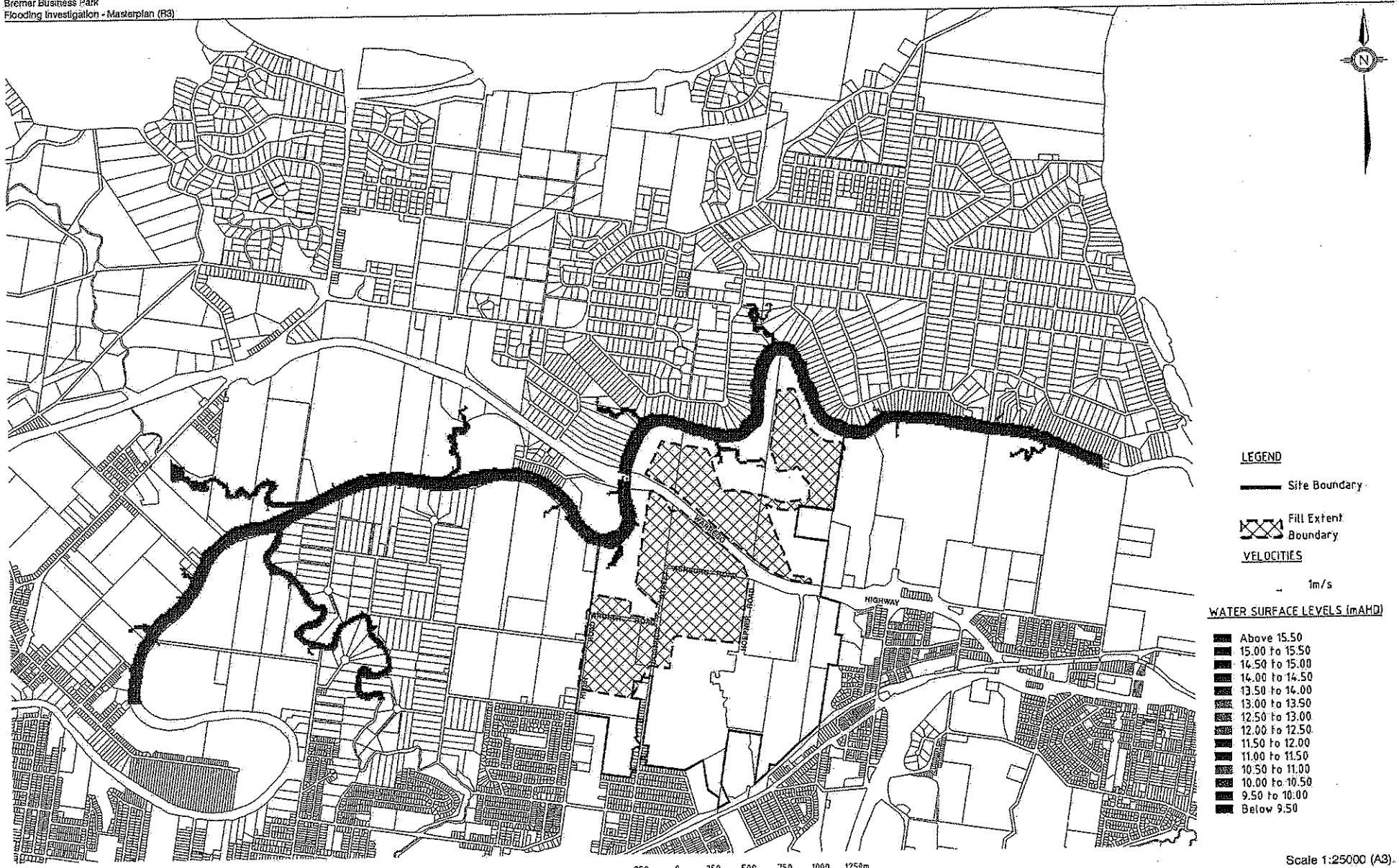
Bremer Business Park
Flooding Investigation - Masterplan (R3)

Cardno Lawson Treloar



Scale 1:25000 (A3)

FIGURE E.4

BREMER RIVER FLOODING - MASTERPLAN CASE - 10 YEAR ARI WATER SURFACE LEVELS (CASE DO3b)

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Bremer Business Park
Flooding Investigation - Masterplan (R3)

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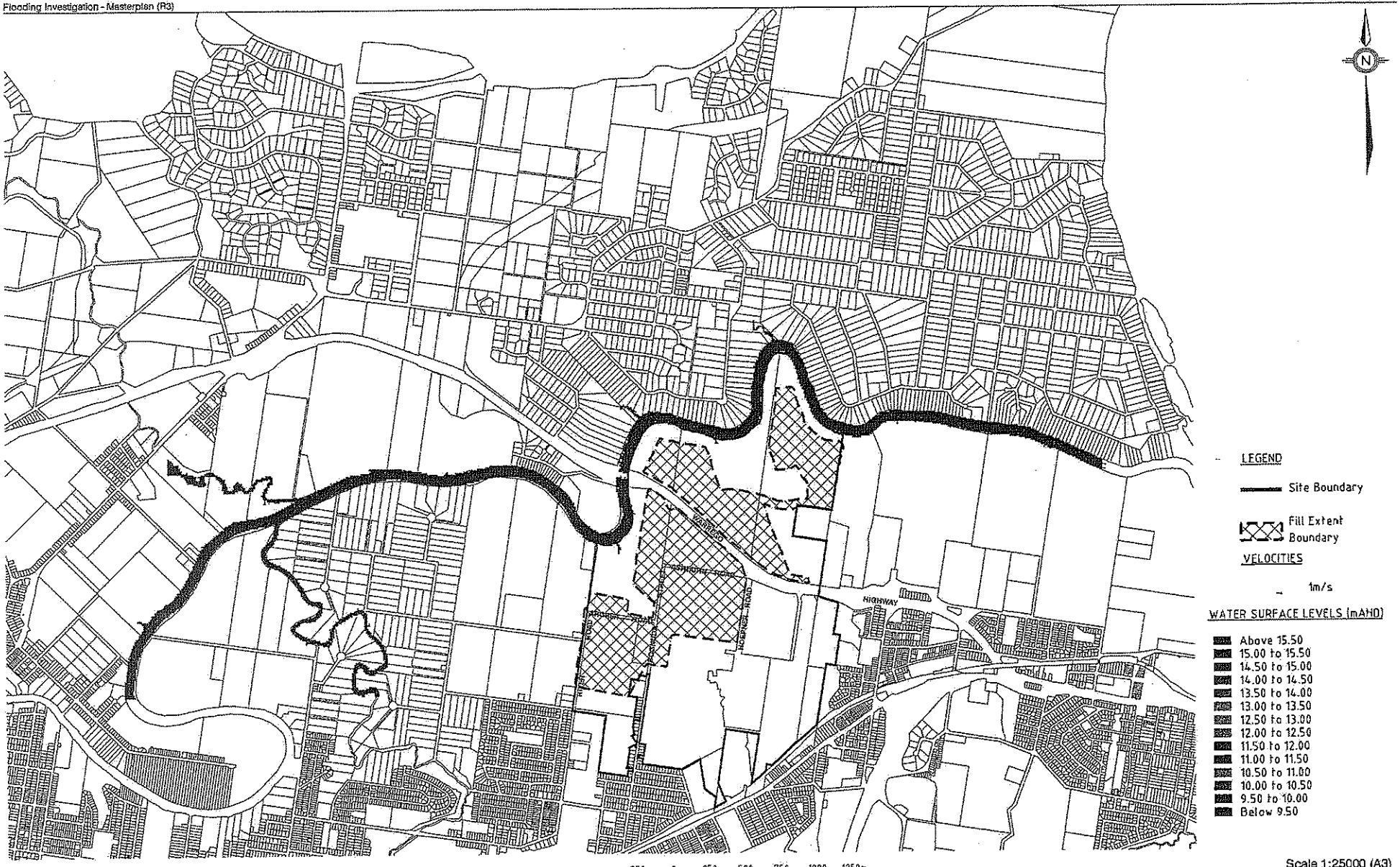

Scale 1:25000 (A3)

FIGURE E.5

BREMER RIVER FLOODING - MASTERPLAN CASE - 5 YEAR ARI WATER SURFACE LEVELS (CASE DO3b)

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DataWorks Document Number: 2349971

Bremer Business Park
Flooding Investigation - Masterplan (R3)

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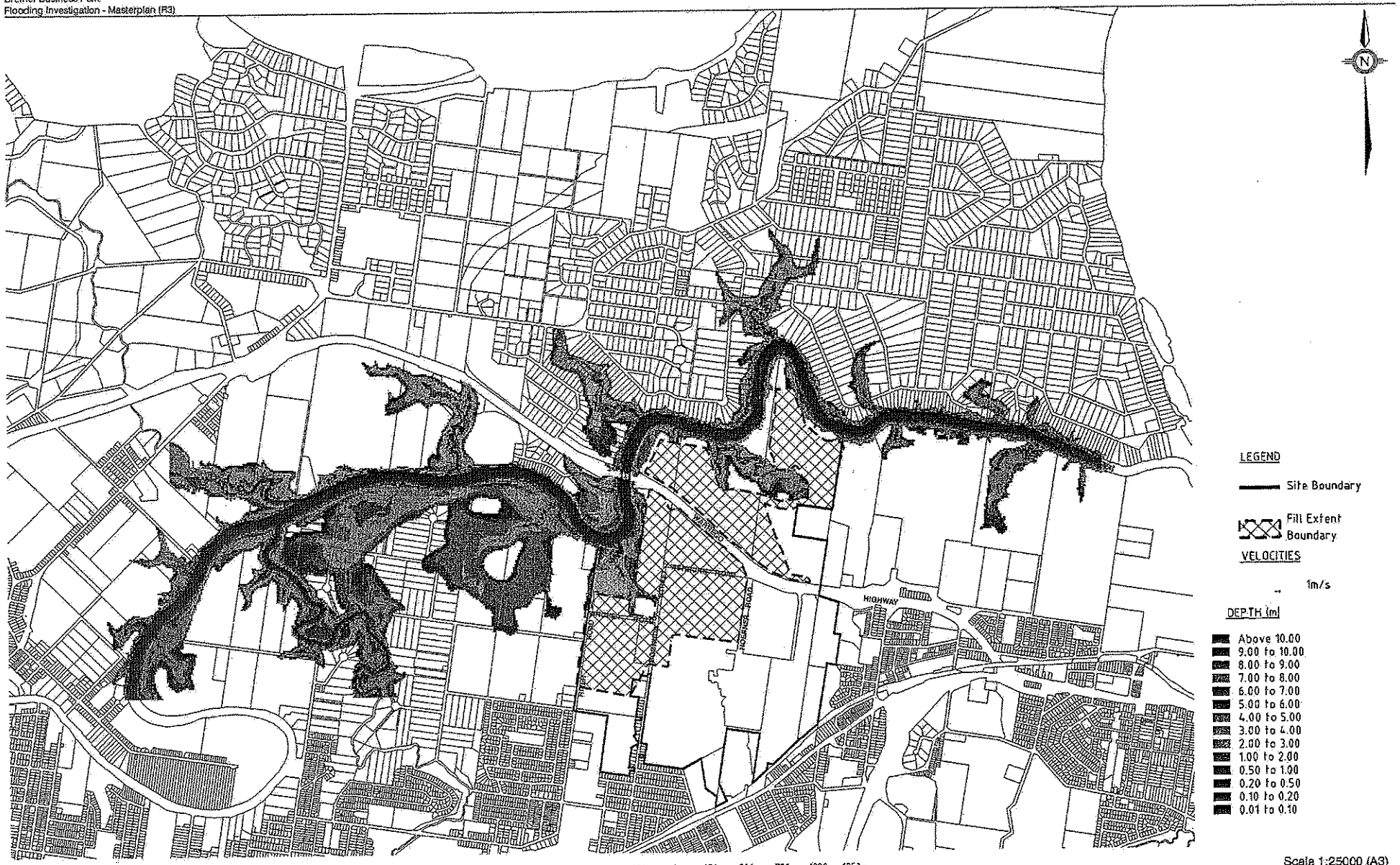

250 0 250 500 750 1000 1250m
1:25,000

Scale 1:25000 (A3)

FIGURE E.6

BREMER RIVER FLOODING - MASTERPLAN CASE - 100 YEAR ARI DEPTH (CASE DO3b)

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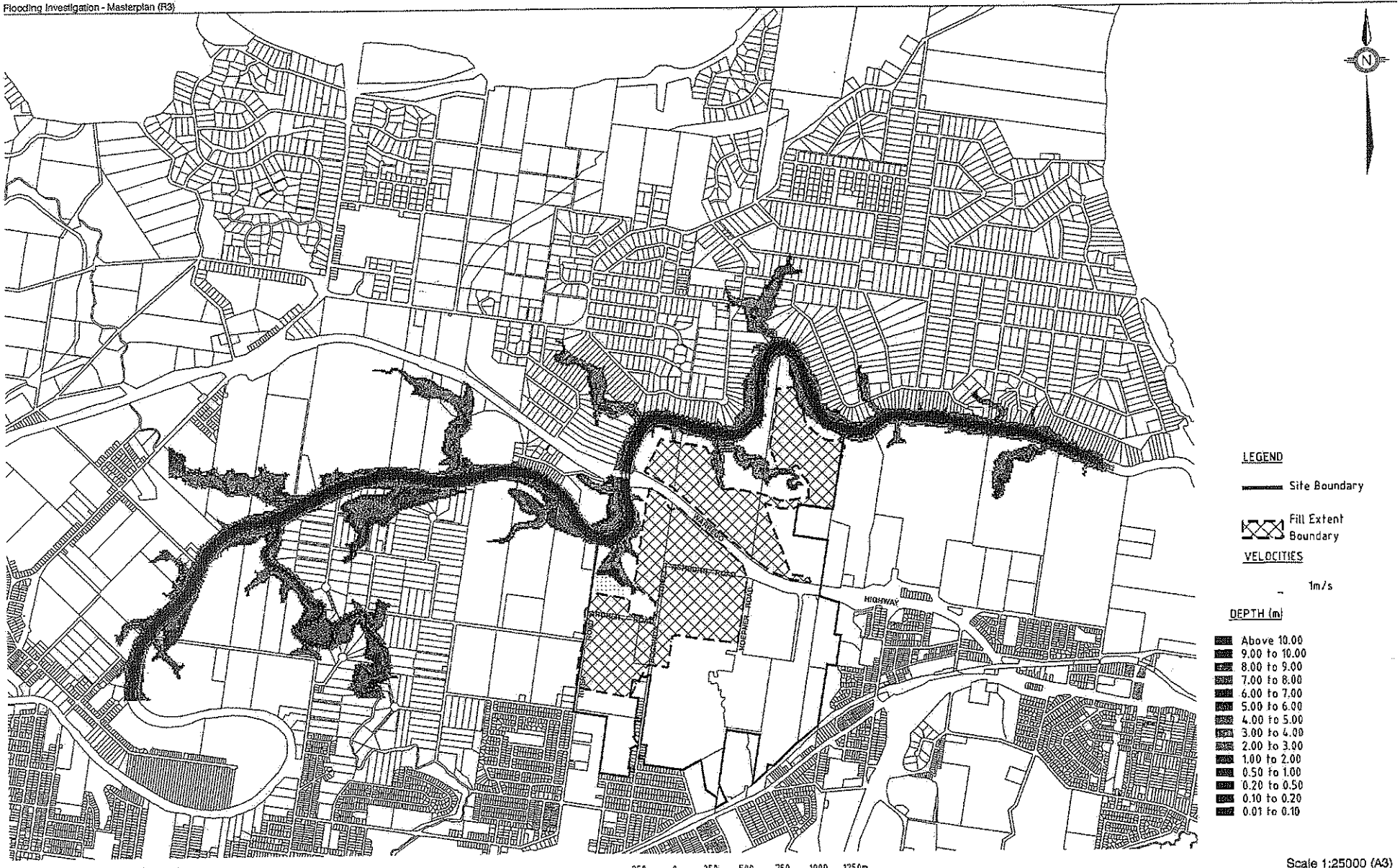
Project No.: J8714

PRINT DATE 16 March, 2007 - 3:32pm

DataWorks Document Number: 2349971

Bremer Business Park
Flooding Investigation - Masterplan (R3)

Cardno Lawson Treloar



Scale 1:25000 (A3)

FIGURE E.7

BREMER RIVER FLOODING - MASTERPLAN CASE - 50 YEAR ARI DEPTH (CASE DO3b)

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Bremer Business Park
Flooding Investigation - Masterplan (R3)

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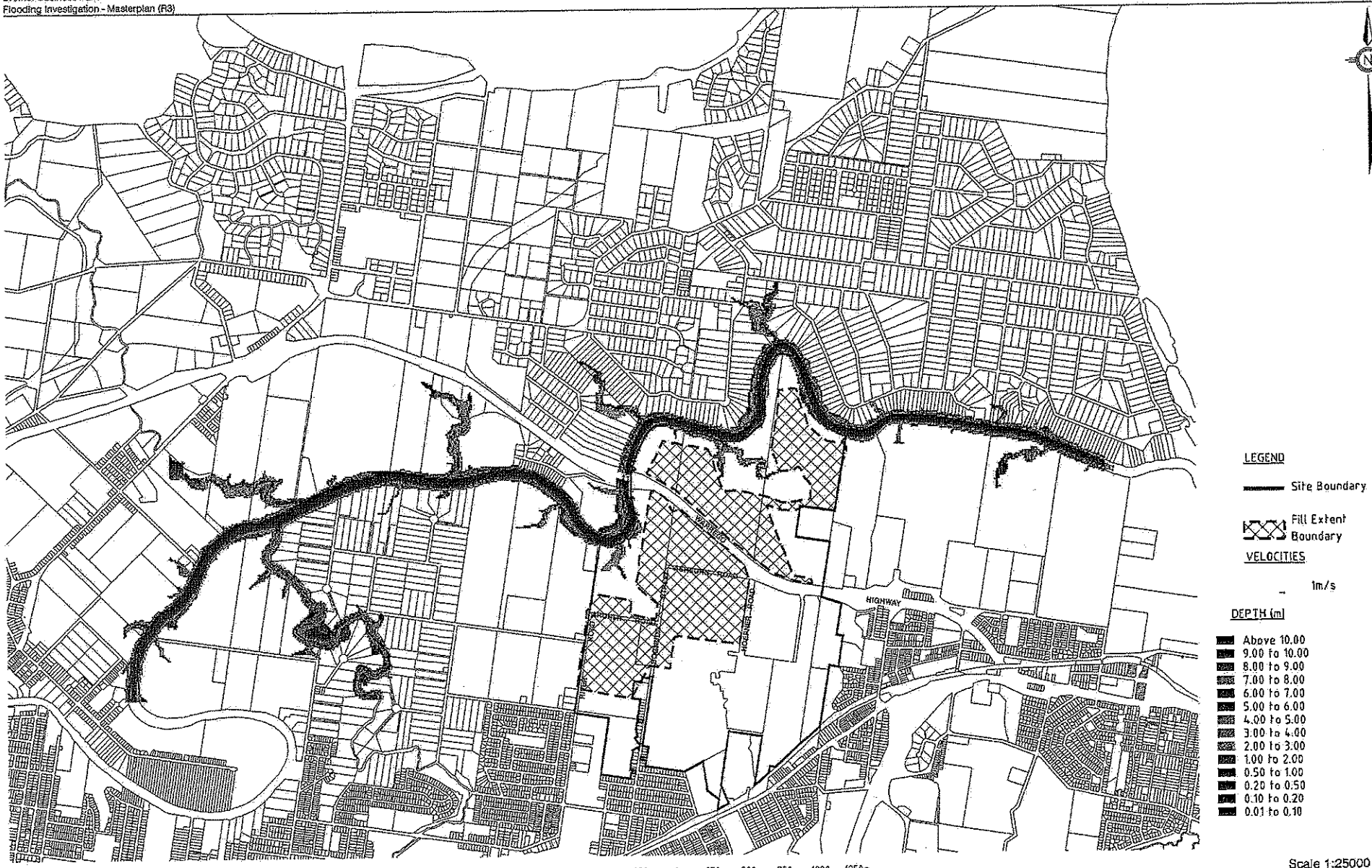

250 0 250 500 750 1000 1250m
1:25,000

Scale 1:25000 (A3)

FIGURE E.8

BREMER RIVER FLOODING - MASTERPLAN CASE - 20 YEAR ARI DEPTH (DO3b)

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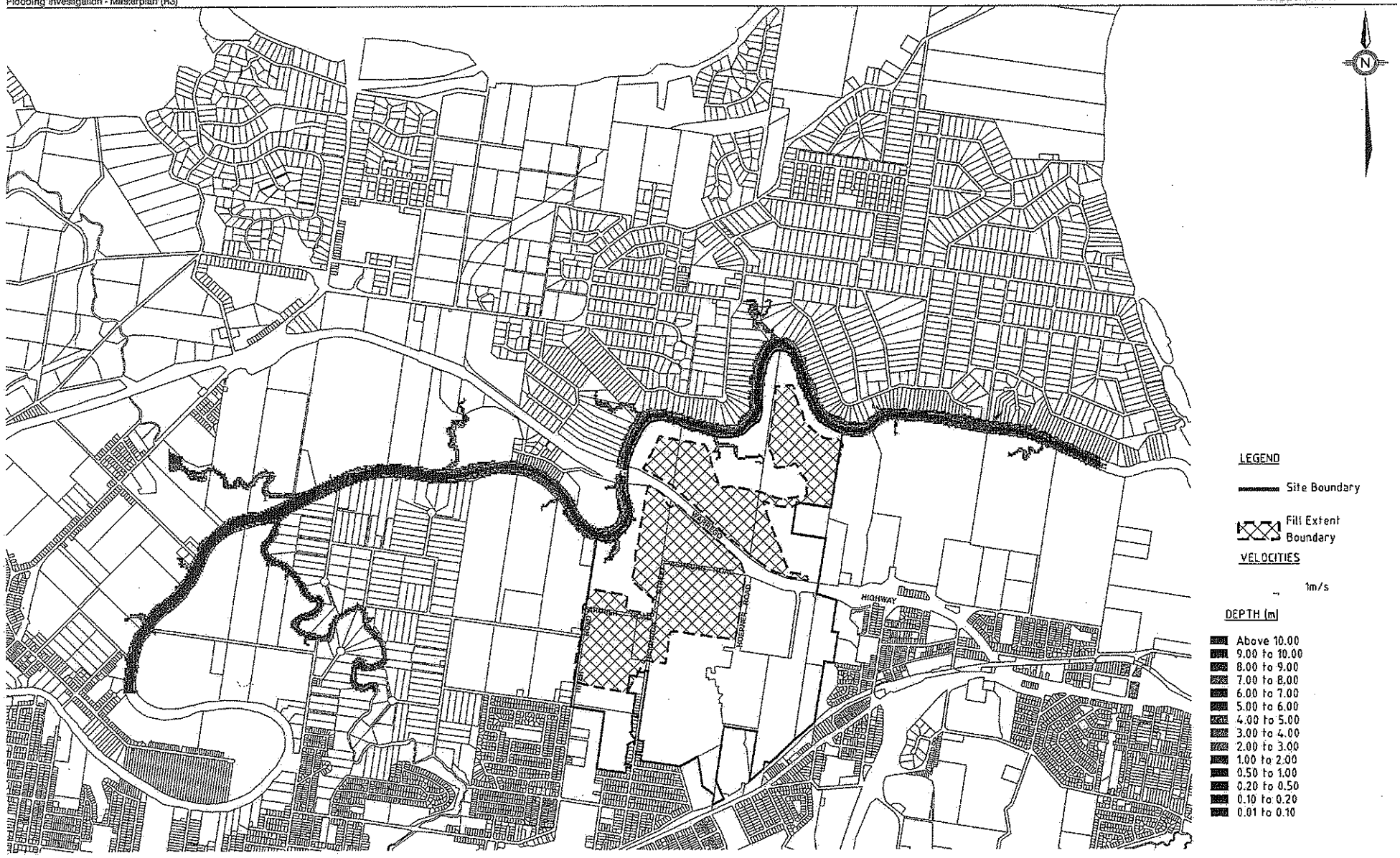
Rev: 0 Date: February 2007

Walker Corporation Pty Ltd

Project No.: J8714

DataWorks Document Number: 2349971

Cardno Lawson Treloar



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Scale 1:25000 (A3)

FIGURE E.9

BREMER RIVER FLOODING - MASTERPLAN CASE - 10 YEAR ARI DEPTH (CASE DO3b)

Rev: 0 Date: February 2007

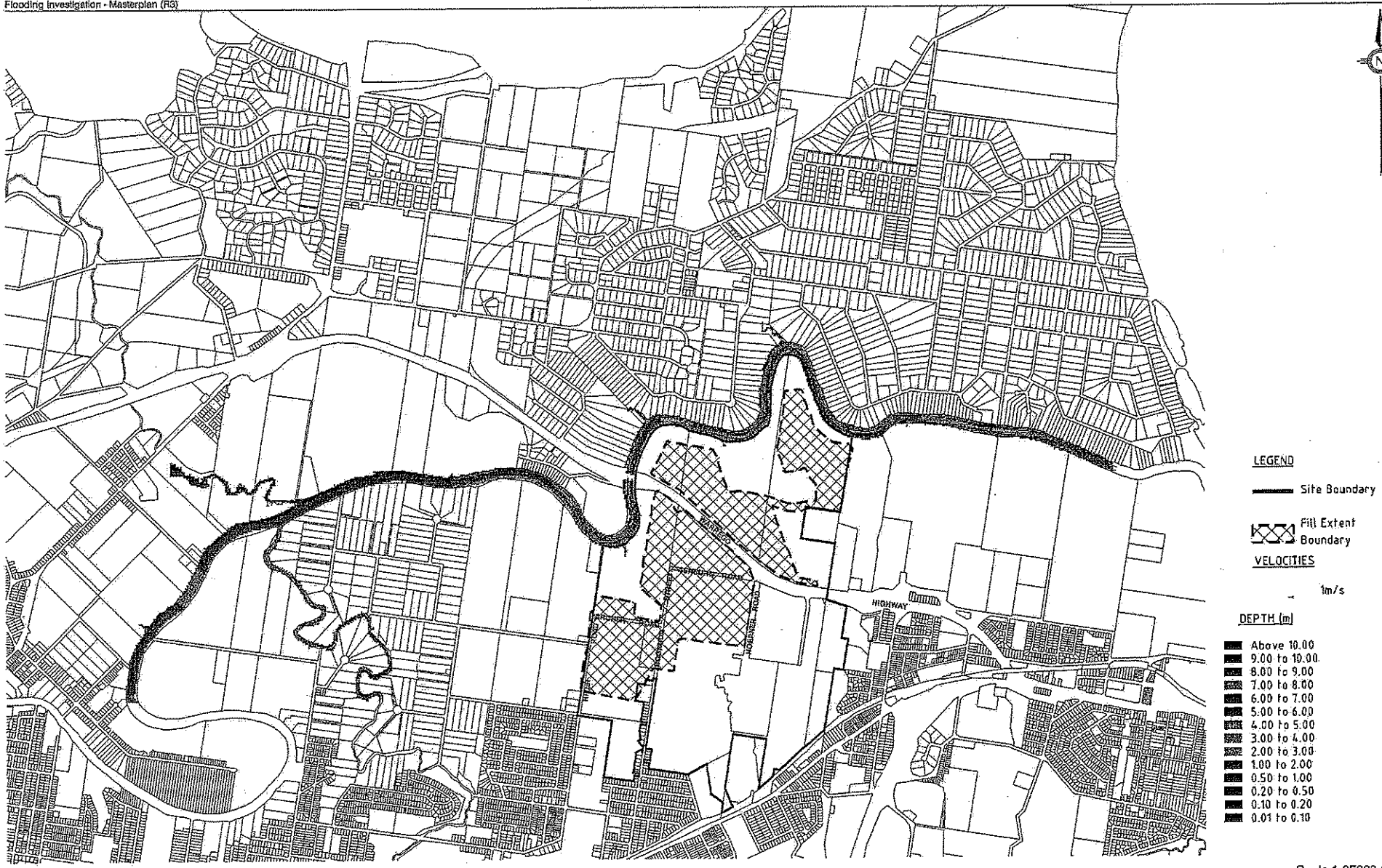
Project No.: J8714

Walker Corporation Pty Ltd

DataWorks Document Number: 2349971

Bremer Business Park
Flooding Investigation - Masterplan (R3)

Cardno Lawson Treloar



250 0 250 500 750 1000 1250m
1:25,000

Scale 1:25000 (A3)

FIGURE E.10

BREMER RIVER FLOODING - MASTERPLAN CASE - 5 YEAR ARI DEPTH (CASE DO3b)

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Rev: 0 Date: February 2007

Project No.: J8714

Walker Corporation Pty Ltd

DataWorks Document Number: 2349971

Cardno LawsonTreloar

APPENDIX F

Bremer River Flood SOBEK 2D Impact Plots

DataWorks Document Number: 2349971

Cardno Lawson Treloar

LEGEND

Site Boundary

Fill Extent Boundary

IMPACTS (mm)

- Above 60
- 50 to 60
- 40 to 50
- 30 to 40
- 20 to 30
- 15 to 20
- 10 to 15
- -15 to -10
- -20 to -15
- -30 to -20
- -40 to -30
- -50 to -40
- Below -50

250 0 250 500 750 1000 1250m
1:25,000

Scale 1:25000 (A3)

FIGURE F.1

BREMER RIVER FLOODING - MASTERPLAN CASE - 100 YEAR ARI IMPACTS (CASE DO3b)

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Rev: 0 Date: February 2007

Walker Corporation Pty Ltd

Project No.: J8714

PRINT DATE: 16 March, 2007 - 3:26pm

DataWorks Document Number: 2349971

Ipswich
City Council

Your Reference:
Our Reference: 1837/07 WSL:WSL
Contact Officer: [redacted]
Telephone No.: [redacted]

25 May 2007

Dear Sir/Madam

Re: Development Application Information Request (Section 3.3.6)
Application Number: 1837/07
Proposal: Reconfiguring a Lot (Three (3) Lots into 27 Lots plus Balance Lots)
Property Location: 120 Bognuda Street and 2-51 Ashburn Road, Bundamba

Upon review of the abovementioned Development Approval Application and supporting information we require further information to satisfactorily assess this application. The information requested is set-out below.

1. Traffic

(a) The Applicant is requested to provide a traffic impact assessment report, prepared by a RPEQ to address the impact of the potential ultimate traffic generation by the proposal on the external road network.

(b) Amongst other matters, the study shall address the following:

(i) a review of the traffic generated by the proposal;

(ii) recommendation of specific measures to be undertaken to improve the alignment, sight distances, and signage of the external roads which will result in safe movements of light and heavy vehicles, and reduce delays and queuing distances;

(iii) recommendations of specific measures to be undertaken to define and improve the intersections and alignment of the external roads; and

Department of Local Government, Planning, Sport and Recreation
Attn. [redacted]
PO Box 15031
CITY EAST QLD 4002

Please Address All Correspondence to:
Chief Executive Officer
Ipswich City Council
A.B.N. 61 461 981 077
PO Box 191 Ipswich Qld 4305
Telephone: [redacted]
Facsimile: [redacted]
Email: [redacted]
Website: www.ipswich.qld.gov.au

(iv) a local area traffic management (LATM) scheme in the existing residential areas to the south and south-west of the Bremer Business Park development.

Note: The Applicant should account those items discussed in Council's correspondence dated 15 May 2007 (copy attached).

2. Water and Sewerage

(a) The Applicant is requested to submit a water and sewerage reticulation analysis, prepared by a RPEQ, for the full development to determine the adequacy of the external water and sewerage to service the development including fire fighting flows. The requirements of Ipswich Water's "Water Supply Planning Guidelines" and "Sewerage Planning Guidelines" are to be met. The water and sewerage reticulation analysis is required to identify the infrastructure necessary for each stage of development, demonstrate adequate sizing, and show consistency with timing of both water and sewerage.

Note: The EP values to be used for modelling for Regional Business & industry Zone is 37.5 EP/ha.

(b) The Applicant is requested to demonstrate that the minimum cover over the existing 600mm MSCL water pipe which traverses the subject property, will be 600mm and the maximum cover is within the manufacturers guidelines and that the pipe is able to be serviced. The Applicant is requested to show existing and proposed infrastructure when checking service ability. The 600mm water main is not to be located under surface drains, where practicable. "As Constructed" information for infrastructure is available from Council's Works Department.

3. Earthworks

The Applicant is requested to provide details of the proposed earthworks for the subject property including cut/fill depths, batter slopes, retaining walls, typical cross section (particularly where adjoining roads) etc.

The Applicant shall note the following:

(i) fill shall not exceed a maximum height of 2.0 metres;

(ii) retaining walls shall not exceed a maximum height of 1.2 metres with 1 : 4 batters from the top and toe of the wall, unless it can be demonstrated to the Council's Senior Development Engineer's reasonable satisfaction that a greater height is acceptable; and

(iii) there shall be no fill under the 1:20 development line.

4. Flooding

(a) The flood investigation report prepared by Cardno Lawson Treloar dated March 2007 appears to not adequately address the impact on flood levels by the proposed development. The Applicant is requested to submit a subsequent flood investigation report which addresses the following:

(i) calibration for the hydrologic model WBNM and justification of the model's design flow results;

(ii) the hydrologic modelling 'pre-development' or existing scenario assumed that the entire external catchments are fully developed, however this is not the case. The Applicant is requested to identify the effect up to the time the entire external catchment is fully developed; and

(iii) the flooding investigation report has indicated that there is no impact on the flood levels for surrounding properties, however there are concerns that this information is not accurate considering the significant amount of fill proposed on the site without any compensatory earth works. The proposed filling is expected to reduce the conveyance of the river and is expected to have significant afflux to the Bremer River only flood as well as Brisbane River flood by back water. There are existing properties located on the northern side of the Bremer River opposite the subject site, which are affected by the regional Q20 floods. The Applicant is requested to provide detailed justification of the findings of the flood investigation report.

(b) The Applicant is also requested to demonstrate that the proposed fill does not compromise the existing flood immunity of the Warrego Highway.

5. Stormwater Quality and Quantity

(a) It is understood, further to discussions held between Hamish Pressland of Walker Corporation, the Healthy Waterways Partnership and Ipswich City Council with respect to the development of the Memorandum of Understanding (MOU), it was agreed in principle that a professional review of stormwater treatment reports is to be undertaken at the expense of the Partnership. The Applicant is requested to confirm that the relevant reports have been sent to the Partnership for review. A copy of the response is requested to be lodged prior to the decision making period.

(b) The Applicant is requested to provide a schedule which outlines the implementation timing of the regional water quality treatment measures associated with each stage as conceptually outlined in the Stormwater Management Strategy Overall Site Master Plan.

(c) The Applicant is requested to provide an individual stage detailed stormwater management plan in accordance with the Stormwater Management Strategy Overall Site Master Plan. The plan shall address the following:

(i) treatment of both public and private land with separate treatment trains for each use;

(ii) detailed design options which clarify the extent of treatment required (e.g. size of bioretention cells) relative to each industrial site; and

(iii) a range of options consistent with the Fact Sheet 3: WSUD in Industrial Areas (Healthy Waterways 2007).

Note: Sufficient detail should be provided so that further stormwater plans are not required for individual industrial lots unless the future Applicants of those lots wish to depart from the strategy outlined. This requirement should be outlined in the report.

A copy of the MUSIC sqz. file is requested for ease of assessment for both the Stormwater Management Strategy Overall Site Master Plan and for each of the stage-based reports.

6. Buffering to Warrego Highway

(a) The Applicant is requested to demonstrate (via Building Location Envelopes) the developable portion of the lots adjacent to the Warrego Highway taking into account setbacks and landscape buffers from the highway and the internal road.

(b) The Applicant is requested to provide a cross section of the Warrego Highway, the landscape buffer, the lots and the internal road.

7. Contaminated Land

(a) The site is listed on the Environmental Management Register. Considering this, there is a potential that any existing soil contamination may result in offsite effects and / or risks of contaminated soil dispersal during Operational Works. As such, the Applicant is requested to provide a Stage 1 Preliminary Site Investigation Report to Council. The report shall be undertaken by a suitably qualified person to a standard that is to the satisfaction of the Regulatory Services Manager. This assessment must be undertaken following the Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland by the Queensland Department of Environment (May 1998). As a minimum, the assessment must provide initial information which includes:

(i) A complete site history, detailing the previous uses of the property (including time frames of activities). This information can be obtained from interviews with previous site owners and neighbours of the property and aerial photographs etc;

(ii) Description of current and past site operations, activities and chemical storage (eg. bulk fuel storage, mechanical repairs, etc.);

(iii) A sampling program to determine if contamination is present and an evaluation of the requirement for future site sampling;

(iv) Representative sampling for likely contaminant levels/concentrations for potential sources of contamination identified in the site history evaluation; and

(v) A comparison of these levels with the Environmental Protection Agency's investigation thresholds.

If the Stage 1 Preliminary Site Investigation identifies the need for any further site sampling and/or remediation, further investigations may be required by Council.

(b) The Applicant is requested to provide details regarding how the contaminated soil dispersal risks during the Operational Works phase will be effectively controlled to contain the contaminated soil to the area(s) of risk identified. This should detail the erosion and sediment and dust controls to be incorporated during the earthworks at the site.

(c) In addition to the above, the Applicant is requested to demonstrate compliance with Condition 20: Contaminated Land of the Preliminary Approval (Appl. No. 3356/02).

8. Overall Development Plan

(a) The Applicant is requested to submit a preliminary master plan, which incorporates the following:

(i) a minimum road frontage to parkland of 75%;

(ii) on road pedestrian and cycle link to connect to the northern portion of the development (i.e. north of the Warrego Highway) in accordance with Figure 9 of the Preliminary Approval;

(iii) a park for a boat ramp or canoe access along the Bremer River and Bremer Meadows Parkland;

(iv) an amended traffic network plan illustrating the intended future bus routes throughout the development as well as the location of any future public transport network infrastructure (i.e. bus bays, bus stops, etc.);

(v) retention of the major natural overland flow paths within the development in accordance with the requirements outlined in the Preliminary Approval;

(vi) location of stormwater quality and quantity devices and other infrastructure items;

(vii) direct road access to 1 Carberry Street, Bundamba (Lot 2 RP86838); and

(viii) direct road access to the Boundary Street Park or alternatively provide a connection from the park to the north-east road and demonstrate that the recreation areas and paths within the park meet the CEPTED principles and provide for a safe pedestrian environment. Consideration should also be given to gravel maintenance tracks where lots back directly onto parkland.

(b) The Applicant is requested to clarify the purpose of the emergency vehicle access, specifically, whether these are intended to service the pedestrian and cycle links in the open space network.

(c) The Applicant is requested to advise of the intent of the Archer Street Park. The plan annotation lists potential space to upgrade to Level 2 or sports facility. The Applicant is requested to advise if there is suitable spatial area for a Level 3 facility as per current DSS (i.e. 5 ha sportsgrounds and courts, etc.).

(d) The Applicant is requested to provide preliminary earthworks drawings for the entire Bremer Business Park to ensure Stage 1 integrates with the balance area.

Under the provisions of the *Integrated Planning Act 1997*, the applicant has three (3) options available in response to this Information Request. The Applicant must give the Development Manager and each Referral Agency (if applicable):

1. all of the information requested; or

2. part of the information requested together with a notice asking the Development Manager and each Referral Agency (if applicable) to proceed with the assessment of the application; or

3. a notice:

(a) stating that the applicant does not intend to supply any of the information requested; and

(b) asking the Development Manager and each Referral Agency (if applicable) to proceed with the assessment of the application.

Access PD Online at www.ipswich.qld.gov.au to view, search and print property information, interactive mapping, track development applications and the Ipswich Planning Scheme. Undertake a development enquiry as part of the Property Search function to identify the planning scheme provisions that apply to a particular use on a property. PD Online - information at your fingertips 24 hours a day, 7 days a week.

Response to this Information Request should be forwarded to:-

The Development Manager
Development Branch
Ipswich City Council
PO Box 191
IPSWICH QLD 4305

Note: The notification stage for the application cannot commence until you, the applicant, give:

(a) all information request responses to all information requests made, and

(b) copies of the responses to the Development Manager.

Yours faithfully

[redacted]

DEVELOPMENT TEAM CO-ORDINATOR - EASTERN

Ipswich
City Council

Your Reference:
Our Reference:
Contact Officer: 3356/02 1837/07 NH:
Telephone No.: [redacted]

15 May 2007

Dear Sir

Re: Bremer Business Park Preliminary Approval

I refer to your letter of 27 February 2007 and recent discussions between Hamish Pressland (Walkers Corporation Pty Ltd) and Council's Natalie Handyside in respect to the abovementioned Preliminary Approval and requesting clarification of a number of conditions. A response is outlined below:

Condition 12: Local Area Traffic Management Scheme (MCU)

Council is agreeable to your request to provide a contribution in lieu of undertaking actual planning, design and construction works for local area traffic management. This option will necessitate a contribution for Stage 1 to Council in the approximate order of $100,000.00 to permit the preparation of concept planning, community consultation and cost estimates. The balance of the contribution will need to be paid in a lump sum to permit construction of works for the balance of the development to be undertaken as part of Stage 2. Such works will need to be bonded as 'uncompleted works' to secure the release of the Stage 1 Plan of Survey.

Condition 11: Roadworks/Traffic (RAL)

I would like to confirm that no conflict exists between this condition and the requirements outlined in the Department of Main Roads (DMR) concurrence agency response. It is Council's view that the Developer is able to satisfy DMR's requirements by satisfying Council's requirements.

Further, I can advise that Council may agree to the release of the Stage 1 Plan of Survey prior to the construction of the Hoepner Road extension (to Brisbane Road) subject to the following:

- Council has approved the Operational Works for the road;
- All land required for construction is owned by Council or the Developer or is dedicated road;
- The Developer has provided Council with a bond to the value of a 125% of the works; and
- The Developer has entered into a legal agreement with Council stipulating the Developer's construction obligations. Such legal agreement would require that the road be provided within a

[redacted]
Planning Initiatives
PO Box 1774
NEW FARM QLD 4005

Please Address All Correspondence to:
Chief Executive Officer
Ipswich City Council
A.B.N. 61 461 981 077
PO Box 191 Ipswich Qld 4305
Telephone: [redacted]
Facsimile: [redacted]
Email: [redacted]
Website: www.ipswich.qld.gov.au

specific timeframe and/or by a certain date and may also be linked to a trigger for a certain portion of development for Stage 1 and/or a traffic volume threshold.

I would envisage that Council would condition the Hoepner Road construction on the Reconfiguring a Lot approval associated with Stage 1 to ensure consistency with the Preliminary Approval. Such works would then be bonded as 'uncompleted works' or the like subject to the above requirements being satsified prior to the release of the plan.

I trust this information is of assistance. If you require any further information, please contact Ms [redacted] on telephone number [redacted]

Yours faithfully

[redacted]

Brendan Nelson
DEVELOPMENT MANAGER

Our Reference: RCU 2766
Enquiries [redacted]
Extension [redacted]
Address: PO Box 15031 City East Qld 4002
E-mail address [redacted]

Queensland Government

Department of
Local Government, Planning, Sport and Recreation

13 July 2007

Walker Corporation
C/- Planning Initiatives
PO Box 1774
NEW FARM QLD 4005

Attention: [redacted]

RE: REFERRAL COORDINATION — *INFORMATION REQUEST*

Dear Sir,

I refer to your letter dated 2 April 2007 and received in this office on 17 April 2007, requesting referral coordination under the *Integrated Planning Act 1997* (IPA) for the following application:

APPLICANT:	**Walker Corporation**
APPLICATION TYPE:	**Reconfiguring a Lot**
REFERRAL COORDINATION TRIGGER:	**3+ Concurrence Agencies**
LOCATION:	**120 Bognuda Street & 2-51 Ashburn Road Bundamba QLD, described as Lot 13 on SL 2892, Lot 34 on SL 3911 and Lot 2 on SP 179307**
LOCAL GOVERNMENT:	**Ipswich City Council**

I wish to advise that after preliminary assessment of your application additional information is required to fully assess the proposal. Details of the information requested are contained in pages 3 – 11 attached to this letter.

The following agencies were consulted in the preparation of this information request:

- Ipswich City Council (Assessment Manager)
- Environmental Protection Agency (Concurrence agency)
- Department of Main Roads (Concurrence agency)
- Queensland Transport (Concurrence agency)
- Department of Natural Resources and Water (Concurrence agency)
- Powerlink Queensland (Advice agency)
- Department of Primary Industries and Fisheries (Third Party)

The Department of Main Roads as a concurrence agency and the Department of Primary Industries and Fisheries as a third party require no further information.

The Act requires the applicant to provide a copy of the response to the information request to the Assessment Manager and any IDAS concurrence or advice agency. It is also recommended that copies of your information response be forwarded to the third parties listed above. Please note, under section 3.3.8 (3) of the IPA you are not required to send a copy of your information response to this Department.

Please note, you have 12 months to respond to this information request. The response must be made in one of the following three ways —

- Provide all the information requested; or
- Provide part of the information requested together with a notice asking the assessment manager and each IDAS referral agency to proceed with the assessment of the application; or
- Provide a notice —
  - (i) Stating that the applicant does not intend to supply any of the information requested; and
  - (ii) Asking the assessment manager and each IDAS referral agency to proceed with the assessment of the application.

It should be noted that in the event of an appeal against a decision on a development application, costs may be awarded against an applicant if the court considers the applicant did not give all information reasonably requested in the information request (s4.1.23(2)(g) of the IPA).

Further information or assistance may be obtained by contacting the above contact officer by telephone or e-mail.

Yours sincerely

Principal Planner
Statutory Planning Branch

CC:
Ipswich City Council
Environmental Protection Agency
Department of Main Roads
Queensland Transport
Department of Natural Resources and Water
Department of Primary Industries and Fisheries
Powerlink Queensland

MATTERS OF INTEREST TO THE ASSESSMENT MANAGER

The Ipswich City Council, as assessment manager for the application, raises the following matters of concern and requests the following additional information:

INFORMATION REQUESTED

Please provide the following information:

1. Traffic

(a) A traffic impact assessment report, prepared by a RPEQ, to address the impact of the potential ultimate traffic generation by the proposal on the external road network.

(b) Amongst other matters, the study should address the following:

(i) a review of the traffic generated by the proposal;

(ii) recommendation of specific measures to be undertaken to improve the alignment, sight distances, and signage of the external roads which will result in safe movements of light and heavy vehicles, and reduce delays and queuing distances;

(iii) recommendations of specific measures to be undertaken to define and improve the intersections and alignment of the external roads; and

(iv) a local area traffic management (LATM) scheme in the existing residential areas to the south and south-west of the Bremer Business Park development.

Note: The Applicant should account those items discussed in Council's correspondence dated 15 May 2007 (copy attached).

2. Water and Sewerage

(a) Please submit a water and sewerage reticulation analysis, prepared by a RPEQ, for the full development to determine the adequacy of the external water and sewerage to service the development including fire fighting flows. The requirements of Ipswich Water's "Water Supply Planning Guidelines" and "Sewerage Planning Guidelines" are to be met. The water and sewerage reticulation analysis is required to identify the infrastructure necessary for each stage of development, demonstrate adequate sizing, and show consistency with timing of both water and sewerage.

Note: The EP values to be used for modelling for Regional Business & industry Zone is 37.5 EP/ha.

(b) Demonstrate that the minimum cover over the existing 600mm MSCL water pipe which traverses the subject property, will be 600mm and the maximum cover is within the manufacturers guidelines and that the pipe is able to be serviced. Also show existing and proposed infrastructure when checking service ability. The 600mm water main is not to be located under surface drains, where practicable. "As Constructed" information for infrastructure is available from Council's Works Department.

3. Earthworks

Please provide details of the proposed earthworks for the subject property including cut/fill depths, batter slopes, retaining walls, typical cross section (particularly where adjoining roads) etc.

In particular, please note the following:

(i) fill shall not exceed a maximum height of 2.0 metres;

(ii) retaining walls shall not exceed a maximum height of 1.2 metres with 1 : 4 batters from the top and toe of the wall, unless it can be demonstrated to the Council's Senior Development Engineer's reasonable satisfaction that a greater height is acceptable; and

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(a) The flood investigation report prepared by Cardno Lawson Treloar dated March 2007 appears to not adequately address the impact on flood levels by the proposed development. Please submit a subsequent flood investigation report which addresses the following:

(i) calibration for the hydrologic model WBNM and justification of the model's design flow results;

(ii) the hydrologic modelling 'pre-development' or existing scenario assumed that the entire external catchments are fully developed, however this is not the case. Please identify the effect up to the time the entire external catchment is fully developed; and

(iii) the flooding investigation report has indicated that there is no impact on the flood levels for surrounding properties, however there are concerns that this information is not accurate considering the significant amount of fill proposed on the site without any compensatory earth works. The proposed filling is expected to reduce the conveyance of the river and is expected to have significant afflux to the Bremer River only flood as well as Brisbane River flood by back water. There are existing properties located on the northern side of the Bremer River opposite the subject site, which are affected by the regional Q20 floods. Please provide detailed justification of the findings of the flood investigation report.

(b) Demonstrate that the proposed fill does not compromise the existing flood immunity of the Warrego Highway.

5. Stormwater Quality and Quantity

(a) It is understood, further to discussions held between Hamish Pressland of Walker Corporation, the Healthy Waterways Partnership and Ipswich City Council with respect to the development of the Memorandum of Understanding (MOU), it was agreed in principle that a professional review of stormwater treatment reports is to be undertaken at the expense of the Partnership. Please confirm that the relevant reports have been sent to the Partnership for review. A copy of the response is requested to be lodged prior to the decision making period.

(b) Please provide a schedule which outlines the implementation timing of the regional water quality treatment measures associated with each stage as conceptually outlined in the Stormwater Management Strategy Overall Site Master Plan.

(c) Please provide an individual stage detailed stormwater management plan in accordance with the Stormwater Management Strategy Overall Site Master Plan. The plan should address the following:

(i) treatment of both public and private land with separate treatment trains for each use;

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Note: Sufficient detail should be provided so that further stormwater plans are not required for individual industrial lots unless the future Applicants of those lots wish to depart from the strategy outlined. This requirement should be outlined in the report.

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6. Buffering to Warrego Highway

(a) Please demonstrate (via Building Location Envelopes) the developable portion of the lots adjacent to the Warrego Highway taking into account setbacks and landscape buffers from the highway and the internal road.

(b) Please provide a cross section of the Warrego Highway, the landscape buffer, the lots and the internal road.

7. Contaminated Land

(a) The site is listed on the Environmental Management Register. Considering this, there is a potential that any existing soil contamination may result in offsite effects and / or risks of contaminated soil dispersal during Operational Works. As such, please provide a Stage 1 Preliminary Site Investigation Report to Council. The report should be undertaken by a suitably qualified person to a standard that is to the satisfaction of the Regulatory Services Manager. This assessment must be undertaken following the Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland by the Queensland Department of Environment (May 1998). As a minimum, the assessment must provide initial information which includes:

(i) A complete site history, detailing the previous uses of the property (including time frames of activities). This information can be obtained from interviews with previous site owners and neighbours of the property and aerial photographs etc;

(ii) Description of current and past site operations, activities and chemical storage (eg. bulk fuel storage, mechanical repairs, etc.);

(iii) A sampling program to determine if contamination is present and an evaluation of the requirement for future site sampling;

(iv) Representative sampling for likely contaminant levels/concentrations for potential sources of contamination identified in the site history evaluation; and

(v) A comparison of these levels with the Environmental Protection Agency's investigation thresholds.

If the Stage 1 Preliminary Site Investigation identifies the need for any further site sampling and/or remediation, further investigations may be required by Council.

(b) Please provide details regarding how the contaminated soil dispersal risks during the Operational Works phase will be effectively controlled to contain the contaminated soil to the area(s) of risk identified. This should detail the erosion and sediment and dust controls to be incorporated during the earthworks at the site.

(c) In addition to the above, demonstrate compliance with Condition 20: Contaminated Land of the Preliminary Approval (Appl. No. 3356/02).

8. Overall Development Plan

(a) Please submit a preliminary master plan, which incorporates the following:

(i) a minimum road frontage to parkland of 75%;

(ii) on road pedestrian and cycle link to connect to the northern portion of the development (i.e. north of the Warrego Highway) in accordance with Figure 9 of the Preliminary Approval;

(iii) a park for a boat ramp or canoe access along the Bremer River and Bremer Meadows Parkland;

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(viii) direct road access to the Boundary Street Park or alternatively provide a connection from the park to the north-east road and demonstrate that the recreation areas and paths within the park meet the CEPTED principles and provide for a safe pedestrian environment. Consideration should also be given to gravel maintenance tracks where lots back directly onto parkland.

(b) Please provide clarification on the purpose of the emergency vehicle access, specifically, whether these are intended to service the pedestrian and cycle links in the open space network.

(c) Please provide information on the intent of the Archer Street Park. The plan annotation lists potential space to upgrade to Level 2 or sports facility. Please advise if there is suitable spatial area for a Level 3 facility as per current DSS (i.e. 5 ha sportsgrounds and courts, etc.).

(d) Please provide preliminary earthworks drawings for the entire Bremer Business Park to ensure Stage 1 integrates with the balance area.

For further information in relation to this request please contact [redacted] on telephone [redacted]

A copy of the response to the information request can be forwarded to:

The Development Manager
Development Branch
Ipswich City Council
PO Box 191
IPSWICH QLD 4305

MATTERS OF INTEREST TO ENVIRONMENTAL PROTECTION AGENCY

The Environmental Protection Agency as a concurrence agency for the application raises the following matters of concern and requests the following additional information:

INFORMATION REQUESTED

Please provide the following information:

1. A site investigation report, prepared in accordance with the *Environmental Protection Act 1994* (EP Act) and the *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland* (DEH, 1998), must be submitted to the Environmental Protection Agency – Waste and Contaminated Land Unit (EPA-W&CLU). The report must demonstrate that **Lot 2 on SP179307** is suitable for the intended use and enable the EPA to either:
   a. remove the site from the Environmental Management Register, or
   b. approve a submitted draft Site Management Plan / Remediation Action Plan.

2. A site investigation report, prepared in accordance with the *Environmental Protection Act 1994* (EP Act) and the *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland* (DEH, 1998), must be submitted to the Environmental Protection Agency – Contaminated Land Unit (EPA-CLU) showing that the **Lot 13 on SL2892 and Lot 34 on SL3911** are suitable for the intended use.

ADVICE

- Third Party Reviewer. A Third Party Reviewer (TPR) must be appointed under the EPA's *Terms of Reference - Use of a Third Party Reviewer for Assessment and Management of Site Contamination dated 28 August 2003* (TOR).
- The information requested under clause 1 & 2 above must be reviewed and consented to by the TPR before submitting to the EPA.
- A TPR acceptable to the EPA must be engaged at all times until draft Site Management Plans, acceptable to the EPA are submitted or the subject land has been removed from the Environmental Management Register.

The Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland may be obtained from the EPA's Internet site at www.epa.gov.au, or by contacting the EPA's Contaminated Land Unit. Please ensure that the appropriate statutory fee [as of the 1 July 2006 $972.00 per lot listed on the Environmental Management Register] is included with this application for the assessment of the site investigation / validation reports.

For further information in relation to this request please contact [redacted] Chief Scientific Advisor on [redacted]

A copy of the response to the information request can be forwarded to:

EcoAccess
Environmental Protection Agency
PO Box 15155
CITY EAST QLD 4002

Attention: [redacted]

MATTERS OF INTEREST TO DEPARTMENT OF NATURAL RESOURCES AND WATER

The Department of Natural Resources and Water as a concurrence agency for the application provides the following advice:

THIRD PARTY MATTERS

Aboriginal Cultural Heritage

Under section 23 of the *Aboriginal Cultural Heritage Act 2003*, a person who carries out an activity must take all reasonable and practicable measures to ensure the activity does not harm Aboriginal cultural heritage (the "cultural heritage duty of care"). Maximum penalties for breaching the duty of care are $750,000 for a corporation and $75,000 for an individual.

You will comply with the duty of care in relation to Aboriginal cultural heritage if you are acting in compliance with cultural heritage duty of care guidelines gazetted under the *Aboriginal Cultural Heritage Act 2003*, available on the NRW website, or in accordance with an agreement with the Aboriginal party for the area or a cultural heritage management plan approved under part 7 of the *Aboriginal Cultural Heritage Act 2003*.

You should also undertake a search of the Aboriginal Cultural Heritage Database and the Aboriginal Cultural Heritage Register, administered by the Cultural Heritage Coordination Unit, NRW. Application forms to undertake a free search of the Cultural Heritage Register and the Database may be obtained by contacting the Cultural Heritage Coordination Unit on [redacted] or on the NRW website www.nrw.qld.gov.au/cultural_heritage.

NRW looks forward to receiving a copy of the information request issued to the applicant or a notice advising that an information request will not be made in accordance with s3.3.7 of IPA.

For further information in relation to this request please contact Planning & Environment on [redacted] quoting reference number IC0607BEE0005.

A copy of the response to the information request can be forwarded to:

[redacted]
A/Senior Officer (Planning & Environment)
South-East Region – Beenleigh
Department of Natural Resources & Water
PO Box 1164
BEENLEIGH QLD 4207

MATTERS OF INTEREST TO QUEENSLAND TRANSPORT

The Queensland Transport as a concurrence agency for the application raises the following matters of concern and requests the following additional information:

INFORMATION REQUESTED

QT has reviewed the application on the basis of its jurisdiction, namely the increased integration between land use and transport (s8A of the *Transport Planning and Coordination Act 1994*) and the safety and operational integrity of railways and future railways (s258 of the *Transport Infrastructure Act 1994*).

Please provide the following information.

1. A planning report;
2. Clarification of whether Archer Street will connect Bognuda Street to River Road and will be formed as part of this development;
3. Details of how off-road cycle access will be provided to the Ebbw Vale Railway Station;
4. The expected ultimate number of employees working within the Bremer Business Park;
5. The likely hours of operation;
6. The types of business operating within the Bremer Business Park; and
7. Details of how employees of the Bremer Business Park would access the site from PT services.

ADVICE

Regarding the impact of the development for traffic entering and exiting Warrego Highway around Police and Compliance enforcement bays, please commence discussions with:

1. Queensland Transport, Manager Compliance for South East Region, [redacted]
   Phone: [redacted] Email: [redacted]
2. Police Inspector (Southern Region)
   Phone: [redacted] Email: [redacted]

Queensland Transport proposes the discussion of the following:

1. The likely increases in traffic movements within 200 meters of these two enforcement bays;
2. The increased opportunity for drivers to avoid this enforcement site; and
3. The increased difficulty for Police and Compliance staff to intercept vehicles.

If you have a query or wish to seek clarification about any of these details, please contact [redacted], Planner (Land Use) on [redacted].

A copy of the response to the information request can be forwarded to:

Transport Planning Branch
South East Queensland & Southern Region
Queensland Transport
GPO Box 213
BRISBANE QLD 4001

MATTERS OF INTEREST TO POWERLINK QUEENSLAND

The Powerlink Queensland as an advice agency for the application provides the following advice and requests the following additional information:

INFORMATION REQUESTED

A Powerlink pole (Structure No 8201) is located in Lot 2 on SP179307 near the road junction of Archer Street and Bognuda Street.

1. Please provide a plan that accurately identifies the proposed new road boundary in relation to the face of this pole so that we can establish what additional risk there is to our infrastructure as a consequence of the proposed road widening.

For further information in relation to this request please contact [redacted] on telephone [redacted].

A copy of the response to the information request can be forwarded to:

Powerlink Queensland
PO Box 1193
VIRGINIA QLD 4014

Attention: [redacted]

PLANNING INITIATIVES
DEVELOPMENT PLANNING CONSULTANTS

3 August 2007

Ipswich City Council
RECEIVED
06 AUG 2007
Doc. No. 2630158
Applic. No. 1837/07
Action Off [redacted]

The Development Manager
Development Branch
Ipswich City Council
PO Box 191
IPSWICH QLD 4305

Attention [redacted]

RE: REFERRAL COORDINATION — *INFORMATION REQUEST*
120 Bognuda Street & 2-51 Ashburn Road Bundamba QLD, described as Lot 13 on SL 2892, Lot 34 on SL 3911 and Lot 2 on SP 179307

The Ipswich City Council, as assessment manager for the application, raises the following matters of concern and requests the following additional information:

Under Section *3.3.8 (1) (b)* of the *Integrated Planning Act 1997* we wish to make a part response to the Information request items raised by Council. We have responded to each concern under the issue raised.

INFORMATION REQUESTED

Please provide the following information:

1. *Traffic*

(a) *A traffic impact assessment report, prepared by a RPEQ, to address the impact of the potential ultimate traffic generation by the proposal on the external road network.*

(b) *Amongst other matters, the study should address the following:*

(i) *a review of the traffic generated by the proposal;*

(ii) *recommendation of specific measures to be undertaken to improve the alignment, sight distances, and signage of the external roads which will result in safe movements of light and heavy vehicles, and reduce delays and queuing distances;*

(iii) *recommendations of specific measures to be undertaken to define and improve the intersections and alignment of the external roads; and*

(iv) *a local area traffic management (LATM) scheme in the existing residential areas to the south and south-west of the Bremer Business Park development.*

Note: The Applicant should account those items discussed in Council's correspondence dated 15 May 2007 (copy attached).

Level 1, 895 Ann Street
Fortitude Valley Qld 4006
PO Box 1774
New Farm Qld 4005

Telephone [redacted]
Facsimile [redacted]
Jilland Pty Ltd ABN 22 893 260 230

A Traffic Report has previously been submitted to Council as part of further information regarding the application. This report has addressed Council's issues raised above and has provided a detailed analysis of all roads relating to the proposed reconfiguration.
A copy of this report has also been submitted to Main Roads. An information request was not issued by main Roads and the assessment is currently being finalised.

2. <u>*Water and Sewerage*</u>

(a) *Please submit a water and sewerage reticulation analysis, prepared by a RPEQ, for the full development to determine the adequacy of the external water and sewerage to service the development including fire fighting flows. The requirements of Ipswich Water's "Water Supply Planning Guidelines" and "Sewerage Planning Guidelines" are to be met. The water and sewerage reticulation analysis is required to identify the infrastructure necessary for each stage of development, demonstrate adequate sizing, and show consistency with timing of both water and sewerage.*

Note: The EP values to be used for modelling for Regional Business & industry Zone is 37.5 EP/ha.

(b) *Demonstrate that the minimum cover over the existing 600mm MSCL water pipe which traverses the subject property, will be 600mm and the maximum cover is within the manufacturers guidelines and that the pipe is able to be serviced. Also show existing and proposed infrastructure when checking service ability. The 600mm water main is not to be located under surface drains, where practicable. "As Constructed" information for infrastructure is available from Council's Works Department.*

Water and Sewage Reports have been submitted to Council as part of further information relating to the application. These reports have addressed Council's concerns in relation to these matters.

3. <u>*Earthworks*</u>

Please provide details of the proposed earthworks for the subject property including cut/fill depths, batter slopes, retaining walls, typical cross section (particularly where adjoining roads) etc.

In particular, please note the following:

(i) *fill shall not exceed a maximum height of 2.0 metres;*

(ii) *retaining walls shall not exceed a maximum height of 1.2 metres with 1 : 4 batters from the top and toe of the wall, unless it can be demonstrated to the Council's Senior Development Engineer's reasonable satisfaction that a greater height is acceptable; and*

(iii) *there shall be no fill under the 1:20 development line.*

In response to Councils concerns raised above the proposed filling onsite will ensure that all sites reach flood immunity and have flood free access and no retaining walls are proposed as part of this application.

The proposed filling associated with Stage 1 is located in the fringing extents of the 1 in 20 development line. This filling does not influence the critical conveyance path of the associated flood event.

A flood assessment has been completed by Cardno Lawson Treloar as detailed within their report '*Bremer Business Park Masterplan Flood Investigation*' dated March 2007. This report demonstrates the compliance to Council's Current Planning Scheme Policy.

It is noted based on this assessment that the 1 in 20 year Development Line is considered overly conservative based on the revision ICC have undertaken on the 1 in 100 year flood line.

It is noted that Cardno Lawson Treloar are currently undertaking additional assessments specifically at ICC's request, to address some of Council's concerns that are beyond the current planning scheme requirements.

4. *Flooding*

(a) The flood investigation report prepared by Cardno Lawson Treloar dated March 2007 appears to not adequately address the impact on flood levels by the proposed development. Please submit a subsequent flood investigation report which addresses the following:

(i) calibration for the hydrologic model WBNM and justification of the model's design flow results;

(ii) the hydrologic modelling 'pre-development' or existing scenario assumed that the entire external catchments are fully developed, however this is not the case. Please identify the effect up to the time the entire external catchment is fully developed; and

(iii) the flooding investigation report has indicated that there is no impact on the flood levels for surrounding properties, however there are concerns that this information is not accurate considering the significant amount of fill proposed on the site without any compensatory earth works. The proposed filling is expected to reduce the conveyance of the river and is expected to have significant afflux to the Bremer River only flood as well as Brisbane River flood by back water. There are existing properties located on the northern side of the Bremer River opposite the subject site, which are affected by the regional Q20 floods. Please provide detailed justification of the findings of the flood investigation report.

(b) Demonstrate that the proposed fill does not compromise the existing flood immunity of the Warrego Highway.

Further to Council's request please find the attached letter from Cardno Lawson Treloar which has addressed each of Council's issues raised above.

5. <u>Stormwater Quality and Quantity</u>

(a) *It is understood, further to discussions held between Hamish Pressland of Walker Corporation, the Healthy Waterways Partnership and Ipswich City Council with respect to the development of the Memorandum of Understanding (MOU), it was agreed in principle that a professional review of stormwater treatment reports is to be undertaken at the expense of the Partnership. Please confirm that the relevant reports have been sent to the Partnership for review. A copy of the response is requested to be lodged prior to the decision making period.*

(b) *Please provide a schedule which outlines the implementation timing of the regional water quality treatment measures associated with each stage as conceptually outlined in the Stormwater Management Strategy Overall Site Master Plan.*

(c) *Please provide an individual stage detailed stormwater management plan in accordance with the Stormwater Management Strategy Overall Site Master Plan. The plan should address the following:*

(i) *treatment of both public and private land with separate treatment trains for each use;*

(ii) *detailed design options which clarify the extent of treatment required (e.g. size of bioretention cells) relative to each industrial site; and*

(iii) *a range of options consistent with the Fact Sheet 3: WSUD in Industrial Areas (Healthy Waterways 2007).*

Note: Sufficient detail should be provided so that further stormwater plans are not required for individual industrial lots unless the future Applicants of those lots wish to depart from the strategy outlined. This requirement should be outlined in the report.

A copy of the MUSIC sqz. file is requested for ease of assessment for both the Stormwater Management Strategy Overall Site Master Plan and for each of the stage-based reports.

Further to Council's request please find the attached letter from Cardno Lawson Treloar which has addressed each of Council's issues raised above.

6. <u>Buffering to Warrego Highway</u>

(a) *Please demonstrate (via Building Location Envelopes) the developable portion of the lots adjacent to the Warrego Highway taking into account setbacks and landscape buffers from the highway and the internal road.*

(b) *Please provide a cross section of the Warrego Highway, the landscape buffer, the lots and the internal road.*

Further to Council's request please find the attached revised Plan SK17 which indicates the proposed 20m wide setback from the Warrego Highway. The setback includes a 10m wide Q.D.M.R Resumption and a 10m wide buffer. Please also refer to plan 16011D which identifies the building envelopes and developable portion of the land.

Located on Plan Sk17 for Council's reference is a cross section of the Warrego Highway incorporating the landscape buffer, the lots and the internal road.

7. <u>Contaminated Land</u>

(a) *The site is listed on the Environmental Management Register. Considering this, there is a potential that any existing soil contamination may result in offsite effects and / or risks of contaminated soil dispersal during Operational Works. As such, please provide a Stage 1 Preliminary Site Investigation Report to Council. The report should be undertaken by a suitably qualified person to a standard that is to the satisfaction of the Regulatory Services Manager. This assessment must be undertaken following the Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland by the Queensland Department of Environment (May 1998). As a minimum, the assessment must provide initial information which includes:*

(i) *A complete site history, detailing the previous uses of the property (including time frames of activities). This information can be obtained from interviews with previous site owners and neighbours of the property and aerial photographs etc;*

(ii) *Description of current and past site operations, activities and chemical storage (eg. bulk fuel storage, mechanical repairs, etc.);*

(iii) *A sampling program to determine if contamination is present and an evaluation of the requirement for future site sampling;*

(iv) *Representative sampling for likely contaminant levels/concentrations for potential sources of contamination identified in the site history evaluation; and*

(v) *A comparison of these levels with the Environmental Protection Agency's investigation thresholds.*

If the Stage 1 Preliminary Site Investigation identifies the need for any further site sampling and/or remediation, further investigations may be required by Council.

(b) *Please provide details regarding how the contaminated soil dispersal risks during the Operational Works phase will be effectively controlled to contain the contaminated soil to the area(s) of risk identified. This should detail the erosion and sediment and dust controls to be incorporated during the earthworks at the site.*

(c) *In addition to the above, demonstrate compliance with Condition 20: Contaminated Land of the Preliminary Approval (Appl. No. 3356/02).*

We are currently preparing additional reporting to comply with requests from both Council and the EPA and this information will be forwarded in due course.

8. *Overall Development Plan*

(a) *Please submit a preliminary master plan, which incorporates the following:*

(i) *a minimum road frontage to parkland of 75%;*

(ii) *on road pedestrian and cycle link to connect to the northern portion of the development (i.e. north of the Warrego Highway) in accordance with Figure 9 of the Preliminary Approval;*

(iii) *a park for a boat ramp or canoe access along the Bremer River and Bremer Meadows Parkland;*

(iv) *an amended traffic network plan illustrating the intended future bus routes throughout the development as well as the location of any future public transport network infrastructure (i.e. bus bays, bus stops, etc.);*

(v) *retention of the major natural overland flow paths within the development in accordance with the requirements outlined in the Preliminary Approval;*

(vi) *location of stormwater quality and quantity devices and other infrastructure items;*

(vii) *direct road access to 1 Carberry Street, Bundamba (Lot 2 RP86838); and*

(viii) *direct road access to the Boundary Street Park or alternatively provide a connection from the park to the north-east road and demonstrate that the recreation areas and paths within the park meet the CEPTED principles and provide for a safe pedestrian environment. Consideration should also be given to gravel maintenance tracks where lots back directly onto parkland.*

(b) *Please provide clarification on the purpose of the emergency vehicle access, specifically, whether these are intended to service the pedestrian and cycle links in the open space network.*

(c) *Please provide information on the intent of the Archer Street Park. The plan annotation lists potential space to upgrade to Level 2 or sports facility. Please advise if there is suitable spatial area for a Level 3 facility as per current DSS (i.e. 5 ha sportsgrounds and courts, etc.).*

(d) *Please provide preliminary earthworks drawings for the entire Bremer Business Park to ensure Stage 1 integrates with the balance area.*

Further to Council's request please find the attached revised Overall Development Plans by Anembo Consultants and Burchill VDM addressing Council's concerns raised above.

In response to point (a)(i) adequate access and frontage has been provided to the parkland area with Stage1a. The proposal provides for an active frontage of the park

which is current designed as a level 3 recreation area. Provision has been made to upgrade this area to a level 2 recreation area in the future. All facilities allow for convenient and safe pedestrian and vehicular access to and from the site.

The preliminary approval previously issued over the site provides for designated areas of open space and park to cater for the entire precinct. These parkland areas have been maintained and the current design provides pedestrian and bicycle movements that will ensure safe and efficient access to the designated park areas.

The above represents a response in part to Council's Information. As previously stated, all other facets of the Information are in the process of being prepared and will be forwarded to Council once completed.

I trust that this is to your satisfaction, however, should you have any further queries, please feel free to call our office.

Yours Faithfully,
PLANNING INITIATIVES

[redacted]

Cardno
LawsonTreloar
Shaping the Future

BREMER BUSINESS PARK - STAGE 1

Stormwater Management Strategy to Support ROL Development Application

August 2007
Job No. LJ8714/R5

Walker Corporation Pty Limited

FLOOD ASSESSMENT

Our Ref LJ8714/Lt07 :DNN/dn

Contact [redacted]

Cardno LawsonTreloar

Shaping the Future

2 August 2007

Walker Corporation Pty Ltd
Suite 1, Harbour Point Marina Shopping Village,
Santa Barbara Rd,
HOPE ISLAND, QLD 4212

Attention: Mr [redacted]

Dear [redacted]

RE: BREMER BUSINESS PARK – FLOODING, STORMWATER QUALITY AND QUANTITY RESPONSE TO INFORMATION REQUEST

We provide the following response to Department of Local Government, Planning, Sport and Recreation's information request dated 13 July 2007 (ref RCU 2766). This letter provides a response to the Assessment Manager (ICC) requests relating specifically to items associated with flooding, stormwater quality and quantity.

The information request item and our response are as follows:

MATTERS OF INTEREST TO THE ASSESSMENT MANAGER

4. Flooding

(a) The flood investigation report prepared by Cardno Lawson Treloar dated March 2007 appears to not adequately address the impact on the flood levels by the proposed development. The Applicant is requested to submit a subsequent flood investigation report which addresses the following:

(i) calibration for the hydrologic model WBNM and justification of the model's design flow results;

(ii) the hydrologic modelling 'pre-development' or existing scenario assumed that the entire external catchments are fully developed, however this is not the case. The Applicant is requested to identify the effect up to the time the entire external catchment is fully developed; and

(iii) the flooding investigation report has indicated that there is no impact on the flood levels for surrounding properties, however there are concerns that this information is not accurate considering the significant amount of fill proposed on the site without any compensatory earth works. The proposed filling is expected to reduce the conveyance of the river and is expected to have significant afflux to the Bremer River only flood as well as Brisbane River flood by back water. There are existing properties located on the northern side of Bremer River opposite the subject site, which are affected by the regional Q20 floods. The Applicant is requested to provide detailed justification of the findings of the flood investigation report.

Cardno Lawson Treloar Pty Ltd
ABN 55 001 882 873

Level 1, 9 Gardner Close
Milton Qld 4064
PO Box 388
Toowong Qld 4066
Australia
Telephone: [redacted]
Facsimile: [redacted]
International: [redacted]
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Web: www.cardno.com.au

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Baulkham Hills
Wollongong
Busselton

Papua New Guinea
Indonesia
Vietnam
China
Kenya
United Arab Emirates
United Kingdom

2005 UDIA Awards for Excellence WINNER
Engineering Excellence Award 2005 WINNER Queensland Division
ACEA ASSOCIATION OF CONSULTING ENGINEERS AUSTRALIA MEMBER
Quality System Quality Endorsed Company

(b) *The Applicant is also requested to demonstrate that the proposed fill does not compromise the existing flood immunity of the Warrego Highway.*

CLT and the Walker Corporation are currently in discussions with Ipswich City Council (ICC) regarding the flood request items specified above. Following the resolution of these discussions CLT will update the Masterplan flooding investigation to include the changes and additional details requested above in our report '*Bremer Business Park Masterplan Flooding Investigation*' dated July 2007 (ref J8714/R3/V2).

To respond to Item 4 (b) the flood maps presented in the Appendices of our report '*Bremer Business Park Masterplan Flooding Investigation*' dated July 2007 (ref J8714/R3/V2) indicate that the only event that the Warrego Highway is inundated in is the Brisbane River 100 year ARI event in the pre development scenario. Following the proposed filling there are negligible impacts, with no increase in flood level reported to the accuracy of the model. Due to the proposed filling the Warrego highway will remain flood free to the east of the Bremer River Bridge and thus the immunity of the Warrego highway has been improved.

5. <u>Stormwater Quality and Quantity</u>

(a) *It is understood, further to discussions held between Hamish Pressland of Walker Corporation, the Healthy Waterways Partnership and Ipswich City Council with respect to the development of the Memorandum of Understanding (MOU), it was agreed in principle that a professional review of stormwater treatment reports is to be undertaken at the expense of the Partnership. The Applicant is requested to confirm that the relevant reports have been sent to the Partnership for review. A copy of the response is requested to be lodged prior to the decision making period.*

(b) *The Applicant is requested to provide a schedule which outlines the implementation timing of the regional water quality treatment measures associated with each stage as conceptually outlined in the Stormwater Management Strategy Overall Site Master Plan.*

(c) *The Applicant is requested to provide an individual stage detailed stormwater management plan in accordance with the Stormwater Management Strategy Overall Site master Plan. The plan shall address the following:*

(i) *treatment of both public and private land with separate treatment trains for each use;*

(ii) *detailed design options which clarify the extent of the treatment required (e.g. size of bioretention cells) relative to each industrial site; and*

(iii) *a range of options consistent with the Fact sheet 3: WSUD in industrial Areas (Healthy Waterways 2007).*

Note: Sufficient detail should be provided so that further stormwater plans are not required for individual industrial lots unless the future Applicants of those lots wish to depart from the strategy outlined. This requirement should be outlined in the report.

A copy of the MUSIC sqz. file is requested for ease of assessment for both the Stormwater Management Strategy Overall Site Master Plan and for each of the stage-based reports.

In response to Item 5 (a) the previous masterplan reports were supplied to the Healthy Waterways on the 5 July 2007. We are still awaiting a final response.

In response to item 5 (b), Figure 1 attached shows Conceptual Master Plan Stormwater Management Plan. As discussed in our '*Bremer Business Park Masterplan Stormwater Management strategy Overall Site Master Plan*' dated March 2007 (ref LJ8714/R4) the stormwater management will consist of:

- For the industrial lots minor bio-retention basins on a lot by lot basis and GPTs at the end of the stormwater system prior to discharge;
- For the road network within the industrial subdivision rain-gardens and central median bio-swales in appropriate locations or small off-line bio-retention systems downstream of the stormwater outlets;
- For the residential lots in the south-west corner of the development a bio-retention system for the total residential lot development; and
- Through-out the catchment vegetated swales where possible and regional extended detention basins.

Due to this proposed treatment system most of the treatment devices are off-line from the two tributaries discharging through the site. Each of these devices will be established as part of each individual stage. That is:

- The individual industrial lot bio-retention basin will be established as part of the individual lot development;
- The industrial road network bio-retention systems and GPTs will installed as part of the civil works for each approved stage;
- The residential lot bio-retention system will be constructed as part of Stage 6; and

An indicative staging layout is shown on Figure 1.

The regional extended detention basin are primarily proposed to assist in improving the environmental flows into the Bremer River and are not considered a critical component of the stormwater treatment train. Table 1 below details the proposed staging of each of these extended detention basins, in step with the proposed development staging.

Table 1 – Proposed Extended Detention Basin Staging

Extended Detention Basin	Development Stage	Approximate Timing
EB1	Stage 4	May 2010
EB2	Stage 3	May 2009
EB3	Stage 7	Beyond 2011
EB4	Stage 7	Beyond 2011
EB5	Stage 7	Beyond 2011

In response to Item 5 (c), please find attached a copy of '*Bremer Business Park – Stage 1 Stormwater Management Strategy*' dated July 2007 (ref #LJ8714/R5), which addresses each of the stated items.

If further information is required please do not hesitate to contact the undersigned.

Yours sincerely,

[redacted]

Senior Engineer
for **Cardno Lawson Treloar**

Enc: Figure - Conceptual Master Plan Stormwater Management Plan
Bremer Business Park – Stage 1 Stormwater Management Strategy (LJ8714/R5)

Cardno Lawson Treloar Pty Ltd

ABN 55 001 882 873

Ground Level, 9 Gardner Close

Milton Queensland 4064

PO Box 388 Toowong

Queensland 4066 Australia

Telephone: [redacted]

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Document Control

Version	Date	Author		Reviewer		Approved	
		Name	Initials	Name	Initials	Name	Initials
LJ8714/R5	02/08/07	[redacted]					

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APPENDICES

APPENDIX A STORMWATER MANAGEMENT PLAN
APPENDIX B MAINTENANCE PLANS
APPENDIX C SOBEK RESULTS

1. INTRODUCTION

This Stormwater Management Strategy (SWMS) has been prepared by Cardno Lawson Treloar (CLT), specialist stormwater consultants, for Stage 1 of the Bremer Business Park industrial development located off the Warrego Highway at Bundamba in Ipswich City. This report has been completed for Walker Corporation Pty Limited (WCL), the project managers of the proposed development. The report provides advice in relation to stormwater management, including local flooding and pollutant management to support a Reconfiguration of Lot (ROL) development application.

Stage 1 of the Bremer Business Park site is located to the south of the Warrego Highway upstream of the highway crossing of the Bremer River. The Stage 1 and Bremer Business Park extents are shown on Figure 1 and the proposed layout is shown on Burchill VDM Stage 1 General Site Layout and Catchment Plan included in the reference drawings.

Details of the masterplan flood assessment are contained in CLT's *'Bremer Business Park Masterplan Flood Investigation'* dated March 2007 (ref# LJ8714/R3). The masterplan report details the ultimate filling and mitigation measures for the site. This report refines the local flooding assessment and provides additional detail on the flood mitigation measures for Stage 1.

The details of the masterplan water quality management are contained within CLT's *'Bremer Business Park Masterplan Stormwater Management Strategy Overall Site Masterplan'* dated March 2007 (ref# LJ8714/R4). The masterplan report details the overall site management for the stormwater quality. This report refines this assessment and provides additional detail for the proposed stormwater management requirements specifically relating to Stage 1.

Walker Corporation is in the final stages of reaching a Memorandum of Understanding (MoU) agreement with ICC and others which commits to current best practise techniques and load reduction targets for the site stormwater quality management.

This report details the Stormwater Management Plan and provides a framework for stormwater quality management for Stage 1 of the Bremer Business Park site which meets the Planning Scheme, Conditions of Development and the MoU.

As the site development progresses, it is planned that individual stage by stage (or series of stages combined) reports will be prepared as part of the detailed design to support subsequent applications to ensure that the Planning Scheme, Conditions of Development and the MoU are achieved. This report is the first instalment of the planned stage by stage reports for the Bremer Business Park site.

2. THE EXISTING SITE & PROPOSED DEVELOPMENT

2.1 Existing Site Description

Stage 1 of the Bremer Business Park is approximately 53ha in area and is generally bound by the Warrego Highway to the north, the Private Road to Australian Hardboards Limited (AHL) to the east, a Powerlink Easement to the south and the Bremer River to the west. The majority of the site is cleared land and until recently used for cattle grazing over a portion with a separate portion used for effluent disposal for the AHL operations. Ashburn Road and Bognuda Street traverse east-west and north-south respectively through the site. The site location is shown on Figure 1.

Due to the now decommissioned AHL effluent disposal system the site includes a number of existing dams, an effluent pond and effluent irrigation canals. Figure 2 shows the previous effluent system which predominately depended on evaporation from the dams and canals for treatment of the AHL effluent. This system has resulted in some soil contamination by organic carbon, metals and total petroleum hydrocarbons (TPH) which require special management measures which are discussed in Section 6.

The AHL effluent is now treated by AHL with an on-site effluent treatment plant.

In terms of stormwater there are two minor gullies that traverse Stage 1, which drain the majority of the Stage. Both gullies drain to the Bremer River upstream of the Warrego Highway crossing, located to western boundary of Stage 1. A small portion of Stage 1 currently drains in a northerly direction under the Warrego Highway. The local Stage 1 drainage patterns are shown in the MUSIC model layout presented on Figure 7.

Some portions of the site are inundated during the regional Bremer and Brisbane River floods, with the Brisbane River flood event dominating the peak flood levels for the site at RL 16.22mAHD (CLT, 2007).

The Stage 1 receiving waters are that of the Lower Bremer River, which has been identified as having a very poor water quality rating, (Healthy Waterways, October 2006). Previous studies by Pollard and Bunn (uncited) and Healthy Waterways (2003) indicated that the site, including the Australian Hardboards operations, possibly discharged high amounts of organic carbon into the Bremer River. Since these publications and prior to the writing of this management strategy, AHL has implemented an on-site effluent treatment facility and are no longer discharging effluent to the Bremer River as mentioned above.

Recent studies of the Bremer Business Park site by GHD (2007) have indicated that this has had a significant improvement on the organic carbon outflow from the site. Additional details are provided in Section 6 of this report.

2.2 The Proposed Development

The proposed Stage 1 development comprises of industrial allotments ranging in size from around 8000m^2 to about 90,000m^2, including new roadways to be constructed.

Access to Stage 1 of the Bremer Business Park site will be from Ashbum Street off the Warrego Highway to the east and Bognuda Street to the south.

Some filling is required to achieve ARI 100 year flood immunity for the lots during the major Brisbane River flood event. This is discussed in CLT's *'Bremer Business Park Masterplan Flood Investigation'* dated March 2007 (ref# LJ8714/R3).

It is also proposed to include the latest water sensitive urban design devices and techniques into the development which will need to be appropriate for the site's specific conditions. This involves the following:

- Ensure the philosophy and principles of WSUD, including those for best practice industrial WSUD design, are incorporated into the Bremer Business Park design and construction.
- Develop a set of performance outcomes and design objectives that recognise the unique management issues (e.g. the need to increase the base flows into the Bremer River) currently being experienced by the Bremer River catchment which are a legacy of previous development of the river catchment.
- Ensure the Bremer Business Park demonstrates compliance with the agreed design objectives for stormwater management, water conservation and wastewater minimisation.
- Implement appropriate water quality and erosion and sediment control throughout all phases of the Bremer Business Park development, particularly taking account of the importance of managing the contaminated soils. This will include:
    - Incorporation of 'at source' bio-retention and gross pollutant traps;
    - Direct management of organic carbons;
    - Removal of soil contaminated by TPH and metals to appropriate locations offsite; and
    - Stabilisation and landscaping of the natural gullies to control the impacts of the development on channel bed and bank erosion.

Further details of these management methods are discussed in detail below.

3. DATA

The assessments detailed in this report have been based on:

- Detailed Site survey data provided by Walker Corporation Pty Limited;
- Laser Survey of the surrounding the site supplied by Terranean Mapping Technologies;
- 1m Contour information, digital orthophotos and property data supplied by Ipswich City Council;
- Detailed ground survey sections of the site tributary supplied by Walker Corporation Pty Limited;
- Stage 1 layout stormwater pipe layout and final fill levels supplied by Burchill VDM;
- 1:25,000 scale topographic maps, supplied by SUNMAP; and
- Rainfall and evaporation data for Ipswich supplied by the Bureau of Meteorology.

4. OPPORTUNITIES AND CONSTRAINTS

Key Statutory requirements include the following:

- Stormwater discharging from the proposed Stage 1 of the Bremer Business Park development is to be at acceptable discharge standards, in terms of quality i.e. pollutants from the Stage 1 site are to be contained and/or controlled on-site. These standards are detailed in the ICC Planning Scheme (April 2004) and the preliminary approval;
- All reasonable and practicable measures must be taken to minimise or prevent environmental harm; and
- EPA's requirements for water quality control relevant to the site are detailed in the *EPP Water*, and in the *Model Urban Stormwater Quality Management Plans and Guideline* (2001).

Constraints specific to Bremer Business Park include:

- The previous use of the Stage 1 site for effluent treatment from the AHL operations and associated contaminants;
- The current poor conditions of the Bremer River receiving waters leading to the desire for high standards in runoff treatment.; and
- The ultimate end use for individual allotments or the industrial development layout is not known at this stage of application;

Although there are a number of constraints within the Stage 1 development, the opportunities identified due to the proposed development include:

- The intent of the Best Practice Load Based Design Objectives is to ensure that all developments deliver current best practice stormwater treatment outcomes;
- It will be possible to achieve the following minimum reductions in the mean annual load of stormwater pollutants leaving a development compared to traditional design where stormwater is not treated (based on the current draft MoU):
  - ≥ 80% reduction in Total Suspended Solids
  - ≥ 60% reduction in Total Phosphorus
  - ≥ 45% reduction in Total Nitrogen
  - ≥ 90% reduction in gross pollution
- Geomorphic and habitat protection design objectives for all drainage lines within Stage 1 of the Bremer Business Park site. The design must demonstrate that these drainage lines are stable and will be resistant to erosion.
- Provision of a design, management and on going maintenance set of guidelines;

5. ENVIRONMENTAL VALUES & WATER QUALITY OBJECTIVES

5.1 Environmental Values

As discussed earlier Stage 1 of the Bremer Business Park site drains to the Bremer River, which forms part of the Brisbane River catchment. Considering the importance of the receiving waters and the current poor rating of the system, the stormwater management strategy should ensure that no detriment to the downstream environment is caused by the proposed development.

To this end, WQOs have been nominated for the project based on existing and potential environment values (EVs) associated with Bremer River's current condition and advice from ICC.

The EVs and WQOs have been defined as part of the Master Plan assessment as detailed in CLT's *'Bremer Business Park Masterplan Stormwater Management Strategy Overall Site Masterplan'* dated March 2007 (ref# LJ8714/R4). These are as follows:

Table 5.1 – Environmental Values for Protection: Lower Bremer River

Aquatic Ecosystems	The intrinsic value of aquatic ecosystems (e.g. plants, animals and their ecological interactions).
Wildlife Habitat	Riparian wildlife and their habitat, food and drinking water (e.g. key species such as turtles, platypus, seagrass and dugongs).
Secondary Recreation	Health of humans during recreation which involves indirect contact and a low probability of water being swallowed (e.g. wading, boating, rowing and fishing).
Visual Recreation	Amenity of waterways for recreation which does not involve any contact with water (e.g. walking and picnicking adjacent to a waterway).
Cultural Heritage	Indigenous and non-indigenous cultural heritage (e.g. custodial, spiritual, cultural and traditional heritage, hunting, gathering and ritual responsibilities; symbols, landmarks and icons (such as waterways, turtles and frogs); and lifestyles (such as agriculture and fishing)).

5.2 Water Quality Objectives

With these EVs in mind, long term WQOs proposed in accordance with the Ipswich Planning Scheme, are as follows:

Table 5.2 – Long-term Water Quality Objectives (Operational Phase)

Indicator	Water Quality Objective
pH	6.5 to 8.5
Dissolved Oxygen	80-105% saturation
Total Phosphorous	< 0.07 mg/L
Total Nitrogen	< 0.65 mg/L
Turbidity	< 20 NTU
Suspended Solids	< 15mg/L
Faecal Coliforms	150 organisms/100mL (minimum of 5 samples taken at regular intervals not exceeding one month, with 4 to 5 not exceeding 600 organisms/100mL)
Oils & Grease	No visible films or odour
Litter/Gross Pollutants	No anthropogenic (man-made) material greater than 5mm in any dimension

It should be noted that these WQOs are long-term objectives for a fully stabilised catchment with fully established water quality improvement devices throughout. In the long term, discharges from the operational site should conform to the above WQOs.

To assist in the assessment of the proposed development the following load reduction targets are to be achieved:

- ≥ 80% reduction in Total Suspended Solids
- ≥ 60% reduction in Total Phosphorus
- ≥ 45% reduction in Total Nitrogen
- ≥ 90% reduction in gross pollution

It is proposed to protect the geomorphology and habitat associated with all drainage lines within the site by ensuring that these drainage lines are stable and will be resistant to erosion.

During the construction period, a set of water quality objectives has been nominated to be immediately achievable for the release criteria which will ensure the EVs are maintained.

Table 5.3 – Water Quality Objectives – Construction Phase

Indicator	Water Quality Objective
pH	6.5 to 8.5
Suspended Solids	<50mg/L
Oils & Grease	No visible films or odour
Litter/Gross Pollutants	No visible litter washed from the site

5.3 Background Water Quality Data

The Ipswich City Council (ICC) conducted frequent water quality monitoring of the Lower Bremer River from 1985 to 2000 when the Queensland Environment Protection Agency (QEPA) took over from the ICC. Table 5.4 and Table 5.5 show the median water quality monitoring results from the ICC and the QEPA, respectively, at locations as presented on Figure 3.

Table 5.4 – Background Median Water Quality Results as sampled by the ICC

Site	Temperature (°C)	pH	DO (mg/L)	Conductivity (mS/cm)	Turbidity (NTU)	Chloride (mg/L)	Sulphate (mg/L)
ICC08	23.10	7.60	6.15	0.554	*53.0*	106.0	40.0
ICC09	22.50	7.60	6.00	0.585	*59.0*	106.5	29.8
ICC10	23.10	7.50	*5.90*	0.605	*43.5*	99.0	29.0
ICC11	23.10	7.50	*5.80*	0.663	*40.1*	121.0	40.0
ICC12	22.80	7.50	*5.65*	0.693	*32.0*	127.5	35.5
Site	**Total Phosphorus (mg/L)**	**Suspended Solids (mg/L)**	**Total Nitrogen (mg/L)**	**Ammonia (mg/L)**	**Nitrite (mg/L)**	**Nitrate (mg/L)**	**Faecal Coliforms (orgs/100mL)**
ICC08	*1.35*	*35.5*	*2.71*	0.21	0.10	1.15	*270*
ICC09	*1.37*	*38.0*	*2.58*	0.20	0.10	1.10	*270*
ICC10	*1.53*	*32.0*	*3.30*	0.15	0.14	1.50	*260*
ICC11	*1.75*	*31.0*	*3.56*	0.18	0.18	1.69	*320*
ICC12	*1.65*	*29.0*	*4.56*	0.16	0.12	1.62	*368*

Table 5.5 – Background Median Water Quality Results as sampled by the QEPA

Site	Temperature (°C)	pH	DO (%)	Conductivity (mS/cm)	Turbidity (NTU)	Chlorophyll 'a' (mg/L)
EPA01	24.50	7.80	82.00	1.915	*41.5*	4.4
EPA02	24.45	7.80	80.00	1.475	*40.0*	5.0
EPA03	24.25	7.70	*78.00*	1.105	*34.0*	5.0
EPA04	24.40	7.70	*74.00*	1.070	*35.0*	5.9
EPA05	23.60	7.60	*69.50*	0.897	*24.0*	1.5
EPA06	24.50	7.70	*77.00*	0.970	*36.0*	10.1
EPA07	24.40	7.70	*75.50*	0.926	*39.0*	13.5
EPA08	24.20	7.70	*78.00*	0.868	*38.0*	14.9
EPA09	20.10	7.40	*62.00*	0.547	5.5	9.5

Site	Total Phosphorus (mg/L)	Total Nitrogen (mg/L)	Ammonia (mg/L)	Organic Nitrogen (mg/L)	Oxidised Nitrogen (mg/L)	Secchi Disk Depth (m)
EPA01	*0.80*	*1.40*	0.004	0.478	0.74	0.4
EPA02	*0.74*	*1.30*	0.004	0.489	0.76	0.4
EPA03	*0.63*	*1.30*	0.004	0.560	0.98	0.4
EPA04	*0.69*	*1.40*	0.004	0.627	0.86	0.4
EPA05	*1.80*	*2.95*	0.004	0.735	-	0.4
EPA06	*0.50*	*1.10*	0.004	0.655	0.16	0.4
EPA07	*0.61*	*1.20*	0.004	0.679	0.04	0.4
EPA08	*0.50*	*1.00*	0.004	0.661	0.03	0.4
EPA09	*0.15*	*0.66*	0.004	0.686	-	0.4

These results indicate dissolved oxygen, turbidity, suspended solids, Total Phosphorous, Total Nitrogen and Faecal Coliforms levels to not currently meet the proposed WQOs.

6. CONTAMINANT MANAGEMENT

6.1 Background

The latest water quality results (Healthy Waterways 2006 report card) indicates that the Lower Bremer River currently has high nutrient and turbidity levels, with limited nutrient process as well as fluctuating dissolved oxygen levels.

Previous studies by Pollard and Bunn (uncited) and Healthy Waterways (2003) indicated that the Stage 1 site, including the Australian Hardboards operations, possibly discharged high amounts of organic carbon into the Bremer River. Since these publications and prior to the writing of this management strategy, AHL has implemented an on-site effluent treatment facility and are no longer discharging effluent to the Bremer River.

In January 2007, GHD completed a *'Report for AHL, Bundamba Queensland Wastewater Irrigation Area Assessment'* that assessed the AHL wastewater irrigation area including additional analysis of the site following the implementation of the effluent treatment plant. A summary of the key findings with regard to the organic carbon are summarised below.

- The groundwater beneath the site is not continuous, and varies in thickness where present;
- The input of organic carbon via groundwater to the Bremer River is insignificant;
- The input of organic carbon is still being readily assimilated by soils on the site;
- The soil at the site was identified as having increased TOC concentrations due to irrigation practices;
- The TOC concentrations of soils away from the irrigation channels was considered moderate and within the range expected of natural soils in this area. This indicates that the lateral dispersal of TOC from the irrigation channels is limited, suggesting that TOC is not very mobile.
- The surface of the irrigation area is covered in vigorous pasture. Sheet erosion at the site is expected to be low, and therefore little soil and organic matter would be expected to be transported from the site.

With regard to Organic Carbon management the critical outcomes from this study indicate that the current Stage 1 site, without receiving the continuous effluent from the AHL operations, has greatly reduced the organic carbon load potential to the Bremer River. This study also indicates that the organic carbon will be mobilised to the Bremer River from surface runoff and erosion of site soils. Hence through appropriate management of the surface runoff and soils, the TOC runoff from the site can be effectively managed.

In addition, FSA Consulting state in their report *'Soil Environmental Monitoring Report'* (2006) to AHL that the "... *soil organic carbon levels can be decreased by soil disturbance such as cultivation or by growing and removing plant material from the site (exporting)*". Hence a particular management technique has been identified.

GHD also noted that elevated TPH levels were in the soils and wastewater sediment that originated predominately from petrogenic material (heavy oil). A decreasing trend in TPH with distance from the channels was noted. The TPH was identified as relatively

immobile and all samples from depth and groundwater reported TPH concentrations below laboratory reporting limits.

GHD reported that manganese was detected in the soils, sediment and groundwater. GHD indicated that the soils in the areas tested are slightly acidic to neutral and the manganese (predominately in the form of Mn^{3+}), '*...is generally not considered to represent a risk to plants*'. GHD concluded that the '*...risk to the environment of manganese within the site groundwater is considered low*'.

6.2 Management Method

A management method has been adopted as described below recognising the following characteristics of the TOC runoff:

- TOC levels accumulating on the site were related to the irrigation of areas with effluent from the AHL operations (which has now ceased due to the installation of a site treatment plant);
- TOC enters the Bremer River from surface runoff and erosion; and
- TOC can be reduced through the disturbance of the soil and export of plant material off-site.

The TOC in the soils will be managed through:

- Disturbance and cultivation through the bulk earthworks activities;
- Stripping of the top layer (approximately 0.5m) and relocation to the sites proposed for topsoil spreading and mounding as shown on Burchill VDM '*Overall Topsoil Management Plan*' included in the reference drawings section;
- Re-vegetation of topsoil spreading and mounding sites;
- Monitoring of runoff for organic content from the topsoil spreading and mounding sites;
- Capping of soils not removed as part of the earthworks with structural fill or with the ultimate development (buildings, roads etc) to disconnect them from the surface runoff; and
- Management of the stormwater quality through methods (e.g. bio-retention systems) that will be disconnected via impermeable material from the existing soil profile.

If any soil is found to be contaminated by TPH and metals, it will be managed with a suitable remediation plan.

7. STORMWATER QUALITY MANAGEMENT

7.1 Construction Phase Management

It is expected that the construction phase works will comprise of:

- Removal and stockpiling of topsoil and existing vegetation;
- Management of contaminated soils;
- Bulk Earthworks, including the construction of sediment basins;
- Final allotment trimming and profiling;
- Road boxing and construction;
- Street drainage; and
- Buffer area landscaping and associated drainage. ;

At the commencement of the bulk earthworks phase the primary management will be of the contaminated soils. Where contaminated soils are encountered this will be managed with a suitable remediation plan.

Following the removal of this material the primary pollutants that are to be managed during the construction phase include:

- Litter;
- Sediment; and
- Organic Carbon.

During the construction phase the management of stormwater runoff from the exposed earthworks surfaces will be based on containment, diversion and retention.

The management of the construction phase will consider 3 levels of management.

Firstly, the earthworks will be undertaken on a staged basis to limit the extent of disturbance to a confined area. The management of this area will be in accordance with the current IEAust sediment and erosion guidelines. Management will include:

- Erosion controls such as sediment fences surrounding stripped earth.
- Sediment fences surrounding stockpiles of soil and debris.
- Construction of perimeter bunding at the toe and/or top of the earthworks

Plate 7.1 – Typical Catch Drain

Plate 7.2 – Typical Sediment Fences

batters.

- Catch drains, including check dams, through the site to catch and direct runoff to sediment sumps.

The second level of management will be to direct the runoff from the disturbed surfaces into the undisturbed existing vegetated channels located on the existing site.

Plate 7.3 – Existing Site Drainage Swale

The third level if required will be the specific construction of site sediment basins prior to discharge into the Bremer River.

Plate 7.4 – Typical Sediment Basin

It will be the responsibility of the contractor to prepare an approved erosion and Sediment Control Plan to Council specifications prior to any construction activity taking place. At all stages of the construction process current standards of building practises will be adhered to.

7.2 Operational Phase Management

It is proposed to fill Stage 1 of the development, which will change the existing flow patterns. Following this filling, the site will drain to two outlets as shown on the MUSIC model layout presented on Figure 8.

It is proposed to develop the majority of Stage 1 into an industrial estate. The site will also include areas of green space along the drainage reserves.

Based on this the Stage 1 stormwater quality management considers 3 broad treatment areas as follows:

- Industrial Areas;
- Road and Road Reserve Areas; and
- Total Drainage Catchment.

The Stage 1 conceptual stormwater management strategy, shown on Figure 9, treats the pollutants of concern for the operational phase of the proposed development that include:

- Litter;
- Metals and oils;
- Sediment;
- Nutrients (Nitrogen and Phosphorous); and
- Organic Carbon.

7.2.1 Industrial Areas

Individual Lot Bio-retention basin – Each industrial lot will include a bio-retention system to reduce pollutant loads. The bio-retention system will allow the stormwater to pass though a sand/gravel filter and a bio-film medium prior to discharge. This will improve the water quality by removing suspended solids; nutrients; and metals.

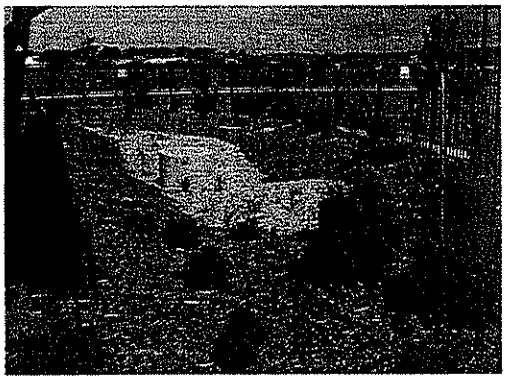

Plate 7.5 – Individual Lot Bio-Retention

Figure 10 shows a typical industrial lot development including the above treatment measures. Additional treatment and specific management of pollutants may also be required depending on the final lot use. This detail will be provided on a lot by lot basis as part of the individual lot building applications.

Gross Pollutant Traps (GPTs) – All stormwater from the individual lot bio-retention systems will be directed through a regional GPT system. This will:

- Trap trash and litter;
- Capture oils;
- Remove sediment, and

- Remove associated attached metals.

The individual lot treatment may also include the use the **Ingal 'Storm filter'**. The 'Stormfilter' will allow the stormwater to pass though a filter media prior to discharge. This will improve the water quality by removing suspended solids; nutrients; and metals.

Typical details are shown on Figure 11 and Figure 12.

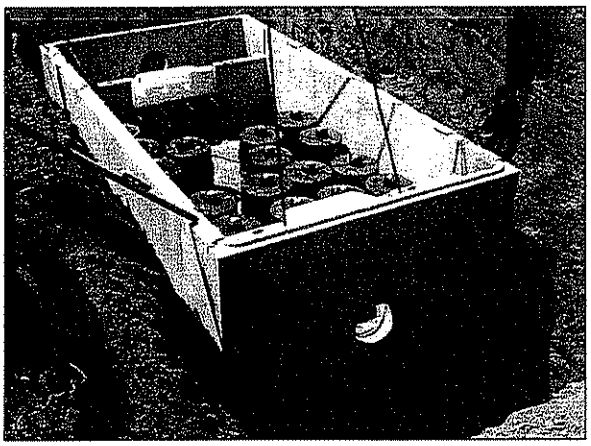

Plate 7.6 – Individual 'Stormfilter'

7.2.2 Road and Road Reserve Areas

The road and road reserve areas will be treated with an end-of-line GPT and bio-retention system as shown on Figure 9.

Gross Pollutant Traps (GPTs) – All stormwater can be directed through a GPT adopting an end-of-line system. This will

- Trap trash and litter;
- Capture oils;
- Remove sediment, and
- Remove associated attached metals.

Bio-retention system – Stormwater from the GPT will run through a bio-retention system before flowing off-site. This system will improve the water quality by removing:

- Suspended Solids;
- Nutrients; and
- Metals.

The inlet zones of the bio-retention system will include a flow velocity dissipater and sediment sump to provide protection for the bio-retention system.

Plate 7.7 – Typical Bio-Retention System

7.2.3 Total Catchment

In addition to these treatment methods total catchment stormwater management is also proposed through the use of:

On-Site Landscaping Practices – the Stage 1 extents will be, where possible, landscaped and re-vegetated using species and techniques that do **not** require excessive fertilisation and watering.

7.3 Intermediate Treatment

The individual lot bio-retention basins will be established after the completion of the bulk and civil earthworks and prior to the operational phase of each individual lot. Lot owners will be responsible for the construction and implementation of the bio-retention basins within their lot prior to the lot being operational.

Between the construction phase and the operational phase stormwater will be treated by passing through a Gross Pollutant Trap and Bio-Retention System.

Gross Pollutant Traps (GPTs) – All stormwater can be directed through a GPT adopting an end-of-line system. This will

- Trap trash and litter;
- Capture oils;
- Remove sediment, and
- Remove associated attached metals.

Bio-retention system – Stormwater from the GPT will run through a bio-retention system before flowing off-site. This system will improve the water quality by removing:

- Suspended Solids;
- Nutrients; and
- Metals.

The inlet zones of the bio-retention system will include a flow velocity dissipater and sediment sump to provide protection for the bio-retention system.

Plate 7.8 – Typical Bio-Retention System

8. WATER QUALITY ASSESSMENT

8.1 Bremer Business Park - Stage 1

8.1.1 Approach

CLT has carried out detailed pollutant export analysis using MUSIC Version 3.01 to assess the possible pollutant loads from the proposed Stage 1 of the Bremer Business Park development.

The pollutant impact analysis has been carried out in accordance with the latest South East Queensland pollutant guidelines and data, detailed in:

- ICC, April 2004, '*Ipswich Planning Scheme*';
- Gold Coast City Council (GCCC), 2006, '*MUSIC Modelling Guidelines*';
- BCC, 2000, '*Subdivision and Development Guidelines*';
- CRC for Catchment Hydrology, 2005, '*Model for Urban Stormwater Improvement Conceptualisation Version 3.01 User Manual*'; and
- Healthy Waterways, 2006, '*Water Sensitive Urban Design Technical Design Guidelines for South East Queensland.*'

CLT has considered the following modelled catchment conditions:

- **Post-Development Case** – Post-development catchment conditions without treatment; and
- **Mitigated Case** – Post-development catchment conditions with treatment.

Table 8.1 below indicates the catchment areas and land uses assumed in the MUSIC assessment as shown on Figure 8.

Table 8.1 – MUSIC Model Post-Development Adopted Land Uses

Catchment Label	Land Use	Sub- Area (ha)	Total Area (ha)
S1-1	Urban Roads	3.045	53.124
S1-2	Industrial	8.792	
S1-3	Industrial	39.439	
S1-4a	Rural Residential	0.170	
S1-4b	Rural Residential	1.678	

Over 20 years of continuous rainfall data for Amberley (Station Number 40004) was obtained from the Bureau of Meteorology for the period 01/05/1980 to 30/11/2004. Table 8.2 presents the statistical assessment of the annual rainfall totals from the Amberley Station.

Table 8.2 – Statistical Results for the Daily Rainfall at Amberley

Statistical Parameter	Annual Rainfall (mm)
Average	768
Median	773
10th Percentile (dry)	487
90th Percentile (wet)	1043

The adopted 10 year period considered in the MUSIC modelling for Stage 1 of the Bremer Industrial Park was January 1985 to December 1994. This had an average rainfall over the 10 years of 768mm. It also contained a wet year (1989 – 1047mm), a dry year (1994 – 470mm) and an average year (1985 – 732mm).

The potential evaporation details were obtained from the Bureau of Meteorology using the co-ordinates of the Amberley Station. The stormwater quality improvement devices assessed in the MUSIC model are discussed in Section 7.2 which includes a combination of the following at source treatments as shown on Figure 9:

- Bio-retention Basins; and
- Gross Pollutant Traps.

The following assumptions were made in the modelling:

- A 6 minute time step was adopted to ensure accurate assessment of the proposed treatment devices.
- The pollutant generation parameters are adopted from Gold Coast City Council's (GCCC) 'MUSIC Modelling Guidelines' (2006), with a break down into macro scale parameters.
- No flow routing was assumed, which provides a conservative estimate of treatment device efficiency.
- Total Impervious Area (TIA) was converted to Effective Impervious Area (EIA) by calibrating the post development model to the expected Annual Volumetric Runoff Coefficients (AVRC) based on GCCC (2006) recommendations for different land uses. Table 8-3 below details the expected AVRC for Stage 1 of the Bremer Business Park site.

Table 8.3 – Expected AVRC

Land Use	AVRC	Area (ha)	AVRC x Area	Expected AVRC
Rural Residential	0.22	1.85	0.41	$\frac{\Sigma \text{ (ARVC x Area)}}{\text{Total Area}}$
Urban (Roads)	0.39	3.05	1.19	
Industrial	0.57	48.23	27.49	
Total		53.12	28.09	0.548

- The assumed removal rates for Gross Pollutant Traps are 20% for Total Suspended Solids, 10% for Total Phosphorous and 0% for Total Nitrogen.
- Default MUSIC pollutant removal efficiencies were adopted for all other treatment devices.

- The surface area of the bio-retention basins was assumed to be 2% of the total area draining to each basin and to have an extended detention depth of 0.3m. the bio-retention filter depth was assumed to be 0.8m and to have a hydraulic conductivity of 180mm/hr.
- To remove the bias in the median values resulting from zero flows, flow based sub samples of 0.1L/s were used for reporting all pollutant concentrations.

8.1.2 Results

A comparison of the flow from the post development case to the expected Annual Volumetric Runoff Coefficient (AVRC) for the site is provided in Table 8.4. This demonstrates the adopted rainfall runoff parameters for each land use is appropriate and provides a good calibration to the AVRCs.

Table 8.4 – Runoff and AVRC Calibration

AVRC	Post Development
MUSIC Annual Flow (ML/year)	225.85
Modelled Area (ha)	53.13
Average Rainfall (mm/year)	763
AVRC	**0.557**
Expected AVRC	**0.548**

The annual average pollutant loads discharged from the proposed Stage 1 of the Bremer Industrial Park development are shown in Table 8.5 for the post-development and mitigated cases.

Table 8.5 – 10 Year Predicted Annual Pollutant Loads

Pollutant	Annual Load (kg/yr)		Reduction - Mitigated to Unmitigated	Required Reduction	Requirement Met?
	Post-Development	Mitigated			
SS	34000	3060	91%	80%	Yes
TP	85	17	80%	60%	Yes
TN	524	213	59%	45%	Yes

Table 8.5 shows that the proposed mitigation measures lead to a reduction in loads from Stage 1 of the Bremer Business Park site. The reductions of loads meet the operational phase performance criteria. With suitable operation and maintenance of the treatment devices it is expected that the treatment devices will meet the performance shown above.

Table 8.6 summarises the predicted pollutant concentrations that discharge from the proposed Stage 1 of the Bremer Industrial Park development. This indicates that with the implementation of the proposed treatment devices the proposed Stage 1 development at Bremer Park will meet the required WQOs.

Table 8.6 – Predicted Median Pollutant Concentrations

Pollutant	Post-Development	Mitigated	WQO
SS	7.38 mg/L	0.31 mg/L	15 mg/L
TP	0.10 mg/L	0.01 mg/L	0.07 mg/L
TN	1.37 mg/L	0.46 mg/L	0.65 mg/L

8.1.3 Discussion

The pollutant impact analysis indicates that the 'at-source' water quality treatment methods will achieve the proposed discharge criteria for the load based assessments for suspended solids, total phosphorus and total nitrogen.

Figure 9 shows the Stage 1 conceptual stormwater management strategy, with typical in lot development presented in Figure 10 to Figure 12.

8.2 Individual Industrial Lot Assessment

8.2.1 Approach

CLT has carried out detailed pollutant export analysis that considered 3 typical industrial types as shown on Figure 10 to Figure 12. The different type of industrial treatment measures were as follows:

- **Type A** (Figure 10): Total Lot drains to bio-retention system;
- **Type B** (Figure 11): 50% of the lot drains to a bio-retention system and 50% of the lot drains is treated by an Ingal enviropod GPT and 10 Ingal 'stormfilters'; and
- **Type C** (Figure 12): 20% of the lot drains to an Ingal enviropod 200 and into a bio-retention system. The remaining 80% of the lot area passes through an Ingal enviropod 200 and through 50 Ingal 'stormfilters'.

The previous MUSIC model assumptions discussed in Section 8.1.1 were adopted for the model setup. It was assumed that the lot was 1ha in size, with the bio-retention equal to 2% of the catchment area draining to it.

The pollutant concentrations to be achieved for each lot were based on the results from the Stage 1 MUSIC model industrial nodes. That is although the stormwater exiting the lot may not meet the WQOs there is additional treatment downstream of the node.

8.2.2 Results

The annual average pollutant loads discharged for each of the proposed lot treatment measures Type A to C is shown in Table 8.7 to Table 8.9.

Table 8.7 – 10 Year Predicted Annual Pollutant Loads – Type A

Pollutant	Annual Load (kg/yr)		Reduction - Mitigated to Unmitigated	Required Reduction	Requirement Met?
	Post-Development	Mitigated			
SS	577	33	94	80%	Yes
TP	1.51	0.32	79	60%	Yes
TN	9.9	4.3	56	45%	Yes

Table 8.8 – 10 Year Predicted Annual Pollutant Loads – Type B

Pollutant	Annual Load (kg/yr)		Reduction - Mitigated to Unmitigated	Required Reduction	Requirement Met?
	Post-Development	Mitigated			
SS	577	88	85	80%	Yes
TP	1.51	0.46	69	60%	Yes
TN	9.9	5.5	45	45%	Yes

Table 8.9 – 10 Year Predicted Annual Pollutant Loads – Type C

Pollutant	Annual Load (kg/yr)		Reduction - Mitigated to Unmitigated	Required Reduction	Requirement Met?
	Post-Development	Mitigated			
SS	577	57	90	80%	Yes
TP	1.51	0.40	74	60%	Yes
TN	9.9	5.4	45	45%	Yes

The above tables show that each of the proposed lot water quality mitigation options lead to a reduction in loads in accordance with the operational phase performance criteria.

Table 8.10 summarises the predicted pollutant concentrations that discharge from the lot for each of the treatment train options. This indicates for each of the pollutant concentrations are generally slightly above the target concentration, though are generally considered within the bounds of the statistical variance and are expected to met the WQOs following the additional treatment downstream of the Stage 1 stormwater outlet. It is noted that the suspended solids and total phosphorous levels are already within the WQO.

Table 8.10 – Predicted Median Pollutant Concentrations

Pollutant	Type A (mg/L)	Type B (mg/L)	Type C (mg/L)	Target Concentration (mg/L)
SS	1.2	3.3	1.5	0.4
TP	0.039	0.047	0.39	0.026
TN	0.72	0.80	0.73	0.76

8.2.3 Discussion

The assessment has indicated for various treatment designs for individual lots the stormwater runoff from the site can fulfil all the water quality objectives (i.e. load based and concentrations and concentrations).

9. HYDROLOGIC & HYDRAULIC ASSESSMENT

9.1 Model Setup

9.1.1 Hydrologic Model

A detailed hydrologic analysis has been undertaken using the Watershed Bounded Network Model (WBNM) 2003 Version 103. WBNM is a non-linear runoff routing software package produced by the University of Wollongong in New South Wales. WBNM has been used in accordance with Council's '*Planning Scheme*' (2004), '*Queensland Urban Drainage Manual*' (1994) and '*Australian Rainfall and Runoff*' (1998).

A hydrologic model has been set up to include the site and external catchments. The total catchment and sub-catchment extents were determined from the supplied aerial survey and the 1:25000 topographic maps, produced by the Queensland Department of Lands. The WBNM model layout and sub-catchment boundaries are shown in Figure 4 and Figure 5.

The WBNM model was used to assess the impacts of the proposed Bremer Business Park development on the peak flows discharging from the site for a full range of Average Recurrence Intervals (ARIs) (2 to 100 years) and for a range of durations.

The hydrologic modelling considers the following scenarios:

- **Pre-Development:** This scenario assumes that the catchments external to the site are fully developed as allowed in Council's Planning Scheme, with no mitigation of flows. The site catchments were assumed to be undeveloped. Figure 4 shows the catchment layout.
- **Post-Development:** External catchments were assumed to have the same development as for the pre-development scenario. The site land use was modified to include the proposed development and catchment boundaries modified to account for the proposed site drainage. Figure 5 shows the catchment layout.

The fraction impervious areas for were based on the details presented in Figure 4 and Figure 5. The adopted fraction impervious and C_{10} value for each land use is listed in Table 9.1. The fraction impervious and C_{10} values were adopted from QUDM (1994).

Table 9.1 – Runoff Coefficient and Fraction Impervious for Land Uses

Land Use Category	C_{10}	Fraction Impervious (%)
Open space	0.7	5
Business and Industry	0.88	95
Regional Business and Industrial Investigation	0.88	95
Residential High Density	0.86	75
Residential Medium Density	0.83	50
Residential Low Density	0.79	30
Special Use	0.88	95

The initial and continuing losses adopted for the WBNM model are shown in Table 9.2 A catchment lag of m = 1.3 was adopted for all ARI events.

Table 9.2 – Adopted WBNM Initial and Continual Loss Parameters

ARI (years)	Pervious		Impervious	
	Initial Loss (mm)	Continuing Loss (mm/hr)	Initial Loss (mm)	Continuing Loss (mm/hr)
2, 5	5	2.5	0	0
10, 20	2.5	2.5	0	0
50, 100	0	2	0	0

The pre-development model was validated against the Rational Method Calculation at the confluence of the tributary with the Bremer River as defined by the parameters detailed in Table 9.3.

Table 9.3 – Adopted Rational Method Parameters

Parameter	Catchment (Node 9)
Area (ha)	182.7
C_{10}	0.75
Time of Concentration (min)	50

9.1.2 Hydraulic Model

A detailed hydraulic analysis was performed using the Delft Hydraulics Institute one dimensional fully dynamic hydraulic modelling package, SOBEK. This assessment has been undertaken in accordance with Council's *'Planning Scheme'* (2004), and *'Queensland Urban Drainage Manual'* (1994).

The following scenarios have been considered:

- **Pre-development Case:** This case models the western tributary that passes through the site. The model assumes Stage 1 and the remainder of the site in its existing condition. This case incorporates the pre-development hydrologic flows as described in Section 9.1.1.
- **Post-development Case:** This case adopted the pre-development model and incorporates the post-development hydrologic flows as described in Section 9.1.1.

The site topography was based on detailed ground survey and aerial survey of the site for the minor tributary.

The model adopted a tailwater level of RL 2.623mAHD roughly equivalent to the Bremer River 5 year ARI event, based on the details of the modelling reported in CLT's *'Bremer Business Park Masterplan Flood Investigation'* dated March 2007 (ref# LJ8714/R3).

Based on the aerial photography and a site inspection a Manning's roughness for the tributary was adopted at 0.05.

The SOBEK model extent and cross-section layout are shown on Figure 6.

9.2 Results

9.2.1 Hydrologic Assessment

Table 9.4 details the results of the WBNM validation to the Rational Method calculations. This indicates that the adopted parameters are acceptable.

Table 9.4 – WBNM Validation Results

ARI (Years)	WBNM Reporting Node 9			
	Rational Flow (m^3/s)	WBNM		
		Flow (m^3/s)	Critical Duration (min)	Time to peak (min)
2	16.30	17.79	60	53
5	23.80	25.36	60	51
10	28.70	31.09	60	49
20	35.22	37.81	60	48
50	46.13	47.22	60	47
100	54.36	54.68	60	46

The predicted peak flows discharging into the Bremer River from the western tributary for the pre-development and post-development scenarios are presented in Table 9.5.

Table 9.5 – WBNM Predicted Peak Flows Western Tributary

ARI (Years)	Pre-Developed			Post-Developed			Impact (Exist to Prop) (m^3/s)
	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	
2	17.79	60	53	22.22	60	41	4.43
5	25.36	60	51	31.38	60	41	6.03
10	31.09	60	49	38.22	60	40	7.14
20	37.81	60	48	46.39	60	40	8.58
50	47.22	60	47	57.44	60	40	10.22
100	54.68	60	46	66.39	60	41	11.71

The discharge estimates into the Bremer River from the western catchment indicate that the proposed development of Stage 1 is predicted to cause a slight increase the flows. This was further assessed in the hydraulic model.

9.2.2 Hydraulic Assessment

The predicted 100 year ARI flood levels for the local western tributary are shown in Table 9.6. Additional results for the lower ARIs are presented in Appendix C.

Table 9.6 – 100 Year ARI Predicted Peak Flood Levels

SOBEK ID	100 Year ARI		
	Pre- WSL (mAHD)	Post-WSL (mAHD)	Impact (m)
Tributary 1 of Bremer River			
XS_RCH_1_1	26.37	26.37	-
XS_RCH_1_2	24.54	24.54	-
XS_RCH_1_3	23.91	23.91	-
XS_RCH_1_4	22.26	22.26	-
XS_RCH_1_5	20.25	20.25	-
XS_RCH_1_6	19.44	19.44	-
XS_RCH_1_7	18.57	18.57	-
XS_RCH_1_8	18.06	18.06	-
XS_RCH_1_9	18.02	18.02	-
XS_RCH_1_10	17.96	17.96	-
XS_RCH_1_11	17.45	17.45	-
XS_RCH_1_12	15.76	15.76	-
XS_RCH_1_13	15.74	15.74	-
XS_RCH_1_14	15.12	15.12	-
XS_RCH_1_15	14.05	14.05	-
XS_RCH_1_16	13.34	13.34	-
XS_RCH_1_17	12.87	12.87	-
XS_RCH_1_18	12.42	12.42	-
XS_RCH_1_19	11.16	11.16	-
XS_RCH_1_20	10.46	10.46	-
XS_RCH_1_21	9.13	9.13	-
XS_RCH_1_22	8.15	8.15	-
XS_RCH1_22b	6.87	6.86	-0.01
XS_RCH1_23	6.35	6.34	-0.01
XS_RCH1_24	5.66	5.66	-
XS_RCH_1_25	4.93	4.98	0.05
XS_RCH1_25b	4.42	4.47	0.05
XS_RCH_1_26	4.26	4.32	0.06
XS_RCH1_26b	3.61	3.67	0.06
DS_Boundary	2.62	2.62	

SOBEK ID	100 Year ARI		
	Pre- WSL (mAHD)	Post-WSL (mAHD)	Impact (m)
Tributary 2 of Bremer River			
XS_RCH_2_1	31.02	31.02	-
XS_RCH_2_2	31.02	31.02	-
XS_RCH_2_3	28.56	28.56	-
XS_RCH_2_4	27.50	27.50	-
XS_RCH_2_5	25.68	25.68	-
XS_RCH_2_6	24.20	24.20	-
XS_RCH_2_7	23.34	23.34	-
XS_RCH_2_8	21.49	21.49	-
XS_RCH_2_9	20.53	20.53	-
XS_RCH_2_10	18.56	18.56	-
XS_RCH_2_11	17.68	17.68	-
Tributary 3 of Bremer River			
XS_RCH_3_1	14.12	14.20	0.08
XS_RCH_3_2	13.76	13.87	0.11
XS_RCH3_16	12.50	12.69	0.19
XS_RCH3_15	11.85	12.07	0.22
XS_RCH3_14	11.73	11.89	0.16
XS_RCH3_13	11.72	11.87	0.15
XS_RCH3_12	11.71	11.85	0.14
XS_RCH3_11	10.16	10.32	0.16
XS_RCH3_10	9.17	9.39	0.22
XS_RCH3_09	8.58	8.79	0.21
XS_RCH3_08	7.71	7.93	0.22
XS_RCH3_07	6.63	6.86	0.23
XS_RCH3_06	5.84	6.08	0.24

The results from the hydraulic analysis indicate that the proposed development of Stage 1 will slightly increase the predicted flood levels. These predicted increases are contained within the site and below the proposed development pad which is above the 100 year ARI flood level of RL 16.22mAHD.

9.3 Discussion

The local hydrologic and hydraulic assessment has indicated that within the western tributary the proposed Stage 1 development will cause a minor increase in the predicted

peak flows. This predicted increase in flows causes an increase in the flood levels within the tributary. These increases are within the site and below the proposed fill level for the development pad.

It is proposed to include stabilisation works to meet the requirements of the Memorandum of Understanding to ensure the banks are stable and no erosion impact will occur. These works will be fully contained within the creek systems and details of the works will be part of future operational works applications. Additional analysis and detailed hydraulic and bed shear assessments will be undertaken to ensure this design requirement is obtained for all subsequent stage operational works applications

10. WATER QUALITY MONITORING PROGRAM

Surface water quality monitoring is proposed to be carried out at locations prior to discharge into the Bremer River and within the Bremer River.

Table 10.1 details the water quality parameters to be monitored during each monitoring campaign.

Table 10.1 – Operational Phase Water Quality Parameters

In-situ Parameters	Laboratory Parameters
Temperature*	Total Nitrogen
Dissolved Oxygen*	Total Phosphorous
pH*	Total Organic Carbon
Specific Conductance*	Suspended Solids*
Salinity*	Faecal Coliforms
Turbidity*	Algae Count & ID

* Construction phase parameters

Table 10.2 details the proposed water quality monitoring locations for the Stage 1 development. Figure 1 shows the proposed monitoring locations.

Table 10.2 – Water Quality Monitoring Locations

Location ID	Description of Location
WQ01	Western Outlet of Stage 1
WQ02	South-western Outlet of Stage 1
WQ04	Bremer River; Downstream of the Bundamba sewage treatment plant
WQ05	Bremer River; Under the Warrego Highway crossing

Due to the limited runoff that is present within the site the monitoring shall include 4 rainfall event monitoring campaigns per year. During the construction, following each rainfall event, water quality in any sediment basin shall be tested for compliance prior to release.

11. ADMINISTRATION OF THE SWMS

11.1 Responsible Persons

Unless stated otherwise the person(s) and/or companies specifically responsible for the SWMP implementation are:

Contractor:
The Contractor's Site Manager. This person or his representative will be notified to Council upon assignment.

Civil Engineer:
This person/ company and/or a nominated representative will be notified to Council upon assignment.

Environmental Consultant:
This person/ company and/or a nominated representative will be notified to Council upon assignment.

11.2 Amendments

It is likely that as the development proceeds amendments to the SWMS will be required to reflect knowledge gained during the course of the operation.

Amendments shall be made by application in writing to Ipswich City Council stating clearly and in detail:

- The SWMP provision to be amended
- The reasons for the amendment, and
- How the new amendment better serves the environmental management of the development and its surroundings.

12. STAGE 1 CODE AND APPROVAL COMPLIANCE

12.1 Ipswich City Council Planning Scheme

12.1.1 Section 6.7

(2) Environmental Management

Specific Outcomes

(a) The quality of stormwater runoff from a use or site is similar to or better than the established water quality standards for the receiving waters or lawful point of discharge.

(b) Uses and works are designed to support integrated catchment management, including-

(i) protection and rehabilitation of natural drainage patterns and riparian vegetation;

(ii) environmentally acceptable effluent and runoff management systems or techniques which prevent pollution of water sources; and

(iii) appropriate buffering along any adjoining major watercourses.

(c) Uses and works with the potential for material or serious environmental harm, establish and implement a site specific Environmental Management Plan, which describes the measures to be used to avoid or minimise adverse impacts, and how such measures are to be implemented during the life of the development.

This report details the proposed stormwater management strategy, which will improve the runoff from the Stage 1 development of the Bremer Business Park site to meet the water quality standards for the receiving waters. An integrated catchment approach is proposed to maintain and protect the drainage patterns through Stage 1.

12.1.2 Section 11.4.7.(1)

(b) Land Situated Below the 1 in 20 Development Line - Commercial, Industrial and Other Non Residential Uses

(i) Where possible, the design and layout of buildings provides for-

(A) parking, or other low intensive, or non habitable uses at ground level; and

(B) retail, commercial and work areas above the parking areas, to increase flood immunity.

(ii) Expensive plant and equipment and stock are located in the area of the site or building with the greatest flood immunity.

(iii) Building materials used below the 1 in 20 development line are resistant to water damage.

(iv) Electrical installations are sited in the area of greatest flood immunity.

(v) Electrical installations below the 1 in 20 development line are designed and constructed to withstand submergence in flood water.

(vi) Access routes are designed or alternative emergency evacuation routes are provided so that in the event of a serious incident occupants can escape to a safe and secure area.

(vii) The concentration of people in flood affected areas, particularly within areas affected by significant flood flows (i.e. one metre or more in depth), is minimised.

(viii) Buildings are located to avoid areas affected by significant flood flows (i.e. one metre or more in depth), or alternatively, buildings are designed to be capable of withstanding the static and dynamic loads, including debris loads, applicable to a flood event of 1 in 100 Average Recurrence Interval (ARI).

(ix) Materials stored on-site-

(A) are those that are readily able to be moved in a flood event;

(B) are not hazardous or noxious, or comprise materials that may cause a deleterious effect on the environment if discharged in a flood event; and

(C) where capable of creating a safety hazard by being shifted by flood waters, are contained in order to minimise movement in times of flood.

(x) The development does not increase the flood hazard (e.g. by way of increased depth, duration or velocity of flood waters or a reduction in warning times) for other properties within a flood plain.

(xi) Filling of land below the 1 in 20 development line and the clearing of native vegetation within the stream banks are avoided.

(d) Land Situated Between the 1 in 20 Development Line and the 1 in 100 Flood Line - Commercial, Industrial and Other Non Residential Uses

(i) Where possible, the design and layout of buildings provides for-

(A) parking, or other low intensive, or non habitable uses at ground level; and

(B) retail, commercial and work areas above the parking areas, to increase flood immunity.

(ii) Expensive plant and equipment and stock are located in the area of the site or building with the greatest flood immunity.

(iii) Building materials used below the adopted flood level are resistant to water damage.

(iv) Access routes are designed or alternative emergency evacuation routes are provided so that in the event of a serious incident occupants can escape to a safe and secure area.

(v) Buildings are located to avoid areas affected by significant flood flows (i.e. one metre or more in depth), or alternatively, buildings are designed to be capable of withstanding the static and dynamic loads, including debris loads, applicable to a flood event of 1 in 100 Average Recurrence Interval (ARI).

(vi) Materials stored on-site-

(A) are those that are readily able to be moved in a flood event;

(B) are not hazardous or noxious, or comprise materials that may cause a deleterious effect on the environment if discharged in a flood event; and

(C) where capable of creating a safety hazard by being shifted by flood waters, are contained in order to minimise movement in times of flood.

(vii) The development does not increase the flood hazard (e.g. by way of increased depth, duration or velocity of flood waters or a reduction in warning times) for other properties within a flood plain.

(viii) Filling of land below the 1 in 100 flood level and the clearing of native vegetation within the stream banks are avoided.

The proposed Bremer Business Park will be filled to be above the 100 year ARI. The flood assessment is detailed in CLT's *'Bremer Business Park Masterplan Flood Investigation'* dated March 2007 (ref# LJ8714/R3) which indicates that no adverse flood impacts external to the site will occur.

12.1.3 Section 12.15.3

(2) *The overall outcomes sought for the Earthworks Code are the following-*

(a) Earthworks ensure-

(i) there is no adverse impact to adjoining properties;

(ii) there is no adverse impact on flooding of upstream, downstream and adjoining land;

(iii) the visual character and amenity of the site and the surrounding area is not adversely affected;

(iv) there is no adverse impact to infrastructure or public utilities easements;

(v) natural landforms and drainage lines are maintained, where possible;

(vi) that land or water is not contaminated;

(vii) that the site is stable;

(viii) appropriate site access is provided from the road reserve to existing or future building envelopes; and

(ix) there is no environmental harm or nuisance created by way of the release of air pollutants, noise or removal of significant vegetation.

8) Specific Outcomes

(a) Earthworks are avoided below the adopted flood level.

(b) Earthworks -

(i) do not cause any increase in flooding or drainage problems;

(ii) do not cause an impediment to flood waters; or

(iii) do not adversely impact adjoining, upstream or down stream properties.

(c) Earthworks are avoided in natural gullies and overland flow paths.

The proposed Bremer Business Park will be filled to be above the 100 year ARI. The flood assessment is detailed in CLT's *'Bremer Business Park Masterplan Flood Investigation'* dated March 2007 (ref# LJ8714/R3) which indicates that no adverse flood impacts external to the site will occur.

In general the natural flow paths will be maintained. Any minor modifications will maintain flood conveyance. Appropriate works will be undertaken with the gullies to ensure they are stable. Details of these works will be provided in future operational works application.

12.1.4 Planning Policy 2

Flooding and Stormwater Flow Paths

(8) if an application involving land which is subject to flooding or major stormwater flows, information and an assessment which identifies—

(a) the likely probability, depth, volume and velocity of flows (including the submission of relevant computer software model data files which are compatible with the Local Government's software to enable checking of data) across the site;

(b) the likely impact of the proposed development, including any associated earth works, both upstream and downstream from the site, particularly in terms of changes to the depth, duration or velocity of flood waters and the duration of warning time;

(c) likely impacts in terms of watercourse bank stability;

(d) preferred areas and non-preferred areas on site for various activities, based on the probability of inundation and the volume and velocity of flows;

(e) recommendations for—

(i) the use of flood resistant materials and construction techniques able to withstand relevant debris loads;

(ii) the location and height of means of ingress and egress, including possible flood escape routes;

(iii) the location and height of buildings, particularly habitable floor areas;

(iv) structural design, including the design of footings and foundations to take account of static and dynamic loads (including debris loads and any reduced bearing capacity owing to submerged soils);

(v) the location and design of plant and equipment, including electrical fittings;

(vi) the storage of materials which are likely to cause environmental harm if released as a result of inundation or stormwater flows;

(vii) the appropriate treatment of water supply and sanitation systems and other relevant infrastructure; and

(viii) relevant management practices, including flood warning and evacuation measures;

The proposed Bremer Business Park will be filled to be above the 100 year ARI. The flood assessment is detailed in CLT's *'Bremer Business Park Masterplan Flood Investigation'* dated March 2007 (ref# LJ8714/R3) which indicates that no adverse flood impacts external to the site will occur.

12.1.5 Planning Policy 3

2.3.3 Stormwater Quality Management Strategy

(1) Development that is likely to have a significant adverse impact on water quality is to compile and submit a Water Quality Management Plan that details the temporary and permanent methods of water quality control that are to be included in the development.

(2) For developments which are likely to have a significant adverse impact on water quality, relevant Water Quality Objectives as outlined in Table 2.3.1 are to be nominated and the temporary and permanent methods for water quality to ensure that these objectives will be satisfied are to be identified on the Water Quality Management Plans.

Table 2.3.1: Water Quality Objectives

Indicator	*Modified ecosystem, wildlife, cultural heritage, secondary and visual recreation, industry, stock and irrigation*
Total Phosphorus	*70ug/L*
Total Nitrogen	*650ug/L*
Suspended Solids	*15mg/L for combined wet and dry periods* *90%ile < 100mg/L for wet weather periods*
Oils and grease	*No visible films or odour*
Litter/gross pollutants	*No anthropogenic (man-made) material greater than 5mm in any dimension*
Riparian vegetation and habitat	*Protect and restore consistent with Council policy and plans*

2.3.4 Temporary Methods of Water Quality Control

(1) Temporary water quality methods and techniques (excluding devices which divert or concentrate runoff) are to be in accordance with the QUDM and the Institution of Engineers, Australia (Qld) "Soil Erosion and Sediment Control – Engineering Guidelines for Queensland Construction Sites".

2.3.5 Permanent Methods of Water Quality Control

(1) The design of the permanent water quality control methods is to be in accordance with the QUDM and the Institution of Engineers, Australia (QLD) "Soil Erosion and Sediment Control" Engineering Guidelines for Queensland Construction Sites.

The stormwater quality assessments have been undertaken in accordance with the provisions detailed in Planning Policy 3, as detailed in this report.

12.2 Development Application Negotiated Decision Notice

Ipswich City Council issued a development application negotiated decision notice on the 6 July 2004. The relevant details relating to the Stage 1 assessments are as follows:

18. <u>Stormwater</u>

(a) The developer shall provide all necessary stormwater drainage (both internal and external to the development) and such drainage works (except for roofwater systems) shall be designed and constructed in accordance with QUDM such that the overall drainage system caters for a storm event with an ARI of 100 years.

Overland flow paths shall be suitably designed to cater for the water from a storm event with an ARI of 100 years. In the case where the piped system is carrying part of the flow, the overland flow paths shall be designed to cater for that volume which is represented by the difference between the predicted volume from the storm event with an ARI of 100 years and the capacity of the pipe system, noting the requirements of QUDM.

The details are shown on the detailed engineering design drawings supplied as part of the project civil engineer design package.

(b) All stormwater flows within and adjacent to the Bremer Business Park Area, other than inter-allotment drainage, shall be confined to dedicated roads, drainage reserves, registered drainage easements or within parkland. The registered drainage easements, if related to piped drainage, shall be centrally located over such underground pipe system and shall be not less than 4.0m wide, except for drainage easements required for side boundaries which may be 3.0m wide where approved by the Senior Development Engineer. In addition, the easements shall be of suitable width to contain the predicted overland flow from the storm event with an ARI of 100 years in that location.

All stormwater up to the 100 year ARI is contained within the local drainage paths.

(c) No ponding or redirection of stormwater shall occur onto adjoining land unless specifically approved by Council in consultation with the owner of the adjoining land.

No ponding of redirection of stormwater occurs due to the proposed Stage 1 development.

(d) *Due consideration shall be given in these and future designs and construction of the development in relation to the effect of the developed catchment flows on the downstream discharge receival areas. Suitable stormwater control devices are to be provided to ensure that there is no increase in flows in watercourses. Such control devices are to be designed so as to integrate the landscaping, recreational, infrastructural and drainage roles of watercourses.*

The modelling has assumed the upstream catchments are designed to the ultimate planning scheme without any mitigation. This ensures all drainage paths through the site that convey external catchments will convey the ultimate flow.

The predicted increases from the proposed Stage 1 development causes slight increase in the flood levels within the site which are below the proposed development pads.

(e) *Each proposed residential, commercial and/or industrial allotment shall be designed to comply with QUDM, Council's standards and the New Ipswich City Planning Scheme, including unimpeded access to a road system which is also above the design flood level.*

The flood modelling has assumed that the proposed Bremer Business Park will be located above the 100 year ARI. The proposed filling to achieve this immunity is predicted to cause no adverse impact external to the site.

(f) *There shall be no filling or removal of material in the flood area below the flood level associated with an ARI of 100 years without the approval of the Senior Development Engineer. There shall be minimal disturbance to vegetation in the flood area, unless prior written approval is obtained from Council.*

It is proposed to include filling in the flood area below the flood level associated with an ARI 100 year event. Details of the predicted impacts are presented in this detailed in CLT's *'Bremer Business Park Masterplan Flood Investigation'* dated March 2007 (ref# LJ8714/R3) which indicates that no adverse flood impacts external to the site will occur.

(f) *Filling in proposed Lots, which are adjacent to the watercourse shown on the proposal plan, shall not be undertaken without the written approval of Council.*

Details of the predicted impacts due to the proposed filling are presented in this detailed in CLT's *'Bremer Business Park Masterplan Flood Investigation'* dated March 2007 (ref# LJ8714/R3) which indicates that no adverse flood impacts external to the site will occur.

21. <u>Stormwater Quality</u>

The developer shall submit to and receive approval from the Health and Environmental Protection Manager for a Master Stormwater Quality Management Plan for the Bremer Business Park Area (the Master SQMP) prior to the issuing of a Development Permit for Building Works and/or prior to the issuing of a Development Permit for Reconfiguring a Lot and/or Development Permit for a Material Change of Use (Code or Impact or Self-Assessable (if applicable)). A suitably qualified and experienced professional must prepare the Master SQMP. The Master SQMP must:

The master plan stormwater quality is detailed in CLT's *'Bremer Business Park Masterplan Stormwater Management Strategy Overall Site Masterplan'* dated March 2007 (ref# LJ8714/R4). This Stage 1 stormwater management plan is in accordance with the master plan management plan and provides specific details for Stage 1.

(i) Provide a management approach that ensures:

- *Stormwater quality management measures for the Bremer Business Park Area consist of physical treatment measures to ensure that the stormwater discharged from a land use type complies with the pollutant levels identified in Table 1 below;*

Section 7 of this report indicates that the proposed treatment measures will meet the defined WQOs. Figure 9 shows the proposed stormwater quality treatment devices for Stage 1.

- *Stormwater quality management measures for residential areas and roads consist of physical treatment measures to ensure that the stormwater discharged from these areas comply with the pollutant levels identified in Table 1 below;*

Section 8 of this report indicates that the proposed treatment measures will meet the defined WQOs.

- *The matters of water sensitive urban design (WSUD), stormwater management and stormwater quality will be addressed throughout the Bremer Business Park Area in an integrated approach, and*

It is proposed to utilise WSUD in accordance with Healthy Waterways (2006) '*Water Sensitive Urban Design Technical Design Guidelines for South East Queensland.*' Details of some of the concepts are presented on Figure 9 to Figure 12.

- *A refined Conceptual Design Stormwater Quality Management Plan (the Conceptual Design SQMP) is supplied for each development site prior to the issuing of a Development Permit for Building Works and/or prior to the issuing of a Development Permit for Reconfiguring a Lot and/or Development Permit for a Material Change of Use (Code or Impact or Self-Assessable (if applicable)) and then a Detailed Design Stormwater Quality Management Plan (the Detailed Design SQMP) is supplied for each development site prior to the issuing of a Development Permit for Operational Works.*

This report details the refinements to the stormwater management relating to Stage 1.

(ii) Demonstrate, through appropriate pollutant export modelling (eg AQUALM or MUSIC), that the pollutant levels in the stormwater discharged from the Bremer Business Park Area comply with the pollutant levels identified in Table 1 below.

TABLE 1

Indicator	*Modified ecosystem, wildlife, cultural heritage, secondary & visual recreation, industry, stock and*
Total Phosphorus	*70 ug/L*
Total Nitrogen	*650 ug/L*
Suspended solids	*15mg/L for combined wet and dry periods* *90% ile < 100mg/L for wet weather periods*
Oils and grease	*no visible films or odour*
Organic Carbon	*As determined through the investigations into organic carbon on*
Litter/gross pollutants	*No anthropogenic (man-made) material greater than 5mm in any*
Riparian vegetation & habitat	*Protect & restore consistent with Council policy and plans*
Cultural heritage	*Protect & restore consistent with Council policy and plans*

- *Levels are upper limits for median values or ranges in which medians should lie, unless otherwise stated.*
- *Dependencies on hardness iron and chromium shown in brackets are difficult to quantify. They may be ignored initially but subsequently considered if the pollutant level range is exceeded. For more information refer to the latest Australian Water Quality Guidelines for Fresh and Marine Waters (ANZECC).*
- *A wet weather period is defined as "any period where stormwater runoff leaves the site".*

Section 8 of this report indicates that the proposed treatment measures will meet the defined WQOs.

12.3 Memorandum of Understanding

A 'Memorandum of Understanding' currently in draft form is proposed to be signed between Walker Corporation Pty Ltd, Healthy Waterways, Ipswich City Council and South East Queensland Catchments.

This memorandum indicates:

The best practice load based design objective for stormwater quality is to:

- *achieve the following minimum reductions in the mean annual load of stormwater pollutants leaving a development compared to traditional urban design where stormwater is not treated:*

  - *≥ 80% reduction in Total Suspended Solids*
  - *≥ 60% reduction in Total Phosphorus*
  - *≥ 45% reduction in Total Nitrogen*
  - *≥ 90% reduction in gross pollution*

The intent of the Geomorphic and Habitat Protection Design Objective is to ensure that all developments minimise the impact that stormwater flow volume, duration

and frequency has on receiving waters. The geomorphic and habitat protection design objective is for:

- *For all drainage lines within the site, the design must demonstrate that these drainage lines are stable and will be resistant to erosion.*

The proposed design objectives will be reviewed to ensure the most locally relevant objectives for the Bremer Business Park are developed.

Section 8 of this report indicates the conceptual management strategy for the Bremer Business Park will achieve the reduction of pollutant loads specified in the MoU.

As part of the subsequent operational works application additional details including site specific soil tests and bed shear analysis will be undertaken to ensure management practices are in place which maintain the drainage lines in a stable and erosion resistant condition.

13. CONCLUSION

This report details the Stage 1 Stormwater Management Strategy to support a ROL application. This report provides the details of the proposed stormwater management for Stage 1 of the Bremer Business Park site which meets the Planning Scheme, Conditions of Development and the Memorandum of Understanding.

The pollutant impact analysis indicates that the 'at-source' water quality treatment methods will achieve the proposed discharge criteria associated with the load based assessment method.

It is proposed to provide additional treatment of the water quality through extended detention basins following discharge from the industrial stormwater system. This 'end-of-pipe' solution will assist in extending the environmental flows within the Bremer River.

Figure 9 shows the Stage 1 conceptual stormwater management strategy. Figure 10 to Figure 12 shows 3 different solutions of future lot development.

The local tributary flood assessment has indicated that the Stage 1 works will produce an increase in the predicted flood levels, though these are contained within the site and are below the proposed development pad final fill level.

14. REFERENCES

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Queensland EPA, 2001, "Model Urban Stormwater Quality Management Plans and Guideline"

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15. QUALIFICATIONS

This report has been prepared by Cardno Lawson Treloar (CLT) specifically for Walker Corporation Pty Ltd and specifically to provide advice on Stormwater Management Planning for Stage 1 of the proposed industrial development of Bremer Park.

Our analysis and overall approach has been specifically catered for the particular requirements of Walker Corporation Pty Ltd, and may not be applicable beyond this scope. For this reason any other third parties are not authorised to utilise this report without further input and advice from CLT.

CLT has relied on the following information provided by others:

- Detailed Site survey data provided by Walker Corporation Pty Limited.
- Laser Survey of the surrounding the site supplied by Terranean Mapping Technologies.
- 1m Contour information, digital orthophotos and property data supplied by Ipswich City Council.
- Masterplan and Stage 1 layout supplied by Burchill VDM
- Sinclair Knight Merz (SKM) one-dimensional MIKE 11 (Danish Hydraulic Institutes (DHI's) dynamic) model of the major creeks and rivers within the Ipswich City Council district.
- Rainfall and evaporation data for Ipswich supplied by the Bureau of Meteorology.
- Historical water quality monitoring data for the Bremer River from 1985 to 2000 supplied by the Ipswich City Council.
- Monthly water quality monitoring data for the Bremer River from 2000 to 2007 supplied by the Queensland Environment Protection Agency.

The accuracy of the report is dependent upon the accuracy of this information.

While CLT's report accurately assesses peak flows from design storms, it is an ungauged catchment; consequently future observed flows may vary from that predicted.

Pollutant assessments, provided in this report, have been based on published typical land use parameters and are therefore indicative only. Monitoring would be required to accurately assess pollutant impacts of this development. It is for this reason that the SWMS should remain a living document throughout the construction and operational phases of this development.

FIGURES

Figure 1 Site Location

Figure 2 Australian Hardboards Limited Decommissioned Effluent Disposal System

Figure 3 Ipswich City Council and Queensland Environment Protection Agency Water Quality Monitoring Locations

Figure 4 Pre-Development WBNM Catchment Layout

Figure 5 Post-Developed WBMN Catchment Layout

Figure 6 SOBEK Model Layout

Figure 7 Stage 1 Pre-Developed MUSIC Catchment Layout

Figure 8 Stage 1 Post-Developed MUSIC Catchment Layout

Figure 9 Stage 1 Conceptual Operational Stormwater Management Strategy

Figure 10 Type A Industrial At-Source Stormwater Management Strategy for a Typical 1ha Lot

Figure 11 Type B Industrial At-Source Stormwater Management Strategy for a Typical 1ha Lot

Figure 12 Type C Industrial At-Source Stormwater Management Strategy for a Typical 1ha Lot

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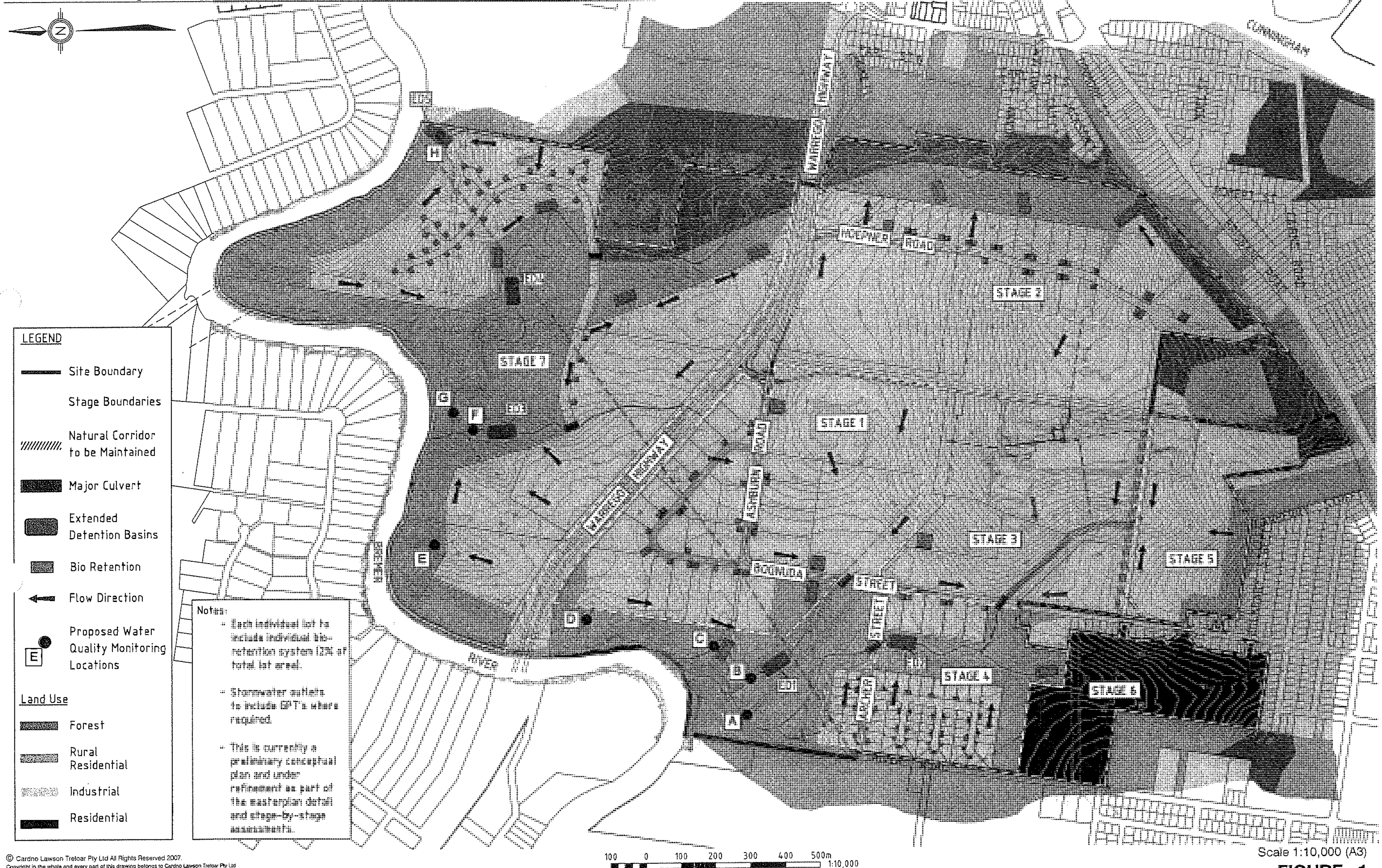

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FIGURE 1

CONCEPTUAL MASTERPLAN OPERATIONAL STORMWATER MANAGEMENT PLAN

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Project No.: LJ8714

Walker Corporation Pty Ltd

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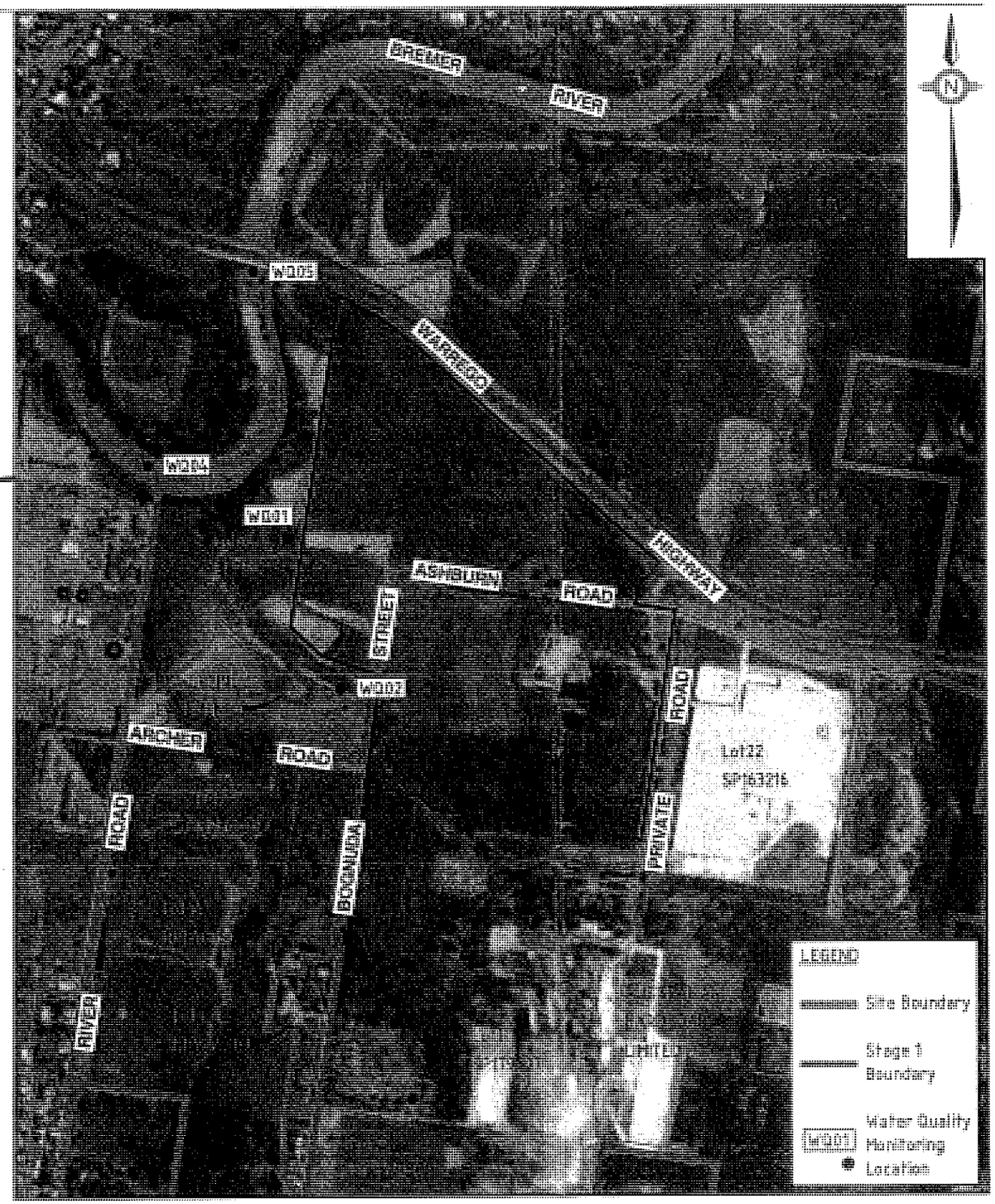

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FIGURE 1
SITE LOCATION

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Project No.: LJ8714

WALKER CORPORATION PTY LTD

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FIGURE 2

AUSTRALIAN HARDBOARDS LIMITED DECOMMISSIONED EFFLUENT DISPOSAL SYSTEM

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Project No.: LJ8714

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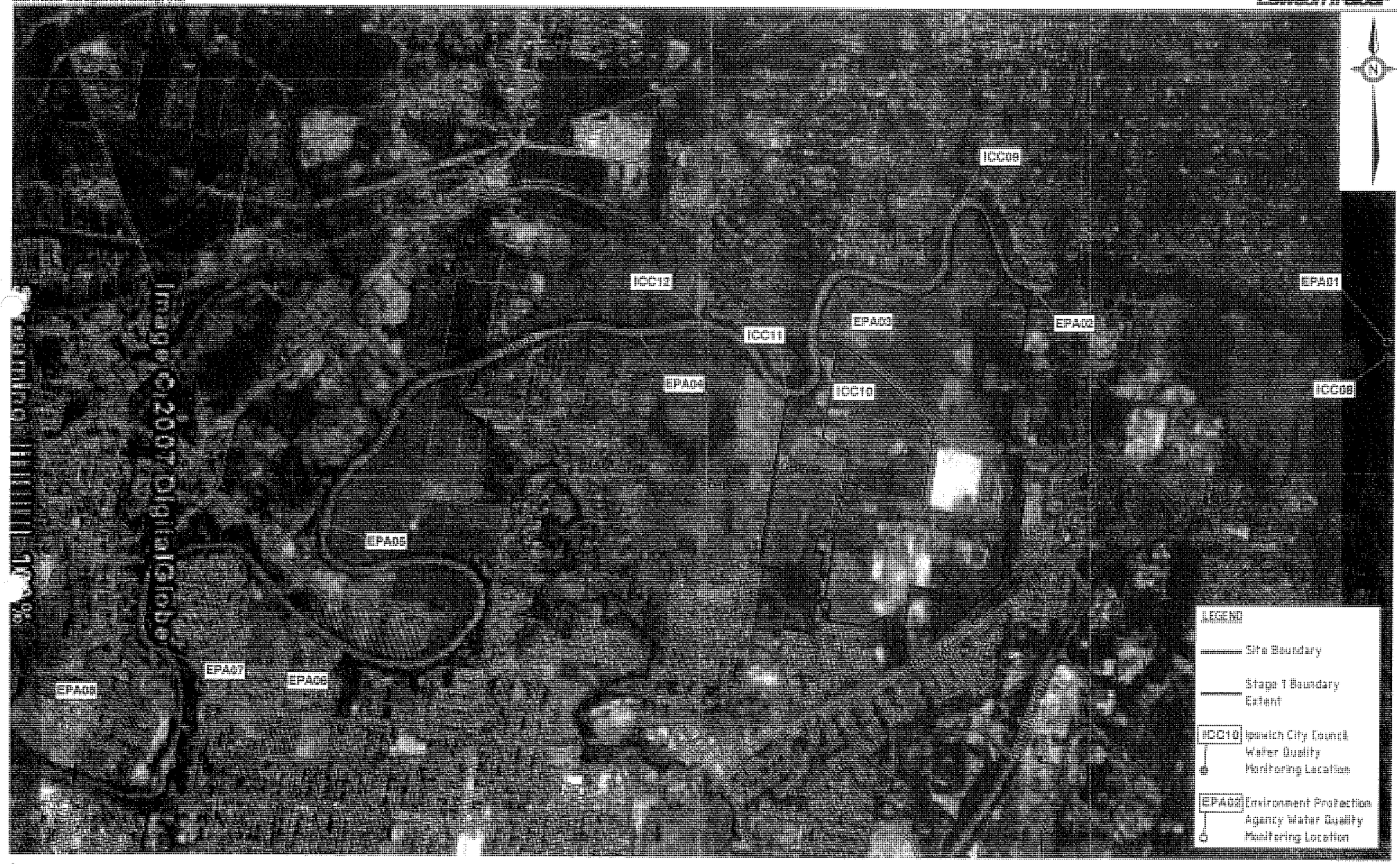

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FIGURE 3

IPSWICH CITY COUNCIL AND QUEENSLAND ENVIRONMENT PROTECTION AGENCY WATER QUALITY MONITORING LOCATIONS

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APPENDIX A

STORMWATER MANAGEMENT PLAN

APPENDIX A

STAGE 1 - STORMWATER MANAGEMENT PLAN

1. Water Quality Management – Construction Phase

Issue:	Water Quality Management – Construction Phase
Operational Policy:	To provide a set of guidelines to control the severity and extent of erosion and pollutant transport during firstly the earthworks stage, and then construction.
Performance Criteria:	Water discharges off the site are to comply with the Environmental Protection Act to ensure that no detrimental impacts on water quality and aquatic environment occur during the construction phase. The quality of discharge from the site should not exceed the Water Quality Objectives, as follows: Release Criteria • pH – 6.5-8.5.(range) • Suspended Solids – <50mg/L. (maximum). • Oils and Grease – No visible films or odour • Litter – no visible litter washed from site.
Responsibility:	The owner of the property or their appointed representative & the Construction Contractor. The owner will be responsible for the implementation of the WQMP during the course of all construction activity.
Implementation Strategy:	A detailed erosion & sediment control plan is to be prepared by the projects civil engineers & will incorporate the following: • Sediment and erosion control in accordance with the Institution of Engineers Australia Soil Erosion and Sediment Control Guidelines will be adopted. • Earthworks will be completed in stages with works restricted to the immediate areas. • Subsequent stages of development should not commence if prior stages are affected by acid sulphate conditions &/or construction phase water quality objectives are not met. • Prior to the commencement of any stage construction works temporary sediment basins are to be installed as per the details shown in the stages construction phase stormwater management strategy. • All disturbed site discharge to pass through temporary sediment basins prior to discharge from the site.

Issue:	Water Quality Management – Construction Phase
Implementation Strategy (Cont'd):	• Catch drains should be installed to divert upstream 'clean' water. • Silt fences will be placed along the downstream extents of all earthworks. • Check dams will be installed at regular intervals along catch drains. Drains and bund walls will be topsoiled and vegetated with suitable vegetation as soon as possible. Sediment and sludge trapped in the basins will be removed and mixed with topsoil and reused on site for landscaping purposes. Clean-up of general site litter on a weekly basis and after significant rainfall events. (>25mm/24hours) Landscaping activities and revegetation will occur as soon as possible during/after the construction phase of the development. Only appropriate herbicides and fertilisers are to be used.
Monitoring:	Sediment and erosion control measures will be inspected daily by the site manager during periods of rainfall. (>25mm/24hrs) Establishment and growth of vegetation – to be monitored monthly. No occurrence of excessive sediment deposit - to be monitored weekly or daily during periods of heavy rainfall (>25mm/24hrs). No release of construction material and silt from the site – to be monitored weekly or daily during periods of heavy rainfall (>25mm/24hrs). Vegetation established and growing prior to the rainy season. Erosion monitoring immediately following heavy rainfall. (>25mm) Inspection of silt fences and check dams following heavy rainfall. (>25mm/24hrs) Water quality monitoring shall be carried out following a rainfall event (>25mm of rainfall), and prior to discharge water quality monitoring will be conducted on the waters detained in the sediment basins

Issue:	Water Quality Management – Construction Phase
Monitoring (Cont'd)	The parameters to be tested shall include: • **Water collected in basins**: Prior to release **Parameters**: pH, suspended solids. Note that additional water quality monitoring maybe required if the WQOs are not being met.
Auditing:	Reviews are to be carried out on a monthly basis to assess the implementation strategy. A checklist is to be completed which assesses the strategies listed above.
Identification of Incident or Failure:	Non compliance with agreed performance criteria will be identified by: 1. Visual inspections identifying: • build up of sediment on and off the site. • Excessive erosion on the site • Release of construction material from the site • Lack of vegetation establishment 2. Poorly maintained, damaged or failed control devices. 3. Deteriorated water quality identified by the Environmental Consultant as being attributable to the construction activities.
Corrective Action:	After any identification of incident or failure, the source is to be located immediately and the following measures implemented: • If vegetation growth fails, new vegetation should be planted and established. Vegetation may require supplementary watering & replanting. • If silt fences fail, replace and monitor more frequently. • If gully erosion occurs, fill, vegetate and install velocity dissipation steps. • If release of silt and other material off the site occurs, or water quality monitoring indicates levels not within the WQOs, clean up, inspect all treatment techniques, revise designs and review different alternatives and install, otherwise reduce the rate of excavation. If monitored levels within the sediment basins do not conform to the release criteria for: • Suspended solids: flocculate and retest. • pH: add acid if pH is too high or add hydrated lime if pH is too low and retest.

Issue:	Water Quality Management – Construction Phase
Reporting:	Reports will be submitted monthly during the construction of each stage. The reporting will include: • Construction Contractor site managers report; & • Environmental Consultant water quality monitoring report Reporting will conform to the WQMP & identify performance of the implementation strategy, monitoring, identification of incidents & failure & associated corrective action. Reports will be submitted to the owner (or their appointed representative) monthly for submission to Council.

2. Water Quality Management – Operational Phase

Issue:	Surface Water Quality Management – Operational Phase
Operational Policy:	To provide a set of guidelines to ensure that the water quality in the waterways remain at an acceptable level as specified in the water quality objectives (WQOs) for the site at all times and to ensure that any waters discharged from the site are of an acceptable quality.
Performance Criteria:	Water discharges off the site should be of a quality, which ensures there is no detriment to the downstream environment. The quality of discharge from the site should achieve the following long term WQOs: • pH – 6.5-8.5 • Dissolved Oxygen – 80 – 105% saturation. • Total Phosphorous – 70µg/L. • Total Nitrogen – 650µg/L • Turbidity – 20 NTU • Suspended Solids – <15mg/L • Faecal Coliforms – 150 organisms/100mL. • Oils and Grease – No visible films or odour. • Litter/Gross Pollutants – No man made material greater than 5mm in any direction. WQO's are upper limits for median values or ranges in which medians should lie, unless otherwise stated.
Responsibility:	The owner of the property or their appointed representative. The owner will be responsible for implementation of the SWMP for the life of the building after completion of construction.
Implementation Strategy:	A comprehensive conceptual stormwater runoff management system is proposed for the development, comprising local runoff water quality control. Local catchment runoff water quality control is achieved by: • In-lot bio-retention systems/Ingal 'stormfilters'; • GPTs; and • Extended Detention Basins. These controls will: • trap trash; • trap coarse sediment and attached nutrients and metals; and • trap oil and grease.

Issue:	Surface Water Quality Management – Operational Phase
Implementation Strategy Cont'd:	Periodical monitoring of erosion within treatment devices. Periodic maintenance of vegetation within treatment devices. Gross pollutant traps to be cleared out quarterly to annually dependent on visual inspection and maintenance form.
Monitoring:	Inspect outflow points from the stormwater outlets and treatment trains to ensure that there are no signs of erosive activity or significant sediment deposits. Monitoring shall include inspection of all treatment devices to ensure they are operating efficiently. Water Quality monitoring will occur monthly for a period of 2 year after the treatment train is established, including 1 to 2 events per year. The monitoring will ensure that the implementation strategy is working effectively. Monitoring locations will include all legal points of discharge: • **WQ01** - Western Outlet of Stage 1 • **WQ02** - South-western Outlet of Stage 1 • **WQ04** - Bremer River; Downstream of the Bundamba sewage treatment plant • **WQ05** - Bremer River; Under the Warrego Highway crossing Key water quality parameters to be monitored are: • **Surface Waters:**, 4 events per year Monitoring • **Parameters:** temperature, dissolved oxygen, pH, specific conductance, salinity, turbidity, suspended solids, total nitrogen, total phosphorous, faecal coliforms, and Algae count and ID. Note that additional water quality monitoring may be required if compliance with the water quality objectives for the site are not being met.
Auditing:	Reviews are to be carried out on a quarterly basis to assess the implementation strategy. A checklist is to be completed which assesses the strategies listed above.

Issue:	Surface Water Quality Management – Operational Phase
Identification of Incident or Failure:	Non compliance with agreed performance criteria will be identified by: 1. Visual inspections identifying poorly maintained, damaged or failed control devices. 2. Deteriorated water quality identified by the Environmental Consultant as being attributable to the state of the treatment devices.
Corrective Action:	If release of silt and other material off the site occurs, clean up, inspect all treatment techniques, revise designs and review different alternatives and install.
Reporting:	A water quality reporting summarising the monitoring results shall be completed following each monitoring campaign.

APPENDIX B

MAINTENANCE PLANS

APPENDIX B

MAINTENANCE PLAN DETAILS

GROSS POLLUTANT TRAP's

SCHEDULE OF SITE VISITS													
Purpose of Visit	Frequency	J	F	M	A	M	J	J	A	S	O	N	D
Routine inspection	12/year	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Annual inspection	1/year				✓								
Routine maintenance	4/year		✓		✓				✓				✓
Routine clean out of sediment	1 year				✓								

The above schedule is a guideline only. Routine clean out of sediment and gross pollutants should be scheduled based on the outcome of routine inspection and/or manufacturers guidelines.

INSPECTION	
1.	**Routine Inspection**
1.1	Routine inspection should be carried out on a regular monthly basis. The purpose of the inspection is to indicate when cleanout of the GPT is required.
1.2	The depth of sediment/gross pollutants in the GPT should be measured according to design specifications.
1.3	Complete an appropriate Maintenance Form. Routine cleanout of sediment/gross pollutants should be scheduled when the depth of sediment/gross pollutants in the GPTs exceeds design levels.
2.	**Annual Inspection**
2.1	Once a year, the condition of the GPTs should be closely inspected. Any damage or problems should be noted on the Maintenance Form for action.

ROUTINE MAINTENANCE	
1.	**Purpose**
1.1	Routine maintenance of the GPT involves weed control and the collection of any gross pollutants, if required.
2.	**Weed Management**
2.1	If weeds have been observed during routine inspection, these weeds should be removed from the GPT. Weeding generally involves manual removal of perennial species.
2.2	The aim is to remove the weed including the roots when the weeds are less than 3 months old, otherwise weeds infestation rapidly occurs and is difficult to control.
2.3	Herbicides should not be used as they would contaminate the water in the creek.
2.4	The weeds should be disposed offsite at appropriate waste management facility.
2.5	Replant appropriate plant species, where necessary, in areas that have been extensively weeded.
3.	**Gross Pollutant Management**
3.1	Remove and dispose of gross pollutants that may be visible around the GPT perimeter.

CLEANOUT OF SEDIMENT	
1.	**Setup and Prepare Site for Cleanout**
1.1	Notify adjacent residents of cleanout at least three days prior to date of cleanout.
1.2	Setup equipment onsite including pump.
2.	**Cleanout of Sediment**
2.1	The preferred method of cleanout of the GPT is by using equipment as specified by GPT designer.
2.2	Position the equipment on the side of the GPT to allow easy access into the sediment area and transfer of material into adjacent tipper truck. The truck should be positioned so that water from the truck body drains into the GPT.
2.3	Drain waste in the truck thoroughly before proceeding to the disposal point.

BIO RETENTION SYSTEM

SCHEDULE OF SITE VISITS													
Purpose of Visit	Frequency	J	F	M	A	M	J	J	A	S	O	N	D
Routine inspection	12/year	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Annual inspection	1/year				✓								
Routine maintenance	2/year				✓						✓		
Routine clean out of sediment	1 / 2 years				✓								

There are three phases to this maintenance plan which are:

- The establishment phase;
- The inspection and monitoring phase; and
- Cleanout and replacement phase

The above schedule is a guideline only. Routine clean out and maintenance should be scheduled based on the outcome of routine inspection.

ESTABLISHMENT	
1.1	The aim of the establishment phase is to ensure appropriate plant establishment within the bio-retention system through adequate weed control and watering.
1.2	Weed control during the establishment phase focuses on weed growth prevention rather than removal. By adopting high planting densities and if necessary, applying a suitable biodegradable erosion control matting to the basin batters.
1.3	Regular watering of the bio-retention basin vegetation is essential for successful establishment of the selected plants. Each site will need specific watering requirements but as a guide during the first two weeks there will need to be three visits each week, after this (weeks 3-6) there will need to be two visits each week. The third and final period of establishment maintenance (weeks 7-12) there is only one visit each week required. The Bio-retention Basin Maintenance Checklist provides the schedule of visits and a tick box to help monitor what stage of the establishment phase they are in and provides a record as to whether proper establishment has occurred.

INSPECTION	
1.	**Routine Inspection**
1.1	Routine inspection should be carried out on a regular monthly basis. The purpose of the inspection is to indicate when maintenance of the Bio-retention system is required.
1.2	Inspections should consider items listed on the Bio-retention Basin Maintenance Checklist
2.	**Event Inspection**
2.1	Following bushfires the bio-retention system shall be inspected for damage to the structure, vegetation and filter media.
2.2	After any significant rainfall events the bio-retention system shall be inspected for damage to the structure, vegetation and filter media.

ROUTINE MAINTENANCE	
1.	**Purpose**
1.1	Maintenance of the bio retention system involves routine inspections of the bio-retention basin profile to identify any areas of obvious increased sediment deposition or scouring. Based on inspections there should be actions taken to remove dead or diseased vegetation, any litter or foreign objects. Filter Media replacement should occur when necessary and any items from checklist that are noted are to be reported to the site manager.
2.	**Weed Management**
2.1	If weeds have been observed during routine inspection, these weeds should be removed from the bio retention system. Weeding generally involves manual removal of perennial species.
2.2	The aim is to remove the weed including the roots when the weeds are less than 3 months old, otherwise weeds infestation rapidly occurs and is difficult to control.
2.3	Herbicides should not be used as they would contaminate the water in the creek.
2.4	The weeds should be disposed offsite at appropriate waste management facility.
2.5	Replant appropriate plant species, where necessary, in areas that have been extensively weeded.
3.	**Litter Management**
3.1	Remove and dispose of litter that may be visible around the bio retention system.
4.	**Dead or Diseased Vegetation**
4.1	Remove or dispose of any dead or diseased vegetation within system.
5.	**Filter Media Replacement**
5.1	Filter Media replacement is recommended when erosion is evident or system looks unattractive or is not draining in 30 days. Conventional surface mulching with organic material like tank bark, should not be undertaken as most mulch floats and is washed away.
6.	**Structural Integrity**
6.1	Report any damage to the structure immediately to the civil engineer
6.2	Report significant scour to the civil engineer
6.3	Ensure that the system is draining correctly via visual inspection of a rainfall event. If poor drainage is observed then inspect the outlet pipe for blockage. If the drainage is still poor then contact the civil engineer and arrange for a permeability test to ensure replacement of filter material is not clogged.

EVENT MAINTENANCE	
1.	**Purpose**
1.1	Event Maintenance of the bio retention system involves undertaking any maintenance to the bio-retention system following an event. Based on the event inspections there should be actions taken to remove dead or diseased vegetation, any litter or foreign objects. Filter Media replacement should occur when necessary and any items from checklist that are noted are to be reported to the site manager. Maintenance is in accordance with the Routine Maintenance guidelines listed above.

CLEANOUT AND REPLACEMENT OF SEDIMENT	
1.	**Setup and Prepare Site for Cleanout**
1.1	Notify adjacent residents of cleanout at least three days prior to date of cleanout.
1.2	Setup equipment onsite.
2.	**Cleanout of Sediment**
2.1	The preferred method of cleanout of the bio-retention system is replacing the clogged medium.
2.2	Position the equipment on the side of the system to allow easy access into the bio retention system and transfer of material into adjacent tipper truck. The truck should be positioned so that water from the truck body drains into the bio retention system.
2.3	Drain waste in the truck thoroughly before proceeding to the disposal point.

BIORETENTION BASIN MAINTANANCE CHECKLIST			
Location:			
Start Date:			
Inspection Date:			
Site Visit by:			
Establishment Phase Watering schedule	Tick for each visit		
Weeks 1 (3 times/week)			
Weeks 2 (3 times/week)			
Weeks 3 (2 times/week)			
Weeks 4 (2 times/week)			
Weeks 5 (2 times/week)			
Weeks 6 (2 times/week)			
Weeks 7 (1 times/week)			
Weeks 8 (1 times/week)			
Weeks 9 (1 times/week)			
Weeks 10 (1 times/week)			
Weeks 11 (1 times/week)			
Weeks 12 (1 times/week)			
Routine Inspection Checklist items	Y	N	Recommended action
Sediment accumulation at inflow points?			
Litter within basin?			
Erosion at structures?			
Traffic damage?			
Evidence of dumping?			
Vegetation condition satisfactory?			
Watering of vegetation?			
Replanting required?			
Clogging of drainage points?			
Evidence of ponding?			
Damage/vandalism to structure present?			
Surface clogging visible?			
Drainage system inspected?			
Cleanout and Replacement Checklist	Y	N	Recommended action
Resetting of system required?			
Suitable equipment and machinery available?			
Notification to stakeholders and residents?			
Thought towards public safety and risk?			
Weather forecast showing extended dry periods?			

APPENDIX C

SOBEK RESULTS

Cardno Lawson Treloar

Pre-Development Case: EX01a
Post-Development Case: DE01a

SOBEK Cross-ID	Peak Water Level (m AHD)																				
	100 Year ARI			50 Year ARI			20 Year ARI			10 Year ARI			5 Year ARI			2 Year ARI			1 Year ARI		
	Ex.	Dev.	Impact	Ex.	Dev.	Impact	Ex.	Dev.	Impact	Ex.	Dev.	Impact	Ex.	Dev.	Impact	Ex.	Dev.	Impact	Ex.	Dev.	Impact
	Tributary 1 of Bremer River																				
XS_RCH_1_1	26.37	26.37		26.35	26.35		26.33	26.33		26.31	26.31		26.29	26.29		26.25	26.25		26.22	26.22	
XS_RCH_1_2	24.54	24.54		24.53	24.53		24.51	24.51		24.49	24.49		24.48	24.48		24.45	24.45		24.42	24.42	
XS_RCH_1_3	23.91	23.91		23.89	23.89		23.87	23.87		23.84	23.84		23.81	23.81		23.77	23.77		23.73	23.73	
XS_RCH_1_4	22.26	22.26		22.24	22.24		22.21	22.21		22.18	22.18		22.15	22.15		22.11	22.11		22.07	22.07	
XS_RCH_1_5	20.25	20.25		20.20	20.20		20.16	20.16		20.11	20.11		20.06	20.06		19.99	19.99		19.92	19.92	
XS_RCH_1_6	19.44	19.44		19.40	19.40		19.36	19.36		19.32	19.32		19.28	19.28		19.22	19.22		19.17	19.17	
XS_RCH_1_7	18.57	18.57		18.52	18.52		18.47	18.47		18.42	18.42		18.37	18.37		18.30	18.30		18.24	18.24	
XS_RCH_1_8	18.06	18.06		18.00	18.00		17.92	17.92		17.84	17.84		17.77	17.77		17.66	17.66		17.56	17.56	
XS_RCH_1_9	18.02	18.02		17.96	17.96		17.88	17.88		17.81	17.81		17.74	17.74		17.63	17.63		17.54	17.54	
XS_RCH_1_10	17.96	17.96		17.90	17.90		17.83	17.83		17.77	17.77		17.70	17.70		17.60	17.60		17.51	17.51	
XS_RCH_1_11	17.45	17.45		17.40	17.40		17.33	17.33		17.27	17.27		17.21	17.21		17.13	17.13		17.06	17.06	
XS_RCH_1_12	15.76	15.76		15.69	15.69		15.61	15.61		15.53	15.53		15.45	15.45		15.29	15.29		15.16	15.16	
XS_RCH_1_13	15.74	15.74		15.68	15.68		15.60	15.60		15.52	15.52		15.44	15.44		15.27	15.27		15.14	15.14	
XS_RCH_1_14	15.12	15.12		15.06	15.06		14.98	14.98		14.91	14.91		14.84	14.84		14.74	14.74		14.67	14.67	
XS_RCH_1_15	14.05	14.05		13.99	13.99		13.93	13.93		13.87	13.87		13.81	13.81		13.71	13.71		13.63	13.63	
XS_RCH_1_16	13.34	13.34		13.28	13.28		13.22	13.22		13.16	13.16		13.10	13.10		13.01	13.01		12.93	12.93	
XS_RCH_1_17	12.87	12.87		12.81	12.81		12.74	12.74		12.67	12.67		12.60	12.60		12.50	12.50		12.42	12.42	
XS_RCH_1_18	12.42	12.42		12.35	12.35		12.28	12.28		12.20	12.20		12.13	12.13		12.01	12.01		11.92	11.92	
XS_RCH_1_19	11.16	11.16		11.08	11.08		10.99	10.99		10.91	10.91		10.83	10.83		10.70	10.70		10.60	10.60	
XS_RCH_1_20	10.46	10.46		10.38	10.38		10.29	10.29		10.21	10.21		10.13	10.13		10.00	10.00		9.89	9.89	
XS_RCH_1_21	9.13	9.13		9.03	9.03		8.92	8.92		8.81	8.81		8.70	8.70		8.54	8.54		8.41	8.41	
XS_RCH_1_22	8.15	8.15		8.07	8.07		7.96	7.96		7.87	7.87		7.78	7.78		7.63	7.63		7.51	7.51	
XS_RCH1_22b	6.87	6.86	-0.01	6.77	6.77		6.64	6.64		6.53	6.53		6.42	6.42		6.25	6.25		6.11	6.11	
XS_RCH1_23	6.35	6.34	-0.01	6.26	6.26		6.14	6.14		6.04	6.04		5.93	5.93		5.77	5.77		5.64	5.64	
XS_RCH1_24	5.66	5.66		5.58	5.59	0.01	5.49	5.49		5.40	5.40		5.31	5.32	0.01	5.18	5.19	0.01	5.08	5.08	
XS_RCH_1_25	4.93	4.98	**0.05**	4.82	4.88	**0.06**	4.70	4.75	**0.05**	4.58	4.63	**0.05**	4.47	4.51	**0.04**	4.30	4.34	**0.04**	4.16	4.20	**0.04**
XS_RCH1_25b	4.42	4.47	**0.05**	4.30	4.36	**0.06**	4.15	4.20	**0.05**	4.01	4.06	**0.05**	3.88	3.93	**0.05**	3.68	3.72	**0.04**	3.52	3.56	**0.04**
XS_RCH_1_26	4.26	4.32	**0.06**	4.13	4.19	**0.06**	3.96	4.02	**0.06**	3.81	3.86	**0.05**	3.66	3.71	**0.05**	3.44	3.49	**0.05**	3.27	3.31	**0.04**
XS_RCH1_26b	3.61	3.67	**0.06**	3.48	3.54	**0.06**	3.33	3.38	**0.05**	3.18	3.24	**0.06**	3.05	3.10	**0.05**	2.92	2.92		2.92	2.92	
DS_Boundary	2.62	2.62		2.62	2.62		2.62	2.62		2.62	2.62		2.62	2.62		2.62	2.62		2.62	2.62	

Pre-Development Case: EX01a
Post-Development Case: DE01a

SOBEK Cross-Pre- ID	Peak Water Level (m AHD)																				
	100 Year ARI			50 Year ARI			20 Year ARI			10 Year ARI			5 Year ARI			2 Year ARI			1 Year ARI		
	Ex.	Dev.	Impact	Ex.	Dev.	Impact	Ex.	Dev.	Impact	Ex.	Dev.	Impact	Ex.	Dev.	Impact	Ex.	Dev.	Impact	Ex.	Dev.	Impact
	Tributary 2 of Bremer River																				
XS_RCH_2_1	31.02	31.02		30.99	30.99		30.96	30.96		30.93	30.93		30.89	30.89		30.85	30.85		30.81	30.81	
XS_RCH_2_2	31.02	31.02		30.99	30.99		30.96	30.96		30.93	30.93		30.89	30.89		30.85	30.85		30.81	30.81	
XS_RCH_2_3	28.56	28.56		28.53	28.53		28.50	28.50		28.47	28.47		28.44	28.44		28.39	28.39		28.35	28.35	
XS_RCH_2_4	27.50	27.50		27.48	27.48		27.45	27.45		27.43	27.43		27.40	27.40		27.36	27.36		27.33	27.33	
XS_RCH_2_5	25.68	25.68		25.64	25.64		25.60	25.60		25.56	25.56		25.52	25.52		25.45	25.45		25.40	25.40	
XS_RCH_2_6	24.20	24.20		24.16	24.16		24.12	24.12		24.08	24.08		24.03	24.03		23.97	23.97		23.92	23.92	
XS_RCH_2_7	23.34	23.34		23.31	23.31		23.27	23.27		23.24	23.24		23.20	23.20		23.15	23.15		23.10	23.10	
XS_RCH_2_8	21.49	21.49		21.47	21.47		21.43	21.43		21.40	21.40		21.37	21.37		21.33	21.33		21.29	21.29	
XS_RCH_2_9	20.53	20.53		20.49	20.49		20.43	20.43		20.37	20.37		20.31	20.31		20.23	20.23		20.16	20.16	
XS_RCH_2_10	18.56	18.56		18.49	18.49		18.41	18.41		18.32	18.32		18.24	18.24		18.11	18.11		17.99	17.99	
XS_RCH_2_11	17.68	17.68		17.64	17.64		17.60	17.60		17.55	17.55		17.50	17.50		17.43	17.43		17.36	17.36	
	Tributary 3 of Bremer River																				
XS_RCH_3_1	14.12	14.20	0.08	14.10	14.18	0.08	14.07	14.17	0.10	14.05	14.14	0.09	14.02	14.12	0.10	13.98	14.09	0.11	13.94	14.05	0.11
XS_RCH_3_2	13.76	13.87	0.11	13.74	13.84	0.10	13.72	13.83	0.11	13.70	13.80	0.10	13.67	13.77	0.10	13.63	13.73	0.10	13.60	13.70	0.10
XS_RCH3_16	12.50	12.69	0.19	12.46	12.64	0.18	12.41	12.61	0.20	12.36	12.56	0.20	12.32	12.51	0.19	12.25	12.43	0.18	12.19	12.36	0.17
XS_RCH3_15	11.85	12.07	0.22	11.80	12.01	0.21	11.75	11.97	0.22	11.70	11.91	0.21	11.65	11.85	0.20	11.57	11.76	0.19	11.51	11.69	0.18
XS_RCH3_14	11.73	11.89	0.16	11.69	11.84	0.15	11.65	11.81	0.16	11.61	11.76	0.15	11.57	11.71	0.14	11.51	11.64	0.13	11.46	11.59	0.13
XS_RCH3_13	11.72	11.87	0.15	11.69	11.83	0.14	11.64	11.79	0.15	11.61	11.74	0.13	11.57	11.70	0.13	11.51	11.64	0.13	11.46	11.58	0.12
XS_RCH3_12	11.71	11.85	0.14	11.68	11.81	0.13	11.64	11.78	0.14	11.60	11.74	0.14	11.56	11.70	0.14	11.51	11.63	0.12	11.46	11.58	0.12
XS_RCH3_11	10.16	10.32	0.16	10.12	10.27	0.15	10.08	10.24	0.16	10.04	10.18	0.14	10.00	10.14	0.14	9.93	10.07	0.14	9.89	10.01	0.12
XS_RCH3_10	9.17	9.39	0.22	9.10	9.33	0.23	9.03	9.27	0.24	8.96	9.20	0.24	8.90	9.13	0.23	8.79	9.02	0.23	8.71	8.92	0.21
XS_RCH3_09	8.58	8.79	0.21	8.52	8.73	0.21	8.45	8.68	0.23	8.38	8.61	0.23	8.32	8.55	0.23	8.22	8.44	0.22	8.13	8.34	0.21
XS_RCH3_08	7.71	7.93	0.22	7.65	7.86	0.21	7.59	7.81	0.22	7.53	7.74	0.21	7.46	7.68	0.22	7.37	7.57	0.20	7.30	7.48	0.18
XS_RCH3_07	6.63	6.86	0.23	6.57	6.79	0.22	6.50	6.74	0.24	6.43	6.66	0.23	6.37	6.59	0.22	6.27	6.48	0.21	6.20	6.39	0.19
XS_RCH3_06	5.84	6.08	0.24	5.77	6.00	0.23	5.69	5.94	0.25	5.61	5.86	0.25	5.54	5.78	0.24	5.43	5.67	0.24	5.34	5.56	0.22

Pre-Development Case: EX01a
Post-Development Case: DE01a

SOBEK Cross-ID	Peak Water Depth (m)																				
	100 Year ARI			50 Year ARI			20 Year ARI			10 Year ARI			5 Year ARI			2 Year ARI			1 Year ARI		
	Ex.	Dev.	Impact	Ex.	Dev.	Impact	Ex.	Dev.	Impact	Ex.	Dev.	Impact	Ex.	Dev.	Impact	Ex.	Dev.	Impact	Ex.	Dev.	Impact
	Tributary 1 of Bremer River																				
XS_RCH_1_1	0.39	0.39		0.37	0.37		0.36	0.36		0.33	0.33		0.31	0.31		0.28	0.28		0.25	0.25	
XS_RCH_1_2	0.36	0.36		0.34	0.34		0.33	0.33		0.31	0.31		0.29	0.29		0.27	0.27		0.24	0.24	
XS_RCH_1_3	0.63	0.63		0.61	0.61		0.59	0.59		0.56	0.56		0.53	0.53		0.49	0.49		0.45	0.45	
XS_RCH_1_4	0.44	0.44		0.41	0.41		0.39	0.39		0.36	0.36		0.33	0.33		0.29	0.29		0.25	0.25	
XS_RCH_1_5	0.82	0.82		0.77	0.77		0.73	0.73		0.68	0.68		0.63	0.63		0.56	0.56		0.49	0.49	
XS_RCH_1_6	1.12	1.12		1.08	1.08		1.05	1.05		1.00	1.00		0.96	0.96		0.90	0.90		0.85	0.85	
XS_RCH_1_7	0.63	0.63		0.58	0.58		0.53	0.53		0.48	0.48		0.43	0.43		0.36	0.36		0.30	0.30	
XS_RCH_1_8	1.36	1.36		1.30	1.30		1.22	1.22		1.14	1.14		1.07	1.07		0.96	0.96		0.86	0.86	
XS_RCH_1_9	1.32	1.32		1.26	1.26		1.18	1.18		1.11	1.11		1.04	1.04		0.93	0.93		0.84	0.84	
XS_RCH_1_10	1.19	1.19		1.13	1.13		1.06	1.06		0.99	0.99		0.92	0.92		0.82	0.82		0.74	0.74	
XS_RCH_1_11	0.87	0.87		0.81	0.81		0.74	0.74		0.68	0.68		0.63	0.63		0.54	0.54		0.47	0.47	
XS_RCH_1_12	1.29	1.29		1.22	1.22		1.14	1.14		1.06	1.06		0.97	0.97		0.82	0.82		0.69	0.69	
XS_RCH_1_13	1.39	1.39		1.32	1.32		1.24	1.24		1.16	1.16		1.08	1.08		0.92	0.92		0.79	0.79	
XS_RCH_1_14	1.03	1.03		0.97	0.97		0.89	0.89		0.82	0.82		0.75	0.75		0.65	0.65		0.58	0.58	
XS_RCH_1_15	1.08	1.08		1.03	1.03		0.96	0.96		0.90	0.90		0.84	0.84		0.74	0.74		0.66	0.66	
XS_RCH_1_16	1.12	1.12		1.07	1.07		1.00	1.00		0.94	0.94		0.89	0.89		0.79	0.79		0.72	0.72	
XS_RCH_1_17	1.03	1.03		0.96	0.96		0.89	0.89		0.82	0.82		0.76	0.76		0.65	0.65		0.57	0.57	
XS_RCH_1_18	1.07	1.07		1.01	1.01		0.93	0.93		0.86	0.86		0.78	0.78		0.67	0.67		0.57	0.57	
XS_RCH_1_19	1.09	1.09		1.01	1.01		0.92	0.92		0.84	0.84		0.76	0.76		0.63	0.63		0.53	0.53	
XS_RCH_1_20	1.17	1.17		1.09	1.09		1.00	1.00		0.92	0.92		0.83	0.83		0.70	0.70		0.60	0.60	
XS_RCH_1_21	1.60	1.60		1.50	1.50		1.39	1.39		1.28	1.28		1.17	1.17		1.01	1.01		0.88	0.88	
XS_RCH_1_22	1.35	1.35		1.27	1.27		1.16	1.16		1.07	1.07		0.98	0.98		0.83	0.83		0.71	0.71	
XS_RCH1_22b	1.60	1.60		1.50	1.50		1.38	1.38		1.27	1.27		1.15	1.15		0.98	0.98		0.84	0.84	
XS_RCH1_23	1.58	1.57	-0.01	1.49	1.49		1.37	1.37		1.27	1.27		1.16	1.16		1.00	1.00		0.87	0.87	
XS_RCH1_24	1.16	1.16		1.08	1.08		0.98	0.99	0.01	0.89	0.90	0.01	0.81	0.81		0.68	0.68		0.58	0.58	
XS_RCH_1_25	1.74	1.79	**0.05**	1.63	1.69	**0.06**	1.51	1.56	**0.05**	1.39	1.44	**0.05**	1.28	1.32	**0.04**	1.11	1.15	**0.04**	0.97	1.01	**0.04**
XS_RCH1_25b	2.24	2.29	**0.05**	2.12	2.17	**0.05**	1.97	2.02	**0.05**	1.83	1.88	**0.05**	1.70	1.75	**0.05**	1.50	1.54	**0.04**	1.34	1.38	**0.04**
XS_RCH_1_26	2.31	2.37	**0.06**	2.18	2.24	**0.06**	2.01	2.07	**0.06**	1.86	1.91	**0.05**	1.71	1.77	**0.06**	1.49	1.54	**0.05**	1.32	1.36	**0.04**
XS_RCH1_26b	2.34	2.40	**0.06**	2.21	2.27	**0.06**	2.06	2.11	**0.05**	1.91	1.97	**0.06**	1.78	1.83	**0.05**	1.65	1.65		1.65	1.65	
DS_Boundary	1.35	1.35		1.35	1.35		1.35	1.35		1.35	1.35		1.35	1.35		1.35	1.35		1.35	1.35	

Cardno Lawson Treloar

Pre-Development Case: EX01a
Post-Development Case: DE01a

SOBEK Cross-Pre- ID	Peak Water Depth (m)																				
	100 Year ARI			50 Year ARI			20 Year ARI			10 Year ARI			5 Year ARI			2 Year ARI			1 Year ARI		
	Ex.	Dev.	Impact	Ex.	Dev.	Impact	Ex.	Dev.	Impact	Ex.	Dev.	Impact	Ex.	Dev.	Impact	Ex.	Dev.	Impact	Ex.	Dev.	Impact
	Tributary 2 of Bremer River																				
XS_RCH_2_1	2.00	2.00		1.97	1.97		1.93	1.93		1.90	1.90		1.87	1.87		1.82	1.82		1.78	1.78	
XS_RCH_2_2	2.48	2.48		2.45	2.45		2.42	2.42		2.39	2.39		2.35	2.35		2.30	2.30		2.26	2.26	
XS_RCH_2_3	0.47	0.47		0.44	0.44		0.41	0.41		0.38	0.38		0.35	0.35		0.30	0.30		0.27	0.27	
XS_RCH_2_4	0.43	0.43		0.40	0.40		0.38	0.38		0.35	0.35		0.33	0.33		0.29	0.29		0.25	0.25	
XS_RCH_2_5	0.58	0.58		0.54	0.54		0.50	0.50		0.45	0.45		0.41	0.41		0.35	0.35		0.30	0.30	
XS_RCH_2_6	0.70	0.70		0.66	0.66		0.62	0.62		0.57	0.57		0.53	0.53		0.47	0.47		0.41	0.41	
XS_RCH_2_7	0.54	0.54		0.50	0.50		0.47	0.47		0.43	0.43		0.40	0.40		0.34	0.34		0.30	0.30	
XS_RCH_2_8	1.60	1.60		1.57	1.57		1.54	1.54		1.51	1.51		1.48	1.48		1.43	1.43		1.39	1.39	
XS_RCH_2_9	0.85	0.85		0.80	0.80		0.74	0.74		0.68	0.68		0.63	0.63		0.54	0.54		0.47	0.47	
XS_RCH_2_10	1.58	1.58		1.51	1.51		1.42	1.42		1.34	1.34		1.25	1.25		1.12	1.12		1.01	1.01	
XS_RCH_2_11	0.86	0.86		0.82	0.82		0.78	0.78		0.73	0.73		0.69	0.69		0.61	0.61		0.54	0.54	
	Tributary 3 of Bremer River																				
XS_RCH_3_1	0.54	0.63	**0.09**	0.52	0.61	**0.09**	0.50	0.59	**0.09**	0.47	0.57	**0.10**	0.45	0.55	**0.10**	0.40	0.51	**0.11**	0.37	0.47	**0.10**
XS_RCH_3_2	0.64	0.74	**0.10**	0.61	0.72	**0.11**	0.59	0.70	**0.11**	0.57	0.67	**0.10**	0.54	0.65	**0.11**	0.50	0.60	**0.10**	0.47	0.57	**0.10**
XS_RCH3_16	0.65	0.84	**0.19**	0.61	0.80	**0.19**	0.56	0.76	**0.20**	0.51	0.71	**0.20**	0.47	0.66	**0.19**	0.40	0.58	**0.18**	0.34	0.51	**0.17**
XS_RCH3_15	0.98	1.19	**0.21**	0.93	1.14	**0.21**	0.87	1.09	**0.22**	0.82	1.03	**0.21**	0.77	0.98	**0.21**	0.69	0.89	**0.20**	0.63	0.81	**0.18**
XS_RCH3_14	1.42	1.57	**0.15**	1.38	1.53	**0.15**	1.34	1.49	**0.15**	1.30	1.44	**0.14**	1.26	1.40	**0.14**	1.20	1.33	**0.13**	1.15	1.27	**0.12**
XS_RCH3_13	1.73	1.87	**0.14**	1.69	1.83	**0.14**	1.65	1.80	**0.15**	1.61	1.75	**0.14**	1.57	1.71	**0.14**	1.51	1.64	**0.13**	1.46	1.58	**0.12**
XS_RCH3_12	2.54	2.68	**0.14**	2.51	2.64	**0.13**	2.47	2.61	**0.14**	2.43	2.56	**0.13**	2.39	2.52	**0.13**	2.33	2.46	**0.13**	2.28	2.40	**0.12**
XS_RCH3_11	0.56	0.71	**0.15**	0.52	0.67	**0.15**	0.47	0.63	**0.16**	0.43	0.58	**0.15**	0.39	0.53	**0.14**	0.33	0.46	**0.13**	0.28	0.40	**0.12**
XS_RCH3_10	0.92	1.14	**0.22**	0.86	1.08	**0.22**	0.78	1.02	**0.24**	0.71	0.95	**0.24**	0.65	0.88	**0.23**	0.55	0.77	**0.22**	0.47	0.67	**0.20**
XS_RCH3_09	1.01	1.23	**0.22**	0.95	1.16	**0.21**	0.88	1.12	**0.24**	0.82	1.04	**0.22**	0.75	0.98	**0.23**	0.65	0.87	**0.22**	0.57	0.77	**0.20**
XS_RCH3_08	0.91	1.12	**0.21**	0.85	1.06	**0.21**	0.79	1.01	**0.22**	0.72	0.94	**0.22**	0.66	0.88	**0.22**	0.57	0.77	**0.20**	0.50	0.68	**0.18**
XS_RCH3_07	0.88	1.11	**0.23**	0.83	1.05	**0.22**	0.76	0.99	**0.23**	0.69	0.92	**0.23**	0.62	0.85	**0.23**	0.53	0.74	**0.21**	0.45	0.65	**0.20**
XS_RCH3_06	1.02	1.26	**0.24**	0.96	1.19	**0.23**	0.87	1.13	**0.26**	0.80	1.04	**0.24**	0.72	0.97	**0.25**	0.61	0.85	**0.24**	0.52	0.74	**0.22**

Pre-Development Case: EX01a
Post-Development Case: DE01a

SOBEK Cross-ID	Peak Water Flow (m3/s)																				
	100 Year ARI			50 Year ARI			20 Year ARI			10 Year ARI			5 Year ARI			2 Year ARI			1 Year ARI		
	Ex.	Dev.	Impact	Ex.	Dev.	Impact	Ex.	Dev.	Impact	Ex.	Dev.	Impact	Ex.	Dev.	Impact	Ex.	Dev.	Impact	Ex.	Dev.	Impact
	Tributary 1 of Bremer River																				
XS_RCH_1_1	20.81	20.81		18.33	18.33		16.37	16.37		13.87	13.87		11.75	11.75		8.79	8.79		6.63	6.63	
XS_RCH_1_2	20.45	20.46	0.01	18.03	18.03		16.05	16.05		13.60	13.60		11.51	11.51		8.59	8.59		6.45	6.45	
XS_RCH_1_3	20.49	20.49		18.04	18.04		16.05	16.05		13.57	13.57		11.46	11.46		8.53	8.53		6.40	6.40	
XS_RCH_1_4	24.55	24.55		21.50	21.50		18.84	18.84		15.91	15.91		13.34	13.34		9.85	9.85		7.31	7.31	
XS_RCH_1_5	24.37	24.37		21.37	21.37		18.62	18.62		15.76	15.76		13.24	13.24		9.78	9.78		7.24	7.24	
XS_RCH_1_6	24.32	24.32		21.22	21.22		18.60	18.60		15.60	15.60		13.12	13.12		9.71	9.71		7.18	7.18	
XS_RCH_1_7	24.22	24.22		21.24	21.24		18.50	18.50		15.63	15.63		13.13	13.13		9.69	9.69		7.17	7.17	
XS_RCH_1_8	24.22	24.22		21.23	21.23		18.48	18.48		15.62	15.62		13.09	13.09		9.61	9.61		7.14	7.14	
XS_RCH_1_9	28.42	28.42		24.84	24.84		21.15	21.15		17.78	17.78		14.75	14.75		10.78	10.78		7.97	7.97	
XS_RCH_1_10	28.39	28.39		24.78	24.78		21.12	21.12		17.71	17.71		14.73	14.73		10.76	10.76		7.95	7.95	
XS_RCH_1_11	28.11	28.11		24.60	24.60		20.85	20.85		17.49	17.49		14.58	14.58		10.63	10.63		7.87	7.87	
XS_RCH_1_12	47.15	47.15		41.06	41.06		34.48	34.48		28.71	28.71		23.69	23.68	-0.01	16.92	16.91	-0.01	12.31	12.31	
XS_RCH_1_13	47.14	47.15	0.01	41.03	41.03		34.50	34.50		28.70	28.70		23.69	23.69		16.92	16.92		12.32	12.32	
XS_RCH_1_14	47.13	47.14	0.01	41.00	41.00		34.50	34.50		28.68	28.68		23.69	23.69		16.92	16.92		12.32	12.32	
XS_RCH_1_15	50.36	50.36		43.94	43.94		36.89	36.89		30.68	30.68		25.31	25.31		18.08	18.08		13.19	13.19	
XS_RCH_1_16	50.39	50.39		43.94	43.94		36.80	36.80		30.68	30.68		25.31	25.31		18.09	18.09		13.18	13.18	
XS_RCH_1_17	50.39	50.40	0.01	43.90	43.90		36.82	36.82		30.66	30.66		25.31	25.31		18.09	18.09		13.18	13.18	
XS_RCH_1_18	50.34	50.34		43.77	43.77		36.82	36.82		30.58	30.58		25.28	25.28		18.06	18.06		13.17	13.17	
XS_RCH_1_19	50.22	50.22		43.75	43.75		36.71	36.71		30.54	30.54		25.23	25.23		18.03	18.03		13.15	13.15	
XS_RCH_1_20	58.91	58.91		51.32	51.32		42.91	42.91		35.71	35.71		29.40	29.39	-0.01	20.97	20.96	-0.01	15.24	15.24	
XS_RCH_1_21	58.86	58.86		51.21	51.21		42.86	42.86		35.61	35.61		29.34	29.34		20.92	20.92		15.21	15.21	
XS_RCH_1_22	58.76	58.76		51.22	51.22		42.77	42.77		35.62	35.62		29.35	29.34	-0.01	20.91	20.91		15.19	15.19	
XS_RCH1_22b	58.77	58.76	-0.01	51.20	51.20		42.80	42.80		35.55	35.55		29.32	29.31	-0.01	20.90	20.89	-0.01	15.20	15.20	
XS_RCH1_23	61.60	60.95	-0.65	53.67	53.67		44.74	44.74		37.15	37.14	-0.01	30.60	30.60		21.79	21.79		15.85	15.85	
XS_RCH1_24	61.58	60.92	-0.66	53.53	53.55	**0.02**	44.73	44.73		37.13	37.14	0.01	30.57	30.57		21.78	21.78		15.82	15.82	
XS_RCH_1_25	77.03	81.70	**4.67**	67.12	71.76	**4.64**	55.73	59.88	**4.15**	46.35	49.78	**3.43**	38.17	41.17	**3.00**	27.14	29.44	**2.30**	19.72	21.49	**1.77**
XS_RCH1_25b	76.97	81.47	**4.50**	66.92	71.67	**4.75**	55.68	59.70	**4.02**	46.26	49.67	**3.41**	38.09	41.11	**3.02**	27.12	29.34	**2.22**	19.68	21.45	**1.77**
XS_RCH_1_26	76.95	81.50	**4.55**	66.89	71.67	**4.78**	55.66	59.72	**4.06**	46.26	49.64	**3.38**	38.09	41.08	**2.99**	27.11	29.35	**2.24**	19.68	21.45	**1.77**
XS_RCH1_26b	76.93	81.52	**4.59**	66.91	71.65	**4.74**	55.63	59.73	**4.10**	46.25	49.62	**3.37**	38.09	41.05	**2.96**	27.09	29.36	**2.27**	19.69	21.46	**1.77**
DS_Boundary	76.93	81.58	**4.65**	66.94	71.62	**4.68**	55.59	59.74	**4.15**	46.24	49.66	**3.42**	38.09	41.07	**2.98**	27.10	29.38	**2.28**	23.65	23.65	

Pre-Development Case: EX01a
Post-Development Case: DE01a

SOBEK Cross-Pre- ID	Peak Water Flow (m3/s)																				
	100 Year ARI			50 Year ARI			20 Year ARI			10 Year ARI			5 Year ARI			2 Year ARI			1 Year ARI		
	Ex.	Dev.	Impact	Ex.	Dev.	Impact	Ex.	Dev.	Impact	Ex.	Dev.	Impact	Ex.	Dev.	Impact	Ex.	Dev.	Impact	Ex.	Dev.	Impact
	Tributary 2 of Bremer River																				
XS_RCH_2_1	7.49	7.49		6.51	6.51		5.41	5.41		4.48	4.48		3.62	3.62		2.54	2.54		1.80	1.80	
XS_RCH_2_2	7.05	7.05		6.08	6.08		4.99	4.99		4.09	4.09		3.29	3.29		2.29	2.29		1.63	1.63	
XS_RCH_2_3	7.06	7.06		6.07	6.07		4.99	4.98	-0.01	4.09	4.09		3.29	3.29		2.29	2.29		1.63	1.63	
XS_RCH_2_4	15.58	15.58		13.52	13.52		11.30	11.30		9.32	9.32		7.57	7.56	-0.01	5.26	5.25	-0.01	3.67	3.67	
XS_RCH_2_5	15.53	15.53		13.48	13.48		11.25	11.25		9.26	9.26		7.52	7.52		5.23	5.23		3.67	3.67	
XS_RCH_2_6	15.45	15.45		13.40	13.40		11.17	11.17		9.23	9.22	-0.01	7.49	7.48	-0.01	5.21	5.21		3.66	3.66	
XS_RCH_2_7	19.30	19.30		16.76	16.75	-0.01	13.95	13.94	-0.01	11.53	11.53		9.38	9.38		6.56	6.56		4.63	4.63	
XS_RCH_2_8	19.27	19.27		16.74	16.74		13.95	13.95		11.52	11.52		9.37	9.37		6.55	6.55		4.63	4.63	
XS_RCH_2_9	19.28	19.28		16.74	16.74		13.93	13.93		11.52	11.52		9.38	9.38		6.56	6.56		4.63	4.63	
XS_RCH_2_10	19.28	19.28		16.72	16.71	-0.01	13.95	13.95		11.51	11.51		9.38	9.38		6.56	6.55	-0.01	4.63	4.63	
XS_RCH_2_11	19.24	19.24		16.71	16.71		13.94	13.94		11.51	11.51		9.37	9.37		6.55	6.55		4.63	4.63	
	Tributary 3 of Bremer River																				
XS_RCH_3_1	13.98	24.81	**10.83**	12.18	21.97	**9.79**	10.39	20.00	**9.61**	8.73	17.10	**8.37**	7.18	14.82	**7.64**	5.22	11.30	**6.08**	3.82	8.73	**4.91**
XS_RCH_3_2	13.79	24.54	**10.75**	12.00	21.77	**9.77**	10.20	19.79	**9.59**	8.55	16.91	**8.36**	7.01	14.64	**7.63**	5.08	11.15	**6.07**	3.71	8.60	**4.89**
XS_RCH3_16	13.85	24.26	**10.41**	12.08	21.51	**9.43**	10.17	19.51	**9.34**	8.52	16.67	**8.15**	7.02	14.42	**7.40**	5.12	10.98	**5.86**	3.74	8.46	**4.72**
XS_RCH3_15	13.87	24.27	**10.40**	12.09	21.49	**9.40**	10.23	19.50	**9.27**	8.57	16.71	**8.14**	7.04	14.51	**7.47**	5.10	11.10	**6.00**	3.70	8.56	**4.86**
XS_RCH3_14	13.82	24.39	**10.57**	12.03	21.60	**9.57**	10.19	19.62	**9.43**	8.52	16.79	**8.27**	6.96	14.56	**7.60**	4.99	11.11	**6.12**	3.57	8.55	**4.98**
XS_RCH3_13	13.65	24.40	**10.75**	11.87	21.61	**9.74**	10.03	19.62	**9.59**	8.36	16.77	**8.41**	6.81	14.51	**7.70**	4.84	11.03	**6.19**	3.51	8.45	**4.94**
XS_RCH3_12	18.22	29.01	**10.79**	15.87	25.64	**9.77**	13.29	23.08	**9.79**	11.04	19.64	**8.60**	9.03	16.84	**7.81**	6.38	12.67	**6.29**	4.61	9.65	**5.04**
XS_RCH3_11	18.24	28.91	**10.67**	15.88	25.54	**9.66**	13.29	22.98	**9.69**	11.03	19.54	**8.51**	9.01	16.74	**7.73**	6.38	12.70	**6.32**	4.61	9.70	**5.09**
XS_RCH3_10	18.24	28.72	**10.48**	15.86	25.41	**9.55**	13.26	22.88	**9.62**	10.99	19.54	**8.55**	9.00	16.84	**7.84**	6.38	12.77	**6.39**	4.61	9.73	**5.12**
XS_RCH3_09	18.19	28.87	**10.68**	15.80	25.54	**9.74**	13.20	23.01	**9.81**	10.99	19.63	**8.64**	9.01	16.89	**7.88**	6.37	12.77	**6.40**	4.61	9.70	**5.09**
XS_RCH3_08	18.13	28.97	**10.84**	15.80	25.61	**9.81**	13.24	23.07	**9.83**	11.01	19.65	**8.64**	9.00	16.87	**7.87**	6.37	12.70	**6.33**	4.60	9.61	**5.01**
XS_RCH3_07	18.17	28.95	**10.78**	15.82	25.58	**9.76**	13.24	23.01	**9.77**	10.99	19.56	**8.57**	8.97	16.76	**7.79**	6.37	12.60	**6.23**	4.60	9.64	**5.04**
XS_RCH3_06	18.16	28.84	**10.68**	15.80	25.46	**9.66**	13.20	22.88	**9.68**	10.93	19.42	**8.49**	8.98	16.67	**7.69**	6.35	12.67	**6.32**	4.60	9.66	**5.06**

Pre-Development Case: EX01a
Post-Development Case: DE01a

SOBEK Cross-ID	Peak Water Velocities (m/s)																				
	100 Year ARI			50 Year ARI			20 Year ARI			10 Year ARI			5 Year ARI			2 Year ARI			1 Year ARI		
	Ex.	Dev.	Impact	Ex.	Dev.	Impact	Ex.	Dev.	Impact	Ex.	Dev.	Impact	Ex.	Dev.	Impact	Ex.	Dev.	Impact	Ex.	Dev.	Impact
	Tributary 1 of Bremer River																				
XS_RCH_1_1	1.20	1.20		1.15	1.15		1.10	1.10		1.05	1.05		0.99	0.99		0.91	0.91		0.84	0.84	
XS_RCH_1_2	1.47	1.47		1.42	1.42		1.38	1.38		1.32	1.32		1.27	1.27		1.20	1.20		1.14	1.14	
XS_RCH_1_3	1.24	1.24		1.21	1.21		1.19	1.19		1.16	1.16		1.13	1.13		1.09	1.09		1.04	1.04	
XS_RCH_1_4	1.43	1.43		1.37	1.37		1.31	1.31		1.25	1.25		1.18	1.18		1.07	1.07		0.97	0.97	
XS_RCH_1_5	1.59	1.59		1.54	1.54		1.48	1.48		1.41	1.41		1.35	1.35		1.24	1.24		1.14	1.14	
XS_RCH_1_6	1.77	1.77		1.70	1.70		1.63	1.63		1.55	1.55		1.47	1.47		1.34	1.34		1.22	1.22	
XS_RCH_1_7	1.90	1.90		1.84	1.84		1.79	1.79		1.71	1.71		1.63	1.63		1.51	1.51		1.39	1.39	
XS_RCH_1_8	1.40	1.40		1.32	1.32		1.25	1.25		1.16	1.16		1.07	1.07		0.93	0.93		0.81	0.81	
XS_RCH_1_9	0.99	0.99		0.92	0.92		0.85	0.85		0.78	0.78		0.71	0.71		0.59	0.59		0.50	0.50	
XS_RCH_1_10	1.38	1.38		1.32	1.32		1.25	1.25		1.18	1.18		1.10	1.10		0.98	0.98		0.88	0.88	
XS_RCH_1_11	1.18	1.18		1.14	1.14		1.11	1.11		1.07	1.07		1.03	1.03		0.95	0.95		0.89	0.89	
XS_RCH_1_12	1.30	1.30		1.22	1.22		1.14	1.14		1.05	1.05		0.97	0.97		0.89	0.89		0.81	0.81	
XS_RCH_1_13	2.58	2.58		2.53	2.53		2.50	2.50		2.50	2.50		2.47	2.47		2.22	2.22		1.99	1.99	
XS_RCH_1_14	2.23	2.23		2.13	2.13		2.02	2.02		1.90	1.90		1.79	1.79		1.57	1.57		1.39	1.39	
XS_RCH_1_15	2.16	2.16		2.09	2.09		1.99	1.99		1.89	1.89		1.79	1.79		1.63	1.63		1.49	1.49	
XS_RCH_1_16	2.03	2.03		1.98	1.98		1.91	1.91		1.84	1.84		1.76	1.76		1.64	1.64		1.50	1.50	
XS_RCH_1_17	1.81	1.81		1.74	1.74		1.66	1.66		1.57	1.57		1.48	1.48		1.35	1.35		1.22	1.22	
XS_RCH_1_18	1.92	1.92		1.86	1.86		1.79	1.79		1.72	1.72		1.64	1.64		1.49	1.49		1.36	1.36	
XS_RCH_1_19	1.71	1.71		1.63	1.63		1.54	1.54		1.44	1.44		1.35	1.35		1.21	1.21		1.08	1.08	
XS_RCH_1_20	2.00	2.00		1.92	1.92		1.82	1.82		1.73	1.73		1.64	1.64		1.49	1.49		1.36	1.36	
XS_RCH_1_21	2.40	2.40		2.29	2.29		2.16	2.16		2.03	2.03		1.90	1.90		1.69	1.69		1.52	1.52	
XS_RCH_1_22	2.47	2.47		2.37	2.37		2.26	2.26		2.14	2.14		2.04	2.04		1.87	1.87		1.72	1.72	
XS_RCH1_22b	2.80	2.81	0.01	2.70	2.70		2.57	2.57		2.45	2.45		2.32	2.32		2.10	2.10		1.91	1.91	
XS_RCH1_23	2.84	2.83	-0.01	2.70	2.70		2.51	2.51		2.34	2.34		2.17	2.16	-0.01	1.89	1.89		1.66	1.66	
XS_RCH1_24	2.05	2.02	-0.03	1.96	1.94	-0.02	1.85	1.84	-0.01	1.74	1.73	-0.01	1.63	1.62	-0.01	1.46	1.45	-0.01	1.31	1.30	-0.01
XS_RCH_1_25	1.88	1.89	0.01	1.82	1.84	**0.02**	1.75	1.77	**0.02**	1.68	1.70	**0.02**	1.60	1.63	**0.03**	1.48	1.50	**0.02**	1.37	1.39	**0.02**
XS_RCH1_25b	1.98	1.99	0.01	1.97	1.97		1.94	1.95	0.01	1.91	1.92	0.01	1.87	1.89	**0.02**	1.80	1.82	**0.02**	1.73	1.75	**0.02**
XS_RCH_1_26	2.91	2.93	**0.02**	2.85	2.88	**0.03**	2.76	2.79	**0.03**	2.67	2.71	**0.04**	2.57	2.61	**0.04**	2.38	2.43	**0.05**	2.18	2.24	**0.06**
XS_RCH1_26b	2.66	2.71	**0.05**	2.54	2.60	**0.06**	2.38	2.44	**0.06**	2.22	2.28	**0.06**	2.05	2.12	**0.07**	1.74	1.81	**0.07**	1.43	1.51	**0.08**
DS_Boundary	3.34	3.46	**0.12**	3.06	3.19	**0.13**	2.71	2.84	**0.13**	2.38	2.51	**0.13**	2.06	2.19	**0.13**	1.56	1.67	**0.11**	1.29	1.29	

Pre-Development Case: EX01a
Post-Development Case: DE01a

SOBEK Cross-	Peak Water Velocities (m/s)																				
Pre- ID	100 Year ARI			50 Year ARI			20 Year ARI			10 Year ARI			5 Year ARI			2 Year ARI			1 Year ARI		
	Ex.	Dev.	Impact	Ex.	Dev.	Impact	Ex.	Dev.	Impact	Ex.	Dev.	Impact	Ex.	Dev.	Impact	Ex.	Dev.	Impact	Ex.	Dev.	Impact
	Tributary 2 of Bremer River																				
XS_RCH_2_1	0.14	0.14		0.13	0.13		0.11	0.11		0.10	0.10		0.08	0.08		0.06	0.06		0.05	0.05	
XS_RCH_2_2	1.38	1.38		1.37	1.37		1.31	1.31		1.26	1.26		1.20	1.20		1.12	1.12		1.02	1.02	
XS_RCH_2_3	1.13	1.13		1.08	1.08		1.01	1.01		0.95	0.95		0.89	0.89		0.79	0.79		0.71	0.71	
XS_RCH_2_4	1.07	1.07		1.03	1.03		0.97	0.97		0.92	0.92		0.88	0.88		0.80	0.80		0.72	0.72	
XS_RCH_2_5	1.31	1.31		1.26	1.26		1.19	1.19		1.12	1.12		1.05	1.05		0.94	0.94		0.84	0.84	
XS_RCH_2_6	1.11	1.11		1.06	1.06		1.00	1.00		0.94	0.94		0.88	0.88		0.78	0.78		0.72	0.72	
XS_RCH_2_7	1.53	1.53		1.48	1.48		1.41	1.41		1.35	1.35		1.28	1.28		1.17	1.17		1.07	1.07	
XS_RCH_2_8	1.42	1.42		1.37	1.37		1.31	1.31		1.24	1.24		1.17	1.17		1.06	1.06		0.96	0.96	
XS_RCH_2_9	2.26	2.26		2.18	2.18		2.08	2.08		1.98	1.98		1.88	1.88		1.71	1.71		1.56	1.56	
XS_RCH_2_10	2.73	2.73		2.59	2.59		2.41	2.41		2.25	2.25		2.08	2.08		1.82	1.82		1.59	1.59	
XS_RCH_2_11	1.61	1.61		1.58	1.58		1.54	1.54		1.51	1.51		1.44	1.44		1.33	1.33		1.23	1.23	
	Tributary 3 of Bremer River																				
XS_RCH_3_1	1.21	1.21		1.20	1.21	0.01	1.20	1.21	0.01	1.18	1.21	**0.03**	1.15	1.21	**0.06**	1.10	1.20	**0.10**	1.04	1.18	**0.14**
XS_RCH_3_2	1.28	1.44	**0.16**	1.25	1.41	**0.16**	1.22	1.38	**0.16**	1.17	1.33	**0.16**	1.12	1.30	**0.18**	1.03	1.24	**0.21**	0.95	1.17	**0.22**
XS_RCH3_16	1.53	1.72	**0.19**	1.48	1.68	**0.20**	1.42	1.65	**0.23**	1.35	1.60	**0.25**	1.28	1.56	**0.28**	1.18	1.46	**0.28**	1.09	1.36	**0.27**
XS_RCH3_15	1.35	1.72	**0.37**	1.27	1.64	**0.37**	1.19	1.58	**0.39**	1.10	1.49	**0.39**	1.01	1.41	**0.40**	0.87	1.26	**0.39**	0.74	1.12	**0.38**
XS_RCH3_14	0.70	1.04	**0.34**	0.63	0.97	**0.34**	0.57	0.91	**0.34**	0.50	0.82	**0.32**	0.43	0.75	**0.32**	0.33	0.62	**0.29**	0.26	0.51	**0.25**
XS_RCH3_13	0.45	0.69	**0.24**	0.41	0.64	**0.23**	0.36	0.60	**0.24**	0.32	0.54	**0.22**	0.27	0.49	**0.22**	0.21	0.40	**0.19**	0.16	0.33	**0.17**
XS_RCH3_12	1.62	1.84	**0.22**	1.56	1.78	**0.22**	1.49	1.73	**0.24**	1.42	1.65	**0.23**	1.35	1.58	**0.23**	1.27	1.47	**0.20**	1.18	1.38	**0.20**
XS_RCH3_11	1.91	2.18	**0.27**	1.84	2.11	**0.27**	1.74	2.05	**0.31**	1.64	1.95	**0.31**	1.55	1.87	**0.32**	1.39	1.71	**0.32**	1.26	1.58	**0.32**
XS_RCH3_10	2.14	2.44	**0.30**	2.05	2.35	**0.30**	1.95	2.28	**0.33**	1.84	2.18	**0.34**	1.73	2.09	**0.36**	1.56	1.93	**0.37**	1.41	1.78	**0.37**
XS_RCH3_09	2.11	2.42	**0.31**	2.03	2.33	**0.30**	1.93	2.26	**0.33**	1.83	2.15	**0.32**	1.73	2.07	**0.34**	1.56	1.91	**0.35**	1.41	1.76	**0.35**
XS_RCH3_08	2.30	2.61	**0.31**	2.22	2.53	**0.31**	2.11	2.46	**0.35**	2.00	2.36	**0.36**	1.89	2.26	**0.37**	1.70	2.09	**0.39**	1.53	1.92	**0.39**
XS_RCH3_07	2.17	2.49	**0.32**	2.08	2.40	**0.32**	1.97	2.33	**0.36**	1.87	2.22	**0.35**	1.75	2.13	**0.38**	1.57	1.95	**0.38**	1.40	1.79	**0.39**
XS_RCH3_06	2.50	2.86	**0.36**	2.41	2.77	**0.36**	2.32	2.69	**0.37**	2.20	2.58	**0.38**	2.08	2.48	**0.40**	1.89	2.30	**0.41**	1.72	2.14	**0.42**

OVERALL BULKWORKS SCHEMATIC PLAN, PRELIMINARY MASTER PLAN AND STAGING PLAN

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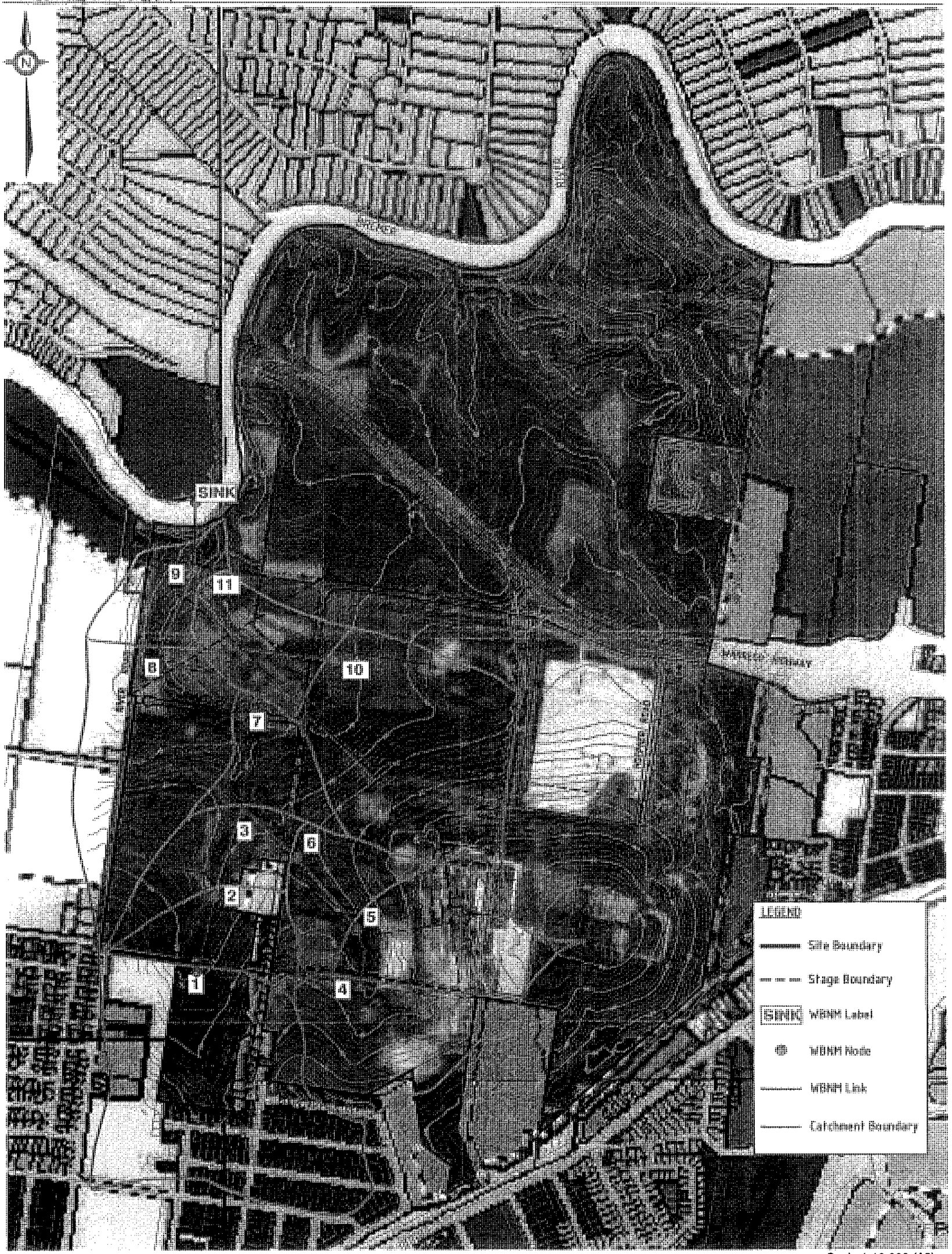

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Scale 1:10,000 (A3)

FIGURE 4

STAGE 1 PRE DEVELOPED CASE WBNM CATCHMENT LAYOUT

Rev: Orig. Date: July 2007

Project No.: J8714

WALKER CORPORATION PTY LTD

CAD FILE: O:\Work\AT\J8714\Figures\R5\Figure 4_5.dwg
XREF's: XR-3632-02BASE

PRINT DATE: 02 August, 2007 - 4:52pm

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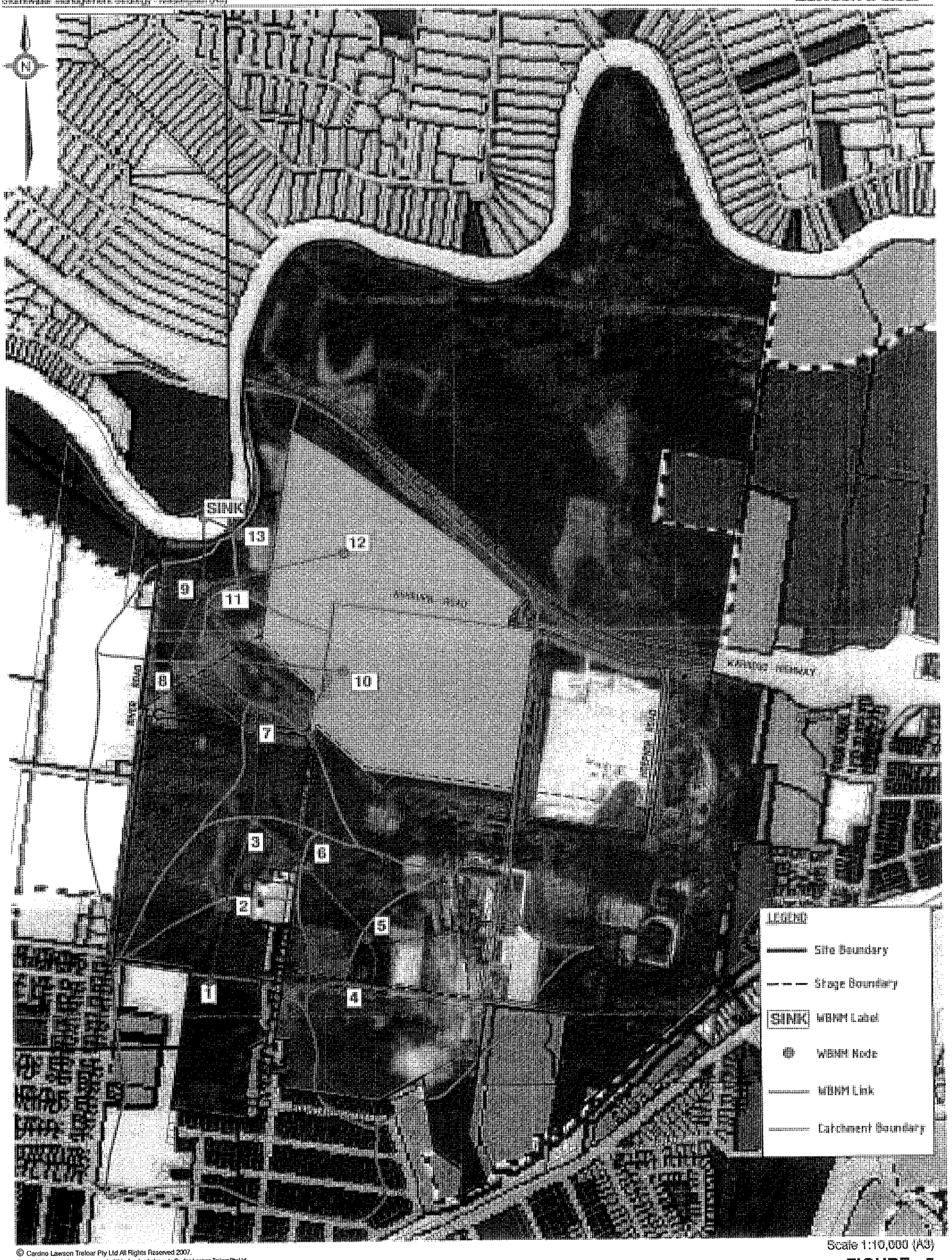

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FIGURE 5

STAGE 1 POST DEVELOPED CASE WBNM CATCHMENT LAYOUT

Project No.: J8714

Rev: Orig. Date: July 2007

PRINT DATE: 02 August, 2007 - 4:52pm

WALKER CORPORATION PTY LTD

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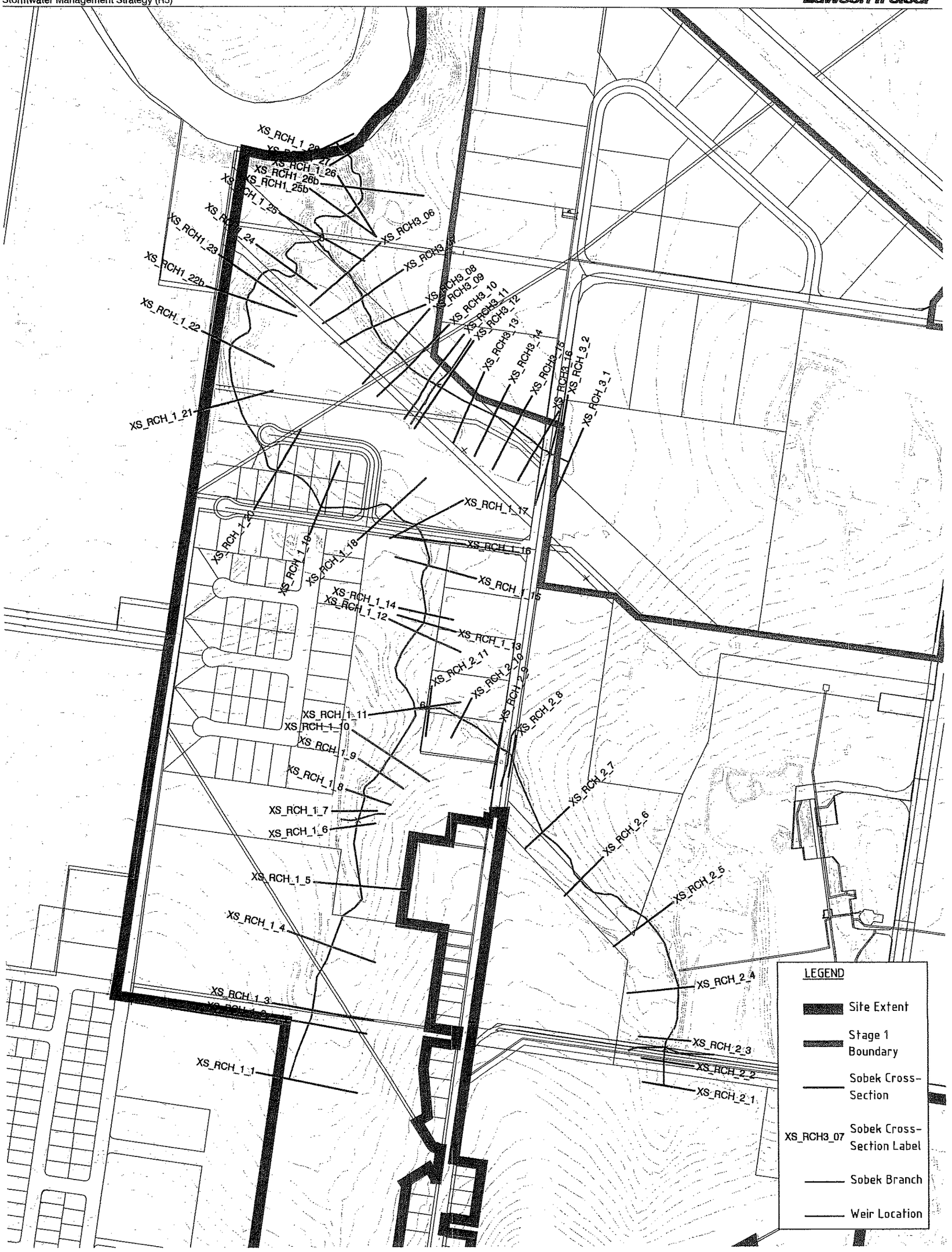

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50 0 50 100 150 200 250m
1:5000

Scale 1:5000 (A3)

FIGURE 6
SOBEK MODEL LAYOUT

Project No.: LJ8714

Rev: Orig. Date: July 2007

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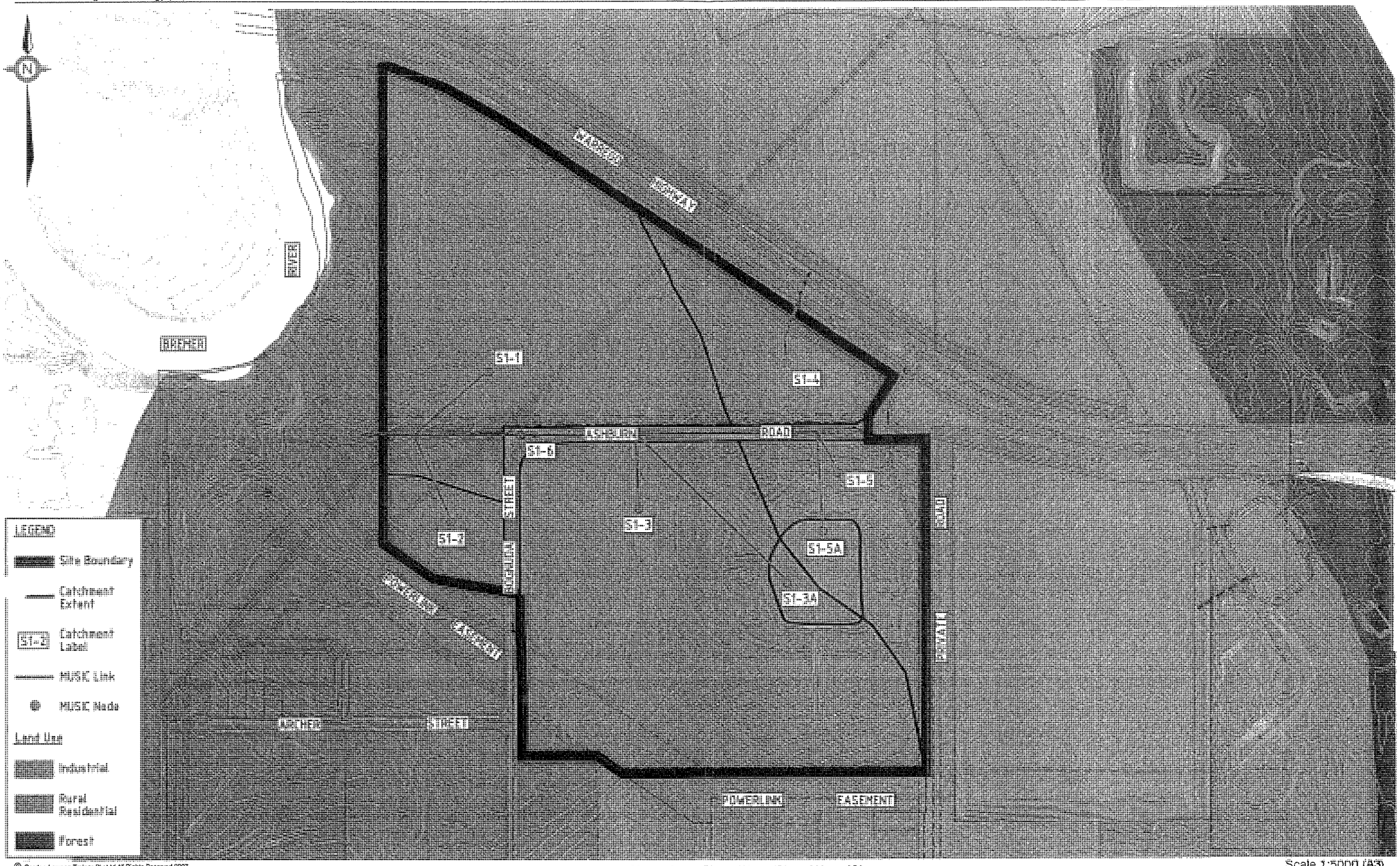

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50 0 50 100 150 200 250m
1:5000

Scale 1:5000 (A3)

FIGURE 7

STAGE 1 PRE-DEVELOPED MUSIC MODEL CATCHMENT LAYOUT

Rev: Orig. Date: July 2007

Project No.: LJ8714

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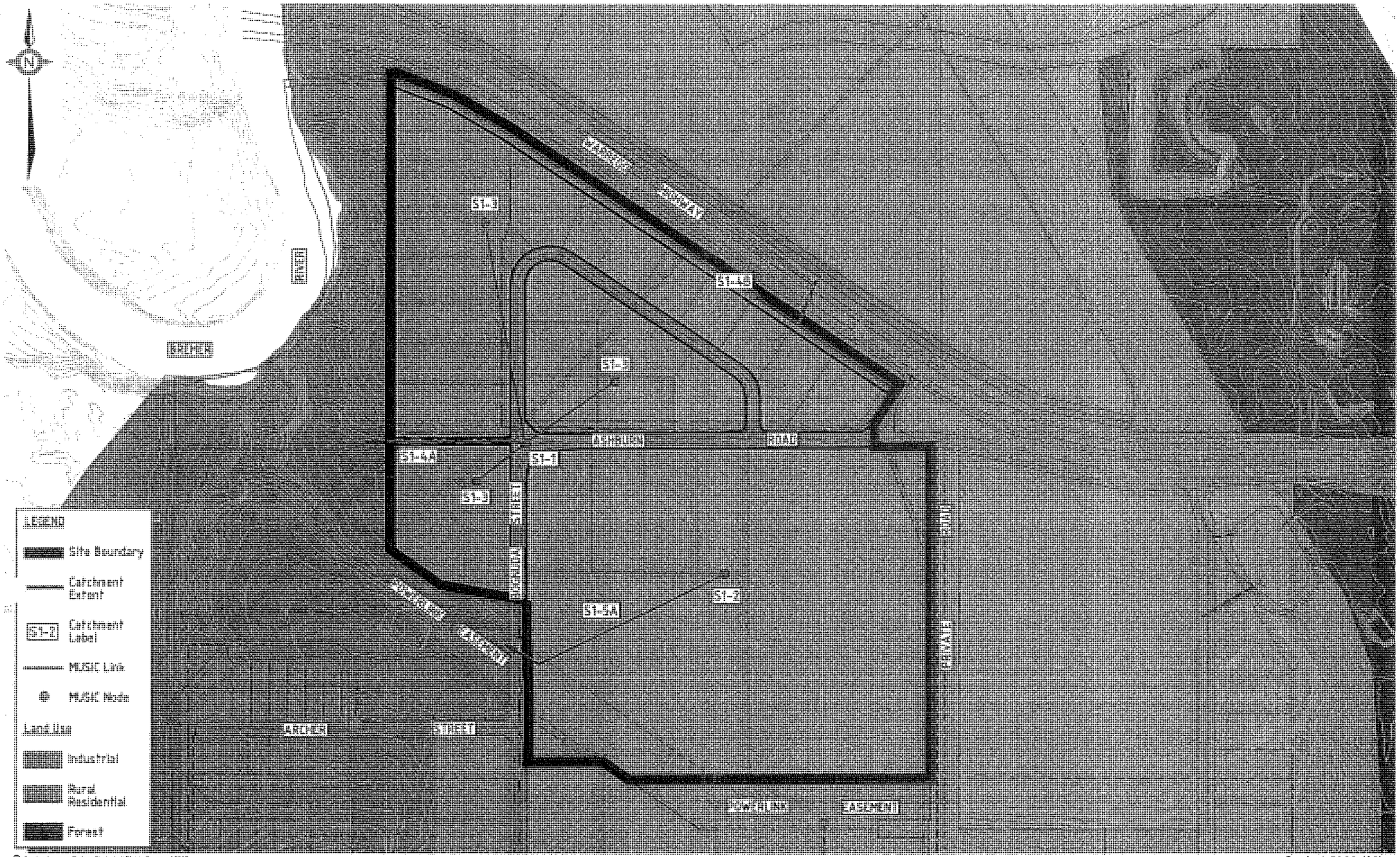

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50 0 50 100 150 200 250m
1:5000

Scale 1:5000 (A3)

FIGURE 8

STAGE 1 POST-DEVELOPED MUSIC MODEL CATCHMENT LAYOUT

Rev: Orig. Date: July 2007

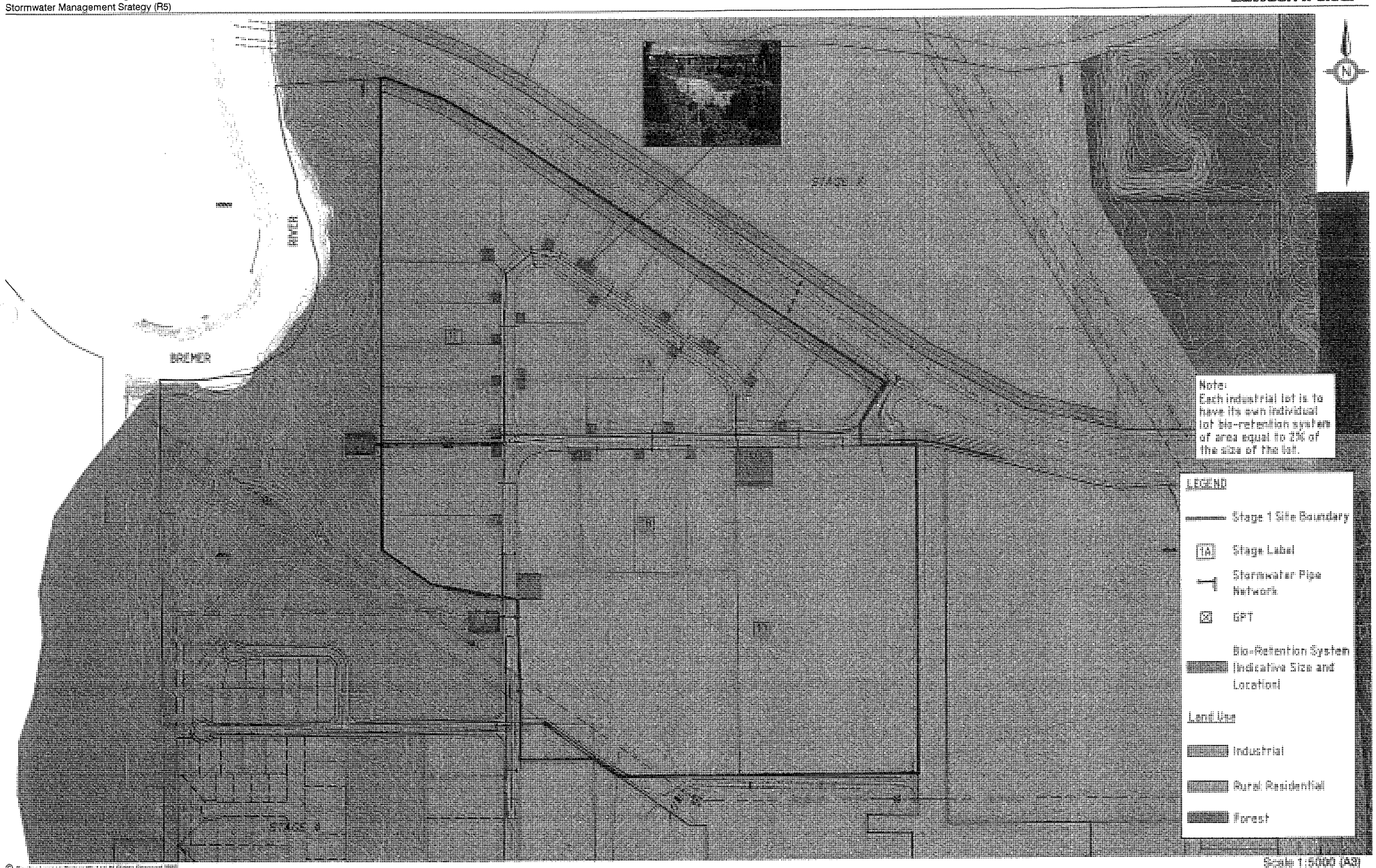
Project No.: LJ8714

WALKER CORPORATION PTY LTD

CAD FILE: O:\WorkLAT\LJ8714\Figures\R5\Figure_7_8.dwg
XREF's: xr-Cont-1m; XR-3632-01;CONT2500

PRINT DATE: 02 August, 2007 - 4:53pm

Cardno Lawson Treloar



Scale 1:5000 (A3)

50 0 50 100 150 200 250m 1:5000

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FIGURE 9

STAGE 1 CONCEPTUAL OPERATIONAL STORMWATER MANAGEMENT STRATEGY

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Project No.: LJ8714

WALKER CORPORATION PTY LTD

CAD FILE: O:\WorkLAT\LJ8714\Figures\R5\Figure_9.dwg

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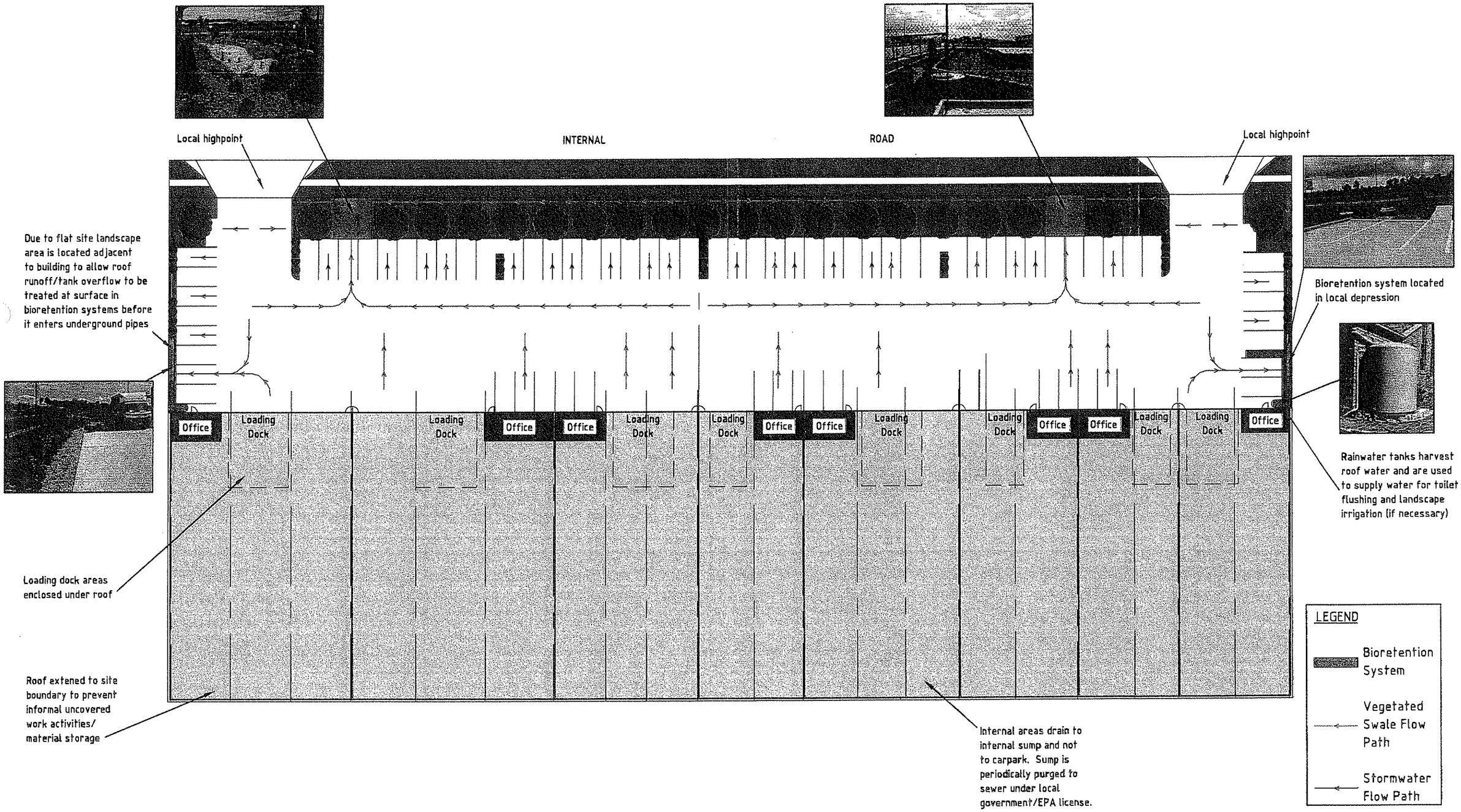

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5 0 5 10 15 20 25m 1:500

Scale 1:500(A3)

FIGURE 10

TYPE A INDUSTRIAL AT SOURCE STORMWATER MANAGEMENT STRATEGY FOR A TYPICAL 1 ha LOT

Rev: Orig. Date: July 2007

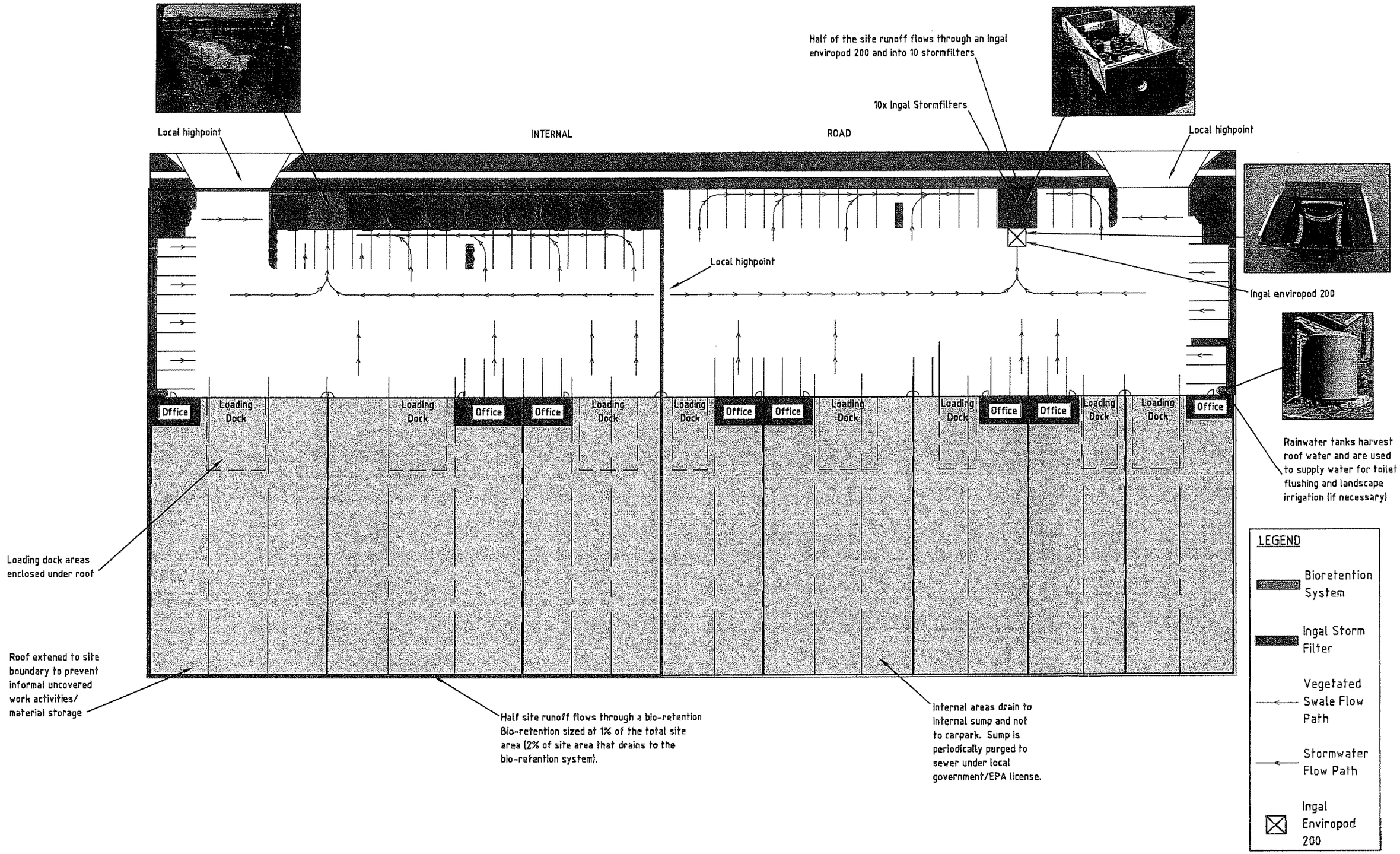
Project No.: LJ8714

WALKER CORPORATION PTY LTD

CAD FILE: O:\WorkLAT\J8714\Figures\R5\Figure_10-12.dwg
XREF's:

PRINT DATE: 02 August, 2007 - 4:55pm

Cardno Lawson Treloar



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5 0 5 10 15 20 25m 1:500

Scale 1:500(A3)

FIGURE 11

TYPE B INDUSTRIAL AT SOURCE STORMWATER MANAGEMENT STRATEGY FOR A TYPICAL 1 ha LOT

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Project No.: LJ8714

WALKER CORPORATION PTY LTD

CAD FILE: O:\Work\LAT\J8714\Figures\R5\Figure_10-12.dwg
XREF's:

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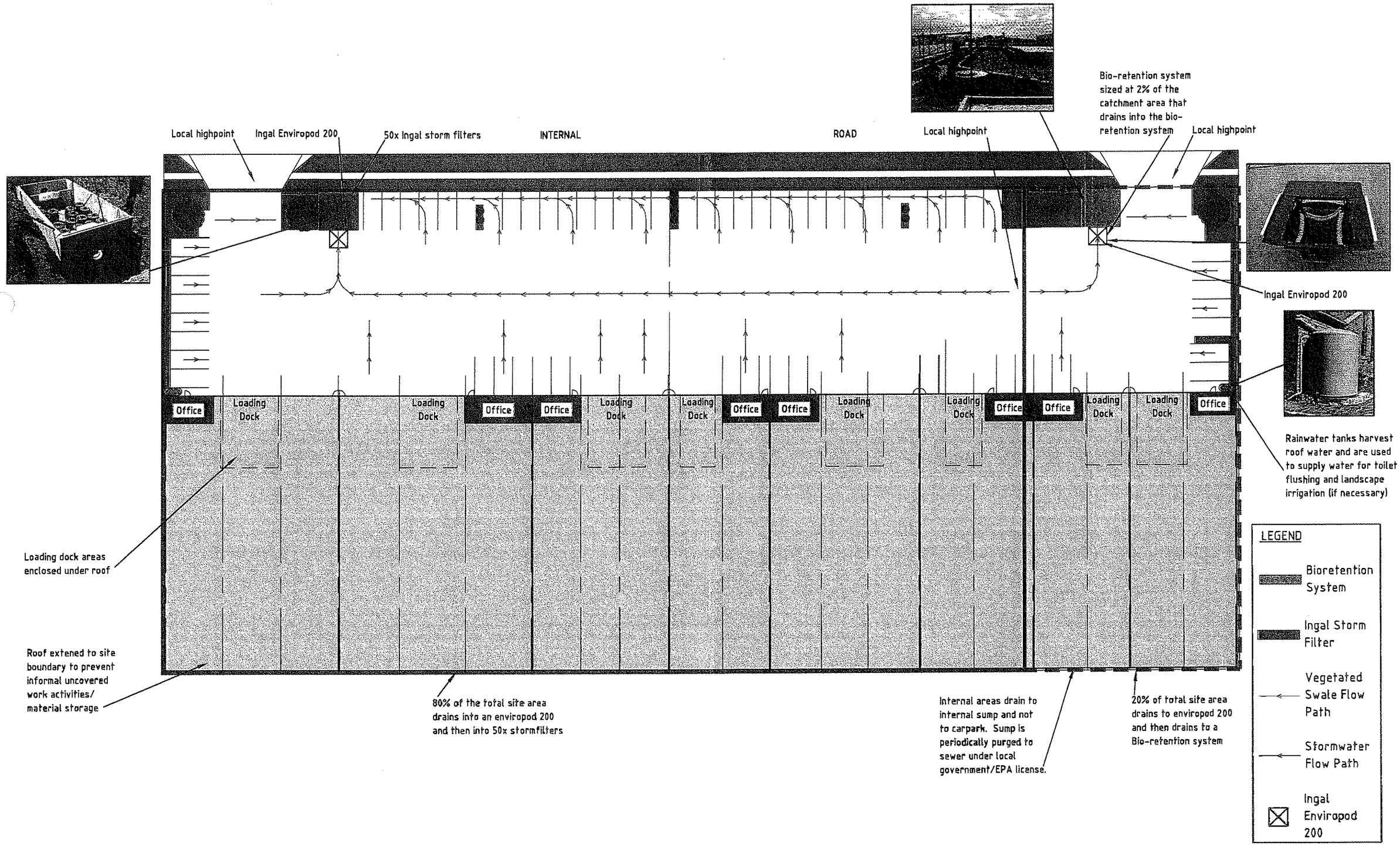

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4 0 4 8 12 16 20m 1:400

Scale 1:400(A3)

FIGURE 12

TYPE C INDUSTRIAL AT SOURCE STORMWATER MANAGEMENT STRATEGY FOR A TYPICAL 1 ha LOT

Rev: Orig. Date: July 2007

Project No.: LJ8714

WALKER CORPORATION PTY LTD

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XREF's:

PRINT DATE: 02 August, 2007 - 4:57pm

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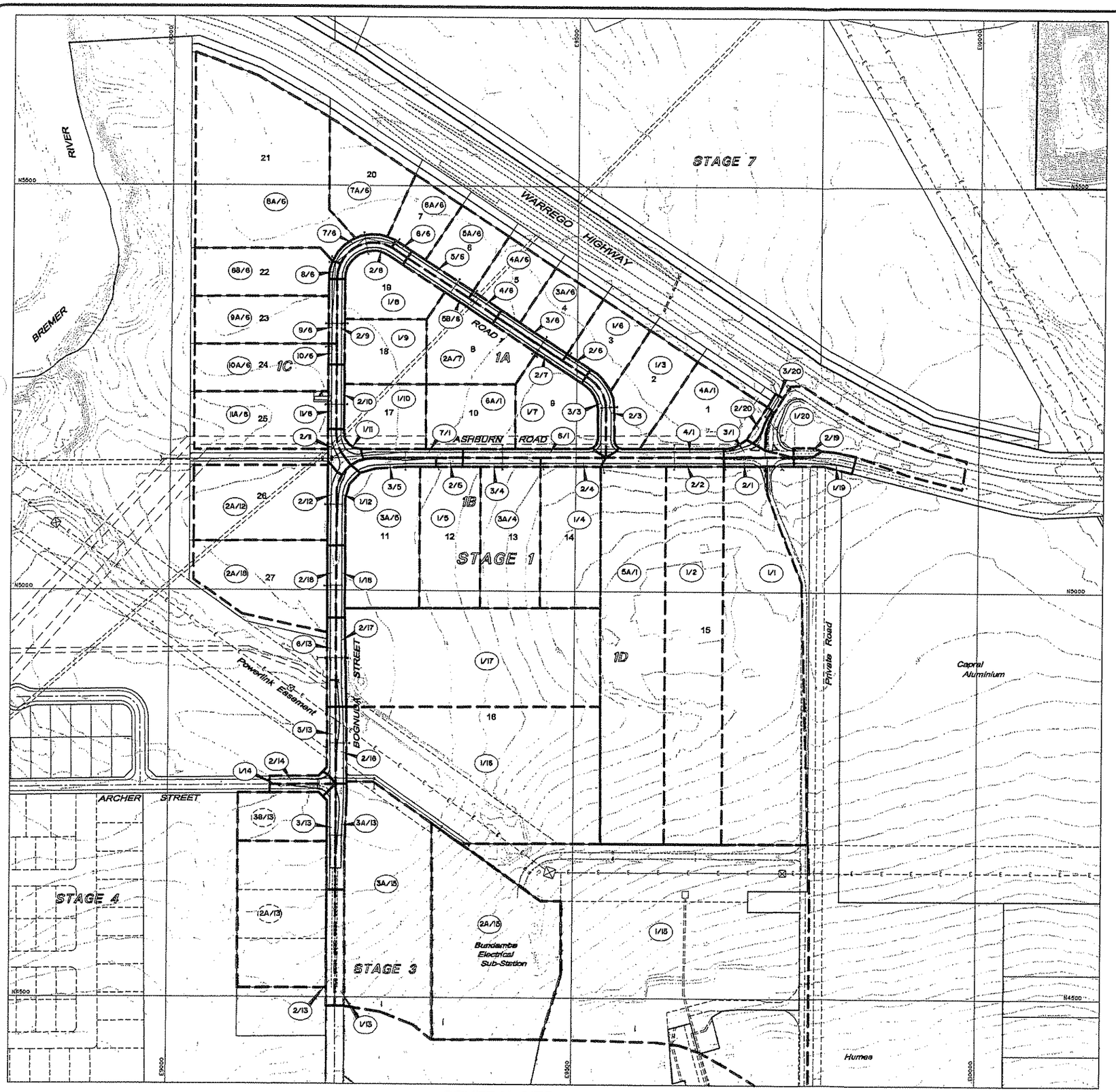

N

GENERAL SITE LAYOUT PLAN

SCALE 50 0 50 100 (metres)
1 : 2500 [FULL SIZE]

SCHEDULE OF CATCHMENTS			
CATCHMENT No.	AREA	CATCHMENT No.	AREA
1/1	4.966 Ha.	1/8	0.778 Ha.
2/1	0.129 Ha.	2/8	0.108 Ha.
3/1	0.086 Ha.		
4/1	0.152 Ha.	1/9	0.806 Ha.
4A/1	0.979 Ha.	2/9	0.106 Ha.
5A/1	3.699 Ha.		
6/1	0.185 Ha.	1/10	0.797 Ha.
6A/1	0.880 Ha.	2/10	0.079 Ha.
7/1	0.137 Ha.		
		1/11	0.069 Ha.
1/2	3.316 Ha.	2/11	0.084 Ha.
2/2	0.164 Ha.		
		1/12	0.122 Ha.
1/3	0.862 Ha.	2/12	0.115 Ha.
2/3	0.115 Ha.	2A/12	1.536 Ha.
3/3	0.106 Ha.		
		1/13	0.155 Ha.
1/4	1.300 Ha.	2/13	0.157 Ha.
2/4	0.085 Ha.	2A/13	1.971 Ha.
3/4	0.106 Ha.	3/13	0.139 Ha.
3A/4	1.301 Ha.	3A/13	0.155 Ha.
		3B/13	0.625 Ha.
1/5	1.300 Ha.	5/13	0.099 Ha.
2/5	0.036 Ha.	6/13	0.121 Ha.
3/5	0.124 Ha.		
3A/5	1.559 Ha.	1/14	0.078 Ha.
		2/14	0.080 Ha.
1/6	0.575 Ha.		
2/6	0.035 Ha.	1/15	8.881 Ha.
3/6	0.098 Ha.	2A/15	3.278 Ha.
3A/6	0.566 Ha.	3A/15	2.906 Ha.
4/6	0.042 Ha.		
4A/6	0.566 Ha.	1/16	4.413 Ha.
5/6	0.090 Ha.	2/16	0.125 Ha.
5A/6	0.566 Ha.		
5B/6	0.132 Ha.	1/17	3.812 Ha.
6/6	0.024 Ha.	2/17	0.132 Ha.
6A/6	0.502 Ha.		
7/6	0.083 Ha.	1/18	0.098 Ha.
7A/6	1.003 Ha.	2/18	0.098 Ha.
8/6	0.021 Ha.	2A/18	1.484 Ha.
8A/6	3.497 Ha.		
8B/6	0.972 Ha.	1/19	0.133 Ha.
9/6	0.080 Ha.	2/19	0.035 Ha.
9A/6	0.974 Ha.		
10/6	0.026 Ha.	1/20	1.249 Ha.
10A/6	0.974 Ha.	2/20	0.043 Ha.
11/6	0.079 Ha.	3/20	0.052 Ha.
11A/6	1.170 Ha.		
1/7	0.958 Ha.		
2/7	0.133 Ha.		
2A/7	1.029 Ha.		

NOTE : CATCHMENT NUMBERS SHOWN CORRESPOND WITH INLET STRUCTURE NOS AS SHOWN ON SERVICES LAYOUT PLANS.

BREMER BUSINESS PARK IPSWICH

prepared for

Walker

Walker Corporation Pty Limited

AREA/STAGE: STAGE 1
ROADWORKS & SERVICES

ASSOCIATED CONSULTANTS:

SURVEYORS : B & P SURVEYS
GEOTECHNICAL : SOIL SURVEYS ENGINEERING PTY LIMITED
HYDRAULIC CONSULTANTS : CARDNO LAWSON TRELOAR
LANDSCAPE ARCHITECTS : ANEMBO CONSULTANTS

AMEND	DATE	DESCRIPTION	APPR.

AMENDMENTS

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VERIFY DIMENSIONS PRIOR TO COMMENCING ANY WORKS.

FULL SIZE : A1

DRAWING TITLE :

GENERAL SITE LAYOUT AND CATCHMENT PLAN

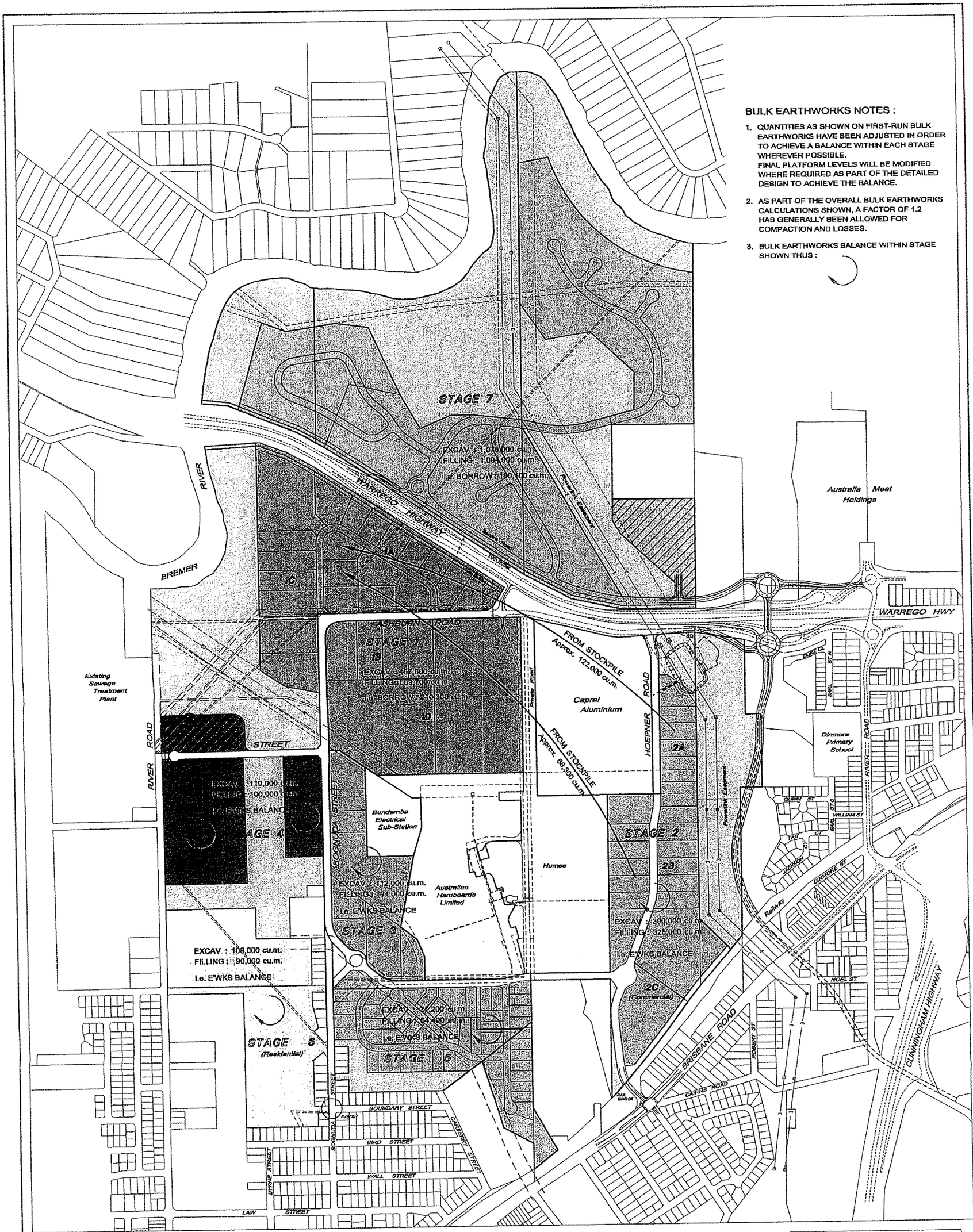
BURCHILL VDM
ACN 010 140 495 PTY LIMITED
CIVIL & STRUCTURAL CONSULTING ENGINEERS & PLANNERS
142 Bundall Road, Surfers Paradise, Qld. 4217
Phone [redacted]
Fax Civil
Fax Structural [redacted]
Email
Member of the VDM GROUP

DESIGNED : P.S.K. DRAWN : A.B.C.
CHECKED : DATE : 19.04.2007
FILENAME : 363202202.DWG

APPROVED FOR AND ON BEHALF OF BURCHILL VDM PTY LIMITED :

R.P.E.Q. No. :

DRAWING No. : C3632:02:02
AMENDMENT :



BULK EARTHWORKS NOTES :

1. QUANTITIES AS SHOWN ON FIRST-RUN BULK EARTHWORKS HAVE BEEN ADJUSTED IN ORDER TO ACHIEVE A BALANCE WITHIN EACH STAGE WHEREVER POSSIBLE.
   FINAL PLATFORM LEVELS WILL BE MODIFIED WHERE REQUIRED AS PART OF THE DETAILED DESIGN TO ACHIEVE THE BALANCE.
2. AS PART OF THE OVERALL BULK EARTHWORKS CALCULATIONS SHOWN, A FACTOR OF 1.2 HAS GENERALLY BEEN ALLOWED FOR COMPACTION AND LOSSES.
3. BULK EARTHWORKS BALANCE WITHIN STAGE SHOWN THUS :

DIGITAL INFORMATION SHOWN ON THIS DRAWING HAS BEEN COMPILED FROM VARIOUS SOURCES AND IS NOT INTENDED TO BE USED FOR ANY PURPOSES OTHER THAN INITIAL SKETCHES AND PRELIMINARY PLANNING.

OVERALL DEVELOPMENT BULK EARTHWORKS SCHEMATIC

SCALE 50 0 50 100 150 200 250 (metres)
1 : 5000 (FULL SIZE)

THIS DRAWING HAS BEEN PREPARED FOR PRELIMINARY PLANNING AND DISCUSSION PURPOSES ONLY, AND IS SUBJECT TO SURVEY, GEOTECHNICAL INVESTIGATION, AUTHORITY APPROVALS AND DETAILED DESIGN.

Prepared for

Walker

Walker Corporation Pty Limited

PROPOSED SUBDIVISION AT BREMER BUSINESS PARK - IPSWICH

June 2007

DWG No. C3632:00:Sk.68

BURCHILL VDM PTY LIMITED
ACN 010 140 495
CIVIL & STRUCTURAL CONSULTING ENGINEERS & PLANNERS
Evandale Place, 142 Bundall Road
Surfers Paradise, Qld. 4217
Phone [redacted]
Fax
Email [redacted]
Member of the VDM GROUP

BREMER BUSINESS PARK

Buffer for maintenance and emergency vehicle access.

Proposed Boat Ramp and Canoe Access.

Buffer for maintenance and emergency vehicle access.

Proposed Pedestrian/Cycle Link on road to connect with Stage 7 road network.

Emergency Vehicle access.

Proposed Road to Bremer River Boat Ramp and Canoe Access

Potential Pedestrian and cycle link on road through to Bremer River Park and Bremer Meadows Park to the north.

Proposed Water Quality Monitoring Locations

ARCHER STREET ACTIVE RECREATION PARK
- Level 3 **PLAY & PICNIC PARK** with space to upgrade to Level 2 or Sports Facility

Buffer for maintenance and emergency vehicle access.

BOUNDARY STREET PARK
Transparent boundary fence to allow for passive surveillance of openspace. Limited shrub planting to allow for visual permeability of vegetation. Absence of facilities to discourage illegitimate use of the space.

Maintenance Access Network In Boundary Street Park.

Proposed Access Easement to eastern end of Boundary Street Park.

Direct road access to Lot 2 RP86838.

Emergency Vehicle access.

Proposed storm water detention area fits with forest rehabilitation planning requirements.

Pedestrian and cycle links on road.

BREMER RIVER
WARREGO HIGHWAY
ASHBURN ROAD
ARCHER STREET
RIVER RD
BOGNUDA STREET
HOEPNER ROAD
BOUNDARY STREET
BIRD STREET
CAREERY STREET
DIXMORE ST
BRISBANE ROAD
IPSWICH RAILWAY
Dinmore Train Station
Ebbw Vale Train Station
TIVOLLI ALL SPORTS
SEWAGE TREATMENT PLANT
PROPOSED BIO-RETENTION BASIN
STAGE 1
STAGE 2
STAGE 3
STAGE 4
STAGE 5
STAGE 6
STAGE 7
1A
1B
1C
1D
2A
2B
2C
3A
3B
4A
4B
4C
5A
5B
5C
CAPRAL ALUMINIUM
AUSTRALIAN HARDBOARDS
BUNDAMBA SUB-STATION
Future Residential
1 RP 121057
1 RP 104683
1 RP 103506
2 RP 122265
1 RP 129764
22 SP 163216
15 RP905898
14 RP905858
7 SP167997
5 SP 140694
900 RP836232
503 CP910076
2 RP160804
2 RP86838

LEGEND

- Proposed Bus Route
- Proposed Bus Stop
- Proposed Water Quality Monitoring Locations
- Proposed Stormwater Detention
- Natural Flow Paths
- Major Culvert
- Boat Ramp and Canoe Access
- Boundary Street Park Maintenance Access
- Pedestrian/Cycle Link - on Road
- Stage Boundaries

NORTH

Client
WALKER CORPORATION Pty Ltd

Walker

BREMER BUSINESS PARK - IPSWICH
RFI Response - Preliminary Master Plan

anembo consultants

MASTER STAGING PLAN - BREMER BUSINESS PARK

PROPERTY DESCRIPTION ; LOT 13 SL2982, LOT 34 SL3911, LOT 2 RP104683, LOT 1 & 2 SP179307, LOT 1 SP163216, LOT 2 RP854997, LOT 1 RP125443, LOT 1 RP22385, LOT 1 RP22378, LOT 3 RP132087, LOTS 4,5 & 6 RP92591, LOT 142 RP846150, LOT 1 RP84779. TOTAL SITE AREA BY TITLE ..... 314.5789 ha

STAGE 1–TOTAL AREA 72.73 ha (Incl park)

STAGE	1A	1B	1C	1D
NUMBER OF LOTS	10	4	11	2
STAGE AREA	9.32 ha	5.6 ha	37.29 ha	20.52 ha
DEVELOPABLE AREA	9.32 ha	5.6 ha	15.84 ha	20.38 ha
LENGTH OF NEW ROAD	397m	0	294 m	0
AREA NEW ROAD	0.81 ha	0.14 ha	0.60 ha	0.13 ha
AREA PARK	0	0	21.45 ha	0.14 ha

STAGE 2–TOTAL AREA 38.74 ha (Incl park)

STAGE	2A	2B	2C
NUMBER OF LOTS	6	12	4
STAGE AREA	13.561ha	8.59 ha	16.54 ha
DEVELOPABLE AREA	4.04 ha	8.59 ha	10.71 ha
LENGTH OF NEW ROAD	0	330 m	535 m
AREA NEW ROAD	0	0.77 ha	1.47 ha
AREA PARK	9.57 ha	0	5.83 ha
LINK ROAD	0.47 ha		

STAGE 3–TOTAL AREA 10.05 ha (Incl park)

STAGE	3A	3B	
NUMBER OF LOTS	6	3	
STAGE AREA	6.24 ha	3.82 ha	
DEVELOPABLE AREA	6.24 ha	3.55 ha	
LENGTH OF NEW ROAD	0	243m	
AREA NEW ROAD	0.08 ha	0.65 ha	
AREA PARK	0	0.27 ha	

STAGE 4–TOTAL AREA 23.84 ha (Incl park)

STAGE	4A	4B	4C
NUMBER OF LOTS	5	52	15
STAGE AREA	3.28 ha	18.00 ha	2.55 ha
DEVELOPABLE AREA	3.28 ha	8.96 ha	2.55 ha
LENGTH OF NEW ROAD	0	635 m	240 m
AREA NEW ROAD	0	1.55 ha	0.54 ha
AREA PARK	0	9.04 ha	0

STAGE 5–TOTAL AREA 17.61 ha (Incl park)

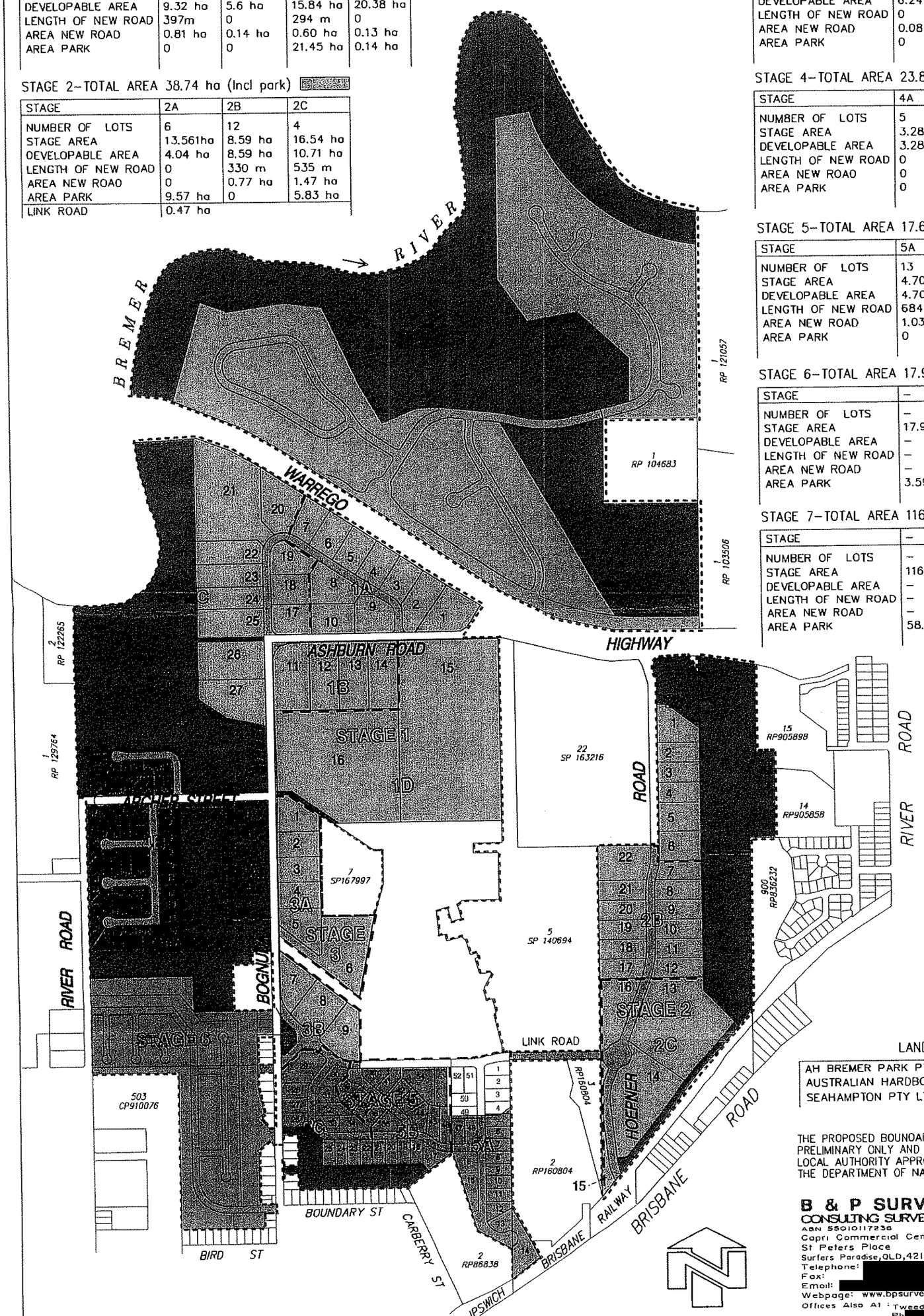
STAGE	5A	5B	5C
NUMBER OF LOTS	13	17	13
STAGE AREA	4.70 ha	5.89 ha	7.02 ha
DEVELOPABLE AREA	4.70 ha	5.89 ha	4.46 ha
LENGTH OF NEW ROAD	684 m	451 m	433 m
AREA NEW ROAD	1.03 ha	1.05 ha	0.87 ha
AREA PARK	0	0	2.56 ha

STAGE 6–TOTAL AREA 17.93 ha (Incl park)

STAGE	–	–	–
NUMBER OF LOTS	–	–	–
STAGE AREA	17.93 ha	–	–
DEVELOPABLE AREA	–	–	–
LENGTH OF NEW ROAD	–	UNDER REVIEW	
AREA NEW ROAD	–	–	–
AREA PARK	3.59 ha	–	–

STAGE 7–TOTAL AREA 116.05 ha (Incl park)

STAGE	–	–	–
NUMBER OF LOTS	–	–	–
STAGE AREA	116.05ha	–	–
DEVELOPABLE AREA	–	–	–
LENGTH OF NEW ROAD	–	UNDER REVIEW	
AREA NEW ROAD	–	–	–
AREA PARK	58.05 ha	–	–



LAND OWNERS

AH BREMER PARK PTY LTD	239.59 ha
AUSTRALIAN HARDBOARDS LIMITED	21.84 ha
SEAHAMPTON PTY LTD	53.15 ha

THE PROPOSED BOUNDARIES AS SHOWN HEREON ARE PRELIMINARY ONLY AND ARE SUBJECT TO FINAL DESIGN, LOCAL AUTHORITY APPROVAL AND REGISTRATION IN THE DEPARTMENT OF NATURAL RESOURCES & WATER

B & P SURVEYS
CONSULTING SURVEYORS
ABN 55010117236
Capri Commercial Centre
St Peters Place
Surfers Paradise,QLD,4217,Australia
Telephone: [redacted]
Fax:
Email: [redacted]
Webpage: www.bpsurveys.com.au
Offices Also At : Tweed Heads Ph [redacted] Murwillumbah Ph. [redacted]
A QUALITY ASSURED COMPANY

J:\41891\dwgs\15784DrevE.pro 26/07/2007

Associate Consultants
BURCHILL VDM Pty Limited
PLANNING INITIATIVES

WALKER CORPORATION PTY LTD

SCALE 1:10000

0 500 m 50|mm 1000 m 100|mm 1500 m 150|mm

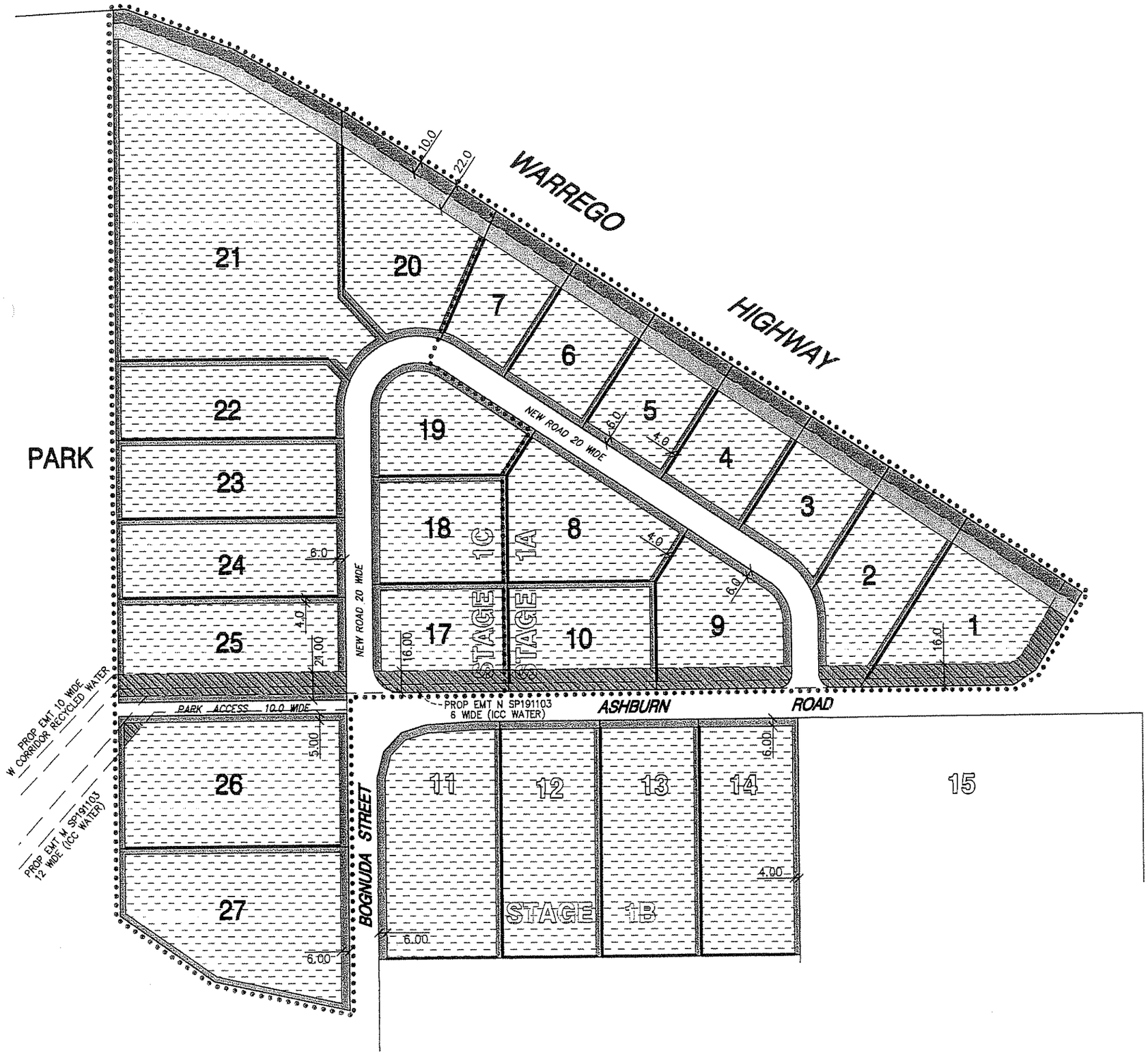
BUILDING ENVELOPE, WARREGO HIGHWAY FRONTAGE AND BUFFER AND ROADWORKS AND SERVICES PLANS

BREMER BUSINESS PARK

LEGEND

- STAGE BOUNDARY
- POSSIBLE FUTURE DMR ROAD WIDENING
- LANDSCAPED FRONTAGE
- BUILDING SETBACKS
- GENERAL BUILDING AREA & ZERO SETBACK BOUNDARY
- HARD STAND ZONE

ALTERATION TO THE ZERO SETBACK BOUNDARIES ARE SUBJECT TO APPROVAL BY IPSWICH CITY COUNCIL.



BREMER BUSINESS PARK

STAGE 1A & 1C

BUILDING ENVELOPE PLAN

0 25 50 75 100 125 metres

N

Scale 1:3000 – AT A3
Date: 27-07-07

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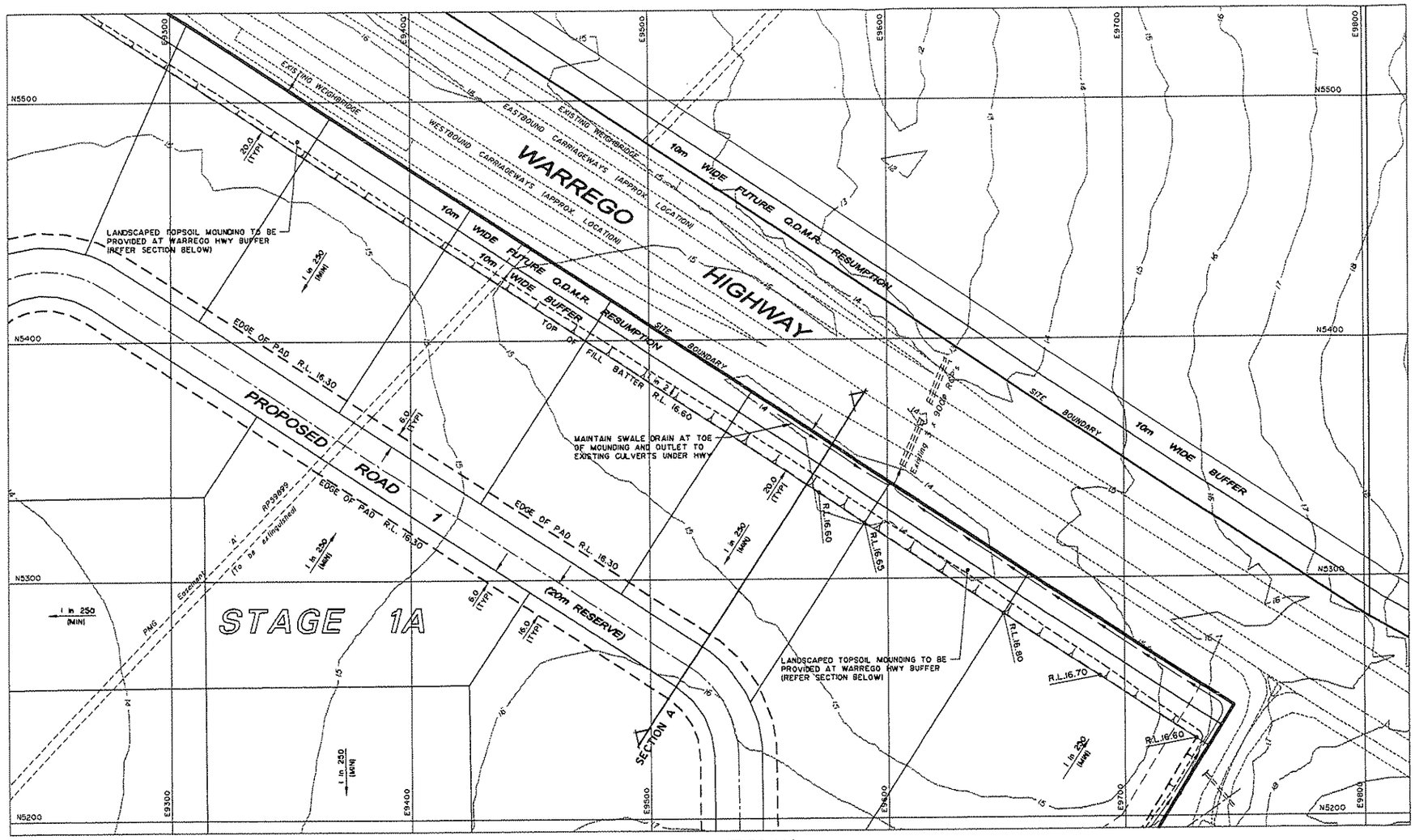
Walker



LAYOUT PLAN

SCALE 10 0 10 20 30 40 50 (metres)
1 : 1000 (FULL SIZE)

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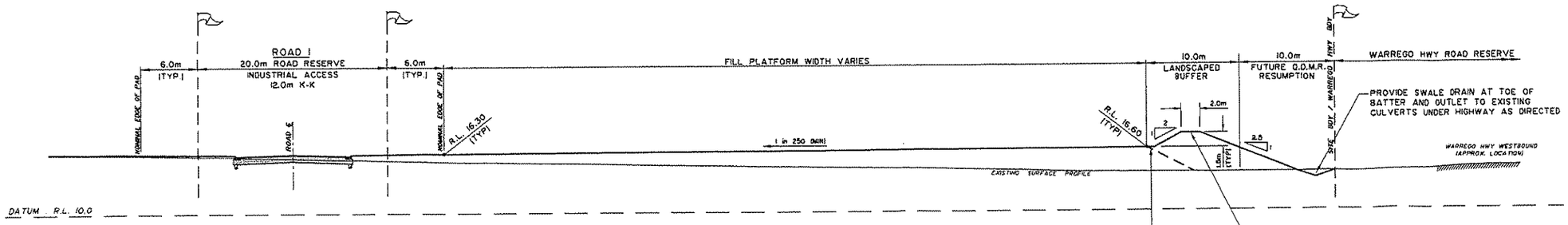

WARREGO HIGHWAY FRONTAGE AND BUFFER

TYPICAL SECTION A

SCALE 5 0 5 10 (metres)
1 : 250 (FULL SIZE)

BREMER BUSINESS PARK IPSWICH

prepared for

Walker

Walker Corporation Pty Limited

AREA/STAGE: STAGE 1
ROADWORKS & SERVICES

ASSOCIATED CONSULTANTS:

SURVEYORS : B & P SURVEYS
GEOTECHNICAL : SOIL SURVEYS ENGINEERING PTY LIMITED
HYDRAULIC CONSULTANTS : CARDNO LAWSON TRELOAR
LANDSCAPE ARCHITECTS : ANEMBO CONSULTANTS

AMEND	DATE	DESCRIPTION	APPR.

AMENDMENTS

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FULL SIZE : A1

DRAWING TITLE:

WARREGO HIGHWAY FRONTAGE AND BUFFER

BURCHILL VDM PTY LIMITED
ACN 010 140 485
CIVIL & STRUCTURAL CONSULTING ENGINEERS & PLANNERS
142 Bundall Road, Surfers Paradise, Qld. 4217
Phone [redacted]
Fax Civil
Fax Structural
Email
Member of the VDM GROUP

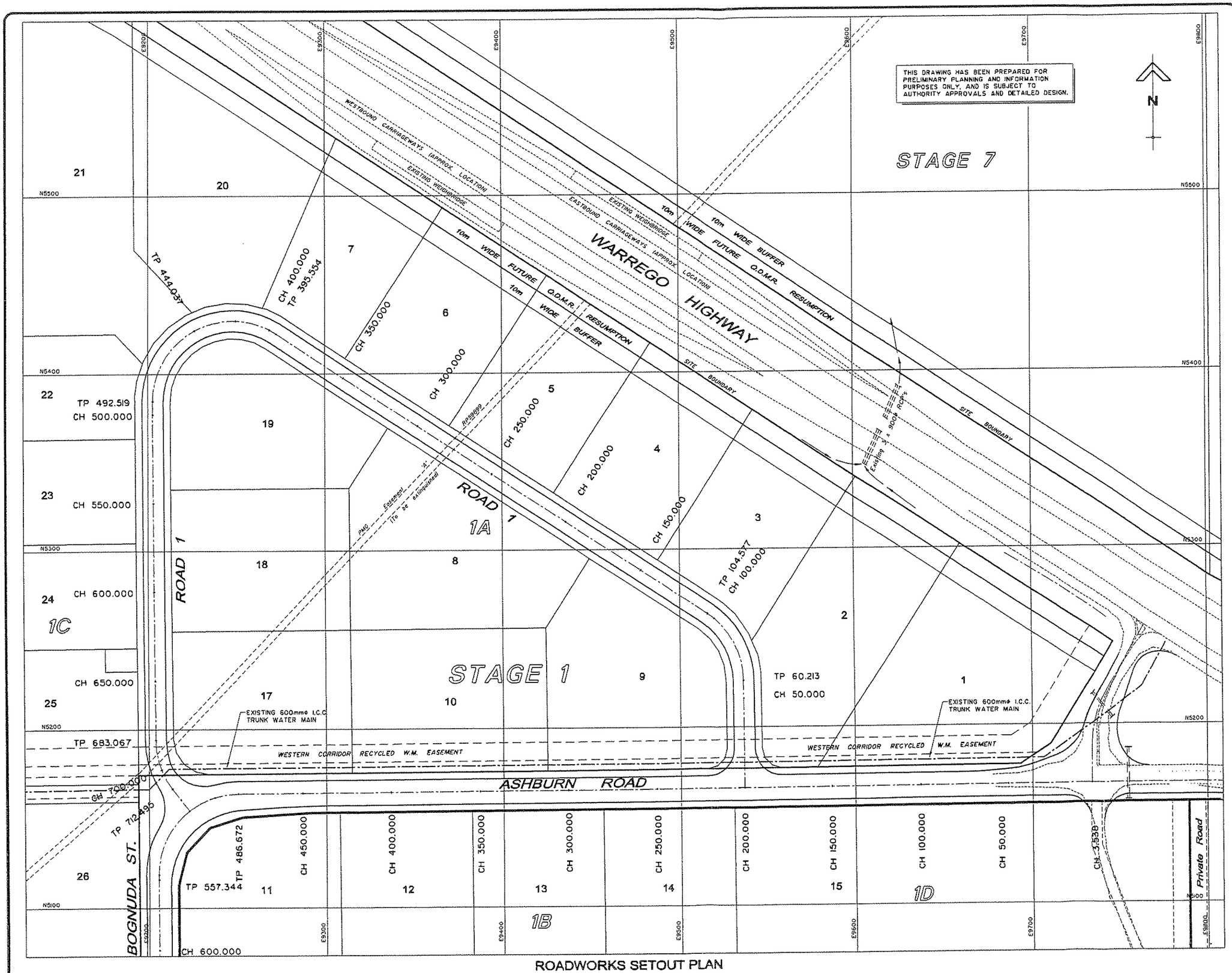
DESIGNED: P.S.K. DRAWN: A.B.C.
CHECKED: DATE: 20.08.2007
FILENAME: 3632-02-SK17.DWG

APPROVED FOR AND ON BEHALF OF BURCHILL VDM PTY LIMITED:

R.P.E.Q. No.:

DRAWING No.: AMENDMENT:

C3632:02:Sk.17



ROADWORKS SETOUT PLAN

SCALE 10 0 10 20 30 40 50 (metres)
1 : 1000 (FULL SIZE)

BREMER BUSINESS PARK IPSWICH

prepared for

Walker

Walker Corporation Pty Limited

AREA/STAGE: STAGE 1
ROADWORKS & SERVICES

ASSOCIATED CONSULTANTS:

SURVEYORS : B & P SURVEYS
GEOTECHNICAL : SOIL SURVEYS ENGINEERING PTY LIMITED
HYDRAULIC CONSULTANTS : CARDNO LAWSON TRELOAR
LANDSCAPE ARCHITECTS : ANEMBO CONSULTANTS

AMEND	DATE	DESCRIPTION	APPR.

AMENDMENTS

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FULL SIZE : A1

DRAWING TITLE:

ASHBURN ROAD SETOUT PLAN AND CROSS - SECTION LOCATIONS

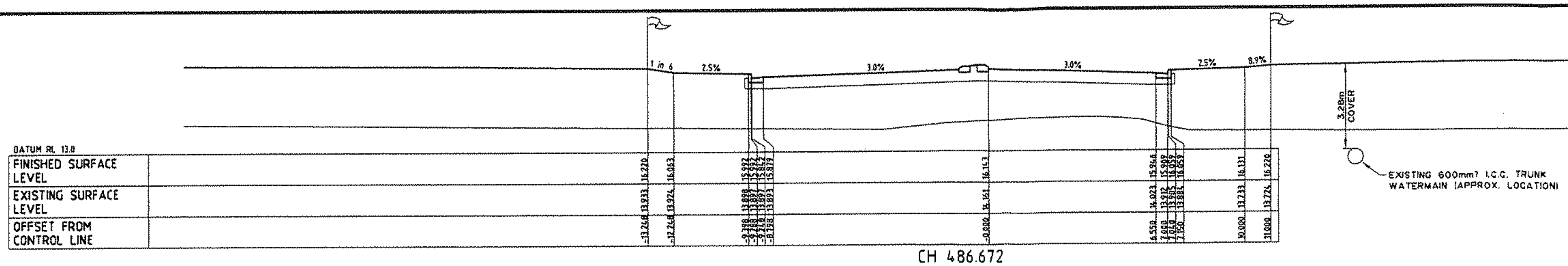
BURCHILL VDM PTY LIMITED
ACN 010 140 495
CIVIL & STRUCTURAL CONSULTING ENGINEERS & PLANNERS
142 Bundall Road, Surfers Paradise, Qld. 4217
Phone [redacted]
Fax Civil [redacted]
Fax Structural [redacted]
Email [redacted]
Member of the VDM GROUP

DESIGNED: A.B.C. DRAWN: A.B.C.
CHECKED: DATE: 20.06.2007
FILENAME: 3632-02-SK18.DWG

APPROVED FOR AND ON BEHALF OF BURCHILL VDM PTY LIMITED:

R.P.E.Q. No.:

DRAWING No.: C3632:02:Sk.18 AMENDMENT:



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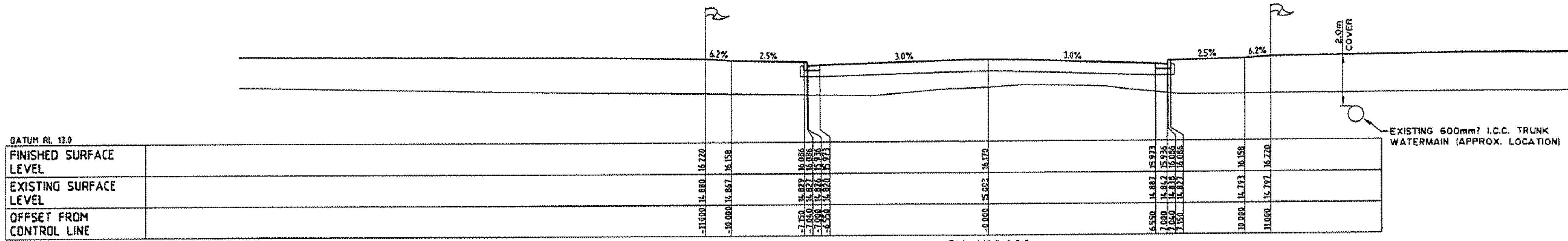

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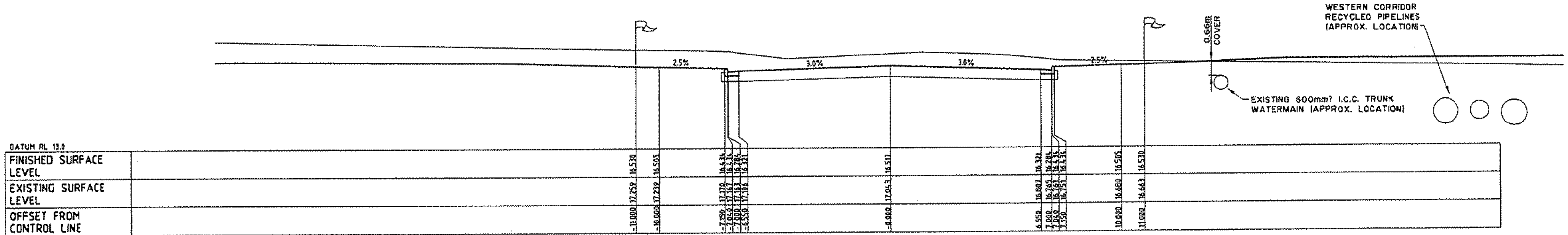

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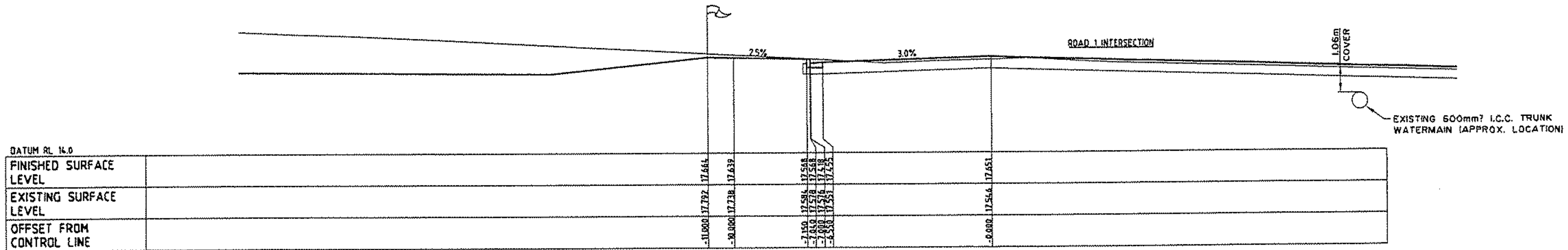

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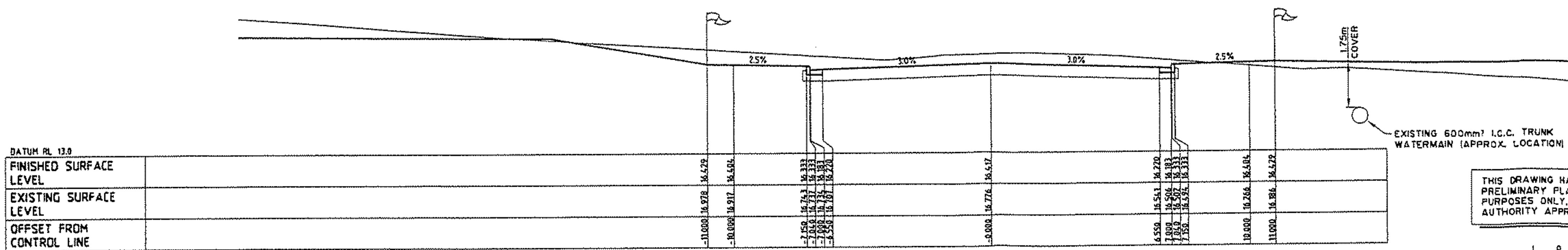

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SCALE 1 0 1 2 3 4 5 (metres)
1 : 100 (FULL SIZE)

BREMER BUSINESS PARK IPSWICH

prepared for

Walker

Walker Corporation Pty Limited

AREA/STAGE: STAGE 1
ROADWORKS & SERVICES

ASSOCIATED CONSULTANTS :

SURVEYORS : B & P SURVEYS
GEOTECHNICAL : SOIL SURVEYS ENGINEERING PTY LIMITED
HYDRAULIC CONSULTANTS : CARDNO LAWSON TRELOAR
LANDSCAPE ARCHITECTS : ANEMBO CONSULTANTS

AMEND	DATE	DESCRIPTION	APPR.

AMENDMENTS

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FULL SIZE : A1

DRAWING TITLE :

ASHBURN ROAD CROSS - SECTIONS SHOWING EXISTING 600mm DIA I.C.C. WATER MAIN

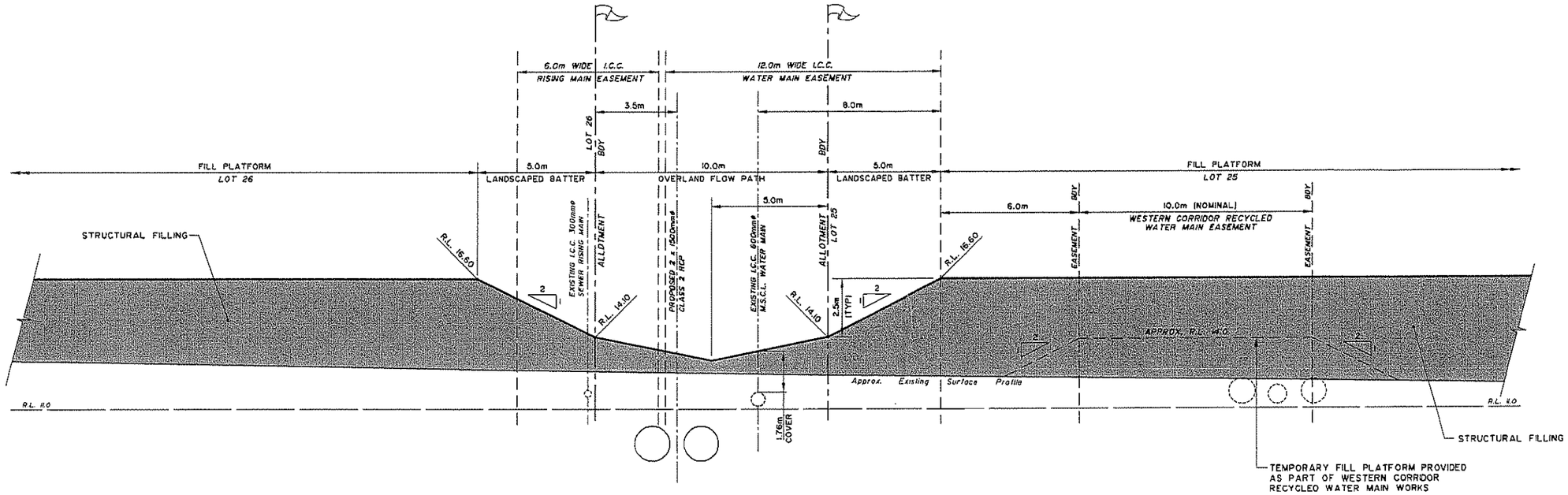
BURCHILL VDM PTY LIMITED
ACN 010 140 495
CIVIL & STRUCTURAL CONSULTING ENGINEERS & PLANNERS
142 Bundall Road, Surfers Paradise, Qld. 4217
Phone [redacted]
Fax Civil
Fax Structural
Email
Member of the VDM GROUP

DESIGNED : A.B.C. DRAWN : A.B.C.
CHECKED : DATE : 20.06.2007
FILENAME : 3632-02-SK19.DWG

APPROVED FOR AND ON BEHALF OF BURCHILL VDM PTY LIMITED :

R.P.E.Q. No. :

DRAWING No. : C3632:02:Sk.19 AMENDMENT :



TYPICAL CROSS SECTION - OVERLAND FLOW PATH AT END OF ASHBURN ROAD

SCALE 1 0 1 2 3 4 5 (metres)
1 : 100 (FULL SIZE)

BREMER BUSINESS PARK IPSWICH

prepared for

Walker

Walker Corporation Pty Limited

AREA/STAGE: STAGE 1
ROADWORKS & SERVICES

ASSOCIATED CONSULTANTS:

SURVEYORS : B & P SURVEYS
GEOTECHNICAL : SOIL SURVEYS ENGINEERING PTY LIMITED
HYDRAULIC CONSULTANTS : CARDNO LAWSON TRELOAR
LANDSCAPE ARCHITECTS : ANEMBO CONSULTANTS

AMEND	DATE	DESCRIPTION	APPR.

AMENDMENTS

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FULL SIZE : A1

DRAWING TITLE:

TYPICAL SECTION
OVERLAND FLOW PATH
AT END OF ASHBURN ROAD
SHOWING 600mm DIA.
I.C.C. WATER MAIN

BURCHILL VDM
ACN 010 140 485 PTY LIMITED
CIVIL & STRUCTURAL CONSULTING ENGINEERS & PLANNERS
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Phone [redacted]
Fax Civil
Fax Structural
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Member of the VDM GROUP

DESIGNED: P.S.K. DRAWN: A.B.C.
CHECKED: DATE: 20.06.2007
FILENAME: 3632-02-SK20.DWG

APPROVED FOR AND ON BEHALF OF BURCHILL VDM PTY LIMITED:

R.P.E.Q. No.:

DRAWING No.: AMENDMENT:
C3632:02:Sk.20

Our Ref LJ8714/Lt07 :DNN/dn

Contact [redacted]

Cardno LawsonTreloar

Shaping the Future

2 August 2007

Walker Corporation Pty Ltd
Suite 1, Harbour Point Marina Shopping Village,
Santa Barbara Rd,
HOPE ISLAND, QLD 4212

Attention: Mr [redacted]

Dear [redacted]

RE: BREMER BUSINESS PARK – FLOODING, STORMWATER QUALITY AND QUANTITY RESPONSE TO INFORMATION REQUEST

We provide the following response to Department of Local Government, Planning, Sport and Recreation's information request dated 13 July 2007 (ref RCU 2766). This letter provides a response to the Assessment Manager (ICC) requests relating specifically to items associated with flooding, stormwater quality and quantity.

The information request item and our response are as follows:

MATTERS OF INTEREST TO THE ASSESSMENT MANAGER

4. Flooding

(a) The flood investigation report prepared by Cardno Lawson Treloar dated March 2007 appears to not adequately address the impact on the flood levels by the proposed development. The Applicant is requested to submit a subsequent flood investigation report which addresses the following:

(i) calibration for the hydrologic model WBNM and justification of the model's design flow results;

(ii) the hydrologic modelling 'pre-development' or existing scenario assumed that the entire external catchments are fully developed, however this is not the case. The Applicant is requested to identify the effect up to the time the entire external catchment is fully developed; and

(iii) the flooding investigation report has indicated that there is no impact on the flood levels for surrounding properties, however there are concerns that this information is not accurate considering the significant amount of fill proposed on the site without any compensatory earth works. The proposed filling is expected to reduce the conveyance of the river and is expected to have significant afflux to the Bremer River only flood as well as Brisbane River flood by back water. There are existing properties located on the northern side of Bremer River opposite the subject site, which are affected by the regional Q20 floods. The Applicant is requested to provide detailed justification of the findings of the flood investigation report.

Cardno Lawson Treloar Pty Ltd
ABN 55 001 882 873

Level 1, 9 Gardner Close
Milton Qld 4064
PO Box 388
Toowong Qld 4066
Australia
Telephone: [redacted]
Facsimile: [redacted]
International: [redacted]
Email: [redacted]
Web: www.cardno.com.au

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Brisbane
Sydney
Canberra
Melbourne
Perth
Darwin

Cairns
Townsville
Mackay
Rockhampton
Hervey Bay
Sunshine Coast
Toowoomba
Gold Coast
Gosford
Baulkham Hills
Wollongong
Busselton

Papua New Guinea
Indonesia
Vietnam
China
Kenya
United Arab Emirates
United Kingdom

(b) *The Applicant is also requested to demonstrate that the proposed fill does not compromise the existing flood immunity of the Warrego Highway.*

CLT and the Walker Corporation are currently in discussions with Ipswich City Council (ICC) regarding the flood request items specified above. Following the resolution of these discussions CLT will update the Masterplan flooding investigation to include the changes and additional details requested above in our report '*Bremer Business Park Masterplan Flooding Investigation*' dated July 2007 (ref J8714/R3/V2).

To respond to Item 4 (b) the flood maps presented in the Appendices of our report '*Bremer Business Park Masterplan Flooding Investigation*' dated July 2007 (ref J8714/R3/V2) indicate that the only event that the Warrego Highway is inundated in is the Brisbane River 100 year ARI event in the pre development scenario. Following the proposed filling there are negligible impacts, with no increase in flood level reported to the accuracy of the model. Due to the proposed filling the Warrego highway will remain flood free to the east of the Bremer River Bridge and thus the immunity of the Warrego highway has been improved.

5. <u>Stormwater Quality and Quantity</u>

(a) *It is understood, further to discussions held between Hamish Pressland of Walker Corporation, the Healthy Waterways Partnership and Ipswich City Council with respect to the development of the Memorandum of Understanding (MOU), it was agreed in principle that a professional review of stormwater treatment reports is to be undertaken at the expense of the Partnership. The Applicant is requested to confirm that the relevant reports have been sent to the Partnership for review. A copy of the response is requested to be lodged prior to the decision making period.*

(b) *The Applicant is requested to provide a schedule which outlines the implementation timing of the regional water quality treatment measures associated with each stage as conceptually outlined in the Stormwater Management Strategy Overall Site Master Plan.*

(c) *The Applicant is requested to provide an individual stage detailed stormwater management plan in accordance with the Stormwater Management Strategy Overall Site master Plan. The plan shall address the following:*

(i) *treatment of both public and private land with separate treatment trains for each use;*

(ii) *detailed design options which clarify the extent of the treatment required (e.g. size of bioretention cells) relative to each industrial site; and*

(iii) *a range of options consistent with the Fact sheet 3: WSUD in industrial Areas (Healthy Waterways 2007).*

Note: Sufficient detail should be provided so that further stormwater plans are not required for individual industrial lots unless the future Applicants of those lots wish to depart from the strategy outlined. This requirement should be outlined in the report.

A copy of the MUSIC sqz. file is requested for ease of assessment for both the Stormwater Management Strategy Overall Site Master Plan and for each of the stage-based reports.

In response to Item 5 (a) the previous masterplan reports were supplied to the Healthy Waterways on the 5 July 2007. We are still awaiting a final response.

In response to item 5 (b), Figure 1 attached shows Conceptual Master Plan Stormwater Management Plan. As discussed in our '*Bremer Business Park Masterplan Stormwater Management strategy Overall Site Master Plan*' dated March 2007 (ref LJ8714/R4) the stormwater management will consist of:

- For the Industrial lots minor bio-retention basins on a lot by lot basis and GPTs at the end of the stormwater system prior to discharge;
- For the road network within the industrial subdivision rain-gardens and central median bio-swales in appropriate locations or small off-line bio-retention systems downstream of the stormwater outlets;
- For the residential lots in the south-west corner of the development a bio-retention system for the total residential lot development; and
- Through-out the catchment vegetated swales where possible and regional extended detention basins.

Due to this proposed treatment system most of the treatment devices are off-line from the two tributaries discharging through the site. Each of these devices will be established as part of each individual stage. That is:

- The individual industrial lot bio-retention basin will be established as part of the individual lot development;
- The industrial road network bio-retention systems and GPTs will installed as part of the civil works for each approved stage;
- The residential lot bio-retention system will be constructed as part of Stage 6; and

An indicative staging layout is shown on Figure 1.

The regional extended detention basin are primarily proposed to assist in improving the environmental flows into the Bremer River and are not considered a critical component of the stormwater treatment train. Table 1 below details the proposed staging of each of these extended detention basins, in step with the proposed development staging.

Table 1 – Proposed Extended Detention Basin Staging

Extended Detention Basin	Development Stage	Approximate Timing
EB1	Stage 4	May 2010
EB2	Stage 3	May 2009
EB3	Stage 7	Beyond 2011
EB4	Stage 7	Beyond 2011
EB5	Stage 7	Beyond 2011

In response to Item 5 (c), please find attached a copy of '*Bremer Business Park – Stage 1 Stormwater Management Strategy*' dated July 2007 (ref #LJ8714/R5), which addresses each of the stated items.

If further information is required please do not hesitate to contact the undersigned.

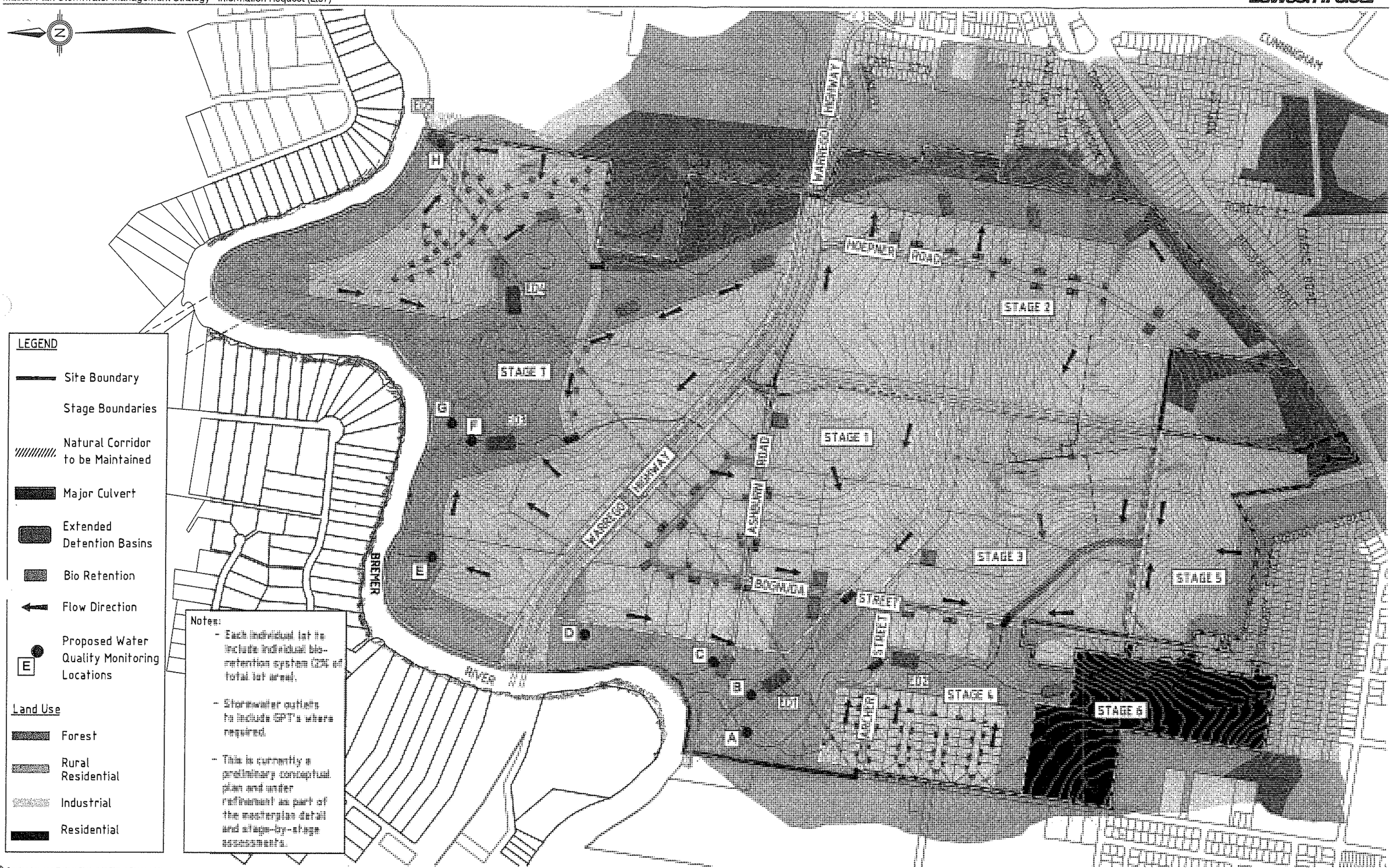
Yours sincerely,

[redacted].

Senior Engineer
for **Cardno Lawson Treloar**

Enc: Figure - Conceptual Master Plan Stormwater Management Plan
Bremer Business Park – Stage 1 Stormwater Management Strategy (LJ8714/R5)

Cardno Lawson Treloar



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Scale 1:10,000 (A3)

FIGURE 1

CONCEPTUAL MASTERPLAN OPERATIONAL STORMWATER MANAGEMENT PLAN

Rev: 0 Date: July 2007

Walker Corporation Pty Ltd

CAD FILE: O:\Work\LAT\J8714\Figures\Lt07\Figure1_COSMP.dwg

Project No.: LJ8714

PRINT DATE: 02 August, 2007 - 2:19pm

Author [redacted]
Council Reference 1837/07
NRW Reference IC0607BEE0005_IPS7599
Directorate / Unit Planning & Environment
Phone [redacted]

Queensland Government
Natural Resources and Water

Ipswich City Council

RECEIVED
13 AUG 2007
Doc. No.
Applic. No. 1837/07 RAL
Action O [redacted]

10 August 2007

Chief Executive Officer
Ipswich City Council
PO Box 191
Ipswich Qld 4305

Attention: [redacted]

Dear [redacted]

Application for Reconfiguring a Lot (3 into 27 Lots plus Balance Lots) – Lot 13 on SL2892, Lot 34 on SL3911 & Lot 2 on SP179307 – 120 Bognuda Street & 2-51 Ashburn Road, Bundamba – Referral Agency Response.

The Chief Executive of the Department of Natural Resources and Water (NRW) advises that the Referral Agency Response for the abovementioned application, prepared pursuant to section 3.3.16 of the *Integrated Planning Act 1997*, is enclosed. A copy of the Referral Agency Response has been sent to the applicant.

NRW looks forward to receiving a copy of the Decision Notice for the application in due course.

Should you have any questions regarding the Referral Agency Response, please contact [redacted] on [redacted] quoting reference number IC0607BEE0005.

Yours sincerely,

[redacted]

A/Senior Officer (Planning & Environment)
South-East Region (Beenleigh)

Enc *Referral Agency Response – Reconfiguring a Lot*

cc Planning Initiatives
PO Box 1774
New Farm Qld 4005
Attention: [redacted]

Department of Natural Resources and Water
SE Region
32 Tansey Street
PO Box 1164
Beenleigh Qld 4207

Telephone [redacted]
Facsimile [redacted]
Website www.nrw.qld.gov.au
ABN 83 705 537 588

Referral Agency Response – Reconfiguring a Lot

s 3.3.16 Integrated Planning Act 1997

1. Application information

1.1. **Applicant's name:** Walker Corporation Pty Ltd.

1.2. **Property description:** 2 SP179307, 13 SL2982 & 34 SL3911

1.3. **Assessment Manager/Reference:** Ipswich City Council- 1837/07

1.4. **Date application was referred to Department:** 30/04/07

1.5. **Departmental Reference:** eLVAS Case No: 2007/004486, File Ref. No: IPS/022183, Trackjob No: IR0407BEE0003

1.6. **Type/s of development sought by the application:**

- Reconfiguring a Lot (RaL)

2. Concurrence Agency response:

An officer has considered the Common Material and other relevant information and on this basis concludes the proposal for RaL is for urban purposes in an urban area that is:

1. Shown on a property map of assessable vegetation as a category 2 area or a category 3 area; or
2. If there is no property map of assessable vegetation, remnant vegetation that is not an endangered regional ecosystem.

The Chief Executive of the Department of Natural Resources and Water directs that the following conditions must be imposed on any approval given by the Assessment Manager:

(a) Any subsequent clearing of remnant vegetation on the lots must be applied for as operational works that is the clearing of native vegetation unless exempt under Schedule 8, Part 1, Table 4 of the *Integrated Planning Act 1997*.

(b) Any subsequent amendment or alteration to the submission; from which this Response was generated, must be re-submitted for consideration to the Department of Natural Resources and Water prior to the Decision Notice being issued.

3. Reasons:

A Statement of Reasons is attached at Schedule 1.

4. Authorised Officer Signature:

[redacted]

A/Senior Vegetation Management Officer
South East Region

22/06/2007

Att. Schedule 1 – Statement of Reasons

eLVAS Case No:	2007/004486
File Ref. No:	IPS/022183
Trackjob No:	IR0407BEE0003

Schedule 1

Statement of Reasons
Referral Agency Response
Application for Reconfiguring a Lot
Walker Corporation Pty Ltd

The following Statement of Reasons is provided pursuant to s. 3.3.18(7) of the *Integrated Planning Act 1997.*

Introduction

1. The Department of Natural Resources and Water (NRW) received an application from Walker Corporation Pty Ltd on 30/04/07.
2. The application is for RaL (Concurrence-Multiple Issue) on Lot 2 SP179307, 13 SL2982 & 34 SL3911.
3. The Delegate determined the Referral Agency Response on 22/06/07.

Evidence

1. Application dated 30/04/07.
   a) Completed IDAS Form 1 Part "F".
   b) Property Vegetation Management Plan.
2. *Integrated Planning Act 1997 & Integrated Planning Regulation 1998 (Schedule 2).*
3. *Vegetation Management Act 1999.*
4. *Department of Natural Resources and Waters Concurrence Agency Policy for Reconfiguring a Lot dated 20 November 2006.*
5. *State Planning Policy (SPP) 1/03 – Mitigating the Adverse Impacts of Flood, Bushfire, and Landslide.*
6. Natural Resource (IPA) Delegation (No.1) 2007.
7. Vegetation Management Delegation (No. 1) 2007.
8. Smartmap and VIN.
9. Electronic Land and Vegetation Assessment Report (ELVAS).
10. Regional Ecosystem (RE) Mapping version 5.0.
11. Ipswich City Planning Scheme.

Findings of fact

1. Smartmap indicates the land tenure of Lots 13 SL2982, 34 SL3911 and Lot 2 SP179307 is **Freehold.**
2. Regional Ecosystem (RE) Mapping version 5.0 indicates that remnant vegetation occurs on the freehold lot (Lot 2 SP179307).
3. Regional Ecosystem (RE) Mapping version 5.0 indicates that no remnant vegetation occurs on the other freehold lots (Lots 13 SL2982 and 34 SL3911).
4. ELVAS and VIN indicates that there is no certified Property Map of Assessable Vegetation on Lot 2 SP179307.
5. RE mapping indicates that there is a **Not Of Concern** RE (12.9-10.2) and non remnant vegetation on Lot 2 SP179307.
6. The Ipswich City Council Planning Scheme indicates that Lot 2 SP179307 is within an **urban** area and is zoned 'Regional Business and Industry' & 'Regional Business and Industry Buffer'.
7. The overall vision for the Regionally Significant Business and Industry Areas is: "Regionally significant business enterprise and industry nodes are created and maintained, which enjoy sustained economic growth, good design and ecological sustainability".
8. The proposed RaL is for business / industrial purposes.
9. The policy RaL indicates that the application must be assessed against **Assessment Table 1** - Urban Area on Freehold Land:
   - *COLUMN 1*- In an area to which a PMAV does not apply- remnant vegetation containing an *Of Concern* or *Not Of Concern* regional ecosystem.
   - *COLUMN 2*- Applications for all **urban purposes** as defined at Schedule 10 of the IPA.
   - *COLUMN 3*- **Criteria Table B** of this policy.
10. Criteria Table B of the policy contains one performance requirement that states:

    > Clearing as a result of the MCU/RaL assessed under this Table may occur only where the MCU/RaL is for an urban purpose in an urban area on freehold land where the land is shown on a PMAV as a 'Category 2 area' or a 'Category 3 area' or if there is no PMAV for the area- the area subject to clearing is remnant vegetation that does not contain an *endangered* regional ecosystem.
11. Clearing as a result of the RaL is for an urban purpose in an urban area.

Reasons

1. An officer has considered the Common Material and other relevant information and on this basis concludes the proposal for RaL is for urban purposes in an urban area that is:
   - Shown on a property map of assessable vegetation as a category 2 area or a category 3 area; or
   - If there is no property map of assessable vegetation, remnant vegetation that is not an endangered regional ecosystem.

2. Any subsequent clearing of remnant vegetation on the lots must be applied for as operational works that is the clearing of native vegetation unless exempt under Schedule 8, Part 1, Table 4 of the *Integrated Planning Act 1997*.
3. Any subsequent amendment or alteration to the submission; from which this response was generated, must be re-submitted for consideration to the Department of Natural Resources and Water prior to Decision Notice being issued.
4. To ensure that a decision regarding the application is consistent with the purpose of the *Vegetation Management Act 1999*, it is required that the above conditions be applied.

[redacted]

A/Senior Vegetation Management Officer
South East Region
22/06/2007

1. Terms

(a) RPEQ - A Registered Professional Engineer of Queensland, suitably qualified and experienced in the particular area of expertise required. Furthermore, the RPEQ required for the analysis and reporting for mining shall be experienced in the analysis of underground and surface mining within the Ipswich area.

(b) QUDM - The Queensland Urban Drainage Manual, produced by the Queensland Department of Primary Industries.

(c) DMR - Department of Main Road.

(d) MUTCD - The Manual of Uniform Traffic Control Devices, published by DMR.

(e) Ipswich Water - Commercial Business Unit of Ipswich City Council providing water and sewerage services.

(f) DNRM - Department of Natural Resources and Mines.

2. Roadworks/Traffic

(a) Roadworks shall be designed and constructed in accordance with Council's Standards, Queensland Streets, Austroads Publications, AMCORD, the relevant and appropriate roadworks design standards and guidelines, and any other documentation deemed appropriate by Council. Such design and construction shall ensure that road carriageway widths are consistent with the road function and position in the road hierarchy and are in accordance with the relevant design speed environment. Threshold treatments shall be highly visible, and shall only be constructed after approval of the proposed surface treatment by the Senior Development Engineer.

(b) The pavement designs shall be in accordance with Ipswich Planning Scheme Policy 3 - General Works.

(c) The Developer shall provide minimum 1.5 m wide concrete footpaths on one side of all the streets.

The construction of footpaths shall be in accordance with Council's Standard Drawing SR.19. The concrete footpaths shall be on the same side as the street lights, and the maximum longitudinal grade shall not exceed 1:8.

(d) Kerb ramps are to be constructed in accordance with Council’s Standard Drawing SR.18 at all intersections and at additional locations where required to connect the concrete pathways and cycleways. Generally at "T" intersections, 4 kerb ramps are required.

(e) The developer shall construct Hoepner Road extending from the existing constructed road to Brisbane Road. The road extension/new road shall:

(i) Function as an industrial collector road and as such the design and construction of this road shall satisfy this intent and function and be generally consistent with Council's Standard Drawings;

(ii) Intersect with Brisbane Road in the vicinity of Whitwood Street and be controlled by traffic signals;

(iii) Include traffic signals at the intersection of Ashburn Road / Hoepner Road;

(iv) Be designed and configured:

(a) In accordance with the Department of Main Roads Road Planning & Design Manual for a 70km/h design speed; and

(b) For the safe and efficient movement of 26.0 metre B-double Com bination Vehicles and Higher Mass Limit Vehicles.

(v) Be fully constructed, on-maintenance in accordance with the Ipswich Planning Scheme and open to traffic at the following times (which ever is earlier):

(a) Before Council signs the plan of survey that creates the twelfth (12th) lot over the development site; and

(b) Within two (2) years from the date the plan of survey is signed for the first lot created on the development site.

(f) Prior to the first plan of survey being signed over the development site, the following matters shall be completed:

(i) A Development Permit for Operational Works for the Hoepner Road Extension has been issued;

(ii) All land required for the construction of the Hoepner Road Extension, including its intersection with Brisbane Road and Whitwood Road, is owned by Council or the Developer or is dedicated road (except for the crossing over the railway corridor);

(iii) The Developer has provided Council with a bond to the value of 125% of the works; and

(iv) The Developer has entered into a legal agreement with Council stipulating the Developer's construction obligations for the Hoepner Road Extension.

(g) The Developer shall reconstruct and upgrade Ashburn Road, Bognuda Street and the 'Warrego Highway Access Road' along the frontages of the

development site in accordance with Council's Standards for an industrial collector street. Works shall include:

(i) A nominal 14.0m wide carriageway on a nominal 22.0m road reserve (wider at intersections). This will require a dedication of land from one or both sides of the development site's frontages;

(ii) Concrete kerb and channel on both sides (Type B1 with an additional 50mm thickness);

(iii) Concrete footpaths 2.0m wide on both sides, with kerb ramps designed in accordance with ICC Standard Drawing SR.19;

(iv) Pedestrian refuge islands provided in accordance with the Manual of Uniform Traffic Control Devices (Figure 4 of Part 10) including signage and line marking. The scope of works is to include kerb ramps designed in accordance with ICC Standard Drawing SR.19, and street lighting;

(v) Bus stops and associated infrastructure. Works shall include concrete slabs for future shelters, indented bus bays where required to provide sufficient clearance for through traffic movements, pavement markings and a flag sign indicating 'future bus route' (white writing with dark blue background) and be provided in accordance with Translink specifications and the Disability Standards for Accessible Public Transport.

NOTE: Footpaths, refuge islands and bus stops do not need to be provided along the 'Warrego Highway Access Road'.

(vi) Street lighting and route lighting installed in accordance with the relevant Australian Standards and Energex public lighting standards. The lighting shall be provided in accordance with the requirements for Energex Rate 2 lighting;

(vii) A geometric design in accordance with the Department of Main Roads' Road Planning and Design Manual for a 60km/h design speed; and

(viii) Stormwater drainage infrastructure designed in accordance with Council's Planning Scheme Policy 3 – General Works, Queensland Urban Drainage Manual and the Department of Main Roads Drainage Design Manual, in that order of precedence.

(h) The Developer shall upgrade the intersection of Ashburn Road / 'Warrego Highway Access Road' with traffic signals. The design and configuration of the intersection shall:

(i) Be sufficient to meet the capacity requirements of a minimum 10 year operating horizon (from the day the last plan of survey is signed over the development site);

(ii) Meet the requirements of the Department of Main Roads;

(iii) Include any future access to lot 15 shall form the southern leg of the intersection. Provision for a driveway access to Lots 1 SP 179307 (Australian Hardboards), Lots 4 and 5 on SP140694 shall be made from this future Lot 15 access road.; and

(iv) Be in accordance with the Department of Main Roads' Road Planning and Design Manual for a 50km/h design speed. Where any design element is not specified in this manual or in Council's Planning Scheme Policy 3 – General Works, Austroads Guide to Traffic Engineering Practice – Part 5 (Intersections at Grade) and Part 7 (Traffic Signals) should be used.

(i) The Developer shall provide an individual roundabout for Ashburn Road/Bognuda Street/Road 1 and Ashburn Road/Road 1 intersections, which shall function as an industrial collector road and as such the design and construction of this road shall satisfy this intent and function and be generally consistent with Council's Standard Drawings and generally in accordance with Burchill VDM drawings C3632:02:sk.34-38. Additionally the design and configuration of the roundabouts shall:

(i) Be in accordance with the Department of Main Roads' Road Planning and Design Manual for a 60km/h design speed;

(ii) Provide for the safe and efficient movement of 26.0 metre B-double Combination Vehicles and Higher Mass Limit Vehicles; and

(iii) Include stormwater drainage infrastructure designed in accordance with Council's Planning Scheme Policy 3 – General Works, Queensland Urban Drainage Manual and the Department of Main Roads Drainage Design Manual, in that order of precedence.

(j) Concerning proposed Lots 1 and 2, access to Ashburn Road shall be left in and left out only. Accordingly the Developer shall provide raised medians / islands extending from Warrego Exit/Ashburn Road signalised intersection and along Lots 1 and 2 Ashburn Road frontage.

(k) The Developer shall upgrade the intersection of Ashburn Road / Warrego Highway on-ramp (in the vicinity of Duke Close) to ensure the safe and efficient movement of 26.0 metre B-double Combination Vehicles and Higher Mass Limit Vehicles.

(l) The Developer shall prepare conceptual designs of the roadworks to be undertaken as outlined in Conditions (e), (f), (g), (h), (i), (j) and (k) above, and submit these plans to Council for approval before detailed design commences. The concept designs are to show:

(i) Horizontal and vertical geometry;
(ii) Intersection configurations;
(iii) Cross sections;
(iv) Bus stops locations; and

(v) Pedestrian refuge islands.

(m) The proposed new street that will provide access for Stage 1A and Stage1C shall be designed and constructed in accordance with Council's Standard for an industrial access street.

(n) The Developer shall provide to Council a monetary contribution of $600,000 (to be adjusted from PA) for the implementation of an Council approved LATM Scheme. The LATM Scheme (monetary contribution) shall be paid prior to Council dating and signing the plan of survey that creates the twelfth (12th) lot over the development site or within two (2) years from the date the plan of survey is signed for the first lot created on the development site (which ever trigger is earlier).

This contribution shall be applicable for a period of twelve months and thereafter shall be re-calculated from the date of development approval to the date when payment is made in accordance with the CPI.

3. Access

(a) Direct property access for proposed Lot 15 to Ashburn Street is not permitted. Vehicular access to and from proposed Lot 15 shall only be via the provision of a fourth leg to a constructed signalised intersection in the vicinity of Warrego Highway exit road and Ashburn Street intersection.

Similarly, 'right of way' easements on SP 179307 shall be preserved (except where land common to easements is dedicated as road reserve) and access to the respective allotments configured to co-aligned with Lot 15 public and private access road.

(b) The developer shall construct a public road, in accordance with Council standards for industrial access, to service existing Lot 1 in SP 179307, and Lots 4 and 5 on SP140694 from any future internal access to Lot 15. The new road shall be constructed from the intersection with the Lot 15 access extending to the property boundary and connecting with the existing access.

(c) Vehicular access to and from proposed Lots 2, 9 and 18 shall be via the proposed internal road only, i.e. direct property access to Ashburn Street is NOT permitted for these allotments.

4. Sewerage

(a) The Developer shall provide a sewerage reticulation system with appropriate connection branches and external trunk works, designed so as to command the whole of each of the proposed allotments. The sewerage reticulation system and external trunk works shall be generally in accordance with, except where amended within this approval, Sewerage Planning Report prepared by Burchill ADM and dated September 2007.

(b) Concerning the timing of external trunk works, the developer shall construct pump station BBP1 and Line 04A extending from pump station SP5 to BP1 with any development of Stage 1. Commissioning and decommissioning of BBP1 and SP5 respectively shall be undertaken by Ipswich Water at full expense to the Developer. The Developer shall lodge a private works application to Ipswich Water for commissioning and decommissioning works.

(c) Pump station BBP1 building platform/compound shall be a minimum 500 m^2 and located at minimum RL 16.6m AHD.

(d) Where proposed sewer reticulation or trunk is located within an existing or future easement, the Developer is required to submit in conjunction with operational works application written consent from the respective easement owner (other than Council).

(e) All sewer pipes and rising mains shall be constructed from Vitreous Clay (VC) or similar material as approved by Ipswich Water. Synthetic type material (such as uPVC) is not permitted unless otherwise approved by Ipswich Water.

5. Water_____

(a) The Developer shall provide a reticulated water supply system together with valves and fire hydrants, in accordance with the "Guidelines for Planning and Design of Urban Water Supply Systems", which connects into Council's existing reticulation system.

(b) A blue, bi-directional raised reflective pavement marker (RRPM) shall be provided to all hydrants. The marker shall be installed in accordance with the Department of Main Roads Fire Hydrant Indication System Technical Guideline.

(c) All works on live water mains are to be carried out by Ipswich Water in accordance with Council's policy, and at the Developer's expense.

(d) Where concrete footpaths are to be constructed, the Developer shall provide 100 mm diameter conduits under the footpath and in line with the conduits under the road, for future ease of installing the individual water services. The letter "W" shall be embossed in the concrete to mark the location of the conduit.

(e) Sufficient stop valves shall be installed so that in the event of any break in the supply, the maximum number of lots to be without water is 20.

(f) The developer shall provide water mains on both sides of each applicable road, unless otherwise agreed to by Ipswich Water.

6. Storm_____water

(a) The developer shall provide all necessary stormwater drainage (both internal and external to the development) and such drainage works (except for roofwater systems) shall be designed and constructed in accordance with QUDM such that the overall drainage system caters for a storm event with an ARI of 100 years.

Overland flow paths shall be suitably designed to cater for the water from a storm event with an ARI of 100 years. In the case where the piped system is carrying part of the flow, the overland flow paths shall be designed to cater for that volume which is represented by the difference between the predicted volume from the storm event with an ARI of 100 years and the capacity of the pipe system, noting the requirements of QUDM.

(b) All stormwater flows within and adjacent to the Bremer Business Park Area, other than inter-allotment drainage, shall be confined to dedicated roads, drainage reserves, registered drainage easements or within parkland. The registered drainage easements, if related to piped drainage, shall be centrally located over such underground pipe system and shall be not less than 4.0 m wide, except for drainage easements required for side boundaries which may be 3.0 m wide where approved by the Senior Development Engineer. In addition, the easements shall be of suitable width to contain the predicted overland flow from the storm event with an ARI of 100 years in that location.

(c) No ponding, concentration or redirection of stormwater shall occur onto adjoining land unless specifically approved by Council in consultation with the owner of the adjoining land.

(d) Due consideration shall be given in these and future designs and construction of the development in relation to the effect of the developed catchment flows on the downstream discharge receival areas. Suitable stormwater control devices are to be provided to ensure that there is no increase in flows in watercourses. Such control devices are to be designed so as to integrate the landscaping, recreational, infrastructural and drainage roles of watercourses. Notably the development shall limit the post-development peak one-year Average Recurrence Interval (ARI) event discharge to the receiving waterway to the pre-development peak one-year ARI discharge. Analysis of pre-development catchment hydrology shall assume current level of development rather than fully developed upstream catchment.

(e) There shall be no filling or removal of material in the flood area below the development flood line associated with an ARI of 20 years. There shall be minimal disturbance to vegetation in the flood area, unless prior written approval is obtained from Council.

(f) Filling in proposed Lots, which are adjacent to the watercourse shown on the proposal plan, shall not be undertaken without the written approval of Council.

(g) A suitable roofwater system shall be designed in accordance with QUDM, for allotments that do not have adequate fall from within the allotment to the design invert level of the kerb and channel or access to lawful discharge point. The design is to be to a minimum Level V in QUDM.

7. Public Utilities

(a) Adequate provision shall be made in all proposed road reserves, access strips, common areas and easements, to cater for the public utility services that would normally serve the development.

(b) The Developer shall provide appropriate road crossing conduits in accordance with Council's Standard Drawings SR.22, SR.23 and SR.24. Where concrete footpaths are to be constructed, the conduits shall be extended to the property boundaries.

(c) Street lighting shall be installed, for internal road and applicable frontages of Ashburn Road and Bognuda Street, by the Developer in accordance with the Australian Standard 1158.3.1 Table 1.1. All street lighting associated with the development shall be certified by a RPEQ. Street lighting shall be installed on the same side as concrete footpaths (where applicable).

(d) The Developer shall provide underground electricity/telecommunications within the development, constructed in the approved allocation as detailed in Council's standard drawings SR.22 and SR.23. Electricity and telecommunication drawings shall be coordinated with the civil engineering design documents, to ensure that service clashes are avoided.

(e) The Developer shall provide an Energex approved electrical reticulation layout plan. The electricity layout shall also be shown on the water reticulation layout plans.

(f) Prior to the commencement of use of the site, the Developer shall provide Council with a copy of an agreement with Energex for the supply of electricity to the development.

(g) Telephone and cable services may be laid in a combined trench with electricity cables, subject to the approval of Energex and the authorised telephone/cable service provider.

(h) The Developer shall make suitable arrangements for the provision of telephone and cable services to the Development. Documentary evidence that discussions have commenced with any authorised telephone/cable service provider, on the provision of telephone/cable services, shall be produced before the completion of the development.

8. Erosion & Silt Management

(a) The Developer shall be responsible for the installation and maintenance of silt management facilities from the time of commencement of construction

until the development has been released "Off Maintenance". All silt management facilities are to be in accordance with the document "Soil Erosion and Sediment Control" published by the Institution of Engineers Australia, or equivalent.

(b) Silt traps shall be sited upstream from any park or reserve area discharge point preferably on land comprising future allotments, such that no silt impinges on the park or reserve areas. The silt trap areas may be phased out after the development work is complete and adequate grass cover is obtained.

(c) Diversion drains and ponds, as necessary, shall be installed on the site before any other work is undertaken on site to ensure that "dirty water" is contained and/or isolated.

(d) A procedure shall be submitted with the engineering drawings for approval for maintaining the facilities, setting out the frequency of attention, with inspections to be made after each significant rainfall event.

(e) Council reserves the right to enter the site for the purpose of rectifying any silt management facilities which it deems to be inadequate, improperly maintained or not operating in a satisfactory manner.

(f) The Developer shall lodge a $10, 000 siltation and erosion performance bond with Council, prior to the commencement of works, which shall only be released by Council at the termination of the maintenance period. Where Council determines that a draw-down of the bond is required, the Developer shall restore the bond to its full amount within 10 days of a notice from Council to that effect. Such bond shall guarantee adequate performance in the circumstances (i) and (ii) below:

(i) In the event that instructions issued to the Consulting Engineer by the Senior Development Engineer for the installation of erosion control measures, are not complied with within 24 hours, Council will call upon the bond to the extent required to carry out the necessary works.

(ii) If the Senior Development Engineer determines that silt damage has occurred on the site, or the downstream drainage system has become silted, the Developer shall be responsible for restoration. Such restoration shall be completed in the time determined by the Senior Development Engineer.

Should the Developer fail to complete the works determined by the Senior Development Engineer within the specified time, Council shall complete the work and recover all costs from the Developer associated with that work.

9. <u>Operational Works – Municipal Works</u>
(ie Works being handed over to Council)

(a) Plans relating to all civil engineering works shall be prepared and submitted for review by Council under the cover of Form 1 - Part A (Common details for all applications) and Form 1 - Part E (Planning Scheme Works). The

plans shall show full construction details, layout dimensions, and finished surface levels and shall be submitted together with the appropriate fees for Council approval, prior to the commencement of construction on site.

(b) The Developer shall comply with the requirements of the documents entitled "Planning Scheme Policy 3 - General Works" and "Standard Drawings".

(c) All engineering drawings submitted to Council shall be in accordance with Council's Planning Scheme Policy 3 - General Works and Standard Drawings, and shall include as a minimum the following:

(i) Engineering drawings shall be marked as confirmation that they have been checked and approved by a RPEQ;

(ii) The drawings shall be submitted as four (4) hardcopy A3 size sets and two (2) hardcopy sets of any reports and supporting information. One set of plans shall be returned to the applicant with the Decision Notice.

The submission shall also include a Compact Disc containing electronic data as follows:

- One (1) full set of all engineering drawings contained in one file;
- Separate individual files containing layout plans for sewerage, water supply and drainage;
- Any reports submitted in support of the Application. Each report shall be included as a separate file;
- An index of all files on the Compact Disc including descriptions of contents of each file; and
- All files shall be submitted in PDF format.

(iii) A "Certificate of Design" shall be submitted by a RPEQ, certifying that the design is in accordance with all relevant engineering standards, Council's requirements and standards, relevant development conditions of approval, and sound engineering practice.

(d) Municipal works shall require a detailed design certified by a RPEQ, the design approved by Council Engineers with appropriate fees payable, a works pre-start meeting on-site and various detailed construction and audit inspections by Council Officers. A twelve month maintenance period is applicable for the works as well as the payment of a maintenance security deposit.

(e) All works shall be supervised by a RPEQ competent in civil works and shall be undertaken by a nominated principal contractor experienced in the construction of municipal works. Council reserves the right to request evidence of the principal contractor's competency. Should it be deemed by the Senior Development Engineer that the contractor does not have the necessary competency or has constructed substandard works for Council in the past, Council reserves the right to reject the nominated contractor.

(f) Municipal works shall be accepted "On Maintenance" prior to commencement of use. A maintenance bond equal to 5% of the construction cost (minimum of $1,000.00) shall be retained by Council for a minimum period of twelve months, or until such time as the works are accepted "Off Maintenance" by Council.

(g) "As Constructed" plans for municipal works shall be submitted to Council and approved prior to the formal acceptance of the works "On Maintenance". These plans shall be submitted electronically in PDF format, contained on a Compact Disk labelled appropriately to indicate the contents.

(h) On completion of the works a certificate shall be submitted to Council by a RPEQ certifying that the works have been constructed in accordance with Council's construction standards and in compliance with the approved plans and specification. It is expected that the RPEQ will undertake the necessary inspections to make this certification.

(i) Council reserves the right to require further amendments and/or additions at a later date, should design errors or omissions become apparent in regard to the works relevant to the Operational Works approval.

10. Plan of Survey

(a) The Developer shall grant, free of cost to or compensation payable by Council, minimum 4 m wide easements located centrally over proposed stormwater drains, water mains and sewerage rising mains, where they are located within private property.

The documentation associated with these easements may be prepared by the Developer in a form satisfactory to Council's City Solicitor, or the Developer may submit easement plans, only where Council is party to the easements, to Council for the preparation of easement documents at the Developer's expense.

(b) Easements required for discharge of stormwater over adjacent land shall be agreed to in writing by the owner of the subject land prior to construction work commencing.

(c) Easements shall be centrally located over the alignment of stormwater paths and be of a width sufficient to encompass the overland flow from a storm event with an ARI of 100 years.

(d) Easements shall be of sufficient width to contain any fitting, access chamber etc located on stormwater drains, water mains, and sewerage mains.

(e) All pre-existing easements crossing the site shall be pegged where they cross each property boundary and at every change of direction.

(f) Adequate permanent survey marks shall be installed. The Developer shall submit a certificate signed by a licensed surveyor, stating that after the

completion of all works associated with the development, permanent survey marks are in their correct position, in accordance with the plan of survey.

(g) Land required for detention basins or equivalent is to be dedicated as 'drainage reserve' in favour of Council and not included within parkland dedication unless approved as parkland by Council.

11. General

(a) All disturbed areas shall be graded, grassed and left in a mowable condition. The grass cover shall be obtained as early as possible during the development and an acceptable grass cover shall be achieved before the development can be accepted "Off Maintenance".

(b) Street name signs shall be manufactured to Council specifications and shall be erected in accordance with Council's Standard Drawing SR.26 at each intersection.

(c) With reference to any works, on land under other private ownership, written permission for the works shall be obtained and forwarded to Council. Similarly, written clearances shall be obtained after the works are completed, unless otherwise accepted by the Senior Development Engineer.

(d) All works required for this development shall take due regard of any and all existing services and, if considered necessary by the relevant authority or the Senior Development Engineer, such works shall be altered at the cost of the Developer.

(e) Any filling for a greater depth than 800 mm to provide for building platforms shall be conducted in accordance with Australian Standard 3798. Test results as required by Australian Standard 3798, and a certificate of quality and uniformity of fill shall be provided by a RPEQ. The level of responsibility shall be Level 1.

(f) A certificate from a RPEQ shall be issued to Council certifying that any retaining wall greater than 800 mm in height is structurally sound and capable of withstanding any likely surcharge loads. Retaining walls greater than 1 m in height are to be provided with railings or other barriers to provide pedestrian safety.

(g) Retaining walls shall be designed so that there are no imposed loads placed upon Council's underground services. This may include extending the footing to a level 300-mm below the invert of the pipe.

(h) Filling of gully areas if permitted shall be carried out strictly in accordance with Australian Standard 3798. Test results as required by Australian Standard 3798 and a certificate of quality and uniformity of fill, shall be provided by the Supervising RPEQ for all filled areas.

(i) For batters resulting from cutting and filling of the site and producing slopes greater than 1:6, Council requires a RPEQ to certify that they are stable and properly drained.

(j) If, after the preparation of detailed design plans for the various roads, it is found necessary to provide any additional road reserve area, or modify the proposed road reserves to enable the full requirements of Council's Standards, Queensland Streets, AMCORD and Austroads documents to be incorporated in any way, (but particularly in the production of the required speed environment or because of longitudinal and cross sectional constraints) then the estate layout plan shall be altered accordingly.

Further Advice

B. The Developer be further advised of the following:

1. Portable Long Service Leave

The Building and Construction Industry (Portable Long Service Leave) Levy must be paid prior to the issue of a development permit where one is required for the 'Building and Construction Industry'. This applies to Building Works, Operational Works and Plumbing and Drainage Works applications, as defined under the Integrated Planning Act 1997, where the works are $80 000 or more and matching the definition of 'Building and Construction Industry' under the Building and Construction Industry (Portable Long Service Leave) Act 1991.

Council will not be able to issue an Operational Works Decision Notice without receipt of details that the Levy has been paid. Should you require clarification in regard to the amendments to the Building and Construction Industry (Portable Long Service Leave) Act 1991, you should contact QLeave on 1800 803 481 (free call) or [redacted]

2. High Water Demand

On 15 August 2007 Council introduced its *Policy For Installation Of Electronic Water Meters To Commercial, Industrial And Large Multi-Residential Properties*. This policy states that:

All new commercial, industrial or large multi-residential property connections with a projected annual consumption greater than or equal to 20,000 kL shall include, at the customers expense, an electronic water meter with data logger and an approved back-to-base communication system as specified by Ipswich Water.

Properties with electronic water meters shall be subject to billing on a monthly basis in accordance with the metered monthly consumption.

If, in the opinion of the Senior Development Engineer, a proposed development is likely to have an annual water consumption equal to or greater than 20,000 kL, the Developer will be required to contact Ipswich Water on [redacted] to arrange installation of electronic flow meter(s).

1837/07 [redacted]

21 April 2008

MEMORANDUM

TO: ACTING DEVELOPMENT MANAGER

FROM: ACTING ASSISTANT DEVELOPMENT MANAGER - PLANNING

RE: **DEVELOPMENT APPLICATION - CODE ASSESSMENT**
***INTEGRATED PLANNING ACT 1997* - SECTION 3.2.1(1)**

Appn No: 1837/07

Applicant: Walker Corporation Pty Ltd

Real Property Description: Lot 13 SL2982, Lot 34 SL3911 and Lot 2 SP179307

Property Location: 120 Bognuda Street, 2-50 and 51 Ashburn Road, Bundamba.

Division: 4

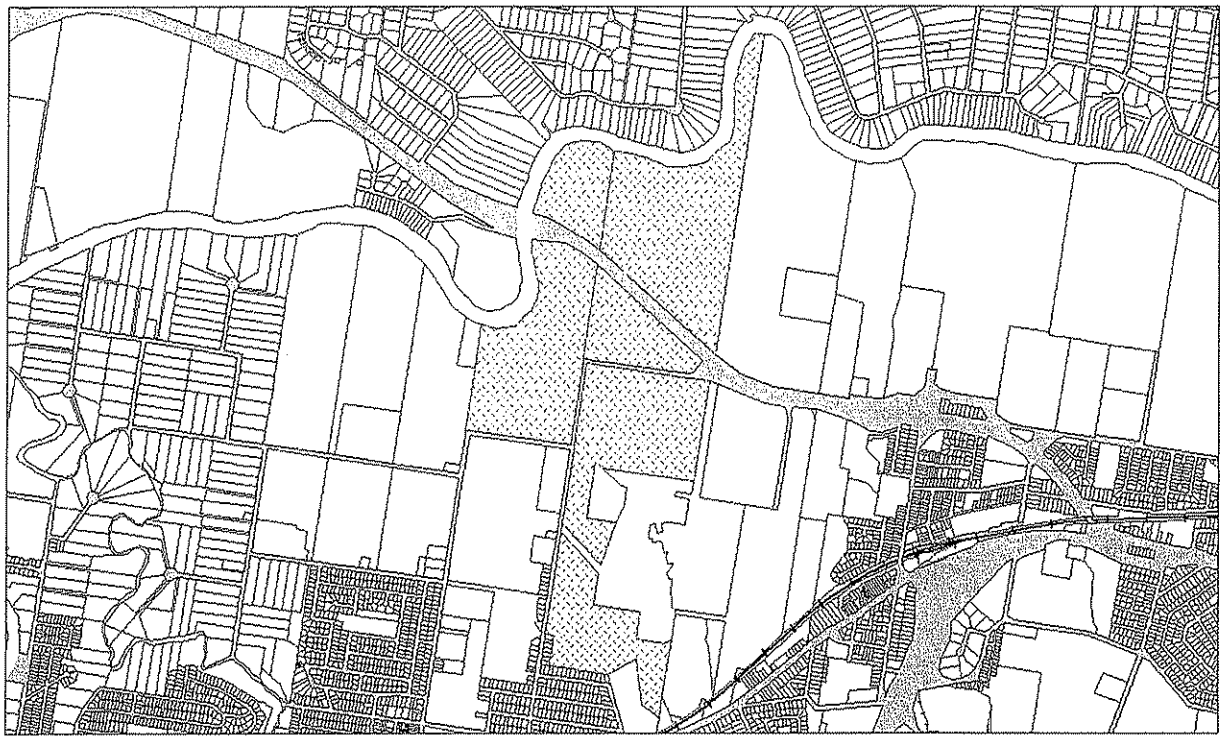
Proposal	Development	Approval Type Requested
Three (3) Lots into 28 Lots	Reconfiguring a Lot	Development Permit.

Date Received: 12 March 2007
Start Date for Decision Stage: 26 March 2008
Stat. Date for Determination: 23 April 2008

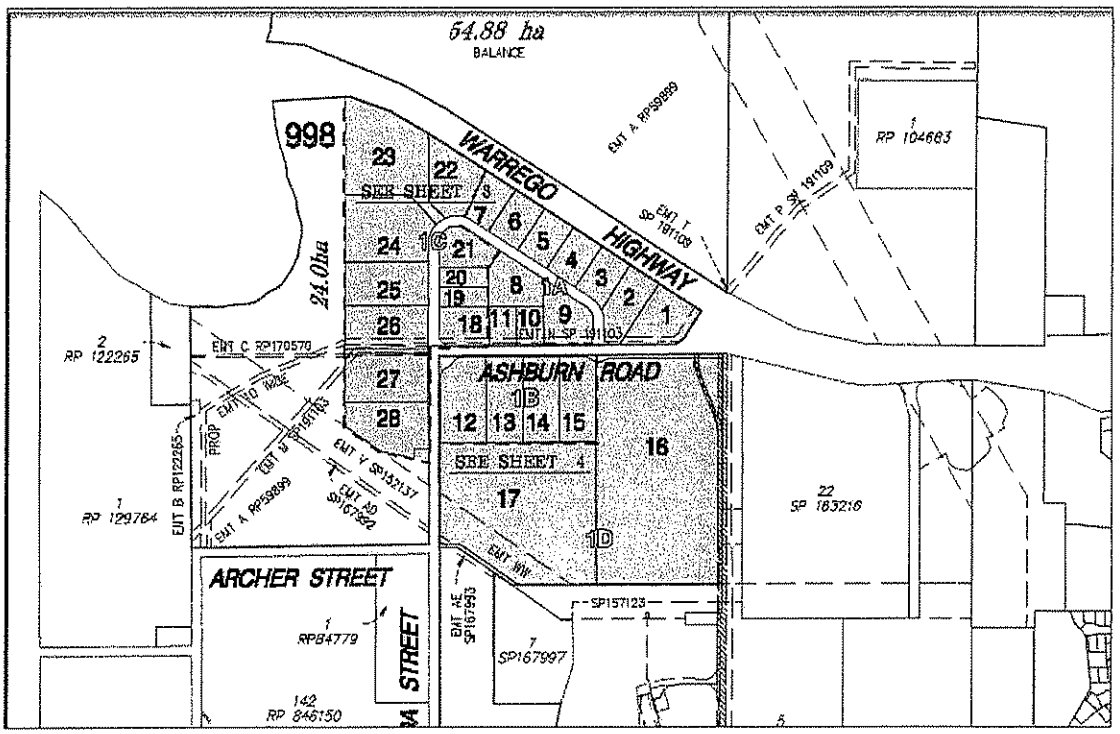
Site Area: 157.261 ha

Zone: Regional Business and Industry Buffer, Regional Business and Industry (RB2L) and Regional Business and Industry (RB2M).

SITE LOCATION



PROPOSAL PLAN



SUMMARY

On 6 July 2004, Council approved a Negotiated Decision Notice (Development Application 3356/2002) for a Preliminary Approval to Override the Planning Scheme for an industrial development known as "Bremer Business Park". Since this time, the Developer has renamed the development to "Citiswich".

The subject application is for Stage 1 of the abovementioned development for 28 industrial lots in 4 stages. Notwithstanding, Council has imposed conditions to amalgamate 3 lots (i.e. proposed Lot 15, 16 & 17) into a balance lot to provide for the future overpass to the northern side of the Warrego Highway, thus only approving 25 new lots.

A number of noteworthy conditions are proposed to be attached to the approval, including:

- The Developer shall submit a Landscaping and Rehabilitation Masterplan for the whole development. The Landscaping and Rehabilitation Masterplan shall include a Master Recreation Strategy, a Master Streetscape Strategy, a Master Stormwater Quality Treatment Strategy, a Master Bushland Rehabilitation Strategy and a Master Cultural Heritage Strategy. The Landscaping and Rehabilitation Masterplan shall also identify what works relate to each civil works stage including pedestrian/cycle paths and parkland embellishments.

- The Developer shall construct / extend Hoepner Road from the southern end of the existing constructed road to Brisbane Road and shall be fully constructed, on-maintenance in accordance with the Ipswich Planning Scheme and open to traffic at the following times (whichever is earlier):

  - Before Council signs the plan of survey that creates the twelfth (12th) additional lot over the development site; and

  - Within two (2) years from the date the plan of survey is signed that creates the first (1st) additional lot over the development site.

- The Developer shall reconstruct and upgrade Ashburn Road, Bognuda Street and the 'Warrego Highway Access Road' along the frontages of the development site (including any 'balance' or 'project' lots) in accordance with Council's Standards for an industrial collector street. The design and configuration of each road shall include pedestrian refuge islands provided at the following locations:

  - Ashburn Road between the proposed intersections with the internal industrial access street (Road 1) in the vicinity of proposed Lots 10, 11, 13 & 14); and
  - Bognuda Street between Ashburn Road and Archer Street in the vicinity of proposed Lot 28.

  Further, the following bus stops, shall be provided at the following locations:

  - Both sides of Ashburn Road on the departure side of the proposed eastern intersection with the internal industrial access street (Road 1); and

- Both sides of Bognuda Street between Ashburn Road and Archer Street in the vicinity of proposed Lots 12 and 28.

- The Developer shall upgrade the intersection of Ashburn Road / 'Warrego Highway Access Road' with traffic signals before the plan that creates the twelfth (12th) additional lot over the development site is signed by Council.

- The Developer shall construct roundabouts at the two locations where the proposed new Industrial Collector Street (Road 1) intersects with Ashburn Road.

- The Developer shall construct a raised median (minimum 2.0 metres wide) along Ashburn Road between the eastern roundabout and the intersection of Ashburn Road / "Warrego Highway Access Road".

- The Developer shall configure the access for proposed Lot 1 along Ashburn Road for left-in and left-out movements only. This shall be supported by the construction of an island on the driveway of Lot 1 to restrict right turn movements out of this lot.

- The Developer shall organise a Road Safety Audit (RSA) to be undertaken of the intersection of Ashburn Road / Warrego Highway on-ramp (in the vicinity of Duke Close and Earl Street) including its approach and departure legs (minimum 200 metres in each direction). The RSA shall be undertaken by a DMR accredited road safety auditor and provide recommendations on any improvements that are required to be undertaken at this intersection to improve its safety and operation. The RSA shall take into account the changes in traffic movements and vehicle types generated by the development site, including the movement of B-double combination vehicles (26.0m in length). The RSA Report shall be submitted with the conceptual design plans for the roadworks along Ashburn Road.

- The Developer shall upgrade / reconfigure the intersection of Ashburn Road / Warrego Highway on-ramp (in the vicinity of Duke Close and Earl Street) to ensure the safe and efficient movement of the type and volumes of vehicles expected to use the intersection as a result of the development, including B-double Combination Vehicles (26.0m in length) and Higher Mass Limit Vehicles.

- The Developer shall construction kerb & channel along both sides of Bird Street. Works shall include stormwater infrastructure, driveway reconstruction, verge re-profiling and pavement infill in accordance with Council's requirements. These works shall be completed before the plan that creates the twelfth (12th) additional lot over the development site is signed by Council.

- The Developer shall implement a staged integrated local area traffic management (LATM) scheme in the existing residential areas to the south and south-west of the development site, generally in the vicinity of Bognuda Street and Law Street.

- The Developer shall pay water, sewer and road contributions.

In summary, it is considered that the proposal to permit the development of a Three (3) Lots into 25 Lots and 3 balance lots is suitable for the subject site and should be approved, subject to the conditions detailed below.

RECOMMENDATION

A. That the Developer be advised that Development Application No. 1837/07 is determined as outlined in the table below and is subject to the conditions specified below.

Proposal	Development	Decision	Approval Type
Three (3) Lots into 25 Lots and 3 balance lots	Reconfiguring a lot	Approved	Development Permit.

Further Development Permits Required

Further Development Permits, as required by the *Integrated Planning Act 1997,* shall be obtained in respect of any Material Change of Use, Operational Works, Building Works and Plumbing Works in relation to this approval before any such works are commenced.

Conditions of Assessment Manager (Ipswich City Council)

1. Basis of Approval

   Subject to these conditions, the facts and circumstances set out in the application and all relevant Council Local Laws and/or Planning Scheme Policies and the Bremer Business Park Preliminary Approval (dated 30 June 2004) shall be adhered to.

2. Minor Alterations

   Notwithstanding the requirements detailed in this approval, any other minor alterations and/or modifications acceptable to the Development Manager will suffice.

3. Plan of Survey

   (a) The Developer shall submit a plan of survey to generally conform with Proposed "Citiswich" Development at Ipswich April 2008 Drawing No. QC00-3632:00:SK.116 (prepared by Burhcill VDM Consulting Engineers and Planners) with the following exception:

   (i) Proposed Lots 15, 16 & 17 shall be incorporated into a balance lot until such time as the detailed planning and conceptual design drawings for the road network are finalised and approved by Council, in particular the road linking the northern and southern areas of Citiswich over the Warrego Highway ("North-South Link Road").

(b) The Developer shall grant, free of cost to or compensation payable by Council, minimum 4.0 m wide easements located centrally over proposed and existing stormwater drains, water mains and sewerage rising mains, where they are located within private property.

The documentation associated with these easements may be prepared by the Developer in a form satisfactory to Council's City Solicitor, or the Developer may submit easement plans, only where Council is party to the easements, to Council for the preparation of easement documents at the Developer's expense.

(c) Easements required for discharge of stormwater over adjacent land shall be agreed to in writing by the owner of the subject land prior to construction work commencing.

(d) Easements shall be centrally located over the alignment of stormwater paths and be of a width sufficient to encompass the overland flow from a storm event with an ARI of 100 years.

(e) Easements shall be of sufficient width to contain any fitting, access chamber etc located on stormwater drains, water mains, and sewerage rising mains.

(f) All pre-existing easements crossing the site shall be pegged where they cross each property boundary and at every change of direction.

(g) Adequate permanent survey marks shall be installed. The Developer shall submit a certificate signed by a cadastral surveyor, stating that after the completion of all works associated with the development, permanent survey marks are in their correct position, in accordance with the plan of survey.

(h) Land required for detention basins or equivalent are to be dedicated as drainage reserve in favour of Council and not included within parkland dedication unless approved as parkland by Council.

(i) Land required for open space shall be dedicated, free of cost to and compensation by Council, in fee simple at the time of registration of a plan of survey for any part of the land adjoining the area to be dedicated and in accordance with the plan approved pursuant to Condition 5: Landscaping and Rehabilitation.

(j) The proposed Archer Street Active Recreation Park for dedication shall meet the desired standards of service for "Local-Recreation Parkland" as per the current Ipswich Planning Scheme.

3. Building Envelope Plan

The Developer shall submit a Building Envelope Plan to the Development Manager for approval prior to signing the relevant plan of survey. The Building Envelope Plan shall nominate that no works/storage are permitted within the twelve (12) metre landscape buffer to the Warrego Highway, amongst other matters.

4. Proposed Stages For Reconfiguration

The staging of the reconfiguration shall be in accordance with the approved plans and shall be as follows:

Stage 1A	Proposed Lots 1 to 11 (11 lots)
Stage 1B	Proposed Lots 12 to 14 (3 lots)
Stage 1C	Proposed Lots 18 to 28 (11 lots)

5. Rates in Arrears

In accordance with the provisions of the *Integrated Planning Act 1997*, all rates and other expenses as a charge against the land shall not be in arrears at the date of signing of the plan of survey.

6. Hours of Construction

Unless otherwise determined in writing by the Development Manager hours of construction shall be:

Monday to Saturday 6.30 a.m. to 6.30 p.m.

Work or business shall not be conducted from or on the premises outside the above hours or on Sundays or public holidays.

7. Locality References

(a) Any place name or estate name used by the developer (excluding a reference to a building, structure or the like and excluding minor, subsidiary signage within a development) shall make reference to the relevant, approved place name under the *Place Names Act 1994* in a contrasting colour and in lettering no less than 50% of the Estate name.

(b) Any reference to the regional location of the site or the development shall not refer to the place or estate as being located in Brisbane or a Brisbane suburb or in the metropolitan area or in the western suburbs (excluding the western suburbs of Ipswich as determined by Council in writing from time to time).

8. Road Naming

The Developer may submit to Council a list of proposed street names and the corresponding name meanings for the new road(s) to be opened. The proposed names should normally be submitted as part of the Operational Works application. Should a theme be considered appropriate, the theme should be submitted at the same time. Council reserves the right to accept any or none of the proposed names.

9. Contributions

In accordance with the relevant Planning Scheme Policies, the Developer shall pay, prior to Council signing the plan of survey, the following monies to Council:-

Contribution	Sector	Rate	Proposal	Calculation
Water Supply Infrastructure	Bundamba Low Level Zone (5)	$734.00/NRU Unit Charge = 1.000 Total = $734.00/NRU	***Stage 1A*** 22.5 NRU per ha @ 8.5089 ha (11 lots) **Total = 191.475 NRU**	$734.00 x 191.450 = $140,524.30 **Total = $140,524.00**
			Stage 1B 22.5 NRU per ha @ 4.139 ha (3 lots) **Total = 93.1275 NRU**	$734.00 x 93.1275 = $68,355.59 **Total = $68,355.00**
			Stage 1C 22.5 NRU per ha @ 15.1785 ha (11 lots) **Total = 341.5163 NRU**	$734.00 x 341.5163 = $250,672.96 **Total = $250,672.00**
Sewerage Infrastructure	South Bremer (23)	$1,052.00/NRU Unit Charge = 1.000 Total = $1,052.00/NRU	***Stage 1A*** 22.5 NRU per ha @ 8.5089 ha (11 lots) **Total = 191.475 NRU**	$1,052.00 x 191.450 = $201,405.40 **Total = $201,405.00**
			Stage 1B 22.5 NRU per ha @ 4.139 ha (3 lots) **Total = 93.1275 NRU**	$1,052.00 x 93.1275 = $97,970.13 **Total = $97,970.00**
			Stage 1C 22.5 NRU per ha @ 15.1785 ha (11 lots) **Total = 341.5163 NRU**	$1,052.00 x **341.5163** = $359,275.14 **Total = $359,275.00**
Roadworks Infrastructure	Bundamba Industry (25)	$554.00/VT Unit Charge = 1.000 Total = $554.00/VT	***Stage 1A*** 140 VT per ha @ 8.5089 ha (11 lots) **Total = 1,191.246 VT**	$554.00 x 1191.246 = $659,950.28 **Total = $659,950.00**
			Stage 1B 140 VT per ha @ 4.139 ha (3 lots) **Total = 579.46 VT**	$554.00 x 597.46 = $321,020.84 **Total = $321,020.00**
			Stage 1C 140 VT per ha @ 15.1785 ha (11 lots) **Total = 2,124.99 VT**	$554.00 x 2,124.99 = $1,177,244.40 **Total = $1,177,244.00**
Stage 1A Total				**$ 1,001,879.00**
Stage 1B Total				**$ 487,345.00**
Stage 1C Total				**$ 1,787,191.00**
Total for Stage 1				**$ 3,276,415.00**

Calculations of headworks and contributions are based on the infrastructure contribution policies and rates applicable at the date the development application was determined by Council. The contributions above shall be applicable for a period of twelve (12) months from the date of the development approval, and thereafter shall be based on the infrastructure contribution policies and rates applicable at the date when payment is made.

10. Landscaping and Rehabilitation

(a) The Developer shall undertake landscaping and rehabilitation generally in accordance with the Bremer Business Park Open Space Master Plan by Anembo Consultants (Dated 8 March 2007) except where otherwise indicated in this Decision Notice.

(b) The Developer shall submit a Landscaping and Rehabilitation Masterplan for the whole development to be prepared by a corporate member of Australian Institute of Landscape Architects or other approved licensed landscape architect. The Landscaping and Rehabilitation Masterplan shall take account of the requested amendments to the Master Staging Plan – Citiswich and shall be submitted to the Development Manager for approval in conjunction with the first civil Operational Works application. The Landscaping and Rehabilitation Masterplan shall include a Master Recreation Strategy, a Master Streetscape Strategy, a Master Stormwater Quality Treatment Strategy, a Master Bushland Rehabilitation Strategy and a Master Cultural Heritage Strategy (as per Condition 8 of the Negotiated Decision Notice dated 6 July 2004 for ICC Development Application 3356/2002). The Landscaping and Rehabilitation Masterplan shall also identify what works relate to each civil works stage including pedestrian/cycle paths and parkland embellishments. The extent of information required in this Masterplan and future landscape applications shall be agreed upon with Council prior to lodgement of any further landscape plans. The following matters should be considered in preparing the plan:

(i) The Warrego Highway buffer shall be planted with ex-ground fig trees. Jute matting may be required to be used for stabilisation to the satisfaction of Council depending on the final approved batter.

(ii) Areas for remediation and rehabilitation shall be identified and treatment strategies outlined. Unless approved for stormwater treatment, active open space or bushfire management, all other areas of parkland and drainage reserve shall be remediated and rehabilitated to a natural bushland setting in accordance with the species outlined in the *Ipswich City Council Vegetation Communities Rehabilitation Guide 2 and 4*, locally endemic species and native flora observed on site.

(iii) All declared weeds, environmental weeds, and exotic pests shall be removed from the site to the greatest extent practicable. A staged rehabilitation approach shall be adopted to ensure that any habitat values provided by the exotic species is gradually replaced by natives and rehabilitation works do not cause erosion. Any areas which are disturbed as a result of weed control shall be rehabilitated with native species.

(iv) The plans shall make provision for the placement of rocks and logs (which can be relocated from cleared areas), into the Bremer River Park and Eastern Forest Park to compensate for the loss of fauna habitat. The plan shall indicate the stockpile location and indicate the quantity and general relocation areas.

(v) A series of different sized nest boxes shall be installed which include a range of sizes and configurations up to an including Greater Glider size. The number and location of nest boxes shall be included on the detailed rehabilitation plans.

(vi) Rehabilitation shall consider the need for maintenance access to the power easement and minimum separation distances to transmission lines. Maintenance paths shall be suitably stabilised to the satisfaction of Council. Species to be planted below the transmission lines shall consist of species which do not grow greater than 3.5 metres in height at maturity or as otherwise stipulated by the relevant power authority.

(vii) Rehabilitation areas shall be planted at a minimum of one (1) plant per square metre taking into consideration existing native vegetation. For slopes greater than one (1) in six (6) a denser planting schedule will be required. Any stormwater treatment devices which require planting shall be planted in accordance with the species and densities outlined in the Water Sensitive Urban Design Technical Design Guidelines for South East Queensland. Only waterwise, drought tolerant natives shall be used consisting preferably of locally occurring species.

(viii) The plans shall demonstrate suitable stabilisation and screening around stormwater outlets and culverts. Dense planting will be required on the steep batters around culverts and pocket planting used in areas of dumped rock to inhibit weed growth.

(ix) Street Trees shall be provided in accordance with the Ipswich City Council Street Tree Strategy.

(x) All exposed culvert/wingwall surfaces shall be suitably treated to avoid exposed concrete surfaces.

(xi) Suitable embellishment in the formal park areas are required to be specified in accordance with the Desired Standards of Service outlined in Part 5 of Council's Planning Scheme Policy 3 – General Works.

(xii) The location of footpaths and cycle paths.

(c) Stage 1 streetscape and landscape works shall be undertaken generally in accordance with the following plans:

(i) General Notes Legend, Site Location Dwg Schedule and Sheet Layout Plan Dwg. No: LD01, Sheet 1 of 17, Revision A (prepared by Anembo Consultants, dated 1 August 2007);

(ii) Details and Plant Schedule Plan Dwg. No: LD02, Sheet 2 of 17, Revision A (prepared by Anembo Consultants, dated 1 August 2007);

(iii) Landscape Plan Dwg. No: LP01, Sheet 3 of 17, Revision A (prepared by Anembo Consultants, dated 1 August 2007);

(iv) Landscape Plan Dwg. No: LP02, Sheet 4 of 17, Revision A (prepared by Anembo Consultants, dated 1 August 2007);

(v) Landscape Plan Dwg. No: LP03, Sheet 5 of 17, Revision A (prepared by Anembo Consultants, dated 1 August 2007);

(vi) Landscape Plan Dwg. No: LP04, Sheet 6 of 17, Revision A (prepared by Anembo Consultants, dated 1 August 2007);

(vii) Landscape Plan Dwg. No: LP05, Sheet 7 of 17, Revision A (prepared by Anembo Consultants, dated 1 August 2007);

(viii) Landscape Plan Dwg. No: LP06, Sheet 8 of 17, Revision A (prepared by Anembo Consultants, dated 1 August 2007);

(ix) Landscape Plan Dwg. No: LP07, Sheet 9 of 17, Revision A (prepared by Anembo Consultants, dated 1 August 2007);

(x) Landscape Plan Dwg. No: LP08, Sheet 10 of 17, Revision A (prepared by Anembo Consultants, dated 1 August 2007);

(xi) Landscape Plan Dwg. No: LP09, Sheet 11 of 17, Revision A (prepared by Anembo Consultants, dated 1 August 2007);

(xii) Landscape Plan Dwg. No: LP010, Sheet 12 of 17, Revision A (prepared by Anembo Consultants, dated 1 August 2007);

(xiii) Landscape Plan Dwg. No: LP011, Sheet 13 of 17, Revision A (prepared by Anembo Consultants, dated 1 August 2007);

(xiv) Landscape Plan Dwg. No: LP012, Sheet 14 of 17, Revision A (prepared by Anembo Consultants, dated 1 August 2007);

(xv) Landscape Plan Dwg. No: LP013, Sheet 15 of 17, Revision A (prepared by Anembo Consultants, dated 1 August 2007);

(xvi) Landscape Plan Dwg. No: LP014, Sheet 16 of 17, Revision A (prepared by Anembo Consultants, dated 1 August 2007); and

(xvii) Landscape Plan Dwg. No: LP015, Sheet 17 of 17, Revision A (prepared by Anembo Consultants, dated 1 August 2007) incorporating a minimum width of 4 metres for the Turfed Maintenance Path.

(d) The Developer shall ensure all cultivation, planting detail and garden edging shall be in accordance with Parks Standard Drawing SP.06, Ipswich Standard Drawing SP.20 and Ipswich Standard Drawing Timber Log Edge SP. 23.

(e) The Developer shall submit to the Development Manager for approval separate detailed plans for stormwater treatment devices in Stage 1.

(f) The Developer shall complete all approved landscaping and rehabilitation works for the parkland, drainage corridors and streetscape to the satisfaction of the Development Manager prior to the plan sealing of the adjacent stage.

(g) The Developer shall submit to Council a Certificate of Compliance – Landscape Works (Appendix 3 of Planning Scheme Policy 3 – General Works), which shall be signed by a corporate member of Australian Institute of Landscape Architects or other approved licensed landscape architect prior to Council signing the plan of survey to certify all landscape works have been completed in accordance with the approved plans.

11. Engineering Requirements

The following engineering requirements, detailed in Conditions 12 – 24, shall be completed to the satisfaction of the Senior Development Engineer.

Terms

(a) RPEQ - A Registered Professional Engineer of Queensland, suitably qualified and experienced in the particular area of expertise required. Furthermore, the RPEQ required for the analysis and reporting for mining shall be experienced in the analysis of underground and surface mining within the Ipswich area.

(b) QUDM - The Queensland Urban Drainage Manual, produced by the Queensland Department of Primary Industries.

(c) DMR – Queensland Department of Main Roads.

(d) MUTCD - The Manual of Uniform Traffic Control Devices, published by DMR.

(e) Ipswich Water - Commercial Business Unit of Ipswich City Council providing water and sewerage services.

(f) DNRM - Department of Natural Resources and Mines.

12. Roadworks

General

(a) All roadworks included in this approval shall be designed and constructed:

(i) As public roads;

(ii) At no cost to Council;

(iii) To ensure that the carriageway width, geometry, design speed and other attributes are consistent with the function of the road or street in the road hierarchy;

(iv) In accordance with Ipswich Planning Scheme Policy 3 - General Works, Council Standards and the DMR Road Planning & Design Manual (or other relevant documentation agreed by Council);

(v) With stormwater drainage infrastructure designed in accordance with Council's Planning Scheme Policy 3 – General Works, Queensland Urban Drainage Manual and the Department of Main Roads Drainage Design Manual, in that order of precedence;

(vi) For the safe and efficient movement of B-double combination vehicles (26.0 metres in length) and Higher Mass Limit Vehicles (including u-turn manoeuvres where required). This includes those roadworks to be undertaken by the Developer as specified by DMR in their referral agency response dated 25 March 2008.

(vii) With street lighting and route lighting installed in accordance with the relevant Australian Standards and Energex public lighting standards. The lighting shall be provided in accordance with the requirements for Energex Rate 3 lighting;

(viii) To include the relocation and protection of existing public utility services required in association with the roadworks at no cost to Council;

(ix) To include the installation of new public utility services to service land subject of this approval;

(x) To ensure access to existing properties is maintained at all times; and

(xi) With all medians, verges and batters topsoiled, turfed and landscaped generally in accordance with Council's Street Tree Planting Guidelines and the approved landscape master plan for the development site.

(xii) With kerb ramps (in accordance with Council's Standard Drawing SR.18) at all intersections and at additional locations where required to connect future path networks and pedestrian crossing points. Generally at "T" intersections, six kerb ramps are required.

<u>"Hoepner Road Extension"</u>

(b) The Developer shall construct / extend Hoepner Road from the southern end of the existing constructed road to Brisbane Road. The "Hoepner Road Extension" shall:

(i) Function as an industrial collector road and as such the design and construction of this road shall satisfy this intent and function and be generally consistent with Council's Standard Drawings;

(ii) Intersect with Brisbane Road in the vicinity of Whitwood Street and be controlled by traffic signals;

(iii) Include traffic signals at the intersection of Ashburn Road / Hoepner Road configured to provide sufficient capacity for a minimum operating horizon of 10

years from the date the last plan of survey of the development site is signed by Council;

(iv) Be designed and configured for a 70km/h design speed;

(v) Be fully constructed, on-maintenance in accordance with the Ipswich Planning Scheme and open to traffic at the following times (whichever is earlier):

- Before Council signs the plan of survey that creates the twelfth (12th) additional lot over the development site; and

- Within two (2) years from the date the plan of survey is signed that creates the first (1st) additional lot over the development site.

(c) Prior to the Council signing the plan of survey that creates the first (1st) additional lot over the development site, the following matters shall be completed:

(i) A Development Permit for Operational Works for the "Hoepner Road Extension" shall be lodged with and approved by Council;

(ii) All land required for the construction of the "Hoepner Road Extension", including its intersection with Brisbane Road and Whitwood Road, is owned by Council, the Department of Main Roads or the Developer or is dedicated road (except for the crossing over the railway corridor);

(iii) The Developer has provided Council with a bond to the value of 125% of the construction cost. As such, the Developer shall provide a preliminary cost estaimte for the 'Hopener Road Extension', including a schedule of rates and quanatities, before the Development Permit for Operational Works for the Hoepner Road Extension is issued ; and

(iv) The Developer has entered into a legal agreement with Council stipulating the Developer's construction obligations for the "Hoepner Road Extension".

<u>Site Frontage Works</u>

(d) The Developer shall reconstruct and upgrade Ashburn Road, Bognuda Street and the 'Warrego Highway Access Road' along the frontages of the development site (including any 'balance' or 'project' lots) in accordance with Council's Standards for an industrial collector street. The design and configuration of each road shall include:

(i) Geometry and sight distances for a 70km/h design speed;

(ii) A nominal 14.0m wide carriageway on a nominal 22.0m road reserve (wider at intersections and where a divided carriageway is required). This will require a dedication of land from one or both sides of the development site's frontages to these roads;

(iii) Concrete kerb and channel on both sides (Type B1 with an additional 50mm thickness) plus associated stormwater drainage infrastructure (designed in accordance with Council's Planning Scheme Policy 3 – General Works, QUDM and the DMR Drainage Design Manual, in that order of precedence).

(iv) Concrete paths (minimum 2.0m wide) on both sides, with kerb ramps designed in accordance with ICC Standard Drawing SR.19;

(v) Edge lines and 'bicycle awareness zones' marked on the carriageway;

(vi) Signs and pavement markings in accordance with the MUTCD including 60km/h speed limit signs and "No Stopping" Signs;

(iv) Pedestrian refuge islands provided at the following locations:

- Ashburn Road between the proposed intersections with the internal industrial access street (Road 1) in the vicinity of proposed Lots 10, 11, 13 & 14); and
- Bognuda Street between Ashburn Road and Archer Street in the vicinity of proposed Lot 28.

Each pedestrian refuge island shall be designed and constructed in accordance with the MUTCD (Figure 4 of Part 10) including signs, pavement markings, lighting and kerb ramps (designed in accordance with ICC Standard Drawing SR.19). The pedestrian refuge islands shall be positioned to ensure driveway access to adjacent lots will not be impeded in the future;

(vii) Bus stops, and associated infrastructure, provided at the following locations:

- Both sides of Ashburn Road on the departure side of the proposed eastern intersection with the internal industrial access street (Road 1); and

- Both sides of Bognuda Street between Ashburn Road and Archer Street in the vicinity of proposed Lots 12 and 28.

The bus stop works shall be positioned, designed and constructed in accordance with Translink specifications / standards and Disability Standards for Accessible Public Transport and include:

- A reinforced concrete hardstand area with a sufficient footprint for the installation of a future non-illuminated Translink Type 1A bus shelter (2.1m x 5.8m). The hardstand area shall be positioned between the kerb and path;

- Pavement markings in accordance with the MUTCD;

- A flag sign indicating 'future bus route' (white writing with dark blue background); and

- A litter bin with bird proof cover.

NOTE: Footpaths, pedestrian refuge islands and bus stops do not need to be provided along the 'Warrego Highway Access Road'.

Ashburn Road / 'Warrego Highway Access Road'

(e) The Developer shall upgrade the intersection of Ashburn Road / 'Warrego Highway Access Road' with traffic signals before the plan that creates the twelfth (12th) additional lot over the development site is signed by Council. The design and construction shall:

(i) Be sufficient to meet the capacity requirements of a minimum 10 year operating horizon (from the day the last plan of survey is signed over the development site).

(ii) Meet the requirements of the DMR;

(iii) Provide a southern leg of the intersection to facilitate future access for proposed Lot 16 and continued access for Lot 7 SP167997 (located at Lot 7 Bognuda Street), Lot 1 5P179307 (located at 83 Bognuda Street) and Lot 5 SP140694 (located at 61 Ashburn Road)

(iv) Be in accordance with the DMR Road Planning and Design Manual for a 60km/h design speed. Where any design element is not specified in this manual or in Council's Planning Scheme Policy 3 – General Works, Austroads Guide to Traffic Engineering Practice – Part 5 (Intersections at Grade) and Part 7 (Traffic Signals) should be used.

Ashburn Road

(f) The Developer shall construct roundabouts at the two locations where the proposed new Industrial Collector Street (Road 1) intersects with Ashburn Road. The design and configuration of these roundabouts shall be in accordance with a 60km/h design speed.

(g) The Developer shall construct a raised median (minimum 2.0 metres wide) along Ashburn Road between the eastern roundabout and the intersection of Ashburn Road / "Warrego Highway Access Road".

(h) The Developer shall configure the access for proposed Lot 1 along Ashburn Road for left-in and left-out movements only. This shall be supported by the construction of an island on the driveway of Lot 1 to restrict right turn movements out of this lot.

Ashburn Road / Warrego Highway On-ramp

(i) The Developer shall organise a Road Safety Audit (RSA) to be undertaken of the intersection of Ashburn Road / Warrego Highway on-ramp (in the vicinity of Duke Close and Earl Street) including its approach and departure legs (minimum 200 metres in each direction). The RSA shall be undertaken by a DMR accredited road safety auditor and provide recommendations on any improvements that are required to be undertaken at this intersection to improve its safety and operation. The RSA shall take into account the changes in traffic movements and vehicle types

generated by the development site, including the movement of B-double combination vehicles (26.0m in length). The RSA Report shall be submitted with the conceptual design plans for the roadworks along Ashburn Road.

(j) The Developer shall upgrade / reconfigure the intersection of Ashburn Road / Warrego Highway on-ramp (in the vicinity of Duke Close and Earl Street) to ensure the safe and efficient movement of the type and volumes of vehicles expected to use the intersection as a result of the development, including B-double Combination Vehicles (26.0m in length) and Higher Mass Limit Vehicles. The intersection upgrade shall be configured to ensure:

(i) A minimum design speed of 60km/h is achieved including safe intersection site distances (SISD);

(ii) Sufficient capacity of a minimum 10 year operating horizon (from the day the last plan of survey is signed over the development site);

(iii) The recommendations from the RSA are incorporated into the design; and

(iv) The requirements of DMR are met.

Works may include realignment, reprioritisation and/or the installation of traffic signals.

New Industrial Street

(k) The proposed new street that will provide access for Stage 1A and Stage1C shall be designed and constructed in accordance with Council's Standard for an industrial access street. Works shall include a concrete path (minimum 1.5 metres wide) on one side designed in accordance with Council's Standard Drawing SR.19. The path shall be on the same side as the street lights and its maximum longitudinal grade shall not exceed 1:8.

Bird Street

(l) The Developer shall construction kerb & channel along both sides of Bird Street. Works shall include stormwater infrastructure, driveway reconstruction, verge re-profiling and pavement infill in accordance with Council's requirements. These works shall be completed before the plan that creates the twelfth (12th) additional lot over the development site is signed by Council.

NOTE: As part of the development of a master plan for the Bremer Business Park in 2003 (and as outlined in Council's Preliminary Approval Decision Notice date 6 July 2004), the Developer at this time made a commitment to the community that certain works would be undertaken along Bird Street.

Conceptual Design Development & Approval

(m) The Developer shall organise for conceptual design plans of the roadworks outlined in this approval to be prepared by an RPEQ and then submit these plans to Council

for approval before detailed design commences. The conceptual design plans are to show:

(i) Horizontal and vertical geometry;
(ii) Intersection configurations;
(iii) Cross sections;
(iv) Pavement markings;
(v) Bus stops locations; and
(vi) Pedestrian refuge islands.

(n) The Developer shall organise the detailed planning and conceptual design plans for the proposed road linking the northern and southern areas of 'Citiswich' over the Warrego Highway ("North-South Link Road") to be prepared by an RPEQ before detailed design commences. The conceptual design plans for the 'North-South Link Road' shall:

(i) Meet geometric and sight distance standards for a minimum design speed of 70km/h and a maximum vertical grade of 5 percent;

(ii) Provide information relating to it's interface, interaction and impacts on the development site and Ashburn Road; and

(iii) Be submitted to Council for approval at the same time the conceptual design plans for Ashburn Road and the Ashburn Road / 'Warrego Highway Access Road intersection are submitted.

Main Roads Requirements

(o) If DMR modifies any of its conditions of approval and associated threshold triggers for roadworks (including addition and deletion) as outlined in their Referral Agency Response dated 25 March 2008:

(i) The Developer shall inform Council in writing with the relevant information within ten (10) business days of the DMR modification; and

(ii) Council reserves the right to reassess the suitability of all of the roadworks requirements and associated design parameters as outlined in Condition 12 (above) and revise the roadworks conditions accordingly including the possible addition of other conditions.

13. Local Area Traffic Management

(a) The Developer shall implement an integrated local area traffic management (LATM) scheme in the existing residential areas to the south and south-west of the development site, generally in the vicinity of Bognuda Street and Law Street. The parameters for the LATM Scheme are as follows:

(i) The LATM scheme shall be designed and approved by Council before the plan of survey that creates the twelfth (12th) additional lot over the development site is signed by Council;

(ii) The approved LATM Scheme shall be fully constructed and open to traffic either within two (2) years from the date the plan of survey that creates the first (1st) lot over the development site is signed by Council or within six (months) from the date the first Development Permit for Building Works over the site is issued (which ever threshold is triggered is earlier). Council may by agreement extend the period by which the LATM scheme has to be completed;

(iii) The LATM scheme shall include a comprehensive public consultation component in which the Developer must prepare and submit a 'Community Engagement Plan' for approval by the Council before the planning and design of the LATM Scheme commences;

(iv) The scope of the LATM Scheme shall be generally in accordance with that outlined in the Preliminary Approval for the Bremer Business Park (refer Condition 12 (a) (iii) of the Negotiated Decision Notice dated 6 July 2004 for ICC Development Application 3356/2002), subject to community consultation.

(v) The LATM Scheme shall be designed and constructed at no cost to Council.

(b) In lieu of Condition 13 (a) above, the Developer shall provide to Council a monetary contribution of AUD$670,000 towards the implementation of a future LATM scheme to the south and south-west of the development site.

This contribution shall be paid as a lump sum before the plan of survey that creates the first (1st) lot over the development site is signed by Council or paid in stages as follows:

(i) An amount of AUD $100,000 is payable to Council before the plan of survey that creates the first (1st) additional lot over the development site is signed by Council;

(ii) The balance is payable to Council before the plan of survey that creates the twelfth (12th) additional lot over the development site is signed by Council

The contribution amount (whether paid as a lump sum or in stages) is fixed for a period of twelve (12) months from the date of this Decision Notice and thereafter shall be calculated from the date of development approval to the date when payment is made in accordance with the Non-building Construction Cost Index (Queensland).

(c) The Developer shall inform Council in writing as to which option they intend to take with regard to satisfying Condition 13 before the plan of survey that creates the first (1st) additional lot over the development site is signed by Council.

14. <u>Access</u>

(a) Direct property access for proposed Lot 16 along Ashburn Street is not permitted. Vehicular access to and from proposed Lot 16 shall only be via the provision of a

southern leg to an upgraded intersection of Ashburn Road / 'Warrego Highway Access Road'.

Similarly, 'right of way' easements on Lots 1 and 2 SP 179307 shall be preserved (except where land common to these easements is dedicated as road reserve) and access to the respective allotments configured to co-aligned with Lot 16 public and private access road.

(b) Safe and efficient access to existing lots and associated land uses shall be maintained at all times during both the construction and operating stages of the development as well as during the construction of the relevant roadworks outlined in this approval.

(c) The Developer shall construct a public road, in accordance with Council Standards for an industrial access street, to provide continued access for Lot 7 SP167997 (located at Lot 7 Bognuda Street), Lot 1 SP179307 (located at 83 Bognuda Street) and Lot 5 SP140694 (located at 61 Ashburn Road). The new road shall be constructed from the intersection with the Lot 16 access extending to the eastern property boundary of the development site and connecting with the existing access.

(d) Vehicular access to and from proposed Lots 2, 9, 18 and 26 shall be via the proposed internal industrial access street (Road 1). Direct property access along Ashburn Street is NOT permitted for these allotments.

(e) Permanent heavy vehicle access for the development site shall NOT be via Bognuda Street south of Archer Street;

15. <u>Stormwater Quality Reporting</u>

(a) The Developer is requested to submit an amended Stormwater Quality Report to the Development Manager for approval incorporating comments made in the review by Ecological Engineering (dated 30 July 2007) and Healthy Waterways (dated 21 January 2008) to the *Bremer Business Park Masterplan - Stormwater Management Strategy Overall Site Masterplan* (prepared by Cardno Lawson Treloar, dated 8 March 2007) and the *Bremer Business Park Stage 1- Stormwater Management Strategy* (prepared by Cardno Lawson Treloar, dated 2 August 2007).

(b) The amended report shall suitably address all matters outlined in the two reviews and shall include a Stormwater Masterplan and stage-based reports, as well as the following:

(i) The Cardno Lawson Treloar Review(dated 2 August 2007) partially addresses the issue of implementation and timing of the regional water quality treatment measures, this shall be integrated into the Stormwater Masterplan, stage-based reports and detailed Operational Works drawings for both the lot-scale and regional-scale bioretention. Construction, establishment and maintenance of all bioretention is required to be in accordance with Section 5.5 of the WSUD TDG and the reports and drawings shall specify how stormwater treatment areas relate to the staging of civil works, building works and the staged implementation of landscaping.

(ii) The Developer shall support the proposed bioretention in the road network (as listed in the Information Response) by the provision of modelling and figures. Furthermore, the treatment in roads via biopods and small bioretention basins is strongly supported and shall be further explored in the amended reports and drawings.

(iii) The Masterplan shall set up the extent of reporting for subsequent applications and provide guidance on the sizing of treatment devices. Reference shall be made to the treatment performance curves (figures 5-3 to 5-5), of the WSUD TDG ensuring that at a minimum 2% of each site area is reserved for treatment. The reports for each individual industrial lots shall be a summary of the steps 1-9 (Section 5.3.1) of the WSUD TDG as they apply to each site. A detailed water quality model shall not be required for individual industrial sites except where the proposed train varies from the WSUD TDG or the approved masterplan.

(iv) The reports shall address the potential conflict with landscape screening requirements and the location of bioretention treatment areas ensuring that trees are not planted in bioretention treatment areas.

(v) Gross pollutant traps and stormfilters shall not be relied upon for nitrogen removal. These units shall only be installed to control gross pollutants, oils and greases within industrial sites. For regional treatment measures, above ground trash racks shall be used in place of these units.

(vi) The stage-based report shall set up the responsibilities of the water quality specialist/s which shall be employed to oversee bioretention basin construction.

(vii) A copy of the MU5IC sqz. file for both the Stormwater Management Strategy and Overall Site Masterplan and for each of the stage-based reports shall be provided to Council for assessment in conjunction with the first Operational Works application.

(viii) Where non-default pollutant reduction efficiencies are used in the modelling these shall be agreed upon by Council prior to modelling. For gross pollutant traps reduction efficiencies shall not exceed TSS 50%, TP 10% and TN 0% unless otherwise approved by Council prior to modelling.

(ix) The reports shall be accompanied by a point by point response to the aforementioned reviews by Healthy Waterways and Ecological Engineering as well as Council's concerns outlined in the above conditions.

(x) The Masterplan shall include a schedule which outlines the implementation timing of the regional water quality treatment measures associated with each stage.

(c) The amended reports shall be prepared by a suitably qualified and experienced professional in accordance with the Water Sensitive Urban Design Technical Design Guidelines (WSUD TDG) for South East Queensland (Healthy Waterways - Version 1 June 2006), and demonstrate through appropriate pollutant export modelling that stormwater will be treated on site to a standard which meets Council's stormwater quality concentration-based objectives and the load-based objectives for South East Queensland (TSS 80%, TP 60%, TN 45% and GP 90%).

(d) All detailed stormwater quality drawings shall detail amongst other necessary items the following requirements/amendments:

(i) Specify the depth and appropriate particle size diameter of the filter media, transitional layer and drainage layer. The transitional and drainage layers should not be included in the depth of filter media modelled. Biofiltration should consist of a filter media featuring a sandy loam layer (depth 0.3-0.8m, particle size 0.45mm); a transitional layer of coarse sand (depth 0.1-0.2m, particle size 1.0mm) and a drainage layer of coarse sand/gravel (depth 0.1-0.2m, particle size 2mm-20mm).

(ii) Slotted PVC pipes shall be spaced a maximum of 1.5m apart within the drainage layers. A minimum of two slotted PVC pipes shall be placed within the drainage layer of bioretention swales. Drainage shall be designed in accordance with Section 5.9.5 of the WSUD TDG.

(iii) Provide geofabric around the base of the drainage layer and the walls of the basin. Geofabric shall not be laid between any of the filter layers or used to wrap the slotted PVC drainage pipes.

(iv) Provide a riser with PVC cap at the head of each the slotted pipe for maintenance flushing. A cross section detail shall be shown on the plan. The drawings shall specify that risers are not to be slotted.

(v) Adequate scour protection and maintenance access shall be provided. Scour protection shall be in accordance with Section 5.3.3.1 of the WSUD TDG. Scour protection areas shall not be included in the total filter areas. A plan detail and cross section similar to Figure 5-6 of the Water Sensitive Urban Design Technical Design Guidelines (WSUDTDG) shall be detailed on the plans.

(vi) A suitable sediment fore bay shall be designed for each basin in accordance with Section 5.3.3.2 of the WSUD TDG ensuring that particles equal to or greater than 1mm in diameter are removed from the 3 month ARI storm event. Calculations shall be provided to demonstrate compliance with the guidelines.

(vii) A high flow bypass shall be incorporated into the design of each basin to ensure that only flows up to the 3 month ARI storm event are treated through bioretention treatment basins.

(viii) The plans shall refer to the guideline for Bioretention and Tree Pit Media Specifications, Facility for Advancing Water Biofiltration (FAWB) for the filter specifications and objectives and note that construction and testing of bioretention filter media shall be undertaken with the most current version (at the time of construction/testing) of this guideline.

(e) Where any stormwater treatment is proposed to be located in existing easements the Developer shall provide to Council evidence from the relative authority that consent has been granted to construct within the easement.

16. <u>Construction of Stormwater Treatment</u>

(a) All stormwater quality management treatments shall be fully constructed in accordance with the final approved *Stormwater Management Strategy Overall Site Masterplan, stage-based reports* and detailed Operational Works drawings.

(b) All regional scale treatment devices shall be fully operational prior to works being accepted on-maintenance.

(c) Construction, establishment and maintenance of all bioretention basins shall be carried out in accordance with Section 5.5 of the WSUD TDG. A staged implementation approach shall be employed for the bioretention areas ensuring that filter media is either laid after construction works have been completed or the filter is protected until the completion of any works.

(d) The Operational Works staging boundaries shall include adjacent regional scale stormwater treatment devices in accordance with the approved staging and implementation plan as required in Condition 12(d)(i) above.

(e) The Developer shall provide to Council certification from a suitably qualified water quality specialist to verify that all bioretention basins have been constructed in accordance with the approved reports and drawings. This shall include certification that the biofiltration filter media meet the criteria outlined in the most current version (at the time of testing), of the guideline for Bioretention and Tree Pit Media Specifications, Facility for Advancing Water Biofiltration (FAWB). The minimum parameters to be tested include: hydraulic conductivity, particle size distribution, organic matter content, pH, electrical conductivity and phosphorus concentration. Should filter media fail to meet these or other agreed criteria, suitable remedial measures shall be implemented by the Developer prior to the on-maintenance for regional scale bioretention basins.

17. <u>Stormwater Quality Maintenance Plans</u>

(a) The Developer shall prepare a detailed Stormwater Quality Maintenance Masterplan for the development which addresses both the regional and lot scale treatment devices for each stage. The Masterplan shall be submitted to the Development Manager for approval in conjunction with the first Operational Works application. The Masterplan shall:

(i) Outline requirements for Stage 1 in accordance with Appendix A – Stormwater Management Plan and Appendix B – Maintenance Plan of the *Bremer Business Park Stage 1- Stormwater Management Strategy* by Cardno Lawson Treloar (Report LJ8714/R5 and dated 2 August 2007) except where otherwise directed by Council. The Stormfilters mentioned in this report are not approved.

(ii) Outline requirements for construction, building and operational phases specifying the regular maintenance of the stormwater system (e.g. cleaning of gully pit filter baskets after storm events) along with the long-term management such as the replacement of the bio-retention filters.

(iii) At a minimum, include the following details:

- aims and objectives (including water quality and filter media parameters);
- regular maintenance – maintenance/inspection checklists for each device with comments on timing, frequency, data collection and non-compliance procedures;
- long-term maintenance – timing, frequency, data collection, filter and water quality testing, non-compliance procedures;
- describe how each maintenance action is to be carried out (including maintenance techniques, environmental management considerations, disposal requirements for polluted water and solid waste);
- management structure and responsibilities;
- record keeping and reporting;
- review and update;
- any relevant contractor contact information.

(b) The Stormwater Quality Maintenance Masterplan shall be prepared by a suitably qualified and experienced professional to the satisfaction of Council and utilise the maintenance checklists located in the Water Sensitive Urban Design Technical Design Guidelines (WSUD TDG) for South East Queensland (Healthy Waterways - Version 1 June 2006).

(f) The Stormwater Quality Maintenance Masterplan shall be implemented in perpetuity to the satisfaction of Council except for regional treatment devices which shall be maintained until accepted off maintenance. Regular inspection records shall be maintained on site and made available to Council upon request for both the construction and operational phases. All necessary improvements shall be made immediately upon awareness of any deficiencies in the system.

18. <u>Sewerage</u>

(a) The Developer shall provide a sewerage reticulation system with appropriate connection branches and external trunk works, designed so as to command the whole of each of the proposed allotments. The sewerage reticulation system and external trunk works shall be generally in accordance with, except where amended within this approval, Sewerage Planning Report prepared by Burchill ADM and dated September 2007.

(b) Concerning the timing of external trunk works, the developer shall construct pump station BBP1 and Line 04A extending from pump station SP5 to BP1 with any development of Stage 1. Commissioning and decommissioning of BBP1 and SP5 respectively shall be undertaken by Ipswich Water at full expense to the Developer. The Developer shall lodge a private works application to Ipswich Water for commissioning and decommissioning works.

(c) Pump station BBP1 building platform/compound shall be a minimum 500 m^2 and located at minimum RL 16.6m AHD.

(d) Where proposed sewer reticulation or trunk is located within an existing or future easement, the Developer is required to submit in conjunction with operational works application written consent from the respective easement owner (other than Council).

(e) All sewer pipes and rising mains shall be constructed from Vitreous Clay (VC) or similar material as approved by Ipswich Water. Synthetic type material (such as uPVC) is not permitted.

19. Water

(a) The Developer shall provide a reticulated water supply system together with valves and fire hydrants, in accordance with the "Guidelines for Planning and Design of Urban Water Supply Systems", which connects into Council's existing reticulation system.

(b) A blue, bi-directional raised reflective pavement marker (RRPM) shall be provided to all hydrants. The marker shall be installed in accordance with the Department of Main Roads Fire Hydrant Indication System Technical Guideline.

(c) All works on live water mains are to be carried out by Ipswich Water in accordance with Council's policy, and at the Developer's expense.

(d) Where concrete footpaths are to be constructed, the Developer shall provide 100 mm diameter conduits under the footpath and in line with the conduits under the road, for future ease of installing the individual water services. The letter "W" shall be embossed in the concrete to mark the location of the conduit.

(e) Sufficient stop valves shall be installed so that in the event of any break in the supply, the maximum number of lots to be without water is 20.

(f) The developer shall provide water mains on both sides of each applicable road, unless otherwise agreed to by Ipswich Water.

20. Stormwater Quantity

(a) The developer shall provide all necessary stormwater drainage (both internal and external to the development) and such drainage works (except for roofwater systems) shall be designed and constructed in accordance with QUDM such that the overall drainage system caters for a storm event with an ARI of 100 years.

Overland flow paths shall be suitably designed to cater for the water from a storm event with an ARI of 100 years. In the case where the piped system is carrying part of the flow, the overland flow paths shall be designed to cater for that volume which is represented by the difference between the predicted volume from the

storm event with an ARI of 100 years and the capacity of the pipe system, noting the requirements of QUDM.

(b) All stormwater flows within and adjacent to the Citiswich Area, other than inter-allotment drainage, shall be confined to dedicated roads, drainage reserves, registered drainage easements or within parkland. The registered drainage easements, if related to piped drainage, shall be centrally located over such underground pipe system and shall be not less than 4.0 m wide, except for drainage easements required for side boundaries which may be 3.0 m wide where approved by the Senior Development Engineer. In addition, the easements shall be of suitable width to contain the predicted overland flow from the storm event with an ARI of 100 years in that location.

(c) No ponding, concentration or redirection of stormwater shall occur onto adjoining land unless specifically approved by Council in consultation with the owner of the adjoining land.

(d) Due consideration shall be given in these and future designs and construction of the development in relation to the effect of the developed catchment flows on the downstream discharge receival areas. Suitable stormwater control devices are to be provided to ensure that there is no increase in flows in watercourses. Such control devices are to be designed so as to integrate the landscaping, recreational, infrastructural and drainage roles of watercourses. Notably the development shall limit the post-development peak one-year Average Recurrence Interval (ARI) event discharge to the receiving waterway to the pre-development peak one-year ARI discharge. Analysis of pre-development catchment hydrology shall assume current level of development rather than fully developed upstream catchment.

(e) There shall be no filling or removal of material in the flood area below the development flood line associated with an ARI of 20 years. There shall be minimal disturbance to vegetation in the flood area, unless prior written approval is obtained from Council.

(f) Filling in proposed Lots, which are adjacent to the watercourse shown on the proposal plan, shall not be undertaken without the written approval of Council.

(g) A suitable roofwater system shall be designed in accordance with QUDM, for allotments that do not have adequate fall from within the allotment to the design invert level of the kerb and channel or access to lawful discharge point. The design is to be to a minimum Level V in QUDM.

21. <u>Public Utilities</u>

(a) Adequate provision shall be made in all proposed road reserves, access strips, common areas and easements, to cater for the public utility services that would normally serve the development.

(b) The Developer shall provide appropriate road crossing conduits in accordance with Council's Standard Drawings SR.22, SR.23 and SR.24. Where concrete footpaths are to be constructed, the conduits shall be extended to the property boundaries.

(c) Street lighting shall be installed, for internal road and applicable frontages of Ashburn Road and Bognuda Street, by the Developer in accordance with the Australian Standard 1158.3.1 Table 1.1. All street lighting associated with the development shall be certified by a RPEQ. Street lighting shall be installed on the same side as concrete footpaths (where applicable).

(d) The Developer shall provide underground electricity/telecommunications within the development, constructed in the approved allocation as detailed in Council's standard drawings SR.22 and SR.23. Electricity and telecommunication drawings shall be coordinated with the civil engineering design documents, to ensure that service clashes are avoided.

(e) The Developer shall provide an Energex approved electrical reticulation layout plan. The electricity layout shall also be shown on the water reticulation layout plans.

(f) Prior to the commencement of use of the site, the Developer shall provide Council with a copy of an agreement with Energex for the supply of electricity to the development.

(g) Telephone and cable services may be laid in a combined trench with electricity cables, subject to the approval of Energex and the authorised telephone/cable service provider.

(h) The Developer shall make suitable arrangements for the provision of telephone and cable services to the Development. Documentary evidence that discussions have commenced with any authorised telephone/cable service provider, on the provision of telephone/cable services, shall be produced before the completion of the development.

22. <u>Erosion & Silt Management</u>

(a) The Developer shall prepare an Erosion and Sediment Control Plan (ESCP). The ESCP is to incorporate detailed drawings and a management plan which are to be continually revised subject to Council instruction, site conditions and different development stages particularly during the earthworks stage. Where any amendments are required further approval shall be received from Council. The Developer shall be responsible for the installation and maintenance of silt management facilities from the time of commencement of construction until the development has been released "Off Maintenance". All silt management facilities are to be in accordance with the document "Soil Erosion and Sediment Control" published by the Institution of Engineers Australia, or equivalent.

(b) A completed copy of the Brisbane City Council Erosion Hazard Assessment Checklist shall be submitted and used as the basis for determining appropriate erosion and sediment control measures.

(c) The design of sediment basins shall be in accordance with the current version of the Brisbane City Council Sediment Basin Design Construction and Maintenance

Guidelines. The Developer shall lodge the detailed calculations as required by steps 1-16 of Section 2 - *Design Procedure* along with detailed drawings.

(d) A Water Quality Testing strategy including the testing of baseline shall be undertaken as part of the ESCP.

(e) The ESCP shall be a flexible document which is designed to adapt to the staging of construction works.

(f) Suitable permanent stabilisation works will be required at stormwater outlets, above and below the culvert. Dumped rock will need to be pocket planted and a layer of geofabric laid below the rocks.

(g) Particular attention should be paid to batters around culverts and stormwater outlets with the aim to minimise to the greatest possible extent the slope of adjacent batters.

(h) All lots shall be 90% grassed prior to civil works being accepted off-maintenance and prior to signing the plan of survey.

(i) Silt traps shall be sited upstream from any park or reserve area discharge point preferably on land comprising future allotments, such that no silt impinges on the park or reserve areas. The silt trap areas may be phased out after the development work is complete and adequate grass cover is obtained.

(j) Diversion drains and ponds, as necessary, shall be installed on the site before any other work is undertaken on site to ensure that "dirty water" is contained and/or isolated.

(k) A procedure shall be submitted with the engineering drawings for approval for maintaining the facilities, setting out the frequency of attention, with inspections to be made after each significant rainfall event.

(l) Council reserves the right to enter the site for the purpose of rectifying any silt management facilities which it deems to be inadequate, improperly maintained or not operating in a satisfactory manner.

(m) The Developer shall lodge a $10, 000 siltation and erosion performance bond with Council, prior to the commencement of works, which shall only be released by Council at the termination of the maintenance period. Where Council determines that a draw-down of the bond is required, the Developer shall restore the bond to its full amount within 10 days of a notice from Council to that effect. Such bond shall guarantee adequate performance in the circumstances (i) and (ii) below:

(i) In the event that instructions issued to the Consulting Engineer by the Senior Development Engineer for the installation of erosion control measures, are not complied with within 24 hours, Council will call upon the bond to the extent required to carry out the necessary works.

(ii) If the Senior Development Engineer determines that silt damage has occurred on the site, or the downstream drainage system has become silted, the Developer shall be responsible for restoration. Such restoration shall be completed in the time determined by the Senior Development Engineer.

Should the Developer fail to complete the works determined by the Senior Development Engineer within the specified time, Council shall complete the work and recover all costs from the Developer associated with that work.

23. Operational Works – Municipal Works
(ie Works being handed over to Council)

(a) Plans relating to all civil engineering works shall be prepared and submitted for review by Council under the cover of Form 1 - Part A (Common details for all applications) and Form 1 - Part E (Planning Scheme Works). The plans shall show full construction details, layout dimensions, and finished surface levels and shall be submitted together with the appropriate fees for Council approval, prior to the commencement of construction on site.

(b) The Developer shall comply with the requirements of the documents entitled "Planning Scheme Policy 3 - General Works" and "Standard Drawings".

(c) All engineering drawings submitted to Council shall be in accordance with Council's Planning Scheme Policy 3 - General Works and Standard Drawings, and shall include as a minimum the following:

(i) Engineering drawings shall be marked as confirmation that they have been checked and approved by a RPEQ;

(ii) The drawings shall be submitted as four (4) hardcopy A3 size sets and two (2) hardcopy sets of any reports and supporting information. One set of plans shall be returned to the applicant with the Decision Notice.

The submission shall also include a Compact Disc containing electronic data as follows:

- One (1) full set of all engineering drawings contained in one file;
- Separate individual files containing layout plans for sewerage, water supply and drainage;
- Any reports submitted in support of the Application. Each report shall be included as a separate file;
- An index of all files on the Compact Disc including descriptions of contents of each file; and
- All files shall be submitted in PDF format.

(iii) A "Certificate of Design" shall be submitted by a RPEQ, certifying that the design is in accordance with all relevant engineering standards, Council's requirements and standards, relevant development conditions of approval, and sound engineering practice.

(d) Municipal works shall require a detailed design certified by a RPEQ, the design approved by Council Engineers with appropriate fees payable, a works pre-start meeting on-site and various detailed construction and audit inspections by Council Officers. A twelve month maintenance period is applicable for the works as well as the payment of a maintenance security deposit.

(e) All works shall be supervised by a RPEQ competent in civil works and shall be undertaken by a nominated principal contractor experienced in the construction of municipal works. Council reserves the right to request evidence of the principal contractor's competency. Should it be deemed by the Senior Development Engineer that the contractor does not have the necessary competency or has constructed substandard works for Council in the past, Council reserves the right to reject the nominated contractor.

(f) Municipal works shall be accepted "On Maintenance" prior to commencement of use. A maintenance bond equal to 5% of the construction cost (minimum of $1,000.00) shall be retained by Council for a minimum period of twelve months, or until such time as the works are accepted "Off Maintenance" by Council.

(g) "As Constructed" plans for municipal works shall be submitted to Council and approved prior to the formal acceptance of the works "On Maintenance". These plans shall be submitted electronically in PDF format, contained on a Compact Disk labelled appropriately to indicate the contents.

(h) On completion of the works a certificate shall be submitted to Council by a RPEQ certifying that the works have been constructed in accordance with Council's construction standards and in compliance with the approved plans and specification. It is expected that the RPEQ will undertake the necessary inspections to make this certification.

(i) Council reserves the right to require further amendments and/or additions at a later date, should design errors or omissions become apparent in regard to the works relevant to the Operational Works approval.

24. General

(a) All disturbed areas shall be graded, grassed and left in a mowable condition. The grass cover shall be obtained as early as possible during the development and an acceptable grass cover shall be achieved before the development can be accepted "Off Maintenance".

(b) Street name signs shall be manufactured to Council specifications and shall be erected in accordance with Council's Standard Drawing SR.26 at each intersection.

(c) With reference to any works, on land under other private ownership, written permission for the works shall be obtained and forwarded to Council. Similarly, written clearances shall be obtained after the works are completed, unless otherwise accepted by the Senior Development Engineer.

(d) All works required for this development shall take due regard of any and all existing services and, if considered necessary by the relevant authority or the Senior Development Engineer, such works shall be altered at the cost of the Developer.

(e) Any filling for a greater depth than 800 mm to provide for building platforms shall be conducted in accordance with Australian Standard 3798. Test results as required by Australian Standard 3798, and a certificate of quality and uniformity of fill shall be provided by a RPEQ. The level of responsibility shall be Level 1.

(f) A certificate from a RPEQ shall be issued to Council certifying that any retaining wall greater than 800 mm in height is structurally sound and capable of withstanding any likely surcharge loads. Retaining walls greater than 1 m in height are to be provided with railings or other barriers to provide pedestrian safety.

(g) Retaining walls shall be designed so that there are no imposed loads placed upon Council's underground services. This may include extending the footing to a level 300-mm below the invert of the pipe.

(h) Filling of gully areas if permitted shall be carried out strictly in accordance with Australian Standard 3798. Test results as required by Australian Standard 3798 and a certificate of quality and uniformity of fill, shall be provided by the Supervising RPEQ for all filled areas.

(i) For batters resulting from cutting and filling of the site and producing slopes greater than 1:6, Council requires a RPEQ to certify that they are stable and properly drained.

(j) If, after the preparation of detailed design plans for the various roads, it is found necessary to provide any additional road reserve area, or modify the proposed road reserves to enable the full requirements of Council's Standards, Queensland Streets, AMCORD and Austroads documents to be incorporated in any way, (but particularly in the production of the required speed environment or because of longitudinal and cross sectional constraints) then the estate layout plan shall be altered accordingly.

25. Fencing

A 1.8m high pool style fence or alternate fence design approved in writing by the Development Manager, is to be constructed on the common boundary of proposed Lots 1 – 23 and 23 - 25 and the drainage/parkland/buffer reserves.

26. Naming of Parkland

(a) The Developer shall submit a selection of three (3) alternative names for the park, to be considered by Council prior to lodgement of the plan of survey.

(b) The Developer shall erect a suitable park name sign to the satisfaction of the Development Manager.

27. Quality of Park Dedication

Land to be dedicated for park purposes shall be upgraded to the satisfaction of the Chief Operating Officer (Health, Parks and Recreation) as follows:

(a) Suitable embellishment is required to be provided in accordance with the Desired Standards of Service outlined in Part 5 of Council's Planning Scheme Policy 3 – *General Works.*

(b) Declared plants, environmental weeds and rubbish shall be removed;

(c) Dead trees shall be removed and dangerous trees made safe within 10 m of proposed pathways or playgrounds;

(d) All rubbish shall be removed from parkland;

(e) Parkland shall be freely and safely drained;

(f) All playground equipment and park furniture shall meet Australian Standards both in supply and installation;

(g) No overburden or spoil shall be pushed or deposited into parkland;

(h) Water / sewer / power service shall be provided to the proposed park; and

28. Irrigation to Footpaths

Irrigation to streetscape works is not permitted on a permanent basis. Temporary irrigation systems used for vegetation establishment may be approved by the Conservation, Parks and Sport Manager subject to their removal prior to the on maintenance inspection. Such irrigation shall include all necessary devices to prevent contamination of the water supply.

29. Other Streetscape and Temporary Works

Authorisation for temporary landscaping treatments and / or features shall be obtained from the Chief Operating Officer (Health, Parks and Recreation), and a bond lodged for their removal. Such special treatment / features shall be removed by the Developer, and the site remediated, prior to the streetscape on maintenance inspection.

30. Compliance with Conditions

(a) Unless otherwise stated all conditions shall be completed prior to signing of the relevant plan of survey or as determined by the Development Manager.

(b) All conditions shall be completed to the satisfaction of the Development Manager.

31. When Approval Takes Effect

This approval has effect in accordance with the provisions of Section 3.5.19 of the *Integrated Planning Act 1997* as follows:

The Building and Construction Industry (Portable Long Service Leave) Levy must be paid prior to the issue of a development permit where one is required for the 'Building and Construction Industry'. This applies to Building Works, Operational Works and Plumbing and Drainage Works applications, as defined under the Integrated Planning Act 1997, where the works are $80 000 or more and matching the definition of 'Building and Construction Industry' under the Building and Construction Industry (Portable Long Service Leave) Act 1991.

Council will not be able to issue an Operational Works Decision Notice without receipt of details that the Levy has been paid. Should you require clarification in regard to the amendments to the Building and Construction Industry (Portable Long Service Leave) Act 1991, you should contact QLeave on 1800 803 481 (free call) or [redacted].

2. High Water Demand

The Developer should consider the implications of water restrictions during the construction of the proposal and in consideration of the requirements of the above conditions. It should be specifically noted that this approval does not permit the Developer to use the potable water supply for the development of the site.

On 15 August 2007 Council introduced its *Policy For Installation Of Electronic Water Meters To Commercial, Industrial And Large Multi-Residential Properties*. This policy states that:

All new commercial, industrial or large multi-residential property connections with a projected annual consumption greater than or equal to 20,000 kL shall include, at the customers expense, an electronic water meter with data logger and an approved back-to-base communication system as specified by Ipswich Water.

Properties with electranic water meters shall be subject to billing on a monthly basis in accordance with the metered monthly consumption.

If, in the opinion of the Senior Development Engineer, a proposed development is likely to have an annual water consumption equal to or greater than 20,000 kL, the Developer will be required to contact Ipswich Water on 3810 7855 to arrange installation of electronic flow meter(s).

3. Amended Masterplan

(a) The proposed development and future stages shall be generally in accordance with the Master Staging Plan – Citiswich (prepared by B & P Survey Consulting Surveyors, dated 11 March 2008) with the following amendments and clarifications, as marked on the attached plan:

(i) The Developer shall remove the proposed cul-de-sac from within Stage 4C as indicated in black on the "Master Staging Plan – Citiswich";

(i) Additional road frontage to parkland shall be provided for Stages 4, 5 and 7 as indicated in black on the "Master Staging Plan – Citiswich";

(iii) An indicative subdivision layout should be provided for Stage 6 and the land to the west of Stage 6 to ensure that both Stage 6 and the adjoining land can be developed in an orderly fashion. The indicative layout should ensure that both site's integrate in terms of pedestrian and vehicle linkages;

(iv) Additional 5000m^2 Local (Level 3) Recreation Park is required to service the need of local residents in Stage 6 (Refer to Ipswich Planning Scheme Desired Standards of Service);

An amended Master Plan shall be submitted to Council for approval prior to any application be lodged for Stage 2.

Note: Please contact Council for additional details relating to the items listed above.

4. Advise to Purchasers

The Developer shall provide the purchaser of each industrial lot a copy of the Building Envelope Plan and WSUD TDG Design Assessment Checklist and Calculation Summary Checklist to demonstrate that the bioretention basins are designed in accordance with the guideline and the approved Stormwater Masterplan.

5. Fire Ants

In accordance with the *Plant Protection Act 1989* and the Plant Protection Regulation 1990, a quarantine notice has been issued for the State of Queensland to prevent the spread of the Red Imported Fire Ant (ant species Solenopsis invicta) and to eradicate it from the State.
It is the legal obligation of the land owner or any consultant or contractor employed by the land owner to report the presence or suspicion of Fire Ants to the Queensland Department of Primary Industries on 132523 within 24 hours of becoming aware of the presence or suspicion, and to advise in writing within seven days to:

Director General
Department of Primary Industries
GPO Box 46, Brisbane QLD 4001

It should be noted that the movement of Fire Ants is prohibited, unless under the conditions of a Department of Primary Industries Inspectors Approval. More information can be obtained from the Queensland Department of Primary Industries website www.dpi.qld.gov.au.

The development approved herein, by its very nature, includes activities considered to be "high risk" in respect of controlling the spread of Fire Ants. The following lists show high risk activities and some precautions should be considered for implementation.

(a) High risk activities can include:

(i) Earthworks of a minor or major scale;

(ii) Revegetation or rehabilitation;

(iii) Import of fill onto a site;

(iv) Export of fill or other materials such as soils, gravel, mulch and plants; and

(v) Export off or import on to a site of construction and demolition waste and materials or green waste.

(b) Precautions for implementation

(i) Checking for ants regularly;

(ii) Checking all soil, fill and waste materials (construction and green waste) for ants;

(iii) Asking questions about the quality and source of soil, fill and waste materials (construction and green waste);

(iv) Keeping records of all movements of soil, fill and waste materials (construction and green waste);

(v) Cleaning of all earthmoving or other soiled vehicles prior to exit from the site; and

(vi) Informing staff and contractors about these precautions.

6. Infrastructure Agreement

The subject approval does not preclude Council and the Developer from entering into an Infrastructure Agreement at some time in the future.

C. A copy of this decision be forwarded to the following referral agencies:

(a) Contaminated Land Unit
Environmental Protection Agency
GPO Box 2771
BRISBANE QLD 4001

(b) District Director
Metropolitan District Office
Department of Main Roads
P O Box 70
SPRING HILL QLD 4004

(c) Principal Manager
Transport Planning Branch
Queensland Transport

GPO Box 213
BRISBANE QLD 4001

(d) South East Region - Beenleigh
Department of Natural Resources and Water
PO Box 1164
BEENLEIGH QLD 4207

(e) Powerlink
PO Box 1193
VIRGINIA QLD 4014

[redacted]
ACTING ASSISTANT DEVELOPMENT MANAGER

I have this day adopted the recommendation specified in this report.

Such action was taken pursuant to the delegation entitled "Determination of a Development Application, including Negotiated Decisions" granted to me by the Chief Executive Officer dated 16 August 2001 and 22 August 2001.

For [redacted]

[redacted]
ACTING DEVELOPMENT MANAGER

Date: 22/4/08

Ipswich City Council

Assessment Checklist

Code Assessable Development

A. Application Details

Appln No.: **1837/07** Division: **4**

B. Preamble Assessment

1.	Are the real property description and location details provided on the Application Form correct?	Yes	No
2.	Has the 'consent of owner' been correctly obtained?	Yes	No
3.	Has the correct fee been paid?	Yes	No

C. Supporting Information

1.	(a) Was any supporting material lodged with the application?	Yes	No	
	Comment:			
	(b) Are there any planning issues associated with this material?	Yes	No	
2.	(a) Is there a need for an Information Request?	Yes	No	
	Comment:			
	(b) Are there any outstanding issues associated with the Information Response?	Yes	No	N/A
	Comment:			

D. Referral / Advice Agencies

1. Are there any referral or advice agencies applicable to this development? Comment:	Yes	No	
2. Are there any issues associated with advice received from a Referral / Advice Agency?	Yes	No	N/A

E. State Planning Policies (SPP's)

1. Are there any SPP's applicable to this development?	Yes	No	
2. Does the development comply with any relevant SPP's?	Yes	No	N/A

F. Zone Code

1. What is the relevant zone code(s) for this development?			
2. (a) Does the development require Code assessment under the relevant assessment table for the zone? Comment:	Yes	No	
3. (a) Are there any overall or specific outcomes for the locality which apply to the development? Comment:	Yes	No	
(b) Does the development comply with any relevant overall or specific outcomes for the locality?	Yes	No	N/A
4. Does the development comply with the overall outcomes for the zone?	Yes	No	N/A

F. Zone Code			
5. Does the development comply with the "Effects of Development – General" (including the specific outcomes and any applicable probable solutions or acceptable solutions) for the zone?	Yes	No	N/A
6. (a) Are there any Sub Area or Precinct provisions within the zone which apply to this development? Comment:	Yes	No	
(b) Does the development comply with these provisions?	Yes	No	N/A

G. Codes for a Stated Purpose or of a Stated Type (refer Part 12 of the Planning Scheme)			
1. Are there any codes under Part 12 of the Planning Scheme applicable to the development? Comment:	Yes	No	
2. Does the development comply with these codes?	Yes	No	N/A

H. Overlays (refer Part 11 of the Planning Scheme)			
1. (a) Is the site affected by a Character Places Overlay? Comment:	Yes	No	
(b) Is the assessment category changed (refer Table 11.3.2)?	Yes	No	N/A
(c) Does the development comply with the Character Places Overlay Code and the Character Code?	Yes	No	N/A
2. (a) Is the site affected by a Development Constraints Overlay? Comment:	Yes	No	

H. Overlays (refer Part 11 of the Planning Scheme)			
(b) Is the assessment category changed (refer Table 11.4.3 and 11.4.4)? Comment:	Yes	No	N/A
(c) Does the development comply with the relevant provisions of the Development Constraints Overlay Code?	Yes	No	N/A

I. Other Relevant Matters			
1. (a) Are there any Planning Scheme Policy provisions which specifically apply to this development? Comment:	Yes	No	
(b) Does the development comply with these provisions?	Yes	No	N/A
2. (a) Are there any Implementation Guidelines which specifically apply to this development?	Yes	No	
(b) Does the development comply with these Guidelines?	Yes	No	N/A
3. Are there any other relevant matters which pertain to this development? Comment:	Yes	No	N/A
4. Infrastructure Contributions – Calculation Sheet attached to this checklist?	Yes	No	N/A

J. Summary	
1. Recommended for:	Approval - Subject to Conditions Refusal Part Refusal / Part Approval -Subject to conditions
2. Comment:	

[redacted]
ACTING ASSISTANT DEVELOPMENT MANAGER

for. [redacted]

[redacted]
ACTING DEVELOPMENT MANAGER

MAIL PUBLIC.
COLLECTED 22-4-08

Your reference
Our reference 1837/07 NH:MM
Contact Officer [redacted]
Telephone

City of Ipswich

Ipswich City Council

45 Roderick St
PO Box 191
Ipswich QLD 4305
Australia

Tel [redacted]
Fax
Email
Web www.ipswich.qld.gov.au

Walker Corporation Pty Ltd
(Attn: [redacted]
C/- Planning Initiatives
PO Box 1774
NEW FARM QLD 4005

22 April 2008

INTEGRATED PLANNING ACT 1997

DEVELOPMENT APPLICATION DECISION NOTICE

Application Details

Application No:	1837/07
Real Property Description:	Lot 13 on SL 2982, Lot 34 on SL 3911 & Lot 2 on SP 179307
Property Location:	120 Bognuda Street,Bundamba & 2-50, 51 Ashburn Road, Bundamba
Names and Addresses of all Referral Agencies:	Contaminated Land Unit Environmental Protection Agency GPO Box 2771 BRISBANE QLD 4001 District Director Metropolitan District Office Department of Main Roads P O Box 70 SPRING HILL QLD 4004 Principal Manager Transport Planning Branch Queensland Transport GPO Box 213 BRISBANE QLD 4001

SCANNED
DEVELOPMENT BRANCH
23 APR 2008
Doc No: 3093013

South East Region - Beenleigh
Department of Natural Resources and Water
PO Box 1164
BEENLEIGH QLD 4207

Powerlink
PO Box 1193
VIRGINIA QLD 4014

Decision Date: 22 April 2008

Decision: Approved subject to the conditions detailed below.

Decision Authority: Acting Development Manager

Approval Details:

Proposal	Development	Decision	Approval Type
Three (3) Lots into 25 Lots and 3 balance lots	Reconfiguring a lot	Approved	Development Permit.

Further Development Permits Required

Further Development Permits, as required by the *Integrated Planning Act 1997,* shall be obtained in respect of any Material Change of Use, Operational Works, Building Works and Plumbing Works in relation to this approval before any such works are commenced.

Conditions

Assessment Manager (Ipswich City Council)

Conditions applicable to this approval under Integrated Planning Act:

1. Basis of Approval

   Subject to these conditions, the facts and circumstances set out in the application and all relevant Council Local Laws and/or Planning Scheme Policies and the Bremer Business Park Preliminary Approval (dated 30 June 2004) shall be adhered to.

2. Minor Alterations

   Notwithstanding the requirements detailed in this approval, any other minor alterations and/or modifications acceptable to the Development Manager will suffice.

3. Plan of Survey

(a) The Developer shall submit a plan of survey to generally conform with Proposed "Citiswich" Development at Ipswich April 2008 Drawing No. QC00-3632:00:SK.116 (prepared by Burhcill VDM Consulting Engineers and Planners) with the following exception:

(i) Proposed Lots 15, 16 & 17 shall be incorporated into a balance lot until such time as the detailed planning and conceptual design drawings for the road network are finalised and approved by Council, in particular the road linking the northern and southern areas of Citiswich over the Warrego Highway ("North-South Link Road").

(b) The Developer shall grant, free of cost to or compensation payable by Council, minimum 4.0 m wide easements located centrally over proposed and existing stormwater drains, water mains and sewerage rising mains, where they are located within private property.

The documentation associated with these easements may be prepared by the Developer in a form satisfactory to Council's City Solicitor, or the Developer may submit easement plans, only where Council is party to the easements, to Council for the preparation of easement documents at the Developer's expense.

(c) Easements required for discharge of stormwater over adjacent land shall be agreed to in writing by the owner of the subject land prior to construction work commencing.

(d) Easements shall be centrally located over the alignment of stormwater paths and be of a width sufficient to encompass the overland flow from a storm event with an ARI of 100 years.

(e) Easements shall be of sufficient width to contain any fitting, access chamber etc located on stormwater drains, water mains, and sewerage rising mains.

(f) All pre-existing easements crossing the site shall be pegged where they cross each property boundary and at every change of direction.

(g) Adequate permanent survey marks shall be installed. The Developer shall submit a certificate signed by a cadastral surveyor, stating that after the completion of all works associated with the development, permanent survey marks are in their correct position, in accordance with the plan of survey.

(h) Land required for detention basins or equivalent are to be dedicated as drainage reserve in favour of Council and not included within parkland dedication unless approved as parkland by Council.

(i) Land required for open space shall be dedicated, free of cost to and compensation by Council, in fee simple at the time of registration of a plan of survey for any part of the land adjoining the area to be dedicated and in accordance with the plan approved pursuant to Condition 5: Landscaping and Rehabilitation.

(j) The proposed Archer Street Active Recreation Park for dedication shall meet the desired standards of service for "Local-Recreation Parkland" as per the current Ipswich Planning Scheme.

3. Building Envelope Plan

The Developer shall submit a Building Envelope Plan to the Development Manager for approval prior to signing the relevant plan of survey. The Building Envelope Plan shall nominate that no works/storage are permitted within the twelve (12) metre landscape buffer to the Warrego Highway, amongst other matters.

4. Proposed Stages For Reconfiguration

The staging of the reconfiguration shall be in accordance with the approved plans and shall be as follows:

Stage 1A	Proposed Lots 1 to 11 (11 lots)
Stage 1B	Proposed Lots 12 to 14 (3 lots)
Stage 1C	Proposed Lots 18 to 28 (11 lots)

5. Rates in Arrears

In accordance with the provisions of the *Integrated Planning Act 1997*, all rates and other expenses as a charge against the land shall not be in arrears at the date of signing of the plan of survey.

6. Hours of Construction

Unless otherwise determined in writing by the Development Manager hours of construction shall be:

Monday to Saturday 6.30 a.m. to 6.30 p.m.

Work or business shall not be conducted from or on the premises outside the above hours or on Sundays or public holidays.

7. Locality References

(a) Any place name or estate name used by the developer (excluding a reference to a building, structure or the like and excluding minor, subsidiary signage within a development) shall make reference to the relevant, approved place name under the *Place Names Act 1994* in a contrasting colour and in lettering no less than 50% of the Estate name.

(b) Any reference to the regional location of the site or the development shall not refer to the place or estate as being located in Brisbane or a Brisbane suburb or in the metropolitan area or in the western suburbs (excluding the western suburbs of Ipswich as determined by Council in writing from time to time).

8. Road Naming

The Developer may submit to Council a list of proposed street names and the corresponding name meanings for the new road(s) to be opened. The proposed names should normally be submitted as part of the Operational Works application. Should a theme be considered appropriate, the theme should be submitted at the same time. Council reserves the right to accept any or none of the proposed names.

9. Contributions

In accordance with the relevant Planning Scheme Policies, the Developer shall pay, prior to Council signing the plan of survey, the monies as outlined in Appendix 1 to Council:-

Calculations of headworks and contributions are based on the infrastructure contribution policies and rates applicable at the date the development application was determined by Council. The contributions above shall be applicable for a period of twelve (12) months from the date of the development approval, and thereafter shall be based on the infrastructure contribution policies and rates applicable at the date when payment is made.

10. Landscaping and Rehabilitation

(a) The Developer shall undertake landscaping and rehabilitation generally in accordance with the Bremer Business Park Open Space Master Plan by Anembo Consultants (Dated 8 March 2007) except where otherwise indicated in this Decision Notice.

(b) The Developer shall submit a Landscaping and Rehabilitation Masterplan for the whole development to be prepared by a corporate member of Australian Institute of Landscape Architects or other approved licensed landscape architect. The Landscaping and Rehabilitation Masterplan shall take account of the requested amendments to the Master Staging Plan – Citiswich and shall be submitted to the Development Manager for approval in conjunction with the first civil Operational Works application. The Landscaping and Rehabilitation Masterplan shall include a Master Recreation Strategy, a Master Streetscape Strategy, a Master Stormwater Quality Treatment Strategy, a Master Bushland Rehabilitation Strategy and a Master Cultural Heritage Strategy (as per Condition 8 of the Negotiated Decision Notice dated 6 July 2004 for ICC Development Application 3356/2002). The Landscaping and Rehabilitation Masterplan shall also identify what works relate to each civil works stage including pedestrian/cycle paths and parkland embellishments. The extent of information required in this Masterplan and future landscape applications shall be agreed upon with Council prior to lodgement of any further landscape plans. The following matters should be considered in preparing the plan:

(i) The Warrego Highway buffer shall be planted with ex-ground fig trees. Jute matting may be required to be used for stabilisation to the satisfaction of Council depending on the final approved batter.

(ii) Areas for remediation and rehabilitation shall be identified and treatment strategies outlined. Unless approved for stormwater treatment, active open space or bushfire management, all other areas of parkland and drainage reserve shall be remediated and rehabilitated to a natural bushland setting in accordance with the species outlined in the *Ipswich City Council Vegetation Communities Rehabilitation Guide 2 and 4*, locally endemic species and native flora observed on site.

(iii) All declared weeds, environmental weeds, and exotic pests shall be removed from the site to the greatest extent practicable. A staged rehabilitation approach shall be adopted to ensure that any habitat values provided by the exotic species is gradually replaced by natives and rehabilitation works do not cause erosion. Any areas which are disturbed as a result of weed control shall be rehabilitated with native species.

(iv) The plans shall make provision for the placement of rocks and logs (which can be relocated from cleared areas), into the Bremer River Park and Eastern Forest Park to compensate for the loss of fauna habitat. The plan shall indicate the stockpile location and indicate the quantity and general relocation areas.

(v) A series of different sized nest boxes shall be installed which include a range of sizes and configurations up to an including Greater Glider size. The number and location of nest boxes shall be included on the detailed rehabilitation plans.

(vi) Rehabilitation shall consider the need for maintenance access to the power easement and minimum separation distances to transmission lines. Maintenance paths shall be suitably stabilised to the satisfaction of Council. Species to be planted below the transmission lines shall consist of species which do not grow greater than 3.5 metres in height at maturity or as otherwise stipulated by the relevant power authority.

(vii) Rehabilitation areas shall be planted at a minimum of one (1) plant per square metre taking into consideration existing native vegetation. For slopes greater than one (1) in six (6) a denser planting schedule will be required. Any stormwater treatment devices which require planting shall be planted in accordance with the species and densities outlined in the Water Sensitive Urban Design Technical Design Guidelines for South East Queensland. Only waterwise, drought tolerant natives shall be used consisting preferably of locally occurring species.

(viii) The plans shall demonstrate suitable stabilisation and screening around stormwater outlets and culverts. Dense planting will be required on the steep batters around culverts and pocket planting used in areas of dumped rock to inhibit weed growth.

(ix) Street Trees shall be provided in accordance with the Ipswich City Council Street Tree Strategy.

(x) All exposed culvert/wingwall surfaces shall be suitably treated to avoid exposed concrete surfaces.

(xi) Suitable embellishment in the formal park areas are required to be specified in accordance with the Desired Standards of Service outlined in Part 5 of Council's Planning Scheme Policy 3 – General Works.

(xii) The location of footpaths and cycle paths.

(c) Stage 1 streetscape and landscape works shall be undertaken generally in accordance with the following plans:

(i) General Notes Legend, Site Location Dwg Schedule and Sheet Layout Plan Dwg. No: LD01, Sheet 1 of 17, Revision A (prepared by Anembo Consultants, dated 1 August 2007);

(ii) Details and Plant Schedule Plan Dwg. No: LD02, Sheet 2 of 17, Revision A (prepared by Anembo Consultants, dated 1 August 2007);

(iii) Landscape Plan Dwg. No: LP01, Sheet 3 of 17, Revision A (prepared by Anembo Consultants, dated 1 August 2007);

(iv) Landscape Plan Dwg. No: LP02, Sheet 4 of 17, Revision A (prepared by Anembo Consultants, dated 1 August 2007);

(v) Landscape Plan Dwg. No: LP03, Sheet 5 of 17, Revision A (prepared by Anembo Consultants, dated 1 August 2007);

(vi) Landscape Plan Dwg. No: LP04, Sheet 6 of 17, Revision A (prepared by Anembo Consultants, dated 1 August 2007);

(vii) Landscape Plan Dwg. No: LP05, Sheet 7 of 17, Revision A (prepared by Anembo Consultants, dated 1 August 2007);

(viii) Landscape Plan Dwg. No: LP06, Sheet 8 of 17, Revision A (prepared by Anembo Consultants, dated 1 August 2007);

(ix) Landscape Plan Dwg. No: LP07, Sheet 9 of 17, Revision A (prepared by Anembo Consultants, dated 1 August 2007);

(x) Landscape Plan Dwg. No: LP08, Sheet 10 of 17, Revision A (prepared by Anembo Consultants, dated 1 August 2007);

(xi) Landscape Plan Dwg. No: LP09, Sheet 11 of 17, Revision A (prepared by Anembo Consultants, dated 1 August 2007);

(xii) Landscape Plan Dwg. No: LP010, Sheet 12 of 17, Revision A (prepared by Anembo Consultants, dated 1 August 2007);

(xiii) Landscape Plan Dwg. No: LP011, Sheet 13 of 17, Revision A (prepared by Anembo Consultants, dated 1 August 2007);

(xiv) Landscape Plan Dwg. No: LP012, Sheet 14 of 17, Revision A (prepared by Anembo Consultants, dated 1 August 2007);

(xv) Landscape Plan Dwg. No: LP013, Sheet 15 of 17, Revision A (prepared by Anembo Consultants, dated 1 August 2007);

(xvi) Landscape Plan Dwg. No: LP014, Sheet 16 of 17, Revision A (prepared by Anembo Consultants, dated 1 August 2007); and

(xvii) Landscape Plan Dwg. No: LP015, Sheet 17 of 17, Revision A (prepared by Anembo Consultants, dated 1 August 2007) incorporating a minimum width of 4 metres for the Turfed Maintenance Path.

(d) The Developer shall ensure all cultivation, planting detail and garden edging shall be in accordance with Parks Standard Drawing SP.06, Ipswich Standard Drawing SP.20 and Ipswich Standard Drawing Timber Log Edge SP. 23.

(e) The Developer shall submit to the Development Manager for approval separate detailed plans for stormwater treatment devices in Stage 1.

(f) The Developer shall complete all approved landscaping and rehabilitation works for the parkland, drainage corridors and streetscape to the satisfaction of the Development Manager prior to the plan sealing of the adjacent stage.

(g) The Developer shall submit to Council a Certificate of Compliance – Landscape Works (Appendix 3 of Planning Scheme Policy 3 – General Works), which shall be signed by a corporate member of Australian Institute of Landscape Architects or other approved licensed landscape architect prior to Council signing the plan of survey to certify all landscape works have been completed in accordance with the approved plans.

11. Engineering Requirements

The following engineering requirements, detailed in Conditions 12 – 24, shall be completed to the satisfaction of the Senior Development Engineer.

Terms

(a) RPEQ - A Registered Professional Engineer of Queensland, suitably qualified and experienced in the particular area of expertise required. Furthermore, the RPEQ required for the analysis and reporting for mining shall be experienced in the analysis of underground and surface mining within the Ipswich area.

(b) QUDM - The Queensland Urban Drainage Manual, produced by the Queensland Department of Primary Industries.

(c) DMR – Queensland Department of Main Roads.

(d) MUTCD - The Manual of Uniform Traffic Control Devices, published by DMR.

(e) Ipswich Water - Commercial Business Unit of Ipswich City Council providing water and sewerage services.

(f) DNRM - Department of Natural Resources and Mines.

12. Roadworks

General

(a) All roadworks included in this approval shall be designed and constructed:

(i) As public roads;

(ii) At no cost to Council;

(iii) To ensure that the carriageway width, geometry, design speed and other attributes are consistent with the function of the road or street in the road hierarchy;

(iv) In accordance with Ipswich Planning Scheme Policy 3 - General Works, Council Standards and the DMR Road Planning & Design Manual (or other relevant documentation agreed by Council);

(v) With stormwater drainage infrastructure designed in accordance with Council's Planning Scheme Policy 3 – General Works, Queensland Urban Drainage Manual and the Department of Main Roads Drainage Design Manual, in that order of precedence;

(vi) For the safe and efficient movement of B-double combination vehicles (26.0 metres in length) and Higher Mass Limit Vehicles (including u-turn manoeuvres where required). This includes those roadworks to be undertaken by the Developer as specified by DMR in their referral agency response dated 25 March 2008.

(vii) With street lighting and route lighting installed in accordance with the relevant Australian Standards and Energex public lighting standards. The lighting shall be provided in accordance with the requirements for Energex Rate 3 lighting;

(viii) To include the relocation and protection of existing public utility services required in association with the roadworks at no cost to Council;

(ix) To include the installation of new public utility services to service land subject of this approval;

(x) To ensure access to existing properties is maintained at all times; and

(xi) With all medians, verges and batters topsoiled, turfed and landscaped generally in accordance with Council's Street Tree Planting Guidelines and the approved landscape master plan for the development site.

(xii) With kerb ramps (in accordance with Council's Standard Drawing SR.18) at all intersections and at additional locations where required to connect future path networks and pedestrian crossing points. Generally at "T" intersections, six kerb ramps are required.

"Hoepner Road Extension"

(b) The Developer shall construct / extend Hoepner Road from the southern end of the existing constructed road to Brisbane Road. The "Hoepner Road Extension" shall:

(i) Function as an industrial collector road and as such the design and construction of this road shall satisfy this intent and function and be generally consistent with Council's Standard Drawings;

(ii) Intersect with Brisbane Road in the vicinity of Whitwood Street and be controlled by traffic signals;

(iii) Include traffic signals at the intersection of Ashburn Road / Hoepner Road configured to provide sufficient capacity for a minimum operating horizon of 10 years from the date the last plan of survey of the development site is signed by Council;

(iv) Be designed and configured for a 70km/h design speed;

(v) Be fully constructed, on-maintenance in accordance with the Ipswich Planning Scheme and open to traffic at the following times (whichever is earlier):

- Before Council signs the plan of survey that creates the twelfth (12th) additional lot over the development site; and

- Within two (2) years from the date the plan of survey is signed that creates the first (1st) additional lot over the development site.

(c) Prior to the Council signing the plan of survey that creates the first (1st) additional lot over the development site, the following matters shall be completed:

(i) A Development Permit for Operational Works for the "Hoepner Road Extension" shall be lodged with and approved by Council;

(ii) All land required for the construction of the "Hoepner Road Extension", including its intersection with Brisbane Road and Whitwood Road, is owned by Council, the Department of Main Roads or the Developer or is dedicated road (except for the crossing over the railway corridor);

(iii) The Developer has provided Council with a bond to the value of 125% of the construction cost. As such, the Developer shall provide a preliminary cost estaimte for the 'Hopener Road Extension', including a schedule of rates and quanatities, before the Development Permit for Operational Works for the Hoepner Road Extension is issued ; and

(iv) The Developer has entered into a legal agreement with Council stipulating the Developer's construction obligations for the "Hoepner Road Extension".

Site Frontage Works

(d) The Developer shall reconstruct and upgrade Ashburn Road, Bognuda Street and the 'Warrego Highway Access Road' along the frontages of the development site (including any 'balance' or 'project' lots) in accordance with Council's Standards for an industrial collector street. The design and configuration of each road shall include:

(i) Geometry and sight distances for a 70km/h design speed;

(ii) A nominal 14.0m wide carriageway on a nominal 22.0m road reserve (wider at intersections and where a divided carriageway is required). This will require a dedication of land from one or both sides of the development site's frontages to these roads;

(iii) Concrete kerb and channel on both sides (Type B1 with an additional 50mm thickness) plus associated stormwater drainage infrastructure (designed in accordance with Council's Planning Scheme Policy 3 – General Works, QUDM and the DMR Drainage Design Manual, in that order of precedence).

(iv) Concrete paths (minimum 2.0m wide) on both sides, with kerb ramps designed in accordance with ICC Standard Drawing SR.19;

(v) Edge lines and 'bicycle awareness zones' marked on the carriageway;

(vi) Signs and pavement markings in accordance with the MUTCD including 60km/h speed limit signs and "No Stopping" Signs;

(iv) Pedestrian refuge islands provided at the following locations:

- Ashburn Road between the proposed intersections with the internal industrial access street (Road 1) in the vicinity of proposed Lots 10, 11, 13 & 14); and

- Bognuda Street between Ashburn Road and Archer Street in the vicinity of proposed Lot 28.

Each pedestrian refuge island shall be designed and constructed in accordance with the MUTCD (Figure 4 of Part 10) including signs, pavement markings, lighting and kerb ramps (designed in accordance with ICC Standard Drawing SR.19). The pedestrian refuge islands shall be positioned to ensure driveway access to adjacent lots will not be impeded in the future;

(vii) Bus stops, and associated infrastructure, provided at the following locations:

- Both sides of Ashburn Road on the departure side of the proposed eastern intersection with the internal industrial access street (Road 1); and

- Both sides of Bognuda Street between Ashburn Road and Archer Street in the vicinity of proposed Lots 12 and 28.

Each bus stop shall be positioned, designed and constructed in accordance with Translink specifications / standards and Disability Standards for Accessible Public Transport and include:

- A reinforced concrete hardstand area with a sufficient footprint for the installation of a illuminated Translink Type 2A bus shelter. The hardstand area shall be positioned between the kerb and path;
- An illuminated Translink Type 2A bus shelter installed by a Translink preferred supplier;
- Connection to the electricity network including conduits and pits;
- Raised tactile ground indicators;
- Pavement markings in accordance with the MUTCD;
- A flag sign indicating 'future bus route' (white writing with dark blue background); and
- A litter bin with bird proof cover.

NOTE: Footpaths, pedestrian refuge islands and bus stops do not need to be provided along the 'Warrego Highway Access Road'.

Ashburn Road / 'Warrego Highway Access Road'

(e) The Developer shall upgrade the intersection of Ashburn Road / 'Warrego Highway Access Road' with traffic signals before the plan that creates the twelfth (12th) additional lot over the development site is signed by Council. The design and construction shall:

(i) Be sufficient to meet the capacity requirements of a minimum 10 year operating horizon (from the day the last plan of survey is signed over the development site).

(ii) Meet the requirements of the DMR;

(iii) Provide a southern leg of the intersection to facilitate future access for proposed Lot 16 and continued access for Lot 7 SP167997 (located at Lot 7 Bognuda Street), Lot 1 SP179307 (located at 83 Bognuda Street) and Lot 5 SP140694 (located at 61 Ashburn Road)

(iv) Be in accordance with the DMR Road Planning and Design Manual for a 60km/h design speed. Where any design element is not specified in this manual or in Council's Planning Scheme Policy 3 – General Works, Austroads Guide to Traffic Engineering Practice – Part 5 (Intersections at Grade) and Part 7 (Traffic Signals) should be used.

Ashburn Road

(f) The Developer shall construct roundabouts at the two locations where the proposed new Industrial Collector Street (Road 1) intersects with Ashburn Road. The design and configuration of these roundabouts shall be in accordance with a 60km/h design speed.

(g) The Developer shall construct a raised median (minimum 2.0 metres wide) along Ashburn Road between the eastern roundabout and the intersection of Ashburn Road / "Warrego Highway Access Road".

(h) The Developer shall configure the access for proposed Lot 1 along Ashburn Road for left-in and left-out movements only. This shall be supported by the construction of an island on the driveway of Lot 1 to restrict right turn movements out of this lot.

Ashburn Road / Warrego Highway On-ramp

(i) The Developer shall organise a Road Safety Audit (RSA) to be undertaken of the intersection of Ashburn Road / Warrego Highway on-ramp (in the vicinity of Duke Close and Earl Street) including its approach and departure legs (minimum 200 metres in each direction).

The RSA shall be undertaken by a DMR accredited road safety auditor and provide recommendations on any improvements that are required to be undertaken at this intersection to improve its safety and operation. The RSA shall take into account the changes in traffic movements and vehicle types generated by the development site, including the movement of B-double combination vehicles (26.0m in length). The RSA Report shall be submitted with the conceptual design plans for the roadworks along Ashburn Road.

(j) The Developer shall upgrade / reconfigure the intersection of Ashburn Road / Warrego Highway on-ramp (in the vicinity of Duke Close and Earl Street) to ensure the safe and efficient movement of the type and volumes of vehicles expected to use the intersection as a result of the development, including B-double Combination Vehicles (26.0m in length) and Higher Mass Limit Vehicles. The intersection upgrade shall be configured to ensure:

(i) A minimum design speed of 60km/h is achieved including safe intersection site distances (SISD);

(ii) Sufficient capacity of a minimum 10 year operating horizon (from the day the last plan of survey is signed over the development site);

(iii) The recommendations from the RSA are incorporated into the design; and

(iv) The requirements of DMR are met.

Works may include realignment, reprioritisation and/or the installation of traffic signals.

New Industrial Street

(k) The proposed new street that will provide access for Stage 1A and Stage1C shall be designed and constructed in accordance with Council's Standard for an industrial access street. Works shall include a concrete path (minimum 1.5 metres wide) on one side designed in accordance with Council's Standard Drawing SR.19. The path shall be on the same side as the street lights and its maximum longitudinal grade shall not exceed 1:8.

Bird Street

(l) The Developer shall construction kerb & channel along both sides of Bird Street. Works shall include stormwater infrastructure, driveway reconstruction, verge re-profiling and pavement infill in accordance with Council's requirements. These works shall be completed before the plan that creates the twelfth (12th) additional lot over the development site is signed by Council.

NOTE: As part of the development of a master plan far the Bremer Business Park in 2003 (and as outlined in Council's Preliminary Approval Decision Notice date 6 July 2004), the Developer at this time made a cammitment to the community that certain works would be undertaken along Bird Street.

Conceptual Design Development & Approval

(m) The Developer shall organise for conceptual design plans of the roadworks outlined in this approval to be prepared by an RPEQ and then submit these plans to Council for approval before detailed design commences. The conceptual design plans are to show:

(i) Horizontal and vertical geometry;

(ii) Intersection configurations;

(iii) Cross sections;

(iv) Pavement markings;

(v) Bus stops locations; and

(vi) Pedestrian refuge islands.

(n) The Developer shall organise the detailed planning and conceptual design plans for the proposed road linking the northern and southern areas of 'Citiswich' over the Warrego Highway ("North-South Link Road") to be prepared by an RPEQ before detailed design commences. The conceptual design plans for the 'North-South Link Road' shall:

(i) Meet geometric and sight distance standards for a minimum design speed of 70km/h and a maximum vertical grade of 5 percent;

(ii) Provide information relating to it's interface, interaction and impacts on the development site and Ashburn Road; and

(iii) Be submitted to Council for approval at the same time the conceptual design plans for Ashburn Road and the Ashburn Road / 'Warrego Highway Access Road intersection are submitted.

Main Roads Requirements

(o) If DMR modifies any of its conditions of approval and associated threshold triggers for roadworks (including addition and deletion) as outlined in their Referral Agency Response dated 25 March 2008:

(i) The Developer shall inform Council in writing with the relevant information within ten (10) business days of the DMR modification; and

(ii) Council reserves the right to reassess the suitability of all of the roadworks requirements and associated design parameters as outlined in Condition 12 (above) and revise the roadworks conditions accordingly including the possible addition of other conditions.

13. Local Area Traffic Management

(a) The Developer shall implement an integrated local area traffic management (LATM) scheme in the existing residential areas to the south and south-west of the development site, generally in the vicinity of Bognuda Street and Law Street. The parameters for the LATM Scheme are as follows:

(i) The LATM scheme shall be designed and approved by Council before the plan of survey that creates the twelfth (12th) additional lot over the development site is signed by Council;

(ii) The approved LATM Scheme shall be fully constructed and open to traffic either within two (2) years from the date the plan of survey that creates the first (1st) lot over the development site is signed by Council or within six (months) from the date the first Development Permit for Building Works over the site is issued (which ever threshold is triggered is earlier). Council may by agreement extend the period by which the LATM scheme has to be completed;

(iii) The LATM scheme shall include a comprehensive public consultation component in which the Developer must prepare and submit a 'Community Engagement Plan' for approval by the Council before the planning and design of the LATM Scheme commences;

(iv) The scope of the LATM Scheme shall be generally in accordance with that outlined in the Preliminary Approval for the Bremer Business Park (refer Condition 12 (a) (iii) of the Negotiated Decision Notice dated 6 July 2004 for ICC Development Application 3356/2002), subject to community consultation.

(v) The LATM Scheme shall be designed and constructed at no cost to Council.

(b) In lieu of Condition 13 (a) above, the Developer shall provide to Council a monetary contribution of AUD$670,000 towards the implementation of a future LATM scheme to the south and south-west of the development site.

This contribution shall be paid as a lump sum before the plan of survey that creates the first (1st) lot over the development site is signed by Council or paid in stages as follows:

(i) An amount of AUD $100,000 is payable to Council before the plan of survey that creates the first (1st) additional lot over the development site is signed by Council;

(ii) The balance is payable to Council before the plan of survey that creates the twelfth (12th) additional lot over the development site is signed by Council

The contribution amount (whether paid as a lump sum or in stages) is fixed for a period of twelve (12) months from the date of this Decision Notice and thereafter shall be calculated from the date of development approval to the date when payment is made in accordance with the Non-building Construction Cost Index (Queensland).

(c) The Developer shall inform Council in writing as to which option they intend to take with regard to satisfying Condition 13 before the plan of survey that creates the first (1st) additional lot over the development site is signed by Council.

14. Access

(a) Direct property access for proposed Lot 16 along Ashburn Street is not permitted. Vehicular access to and from proposed Lot 16 shall only be via the provision of a southern leg to an upgraded intersection of Ashburn Road / 'Warrego Highway Access Road'.

Similarly, 'right of way' easements on Lots 1 and 2 SP 179307 shall be preserved (except where land common to these easements is dedicated as road reserve) and access to the respective allotments configured to co-aligned with Lot 16 public and private access road.

(b) Safe and efficient access to existing lots and associated land uses shall be maintained at all times during both the construction and operating stages of the development as well as during the construction of the relevant roadworks outlined in this approval.

(c) The Developer shall construct a public road, in accordance with Council Standards for an industrial access street, to provide continued access for Lot 7 SP167997 (located at Lot 7 Bognuda Street), Lot 1 SP179307 (located at 83 Bognuda Street) and Lot 5 SP140694 (located at 61 Ashburn Road). The new road shall be constructed from the intersection with the Lot 16 access extending to the eastern property boundary of the development site and connecting with the existing access.

(d) Vehicular access to and from proposed Lots 2, 9, 18 and 26 shall be via the proposed internal industrial access street (Road 1). Direct property access along Ashburn Street is NOT permitted for these allotments.

(e) Permanent heavy vehicle access for the development site shall NOT be via Bognuda Street south of Archer Street;

15. Stormwater Quality Reporting

(a) The Developer is requested to submit an amended Stormwater Quality Report to the Development Manager for approval incorporating comments made in the review by Ecological Engineering (dated 30 July 2007) and Healthy Waterways (dated 21 January 2008) to the *Bremer Business Park Masterplan - Stormwater Management Strategy Overall Site Masterplan* (prepared by Cardno Lawson Treloar, dated 8 March 2007) and the *Bremer Business Park Stage 1- Stormwater Management Strategy* (prepared by Cardno Lawson Treloar, dated 2 August 2007).

(b) The amended report shall suitably address all matters outlined in the two reviews and shall include a Stormwater Masterplan and stage-based reports, as well as the following:

(i) The Cardno Lawson Treloar Review(dated 2 August 2007) partially addresses the issue of implementation and timing of the regional water quality treatment measures, this shall be integrated into the Stormwater Masterplan, stage-based reports and detailed Operational Works drawings for both the lot-scale and regional-scale bioretention. Construction, establishment and maintenance of all bioretention is required to be in accordance with Section 5.5 of the WSUD TDG and the reports and drawings shall specify how stormwater treatment areas relate to the staging of civil works, building works and the staged implementation of landscaping.

(ii) The Developer shall support the proposed bioretention in the road network (as listed in the Information Response) by the provision of modelling and figures. Furthermore, the treatment in roads via biopods and small bioretention basins is strongly supported and shall be further explored in the amended reports and drawings.

(iii) The Masterplan shall set up the extent of reporting for subsequent applications and provide guidance on the sizing of treatment devices. Reference shall be made to the treatment performance curves (figures 5-3 to 5-5), of the WSUD TDG ensuring that at a minimum 2% of each site area is reserved for treatment. The reports for each individual industrial lots shall be a summary of the steps 1-9 (Section 5.3.1) of the WSUD TDG as they apply to each site. A detailed water quality model shall not be required for individual industrial sites except where the proposed train varies from the WSUD TDG or the approved masterplan.

(iv) The reports shall address the potential conflict with landscape screening requirements and the location of bioretention treatment areas ensuring that trees are not planted in bioretention treatment areas.

(v) Gross pollutant traps and stormfilters shall not be relied upon for nitrogen removal. These units shall only be installed to control gross pollutants, oils and greases within industrial sites. For regional treatment measures, above ground trash racks shall be used in place of these units.

(vi) The stage-based report shall set up the responsibilities of the water quality specialist/s which shall be employed to oversee bioretention basin construction.

(vii) A copy of the MUSIC sqz. file for both the Stormwater Management Strategy and Overall Site Masterplan and for each of the stage-based reports shall be provided to Council for assessment in conjunction with the first Operational Works application.

(viii) Where non-default pollutant reduction efficiencies are used in the modelling these shall be agreed upon by Council prior to modelling. For gross pollutant traps reduction efficiencies shall not exceed TSS 50%, TP 10% and TN 0% unless otherwise approved by Council prior to modelling.

(ix) The reports shall be accompanied by a point by point response to the aforementioned reviews by Healthy Waterways and Ecological Engineering as well as Council's concerns outlined in the above conditions.

(x) The Masterplan shall include a schedule which outlines the implementation timing of the regional water quality treatment measures associated with each stage.

(c) The amended reports shall be prepared by a suitably qualified and experienced professional in accordance with the Water Sensitive Urban Design Technical Design Guidelines (WSUD TDG) for South East Queensland (Healthy Waterways - Version 1 June 2006), and demonstrate through appropriate pollutant export modelling that stormwater will be treated on site to a standard which meets Council's stormwater quality concentration-based objectives and the load-based objectives for South East Queensland (TSS 80%, TP 60%, TN 45% and GP 90%).

(d) All detailed stormwater quality drawings shall detail amongst other necessary items the following requirements/amendments:

(i) Specify the depth and appropriate particle size diameter of the filter media, transitional layer and drainage layer. The transitional and drainage layers should not be included in the depth of filter media modelled. Biofiltration should consist of a filter media featuring a sandy loam layer (depth 0.3-0.8m, particle size 0.45mm); a transitional layer of coarse sand (depth 0.1-0.2m, particle size 1.0mm) and a drainage layer of coarse sand/gravel (depth 0.1-0.2m, particle size 2mm-20mm).

(ii) Slotted PVC pipes shall be spaced a maximum of 1.5m apart within the drainage layers. A minimum of two slotted PVC pipes shall be placed within the drainage layer of bioretention swales. Drainage shall be designed in accordance with Section 5.9.5 of the WSUD TDG.

(iii) Provide geofabric around the base of the drainage layer and the walls of the basin. Geofabric shall not be laid between any of the filter layers or used to wrap the slotted PVC drainage pipes.

(iv) Provide a riser with PVC cap at the head of each the slotted pipe for maintenance flushing. A cross section detail shall be shown on the plan. The drawings shall specify that risers are not to be slotted.

(v) Adequate scour protection and maintenance access shall be provided. Scour protection shall be in accordance with Section 5.3.3.1 of the WSUD TDG. Scour protection areas shall not be included in the total filter areas. A plan detail and cross section similar to Figure 5-6 of the Water Sensitive Urban Design Technical Design Guidelines (WSUDTDG) shall be detailed on the plans.

(vi) A suitable sediment fore bay shall be designed for each basin in accordance with Section 5.3.3.2 of the WSUD TDG ensuring that particles equal to or greater than 1mm in diameter are removed from the 3 month ARI storm event. Calculations shall be provided to demonstrate compliance with the guidelines.

(vii) A high flow bypass shall be incorporated into the design of each basin to ensure that only flows up to the 3 month ARI storm event are treated through bioretention treatment basins.

(viii) The plans shall refer to the guideline for Bioretention and Tree Pit Media Specifications, Facility for Advancing Water Biofiltration (FAWB) for the filter specifications and objectives and note that construction and testing of bioretention filter media shall be undertaken with the most current version (at the time of construction/testing) of this guideline.

(e) Where any stormwater treatment is proposed to be located in existing easements the Developer shall provide to Council evidence from the relative authority that consent has been granted to construct within the easement.

16. Construction of Stormwater Treatment

(a) All stormwater quality management treatments shall be fully constructed in accordance with the final approved *Stormwater Management Strategy Overall Site Masterplan, stage-based reports* and detailed Operational Works drawings.

(b) All regional scale treatment devices shall be fully operational prior to works being accepted on-maintenance.

(c) Construction, establishment and maintenance of all bioretention basins shall be carried out in accordance with Section 5.5 of the WSUD TDG. A staged implementation approach shall be employed for the bioretention areas ensuring that filter media is either laid after construction works have been completed or the filter is protected until the completion of any works.

(d) The Operational Works staging boundaries shall include adjacent regional scale stormwater treatment devices in accordance with the approved staging and implementation plan as required in Condition 12(d)(i) above.

(e) The Developer shall provide to Council certification from a suitably qualified water quality specialist to verify that all bioretention basins have been constructed in accordance with the approved reports and drawings. This shall include certification that the biofiltration filter media meet the criteria outlined in the most current version (at the time of testing), of the guideline for Bioretention and Tree Pit Media Specifications, Facility for Advancing Water Biofiltration (FAWB).

The minimum parameters to be tested include: hydraulic conductivity, particle size distribution, organic matter content, pH, electrical conductivity and phosphorus concentration. Should filter media fail to meet these or other agreed criteria, suitable remedial measures shall be implemented by the Developer prior to the on-maintenance for regional scale bioretention basins.

17. Stormwater Quality Maintenance Plans

(a) The Developer shall prepare a detailed Stormwater Quality Maintenance Masterplan for the development which addresses both the regional and lot scale treatment devices for each stage. The Masterplan shall be submitted to the Development Manager for approval in conjunction with the first Operational Works application. The Masterplan shall:

(i) Outline requirements for Stage 1 in accordance with Appendix A – Stormwater Management Plan and Appendix B – Maintenance Plan of the *Bremer Business Park Stage 1- Stormwater Management Strategy* by Cardno Lawson Treloar (Report LJ8714/R5 and dated 2 August 2007) except where otherwise directed by Council. The Stormfilters mentioned in this report are not approved.

(ii) Outline requirements for construction, building and operational phases specifying the regular maintenance of the stormwater system (e.g. cleaning of gully pit filter baskets after storm events) along with the long-term management such as the replacement of the bio-retention filters.

(iii) At a minimum, include the following details:

- aims and objectives (including water quality and filter media parameters);
- regular maintenance – maintenance/inspection checklists for each device with comments on timing, frequency, data collection and non-compliance procedures;
- long-term maintenance – timing, frequency, data collection, filter and water quality testing, non-compliance procedures;
- describe how each maintenance action is to be carried out (including maintenance techniques, environmental management considerations, disposal requirements for polluted water and solid waste);
- management structure and responsibilities;
- record keeping and reporting;
- review and update;
- any relevant contractor contact information.

(b) The Stormwater Quality Maintenance Masterplan shall be prepared by a suitably qualified and experienced professional to the satisfaction of Council and utilise the maintenance checklists located in the Water Sensitive Urban Design Technical Design Guidelines (WSUD TDG) for South East Queensland (Healthy Waterways - Version 1 June 2006).

(f) The Stormwater Quality Maintenance Masterplan shall be implemented in perpetuity to the satisfaction of Council except for regional treatment devices which shall be maintained until accepted off maintenance. Regular inspection records shall be maintained on site and made available to Council upon request for both the construction and operational phases. All necessary improvements shall be made immediately upon awareness of any deficiencies in the system.

18. Sewerage

(a) The Developer shall provide a sewerage reticulation system with appropriate connection branches and external trunk works, designed so as to command the whole of each of the proposed allotments. The sewerage reticulation system and external trunk works shall be generally in accordance with, except where amended within this approval, Sewerage Planning Report prepared by Burchill ADM and dated September 2007.

(b) Concerning the timing of external trunk works, the developer shall construct pump station BBP1 and Line 04A extending from pump station SP5 to BP1 with any development of Stage 1. Commissioning and decommissioning of BBP1 and SP5 respectively shall be undertaken by Ipswich Water at full expense to the Developer. The Developer shall lodge a private works application to Ipswich Water for commissioning and decommissioning works.

(c) Pump station BBP1 building platform/compound shall be a minimum 500 m^2 and located at minimum RL 16.6m AHD.

(d) Where proposed sewer reticulation or trunk is located within an existing or future easement, the Developer is required to submit in conjunction with operational works application written consent from the respective easement owner (other than Council).

(e) All sewer pipes and rising mains shall be constructed from Vitreous Clay (VC) or similar material as approved by Ipswich Water. Synthetic type material (such as uPVC) is not permitted.

19. Water

(a) The Developer shall provide a reticulated water supply system together with valves and fire hydrants, in accordance with the "Guidelines for Planning and Design of Urban Water Supply Systems", which connects into Council's existing reticulation system.

(b) A blue, bi-directional raised reflective pavement marker (RRPM) shall be provided to all hydrants. The marker shall be installed in accordance with the Department of Main Roads Fire Hydrant Indication System Technical Guideline.

(c) All works on live water mains are to be carried out by Ipswich Water in accordance with Council's policy, and at the Developer's expense.

(d) Where concrete footpaths are to be constructed, the Developer shall provide 100 mm diameter conduits under the footpath and in line with the conduits under the road, for future ease of installing the individual water services. The letter "W" shall be embossed in the concrete to mark the location of the conduit.

(e) Sufficient stop valves shall be installed so that in the event of any break in the supply, the maximum number of lots to be without water is 20.

(f) The developer shall provide water mains on both sides of each applicable road, unless otherwise agreed to by Ipswich Water.

20. Stormwater Quantity

(a) The developer shall provide all necessary stormwater drainage (both internal and external to the development) and such drainage works (except for roofwater systems) shall be designed and constructed in accordance with QUDM such that the overall drainage system caters for a storm event with an ARI of 100 years.

Overland flow paths shall be suitably designed to cater for the water from a storm event with an ARI of 100 years. In the case where the piped system is carrying part of the flow, the overland flow paths shall be designed to cater for that volume which is represented by the difference between the predicted volume from the storm event with an ARI of 100 years and the capacity of the pipe system, noting the requirements of QUDM.

(b) All stormwater flows within and adjacent to the Citiswich Area, other than inter-allotment drainage, shall be confined to dedicated roads, drainage reserves, registered drainage easements or within parkland. The registered drainage easements, if related to piped drainage, shall be centrally located over such underground pipe system and shall be not less than 4.0 m wide, except for drainage easements required for side boundaries which may be 3.0 m wide where approved by the Senior Development Engineer. In addition, the easements shall be of suitable width to contain the predicted overland flow from the storm event with an ARI of 100 years in that location.

(c) No ponding, concentration or redirection of stormwater shall occur onto adjoining land unless specifically approved by Council in consultation with the owner of the adjoining land.

(d) Due consideration shall be given in these and future designs and construction of the development in relation to the effect of the developed catchment flows on the downstream discharge receival areas. Suitable stormwater control devices are to be provided to ensure that there is no increase in flows in watercourses. Such control devices are to be designed so as to integrate the landscaping, recreational, infrastructural and drainage roles of watercourses. Notably the development shall limit the post-development peak one-year Average Recurrence Interval (ARI) event discharge to the receiving waterway to the pre-development peak one-year ARI discharge. Analysis of pre-development catchment hydrology shall assume current level of development rather than fully developed upstream catchment.

(e) There shall be no filling or removal of material in the flood area below the development flood line associated with an ARI of 20 years. There shall be minimal disturbance to vegetation in the flood area, unless prior written approval is obtained from Council.

(f) Filling in proposed Lots, which are adjacent to the watercourse shown on the proposal plan, shall not be undertaken without the written approval of Council.

(g) A suitable roofwater system shall be designed in accordance with QUDM, for allotments that do not have adequate fall from within the allotment to the design invert level of the kerb and channel or access to lawful discharge point. The design is to be to a minimum Level V in QUDM.

21. Public Utilities

(a) Adequate provision shall be made in all proposed road reserves, access strips, common areas and easements, to cater for the public utility services that would normally serve the development.

(b) The Developer shall provide appropriate road crossing conduits in accordance with Council's Standard Drawings SR.22, SR.23 and SR.24. Where concrete footpaths are to be constructed, the conduits shall be extended to the property boundaries.

(c) Street lighting shall be installed, for internal road and applicable frontages of Ashburn Road and Bognuda Street, by the Developer in accordance with the Australian Standard 1158.3.1 Table 1.1. All street lighting associated with the development shall be certified by a RPEQ. Street lighting shall be installed on the same side as concrete footpaths (where applicable).

(d) The Developer shall provide underground electricity/telecommunications within the development, constructed in the approved allocation as detailed in Council's standard drawings SR.22 and SR.23. Electricity and telecommunication drawings shall be coordinated with the civil engineering design documents, to ensure that service clashes are avoided.

(e) The Developer shall provide an Energex approved electrical reticulation layout plan. The electricity layout shall also be shown on the water reticulation layout plans.

(f) Prior to the commencement of use of the site, the Developer shall provide Council with a copy of an agreement with Energex for the supply of electricity to the development.

(g) Telephone and cable services may be laid in a combined trench with electricity cables, subject to the approval of Energex and the authorised telephone/cable service provider.

(h) The Developer shall make suitable arrangements for the provision of telephone and cable services to the Development. Documentary evidence that discussions have commenced with any authorised telephone/cable service provider, on the provision of telephone/cable services, shall be produced before the completion of the development.

22. Erosion & Silt Management

(a) The Developer shall prepare an Erosion and Sediment Control Plan (ESCP). The ESCP is to incorporate detailed drawings and a management plan which are to be continually revised subject to Council instruction, site conditions and different development stages particularly during the earthworks stage. Where any amendments are required further approval shall be received from Council. The Developer shall be responsible for the installation and maintenance of silt management facilities from the time of commencement of construction until the development has been released "Off Maintenance". All silt management facilities are to be in accordance with the document "Soil Erosion and Sediment Control" published by the Institution of Engineers Australia, or equivalent.

(b) A completed copy of the Brisbane City Council Erosion Hazard Assessment Checklist shall be submitted and used as the basis for determining appropriate erosion and sediment control measures.

(c) The design of sediment basins shall be in accordance with the current version of the Brisbane City Council Sediment Basin Design Construction and Maintenance Guidelines. The Developer shall lodge the detailed calculations as required by steps 1-16 of Section 2 - *Design Procedure* along with detailed drawings.

(d) A Water Quality Testing strategy including the testing of baseline shall be undertaken as part of the ESCP.

(e) The ESCP shall be a flexible document which is designed to adapt to the staging of construction works.

(f) Suitable permanent stabilisation works will be required at stormwater outlets, above and below the culvert. Dumped rock will need to be pocket planted and a layer of geofabric laid below the rocks.

(g) Particular attention should be paid to batters around culverts and stormwater outlets with the aim to minimise to the greatest possible extent the slope of adjacent batters.

(h) All lots shall be 90% grassed prior to civil works being accepted off-maintenance and prior to signing the plan of survey.

(i) Silt traps shall be sited upstream from any park or reserve area discharge point preferably on land comprising future allotments, such that no silt impinges on the park or reserve areas. The silt trap areas may be phased out after the development work is complete and adequate grass cover is obtained.

(j) Diversion drains and ponds, as necessary, shall be installed on the site before any other work is undertaken on site to ensure that "dirty water" is contained and/or isolated.

(k) A procedure shall be submitted with the engineering drawings for approval for maintaining the facilities, setting out the frequency of attention, with inspections to be made after each significant rainfall event.

(l) Council reserves the right to enter the site for the purpose of rectifying any silt management facilities which it deems to be inadequate, improperly maintained or not operating in a satisfactory manner.

(m) The Developer shall lodge a $10, 000 siltation and erosion performance bond with Council, prior to the commencement of works, which shall only be released by Council at the termination of the maintenance period. Where Council determines that a draw-down of the bond is required, the Developer shall restore the bond to its full amount within 10 days of a notice from Council to that effect. Such bond shall guarantee adequate performance in the circumstances (i) and (ii) below:

(i) In the event that instructions issued to the Consulting Engineer by the Senior Development Engineer for the installation of erosion control measures, are not complied with within 24 hours, Council will call upon the bond to the extent required to carry out the necessary works.

(ii) If the Senior Development Engineer determines that silt damage has occurred on the site, or the downstream drainage system has become silted, the Developer shall be responsible for restoration. Such restoration shall be completed in the time determined by the Senior Development Engineer.

Should the Developer fail to complete the works determined by the Senior Development Engineer within the specified time, Council shall complete the work and recover all costs from the Developer associated with that work.

23. Operational Works – Municipal Works
(ie Works being handed over to Council)

(a) Plans relating to all civil engineering works shall be prepared and submitted for review by Council under the cover of Form 1 - Part A (Common details for all applications) and Form 1 - Part E (Planning Scheme Works). The plans shall show full construction details, layout dimensions, and finished surface levels and shall be submitted together with the appropriate fees for Council approval, prior to the commencement of construction on site.

(b) The Developer shall comply with the requirements of the documents entitled "Planning Scheme Policy 3 - General Works" and "Standard Drawings".

(c) All engineering drawings submitted to Council shall be in accordance with Council's Planning Scheme Policy 3 - General Works and Standard Drawings, and shall include as a minimum the following:

(i) Engineering drawings shall be marked as confirmation that they have been checked and approved by a RPEQ;

(ii) The drawings shall be submitted as four (4) hardcopy A3 size sets and two (2) hardcopy sets of any reports and supporting information. One set of plans shall be returned to the applicant with the Decision Notice.

The submission shall also include a Compact Disc containing electronic data as follows:

- One (1) full set of all engineering drawings contained in one file;
- Separate individual files containing layout plans for sewerage, water supply and drainage;
- Any reports submitted in support of the Application. Each report shall be included as a separate file;
- An index of all files on the Compact Disc including descriptions of contents of each file; and
- All files shall be submitted in PDF format.

(iii) A "Certificate of Design" shall be submitted by a RPEQ, certifying that the design is in accordance with all relevant engineering standards, Council's requirements and standards, relevant development conditions of approval, and sound engineering practice.

(d) Municipal works shall require a detailed design certified by a RPEQ, the design approved by Council Engineers with appropriate fees payable, a works pre-start meeting on-site and various detailed construction and audit inspections by Council Officers. A twelve month maintenance period is applicable for the works as well as the payment of a maintenance security deposit.

(e) All works shall be supervised by a RPEQ competent in civil works and shall be undertaken by a nominated principal contractor experienced in the construction of municipal works. Council reserves the right to request evidence of the principal contractor's competency. Should it be deemed by the Senior Development Engineer that the contractor does not have the necessary competency or has constructed substandard works for Council in the past, Council reserves the right to reject the nominated contractor.

(f) Municipal works shall be accepted "On Maintenance" prior to commencement of use. A maintenance bond equal to 5% of the construction cost (minimum of $1,000.00) shall be retained by Council for a minimum period of twelve months, or until such time as the works are accepted "Off Maintenance" by Council.

(g) "As Constructed" plans for municipal works shall be submitted to Council and approved prior to the formal acceptance of the works "On Maintenance". These plans shall be submitted electronically in PDF format, contained on a Compact Disk labelled appropriately to indicate the contents.

(h) On completion of the works a certificate shall be submitted to Council by a RPEQ certifying that the works have been constructed in accordance with Council's construction standards and in compliance with the approved plans and specification. It is expected that the RPEQ will undertake the necessary inspections to make this certification.

(i) Council reserves the right to require further amendments and/or additions at a later date, should design errors or omissions become apparent in regard to the works relevant to the Operational Works approval.

24. General

(a) All disturbed areas shall be graded, grassed and left in a mowable condition. The grass cover shall be obtained as early as possible during the development and an acceptable grass cover shall be achieved before the development can be accepted "Off Maintenance".

(b) Street name signs shall be manufactured to Council specifications and shall be erected in accordance with Council's Standard Drawing SR.26 at each intersection.

(c) With reference to any works, on land under other private ownership, written permission for the works shall be obtained and forwarded to Council. Similarly, written clearances shall be obtained after the works are completed, unless otherwise accepted by the Senior Development Engineer.

(d) All works required for this development shall take due regard of any and all existing services and, if considered necessary by the relevant authority or the Senior Development Engineer, such works shall be altered at the cost of the Developer.

(e) Any filling for a greater depth than 800 mm to provide for building platforms shall be conducted in accordance with Australian Standard 3798. Test results as required by Australian Standard 3798, and a certificate of quality and uniformity of fill shall be provided by a RPEQ. The level of responsibility shall be Level 1.

(f) A certificate from a RPEQ shall be issued to Council certifying that any retaining wall greater than 800 mm in height is structurally sound and capable of withstanding any likely surcharge loads. Retaining walls greater than 1 m in height are to be provided with railings or other barriers to provide pedestrian safety.

(g) Retaining walls shall be designed so that there are no imposed loads placed upon Council's underground services. This may include extending the footing to a level 300-mm below the invert of the pipe.

(h) Filling of gully areas if permitted shall be carried out strictly in accordance with Australian Standard 3798. Test results as required by Australian Standard 3798 and a certificate of quality and uniformity of fill, shall be provided by the Supervising RPEQ for all filled areas.

(i) For batters resulting from cutting and filling of the site and producing slopes greater than 1:6, Council requires a RPEQ to certify that they are stable and properly drained.

(j) If, after the preparation of detailed design plans for the various roads, it is found necessary to provide any additional road reserve area, or modify the proposed road reserves to enable the full requirements of Council's Standards, Queensland Streets, AMCORD and Austroads documents to be incorporated in any way, (but particularly in the production of the required speed environment or because of longitudinal and cross sectional constraints) then the estate layout plan shall be altered accordingly.

25. Fencing

A 1.8m high pool style fence or alternate fence design approved in writing by the Development Manager, is to be constructed on the common boundary of proposed Lots 1 – 23 and 23 - 25 and the drainage/parkland/buffer reserves.

26. Naming of Parkland

(a) The Developer shall submit a selection of three (3) alternative names for the park, to be considered by Council prior to lodgement of the plan of survey.

(b) The Developer shall erect a suitable park name sign to the satisfaction of the Development Manager.

27. Quality of Park Dedication

Land to be dedicated for park purposes shall be upgraded to the satisfaction of the Chief Operating Officer (Health, Parks and Recreation) as follows:

(a) Suitable embellishment is required to be provided in accordance with the Desired Standards of Service outlined in Part 5 of Council's Planning Scheme Policy 3 – *General Works.*

(b) Declared plants, environmental weeds and rubbish shall be removed;

(c) Dead trees shall be removed and dangerous trees made safe within 10 m of proposed pathways or playgrounds;

(d) All rubbish shall be removed from parkland;

(e) Parkland shall be freely and safely drained;

(f) All playground equipment and park furniture shall meet Australian Standards both in supply and installation;

(g) No overburden or spoil shall be pushed or deposited into parkland;

(h) Water / sewer / power service shall be provided to the proposed park; and

28. Irrigation to Footpaths

Irrigation to streetscape works is not permitted on a permanent basis. Temporary irrigation systems used for vegetation establishment may be approved by the Conservation, Parks and Sport Manager subject to their removal prior to the on maintenance inspection. Such irrigation shall include all necessary devices to prevent contamination of the water supply.

29. Other Streetscape and Temporary Works

Authorisation for temporary landscaping treatments and / or features shall be obtained from the Chief Operating Officer (Health, Parks and Recreation), and a bond lodged for their removal. Such special treatment / features shall be removed by the Developer, and the site remediated, prior to the streetscape on maintenance inspection.

30. Compliance with Conditions

(a) Unless otherwise stated all conditions shall be completed prior to signing of the relevant plan of survey or as determined by the Development Manager.

(b) All conditions shall be completed to the satisfaction of the Development Manager.

31. When Approval Takes Effect

This approval has effect in accordance with the provisions of Section 3.5.19 of the *Integrated Planning Act 1997* as follows:

(a) If the applicant does not appeal the decision to the court - from the time the decision notice is given (or if a negotiated decision notice is given, from the time the negotiated decision notice is given); or

(b) If an appeal is made to the court - subject to the decision of the court, when the appeal is finally decided.

32. When Approval Lapses

(a) The relevant period for this approval is 4 years starting the day the approval takes effect. The Developer is required to submit to Council an accurate plan of survey before the end of the relevant period, otherwise the approval will lapse.

(b) An extended relevant period may be agreed upon, pursuant to Section 3.5.22 of the *Integrated Planning Act 1997*, provided a written notice to Council is made before the end of the relevant period. Such written notice is to be on Council's approved form, accompanied by the owner's consent and the prescribed fee in Council's Register of General Charges.

NOTE: Operational Works application(s) required to be submitted must be approved and works completed within the relevant period stated above.

Concurrence Agency

Conditions applicable to this approval imposed by the following Concurrence Agencies:

1. The Environmental Protection Agency (Contaminated Land Unit) is a concurrence agency with regard to this development approval. The attached concurrence agency response, dated 2 January 2008, forms part of this Decision Notice.

2. The Department of Main Roads is a concurrence agency with regard to this development approval. The attached concurrence agency response, dated 25 March 2008, forms part of this Decision Notice.

3. Queensland Transport is a concurrence agency with regard to this development approval. The attached concurrence agency response, dated 18 September 2007, forms part of this Decision Notice.

4. The Department of Natural Resources and Water is a concurrence agency with regard to this development approval. The attached concurrence agency response, dated 10 August 2007, forms part of this Decision Notice.

5. Powerlink is an advice agency with regard to this development approval. The attached concurrence agency response, dated 11 October 2007, forms part of this Decision Notice.

Advice

The following advices are offered for your information only and should not be viewed as mandatory conditions of this approval.

Assessment Manager (Ipswich City Council)

1. Portable Long Service Leave

The Building and Construction Industry (Portable Long Service Leave) Levy must be paid prior to the issue of a development permit where one is required for the 'Building and Construction Industry'.

This applies to Building Works, Operational Works and Plumbing and Drainage Works applications, as defined under the Integrated Planning Act 1997, where the works are $80 000 or more and matching the definition of 'Building and Construction Industry' under the Building and Construction Industry (Portable Long Service Leave) Act 1991.

Council will not be able to issue an Operational Works Decision Notice without receipt of details that the Levy has been paid. Should you require clarification in regard to the amendments to the Building and Construction Industry (Portable Long Service Leave) Act 1991, you should contact QLeave on 1800 803 481 (free call) or [redacted].

2. High Water Demand

The Developer should consider the implications of water restrictions during the construction of the proposal and in consideration of the requirements of the above conditions. It should be specifically noted that this approval does not permit the Developer to use the potable water supply for the development of the site.

On 15 August 2007 Council introduced its *Policy For Installation Of Electronic Water Meters To Commercial, Industrial And Large Multi-Residential Properties*. This policy states that:

All new commercial, industrial or large multi-residential property connections with a projected annual consumption greater than or equal to 20,000 kL shall include, at the customers expense, an electronic water meter with data logger and an approved back-to-base communication system as specified by Ipswich Water.

Properties with electronic water meters shall be subject to billing on a monthly basis in accordance with the metered monthly consumption.

If, in the opinion of the Senior Development Engineer, a proposed development is likely to have an annual water consumption equal to or greater than 20,000 kL, the Developer will be required to contact Ipswich Water on [redacted] to arrange installation of electronic flow meter(s).

3. Amended Masterplan

(a) The proposed development and future stages shall be generally in accordance with the Master Staging Plan – Citiswich (prepared by B & P Survey Consulting Surveyors, dated 11 March 2008) with the following amendments and clarifications, as marked on the attached plan:

(i) The Developer shall remove the proposed cul-de-sac from within Stage 4C as indicated in black on the "Master Staging Plan – Citiswich";

(ii) Additional road frontage to parkland shall be provided for Stages 4, 5 and 7 as indicated in black on the "Master Staging Plan – Citiswich";

(iii) An indicative subdivision layout should be provided for Stage 6 and the land to the west of Stage 6 to ensure that both Stage 6 and the adjoining land can be developed in an orderly fashion. The indicative layout should ensure that both site's integrate in terms of pedestrian and vehicle linkages;

(iv) Additional 5000m^2 Local (Level 3) Recreation Park is required to service the need of local residents in Stage 6 (Refer to Ipswich Planning Scheme Desired Standards of Service);

An amended Master Plan shall be submitted to Council for approval prior to any application be lodged for Stage 2.

Note: Please contact Council for additional details relating to the items listed above.

4. Advise to Purchasers

The Developer shall provide the purchaser of each industrial lot a copy of the Building Envelope Plan and WSUD TDG Design Assessment Checklist and Calculation Summary Checklist to demonstrate that the bioretention basins are designed in accordance with the guideline and the approved Stormwater Masterplan.

5. Fire Ants

In accordance with the *Plant Protection Act 1989* and the Plant Protection Regulation 1990, a quarantine notice has been issued for the State of Queensland to prevent the spread of the Red Imported Fire Ant (ant species Solenopsis invicta) and to eradicate it from the State.
It is the legal obligation of the land owner or any consultant or contractor employed by the land owner to report the presence or suspicion of Fire Ants to the Queensland Department of Primary Industries on 132523 within 24 hours of becoming aware of the presence or suspicion, and to advise in writing within seven days to:

Director General
Department of Primary Industries
GPO Box 46, Brisbane QLD 4001

It should be noted that the movement of Fire Ants is prohibited, unless under the conditions of a Department of Primary Industries Inspectors Approval. More information can be obtained from the Queensland Department of Primary Industries website www.dpi.qld.gov.au.

The development approved herein, by its very nature, includes activities considered to be "high risk" in respect of controlling the spread of Fire Ants. The following lists show high risk activities and some precautions should be considered for implementation.

(a) High risk activities can include:

(i) Earthworks of a minor or major scale;

(ii) Revegetation or rehabilitation;

(iii) Import of fill onto a site;

(iv) Export of fill or other materials such as soils, gravel, mulch and plants; and

(v) Export off or import on to a site of construction and demolition waste and materials or green waste.

(b) Precautions for implementation

(i) Checking for ants regularly;

(ii) Checking all soil, fill and waste materials (construction and green waste) for ants;

(iii) Asking questions about the quality and source of soil, fill and waste materials (construction and green waste);

(iv) Keeping records of all movements of soil, fill and waste materials (construction and green waste);

(v) Cleaning of all earthmoving or other soiled vehicles prior to exit from the site; and

(vi) Informing staff and contractors about these precautions.

6. Infrastructure Agreement

The subject approval does not preclude Council and the Developer from entering into an Infrastructure Agreement at some time in the future.

Pursuant to the provisions of the *Integrated Planning Act 1997*, I also enclose herewith a copy of the relevant sections concerning:

- Making representations about conditions during the applicant's appeal period (i.e. Negotiated Decision Notice); and
- The institution of an appeal.

Access PD Online at www.ipswich.qld.gov.au to view, search and print property information, interactive mapping, track development applications and the Ipswich Planning Scheme. Undertake a development enquiry as part of the Property Enquiry function to identify the planning scheme provisions that apply to a particular use on a property. PD Online - information at your fingertips 24 hours a day, 7 days a week.

Yours faithfully

for [redacted]

[redacted]

ACTING DEVELOPMENT MANAGER

Appendix 1

Contribution	Sector	Rate	Proposal	Calculation
Water Supply Infrastructure	Bundamba Low Level Zone (5)	$734.00/NRU Unit Charge = 1.000 Total = $734.00/NRU	***Stage 1A*** 22.5 NRU per ha @ 8.5089 ha (11 lots) **Total = 191.4503 NRU**	$734.00 x 191.4503 = $140,524.52 **Total = $140,524.00**
			Stage 1B 22.5 NRU per ha @ 4.139 ha (3 lots) **Total = 93.1275 NRU**	$734.00 x 93.1275 = $68,355.59 **Total = $68,355.00**
			Stage 1C 22.5 NRU per ha @ 15.1785 ha (11 lots) **Total = 341.5163 NRU**	$734.00 x 341.5163 = $250,672.96 **Total = $250,672.00**
Sewerage Infrastructure	South Bremer (23)	$1,052.00/NRU Unit Charge = 1.000 Total = $1,052.00/NRU	***Stage 1A*** 22.5 NRU per ha @ 8.5089 ha (11 lots) **Total = 191.4503 NRU**	$1,052.00 x 191.4503 = $201,405.71 **Total = $201,405.00**
			Stage 1B 22.5 NRU per ha @ 4.139 ha (3 lots) **Total = 93.1275 NRU**	$1,052.00 x 93.1275 = $97,970.13 **Total = $97,970.00**
			Stage 1C 22.5 NRU per ha @ 15.1785 ha (11 lots) **Total = 341.5163 NRU**	$1,052.00 x 341.5163 = $359,275.14 **Total = $359,275.00**
Roadworks Infrastructure	Bundamba Industry (25)	$554.00/VT Unit Charge = 1.000 Total = $554.00/VT	***Stage 1A*** 140 VT per ha @ 8.5089 ha (11 lots) **Total = 1,191.246 VT**	$554.00 x 1191.246 = $659,950.28 **Total = $659,950.00**
			Stage 1B 140 VT per ha @ 4.139 ha (3 lots) **Total = 579.46 VT**	$554.00 x 579.46 = $321,020.84 **Total = $321,020.00**
			Stage 1C 140 VT per ha @ 15.1785 ha (11 lots) **Total = 2,124.99 VT**	$554.00 x 2,124.99 = $1,177,244.40 **Total = $1,177,244.00**
Stage 1A Total				**$ 1,001,879.00**
Stage 1B Total				**$ 487,345.00**
Stage 1C Total				**$ 1,787,191.00**
Total for Stage 1				**$ 3,276,415.00**

Extract from the Integrated Planning Act

Division 4 – Representations about conditions and other matters

Application of div 4

3.5.16 This division applies only during the applicants appeal period.

Changing conditions and other matters during the applicant's appeal period

3.5.17 (1) This section applies if the applicant makes representations to the assessment manager about a matter stated in the decision notice, other than a refusal or a matter about which a concurrence agency told the assessment manager under section 3.3.18(1).

(2) If the assessment manager agrees with any of the representations, the assessment manager must give a new decision notice (the ***negotiated decision notice)*** to –

(a) the applicant; and

(b) each principal submitter; and

(c) each referral agency; and

(d) if the assessment manager is not the local government and the development is in a local government area – the local government.

(3) Only 1 negotiated decision notice may be given.

(4) The negotiated decision notice –

(a) must be given within 5 business days after the day the assessment manager agrees with the representations; and

(b) must be in the same form as the decision notice previously given; and

(c) must state the nature of the changes; and

(d) replaces the decision notice previously given.

(5) If the assessment manager does not agree with any of the representations, the assessment manager must, within 5 business days after the day the assessment manager decides not to agree with any of the representations, give a written notice to the applicant stating the decision about the representations.

(6) Before the assessment manager agrees to a change under this section, the assessment manager must reconsider the matters considered when the original decision was made, to the extent the matters are relevant.

(7) If the development approved by the negotiated decision notice is different from the development approved in the decision notice in a way that affects the amount of an infrastructure charge or regulated infrastructure charge, the local government may give the applicant a new infrastructure charges notice under 5.1.8 or regulated infrastructure charges notice under section 5.1.18 to replace the original notice.

(8) If the development approved by the negotiated decision notice is different from the development approved in the decision notice in a way that affects the amount of a regulated State infrastructure charge, the relevant State infrastructure provider may give the applicant a new regulated State infrastructure charges notice under section 5.3.4 to replace the original notice.

Applicant may suspend applicant's appeal period

3.5.18 (1) If the applicant needs more time to make the written representations, the applicant may, by written notice given to the assessment manager, suspend the applicants appeal period.

(2) The applicant may act under subsection (1) only once.

(3) If the written representations are not made within 20 business days after the day written notice was given to the assessment manager, the balance of the applicants appeal period restarts.

(4) If the written representations are made within 20 business days after the day written notice was given to the assessment manager -

(a) if the applicant gives the assessment manager a notice withdrawing the notice under subsection (1) – the balance of the applicants appeal period restarts the day after the assessment manager receives the notice of withdrawal; or

(b) if the assessment manager gives the applicant a notice under section 3.5.17(5) – the balance of the applicant's appeal period restarts the day after the applicant receives the notice; or

(c) if the assessment manager gives the applicant a negotiated decision notice – the applicant's appeal period starts again the day after the applicant receives the negotiated decision notice.

Division *8–Appeals to court relating to development applications*

Appeals by applicants

4.1.27. (1) An applicant for a development application may appeal to the court against any of the following–
(a) the refusal, or the refusal in part, of a development application;
(b) a matter stated in a development approval, including any condition applying to the development, and the identification of a code under Section 3.1.6;
(c) the decision to give a preliminary approval when a development permit was applied for;
(d) the length of a period mentioned in 3.5.21;
(e) a deemed refusal.
(2) An appeal under subsection (1)(a) to (d) must be started within 20 business days (the "applicant's **appeal period")** after the day the decision notice or negotiated decision notice is given to the applicant.
(3) An appeal under subsection (1)(e) may be started at any time after the last day a decision on the matter should have been made.

Appeals by submitters

4.1.28. (1) A submitter for a development application may appeal to the court only against-
(a) the part of the approval relating to the assessment manager's decision under section 3.5.14 or 3.5.14A; or
(b) for an application processed under section 6.1.28(2)-the part of the approval about the aspects of the development that would have required public notification under the repealed Act.
(2) To the extent an appeal may be made under subsection (1), the appeal may be against 1 or more of the following-
(a) the giving of development approval;
(b) any provision of the approval including –
(i) a condition of, or lack of condition for, the approval; or
(ii) the length of a period mentioned in section 3.5.21 for the approval.
(3) However, a submitter may not appeal if the submitter-
(a) withdraws the submission before the application is decided; or
(b) has given the assessment manager a notice under section 3.5.19(1)(b)(ii)
(4) The appeal must be started within 20 business days (the ***submitter's appeal period)*** after the decision notice or negotiated decision notice is given to the submitter.

Appeals for matters arising after approval given (co-respondents)

4.1.30. (1) For a development approval given for a development application, a person to whom any of the following notices have been given may appeal to the court against the decision in the notice-
(a) a notice giving a decision on a request for an extension of a period mentioned in section 3.5.21;
(b) a notice giving a decision on a request to make a minor change to an approval
(2) The appeal must be started within 20 business days after the day the notice of the decision is given to the person.
(3) Subsection (1)(a) does not apply if the approval resulted from a development application (superseded planning scheme) that was assessed as if it were an application made under a superseded planning scheme.
(4) Also, a person who has made a request mentioned in subsection (1) may appeal to the court against a deemed refusal of the request.
(5) An appeal under subsection (4) may be started at any time after the last day the decision on the matter should have been made.

Appeals for matters arising after approval given (no co-respondents)

4.1.31. (1) A person to whom any of the following notices have been given may appeal to the court against the decision in the notice-
(a) a notice giving a decision on a request to change or cancel a condition of a development approval;
(b) a notice under section 3.5.33A(9)(b) or 6.1.44 giving a decision to change or cancel a condition of a development approval.
(2) The appeal must be started within 20 business days after the day the notice of the decision is given to the person.
(3) Also, a person who has made a request mentioned in subsection (1)(a) may appeal to the court against a deemed refusal of the request.
(4) An appeal under subsection (3) may be started at any time after the last day the decision on the matter should have been made.

Appeals on matters relating to the Building Act 1975 the following also applies: -

Jurisdiction of tribunals

4.2.7. (1) A tribunal has jurisdiction to decide any matter that under this or another Act may be appealed to it.

(2) However, an appeal to a tribunal under this Act may only be about—

(a) a matter under this Act that relates to the *Building Act 1975* (other than a matter under that Act that may or must be decided by the Building Services Authority) or the *Plumbing and Drainage Act 2002;* or

(b) a matter prescribed under a regulation.

Appeals by applicants

4.2.9. (1) An applicant for a development application may appeal to a tribunal against any of the following—

(a) the refusal, or the refusal in part, of a development application;

(b) a matter stated in a development approval, including any condition applying to the development, but not including the identification of a code under section 3.1.6;

(c) the decision to give a preliminary approval when a development permit was applied for;

(d) the length of a period mentioned in section 3.5.21;

(e) a deemed refusal.

(2) An appeal under subsection (1)(a) to (d) must be started within 20 business days (the **"applicant's appeal period")** after the day the decision notice or negotiated decision notice is given to the applicant.

(3) An appeal under subsection (1)(e) may be started at any time after the last day a decision on the matter should have been made.

1837/07 [redacted]

3 July 2008

MEMORANDUM

TO: DEVELOPMENT TEAM CO-ORDINATOR - EASTERN

FROM: ASSISTANT DEVELOPMENT PLANNER - [redacted]

RE: NEGOTIATED DECISION NOTICE REQUEST - CODE ASSESSMENT
***INTEGRATED PLANNING ACT 1997* - SECTION 3.5.16**

Appn No: 1837/07

Applicant: Walker Corporation Pty Ltd

Real Property Description: Lot 13 on SL 2982, Lot 34 on SL 3911 & Lot 2 on SP 179307

Property Location: 120 Bognuda Street, Bundamba & 2-50 & 51 Ashburn Road, Bundamba

Division: 4

Proposal	Development	Approval Type Requested
Reconfiguring a Lot (Three (3) Lots into 28 Lots)	Reconfiguring a Lot	Development Permit.

Date Original Decision Notice Issued: 22 April 2008

Date Received: 27 May 2008

Site Area: 157.261 ha

Zone: Regional Business and Industry Buffer, Regional Business and Industry (RB2L) & Regional Business and Industry (RB2M)

SUMMARY

On 22 April 2008, Council approved an application for Reconfiguring a Lot (Three (3) Lots into 25 Lots and Three (3) Balance Lots) on land located at 120 Bognuda Street, 2-50 & 51 Ashburn Road, Bundamba. The Applicant has subsequently made representations regarding nine (9) conditions of the approval as follows:

- **Condition 3 - Plan of Survey:** The Applicant has made representations stating that detailed planning and conceptual design drawings have been submitted to Council demonstrating that no modifications of the Stage 1 ROL layout will be required to accommodate the North-South Link road. Accordingly, the Applicant has requested the deletion of condition 3(a)(i) and the amendment of the approval details to allow the creation of 28 lots as part of this stage. Upon review of the Applicant's representations, it is considered reasonable to delete this section of the condition as requested. *(Recommendation – to be amended)*

- **Condition 3 (incorrectly numbered) – Building Envelope Plan:** This condition requires the Developer to submit a Building Envelope Plan (BEP), nominating that no works/storage are permitted within the twelve (12) metre landscape buffer to the Warrego Highway. The Applicant has made representations requesting the condition be amended for a 22 metre setback, incorporating a 10 metre setback for future road widening to the Warrego highway, a 9 metre setback for landscaping and 3 metre setback to allow access for maintenance. Furthermore, the Applicant has requested that no works/storage be allowed within the 9 metre setback for landscaping, and no buildings to be erected within the 3 metre setback to allow access for maintenance. Upon review of the Applicant's representations, it is considered reasonable to amend the condition as requested. *(Recommendation – to be amended)*

- **Condition 4 – Proposed Stages for Reconfiguration:** The Applicant has made representations stating that the proposed North-South Link Road conceptual design drawings demonstrate that no modification of the Stage 1 layout will be required to accommodate the North South Link Road. Accordingly, they have requested the condition be amended to reflect the 28 lots originally applied for. Upon review of the Applicant's representations, it is considered reasonable to amend the condition as requested. *(Recommendation – to be amended)*

- **Condition 9 – Contributions:** The Applicant has made representations requesting contributions for the entire 28 lots applied for be calculated. Upon review of the Applicant's representations, it is considered reasonable to recalculate contributions for all 28 lots applied for. *(Recommendation – to be amended)*

- **Condition 12 – Roadworks:** The Applicant has requested amendments to the following parts of this condition:

    - In relation to Condition 12(b)(iv), (d)(i) and (n)(i), the Applicant has made representations requesting the design speed of 70km/h be reduced due to some sections of the road operating at a speed lower than this. Upon review of the Applicant's representations, it is considered reasonable to reduce the design speed from 70km/h to 60km/h. *(Recommendation – to be amended)*

- In relation to Condition 12(d), the Applicant has made representations requesting the 'Warrego Highway Access Road' be removed from this condition as the Department of Main Roads require this to be closed upon the introduction of the proposed North-South Link Road. Upon review of the Applicant's representations, it is considered reasonable to delete reference to the 'Warrego Highway Access Road'. *(Recommendation – to be amended)*

- In relation to Condition 12(d)(vi), the Applicant has made representations requesting Council delete reference to '60km/h speed limit signs' and insert the words 'appropriate speed limit signage' as certain road elements within the estate will operate at speeds lower than 60km/h. Upon review of the Applicant's representations, it is recommended this section of the condition remain unchanged as industrial collector streets should have a posted speed limit of 60km/h to be consistent with the Queensland Transport Speed Signing Policy. *(Recommendation – to remain unchanged)*

- In relation to Condition 12(d)(iv), the Applicant has made representations requesting pedestrian refuges be located within the splitter islands of the western and eastern intersection of 'Road 1' roundabouts in the vicinity of proposed Lots 12 and 15 to increase pedestrian amenity within the estate. Upon review of the Applicant's representations in relation to Condition 12(d)(iv), it is considered reasonable to amend the condition as requested. *(Recommendation – to be amended)*

- In relation to Condition 12(n)(i) to(iii), the Applicant has made representations requesting Council delete this section of the approval as no modification of the Stage 1 RAL layout will be required to accommodate the North-South Link Road. Upon review of the Applicant's representations in relation to Condition 12(n)(i) to (iii), it would be prudent for this condition to remain to ensure the design of Ashburn Road integrates with the design of the Warrego Highway Overpass. Therefore, it is recommended that the condition not be deleted but be amended as necessary. *(Recommendation – to be amended)*

- **Condition 14(e) – Access:** This condition requires no permanent heavy vehicle access for the development via Bognuda Street south of Archer Street. The Applicant has made representations suggesting link roads which have been designed into the proposal will allow heavy vehicle traffic along Bognuda Street South of Archer Street. Accordingly, the Applicant has requested the condition be amended to incorporate a reference to Boundary Street rather than Archer Street. Upon review of the Applicant's representations, it is considered reasonable to amend the condition. *(Recommendation – to be amended)*

- **Condition 15(c) – Stormwater Quality Reporting:** The Applicant has made representations requesting Condition 15 be amended to delete reference to Council's stormwater quality concentration based objectives on the basis that best practice management techniques and guidelines and Healthy Waterwise advice is to meet load based objectives only. Upon review of the Applicant's representations, it is considered reasonable to amend the condition. *(Recommendation – to be amended)*

- **Condition 16(d) – Construction of Stormwater Treatment:** The Applicant has made representations outlining an error in that the condition refers to Condition 12(d)(i) which

relates to sight distances. Accordingly, the Applicant has requested the condition be amended to refer to the correct section of the approval, being Condition 15(b)(i). Upon review of the Applicant's representations, it is considered reasonable to amend the condition. *(Recommendation – to be amended)*

- **Condition 18(e) – Sewerage:** This condition requires all sewer pipes and rising mains to be constructed from Vitreous Clay or other similar material. The Applicant has made representations requesting clarification that "Vinidex Sewer-Pro" pipes and fittings are generally acceptable to Ipswich City Council. Accordingly, the Applicant has requested that reference to Vitreous Clay be removed and replaced with reference to "Vinidex Sewer-Pro". Upon review of the Applicant's representations, it is considered reasonable to amend the condition. *(Recommendation – to be amended)*

- **Advice Condition 3(a)(iv) – Amended Masterplan:** The Applicant has made representations requesting clarification as to whether the additional 5000m^2 of recreation park is required over and above what park areas are already proposed as part of the estate. It is proposed to further advise that should the development meet the Ipswich Planning Scheme Desired Standards of Service for the design of parks without including any additional parkland, then it will not need to be provided. However if it does not, this parkland will be required over and above the park areas already proposed. The advice condition is recommended to be amended in order to further clarify this. *(Recommendation – to be amended)*

In summary, it is considered that the negotiated decision request to negotiate conditions of a Reconfiguring a Lot (Three (3) Lots into 25 Lots and 3 Balance Lots) (Application No. 1837/07) is suitable in part.

Nature of Change

'Approval details' to be amended
Condition 3(a)(i): Plan of Survey to be deleted,
Conditions 3(a): Plan of Survey to be amended
Condition 3 (incorrectly numbered): Building Envelope Plan to be amended
Condition 4: Proposed Stages For Reconfiguration to be amended
Condition 9: Contributions to be updated
Condition 12(b)(iv): Roadworks to be amended
Condition 12(d): Roadworks to be amended
Condition 12(d)(i): Roadworks to be amended
Condition 12(n)(i): Roadworks to be amended
Condition 12(d): Roadworks to be amended
Condition 12(d)(iv): Roadworks to be amended
Condition 12(d)(vii): Roadworks to be amended
Condition 12(f): Roadworks to be amended
Condition 12(n)(i): Roadworks to be amended
Condition 14(e): Access to be amended
Condition 15(c): Stormwater Quality Reporting to be amended
Condition 16(d): Construction of Stormwater Treatment to be amended
Condition 18(e): Sewerage to be amended
Advice 3(a)(iv): Amended Masterplan to be amended
Condition 12(d)(vi): Roadworks to remain unchanged
Condition 12(n)(i): Roadworks to remain unchanged

Condition 12(n)(ii): Roadworks to remain unchanged
Condition 12(n)(ii): Roadworks to remain unchanged
Advice 7: Contributions to be inserted

The numbering of all conditions is to be updated accordingly.

A. BACKGROUND

On 22 April 2008, Council approved a Reconfiguring a Lot Development Application for the development of Three (3) Lots into 25 Lots and Three (3) Balance Lots on the subject site. (Appl. No. 1837/07)

On 27 May 2008, Council received representations from the Applicant in respect to a number of conditions of the above referenced approval to which this report relates.

B. EVALUATION OF PROPOSED DEVELOPMENT

Existing Condition	Applicant's Comments	Development Branch Comments	Amended Condition
3. Plan of Survey (a) The Developer shall submit a plan of survey to generally conform with Proposed "Citiswich" Development at Ipswich April 2008 Drawing No. QC00-3632:00:SK.116 (prepared by Burchill VDM Consulting Engineers and Planners) with the following exception: (i) Proposed Lots 15, 16 & 17 shall be incorporated into a balance lot until such time as the detailed planning and conceptual design drawings for the road network are finalised and approved by Council, in particular the road linking the northern and southern areas of Citiswich over the Warrego Highway ("North-South Link Road").	The Applicant has made representations stating that detailed planning and conceptual design drawings have been submitted to Council demonstrating that no modifications of the Stage 1 ROL layout will be required to accommodate the North-South Link road. Accordingly, the Applicant has requested the deletion of condition 3(a)(i) and the amendment of the approval details to allow the creation of 28 lots as part of this stage.	Upon review of the Applicant's representations, it is considered reasonable to delete this section of the condition as requested.	3. Plan of Survey (a) The Developer shall submit a plan of survey to generally conform with *'Proposed Reconfiguration' Drawing Number 15675 (prepared by B&P Consulting Surveys Consulting Surveyors and dated 12 December 2006)* ~~Proposed "Citiswich" Development at Ipswich April 2008 Drawing No. QC00-3632:00:SK.116 (prepared by Burchill VDM Consulting Engineers and Planners). with the following exception:~~ ~~(i) Proposed Lots 15, 16 & 17 shall be incorporated into a balance lot until such time as the detailed planning and conceptual design drawings for the road network are finalised and approved by Council, in particular the road linking the northern and southern areas of Citiswich over the Warrego Highway ("North-South Link Road").~~
3. Building Envelope Plan The Developer shall submit a Building Envelope Plan to the Development Manager for approval prior to signing the relevant plan of survey. The Building Envelope Plan shall nominate that no works/storage are permitted within the twelve (12) metre landscape buffer to the Warrego Highway, amongst other matters.	The Applicant has made representations requesting the condition be amended for a 22 metre setback, incorporating a 10 metre setback for future road widening to the Warrego Highway, a 9 metre setback for landscaping and 3 metre setback to allow access for maintenance. Furthermore, the Applicant has requested that no works/storage be permitted within the 9 metre setback for landscaping, and no buildings to be erected within the 3 metre setback to allow access for maintenance.	Upon review of the Applicant's representations, it is considered reasonable to amend the condition as requested.	4. Building Envelope Plan The Developer shall submit a Building Envelope Plan to the Development Manager for approval prior to signing the relevant plan of survey. The Building Envelope Plan shall nominate ~~that no works/storage are permitted within the twelve (12) nine (9) metre landscape buffer to the Warrego Highway.~~ *a 10 metre setback for future road widening to*

				the Warrego Highway, a nine (9) metre setback for landscaping, and a three (3) metre setback to allow access for maintenance. No works/storage shall be permitted within the 10 metre setback for future road widening or the nine (9) metre landscape buffer to the Warrego Highway, and no storage, landscaping or building works are to be permitted within the three (3) metre setback to allow access for maintenance.
4.	Proposed Stages For Reconfiguration The staging of the reconfiguration shall be in accordance with the approved plans and shall be as follows: **Stage 1A** Proposed Lots 1 to 11 (11 lots) **Stage 1B** Proposed Lots 12 to 14 (3 lots) **Stage 1C** Proposed Lots 18 to 28 (11 lots)	The Applicant has made representations stating that the proposed North-South Link Road conceptual design drawings demonstrate that no modification of the Stage 1 layout will be required to accommodate the North South Link Road. Accordingly, they have requested the condition be amended to reflect the 28 lots originally applied for.	Upon review of the Applicant's representations, it is considered reasonable to amend the condition as requested.	4. Proposed Stages For Reconfiguration The staging of the reconfiguration shall be in accordance with the approved plans and shall be as follows: **Stage 1A** Proposed Lots 1 to 11 (11 lots) **Stage 1B** Proposed Lots 12 to ~~14~~ 15 (~~3~~ *4* lots) **Stage 1C** Proposed Lots 18 to 28 (11 lots) ***Stage 1D*** *Proposed Lots 16 and 17 (2 lots)*
9.	Contributions In accordance with the relevant Planning Scheme Policies, the Developer shall pay, prior to Council signing the plan of survey, the monies as outlined in Appendix 1 to Council:- Calculations of headworks and contributions are based on the infrastructure contribution policies and rates applicable at the date the development application was	The Applicant has made representations requesting contributions for the entire 28 lots applied for be calculated.	Upon review of the Applicant's representations, it is considered reasonable to amend the condition as requested.	*Appendix 1 Updated*

determined by Council. The contributions above shall be applicable for a period of twelve (12) months from the date of the development approval, and thereafter shall be based on the infrastructure contribution policies and rates applicable at the date when payment is made.			
12. Roadworks "Hoepner Road Extension" (b) The Developer shall construct / extend Hoepner Road from the southern end of the existing constructed road to Brisbane Road. The "Hoepner Road Extension" shall: (iv) Be designed and configured for a 70km/h design speed; Site Frontage Works (d) The Developer shall reconstruct and upgrade Ashburn Road, Bognuda Street and the 'Warrego Highway Access Road' along the frontages of the development site (including any 'balance' or 'project' lots) in accordance with Council's Standards for an industrial collector street. The design and configuration of each road shall include: (i) Geometry and sight distances for a 70km/h design speed; (vi) Signs and pavement markings in accordance with the MUTCD	In relation to Condition 12(b)(iv), (d)(i) and (n)(i), the Applicant has made representations requesting the design speed of 70km/h to be reduced due to some sections of the road operating at a speed lower than this. In relation to Condition 12(d), the Applicant has made representations requesting the 'Warrego Highway Access Road' be removed from this condition as the Department of Main Roads require this to be closed upon the introduction of the proposed North-South Link Road. In relation to Condition 12(d)(vi), the Applicant has made representations requesting Council delete reference to '60km/h speed limit signs' and insert the words 'appropriate speed limit signage' as certain road elements within the estate will operate at speeds lower than 60km/h. In relation to Condition 12(d)(iv), the Applicant has made representations requesting pedestrian refuges be located within the splitter islands of the western and eastern intersection of 'Road 1' roundabouts in the vicinity of proposed Lots 12 and 15 to increase pedestrian amenity within the estate. In relation to Condition 12(d)(vii), the Applicant has made representations requesting Council	Upon review of the Applicant's representations in relation to Condition 12(b)(iv), (d)(i) and (n)(i), it is considered reasonable to reduce the design speed from 70km/h to 60km/h. Upon review of the Applicant's representations in relation to Condition 12(d), it is considered reasonable to delete reference to the 'Warrego Highway Access Road'. Upon review of the Applicant's representations in relation to Condition 12(d)(vi), it is recommended this section of the condition remain unchanged as industrial collector streets should have a posted speed limit of 60km/h to be consistent with the Queensland Transport Speed Signing Policy. Upon review of the Applicant's representations in relation to Condition 12(d)(iv), it is considered reasonable to amend the condition as requested. Upon review of the Applicant's representations in relation to Condition 12(d)(vii), it is considered	12. Roadworks "Hoepner Road Extension" (b) The Developer shall construct / extend Hoepner Road from the southern end of the existing constructed road to Brisbane Road. The "Hoepner Road Extension" shall: (iv) Be designed and configured for a ~~70km/h~~ 60km/h design speed *(unless otherwise approved by the Development Manager – Engineering)*; Site Frontage Works (d) The Developer shall reconstruct and upgrade Ashburn Road *and* Bognuda Street ~~and the 'Warrego Highway Access Road'~~ along the *full* frontages of the development site (including any 'balance' or 'project' lots) in accordance with Council's Standards for an industrial collector street. The design and configuration of each road shall include: (i) Geometry and sight distances for a ~~70km/h~~ 60km/h design speed *(unless*

including 60km/h speed limit signs and "No Stopping" Signs; (iv) Pedestrian refuge islands provided at the following locations: • Ashburn Road between the proposed intersections with the internal industrial access street (Road 1) in the vicinity of proposed Lots 10, 11, 13 & 14); and • Bognuda Street between Ashburn Road and Archer Street in the vicinity of proposed Lot 28. Each pedestrian refuge island shall be designed and constructed in accordance with the MUTCD (Figure 4 of Part 10) including signs, pavement markings, lighting and kerb ramps (designed in accordance with ICC Standard Drawing SR.19). The pedestrian refuge islands shall be positioned to ensure driveway access to adjacent lots will not be impeded in the future; (vii) Bus stops, and associated infrastructure, provided at the following locations: • Both sides of Ashburn Road on the departure side of the proposed eastern intersection with the internal industrial access street (Road 1); and • Both sides of Bognuda Street between Ashburn Road and Archer Street in the vicinity of proposed Lots 12 and 28.	delete the words 'Both sides of Ashburn Road on the departure side of the proposed eastern intersection with the internal industrial access street', and replace with the words 'Both sides of Ashburn Road between the eastern and western intersections of Road 1 and Ashburn Road', as it will allow bus stops to be located where adequate road frontage is available to provide a kerbside bus stop and convenient pedestrian access is provided nearby (as proposed in Condition 12(b)(iv) above. In relation to Condition 12(n)(i) to(iii), the Applicant has made representations requesting Council delete this section of the approval as no modification of the Stage 1 RAL layout will be required to accommodate the North-South Link Road.	reasonable to amend the condition as requested. Upon review of the Applicant's representations in relation to Condition 12(n)(i) to (iii), it would be prudent for this condition to remain to ensure the design of Ashburn Road integrates with the design of the Warrego Highway Overpass. Therefore, it is recommended that the condition not be deleted but be amended as necessary.	*otherwise approved by the Development Manager – Engineering);* (vi) Signs and pavement markings in accordance with the MUTCD including 60km/h speed limit signs and "No Stopping" Signs; (iv) *Safe* pedestrian ~~refuge islands~~ *crossing points* provided at the following locations: • ~~Ashburn Road between the proposed intersections with the internal industrial access street (Road 1) in the vicinity of proposed Lots 10, 11, 13 & 14); and~~ *Ashburn Road within the splitter island of the western and eastern intersection of 'Road 1' roundabouts in the vicinity of proposed lots 12 and 15. Works shall include kerb ramps, island breaks and signs; and* • Bognuda Street between Ashburn Road and Archer Street in the vicinity of proposed Lot 28. ~~Each~~ *Works shall include a* pedestrian refuge island ~~shall be~~ designed and constructed in accordance with the MUTCD (Figure 4 of Part 10) including signs, pavement markings, lighting and kerb ramps (designed in accordance with ICC Standard Drawing SR.19). The pedestrian refuge islands shall be positioned to ensure driveway access to adjacent lots will not be impeded in the future; (vii) Bus stops, and associated

Each bus stop shall be positioned, designed and constructed in accordance with Translink specifications / standards and Disability Standards for Accessible Public Transport and include: • A reinforced concrete hardstand area with a sufficient footprint for the installation of a illuminated Translink Type 2A bus shelter. The hardstand area shall be positioned between the kerb and path; • An illuminated Translink Type 2A bus shelter installed by a Translink preferred supplier; • Connection to the electricity network including conduits and pits; • Raised tactile ground indicators; • Pavement markings in accordance with the MUTCD; • A flag sign indicating 'future bus route' (white writing with dark blue background); and • A litter bin with bird proof cover. NOTE: Footpaths, pedestrian refuge islands and bus stops do not need to be provided along the 'Warrego Highway Access Road'. <u>Ashburn Road</u> (f) The Developer shall construct roundabouts at the two locations where the proposed new Industrial Collector Street (Road 1) intersects with Ashburn Road. The design and configuration of these roundabouts shall be in accordance with a 60km/h			infrastructure, provided at the following locations: • Both sides of Ashburn Road ~~on the departure side of the proposed eastern intersection with the internal industrial access street (Road 1); and~~ *between the western and eastern intersection of 'Road 1' roundabouts; and* • Both sides of Bognuda Street between Ashburn Road and Archer Street in the vicinity of proposed Lots 12 and 28. Each bus stop shall be positioned, designed and constructed in accordance with Translink specifications / standards and Disability Standards for Accessible Public Transport and include: • A reinforced concrete hardstand area with a sufficient footprint for the installation of a illuminated Translink Type 2A bus shelter. The hardstand area shall be positioned between the kerb and path; • An illuminated Translink Type 2A bus shelter installed by a Translink preferred supplier *(preferably Adshel)*; • Connection to the electricity network including conduits and pits; • ~~Raised~~ Tactile ground *surface* indicators; • Pavement markings in accordance with the MUTCD; • A flag sign indicating 'future bus route' (white writing with dark blue

design speed. Conceptual Design Development & Approval (n) The Developer shall organise the detailed planning and conceptual design plans for the proposed road linking the northern and southern areas of 'Citiswich' over the Warrego Highway ("North-South Link Road") to be prepared by an RPEQ before detailed design commences. The conceptual design plans for the 'North-South Link Road' shall: (i) Meet geometric and sight distance standards for a minimum design speed of 70km/h and a maximum vertical grade of 5 percent; (ii) Provide information relating to it's interface, interaction and impacts on the development site and Ashburn Road; and (iii) Be submitted to Council for approval at the same time the conceptual design plans for Ashburn Road and the Ashburn Road / 'Warrego Highway Access Road intersection are submitted.			background); and • A litter bin with bird proof cover. ~~NOTE: Footpaths, pedestrian refuge islands and bus stops do not need to be provided along the 'Warrego Highway Access Road'.~~ Ashburn Road (f) The Developer shall construct roundabouts at the two locations where the proposed new Industrial ~~Collector~~ *Access* Street (Road 1) intersects with Ashburn Road. The design and configuration of these roundabouts shall be in accordance with a 60km/h design speed. Conceptual Design Development & Approval (n) The Developer shall organise the detailed planning and conceptual design plans for the proposed road linking the northern and southern areas of 'Citiswich' over the Warrego Highway ("North-South Link Road") to be prepared by an RPEQ before detailed design commences. The conceptual design plans for the 'North-South Link Road' shall: (i) Meet geometric and sight distance standards for a minimum design speed of ~~70km/h~~ 60km/h and a maximum vertical grade of 5 percent. *These design parameters may be altered with approval by the Development Manager – Engineering;* *(ii) Meet the requirements of the*

			Department of Main Roads (DMR). As such, written correspondence from DMR is required to be submitted by the Developer outlining DMR's general design parameters for the "North-South Link Road" including clearances, structure spans and pier locations. (iii) Provide information relating to it's interface, interaction and impacts on the development site and Ashburn Road; and (iv) Be submitted to Council for approval at the same time the conceptual design plans for Ashburn Road and the Ashburn Road / 'Warrego Highway Access Road intersection are submitted.
14. (e) <u>Access</u> Permanent heavy vehicle access for the development site shall NOT be via Bognuda Street south of Archer Street;	The Applicant has made representations suggesting link roads which have been designed into the proposal will allow heavy vehicle traffic along Bognuda Street South of Archer Street. Accordingly, the Applicant has requested the condition be amended to incorporate a reference to Boundary Street rather than Archer Street.	Upon review of the Applicant's representations, it is considered reasonable to amend the condition.	14. <u>Access</u> (e) Permanent heavy vehicle access for the development site shall NOT be via Bognuda Street south of ~~Archer~~ *Boundary* Street;
15. <u>Stormwater Quality Reporting</u> (c) The amended reports shall be prepared by a suitably qualified and experienced professional in accordance with the Water Sensitive Urban Design Technical Design Guidelines (WSUD TDG) for South East Queensland (Healthy Waterways - Version 1 June 2006), and demonstrate through appropriate pollutant export modelling that stormwater will be treated on site to	The Applicant has made representations requesting Condition 15 be amended to delete reference to Council's stormwater quality concentration based objectives on the basis that best practice management techniques and guidelines and Healthy Waterwise advice is to meet load based objectives only.	Upon review of the Applicant's representations, it is considered reasonable to amend the condition.	15. <u>Stormwater Quality Reporting</u> (c) The amended reports shall be prepared by a suitably qualified and experienced professional in accordance with the Water Sensitive Urban Design Technical Design Guidelines (WSUD TDG) for South East Queensland (Healthy Waterways - Version 1 June 2006), and demonstrate through appropriate pollutant export modelling that stormwater will be treated on site to

	a standard which meets Council's stormwater quality concentration-based objectives and the load-based objectives for South East Queensland (TSS 80%, TP 60%, TN 45% and GP 90% removal respectively).			a standard which meets ~~Council's stormwater quality concentration-based objectives and~~ the load-based objectives for South East Queensland (TSS 80%, TP 60%, TN 45% and GP 90% removal respectively).
16. (d)	Construction of Stormwater Treatment The Operational Works staging boundaries shall include adjacent regional scale stormwater treatment devices in accordance with the approved staging and implementation plan as required in Condition 12(d)(i) above.	The Applicant has made representations outlining an error in that the Condition refers to Condition 12(d)(i) which relates to sight distances. Accordingly, the Applicant has requested the condition be amended to refer to the correct section of the approval, being Condition 15(b)(i).	Upon review of the Applicant's representations, it is considered reasonable to amend the condition.	16. (d)	Construction of Stormwater Treatment The Operational Works staging boundaries shall include adjacent regional scale stormwater treatment devices in accordance with the approved staging and implementation plan as required in Condition ~~12(d)(i)~~ *15(b)(i)* above.
18. (e)	Sewerage All sewer pipes and rising mains shall be constructed from Vitreous Clay (VC) or similar material as approved by Ipswich Water. Synthetic type material (such as uPVC) is not permitted.	The Applicant has made representations requesting clarification that "Vinidex Sewer-Pro" pipes and fittings are generally acceptable to Ipswich City Council. Accordingly, the Applicant has requested that reference to Vitreous Clay be removed and replaced with reference to "Vinidex Sewer-Pro".	Upon review of the Applicant's representations, it is considered reasonable to amend the condition.	18. (e)	Sewerage All sewer pipes and rising mains shall be constructed from ~~Vitreous Clay (VC)~~ *Vinidex Sewer-Pro* or similar material as approved by Ipswich Water. Synthetic type material (such as uPVC) is not permitted.
3. (a) (iv)	Amended Masterplan The proposed development and future stages shall be generally in accordance with the Master Staging Plan – Citiswich (prepared by B & P Survey Consulting Surveyors, dated 11 March 2008) with the following amendments and clarifications, as marked on the attached plan: Additional 5000m^2 Local (Level 3) Recreation Park is required to service the need of local residents in Stage 6 (Refer to Ipswich Planning Scheme Desired Standards of Service);	The Applicant has made representations requesting clarification as to whether the additional 5000m^2 of recreation park is required over and above what park areas are already proposed as part of the estate.	Should the Development meet the Ipswich Planning Scheme Desired Standards of Service without including this extra parkland it will not need to be provided however if it does not, this parkland will be required over and above the park areas already proposed. The advice condition is recommended to be amended in order to further clarify this.	3. (a) (iv)	Amended Masterplan The proposed development and future stages shall be generally in accordance with the Master Staging Plan – Citiswich (prepared by B & P Survey Consulting Surveyors, dated 11 March 2008) with the following amendments and clarifications, as marked on the attached plan: Additional 5000m^2 Local (Level 3) Recreation Park is required *over and above the park areas proposed* to service the need of local residents in Stage 6 (Refer to Ipswich Planning Scheme Desired Standards of Service). *Notwithstanding, should*

			the existing amount of park proposed (exclusive of stormwater quantity and quality treatment areas) meet the Ipswich Planning Scheme Desired Standards of Service, then this additional park will not be required;

RECOMMENDATION

A. That the Developer be advised that the request to negotiate Development Application No. 1837/07, as detailed in Decision Notice dated 22 April 2008 is determined as follows:

Nature of Change:

Approval Details:

Proposal	Development	Decision	Approval Type
Three (3) Lots into ~~25 Lots and 3 balance lots~~ *28 Lots*	Reconfiguring a lot	Approved	Development Permit.

Condition 3(a)(i): Plan of Survey to be deleted,
Conditions 3(a): Plan of Survey to be amended
Condition 3 (incorrectly numbered): Building Envelope Plan to be amended
Condition 4: Proposed Stages For Reconfiguration to be amended
Condition 9: Contributions to be updated
Condition 12(b)(iv): Roadworks to be amended
Condition 12(d): Roadworks to be amended
Condition 12(d)(i): Roadworks to be amended
Condition 12(n)(i): Roadworks to be amended
Condition 12(d): Roadworks to be amended
Condition 12(d)(iv): Roadworks to be amended
Condition 12(d)(vii): Roadworks to be amended
Condition 12(f): Roadworks to be amended
Condition 12(n)(i): Roadworks to be amended
Condition 14(e): Access to be amended
Condition 15(c): Stormwater Quality Reporting to be amended
Condition 16(d): Construction of Stormwater Treatment to be amended
Condition 18(e): Sewerage to be amended
Advice 3(a)(iv): Amended Masterplan to be amended
Condition 12(d)(vi): Roadworks to remain unchanged
Condition 12(n)(i): Roadworks to remain unchanged
Condition 12(n)(ii): Roadworks to remain unchanged
Condition 12(n)(ii): Roadworks to remain unchanged
Advice 7: Contributions to be inserted

The numbering of all conditions is to be updated accordingly.

[redacted]

ASSISTANT DEVELOPMENT PLANNER

I have this day adopted the recommendation specified in this report.

Such action was taken pursuant to the delegation entitled "Determination of a Development Application, including Negotiated Decisions" granted to me by the Chief Executive Officer dated 16 August 2001 and 22 August 2001.

[redacted]

[redacted]

DEVELOPMENT TEAM
CO-ORDINATOR - EASTERN

DATE: 8/7/08

Approval Details:

Proposal	Development	Decision	Approval Type
Three (3) Lots into ~~25 Lots and 3 balance lots~~ *28 Lots*	Reconfiguring a lot	Approved	Development Permit.

Further Development Permits Required

Further Development Permits, as required by the *Integrated Planning Act 1997,* shall be obtained in respect of any Material Change of Use, Operational Works, Building Works and Plumbing Works in relation to this approval before any such works are commenced.

Conditions

Assessment Manager (Ipswich City Council)

Conditions applicable to this approval under Integrated Planning Act:

1. Basis of Approval

   Subject to these conditions, the facts and circumstances set out in the application and all relevant Council Local Laws and/or Planning Scheme Policies and the Bremer Business Park Preliminary Approval (dated 30 June 2004) shall be adhered to.

2. Minor Alterations

   Notwithstanding the requirements detailed in this approval, any other minor alterations and/or modifications acceptable to the Development Manager will suffice.

3. Plan of Survey

   (a) The Developer shall submit a plan of survey to generally conform with '*Proposed Reconfiguration' Drawing Number 15675 (prepared by B&P Consulting Surveys Consulting Surveyors and dated 12 December 2006)* ~~Proposed "Citiswich" Development at Ipswich April 2008 Drawing No. QC00-3632:00:SK.116 (prepared by Burchill VDM Consulting Engineers and Planners). with the following exception:~~

   ~~(i) Proposed Lots 15, 16 & 17 shall be incorporated into a balance lot until such time as the detailed planning and conceptual design drawings for the road network are finalised and approved by Council, in particular the road linking the northern and southern areas of Citiswich over the Warrego Highway ("North-South Link Road").~~

   (b) The Developer shall grant, free of cost to or compensation payable by Council, minimum 4.0 m wide easements located centrally over proposed and existing stormwater drains, water mains and sewerage rising mains, where they are located within private property.

The documentation associated with these easements may be prepared by the Developer in a form satisfactory to Council's City Solicitor, or the Developer may submit easement plans, only where Council is party to the easements, to Council for the preparation of easement documents at the Developer's expense.

(c) Easements required for discharge of stormwater over adjacent land shall be agreed to in writing by the owner of the subject land prior to construction work commencing.

(d) Easements shall be centrally located over the alignment of stormwater paths and be of a width sufficient to encompass the overland flow from a storm event with an ARI of 100 years.

(e) Easements shall be of sufficient width to contain any fitting, access chamber etc located on stormwater drains, water mains, and sewerage rising mains.

(f) All pre-existing easements crossing the site shall be pegged where they cross each property boundary and at every change of direction.

(g) Adequate permanent survey marks shall be installed. The Developer shall submit a certificate signed by a cadastral surveyor, stating that after the completion of all works associated with the development, permanent survey marks are in their correct position, in accordance with the plan of survey.

(h) Land required for detention basins or equivalent are to be dedicated as drainage reserve in favour of Council and not included within parkland dedication unless approved as parkland by Council.

(i) Land required for open space shall be dedicated, free of cost to and compensation by Council, in fee simple at the time of registration of a plan of survey for any part of the land adjoining the area to be dedicated and in accordance with the plan approved pursuant to Condition 5: Landscaping and Rehabilitation.

(j) The proposed Archer Street Active Recreation Park for dedication shall meet the desired standards of service for "Local-Recreation Parkland" as per the current Ipswich Planning Scheme.

4. <u>Building Envelope Plan</u>

The Developer shall submit a Building Envelope Plan to the Development Manager for approval prior to signing the relevant plan of survey. The Building Envelope Plan shall nominate ~~that no works/storage are permitted within the twelve (12) nine (9) metre landscape buffer to the Warrego Highway.~~ *a 10 metre setback for future road widening to the Warrego Highway, a nine (9) metre setback for landscaping, and a three (3) metre setback to allow access for maintenance. No works/storage shall be permitted within the 10 metre setback for future road widening or the nine (9) metre landscape buffer to the Warrego Highway, and no storage landscaping or building works are to be permitted within the three (3) metre setback to allow access for maintenance.*

5. Proposed Stages For Reconfiguration

The staging of the reconfiguration shall be in accordance with the approved plans and shall be as follows:

Stage 1A Proposed Lots 1 to 11 (11 lots)
Stage 1B Proposed Lots 12 to ~~14~~ 15 (~~3~~ *4* lots)
Stage 1C Proposed Lots 18 to 28 (11 lots)
Stage 1D Proposed Lots 16 and 17 (2 lots)

6. Rates in Arrears

In accordance with the provisions of the *Integrated Planning Act 1997,* all rates and other expenses as a charge against the land shall not be in arrears at the date of signing of the plan of survey.

7. Hours of Construction

Unless otherwise determined in writing by the Development Manager hours of construction shall be:

Monday to Saturday 6.30 a.m. to 6.30 p.m.

Work or business shall not be conducted from or on the premises outside the above hours or on Sundays or public holidays.

8. Locality References

(a) Any place name or estate name used by the developer (excluding a reference to a building, structure or the like and excluding minor, subsidiary signage within a development) shall make reference to the relevant, approved place name under the *Place Names Act 1994* in a contrasting colour and in lettering no less than 50% of the Estate name.

(b) Any reference to the regional location of the site or the development shall not refer to the place or estate as being located in Brisbane or a Brisbane suburb or in the metropolitan area or in the western suburbs (excluding the western suburbs of Ipswich as determined by Council in writing from time to time).

9. Road Naming

The Developer may submit to Council a list of proposed street names and the corresponding name meanings for the new road(s) to be opened. The proposed names should normally be submitted as part of the Operational Works application. Should a theme be considered appropriate, the theme should be submitted at the same time. Council reserves the right to accept any or none of the proposed names.

10. Contributions

In accordance with the relevant Planning Scheme Policies, the Developer shall pay, prior to Council signing the plan of survey, the monies as outlined in Appendix 1 to Council:-

Calculations of headworks and contributions are based on the infrastructure contribution policies and rates applicable at the date the development application was determined by Council. The contributions above shall be applicable for a period of twelve (12) months from the date of the development approval, and thereafter shall be based on the infrastructure contribution policies and rates applicable at the date when payment is made.

11. Landscaping and Rehabilitation

(a) The Developer shall undertake landscaping and rehabilitation generally in accordance with the Bremer Business Park Open Space Master Plan by Anembo Consultants (Dated 8 March 2007) except where otherwise indicated in this Decision Notice.

(b) The Developer shall submit a Landscaping and Rehabilitation Masterplan for the whole development to be prepared by a corporate member of Australian Institute of Landscape Architects or other approved licensed landscape architect. The Landscaping and Rehabilitation Masterplan shall take account of the requested amendments to the Master Staging Plan – Citiswich and shall be submitted to the Development Manager for approval in conjunction with the first civil Operational Works application. The Landscaping and Rehabilitation Masterplan shall include a Master Recreation Strategy, a Master Streetscape Strategy, a Master Stormwater Quality Treatment Strategy, a Master Bushland Rehabilitation Strategy and a Master Cultural Heritage Strategy (as per Condition 8 of the Negotiated Decision Notice dated 6 July 2004 for ICC Development Application 3356/2002). The Landscaping and Rehabilitation Masterplan shall also identify what works relate to each civil works stage including pedestrian/cycle paths and parkland embellishments. The extent of information required in this Masterplan and future landscape applications shall be agreed upon with Council prior to lodgement of any further landscape plans. The following matters should be considered in preparing the plan:

(i) The Warrego Highway buffer shall be planted with ex-ground fig trees. Jute matting may be required to be used for stabilisation to the satisfaction of Council depending on the final approved batter.

(ii) Areas for remediation and rehabilitation shall be identified and treatment strategies outlined. Unless approved for stormwater treatment, active open space or bushfire management, all other areas of parkland and drainage reserve shall be remediated and rehabilitated to a natural bushland setting in accordance with the species outlined in the *Ipswich City Council Vegetation Communities Rehabilitation Guide 2 and 4*, locally endemic species and native flora observed on site.

(iii) All declared weeds, environmental weeds, and exotic pests shall be removed from the site to the greatest extent practicable. A staged rehabilitation approach shall be adopted to ensure that any habitat values provided by the exotic species is gradually replaced by natives and rehabilitation works do not cause erosion. Any

areas which are disturbed as a result of weed control shall be rehabilitated with native species.

(iv) The plans shall make provision for the placement of rocks and logs (which can be relocated from cleared areas), into the Bremer River Park and Eastern Forest Park to compensate for the loss of fauna habitat. The plan shall indicate the stockpile location and indicate the quantity and general relocation areas.

(v) A series of different sized nest boxes shall be installed which include a range of sizes and configurations up to an including Greater Glider size. The number and location of nest boxes shall be included on the detailed rehabilitation plans.

(vi) Rehabilitation shall consider the need for maintenance access to the power easement and minimum separation distances to transmission lines. Maintenance paths shall be suitably stabilised to the satisfaction of Council. Species to be planted below the transmission lines shall consist of species which do not grow greater than 3.5 metres in height at maturity or as otherwise stipulated by the relevant power authority.

(vii) Rehabilitation areas shall be planted at a minimum of one (1) plant per square metre taking into consideration existing native vegetation. For slopes greater than one in six a denser planting schedule will be required. Any stormwater treatment devices which require planting shall be planted in accordance with the species and densities outlined in the Water Sensitive Urban Design Technical Design Guidelines for South East Queensland. Only waterwise, drought tolerant natives shall be used consisting preferably of locally occurring species.

(viii) The plans shall demonstrate suitable stabilisation and screening around stormwater outlets and culverts. Dense planting will be required on the steep batters around culverts and pocket planting used in areas of dumped rock to inhibit weed growth.

(ix) Street Trees shall be provided in accordance with the Ipswich City Council Street Tree Strategy.

(x) All exposed culvert/wingwall surfaces shall be suitably treated to avoid exposed concrete surfaces.

(xi) Suitable embellishment in the formal park areas are required to be specified in accordance with the Desired Standards of Service outlined in Part 5 of Council's Planning Scheme Policy 3 – General Works.

(xii) The location of footpaths and cycle paths.

(c) Stage 1 streetscape and landscape works shall be undertaken generally in accordance with the following plans:

(i) General Notes Legend, Site Location Dwg Schedule and Sheet Layout Plan Dwg. No: LD01, Sheet 1 of 17, Revision A (prepared by Anembo Consultants, dated 1 August 2007);

(ii) Details and Plant Schedule Plan Dwg. No: LD02, Sheet 2 of 17, Revision A (prepared by Anembo Consultants, dated 1 August 2007);

(iii) Landscape Plan Dwg. No: LP01, Sheet 3 of 17, Revision A (prepared by Anembo Consultants, dated 1 August 2007);

(iv) Landscape Plan Dwg. No: LP02, Sheet 4 of 17, Revision A (prepared by Anembo Consultants, dated 1 August 2007);

(v) Landscape Plan Dwg. No: LP03, Sheet 5 of 17, Revision A (prepared by Anembo Consultants, dated 1 August 2007);

(vi) Landscape Plan Dwg. No: LP04, Sheet 6 of 17, Revision A (prepared by Anembo Consultants, dated 1 August 2007);

(vii) Landscape Plan Dwg. No: LP05, Sheet 7 of 17, Revision A (prepared by Anembo Consultants, dated 1 August 2007);

(viii) Landscape Plan Dwg. No: LP06, Sheet 8 of 17, Revision A (prepared by Anembo Consultants, dated 1 August 2007);

(ix) Landscape Plan Dwg. No: LP07, Sheet 9 of 17, Revision A (prepared by Anembo Consultants, dated 1 August 2007);

(x) Landscape Plan Dwg. No: LP08, Sheet 10 of 17, Revision A (prepared by Anembo Consultants, dated 1 August 2007);

(xi) Landscape Plan Dwg. No: LP09, Sheet 11 of 17, Revision A (prepared by Anembo Consultants, dated 1 August 2007);

(xii) Landscape Plan Dwg. No: LP010, Sheet 12 of 17, Revision A (prepared by Anembo Consultants, dated 1 August 2007);

(xiii) Landscape Plan Dwg. No: LP011, Sheet 13 of 17, Revision A (prepared by Anembo Consultants, dated 1 August 2007);

(xiv) Landscape Plan Dwg. No: LP012, Sheet 14 of 17, Revision A (prepared by Anembo Consultants, dated 1 August 2007);

(xv) Landscape Plan Dwg. No: LP013, Sheet 15 of 17, Revision A (prepared by Anembo Consultants, dated 1 August 2007);

(xvi) Landscape Plan Dwg. No: LP014, Sheet 16 of 17, Revision A (prepared by Anembo Consultants, dated 1 August 2007); and

(xvii) Landscape Plan Dwg. No: LP015, Sheet 17 of 17, Revision A (prepared by Anembo Consultants, dated 1 August 2007) incorporating a minimum width of 4 metres for the Turfed Maintenance Path.

(d) The Developer shall ensure all cultivation, planting detail and garden edging shall be in accordance with Parks Standard Drawing SP.06, Ipswich Standard Drawing SP.20 and Ipswich Standard Drawing Timber Log Edge SP. 23.

(e) The Developer shall submit to the Development Manager for approval, separate detailed plans for stormwater treatment devices in Stage 1.

(f) The Developer shall complete all approved landscaping and rehabilitation works for the parkland, drainage corridors and streetscape to the satisfaction of the Development Manager prior to the plan sealing of the adjacent stage.

(g) The Developer shall submit to Council a Certificate of Compliance – Landscape Works (Appendix 3 of Planning Scheme Policy 3 – General Works), which shall be signed by a corporate member of Australian Institute of Landscape Architects or other approved licensed landscape architect prior to Council signing the plan of survey to certify all landscape works have been completed in accordance with the approved plans.

12. Engineering Requirements

The following engineering requirements, detailed in Conditions 13 – 25, shall be completed to the satisfaction of the Senior Development Engineer.

Terms

(a) RPEQ - A Registered Professional Engineer of Queensland, suitably qualified and experienced in the particular area of expertise required. Furthermore, the RPEQ required for the analysis and reporting for mining shall be experienced in the analysis of underground and surface mining within the Ipswich area.

(b) QUDM - The Queensland Urban Drainage Manual, produced by the Queensland Department of Primary Industries.

(c) DMR – Queensland Department of Main Roads.

(d) MUTCD - The Manual of Uniform Traffic Control Devices, published by DMR.

(e) Ipswich Water - Commercial Business Unit of Ipswich City Council providing water and sewerage services.

(f) DNRM - Department of Natural Resources and Mines.

13. Roadworks

General

(a) All roadworks included in this approval shall be designed and constructed:

(i) As public roads;

(ii) At no cost to Council;

(iii) To ensure that the carriageway width, geometry, design speed and other attributes are consistent with the function of the road or street in the road hierarchy;

(iv) In accordance with Ipswich Planning Scheme Policy 3 - General Works, Council Standards and the DMR Road Planning & Design Manual (or other relevant documentation agreed by Council);

(v) With stormwater drainage infrastructure designed in accordance with Council's Planning Scheme Policy 3 – General Works, Queensland Urban Drainage Manual and the Department of Main Roads Drainage Design Manual, in that order of precedence;

(vi) For the safe and efficient movement of B-double combination vehicles (26.0 metres in length) and Higher Mass Limit Vehicles (including u-turn manoeuvres where required). This includes those roadworks to be undertaken by the Developer as specified by DMR in their referral agency response dated 25 March 2008.

(vii) With street lighting and route lighting installed in accordance with the relevant Australian Standards and Energex public lighting standards. The lighting shall be provided in accordance with the requirements for Energex Rate 3 lighting;

(viii) To include the relocation and protection of existing public utility services required in association with the roadworks at no cost to Council;

(ix) To include the installation of new public utility services to service land subject of this approval;

(x) To ensure access to existing properties is maintained at all times; and

(xi) With all medians, verges and batters topsoiled, turfed and landscaped generally in accordance with Council's Street Tree Planting Guidelines and the approved landscape master plan for the development site.

(xii) With kerb ramps (in accordance with Council's Standard Drawing SR.18) at all intersections and at additional locations where required to connect future path networks and pedestrian crossing points. Generally at "T" intersections, six kerb ramps are required.

<u>"Hoepner Road Extension"</u>

(b) The Developer shall construct / extend Hoepner Road from the southern end of the existing constructed road to Brisbane Road. The "Hoepner Road Extension" shall:

(i) Function as an industrial collector road and as such the design and construction of this road shall satisfy this intent and function and be generally consistent with Council's Standard Drawings;

(ii) Intersect with Brisbane Road in the vicinity of Whitwood Street and be controlled by traffic signals;

(iii) Include traffic signals at the intersection of Ashburn Road / Hoepner Road configured to provide sufficient capacity for a minimum operating horizon of 10 years from the date the last plan of survey of the development site is signed by Council;

(iv) Be designed and configured for a ~~70km/h~~ 60km/h design speed *(unless otherwise approved by the Development Manager – Engineering)*;

(v) Be fully constructed, on-maintenance in accordance with the Ipswich Planning Scheme and open to traffic at the following times (whichever is earlier):

- Before Council signs the plan of survey that creates the twelfth (12th) additional lot over the development site; and

- Within two (2) years from the date the plan of survey is signed that creates the first additional lot over the development site.

(c) Prior to the Council signing the plan of survey that creates the first additional lot over the development site, the following matters shall be completed:

(i) A Development Permit for Operational Works for the "Hoepner Road Extension" shall be lodged with and approved by Council;

(ii) All land required for the construction of the "Hoepner Road Extension", including its intersection with Brisbane Road and Whitwood Road, is owned by Council, the Department of Main Roads or the Developer or is dedicated road (except for the crossing over the railway corridor);

(iii) The Developer has provided Council with a bond to the value of 125% of the construction cost. As such, the Developer shall provide a preliminary cost estimate for the 'Hoepner Road Extension', including a schedule of rates and quanatities, before the Development Permit for Operational Works for the Hoepner Road Extension is issued ; and

(iv) The Developer has entered into a legal agreement with Council stipulating the Developer's construction obligations for the "Hoepner Road Extension".

<u>Site Frontage Works</u>

(d) The Developer shall reconstruct and upgrade Ashburn Road *and* Bognuda Street ~~and the 'Warrego Highway Access Road'~~ along the *full* frontages of the development site (including any 'balance' or 'project' lots) in accordance with Council's Standards for an industrial collector street. The design and configuration of each road shall include:

(i) Geometry and sight distances for a ~~70km/h~~ 60km/h design speed *(unless otherwise approved by the Development Manager – Engineering)*;

(ii) A nominal 14.0m wide carriageway on a nominal 22.0m road reserve (wider at intersections and where a divided carriageway is required). This will require a

dedication of land from one or both sides of the development site's frontages to these roads;

(iii) Concrete kerb and channel on both sides (Type B1 with an additional 50mm thickness) plus associated stormwater drainage infrastructure (designed in accordance with Council's Planning Scheme Policy 3 – General Works, QUDM and the DMR Drainage Design Manual, in that order of precedence).

(iv) Concrete paths (minimum 2.0m wide) on both sides, with kerb ramps designed in accordance with ICC Standard Drawing SR.19;

(v) Edge lines and 'bicycle awareness zones' marked on the carriageway;

(vi) Signs and pavement markings in accordance with the MUTCD including 60km/h speed limit signs and "No Stopping" Signs;

(vii) *Safe* pedestrian ~~refuge islands~~ *crossing points* provided at the following locations:

- ~~Ashburn Road between the proposed intersections with the internal industrial access street (Road 1) in the vicinity of proposed Lots 10, 11, 13 & 14); and~~ *Ashburn Road within the splitter island of the western and eastern intersection of 'Road 1' roundabouts in the vicinity of proposed lots 12 and 15. Works shall include kerb ramps, island breaks and signs; and*

- Bognuda Street between Ashburn Road and Archer Street in the vicinity of proposed Lot 28. ~~Each~~ *Works shall include a* pedestrian refuge island ~~shall be~~ designed and constructed in accordance with the MUTCD (Figure 4 of Part 10) including signs, pavement markings, lighting and kerb ramps (designed in accordance with ICC Standard Drawing SR.19). The pedestrian refuge islands shall be positioned to ensure driveway access to adjacent lots will not be impeded in the future;

(viii) Bus stops, and associated infrastructure, provided at the following locations:

- Both sides of Ashburn Road on the departure side of the proposed eastern intersection with the internal industrial access street (Road 1); and *between the western and eastern intersection of 'Road 1' roundabouts; and*

- Both sides of Bognuda Street between Ashburn Road and Archer Street in the vicinity of proposed Lots 12 and 28.

  Each bus stop shall be positioned, designed and constructed in accordance with Translink specifications / standards and Disability Standards for Accessible Public Transport and include:

- A reinforced concrete hardstand area with a sufficient footprint for the installation of a illuminated Translink Type 2A bus shelter. The hardstand area shall be positioned between the kerb and path;

- An illuminated Translink Type 2A bus shelter installed by a Translink preferred supplier *(preferably Adshel)*;

- Connection to the electricity network including conduits and pits;

- ~~Raised~~ Tactile ground *surface* indicators;

- Pavement markings in accordance with the MUTCD;

- A flag sign indicating 'future bus route' (white writing with dark blue background); and

- A litter bin with bird proof cover.

~~*NOTE: Footpaths, pedestrian refuge islands and bus stops do not need to be provided along the 'Warrego Highway Access Road'.*~~

Ashburn Road / 'Warrego Highway Access Road'

(e) The Developer shall upgrade the intersection of Ashburn Road / 'Warrego Highway Access Road' with traffic signals before the plan that creates the twelfth (12th) additional lot over the development site is signed by Council. The design and construction shall:

(i) Be sufficient to meet the capacity requirements of a minimum 10 year operating horizon (from the day the last plan of survey is signed over the development site).

(ii) Meet the requirements of the DMR;

(iii) Provide a southern leg of the intersection to facilitate future access for proposed Lot 16 and continued access for Lot 7 SP167997 (located at Lot 7 Bognuda Street), Lot 1 SP179307 (located at 83 Bognuda Street) and Lot 5 SP140694 (located at 61 Ashburn Road)

(iv) Be in accordance with the DMR Road Planning and Design Manual for a 60km/h design speed. Where any design element is not specified in this manual or in Council's Planning Scheme Policy 3 – General Works, Austroads Guide to Traffic Engineering Practice – Part 5 (Intersections at Grade) and Part 7 (Traffic Signals) should be used.

Ashburn Road

(f) The Developer shall construct roundabouts at the two locations where the proposed new Industrial ~~Collector~~ *Access* Street (Road 1) intersects with Ashburn Road. The design and configuration of these roundabouts shall be in accordance with a 60km/h design speed.

(g) The Developer shall construct a raised median (minimum 2.0 metres wide) along Ashburn Road between the eastern roundabout and the intersection of Ashburn Road / "Warrego Highway Access Road".

(h) The Developer shall configure the access for proposed Lot 1 along Ashburn Road for left-in and left-out movements only. This shall be supported by the construction of an island on the driveway of Lot 1 to restrict right turn movements out of this lot.

Ashburn Road / Warrego Highway On-ramp

(i) The Developer shall organise a Road Safety Audit (RSA) to be undertaken of the intersection of Ashburn Road / Warrego Highway on-ramp (in the vicinity of Duke Close and Earl Street) including its approach and departure legs (minimum 200 metres in each direction).

The RSA shall be undertaken by a DMR accredited road safety auditor and provide recommendations on any improvements that are required to be undertaken at this intersection to improve its safety and operation. The RSA shall take into account the changes in traffic movements and vehicle types generated by the development site, including the movement of B-double combination vehicles (26.0m in length). The RSA Report shall be submitted with the conceptual design plans for the roadworks along Ashburn Road.

(j) The Developer shall upgrade / reconfigure the intersection of Ashburn Road / Warrego Highway on-ramp (in the vicinity of Duke Close and Earl Street) to ensure the safe and efficient movement of the type and volumes of vehicles expected to use the intersection as a result of the development, including B-double Combination Vehicles (26.0m in length) and Higher Mass Limit Vehicles. The intersection upgrade shall be configured to ensure:

(i) A minimum design speed of 60km/h is achieved including safe intersection site distances (SISD);

(ii) Sufficient capacity of a minimum 10 year operating horizon (from the day the last plan of survey is signed over the development site);

(iii) The recommendations from the RSA are incorporated into the design; and

(iv) The requirements of DMR are met.

(v) Works may include realignment, reprioritisation and/or the installation of traffic signals.

New Industrial Street

(k) The proposed new street that will provide access for Stage 1A and Stage1C shall be designed and constructed in accordance with Council's Standard for an industrial access street. Works shall include a concrete path (minimum 1.5 metres wide) on one side designed in accordance with Council's Standard Drawing SR.19. The path shall be on the same side as the street lights and its maximum longitudinal grade shall not exceed 1:8.

Bird Street

(l) The Developer shall construction kerb & channel along both sides of Bird Street. Works shall include stormwater infrastructure, driveway reconstruction, verge re-profiling and pavement infill in accordance with Council's requirements. These works shall be completed before the plan that creates the twelfth (12th) additional lot over the development site is signed by Council.

NOTE: As part of the development of a master plan for the Bremer Business Park in 2003 (and as outlined in Council's Preliminary Approval Decision Notice dote 6 July 2004), the Developer at this time made a commitment to the community that certain works would be undertaken along Bird Street.

Conceptual Design Development & Approval

(m) The Developer shall organise for conceptual design plans of the roadworks outlined in this approval to be prepared by an RPEQ and then submit these plans to Council for approval before detailed design commences. The conceptual design plans are to show:

(i) Horizontal and vertical geometry;

(ii) Intersection configurations;

(iii) Cross sections;

(iv) Pavement markings;

(v) Bus stops locations; and

(vi) Pedestrian refuge islands.

(n) The Developer shall organise the detailed planning and conceptual design plans for the proposed road linking the northern and southern areas of 'Citiswich' over the Warrego Highway ("North-South Link Road") to be prepared by an RPEQ before detailed design commences. The conceptual design plans for the 'North-South Link Road' shall:

(i) Meet geometric and sight distance standards for a minimum design speed of ~~70km/h~~ 60km/h and a maximum vertical grade of 5 percent. *These design parameters may be altered with approval by the Development Manager – Engineering;*

(ii) Meet the requirements of the Department of Main Roads (DMR). As such, written correspondence from DMR is required to be submitted by the Developer outlining DMR's general design parameters for the "North-South Link Road" including clearances, structure spans and pier locations.

(iii) Provide information relating to it's interface, interaction and impacts on the development site and Ashburn Road; and

(iv) Be submitted to Council for approval at the same time the conceptual design plans for Ashburn Road and the Ashburn Road / 'Warrego Highway Access Road intersection are submitted.

Main Roads Requirements

(o) If DMR modifies any of its conditions of approval and associated threshold triggers for roadworks (including addition and deletion) as outlined in their Referral Agency Response dated 25 March 2008:

(i) The Developer shall inform Council in writing with the relevant information within ten (10) business days of the DMR modification; and

(ii) Council reserves the right to reassess the suitability of all of the roadworks requirements and associated design parameters as outlined in Condition 12 (above) and revise the roadworks conditions accordingly including the possible addition of other conditions.

14. Local Area Traffic Management

(a) The Developer shall implement an integrated local area traffic management (LATM) scheme in the existing residential areas to the south and south-west of the development site, generally in the vicinity of Bognuda Street and Law Street. The parameters for the LATM Scheme are as follows:

(i) The LATM scheme shall be designed and approved by Council before the plan of survey that creates the twelfth (12th) additional lot over the development site is signed by Council;

(ii) The approved LATM Scheme shall be fully constructed and open to traffic either within two (2) years from the date the plan of survey that creates the first (1st) lot over the development site is signed by Council or within six (months) from the date the first Development Permit for Building Works over the site is issued (which ever threshold is triggered is earlier). Council may by agreement extend the period by which the LATM scheme has to be completed;

(iii) The LATM scheme shall include a comprehensive public consultation component in which the Developer must prepare and submit a 'Community Engagement Plan' for approval by the Council before the planning and design of the LATM Scheme commences;

(iv) The scope of the LATM Scheme shall be generally in accordance with that outlined in the Preliminary Approval for the Bremer Business Park (refer Condition 12 (a) (iii) of the Negotiated Decision Notice dated 6 July 2004 for ICC Development Application 3356/2002), subject to community consultation.

(v) The LATM Scheme shall be designed and constructed at no cost to Council.

(b) In lieu of Condition 13 (a) above, the Developer shall provide to Council a monetary contribution of AUD$670,000 towards the implementation of a future LATM

scheme to the south and south-west of the development site.

This contribution shall be paid as a lump sum before the plan of survey that creates the first (1st) lot over the development site is signed by Council or paid in stages as follows:

(i) An amount of AUD $100,000 is payable to Council before the plan of survey that creates the first (1st) additional lot over the development site is signed by Council;

(ii) The balance is payable to Council before the plan of survey that creates the twelfth (12th) additional lot over the development site is signed by Council

The contribution amount (whether paid as a lump sum or in stages) is fixed for a period of twelve (12) months from the date of this Decision Notice and thereafter shall be calculated from the date of development approval to the date when payment is made in accordance with the Non-building Construction Cost Index (Queensland).

(c) The Developer shall inform Council in writing as to which option they intend to take with regard to satisfying Condition 13 before the plan of survey that creates the first (1st) additional lot over the development site is signed by Council.

15. Access

(a) Direct property access for proposed Lot 16 along Ashburn Street is not permitted. Vehicular access to and from proposed Lot 16 shall only be via the provision of a southern leg to an upgraded intersection of Ashburn Road / 'Warrego Highway Access Road'.

Similarly, 'right of way' easements on Lots 1 and 2 SP 179307 shall be preserved (except where land common to these easements is dedicated as road reserve) and access to the respective allotments configured to co-aligned with Lot 16 public and private access road.

(b) Safe and efficient access to existing lots and associated land uses shall be maintained at all times during both the construction and operating stages of the development as well as during the construction of the relevant roadworks outlined in this approval.

(c) The Developer shall construct a public road, in accordance with Council Standards for an industrial access street, to provide continued access for Lot 7 SP167997 (located at Lot 7 Bognuda Street), Lot 1 SP179307 (located at 83 Bognuda Street) and Lot 5 SP140694 (located at 61 Ashburn Road). The new road shall be constructed from the intersection with the Lot 16 access extending to the eastern property boundary of the development site and connecting with the existing access.

(d) Vehicular access to and from proposed Lots 2, 9, 18 and 26 shall be via the proposed internal industrial access street (Road 1). Direct property access along Ashburn Street is NOT permitted for these allotments.

(e) Permanent heavy vehicle access for the development site shall NOT be via Bognuda Street south of ~~Archer~~ *Boundary* Street;

16. Stormwater Quality Reporting

(a) The Developer is requested to submit an amended Stormwater Quality Report to the Development Manager for approval incorporating comments made in the review by Ecological Engineering (dated 30 July 2007) and Healthy Waterways (dated 21 January 2008) to the *Bremer Business Park Masterplan - Stormwater Management Strategy Overall Site Masterplan* (prepared by Cardno Lawson Treloar, dated 8 March 2007) and the *Bremer Business Park Stage 1- Stormwater Management Strategy* (prepared by Cardno Lawson Treloar, dated 2 August 2007).

(b) The amended report shall suitably address all matters outlined in the two reviews and shall include a Stormwater Masterplan and stage-based reports, as well as the following:

(i) The Cardno Lawson Treloar Review(dated 2 August 2007) partially addresses the issue of implementation and timing of the regional water quality treatment measures, this shall be integrated into the Stormwater Masterplan, stage-based reports and detailed Operational Works drawings for both the lot-scale and regional-scale bioretention. Construction, establishment and maintenance of all bioretention is required to be in accordance with Section 5.5 of the WSUD TDG and the reports and drawings shall specify how stormwater treatment areas relate to the staging of civil works, building works and the staged implementation of landscaping.

(ii) The Developer shall support the proposed bioretention in the road network (as listed in the Information Response) by the provision of modelling and figures. Furthermore, the treatment in roads via biopods and small bioretention basins is strongly supported and shall be further explored in the amended reports and drawings.

(iii) The Masterplan shall set up the extent of reporting for subsequent applications and provide guidance on the sizing of treatment devices. Reference shall be made to the treatment performance curves (figures 5-3 to 5-5), of the WSUD TDG ensuring that at a minimum 2% of each site area is reserved for treatment. The reports for each individual industrial lots shall be a summary of the steps 1-9 (Section 5.3.1) of the WSUD TDG as they apply to each site. A detailed water quality model shall not be required for individual industrial sites except where the proposed train varies from the WSUD TDG or the approved masterplan.

(iv) The reports shall address the potential conflict with landscape screening requirements and the location of bioretention treatment areas ensuring that trees are not planted in bioretention treatment areas.

(v) Gross pollutant traps and stormfilters shall not be relied upon for nitrogen removal. These units shall only be installed to control gross pollutants, oils and greases within industrial sites. For regional treatment measures, above ground trash racks shall be used in place of these units.

(vi) The stage-based report shall set up the responsibilities of the water quality specialist/s which shall be employed to oversee bioretention basin construction.

(vii) A copy of the MUSIC sqz. file for both the Stormwater Management Strategy and Overall Site Masterplan and for each of the stage-based reports shall be provided to Council for assessment in conjunction with the first Operational Works application.

(viii) Where non-default pollutant reduction efficiencies are used in the modelling these shall be agreed upon by Council prior to modelling. For gross pollutant traps calculated reduction efficiencies shall not exceed TSS 50%, TP 10% and TN 0% unless otherwise approved by Council prior to modelling.

(ix) The reports shall be accompanied by a point by point response to the aforementioned reviews by Healthy Waterways and Ecological Engineering as well as Council's concerns outlined in the above conditions.

(x) The Masterplan shall include a schedule which outlines the implementation timing of the regional water quality treatment measures associated with each stage.

(c) The amended reports shall be prepared by a suitably qualified and experienced professional in accordance with the Water Sensitive Urban Design Technical Design Guidelines (WSUD TDG) for South East Queensland (Healthy Waterways - Version 1 June 2006), and demonstrate through appropriate pollutant export modelling that stormwater will be treated on site to a standard which meets ~~Council's stormwater quality concentration-based objectives and~~ the load-based objectives for South East Queensland (TSS 80%, TP 60%, TN 45% and GP 90% removal respectively).

(d) All detailed stormwater quality drawings shall detail amongst other necessary items the following requirements/amendments:

(i) Specify the depth and appropriate particle size diameter of the filter media, transitional layer and drainage layer. The transitional and drainage layers should not be included in the depth of filter media modelled. Biofiltration should consist of a filter media featuring a sandy loam layer (depth 0.3-0.8m, particle size 0.45mm); a transitional layer of coarse sand (depth 0.1-0.2m, particle size 1.0mm) and a drainage layer of coarse sand/gravel (depth 0.1-0.2m, particle size 2mm-20mm).

(ii) Slotted PVC pipes shall be spaced a maximum of 1.5m apart within the drainage layers. A minimum of two slotted PVC pipes shall be placed within the drainage layer of bioretention swales. Drainage shall be designed in accordance with Section 5.9.5 of the WSUD TDG.

(iii) Provide geofabric around the base of the drainage layer and the walls of the basin. Geofabric shall not be laid between any of the filter layers or used to wrap the slotted PVC drainage pipes.

(iv) Provide a riser with PVC cap at the head of each the slotted pipe for maintenance flushing. A cross section detail shall be shown on the plan. The drawings shall specify that risers are not to be slotted.

(v) Adequate scour protection and maintenance access shall be provided. Scour protection shall be in accordance with Section 5.3.3.1 of the WSUD TDG. Scour protection areas shall not be included in the total filter areas. A plan detail and cross section similar to Figure 5-6 of the Water Sensitive Urban Design Technical Design Guidelines (WSUDTDG) shall be detailed on the plans.

(vi) A suitable sediment fore bay shall be designed for each basin in accordance with Section 5.3.3.2 of the WSUD TDG ensuring that particles equal to or greater than 1mm in diameter are removed from the 3 month ARI storm event. Calculations shall be provided to demonstrate compliance with the guidelines.

(vii) A high flow bypass shall be incorporated into the design of each basin to ensure that only flows up to the 3 month ARI storm event are treated through bioretention treatment basins.

(viii) The plans shall refer to the guideline for Bioretention and Tree Pit Media Specifications, Facility for Advancing Water Biofiltration (FAWB) for the filter specifications and objectives and note that construction and testing of bioretention filter media shall be undertaken with the most current version (at the time of construction/testing) of this guideline.

(e) Where any stormwater treatment is proposed to be located in existing easements the Developer shall provide to Council evidence from the relative authority that consent has been granted to construct within the easement.

17. Construction of Stormwater Treatment

(a) All stormwater quality management treatments shall be fully constructed in accordance with the final approved *Stormwater Management Strategy Overall Site Masterplan, stage-based reports* and detailed Operational Works drawings.

(b) All regional scale treatment devices shall be fully operational prior to works being accepted on-maintenance.

(c) Construction, establishment and maintenance of all bioretention basins shall be carried out in accordance with Section 5.5 of the WSUD TDG. A staged implementation approach shall be employed for the bioretention areas ensuring that filter media is either laid after construction works have been completed or the filter is protected until the completion of any works.

(d) The Operational Works staging boundaries shall include adjacent regional scale stormwater treatment devices in accordance with the approved staging and implementation plan as required in Condition ~~12(d)(i)~~ *15(b)(i)* above.

(e) The Developer shall provide to Council certification from a suitably qualified water quality specialist to verify that all bioretention basins have been constructed in accordance with the approved reports and drawings. This shall include certification that the biofiltration filter media meet the criteria outlined in the most current version (at the time of testing), of the guideline for Bioretention and Tree Pit Media Specifications, Facility for Advancing Water Biofiltration (FAWB).

The minimum parameters to be tested include: hydraulic conductivity, particle size distribution, organic matter content, pH, electrical conductivity and phosphorus concentration. Should filter media fail to meet these or other agreed criteria, suitable remedial measures shall be implemented by the Developer prior to the on-maintenance for regional scale bioretention basins.

18. Stormwater Quality Maintenance Plans

(a) The Developer shall prepare a detailed Stormwater Quality Maintenance Masterplan for the development which addresses both the regional and lot scale treatment devices for each stage. The Masterplan shall be submitted to the Development Manager for approval in conjunction with the first Operational Works application. The Masterplan shall:

(i) Outline requirements for Stage 1 in accordance with Appendix A – Stormwater Management Plan and Appendix B – Maintenance Plan of the *Bremer Business Park Stage 1- Stormwater Management Strategy* by Cardno Lawson Treloar (Report LJ8714/R5 and dated 2 August 2007) except where otherwise directed by Council. The Stormfilters mentioned in this report are not approved.

(ii) Outline requirements for construction, building and operational phases specifying the regular maintenance of the stormwater system (e.g. cleaning of gully pit filter baskets after storm events) along with the long-term management such as the replacement of the bio-retention filters.

(iii) At a minimum, include the following details:

- aims and objectives (including water quality and filter media parameters);
- regular maintenance – maintenance/inspection checklists for each device with comments on timing, frequency, data collection and non-compliance procedures;
- long-term maintenance – timing, frequency, data collection, filter and water quality testing, non-compliance procedures;
- describe how each maintenance action is to be carried out (including maintenance techniques, environmental management considerations, disposal requirements for polluted water and solid waste);
- management structure and responsibilities;
- record keeping and reporting;
- review and update;
- any relevant contractor contact information.

(b) The Stormwater Quality Maintenance Masterplan shall be prepared by a suitably qualified and experienced professional to the satisfaction of Council and utilise the maintenance checklists located in the Water Sensitive Urban Design Technical

Design Guidelines (WSUD TDG) for South East Queensland (Healthy Waterways - Version 1 June 2006).

(c) The Stormwater Quality Maintenance Masterplan shall be implemented in perpetuity to the satisfaction of Council except for regional treatment devices which shall be maintained until accepted off maintenance. Regular inspection records shall be maintained on site and made available to Council upon request for both the construction and operational phases. All necessary improvements shall be made immediately upon awareness of any deficiencies in the system.

19. Sewerage

(a) The Developer shall provide a sewerage reticulation system with appropriate connection branches and external trunk works, designed so as to command the whole of each of the proposed allotments. The sewerage reticulation system and external trunk works shall be generally in accordance with, except where amended within this approval, Sewerage Planning Report prepared by Burchill ADM and dated September 2007.

(b) Concerning the timing of external trunk works, the developer shall construct pump station BBP1 and Line 04A extending from pump station SP5 to BP1 with any development of Stage 1. Commissioning and decommissioning of BBP1 and SP5 respectively shall be undertaken by Ipswich Water at full expense to the Developer. The Developer shall lodge a private works application to Ipswich Water for commissioning and decommissioning works.

(c) Pump station BBP1 building platform/compound shall be a minimum 500 m^2 and located at minimum RL 16.6m AHD.

(d) Where proposed sewer reticulation or trunk is located within an existing or future easement, the Developer is required to submit in conjunction with operational works application written consent from the respective easement owner (other than Council).

(e) All sewer pipes and rising mains shall be constructed from ~~Vitreous Clay (VC)~~ *Vinidex Sewer-Pro* or similar material as approved by Ipswich Water. Synthetic type material (such as uPVC) is not permitted.

20. Water

(a) The Developer shall provide a reticulated water supply system together with valves and fire hydrants, in accordance with the "Guidelines for Planning and Design of Urban Water Supply Systems", which connects into Council's existing reticulation system.

(b) A blue, bi-directional raised reflective pavement marker (RRPM) shall be provided to all hydrants. The marker shall be installed in accordance with the Department of Main Roads Fire Hydrant Indication System Technical Guideline.

(c) All works on live water mains are to be carried out by Ipswich Water in accordance with Council's policy, and at the Developer's expense.

(d) Where concrete footpaths are to be constructed, the Developer shall provide 100 mm diameter conduits under the footpath and in line with the conduits under the road, for future ease of installing the individual water services. The letter "W" shall be embossed in the concrete to mark the location of the conduit.

(e) Sufficient stop valves shall be installed so that in the event of any break in the supply, the maximum number of lots to be without water is 20.

(f) The developer shall provide water mains on both sides of each applicable road, unless otherwise agreed to by Ipswich Water.

21. Stormwater Quantity

(a) The developer shall provide all necessary stormwater drainage (both internal and external to the development) and such drainage works (except for roofwater systems) shall be designed and constructed in accordance with QUDM such that the overall drainage system caters for a storm event with an ARI of 100 years.

Overland flow paths shall be suitably designed to cater for the water from a storm event with an ARI of 100 years. In the case where the piped system is carrying part of the flow, the overland flow paths shall be designed to cater for that volume which is represented by the difference between the predicted volume from the storm event with an ARI of 100 years and the capacity of the pipe system, noting the requirements of QUDM.

(b) All stormwater flows within and adjacent to the Citiswich Area, other than inter-allotment drainage, shall be confined to dedicated roads, drainage reserves, registered drainage easements or within parkland. The registered drainage easements, if related to piped drainage, shall be centrally located over such underground pipe system and shall be not less than 4.0 m wide, except for drainage easements required for side boundaries which may be 3.0 m wide where approved by the Senior Development Engineer. In addition, the easements shall be of suitable width to contain the predicted overland flow from the storm event with an ARI of 100 years in that location.

(c) No ponding, concentration or redirection of stormwater shall occur onto adjoining land unless specifically approved by Council in consultation with the owner of the adjoining land.

(d) Due consideration shall be given in these and future designs and construction of the development in relation to the effect of the developed catchment flows on the downstream discharge receival areas. Suitable stormwater control devices are to be provided to ensure that there is no increase in flows in watercourses. Such control devices are to be designed so as to integrate the landscaping, recreational, infrastructural and drainage roles of watercourses. Notably the development shall limit the post-development peak one-year Average Recurrence Interval (ARI) event discharge to the receiving waterway to the pre-development peak one-year ARI discharge. Analysis of pre-development catchment hydrology shall assume current level of development rather than fully developed upstream catchment.

(e) There shall be no filling or removal of material in the flood area below the development flood line associated with an ARI of 20 years. There shall be minimal disturbance to vegetation in the flood area, unless prior written approval is obtained from Council.

(f) Filling in proposed Lots, which are adjacent to the watercourse shown on the proposal plan, shall not be undertaken without the written approval of Council.

(g) A suitable roofwater system shall be designed in accordance with QUDM, for allotments that do not have adequate fall from within the allotment to the design invert level of the kerb and channel or access to lawful discharge point. The design is to be to a minimum Level V in QUDM.

22. Public Utilities

(a) Adequate provision shall be made in all proposed road reserves, access strips, common areas and easements, to cater for the public utility services that would normally serve the development.

(b) The Developer shall provide appropriate road crossing conduits in accordance with Council's Standard Drawings SR.22, SR.23 and SR.24. Where concrete footpaths are to be constructed, the conduits shall be extended to the property boundaries.

(c) Street lighting shall be installed, for internal road and applicable frontages of Ashburn Road and Bognuda Street, by the Developer in accordance with the Australian Standard 1158.3.1 Table 1.1. All street lighting associated with the development shall be certified by a RPEQ. Street lighting shall be installed on the same side as concrete footpaths (where applicable).

(d) The Developer shall provide underground electricity/telecommunications within the development, constructed in the approved allocation as detailed in Council's standard drawings SR.22 and SR.23. Electricity and telecommunication drawings shall be coordinated with the civil engineering design documents, to ensure that service clashes are avoided.

(e) The Developer shall provide an Energex approved electrical reticulation layout plan. The electricity layout shall also be shown on the water reticulation layout plans.

(f) Prior to the commencement of use of the site, the Developer shall provide Council with a copy of an agreement with Energex for the supply of electricity to the development.

(g) Telephone and cable services may be laid in a combined trench with electricity cables, subject to the approval of Energex and the authorised telephone/cable service provider.

(h) The Developer shall make suitable arrangements for the provision of telephone and cable services to the Development. Documentary evidence that discussions have commenced with any authorised telephone/cable service provider, on the provision of telephone/cable services, shall be produced before the completion of the development.

23. Erosion & Silt Management

(a) The Developer shall prepare an Erosion and Sediment Control Plan (ESCP). The ESCP is to incorporate detailed drawings and a management plan which are to be continually revised subject to Council instruction, site conditions and different development stages particularly during the earthworks stage. Where any amendments are required further approval shall be received from Council. The Developer shall be responsible for the installation and maintenance of silt management facilities from the time of commencement of construction until the development has been released "Off Maintenance". All silt management facilities are to be in accordance with the document "Soil Erosion and Sediment Control" published by the Institution of Engineers Australia, or equivalent.

(b) A completed copy of the Brisbane City Council Erosion Hazard Assessment Checklist shall be submitted and used as the basis for determining appropriate erosion and sediment control measures.

(c) The design of sediment basins shall be in accordance with the current version of the Brisbane City Council Sediment Basin Design Construction and Maintenance Guidelines. The Developer shall lodge the detailed calculations as required by steps 1-16 of Section 2 - *Design Procedure* along with detailed drawings.

(d) A Water Quality Testing strategy including the testing of baseline shall be undertaken as part of the ESCP.

(e) The ESCP shall be a flexible document which is designed to adapt to the staging of construction works.

(f) Suitable permanent stabilisation works will be required at stormwater outlets, above and below the culvert. Dumped rock will need to be pocket planted and a layer of geofabric laid below the rocks.

(g) Particular attention should be paid to batters around culverts and stormwater outlets with the aim to minimise to the greatest possible extent the slope of adjacent batters.

(h) All lots shall be 90% grassed prior to civil works being accepted off-maintenance and prior to signing the plan of survey.

(i) Silt traps shall be sited upstream from any park or reserve area discharge point preferably on land comprising future allotments, such that no silt impinges on the park or reserve areas. The silt trap areas may be phased out after the development work is complete and adequate grass cover is obtained.

(j) Diversion drains and ponds, as necessary, shall be installed on the site before any other work is undertaken on site to ensure that "dirty water" is contained and/or isolated.

(k) A procedure shall be submitted with the engineering drawings for approval for maintaining the facilities, setting out the frequency of attention, with inspections to be made after each significant rainfall event.

(l) Council reserves the right to enter the site for the purpose of rectifying any silt management facilities which it deems to be inadequate, improperly maintained or not operating in a satisfactory manner.

(m) The Developer shall lodge a $10, 000 siltation and erosion performance bond with Council, prior to the commencement of works, which shall only be released by Council at the termination of the maintenance period. Where Council determines that a draw-down of the bond is required, the Developer shall restore the bond to its full amount within 10 days of a notice from Council to that effect. Such bond shall guarantee adequate performance in the circumstances (i) and (ii) below:

(i) In the event that instructions issued to the Consulting Engineer by the Senior Development Engineer for the installation of erosion control measures, are not complied with within 24 hours, Council will call upon the bond to the extent required to carry out the necessary works.

(ii) If the Senior Development Engineer determines that silt damage has occurred on the site, or the downstream drainage system has become silted, the Developer shall be responsible for restoration. Such restoration shall be completed in the time determined by the Senior Development Engineer.

Should the Developer fail to complete the works determined by the Senior Development Engineer within the specified time, Council shall complete the work and recover all costs from the Developer associated with that work.

24. <u>Operational Works – Municipal Works</u>
(ie Works being handed over to Council)

(a) Plans relating to all civil engineering works shall be prepared and submitted for review by Council under the cover of Form 1 - Part A (Common details for all applications) and Form 1 - Part E (Planning Scheme Works). The plans shall show full construction details, layout dimensions, and finished surface levels and shall be submitted together with the appropriate fees for Council approval, prior to the commencement of construction on site.

(b) The Developer shall comply with the requirements of the documents entitled "Planning Scheme Policy 3 - General Works" and "Standard Drawings".

(c) All engineering drawings submitted to Council shall be in accordance with Council's Planning Scheme Policy 3 - General Works and Standard Drawings, and shall include as a minimum the following:

(i) Engineering drawings shall be marked as confirmation that they have been checked and approved by a RPEQ;

(ii) The drawings shall be submitted as four (4) hardcopy A3 size sets and two (2) hardcopy sets of any reports and supporting information. One set of plans shall be returned to the applicant with the Decision Notice.

The submission shall also include a Compact Disc containing electronic data as follows:

- One (1) full set of all engineering drawings contained in one file;
- Separate individual files containing layout plans for sewerage, water supply and drainage;
- Any reports submitted in support of the Application. Each report shall be included as a separate file;
- An index of all files on the Compact Disc including descriptions of contents of each file; and
- All files shall be submitted in PDF format.

(iii) A "Certificate of Design" shall be submitted by a RPEQ, certifying that the design is in accordance with all relevant engineering standards, Council's requirements and standards, relevant development conditions of approval, and sound engineering practice.

(d) Municipal works shall require a detailed design certified by a RPEQ, the design approved by Council Engineers with appropriate fees payable, a works pre-start meeting on-site and various detailed construction and audit inspections by Council Officers. A twelve month maintenance period is applicable for the works as well as the payment of a maintenance security deposit.

(e) All works shall be supervised by a RPEQ competent in civil works and shall be undertaken by a nominated principal contractor experienced in the construction of municipal works. Council reserves the right to request evidence of the principal contractor's competency. Should it be deemed by the Senior Development Engineer that the contractor does not have the necessary competency or has constructed substandard works for Council in the past, Council reserves the right to reject the nominated contractor.

(f) Municipal works shall be accepted "On Maintenance" prior to commencement of use. A maintenance bond equal to 5% of the construction cost (minimum of $1,000.00) shall be retained by Council for a minimum period of twelve months, or until such time as the works are accepted "Off Maintenance" by Council.

(g) "As Constructed" plans for municipal works shall be submitted to Council and approved prior to the formal acceptance of the works "On Maintenance". These plans shall be submitted electronically in PDF format, contained on a Compact Disk labelled appropriately to indicate the contents.

(h) On completion of the works a certificate shall be submitted to Council by a RPEQ certifying that the works have been constructed in accordance with Council's construction standards and in compliance with the approved plans and

specification. It is expected that the RPEQ will undertake the necessary inspections to make this certification.

(i) Council reserves the right to require further amendments and/or additions at a later date, should design errors or omissions become apparent in regard to the works relevant to the Operational Works approval.

25. General

(a) All disturbed areas shall be graded, grassed and left in a mowable condition. The grass cover shall be obtained as early as possible during the development and an acceptable grass cover shall be achieved before the development can be accepted "Off Maintenance".

(b) Street name signs shall be manufactured to Council specifications and shall be erected in accordance with Council's Standard Drawing SR.26 at each intersection.

(c) With reference to any works, on land under other private ownership, written permission for the works shall be obtained and forwarded to Council. Similarly, written clearances shall be obtained after the works are completed, unless otherwise accepted by the Senior Development Engineer.

(d) All works required for this development shall take due regard of any and all existing services and, if considered necessary by the relevant authority or the Senior Development Engineer, such works shall be altered at the cost of the Developer.

(e) Any filling for a greater depth than 800 mm to provide for building platforms shall be conducted in accordance with Australian Standard 3798. Test results as required by Australian Standard 3798, and a certificate of quality and uniformity of fill shall be provided by a RPEQ. The level of responsibility shall be Level 1.

(f) A certificate from a RPEQ shall be issued to Council certifying that any retaining wall greater than 800 mm in height is structurally sound and capable of withstanding any likely surcharge loads. Retaining walls greater than 1 m in height are to be provided with railings or other barriers to provide pedestrian safety.

(g) Retaining walls shall be designed so that there are no imposed loads placed upon Council's underground services. This may include extending the footing to a level 300-mm below the invert of the pipe.

(h) Filling of gully areas if permitted shall be carried out strictly in accordance with Australian Standard 3798. Test results as required by Australian Standard 3798 and a certificate of quality and uniformity of fill, shall be provided by the Supervising RPEQ for all filled areas.

(i) For batters resulting from cutting and filling of the site and producing slopes greater than 1:6, Council requires a RPEQ to certify that they are stable and properly drained.

(j) If, after the preparation of detailed design plans for the various roads, it is found necessary to provide any additional road reserve area, or modify the proposed road

reserves to enable the full requirements of Council's Standards, Queensland Streets, AMCORD and Austroads documents to be incorporated in any way, (but particularly in the production of the required speed environment or because of longitudinal and cross sectional constraints) then the estate layout plan shall be altered accordingly.

26. Fencing

A 1.8m high pool style fence or alternate fence design approved in writing by the Development Manager, is to be constructed on the common boundary of proposed Lots 1 – 23 and 23 - 25 and the drainage/parkland/buffer reserves.

27. Naming of Parkland

(a) The Developer shall submit a selection of three (3) alternative names for the park, to be considered by Council prior to lodgement of the plan of survey.

(b) The Developer shall erect a suitable park name sign to the satisfaction of the Development Manager.

28. Quality of Park Dedication

Land to be dedicated for park purposes shall be upgraded to the satisfaction of the Chief Operating Officer (Health, Parks and Recreation) as follows:

(a) Suitable embellishment is required to be provided in accordance with the Desired Standards of Service outlined in Part 5 of Council's Planning Scheme Policy 3 – *General Works*.

(b) Declared plants, environmental weeds and rubbish shall be removed;

(c) Dead trees shall be removed and dangerous trees made safe within 10 m of proposed pathways or playgrounds;

(d) All rubbish shall be removed from parkland;

(e) Parkland shall be freely and safely drained;

(f) All playground equipment and park furniture shall meet Australian Standards both in supply and installation;

(g) No overburden or spoil shall be pushed or deposited into parkland;

(h) Water / sewer / power service shall be provided to the proposed park; and

29. Irrigation to Footpaths

Irrigation to streetscape works is not permitted on a permanent basis. Temporary irrigation systems used for vegetation establishment may be approved by the Conservation, Parks and Sport Manager subject to their removal prior to the on maintenance inspection. Such irrigation shall include all necessary devices to prevent contamination of the water supply.

30. Other Streetscape and Temporary Works

Authorisation for temporary landscaping treatments and / or features shall be obtained from the Chief Operating Officer (Health, Parks and Recreation), and a bond lodged for their removal. Such special treatment / features shall be removed by the Developer, and the site remediated, prior to the streetscape on maintenance inspection.

31. Compliance with Conditions

(a) Unless otherwise stated all conditions shall be completed prior to signing of the relevant plan of survey or as determined by the Development Manager.

(b) All conditions shall be completed to the satisfaction of the Development Manager.

32. When Approval Takes Effect

This approval has effect in accordance with the provisions of Section 3.5.19 of the *Integrated Planning Act 1997* as follows:

(a) If the Applicant does not appeal the decision to the court - from the time the decision notice is given (or if a negotiated decision notice is given, from the time the negotiated decision notice is given); or

(b) If an appeal is made to the court - subject to the decision of the court, when the appeal is finally decided.

33. When Approval Lapses

(a) The relevant period for this approval is 4 years starting the day the approval takes effect. The Developer is required to submit to Council an accurate plan of survey before the end of the relevant period, otherwise the approval will lapse.

(b) An extended relevant period may be agreed upon, pursuant to Section 3.5.22 of the *Integrated Planning Act 1997*, provided a written notice to Council is made before the end of the relevant period. Such written notice is to be on Council's approved form, accompanied by the owner's consent and the prescribed fee in Council's Register of General Charges.

NOTE: Operational Works application(s) required to be submitted must be approved and works completed within the relevant period stated above.

Concurrence Agency

Conditions applicable to this approval imposed by the following Concurrence Agencies:

1. The Environmental Protection Agency (Contaminated Land Unit) is a concurrence agency with regard to this development approval. The attached concurrence agency response, dated 2 January 2008, forms part of this Decision Notice.

2. The Department of Main Roads is a concurrence agency with regard to this development approval. The attached concurrence agency response, dated 25 March 2008, forms part of this Decision Notice.

3. Queensland Transport is a concurrence agency with regard to this development approval. The attached concurrence agency response, dated 18 September 2007, forms part of this Decision Notice.

4. The Department of Natural Resources and Water is a concurrence agency with regard to this development approval. The attached concurrence agency response, dated 10 August 2007, forms part of this Decision Notice.

5. Powerlink is an advice agency with regard to this development approval. The attached concurrence agency response, dated 11 October 2007, forms part of this Decision Notice.

Advice

The following advices are offered for your information only and should not be viewed as mandatory conditions of this approval.

Assessment Manager (Ipswich City Council)

1. Portable Long Service Leave

The Building and Construction Industry (Portable Long Service Leave) Levy must be paid prior to the issue of a development permit where one is required for the 'Building and Construction Industry'.

This applies to Building Works, Operational Works and Plumbing and Drainage Works applications, as defined under the Integrated Planning Act 1997, where the works are $80 000 or more and matching the definition of 'Building and Construction Industry' under the Building and Construction Industry (Portable Long Service Leave) Act 1991.

Council will not be able to issue an Operational Works Decision Notice without receipt of details that the Levy has been paid. Should you require clarification in regard to the amendments to the Building and Construction Industry (Portable Long Service Leave) Act 1991, you should contact QLeave on 1800 803 481 (free call) or [redacted].

2. High Water Demand

The Developer should consider the implications of water restrictions during the construction of the proposal and in consideration of the requirements of the above conditions. It should be specifically noted that this approval does not permit the Developer to use the potable water supply for the development of the site.

On 15 August 2007 Council introduced its *Policy For Installation Of Electronic Water Meters To Commercial, Industrial And Large Multi-Residential Properties*. This policy states that:

All new commercial, industrial or large multi-residential property connections with a projected annual consumption greater than or equal to 20,000 kL shall include, at the customers expense, an electronic water meter with data logger and an approved back-to-base communication system as specified by Ipswich Water.

Properties with electronic water meters shall be subject to billing on a monthly basis in accordance with the metered monthly consumption.

If, in the opinion of the Senior Development Engineer, a proposed development is likely to have an annual water consumption equal to or greater than 20,000 kL, the Developer will be required to contact Ipswich Water on [redacted] to arrange installation of electronic flow meter(s).

3. Amended Masterplan

(a) The proposed development and future stages shall be generally in accordance with the Master Staging Plan – Citiswich (prepared by B & P Survey Consulting Surveyors, dated 11 March 2008) with the following amendments and clarifications, as marked on the attached plan:

(i) The Developer shall remove the proposed cul-de-sac from within Stage 4C as indicated in black on the "Master Staging Plan – Citiswich";

(ii) Additional road frontage to parkland shall be provided for Stages 4, 5 and 7 as indicated in black on the "Master Staging Plan – Citiswich";

(iii) An indicative subdivision layout should be provided for Stage 6 and the land to the west of Stage 6 to ensure that both Stage 6 and the adjoining land can be developed in an orderly fashion. The indicative layout should ensure that both site's integrate in terms of pedestrian and vehicle linkages;

(iv) Additional 5000m^2 Local (Level 3) Recreation Park is required *over and above the park areas proposed* to service the need of local residents in Stage 6 (Refer to Ipswich Planning Scheme Desired Standards of Service). *Notwithstanding, should the existing amount of park proposed (exclusive of stormwater quantity and quality treatment areas) meet the Ipswich Planning Scheme Desired Standards of Service, then this additional park will not be required;*

An amended Master Plan shall be submitted to Council for approval prior to any application be lodged for Stage 2.

Note: Please contact Council for additional details relating to the items listed above.

4. Advice to Purchasers

The Developer shall provide the purchaser of each industrial lot a copy of the Building Envelope Plan and WSUD TDG Design Assessment Checklist and Calculation Summary Checklist to demonstrate that the bioretention basins are designed in accordance with the guideline and the approved Stormwater Masterplan.

5. Fire Ants

In accordance with the *Plant Protection Act 1989* and the Plant Protection Regulation 1990, a quarantine notice has been issued for the State of Queensland to prevent the spread of the Red Imported Fire Ant (ant species Solenopsis invicta) and to eradicate it from the State.
It is the legal obligation of the land owner or any consultant or contractor employed by the land owner to report the presence or suspicion of Fire Ants to the Queensland Department of Primary Industries on 132523 within 24 hours of becoming aware of the presence or suspicion, and to advise in writing within seven days to:

Director General
Department of Primary Industries
GPO Box 46, Brisbane QLD 4001

It should be noted that the movement of Fire Ants is prohibited, unless under the conditions of a Department of Primary Industries Inspectors Approval. More information can be obtained from the Queensland Department of Primary Industries website www.dpi.qld.gov.au.

The development approved herein, by its very nature, includes activities considered to be "high risk" in respect of controlling the spread of Fire Ants. The following lists show high risk activities and some precautions should be considered for implementation.

(a) High risk activities can include:

(i) Earthworks of a minor or major scale;

(ii) Revegetation or rehabilitation;

(iii) Import of fill onto a site;

(iv) Export of fill or other materials such as soils, gravel, mulch and plants; and

(v) Export off or import on to a site of construction and demolition waste and materials or green waste.

(b) Precautions for implementation

(i) Checking for ants regularly;

(ii) Checking all soil, fill and waste materials (construction and green waste) for ants;

(iii) Asking questions about the quality and source of soil, fill and waste materials (construction and green waste);

(iv) Keeping records of all movements of soil, fill and waste materials (construction and green waste);

(v) Cleaning of all earthmoving or other soiled vehicles prior to exit from the site; and

(vi) Informing staff and contractors about these precautions.

6. Infrastructure Agreement

The subject approval does not preclude Council and the Developer from entering into an Infrastructure Agreement at some time in the future.

7. Contributions

If infrastructure charges for Stage 1D are paid with Application 4078/08 please contact Council to have the contributions recalculated (i.e. contributions for lots 16 and 17 will not be required).

Appendix 1

Contribution	Sector	Rate	Proposal	Calculation
Water Supply Infrastructure	Bundamba Low Level Zone (5)	$734.00/NRU Unit Charge = 1.000 Total = $734.00/NRU	***Stage 1A*** 22.5 NRU per ha @ 8.5089 ha (11 lots) **Total = 191.475 NRU**	$734.00 x 191.450 = $140,524.30 **Total = $140,524.00**
			Stage 1B 22.5 NRU per ha @ 5.427 ha (4 lots) **Total = 122.1075 NRU**	$734.00 x 122.1075 = $89,626.905 **Total = $89,627.00**
			Stage 1C 22.5 NRU per ha @ 15.1785 ha (11 lots) **Total = 341.5163 NRU**	$734.00 x 341.5163 = $250,672.96 **Total = $250,672.00**
			Stage 1D 22.5 NRU per ha @ 20.132 ha (2 lots) **Total = 452.97 NRU**	$734.00 x 452.97 = $332,479.98 **Total = $332,480.00**
Sewerage Infrastructure	South Bremer (23)	$1,052.00/NRU Unit Charge = 1.000 Total = $1,052.00/NRU	***Stage 1A*** 22.5 NRU per ha @ 8.5089 ha (11 lots) **Total = 191.475 NRU**	$1,052.00 x 191.450 = $201,405.40 **Total = $201,405.00**
			Stage 1B 22.5 NRU per ha @ 5.427 ha (4 lots) **Total = 122.1075 NRU**	$1,052.00 x 122.1075 = $128,457.09 **Total = $128,457.00**
			Stage 1C 22.5 NRU per ha @ 15.1785 ha (11 lots)	$1,052.00 x **341.5163** = $359,275.14

			Total = 341.5163 NRU	**Total = $359,275.00**
			Stage 1D 22.5 NRU per ha @ 20.132 ha (2 lots) **Total = 452.97 NRU**	$1,052.00 x 452.97 = $476,524.44 **Total = $476,524.00**
Roadworks Infrastructure	Bundamba Industry (25)	$554.00/VT Unit Charge = 1.000 Total = $554.00/VT	***Stage 1A*** 140 VT per ha @ 8.5089 ha (11 lots) **Total = 1,191.246 VT**	$554.00 x 1191.246 = $659,950.28 **Total = $659,950.00**
			Stage 1B 140 VT per ha @ 5.427 ha (4 lots) **Total = 759.78 VT**	$554.00 x 759.78 = $420,918.12 **Total = $420,918.00**
			Stage 1C 140 VT per ha @ 15.1785 ha (11 lots) **Total = 2,124.99 VT**	$554.00 x 2,124.99 = $1,177,244.40 **Total = $1,177,244.00**
			Stage 1D 140 VT per ha @ 20.132 ha (2 lots) **Total = 2,818.48 VT**	$554.00 x 2,818.48 = $1,561,437.92 **Total = $1,561,438.00**
Stage 1A Total				**$ 1,001,879.00**
Stage 1B Total				**$ 639,002.00**
Stage 1C Total				**$ 1,787,191.00**
Stage 1D Total				**$ 2,370,442.00**
Total for Stage 1				**$ 5,798,514.00**

Posted 9.7.08
Made Public.

Your reference
Our reference 1837/07 MG:MM
Contact Officer [redacted]
Telephone [redacted]

City of Ipswich

Ipswich City Council

45 Roderick St
PO Box 191
Ipswich QLD 4305
Australia

Tel [redacted]
Fax
Email council@ipswich.qld.gov.au
Web www.ipswich.qld.gov.au

SCANNED
DEVE BRANCH
0 9 JUL 2008
Doc No 3218062

Walker Corporation Pty Ltd
C/- Planning Initiatives
PO Box 1774
NEW FARM QLD 4005

8 July 2008

INTEGRATED PLANNING ACT 1997

DEVELOPMENT APPLICATION NEGOTIATED DECISION NOTICE
Note: This Negotiated Decision Notice replaces Council's previous Decision Notice dated 22 April 2008

Application Details

Appn No:	1837/07
Real Property Description:	Lot 13 on SL 2982, Lot 34 on SL 3911 & Lot 2 on SP 179307
Property Location:	120 Bognuda Street, Bundamba, 2-50 Ashburn Road, Bundamba & 51 Ashburn Road, Bundamba
Names and Addresses of all Referral Agencies:	Contaminated Land Unit Environmental Protection Agency GPO Box 2771 BRISBANE QLD 4001 District Director Metropolitan District Office Department of Main Roads P O Box 70 SPRING HILL QLD 4004 Principal Manager Transport Planning Branch Queensland Transport GPO Box 213 BRISBANE QLD 4001

Department of Natural Resources & Water
PO Box 1164
BEENLEIGH QLD 4207

Powerlink
PO Box 1193
VIRGINA QLD 4014

Negotiated Decision Date: 8 July 2008

Decision: Approved subject to the conditions detailed below.

Decision Authority: Team Co-ordinator - East

Nature of Change:
Condition 3(a)(i): Plan of Survey to be deleted,
Conditions 3(a): Plan of Survey to be amended
Condition 3 (incorrectly numbered): Building Envelope Plan to be amended
Condition 4: Proposed Stages For Reconfiguration to be amended
Condition 9: Contributions to be updated
Condition 12(b)(iv): Roadworks to be amended
Condition 12(d): Roadworks to be amended
Condition 12(d)(i): Roadworks to be amended
Condition 12(n)(i): Roadworks to be amended
Condition 12(d): Roadworks to be amended
Condition 12(d)(iv): Roadworks to be amended
Condition 12(d)(vii): Roadworks to be amended
Condition 12(f): Roadworks to be amended
Condition 12(n)(i): Roadworks to be amended
Condition 14(e): Access to be amended
Condition 15(c): Stormwater Quality Reporting to be amended
Condition 16(d): Construction of Stormwater Treatment to be amended
Condition 18(e): Sewerage to be amended
Advice 3(a)(iv): Amended Masterplan to be amended
Condition 12(d)(vi): Roadworks to remain unchanged
Condition 12(n)(i): Roadworks to remain unchanged
Condition 12(n)(ii): Roadworks to remain unchanged
Condition 12(n)(ii): Roadworks to remain unchanged
Advice 7: Contributions to be inserted

Approval Details:

Proposal	Development	Decision	Approval Type
Three (3) Lots into ~~25 Lots and 3 balance lots~~ *28 Lots*	Reconfiguring a lot	Approved	Development Permit.

Further Development Permits Required

Further Development Permits, as required by the *Integrated Planning Act 1997,* shall be obtained in respect of any Material Change of Use, Operational Works, Building Works and Plumbing Works in relation to this approval before any such works are commenced.

Conditions

Assessment Manager (Ipswich City Council)

Conditions applicable to this approval under Integrated Planning Act:

1. Basis of Approval

   Subject to these conditions, the facts and circumstances set out in the application and all relevant Council Local Laws and/or Planning Scheme Policies and the Bremer Business Park Preliminary Approval (dated 30 June 2004) shall be adhered to.

2. Minor Alterations

   Notwithstanding the requirements detailed in this approval, any other minor alterations and/or modifications acceptable to the Development Manager will suffice.

3. Plan of Survey

   (a) The Developer shall submit a plan of survey to generally conform with '*Proposed Reconfiguration' Drawing Number 15675 (prepared by B&P Consulting Surveys Consulting Surveyors and dated 12 December 2006)* ~~Proposed "Citiswich" Development at Ipswich April 2008 Drawing No. QC00-3632:00:SK.116 (prepared by Burchill VDM Consulting Engineers and Planners). with the following exception:~~

   ~~(i) Proposed Lots 15, 16 & 17 shall be incorporated into a balance lot until such time as the detailed planning and conceptual design drawings for the road network are finalised and approved by Council, in particular the road linking the northern and southern areas of Citiswich over the Warrego Highway ("North-South Link Road").~~

   (b) The Developer shall grant, free of cost to or compensation payable by Council, minimum 4.0 m wide easements located centrally over proposed and existing stormwater drains, water mains and sewerage rising mains, where they are located within private property.

The documentation associated with these easements may be prepared by the Developer in a form satisfactory to Council's City Solicitor, or the Developer may submit easement plans, only where Council is party to the easements, to Council for the preparation of easement documents at the Developer's expense.

(c) Easements required for discharge of stormwater over adjacent land shall be agreed to in writing by the owner of the subject land prior to construction work commencing.

(d) Easements shall be centrally located over the alignment of stormwater paths and be of a width sufficient to encompass the overland flow from a storm event with an ARI of 100 years.

(e) Easements shall be of sufficient width to contain any fitting, access chamber etc located on stormwater drains, water mains, and sewerage rising mains.

(f) All pre-existing easements crossing the site shall be pegged where they cross each property boundary and at every change of direction.

(g) Adequate permanent survey marks shall be installed. The Developer shall submit a certificate signed by a cadastral surveyor, stating that after the completion of all works associated with the development, permanent survey marks are in their correct position, in accordance with the plan of survey.

(h) Land required for detention basins or equivalent are to be dedicated as drainage reserve in favour of Council and not included within parkland dedication unless approved as parkland by Council.

(i) Land required for open space shall be dedicated, free of cost to and compensation by Council, in fee simple at the time of registration of a plan of survey for any part of the land adjoining the area to be dedicated and in accordance with the plan approved pursuant to Condition 5: Landscaping and Rehabilitation.

(j) The proposed Archer Street Active Recreation Park for dedication shall meet the desired standards of service for "Local-Recreation Parkland" as per the current Ipswich Planning Scheme.

4. Building Envelope Plan

The Developer shall submit a Building Envelope Plan to the Development Manager for approval prior to signing the relevant plan of survey. The Building Envelope Plan shall nominate ~~that no works/storage are permitted within the twelve (12) nine (9) metre landscape buffer to the Warrego Highway.~~ *a 10 metre setback for future road widening to the Warrego Highway, a nine (9) metre setback for landscaping, and a three (3) metre setback to allow access for maintenance. No works/storage shall be permitted within the 10 metre setback for future road widening or the nine (9) metre landscape buffer to the Warrego Highway, and no storage landscaping or building works are to be permitted within the three (3) metre setback to allow access for maintenance.*

5. Proposed Stages For Reconfiguration

The staging of the reconfiguration shall be in accordance with the approved plans and shall be as follows:

Stage 1A Proposed Lots 1 to 11 (11 lots)
Stage 1B Proposed Lots 12 to ~~14~~ 15 (~~3~~ *4* lots)
Stage 1C Proposed Lots 18 to 28 (11 lots)
Stage 1D Proposed Lots 16 and 17 (2 lots)

6. Rates in Arrears

In accordance with the provisions of the *Integrated Planning Act 1997*, all rates and other expenses as a charge against the land shall not be in arrears at the date of signing of the plan of survey.

7. Hours of Construction

Unless otherwise determined in writing by the Development Manager hours of construction shall be:

Monday to Saturday 6.30 a.m. to 6.30 p.m.

Work or business shall not be conducted from or on the premises outside the above hours or on Sundays or public holidays.

8. Locality References

(a) Any place name or estate name used by the developer (excluding a reference to a building, structure or the like and excluding minor, subsidiary signage within a development) shall make reference to the relevant, approved place name under the *Place Names Act 1994* in a contrasting colour and in lettering no less than 50% of the Estate name.

(b) Any reference to the regional location of the site or the development shall not refer to the place or estate as being located in Brisbane or a Brisbane suburb or in the metropolitan area or in the western suburbs (excluding the western suburbs of Ipswich as determined by Council in writing from time to time).

9. Road Naming

The Developer may submit to Council a list of proposed street names and the corresponding name meanings for the new road(s) to be opened. The proposed names should normally be submitted as part of the Operational Works application. Should a theme be considered appropriate, the theme should be submitted at the same time. Council reserves the right to accept any or none of the proposed names.

10. Contributions

In accordance with the relevant Planning Scheme Policies, the Developer shall pay, prior to Council signing the plan of survey, the monies as outlined in Appendix 1 to Council:-

Calculations of headworks and contributions are based on the infrastructure contribution policies and rates applicable at the date the development application was determined by Council. The contributions above shall be applicable for a period of twelve (12) months from the date of the development approval, and thereafter shall be based on the infrastructure contribution policies and rates applicable at the date when payment is made.

11. Landscaping and Rehabilitation

(a) The Developer shall undertake landscaping and rehabilitation generally in accordance with the Bremer Business Park Open Space Master Plan by Anembo Consultants (Dated 8 March 2007) except where otherwise indicated in this Decision Notice.

(b) The Developer shall submit a Landscaping and Rehabilitation Masterplan for the whole development to be prepared by a corporate member of Australian Institute of Landscape Architects or other approved licensed landscape architect. The Landscaping and Rehabilitation Masterplan shall take account of the requested amendments to the Master Staging Plan – Citiswich and shall be submitted to the Development Manager for approval in conjunction with the first civil Operational Works application. The Landscaping and Rehabilitation Masterplan shall include a Master Recreation Strategy, a Master Streetscape Strategy, a Master Stormwater Quality Treatment Strategy, a Master Bushland Rehabilitation Strategy and a Master Cultural Heritage Strategy (as per Condition 8 of the Negotiated Decision Notice dated 6 July 2004 for ICC Development Application 3356/2002). The Landscaping and Rehabilitation Masterplan shall also identify what works relate to each civil works stage including pedestrian/cycle paths and parkland embellishments. The extent of information required in this Masterplan and future landscape applications shall be agreed upon with Council prior to lodgement of any further landscape plans. The following matters should be considered in preparing the plan:

(i) The Warrego Highway buffer shall be planted with ex-ground fig trees. Jute matting may be required to be used for stabilisation to the satisfaction of Council depending on the final approved batter.

(ii) Areas for remediation and rehabilitation shall be identified and treatment strategies outlined. Unless approved for stormwater treatment, active open space or bushfire management, all other areas of parkland and drainage reserve shall be remediated and rehabilitated to a natural bushland setting in accordance with the species outlined in the *Ipswich City Council Vegetation Communities Rehabilitation Guide 2 and 4*, locally endemic species and native flora observed on site.

(iii) All declared weeds, environmental weeds, and exotic pests shall be removed from the site to the greatest extent practicable. A staged rehabilitation approach shall be adopted to ensure that any habitat values provided by the exotic species is gradually replaced by natives and rehabilitation works do not cause erosion. Any areas which are disturbed as a result of weed control shall be rehabilitated with native species.

(iv) The plans shall make provision for the placement of rocks and logs (which can be relocated from cleared areas), into the Bremer River Park and Eastern Forest Park to compensate for the loss of fauna habitat. The plan shall indicate the stockpile location and indicate the quantity and general relocation areas.

(v) A series of different sized nest boxes shall be installed which include a range of sizes and configurations up to an including Greater Glider size. The number and location of nest boxes shall be included on the detailed rehabilitation plans.

(vi) Rehabilitation shall consider the need for maintenance access to the power easement and minimum separation distances to transmission lines. Maintenance paths shall be suitably stabilised to the satisfaction of Council. Species to be planted below the transmission lines shall consist of species which do not grow greater than 3.5 metres in height at maturity or as otherwise stipulated by the relevant power authority.

(vii) Rehabilitation areas shall be planted at a minimum of one (1) plant per square metre taking into consideration existing native vegetation. For slopes greater than one in six a denser planting schedule will be required. Any stormwater treatment devices which require planting shall be planted in accordance with the species and densities outlined in the Water Sensitive Urban Design Technical Design Guidelines for South East Queensland. Only waterwise, drought tolerant natives shall be used consisting preferably of locally occurring species.

(viii) The plans shall demonstrate suitable stabilisation and screening around stormwater outlets and culverts. Dense planting will be required on the steep batters around culverts and pocket planting used in areas of dumped rock to inhibit weed growth.

(ix) Street Trees shall be provided in accordance with the Ipswich City Council Street Tree Strategy.

(x) All exposed culvert/wingwall surfaces shall be suitably treated to avoid exposed concrete surfaces.

(xi) Suitable embellishment in the formal park areas are required to be specified in accordance with the Desired Standards of Service outlined in Part 5 of Council's Planning Scheme Policy 3 – General Works.

(xii) The location of footpaths and cycle paths.

(c) Stage 1 streetscape and landscape works shall be undertaken generally in accordance with the following plans:

(i) General Notes Legend, Site Location Dwg Schedule and Sheet Layout Plan Dwg. No: LD01, Sheet 1 of 17, Revision A (prepared by Anembo Consultants, dated 1 August 2007);

(ii) Details and Plant Schedule Plan Dwg. No: LD02, Sheet 2 of 17, Revision A (prepared by Anembo Consultants, dated 1 August 2007);

(iii) Landscape Plan Dwg. No: LP01, Sheet 3 of 17, Revision A (prepared by Anembo Consultants, dated 1 August 2007);

(iv) Landscape Plan Dwg. No: LP02, Sheet 4 of 17, Revision A (prepared by Anembo Consultants, dated 1 August 2007);

(v) Landscape Plan Dwg. No: LP03, Sheet 5 of 17, Revision A (prepared by Anembo Consultants, dated 1 August 2007);

(vi) Landscape Plan Dwg. No: LP04, Sheet 6 of 17, Revision A (prepared by Anembo Consultants, dated 1 August 2007);

(vii) Landscape Plan Dwg. No: LP05, Sheet 7 of 17, Revision A (prepared by Anembo Consultants, dated 1 August 2007);

(viii) Landscape Plan Dwg. No: LP06, Sheet 8 of 17, Revision A (prepared by Anembo Consultants, dated 1 August 2007);

(ix) Landscape Plan Dwg. No: LP07, Sheet 9 of 17, Revision A (prepared by Anembo Consultants, dated 1 August 2007);

(x) Landscape Plan Dwg. No: LP08, Sheet 10 of 17, Revision A (prepared by Anembo Consultants, dated 1 August 2007);

(xi) Landscape Plan Dwg. No: LP09, Sheet 11 of 17, Revision A (prepared by Anembo Consultants, dated 1 August 2007);

(xii) Landscape Plan Dwg. No: LP010, Sheet 12 of 17, Revision A (prepared by Anembo Consultants, dated 1 August 2007);

(xiii) Landscape Plan Dwg. No: LP011, Sheet 13 of 17, Revision A (prepared by Anembo Consultants, dated 1 August 2007);

(xiv) Landscape Plan Dwg. No: LP012, Sheet 14 of 17, Revision A (prepared by Anembo Consultants, dated 1 August 2007);

(xv) Landscape Plan Dwg. No: LP013, Sheet 15 of 17, Revision A (prepared by Anembo Consultants, dated 1 August 2007);

(xvi) Landscape Plan Dwg. No: LP014, Sheet 16 of 17, Revision A (prepared by Anembo Consultants, dated 1 August 2007); and

(xvii) Landscape Plan Dwg. No: LP015, Sheet 17 of 17, Revision A (prepared by Anembo Consultants, dated 1 August 2007) incorporating a minimum width of 4 metres for the Turfed Maintenance Path.

(d) The Developer shall ensure all cultivation, planting detail and garden edging shall be in accordance with Parks Standard Drawing SP.06, Ipswich Standard Drawing SP.20 and Ipswich Standard Drawing Timber Log Edge SP. 23.

(e) The Developer shall submit to the Development Manager for approval, separate detailed plans for stormwater treatment devices in Stage 1.

(f) The Developer shall complete all approved landscaping and rehabilitation works for the parkland, drainage corridors and streetscape to the satisfaction of the Development Manager prior to the plan sealing of the adjacent stage.

(g) The Developer shall submit to Council a Certificate of Compliance – Landscape Works (Appendix 3 of Planning Scheme Policy 3 – General Works), which shall be signed by a corporate member of Australian Institute of Landscape Architects or other approved licensed landscape architect prior to Council signing the plan of survey to certify all landscape works have been completed in accordance with the approved plans.

12. Engineering Requirements

The following engineering requirements, detailed in Conditions 13 – 25, shall be completed to the satisfaction of the Senior Development Engineer.

Terms

(a) RPEQ - A Registered Professional Engineer of Queensland, suitably qualified and experienced in the particular area of expertise required. Furthermore, the RPEQ required for the analysis and reporting for mining shall be experienced in the analysis of underground and surface mining within the Ipswich area.

(b) QUDM - The Queensland Urban Drainage Manual, produced by the Queensland Department of Primary Industries.

(c) DMR – Queensland Department of Main Roads.

(d) MUTCD - The Manual of Uniform Traffic Control Devices, published by DMR.

(e) Ipswich Water - Commercial Business Unit of Ipswich City Council providing water and sewerage services.

(f) DNRM - Department of Natural Resources and Mines.

13. Roadworks

General

(a) All roadworks included in this approval shall be designed and constructed:

(i) As public roads;

(ii) At no cost to Council;

(iii) To ensure that the carriageway width, geometry, design speed and other attributes are consistent with the function of the road or street in the road hierarchy;

(iv) In accordance with Ipswich Planning Scheme Policy 3 - General Works, Council Standards and the DMR Road Planning & Design Manual (or other relevant documentation agreed by Council);

(v) With stormwater drainage infrastructure designed in accordance with Council's Planning Scheme Policy 3 – General Works, Queensland Urban Drainage Manual and the Department of Main Roads Drainage Design Manual, in that order of precedence;

(vi) For the safe and efficient movement of B-double combination vehicles (26.0 metres in length) and Higher Mass Limit Vehicles (including u-turn manoeuvres where required). This includes those roadworks to be undertaken by the Developer as specified by DMR in their referral agency response dated 25 March 2008.

(vii) With street lighting and route lighting installed in accordance with the relevant Australian Standards and Energex public lighting standards. The lighting shall be provided in accordance with the requirements for Energex Rate 3 lighting;

(viii) To include the relocation and protection of existing public utility services required in association with the roadworks at no cost to Council;

(ix) To include the installation of new public utility services to service land subject of this approval;

(x) To ensure access to existing properties is maintained at all times; and

(xi) With all medians, verges and batters topsoiled, turfed and landscaped generally in accordance with Council's Street Tree Planting Guidelines and the approved landscape master plan for the development site.

(xii) With kerb ramps (in accordance with Council's Standard Drawing SR.18) at all intersections and at additional locations where required to connect future path networks and pedestrian crossing points. Generally at "T" intersections, six kerb ramps are required.

<u>"Hoepner Road Extension"</u>

(b) The Developer shall construct / extend Hoepner Road from the southern end of the existing constructed road to Brisbane Road. The "Hoepner Road Extension" shall:

(i) Function as an industrial collector road and as such the design and construction of this road shall satisfy this intent and function and be generally consistent with Council's Standard Drawings;

(ii) Intersect with Brisbane Road in the vicinity of Whitwood Street and be controlled by traffic signals;

(iii) Include traffic signals at the intersection of Ashburn Road / Hoepner Road configured to provide sufficient capacity for a minimum operating horizon of 10 years from the date the last plan of survey of the development site is signed by Council;

(iv) Be designed and configured for a ~~70km/h~~ 60km/h design speed *(unless otherwise approved by the Development Manager – Engineering)*;

(v) Be fully constructed, on-maintenance in accordance with the Ipswich Planning Scheme and open to traffic at the following times (whichever is earlier):

- Before Council signs the plan of survey that creates the twelfth (12th) additional lot over the development site; and
- Within two (2) years from the date the plan of survey is signed that creates the first additional lot over the development site.

(c) Prior to the Council signing the plan of survey that creates the first additional lot over the development site, the following matters shall be completed:

(i) A Development Permit for Operational Works for the "Hoepner Road Extension" shall be lodged with and approved by Council;

(ii) All land required for the construction of the "Hoepner Road Extension", including its intersection with Brisbane Road and Whitwood Road, is owned by Council, the Department of Main Roads or the Developer or is dedicated road (except for the crossing over the railway corridor);

(iii) The Developer has provided Council with a bond to the value of 125% of the construction cost. As such, the Developer shall provide a preliminary cost estimate for the 'Hoepner Road Extension', including a schedule of rates and quanatities, before the Development Permit for Operational Works for the Hoepner Road Extension is issued ; and

(iv) The Developer has entered into a legal agreement with Council stipulating the Developer's construction obligations for the "Hoepner Road Extension".

Site Frontage Works

(d) The Developer shall reconstruct and upgrade Ashburn Road *and* Bognuda Street ~~and the 'Warrego Highway Access Road'~~ along the *full* frontages of the development site (including any 'balance' or 'project' lots) in accordance with Council's Standards for an industrial collector street. The design and configuration of each road shall include:

(i) Geometry and sight distances for a ~~70km/h~~ 60km/h design speed *(unless otherwise approved by the Development Manager – Engineering)*;

(ii) A nominal 14.0m wide carriageway on a nominal 22.0m road reserve (wider at intersections and where a divided carriageway is required). This will require a dedication of land from one or both sides of the development site's frontages to these roads;

(iii) Concrete kerb and channel on both sides (Type B1 with an additional 50mm thickness) plus associated stormwater drainage infrastructure (designed in accordance with Council's Planning Scheme Policy 3 – General Works, QUDM and the DMR Drainage Design Manual, in that order of precedence).

(iv) Concrete paths (minimum 2.0m wide) on both sides, with kerb ramps designed in accordance with ICC Standard Drawing SR.19;

(v) Edge lines and 'bicycle awareness zones' marked on the carriageway;

(vi) Signs and pavement markings in accordance with the MUTCD including 60km/h speed limit signs and "No Stopping" Signs;

(vii) *Safe* pedestrian ~~refuge islands~~ *crossing points* provided at the following locations:

- ~~Ashburn Road between the proposed intersections with the internal industrial access street (Road 1) in the vicinity of proposed Lots 10, 11, 13 & 14); and~~ *Ashburn Road within the splitter island of the western and eastern intersection of 'Road 1' roundabouts in the vicinity of proposed lots 12 and 15. Works shall include kerb ramps, island breaks and signs; and*

- Bognuda Street between Ashburn Road and Archer Street in the vicinity of proposed Lot 28. ~~Each~~ *Works shall include a* pedestrian refuge island ~~shall be~~ designed and constructed in accordance with the MUTCD (Figure 4 of Part 10) including signs, pavement markings, lighting and kerb ramps (designed in accordance with ICC Standard Drawing SR.19). The pedestrian refuge islands shall be positioned to ensure driveway access to adjacent lots will not be impeded in the future;

(viii) Bus stops, and associated infrastructure, provided at the following locations:

- Both sides of Ashburn Road on the departure side of the proposed eastern intersection with the internal industrial access street (Road 1); and *between the western and eastern intersection of 'Road 1' roundabouts; and*

- Both sides of Bognuda Street between Ashburn Road and Archer Street in the vicinity of proposed Lots 12 and 28.

Each bus stop shall be positioned, designed and constructed in accordance with Translink specifications / standards and Disability Standards for Accessible Public Transport and include:

- A reinforced concrete hardstand area with a sufficient footprint for the installation of a illuminated Translink Type 2A bus shelter. The hardstand area shall be positioned between the kerb and path;

- An illuminated Translink Type 2A bus shelter installed by a Translink preferred supplier *(preferably Adshel)*;

- Connection to the electricity network including conduits and pits;

- ~~Raised~~ Tactile ground *surface* indicators;
- Pavement markings in accordance with the MUTCD;
- A flag sign indicating 'future bus route' (white writing with dark blue background); and
- A litter bin with bird proof cover.

~~*NOTE: Footpaths, pedestrian refuge islands and bus stops do not need to be provided along the 'Warrego Highway Access Road'.*~~

Ashburn Road / 'Warrego Highway Access Road'

(e) The Developer shall upgrade the intersection of Ashburn Road / 'Warrego Highway Access Road' with traffic signals before the plan that creates the twelfth (12th) additional lot over the development site is signed by Council. The design and construction shall:

(i) Be sufficient to meet the capacity requirements of a minimum 10 year operating horizon (from the day the last plan of survey is signed over the development site).

(ii) Meet the requirements of the DMR;

(iii) Provide a southern leg of the intersection to facilitate future access for proposed Lot 16 and continued access for Lot 7 SP167997 (located at Lot 7 Bognuda Street), Lot 1 SP179307 (located at 83 Bognuda Street) and Lot 5 SP140694 (located at 61 Ashburn Road)

(iv) Be in accordance with the DMR Road Planning and Design Manual for a 60km/h design speed. Where any design element is not specified in this manual or in Council's Planning Scheme Policy 3 – General Works, Austroads Guide to Traffic Engineering Practice – Part 5 (Intersections at Grade) and Part 7 (Traffic Signals) should be used.

Ashburn Road

(f) The Developer shall construct roundabouts at the two locations where the proposed new Industrial ~~Collector~~ *Access* Street (Road 1) intersects with Ashburn Road. The design and configuration of these roundabouts shall be in accordance with a 60km/h design speed.

(g) The Developer shall construct a raised median (minimum 2.0 metres wide) along Ashburn Road between the eastern roundabout and the intersection of Ashburn Road / "Warrego Highway Access Road".

(h) The Developer shall configure the access for proposed Lot 1 along Ashburn Road for left-in and left-out movements only. This shall be supported by the construction of an island on the driveway of Lot 1 to restrict right turn movements out of this lot.

Ashburn Road / Warrego Highway On-ramp

(i) The Developer shall organise a Road Safety Audit (RSA) to be undertaken of the intersection of Ashburn Road / Warrego Highway on-ramp (in the vicinity of Duke Close and Earl Street) including its approach and departure legs (minimum 200 metres in each direction).

The RSA shall be undertaken by a DMR accredited road safety auditor and provide recommendations on any improvements that are required to be undertaken at this intersection to improve its safety and operation. The RSA shall take into account the changes in traffic movements and vehicle types generated by the development site, including the movement of B-double combination vehicles (26.0m in length). The RSA Report shall be submitted with the conceptual design plans for the roadworks along Ashburn Road.

(j) The Developer shall upgrade / reconfigure the intersection of Ashburn Road / Warrego Highway on-ramp (in the vicinity of Duke Close and Earl Street) to ensure the safe and efficient movement of the type and volumes of vehicles expected to use the intersection as a result of the development, including B-double Combination Vehicles (26.0m in length) and Higher Mass Limit Vehicles. The intersection upgrade shall be configured to ensure:

(i) A minimum design speed of 60km/h is achieved including safe intersection site distances (SISD);

(ii) Sufficient capacity of a minimum 10 year operating horizon (from the day the last plan of survey is signed over the development site);

(iii) The recommendations from the RSA are incorporated into the design; and

(iv) The requirements of DMR are met.

(v) Works may include realignment, reprioritisation and/or the installation of traffic signals.

New Industrial Street

(k) The proposed new street that will provide access for Stage 1A and Stage1C shall be designed and constructed in accordance with Council's Standard for an industrial access street. Works shall include a concrete path (minimum 1.5 metres wide) on one side designed in accordance with Council's Standard Drawing SR.19. The path shall be on the same side as the street lights and its maximum longitudinal grade shall not exceed 1:8.

Bird Street

(l) The Developer shall construction kerb & channel along both sides of Bird Street. Works shall include stormwater infrastructure, driveway reconstruction, verge re-profiling and pavement infill in accordance with Council's requirements. These works shall be completed before the plan that creates the twelfth (12th) additional lot over the development site is signed by Council.

NOTE: As part of the development of a master plan for the Bremer Business Park in 2003 (and as outlined in Council's Preliminary Approval Decision Notice date 6 July 2004), the Developer at this time made a commitment to the community that certain works would be undertaken along Bird Street.

Conceptual Design Development & Approval

(m) The Developer shall organise for conceptual design plans of the roadworks outlined in this approval to be prepared by an RPEQ and then submit these plans to Council for approval before detailed design commences. The conceptual design plans are to show:

(i) Horizontal and vertical geometry;

(ii) Intersection configurations;

(iii) Cross sections;

(iv) Pavement markings;

(v) Bus stops locations; and

(vi) Pedestrian refuge islands.

(n) The Developer shall organise the detailed planning and conceptual design plans for the proposed road linking the northern and southern areas of 'Citiswich' over the Warrego Highway ("North-South Link Road") to be prepared by an RPEQ before detailed design commences. The conceptual design plans for the 'North-South Link Road' shall:

(i) Meet geometric and sight distance standards for a minimum design speed of ~~70km/h~~ 60km/h and a maximum vertical grade of 5 percent. *These design parameters may be altered with approval by the Development Manager – Engineering;*

(ii) Meet the requirements of the Department of Main Roads (DMR). As such, written correspondence from DMR is required to be submitted by the Developer outlining DMR's general design parameters for the "North-South Link Road" including clearances, structure spans and pier locations.

(iii) Provide information relating to it's interface, interaction and impacts on the development site and Ashburn Road; and

(iv) Be submitted to Council for approval at the same time the conceptual design plans for Ashburn Road and the Ashburn Road / 'Warrego Highway Access Road intersection are submitted.

Main Roads Requirements

(o) If DMR modifies any of its conditions of approval and associated threshold triggers for roadworks (including addition and deletion) as outlined in their Referral Agency Response dated 25 March 2008:

(i) The Developer shall inform Council in writing with the relevant information within ten (10) business days of the DMR modification; and

(ii) Council reserves the right to reassess the suitability of all of the roadworks requirements and associated design parameters as outlined in Condition 12 (above) and revise the roadworks conditions accordingly including the possible addition of other conditions.

14. Local Area Traffic Management

(a) The Developer shall implement an integrated local area traffic management (LATM) scheme in the existing residential areas to the south and south-west of the development site, generally in the vicinity of Bognuda Street and Law Street. The parameters for the LATM Scheme are as follows:

(i) The LATM scheme shall be designed and approved by Council before the plan of survey that creates the twelfth (12th) additional lot over the development site is signed by Council;

(ii) The approved LATM Scheme shall be fully constructed and open to traffic either within two (2) years from the date the plan of survey that creates the first (1st) lot over the development site is signed by Council or within six (months) from the date the first Development Permit for Building Works over the site is issued (which ever threshold is triggered is earlier). Council may by agreement extend the period by which the LATM scheme has to be completed;

(iii) The LATM scheme shall include a comprehensive public consultation component in which the Developer must prepare and submit a 'Community Engagement Plan' for approval by the Council before the planning and design of the LATM Scheme commences;

(iv) The scope of the LATM Scheme shall be generally in accordance with that outlined in the Preliminary Approval for the Bremer Business Park (refer Condition 12 (a) (iii) of the Negotiated Decision Notice dated 6 July 2004 for ICC Development Application 3356/2002), subject to community consultation.

(v) The LATM Scheme shall be designed and constructed at no cost to Council.

(b) In lieu of Condition 13 (a) above, the Developer shall provide to Council a monetary contribution of AUD$670,000 towards the implementation of a future LATM scheme to the south and south-west of the development site.

This contribution shall be paid as a lump sum before the plan of survey that creates the first (1st) lot over the development site is signed by Council or paid in stages as follows:

(i) An amount of AUD $100,000 is payable to Council before the plan of survey that creates the first (1st) additional lot over the development site is signed by Council;

(ii) The balance is payable to Council before the plan of survey that creates the twelfth (12th) additional lot over the development site is signed by Council

The contribution amount (whether paid as a lump sum or in stages) is fixed for a period of twelve (12) months from the date of this Decision Notice and thereafter shall be calculated from the date of development approval to the date when payment is made in accordance with the Non-building Construction Cost Index (Queensland).

(c) The Developer shall inform Council in writing as to which option they intend to take with regard to satisfying Condition 13 before the plan of survey that creates the first (1st) additional lot over the development site is signed by Council.

15. Access

(a) Direct property access for proposed Lot 16 along Ashburn Street is not permitted. Vehicular access to and from proposed Lot 16 shall only be via the provision of a southern leg to an upgraded intersection of Ashburn Road / 'Warrego Highway Access Road'.

Similarly, 'right of way' easements on Lots 1 and 2 SP 179307 shall be preserved (except where land common to these easements is dedicated as road reserve) and access to the respective allotments configured to co-aligned with Lot 16 public and private access road.

(b) Safe and efficient access to existing lots and associated land uses shall be maintained at all times during both the construction and operating stages of the development as well as during the construction of the relevant roadworks outlined in this approval.

(c) The Developer shall construct a public road, in accordance with Council Standards for an industrial access street, to provide continued access for Lot 7 SP167997 (located at Lot 7 Bognuda Street), Lot 1 SP179307 (located at 83 Bognuda Street) and Lot 5 SP140694 (located at 61 Ashburn Road). The new road shall be constructed from the intersection with the Lot 16 access extending to the eastern property boundary of the development site and connecting with the existing access.

(d) Vehicular access to and from proposed Lots 2, 9, 18 and 26 shall be via the proposed internal industrial access street (Road 1). Direct property access along Ashburn Street is NOT permitted for these allotments.

(e) Permanent heavy vehicle access for the development site shall NOT be via Bognuda Street south of ~~Archer~~ *Boundary* Street;

16. Stormwater Quality Reporting

(a) The Developer is requested to submit an amended Stormwater Quality Report to the Development Manager for approval incorporating comments made in the review by Ecological Engineering (dated 30 July 2007) and Healthy Waterways (dated 21 January 2008) to the *Bremer Business Park Masterplan - Stormwater Management Strategy Overall Site Masterplan* (prepared by Cardno Lawson Treloar, dated 8 March 2007) and the *Bremer Business Park Stage 1- Stormwater Management Strategy* (prepared by Cardno Lawson Treloar, dated 2 August 2007).

(b) The amended report shall suitably address all matters outlined in the two reviews and shall include a Stormwater Masterplan and stage-based reports, as well as the following:

(i) The Cardno Lawson Treloar Review(dated 2 August 2007) partially addresses the issue of implementation and timing of the regional water quality treatment measures, this shall be integrated into the Stormwater Masterplan, stage-based reports and detailed Operational Works drawings for both the lot-scale and regional-scale bioretention. Construction, establishment and maintenance of all bioretention is required to be in accordance with Section 5.5 of the WSUD TDG and the reports and drawings shall specify how stormwater treatment areas relate to the staging of civil works, building works and the staged implementation of landscaping.

(ii) The Developer shall support the proposed bioretention in the road network (as listed in the Information Response) by the provision of modelling and figures. Furthermore, the treatment in roads via biopods and small bioretention basins is strongly supported and shall be further explored in the amended reports and drawings.

(iii) The Masterplan shall set up the extent of reporting for subsequent applications and provide guidance on the sizing of treatment devices. Reference shall be made to the treatment performance curves (figures 5-3 to 5-5), of the WSUD TDG ensuring that at a minimum 2% of each site area is reserved for treatment. The reports for each individual industrial lots shall be a summary of the steps 1-9 (Section 5.3.1) of the WSUD TDG as they apply to each site. A detailed water quality model shall not be required for individual industrial sites except where the proposed train varies from the WSUD TDG or the approved masterplan.

(iv) The reports shall address the potential conflict with landscape screening requirements and the location of bioretention treatment areas ensuring that trees are not planted in bioretention treatment areas.

(v) Gross pollutant traps and stormfilters shall not be relied upon for nitrogen removal. These units shall only be installed to control gross pollutants, oils and greases within industrial sites. For regional treatment measures, above ground trash racks shall be used in place of these units.

(vi) The stage-based report shall set up the responsibilities of the water quality specialist/s which shall be employed to oversee bioretention basin construction.

(vii) A copy of the MUSIC sqz. file for both the Stormwater Management Strategy and Overall Site Masterplan and for each of the stage-based reports shall be provided to Council for assessment in conjunction with the first Operational Works application.

(viii) Where non-default pollutant reduction efficiencies are used in the modelling these shall be agreed upon by Council prior to modelling. For gross pollutant traps calculated reduction efficiencies shall not exceed TSS 50%, TP 10% and TN 0% unless otherwise approved by Council prior to modelling.

(ix) The reports shall be accompanied by a point by point response to the aforementioned reviews by Healthy Waterways and Ecological Engineering as well as Council's concerns outlined in the above conditions.

(x) The Masterplan shall include a schedule which outlines the implementation timing of the regional water quality treatment measures associated with each stage.

(c) The amended reports shall be prepared by a suitably qualified and experienced professional in accordance with the Water Sensitive Urban Design Technical Design Guidelines (WSUD TDG) for South East Queensland (Healthy Waterways - Version 1 June 2006), and demonstrate through appropriate pollutant export modelling that stormwater will be treated on site to a standard which meets ~~Council's stormwater quality concentration-based objectives and~~ the load-based objectives for South East Queensland (TSS 80%, TP 60%, TN 45% and GP 90% removal respectively).

(d) All detailed stormwater quality drawings shall detail amongst other necessary items the following requirements/amendments:

(i) Specify the depth and appropriate particle size diameter of the filter media, transitional layer and drainage layer. The transitional and drainage layers should not be included in the depth of filter media modelled. Biofiltration should consist of a filter media featuring a sandy loam layer (depth 0.3-0.8m, particle size 0.45mm); a transitional layer of coarse sand (depth 0.1-0.2m, particle size 1.0mm) and a drainage layer of coarse sand/gravel (depth 0.1-0.2m, particle size 2mm-20mm).

(ii) Slotted PVC pipes shall be spaced a maximum of 1.5m apart within the drainage layers. A minimum of two slotted PVC pipes shall be placed within the drainage layer of bioretention swales. Drainage shall be designed in accordance with Section 5.9.5 of the WSUD TDG.

(iii) Provide geofabric around the base of the drainage layer and the walls of the basin. Geofabric shall not be laid between any of the filter layers or used to wrap the slotted PVC drainage pipes.

(iv) Provide a riser with PVC cap at the head of each the slotted pipe for maintenance flushing. A cross section detail shall be shown on the plan. The drawings shall specify that risers are not to be slotted.

(v) Adequate scour protection and maintenance access shall be provided. Scour protection shall be in accordance with Section 5.3.3.1 of the WSUD TDG. Scour protection areas shall not be included in the total filter areas. A plan detail and cross section similar to Figure 5-6 of the Water Sensitive Urban Design Technical Design Guidelines (WSUDTDG) shall be detailed on the plans.

(vi) A suitable sediment fore bay shall be designed for each basin in accordance with Section 5.3.3.2 of the WSUD TDG ensuring that particles equal to or greater than 1mm in diameter are removed from the 3 month ARI storm event. Calculations shall be provided to demonstrate compliance with the guidelines.

(vii) A high flow bypass shall be incorporated into the design of each basin to ensure that only flows up to the 3 month ARI storm event are treated through bioretention treatment basins.

(viii) The plans shall refer to the guideline for Bioretention and Tree Pit Media Specifications, Facility for Advancing Water Biofiltration (FAWB) for the filter specifications and objectives and note that construction and testing of bioretention filter media shall be undertaken with the most current version (at the time of construction/testing) of this guideline.

(e) Where any stormwater treatment is proposed to be located in existing easements the Developer shall provide to Council evidence from the relative authority that consent has been granted to construct within the easement.

17. Construction of Stormwater Treatment

(a) All stormwater quality management treatments shall be fully constructed in accordance with the final approved *Stormwater Management Strategy Overall Site Masterplan, stage-based reports* and detailed Operational Works drawings.

(b) All regional scale treatment devices shall be fully operational prior to works being accepted on-maintenance.

(c) Construction, establishment and maintenance of all bioretention basins shall be carried out in accordance with Section 5.5 of the WSUD TDG. A staged implementation approach shall be employed for the bioretention areas ensuring that filter media is either laid after construction works have been completed or the filter is protected until the completion of any works.

(d) The Operational Works staging boundaries shall include adjacent regional scale stormwater treatment devices in accordance with the approved staging and implementation plan as required in Condition ~~12(d)(i)~~ *15(b)(i)* above.

(e) The Developer shall provide to Council certification from a suitably qualified water quality specialist to verify that all bioretention basins have been constructed in accordance with the approved reports and drawings. This shall include certification that the biofiltration filter media meet the criteria outlined in the most current version (at the time of testing), of the guideline for Bioretention and Tree Pit Media Specifications, Facility for Advancing Water Biofiltration (FAWB).

The minimum parameters to be tested include: hydraulic conductivity, particle size distribution, organic matter content, pH, electrical conductivity and phosphorus concentration. Should filter media fail to meet these or other agreed criteria, suitable remedial measures shall be implemented by the Developer prior to the on-maintenance for regional scale bioretention basins.

18. Stormwater Quality Maintenance Plans

(a) The Developer shall prepare a detailed Stormwater Quality Maintenance Masterplan for the development which addresses both the regional and lot scale treatment devices for each stage. The Masterplan shall be submitted to the Development Manager for approval in conjunction with the first Operational Works application. The Masterplan shall:

(i) Outline requirements for Stage 1 in accordance with Appendix A – Stormwater Management Plan and Appendix B – Maintenance Plan of the *Bremer Business Park Stage 1- Stormwater Management Strategy* by Cardno Lawson Treloar (Report LJ8714/R5 and dated 2 August 2007) except where otherwise directed by Council. The Stormfilters mentioned in this report are not approved.

(ii) Outline requirements for construction, building and operational phases specifying the regular maintenance of the stormwater system (e.g. cleaning of gully pit filter baskets after storm events) along with the long-term management such as the replacement of the bio-retention filters.

(iii) At a minimum, include the following details:

- Aims and objectives (including water quality and filter media parameters);
- Regular maintenance – maintenance/inspection checklists for each device with comments on timing, frequency, data collection and non-compliance procedures;
- Long-term maintenance – timing, frequency, data collection, filter and water quality testing, non-compliance procedures;
- Describe how each maintenance action is to be carried out (including maintenance techniques, environmental management considerations, disposal requirements for polluted water and solid waste);
- Management structure and responsibilities;
- Record keeping and reporting;
- Review and update;
- Any relevant contractor contact information.

(b) The Stormwater Quality Maintenance Masterplan shall be prepared by a suitably qualified and experienced professional to the satisfaction of Council and utilise the maintenance checklists located in the Water Sensitive Urban Design Technical Design Guidelines (WSUD TDG) for South East Queensland (Healthy Waterways - Version 1 June 2006).

(c) The Stormwater Quality Maintenance Masterplan shall be implemented in perpetuity to the satisfaction of Council except for regional treatment devices which shall be maintained until accepted off maintenance. Regular inspection records shall be maintained on site and made available to Council upon request for both the construction and operational phases. All necessary improvements shall be made immediately upon awareness of any deficiencies in the system.

19. Sewerage

(a) The Developer shall provide a sewerage reticulation system with appropriate connection branches and external trunk works, designed so as to command the whole of each of the proposed allotments. The sewerage reticulation system and external trunk works shall be generally in accordance with, except where amended within this approval, Sewerage Planning Report prepared by Burchill ADM and dated September 2007.

(b) Concerning the timing of external trunk works, the developer shall construct pump station BBP1 and Line 04A extending from pump station SP5 to BP1 with any development of Stage 1. Commissioning and decommissioning of BBP1 and SP5 respectively shall be undertaken by Ipswich Water at full expense to the Developer. The Developer shall lodge a private works application to Ipswich Water for commissioning and decommissioning works.

(c) Pump station BBP1 building platform/compound shall be a minimum 500 m^2 and located at minimum RL 16.6m AHD.

(d) Where proposed sewer reticulation or trunk is located within an existing or future easement, the Developer is required to submit in conjunction with operational works application written consent from the respective easement owner (other than Council).

(e) All sewer pipes and rising mains shall be constructed from ~~Vitreous Clay (VC)~~ *Vinidex Sewer-Pro* or similar material as approved by Ipswich Water. Synthetic type material (such as uPVC) is not permitted.

20. Water

(a) The Developer shall provide a reticulated water supply system together with valves and fire hydrants, in accordance with the "Guidelines for Planning and Design of Urban Water Supply Systems", which connects into Council's existing reticulation system.

(b) A blue, bi-directional raised reflective pavement marker (RRPM) shall be provided to all hydrants. The marker shall be installed in accordance with the Department of Main Roads Fire Hydrant Indication System Technical Guideline.

(c) All works on live water mains are to be carried out by Ipswich Water in accordance with Council's policy, and at the Developer's expense.

(d) Where concrete footpaths are to be constructed, the Developer shall provide 100 mm diameter conduits under the footpath and in line with the conduits under the road, for future ease of installing the individual water services. The letter "W" shall be embossed in the concrete to mark the location of the conduit.

(e) Sufficient stop valves shall be installed so that in the event of any break in the supply, the maximum number of lots to be without water is 20.

(f) The developer shall provide water mains on both sides of each applicable road, unless otherwise agreed to by Ipswich Water.

21. Stormwater Quantity

(a) The developer shall provide all necessary stormwater drainage (both internal and external to the development) and such drainage works (except for roofwater systems) shall be designed and constructed in accordance with QUDM such that the overall drainage system caters for a storm event with an ARI of 100 years.

Overland flow paths shall be suitably designed to cater for the water from a storm event with an ARI of 100 years. In the case where the piped system is carrying part of the flow, the overland flow paths shall be designed to cater for that volume which is represented by the difference between the predicted volume from the storm event with an ARI of 100 years and the capacity of the pipe system, noting the requirements of QUDM.

(b) All stormwater flows within and adjacent to the Citiswich Area, other than inter-allotment drainage, shall be confined to dedicated roads, drainage reserves, registered drainage easements or within parkland. The registered drainage easements, if related to piped drainage, shall be centrally located over such underground pipe system and shall be not less than 4.0 m wide, except for drainage easements required for side boundaries which may be 3.0 m wide where approved by the Senior Development Engineer. In addition, the easements shall be of suitable width to contain the predicted overland flow from the storm event with an ARI of 100 years in that location.

(c) No ponding, concentration or redirection of stormwater shall occur onto adjoining land unless specifically approved by Council in consultation with the owner of the adjoining land.

(d) Due consideration shall be given in these and future designs and construction of the development in relation to the effect of the developed catchment flows on the downstream discharge receival areas. Suitable stormwater control devices are to be provided to ensure that there is no increase in flows in watercourses. Such control devices are to be designed so as to integrate the landscaping, recreational, infrastructural and drainage roles of watercourses. Notably the development shall limit the post-development peak one-year Average Recurrence Interval (ARI) event discharge to the receiving waterway to the pre-development peak one-year ARI discharge. Analysis of pre-development catchment hydrology shall assume current level of development rather than fully developed upstream catchment.

(e) There shall be no filling or removal of material in the flood area below the development flood line associated with an ARI of 20 years. There shall be minimal disturbance to vegetation in the flood area, unless prior written approval is obtained from Council.

(f) Filling in proposed Lots, which are adjacent to the watercourse shown on the proposal plan, shall not be undertaken without the written approval of Council.

(g) A suitable roofwater system shall be designed in accordance with QUDM, for allotments that do not have adequate fall from within the allotment to the design invert level of the kerb and channel or access to lawful discharge point. The design is to be to a minimum Level V in QUDM.

22. Public Utilities

(a) Adequate provision shall be made in all proposed road reserves, access strips, common areas and easements, to cater for the public utility services that would normally serve the development.

(b) The Developer shall provide appropriate road crossing conduits in accordance with Council's Standard Drawings SR.22, SR.23 and SR.24. Where concrete footpaths are to be constructed, the conduits shall be extended to the property boundaries.

(c) Street lighting shall be installed, for internal road and applicable frontages of Ashburn Road and Bognuda Street, by the Developer in accordance with the Australian Standard 1158.3.1 Table 1.1. All street lighting associated with the development shall be certified by a RPEQ. Street lighting shall be installed on the same side as concrete footpaths (where applicable).

(d) The Developer shall provide underground electricity/telecommunications within the development, constructed in the approved allocation as detailed in Council's standard drawings SR.22 and SR.23. Electricity and telecommunication drawings shall be coordinated with the civil engineering design documents, to ensure that service clashes are avoided.

(e) The Developer shall provide an Energex approved electrical reticulation layout plan. The electricity layout shall also be shown on the water reticulation layout plans.

(f) Prior to the commencement of use of the site, the Developer shall provide Council with a copy of an agreement with Energex for the supply of electricity to the development.

(g) Telephone and cable services may be laid in a combined trench with electricity cables, subject to the approval of Energex and the authorised telephone/cable service provider.

(h) The Developer shall make suitable arrangements for the provision of telephone and cable services to the Development. Documentary evidence that discussions have commenced with any authorised telephone/cable service provider, on the provision of telephone/cable services, shall be produced before the completion of the development.

23. Erosion & Silt Management

(a) The Developer shall prepare an Erosion and Sediment Control Plan (ESCP). The ESCP is to incorporate detailed drawings and a management plan which are to be continually revised subject to Council instruction, site conditions and different development stages particularly during the earthworks stage. Where any amendments are required further approval shall be received from Council. The Developer shall be responsible for the installation and maintenance of silt management facilities from the time of commencement of construction until the development has been released "Off Maintenance". All silt management facilities are to be in accordance with the document "Soil Erosion and Sediment Control" published by the Institution of Engineers Australia, or equivalent.

(b) A completed copy of the Brisbane City Council Erosion Hazard Assessment Checklist shall be submitted and used as the basis for determining appropriate erosion and sediment control measures.

(c) The design of sediment basins shall be in accordance with the current version of the Brisbane City Council Sediment Basin Design Construction and Maintenance Guidelines. The Developer shall lodge the detailed calculations as required by steps 1-16 of Section 2 - *Design Procedure* along with detailed drawings.

(d) A Water Quality Testing strategy including the testing of baseline shall be undertaken as part of the ESCP.

(e) The ESCP shall be a flexible document which is designed to adapt to the staging of construction works.

(f) Suitable permanent stabilisation works will be required at stormwater outlets, above and below the culvert. Dumped rock will need to be pocket planted and a layer of geofabric laid below the rocks.

(g) Particular attention should be paid to batters around culverts and stormwater outlets with the aim to minimise to the greatest possible extent the slope of adjacent batters.

(h) All lots shall be 90% grassed prior to civil works being accepted off-maintenance and prior to signing the plan of survey.

(i) Silt traps shall be sited upstream from any park or reserve area discharge point preferably on land comprising future allotments, such that no silt impinges on the park or reserve areas. The silt trap areas may be phased out after the development work is complete and adequate grass cover is obtained.

(j) Diversion drains and ponds, as necessary, shall be installed on the site before any other work is undertaken on site to ensure that "dirty water" is contained and/or isolated.

(k) A procedure shall be submitted with the engineering drawings for approval for maintaining the facilities, setting out the frequency of attention, with inspections to be made after each significant rainfall event.

(l) Council reserves the right to enter the site for the purpose of rectifying any silt management facilities which it deems to be inadequate, improperly maintained or not operating in a satisfactory manner.

(m) The Developer shall lodge a $10, 000 siltation and erosion performance bond with Council, prior to the commencement of works, which shall only be released by Council at the termination of the maintenance period. Where Council determines that a draw-down of the bond is required, the Developer shall restore the bond to its full amount within 10 days of a notice from Council to that effect. Such bond shall guarantee adequate performance in the circumstances (i) and (ii) below:

(i) In the event that instructions issued to the Consulting Engineer by the Senior Development Engineer for the installation of erosion control measures, are not complied with within 24 hours, Council will call upon the bond to the extent required to carry out the necessary works.

(ii) If the Senior Development Engineer determines that silt damage has occurred on the site, or the downstream drainage system has become silted, the Developer shall be responsible for restoration. Such restoration shall be completed in the time determined by the Senior Development Engineer.

Should the Developer fail to complete the works determined by the Senior Development Engineer within the specified time, Council shall complete the work and recover all costs from the Developer associated with that work.

24. Operational Works – Municipal Works
(ie Works being handed over to Council)

(a) Plans relating to all civil engineering works shall be prepared and submitted for review by Council under the cover of Form 1 - Part A (Common details for all applications) and Form 1 - Part E (Planning Scheme Works). The plans shall show full construction details, layout dimensions, and finished surface levels and shall be submitted together with the appropriate fees for Council approval, prior to the commencement of construction on site.

(b) The Developer shall comply with the requirements of the documents entitled "Planning Scheme Policy 3 - General Works" and "Standard Drawings".

(c) All engineering drawings submitted to Council shall be in accordance with Council's Planning Scheme Policy 3 - General Works and Standard Drawings, and shall include as a minimum the following:

(i) Engineering drawings shall be marked as confirmation that they have been checked and approved by a RPEQ;

(ii) The drawings shall be submitted as four (4) hardcopy A3 size sets and two (2) hardcopy sets of any reports and supporting information. One set of plans shall be returned to the applicant with the Decision Notice.

The submission shall also include a Compact Disc containing electronic data as follows:

- One (1) full set of all engineering drawings contained in one file;
- Separate individual files containing layout plans for sewerage, water supply and drainage;
- Any reports submitted in support of the Application. Each report shall be included as a separate file;
- An index of all files on the Compact Disc including descriptions of contents of each file; and

- All files shall be submitted in PDF format.

(iii) A "Certificate of Design" shall be submitted by a RPEQ, certifying that the design is in accordance with all relevant engineering standards, Council's requirements and standards, relevant development conditions of approval, and sound engineering practice.

(d) Municipal works shall require a detailed design certified by a RPEQ, the design approved by Council Engineers with appropriate fees payable, a works pre-start meeting on-site and various detailed construction and audit inspections by Council Officers. A twelve month maintenance period is applicable for the works as well as the payment of a maintenance security deposit.

(e) All works shall be supervised by a RPEQ competent in civil works and shall be undertaken by a nominated principal contractor experienced in the construction of municipal works. Council reserves the right to request evidence of the principal contractor's competency. Should it be deemed by the Senior Development Engineer that the contractor does not have the necessary competency or has constructed substandard works for Council in the past, Council reserves the right to reject the nominated contractor.

(f) Municipal works shall be accepted "On Maintenance" prior to commencement of use. A maintenance bond equal to 5% of the construction cost (minimum of $1,000.00) shall be retained by Council for a minimum period of twelve months, or until such time as the works are accepted "Off Maintenance" by Council.

(g) "As Constructed" plans for municipal works shall be submitted to Council and approved prior to the formal acceptance of the works "On Maintenance". These plans shall be submitted electronically in PDF format, contained on a Compact Disk labelled appropriately to indicate the contents.

(h) On completion of the works a certificate shall be submitted to Council by a RPEQ certifying that the works have been constructed in accordance with Council's construction standards and in compliance with the approved plans and specification. It is expected that the RPEQ will undertake the necessary inspections to make this certification.

(i) Council reserves the right to require further amendments and/or additions at a later date, should design errors or omissions become apparent in regard to the works relevant to the Operational Works approval.

25. General

(a) All disturbed areas shall be graded, grassed and left in a mowable condition. The grass cover shall be obtained as early as possible during the development and an acceptable grass cover shall be achieved before the development can be accepted "Off Maintenance".

(b) Street name signs shall be manufactured to Council specifications and shall be erected in accordance with Council's Standard Drawing SR.26 at each intersection.

(c) With reference to any works, on land under other private ownership, written permission for the works shall be obtained and forwarded to Council. Similarly, written clearances shall be obtained after the works are completed, unless otherwise accepted by the Senior Development Engineer.

(d) All works required for this development shall take due regard of any and all existing services and, if considered necessary by the relevant authority or the Senior Development Engineer, such works shall be altered at the cost of the Developer.

(e) Any filling for a greater depth than 800 mm to provide for building platforms shall be conducted in accordance with Australian Standard 3798. Test results as required by Australian Standard 3798, and a certificate of quality and uniformity of fill shall be provided by a RPEQ. The level of responsibility shall be Level 1.

(f) A certificate from a RPEQ shall be issued to Council certifying that any retaining wall greater than 800 mm in height is structurally sound and capable of withstanding any likely surcharge loads. Retaining walls greater than 1 m in height are to be provided with railings or other barriers to provide pedestrian safety.

(g) Retaining walls shall be designed so that there are no imposed loads placed upon Council's underground services. This may include extending the footing to a level 300-mm below the invert of the pipe.

(h) Filling of gully areas if permitted shall be carried out strictly in accordance with Australian Standard 3798. Test results as required by Australian Standard 3798 and a certificate of quality and uniformity of fill, shall be provided by the Supervising RPEQ for all filled areas.

(i) For batters resulting from cutting and filling of the site and producing slopes greater than 1:6, Council requires a RPEQ to certify that they are stable and properly drained.

(j) If, after the preparation of detailed design plans for the various roads, it is found necessary to provide any additional road reserve area, or modify the proposed road reserves to enable the full requirements of Council's Standards, Queensland Streets, AMCORD and Austroads documents to be incorporated in any way, (but particularly in the production of the required speed environment or because of longitudinal and cross sectional constraints) then the estate layout plan shall be altered accordingly.

26. Fencing

A 1.8m high pool style fence or alternate fence design approved in writing by the Development Manager, is to be constructed on the common boundary of proposed Lots 1 – 23 and 23 - 25 and the drainage/parkland/buffer reserves.

27. Naming of Parkland

(a) The Developer shall submit a selection of three (3) alternative names for the park, to be considered by Council prior to lodgement of the plan of survey.

(b) The Developer shall erect a suitable park name sign to the satisfaction of the Development Manager.

28. Quality of Park Dedication

Land to be dedicated for park purposes shall be upgraded to the satisfaction of the Chief Operating Officer (Health, Parks and Recreation) as follows:

(a) Suitable embellishment is required to be provided in accordance with the Desired Standards of Service outlined in Part 5 of Council's Planning Scheme Policy 3 – *General Works.*

(b) Declared plants, environmental weeds and rubbish shall be removed;

(c) Dead trees shall be removed and dangerous trees made safe within 10 m of proposed pathways or playgrounds;

(d) All rubbish shall be removed from parkland;

(e) Parkland shall be freely and safely drained;

(f) All playground equipment and park furniture shall meet Australian Standards both in supply and installation;

(g) No overburden or spoil shall be pushed or deposited into parkland;

(h) Water / sewer / power service shall be provided to the proposed park; and

29. Irrigation to Footpaths

Irrigation to streetscape works is not permitted on a permanent basis. Temporary irrigation systems used for vegetation establishment may be approved by the Conservation, Parks and Sport Manager subject to their removal prior to the on maintenance inspection. Such irrigation shall include all necessary devices to prevent contamination of the water supply.

30. Other Streetscape and Temporary Works

Authorisation for temporary landscaping treatments and / or features shall be obtained from the Chief Operating Officer (Health, Parks and Recreation), and a bond lodged for their removal. Such special treatment / features shall be removed by the Developer, and the site remediated, prior to the streetscape on maintenance inspection.

31. Compliance with Conditions

(a) Unless otherwise stated all conditions shall be completed prior to signing of the relevant plan of survey or as determined by the Development Manager.

(b) All conditions shall be completed to the satisfaction of the Development Manager.

32. When Approval Takes Effect

This approval has effect in accordance with the provisions of Section 3.5.19 of the *Integrated Planning Act 1997* as follows:

(a) If the Applicant does not appeal the decision to the court - from the time the decision notice is given (or if a negotiated decision notice is given, from the time the negotiated decision notice is given); or

(b) If an appeal is made to the court - subject to the decision of the court, when the appeal is finally decided.

33. When Approval Lapses

(a) The relevant period for this approval is 4 years starting the day the approval takes effect. The Developer is required to submit to Council an accurate plan of survey before the end of the relevant period, otherwise the approval will lapse.

(b) An extended relevant period may be agreed upon, pursuant to Section 3.5.22 of the *Integrated Planning Act 1997*, provided a written notice to Council is made before the end of the relevant period. Such written notice is to be on Council's approved form, accompanied by the owner's consent and the prescribed fee in Council's Register of General Charges.

NOTE: Operational Works application(s) required to be submitted must be approved and works completed within the relevant period stated above.

Concurrence Agency

Conditions applicable to this approval imposed by the following Concurrence Agencies:

1. The Environmental Protection Agency (Contaminated Land Unit) is a concurrence agency with regard to this development approval. The attached concurrence agency response, dated 2 January 2008, forms part of this Decision Notice.

2. The Department of Main Roads is a concurrence agency with regard to this development approval. The attached concurrence agency response, dated 25 March 2008, forms part of this Decision Notice.

3. Queensland Transport is a concurrence agency with regard to this development approval. The attached concurrence agency response, dated 18 September 2007, forms part of this Decision Notice.

4. The Department of Natural Resources and Water is a concurrence agency with regard to this development approval. The attached concurrence agency response, dated 10 August 2007, forms part of this Decision Notice.

5. Powerlink is an advice agency with regard to this development approval. The attached concurrence agency response, dated 11 October 2007, forms part of this Decision Notice.

Advice

The following advices are offered for your information only and should not be viewed as mandatory conditions of this approval.

Assessment Manager (Ipswich City Council)

1. Portable Long Service Leave

The Building and Construction Industry (Portable Long Service Leave) Levy must be paid prior to the issue of a development permit where one is required for the 'Building and Construction Industry'.

This applies to Building Works, Operational Works and Plumbing and Drainage Works applications, as defined under the Integrated Planning Act 1997, where the works are $80 000 or more and matching the definition of 'Building and Construction Industry' under the Building and Construction Industry (Portable Long Service Leave) Act 1991.

Council will not be able to issue an Operational Works Decision Notice without receipt of details that the Levy has been paid. Should you require clarification in regard to the amendments to the Building and Construction Industry (Portable Long Service Leave) Act 1991, you should contact QLeave on 1800 803 481 (free call) or [redacted].

2. High Water Demand

The Developer should consider the implications of water restrictions during the construction of the proposal and in consideration of the requirements of the above conditions. It should be specifically noted that this approval does not permit the Developer to use the potable water supply for the development of the site.

On 15 August 2007 Council introduced its *Policy For Installation Of Electronic Water Meters To Commercial, Industrial And Large Multi-Residential Properties*. This policy states that:

All new commercial, industrial or large multi-residential property connections with a projected annual consumption greater than or equal to 20,000 kL shall include, at the customers expense, an electronic water meter with data logger and an approved back-to-base communication system as specified by Ipswich Water.

Properties with electronic water meters shall be subject to billing on a monthly basis in accordance with the metered monthly consumption.

If, in the opinion of the Senior Development Engineer, a proposed development is likely to have an annual water consumption equal to or greater than 20,000 kL, the Developer will be required to contact Ipswich Water on [redacted] to arrange installation of electronic flow meter(s).

3. Amended Masterplan

(a) The proposed development and future stages shall be generally in accordance with the Master Staging Plan – Citiswich (prepared by B & P Survey Consulting Surveyors, dated 11 March 2008) with the following amendments and clarifications, as marked on the attached plan:

(i) The Developer shall remove the proposed cul-de-sac from within Stage 4C as indicated in black on the "Master Staging Plan – Citiswich";

(ii) Additional road frontage to parkland shall be provided for Stages 4, 5 and 7 as indicated in black on the "Master Staging Plan – Citiswich";

(iii) An indicative subdivision layout should be provided for Stage 6 and the land to the west of Stage 6 to ensure that both Stage 6 and the adjoining land can be developed in an orderly fashion. The indicative layout should ensure that both site's integrate in terms of pedestrian and vehicle linkages;

(iv) Additional 5000m^2 Local (Level 3) Recreation Park is required *over and above the park areas proposed* to service the need of local residents in Stage 6 (Refer to Ipswich Planning Scheme Desired Standards of Service). *Notwithstanding, should the existing amount of park proposed (exclusive of stormwater quantity and quality treatment areas) meet the Ipswich Planning Scheme Desired Standards of Service, then this additional park will not be required*;

An amended Master Plan shall be submitted to Council for approval prior to any application be lodged for Stage 2.

Note: Please contact Council for additional details relating to the items listed above.

4. Advice to Purchasers

The Developer shall provide the purchaser of each industrial lot a copy of the Building Envelope Plan and WSUD TDG Design Assessment Checklist and Calculation Summary Checklist to demonstrate that the bioretention basins are designed in accordance with the guideline and the approved Stormwater Masterplan.

5. Fire Ants

In accordance with the *Plant Protection Act 1989* and the Plant Protection Regulation 1990, a quarantine notice has been issued for the State of Queensland to prevent the spread of the Red Imported Fire Ant (ant species Solenopsis invicta) and to eradicate it from the State.
It is the legal obligation of the land owner or any consultant or contractor employed by the land owner to report the presence or suspicion of Fire Ants to the Queensland Department of Primary Industries on 132523 within 24 hours of becoming aware of the presence or suspicion, and to advise in writing within seven days to:

Director General
Department of Primary Industries
GPO Box 46, Brisbane QLD 4001

It should be noted that the movement of Fire Ants is prohibited, unless under the conditions of a Department of Primary Industries Inspectors Approval. More information can be obtained from the Queensland Department of Primary Industries website www.dpi.qld.gov.au.

The development approved herein, by its very nature, includes activities considered to be "high risk" in respect of controlling the spread of Fire Ants. The following lists show high risk activities and some precautions should be considered for implementation.

(a) High risk activities can include:

(i) Earthworks of a minor or major scale;

(ii) Revegetation or rehabilitation;

(iii) Import of fill onto a site;

(iv) Export of fill or other materials such as soils, gravel, mulch and plants; and

(v) Export off or import on to a site of construction and demolition waste and materials or green waste.

(b) Precautions for implementation

(i) Checking for ants regularly;

(ii) Checking all soil, fill and waste materials (construction and green waste) for ants;

(iii) Asking questions about the quality and source of soil, fill and waste materials (construction and green waste);

(iv) Keeping records of all movements of soil, fill and waste materials (construction and green waste);

(v) Cleaning of all earthmoving or other soiled vehicles prior to exit from the site; and

(vi) Informing staff and contractors about these precautions.

6. Infrastructure Agreement

The subject approval does not preclude Council and the Developer from entering into an Infrastructure Agreement at some time in the future.

7. *Contributions*

If infrastructure charges for Stage 1D are paid with Application 4078/08 please contact Council to have the contributions recalculated (i.e. contributions for lots 16 and 17 will not be required).

Appendix 1

Contribution	Sector	Rate	Proposal	Calculation
Water Supply Infrastructure	Bundamba Low Level Zone (5)	$734.00/NRU Unit Charge = 1.000 Total = $734.00/NRU	***Stage 1A*** 22.5 NRU per ha @ 8.5089 ha (11 lots) **Total = 191.475 NRU**	$734.00 x 191.450 = $140,524.30 **Total = $140,524.00**
			Stage 1B 22.5 NRU per ha @ 5.427 ha (4 lots) **Total = 122.1075 NRU**	$734.00 x 122.1075 = $89,626.905 **Total = $89,627.00**
			Stage 1C 22.5 NRU per ha @ 15.1785 ha (11 lots) **Total = 341.5163 NRU**	$734.00 x 341.5163 = $250,672.96 **Total = $250,672.00**
			Stage 1D 22.5 NRU per ha @ 20.132 ha (2 lots) **Total = 452.97 NRU**	$734.00 x 452.97 = $332,479.98 **Total = $332,480.00**
Sewerage Infrastructure	South Bremer (23)	$1,052.00/NRU Unit Charge = 1.000 Total = $1,052.00/NRU	***Stage 1A*** 22.5 NRU per ha @ 8.5089 ha (11 lots) **Total = 191.475 NRU**	$1,052.00 x 191.450 = $201,405.40 **Total = $201,405.00**

			Stage 1B 22.5 NRU per ha @ 5.427 ha (4 lots) **Total = 122.1075 NRU**	$1,052.00 x 122.1075 = $128,457.09 **Total = $128,457.00**
			Stage 1C 22.5 NRU per ha @ 15.1785 ha (11 lots) **Total = 341.5163 NRU**	$1,052.00 x **341.5163** = $359,275.14 **Total = $359,275.00**
			Stage 1D 22.5 NRU per ha @ 20.132 ha (2 lots) **Total = 452.97 NRU**	$1,052.00 x 452.97 = $476,524.44 **Total = $476,524.00**
Roadworks Infrastructure	Bundamba Industry (25)	$554.00/VT Unit Charge = 1.000 Total = $554.00/VT	***Stage 1A*** 140 VT per ha @ 8.5089 ha (11 lots) **Total = 1,191.246 VT**	$554.00 x 1191.246 = $659,950.28 **Total = $659,950.00**
			Stage 1B 140 VT per ha @ 5.427 ha (4 lots) **Total = 759.78 VT**	$554.00 x 759.78 = $420,918.12 **Total = $420,918.00**
			Stage 1C 140 VT per ha @ 15.1785 ha (11 lots) **Total = 2,124.99 VT**	$554.00 x 2,124.99 = $1,177,244.40 **Total = $1,177,244.00**

			Stage 1D 140 VT per ha @ 20.132 ha (2 lots) **Total = 2,818.48 VT**	$554.00 x 2,818.48 = $1,561,437.92 **Total = $1,561,438.00**
Stage 1A Total				**$ 1,001,879.00**
Stage 1B Total				**$ 639,002.00**
Stage 1C Total				**$ 1,787,191.00**
Stage 1D Total				**$ 2,370,442.00**
Total for Stage 1				**$ 5,798,514.00**

Pursuant to the provisions of the *Integrated Planning Act 1997*, I also enclose herewith a copy of the relevant sections concerning:

- Making representations about conditions during the applicant's appeal period (i.e. Negotiated Decision Notice); and
- The institution of an appeal.

Access PD Online at www.ipswich.qld.gov.au to view, search and print property information, interactive mapping, track development applications and the Ipswich Planning Scheme. Undertake a development enquiry as part of the Property Enquiry function to identify the planning scheme provisions that apply to a particular use on a property. PD Online - information at your fingertips 24 hours a day, 7 days a week.

Yours faithfully

[redacted]

DEVELOPMENT MANAGER - PLANNING

Extract from the Integrated Planning Act

Division 4 – Representations about conditions and other matters

Application of div 4

3.5.16 This division applies only during the applicants appeal period.

Changing conditions and other matters during the applicant's appeal period

3.5.17 (1) This section applies if the applicant makes representations to the assessment manager about a matter stated in the decision notice, other than a refusal or a matter about which a concurrence agency told the assessment manager under section 3.3.18(1).

(2) If the assessment manager agrees with any of the representations, the assessment manager must give a new decision notice (the ***negotiated decision notice)*** to –

(a) the applicant; and

(b) each principal submitter; and

(c) each referral agency; and

(d) if the assessment manager is not the local government and the development is in a local government area – the local government.

(3) Only 1 negotiated decision notice may be given.

(4) The negotiated decision notice –

(a) must be given within 5 business days after the day the assessment manager agrees with the representations; and

(b) must be in the same form as the decision notice previously given; and

(c) must state the nature of the changes; and

(d) replaces the decision notice previously given.

(5) If the assessment manager does not agree with any of the representations, the assessment manager must, within 5 business days after the day the assessment manager decides not to agree with any of the representations, give a written notice to the applicant stating the decision about the representations.

(6) Before the assessment manager agrees to a change under this section, the assessment manager must reconsider the matters considered when the original decision was made, to the extent the matters are relevant.

(7) If the development approved by the negotiated decision notice is different from the development approved in the decision notice in a way that affects the amount of an infrastructure charge or regulated infrastructure charge, the local government may give the applicant a new infrastructure charges notice under 5.1.8 or regulated infrastructure charges notice under section 5.1.18 to replace the original notice.

(8) If the development approved by the negotiated decision notice is different from the development approved in the decision notice in a way that affects the amount of a regulated State infrastructure charge, the relevant State infrastructure provider may give the applicant a new regulated State infrastructure charges notice under section 5.3.4 to replace the original notice.

Applicant may suspend applicant's appeal period

3.5.18 (1) If the applicant needs more time to make the written representations, the applicant may, by written notice given to the assessment manager, suspend the applicants appeal period.

(2) The applicant may act under subsection (1) only once.

(3) If the written representations are not made within 20 business days after the day written notice was given to the assessment manager, the balance of the applicants appeal period restarts.

(4) If the written representations are made within 20 business days after the day written notice was given to the assessment manager -

(a) if the applicant gives the assessment manager a notice withdrawing the notice under subsection (1) – the balance of the applicants appeal period restarts the day after the assessment manager receives the notice of withdrawal; or

(b) if the assessment manager gives the applicant a notice under section 3.5.17(5) – the balance of the applicant's appeal period restarts the day after the applicant receives the notice; or

(c) if the assessment manager gives the applicant a negotiated decision notice – the applicant's appeal period starts again the day after the applicant receives the negotiated decision notice.

Division *8–Appeals to court relating to development applications*

Appeals by applicants

4.1.27. (1) An applicant for a development application may appeal to the court against any of the following–
(a) the refusal, or the refusal in part, of a development application;
(b) a matter stated in a development approval, including any condition applying to the development, and the identification of a code under Section 3.1.6;
(c) the decision to give a preliminary approval when a development permit was applied for;
(d) the length of a period mentioned in 3.5.21;
(e) a deemed refusal.
(2) An appeal under subsection (1)(a) to (d) must be started within 20 business days (the "applicant's **appeal period")** after the day the decision notice or negotiated decision notice is given to the applicant.
(3) An appeal under subsection (1)(e) may be started at any time after the last day a decision on the matter should have been made.

Appeals by submitters

4.1.28. (1) A submitter for a development application may appeal to the court only against-
(a) the part of the approval relating to the assessment manager's decision under section 3.5.14 or 3.5.14A; or
(b) for an application processed under section 6.1.28(2)-the part of the approval about the aspects of the development that would have required public notification under the repealed Act.
(2) To the extent an appeal may be made under subsection (1), the appeal may be against 1 or more of the following-
(a) the giving of development approval;
(b) any provision of the approval including –
(i) a condition of, or lack of condition for, the approval; or
(ii) the length of a period mentioned in section 3.5.21 for the approval.
(3) However, a submitter may not appeal if the submitter-
(a) withdraws the submission before the application is decided; or
(b) has given the assessment manager a notice under section 3.5.19(1)(b)(ii)
(4) The appeal must be started within 20 business days (the ***submitter's appeal period)*** after the decision notice or negotiated decision notice is given to the submitter.

Appeals for matters arising after approval given (co-respondents)

4.1.30. (1) For a development approval given for a development application, a person to whom any of the following notices have been given may appeal to the court against the decision in the notice-
(a) a notice giving a decision on a request for an extension of a period mentioned in section 3.5.21;
(b) a notice giving a decision on a request to make a minor change to an approval
(2) The appeal must be started within 20 business days after the day the notice of the decision is given to the person.
(3) Subsection (1)(a) does not apply if the approval resulted from a development application (superseded planning scheme) that was assessed as if it were an application made under a superseded planning scheme.
(4) Also, a person who has made a request mentioned in subsection (1) may appeal to the court against a deemed refusal of the request.
(5) An appeal under subsection (4) may be started at any time after the last day the decision on the matter should have been made.

Appeals for matters arising after approval given (no co-respondents)

4.1.31. (1) A person to whom any of the following notices have been given may appeal to the court against the decision in the notice-
(a) a notice giving a decision on a request to change or cancel a condition of a development approval;
(b) a notice under section 3.5.33A(9)(b) or 6.1.44 giving a decision to change or cancel a condition of a development approval.
(2) The appeal must be started within 20 business days after the day the notice of the decision is given to the person.
(3) Also, a person who has made a request mentioned in subsection (1)(a) may appeal to the court against a deemed refusal of the request.
(4) An appeal under subsection (3) may be started at any time after the last day the decision on the matter should have been made.

Appeals on matters relating to the Building Act 1975 the following also applies: -

Jurisdiction of tribunals

4.2.7. (1) A tribunal has jurisdiction to decide any matter that under this or another Act may be appealed to it.

(2) However, an appeal to a tribunal under this Act may only be about—

(a) a matter under this Act that relates to the *Building Act 1975* (other than a matter under that Act that may or must be decided by the Building Services Authority) or the *Plumbing and Drainage Act 2002;* or

(b) a matter prescribed under a regulation.

Appeals by applicants

4.2.9. (1) An applicant for a development application may appeal to a tribunal against any of the following—

(a) the refusal, or the refusal in part, of a development application;

(b) a matter stated in a development approval, including any condition applying to the development, but not including the identification of a code under section 3.1.6;

(c) the decision to give a preliminary approval when a development permit was applied for;

(d) the length of a period mentioned in section 3.5.21;

(e) a deemed refusal.

(2) An appeal under subsection (1)(a) to (d) must be started within 20 business days (the **"applicant's appeal period")** after the day the decision notice or negotiated decision notice is given to the applicant.

(3) An appeal under subsection (1)(e) may be started at any time after the last day a decision on the matter should have been made.

Martin
COSGROVE
and Associates Pty Ltd
Consulting Structural and Civil Engineers

STORMWATER MANAGEMENT REPORT

FOR

PROPOSED WAREHOUSE/OFFICE DEVELOPMENT

Lot 23 ASHBURN ROAD, BREMER

Reference #: 08214-L1

Date: 17-12-08

93 Warry Street PO Box 765 Spring Hill QLD 4000 Telephone: [redacted] Facsimile: [redacted]

INTRODUCTION

This is a stormwater management report and for the proposed warehouse and office development at Lot 23, Citiswich sub-division, Ashburn Road, Bremer. The attached drawings C101-B and C105-B refer.

DEVELOPMENT

The proposed development comprises a 25,000 m2 industrial warehouse building with attached offices. The building is surrounded by loading docks and access hardstands. There is a staff and customer carpark adjacent to the office areas. (Refer drawing 08214 C101-A and C102-A).

CATCHMENT

The proposed development site is currently vacant land (new sub-division). The total site area is approximately 38,176 m^2 and grades gently from the North-West corner of the site to the South-East corner where the property adjoins "Road 1" of the new sub-division. The new sub-division has stormwater pits located in Road 1 which drain to the South. Previous to the sub-division, the natural ground of the site drained West and discharged directly into the Bremer River as overland flow.

PRELIMINARY DESIGN AND HYDRAULIC CALCULATIONS

It is proposed to detain the stormwater from the developed site in bio-retention storage and pavement storage to ensure post-development flows are at or below pre-development flows. Stormwater runoff from the developed site will discharge to the existing stormwater pit located at the Road 1 frontage. This existing stormwater pit is the legal point of discharge for the site. Currently all stormwater runs off the site to the South-East as overland flow. The proposed design will result in stormwater runoff for all events up to 1:10 ARI being discharged to the piped drainage system in Ashburn Road. Therefore downstream properties will not be adversely affected by the development.

A summary of the pre and post development flows for minor and major rainfall events are documented below:

PRE-DEVELOPMENT

SITE AREA	38,176 m2 vacant land – lightly grassed, flat.
% IMPERVIOUS	0%
NET RUNOFF COEFFICIENT	C=0.7
Q10 5 minute storm flow = 1551 L/s	
Q100 5 minute storm flow = 2360 L/s	

POST-DEVELOPMENT (WITHOUT DETENTION MEASURES)

ROOFED AREA	20,217 m2 @ 100% impervious (C=0.95)
PAVED AREA	15,135 m2 @ 100% impervious (C=0.95)
LANDSCAPED AREA	2,824 m2 @ 0% impervious (C=0.70)
Q10 5 minute storm flow = 2064 L/s	(33% increase)
Q100 5 minute storm flow = 3140 L/s	(33% increase)

POST-DEVELOPMENT (WITH DETENTION AND LIMITS TO OUTFLOW)

NUMBER OF OUTLETS	1
OUTLET DIAMETERS	750 mm dia @ 0.35% grade
SINGLE OUTLET CAPACITY	665 L/s
TOTAL LIMITED OUTFLOW	***665 L/s***

The outflow is limited by the design of existing sub-divisional stormwater system located in Road 1. The above calculations show that the post-development outflows with the proposed bio-retention and limited outflow will result in a net reduction compared to pre-development flows. The reduction will be in the order of 58% for a 1:10 ARI event.

For events greater than 1:10 ARI, flows exceeding the storage of the bio retention basins and carpark areas will discharge as overland flow to the Bremer River and to the Road 1 street frontage.

STORMWATER TREATMENT AND WATER QUALITY OBJECTIVES (WQO)

A total of nine (9) bio-retention basins are proposed for the development, located as shown on drawing C101-A and C102-A. The total area of bio-retention is 665 m^2, or 1.97% of the total site area. This has been designed in accordance with the Citiswich Individual Industrial Lot Stormwater Management Strategy by Cardno Lawson Treloar (report #LJ8714/R9, July 2008). All roof and most of the paved stormwater shall be directed to the bio-retention basins. The Individual Lot Stormwater Strategy allows for 570 m2 (150 m2 per hectare) of untreated carpark whilst still maintaining the water quality objectives. For the proposed design, only 270 m2 (catchment P8 on C101-A) will be untreated. Therefore, the proposed design meets the criteria set out in the Citiswich Individual In-Lot Stormwater Management Strategy.

The proposed bioretention area (1.97% of the total site) will result in the following water quality objectives (WQO), based on Healthy Waterways WSUD Technical Design Guidelines design charts 5-3 to 5-5:

- Total Suspended Solids (TSS) Removal 87% (Figure 5-3)
- Total Phosphorus (TP) Removal 75% (Figure 5-3)
- Total Nitrogen (TN) Removal 42% (Figure 5-3)

Gross pollutants will be removed through the use of filter baskets within stormwater pits and coarse sediment forebays at pipe inlets to bio-retention basins. Gross pollutants from pavement runoff directly into bio-retention basins will be captured on the battered banks and/or basis surface. Gross pollutant removal will be greater than 90% for the development.

The above WQO's are equivalent to or in excess of the requirements of the SEQRP Part 11 as per ICC requirements. Detailed design calculations for he bio-retention basins are shown on drawing C105-A.

STORMWATER DETENTION AND STORAGE

The six bio-retention basins will be designed to provide extended detention through the limiting of outflows. It is proposed that overflow chambers will be located 400 mm above the bio-retention surface, providing the extended detention storage. This will result the first 9 mm of ANY rainfall event ranging from 1 year ARI 5 minute event to 100 year ARI 3 day event being detained on site and then discharge through controlled release via seepage and detention overflow. Extended detention of up to 400 mm above the outlet grates will be allowed for in the landscaping batters and car-parking areas around the bio-retention pits. This design which detains the first 9 mm of any event is still a significant achievement and results in overall reduction in pre-development flows.

Construction and maintenance of the bio-retention basins should be undertaken in accordance with the Citiswich Individual Industrial Lot Stormwater Management Strategy by Cardno Lawson Treloar (report #LJ8714/R9, July 2008).

CONCLUSION

It is our opinion the proposed stormwater management plan is consistent with WSUD and will result in net reduction in stormwater flows off site, and achieve WQO in accordance with best practice. We trust this is satisfactory for your requirements, please contact us if you have any queries.

Yours faithfully
MARTIN COSGROVE AND ASSOCIATES PTY LTD

[redacted]

[redacted] *BE (Civil) Hons MIEAust RPEQ 8026*
Director

Attached:
Civil Drawings C101A, C102A, C103A,C105A

Martin
COSGROVE
and Associates Pty Ltd
ACN 052933221

CONSULTING STRUCTURAL & CIVIL ENGINEERS
93 WARRY St. SPRING HILL Qld. 4000
Tel. [redacted] Fax. [redacted]
EMAIL: [redacted]@mcaeng.com.au

DRAWING ISSUE RECORD

TO:

ATTENTION:

PROJECT: PROPOSED WAREHOUSE AND OFFICE DEVELOPMENT AT LOT 23 NEW ROAD, IPSWICH.

JOB No.: 08214

SHEET: 1 of 1

DATE: -

DAY	15	15	17												
MONTH	12	12	12												
YEAR	08	08	08												
BY	JI	JI	JI												

DRAWING REGISTER

No.	DRAWING TITLE	ISSUE													
C101	PART SITE LAYOUT PLAN -1, STORMWATER AND CATCHMENT PLAN	P1	P1	A											
C102	PART SITE LAYOUT PLAN -2, STORMWATER AND CATCHMENT PLAN	P1	P1	A											
C103	CIVIL, EROSION AND SEDIMENT CONTROL PLAN AND DETAILS			A											
C104															
C105	STORMWATER MANAGEMENT NOTES AND DETAILS	P1	P1	A											

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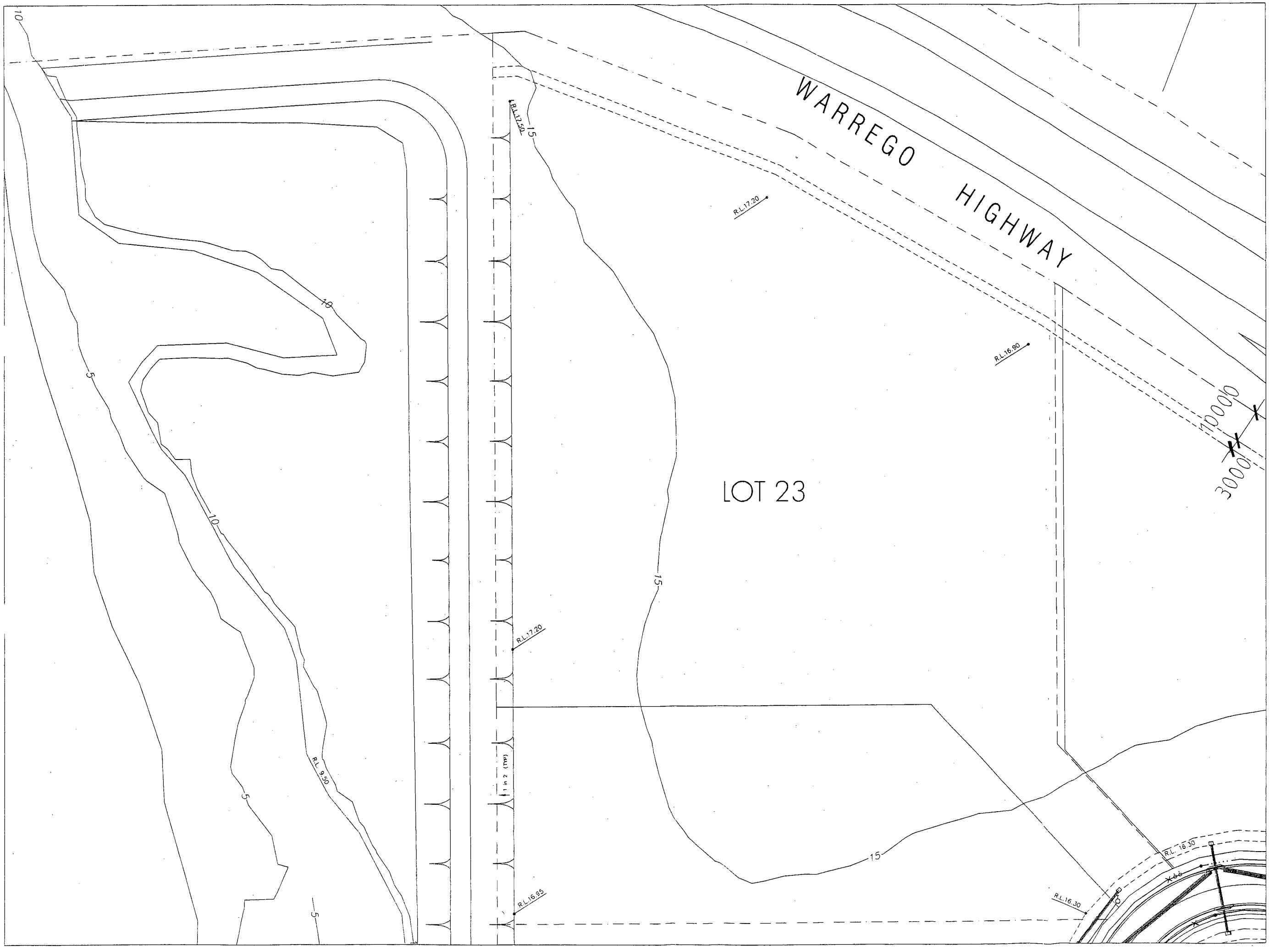
Lange Design		Ep D													

ISSUE KEY

P	PRELIMINARY	I	INFORMATION	A	APPROVAL	$	PRICING	O	ORIGINAL	CD	DISC		
D	DEVELOPMENT APP.	B	BUILDING APP.	T	TENDER	C	CONSTRUCTION	R	REVISION	E	EMAIL	Ep - PDF / Ed - DWG	

X:\08 Jobs\08214\Struct\Drawing Register.dwg, Model, 11/12/2008 4:33:01 PM, Inc. 1:1



Existing Civil Works Pad Levels

drawing no.	AP-HC-CS-001
date	16.12.2008
scale	1:500 @ A1

Walker

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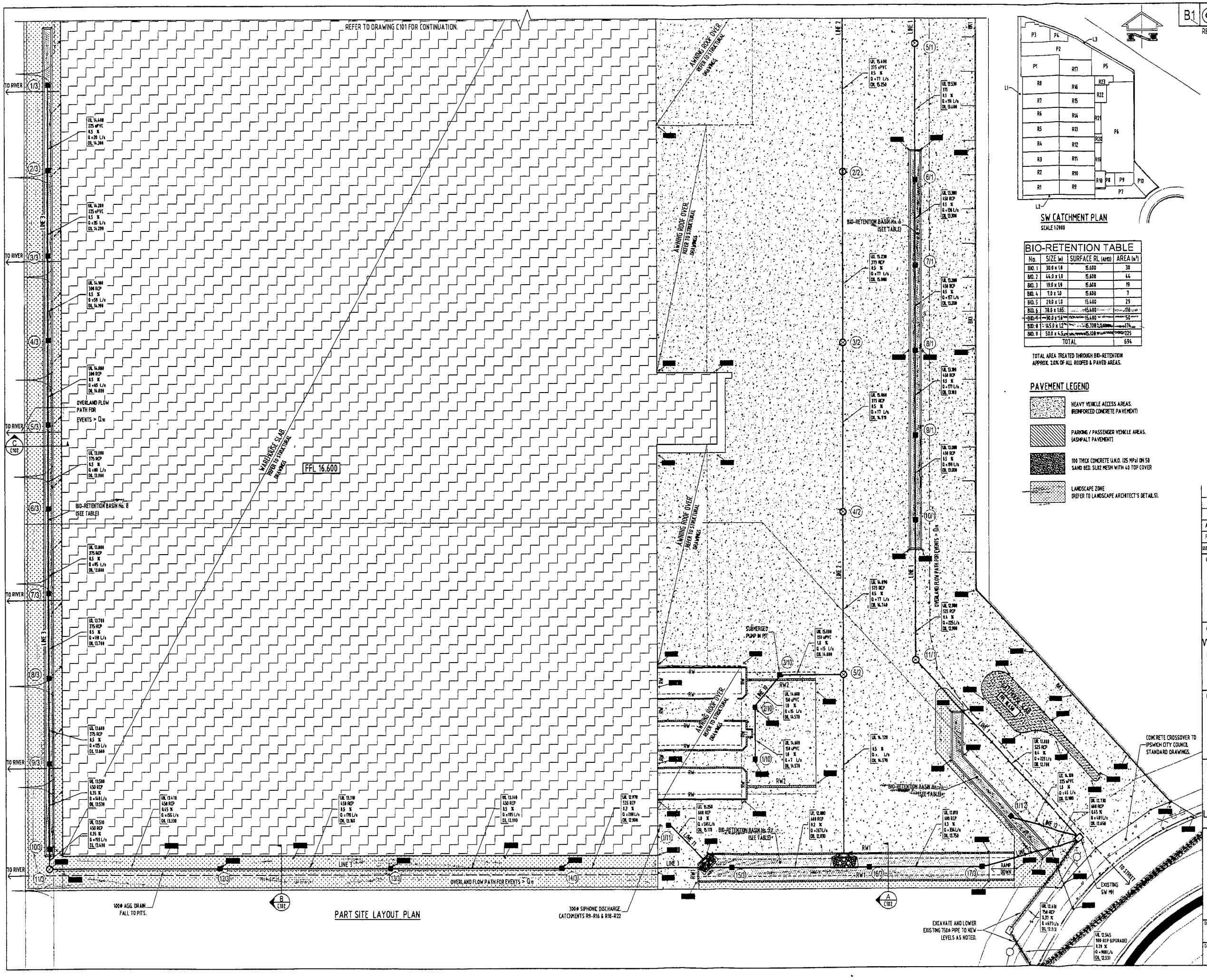
REFER TO DRAWING C105 FOR CIVIL NOTES & DETAILS.



PART SITE LAYOUT PLAN

SW CATCHMENT PLAN

SCALE 1:2000

SW CATCHMENT TABLE

No.	CATCHMENT TYPE	AREA (m²)
R1	ROOF	1044
R2	ROOF	1044
R3	ROOF	1044
R4	ROOF	1044
R5	ROOF	1044
R6	ROOF	1044
R7	ROOF	1044
R8	ROOF	1044
R9	ROOF	1044
R10	ROOF	1044
R11	ROOF	1044
R12	ROOF	1044
R13	ROOF	1044
R14	ROOF	1044
R15	ROOF	1044
R16	ROOF	1253
R17	ROOF	1184
R18	ROOF	380
R19	ROOF	347
R20	ROOF	130
R21	ROOF	382
R22	ROOF	432
R23	ROOF	328
P1	AC PAVEMENT	1570
P2	AC PAVEMENT	2220
P3	AC PAVEMENT	960
P4	AC PAVEMENT	355
P5	AC PAVEMENT	1468
P6	CONCRETE PAVEMENT	5890
P7	CONCRETE PAVEMENT	1190
P8	CONCRETE PAVEMENT	270
P9	CONCRETE PAVEMENT	470
P10	CONCRETE PAVEMENT	920
L1	LANDSCAPING	1640
L2	LANDSCAPING	624
L3	LANDSCAPING	560

BIO-RETENTION TABLE

No.	SIZE (m)	SURFACE RL (AHD)	AREA (m²)
BIO. 1	30.0 x 1.0	15.600	30
BIO. 2	44.0 x 1.0	15.600	44
BIO. 3	19.0 x 1.0	15.600	19
BIO. 4	7.0 x 1.0	15.600	7
BIO. 5	29.0 x 1.0	15.600	29
BIO. 6	78.0 x 1.65	15.600	116
BIO. 7	30.0 x 1.6	15.600	52
BIO. 8	14.5 x 1.2	15.700	174
BIO. 9	50.0 x 4.5	15.500	225
TOTAL			694

TOTAL AREA TREATED THROUGH BIO-RETENTION APPROX. 2.0% OF ALL ROOFED & PAVED AREAS.

PAVEMENT LEGEND

- HEAVY VEHICLE ACCESS AREAS. (REINFORCED CONCRETE PAVEMENT)
- PARKING / PASSENGER VEHICLE AREAS. (ASPHALT PAVEMENT)
- 100 THICK CONCRETE U.N.O. (25 MPa) ON 50 SAND BED. SL82 MESH WITH 40 TOP COVER
- LANDSCAPE ZONE (REFER TO LANDSCAPE ARCHITECT'S DETAILS).

ISSUED FOR APPROVAL

ISSUE	DATE	REVISION	INITIAL
A	17-12-08	ISSUED FOR DEVELOPMENT APPROVAL (OPERATIONAL WORKS)	J
P1	15-12-08	ISSUED FOR PRELIMINARY DEVELOPMENT APPROVAL.	J

CLIENT
XAct solutions
Ph. [redacted] - MAIN OFFICE
Ph. [redacted] - DIRECT
Fax [redacted]

ARCHITECT
WALKER CORPORATION Pty. Ltd.
Level 50, Governor Phillip Tower, 1 Farrer Place, Sydney.
Ph. [redacted]
Fax. [redacted]

PROJECT
PROPOSED WAREHOUSE AND OFFICE DEVELOPMENT AT LOT 23 NEW ROAD, IPSWICH.

SHEET SUBJECT
PART SITE LAYOUT PLAN - 1, STORMWATER MANAGEMENT LAYOUT AND CATCHMENT PLAN

Martin COSGROVE and Associates Pty Ltd
ACN 052933221
CONSULTING STRUCTURAL AND CIVIL ENGINEERS
93 WARRY STREET SPRING HILL QLD 4000
Tel [redacted] Fax [redacted]
Email [redacted]@mcaeng.com.au

DESIGNED	DRAWN	JOB NO.
SM	JR	08214

DATE	SCALE	DRAWING No.	ISSUE
DEC. 2008	1 : 250 U.N.O.	C101	A

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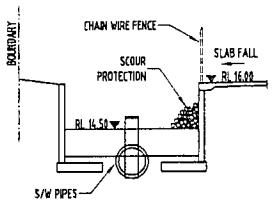
REFER TO DRAWING C105 FOR CIVIL NOTES & DETAILS.



SECTION A (C101)
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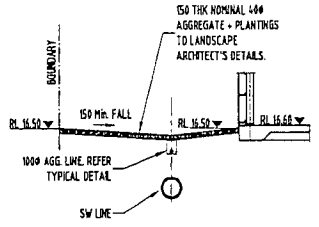

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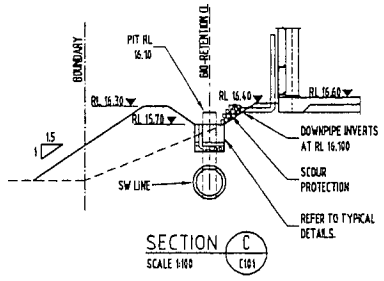

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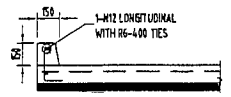
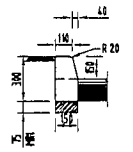


B.K.1 - TYPICAL BARRIER KERB DETAIL
SCALE 1:20



B.K.2 - BARRIER KERB DETAIL
SCALE 1:20

BIO-RETENTION TABLE

No.	SIZE (m)	SURFACE RL (AHD)	AREA (m²)
BIO. 1	30.0 x 1.0	15.600	30
BIO. 2	44.0 x 1.0	15.600	44
BIO. 3	19.0 x 1.0	15.600	19
BIO. 4	7.0 x 1.0	15.600	7
BIO. 5	29.0 x 1.0	15.600	29
BIO. 6	70.0 x 1.65	15.600	116
BIO. 7	30.0 x 1.6	15.600	50
BIO. 8	145.0 x 1.2	15.700	174
BIO. 9	50.0 x 4.5	15.100	225
TOTAL			694

TOTAL AREA TREATED THROUGH BIO-RETENTION APPROX. 2.0% OF ALL ROOFED & PAVED AREAS.

PAVEMENT LEGEND

- HEAVY VEHICLE ACCESS AREAS. (REINFORCED CONCRETE PAVEMENT)
- PARKING / PASSENGER VEHICLE AREAS. (ASPHALT PAVEMENT)
- 100 THICK CONCRETE U.N.O. (25 MPa) ON 50 SAND BED. SL82 MESH WITH 40 TOP COVER
- LANDSCAPE ZONE (REFER TO LANDSCAPE ARCHITECT'S DETAILS).

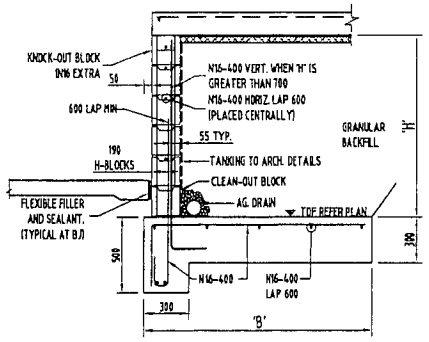
LEGEND

EXISTING

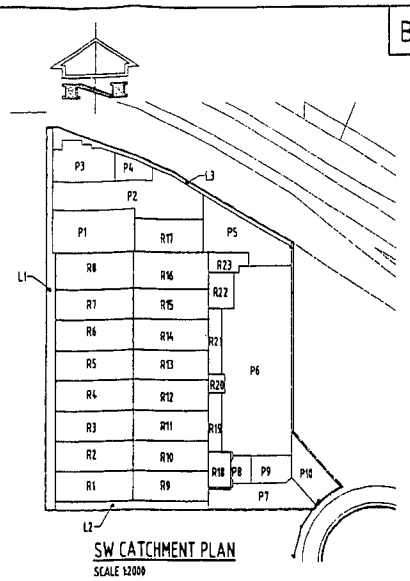
- 123 — SURVEY GROUND LEVEL
- SURVEY BOUNDARY
- 123 — SURVEY CONTOUR

PROPOSED

- FINISHED LEVEL
- STRUCTURAL FINISHED LEVEL
- BULK EARTHWORKS LEVEL
- EXISTING INTERPOLATED LEVEL
- 123 — PROPOSED CONTOUR
- OD — OSHED DRAIN
- IX — INVERT DRAIN
- KG — KERB & GUTTER
- BK — BARRIER KERB
- RW1 — BLOCK RETAINING WALL AND FOOTING RW AT FINGER DOCK BY OTHERS
- PIPE ENLARGER / REDUCER
- GRATED DRAIN
- RP — RODDING POINT
- GRASS CATCH DRAIN
- HR — 100ø SUB-SOIL DRAIN WITH HIGH END RISER
- LINE 1 — 5/1 — STORMWATER LINE, PIT & PIT No.
- IL 12.010 / 600 RCP / G.I. X / Q = 100 L/s / DL 12.710 — INVERT LEVEL (UPSTREAM) / PIPE SIZE & TYPE / PIPE GRADE / FLOW RATE-LITRES PER SEC. / INVERT LEVEL (DOWNSTREAM)
- X — SILT FENCE
- S — SEWER LINE



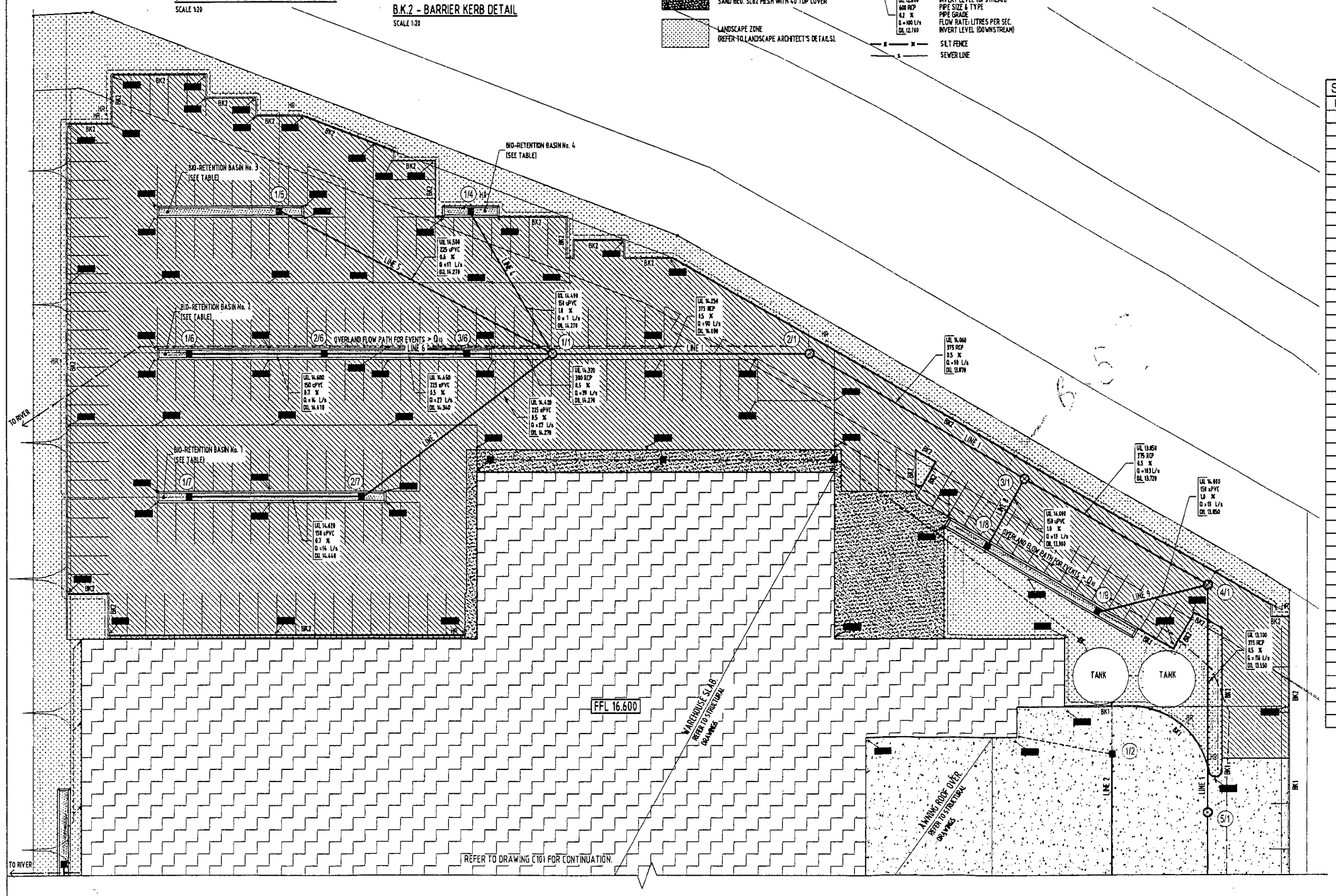
RETAINING WALL RW2 DETAIL
SCALE 1:20



SW CATCHMENT PLAN
SCALE 1:2000

SW CATCHMENT TABLE

No.	CATCHMENT TYPE	AREA (m²)
R1	ROOF	1044
R2	ROOF	1044
R3	ROOF	1044
R4	ROOF	1044
R5	ROOF	1044
R6	ROOF	1044
R7	ROOF	1044
R8	ROOF	1044
R9	ROOF	1044
R10	ROOF	1044
R11	ROOF	1044
R12	ROOF	1044
R13	ROOF	1044
R14	ROOF	1044
R15	ROOF	1044
R16	ROOF	1253
R17	ROOF	1104
R18	ROOF	389
R19	ROOF	347
R20	ROOF	130
R21	ROOF	387
R22	ROOF	437
R23	ROOF	329
P1	AC PAVEMENT	1520
P2	AC PAVEMENT	2226
P3	AC PAVEMENT	960
P4	AC PAVEMENT	325
P5	AC PAVEMENT	1460
P6	CONCRETE PAVEMENT	5800
P7	CONCRETE PAVEMENT	1190
P8	CONCRETE PAVEMENT	270
P9	CONCRETE PAVEMENT	478
P10	CONCRETE PAVEMENT	920
L1	LANDSCAPING	1640
L2	LANDSCAPING	624
L3	LANDSCAPING	560



PART SITE LAYOUT PLAN

SW PIT SCEDULE

PIT No.	SIZE (mm)	PIT TYPE
1/1	1050 Dia.	JUNCTION PIT (SEALED)
2/1	1050 Dia.	JUNCTION PIT (SEALED)
3/1	1050 Dia.	JUNCTION PIT (SEALED)
4/1	1050 Dia.	JUNCTION PIT (SEALED)
5/1	1050 Dia.	JUNCTION PIT (SEALED)
6/1	600 x 600	DOMED GRATE (BIO-RETENTION OUTLET)
7/1	600 x 600	DOMED GRATE (BIO-RETENTION OUTLET)
8/1	600 x 600	DOMED GRATE (BIO-RETENTION OUTLET)
9/1	600 x 600	DOMED GRATE (BIO-RETENTION OUTLET)
10/1	600 x 600	DOMED GRATE (BIO-RETENTION OUTLET)
11/1	1050 Dia.	JUNCTION PIT (SEALED)
1/2	600 x 600	HEAVY DUTY GALV. GRATED FIELD INLET
2/2	1050 Dia.	JUNCTION PIT (SEALED)
3/2	1050 Dia.	JUNCTION PIT (SEALED)
4/2	1050 Dia.	JUNCTION PIT (SEALED)
5/2	1050 Dia.	JUNCTION PIT (SEALED)
1/3	600 x 600	DOMED GRATE (BIO-RETENTION OUTLET)
2/3	600 x 600	DOMED GRATE (BIO-RETENTION OUTLET)
3/3	600 x 600	DOMED GRATE (BIO-RETENTION OUTLET)
4/3	600 x 600	DOMED GRATE (BIO-RETENTION OUTLET)
5/3	600 x 600	DOMED GRATE (BIO-RETENTION OUTLET)
6/3	600 x 600	DOMED GRATE (BIO-RETENTION OUTLET)
7/3	600 x 600	DOMED GRATE (BIO-RETENTION OUTLET)
8/3	600 x 600	DOMED GRATE (BIO-RETENTION OUTLET)
9/3	600 x 600	DOMED GRATE (BIO-RETENTION OUTLET)
10/3	600 x 600	DOMED GRATE (BIO-RETENTION OUTLET)
11/3	1050 Dia.	JUNCTION PIT (SEALED)
12/3	600 x 600	DOMED GRATE (BIO-RETENTION OUTLET)
13/3	600 x 600	DOMED GRATE (BIO-RETENTION OUTLET)
14/3	600 x 600	DOMED GRATE (BIO-RETENTION OUTLET)
15/3	600 x 600	DOMED GRATE (BIO-RETENTION OUTLET)
16/3	600 x 600	DOMED GRATE (BIO-RETENTION OUTLET)
17/3	600 x 600	DOMED GRATE (BIO-RETENTION OUTLET)
1/4	600 x 600	DOMED GRATE (BIO-RETENTION OUTLET)
1/5	600 x 600	DOMED GRATE (BIO-RETENTION OUTLET)
1/6	600 x 600	DOMED GRATE (BIO-RETENTION OUTLET)
2/6	600 x 600	DOMED GRATE (BIO-RETENTION OUTLET)
3/6	600 x 600	DOMED GRATE (BIO-RETENTION OUTLET)
1/7	600 x 600	DOMED GRATE (BIO-RETENTION OUTLET)
2/7	600 x 600	DOMED GRATE (BIO-RETENTION OUTLET)
1/8	600 x 600	DOMED GRATE (BIO-RETENTION OUTLET)
1/9	600 x 600	DOMED GRATE (BIO-RETENTION OUTLET)
1/10	600 x 600	MEDIUM DUTY GALV. GRATED FIELD INLET
2/10	600 x 600	MEDIUM DUTY GALV. GRATED FIELD INLET
3/10	600 x 600	HEAVY DUTY GALV. GRATED FIELD INLET
1/11	600 x 600	MEDIUM DUTY GALV. GRATED FIELD INLET
1/12	600 x 600	DOMED GRATE (BIO-RETENTION OUTLET)

ISSUED FOR APPROVAL

ISSUE	DATE	REVISION	INITIAL
A	17-12-08	ISSUED FOR DEVELOPMENT APPROVAL OPERATIONAL WORKS	JI
P1	15-12-08	ISSUED FOR PRELIMINARY DEVELOPMENT APPROVAL	JI

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PROJECT
PROPOSED WAREHOUSE AND OFFICE DEVELOPMENT AT LOT 23 NEW ROAD, IPSWICH.

SHEET SUBJECT
PART SITE LAYOUT PLAN - 2, STORMWATER MANAGEMENT LAYOUT AND CATCHMENT PLAN

Martin COSGROVE and Associates Pty Ltd
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DESIGNED	DRAWN	JOB No.	
SM	JI	08214	
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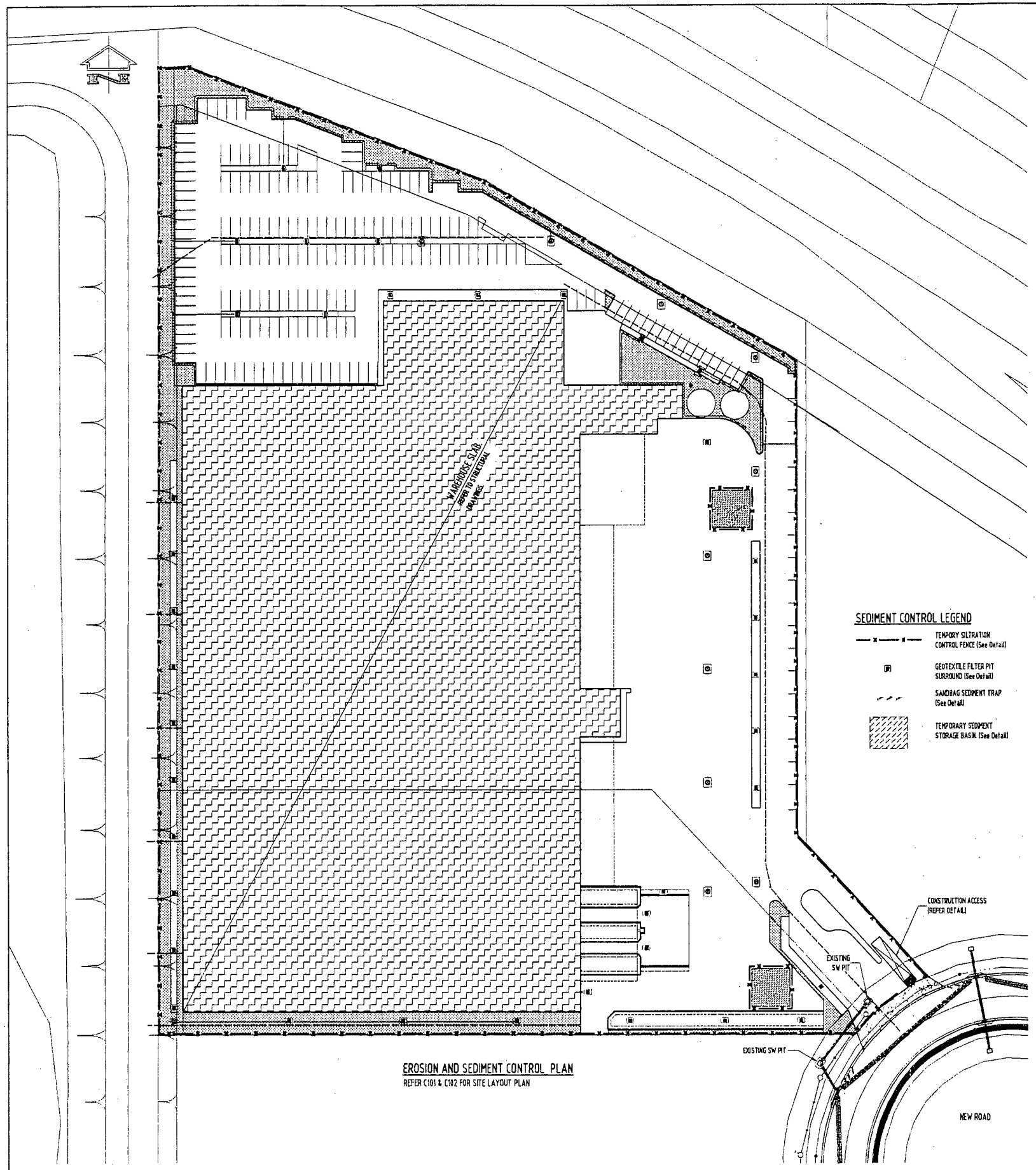
REFER TO DRAWING C105 FOR CIVIL NOTES & DETAILS.

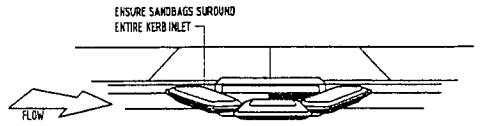


EROSION AND SEDIMENT CONTROL PLAN

REFER C101 & C102 FOR SITE LAYOUT PLAN

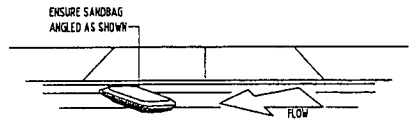
SEDIMENT CONTROL LEGEND

- TEMPORY SILTRATION CONTROL FENCE (See Detail)
- GEOTEXTILE FILTER PIT SURROUND (See Detail)
- SANDBAG SEDIMENT TRAP (See Detail)
- TEMPORARY SEDIMENT STORAGE BASIN (See Detail)



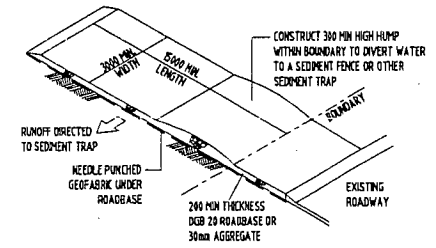
SANDBAG SEDIMENT INLET TRAP

N.T.S.



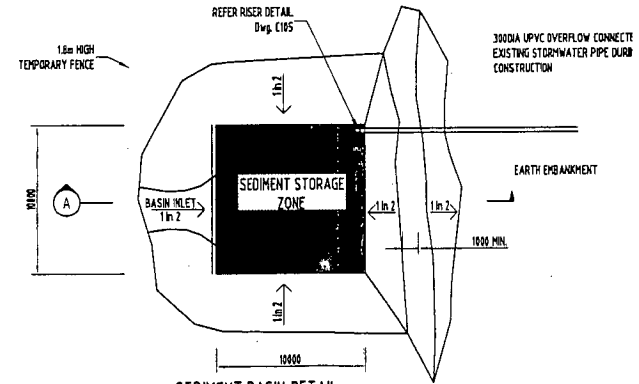
SANDBAG SEDIMENT TRAP

N.T.S.



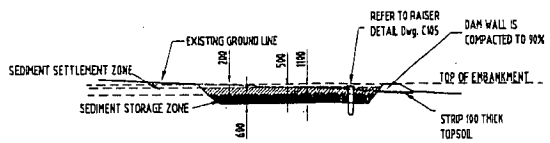
TEMPORARY SITE ACCESS SEDIMENT STABLISING DETAIL

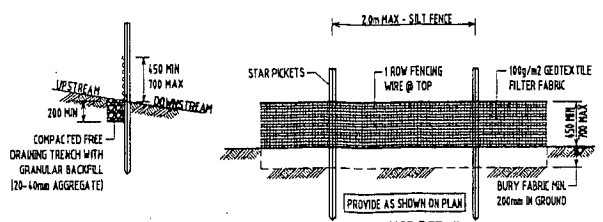
STRIP TOPSOIL, REDUCE TO BULK EARTHWORKS LEVEL AND COMPACT SUBGRADE.



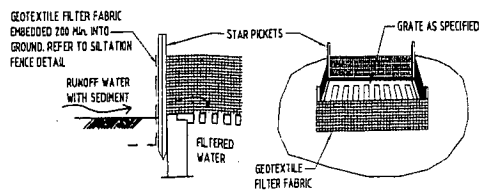
SEDIMENT BASIN DETAIL

SCALE 1:50





SILT FENCE DETAIL



GEOTEXTILE FILTER PIT SURROUND

N.T.S.

EROSION AND SEDIMENT CONTROL NOTES

1. ALL WORK SHALL BE CARRIED OUT IN ACCORDANCE WITH :-
   (a) E.P.A. - "POLLUTION CONTROL MANUAL FOR URBAN STORMWATER".
   (b) INSTITUTE OF ENGINEERS – "SOIL EROSION AND SEDIMENT CONTROL FOR QUEENSLAND CONSTRUCTION SITES".
   (c) BCC SUB-DIVISION AND DEVELOPMENT GUIDELINES, PART C SECTION 12 AND APPENDIX 2.
2. PRIOR TO THE COMMENCEMENT AND DURING THE EARTHWORK CONSTRUCTION PHASE, INSTALL EROSION CONTROL DEVICES AS PER THE PLAN.
3. DURING CONSTRUCTION, MAINTAIN EROSION SEDIMENT CONTROL DEVICES IN A WORKING CONDITION.
4. PRIOR TO, AND FOLLOWING STORM EVENTS, CHECK EROSION SEDIMENT CONTROL DEVICES AND PAVEMENT AREAS FOR LADEN SEDIMENT.
5. CONSTRUCT TEMPORARY SITE ACCESS TO FILTER AND DIVERT ANY SEDIMENT, REFER DETAIL.
6. MUD TRACKED ONTO OR SILT WASHED ONTO ROADS SHALL BE SWEPT UP AND COLLECTED. SEDIMENT SHALL NOT BE WASHED INTO THE STREET DRAINAGE SYSTEM.
7. SILT FENCES SHALL BE PLACED ALONG ALL BOUNDARIES AS PER PLAN.
8. DUST EMISSIONS FROM CONSTRUCTION MACHINERY SHALL BE MINIMISED BY WETTING THE EXPOSED SITE ON A AS-NEEDS BASIS.
9. ALLOWANCE SHALL BE MADE FOR WATER TO POND ON SITE FOR COLLECTION OR TO SEEP NATURALLY. PUMPING OF WATER SHALL BE PERFORMED BY A WASTE WATER DISPOSAL CONTRACTOR OR DISCARGED TO THE STORMWATER SYSTEM WHERE ADEQUATELY FILTERED.
10. WHEN STORMWATER PITS ARE ACTIVE DURING CONSTRUCTION PREVENT SITE RUNOFF ENTERING UNLESS GEOTEXTILE SILT FENCES ARE ERECTED AROUND THE PITS, REFER TO DETAIL.
11. SAND BAG SEDIMENT FILTERS SHALL BE PLACED AT LOCATIONS WHERE WATER RUN OFF FROM THE SITE IS DIRECTED. ON ROAD FRONTAGE USE GRAVEL BAGS SHELDED WITH ROADWORK BARACADES AND AMBER HAZARD WARNING LIGHTS.
12. OPEN ERODED PIPEWORK LOCATED IN OPEN OR INCOMPLETE TRENCHES SHALL BE CAPPED OR COVERED WITH GEOTEXTILE FILTER FABRIC, AT THE END OF EACH DAY OR PRIOR TO A STORM EVENT.

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A	17-12-08	ISSUED FOR DEVELOPMENT APPROVAL - OPERATIONAL WORKS	JI

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PROJECT

PROPOSED WAREHOUSE AND OFFICE DEVELOPMENT AT LOT 23 NEW ROAD, IPSWICH.

SHEET SUBJECT

CIVIL, EROSION AND SEDIMENT CONTROL PLAN.

Martin COSGROVE and Associates Pty Ltd

ACN 052033321

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SM	JI	08214	
DATE	SCALE	DRAWING No.	ISSUE
DEC. 2008	1 : 500 UNO	C103	A

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STORMWATER MANAGEMENT NOTES

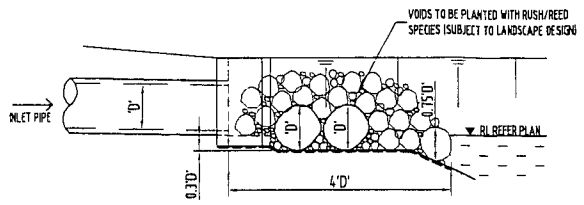
1. ALL WORK SHALL BE CARRIED OUT IN ACCORDANCE WITH THE STORMWATER MANAGEMENT STRATEGY FOR INDIVIDUAL LOTS IN REPORT #LJ8714/R9 PREPARED BY CARDNO LAWSON TRELOAR DATED JULY 2008.
2. PREVENT THE RELEASE OF CONTAMINATED STORMWATER FROM THE SITE DURING CONSTRUCTION. REFER TO THE EROSION AND SEDIMENT CONTROL NOTES.
3. STORMWATER PITS SHALL BE CONSTRUCTED WITH LEAF GUARD OR FINELY MESHED GRATES TO PREVENT INFILTRATION OF LITTER. THE BODY CORPORATE SHALL ENSURE STORMWATER PITS ARE REGULARLY MAINTAINED.
4. STORMWATER RUNOFF SHALL NOT POND ON-SITE OR IN ADJACENT PROPERTIES.
5. ALL STORMWATER SHALL BE DIRECTED THROUGH THE BIORETENTION BASIN PRIOR TO DISCHARGE TO COUNCILS SYTEM WITH THE EXCEPTION OF RUNOFF FROM CATCHMENTS P11 & P14.
6. LANDSCAPING ZONES SHALL BE TOPSOILED AND VEGETATED WITH SUITABLE PLANTING AS SOON AS POSSIBLE.
7. REFER 08160L1 STORMWATER MANAGEMENT PLAN FOR DESIGN RATIONALE AND CALCULATIONS.

STORMWATER DRAINAGE NOTES

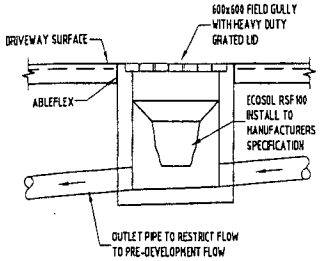
1. STORMWATER DESIGN CRITERIA:
   (a). AVERAGE RECURRANCE INTERVAL:
   1:10 YEARS FOR PAVED AND LANDSCAPED AREAS
   (b). RAINFALL INTENSITES - TIME OF CONCENTRATION - 5 MINUTES:
   1:10 YEARS = 209mm/hr.
   (c). RUNOFF COEFFICIENTS:
   ROOF AREAS - C = 0.95
   PAVED AREAS - C = 0.95
   LANDSCAPED AREAS - C = 0.70
2. THE CONTRACTOR IS TO CHECK THAT THE PROPOSED PIPEWORKS DO NOT CLASH WITH ANY EXISTING SERVICES PRIOR TO COMMENCING WORK. THE CONTRACTOR MUST NOTIFY THE ENGINEER IF ANY CLASHES ARE FOUND FOR ADVICE OF ANY REDESIGN REQUIREMENTS.
3. PIPES 300 DIA. AND LARGER TO BE REINFORCED CONCRETE CLASS 'X' APPROVED SPIGOT AND SOCKET WITH RUBBER RING JOINTS. U.N.O.
4. PIPES UP TO 300 DIA SHALL BE SEWER GRADE UPVC WITH SOLVENT WELDED JOINTS U.N.O.
5. EQUIVALENT STRENGTH VCP OR FRC PIPES MAY BE USED.
6. PIPES SHALL BE LAID ON A 75mm THICK SAND BED. IN ALL CASES BACKFILL TRENCH WITH SAND TO 200mm ABOVE PIPE U.N.O. WHERE PIPE IS UNDER PAVEMENTS BACKFILL REMAINDER OF TRENCH TO UNDERSIDE OF PAVEMENT WITH SAND OR APPROVED RIPPED SANDSTONE COMPACTED IN 150mm LAYERS TO MINIMUM 100% STANDARD MAXIMUM DRY DENSITY IN ACCORDANCE WITH AS 1289 E2.1.
7. ENLARGERS, CONNECTIONS AND JUNCTIONS TO BE PRECAST FITTINGS WHERE PIPES ARE LESS THAN 300 DIA.
8. WHERE SUBSOIL DRAINS PASS UNDER FLOOR SLABS AND VEHICULAR PAVEMENTS, UNSLOTTED UPVC SEWER GRADE PIPE IS TO BE USED.
9. CARE IS TO BE TAKEN WITH LEVELS OF STORMWATER LINES. GRADES SHOWN ARE NOT TO BE REDUCED WITHOUT APPROVAL
10. PRECAST PITS MAY BE USED EXTERNAL TO THE BUILDING SUBJECT TO APPROVAL.
11. WHERE TRENCHES ARE IN ROCK, THE PIPE SHALL BE BEDDED ON A MIX OF 50mm CONCRETE BED (OR 75mm BED OF BLUE METAL) UNDER THE BARREL OF THE PIPE.
12. GRATES AND COVERS SHALL BE ABLE TO SUPPORT THE FOLLOWING LOADS -
    LIGHT DUTY - 1 TONNE WHEEL LOADS
    MEDIUM DUTY - 3.5 TONNE WHEEL LOADS
    HEAVY DUTY - 9 TONNE WHEEL LOADS.
13. THIS STORMWATER MANAGEMENT PLAN IS CONSISTENT WITH THE STORMWATER MANAGEMENT STRATEGY FOR INDIVIDUAL LOTS IN REPORT #LJ8714/R9 PREPARED BY CARDNO LAWSON TRELOAR DATED JULY 2008.

BIORETENTION BASIN NOTES

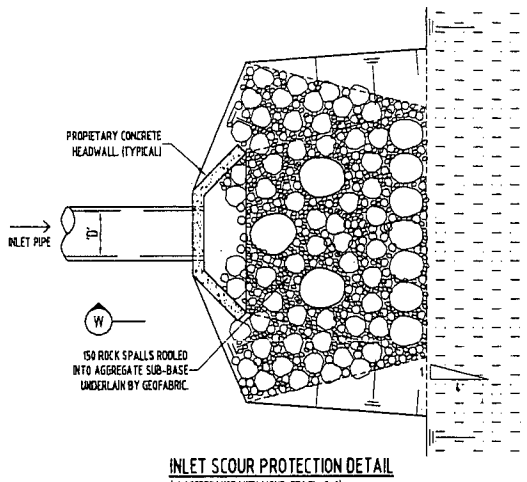
1. ALL WORK SHALL BE CARRIED OUT IN ACCORDANCE WITH THE STORMWATER MANAGEMENT STRATEGY FOR INDIVIDUAL LOTS IN REPORT #LJ8714/R9 PREPARED BY CARDNO LAWSON TRELOAR DATED JULY 2008.
2. DESIGN IS BASED ON THE STORMWATER MANAGEMENT REPORT AND ALL WORK SHALL BE CARRIED OUT IN ACCORDANCE WITH THE REPORT.
3. THE BIORETENTION DEVICES SHALL NOT BE CONSTRUCTED UNTIL ALL BUILDING WORK CONTRIBUTING TO SEDIMENT PRODUCTION, HAVE BEEN COMPLETED.
4. FILTER MEDIA SHALL BE PROVIDED IN THREE LAYERS:-
   a) FILTER LAYER SHALL CONSIST OF A SANDY LOAM TOP SOIL WITH A MINIMUM SATURATED HYDRAULIC CONDUCTIVITY OF 200mm/hr., A 5-10% ORGANIC CONTENT AND A pH OF 6.0-7.8. LABORATORY TESTING IN ACCORDANCE WITH AS4419 OR AS 1289 WITH A MINIMUM OF TEN SAMPLES SHALL BE SUBMITTED CONFIRMING THE MATERIAL'S SUITABILITY.
   b) TRANSITION LAYER SHALL CONSIST OF COARSE SAND CONFORMING TO A UNIMIX 16/30 FG SAND GRADING OR EQUIVALENT.
   c) DRAINAGE LAYER SHALL CONSIST OF FINE GRAVEL WITH 5MM SCREENINGS.
5. PRIOR TO FINAL PLANTING, PLACE GEOFABRIC OVER THE FILTER MEDIA WITH 50mm TOPSOIL FOR TEMPORARY TURFING LAYED PERPENDICULAR TO THE FLOW PATH.
6. ENSURE PIPE FLOWS ARE RESTRICTED FROM ENTERING THE DEVICE UNTIL PLANTING IS FULLY ESTABLISHED.
7. ALL PLANTING SHALL BE CARRIED OUT IN ACCORDANCE WITH THE LANDSCAPE ARCHITECTS SPECIFICATIONS. PLANTING SHALL CONSIST OF 70-80% DENSITY COVER WITH A HEIGHT EQUAL TO THE 400mm OF EXTENDED DETENTION REQUIRED.
8. THE BIORETENTION BASIN SHALL BE MAINTAINED THROUGHOUT ITS USE TO ENSURE THE DESIGN WATER QUALITY TREATMENT TARGETS ARE ACHEVED. MAINTANANCE SHALL INCLUDE WATERING WITH PARTICULAR FREQUENCY DURING THE FIRST THREE MONTHS, WEED CONTROL, CLEARING OF LITTER, REMOVAL OF SEDIMENT, REPAIRING OF SCORING AND IMPLEMENTING MEASURES TO PREVENT FUTURE OCCURANCE, REPLACEMENT OF DEAD PLANTS AND REPORTING OF THE WORKS CARRIED OUT. REPORTS SHALL BE AS PER THE CARDNO LAWSON TRELOAR STORMWATER MANEGEMENT STRATEGY.



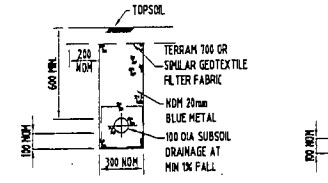
SECTION (W)



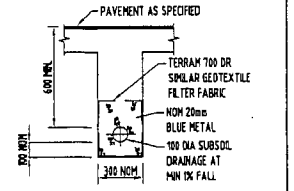
TYPICAL STORMWATER INLET PIT DETAIL



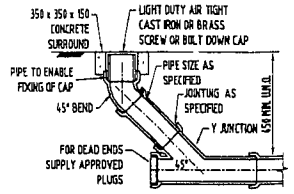
INLET SCOUR PROTECTION DETAIL
(IN ACCORDANCE WITH WSUD-TD6 Fig. 5-6)



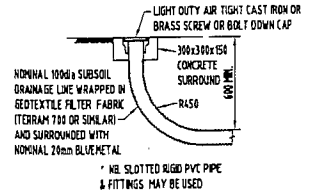
SUBSOIL IN LANDSCAPED AREAS
SCALE 1:20



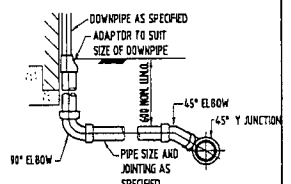
SUBSOIL IN PAVED AREAS
SCALE 1:20



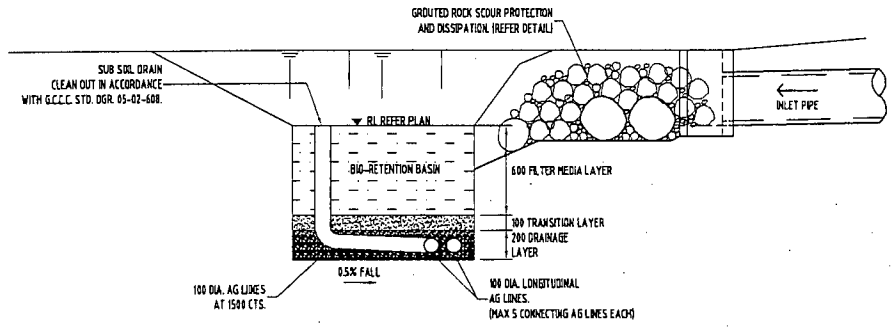
RODDING POINT AT 45
SCALE 1:20



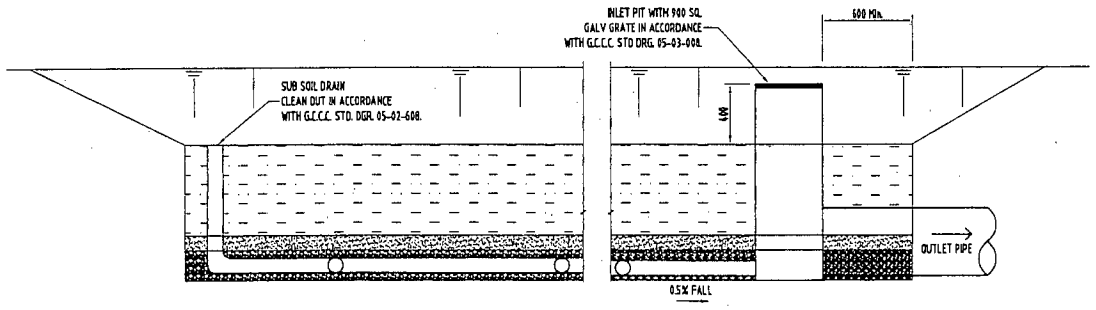
HIGH END RISER
SCALE 1:20



UPVC DOWNPIPE CONNECTION
SCALE 1:20



TYPICAL BIO-RETENTION BASIN CROSS SECTION
SCALE 1:20



TYPICAL BIO-RETENTION BASIN LONGITUDINAL SECTION
SCALE 1:20

BIORETENTION BASIN DESIGN CALCULATIONS SUMMARY

IN ACCORDANCE WITH 'HEALTHY WATERWAYS' WSUD TECHNICAL DESIGN GUIDELINES

CATCHMENT NUMBER	1	2	3	4	5	6	7	8	9
Catchment Characteristics									
Catchment Area	1520	2220	960	325	1460	5800	2420	8561	1190
Catchment Use	Industrial								
Storm Event Entering Inlet	1:2-10 ARI PIPE FLOW, 1:50 ARI OVERLAND FLOW								
Conceptual Design									
Bioretention area	30	44	19	7	29	116	48	174	225
Filter media saturated hydraulic conductivity	200								
Extended detention depth	400								
Size for Treatment	1.97	1.97	1.97	1.97	1.97	1.97	2.97	3.97	4.97
	(in accordance with In-Lot Stormwater Management Strategy Requirements)								
Bioretention area	30	44	19	6	29	114	72	340	59
Extended detention depth	400								
Design Flows									
Rainfall Intensities									
Minor Storm (2 year ARI)	150								
Major Storm (50 year ARI)	285								
Design Runoff Co-efficient (all storms)	0.92								
Peak Design Flows									
Minor Storm (2 year ARI)	58	85	37	12	56	222	93	328	46
Major Storm (50 year ARI)	111	162	70	24	106	422	176	624	87
Inflow System									
Scour Protection Adequate	Yes - Refer Detail This Drawing								
Coarse Sediment Forebay Required	Yes - Refer Detail This Drawing								
Flow Widths in Upstream Channel	N/A								
Kerb Opening Width	N/A								
Bioretention Media Characteristics									
Filter media hydraulic conductivity	200								
Filter media depth	600								
Drainage Layer media	Sand								
Drainage Layer depth	150								
Transistion Layer depth	150								
Under-drain design and capacity checks									
Flow Capacity of Filter Media	2.8	4.1	1.8	0.6	2.7	10.7	4.4	16.1	20.8
Perforations inflow Check									
Pipe Diameter	100	100	100	100	100	100	100	100	100
Number of Perforated Pipes	20	30	13	6	20	48	20	98	60
Capacity of Perforations	>> Filter Media Infiltration								
Perforation Capacity > Filter Media Capacity	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of Distribution Pipes	5	8	3	2	5	10	4	20	12
Distribution Pipe Capacity	3.75	6.01	2.25	1.5	3.75	10.72	5.2	21.23	22.07
Pipe Capacity > Filter Media Capacity	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Requirement for impermeable lining	No	No	No	No	No	No	No	No	No
Size Overflow Pit/s	2 / 600 x 600	3 / 600 x 600	1 / 600 x 600	1 / 600 x 600	2 / 600 x 600	5 / 600 x 600	1 / 600 x 600	10 / 600 x 600	3 / 600 x 600
Verification Checks									
Minor Storm (2 year ARI) velocity < 0.5 m/s	N/A - No pipe inlets							0.2	0.4
Major Storm (50 year ARI) velocity < 2.0 m/s	N/A - No pipe inlets							0.3	0.9

ISSUED FOR APPROVAL

ISSUE	DATE	REVISION	INITIAL
A	17-12-08	ISSUED FOR DEVELOPMENT APPROVAL OPERATIONAL WORKS	JI
P1	15-12-08	ISSUED FOR PRELIMINARY DEVELOPMENT APPROVAL	JI

CLIENT
XAct solutions
Ph. [redacted] - MAIN OFFICE
Ph. [redacted] - DIRECT
Fax [redacted]

ARCHITECT
WALKER CORPORATION Pty. Ltd.
Level 50, Governor Phillip Tower, 1 Farrer Place, Sydney.
Ph. [redacted]
Fax. [redacted]

PROJECT
PROPOSED WAREHOUSE AND OFFICE DEVELOPMENT AT LOT 23 NEW ROAD, IPSWICH.

SHEET SUBJECT
STORMWATER MANAGEMENT NOTES AND DETAILS.

Martin COSGROVE and Associates Pty Ltd
ACN 052933221
CONSULTING STRUCTURAL AND CIVIL ENGINEERS
93 WARRY STREET, SPRING HILL, QLD 4000
Tel [redacted] Fax [redacted]
Email : [redacted]@mcaeng.com.au

DESIGNED	DRAWN	JOB No.	
SM	JI	08214	
DATE	SCALE	DRAWING No.	ISSUE
DEC. 2008	1 : 20 UNO	C105	A

Your reference
Our reference 9411/08 MG:M
Contact Officer [redacted]
Telephone

City of Ipswich

Ipswich City Council

45 Roderick St
PO Box 191
Ipswich QLD 4305
Australia

Tel [redacted]
Fax
Email council@ipswich.qld.gov.au
Web www.ipswich.qld.gov.au

Walker Corporation Pty Ltd
Att [redacted]
PO Box 939
OXENFORD QLD 4210

23 December 2008

INTEGRATED PLANNING ACT 1997

ASSESSMENT MANAGER ACKNOWLEDGMENT NOTICE

Application Details

Appn No:	9411/08
Assessment Manager:	Ipswich City Council PO Box 191 IPSWICH QLD 4305 Ph: [redacted] Fax:
Real Property Description:	Part of Lot 13 SL2982
Property Location:	120 Bognuda Street, Bundamba

It is advised that the following matters relate to the above application.

1. <u>Development Approval</u>

The following development approval is being sought.

Proposal	Development	Approval Type
Service Trades Use (Warehouse)	Making a material change of use of premises	Development Permit.
Stormwater, Drainage Works, Earthworks, Carpark, Landscaping.	Carrying out operational work	Development Permit.

2. Referral Agencies

As there are referral agencies applicable to this application, it is advised that the applicant is required to give each referral agency the following:

(a) A copy of the application; and
(b) A copy of the acknowledgment notice; and
(c) The fee prescribed under a regulation under the *Integrated Planning Act 1997* or another Act.

In accordance with Section 3.3.4.(1) of the *Integrated Planning Act 1997* the applicant is to give the assessment manager written notice of the day the applicant gave each referral agency the things mentioned above.

The following are Referral Agencies for this application:-

Concurrence Agencies

(a) District Director
Metropolitan District Office
Department of Main Roads
P O Box 70
SPRING HILL QLD 4004

Advice Agencies

(b) Powerlink
PO Box 1193
VIRGINIA QLD 4014

3. Code Assessment

It is determined that an aspect of the development applied for requires Code Assessment.

The following are the applicable codes for this application:

(a) Regionally Significant Business and Industry Area Code
(b) Regional Business and Industry Zone Code
(c) Commercial and Industrial Code
(d) Parking Code
(e) Development Constraints Overlay Code

4. Impact Assessment

It is determined that the aspects of the development applied for do not require Impact Assessment.

5. Information Request

Council may require further information to be submitted. If so, the requirements will be notified within 10 business days of this Notice.

Access PD Online at www.ipswich.qld.gov.au to view, search and print property information, interactive mapping, track development applications and the Ipswich Planning Scheme. Undertake a development enquiry as part of the Property Enquiry function to identify the planning scheme provisions that apply to a particular use on a property. PD Online - information at your fingertips 24 hours a day, 7 days a week.

Yours faithfully

ACTING TEAM CO-ORDINATOR (EAST)

APPENDIX 1

Your application has been received and has been registered within Council's processing systems. As part of this, your application has been directed to one of Council's assessment teams. The team and officers which are dealing with your application are:-

East Team

[redacted] - Assistant Planner (Development)
Town Planning assessment up to the time Council determines the application

[redacted] - Assistant Engineer (Development)
Operational Works assessment up to the time Council determines the application

City of Ipswich
RECEIVED
21 JAN 2009
Doc. No. 3545/57
Applic. No. 9411/08
Action Off. [redacted]

Walker

PO Box 939
Oxenford Qld Australia 4210
Suite 1 Harbour Point
Marina Shopping Village
Santa Barbara Road
Hope Island Qld Australia 4212
Telephone [redacted]
Facsimile
www.walkercorp.com.au

20 January 2009

The Chief Executive Officer
Ipswich City Council
PO Box 191
Ipswich QLD 4305

For the attention of: [redacted]

Dear Mr [redacted]

Application Reference: 9411/08 Code Assessable Service Trade Use (Warehouse) with Ancillary Office, 120 Bognuda Street, Bundamba on plan described as Lot 13 on SL 2982. Parish of Goodna.

I write with reference to the above planning application for Material Change of Use and Operational Works at Citiswich and your emails dated 12 January 2009 and 16 January 2009 requesting additional information. Accordingly I am pleased to provide you with the following information to assist you in your consideration of this application.

In relation to stormwater

- Updated stormwater report addresses earthworks sections raised in the council RFI, and the DG store non-leeching requirements wanted by DMR.
- There are 18 pages of hydraulic calculations for the stormwater, all have been revised for the 300mm requirement requested by ICC.
- Design certificate is also attached.
- Additional detailing has been included on the drawings.

In relation to transportation:

- A plan to demonstrate how safe and efficient access for pedestrians and cyclists is to be facilitated between the external street and the proposed site office area.
- Design Certificate to follow.

Should you require any further information or have any questions regarding this submission, please do not hesitate to contact the undersigned on [redacted]

Yours Faithfully

[redacted]

Walker Corporation Pty Ltd

to Wish
RECEIVED
22 JAN 2009
Doc. No. 3547713
Applic. No. 9411/08
Action Off. [redacted]

Martin
COSGROVE
and Associates Pty Ltd
Consulting Structural and Civil Engineers

STORMWATER MANAGEMENT REPORT

FOR

PROPOSED WAREHOUSE/OFFICE DEVELOPMENT

Lot 23 ASHBURN ROAD, BREMER

Reference #: 08214-L1a

Date: 19-01-09

93 Warry Street PO Box 765 Spring Hill QLD 4000 Telephone: [redacted] Facsimile: [redacted]

INTRODUCTION

This is a stormwater management report and for the proposed warehouse and office development at Lot 23, Citiswich sub-division, Ashburn Road, Bremer.

DEVELOPMENT

The proposed development comprises a 25,000 m2 industrial warehouse building with attached offices. The building is surrounded by loading docks and access hardstands. There is a staff and customer carpark adjacent to the office areas. (Refer drawing 08214 C101-B and C102-B).

CATCHMENT

The proposed development site is currently vacant land (new sub-division). The total site area is approximately 38,176 m^2 and grades gently from the North-West corner of the site to the South-East corner where the property adjoins "Road 1" of the new sub-division. The new sub-division has stormwater pits located in Road 1 which drain to the South. Previous to the sub-division, the natural ground of the site drained West and discharged directly into the Bremer River as overland flow.

PRELIMINARY DESIGN AND HYDRAULIC CALCULATIONS

It is proposed to detain the stormwater from the developed site in bio-retention storage and pavement storage to ensure post-development flows are at or below pre-development flows. Stormwater runoff from the developed site will discharge to the existing stormwater pit located at the Road 1 frontage. This existing stormwater pit is the legal point of discharge for the site. Currently all stormwater runs off the site to the South-East as overland flow. The proposed design will result in stormwater runoff for all events up to 1:10 ARI being discharged to the piped drainage system in Ashburn Road. Therefore downstream properties will not be adversely affected by the development.

A summary of the pre and post development flows for minor and major rainfall events are documented below:

PRE-DEVELOPMENT

SITE AREA	38,176 m2 vacant land – lightly grassed, flat.
% IMPERVIOUS	0%
NET RUNOFF COEFFICIENT	C=0.7
Q10 5 minute storm flow = 1551 L/s	
Q100 5 minute storm flow = 2360 L/s	

POST-DEVELOPMENT (WITHOUT DETENTION MEASURES)

ROOFED AREA	20,217 m2 @ 100% impervious (C=0.95)
PAVED AREA	15,135 m2 @ 100% impervious (C=0.95)
LANDSCAPED AREA	2,824 m2 @ 0% impervious (C=0.70)
Q10 5 minute storm flow = 2064 L/s	(33% increase)
Q100 5 minute storm flow = 3140 L/s	(33% increase)

POST-DEVELOPMENT (WITH DETENTION AND LIMITS TO OUTFLOW)

NUMBER OF OUTLETS	1
OUTLET DIAMETERS	750 mm dia @ 0.35% grade
SINGLE OUTLET CAPACITY	665 L/s
TOTAL LIMITED OUTFLOW	***665 L/s***

The outflow is limited by the design of existing sub-divisional stormwater system located in Road 1. The above calculations show that the post-development outflows with the proposed bio-retention and limited outflow will result in a net reduction compared to pre-development flows. The reduction will be in the order of 58% for a 1:10 ARI event.

For events greater than 1:10 ARI, flows exceeding the storage of the bio retention basins and carpark areas will discharge as overland flow to the Bremer River and to the Road 1 street frontage.

STORMWATER TREATMENT AND WATER QUALITY OBJECTIVES (WQO)

A total of nine (9) bio-retention basins are proposed for the development, located as shown on drawing C101-B and C102-B. The total area of bio-retention is 665 m^2, or 1.97% of the total site area. This has been designed in accordance with the Citiswich Individual Industrial Lot Stormwater Management Strategy by Cardno Lawson Treloar (report #LJ8714/R9, July 2008). All roof and most of the paved stormwater shall be directed to the bio-retention basins. The Individual Lot Stormwater Strategy allows for 570 m2 (150 m2 per hectare) of untreated carpark whilst still maintaining the water quality objectives. For the proposed design, only 270 m2 (catchment P8 on C101-A) will be untreated. Therefore, the proposed design meets the criteria set out in the Citiswich Individual In-Lot Stormwater Management Strategy.

The proposed bioretention area (1.97% of the total site) will result in the following water quality objectives (WQO), based on Healthy Waterways WSUD Technical Design Guidelines design charts 5-3 to 5-5:

- Total Suspended Solids (TSS) Removal 87% (Figure 5-3)
- Total Phosphorus (TP) Removal 75% (Figure 5-3)
- Total Nitrogen (TN) Removal 42% (Figure 5-3)

Gross pollutants will be removed through the use of filter baskets within stormwater pits and coarse sediment forebays at pipe inlets to bio-retention basins. Gross pollutants from pavement runoff directly into bio-retention basins will be captured on the battered banks and/or basis surface. Gross pollutant removal will be greater than 90% for the development.

The above WQO's are equivalent to or in excess of the requirements of the SEQRP Part 11 as per ICC requirements. Detailed design calculations for the bio-retention basins are shown on drawing C105-B and as appendices to this report.

STORMWATER DETENTION AND STORAGE

The nine bio-retention basins will be designed to provide extended detention through the limiting of outflows. It is proposed that overflow chambers will be located 300 mm above the bio-retention surface, providing the extended detention storage. This will result the first 7 mm of ANY rainfall event ranging from 1 year ARI 5 minute event to 100 year ARI 3 day event being detained on site and then discharge through controlled release via seepage and detention overflow. Extended detention of up to 200 mm above the outlet grates will be allowed for in the landscaping batters and car-parking areas around the bio-retention pits. This design which detains the first 7 mm of any event is a significant achievement and results in overall reduction in pre-development flows.

Construction and maintenance of the bio-retention basins should be undertaken in accordance with the Citiswich Individual Industrial Lot Stormwater Management Strategy by Cardno Lawson Treloar (report #LJ8714/R9, July 2008).

DANGEROUS GOODS STORE POTENTIAL RUNOFF

The dangerous goods store for this development is located within the main proposed building structure. It is proposed that the internal DG store area will have a bunded slab which will prevent contamination of any runoff from the site in the event of a DG spill. The design of this bunded slab must be incorporated into the structural design of the building, which is outside the scope of this report.

The inclusion of an internal bunded slab will ensure that no Dangerous Goods will be able to leech into the Warrego Highway stormwater system.

EARTHWORKS PHASE/EROSION AND SEDIMENT CONTROL

Bulk earthworks for this development are being completed under a separate development approval, being the sub-division works of the industrial estate. The design drawings for the bulk earthworks are by Burchill VDM. At the completion of the bulk earthworks, there should be no major cutting and filling required under this development

application. Cutting and filling will be limited to final trimming and excavation of the bio-retention basins. Detailed sections through the basins are shown on drawing C102-B.

The only retaining walls on the project are for a recessed loading dock and for Bioretention Basin No 8. These retaining walls are detailed on drawing C102-B.

Erosion and sediment control devices for use in the construction phase, including sedimentation basins, are shown on drawing C105-B. Notes regarding the specifications for these devices are also included on the drawing.

CONCLUSION

It is our opinion the proposed stormwater management plan is consistent with WSUD and will result in net reduction in stormwater flows off site, and achieve WQO in accordance with best practice. We trust this is satisfactory for your requirements, please contact us if you have any queries.

Yours faithfully
MARTIN COSGROVE AND ASSOCIATES PTY LTD

[redacted]

[redacted] *BE (Civil) Hons MIEAust RPEQ 8026*
Director

Attached:
Civil Drawings C101B, C102B, C103B,C105B
Bio-Retention Treatment and Storage Calculations

Building Act 1975 s10 & s50 Building Regulation s46 & s48

Compliance Certificate for building Design or Specification

15

NOTE	**A Compliance Certificate states building work complies with the building assessment provisions.** **To be used for all classes of building and structures to certify a material, system, method of building or building element complies with the BCA or a provision of the QDC.** **RESTRICTION: A building certifier (class B) can only give a compliance certificate about whether building work complies with the BCA or a provision of the QDC. A building certifier (Class B) can not give a certificate regarding QDC boundary clearance and site cover provisions.**
1. Property description The description must identify all land the subject of the application. The lot & plan details (eg. SP / RP) are shown on title documents or a rates notice. If the plan is not registered by title, provide previous lot and plan details.	Street address *(include no., street, suburb / locality & postcode)* Lot 23, Bognuda Street (Proposed API Warehouse Facility) Bremer Lot & plan details *(attach list if necessary)* In which local government area is the land situated? Ispswich City
2. Description of component/s certified Clearly describe the extent of work covered by this certificate.	External Stormwater in-lot design including in-ground drainage, site falls and bio-retention design. As per documentation listed in 4.
3. Basis of certification Detail the basis for giving the certificate and the extent to which tests, specifications, rules, standards, codes of practice and other publications, were relied upon.	Design is in accordance with AS/NZS 3500.3.2 Plumbing and Drainage: Stormwater Drainage, Healthy Waterways WSUD, Ispwich City Council Planning Scheme Policies and sound engineering practice.
4. Reference documentation Clearly identify any relevant documentation, e.g. numbered structural engineering plans.	Martin Cosgrove & Associates report 08214.L1a, Drawings C101-B, C102-B, C103-B, C105-B

LOCAL GOVERNMENT USE ONLY

Date received		Reference Number/s		Approved form 15 Version 1, 08/06

5. Building certifier reference number	Building certifier reference number 08214.c1
6. Competent person details A competent person for building work, means a person who is assessed by the building certifier for the work as competent to practise in an aspect of the building and specification design, of the building work because of the individual's skill, experience and qualifications in the aspect. The competent person must also be registered or licensed under a law applying in the State to practice the aspect. If no relevant law requires the individual to be licensed or registered to be able to give the help, the certifier must assess the individual as having appropriate experience, qualifications or skills to be able to give the help. If the chief executive issues any guidelines for assessing a competent person, the building certifier must use the guidelines when assessing the person.	Name (*in full*) [redacted] Company name (*if applicable*): Martin Cosgrove & Associates Pty Ltd Contact person: [redacted] Phone no. *business hours*: [redacted] Mobile no.: [redacted] Fax no.: [redacted] Email address: [redacted] Postal address PO Box 765 SPRING HILL QLD Postcode 4000 Licence or registration number (*if applicable*) [redacted]
7. Signature of competent person This certificate must be signed by the individual assessed by the building certifier as competent.	I certify that the item/s described above, if installed or carried out under the certificate, including any referenced documentation, will comply with the *Building Act 1975*. Signature: [redacted] Date: 19-01-09

BIO-RETENTION PIT 1 FLOOD STORAGE CALCULATION SHEET

TOTAL SITE AREA	38176 m^3
EQUIVALENT RUNOFF CO-EFFICIENT	0.92
EQUIVALENT IMPERVIOUS AREA	35122 m^3
TOTAL BIO-RETENTION	695 m^3
BIO-RETENTION PIT 1 AREA	**30** m^3
BIO-RETENTION PIT 1 CATCHMENT	**1516** m^2
INLET HEIGHT ABOVE PIT SURFACE	0.3 m
SEEPAGE DETENTION VOLUME	9 m^3
PAVEMENT STORAGE AREA	420 m^2
PAVEMENT STORAGE DEPTH	0.2 M
OUTLET PIPE CAPACITY	27
NUMBER OF OUTLET PIPES	1
TOTAL OUTLET CAPACITY	27.0 L/S
SOIL CONDUCTIVITY	200 MM/H
SEEPAGE RATE	0.056 L/S/M2
SEEPAGE OUTFLOW RATE	2.5

FLOOD STORAGE DEPTH REQUIRED IS LESS THAN PROVIDED STORAGE DEPTH - THEREFORE OK

RAINFALL INTENSITY (mm/h)

	1	2	10	20	50	*100*
5	113	145	209	241	284	*318*
15	72	94	137	159	188	*211*
30	51	33	98	115	137	*154*
60	34.9	45.5	68	80	96	*108*
120	21	27.3	41.1	48.2	58	*65*
240	12.4	16.2	24.5	28.7	34.4	*38.9*
12	5.43	7.09	10.7	12.6	15.1	*17.1*
24	3.38	4.43	6.79	7.99	9.63	*10.9*
72	1.49	1.96	3.06	3.62	4.4	*5.02*

INFLOW RATE (L/s)

	1	2	10	20	50	*100*
5	48	61	88	101	120	*134*
15	30	40	58	67	79	*89*
30	21	14	41	48	58	*65*
60	15	19	29	34	40	*45*
120	9	11	17	20	24	*27*
240	5	7	10	12	14	*16*
12	2	3	5	5	6	*7*
24	1	2	3	3	4	*5*
72	1	1	1	2	2	*2*

TOTAL FALL OF RAIN (mm)

5	9	12	17	20	24	*27*
15	18	24	34	40	47	*53*
30	26	17	49	58	69	*77*
60	35	46	68	80	96	*108*
120	42	55	82	96	116	*130*
240	50	65	98	115	138	*156*
12	65	85	128	151	181	*205*
24	81	106	163	192	231	*262*
72	107	141	220	261	317	*361*

INFLOW VOLUME (m3)

5	14	18	26	30	36	*40*
15	27	36	52	60	71	*80*
30	39	25	74	87	104	*117*
60	53	69	103	121	146	*164*
120	64	83	125	146	176	*197*
240	75	98	149	174	209	*236*
12	99	129	195	229	275	*311*
24	123	161	247	291	350	*397*
72	163	214	334	395	480	*548*

VOLUME OVER INLET WEIR (m3)

5	5	9	17	21	27	*31*
15	18	27	43	51	62	*71*
30	30	16	65	78	95	*108*
60	44	60	94	112	137	*155*
120	55	74	116	137	167	*188*
240	66	89	140	165	200	*227*
12	90	120	186	220	266	*302*
24	114	152	238	282	341	*388*
72	154	205	325	386	471	*539*

CAPTURE RATE OVER INLET WEIR (L/s)

5	18	32	59	72	90	*104*
15	1	10	28	37	50	*59*
30	0	0	12	19	28	*35*
60	0	0	0	4	11	*16*
120	0	0	0	0	0	*0*
240	0	0	0	0	0	*0*
12	0	0	0	0	0	*0*
24	0	0	0	0	0	*0*
72	0	0	0	0	0	*0*

EXTENDED FLOOD STORAGE VOLUME (m3)

5	2	5	12	15	20	*24*
15	0	7	21	29	39	*47*
30	0	0	19	31	46	*59*
60	0	0	0	14	37	*54*
120	0	0	0	0	0	*0*
240	0	0	0	0	0	*0*
12	0	0	0	0	0	*0*
24	0	0	0	0	0	*0*
72	0	0	0	0	0	*0*

EXTENDED FLOOD STORAGE DEPTH (m3)

5	0.0	0.0	0.0	0.0	0.0	0.1
15	0.0	0.0	0.0	0.1	0.1	0.1
30	0.0	0.0	0.0	0.1	0.1	0.1
60	0.0	0.0	0.0	0.0	0.1	0.1
120	0.0	0.0	0.0	0.0	0.0	0.0
240	0.0	0.0	0.0	0.0	0.0	0.0
12	0.0	0.0	0.0	0.0	0.0	0.0
24	0.0	0.0	0.0	0.0	0.0	0.0
72	0.0	0.0	0.0	0.0	0.0	0.0

BIO-RETENTION PIT 2 FLOOD STORAGE CALCULATION SHEET

TOTAL SITE AREA	38176 m^3
EQUIVALENT RUNOFF CO-EFFICIENT	0.92
EQUIVALENT IMPERVIOUS AREA	35122 m^3
TOTAL BIO-RETENTION	695 m^3
BIO-RETENTION PIT 2 AREA	**44** m^3
BIO-RETENTION PIT 2 CATCHMENT	**2224** m^2
INLET HEIGHT ABOVE PIT SURFACE	0.3 m
SEEPAGE DETENTION VOLUME	13.2 m^3
PAVEMENT STORAGE AREA	500 m^2
PAVEMENT STORAGE DEPTH	0.2 M
OUTLET PIPE CAPACITY	27
NUMBER OF OUTLET PIPES	1
TOTAL OUTLET CAPACITY	39.0 L/S
SOIL CONDUCTIVITY	200 MM/H
SEEPAGE RATE	0.056 L/S/M2
SEEPAGE OUTFLOW RATE	3.667

FLOOD STORAGE DEPTH REQUIRED IS EQUAL TO PROVIDED STORAGE DEPTH - THEREFORE OK

RAINFALL INTENSITY (mm/h)

	1	2	10	20	50	*100*
5	113	145	209	241	284	*318*
15	72	94	137	159	188	*211*
30	51	33	98	115	137	*154*
60	34.9	45.5	68	80	96	*108*
120	21	27.3	41.1	48.2	58	*65*
240	12.4	16.2	24.5	28.7	34.4	*38.9*
12	5.43	7.09	10.7	12.6	15.1	*17.1*
24	3.38	4.43	6.79	7.99	9.63	*10.9*
72	1.49	1.96	3.06	3.62	4.4	*5.02*

INFLOW RATE (L/s)

	1	2	10	20	50	*100*
5	70	90	129	149	175	*196*
15	44	58	85	98	116	*130*
30	32	20	61	71	85	*95*
60	22	28	42	49	59	*67*
120	13	17	25	30	36	*40*
240	8	10	15	18	21	*24*
12	3	4	7	8	9	*11*
24	2	3	4	5	6	*7*
72	1	1	2	2	3	*3*

TOTAL FALL OF RAIN (mm)

5	9	12	17	20	24	*27*
15	18	24	34	40	47	*53*
30	26	17	49	58	69	*77*
60	35	46	68	80	96	*108*
120	42	55	82	96	116	*130*
240	50	65	98	115	138	*156*
12	65	85	128	151	181	*205*
24	81	106	163	192	231	*262*
72	107	141	220	261	317	*361*

INFLOW VOLUME (m3)

5	21	27	39	45	53	*59*
15	40	52	76	88	105	*117*
30	57	37	109	128	152	*171*
60	78	101	151	178	213	*240*
120	93	121	183	214	258	*289*
240	110	144	218	255	306	*346*
12	145	189	286	336	403	*456*
24	180	236	362	426	514	*582*
72	239	314	490	580	704	*804*

VOLUME OVER INLET WEIR (m3)

5	8	14	26	31	39	*46*
15	27	39	63	75	91	*104*
30	44	23	96	115	139	*158*
60	64	88	138	165	200	*227*
120	80	108	170	201	245	*276*
240	97	131	205	242	293	*333*
12	132	176	272	323	390	*443*
24	167	223	349	413	501	*568*
72	225	301	477	566	691	*790*

CAPTURE RATE OVER INLET WEIR (L/s)

5	27	47	86	106	133	*154*
15	2	15	42	56	73	*88*
30	0	0	18	28	42	*52*
60	0	0	0	7	17	*24*
120	0	0	0	0	0	*0*
240	0	0	0	0	0	*0*
12	0	0	0	0	0	*0*
24	0	0	0	0	0	*0*
72	0	0	0	0	0	*0*

EXTENDED FLOOD STORAGE VOLUME (m3)

5	3	7	17	22	30	*36*
15	1	10	31	43	58	*70*
30	0	0	28	46	69	*87*
60	0	0	0	22	56	*82*
120	0	0	0	0	0	*0*
240	0	0	0	0	0	*0*
12	0	0	0	0	0	*0*
24	0	0	0	0	0	*0*
72	0	0	0	0	0	*0*

EXTENDED FLOOD STORAGE DEPTH (m3)

5	0.0	0.0	0.0	0.0	0.1	0.1
15	0.0	0.0	0.1	0.1	0.1	0.1
30	0.0	0.0	0.1	0.1	0.1	0.2
60	0.0	0.0	0.0	0.0	0.1	0.2
120	0.0	0.0	0.0	0.0	0.0	0.0
240	0.0	0.0	0.0	0.0	0.0	0.0
12	0.0	0.0	0.0	0.0	0.0	0.0
24	0.0	0.0	0.0	0.0	0.0	0.0
72	0.0	0.0	0.0	0.0	0.0	0.0

BIO-RETENTION PIT 3 FLOOD STORAGE CALCULATION SHEET

TOTAL SITE AREA	38176 m^3
EQUIVALENT RUNOFF CO-EFFICIENT	0.92
EQUIVALENT IMPERVIOUS AREA	35122 m^3
TOTAL BIO-RETENTION	695 m^3
BIO-RETENTION PIT 3 AREA	**19** m^3
BIO-RETENTION PIT 3 CATCHMENT	**960** m^2
INLET HEIGHT ABOVE PIT SURFACE	0.3 m
SEEPAGE DETENTION VOLUME	5.7 m^3
PAVEMENT STORAGE AREA	250 m^2
PAVEMENT STORAGE DEPTH	0.2 M
OUTLET PIPE CAPACITY	17
NUMBER OF OUTLET PIPES	1
TOTAL OUTLET CAPACITY	17.0 L/S
SOIL CONDUCTIVITY	200 MM/H
SEEPAGE RATE	0.056 L/S/M2
SEEPAGE OUTFLOW RATE	1.583

FLOOD STORAGE DEPTH REQUIRED IS LESS THAN PROVIDED STORAGE DEPTH - THEREFORE OK

RAINFALL INTENSITY (mm/h)

	1	2	10	20	50	*100*
5	113	145	209	241	284	*318*
15	72	94	137	159	188	*211*
30	51	33	98	115	137	*154*
60	34.9	45.5	68	80	96	*108*
120	21	27.3	41.1	48.2	58	*65*
240	12.4	16.2	24.5	28.7	34.4	*38.9*
12	5.43	7.09	10.7	12.6	15.1	*17.1*
24	3.38	4.43	6.79	7.99	9.63	*10.9*
72	1.49	1.96	3.06	3.62	4.4	*5.02*

INFLOW RATE (L/s)

	1	2	10	20	50	*100*
5	30	39	56	64	76	*85*
15	19	25	37	42	50	*56*
30	14	9	26	31	37	*41*
60	9	12	18	21	26	*29*
120	6	7	11	13	15	*17*
240	3	4	7	8	9	*10*
12	1	2	3	3	4	*5*
24	1	1	2	2	3	*3*
72	0	1	1	1	1	*1*

TOTAL FALL OF RAIN (mm)

5	9	12	17	20	24	*27*
15	18	24	34	40	47	*53*
30	26	17	49	58	69	*77*
60	35	46	68	80	96	*108*
120	42	55	82	96	116	*130*
240	50	65	98	115	138	*156*
12	65	85	128	151	181	*205*
24	81	106	163	192	231	*262*
72	107	141	220	261	317	*361*

INFLOW VOLUME (m3)

5	9	12	17	19	23	*25*
15	17	23	33	38	45	*51*
30	24	16	47	55	66	*74*
60	34	44	65	77	92	*104*
120	40	52	79	93	111	*125*
240	48	62	94	110	132	*149*
12	63	82	123	145	174	*197*
24	78	102	156	184	222	*251*
72	103	135	212	250	304	*347*

VOLUME OVER INLET WEIR (m3)

5	3	6	11	14	17	*20*
15	12	17	27	32	39	*45*
30	19	10	41	50	60	*68*
60	28	38	60	71	86	*98*
120	35	47	73	87	106	*119*
240	42	57	88	105	126	*144*
12	57	76	118	139	168	*191*
24	72	96	151	178	216	*245*
72	97	130	206	245	298	*341*

CAPTURE RATE OVER INLET WEIR (L/s)

5	12	20	37	46	57	*66*
15	1	6	18	24	32	*38*
30	0	0	8	12	18	*22*
60	0	0	0	3	7	*10*
120	0	0	0	0	0	*0*
240	0	0	0	0	0	*0*
12	0	0	0	0	0	*0*
24	0	0	0	0	0	*0*
72	0	0	0	0	0	*0*

EXTENDED FLOOD STORAGE VOLUME (m3)

5	1	3	7	10	13	*15*
15	0	4	13	18	25	*30*
30	0	0	12	20	30	*37*
60	0	0	0	9	24	*35*
120	0	0	0	0	0	*0*
240	0	0	0	0	0	*0*
12	0	0	0	0	0	*0*
24	0	0	0	0	0	*0*
72	0	0	0	0	0	*0*

EXTENDED FLOOD STORAGE DEPTH (m3)

5	0.0	0.0	0.0	0.0	0.1	0.1
15	0.0	0.0	0.1	0.1	0.1	0.1
30	0.0	0.0	0.0	0.1	0.1	0.1
60	0.0	0.0	0.0	0.0	0.1	0.1
120	0.0	0.0	0.0	0.0	0.0	0.0
240	0.0	0.0	0.0	0.0	0.0	0.0
12	0.0	0.0	0.0	0.0	0.0	0.0
24	0.0	0.0	0.0	0.0	0.0	0.0
72	0.0	0.0	0.0	0.0	0.0	0.0

BIO-RETENTION PIT 4 FLOOD STORAGE CALCULATION SHEET

TOTAL SITE AREA	38176 m^3
EQUIVALENT RUNOFF CO-EFFICIENT	0.92
EQUIVALENT IMPERVIOUS AREA	35122 m^3
TOTAL BIO-RETENTION	695 m^3
BIO-RETENTION PIT 4 AREA	7 m^3
BIO-RETENTION PIT 4 CATCHMENT	354 m^2
INLET HEIGHT ABOVE PIT SURFACE	0.3 m
SEEPAGE DETENTION VOLUME	2.1 m^3
PAVEMENT STORAGE AREA	30 m^2
PAVEMENT STORAGE DEPTH	0.2 M
OUTLET PIPE CAPACITY	27
NUMBER OF OUTLET PIPES	1
TOTAL OUTLET CAPACITY	27.0 L/S
SOIL CONDUCTIVITY	200 MM/H
SEEPAGE RATE	0.056 L/S/M2
SEEPAGE OUTFLOW RATE	0.583

FLOOD STORAGE DEPTH REQUIRED IS LESS THAN PROVIDED STORAGE DEPTH - THEREFORE OK

RAINFALL INTENSITY (mm/h)

	1	2	10	20	50	*100*
5	113	145	209	241	284	*318*
15	72	94	137	159	188	*211*
30	51	33	98	115	137	*154*
60	34.9	45.5	68	80	96	*108*
120	21	27.3	41.1	48.2	58	*65*
240	12.4	16.2	24.5	28.7	34.4	*38.9*
12	5.43	7.09	10.7	12.6	15.1	*17.1*
24	3.38	4.43	6.79	7.99	9.63	*10.9*
72	1.49	1.96	3.06	3.62	4.4	*5.02*

INFLOW RATE (L/s)

	1	2	10	20	50	*100*
5	11	14	21	24	28	*31*
15	7	9	13	16	18	*21*
30	5	3	10	11	13	*15*
60	3	4	7	8	9	*11*
120	2	3	4	5	6	*6*
240	1	2	2	3	3	*4*
12	1	1	1	1	1	*2*
24	0	0	1	1	1	*1*
72	0	0	0	0	0	*0*

TOTAL FALL OF RAIN (mm)

5	9	12	17	20	24	*27*
15	18	24	34	40	47	*53*
30	26	17	49	58	69	*77*
60	35	46	68	80	96	*108*
120	42	55	82	96	116	*130*
240	50	65	98	115	138	*156*
12	65	85	128	151	181	*205*
24	81	106	163	192	231	*262*
72	107	141	220	261	317	*361*

INFLOW VOLUME (m3)

5	3	4	6	7	8	*9*
15	6	8	12	14	17	*19*
30	9	6	17	20	24	*27*
60	12	16	24	28	34	*38*
120	15	19	29	34	41	*46*
240	18	23	35	41	49	*55*
12	23	30	45	53	64	*73*
24	29	38	58	68	82	*93*
72	38	50	78	92	112	*128*

VOLUME OVER INLET WEIR (m3)

5	1	2	4	5	6	*7*
15	4	6	10	12	15	*17*
30	7	4	15	18	22	*25*
60	10	14	22	26	32	*36*
120	13	17	27	32	39	*44*
240	15	21	33	39	47	*53*
12	21	28	43	51	62	*70*
24	27	36	56	66	80	*90*
72	36	48	76	90	110	*126*

CAPTURE RATE OVER INLET WEIR (L/s)

5	0	0	0	0	0	*4*
15	0	0	0	0	0	*0*
30	0	0	0	0	0	*0*
60	0	0	0	0	0	*0*
120	0	0	0	0	0	*0*
240	0	0	0	0	0	*0*
12	0	0	0	0	0	*0*
24	0	0	0	0	0	*0*
72	0	0	0	0	0	*0*

EXTENDED FLOOD STORAGE VOLUME (m3)

5	0	0	0	0	0	*1*
15	0	0	0	0	0	*0*
30	0	0	0	0	0	*0*
60	0	0	0	0	0	*0*
120	0	0	0	0	0	*0*
240	0	0	0	0	0	*0*
12	0	0	0	0	0	*0*
24	0	0	0	0	0	*0*
72	0	0	0	0	0	*0*

EXTENDED FLOOD STORAGE DEPTH (m3)

5	0.0	0.0	0.0	0.0	0.0	0.0
15	0.0	0.0	0.0	0.0	0.0	0.0
30	0.0	0.0	0.0	0.0	0.0	0.0
60	0.0	0.0	0.0	0.0	0.0	0.0
120	0.0	0.0	0.0	0.0	0.0	0.0
240	0.0	0.0	0.0	0.0	0.0	0.0
12	0.0	0.0	0.0	0.0	0.0	0.0
24	0.0	0.0	0.0	0.0	0.0	0.0
72	0.0	0.0	0.0	0.0	0.0	0.0

BIO-RETENTION PIT 5 FLOOD STORAGE CALCULATION SHEET

TOTAL SITE AREA	38176 m^3
EQUIVALENT RUNOFF CO-EFFICIENT	0.92
EQUIVALENT IMPERVIOUS AREA	35122 m^3
TOTAL BIO-RETENTION	695 m^3
BIO-RETENTION PIT 5 AREA	**29** m^3
BIO-RETENTION PIT 5 CATCHMENT	**1466** m^2
INLET HEIGHT ABOVE PIT SURFACE	0.3 m
SEEPAGE DETENTION VOLUME	8.7 m^3
PAVEMENT STORAGE AREA	350 m^2
PAVEMENT STORAGE DEPTH	0.2 M
OUTLET PIPE CAPACITY	27
NUMBER OF OUTLET PIPES	1
TOTAL OUTLET CAPACITY	27.0 L/S
SOIL CONDUCTIVITY	200 MM/H
SEEPAGE RATE	0.056 L/S/M2
SEEPAGE OUTFLOW RATE	2.417

FLOOD STORAGE OEPTH REQUIRED IS EQUAL TO PROVIDED STORAGE DEPTH - THEREFORE OK

RAINFALL INTENSITY (mm/h)

	1	2	10	20	50	*100*
5	113	145	209	241	284	*318*
15	72	94	137	159	188	*211*
30	51	33	98	115	137	*154*
60	34.9	45.5	68	80	96	*108*
120	21	27.3	41.1	48.2	58	*65*
240	12.4	16.2	24.5	28.7	34.4	*38.9*
12	5.43	7.09	10.7	12.6	15.1	*17.1*
24	3.38	4.43	6.79	7.99	9.63	*10.9*
72	1.49	1.96	3.06	3.62	4.4	*5.02*

INFLOW RATE (L/s)

	1	2	10	20	50	*100*
5	46	59	85	98	116	*129*
15	29	38	56	65	77	*86*
30	21	13	40	47	56	*63*
60	14	19	28	33	39	*44*
120	9	11	17	20	24	*26*
240	5	7	10	12	14	*16*
12	2	3	4	5	6	*7*
24	1	2	3	3	4	*4*
72	1	1	1	1	2	*2*

TOTAL FALL OF RAIN (mm)

5	9	12	17	20	24	*27*
15	18	24	34	40	47	*53*
30	26	17	49	58	69	*77*
60	35	46	68	80	96	*108*
120	42	55	82	96	116	*130*
240	50	65	98	115	138	*156*
12	65	85	128	151	181	*205*
24	81	106	163	192	231	*262*
72	107	141	220	261	317	*361*

INFLOW VOLUME (m3)

5	14	18	26	29	35	*39*
15	26	34	50	58	69	*77*
30	37	24	72	84	100	*113*
60	51	67	100	117	141	*158*
120	62	80	120	141	170	*191*
240	73	95	144	168	202	*228*
12	95	125	188	222	266	*301*
24	119	156	239	281	339	*383*
72	157	207	323	382	464	*530*

VOLUME OVER INLET WEIR (m3)

5	5	9	17	21	26	*30*
15	18	26	41	50	60	*69*
30	29	15	63	76	92	*104*
60	42	58	91	109	132	*150*
120	53	71	112	133	161	*182*
240	64	86	135	160	193	*219*
12	87	116	179	213	257	*292*
24	110	147	230	272	330	*375*
72	149	198	314	373	456	*521*

CAPTURE RATE OVER INLET WEIR (L/s)

5	17	30	56	69	86	*100*
15	0	9	26	35	47	*56*
30	0	0	10	17	26	*33*
60	0	0	0	3	10	*15*
120	0	0	0	0	0	*0*
240	0	0	0	0	0	*0*
12	0	0	0	0	0	*0*
24	0	0	0	0	0	*0*
72	0	0	0	0	0	*0*

EXTENDED FLOOD STORAGE VOLUME (m3)

5	2	5	11	15	19	*23*
15	0	6	20	27	37	*45*
30	0	0	17	28	43	*55*
60	0	0	0	10	33	*49*
120	0	0	0	0	0	*0*
240	0	0	0	0	0	*0*
12	0	0	0	0	0	*0*
24	0	0	0	0	0	*0*
72	0	0	0	0	0	*0*

EXTENDED FLOOD STORAGE DEPTH (m3)

5	0.0	0.0	0.0	0.0	0.1	0.1
15	0.0	0.0	0.1	0.1	0.1	0.1
30	0.0	0.0	0.0	0.1	0.1	0.2
60	0.0	0.0	0.0	0.0	0.1	0.1
120	0.0	0.0	0.0	0.0	0.0	0.0
240	0.0	0.0	0.0	0.0	0.0	0.0
12	0.0	0.0	0.0	0.0	0.0	0.0
24	0.0	0.0	0.0	0.0	0.0	0.0
72	0.0	0.0	0.0	0.0	0.0	0.0

BIO-RETENTION PIT 6 FLOOD STORAGE CALCULATION SHEET

TOTAL SITE AREA	38176 m^3
EQUIVALENT RUNOFF CO-EFFICIENT	0.92
EQUIVALENT IMPERVIOUS AREA	35122 m^3
TOTAL BIO-RETENTION	695 m^3
BIO-RETENTION PIT 6 AREA	**116** m^3
BIO-RETENTION PIT 6 CATCHMENT	**5862** m^2
INLET HEIGHT ABOVE PIT SURFACE	0.3 m
SEEPAGE DETENTION VOLUME	34.8 m^3
PAVEMENT STORAGE AREA	1000 m^2
PAVEMENT STORAGE DEPTH	0.2 M
OUTLET PIPE CAPACITY	225
NUMBER OF OUTLET PIPES	1
TOTAL OUTLET CAPACITY	225.0 L/S
SOIL CONDUCTIVITY	200 MM/H
SEEPAGE RATE	0.056 L/S/M2
SEEPAGE OUTFLOW RATE	9.667

FLOOD STORAGE DEPTH REQUIRED IS LESS THAN PROVIDED STORAGE DEPTH - THEREFORE OK

RAINFALL INTENSITY (mm/h)

	1	2	10	20	50	*100*
5	113	145	209	241	284	*318*
15	72	94	137	159	188	*211*
30	51	33	98	115	137	*154*
60	34.9	45.5	68	80	96	*108*
120	21	27.3	41.1	48.2	58	*65*
240	12.4	16.2	24.5	28.7	34.4	*38.9*
12	5.43	7.09	10.7	12.6	15.1	*17.1*
24	3.38	4.43	6.79	7.99	9.63	*10.9*
72	1.49	1.96	3.06	3.62	4.4	*5.02*

INFLOW RATE (L/s)

	1	2	10	20	50	*100*
5	184	236	340	392	462	*518*
15	117	153	223	259	306	*344*
30	83	54	160	187	223	*251*
60	57	74	111	130	156	*176*
120	34	44	67	78	94	*106*
240	20	26	40	47	56	*63*
12	9	12	17	21	25	*28*
24	6	7	11	13	16	*18*
72	2	3	5	6	7	*8*

TOTAL FALL OF RAIN (mm)

5	9	12	17	20	24	*27*
15	18	24	34	40	47	*53*
30	26	17	49	58	69	*77*
60	35	46	68	80	96	*108*
120	42	55	82	96	116	*130*
240	50	65	98	115	138	*156*
12	65	85	128	151	181	*205*
24	81	106	163	192	231	*262*
72	107	141	220	261	317	*361*

INFLOW VOLUME (m3)

5	55	71	102	118	139	*155*
15	106	138	201	233	276	*309*
30	149	97	287	337	402	*451*
60	205	267	399	469	563	*633*
120	246	320	482	565	680	*762*
240	291	380	574	673	807	*912*
12	382	499	753	886	1062	*1203*
24	476	623	955	1124	1355	*1534*
72	629	827	1292	1528	1857	*2119*

VOLUME OVER INLET WEIR (m3)

5	20	36	67	83	104	*121*
15	71	103	166	198	241	*274*
30	115	62	252	302	367	*417*
60	170	232	364	434	528	*598*
120	211	285	447	530	645	*727*
240	256	345	540	638	772	*877*
12	347	464	718	852	1027	*1168*
24	441	588	920	1089	1320	*1499*
72	594	792	1257	1493	1822	*2084*

CAPTURE RATE OVER INLET WEIR (L/s)

5	0	1	106	158	228	*283*
15	0	0	0	24	71	*109*
30	0	0	0	0	0	*16*
60	0	0	0	0	0	*0*
120	0	0	0	0	0	*0*
240	0	0	0	0	0	*0*
12	0	0	0	0	0	*0*
24	0	0	0	0	0	*0*
72	0	0	0	0	0	*0*

EXTENDED FLOOD STORAGE VOLUME (m3)

5	0	0	21	33	51	*66*
15	0	0	0	19	56	*87*
30	0	0	0	0	0	*27*
60	0	0	0	0	0	*0*
120	0	0	0	0	0	*0*
240	0	0	0	0	0	*0*
12	0	0	0	0	0	*0*
24	0	0	0	0	0	*0*
72	0	0	0	0	0	*0*

EXTENDED FLOOD STORAGE DEPTH (m3)

5	0.0	0.0	0.0	0.0	0.1	0.1
15	0.0	0.0	0.0	0.0	0.1	0.1
30	0.0	0.0	0.0	0.0	0.0	0.0
60	0.0	0.0	0.0	0.0	0.0	0.0
120	0.0	0.0	0.0	0.0	0.0	0.0
240	0.0	0.0	0.0	0.0	0.0	0.0
12	0.0	0.0	0.0	0.0	0.0	0.0
24	0.0	0.0	0.0	0.0	0.0	0.0
72	0.0	0.0	0.0	0.0	0.0	0.0

BIO-RETENTION PIT 7 FLOOD STORAGE CALCULATION SHEET

TOTAL SITE AREA	38176 m^3
EQUIVALENT RUNOFF CO-EFFICIENT	0.92
EQUIVALENT IMPERVIOUS AREA	35122 m^3
TOTAL BIO-RETENTION	695 m^3
BIO-RETENTION PIT 7 AREA	**48** m^3
BIO-RETENTION PIT 7 CATCHMENT	**2426** m^2
INLET HEIGHT ABOVE PIT SURFACE	0.3 m
SEEPAGE DETENTION VOLUME	14.4 m^3
PAVEMENT STORAGE AREA	400 m^2
PAVEMENT STORAGE DEPTH	0.2 M
OUTLET PIPE CAPACITY	27
NUMBER OF OUTLET PIPES	1
TOTAL OUTLET CAPACITY	45.0 L/S
SOIL CONDUCTIVITY	200 MM/H
SEEPAGE RATE	0.056 L/S/M2
SEEPAGE OUTFLOW RATE	4

FLOOD STORAGE DEPTH REQUIRED IS EQUAL TO PROVIDED STORAGE DEPTH - THEREFORE OK

RAINFALL INTENSITY (mm/h)

	1	2	10	20	50	*100*
5	113	145	209	241	284	*318*
15	72	94	137	159	188	*211*
30	51	33	98	115	137	*154*
60	34.9	45.5	68	80	96	*108*
120	21	27.3	41.1	48.2	58	*65*
240	12.4	16.2	24.5	28.7	34.4	*38.9*
12	5.43	7.09	10.7	12.6	15.1	*17.1*
24	3.38	4.43	6.79	7.99	9.63	*10.9*
72	1.49	1.96	3.06	3.62	4.4	*5.02*

INFLOW RATE (L/s)

	1	2	10	20	50	*100*
5	76	98	141	162	191	*214*
15	49	63	92	107	127	*142*
30	34	22	66	77	92	*104*
60	24	31	46	54	65	*73*
120	14	18	28	32	39	*44*
240	8	11	17	19	23	*26*
12	4	5	7	8	10	*12*
24	2	3	5	5	6	*7*
72	1	1	2	2	3	*3*

TOTAL FALL OF RAIN (mm)

5	9	12	17	20	24	*27*
15	18	24	34	40	47	*53*
30	26	17	49	58	69	*77*
60	35	46	68	80	96	*108*
120	42	55	82	96	116	*130*
240	50	65	98	115	138	*156*
12	65	85	128	151	181	*205*
24	81	106	163	192	231	*262*
72	107	141	220	261	317	*361*

INFLOW VOLUME (m3)

5	23	29	42	49	57	*64*
15	44	57	83	96	114	*128*
30	62	40	119	139	166	*187*
60	85	110	165	194	233	*262*
120	102	132	199	234	281	*315*
240	120	157	238	278	334	*377*
12	158	206	311	367	440	*498*
24	197	258	395	465	561	*635*
72	260	342	534	632	768	*877*

VOLUME OVER INLET WEIR (m3)

5	8	15	28	34	43	*50*
15	29	43	69	82	100	*114*
30	47	26	104	125	152	*172*
60	70	96	151	180	218	*248*
120	87	118	185	219	267	*301*
240	106	143	223	264	319	*363*
12	144	192	297	352	425	*483*
24	182	243	381	451	546	*620*
72	246	328	520	618	754	*862*

CAPTURE RATE OVER INLET WEIR (L/s)

5	27	49	92	113	142	*165*
15	0	14	43	58	78	*93*
30	0	0	17	28	43	*55*
60	0	0	0	5	16	*24*
120	0	0	0	0	0	*0*
240	0	0	0	0	0	*0*
12	0	0	0	0	0	*0*
24	0	0	0	0	0	*0*
72	0	0	0	0	0	*0*

EXTENDED FLOOD STORAGE VOLUME (m3)

5	3	7	18	24	32	*38*
15	0	10	32	45	61	*74*
30	0	0	27	46	71	*91*
60	0	0	0	16	53	*81*
120	0	0	0	0	0	*0*
240	0	0	0	0	0	*0*
12	0	0	0	0	0	*0*
24	0	0	0	0	0	*0*
72	0	0	0	0	0	*0*

EXTENDED FLOOD STORAGE DEPTH (m3)

5	0.0	0.0	0.0	0.1	0.1	0.1
15	0.0	0.0	0.1	0.1	0.2	0.2
30	0.0	0.0	0.1	0.1	0.2	0.2
60	0.0	0.0	0.0	0.0	0.1	0.2
120	0.0	0.0	0.0	0.0	0.0	0.0
240	0.0	0.0	0.0	0.0	0.0	0.0
12	0.0	0.0	0.0	0.0	0.0	0.0
24	0.0	0.0	0.0	0.0	0.0	0.0
72	0.0	0.0	0.0	0.0	0.0	0.0

BIO-RETENTION PIT 8 FLOOD STORAGE CALCULATION SHEET

TOTAL SITE AREA	38176 m^3
EQUIVALENT RUNOFF CO-EFFICIENT	0.92
EQUIVALENT IMPERVIOUS AREA	35122 m^3
TOTAL BIO-RETENTION	695 m^3
BIO-RETENTION PIT 8 AREA	**174** m^3
BIO-RETENTION PIT 8 CATCHMENT	**8793** m^2
INLET HEIGHT ABOVE PIT SURFACE	0.3 m
SEEPAGE DETENTION VOLUME	52.2 m^3
PAVEMENT STORAGE AREA	375 m^2
PAVEMENT STORAGE DEPTH	0.3 M
OUTLET PIPE CAPACITY	27
NUMBER OF OUTLET PIPES	1
TOTAL OUTLET CAPACITY	155.0 L/S
SOIL CONDUCTIVITY	200 MM/H
SEEPAGE RATE	0.056 L/S/M2
SEEPAGE OUTFLOW RATE	14.5

FLDOD STORAGE DEPTH REQUIRED EXCEEDS STORAGE CAPACITY FOR > Q10 EVENTS
THEREFORE OVERLAND FLOW OCCURS TO RIVER FOR > Q10 EVENTS

RAINFALL INTENSITY (mm/h)

	1	2	10	20	50	*100*
5	113	145	209	241	284	*318*
15	72	94	137	159	188	*211*
30	51	33	98	115	137	*154*
60	34.9	45.5	68	80	96	*108*
120	21	27.3	41.1	48.2	58	*65*
240	12.4	16.2	24.5	28.7	34.4	*38.9*
12	5.43	7.09	10.7	12.6	15.1	*17.1*
24	3.38	4.43	6.79	7.99	9.63	*10.9*
72	1.49	1.96	3.06	3.62	4.4	*5.02*

INFLOW RATE (L/s)

	1	2	10	20	50	*100*
5	276	354	510	589	694	*777*
15	176	230	335	388	459	*515*
30	125	81	239	281	335	*376*
60	85	111	166	195	234	*264*
120	51	67	100	118	142	*159*
240	30	40	60	70	84	*95*
12	13	17	26	31	37	*42*
24	8	11	17	20	24	*27*
72	4	5	7	9	11	*12*

TOTAL FALL OF RAIN (mm)

5	9	12	17	20	24	*27*
15	18	24	34	40	47	*53*
30	26	17	49	58	69	*77*
60	35	46	68	80	96	*108*
120	42	55	82	96	116	*130*
240	50	65	98	115	138	*156*
12	65	85	128	151	181	*205*
24	81	106	163	192	231	*262*
72	107	141	220	261	317	*361*

INFLOW VOLUME (m3)

5	83	106	153	177	208	*233*
15	158	207	301	350	413	*464*
30	224	145	431	506	602	*677*
60	307	400	598	703	844	*950*
120	369	480	723	848	1020	*1143*
240	436	570	862	1009	1210	*1368*
12	573	748	1129	1330	1593	*1804*
24	713	935	1433	1686	2032	*2300*
72	943	1241	1937	2292	2786	*3178*

VOLUME OVER INLET WEIR (m3)

5	31	54	101	124	156	*181*
15	106	154	249	297	361	*412*
30	172	93	379	453	550	*625*
60	255	348	546	651	792	*897*
120	317	428	671	795	968	*1091*
240	384	518	810	957	1158	*1316*
12	521	696	1077	1277	1541	*1752*
24	661	883	1381	1634	1980	*2248*
72	891	1189	1885	2240	2733	*3126*

CAPTURE RATE OVER INLET WEIR (L/s)

5	107	185	341	419	524	*607*
15	6	60	165	219	290	*346*
30	0	0	70	111	165	*207*
60	0	0	0	26	65	*94*
120	0	0	0	0	0	*0*
240	0	0	0	0	0	*0*
12	0	0	0	0	0	*0*
24	0	0	0	0	0	*0*
72	0	0	0	0	0	*0*

EXTENDED FLOOD STORAGE VOLUME (m3)

5	12	28	67	89	118	*141*
15	4	40	123	168	228	*276*
30	0	0	111	180	271	*343*
60	0	0	0	86	219	*321*
120	0	0	0	0	0	*0*
240	0	0	0	0	0	*0*
12	0	0	0	0	0	*0*
24	0	0	0	0	0	*0*
72	0	0	0	0	0	*0*

EXTENDED FLOOD STORAGE DEPTH (m3)

5	0.0	0.1	0.2	0.2	0.3	0.4
15	0.0	0.1	0.3	0.4	0.6	0.7
30	0.0	0.0	0.3	0.5	0.7	0.9
60	0.0	0.0	0.0	0.2	0.6	0.9
120	0.0	0.0	0.0	0.0	0.0	0.0
240	0.0	0.0	0.0	0.0	0.0	0.0
12	0.0	0.0	0.0	0.0	0.0	0.0
24	0.0	0.0	0.0	0.0	0.0	0.0
72	0.0	0.0	0.0	0.0	0.0	0.0

BIO-RETENTION PIT 1 FLOOD STORAGE CALCULATION SHEET

TOTAL SITE AREA	38176 m^3
EQUIVALENT RUNOFF CO-EFFICIENT	0.92
EQUIVALENT IMPERVIOUS AREA	35122 m^3
TOTAL BIO-RETENTION	695 m^3
BIO-RETENTION PIT 1 AREA	**225** m^3
BIO-RETENTION PIT 1 CATCHMENT	**11370** m^2
INLET HEIGHT ABOVE PIT SURFACE	0.3 m
SEEPAGE DETENTION VOLUME	67.5 m^3
PAVEMENT STORAGE AREA	225 m^2
PAVEMENT STORAGE DEPTH	1.5 M
OUTLET PIPE CAPACITY	260
NUMBER OF OUTLET PIPES	1
TOTAL OUTLET CAPACITY	260.0 L/S
SOIL CONDUCTIVITY	200 MM/H
SEEPAGE RATE	0.056 L/S/M2
SEEPAGE OUTFLOW RATE	18.75

FLOOD STORAGE DEPTH REQUIRED IS EQUAL TO PROVIDED STORAGE DEPTH - THEREFORE OK

RAINFALL INTENSITY (mm/h)

	1	2	10	20	50	*100*
5	113	145	209	241	284	*318*
15	72	94	137	159	188	*211*
30	51	33	98	115	137	*154*
60	34.9	45.5	68	80	96	*108*
120	21	27.3	41.1	48.2	58	*65*
240	12.4	16.2	24.5	28.7	34.4	*38.9*
12	5.43	7.09	10.7	12.6	15.1	*17.1*
24	3.38	4.43	6.79	7.99	9.63	*10.9*
72	1.49	1.96	3.06	3.62	4.4	*5.02*

INFLOW RATE (L/s)

	1	2	10	20	50	*100*
5	357	458	660	761	897	*1004*
15	227	297	433	502	594	*666*
30	161	104	310	363	433	*486*
60	110	144	215	253	303	*341*
120	66	86	130	152	183	*205*
240	39	51	77	91	109	*123*
12	17	22	34	40	48	*54*
24	11	14	21	25	30	*34*
72	5	6	10	11	14	*16*

TOTAL FALL OF RAIN (mm)

5	9	12	17	20	24	*27*
15	18	24	34	40	47	*53*
30	26	17	49	58	69	*77*
60	35	46	68	80	96	*108*
120	42	55	82	96	116	*130*
240	50	65	98	115	138	*156*
12	65	85	128	151	181	*205*
24	81	106	163	192	231	*262*
72	107	141	220	261	317	*361*

INFLOW VOLUME (m3)

5	107	137	198	228	269	*301*
15	205	267	389	452	534	*600*
30	290	188	557	654	779	*876*
60	397	517	773	910	1092	*1228*
120	478	621	935	1096	1319	*1478*
240	564	737	1114	1305	1565	*1769*
12	741	967	1460	1719	2060	*2333*
24	922	1209	1853	2180	2628	*2974*
72	1220	1605	2505	2964	3602	*4110*

VOLUME OVER INLET WEIR (m3)

5	40	70	131	161	202	*234*
15	137	200	322	384	467	*532*
30	222	120	490	586	711	*808*
60	329	450	706	842	1024	*1161*
120	410	553	867	1029	1251	*1411*
240	496	669	1047	1238	1497	*1702*
12	673	900	1392	1652	1993	*2266*
24	855	1141	1785	2113	2560	*2907*
72	1152	1537	2438	2896	3535	*4042*

CAPTURE RATE OVER INLET WEIR (L/s)

5	78	179	381	482	618	*726*
15	0	18	154	223	315	*388*
30	0	0	31	84	154	*208*
60	0	0	0	0	24	*62*
120	0	0	0	0	0	*0*
240	0	0	0	0	0	*0*
12	0	0	0	0	0	*0*
24	0	0	0	0	0	*0*
72	0	0	0	0	0	*0*

EXTENDED FLOOD STORAGE VOLUME (m3)

5	9	27	75	102	139	*169*
15	0	12	115	171	248	*310*
30	0	0	49	136	253	*345*
60	0	0	0	0	83	*212*
120	0	0	0	0	0	*0*
240	0	0	0	0	0	*0*
12	0	0	0	0	0	*0*
24	0	0	0	0	0	*0*
72	0	0	0	0	0	*0*

EXTENDED FLOOD STORAGE DEPTH (m3)

5	0.0	0.1	0.3	0.5	0.6	0.8
15	0.0	0.1	0.5	0.8	1.1	1.4
30	0.0	0.0	0.2	0.6	1.1	1.5
60	0.0	0.0	0.0	0.0	0.4	0.9
120	0.0	0.0	0.0	0.0	0.0	0.0
240	0.0	0.0	0.0	0.0	0.0	0.0
12	0.0	0.0	0.0	0.0	0.0	0.0
24	0.0	0.0	0.0	0.0	0.0	0.0
72	0.0	0.0	0.0	0.0	0.0	0.0

BIORETENTION DESIGN

1

Location	IPSWICH
Development Type	INDUSTRIAL

SITE AREAS

Roof Area	0	m^2
Pavement Area	1520	m^2
Landscape Area	0	m^2
External Road Area	0	m^2
Upstream Roof Area	0	m^2
Upstream Pavement Area	0	m^2
Upstream Overland Flow Area	0	m^2
Total Area	1520	m^2

BIORETENTION DATA

Max.BioDentention Height above Overflow	0.6	m	
Vegetation Height	0.4	m	
Detention Depth (0 - 0.3m Max.)	0.3	m	Depth Okay
Filter Media Depth	0.6	m	Depth Okay
Filter Media Transition Depth	0.1	m	
Width - Flat	1	m	
Slope - Left (H:V)	0		
Slope - Right (H:V)	0		
Length	30	m	
Surface Slope	0.10%		
Inlet Pipe Diameter	0.45		
Inlet Pipe Slope	1.00%		
Ag Pipe Diameter	0.1	m	
Base Slope	0.05%		
Number Ag Main Outlet Pipes	5		
Number Ag Sub Pipes	20		Spacing Okay

RAINFALL AND HYDRAULIC DATA

Time of Concentration	15 MIN. STORM	
3mth ARI	36	mm/hr
2yr ARI	94	mm/hr
10yr ARI	137	mm/hr
50yr ARI	188	mm/hr
C_{ROOF}	1.0	
$C_{PAVEMENT}$	0.9	
$C_{LANDSCAPE}$	0.75	
Hydraulic Conductivity	200	mm/hr (200mm/hr Max)
$n_{BIORETENTION\ SWALE}$	0.04	
Overflow Pit Coefficient	1.66	
Outlet Pipe Coefficient	0.61	
Outlet Pipe Slot Area	1050	mm^2/m

BIORETENTION DATA

BioRetention Area	30	m^2	
BioRetention vs Site Area Percentage	1.97%		
BioRetention Volume	9	m^3	
TSS Removal	87%		Okay
TP Removal	75%		Okay
TN Removal	42%		Okay
Inlet Flow 3m ARI	14	L/s	
Inlet Flow 2yr ARI	36	L/s	
Inlet Flow 10yr ARI	52	L/s	
Inlet Flow 50/100yr ARI	71	L/s	
$V_{INTLET\ PIPE\ 2YR\ ARI}$	0.1	m/s	Okay
$V_{INTLET\ PIPE\ 50YR\ ARI}$	0.2	m/s	Okay
$Q_{IMAX\ BIORETENTION\ SWALE}$	78	L/s	Okay - Bypass flow > 50YR ARI
$V_{2YR\ ARI\ BIORETENTION\ SWALE}$	0.12	m/s	Okay
$V_{50/100YR\ ARI\ BIORETENTION\ SWALE}$	0.24	m/s	Okay
$Q_{BIORETENTION\ INFILTRATION}$	2.5	L/s	Fails - Infiltration < Qinflow, Requires Storage See Below
$Volume_{BIORETENTION\ INFILTRATION}$	10.1	m^3	Storage Requirement see Storege Calculations Attached
$Q_{SUBSOIL\ PIPE\ PERFORATIONS}$	145.30	L/s	Okay
$Q_{OUTLET\ PIPE}$	3.75	L/s	Okay
$A_{OVERFLOW\ PIT\ -\ WEIR}$	0.00	m^2	
$A_{OVERFLOW\ PIT\ -\ ORIFFICE}$	0.05	m^2	
$Q_{OVERFLOW\ PIT\ SIZE}$	300x300 PIT		

BIORETENTION DESIGN
2

Location	IPSWICH
Development Type	INDUSTRIAL

SITE AREAS

Roof Area	0	m^2
Pavement Area	2220	m^2
Landscape Area	0	m^2
External Road Area	0	m^2
Upstream Roof Area	0	m^2
Upstream Pavement Area	0	m^2
Upstream Overland Flow Area	0	m^2
Total Area	2220	m^2

BIORETENTION DATA

Max.BioDentention Height above Overflow	0.6	m	
Vegetation Height	0.4	m	
Detention Depth (0 - 0.3m Max.)	0.3	m	Depth Okay
Filter Media Depth	0.6	m	Depth Okay
Filter Media Transition Depth	0.1	m	
Width - Flat	1	m	
Slope - Left (H:V)	0		
Slope - Right (H:V)	0		
Length	44	m	
Surface Slope	0.10%		
Inlet Pipe Diameter	0.45		
Inlet Pipe Slope	1.00%		
Ag Pipe Diameter	0.1	m	
Base Slope	0.05%		
Number Ag Main Outlet Pipes	8		
Number Ag Sub Pipes	30		Spacing Okay

RAINFALL AND HYDRAULIC DATA

Time of Concentration	15 MIN. STORM	
3mth ARI	36	mm/hr
2yr ARI	94	mm/hr
10yr ARI	137	mm/hr
50yr ARI	188	mm/hr
C_{ROOF}	1.0	
$C_{PAVEMENT}$	0.9	
$C_{LANDSCAPE}$	0.75	
Hydraulic Conductivity	200	mm/hr (200mm/hr Max)
$n_{BIORETENTION\ SWALE}$	0.04	
Overflow Pit Coefficient	1.66	
Outlet Pipe Coefficient	0.61	
Outlet Pipe Slot Area	1050	mm^2/m

BIORETENTION DATA

BioRetention Area	44	m^2	
BioRetention vs Site Area Percentage	1.98%		
BioRetention Volume	13.2	m^3	
TSS Removal	87%		Okay
TP Removal	75%		Okay
TN Removal	42%		Okay
Inlet Flow 3m ARI	20	L/s	
Inlet Flow 2yr ARI	52	L/s	
Inlet Flow 10yr ARI	76	L/s	
Inlet Flow 50/100yr ARI	104	L/s	
$V_{INTLET\ PIPE\ 2YR\ ARI}$	0.1	m/s	Okay
$V_{INTLET\ PIPE\ 50YR\ ARI}$	0.3	m/s	Okay
$Q_{8MAX\ BIORETENTION\ SWALE}$	78	L/s	Fails - Bypass Capacity Insufficient
$V_{2YR\ ARI\ BIORETENTION\ SWALE}$	0.17	m/s	Okay
$V_{50/100YR\ ARI\ BIORETENTION\ SWALE}$	0.35	m/s	Okay
$Q_{BIORETENTION\ INFILTRATION}$	3.7	L/s	Fails - Infiltration < Qinflow, Requires Storage See Below
$Volume_{BIORETENTION\ INFILTRATION}$	14.7	m^3	Storage Requirement see Storage Calculations Attached
$Q_{SUBSOIL\ PIPE\ PERFORATIONS}$	215.05	L/s	Okay
$Q_{OUTLET\ PIPE}$	6.01	L/s	Okay
$A_{OVERFLOW\ PIT\ -\ WEIR}$	0.00	m^2	
$A_{OVERFLOW\ PIT\ -\ ORIFFICE}$	0.07	m^2	
$Q_{OVERFLOW\ PIT\ SIZE}$	300x300 PIT		

BIORETENTION DESIGN
3

Location	IPSWICH
Development Type	INDUSTRIAL

SITE AREAS

Roof Area	0	m^2
Pavement Area	960	m^2
Landscape Area	0	m^2
External Road Area	0	m^2
Upstream Roof Area	0	m^2
Upstream Pavement Area	0	m^2
Upstream Overland Flow Area	0	m^2
Total Area	960	m^2

BIORETENTION DATA

Max.BioDentention Height above Overflow	0.6	m	
Vegetation Height	0.4	m	
Detention Depth (0 - 0.3m Max.)	0.3	m	Depth Okay
Filter Media Depth	0.6	m	Depth Okay
Filter Media Transition Depth	0.1	m	
Width - Flat	1	m	
Slope - Left (H:V)	0		
Slope - Right (H:V)	0		
Length	19	m	
Surface Slope	0.10%		
Inlet Pipe Diameter	0.45		
Inlet Pipe Slope	1.00%		
Ag Pipe Diameter	0.1	m	
Base Slope	0.05%		
Number Ag Main Outlet Pipes	3		
Number Ag Sub Pipes	13		Spacing Okay

RAINFALL AND HYDRAULIC DATA

Time of Concentration	15 MIN. STORM	
3mth ARI	36	mm/hr
2yr ARI	94	mm/hr
10yr ARI	137	mm/hr
50yr ARI	188	mm/hr
C_{ROOF}	1.0	
$C_{PAVEMENT}$	0.9	
$C_{LANDSCAPE}$	0.75	
Hydraulic Conductivity	200	mm/hr. (200mm/hr Max)
$n_{BIORETENTION\ SWALE}$	0.04	
Overflow Pit Coefficient	1.66	
Outlet Pipe Coefficient	0.61	
Outlet Pipe Slot Area	1050	mm^2/m

BIORETENTION DATA

BioRetention Area	19	m^2	
BioRetention vs Site Area Percentage	1.98%		
BioRetention Volume	5.7	m^3	
TSS Removal	87%		Okay
TP Removal	75%		Okay
TN Removal	42%		Okay
Inlet Flow 3m ARI	9	L/s	
Inlet Flow 2yr ARI	23	L/s	
Inlet Flow 10yr ARI	33	L/s	
Inlet Flow 50/100yr ARI	45	L/s	
$V_{INTLET\ PIPE\ 2YR\ ARI}$	0.1	m/s	Okay
$V_{INTLET\ PIPE\ 50YR\ ARI}$	0.1	m/s	Okay
$Q_{IMAX\ BIORETENTION\ SWALE}$	78	L/s	Okay - Bypass flow > 50YR ARI
$V_{2YR\ ARI\ BIORETENTION\ SWALE}$	0.08	m/s	Okay
$V_{50/100YR\ ARI\ BIORETENTION\ SWALE}$	0.15	m/s	Okay
$Q_{BIORETENTION\ INFILTRATION}$	1.6	L/s	Fails - Infiltration < Qinflow, Requires Storage See Below
$Volume_{BIORETENTION\ INFILTRATION}$	6.4	m^3	Storage Requirement see Storage Calculations Attached
$Q_{SUBSOIL\ PIPE\ PERFORATIONS}$	92.99	L/s	Okay
$Q_{OUTLET\ PIPE}$	2.25	L/s	Okay
$A_{OVERFLOW\ PIT\ -\ WEIR}$	0.00	m^2	
$A_{OVERFLOW\ PIT\ -\ ORIFFICE}$	0.03	m^2	
$Q_{OVERFLOW\ PIT\ SIZE}$	300x300 PIT		

BIORETENTION DESIGN

4

Location	IPSWICH
Development Type	INDUSTRIAL

SITE AREAS

Roof Area	0	m^2
Pavement Area	325	m^2
Landscape Area	0	m^2
External Road Area	0	m^2
Upstream Roof Area	0	m^2
Upstream Pavement Area	0	m^2
Upstream Overland Flow Area	0	m^2
Total Area	325	m^2

BIORETENTION DATA

Max.BioDentention Height above Overflow	0.6	m	
Vegetation Height	0.4	m	
Detention Depth (0 - 0.3m Max.)	0.3	m	Depth Okay
Filter Media Depth	0.6	m	Depth Okay
Filter Media Transition Depth	0.1	m	
Width - Flat	1	m	
Slope - Left (H:V)	0		
Slope - Right (H:V)	0		
Length	7	m	
Surface Slope	0.10%		
Inlet Pipe Diameter	0.45		
Inlet Pipe Slope	1.00%		
Ag Pipe Diameter	0.1	m	
Base Slope	0.05%		
Number Ag Main Outlet Pipes	2		
Number Ag Sub Pipes	6		Spacing Okay

RAINFALL AND HYDRAULIC DATA

Time of Concentration	15 MIN. STORM	
3mth ARI	36	mm/hr
2yr ARI	94	mm/hr
10yr ARI	137	mm/hr
50yr ARI	188	mm/hr
C_{ROOF}	1.0	
$C_{PAVEMENT}$	0.9	
$C_{LANDSCAPE}$	0.75	
Hydraulic Conductivity	200	mm/hr (200mm/hr Max)
$n_{BIORETENTION\ SWALE}$	0.04	
Overflow Pit Coefficient	1.66	
Outlet Pipe Coefficient	0.61	
Outlet Pipe Slot Area	1050	mm^2/m

BIORETENTION DATA

BioRetention Area	7	m^2	
BioRetention vs Site Area Percentage	2.15%		
BioRetention Volume	2.1	m^3	
TSS Removal	87%		Okay
TP Removal	76%		Okay
TN Removal	43%		Okay
Inlet Flow 3m ARI	3	L/s	
Inlet Flow 2yr ARI	8	L/s	
Inlet Flow 10yr ARI	11	L/s	
Inlet Flow 50/100yr ARI	15	L/s	
$V_{INTLET\ PIPE\ 2YR\ ARI}$	0.0	m/s	Okay
$V_{INTLET\ PIPE\ 50YR\ ARI}$	0.0	m/s	Okay
$Q_{IMAX\ BIORETENTION\ SWALE}$	78	L/s	Okay - Bypass flow > 50YR ARI
$V_{2YR\ ARI\ BIORETENTION\ SWALE}$	0.03	m/s	Okay
$V_{50/100YR\ ARI\ BIORETENTION\ SWALE}$	0.05	m/s	Okay
$Q_{BIORETENTION\ INFILTRATION}$	0.6	L/s	Fails - Infiltration < Qinflow, Requires Storage See Below
$Volume_{BIORETENTION\ INFILTRATION}$	2.1	m^3	Storage Requirement see Storage Calculations Attached
$Q_{SUBSOIL\ PIPE\ PERFORATIONS}$	37.78	L/s	Okay
$Q_{OUTLET\ PIPE}$	1.50	L/s	Okay
$A_{OVERFLOW\ PIT\ -\ WEIR}$	0.00	m^2	
$A_{OVERFLOW\ PIT\ -\ ORIFFICE}$	0.01	m^2	
$Q_{OVERFLOW\ PIT\ SIZE}$	300x300 PIT		

BIORETENTION DESIGN

5

Location	IPSWICH
Development Type	INDUSTRIAL

SITE AREAS

Roof Area	0	m^2
Pavement Area	1460	m^2
Landscape Area	0	m^2
External Road Area	0	m^2
Upstream Roof Area	0	m^2
Upstream Pavement Area	0	m^2
Upstream Overland Flow Area	0	m^2
Total Area	1460	m^2

BIORETENTION DATA

Max.BioDentention Height above Overflow	0.6	m	
Vegetation Height	0.4	m	
Detention Depth (0 - 0.3m Max.)	0.4	m	Depth Okay
Filter Media Depth	0.6	m	Depth Okay
Filter Media Transition Depth	0.1	m	
Width - Flat	1	m	
Slope - Left (H:V)	0		
Slope - Right (H:V)	0		
Length	29	m	
Surface Slope	0.10%		
Inlet Pipe Diameter	0.45		
Inlet Pipe Slope	1.00%		
Ag Pipe Diameter	0.1	m	
Base Slope	0.05%		
Number Ag Main Outlet Pipes	5		
Number Ag Sub Pipes	6		Exceeds maximum 1.5m Spacing

RAINFALL AND HYDRAULIC DATA

Time of Concentration	15 MIN. STORM	
3mth ARI	36	mm/hr
2yr ARI	94	mm/hr
10yr ARI	137	mm/hr
50yr ARI	188	mm/hr
C_{ROOF}	1.0	
$C_{PAVEMENT}$	0.9	
$C_{LANDSCAPE}$	0.75	
Hydraulic Conductivity	200	mm/hr (200mm/hr Max)
$n_{BIORETENTION\ SWALE}$	0.04	
Overflow Pit Coefficient	1.66	
Outlet Pipe Coefficient	0.61	
Outlet Pipe Slot Area	1050	mm^2/m

BIORETENTION DATA

BioRetention Area	29	m^2	
BioRetention vs Site Area Percentage	1.99%		
BioRetention Volume	11.6	m^3	
TSS Removal	87%		Okay
TP Removal	75%		Okay
TN Removal	42%		Okay
Inlet Flow 3m ARI	13	L/s	
Inlet Flow 2yr ARI	34	L/s	
Inlet Flow 10yr ARI	50	L/s	
Inlet Flow 50/100yr ARI	69	L/s	
$V_{INTLET\ PIPE\ 2YR\ ARI}$	0.1	m/s	Okay
$V_{INTLET\ PIPE\ 50YR\ ARI}$	0.2	m/s	Okay
$Q_{IMAX\ BIORETENTION\ SWALE}$	116	L/s	Okay - Bypass flow > 50YR ARI
$V_{2YR\ ARI\ BIORETENTION\ SWALE}$	0.09	m/s	Okay
$V_{50/100YR\ ARI\ BIORETENTION\ SWALE}$	0.17	m/s	Okay
$Q_{BIORETENTION\ INFILTRATION}$	2.7	L/s	Fails - Infiltration < Qinflow, Requires Storage See Below
$Volume_{BIORETENTION\ INFILTRATION}$	9.4	m^3	Okay
$Q_{SUBSOIL\ PIPE\ PERFORATIONS}$	106.45	L/s	Okay
$Q_{OUTLET\ PIPE}$	3.75	L/s	Okay
$A_{OVERFLOW\ PIT\ -\ WEIR}$	0.00	m^2	
$A_{OVERFLOW\ PIT\ -\ ORIFFICE}$	0.05	m^2	
$Q_{OVERFLOW\ PIT\ SIZE}$	300x300 PIT		

BIORETENTION DESIGN
6

Location	IPSWICH
Development Type	INDUSTRIAL

SITE AREAS			
Roof Area	0	m^2	
Pavement Area	5800	m^2	
Landscape Area	0	m^2	
External Road Area	0	m^2	
Upstream Roof Area	0	m^2	
Upstream Pavement Area	0	m^2	
Upstream Overland Flow Area	0	m^2	
Total Area	5800	m^2	
BIORETENTION DATA			
Max.BioDentention Height above Overflow	0.6	m	
Vegetation Height	0.4	m	
Detention Depth (0 - 0.3m Max,)	0.3	m	Depth Okay
Filter Media Depth	0.6	m	Depth Okay
Filter Media Transition Depth	0.1	m	
Width - Flat	1.65	m	
Slope - Left (H:V)	0		
Slope - Right (H:V)	0		
Length	70	m	
Surface Slope	0.10%		
Inlet Pipe Diameter	0.45		
Inlet Pipe Slope	1.00%		
Ag Pipe Diameter	0.1	m	
Base Slope	0.10%		
Number Ag Main Outlet Pipes	10		
Number Ag Sub Pipes	48		Spacing Okay

RAINFALL AND HYDRAULIC DATA		
Time of Concentration	15 MIN. STORM	
3mth ARI	36	mm/hr
2yr ARI	94	mm/hr
10yr ARI	137	mm/hr
50yr ARI	188	mm/hr
C_{ROOF}	1.0	
$C_{PAVEMENT}$	0.9	
$C_{LANDSCAPE}$	0.75	
Hydraulic Conductivity	200	mm/hr (200mm/hr Max)
$n_{BIORETENTION\ SWALE}$	0.04	
Overflow Pit Coefficient	1.66	
Outlet Pipe Coefficient	0.61	
Outlet Pipe Slot Area	1050	mm^2/m

BIORETENTION DATA			
BioRetention Area	115.5	m^2	
BioRetention vs Site Area Percentage	1.99%		
BioRetention Volume	34.65	m^3	
TSS Removal	87%		Okay
TP Removal	75%		Okay
TN Removal	42%		Okay
Inlet Flow 3m ARI	52	L/s	
Inlet Flow 2yr ARI	136	L/s	
Inlet Flow 10yr ARI	199	L/s	
Inlet Flow 50/100yr ARI	273	L/s	
$V_{INTLET\ PIPE\ 2YR\ ARI}$	0.4	m/s	Okay
$V_{INTLET\ PIPE\ 50YR\ ARI}$	0.8	m/s	Okay
$Q_{IMAX\ BIORETENTION\ SWALE}$	143	L/s	Okay - Requires Flood Storage
$V_{2YR\ ARI\ BIORETENTION\ SWALE}$	0.28	m/s	Okay
$V_{50/100YR\ ARI\ BIORETENTION\ SWALE}$	0.55	m/s	Okay
$Q_{BIORETENTION\ INFILTRATION}$	9.6	L/s	Fails - Infiltration < Qinflow, Requires Storage See Below
$Volume_{BIORETENTION\ INFILTRATION}$	38.3	m^3	Storage Requirement see Storage Calculations Attached
$Q_{SUBSOIL\ PIPE\ PERFORATIONS}$	433.59	L/s	Okay
$Q_{OUTLET\ PIPE}$	10.72	L/s	Okay
$A_{OVERFLOW\ PIT\ -\ WEIR}$	0.02	m^2	
$A_{OVERFLOW\ PIT\ -\ ORIFFICE}$	0.19	m^2	
$Q_{OVERFLOW\ PIT\ SIZE}$	300x300 PIT		

BIORETENTION DESIGN
7

Location	IPSWICH
Development Type	INDUSTRIAL

SITE AREAS

Roof Area	0	m^2
Pavement Area	2420	m^2
Landscape Area	0	m^2
External Road Area	0	m^2
Upstream Roof Area	0	m^2
Upstream Pavement Area	0	m^2
Upstream Overland Flow Area	0	m^2
Total Area	2420	m^2

BIORETENTION DATA

Max.BioDentention Height above Overflow	0.2	m	
Vegetation Height	0.4	m	
Detention Depth (0 - 0.3m Max.)	0.3	m	Depth Okay
Filter Media Depth	0.6	m	Depth Okay
Filter Media Transition Depth	0.1	m	
Width - Flat	1.6	m	
Slope - Left (H:V)	0		
Slope - Right (H:V)	0		
Length	30	m	
Surface Slope	0.10%		
Inlet Pipe Diameter	0.45		
Inlet Pipe Slope	1.00%		
Ag Pipe Diameter	0.1	m	
Base Slope	0.15%		
Number Ag Main Outlet Pipes	4		
Number Ag Sub Pipes	20		Spacing Okay

RAINFALL AND HYDRAULIC DATA

Time of Concentration	15 MIN. STORM	
3mth ARI	36	mm/hr
2yr ARI	94	mm/hr
10yr ARI	137	mm/hr
50yr ARI	188	mm/hr
C_{ROOF}	1.0	
$C_{PAVEMENT}$	0.9	
$C_{LANDSCAPE}$	0.75	
Hydraulic Conductivity	200	mm/hr (200mm/hr Max)
$n_{BIORETENTION\ SWALE}$	0.04	
Overflow Pit Coefficient	1.66	
Outlet Pipe Coefficient	0.61	
Outlet Pipe Slot Area	1050	mm^2/m

BIORETENTION DATA

BioRetention Area	48	m^2	
BioRetention vs Site Area Percentage	1.98%		
BioRetention Volume	14.4	m^3	
TSS Removal	87%		Okay
TP Removal	75%		Okay
TN Removal	42%		Okay
Inlet Flow 3m ARI	22	L/s	
Inlet Flow 2yr ARI	57	L/s	
Inlet Flow 10yr ARI	83	L/s	
Inlet Flow 50/100yr ARI	114	L/s	
$V_{INTLET\ PIPE\ 2YR\ ARI}$	0.2	m/s	Okay
$V_{INTLET\ PIPE\ 50YR\ ARI}$	0.3	m/s	Okay
$Q_{IMAX\ BIORETENTION\ SWALE}$	138	L/s	Okay - Bypass flow > 50YR ARI
$V_{2YR\ ARI\ BIORETENTION\ SWALE}$	0.12	m/s	Okay
$V_{50/100YR\ ARI\ BIORETENTION\ SWALE}$	0.24	m/s	Okay
$Q_{BIORETENTION\ INFILTRATION}$	4.0	L/s	Fails - Infiltration < Oinflow, Requires Storage See Below
$Volume_{BIORETENTION\ INFILTRATION}$	16.0	m^3	Storage Requirement see Storage Calculations Attached
$Q_{SUBSOIL\ PIPE\ PERFORATIONS}$	180.18	L/s	Okay
$Q_{OUTLET\ PIPE}$	5.20	L/s	Okay
$A_{OVERFLOW\ PIT\ -\ WEIR}$	0.08	m^2	
$A_{OVERFLOW\ PIT\ -\ DRIFFICE}$	0.14	m^2	
$Q_{OVERFLOW\ PIT\ SIZE}$	300x300 PIT		

BIORETENTION DESIGN
8

Location	IPSWICH
Development Type	INDUSTRIAL

SITE AREAS

Roof Area	8793	m^2
Pavement Area	0	m^2
Landscape Area	0	m^2
External Road Area	0	m^2
Upstream Roof Area	0	m^2
Upstream Pavement Area	0	m^2
Upstream Overland Flow Area	0	m^2
Total Area	8793	m^2

BIORETENTION DATA

Max.BioDentention Height above Overflow	0.6	m	
Vegetation Height	0.4	m	
Detention Depth (0 - 0.3m Max.)	0.3	m	Depth Okay
Filter Media Depth	0.6	m	Depth Okay
Filter Media Transition Depth	0.1	m	
Width - Flat	1.2	m	
Slope - Left (H:V)	0		
Slope - Right (H:V)	0		
Length	145	m	
Surface Slope	0.10%		
Inlet Pipe Diameter	0.45		
Inlet Pipe Slope	1.00%		
Ag Pipe Diameter	0.1	m	
Base Slope	0.10%		
Number Ag Main Outlet Pipes	20		
Number Ag Sub Pipes	100		Spacing Okay

RAINFALL AND HYDRAULIC DATA

Time of Concentration	15 MIN. STORM		
3mth ARI	36	mm/hr	
2yr ARI	94	mm/hr	
10yr ARI	137	mm/hr	
50yr ARI	188	mm/hr	
C_{ROOF}	1.0		
$C_{PAVEMENT}$	0.9		
$C_{LANDSCAPE}$	0.75		
Hydraulic Conductivity	200	mm/hr	(200mm/hr Max)
$n_{BIORETENTION\ SWALE}$	0.04		
Overflow Pit Coefficient	1.66		
Outlet Pipe Coefficient	0.61		
Outlet Pipe Slot Area	1050	mm^2/m	

BIORETENTION DATA

BioRetention Area	174	m^2	
BioRetention vs Site Area Percentage	1.98%		
BioRetention Volume	52.2	m^3	
TSS Removal	87%		Okay
TP Removal	75%		Okay
TN Removal	42%		Okay
Inlet Flow 3m ARI	88	L/s	
Inlet Flow 2yr ARI	230	L/s	
Inlet Flow 10yr ARI	335	L/s	
Inlet Flow 50/100yr ARI	459	L/s	
$V_{INTLET\ PIPE\ 2YR\ ARI}$	0.3	m/s	Okay
$V_{INTLET\ PIPE\ 50YR\ ARI}$	0.6	m/s	Okay
$Q_{IMAX\ BIORETENTION\ SWALE}$	97	L/s	Okay - Flood Storage Required
$V_{2YR\ ARI\ BIORETENTION\ SWALE}$	0.32	m/s	Okay
$V_{50/100YR\ ARI\ BIORETENTION\ SWALE}$	1.28	m/s	Okay
$Q_{BIORETENTION\ INFILTRATION}$	14.5	L/s	Fails - Infiltration < Qinflow, Requires Storage See Below
$Volume_{BIORETENTION\ INFILTRATION}$	66.1	m^3	Storage Requirement see Storage Calculations Attached
$Q_{SUBSOIL\ PIPE\ PERFORATIONS}$	770.11	L/s	Okay
$Q_{OUTLET\ PIPE}$	21.23	L/s	Okay
$A_{OVERFLOW\ PIT\ -\ WEIR}$	0.05	m^2	
$A_{OVERFLOW\ PIT\ -\ ORIFFICE}$	0.32	m^2	
$Q_{OVERFLOW\ PIT\ SIZE}$	450x450 PIT		

BIORETENTION DESIGN
9

Location	IPSWICH
Development Type	INDUSTRIAL

SITE AREAS

Roof Area	10232	m^2
Pavement Area	1190	m^2
Landscape Area	0	m^2
External Road Area	0	m^2
Upstream Roof Area	0	m^2
Upstream Pavement Area	0	m^2
Upstream Overland Flow Area	0	m^2
Total Area	11422	m^2

BIORETENTION DATA

Max.BioDentention Height above Overflow	1.5	m	
Vegetation Height	0.4	m	
Detention Depth (0 - 0.3m Max,)	0.3	m	Depth Okay
Filter Media Depth	0.6	m	Depth Okay
Filter Media Transition Depth	0.1	m	
Width - Flat	4.5	m	
Slope - Left (H:V)	0		
Slope - Right (H:V)	0		
Length	50	m	
Surface Slope	0.10%		
Inlet Pipe Diameter	0.45		
Inlet Pipe Slope	1.00%		
Ag Pipe Diameter	0.1	m	
Base Slope	0.30%		
Number Ag Main Outlet Pipes	12		
Number Ag Sub Pipes	60		Spacing Okay

RAINFALL AND HYDRAULIC DATA

Time of Concentration	15 MIN. STORM	
3mth ARI	36	mm/hr
2yr ARI	94	mm/hr
10yr ARI	137	mm/hr
50yr ARI	188	mm/hr
C_{ROOF}	1.0	
$C_{PAVEMENT}$	0.9	
$C_{LANDSCAPE}$	0.75	
Hydraulic Conductivity	200	mm/hr (200mm/hr Max)
$n_{BIORETENTION\ SWALE}$	0.04	
Overflow Pit Coefficient	1.66	
Outlet Pipe Coefficient	0.61	
Outlet Pipe Slot Area	1050	mm^2/m

BIORETENTION DATA

BioRetention Area	225	m^2	
BioRetention vs Site Area Percentage	1.97%		
BioRetention Volume	67.5	m^3	
TSS Removal	87%		Okay
TP Removal	75%		Okay
TN Removal	42%		Okay
Inlet Flow 3m ARI	113	L/s	
Inlet Flow 2yr ARI	295	L/s	
Inlet Flow 10yr ARI	430	L/s	
Inlet Flow 50/100yr ARI	590	L/s	
$V_{INTLET\ PIPE\ 2YR\ ARI}$	0.4	m/s	Okay
$V_{INTLET\ PIPE\ 50YR\ ARI}$	0.8	m/s	Okay
$Q_{IMAX\ BIORETENTION\ SWALE}$	440	L/s	Okay - Requires Flood Storage
$V_{2YR\ ARI\ BIORETENTION\ SWALE}$	0.22	m/s	Okay
$V_{50/100YR\ ARI\ BIORETENTION\ SWALE}$	0.44	m/s	Okay
$Q_{BIORETENTION\ INFILTRATION}$	18.8	L/s	Fails - Infiltration < Qinflow, Requires Storage See Below
$Volume_{BIORETENTION\ INFILTRATION}$	84.9	m^3	Storage Requirement see Storage Calculations Attached
$Q_{SUBSOIL\ PIPE\ PERFORATIONS}$	929.95	L/s	Okay
$Q_{OUTLET\ PIPE}$	22.07	L/s	Okay
$A_{OVERFLOW\ PIT\ -\ WEIR}$	0.00	m^2	
$A_{OVERFLOW\ PIT\ -\ ORIFFICE}$	0.26	m^2	
$Q_{OVERFLOW\ PIT\ SIZE}$	450x450 PIT		

Martin COSGROVE and Associates Pty Ltd
ACN 052933221

CONSULTING STRUCTURAL & CIVIL ENGINEERS
93 WARRY St. SPRING HILL Qld. 4000
Tel. [redacted] Fax. [redacted]
EMAIL: [redacted]@mcaeng.com.au

DRAWING ISSUE RECORD

TO:

ATTENTION:

PROJECT: PROPOSED WAREHOUSE AND OFFICE DEVELOPMENT AT LOT 23 NEW ROAD, IPSWICH.

JOB No.: 08214

SHEET: 1 of 1

DATE: -

DAY	15	15	17	19
MONTH	12	12	12	01
YEAR	08	08	08	09
BY	JI	JI	JI	JI

DRAWING REGISTER

No.	DRAWING TITLE	ISSUE			
C101	PART SITE LAYOUT PLAN -1, STORMWATER AND CATCHMENT PLAN	P1	P1	A	B
C102	PART SITE LAYOUT PLAN -2, STORMWATER AND CATCHMENT PLAN	P1	P1	A	B
C103	CIVIL, EROSION AND SEDIMENT CONTROL PLAN AND DETAILS			A	B
C104					
C105	STORMWATER MANAGEMENT NOTES AND DETAILS	P1	P1	A	B

DISTRIBUTION

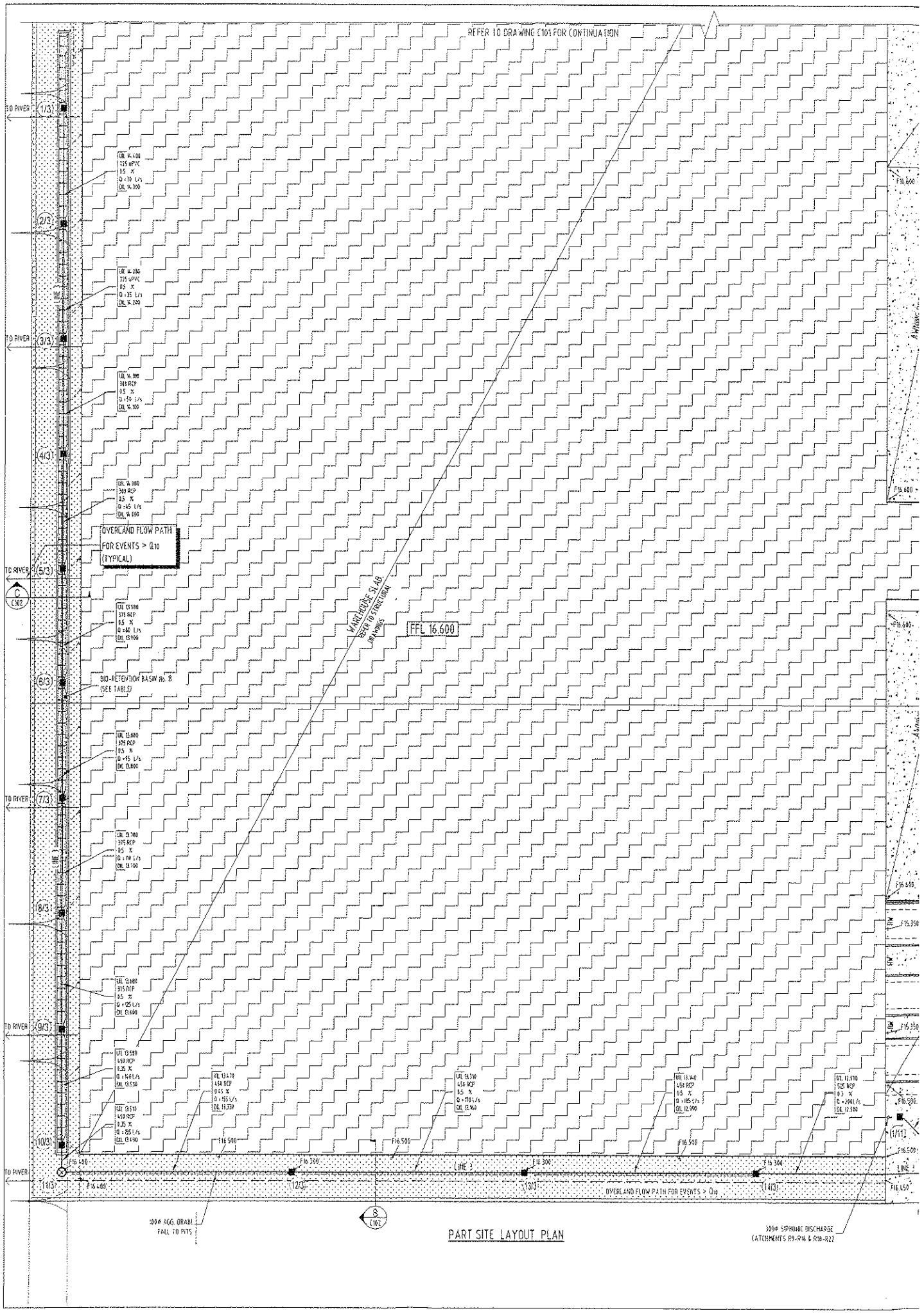
No. OF COPIES ISSUED / REASON FOR ISSUE

WALKER CORPORATION Pty. Ltd. (Peter Darling)	Ep/D		Ep/D	Ep/D
Lange Design		Ep/D		

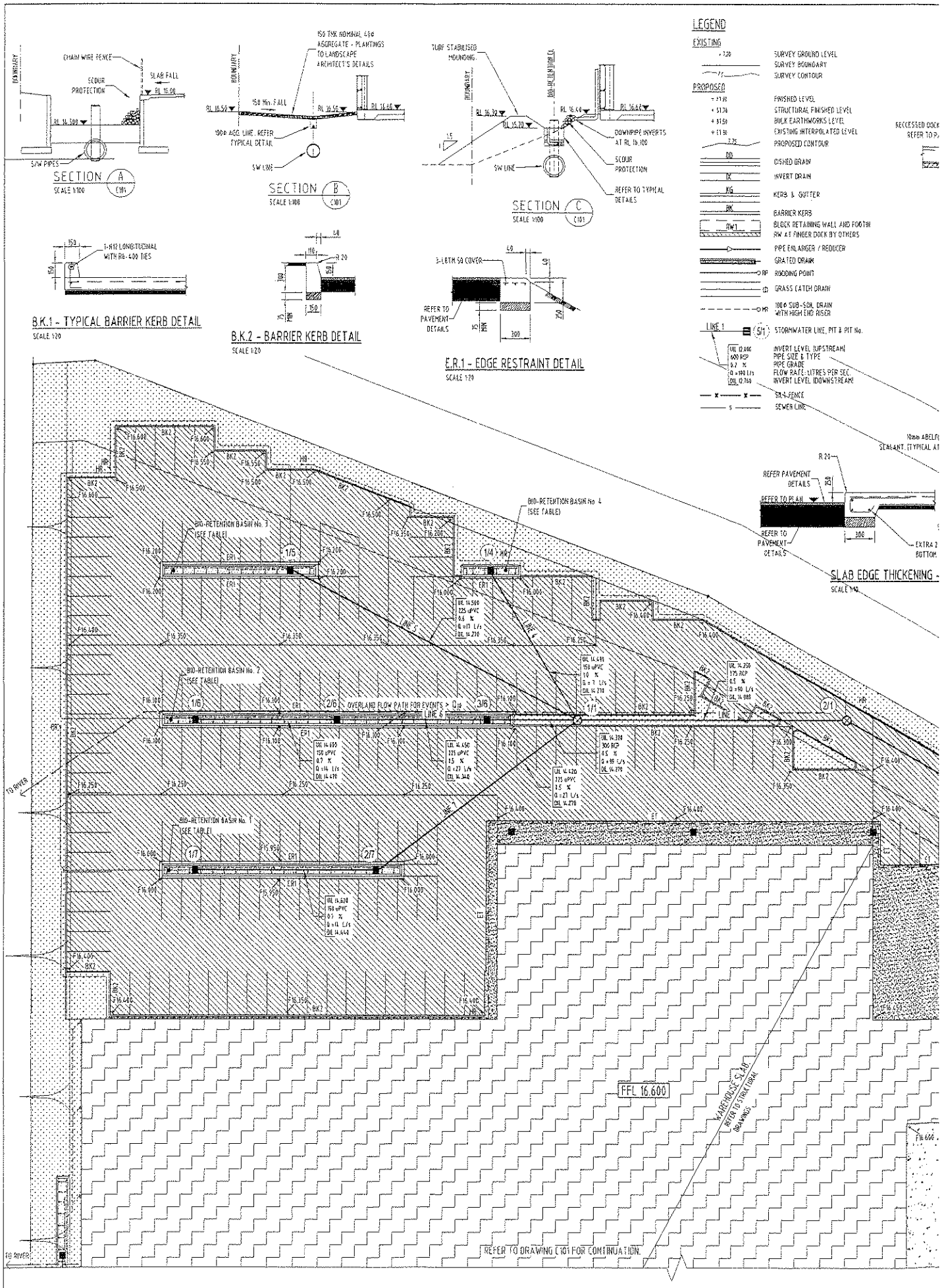
ISSUE KEY

P	PRELIMINARY	I	INFORMATION	A	APPROVAL	$	PRICING	O	ORIGINAL	CD	DISC
D	DEVELOPMENT APP.	B	BUILDING APP.	T	TENDER	C	CONSTRUCTION	R	REVISION	E	EMAIL Ep - PDF Ed - DWG

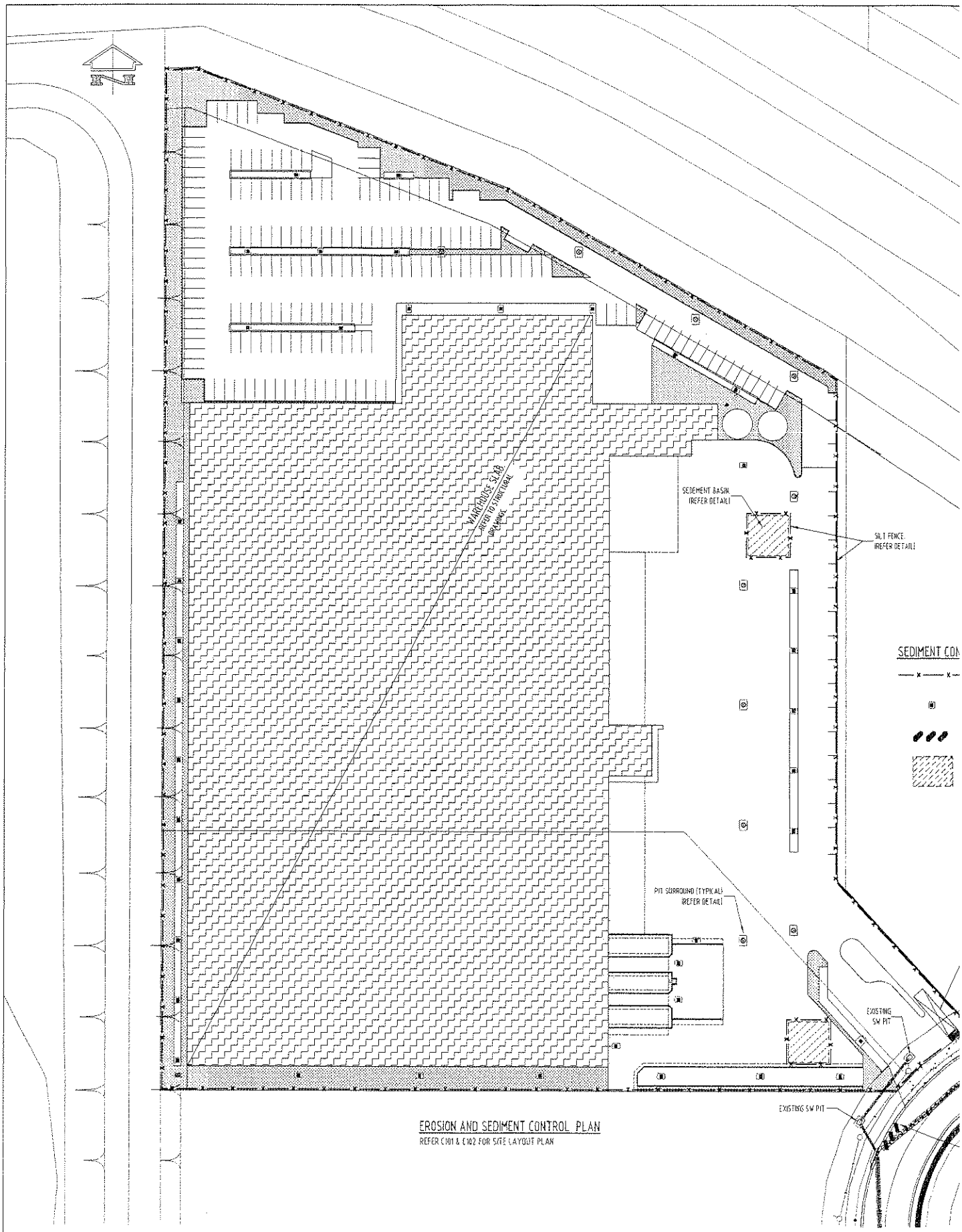
S:\08 Jobs\08214 Struct\Drawing Register.dwg Model 19/01/2009 1:18:03 PM Joe 7.4 1:1



PART SITE LAYOUT PLAN



PART SITE LAYOUT PLAN



EROSION AND SEDIMENT CONTROL PLAN

REFER C101 & C102 FOR SITE LAYOUT PLAN

STORMWATER MANAGEMENT NOTES

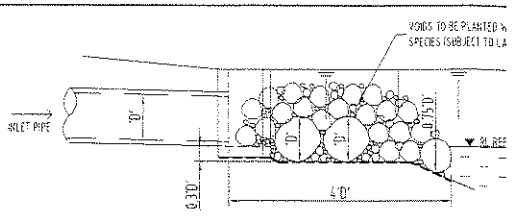
1. ALL WORK SHALL BE CARRIED OUT IN ACCORDANCE WITH THE STORMWATER MANAGEMENT STRATEGY FOR INDIVIDUAL LOTS IN REPORT WL/8714/R9 PREPARED BY CARDNO LAWSON TRELOAR DATED JULY 2008
2. PREVENT THE RELEASE OF CONTAMINATED STORMWATER FROM THE SITE DURING CONSTRUCTION. REFER TO THE EROSION AND SEDIMENT CONTROL NOTES.
3. STORMWATER PITS SHALL BE CONSTRUCTED WITH LEAF GUARD OR FINELY MESHED GRATES TO PREVENT INFILTRATION OF LITTER. THE BODY CORPORATE SHALL ENSURE STORMWATER PITS ARE REGULARLY MAINTAINED.
4. STORMWATER RUNOFF SHALL NOT POND ON-SITE OR IN ADJACENT PROPERTIES.
5. ALL STORMWATER SHALL BE DIRECTED THROUGH THE BIORETENTION BASIN PRIOR TO DISCHARGE TO COUNCIL'S SYSTEM WITH THE EXCEPTION OF RUNOFF FROM CATCHMENTS P1b & P1c.
6. LANDSCAPING ZONES SHALL BE TOPSOILED AND VEGETATED WITH SUITABLE PLANTING AS SOON AS POSSIBLE.
7. REFER 08160 L1 STORMWATER MANAGEMENT PLAN FOR DESIGN RATIONALE AND CALCULATIONS

STORMWATER DRAINAGE NOTES

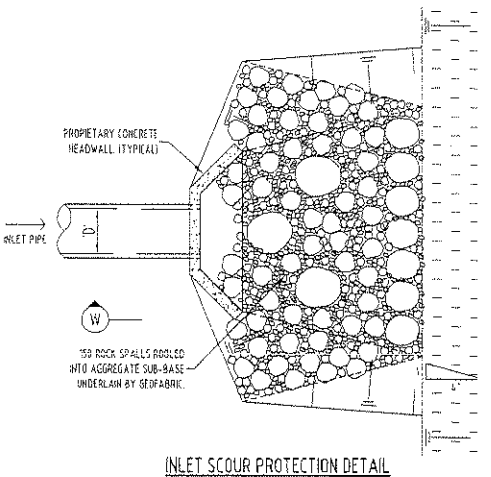
1. STORMWATER DESIGN CRITERIA:
   (a) AVERAGE RECURRANCE INTERVAL
   1:10 YEARS FOR PAVED AND LANDSCAPED AREAS
   (b). RAINFALL INTENSITIES - TIME OF CONCENTRATION - 5 MINUTES:
   1:10 YEARS = 209mm/hr.
   (c) RUNOFF COEFFICIENTS:
   ROOF AREAS - C = 0.95
   PAVED AREAS - C = 0.95
   LANDSCAPED AREAS - C = 0.70
2. THE CONTRACTOR IS TO CHECK THAT THE PROPOSED PIPEWORKS DO NOT CLASH WITH ANY EXISTING SERVICES PRIOR TO COMMENCING WORK. THE CONTRACTOR MUST NOTIFY THE ENGINEER IF ANY CLASHES ARE FOUND FOR ADVICE OF ANY REDESIGN REQUIREMENTS.
3. PIPES 300 DIA. AND LARGER TO BE REINFORCED CONCRETE CLASS "X" APPROVED SPIGOT AND SOCKET WITH RUBBER RING JOINTS. U.N.O
4. PIPES UP TO 300 DIA SHALL BE SEWER GRADE UPVC. WITH SOLVENT WELDED JOINTS U.N.O.
5. EQUIVALENT STRENGTH VCP OR FRC PIPES MAY BE USED
6. PIPES SHALL BE LAID ON A 75mm THICK SAND BED. IN ALL CASES BACKFILL TRENCH WITH SAND TO 300mm ABOVE PIPE U.N.O. WHERE PIPE IS UNDER PAVEMENTS BACKFILL REMAINDER OF TRENCH TO UNDERSIDE OF PAVEMENT WITH SAND OR APPROVED RIPPED SANDSTONE COMPACTED IN 150mm LAYERS TO MINIMUM 100% STANDARD MAXIMUM DRY DENSITY IN ACCORDANCE WITH AS 1289 E2.1.
7. ENLARGERS, CONNECTIONS AND JUNCTIONS TO BE PRECAST FITTINGS WHERE PIPES ARE LESS THAN 300 DIA.
8. WHERE SUBSOIL DRAINS PASS UNDER FLOOR SLABS AND VEHICULAR PAVEMENTS, UNSLOTTED UPVC SEWER GRADE PIPE IS TO BE USED.
9. CARE IS TO BE TAKEN WITH LEVELS OF STORMWATER LINES. GRADES SHOWN ARE NOT TO BE REDUCED WITHOUT APPROVAL.
10. PRECAST PITS MAY BE USED EXTERNAL TO THE BUILDING SUBJECT TO APPROVAL.
11. WHERE TRENCHES ARE IN ROCK, THE PIPE SHALL BE BEDDED ON A MIN. OF 50mm CONCRETE BED (OR 75mm BED OF BLUE METAL) UNDER THE BARREL OF THE PIPE.
12. GRATES AND COVERS SHALL BE ABLE TO SUPPORT THE FOLLOWING LOADS :-
    LIGHT DUTY - 1 TONNE WHEEL LOADS
    MEDIUM DUTY - 3.5 TONNE WHEEL LOADS
    HEAVY DUTY - 9 TONNE WHEEL LOADS.
13. THIS STORMWATER MANAGEMENT PLAN IS CONSISTENT WITH THE STORMWATER MANAGEMENT STRATEGY FOR INDIVIDUAL LOTS IN REPORT WL/8714/R9 PREPARED BY CARDNO LAWSON TRELOAR DATED JULY 2008

BIORETENTION BASIN NOTES

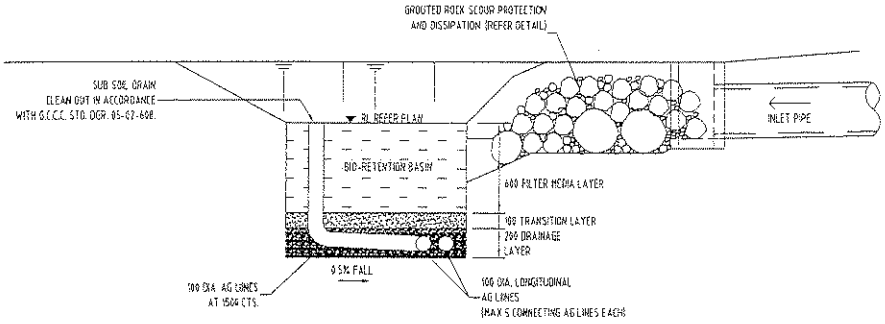
1. ALL WORK SHALL BE CARRIED OUT IN ACCORDANCE WITH THE STORMWATER MANAGEMENT STRATEGY FOR INDIVIDUAL LOTS IN REPORT WL/8714/R9 PREPARED BY CARDNO LAWSON TRELOAR DATED JULY 2008
2. DESIGN IS BASED ON THE STORMWATER MANAGEMENT REPORT AND ALL WORK SHALL BE CARRIED OUT IN ACCORDANCE WITH THE REPORT
3. THE BIORETENTION DEVICES SHALL NOT BE CONSTRUCTED UNTIL ALL BUILDING WORK CONTRIBUTING TO SEDIMENT PRODUCTION, HAVE BEEN COMPLETED.
4. FILTER MEDIA SHALL BE PROVIDED IN THREE LAYERS:-
   a) FILTER LAYER SHALL CONSIST OF A SANDY LOAM TOP SOIL WITH A MINIMUM SATURATED HYDRAULIC CONDUCTIVITY OF 200mm/hr , A 5-10% ORGANIC CONTENT AND A pH OF 6.0-7.0 LABORATORY TESTING IN ACCORDANCE WITH AS4419 AN AS 1289 WITH A MINIMUM OF TEN SAMPLES SHALL BE SUBMITTED CONFIRMING THE MATERIAL'S SUITABILITY
   b) TRANSITION LAYER SHALL CONSIST OF COARSE SAND CONFORMING TO A UNIMIX 16/30 FG SAND GRADING OR EQUIVALENT
   c) DRAINAGE LAYER SHALL CONSIST OF FINE GRAVEL WITH 5MM SCREENINGS
5. PRIOR TO FINAL PLANTING, PLACE GEOFABRIC OVER THE FILTER MEDIA WITH 50mm TOPSOIL FOR TEMPORARY TURFING LAYED PERPENDICULAR TO THE FLOW PATH.
6. ENSURE PIPE FLOWS ARE RESTRICTED FROM ENTERING THE DEVICE UNTIL PLANTING IS FULLY ESTABLISHED.
7. ALL PLANTING SHALL BE CARRIED OUT IN ACCORDANCE WITH THE LANDSCAPE ARCHITECTS SPECIFICATIONS. PLANTING SHALL CONSIST OF 70-80% DENSITY COVER WITH A HEIGHT EQUAL TO THE 400mm OF EXTENDED DETENTION REQUIRED.
8. THE BIORETENTION BASIN SHALL BE MAINTAINED THROUGHOUT ITS USE TO ENSURE THE DESIGN WATER QUALITY TREATMENT TARGETS ARE ACHIEVED. MAINTANANCE SHALL INCLUDE WATERING WITH PARTICULAR FREQUENCY DURING THE FIRST THREE MONTHS, WEED CONTROL, CLEARING OF LITTER, REMOVAL OF SEDIMENT, REPAIRING OF SCORING AND IMPLEMENTING MEASURES TO PREVENT FUTURE OCCURANCE, REPLACEMENT OF DEAD PLANTS AND REPORTING OF THE WORKS CARRIED OUT. REPORTS SHALL BE AS PER THE CARDNO LAWSON TRELOAR STORMWATER MANGEMENT STRATEGY



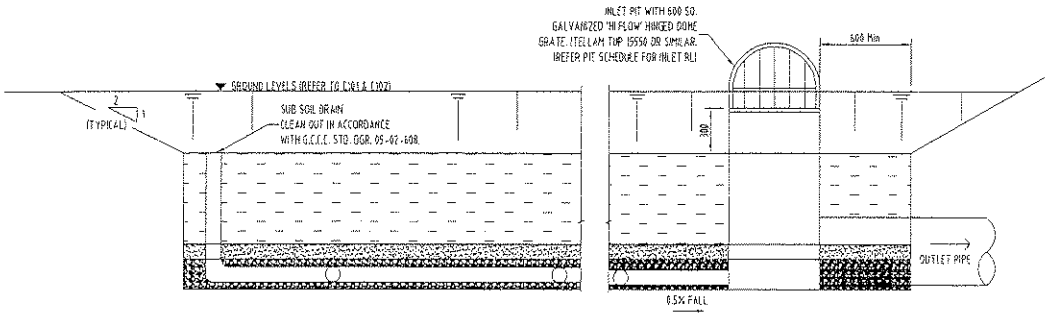
SECTION (W)



INLET SCOUR PROTECTION DETAIL
(IN ACCORDANCE WITH WSUD-T06 Fig. S-6)



TYPICAL BIO-RETENTION BASIN CROSS SECTION
SCALE 1:20

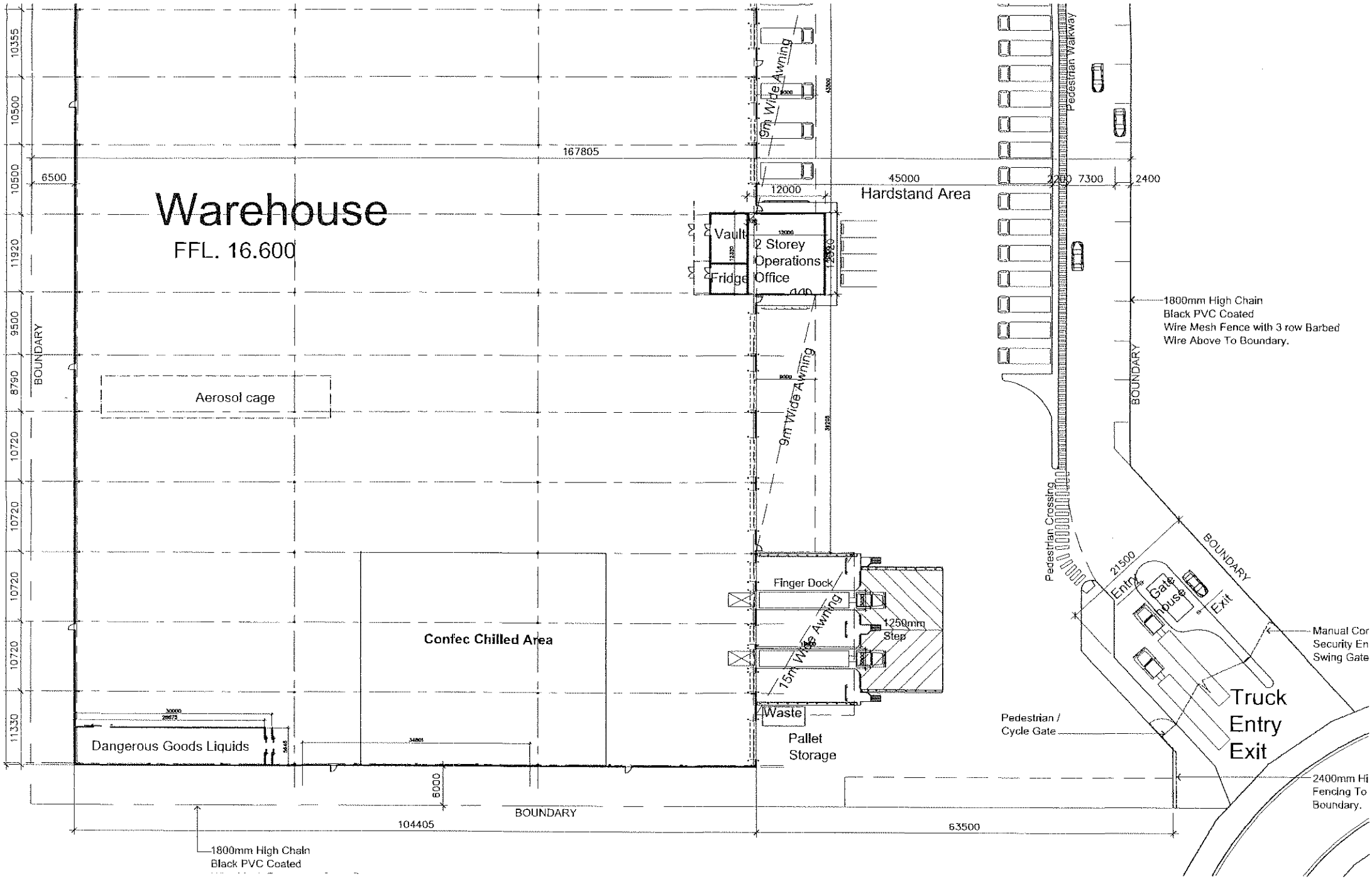


TYPICAL BIO-RETENTION BASIN LONGITUDINAL SECTION
SCALE 1:20

BIORETENTION B

IN ACCORDANCE

CATCHMENT NU
Catchment Characteristics
Catchment Area
Catchment Use
Storm Event Entering Inlet
Conceptual Design
Bioretention area
Filter media saturated hydrau
Extended detention depth
Size for Treatment
Bioretention area
Extended detention depth
Design Flows
Rainfall Intensities
Minor Storm (2 year ARI)
Major Storm (50 year ARI)
Design Runoff Co-efficient (al
Peak Design Flows
Minor Storm (2 year ARI)
Major Storm (50 year ARI)
Inflow System
Scour Protection Adequate
Coarse Sediment Forebay Re
Flow Widths in Upstream Che
Kerb Opening Width
Bioretention Media Charac
Filter media hydraulic conduc
Filter media depth
Drainage Layer media
Drainage Layer depth
Transistion Layer depth
Under-drain design and ca
Flow Capacity of Filter Media
Perforations inflow Check
Pipe Diameter
Number of Perforated Pipes
Capacity of Perforations
Perforation Capacity > Filter M
Number of Distribution Pipes
Distribution Pipe Capacity
Pipe Capacity > Filter Media
Requirement for impermea
Size Overflow Pit/s
Verification Checks
Minor Storm (2 year ARI) velo
Major Storm (50 year ARI) vel


Warehouse
FFL. 16.600
167805
6500
45000
12000
Hardstand Area
Vault
Fridge
2 Storey Operations Office
9m Wide Awning
9m Wide Awning
15m Wide Awning
Pedestrian Walkway
Pedestrian Crossing
BOUNDARY
BOUNDARY
BOUNDARY
1800mm High Chain Black PVC Coated Wire Mesh Fence with 3 row Barbed Wire Above To Boundary.
Aerosol cage
Confec Chilled Area
Finger Dock
1250mm Step
Waste
Pallet Storage
Dangerous Goods Liquids
Pedestrian / Cycle Gate
Truck Entry Exit
Gate house
Entry
Exit
21500
Manual Cor Security En Swing Gate
2400mm Hi Fencing To Boundary.
104405
63500
6000
1800mm High Chain Black PVC Coated

9411/08 Gary Ellis

22 January 2009

MEMORANDUM

FROM: ENGINEERING & ENVIRONMENT MANAGER – GARY ELLIS

RE: **DEVELOPMENT APPLICATION - CODE ASSESSMENT**
OPERATIONAL WORKS
***INTEGRATED PLANNING ACT 1997* - SECTION 3.2.1(1)**

Application No: 9411/2008

Applicant: Walker Corporation Pty Ltd

Real Property Description: Lot 13 SL 2982

Property Location: 120 Bognuda Street, Bundamba

Division: 4

Proposal	*Development Approval*	*Type Requested*
Internal Works	Carrying out Operational Work	Development Permit.

Date Received: 18 December 2008

Start Date for Decision Stage: 22 January 2009

Stat. Date for Determination: 22 January 2009

Site Area:

SUMMARY

In summary, it is considered that the engineering plans involving internal works submitted with this application are generally acceptable and should be approved, subject to the conditions detailed below.

A. EVALUATION OF PROPOSED DEVELOPMENT

1. Applicable Codes

This application has been assessed against the following codes:-

(a) Ipswich Planning Scheme Policy 2 – Local Government Information;
(b) Ipswich Planning Scheme Policy 3 – General Works;
(c) Queensland Urban Drainage Manual;
(d) Ipswich City Council Standards Drawings;

The proposal generally complies with or has been conditioned to comply with the above codes.

2. Supporting Material

The following supporting material was submitted with this application:-

(a) Stormwater Management Plan by Martin Cosgrove and Associates Pty Ltd (reference 08214-L1 dated 17 December 2008.

3. Engineering Plans

The engineering plans listed below are generally considered to be adequate:-

Plan Number	Revision Number
Job No 08214	
C-101 to C103 inclusive	B
C-105	B

RECOMMENDATION

A. That the Developer be advised that Development Application No. 9411/08 involving operational works, is determined as outlined in the table below and is subject to the conditions specified below.

Proposal	Development Decision	Approval	Type
Internal Works	Carrying out operational work	Approved	Development Permit.

1. Basis of Approval

The facts and circumstances set out in the application and all relevant Council Local Laws and/or Local Planning Policies shall be adhered to, except as amended in these conditions. Non municipal structural and building details are excluded from this approval.

2. Minor Alterations

Notwithstanding the requirements detailed in this approval, any other minor alterations and/or modifications shall be subject to the prior written approval of the Senior Development Engineer.

3. Hours of Construction

Unless otherwise approved in writing by the Development Manager hours of construction shall be:

Monday to Saturday 6.30 a.m. to 6.30 p.m.

Work or business shall not be conducted from or on the premises outside the above hours or on Sundays or public holidays.

4. Terms

RPEQ - A Registered Professional Engineer of Queensland, suitably qualified and experienced in the particular area of expertise required. Furthermore, the RPEQ required for the analysis and reporting for mining shall be experienced in the analysis of underground and surface mining within the Ipswich area.

5. Submission of the following information prior to commencement of work:-

(a) Contractor's on site and after hours telephone number;

(b) Supervising engineer's office and after hours telephone number; and

(c) Date of commencement of works and expected duration.

6. Amended engineering drawings shall be marked as confirmation that they have been checked and approved by a RPEQ.

7. Engineering certification (by RPEQ or other competent person accepted by the Senior Development Engineer) shall be submitted to Council for the construction of all internal civil works associated with the development.

8. The certifying authority (or his/her representative) is expected to undertake inspections as necessary to ensure the finished product conforms to standards, and is appropriate for its intended use.

9. The Developer shall obtain a current Water Use Authority (WUA) from Ipswich Water if, over the approval relevant period, the potable water restriction level at the time of commencement of, and during, construction prohibits potable water consumption for construction or associated development purposes. The WUA can be obtained by completing a Water Use Declaration and forwarding it to Ipswich Water for approval. Evidence of a current WUA, where applicable, shall be provided to Council's Planning Development Dept prior to the pre-start meeting.

10. Formal 'give way' points shall be installed at the first and second intersections internal to the site. Priority shall be given to north-south traffic movements. Works shall consist of signs and pavement markings provided in accordance with the MUTCD.

11. "No Stopping" zones shall be installed at those locations outlined on plan C103. Works shall consist of a yellow line (100mm wide) marked 50mm from the lip of the kerb. "No Stopping" signs shall also be installed on the western side of the north-south driveway to assist with the demarcation of the No Stopping zone at this location.

12. The Developer shall install wheel stops on the parking bays located adjacent to pedestrian walkways or bio-retention basins. Also, the developer shall place saw- tooth barrier type kerb (or similar) along the eastern side of proposed bio-retention basin No. 6 and footpath to separate pathway from vehicular traffic.

13. The Developer shall amend engineering drawings to accord with pedestrian link as shown on Plan No AR-DA-11 Rev A in the vicinity of proposed bio-retention basin No. 5.

14. The Developer shall submit to Council for approval a linemarking plan detailing carparking areas and circulation driveway linemarking, signs, "No Stopping" areas and wheel stops etc prior to these particular works being undertaken.

15. Ipswich Water has implemented a Permit to Work System. The purpose of the Permit to Work System is to reduce risk to Ipswich Water employees, external contractors, assets and the environment . All planned works conducted on or near Ipswich Water assets come under the control of the Ipswich Water Operations Control Room and must be authorised. The Developer or his representative must contact the Ipswich Water Control Room on telephone [redacted] to obtain a Permit to Work form, which must be completed and submitted to the Control Room prior to the pre-start meeting.

16. Upon completion of the work a certificate shall be issued by a RPEQ certifying that all municipal and internal work has been constructed in accordance with Council construction standards, and in compliance with the approved plans and specifications. All work shall be supervised by a RPEQ competent in the

construction of municipal works and shall be undertaken by a nominated principal contractor experienced in the construction of municipal works. Council may request evidence of the principal contractor's competency. It is a mandatory requirement that the RPEQ will undertake all the necessary inspections to validate the certification.

17. The developer shall be responsible for the installation and maintenance of silt management facilities and truck shake down facilities from the time of commencement of construction until the works have been completed. **All silt and erosion control and truck shake down facilities are to be installed prior to any construction commencing within the site.**

(a) The proposed sedimentation and erosion control plans and all proposed stormwater devices including proposed outlets are subject to performance and may be subject to on-site direction from the Senior Development Engineer to the developer to change the design.

(b) Sediment fences shall be installed along all common property boundaries to existing properties where fall is towards these properties.

18. The following is a list of the plans upon which this determination is forwarded:-

Plan Number Job No 08214	Revision Number
C-101 to C103 inclusive	B
C-105	B

19. <u>When Approval Takes Effect</u>

This approval has effect in accordance with the provisions of Section 3.5.19 of the *Integrated Planning Act 1997* as follows:

(a) If the applicant does not appeal the decision to the court - from the time the decision notice is given (or if a negotiated decision notice is given, from the time the negotiated decision notice is given); or

(b) If an appeal is made to the court - subject to the decision of the court, when the appeal is finally decided.

20. <u>When Approval Lapses</u>

(a) This approval lapses at the end of the relevant period, unless the development happens before the end of the relevant period. The relevant period for this approval is 2 years starting the day the approval takes effect.

(b) An extended relevant period may be agreed upon, pursuant to Section 3.5.22 of the *Integrated Planning Act 1997*, provided a written notice to Council is made before the end of the relevant period. Such written notice is to be on Council's approved

form, accompanied by the owner's consent and the prescribed fee in Council's Register of General Charges.

B. That the Developer be further advised of the following:-

1. Council has reviewed the Operational Works drawings in relation to the proposed works, to ensure that the design conforms to the engineering conditions of the Development Permit 9411/2008 MCU component. A detailed check of the calculations and drawing details has not been undertaken, as they shall be certified by a RPEQ. Council reserves the right to require further amendments and/or additions at a later date should design errors or omissions become apparent in regard to the works relevant to this Operational Works approval.

2. Review of internal water and sewerage plumbing works does not fall within this approval – they are a part of the approval process relating to the Plumbing and Drainage Application.

3. Fire Ants *Restricted Areas*

   In accordance with the *Plant Protection Act 1989* and the Plant Protection Regulation 1990, a quarantine notice has been issued for the State of Queensland to prevent the spread of the Red Imported Fire Ant (ant species Solenopsis invicta) and to eradicate it from the State.

   It is the legal obligation of the land owner or any consultant or contractor employed by the land owner to report the presence or suspicion of Fire Ants to the Queensland Department of Primary Industries on 132523 within 24 hours of becoming aware of the presence or suspicion, and to advise in writing within seven days to:

   Director General
   Department of Primary Industries
   GPO Box 46, Brisbane QLD 4001

   It should be noted that the movement of Fire Ants is prohibited, unless under the conditions of an Inspectors Approval. More information can be obtained from the Queensland Department of Primary Industries website www.dpi.qld.gov.au.

   The land over which you have made a development application is within a suburb known to have Fire Ants and as such is within a "Restricted Area". The presence of Fire Ants on the site may affect the nature, form and extent of works permitted on the site. In view of this it will be necessary for you to contact the Department of Primary Industries to investigate the site and for you to implement any necessary matters required by that Department prior to the commencement of any works.

I have this day adopted the recommendation specified in this report.

Such action was taken pursuant to the delegation entitled "Determination of a Development Application, including Negotiated Decisions" granted to me by the Chief Executive Officer dated 16 August 2001 and 22 August 2001.

Gary Ellis
ENGINEERING AND ENVIRONMENT MANAGER

DATE: 23 January 2009

Engineering 23/1/09

MCU CONDITIONS

A OTHER DEVELOPMENT APPROVALS REQUIRED

From an engineering perspective, further Development Permits, as required by the *Integrated Planning Act 1997,* shall be obtained in respect of any Operational Works in relation to this approval before any such works are commenced.

RECOMMENDATION

B. Based on engineering and environment grounds only, it is recommended that the application for Code Assessment - Development Permit – Material Change of Use at 120 Bognuda Street, Bundamba as proposed and detailed on Plan No AR-DA-11 Rev A, prepared by Walker Corporation Pty Ltd, be approved, subject to the following terms and conditions being completed by the Developer, to the satisfaction of the Senior Development Engineer:

1. Terms

(a) RPEQ - A Registered Professional Engineer of Queensland, suitably qualified and experienced in the particular area of expertise required.

(b) QUDM 2007 - The Queensland Urban Drainage Manual, produced by the Queensland Department of Natural Resources and Water (2007 Version).

(c) Ipswich Water - Commercial Business Unit of Ipswich City Council providing water and sewerage services to Ipswich City

2. Access and Parking

(a) Design and construction of all access and parking shall be in accordance with the provisions of the Ipswich City Council Parking Code and Australian Standards (2890 series).

(b) Parking and manoeuvring areas shall accommodate the largest anticipated vehicle to use the site.

(c) Adequate facilities for servicing the development shall be provided on site to ensure loading and/or unloading activities do not occur on-street.

(d) Provision shall be made for all vehicles to enter and exit the site in forward gear.

(e) All parking, access and manoeuvring areas shall be constructed of concrete, bitumen or equivalent and shall be line-marked in accordance with the relevant Australian Standard.

(f) "End of trip" facilities for cyclists shall be provide in accordance with the Austroads Guide to Traffic Engineering Practice Part 14 - Bicycles for a 'Category 2' facility and

as outlined in the Technical Note prepared by Transport & Traffic Planning Associates dated 20 January 2009. Works shall include:

(i) A locked compound area for bicycle parking in the general location outlined on Plan No AR-DA-11 Rev A. The compound shall be designed and fitted with facilities where a minimum 19 bicycles can be readily parked and with communal access being provided using duplicate keys or electronic swipe cards; and

(ii) Areas for staff (male and female) fitted with lockers (minimum 12 in each area), showers (minimum 2 in each area), toilets and change facilities.

(g) The Developer shall install wheel stops on the parking bays located adjacent to pedestrian walkways and bio-retention basins.

(h) The internal carpark and circulation driveways shall be lit appropriately. Parking spaces, aisles and circulation driveways shall be illuminated to minimum average of 20 lux. Parking spaces dedicated for disability and pedestrian walkways/crossing points shall illuminated to minimum average of 50 lux.

3. Sewerage

Where applicable, the Developer shall pay the full cost for Council to provide a suitable connection into the existing sewerage reticulation system. All works on live sewers are to be carried out by Council at the Developer's expense, unless arranged otherwise with Ipswich Water.

4. Water

Council's water supply system has been designed to achieve the target levels of service as outlined in Ipswich Water's Water Supply Planning Guidelines. It is the responsibility of the Developer to provide any fire fighting requirements over and above Council's target levels of service, at their expense, internally and without adverse impact to Council's water supply system.

5. Stormwater Quantity

(a) The Development in terms of stormwater quantity management shall generally be undertaken in accordance with Stormwater Management Plan dated 17 December 2008 and prepared by Martin Cosgrove and Associates Pty Ltd subject to conditions of this approval.

(b) The developer shall provide an allotment drainage system designed in accordance with QUDM 2007. The drainage system shall be minimum level IV in QUDM .

(c) No ponding, concentration or redirection of stormwater shall occur onto adjoining land unless specifically approved by Council in consultation with the owner of the adjoining land.

(d) Stormwater drainage plans and calculations shall be submitted by the Developer and approved by the Senior Development Engineer, in conjunction with the submission of an Operational Works application.

6. Stormwater Quality

(a) Stormwater quality for the development shall achieve a reduction in the average annual pollutant load as follows prior to discharge from the site:

- 80% for total suspended solids;
- 60% for total phosphorus;
- 45% for total nitrogen; and
- 90% for gross pollutants

(b) The water quality objectives listed in (a) shall be achieved through the implementation of rainwater tanks, filter baskets within all stormwater pits and nine (9) bio-retention basins each with a coarse sediment forebay at the pipe inlets in accordance with the Stormwater Management Report prepared by Martin Cosgrove and Associates Pty Ltd (reference 08214-L1 dated 17 December 2008.

(c) The bio-retention basins shall be in accordance with the parameters represented in Table 1 below:

Table 1: Bio-retention Basin Configurations

Bio-retention Basin	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
Filter Area (m^2)	*30*	*44*	*19*	*7*	*29*	*116*	*50*	*174*	*225*
Filter Media Median Particle Size (mm)	*0.45*	*0.45*	*0.45*	*0.45*	*0.45*	*0.45*	*0.45*	*0.45*	*0.45*
Filter Media Depth (m)	*0.6*	*0.6*	*0.6*	*0.6*	*0.6*	*0.6*	*0.6*	*0.6*	*0.6*
Hydraulic conductivity (mm/hr)	*180*	*180*	*180*	*180*	*180*	*180*	*180*	*180*	*180*
Transition layer depth (mm)	*100*	*100*	*100*	*100*	*100*	*100*	*100*	*100*	*100*
Drainage layer depth (mm)	*200*	*200*	*200*	*200*	*200*	*200*	*200*	*200*	*200*
Extended detention depth (m)	*0.3*	*0.3*	*0.3*	*0.3*	*0.3*	*0.3*	*0.3*	*0.3*	*0.3*

(d) The surface of the bio-retention swale is not covered in river stone but planted out in accordance with species and densities detailed in Appendix A of the Water Sensitive Urban Design Technical Design Guidelines. Shades trees for the purposes of satisfying car parking code requirements are NOT to be planted in bio-retention areas. Separate landscaped areas are to be created for the purpose of shade, alternatively the Developer shall implement shade structure (eg. shade sails) as per Condition (Landscaping).

(e) Prior to commencement of use, the Developer shall provide to Council certification from the consulting engineers that prepared the approved Stormwater Management Report certifying that all stormwater quality treatment devices have been constructed in accordance with the approved Stormwater Management Report. This shall include certification that the bio-filtration filter media meets the criteria outlined in the Guideline for Soil Filter Media in Bio-retention Systems (Version 2.01), Facility for Advancing Water Bio-filtration (FAWB) dated March 2008.

7. Landscaping Plan

(a) A Landscape Plan, which conforms to the approved development plan, the Regional Business and Industry Zone Code and the Commercial and Industrial Code shall be submitted to Council (in conjunction with re-assessment fee) for approval prior to commencement of use. Such plan shall be generally in accordance with the Landscape Concept Plan prepared by Lange Design Landscape Architecture dated 15 December 2008 Issue B (Drawing numbers WC1208-Lt23-CS and WC1208-Lt23-LP01 to WC1208-Lt23-LP04) subject to the following:

(i) The trees proposed within the entry and car parking bio-retention basins as shown on drawing numbers WC1208-Lt23-LP02 and WC1208-Lt23-LP03 shall be removed;

(ii) the Developer shall reduce the number of car parks to facilitate the planting of shade trees (i.e. car parking spaces shall generally not be continuous for more than eight (8) spaces without the provision of landscaping). Alternatively shade sails or a combination of shade sails and planting shall be implemented in order to comply with the parking code. Details of how the Developer proposes to achieve this requirement shall be submitted for approval by Council, in conjunction with the landscape plan prior to commencement of use;

(iii) landscaping of bio-retention basins required by Condition [stormwater condition number] is in accordance with species and densities detailed in Appendix A of the Water Sensitive Urban Design Technical Design Guidelines ensuring cross sections comply with chapter 5 as follows:

- the surface of the bio-retention swales are planted out and not covered in river stone, the drainage layer must be 200mm and the transition layer 100mm.

- The filter media must have a median particle size of 0.45mm and a hydraulic conductivity of 180mm/hr and be 0.6m deep;

(iv) include extent of other landscaped areas;

(v) fence size and type of material;

(vi) schedule of plant species size (see Note 1 below), densities (see Note 2 below) and attributes for other landscaped areas; and

(vii) exclude the use of exotics and environmental weeds. Consideration shall be given to utilising Council's Vegetation Communities Rehabilitation Guide 2 Alluvial Flats,

Watercourses & Wetlands and Appendix A Plant Selection for Water Sensitive Urban Design published by Healthy Waterways.

Note 1: Planting sizes are at least as follows

Street and features trees	45L
Other trees	300mm
Larger shrubs	200mm
Groundcovers	150mm

Note 2: Planting at approximately the following density rates:

	For buffer planting	**All Other instances**
Trees	at 2m centres	at 5m centres
Large shrubs	at 1m centres	at 2m centres
Groundcovers	at 0.5-1m centres	at 0.5-1m centres

(b) The Developer shall provide on site rainwater retention tanks, minimum 60,000 L storage, and distribution system (eg. drip irrigation) for the purpose of irrigating landscape and bio-retention gardens.

(c) The Developer shall complete landscaping and fencing works in accordance with the approved landscape plans to the satisfaction of the Development Manager prior to the commencement of the use of the land unless Council determines otherwise. Such landscaping and fencing shall be maintained in perpetuity to Council's satisfaction by the existing or future owners and occupiers of the property.

8. Retaining Walls

A certificate from a RPEQ shall be issued to Council certifying that any retaining wall greater than 800mm in height is structurally sound, stable and capable of withstanding any likely surcharge loads.

9. Erosion and Silt Management

(a) The Developer shall be responsible for the installation and maintenance of silt management facilities from the time of commencement of construction until all municipal infrastructure associated with the development has been released "Off Maintenance" by Council. All silt management facilities shall be constructed and maintained in accordance with the document *"Best Practice Erosion and Sediment Control – November 2008"* published by International Erosion Control Association, or equivalent.

(b) Diversion drains and ponds, as necessary, shall be installed on the site before any other work is undertaken on site to ensure that water containing silt, clay, solids or contaminants is contained and/or isolated.

(c) The Developer shall lodge a $5,000 siltation and erosion performance bond with Council prior to any commencement of works,. This bond shall only be released by Council at the completion of building and construction works. Where Council determines that a draw-down of the bond is required, the Developer shall restore the bond to its full amount within ten days of a notice from Council to that effect.

(d) In the event that instructions issued by the Senior Development Engineer to the Consulting Engineer for the installation of erosion control measures, are not addressed within 24 hours, Council will call upon the bond to the extent required to carry out the necessary works. Should the Developer fail to complete the works determined by the Senior Development Engineer within the specified time, Council shall complete the work and recover all costs from the Developer associated with the work.

10. General

(a) All works required for this development shall take due regard of any and all existing services and, if considered necessary by the relevant authority or the Senior Development Engineer, such works shall be altered at the cost of the Developer.

(b) Approval of the Senior Development Engineer is required for any fill intended to be placed over Council's underground services.

(c) Should any works be proposed to be undertaken on land under other private ownership, written permission for the works shall be obtained from the owners of the other lands and forwarded to Council. Similarly, written clearances shall be obtained after the works are completed, unless the works are otherwise accepted by the Senior Development Engineer.

(C) Further Advice

(a) The Developer shall submit to Council hydraulic plans that comply with the requirements of the Water Act 2000 for scrutiny by Council.

(b) Scrutiny fees in accordance with the Council's Schedule of Fees and Charges shall be paid at the time of lodgement of plans. No work on plumbing and drainage shall commence prior to the approval of the plan and the issuing of a permit by Council, to a Licensed Plumber/Drainer.

(c) Tests and inspections shall be arranged with the Building & Plumbing Section upon payment of the appropriate current fees.

(D) Special Advice

1. Portable Long Service Leave

From 1 January 2000, the Building and Construction Industry (Portable Long Service Leave) Levy must be paid prior to the issue of a development permit where one is required. This applies to Building Works, Operational Works and Plumbing and

Drainage Works applications, as defined under the *Integrated Planning Act 1997*, where the works are $80 000 or more and matching the definition of 'Building and Construction Industry' under the *Building and Construction Industry (Portable Long Service Leave) Act 1991*.

Council will not be able to issue a Decision Notice without receipt of evidence that the Levy has been paid. Should you require clarification in regard to the amendments to the *Building and Construction Industry (Portable Long Service Leave) Act 1991*, you should contact QLeave on 1800 803 481 (free call) or [redacted]

2. Water Use Authority

The Developer is advised to obtain a current Water Use Authority (WUA) from Ipswich Water if, over the approval relevant period, the potable water restriction level at the time of commencement of, and during, construction prohibits potable water consumption for construction or associated development purposes. The WUA can be obtained by completing a Water Use Declaration and forwarding it to Ipswich Water for approval. Evidence of a current WUA, where applicable, shall be provided to Council's Planning Development Dept prior to the pre-start meeting.

3. Water Meter

Where the proposed development is likely to have an annual water consumption equal to or greater than 20,000 kL, the Developer must contact Ipswich Water on [redacted] to arrange installation of an electronic flow meter.

Gary Ellis
ENGINEERING AND ENVIRONMENT MANAGER

23 January 2009

9411/08[redacted]

28 January 2008

MEMORANDUM

TO: DEVELOPMENT TEAM CO-ORDINATOR - EAST

FROM: ASSISTANT PLANNER (DEVELOPMENT) [redacted]

RE: DEVELOPMENT APPLICATION - CODE ASSESSMENT
***INTEGRATED PLANNING ACT 1997* - SECTION 3.2.1(1)**

Appn No: 9411/08

Applicant: Mr[redacted]

Real Property Description: Lot 13 SL2982

Property Location: Part of 120 Bognuda Street, Bundamba

Division: 4

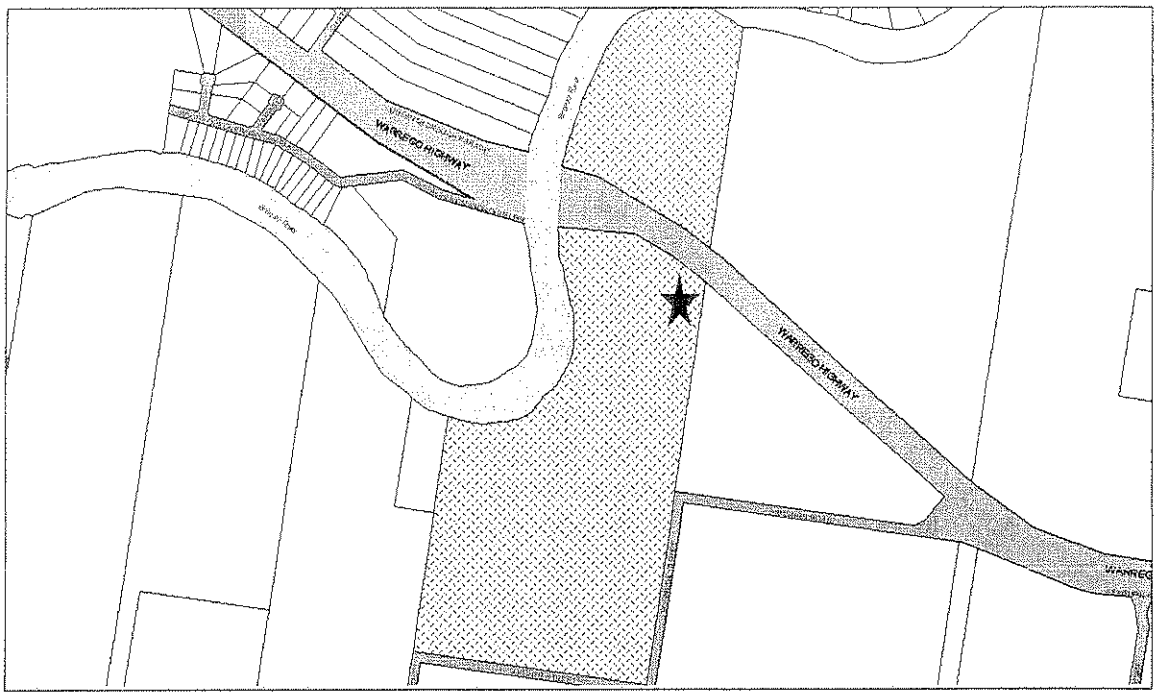
Proposal	Development	Approval Type Requested
Service/Trades Use (Warehouse/Storage)	Making a Material Change of Use of Premises	Development Permit.
Stormwater, Drainage Works, Earthworks, Landscaping	Carrying out Operational Work	Development Permit.

Date Received: 18 December 2008
Start Date for Decision Stage: 20 January 2009
Stat. Date for Determination: 18 February 2009

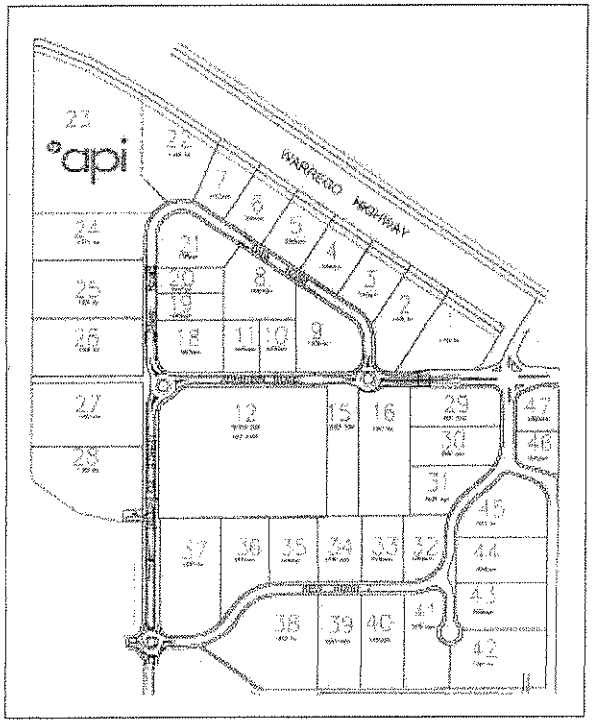
Site Area: 38,176 m^2

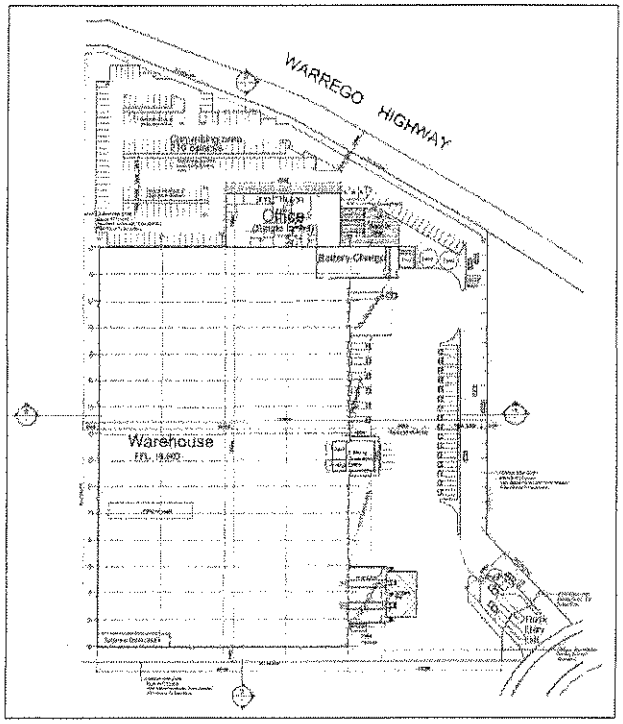
Zone: Regional Business and Industry

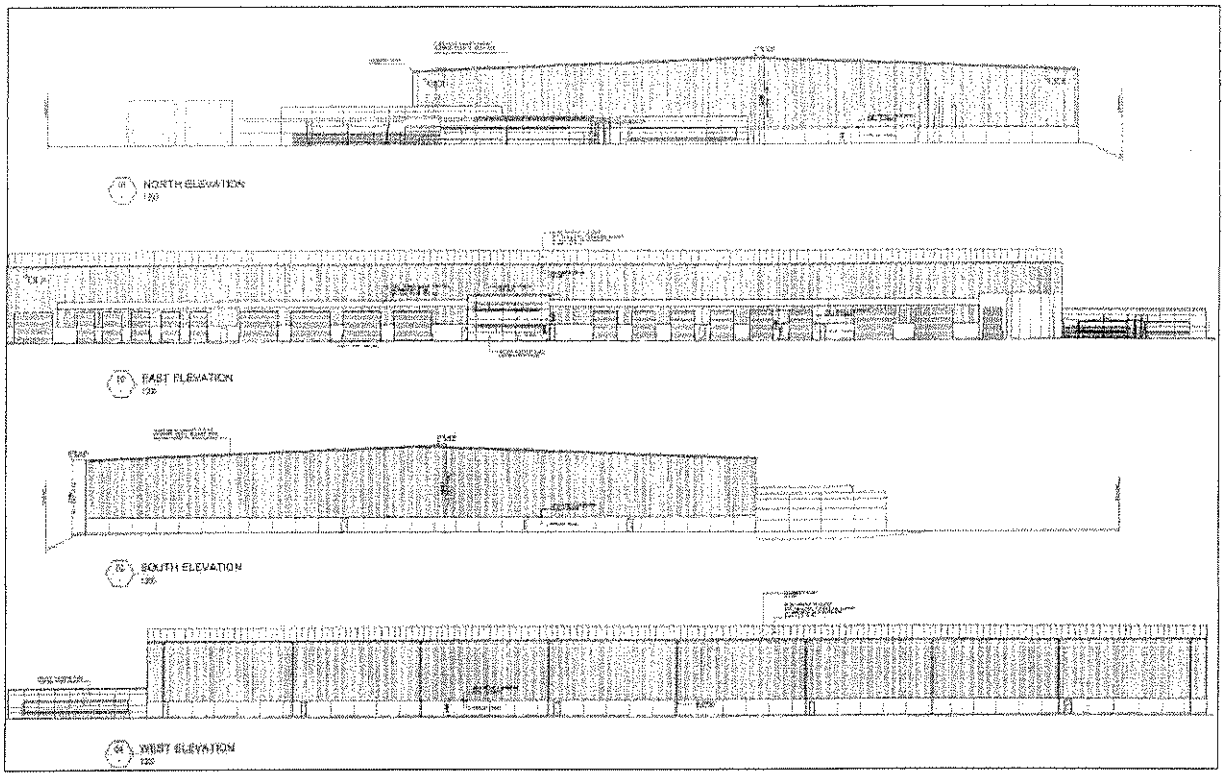
SITE LOCATION



PROPOSAL PLAN







SUMMARY

This proposal is for a Material Change of Use for a Service/Trades Use (Warehouse) on proposed Lot 23 of Stage 1 of the Citiswich Industrial Estate (Application No. 1837/07). The total building area for the development is 18,935.75m^2; which is made up of 16,882m^2 of warehouse, 1,416.25m^2 of office space and 613m^2 of Battery Charge and Dangerous Goods Store area. It is proposed to operate Australian Pharmaceuticals Industries (API) from the site.

The proposal is consistent with the intent of and complies with the Specific Outcomes of the Bremer Business Park Preliminary Approval (Application No. 3356/02), the Commercial and Industrial Code and the Parking Code.

Conditions of noteworthy mention proposed to be attached to the approval include:

- Unless otherwise determined in writing by the Development Planning Manager, the operating hours for the development are not limited.
- Prior to the commencement of any works/issue of any Building Works approval, the Applicant shall submit to Council for approval a noise management plan which details measures designed to minimise noise impacts from the development.
- A minimum of 190 car parking spaces shall be provided on the site, with a minimum of 95 car parking spaces sealed and line-marked. The remaining 95 car parking spaces shall be available if required.

The Department of Main Roads is a concurrence agency and Powerlink is an advice agency with regard to the development. DMR have attached conditions relating to erection of advertising devices, storage of hazardous materials, stormwater, pedestrian access to the Warrego Highway and future land requirements. Powerlink have no

requirements/conditions. Public notification of the proposal was not required to be undertaken pursuant to the *Integrated Planning Act 1997*.

In summary, it is considered that the proposal to permit the development of a Service Trades Use (Warehouse) is suitable for the subject site and should be approved, subject to the conditions detailed below.

RECOMMENDATION

A. That the Developer be advised that Development Application No. 9411/08 is determined as outlined in the table below and is subject to the conditions specified below.

Proposal	Development	Decision	Approval Type
Service/Trades Use (Warehouse/Storage)	Making a material change of use of premises	Approved	Development Permit.
Stormwater, Drainage Works, Earthworks, Car Park, Landscaping	Carrying out operational work	Approved	Development Permit.

Further Development Permits Required

Further Development Permits, as required by the *Integrated Planning Act 1997,* shall be obtained in respect of any Building Works and Plumbing Works in relation to this approval before any such works are commenced.

Conditions of Assessment Manager (Ipswich City Council) – Service/Trades Use (Warehouse/Storage)

1. Basis of Approval

   Subject to these conditions, the facts and circumstances set out in the application and all relevant Council Local Laws and/or Planning Scheme Policies shall be adhered to.

2. Minor Alterations

   Notwithstanding the requirements detailed in this approval, any other minor alterations and/or modifications acceptable to the Development Planning Manager will suffice.

3. Site Development

   The development of the site shall be undertaken generally in accordance with the following plans:

Title	Project No.	Drawing No.	Issue	Prepared By	Dated
Pedestrian Walkway	1781301	AR-DA-11	A	Walker Corporation	21 January 2009
Site Plan	1781301	AR-DA-02	C	Walker Corporation	17 December 2008
Truck Articulation	1781301	AR-DA-08	B	Walker Corporation	16 December 2008
Warehouse Internal Fitout	1781301	AR-DA-10	A	Walker Corporation	16 December 2008
Main and Operations Office	1781301	AR-DA-04	B	Walker Corporation	16 December 2008
Warehouse Floor Plan	1781301	AR-DA-03	C	Walker Corporation	17 December 2008
Elevations	1781301	AR-DA-07	B	Walker Corporation	16 December 2008
Coloured Elevations	1781301	AR-DA-09	B	Walker Corporation	16 December 2008
Sections	1781301	AR-DA-06	B	Walker Corporation	16 December 2008

4. Particular Use

This approval is for the particular use stated, and does not imply approval for other similar uses. To this end, the use of any of the proposed structures associated with the Service Trades Use (Warehouse), inclusive of car parking and any associated outdoor areas on site, are not permitted to be used for any other purpose, unless, in the opinion of the Development Planning Manager, such use is ancillary and incidental to the predominant use of the site for a Service Trades Use (Warehouse).

5. Hours of Construction

Unless otherwise determined in writing by the Development Planning Manager hours of construction shall be:

Monday to Saturday 6.30 a.m. to 6.30 p.m.

Work or business shall not be conducted from or on the premises outside the above hours or on Sundays or public holidays.

6. Hours of Operation

(a) Unless otherwise determined in writing by the Development Planning Manager, the operating hours for the development are not limited, subject to any requirements of Condition 23: Noise Management Plan.

(b) In the event that Council receives ongoing complaints about noise that Council considers are not frivolous or vexatious, then the hours of operation above may be reviewed.

7. Locality References

(a) Any place name or estate name used by the Developer (excluding a reference to a building, structure or the like and excluding minor, subsidiary signage within a development) shall make reference to the relevant, approved place name under the *Place Names Act 1994* in a contrasting colour and in lettering no less than 50% of the size of the lettering for the Estate name.

(b) Any reference to the regional location of the site or the development shall not refer to the place or estate as being located in Brisbane or a Brisbane suburb or in the metropolitan area or in the western suburbs (excluding the western suburbs of Ipswich as determined by Council in writing from time to time).

8. Car Parking - Use and Maintenance

(a) A minimum of 190 car parking spaces shall be provided on the site, with a minimum of 95 car parking spaces sealed and line-marked. The remaining 95 car parking spaces shall be available if determined by Council to be required.

(b) Unless otherwise indicated on the approved plan of development or approved by the Development Planning Manager, parking areas shall not be:

(i) Exclusively used for staff parking at the expense of general public/customer parking; or

(ii) Exclusively used for general public/customer parking at the expense of staff parking.

(c) All parking areas shall be:

(i) Kept exclusively for parking;

(ii) Used exclusively for parking;

(iii) Accessible to both staff and the general public/customer during any approved hours of operation;

(iv) Appropriately signposted at the entry/entries to the carpark, to the satisfaction of the Development Planning Manager (eg. "Staff and Customer Parking"), in accordance with AS1742; and

(v) Maintained to the satisfaction of the Development Planning Manager.

9. Access for People with a Disability

The Developer shall provide adequate access for people in wheelchairs by means of an unimpeded continuous path of travel from any adjacent roadway and from any car parking bay allocated for use by people with a disability, to all parts of the development which are normally open to the public.

10. Trade Materials, Products and Plant

All trade materials, products and plant shall be kept within the confines of the building and/or approved storage areas.

11. Recreation Space

Recreation space shall be provided for employees and shall:

(a) Be available for the recreational use of all employees on the site and may be covered or uncovered;

(b) Be accessible via properly constructed pedestrian pathways or covered walkways from all factory units or tenancies on the site; and

(c) Be furnished, landscaped and maintained generally to the satisfaction of the Development Planning Manager.

12. Loading and Unloading

All loading and unloading shall take place at an approved location within the boundaries of the subject property..

13. Contributions

In accordance with the relevant Planning Scheme Policies, the Developer shall pay, prior to the issue of any Building Works approval associated with the development, the monies as outlined below to Council:-

Contribution	Sector	Rate	Proposal	Calculation
Water Supply	Bundamba Low Level Zone (WT5)	$734.00 NRU Unit Charge = 1.1041 Total = $810.41 NRU	0.25 NRU per 100 m² (GFA) Total GFA = 18,935.75 m² **Proposal = 47.34 NRU**	$810.41 x 47.34 = $38,364.81 **Total = $38,365.00**
Sewerage Infrastructure	South Bremer Business Park (SW23)	$1,052.00 NRU Unit Charge = 1.1041 Total = $1,161.51 NRU	0.25 NRU per 100 m² (GFA) Total GFA = 18,935.75 m² **Proposal = 47.34 NRU**	$1,161.51 x 47.34 = $54,985.88 **Total = $54,986.00**
Road Contributions	Bundamba Industry (RD25)	$554.00 VT Unit Charge = 1.1041 Total = $611.67 VT	2.30 VT per 100 m² (GFA) Total GFA = 18,935.75 m²	$611.67 x 435.52 = $266,394.51 **Total = $266,395.00**

			Proposal = 435.52 VT	
Total for Development				$359,746.00

The contributions above shall be applicable for a period of **twelve (12) months from the date of the development approval**, and thereafter shall be based on the infrastructure contribution policies and rates applicable at the date when payment is made.

NOTE: The payment of contributions for Reconfiguring a Lot Application No 1837/07 will negate the need to pay the contributions outlined above for the Service/Trades Use (Warehouse/Storage).

14. Engineering Requirements

The following engineering requirements, detailed in Conditions 15 – 23, shall be completed to the satisfaction of the Senior Development Engineer.

Terms

(a) RPEQ - A Registered Professional Engineer of Queensland, suitably qualified and experienced in the particular area of expertise required.

(b) QUDM 2007 - The Queensland Urban Drainage Manual, produced by the Queensland Department of Natural Resources and Water (2007 Version).

(c) Ipswich Water - Commercial Business Unit of Ipswich City Council providing water and sewerage services to Ipswich City

15. Access and Parking

(a) Design and construction of all access and parking shall be in accordance with the provisions of the Ipswich City Council Parking Code and Australian Standards (2890 series).

(b) All loading and/or unloading activities shall occur within the site.

(c) All parking, access and manoeuvring areas shall be constructed of concrete, bitumen or equivalent and shall be line-marked in accordance with the relevant Australian Standard.

(d) "End of trip" facilities for cyclists shall be provide in accordance with the Austroads Guide to Traffic Engineering Practice Part 14 - Bicycles for a 'Category 2' facility and as outlined in the Technical Note prepared by Transport & Traffic Planning Associates dated 20 January 2009. Works shall include:

(i) A locked compound area for bicycle parking in the general location outlined on Plan No AR-DA-11 Rev A. The compound shall be designed and fitted with facilities

where a minimum 19 bicycles can be readily parked and with communal access being provided using duplicate keys or electronic swipe cards for staff/employees; and

(ii) Areas for staff/employees (male and female) fitted with lockers (minimum 12 in each area), showers (minimum 2 in each area), toilets and change facilities.

(e) The Developer shall install wheel stops on the parking bays located adjacent to pedestrian walkways and bio-retention basins.

(f) The internal car park and circulation driveways shall be lit appropriately. Parking spaces, aisles and circulation driveways shall be illuminated to minimum average of 20 lux. Parking spaces dedicated for disability and pedestrian walkways/crossing points shall be illuminated to a minimum average of 50 lux.

16. Sewerage

Where applicable, the Developer shall pay the full cost for Council to provide a suitable connection into the existing sewerage reticulation system. All works on live sewers are to be carried out by Council at the Developer's expense, unless arranged otherwise with Ipswich Water.

17. Water

Council's water supply system has been designed to achieve the target levels of service as outlined in Ipswich Water's Water Supply Planning Guidelines. It is the responsibility of the Developer to provide any fire fighting requirements over and above Council's target levels of service, at their expense, internally and without adverse impact to Council's water supply system.

18. Stormwater Quantity

(a) Stormwater quantity management shall be undertaken generally in accordance with the Stormwater Management Plan dated 17 December 2008 and prepared by Martin Cosgrove and Associates Pty Ltd subject to conditions of this approval.

(b) The Developer shall provide an allotment drainage system designed in accordance with QUDM 2007. The drainage system shall be minimum level IV in QUDM .

(c) No ponding, concentration or redirection of stormwater shall occur onto adjoining land unless specifically approved by Council in consultation with the owner of the adjoining land.

19. Stormwater Quality

(a) Stormwater quality management shall achieve a reduction in the average annual pollutant load as follows prior to discharge from the site:

- 80% for total suspended solids;
- 60% for total phosphorus;

- 45% for total nitrogen; and
- 90% for gross pollutants

(b) The water quality objectives listed in (a) shall be achieved through the implementation of rainwater tanks, filter baskets within all stormwater pits and nine (9) bio-retention basins each with a coarse sediment forebay at the pipe inlets in accordance with the Stormwater Management Report prepared by Martin Cosgrove and Associates Pty Ltd (reference 08214-L1 dated 17 December 2008.

(c) The bio-retention basins shall be in accordance with the parameters represented in Table 1 below:

Table 1: Bio-retention Basin Configurations

Bio-retention Basin	1	2	3	4	5	6	7	8	9
Filter Area (m^2)	30	44	19	7	29	116	50	174	225
Filter Media Median Particle Size (mm)	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45
Filter Media Depth (m)	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Hydraulic conductivity (mm/hr)	180	180	180	180	180	180	180	180	180
Transition layer depth (mm)	100	100	100	100	100	100	100	100	100
Drainage layer depth (mm)	200	200	200	200	200	200	200	200	200
Extended detention depth (m)	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3

(d) The surface of the bio-retention swale is not to be covered in river stone but planted out in accordance with species and densities detailed in Appendix A of the Water Sensitive Urban Design Technical Design Guidelines. Shade trees for the purposes of satisfying Council's Parking Code requirements are NOT to be planted in bio-retention areas. Separate landscaped areas are to be created for the purpose of shade; or alternatively the Developer shall implement shade structures (eg. shade sails) as per Condition 20: Landscaping.

(e) The Developer shall provide to Council certification from the consulting engineers that prepared the approved Stormwater Management Report certifying that all stormwater quality treatment devices have been constructed in accordance with the approved Stormwater Management Report. This shall include certification that the bio-filtration filter media meets the criteria outlined in the Guideline for Soil Filter Media in Bio-retention Systems (Version 2.01), Facility for Advancing Water Bio-filtration (FAWB) dated March 2008.

20. Landscaping

(a) A Landscape Plan, which conforms to the approved development plan, the Bremer Business Park Preliminary Approval and the Commercial and Industrial Code shall be

submitted to Council (in conjunction with re-assessment fee) for approval. Such plan shall be generally in accordance with the Landscape Concept Plan prepared by Lange Design Landscape Architecture dated 15 December 2008 Issue B (Drawing numbers WC1208-Lt23-CS and WC1208-Lt23-LP01 to WC1208-Lt23-LP04) subject to the following:

(i) the trees proposed within the entry and car parking bio-retention basins as shown on drawing numbers WC1208-Lt23-LP02 and WC1208-Lt23-LP03 shall be removed;

(ii) the Developer shall reduce the number of car parks to facilitate the planting of shade trees within the car park. Generally, car parking spaces shall not be continuous for more than eight (8) spaces without the provision of a shade tree. Alternatively shade sails or a combination of shade sails and planting shall be implemented in order to comply with Council's Parking Code. Details of how the Developer proposes to achieve this requirement shall be submitted for approval by Council, in conjunction with the landscape plan;

(iii) landscaping of bio-retention basins required by Condition 19: Stormwater Quality is in accordance with species and densities detailed in Appendix A of the Water Sensitive Urban Design Technical Design Guidelines ensuring cross sections comply with Chapter 5 as follows:

- the surface of the bio-retention swales are planted out and not covered in river stone, the drainage layer must be 200mm and the transition layer 100mm.

- the filter media must have a median particle size of 0.45mm and a hydraulic conductivity of 180mm/hr and be 0.6m deep;

(iv) include extent of other landscaped areas;

(v) fence size and type of material;

(vi) schedule of plant species size (see Note 1 below), densities (see Note 2 below) and attributes for other landscaped areas; and

(vii) exclude the use of exotics and environmental weeds. Consideration shall be given to utilising Council's Vegetation Communities Rehabilitation Guide 2 Alluvial Flats, Watercourses & Wetlands and Appendix A Plant Selection for Water Sensitive Urban Design published by Healthy Waterways.

Note 1: Planting sizes are at least as follows

Street and features trees	45L
Other trees	300mm
Larger shrubs	200mm
Groundcovers	150mm

Note 2: Planting at approximately the following density rates:

	For buffer planting	All Other instances

Trees	at 2m centres	at 5m centres
Large shrubs	at 1m centres	at 2m centres
Groundcovers	at 0.5-1m centres	at 0.5-1m centres

(b) The Developer shall provide on site rainwater retention tanks, minimum 60,000 L storage, and distribution system (eg drip irrigation) for the purpose of irrigating landscape and bio-retention gardens.

(c) The Developer shall complete landscaping and fencing works in accordance with the approved landscape plans to the satisfaction of the Development Planning Manager. Such landscaping and fencing shall be maintained in perpetuity to Council's satisfaction by the existing or future owners and occupiers of the property.

21. Retaining Walls

A certificate from a RPEQ shall be issued to Council certifying that any retaining wall greater than 800mm in height is structurally sound, stable and capable of withstanding any likely surcharge loads.

22. Erosion and Silt Management

(a) The Developer shall be responsible for the installation and maintenance of silt management facilities from the time of commencement of construction until all municipal infrastructure associated with the development has been released "Off Maintenance" by Council. All silt management facilities shall be constructed and maintained in accordance with the document *"Best Practice Erosion and Sediment Control – November 2008"* published by International Erosion Control Association, or equivalent.

(b) Diversion drains and ponds, as necessary, shall be installed on the site before any other work is undertaken on site to ensure that water containing silt, clay, solids or contaminants is contained and/or isolated.

(c) The Developer shall lodge a $5,000 siltation and erosion performance bond with Council prior to any commencement of works. This bond shall only be released by Council at the completion of building and construction works. Where Council determines that a draw-down of the bond is required, the Developer shall restore the bond to its full amount within ten days of a notice from Council to that effect.

(d) In the event that instructions issued by the Senior Development Engineer to the Consulting Engineer for the installation of erosion control measures, are not addressed within 24 hours, Council will call upon the bond to the extent required to carry out the necessary works. Should the Developer fail to complete the works determined by the Senior Development Engineer within the specified time, Council shall complete the work and recover all costs from the Developer associated with the work.

23. General

(a) All works required for this development shall take due regard of any and all existing services and, if considered necessary by the relevant authority or the Senior Development Engineer, such works shall be altered at the cost of the Developer.

(b) Approval of the Senior Development Engineer is required for any fill intended to be placed over Council's underground services.

(c) Should any works be proposed to be undertaken on land under other private ownership, written permission for the works shall be obtained from the owners of the other lands and forwarded to Council. Similarly, written clearances shall be obtained after the works are completed, unless the works are otherwise accepted by the Senior Development Engineer.

24. Health, Parks and Recreation Requirements

Conditions 25 – 28, unless otherwise stated, shall be completed to the satisfaction of the Regulatory Services Manager (Health, Parks and Recreation).

25. Contaminated Land / EMR

Prior to the commencement of any works, the Developer shall provide the Regulatory Services Manager with details on how the contaminated soil dispersal risks during the Operational Works phase will be managed to contain the contaminated soil to the area(s) of risk identified. The erosion, sediment and dust controls to be incorporated during the earthworks at the site should also be detailed.

26. Lighting

The provision of advertising, security and flood lighting shall be designed, constructed, located and maintained in accordance with Australian Standard 4282 – 1997 (Control of the obtrusive effects of outdoor lighting) and so as not to cause nuisance to the occupants of nearby properties or passing traffic.

27. Noise Management Plan

(a) Prior to the commencement of any works/issue of any Building Works approval, the Applicant shall submit to Council for approval a noise management plan which details measures designed to minimise noise impacts from the development. The plan shall address the following issues:

(i) identified noise sources likely to cause nuisance;
(ii) aims and objectives;
(iii) reference to the applicable legislation;
(iv) performance indicators;
(v) actions required to minimise the noise impacts from the development's operation;
(vi) responsible person(s) for achieving the plan aim; and

(vii) a review schedule.

(b) Within this plan consideration must be given to but not be limited to:

(i) the use of the loading bays;
(ii) hours of operation and delivery times;
(iii) vehicle speed management devices (preferably not speed bumps) and the like;
(iv) service vehicle activities/loading bays;
(v) forklift operations;
(vi) refrigeration equipment, pumps, compressors, mechanical ventilation equipment and vents; and
(vii) maintenance of mechanical plant.

(c) The Developer shall implement the approved Noise Management Plan to the satisfaction of the Regulatory Services Manager (Health, Parks and Recreation).

28. Waste Storage and Collection

(a) An adequate refuse collection service shall be provided to the development.

Unless otherwise specifically agreed to in writing by the Regulatory Services Manager (Health, Parks and Recreation), all refuse collection shall occur on the site.

(b) The area on which the bin is to be accessed by refuse collection vehicles shall be screened, level, concreted and constructed in conjunction with the driveway surface with no intervening step, ledge, kerb or other obstruction.

The waste storage and collection areas shall be unimpeded at all times and shall allow forward motion entry to the waste containers and forward motion entry and exit to and from the site. The following dimensions are given as a minimum of front, rear and side loading truck dimensions for a guide to design for the adequate emptying of the bin and manoeuvring of the truck:

Ipswich City Council Waste Collection Vehicle Dimensions

	Front Load	Rear Load	Side Load	Roll on/off
Length overall	10.4 m	10.4 m	10.4 m	10.7 m
Length when loading	10.5 m	10.4 m	10.4 m	20.0 m
Height	3.9 m	3.9 m	3.9 m	3.9 m
Height during loading	6.1m	3.9 m	4.2 m	7.3 m
Access width	4.0 m	4.0 m	4.0 m	4.0 m
Width during loading	3.0m	3.0m	5.0m	3.0 m
Gross vehicle mass (GVM)	22.5 t	15 t	22.5 t	27.5 t

29. Compliance with Conditions

(a) Unless otherwise stated all conditions shall be completed prior to commencement of the proposed change of use of the site or as determined by the Development Planning Manager.

(b) All conditions shall be completed to the satisfaction of the Development Planning Manager.

30. When Approval Takes Effect

This approval has effect in accordance with the provisions of Section 3.5.19 of the *Integrated Planning Act 1997* as follows:

(a) If the Applicant does not appeal the decision to the court - from the time the decision notice is given (or if a negotiated decision notice is given, from the time the negotiated decision notice is given); or

(b) If an appeal is made to the court - subject to the decision of the court, when the appeal is finally decided or the appeal is withdrawn.

31. When Approval Lapses

(a) This approval lapses at the end of the relevant period, unless the change of use happens before the end of the relevant period. The relevant period for this approval is 4 years starting the day the approval takes effect.

(b) An extended relevant period may be agreed upon, pursuant to Section 3.5.22 of the *Integrated Planning Act 1997*, provided a written notice to Council is made before the end of the relevant period. Such written notice is to be on Council's approved form, accompanied by the owner's consent and the prescribed fee in Council's Register of General Charges.

Conditions of Assessment Manager (Ipswich City Council) – Stormwater, Drainage Works, Earthworks, Car Park, Landscaping

1. Basis of Approval

The facts and circumstances set out in the application and all relevant Council Local Laws and/or Local Planning Policies shall be adhered to, except as amended in these conditions. Non municipal structural and building details are excluded from this approval.

2. Minor Alterations

Notwithstanding the requirements detailed in this approval, any other minor alterations and/or modifications shall be subject to the prior written approval of the Senior Development Engineer.

3. Hours of Construction

Unless otherwise approved in writing by the Engineering and Environment Manager hours of construction shall be:

Monday to Saturday 6.30 a.m. to 6.30 p.m.

Work or business shall not be conducted from or on the premises outside the above hours or on Sundays or public holidays.

4. Terms

RPEQ - A Registered Professional Engineer of Queensland, suitably qualified and experienced in the particular area of expertise required. Furthermore, the RPEQ required for the analysis and reporting for mining shall be experienced in the analysis of underground and surface mining within the Ipswich area.

5. Site Development

(a) The Developer shall amend engineering drawings to accord with pedestrian link as shown on 'Pedestrian Walkway' Drawing Number AR-DA-11 Issue A prepared by Walker Corporation and dated 21 January 2009 in the vicinity of proposed bio-retention basin No. 5.

(b) Amended engineering drawings shall be marked as confirmation that they have been checked and approved by a RPEQ.

(c) The Developer shall submit to Council for approval a linemarking plan detailing car parking areas and circulation driveway linemarking, signs, "No Stopping" areas and wheel stops etc prior to these particular works being undertaken.

(d) The following is a list of the plans upon which this determination is forwarded:-

Job Number	Plan Number	Issue	Prepared By	Dated
08214	C-101	A	Walker Corporation	17 December 2008
08214	C-102	A	Walker Corporation	17 December 2008
08214	C-103	A	Walker Corporation	17 December 2008
08214	C-105	A	Walker Corporation	17 December 2008

6. Water Use

The Developer shall obtain a current Water Use Authority (WUA) from Ipswich Water if, over the approval relevant period, the potable water restriction level at the time of commencement of, and during, construction prohibits potable water consumption for construction or associated development purposes. The WUA can be obtained by completing a Water Use Declaration and forwarding it to Ipswich Water for approval. Evidence of a current WUA, where applicable, shall be provided to Council's Planning and Development Department prior to the pre-start meeting.

7. Internal Works

(a) The Developer shall install formal 'give way' points at the first and second intersections internal to the site. Priority shall be given to north-south traffic movements. Works shall consist of signs and pavement markings provided in accordance with the MUTCD.

(b) The Developer shall install "No Stopping" zones at those locations outlined on 'Civil, Erosion and Sediment Control Plan' Drawing Number C-103 Issue A prepared by Walker Corporation and dated 17 December 2008. Works shall consist of a yellow line (100mm wide) marked 50mm from the lip of the kerb. "No Stopping" signs shall also be installed on the western side of the north-south driveway to assist with the demarcation of the "No Stopping" zone at this location.

(c) The Developer shall install wheel stops on the parking bays located adjacent to pedestrian walkways or bio-retention basins. Also, the Developer shall place saw- tooth barrier type kerb (or similar) along the eastern side of proposed bio-retention basin No. 6 and footpath to separate the pathway from vehicular traffic.

8. Erosion and Silt Management

(a) The Developer shall be responsible for the installation and maintenance of silt management facilities and truck shake down facilities from the time of commencement of construction until the works have been completed. **All silt and erosion control and truck shake down facilities are to be installed prior to any construction commencing within the site.**

(b) The sedimentation and erosion control plans and all stormwater devices including outlets are subject to performance and may be subject to on-site direction from the Senior Development Engineer to the Developer to change the design.

(c) The Developer shall install sediment fences along all common property boundaries to existing properties where fall is towards these properties.

9. General

(a) The Developer shall submit the following information to Council prior to commencement of work:-

(i) Contractor's on site and after hours telephone number;

(ii) Supervising engineer's office and after hours telephone number; and

(iii) Date of commencement of works and expected duration.

(b) The Developer shall submit engineering certification (by RPEQ or other competent person accepted by the Senior Development Engineer) to Council for the construction of all internal civil works associated with the development.

(c) The certifying authority (or his/her representative) is expected to undertake inspections as necessary to ensure the finished product conforms to standards, and is appropriate for its intended use.

(d) Ipswich Water has implemented a 'Permit to Work System'. The purpose of the 'Permit to Work System' is to reduce risk to Ipswich Water employees, external contractors, assets and the environment . All planned works conducted on or near Ipswich Water assets come under the control of the Ipswich Water Operations Control Room and must be authorised. The Developer or his representative must contact the Ipswich Water Control Room on telephone number 3810 7998 to obtain a Permit to Work form, which must be completed and submitted to the Control Room prior to the pre-start meeting.

(e) Upon completion of the work, a certificate shall be issued by a RPEQ certifying that all municipal and internal work has been constructed in accordance with Council construction standards, and in compliance with the approved plans and specifications. All work shall be supervised by a RPEQ competent in the construction of municipal works and shall be undertaken by a nominated principal contractor experienced in the construction of municipal works. Council may request evidence of the principal contractor's competency. It is a mandatory requirement that the RPEQ will undertake all the necessary inspections to validate the certification.

19. When Approval Takes Effect

This approval has effect in accordance with the provisions of Section 3.5.19 of the *Integrated Planning Act 1997* as follows:

(a) If the applicant does not appeal the decision to the court - from the time the decision notice is given (or if a negotiated decision notice is given, from the time the negotiated decision notice is given); or

(b) If an appeal is made to the court - subject to the decision of the court, when the appeal is finally decided.

20. When Approval Lapses

(a) This approval lapses at the end of the relevant period, unless the development happens before the end of the relevant period. The relevant period for this approval is 2 years starting the day the approval takes effect.

(b) An extended relevant period may be agreed upon, pursuant to Section 3.5.22 of the *Integrated Planning Act 1997*, provided a written notice to Council is made before the end of the relevant period. Such written notice is to be on Council's approved form, accompanied by the owner's consent and the prescribed fee in Council's Register of General Charges.

Conditions of Concurrence Agencies

1. The Department of Main Roads is a concurrence agency with regard to this development approval. The attached concurrence agency response, dated 27 January 2009, forms part of this Decision Notice.

2. Powerlink is an advice agency with regard to this development approval. The attached concurrence agency response, dated 28 January 2009, forms part of this Decision Notice.

B. The Developer be further advised of the following:-

1. Operational Works Drawings

Council has reviewed the Operational Works drawings to ensure that the design conforms with 'Material Change of Use conditions of Development Permit Application No. 9411/08'. Notwithstanding, a detailed check of the calculations and drawing details has not been undertaken, as they shall be certified by a RPEQ. Council reserves the right to require further amendments and/or additions at a later date should design errors or omissions become apparent in regard to the works relevant to this Operational Works approval.

2. Internal Water and Sewerage Plumbing Works

Review of internal water and sewerage plumbing works does not fall within this approval. Such works are part of the Plumbing and Drainage Application.

3. Fire Ants

In accordance with the *Plant Protection Act 1989* and the Plant Protection Regulation 1990, a quarantine notice has been issued for the State of Queensland to prevent the spread of the Red Imported Fire Ant (ant species Solenopsis invicta) and to eradicate it from the State.

It is the legal obligation of the land owner or any consultant or contractor employed by the land owner to report the presence or suspicion of Fire Ants to the Queensland Department of Primary Industries on 132523 within 24 hours of becoming aware of the presence or suspicion, and to advise in writing within seven days to:

Director General
Department of Primary Industries
GPO Box 46, Brisbane QLD 4001

It should be noted that the movement of Fire Ants is prohibited, unless under the conditions of an Inspectors Approval. More information can be obtained from the Queensland Department of Primary Industries website www.dpi.qld.gov.au.

The land over which you have made a development application is within a suburb known to have Fire Ants and as such is within a "Restricted Area". The presence of Fire Ants on the site may affect the nature, form and extent of works permitted on the site. In view of this it will be necessary for you to contact the Department of Primary Industries to investigate the site and for you to implement any necessary matters required by that Department prior to the commencement of any works.

4. Hydraulic Plans

(a) The Developer shall submit to Council hydraulic plans that comply with the requirements of the *Water Act 2000* for scrutiny by Council.

(b) Scrutiny fees in accordance with the Council's Schedule of Fees and Charges shall be paid at the time of lodgement of plans. No work on plumbing and drainage shall commence prior to the approval of the plan and the issuing of a permit by Council, to a Licensed Plumber/Drainer.

(c) Tests and inspections shall be arranged with the Building & Plumbing Section upon payment of the appropriate current fees.

5. Portable Long Service Leave

From 1 January 2000, the Building and Construction Industry (Portable Long Service Leave) Levy must be paid prior to the issue of a development permit where one is required. This applies to Building Works, Operational Works and Plumbing and Drainage Works applications, as defined under the *Integrated Planning Act 1997*, where the works are $80 000 or more and matching the definition of 'Building and Construction Industry' under the *Building and Construction Industry (Portable Long Service Leave) Act 1991*.

Council will not be able to issue a Decision Notice without receipt of evidence that the Levy has been paid. Should you require clarification in regard to the amendments to the *Building and Construction Industry (Portable Long Service Leave) Act 1991*, you should contact QLeave on 1800 803 481 (free call) or [redacted]

6. Water Use Authority

The Developer is advised to obtain a current Water Use Authority (WUA) from Ipswich Water if, over the approval relevant period, the potable water restriction level at the time of commencement of, and during, construction prohibits potable water consumption for construction or associated development purposes. The WUA can be obtained by completing a Water Use Declaration and forwarding it to Ipswich Water for approval. Evidence of a current WUA, where applicable, shall be provided to Council's Planning Development Dept prior to the pre-start meeting.

7. Water Meter

Where the proposed development is likely to have an annual water consumption equal to or greater than 20,000 kL, the Developer must contact Ipswich Water on telephone number [redacted] to arrange installation of an electronic flow meter.

C. A copy of this decision be forwarded to the following referral agencies:

1. District Director
Metropolitan District Office
Department of Main Roads

PO Box 70
SPRING HILL QLD 4004

2. Powerlink
PO Box 1193
VIRGINIA QLD 4014

[redacted]
ASSISTANT PLANNER (DEVELOPMENT)

I have this day adopted the recommendation specified in this report.

Such action was taken pursuant to the delegation entitled "Determination of a Development Application, including Negotiated Decisions" granted to me by the Chief Executive Officer dated 16 August 2001 and 22 August 2001.

[redacted]

[redacted]
DEVELOPMENT TEAM
CO-ORDINATOR - EAST

Date: 30/11/09

Ipswich City Council

Assessment Checklist

Code Assessable Development

A. Application Details

Appln No.: **9411/08** Division: **4**

B. Preamble Assessment

1. Are the real property description and location details provided on the Application Form correct? ☒ Yes ☐ No

2. Has the 'consent of owner' been correctly obtained? ☒ Yes ☐ No

3. Has the correct fee been paid? ☒ Yes ☐ No

C. Supporting Information

1. (a) Was any supporting material lodged with the application? ☒ Yes ☐ No

- IDAS Forms A, D, E, N and IDAS Assessment Checklist;
- Planning Assessment Report;
- Architectural Drawings;
- Environmental Noise Assessment;
- Traffic and Car Parking Assessment;
- Cultural Heritage Management Plan;
- Dangerous Goods Manifest;
- Waste Management Information;
- OPW Landscaping Drawings; and
- OPW Stormwater Reports and Drawings.

(b) Are there any planning issues associated with this material? ☐ Yes ☒ No

2. (a) Is there a need for an Information Request? ☒ Yes ☐ No

C. Supporting Information

(b) Are there any outstanding issues associated with the Information Response? ☐ Yes ☒ No ☐ N/A

D. Referral / Advice Agencies

1. Are there any referral or advice agencies applicable to this development? ☒ Yes ☐ No

   - DMR (Concurrence) and Powerlink (Advice)

2. Are there any issues associated with advice received from a Referral / Advice Agency? ☐ Yes ☒ No ☐ N/A

E. State Planning Policies (SPP's)

1. Are there any SPP's applicable to this development? ☐ Yes ☒ No

2. Does the development comply with any relevant SPP's? ☐ Yes ☐ No ☒ N/A

F. Zone Code

1. What is the relevant zone code(s) for this development?

   Regional Business and Industry Zone Code

2. (a) Does the development require Code assessment under the relevant assessment table for the zone? ☒ Yes ☐ No

   - Regionally Significant Business and Industry Area Code;
   - Regional Business and Industry Zone Code;
   - Commercial and Industrial Code;
   - Parking Code; and
   - Development Constraints Overlay Code.

3. (a) Are there any overall or specific outcomes for the locality which apply to the development? ☒ Yes ☐ No

F. Zone Code

(b) Does the development comply with any relevant overall or specific outcomes for the locality?	☒ Yes ☐ No ☐ N/A
4. Does the development comply with the overall outcomes for the zone?	☒ Yes ☐ No ☐ N/A
5. Does the development comply with the "Effects of Development – General" (including the specific outcomes and any applicable probable solutions or acceptable solutions) for the zone?	☒ Yes ☐ No ☐ N/A
6. (a) Are there any Sub Area or Precinct provisions within the zone which apply to this development? ➢ RB2L & RBB	☒ Yes ☐ No
(b) Does the development comply with these provisions?	☒ Yes ☐ No ☐ N/A

G. Codes for a Stated Purpose or of a Stated Type (refer Part 12 of the Planning Scheme)

1. Are there any codes under Part 12 of the Planning Scheme applicable to the development? ➢ Commercial and Industrial Code and Parking Code	☒ Yes ☐ No
2. Does the development comply with these codes?	☒ Yes ☐ No ☐ N/A

H. Overlays (refer Part 11 of the Planning Scheme)

1. (a) Is the site affected by a Character Places Overlay? ➢ The parent lot to which this application relates is affected by a Character Places Overlay however the particular site to be registered is not affected by this overlay.	☒ Yes ☐ No
(b) Is the assessment category changed (refer Table 11.3.2)?	☐ Yes ☒ No ☐ N/A

H. Overlays (refer Part 11 of the Planning Scheme)

	(c) Does the development comply with the Character Places Overlay Code and the Character Code?	☒ Yes ☐ No ☐ N/A
2.	(a) Is the site affected by a Development Constraints Overlay?	☒ Yes ☐ No
	(b) Is the assessment category changed (refer Table 11.4.3 and 11.4.4)?	☐ Yes ☒ No ☐ N/A
	(c) Does the development comply with the relevant provisions of the Development Constraints Overlay Code?	☒ Yes ☐ No ☐ N/A

I. Other Relevant Matters

1.	(a) Are there any Planning Scheme Policy provisions which specifically apply to this development? ➢ Planning Scheme Policy 5 - Infrastructure	☒ Yes ☐ No
	(b) Does the development comply with these provisions?	☒ Yes ☐ No ☐ N/A
2.	(a) Are there any Implementation Guidelines which specifically apply to this development?	☐ Yes ☒ No
	(b) Does the development comply with these Guidelines?	☐ Yes ☐ No ☒ N/A
3.	Are there any other relevant matters which pertain to this development?	☐ Yes ☒ No ☐ N/A
4.	Infrastructure Contributions – Calculation Sheet attached to this checklist?	☒ Yes ☐ No ☐ N/A

J. Summary

1. Recommended for:

- [x] Approval - Subject to Conditions
- [ ] Refusal
- [ ] Part Refusal / Part Approval -Subject to conditions

[redacted]

ASSISTANT PLANNER (DEVELOPMENT)
Date:

[redacted]

TEAM CO-ORDINATOR (EAST)
Date:

30/1/09

From: [redacted]
Sent: Thursday, 15 January 2009 2:30:03 PM
To [redacted]
Subject: FW: 9411/2008 Engineering information request combined OW and MCU

Regards
[redacted] Assistant Planner (Development)
T| 7279

From: [redacted]
Sent: Thursday, 15 January 2009 2:04 PM
To: [redacted]
Cc: [redacted]
Subject: 9411/2008 Engineering information request combined OW and MCU

[redacted]

Additional information is required to adequately assess this application for development at 120 Bognuda Street, Bundamba.

Traffic

The Applicant is requested to provide:

* Formal certification from an RPEQ (Traffic) that the car parking area and on-site circulation has been designed in accordance with Australian Standard AS2890.1 and AS2890.2

* The electronic files (on CD) of the heavy vehicle swept path analysis provided in hard copy format as part of the Traffic Report prepared by Traffic & Transport Planning Associates dated December 2008.

* Information on how and where 'end of trip' facilities for cyclists are to be provided on the site in accordance with the Austroads Guide to Traffic Engineering Practice Part 14 - Bicycles for a 'light industry' land use category.

* Information to demonstrate how safe and efficient access for pedestrians and cyclists is to be facilitate between the external street and the proposed site office area. Facilities may include a formalised route consisting of paths, gates, stairs, ramps, crossing points, pavement markings, signage and lighting.

Earthworks

The applicant is requested to provide cross sections at regular intervals and critical locations that clearly identifies the extent of the proposed earthworks within the subject property including proposed depth of cut and fill, retaining wall heights, batter slopes etc inaccordance with Council's earthworks code and Planning Scheme Policy 3 - General Works.

Stormwater Drainage Quantity

The applicant is requested to submit the detail hydraulic calculations prepared a RPEQ inaccordance with QUDM that support the stormwater design drawings. The design and calculations are to be adjusted to allow for 300mm of extended detention and not 400mm.

Certificate of Design

The applicant is request to provide a certificate of design signed by a RPEQ, certifying that the design is in accordance with all relevant engineering standards, Council's requirements and standards, and sound engineering practice.

Engineering Drawings

The Applicant is requested to submit a total of four (4) A3 size sets in hard copy format. The submission shall also include a Compact Disc containing electronic data as follows:

(i) A full set of all engineering drawings contained in one file;

(ii) Any reports submitted in support of the Application. Each report shall be included as a separate file; and

(iii) An index of all files on the Compact Disc including descriptions of contents of each file.

All files shall be submitted in PDF format.

Regards

[redacted]

From: [redacted]
Sent: Friday, 16 January 2009 9:04:22 AM
To: [redacted]
Subject: RE: API

Morning [redacted]

My apologies, I had meant to get this email out to you yesterday afternoon but it slipped my mind. As per our telephone conversation, Council has requested you provide the following information:

Earthworks

The Applicant is requested to provide cross sections at regular intervals and critical locations that clearly identifies the extent of the proposed earthworks within the subject property including proposed depth of cut and fill, retaining wall heights, batter slopes etc in accordance with Council's Earthworks Code and Planning Scheme Policy 3 - General Works.

Stormwater Drainage Quantity

The Applicant is requested to submit the detailed hydraulic calculations prepared a RPEQ in accordance with QUDM that support the stormwater design drawings. The design and calculations are to be adjusted to allow for 300mm of extended detention and not 400mm.

Certificate of Design

The Applicant is request to provide a certificate of design signed by a RPEQ, certifying that the design is in accordance with all relevant engineering standards, Council's requirements and standards, and sound engineering practice.

Engineering Drawings

The Applicant is requested to submit a total of four (4) A3 size sets in hard copy format. The submission shall also include a Compact Disc containing electronic data as follows:

(I) A full set of all engineering drawings contained in one file;
(ii) Any reports submitted in support of the Application. Each report shall be included as a separate file; and
(iii) An index of all files on the Compact Disc including descriptions of contents of each file.

Should you require any further information, please contact myself on telephone number [redacted]

Regards
[redacted] | Assistant Planner (Development)
T| 7279

From: [redacted]

Sent: Friday, 16 January 2009 8:58 AM
To: [redacted]
Subject: API

Walker Corporation Qld | Ph [redacted] | Fax: [redacted] www.walkercorp.com.au

Morning [redacted]

Further to our very brief discussion yesterday afternoon, would you prefer to run through the action items on API over the phone or will you send through an email??

[redacted]

[redacted]
Planning Manager - Approvals Division
Walker Corporation Pty Ltd

[redacted]
www.walkercorp.com.au

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Posted 30.1.09
Made Public

Your reference
Our reference 9411/08 MG:MM
Contact Officer [redacted]
Telephone

City of Ipswich

Ipswich City Council

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SCANNED
DEVELOPMENT BRANCH
03 FEB 2009
Doc No:

Walker Corporation Pty Ltd
Po Box 939
OXENFORD QLD 4210

SCANNED
DEVELOPMENT BRANCH
30 JAN 2009
Doc No: 3559047

30 January 2009

INTEGRATED PLANNING ACT 1997

DEVELOPMENT APPLICATION DECISION NOTICE

Application Details

Application No:	9411/08
Real Property Description:	Lot 13 on SL 2982
Property Location:	120 Bognuda Street, Bundamba
Names and Addresses of all Referral Agencies:	District Director Metropolitan District Office Department of Main Roads PO Box 70 SPRING HILL QLD 4004 Powerlink PO Box 1193 VIRGINIA QLD 4014
Decision Date:	30 January 2009
Decision:	Approved subject to the conditions detailed below.
Decision Authority:	Team Co-ordinator - East

Approval Details:

Proposal	Development	Decision	Approval Type
Service/Trades Use (Warehouse/Storage)	Making a material change of use of premises	Approved	Development Permit.
Stormwater, Drainage Works, Earthworks, Car Park, Landscaping	Carrying out operational work	Approved	Development Permit.

Further Development Permits Required

Further Development Permits, as required by the *Integrated Planning Act 1997*, shall be obtained in respect of any Building Works and Plumbing Works in relation to this approval before any such works are commenced.

Conditions

Assessment Manager (Ipswich City Council)

Conditions applicable to this approval under Integrated Planning Act:

Conditions of Assessment Manager (Ipswich City Council) – Service/Trades Use (Warehouse/Storage)

1. Basis of Approval

   Subject to these conditions, the facts and circumstances set out in the application and all relevant Council Local Laws and/or Planning Scheme Policies shall be adhered to.

2. Minor Alterations

   Notwithstanding the requirements detailed in this approval, any other minor alterations and/or modifications acceptable to the Development Planning Manager will suffice.

3. Site Development

   The development of the site shall be undertaken generally in accordance with the following plans:

Title	Project No.	Drawing No.	Issue	Prepared By	Dated
Pedestrian Walkway	1781301	AR-DA-11	A	Walker Corporation	21 January 2009
Site Plan	1781301	AR-DA-02	C	Walker Corporation	17 December 2008
Truck Articulation	1781301	AR-DA-08	B	Walker Corporation	16 December 2008
Warehouse Internal Fitout	1781301	AR-DA-10	A	Walker Corporation	16 December 2008

Main and Operations Office	1781301	AR-DA-04	B	Walker Corporation	16 December 2008
Warehouse Floor Plan	1781301	AR-DA-03	C	Walker Corporation	17 December 2008
Elevations	1781301	AR-DA-07	B	Walker Corporation	16 December 2008
Coloured Elevations	1781301	AR-DA-09	B	Walker Corporation	16 December 2008
Sections	1781301	AR-DA-06	B	Walker Corporation	16 December 2008

4. Particular Use

This approval is for the particular use stated, and does not imply approval for other similar uses. To this end, the use of any of the proposed structures associated with the Service Trades Use (Warehouse), inclusive of car parking and any associated outdoor areas on site, are not permitted to be used for any other purpose, unless, in the opinion of the Development Planning Manager, such use is ancillary and incidental to the predominant use of the site for a Service Trades Use (Warehouse).

5. Hours of Construction

Unless otherwise determined in writing by the Development Planning Manager hours of construction shall be:

Monday to Saturday 6.30 a.m. to 6.30 p.m.

Work or business shall not be conducted from or on the premises outside the above hours or on Sundays or public holidays.

6. Hours of Operation

(a) Unless otherwise determined in writing by the Development Planning Manager, the operating hours for the development are not limited, subject to any requirements of Condition 23: Noise Management Plan.

(b) In the event that Council receives ongoing complaints about noise that Council considers are not frivolous or vexatious, then the hours of operation above may be reviewed.

7. Locality References

(a) Any place name or estate name used by the Developer (excluding a reference to a building, structure or the like and excluding minor, subsidiary signage within a development) shall make reference to the relevant, approved place name under the *Place Names Act 1994* in a contrasting colour and in lettering no less than 50% of the size of the lettering for the Estate name.

(b) Any reference to the regional location of the site or the development shall not refer to the place or estate as being located in Brisbane or a Brisbane suburb or in the metropolitan area or in the western suburbs (excluding the western suburbs of Ipswich as determined by Council in writing from time to time).

8. Car Parking - Use and Maintenance

(a) A minimum of 190 car parking spaces shall be provided on the site, with a minimum of 95 car parking spaces sealed and line-marked. The remaining 95 car parking spaces shall be available if determined by Council to be required.

(b) Unless otherwise indicated on the approved plan of development or approved by the Development Planning Manager, parking areas shall not be:

(i) Exclusively used for staff parking at the expense of general public/customer parking; or

(ii) Exclusively used for general public/customer parking at the expense of staff parking.

(c) All parking areas shall be:

(i) Kept exclusively for parking;

(ii) Used exclusively for parking;

(iii) Accessible to both staff and the general public/customer during any approved hours of operation;

(iv) Appropriately signposted at the entry/entries to the carpark, to the satisfaction of the Development Planning Manager (eg. "Staff and Customer Parking"), in accordance with AS1742; and

(v) Maintained to the satisfaction of the Development Planning Manager.

9. Access for People with a Disability

The Developer shall provide adequate access for people in wheelchairs by means of an unimpeded continuous path of travel from any adjacent roadway and from any car parking bay allocated for use by people with a disability, to all parts of the development which are normally open to the public.

10. Trade Materials, Products and Plant

All trade materials, products and plant shall be kept within the confines of the building and/or approved storage areas.

11. Recreation Space

Recreation space shall be provided for employees and shall:

(a) Be available for the recreational use of all employees on the site and may be covered or uncovered;

(b) Be accessible via properly constructed pedestrian pathways or covered walkways from all factory units or tenancies on the site; and

(c) Be furnished, landscaped and maintained generally to the satisfaction of the Development Planning Manager.

12. Loading and Unloading

All loading and unloading shall take place at an approved location within the boundaries of the subject property..

13. Contributions

In accordance with the relevant Planning Scheme Policies, the Developer shall pay, prior to the issue of any Building Works approval associated with the development, the monies as outlined below to Council:-

Contribution	Sector	Rate	Proposal	Calculation
Water Supply	Bundamba Low Level Zone (WT5)	$734.00 NRU Unit Charge = 1.1041 Total = $810.41 NRU	0.25 NRU per 100 m² (GFA) Total GFA = 18,935.75 m² **Proposal = 47.34 NRU**	$810.41 x 47.34 = $38,364.81 **Total = $38,365.00**
Sewerage Infrastructure	South Bremer Business Park (SW23)	$1,052.00 NRU Unit Charge = 1.1041 Total = $1,161.51 NRU	0.25 NRU per 100 m² (GFA) Total GFA = 18,935.75 m² **Proposal = 47.34 NRU**	$1,161.51 x 47.34 = $54,985.88 **Total = $54,986.00**
Road Contributions	Bundamba Industry (RD25)	$554.00 VT Unit Charge = 1.1041 Total = $611.67 VT	2.30 VT per 100 m² (GFA) Total GFA = 18,935.75 m² **Proposal = 435.52 VT**	$611.67 x 435.52 = $266,394.51 **Total = $266,395.00**
Total for Development				**$359,746.00**

The contributions above shall be applicable for a period of **twelve (12) months from the date of the development approval**, and thereafter shall be based on the infrastructure contribution policies and rates applicable at the date when payment is made.

NOTE: The payment of contributions for Reconfiguring a Lot Application No 1837/07 will negate the need to pay the contributions outlined above for the Service/Trades Use (Warehouse/Storage).

14. Engineering Requirements

The following engineering requirements, detailed in Conditions 15 – 23, shall be completed to the satisfaction of the Senior Development Engineer.

Terms

(a) RPEQ - A Registered Professional Engineer of Queensland, suitably qualified and experienced in the particular area of expertise required.

(b) QUDM 2007 - The Queensland Urban Drainage Manual, produced by the Queensland Department of Natural Resources and Water (2007 Version).

(c) Ipswich Water - Commercial Business Unit of Ipswich City Council providing water and sewerage services to Ipswich City

15. Access and Parking

(a) Design and construction of all access and parking shall be in accordance with the provisions of the Ipswich City Council Parking Code and Australian Standards (2890 series).

(b) All loading and/or unloading activities shall occur within the site.

(c) All parking, access and manoeuvring areas shall be constructed of concrete, bitumen or equivalent and shall be line-marked in accordance with the relevant Australian Standard.

(d) "End of trip" facilities for cyclists shall be provide in accordance with the Austroads Guide to Traffic Engineering Practice Part 14 - Bicycles for a 'Category 2' facility and as outlined in the Technical Note prepared by Transport & Traffic Planning Associates dated 20 January 2009. Works shall include:

(i) A locked compound area for bicycle parking in the general location outlined on Plan No AR-DA-11 Rev A. The compound shall be designed and fitted with facilities where a minimum 19 bicycles can be readily parked and with communal access being provided using duplicate keys or electronic swipe cards for staff/employees; and

(ii) Areas for staff/employees (male and female) fitted with lockers (minimum 12 in each area), showers (minimum 2 in each area), toilets and change facilities.

(e) The Developer shall install wheel stops on the parking bays located adjacent to pedestrian walkways and bio-retention basins.

(f) The internal car park and circulation driveways shall be lit appropriately. Parking spaces, aisles and circulation driveways shall be illuminated to minimum average of 20 lux. Parking spaces dedicated for disability and pedestrian walkways/crossing points shall be illuminated to a minimum average of 50 lux.

16. Sewerage

Where applicable, the Developer shall pay the full cost for Council to provide a suitable connection into the existing sewerage reticulation system. All works on live sewers are to be carried out by Council at the Developer's expense, unless arranged otherwise with Ipswich Water.

17. Water

Council's water supply system has been designed to achieve the target levels of service as outlined in Ipswich Water's Water Supply Planning Guidelines. It is the responsibility of the Developer to provide any fire fighting requirements over and above Council's target levels of service, at their expense, internally and without adverse impact to Council's water supply system.

18. Stormwater Quantity

(a) Stormwater quantity management shall be undertaken generally in accordance with the Stormwater Management Plan dated 17 December 2008 and prepared by Martin Cosgrove and Associates Pty Ltd subject to conditions of this approval.

(b) The Developer shall provide an allotment drainage system designed in accordance with QUDM 2007. The drainage system shall be minimum level IV in QUDM .

(c) No ponding, concentration or redirection of stormwater shall occur onto adjoining land unless specifically approved by Council in consultation with the owner of the adjoining land.

19. Stormwater Quality

(a) Stormwater quality management shall achieve a reduction in the average annual pollutant load as follows prior to discharge from the site:

- 80% for total suspended solids;
- 60% for total phosphorus;
- 45% for total nitrogen; and
- 90% for gross pollutants

(b) The water quality objectives listed in (a) shall be achieved through the implementation of rainwater tanks, filter baskets within all stormwater pits and nine (9) bio-retention basins each with a coarse sediment forebay at the pipe inlets in accordance with the Stormwater Management Report prepared by Martin Cosgrove and Associates Pty Ltd (reference 08214-L1 dated 17 December 2008.

(c) The bio-retention basins shall be in accordance with the parameters represented in Table 1 below:

Table 1: Bio-retention Basin Configurations

Bio-retention Basin	1	2	3	4	5	6	7	8	9
Filter Area (m^2)	30	44	19	7	29	116	50	174	225
Filter Media Median Particle Size (mm)	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45
Filter Media Depth (m)	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Hydraulic conductivity (mm/hr)	180	180	180	180	180	180	180	180	180
Transition layer depth (mm)	100	100	100	100	100	100	100	100	100
Drainage layer depth (mm)	200	200	200	200	200	200	200	200	200
Extended detention depth (m)	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3

(d) The surface of the bio-retention swale is not to be covered in river stone but planted out in accordance with species and densities detailed in Appendix A of the Water Sensitive Urban Design Technical Design Guidelines. Shade trees for the purposes of satisfying Council's Parking Code requirements are NOT to be planted in bio-retention areas. Separate landscaped areas are to be created for the purpose of shade; or alternatively the Developer shall implement shade structures (eg. shade sails) as per Condition 20: Landscaping.

(e) The Developer shall provide to Council certification from the consulting engineers that prepared the approved Stormwater Management Report certifying that all stormwater quality treatment devices have been constructed in accordance with the approved Stormwater Management Report. This shall include certification that the bio-filtration filter media meets the criteria outlined in the Guideline for Soil Filter Media in Bio-retention Systems (Version 2.01), Facility for Advancing Water Bio-filtration (FAWB) dated March 2008.

20. Landscaping

(a) A Landscape Plan, which conforms to the approved development plan, the Bremer Business Park Preliminary Approval and the Commercial and Industrial Code shall be submitted to Council (in conjunction with re-assessment fee) for approval. Such plan shall be generally in accordance with the Landscape Concept Plan prepared by Lange Design Landscape Architecture dated 15 December 2008 Issue B (Drawing numbers WC1208-Lt23-CS and WC1208-Lt23-LP01 to WC1208-Lt23-LP04) subject to the following:

(i) The trees proposed within the entry and car parking bio-retention basins as shown on drawing numbers WC1208-Lt23-LP02 and WC1208-Lt23-LP03 shall be removed;

(ii) The Developer shall reduce the number of car parks to facilitate the planting of shade trees within the car park. Generally, car parking spaces shall not be continuous for more than eight (8) spaces without the provision of a shade tree. Alternatively shade sails or a combination of shade sails and planting shall be implemented in order to comply with Council's Parking Code. Details of how the Developer proposes to achieve this requirement shall be submitted for approval by Council, in conjunction with the landscape plan;

(iii) Landscaping of bio-retention basins required by Condition 19: Stormwater Quality is in accordance with species and densities detailed in Appendix A of the Water Sensitive Urban Design Technical Design Guidelines ensuring cross sections comply with Chapter 5 as follows:

- The surface of the bio-retention swales are planted out and not covered in river stone, the drainage layer must be 200mm and the transition layer 100mm.

- The filter media must have a median particle size of 0.45mm and a hydraulic conductivity of 180mm/hr and be 0.6m deep;

(iv) Include extent of other landscaped areas;

(v) Fence size and type of material;

(vi) Schedule of plant species size (see Note 1 below), densities (see Note 2 below) and attributes for other landscaped areas; and

(vii) Exclude the use of exotics and environmental weeds. Consideration shall be given to utilising Council's Vegetation Communities Rehabilitation Guide 2 Alluvial Flats, Watercourses & Wetlands and Appendix A Plant Selection for Water Sensitive Urban Design published by Healthy Waterways.

Note 1: Planting sizes are at least as follows

Street and features trees	45L
Other trees	300mm
Larger shrubs	200mm
Groundcovers	150mm

Note 2: Planting at approximately the following density rates:

	For buffer planting	All Other instances
Trees	at 2m centres	at 5m centres
Large shrubs	at 1m centres	at 2m centres
Groundcovers	at 0.5-1m centres	at 0.5-1m centres

(b) The Developer shall provide on site rainwater retention tanks, minimum 60,000 L storage, and distribution system (eg drip irrigation) for the purpose of irrigating landscape and bio-retention gardens.

(c) The Developer shall complete landscaping and fencing works in accordance with the approved landscape plans to the satisfaction of the Development Planning Manager. Such landscaping and fencing shall be maintained in perpetuity to Council's satisfaction by the existing or future owners and occupiers of the property.

21. Retaining Walls

A certificate from a RPEQ shall be issued to Council certifying that any retaining wall greater than 800mm in height is structurally sound, stable and capable of withstanding any likely surcharge loads.

22. Erosion and Silt Management

(a) The Developer shall be responsible for the installation and maintenance of silt management facilities from the time of commencement of construction until all municipal infrastructure associated with the development has been released "Off Maintenance" by Council. All silt management facilities shall be constructed and maintained in accordance with the document *"Best Practice Erosion and Sediment Control – November 2008"* published by International Erosion Control Association, or equivalent.

(b) Diversion drains and ponds, as necessary, shall be installed on the site before any other work is undertaken on site to ensure that water containing silt, clay, solids or contaminants is contained and/or isolated.

(c) The Developer shall lodge a $5,000 siltation and erosion performance bond with Council prior to any commencement of works. This bond shall only be released by Council at the completion of building and construction works. Where Council determines that a draw-down of the bond is required, the Developer shall restore the bond to its full amount within ten days of a notice from Council to that effect.

(d) In the event that instructions issued by the Senior Development Engineer to the Consulting Engineer for the installation of erosion control measures, are not addressed within 24 hours, Council will call upon the bond to the extent required to carry out the necessary works. Should the Developer fail to complete the works determined by the Senior Development Engineer within the specified time, Council shall complete the work and recover all costs from the Developer associated with the work.

23. General

(a) All works required for this development shall take due regard of any and all existing services and, if considered necessary by the relevant authority or the Senior Development Engineer, such works shall be altered at the cost of the Developer.

(b) Approval of the Senior Development Engineer is required for any fill intended to be placed over Council's underground services.

(c) Should any works be proposed to be undertaken on land under other private ownership, written permission for the works shall be obtained from the owners of the other lands and forwarded to Council. Similarly, written clearances shall be obtained after the works are completed, unless the works are otherwise accepted by the Senior Development Engineer.

24. Health, Parks and Recreation Requirements

Conditions 25 – 28, unless otherwise stated, shall be completed to the satisfaction of the Regulatory Services Manager (Health, Parks and Recreation).

25. Contaminated Land / EMR

Prior to the commencement of any works, the Developer shall provide the Regulatory Services Manager with details on how the contaminated soil dispersal risks during the Operational Works phase will be managed to contain the contaminated soil to the area(s) of risk identified. The erosion, sediment and dust controls to be incorporated during the earthworks at the site should also be detailed.

26. Lighting

The provision of advertising, security and flood lighting shall be designed, constructed, located and maintained in accordance with Australian Standard 4282 – 1997 (Control of the obtrusive effects of outdoor lighting) and so as not to cause nuisance to the occupants of nearby properties or passing traffic.

27. Noise Management Plan

(a) Prior to the commencement of any works/issue of any Building Works approval, the Applicant shall submit to Council for approval a noise management plan which details measures designed to minimise noise impacts from the development. The plan shall address the following issues:

(i) Identified noise sources likely to cause nuisance;

(ii) Aims and objectives;

(iii) Reference to the applicable legislation;

(iv) Performance indicators;

(v) Actions required to minimise the noise impacts from the development's operation;

(vi) Responsible person(s) for achieving the plan aim; and

(vii) A review schedule.

(b) Within this plan consideration must be given to but not be limited to:

(i) The use of the loading bays;

(ii) Hours of operation and delivery times;

(iii) Vehicle speed management devices (preferably not speed bumps) and the like;

(iv) Service vehicle activities/loading bays;

(v) Forklift operations;

(vi) Refrigeration equipment, pumps, compressors, mechanical ventilation equipment and vents; and

(vii) Maintenance of mechanical plant.

(c) The Developer shall implement the approved Noise Management Plan to the satisfaction of the Regulatory Services Manager (Health, Parks and Recreation).

28. Waste Storage and Collection

(a) An adequate refuse collection service shall be provided to the development.

Unless otherwise specifically agreed to in writing by the Regulatory Services Manager (Health, Parks and Recreation), all refuse collection shall occur on the site.

(b) The area on which the bin is to be accessed by refuse collection vehicles shall be screened, level, concreted and constructed in conjunction with the driveway surface with no intervening step, ledge, kerb or other obstruction.

The waste storage and collection areas shall be unimpeded at all times and shall allow forward motion entry to the waste containers and forward motion entry and exit to and from the site. The following dimensions are given as a minimum of front, rear and side loading truck dimensions for a guide to design for the adequate emptying of the bin and manoeuvring of the truck:

Ipswich City Council Waste Collection Vehicle Dimensions

	Front Load	Rear Load	Side Load	Roll on/off
Length overall	10.4 m	10.4 m	10.4 m	10.7 m
Length when loading	10.5 m	10.4 m	10.4 m	20.0 m
Height	3.9 m	3.9 m	3.9 m	3.9 m
Height during loading	6.1m	3.9 m	4.2 m	7.3 m
Access width	4.0 m	4.0 m	4.0 m	4.0 m
Width during loading	3.0m	3.0m	5.0m	3.0 m
Gross vehicle mass (GVM)	22.5 t	15 t	22.5 t	27.5 t

29. Compliance with Conditions

(a) Unless otherwise stated all conditions shall be completed prior to commencement of the proposed change of use of the site or as determined by the Development Planning Manager.

(b) All conditions shall be completed to the satisfaction of the Development Planning Manager.

30. When Approval Takes Effect

This approval has effect in accordance with the provisions of Section 3.5.19 of the *Integrated Planning Act 1997* as follows:

(a) If the Applicant does not appeal the decision to the court - from the time the decision notice is given (or if a negotiated decision notice is given, from the time the negotiated decision notice is given); or

(b) If an appeal is made to the court - subject to the decision of the court, when the appeal is finally decided or the appeal is withdrawn.

31. When Approval Lapses

(a) This approval lapses at the end of the relevant period, unless the change of use happens before the end of the relevant period. The relevant period for this approval is 4 years starting the day the approval takes effect.

(b) An extended relevant period may be agreed upon, pursuant to Section 3.5.22 of the *Integrated Planning Act 1997*, provided a written notice to Council is made before the end of the relevant period. Such written notice is to be on Council's approved form, accompanied by the owner's consent and the prescribed fee in Council's Register of General Charges.

Conditions of Assessment Manager (Ipswich City Council) – Stormwater, Drainage Works, Earthworks, Car Park, Landscaping

1. Basis of Approval

The facts and circumstances set out in the application and all relevant Council Local Laws and/or Local Planning Policies shall be adhered to, except as amended in these conditions. Non municipal structural and building details are excluded from this approval.

2. Minor Alterations

Notwithstanding the requirements detailed in this approval, any other minor alterations and/or modifications shall be subject to the prior written approval of the Senior Development Engineer.

3. Hours of Construction

Unless otherwise approved in writing by the Engineering and Environment Manager hours of construction shall be:

Monday to Saturday 6.30 a.m. to 6.30 p.m.

Work or business shall not be conducted from or on the premises outside the above hours or on Sundays or public holidays.

4. Terms

RPEQ - A Registered Professional Engineer of Queensland, suitably qualified and experienced in the particular area of expertise required. Furthermore, the RPEQ required for the analysis and reporting for mining shall be experienced in the analysis of underground and surface mining within the Ipswich area.

5. Site Development

(a) The Developer shall amend engineering drawings to accord with pedestrian link as shown on 'Pedestrian Walkway' Drawing Number AR-DA-11 Issue A prepared by Walker Corporation and dated 21 January 2009 in the vicinity of proposed bio-retention basin No. 5.

(b) Amended engineering drawings shall be marked as confirmation that they have been checked and approved by a RPEQ.

(c) The Developer shall submit to Council for approval a linemarking plan detailing car parking areas and circulation driveway linemarking, signs, "No Stopping" areas and wheel stops etc prior to these particular works being undertaken.

(d) The following is a list of the plans upon which this determination is forwarded:-

Job Number	Plan Number	Issue	Prepared By	Dated
08214	C-101	A	Walker Corporation	17 December 2008
08214	C-102	A	Walker Corporation	17 December 2008
08214	C-103	A	Walker Corporation	17 December 2008
08214	C-105	A	Walker Corporation	17 December 2008

6. Water Use

The Developer shall obtain a current Water Use Authority (WUA) from Ipswich Water if, over the approval relevant period, the potable water restriction level at the time of commencement of, and during, construction prohibits potable water consumption for construction or associated development purposes. The WUA can be obtained by completing a Water Use Declaration and forwarding it to Ipswich Water for approval. Evidence of a current WUA, where applicable, shall be provided to Council's Planning and Development Department prior to the pre-start meeting.

7. Internal Works

(a) The Developer shall install formal 'give way' points at the first and second intersections internal to the site. Priority shall be given to north-south traffic movements. Works shall consist of signs and pavement markings provided in accordance with the MUTCD.

(b) The Developer shall install "No Stopping" zones at those locations outlined on 'Civil, Erosion and Sediment Control Plan' Drawing Number C-103 Issue A prepared by Walker Corporation and dated 17 December 2008. Works shall consist of a yellow line (100mm wide) marked 50mm from the lip of the kerb. "No Stopping" signs shall also be installed on the western side of the north-south driveway to assist with the demarcation of the "No Stopping" zone at this location.

(c) The Developer shall install wheel stops on the parking bays located adjacent to pedestrian walkways or bio-retention basins. Also, the Developer shall place saw-tooth barrier type kerb (or similar) along the eastern side of proposed bio-retention basin No. 6 and footpath to separate the pathway from vehicular traffic.

8. Erosion and Silt Management

(a) The Developer shall be responsible for the installation and maintenance of silt management facilities and truck shake down facilities from the time of commencement of construction until the works have been completed. **All silt and erosion control and truck shake down facilities are to be installed prior to any construction commencing within the site.**

(b) The sedimentation and erosion control plans and all stormwater devices including outlets are subject to performance and may be subject to on-site direction from the Senior Development Engineer to the Developer to change the design.

(c) The Developer shall install sediment fences along all common property boundaries to existing properties where fall is towards these properties.

9. General

(a) The Developer shall submit the following information to Council prior to commencement of work:-

(i) Contractor's on site and after hours telephone number;

(ii) Supervising engineer's office and after hours telephone number; and

(iii) Date of commencement of works and expected duration.

(b) The Developer shall submit engineering certification (by RPEQ or other competent person accepted by the Senior Development Engineer) to Council for the construction of all internal civil works associated with the development.

(c) The certifying authority (or his/her representative) is expected to undertake inspections as necessary to ensure the finished product conforms to standards, and is appropriate for its intended use.

(d) Ipswich Water has implemented a 'Permit to Work System'. The purpose of the 'Permit to Work System' is to reduce risk to Ipswich Water employees, external contractors, assets and the environment . All planned works conducted on or near Ipswich Water assets come under the control of the Ipswich Water Operations Control Room and must be authorised. The Developer or his representative must contact the Ipswich Water Control Room on telephone number [redacted] to obtain a Permit to Work form, which must be completed and submitted to the Control Room prior to the pre-start meeting.

(e) Upon completion of the work, a certificate shall be issued by a RPEQ certifying that all municipal and internal work has been constructed in accordance with Council construction standards, and in compliance with the approved plans and specifications. All work shall be supervised by a RPEQ competent in the construction of municipal works and shall be undertaken by a nominated principal contractor experienced in the construction of municipal works. Council may request evidence of the principal contractor's competency. It is a mandatory requirement that the RPEQ will undertake all the necessary inspections to validate the certification.

19. When Approval Takes Effect

This approval has effect in accordance with the provisions of Section 3.5.19 of the *Integrated Planning Act 1997* as follows:

(a) If the applicant does not appeal the decision to the court - from the time the decision notice is given (or if a negotiated decision notice is given, from the time the negotiated decision notice is given); or

(b) If an appeal is made to the court - subject to the decision of the court, when the appeal is finally decided.

20. When Approval Lapses

(a) This approval lapses at the end of the relevant period, unless the development happens before the end of the relevant period. The relevant period for this approval is 2 years starting the day the approval takes effect.

(b) An extended relevant period may be agreed upon, pursuant to Section 3.5.22 of the *Integrated Planning Act 1997*, provided a written notice to Council is made before the end of the relevant period. Such written notice is to be on Council's approved form, accompanied by the owner's consent and the prescribed fee in Council's Register of General Charges.

Concurrence Agency

Conditions applicable to this approval imposed by the following Concurrence Agencies:

1. The Department of Main Roads is a concurrence agency with regard to this development approval. The attached concurrence agency response, dated 27 January 2009, forms part of this Decision Notice.

2. Powerlink is an advice agency with regard to this development approval. The attached concurrence agency response, dated 28 January 2009, forms part of this Decision Notice.

Advice

The following advices are offered for your information only and should not be viewed as mandatory conditions of this approval.

Assessment Manager (Ipswich City Council)

1. Operational Works Drawings

Council has reviewed the Operational Works drawings to ensure that the design conforms with 'Material Change of Use conditions of Development Permit Application No. 9411/08'. Notwithstanding, a detailed check of the calculations and drawing details has not been undertaken, as they shall be certified by a RPEQ. Council reserves the right to require further amendments and/or additions at a later date should design errors or omissions become apparent in regard to the works relevant to this Operational Works approval.

2. Internal Water and Sewerage Plumbing Works

Review of internal water and sewerage plumbing works does not fall within this approval. Such works are part of the Plumbing and Drainage Application.

3. Fire Ants

In accordance with the *Plant Protection Act 1989* and the Plant Protection Regulation 1990, a quarantine notice has been issued for the State of Queensland to prevent the spread of the Red Imported Fire Ant (ant species Solenopsis invicta) and to eradicate it from the State.

It is the legal obligation of the land owner or any consultant or contractor employed by the land owner to report the presence or suspicion of Fire Ants to the Queensland Department of Primary Industries on 132523 within 24 hours of becoming aware of the presence or suspicion, and to advise in writing within seven days to:

Director General
Department of Primary Industries
GPO Box 46, Brisbane QLD 4001

It should be noted that the movement of Fire Ants is prohibited, unless under the conditions of an Inspectors Approval. More information can be obtained from the Queensland Department of Primary Industries website www.dpi.qld.gov.au.

The land over which you have made a development application is within a suburb known to have Fire Ants and as such is within a "Restricted Area". The presence of Fire Ants on the site may affect the nature, form and extent of works permitted on the site. In view of this it will be necessary for you to contact the Department of Primary Industries to investigate the site and for you to implement any necessary matters required by that Department prior to the commencement of any works.

4. Hydraulic Plans

(a) The Developer shall submit to Council hydraulic plans that comply with the requirements of the *Water Act 2000* for scrutiny by Council.

(b) Scrutiny fees in accordance with the Council's Schedule of Fees and Charges shall be paid at the time of lodgement of plans. No work on plumbing and drainage shall commence prior to the approval of the plan and the issuing of a permit by Council, to a Licensed Plumber/Drainer.

(c) Tests and inspections shall be arranged with the Building & Plumbing Section upon payment of the appropriate current fees.

5. Portable Long Service Leave

From 1 January 2000, the Building and Construction Industry (Portable Long Service Leave) Levy must be paid prior to the issue of a development permit where one is required. This applies to Building Works, Operational Works and Plumbing and Drainage Works applications, as defined under the *Integrated Planning Act 1997*, where the works are $80 000 or more and matching the definition of 'Building and Construction Industry' under the *Building and Construction Industry (Portable Long Service Leave) Act 1991*.

Council will not be able to issue a Decision Notice without receipt of evidence that the Levy has been paid. Should you require clarification in regard to the amendments to the *Building and Construction Industry (Portable Long Service Leave) Act 1991*, you should contact QLeave on 1800 803 481 (free call) or [redacted]

6. Water Use Authority

The Developer is advised to obtain a current Water Use Authority (WUA) from Ipswich Water if, over the approval relevant period, the potable water restriction level at the time of commencement of, and during, construction prohibits potable water consumption for construction or associated development purposes. The WUA can be obtained by completing a Water Use Declaration and forwarding it to Ipswich Water for approval. Evidence of a current WUA, where applicable, shall be provided to Council's Planning Development Dept prior to the pre-start meeting.

7. Water Meter

Where the proposed development is likely to have an annual water consumption equal to or greater than 20,000 kL, the Developer must contact Ipswich Water on telephone number [redacted] to arrange installation of an electronic flow meter.

Pursuant to the provisions of the *Integrated Planning Act 1997*, I also enclose herewith a copy of the relevant sections concerning:

- Making representations about conditions during the applicant's appeal period (i.e. Negotiated Decision Notice); and
- The institution of an appeal.

Access PD Online at www.ipswich.qld.gov.au to view, search and print property information, interactive mapping, track development applications and the Ipswich Planning Scheme. Undertake a development enquiry as part of the Property Enquiry function to identify the planning scheme provisions that apply to a particular use on a property. PD Online - information at your fingertips 24 hours a day, 7 days a week.

Yours faithfully

[redacted]

Jo Pocock
ACTING DEVELOPMENT PLANNING MANAGER

Extract from the Integrated Planning Act

Division 4 – Representations about conditions and other matters

Application of div 4

3.5.16 This division applies only during the applicants appeal period.

Changing conditions and other matters during the applicant's appeal period

3.5.17 (1) This section applies if the applicant makes representations to the assessment manager about a matter stated in the decision notice, other than a refusal or a matter about which a concurrence agency told the assessment manager under section 3.3.18(1).

(2) If the assessment manager agrees with any of the representations, the assessment manager must give a new decision notice (the ***negotiated decision notice)*** to –

(a) the applicant; and

(b) each principal submitter; and

(c) each referral agency; and

(d) if the assessment manager is not the local government and the development is in a local government area – the local government.

(3) Only 1 negotiated decision notice may be given.

(4) The negotiated decision notice –

(a) must be given within 5 business days after the day the assessment manager agrees with the representations; and

(b) must be in the same form as the decision notice previously given; and

(c) must state the nature of the changes; and

(d) replaces the decision notice previously given.

(5) If the assessment manager does not agree with any of the representations, the assessment manager must, within 5 business days after the day the assessment manager decides not to agree with any of the representations, give a written notice to the applicant stating the decision about the representations.

(6) Before the assessment manager agrees to a change under this section, the assessment manager must reconsider the matters considered when the original decision was made, to the extent the matters are relevant.

(7) If the development approved by the negotiated decision notice is different from the development approved in the decision notice in a way that affects the amount of an infrastructure charge or regulated infrastructure charge, the local government may give the applicant a new infrastructure charges notice under 5.1.8 or regulated infrastructure charges notice under section 5.1.18 to replace the original notice.

(8) If the development approved by the negotiated decision notice is different from the development approved in the decision notice in a way that affects the amount of a regulated State infrastructure charge, the relevant State infrastructure provider may give the applicant a new regulated State infrastructure charges notice under section 5.3.4 to replace the original notice.

Applicant may suspend applicant's appeal period

3.5.18 (1) If the applicant needs more time to make the written representations, the applicant may, by written notice given to the assessment manager, suspend the applicants appeal period.

(2) The applicant may act under subsection (1) only once.

(3) If the written representations are not made within 20 business days after the day written notice was given to the assessment manager, the balance of the applicants appeal period restarts.

(4) If the written representations are made within 20 business days after the day written notice was given to the assessment manager -

(a) if the applicant gives the assessment manager a notice withdrawing the notice under subsection (1) – the balance of the applicants appeal period restarts the day after the assessment manager receives the notice of withdrawal; or

(b) if the assessment manager gives the applicant a notice under section 3.5.17(5) – the balance of the applicant's appeal period restarts the day after the applicant receives the notice; or

(c) if the assessment manager gives the applicant a negotiated decision notice – the applicant's appeal period starts again the day after the applicant receives the negotiated decision notice.

Division *8–Appeals to court relating to development applications*

Appeals by applicants

4.1.27. (1) An applicant for a development application may appeal to the court against any of the following–
(a) the refusal, or the refusal in part, of a development application;
(b) a matter stated in a development approval, including any condition applying to the development, and the identification of a code under Section 3.1.6;
(c) the decision to give a preliminary approval when a development permit was applied for;
(d) the length of a period mentioned in 3.5.21;
(e) a deemed refusal.
(2) An appeal under subsection (1)(a) to (d) must be started within 20 business days (the "applicant's **appeal period")** after the day the decision notice or negotiated decision notice is given to the applicant.
(3) An appeal under subsection (1)(e) may be started at any time after the last day a decision on the matter should have been made.

Appeals by submitters

4.1.28. (1) A submitter for a development application may appeal to the court only against-
(a) the part of the approval relating to the assessment manager's decision under section 3.5.14 or 3.5.14A; or
(b) for an application processed under section 6.1.28(2)-the part of the approval about the aspects of the development that would have required public notification under the repealed Act.
(2) To the extent an appeal may be made under subsection (1), the appeal may be against 1 or more of the following-
(a) the giving of development approval;
(b) any provision of the approval including –
(i) a condition of, or lack of condition for, the approval; or
(ii) the length of a period mentioned in section 3.5.21 for the approval.
(3) However, a submitter may not appeal if the submitter-
(a) withdraws the submission before the application is decided; or
(b) has given the assessment manager a notice under section 3.5.19(1)(b)(ii)
(4) The appeal must be started within 20 business days (the ***submitter's appeal period)*** after the decision notice or negotiated decision notice is given to the submitter.

Appeals for matters arising after approval given (co-respondents)

4.1.30. (1) For a development approval given for a development application, a person to whom any of the following notices have been given may appeal to the court against the decision in the notice-
(a) a notice giving a decision on a request for an extension of a period mentioned in section 3.5.21;
(b) a notice giving a decision on a request to make a minor change to an approval
(2) The appeal must be started within 20 business days after the day the notice of the decision is given to the person.
(3) Subsection (1)(a) does not apply if the approval resulted from a development application (superseded planning scheme) that was assessed as if it were an application made under a superseded planning scheme.
(4) Also, a person who has made a request mentioned in subsection (1) may appeal to the court against a deemed refusal of the request.
(5) An appeal under subsection (4) may be started at any time after the last day the decision on the matter should have been made.

Appeals for matters arising after approval given (no co-respondents)

4.1.31. (1) A person to whom any of the following notices have been given may appeal to the court against the decision in the notice-
(a) a notice giving a decision on a request to change or cancel a condition of a development approval;
(b) a notice under section 3.5.33A(9)(b) or 6.1.44 giving a decision to change or cancel a condition of a development approval.
(2) The appeal must be started within 20 business days after the day the notice of the decision is given to the person.
(3) Also, a person who has made a request mentioned in subsection (1)(a) may appeal to the court against a deemed refusal of the request.
(4) An appeal under subsection (3) may be started at any time after the last day the decision on the matter should have been made.

Appeals on matters relating to the Building Act 1975 the following also applies: -

Jurisdiction of tribunals

4.2.7. (1) A tribunal has jurisdiction to decide any matter that under this or another Act may be appealed to it.

(2) However, an appeal to a tribunal under this Act may only be about—

(a) a matter under this Act that relates to the *Building Act 1975* (other than a matter under that Act that may or must be decided by the Building Services Authority) or the *Plumbing and Drainage Act 2002;* or

(b) a matter prescribed under a regulation.

Appeals by applicants

4.2.9. (1) An applicant for a development application may appeal to a tribunal against any of the following—

(a) the refusal, or the refusal in part, of a development application;

(b) a matter stated in a development approval, including any condition applying to the development, but not including the identification of a code under section 3.1.6;

(c) the decision to give a preliminary approval when a development permit was applied for;

(d) the length of a period mentioned in section 3.5.21;

(e) a deemed refusal.

(2) An appeal under subsection (1)(a) to (d) must be started within 20 business days (the **"applicant's appeal period")** after the day the decision notice or negotiated decision notice is given to the applicant.

(3) An appeal under subsection (1)(e) may be started at any time after the last day a decision on the matter should have been made.

Martin
COSGROVE
and Associates Pty Ltd
Consulting Structural and Civil Engineers

STORMWATER MANAGEMENT REPORT

FOR

PROPOSED WAREHOUSE/OFFICE DEVELOPMENT

Lot 18 ASHBURN ROAD, BREMER

Reference #: 10162-L1

Date: 25-10-10

93 Warry Street PO Box 765 Spring Hill QLD 4000 Telephone: [redacted] Facsimile: [redacted]

INTRODUCTION

This is a stormwater management report and for the proposed warehouse and office development at Lot 18, Citiswich sub-division, Ashburn Road, Bremer.

DEVELOPMENT

The proposed development comprises two stages which consist of a total of 2025 m2 industrial warehouse building with attached offices and retail/commercial premises. The buildings are located on the North and East boundaries and have access hardstands and carparks to the South and West. (Refer drawing 10162 C101-A).

CATCHMENT

The proposed development site is currently vacant land (new sub-division). The total site area is approximately 4933 m^2 and is almost flat. There is a nominal grade from the North-East corner to the South and West of the site. Stage 2 of the site has an existing stormwater pit located inside the boundary. Previous to the sub-division, the natural ground of the site drained West and discharged directly into the Bremer River as overland flow.

STORMWATER QUANTITY ANALYSIS

It is proposed to detain the stormwater from the developed site in bio-retention storage and pavement storage to ensure post-development flows are at or below pre-development flows. Stormwater runoff from the developed site will discharge to the existing stormwater pit inside the boundary on the Western frontage. This existing stormwater pit is the legal point of discharge for the site. Currently all stormwater runs off the site to the South-West as overland flow. The proposed design will result in stormwater runoff for all events up to 1:50 ARI being discharged to the piped drainage system through the use of onsite detention in the bio-retention basins and carpark pavements. Therefore downstream properties will not be adversely affected by the development.

An assessment on the proposed development has been carried out to limit peak flows to pre-development peak flows for a range of ARIs and storm durations. The pre-development catchment calculations are based on a predominately pervious catchment while the post development catchment is predominately impervious (Table 1).

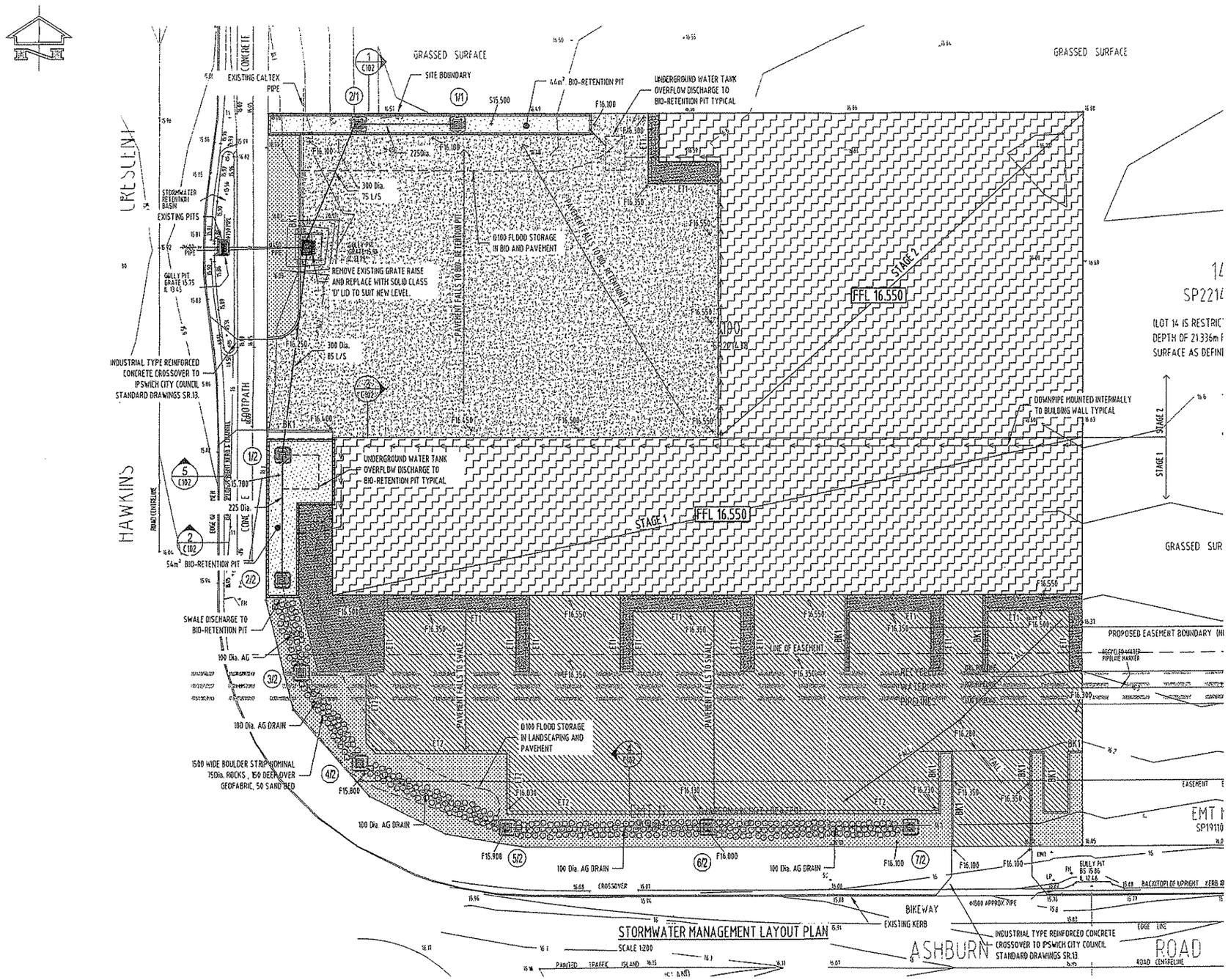
In accordance with QUDM guidelines, a 50 year ARI has been used as the major drainage event.

→ Table 7.02.1 [1] → Method : intensity not roughness ∴ 100 ARI

Table 1. – Pre and Post Development Areas and Runoff Coefficients

Catchments	Pre-Development	Post Development (Stage 2)
Total Site		
Area (ha)	0.49	0.49
Slope (%)	0.5	0.5
Surface Roughness	0.1	0.01
C_{10}	0.7	0.95

From the above, the peak flows for selected events up to Q50 were determined using the rational method. (Refer Table 2)



STORMWATER MANAGEMENT LAYOUT PLAN

SW PIT SCHEDULE

(ALL PIT AND MANHOLE DETAILS TO COUNCIL STANDARD DETAILS)

PIT No.	SIZE (mm)	PIT TYPE	SURFACE INLET RL.
1/1	1050 Dia	BIO-RETENTION OUTLET PIT WITH 600x 600, MEDIUM DUTY Galv. GRATE	15.800
2/1	1050 Dia	BIO-RETENTION OUTLET PIT WITH 600x 600, MEDIUM DUTY Galv. GRATE	15.800
1/2	1050 Dia	BIO-RETENTION OUTLET PIT WITH 600x 600, MEDIUM DUTY Galv. GRATE	16.000
2/2	1050 Dia	BIO-RETENTION OUTLET PIT WITH 600x 600, MEDIUM DUTY Galv. GRATE	16.000
3/2	600 x 600	PRECAST OR PLASTIC PIT WITH MEDIUM DUTY Galv. GRATE	15.750
4/2	600 x 600	PRECAST OR PLASTIC PIT WITH MEDIUM DUTY Galv. GRATE	15.800
5/2	600 x 600	PRECAST OR PLASTIC PIT WITH MEDIUM DUTY Galv. GRATE	15.900
6/2	600 x 600	PRECAST OR PLASTIC PIT WITH MEDIUM DUTY Galv. GRATE	16.000
7/2	600 x 600	PRECAST OR PLASTIC PIT WITH MEDIUM DUTY Galv. GRATE	16.100

CIVIL WORKS LEGEND

EXISTING

- SURVEY GROUND LEVEL
- SURVEY BOUNDARY
- SURVEY CONTOUR

PROPOSED

- TOF xx.xxx — TOP OF FOOTING LEVEL
- FXX.XXX — FINISHED LEVEL
- SXX.XXX — STRUCTURAL SURFACE LEVEL
- BEXX.XX — BULK EARTHWORKS LEVEL
- EXX.XXX — EXISTING INTERPOLATED LEVEL
- 135 — PROPOSED CONTOUR
- OD — DISHED DRAIN
- IV — INVERT DRAIN
- KG — KERB & GUTTER
- BK1 — BARRIER KERB
- RW — BLOCK RETAINING WALL AND FOOTING
- PIPE ENLARGER / REDUCER
- GRATED DRAIN
- RP — RODDING POINT
- LD — GRASS CATCH DRAIN
- HR — 1000 SUB-SOIL DRAIN WITH HIGH END RISER
- DOWNPIPE AND U/GROUND S/W LINE TO HYDRAULIC CONSULTANTS DETAILS
- LINE 1 (1/10) — STORMWATER LINE, PIT & PIT No
  - IL xx.xxx — INVERT LEVEL (UPSTREAM)
  - 15 xxc — PIPE SIZE & TYPE
  - ex % — PIPE GRADE
  - Q xxx L/s — FLOW RATE: LITRES PER SEC.
  - DL xx.xxx — INVERT LEVEL (DOWNSTREAM)
- SWD — EXISTING STORMWATER LINE

PAVEMENT LEGEND

- HEAVY VEHICLE ACCESS AREAS (REINFORCED CONCRETE PAVEMENT)
- PARKING / PASSENGER VEHICLE AREAS. (REINFORCED CONCRETE PAVEMENT)
- PEDESTRIAN ACCESS AREAS. (REINFORCED CONCRETE PAVEMENT)
- LANDSCAPE ZONE. (REFER TO LANDSCAPE ARCHITECT'S DETAILS)
- BUILDING OUTLINE. (REFER TO ARCHITECTURAL DRAWINGS)
- BIO-RETENTION. (REFER TO SECTIONS)

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ISSUED FOR APPROVAL

NOT TO BE USED FOR CONSTRUCTION PURPOSES

[redacted]

APPROVING ENGINEER

[redacted] PEQ 8026 18-10-10

ISSUE	DATE	REVISION	INITIAL
A	18-10-10	ISSUED FOR DEVELOPMENT APPROVAL	FT

CLIENT

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PH: [redacted] FAX: [redacted]

ARCHITECT

Walker

PROJECT

PROPOSED WAREHOUSE/ UNIT DEVELOPMENT

LOT 18 ASHBURN ROAD IPSWICH

SHEET SUBJECT

STORMWATER MANAGEMENT PLAN

Martin COSGROVE and Associates Pty Ltd
ACN 052933221

CONSULTING STRUCTURAL AND CIVIL ENGINEERS
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DESIGNED	DRAWN	JOB No.	
MS	FT	10162	
DATE	SCALE	DRAWING No.	ISSUE
OCT.2010	1:200 U.N.O.	C101	A

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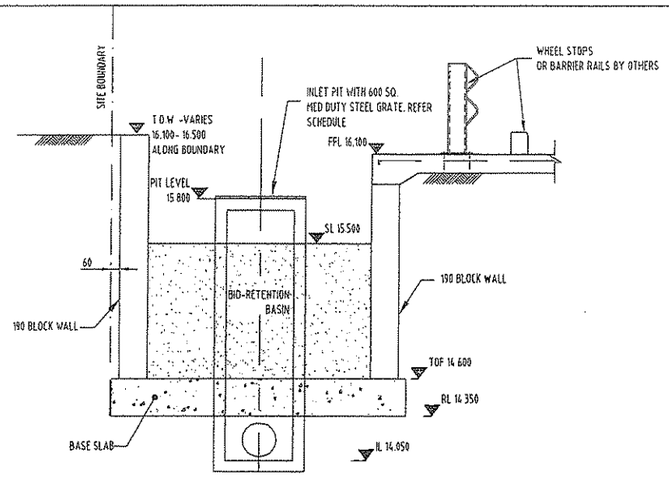

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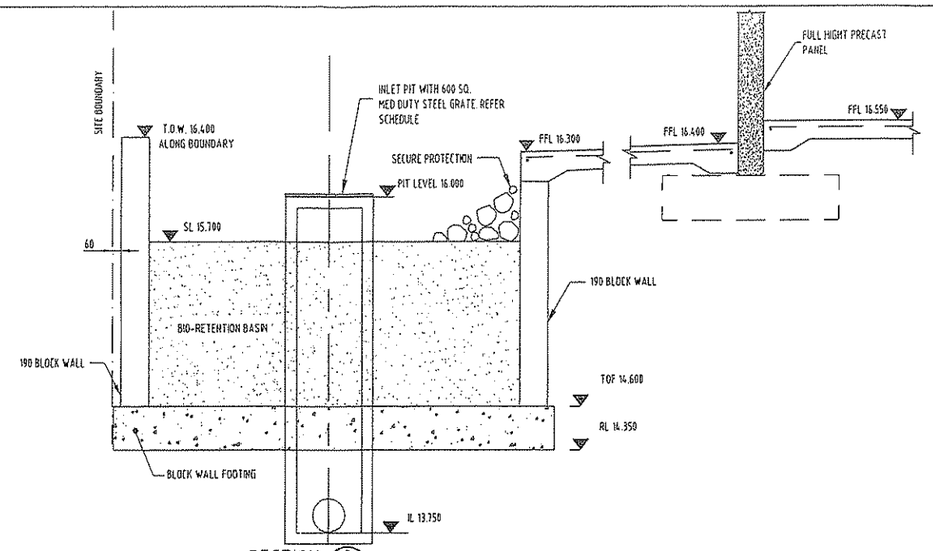

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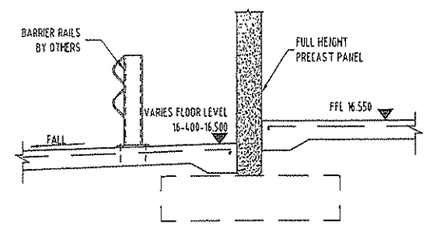

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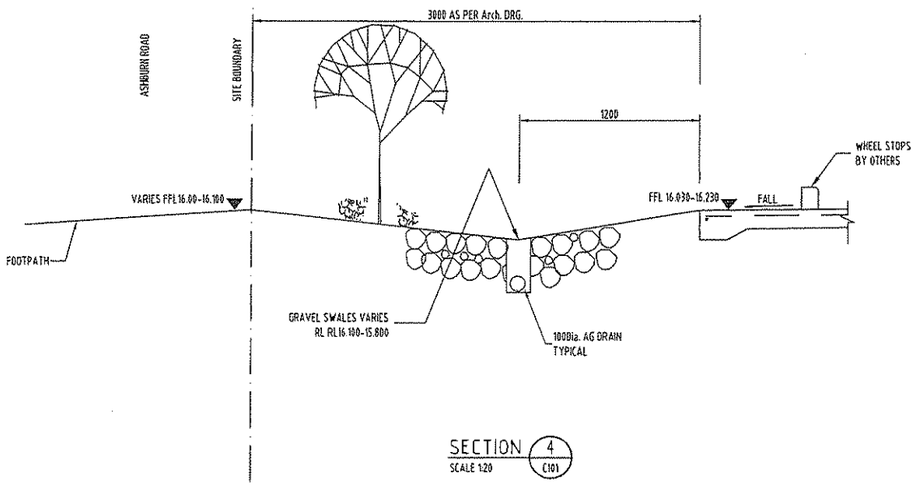

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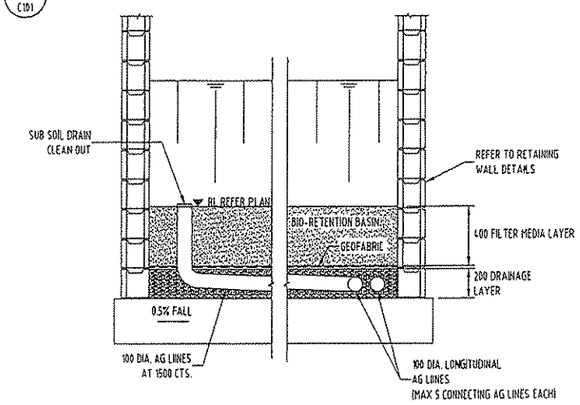

TYPICAL BIO-RETENTION BASIN CROSS SECTION
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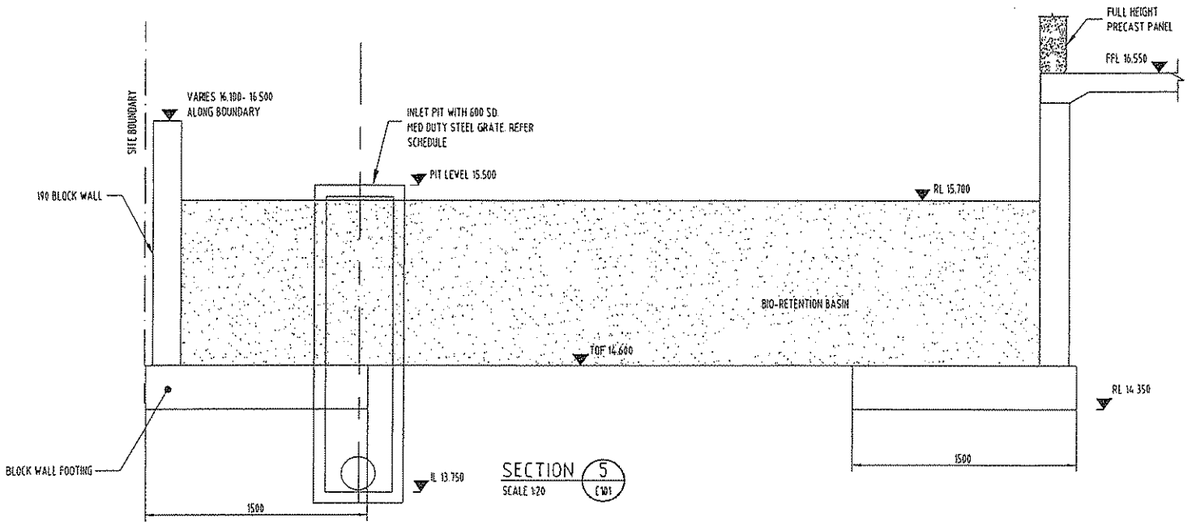

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[redacted]

APPROVING ENGINEER
STEPHEN R MOSS RPEQ 8026 18-10-10

ISSUE	DATE	REVISION	INITIAL
A	18-10-10	ISSUED FOR DEVELOPMENT APPROVAL	FT

CLIENT
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1 FARMER PLACE, SYDNEY NSW 2000
PH: [redacted] FAX: [redacted]

ARCHITECT
Walker

PROJECT
PROPOSED WAREHOUSE/ UNIT DEVELOPMENT
LOT 18 ASHBURN ROAD IPSWICH

SHEET SUBJECT
CIVIL SECTIONS

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STORMWATER DRAINAGE NOTES

1. STORMWATER DESIGN CRITERIA:
   (a) AVERAGE RECURRENCE INTERVAL:
   1:10 YEARS FOR PAVED AND LANDSCAPED AREAS
   (b). RAINFALL INTENSITIES - TIME OF CONCENTRATION - 5 MINUTES:
   1:10 YEARS = 209mm/hr.
   (c). RUNOFF COEFFICIENTS:
   ROOF AREAS - C = 0.95
   PAVED AREAS - C = 0.95
   LANDSCAPED AREAS - C = 0.70
2. THE CONTRACTOR IS TO CHECK THAT THE PROPOSED PIPEWORKS DO NOT CLASH WITH ANY EXISTING SERVICES PRIOR TO COMMENCING WORK. THE CONTRACTOR MUST NOTIFY THE ENGINEER IF ANY CLASHES ARE FOUND FOR ADVICE OF ANY REDESIGN REQUIREMENTS.
3. PIPES 300 DIA. AND LARGER TO BE REINFORCED CONCRETE CLASS 'X' APPROVED SPIGOT AND SOCKET WITH RUBBER RING JOINTS. U.N.O.
4. PIPES UP TO 300 DIA SHALL BE SEWER GRADE UPVC WITH SOLVENT WELDED JOINTS U.N.O.
5. EQUIVALENT STRENGTH VCP OR FRC PIPES MAY BE USED.
6. PIPES SHALL BE LAID ON A 75mm THICK SAND BED. IN ALL CASES BACKFILL TRENCH WITH SAND TO 200mm ABOVE PIPE U.N.O. WHERE PIPE IS UNDER PAVEMENTS BACKFILL REMAINDER OF TRENCH TO UNDERSIDE OF PAVEMENT WITH SAND OR PROVED RIPPED SANDSTONE COMPACTED IN 150mm LAYERS TO MINIMUM 95% STANDARD MAXIMUM DRY DENSITY IN ACCORDANCE WITH AS 1289 E2.1
7. ENLARGERS, CONNECTIONS AND JUNCTIONS TO BE PRECAST FITTINGS WHERE PIPES ARE LESS THAN 300 DIA.
8. WHERE SUBSOIL DRAINS PASS UNDER FLOOR SLABS AND VEHICULAR PAVEMENTS, UNSLOTTED UPVC SEWER GRADE PIPE IS TO BE USED.
9. CARE IS TO BE TAKEN WITH LEVELS OF STORMWATER LINES GRADES SHOWN ARE NOT TO BE REDUCED WITHOUT APPROVAL.
10. PRECAST PITS MAY BE USED EXTERNAL TO THE BUILDING SUBJECT TO APPROVAL.
11. WHERE TRENCHES ARE IN ROCK, THE PIPE SHALL BE BEDDED ON A MIN. OF 50mm CONCRETE BED (OR 75mm BED OF BLUE METAL) UNDER THE BARREL OF THE PIPE.
12. GRATES AND COVERS SHALL BE ABLE TO SUPPORT THE FOLLOWING LOADS :-
    LIGHT DUTY - 1 TONNE WHEEL LOADS
    MEDIUM DUTY - 3.5 TONNE WHEEL LOADS
    HEAVY DUTY - 9 TONNE WHEEL LOADS.

SITEWORKS NOTES

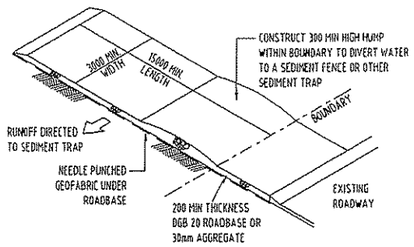
1. LEVEL OF DATUM AHD
2. CONTRACTOR MUST VERIFY ALL DIMENSIONS AND EXISTING LEVELS ON SITE PRIOR TO COMMENCEMENT OF WORK. ANY DISCREPANCIES TO BE REPORTED TO THE ENGINEER / SUPERINTENDENT.
3. MARTIN COSGROVE & ASSOCIATES ACCEPTS NO LIABILITY FOR THE LOCATION OF EXISTING SERVICES. THE CONTRACTOR MUST VERIFY THE LOCATION OF ALL EXISTING SERVICES PRIOR TO COMMENCING WORKS. ALL EXISTING SERVICES AND STRUCTURES ARE TO BE MAINTAINED IN GOOD ORDER FOR THE DURATION OF THE CONTRACT. ANY COSTS ASSOCIATED WITH REPAIRING DAMAGE TO EXISTING SERVICES SHALL BE PAID FOR BY THE CONTRACTOR.
4. ALL WORKS MUST BE CARRIED OUT IN ACCORDANCE WITH CURRENT COUNCIL STANDARD SPECIFICATIONS.
5. ALL WORKS TO BE IN ACCORDANCE WITH GEOTECHNICAL REPORT.
6. STRIP ALL TOPSOIL FROM CONSTRUCTION AREA AND STOCKPILE FOR LANDSCAPING PURPOSES ONLY.
7. REMOVE LOOSE MATERIAL UNDER BUILDING PLATFORM & PAVEMENTS, PROOF ROLL SUBGRADE, REMOVE ANY SOFT SPOTS AND RECOMPACT.
8. PROVIDE SUB BASE LAYER UNDER BUILDINGS AND PAVEMENTS AS PER SCHEDULE ON DRAWING C102
9. IMPORTED FILL SHALL BE OF FAIR TO GOOD QUALITY OF A MINIMUM CBR10, HAVE A MAXIMUM AGGREGATE SIZE NOT EXCEEDING 75mm AND A SHRINK / SWELL INDEX OF NOT GREATER THAN 1.0%. FILL SHALL BE LAYED IN MAXIMUM 200mm (LOOSE THICKNESS) LAYERS AND COMPACTED TO MINIMUM 98% M.D.D IN ACCORDANCE WITH AS1289 5.1.1
10. ALL TRENCH BACKFILL MATERIAL SHALL BE COMPACTED TO THE SAME DENSITY AS THE ADJACENT MATERIAL
11. ALL SERVICE TRENCHES UNDER VEHICULAR PAVEMENTS SHALL BE BACKFILLED WITH SAND OR AN APPROVED GRANULAR MATERIAL AND COMPACTED TO MINIMUM 98% MODIFIED MAXIMUM DRY DENSITY, IN ACCORDANCE WITH AS 1289 E2.1.
12. FIELD DENSITY TESTING TO BE CARRIED OUT TO THE ATTAINED COMPACTION RATIOS & THE PLACEMENT MOISTURE CONTENT WITH FREQUENCY OF TESTING IN ACCORDANCE WITH AS 3798 SECTION 8.0.
13. PROVIDE 10MM WIDE EXPANSION JOINTS BETWEEN BUILDINGS AND ALL CONCRETE OR UNIT PAVEMENTS U.N.O
14. MAKE SMOOTH CONNECTION WITH EXISTING WORKS.

STORMWATER MANAGEMENT NOTES

1. THIS DESIGN IS IN ACCORDANCE WITH THE CARDNO(FROM STANDARD) OR 08214
2. PREVENT THE RELEASE OF CONTAMINATED STORMWATER FROM THE SITE DURING CONSTRUCTION. REFER TO THE EROSION AND SEDIMENT CONTROL DRAWING C103.
3. STORMWATER PITS SHALL BE CONSTRUCTED WITH LEAF GUARD OR FINELY MESHED GRATES TO PREVENT INFILTRATION OF LITTER. THE PROPERTY MANAGER SHALL ENSURE STORMWATER PITS ARE REGULARLY MAINTAINED
4. STORMWATER RUNOFF SHALL NOT POND ON-SITE OR IN ADJACENT PROPERTIES
5. LANDSCAPING ZONES SHALL BE TOPSOILED AND VEGETATED WITH SUITABLE PLANTING AS SOON AS POSSIBLE.

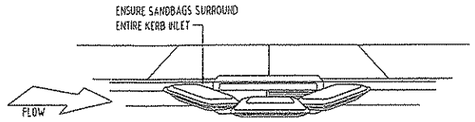
BIORETENTION BASIN NOTES

1. ALL WORK SHALL BE CARRIED OUT IN ACCORDANCE WITH CARDNO LAWSON TRELOAR GUIDELINES.
2. DESIGN IS BASED ON THE STORMWATER MANAGEMENT REPORT AND ALL WORK SHALL BE CARRIED OUT IN ACCORDANCE WITH THE REPORT.
3. THE BIORETENTION DEVICE SHALL NOT BE CONSTRUCTED UNTIL ALL BUILDING WORK CONTRIBUTING TO SEDIMENT PRODUCTION, HAVE BEEN COMPLETED.
4. FILTER MEDIA SHALL BE PROVIDED IN THREE LAYERS:-
   a) FILTER LAYER SHALL CONSIST OF A SANDY LOAM TOP SOIL WITH A MINIMUM SATURATED HYDRAULIC CONDUCTIVITY OF 180mm/hr , A 5-10% ORGANIC CONTENT AND A pH OF 6.0-7.0. LABORATORY TESTING IN ACCORDANCE WITH AS4419 AN AS 1289 WITH A MINIMUM OF TEN SAMPLES SHALL BE SUBMITTED CONFIRMING THE MATERIAL'S SUITABILITY.
   b) TRANSITION LAYER SHALL CONSIST OF COARSE SAND CONFORMING TO A UNIMIN 16/30 FG SAND GRADING OR EQUIVALENT.
   c) DRAINAGE LAYER SHALL CONSIST OF FINE GRAVEL WITH 5MM SCREENINGS.
5. PRIOR TO FINAL PLANTING, PLACE GEOFABRIC OVER THE FILTER MEDIA WITH 50mm TOPSOIL FOR TEMPORARY TURFING LAYED PERPENDICULAR TO THE FLOW PATH.
6. ENSURE PIPE FLOWS ARE RESTRICTED FROM ENTERING THE DEVICE UNTIL PLANTING IS FULLY ESTABLISHED.
7. ALL PLANTING SHALL BE CARRIED OUT IN ACCORDANCE WITH THE LANDSCAPE ARCHITECTS SPECIFICATIONS. PLANTING SHALL CONSIST OF 70-80% DENSITY COVER WITH A HEIGHT EQUAL TO THE 400mm OF EXTENDED DETENTION REQUIRED.
8. THE BIORETENTION BASIN SHALL BE MAINTAINED THROUGHOUT ITS USE TO ENSURE THE DESIGN WATER QUALITY TREATMENT TARGETS ARE ACHIEVED. MAINTENANCE SHALL INCLUDE WATERING WITH PARTICULAR FREQUENCY DURING THE FIRST THREE MONTHS, WEED CONTROL, CLEARING OF LITTER, REMOVAL OF SEDIMENT, REPAIRING OF SCORING AND IMPLEMENTING MEASURES TO PREVENT FUTURE OCCURRENCE, REPLACEMENT OF DEAD PLANTS AND REPORTING OF THE WORKS CARRIED OUT. REPORTS SHALL BE AS PER THE CARDNO LAWSON TRELOAR STORMWATER MANAGEMENT STRATEGY



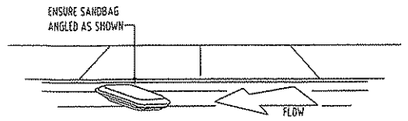
TEMPORARY SITE ACCESS SEDIMENT STABLISING DETAIL

STRIP TOPSOIL, REDUCE TO BULK EARTHWORKS LEVEL AND COMPACT SUBGRADE.



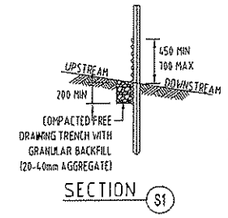
SANDBAG SEDIMENT INLET TRAP

N.T.S

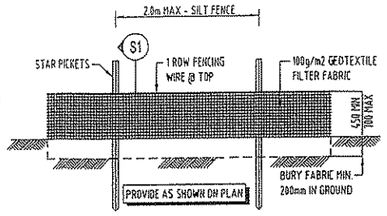


SANDBAG SEDIMENT TRAP

N.T.S.

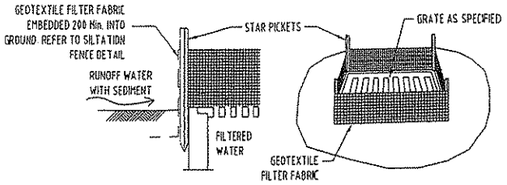


SECTION S1



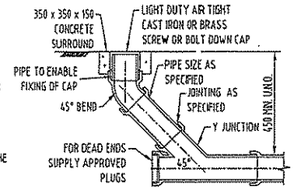
SILT FENCE DETAIL

N.T.S



GEOTEXTILE FILTER PIT SURROUND

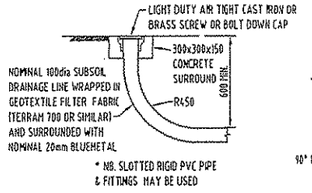
N.T.S.



RODDING POINT AT 45

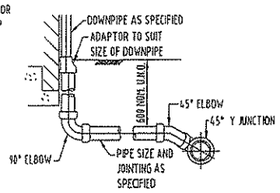
SCALE 1:20

(DO NOT SLOT RISERS)



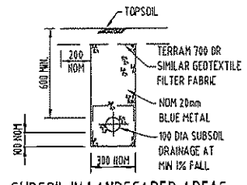
HIGH END RISER

SCALE 1:20



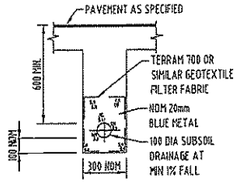
UPVC DOWNPIPE CONNECTION

SCALE 1:20



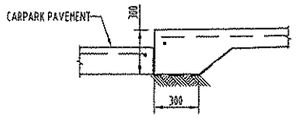
SUBSOIL IN LANDSCAPED AREAS

SCALE 1:20



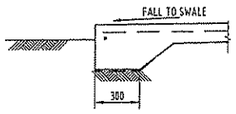
SUBSOIL IN PAVED AREAS

SCALE 1:20



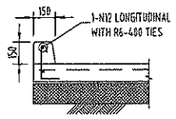
TYPICAL 'ET1' DETAIL

SCALE 1:20



TYPICAL 'ET2' DETAIL

SCALE 1:20



B.K.1 - TYPICAL BARRIER KERB DETAIL

SCALE 1:20

ISSUED FOR APPROVAL

NOT TO BE USED FOR CONSTRUCTION PURPOSES

[redacted]

APPROVING ENGINEER

STEPHEN R MOSS RPEQ 8026 18-10-10

ISSUE	DATE	REVISION	INITIAL
A	18-10-10	ISSUED FOR DEVELOPMENT APPROVAL	FT

CLIENT

WALKER CORPORATION

LEVEL 21 GOVERNOR MACQUARIE TOWER
1 FARMER PLACE, SYDNEY NSW 2000

PH: [redacted] FAX: [redacted]

ARCHITECT

Walker

PROJECT

PROPOSED WAREHOUSE/ UNIT DEVELOPMENT

LOT 1B ASHBURN ROAD IPSWICH

SHEET SUBJECT

CIVIL NOTES

TYPICAL DETAILS

Martin COSGROVE and Associates Pty Ltd
ACN 052933221

CONSULTING STRUCTURAL AND CIVIL ENGINEERS
93 WARRY STREET SPRING HILL QLD 4000
Tel. [redacted] Fax [redacted]
Email : [redacted]@mcaeng.com.au

DESIGNED	DRAWN	JOB No.	
MS	FT	10162	
DATE	SCALE	DRAWING No.	ISSUE
OCT.2010	AS SHOWN	C103	A

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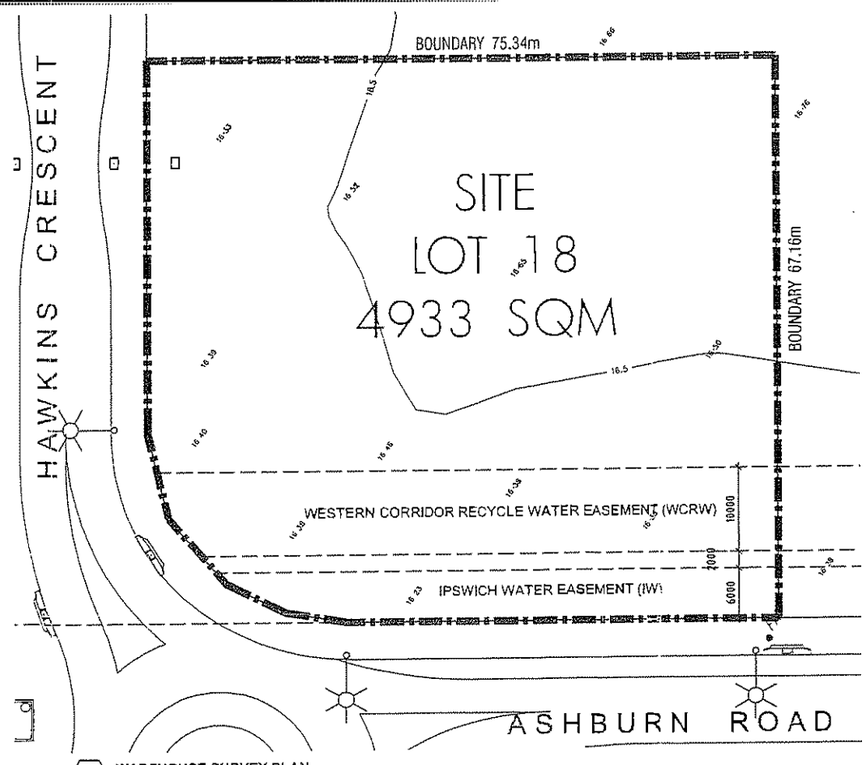
Revision :	Amendments :	Drawn :	Date :
A	ISSUED AS DA DOCUMENTS	TP	05.10.10
B	DRAWING SCHEDULE AMENDED	AM	25.10.10

00 INDICATIVE PERSPECTIVE
N.T.S

DRAWING SCHEDULE

DRAWING No.	DRAWING TITLE
SP-CS-DA-000	SURVEY / PERSPECTIVE / DRAWING SCHEDULE
SP-CS-DA-001	SITE / FLOOR PLAN
SP-CS-DA-002	MEZZANINE LEVEL
SP-CS-DA-003	ROOF PLAN
SP-CS-DA-004	SECTIONS
SP-CS-DA-005	ELEVATIONS
SP-CS-DA-006	COLOURED ELEVATIONS
SP-CS-DA-007	TRUCK ARTICULATION AND PARKING PLAN
SP-CS-DA-008	SIGNAGE PLAN

01 LOCATION PLAN
N.T.S



02 WAREHOUSE SURVEY PLAN
1:500

NOTE :
ALL REDUCED LEVELS ARE NOMINAL (+/- 500mm)
SUBJECT TO FINAL DETAIL DESIGN

Walker Corporation Pty Ltd
ABN 95 001 176 253
PO Box 4073
Sydney NSW 2001
Level 21 Governor Macquarie Tower
1 Farrer Place, Sydney NSW 2000
Telephone
Facsimile
Web [redacted]

Project :
Proposed Warehouse / Storage & Office & Cafe Development

Address :
LOT 18
Ashburn Road, Ipswich

For :
Walker Corporation

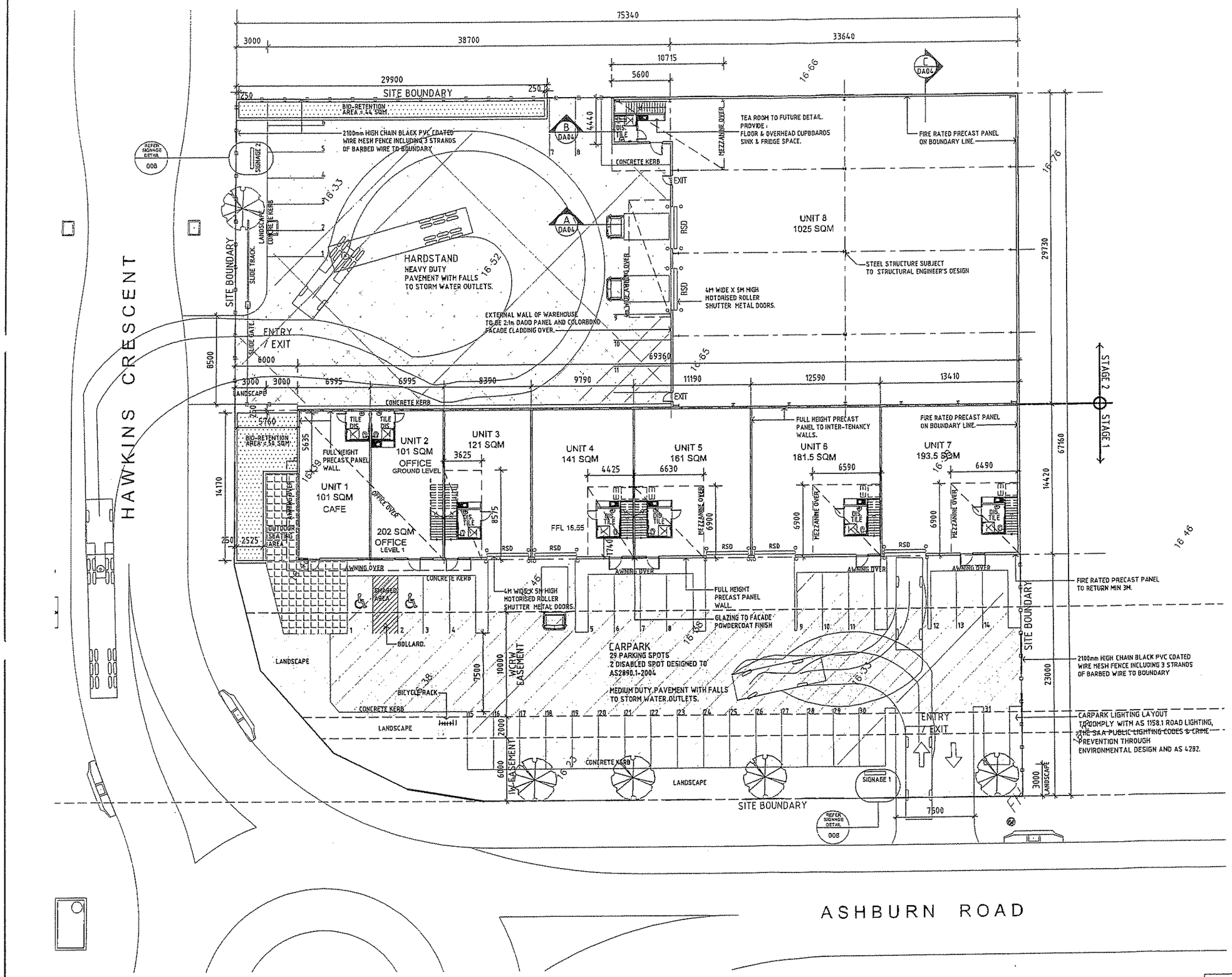
Drawing :
Site Survey Plan & Drawing Schedule

Scales :	Date :	Drawn :	Checked :
1:500	06 OCT 10	TP	

Status
DA - Not for Construction

Project No :	Drawing No :	Issue :
	SP-CS-DA-000	B

B1 SHEET



Revision	Amendments	Drawn	Date
A	ISSUED AS DA DOCUMENTS	TP	14.10.10
B	GENERAL AMENDMENT TO MEZZ. OFFICE	AM	26.10.10

DEVELOPMENT DATA

TOTAL SITE AREA	4 933 m2

SITE AREA STAGE 1	2 693 m2
- UNIT 1 = 101 SQM (CAFE)	
- UNIT 2 = 303 SQM (2 LEVELS)	
- UNIT 3 = 121 SQM + MEZZ. OFFICE 25 SQM	
- UNIT 4 = 141 SQM + MEZZ. OFFICE 25 SQM	
- UNIT 5 = 161 SQM + MEZZ. OFFICE 40 SQM	
- UNIT 6 = 181.5 SQM + MEZZ. OFFICE 40 SQM	
- UNIT 7 = 193.5 SQM + MEZZ. OFFICE 40 SQM	
TOTAL BUILDING AREA	1 372 m2
OUTDOOR SEATING AREA	90 m2
MEDIUM DUTY PAVEMENT	1 144 m2
CARPARKING PROVIDED	31 SPACES

SITE AREA STAGE 2	2 240 m2
UNIT 8 AREA	1 025 m2
MEZZANINE OFFICE	75 m2
TOTAL BUILDING AREA	1 100 m2
HEAVY DUTY PAVEMENT	1 119 m2
CARPARKING PROVIDED	11 SPACES

HEAVY DUTY PAVEMENT

MEDIUM DUTY PAVEMENT

NOTE :
ALL REDUCED LEVELS ARE NOMINAL (+/- 500mm)
SUBJECT TO FINAL DETAIL DESIGN

Walker Corporation Pty Ltd
ABN 55 001 116 263
PO Box 1843
Sydney NSW 2001
Level 21 Governor Macquarie Tower
1 Farrer Place, Sydney NSW 2000
Telephone
Facsimile
Web

Project :
Proposed Warehouse / Storage & Office & Cafe Development

Address :
LOT 18
Ashburn Road, Ipswich

For :
Walker Corporation

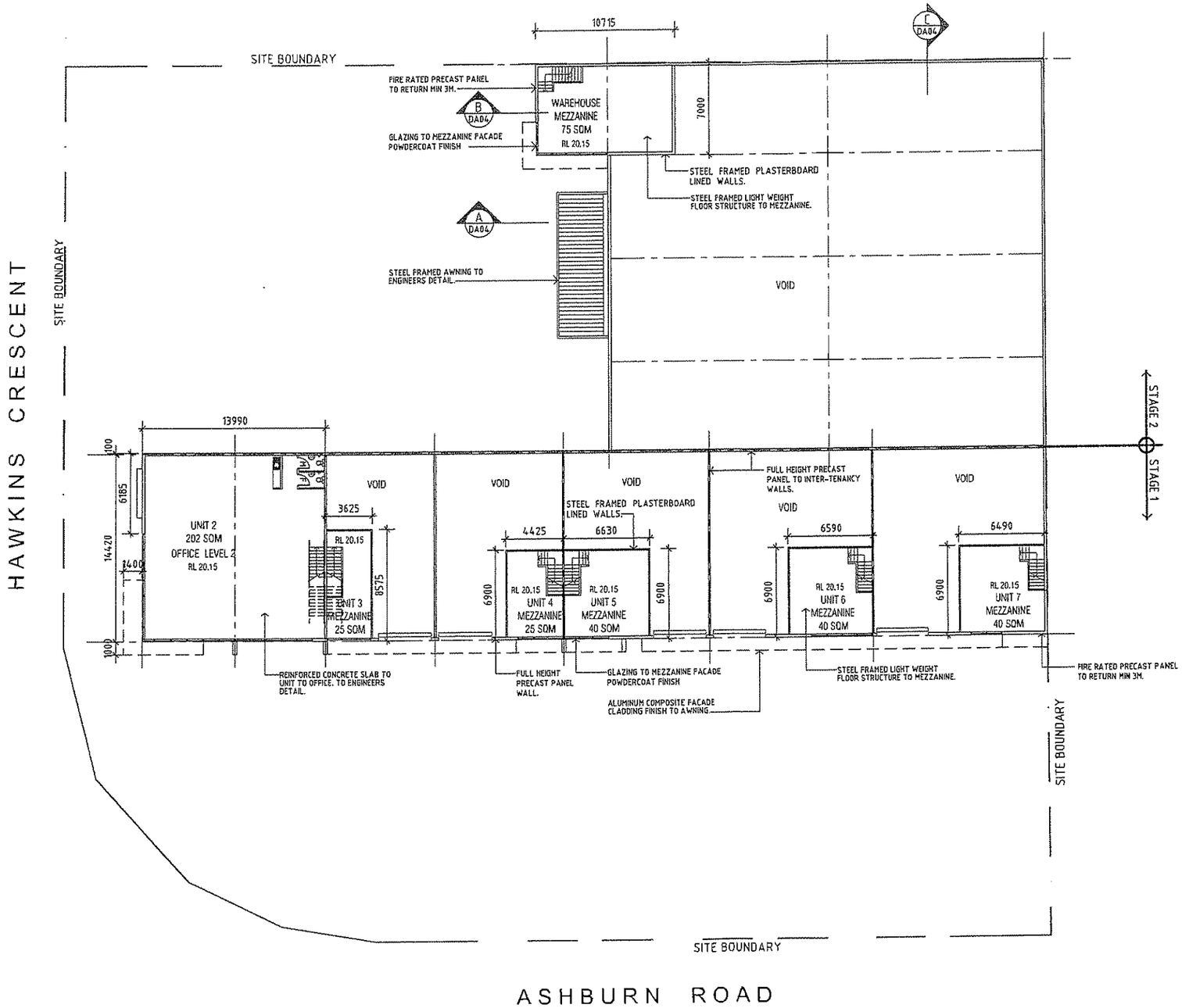
Drawing :
Site / Floor Plan

Scales :	Date :	Drawn :	Checked :
NSW	16 OCT 10	TP	

Status
DA - Not for Construction

Project No :	Drawing No :	Issue :
	SP-CS-DA-001	B

B1 SHEET



Revision	Amendments	Drawn	Date
A	ISSUED AS DA DOCUMENTS	TP	06.10.10
B	MEZZANINE OFFICE UPDATED	AW	22.10.10

DEVELOPMENT DATA

SITE AREA STAGE 1	2 693 m2
- UNIT 2 = MEZZ. OFFICE 202 SQM - UNIT 3 = MEZZ. OFFICE 25 SQM - UNIT 4 = MEZZ. OFFICE 25 SQM - UNIT 5 = MEZZ. OFFICE 40 SQM - UNIT 6 = MEZZ. OFFICE 40 SQM - UNIT 7 = MEZZ. OFFICE 40 SQM	
TOTAL MEZZANINE LEVEL AREA	372 m2

SITE AREA STAGE 2	2 240 m2
WAREHOUSE MEZZ. OFFICE	75 m2

NOTE:
ALL REDUCED LEVELS ARE NOMINAL.(+/- 500mm)
SUBJECT TO FINAL DETAIL DESIGN

Walker

Walker Corporation Pty Ltd
ABN 99 001 176 263
PO Box 4073
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1 Farrer Place, Sydney NSW 2000
Telephone
Facsimile
Web

Project:
Proposed Warehouse / Storage & Office & Cafe Development

Address:
LOT 18
Ashburn Road, Ipswich

For:
Walker Corporation

Drawing:
Mezzanine Floor Plan

Scales:	Date:	Drawn:	Checked:
1:50	06 OCT 10	TP	

Status:
DA - Not for Construction

Project No:	Drawing No:	Issue:
	SP-CS-DA-002	B

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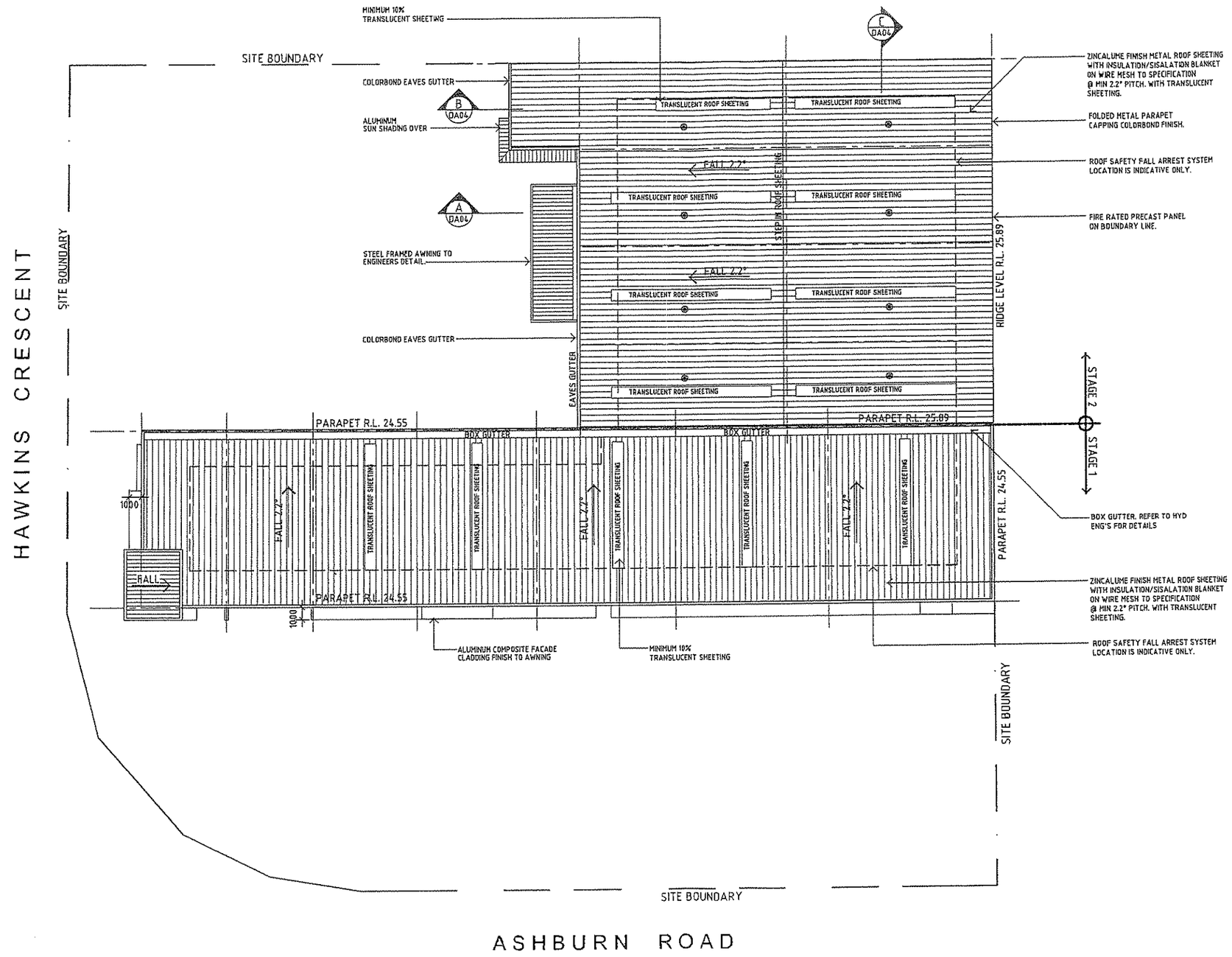
Revision:	Amendments:	Drawn:	Date:
A	ISSUED AS DA DOCUMENTS	TP	15.10.10
B	REVISION UPDATED	AW	26.10.10



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Walker

Walker Corporation Pty Ltd
ABN 95 001 576 253
PO Box 4010
Sydney NSW 2001
Level 21 Governor Macquarie Tower
1 Farrer Place, Sydney NSW 2000

Telephone
Facsimile
Web

Project :
Proposed Warehouse / Storage & Office & Cafe Development

Address :
LOT 18
Ashburn Road, Ipswich

For :
Walker Corporation

Drawing :
Roof Plan

Scale :	Date :	Drawn :	Checked :
NTS	26 OCT 10	TP	

Status :
DA - Not for Construction

Project No :	Drawing No :	Issue :
	SP-CS-DA-003	B

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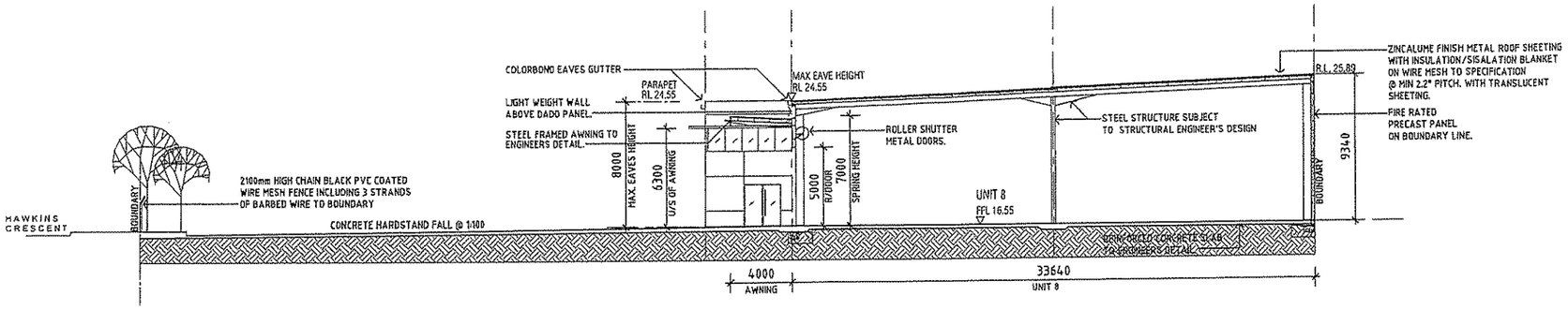
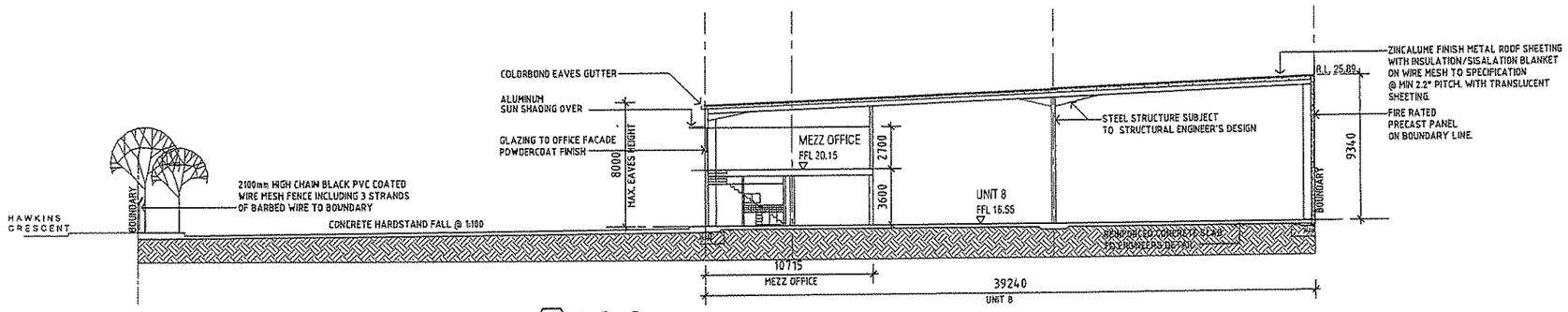
Revision:	Amendments:	Drawn:	Date:
A	ISSUED AS DA DOCUMENTS	TP	16.10.10



01 Section A
1:150



02 Section B
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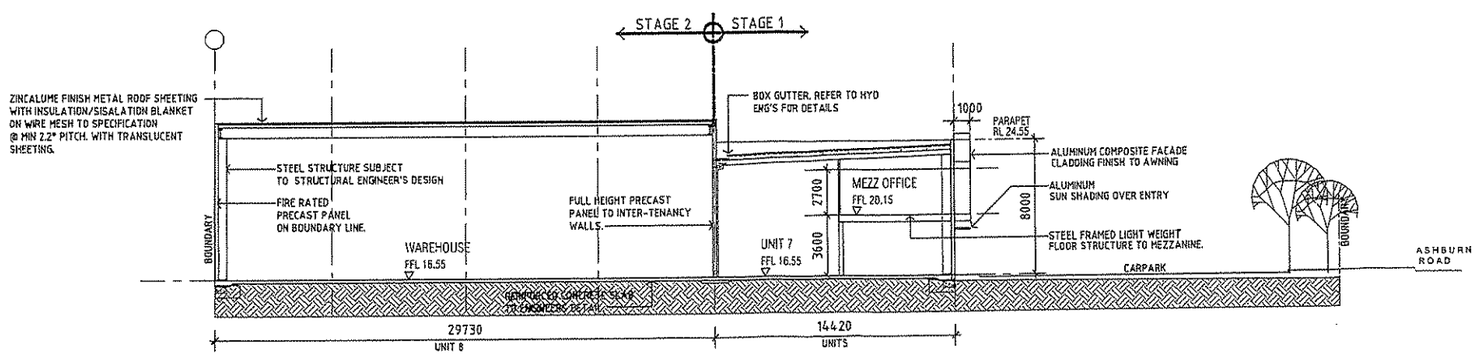

03 Section C
1:150

NOTE:
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Walker
Walker Corporation Pty Ltd
ABN 95 001 176 283
PO Box 4073
Sydney NSW 2001
Level 27 Governor Macquarie Tower
1 Farrer Place, Sydney NSW 2000
Telephone [redacted]
Facsimile
Web

Project:
Proposed Warehouse / Storage & Office & Cafe Development

Address:
LOT 18
Ashburn Road, Ipswich

For:
Walker Corporation

Drawing:
Sections

Scales:	Date:	Drawn:	Checked:
NSW	16 OCT 10	TP	

Status:
DA - Not for Construction

Project No:	Drawing No:	Issue:
	SP-CS-DA-004	B

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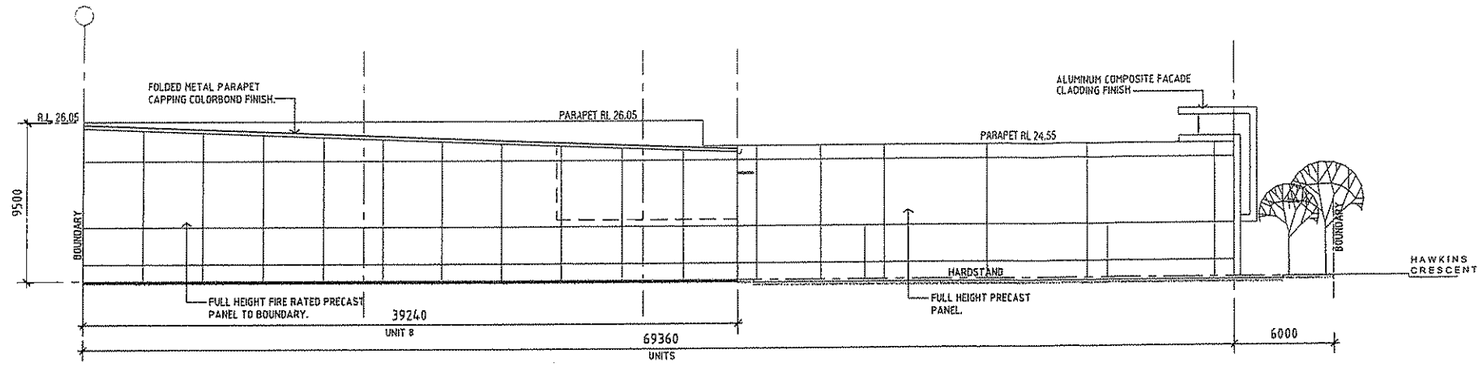
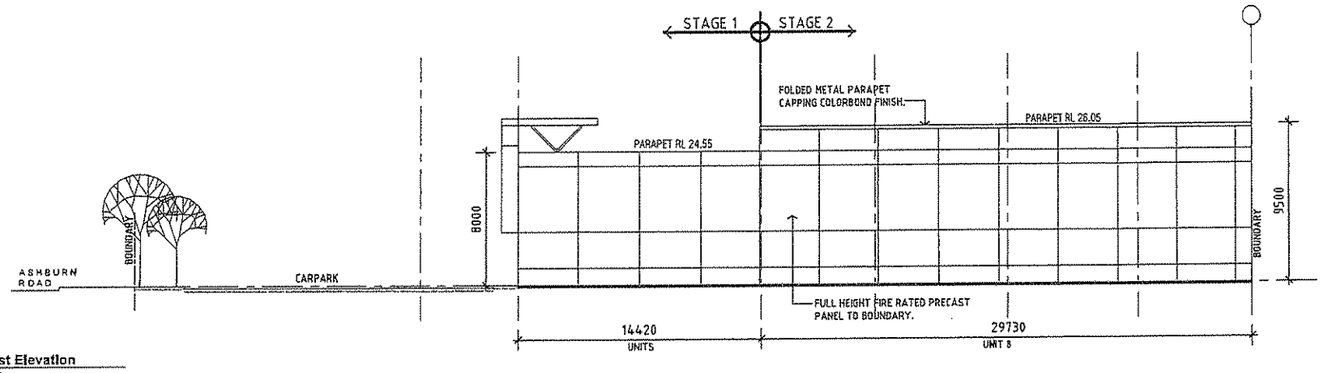
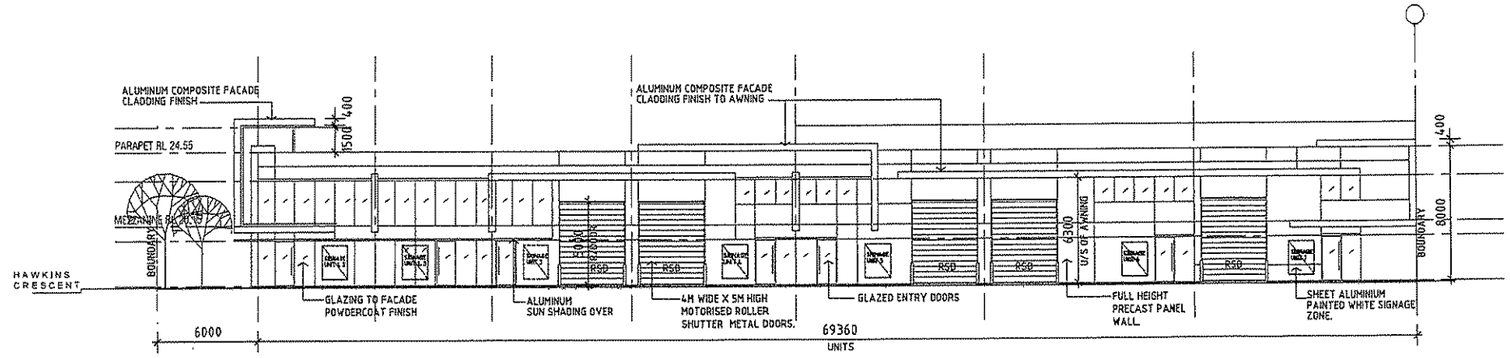
Revision :	Amendments :	Drawn :	Date :
A	ISSUED AS DA DOCUMENTS	TP	06.10.10
B	SIGNAGE SITE/AREA ADJUSTED	AW	26.10.10



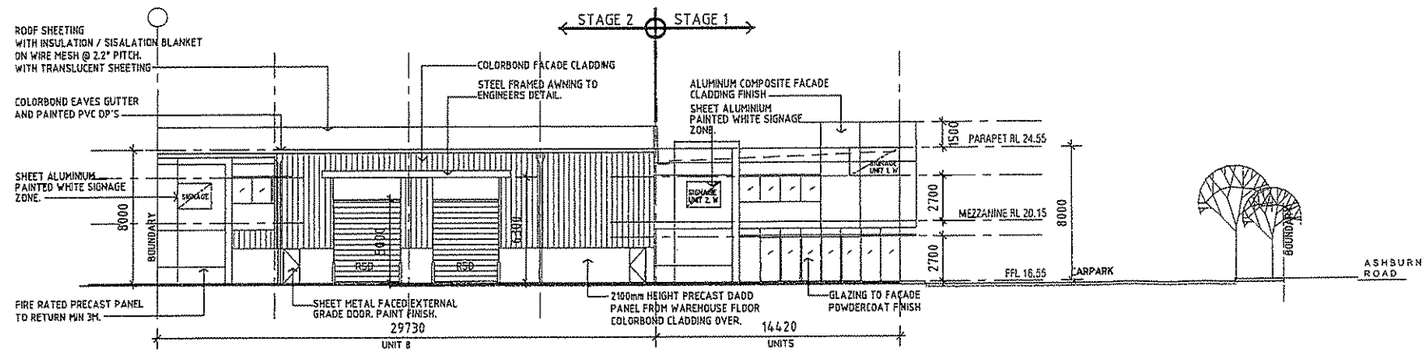
01 North Elevation
1:150



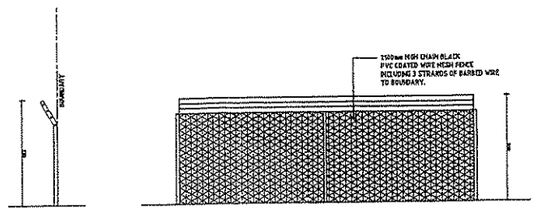
02 East Elevation
1:150



03 South Elevation
1:150



04 West Elevation
1:150



05 Perimeter Fence Detail
1:50

FINISHES LEGEND

PC1	PRECAST CONCRETE PANEL WITH EXTERNAL TEXTURED MASONRY PAINT FINISH.
AFG1	POWDER-COATED ALUMINIUM-FRAMED GLAZING SYSTEM
CP1	COLORBOND PROFILED WALL CLADDING.
RS	ZINCALUME ROOF SHEETING.
RSD	COLORBOND ROLLER SHUTTERS.

NOTE :
ALL REDUCED LEVELS ARE NOMINAL (+/- 500mm)
SUBJECT TO FINAL DETAIL DESIGN

Walker Corporation Pty Ltd
ABN 85 001 176 253
PO Box 4273
Sydney NSW 2001
Level 21 Governor Macquarie Tower
1 Farrer Place, Sydney NSW 2000
Telephone
Facsimile
Web

Walker

Project :
Proposed Warehouse / Storage & Office & Cafe Development

Address :
LOT 18
Ashburn Road, Ipswich

For :
Walker Corporation

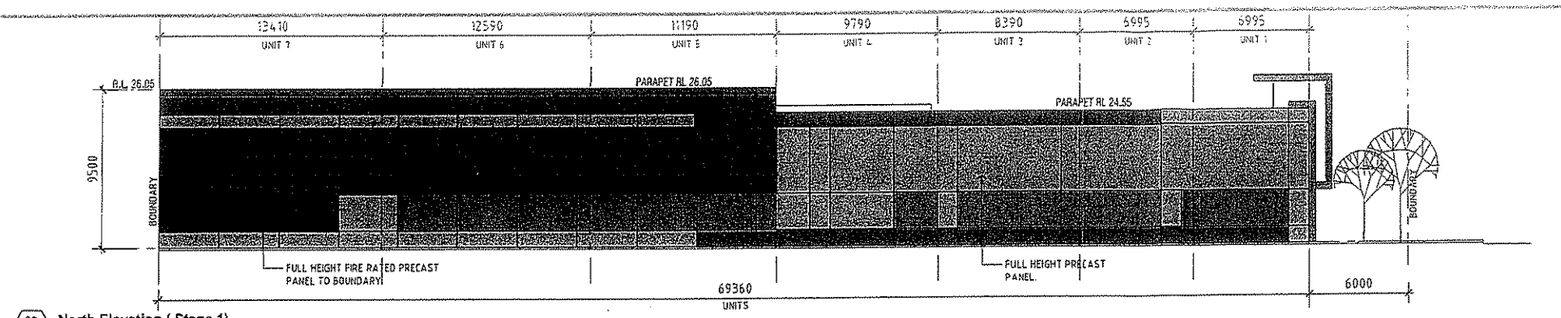
Drawing :
Elevations

Scales :	Date :	Drawn :	Checked :
1:150	06 OCT 10	TP	

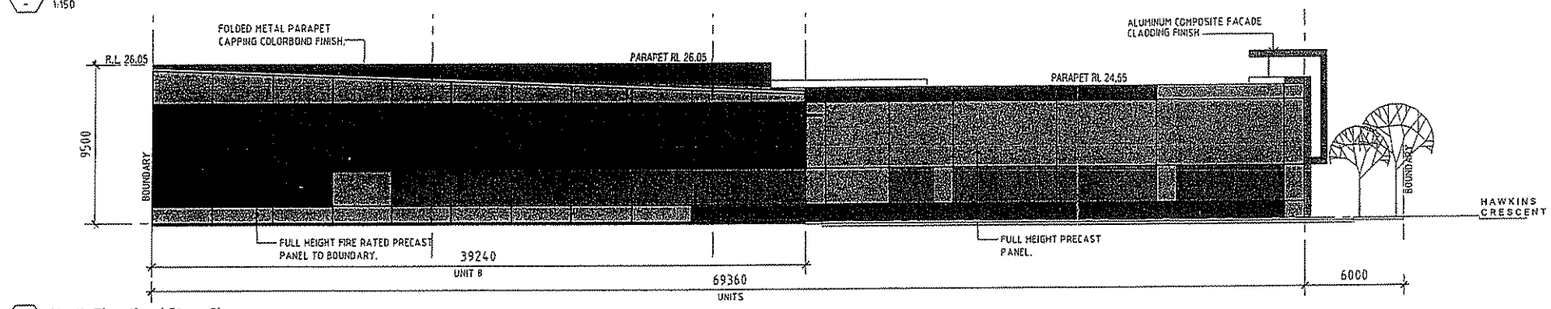
Status
DA - Not for Construction

Project No :	Drawing No :	Issue :
	SP-CS-DA-005	B

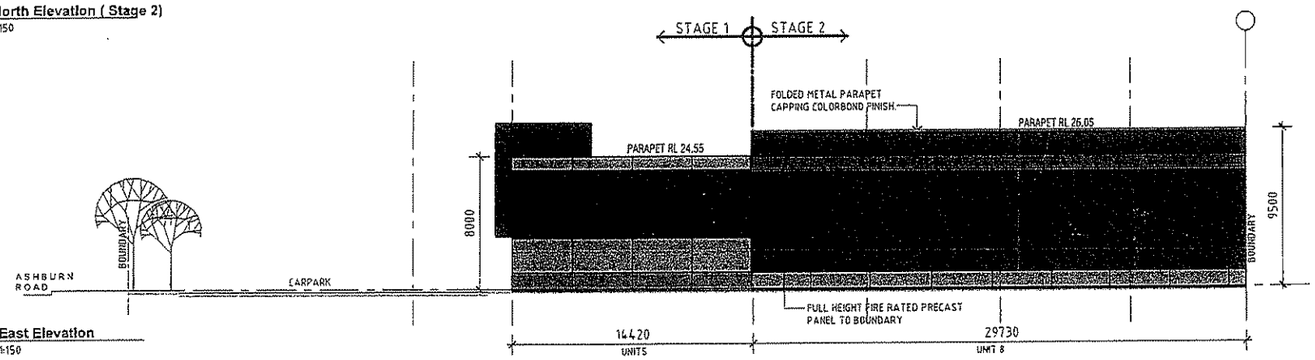
B1 SHEET



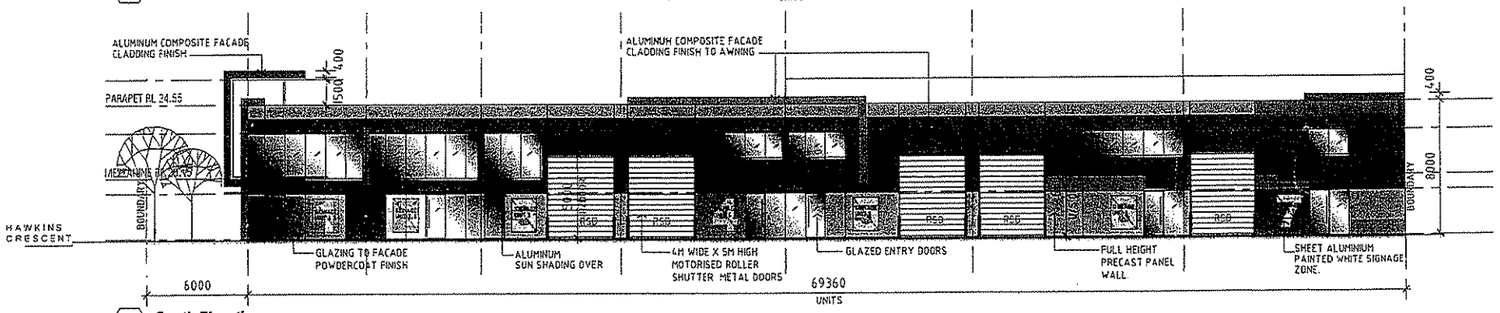
00 North Elevation (Stage 1)
1:150



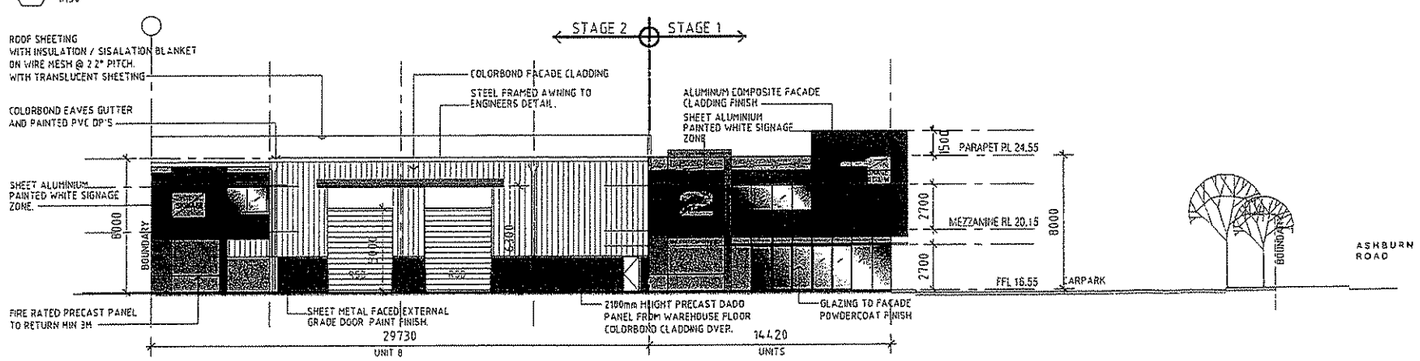
01 North Elevation (Stage 2)
1:150



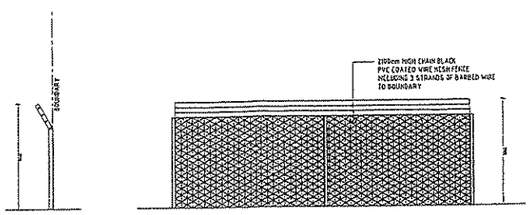
02 East Elevation
1:150



03 South Elevation
1:150



04 West Elevation
1:150



05 Perimeter Fence Detail
1:50

NOTE :
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SUBJECT TO FINAL DETAIL DESIGN

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Revision :	Amendments	Drawn :	Date
A	ISSUED AS DA DOCUMENTS	EP	06.10.10
B	STAGE 1 – NORTH ELEVATION ADDED	AM	28.10.10

COLOUR & FINISHES LEGEND

PC1	PRECAST CONCRETE PANEL WITH EXTERNAL TEXTURED MASONRY PAINT FINISH. COLOUR - DULUX (MOXA PG2 .B3)
PC2	PRECAST CONCRETE PANEL WITH EXTERNAL TEXTURED MASONRY PAINT FINISH. COLOUR - DULUX (DOUBLE BASS PG2 .A9)
PC3	PRECAST CONCRETE PANEL WITH EXTERNAL TEXTURED MASONRY PAINT FINISH. COLOUR - DULUX (QUINCE JELLY P10 .H8)
AFG1	POWDER-COATED ALUMINIUM-FRAMED GLAZING SYSTEM (COLORBOND SURFMIST)
AP1	COLORBOND PROFILED SHEET CLADDING. COLOUR - SHALE GREY
RS	ZINCALUME METAL ROOF SHEETING COLOUR - DULUX (DOUBLE BASS PG2 .A9)
RSD	ROLLER SHUTTER DOOR PAINT FINISH COLOUR - DULUX (ASHVILLE PG2 .B1)
ACP1	ALUMINUM COMPOSITE FACADE CLADDING COLOUR - DULUX (FULL OF LIFE P09. H8) OR SIMILAR
ACP2	ALUMINUM COMPOSITE FACADE CLADDING COLOUR - DULUX (QUINCE JELLY P10. H8) OR SIMILAR

Walker

Walker Corporation Pty Ltd
ABN 55 001 678 253
PO Box 4073
Sydney NSW 2001
Level 21 Governor Macquarie Tower
1 Farrer Place, Sydney NSW 2000
Telephone
Facsimile
Web

Project :
Proposed Warehouse / Storage & Office & cafe Development

Address :
LOT 18
Ashburn Road, Ipswich

For :
Walker Corporation

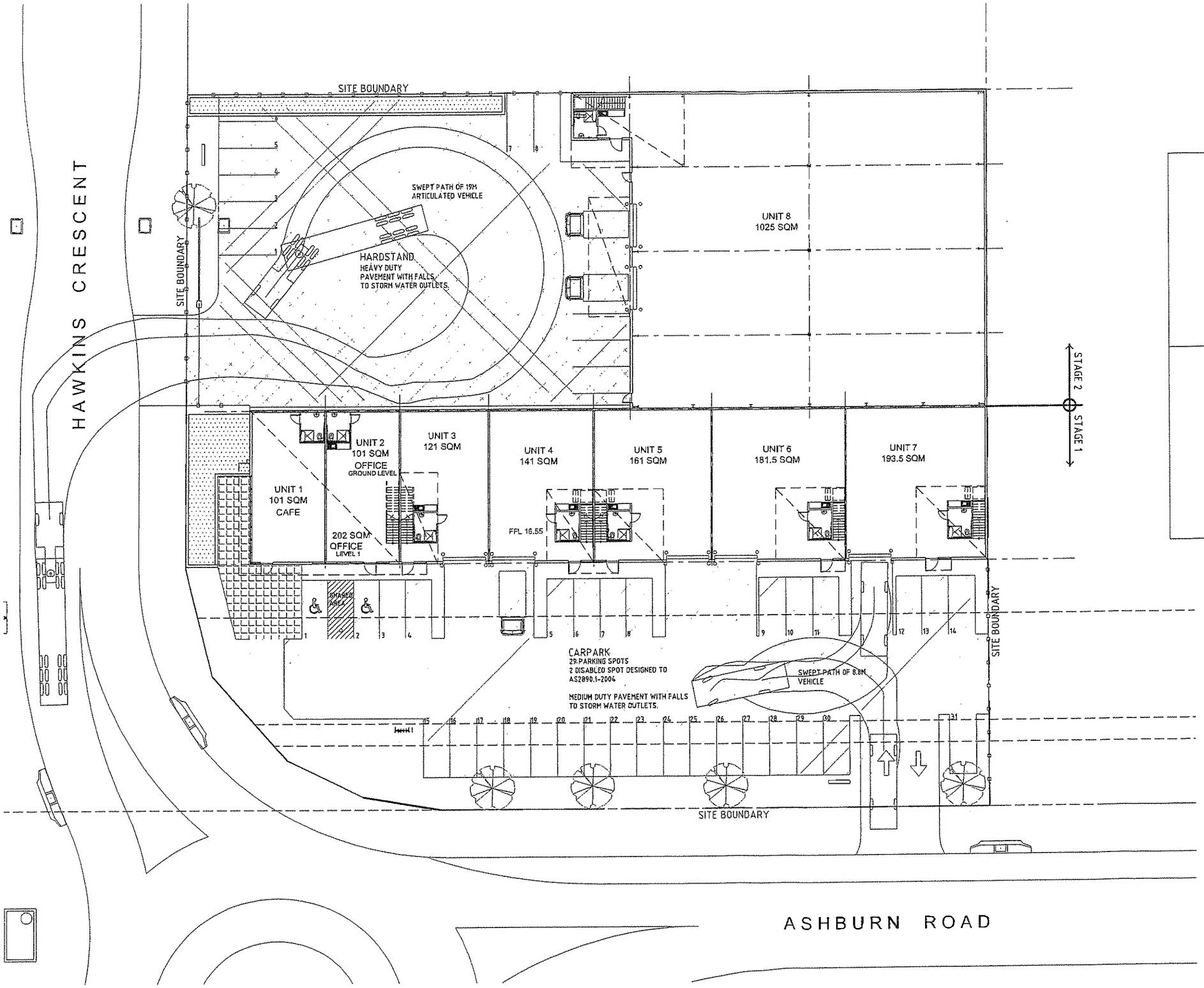
Drawing :
Coloured Elevations

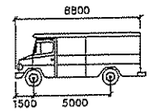
Scale :	Date :	Drawn :	Checked :
1:150	06 OCT 10	EP	

Status :
DA - Not for Construction

Project No :	Drawing No :	Issue :
	SP-CS-DA-006	B

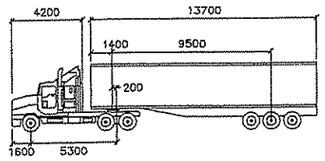
B1 SHEET





SVEH mm

Width	: 2500
Track	: 2500
Lock to Lock Time	: 6.0
Steering Angle	: 26.2



S ARTICULATED 19M mm

Tractor Width	: 2500	Lock to Lock Time	: 6.0
Trailer Width	: 2500	Steering Angle	: 27.7
Tractor Track	: 2500	Articulating Angle	: 70.0
Trailer Track	: 2500		

HEAVY DUTY PAVEMENT

MEDIUM DUTY PAVEMENT

Walker

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ABN 95 001 176 263
PO Box 4073
Sydney NSW 2001
Level 21 Governor Macquarie Tower
1 Farrer Place, Sydney NSW 2000
Telephone
Facsimile
Web
[redacted]

Project:
Proposed Warehouse / Storage & Office & Cafe Development

Address:
LOT 18
Ashburn Road, Ipswich

For:
Walker Corporation

Drawing:
Truck turning path

Scales:	Date:	Drawn:	Checked:
1:150	06 OCT 10	TP	

Status:
DA - Not for Construction

Project No:	Drawing No:	Issue:
	SP-CS-DA-007	B

B1 SHEET

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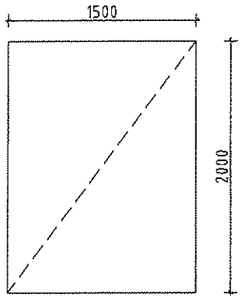
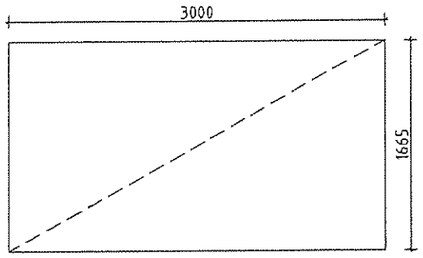
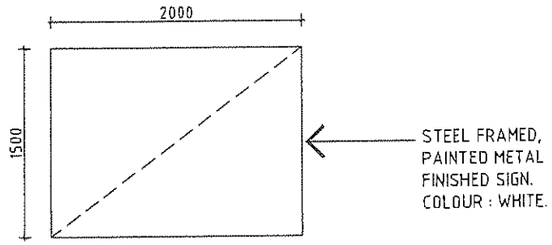
Revision	Amendments	Drawn	Date
A	SIGNAGE DIMENSIONS	AW	24.10.10



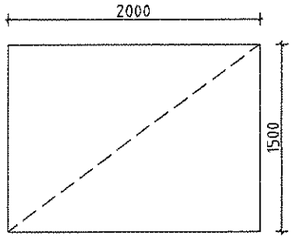
STAGE 1
TYPICAL SIGNAGE
UNIT 1 TO UNIT 7 (SOUTH)
AREA = 3 SQM X (7)



STAGE 1
UNIT 1 - FEATURE WALL (WEST)
AREA = 5 SQM

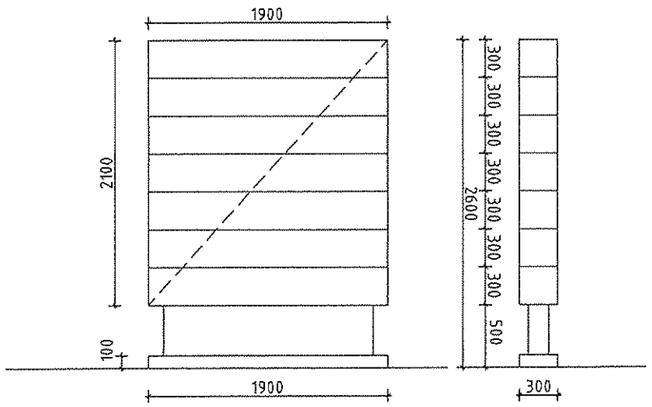


STAGE 1
UNIT 2 (WEST)
AREA = 3 SQM

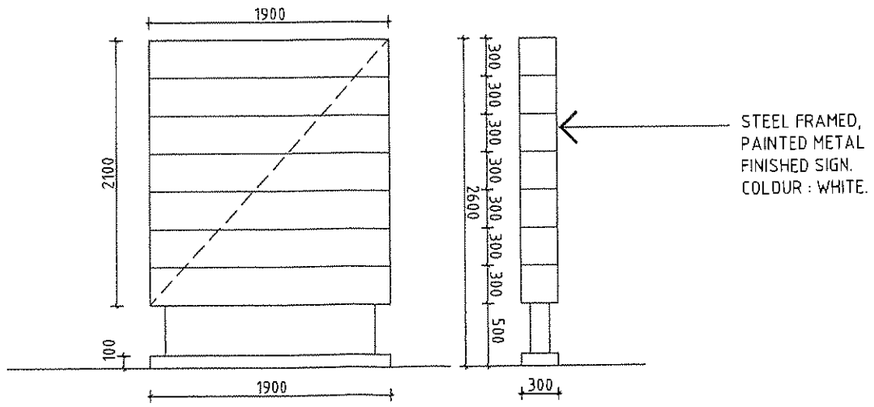


STAGE 2
SIGNAGE (WEST)
AREA = 3 SQM

TOTAL SIGNAGE AREA = 40 SQM



STAGE 1
SIGNAGE 1 (ASHBURN ROAD)
AREA = 4 SQM



STAGE 2
SIGNAGE 2 (HAWKINS CRESCENT)
AREA = 4 SQM

NOTE :
ALL REDUCED LEVELS ARE NOMINAL (+/- 500mm)
SUBJECT TO FINAL DETAIL DESIGN

Walker

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ABN 05 401 176 253
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Facsimile
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Project :
Proposed Warehouse / Storage & Office & Cafe Development

Address :
LOT 18
Ashburn Road, Ipswich

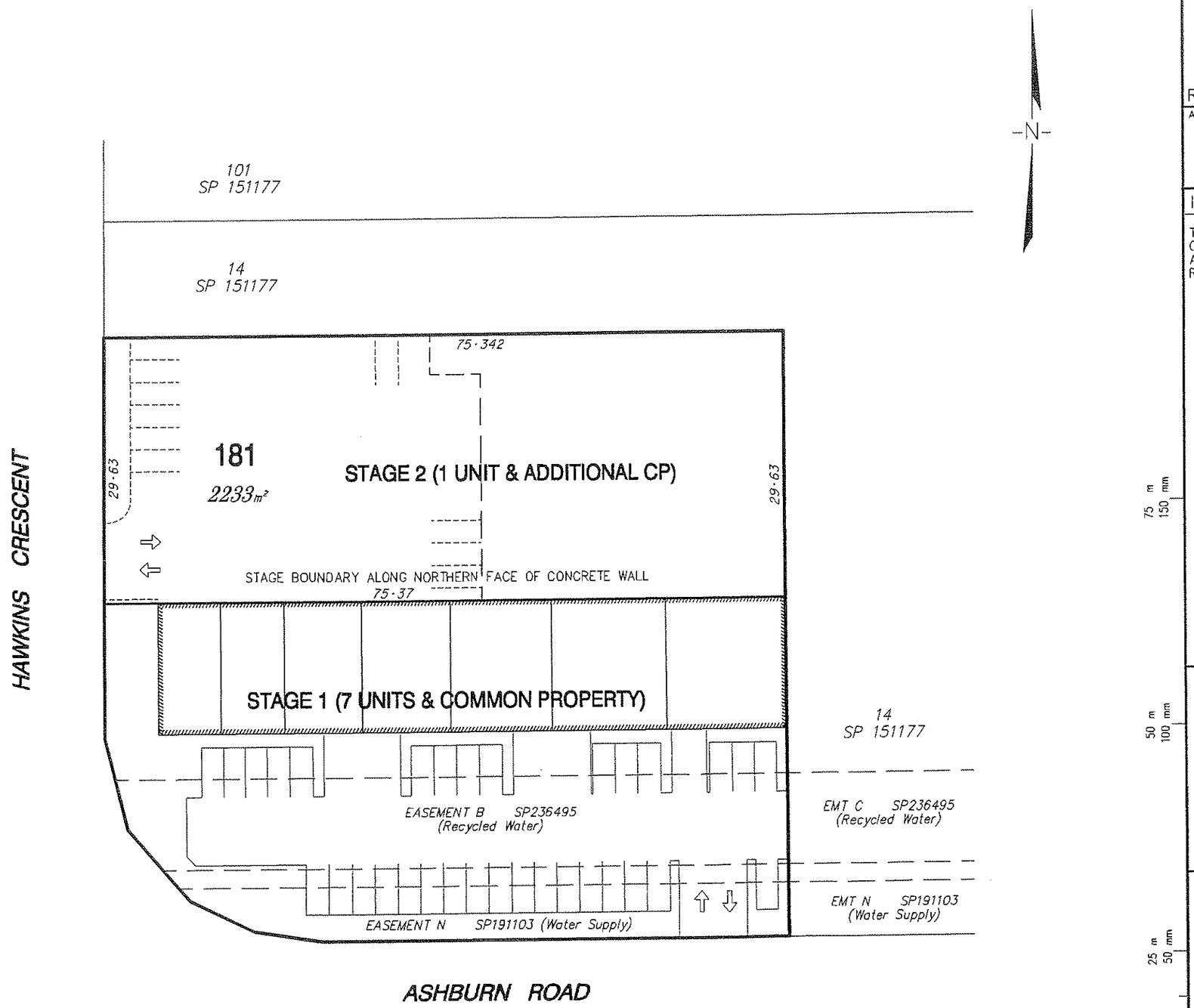
For :
Walker Corporation

Drawing :
Signage plan

Scales : 1:50	Date : 08 OCT 10	Drawn : TP	Checked :

Status :
DA - Not for Construction

Project No :	Drawing No :	Issue :
	SP-CS-DA-008	B



Revision	Chk'd
Associate Consultant / Client	

Important Notes:

THE PROPOSED BOUNDARIES AS SHOWN HEREON ARE PRELIMINARY ONLY AND ARE SUBJECT TO FINAL DESIGN, LOCAL AUTHORITY APPROVAL AND REGISTRATION IN THE DEPARTMENT OF NATURAL RESOURCES.

WALKER BREMER PARK PTY LTD

PROPOSED STAGING PLAN

Strata Title Development of Proposed Lot 18
being part of Lot 101 on SP151177

Locality of BUNDAMBA
City of IPSWICH

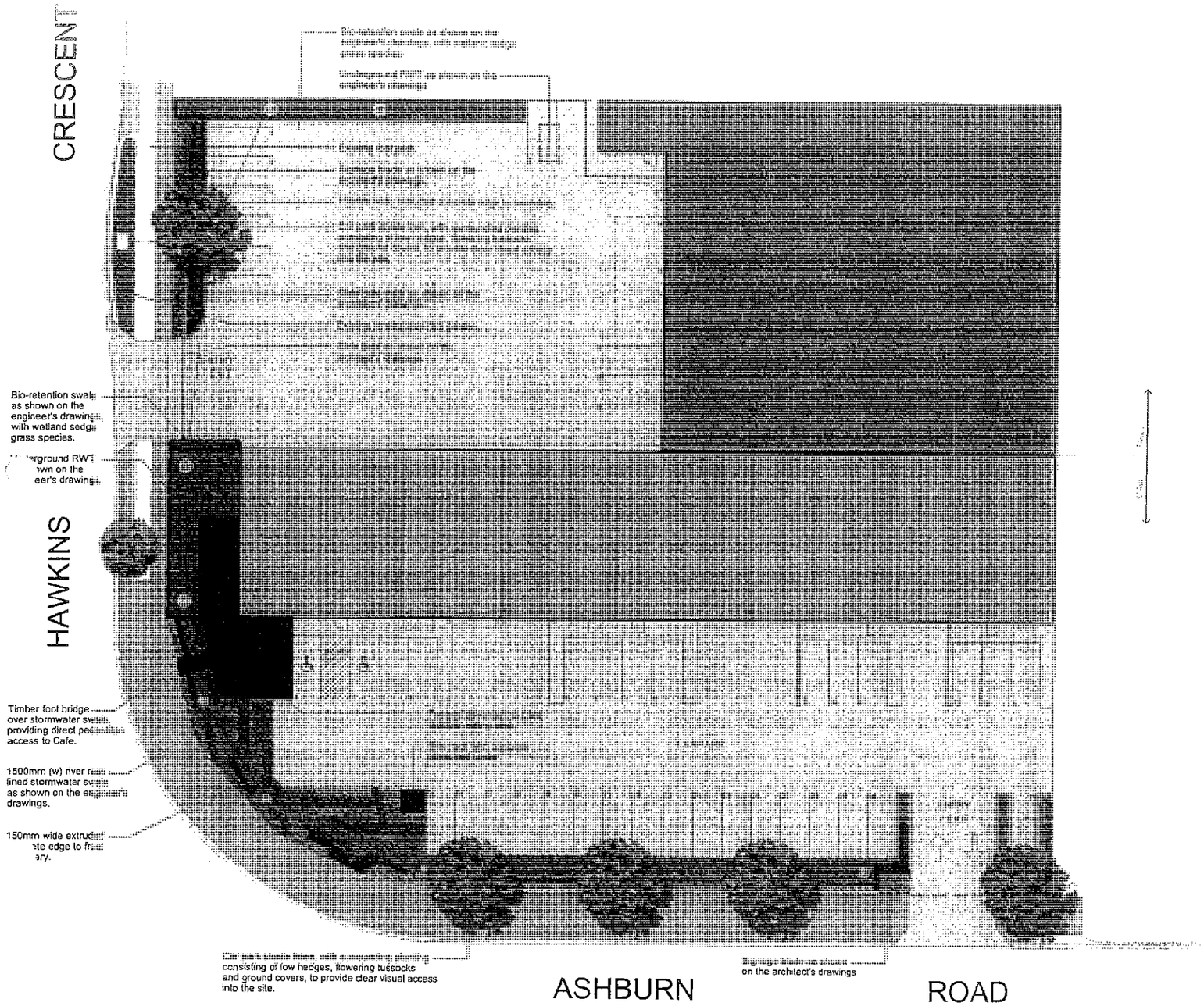
Parish of GOODNA County of Stanley

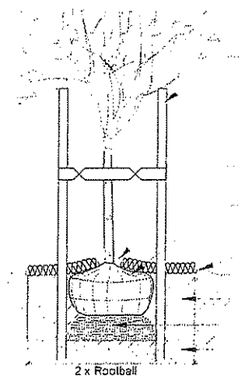
B & P SURVEYS
CONSULTING SURVEYORS
ABN 55010117236
Capri Commercial Centre
St Peters Place
Surfers Paradise, QLD, 4217, Australia
Telephone: [redacted]
Fax: [redacted]
Email: [redacted]@bpsurveys.com.au
Webpage: www.bpsurveys.com.au
Offices Also At :
Tweed Heads Ph. [redacted]
Murwillumbah Ph. [redacted]
A QUALITY ASSURED COMPANY

J:\41891\dwgs\18564D.pro

Scale	Level Datum	Drawn	Chk'd	F.Bk	L.Bk
1 : 500		GVG		—	—

REF. No.	Date	Drawing No./Size	Sheet	Of	Rev.
41891/18	3/11/10	18564 D	-	-	-





All trees shall be staked with 4 No. 50 x 50 x 1800mm hardwood stakes, smoothed over to remove splinters. Stakes shall be firmly installed. Provide 50mm wide loose fitting hessian ties from each stake around trunk.

Ensure mulch 50mm min. clear of plant stem.

Remove burlap from top third of rootball after partial backfilling.

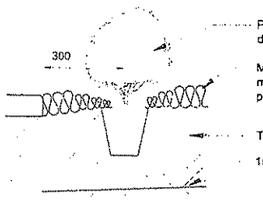
100mm High berm around excavation.

Topsoil as specified.

Settling mound.

Undisturbed earth.

ADVANCED TREE PLANTING



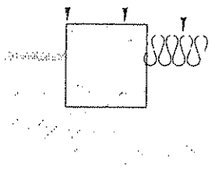
Plant stock as shown on the drawings and as specified.

Mulch as specified. Ensure mulch 25mm min. clear of plant stem.

Topsoil as specified.

150mm Cultivated subgrade.

PLANTING



Finish edge 25mm above adjoining surfaces.

150 (w) x 150mm (d), concrete footing. Install control joints at 1.5m centres, and expansion joints at 4.5m intervals.

Adjoining planting areas.

CONCRETE EDGE

LANDSCAPE SPECIFICATION

[illegible]

PLANT SCHEDULE

[illegible]

LANGE design

[redacted]

WALKER CORPORATION PTY LTD

LANDSCAPE CONCEPT PLAN

WCW1010-LCP01 B

Your reference Citiswich Stage 1 MCU (café, office & service/trade uses)
Our reference 7606/2010/CA
Contact Officer [redacted]
Telephone [redacted]

City of Ipswich

Ipswich City Council

45 Roderick St
PO Box 191
Ipswich QLD 4305
Australia

Tel [redacted]
Fax
Email council@ipswich.qld.gov.au
Web www.ipswich.qld.gov.au

Walker Bremer Park Pty Ltd
[redacted]
PO Box 122
BOOVAL FAIR QLD 4304

23 November 2010

Dear Sir/Madam

Re: **Development Application Information Request (Section 276 of the *Sustainable Planning Act 2009*)**

Application Number: **7606/2010/CA**
Proposal: **Material change of use for service trade use (six tenancies), business use (office) (one tenancy) and business use (café) (one tenancy); and operational works (advertising devices).**
Property Location: **Part of 1 Hawkins Crescent, BUNDAMBA QLD 4304**

Upon review of the abovementioned development approval application and supporting information, further information is required to satisfactorily assess this application. The information requested is set-out below.

1. Easements

The applicant is requested to demonstrate that the proposal is consistent with the terms of all easements on the property. Alternatively, the developer is requested to submit the consent of the servient tenement in accordance with section 263 of the *Sustainable Planning Act 2009.*

2. Landscaping

The applicant is requested to incorporate additional landscaping into the car parking areas on site. The parking code (part 12, division 9) of the *Ipswich Planning Scheme 2006* requires a minimum of one space to be used for landscaping for every eight (8) standard car spaces. The applicant should ensure any request for car parking dispensations is supported by an RPEQ analysis.

3. Proposal Plans

The applicant is requested to submit an amended site plan demonstrating the following:

(a) How safe and efficient access for pedestrians and cyclists is to be facilitated between the external street and the proposed site office area. Facilities may include a formalised route consisting of paths, gates, stairs, ramps, crossing points, pavement markings, signage and lighting.

(b) Provision of shower and locker facilities for cyclists in accordance with the *Ipswich Planning Scheme 2006* and Australian Standards;

4. Elevations

The applicant is requested to give further consideration to the treatment of the approximate 30 metres of back wall proposed to be created at the rear of the stage one building area (in front of the stage two warehouse). Appropriate treatment may include relevant signage, further articulation or landscaping. Furthermore, the applicant should provide an interim option for the treatment of the full length of the wall (ie prior to the establishment of stage 2 of the development).

5. Stormwater Quantity Management

The Stormwater Management Plan (SMP) submitted (prepared by Martin Cosgrove and Associates Pty Ltd and dated 25 October 2010) includes a stormwater quantity analysis for a 1 in 50 year Average Recurrence Interval (ARI) stormwater event and an extended detention depth of 0.6m over the bio retention basin filter media for on-site detention purposes. The applicant is requested to submit an amended SMP prepared by an RPEQ with a stormwater quantity analysis for a stormwater event with an ARI of up to 1 in 100 years pursuant to the Queensland Urban Drainage Manual 2007 (QUDM) and Council's Planning Scheme Policy 3 – General Works. The extended detention depth for the bio retention basin is to be 0.3m for optimum plant health and the proposed detention storage is requested to be amended.

The stormwater discharge from the proposed development must be maintained at pre-development flows for a stormwater event with an ARI of up to 1 in 100 years. The applicant should identify the proposed method of stormwater detention and clearly identify any stormwater detention structures on the development plan. The applicant is requested to demonstrate that there is sufficient area of land available within the development to provide for the on-site detention system.

6. Stormwater Quality Management

The applicant is requested to address the following matters in relation to the SMP (prepared by Martin Cosgrove and Associates Pty Ltd and dated 25 October 2010):

(a) The proposal plans indicate that there is a base slab located between the high flow bypass and the bioretention basin filter media. The plans show that the high flow bypass flows to the legal point of discharge, however there are no details to show the aggi pipes are placed within the drainage layer of the swale or that the bioretention basin flows to the legal point of discharge. To this end, the applicant is requested to submit amended plans indicating that slotted PVC pipes rather than pre-socked aggi pipes are used within the drainage layer of the swale and that the bioretention basin flows to the legal point of discharge.

(b) The site plans indicate that there is an underground water tank located within the proposed 54m^2 bioretention basin. This tank must not be located within the total filter areas of the bioretention basin. To this end, the applicant is requested to submit amended plans indicating the location of the water tank outside the filter area of the bioretention basin.

(c) The site plans indicate that that the extended detention depth of the bioretention basins are 0.6m. The applicant is requested to submit amended plans indicating an extended detention depth of 0.3m for optimum plant health.

(d) The 46m^2 bioretention basin is proposed to be located above existing sewerage infrastructure. The applicant must consider the location and depth of this service ensuring that the depths of the filter layer, transitional layer, drainage layer and extended detention can be accommodated while not impacting on these services.

(e) The proposal plans do not specify the depth and appropriate particle size diameter of the filter media, transitional layer and drainage layer. The applicant is requested to submit amended plans indicating depth and appropriate particle size diameter of the filter media, transitional layer and drainage layer accordance with chapter 3 of the Water Sensitive Technical Design Guidelines (WSUD TDG) for South East Queensland published by Healthy Waterways.

(f) The applicant is requested to specify on the plan the grade at which drainage pipes are to be laid and the relevant width of the drainage pipes slots. It should be noted that a minimum of 0.5% slope is required and, depending on the length of the bioretention, this may impact significantly on the depth of the drainage layer.

(g) The applicant is requested to confirm whether a rainwater tank is proposed to be re-used for irrigation and internal plumbing (ie toilets). Given the reduction in potable water consumption required by the Queensland Development Code (dated 1 January 2008), and Council's requirement to use harvested stormwater for landscaping purposes (as set out in section 12.7.4 (11)(i) of the commercial and industrial code (part 12, division 7) of the *Ipswich Planning Scheme 2006*), the applicant is requested to provide information detailing the location and size of stormwater collection for internal use and minor landscaped areas. This should include conceptual drainage plans detailing location of overflow from stormwater collection structures and pumps for reticulation.

(h) The applicant is requested to submit an amended report that addresses the issues raised in items (a) to (e) above. The amended SMP must be prepared by a RPEQ in accordance with QUDM and demonstrate compliance with the water quality objectives outlined in table 2.3.1 of Planning Scheme Policy 3 and a reduction in the average annual pollutant load as required by the South East Queensland Regional Plan as follows:

- 80% for total suspended solids;
- 60% for total phosphorus;
- 45% for total nitrogen; and
- 90% for gross pollutants.

7. Waste Storage and Collection

The applicant is requested to detail on an appropriately scaled plan the following:

(a) The area proposed for waste storage and collection ensuring it can be accessed by a refuse collection vehicle and is screened, level, concreted and constructed in conjunction with the driveway surface with no intervening step, ledge, kerb or other obstruction.

(b) A bin wash-down area for the food premises. The applicant is requested to demonstrate that wash down waters from bin cleansing performed on-site is appropriately treated and discharged to sewer (subject to a trade waste approval). No wash down waters are permitted to flow to a roadway, gutter, stormwater drain or natural waterway.

(c) That the waste storage and collection area(s) allow forward motion entry to the waste containers with reversing of a minimum of two (2) vehicle lengths and forward motion entry and exit to and from the site.

Further information is required to satisfactorily assess this application in relation to water and wastewater components of the development. The following information

request is issued by Council under delegation from the Central SEQ Distributor - Retailer Authority.

1. Sewer

(a) The applicant is requested to ensure the proposed bioretention basin on the northern property boundary is clear of the existing sewer main.

(b) The northern building proposed as part of stage 2 of the development appears to be located over existing sewerage infrastructure. The applicant is requested to precisely identify the location of the proposed building in relation to the existing sewer main.

(c) In the positioning of buildings on site the applicant is required to comply with one of the following in relation to sewerage infrastructure:

(i) All structures shall be a minimum of 1.5m clear of the outer edge of the existing sewers; or

(ii) Should it be impractical for the structures to be constructed clear of the existing sewer, the applicant shall either:

- Relay the sewer around the proposed structures; or
- Replace the existing sewer in polyethylene wrapped cement lined ductile iron (DICL) pipe for the length to be overbuilt, with access chambers constructed at both ends of the DICL section, unless approved otherwise by Queensland Urban Utilities (QUU).

(d) Where it is proposed to build over the existing sewerage infrastructure, the applicant should be aware that prior approval to build over sewers shall be obtained from Council where the following requirements are to be met:

(i) The part of the sewer to be built over shall be straight for the whole distance under the building;

(ii) Access chambers shall be positioned on the sewer outside the building. Access to access chambers shall be provided at all times;

(iii) Whenever a footing crosses a sewer or is located within 1.5m of the sewer, the footing shall be designed with a minimum of 450mm diameter piers each side of the sewer, penetrating to a level of 300mm below the invert of the sewer. No footing shall impose a load on the sewer; and

(iv) The existing sewer shall be replaced with DICL pipe, with upstream and downstream access chamber connections to the existing sewer, unless approved otherwise by QUU.

Pursuant to section 278 of the *Sustainable Planning Act 2009*, the applicant has three (3) options available in response to this Information Request. The applicant must give the requesting authority (in this case the assessment manager):

1. all of the information requested; or

2. part of the information requested together with a written notice asking the requesting authority to proceed with the assessment of the application; or

3. a written notice:

   (a) stating that the applicant does not intend to supply any of the information requested; and

   (b) asking the requesting authority to proceed with the assessment of the application.

The information response should also include a statement indicating which of the above options describes the response you are providing. To assist in the matter, Appendix 1 provides a checklist that you should complete and return with your response.

Response to this Information Request should be forwarded to:-

Chief Executive Officer
C/- Assessment Manager
Development Planning Branch
Ipswich City Council
PO Box 191
IPSWICH QLD 4305

Pursuant to section 279 (1)(b) of the *Sustainable Planning Act 2009*, the application lapses if the applicant does not comply with section 278 of the *Sustainable Planning Act 2009* within **six (6) months** after receiving the information request (the response period) or the further period agreed between the applicant and the requesting authority.

If the application lapses in accordance with section 279 of the *Sustainable Planning Act 2009* (i.e. no response to the information request is received) it may be revived in accordance with section 280 of the *Sustainable Planning Act 2009*.

If you have any queries in regards to this Information Request, please contact [redacted] on telephone number [redacted]

Yours faithfully

[redacted]

Natalie Plumbe
TEAM COORDINATOR (Team Central)

RESPONSE TO DEVELOPMENT APPLICATION INFORMATION REQUEST

Chief Executive Officer
C/- Assessment Manager
Development Planning Branch
Ipswich City Council
PO Box 191
IPSWICH QLD 4305

Date: _____

Application No. _____

Site Address: _____

☐ Please find enclosed the applicant's response to the development application information request, which contains:

☐ all of the information requested; or

☐ part of the information requested; and

☐ we intend to provide further information; or

☐ it is requested that the assessment manager proceed with the assessment of the application based on the information provided and it is noted that by not supplying all information requested that it may result in the refusal of the application if such matters can not be adequately conditioned.

☐ Notice is hereby given that the applicant does not intend to supply any of the information requested and asks that the assessment manager proceed with the assessment of the application based on the information provided and it is noted that by not supplying all information requested that it may result in the refusal of the application if such matters can not be adequately conditioned.

Response From:

Name_____

_____

Address_____

_____

Address_____

_____

Address_____

_____

Address_____

_____

Signature:_____

_____

[redacted]

From: [redacted]
Sent: Monday, 22 November 2010 4:02 PM
To: [redacted]
Subject: 7606/10 /CA - 1 Hawkins Crescent, Bundamba - Engineering FIR

[redacted]

The following information is required to allow assessment of this application:

1. Stormwater Quantity Management

The Stormwater Management Plan dated 25 October 2010 prepared by Martin Cosgrove and Associates Pty Ltd includes the stormwater quantity analysis for only 1 in 50 year ARI stormwater event and the extended detention depth of 0.6m over bio retention basin filter media has been taken for the on-site detention purpose. The Applicant is requested to submit amended Stormwater Management Plan prepared by an RPEQ with the stormwater quantity analysis for up to 1 in 100 year ARI stormwater event as per the QUDM 2007 and Council's Planning Scheme Policy 3 - General Works. The extended detention depth for the bio retention basin must be 0.3m for the optimum plant health and the proposed detention storage needs to be amended.

The stormwater discharge from the proposed development must be maintained at pre-development flows for up to 1 in 100 year ARI. The Applicant should identify the proposed method of stormwater detention and clearly identify any stormwater detention structures on the development plan. The Applicant is requested to demonstrate that there is sufficient area of land available within the development to provide for the on-site detention system.

2. Sewer

(a) The Applicant needs to avoid to locate the proposed bio retention basin on North boundary over the existing sewer main.

(b) The proposed building appears to be built over the existing sewerage infrastructure.
The Applicant is requested to precisely identify the location of proposed building with reference to existing sewer main.

The Applicant should be aware that in the positioning of the buildings on site with regard to sewerage infrastructure, the Applicant will be required to comply with one of the following:

(i) All structures shall be a minimum of 1.5m clear of the outer edge of the existing sewers; or

(ii) Should it be impractical for the structures to be constructed clear of the existing sewer, then the Applicant shall either:

- Relay the sewer around the proposed structures, or

- Replace the existing sewer in polyethylene wrapped cement lined ductile iron(DICL) pipe for the length to be overbuilt, with access chambers constructed at both ends of the DICL section, unless approved otherwise by Queensland Urban Utilities (QUU).

Further, the Applicant should be aware that approval to build over/very close to sewers shall be obtained from the Council where the following requirements are met:

(i) The part of the sewer to be built over shall be straight for the whole distance under the building;

(ii) Access chambers shall be positioned on the sewer outside the building. Access to access chambers shall be provided at all times;

(iii) Whenever a footing crosses a sewer or is located within 1.5m of the sewer, the footing shall be designed with a minimum of 450mm diameter piers each side of the sewer, penetrating to a level of 300mm below the invert of the sewer. No footing shall impose a load on the sewer; and

(iv) The existing sewer shall be replaced with polyethylene wrapped cement lined ductile iron pipe, with upstream and downstream access chamber connections to the existing sewer, unless approved otherwise by Queensland Urban Utilities (QUU).

Thanks

[redacted] Senior Development Engineer
Planning & Development
Ipswich City Council
PO Box 191, Ipswich QLD 4305
[redacted]
45 Roderick Street, Ipswich QLD 4305

Walker

PO Box 122
Booval Fair QLD 4304
Australia

61 Ashburn Road
Bundamba QLD 4304
Australia

Telephone: [redacted]
Direct Line: [redacted]
Facsimile: [redacted]
www.walkercorp.com.au

10 MAR 2011
7606/10
[redacted]

8 March 2011

Chief Executive Officer
Ipswich City Council
PO Box 191
IPSWICH QLD 4305

For the attention of: [redacted]

Dear Sir

RESPONSE TO INFORMATION REQUEST
COMBINED DEVELOPMENT APPLICATION REFERENCE: 7606/10/CA
1 HAWKINS CRESCENT, BUNDAMBA QLD 4304

I write with reference to Council's information Request dated 23 November 2010 in relation to the combined development application Council reference 7606/2010/CA. In the table below I provide a summary of Council's information request item and a response from Walker.

Council Information Request	Walker Response
1. Easements The applicant is requested to demonstrate that the proposal is consistent with the terms of all easements on the property. Alternatively, the developer is requested to submit the consent of the servient tenement in accordance with section 263 of the *Sustainable Planning Act 2009*.	Please find a letter from Water Secure stating that they have no objection to the development proposal.
2. Landscaping The applicant is requested to incorporate additional landscaping into the car parking areas on site. The parking code (part 12, division 9) of the *Ipswich Planning Scheme 2006* requires a minimum of one space to be used for landscaping for every eight (8) standard car spaces. The applicant should ensure any request for car parking dispensations is supported by an RPEQ analysis.	We enclose a revised package of drawings which provides additional landscaping to the car parking areas as requested by Council. We have sought to maximise the amount of landscaping through revisions to the car parking layout and the introduction of landscaping triangles and a new landscaping strip between bays 22 and 23. The development proposal achieves Council standards in terms of the number of car parking bays, and maximises landscaping to car parking areas as far as practicable – which we believe is a good outcome for the development.
3. Proposal Plans The applicant is requested to submit an amended site plan demonstrating the following:	
(a) How safe and efficient access for pedestrians and cyclists is to be facilitated between the external street and the proposed site office area. Facilities may include a formalised route consisting of paths, gates,	We have revised the site plan to incorporate clear pedestrian access route from the street through to the units.

stairs, ramps, crossing points, pavement markings, signage and lighting.	
(b) Provision of shower and locker facilities for cyclists in accordance with the *Ipswich Planning Scheme 2006* and Australian Standards;	We have revised the plans to incorporate shower and locker facilities within each of the units.
4. Elevations The applicant is requested to give further consideration to the treatment of the approximate 30 metres of back wall proposed to be created at the rear of the stage one building area (in front of the stage two warehouse). Appropriate treatment may include relevant signage, further articulation or landscaping. Furthermore, the applicant should provide an interim option for the treatment of the full length of the wall (ie prior to the establishment of stage 2 of the development).	We have revised the plan to incorporate additional articulation and landscaping as requested.
5. Stormwater Quantity Management The Stormwater Management Plan (SMP) submitted (prepared by Martin Cosgrove and Associates Pty Ltd and dated 25 October 2010) includes a stormwater quantity analysis for a 1 in 50 year Average Recurrence Interval (ARI) stormwater event and an extended detention depth of 0.6m over the bio retention basin filter media for on-site detention purposes. The applicant is requested to submit an amended SMP prepared by an RPEQ with a stormwater quantity analysis for a stormwater event with an ARI of up to 1 in 100 years pursuant to the Queensland Urban Drainage Manual 2007 (QUDM) and Council's Planning Scheme Policy 3 – General Works. The extended detention depth for the bio retention basin is to be 0.3m for optimum plant health and the proposed detention storage is requested to be amended. The stormwater discharge from the proposed development must be maintained at pre-development flows for a stormwater event with an ARI of up to 1 in 100 years. The applicant should identify the proposed method of stormwater detention and clearly identify any stormwater detention structures on the development plan. The applicant is requested to demonstrate that there is sufficient area of land available within the development to provide for the on-site detention system.	Martin Cosgrove and Associates has amended their stormwater management plan to address Council's requirement.
6. Stormwater Quality Management The applicant is requested to address the following matters in relation to the SMP (prepared by Martin Cosgrove and Associates Pty Ltd and dated 25 October 2010):	
(a) The proposal plans indicate that there is a base slab located between the high flow bypass and the bioretention basin filter media. The plans show that the high flow bypass flows to the legal point of discharge, however there are no details to show the aggi pipes are placed within the drainage layer of the swale or that	Aggi pipes have been changed to PVC on the drawings. Note shows these to be connected to overflow pits.

the bioretention basin flows to the legal point of discharge. To this end, the applicant is requested to submit amended plans indicating that slotted PVC pipes rather than pre-socked aggi pipes are used within the drainage layer of the swale and that the bioretention basin flows to the legal point of discharge.	
(b) The site plans indicate that there is an underground water tank located within the proposed 54m2 bioretention basin. This tank must not be located within the total filter areas of the bioretention basin. To this end, the applicant is requested to submit amended plans indicating the location of the water tank outside the filter area of the bioretention basin.	Water tank is not under bio pit. Note incorrectly pointed to footings on previous drawing. Has been corrected
(c) The site plans indicate that that the extended detention depth of the bioretention basins are 0.6m. The applicant is requested to submit amended plans indicating an extended detention depth of 0.3m for optimum plant health.	See revised Stormwater Management Plan which addresses this issue.
(d) The 46m2 bioretention basin is proposed to be located above existing sewerage infrastructure. The applicant must consider the location and depth of this service ensuring that the depths of the filter layer, transitional layer, drainage layer and extended detention can be accommodated while not impacting on these services.	The sewerage infrastructure Council refers to in this item is actually in the Caltex allotment to the north of the subject site.
(e) The proposal plans do not specify the depth and appropriate particle size diameter of the filter media, transitional layer and drainage layer. The applicant is requested to submit amended plans indicating depth and appropriate particle size diameter of the filter media, transitional layer and drainage layer accordance with chapter 3 of the Water Sensitive Technical Design Guidelines (WSUD TDG) for South East Queensland published by Healthy Waterways.	Filter media and drainage layer specs were on notes on C103. Have moved to C102 to be read more clearly with Bio details.
(f) The applicant is requested to specify on the plan the grade at which drainage pipes are to be laid and the relevant width of the drainage pipes slots. It should be noted that a minimum of 0.5% slope is required and, depending on the length of the bioretention, this may impact significantly on the depth of the drainage layer.	grade on cross pipes was shown, has now been added to longitudinal pipes. Maximum run to a pit will be 10 metres, which gives 50mm fall. Allowing for the 100 diameter pipe, this can fit in the 200mm drainage layer.
(g) The applicant is requested to confirm whether a rainwater tank is proposed to be re-used for irrigation and internal plumbing (ie toilets). Given the reduction in potable water consumption required by the Queensland Development Code (dated 1 January 2008), and Council's requirement to use harvested stormwater for landscaping purposes (as set out in section 12.7.4 (11)(i) of the commercial and industrial code (part 12, division 7) of the *Ipswich Planning Scheme 2006*), the applicant is requested to provide information detailing the location and size of stormwater collection for internal use and minor landscaped areas. This should include conceptual drainage plans detailing location of overflow from stormwater collection structures and pumps for	The tank water will be reused for irrigation and toilets.

reticulation.	
(h) The applicant is requested to submit an amended report that addresses the issues raised in items (a) to (e) above. The amended SMP must be prepared by a RPEQ in accordance with QUDM and demonstrate compliance with the water quality objectives outlined in table 2.3.1 of Planning Scheme Policy 3 and a reduction in the average annual pollutant load as required by the South East Queensland Regional Plan as follows: • 80% for total suspended solids; • 60% for total phosphorus; • 45% for total nitrogen; and • 90% for gross pollutants.	Please find enclosed a revised Stormwater Management Plan which addresses this item.
7. Waste Storage and Collection The applicant is requested to detail on an appropriately scaled plan the following:	
(a) The area proposed for waste storage and collection ensuring it can be accessed by a refuse collection vehicle and is screened, level, concreted and constructed in conjunction with the driveway surface with no intervening step, ledge, kerb or other obstruction.	We have revised the drawings – see drawing reference SP-CS-DA-001 Rev D.
(b) A bin wash-down area for the food premises. The applicant is requested to demonstrate that wash down waters from bin cleansing performed on-site is appropriately treated and discharged to sewer (subject to a trade waste approval). No wash down waters are permitted to flow to a roadway, gutter, stormwater drain or natural waterway.	A bin wash down area is provided – see drawing reference SP-CS-DA-001 Rev D.
(c) That the waste storage and collection area(s) allow forward motion entry to the waste containers with reversing of a minimum of two (2) vehicle lengths and forward motion entry and exit to and from the site.	See drawing reference SP-CS-DA-009 Rev B.
1. Sewer (a) The applicant is requested to ensure the proposed bioretention basin on the northern property boundary is clear of the existing sewer main.	The location of the sewer Council is referring to in this item is on the adjoining Caltex allotment to the north of the subject site.
(c) In the positioning of buildings on site the applicant is required to comply with one of the following in relation to sewerage infrastructure:	The location of the sewer Council is referring to in this item is on the adjoining Caltex allotment to the north of the subject site.
(i) All structures shall be a minimum of 1.5m clear of the outer edge of the existing sewers; or	
(ii) Should it be impractical for the structures to be constructed clear of the existing sewer, the applicant shall either: • Relay the sewer around the proposed structures; or • Replace the existing sewer in polyethylene wrapped cement lined ductile iron (DICL) pipe for the length to be overbuilt, with access chambers constructed at both ends of the DICL section, unless approved otherwise by Queensland Urban Utilities (QUU).	The location of the sewer Council is referring to in this item is on the adjoining Caltex allotment to the north of the subject site.
(d) Where it is proposed to build over the existing sewerage infrastructure, the applicant should be aware	

that prior approval to build over sewers shall be obtained from Council where the following requirements are to be met:	
(i) The part of the sewer to be built over shall be straight for the whole distance under the building;	The location of the sewer Council is referring to in this item is on the adjoining Caltex allotment to the north of the subject site.
(ii) Access chambers shall be positioned on the sewer outside the building. Access to access chambers shall be provided at all times;	The location of the sewer Council is referring to in this item is on the adjoining Caltex allotment to the north of the subject site.
(iii) Whenever a footing crosses a sewer or is located within 1.5m of the sewer, the footing shall be designed with a minimum of 450mm diameter piers each side of the sewer, penetrating to a level of 300mm below the invert of the sewer. No footing shall impose a load on the sewer; and	The location of the sewer Council is referring to in this item is on the adjoining Caltex allotment to the north of the subject site.
(iv) The existing sewer shall be replaced with DICL pipe, with upstream and downstream access chamber connections to the existing sewer, unless approved otherwise by QUU.	The location of the sewer Council is referring to in this item is on the adjoining Caltex allotment to the north of the subject site.

To assist you in your consideration of this application we enclose the following information:

- Letter from Water Secure confirming no objections to the proposal;
- Revised application drawings:
  - SP-CS-DA-001 Rev D (Site/Floor Plan)
  - SP-CS-DA-002 Rev C (Mezzanine Floor Plan)
  - SP-CS-DA-003 Rev D (Roof Plan)
  - SP-CS-DA-004 Rev B (Sections)
  - SP-CS-DA-005 Rev C (Elevations)
  - SP-CS-DA-006 Rev C (Coloured Elevations)
  - SP-CS-DA-007 Rev D (Truck Turning Path)
  - SP-CS-DA-008 Rev C (Signage Plan)
  - SP-CS-DA-009 Rev B (Waste Management Plan)
- Revised Stormwater Management Plan and associated drawings

Please note this response to the development application information request provides all the information requested. Should you have any further enquiries regarding this response then please contact the undersigned.

Yours sincerely

[redacted]

Planning Manager – Approvals Division
Walker Corporation Pty Limited

Our Ref: 40260_AH Bremer

24 November 2010

[redacted]
Project Manager
Land Acquisition and Management
Department of Infrastructure and Planning
PO Box 15009
CITY EAST QLD 4002

Dear Sir

RE: WESTERN CORRIDOR RECYCLED WATER PIPELINE
PROPOSED DEVELOPMENT OVER EASEMENT - LOT 18 ASHBURN RD, BUNDAMBA

We refer to your email correspondence of 25 October 2010 requesting our consideration of the proposed warehouse / unit and office development at the corner of Hawkins Crescent and Ashburn Rd (Lot 18) owned by Walker Bremer Pty Ltd.

It is noted that the development is subject to approval by the local authority and that no detailed design drawings have been submitted by the landowner to WaterSecure. As such, please note that the comments provided below are on a 'without prejudice' in principle basis.

WaterSecure has no objection in principle to the development as shown on the floor plan and section drawings submitted (SP-CS-RW-000 A, SP-CS-RW-001 A), subject to the submission and approval of an application to WaterSecure including detailed design drawings. No works or construction within the easement areas is to proceed without prior approval from WaterSecure.

A copy of WaterSecure's 'Consent Guidelines' is enclosed for provision to the landowner so they may review WaterSecure's requirements. WaterSecure reserves the right to recover any reasonable costs incurred in reviewing the landowner's development proposal and design.

Should you have any queries, please contact [redacted] Property Services Manager on [redacted]

Yours sincerely

[redacted]

CHIEF OPERATING OFFICER
Enc Consent Guidelines

Martin
COSGROVE
and Associates Pty Ltd
Consulting Structural and Civil Engineers

STORMWATER MANAGEMENT REPORT

FOR

PROPOSED WAREHOUSE/OFFICE DEVELOPMENT

Lot 18 ASHBURN ROAD, BREMER

Reference #: 10162-L1a

Date: 03-03-11

93 Warry Street PO Box 765 Spring Hill QLD 4000 Telephone: [redacted] Facsimile: [redacted]

INTRODUCTION

This is a stormwater management report and for the proposed warehouse and office development at Lot 18, Citiswich sub-division, Ashburn Road, Bremer.

DEVELOPMENT

The proposed development comprises two stages which consist of a total of 2025 m2 industrial warehouse building with attached offices and retail/commercial premises. The buildings are located on the North and East boundaries and have access hardstands and carparks to the South and West. (Refer drawing 10162 C101-A).

CATCHMENT

The proposed development site is currently vacant land (new sub-division). The total site area is approximately 4933 m^2 and is almost flat. There is a nominal grade from the North-East corner to the South and West of the site. Stage 2 of the site has an existing stormwater pit located inside the boundary. Previous to the sub-division, the natural ground of the site drained West and discharged directly into the Bremer River as overland flow.

STORMWATER QUANTITY ANALYSIS

It is proposed to detain the stormwater from the developed site in bio-retention storage and pavement storage to ensure post-development flows are at or below pre-development flows. Stormwater runoff from the developed site will discharge to the existing stormwater pit inside the boundary on the Western frontage. This existing stormwater pit is the legal point of discharge for the site. Currently all stormwater runs off the site to the South-West as overland flow. The proposed design will result in stormwater runoff for all events up to 1:100 ARI being discharged to the piped drainage system through the use of onsite detention in the bio-retention basins and carpark pavements. Therefore downstream properties will not be adversely affected by the development.

An assessment on the proposed development has been carried out to limit peak flows to pre-development peak flows for a range of ARIs and storm durations. The pre-development catchment calculations are based on a predominately pervious catchment while the post development catchment is predominately impervious (Table 1).

In accordance with QUDM guidelines, a 50 year ARI has been used as the major drainage event.

Table 1. – Pre and Post Development Areas and Runoff Coefficients

Catchments	Pre Development	Post Development (Stage 2)
Total Site		
Area (ha)	0.49	0.49
Slope (%)	0.5	0.5
Surface Roughness	0.1	0.01
C_{10}	0.7	0.95

From the above, the peak flows for selected events up to Q100 were determined using the rational method. (Refer Table 2)

Table 2. – Peak Flows Rates

ARI	Peak Flows (L/s)	
	Pre-Development	Post Development (Stage 2)
Total Site		
2	144	190
10	201	266
50	311	409

With the peak pre-development flow rates determined, the temporal patterns for a range of storms durations up to a three-hour storm were analysed to determine the detention requirements for the site.

Post-development flows will be limited by using detention and seepage storage in the bio-retention basin (and to a minor extent the rainwater harvest tank). Low flows (Q2) will be mitigated by seepage and capture alone. The piped system off the site will be throttled to accept a maximum of 201 l/s as per the pre-development Q10 flows.

By limiting the outlet capacity of the piped system, on-site detention storage will be required. A volume of 52 m^3 has been calculated as the storage requirements for the catchment. (This is less than the previous storage requirement as the full allowable outlet flow of 201 l/s is now being utilized due to the Q100 requirement. Previously a lower outlet rate of 160 l/s was used in the actual design drawings.) A break up of the proposed storage detention areas is presented in Table 3.

Table 3. – On-Site Detention

Catchments	Storage Volume (m^3)	Detention Depth (mm)
Total Site		
Bio-retention (SOUTH 54 m^2) (direct detention up to overflow outlets)	16.2	0.300 m
Bio-retention (SOUTH 54 m^2) (extended detention depth)	12.4	0.230 m
Bio-retention (NORTH 44 m^2) (direct detention up to overflow outlets)	13.2	0.300 m
Bio-retention (NORTH 44 m^2) (extended detention depth)	10.2	0.230 m
Total	**52**	

The above calculations show that the post-development outflows with the proposed bio-retention and limited outflow will result in no net increase compared to pre-development flows.

The storage depths in the bioretention basins only reach the overflow pit levels (300mm) for 5 minute storm events for Q10, 20, 50 and 100 and for 15 minute storm events for Q50 and Q100. In these cases, the maximum duration of inundation of the bio-retention plants over 300 mm is 19 minutes (for the 15 minute Q100 storm). We would deem this is not hazardous to the health of the plants for such a short duration.

STORMWATER TREATMENT AND WATER QUALITY OBJECTIVES (WQO)

A total of two (2) bio-retention basins are proposed for the development, located as shown on drawing C101-A. The total area of bio-retention is 98 m^2, or 1.99% of the total site area. This has been designed in accordance with the Citiswich Individual Industrial Lot Stormwater Management Strategy by Cardno Lawson Treloar (report #LJ8714/R9, July 2008). All roof and most of the paved stormwater shall be directed to the bio-retention basins. The Individual Lot Stormwater Strategy allows for 75 m2 (150 m2 per hectare) of untreated carpark whilst still maintaining the water quality objectives. For the proposed design, only the driveway crossovers will be untreated. Therefore, the proposed design meets the criteria set out in the Citiswich Individual In-Lot Stormwater Management Strategy.

The proposed bioretention area (1.97% of the total site) will result in the following water quality objectives (WQO), based on Healthy Waterways WSUD Technical Design Guidelines design charts 5-3 to 5-5:

- Total Suspended Solids (TSS) Removal 87% (Figure 5-3)
- Total Phosphorus (TP) Removal 75% (Figure 5-3)
- Total Nitrogen (TN) Removal 42% (Figure 5-3)

Gross pollutants will be removed through the use of filter baskets within stormwater pits and coarse sediment forebays at pipe inlets to bio-retention basins. Gross pollutants from pavement runoff directly into bio-retention basins will be captured approaching swales or the basin surface. Gross pollutant removal will be greater than 90% for the development. The above WQO's are equivalent to or in excess of the requirements of the SEQRP Part 11 as per ICC requirements. The design of the proposed stormwater system is in accordance with best practice and uses passive systems. The nitrogen removal level of 42% is slightly below the required compliance of 45%, however it is our opinion that this slightly low number is offset by the TSS and TP removal rates which are higher than required.

Construction and maintenance of the bio-retention basins should be undertaken in accordance with the Citiswich Individual Industrial Lot Stormwater Management Strategy by Cardno Lawson Treloar (report #LJ8714/R9, July 2008).

CONCLUSION

It is our opinion the proposed stormwater management plan is consistent with WSUD and will result in net reduction in stormwater flows off site, and achieve WQO in accordance with best practice. We trust this is satisfactory for your requirements, please contact us if you have any queries.

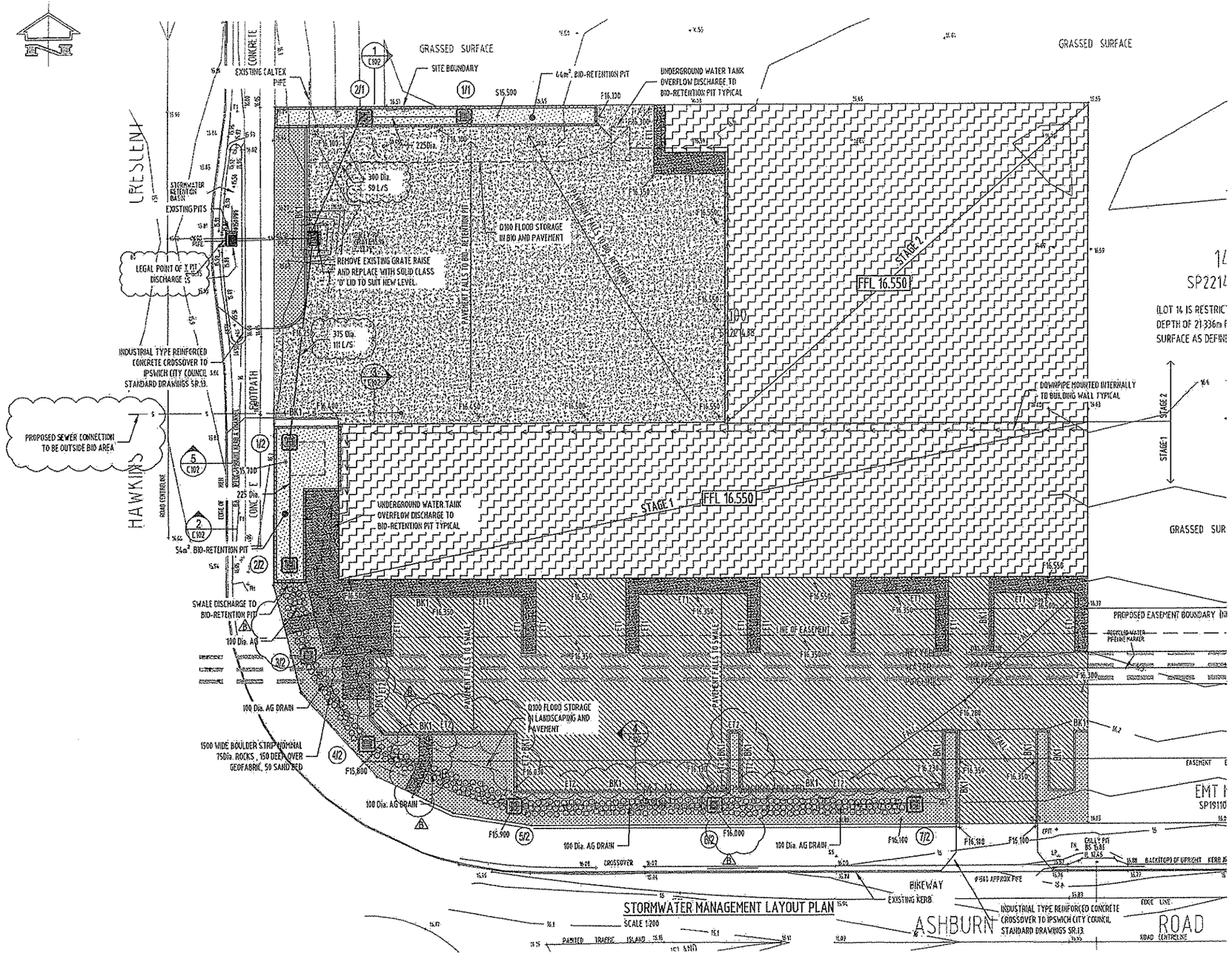
Yours faithfully
MARTIN COSGROVE AND ASSOCIATES PTY LTD

[redacted]

[redacted] *BE (Civil) Hons MIEAust RPEQ 8026*

Director

Attached:
Civil Drawings C101B, C102B, C103B



STORMWATER MANAGEMENT LAYOUT PLAN
SCALE 1:200

SW PIT SCHEDULE

(ALL PIT AND MANHOLE DETAILS TO COUNCIL STANDARD DETAILS)

PIT No.	SIZE (mm)	PIT TYPE	SURFACE INLET RL.
1/1	1050 Dia	BIO-RETENTION OUTLET PIT WITH 600x 600, MEDIUM DUTY Galv. GRATE	15.800
2/1	1050 Dia	BIO-RETENTION OUTLET PIT WITH 600x 600, MEDIUM DUTY Galv. GRATE	15.800
1/2	1050 Dia	BIO-RETENTION OUTLET PIT WITH 600x 600, MEDIUM DUTY Galv. GRATE	16.000
2/2	1050 Dia	BIO-RETENTION OUTLET PIT WITH 600x 600, MEDIUM DUTY Galv. GRATE	16.000
3/2	600 x 600	PRECAST OR PLASTIC PIT WITH MEDIUM DUTY Galv. GRATE	15.750
4/2	600 x 600	PRECAST OR PLASTIC PIT WITH MEDIUM DUTY Galv. GRATE	15.800
5/2	600 x 600	PRECAST OR PLASTIC PIT WITH MEDIUM DUTY Galv. GRATE	15.900
6/2	600 x 600	PRECAST OR PLASTIC PIT WITH MEDIUM DUTY Galv. GRATE	16.000
7/2	600 x 600	PRECAST OR PLASTIC PIT WITH MEDIUM DUTY Galv. GRATE	16.100

CIVIL WORKS LEGEND

EXISTING

- 7.20 — SURVEY GROUND LEVEL
- SURVEY BOUNDARY
- 75 — SURVEY CONTOUR

PROPOSED

- TOF xx.xxx — TOP OF FOOTING LEVEL
- F xx.xxx — FINISHED LEVEL
- S xx.xxx — STRUCTURAL SURFACE LEVEL
- BE xx.xx — BULK EARTHWORKS LEVEL
- E xx.xxx — EXISTING INTERPOLATED LEVEL
- 7.75 — PROPOSED CONTOUR
- DD — DISHED DRAIN
- IX — INVERT DRAIN
- KG — KERB & GUTTER
- BK1 — BARRIER KERB
- RW — BLOCK RETAINING WALL AND FOOTING
- PIPE ENLARGER / REDUCER
- GRATED DRAIN
- RP — ROODING POINT
- CD — GRASS CATCH DRAIN
- HR — 1050 SLAB-SOIL DRAIN WITH HIGH END RISER
- DOWNPIPE AND U/GROUND S/W LINE TO HYDRAULIC CONSULTANTS DETAILS
- LINE 1 — 1/10 — STORMWATER LINE, PIT & PIT No.
- IL xx.xxx — INVERT LEVEL (UPSTREAM)
- xx xxx — PIPE SIZE & TYPE
- xx % — PIPE GRADE
- 0 xxx L/s — FLOW RATE: LITRES PER SEC.
- DL xx.xxx — INVERT LEVEL (DOWNSTREAM)
- SWD — EXISTING STORMWATER LINE

PAVEMENT LEGEND

- HEAVY VEHICLE ACCESS AREAS. (REINFORCED CONCRETE PAVEMENT)
- PARKING / PASSENGER VEHICLE AREAS. (REINFORCED CONCRETE PAVEMENT)
- PEDESTRIAN ACCESS AREAS. (REINFORCED CONCRETE PAVEMENT)
- LANDSCAPE ZONE. (REFER TO LANDSCAPE ARCHITECT'S DETAILS)
- BUILDING OUTLINE. (REFER TO ARCHITECTURAL DRAWINGS)
- BIO-RETENTION. (REFER TO SECTIONS)

A1

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ISSUED FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION PURPOSES

[redacted]

APPROVING ENGINEER
[redacted] S RPEQ 8026 18-10-10

ISSUE	DATE	REVISION	INITIAL
B	03-03-11	REVISED AS CLOUDED	JP
A	18-10-10	ISSUED FOR DEVELOPMENT APPROVAL	FT

CLIENT
WALKER CORPORATION
LEVEL 21 GOVERNOR MACQUARIE TOWER
1 FARMER PLACE, SYDNEY NSW 2000
PH: [redacted] FAX: [redacted]

ARCHITECT
Walker

PROJECT
PROPOSED WAREHOUSE/ UNIT DEVELOPMENT
LOT 18 ASHBURN ROAD IPSWICH

SHEET SUBJECT
STORMWATER MANAGEMENT PLAN

Martin COSGROVE and Associates Pty Ltd
ACN 052933221
CONSULTING STRUCTURAL AND CIVIL ENGINEERS
93 WARRY STREET SPRING HILL QLD 4000
Tel [redacted] Fax [redacted]
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DESIGNED	DRAWN	JOB No.	
MS	FT	10162	
DATE	SCALE	DRAWING No.	ISSUE
OCT.2010	1:200 U.N.O.	C101	B

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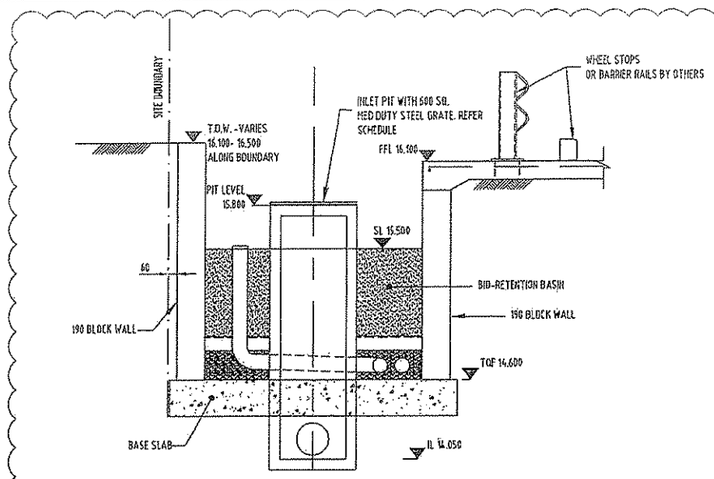
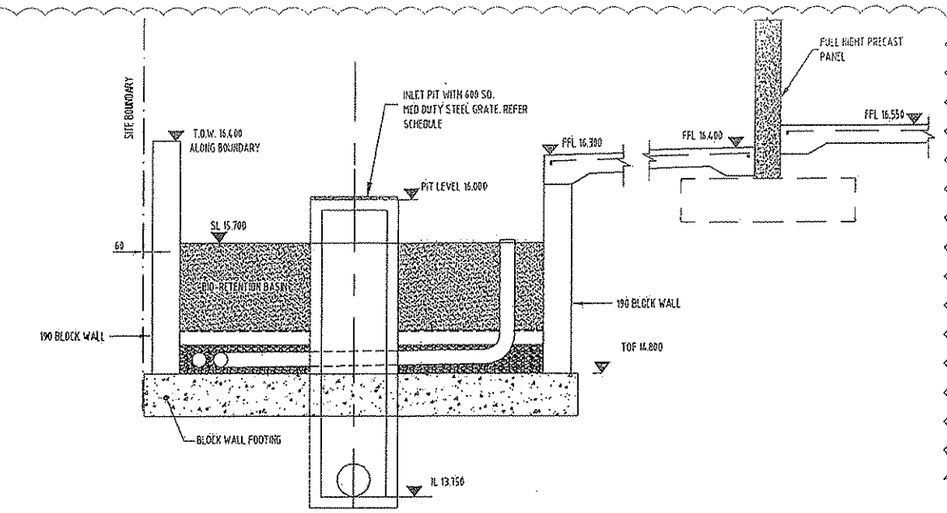


SECTION 1 C101
SCALE 1:20



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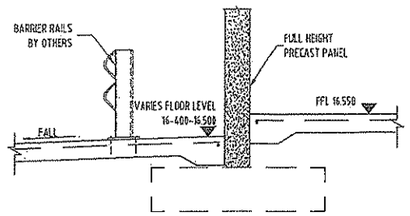

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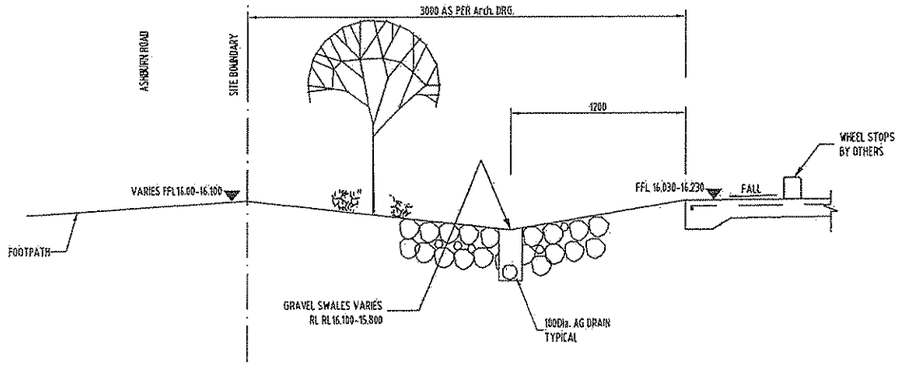

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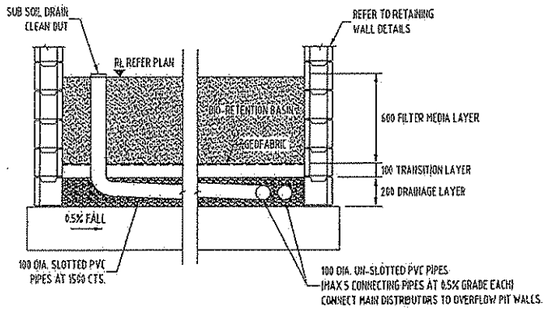
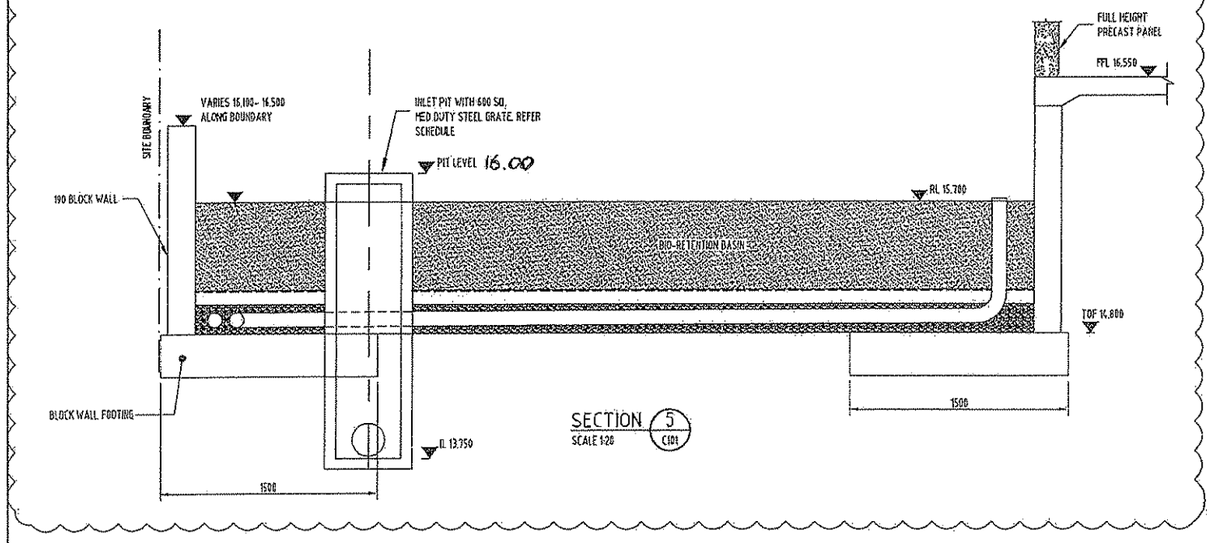


TYPICAL BIO-RETENTION BASIN CROSS SECTION
SCALE 1:20



SECTION 5 C101
SCALE 1:20

BIORETENTION BASIN NOTES

1. ALL WORK SHALL BE CARRIED OUT IN ACCORDANCE WITH CARDNO LAWSON TRELOAR GUIDELINES.
2. DESIGN IS BASED ON THE STORMWATER MANAGEMENT REPORT AND ALL WORK SHALL BE CARRIED OUT IN ACCORDANCE WITH THE REPORT.
3. THE BIORETENTION DEVICE SHALL NOT BE CONSTRUCTED UNTIL ALL BUILDING WORK CONTRIBUTING TO SEDIMENT PRODUCTION, HAVE BEEN COMPLETED.
4. FILTER MEDIA SHALL BE PROVIDED IN THREE LAYERS:-
   a) FILTER LAYER SHALL CONSIST OF A SANDY LOAM TOP SOIL WITH A MINIMUM SATURATED HYDRAULIC CONDUCTIVITY OF 180mm/hr , A 5-10% ORGANIC CONTENT AND A pH OF 6.0-7.0. LABORATORY TESTING IN ACCORDANCE WITH AS4419 AM AS 1289 WITH A MINIMUM OF TEN SAMPLES SHALL BE SUBMITTED CONFIRMING THE MATERIAL'S SUITABILITY.
   b) TRANSITION LAYER SHALL CONSIST OF COARSE SAND CONFORMING TO A UNIMIN 16/30 FG SAND GRADING OR EQUIVALENT.
   c) DRAINAGE LAYER SHALL CONSIST OF FINE GRAVEL WITH 5MM SCREENINGS.
5. PRIOR TO FINAL PLANTING, PLACE GEOFABRIC OVER THE FILTER MEDIA WITH 50mm TOPSOIL FOR TEMPORARY TURFING LAYED PERPINDICULAR TO THE FLOW PATH.
6. ENSURE PIPE FLOWS ARE RESTRICTED FROM ENTERING THE DEVICE UNTIL PLANTING IS FULLY ESTABLISHED.
7. ALL PLANTING SHALL BE CARRIED OUT IN ACCORDANCE WITH THE LANDSCAPE ARCHITECTS SPECIFICATIONS. PLANTING SHALL CONSIST OF 70-80% DENSITY COVER WITH A HEIGHT EQUAL TO THE 400mm OF EXTENDED DETENTION REQUIRED.
8. THE BIORETENTION BASIN SHALL BE MAINTAINED THROUGHOUT ITS USE TO ENSURE THE DESIGN WATER QUALITY TREATMENT TARGETS ARE ACHIEVED. MAINTENANCE SHALL INCLUDE: WATERING WITH PARTICULAR FREQUENCY DURING THE FIRST THREE MONTHS, WEED CONTROL, CLEARING OF LITTER, REMOVAL OF SEDIMENT, REPAIRING OF SCORING AND IMPLEMENTING MEASURES TO PREVENT FUTURE OCCURRENCE, REPLACEMENT OF DEAD PLANTS AND REPORTING OF THE WORKS CARRED OUT. REPORTS SHALL BE AS PER THE CARDNO LAWSON TRELOAR STORMWATER MANAGEMENT STRATEGY.

ISSUED FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION PURPOSES

[redacted]

APPROVING ENGINEER
STEPHEN R MOSS RPEQ 8026 18-10-10

ISSUE	DATE	REVISION	INITIAL
B	03-03-11	REVISED AS ISSUED.	JP
A	18-10-10	ISSUED FOR DEVELOPMENT APPROVAL	FT

CLIENT
WALKER CORPORATION
LEVEL 21 GOVERNOR MACQUARIE TOWER
1 FARMER PLACE, SYDNEY NSW 2000
PH: [redacted] FAX: [redacted]

ARCHITECT
Walker

PROJECT
PROPOSED WAREHOUSE/ UNIT DEVELOPMENT
LOT 18 ASHBURN ROAD IPSWICH

SHEET SUBJECT
CIVIL SECTIONS

Martin COSGROVE and Associates Pty Ltd
ACN 052933221
CONSULTING STRUCTURAL AND CIVIL ENGINEERS
93 WARRY STREET SPRING HILL QLD 4000
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DESIGNED	DRAWN	JOB No.	
MS	FT	10162	
DATE	SCALE	DRAWING No.	ISSUE
OCT.2010	SCALE 1:20	C102	B

STORMWATER DRAINAGE NOTES

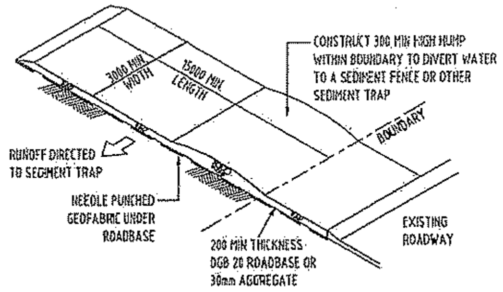
1. STORMWATER DESIGN CRITERIA:
   (a). AVERAGE RECURRENCE INTERVAL:
   1:10 YEARS FOR PAVED AND LANDSCAPED AREAS
   (b). RAINFALL INTENSITIES - TIME OF CONCENTRATION - 5 MINUTES:
   1:10 YEARS = 209mm/hr.
   (c). RUNOFF COEFFICIENTS:
   ROOF AREAS - C = 0.95
   PAVED AREAS - C = 0.95
   LANDSCAPED AREAS - C = 0.70
2. THE CONTRACTOR IS TO CHECK THAT THE PROPOSED PIPEWORKS DO NOT CLASH WITH ANY EXISTING SERVICES PRIOR TO COMMENCING WORK. THE CONTRACTOR MUST NOTIFY THE ENGINEER IF ANY CLASHES ARE FOUND FOR ADVICE OF ANY REDESIGN REQUIREMENTS.
3. PIPES 300 DIA. AND LARGER TO BE REINFORCED CONCRETE CLASS 'X' APPROVED SPIGOT AND SOCKET WITH RUBBER RING JOINTS. U.N.O.
4. PIPES UP TO 300 DIA SHALL BE SEWER GRADE UPVC. WITH SOLVENT WELDED JOINTS U.N.O.
5. EQUIVALENT STRENGTH VCP OR FRC PIPES MAY BE USED.
6. PIPES SHALL BE LAID ON A 75mm THICK SAND BED. IN ALL CASES BACKFILL TRENCH WITH SAND TO 200mm ABOVE PIPE U.N.O. WHERE PIPE IS UNDER PAVEMENTS BACKFILL REMAINDER OF TRENCH TO UNDERSIDE OF PAVEMENT WITH SAND OR PROVED RIPPED SANDSTONE COMPACTED IN 150mm LAYERS TO MINIMUM 95% STANDARD MAXIMUM DRY DENSITY IN ACCORDANCE WITH AS 1289 E2.1.
7. ENLARGERS, CONNECTIONS AND JUNCTIONS TO BE PRECAST FITTINGS WHERE PIPES ARE LESS THAN 300 DIA.
8. WHERE SUBSOIL DRAINS PASS UNDER FLOOR SLABS AND VEHICULAR PAVEMENTS, UNSLOTTED UPVC SEWER GRADE PIPE IS TO BE USED.
9. CARE IS TO BE TAKEN WITH LEVELS OF STORMWATER LINES. GRADES SHOWN ARE NOT TO BE REDUCED WITHOUT APPROVAL.
10. PRECAST PITS MAY BE USED EXTERNAL TO THE BUILDING SUBJECT TO APPROVAL.
11. WHERE TRENCHES ARE IN ROCK, THE PIPE SHALL BE BEDDED ON A MIN. OF 50mm CONCRETE BED (OR 75mm BED OF BLUE METAL). UNDER THE BARREL OF THE PIPE.
12. GRATES AND COVERS SHALL BE ABLE TO SUPPORT THE FOLLOWING LOADS :-
    LIGHT DUTY - 1 TONNE WHEEL LOADS
    MEDIUM DUTY - 3.5 TONNE WHEEL LOADS
    HEAVY DUTY - 9 TONNE WHEEL LOADS

SITEWORKS NOTES

1. LEVEL OF DATUM AHD
2. CONTRACTOR MUST VERIFY ALL DIMENSIONS AND EXISTING LEVELS ON SITE PRIOR TO COMMENCEMENT OF WORK. ANY DISCREPANCIES TO BE REPORTED TO THE ENGINEER / SUPERINTENDENT.
3. MARTIN COSGROVE & ASSOCIATES ACCEPTS NO LIABILITY FOR THE LOCATION OF EXISTING SERVICES. THE CONTRACTOR MUST VERIFY THE LOCATION OF ALL EXISTING SERVICES PRIOR TO COMMENCING WORKS. ALL EXISTING SERVICES AND STRUCTURES ARE TO BE MAINTAINED IN GOOD ORDER FOR THE DURATION OF THE CONTRACT. ANY COSTS ASSOCIATED WITH REPAIRING DAMAGE TO EXISTING SERVICES SHALL BE PAID FOR BY THE CONTRACTOR.
4. ALL WORKS MUST BE CARRIED OUT IN ACCORDANCE WITH CURRENT COUNCIL STANDARD SPECIFICATIONS.
5. ALL WORKS TO BE IN ACCORDANCE WITH GEOTECHNICAL REPORT.
6. STRIP ALL TOPSOIL FROM CONSTRUCTION AREA AND STOCKPILE FOR LANDSCAPING PURPOSES ONLY.
7. REMOVE LOOSE MATERIAL UNDER BUILDING PLATFORM & PAVEMENTS, PROOF ROLL SUBGRADE, REMOVE ANY SOFT SPOTS AND RECOMPACT.
8. PROVIDE SUB BASE LAYER UNDER BUILDINGS AND PAVEMENTS AS PER SCHEDULE ON DRAWING C102.
9. IMPORTED FILL SHALL BE OF FAIR TO GOOD QUALITY OF A MINIMUM CBR10, HAVE A MAXIMUM AGGREGATE SIZE NOT EXCEEDING 75mm AND A SHRINK / SWELL INDEX OF NOT GREATER THAN 1.0%. FILL SHALL BE LAYED IN MAXIMUM 200mm (LOOSE THICKNESS) LAYERS AND COMPACTED TO MINIMUM 98% M.D.D. IN ACCORDANCE WITH AS1289 5.1.5
10. ALL TRENCH BACKFILL MATERIAL SHALL BE COMPACTED TO THE SAME DENSITY AS THE ADJACENT MATERIAL.
11. ALL SERVICE TRENCHES UNDER VEHICULAR PAVEMENTS SHALL BE BACKFILLED WITH SAND OR AN APPROVED GRANULAR MATERIAL AND COMPACTED TO MINIMUM 98% MODIFIED MAXIMUM DRY DENSITY, IN ACCORDANCE WITH AS 1289 E2.1.
12. FIELD DENSITY TESTING TO BE CARRIED OUT TO THE ATTAINED COMPACTION RATIOS & THE PLACEMENT MOISTURE CONTENT WITH FREQUENCY OF TESTING IN ACCORDANCE WITH AS 3798 SECTION 8.0.
13. PROVIDE 10MM WIDE EXPANSION JOINTS BETWEEN BUILDINGS AND ALL CONCRETE OR UNIT PAVEMENTS. U.N.O.
14. MAKE SMOOTH CONNECTION WITH EXISTING WORKS.

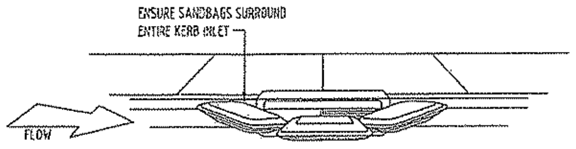
STORMWATER MANAGEMENT NOTES

1. THIS DESIGN IS IN ACCORDANCE WITH THE CARDNO(FROM STANDARD) CR 0821%
2. PREVENT THE RELEASE OF CONTAMINATED STORMWATER FROM THE SITE DURING CONSTRUCTION. REFER TO THE EROSION AND SEDIMENT CONTROL DRAWING C103.
3. STORMWATER PITS SHALL BE CONSTRUCTED WITH LEAF GUARD OR FINELY MESHED GRATES TO PREVENT INFILTRATION OF LITTER. THE PROPERTY MANAGER SHALL ENSURE STORMWATER PITS ARE REGULARLY MAINTAINED.
4. STORMWATER RUNOFF SHALL NOT POND ON-SITE OR IN ADJACENT PROPERTIES.
5. LANDSCAPING ZONES SHALL BE TOPSOILED AND VEGETATED WITH SUITABLE PLANTING AS SOON AS POSSIBLE.



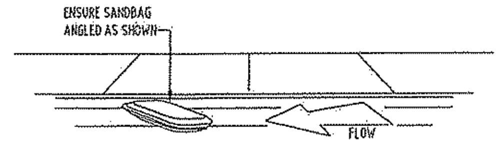
TEMPORARY SITE ACCESS SEDIMENT STABLISING DETAIL

STRIP TOPSOIL, REDUCE TO BULK EARTHWORKS LEVEL AND COMPACT SUBGRADE.



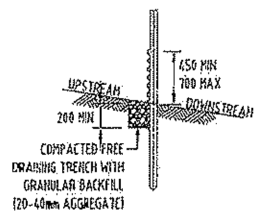
SANDBAG SEDIMENT INLET TRAP

N.T.S.

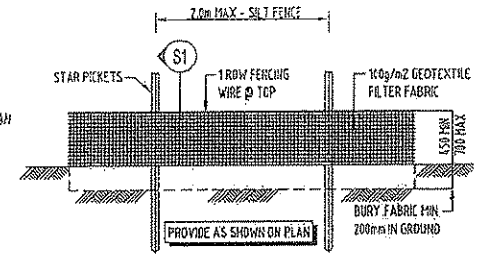


SANDBAG SEDIMENT TRAP

N.T.S.



SECTION (S1)



SILT FENCE DETAIL

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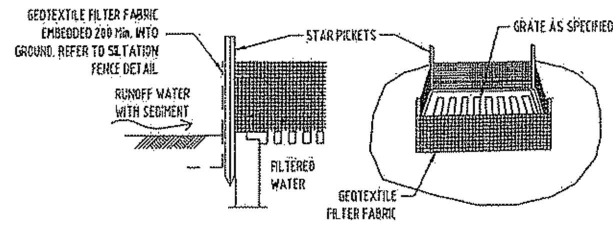
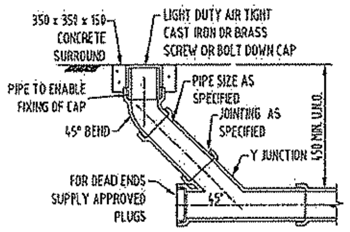


GEOTEXTILE FILTER PIT SURROUND

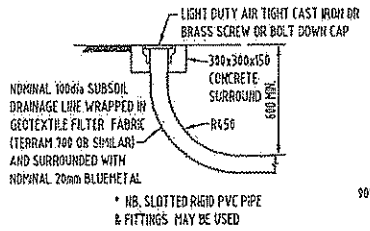
N.T.S.



RODDING POINT AT 45

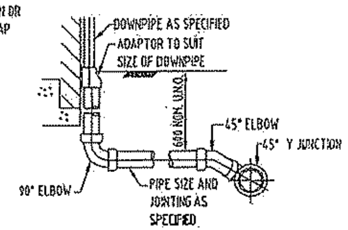
SCALE 1:20

(DO NOT SLOT RISERS)



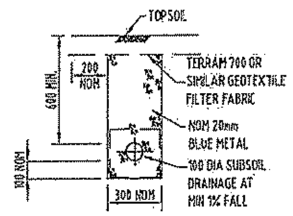
HIGH END RISER

SCALE 1:20



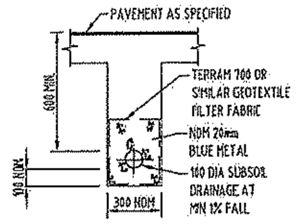
UPVC DOWNPIPE CONNECTION

SCALE 1:20



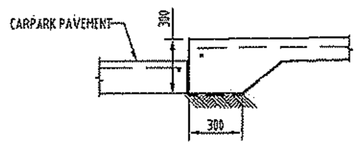
SUBSOIL IN LANDSCAPED AREAS

SCALE 1:20



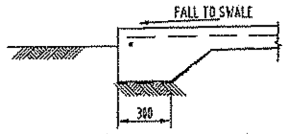
SUBSOIL IN PAVED AREAS

SCALE 1:20



TYPICAL 'ET1' DETAIL

SCALE 1:20



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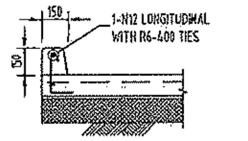

B.K.1 - TYPICAL BARRIER KERB DETAIL

SCALE 1:20

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[redacted]
APPROVING ENGINEER
[redacted] RPEQ 8026 18-10-10

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ISSUE	DATE	REVISION	INITIAL
B	03-03-11	NORETENTION BASIN NOTES REMOVED	JP
A	18-10-10	ISSUED FOR DEVELOPMENT APPROVAL	FT

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WALKER CORPORATION
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ARCHITECT
Walker

PROJECT
PROPOSED WAREHOUSE/ UNIT DEVELOPMENT
LOT 18 ASHBURN ROAD IPSWICH

SHEET SUBJECT
CIVIL NOTES
TYPICAL DETAILS

Martin COSGROVE and Associates Pty Ltd
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DESIGNED	DRAWN	JOB No.	
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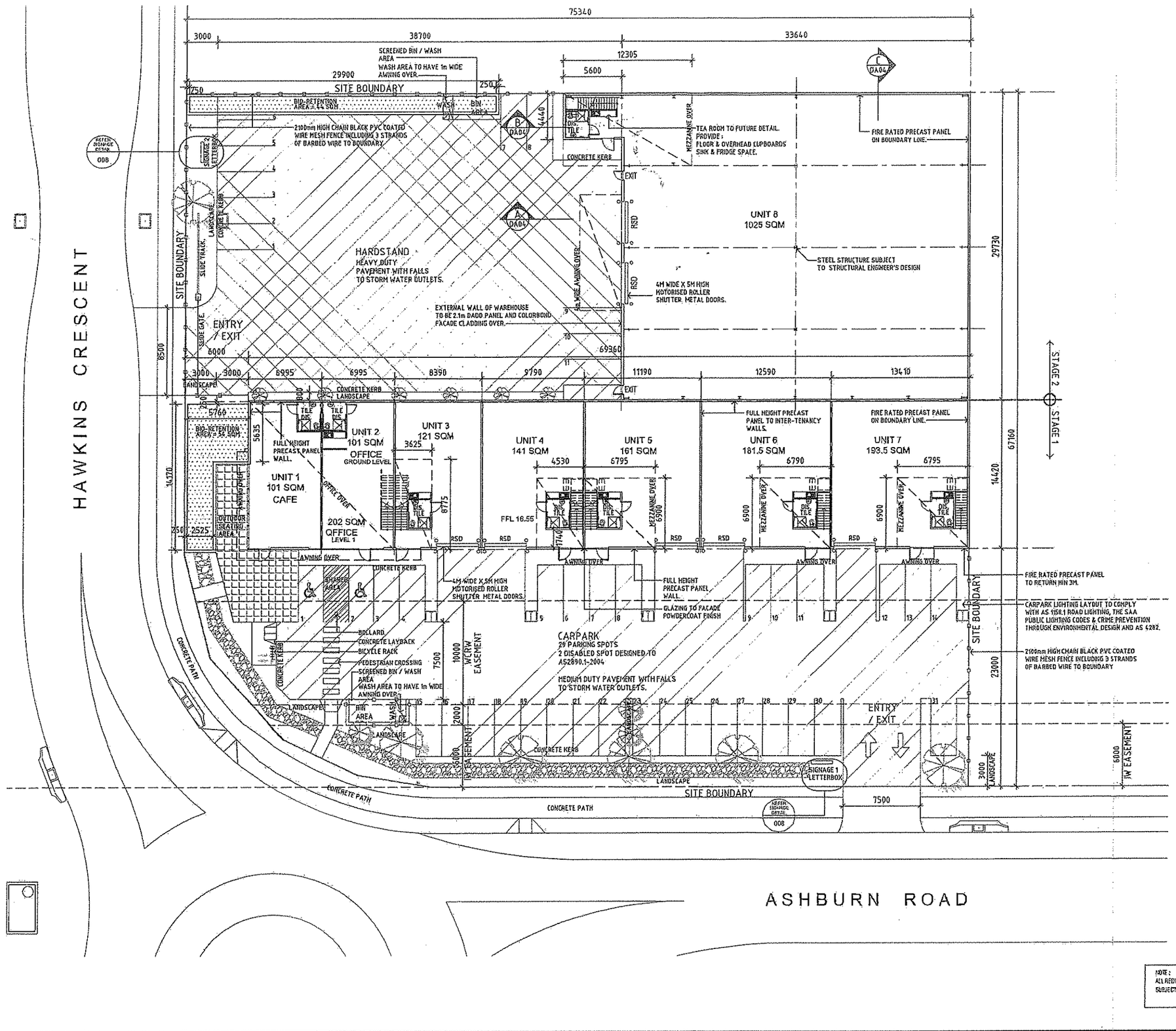
DATE	SCALE	DRAWING No.	ISSUE
OCT.2010	AS SHOWN	C103	B

B1 SHEET



Revisions	Amendments	Drawn	Date
A	ISSUED AS DA DOCUMENTS	TP	05.03.18
B	GENERAL AMENDMENT TO MEZZ. OFFICE	AM	05.03.18
C	PARKING LAYOUT REVISED. CONCRETE PATH FOR PEDESTRIANS ADDED. LANDSCAPE TRIANGLES ADDED TO CARPARK. LANDSCAPE BUFFER ADDED BETWEEN UNIT 8 HARDSTAND AND STAGE 1 NORTHERN WALL. WASTE BIN / WASH AREA ADDED	TP	05.03.18
D	PARKING LAYOUT REVISED. WASTE BIN / WASH AREA ADDED	TP	16.12.18

DEVELOPMENT DATA

TOTAL SITE AREA	4 933 m2

SITE AREA STAGE 1	2 693 m2
- UNIT 1 = 101 SQM (CAFE)	
- UNIT 2 = 303 SQM (2 LEVELS)	
- UNIT 3 = 121 SQM + MEZZ. OFFICE 25 SQM	
- UNIT 4 = 141 SQM + MEZZ. OFFICE 25 SQM	
- UNIT 5 = 161 SQM + MEZZ. OFFICE 40 SQM	
- UNIT 6 = 181.5 SQM + MEZZ. OFFICE 40 SQM	
- UNIT 7 = 193.5 SQM + MEZZ. OFFICE 40 SQM	
TOTAL BUILDING AREA	1 372 m2
OUTDOOR SEATING AREA	90 m2
MEDIUM DUTY PAVEMENT	1 160 m2
CARPARKING PROVIDED	31 SPACES

SITE AREA STAGE 2	2 240 m2
UNIT 8 AREA	1 025 m2
MEZZANINE OFFICE	75 m2
TOTAL BUILDING AREA	1 100 m2
HEAVY DUTY PAVEMENT	1 105 m2
CARPARKING PROVIDED	11 SPACES

HEAVY DUTY PAVEMENT

MEDIUM DUTY PAVEMENT

NOTE :
ALL REDUCED LEVELS ARE NOMINAL (+/- 500mm)
SUBJECT TO FINAL DETAIL DESIGN

Walker Corporation Pty Ltd
ABN 95 001 178 269
PO Box 4089
Sydney NSW 2001
Level 21 Governor Macquarie Tower
1 Farrer Place, Sydney NSW 2000
Telephone
Facsimile
WEB

Project :
Proposed Warehouse / Storage & Office & Cafe Development

Address :
LOT 18
Ashburn Road, Ipswich

For :
Walker Corporation

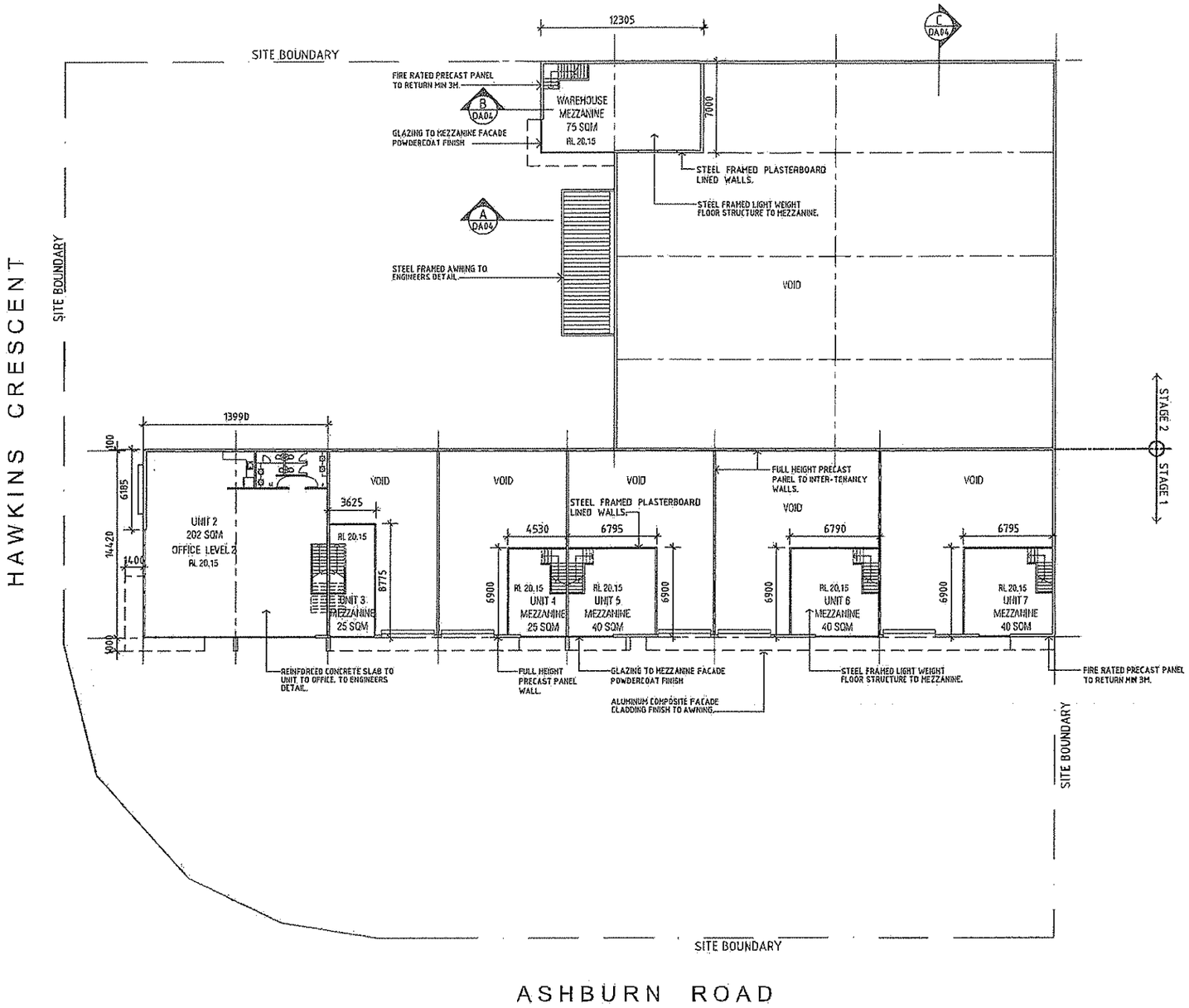
Drawing :
Site / Floor Plan

Scale	Date	Drawn	Checked
1:250	05.03.18	TP	

Status
DA - Not for Construction

Project No	Drawing No	Issue
	SP-CS-DA-001	D

B1 SHEET



Revision	Amendments	Drawn	Date
A	ISSUED AS DA DOCUMENTS	TP	06.10.18
B	MEZZANINE OFFICE UPDATED	AW	22.10.18
C	LEVEL 2 OFFICE AMENTIES UPDATED	TP	15.12.18

DEVELOPMENT DATA

SITE AREA STAGE 1	2 693 m2
- UNIT 2 = MEZZ. OFFICE 202 SQM - UNIT 3 = MEZZ. OFFICE 25 SQM - UNIT 4 = MEZZ. OFFICE 25 SQM - UNIT 5 = MEZZ. OFFICE 40 SQM - UNIT 6 = MEZZ. OFFICE 40 SQM - UNIT 7 = MEZZ. OFFICE 40 SQM	
TOTAL MEZZANINE LEVEL AREA	372 m2

SITE AREA STAGE 2	2 240 m2
WAREHOUSE MEZZ. OFFICE	75 m2

Walker Corporation Pty Ltd
ABN 65 001 176 260
PO Box 6070
Sydney NSW 2001
Level 21 Governor Macquarie Tower, 1 Farrer Place, Sydney NSW 2000
Telephone [redacted]
Facsimile
Web

Project:
Proposed Warehouse / Storage & Office & Cafe Development

Address:
LDT 18
Ashburn Road, Ipswich

Client:
Walker Corporation

Drawing:
Mezzanine Floor Plan

Scale	Date	Drawn	Checked
1:100	05 OCT 18	TP	

Status:
DA - Not for Construction

Project No.	Drawing No.	Issue
	SP-CS-DA-002	C

NOTE:
ALL REDUCED LEVELS ARE NOMINAL (+/- 500mm)
SUBJECT TO FINAL DETAIL DESIGN

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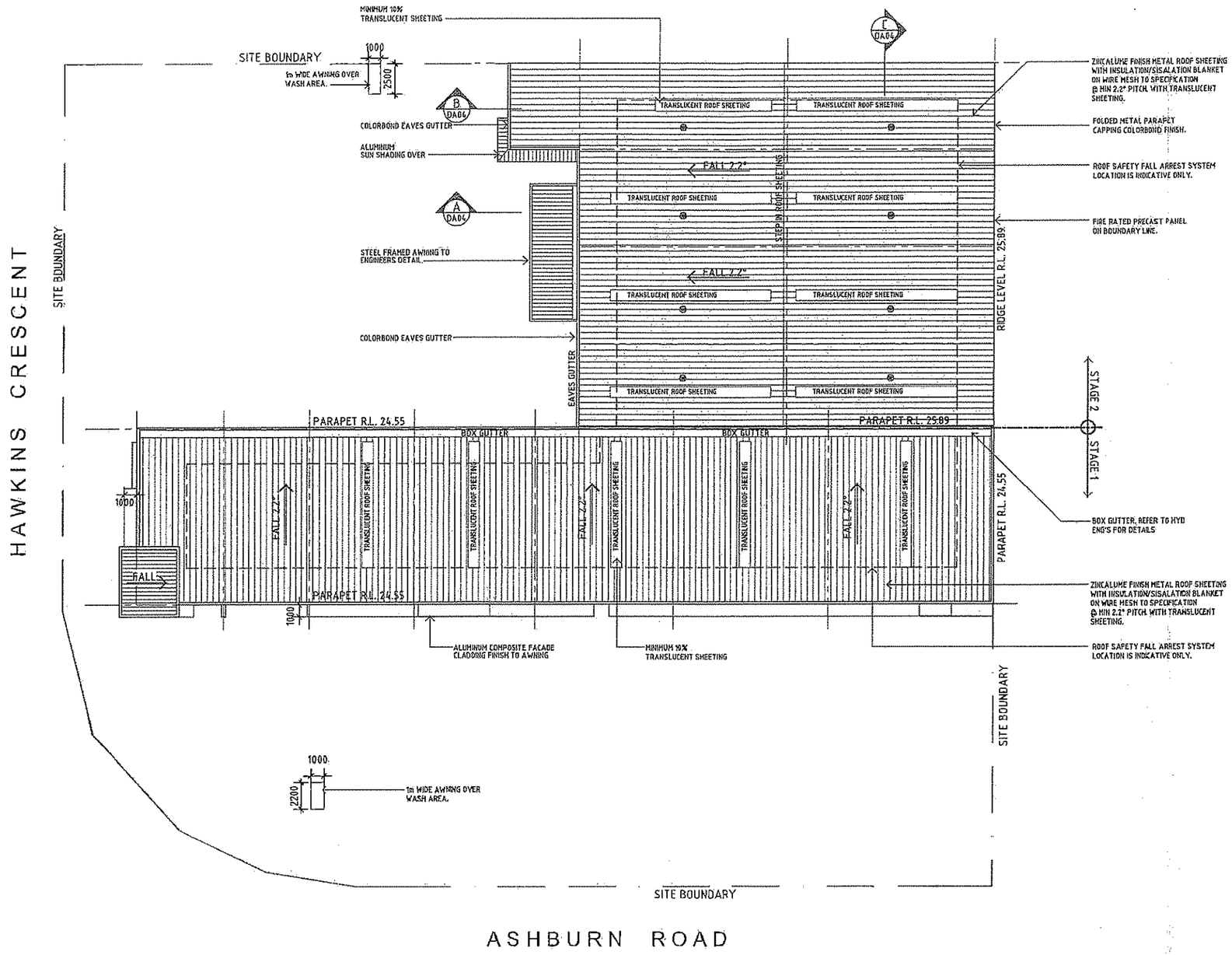
Revision	Amendments	Drawn	Date
A	ISSUED AS DA DOCUMENTS	TP	09.10.18
B	REVISION UPDATED	AM	25.10.18
C	AWNINGS TO WASH AREA ADDED	TP	13.12.18
D	STAGE 1 WASH AREA LOCATION REVISED	TP	14.12.18



NOTE:
ALL REDUCED LEVELS ARE NOMINAL (+/- 500mm)
SUBJECT TO FINAL DETAIL DESIGN

Walker Corporation Pty Ltd
ABN 99 001 178 283
PO Box 1073
Sydney NSW 2001
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1 Farrer Place, Sydney NSW 2000
Telephone
Facsimile
Web

Project:
Proposed Warehouse / Storage & Office & Cafe Development

Address:
LOT 18
Ashburn Road, Ipswich

For:
Walker Corporation

Drawing:
Roof Plan

Status	Date	Drawn	Checked
YES	[redacted]	TP	

Status:
DA - Not for Construction

Project No:	Drawing No:	Issue:
	SP-CS-DA-003	D

B1 SHEET

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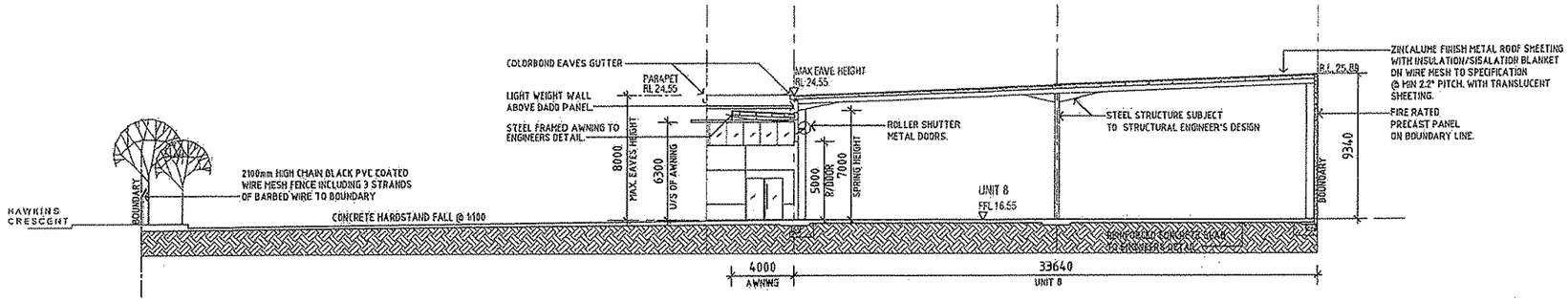
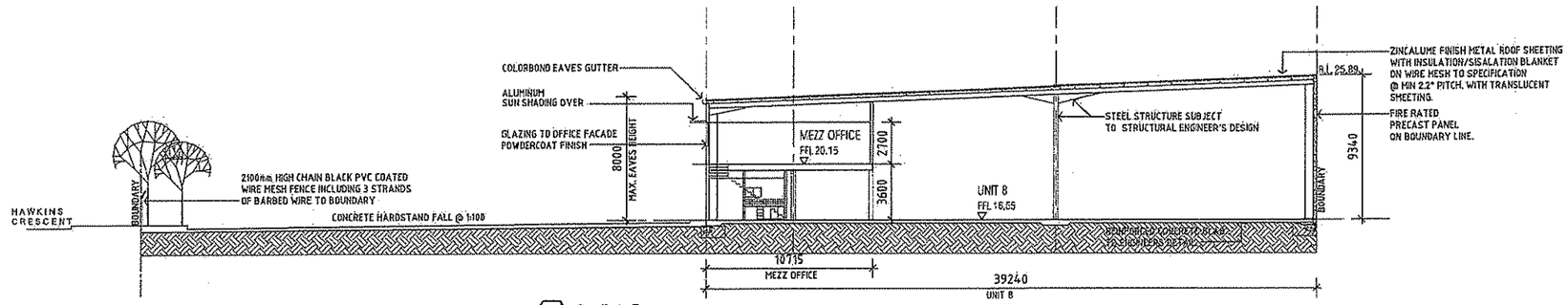
Revision:	Amendments:	Drawn:	Date:
A	ISSUED AS DA DOCUMENTS	TP	01.12.15



01 Section A
1:150



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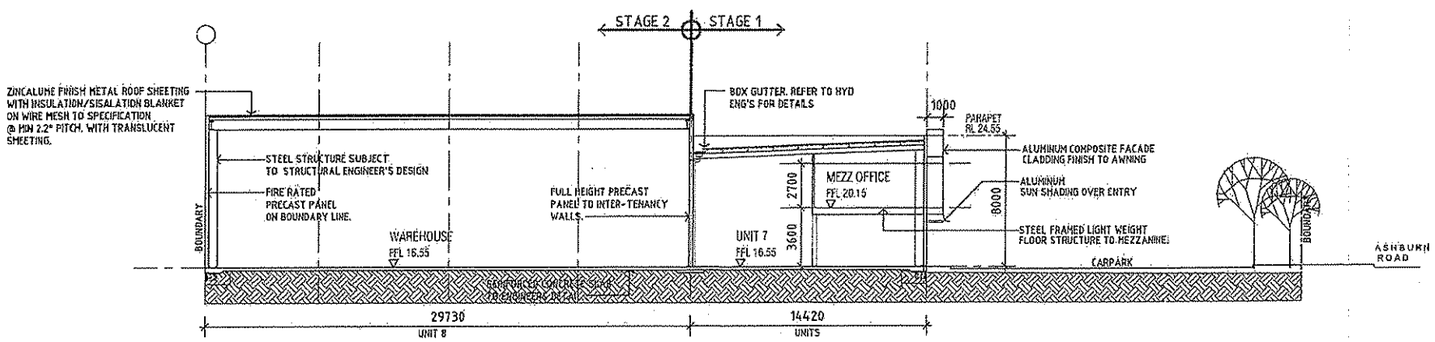

03 Section C
1:150

NOTE:
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Walker Corporation Pty Ltd
ABN 68 001 175 269
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Sydney NSW 2001
Level 21 Governor Macquarie Tower
1 Farrer Place, Sydney NSW 2000
Telephone: [redacted]
Facsimile:
Web:

Project:
Proposed Warehouse / Storage & Office & Cafe Development

Address:
LOT 18
Ashburn Road, Ipswich

Client:
Walker Corporation

Drawing:
Sections

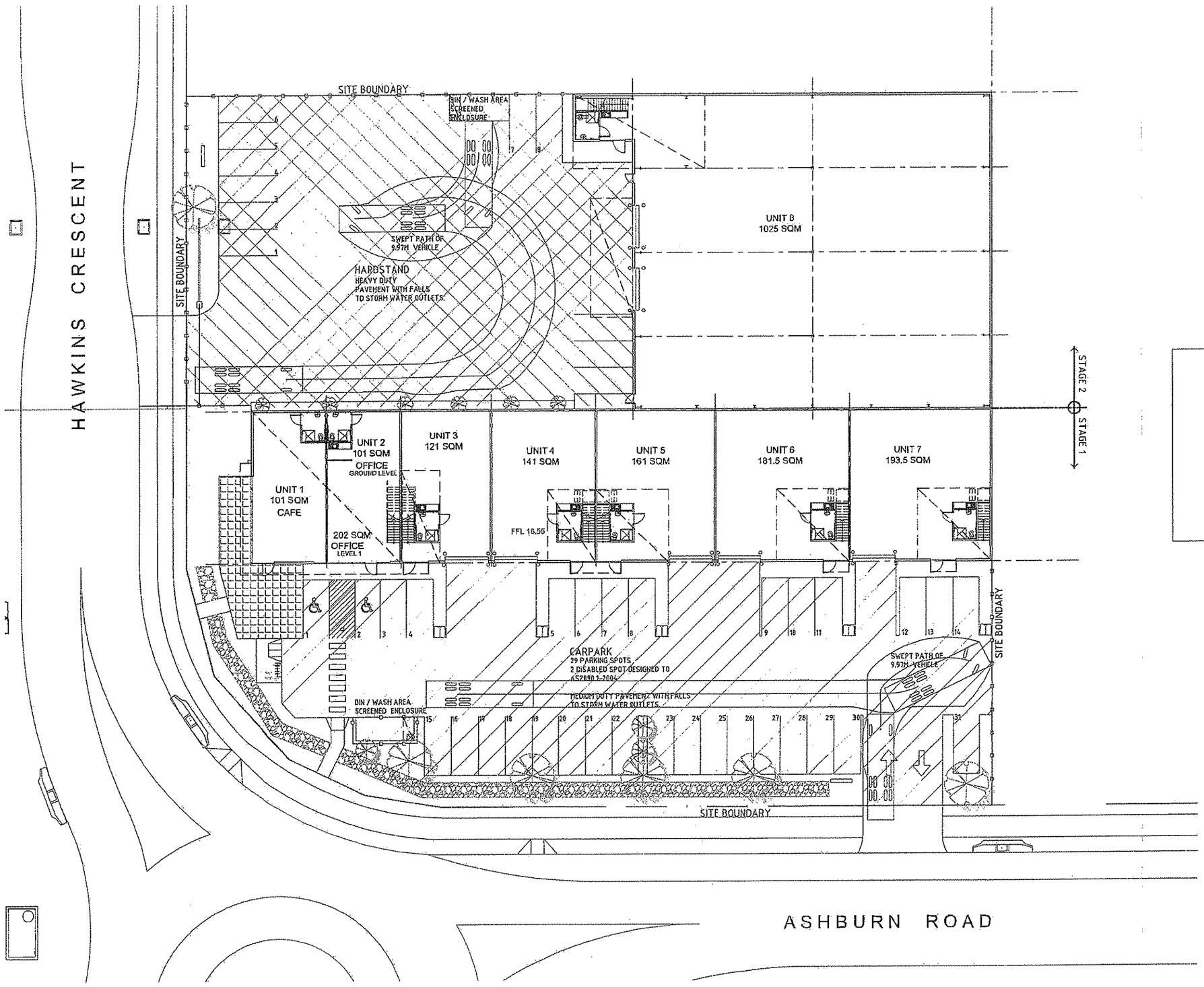
Scales:	Date:	Drawn:	Checked:
1:150	01.12.15	TP	

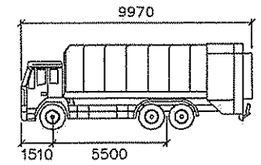
Status:
DA - Not for Construction

Project No:	Drawing No:	Issue:
	SP-CS-DA-004	B

B1 SHEET

Revision	Amendments	Drawn	Date
A	ISSUED AS DA DOCUMENTS	TP	05.02.14
B	BIN WASH AREA LOCATION REVISED	TP	10.02.15





GARBAGE mm

Width	: 2500
Track	: 2170
Lock to Lock Time	: 6.0
Steering Angle	: 42.0

HEAVY DUTY PAVEMENT

MEDIUM DUTY PAVEMENT

Walker

Walker Corporation Pty Ltd
ABN 55 001 177 263
PO Box 4723
Sydney NSW 2001
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Facsimile
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Project:
Proposed Warehouse / Storage & Office & Cafe Development

Address:
LOT 18
Ashburn Road, Ipswich

For:
Walker Corporation

Drawing:
Waste Mangement Plan
Truck turning path

Scales	Date	Drawn	Checked
NTS	10.02.15	TP	

Status
DA - Not for Construction

Project No:	Drawing No:	Issue:
	SP-CS-DA-009	B

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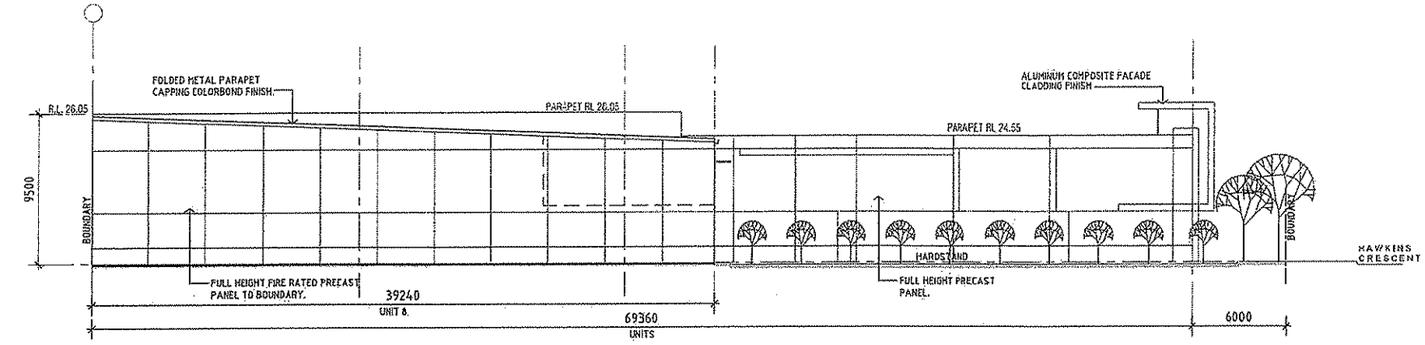
Revision	Amendments	Drawn by	Date
A	ISSUED AS DA DOCUMENTS	TP	05.10.16
B	SIGNAGE SIZE/AREA ADJUSTED	AW	28.10.16
C	NORTH ELEVATION REVISED LANDSCAPE BUFFER ADDED BETWEEN STAGE 2 HARDSTAND AND STAGE 1 NORTH WALL	TP	13.12.16



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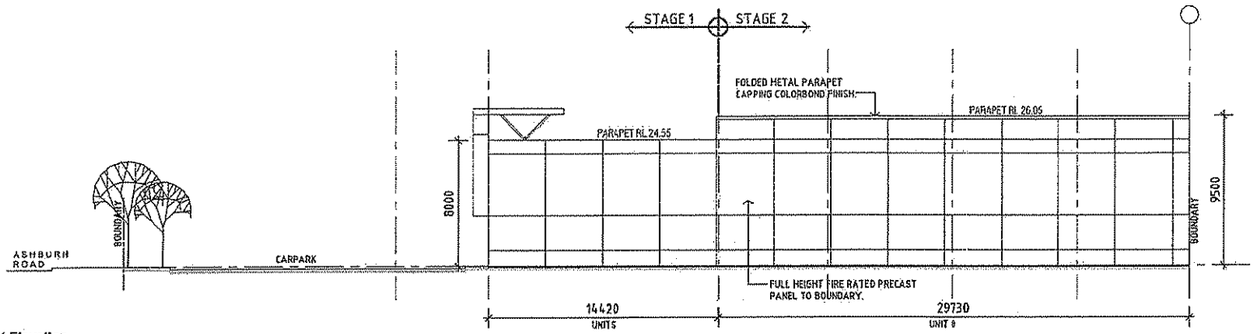
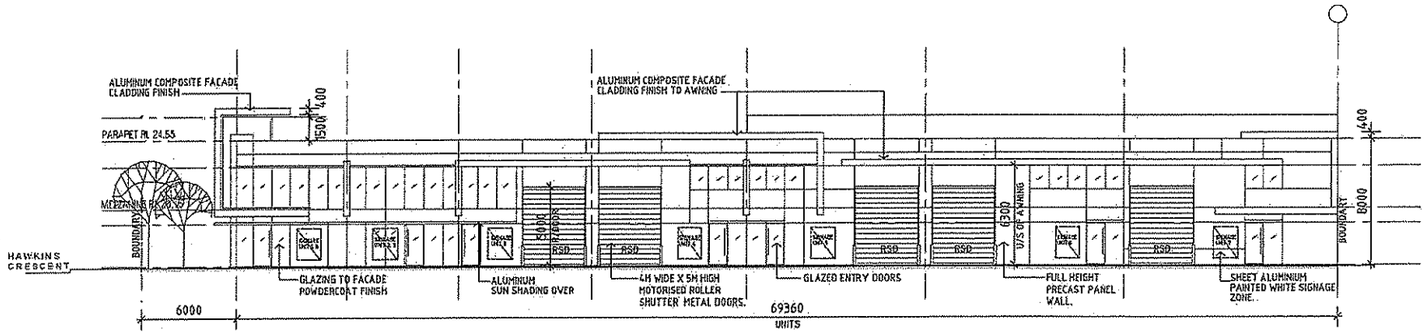
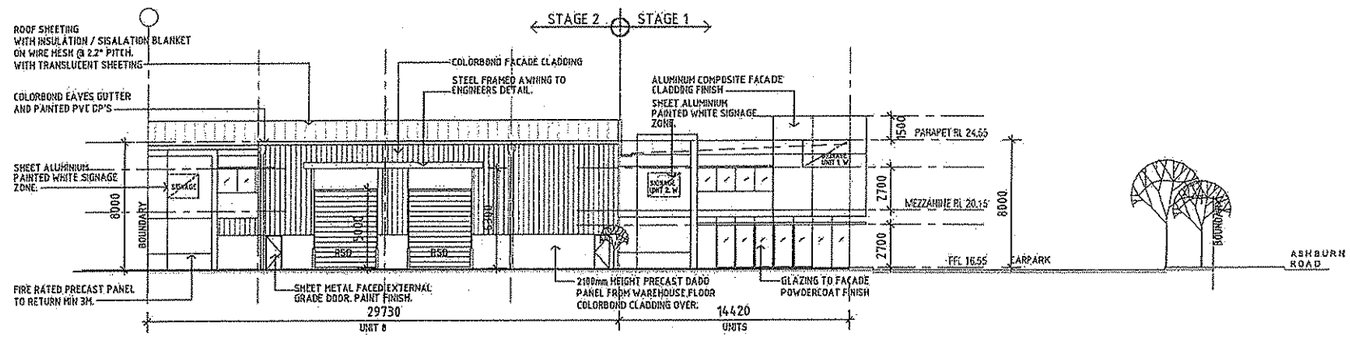
1:150



02 East Elevation
1:150



03 South Elevation
1:150



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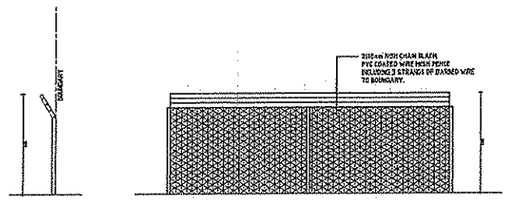
1:150



05 Perimeter Fence Detail
1:50

FINISHES LEGEND

PC1	PRECAST CONCRETE PANEL WITH EXTERNAL TEXTURED MASONRY PAINT FINISH.
AFG1	POWDER-COATED ALUMINIUM-FRAMED GLAZING SYSTEM
CP1	COLORBOND PROFILED WALL CLADDING.
RS	ZINCALUME ROOF SHEETING.
RSD	COLORBOND ROLLER SHUTTERS.

NOTE:
ALL REDUCED LEVELS ARE NOMINAL (+/- 500mm)
SUBJECT TO FINAL DETAIL DESIGN

Walker Corporation Pty Ltd
ABN 99 081 176 263
PO Box 4043
Sydney NSW 2001
Level 21 Governor Macquarie Tower
1 Farrer Place, Sydney NSW 2000
Telephone
Facsimile
[redacted]

Project:
Proposed Warehouse / Storage & Office & Cafe Development

Address:
LOT 18
Ashburn Road, Ipswich

For:
Walker Corporation

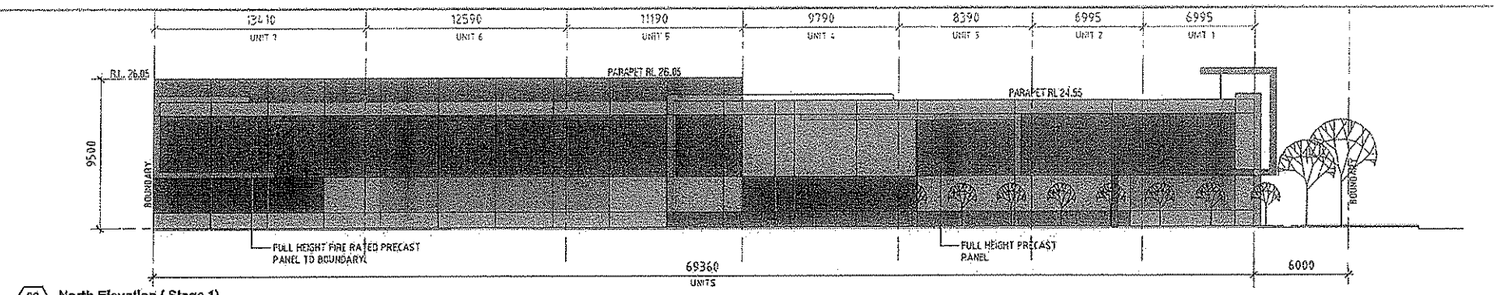
Drawing:
Elevations

Status	Date	Drawn	Checked
DA	05.10.16	TP	

Status:
DA - Not for Construction

Project No:	Drawing No:	Issue:
	SP-CS-DA-005	C

B1 SHEET



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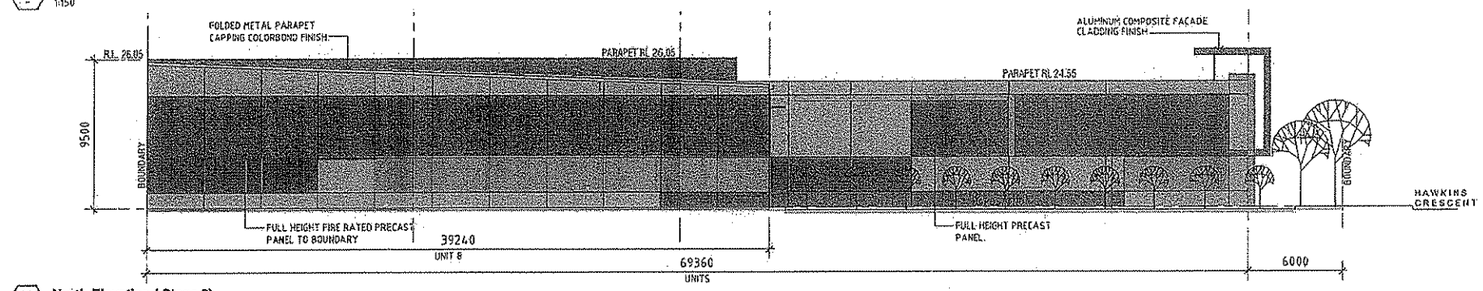
1:150



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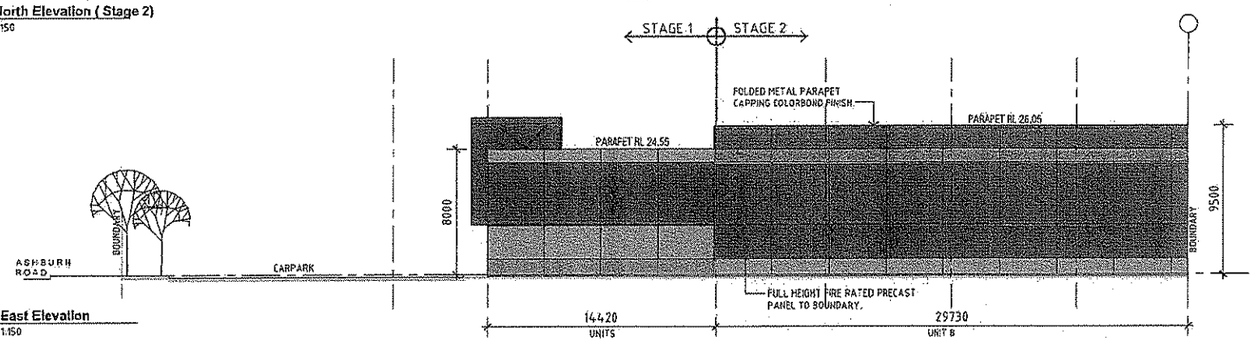
1:150



02 East Elevation
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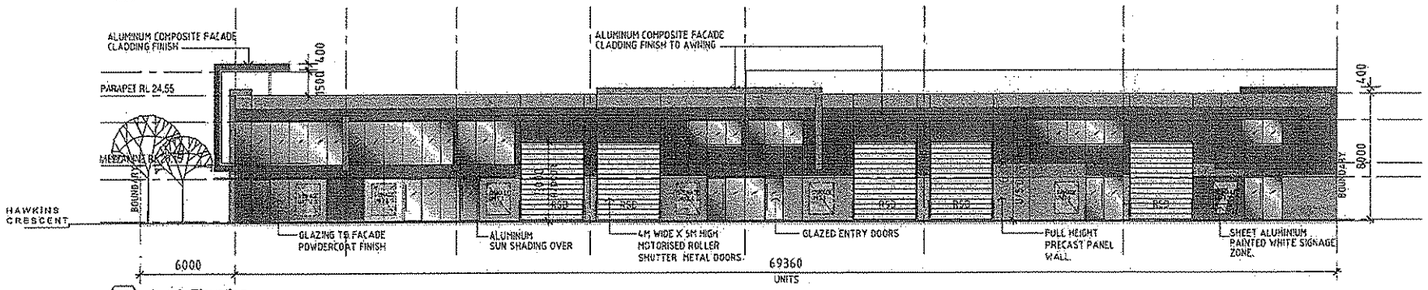

03 South Elevation
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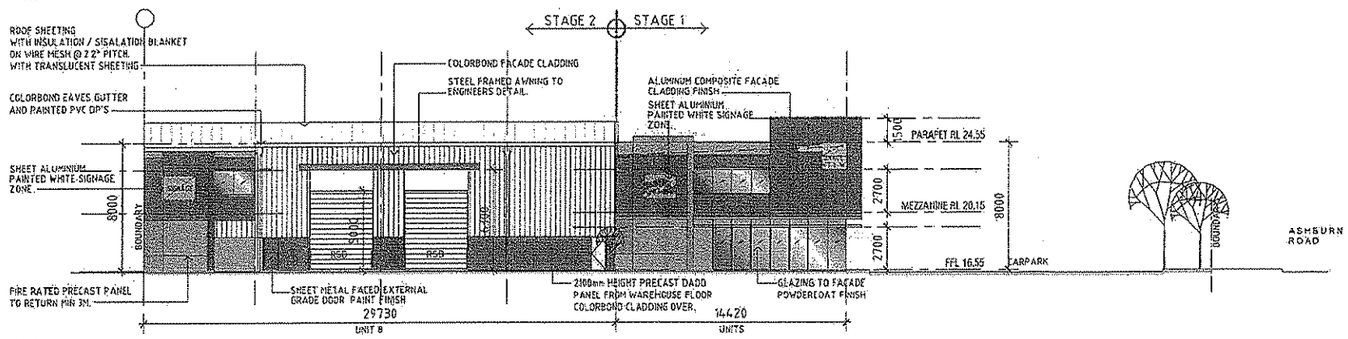
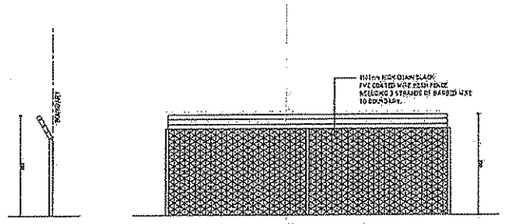


04 West Elevation
1:150



05 Perimeter Fence Detail
1:50

NOTE :
ALL REDUCED LEVELS ARE NOM/PAVE (+/- 500mm)
SUBJECT TO FINAL DETAIL DESIGN

Revision	Amendment	Drawn	Date
A	ISSUED AS DA DOCUMENTS	TP	[illegible]
B	STAGE 1 - NORTH ELEVATION ADDED	AM	[illegible]
C	STAGE 1 - NORTH ELEVATION REVISED LANDSCAPE BUFFER ADDED	TP	[illegible]

COLOUR & FINISHES LEGEND

PC1	PRECAST CONCRETE PANEL WITH EXTERNAL TEXTURED MASONRY PAINT FINISH. COLOUR - DULUX (MOXA PG2 .B3)
PC2	PRECAST CONCRETE PANEL WITH EXTERNAL TEXTURED MASONRY PAINT FINISH. COLOUR - DULUX (DOUBLE BASS PG2 .A9)
PC3	PRECAST CONCRETE PANEL WITH EXTERNAL TEXTURED MASONRY PAINT FINISH. COLOUR - DULUX (FULL OF LIFE P09 .H8)
PC4	PRECAST CONCRETE PANEL WITH EXTERNAL TEXTURED MASONRY PAINT FINISH. COLOUR - DULUX (QUINCE JELLY P10 .H8)
AFG1	POWDER-COATED ALUMINIUM-FRAMED GLAZING SYSTEM (COLORBOND SURFMIST)
AP1	COLORBOND PROFILED SHEET CLADDING. COLOUR - SHALE GREY
RS	ZINCALUME METAL ROOF SHEETING
RSD	ROLLER SHUTTER DOOR PAINT FINISH COLOUR - DULUX (ASHVILLE PG2 .B1)
ACP1	ALUMINUM COMPOSITE FACADE CLADDING COLOUR - DULUX (FULL OF LIFE P09. H8) OR SIMILAR
ACP2	ALUMINUM COMPOSITE FACADE CLADDING COLOUR - DULUX (QUINCE JELLY P10. H8) OR SIMILAR

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ABN 69 000 175 350
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1 Farrer Place, Sydney NSW 2000
Telephone [redacted]
Facsimile
Web

Project :
Proposed Warehouse / Storage & Office & cafe Development

Address :
LOT 18
Ashburn Road, Ipswich

For :
Walker Corporation

Drawing :
Coloured Elevations

Scale :	Date :	Drawn :	Checked :
1:150	[illegible]	TP	

Status :
DA - Not for Construction

Project No :	Drawing No :	Issue :
	SP-CS-DA-006	C

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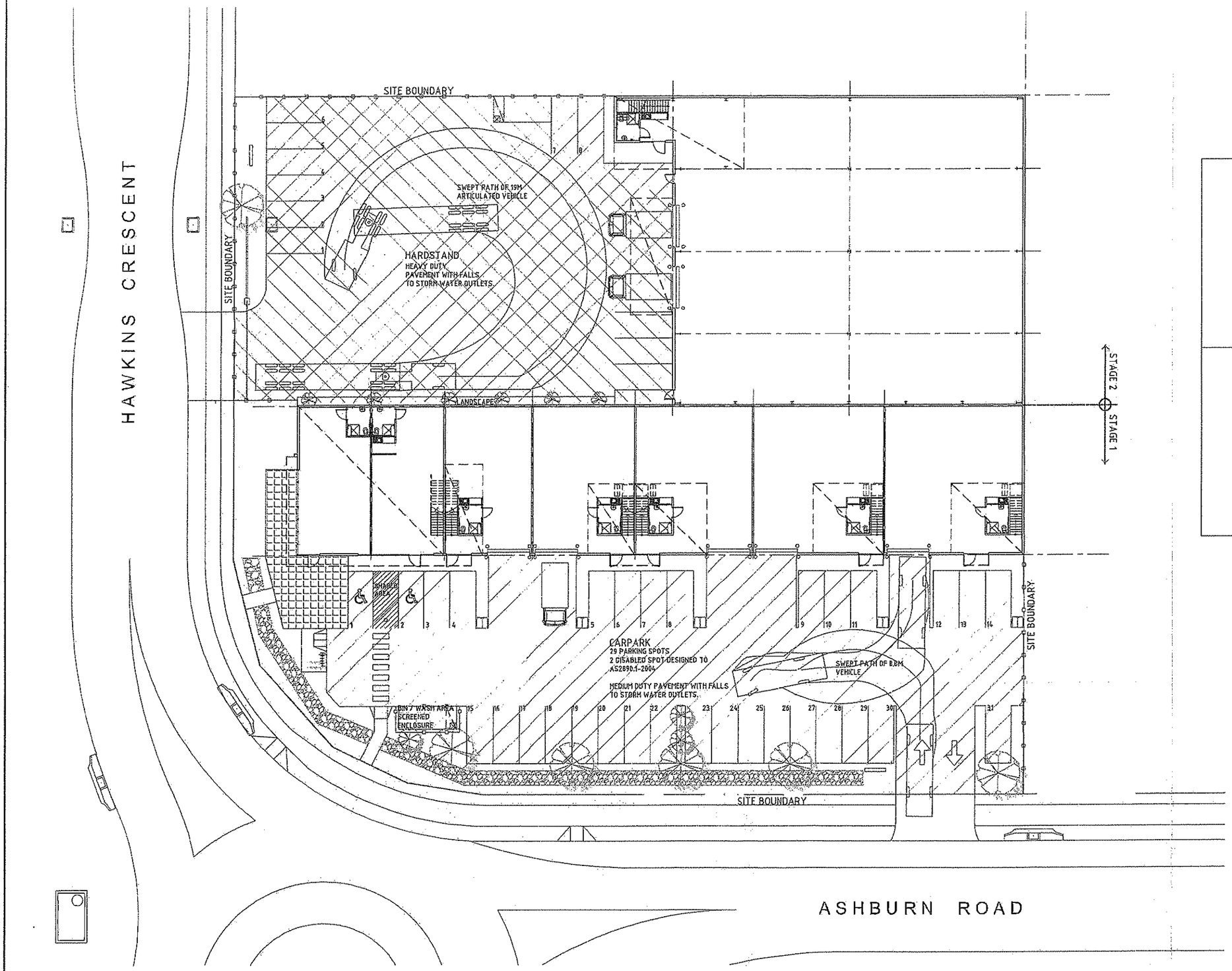
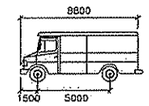
Revision	Amendments	Drawn	Date
A	ISSUED AS DA DOCUMENTS	TP	18.10.10
B	TRUCK INFORMATION ADDED	AW	28.10.10
C	CARPARK LAYOUT REVISED	TP	05.11.10
D	BIN WASH AREA LOCATION REVISED	TP	16.12.10





SVEH mm

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Track	: 2500	
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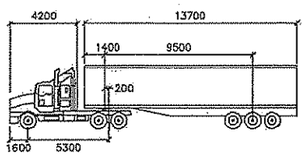
Steering Angle	: 28.2	



S ARTICULATED 19M mm

Tractor Width	: 2500	Lock to Lock Time	: 6.0
Trailer Width	: 2500	Steering Angle	: 27.7
Tractor Track	: 2500	Articulating Angle	: 70.0
Trailer Track	: 2500		

HEAVY DUTY PAVEMENT

MEDIUM DUTY PAVEMENT

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ABN 99 001 193 253
PO Box 4019,
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Level 21 Governor Macquarie Tower
1 Farrer Place, Sydney NSW 2000
Telephone: [redacted]
Facsimile:
WWW:

Project:
Proposed Warehouse / Storage & Office & Cafe Development

Address:
LOT 18
Ashburn Road, Ipswich

For:
Walker Corporation

Drawing:
Truck turning path

Scales: 1:00	Date: 18 OCT 10	Drawn: TP	Checked:

Status:
DA - Not for Construction

Project No:	Drawing No:	Issue:
	SP-CS-DA-007	D

B1 SHEET

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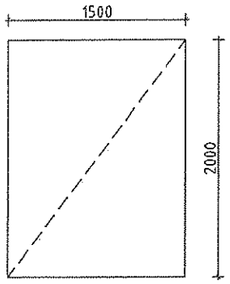
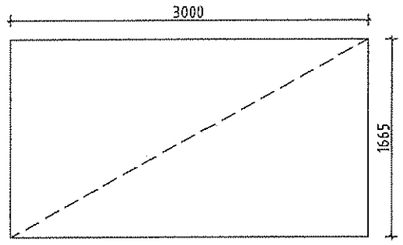
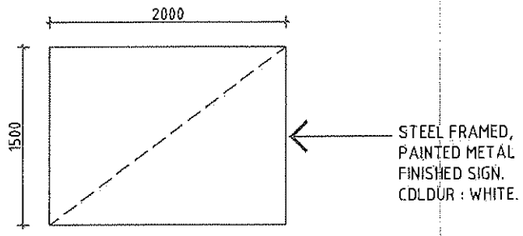
Revision	Amendments	Drawn	Date
A	SIGNAGE DIMENSIONS	AV	26.10.18
B	SIGNAGE DIMENSIONS		01.11.18
C	LETTERBOX ADDED TO SIGNAGE		16.12.19



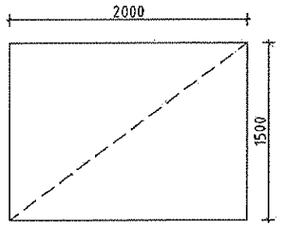
STAGE 1
TYPICAL SIGNAGE
UNIT 1 TO UNIT 7 (SOUTH)
AREA = 3 SQM X (7)



STAGE 1
UNIT 1 - FEATURE WALL (WEST)
AREA = 5 SQM

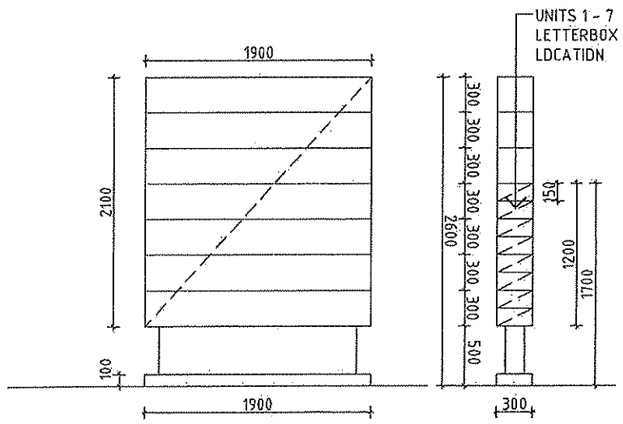


STAGE 1
UNIT 2 (WEST)
AREA = 3 SQM

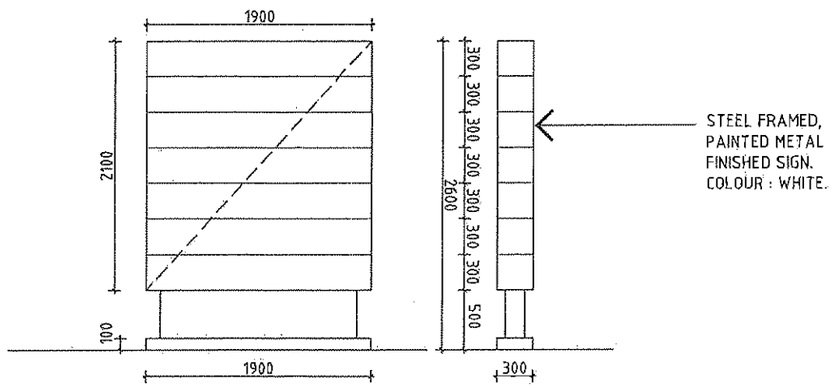


STAGE 2
SIGNAGE (WEST)
AREA = 3 SQM

TOTAL SIGNAGE AREA = 40 SQM



STAGE 1
SIGNAGE 1 (ASHBURN ROAD)
AREA = 4 SQM



STAGE 2
SIGNAGE 2 (HAWKINS CRESCENT)
AREA = 4 SQM

NOTE :
ALL REDUCED LEVELS ARE NOMINAL.(+/-500mm)
SUBJECT TO FINAL DETAIL DESIGN

Walker Corporation Pty Ltd
ABN 94 001 190 296
PO Box 1453
Sydney NSW 2001
Level 26 Governor Macquarie Tower
1 Farrer Place, Sydney NSW 2000
Telephone
Facsimile
Web

Project :
Proposed Warehouse / Storage & Office & Cafe Development

Address :
LOT 18
Ashburn Road, Ipswich

For :
Walker Corporation

Drawing :
Signage plan

Scale @ A3	Date	Drawn	Checked
	16 OCT 18	TP	

Status
DA - Not for Construction

Project No	Drawing No	Issue
	SP-CS-DA-008	C

Martin
COSGROVE
and Associates Pty Ltd
Consulting Structural and Civil Engineers

STORMWATER MANAGEMENT REPORT

FOR

PROPOSED WAREHOUSE/OFFICE DEVELOPMENT

Lot 18 ASHBURN ROAD, BREMER

Reference #: 10162-L1a

Date: 03-03-11

93 Warry Street PO Box 765 Spring Hill QLD 4000 Telephone: [redacted] Facsimile: [redacted]

INTRODUCTION

This is a stormwater management report and for the proposed warehouse and office development at Lot 18, Citiswich sub-division, Ashburn Road, Bremer.

DEVELOPMENT

The proposed development comprises two stages which consist of a total of 2025 m2 industrial warehouse building with attached offices and retail/commercial premises. The buildings are located on the North and East boundaries and have access hardstands and carparks to the South and West. (Refer drawing 10162 C101-A).

CATCHMENT

The proposed development site is currently vacant land (new sub-division). The total site area is approximately 4933 m^2 and is almost flat. There is a nominal grade from the North-East corner to the South and West of the site. Stage 2 of the site has an existing stormwater pit located inside the boundary. Previous to the sub-division, the natural ground of the site drained West and discharged directly into the Bremer River as overland flow.

STORMWATER QUANTITY ANALYSIS

It is proposed to detain the stormwater from the developed site in bio-retention storage and pavement storage to ensure post-development flows are at or below pre-development flows. Stormwater runoff from the developed site will discharge to the existing stormwater pit inside the boundary on the Western frontage. This existing stormwater pit is the legal point of discharge for the site. Currently all stormwater runs off the site to the South-West as overland flow. The proposed design will result in stormwater runoff for all events up to 1:100 ARI being discharged to the piped drainage system through the use of onsite detention in the bio-retention basins and carpark pavements. Therefore downstream properties will not be adversely affected by the development.

An assessment on the proposed development has been carried out to limit peak flows to pre-development peak flows for a range of ARIs and storm durations. The pre-development catchment calculations are based on a predominately pervious catchment while the post development catchment is predominately impervious (Table 1).

In accordance with QUDM guidelines, a 50 year ARI has been used as the major drainage event.

Table 1. – Pre and Post Development Areas and Runoff Coefficients

Catchments	Pre-Development	Post Development (Stage 2)
Total Site		
Area (ha)	0.49	0.49
Slope (%)	0.5	0.5
Surface Roughness	0.1	0.01
C_{10}	0.7	0.95

From the above, the peak flows for selected events up to Q100 were determined using the rational method. (Refer Table 2)

Table 2. – Peak Flows Rates

ARI	Peak Flows (L/s)	
	Pre-Development	Post Development (Stage 2)
Total Site		
2	144	190
10	201	266
50	311	409

With the peak pre-development flow rates determined, the temporal patterns for a range of storms durations up to a three-hour storm were analysed to determine the detention requirements for the site.

Post-development flows will be limited by using detention and seepage storage in the bio-retention basin (and to a minor extent the rainwater harvest tank). Low flows (Q2) will be mitigated by seepage and capture alone. The piped system off the site will be throttled to accept a maximum of 201 l/s as per the pre-development Q10 flows.

By limiting the outlet capacity of the piped system, on-site detention storage will be required. A volume of 52 m^3 has been calculated as the storage requirements for the catchment. (This is less than the previous storage requirement as the full allowable outlet flow of 201 l/s is now being utilized due to the Q100 requirement. Previously a lower outlet rate of 160 l/s was used in the actual design drawings.) A break up of the proposed storage detention areas is presented in Table 3.

Table 3. – On-Site Detention

Catchments	Storage Volume (m^3)	Detention Depth (mm)
Total Site		
Bio-retention (SOUTH 54 m^2) (direct detention up to overflow outlets)	16.2	0.300 m
Bio-retention (SOUTH 54 m^2) (extended detention depth)	12.4	0.230 m
Bio-retention (NORTH 44 m^2) (direct detention up to overflow outlets)	13.2	0.300 m
Bio-retention (NORTH 44 m^2) (extended detention depth)	10.2	0.230 m
Total	**52**	

The above calculations show that the post-development outflows with the proposed bio-retention and limited outflow will result in no net increase compared to pre-development flows.

The storage depths in the bioretention basins only reach the overflow pit levels (300mm) for 5 minute storm events for Q10, 20, 50 and 100 and for 15 minute storm events for Q50 and Q100. In these cases, the maximum duration of inundation of the bio-retention plants over 300 mm is 19 minutes (for the 15 minute Q100 storm). We would deem this is not hazardous to the health of the plants for such a short duration.

STORMWATER TREATMENT AND WATER QUALITY OBJECTIVES (WQO)

A total of two (2) bio-retention basins are proposed for the development, located as shown on drawing C101-A. The total area of bio-retention is 98 m^2, or 1.99% of the total site area. This has been designed in accordance with the Citiswich Individual Industrial Lot Stormwater Management Strategy by Cardno Lawson Treloar (report #LJ8714/R9, July 2008). All roof and most of the paved stormwater shall be directed to the bio-retention basins. The Individual Lot Stormwater Strategy allows for 75 m2 (150 m2 per hectare) of untreated carpark whilst still maintaining the water quality objectives. For the proposed design, only the driveway crossovers will be untreated. Therefore, the proposed design meets the criteria set out in the Citiswich Individual In-Lot Stormwater Management Strategy.

The proposed bioretention area (1.97% of the total site) will result in the following water quality objectives (WQO), based on Healthy Waterways WSUD Technical Design Guidelines design charts 5-3 to 5-5:

- Total Suspended Solids (TSS) Removal 87% (Figure 5-3)
- Total Phosphorus (TP) Removal 75% (Figure 5-3)
- Total Nitrogen (TN) Removal 42% (Figure 5-3)

Gross pollutants will be removed through the use of filter baskets within stormwater pits and coarse sediment forebays at pipe inlets to bio-retention basins. Gross pollutants from pavement runoff directly into bio-retention basins will be captured approaching swales or the basin surface. Gross pollutant removal will be greater than 90% for the development. The above WQO's are equivalent to or in excess of the requirements of the SEQRP Part 11 as per ICC requirements. The design of the proposed stormwater system is in accordance with best practice and uses passive systems. The nitrogen removal level of 42% is slightly below the required compliance of 45%, however it is our opinion that this slightly low number is offset by the TSS and TP removal rates which are higher than required.

Construction and maintenance of the bio-retention basins should be undertaken in accordance with the Citiswich Individual Industrial Lot Stormwater Management Strategy by Cardno Lawson Treloar (report #LJ8714/R9, July 2008).

CONCLUSION

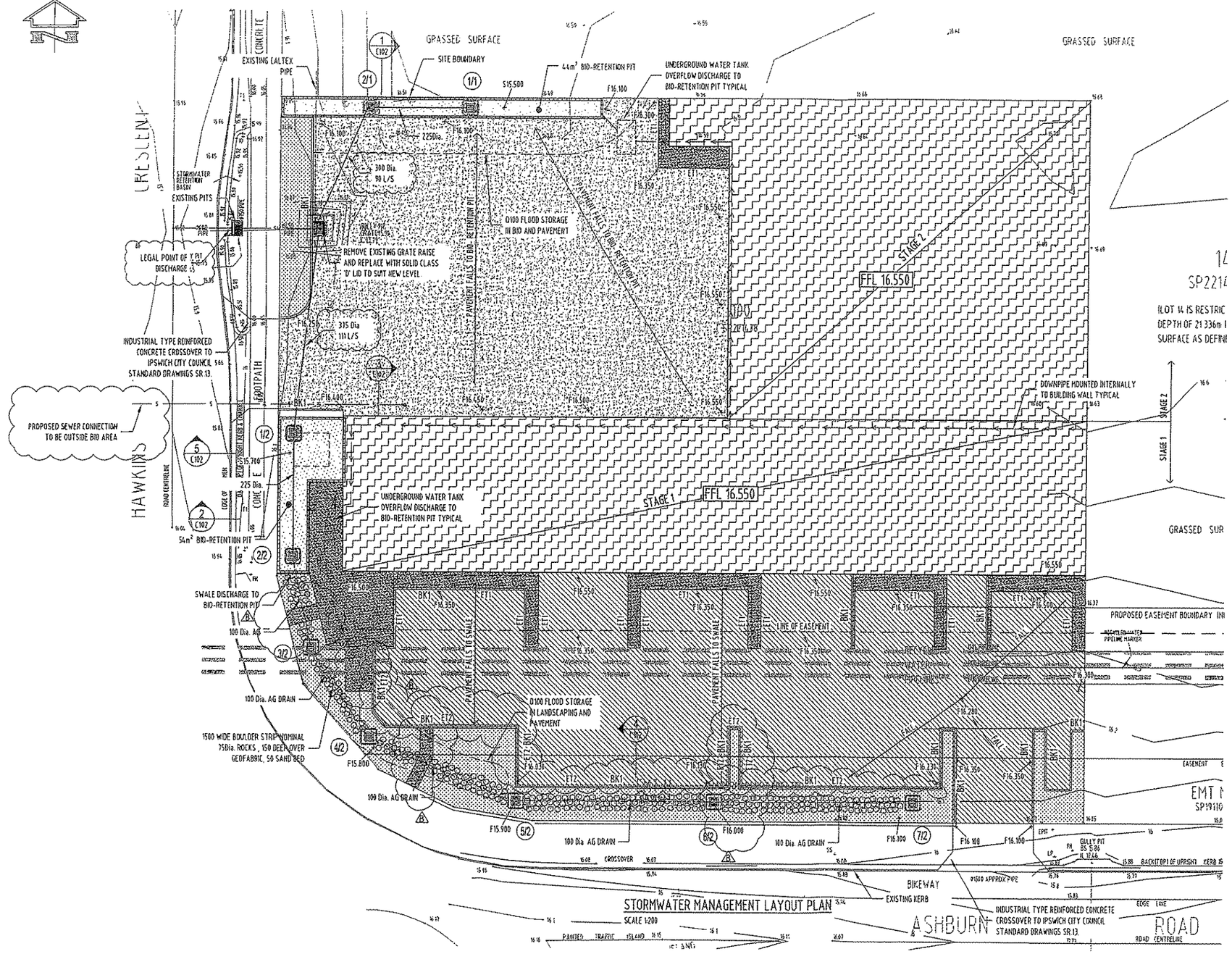
It is our opinion the proposed stormwater management plan is consistent with WSUD and will result in net reduction in stormwater flows off site, and achieve WQO in accordance with best practice. We trust this is satisfactory for your requirements, please contact us if you have any queries.

Yours faithfully
MARTIN COSGROVE AND ASSOCIATES PTY LTD

[redacted] *BE (Civil) Hons MIEAust RPEQ 8026*

Director

Attached:
Civil Drawings C101B, C102B, C103B



STORMWATER MANAGEMENT LAYOUT PLAN
SCALE 1:200

SW PIT SCHEDULE

(ALL PIT AND MANHOLE DETAILS TO COUNCIL STANDARD DETAILS)

PIT No.	SIZE (mm)	PIT TYPE	SURFACE INLET RL
1/1	1050 Dia	BIO-RETENTION OUTLET PIT WITH 600x 600, MEDIUM DUTY Galv GRATE	15.800
2/1	1050 Dia	BIO-RETENTION OUTLET PIT WITH 600x 600, MEDIUM DUTY Galv. GRATE	15.800
1/2	1050 Dia	BIO-RETENTION OUTLET PIT WITH 600x 600, MEDIUM DUTY Galv. GRATE	16.000
2/2	1050 Dia	BIO-RETENTION OUTLET PIT WITH 600x 600, MEDIUM DUTY Galv. GRATE	16.000
3/2	600 x 600	PRECAST OR PLASTIC PIT WITH MEDIUM DUTY Galv GRATE	15.750
4/2	600 x 600	PRECAST OR PLASTIC PIT WITH MEDIUM DUTY Galv. GRATE	15.800
5/2	600 x 600	PRECAST OR PLASTIC PIT WITH MEDIUM DUTY Galv GRATE	15.900
6/2	600 x 600	PRECAST OR PLASTIC PIT WITH MEDIUM DUTY Galv GRATE	16.000
7/2	600 x 600	PRECAST OR PLASTIC PIT WITH MEDIUM DUTY Galv. GRATE	16.100

CIVIL WORKS LEGEND

EXISTING

- 7.20 SURVEY GROUND LEVEL
- SURVEY BOUNDARY
- 75 SURVEY CONTOUR

PROPOSED

- TGFxx.xxx TOP OF FOOTING LEVEL
- Fxx.xxx FINISHED LEVEL
- Sxx.xxx STRUCTURAL SURFACE LEVEL
- BExx.xx BULK EARTHWORKS LEVEL
- Exx.xxx EXISTING INTERPOLATED LEVEL
- 7.35 PROPOSED CONTOUR
- DD DISHED DRAIN
- IX INVERT DRAIN
- KG KERB & GUTTER
- BK1 BARRIER KERB
- RW BLOCK RETAINING WALL AND FOOTING
- PIPE ENLARGER / REDUCER
- GRATED DRAIN
- RP RODDING POINT
- CD GRASS CATCH DRAIN
- HR 100Ø SUB-SOIL DRAIN WITH HIGH END RISER
- DOWNPIPE AND U/GROUND S/W LINE TO HYDRAULIC CONSULTANTS DETAILS
- LINE 1 (1/10) STORMWATER LINE, PIT & PIT No.
- UL xx.xxx INVERT LEVEL (UPSTREAM)
- xx xxx PIPE SIZE & TYPE
- xx % PIPE GRADE
- Q xxx L/s FLOW RATE-LITRES PER SEC
- DL xx.xxx INVERT LEVEL (DOWNSTREAM)
- SWD EXISTING STORMWATER LINE

PAVEMENT LEGEND

- HEAVY VEHICLE ACCESS AREAS (REINFORCED CONCRETE PAVEMENT)
- PARKING / PASSENGER VEHICLE AREAS (REINFORCED CONCRETE PAVEMENT)
- PEDESTRIAN ACCESS AREAS (REINFORCED CONCRETE PAVEMENT)
- LANDSCAPE ZONE (REFER TO LANDSCAPE ARCHITECT'S DETAILS)
- BUILDING OUTLINE. (REFER TO ARCHITECTURAL DRAWINGS)
- BIO-RETENTION. (REFER TO SECTIONS)

A1

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[redacted]

APPROVING ENGINEER
[redacted]RPEQ 8026 18-10-10

ISSUE	DATE	REVISION	INITIAL
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ARCHITECT
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PROJECT
PROPOSED WAREHOUSE/ UNIT DEVELOPMENT
LOT 18 ASHBURN ROAD IPSWICH

SHEET SUBJECT
STORMWATER MANAGEMENT PLAN

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DESIGNED	DRAWN	JOB No.	
MS	FT	10162	
DATE	SCALE	DRAWING No.	ISSUE
OCT.2010	1:200 U.N.O.	C101	B

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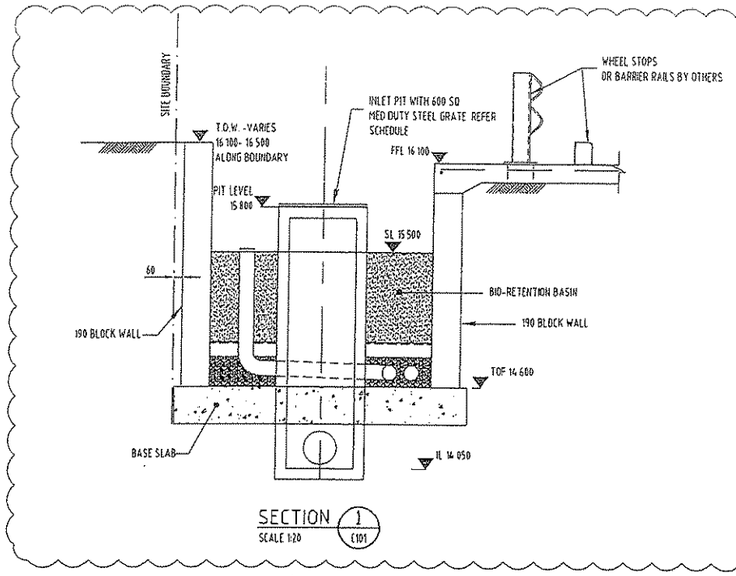

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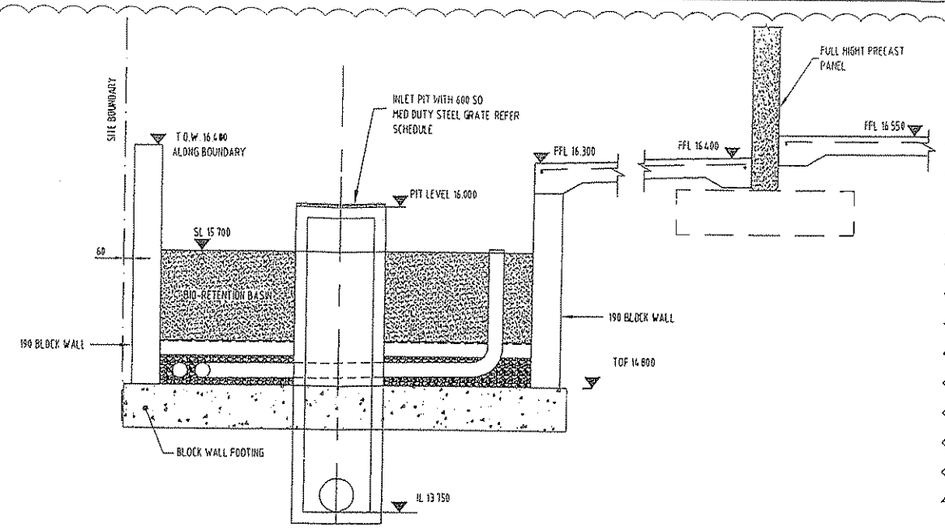

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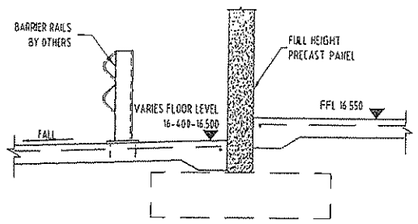

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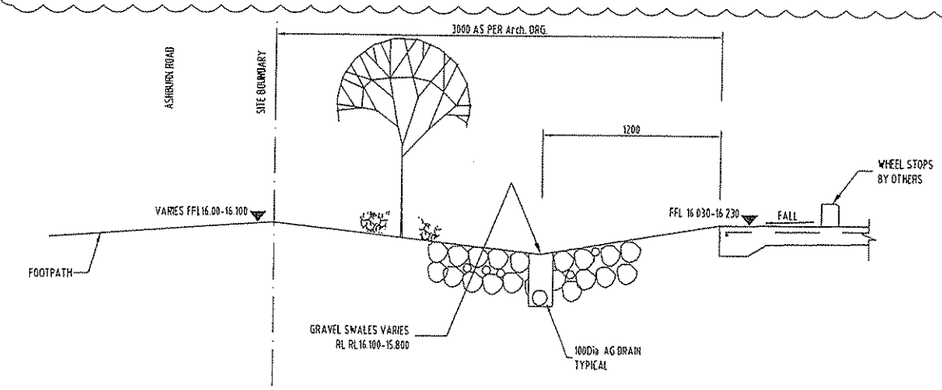

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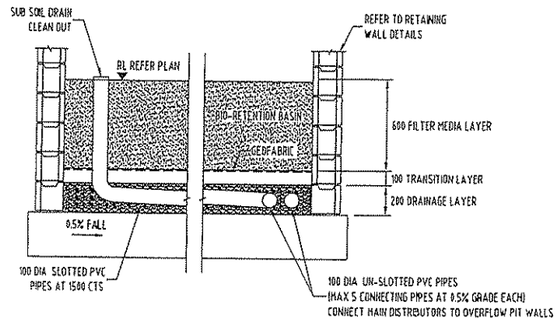
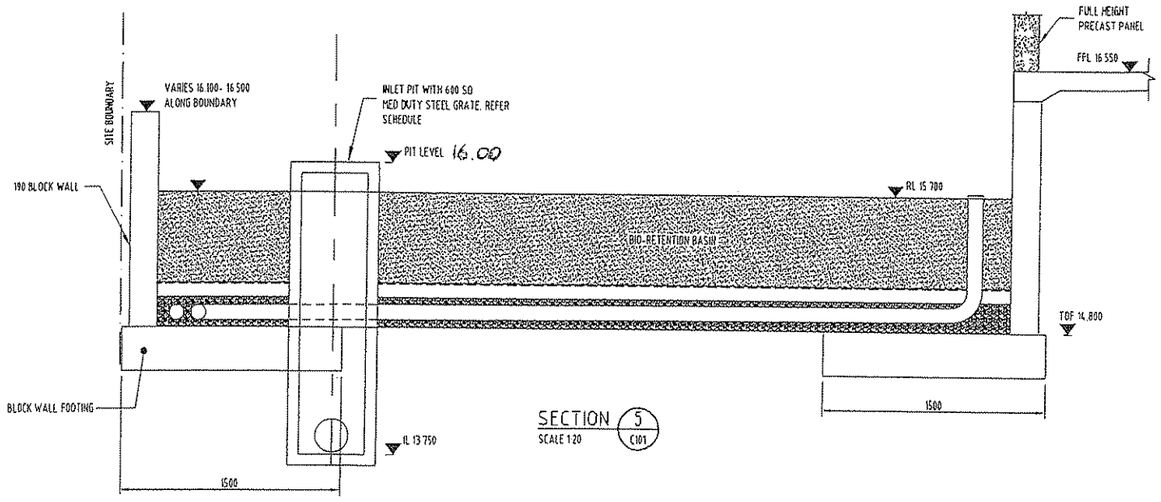


TYPICAL BIO-RETENTION BASIN CROSS SECTION
SCALE 1:20



SECTION 5 (C101)
SCALE 1:20

BIORETENTION BASIN NOTES

1. ALL WORK SHALL BE CARRIED OUT IN ACCORDANCE WITH CARDNO LAWSON TRELOAR GUIDELINES.
2. DESIGN IS BASED ON THE STORMWATER MANAGEMENT REPORT AND ALL WORK SHALL BE CARRIED OUT IN ACCORDANCE WITH THE REPORT
3. THE BIORETENTION DEVICE SHALL NOT BE CONSTRUCTED UNTIL ALL BUILDING WORK CONTRIBUTING TO SEDIMENT PRODUCTION, HAVE BEEN COMPLETED
4. FILTER MEDIA SHALL BE PROVIDED IN THREE LAYERS:-
   a) FILTER LAYER SHALL CONSIST OF A SANDY LOAM TOP SOIL WITH A MINIMUM SATURATED HYDRAULIC CONDUCTIVITY OF 180mm/hr , A 5-10% ORGANIC CONTENT AND A pH OF 6.0-7.0 LABORATORY TESTING IN ACCORDANCE WITH AS4419 AN AS 1289 WITH A MINIMUM OF TEN SAMPLES SHALL BE SUBMITTED CONFIRMING THE MATERIAL'S SUITABILITY.
   b) TRANSITION LAYER SHALL CONSIST OF COARSE SAND CONFORMING TO A UNIMIN 16/30 FG SAND GRADING OR EQUIVALENT.
   c) DRAINAGE LAYER SHALL CONSIST OF FINE GRAVEL WITH 5MM SCREENINGS
5. PRIOR TO FINAL PLANTING, PLACE GEOFABRIC OVER THE FILTER MEDIA WITH 50mm TOPSOIL FOR TEMPORARY TURFING LAYED PERPINDICULAR TO THE FLOW PATH
6. ENSURE PIPE FLOWS ARE RESTRICTED FROM ENTERING THE DEVICE UNTIL PLANTING IS FULLY ESTABLISHED
7. ALL PLANTING SHALL BE CARRIED OUT IN ACCORDANCE WITH THE LANDSCAPE ARCHITECTS SPECIFICATIONS PLANTING SHALL CONSIST OF 70-80% DENSITY COVER WITH A HEIGHT EQUAL TO THE 400mm OF EXTENDED DETENTION REQUIRED
8. THE BIORETENTION BASIN SHALL BE MAINTAINED THROUGHOUT ITS USE TO ENSURE THE DESIGN WATER QUALITY TREATMENT TARGETS ARE ACHEVED MAINTENANCE SHALL INCLUDE WATERING WITH PARTICULAR FREQUENCY DURING THE FIRST THREE MONTHS, WEED CONTROL, CLEARING OF LITTER, REMOVAL OF SEDIMENT, REPAIRING OF SCORING AND IMPLEMENTING MEASURES TO PREVENT FUTURE OCCURRENCE, REPLACEMENT OF DEAD PLANTS AND REPORTING OF THE WORKS CARRIED OUT REPORTS SHALL BE AS PER THE CARDNO LAWSON TRELOAR STORMWATER MANAGEMENT STRATEGY

ISSUED FOR APPROVAL
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[redacted] 18-10-10

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PROJECT
PROPOSED WAREHOUSE/ UNIT DEVELOPMENT
LOT 18 ASHBURN ROAD IPSWICH

SHEET SUBJECT
CIVIL SECTIONS

Martin COSGROVE and Associates Pty Ltd
ACN 052933221
CONSULTING STRUCTURAL AND CIVIL ENGINEERS
93 WARRY STREET SPRING HILL QLD 4000
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DESIGNED	DRAWN	JOB No.	
MS	FT	10162	
DATE	SCALE	DRAWING No.	ISSUE
OCT.2010	SCALE 1:20	C102	B

STORMWATER DRAINAGE NOTES

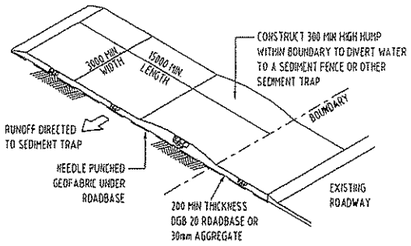
1 STORMWATER DESIGN CRITERIA:
 (a) AVERAGE RECURRENCE INTERVAL
  1:10 YEARS FOR PAVED AND LANDSCAPED AREAS
 (b) RAINFALL INTENSITIES - TIME OF CONCENTRATION - 5 MINUTES:
  1:10 YEARS = 209mm/hr
 (c). RUNOFF COEFFICIENTS
  ROOF AREAS - C = 0.95
  PAVED AREAS - C = 0.95
  LANDSCAPED AREAS - C = 0.70
2. THE CONTRACTOR IS TO CHECK THAT THE PROPOSED PIPEWORKS DO NOT CLASH WITH ANY EXISTING SERVICES PRIOR TO COMMENCING WORK. THE CONTRACTOR MUST NOTIFY THE ENGINEER IF ANY CLASHES ARE FOUND FOR ADVICE OF ANY REDESIGN REQUIREMENTS
3. PIPES 300 DIA AND LARGER TO BE REINFORCED CONCRETE CLASS "X" APPROVED SPIGOT AND SOCKET WITH RUBBER RING JOINTS. U.N.O.
4 PIPES UP TO 300 DIA SHALL BE SEWER GRADE UPVC WITH SOLVENT WELDED JOINTS U.N.O.
5 EQUIVALENT STRENGTH VCP OR FRC PIPES MAY BE USED
6 PIPES SHALL BE LAID ON A 75mm THICK SAND BED. IN ALL CASES BACKFILL TRENCH WITH SAND TO 200mm ABOVE PIPE U.N.O. WHERE PIPE IS UNDER PAVEMENTS BACKFILL REMAINDER OF TRENCH TO UNDERSIDE OF PAVEMENT WITH SAND OR PROVED RIPPED SANDSTONE COMPACTED IN 150mm LAYERS TO MINIMUM 95% STANDARD MAXIMUM DRY DENSITY IN ACCORDANCE WITH AS 1289 E2.1
7. ENLARGERS, CONNECTIONS AND JUNCTIONS TO BE PRECAST FITTINGS WHERE PIPES ARE LESS THAN 300 DIA.
8 WHERE SUBSOIL DRAINS PASS UNDER FLOOR SLABS AND VEHICULAR PAVEMENTS, UNSLOTTED UPVC SEWER GRADE PIPE IS TO BE USED.
9. CARE IS TO BE TAKEN WITH LEVELS OF STORMWATER LINES. GRADES SHOWN ARE NOT TO BE REDUCED WITHOUT APPROVAL
10 PRECAST PITS MAY BE USED EXTERNAL TO THE BUILDING SUBJECT TO APPROVAL.
11 WHERE TRENCHES ARE IN ROCK THE PIPE SHALL BE BEDDED ON A MIN. OF 50mm CONCRETE BED (OR 75mm BED OF BLUE METAL) UNDER THE BARREL OF THE PIPE.
12 GRATES AND COVERS SHALL BE ABLE TO SUPPORT THE FOLLOWING LOADS :-
 LIGHT DUTY - 1 TONNE WHEEL LOADS
 MEDIUM DUTY - 3.5 TONNE WHEEL LOADS
 HEAVY DUTY - 9 TONNE WHEEL LOADS

SITEWORKS NOTES

1. LEVEL OF DATUM AHD
2. CONTRACTOR MUST VERIFY ALL DIMENSIONS AND EXISTING LEVELS ON SITE PRIOR TO COMMENCEMENT OF WORK. ANY DISCREPANCIES TO BE REPORTED TO THE ENGINEER / SUPERINTENDENT.
3 MARTIN COSGROVE & ASSOCIATES ACCEPTS NO LIABILITY FOR THE LOCATION OF EXISTING SERVICES THE CONTRACTOR MUST VERIFY THE LOCATION OF ALL EXISTING SERVICES PRIOR TO COMMENCING WORKS. ALL EXISTING SERVICES AND STRUCTURES ARE TO BE MAINTAINED IN GOOD ORDER FOR THE DURATION OF THE CONTRACT ANY COSTS ASSOCIATED WITH REPAIRING DAMAGE TO EXISTING SERVICES SHALL BE PAID FOR BY THE CONTRACTOR.
4 ALL WORKS MUST BE CARRIED OUT IN ACCORDANCE WITH CURRENT COUNCIL STANDARD SPECIFICATIONS.
5. ALL WORKS TO BE IN ACCORDANCE WITH GEOTECHNICAL REPORT.
6. STRIP ALL TOPSOIL FROM CONSTRUCTION AREA AND STOCKPILE FOR LANDSCAPING PURPOSES ONLY
7 REMOVE LOOSE MATERIAL UNDER BUILDING PLATFORM & PAVEMENTS, PROOF ROLL SUBGRADE, REMOVE ANY SOFT SPOTS AND RECOMPACT.
8. PROVIDE SUB BASE LAYER UNDER BUILDINGS AND PAVEMENTS AS PER SCHEDULE ON DRAWING C102.
9 IMPORTED FILL SHALL BE OF FAIR TO GOOD QUALITY OF A MINIMUM CBR10, HAVE A MAXIMUM AGGREGATE SIZE NOT EXCEEDING 75mm AND A SHRINK / SWELL INDEX OF NOT GREATER THAN 1.0%. FILL SHALL BE LAYED IN MAXIMUM 200mm (LOOSE THICKNESS) LAYERS AND COMPACTED TO MINIMUM 98% M.D.D. IN ACCORDANCE WITH AS1289 5.1.5
10 ALL TRENCH BACKFILL MATERIAL SHALL BE COMPACTED TO THE SAME DENSITY AS THE ADJACENT MATERIAL.
11 ALL SERVICE TRENCHES UNDER VEHICULAR PAVEMENTS SHALL BE BACKFILLED WITH SAND OR AN APPROVED GRANULAR MATERIAL AND COMPACTED TO MINIMUM 98% MODIFIED MAXIMUM DRY DENSITY, IN ACCORDANCE WITH AS 1289 E2.1.
12. FIELD DENSITY TESTING TO BE CARRIED OUT TO THE ATTAINED COMPACTION RATIOS & THE PLACEMENT MOISTURE CONTENT WITH FREQUENCY OF TESTING IN ACCORDANCE WITH AS 3798 SECTION 8.9
13 PROVIDE 10MM WIDE EXPANSION JOINTS BETWEEN BUILDINGS AND ALL CONCRETE OR UNIT PAVEMENTS U.N.O
14. MAKE SMOOTH CONNECTION WITH EXISTING WORKS

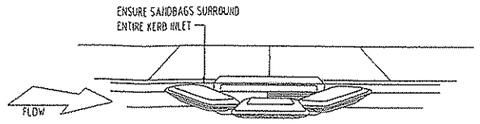
STORMWATER MANAGEMENT NOTES

1 THIS DESIGN IS IN ACCORDANCE WITH THE CARDHOI(FROM STANDARD) OR 08214
2 PREVENT THE RELEASE OF CONTAMINATED STORMWATER FROM THE SITE DURING CONSTRUCTION. REFER TO THE EROSION AND SEDIMENT CONTROL DRAWING C103
3 STORMWATER PITS SHALL BE CONSTRUCTED WITH LEAF GUARD OR FINELY MESHED GRATES TO PREVENT INFILTRATION OF LITTER. THE PROPERTY MANAGER SHALL ENSURE STORMWATER PITS ARE REGULARLY MAINTAINED
4. STORMWATER RUNOFF SHALL NOT POND ON-SITE OR IN ADJACENT PROPERTIES
5 LANDSCAPING ZONES SHALL BE TOPSOILED AND VEGETATED WITH SUITABLE PLANTING AS SOON AS POSSIBLE



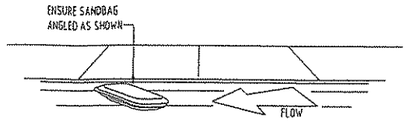
TEMPORARY SITE ACCESS SEDIMENT STABLISING DETAIL

STRIP TOPSOIL, REDUCE TO BULK EARTHWORKS LEVEL AND COMPACT SUBGRADE.



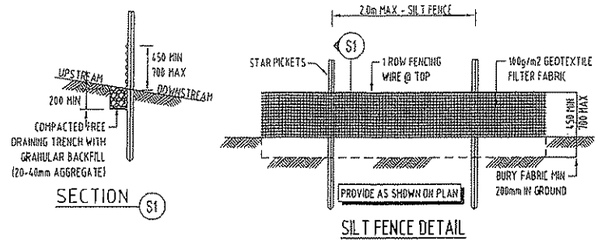
SANDBAG SEDIMENT INLET TRAP

N.T.S



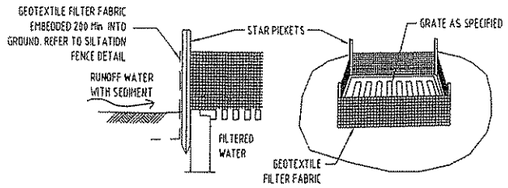
SANDBAG SEDIMENT TRAP

N.T.S



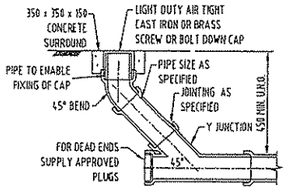
SILT FENCE DETAIL

N.T.S



GEOTEXTILE FILTER PIT SURROUND

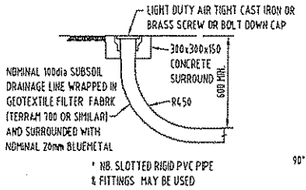
N.T.S.



RODDING POINT AT 45

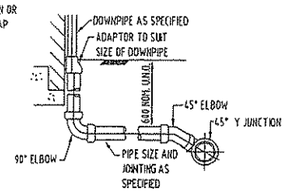
SCALE 1:20

(DO NOT SLOT RISERS)



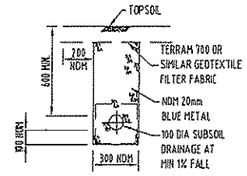
HIGH END RISER

SCALE 1:20



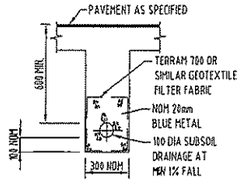
UPVC DOWNPIPE CONNECTION

SCALE 1:20



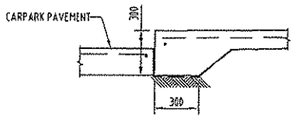
SUBSOIL IN LANDSCAPED AREAS

SCALE 1:20



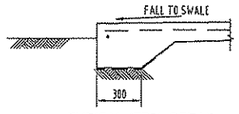
SUBSOIL IN PAVED AREAS

SCALE 1:20



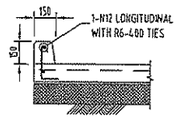
TYPICAL 'ET1' DETAIL

SCALE 1:20



TYPICAL 'ET2' DETAIL

SCALE 1:20



B.K.1 - TYPICAL BARRIER KERB DETAIL

SCALE 1:20

ISSUED FOR APPROVAL

NOT TO BE USED FOR CONSTRUCTION PURPOSES

[redacted] 026 18-10-10

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ISSUE	DATE	REVISION	INITIAL
B	03-03-11	INGROE RETENTION BASIN NOTES REMOVED	JP
A	18-10-10	ISSUED FOR DEVELOPMENT APPROVAL	FT

CLIENT

WALKER CORPORATION

LEVEL 21 GOVERNOR MACQUARIE TOWER
1 FARMER PLACE, SYDNEY NSW 2000

PH:(02) 8273 9600 FAX:(02) 9252 7400

ARCHITECT

Walker

PROJECT

PROPOSED WAREHOUSE/ UNIT DEVELOPMENT

LOT 18 ASHBURN ROAD IPSWICH

SHEET SUBJECT

CIVIL NOTES

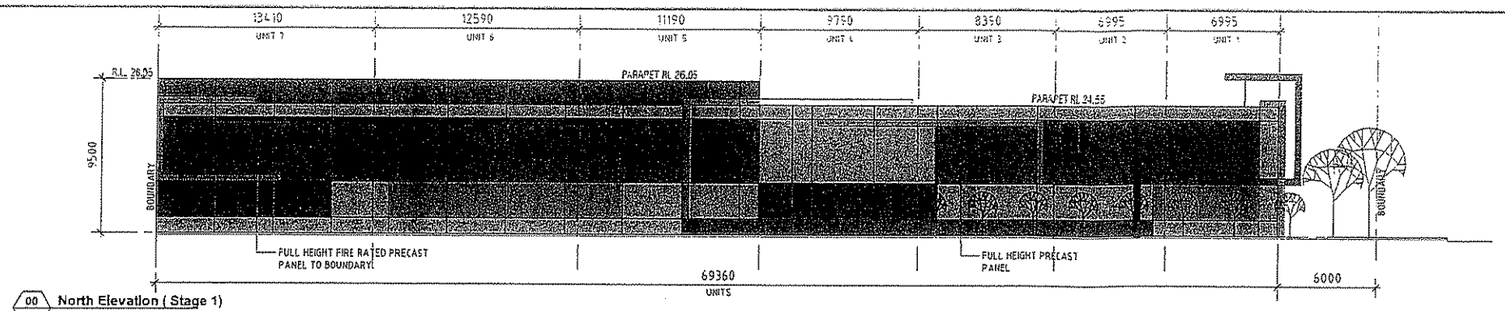
TYPICAL DETAILS

Martin COSGROVE and Associates Pty Ltd
ACN 052933221

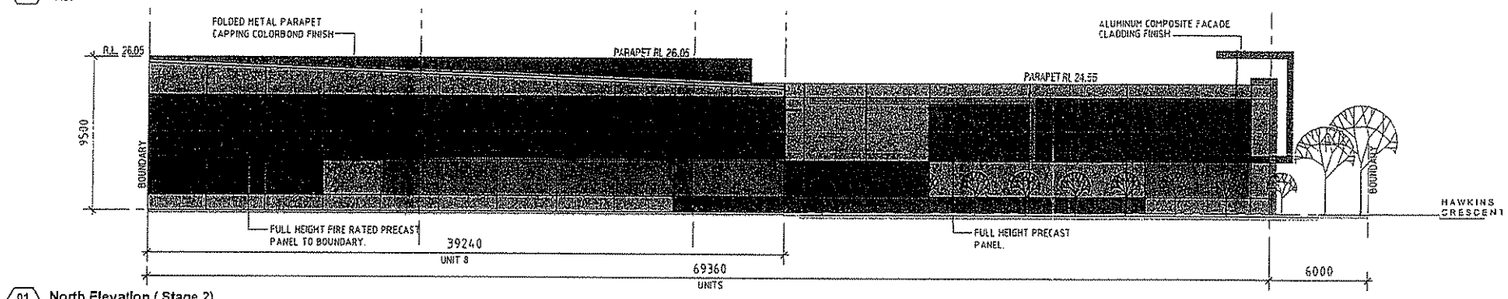
CONSULTING STRUCTURAL AND CIVIL ENGINEERS
93 WARRY STREET SPRING HILL QLD 4000
Tel.(07) 3252 4644 Fax.(07) 3252 4649
Email : mca@mcaeng.com.au

DESIGNED	DRAWN	JOB No.	
MS	FT	10162	
DATE	SCALE	DRAWING No.	ISSUE
OCT.2010	A.S SHOWN	C103	B

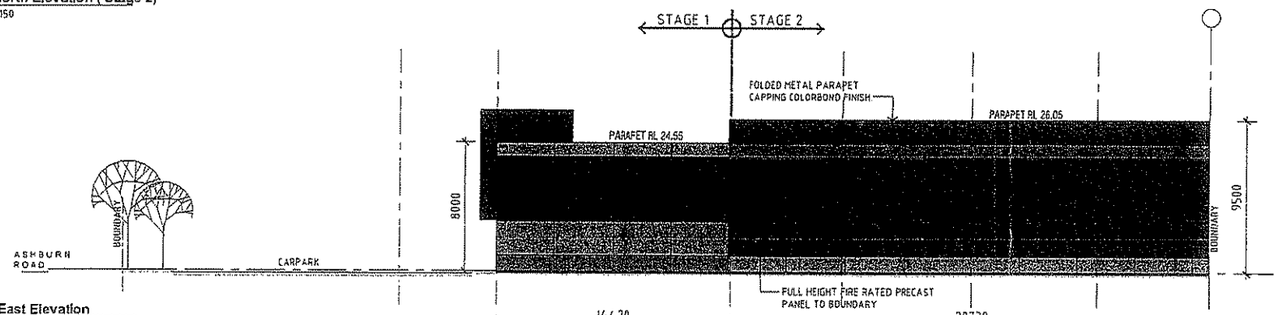
B1 SHEET



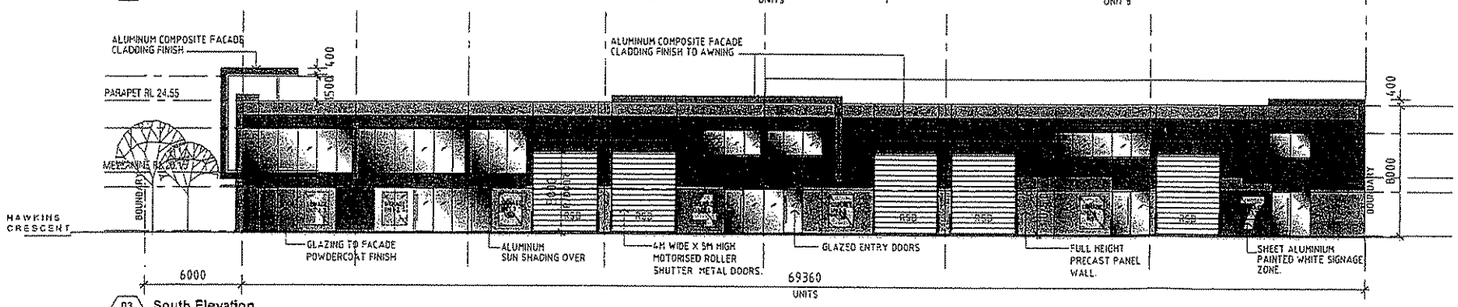
00 North Elevation (Stage 1)
1:150



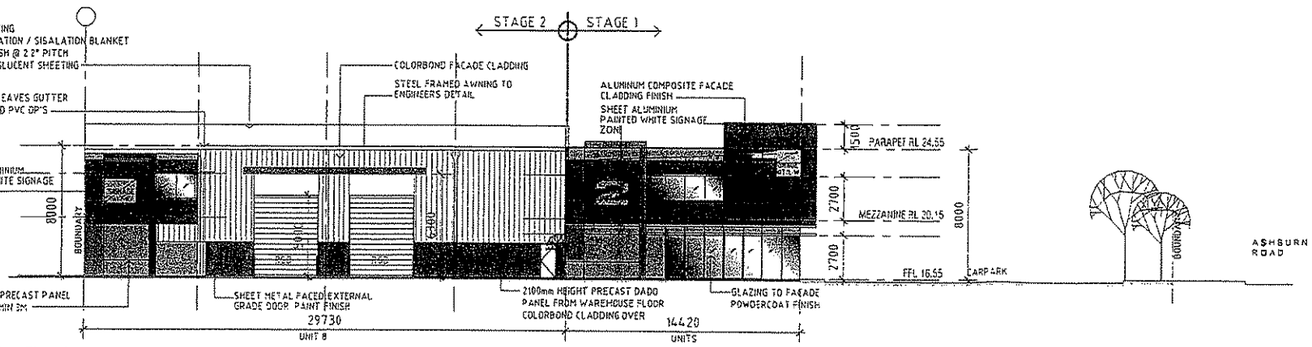
01 North Elevation (Stage 2)
1:150



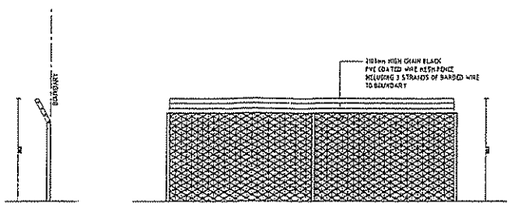
02 East Elevation
1:150



03 South Elevation
1:150



04 West Elevation
1:150



05 Perimeter Fence Detail
1:50

NOTE:
ALL REDUCED LEVELS ARE NOMINAL (+/- 500mm) SUBJECT TO FINAL DETAIL DESIGN

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Revision:	Amendments:	Drawn:	Date:
A	ISSUED AS DA DOCUMENTS	TP	06.10.12
B	STAGE 1 - NORTH ELEVATION ADDED	AM	26.10.12
C	STAGE 1 - NORTH ELEVATION REVISED LANDSCAPE BUFFER ADDED	TP	06.12.12

COLOUR & FINISHES LEGEND

PC1	PRECAST CONCRETE PANEL WITH EXTERNAL TEXTURED MASONRY PAINT FINISH. COLOUR - DULUX (MOXA PG2 .B3)
PC2	PRECAST CONCRETE PANEL WITH EXTERNAL TEXTURED MASONRY PAINT FINISH. COLOUR - DULUX (DOUBLE BASS PG2 .A9)
PC3	PRECAST CONCRETE PANEL WITH EXTERNAL TEXTURED MASONRY PAINT FINISH. COLOUR - DULUX (FULL OF LIFE P09 .H8)
PC4	PRECAST CONCRETE PANEL WITH EXTERNAL TEXTURED MASONRY PAINT FINISH. COLOUR - DULUX (QUINCE JELLY P10 .H8)
AFG1	POWDER-COATED ALUMINIUM-FRAMED GLAZING SYSTEM (COLORBOND SURFMIST)
AP1	COLORBOND PROFILED SHEET CLADDING. COLOUR - SHALE GREY
RS	ZINCALUME METAL ROOF SHEETING
RSO	ROLLER SHUTTER DOOR PAINT FINISH COLOUR - DULUX (ASHVILLE PG2 .B1)
ACP1	ALUMINUM COMPOSITE FACADE CLADDING COLOUR - DULUX (FULL OF LIFE P09. H8) OR SIMILAR
ACP2	ALUMINUM COMPOSITE FACADE CLADDING COLOUR - DULUX (QUINCE JELLY P10. H8) OR SIMILAR

Walker
Walker Corporation Pty Ltd
ABN 53 001 178 253
PO Box 4073
Sydney NSW 2001
Level 21 Governor Macquarie Tower
1 Farrer Place, Sydney NSW 2000
Telephone (02) 9273 0600
Facsimile (02) 9252 2400
Web walkercorp.com.au

Project
Proposed Warehouse / Storage & Office & cafe Development

Address
LOT 18
Ashburn Road, Ipswich

For
Walker Corporation

Drawing
Coloured Elevations

Scale:	Date:	Drawn	Checked
1:150	06.12.12	TP	

Status
DA - Not for Construction

Project No:	Drawing No:	Issue:
	SP-CS-DA-006	C

B1 SHEET

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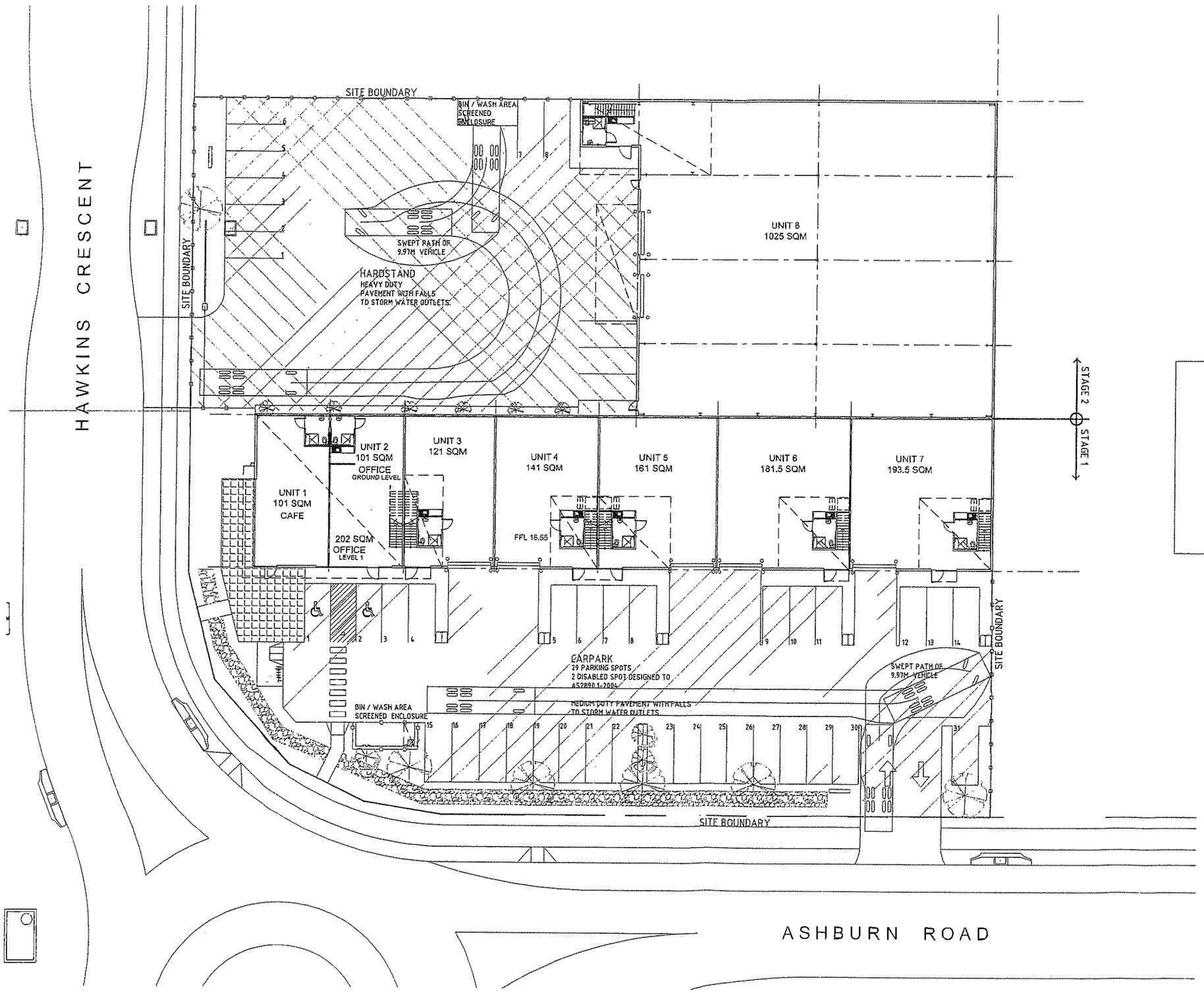
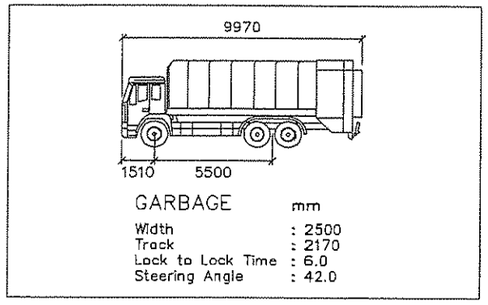
Revision	Amendments	Drawn	Date
A	ISSUED AS DA DOCUMENTS	TP	08.12.16
B	BIN WASH AREA LOCATION REVISED	TP	16.12.16





HEAVY DUTY PAVEMENT

MEDIUM DUTY PAVEMENT

Walker Corporation Pty Ltd
ABN 95 001 174 352
PO Box 4073
Sydney NSW 2001
Level 21 Governor Macquarie Tower
1 Farrer Place, Sydney NSW 2000
Telephone (02) 8273 9600
Facsimile (02) 9252 7400
Web walkercorporation.com.au

Project:
Proposed Warehouse / Storage & Office & Cafe Development

Address:
LOT 18
Ashburn Road, Ipswich

For:
Walker Corporation

Drawing:
Waste Mangement Plan
Truck turning path

Scales:	Date:	Drawn:	Checked:
1:500	08 DEC 16	TP	

Status:
DA - Not for Construction

Project No:	Drawing No:	Issue:
	SP-CS-DA-009	B

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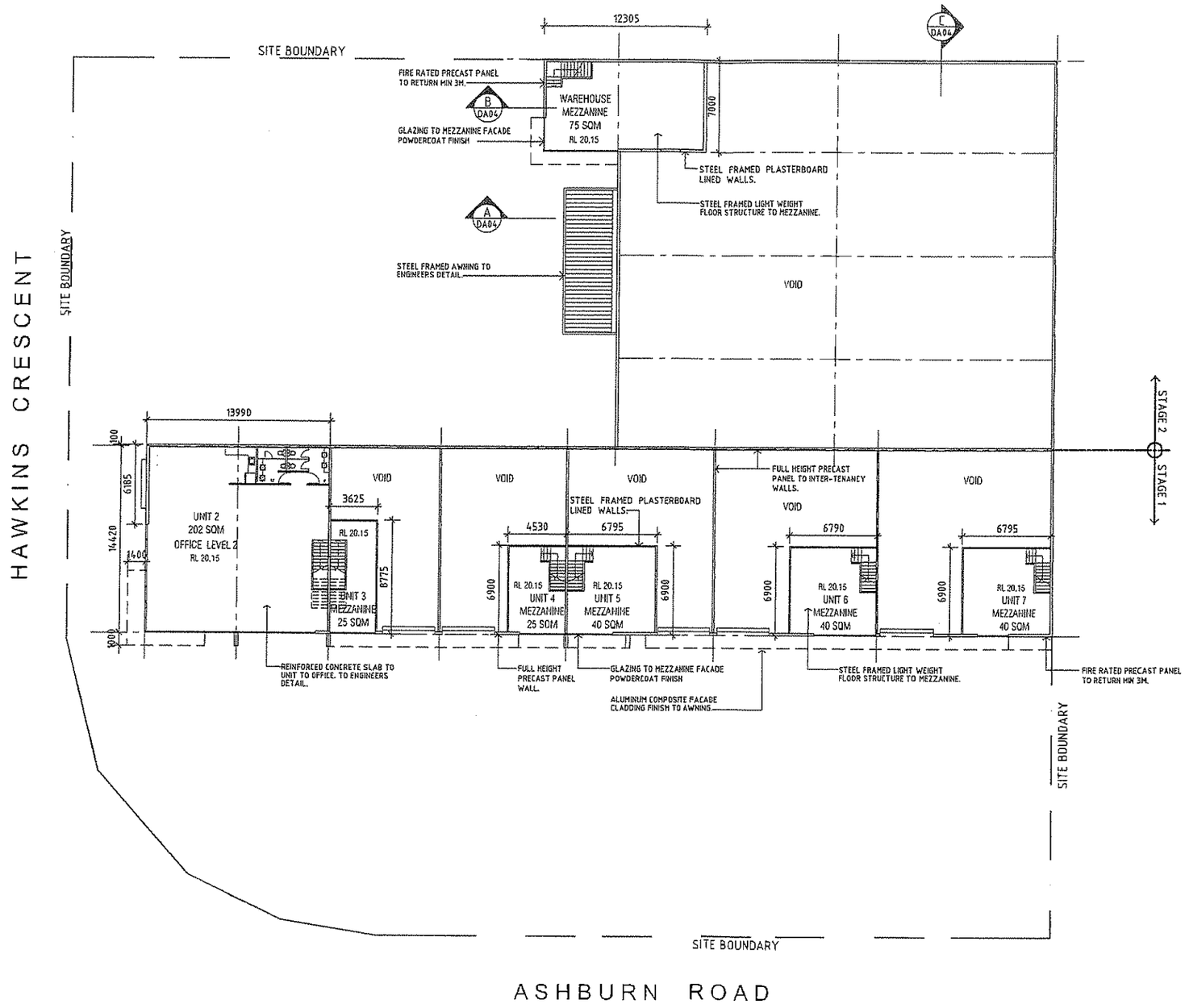
Revision	Amendments	Drawn	Date
A	ISSUED AS DA DOCUMENTS	TP	06.10.10
B	MEZZANINE OFFICE UPDATED	AW	21.10.10
C	LEVEL 2 OFFICE AMENDED UPDATED	TP	10.12.10



DEVELOPMENT DATA

SITE AREA STAGE 1	2 693 m2
- UNIT 2 = MEZZ. OFFICE 202 SQM - UNIT 3 = MEZZ. OFFICE 25 SQM - UNIT 4 = MEZZ. OFFICE 25 SQM - UNIT 5 = MEZZ. OFFICE 40 SQM - UNIT 6 = MEZZ. OFFICE 40 SQM - UNIT 7 = MEZZ. OFFICE 40 SQM	
TOTAL MEZZANINE LEVEL AREA	372 m2

SITE AREA STAGE 2	2 240 m2
WAREHOUSE MEZZ. OFFICE	75 m2

NOTE :
ALL REDUCED LEVELS ARE NOMINAL (+/- 500mm)
SUBJECT TO FINAL DETAIL DESIGN

Walker Corporation Pty Ltd
ABN 99 001 176 283
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Telephone (02) 9273 9900
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Web walkercorp.com.au

Project :
Proposed Warehouse / Storage & Office & Cafe Development

Address :
LOT 18
Ashburn Road, Ipswich

For :
Walker Corporation

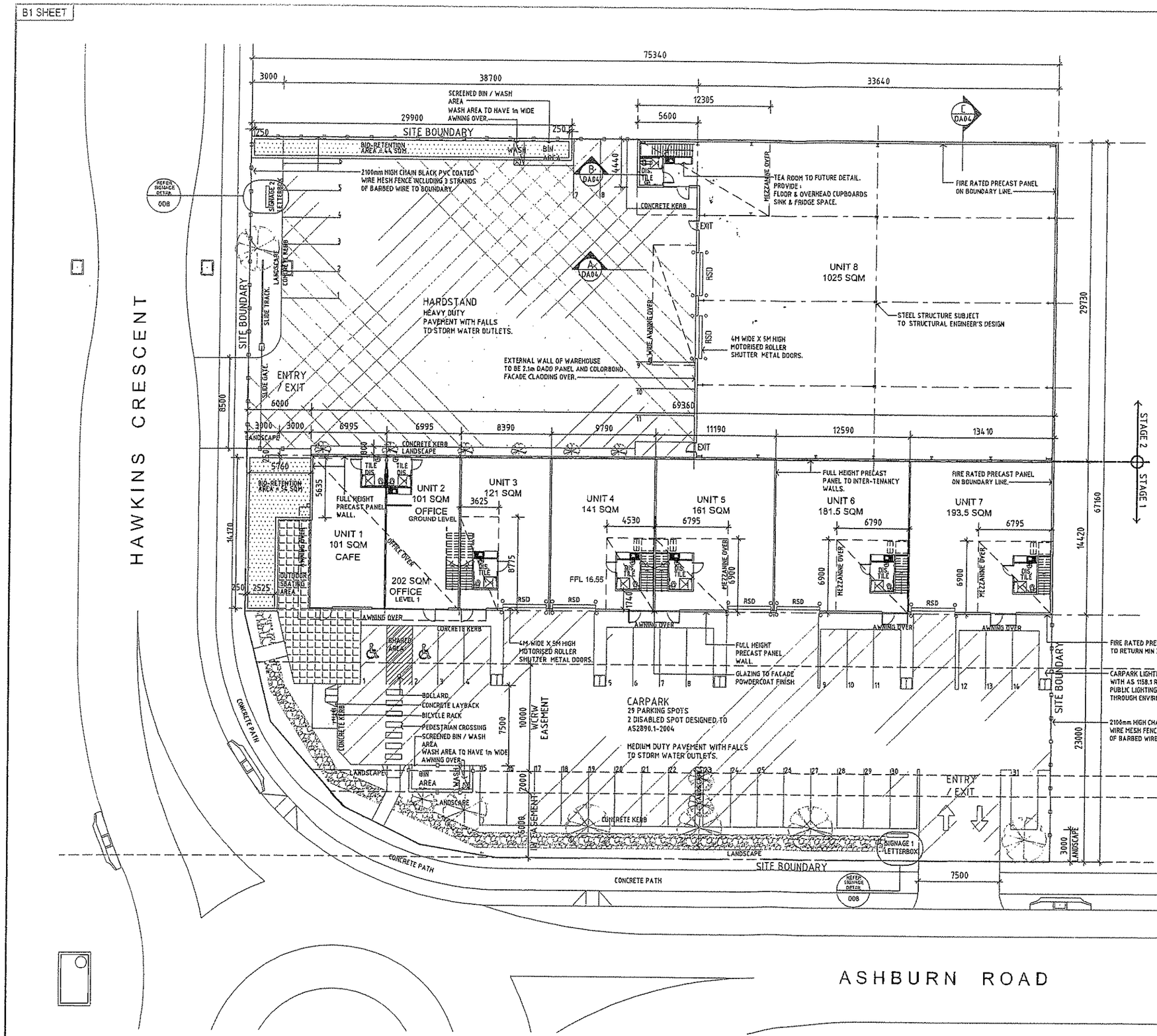
Drawing :
Mezzanine Floor Plan

Scale	Date	Drawn	Checked
1:200	06.OCT.10	TP	

Status
DA - Not for Construction

Project No	Drawing No	Issue
	SP-CS-DA-002	C

B1 SHEET



Revision :	Amendments :	Drawn :	Date :
A	ISSUED AS DA DOCUMENTS	TP	08.10.18
B	GENERAL AMENDMENT TO MEZZ. OFFICE	AW	22.10.18
C	PARKING LAYOUT REVISED. CONCRETE PATH FOR PEDESTRIANS ADDED. LANDSCAPE TRIANGLES ADDED TO CARPARK. LANDSCAPE BUFFER ADDED BETWEEN UNIT 8 HARDSTAND AND STAGE 1 NORTHERN WALL. WASTE BIN / WASH AREA ADDED	TP	28.10.18
D	PARKING LAYOUT REVISED. WASTE BIN / WASH AREA ADDED	TP	18.12.18

DEVELOPMENT DATA

TOTAL SITE AREA	4 933 m2
SITE AREA STAGE 1	2 693 m2
- UNIT 1 = 101 SQM (CAFE)	
- UNIT 2 = 303 SQM (2 LEVELS)	
- UNIT 3 = 121 SQM + MEZZ. OFFICE 25 SQM	
- UNIT 4 = 141 SQM + MEZZ. OFFICE 25 SQM	
- UNIT 5 = 161 SQM + MEZZ. OFFICE 40 SQM	
- UNIT 6 = 181.5 SQM + MEZZ. OFFICE 40 SQM	
- UNIT 7 = 193.5 SQM + MEZZ. OFFICE 40 SQM	
TOTAL BUILDING AREA	1 372 m2
OUTDOOR SEATING AREA	90 m2
MEDIUM DUTY PAVEMENT	1 160 m2
CARPARKING PROVIDED	31 SPACES
SITE AREA STAGE 2	2 240 m2
UNIT 8 AREA	1 025 m2
MEZZANINE OFFICE	75 m2
TOTAL BUILDING AREA	1 100 m2
HEAVY DUTY PAVEMENT	1 105 m2
CARPARKING PROVIDED	11 SPACES

HEAVY DUTY PAVEMENT

MEDIUM DUTY PAVEMENT

NOTE :
ALL REDUCED LEVELS ARE NOMINAL (+/- 500mm)
SUBJECT TO FINAL DETAIL DESIGN

Walker

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Sydney NSW 2001
Level 21 Generation Metropolis Tower
1 Farrer Place, Sydney NSW 2000
Telephone (02) 8273 5200
Facsimile (02) 9252 7400
Web www.walkercorp.com.au

Project :
Proposed Warehouse / Storage & Office & Cafe Development

Address :
LOT 18
Ashburn Road, Ipswich

For :
Walker Corporation

Drawing :
Site / Floor Plan

Scale :	Date :	Drawn :	Checked :
1:500	18 OCT 18	TP	

Status :
DA - Not for Construction

Project No :	Drawing No :	Issue :
	SP-CS-DA-001	D

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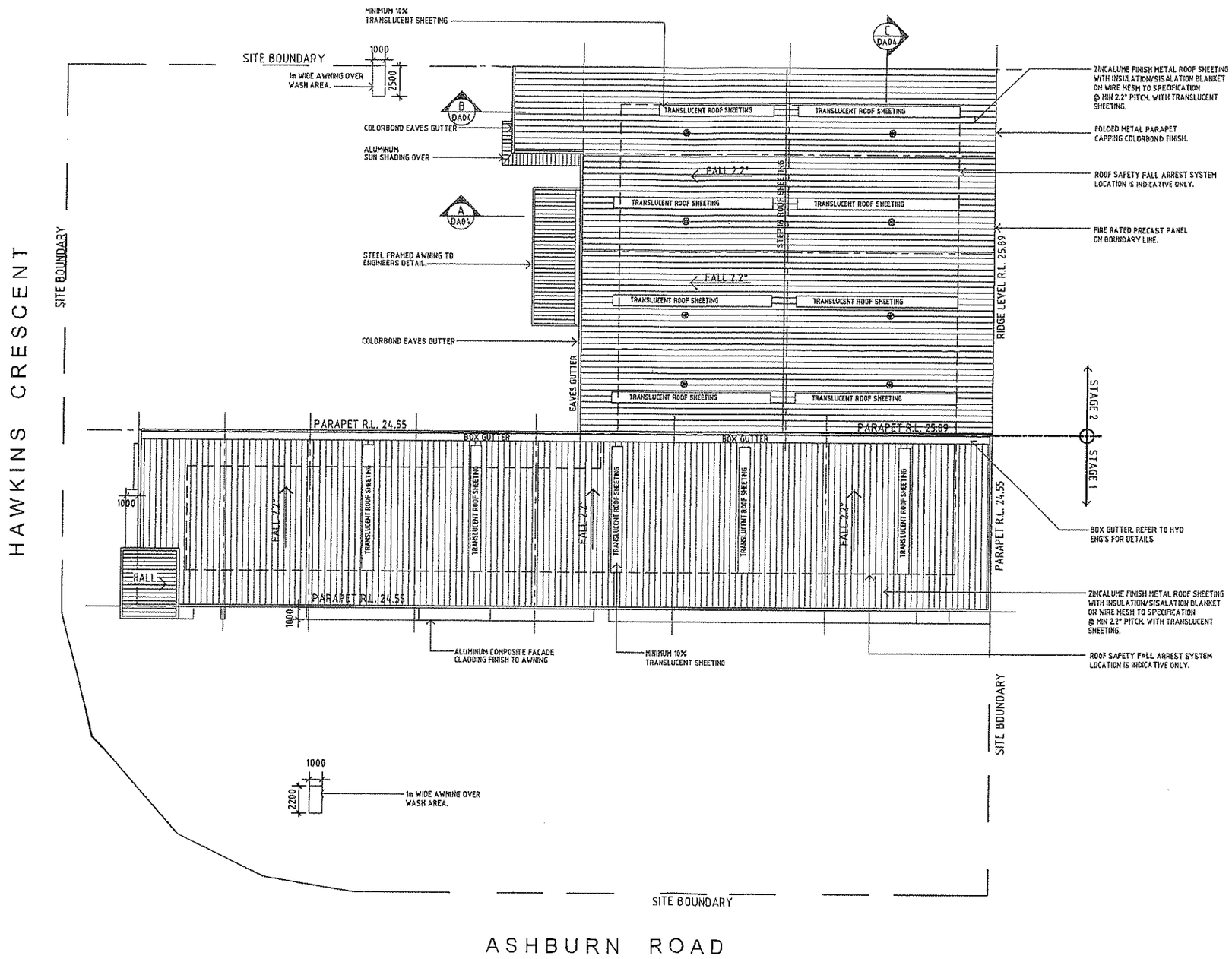
Revision :	Amendments :	Drawn :	Date :
A	ISSUED AS DA DOCUMENTS	TP	09.12.14
B	REVISION UPDATED	AW	24.10.16
C	AWNINGS TO WASH AREA ADDED	TP	13.12.16
D	STAGE 1 WASH AREA LOCATION REVISED	TP	14.12.16



NOTE :
ALL REDUCED LEVELS ARE NOMINAL : +/- 500mm)
SUBJECT TO FINAL DETAIL DESIGN

Walker
Walker Corporation Pty Ltd
ABN 99 061 179 263
PO Box 4073
Sydney NSW 2001
Level 21 Governor Macquarie Tower
1 Farrer Place Sydney NSW 2000
Telephone (02) 9233 9000
Facsimile (02) 9240 7400
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Project :
Proposed Warehouse / Storage & Office & Cafe Development

Address :
LOT 18
Ashburn Road, Ipswich

For :
Walker Corporation

Drawing :
Roof Plan

Scales : 1:100	Date : 06 OCT 16	Drawn : TP	Checked :

Status :
DA - Not for Construction

Project No :	Drawing No :	Issue :
	SP-CS-DA-003	D

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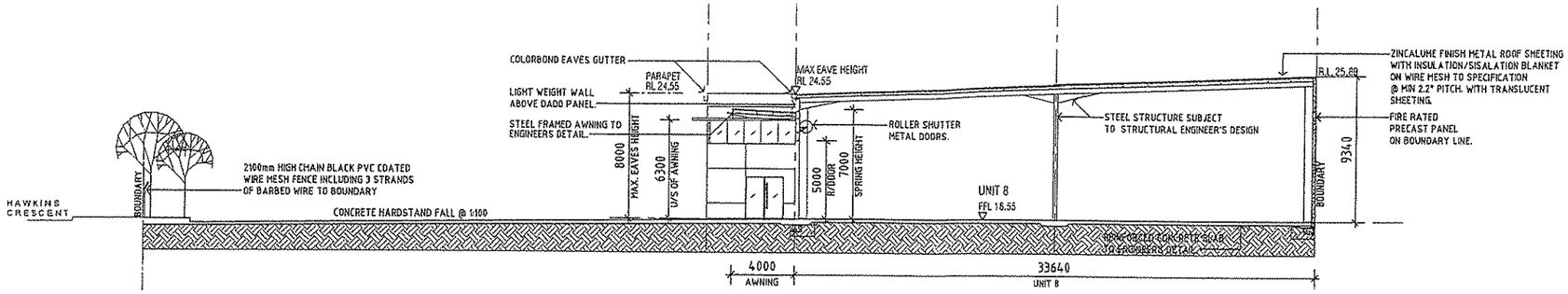
Revision	Amendment	Drawn	Date
A	ISSUED AS DA DOCUMENTS	TP	13.10.10



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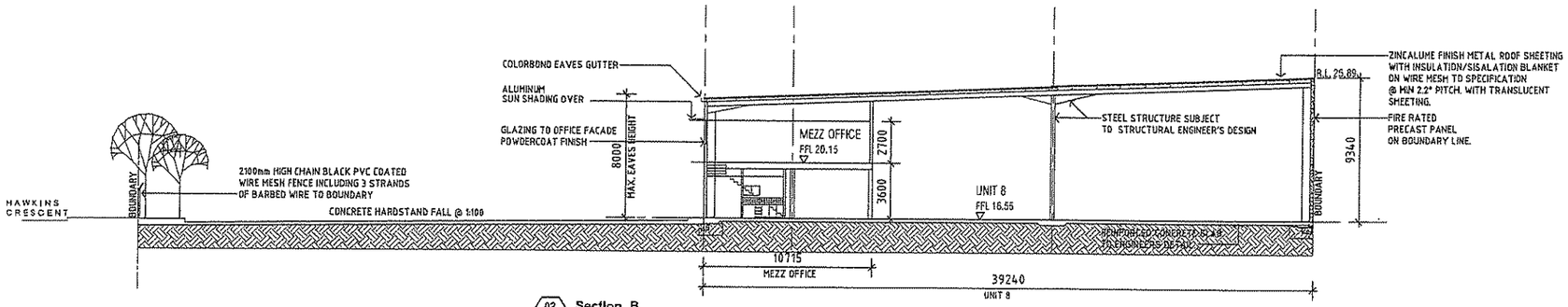

02 Section B
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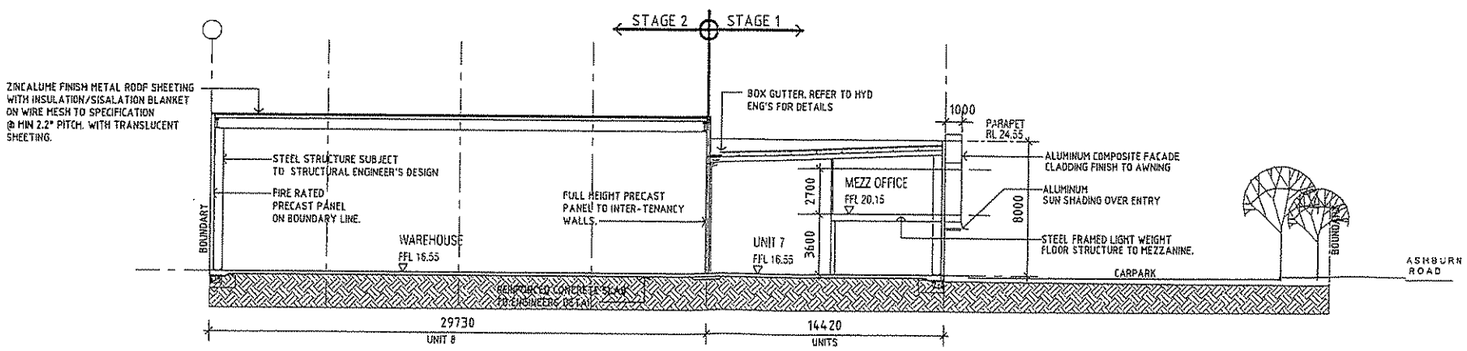

03 Section C
1:150

NOTE :
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Walker
Walker Corporation Pty Ltd
ABN 55 001 176 283
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Level 21 Governor Macquarie Tower
1 Farrer Place, Sydney NSW 2000
Telephone (02) 8273 9000
Facsimile (02) 9252 2400
Web walkercorp.com.au

Project :
Proposed Warehouse / Storage & Office & Cafe Development

Address :
LOT 18
Ashburn Road, Ipswich

For :
Walker Corporation

Drawing :
Sections

Scales	Date	Drawn	Checked
NSB	06 OCT 10	TP	

Status
DA - Not for Construction

Project No	Drawing No	Issue
	SP-CS-DA-004	B

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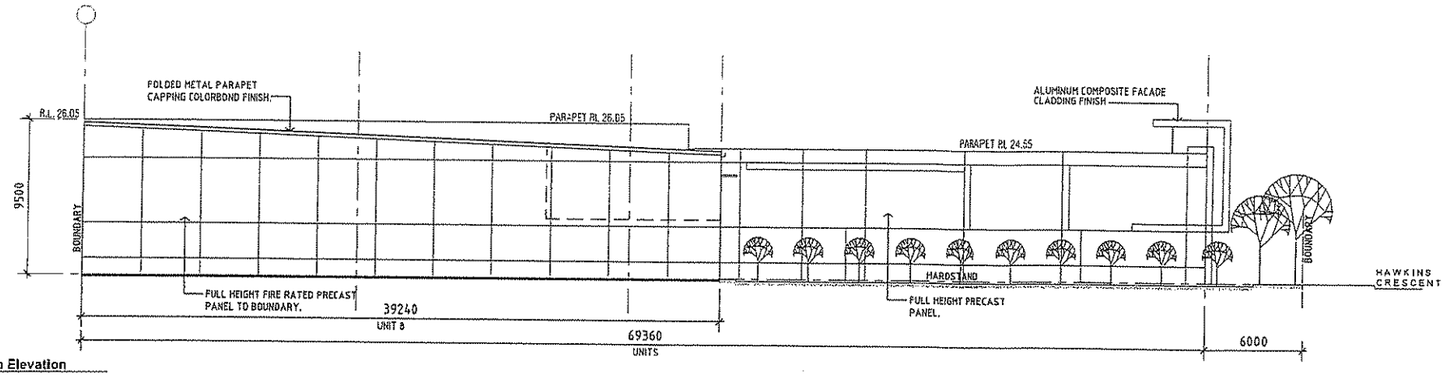
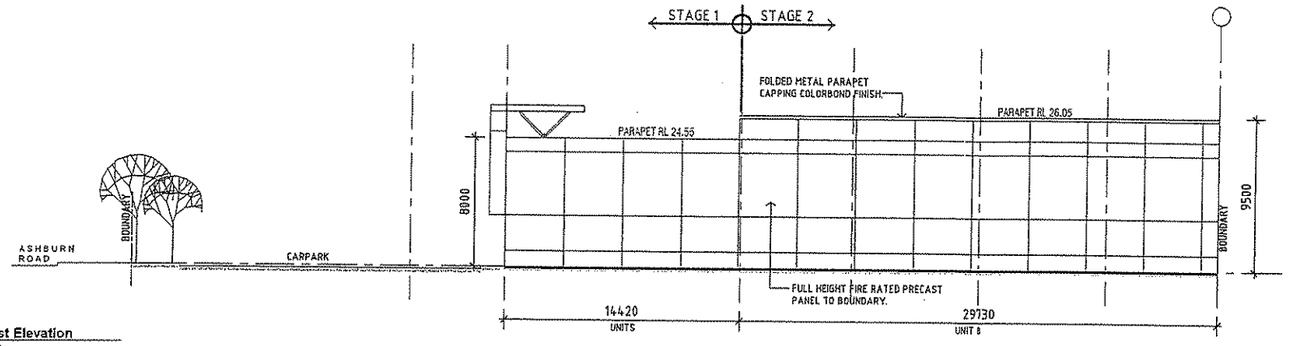
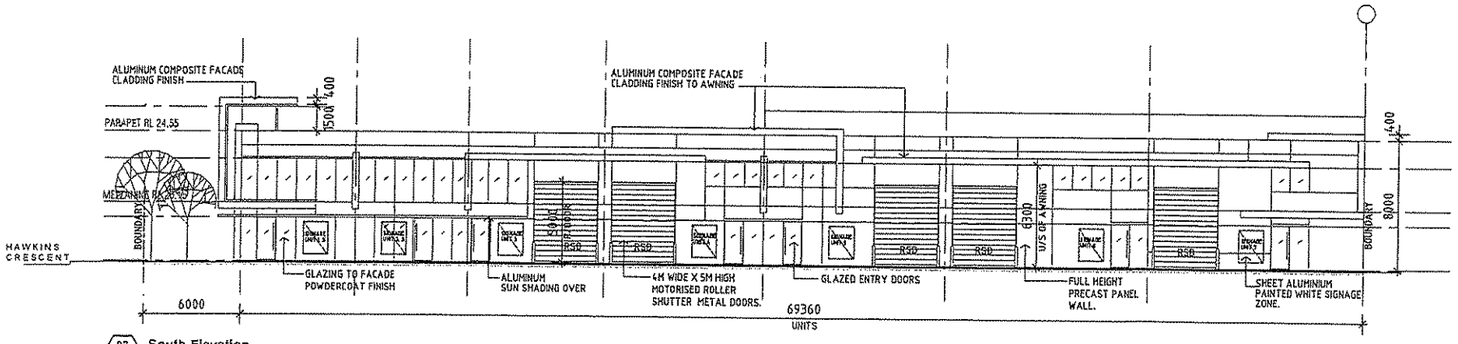
Revision	Amendments	Drawn	Date
A	ISSUED AS DA DOCUMENTS	TP	08.10.18
B	SIGNAGE SIZE/AREA ADJUSTED	AW	24.10.18
C	NORTH ELEVATION REVISED LANDSCAPE BUFFER ADDED BETWEEN STAGE 2 HARDSTAND AND STAGE 1 NORTH WALL	TP	05.12.18



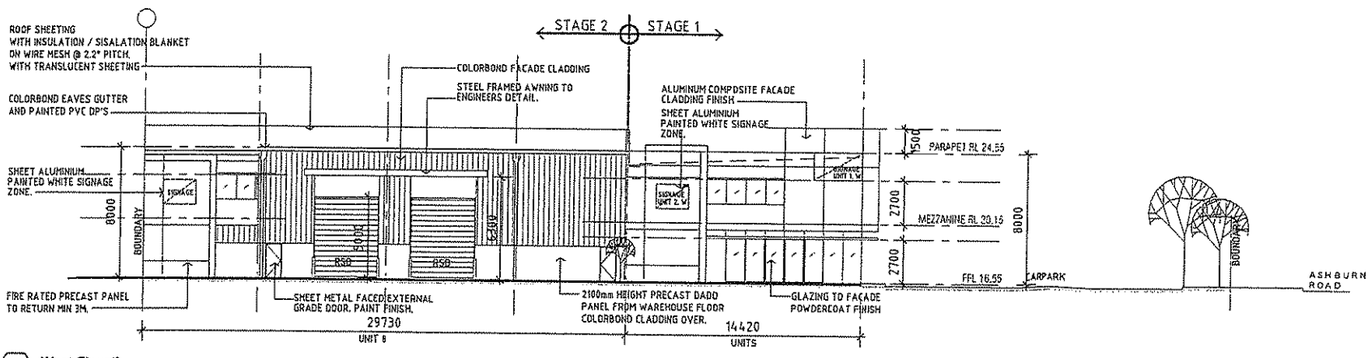
01 North Elevation
1:150



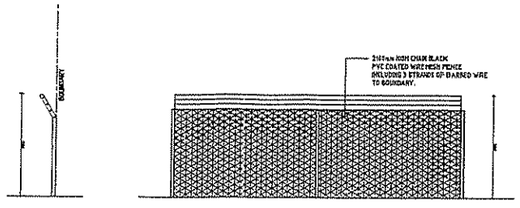
02 East Elevation
1:150



03 South Elevation
1:150



04 West Elevation
1:150



05 Perimeter Fence Detail
1:50

FINISHES LEGEND

PC1	PRECAST CONCRETE PANEL WITH EXTERNAL TEXTURED MASONRY PAINT FINISH.
AFG1	POWDER-COATED ALUMINIUM-FRAMED GLAZING SYSTEM
CP1	COLORBOND PROFILED WALL CLADDING.
RS	ZINCALUME ROOF SHEETING.
RSD	COLORBOND ROLLER SHUTTERS.

NOTE:
ALL REDUCED LEVELS ARE NOMINAL.(+/- 500mm)
SUBJECT TO FINAL DETAIL DESIGN

Walker
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A.B.N. 55 001 178 263
PO Box 1073
Sydney NSW 2001
Level 21 Governor Macquarie Tower
1 Farrer Place Sydney NSW 2000
Telephone (02) 9273 5400
Facsimile (02) 9252 7460
www.walkercorp.com.au

Project:
Proposed Warehouse / Storage & Office & Cafe Development

Address:
LOT 18
Ashburn Road, Ipswich

For:
Walker Corporation

Drawing:
Elevations

Scale @ A1	Date	Drawn	Checked
1:150	05.12.18	TP	

Status:
DA - Not for Construction

Project No.	Drawing No.	Issue
	SP-CS-DA-005	C

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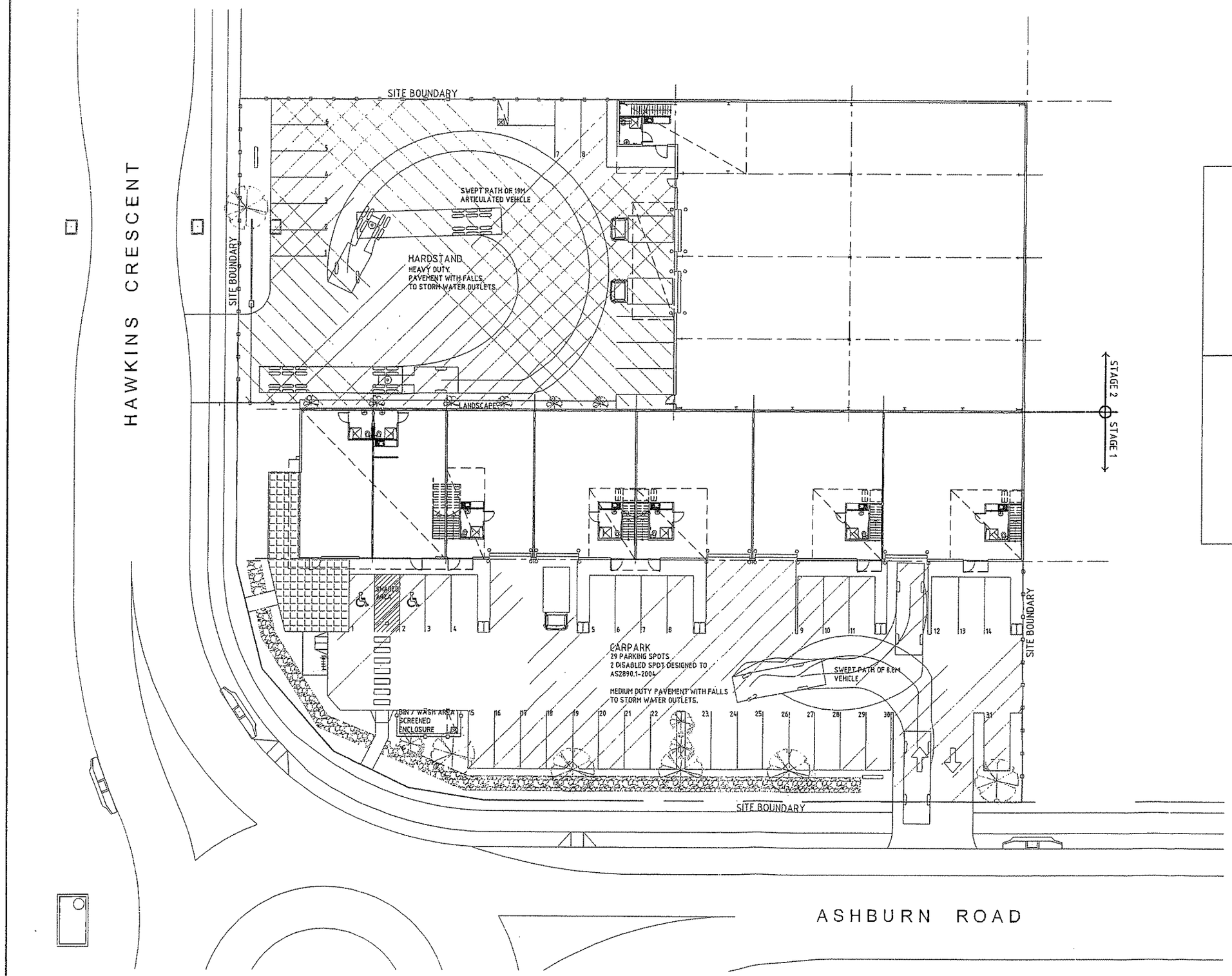
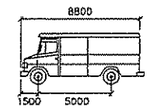
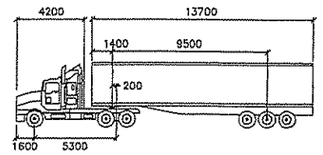
Revision :	Amendments :	Drawn :	Date :
A	ISSUED AS DA DOCUMENTS	TP	08.10.18
B	TRUCK INFORMATION ADDED	AM	26.10.18
C	CARPARK LAYOUT REVISED	TP	05.12.18
D	BIN WASH AREA LOCATION REVISED	TP	10.12.18





SVEH mm

Width	: 2500
Track	: 2500
Lock to Lock Time	: 6.0
Steering Angle	: 28.2



S ARTICULATED 19M mm

Tractor Width	: 2500	Lock to Lock Time	: 6.0
Trailer Width	: 2500	Steering Angle	: 27.7
Tractor Track	: 2500	Articulating Angle	: 70.0
Trailer Track	: 2500		

HEAVY DUTY PAVEMENT

MEDIUM DUTY PAVEMENT

Walker

Walker Corporation Pty Ltd
ABN 55 001 178 280
PO Box 4079
Sydney NSW 2001
Level 21 Governor Macquarie Tower
1 Farrer Place, Sydney NSW 2000

Telephone (02) 8272 8800
Facsimile (02) 9252 7450
Web walker.com.au

Project:
Proposed Warehouse / Storage & Office & Cafe Development

Address:
LOT 18
Ashburn Road, Ipswich

For:
Walker Corporation

Drawing:
Truck turning path

Scale:	Date:	Drawn:	Checked:
1:500	05.12.18	TP	

Status:
DA - Not for Construction

Project No:	Drawing No:	Issue:
	SP-CS-DA-007	D

B1 SHEET

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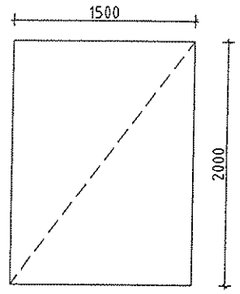
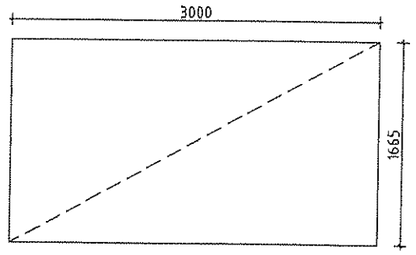
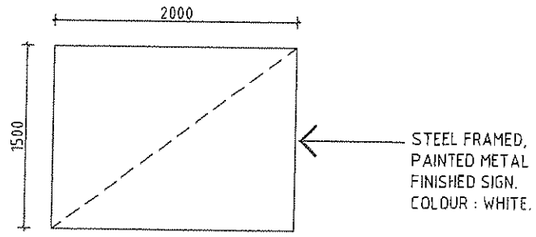
Revision:	Amendments:	Drawn:	Date:
A	SIGNAGE DIMENSIONS	AW	30.10.18
B	SIGNAGE DIMENSIONS		01.11.18
C	LETTERBOX ADDED TO SIGNAGE		14.12.18



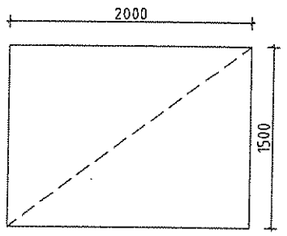
STAGE 1
TYPICAL SIGNAGE
UNIT 1 TO UNIT 7 (SOUTH)
AREA = 3 SQM X (7)



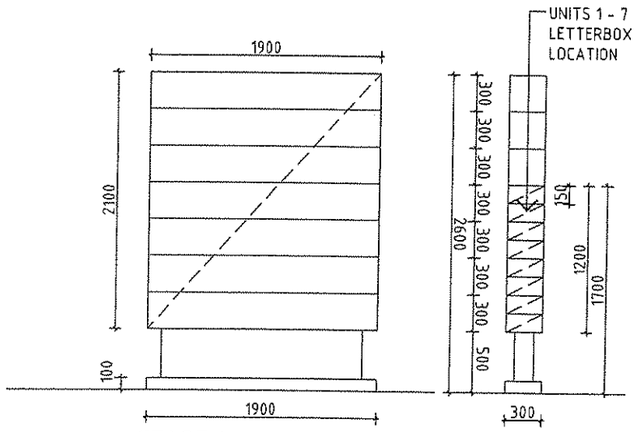
STAGE 1
UNIT 1 - FEATURE WALL (WEST)
AREA = 5 SQM



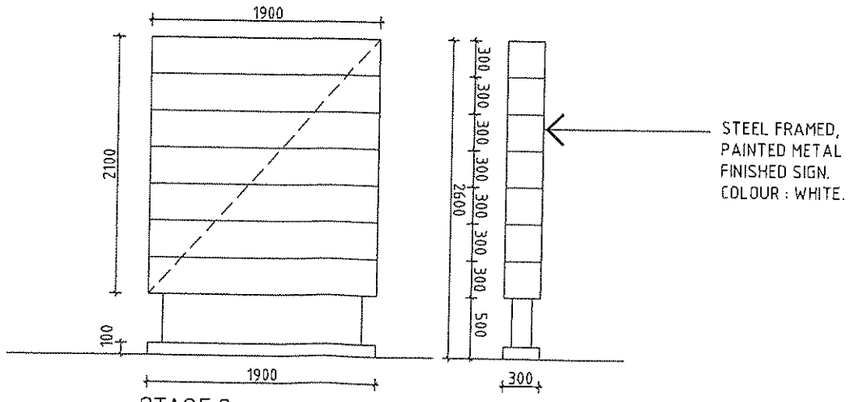
STAGE 1
UNIT 2 (WEST)
AREA = 3 SQM



STAGE 2
SIGNAGE (WEST)
AREA = 3 SQM



STAGE 1
SIGNAGE 1 (ASHBURN ROAD)
AREA = 4 SQM



STAGE 2
SIGNAGE 2 (HAWKINS CRESCENT)
AREA = 4 SQM

TOTAL SIGNAGE AREA = 40 SQM

NOTE :
ALL REDUCED LEVELS ARE NOMINAL.(+/- 500mm)
SUBJECT TO FINAL DETAIL DESIGN

Walker
Walker Corporation Pty Ltd
ABN 95 001 178 363
PO Box 4073
Sydney NSW 2001
Level 21 Governor Macquarie Tower
1 Farrer Place, Sydney NSW 2000
Telephone (02) 8273 9000
Facsimile (02) 9252 7490
Web walkercorp.com.au

Project :
Proposed Warehouse / Storage & Office & Cafe Development

Address :
LOT 18
Ashburn Road, Ipswich

For :
Walker Corporation

Drawing :
Signage plan

Scale :	Date :	Drawn :	Checked :
1:20	16 OCT 18	TP	

Status :
DA - Not for Construction

Project No :	Drawing No :	Issue :
	SP-CS-DA-008	C

7606/2010 HAWKINS CRESCENT, IPSWICH [redacted]

4 May 2011

MEMORANDUM

TO: SENIOR ENGINEERING OFFICER - [redacted]

FROM: SENIOR ENGINEERING OFFICER - [redacted]

RE: DEVELOPMENT APPLICATION
***SUSTAINABLE PLANNING ACT 2009*- SECTION 313**
ENGINEERING ASSESSMENT REPORT

Application No: 7606/2010

Applicant: Walker Bremer Park Pty Ltd

Property Location: 1 Hawkins Crescent, Bundamba, Qld, 4304

Proposal	Development	Approval Type
Warehouse/Storage, Office & Café Facility	Making a Material Change of Use of Premises	Development Permit.

Date Received: 8 November 2010

The following comments are made in respect of the above proposed development.

1. APPLICABLE CODES

This application has been assessed against the following codes:

(a) Ipswich Planning Scheme Policy 2 – Local Government Information;
(b) Ipswich Planning Scheme Policy 3 – General Works;
(c) Ipswich Planning Scheme Policy 5 – Infrastructure;
(d) Ipswich Planning Scheme Part 12, Div 5 – Reconfiguring a Lot Code;
(e) Ipswich Planning Scheme Part 12, Div 7 – Commercial and Industrial Code;
(f) Ipswich Planning Scheme Part 12, Div 9 – Parking Code;
(g) Ipswich Planning Scheme Part 12, Div 15 – Earthworks Code (Including lot filling);
(h) Australian Rainfall and Runoff (Engineers Australia);
(i) Ipswich City Council Standard Drawings;
(j) Guidelines for Planning and Design of Sewerage Schemes (Water Resources);
(k) Water Supply (Safety and Reliability) Act 2008;

The proposal generally complies with or has been conditioned to comply with the above codes.

2. OTHER DEVELOPMENT APPROVALS REQUIRED

From an engineering perspective, further Development Permits, as required by the *Sustainable Planning Act 2009,* shall be obtained in respect of any Operational Works in relation to this approval before any such works are commenced.

RECOMMENDATION

A. Based on engineering grounds only, it is recommended that the application for Code Assessment - Development Permit - Material Change Of Use of land at 1 Hawkins Crescent, Bundamba as proposed by Walker Bremer Park Pty Ltd and detailed on plan number SP-CS-DA-001 Issue B dated 6 October 2010, be approved, subject to the following terms and conditions being completed by the Developer, to the satisfaction of the Assessment Manager:

1. Terms

(a) RPEQ - A Registered Professional Engineer of Queensland, suitably qualified and experienced in the particular area of expertise required.

(b) QUDM – The *Queensland Urban Drainage Manual (2007 Edition)*, produced by the Queensland Department of Environment and Resource Management.

(c) QUU – Queensland Urban Utilities – trading name of the Central SEQ Distributor-Retailer Authority, providing water and wastewater services to Ipswich City under the South-East Queensland Water (Distribution and Retail Restructuring) Act 2009.

Conditions of Concurrence Agency – Queensland Urban Utilities

Under the South East Queensland Water (Distribution and Retail Restructuring) Act 2009, the Central Distributor-Retail Authority (Queensland Urban Utilities) is a concurrence agency with regard to this development assessment, and delegates its functions under the Sustainable Planning Act 2009 to Ipswich City Council. The following conditions for Water and Sewerage form part of this Decision Notice.

2. Water Supply

(a) The developer must provide a reticulated water supply which connects into Council's existing reticulation system.

(b) All works on live water mains must be carried out by QUU in accordance with *Planning Scheme Palicy 3 Section 11.1.2*, and at the Developer's expense.

(c) Council's water supply system has been designed to achieve the target levels of service as outlined in Planning Scheme Policy 3 Section 4.1.2 *Standard of Service*. It is the responsibility of the Developer to provide any fire fighting requirements over and above

Council's target levels of service, at their expense, internally and without adverse impact to Council's water supply system.

(d) As part of the application for Operational Works, the Developer must submit authorisation from Queensland Urban Utilities for the proposed works on or near Queensland Urban Utilities assets, adjacent to Ashburn Road.

(e) The Developer must lodge a private works request for QUU to:

(i) Supply and install a suitable metered water connection for the lot;

(ii) Amend the existing connection if necessary; and

(iii) Seal off any existing water connections if necessary.

The relevant fees must be paid and evidence of payment submitted to Council prior to use of the site.

3. Sewerage

(a) The developer must provide a sewerage reticulation system designed so as to command the whole of the site, which connects into Council's existing reticulation system adjoining the site, generally in accordance with the Martin Cosgrove and Associates' drawing number C111 Issue A, dated 12 May 2011. The connection must be bored beneath the road to prevent damage to and disruption in Hawkins Crescent.

(b) The Developer must pay the full cost for QUU to provide a suitable connection into the existing sewerage reticulation system. All works on live sewers must be carried out by QUU at the Developer's expense in accordance with *Planning Scheme Policy 3 Section 10.1.2*, unless arranged otherwise with QUU.

(c) Any existing sewerage or sanitary drainage that crosses proposed lot boundaries must be located, disconnected and removed to the satisfaction of the Assessment Manager.

4. Access and Parking

(a) Design and construction of all access and parking must be in accordance with the provisions of the Ipswich Planning Scheme, Part 12, Division 9 - Parking Code, the Australian Standards (2890 series), and the Traffic and Transport Planning Associates', Assessment of Traffic and Parking Implications report dated 20 November 2010.

(b) As part of the application for Operational Works, and in accordance with the Traffic and Transport Planning Associates', Assessment of Traffic and Parking Implications report, details of bicycle parking must be provided.

(c) Drawings indicating parking and aisle width dimensions in accordance with AS 2890 must be provided as part of the Operational Works submission.

(d) Drawings indicating the swept path analysis for the vehicles intended to use the site must be provided as part of the Operational Works submission.

(e) All access and parking must be designed and constructed in accordance with the provisions of the *Planning Scheme Parking Code* and *Australian Standards (2890 Series).*

(f) Parking and manoeuvring areas must accommodate the largest anticipated vehicle to use the site.

(g) Adequate facilities for servicing the development must be provided on site to ensure loading and/or unloading activities do not occur on-street.

(h) Provision must be made for all vehicles to enter and exit the site in forward gear.

(i) All parking, access and manoeuvring areas must be constructed of concrete, bitumen or equivalent materials approved by the Assessment Manager, and must be line-marked in accordance with the relevant Australian Standard.

(j) A concrete layback and driveway slab minimum 8.5m wide, must be constructed from the layback in Hawkins Crescent to the property boundary for access to the proposed development in accordance with Council's Standard Drawing SR 13.

(k) A concrete layback and driveway slab minimum 7.5m wide, must be constructed from the layback in Ashburn Road to the property boundary for access to the proposed development in accordance with Council's Standard Drawing SR 13.

5. <u>Stormwater</u>

(a) The Developer must provide all necessary internal and external stormwater drainage to service the development. Such drainage works (except for building gutters and downpipes) must be designed and constructed in accordance with QUDM such that the overall drainage system caters for a storm event with an ARI of 100 years.

(b) No ponding, concentration or redirection of stormwater may occur onto adjoining land unless specifically approved by Council in consultation with the owner of the adjoining land.

(c) All stormwater runoff from the development must be discharged in a manner and to a point to be approved by the Assessment Manager. In this instance, stormwater discharge from all impervious areas must be directed to the existing stormwater infrastructure in Hawkins Crescent.

(d) The Developer must provide a stormwater detention basin/s (or equivalent) on the subject land, which must be designed and constructed in accordance with *QUDM 2007.* The detention basin (or equivalent) must be constructed to ensure that flows at any point downstream in the catchment are not increased by the development for any combination of frequency and duration from the storm event with an ARI of one (1) year up to and including the storm event with an ARI of 100 years.

(e) An amended stormwater management plan must be submitted for approval at the Operational Works stage demonstrating compliance with Condition 3(d).

(f) Stormwater drainage plans and calculations must be submitted for approval by the Assessment Manager, as part of the Operational Works application.

6. Flooding

(a) Expensive Plant and equipment and stock must be located in the area of the site or building with the greatest flood immunity. The developer is to undertake a risk assessment to determine the floor level which maximises flood immunity having regard to this.

(b) The building materials and surface treatments used below RL 21m AHD are to be resistant to water damage and must not include wall cavities that may be susceptible to the intrusion of water and sediment. Flood resistant materials such as core filled concrete block are to be used as alternatives to materials such as plasterboard or particle board to minimise replacement/repair and provide for ease of cleaning in the event of a flood.

(c) Electrical installations must be sited in the area of greatest flood immunity.

(d) Electrical switchboards, main data servers and the like must be positioned above RL 21m AHD with all electrical and data installations below this level designed and constructed to withstand submergence in flood water.

(e) Access routes must be designed or alternative emergency evacuation routes provided so that in a flood event occupants can escape to a safe and secure area.

(f) All buildings must be designed to be capable of withstanding the static and dynamic loads, including debris loads, applicable to a flood event equivalent to the RL 21m AHD.

(g) Materials stored on site must -

(i) be limited to those that are readily able to be moved in a flood event;

(ii) not be hazardous or noxious, or comprise materials that may cause a deleterious effect on the environment if discharged in a flood event; and

(iii) where capable of creating a safety hazard by being shifted by flood waters, be contained in order to minimise movement in times of flood.

(g) The development is not permitted to increase the flood hazard (e.g. by way of increased depth, duration or velocity of flood waters or a reduction in warning times) for other properties.

7. Erosion & Silt Management

(a) As part of the application for Operational Works, the Developer must submit an Erosion and Silt Management Plan designed in accordance with *"Best Practice Erosion and Sediment Control"* published by the International Erosion Control Association (Australasia) November 2008, or equivalent.

(b) The Developer must install silt management facilities at commencement of construction and maintain these facilities until the development has been completed.

(c) Diversion drains and ponds, as necessary, must be installed on the site before any other work is undertaken on site to ensure that water containing silt, clay, solids or contaminants is contained and/or isolated.

(d) A procedure must be submitted with the engineering drawings for approval for maintaining the facilities, setting out the frequency of attention, with inspections to be made after each significant rainfall event.

(e) If the Assessment Manager determines that silt damage has occurred as a result of this development, the Developer shall be responsible for restoration of any damage. Such restoration must be completed within a time to be advised by the Assessment Manager. Should the Developer fail to complete the works determined by the Assessment Manager within the specified time, Council may elect to complete the works and recover all costs associated with that work from the Developer.

For this purpose, the Developer must lodge a $10 000 performance bond with Council, prior to the commencement of work, which shall only be released by Council at the completion of construction. Where Council determines that a draw-down of the bond is required, the Developer must restore the bond to its full amount within 10 days of a notice from Council to that effect.

8. Public Utilities

(a) Adequate provision must be made for the proposed development, to cater for the public utility services that would normally serve the development.

(b) Lighting of the carparks, aisles and circulation roadways must be in accordance with AS/NZS 1158.3.1:2005, and its design and construction must be certified by a qualified Electrical Engineer (RPEQ).

9. Easements

As part of the application for Operational Works, the Developer must demonstrate that the proposal is consistent with the terms of **all** easements on the property. Alternatively, the developer must submit the consent of the servient tenement in accordance with section 263 of the *Sustainable Planning Act 2009.*

10. Operational Works – Municipal Works
(ie Works being handed over to Council ie sewer)

External Municipal Works relates to those works external to the subject site and located in dedicated public areas, for example existing road or drainage reserve, or private property not subject to Developer ownership.

(a) Municipal works must be completed in accordance with a detailed design certified by an RPEQ and approved by Council Engineers with appropriate fees payable, a works pre-start meeting on-site and various detailed construction and audit inspections by Council Officers. In accordance with Planning Scheme Policy 3, a maintenance period applies for the works and a maintenance security deposit is required.

(b) The requirements of Council's Planning Scheme Policy 3 - General Works and Council's Standard Drawings shall apply to the municipal works. Where inconsistencies between any documents occur, Planning Scheme Policy 3 has precedence and must prevail to the extent of the inconsistency.

(c) All engineering drawings must be submitted in accordance with *Planning Scheme Policy 2 – Information Local Government May Request* and include as a minimum the following:

(i) Engineering drawings must be marked as confirmation that they have been checked and approved by an RPEQ;

(ii) The drawings must be submitted as four (4) hardcopy, A3 size sets. Reports and supporting information must be submitted as two (2) hardcopy sets.

The submission must also include a compact disk containing electronic data as follows:

(a) One (1) full set of all engineering drawings contained in one file;

(a) Separate individual files containing layout plans for sewerage, water supply and drainage;

(b) Any reports submitted in support of the application. Each report must be included as a separate file; and

(c) An index of all files on the compact disk including descriptions of contents of each file.

All files must be submitted in PDF format.

(d) The Developer must submit a Certificate of Design signed by an RPEQ, certifying that the design is in accordance with all conditions of development approval, relevant engineering standards, Council's requirements and standards, and sound engineering practice.

(e) All works must be supervised by an RPEQ competent in civil works and must be undertaken by a nominated principal contractor experienced in the construction of municipal works. Council reserves the right to request evidence of the principal contractor's competency. Should the contractor not be able to demonstrate the necessary competency to the satisfaction of the Assessment Manager or if the contractor

has constructed substandard works for Council in the past, Council reserves the right to reject the nominated contractor.

(f) Prior to the Pre-Start meeting, the Developer must submit to Council a Development Performance Bond of not less than 10% of the value of external municipal works (minimum $5,000.00), as security for the performance of the various construction and certification obligations (including provision of "As Constructed" information).

(g) Municipal works must be accepted "On Maintenance" prior to commencement of use. On completion of the works an "On Maintenance" acceptance inspection may be arranged by submission of a certificate signed by an RPEQ certifying that the works have been constructed in accordance with the approved plans and specifications and in compliance with Council's construction standards. It is expected that the RPEQ will undertake the necessary inspections to make this certification.

(h) Upon formal acceptance of the works "On Maintenance", the Development Performance Bond shall be reduced to an amount not less than 5% of the value of the works or $5,000.00 whichever is greater, and shall be retained by Council during the maintenance period as a Maintenance Security Bond for the performance of the maintenance obligations. Alternatively the Developer may submit a separate Maintenance Security Bond of equivalent value. This Bond shall be retained by Council in accordance with *Planning Scheme Policy 3*, until the works are accepted "Off Maintenance" by Council.

(i) "As Constructed" information and final construction issue engineering design drawings, compiled in accordance *with Planning Scheme Policy 2 for Municipal Works*, with a Contributed Assets Financial Apportionment Form, must be submitted to Council and approved prior to the formal acceptance of the works "On Maintenance". This data must be submitted electronically on a compact disk labelled appropriately to indicate the contents.

(j) Council reserves the right to require further amendments and/or additions at a later date, should design errors or omissions become apparent in regard to the works relevant to the Operational Works approval.

11. <u>Operational Works – Internal Works</u>
(ie Works not being handed over to Council)

(a) Engineering plans must be submitted to Council prior to the commencement of construction on site and must show full construction details, layout dimensions, and finished surface levels.

(b) Engineering drawings must be marked as confirmation that they have been checked and approved by an RPEQ.

(c) The drawings must be submitted as four (4) hardcopy A3 size sets and one (1) full size set with two (2) hardcopy sets of any reports and supporting information. One set of drawings will be returned to the applicant with the Decision Notice. The submission must also include a compact disk containing electronic data as follows:

(i) A full set of all engineering drawings contained in one file;

(ii) Separate individual files containing layouts for sewerage, water supply and drainage;

(iii) Any reports submitted in support of the application. Each report must be included as a separate file; and

(iv) An index of all files on the Compact Disc including descriptions of contents of each file.

All files must be submitted in PDF format.

Where municipal works are also being undertaken, it is usually appropriate to make a combined submission.

(d) The Developer must submit a Certificate of Design signed by an RPEQ, certifying that the design is in accordance with all conditions of the development approval, relevant engineering standards, Council's requirements and standards, and sound engineering practice.

(e) On completion of the works a certificate signed by an RPEQ must be submitted to Council, certifying that the works have been constructed in compliance with the approved plans and specifications and in accordance with Council's construction standards. The RPEQ must personally undertake the necessary inspections to make this certification.

(f) Council reserves the right to require further amendments and/or additions at a later date, should design errors or omissions become apparent.

12. General

(a) All works required for this development must take due regard of any and all existing services and, if considered necessary by the relevant authority or the Assessment Manager, such works must be altered at the cost of the Developer.

(b) Any fill intended to be placed over Council's underground services must be approved in advance by the Assessment Manager.

(c) All parking, access and manoeuvring areas must be constructed of concrete, bitumen or equivalent materials approved by the Assessment Manager, and must be line-marked in accordance with the relevant Australian Standard. Any proposed hardstand areas must be finished level with the design finished level of surrounding surfaces.

(d) All disturbed verge, park, allotment and other grassed areas must be rehabilitated and revegetated (including provision of topsoil to a minimum depth of 50mm) and turfed or seeded to the satisfaction of the Assessment Manager and in accordance with Planning Scheme Policy 3 - General Works (specifically part 6.1.6). Grass cover must be achieved as early as possible during the development and a minimum grass coverage of 80% must be achieved.

B. Special Advice

1. Portable Long Service Leave

Where the works are valued at $80,000 or more and match the definition of Building and Construction Industry, the *Building and Construction Industry (Portable Long Service Leave) Act 1991* requires that evidence of payment of the Portable Long Service Leave (QLeave) Levy be received by Council as a condition of issuing a Development Permit. This applies to Building Works, Operational Works and Plumbing and Drainage Works applications, as defined under the *Sustainable Planning Act 2009.*

If such evidence is not received by the time of issuing the Decision Notice, Council may only issue a Preliminary Approval, notifying the Developer that the application is approved, but not permitting commencement of Operational Works.

All statutory timeframes applying under the *Sustainable Planning Act 2009* for appeals and expiry of the Approval continue in force after issuing of the Decision Notice containing the Preliminary Approval.

If a Preliminary Approval is issued in the absence of evidence of payment of the QLeave Levy, a subsequent Development Permit will have to be issued by Council upon receipt of evidence of payment. This will require a new Application and fees will apply.

If you require clarification in regard to the *Building and Construction Industry (Portable Long Service Leave) Act 1991*, you should contact QLeave on 1800 803 481 (free call) or (07) 3212 6855.

2. Water Meter

All new commercial, industrial or large multi-residential property connections with a projected annual consumption greater than or equal to 20,000kL must have installed, at the customer's expense, an electronic water meter with a data logger and an approved back-to-base communication system as specified by QUU.

Properties with electronic water meters are subject to billing on a monthly basis in accordance with the metered monthly consumption.

If the proposed development is likely to have an annual water consumption equal to or greater than 20,000kL, the Developer will be required to contact QUU on telephone 13 26 57 to arrange installation of an electronic flow meter.

[redacted]
SENIOR ENGINEERING OFFICER

(b) for supporting the order, may make an order restraining the party from entering premises.

349 Defects in notices

(1) If an application is made to a tribunal by a lessor for a termination order because of a failure to leave, the tribunal may make the order if it is satisfied it is appropriate to make the order in all the circumstances of the case, even though the notice to leave contains a defect.

(2) If an application is made to a tribunal about a notice of intention to leave, the tribunal may make any order it is satisfied it is appropriate to make in all the circumstances of the case, even though the notice contains a defect.

Editor's notes—

See section 326 (Notice to leave) for requirements for the notice.

See section 327 (Notice of intention to leave) for requirements for the notice.

Division 7 Recovery of possession of premises

350 Issue of warrant of possession

(1) If a tribunal makes a termination order on an application made other than by a tenant, it also must issue a warrant of possession.

(2) If the termination order is made on an application made because of excessive hardship, as well as issuing the warrant of possession, the tribunal may make any other order it considers appropriate including, for example, an order that the applicant pay compensation to the other party to the agreement for the other party's loss of the tenancy.

351 Warrant of possession

(1) A warrant of possession must—

(a) authorise a police officer, or a stated authorised person, to enter the premises and give possession of the premises to the person in whose favour the termination order was made; and

(b) authorise the person to whom the warrant is directed to exercise the powers under the warrant with necessary and reasonable help and force; and

(c) state the hours of the day when entry may be made; and

(d) state the day the warrant ends.

(2) The registrar must give written notice of the issue of a warrant of possession to the former tenant as soon as practicable after the warrant is issued.

(3) If the registrar can not comply with subsection (2) after reasonable efforts (whether before or after the warrant is executed), the validity of the warrant is not affected merely because of the noncompliance.

(4) A warrant of possession takes effect on the day stated in the warrant for it to take effect and ends—

(a) if paragraph (b) does not apply—14 days after it takes effect; or

(b) if the tribunal is satisfied that, because of special circumstances, the warrant should continue until a later day stated in the warrant—on the later day.

Examples of special circumstances under subsection (4)(b)—

1 natural disasters, including floods, affecting the area in which the premises are located

2 the remoteness of the premises

(5) However, the day on which the warrant takes effect must not be later than 3 business days after it is issued.

(6) If a warrant of possession (the ***original warrant***) is lost or destroyed before it ends, the registrar may issue a copy of the warrant.

(7) A copy of a warrant issued under subsection (6)—

(a) has effect as if it were the original warrant; and

(b) is taken to have been issued when the original warrant was issued; and

(c) ends when the original warrant ends.

352 Execution of warrant of possession

The person to whom a warrant of possession is directed may exercise the powers under the warrant in the way stated in the warrant.

353 Way of recovering possession of premises

(1) This section applies to premises in the possession of a person—

(a) as the tenant under an agreement; or

(b) as the former tenant under an agreement holding over after termination of the agreement.

(2) A person must not recover possession of the premises other than in a way authorised under this Act.

Maximum penalty for subsection (2)—50 penalty units.

354 Obstruction of person executing warrant of possession

A person must not obstruct a person in the exercise of a power under a warrant of possession, unless the person has a reasonable excuse.

Maximum penalty—50 penalty units.

7606/10[redacted]

SCANNED
DEVELOPMENT BRANCH
26 MAY 2011
Doc No: 5272847

20 May 2011

MEMORANDUM

TO: TEAM COORDINATOR (TEAM CENTRAL)

FROM: SENIOR PLANNER (DEVELOPMENT)[redacted]

RE: DEVELOPMENT APPLICATION - CODE ASSESSMENT
***SUSTAINABLE PLANNING ACT 2009* - SECTION 313**

Appn No: 7606/10

Applicant: Walker Corporation Pty Ltd

Real Property Description: Part of Lot 101 SP151177

Property Location: 1 Hawkins Crescent, Bundamba

Division: 4

Proposal	Development	Approval Type Requested
Service/trades use (6 tenancies), business use - café (1 tenancy) and business use – office (1 tenancy)	Making a Material Change of Use of Premises	Development Permit.
Advertising Devices	Carrying Out Operational Works	Development Permit

Date Received: 8 November 2010

Start Date for Decision Stage: 30 March 2011

Stat. Date for Determination: 3 May 2011

Site Area: 28,238m²

Zone: Regional Business and Industry (Medium Impact) – subject to the provisions of the Bremer Business Park Preliminary Approval.

Sub Area: Highway Sub-Area

SITE LOCATION

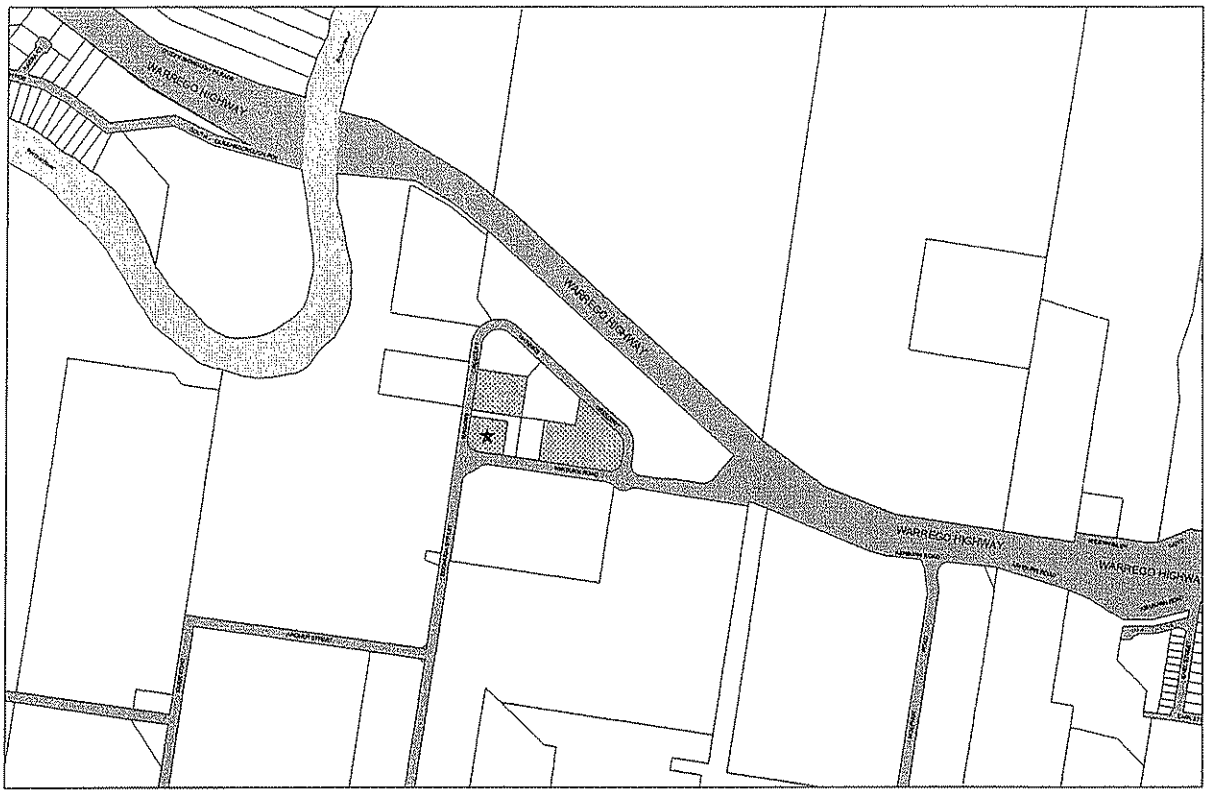


Figure 1 – Site Location

PROPOSAL PLAN

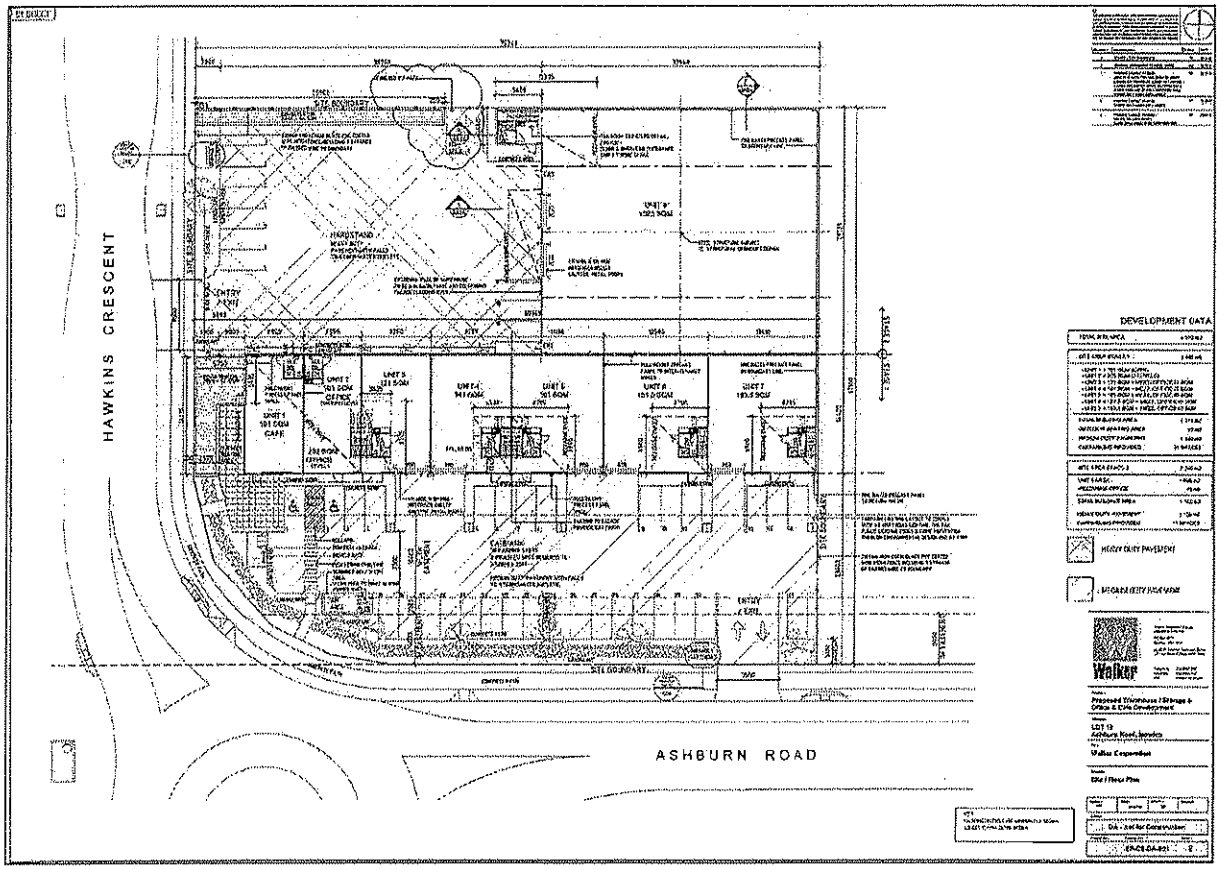


Figure 2 – Site Plan

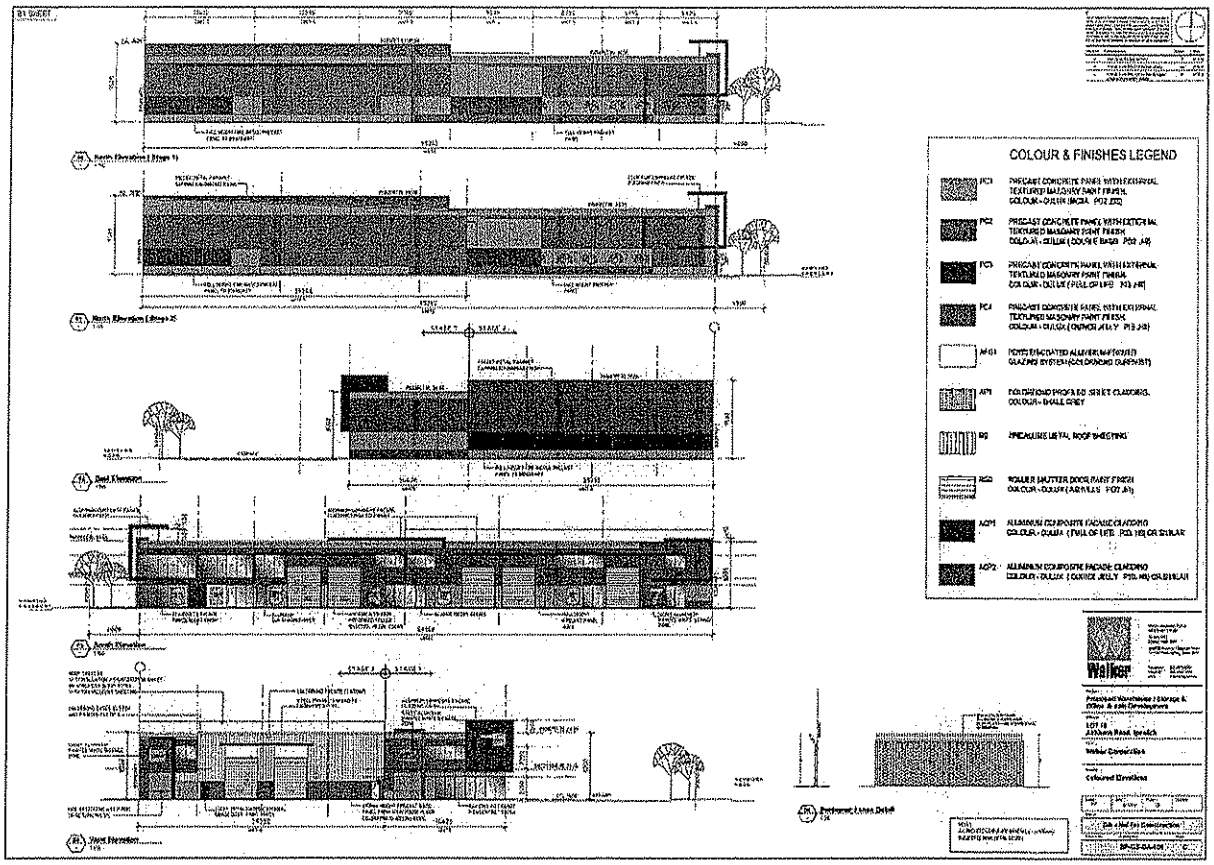


Figure 3 - Elevations

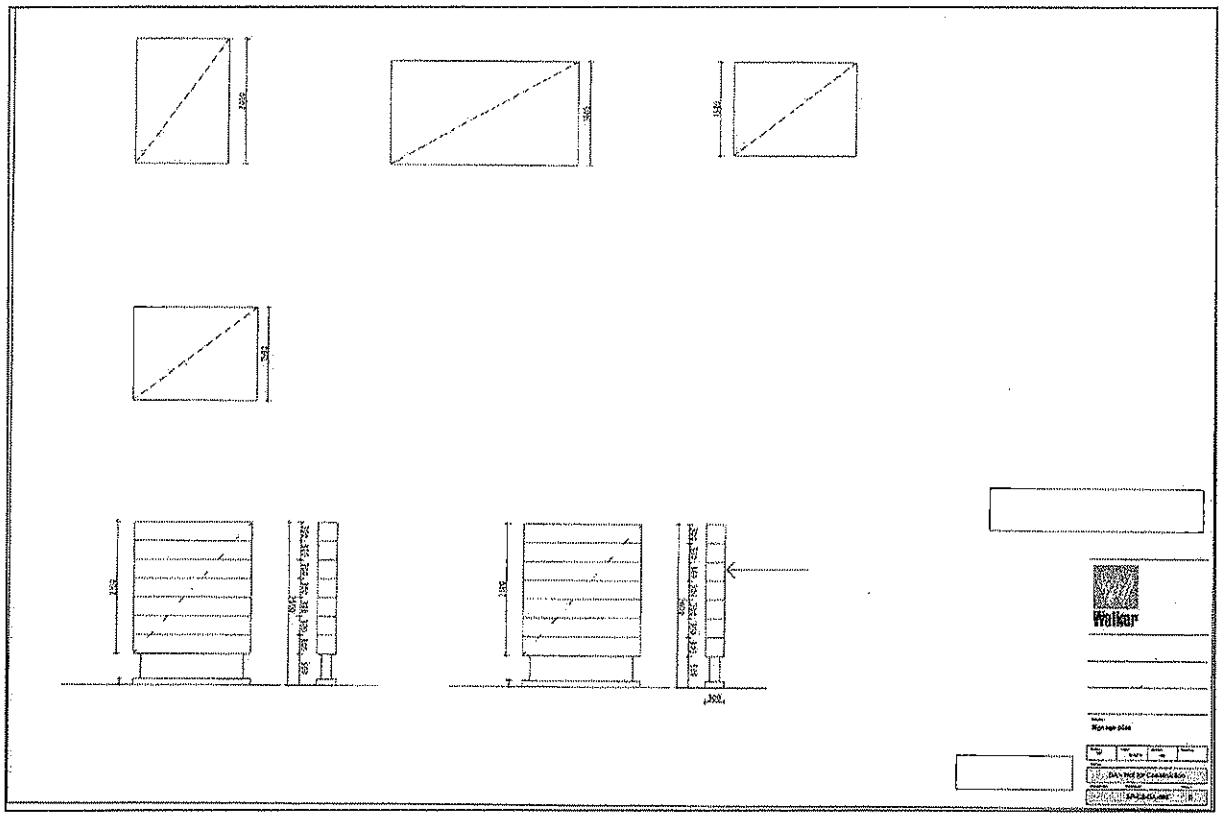


Figure 4 – Signage Plan

SUMMARY

SITE ADDRESS: 1 Hawkins Crescent, BUNDAMBA
APPLICATION TYPE: 7606/10
ZONE: Regional Business and Industry (Medium Impact)
OVERLAYS: OV5 1 in 20 and 1 in 100 Flood Line and OV7 Building Height Restriction Area 15m, Transitional Surface and Existing Committed Urban Townships.
APPLICANT: Walker Corporation Pty Ltd
OWNER: Walker Bremer Park Pty Ltd
APPLICATION NO: 7606/10
DIVISION: 4
AREA: 28,238m^2
REFERRAL AGENCIES: Nil
EXISTING USE: Vacant Land
PREVIOUS RELATED APPROVALS: 3356/02 – preliminary approval to override the planning scheme (Bremer Business Park Preliminary Approval); and 1837/07 – reconfiguring a lot (three (3) lots into twenty-eight (28) lots).
DATE RECEIVED: 8 November 2010
DECISION STAGE START DATE: 30 March 2011
EXPECTED DETERMINATION DATE: 3 May 2011

PROPOSAL:

The applicant proposes to establish an 8 tenancy building, including both industrial and commercial tenancies, on proposed lot 18 (not yet created) of reconfiguring a lot application number 1837/07 within the Citiswich business park at Bundamba. The building is proposed to contain six (6) service/trades use tenancies, one (1) business use (café) tenancy and one (1) business use (office) tenancy, to be constructed in two stages. Stage one proposes seven tenancies facing and gaining access via Ashburn Road, and stage two proposes one larger tenancy to the north of the stage 1 building, which is proposed to gain access via Hawkins Crescent. The car parking and manoeuvring areas for each stage are proposed to be separated and as such; the two stages will essentially operate independently. The application also contains a component for advertising devices to provide signage for each of the proposed tenancies.

OTHER RELEVANT INFORMATION:

The development was fully inundated in the 2011 flood event. Relevant conditions are recommended to be included to ensure the building is designed, constructed and managed to minimise the impacts associated with any flood event.

An infrastructure agreement exists over the subject property which sets an infrastructure contribution credit 22.5 NRU per hectare for water and sewerage infrastructure, and 140 VT per hectare for roadworks.

PUBLIC NOTIFICATION:

Not applicable.

NOTEWORTHY CONDITIONS OF APPROVAL INCLUDE:

Material Change of Use – Service trades use (6 tenancies), business use (café – 1 tenancy) and business use (office – 1 tenancy)

- The developer must satisfactorily complete all conditions as required by Council's Negotiated Decision Notice 1837/07 dated 8 July 2008 and as lawfully amended. This approval does not take effect until all conditions of this approval are satisfied.
- Expensive plant and equipment and stock must be located in the area of the site or building with the greatest flood immunity. The developer is to undertake a risk assessment to determine the floor level which maximises flood immunity having regard to this.
- The building materials and surface treatments used below RL 20.75m AHD are to be resistant to water damage.
- Electrical installations must be sited in the area of greatest flood immunity. Electrical switchboards, main data servers and the like must be positioned above RL 20.75m AHD with all electrical and data installations below this level designed and constructed to withstand submergence in flood water.
- All buildings must be designed to be capable of withstanding the static and dynamic loads, including debris loads, applicable to a flood event equivalent to the RL 20.75m AHD.
- Materials stored on site must be limited to those that are readily able to be moved in a flood event; not be hazardous or noxious, or comprise materials that may cause a deleterious effect on the environment if discharged in a flood event; and, where capable of creating a safety hazard by being shifted by flood waters, be contained in order to minimise movement in times of flood.
- The development is not permitted to increase the flood hazard (e.g. by way of increased depth, duration or velocity of flood waters or a reduction in warning times) for other properties
- The developer must submit to Council for approval a noise management plan which details measures designed to minimise noise impacts from the development.
- The developer must pay $104,654.00 for infrastructure contributions.
- Standard conditions are included in the recommendation in relation to water and wastewater requirements under delegation from the Central SEQ Distributor-Retailer Authority (QUU).

Operational Works – Advertising Devices

- This approval is limited to the advertising of the proposed service/trades use, business use (café) and business use (tenancy) development at 1 Hawkins Crescent, Bundamba, identified as part of Lot 1010 on SP151177, as detailed on the approved plans. Advertising of any other nature will require separate approval.

In summary, it is considered that the proposal to permit the development of a service/trades use (6 tenancies), business use - café (1 tenancy) and business use – office (1 tenancy), and associated advertising devices, is suitable for the subject site and should be approved, subject to the conditions below.

RECOMMENDATION

A. That the developer be advised that development application no. 7606/10 is determined as outlined below and is subject to the conditions specified in Attachment A below.

1. Decision Details:

Development	Approval Type	Decision	Relevant Period
Material Change of Use of Premises (Service/trades use (6 tenancies), business use - café (1 tenancy) and business use – office (1 tenancy))	Development Permit	Approved subject to the conditions set out in Attachment A and B – Assessment Manager Conditions	4 years
Operational Works – Advertising Devices	Development Permit	Approved subject to the conditions set out in Attachment A – Assessment Manager Conditions	2 years

2. Preliminary Approval Affecting the Planning Scheme:

Not applicable to this decision.

3. Approved Plans

The approved plans for this development approval are:

(a) the plans referred to in the table of approved plans (including the amendments that are required to be made to those plans); and
(b) where the amended version of the plans referred to in the table of approved plans have been approved by the assessment manager, the amended version of those plans; and
(c) the approved plans are attached to this decision notice.

Table of Approved Plans:

Plan/ Document No	Description	Prepared By	Date	Amendments
SP-CS-DA-001 Issue E	Site/Floor Plan	Walker Corporation	25 March 2011	N/A

SP-CS-DA-002 Issue C	Mezzanine Floor Plan	Walker Corporation	16 December 2010	N/A
SP-CS-DA-009 Issue C	Waste Management Plan Truck turning path	Walker Corporation	25 March 2011	N/A
SP-CS-DA-006 Issue C	Coloured Elevations	Walker Corporation	6 December 2010	N/A
SP-CS-DA-007 Issue D	Truck turning path	Walker Corporation	16 December 2010	N/A
Job Number 10162 Drawing Number C111 Issue A	Proposed Sewer Layout Plan	Martin Cosgrove and Associates Pty Ltd	12 May 2011	N/A
SP-CS-DA-008 Issue C	Signage Plan	Walker Corporation	16 December 2010	N/A

Note: Amended plans shall be to the satisfaction of the assessment manager and submitted for endorsement prior to the submission of a building works/ operational works application or the plan of subdivision for signing.

4. Codes for Self Assessable Development

Not applicable to this decision.

5. Other Necessary Development Permits and/or Compliance Permits

Further development permits, as required by the *Sustainable Planning Act 2009,* shall be obtained in respect of any operational works, building works and plumbing works in relation to this approval prior to the commencement of works/use pursuant to the *Sustainable Planning Act 2009*.

6. Details of any Compliance Assessment Required for Documents or Work in Relation to the Development

Not applicable to this decision.

7. Submissions

Not applicable to this decision.

8. Conflict with a Relevant Instrument and Reasons for the Decision Despite the Conflict

Not applicable to this decision.

9. Referral Agencies

Not applicable to this decision.

10. When Development Approval Lapses

The relevant period for this approval is as outlined in part 1 –'decision details' of this decision notice, starting the day the approval takes effect. This development approval lapses is in accordance with section 341 of the *Sustainable Planning Act 2009*.
Should the assessment manager determine a new relevant period in writing, prior to the lapsing of this approval, then the use may continue for a further period of time, as specified in writing by the assessment manager.

11. When Section 242 Preliminary Approval Lapses

Not applicable to this decision.

12. Conditions of Assessment Manager (Ipswich City Council)

(a) Refer to Attachment A for Assessment Manager conditions.

(b) Refer to Attachment B for Assessment Manager conditions for water and wastewater requirements issued by Council under delegation from the Central SEQ Distributor-Retailer Authority.

13. Appeal Rights

Attachment C is an extract from the *Sustainable Planning Act 2009* which details the applicant's appeal rights and the appeal rights of any submitters regarding this decision.

SENIOR PLANNER (DEVELOPMENT)

I have this day adopted the recommendation specified in this report.

Such action was taken pursuant to the delegation entitled *Sustainable Planning Act 2009* and *Sustainable Planning Regulation* (Distributor-Retailer) and the delegation entitled "*Sustainable Planning Act 2009* - Assessment Manager" and granted to me by the Chief Executive Officer authorising the exercise of the powers of 'assessment manager' set out in Schedule 2 in relation to the *Sustainable Planning Act 2009* granted to me by the Chief Executive Officer authorising the exercise of the powers.

Natalie Plumbe
TEAM COORDINATOR (CENTRAL)

Date: 25/5/11

Attachment A
File No: 7606/10
Location: 1 Hawkins Crescent, Bundamba
Assessment Manager (Ipswich City Council) Conditions

Conditions applicable to this approval under Sustainable Planning Act:

1. **Material Change of Use – Service trades use (6 tenancies), business use (café – 1 tenancy) and business use (office – 1 tenancy)**

1. Basis of Approval

This approval is subject to these conditions, the facts and circumstances set out in the application and adherence to all relevant Council Local Laws and/or Planning Scheme Policies.

2. Minor Alterations

Notwithstanding the requirements detailed in this approval, any other minor alterations and/or modifications accepted in writing by the assessment manager will suffice.

3. Development Plans

The development of the site must be undertaken generally in accordance with the approved plans outlined in part 3 of the decision notice.

4. Compliance with Conditions

Unless otherwise stated, all conditions must be completed prior to commencement of the change of use of the site or as determined in writing by the assessment manager.

5. Particular Use

This approval is for the particular use stated, and does not imply approval for other similar uses. The use of any of the structures associated with the service/trades use (6 tenancies), business use - café (1 tenancy) and business use – office (1 tenancy) inclusive of car parking and any associated outdoor areas on the site, are not permitted to be used for any other purpose, unless, in the written opinion of the assessment manager, such use is ancillary and incidental to the predominant use of the site for a service/trades use (6 tenancies), business use - café (1 tenancy) and business use – office (1 tenancy).

6. Completion of Conditions of Previous Approval

The developer must satisfactorily complete all conditions as required by Council's Negotiated Decision Notice 1837/07 dated 8 July 2008 and as lawfully amended. This approval does not take effect until all conditions of this approval are satisfied.

7. Staging

The staging of the development must be in accordance with Plan SP-CS-DA-001 Revision E, prepared by Walker Corporation and must be as follows:

(a) Stage 1 – proposed tenancies numbers one (1) to seven (7)

(b) Stage 2 – proposed tenancy number eight (8)

8. Flooding

(a) Expensive plant and equipment and stock must be located in the area of the site or building with the greatest flood immunity. The developer is to undertake a risk assessment to determine the floor level which maximises flood immunity having regard to this.

(b) The building materials and surface treatments used below RL 20.75m AHD are to be resistant to water damage and must not include wall cavities that may be susceptible to the intrusion of water and sediment. Flood resistant materials such as core filled concrete block are to be used as alternatives to materials such as plasterboard or particle board to minimise replacement/repair and provide for ease of cleaning in the event of a flood.

(c) Electrical installations must be sited in the area of greatest flood immunity.

(d) Electrical switchboards, main data servers and the like must be positioned above RL 20.75m AHD with all electrical and data installations below this level designed and constructed to withstand submergence in flood water.

(e) Access routes must be designed or alternative emergency evacuation routes provided so that in a flood event occupants can escape to a safe and secure area.

(f) All buildings must be designed to be capable of withstanding the static and dynamic loads, including debris loads, applicable to a flood event equivalent to the RL 20.75m AHD.

(g) Materials stored on site must -

(i) be limited to those that are readily able to be moved in a flood event;

(ii) not be hazardous or noxious, or comprise materials that may cause a deleterious effect on the environment if discharged in a flood event; and

(iii) where capable of creating a safety hazard by being shifted by flood waters, be contained in order to minimise movement in times of flood.

(g) The development is not permitted to increase the flood hazard (e.g. by way of increased depth, duration or velocity of flood waters or a reduction in warning times) for other properties.

9. Hours of Construction

Unless otherwise determined in writing by the assessment manager, hours of construction must not exceed:

Monday to Saturday 6:30am to 6:30pm

Construction work must not be conducted from or on the premises outside the above hours or on Sundays or public holidays.

10. Hours of Operation

(a) Unless otherwise determined in writing by the assessment manager, hours of operation for the business use (café) must not exceed:

Monday to Sunday 6:30am to 6:30pm

Work or business must not be conducted from the premises outside the above hours or on Sundays or public holidays. Hours of operation are subject to any requirements of Condition 10 – Noise Management Plan.

(b) Unless otherwise determined in writing by the assessment manager, the operating hours for the service trades use (6 tenancies) and office (1 tenancy) are not limited, subject to any requirements of Condition 10 – Noise Management Plan. In the event that Council receives ongoing complaints about noise that Council considers are not frivolous or vexatious, then the hours of operation above may be reviewed.

11. Noise Management Plan

(a) Prior to the commencement of any works/issue of any building works approval, the developer must submit to Council for approval a noise management plan which details measures designed to minimise noise impacts from the development. The plan shall address the following issues:

(i) Identified noise sources likely to cause nuisance;

(ii) Aims and objectives;

(iii) Reference to the applicable legislation;

(iv) Performance indicators;

(v) Actions required to minimise the noise impacts from the development's operation;

(vi) Responsible person(s) for achieving the plan aim; and

(vii) A review schedule.

(b) Within this plan consideration must be given to but not be limited to:

(i) The use of the loading bays;

(ii) Hours of operation and delivery times;

(iii) Vehicle speed management devices (preferably not speed bumps) and the like;

(iv) Service vehicle activities/loading bays;

(v) Forklift operations;

(vi) Refrigeration equipment, pumps, compressors, mechanical ventilation equipment and vents; and

(vii) Maintenance of mechanical plant.

(c) The developer shall implement the approved Noise Management Plan to the satisfaction of the assessment manager.

12. Lighting

Lighting used to illuminate any areas of the premises (ie security or flood lighting) must be designed, constructed, located and maintained to the satisfaction of the assessment manager so as not to cause nuisance to the occupants of nearby properties or passing traffic. All lighting must be angled or shaded in such a manner so that light does not directly illuminate any nearby premises or roadways and does not cause extraneous light to be directed or reflected upwards.

13. Contributions

The developer must pay, prior to the issue of Form 21 – 'Final Inspection Certificate for Building Works' or prior to the commencement of the use, whichever comes first, the following monies to Council:-

Contribution	Sector	Rate	Proposal	Calculation
Road Contributions	Bundamba Industry (RD25)	$668/VT Rate = 1.1281 $753.57	**STAGE 1** **Café** 18.6 VT per 100m² = 1.01 x 18.6 = 18.786 VT **Office** 10.30 VT per 100m² = 3.03 x 10.30 = 31.209 VT **Service Trades Use** 4.7 VT per 100m² = 9.68 x 4.7 = 45.496 VT Total = 95.491 VT Existing Credit = 69.062 VT (4,933m² @ 140 VT/ha)	$753.57 x 26.429 = $19,916.102

			Proposal = 26.429 VT	Total = $19,916.00
			<u>STAGE 2</u> **Service Trades Use** 4.7 VT per 100m² = 11 x 4.7 VT = 51.7 VT **Proposal = 51.7 VT**	$753.57 x 51.7 = $38,959.57 Total = $38 960.00
Total				**$58,876.00**

The contributions above must be applicable for a period of **twelve (12) months from the date of the development approval**, and thereafter must be based on the infrastructure contribution policies and rates applicable at the date when payment is made.

The developer is advised that direct debit, personal and/or company cheques cannot be accepted as payment for the above contributions. The only acceptable forms of payments are cash (EFT payments included) or bank cheques.

14. <u>Locality References</u>

(a) Any place name or estate name used by the developer (excluding a reference to a building, structure or the like and excluding minor, subsidiary signage within a development) must specify the relevant, approved place name under the *Place Names Act 1994*, which must be in the same colour and background colour as the estate name, in lettering no less than 50% of the estate name and in the same orientation as the estate name.

(b) Any reference to the regional location of the site or the development must not refer to the place or estate as being located in Brisbane or a Brisbane suburb or in the metropolitan area or in the western suburbs (excluding the western suburbs of Ipswich as determined by Council in writing from time to time).

15. <u>Car Parking - Use and Maintenance</u>

(a) A total of thirty-one (31) car parking spaces for stage 1 and eleven (11) car parking spaces for stage 2 must be provided on site for the development.

(b) Unless otherwise indicated on the approved plan of development or approved by the assessment manager, parking areas must <u>not</u> be:

(i) Exclusively used for staff parking at the expense of customer parking; or

(ii) Exclusively used for customer parking at the expense of staff parking, or

(iii) Exclusively used by any individual tenancy within the development.

(c) All parking areas must be:

(i) Kept exclusively for parking;

(ii) Used exclusively for parking;

(iii) Accessible to both staff and the customer during any approved hours of operation;

(iv) Appropriately signposted at the entry/entries to the car park, to the satisfaction of the assessment manager (eg "Staff and Customer Parking"), in accordance with AS1742; and

(v) Maintained to the satisfaction of the assessment manager.

16. Access and Parking

(a) Design and construction of all access and parking must be in accordance with the provisions of the Parking Code (Part 12, division 9) of the *Ipswich Planning Scheme 2006*, the Australian Standards (2890 series), and the Traffic and Transport Planning Associates', Assessment of Traffic and Parking Implications report dated 20 November 2010.

(b) As part of the application for operational works, and in accordance with the Traffic and Transport Planning Associates', Assessment of Traffic and Parking Implications report, details of bicycle parking must be provided.

(c) Drawings indicating parking and aisle width dimensions in accordance with AS 2890 must be provided as part of the operational works submission.

(d) Drawings indicating the swept path analysis for the vehicles intended to use the site must be provided as part of the operational works submission.

(e) All access and parking must be designed and constructed in accordance with the provisions of the Parking Code (Part 12, division 9) of the *Ipswich Planning Scheme 2006* and Australian Standards (2890 Series).

(f) Parking and manoeuvring areas must accommodate the largest anticipated vehicle to use the site.

(g) Adequate facilities for servicing the development must be provided on site to ensure loading and/or unloading activities do not occur on-street.

(h) Provision must be made for all vehicles to enter and exit the site in forward gear.

(i) All parking, access and manoeuvring areas must be constructed of concrete, bitumen or equivalent materials approved by the assessment manager, and must be line-marked in accordance with the relevant Australian Standard.

(j) A concrete layback and driveway slab minimum 8.5m wide, must be constructed from the layback in Hawkins Crescent to the property boundary for access to the proposed development in accordance with Council's Standard Drawing SR 13.

(k) A concrete layback and driveway slab minimum 7.5m wide, must be constructed from the layback in Ashburn Road to the property boundary for access to the proposed development in accordance with Council's Standard Drawing SR 13.

17. Stormwater Quantity

(a) The developer must provide all necessary internal and external stormwater drainage to service the development. Such drainage works (except for building gutters and downpipes) must be designed and constructed in accordance with QUDM such that the overall drainage system caters for a storm event with an ARI of 100 years.

(b) No ponding, concentration or redirection of stormwater may occur onto adjoining land unless specifically approved by Council in consultation with the owner of the adjoining land.

(c) All stormwater runoff from the development must be discharged in a manner and to a point to be approved by the assessment manager. In this instance, stormwater discharge from all impervious areas must be directed to the existing stormwater infrastructure in Hawkins Crescent.

(d) The developer must provide a stormwater detention basin/s (or equivalent) on the subject land, which must be designed and constructed in accordance with QUDM 2007. The detention basin (or equivalent) must be constructed to ensure that flows at any point downstream in the catchment are not increased by the development for any combination of frequency and duration from the storm event with an ARI of one (1) year up to and including the storm event with an ARI of 100 years.

(e) An amended stormwater management plan must be submitted for approval at the operational works stage demonstrating compliance with subsection (d) above.

(f) Stormwater drainage plans and calculations must be submitted for approval by the assessment manager, as part of the operational works application.

18. Erosion & Silt Management

(a) As part of the application for operational works, the developer must submit an Erosion and Silt Management Plan designed in accordance with 'Best Practice Erosion and Sediment Control' published by the International Erosion Control Association (Australasia) November 2008, or equivalent.

(b) The developer must install silt management facilities at the commencement of construction and maintain these facilities until the development has been completed.

(c) Diversion drains and ponds, as necessary, must be installed on the site before any other work is undertaken on site to ensure that water containing silt, clay, solids or contaminants is contained and/or isolated.

(d) A procedure must be submitted with the engineering drawings for approval for maintaining the facilities, setting out the frequency of attention, with inspections to be made after each significant rainfall event.

(e) If the assessment manager determines that silt damage has occurred as a result of this development, the developer shall be responsible for restoration of any damage. Such restoration must be completed within a time to be advised by the assessment manager. Should the developer fail to complete the works determined by the assessment manager within the specified time, Council may elect to complete the works and recover all costs associated with that work from the developer.

For this purpose, the developer must lodge a $10,000 performance bond with Council, prior to the commencement of work, which shall only be released by Council at the completion of construction. Where Council determines that a draw-down of the bond is required, the developer must restore the bond to its full amount within 10 days of a notice from Council to that effect.

19. Public Utilities

(a) Adequate provision must be made for the proposed development, to cater for the public utility services that would normally serve the development.

(b) Lighting of the carparks, aisles and circulation roadways must be in accordance with AS/NZS 1158.3.1:2005, and its design and construction must be certified by a qualified Electrical Engineer (RPEQ).

20. Easements

As part of the application for operational works, the developer must demonstrate that the proposal is consistent with the terms of all easements on the property. Alternatively, the developer must submit the consent of the servient tenement in accordance with section 263 of the *Sustainable Planning Act 2009.*

21. Operational Works – Municipal Works
(ie Works being handed over to Council ie sewer)

External Municipal Works relates to those works external to the subject site and located in dedicated public areas, for example existing road or drainage reserve, or private property not subject to developer ownership.

(a) Municipal works must be completed in accordance with a detailed design certified by an RPEQ and approved by Council Engineers with appropriate fees payable, a works pre-start meeting on-site and various detailed construction and audit inspections by Council Officers. In accordance with Planning Scheme Policy 3, a maintenance period applies for the works and a maintenance security deposit is required.

(b) The requirements of Council's Planning Scheme Policy 3 - General Works and Council's Standard Drawings shall apply to the municipal works. Where

inconsistencies between any documents occur, Planning Scheme Policy 3 has precedence and must prevail to the extent of the inconsistency.

(c) All engineering drawings must be submitted in accordance with Planning Scheme Policy 2 – Information Local Government May Request and include as a minimum the following:

(i) Engineering drawings must be marked as confirmation that they have been checked and approved by an RPEQ;

(ii) The drawings must be submitted as four (4) hardcopy, A3 size sets. Reports and supporting information must be submitted as two (2) hardcopy sets.

The submission must also include a compact disk containing electronic data as follows:

(a) One (1) full set of all engineering drawings contained in one file;

(b) Separate individual files containing layout plans for sewerage, water supply and drainage;

(c) Any reports submitted in support of the application. Each report must be included as a separate file; and

(d) An index of all files on the compact disk including descriptions of contents of each file.

All files must be submitted in PDF format.

(d) The developer must submit a Certificate of Design signed by an RPEQ, certifying that the design is in accordance with all conditions of development approval, relevant engineering standards, Council's requirements and standards, and sound engineering practice.

(e) All works must be supervised by an RPEQ competent in civil works and must be undertaken by a nominated principal contractor experienced in the construction of municipal works. Council reserves the right to request evidence of the principal contractor's competency. Should the contractor not be able to demonstrate the necessary competency to the satisfaction of the assessment manager or if the contractor has constructed substandard works for Council in the past, Council reserves the right to reject the nominated contractor.

(f) Prior to the pre-start meeting, the developer must submit to Council a development performance bond of not less than 10% of the value of external municipal works (minimum $5,000.00), as security for the performance of the various construction and certification obligations (including provision of as constructed information).

(g) Municipal works must be accepted on maintenance prior to the commencement of the use. On completion of the works an on maintenance acceptance inspection may be arranged by submission of a certificate signed by an RPEQ certifying that the

works have been constructed in accordance with the approved plans and specifications and in compliance with Council's construction standards. It is expected that the RPEQ will undertake the necessary inspections to make this certification.

(h) Upon formal acceptance of the works on maintenance, the development performance bond shall be reduced to an amount not less than 5% of the value of the works or $5,000.00 whichever is greater, and shall be retained by Council during the maintenance period as a maintenance security bond for the performance of the maintenance obligations. Alternatively, the developer may submit a separate maintenance security bond of equivalent value. This bond shall be retained by Council in accordance with Planning Scheme Policy 3, until the works are accepted off maintenance by Council.

(i) As constructed information and final construction issue engineering design drawings, compiled in accordance with Planning Scheme Policy 2 for municipal works, with a contributed assets financial apportionment form, must be submitted to Council and approved prior to the formal acceptance of the works on maintenance. This data must be submitted electronically on a compact disk labelled appropriately to indicate the contents.

(j) Council reserves the right to require further amendments and/or additions at a later date, should design errors or omissions become apparent in regard to the works relevant to the operational works approval.

22. <u>Operational Works – Internal Works</u>
(ie works not being handed over to Council)

(a) Engineering plans must be submitted to Council prior to the commencement of construction on site and must show full construction details, layout dimensions, and finished surface levels.

(b) Engineering drawings must be marked as confirmation that they have been checked and approved by an RPEQ.

(c) The drawings must be submitted as four (4) hardcopy A3 size sets and one (1) full size set with two (2) hardcopy sets of any reports and supporting information. One set of drawings will be returned to the applicant with the Decision Notice. The submission must also include a compact disk containing electronic data as follows:

(i) A full set of all engineering drawings contained in one file;

(ii) Separate individual files containing layouts for sewerage, water supply and drainage;

(iii) Any reports submitted in support of the application. Each report must be included as a separate file; and

(iv) An index of all files on the Compact Disc including descriptions of contents of each file.

All files must be submitted in PDF format.

Where municipal works are also being undertaken, it is usually appropriate to make a combined submission.

(d) The developer must submit a certificate of design signed by an RPEQ, certifying that the design is in accordance with all conditions of the development approval, relevant engineering standards, Council's requirements and standards, and sound engineering practice.

(e) On completion of the works a certificate signed by an RPEQ must be submitted to Council, certifying that the works have been constructed in compliance with the approved plans and specifications and in accordance with Council's construction standards. The RPEQ must personally undertake the necessary inspections to make this certification.

(f) Council reserves the right to require further amendments and/or additions at a later date, should design errors or omissions become apparent.

23. General

(a) All works required for this development must take due regard of any and all existing services and, if considered necessary by the relevant authority or the assessment manager, such works must be altered at the cost of the developer.

(b) Any fill intended to be placed over Council's underground services must be approved in advance by the assessment manager.

(c) All parking, access and manoeuvring areas must be constructed of concrete, bitumen or equivalent materials approved by the assessment manager, and must be line-marked in accordance with the relevant Australian Standard. Any proposed hardstand areas must be finished level with the design finished level of surrounding surfaces.

(d) All disturbed verge, park, allotment and other grassed areas must be rehabilitated and revegetated (including provision of topsoil to a minimum depth of 50mm) and turfed or seeded to the satisfaction of the assessment manager and in accordance with Planning Scheme Policy 3 – General Works (specifically part 6.1.6). Grass cover must be achieved as early as possible during the development and a minimum grass coverage of 80% must be achieved.

24. Trade Materials, Products and Plant

(a) All trade materials, products and plant must be kept within the confines of the approved buildings. To this end, air conditioning units and other equipment must not be located on the roof unless screened appropriately and approved in writing by the assessment manager.

(b) Stacking of material for outdoor storage areas must not exceed two (2) metres in height above natural ground level, unless otherwise approved in writing by the assessment manager.

25. Loading and Unloading

All loading and unloading must take place at the approved locations within the boundaries of the subject property.

26. Stormwater Quality

(a) Stormwater quality for the development must achieve a reduction in the average annual pollutant load as follows prior to discharge from the site in accordance with Planning Scheme Policy 3 Table 2.3.1:

- 80% for total suspended solids;
- 60% for total phosphorus;
- 45% for total nitrogen; and
- 90% for gross pollutants.

(b) The water quality objectives listed in (a) must be achieved through the installation of two (2) bioretention basins and rainwater tank generally in accordance in accordance with Stormwater Management Report prepared by Martin Cosgrove & Associates Pty Ltd, reference number 10162-L1a, dated 3 March 2011 and the Healthy Waterways Water Sensitive Urban Design Technical Design Guidelines (WSUD TDG and Construction and Establishment Guidelines).

(c) In conjunction with the application for operational works, the developer must provide to Council for approval by the assessment manager, operational works drawings that detail, amongst other necessary items, the following:

(i) The bioretention basin must be designed and constructed in accordance with the parameters represented in Table 1 below:

Table 1 – Bioretention Basin Parameters

	Bioretention South	Bioretention North
Surface Area (m^2)	54	44
Filter Media Area (m^2)	54	44
Filter Media Median Particle Size (mm)	0.45	0.45
Filter Media material	Sandy loam	Sandy loam
Filter Media Depth (m)	0.6	0.6
Hydraulic conductivity (mm/hr)	180	180
Transition layer depth (mm)	0.1	0.1
Minimum drainage layer depth (mm)*	0.2	0.2
Extended detention depth (m)	0.3	0.3
Pre-treatment method**	Sediment forebay	Sediment forebay
Maximum batter slope	1:6	1:6

* *The length of the bioretention basin will dictate the depth of the drainage layer, in order to maintain a minimum fall of 0.5% within the drainage pipes.*

** *The area required for sediment forebay must be confirmed during detailed design, in accordance with WSUD TDG.*

(ii) Plans and cross sections showing the final locations for stormwater infrastructure required by this condition, consistent with Council's Standard Drawings and the WSUD TDG (version current at the time of detailed design);

(iii) Detail the area required for scour protection, in accordance with the design principles outlined in the WSUD TDG. The area required for scour protection must not be included in the total bioretention filter area;

(iv) Where temporary flood storage is to be provided the plans must detail the overflow weir/outlet that has been positioned at the height of the extended detention specified in Table 1. The weir/outlet must be designed such that the temporary flood storage drains rapidly (within 4-6hrs) after all storm events. Calculations must be provided to demonstrate this and that the velocities across the bioretention basin comply with those listed in section 5.2.2 of the WSUD TDG;

(v) Drainage and transitional layers that have been designed in accordance with sections 5.3.4.2 and 5.3.4.3 of the WSUD TDG, respectively, and an underdrain design in accordance with section 5.3.5 of the WSUD TDG;

(vi) The slotted 100mm uPVC pipes placed within the drainage layer of the bioretention basin. The drawings must specify that these are not to be substituted with aggi pipes nor wrapped in geofabric;

(vii) Detail the grade at which drainage pipes must be laid, the relevant density and the size of slots in the drainage pipes. A minimum fall of 0.5% is required for the drainage pipes, and depending on the length of the bioretention, this may impact significantly on the depth of the drainage layer specified in Table 1. The length of all 100mm slotted drainage pipes must not exceed 25m. For longer lengths the pipe diameter must be increased or duplicated to increase conveyance;

(viii) A uPVC inspection riser with screw cap lid at the head of each slotted pipe, for maintenance flushing. The risers are to be generally in accordance with BCC drawing UMS153, however, must extend a minimum of 150mm above the surface of the filter media. The drawings must contain a note that states that risers are not to be slotted;

(ix) A level (flat) surface of the bioretention basin filter media in order to allow even absorption through the filter media;

(x) Soil specifications for the various bioretention basin filter media layers, which are provided in accordance with the current version of the Guidelines For Soil Filter Media In Bioretention Systems, Facility for Advancing Water Biofiltration (FAWB);

(xi) Provide geofabric around the base of the drainage layer, walls and batters of the basins. Geofabric must not be laid between any of the filter layers or used to wrap the slotted uPVC drainage pipes;

(xii) Landscaping to the bioretention basin and detention basin, including filter media and batters, in accordance with plant species and densities outlined in Appendix A of the WSUD TDG. Bioretention basin filter media planting schedules (plant species, number and planting densities) must be included on the plans; and

(xiii) Include a note which refers to the Healthy Waterways Bioretention Basin Construction and Establishment Guidelines and Sign Off Forms (including the pre-start meeting form and forms A-G) for use throughout construction. The operational works drawings must include notes referring to the staging and timing of the commissioning of the bioretention basin and measures to protect the filter media during development within the contributing catchment.

(d) Prior to lodgement of detailed operational works drawings the developer must receive certification from a RPEQ that the detailed drawings are in accordance with the approved stormwater management plan, these conditions of approval and the WSUD TDG. A copy of the certification must be lodged in conjunction with an operational works application along with completed copies of the WSUD TDG Design Assessment Checklists and Calculation Summary Checklists. Where amended MUSIC modelling is undertaken an electronic copy of the MUSIC .sqz file must be submitted to Council for review.

27. Landscaping Plan

(a) A landscape plan, which conforms to the approved development plan must be submitted to Council for approval in conjunction with an application for operational works. Such plan must include, amongst other necessary items, the following features:

(i) Extent of landscaped areas;

(ii) Fence size and type of material;

(iii) Schedule of plant species size (see Note 1 below), densities (see Note 2 below) and attributes for other landscaped areas; and

(iv) Exclude the use of exotics and environmental weeds. Consideration must be given to utilising Council's Vegetation Communities Rehabilitation Guide 2 Alluvial Flats, Watercourses & Wetlands and Appendix A Plant Selection for Water Sensitive Urban Design published by Healthy Waterways.

Note 1: Planting sizes are at least as follows

Street and features trees	45L
Other trees	300mm
Larger shrubs	200mm
Groundcovers	150mm

Note 2: Planting at approximately the following density rates:

	For buffer planting	All Other instances
Trees	at 2m centres	at 5m centres
Large shrubs	at 1m centres	at 2m centres
Groundcovers	at 0.5-1m centres	at 0.5-1m centres

(b) The developer must complete landscaping and fencing works in accordance with the approved landscape plans to the satisfaction of the assessment manager prior to the commencement of the use of the land unless Council determines otherwise. Such landscaping and fencing must be maintained in perpetuity to Council's satisfaction by the existing or future owners and occupiers of the property.

28. Waste Storage & Collection

(a) The area on which the bin(s) is to be accessed by refuse collection vehicles must be screened, level, concreted and constructed in conjunction with the driveway surface with no intervening step, ledge, kerb or other obstruction.

(b) All wash down waters from bin cleansing performed on-site must be appropriately treated and discharged to the sewer subject to a trade waste approval. No wash down waters are permitted to flow to a roadway, gutter, stormwater drain or natural waterway.

(c) All waste bins must be serviced on site with no road-side collection. Access for waste vehicle must allow forward motion entry to the industrial refuse containers and forward motion exit from the site.

2. Operational Works – Advertising Devices

1. Basis of Approval

This approval is subject to these conditions, the facts and circumstances set out in the application and adherence to all relevant Council Local Laws and/or Planning Scheme Policies.

2. Minor Alterations

Notwithstanding the requirements detailed in this approval, any other minor alterations and/or modifications accepted in writing by the assessment manager will suffice.

3. Development Plans

The development of the site must be undertaken generally in accordance with the approved plans in part 3 of the decision notice.

4. Hours of Construction

Unless otherwise determined in writing by the assessment manager, hours of construction must not exceed:

Monday to Saturday 6:30am to 6:30pm

Construction work must not be conducted from or on the premises outside the above hours or on Sundays or public holidays.

5. Locality References

(a) Any place name or estate name used by the developer (excluding a reference to a building, structure or the like and excluding minor, subsidiary signage within a development) must specify the relevant approved place name under the *Place Names Act 1994*, which must be in the same colour and background colour as the estate name, in lettering no less than 50% of the estate name and in the same orientation as the estate name.

(b) Any reference to the regional location of the site or the development must not refer to the place or estate as being located in Brisbane or a Brisbane suburb or in the metropolitan area or in the western suburbs (excluding the western suburbs of Ipswich as determined by Council in writing from time to time).

6. Limits to Approval

(a) This approval is limited to the advertising of the proposed service/trades use, business use (café) and business use (tenancy) development at 1 Hawkins Crescent, Bundamba, identified as part of Lot 1010 on SP151177, as detailed on the approved plans. Advertising of any other nature will require separate approval.

(b) Illumination of the advertising device is not permitted.

(c) The advertising device must be located wholly within private property and must not be built on or near Council infrastructure to the satisfaction of the assessment manager.

7. Sign Maintenance

The advertising device must be maintained to the satisfaction of the assessment manager to not cause disturbance to the occupants of nearby developments.

8. Landscaping for Advertising Devices

Landscaping (including ground covers, shrubs and native species) must be planted at the base of the advertising device fronting Ashburn Road and Hawkins Crescent. The landscaping must not impede sight lines of vehicles entering or exiting the site. Landscaped areas must be planted with water wise species.

9. Entry Walls or Features

The provision of entry walls or features on road reserves or park is not permitted, unless otherwise approved in writing by the assessment manager. Entry walls or features must be fully contained on private property. These entry features or walls must be designed such that maintenance for Council following the "Off Maintenance" inspection is minimal. Entry walls must be designed in accordance with Ipswich Planning Scheme 2006 Implementation Guidelines No. 18 - Estate and Directional Signage.

10. Proposed Location and Design

The location and design of the proposed advertising devices must not create a nuisance or potential hazard to pedestrians.

11. Compliance with Conditions

Unless otherwise stated, all conditions must be completed prior to the commencement of the use on the site or as determined in writing by the assessment manager.

Assessment Manager (Ipswich City Council) Advices

Advices applicable to this approval under Sustainable Planning Act:

1. Portable Long Service Leave

Where the works are valued at $80,000 or more and match the definition of Building and Construction Industry, the *Building and Construction Industry (Portable Long Service Leave) Act 1991* requires that evidence of payment of the Portable Long Service Leave (QLeave) Levy be received by Council as a condition of issuing a development permit. This applies to building works, operational works and plumbing and drainage works applications, as defined under the *Sustainable Planning Act 2009*.

If such evidence is not received by the time of issuing the decision notice, Council may only issue a preliminary approval, notifying the developer that the application is approved, but not permitting commencement of operational works.

All statutory timeframes applying under the *Sustainable Planning Act 2009* for appeals and expiry of the approval continue in force after issuing of the decision notice containing the preliminary approval.

If a preliminary approval is issued in the absence of evidence of payment of the QLeave Levy, a subsequent development permit will have to be issued by Council upon receipt of evidence of payment. This will require a new application and fees will apply.

If you require clarification in regard to the *Building and Construction Industry (Portable Long Service Leave) Act 1991*, you should contact QLeave on 1800 803 481 (free call) or [redacted]

2. Water Meter

All new commercial, industrial or large multi-residential property connections with a projected annual consumption greater than or equal to 20,000kL must have installed, at the customer's expense, an electronic water meter with a data logger and an approved back-to-base communication system as specified by QUU.

Properties with electronic water meters are subject to billing on a monthly basis in accordance with the metered monthly consumption.

If the proposed development is likely to have an annual water consumption equal to or greater than 20,000kL, the developer will be required to contact QUU on telephone 13 26 57 to arrange installation of an electronic flow meter.

3. Flammable and Combustible Liquids

Where there is flammable or combustible liquids stored on site there may be a need to hold a licence to do so under the *Dangerous Goods Safety Management Act 2001*. Please contact the Engineering and Environment Branch of the Planning and Development Department of Ipswich City Council for advice regarding this matter by telephone or [redacted]

4. Environmentally Relevant Activity

This approval does not include an approval to operate an Environmentally Relevant Activity. An application under the *Environmental Protection Act 1994* must be submitted to Council prior to the commencement of the Environmentally Relevant Activity. Please contact the Engineering and Environment Branch of the Planning and Development Department of Ipswich City Council for advice regarding this matter by ringing [redacted]

5. Trade Waste Permit

Waste water directed to sewer must only be carried out in compliance with an approved Trade Waste Permit for the site. All associated water treatment equipment (if any) must be covered by the Permit, where released to sewer. Trade Waste enquiries can be made to Council's Trade Waste Branch.

6. Food Licence

Where food is sold, served and or produced on the site there may be a need to hold a licence to do so under the Food Act 2006. Please contact the Engineering and Environment Branch of the Planning and Development Department of Ipswich City Council for advice regarding this matter by ringing [redacted]

Attachment B
File No: 7606/10
Location: 1 Hawkins Crescent, Bundamba
Assessment Manager Conditions issued by Ipswich City Council under delegation from the Central SEQ Distributor-Retailer Authority and relate to requirements for development for water and wastewater

1. Water Supply

(a) The developer must provide a reticulated water supply which connects into Council's existing reticulation system.

(b) All works on live water mains must be carried out by QUU in accordance with Planning Scheme Policy 3 section 11.1.2, and at the developer's expense.

(c) Council's water supply system has been designed to achieve the target levels of service as outlined in Planning Scheme Policy 3 section 4.1.2 'Standard of Service'. It is the responsibility of the developer to provide any fire fighting requirements over and above Council's target levels of service, at their expense, internally and without adverse impact to Council's water supply system.

(d) As part of the application for operational works, the developer must submit authorisation from Queensland Urban Utilities for the proposed works on or near Queensland Urban Utilities assets, adjacent to Ashburn Road.

(d) The developer must lodge a private works request for QUU to:

(i) Supply and install a suitable metered water connection for the lot;

(ii) Amend the existing connection if necessary; and

(iii) Seal off any existing water connections if necessary.

The relevant fees must be paid and evidence of payment submitted to Council prior to use of the site.

3. Sewerage

(a) The developer must provide a sewerage reticulation system designed so as to command the whole of the site, which connects into Council's existing reticulation system adjoining the site, generally in accordance with the Martin Cosgrove and Associates' drawing number C111 Issue A, dated 12 May 2011. The connection must be bored beneath the road to prevent damage to and disruption in Hawkins Crescent.

(b) The developer must pay the full cost for QUU to provide a suitable connection into the existing sewerage reticulation system. All works on live sewers must be carried out by QUU at the developer's expense in accordance with Planning Scheme Policy 3 section 10.1.2, unless arranged otherwise with QUU.

(c) Any existing sewerage or sanitary drainage that crosses proposed lot boundaries must be located, disconnected and removed to the satisfaction of the assessment manager.

City of Ipswich

Ipswich City Council

45 Roderick St
PO Box 191
Ipswich QLD 4305
Australia

Tel (07) 3810 6666
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Email council@ipswich.qld.gov.au
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DA No. 7606/10
ATTACHMENT B - ANNEXURE A
INFRASTRUCTURE CHARGES NOTICE

This Infrastructure Charges Notice is issued by Council under delegation from the Central SEQ Distributor-Retailer Authority and relates to charges for the purpose of water and wastewater network owned by Central SEQ Distributor-Retailer Authority.

Application No: 7606/10

The land to which the infrastructure charge/s applies:
Real Property Description: Part of Lot 101 SP151177

Property Location: Part of 1 Hawkins Crescent, Bundamba

Development Approval Details: In accordance with Section 1 of Development Decision Notice 7606/10

Infrastructure Charges Calculation:

Infrastructure Network & Catchment	Charge/ NRU	Unit Charge Multiplier /NRU	Charge/NRU	Units of Demand and Demand Credit	Net Infrastructure Charge Payable
Water Supply Bundamba Low Level Zone (WT5)	$734	1.1724	$860.54	**STAGE 1** **Café** 4 NRU per 100m² = 1.01 x 4 = 4.04 NRU **Office** 1.25 NRU per 100m² = 3.03 x 1.25 = 3.7875 NRU **Service Trades Use** 0.75 NRU per 100m² = 9.68 x 0.75 = 7.26 NRU Total = 15.0875 NRU Existing Credit = 11.0993 NRU (4,933m² @ 22.5 NRU/ha) **Proposal = 3.9882 NRU**	$860.54 x 3.9882 = $3,432.01 Total = $3,432.00
				STAGE 2 **Service Trades Use** 0.75 NRU per 100m² = 11 x 0.75 = 8.25 NRU **Proposal = 8.25 NRU**	$860.54 x 8.25 = $7,099.46 Total = $7,099.00

Infrastructure Network & Catchment	Charge/ NRU	Unit Charge Multiplier /NRU	Charge/NRU	Units of Demand and Demand Credit	Net Infrastructure Charge Payable
Sewerage South Bremer Business Park (SW23)	$1,052	1.1724	$1,233.36	**STAGE 1** **Café** 4 NRU per 100m² = 1.01 x 4 = 4.04 NRU **Office** 1.25 NRU per 100m² = 3.03 x 1.25 = 3.7875 NRU **Service Trades Use** 0.75 NRU per 100m² = 9.68 x 0.75 = 7.26 NRU Total = 15.0875 NRU Existing Credit = 11.0993 NRU (4,933m² @ 22.5 NRU/ha) **Proposal = 3.9882 NRU**	$1,233.36 x 3.9882 = $4,918.89 Total = $4,919.00
				STAGE 2 **Service Trades Use** 0.75 NRU per 100m² = 11 x 0.75 = 8.25 NRU **Proposal = 8.25 NRU**	$1,233.36 x 8.25 = $10,175.22 Total = 10,175.00
Total Stage 1					**$8,351.00**
Total Stage 2					**$17,274.00**
Total Charge Amount					**$25,625.00**

Details of Payment

Payment Details:	Payment of the infrastructure charges must be made to Ipswich City Council. It is advised that direct debit, personal and/or company cheques cannot be accepted as payment for the above infrastructure charges. The only acceptable forms of payments are cash (EFT payments included), bank cheques or eligible credit cards. A copy of this Infrastructure Charges Notice is to accompany the above payment.
Due date for payment	Payment of the infrastructure charges is required *before the* certificate of classification for the building work is issued or before the change of use happens (whichever comes first) in accordance with Section 634 of the *Sustainable Planning Act 2009.*
Adjusted charge rate:	The infrastructure charges outlined in this notice above are applicable for a period of **twelve (12) months from the date of the development approval**, and thereafter must be based on the infrastructure contribution policies and adjusted charge rates applicable at the date when payment is made. Please contact Council for further advice on adjusted charge rates.

General Information

GST:	The Federal Government has determined that contributions made by developers to Government for Infrastructure and services under the *Sustainable Planning Act 2009* are GST exempt.
Authority for the charge:	The infrastructure charges in this notice are payable in accordance with section 632 of the *Sustainable Planning Act 2009* as amended by clause 755K of the *South-East Queensland Water (Distribution and Retail Restructuring) and Other Legislation Amendment Act 2010.*
Related payments and by provision of infrastructure:	The total infrastructure charges may be altered having regard to other infrastructure charges paid for the particular property or whether it has been offset through the provision of infrastructure through an infrastructure agreement(s).
Appeals:	Pursuant to section 478 of the *Sustainable Planning Act 2009* a person may appeal an infrastructure charges notice. (Refer to clause 755W *South-East Queensland Water (Distribution and Retail Restructuring) and Other Legislation Amendment Act 2010).*
Circumstance where the infrastructure charges are not recoverable:	The above charges are not recoverable unless the entitlements under the development approval or compliance permit are exercised in accordance with Section 633 (4) of the *Sustainable Planning Act 2009.*
When this notice lapses:	This notice lapses if the development approval or compliance permit ceases to have effect in accordance with Section 633 (5) of the *Sustainable Planning Act 2009.*

Ipswich City Council

Assessment Checklist

Code Assessable Development

A. Application Details

Appln No.: 7606/10 Division: 4

B. Preamble Assessment

1.	Are the real property description and location details provided on the Application Form correct?	☒ Yes ☐ No
2.	Has the 'consent of owner' been correctly obtained?	☒ Yes ☐ No
3.	Has the correct fee been paid?	☒ Yes ☐ No

C. Supporting Information

1.	(a) Was any supporting material lodged with the application?	☒ Yes ☐ No
	(b) Are there any planning issues associated with this material?	☒ Yes ☐ No

Comment: An information request was sent by Council on 23 November 2010 relating to easements, landscaping, issues with the proposal plans, issues with the elevations, stormwater quantity management, stormwater quality management, waste storage and collection and sewer.

2.	(a) Was an Information Request required to be made?	☒ Yes ☐ No
	(b) Are there any outstanding issues associated with the Information Response?	☐ Yes ☒ No

D. Referral Agencies

1. Are there any Referral Agencies applicable to this development?	☐ Yes ☒ No
2. Are there any issues associated with advice received from a Referral Agency?	☐ Yes ☐ No ☒ N/A

E. State Planning Policies (SPP's)

1. Are there any SPP's applicable to this development?	☐ Yes ☒ No
2. Does the development comply with the relevant SPP's?	☐ Yes ☐ No ☒ N/A

F. Zone Code

1. What is the relevant zone code(s) for this development?

Regional Business and Industry (Medium Impact) however the application was made under the Bremer Business Park Preliminary Approval.

2. (a) Does the development require impact assessment under the relevant assessment table for the zone?	☐ Yes ☒ No
(b) Is the development consistent with the outcomes sought for the zone?	☒ Yes ☐ No
3. (a) Are there any overall or specific outcomes for the locality which apply to the development?	☒ Yes ☐ No
(b) Does the development comply with any relevant overall or specific outcomes for the locality?	☒ Yes ☐ No
4. Does the development comply with the overall outcomes for the zone?	☒ Yes ☐ No

F. Zone Code

5. Does the development comply with the "Effects of Development – General" (including the specific outcomes and any applicable probable solutions or acceptable solutions) for the zone?	☒ Yes ☐ No
6. (a) Are there any Sub Area or Precinct provisions within the zone which apply to this development?	☒ Yes ☐ No
(b) Does the development comply with these provisions?	☒ Yes ☐ No

G. Codes for a Stated Purpose or of a Stated Type (refer Part 12 of the Planning Scheme)

1. Are there any codes under Part 12 of the Planning Scheme applicable to the development?	☒ Yes ☐ No
2. Does the development comply with these codes?	☒ Yes ☐ No ☐ N/A

H. Overlays (refer Part 11 of the Planning Scheme)

1. (a) Is the site affected by a Character Places Overlay?	☐ Yes ☒ No
(b) Is the assessment category changed (refer Table 11.3.2)?	☐ Yes ☐ No ☒ N/A
(c) Does the development comply with the Character Places Overlay Code and the Character Code?	☐ Yes ☐ No ☒ N/A
2. (a) Is the site affected by a Development Constraints Overlay?	☒ Yes ☐ No
(b) Is the assessment category changed (refer Table 11.4.3 and 11.4.4)?	☐ Yes ☒ No ☐ N/A
(c) Does the development comply with the relevant provisions of the Development Constraints Overlay Code?	☒ Yes ☐ No ☐ N/A

I. Other Relevant Matters

1. (a) Are there any Planning Scheme Policy provisions which specifically apply to this development? ☒ Yes ☐ No

   (b) Does the development comply with these provisions? ☒ Yes ☐ No ☐ N/A

2. (a) Are there any Implementation Guidelines which specifically apply to this development? ☐ Yes ☒ No ☐ N/A

   (b) Does the development comply with these Guidelines? ☐ Yes ☐ No ☒ N/A

3. (a) Are there any previous development approvals relating to the site? ☒ Yes ☐ No ☐ N/A

   (b) If so, are there any outstanding conditions, in particular, are there any outstanding infrastructure charges? ☐ Yes ☒ No ☐ N/A

4. Are there any other relevant matters which pertain to this development? ☐ Yes ☒ No

5. Does Council as Assessment Manager also have jurisdiction delegated to it by the Central SEQ Distributor-Retailer for the assessment of water and wastewater components of this development? ☒ Yes ☐ No

   - Standard conditions are to be applied to the development for water and wastewater requirements.

6. Infrastructure Contributions – Calculation Sheet attached to this checklist?
   ☒ Yes
   ☐ No
   ☐ N/A

   If Yes, Refer Condition X for calculations for roadworks infrastructure and Attachment B-Annexure A for calculations in respect to water and wastewater networks issued by the assessment manager under delegation from the Central SEQ Distributor-Retailer Authority.

J. Public Notification

1. Was the public notification carried out in accordance with the *Sustainable Planning Act* requirements?	☐ Yes ☒ No
2. Were any submissions received?	☐ Yes ☒ No

K. Summary

1. Recommended for:	☒ Approval - Subject to Conditions ☐ Part Refusal / Part Approval -Subject to conditions ☐ Deemed Approval
2. Comment: The proposal is compliant or has been conditioned to be compliant with the requirements of the Bremer Business Park Preliminary Approval and the *Ipswich Planning Scheme 2006*.	

[redacted]

SENIOR PLANNER (DEVELOPMENT)
Date:

[redacted]

Natalie Plumbe
TEAM COORDINATOR (CENTRAL)
Date: 20/5/11

Your reference
Our reference 7606/10
Contact Officer [redacted]
Telephone

SCANNED
DEVELOPMENT BRANCH
9 SEP 2011
No: 353/692

City of Ipswich

Ipswich City Council

45 Roderick St
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Australia

Tel (07) 3810 6666
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Email council@ipswich.qld.gov.au
Web www.ipswich.qld.gov.au

Walker Corporation
(Attention: Ms [redacted]
GPO BOX 4073
SYDNEY NSW 2001

8 September 2011

Dear Sir

Re: Minor Alteration to Development Appl. No. 7606/2010
1 Hawkins Crescent, Bundamba
Service/trades use (6 tenancies), business use – café (1 tenancy), buisness use – office (1 tenancy) & advertising devices

Reference is made to your correspondence dated 5 August 2011 requesting a minor alteration to amend Condition 8(b) and 8(d) (Flooding) of the material change of use of premises development permit of Council's decision notice dated 25 May 2011.

In reply, it is advised that in accordance with Condition 2 (Minor Alterations) of Council's decision notice dated 25 May 2011, the request to amend Condition 8(b) and 8(d) (Flooding) is supported.

A full copy of the updated conditions and approved plans are attached.

Should you wish to discuss the matter further, please contact [redacted] on telephone number ([redacted]

Yours faithfully

[redacted]

Natalie Plumbe
TEAM COORDINATOR (CENTRAL)

1. **Decision Details:**

Development	Approval Type	Decision	Relevant Period
Material Change of Use of Premises (Service/trades use (6 tenancies), business use - café (1 tenancy) and business use – office (1 tenancy))	Development Permit	Approved subject to the conditions set out in Attachment A and B – Assessment Manager Conditions	4 years
Operational Works – Advertising Devices	Development Permit	Approved subject to the conditions set out in Attachment A – Assessment Manager Conditions	2 years

2. **Preliminary Approval Affecting the Planning Scheme:**

Not applicable to this decision.

3. Approved Plans

The approved plans for this development approval are:

(a) The plans referred to in the table of approved plans (including the amendments that are required to be made to those plans); and

(b) Where the amended version of the plans referred to in the table of approved plans have been approved by the assessment manager, the amended version of those plans; and

(c) The approved plans are attached to this decision notice.

Table of Approved Plans:

Plan/ Document No	Description	Prepared By	Date	Amendments
SP-CS-DA-001 Issue E	Site/Floor Plan	Walker Corporation	25 March 2011	N/A
SP-CS-DA-002 Issue C	Mezzanine Floor Plan	Walker Corporation	16 December 2010	N/A

SP-CS-DA-009 Issue C	Waste Management Plan Truck turning path	Walker Corporation	25 March 2011	N/A
SP-CS-DA-006 Issue C	Coloured Elevations	Walker Corporation	6 December 2010	N/A
SP-CS-DA-007 Issue D	Truck turning path	Walker Corporation	16 December 2010	N/A
Job Number 10162 Drawing Number C111 Issue A	Proposed Sewer Layout Plan	Martin Cosgrove and Associates Pty Ltd	12 May 2011	N/A
SP-CS-DA-008 Issue C	Signage Plan	Walker Corporation	16 December 2010	N/A

Note: Amended plans shall be to the satisfaction of the assessment manager and submitted for endorsement prior to the submission of a building works/ operational works application or the plan of subdivision for signing.

4. **Codes for Self Assessable Development**

Not applicable to this decision.

5. **Other Necessary Development Permits and/or Compliance Permits**

Further development permits, as required by the *Sustainable Planning Act 2009,* shall be obtained in respect of any operational works, building works and plumbing works in relation to this approval prior to the commencement of works/use pursuant to the *Sustainable Planning Act 2009.*

6. **Details of any Compliance Assessment Required for Documents or Work in Relation to the Development**

Not applicable to this decision.

7. **Submissions**

Not applicable to this decision.

8. Conflict with a Relevant Instrument and Reasons for the Decision Despite the Conflict

Not applicable to this decision.

9. Referral Agencies

Not applicable to this decision.

10. When Development Approval Lapses

The relevant period for this approval is as outlined in part 1 –'decision details' of this decision notice, starting the day the approval takes effect. This development approval lapses is in accordance with section 341 of the *Sustainable Planning Act 2009*.
Should the assessment manager determine a new relevant period in writing, prior to the lapsing of this approval, then the use may continue for a further period of time, as specified in writing by the assessment manager.

11. When Section 242 Preliminary Approval Lapses

Not applicable to this decision.

12. Conditions of Assessment Manager (Ipswich City Council)

(a) Refer to Attachment A for Assessment Manager conditions.

(b) Refer to Attachment B for Assessment Manager conditions for water and wastewater requirements issued by Council under delegation from the Central SEQ Distributor-Retailer Authority.

Attachment A
File No: 7606/10
Location: 1 Hawkins Crescent, Bundamba
Assessment Manager (Ipswich City Council) Conditions

Conditions applicable to this approval under Sustainable Planning Act:

1. **Material Change of Use – Service trades use (6 tenancies), business use (café – 1 tenancy) and business use (office – 1 tenancy)**

1. Basis of Approval

   This approval is subject to these conditions, the facts and circumstances set out in the application and adherence to all relevant Council Local Laws and/or Planning Scheme Policies.

2. Minor Alterations

   Notwithstanding the requirements detailed in this approval, any other minor alterations and/or modifications accepted in writing by the assessment manager will suffice.

3. Development Plans

   The development of the site must be undertaken generally in accordance with the approved plans outlined in part 3 of the decision notice.

4. Compliance with Conditions

   Unless otherwise stated, all conditions must be completed prior to commencement of the change of use of the site or as determined in writing by the assessment manager.

5. Particular Use

   This approval is for the particular use stated, and does not imply approval for other similar uses. The use of any of the structures associated with the service/trades use (6 tenancies), business use - café (1 tenancy) and business use – office (1 tenancy) inclusive of car parking and any associated outdoor areas on the site, are not permitted to be used for any other purpose, unless, in the written opinion of the assessment manager, such use is ancillary and incidental to the predominant use of the site for a service/trades use (6 tenancies), business use - café (1 tenancy) and business use – office (1 tenancy).

6. Completion of Conditions of Previous Approval

   The developer must satisfactorily complete all conditions as required by Council's Negotiated Decision Notice 1837/07 dated 8 July 2008 and as lawfully amended. This approval does not take effect until all conditions of this approval are satisfied.

7. Staging

The staging of the development must be in accordance with Plan SP-CS-DA-001 Revision E, prepared by Walker Corporation and must be as follows:

(a) Stage 1 – proposed tenancies numbers one (1) to seven (7)

(b) Stage 2 – proposed tenancy number eight (8)

8. Flooding

(a) Expensive plant and equipment and stock must be located in the area of the site or building with the greatest flood immunity. The developer is to undertake a risk assessment to determine the floor level which maximises flood immunity having regard to this.

(b) The building materials and surface treatments used below RL 21m AHD are to be resistant to water damage and must not include wall cavities that may be susceptible to the intrusion of water and sediment. Flood resistant materials such as core filled concrete block or pre-cast concrete are to be used as alternatives to materials such as plasterboard or particle board to minimise replacement/repair and provide for ease of cleaning in the event of a flood.

(c) Electrical installations must be sited in the area of greatest flood immunity.

(d) Electrical switchboards, main data servers and the like must be positioned above RL 21m AHD, however, where circumstances prevent compliance with a height above RL 21m AHD, the height is to be to the satisfaction of the assessment manager. All electrical and data installations below RL 21m AHD are to be accompanied by a sign with minimum dimensions of 300mm x 300mm containing the following wording:

The following actions should be undertaken in the event of a flood:

- Switch off electrical instillations and equipment.
- Do not operate equipment which is in water or whilst standing in water.
- Keep away from any live equipment submerged in water.
- Have any installations or electrical equipment which has been flood damaged checked by an approved electrical contractor before being put back into use.
- Contact the electricity supplier if one has any concerns about the supply from the electricity meter and backwards.

(e) Access routes must be designed or alternative emergency evacuation routes provided so that in a flood event occupants can escape to a safe and secure area.

(f) All buildings must be designed to be capable of withstanding the static and dynamic loads, including debris loads, applicable to a flood event equivalent to the RL 21m AHD.

(g) Materials stored on site must -

(i) be limited to those that are readily able to be moved in a flood event;

(ii) not be hazardous or noxious, or comprise materials that may cause a deleterious effect on the environment if discharged in a flood event; and

(iii) where capable of creating a safety hazard by being shifted by flood waters, be contained in order to minimise movement in times of flood.

(g) The development is not permitted to increase the flood hazard (e.g. by way of increased depth, duration or velocity of flood waters or a reduction in warning times) for other properties.

9. Hours of Construction

Unless otherwise determined in writing by the assessment manager, hours of construction must not exceed:

Monday to Saturday 6:30am to 6:30pm

Construction work must not be conducted from or on the premises outside the above hours or on Sundays or public holidays.

10. Hours of Operation

(a) Unless otherwise determined in writing by the assessment manager, hours of operation for the business use (café) must not exceed:

Monday to Sunday 6:30am to 6:30pm

Work or business must not be conducted from the premises outside the above hours or on Sundays or public holidays. Hours of operation are subject to any requirements of Condition 10 – Noise Management Plan.

(b) Unless otherwise determined in writing by the assessment manager, the operating hours for the service trades use (6 tenancies) and office (1 tenancy) are not limited, subject to any requirements of Condition 10 – Noise Management Plan. In the event that Council receives ongoing complaints about noise that Council considers are not frivolous or vexatious, then the hours of operation above may be reviewed.

11. Noise Management Plan

(a) Prior to the commencement of any works/issue of any building works approval, the developer must submit to Council for approval a noise management plan which details measures designed to minimise noise impacts from the development. The plan shall address the following issues:

(i) Identified noise sources likely to cause nuisance;

(ii) Aims and objectives;

(iii) Reference to the applicable legislation;

(iv) Performance indicators;

(v) Actions required to minimise the noise impacts from the development's operation;

(vi) Responsible person(s) for achieving the plan aim; and

(vii) A review schedule.

(b) Within this plan consideration must be given to but not be limited to:

(i) The use of the loading bays;

(ii) Hours of operation and delivery times;

(iii) Vehicle speed management devices (preferably not speed bumps) and the like;

(iv) Service vehicle activities/loading bays;

(v) Forklift operations;

(vi) Refrigeration equipment, pumps, compressors, mechanical ventilation equipment and vents; and

(vii) Maintenance of mechanical plant.

(c) The developer shall implement the approved Noise Management Plan to the satisfaction of the assessment manager.

12. Lighting

Lighting used to illuminate any areas of the premises (ie security or flood lighting) must be designed, constructed, located and maintained to the satisfaction of the assessment manager so as not to cause nuisance to the occupants of nearby properties or passing traffic. All lighting must be angled or shaded in such a manner so that light does not directly illuminate any nearby premises or roadways and does not cause extraneous light to be directed or reflected upwards.

13. Contributions

The developer must pay, prior to the issue of Form 21 – 'Final Inspection Certificate for Building Works' or prior to the commencement of the use, whichever comes first, the following monies to Council:-

Contribution	Sector	Rate	Proposal	Calculation
Road Contributions	Bundamba Industry (RD25)	$668/VT Rate = 1.1281 $753.57	**STAGE 1** **Café** 18.6 VT per 100m² = 1.01 x 18.6 = 18.786 VT **Office** 10.30 VT per 100m² = 3.03 x 10.30 = 31.209 VT **Service Trades Use** 4.7 VT per 100m² = 9.68 x 4.7 = 45.496 VT Total = 95.491 VT Existing Credit = 69.062 VT (4,933m² @ 140 VT/ha) **Proposal = 26.429 VT**	$753.57 x 26.429 = $19,916.102 Total = $19,916.00
			STAGE 2 **Service Trades Use** 4.7 VT per 100m² = 11 x 4.7 VT = 51.7 VT **Proposal = 51.7 VT**	$753.57 x 51.7 = $38,959.57 Total = $38 960.00
Total				**$58,876.00**

The contributions above must be applicable for a period of **twelve (12) months from the date of the development approval**, and thereafter must be based on the infrastructure contribution policies and rates applicable at the date when payment is made.

The developer is advised that direct debit, personal and/or company cheques cannot be accepted as payment for the above contributions. The only acceptable forms of payments are cash (EFT payments included) or bank cheques.

14. Locality References

(a) Any place name or estate name used by the developer (excluding a reference to a building, structure or the like and excluding minor, subsidiary signage within a development) must specify the relevant, approved place name under the *Place Names Act 1994*, which must be in the same colour and background colour as the estate name, in lettering no less than 50% of the estate name and in the same orientation as the estate name.

(b) Any reference to the regional location of the site or the development must not refer to the place or estate as being located in Brisbane or a Brisbane suburb or in the metropolitan area or in the western suburbs (excluding the western suburbs of Ipswich as determined by Council in writing from time to time).

15. Car Parking - Use and Maintenance

(a) A total of thirty-one (31) car parking spaces for stage 1 and eleven (11) car parking spaces for stage 2 must be provided on site for the development.

(b) Unless otherwise indicated on the approved plan of development or approved by the assessment manager, parking areas must not be:

(i) Exclusively used for staff parking at the expense of customer parking; or

(ii) Exclusively used for customer parking at the expense of staff parking, or

(iii) Exclusively used by any individual tenancy within the development.

(c) All parking areas must be:

(i) Kept exclusively for parking;

(ii) Used exclusively for parking;

(iii) Accessible to both staff and the customer during any approved hours of operation;

(iv) Appropriately signposted at the entry/entries to the car park, to the satisfaction of the assessment manager (eg "Staff and Customer Parking"), in accordance with AS1742; and

(v) Maintained to the satisfaction of the assessment manager.

16. Access and Parking

(a) Design and construction of all access and parking must be in accordance with the provisions of the Parking Code (Part 12, division 9) of the *Ipswich Planning Scheme 2006*, the Australian Standards (2890 series), and the Traffic and Transport Planning Associates', Assessment of Traffic and Parking Implications report dated 20 November 2010.

(b) As part of the application for operational works, and in accordance with the Traffic and Transport Planning Associates', Assessment of Traffic and Parking Implications report, details of bicycle parking must be provided.

(c) Drawings indicating parking and aisle width dimensions in accordance with AS 2890 must be provided as part of the operational works submission.

(d) Drawings indicating the swept path analysis for the vehicles intended to use the site must be provided as part of the operational works submission.

(e) All access and parking must be designed and constructed in accordance with the provisions of the Parking Code (Part 12, division 9) of the *Ipswich Planning Scheme 2006* and Australian Standards (2890 Series).

(f) Parking and manoeuvring areas must accommodate the largest anticipated vehicle to use the site.

(g) Adequate facilities for servicing the development must be provided on site to ensure loading and/or unloading activities do not occur on-street.

(h) Provision must be made for all vehicles to enter and exit the site in forward gear.

(i) All parking, access and manoeuvring areas must be constructed of concrete, bitumen or equivalent materials approved by the assessment manager, and must be line-marked in accordance with the relevant Australian Standard.

(j) A concrete layback and driveway slab minimum 8.5m wide, must be constructed from the layback in Hawkins Crescent to the property boundary for access to the proposed development in accordance with Council's Standard Drawing SR 13.

(k) A concrete layback and driveway slab minimum 7.5m wide, must be constructed from the layback in Ashburn Road to the property boundary for access to the proposed development in accordance with Council's Standard Drawing SR 13.

17. Stormwater Quantity

(a) The developer must provide all necessary internal and external stormwater drainage to service the development. Such drainage works (except for building gutters and downpipes) must be designed and constructed in accordance with QUDM such that the overall drainage system caters for a storm event with an ARI of 100 years.

(b) No ponding, concentration or redirection of stormwater may occur onto adjoining land unless specifically approved by Council in consultation with the owner of the adjoining land.

(c) All stormwater runoff from the development must be discharged in a manner and to a point to be approved by the assessment manager. In this instance, stormwater discharge from all impervious areas must be directed to the existing stormwater infrastructure in Hawkins Crescent.

(d) The developer must provide a stormwater detention basin/s (or equivalent) on the subject land, which must be designed and constructed in accordance with QUDM 2007. The detention basin (or equivalent) must be constructed to ensure that flows at any point downstream in the catchment are not increased by the development for any combination of frequency and duration from the storm event with an ARI of one (1) year up to and including the storm event with an ARI of 100 years.

(e) An amended stormwater management plan must be submitted for approval at the operational works stage demonstrating compliance with subsection (d) above.

(f) Stormwater drainage plans and calculations must be submitted for approval by the assessment manager, as part of the operational works application.

18. Erosion & Silt Management

(a) As part of the application for operational works, the developer must submit an Erosion and Silt Management Plan designed in accordance with 'Best Practice Erosion and Sediment Control' published by the International Erosion Control Association (Australasia) November 2008, or equivalent.

(b) The developer must install silt management facilities at the commencement of construction and maintain these facilities until the development has been completed.

(c) Diversion drains and ponds, as necessary, must be installed on the site before any other work is undertaken on site to ensure that water containing silt, clay, solids or contaminants is contained and/or isolated.

(d) A procedure must be submitted with the engineering drawings for approval for maintaining the facilities, setting out the frequency of attention, with inspections to be made after each significant rainfall event.

(e) If the assessment manager determines that silt damage has occurred as a result of this development, the developer shall be responsible for restoration of any damage. Such restoration must be completed within a time to be advised by the assessment manager. Should the developer fail to complete the works determined by the assessment manager within the specified time, Council may elect to complete the works and recover all costs associated with that work from the developer.

For this purpose, the developer must lodge a $10,000 performance bond with Council, prior to the commencement of work, which shall only be released by Council at the completion of construction. Where Council determines that a draw-down of the bond is required, the developer must restore the bond to its full amount within 10 days of a notice from Council to that effect.

19. Public Utilities

(a) Adequate provision must be made for the proposed development, to cater for the public utility services that would normally serve the development.

(b) Lighting of the carparks, aisles and circulation roadways must be in accordance with AS/NZS 1158.3.1:2005, and its design and construction must be certified by a qualified Electrical Engineer (RPEQ).

20. Easements

As part of the application for operational works, the developer must demonstrate that the proposal is consistent with the terms of all easements on the property. Alternatively, the developer must submit the consent of the servient tenement in accordance with section 263 of the *Sustainable Planning Act 2009.*

21. Operational Works – Municipal Works
(ie Works being handed over to Council ie sewer)

External Municipal Works relates to those works external to the subject site and located in dedicated public areas, for example existing road or drainage reserve, or private property not subject to developer ownership.

(a) Municipal works must be completed in accordance with a detailed design certified by an RPEQ and approved by Council Engineers with appropriate fees payable, a works pre-start meeting on-site and various detailed construction and audit inspections by Council Officers. In accordance with Planning Scheme Policy 3, a maintenance period applies for the works and a maintenance security deposit is required.

(b) The requirements of Council's Planning Scheme Policy 3 - General Works and Council's Standard Drawings shall apply to the municipal works. Where inconsistencies between any documents occur, Planning Scheme Policy 3 has precedence and must prevail to the extent of the inconsistency.

(c) All engineering drawings must be submitted in accordance with Planning Scheme Policy 2 – Information Local Government May Request and include as a minimum the following:

(i) Engineering drawings must be marked as confirmation that they have been checked and approved by an RPEQ;

(ii) The drawings must be submitted as four (4) hardcopy, A3 size sets. Reports and supporting information must be submitted as two (2) hardcopy sets.

The submission must also include a compact disk containing electronic data as follows:

(a) One (1) full set of all engineering drawings contained in one file;

(b) Separate individual files containing layout plans for sewerage, water supply and drainage;

(c) Any reports submitted in support of the application. Each report must be included as a separate file; and

(d) An index of all files on the compact disk including descriptions of contents of each file.

All files must be submitted in PDF format.

(d) The developer must submit a Certificate of Design signed by an RPEQ, certifying that the design is in accordance with all conditions of development approval, relevant engineering standards, Council's requirements and standards, and sound engineering practice.

(e) All works must be supervised by an RPEQ competent in civil works and must be undertaken by a nominated principal contractor experienced in the construction of

municipal works. Council reserves the right to request evidence of the principal contractor's competency. Should the contractor not be able to demonstrate the necessary competency to the satisfaction of the assessment manager or if the contractor has constructed substandard works for Council in the past, Council reserves the right to reject the nominated contractor.

(f) Prior to the pre-start meeting, the developer must submit to Council a development performance bond of not less than 10% of the value of external municipal works (minimum $5,000.00), as security for the performance of the various construction and certification obligations (including provision of as constructed information).

(g) Municipal works must be accepted on maintenance prior to the commencement of the use. On completion of the works an on maintenance acceptance inspection may be arranged by submission of a certificate signed by an RPEQ certifying that the works have been constructed in accordance with the approved plans and specifications and in compliance with Council's construction standards. It is expected that the RPEQ will undertake the necessary inspections to make this certification.

(h) Upon formal acceptance of the works on maintenance, the development performance bond shall be reduced to an amount not less than 5% of the value of the works or $5,000.00 whichever is greater, and shall be retained by Council during the maintenance period as a maintenance security bond for the performance of the maintenance obligations. Alternatively, the developer may submit a separate maintenance security bond of equivalent value. This bond shall be retained by Council in accordance with Planning Scheme Policy 3, until the works are accepted off maintenance by Council.

(i) As constructed information and final construction issue engineering design drawings, compiled in accordance with Planning Scheme Policy 2 for municipal works, with a contributed assets financial apportionment form, must be submitted to Council and approved prior to the formal acceptance of the works on maintenance. This data must be submitted electronically on a compact disk labelled appropriately to indicate the contents.

(j) Council reserves the right to require further amendments and/or additions at a later date, should design errors or omissions become apparent in regard to the works relevant to the operational works approval.

22. <u>Operational Works – Internal Works</u>
(ie works not being handed over to Council)

(a) Engineering plans must be submitted to Council prior to the commencement of construction on site and must show full construction details, layout dimensions, and finished surface levels.

(b) Engineering drawings must be marked as confirmation that they have been checked and approved by an RPEQ.

(c) The drawings must be submitted as four (4) hardcopy A3 size sets and one (1) full size set with two (2) hardcopy sets of any reports and supporting information. One set of drawings will be returned to the applicant with the Decision Notice. The submission must also include a compact disk containing electronic data as follows:

(i) A full set of all engineering drawings contained in one file;

(ii) Separate individual files containing layouts for sewerage, water supply and drainage;

(iii) Any reports submitted in support of the application. Each report must be included as a separate file; and

(iv) An index of all files on the Compact Disc including descriptions of contents of each file. All files must be submitted in PDF format.

Where municipal works are also being undertaken, it is usually appropriate to make a combined submission.

(d) The developer must submit a certificate of design signed by an RPEQ, certifying that the design is in accordance with all conditions of the development approval, relevant engineering standards, Council's requirements and standards, and sound engineering practice.

(e) On completion of the works a certificate signed by an RPEQ must be submitted to Council, certifying that the works have been constructed in compliance with the approved plans and specifications and in accordance with Council's construction standards. The RPEQ must personally undertake the necessary inspections to make this certification.

(f) Council reserves the right to require further amendments and/or additions at a later date, should design errors or omissions become apparent.

23. General

(a) All works required for this development must take due regard of any and all existing services and, if considered necessary by the relevant authority or the assessment manager, such works must be altered at the cost of the developer.

(b) Any fill intended to be placed over Council's underground services must be approved in advance by the assessment manager.

(c) All parking, access and manoeuvring areas must be constructed of concrete, bitumen or equivalent materials approved by the assessment manager, and must be line-marked in accordance with the relevant Australian Standard. Any proposed hardstand areas must be finished level with the design finished level of surrounding surfaces.

(d) All disturbed verge, park, allotment and other grassed areas must be rehabilitated and revegetated (including provision of topsoil to a minimum depth of 50mm) and turfed or

seeded to the satisfaction of the assessment manager and in accordance with Planning Scheme Policy 3 – General Works (specifically part 6.1.6). Grass cover must be achieved as early as possible during the development and a minimum grass coverage of 80% must be achieved.

24. Trade Materials, Products and Plant

(a) All trade materials, products and plant must be kept within the confines of the approved buildings. To this end, air conditioning units and other equipment must not be located on the roof unless screened appropriately and approved in writing by the assessment manager.

(b) Stacking of material for outdoor storage areas must not exceed two (2) metres in height above natural ground level, unless otherwise approved in writing by the assessment manager.

25. Loading and Unloading

All loading and unloading must take place at the approved locations within the boundaries of the subject property.

26. Stormwater Quality

(a) Stormwater quality for the development must achieve a reduction in the average annual pollutant load as follows prior to discharge from the site in accordance with Planning Scheme Policy 3 Table 2.3.1:

- 80% for total suspended solids;
- 60% for total phosphorus;
- 45% for total nitrogen; and
- 90% for gross pollutants.

(b) The water quality objectives listed in (a) must be achieved through the installation of two (2) bioretention basins and rainwater tank generally in accordance in accordance with Stormwater Management Report prepared by Martin Cosgrove & Associates Pty Ltd, reference number 10162-L1a, dated 3 March 2011 and the Healthy Waterways Water Sensitive Urban Design Technical Design Guidelines (WSUD TDG and Construction and Establishment Guidelines).

(c) In conjunction with the application for operational works, the developer must provide to Council for approval by the assessment manager, operational works drawings that detail, amongst other necessary items, the following:

(i) The bioretention basin must be designed and constructed in accordance with the parameters represented in Table 1 below:

Table 1 – Bioretention Basin Parameters

	Bioretention South	Bioretention North

Surface Area (m^2)	54	44
Filter Media Area (m^2)	54	44
Filter Media Median Particle Size (mm)	0.45	0.45
Filter Media material	Sandy loam	Sandy loam
Filter Media Depth (m)	0.6	0.6
Hydraulic conductivity (mm/hr)	180	180
Transition layer depth (mm)	0.1	0.1
Minimum drainage layer depth (mm)*	0.2	0.2
Extended detention depth (m)	0.3	0.3
Pre-treatment method**	Sediment forebay	Sediment forebay
Maximum batter slope	1:6	1:6

* *The length of the bioretention basin will dictate the depth of the drainage layer, in order to maintain a minimum fall of 0.5% within the drainage pipes.*

** *The area required for sediment forebay must be confirmed during detailed design, in accordance with WSUD TDG.*

(ii) Plans and cross sections showing the final locations for stormwater infrastructure required by this condition, consistent with Council's Standard Drawings and the WSUD TDG (version current at the time of detailed design);

(iii) Detail the area required for scour protection, in accordance with the design principles outlined in the WSUD TDG. The area required for scour protection must not be included in the total bioretention filter area;

(iv) Where temporary flood storage is to be provided the plans must detail the overflow weir/outlet that has been positioned at the height of the extended detention specified in Table 1. The weir/outlet must be designed such that the temporary flood storage drains rapidly (within 4-6hrs) after all storm events. Calculations must be provided to demonstrate this and that the velocities across the bioretention basin comply with those listed in section 5.2.2 of the WSUD TDG;

(v) Drainage and transitional layers that have been designed in accordance with sections 5.3.4.2 and 5.3.4.3 of the WSUD TDG, respectively, and an underdrain design in accordance with section 5.3.5 of the WSUD TDG;

(vi) The slotted 100mm uPVC pipes placed within the drainage layer of the bioretention basin. The drawings must specify that these are not to be substituted with aggi pipes nor wrapped in geofabric;

(vii) Detail the grade at which drainage pipes must be laid, the relevant density and the size of slots in the drainage pipes. A minimum fall of 0.5% is required for the drainage pipes, and depending on the length of the bioretention, this may impact significantly on the depth of the drainage layer specified in Table 1. The length of all 100mm slotted drainage pipes must not exceed 25m. For longer lengths the pipe diameter must be increased or duplicated to increase conveyance;

(viii) A uPVC inspection riser with screw cap lid at the head of each slotted pipe, for maintenance flushing. The risers are to be generally in accordance with BCC drawing UMS153, however, must extend a minimum of 150mm above the surface of the filter media. The drawings must contain a note that states that risers are not to be slotted;

(ix) A level (flat) surface of the bioretention basin filter media in order to allow even absorption through the filter media;

(x) Soil specifications for the various bioretention basin filter media layers, which are provided in accordance with the current version of the Guidelines For Soil Filter Media In Bioretention Systems, Facility for Advancing Water Biofiltration (FAWB);

(xi) Provide geofabric around the base of the drainage layer, walls and batters of the basins. Geofabric must not be laid between any of the filter layers or used to wrap the slotted uPVC drainage pipes;

(xii) Landscaping to the bioretention basin and detention basin, including filter media and batters, in accordance with plant species and densities outlined in Appendix A of the WSUD TDG. Bioretention basin filter media planting schedules (plant species, number and planting densities) must be included on the plans; and

(xiii) Include a note which refers to the Healthy Waterways Bioretention Basin Construction and Establishment Guidelines and Sign Off Forms (including the pre-start meeting form and forms A-G) for use throughout construction. The operational works drawings must include notes referring to the staging and timing of the commissioning of the bioretention basin and measures to protect the filter media during development within the contributing catchment.

(d) Prior to lodgement of detailed operational works drawings the developer must receive certification from a RPEQ that the detailed drawings are in accordance with the approved stormwater management plan, these conditions of approval and the WSUD TDG. A copy of the certification must be lodged in conjunction with an operational works application along with completed copies of the WSUD TDG Design Assessment Checklists and Calculation Summary Checklists. Where amended MUSIC modelling is undertaken an electronic copy of the MUSIC .sqz file must be submitted to Council for review.

27. Landscaping Plan

(a) A landscape plan, which conforms to the approved development plan must be submitted to Council for approval in conjunction with an application for operational works. Such plan must include, amongst other necessary items, the following features:

(i) Extent of landscaped areas;

(ii) Fence size and type of material;

(iii) Schedule of plant species size (see Note 1 below), densities (see Note 2 below) and attributes for other landscaped areas; and

(iv) Exclude the use of exotics and environmental weeds. Consideration must be given to utilising Council's Vegetation Communities Rehabilitation Guide 2 Alluvial Flats, Watercourses & Wetlands and Appendix A Plant Selection for Water Sensitive Urban Design published by Healthy Waterways.

Note 1: Planting sizes are at least as follows

Street and features trees	45L
Other trees	300mm
Larger shrubs	200mm
Groundcovers	150mm

Note 2: Planting at approximately the following density rates:

	For buffer planting	**All Other instances**
Trees	at 2m centres	at 5m centres
Large shrubs	at 1m centres	at 2m centres
Groundcovers	at 0.5-1m centres	at 0.5-1m centres

(b) The developer must complete landscaping and fencing works in accordance with the approved landscape plans to the satisfaction of the assessment manager prior to the commencement of the use of the land unless Council determines otherwise. Such landscaping and fencing must be maintained in perpetuity to Council's satisfaction by the existing or future owners and occupiers of the property.

28. Waste Storage & Collection

(a) The area on which the bin(s) is to be accessed by refuse collection vehicles must be screened, level, concreted and constructed in conjunction with the driveway surface with no intervening step, ledge, kerb or other obstruction.

(b) All wash down waters from bin cleansing performed on-site must be appropriately treated and discharged to the sewer subject to a trade waste approval. No wash down waters are permitted to flow to a roadway, gutter, stormwater drain or natural waterway.

(c) All waste bins must be serviced on site with no road-side collection. Access for waste vehicle must allow forward motion entry to the industrial refuse containers and forward motion exit from the site.

2. Operational Works – Advertising Devices

1. Basis of Approval

This approval is subject to these conditions, the facts and circumstances set out in the application and adherence to all relevant Council Local Laws and/or Planning Scheme Policies.

2. Minor Alterations

Notwithstanding the requirements detailed in this approval, any other minor alterations and/or modifications accepted in writing by the assessment manager will suffice.

3. Development Plans

The development of the site must be undertaken generally in accordance with the approved plans in part 3 of the decision notice.

4. Hours of Construction

Unless otherwise determined in writing by the assessment manager, hours of construction must not exceed:

Monday to Saturday 6:30am to 6:30pm

Construction work must not be conducted from or on the premises outside the above hours or on Sundays or public holidays.

5. Locality References

(a) Any place name or estate name used by the developer (excluding a reference to a building, structure or the like and excluding minor, subsidiary signage within a development) must specify the relevant approved place name under the *Place Names Act 1994*, which must be in the same colour and background colour as the estate name, in lettering no less than 50% of the estate name and in the same orientation as the estate name.

(b) Any reference to the regional location of the site or the development must not refer to the place or estate as being located in Brisbane or a Brisbane suburb or in the metropolitan area or in the western suburbs (excluding the western suburbs of Ipswich as determined by Council in writing from time to time).

6. Limits to Approval

(a) This approval is limited to the advertising of the proposed service/trades use, business use (café) and business use (tenancy) development at 1 Hawkins Crescent, Bundamba, identified as part of Lot 1010 on SP151177, as detailed on the approved plans. Advertising of any other nature will require separate approval.

(b) Illumination of the advertising device is not permitted.

(c) The advertising device must be located wholly within private property and must not be built on or near Council infrastructure to the satisfaction of the assessment manager.

7. Sign Maintenance

The advertising device must be maintained to the satisfaction of the assessment manager to not cause disturbance to the occupants of nearby developments.

8. Landscaping for Advertising Devices

Landscaping (including ground covers, shrubs and native species) must be planted at the base of the advertising device fronting Ashburn Road and Hawkins Crescent. The landscaping must not impede sight lines of vehicles entering or exiting the site. Landscaped areas must be planted with water wise species.

9. Entry Walls or Features

The provision of entry walls or features on road reserves or park is not permitted, unless otherwise approved in writing by the assessment manager. Entry walls or features must be fully contained on private property. These entry features or walls must be designed such that maintenance for Council following the "Off Maintenance" inspection is minimal. Entry walls must be designed in accordance with Ipswich Planning Scheme 2006 Implementation Guidelines No. 18 - Estate and Directional Signage.

10. Proposed Location and Design

The location and design of the proposed advertising devices must not create a nuisance or potential hazard to pedestrians.

11. Compliance with Conditions

Unless otherwise stated, all conditions must be completed prior to the commencement of the use on the site or as determined in writing by the assessment manager.

Assessment Manager (Ipswich City Council) Advices

Advices applicable to this approval under Sustainable Planning Act:

1. Portable Long Service Leave

Where the works are valued at $80,000 or more and match the definition of Building and Construction Industry, the *Building and Construction Industry (Portable Long Service Leave) Act 1991* requires that evidence of payment of the Portable Long Service Leave (QLeave) Levy be received by Council as a condition of issuing a development permit. This applies to building works, operational works and plumbing and drainage works applications, as defined under the *Sustainable Planning Act 2009*.

If such evidence is not received by the time of issuing the decision notice, Council may only issue a preliminary approval, notifying the developer that the application is approved, but not permitting commencement of operational works.

All statutory timeframes applying under the *Sustainable Planning Act 2009* for appeals and expiry of the approval continue in force after issuing of the decision notice containing the preliminary approval.

If a preliminary approval is issued in the absence of evidence of payment of the QLeave Levy, a subsequent development permit will have to be issued by Council upon receipt of evidence of payment. This will require a new application and fees will apply.

If you require clarification in regard to the *Building and Construction Industry (Portable Long Service Leave) Act 1991*, you should contact QLeave on 1800 803 481 (free call) or [redacted]

2. Water Meter

All new commercial, industrial or large multi-residential property connections with a projected annual consumption greater than or equal to 20,000kL must have installed, at the customer's expense, an electronic water meter with a data logger and an approved back-to-base communication system as specified by QUU.

Properties with electronic water meters are subject to billing on a monthly basis in accordance with the metered monthly consumption.

If the proposed development is likely to have an annual water consumption equal to or greater than 20,000kL, the developer will be required to contact QUU on telephone 13 26 57 to arrange installation of an electronic flow meter.

3. Flammable and Combustible Liquids

Where there is flammable or combustible liquids stored on site there may be a need to hold a licence to do so under the *Dangerous Goods Safety Management Act 2001*. Please contact the Engineering and Environment Branch of the Planning and Development Department of Ipswich City Council for advice regarding this matter by telephone on [redacted]

4. Environmentally Relevant Activity

This approval does not include an approval to operate an Environmentally Relevant Activity. An application under the *Environmental Protection Act 1994* must be submitted to Council prior to the commencement of the Environmentally Relevant Activity. Please contact the Engineering and Environment Branch of the Planning and Development Department of Ipswich City Council for advice regarding this matter by ringing [redacted]

5. Trade Waste Permit

Waste water directed to sewer must only be carried out in compliance with an approved Trade Waste Permit for the site. All associated water treatment equipment (if any) must

be covered by the Permit, where released to sewer. Trade Waste enquiries can be made to Council's Trade Waste Branch.

6. Food Licence

Where food is sold, served and or produced on the site there may be a need to hold a licence to do so under the Food Act 2006. Please contact the Engineering and Environment Branch of the Planning and Development Department of Ipswich City Council for advice regarding this matter by ringing [redacted]

Attachment B
File No: 7606/10
Location: 1 Hawkins Crescent, Bundamba

Assessment Manager Conditions issued by Ipswich City Council under delegation from the Central SEQ Distributor-Retailer Authority and relate to requirements for development for water and wastewater

1. Water Supply

(a) The developer must provide a reticulated water supply which connects into Council's existing reticulation system.

(b) All works on live water mains must be carried out by QUU in accordance with Planning Scheme Policy 3 section 11.1.2, and at the developer's expense.

(c) Council's water supply system has been designed to achieve the target levels of service as outlined in Planning Scheme Policy 3 section 4.1.2 'Standard of Service'. It is the responsibility of the developer to provide any fire fighting requirements over and above Council's target levels of service, at their expense, internally and without adverse impact to Council's water supply system.

(d) As part of the application for operational works, the developer must submit authorisation from Queensland Urban Utilities for the proposed works on or near Queensland Urban Utilities assets, adjacent to Ashburn Road.

(d) The developer must lodge a private works request for QUU to:

(i) Supply and install a suitable metered water connection for the lot;

(ii) Amend the existing connection if necessary; and

(iii) Seal off any existing water connections if necessary.

The relevant fees must be paid and evidence of payment submitted to Council prior to use of the site.

2. Sewerage

(a) The developer must provide a sewerage reticulation system designed so as to command the whole of the site, which connects into Council's existing reticulation system adjoining the site, generally in accordance with the Martin Cosgrove and Associates' drawing number C111 Issue A, dated 12 May 2011. The connection must be bored beneath the road to prevent damage to and disruption in Hawkins Crescent.

(b) The developer must pay the full cost for QUU to provide a suitable connection into the existing sewerage reticulation system. All works on live sewers must be carried out by

QUU at the developer's expense in accordance with Planning Scheme Policy 3 section 10.1.2, unless arranged otherwise with QUU.

(c) Any existing sewerage or sanitary drainage that crosses proposed lot boundaries must be located, disconnected and removed to the satisfaction of the assessment manager.

DA No. 7606/10
ATTACHMENT B - ANNEXURE A
INFRASTRUCTURE CHARGES NOTICE

This Infrastructure Charges Notice is issued by Council under delegation from the Central SEQ Distributor-Retailer Authority and relates to charges for the purpose of water and wastewater network owned by Central SEQ Distributor-Retailer Authority.

City of Ipswich

Ipswich City Council

45 Roderick St
PO Box 191
Ipswich QLD 4305
Australia

Tel (07) 38106666
Fax (07) 38106731
Email council@ipswichqld.gov.au
Web www.ipswichqld.gov.au

Application No: 7606/10

The land to which the infrastructure charge/s applies:

Real Property Description: Part of Lot 101 SP151177

Property Location: Part of 1 Hawkins Crescent, Bundamba

Development Approval Details: In accordance with Section 1 of Development Decision Notice 7606/10

Infrastructure Charges Calculation:

Infrastructure Network & Catchment	Charge/ NRU	Unit Charge Multiplier /NRU	Charge/NRU	Units of Demand and Demand Credit	Net Infrastructure Charge Payable
Water Supply Bundamba Low Level Zone (WT5)	$734	1.1724	$860.54	**STAGE 1** **Café** 4 NRU per 100m² = 1.01 x 4 = 4.04 NRU **Office** 1.25 NRU per 100m² = 3.03 x 1.25 = 3.7875 NRU **Service Trades Use** 0.75 NRU per 100m² = 9.68 x 0.75 = 7.26 NRU Total = 15.0875 NRU Existing Credit = 11.0993 NRU (4,933m² @ 22.5 NRU/ha) **Proposal = 3.9882 NRU**	$860.54 x 3.9882 = $3,432.01 Total = $3,432.00

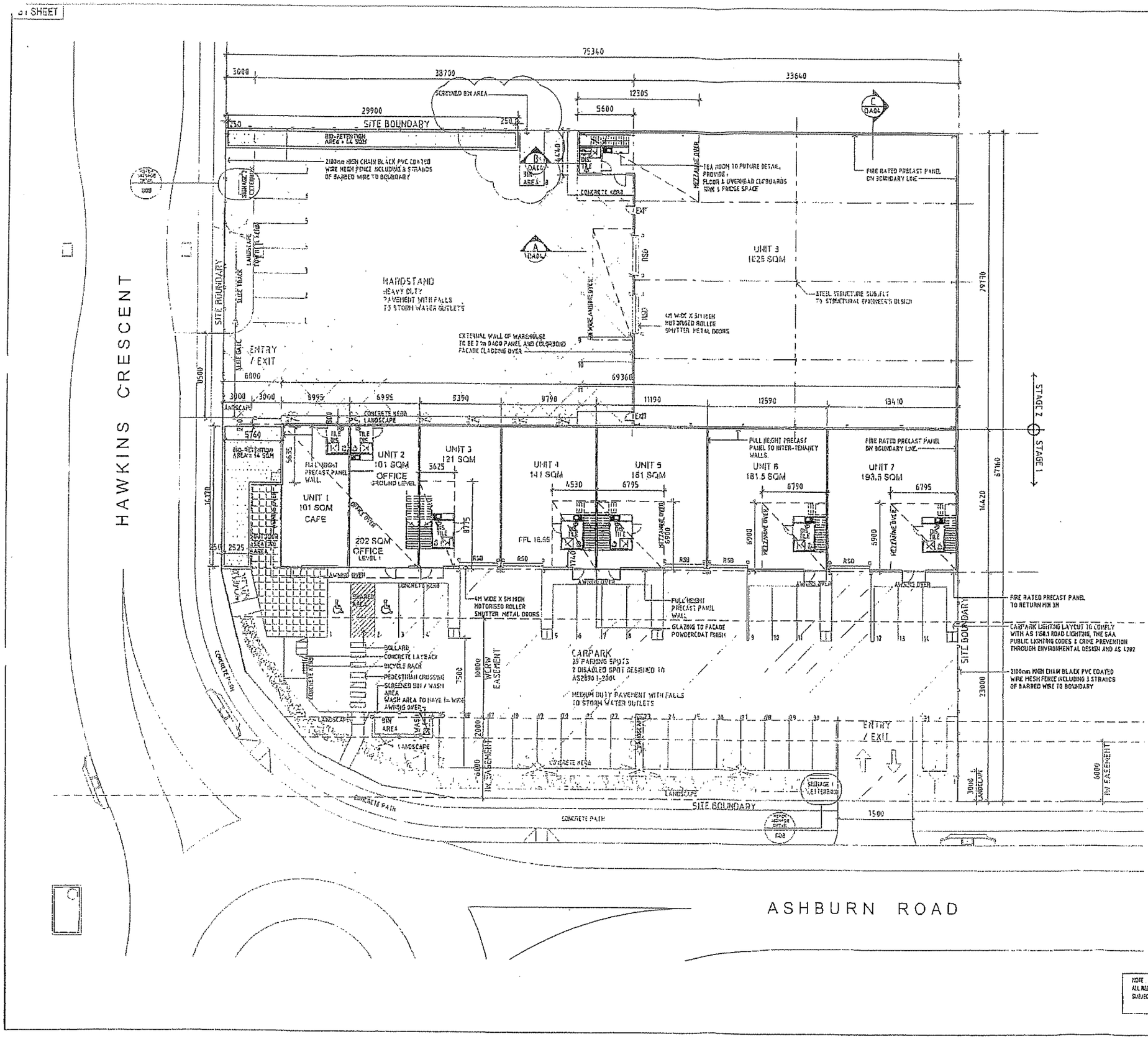
				STAGE 2 **Service Trades Use** 0.75 NRU per 100m² = 11 x 0.75 = 8.25 NRU **Proposal = 8.25 NRU**	$860.54 x 8.25 = $7,099.46 Total = $7,099.00
				STAGE 2 **Service Trades Use** 0.75 NRU per 100m² = 11 x 0.75 = 8.25 NRU **Proposal = 8.25 NRU**	$1,233.36 x 8.25 = $10,175.22 Total = 10,175.00
Total Stage 1					**$8,351.00**
Total Stage 2					**$17,274.00**
Total Charge Amount					**$25,625.00**

Details of Payment

Payment Details:	Payment of the infrastructure charges must be made to Ipswich City Council. It is advised that direct debit, personal and/or company cheques cannot be accepted as payment for the above infrastructure charges. The only acceptable forms of payments are cash (EFT payments included), bank cheques or eligible credit cards. A copy of this Infrastructure Charges Notice is to accompany the above payment.
Due date for payment	Payment of the infrastructure charges is required *before the* certificate of classification for the building work is issued or before the change of use happens (whichever comes first) in accordance with Section 634 of the *Sustainable Planning Act 2009*.
Adjusted charge rate:	The infrastructure charges outlined in this notice above are applicable for a period of **twelve (12) months from the date of the development approval**, and thereafter must be based on the infrastructure contribution policies and adjusted charge rates applicable at the date when payment is made. Please contact Council for further advice on adjusted charge rates.

General Information

GST:	The Federal Government has determined that contributions made by developers to Government for Infrastructure and services under the *Sustainable Planning Act 2009* are GST exempt.
Authority for the charge:	The infrastructure charges in this notice are payable in accordance with section 632 of the *Sustainable Planning Act 2009* as amended by clause 755K of the *South-East Queensland Water (Distribution and Retail Restructuring) and Other Legislation Amendment Act 2010*.
Related payments and by provision of infrastructure:	The total infrastructure charges may be altered having regard to other infrastructure charges paid for the particular property or whether it has been offset through the provision of infrastructure through an infrastructure agreement(s).
Appeals:	Pursuant to section 478 of the *Sustainable Planning Act 2009* a person may appeal an infrastructure charges notice. (Refer to clause 755W *South-East Queensland Water (Distribution and Retail Restructuring) and Other Legislation Amendment Act 2010).*
Circumstance where the infrastructure charges are not recoverable:	The above charges are not recoverable unless the entitlements under the development approval or compliance permit are exercised in accordance with Section 633 (4) of the *Sustainable Planning Act 2009*.
When this notice lapses:	This notice lapses if the development approval or compliance permit ceases to have effect in accordance with Section 633 (5) of the *Sustainable Planning Act 2009*.



Pursuant to Section 336(b) of the Sustainable Planning Act, this plan forms part of Council's approval for

Application No: 7606/11

Dated: 5 August 2011

Signed: [redacted]

Date: 8 September 2011

DEVELOPMENT DATA

TOTAL SITE AREA	4 933 m2
SITE AREA STAGE 1	2 693 m2
- UNIT 1 = 101 SQM (CAFE) - UNIT 2 = 303 SQM (2 LEVELS) - UNIT 3 = 121 SQM + MEZZ. OFFICE 25 SQM - UNIT 4 = 141 SQM + MEZZ. OFFICE 25 SQM - UNIT 5 = 161 SQM + MEZZ. OFFICE 40 SQM - UNIT 6 = 181.5 SQM + MEZZ. OFFICE 40 SQM - UNIT 7 = 193.5 SQM + MEZZ. OFFICE 40 SQM	
TOTAL BUILDING AREA	1 372 m2
OUTDOOR SEATING AREA	90 m2
MEDIUM DUTY PAVEMENT	1 160 m2
CARPARKING PROVIDED	31 SPACES
SITE AREA STAGE 2	2 240 m2
UNIT 8 AREA	1 025 m2
MEZZANINE OFFICE	75 m2
TOTAL BUILDING AREA	1 100 m2
HEAVY DUTY PAVEMENT	1 105 m2
CARPARKING PROVIDED	11 SPACES

HEAVY DUTY PAVEMENT

MEDIUM DUTY PAVEMENT

Walker

Project: Proposed Warehouse / Storage & Office & Cafe Development

Address: LOT 18 Ashburn Road, Ipswich

Client: Walker Corporation

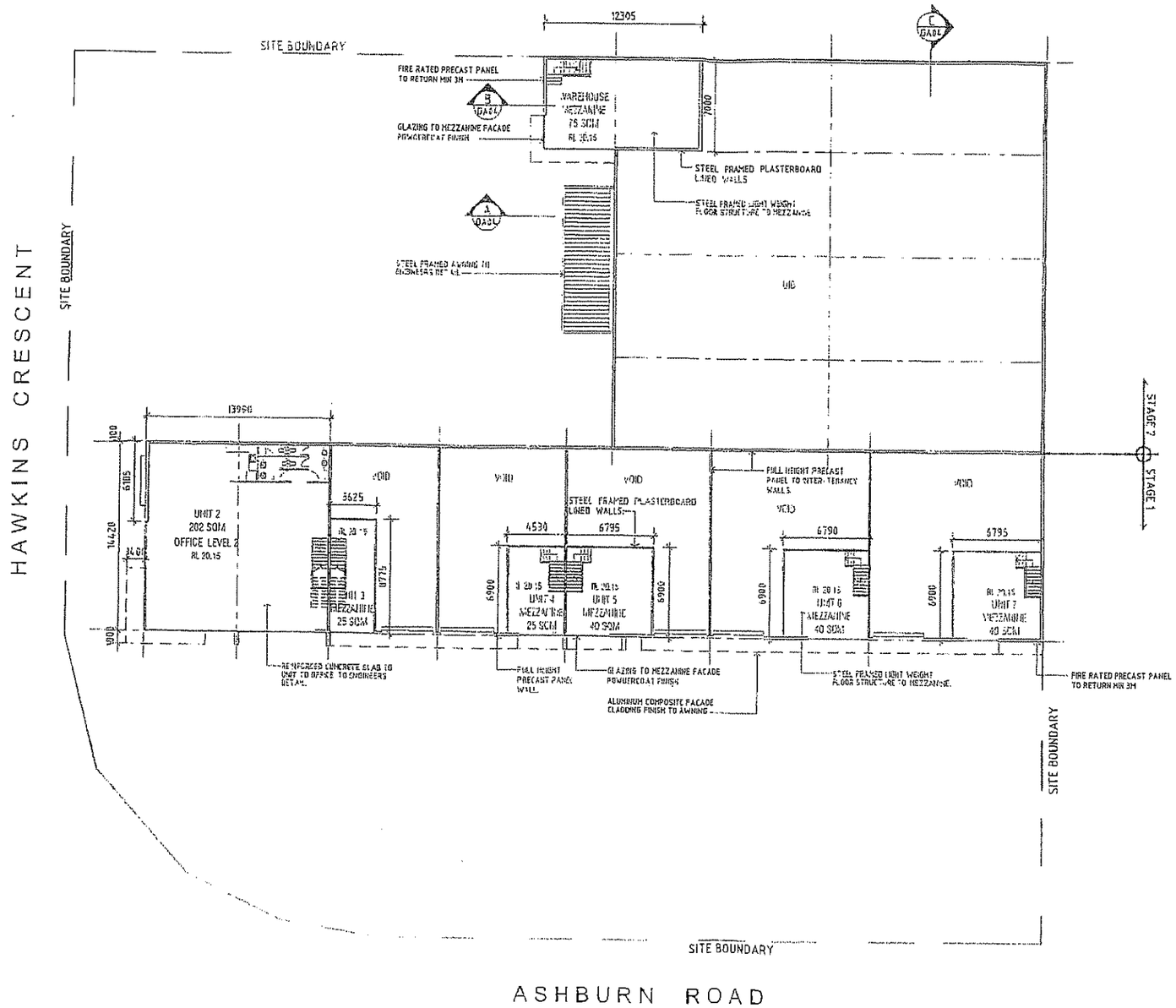
Drawing: Site / Floor Plan

Status: DA - Not for Construction

Project No.: SP-CS-DA-001 Issue: E

NOTE: ALL REDUCED LEVELS ARE NOMINAL (+/- 500mm) SUBJECT TO FINAL DETAIL DESIGN

81 SHEET



Pursuant to Section 336(b) of the Sustainable Planning Act, this plan forms part of Council's approval for

Application No: 7606/11

Dated: 5 August 2011

Signed: [redacted]

Date: 8 September 2011

DEVELOPMENT DATA

SITE AREA STAGE 1	2 603 m2
- UNIT 2 = MEZZ. OFFICE 202 SQM - UNIT 3 = MEZZ. OFFICE 25 SQM - UNIT 4 = MEZZ. OFFICE 25 SQM - UNIT 5 = MEZZ. OFFICE 40 SQM - UNIT 6 = MEZZ. OFFICE 40 SQM - UNIT 7 = MEZZ. OFFICE 40 SQM	
TOTAL MEZZANINE LEVEL AREA	172 m2

SITE AREA STAGE 2	2 240 m2
WAREHOUSE MEZZ. OFFICE	75 m2

Walker

Project: Proposed Warehouse / Storage & Office & Cafe Development

Address: LOT 18 Ashburn Road, Ipswich

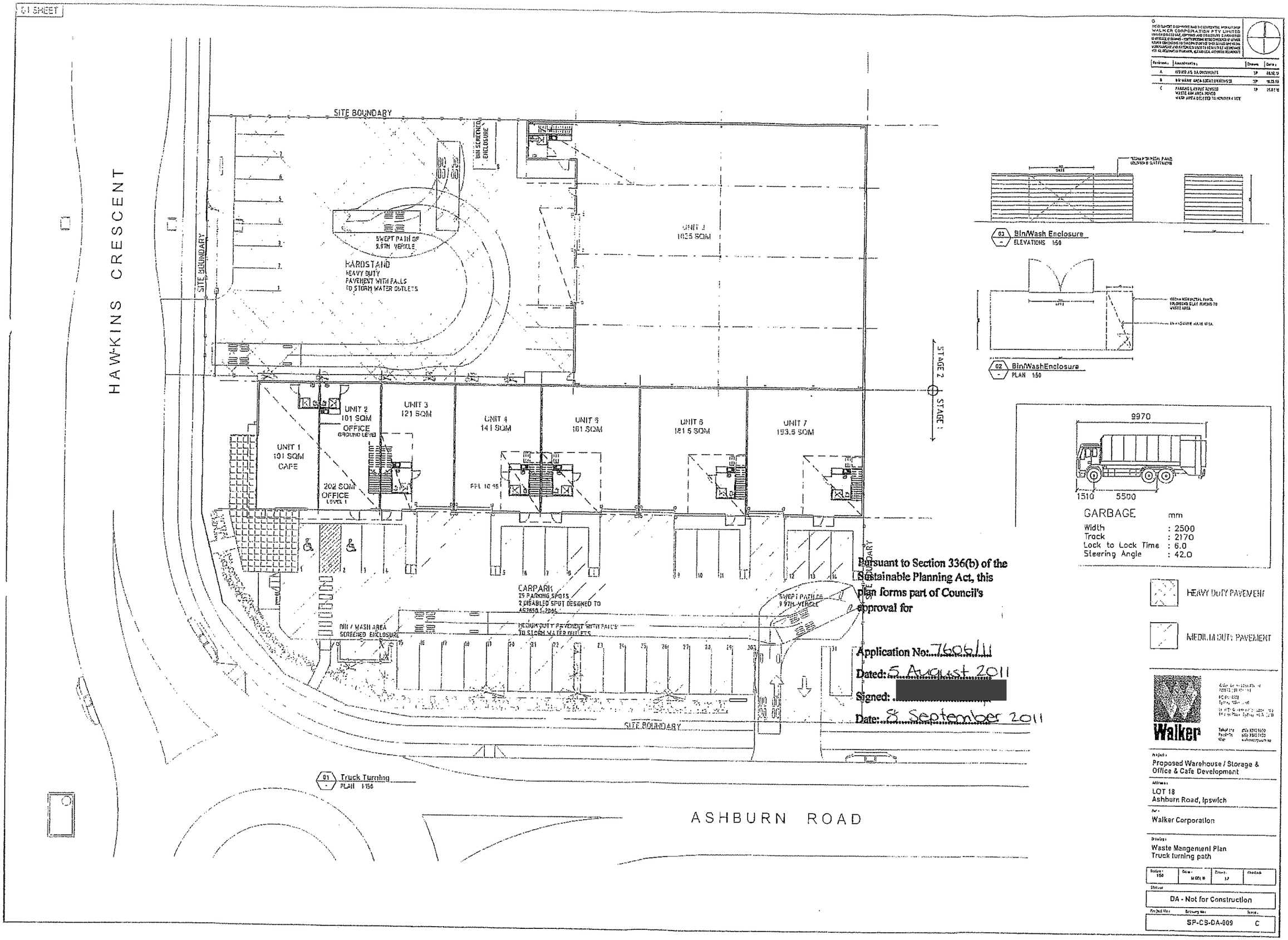
Client: Walker Corporation

Drawing: Mezzanine Floor Plan

NOTE: ALL REDUCED LEVELS ARE NOMINAL (+/- 500mm) SUBJECT TO FINAL DETAIL DESIGN

Status: DA - Not for Construction

Project No: SP-CS-DA-002 Issue: C



Pursuant to Section 336(b) of the Sustainable Planning Act, this plan forms part of Council's approval for

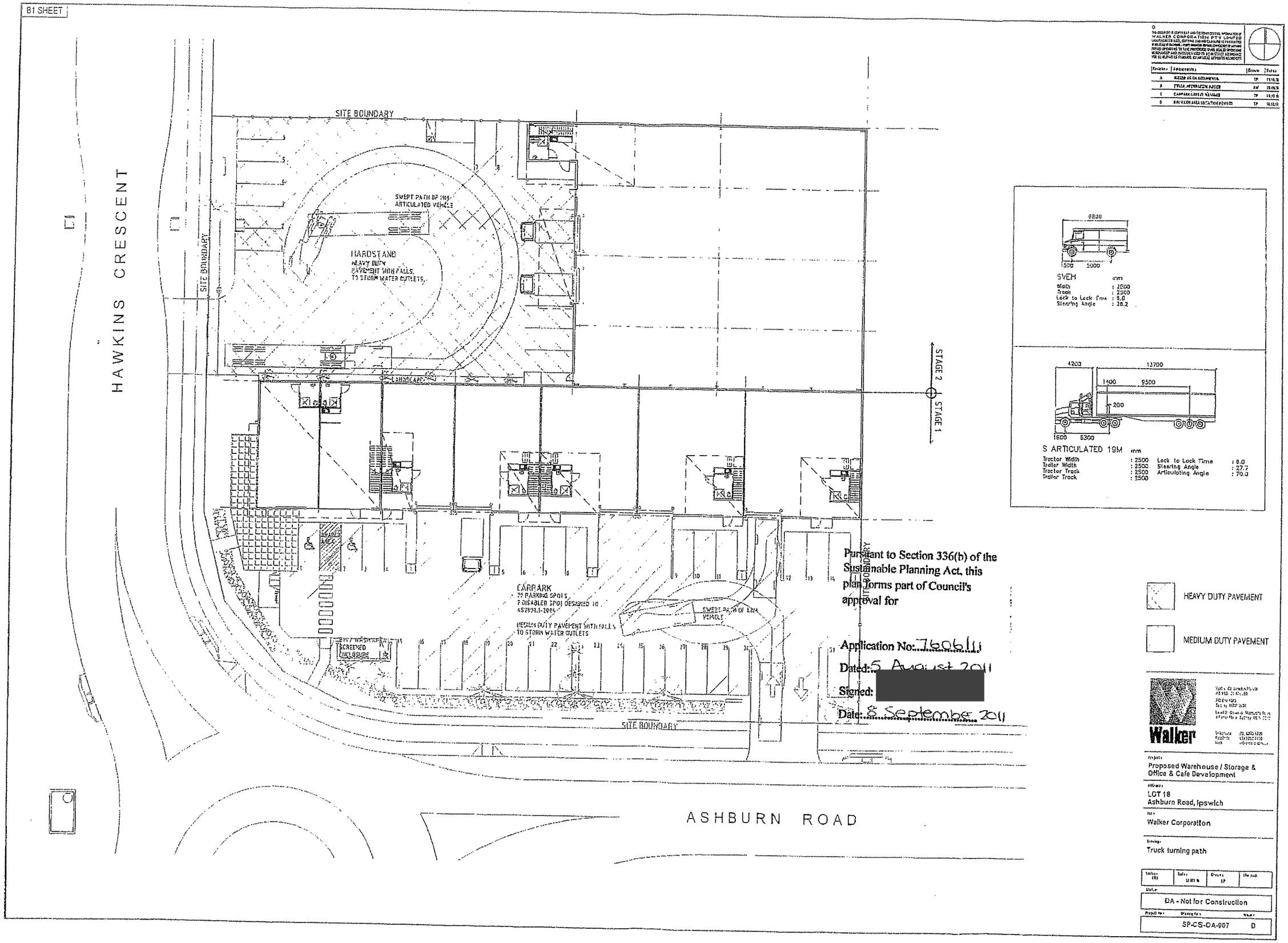
Application No: 7606/11

Dated: 5 August 2011

Signed: [redacted]

Date: 8 September 2011

B1 SHEET



Pursuant to Section 336(b) of the Sustainable Planning Act, this plan forms part of Council's approval for

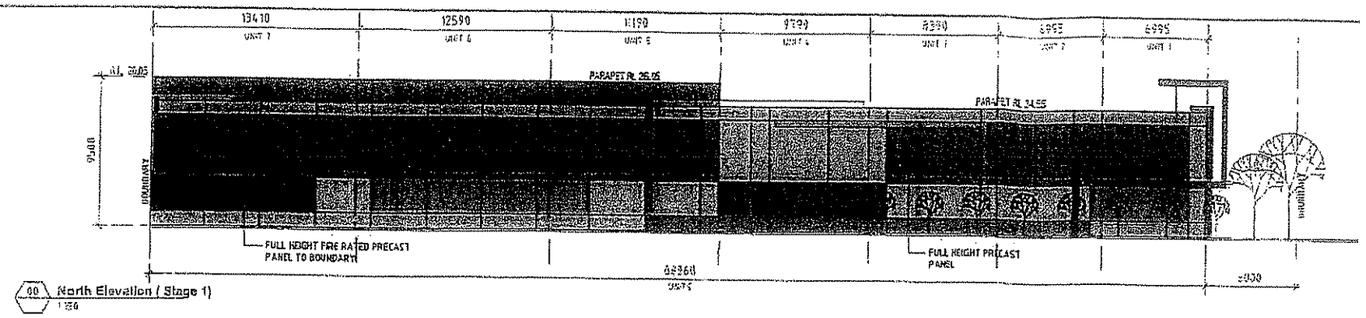
Application No: 7606/11

Dated: 5 August 2011

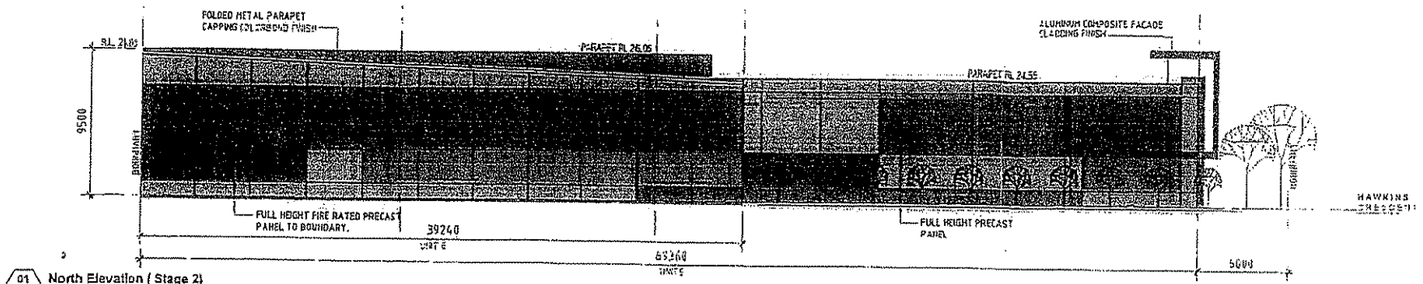
Signed: [redacted]

Date: 8 September 2011

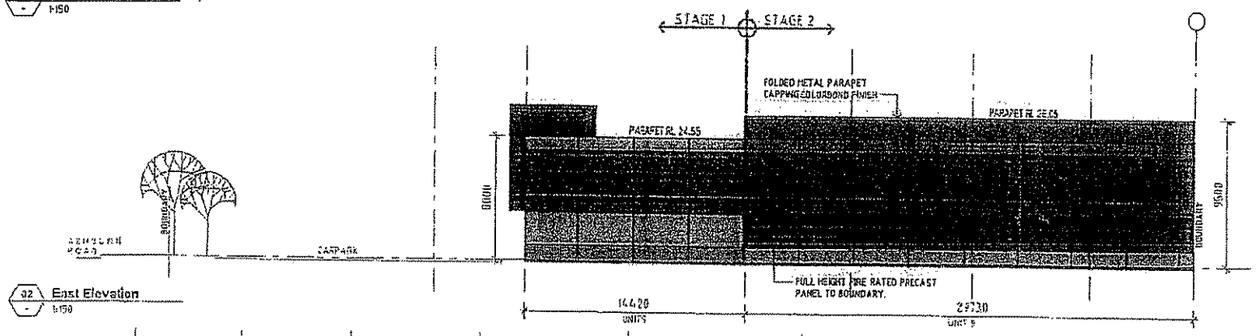
A1 SHEET



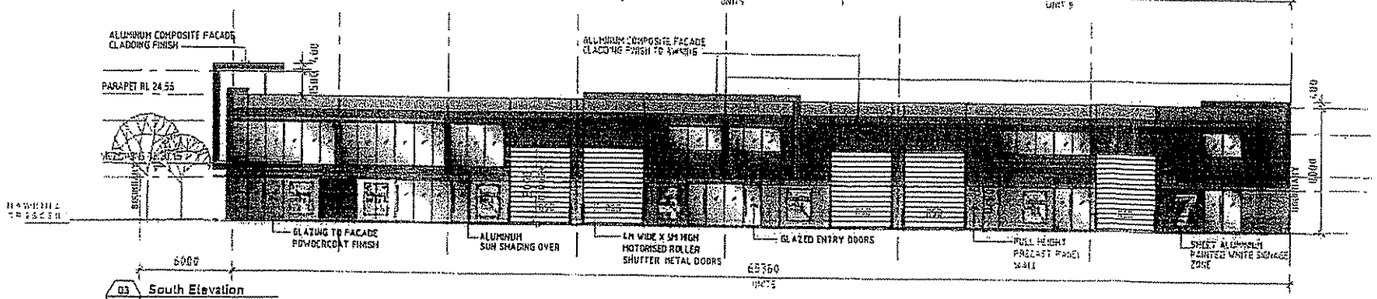
00 North Elevation (Stage 1)
1:150



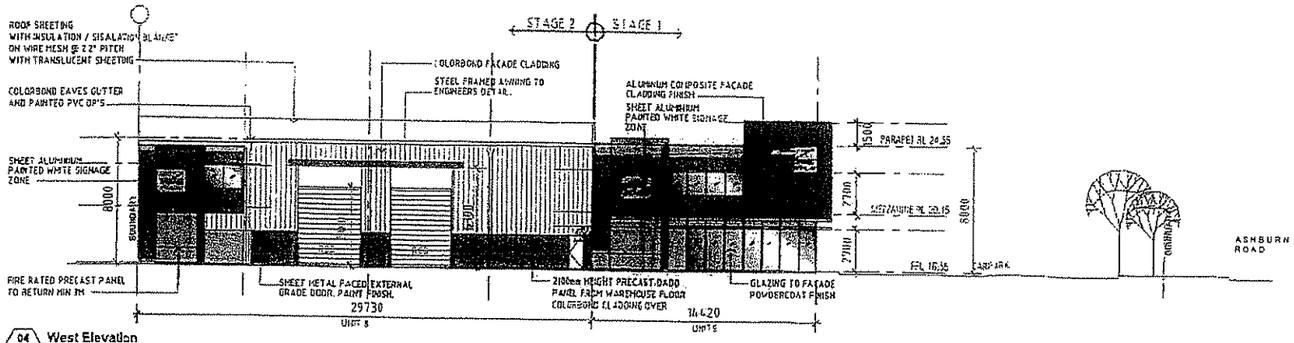
01 North Elevation (Stage 2)
1:150



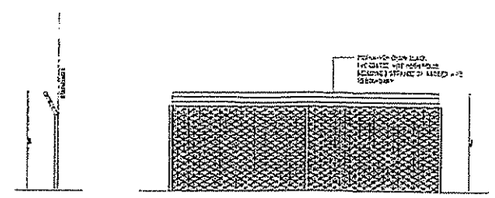
02 East Elevation
1:150



03 South Elevation
1:150



04 West Elevation
1:150



05 Perimeter Fence Detail
1:50

Pursuant to Section 336(b) of the Sustainable Planning Act, this plan forms part of Council's approval for

Application No: 7606/11

Dated: 5 August 2011

Signed: [redacted]

Date: 8 September 2011

NOTE:
ALL REDUCED LEVELS ARE FROM/RELATE (+/- 50mm) SUBJECT TO FINAL DETAIL DESIGN

COLOUR & FINISHES LEGEND

PC1	PRECAST CONCRETE PANEL WITH EXTERNAL TEXTURED MASONRY PAINT FINISH. COLOUR - DULUX (MOXA PG2 .B3)
PC2	PRECAST CONCRETE PANEL WITH EXTERNAL TEXTURED MASONRY PAINT FINISH. COLOUR - DULUX (DOUBLE BASS PG2 .A9)
PC3	PRECAST CONCRETE PANEL WITH EXTERNAL TEXTURED MASONRY PAINT FINISH. COLOUR - DULUX (FULL OF LIFE P09 .H8)
PC4	PRECAST CONCRETE PANEL WITH EXTERNAL TEXTURED MASONRY PAINT FINISH. COLOUR - DULUX (QUINCE JELLY P10 .H8)
AFG1	POWDER-COATED ALUMINIUM-FRAMED GLAZING SYSTEM (COLORBOND SURFMIST)
AP1	COLORBOND PROFILED SHEET CLADDING. COLOUR - SHALE GREY
RS	ZINCALUME METAL ROOF SHEETING
RSD	ROLLER SHUTTER DOOR PAINT FINISH COLOUR - DULUX (ASHVILLE PG2 .B1)
ACP1	ALUMINUM COMPOSITE FACADE CLADDING COLOUR - DULUX (FULL OF LIFE P09. H8) OR SIMILAR
ACP2	ALUMINUM COMPOSITE FACADE CLADDING COLOUR - DULUX (QUINCE JELLY P10. H8) OR SIMILAR

Revision	Amendment	Drawn	Date
A	ISSUED AS DA DOCUMENTS	TP	01.07.11
B	STAGE 2 - NORTH ELEVATION ADDED	TP	29.10.11
C	STAGE 2 - NORTH ELEVATION REVISED LANDSCAPE BUFFER ADDED	TP	11.11.11

Walker

Walker Corporation Pty Ltd
ABN 53 001 118 338
PO Box 1021
Sydney NSW 2001
Level 26 Gateway Hallmark Tower
1 Farrer Place, Sydney NSW 2000
Telephone (02) 9373 6000
Facsimile (02) 9373 7400
Web www.walker.com.au

Project: Proposed Warehouse / Storage & Office & cafe Development

Address: LOT 18 Ashburn Road, Ipswich

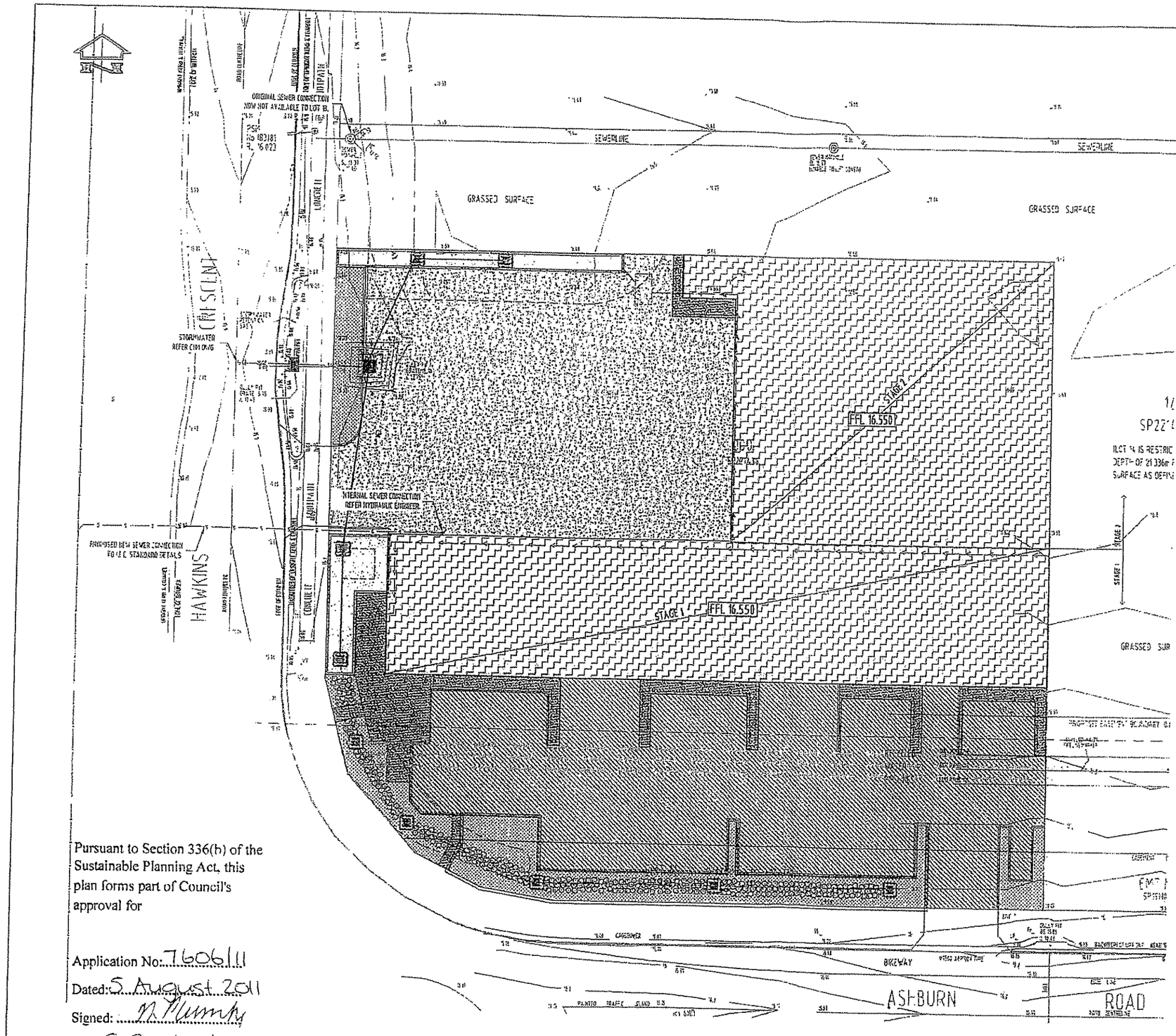
For: Walker Corporation

Drawing: Coloured Elevations

Drawn	Date	Scale	Checked
TP	11.11.11	1:150 @ A1	

Status: DA - Not for Construction

Project No: Drawing No: SP-CS-DA-006 Revision: C



Pursuant to Section 336(b) of the Sustainable Planning Act, this plan forms part of Council's approval for

Application No: 7606/11

Dated: 5 August 2011

Signed: N Plumb

Date: 8 September 2011

CIVIL WORKS LEGEND

EXISTING

- SURVEY GROUND LEVEL
- SURVEY BOUNDARY
- SURVEY CONTOUR

PROPOSED

- TOP OF FOOTING LEVEL
- FINISHED LEVEL
- STRUCTURAL SURFACE LEVEL
- BULK EARTHWORKS LEVEL
- EXISTING INTERPOLATED LEVEL
- PROPOSED CONTOUR
- DISHED DRAIN
- INVERT
- DRAIN
- KERB & GUTTER
- GARDEN KERB
- BLOCK RETAINING WALL AND FOOTING
- PIPE ENLARGER / REDUCER
- GRATED DRAIN
- RODDING POINT
- GRASS CATCH DRAIN
- 1000 SUB-SOIL DRAIN WITH HIGH END RISER
- DOWNPIPE AND IN/GROUND S/W LINE TO HYDRAULIC CONSULTANTS DETAILS
- STORMWATER LINE, PIT & PIT No
- INVERT LEVEL (UPSTREAM) PIPE SIZE & TYPE PIPE GRADE FLOW RATE: LITRES PER SEC INVERT LEVEL (DOWNSTREAM)
- EXISTING STORMWATER LINE
- PROPOSED SEWER LINE
- EXISTING SEWER LINE

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PAVEMENT LEGEND

- HEAVY VEHICLE ACCESS AREAS. (REINFORCED CONCRETE PAVEMENT)
- PARKING / PASSENGER VEHICLE AREAS (REINFORCED CONCRETE PAVEMENT)
- PEDESTRIAN ACCESS AREAS (REINFORCED CONCRETE PAVEMENT)
- LANDSCAPE ZONE (REFER TO LANDSCAPE ARCHITECT'S DETAILS)
- BUILDING OUTLINE (REFER TO ARCHITECTURAL DRAWINGS)
- BIO-RETENTION. (REFER TO SECTIONS)

ISSUED FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION PURPOSES

[redacted]

APPROVING ENGINEER
[redacted]

ISSUE	DATE	REVISION	APPR.
A	12-05-11	ISSUED FOR DEVELOPMENT APPROVAL	FT

CLIENT
WALKER CORPORATION
LEVEL 21 GOVERNOR MACQUARIE TOWER
1 FARMER PLACE, SYDNEY NSW 2000
PH:(02) 8273 9600 FAX:(02) 9252 7400

ARCHITECT
Walker

PROJECT
PROPOSED WAREHOUSE/ UNIT DEVELOPMENT
LOT 18 ASHBURN ROAD IPSWICH

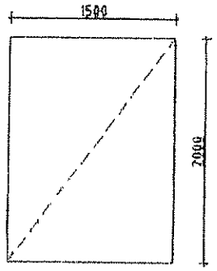
SHEET SUBJECT
PROPOSED SEWER LAYOUT PLAN

Martin COSGROVE and Associates Pty Ltd
ACN 052933221
CONSULTING STRUCTURAL AND CIVIL ENGINEERS
93 WARRY STREET SPRING HILL QLD 4000
Tel.(07) 3252 4644 Fax.(07) 3252 4649
Email : mca@mcaeng.com.au

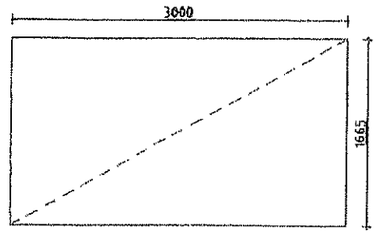
DESIGNED	DRAWN	JOB No.
MS	FT	10162

DATE	SCALE	DRAWING No.	ISSUE
OCT.2010	1:200 U.N.O.	C111	A

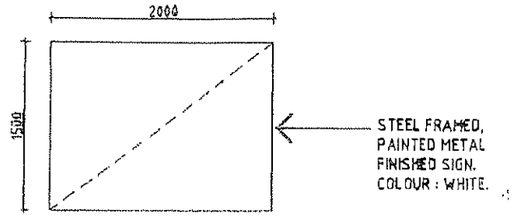
B1 SHEET



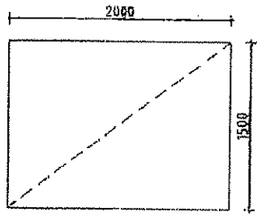
STAGE 1
TYPICAL SIGNAGE
UNIT 1 TO UNIT 7 (SOUTH)
AREA = 3 SQM X (7)



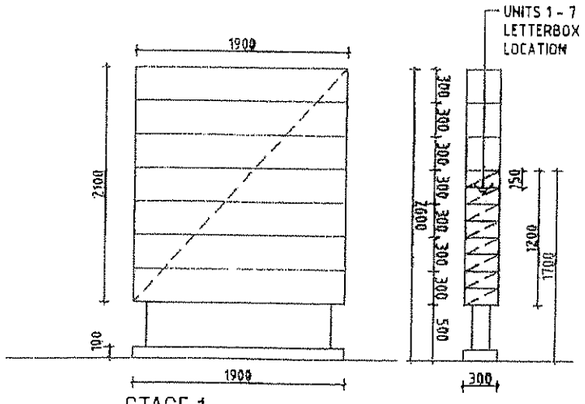
STAGE 1
UNIT 1 - FEATURE WALL (WEST)
AREA = 5 SQM



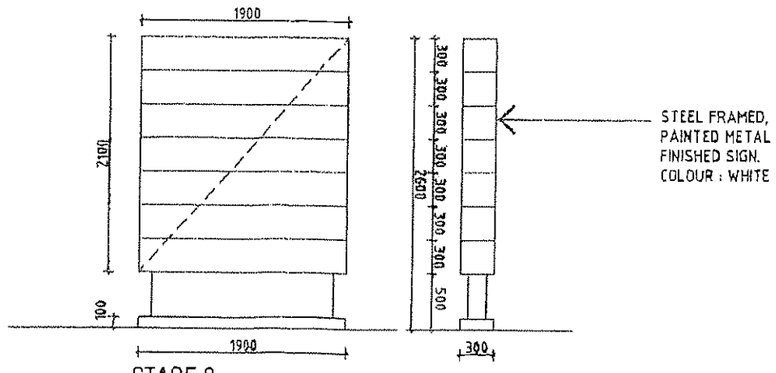
STAGE 1
UNIT 2 (WEST)
AREA = 3 SQM



STAGE 2
SIGNAGE (WEST)
AREA = 3 SQM



STAGE 1
SIGNAGE 1 (ASHBURN ROAD)
AREA = 4 SQM



STAGE 2
SIGNAGE 2 (HAWKINS CRESCENT)
AREA = 4 SQM

TOTAL SIGNAGE AREA = 40 SQM

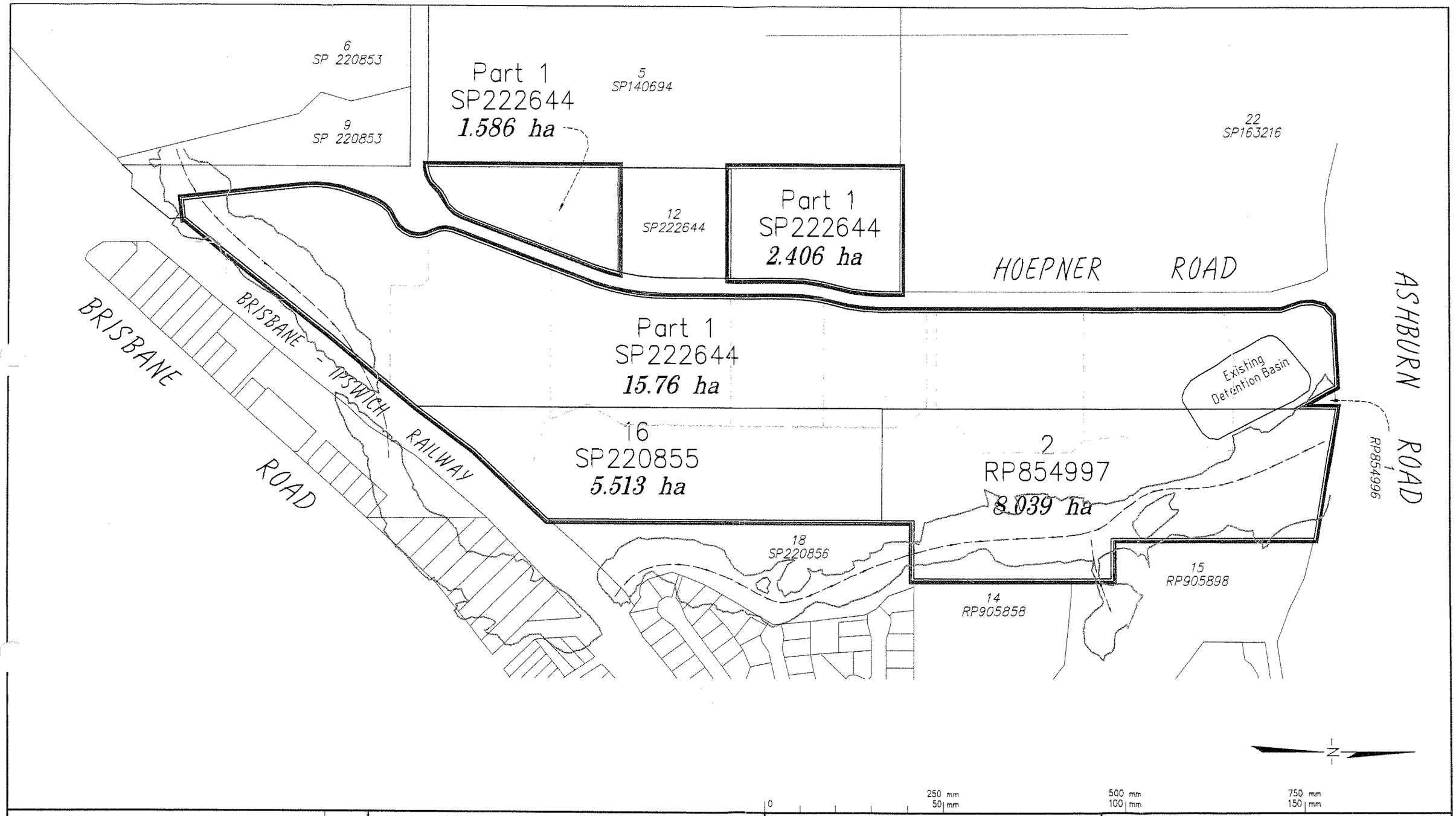
Pursuant to Section 336(b) of the Sustainable Planning Act, this plan forms part of Council's approval for

Application No: 7606/11
Dated: 5 August 2011
Signed: [redacted]
Date: 8 September 2011

Project: Proposed Warehouse / Storage & Office & Cafe Development
Address: LOT 18 Ashburn Road, Ipswich
Client: Walker Corporation
Drawing: Signage plan

DA - Not for Construction

SP-CS-DA-008 C



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Rev B 15/11/10, add topo information
Rev A 25/10/10, Update real property description
Revision | Chk'd

Associate Consultant / Client

WALKER CORPORATION PTY LTD

Notes

TOTAL AREA OF SUBJECT APPLICATION 33.304 ha

Q 100 FLOOD LINE

(Cardno Lawson Treloar plan LJ8714 Figure 1)

LOCATION PLAN

CITISWICH STAGE 2

Parish of GOODNA County of Stanley

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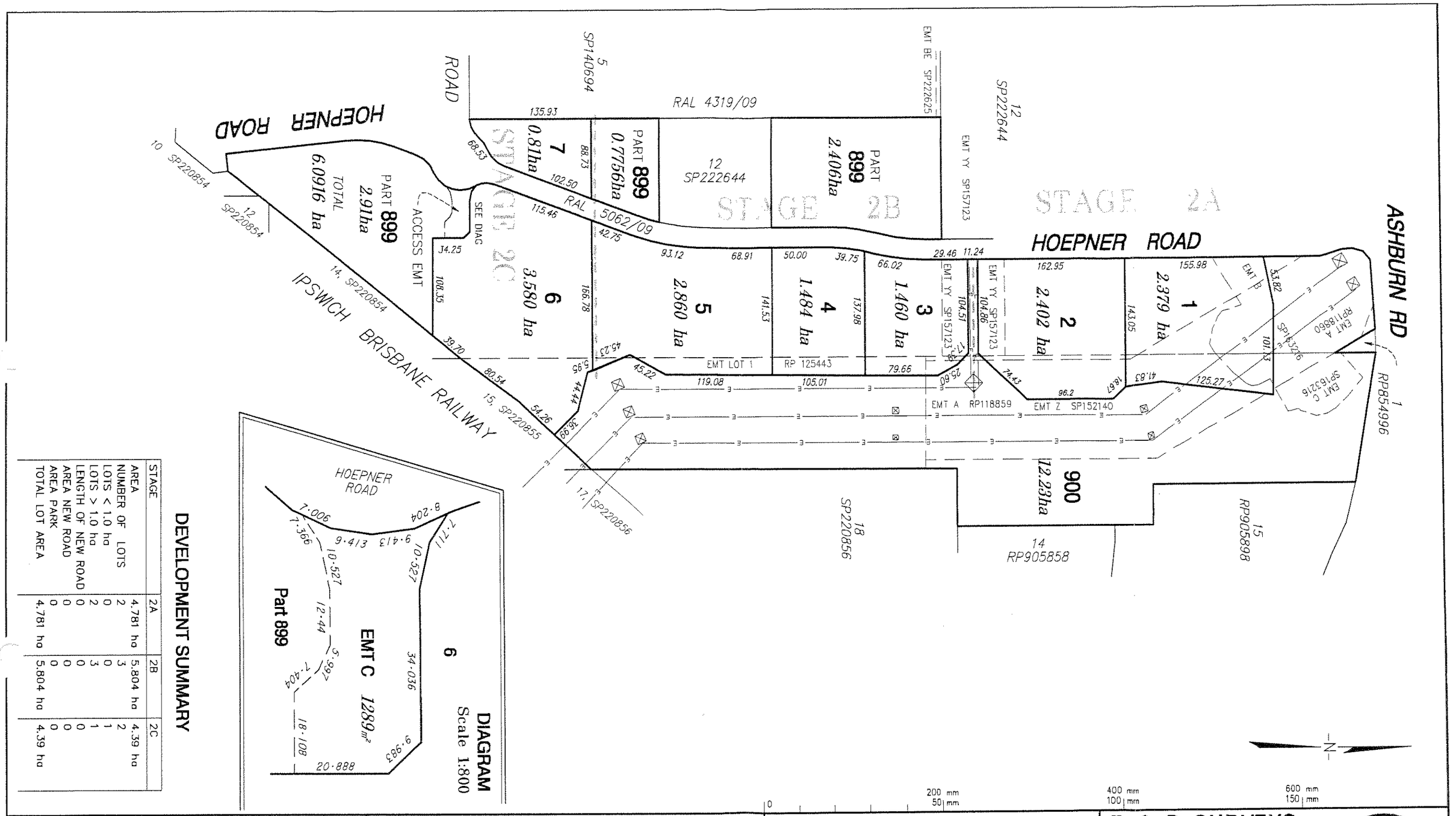

DEVELOPMENT SUMMARY

STAGE	2A	2B	2C
AREA	4.781 ha	5.804 ha	4.39 ha
NUMBER OF LOTS	2	3	2
LOTS < 1.0 ha	0	0	1
LOTS > 1.0 ha	2	3	1
LENGTH OF NEW ROAD	0	0	0
AREA NEW ROAD	0	0	0
AREA PARK	0	0	0
TOTAL LOT AREA	4.781 ha	5.804 ha	4.39 ha

Revision	Chk'd
Rev E 25/10/2010, Amend Lot 2, 899 add access emt, update title	GVG
Rev D 3/06/2010, Amend areas	GVG
Rev C 21/05/2010, Amend Lot 6 Limit	DJH
Rev B 19/05/2010, Amend title,adj RPD	GVG
Rev A 22/04/2010, Amend title, adjust lots	GVG

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THE PROPOSED BOUNDARIES AS SHOWN HEREON ARE PRELIMINARY ONLY AND ARE SUBJECT TO FINAL DESIGN, LOCAL AUTHORITY APPROVAL AND REGISTRATION IN THE DEPARTMENT OF ENVIRONMENT & RESOURCE MANAGEMENT

PROPOSED RECONFIGURATION

3 Lots into 7 plus 2 balance Lots

Of Lot 1 on SP222644
Lot 2 on RP854997 & Lot 16 SP220855

Parish of GOODNA County of Stanley

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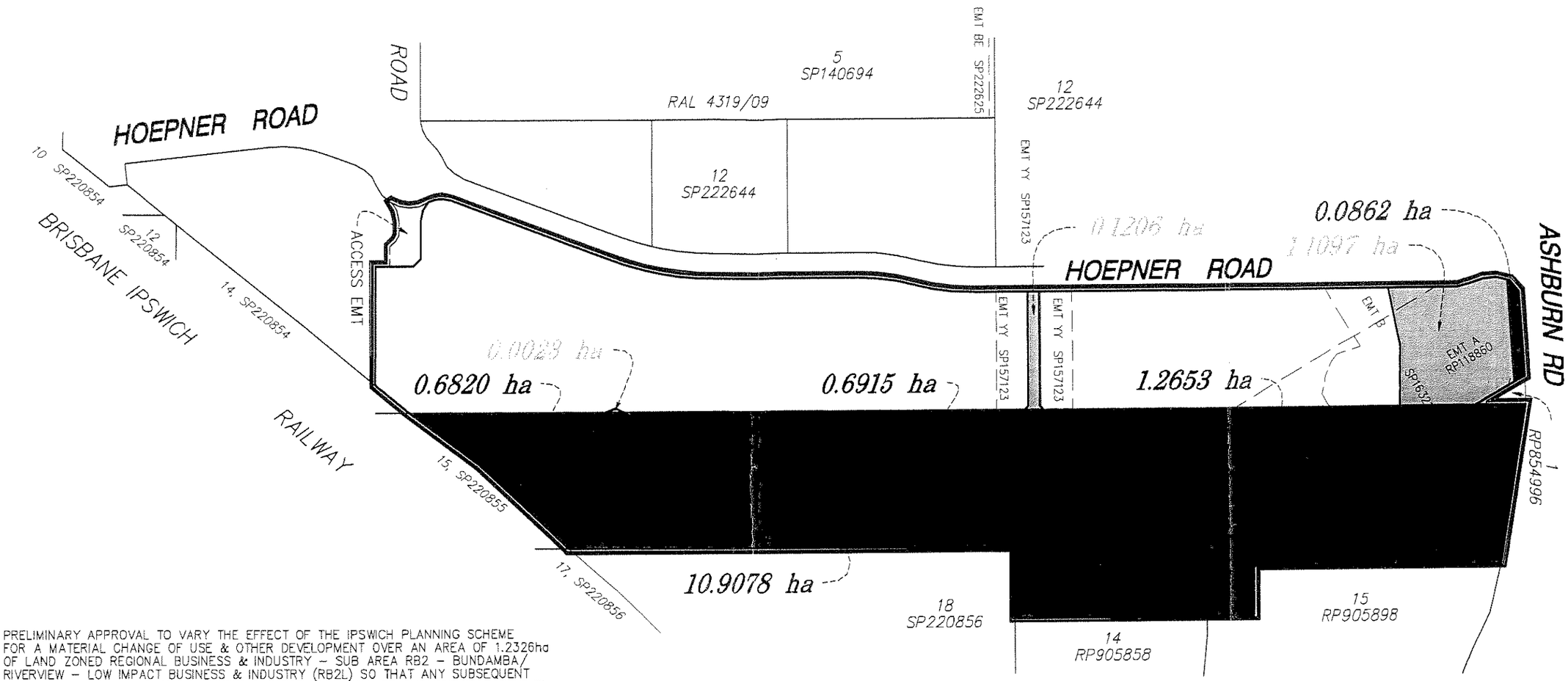

Total
1.2326 ha

PRELIMINARY APPROVAL TO VARY THE EFFECT OF THE IPSWICH PLANNING SCHEME FOR A MATERIAL CHANGE OF USE & OTHER DEVELOPMENT OVER AN AREA OF 1.2326ha OF LAND ZONED REGIONAL BUSINESS & INDUSTRY – SUB AREA RB2 – BUNDAMBA/RIVERVIEW – LOW IMPACT BUSINESS & INDUSTRY (RB2L) SO THAT ANY SUBSEQUENT DEVELOPMENT APPLICATIONS OVER THE SUBJECT LAND WILL BE SUBJECT TO THE LEVEL OF ASSESSMENT & REQUIREMENTS OF THE RECREATION ZONE

Total
10.9940 ha

PRELIMINARY APPROVAL TO VARY THE EFFECT OF THE IPSWICH PLANNING SCHEME FOR A MATERIAL CHANGE OF USE & OTHER DEVELOPMENT OVER AN AREA OF 10.9940ha OF LAND ZONED REGIONAL & INDUSTRY BUFFER SO THAT ANY SUBSEQUENT DEVELOPMENT APPLICATIONS OVER THE SUBJECT LAND WILL BE SUBJECT TO THE LEVEL OF ASSESSMENT & REQUIREMENTS OF THE RECREATION ZONE

Total
2.6388 ha

PRELIMINARY APPROVAL TO VARY THE EFFECT OF THE IPSWICH PLANNING SCHEME FOR A MATERIAL CHANGE OF USE & OTHER DEVELOPMENT OVER AN AREA OF 2.6388ha OF LAND ZONED REGIONAL & INDUSTRY BUFFER SO THAT ANY SUBSEQUENT DEVELOPMENT APPLICATIONS OVER THE SUBJECT LAND WILL BE SUBJECT TO THE LEVEL OF ASSESSMENT & REQUIREMENTS OF THE REGIONAL BUSINESS & INDUSTRY ZONE – SUB AREA RB2 – BUNDAMBA/RIVERVIEW – LOW IMPACT BUSINESS & INDUSTRY (RB2L)

AREA SUBJECT OF PRELIMINARY APPROVAL TO VARY THE EFFECT OF A PLANNING SCHEME (PROVISIONS OF CITISWICH ESTATE STAGE 2 DEVELOPMENT CODE APPLIES TO THIS AREA)

N

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Revision	Chk'd
Rev F 21/12/10, Remove Sub Areas & prop lots	
Rev E 09/12/10, General revision	
Rev D 15/11/10, General revision	
Rev C 25/10/10, Amend Lot 2, add access emt	
Rev B 7/6/10, Change Lot 7 to medium impact	
Rev A 3/6/10, Add open space	

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THE PROPOSED BOUNDARIES AS SHOWN HEREON ARE PRELIMINARY ONLY AND ARE SUBJECT TO FINAL DESIGN & LOCAL AUTHORITY APPROVAL

PRELIMINARY APPROVAL - PLAN 1

TO VARY THE EFFECT OF THE IPSWICH PLANNING SCHEME

Parish of GOODNA County of Stanley

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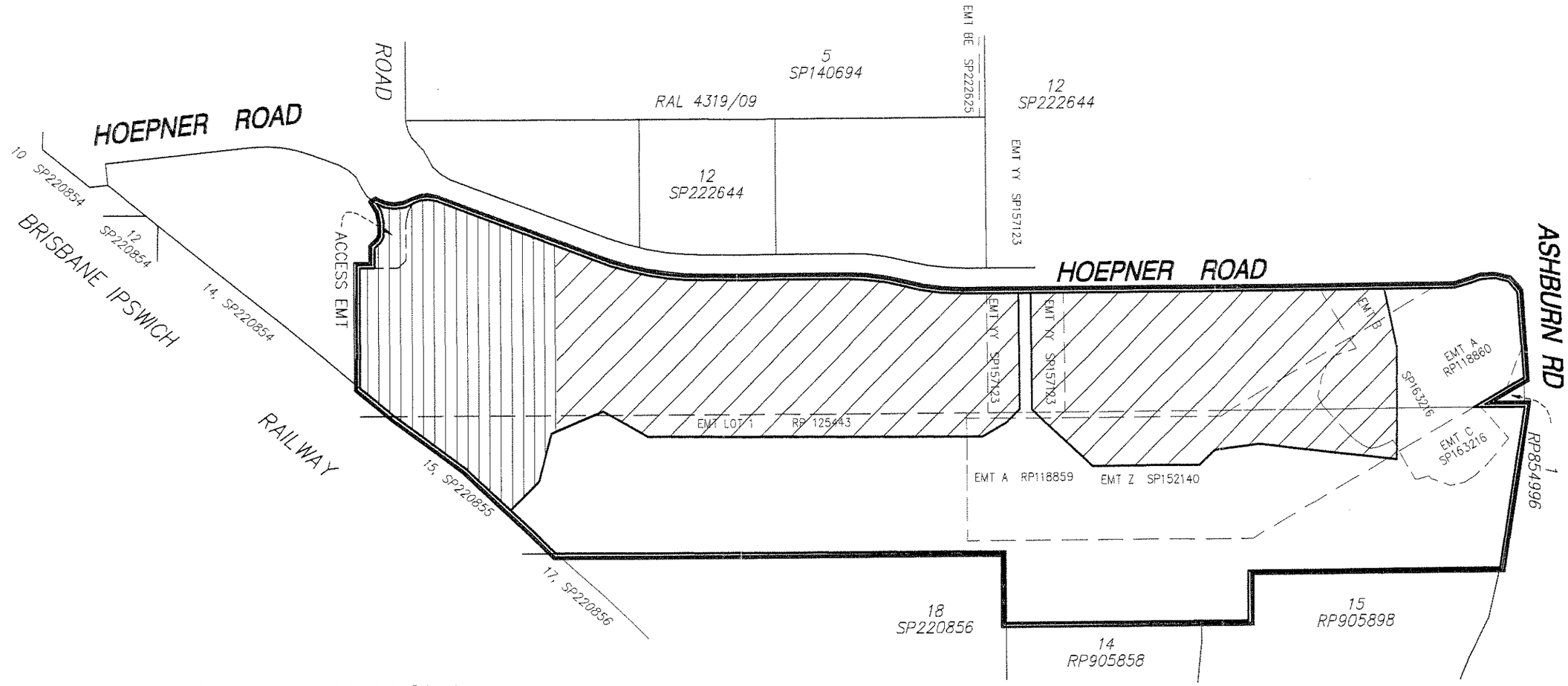

F1 PRECINCT – PROVISIONS OF THE IPSWICH PLANNING SCHEME REGIONAL BUSINESS & INDUSTRY ZONE – SUB AREA RB2 – BUNDAMBA/RIVERVIEW – LOW IMPACT BUSINESS & INDUSTRY (RB2L) ARE APPLICABLE

F2 PRECINCT – PROVISIONS OF THE IPSWICH PLANNING SCHEME REGIONAL BUSINESS & INDUSTRY ZONE – SUB AREA RB2 – BUNDAMBA/RIVERVIEW – LOW IMPACT BUSINESS & INDUSTRY (RB2L) ARE APPLICABLE WITH VARIATION TO TABLE 6.2 OF THE IPSWICH PLANNING SCHEME TO MAKE DEVELOPMENT DEFINED AS "HOME IMPROVEMENT CENTRE" CODE ASSESSABLE DEVELOPMENT

AREA SUBJECT OF PRELIMINARY APPROVAL TO VARY THE EFFECT OF A PLANNING SCHEME (PROVISIONS OF CITISWICH ESTATE STAGE 2 DEVELOPMENT CODE APPLIES TO THIS AREA)

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Revision	Chk'd

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THE PROPOSED BOUNDARIES AS SHOWN HEREON ARE PRELIMINARY ONLY AND ARE SUBJECT TO FINAL DESIGN & LOCAL AUTHORITY APPROVAL

PRELIMINARY APPROVAL - PLAN 2

TO VARY THE EFFECT OF THE IPSWICH PLANNING SCHEME

Parish of GOODNA County of Stanley

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Shaping the Future

CITISWICH ESTATE - STAGE 2

Stormwater Management Strategy to Support Development Application for Reconfiguring a lot and Preliminary Approval to Vary the Effect of a Planning Scheme

Project Number: LJ8714/R17/V3

Prepared for Walker Corporation Pty Ltd **December 2010**

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Document Control: Citiswich Estate – Stage 2 Stormwater Management Strategy

Version	Date	Author Name	Initials	Reviewer Name	Initials
LJ8714/R17	November 2010	[redacted]			
LJ8714/R17/V2	November 2010				
LJ8714/R17/V3	December 2010				

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1 INTRODUCTION

This Stormwater Management Strategy (SWMS) has been prepared by Cardno Lawson Treloar (CLT), specialist stormwater consultants, for Stage 2 of the Citiswich development located off the Warrego Highway at Bundamba in Ipswich City. This report has been completed for Walker Corporation Pty Limited (WCL), the project managers of the proposed development, to support an application for preliminary approval to vary the effects of the Ipswich Planning Scheme and reconfiguration of lot for Stage 2 of the Citiswich development.

Stage 2 of the Citiswich site is located south of the Warrego Highway on both sides of Hoepner Road and west of the Powerlink easement. The Citiswich Estate and Stage 2 extents are shown on Figure 1. The proposed layout for Stage 2 is shown on BP Surveys' - *Drawing Number 18199D Rev E* included in the reference drawings.

This SWMS details the specific flooding and stormwater quality management requirements for Stage 2. Whilst the assessment has been completed independently of the other stages of the Citiswich development, the proposed management strategies have been completed in accordance with the management strategies defined in the masterplan reporting, which includes:

- Development of the fill pads above the Brisbane River (30 hour event) peak flood level of RL 16.22mAHD;
- Conveyance of ultimate catchment flows through the site associated with local tributary flooding;
- No on-site detention basins for flood attenuation of peak run-off from the site;
- Individual lot management for stormwater quality; and
- Water quality treatment of road run-off in common areas (areas outside of individual lots within the development), to be handed back to Council.

2 STAGE 2 EXISTING SITE & PROPOSED DEVELOPMENT

2.1 Existing Site Description

The Citiswich Stage 2 site is approximately 33ha in area and is generally bounded by the Warrego Highway to the north, Australian Hardboards Limited (AHL) to the west, Brisbane Road to the south with a Powerlink easement and residential housing to the east. The majority of the site is cleared land with small amounts of vegetation along the local tributary which drains through the southern extents of Stage 2 and along the eastern the edge of Stage 2.

Due to the now decommissioned AHL effluent disposal system, the Citiswich Stage 2 site includes a number of existing dams, an effluent pond and effluent irrigation canals. Figure 2 shows the previous effluent system which predominately depended on evaporation from the dams and canals for treatment of the AHL effluent. This system resulted in some soil contamination by organic carbon, metals and total petroleum hydrocarbons (TPH) (GHD, 2007) and requires appropriate remediation as part of the Stage 2 development. Measures associated with remediating the contaminated soil are discussed in Section 5. The AHL effluent is now treated by AHL with an on-site effluent treatment plant.

There is one main tributary adjacent to the eastern boundary of Stage 2 site which currently collects stormwater runoff as shown on Figure 3. This eastern tributary discharges north under the Warrego Highway to the Bremer River.

The Brisbane River (30 Hour) flood event dominates the 1 in 100 year peak flood levels for the lower portions of the Citiswich development resulting in a level of RL 16.22mAHD for the 1 in 100 year event (SKM, 2000). The invert level of the culverts under the Warrego Highway at the downstream extent of Stage 2 is RL 17.44mAHD, which indicates that Stage 2 is above the regional flood level.

The Stage 2 receiving waters is that of the Lower Bremer River which has been identified as having a very poor water quality rating (Healthy Waterways, October 2008). Previous studies by Pollard and Bunn (uncited) and Healthy Waterways (2003) indicated that the site, including the AHL operations, possibly discharged high amounts of organic carbon into the Bremer River. Since these publications and prior to the preparation of this management strategy, AHL has implemented an on-site effluent treatment facility and is no longer discharging effluent to the Bremer River.

Studies of the Citiswich site by GHD (2007) indicated that the AHL effluent treatment facility had provided significant reduction in organic carbon load from the site. Additional details are provided in Section 5 of this report.

In the eastern areas of the Stage 2 site, a Department of Environment and Resource Management (DERM) no works zone exists. This zone prohibits any disturbance to this area. The extent of the no works zone is shown on Figure 10.

2.2 The Proposed Development

The proposed Stage 2 development comprises construction of three sub-components (Stage 2A, 2B and 2C) of industrial and commercial allotments ranging in size from approximately 8,100m^2 to 69,000m^2. Details of the Stage 2 layout are shown on BP Surveys' - *Drawing Number 18199D Rev E* included in the reference drawings.

Stage 2 of the Citiswich Estate is proposed to be accessed from Hoepner Road, which connects into Ashburn Road in the north and Brisbane Road in the South. The site is also in close proximity to the Warrego Highway, the Ipswich Motorway and the Cunningham Highway.

Access to Stage 2 of the Citiswich site will be from Hoepner Road off the Warrego Highway to the north and Brisbane Road to the south.

As part of the operational works application for bulk earthworks, Stage 2 will be shaped to achieve usable lot platforms. Any filling will ensure that the lots are above the local tributary 1 in 100 year ARI flood event. The bulk earthworks associated with Stage 2 are expected to modify the catchment drainage as shown on Figure 3.

The existing tributary is proposed to remain untouched through the southern extents of Stage 2C and along the eastern edge of Stage 2.

3 DATA

The flooding and water quality assessments detailed in this report have been based on:

- Detailed site survey data provided by Walker Corporation Pty Ltd;
- Laser Survey of the area surrounding the Citiswich site supplied by Terranean Mapping Technologies;
- 1m Contour information, digital orthophotos and property data supplied by Ipswich City Council (ICC);
- BP Surveys' - *Drawing Number 18199D Rev E*;
- 1:25,000 scale topographic maps, supplied by SUNMAP; and
- Rainfall and evaporation data for Ipswich supplied by the Bureau of Meteorology.

4 STORMWATER QUALITY OBJECTIVES

4.1 Environmental Values (EVs)

As discussed earlier, the site drains to the Bremer River, which forms part of the Brisbane River catchment. Considering the importance of the receiving waters and the current poor rating of the system, the SWMS should ensure that no detriment to the downstream environment is caused by Stage 2 of the Citiswich development.

To this end, Water Quality Objectives (WQOs) have been nominated for the project based on existing and potential environmental values (EVs) associated with Bremer River's current condition and advice from ICC.

The EVs for the site are based on the EPA's '*Bremer River Environmental Values and* Water *Quality Objectives Basin No. 143 (part) including all tributaries of the Bremer River Estuary* (March 2006) as follows:

Table 4.1 Environmental Values for Protection: Lower Bremer River

Environmental Value	Description
Aquatic Ecosystems	The intrinsic value of aquatic ecosystems (e.g. plants, animals and their ecological interactions).
Wildlife Habitat	Riparian wildlife and their habitat, food and drinking water (e.g. key species such as turtles, platypus, seagrass and dugongs).
Secondary Recreation	Health of humans during recreation which involves indirect contact and a low probability of water being swallowed (e.g. wading, boating, rowing and fishing).
Visual Recreation	Amenity of waterways for recreation which does not involve any contact with water (e.g. walking and picnicking adjacent to a waterway).
Cultural Heritage	Indigenous and non-indigenous cultural heritage (e.g. custodial, spiritual, cultural and traditional heritage, hunting, gathering and ritual responsibilities; symbols, landmarks and icons (such as waterways, turtles and frogs); and lifestyles (such as agriculture and fishing)).

4.2 Water Quality Objectives (WQO's)

With the established EVs in mind, long term WQOs proposed in accordance with the Ipswich Planning Scheme, are as follows:

Table 4.2 Long-term Water Quality Objectives (Operational Phase)

Indicator	Water Quality Objective
pH	6.5 to 8.5
Dissolved Oxygen	80-105% saturation
Total Phosphorous	< 0.07 mg/L
Total Nitrogen	< 0.65 mg/L
Turbidity	< 20 NTU
Suspended Solids	< 15mg/L
Faecal Coliforms	150 organisms/100mL (minimum of 5 samples taken at regular intervals not exceeding one month, with 4 to 5 not exceeding 600 organisms/100mL)
Oils & Grease	No visible films or odour
Litter/Gross Pollutants	No anthropogenic (man-made) material greater than 5mm in any dimension

It should be noted that these WQOs are long-term objectives for a fully stabilised catchment with fully established water quality improvement devices throughout. In the long term, discharges from the operational site should conform to the above WQOs.

The proposed development is premised on the basis it will achieve the following load reduction targets:

- ≥ 80% reduction in Total Suspended Solids;
- ≥ 60% reduction in Total Phosphorus;
- ≥ 45% reduction in Total Nitrogen; and
- ≥ 90% reduction in gross pollutants.

It is proposed to protect the geomorphology and habitat associated with existing drainage lines within the site by promoting measures that ensure there is no increase in erosion and associated sediment flow.

During the construction period of the subdivision works the following water quality objectives have been nominated to be immediately achievable for the release criteria which will ensure the EVs are maintained. A sediment and erosion control plan is to be submitted with an operational works application demonstrating how this will be achieved in accordance with the latest *'Best Practices Erosion and Sediment Control'* (IECA, 2008).

Table 4.3 Water Quality Objectives – Construction Phase

Indicator	Water Quality Objective
pH	6.5 to 8.5
Suspended Solids	<50mg/L
Oils & Grease	No visible films or odour
Litter/Gross Pollutants	No visible litter washed from the site

5 SPECIFIC CONTAMINANT MANAGEMENT

In January 2007, GHD completed a '*Report for AHL, Bundamba Queensland Wastewater Irrigation Area Assessment*' that assessed the AHL wastewater irrigation area including additional analysis of the site following the implementation of the effluent treatment plant. Key findings relating to organic carbon are summarised below.

- The groundwater beneath the site is not continuous, and varies in thickness where present;
- The input of organic carbon via groundwater to the Bremer River is insignificant;
- The input of organic carbon is still being readily assimilated by soils on the site;
- The soil at the site was identified as having increased TOC concentrations due to the previous irrigation practices;
- The TOC concentrations of soils away from the irrigation channels was considered moderate and within the range expected of natural soils in this area. This indicates that the lateral dispersion of TOC from the irrigation channels is limited, suggesting that TOC is not very mobile.
- The surface of the irrigation area is covered in vigorous pasture. Sheet erosion at the site is expected to be low, and therefore little soil and organic matter would be expected to be transported from the site.

With regard to organic carbon management, the critical outcomes from this study indicate that the current Stage 2 site, without receiving the continuous effluent from the AHL operations, has greatly reduced the organic carbon load potential to the Bremer River. This study also indicates that, although unlikely, the organic carbon can be mobilised to the Bremer River from surface runoff and erosion of site soils. Hence through appropriate management of the surface runoff and soils, the TOC runoff from the site can be effectively managed.

6 STORMWATER MANAGEMENT STRATEGIES

6.1 Civil Construction Phase Stormwater Quality Management

The primary pollutants that are to be managed during the construction phase include litter and sediment. During the construction phase the management of stormwater runoff from the exposed earthworks surfaces will be based on containment, diversion and retention.

The earthworks will be undertaken on a staged basis to limit the extent of disturbance to a confined area. The management of this area will be in accordance with the current '*Best Practise Erosion and Sediment Control*' (IECA, 2008) Manual. Management will include:

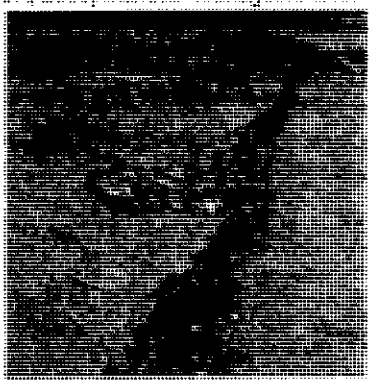

Plate 6.1 – Typical Catch Drain

Plate 6.2 – Typical Sediment Fences

- Erosion controls such as sediment fences surrounding stripped earth.
- Sediment fences surrounding stockpiles of soil and debris.
- Construction of perimeter bunds at the toe and/or top of the earthworks batters.
- Catch drains, including check dams, through the site to catch and direct runoff.
- Gully Pit protection at all gully pits downstream of construction works.
- If required there will be the specific construction of site sediment basins prior to site discharge into the Bremer River.

An Erosion and Sediment Control Plan to Council specifications is to be submitted to Council and approved prior to any construction activity taking place. At all stages of the construction process current building practice standards will be adhered to.

Plate 6.3 – Typical Sediment Basin

6.2 Stormwater Quality Treatment Device Construction

As discussed in further detail in Section 6.4, the operational management will consist of bio-retention systems. The indicative locations of bio-retention systems are shown on Figure 5. Bio-retention systems will improve the water quality by removing:

- Suspended Solids;
- Nutrients; and
- Metals.

The inlet zones of the bio-retention system will include a flow velocity dissipater and sediment forebay to provide protection for the bio-retention basin. Construction of the bio-retention systems will be in accordance with Healthy Waterways' '*Construction and Establishment Guidelines*' dated February 2009.

Plate 6.4 – Typical Bio-Retention System

6.3 Lot Construction Management

Appropriate sediment and erosion control is to be maintained during the redevelopment of individual lots. Evidence of this is to be submitted under separate cover with each operational works application. Annex F contains detailed guidelines prepared by Brisbane City Council (BCC) for appropriate lot management.

In the event that the disturbed lot area exceeds 1ha, local lot sediment basins are recommended. Construction and landscaping of the individual lot bio-retention system should occur at the completion of all other lot works to protect the filter media.

6.4 Operational Phase Stormwater Quality Management

Upon completion of all bulk earthworks, buildings and establishment of the landscaping and water quality treatment zones, the site is considered in its ultimate operational phase.

The pollutants of concern for the operational phase of the Citiswich development include:

- Litter;
- Metals and oils;
- Sediment; and
- Nutrients (Nitrogen and Phosphorous).

The operational phase Stage 2 SWMS is shown on Figure 5 and considers 3 main treatment areas as follows:

- Individual Lot Areas,
- Hoepner Road (including road reserve); and
- Open Space.

6.4.1 Individual Lot Areas

Each individual lot will treat its own stormwater runoff. This treatment zone will be incorporated into the lot landscaping to provide effective use of space and at source treatment.

The proposed treatment train for a typical lot will include collection and re-use of roof water in rainwater tanks, vegetated buffers on hardstand areas with all site runoff passing through an in-lot bio-retention system. Conceptual details are shown on Figure 6.

6.4.2 Hoepner Road (Incl. Road Reserve)

In accordance with operational works approval 9070/07, Hoepner Road will be treated with end-of-line bio-retention systems located at the stormwater pipe network outlets. This includes a bio-retention system within the existing detention basin at the northern end of Stage 2 and a bio-retention basin north-east of the Hoepner Road culverts, as shown conceptually on Figure 5.

6.4.3 Open Space Areas

The open space areas will be, where possible, landscaped and re-vegetated using species and techniques that do not require excessive fertilisation and watering.

6.5 Flood Management

The flood management for the Stage 2 site will not be managed on an individual lot basis; rather the flood management will consider the entire Stage. The management strategy is consistent with the assessments undertaken as part of the planning for the entire development as follows

- Ultimate Catchment flows from the external and upstream catchments will be conveyed through the site; and
- Runoff from Stage 2 will be directed, un-attenuated, to the existing tributary to drain directly to the Bremer River.

7 STORMWATER QUALITY ASSESSMENT

7.1 Stage 2

7.1.1 Approach

CLT has carried out detailed pollutant export analysis using MUSIC Version 3.01 to assess the possible pollutant loads from the proposed Stage 2 development.

The pollutant impact analysis has been carried out in accordance with the latest South East Queensland pollutant guidelines and data, detailed in:

- CRC for Catchment Hydrology, 2005, '*Model for Urban Stormwater Improvement Conceptualisation Version 3.01 User Manual*';
- FAWB, 2009, '*Guidelines for Soil Filter Media in Bio-Filtration Systems (Version 3.01)*'
- Gold Coast City Council (GCCC), 2006, '*MUSIC Modelling Guidelines*';
- Healthy Waterways, 2006, '*Water Sensitive Urban Design Technical Design Guidelines for South East Queensland*.'
- ICC, April 2004, '*Ipswich Planning Scheme*';

CLT has considered the following modelled catchment conditions:

- **Post-Development Case** – Post-development catchment conditions without treatment; and
- **Mitigated Case** – Post-development catchment conditions with treatment.

Table 7.1 summarises the catchment areas and land uses assumed in the MUSIC assessment. The catchments and land uses are also presented on Figure 7. While commercial development is proposed to be incorporated into the Stage 2 development, the development areas have been modelled with an industrial land use in order to be conservative with runoff pollutant concentrations.

Table 7.1 MUSIC Model Post-Development Adopted Land Uses

Catchment Label	Modelled Land Use	Sub Area (ha)	Total Area (ha)
ST2-IND-M	Industrial	9.920	27.4
ST2-IND-S	Industrial	10.810	
ST2-IND-N	Industrial	2.300	
ST2-R1-N	Industrial	1.700	
ST2-R1-S	Industrial	2.55	
ST2-RES-N	Rural Residential	0.120	

Over 20 years of continuous rainfall data for Amberley (Station Number 40004) was obtained from the Bureau of Meteorology for the period 01/05/1980 to 30/11/2004. Table 7.2 presents the statistical assessment of the annual rainfall totals from the Amberley Station.

Table 7.2 Statistical Results for the Daily Rainfall at Amberley

Statistical Parameter	Annual Rainfall (mm)
Average	768
Median	773
10th Percentile (dry)	487
90th Percentile (wet)	1043

The adopted 10 year period considered in the MUSIC modelling for Stage 2 of the Citiswich analysis was from January 1985 to December 1994. This period included an average rainfall over the 10 years of 768mm. It also contained a wet year (1989 – 1047mm), a dry year (1994 – 470mm) and an average year (1985 – 732mm).

The potential evaporation details were obtained from the Bureau of Meteorology using the co-ordinates of the Amberley Station.

The stormwater quality improvement devices assessed in the MUSIC model include a combination of the following at source treatments as discussed in Section 6 and shown on Figure 5.

- In-lot Bio-retention Systems; and
- End-of-line bio-retention basins located within the open space area to the south-east of the Stage 2C industrial lots to treat the southern section of Hoepner Road and located within the existing detention basin to the north of the Stage 2A industrial lots to treat the northern section of Hoepner Road.

The following assumptions were made in the modelling:

- A 6 minute time step was adopted to ensure accurate assessment of the proposed treatment devices.

- The pollutant generation parameters are adopted from Gold Coast City Council's (GCCC) 'MUSIC Modelling Guidelines' (2006), with a break down into macro scale parameters. (i.e. roof water, roads and ground)
- Industrial lots were modelled using the Industrial source node detailed in the GCCC MUSIC Modelling Guidelines, 2006.
- Where catchments included multiple lots, catchment areas and treatment device areas were combined into a single node area to reduce run times and memory space.
- No flow routing was assumed, which provides a conservative estimate of treatment device efficiency.
- A factor of safety of 2 was assumed, as detailed in the Facility for Advancing Water Biofiltration (FAWB) '*Guidelines for Soil Filter Media in Bio-Filtration Systems (Version 3.01)*' dated June 2009. The filter media saturated hydraulic conductivity for all bio-retention systems was modelled as 90mm/hr. The hydraulic conductivity to be specified for construction will be 180mm/hr
- The surface area of the individual in-lot bio-retention systems has been optimised to achieve the load based objectives for South East Queensland (80%, 60% and 45% for suspended solids, total phosphorus and total nitrogen respectively). Each in-lot bio-retention system should have a minimum filter media surface area of 2% of the lot area. Other details used include filter media depth of 800mm (excluding the 100mm transition and 200mm drainage layers), extended detention depth of 300mm and hydraulic conductivity of 180mm/hr.
- Hoepner Road will be treated with two separate end-of-line bio-retention systems (North and South). The two basins have been modelled with a filter media surface area of 180m^2 and 310m^2 for the North and South basins respectively. Other details used include filter media depth of 800mm (excluding the 100mm transition and 200mm drainage layers), extended detention depth of 300mm and hydraulic conductivity of 180mm/hr.
- Runoff from the individual industrial lots that enter the Hoepner Road stormwater pipe network and discharge to end-of-line bio-retention basins to the north and south of Hoepner Rd were modelled separately in MUSIC to avoid double treatment of the lot runoff. The individual lot run off was assumed to flow from the in-lot bio-retention systems off-site to the Bremer River.
- Default MUSIC pollutant removal efficiencies were adopted for all other treatment devices.
- Total Impervious Area (TIA) was converted to Effective Impervious Area (EIA) by calibrating the post development model to the expected Annual Volumetric Runoff Coefficients (AVRC) based on GCCC (2006) recommendations for different land uses. Table 7.3 below details the expected AVRC for Stage 2 of the Citiswich site.

Table 7.3 Expected AVRC

Land Use	AVRC	Area (ha)	AVRC x Area	Expected AVRC
Industrial (Roads)	0.57	4.25	2.42	
Industrial	0.57	23.03	13.13	$\frac{\Sigma \text{ (ARVC x Area)}}{\text{Total Area}}$
Rural Residential	0.22	0.12	0.03	
Total		27.40	15.58	0.568

7.1.2 Results

A comparison of the flow from the post development case to the expected Annual Volumetric Runoff Coefficient (AVRC) for Stage 2 of the Citiswich development is provided in Table 7.4. This demonstrates the adopted rainfall runoff parameters for each land use is appropriate and provides a good calibration to the AVRCs.

Table 7.4 Runoff and AVRC Calibration

AVRC	Post Development
MUSIC Annual Flow (ML/year)	118
Modelled Area (ha)	27.4
Average Rainfall (mm/year)	763
AVRC	0.564
Expected AVRC	0.568

The annual average pollutant loads discharged from the proposed Stage 2 of the Citiswich development are shown in Table 7.5 for the post-development and mitigated cases. The required reductions are 80% 60% and 45% for TSS, TP and TN respectively.

Table 7.5 10 Year Predicted Annual Pollutant Loads

Case	Annual Load (kg/yr)						Reduction - Mitigated to Unmitigated (%)			Reductions Met?
	Developed			Mitigated						
	TSS	TP	TN	TSS	TP	TN	TSS	TP	TN	
Whole of Catchment	20900	48	269	2920	13	148	86	73	45	Yes
R1-N, IND-M, IND-N, RES-N (Northern Nodes)	10000	23	138	1500	7	78	85	72	44	Yes
R1-S IND-S (Southern Nodes)	10800	24	131	1370	6	70	87	75	46	Yes

Table 7.5 shows that the proposed mitigation measures lead to a reduction in loads from Stage 2 of the Citiswich site and these reductions meet the operational phase performance criteria. With suitable operation and maintenance of the treatment devices it is expected that the treatment devices will meet the performance shown above.

7.2 Individual Industrial Lot Assessment

As previously discussed, the Citiswich SWMS includes individual lot treatment devices (rainwater tanks, vegetated buffers, bio-retention system). The total Stage 2 modelling assumed a typical industrial node for each lot with no specific roof / hardstand split.

This may not necessarily be the case for each lot as a range of roof area to hardstand ratios is expected. In addition to this it is expected that there may also be possible limitations associated with directing all lot runoff through the proposed treatment measures.

There are four methodologies available to size the individual lot treatment devices:

1. Assume 2% of the lot area is designated as Bio-Retention area. This is a conservative estimate of the required area, based on the over-all Stage 2 modelling assessment and a broad assumption of the site land use.

2. Utilise design methodology outlined in Section 7.2.1 and detailed in Annex D, which considers in more detail the potential use of the site in terms of roof and car park area.

3. Utilise Water by Design's '*Water Sensitive Urban Design Deemed to Comply Solutions for South East Queensland Stormwater Quality Management Version 1*' September 2009. This also provides a simple design method, based on recent guidelines, that does not entail any additional modelling.

4. Develop a MUSIC model of each individual lot and size treatment devices to meet targets set out in Section 4.2 of this report.

Option 2 has been developed to minimise the necessity for further detailed analysis of each individual lot within the Citiswich development, a typical one hectare industrial lot was modelled for a range of roof / hardstand ratios and percentage of catchment directed to the treatment devices. A series of design charts has been compiled from the results of this individual lot assessment. These are presented in Annex D. The methodology used to develop the charts utilised is outlined in the following sections.

7.2.1 Approach

CLT has carried out detailed pollutant export analysis using MUSIC Version 3.01 to assess the possible pollutant loads from a typical one hectare industrial lot of the Citiswich development.

CLT has considered the following cases in the individual lot analysis:

- Case 1 – Total lot break up of 80% roof area and 20% impervious ground area;
- Case 2 – Total lot break up of 75% roof area and 25% impervious ground area;
- Case 3 – Total lot break up of 70% roof area and 30% impervious ground area;
- Case 4 – Total lot break up of 65% roof area and 35% impervious ground area;
- Case 5 – Total lot break up of 60% roof area and 40% impervious ground area;
- Case 6 – Total lot break up of 55% roof area and 45% impervious ground area; and
- Case 7 – Total lot break up of 50% roof area and 50% impervious ground area.

Impervious ground area refers to all lot area that is not considered roof area, including: car park and driveway areas and any other impervious area.

CLT has considered the following modelled catchment conditions for each of the aforementioned cases:

- Post-Development Case – Post-development catchment conditions without treatment; and
- Mitigated Case – Post-development catchment conditions with treatment.

Table 7.6 below indicates the catchment areas and land uses assumed in the individual lot MUSIC assessment.

Table 7.6 Individual Lot MUSIC Model Post-Development Adopted Land Uses

Case	Modeled Land Use Area (ha)		Total Area (ha)
	Industrial (Roofs)	Industrial (Roads)	
Case 1	0.80	0.20	1.00
Case 2	0.75	0.25	1.00
Case 3	0.70	0.30	1.00
Case 4	0.65	0.35	1.00
Case 5	0.60	0.40	1.00
Case 6	0.55	0.45	1.00
Case 7	0.50	0.50	1.00

The individual lot analysis has adopted the same rainfall data and model assumptions used for the Citiswich Stage 2 analysis.

Total Impervious Area (TIA) was converted to Effective Impervious Area (EIA) by calibrating the post development model to the expected Annual Volumetric Runoff Coefficients (AVRC) based on GCCC (2006) recommendations for different land uses. Table 7.7 details the expected AVRC for Stage 2 for this individual lot approach.

Table 7.7 Expected AVRC – Individual Lot

Land Use	AVRC	Area (ha)	AVRC x Area	Expected AVRC
Industrial (Roofs)	0.57	0.80	0.46	$\frac{\Sigma \text{ (ARVC x Area)}}{\text{Total Area}}$
Industrial (Roads)	0.57	0.20	0.11	
Total		1.00	0.57	0.570

Rainwater tanks were not modelled in the individual lot MUSIC models. This is a conservative assumption as the sizes of the tanks are not specifically known for each lot.

7.2.2 Results

A comparison of the flow from the post developed case to the expected Annual Volumetric Runoff Coefficient (AVRC) for a typical one hectare industrial lot is provided in Table 7.8. This demonstrates the adopted rainfall runoff parameters for each land use are appropriate and provide a good calibration to the AVRCs.

Table 7.8 Runoff and AVRC Calibration – Individual Lot

AVRC	Post Development
MUSIC Annual Flow (ML/year)	4.34
Modelled Area (ha)	1.00
Average Rainfall (mm/year)	763
AVRC	**0.568**
Expected AVRC	**0.570**

The annual average pollutant loads discharged from the individual industrial lots considered in Cases 1 to 7 are shown in Table 7.9 below for the post-development and mitigated cases.

Table 7.9 10 Year Predicted Annual Pollutant Loads for Cases 1 to 7

Case	Annual Load (kg/yr)						Reduction - Mitigated to Unmitigated			Reductions Met?
	Developed			Mitigated						
	TSS	TP	TN	TSS	TP	TN	TSS	TP	TN	
1	482.0	1.21	9.8	77.7	0.28	4.0	84%	77%	59%	Yes
2	565.0	1.32	9.9	76.8	0.28	4.0	86%	79%	60%	Yes
3	649.0	1.42	9.9	68.7	0.27	3.9	89%	81%	60%	Yes
4	713.0	1.52	10.0	69.8	0.28	4.0	90%	81%	60%	Yes
5	826.0	1.66	10.0	72.2	0.29	3.9	91%	82%	61%	Yes
6	934.0	1.79	9.9	70.0	0.29	3.9	93%	84%	61%	Yes
7	981.0	1.86	10.0	77.5	0.30	3.8	92%	84%	62%	Yes

Table 7.9 shows that the proposed mitigation measures for the individual industrial lots analysed in Cases 1 to 7 lead to a reduction in the annual pollutant loads. The load reductions for Cases 1 to 7 meet the operational phase performance criteria. With suitable operation and maintenance of the treatment devices it is expected that the treatment devices will meet the performance shown above.

Table 7.10 summarises the predicted pollutant concentrations that discharge from the individual lots analysed in Cases 1 to 7. This indicates that with the implementation of the proposed treatment devices analysed in Cases 1 to 7 the required WQOs will be met for all of the different types of lots.

Table 7.10 Predicted Median Pollutant Concentrations for Cases 1 to 7

Case	Concentrations (mg/L)					
	Developed			Mitigated		
	TSS	TP	TN	TSS	TP	TN
1	80.2	0.235	1.91	1.2	0.033	0.65
2	92.8	0.255	1.95	1.3	0.033	0.65
3	105.0	0.276	1.97	1.3	0.033	0.64
4	116.0	0.294	1.99	1.3	0.034	0.65
5	128.0	0.310	1.99	1.4	0.034	0.65
6	139.0	0.325	2.00	1.4	0.034	0.65
7	151.0	0.344	2.01	1.4	0.035	0.65
			WQO	15.0	0.070	0.65

7.2.3 Design Charts

A series of design charts has been compiled from the results of this individual lot assessment, with the intention that the design charts can be used to determine the stormwater quality improvement device requirements for each industrial lot based on the following:

- The lot land use is considered industrial as detailed in the GCCC MUSIC modelling guidelines; and
- The roof area as a percent of the total lot area is between 50-80% and the impervious ground area as a percent of the total area is between 20-50%.

Where a particular Lot design is not within the above ranges, detailed pollutant analysis specific to the individual lot arrangement will be required as part of any development application.

Design charts derived from the individual lot pollutant analysis are provided in Annex D. Charts 1 and 1A detail the maximum allowable lot area that can remain ultimately untreated and still allow the individual industrial lot achieve the WQO. Charts 2 and 2A detail the minimum surface area of the bio-retention filter media required to meet the WQO. Charts 3 and 3A detail the minimum area required for the stormwater improvement devices (bio-retention and vegetated buffer pre-treatment) to meet the WQO.

Charts 1, 2 and 3 present the aforementioned results with respect to the percentage of the total lot area denoted as impervious ground. Chart 1A, 2A and 3A present the results with respect to the percentage of the total lot area used as roof.

Annex D details how to use the design charts to determine the minimum bio-retention filter media, vegetated buffer, and lot area that can remain untreated.

In situations where the industrial lot area does not equal one hectare the following steps provide a guide to determine the required bio-retention filter media area and vegetated buffer pre-treatment areas:

- Determine the roof to impervious ground ratio;
- Use Chart 1 and / or Chart 1A to determine the maximum impervious ground area that can remain untreated and meet the WQO;
- Use Chart 2 and / or Chart 2A to determine the minimum area of filter media for the bio-retention system required;
- Use Chart 3 and / or Chart 3A to determine the minimum area of bio-retention filter media and vegetated buffer required; and
- Factor the values determined from Charts 1, 2 and 3 by the area of the industrial lot in hectares to determine the size requirements for the particular industrial lot.

8 HYDROLOGIC ASSESSMENT

8.1 Model Setup

A detailed hydrologic analysis has been undertaken using the Watershed Bounded Network Model (WBNM) 2007 Version 104. WBNM is a non-linear runoff routing software package produced by the University of Wollongong in New South Wales. WBNM has been used in accordance with Council's '*Planning Scheme*' (2004), '*Queensland Urban Drainage Manual* (2008) (QUDM) and '*Australian Rainfall and Runoff* (1998) (AR&R).

A hydrologic model has been set up to include the site and external catchments. The total catchment and sub-catchment extents were determined from the supplied aerial survey and the 1:25000 topographic maps, produced by the Queensland Department of Lands. The WBNM model layout and sub-catchment boundaries for pre and post development conditions are shown in Figure 8 and Figure 9.

The WBNM model was used to assess the impacts of the proposed Citiswich development on the peak flows discharging from the site for a full range of Average Recurrence Intervals (ARI) (1 in 1 to 1 in 100 years) and for a range of storm durations (10 to 360 minutes).

The hydrologic modelling considers the following scenarios for the Citiswich development catchment:

- **Pre-Development:** This scenario assumes the Citiswich site extents in their existing development state with the catchments external to the Citiswich site in their ultimate developed state. Existing land usage was derived from topographical maps and satellite imagery from Google Earth with ultimate developed land usage derived from Council's Planning Scheme. Figure 8 shows the pre-development catchment layout.
- **Post-Development:** This scenario assumes the Citiswich Stage 2 site extents in its ultimate development state in accordance with the BP Survey Drawing 18911D Development Layout with the catchments external to the Citiswich site in their ultimate developed state. Figure 9 shows the post-development catchment layout.

The adopted fraction impervious and C_{10} value for each land use is listed in Table 8.1. The fraction impervious and C_{10} values were adopted from QUDM (2008).

Table 8.1 Runoff Coefficient and Fraction Impervious for Land Uses

Land Use Category	C_{10}	Fraction Impervious (%)
Open space	0.70	5
Business and Industry	0.89	95
Residential Rural	0.71	20
Residential Medium Density	0.83	70
Residential Low Density	0.78	50
Special Use	0.89	95

The initial and continuing losses adopted for the WBNM model are shown in Table 8.2. A catchment lag of m = 1.3 was adopted for all ARI events.

Table 8.2 Adopted WBNM Initial and Continual Loss Parameters

ARI	Pervious Loss		Impervious Loss	
(years)	Initial	Continuing (mm/hr)	Initial (mm)	Continuing (mm/hr)
1, 2, 5	5	2.5	0	0
10, 20	2.5	2.5	0	0
50, 100	0	2	0	0

The pre-development model was validated against the Rational Method calculation at the confluence of the tributary with the Bremer River as defined by the parameters detailed in Table 8.3.

Table 8.3 Adopted Rational Method Parameters

Parameter	Catchment (RPEast)
Area (ha)	453.60
C_{10}	0.78
Time of Concentration (min)	70

8.2 Results

Table 8.4 details the results of the WBNM hydrologic assessment for the eastern tributary discharging at node RPEAST.

Table 8.4 WBNM Predicted Peak Flows (Node RPEAST)

ARI (Years)	Pre-Developed			Post-Developed			Impact (Exist to Prop) (m^3/s)
	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	
1	25.14	90	73	28.07	60	52	2.93
2	34.69	60	55	38.13	60	51	3.44
5	49.37	60	54	53.30	60	50	3.93
10	60.07	60	52	63.11	60	49	3.04
20	73.21	60	50	76.52	60	48	3.32
50	92.06	60	50	94.07	60	48	2.01
100	106.88	60	50	109.14	60	48	2.26

The results in *Table 8.4* indicate that without mitigation the proposed Citiswich Stage 2 development is predicted to cause an increase in peak flows entering the Bremer River from the eastern tributary. These increases will not affect peak flooding in the Bremer River as this is dominated by the regional Brisbane River event, some 10m higher.

The hydrographs generated from the hydrologic model were used as the boundary conditions for the hydraulic model. Further details are provided in Section 9 with detailed WBNM results presented in Annex G.

8.3 Capral Detention Local Assessment

The Capral site to the west of Stage 2 of the Citiswich development contains an existing industrial development. In order to detain peak runoff from this development to pre development peak flows, a detention basin was designed and built. This detention basin is located to the north of Stage 2.

The proposed earthworks for Stage 2 of the Citiswich development encroach into the existing basin. Accordingly, an assessment was undertaken to ensure that the modified basin will still be able to maintain the required detention properties.

WBNM analysis has been undertaken to determine the pre-development and post development peak runoff flows from the Capral site. The previously developed WBNM model of the catchment was utilised to undertake this assessment. The focus of this assessment was on Catchment B8 (refer Figure 8) which primarily comprises of the Capral industrial development.

The pre-development WBNM scenario incorporated the catchment in its conditions prior to the industrial development. Table 8.5 summarises the catchment characteristics modelled for Catchment B8 in the WBNM model.

Table 8.5 Capral Detention – B8 Catchment Characteristics

Condition	Area (ha)	% Impervious
Pre Development	23.35	5
Post Capral Development	23.35	86

The post development scenario incorporated the detention basin into the WBNM model. The basin was assumed to be as per the previously designed and built basin, with the proposed encroachment of Stage 2 earthworks into the basin area. The stage storage relationship was subsequently revised to reflect the modified basin which is now approximately 6100m^2 in plan area.

The pre and post development scenarios were simulated for the range of durations and ARI's between 1 and 100 year. A summary of the results of this analysis is provided in Table 8.6 below. This shows that the post-development flows out of the modified basin are below pre development discharges from the site. As such, it can be concluded that the modified basin will still provide adequate storage capacity.

Table 8.6 Capral Detention – Peak Flow Comparison

ARI (Years)	Pre Development Peak Flow (m^3/s)	Post Development Peak Flow (m^3/s)	Impact Pre vs Post (m^3/s)
1	2.10	2.07	-0.04
2	2.96	2.67	-0.29
5	4.26	3.51	-0.75
10	5.32	4.44	-0.89
20	6.46	5.75	-0.72
50	7.86	7.27	-0.59
100	9.08	8.72	-0.37

The revised outlet arrangement of the proposed Capral detention basin is as follows:

- 2/0.9m RCP
- Upstream IL = 17.5mAHD
- Downstream IL = 16.47mAHD
- Culvert length = 22m
- Weir level = 18.8mAHD
- Weir length = 7m
- Weir side slopes = 1v:5h

The proposed stage-storage relationship of the Capral detention basin is presented in Table 8.7 below.

Table 8.7 Capral Detention – Stage-Storage Relationship

ARI (Years)	Level (mAHD)	Volume (m^3)
1	18.41	3450
2	18.59	4290
5	18.86	5590
10	18.98	6230
20	19.10	6870
50	19.21	7490
100	19.30	8010

9 LOCAL HYDRAULIC ASSESSMENT

9.1 Model Setup

The section details the hydraulic assessment of the Citiswich development using the Deltares one dimensional (1D) fully dynamic hydraulic modelling package, SOBEK (Version 2.10.003). The assessment includes discussion of the hydraulic model set up, mitigation options proposed within the Citiswich development and a full summary of the hydraulic results.

The assessment considers the following modelling scenarios:

- **Pre-development Case:** This case models the eastern tributary that passes through the site and assumes the Citiswich site is in its existing condition. The model incorporates the pre-development hydrologic flows as described in Section 8 with the layout shown on Figure 10.
- **Post-development Case:** This case modifies the pre-development case to include the Stage 2 development plan (reference Drawing 18991D Rev E). The model incorporates the post-development hydrologic flows as described in Section 8 with the layout shown on Figures 10 and 11.

9.1.1 Pre-Development Setup

The pre-developed hydraulic model cross-sections and culvert details were based on detailed aerial and ground surveys. The pre-developed SOBEK model layout is shown on Figures 10 and 11 and is based on the SOBEK model established for the Masterplan assessment, extended upstream of Brisbane Road, and the inclusion of Hoepner Road.

The SOBEK model adopts a tailwater level of RL 2.294mAHD at the Bremer River, which is the level of the Bremer River (18 hour) 2 year ARI event. This level is based on the SOBEK 2D modelling reported in CLT's '*Bremer Business Park Masterplan Flood Investigation*' dated August 2007 (ref: LJ8714/R3/V2).

Based on the aerial photography and a site inspection, a Manning's 'n' roughness value of 0.07 has been adopted for the existing tributary, with the exception of cross-sections upstream of Brisbane Road (sect1_259 to 409) where an 'n' value of 0.04 has been adopted.

9.1.2 Post-Development Setup

The proposed development and fill extents associated with Stage 2 are constrained by the DERM's no earthworks zone. The adopted post-developed hydraulic models are based on the pre-developed hydraulic model updated to incorporate the Stage 2 development and fill extents, with the exception of Balance Lot 899 of Stage 2C. The adopted Manning's 'n' roughness values have remained unchanged from the pre-development case.

Excavation of cross-sections at the downstream extent of Stage 2 (sect1_2629 and 2687) was completed to mitigate flood impacts over the Warrego Highway (refer to Annex H for section modifications).

9.2 Hydraulic Results

A comparison between the pre- and post-developed 100 year ARI predicted flood levels for Stage 2 is shown in Table 9.1 for cross-section locations shown on Figures 10 and 11. The peak flood results for water surface levels, depths, flows and velocities for all ARIs are presented in Annex H.

Table 9.1 Pre vs. Post Development 100 Year ARI Predicted Peak Flood Levels, Discharge and Velocity

SOBEK XS ID	Peak Flood Level (mAHD)			Peak Discharge (m^3/s)			Peak Velocity (m/s)		
	Pre	Post	Impact	Pre	Post	Impact	Pre	Post	Impact
Reach 1 Eastern Tributary									
sect1_259	41.41	41.41		27.24	27.24		2.18	2.18	
sect1_329	40.57	40.57		27.23	27.23		1.75	1.75	
sect1_409	40.44	40.44		27.21	27.21		1.98	1.98	
Brisbane Road									
sect1_468	40.00	40.00		27.21	27.21		1.85	1.85	
Railway									
sect1_517	38.15	38.15		27.20	27.20		1.34	1.34	
sect1_581	37.03	37.03		27.19	27.19		1.80	1.80	
sect1_674	35.70	35.70		27.20	27.20		1.49	1.49	
sect1_784	35.46	35.46		27.17	27.17		1.13	1.13	
sect1_897	34.16	34.16		27.20	27.20		0.61	0.61	
sect1_937	33.58	33.58		27.25	27.25		0.57	0.57	
Hoepner Road									
sect1_1045	32.35	32.35		32.37	32.38	0.01	1.40	1.39	-0.01
sect1_1142	31.56	31.55	-0.01	32.54	32.53	-0.01	1.94	1.94	
sect1_1271	31.52	31.52		32.57	32.57		1.62	1.62	
Railway									
sect1_1386	28.48	28.47	-0.01	34.43	34.19	-0.24	1.06	1.05	-0.01
sect1_1443	28.17	28.17		34.31	34.08	-0.23	0.97	0.97	
sect1_1569	27.44	27.46	0.02	71.43	71.72	0.29	2.00	2.00	
sect1_1659	27.34	27.37	0.03	68.77	69.10	0.33	1.40	1.40	
sect1_1741	27.33	27.35	0.02	67.15	67.48	0.33	1.24	1.24	
Railway									
sect1_1789	25.16	25.16		67.14	67.45	0.31	2.07	2.07	
sect1_1851	24.66	24.67	0.01	67.11	67.44	0.33	1.48	1.48	

SOBEK XS ID	Peak Flood Level (mAHD)			Peak Discharge (m^3/s)			Peak Velocity (m/s)		
	Pre	Post	Impact	Pre	Post	Impact	Pre	Post	Impact
sect1_1927	24.24	24.24		67.08	67.40	0.32	1.37	1.37	
sect1_1996	23.79	23.80	0.01	67.05	67.38	0.33	1.40	1.40	
sect1_2070	22.99	23.00	0.01	67.03	67.37	0.34	2.56	2.56	
sect1_2098	22.13	22.13		67.03	67.36	0.33	1.74	1.75	0.01
sect1_2116	22.07	22.08	0.01	67.03	67.36	0.33	1.90	1.90	
sect1_2134	21.69	21.69		67.03	67.35	0.32	1.80	1.80	
sect1_2152	21.48	21.49	0.01	67.03	67.35	0.32	1.23	1.23	
sect1_2189	21.36	21.36		67.02	67.35	0.33	1.58	1.58	
sect1_2222	21.02	21.02		67.02	67.36	0.34	2.43	2.43	
sect1_2236	20.52	20.52		67.04	67.37	0.33	1.57	1.58	0.01
sect1_2281	20.21	20.21		76.97	76.86	-0.11	1.09	1.09	
sect1_2348	19.96	19.96		76.94	76.84	-0.10	1.28	1.28	
sect1_2410	19.54	19.54		76.91	76.79	-0.12	0.82	0.82	
sect1_2422	19.54	19.54		76.89	76.78	-0.11	0.94	0.94	
sect1_2437	19.45	19.45		76.88	76.77	-0.11	1.42	1.43	0.01
sect1_2459	19.18	19.17	-0.01	76.86	76.74	-0.12	1.32	1.35	0.03
sect1_2474	19.03	19.02	-0.01	76.82	76.69	-0.13	1.30	1.34	0.04
sect1_2507	18.79	18.76	-0.03	76.72	76.57	-0.15	1.28	1.39	0.11
sect1_2534	18.67	18.63	-0.04	76.61	76.44	-0.17	0.79	0.90	0.11
sect1_2576	18.65	18.61	-0.04	79.78	79.86	0.08	0.69	0.87	0.18
sect1_2629	18.60	18.56	-0.04	79.31	79.22	-0.09	0.83	1.17	0.34
sect1_2687	18.55	18.53	-0.02	78.95	78.86	-0.09	1.12	0.53	-0.59
sect1_2725	18.52	18.52		78.85	78.76	-0.09	0.97	0.90	-0.07
Warrego Highway									
sect1_2804	16.85	16.85		78.74	78.64	-0.10	1.73	1.73	
sect1_2871	16.00	16.00		78.72	78.63	-0.09	2.08	2.08	

Results in Table 9.1 above and Annex H indicate peak flood level increases predicted between sect1_1569 and sect1_2459, due to the development of Stage 2. These increases are very minor and generally less than 10mm and are in accordance with the report Masterplan assessment.

Furthermore, increases are generally contained within the DERM's no works zone; hence these impacts will not cause any actionable damage or reduce the developable potential of adjoining sites. The immunity of the Warrego Highway is unchanged, as no flood level impacts are predicted to occur during the overtopping event (20 year ARI and above).

10 ADMINISTRATION OF THE SWMS

10.1 Responsible Persons

Unless stated otherwise the person(s) and/or companies specifically responsible for the SWMS implementation are:

- **Contractor:** The Contractor's Site Manager. This person or his representative will be notified to Council upon assignment.
- **Civil Engineer:** This person/ company and/or a nominated representative will be notified to Council upon assignment.
- **Environmental Consultant:** This person/ company and/or a nominated representative will be notified to Council upon assignment.

10.2 Amendments

It is likely that as the development proceeds amendments to the SWMS will be required to reflect knowledge gained during the course of the operation.

Amendments shall be made by application in writing to Ipswich City Council stating clearly and in detail:

- The SWMS provision to be amended
- The reasons for the amendment, and
- How the new amendment better serves the environmental management of the development and its surroundings.

10.3 Treatment Device Certification

An Environmental Consultant shall be responsible for the treatment device certification. This certification shall be provided for each of the treatment measures proposed, including the individual lot systems. The Environmental Consultant shall ensure that all elements of the design are implemented on-site.

Bio-retention certification shall be in accordance with the Bio-Retention Basin Construction and Establishment Sign-Off Forms contained within Chapter 3 of Healthy Waterways, 2009, '*Construction and Establishment Guidelines: Swales, Bio-Retention Systems and Wetlands*'. Two separate bio-retention certifications are required; 1) Civil Certification (Forms A-F) and 2) Landscape Certification (Forms G and H). A certification letter including the check list shall be provided prior to Council accepting the device as off maintenance.

11 COMPLIANCE WITH IPSWICH CITY COUNCIL PLANNING SCHEME

11.1 Ipswich City Council Planning Scheme

11.1.1 Section 6.7

(2) Environmental Management

Specific Outcomes

(a) The quality of stormwater runoff from a use or site is similar to or better than the established water quality standards for the receiving waters or lawful point of discharge.

(b) Uses and works are designed to support integrated catchment management, including-

(i) protection and rehabilitation of natural drainage patterns and riparian vegetation;

(ii) environmentally acceptable effluent and runoff management systems or techniques which prevent pollution of water sources; and

(iii) appropriate buffering along any adjoining major watercourses.

(c) Uses and works with the potential for material or serious environmental harm, establish and implement a site specific Environmental Management Plan, which describes the measures to be used to avoid or minimise adverse impacts, and how such measures are to be implemented during the life of the development.

This report details the proposed stormwater management strategy, which will improve the runoff from the Stage 2 development of the Citiswich site to meet the water quality standards for the receiving waters.

11.1.2 Section 11.4.7.(1)

(b) Land Situated Below the 1 in 20 Development Line - Commercial, Industrial and Other Non Residential Uses

(i) Where possible, the design and layout of buildings provides for-

(A) parking, or other low intensive, or non habitable uses at ground level; and

(B) retail, commercial and work areas above the parking areas, to increase flood immunity.

(ii) Expensive plant and equipment and stock are located in the area of the site or building with the greatest flood immunity.

(iii) Building materials used below the 1 in 20 development line are resistant to water damage.

(iv) Electrical installations are sited in the area of greatest flood immunity.

(v) Electrical installations below the 1 in 20 development line are designed and constructed to withstand submergence in flood water.

(vi) Access routes are designed or alternative emergency evacuation routes are provided so that in the event of a serious incident occupants can escape to a safe and secure area.

(vii) The concentration of people in flood affected areas, particularly within areas affected by significant flood flows (i.e. one metre or more in depth), is minimised.

(viii) Buildings are located to avoid areas affected by significant flood flows (i.e. one metre or more in depth), or alternatively, buildings are designed to be capable of withstanding the static and dynamic loads, including debris loads, applicable to a flood event of 1 in 100 Average Recurrence Interval (ARI).

(ix) Materials stored on-site-

(A) are those that are readily able to be moved in a flood event;

(B) are not hazardous or noxious, or comprise materials that may cause a deleterious effect on the environment if discharged in a flood event; and

(C) where capable of creating a safety hazard by being shifted by flood waters, are contained in order to minimise movement in times of flood.

(x) The development does not increase the flood hazard (e.g. by way of increased depth, duration or velocity of flood waters or a reduction in warning times) for other properties within a flood plain.

(xi) Filling of land below the 1 in 20 development line and the clearing of native vegetation within the stream banks are avoided.

(d) Land Situated Between the 1 in 20 Development Line and the 1 in 100 Flood Line - Commercial, Industrial and Other Non Residential Uses

(i) Where possible, the design and layout of buildings provides for-

(A) parking, or other low intensive, or non habitable uses at ground level; and

(B) retail, commercial and work areas above the parking areas, to increase flood immunity.

(ii) Expensive plant and equipment and stock are located in the area of the site or building with the greatest flood immunity.

(iii) Building materials used below the adopted flood level are resistant to water damage.

(iv) Access routes are designed or alternative emergency evacuation routes are provided so that in the event of a serious incident occupants can escape to a safe and secure area.

(v) Buildings are located to avoid areas affected by significant flood flows (i.e. one metre or more in depth), or alternatively, buildings are designed to be capable of withstanding the static and dynamic loads, including debris loads, applicable to a flood event of 1 in 100 Average Recurrence Interval (ARI).

(vi) Materials stored on-site-

(A) are those that are readily able to be moved in a flood event;

(B) are not hazardous or noxious, or comprise materials that may cause a deleterious effect on the environment if discharged in a flood event; and

(C) where capable of creating a safety hazard by being shifted by flood waters, are contained in order to minimise movement in times of flood.

(vii) The development does not increase the flood hazard (e.g. by way of increased depth, duration or velocity of flood waters or a reduction in warning times) for other properties within a flood plain.

(viii) Filling of land below the 1 in 100 flood level and the clearing of native vegetation within the stream banks are avoided.

The proposed Stage 2 development will be filled above the peak 100 year ARI flood level as detailed in Section 9 of this report. Minor flood impacts (<10mm) external to the site will occur, but these impacts are in accordance with the Masterplan assessment and indicate that no actionable damage external to the site will occur.

(e) Urban Stormwater Flow Path Areas

(i) Access routes are designed or alternative evacuation routes are provided so that in the event of a serious incident occupants can escape to a safe and secure area.

(ii) Adequate stormwater drainage infrastructure and suitable overland flow paths are provided to carry the 1 in 100 Average Recurrence Interval (ARI) stormwater flow through the property while providing a freeboard of 250mm on the floors of all habitable areas and minimising damage owing to scouring from excessive flow velocities.

(iii) Buildings and other works are designed and located so that nearby properties are not affected by any surcharge/afflux generated as a result of the buildings or other works.

(iv) Buildings and other works are designed and located to accommodate existing and proposed stormwater drainage infrastructure and overland flow paths.

(v) Any damage to existing stormwater drainage infrastructure and overland flow paths resulting from building and other works are rectified prior to the commencement of the new use.

The proposed Stage 2 of Citiswich will be filled to be above the peak 100 year ARI event as detailed in Section 9 of this report which indicates that minor flood impacts external to the site will occur, though these are in accordance with the Masterplan assessment and are generally contained within the DERM's no works zone; hence these impacts will not cause any actionable damage or reduce the developable potential of the adjoining site. The immunity of the Warrego Highway is unchanged, as no flood level impacts are predicted to occur during the overtopping event (20 year ARI and above).

11.1.3 Section 12.15.3

(2) The overall outcomes sought for the Earthworks Code are the following-

(a) Earthworks ensure-

(i) there is no adverse impact to adjoining properties;

(ii) there is no adverse impact on flooding of upstream, downstream and adjoining land;

(iii) the visual character and amenity of the site and the surrounding area is not adversely affected;

(iv) there is no adverse impact to infrastructure or public utilities easements;

(v) natural landforms and drainage lines are maintained, where possible;

(vi) that land or water is not contaminated;

(vii) that the site is stable;

(viii) appropriate site access is provided from the road reserve to existing or future building envelopes; and

(ix) there is no environmental harm or nuisance created by way of the release of air pollutants, noise or removal of significant vegetation.

8) Specific Outcomes

(a) Earthworks are avoided below the adopted flood level.

(b) Earthworks -

(i) do not cause any increase in flooding or drainage problems;

(ii) do not cause an impediment to flood waters; or

(iii) do not adversely impact adjoining, upstream or down stream properties.

(c) Earthworks are avoided in natural gullies and overland flow paths.

The proposed Stage 2 of Citiswich will be filled to be above the peak 100 year ARI event as detailed in Section 9 of this report which indicates that minor flood impacts external to the site will occur, though these are in accordance with the Masterplan assessment and are generally contained within the DERM's no works zone; hence these impacts will not cause any actionable damage or reduce the developable potential of the adjoining site.

Any modifications to the local tributary have been assessed with modelling outcomes contained in Section 9. They indicate that flood conveyance is maintained.

11.1.4 Planning Policy 2

Flooding and Stormwater Flow Paths

(8) if an application involving land which is subject to flooding or major stormwater flows, information and an assessment which identifies—

(a) the likely probability, depth, volume and velocity of flows (including the submission of relevant computer software model data files which are compatible with the Local Government's software to enable checking of data) across the site;

(b) the likely impact of the proposed development, including any associated earth works, both upstream and downstream from the site, particularly in terms of changes to the depth, duration or velocity of flood waters and the duration of warning time;

(c) likely impacts in terms of watercourse bank stability;

(d) preferred areas and non-preferred areas on site for various activities, based on the probability of inundation and the volume and velocity of flows;

(e) recommendations for—

(i) the use of flood resistant materials and construction techniques able to withstand relevant debris loads;

(ii) the location and height of means of ingress and egress, including possible flood escape routes;

(iii) the location and height of buildings, particularly habitable floor areas;

(iv) structural design, including the design of footings and foundations to take account of static and dynamic loads (including debris loads and any reduced bearing capacity owing to submerged soils);

(v) the location and design of plant and equipment, including electrical fittings;

(vi) the storage of materials which are likely to cause environmental harm if released as a result of inundation or stormwater flows;

(vii) the appropriate treatment of water supply and sanitation systems and other relevant infrastructure; and

(viii) relevant management practices, including flood warning and evacuation measures;

The proposed Stage 2 of Citiswich will be filled to be above the peak 100 year ARI event as detailed in Section 9 of this report which indicates that minor flood impacts external to the site will occur, though these are in accordance with the Masterplan assessment and are generally contained within the DERM's no works zone.

11.1.5 Planning Policy 3

2.3.3 Stormwater Quality Management Strategy

(1) Development that is likely to have a significant adverse impact on water quality is to compile and submit a Water Quality Management Plan that details the temporary and permanent methods of water quality control that are to be included in the development.

(2) For developments which are likely to have a significant adverse impact on water quality, relevant Water Quality Objectives as outlined in Table 2.3.1 are to be nominated and the temporary and permanent methods for water quality to ensure that these objectives will be satisfied are to be identified on the Water Quality Management Plans.

Table 2.3.1: Water Quality Objectives

Indicator	*Modified ecosystem, wildlife, cultural heritage, secondary and visual recreation, industry, stock and irrigation*
Total Phosphorus	*70ug/L*
Total Nitrogen	*650ug/L*
Suspended Solids	*15mg/L for combined wet and dry periods* *90%ile < 100mg/L for wet weather periods*
Oils and grease	*No visible films or odour*
Litter/gross pollutants	*No anthropogenic (man-made) material greater than 5mm in any dimension*
Riparian vegetation and habitat	*Protect and restore consistent with Council policy and plans*

2.3.4 Temporary Methods of Water Quality Control

(1) Temporary water quality methods and techniques (excluding devices which divert or concentrate runoff) are to be in accordance with the QUDM and the Institution of Engineers, Australia (Qld) "Soil Erosion and Sediment Control – Engineering Guidelines for Queensland Construction Sites".

2.3.5 Permanent Methods of Water Quality Control

(1) The design of the permanent water quality control methods is to be in accordance with the QUDM and the Institution of Engineers, Australia (QLD) "Soil Erosion and Sediment Control" Engineering Guidelines for Queensland Construction Sites.

The stormwater quality assessments have been undertaken in accordance with the provisions detailed in Ipswich City Council's Planning Policy 3; as detailed in this report.

12 CONCLUSION

This report provides a Stormwater Management Strategy to support the preliminary approval to vary the effects of the Ipswich Planning Scheme and development permit for reconfiguration of lot application for Citiswich Stage 2. This report provides the conceptual details of:

- existing site conditions;
- proposed site conditions;
- management of stormwater quality for the civil construction and operational stages;
- management of stormwater quantity; and
- administration of the stormwater management strategy.

The strategy complies with the provisions of the ICC Planning Scheme.

Both the adopted individual industrial lot 'at-source' and the 'end-of-line' roadway water quality treatment methods will achieve the proposed discharge criteria associated with the load based assessment method.

The local tributary flood assessment has indicated that the proposed works will contain the ultimate catchment flows through Stage 2. Development pads will be filled to above the 100 year ARI flood levels. Modifications to the existing Capral site detention basin impacted by the Stage 2 earthworks still ensure pre-development peak flows off the Capral site are maintained.

13 REFERENCES

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IECA, 2008, 'Best Practise Erosion and Sediment Control'.

Ipswich City Council, April 2004, 'Ipswich Planning Scheme'.

14 QUALIFICATIONS

This report has been prepared by Cardno Lawson Treloar (CLT) specifically for Walker Corporation Pty Ltd and specifically to provide advice on Stormwater Management Planning for Stage 2 of the proposed development of Citiswich.

Our analysis and overall approach has been specifically catered for the particular requirements of Walker Corporation Pty Ltd, and may not be applicable beyond this scope. For this reason any other third parties other than Council are not authorised to utilise this report without further input and advice from CLT.

CLT has relied on the following information provided by others:

- Detailed site survey data provided by Walker Corporation Pty Ltd;
- Laser Survey of the area surrounding the Citiswich site supplied by Terranean Mapping Technologies;
- 1m Contour information, digital orthophotos and property data supplied by ICC;
- BP Surveys' - *Drawing No. 18199D Rev E*;
- 1:25,000 scale topographic maps, supplied by SUNMAP; and
- Rainfall and evaporation data for Ipswich supplied by the Bureau of Meteorology.

The accuracy of the report is dependent upon the accuracy of this information.

While CLT's report accurately assesses peak flows from design storms, it is an ungauged catchment and consequently future observed flows may vary from that predicted.

Pollutant assessments, provided in this report, have been based on published typical land use parameters and are therefore indicative only. Monitoring would be required to accurately assess pollutant impacts of this development. It is for this reason that the SWMS should remain a living document throughout the construction and operational phases of this development and updated accordingly as further information becomes available.

Figures

Figure 1	Site Location
Figure 2	Australian Hardboards Limited Decommissioned Effluent Disposal System
Figure 3	Pre-Developed and Post-Developed Drainage Paths
Figure 4	Background Surface Water Quality Monitoring Locations
Figure 5	Stage 2 Conceptual Operational Stormwater Management Strategy
Figure 6	Individual Industrial Lot Conceptual Operational Stormwater Management Strategy
Figure 7	Citiswich Stage 2 Post-Developed MUSIC Model Catchment Layout
Figure 8	Pre-Developed WBNM Model Layout
Figure 9	Post-Developed WBNM Model Layout
Figure 10	Eastern Tributary: SOBEK Model Layout (Southern Extents)
Figure 11	Eastern Tributary: SOBEK Model Layout (Northern Extents)

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0.5 0 0.5 1.0 1.5 2.0 2.5km
1:50,000

100 0 100 200 300 400 500m
1:10,000

Scale 1:10000 (A3)

FIGURE 1

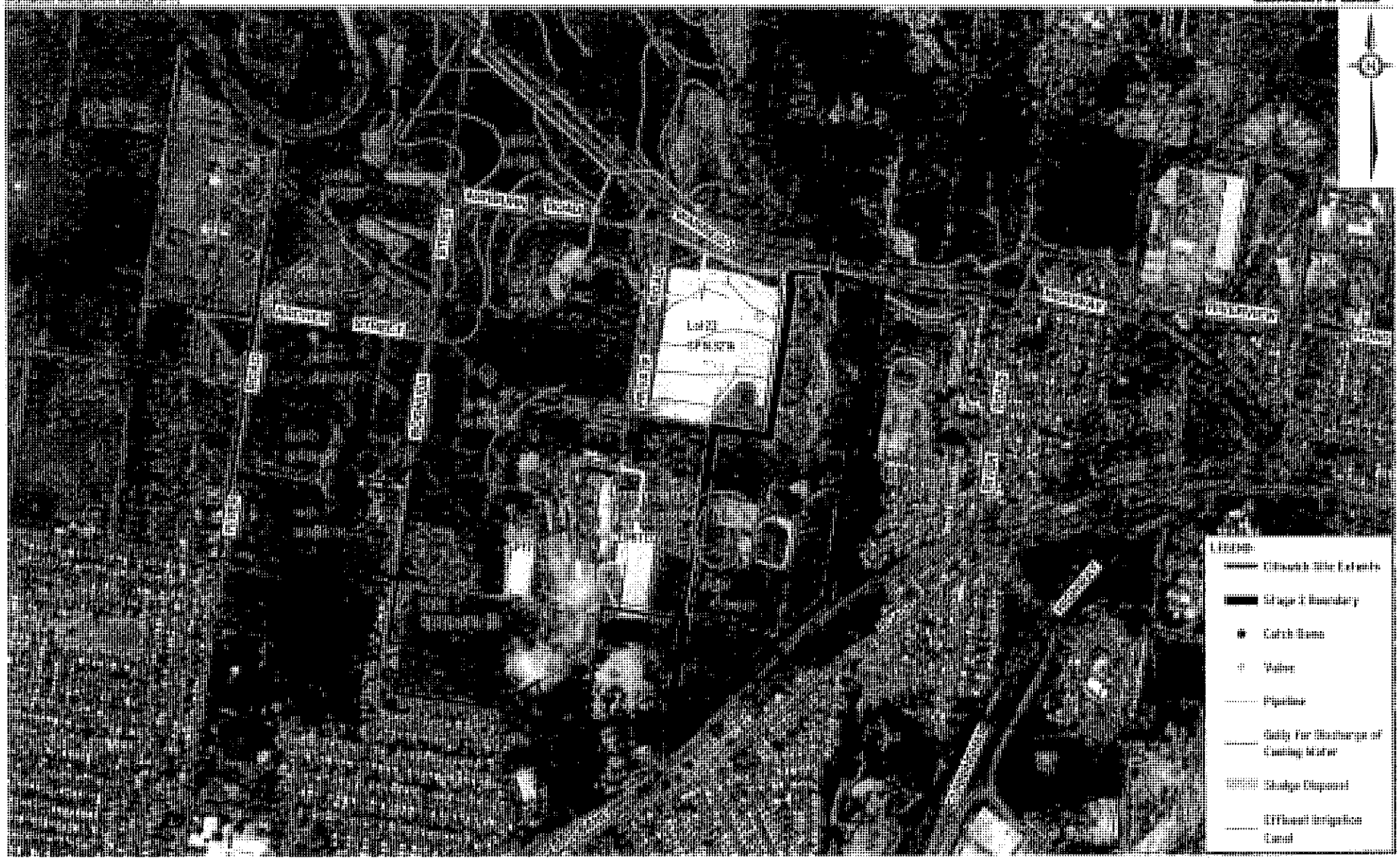
SITE LOCATION & STAGE 2 SITE EXTENTS

Rev: Orig. Date: November 2010

Project No.: LJ8714

Walker Corporation Pty Ltd

PRINT DATE: 02 November, 2010 - 12:26pm



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100 0 100 200 300 400 500m
1:10,000

Scale 1:10000 (A3)

FIGURE 2

AUSTRALIAN HARDBOARDS LIMITED DECOMMISSIONED EFFLUENT DISPOSAL SYSTEM

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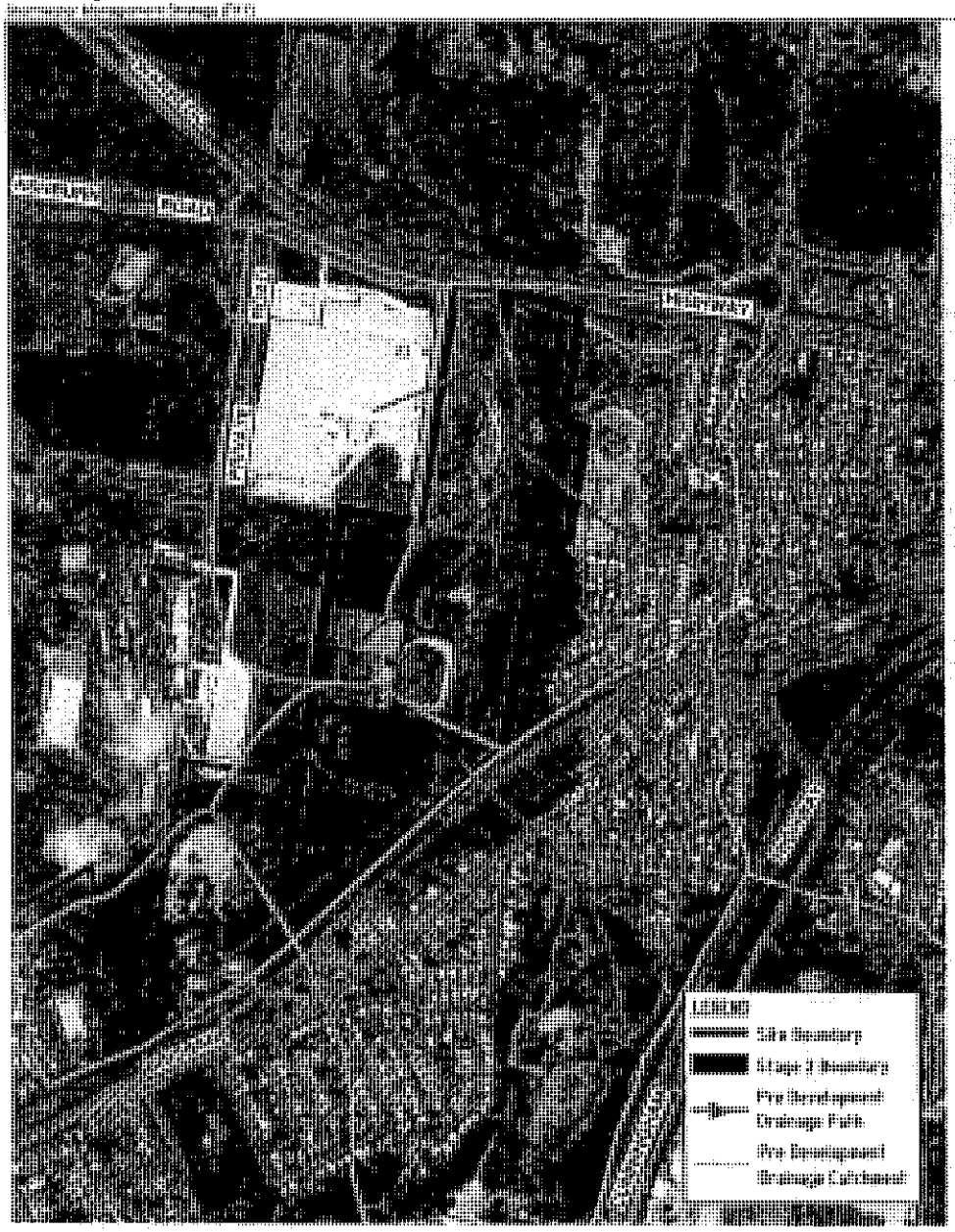

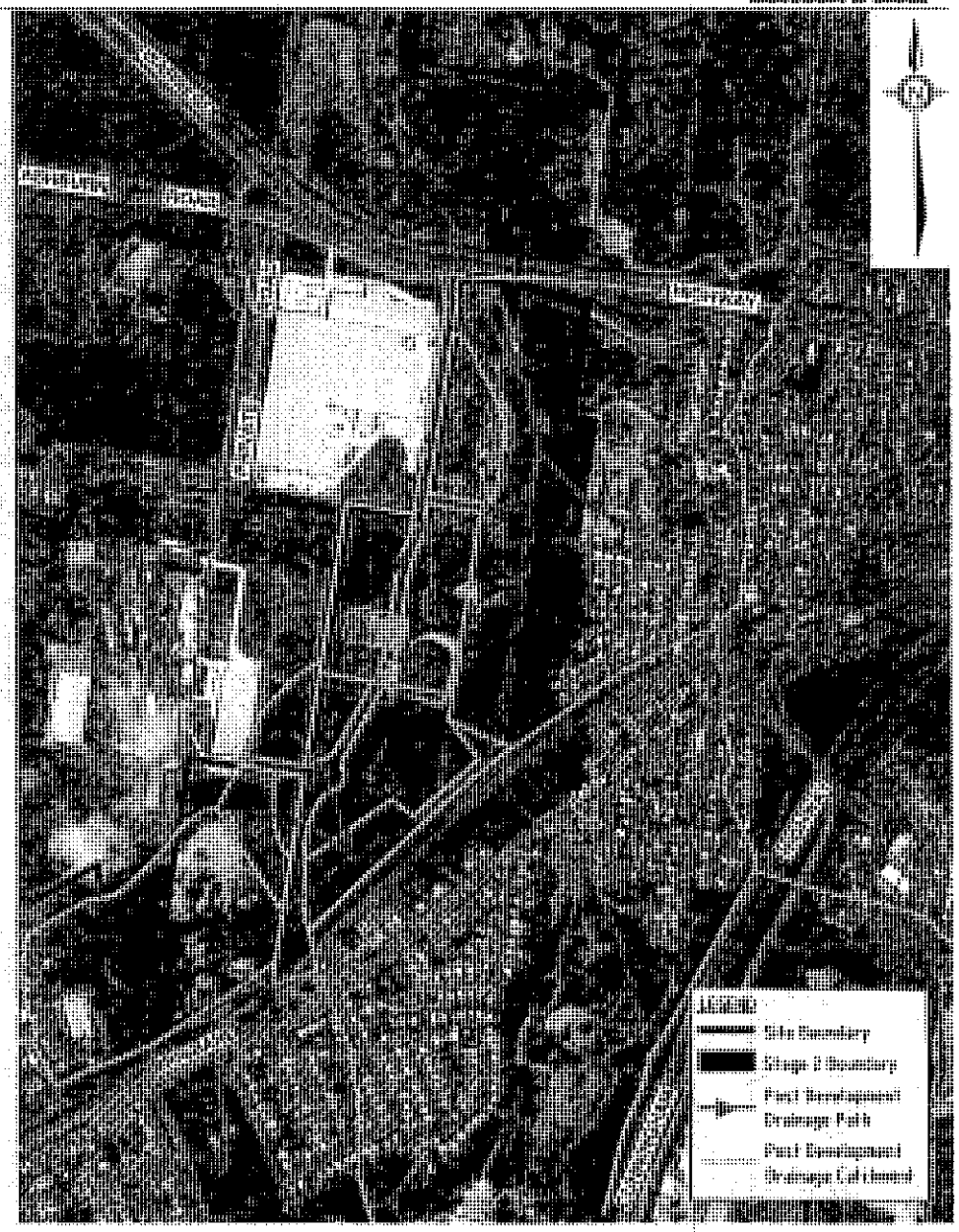

Scale 1:10000 (A3)

FIGURE 3

PRE-DEVELOPED (LHS) & POST-DEVELOPED (RHS) DRAINAGE PATHS

Rev: Orig. Date: Novemeber 2010

Walker Corporation Pty Ltd

Project No.: LJ8714

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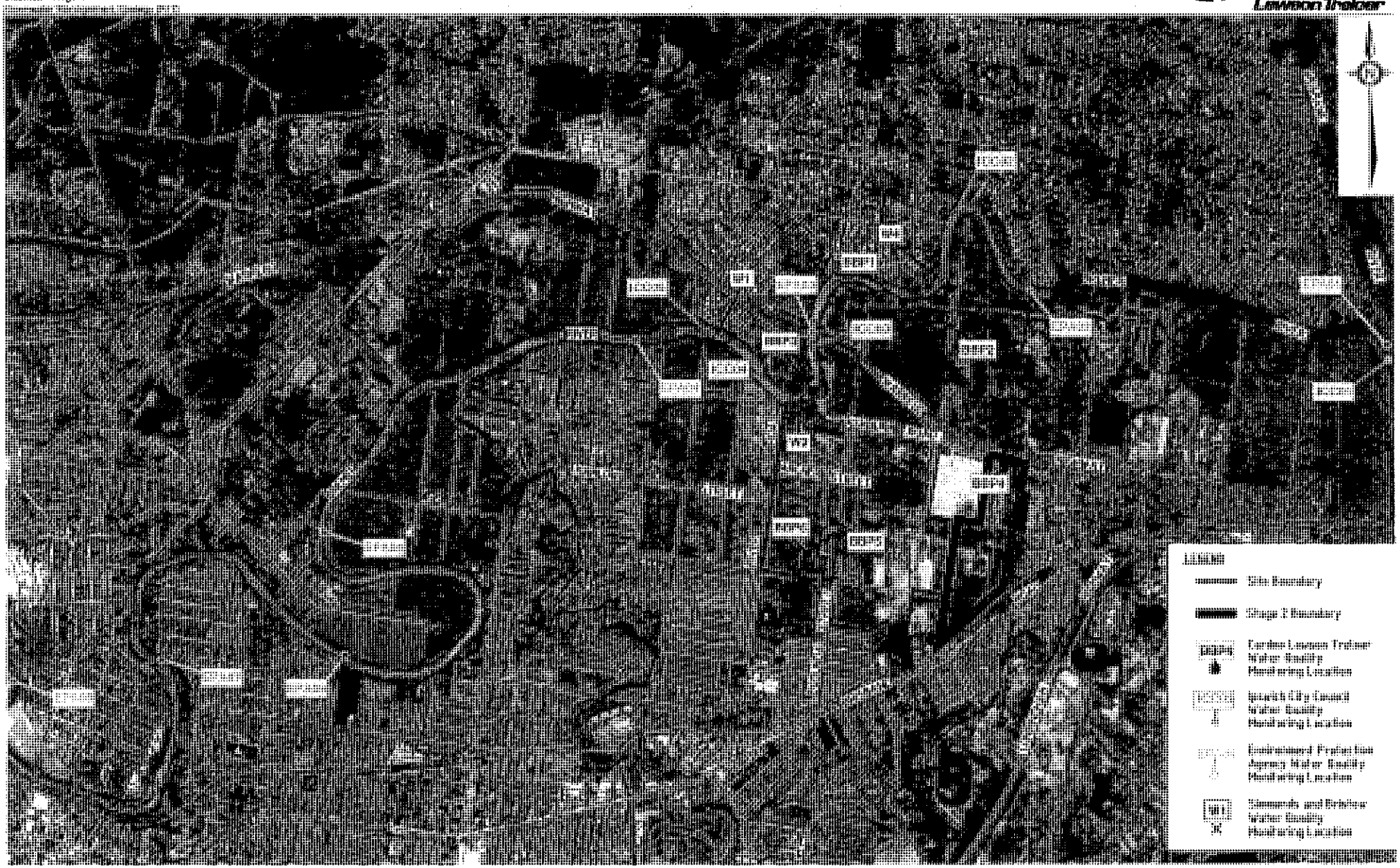
Citiswich - Stage 2

Cardno Lawson Treloar



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250 0 250 500 750 1000 1250m
1:25,000

Scale 1:25 000 (A3)

FIGURE 4

BACKGROUND SURFACE WATER QUALITY MONITORING LOCATIONS

Rev: Orig. Date: November 2010

Project No.: LJ8714

Walker Corporation Pty Ltd

CAD FILE: D:\Mark\ATS\JB714\Figures\GIS\JB714_R17_Figure 4__.dwg
XREF's: ec-ipswich_DEBB_HGA

PRINT DATE: 02 November, 2010 - 12:40pm

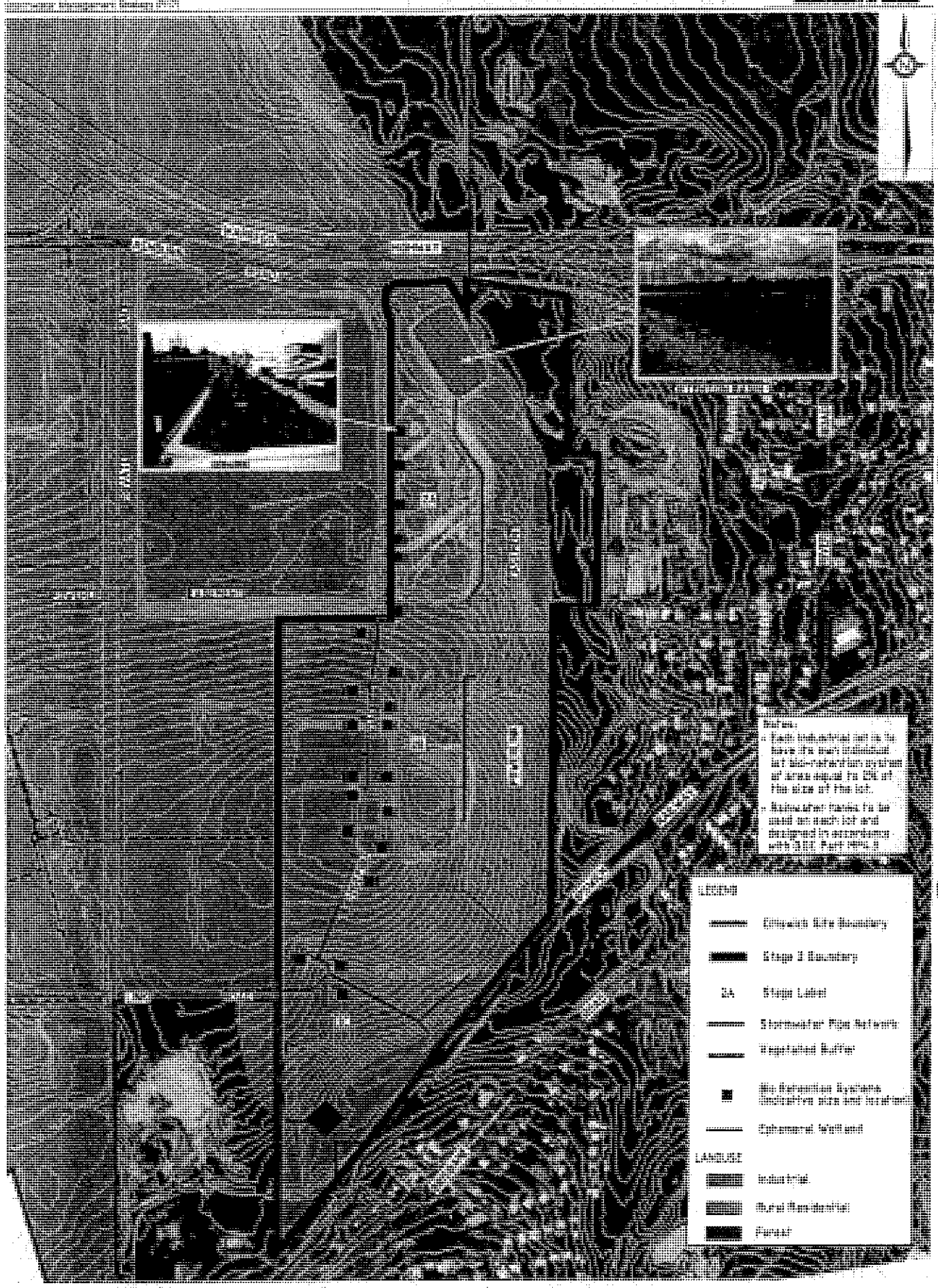

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FIGURE 5

CITISWICH STAGE 2 CONCEPTUAL OPERATIONAL STORMWATER MANAGEMENT STRATEGY

Project No.: LJ8714

Rev: Orig. Date: November 2010

Walker Corporation Pty Ltd

PRINT DATE: 10 December, 2010 - 11:00am

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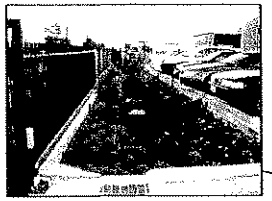

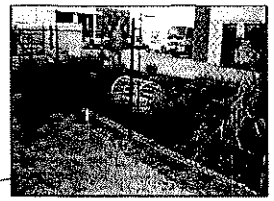

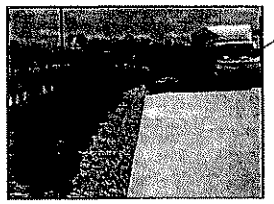

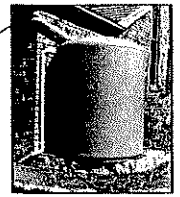

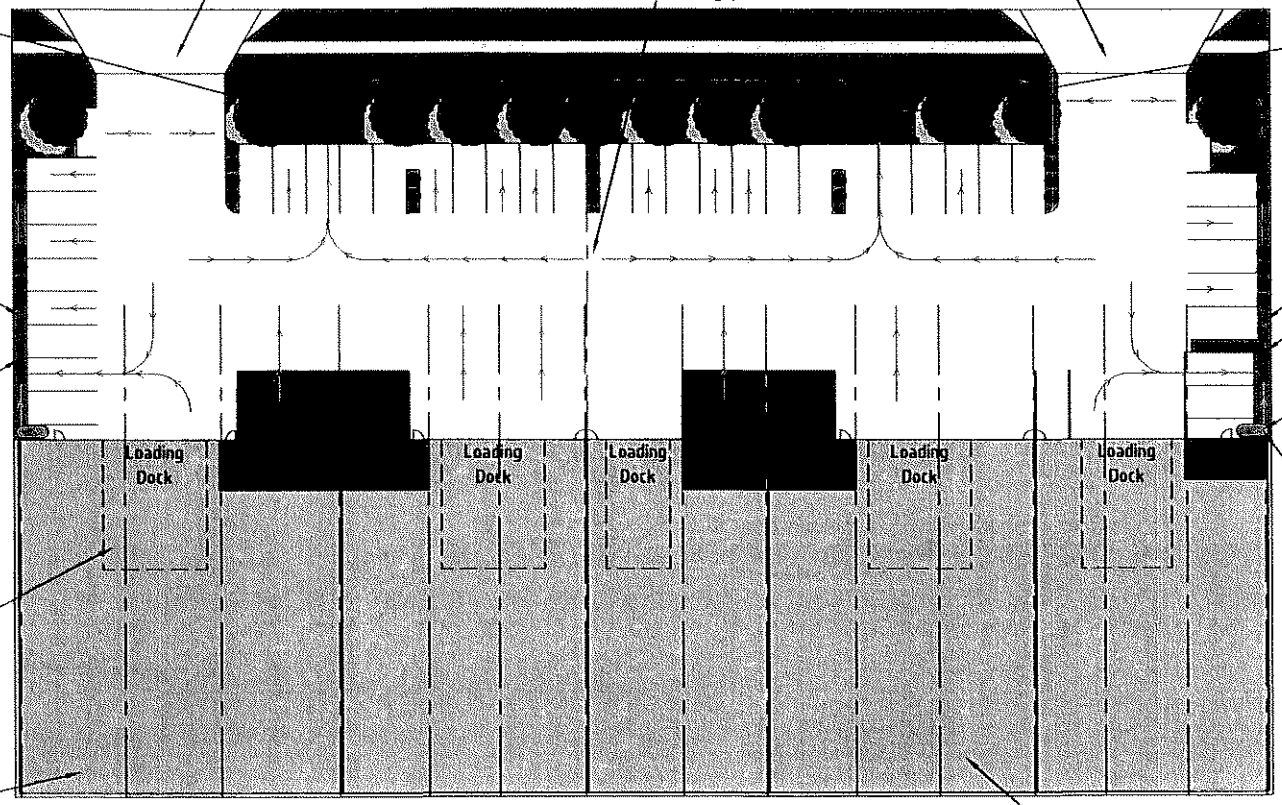

Due to flat site landscape area is located adjacent to building to allow roof runoff/tank overflow to be treated at surface in bioretention systems before it enters underground pipes

Bioretention system located in local depression

Rainwater tanks harvest roof water and are used to supply water for toilet flushing and landscape irrigation

Loading dock areas enclosed under roof

Roof extended to site boundary to prevent informal uncovered work activities/ material storage

Internal areas drain to internal sump and not to carpark. Sump is periodically purged to sewer under local government/EPA license.

LEGEND

- Bioretention System
- Vegetated Swale Flow Path
- Stormwater Flow Path

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4 0 4 8 12 16 20m 1:400

Scale 1:500(A3)

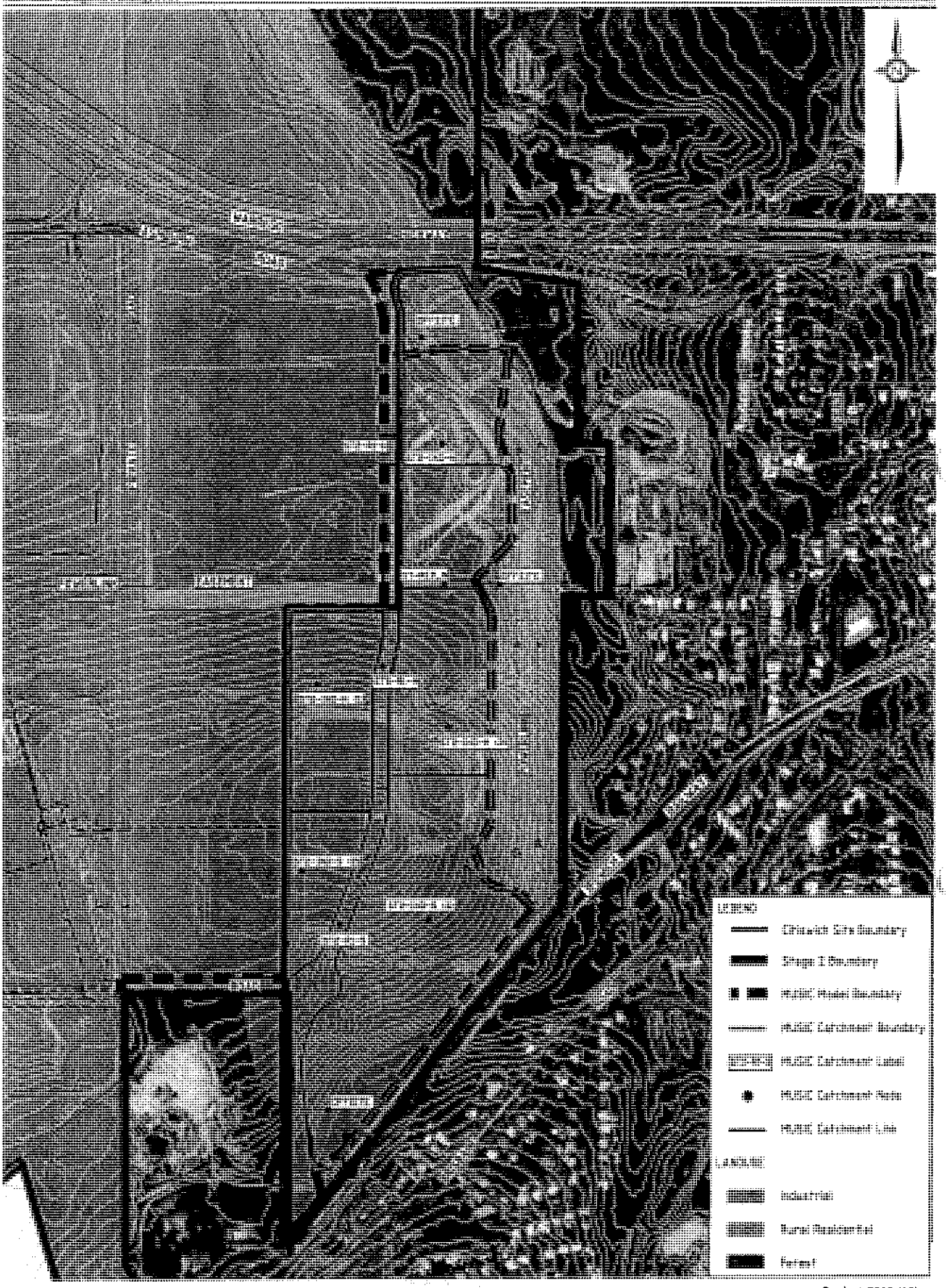
FIGURE 6

INDIVIDUAL INDUSTRIAL LOT CONCEPTUAL OPERATIONAL STORMWATER MANAGEMENT STRATEGY

Rev: Orig. Date: November 2010

Project No.: LJ8714

Walker Corporation Pty Ltd



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50 0 50 100 150 200 250m
1:5000

Scale 1:5000 (A3)

FIGURE 7

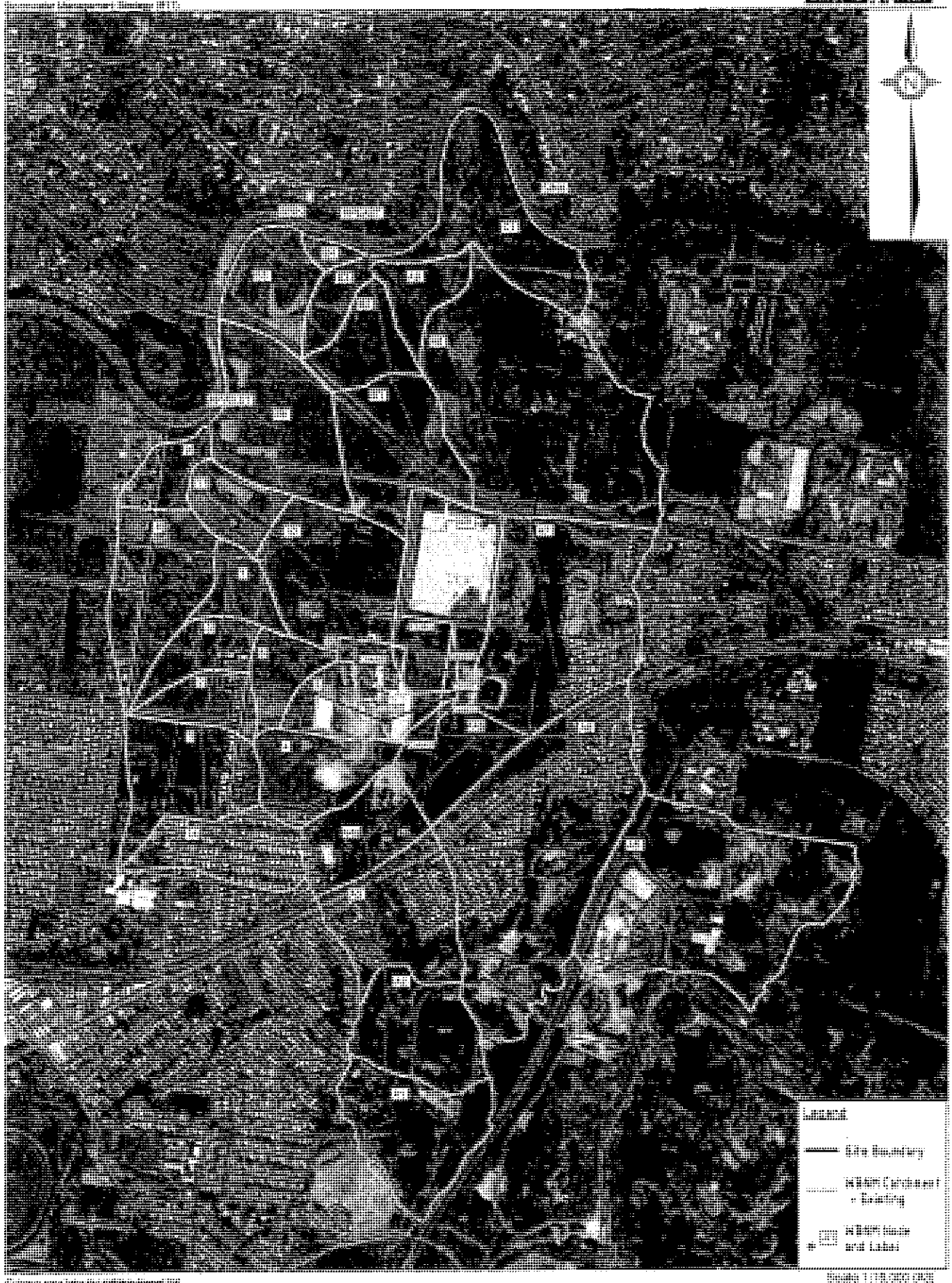
CITISWICH STAGE 2 POST-DEVELOPED MUSIC MODEL CATCHMENT LAYOUT

Project No.: LJ8714

Rev: Orig. Date: November 2010

Walker Corporation Pty Ltd

PRINT DATE: 07 November, 2010 - 12:45pm



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150 0 150 300 450 600 750m
1:15,000

FIGURE 8

PRE-DEVELOPED WBNM MODEL LAYOUT

Project No.: LJ8714

Rev: Orig. Date: November 2010

Walker Corporation Pty Ltd.

CAD FILE: O:\Work\LAT\LJ8714\Figures\RIT\LJ8714_R17_Figure 8_9.dwg
XREF's: xr-Cont-Ht; combined layout: lpswich_DE08_MGA; WLR25_Jet recent Rev f; Master 2007

PRINT DATE: 07 November, 2010 - 12:45pm

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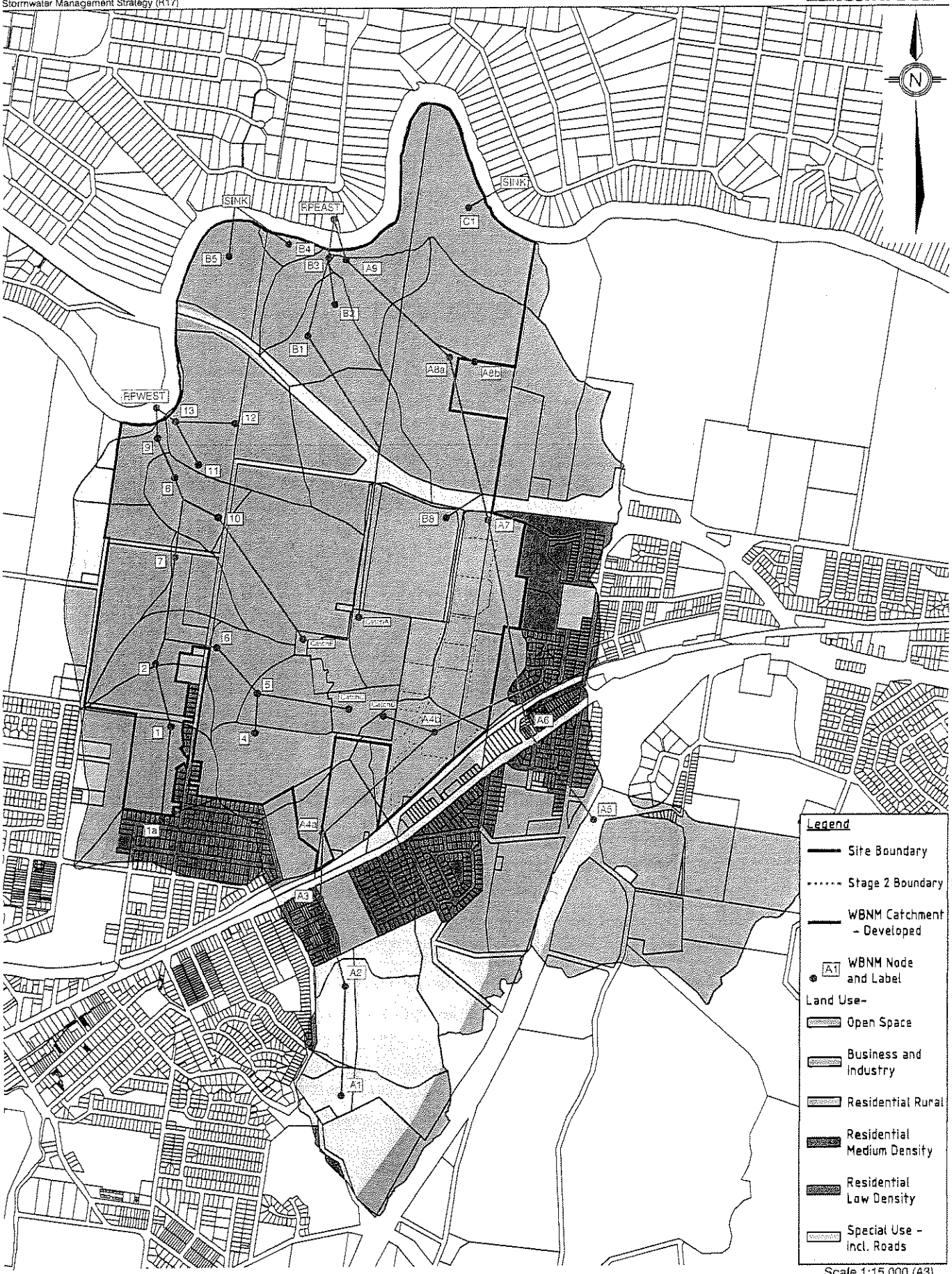

Scale 1:15,000 (A3)

150 0 150 300 450 600 750m 1:15,000

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Rev: Orig. Date: November 2010

Walker Corporation Pty Ltd.

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FIGURE 9

POST-DEVELOPED WBNM MODEL LAYOUT (STAGE 2 ONLY)

Project No.: LJ8714

PRINT DATE: 10 December, 2010 - 1:08am

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FIGURE 10

EASTERN TRIBUTARY: SOBEK MODEL LAYOUT (SOUTHERN EXTENTS)

Rev: Orig. Date: November 2010

Project No.: LJ8714

Walker Corporation Pty Ltd

CAD FILE: D:\Work\LAT\J8714\Figures\R17\J8714-R17_Figure 10_01.dwg
XREFS:

PRINT DATE: 16 November, 2010 - 9:53am

Cardno Lawson Treloar

Scale 1:5000 (A3)

FIGURE 11

EASTERN TRIBUTARY: SOBEK MODEL LAYOUT (NORTHERN EXTENTS)

Project No.: LJ8714

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Rev: Orig. Date: November 2010

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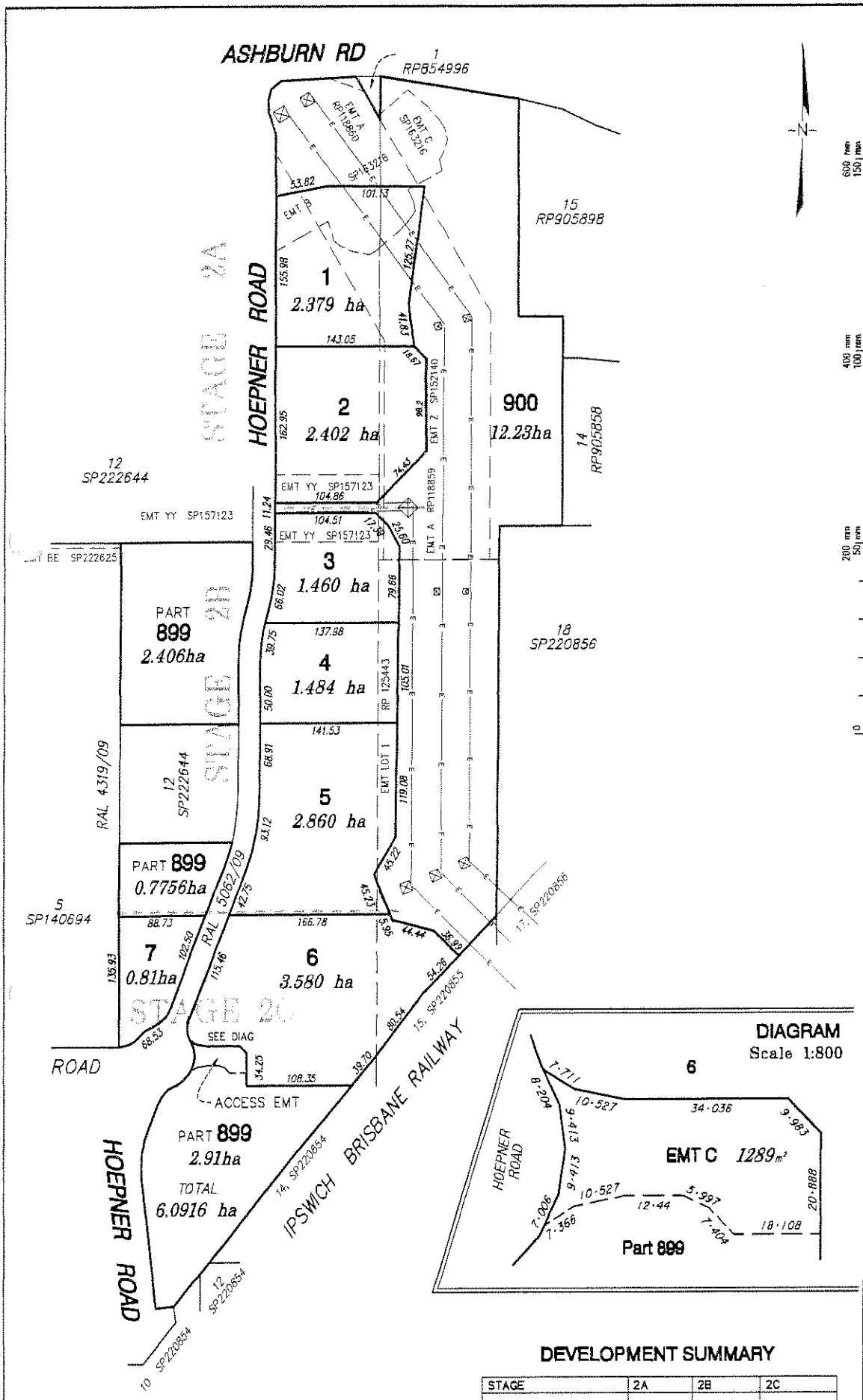
CAD FILE: G:\Work\LJ\LJ8714\Figures\R17\LJ8714.R11_figure 11__11.dwg
XREF's:

PRINT DATE: 02 November, 2010 - 10:19am

Reference Drawings



DEVELOPMENT SUMMARY

STAGE	2A	2B	2C
AREA	4.781 ha	5.804 ha	4.39 ha
NUMBER OF LOTS	2	3	2
LOTS < 1.0 ha	0	0	1
LOTS > 1.0 ha	2	3	1
LENGTH OF NEW ROAD	0	0	0
AREA NEW ROAD	0	0	0
AREA PARK	0	0	0
TOTAL LOT AREA	4.781 ha	5.804 ha	4.39 ha

THE PROPOSED BOUNDARIES AS SHOWN HEREON ARE PRELIMINARY ONLY AND ARE SUBJECT TO FINAL DESIGN, LOCAL AUTHORITY APPROVAL AND REGISTRATION IN THE DEPARTMENT OF ENVIRONMENT & RESOURCE MANAGEMENT

Revision	Chk'd
Rev E 25/10/2010, Amend Lot 2, 899 add access emt, update title	GVG
Rev D 3/06/2010, Amend areas	GVG
Rev C 21/05/2010, Amend Lot 6 Limit	DJH
Rev B 19/05/2010, Amend title,adj RPD	GVG
Rev A 22/04/2010, Amend title, adjust lots	GVG

Associate Consultant / Client

WALKER CORPORATION PTY LTD

PROPOSED RECONFIGURATION

3 Lots into 7 plus 2 balance Lots

Of Lot 1 on SP222644

Lot 2 on RP854997 & Lot 16 SP220855

Parish of GOODNA County of Stanley

J:\41891\dwgs\18199De.pro

Scale	Level Datum	F.Bk	L.Bk	Drawn	Chk'd
1 : 4000		—	—	GVG	

B & P SURVEYS
CONSULTING SURVEYORS
ABN 85101178236
Capri Commercial Centre
St Peters Place
Surfers Paradise,QLD,4217,Australia
Telephone: (07) 5539 0499
Fax: (07) 5592 2615
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Webpage: www.bpsurveys.com.au
Offices Also At : Tweed Heads Ph.(07)55536611
Murwillumbah Ph.(02)66721924
A QUALITY ASSURED COMPANY

Ref. No.	Date	Drawing No./Size	Sheet	Of	Rev.
41891/2	14/04/10	18199 D	1	1	E

Annex A

Stormwater Management Plan

APPENDIX A

STAGE 2 - STORMWATER MANAGEMENT PLAN

1. Water Quality Management – Construction Phase

Issue:	Water Quality Management – Construction Phase
Operational Policy:	To provide a set of guidelines to control the severity and extent of erosion and pollutant transport during firstly the earthworks stage, and then construction.
Performance Criteria:	Water discharges off the site are to comply with the Environmental Protection Act to ensure that no detrimental impacts on water quality and aquatic environment occur during the construction phase. The quality of discharge from the site should not exceed the Water Quality Objectives, as follows: Release Criteria • pH – 6.5-8.5.(range) • Suspended Solids – <50mg/L. (maximum). • Oils and Grease – No visible films or odour • Litter – no visible litter washed from site.
Responsibility:	The owner of the property or their appointed representative & the Construction Contractor. The owner will be responsible for the implementation of the WQMP during the course of all construction activity.
Implementation Strategy:	A detailed erosion & sediment control plan is to be prepared by the projects civil engineers & will incorporate the following: • Sediment and erosion control in accordance with the Institution of Engineers Australia Soil Erosion and Sediment Control Guidelines will be adopted. • Earthworks will be completed in stages with works restricted to the immediate areas. • Subsequent stages of development should not commence if prior stages are affected by acid sulphate conditions &/or construction phase water quality objectives are not met. • Prior to the commencement of any stage construction works temporary sediment basins are to be installed as per the details shown in the stages construction phase stormwater management strategy. • All disturbed site discharge to pass through temporary sediment basins prior to discharge from the site.

Issue:	Water Quality Management – Construction Phase
Implementation Strategy (Cont'd):	• Catch drains should be installed to divert upstream 'clean' water. • Silt fences will be placed along the downstream extents of all earthworks. • Check dams will be installed at regular intervals along catch drains. Drains and bund walls will be topsoiled and vegetated with suitable vegetation as soon as possible. Sediment and sludge trapped in the basins will be removed and mixed with topsoil and reused on site for landscaping purposes. Clean-up of general site litter on a weekly basis and after significant rainfall events. (>25mm/24hours) Landscaping activities and revegetation will occur as soon as possible during/after the construction phase of the development. Only appropriate herbicides and fertilisers are to be used.
Monitoring:	Sediment and erosion control measures will be inspected daily by the site manager during periods of rainfall. (>25mm/24hrs) Establishment and growth of vegetation – to be monitored monthly. No occurrence of excessive sediment deposit - to be monitored weekly or daily during periods of heavy rainfall (>25mm/24hrs). No release of construction material and silt from the site – to be monitored weekly or daily during periods of heavy rainfall (>25mm/24hrs). Vegetation established and growing prior to the rainy season. Erosion monitoring immediately following heavy rainfall. (>25mm) Inspection of silt fences and check dams following heavy rainfall. (>25mm/24hrs) Water quality monitoring shall be carried out following a rainfall event (>25mm of rainfall), and prior to discharge water quality monitoring will be conducted on the waters detained in the sediment basins

Issue:	Water Quality Management – Construction Phase
Monitoring (Cont'd)	The parameters to be tested shall include: • **Water collected in basins**: Prior to release • **Parameters**: pH, suspended solids. Note that additional water quality monitoring maybe required if the WQOs are not being met.
Auditing:	Reviews are to be carried out on a monthly basis to assess the implementation strategy. A checklist is to be completed which assesses the strategies listed above.
Identification of Incident or Failure:	Non compliance with agreed performance criteria will be identified by: 1. Visual inspections identifying: • Build up of sediment on and off the site. • Excessive erosion on the site • Release of construction material from the site • Lack of vegetation establishment 2. Poorly maintained, damaged or failed control devices. 3. Deteriorated water quality identified by the Environmental Consultant as being attributable to the construction activities.
Corrective Action:	After any identification of incident or failure, the source is to be located immediately and the following measures implemented: • If vegetation growth fails, new vegetation should be planted and established. Vegetation may require supplementary watering & replanting. • If silt fences fail, replace and monitor more frequently. • If gully erosion occurs, fill, vegetate and install velocity dissipation steps. • If release of silt and other material off the site occurs, or water quality monitoring indicates levels not within the WQOs, clean up, inspect all treatment techniques, revise designs and review different alternatives and install, otherwise reduce the rate of excavation. If monitored levels within the sediment basins do not conform to the release criteria for: • Suspended solids: flocculate and retest. • pH: add acid if pH is too high or add hydrated lime if pH is too low and retest.

Issue:	Water Quality Management – Construction Phase
Reporting:	Reports will be submitted monthly during the construction of each stage. The reporting will include: • Construction Contractor site managers report; & • Environmental Consultant water quality monitoring report Reporting will conform to the WQMP & identify performance of the implementation strategy, monitoring, identification of incidents & failure & associated corrective action. Reports will be submitted to the owner (or their appointed representative) monthly for submission to Council.

2. Water Quality Management – Operational Phase

Issue:	Surface Water Quality Management – Operational Phase
Operational Policy:	To provide a set of guidelines to ensure that the water quality in the waterways remain at an acceptable level as specified in the water quality objectives (WQOs) for the site at all times and to ensure that any waters discharged from the site are of an acceptable quality.
Performance Criteria:	Water discharges off the site should be of a quality, which ensures there is no detriment to the downstream environment. The quality of discharge from the site should achieve the following long term WQOs: • pH – 6.5-8.5 • Dissolved Oxygen – 80 – 105% saturation. • Total Phosphorous – 70µg/L. • Total Nitrogen – 650µg/L • Turbidity – 20 NTU • Suspended Solids – <15mg/L • Faecal Coliforms – 150 organisms/100mL. • Oils and Grease – No visible films or odour. • Litter/Gross Pollutants – No man made material greater than 5mm in any direction. WOO's are upper limits for median values or ranges in which medians should lie, unless otherwise stated.
Responsibility:	The owner of the property or their appointed representative. The owner will be responsible for implementation of the SWMP for the life of the building after completion of construction.
Implementation Strategy:	A comprehensive conceptual stormwater runoff management system is proposed for the development, comprising local runoff water quality control. Local catchment runoff water quality control is achieved by: • Industrial In-lot bio-retention systems; • End-of-line Bio-retention systems; • Vegetated pre-treatment for all bio-retention systems; • Road side rain gardens; and These controls will: • trap trash; • trap coarse sediment and attached nutrients and metals; and • trap oil and grease.

Issue:	Surface Water Quality Management – Operational Phase
Implementation Strategy Cont'd:	Periodical monitoring of erosion within treatment devices. Periodic maintenance of vegetation within treatment devices. Gross pollutant traps to be cleared out quarterly to annually dependent on visual inspection and maintenance form.
Monitoring:	Inspect outflow points from the stormwater outlets and treatment trains to ensure that there are no signs of erosive activity or significant sediment deposits. Monitoring shall include inspection of all treatment devices to ensure they are operating efficiently. Water Quality monitoring will occur monthly for a period of 2 years after the treatment train is established, including 1 to 2 events per year. The monitoring will ensure that the implementation strategy is working effectively. Monitoring locations will include all legal points of discharge: • **BBP1** Bremer River downstream of the eastern tributary within the Bremer Business Park Site.- • **BBP2** Downstream extents of the eastern tributary - • **BBP3** - Bremer River upstream of the Warrego Highway bridge crossing. • **BBP4** Upstream extents of the eastern tributary upstream of the Warrego Highway.- • **BBP5** Unnamed tributary downstream of Bognuda Street.- • **BBP6** Unnamed tributary upstream of Archer Street.- • **BBP7** Bremer River upstream of the Bremer Business Park Site.- Key water quality parameters to be monitored are: • **Surface Waters:** 4 events per year Monitoring • **Parameters:** temperature, dissolved oxygen, pH, specific conductance, salinity, turbidity, suspended solids, total nitrogen, total phosphorous, faecal coliforms, and Algae count and ID. Note that additional water quality monitoring may be required if compliance with the water quality objectives for the site are not being met.

Issue:	Surface Water Quality Management – Operational Phase
Auditing:	Reviews are to be carried out on a quarterly basis to assess the implementation strategy. A checklist is to be completed which assesses the strategies listed above.
Identification of Incident or Failure:	Non compliance with agreed performance criteria will be identified by: 1. Visual inspections identifying poorly maintained, damaged or failed control devices. 2. Deteriorated water quality identified by the Environmental Consultant as being attributable to the state of the treatment devices.
Corrective Action:	If release of silt and other material off the site occurs, clean up, inspect all treatment techniques, revise designs and review different alternatives and install.
Reporting:	A water quality reporting summarising the monitoring results shall be completed following each monitoring campaign.

Annex B

Maintenance Plans

Annex B.1

Bio-Retention Systems

1. INTRODUCTION

Bio-retention systems are vegetated areas where runoff is filtered through a porous sandy loam filter media as it infiltrates through the system to an arrangement on perforated under-drains and flows to downstream waterways.

Runoff is allowed to temporarily pond to increase the volume of stormwater runoff treated through the bio-retention systems. The temporary ponding level is generally referred to as the extended detention depth.

To protect against possible scour of the bio-retention surface, high flows that exceed the design event are conveyed through an overflow pit or high-flow bypass channel.

2. FUNCTION

Bio-retention basins operate by filtering stormwater runoff through densely planted surface vegetation and percolating through a specified filter media. Pollutants within the stormwater runoff are retained through fine infiltration, adsorption and some biological uptake as the runoff percolates through the filter media. The vegetation in a bio-retention system is a vital functional element to the operational effectiveness of the bio-retention system, providing a substrate for biofilm growth within the upper layer of the bio-retention filter media and facilitates the transport of oxygen to the filter media enhancing soil microbiological communities and the biological transformation of pollutants.

Bio-retention basins are not intended to be an infiltration system that discharges the treated stormwater runoff into the surrounding in-situ soils. Bio-retention systems are generally designed to recover stormwater at the base of the filter media in the perforated under-drain and discharge to receiving waters. In order to accommodate this feature an impermeable geotextile fabric is placed between the in-situ soils of the bio-retention walls and base to limit exfiltration to the surrounding soils.

Bio-retention systems can be installed at various scales, including:

- Landscape planter boxes;
- Roadside rain gardens incorporating traffic calming measures;
- Within suburban Parks; and
- At the base of detention basins.

Generally in larger applications a pre-treatment swale or vegetated buffer area is incorporated upstream of the bio-retention system to minimise the maintenance frequency of the bio-retention system.

3. CONSTRUCTION AND ESTABLISHMENT

Following the completion of the civil construction phase (i.e. bulk earthworks, roads and services) the site is opened for the build out of each of the individual lots. At this time the works are generally 'uncontrolled' as individual builders not associated with the developer will undertake the individual lot construction. Based on practical experience this stage is usually detrimental to the water quality management and establishment of the water quality treatment devices. The following details a recommended construction and establishment methodology for a bio-retention basin.

3.1 Functional Installation

The Functional Installation of a bio-retention basin occurs at the end of the bulk civil works (i.e bulk earthworks, installation of roads, water, sewage and power services) as part of the landscaping works. The functional installation involves:

- Bulking out and trimming (Basin excavation);
- Installation of the bio-retention basin outlet structures;
- Placement of a geo-textile fabric (between the in-situ basin bed and the drainage layer)
- Installation of the drainage layer and under-drain system;
- Placement of the transition layer and filter media;
- Installation of bio-retention inlet structures;
- Placement of a temporary protective management strategy (Refer to sediment and erosion details below).
- Placement of sediment fences around the boundary of the bio-retention basin to prevent silt entering the filter media and restrict access to the basin.
- The temporary protective management strategies are kept in place throughout the entire construction phase.

3.2 Sediment and Erosion Control

Sediment and Erosion Control involves the placement of temporary protective management strategies for the period where the upstream catchments are not in their final state and are contributing sediment / litter laden waters which may cause the filter media to clog.

3.3 Operational Establishment

Operational Establishment of the bio-retention basin occurs at the completion of the building phase of the development. Operational establishment includes the following works:

- Removal of all accumulated sediment from the sediment fore bay and the basin surface;
- Removal of the temporary turf, topsoil and geotextile fabric;
- Re-profile the bio-retention filter media surface;

- Vegetation of the bio-retention basin in accordance with the landscape design; and
- Regular watering of the vegetation and removal of weeds during the plant establishment phase (generally first two years).

4. VEGETATION ESTABLISHMENT

Source: WSUD TDG SEQ 2006 Section 5.5.4

4.1 Weed Control

Conventional surface mulching of bio-retention basins with organic material like tanbark should not be undertaken. Most organic mulch floats and runoff typically causes this material to be washed away with risk of blocking outlet structures. Adopting high plant densities and where necessary applying a suitable biodegradable erosion control matting to the basin batters will help reduce the risk of weed invasion and limit labour intensive maintenance requirements for weed removal. A heavy application of seedless hydro-mulch can also provide short term erosion and weed control prior to planting with nursery stock. No matting or hydro-mulch should be applied to the surface of the bio-retention basin following the construction phase as this will hinder the filtration capacity of stormwater through the filter media.

4.2 Watering

Regular watering of the bio-retention basin vegetation is essential for successful establishment and healthy growth. The frequency of watering to achieve successful plant establishment is dependant upon rainfall, the maturity of the planting stock and the water holding capacity of the soil. The following watering program is generally adequate but should be adjusted (increased) to suit the site conditions:

- Weeks 1-2: 3 Watering campaigns per week;
- Weeks 3-6: 2 Watering campaigns per week; and
- Weeks 7-12: 1 Watering campaigns per week.

After this initial three month watering campaign, watering may still be required, particularly during the first winter (dry period). Watering requirements to sustain healthy vegetation should be determined during ongoing maintenance site visits.

5. MAINTENANCE REQUIREMENTS

Source: WSUD TDG SEQ 2006 Section 5.6

Vegetation plays a key role in maintaining the porosity of the filter media of a bio-retention basin and strong healthy growth of vegetation is critical to its performance. Therefore the most intensive period of maintenance is during the plant establishment period (first two years) when weed removal and replanting may be required.

Inflow systems and overflow pits require careful monitoring, as these can be prone to scour and litter build up. Debris can block inlets or outlets and can be unsightly, particularly in high visible areas. Inspection and removal of debris should be done regularly, and debris should be removed whenever it is observed on a site. Where sediment forebays are adopted, regular inspection of the forebay is required (3 monthly) with removal of accumulated sediment undertaken as required.

For larger bio-retention basins, it is essential that a maintenance access point is designed or and maintained in the bio-retention basin. The size and complexity of the system will guide its design and may involve provision of a reinforced concrete ramp/ pad for truck or machinery access.

Typical maintenance of bio-retention basin elements will involve:

- Routine inspection of the bio-retention basin profile to identify any areas of obvious increased sediment deposition, scouring from storms, rill erosion of the batters from lateral flows, damage to the profile from vehicles and clogging of the bio-retention basin (generally accompanied by a 'boggy' filter media surface);
- Routine inspection of inflow systems, overflow pits and under-drains to identify and clean any areas of scour, litter build up and blockages;
- Removal of sediment where it is smothering the bio-retention basin vegetation;
- Where a sediment fore bay is adopted, removal of accumulated sediment;
- Repairing any damage to the profile resulting from scour, rill erosion or vehicle damage by replacement of appropriate fill (to match on site soils) and revegetating;
- Tilling of the bio-retention basin surface or removal of the surface layer if there is evidence of clogging;
- Regular watering and irrigation of the basin vegetation until plants are established and actively growing;
- Removal and management of invasive weeds (herbicides should not be used);
- Removal of plants that have died and replacement with plants of equivalent size and species as detailed in the plant schedule;
- Pruning to remove dead or diseased vegetation material and stimulate growth;
- Monitoring and controlling vegetation pests;
- Inspections should be also conducted following any large storm event to check for scour and other damage;
- All maintenance should be carried out only after a reasonably rain free period when the soil in the bio-retention systems is dry; and
- All maintenance works are to be documented using the attached maintenance inspection form.

If a bio-retention system fails to drain adequately after tilling of the basin surface and other remedial maintenance, the bio-retention system may require resetting. Resetting involves the complete reconstruction of the bio-retention system.

5.1 Bio-Retention Typical Maintenance Schedule

SCHEDULE OF SITE VISITS													
Purpose of Visit	**Frequency**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
Routine inspection	12/year	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Annual inspection	1/year				✓								
Routine maintenance	2/year				✓						✓		
Routine clean out of sediment	1 / 2 years				✓								

There are three phases to this maintenance plan which are:

- The establishment phase;
- The inspection and monitoring phase; and
- Cleanout and replacement phase

The above schedule is a guideline only. Routine clean out and maintenance should be scheduled based on the outcome of routine inspection.

ESTABLISHMENT	
1.1	The aim of the establishment phase is to ensure appropriate plant establishment within the bio-retention system through adequate weed control and watering.
1.2	Weed control during the establishment phase focuses on weed growth prevention rather than removal. By adopting high planting densities and if necessary, applying a suitable biodegradable erosion control matting to the basin batters.
1.3	Regular watering of the bio-retention basin vegetation is essential for successful establishment of the selected plants. Each site will need specific watering requirements but as a guide during the first two weeks there will need to be three visits each week, after this (weeks 3-6) there will need to be two visits each week. The third and final period of establishment maintenance (weeks 7-12) there is only one visit each week required. The Bio-retention Basin Maintenance Checklist provides the schedule of visits and a tick box to help monitor what stage of the establishment phase they are in and provides a record as to whether proper establishment has occurred.
INSPECTION	
1.	**Routine Inspection**
1.1	Routine inspection should be carried out on a regular monthly basis. The purpose of the inspection is to indicate when maintenance of the Bio-retention system is required.
1.2	Inspections should consider items listed on the Bio-retention Basin Maintenance Checklist
2.	**Event Inspection**
2.1	Following bushfires the bio-retention system shall be inspected for damage to the structure, vegetation and filter media.
2.2	After any significant rainfall events the bio-retention system shall be inspected for damage to the structure, vegetation and filter media.
ROUTINE MAINTENANCE	
1.	**Purpose**
1.1	Maintenance of the bio retention system involves routine inspections of the bio-retention basin profile to identify any areas of obvious increased sediment deposition or scouring. Based on inspections there should be actions taken to remove dead or diseased vegetation, any litter or foreign objects. Filter Media replacement should occur when necessary and any items from checklist that are noted are to be reported to the site manager.
2.	**Weed Management**
2.1	If weeds have been observed during routine inspection, these weeds should be removed from the bio retention system. Weeding generally involves manual removal of perennial species.
2.2	The aim is to remove the weed including the roots when the weeds are less than 3 months old, otherwise weeds infestation rapidly occurs and is difficult to control.

2.3	Herbicides should not be used as they would contaminate the water in the creek.
2.4	The weeds should be disposed offsite at appropriate waste management facility.
2.5	Replant appropriate plant species, where necessary, in areas that have been extensively weeded.
3.	**Litter Management**
3.1	Remove and dispose of litter that may be visible around the bio retention system.
4.	**Dead or Diseased Vegetation**
4.1	Remove or dispose of any dead or diseased vegetation within system.
5.	**Filter Media Replacement**
5.1	Filter Media replacement is recommended when erosion is evident or system looks unattractive or is not draining in 30 days. Conventional surface mulching with organic material like tank bark, should not be undertaken as most mulch floats and is washed away.
6.	**Structural Integrity**
6.1	Report any damage to the structure immediately to the civil engineer
6.2	Report significant scour to the civil engineer
6.3	Ensure that the system is draining correctly via visual inspection of a rainfall event. If poor drainage is observed then inspect the outlet pipe for blockage. If the drainage is still poor then contact the civil engineer and arrange for a permeability test to ensure replacement of filter material is not clogged.
EVENT MAINTENANCE	
1.	**Purpose**
1.1	Event Maintenance of the bio retention system involves undertaking any maintenance to the bio-retention system following an event. Based on the event inspections there should be actions taken to remove dead or diseased vegetation, any litter or foreign objects. Filter Media replacement should occur when necessary and any items from checklist that are noted are to be reported to the site manager. Maintenance is in accordance with the Routine Maintenance guidelines listed above.
CLEANOUT AND REPLACEMENT OF SEDIMENT	
1.	**Setup and Prepare Site for Cleanout**
1.1	Notify adjacent residents of cleanout at least three days prior to date of cleanout.
1.2	Setup equipment onsite.
2.	**Cleanout of Sediment**
2.1	The preferred method of cleanout of the bio-retention system is replacing the clogged medium.
2.2	Position the equipment on the side of the system to allow easy access into the bio retention system and transfer of material into adjacent tipper truck. The truck should be positioned so that water from the truck body drains into the bio retention system.
2.3	Drain waste in the truck thoroughly before proceeding to the disposal point.

APPENDIX C.1.1

BIO-RETENTION CONSTRUCTION INSPECTION CHECKLIST

BIO-RETENTION BASIN CONSTRUCTION INSPECTION CHECKLIST

Asset ID:		Inspected By:	
		Date:	
Site:		Time:	
		Weather:	
Constructed By:		Site Manager:	

Items Inspected	Checked Y	Checked N	Satisfactory Y	Satisfactory N	Items Inspected	Checked Y	Checked N	Satisfactory Y	Satisfactory N
CONSTRUCTION AND ESTABLISHMENT PHASE									
A). FUNCTIONAL INSTALLATION					**Structural Components**				
Preliminary Works					15). Location and configuration of inflow systems as detailed in plans				
1). Erosion and sediment control plan adopted					16). Location and levels of overflow pits as detailed in plans				
2). Temporary traffic / safety control measures					17). Under-drain connected to overflow pits as detailed in plans				
3). Location as detailed in plans					18). Concrete and reinforcement as detailed in plans				
4). Basin protected from site runoff					19). Set down to correct level for flush kerbs (rain gardens only)				
Earthworks and Filter Media					20). Kerb opening width as detailed in plans (rain garden only)				
5). Basin bed surface correct shape and slope as detailed in plans									
6). Side slope batters as detailed in plans					**B). SEDIMENT AND EROSION CONTROL**				
7). Bio-retention dimensions and area as detailed in plans					21). Stabilisation immediately following earthworks and planting of terrestrial landscape around basin				
8). Confirm surrounding soils type with design					22). Silt fences and traffic controls in place				
9). Confirm filter media specifications in accordance with latest FAWB Guidelines					23). Temporary protective turf and topsoil in place				
10). Geotextile fabric placed between in-situ soils and filter media (base and walls)									
11). Under-drain installed as detailed in plans					**C). OPERATIONAL ESTABLISHMENT**				
12). Drainage layer/media as specified					24). Sediment removed from fore bay area				
13). Transition layer media as specified					25). Temporary protective turf, topsoil and geotextile fabric removed				
14). Extended detention depth as detailed in plans					Vegetation				
					26). Planting as designed (species and density)				
					27). Weed removal and watering as required				

FINAL INSPECTION									
1). Confirm levels of the inlets and outlets					6). Check for uneven settling of banks				
2). Confirm structural element sizes					7). Confirm under-drain operational and working				
3). Check side batter slopes					8). Confirm inflow systems operational and working				
4). Check vegetation as designed					9). Confirm maintenance access is provided				
5). Check bio-retention filter media surface flat and free of clogging									

COMMENTS ON INSPECTION

ACTIONS REQUIRED

Inspection Officer's Signature:	

Source: WSUD Technical Design Guidelines for South East Queensland – Version 1 June 2006 (Moreton Bay Waterways and Catchments Partnership)

APPENDIX C.1.2

BIO-RETENTION MAINTENANCE CHECKLIST

BIO-RETENTION BASIN MAINTENANCE CHECKLIST

Asset ID:		Inspected By:	
		Date:	
Site:		Time:	
		Weather:	
Constructed By:		Site Manager:	

Items Inspected	Checked		Satisfactory		Action Required
	Y	N	Y	N	
Sediment accumulation on inflow locations?					
Litter within the basin?					
Erosion at inlet or other key structures?					
Traffic / Vehicle damage present?					
Evidence of illegal dumping (e.g. building waste)?					
Vegetation condition satisfactory (density, weeds etc.)					
Watering of vegetation required?					
Replanting require?					
Mowing / Slashing required?					
Clogging of drainage points (sediment or debris)?					
Evidence of ponding?					
Damage / Vandalism to structures present?					
Surface clogging visible?					
Drainage system inspected?					
Resetting of system require?					

COMMENTS ON INSPECTION

ACTIONS REQUIRED

Inspection Officer's Signature:	

Source: WSUD Technical Design Guidelines for South East Queensland – Version 1 June 2006 (Moreton Bay Waterways and Catchments Partnership)

Annex B.2

Vegetated Buffer Zones

1. VEGETATED BUFFER TYPICAL MAINTENANCE SCHEDULE

SCHEDULE OF SITE VISITS													
Purpose of Visit	Frequency	J	F	M	A	M	J	J	A	S	O	N	D
Routine inspection	12/year	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Annual inspection	1/year				✓								
Routine maintenance	12/year	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

The above schedule is a guideline only. Routine maintenance should be scheduled based on the outcome of routine inspection.

INSPECTION	
1.	Routine Inspection
1.1	Routine inspection should be carried out on a regular monthly basis. The purpose of the inspection is to indicate when mowing/maintenance of the buffer is required.
1.2	The length of grass in the buffer should be assessed.
1.3	Complete appropriate Maintenance Form. Routine mowing/maintenance should be scheduled when the height of vegetation in the buffer is excessive.
2.	Annual Inspection
2.1	Once a year, the condition of the buffers should be closely inspected. Any damage or problems should be noted on the Maintenance Form for action.
ROUTINE MAINTENANCE	
1.	Purpose
1.1	Routine maintenance of the buffer involves weed control the collection of any litter, and mowing of excessive vegetation.
2.	Weed Management
2.1	If weeds have been observed during routine inspection, these weeds should be removed from the buffer. Weeding generally involves manual removal of perennial species.
2.2	The aim is to remove the weed including the roots when the weeds are less than 3 months old, otherwise weeds infestation rapidly occurs and is difficult to control.
2.3	Herbicides should not be used as they would contaminate the water in the creek.
2.4	The weeds should be disposed offsite at appropriate waste management facility.
2.5	Replant appropriate plant species, where necessary, in areas that have been extensively weeded.
3.	Litter Management
3.1	Remove and dispose of litter that may be visible around the swale/buffer.
4.	Mowing
4.1	Mow excessive vegetation and dispose of mulch at any appropriate waste management facility.

Annex C

FAWB Guidelines

GUIDELINES FOR FILTER MEDIA IN BIOFILTRATION SYSTEMS (Version 3.01) June 2009

The following guidelines for filter media in biofiltration systems have been prepared on behalf of the Facility for Advancing Water Biofiltration (FAWB) to assist in the development of biofiltration systems, including the planning, design, construction and operation of those systems.

NOTE: This is a revision of the previous FAWB guideline specifications (published in 2006 (Version 1.01), 2008 (Version 2.01)). It attempts to provide a simpler and more robust guideline for both soil-based and engineered filter media. FAWB acknowledges the contribution of EDAW Inc., Melbourne Water Corporation, Dr Nicholas Somes (Ecodynamics), Alan Hoban (South East Queensland Healthy Waterways Partnership), Shaun Leinster (DesignFlow) and STORM Consulting to the preparation of the revised guidelines.

Disclaimer

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1 GENERAL DESCRIPTION

The biofiltration filter media guidelines require three layers of media: the filter media itself (400-600 mm deep or as specified in the engineering design), a transition layer (100 mm deep), and a drainage layer (50 mm minimum cover over underdrainage pipe). The biofiltration system will operate so that water will infiltrate into the filter media and move vertically down through the profile.

The filter media is required to support a range of vegetation types (from groundcovers to trees) that are adapted to freely draining soils with occasional wetting. The material should be based on **natural or amended natural soils** or it can be **entirely engineered**; in either case, it can be of siliceous or calcareous origin. In general, the media should have an appropriately high permeability under compaction and should be free of rubbish, deleterious material, toxicants, declared plants and local weeds (as listed in local guidelines/Acts), and should not be hydrophobic. The filter media should contain some organic matter for increased water holding capacity but be low in nutrient content. In the case of natural or amended natural soils, the media should be a **loamy sand**.

Maintaining an adequate infiltration capacity is crucial in ensuring the long-term treatment efficiency of the system. The ability of a biofiltration system to detain and infiltrate incoming stormwater is a function of the filter surface area, extended detention (ponding) depth, and the hydraulic conductivity of the filter media (Figure 1). Most importantly, design of a biofiltration system should optimize the combination of these three design elements.

For a biofiltration system in a temperate climate with an extended detention depth of 100 – 300 mm and whose surface area is approximately 2% of the connected impervious area of the contributing catchment, the prescribed hydraulic conductivity will generally be between 100 – 300 mm/hr in order to meet best practice targets (Figure 2). This configuration supports plant growth without requiring too much land space. In warm, humid (sub- and dry- tropical) regions the hydraulic conductivity may need to be higher in order to achieve the required treatment performance using the same land space (i.e., ensuring that the proportion of water treated through the media meets requirements).

Where one of these design elements falls outside the recommended range, the infiltration capacity can still be maintained by offsetting another of the design elements. For example, a filter media with a lower hydraulic conductivity may be used, but the surface area or the extended detention depth would need to be increased in order to maintain the treatment capacity. Similarly, if the available land were the limiting design element, the system could still treat the same size storm if a filter media with a higher hydraulic conductivity were installed. Where a hydraulic conductivity greater than 300 mm/hr is prescribed, potential issues such as higher watering requirements during the establishment should be considered. Biofiltration systems with a hydraulic conductivity greater than 600 mm/hr are unlikely to support plant growth due to poor water retention, and may also result in leaching of pollutants. However plant survival might be possible if the outlet pipe were raised to create a permanently submerged zone.

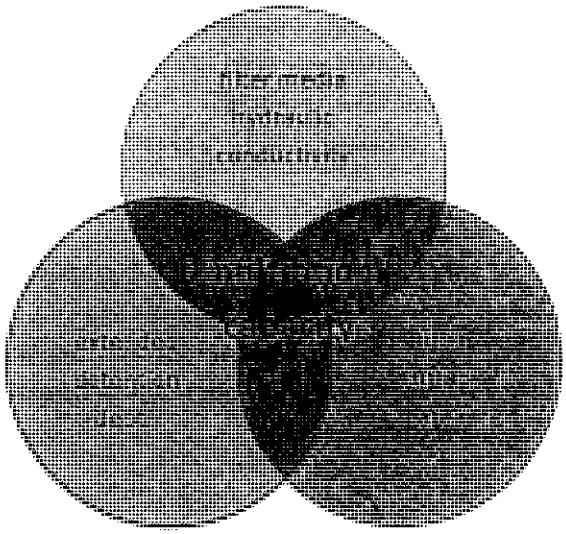

Figure 1. Design elements that influence infiltration capacity.

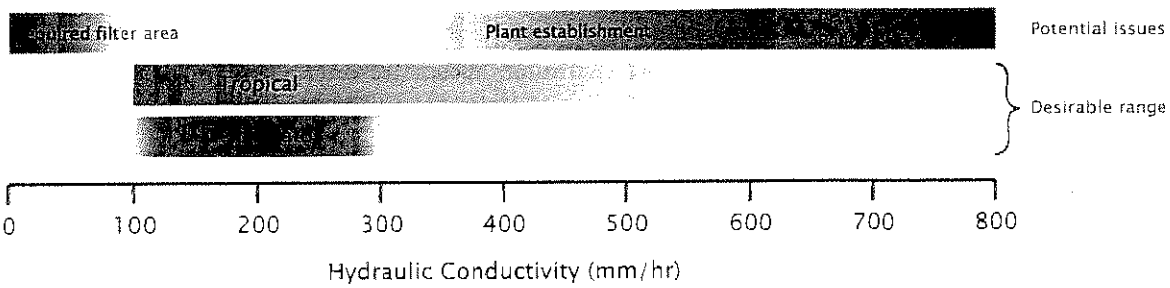

Figure 2. Recommended filter media hydraulic conductivity range and potential issues

The infiltration capacity of the biofiltration system will initially decline during the establishment phase as the filter media settles and compacts, but this will level out and then start to increase as the plant community establishes itself and the rooting depth increases (see Appendix A). In order to ensure that the system functions adequately at its eventual (minimum) hydraulic conductivity, a safety co-efficient of 2 should be used: i.e., **designs should be modelled using half the prescribed hydraulic conductivity**. If a system does not perform adequately with this hydraulic conductivity, then the area and/or ponding depth should be increased. It may also be desirable to report sensitivity to infiltration rate, rather than simply having expected rate. This is important when assessing compliance of constructed systems as systems should ideally meet best practice across a range of infiltration rates.

2 TESTING REQUIREMENTS

2.1 Determination of Hydraulic Conductivity

The hydraulic conductivity of potential filter media should be measured using the ASTM F1815-06 method. This test method uses a compaction method that best represents field conditions and so provides a more realistic assessment of hydraulic conductivity than other test methods.

Note: if a hydraulic conductivity lower than 100 mm/hr is prescribed, the level of compaction associated with this test method may be too severe and so underestimate the actual hydraulic conductivity of the filter media under field conditions. However, FAWB considers this to be an appropriately conservative test, and recommends its use even for low conductivity media.

2.2 Particle Size Distribution

Particle size distribution (PSD) is of secondary importance compared with hydraulic conductivity. A material whose PSD falls within the following recommended range does not preclude the need for hydraulic conductivity testing i.e., it does not guarantee that the material will have a suitable hydraulic conductivity. However, the following composition range (percentage w/w) provides a useful guide for selecting an appropriate material:

Clay & Silt	<3%	(<0.05 mm)
Very Fine Sand	5-30%	(0.05-0.15 mm)
Fine Sand	10-30%	(0.15-0.25 mm)
Medium to Coarse Sand	40-60%	(0.25-1.0 mm)
Coarse Sand	7-10%	(1.0-2.0 mm)
Fine Gravel	<3%	(2.0-3.4 mm)

Clay and silt are important for water retention and sorption of dissolved pollutants, however they substantially reduce the hydraulic conductivity of the filter media. This size fraction also influences the structural stability of the material (through migration of particles to block small pores and/or slump). It is essential that the total clay and silt mix is **less than 3% (w/w)** to reduce the likelihood of structural collapse of such soils.

The filter media should be well-graded i.e., it should have all particle size ranges present from the 0.075 mm to the 4.75 mm sieve (as defined by AS1289.3.6.1 - 1995). There should be no gap in the particle size grading, and the composition should not be dominated by a small particle size range. This is important for preventing structural collapse due to particle migration.

2.3 Soil-Based Filter Media: Properties

The following specifications are based on results of extensive treatment performance testing conducted by FAWB as well as recommendations made by AS4419 – 2003 (Soils for Landscaping and Garden Use). Filter media must be tested for the following; media that do not meet these specifications should be rejected or amended:

i. Total Nitrogen (TN) Content – <1000 mg/kg.

ii. Orthophosphate (PO_4^{3-}) Content – <80 mg/kg. Soils with total phosphorus concentrations >100 mg/kg should be tested for potential leaching. Where plants with moderate phosphorus sensitivity are to be used, total phosphorus concentrations should be <20 mg/kg.

iii. Organic Matter Content – at least 3% (w/w). An organic content lower than 3% is likely to have too low a water holding capacity to support healthy plant growth. In order to comply with both this and the TN and PO_4^{3-} content requirements, a low nutrient organic matter will be required.

iv. pH – as specified for 'natural soils and soil blends' 5.5 – 7.5 (pH 1:5 in water).

v. Electrical Conductivity (EC) – as specified for 'natural soils and soil blends' <1.2 dS/m.

Optional testing:

vi. Dispersibility – this should be carried out where it is suspected that the soil may be susceptible to structural collapse. If in doubt, then this testing should be undertaken.

Potential filter media should generally be assessed by a horticulturalist to ensure that they are capable of supporting a healthy vegetation community. This assessment should take into

consideration delivery of nutrients to the system by stormwater. Any component or soil found to contain high levels of salt (as determined by EC measurements), high levels of clay or silt particles (exceeding the particle size limits set above), or any other extremes which may be considered retardant to plant growth should be rejected.

3 ENGINEERED FILTER MEDIA

Where there is not a locally available soil-based material that complies with the properties outlined in Sections 2.1 - 2.3, it is possible to construct an appropriate filter medium. A washed, well-graded sand with an appropriate hydraulic conductivity should be used as the filter medium. Suitable materials include those used for the construction of turf profiles (e.g. golf greens); these materials are processed by washing to remove clay and silt fractions. In large quantities (>20 m^3), they can be obtained directly from sand suppliers, while smaller quantities can be purchased from local garden yards. The **top 100 mm of the filter medium** should then be ameliorated with appropriate organic matter, fertiliser and trace elements (Table 1). This amelioration is required to aid plant establishment and is designed to last four weeks; the rationale being that, beyond this point, the plants receive adequate nutrients via incoming stormwater.

Table 1. Recipe for ameliorating the top 100 mm of sand filter media

Constituent	Quantity (kg/100 m^2 filter area)
Granulated poultry manure fines	50
Superphosphate	2
Magnesium sulphate	3
Potassium sulphate	2
Trace Element Mix	1
Fertilizer NPK (16.4.14)	4
Lime	20

Laboratory testing has shown that biofilters that contain an engineered filter medium will achieve essentially the same hydraulic and treatment performance as those containing a soil-based filter medium (Bratieres *et al.*, 2009). However, it is recommended that a submerged zone be included in biofiltration systems that utilise such a free draining filter medium to provide a water source for vegetation between rainfall events.

4 TRANSITION LAYER

The transition layer prevents filter media from washing into the drainage layer. Transition layer material shall be a clean, well-graded sand material containing <2% fines. To avoid migration of the filter media into the transition layer, the particle size distribution of the sand should be assessed to ensure it meets 'bridging criteria', that is, the smallest 15% of the sand particles bridge with the largest 15% of the filter media particles (Water by Design, 2009; VicRoads, 2004):

D_{15} (transition layer) $\leq 5 \times D_{85}$ (filter media)

where: D_{15} (transition layer) is the 15th percentile particle size in the transition layer material (i.e., 15% of the sand is smaller than D_{15} mm), and

D_{85} (filter media) is the 85th percentile particle size in the filter media.

A dual-transition layer, where a fine sand overlays a medium-coarse sand, is also possible. While it is acknowledged that this can increase the complexity of the construction process, testing indicates that a dual-transition layer produces consistently lower levels of turbidity and concentrations of suspended solids in treated outflows than a single transition layer. Therefore, it is recommended that this design be specified for stormwater harvesting applications (to enable effective post-treatment disinfection) and where minimising the risk of washout during the establishment period is of particular importance.

The transition layer can be omitted from a biofiltration system provided the filter media and drainage layer meet the following criteria as defined by the Victorian Roads *Drainage of Subsurface Water from Roads - Technical Bulletin No 32* (VicRoads, 2004):

D_{15} (drainage layer) $\leq 5 \times D_{85}$ (filter media)

D_{15} (drainage layer) = 5 to 20 x D_{15} (filter media)

D_{50} (drainage layer < 25 x D_{50} (filter media)

D_{60} (drainage layer) < 20 x D_{10} (drainage layer)

These comparisons are best made by plotting the particle size distributions for the filter media and gravel on the same soil grading graphs and extracting the relevant diameters (Water by Design, 2009).

5 DRAINAGE LAYER

The drainage layer collects treated water at the bottom of the system and converys it to the underdrain pipes. Drainage layer material is to be clean, fine gravel, such as a 2 – 5 mm washed screenings. Bridging criteria should be applied to avoid migration of the transition layer into the drainage layer (Water by Design, 2009; VicRoads, 2004):

D_{15} (drainage layer) $\leq 5 \times D_{85}$ (transition layer)

where: D_{15} (drainage layer) is the 15th percentile particle size in the drainage layer material (i.e., 15% of the gravel is smaller than D_{15} mm), and
D_{85} (transition layer) is the 85th percentile particle size in the transition layer material.

Note: The perforations in the underdrain pipes should be small enough that the drainage layer cannot fall into the pipes. A useful guide is to check to that the D_{85} (drainage layer) is greater than the pipe perforation diameter.

Geotextile fabrics are **not recommended** for use in biofiltration systems due to the risk of clogging. An open-weave shade cloth can be placed between the transition layer and the drainage layer to help reduce the downward migration of smaller particles if required, however this should only be adopted where there is insufficient depth for transition and drainage layers.

6 INSTALLATION

It is recommended that filter media be lightly compacted during installation to prevent migration of fine particles. In small systems, a single pass with a vibrating plate should be used to compact the filter media, while in large systems, a single pass with roller machinery (e.g. a drum lawn roller) should be performed. Under no circumstance should heavy compaction or multiple-passes be made. Filter media should be installed in two lifts unless the depth is less than 500 mm.

7 FIELD TESTING

It is recommended that field testing of hydraulic conductivity be carried out at least twice: 1. one month following commencement of operation, and 2. in the second year of operation to assess the impact of vegetation on hydraulic conductivity.

The hydraulic conductivity of the filter media should be checked at a minimum of three points within the system. The single ring, constant head infiltration test method (shallow test), as described by Le Coustumer *et al.* (2007), should be used. Given the inherent variability in hydraulic conductivity testing and the heterogeneity of the filter media, the laboratory and field results are considered comparable if they are within 50% of each other. However, even if they differ by more than 50%, the system will still function if both the field and laboratory results are within the relevant recommended range of hydraulic conductivities.

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APPENDIX A

Figure A.1 illustrates the change in hydraulic conductivity during the establishment phase of a Melbourne biofiltration system containing a sandy loam filter media. The hydraulic conductivity initially declines as the filter media is compacted under hydraulic loading, but recovers back to the design value (as indicated by the dashed horizontal line) as plant growth and increased rooting depth counters the effects of compaction and clogging.

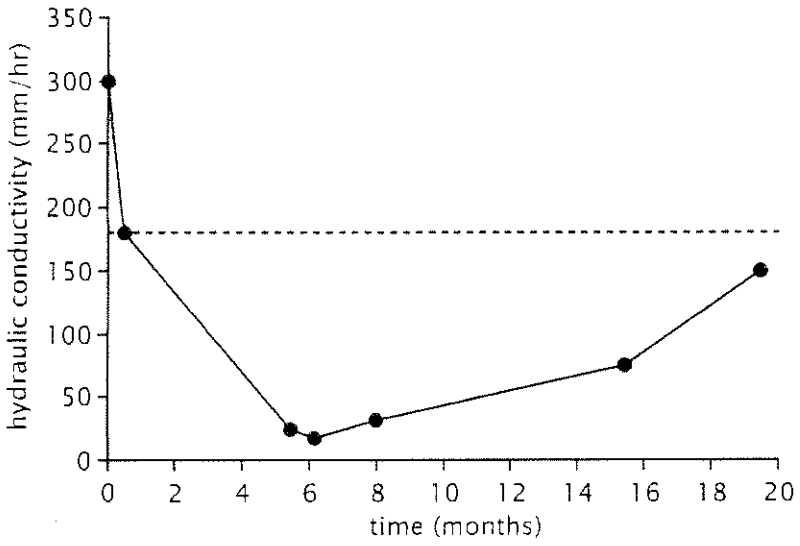

Figure A.1 Evolution of hydraulic conductivity during the first 20 months of a biofiltration system (after Hatt *et al.*, 2009)

CONDITION ASSESSMENT AND PERFORMANCE EVALUATION OF BIOFILTRATION SYSTEMS

PRACTICE NOTE 1: *In Situ* Measurement of Hydraulic Conductivity

Belinda Hatt, Sebastien Le Coustumer

June 2009

The Facility for Advancing Water Biofiltration (FAWB) aims to deliver its research findings in a variety of forms in order to facilitate widespread and successful implementation of biofiltration technologies. This Practice Note for *In Situ* Measurement of Hydraulic Conductivity is the first in a series of Practice Notes being developed to assist practitioners with the assessment of construction and operation of biofiltration systems.

Disclaimer: Information contained in this Practice Note is believed to be correct at the time of publication, however neither the Facility for Advancing Water Bioifltration nor its industry partners accept liability for any loss or damage resulting from its use.

1. SCOPE OF THE DOCUMENT

This Practice Note for *In Situ* Measurement of Hydraulic Conductivity is designed to complement FAWB's Guidelines for Filter Media in Biofiltration Systems, Version 3.01 (visit http://www.monash.edu.au/fawb/publications/index.html for a copy of these guidelines). However, the recommendations contained within this document are more widely applicable to assessing the hydraulic conductivity of filter media in existing biofiltration systems.

For new systems, this Practice Note ***does not*** remove the need to conduct laboratory testing of filter media prior to installation.

2. DETERMINATION OF HYDRAULIC CONDUCTIVITY

The recommended method for determining *in situ* hydraulic conductivity uses a single ring infiltrometer under constant head. The single ring infiltrometer consists of a small plastic or metal ring that is driven 50 mm into the filter media. It is a constant head test that is conducted for two different pressure heads (50 mm and 150 mm). The head is kept constant during all the experiments by pouring water into the ring. The frequency of readings of the volume poured depends on the filter media, but typically varies from 30 seconds to 5 minutes. The experiment is stopped when the infiltration rate is considered steady (i.e., when the volume poured per time interval remains constant for at least 30 minutes). This method has been used extensively (eg. Reynolds and Elrick, 1990; Youngs *et al.*, 1993).

Note: This method measures the hydraulic conductivity at the surface of the filter media. In most cases, it is this top layer which controls the hydraulic conductivity of the system as a whole (i.e., the underlying drainage layer has a flow capacity several orders of magnitude higher than the filter media), as it is this layer where fine sediment will generally be deposited to form a "clogging layer". However this shallow test would not be appropriate for systems where the controlling layer is not

the surface layer (eg. where migration of fine material down through the filter media has caused clogging within the media). In this case, a 'deep ring' method is required; for further information on this method, see Le Coustumer *et al.* (2008).

2.1 Selection of monitoring points

For biofiltration systems with a surface area less than 50 m^2, *in situ* hydraulic conductivity testing should be conducted at three points that are spatially distributed (Figure 1). For systems with a surface area greater than 50 m^2,an extra monitoring point should be added for every additional 100 m^2. It is ***essential*** that the monitoring point is flat and level. Vegetation should not be included in monitoring points.

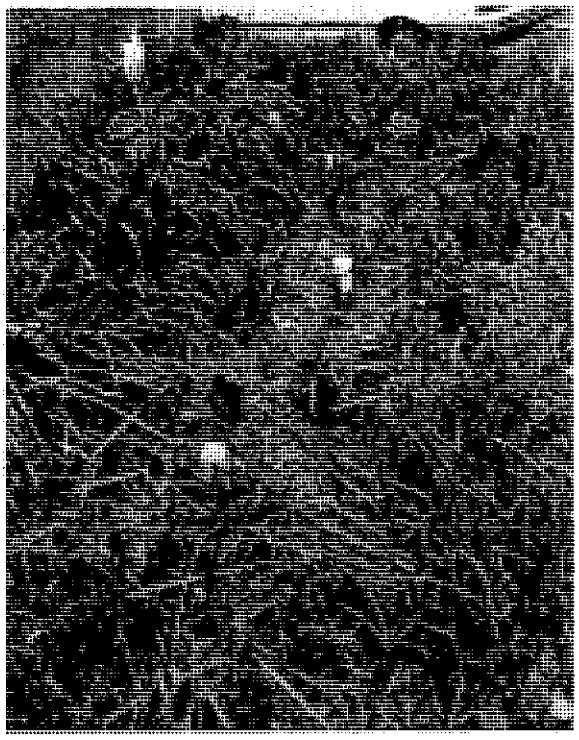

Figure 1. Spatially distributed monitoring points.

2.2 Apparatus

The following is required:

- 100 mm diameter PVC rings with a height of at least 220 mm – the bottom edge of the ring should be bevelled and the inside of the ring should be marked to indicate 50 mm and 150 mm above the filter media surface (Figure 2)
- 40 L water
- 100 mL, 250 mL and 1000 mL measuring cylinders
- Stopwatch
- Thermometer
- Measuring tape
- Spirit level

- Hammer
- Block of wood, approximately 200 x 200 mm

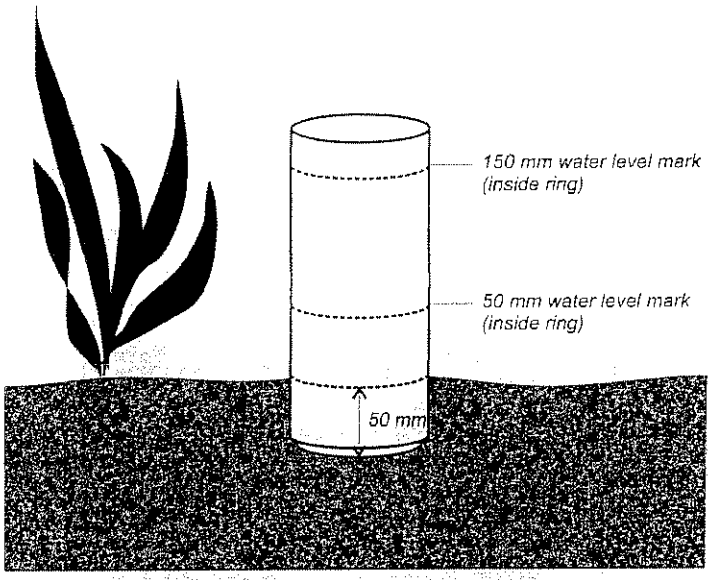

Figure 2. Diagram of single ring infiltrometer.

2.3 Procedure

a. Carefully scrape away any surface covering (eg. mulch, gravel, leaves) ***without disturbing*** the soil filter media surface (Figure 3b).

b. Place the ring on the surface of the soil (Figure 3c), and then place the block of wood on top of the ring. Gently tap with the hammer to drive the ring 50 mm into the filter media (Figure 3d). Use the spirit level to check that the ring is level.

   Note: It is ***essential*** that this the ring is driven in slowly and carefully to minimise disturbance of the filter media profile.

c. Record the initial water temperature.

d. Fill the 1000 mL measuring cylinder.

e. Using a different pouring apparatus, slowly fill the ring to a ponding depth of 50 mm, taking care to minimise disturbance of the soil surface (Figure 3f). Start the stopwatch when the water level reaches 50 mm.

f. Using the 1000 mL measuring cylinder, maintain the water level at 50 mm (Figure 3g). After 30 seconds, record the volume poured.

g. Maintain the water level at 50 mm, recording the time interval and volume required to do so.

   Note: The time interval between recordings will be determined by the infiltration capacity of the filter media. For fast draining media, the time interval should not be greater than one minute however, for slow draining media, the time between recordings may be up to five minutes.

Note: The smallest measuring cylinder that can pour the volume required to maintain a constant water level for the measured time interval should be used for greater accuracy. For example, if the volume poured over one minute is 750 mL, then the 1000 mL measuring cylinder should be used. Similarly, if the volume poured is 50 mL, then the 100 mL measuring cylinder should be used.

h. Continue to repeat Step f until the infiltration rate is steady i.e., the volume poured per time interval remains constant for at least 30 minutes.

i. Fill the ring to a ponding depth of 150 mm (Figure 3h). Restart the stopwatch. Repeat steps e – g for this ponding depth.

Note: Since the filter media is already saturated, the time required to reach steady infiltration should be less than for the first ponding depth.

j. Record the final water temperature.

k. Enter the temperature, time, and volume data into a calculation spreadsheet (see "Practice Note 1_Single Ring Infiltration Test_Example Calculations.xls", available at www.monash.edu.au/fawb/publications/index.html, as an example).

2.4 Calculations

In order to calculate K_{fs} a 'Gardner's' behaviour for the soil should be assumed (Gardner, 1958 in Youngs *et al.*, 1993):

$$K(h) = K_{fs} e^{\alpha h} \qquad \text{Eqn. 1}$$

where K is the hydraulic conductivity, α is a soil pore structure parameter (large for sands and small for clay), and h is the negative pressure head. K_{fs} is then found using the following analytical expression (for a steady flow) (Reynolds and Elrick, 1990):

$$K_{fs} = \frac{G}{a}\left(\frac{Q_2 - Q_1}{H_2 - H_1}\right) \qquad \text{Eqn. 2}$$

where a is the ring radius, H_1 and H_2 are the first (50 mm) and second (150 mm) pressure heads, respectively, Q_1 and Q_2 are the steady flows for the first and second pressure heads, respectively, and G is a shape factor estimated as:

$$G = 0.316\frac{d}{a} + 0.184 \qquad \text{Eqn. 3}$$

where d is the depth of insertion of the ring and a is the ring radius.

G is nearly independent of soil hydraulic conductivity (i.e., K_{fs} and α) and ponding, if the ponding is greater than 50 mm.

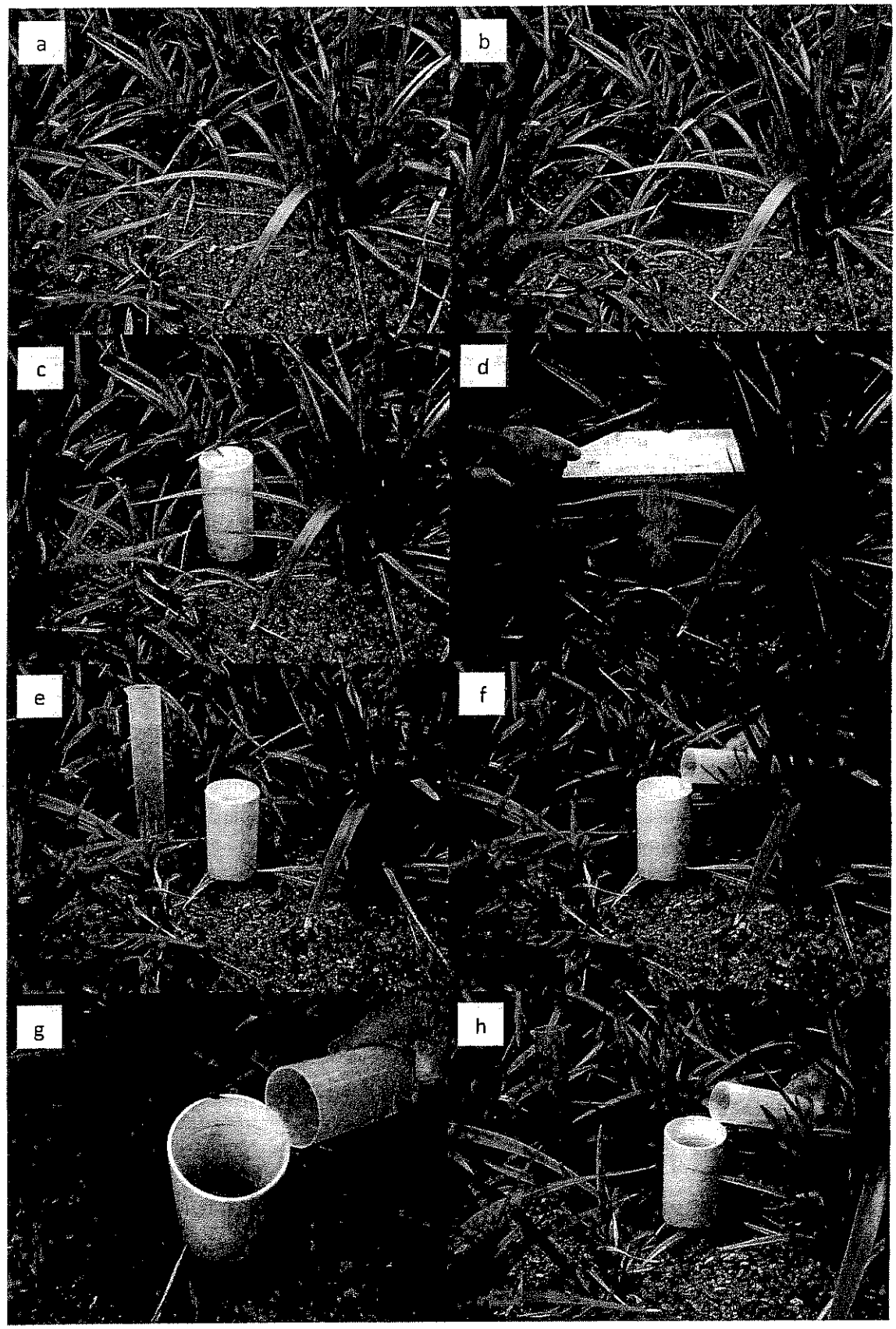

Figure 3. Measuring hydraulic conductivity.

The possible limitations of the test are (Reynolds *et al.*, 2000): (1) the relatively small sample size due to the size of the ring, (2) soil disturbance during installation of the ring (compaction of the soil), and (3) possible edge flow during the experiments.

3 INTERPRETATION OF RESULTS

This test method has been shown to be relatively comparable to laboratory test methods (Le Coustumer *et al.*, 2008), taking into account the inherent variability in hydraulic conductivity testing and the heterogeneity of natural soil-based filter media. While correlation between the two test methods is low, results are not statistically different. In light of this, laboratory and field results are deemed comparable if they are within 50% of each other. In the same way, replicate field results are considered comparable if they differ by less than 50%. Where this is not the case, this is likely to be due to a localised inconsistency in the filter media, therefore additional measurements should be conducted at different monitoring points until comparable results are achieved. If this is not achieved, then an area-weighted average value may need to be calculated.

4 MONITORING FREQUENCY

Field testing of hydraulic conductivity should be carried out at least twice: (1) One month following commencement of operation, and (2) In the second year of operation to assess the impact of vegetation on hydraulic conductivity. Following this, hydraulic conductivity testing should be conducted every two years or when there has been a significant change in catchment characteristics (eg. construction without appropriate sediment control).

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Single Ring Infiltration Test

Site: ______________________________

Date: ______________________________

Constant water level = 50 mm		
Time (min)	Volume (mL)	Q (mL/s)

Constant water level = 150 mm		
Time (min)	Volume (mL)	Q (mL/s)

Annex D

Individual Lot SWMS Operational Phase Design Charts

Annex D.1

How to use the Operational Phase Design Charts – Worked Example

Individual Industrial Lot Stormwater Quality Analysis
For a Typical 1 Hectare Industrial Lot

Cardno Lawson Treloar

Case	Roof Area (%)	Impervious Ground Area (%)	Max. Impervious Ground Area Untreated (%)	Roof Bio Size (m^2)	Roof Area Buffer Size (m^2)	Impervious Ground Bio size (m^2)	Impervious Ground Area Buffer Size (m^2)	Total Bio-Retention Area (m^2)	Total Buffer Area (m^2)	Total SQID Area (m^2)	Impervious Ground Area Untreated (m^2)
1	80	20	14	160	13.92	34.4	3.48	194.4	17.4	211.8	280
2	75	25	10	150	13.05	45	4.35	195	17.4	212.4	250
3	70	30	6	140	12.18	56.4	5.22	196.4	17.4	213.8	180
4	65	35	5	130	11.31	66.5	6.09	196.5	17.4	213.9	175
5	60	40	4	120	10.44	76.8	6.96	196.8	17.4	214.2	160
6	55	45	3	110	9.57	87.3	7.83	197.3	17.4	214.7	135
7	50	50	3	100	8.7	97	8.7	197	17.4	214.4	150

Lot Size = 1.00 ha
Bio-Retention Area = 2.0 % of Upstream Area
Buffer Pre-treatment = 0.3 % of Upstream Impervious Area

Notes:
Analysis Conducted for a Typical 1 hectare Industrial lot
To determine the required size of the bio-retention and vegetated buffer for a different lot size, factor the values determined from the Graphs by the actual lot size (in hectares)
All buildings on the lot are to have rainwater tanks installed in accordance with the Queensland Development Code Part MP 4.3
All bio-retention systems are to have a filter area equal to 2% of the total upstream catchment area
All vegeteated buffers are to be sized at 0.3% of the upstream impervious area

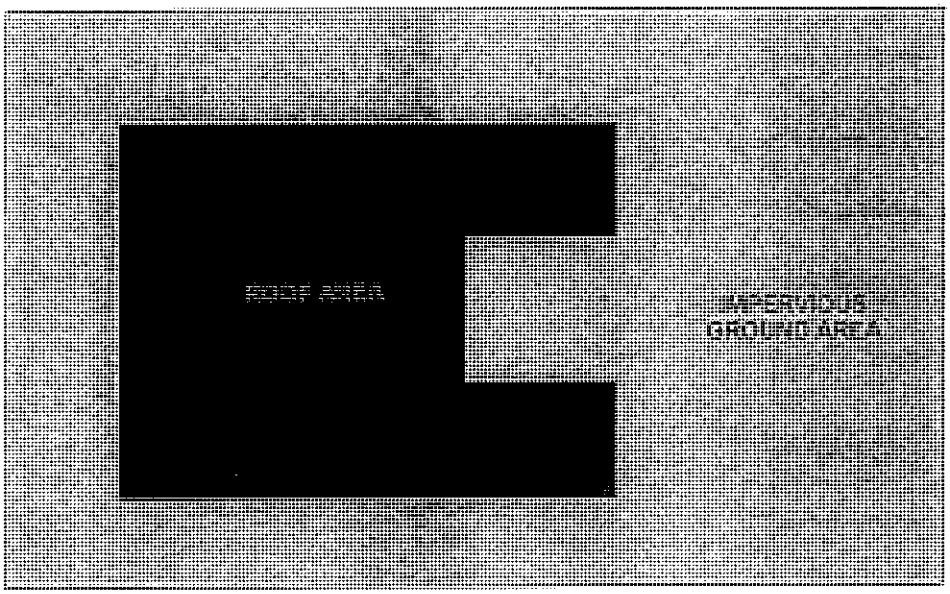
Notes for Charts 1, 2, 3, 1A, 2A and 3A:
Charts 1, 1A presents the maximum allowable lot area that can go without treatment (Lot still meets the Water Quality Objectives)
Charts 2, 2A presents the minimum bio-retention filter media surface area required to meet the Water Quality Objectives
Charts 3, 3A presents the minimum area of the Stormwater Quality Improvement Devices (bio-retention filter media surface area and vegetated buffer area) required to meet the Water Quality Objectives

Chartss 1, 2 and 3 present the data with respect to the percentage of the lot area denoted as "Impervious Ground"
Charts 1A, 2A and 3A present the data with respect to the percentage of the lot area denoted as "Roof"

Individual Industrial Lots
Stormwater Improvement Device Design Charts

How To Use:

Given any Industrial Lot within the Citiswich Development that meets the following requirements:
- The lot land use is considered industrial as detailed in the GCCC MUSIC modelling guidelines; and
- The roof area to impervious ground area is between 80% roof, 20% impervious ground and 50% roof, 50% impervious grour



In this Example:

Total Lot Area = 2.50 ha
Impervious Ground Area = 1.10 ha
Roof Area = 1.40 ha

Calculate the Percent of the Lot Area used as Roof Area

$$\% Roof = \frac{Roof\ Area}{Total\ Area} \times 100$$

% Roof = 56 %

% Impervious Ground = 44 %

The Design Charts Can be used where
- % Roof Area is between 50-80%
- % Impervious Ground Area is between 20-50%

There are 3 methods for determining the area of treatment required and the area of the site that can remain untreated

1) Use Charts 1, 2 and 3
2) Use Charts 1A, 2A and 3A
3) Use Design Table

nd

Individual Industrial Lots
Stormwater Improvement Device Design Charts

How To Use:

Method 1) Charts 1, 2 and 3.

Charts 1, 2 and 3 require the area of the lot used as Impervious Ground as a percent of the total area.

Chart 1
Read off Chart 1 the Carpark % Area
% Impervious Ground = 44 %

$150m^2$ of the Lot can be untreated
NB This is for a Typical 1ha Lot

For a 2.5ha lot:

Total Untreated Area = $150m^2 \times 2.5$
$= 375m^2$

Chart 2
Read off Chart 2 the Impervious Ground % Area
% Impervious Ground = 44 %

$197.1m^2$ minimum bio-retention area required
NB This is for a Typical 1ha Lot

For a 2.5ha lot:

Total Bio-Retention Area = $197.1m^2 \times 2.5$
$= 493m^2$

Chart 3
Read off Chart 3 the Impervious Ground % Area
% Impervious Ground = 44 %

$214.4m^2$ minimum bio-retention area and vegetated buffer area required
NB This is for a Typical 1ha Lot

For a 2.5ha lot:

Total SQID Area = $214.4m^2 \times 2.5$
$= 536m^2$

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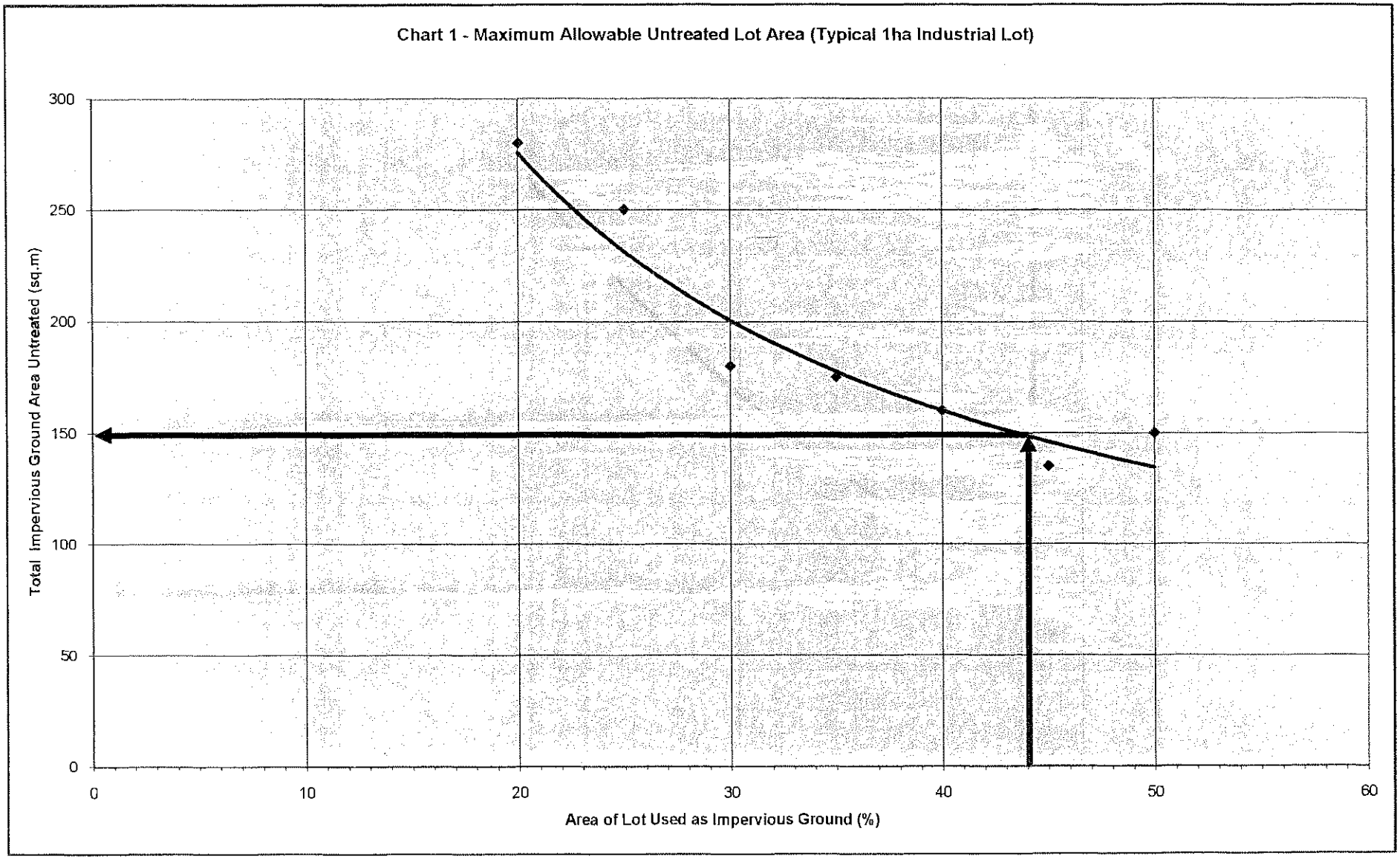

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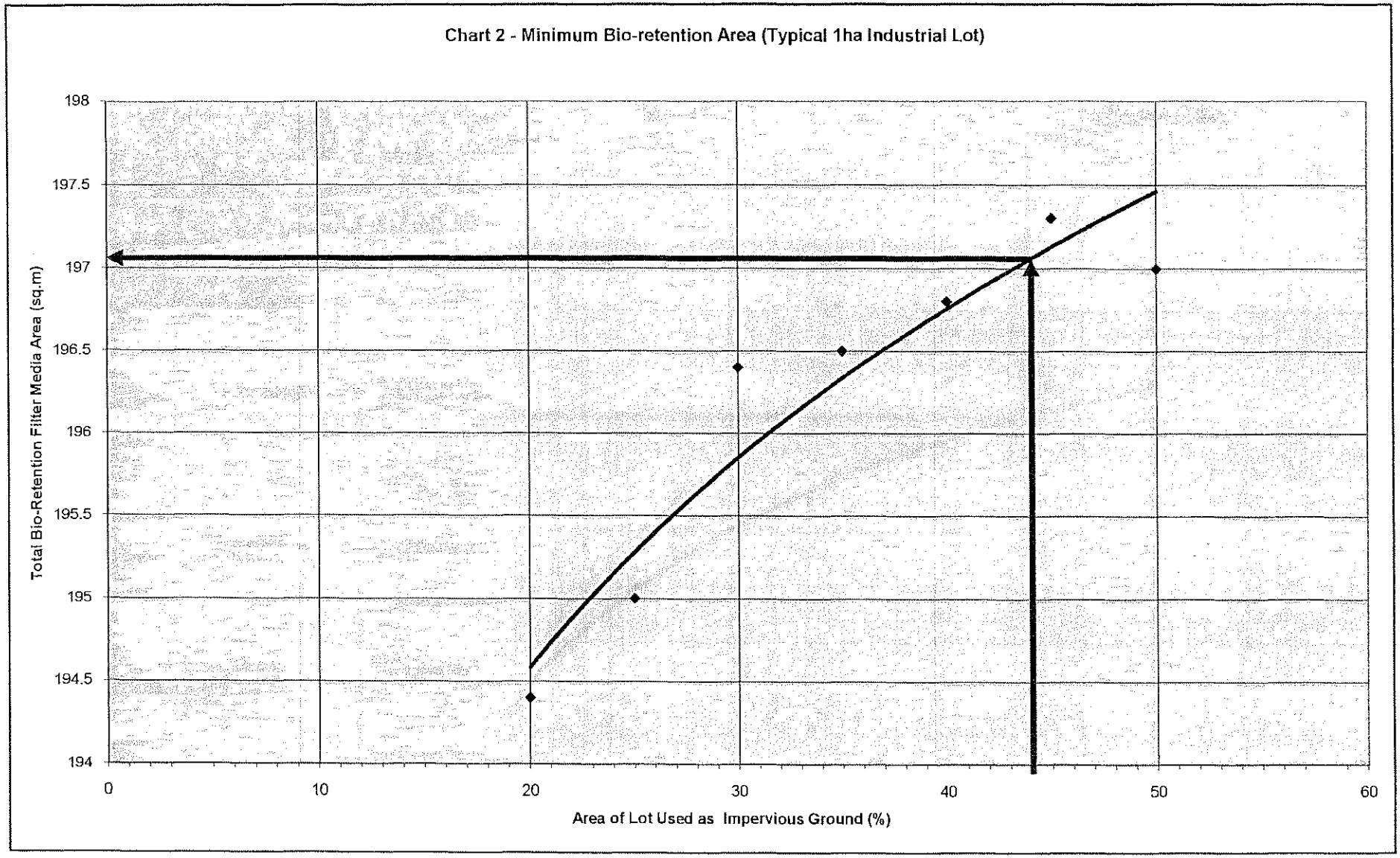

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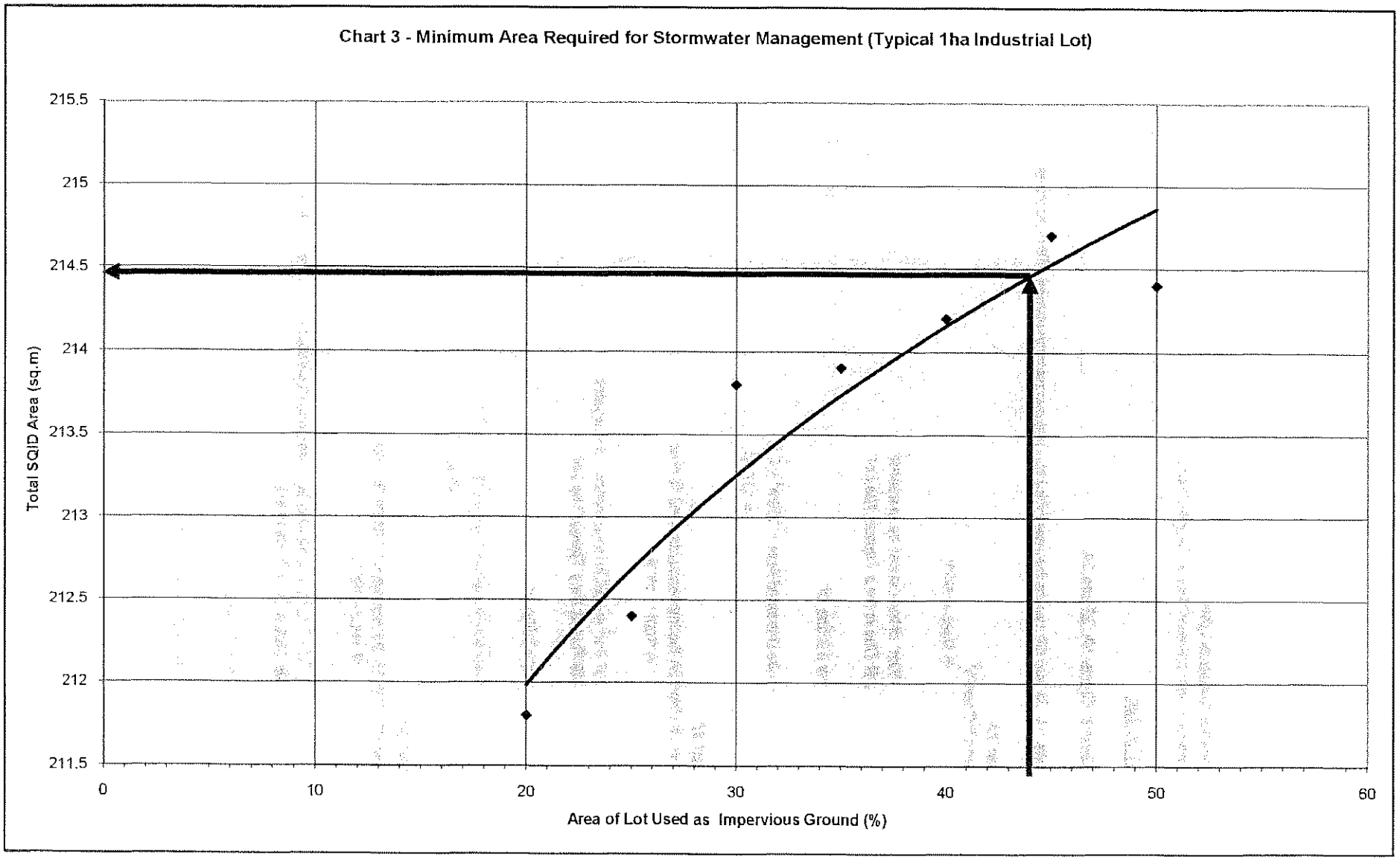

Individual Industrial Lots
Stormwater Improvement Device Design Charts

How To Use:

Method 2) Charts 1A, 2A and 3A.

Charts 1A, 2A and 3A require the area of the lot used es roof as a percent of the total area.

Chart 1A
Read off Chart 1A
% Roof = 56 %

$150m^2$ of the Lot can be untreated
NB This is for a Typical 1ha Lot

For a 2.5ha lot:

Total Untreated Area = $150m^2$ x 2.5
= $375m^2$

Chart 2A
Read off Chart 2A the Impervious Ground % Area
% Roof = 56 %

$197.0m^2$ minimum bio-retention area required
NB This is for a Typical 1ha Lot

For a 2.5ha lot:

Total Bio-Retention Area = $197.0m^2$ x 2.5
= $493m^2$

Chart 3A
Read off Chart 3A the Impervious Ground % Area
% Roof = 56 %

$214.3m^2$ minimum bio-retention area and vegetated buffer area required
NB This is for a Typical 1ha Lot

For a 2.5ha lot:

Total SQID Area = $214.3m^2$ x 2.5
= $536m^2$

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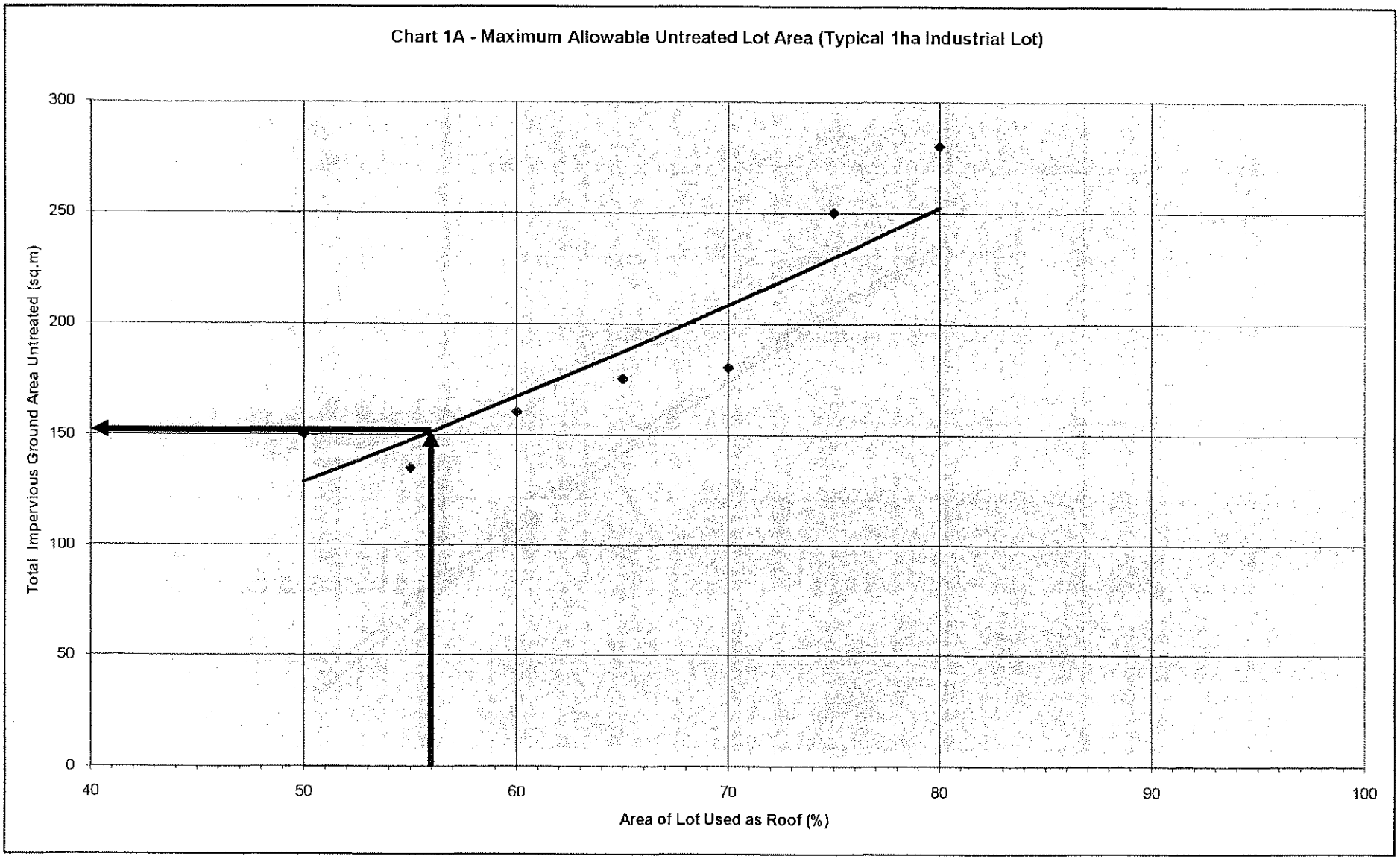

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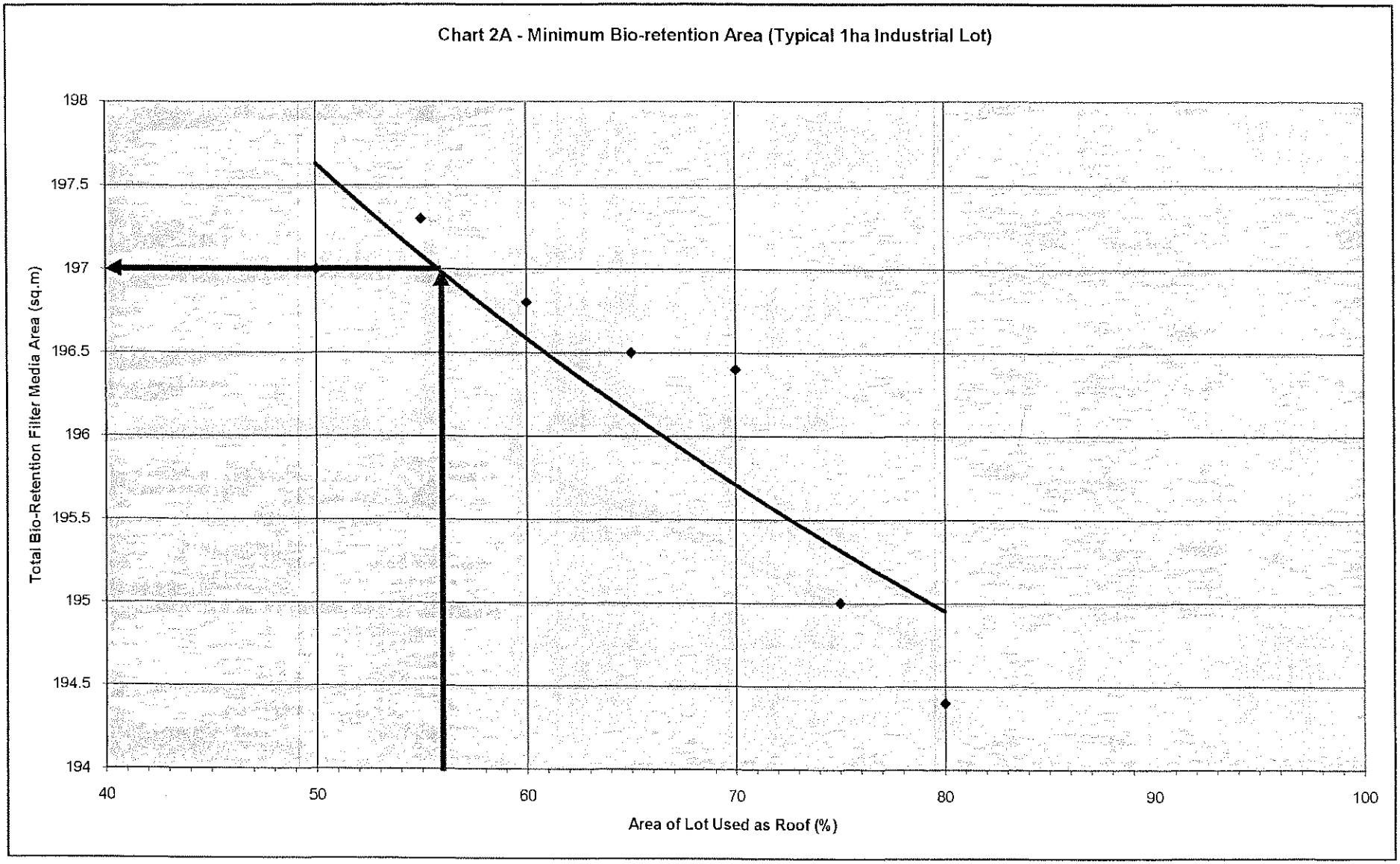

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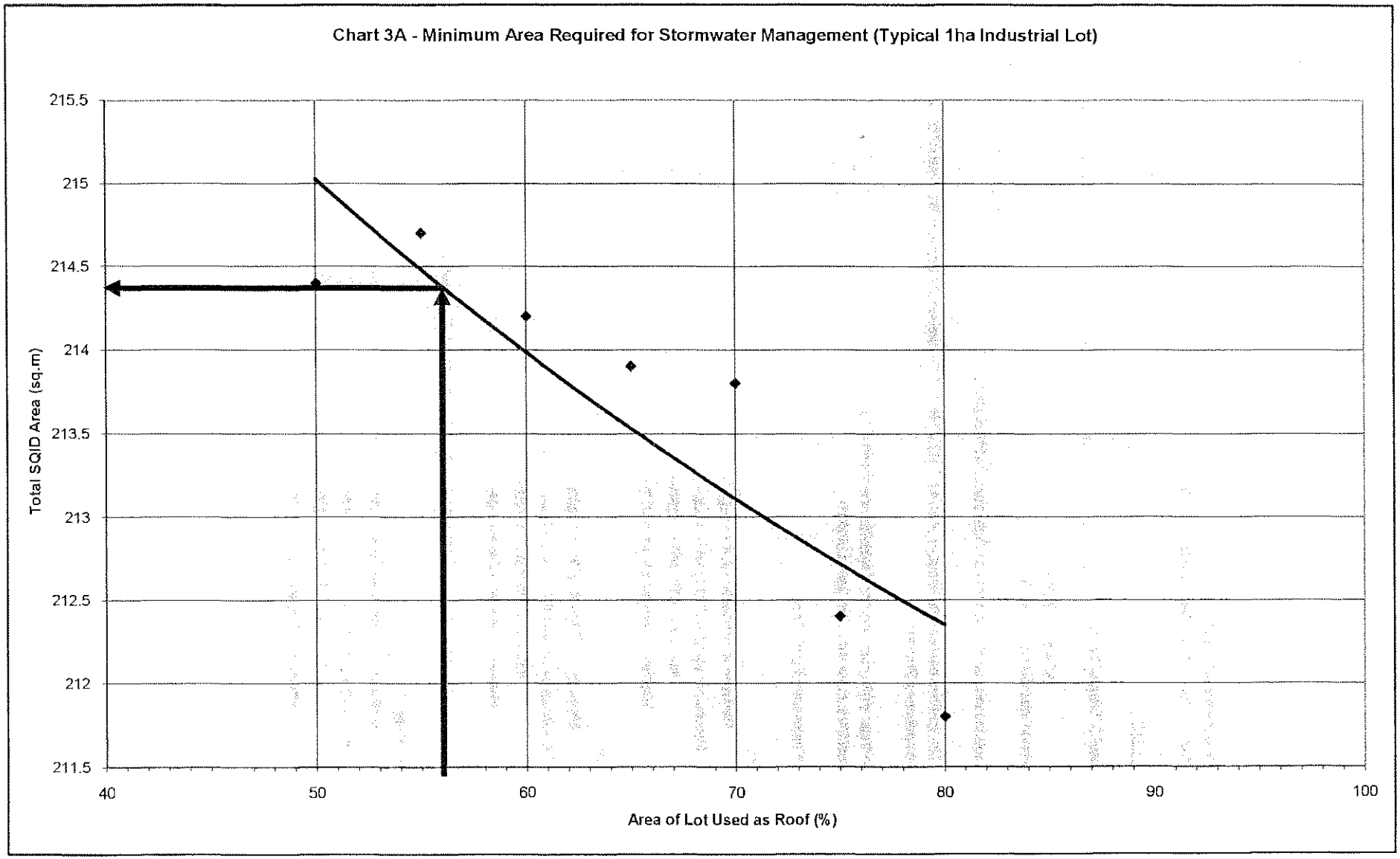

Individual Industrial Lots
Stormwater Improvement Device Design Charts

How To Use:

Method 3) Design Table.

% Roof = 56 %
% Impervious Ground = 44 %

Will need to look up the Cases (1 to 7) that the Lot falls betweer

e.g. The lot Falls between the Ranges of Case 5 (60% Roof, 40% Impervious Ground) and Case 6 (55% Roof, 45% Impervious Ground)

Read Values off values from the Table from the 2.5ha Row
Intersect the 2.5ha Row with Cases 5 and 6.

Read Values from Both Cases

Case 5

Minimum Bio-Retention Area = 492m^2
Minimum Vegetated Buffer Area = 44m^2
Minimum SQID Area = 536m^2
Maximum Untreated Area = 400m^2

Case 6

Minimum Bio-Retention Area = 493m^2
Minimum Vegetated Buffer Area = 44m^2
Minimum SQID Area = 537m^2
Maximum Untreated Area = 338m^2

Adopt the Case that has the Largest Treatment areas, and Smallest Untreated Area

Adopt Case 6

Minimum Bio-Retention Area = 493m^2
Minimum Vegetated Buffer Area = 44m^2
Minimum SQID Area = 537m^2
Maximum Untreated Area = 338m^2

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Design Table: Industrial Lot Stormwater Quality Improvement Device Minimum Requirements

Industrial Lot Area (ha)	Industrial Lot Area (m^2)	Case 1				Case 2				Case 3				Case 4			
		80% Roof, 20% Impervious Ground				75% Roof, 25% Impervious Ground				70% Roof, 30% Impervious Ground				65% Roof, 35% Impervious Ground			
		Minimum Bio-retention Filter Media Area (m^2)	Minimum Vegetated Buffer Area Area (m^2)	Minimum SQID Area (m^2)	Maximim Allowable Untreated Impervious Ground Area (m^2)	Minimum Bio-retention Filter Media Area (m^2)	Minimum Vegetated Buffer Area Area (m^2)	Minimum SQID Area (m^2)	Maximim Allowable Untreated Impervious Ground Area (m^2)	Minimum Bio-retention Filter Media Area (m^2)	Minimum Vegetated Buffer Area Area (m^2)	Minimum SQID Area (m^2)	Maximim Allowable Untreated Impervious Ground Area (m^2)	Minimum Bio-retention Filter Media Area (m^2)	Minimum Vegetated Buffer Area Area (m^2)	Minimum SQID Area (m^2)	Maximim Allowable Untreated Impervious Ground Area (m^2)
0.10	1000	19	2	21	26	20	2	21	25	20	2	21	18	20	2	21	18
0.20	2000	39	3	42	56	39	3	42	50	39	3	43	36	39	3	43	35
0.25	2500	49	4	53	70	49	4	53	63	49	4	53	45	49	4	53	44
0.30	3000	59	5	64	84	59	5	64	75	59	5	64	54	59	5	64	53
0.50	5000	97	9	106	140	98	9	106	125	98	9	107	90	98	9	107	88
0.50	5000	97	9	106	140	98	9	106	125	98	9	107	90	98	9	107	88
0.60	6000	117	10	127	169	117	10	127	150	118	10	128	108	118	10	128	105
0.70	7000	136	12	148	196	137	12	149	175	137	12	150	126	138	12	150	123
0.75	7500	146	13	159	210	146	13	159	188	147	13	160	135	147	13	160	131
0.80	8000	156	14	169	224	156	14	170	200	157	14	171	144	157	14	171	140
0.90	9000	175	16	191	252	176	16	191	225	177	16	192	162	177	16	193	158
1.00	10000	194	17	212	280	195	17	212	250	196	17	214	180	197	17	214	175
1.25	12500	243	22	265	350	244	22	266	313	246	22	267	225	246	22	267	219
1.50	15000	292	26	318	420	293	26	319	375	295	26	321	270	295	26	321	263
1.75	17500	340	30	371	490	341	30	372	438	344	30	374	315	344	30	374	306
2.00	20000	389	35	424	560	390	35	425	500	393	35	428	360	393	35	428	350
2.25	22500	437	39	477	630	439	39	478	563	442	39	481	405	442	39	481	394
2.50	25000	486	44	530	700	488	44	531	625	491	44	535	450	491	44	535	438
2.75	27500	535	48	582	770	536	48	584	688	540	48	588	495	540	48	588	481
3.00	30000	583	52	635	840	585	52	637	750	589	52	641	540	590	52	642	525
3.50	35000	680	61	741	980	683	61	743	875	687	61	748	630	688	61	749	613
4.00	40000	778	70	847	1120	780	70	850	1000	786	70	855	720	786	70	856	700
4.50	45000	875	78	953	1260	878	78	956	1125	884	78	962	810	884	78	963	788
5.00	50000	972	87	1059	1400	975	87	1062	1250	982	87	1069	900	983	87	1070	875
5.50	55000	1069	96	1165	1540	1073	96	1168	1375	1080	96	1176	990	1081	96	1178	963
6.00	60000	1166	104	1271	1680	1170	104	1274	1500	1178	104	1283	1080	1179	104	1283	1050
6.50	65000	1264	113	1377	1820	1268	113	1381	1625	1277	113	1390	1170	1277	113	1390	1138
7	70000	1361	122	1483	1960	1365	122	1487	1750	1375	122	1497	1260	1376	122	1497	1225
7.5	75000	1458	131	1588	2100	1463	131	1593	1875	1473	131	1604	1350	1474	131	1604	1313
8	80000	1555	139	1694	2240	1560	139	1699	2000	1571	139	1710	1440	1572	139	1711	1400
8.5	85000	1652	148	1800	2380	1658	148	1805	2125	1669	148	1817	1530	1670	148	1818	1488
9	90000	1750	157	1906	2520	1755	157	1912	2250	1768	157	1924	1620	1769	157	1925	1575
9.5	95000	1847	165	2012	2660	1853	165	2018	2375	1866	165	2031	1710	1867	165	2032	1663
10	100000	1944	174	2118	2800	1950	174	2124	2500	1964	174	2138	1800	1965	174	2139	1750

Industrial Lot Area (ha)	Industrial Lot Area (m^2)	Case 5				Case 6				Case 7			
		60% Roof, 40% Impervious Ground				55% Roof, 45% Impervious Ground				50% Roof, 50% Impervious Ground			
		Minimum Bio-retention Filter Media Area (m^2)	Minimum Vegetated Buffer Area Area (m^2)	Minimum SQID Area (m^2)	Maximim Allowable Untreated Impervious Ground Area (m^2)	Minimum Bio-retention Filter Media Area (m^2)	Minimum Vegetated Buffer Area Area (m^2)	Minimum SQID Area (m^2)	Maximim Allowable Untreated Impervious Ground Area (m^2)	Minimum Bio-retention Filter Media Area (m^2)	Minimum Vegetated Buffer Area Area (m^2)	Minimum SQID Area (m^2)	Maximim Allowable Untreated Impervious Ground Area (m^2)
0.10	1000	20	2	21	16	20	2	21	14	20	2	21	16
0.20	2000	39	3	43	32	39	3	43	27	39	3	43	30
0.25	2500	49	4	54	40	49	4	54	34	49	4	54	38
0.30	3000	59	5	64	48	59	5	64	41	59	5	64	45
0.50	5000	99	9	107	80	99	9	107	68	99	9	107	75
0.50	5000	99	9	107	80	99	9	107	68	99	9	107	75
0.60	6000	118	10	129	96	118	10	129	81	118	10	129	90
0.70	7000	138	12	150	112	138	12	150	95	138	12	150	105
0.75	7500	149	13	161	120	149	13	161	101	149	13	161	113
0.80	8000	159	14	171	128	158	14	172	108	159	14	172	120
0.90	9000	178	16	193	144	178	16	193	122	178	16	193	135
1.00	10000	197	17	214	160	197	17	215	135	197	17	214	150
1.25	12500	246	22	268	200	247	22	269	169	246	22	268	188
1.50	15000	295	26	321	240	296	26	322	203	296	26	322	225
1.75	17500	344	30	375	280	345	30	376	236	345	30	375	263
2.00	20000	394	35	429	320	395	35	429	270	394	35	429	300
2.25	22500	443	39	482	360	444	39	483	304	443	39	482	338
2.50	25000	492	44	536	400	493	44	537	338	493	44	536	375
2.75	27500	541	48	590	440	542	48	590	372	542	48	590	413
3.00	30000	590	52	643	480	592	52	644	405	591	52	643	450
3.50	35000	689	61	750	560	691	61	751	473	690	61	750	525
4.00	40000	787	70	857	640	789	70	859	540	789	70	858	600
4.50	45000	886	78	964	720	888	78	966	608	887	78	965	675
5.00	50000	984	87	1071	800	987	87	1074	675	986	87	1072	750
5.50	55000	1082	96	1178	880	1085	96	1181	743	1084	96	1179	825
6.00	60000	1181	104	1285	960	1184	104	1288	810	1182	104	1288	900
6.50	65000	1279	113	1392	1040	1282	113	1396	878	1281	113	1394	975
7	70000	1378	122	1499	1120	1381	122	1503	945	1379	122	1501	1050
7.5	75000	1476	131	1607	1200	1480	131	1610	1013	1478	131	1608	1125
8	80000	1574	139	1714	1280	1578	139	1718	1080	1576	139	1715	1200
8.5	85000	1673	148	1821	1360	1677	148	1825	1148	1675	148	1822	1275
9	90000	1771	157	1928	1440	1776	157	1932	1215	1773	157	1930	1350
9.5	95000	1870	165	2035	1520	1874	165	2040	1283	1872	165	2037	1425
10	100000	1968	174	2142	1600	1973	174	2147	1350	1970	174	2144	1500

Annex D.2

Individual Lot SWMS Operational Phase Design Charts

Individual Industrial Lot Stormwater Quality Analysis
For a Typical 1 Hectare Industrial Lot

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Case	Roof Area (%)	Impervious Ground Area (%)	Max. Impervious Ground Area Untreated (%)	Roof Bio Size (m^2)	Roof Area Buffer Size (m^2)	Impervious Ground Bio size (m^2)	Impervious Ground Area Buffer Size (m^2)	Total Bio-Retention Area (m^2)	Total Buffer Area (m^2)	Total SQID Area (m^2)	Impervious Ground Area Untreated (m^2)
1	80	20	14	160	13.92	34.4	3.48	194.4	17.4	211.8	280
2	75	25	10	150	13.05	45	4.35	195	17.4	212.4	250
3	70	30	6	140	12.18	56.4	5.22	196.4	17.4	213.8	180
4	65	35	5	130	11.31	66.4	6.09	196.4	17.4	213.8	180
5	60	40	4	120	10.44	76.8	6.96	196.8	17.4	214.2	160
6	55	45	3	110	9.57	87.2	7.83	197.2	17.4	214.6	140
7	50	50	3	100	8.7	97	8.7	197	17.4	214.4	150

Lot Size = 1.00 ha
Bio-Retention Area = 2.0 % of Upstream Area
Buffer Pre-treatment = 0.3 % of Upstream Impervious Area

Notes:
Analysis Conducted for a Typical 1 hectare Industrial lot
To determine the required size of the bio-retention and vegetated buffer for a different lot size, factor the values determined from the Graphs by the actual lot size (in hectares)
All buildings on the lot are to have rainwater tanks installed in accordance with the Queensland Development Code Part MP 4.3
All bio-retention systems are to have a filter area equal to 2% of the total upstream catchment area
All vegeteated buffers are to be sized at 0.3% of the upstream impervious area

Notes for Charts 1, 2, 3, 1A, 2A and 3A:
Charts 1, 1A presents the maximum allowable lot area that can go without treatment (Lot still meets the Water Quality Objectives)
Charts 2, 2A presents the minimum bio-retention filter media surface area required to meet the Water Quality Objectives
Charts 3, 3A presents the minimum area of the Stormwater Quaility Improvement Devices (bio-retention filter media surface area and vegetated buffer area) required to meet the Water Quality Objectives

Chartss 1, 2 and 3 present the data with respect to the percentage of the lot area denoted as "Impervious Ground"
Charts 1A, 2A and 3A present the data with respect to the percentage of the lot area denoted as "Roof"

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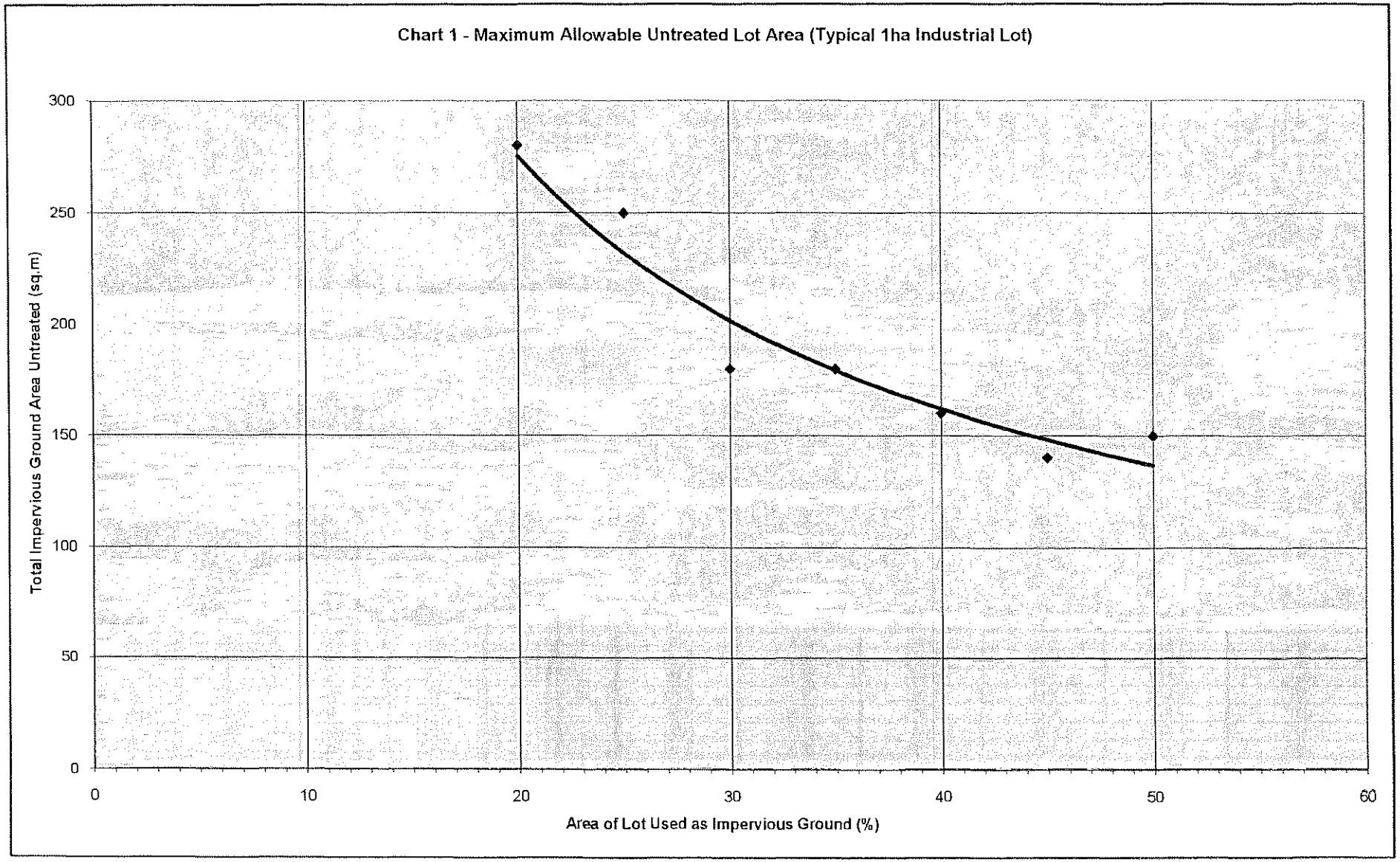

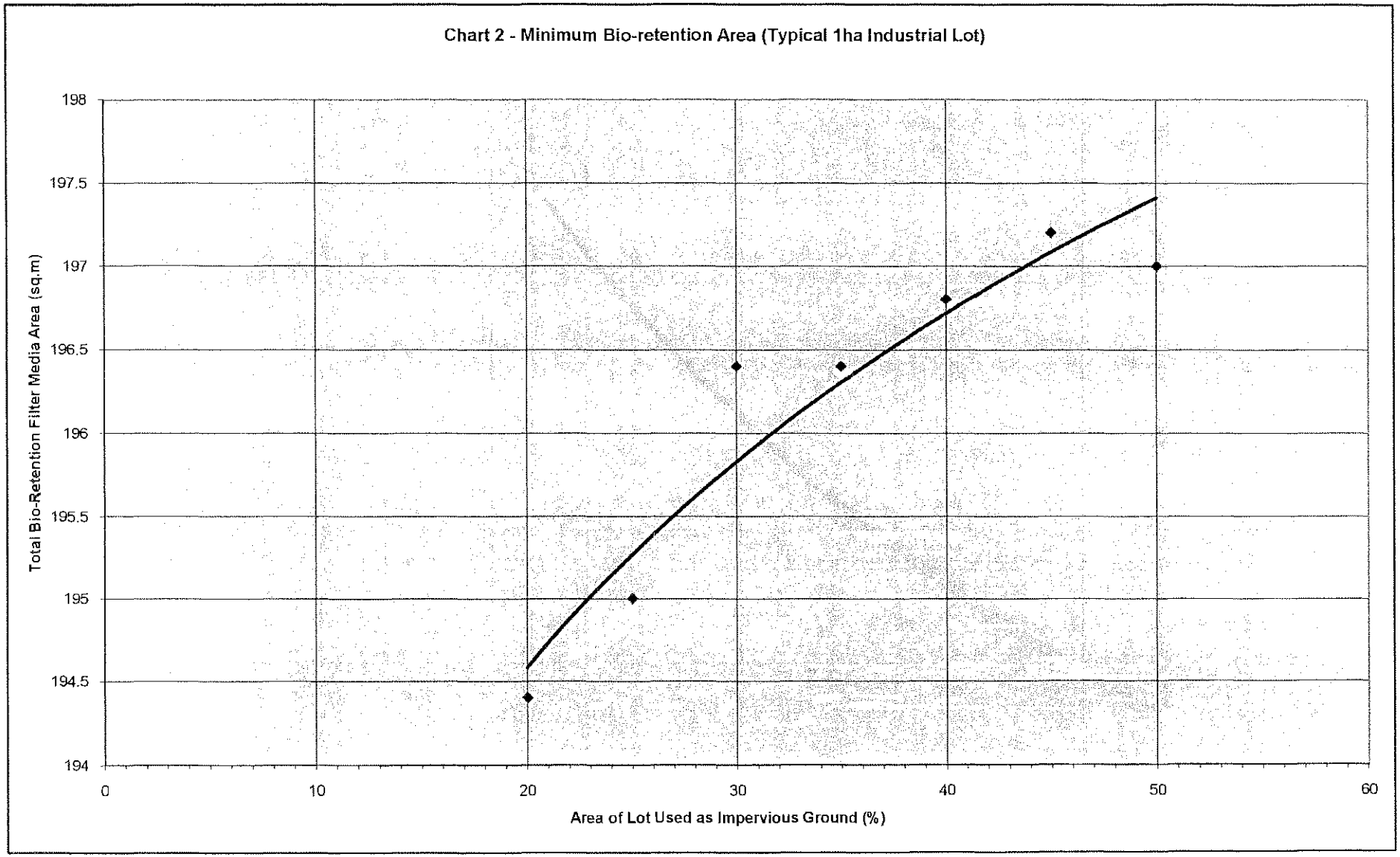
Chart 2 - Minimum Bio-retention Area (Typical 1ha Industrial Lot)
Total Bio-Retention Filter Media Area (sq.m)
198
197.5
197
196.5
196
195.5
195
194.5
194
0
10
20
30
40
50
60
Area of Lot Used as Impervious Ground (%)

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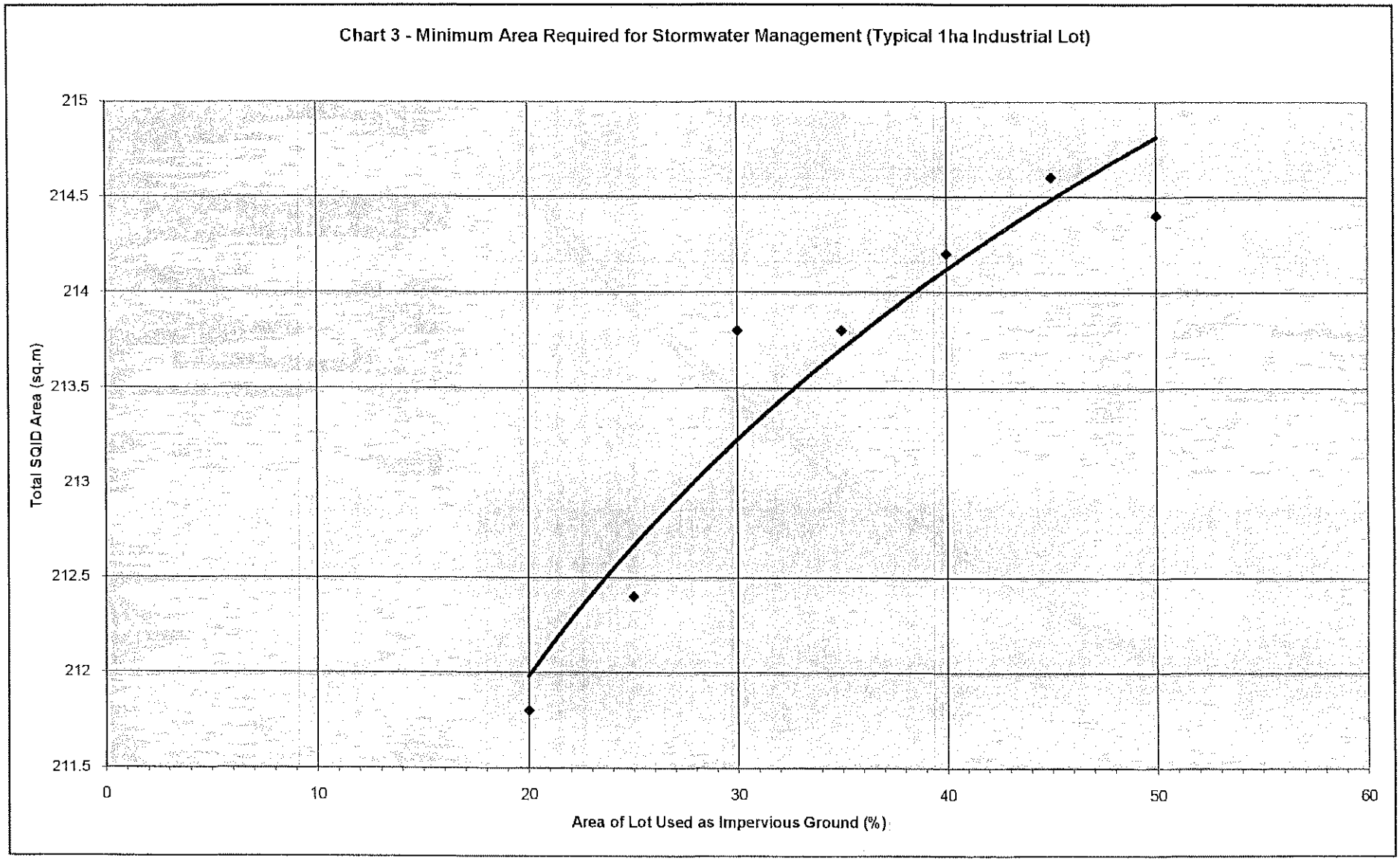


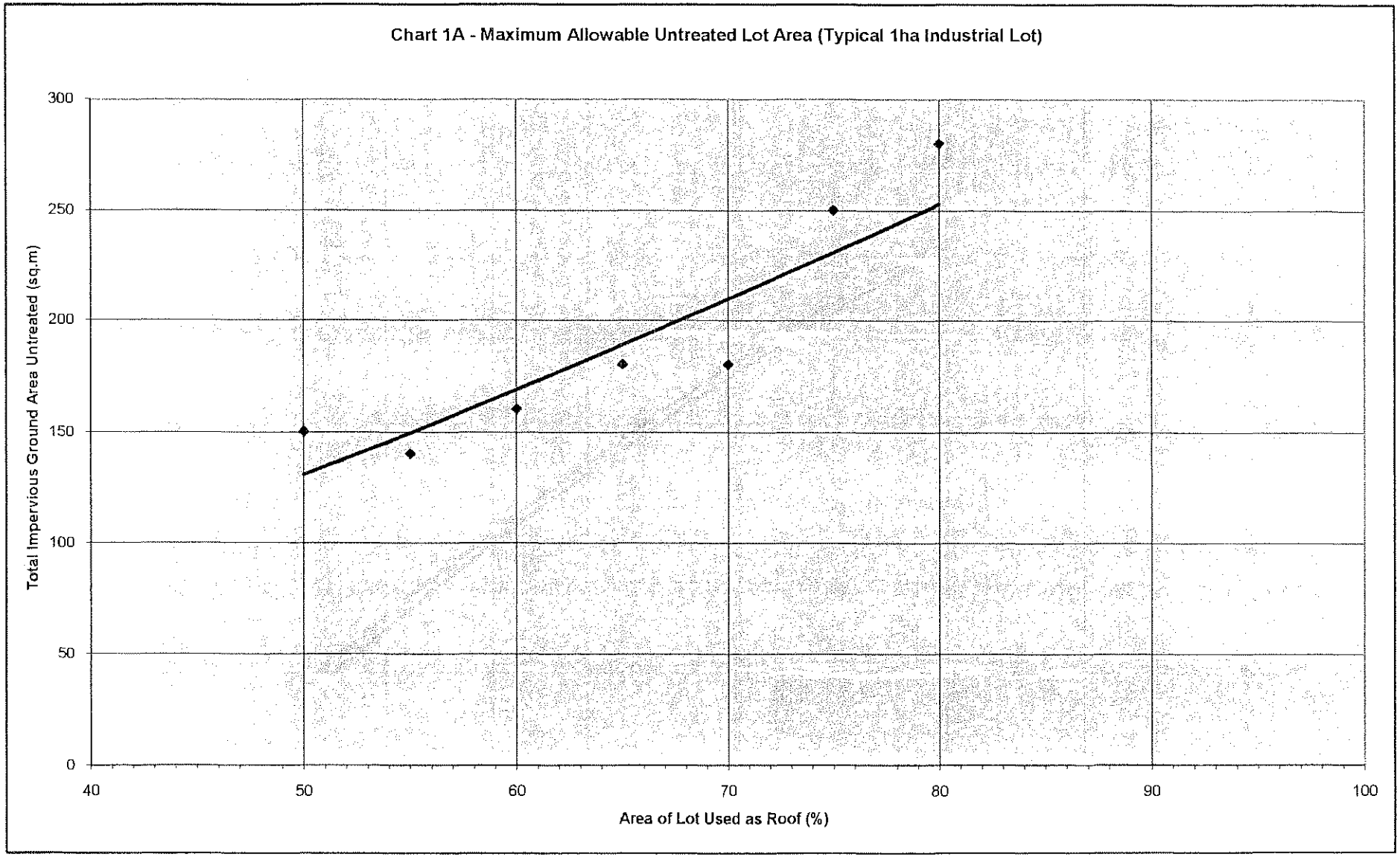
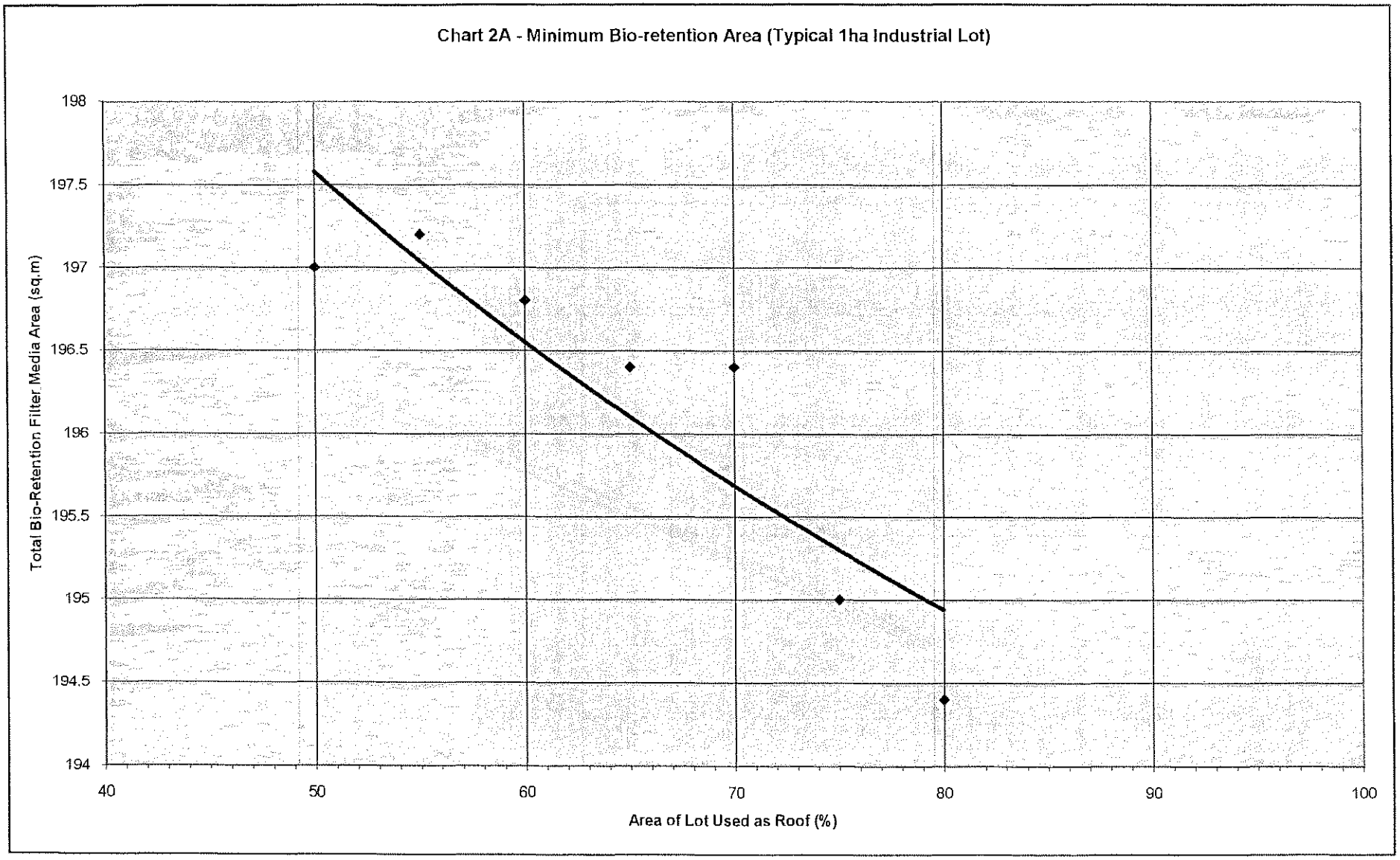


Chart 1A - Maximum Allowable Untreated Lot Area (Typical 1ha Industrial Lot)
Total Impervious Ground Area Untreated (sq.m)
300
250
200
150
100
50
0
40
50
60
70
80
90
100
Area of Lot Used as Roof (%)

Cardno Lawson Treloar



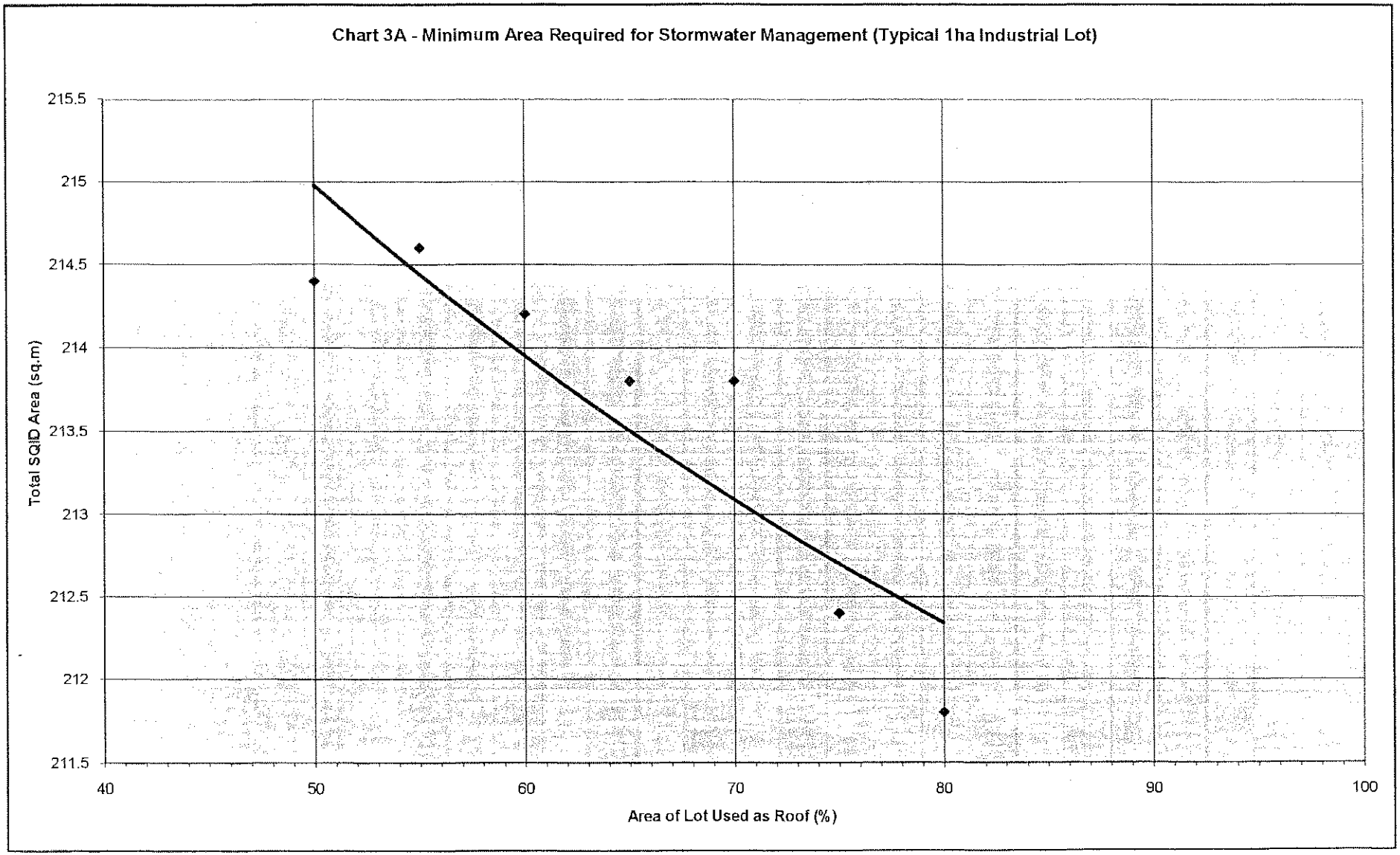


Chart 3A - Minimum Area Required for Stormwater Management (Typical 1ha Industrial Lot)
Total SQID Area (sq.m)
215.5
215
214.5
214
213.5
213
212.5
212
211.5
40
50
60
70
80
90
100
Area of Lot Used as Roof (%)

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Design Table: Industrial Lot Stormwater Quality Improvement Device Minimum Requirements

Industrial Lot Area (ha)	Industrial Lot Area (m^2)	Case 1				Case 2				Case 3				Case 4				Case 5				Case 6				Case 7			
		80% Roof, 20% Impervious Ground				75% Roof, 25% Impervious Ground				70% Roof, 30% Impervious Ground				65% Roof, 35% Impervious Ground				60% Roof, 40% Impervious Ground				55% Roof, 45% Impervious Ground				50% Roof, 50% Impervious Ground			
		Minimum Bio-retention Filter Media Area (m^2)	Minimum Vegetated Buffer Area Area (m^2)	Minimum SQID Area (m^2)	Maximum Allowable Untreated Impervious Ground Area (m^2)	Minimum Bio-retention Filter Media Area (m^2)	Minimum Vegetated Buffer Area Area (m^2)	Minimum SQID Area (m^2)	Maximum Allowable Untreated Impervious Ground Area (m^2)	Minimum Bio-retention Filter Media Area (m^2)	Minimum Vegetated Buffer Area Area (m^2)	Minimum SQID Area (m^2)	Maximum Allowable Untreated Impervious Ground Area (m^2)	Minimum Bio-retention Filter Media Area (m^2)	Minimum Vegetated Buffer Area Area (m^2)	Minimum SQID Area (m^2)	Maximum Allowable Untreated Impervious Ground Area (m^2)	Minimum Bio-retention Filter Media Area (m^2)	Minimum Vegetated Buffer Area Area (m^2)	Minimum SQID Area (m^2)	Maximum Allowable Untreated Impervious Ground Area (m^2)	Minimum Bio-retention Filter Media Area (m^2)	Minimum Vegetated Buffer Area Area (m^2)	Minimum SQID Area (m^2)	Maximum Allowable Untreated Impervious Ground Area (m^2)	Minimum Bio-retention Filter Media Area (m^2)	Minimum Vegetated Buffer Area Area (m^2)	Minimum SQID Area (m^2)	Maximum Allowable Untreated Impervious Ground Area (m^2)
0.10	1000	19	2	21	28	20	2	21	25	20	2	21	16	20	2	21	18	20	2	21	16	20	2	21	14	20	2	21	15
0.20	2000	39	3	42	56	39	3	42	50	39	3	43	36	39	3	43	36	39	3	43	32	39	3	43	28	39	3	43	30
0.25	2500	49	4	53	70	49	4	53	63	49	4	53	45	49	4	53	45	49	4	54	40	49	4	54	35	49	4	54	38
0.30	3000	58	5	64	84	59	5	64	75	59	5	64	54	59	5	64	54	59	5	64	48	59	5	64	42	59	5	64	45
0.40	4000	97	9	106	140	98	9	106	125	98	9	107	90	98	9	107	90	98	9	107	80	98	9	107	70	98	9	107	75
0.50	5000	97	9	106	140	98	9	106	125	98	9	107	90	98	9	107	90	98	9	107	80	98	9	107	70	98	9	107	75
0.60	6000	117	10	127	168	117	10	127	150	118	10	128	108	118	10	128	108	118	10	128	96	118	10	128	84	118	10	128	90
0.70	7000	136	12	149	196	137	12	149	175	137	12	150	126	137	12	150	126	138	12	150	112	138	12	150	98	138	12	150	105
0.75	7500	146	13	159	210	146	13	159	188	147	13	160	135	147	13	160	135	148	13	161	120	148	13	161	105	148	13	161	113
0.80	8000	156	14	169	224	156	14	170	200	157	14	171	144	157	14	171	144	157	14	171	128	158	14	172	112	158	14	172	120
0.90	9000	175	16	191	252	176	16	191	225	177	16	192	162	177	16	192	162	177	16	193	144	177	16	193	126	177	16	193	135
1.00	**10000**	**194**	**17**	**212**	**280**	**195**	**17**	**212**	**250**	**196**	**17**	**214**	**180**	**196**	**17**	**214**	**180**	**197**	**17**	**214**	**160**	**197**	**17**	**215**	**140**	**197**	**17**	**214**	**150**
1.25	12500	243	22	265	350	244	22	266	313	246	22	267	225	246	22	267	225	246	22	268	200	247	22	268	175	246	22	268	188
1.50	15000	292	26	318	420	293	26	319	375	295	26	321	270	295	26	321	270	295	26	321	240	296	26	322	210	296	26	322	225
1.75	17500	340	30	371	490	341	30	372	438	344	30	374	315	344	30	374	315	344	30	375	280	345	30	375	245	345	30	375	263
2.00	20000	389	35	424	560	390	35	426	500	393	35	428	360	393	35	428	360	394	35	428	320	394	35	429	280	394	35	429	300
2.25	22500	437	39	477	630	439	39	478	563	442	39	481	405	442	39	481	405	443	39	482	360	444	39	483	315	443	39	482	338
2.50	25000	486	44	530	700	488	44	531	625	491	44	535	450	491	44	535	450	492	44	536	400	493	44	537	350	493	44	536	375
2.75	27500	535	48	582	770	536	48	584	688	540	48	588	495	540	48	588	495	541	48	589	440	542	49	590	385	542	49	590	413
3.00	30000	583	52	635	840	585	52	637	750	589	52	641	540	589	52	641	540	590	52	643	480	592	52	644	420	591	52	643	450
3.50	35000	680	61	741	980	683	61	743	875	687	61	748	630	687	61	748	630	688	61	750	560	690	61	751	490	690	61	750	525
4.00	40000	778	70	847	1120	780	70	850	1000	786	70	855	720	786	70	855	720	787	70	857	640	789	70	858	560	788	70	858	600
4.50	45000	875	78	953	1260	878	78	956	1125	884	78	962	810	884	78	962	810	886	78	964	720	887	78	966	630	887	78	966	675
5.00	50000	972	87	1059	1400	975	87	1062	1250	982	87	1069	900	982	87	1069	900	984	87	1071	800	985	87	1073	700	985	87	1072	750
5.50	55000	1069	96	1165	1540	1073	96	1168	1375	1080	96	1176	990	1080	96	1176	990	1082	96	1178	880	1085	96	1180	770	1084	96	1179	825
6.00	60000	1166	104	1271	1680	1170	104	1274	1500	1178	104	1283	1080	1178	104	1283	1080	1181	104	1285	960	1183	104	1288	840	1182	104	1286	900
6.50	65000	1264	113	1377	1820	1268	113	1381	1625	1277	113	1390	1170	1277	113	1390	1170	1279	113	1392	1040	1282	113	1395	910	1281	113	1394	975
7	70000	1361	122	1483	1960	1365	122	1487	1750	1375	122	1497	1260	1375	122	1497	1260	1378	122	1499	1120	1380	122	1502	980	1379	122	1501	1050
7.5	75000	1458	131	1589	2100	1463	131	1593	1875	1473	131	1604	1350	1473	131	1604	1350	1476	131	1607	1200	1479	131	1610	1050	1478	131	1609	1125
8	80000	1555	139	1694	2240	1560	139	1699	2000	1571	139	1710	1440	1571	139	1710	1440	1574	139	1714	1280	1578	139	1717	1120	1576	139	1715	1200
8.5	85000	1652	148	1800	2380	1658	148	1805	2125	1669	148	1817	1530	1669	148	1817	1530	1673	148	1821	1360	1676	148	1824	1190	1675	148	1822	1275
9	90000	1750	157	1906	2520	1755	157	1912	2250	1768	157	1924	1620	1768	157	1924	1620	1771	157	1928	1440	1775	157	1931	1260	1773	157	1930	1350
9.5	95000	1847	165	2012	2660	1853	165	2018	2375	1866	165	2031	1710	1866	165	2031	1710	1870	165	2035	1520	1873	165	2039	1330	1872	165	2037	1425
10	100000	1944	174	2116	3800	1950	174	2124	2500	1964	174	2138	1800	1964	174	2138	1800	1968	174	2142	1600	1972	174	2146	1400	1970	174	2144	1500

Annex E

Detailed Stormwater Treatment Device Design

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Bio Retention System Design Spreadsheet Version 1.81_xXx

Using:

Water Senstive Urban Design - Technical Design Guidelines for South East Queensland Version 1, June 2006

Bio-Retention Design Inputs

Bioretention Basin Name & ID [redacted]

Bio-Retention Basin Area 180 m^2	Basin Area Determined in MUSIC 354 m^2	
User Determined Bio-Retention Basin Area [redacted] m^2	Treated Catchment Area [redacted] ha	Total Catchment Area [redacted] ha
Climate Zone [redacted]	C_{10} [redacted]	Under-drain Pipe Size [redacted] (PVC)
Filter Media Depth [redacted] m	Time of Concentration [redacted] min	Under-drain Max Pipe Spacing **2.5 m**
Hydraulic Conductivity [redacted] mm/hr	Design Flows $Q_{1yr\ ARI}$ 0.25 m^3/s	Basin Crest Elevation RL 0.600 m AHD
Extended Detention Depth [redacted] mm	$Q_{2yr\ ARI}$ 0.35 m^3/s $Q_{50yr\ ARI}$ 0.94 m^3/s	Basin Filter Media Surface Elevation RL [redacted] m AHD
Sediment Forebay Depth [redacted] mm	$Q_{100yr\ ARI}$ 1.10 m^3/s Design Intensities	Flow Depth Above Weir 0.30 m
Cleanout Frequency 2 years	$I_{1yr\ ARI}$ [redacted] mm/hr $I_{2yr\ ARI}$ [redacted] mm/hr	User Determined Flow Depth Above Weir [redacted] m
Basin Inlet Type [redacted]	$I_{50yr\ ARI}$ [redacted] mm/hr $I_{100yr\ ARI}$ [redacted] mm/hr	Catchment Land Use [redacted]
Width of Bio Basin [redacted] m		

Bio-Retention Design Coefficients

Step 3: Inflow Design	Step 5: Under-drain Design	Step 7: Overflow Drain Design
Cature Efficiency (R) 80%	Blockage Factor (B) 0.5	Blockage Factor (B) 0.5
Turbulence Parameter (n) 0.5	Qrifice Discharge Coefficient (C_d) 0.6	Weir Coefficient (C_w) 1.66
Settling Velocity (v_s) 0.1 m/s		Discharge Coefficient (C_d) 0.6

STEP 1: Confirm Treatment Performance of Concept Design

Use MUSIC to ensure WQO are met

WQO

Eg Best Practice Load Reduction		*Or Concentration*	
85%	TSS	15 mg/L	TSS
60%	TP	0.07 mg/L	TP
45%	TN	0.65 mg/L	TN

STEP 2: Design Flows

Use Rational Calcs Spreadsheet (Generally QUDM Type 1, or Local Government version if available), Or other (WBNM, RAFTS etc)

	$Q_{1yr\ ARI}$	0.25 m^3/s
Minor	$Q_{2yr\ ARI}$	0.35 m^3/s
Major	$Q_{50yr\ ARI}$	0.94 m^3/s
Minor	$I_{2yr\ ARI}$	103.75 mm/hr
Major	$I_{50yr\ ARI}$	208.37 mm/hr

STEP 3: Inflow Systems

Scour Protection Reqd when Concentrated Flows enter Bio Retention Basin *(ie from pipe or open channel inlet)*

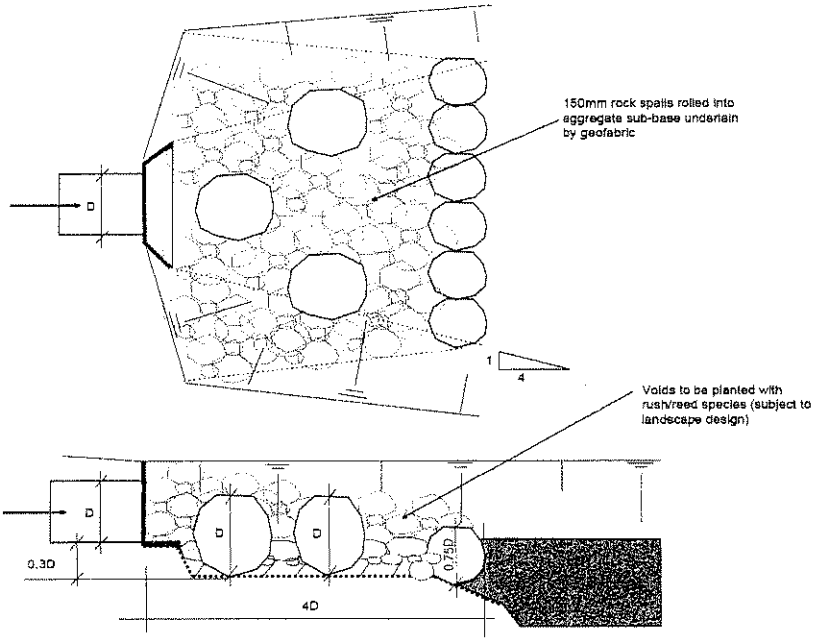

Figure 5-6 Typical Inlet Scour Protection Detail for Bioretention Basins Receiving Piped Flows

Coarse Sediment Forebay

$$V_s = A_c R L_o F_c$$

Where
A_c = 1.772 ha
R = 80%
L_o = 1.6 m^3/ha/year
F_c = 2 years

V_s = 4.54 m^3

$$A_s = \frac{V_s}{D_s}$$

Where
V_s = 4.54 m^3
D_s = 0.3 m

A_s = 15.12 m^2

Check Forebay Capture 1mm and greater particles

$$R = 1 - \left[1 + \frac{1}{n} \cdot \frac{v_s}{Q/A}\right]^{-n}$$

Where
n = 0.5
v_s = 0.1 m/s
Q = 0.126 m^3/s
A = 15.12 m^2

R = 0.80
79.97% of 1mm Particles

Note: The Capture Efficiency should ideally be 80% of 1mm Particles. To achieve this Modify the Area.

$$A = \frac{Q.n}{v_s} \cdot \left[-\sqrt[n]{(1-R)} - 1\right]$$

Where
n = 0.5
v_s = 0.1 m/s
Q = 0.126 m^3/s
R = 0.8 *i.e 80%*

A = 15.17 m^2

$$V_s = A_s . D_s$$

Where
A_s = 15.17 m^2
D_s = 0.3 m

V_s = 4.55 m^3

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STEP 4: Bio Retention Filter Media Characteristics

Filter Media should be as per current FAWB Detailing

Filter Media
K = 180 mm/hr

Drainage Layer
Depth = 200 mm

Transition Layer
Depth = 100 mm

Refer to the Current FAWB Guidelines for Further Information:
Facility for Advacing Water Biofiltration, 'Guidelines for Soil Filter Media in Bio-Retention Systems (Version 2.01) March 2008

STEP 5: Under-Drain Design

Maximum Filtration Rate

$$Q_{max} = K_{sat} LW_{base} \frac{h_{max} + d}{d}$$

Where
K_{sat} = 0.18 m/hr
LW_{base} = 180 m^2
d = 0.8 m
h_{max} = 0.3 m

Q_{max} = 0.012 m^3/s

Perforation Inflow Check

Uses Vinidex Systems and Solutions Pipes: Draincoil - Slotted Subsoil Drainage Pipe

Head (h) = 1.15 m
Assuming Half Slots are blocked
Clear Opening
2100 mm^2/m
Blocked Openings
1050 mm^2/m
Slot Width
1.1 mm
Slot Length
7.4 mm
Pipe Diameter
100 mm
Slots Per Metre
129.0

Alternatively, Solve for A Using $Q_{sat} = Q_{max}$

$$Q_{sat} = BC_d A\sqrt{2gh}$$

$$A = \frac{Q_{sat}}{BC_d\sqrt{2gh}}$$

Where
B = 0.5
C_d = 0.6
Q_{sat} = [illegible]
g = [illegible]
h = [illegible]

A = 1000 m^2

Length Pipe
4.14 m

Minimum Pipe [illegible]
Maximum Pipe Spacing = 2.5m
Using a [illegible] PVC Pipe

STEP 6: Impermeable Lining

Generally Always have an impermeable layer between Bio-retention Media and in-situ Soils

Impermeable Geotextile Fabric Required

STEP 7: Overflow Pit

Generally Always have an impermeable layer between Bio-retention Media and in-situ Soils

For Free Overfall conditions

$$Q_{weir} = B.C_w.L.h^{3/2}$$

Where

Q_{weir} =	0.347	m^3/s
B =	0.5	
C_w =	1.66	
h =	0.30	m

Solve for L

$$L = \frac{Q_{weir}}{BC_w h^{3/2}}$$

L = 2.55 m

Qverflow Pit Area = 0.41 m^2

Grate Size = *600mm x 600mm*

For Drowned Outlet conditions

$$Q_{orifice} = BC_d A\sqrt{2gh}$$

Where

$Q_{orifice}$ =	0.347	m^3/s
B =	0.5	
C_d =	0.6	
h =	0.3	m
g =	9.807	m/s^2

Solve for A

$$A = \frac{Q_{orifice}}{BC_d\sqrt{2gh}}$$

Weir Length = 2.80 m

A = 0.48 m^2

Grate Size = *700mm x 700mm*

QUDM 1992 Section 5.10.4 and QUDM 2007 Section 7.05.4 (a) recommend that the adopted inlet capacity should be the lesser determined from the two methods.

STEP 8: Vegetation

Vegetation Design as per WSUD Section 5.4 and Appendix A

Minimum Planting Density

8 Plants/m^2

Ground Cover Vegetation

Must cover the entire surface of the filter media

Must have a high leaf density and a dense and uniform distribution

Shrubs and Trees

Must have sparse canopies and shallow root systems

Must be able to tolerate short periods of innundation

Preferably be a species native to the region

Vegetation Height Must not exceed 1m

For Further Information on Species Types see WSUD Technical Guiedlines for SEQ (June 2006)

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STEP 9: Checks

If there are two separate channels for the high and low flows or the overflow pit is located near the bio-retention inlet; there is no requirement for maximum velocity; otherwise

Vegetation Scour Velocity (Maximum Flow Velocity)

$Q_{2\text{-}10yr\ ARI}$	0.5 m/s
$Q_{50\text{-}100yr\ ARI}$	2.0 m/s

Unless Stated otherwise, this velocity check assumes the bio-retention geometry to be a rectangle with a length two times its width

Using:

$$V = \frac{Q}{A}$$

V_{100} =	0.39 m/s	Where	Q_{100} =	1.10 m^3/s
			A =	2.85 m^2
V_{50} =	0.33 m/s	Where	Q_{50} =	0.94 m^3/s
			A =	2.85 m^2
V_2 =	0.12 m/s	Where	Q_2 =	0.35 m^3/s
			A =	2.85 m^2
V_1 =	0.09 m/s	Where	Q_1 =	0.25 m^3/s
			A =	2.85 m^2

Scour Protection Not Required

I'm a glass case of emotion!

Well, could be wrong, but I believe Dwandy was an old old wooden ship used during the Civil War Era

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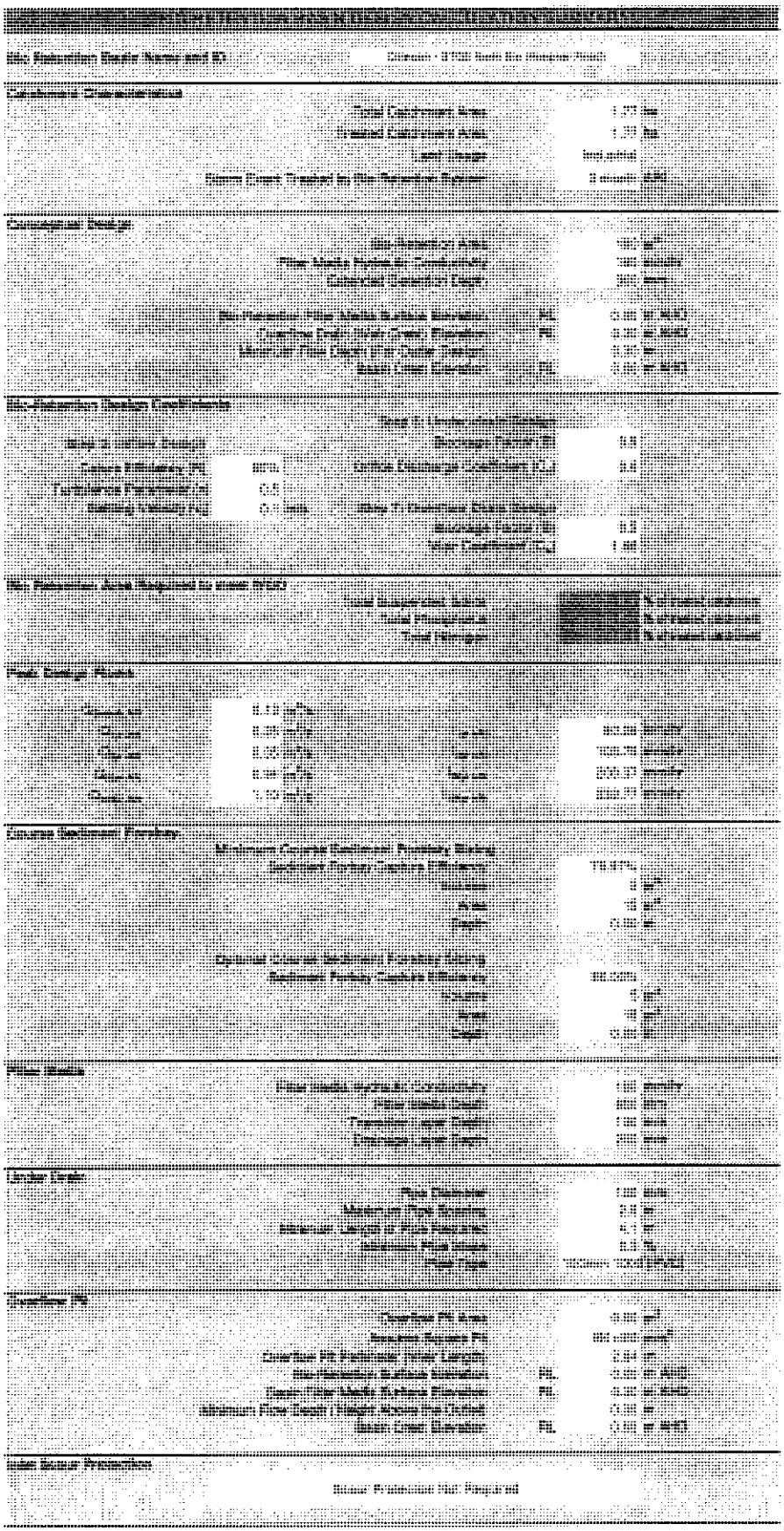

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Bio Retention System Design Spreadsheet **Version 1.81_xXx**

Using:
Water Senstive Urban Design - Technical Design Guidelines for South East Queensland Version 1, June 2006

Bio-Retention Design Inputs

Bioretention Basin Name & ID [redacted]

Bio-Retention Basin Area 310 m^2	Basin Area Determined in MUSIC 614 m^2	
User Determined Bio-Retention Basin Area [redacted] m^2	Treated Catchment Area [redacted] ha	Total Catchment Area [redacted] ha
Climate Zone [redacted]	C_{10} [redacted]	Under-drain Pipe Size [redacted]0 (PVC)
Filter Media Depth [redacted] m	Time of Concentration [redacted] min	Under-drain Max Pipe Spacing **2.5 m**
Hydraulic Conductivity [redacted] mm/hr	Design Flows $Q_{1yr\ ARI}$ 0.44 m^3/s	Basin Crest Elevation RL 0.650 m AHD
Extended Detention Depth [redacted] mm	$Q_{2yr\ ARI}$ 0.60 m^3/s $Q_{50yr\ ARI}$ 1.63 m^3/s	Basin Filter Media Surface Elevation RL [redacted] m AHD
Sediment Forebay Depth [redacted] mm	$Q_{100yr\ ARI}$ 1.91 m^3/s Design Intensities	Flow Depth Above Weir 0.35 m
Cleanout Frequency 2 years	$I_{1yr\ ARI}$ [redacted] mm/hr $I_{2yr\ ARI}$ [redacted] mm/hr	User Determined Flow Depth Above Weir [redacted] m
Basin Inlet Type [redacted]	$I_{50yr\ ARI}$ [redacted] mm/hr $I_{100yr\ ARI}$ [redacted] mm/hr	Catchment Land Use [redacted]
Width of Bio Basin [redacted] m		

Bio-Retention Design Coefficients

Step 3: Inflow Design Cature Efficiency (R) 80% Turbulence Parameter (n) 0.5 Settling Velocity (v_s) 0.1 m/s	Step 5: Under-drain Design Blockage Factor (B) 0.5 Orifice Discharge Coefficient (C_d) 0.6	Step 7: Overflow Drain Design Blockage Factor (B) 0.5 Weir Coefficient (C_w) 1.66 Discharge Coefficient (C_d) 0.6

STEP 1: Confirm Treatment Performance of Concept Design

Use MUSIC to ensure WQO are met

WOO

Eg Best Practice Load Reduction		*Or Concentration*	
85%	TSS	15 mg/L	TSS
60%	TP	0.07 mg/L	TP
45%	TN	0.65 mg/L	TN

STEP 2: Design Flows

Use Rational Calcs Spreadsheet (Generally QUDM Type 1, or Local Government version if available), Or other (WBNM, RAFTS etc)

	$Q_{1yr\ ARI}$	0.44 m^3/s
Minor	$Q_{2yr\ ARI}$	0.60 m^3/s
Major	$Q_{50yr\ ARI}$	1.63 m^3/s
Minor	$I_{2yr\ ARI}$	103.75 mm/hr
Major	$I_{50yr\ ARI}$	208.37 mm/hr

STEP 3: Inflow Systems

Scour Protection Reqd when Concentrated Flows enter Bio Retention Basin *(ie from pipe or open channel inlet)*

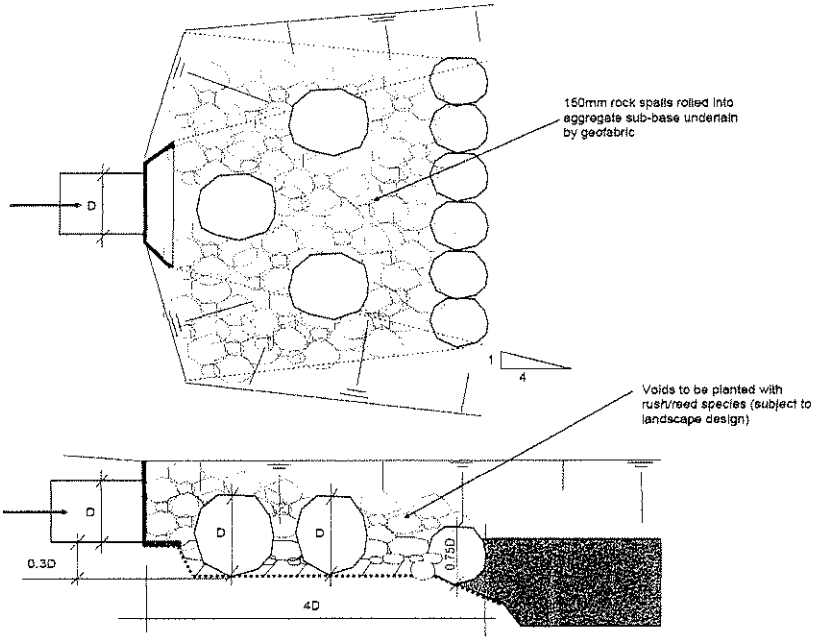

Figure 5-6: Typical Inlet Scour Protection Detail for Bioretention Basins Receiving Piped Flows

Coarse Sediment Forebay

$$V_s = A_c R L_o F_c$$

Where A_c = 3.07 ha
R = 80%
L_o = 1.6 m^3/ha/year
F_c = 2 years

V_s = 7.86 m^3

$$A_s = \frac{V_s}{D_s}$$

Where V_s = 7.86 m^3
D_s = 0.3 m

A_s = 26.20 m^2

Check Forebay Capture 1mm and greater particles

$$R = 1 - \left[1 + \frac{1}{n} \cdot \frac{v_s}{Q/A}\right]^{-n}$$

Where n = 0.5
v_s = 0.1 m/s
Q = 0.219 m^3/s
A = 26.20 m^2

R = 0.80
79.97% of 1mm Particles

Note: The Capture Efficiency should ideally be 80% of 1mm Particles. To achieve this Modify the Area.

$$A = \frac{Q.n}{v_s} \cdot \left[\sqrt[-n]{(1-R)} - 1\right]$$

Where n = 0.5
v_s = 0.1 m/s
Q = 0.219 m^3/s
R = 0.8 *i.e 80%*

A = 26.28 m^2

$$V_s = A_s . D_s$$

Where A_s = 26.28 m^2
D_s = 0.3 m

V_s = 7.88 m^3

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STEP 4: Bio Retention Filter Media Characteristics

Filter Media should be as per current FAWB Detailing

Filter Media

K = 180 mm/hr

Drainage Layer

Depth = 200 mm

Transition Layer

Depth = 100 mm

Refer to the Current FAWB Guidelines for Further Information:

Facility for Advacing Water Biofiltration, 'Guidelines for Soil Filter Media in Bio-Retention Systems (Version 2.01) March 2008

STEP 5: Under-Drain Design

Maximum Filtration Rate

$$Q_{max} = K_{sat} LW_{base} \frac{h_{max} + d}{d}$$

Where

K_{sat} =	0.18	m/hr
LW_{base} =	310	m^2
d =	0.8	m
h_{max} =	0.3	m

Q_{max} = 0.021 m^3/s

Perforation Inflow Check

Uses Vinidex Systems and Solutions Pipes: Draincoil - Slotted Subsoil Drainage Pipe

Head (h) = 1.15 m

Assuming Half Slots are blocked

Clear Opening

2100 mm^2/m

Blocked Openings

1050 mm^2/m

Slot Width

1.1 mm

Slot Length

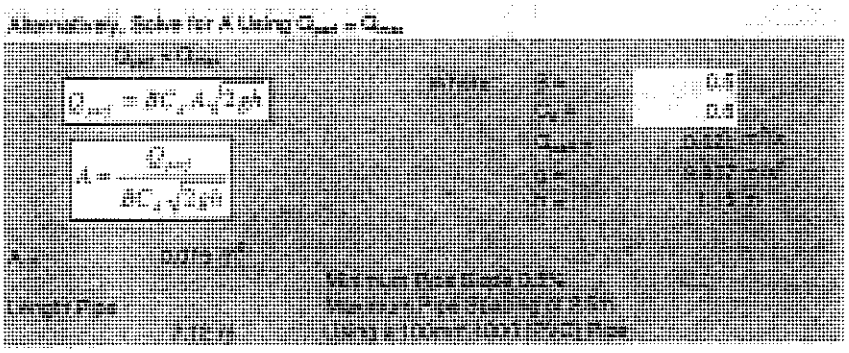
7.4 mm

Pipe Diameter

100 mm

Slots Per Metre

129.0



STEP 6: Impermeable Lining

Generally Always have an impermeable layer between Bio-retention Media and in-situ Soils

Impermeable Geotextile Fabric Required

STEP 7: Overflow Pit

Generally Always have an impermeable layer between Bio-retention Media and in-situ Soils

For Free Overfall conditions

$$Q_{weir} = B.C_w.L.h^{3/2}$$

Where

Q_{weir} =	0.602	m^3/s
B =	0.5	
C_w =	1.66	
h =	0.35	m

Solve for L

$$L = \frac{Q_{weir}}{BC_w h^{3/2}}$$

L = 3.50 m

Overflow Pit Area = 0.77 m^2

Grate Size = *900mm x 900mm*

For Drowned Outlet conditions

$$Q_{orifice} = BC_d A\sqrt{2gh}$$

Where

$Q_{orifice}$ =	0.602	m^3/s
B =	0.5	
C_d =	0.6	
h =	0.35	m
g =	9.807	m/s^2

Solve for A

$$A = \frac{Q_{orifice}}{BC_d\sqrt{2gh}}$$

A = 0.77 m^2

Weir Length = 3.60 m

Grate Size = *900mm x 900mm*

QUDM 1992 Section 5.10.4 and QUDM 2007 Section 7.05.4 (a) recommend that the adopted inlet capacity should be the lesser determined from the two methods.

STEP 8: Vegetation

Vegetation Design as per WSUD Section 5.4 and Appendix A

Minimum Planting Density

8 Plants/m^2

Ground Cover Vegetation

Must cover the entire surface of the filter media

Must have a high leaf density and a dense and uniform distribution

Shrubs and Trees

Must have sparse canopies and shallow root systems

Must be able to tolerate short periods of innundation

Preferably be a species native to the region

Vegetation Height Must not exceed 1m

For Further Information on Species Types see WSUD Technical Guiedlines for SEQ (June 2006)

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STEP 9: Checks

If there are two separate channels for the high and low flows or the overflow pit is located near the bio-retention inlet; there is no requirement for maximum velocity; otherwise

Vegetation Scour Velocity (Maximum Flow Velocity)

$Q_{2\text{-}10yr\ ARI}$	0.5 m/s
$Q_{50\text{-}100yr\ ARI}$	2.0 m/s

Unless Stated otherwise, this velocity check assumes the bio-retention geometry to be a rectangle with a length two times its width

Using:

$$V = \frac{Q}{A}$$

V_{100} =	0.51 m/s	Where	Q_{100} =	1.91 m^3/s
			A =	3.73 m^2
V_{50} =	0.44 m/s	Where	Q_{50} =	1.63 m^3/s
			A =	3.73 m^2
V_2 =	0.16 m/s	Where	Q_2 =	0.60 m^3/s
			A =	3.73 m^2
V_1 =	0.12 m/s	Where	Q_1 =	0.44 m^3/s
			A =	3.73 m^2

Scour Protection Not Required

I'm in a glass case of emotion

Well I could be wrong, but I believe Sweetly was an old old wooden ship used during the Civil War Era

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BIO-RETENTION BASIN DESIGN CALCULATION SUMMARY

Bio Retention Basin Name and ID Citiswich - STG2 South Bio (Hoepner Road)

Catchment Characteristics

Total Catchment Area	3.07	ha
Treated Catchment Area	3.07	ha
Land Usage	Industrial	
Storm Event Treated by Bio-Retention System	3 month ARI	

Conceptual Design

Bio-Retention Area		310	m^2
Filter Media Hydraulic Conductivity		180	mm/hr
Extended Detention Depth		300	mm
Bio-Retention Filter Media Surface Elevation	RL	0.00	m AHD
Overflow Drain (Weir Crest) Elevation	RL	0.30	m AHD
Minimum Flow Depth (For Outlet Design)		0.35	m
Basin Crest Elevation	RL	0.65	m AHD

Bio-Retention Design Coefficients

Step 3: Inflow Design		Step 5: Under-drain Design	
Cature Efficiency (R)	80%	Blockage Factor (B)	0.5
Turbulence Parameter (n)	0.5	Orifice Discharge Coefficient (C_d)	0.6
Settling Velocity (v_s)	0.1 m/s	Step 7: Overflow Drain Design	
		Blockage Factor (B)	0.5
		Weir Coefficient (C_w)	1.66

Bio Retention Area Required to meet WQO

Total Suspended Solids	1.01	% of treated catchment
Total Phosphorus	1.01	% of treated catchment
Total Nitrogen	1.01	% of treated catchment

Peak Design Flows

$Q_{3month\ ARI}$	0.22	m^3/s			
$Q_{1yr\ ARI}$	0.44	m^3/s	$I_{1yr\ ARI}$	80.26	mm/hr
$Q_{2yr\ ARI}$	0.60	m^3/s	$I_{2yr\ ARI}$	103.75	mm/hr
$Q_{50yr\ ARI}$	1.63	m^3/s	$I_{50yr\ ARI}$	208.37	mm/hr
$Q_{100yr\ ARI}$	1.91	m^3/s	$I_{100yr\ ARI}$	233.77	mm/hr

Course Sediment Forebay

Minimum Course Sediment Forebay Sizing		
Sediment Forbay Capture Efficiency	79.97%	
Volume	8	m^3
Area	26	m^2
Depth	0.00	m
Optimal Course Sediment Forebay Sizing		
Sediment Forbay Capture Efficiency	80.00%	
Volume	8	m^3
Area	26	m^2
Depth	0.00	m

Filter Media

Filter Media Hydraulic Conductivity	180	mm/hr
Filter Media Depth	800	mm
Transition Layer Depth	100	mm
Drainage Layer Depth	200	mm

Under Drain

Pipe Diameter	100	mm
Maximum Pipe Spacing	2.5	m
Minimum Length of Pipe Required	7.1	m
Minimum Pipe Slope	0.5	%
Pipe Type	100mm 1000 (PVC)	

Overflow Pit

Overflow Pit Area		0.80	m^2
Assume Square Pit		900 x 900	mm^2
Overflow Pit Perimeter (Weir Length)		3.60	m
Bio-Retention Surface Elevation	RL	0.00	m AHD
Basin Filter Media Surface Elevation	RL	0.30	m AHD
Minimum Flow Depth (Height Above the Outlet)		0.35	m
Basin Crest Elevation	RL	0.65	m AHD

Inlet Scour Protection

Scour Protection Not Required

Annex F

Individual Lot (Brisbane City Council) Sediment and Erosion Guidlines

What are the impacts? SEE FACT SHEET 1

Soil erosion, sediment and litter from building sites can be major sources of stormwater pollution, and can cause:

- significant harm to the environment of Moreton Bay through the loss of valuable seagrass habitat for marine creatures
- weed infestation of waterways by sediment settling on the creek beds and transporting nutrients
- loss of valuable topsoil
- significant public safety problems when washed onto roads and intersections
- blocked drains creating flooding and increased maintenance costs
- the potential to effect the bay's recreational and commercial fishing industry.

Mud and dirt which has been tracked out onto road

Sediment moving out of Moreton Bay into the ocean through Jumpinpin

Erosion and sediment control on residential building sites SEE FACT SHEET 1

Principles of effective stormwater pollution control include:

- sensible site planning
- diversion of up-slope water (where appropriate)
- stabilised site entry/exit point
- minimisation of site disturbance and duration of disturbance
- installation of sediment controls along the lower edge of the site
- appropriate location and protection of stockpiles
- early connection of roofwater downpipes
- trap on-site run-off from tool, paint and concrete washing and brick, tile and concrete cutting
- continual monitoring and maintenance of all control measures
- compaction of backfilled trenches
- revegetation and stabilisation of the site
- development and implementation of Erosion and Sediment Control Management Plans when appropriate.

Control measures in place on a residential building site

SITE PLANNING

When planning the site layout, building location and earthworks, it is possible to minimise the number of control devices, and their interference with the building process, with a little forward thinking. Suggestions are to:

- minimise the reshaping of the land
- direct stormwater to flow around the building area and any unstable batters
- allow room for a sediment barrier, eg. sediment fence, to be located along the lower side of the disturbance
- design the home to suit the property type, eg. construct pole homes on steep properties
- avoid the permanent use of long, steep and unstable driveways
- avoid the use of exposed aggregate concrete surfaces in areas where the wash-off cannot be contained.

Good site planning

Poor site planning – stockpile outside the sediment fence and building waste not placed in skip

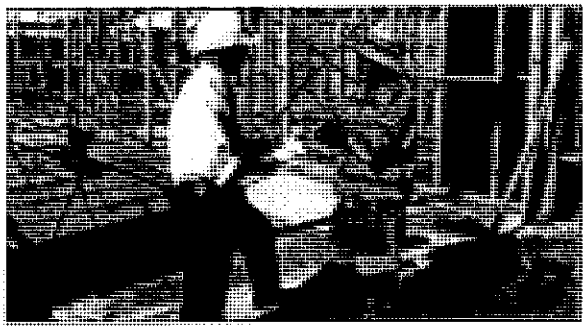
Environmental law SEE FACT SHEET 1

The *Environmental Protection Act 1994*, *Environmental Protection (Water) Policy 1997* and the *Integrated Planning Act 1997* are important pieces of legislation which control the way in which soil erosion and sediment are dealt with on building and development sites.

PENALTIES

Breaches of the *Environmental Protection (Water) Policy 1997* may result in:

- on-the-spot fines under the *Environmental Protection (Water) Policy 1997* (ranging from $300 to $600)
- prosecutions under the *Integrated Planning Act 1997* or the *Environmental Protection Act 1994* (fines of thousands of dollars or prison sentences for serious offences)
- the prosecution of individuals and/or companies.



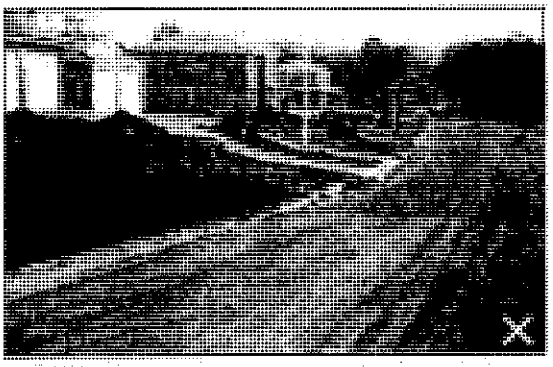
Council officer explaining the *Environmental Protection (Water) Policy 1997*

Erosion controls

SEE FACT SHEET 2

MINIMISE DISTURBANCE

- Earthworks should be kept to a minimum, and should only be commenced immediately prior to building.
- Maintain as much soil coverage as possible with the use of grass, leaf litter, mulch, gravel or erosion control blanket (ECB) or matting.
- Vegetation located down-slope of the work site assists in filtering out sediment. Where practicable, maintain kerb vegetation in a healthy state during the building process.



Stockpiles without protection

STOCKPILES

- Stockpiles and building materials are generally not allowed to be stored on the footpath or within the road reserve without permission from your Council.
- Minimise stockpile losses with the use of covers.
- All stockpiles and building materials should be located within the sediment control zone, for example behind a sediment fence.
- Stockpiles should not be located within an overland flow path.

SERVICE TRENCHES

Backfill service trenches, cap with topsoil, and compact to a level at least 75-100 mm above the adjoining ground level (either manually or with a small machine). This allows for some subsidence of the fill material, and ensures the fill is sufficiently compacted to avoid erosion at a later time. (Note that trenches must be backfilled in accordance with AS3500).

EROSION CONTROL BLANKETS OR MATTING

Erosion control blankets or matting can be used to minimise soil erosion and stormwater pollution from sites by:

- containing high erosion risk soils
- stabilising steep slopes.

SITE REHABILITATION

All areas disturbed by building activities should be promptly and progressively stabilised, using techniques such as revegetation and landscaping, so they no longer act as sources of sediment.

MULCHING AND GARDEN BEDS

To minimise soil loss, mulch should be applied to open garden beds at a depth of 75-100 mm.

This will assist in plant establishment, minimise water loss and help to control weeds.

Rehabilitate the site promptly to reduce the chances of further erosion

Sediment control SEE FACT SHEET 3

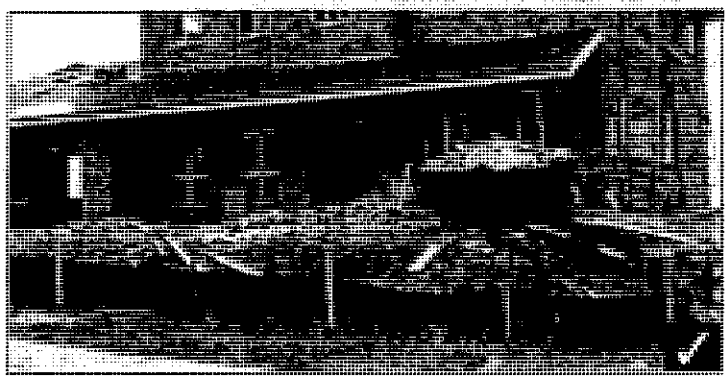
STABILISED ENTRY/EXIT POINT (RUMBLE PAD)

Stabilised gravel entry/exit point (rumble pad)

- Manage entry/exit point (rumble pad) so that sediment is not tracked off the site.
- Restrict site access to one stabilised location.
- Recommended construction method for stabilising access points is a 150-200 mm deep pad of minimum 40 mm crushed rock.
- The pad should be at least 2 metres wide and 5 metres long.
- The pad should extend from the kerb to the building slab.
- Where the entry/exit pad slopes towards the road, a 200 mm high bund (hump) should be installed across the pad to deflect stormwater run-off to the side where it can be filtered by a sediment fence.

Note: The location of the permanent driveway may not be an appropriate location for the construction entrance.

SEDIMENT BARRIERS/FENCES

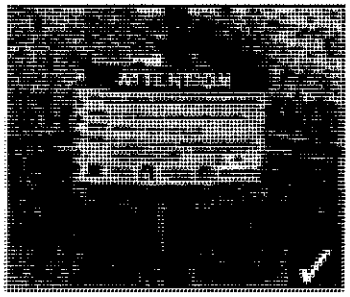


Sediment fence

- Install barriers and fences along the lower side of the soil disturbance.
- The most efficient sediment barrier for building sites is specially-manufactured geotextile sediment fencing.
- Sediment fences on building sites are usually wire-tied to steel posts (wire-tied sediment fences have the advantage of being more readily unhooked from their support posts during working hours).
- The support posts are spaced no greater than 2 metres apart and the sediment fence buried to a depth of 200 mm.
- For public safety and sediment control efficiency, sediment barriers should not be located outside property boundaries without Council approval.
- Sediment barriers should only be placed on the road as a last resort.
- Sediment barriers placed in front of roadside stormwater inlets are rarely effective and at best usually result in the sediment being washed down the street and into the nearest open gully inlet.
- Don't use filter cloth or shade cloth.

USE OF SIGNS

Public signs that warn of the need for proper sediment control devices and maintenance are becoming more widely used. Contact Brisbane City Council on 3403 8888 for information on how to obtain an information sign.

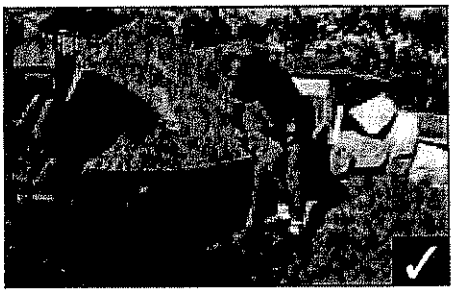


Sediment control information signage

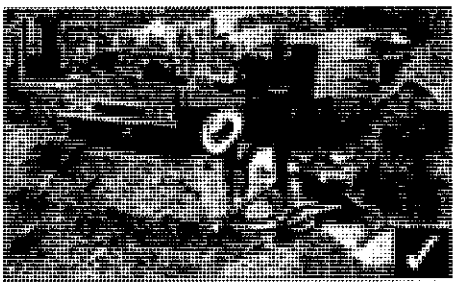
MAINTENANCE OF CONTROL MEASURES

All erosion, sediment and drainage control measures need to be regularly checked and maintained in good working order. Best practice includes anticipation of potential risks and being prepared for abnormal circumstances and emergencies. These measures include:

- Stockpile extra sediment fence fabric and posts on-site to facilitate emergency repairs.
- Reapply crushed rock to the entry/exit pad (rumble pad) if excessive sediment build-up occurs.
- Repair eroded drainage channels with rock, turf or erosion control blankets or matting.
- Ensure built-up sediment is removed at regular intervals from sediment barriers.
- Check daily and replace barriers daily if they are ripped, damaged or no longer anchored.



All measures require regular inspection

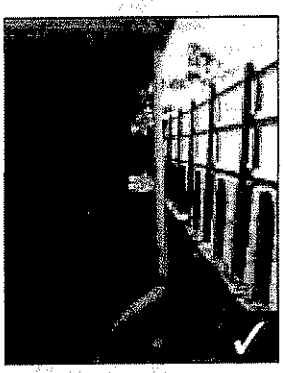


Excessive sediment deposits must be removed from entry/exit point (rumble pad)

Drainage control SEE FACT SHEET 4

DIVERSION OF UP-SLOPE WATER

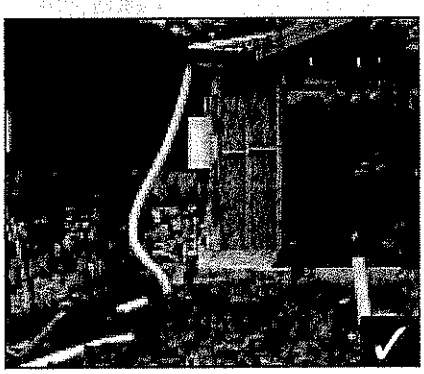
- Where practicable, divert up-slope water around the disturbed area.
- Stormwater can be diverted with the use of small turf or geotextile lined catch drains, or with the use of diversion banks.
- Diverted stormwater should be discharged onto stable ground (for example turfed areas) and should not be diverted into neighbouring properties unless written permission is obtained from the land owner(s).



Temporary roof water connection

EARLY ROOF WATER CONNECTION

- Temporary or permanent downpipes should be installed as soon as practicable after the roof is laid.
- Early connection of roof water to the stormwater system will reduce site wetness and the generation of on-site mud. This has been shown to reduce downtime following storm events and decrease the average building construction time.



Temporary roof water connection

Building operations SEE FACT SHEET 5

Prior to commencing building work

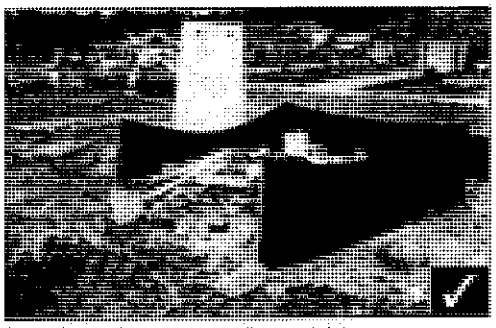
- Obtain all necessary permits, licences and approvals.
- Avoid clearing vegetation and excavating until ready to build.
- Where necessary in new estates, temporary revegetation may be required.

Points to consider as part of building operations

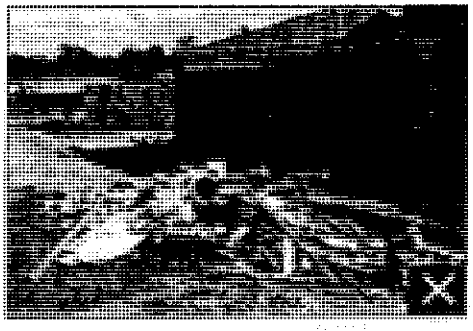
- Tool and paint washing, brick, tile or masonry cutting and water-cooled cutting activities should be done within the property boundaries.
- All waste water should be contained on-site where possible.
- Activities should be carried out on a permeable surface or up-slope of an infiltration trench.
- Vehicles should not be parked on the footpath area or verge where they can damage essential vegetation and transport dirt onto the road.

LITTER AND BUILDING WASTE

All hard waste should be stored on-site in a way that prevents material loss caused by wind or water. Smaller materials such as litter should be contained in covered bins or litter traps formed on three sides by a geotextile wind break or similar device.



One way to properly store litter and building waste



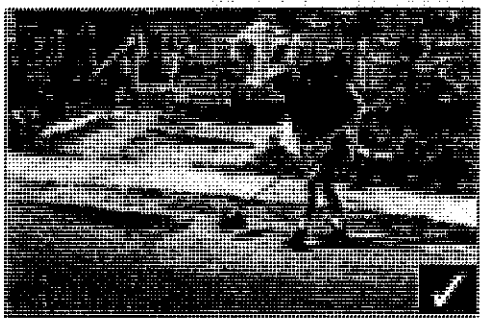
Poor litter and building waste storage

SITE CLEAN-UP

Remove accidental spills of soil or other materials from the road, gutter or any location outside the control of the primary sediment barrier:

- immediately if it's raining or likely to rain during the day
- at least upon completion of the day's work (even if rainfall is unlikely during the night)
- use a broom and shovel instead of hosing to clean hard surfaces.

Following storms, the road reserve and sediment barriers should be inspected and all excessive sediment residue removed.



Undertake regular site clean-ups

CONCRETE MIXER CLEAN-UP

Fully contain concrete waste washed from trucks and mixer units on-site and store where it cannot be washed from the site, harming the environment.

EXPOSED AGGREGATE CONCRETE SURFACES

- Builders need to demonstrate how they intend to prepare exposed aggregate surfaces without allowing cement residue to flow into stormwater drains or waterways.
- Where practicable, wash cement residue onto pervious surfaces or fully contain it within temporary sediment dams created from tightly stacked sand bags.
- When suitably dry, shovel cement residue into a waste disposal bin.
- At no time should cement residue or wastewater run-off enter the roadside gutter.

This may make it impractical on some sites for exposed aggregate driveways to be constructed. In such cases, an alternative driveway finish must be used.

Storage of materials on hard surfaces SEE FACT SHEET 6

Whenever possible, materials should be stockpiled within the sediment control envelope and, where necessary, covered with waterproof sheeting.

Materials may be temporarily stored on hard surfaces where it is necessary to place erodible material on hard surfaces to undertake work and no other reasonable options are available.

Don't store stockpiles on hard surfaces without suitable protection

Grouped building lots SEE FACT SHEET 7

When one builder controls more than one building lot, combined-lot sediment control structures may be placed down-slope if:

- the combined sediment control measures provide a level of protection at least equal to that provided by individual lot protection
- suitable drainage and erosion controls measures are applied to each building lot
- a suitable sign is placed in a prominent location outside each lot and/or at the entrance of the estate indicating such controls are in place.

Erosion and Sediment Control Management Plans SEE FACT SHEET 9

Where appropriate, discuss the submission of a management plan with the appropriate building control body. These plans need to communicate to all - builders, subcontractors, private certifiers, home owners and regulators involved in the building – how stormwater pollution will be controlled on the site.

EROSION AND SEDIMENT CONTROL INSTALLATION SEQUENCE

1. Establish a single stabilised entry/exit point (rumble pad).
2. Install sediment fence(s) along the low side of the site.
3. Divert up-slope water around the work site and appropriately stabilise any drainage channels.
4. Clear only the areas necessary (maintaining vegetation on footpath).
5. Stockpile topsoil within the sediment controlled zone.
6. Stabilise exposed earth banks (for example, vegetation or erosion control blankets).
7. Install on-site waste receptacles (mini-skips, bins, wind-proof litter receptors).
8. Install roof downpipes as soon as practicable after the roof is laid.
9. Ensure that all control measures are maintained in good working order.
10. Revegetate or otherwise stabilise the site.

- *Stockpile is located behind the sediment fence*
- *Good site planning*
- *Turf strip well maintained*
- *Sediment fence well constructed and in correct location*

- *Stockpile has not been placed behind the sediment fence*
- *Building waste and litter has not been placed in the skip*
- *Poor site planning and management*

Erosion and sediment control daily site check list SEE FACT SHEET 8

An erosion and sediment control check list has been developed to assist builders and site supervisors managing the task of control measure maintenance.

For further information on erosion and sediment control, contact Brisbane City Council on 3403 8888 or Gold Coast City Council on 5582 8393.

Note: Diagrams and selected photos courtesy of Catchments & Creeks Pty Ltd.

Annex G

Detailed WBNM Results

Pre-Developed EU13
Post-Developed DU17a

Flow Comparison

ARI (Years)	A1 - T						
	Pre-Developed			Post-Developed			Impact (Exist v Post) (m^3/s)
	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	
1	5.41	25	15	5.41	25	15	0.00
2	7.08	25	15	7.08	25	15	0.00
5	9.34	25	15	9.34	25	15	0.00
10	10.87	25	15	10.87	25	15	0.00
20	12.75	25	15	12.75	25	15	0.00
50	14.07	25	15	14.07	25	15	0.00
100	15.92	25	15	15.92	25	15	0.00

Flow Comparison

ARI (Years)	A2 - T						
	Pre-Developed			Post-Developed			Impact (Exist v Post) (m3/s)
	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	
1	7.15	25	15	7.15	25	15	0.00
2	9.39	25	15	9.39	25	15	0.00
5	12.46	25	15	12.46	25	15	0.00
10	14.50	25	15	14.50	25	15	0.00
20	17.11	25	15	17.11	25	15	0.00
50	19.64	60	25	19.64	60	25	0.00
100	22.40	60	25	22.40	60	25	0.00

Flow Comparison

ARI (Years)	A3 - T						
	Pre-Developed			Post-Developed			Impact (Exist v Post) (m3/s)
	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	
1	7.68	60	35	7.68	60	35	0.00
2	10.25	60	35	10.25	60	35	0.00
5	14.03	60	35	14.03	60	35	0.00
10	16.58	60	32	16.58	60	32	0.00
20	19.87	60	30	19.87	60	30	0.00
50	23.73	60	32	23.73	60	32	0.00
100	27.25	60	31	27.25	60	31	0.00

Flow Comparison

ARI (Years)	A4a - T						
	Pre-Developed			Post-Developed			Impact (Exist v Post) (m3/s)
	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	
1	8.20	60	40	8.20	60	40	0.00
2	11.08	60	38	11.08	60	38	0.00
5	15.37	60	36	15.37	60	36	0.00
10	18.35	60	35	18.35	60	35	0.00
20	22.11	60	35	22.11	60	35	0.00
50	26.71	60	35	26.71	60	35	0.00
100	30.78	60	35	30.78	60	35	0.00

Flow Comparison

ARI (Years)	A4b - T						
	Pre-Developed			Post-Developed			Impact (Exist v Post) (m3/s)
	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	
1	8.82	60	45	8.67	60	45	-0.15
2	11.99	60	45	11.76	60	45	-0.23
5	16.67	60	43	16.35	60	42	-0.32
10	19.94	60	42	19.54	60	40	-0.40
20	24.04	60	41	23.60	60	40	-0.44
50	29.29	60	41	28.80	60	40	-0.50
100	33.79	60	40	33.22	60	40	-0.57

Flow Comparison

ARI (Years)	A5 - T						
	Pre-Development			Post-Developed			Impact (Pre v Post) (m^3/s)
	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	
1	13.56	25	15	13.56	25	15	0.00
2	17.56	25	15	17.56	25	15	0.00
5	22.95	25	15	22.95	25	15	0.00
10	26.43	25	15	26.43	25	15	0.00
20	30.89	25	15	30.89	25	15	0.00
50	33.96	25	15	33.96	25	15	0.00
100	38.32	25	15	38.32	25	15	0.00

Flow Comparison							
ARI (Years)	A6 - T						
	Pre-Development			Post-Developed			Impact (Pre v Post) (m^3/s)
	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	
1	13.70	60	25	13.70	60	25	0.00
2	18.29	60	25	18.29	60	25	0.00
5	25.06	60	25	25.06	60	25	0.00
10	29.84	60	25	29.84	60	25	0.00
20	35.68	60	25	35.68	60	25	0.00
50	42.40	60	30	42.40	60	30	0.00
100	48.65	60	30	48.65	60	30	0.00

Flow Comparison							
ARI (Years)	B8 - T						
	Pre-Development			Post-Developed			Impact (Pre v Post) (m^3/s)
	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	
1	5.14	25	15	5.89	25	15	0.76
2	6.70	25	15	7.63	25	15	0.92
5	8.82	25	15	9.96	25	15	1.13
10	10.23	25	15	11.44	25	15	1.22
20	11.98	25	15	13.36	25	15	1.38
50	13.18	25	15	14.59	25	15	1.41
100	14.89	25	15	16.45	25	15	1.56

Flow Comparison							
ARI (Years)	A7 - T						
	Pre-Developed			Post-Developed			Impact (Pre v Post) (m^3/s)
	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	
1	20.80	60	50	21.06	60	45	0.26
2	28.56	60	47	28.88	60	45	0.32
5	40.21	60	45	40.51	60	45	0.31
10	48.52	60	45	48.64	60	45	0.12
20	58.71	60	45	58.78	60	44	0.07
50	72.41	60	45	72.34	60	44	-0.07
100	83.59	60	45	83.56	60	43	-0.02

Flow Comparison							
ARI (Years)	B1 - T						
	Pre-Developed			Post-Developed			Impact (m^3/s)
	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	
1	3.71	60	31	3.67	60	25	-0.05
2	5.09	60	25	5.04	60	25	-0.04
5	7.12	60	25	7.05	60	25	-0.07
10	8.72	60	25	8.62	60	25	-0.10
20	10.47	60	25	10.34	60	25	-0.13
50	12.55	60	25	12.36	60	25	-0.18
100	14.40	60	25	14.18	60	25	-0.21

Flow Comparison							
ARI (Years)	B2 - T						
	Pre-Developed			Post-Developed			Impact (m^3/s)
	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	
1	4.23	60	36	4.18	60	36	-0.05
2	5.90	60	35	5.82	60	35	-0.08
5	8.35	60	35	8.22	60	35	-0.12
10	10.20	60	35	10.04	60	35	-0.17
20	12.29	60	35	12.08	60	35	-0.21
50	14.96	60	35	14.70	60	34	-0.26
100	17.20	60	34	16.90	60	34	-0.30

Flow Comparison							
ARI (Years)	B3 - T						
	Pre-Developed			Post-Developed			Impact (m^3/s)
	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	
1	0.83	60	25	0.83	60	25	0.00
2	1.16	60	25	1.16	60	25	0.00
5	1.64	60	25	1.64	60	25	0.00
10	2.03	25	15	2.03	25	15	0.00
20	2.44	25	15	2.44	25	15	0.00
50	2.87	60	25	2.87	60	25	0.00
100	3.30	60	25	3.30	60	25	0.00

Flow Comparison							
ARI (Years)	Left1a - T						
	Pre-Developed			Post-Developed			Impact (m^3/s)
	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	
1	3.07	25	15	3.07	25	15	0.00
2	4.10	25	15	4.10	25	15	0.00
5	5.51	25	15	5.51	25	15	0.00
10	6.54	25	15	6.54	25	15	0.00
20	7.73	25	15	7.73	25	15	0.00
50	8.65	25	15	8.65	25	15	0.00
100	9.82	25	15	9.82	25	15	0.00

Flow Comparison							
ARI (Years)	Left1 - T						
	Pre-Developed			Post-Developed			Impact (Pre v Post) (m^3/s)
	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	
1	3.77	60	35	3.77	60	35	0.00
2	5.17	60	35	5.17	60	35	0.00
5	7.23	60	35	7.23	60	35	0.00
10	8.78	60	31	8.78	60	31	0.00
20	10.60	60	30	10.60	60	30	0.00
50	12.88	60	30	12.88	60	30	0.00
100	14.84	60	30	14.84	60	30	0.00

Flow Comparison							
ARI (Years)	Left2 - T						
	Pre-Developed			Post-Developed			Impact (Pre v Post) (m3/s)
	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	
1	4.22	60	40	4.22	60	40	0.00
2	5.86	60	39	5.86	60	39	0.00
5	8.30	60	37	8.30	60	37	0.00
10	10.18	60	36	10.18	60	36	0.00
20	12.33	60	35	12.33	60	35	0.00
50	15.14	60	35	15.14	60	35	0.00
100	17.46	60	35	17.46	60	35	0.00

Flow Comparison							
ARI (Years)	Left4 - T						
	Pre-Development			Masterplan Development			Impact (Pre v Post) (m^3/s)
	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	
1	2.40	25	15	2.40	25	15	0.00
2	3.28	25	15	3.28	25	15	0.00
5	4.50	25	15	4.50	25	15	0.00
10	5.45	25	15	5.45	25	15	0.00
20	6.49	25	15	6.49	25	15	0.00
50	7.43	60	25	7.43	60	25	0.00
100	8.50	60	25	8.50	60	25	0.00

Flow Comparison							
ARI (Years)	Left5 - T						
	Pre-Developed			Post-Developed			Impact (Pre v Post) (m3/s)
	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	
1	2.57	25	15	2.56	25	15	0.00
2	3.39	25	15	3.38	25	15	-0.01
5	4.51	25	15	4.50	25	15	-0.01
10	5.28	25	15	5.26	25	15	-0.02
20	6.22	25	15	6.20	25	15	-0.02
50	6.91	25	15	6.88	25	15	-0.03
100	7.84	25	15	7.80	25	15	-0.04

Flow Comparison							
ARI (Years)	Left6 - T						
	Pre-Developed			Post-Developed			Impact (Pre v Post) (m3/s)
	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	
1	4.40	60	35	4.39	60	35	-0.01
2	5.98	60	34	5.96	60	34	-0.02
5	8.29	60	33	8.26	60	33	-0.03
10	9.99	60	32	9.95	60	32	-0.04
20	11.98	60	32	11.93	60	32	-0.05
50	14.35	60	32	14.28	60	32	-0.06
100	16.45	60	32	16.38	60	31	-0.07

Flow Comparison							
ARI (Years)	Left7 - T						
	Pre-Developed			Post-Developed			Impact (Pre v Post) (m3/s)
	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	
1	8.77	60	45	8.75	60	45	-0.02
2	12.20	60	44	12.17	60	44	-0.03
5	17.29	60	42	17.25	60	42	-0.04
10	21.17	60	41	21.12	60	41	-0.05
20	25.64	60	40	25.58	60	40	-0.06
50	31.55	60	40	31.48	60	40	-0.07
100	36.41	60	39	36.33	60	39	-0.08

Flow Comparison							
ARI (Years)	Left10 - T						
	Pre-Developed			Post-Developed			Impact (Pre v Post) (m3/s)
	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	
1	3.44	60	25	3.44	60	25	0.00
2	4.75	60	25	4.75	60	25	0.00
5	6.69	60	25	6.69	60	25	0.00
10	8.19	60	25	8.19	60	25	0.00
20	9.88	60	25	9.88	60	25	0.00
50	11.87	60	25	11.87	60	25	0.00
100	13.66	60	25	13.66	60	25	0.00

Flow Comparison							
ARI (Years)	Left11 - T						
	Pre-Developed			Post-Developed			Impact (Pre v Post) (m3/s)
	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	
1	3.85	60	37	3.85	60	37	0.00
2	5.37	60	35	5.37	60	35	0.00
5	7.61	60	35	7.61	60	35	0.00
10	9.30	60	35	9.30	60	35	0.00
20	11.21	60	35	11.21	60	35	0.00
50	13.68	60	35	13.68	60	35	0.00
100	15.74	60	34	15.74	60	34	0.00

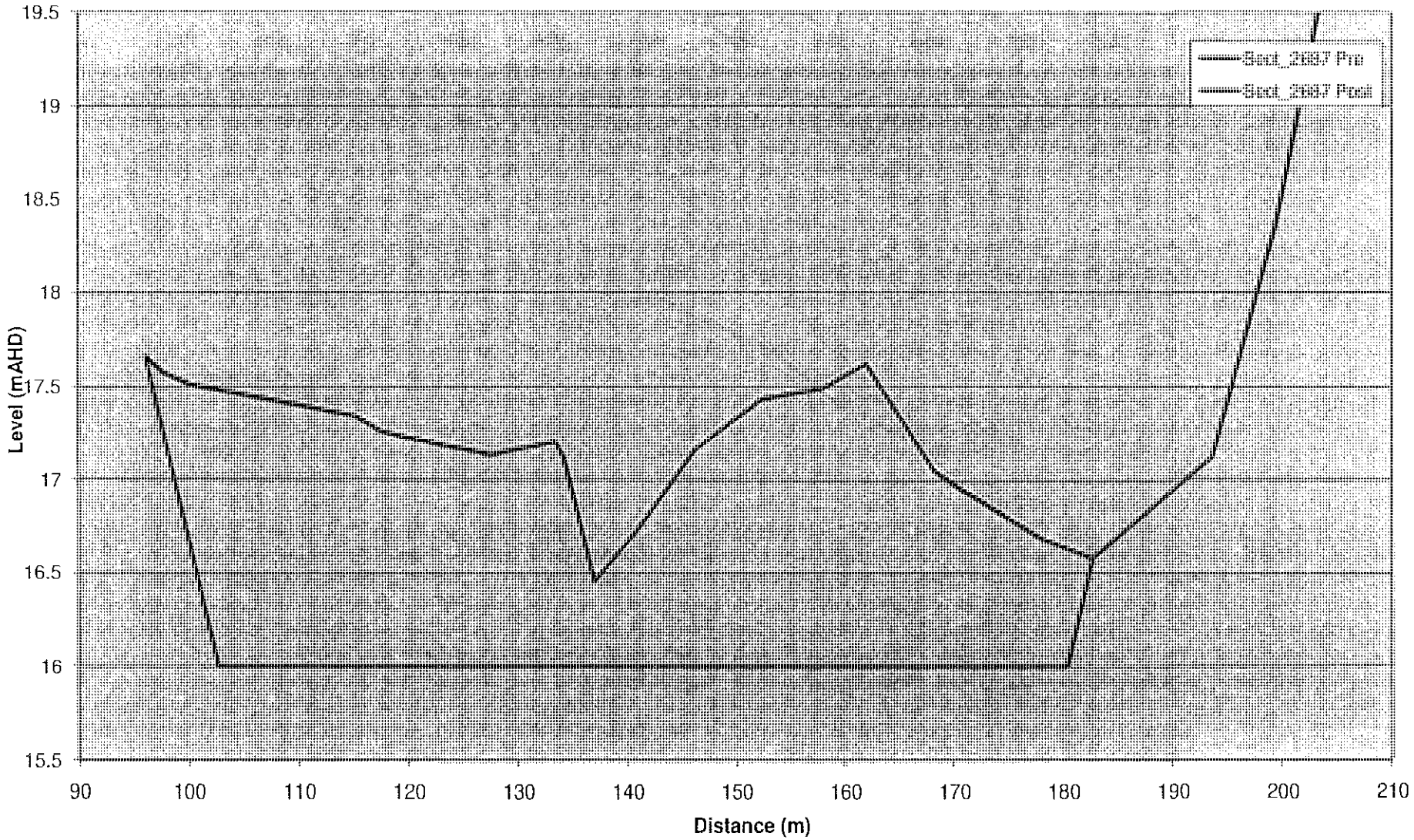
Flow Comparison							
ARI (Years)	Left9						
	Pre-Developed			Post-Developed			Impact (Pre v Post) (m3/s)
	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	
1	12.11	60	55	12.10	60	55	-0.01
2	17.02	60	52	17.01	60	52	-0.02
5	24.41	60	50	24.38	60	50	-0.03
10	30.10	60	48	30.07	60	48	-0.04
20	36.67	60	47	36.63	60	47	-0.04
50	46.04	60	46	45.98	60	46	-0.06
100	53.33	60	46	53.27	60	46	-0.07

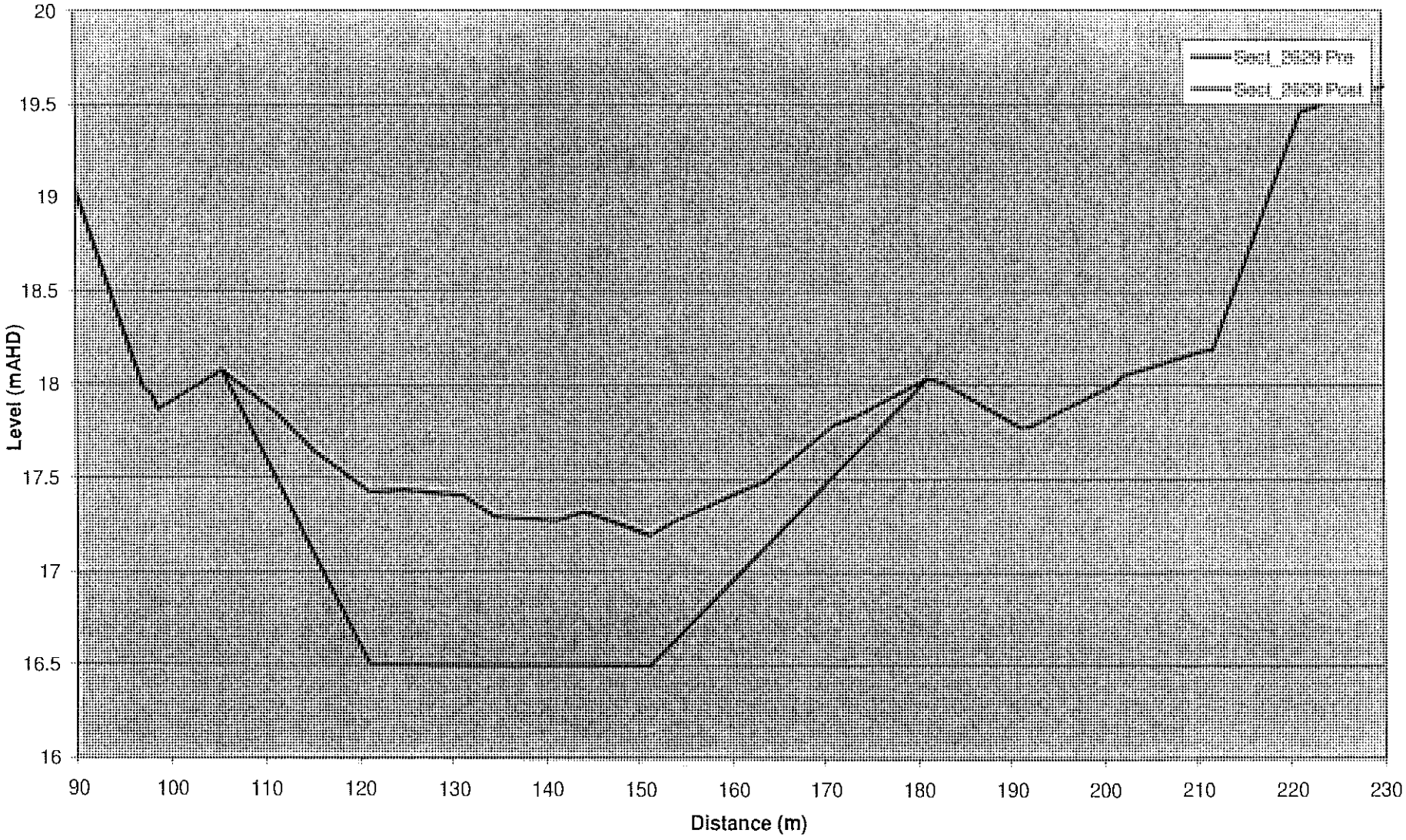
Flow Comparison							
ARI (Years)	RPWest						
	Pre-Developed			Post-Developed			Impact (Pre v Post) (m3/s)
	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	
1	13.91	60	52	13.90	60	52	-0.01
2	19.60	60	50	19.58	60	50	-0.02
5	28.12	60	47	28.09	60	47	-0.03
10	34.77	60	45	34.74	60	45	-0.03
20	42.40	60	45	42.36	60	45	-0.04
50	53.26	60	45	53.21	60	45	-0.05
100	61.64	60	45	61.57	60	45	-0.06

Flow Comparison							
ARI (Years)	RPEast						
	Pre-Developed			Post-Developed			Impact (Pre v Post) (m3/s)
	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	Flow (m^3/s)	Critical Duration (min)	Time to peak (min)	
1	25.14	90	73	26.08	60	54	0.94
2	34.69	60	55	36.06	60	52	1.37
5	49.37	60	54	51.10	60	50	1.73
10	60.07	60	52	61.90	60	49	1.83
20	73.21	60	50	75.29	60	48	2.09
50	92.06	60	50	94.07	60	48	2.01
100	106.88	60	50	109.14	60	48	2.26

Annex H

Detailed SOBEK Results


19.5
19
18.5
18
17.5
17
16.5
16
15.5
Level (mAHD)
90
100
110
120
130
140
150
160
170
180
190
200
210
Distance (m)



O:\WorkLAT\J8714\SobekLoc\Setup\East\DU10c Adjusted Cross Sections Eastern Trib

2/11/201011:22 AM

Existing Case: EU05a (Citiswich) J8714_LE.lit SOBEK v2.10.003
Developed Case: DU10c

Cardno Lawson Treloar

SOBEK Cross-section		Peak Flood Levels (m AHD)																				
Pre- ID	Post- ID	100 Year ARI			50 Year ARI			20 Year ARI			10 Year ARI			5 Year ARI			2 Year ARI			1 Year ARI		
		Ex	Dev	Impact	Ex	Dev	Impact	Ex	Dev	Impact	Ex	Dev	Impact	Ex	Dev	Impact	Ex	Dev	Impact	Ex	Dev	Impact
		Eastern Tributary 1 of Bremer River																				
sect1_259	sect1_259	41.41	41.41		41.36	41.36		41.30	41.30		41.24	41.24		41.19	41.19		41.09	41.09		41.01	41.01	
sect1_329	sect1_329	40.57	40.57		40.54	40.54		40.49	40.49		40.43	40.43		40.37	40.37		40.21	40.21		40.12	40.12	
sect1_409	sect1_409	40.44	40.44		40.41	40.41		40.37	40.37		40.30	40.30		40.21	40.21		39.80	39.80		39.47	39.47	
		Brisbane Road																				
sect1_468	sect1_468	40.00	40.00		39.94	39.94		39.83	39.83		39.48	39.48		39.13	39.13		38.68	38.68		38.48	38.48	
		Railway																				
sect1_517	sect1_517	38.15	38.15		38.10	38.10		38.03	38.03		37.96	37.96		37.89	37.89		37.79	37.79		37.69	37.69	
sect1_581	sect1_581	37.03	37.03		36.96	36.96		36.87	36.87		36.78	36.78		36.72	36.72		36.61	36.61		36.52	36.52	
sect1_674	sect1_674	35.70	35.70		35.64	35.64		35.57	35.57		35.50	35.50		35.44	35.44		35.35	35.35		35.25	35.25	
sect1_784	sect1_784	35.46	35.46		35.42	35.42		35.36	35.36		35.30	35.30		35.26	35.26		35.18	35.18		35.08	35.08	
sect1_897	sect1_897	34.16	34.16		34.03	34.03		33.89	33.89		33.80	33.80		33.72	33.72		33.62	33.62		33.53	33.53	
sect1_937	sect1_937	33.58	33.58		33.29	33.29		33.00	33.00		32.83	32.83		32.70	32.70		32.53	32.53		32.37	32.37	
		Hoepner Road																				
sect1_1045	sect1_1045	32.35	32.35		32.29	32.30	0.01	32.22	32.22		32.16	32.16		32.12	32.12		32.06	32.06		32.01	32.01	
sect1_1142	sect1_1142	31.56	31.55	-0.01	31.42	31.41	-0.01	31.17	31.16	-0.01	30.87	30.86	-0.01	30.62	30.62		30.31	30.31		30.11	30.12	0.01
sect1_1271	sect1_1271	31.52	31.52		31.39	31.38	-0.01	31.15	31.14	-0.01	30.84	30.82	-0.02	30.57	30.56	-0.01	30.22	30.22		29.99	29.99	
		Railway																				
sect1_1386	sect1_1386	28.48	28.47	-0.01	28.38	28.38		28.27	28.26	-0.01	28.20	28.20		28.15	28.15		28.06	28.07	0.01	27.98	27.98	
sect1_1443	sect1_1443	28.17	28.17		28.07	28.07		27.96	27.95	-0.01	27.89	27.89		27.84	27.84		27.75	27.75		27.66	27.66	
sect1_1569	sect1_1569	27.44	27.46	0.02	27.12	27.13	0.01	26.93	26.94	0.01	26.84	26.85	0.01	26.77	26.78	0.01	26.65	26.66	0.01	26.56	26.56	
sect1_1659	sect1_1659	27.34	27.37	0.03	26.79	26.81	0.02	26.18	26.21	0.03	25.80	25.83	0.03	25.51	25.54	0.03	25.12	25.14	0.02	24.88	24.89	0.01
sect1_1741	sect1_1741	27.33	27.35	0.02	26.76	26.79	0.03	26.12	26.16	0.04	25.73	25.76	0.03	25.40	25.43	0.03	24.93	24.95	0.02	24.62	24.63	0.01
		Railway																				
sect1_1789	sect1_1789	25.16	25.16		25.05	25.06	0.01	24.90	24.91	0.01	24.78	24.79	0.01	24.67	24.68	0.01	24.47	24.48	0.01	24.28	24.29	0.01
sect1_1851	sect1_1851	24.66	24.67	0.01	24.57	24.58	0.01	24.44	24.45	0.01	24.35	24.35		24.25	24.26	0.01	24.08	24.08		23.92	23.93	0.01
sect1_1927	sect1_1927	24.24	24.24		24.15	24.16	0.01	24.03	24.04	0.01	23.93	23.94	0.01	23.84	23.85	0.01	23.66	23.67	0.01	23.48	23.49	0.01

Existing Case: EU05a (Citiswich) J8714_LE.lit SOBEK v2.10.003
Developed Case: DU10c

SOBEK Cross-section		Peak Flood Levels (m AHD)																				
Pre- ID	Post- ID	100 Year ARI			50 Year ARI			20 Year ARI			10 Year ARI			5 Year ARI			2 Year ARI			1 Year ARI		
		Ex	Dev	Impact	Ex	Dev	Impact	Ex	Dev	Impact	Ex	Dev	Impact	Ex	Dev	Impact	Ex	Dev	Impact	Ex	Dev	Impact
sect1_1996	sect1_1996	23.79	23.80	0.01	23.71	23.71		23.60	23.60		23.50	23.51	0.01	23.41	23.42	0.01	23.24	23.25	0.01	23.05	23.07	0.02
sect1_2070	sect1_2070	22.99	23.00	0.01	22.90	22.91	0.01	22.78	22.78		22.67	22.68	0.01	22.57	22.58	0.01	22.40	22.41	0.01	22.25	22.26	0.01
sect1_2098	sect1_2098	22.13	22.13		22.05	22.05		21.94	21.95	0.01	21.87	21.87		21.80	21.81	0.01	21.68	21.69	0.01	21.59	21.59	
sect1_2116	sect1_2116	22.07	22.08	0.01	22.00	22.01	0.01	21.91	21.91		21.83	21.84	0.01	21.76	21.77	0.01	21.65	21.65		21.55	21.55	
sect1_2134	sect1_2134	21.69	21.69		21.59	21.60	0.01	21.47	21.48	0.01	21.38	21.39	0.01	21.29	21.30	0.01	21.15	21.16	0.01	21.02	21.03	0.01
sect1_2152	sect1_2152	21.48	21.49	0.01	21.39	21.40	0.01	21.27	21.28	0.01	21.17	21.18	0.01	21.08	21.09	0.01	20.92	20.93	0.01	20.78	20.78	
sect1_2189	sect1_2189	21.36	21.36		21.27	21.27		21.15	21.16	0.01	21.06	21.06		20.97	20.97		20.81	20.81		20.66	20.67	0.01
sect1_2222	sect1_2222	21.02	21.02		20.94	20.94		20.83	20.83		20.74	20.74		20.65	20.66	0.01	20.50	20.50		20.36	20.37	0.01
sect1_2236	sect1_2236	20.52	20.52		20.44	20.44		20.35	20.35		20.27	20.28	0.01	20.20	20.21	0.01	20.08	20.09	0.01	19.97	19.98	0.01
sect1_2281	sect1_2281	20.21	20.21		20.13	20.14	0.01	20.04	20.05	0.01	19.96	19.97	0.01	19.88	19.89	0.01	19.74	19.75	0.01	19.62	19.63	0.01
sect1_2348	sect1_2348	19.96	19.96		19.89	19.89		19.81	19.82	0.01	19.74	19.75	0.01	19.68	19.68		19.56	19.56		19.45	19.46	0.01
sect1_2410	sect1_2410	19.54	19.54		19.47	19.47		19.38	19.38		19.31	19.32	0.01	19.25	19.25		19.13	19.14	0.01	19.04	19.05	0.01
sect1_2422	sect1_2422	19.54	19.54		19.47	19.47		19.38	19.38		19.31	19.32	0.01	19.25	19.25		19.14	19.14		19.05	19.05	
sect1_2437	sect1_2437	19.45	19.45		19.38	19.37	-0.01	19.28	19.29	0.01	19.21	19.22	0.01	19.15	19.15		19.03	19.04	0.01	18.94	18.95	0.01
sect1_2459	sect1_2459	19.18	19.17	-0.01	19.10	19.10		19.01	19.01		18.95	18.95		18.89	18.89		18.79	18.79		18.71	18.72	0.01
sect1_2474	sect1_2474	19.03	19.02	-0.01	18.94	18.93	-0.01	18.82	18.81	-0.01	18.74	18.73	-0.01	18.67	18.66	-0.01	18.56	18.55	-0.01	18.46	18.46	
sect1_2507	sect1_2507	18.79	18.76	-0.03	18.68	18.65	-0.03	18.51	18.47	-0.04	18.40	18.36	-0.04	18.32	18.28	-0.04	18.20	18.16	-0.04	18.10	18.07	-0.03
sect1_2534	sect1_2534	18.67	18.63	-0.04	18.54	18.49	-0.05	18.32	18.24	-0.08	18.16	18.05	-0.11	18.06	17.92	-0.14	17.91	17.76	-0.15	17.79	17.65	-0.14
sect1_2576	sect1_2576	18.65	18.61	-0.04	18.52	18.47	-0.05	18.29	18.20	-0.09	18.12	17.98	-0.14	18.00	17.81	-0.19	17.86	17.62	-0.24	17.73	17.49	-0.24
sect1_2629	sect1_2629	18.60	18.56	-0.04	18.47	18.41	-0.06	18.22	18.12	-0.10	18.02	17.85	-0.17	17.90	17.62	-0.28	17.75	17.36	-0.39	17.64	17.19	-0.45
sect1_2687	sect1_2687	18.55	18.53	-0.02	18.40	18.38	-0.02	18.12	18.07	-0.05	17.86	17.76	-0.10	17.66	17.48	-0.18	17.45	17.10	-0.35	17.31	16.84	-0.47
sect1_2725	sect1_2725	18.52	18.52		18.37	18.37		18.07	18.07		17.75	17.76	0.01	17.45	17.47	0.02	17.04	17.09	0.05	16.75	16.82	0.07
		Warrego Highway																				
sect1_2804	sect1_2804	16.85	16.85		16.78	16.78		16.68	16.68		16.62	16.62		16.55	16.55		16.41	16.42	0.01	16.27	16.28	0.01
sect1_2871	sect1_2871	16.00	16.00		15.91	15.90	-0.01	15.77	15.76	-0.01	15.67	15.67		15.58	15.58		15.41	15.42	0.01	15.26	15.27	0.01

Existing Case: EU05a
Developed Case: DU10c

SOBEK Cross-section		Peak Flood Depths (m)																				
Pre- ID	Post- ID	100 Year ARI			50 Year ARI			20 Year ARI			10 Year ARI			5 Year ARI			2 Year ARI			1 Year ARI		
		Ex	Dev	Impact	Ex	Dev	Impact	Ex	Dev	Impact	Ex	Dev	Impact	Ex	Dev	Impact	Ex	Dev	Impact	Ex	Dev	Impact
		Eastern Tributary 1 of Bremer River																				
sect1_259	sect1_259	1.15	1.15		1.10	1.10		1.04	1.04		0.98	0.98		0.93	0.93		0.83	0.83		0.76	0.76	
sect1_329	sect1_329	1.20	1.20		1.16	1.16		1.12	1.12		1.06	1.06		0.99	0.99		0.84	0.84		0.75	0.75	
sect1_409	sect1_409	1.44	1.44		1.41	1.41		1.37	1.37		1.30	1.30		1.21	1.21		0.80	0.80		0.47	0.47	
		Brisbane Road																				
sect1_468	sect1_468	2.30	2.30		2.24	2.24		2.13	2.13		1.78	1.78		1.43	1.43		0.98	0.98		0.78	0.78	
		Railway																				
sect1_517	sect1_517	1.45	1.45		1.40	1.40		1.33	1.33		1.25	1.25		1.19	1.19		1.08	1.08		0.99	0.99	
sect1_581	sect1_581	1.11	1.11		1.04	1.04		0.94	0.94		0.85	0.85		0.79	0.79		0.69	0.69		0.60	0.60	
sect1_674	sect1_674	1.70	1.70		1.64	1.64		1.57	1.57		1.50	1.50		1.44	1.44		1.35	1.35		1.25	1.25	
sect1_784	sect1_784	1.46	1.46		1.42	1.42		1.36	1.36		1.30	1.30		1.26	1.26		1.18	1.18		1.08	1.08	
sect1_897	sect1_897	1.16	1.16		1.03	1.03		0.89	0.89		0.80	0.80		0.72	0.72		0.62	0.62		0.53	0.53	
sect1_937	sect1_937	2.18	2.18		1.89	1.89		1.60	1.60		1.43	1.43		1.30	1.30		1.13	1.13		0.97	0.97	
		Hoepner Road																				
sect1_1045	sect1_1045	0.79	0.79		0.73	0.73		0.66	0.66		0.60	0.60		0.56	0.56		0.50	0.50		0.44	0.44	
sect1_1142	sect1_1142	2.66	2.65	-0.01	2.52	2.51	-0.01	2.28	2.27	-0.01	1.97	1.96	-0.01	1.73	1.72	-0.01	1.42	1.42		1.21	1.22	0.01
sect1_1271	sect1_1271	2.52	2.52		2.39	2.38	-0.01	2.15	2.14	-0.01	1.84	1.82	-0.02	1.57	1.56	-0.01	1.22	1.22		0.99	0.99	
		Railway																				
sect1_1386	sect1_1386	1.21	1.21		1.12	1.12		1.00	1.00		0.94	0.94		0.89	0.89		0.80	0.80		0.71	0.71	
sect1_1443	sect1_1443	1.17	1.17		1.07	1.07		0.96	0.95	-0.01	0.89	0.89		0.84	0.84		0.75	0.75		0.66	0.66	
sect1_1569	sect1_1569	1.84	1.86	0.02	1.51	1.52	0.01	1.33	1.34	0.01	1.24	1.24		1.17	1.17		1.05	1.06	0.01	0.95	0.96	0.01
sect1_1659	sect1_1659	3.87	3.89	0.02	3.31	3.34	0.03	2.70	2.73	0.03	2.33	2.36	0.03	2.04	2.06	0.02	1.65	1.66	0.01	1.40	1.42	0.02
sect1_1741	sect1_1741	4.33	4.35	0.02	3.76	3.79	0.03	3.12	3.16	0.04	2.73	2.76	0.03	2.40	2.43	0.03	1.93	1.95	0.02	1.62	1.63	0.01
		Railway																				
sect1_1789	sect1_1789	2.70	2.71	0.01	2.59	2.60	0.01	2.44	2.45	0.01	2.32	2.33	0.01	2.21	2.22	0.01	2.01	2.02	0.01	1.82	1.83	0.01
sect1_1851	sect1_1851	2.20	2.20		2.11	2.11		1.98	1.99	0.01	1.88	1.89	0.01	1.79	1.80	0.01	1.61	1.62	0.01	1.46	1.47	0.01
sect1_1927	sect1_1927	1.98	1.99	0.01	1.90	1.90		1.77	1.78	0.01	1.67	1.68	0.01	1.58	1.59	0.01	1.40	1.41	0.01	1.23	1.24	0.01

Existing Case: EU05a
Developed Case: DU10c

SOBEK Cross-section		Peak Flood Depths (m)																				
Pre- ID	Post- ID	100 Year ARI			50 Year ARI			20 Year ARI			10 Year ARI			5 Year ARI			2 Year ARI			1 Year ARI		
		Ex	Dev	Impact	Ex	Dev	Impact	Ex	Dev	Impact	Ex	Dev	Impact	Ex	Dev	Impact	Ex	Dev	Impact	Ex	Dev	Impact
sect1_1996	sect1_1996	2.71	2.72	0.01	2.63	2.63		2.52	2.52		2.42	2.43	0.01	2.33	2.34	0.01	2.16	2.17	0.01	1.97	1.99	0.02
sect1_2070	sect1_2070	2.24	2.24		2.15	2.16	0.01	2.02	2.03	0.01	1.92	1.93	0.01	1.82	1.83	0.01	1.65	1.66	0.01	1.50	1.51	0.01
sect1_2098	sect1_2098	1.47	1.48	0.01	1.39	1.39		1.28	1.29	0.01	1.21	1.22	0.01	1.14	1.15	0.01	1.03	1.03		0.93	0.94	0.01
sect1_2116	sect1_2116	1.10	1.10		1.02	1.03	0.01	0.93	0.93		0.85	0.86	0.01	0.79	0.79		0.67	0.67		0.57	0.58	0.01
sect1_2134	sect1_2134	1.76	1.77	0.01	1.67	1.68	0.01	1.55	1.55		1.46	1.46		1.37	1.38	0.01	1.23	1.23		1.10	1.11	0.01
sect1_2152	sect1_2152	1.87	1.87		1.78	1.78		1.66	1.66		1.56	1.57	0.01	1.47	1.48	0.01	1.31	1.32	0.01	1.16	1.17	0.01
sect1_2189	sect1_2189	1.95	1.95		1.86	1.86		1.74	1.75	0.01	1.65	1.65		1.56	1.56		1.40	1.40		1.25	1.26	0.01
sect1_2222	sect1_2222	1.70	1.70		1.62	1.63	0.01	1.51	1.51		1.42	1.43	0.01	1.33	1.34	0.01	1.18	1.19	0.01	1.04	1.05	0.01
sect1_2236	sect1_2236	1.27	1.27		1.19	1.19		1.10	1.10		1.02	1.03	0.01	0.95	0.96	0.01	0.83	0.83		0.72	0.72	
sect1_2281	sect1_2281	1.70	1.70		1.62	1.63	0.01	1.53	1.54	0.01	1.45	1.46	0.01	1.37	1.38	0.01	1.23	1.24	0.01	1.11	1.12	0.01
sect1_2348	sect1_2348	1.42	1.42		1.36	1.36		1.28	1.28		1.21	1.21		1.14	1.15	0.01	1.02	1.03	0.01	0.92	0.93	0.01
sect1_2410	sect1_2410	2.03	2.03		1.96	1.96		1.87	1.87		1.80	1.81	0.01	1.74	1.74		1.62	1.63	0.01	1.53	1.54	0.01
sect1_2422	sect1_2422	1.13	1.12	-0.01	1.05	1.05		0.97	0.97		0.90	0.90		0.83	0.84	0.01	0.72	0.73	0.01	0.63	0.64	0.01
sect1_2437	sect1_2437	1.24	1.24		1.17	1.16	-0.01	1.08	1.08		1.00	1.01	0.01	0.94	0.94		0.83	0.83		0.73	0.74	0.01
sect1_2459	sect1_2459	1.12	1.11	-0.01	1.04	1.03	-0.01	0.95	0.95		0.89	0.88	-0.01	0.83	0.83		0.73	0.73		0.65	0.65	
sect1_2474	sect1_2474	1.15	1.13	-0.02	1.06	1.04	-0.02	0.94	0.92	-0.02	0.86	0.84	-0.02	0.79	0.78	-0.01	0.67	0.67		0.58	0.58	
sect1_2507	sect1_2507	1.48	1.45	-0.03	1.36	1.33	-0.03	1.20	1.16	-0.04	1.09	1.05	-0.04	1.01	0.97	-0.04	0.89	0.85	-0.04	0.79	0.75	-0.04
sect1_2534	sect1_2534	1.80	1.76	-0.04	1.67	1.63	-0.04	1.45	1.38	-0.07	1.30	1.19	-0.11	1.19	1.06	-0.13	1.05	0.90	-0.15	0.92	0.78	-0.14
sect1_2576	sect1_2576	1.97	1.93	-0.04	1.84	1.79	-0.05	1.61	1.52	-0.09	1.44	1.30	-0.14	1.33	1.13	-0.20	1.18	0.94	-0.24	1.06	0.81	-0.25
sect1_2629	sect1_2629	1.91	2.06	0.15	1.77	1.91	0.14	1.52	1.62	0.10	1.33	1.35	0.02	1.20	1.12	-0.08	1.05	0.86	-0.19	0.94	0.69	-0.25
sect1_2687	sect1_2687	2.09	2.53	0.44	1.95	2.38	0.43	1.67	2.07	0.40	1.40	1.76	0.36	1.20	1.48	0.28	0.99	1.10	0.11	0.86	0.84	-0.02
sect1_2725	sect1_2725	3.47	3.47		3.32	3.32		3.02	3.02		2.70	2.71	0.01	2.40	2.42	0.02	1.99	2.04	0.05	1.70	1.77	0.07
		Warrego Highway																				
sect1_2804	sect1_2804	1.47	1.47		1.41	1.41		1.31	1.31		1.25	1.24	-0.01	1.18	1.18		1.04	1.05	0.01	0.89	0.90	0.01
sect1_2871	sect1_2871	2.02	2.02		1.92	1.92		1.78	1.78		1.69	1.68	-0.01	1.60	1.60		1.43	1.43		1.27	1.28	0.01

Existing Case: EU05a
Developed Case: DU10c

SOBEK Cross-section		Peak Discharge (m^3/s)																				
Pre- ID	Post- ID	100 Year ARI			50 Year ARI			20 Year ARI			10 Year ARI			5 Year ARI			2 Year ARI			1 Year ARI		
		Ex	Dev	Impact	Ex	Dev	Impact	Ex	Dev	Impact	Ex	Dev	Impact	Ex	Dev	Impact	Ex	Dev	Impact	Ex	Dev	Impact
		Eastern Tributary 1 of Bremer River																				
sect1_259	sect1_259	27.24	27.24		23.73	23.73		19.87	19.87		16.58	16.58		14.03	14.03		10.25	10.25		7.67	7.67	
sect1_329	sect1_329	27.23	27.23		23.71	23.71		19.78	19.78		16.52	16.52		13.97	13.96	-0.01	10.24	10.24		7.66	7.66	
sect1_409	sect1_409	27.21	27.21		23.68	23.68		19.60	19.60		16.21	16.21		13.62	13.62		10.17	10.17		7.65	7.65	
		Brisbane Road																				
sect1_468	sect1_468	27.21	27.21		23.67	23.67		19.48	19.48		15.90	15.89	-0.01	13.55	13.55		10.16	10.16		7.64	7.64	
		Railway																				
sect1_517	sect1_517	27.20	27.20		23.67	23.67		19.44	19.44		15.87	15.87		13.54	13.53	-0.01	10.16	10.16		7.64	7.64	
sect1_581	sect1_581	27.19	27.19		23.65	23.66	0.01	19.41	19.41		15.87	15.87		13.53	13.53		10.16	10.16		7.64	7.64	
sect1_674	sect1_674	27.20	27.20		23.66	23.66		19.44	19.44		15.87	15.87		13.54	13.53	-0.01	10.16	10.16		7.64	7.64	
sect1_784	sect1_784	27.17	27.17		23.63	23.63		19.40	19.40		15.87	15.87		13.53	13.53		10.16	10.16		7.63	7.63	
sect1_897	sect1_897	27.20	27.20		23.62	23.62		19.34	19.33	-0.01	15.88	15.88		13.53	13.53		10.17	10.17		7.64	7.64	
sect1_937	sect1_937	27.25	27.25		23.64	23.64		19.34	19.33	-0.01	15.91	15.91		13.56	13.56		10.19	10.18	-0.01	7.66	7.66	
		Hoepner Road																				
sect1_1045	sect1_1045	32.37	32.38	0.01	27.97	27.97		22.62	22.62		18.67	18.67		15.91	15.90	-0.01	12.20	12.20		9.20	9.20	
sect1_1142	sect1_1142	32.54	32.53	-0.01	28.05	28.05		22.64	22.64		18.68	18.68		15.91	15.91		12.20	12.20		9.20	9.20	
sect1_1271	sect1_1271	32.57	32.57		28.08	28.07	-0.01	22.66	22.66		18.68	18.68		15.91	15.91		12.20	12.20		9.20	9.20	
		Railway																				
sect1_1386	sect1_1386	34.43	34.19	-0.24	28.85	28.67	-0.18	22.31	22.15	-0.16	19.03	18.93	-0.10	16.73	16.68	-0.05	13.18	13.20	0.02	10.07	10.13	0.06
sect1_1443	sect1_1443	34.31	34.08	-0.23	28.79	28.61	-0.18	22.29	22.14	-0.15	19.03	18.93	-0.10	16.73	16.67	-0.06	13.17	13.19	0.02	10.05	10.12	0.07
sect1_1569	sect1_1569	71.43	71.72	0.29	61.37	61.74	0.37	51.06	51.74	0.68	43.76	44.40	0.64	37.66	38.28	0.62	28.26	28.72	0.46	21.37	21.78	0.41
sect1_1659	sect1_1659	68.77	69.10	0.33	60.26	60.62	0.36	50.22	50.84	0.62	43.31	43.90	0.59	37.48	38.04	0.56	28.22	28.69	0.47	21.35	21.76	0.41
sect1_1741	sect1_1741	67.15	67.48	0.33	59.28	59.67	0.39	49.61	50.14	0.53	43.00	43.54	0.54	37.26	37.80	0.54	28.15	28.60	0.45	21.31	21.72	0.41
		Railway																				
sect1_1789	sect1_1789	67.14	67.45	0.31	59.27	59.65	0.38	49.59	50.13	0.54	42.98	43.52	0.54	37.25	37.79	0.54	28.14	28.60	0.46	21.31	21.70	0.39
sect1_1851	sect1_1851	67.11	67.44	0.33	59.25	59.63	0.38	49.58	50.10	0.52	42.97	43.50	0.53	37.22	37.77	0.55	28.13	28.57	0.44	21.29	21.68	0.39
sect1_1927	sect1_1927	67.08	67.40	0.32	59.22	59.60	0.38	49.56	50.08	0.52	42.93	43.47	0.54	37.19	37.73	0.54	28.10	28.54	0.44	21.26	21.65	0.39

Existing Case: EU05a
Developed Case: DU10c

SOBEK Cross-section		Peak Discharge (m^3/s)																				
Pre- ID	Post- ID	100 Year ARI			50 Year ARI			20 Year ARI			10 Year ARI			5 Year ARI			2 Year ARI			1 Year ARI		
		Ex	Dev	Impact	Ex	Dev	Impact	Ex	Dev	Impact	Ex	Dev	Impact	Ex	Dev	Impact	Ex	Dev	Impact	Ex	Dev	Impact
sect1_1996	sect1_1996	67.05	67.38	0.33	59.19	59.57	0.38	49.54	50.06	0.52	42.90	43.44	0.54	37.15	37.70	0.55	28.07	28.51	0.44	21.24	21.63	0.39
sect1_2070	sect1_2070	67.03	67.37	0.34	59.18	59.56	0.38	49.52	50.05	0.53	42.89	43.42	0.53	37.14	37.68	0.54	28.07	28.51	0.44	21.23	21.63	0.40
sect1_2098	sect1_2098	67.03	67.36	0.33	59.18	59.56	0.38	49.52	50.05	0.53	42.89	43.42	0.53	37.14	37.68	0.54	28.06	28.51	0.45	21.23	21.63	0.40
sect1_2116	sect1_2116	67.03	67.36	0.33	59.17	59.56	0.39	49.52	50.05	0.53	42.89	43.42	0.53	37.14	37.68	0.54	28.06	28.51	0.45	21.23	21.63	0.40
sect1_2134	sect1_2134	67.03	67.35	0.32	59.17	59.55	0.38	49.52	50.05	0.53	42.89	43.42	0.53	37.13	37.68	0.55	28.06	28.50	0.44	21.23	21.62	0.39
sect1_2152	sect1_2152	67.03	67.35	0.32	59.16	59.55	0.39	49.52	50.04	0.52	42.88	43.41	0.53	37.12	37.67	0.55	28.06	28.50	0.44	21.22	21.61	0.39
sect1_2189	sect1_2189	67.02	67.35	0.33	59.16	59.55	0.39	49.51	50.04	0.53	42.88	43.41	0.53	37.13	37.66	0.53	28.05	28.49	0.44	21.21	21.61	0.40
sect1_2222	sect1_2222	67.02	67.36	0.34	59.16	59.55	0.39	49.52	50.05	0.53	42.88	43.41	0.53	37.13	37.67	0.54	28.05	28.49	0.44	21.21	21.61	0.40
sect1_2236	sect1_2236	67.04	67.37	0.33	59.17	59.56	0.39	49.53	50.07	0.54	42.89	43.43	0.54	37.13	37.68	0.55	28.05	28.50	0.45	21.21	21.61	0.40
sect1_2281	sect1_2281	76.97	76.86	-0.11	68.19	68.49	0.30	58.39	59.00	0.61	50.40	51.09	0.69	43.27	44.09	0.82	32.27	32.97	0.70	24.22	24.79	0.57
sect1_2348	sect1_2348	76.94	76.84	-0.10	68.17	68.45	0.28	58.33	58.98	0.65	50.35	51.07	0.72	43.22	44.02	0.80	32.25	32.93	0.68	24.20	24.77	0.57
sect1_2410	sect1_2410	76.91	76.79	-0.12	68.13	68.38	0.25	58.29	58.95	0.66	50.30	51.03	0.73	43.18	44.00	0.82	32.22	32.90	0.68	24.17	24.74	0.57
sect1_2422	sect1_2422	76.89	76.78	-0.11	68.12	68.36	0.24	58.27	58.93	0.66	50.29	51.02	0.73	43.17	43.99	0.82	32.22	32.89	0.67	24.16	24.74	0.58
sect1_2437	sect1_2437	76.88	76.77	-0.11	68.11	68.35	0.24	58.26	58.92	0.66	50.29	51.02	0.73	43.17	43.98	0.81	32.22	32.89	0.67	24.16	24.74	0.58
sect1_2459	sect1_2459	76.86	76.74	-0.12	68.09	68.30	0.21	58.23	58.89	0.66	50.28	51.01	0.73	43.17	43.96	0.79	32.21	32.89	0.68	24.16	24.74	0.58
sect1_2474	sect1_2474	76.82	76.69	-0.13	68.03	68.19	0.16	58.18	58.84	0.66	50.25	50.98	0.73	43.15	43.96	0.81	32.20	32.88	0.68	24.15	24.73	0.58
sect1_2507	sect1_2507	76.72	76.57	-0.15	67.91	67.96	0.05	58.03	58.66	0.63	50.17	50.89	0.72	43.11	43.93	0.82	32.19	32.87	0.68	24.14	24.72	0.58
sect1_2534	sect1_2534	76.61	76.44	-0.17	67.76	67.75	-0.01	57.75	58.30	0.55	50.04	50.69	0.65	43.05	43.83	0.78	32.16	32.85	0.69	24.10	24.71	0.61
sect1_2576	sect1_2576	79.78	79.86	0.08	70.58	70.79	0.21	60.62	61.20	0.58	52.65	53.36	0.71	45.26	46.24	0.98	33.66	34.59	0.93	25.10	25.93	0.83
sect1_2629	sect1_2629	79.31	79.22	-0.09	69.97	69.84	-0.13	59.01	59.15	0.14	51.80	52.17	0.37	44.87	45.54	0.67	33.52	34.34	0.82	25.02	25.81	0.79
sect1_2687	sect1_2687	78.95	78.86	-0.09	69.57	69.40	-0.17	57.74	57.44	-0.30	50.70	50.43	-0.27	44.30	44.32	0.02	33.40	33.83	0.43	24.98	25.49	0.51
sect1_2725	sect1_2725	78.85	78.76	-0.09	69.48	69.30	-0.18	57.54	57.22	-0.32	50.42	50.20	-0.22	44.04	44.12	0.08	33.33	33.77	0.44	24.96	25.47	0.51
		Warrego Highway																				
sect1_2804	sect1_2804	78.74	78.64	-0.10	69.44	69.24	-0.20	57.51	57.19	-0.32	50.40	50.18	-0.22	44.02	44.10	0.08	33.31	33.75	0.44	24.96	25.47	0.51
sect1_2871	sect1_2871	78.72	78.63	-0.09	69.42	69.23	-0.19	57.49	57.18	-0.31	50.39	50.17	-0.22	44.01	44.09	0.08	33.31	33.74	0.43	24.94	25.46	0.52

Cardno Lawson Treloar

Existing Case: EU05a
Developed Case: DU10c

SOBEK Cross-section		Peak Velocity (m/s)																				
Pre- ID	Post- ID	100 Year ARI			50 Year ARI			20 Year ARI			10 Year ARI			5 Year ARI			2 Year ARI			1 Year ARI		
		Ex	Dev	Impact	Ex	Dev	Impact	Ex	Dev	Impact	Ex	Dev	Impact	Ex	Dev	Impact	Ex	Dev	Impact	Ex	Dev	Impact
		Eastern Tributary 1 of Bremer River																				
sect1_259	sect1_259	2.18	2.18		2.13	2.13		2.04	2.04		1.97	1.97		1.90	1.90		1.78	1.78		1.66	1.66	
sect1_329	sect1_329	1.75	1.75		1.74	1.74		1.73	1.73		1.71	1.71		1.71	1.71		1.64	1.64		1.56	1.56	
sect1_409	sect1_409	1.98	1.98		2.00	2.00		2.02	2.02		2.00	2.00		2.02	2.02		2.01	2.01		2.01	2.01	
		Brisbane Road																				
sect1_468	sect1_468	1.85	1.85		1.84	1.84		1.84	1.84		1.82	1.82		1.83	1.83		1.81	1.81		1.81	1.81	
		Railway																				
sect1_517	sect1_517	1.34	1.34		1.33	1.33		1.33	1.33		1.32	1.32		1.30	1.30		1.28	1.28		1.23	1.23	
sect1_581	sect1_581	1.80	1.80		1.78	1.78		1.70	1.70		1.60	1.60		1.53	1.53		1.40	1.40		1.29	1.29	
sect1_674	sect1_674	1.49	1.49		1.48	1.48		1.47	1.47		1.46	1.46		1.44	1.44		1.37	1.37		1.28	1.28	
sect1_784	sect1_784	1.13	1.13		1.08	1.08		1.00	1.00		0.92	0.92		0.85	0.85		0.73	0.73		0.68	0.68	
sect1_897	sect1_897	0.61	0.61		0.57	0.57		0.53	0.53		0.49	0.49		0.46	0.46		0.41	0.41		0.37	0.37	
sect1_937	sect1_937	0.57	0.57		0.55	0.55		0.51	0.51		0.49	0.49		0.48	0.48		0.48	0.48		0.47	0.47	
		Hoepner Road																				
sect1_1045	sect1_1045	1.40	1.39	-0.01	1.36	1.36		1.29	1.29		1.23	1.23		1.18	1.18		1.09	1.09		1.00	1.00	
sect1_1142	sect1_1142	1.94	1.94		1.92	1.92		1.87	1.87		1.80	1.80		1.74	1.74		1.63	1.63		1.50	1.50	
sect1_1271	sect1_1271	1.62	1.62		1.62	1.62		1.61	1.61		1.57	1.57		1.50	1.50		1.38	1.38		1.26	1.26	
		Railway																				
sect1_1386	sect1_1386	1.06	1.05	-0.01	1.00	1.00		0.92	0.92		0.87	0.87		0.84	0.83	-0.01	0.78	0.78		0.72	0.72	
sect1_1443	sect1_1443	0.97	0.97		0.94	0.94		0.88	0.88		0.84	0.84		0.81	0.81		0.76	0.76		0.71	0.71	
sect1_1569	sect1_1569	2.00	2.00		1.96	1.97	0.01	1.92	1.93	0.01	1.89	1.89		1.84	1.85	0.01	1.74	1.75	0.01	1.64	1.64	
sect1_1659	sect1_1659	1.40	1.40		1.37	1.38	0.01	1.36	1.37	0.01	1.34	1.35	0.01	1.31	1.33	0.02	1.27	1.26	-0.01	1.22	1.22	
sect1_1741	sect1_1741	1.24	1.24		1.29	1.29		1.16	1.16		1.09	1.09		1.14	1.14		1.02	1.02		1.06	1.06	
		Railway																				
sect1_1789	sect1_1789	2.07	2.07		1.98	1.98		1.84	1.85	0.01	1.74	1.75	0.01	1.65	1.66	0.01	1.48	1.49	0.01	1.34	1.35	0.01
sect1_1851	sect1_1851	1.48	1.48		1.43	1.43		1.35	1.35		1.29	1.30	0.01	1.24	1.25	0.01	1.15	1.15		1.07	1.08	0.01
sect1_1927	sect1_1927	1.37	1.37		1.33	1.34	0.01	1.28	1.28		1.23	1.23		1.18	1.18		1.10	1.10		1.04	1.04	

Cardno Lawson Treloar

Existing Case: EU05a
Developed Case: DU10c

SOBEK Cross-section		Peak Velocity (m/s)																				
Pre- ID	Post- ID	100 Year ARI			50 Year ARI			20 Year ARI			10 Year ARI			5 Year ARI			2 Year ARI			1 Year ARI		
		Ex	Dev	Impact	Ex	Dev	Impact	Ex	Dev	Impact	Ex	Dev	Impact	Ex	Dev	Impact	Ex	Dev	Impact	Ex	Dev	Impact
sect1_1996	sect1_1996	1.40	1.40		1.37	1.37		1.34	1.34		1.34	1.34		1.33	1.33		1.31	1.31		1.27	1.27	
sect1_2070	sect1_2070	2.56	2.56		2.56	2.56		2.53	2.53		2.43	2.44	0.01	2.34	2.35	0.01	2.14	2.15	0.01	1.94	1.96	0.02
sect1_2098	sect1_2098	1.74	1.75	0.01	1.67	1.68	0.01	1.57	1.57		1.47	1.48	0.01	1.38	1.39	0.01	1.21	1.22	0.01	1.06	1.07	0.01
sect1_2116	sect1_2116	1.90	1.90		1.89	1.89		1.87	1.87		1.81	1.81		1.74	1.74		1.61	1.61		1.48	1.49	0.01
sect1_2134	sect1_2134	1.80	1.80		1.74	1.74		1.65	1.66	0.01	1.59	1.59		1.52	1.53	0.01	1.42	1.42		1.33	1.34	0.01
sect1_2152	sect1_2152	1.23	1.23		1.16	1.17	0.01	1.08	1.08		1.02	1.02		0.96	0.96		0.85	0.86	0.01	0.77	0.77	
sect1_2189	sect1_2189	1.58	1.58		1.52	1.52		1.44	1.45	0.01	1.38	1.39	0.01	1.33	1.33		1.22	1.23	0.01	1.12	1.13	0.01
sect1_2222	sect1_2222	2.43	2.43		2.39	2.40	0.01	2.30	2.31	0.01	2.20	2.21	0.01	2.10	2.11	0.01	1.92	1.93	0.01	1.76	1.77	0.01
sect1_2236	sect1_2236	1.57	1.58	0.01	1.51	1.52	0.01	1.41	1.42	0.01	1.34	1.35	0.01	1.28	1.28		1.16	1.17	0.01	1.06	1.07	0.01
sect1_2281	sect1_2281	1.09	1.09		1.03	1.03		0.95	0.96	0.01	0.89	0.89		0.82	0.83	0.01	0.70	0.71	0.01	0.61	0.62	0.01
sect1_2348	sect1_2348	1.28	1.28		1.24	1.25	0.01	1.20	1.20		1.16	1.16		1.12	1.13	0.01	1.04	1.05	0.01	0.96	0.97	0.01
sect1_2410	sect1_2410	0.82	0.82		0.77	0.78	0.01	0.72	0.72		0.66	0.67	0.01	0.61	0.62	0.01	0.51	0.52	0.01	0.43	0.44	0.01
sect1_2422	sect1_2422	0.94	0.94		0.90	0.91	0.01	0.86	0.87	0.01	0.82	0.82		0.77	0.78	0.01	0.70	0.71	0.01	0.63	0.64	0.01
sect1_2437	sect1_2437	1.42	1.43	0.01	1.37	1.38	0.01	1.30	1.31	0.01	1.23	1.24	0.01	1.16	1.17	0.01	1.03	1.04	0.01	0.92	0.93	0.01
sect1_2459	sect1_2459	1.32	1.35	0.03	1.30	1.33	0.03	1.26	1.29	0.03	1.22	1.24	0.02	1.17	1.19	0.02	1.08	1.10	0.02	1.00	1.01	0.01
sect1_2474	sect1_2474	1.30	1.34	0.04	1.27	1.32	0.05	1.23	1.28	0.05	1.19	1.23	0.04	1.13	1.18	0.05	1.03	1.07	0.04	0.94	0.97	0.03
sect1_2507	sect1_2507	1.28	1.39	0.11	1.27	1.38	0.11	1.24	1.36	0.12	1.21	1.33	0.12	1.17	1.30	0.13	1.10	1.22	0.12	1.03	1.14	0.11
sect1_2534	sect1_2534	0.79	0.90	0.11	0.78	0.89	0.11	0.76	0.88	0.12	0.72	0.86	0.14	0.69	0.83	0.14	0.61	0.77	0.16	0.55	0.71	0.16
sect1_2576	sect1_2576	0.69	0.87	0.18	0.67	0.84	0.17	0.64	0.82	0.18	0.61	0.80	0.19	0.57	0.77	0.20	0.50	0.72	0.22	0.44	0.67	0.23
sect1_2629	sect1_2629	0.83	1.17	0.34	0.81	1.15	0.34	0.80	1.11	0.31	0.78	1.07	0.29	0.76	1.04	0.28	0.73	1.00	0.27	0.69	0.95	0.26
sect1_2687	sect1_2687	1.12	0.53	-0.59	1.11	0.52	-0.59	1.12	0.49	-0.63	1.12	0.48	-0.64	1.11	0.48	-0.63	1.10	0.46	-0.64	1.09	0.46	-0.63
sect1_2725	sect1_2725	0.97	0.90	-0.07	0.97	0.90	-0.07	0.96	0.90	-0.06	0.95	0.90	-0.05	0.94	0.89	-0.05	0.93	0.88	-0.05	0.92	0.87	-0.05
		Warrego Highway																				
sect1_2804	sect1_2804	1.73	1.73		1.72	1.72		1.72	1.72		1.71	1.71		1.71	1.71		1.69	1.69		1.59	1.60	0.01
sect1_2871	sect1_2871	2.08	2.08		2.00	2.00		1.88	1.87	-0.01	1.80	1.80		1.72	1.72		1.57	1.58	0.01	1.44	1.45	0.01

Your reference
Our reference 8866/2010/CA
Contact Officer [redacted]
Telephone

City of Ipswich

Ipswich City Council

45 Roderick St
PO Box 191
Ipswich QLD 4305
Australia

Tel (07) 3810 6666
Fax (07) 3810 6731
Email council@ipswich.qld.gov.au
Web www.ipswich.qld.gov.au

Walker Corporation Pty Ltd
PO Box 122
BOOVAL FAIR QLD 4304

17 February 2011

SEE NOTES

ASSESSMENT MANAGER AMENDED ACKNOWLEDGMENT NOTICE

SUSTAINABLE PLANNING ACT 2009 (s268)

Application Details

Application No:	8866/2010/CA
Assessment Manager:	Ipswich City Council PO Box 191 IPSWICH QLD 4305 Ph: 3810 6888 Fax: 3281 7085
Assessing Officer:	[redacted]
Real Property Description:	Lot 1 SP 222644 PAR GOODNA Lot 2 RP 854997 PAR GOODNA Lot 16 SP 220855 PAR GOODNA
Property Location:	99-111 Ashburn Road BUNDAMBA QLD 4304 115-129 Ashburn Road BUNDAMBA QLD 4304 Lot 16 Ashburn Road BUNDAMBA QLD 4304

It is advised that the following matters relate to the above application.

1. Development Approval

The following development approval is being sought.

AMENDED TO CHANGE

Proposal	Development	Approval Type
Preliminary approval to vary the effect of the planning scheme for development in accordance with the Citiswich Estate Stage 2 Development Code	Material Change of Use, Building Work, Operational Work and Reconfiguring a Lot	Preliminary Approval in accordance with section 242 of the *Sustainable Planning Act 2009*
Recreation purposes, other than premises in an urban development area, if all or part of the land forming part of the premises is used for, or if there is no existing use was last used for, an industrial activity (other than for a mining activity or chapter 5A activity)	Material Change of Use	Development Permit in accordance with schedule 3, part 1, table 2, item 8
Three (3) lots into seven (7) lots plus two (2) balance lots	Reconfiguring a Lot	Development Permit

2. Referral Agencies

(a) Pursuant to section 272 of the *Sustainable Planning Act 2009*, the applicant is required to give each referral agency the following:
   (i) A copy of the application, unless the agency already has a copy; and
   (ii) A copy of the acknowledgment notice, unless the referral agency is the entity that gave the notice; and
   (iii) The fee prescribed under a regulation under the *Sustainable Planning Act 2009* or another Act; or if the functions of the concurrence agency in relation to the application have been devolved or delegated to a local government, the fee that is, by resolution, adopted by the local government.

(b) This application will lapse unless the applicant gives to each referral agency the referral agency material within the period mentioned in section 272(2) of the *Sustainable Planning Act 2009,* as follows:

s.272 (2) The referral agency material must be given to all referral agencies within—

(a) 20 business days after the applicant receives the acknowledgement notice; or
(b) the further period agreed between the assessment manager and the applicant.

(c) The applicant must give the assessment manager written notice of the day the applicant complied with 2 (a) and (b) above in accordance with section 275 of the *Sustainable Planning Act 2009.*

(d) The following table outlines the applicable referral agencies for this application:-

Referral Agency	Type of Referral
Department of Environment and Resource Management PO Box 15155 CITY EAST QLD 4002	Concurrence
Transport and Main Roads PO Box 70 SPRING HILL QLD 4004	Concurrence
Department of Infrastructure and Planning PO Box 15009 CITY EAST QLD 4002	Concurrence
Department of Employment, Economic Development and Innovation PO Box 15168 CITY EAST QLD 4003	Concurrence
Powerlink PO Box 1193 VIRGINIA QLD 4014	Advice

ADD FOR DESIGNATED LAND

3. Code Assessment

It is determined that an aspect of the development applied for requires Code Assessment.

The following are the applicable codes for this application:

(a) Regional Business and Industry Zone [Part 6, division 4]
(b) Reconfiguring a Lot Code [Part 12, division 5]
(c) Development Constraint Overlays Code [Part 11, division 4]

4. Impact Assessment

It is determined that the development applied for requires Impact Assessment. Public notification of the development is required to be undertaken in accordance with sections 294-304 of the *Sustainable Planning Act 2009* (SPA). A "Guide on public notification of certain development applications" is

available from the Department of Infrastructure and Planning on their website (www.dip.qld.gov.au/development-applications/public-notification.html). However, your specific attention is brought to the following legislative public notification requirements:

296 When notification stage can start

(1) If there are no concurrence agencies and the assessment manager has stated in the acknowledgement notice that the assessment manager does not intend to make an information request, the applicant may start the notification stage as soon as the acknowledgement notice is given.

(2) If no information requests have been made during the last information request period, the applicant may start the notification period as soon as the last information request period ends.

(3) If an information request has been made during the information request period, the applicant may start the notification period as soon as the applicant gives—

(a) all information request responses to all information requests made; and

(b) copies of the responses to the assessment manager.

298 Notification period for applications

(1) The notification period for the application must be at least—

(a) 30 business days starting on the day after the last action under section 297(1) is carried out, if any of the following apply for the application—

(i) there are 3 or more concurrence agencies;

(ii) all or part of the development—

(A) is assessable under a planning scheme; and

(B) is prescribed under a regulation for this subparagraph;

(iii) all or part of the development is the subject of an application for a preliminary approval mentioned in section 242; or

(b) ***if paragraph (a) does not apply—15 business days starting on the day after the last action under section 297(1) is carried out.***

(2) The notification period must not include any business day from 20 December in a particular year to 5 January in the following year, both days inclusive.

300 Applicant to give assessment manager notice about particular motters

If the applicant carries out notification, the applicant must, ***within 5 business days*** *after the day the last of the actions mentioned in section 297(1) is carried out, give the assessment manager written notice of the day the last of the actions is carried out.*

301 Notice of compliance to be given to assessment manager

If the applicant carries out notification, the applicant must, ***within 20 business days*** *after the notification period ends, give the assessment*

manager written notice that the applicant has complied with the requirements of this division.

302 Application lapses if notification not carried out or notice of compliance not given

(1) An application to which the notification stage applies lapses if—

(a) the last action under section 297(1) is not carried aut before the end of 20 business days after the applicant was entitled to start the notification stage or the further period agreed between the assessment monager and the applicant; or

(b) the applicant has not complied with section 301 within the period stated in the section or the further period agreed between the assessment manager and the applicant.

5. Information Request

Pursuant to section 276 of *Sustainable Planning Act 2009*, the assessment manager may require further information to be submitted. If so, the requirements will be notified within 10 business days of this Notice. This period may be extended by 10 business days pursuant to section 277 of the *Sustainable Planning Act 2009.*

Should you have any queries in regards to this acknowledgment notice, please contact [redacted] on telephone number (07[redacted]

Yours faithfully

[redacted]

Natalie Plumbe
TEAM COORDINATOR

Response From:

Name_____

_____

Address_____

_____

Address_____

_____

Address_____

_____

Address_____

_____

Signature:_____

_____

Your reference Citiswich Stage 2
Our reference 8866/2010/CA
Contact Officer [redacted]
Telephone

City of Ipswich

Ipswich City Council

45 Roderick St
PO Box 191
Ipswich QLD 4305
Australia

Tel (07) 3810 6666
Fax (07) 3810 6731
Email council@ipswich.qld.gov.au
Web www.ipswich.qld.gov.au

Walker Corporation Pty Ltd
PO Box 122
BOOVAL FAIR QLD 4304

17 February 2011

Dear Sir/Madam

Re: **Development Application Information Request (Section 276 of the *Sustainable Planning Act 2009*)**

Application Number: **8866/2010/CA**

Proposal: **Preliminary approval to vary the effect of the planning scheme for development in accordance with the Citiswich Estate Stage 2 Development Code (in accordance with s242 of the *Sustainable Planning Act 2009*); Recreation purposes, other than premises in an urban development area, if all or part of the land forming part of the premises is used for, or if there is no existing use was last used for, an industrial activity (other than for a mining activity or chapter 5A activity); and Reconfiguring a Lot (three (3) lots into seven (7) lots plus two (2) balance lots)**

Property Location: **99-111 Ashburn Road BUNDAMBA QLD 4304**
115-129 Ashburn Road BUNDAMBA QLD 4304
Lot 16 Ashburn Road BUNDAMBA QLD 4304

Upon review of the abovementioned development approval application and supporting information, further information is required to satisfactorily assess this application. The information requested is set-out below.

1. Traffic Intersection Analysis

The applicant is requested to provide a technical note, prepared by a traffic engineering professional, that provides an operational analysis and safety assessment (particularly site distance) of the Hoepner Road roundabout as a result of providing access for proposed Lot 6 and to make

recommendations on any works and associated or lot layout changes required to cater for this access. The operational analysis must be based on a 'Home Imporovement Centre' land use as defined in the proposed Citiswich Stage 2 Development Code over proposed lot 6.

2. Economic Impact Assessment

The applicant is requested to provide an economic impact assessment for a Home Improvement Centre (as defined in the application) over proposed lot 6; which is to include the following information:

(a) the extent of existing commercial floor space and approved new commercial floor space in the area likely to be serviced by the proposed facility and in surrounding areas which could be affected by it;

(b) the likely trade area of the proposed facility having regard to its size, the nature of the services proposed to be included within it, the configuration of the general road network which is likely to provide access to the facility, the location of any physical or psychological barriers to movement and the location of competing facilities;

(c) the nature and adequacy of existing facilities and approved new facilities in the trade area referred to above and the level of convenience provided by such facilities;

(d) the population, existing and projected, for the likely future trade area and the socio-economic characteristics of that population;

(e) the demand, or likely future demand, for commercial floor space in the area referred to above;

(f) whether the establishment of the proposed facilities would result in an excess of commercial floor space of the type proposed in the area or would result in an excess of commercial floor space generally and whether the proposal may be premature or inappropriate in this regard;

(g) the likely impact of the proposed development together with the additional cumulative effect of any approved new commercial developments within the same area on existing businesses, with such impacts quantified in dollar terms and the implications of such impacts clearly articulated together with the means by which they can be ameliorated;

(h) whether the proposed location is consistent with the function of the facility and the need to locate such a facility to maximise accessibility within its potential trade area and whether the centre is located where possible, to maximise use of public transport and pedestrian and cycle accessibility;

(i) whether, if not satisfactorily located, it would jeopardise the provision of facilities in a location better placed to provide a higher level of choice or degree of convenience and accessibility;

(j) the potential increases in trip generation within the transport system and the need to upgrade the transport system to accommodate these additional trips;

(k) changing trends in shopping and other behaviour relating to community needs which may affect the proposal;

(l) the environment effects and urban design implications of the proposal; and

(m) any other benefits or detriments to the local area or the community in general.

3. Plan of Development

The applicant is requested to submit an electronic (Microsoft Word) copy of the Citiswich Stage 2 Development Code for Council's review. The electronic copy should be provided as a partial information response before the full information response is made, and should give Council adequate time to provide comments and amendments to the code before the full information response is lodged.

4. Easements

(a) The applicant is requested to demonstrate the viability of proposed lot 1. Specifically, the applicant should provide an indicative plan of the likely development of this lot considering the degree to which it is affected by easements. The applicant should note that this lot is important from an aesthetic perspective due to it's location (ie visible from a main road and the entry statement to vehicular traffic travelling between Ashburn Road and Brisbane Road.

(b) The applicant is requested to consider a means to treat the proposed development within the easement areas of proposed lots 1 to 6. The Citiswich Stage 2 Development Code should include specific provisions for development within the easement areas; which should be agreed upon in writing by the servient tenement (and provided with the information response).

5. Pedestrian Connection

The applicant is requested to provide justification that the location of the pedestrian connection between proposed lots 2 and 3 is the most suitable location for pedestrian connectivity east/west to and from the site. The

applicant should consider the likely uses within the stage 2 area and provide plans showing the exact alignment of the pedestrian connection through the residential area to the east.

6. Preliminary Approval Plan

The applicant is requested to provide an amended preliminary approval plan combining Figures 3 and 4 (as lodged with the Citiswich Stage 2 Development Code). The sub area/precinct plan should show the preliminary approval area in the context of the wider area similar to Figure 3 of the Bremer Business Park Preliminary Approval Area. The applicant should consider renaming the F2 Sub Area to the Home Improvement Sub Area (or similar) to separate it from the Frame Sub Area altogether to allow specific provisions to be directed towards each sub area and to avoid confusion.

Pursuant to section 278 of the *Sustainable Planning Act 2009*, the applicant has three (3) options available in response to this Information Request. The applicant must give the requesting authority (in this case the assessment manager):

1. all of the information requested; or

2. part of the information requested together with a written notice asking the requesting authority to proceed with the assessment of the application; or

3. a written notice:

(a) stating that the applicant does not intend to supply any of the information requested; and

(b) asking the requesting authority to proceed with the assessment of the application.

The information response should also include a statement indicating which of the above options describes the response you are providing. To assist in the matter, Appendix 1 provides a checklist that you should complete and return with your response.

Response to this Information Request should be forwarded to:-

Chief Executive Officer
C/- Assessment Manager
Development Planning Branch
Ipswich City Council
PO Box 191
IPSWICH QLD 4305

If the application lapses in accordance with section 279 of the *Sustainable Planning Act 2009* (i.e. no response to the information request is received) it may be revived in accordance with section 280 of the *Sustainable Planning Act 2009.*

Note: The notification stage for the application cannot commence until you, the applicant, gives:

(a) all information request responses to all information requests made, and

(b) copies of the responses to the assessment manager.

If you have any queries in regards to this Information Request, please contact [redacted] on the telephone number listed above.

Yours faithfully

[redacted]

Natalie Plumbe
TEAM COORDINATOR (Team Central)

RESPONSE TO DEVELOPMENT APPLICATION INFORMATION REQUEST

Chief Executive Officer
C/- Assessment Manager
Development Planning Branch
Ipswich City Council
PO Box 191
IPSWICH QLD 4305

Date: _____

Application No. _____

Site Address: _____

☐ Please find enclosed the applicant's response to the development application information request, which contains:

- ☐ all of the information requested; or
- ☐ part of the information requested; and
  - ☐ we intend to provide further information; or
  - ☐ it is requested that the assessment manager proceed with the assessment of the application based on the information provided and it is noted that by not supplying all information requested that it may result in the refusal of the application if such matters can not be adequately conditioned.

☐ Notice is hereby given that the applicant does not intend to supply any of the information requested and asks that the assessment manager proceed with the assessment of the application based on the information provided and it is noted that by not supplying all information requested that it may result in the refusal of the application if such matters can not be adequately conditioned.

Your reference Citiswich Stage 2
Our reference 8866/2010/CA
Contact Officer [redacted]
Telephone

City of Ipswich

Ipswich City Council

45 Roderick St
PO Box 191
Ipswich QLD 4305
Australia

Tel (07) 3810 6666
Fax (07) 3810 6731
Email council@ipswich.qld.gov.au
Web www.ipswich.qld.gov.au

Walker Corporation Pty Ltd
PO Box 122
BOOVAL FAIR QLD 4304

17 May 2011

Dear Sir/Madam

Re: **Development Application Information Request (Section 276 of the *Sustainable Planning Act 2009*)**

Application Number: **8866/2010/CA**

Proposal: **Preliminary approval to vary the effect of the planning scheme for development in accordance with the Citiswich Estate Stage 2 Development Code (in accordance with s242 of the *Sustainable Planning Act 2009*); Recreation purposes, other than premises in an urban development area, if all or part of the land forming part of the premises is used for, or if there is no existing use was last used for, an industrial activity (other than for a mining activity or chapter 5A activity); and Reconfiguring a Lot (three (3) lots into seven (7) lots plus two (2) balance lots)**

Property Location: **99-111 Ashburn Road BUNDAMBA QLD 4304**
115-129 Ashburn Road BUNDAMBA QLD 4304
Lot 16 Ashburn Road BUNDAMBA QLD 4304

Upon review of the response to Council's information request dated 4 May 2011, further information is required to satisfactorily assess this application.
The information requested is set-out below.

1. Traffic Intersection Analysis

Upon review of the information submitted, it has been identified that no operational analysis of the roundabout for traffic generated by a 'Home Improvement Centre' (as defined in the proposed Citiswich Stage 2

Development Code) for proposed Lot 6 has been undertaken. Accordingly, the applicant is requested to undertake and submit this analysis.

2. Economic Impact Assessment

The economic impact assessment submitted to Council (prepared by Duane Location IQ and dated 29 March 2011) will now be referred for independent review by an appropriately qualified and experienced consultant external to Council and this review will be at the cost of the applicant in accordance with section 1.11 of the Ipswich City Council's fees and charges policy 2010-2011.

Council is currently in the process of obtaining quotes to undertake this review and will advise the applicant of the costs associated with this once all quotes have been reviewed and the successful consultant has been engaged.

Please note that this development application will not enter the decision stage until such time as the initial study and if applicable, any further material as requested by Council has been independently assessed by the external consultant and all additional fees have been paid to Council.

3. Easements

The applicant's response to Council's information request is not adequate. As such, Council's requirements in relation to both elements of this request have been further detailed below.

(a) As identified in Council's original information request, this lot is important from an aesthetic perspective due to it's location (visible from the Warrego Highway and the entry statement to vehicular traffic travelling between Ashburn Road and Brisbane Road). It is not considered practical to develop this lot for the predominant purpose of outdoor storage and car parking whilst ensuring Council's requirements in terms of visual amenity are met (regardless of any design controls built into the preliminary approval). As such, the developer is requested to provide indicative proposal plans of the likely development of this lot (including building elevations, details of screening/outdoor storage/car parking areas etc). Furthermore, the applicant is requested to provide written confirmation from Powerlink demonstrating that the proposal is in accordance with their requirements (generally they limit the height of landscaping within their easement areas).

(b) Council requires specific provisions to be included in the Stage 2 Development Code to ensure future purchases are aware of the implications of developing on these proposed lots up front (ie before any money is spent preparing applications etc). It is necessary to require the

specific provisions for easement affected land to be built into the Citiswich Stage 2 Development Code.

4. Pedestrian Connection

In the information response, Walker Corporation stated Place Design Group were engaged to establish the best location for the pedestrian connection to the Dinmore residential area to the east. The applicant is requested to submit a copy of this report/investigation.

Pursuant to section 278 of the *Sustainable Planning Act 2009*, the applicant has three (3) options available in response to this Information Request. The applicant must give the requesting authority (in this case the assessment manager):

1. all of the information requested; or

2. part of the information requested together with a written notice asking the requesting authority to proceed with the assessment of the application; or

3. a written notice:

(a) stating that the applicant does not intend to supply any of the information requested; and

(b) asking the requesting authority to proceed with the assessment of the application.

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Development Planning Branch
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PO Box 191
IPSWICH QLD 4305

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Note: The notification stage for the application cannot commence until you, the applicant, gives:

(a) all information request responses to all information requests made, and

(b) copies of the responses to the assessment manager.

If you have any queries in regards to this Information Request, please contact [redacted] on the telephone number listed above.

Yours faithfully

[redacted]

Natalie Plumbe
TEAM COORDINATOR (Team Central)

RESPONSE TO DEVELOPMENT APPLICATION INFORMATION REQUEST

Chief Executive Officer
C/- Assessment Manager
Development Planning Branch
Ipswich City Council
PO Box 191
IPSWICH QLD 4305

Date: _____

Application No. _____

Site Address: _____

☐ Please find enclosed the applicant's response to the development application information request, which contains:

- ☐ all of the information requested; or
- ☐ part of the information requested; and
  - ☐ we intend to provide further information; or
  - ☐ it is requested that the assessment manager proceed with the assessment of the application based on the information provided and it is noted that by not supplying all information requested that it may result in the refusal of the application if such matters can not be adequately conditioned.

☐ Notice is hereby given that the applicant does not intend to supply any of the information requested and asks that the assessment manager proceed with the assessment of the application based on the information provided and it is noted that by not supplying all information requested that it may result in the refusal of the application if such matters can not be adequately conditioned.

Response From:

Name_____

_____

Address_____

_____

Address_____

_____

Address_____

_____

Address_____

_____

Signature:_____

_____

Your reference
Our reference 8866/2010/CA
Contact Officer [redacted]
Telephone

City of Ipswich

Ipswich City Council

45 Roderick St
PO Box 191
Ipswich QLD 4305
Australia

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Walker Corporation Pty Ltd
PO Box 122
BOOVAL FAIR QLD 4304

6 October 2011

Dear Sir/Madam

Re: **Development Application Request for Further Information**
Application Number: 8866/2010/CA
Proposal: RAL – Three (3) Lots into Seven (7) Lots Preliminary Approval to Override the Planning Scheme
Property Location: 99-111 Ashburn Road, BUNDAMBA QLD 4304

Upon review of the abovementioned application for development approval and its supporting information, further information is required to satisfactorily assess the application. The further information requested is set out below.

1. Council's Temporary Local Planning Instrument - Flooding

(a) The applicant is requested to submit amended hydraulic modelling and associated reporting demonstrating how the development complies with the requirements of Council's Temporary Local Planning Instrument (TLPI). The amended modelling must take account of the Adopted Flood Regulation Line and the unapproved earthworks which have taken place on land situated between the 1 in 20 Development Line and the Adopted Flood Regulation. It is noted that the TLPI generally does not support such earthworks as currently proposed.

Where any earthworks are proposed in accordance with the requirements of the TLPI, the applicant must demonstrate that the earthworks undertaken on the subject site do not result in a net loss of flood storage volume on the subject site. Further, the hydraulic modelling of the post development state:

(i) must include all earthworks undertaken on the subject site (including the augmentation to the existing detention basin located within proposed lot 900 & lot 1); and

(ii) where indicating a worsening of stormwater runoff and/or flooding for any surrounding properties or an increase the flooded depth across Warrego Highway, must recommend measures to be undertaken to mitigate this to the extent/level prior to the earthworks being undertaken i.e. at natural state.

(b) The applicant is requested to submit amended plans to accord with any recommendations/changes as a result of (a) above.

2. Signalised Intersection

The applicant is requested to submit a preliminary design of the Hoepner Road/Link Road/New Road signalised intersection to determine the footprint required to accommodate the intersection. The drawings must:

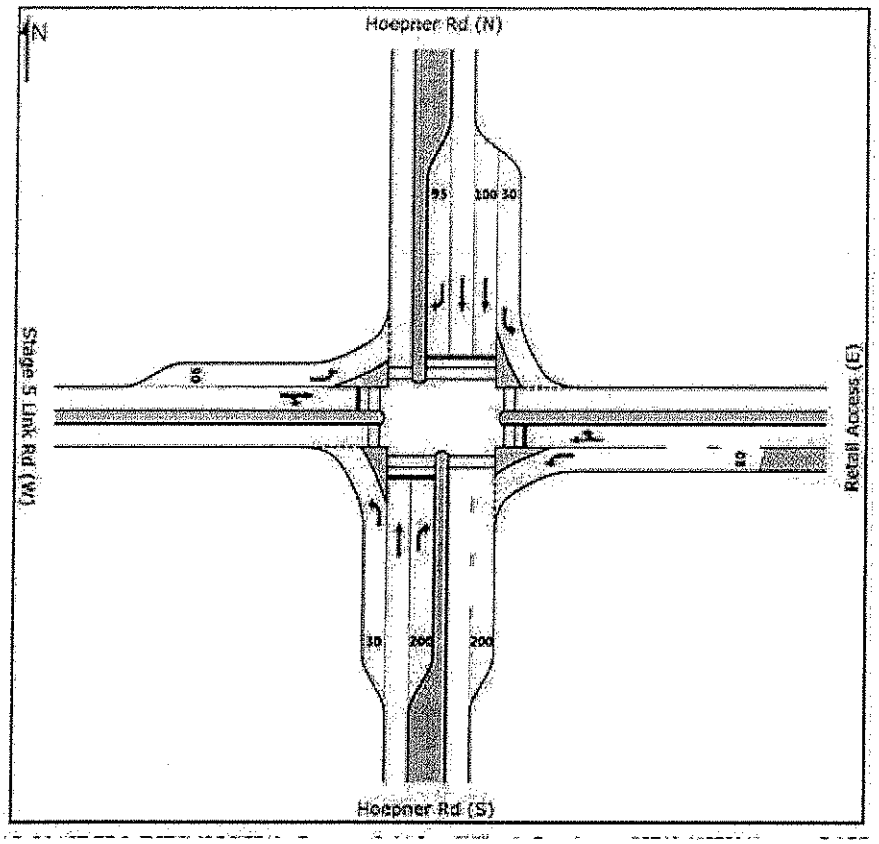
(a) be prepared and endorsed by an RPEQ and based on ground survey;

(b) be configured generally in accordance with Figure 1 below;

(c) be designed in accordance with Austroads' standards and guidelines for a 70km/h design speed; and

(d) provide for the safe and efficient movement of a B-Double (26m long) combination vehicle.

Figure 1 - *Hoepner Road/ Stage 5 Link Road/Retail Access Signalised Intersection Configuration*



Response to this Request for Further Information should be forwarded to:-

Chief Executive Officer
Ipswich City Council
PO Box 191
IPSWICH QLD 4305
Attention: Assessment Manager
Development Planning Branch

Should you have any queries in regards to this Information Request, please contact [redacted] on the telephone number [redacted]

Yours faithfully

[redacted]

Natalie Plumbe
TEAM COORDINATOR (CENTRAL)