Submission to the Queensland Floods Commission of Enquiry

Overview:

Significant flooding in many parts of Queensland in 2010/11 has highlighted that the traditional high-set (Queenslander) home is more robust and less susceptible to total (catastrophic) damage than the newer slab-on-ground type structures. However, the quantum of damage caused by numerous floods over a short period of time has stretched the community's financial and economic resources to an unacceptable level. Media reports of Local Government and State Government culpability in permitting housing development in floodplain areas has spurred speculation of the possibility of government resumption of properties in flood-prone areas, a proposal that is likewise an unfavourable one in terms of human suffering and financial burden to the wider community. This submission argues for retro-fitted hydraulic lifting systems to flood-proof existing high-set Queenslander-style homes rather than consideration of property resumptions in flood-prone areas and the resultant reduction of housing stock in the State.

Discussion:

From an engineering perspective, the most effective means of flood-proofing most high-set homes would be to install hydraulic lifting ram systems which would permit the dwellings so fitted to be raised fairly quickly to a level above the expected flood levels and then lowered to normal levels once the emergency has passed. Most high-set homes built prior to the 1960s used hardwood framing and support beams/joists to carry the house loads across a network of timber piles, brick piers, concrete piers or steel posts. This has the feature of making the dwelling structure a self-contained unit which is amenable to lifting. Indeed, using hydraulic lifting rams, many of these high-set homes are often sold and transported by road transport to new sites, thus proving the feasibility of using hydraulic rams for lifting high-set homes.

In times of eminent floods, homeowners can quickly disengage electrical, plumbing and waste connections with specially-designed quick release fittings (that don't need qualified tradespeople to disconnect), disengage the access staircases (which would need to be self-supporting or easily lowered), activate the hydraulic rams and the dwelling could be lifted up to one or even two storeys above existing levels. Safety catches or pins could then be inserted should the hydraulic ram system fail or be fouled by water during inundation. In only the most extreme cases would such a lift not be enough to prevent water egress. For those dwellings inundated in the 2010/11 floods, it is estimated that probably 85-95% of dwellings retro-fitted with hydraulic lifting rams capable of raising the home one to two storeys higher would escape damage in floods of similar magnitude.

Retro-fitting high-set homes with the capacity to use hydraulic rams quickly in case of flood threat would not be a cheap process. However, in terms of risk management, the plan would be more economical than repeated repair of flood damage, infinitely more economical than resumption of flood-prone properties (an estimated cost of between $3 and $5billion would be needed for this option in the Brisbane/Ipswich area alone, add

another $1.2-1.6billion for similar resumptions in Central Queensland, the point is well made).

If this proposal would be adopted for retro-fitting high-set homes with a hydraulic lifting ram system, other modifications to structures would be necessary. As the structure is lifted by the rams, it would become more susceptible to sideways pressures from wind, and/or running water (oftentimes with significant debris in the water). This would require the insertion of additional cross-bracing of the posts and ram system which would brace the higher structure. If the underside of the highset dwelling is basically open, such cross-bracing could be install quickly and easily. However, if local governments have allowed underneath areas to be "built-in", cross-bracing for stability would become more problematic (but not impossible).

The easiest structure for retro-fitting with the hydraulic ram system would be those high-set homes utilising hollow steel posts to support the dwelling. Smaller size sections of steel post could be inserted inside the existing hollow steel posts so as the structure is lifted, the "new" steel posts would rise from within the existing steel posts and can be easily pinned once the desired height had been reached. Because the existing concrete footing that the steel post is embedded in already carries the structural weight, no extra foundation strengthening would be necessary. Basically the steel posts are modified to become telescopic steel posts permitting the dwelling to be raised 1-2 storeys in the event of potential flood.

The least amenable high-set dwelling to retro-fit would be those constructed using wooden piles. It is proposed that these not be used and as part of the retro-fitting, wooden piles be replaced with telescopic steel posts. This would raise the cost appreciably, effectively including what is common referred to as a re-stumping, but would ensure the home-owner has a more secure and flood-proof dwelling in the event of future floods.

The remaining two types of high-set dwellings, those on brick columns and those on concrete piers/columns could be modified quite easily to incorporate hydraulic rams for lifting the house but would need a collar-type caisson which sits around the concrete or brick columns and when the rams lift the house, the load is transferred to the caissons which rise up with the house. These would likewise require anchoring and cross-bracing while the house was in the elevated position.

Local Government regulations would require amendment to incorporate this lifting concept into any new housing developments where the potential for flooding is a concern. Regulating that existing high-set homes be modified to be flood-proofed would require legislative input from the State Government, much like tightened pool-fencing laws have done so in the recent past. This would also prevent possible circumvention of local government by-laws by some developers.

The above proposal does not address the flood-proofing of slab-on-ground type constructions (low-sets). Given that the concrete slab or concrete footings are buried in the ground and must be lifted as part of the structure if the building were to be raised, the

concept of using hydraulic rams as in the case of high-set homes would be impractical for low-set dwellings. These dwellings should be considered for either resumption or the building of a second-storey on the existing low-set if such a second storey would ensure the habitable section of the home was above potential flood inundation. A case-by-case study would need to be carried out to determine the best course of action.

Finally, with regard to future land development in areas where a risk of floods is present, changes to the building code to stipulate only flood-proofed high-set dwellings needs to be carried out, in much the same way that cyclone-proofing of dwellings led to changes in the Queensland Building codes post cyclone Tracey. Part of those changes to the building code would be quick disconnection devices for utilities (power, water, sewer) within the structure, hydraulic rams to lift the dwelling above expected/predicted flood levels, easily disconnected access stairways and significant cross bracing of the structure in its raised position to withstand horizontal water and wind pressures whilst the dwelling is in the raised position.

Implementation of the above submission would be far less expensive and more quickly implemented than would be resumption of flood-prone properties, compensation to property-owners, legal costs for disputed resumptions and/or resumption valuations, removal of structures on resumed land and the loss of housing stock in areas where housing stock is already far below demand and likely to remain so for the foreseeable medium-term future. Indeed, the proposal contained in the submission could be started in time to partially counter possible flood events in the 2011/2012 summer season. In addition, post-flood events would see far less uninhabitable dwellings, put less demands on the community for flood relief efforts and return families to their intact and undamaged homes sooner than is presently the case. Where the residents are renters, it ensures they have a home to return to, unlike at present where renters are forced to seek alternate rental accommodation in an already severely limited rental market. Finally, this proposal permits early return to undamaged homes which in turn reduces significantly the trauma currently experienced by those less able to cope with flood events like the December/January 2010/2011 floods, namely the elderly, the poor and the very young.

An important note. The above proposal does not, nor is it intended to, address all of the cases of flood damage caused in the Lockyer Valley on 10 January 2011 as this incorporated an “inland tsunami”, to quote the Police Commissioner. Flood-proofing dwellings in the Lockyer Valley against a repeat of that event would require more than the incorporation of lifting devices to raise dwellings above the flood water, given that the water arrived very quickly and unexpectedly, without warning. The hydraulic lifting ram proposal is predicated on traditional flood events where householders do have some prior warning of a flood event, as is the norm in most floods experienced in Queensland. Disconnection of utilities, lifting homes and the insertion of requisite cross bracing would take many hours, time that residents on the Lockyer Valley and Toowoomba did not have in the Jan 10 2011 event.

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