QUEENSLAND FLOODS
COMMISSION OF INQUIRY

STATEMENT OF GLEN THOMAS BRUMBY

I, **GLEN THOMAS BRUMBY**, of c/- 63 George Street Brisbane in the State of Queensland, Executive Director, Building Codes Queensland, Growth Management Queensland, Department of Local Government and Planning, solemnly and sincerely affirm and declare:

1. I make this statement **(Second Statement)** pursuant to the requirement dated 24 October 2011 entitled "Draft Standard for Construction of Buildings in Flood Hazard Areas" served on me to provide further information to the Queensland Floods Commission of Inquiry.

2. I make this Second Statement in addition to the statement **(First Statement)** declared by me and dated 15 September 2011 pursuant to the requirement dated 9 September 2011 to provide information to the Queensland Floods Commission of Inquiry.

3. In relation to the background associated with the steps taken by Building Codes Queensland (BCQ), Department of Local Government and Planning (DLGP), since my appointment to the Australian Building Codes Board (ABCB) on 16 October 2007, please refer to paragraphs 15 to paragraph 27 of my First Statement.

4. In relation to the progress the Queensland Government has made in implementing the proposed national standard for construction of buildings in flood hazard areas into the Queensland Development Code (QDC), please refer to paragraphs 36 to 53 of my First Statement.

5. With reference to paragraph 38 of my First Statement, the draft Standard was the subject of a building newsflash issued by BCQ on 26 July 2011 titled "Building

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Exhibit Number: 1015

Newsflash Number 474 – Early adoption of standard for construction of buildings in flood hazard areas" (Building Newsflash Number 474). This newsflash included a copy of version 6 the draft Standard dated July 2011 and requested feedback during a month-long consultation period on both the draft Standard and the Queensland proposal for early adoption of the Standard.

6. As discussed in Building Newsflash Number 474, a national regulation impact statement for the draft Standard is intended to be released in late 2011 by the ABCB and finalised in early 2012. The draft Standard is scheduled to be included in the 2013 version of the Building Code of Australia (BCA) from 1 May 2013, subject to the approval of the ABCB.

7. In the interim, to help address the immediate need for detailed standards for constructing new buildings, additions, and major alterations (such as raising and relocation) in flood affected areas, and to generally improve flood resilience of communities across Queensland, it is proposed to seek Government approval of the most recent draft of the Standard (version 7 dated October 2011) (**Attachment 1**) as referenced in a new mandatory part of the QDC in late 2011 (**Attachment 2**).

Item 1. Advice as to the current status of the Queensland Government's consideration of the draft Standard

Consultation process on the proposed adoption of the draft Standard and for development of the draft QDC

8. Building Newsflash Number 474 sought comments on early adoption in Queensland of the ABCB's draft national Standard for Construction of Buildings in Flood Hazard Areas. This Newsflash included the following:

"Your comments on the proposal to adopt the draft Standard and additional provisions through a new part to the QDC would be most appreciated. Please provide comments by emailing [redacted] *(subject: Flood code feedback) by 5pm Thursday 25 August 2011".*

9. Circulation of Building Newsflash Number 474 included distribution to approximately 3178 subscribers and publication on the DLGP website. Subscribers include key building organisations, industry groups, local governments and members of the general public.

10. The consultation on the draft Standard also informed the development of the draft QDC for Construction of Buildings in Flood Hazard Areas (draft QDC).

Results of consultation and analysis in relation to the draft Standard and proposed QDC

Building stakeholders

11. Paragraph 53 of my First Statement refers to industry feedback received by BCQ during the consultation period ending on 25 August 2011. Industry feedback on the draft Standard and proposed QDC indicated that there is general support for more detailed building standards in flood prone areas.

12. With reference to paragraph 53 of my First Statement, industry raised some concerns with a lack of flood mapping in some Local Government areas, the lack of detailed knowledge about cost impacts of the new requirements and the ability of Local Governments to adopt additional building requirements that are outside the scope of the draft Standard. The Housing Industry Association (HIA) was of the view that the draft Standard should not be called up in Queensland's building law until the ABCB's regulation impact statement process has been finalised. However, building industry stakeholders, and HIA particularly, do not support any building standards being included in planning instruments.

13. A summary of the consultation responses received from Local Governments is prepared below:

Ipswich City Council

14. On 24 August 2011, DLGP received a response from Ipswich City Council (ICC) (**Attachment 3**). ICC officers did not support adoption of the draft Standard. ICC

officers were of the view that aspects of the draft Standard, including building design matters, should be addressed through land use planning, using temporary local planning instruments (TLPIs) and planning schemes, rather than through the building code. However, at the time the ICC was preparing its TLPI, the ICC advised BCQ that it was aware that the TLPI was intended to be an interim measure until the Building Code of Australia (BCA) or QDC provided further design guidance for the construction of buildings in flood hazard areas. The proposed new mandatory QDC part will provide this design guidance.

15. It remains my view that it is not generally appropriate for building standards to be included in Local Government planning instruments. This follows Queensland's commitment to the ABCB Inter-governmental Agreement discussed in my First Statement. It is also due to the need for certainty and consistency and the fact that compliance with building codes is a matter best addressed through dedicated building legislation and codes that are routinely used by the construction industry, such as the QDC and the BCA.

16. Generally, I consider the planning system should be used to consider whether land uses, and therefore developments through buildings, are appropriate in a certain area. It is submitted that to do this Local Governments should reasonably ascertain the level of threat from natural hazards such as flooding. Where the threats and risks are not prohibitive, the planning system may decide to allow development. Building standards will then complement the planning system by providing appropriate building design criteria for the identified hazards.

17. It is difficult to justify planning schemes or other local planning instruments relating to land use permissions specifying detailed building standards, particularly if the standards are adequately dealt with by building codes. If these matters are included in Local Government planning instruments, it is likely that building requirements and terminology will vary across each Local Government area adding to the complexities involved in having buildings designed, assessed, and approved for compliance.

18. Also, if building requirements are included in a local planning instrument (other than where they are permitted under the *Building Act 1975* (BA)), there is potential for unnecessary confusion and conflict between the building assessment provisions under the BA and planning requirements. Consequently, building certifiers may be unsure as to whether to assess provisions against the BA requirements or against the provisions of a local planning instrument.

19. This can lead to duplication in processes, and additional costs and delays for the applicant, as the matter may be assessed at both the planning and building approval stage. It is also possible that the matter will need to be referred back to the Local Government and a new planning approval may be needed in situations where the building development application complies with the requirements of the BA but does not meet a conflicting building requirement contained within or referred to in a local planning instrument.

20. The draft Standard would provide a single standard that will deal with the risks of flooding in a consistent and comprehensive way and this would be a benefit for industry. In addition, building standards require ongoing attention, maintenance and continuous improvement through feedback from the building industry. To ensure that they are up to date and relevant, building standards are regularly revised to ensure they achieve the desired objectives in the simplest way and at the lowest cost. This process would apply to the draft Standard if it is adopted under Queensland's building law.

Hinchinbrook Shire Council

21. On 25 August 2011, DLGP received correspondence from Hinchinbrook Shire Council (HSC) (**Attachment 4**). HSC was generally supportive of the proposed adoption of the draft Standard. HSC expressed concern about the requirements relating to the inundation of enclosed non-habitable areas. HSC officers believed that this would prevent construction of <u>any</u> new buildings or additions to existing buildings, where inundation of non-habitable areas would exceed 1 metre. HSC has been advised that buildings or additions would still be able to be constructed in these areas.

22. However, to meet the deemed to satisfy (DTS) requirements of the draft Standard the non-habitable areas would need to be unenclosed if inundation is expected to be more than 1 metre. Where it is proposed that the lower level area would be enclosed, the DTS provisions would not apply and an engineer may be required to provide additional design guidance on structural integrity to meet the performance requirement of the draft Standard.

Brisbane City Council

23. Brisbane City Council was represented on the national reference group that assisted the ABCB with the development of the draft Standard, and provided input throughout that process.

24. With reference to paragraph 39 of my First Statement, BCQ held a Building Industry Consultative Group (BICG) meeting on 14 September 2011. The BICG includes members of a wide range of key building industry organisations which include the HIA, the Queensland Master Builders Association, the Property Council of Australia, the Building Designers Association of Queensland and the Local Government Association of Queensland (LGAQ). This meeting of the BICG specifically discussed adoption of the draft Standard through the QDC.

Analysis following consultation

25. BCQ undertook further analysis and research in relation to the draft Standard in the context of stakeholder feedback and the following issues were identified for further consideration or for amendment to the draft Standard:-
    - the combination of loads was considered to be overly conservative (for example, it is not usual for design loadings for peak extreme events, such as wind and flood, to be combined and applied at the same time);
    - the calculation of hydrodynamic actions, debris actions, wave actions, erosion and scour would benefit from further guidance which could be provided as an explanatory guideline for use with the draft Standard; and
    - minor drafting errors, some edits of formulae and definitions and some areas of inconsistency in terminology with Australian Standards and existing building code provisions.

26. BCQ has worked with the ABCB to incorporate the results of feedback and improve the practicality of the draft Standard. Version 7 of the draft Standard dated October 2011 is **Attachment 1**. Version 7 incorporates many of the issues and edits raised by BCQ.

Draft QDC

27. Following the initial consultation period on the draft Standard, the BICG meeting and the further analysis, BCQ developed a draft QDC which, if agreed to by Government, would adopt the draft Standard into Queensland's building law.

28. BCQ placed a draft of the QDC on the Department's website on Friday 28 October 2011 for public consultation and a copy is **Attachment 2**. This draft QDC will soon also be accompanied by explanatory material to assist users. Copies of this material are **Attachments 5** and **6**. It is intended that this public consultation will continue until Wednesday 9 November 2011.

29. As part of this consultation, a further meeting with the BICG and other interested stakeholders such as the Queensland Reconstruction Authority (QRA) has been arranged for 9 November 2011. The meeting will specifically discuss the draft QDC. This meeting will also discuss the changes made to the draft Standard following consultation. A meeting has also been arranged with Local Governments from the South-east corner of Queensland, also on 9 November 2011. BCQ will also invite all other interested Local Governments to participate in teleconferences to discuss the draft QDC. These teleconferences will occur prior to 9 November.

30. BCQ is in the process of preparing an amendment to the *Building Regulation 2006* (BR) which would implement adoption of the draft QDC in Queensland. It is expected that the Queensland Government will consider adopting the draft QDC through the amendment regulation before the end of 2011.

The draft QDC in detail

31. The draft QDC is the vehicle by which the draft Standard will be called up into Queensland's building laws. Its development was informed by feedback on the

consultation on the draft Standard referred to above. It has three broad performance criteria, namely, detailed new standards for residential buildings, services for all classes of buildings and prevention of sewage reflux. It will affect construction of all classes of and additions to buildings identified as being in flood hazard areas to some extent. It will also affect major alterations to existing houses such as raising and relocation.

32. The draft QDC is intended to apply in a practical way to a range of scenarios for buildings in flood hazard areas. For example, the draft QDC has a detailed application section with specific inclusions and a list of exclusions. It will generally apply to the construction of new residential buildings and dwellings (i.e. houses, townhouses, units, hospitals and aged care buildings), raising and relocating houses, additions to existing houses where the addition is greater than 50% of the total floor area of the building and additions to other types of residential buildings.

33. The draft QDC is not intended to apply to minor alterations to an existing home, such as adding a bedroom or an en-suite bathroom, or moving an internal wall. Also, Local Governments will have the ability to provide exemptions from the draft QDC for additions where it is impractical or undesirable to comply. For example, a concurrence referral power is intended to be included in the *Sustainable Planning Regulation 2009* by which Local Governments may provide advice to the responsible building certifier that it would not be desirable for the Standard to apply to an addition to a home in a heritage area.

34. Also, with respect to Local Government feedback on adopting the QDC, they will retain their ability to specify flood hazard areas in accordance with the BR. Where Local Governments decide that heritage concerns are of such importance that homes should be built at the same level as other homes in a heritage area then they may omit the relevant lots from being identified as subject to a flood hazard for the purposes of the BR. However, while it may be appropriate for Local Governments to consider the importance of heritage issues for a particular precinct, it may be preferable for permission to build a home to be refused rather than allowing a home to be built with habitable rooms built below the expected

flood level. It should be noted that section 13 of the BR has been in place for some considerable time. Section 13 allows Local Governments to declare levels for habitable rooms and BCQ has not received any feedback that this section introduces conflict with heritage considerations.

35. The draft QDC also sets standards for critical building services, such as lift motors and lift motor rooms for emergency lifts, sprinkler alarm rooms, back-up power supplies for essential services, electrical switchboards and meters, hot water systems and fire indicator panels. Services will need to be raised or designed to resist flood actions in all buildings, other than sheds and garages. This will assist with the safe occupation of buildings during a flood event and with re-occupation after the event. In some cases, it may be impractical to apply the QDC requirements for essential services for all new commercial buildings. As a result, the draft QDC allows building certifiers to specify in the building's certificate of classification that the building does not comply with the services requirements of the QDC because the building is not intended to be occupied during a flood event or in the aftermath of a flood event.

36. The draft QDC will also require all new buildings to be protected from sewage backflow by fitting a reflux valve as part of the sewerage system.

37. The draft QDC is intended to complement planning requirements. Similar to the operation of the Australian Standard for the Construction of building in bushfire prone areas, the draft QDC will provide the building design requirements where a Local Government has designated the land as flood prone and has approved the land for development. For example, the Local Government will identify the risk of flooding in an area through its planning scheme, thereby managing the land use impacts for the site. Once the Local Government is satisfied that there is an acceptable level of risk for development to occur on a flood prone site, the building approval will require compliance with the draft QDC, i.e. the draft QDC will provide the building design requirements for the building to withstand the effects of flooding.

38. For the defined flood level (DFL), the draft QDC adopts the level set by the Local Government through the proposed amendments to section 13 of the BR. Where the Local Government has not designated a flood level, the QDC allows the building certifier to take advice from a competent person (as defined under the BA) on the 1% Annual Exceedance of Probability flood level or to use the highest recorded flood level for the lot.

39. The operation of the proposed QDC is intended to be supported by BR amendments that will allow Local Governments to identify maximum flow velocities for an area and 'inactive flow or backwater areas' within designated flood hazard areas. This will help to ensure that expensive engineering and hydrologist reports are not required in every situation where a building is proposed.

40. It is also intended to assist with implementation by providing guidelines on how Local Governments may appropriately use local knowledge, the QRA mapping and local gauging stations to identify areas of inactive flow or backwater areas and ascertain the highest recorded flood level for the lot. For example, pictorial records and the performance of surviving buildings and structures may reasonably provide adequate evidence of areas of low flow that can be readily accepted as being within the design criteria of the DTS provisions of the draft Standard. Similarly, where a Local Government does not provide a flood level for a lot there may be a local water level gauging station in the same basin that can be used to ascertain the highest recorded flood level for the lot. QRA advise this approach is expected to help Local Governments and building owners in implementing the proposed new arrangements if the draft Standard is adopted through the proposed QDC.

Item 2. Proposed timeframe for adoption of the draft Standard into the Queensland Development Code

41. With reference to paragraph 14 above, BCQ is in the process of preparing an amendment to the BR which would implement adoption of the draft QDC in Queensland.

42. It is proposed to recommend to the Minister responsible for the BA that he consider approving a regulation adopting the new QDC part for Governor in Council consideration on 24 November 2011. If approved by Governor in Council, the QDC would take effect immediately.

Item 3. Response to Second Witness Statement of John Stephen Adams, City Planner, Ipswich City Council dated 25 October 2011

43. I have sighted the Statement of John Stephen Adams dated 25 October 2011 provided to the Commission.

44. With respect to paragraph 40 of this statement, I make the following comments:

(a) Queensland has had a system of private building certification since 1998. Prior to 1998 Local Government building certifiers were solely responsible for building certification. Since the introduction of the system of private certification, both Local Governments and private building certifiers may approve buildings for construction. Local Governments are required by the BA to provide building certification services, although in many areas Local Governments no longer have a significant role as the assessment manager in building development approvals. I do not consider that Local Governments should be the only available assessment manager for building development approvals in flood hazard areas. Local Governments have an important role with respect to planning development for flood affected land and this role involves assessing whether the land use is appropriate given the planning scheme and the potential natural hazards. This is distinct from the role of Local Government or private building certifiers in giving building development approvals. There is no justification to restrict all building development approvals to Local Government in relation to flood affected land. This would be contrary to Queensland practice and the policy that is reflected in Queensland's building legislation.

(b) With respect to paragraph 40(b) of this statement, the matters referred to such as visual amenity, overlooking and the potential to develop

small lot housing are routine matters which may appropriately be regulated through planning schemes and the QDC. The current QDC has many default provisions to help achieve consistency for housing approvals across Queensland. Many Local Governments apply the QDC's default provisions in lieu of having specific planning scheme requirements for matters such as site cover and boundary clearances (including set backs). However, in Queensland these matters and the relevant default building codes, are routinely applied by private building certifiers. Mandatory parts of the QDC (parts 1.1, 1.2, 1.3) have site cover and boundary clearance provisions along with a range of other provisions such as building height, privacy, car parking, landscaping and overshadowing provisions that are designed to assist Local Governments.

(c) I respectfully disagree that the matter of building design is best dealt with by Local Government in the context of the local planning scheme. I also respectfully disagree that State-wide, mandatory building code provisions (assessed by private building certifiers) should relate principally to structural adequacy, use of flood resistant materials and construction techniques. Building codes take into consideration a wide range of social policy considerations, including health, sustainability and amenity. For example, existing building codes specify required levels of safety in the event of cyclones, bushfire or building fire, sustainability (energy efficiency, efficient lighting, water savings), disability access and amenity standards (privacy and toilet facilities). As mentioned above, in paragraph (c), building codes also apply standard and routine development matters very successfully, such as setbacks, site coverage, privacy, and building height. In addition, the level of habitable floors can easily be set by a Local Government and applied through the building certification processes. The setting of habitable floor levels has been routine for many years in Queensland and the requirements are easily enforced through building approval processes.

(d) Development of building codes involves wide consultation with stakeholders. Changes to the QDC and the BCA in particular, are

usually made after extensive consultation and detailed cost-benefit analysis. The application of building codes promotes consistency, helps to keep costs down and reduces unnecessary approvals.

(e) With respect to paragraph 40(d) of this statement, the draft QDC has a range of appropriate application clauses and exemptions, such as those for small additions and non-habitable buildings such as sheds.

(f) With respect to paragraph 40(e) of this statement, the default freeboard in the draft QDC is 300mm, consistent with Local Governments such as the former Caboolture Shire Council. Local Governments can control the application of the proposed QDC by designating flood hazard areas and they may set alternative freeboard levels. For example, I understand that in some Local Government areas, such as Brisbane City Council, freeboards are set higher than 300mm due to the need to cater for different flood scenarios. Local Governments can continue to set visual amenity rules through their planning instruments and this will be not be changed by the draft QDC.

(g) With respect to paragraph 40(f) of this statement, I respectfully disagree that building design for extensions or alterations to character places should also be assessed by Local Government. I do not believe that there is justification for Local Government to assess all building development applications, particularly where planning approval has already been granted.

(h) With respect to paragraph 40(g) of this statement, I reiterate that the draft QDC has a range of appropriate application clauses and exemptions, such as those for small additions and non-habitable buildings such as sheds.

(i) With respect to paragraph 40(h) of this statement, the ABCB will be undertaking a regulation impact statement in relation to the draft Standard. The results of this process, and any subsequent amendments to the draft Standard, will be taken into consideration by BCQ once this process is completed. This is in contrast to existing Local Government planning instruments, which may not have undergone any regulatory impact assessment. For example, TLPIs are not required to undergo cost-benefit analysis or public consultation.

(j) With respect to paragraphs 40(i) to (j) of this statement, it is preferred for Local Governments to use their local knowledge and other historical records (including pictorial records and experience from surviving buildings and structures) to identify inactive or backflow areas. In this regard see also my comments at paragraph 39 above. Engineering reports would only be required if such information was not available. BCQ's work with the QRA indicates that many Local Governments would try to specify inactive flow areas or do so by default such as by identifying high flow areas.

(k) With respect to paragraph (j) of this statement, where an area is subject to flooding, any assessment of a proposed building will require some information on the likely level of inundation and water flows. This is irrespective of whether the assessment is made under the proposed QDC or under applicable planning scheme requirements. If practical information about water velocity is available for a Local Government assessment there is no reason the same information should not be available for assessment of the proposed building under a building development application. The arrangements that are proposed for adoption of the QDC will allow Local Governments to specify high water velocity areas and have back water areas identified by default.

I make this solemn declaration conscientiously believing the same to be true, and by virtue of the provisions of the *Oaths Act 1867*.

Signed ..... [redacted]

Glen Thomas Brumby

Taken and declared before me, at Brisbane this 1 day of November 2011.

[redacted]

Solicitor/~~Barrister/Justice of the Peace/Commissioner~~ for Declarations

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MP 3.5 – CONSTRUCTION OF BUILDINGS IN FLOOD HAZARD AREAS

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Draft-pending part only

Purpose

To ensure *buildings* in a *flood hazard area*:

(a) resist flotation, collapse or significant permanent movement caused by flood water; and

(b) safeguard occupants and other people against illness or injury caused by flood water affecting *buildings*; and

(c) are appropriately protected from the effects of flood water by standards for *services* and drainage outlets associated with *buildings*.

Commencement

This version of Mandatory Part (MP) 3.5, published on 28 October 2011, commences on [*date*].

Application

(1) This part applies to the lawful carrying out of building work[1], as indicated by crosses (☒) in the relevant columns in Table 1 below, located wholly or partly within a *flood hazard area*.

Table 1 – Application of MP 3.5

Application	Performance Requirements		
	P1	P2	P3
Construction of a new *class* 1, 2, 3, 9a, 9c *building*, or a *class* 4 part of a *building*.	☒	☒	☒
Relocation of a *class* 1 *building*.	☒	☒	☒
Raising a *class* 1 *building*.	☒	☒	☒
Additions to a *class* 1 *building* where the additions constitute 50% or more of the *floor area* of the entire *building*.	☒	☒	☒
Additions to a *class* 2, 3, 9a, 9c *building*, or a *class* 4 part of a *building*.	☒	☒	☒
Additions to a *class* 1 *building* where the additions will constitute less than 50% of the *floor area* of the entire *building*.		☒	☒
Construction of a new *class* 5, 6, 7, 8 or 9b *building*.		☒	☒

[1]Any plumbing or drainage work included in this part is plumbing and drainage work under the *Plumbing and Drainage Act 2002* (PDA) and is subject to the requirements under the PDA.

(2) Despite sub-section (1), this part does not apply to:

(a) *buildings* with an importance level 4 as specified by the BCA; or

(b) alterations that are not additions to the floor area of an existing *building*; or

(c) adding an extra storey above an existing part of the *building* that is not being raised; or

(d) additions to an existing *building* where a Local Government advises, by written notice to the owner, that it is impractical or undesirable for the building work to comply with this part; or

(e) floating *buildings* that are anchored to mooring piles that comply with the mandatory part of the Queensland Development Code 3.1 *performance requirement* 3; or

(f) *services* for a new *class* 5, 6, 7, 8 or 9b *building* where the *building's* certificate of classification states that the *building* is not intended to be occupied during, or in the aftermath of a *DFE*; or

(g) a *building* located on a lot that is subject to:
  (i) significant mudslide or significant landslide caused by rainfall or runoff, where it would be reasonable to expect that the mudslide or landslide would affect the part of the lot where the proposed building is to be located; or
  (ii) storm surge.

Note:

See the *Act*, section 36 and section 37. In advising an owner that it is impractical or undesirable for building work to comply with this part, it is intended that the Local Government take into account all relevant matters such as heritage, demolition control precincts and other planning related matters.

Limitation

The *acceptable solution* A1 for this part only applies to a *building* located on a lot if:
(a) the Local Government has specified a predicted *average velocity* for water flowing in the area in which the lot is located that is less than 1.5 metres per second; or
(b) it is reasonable to expect the lot to have water flowing over it during the *DFE* at a *maximum average velocity* of less than 1.5 metres per second; or
(c) the lot is located in an *inactive flow or backwater area*; or

Referral agency

Local Government is a referral agency for building development applications where the assessment manager proposes to seek written advice from the Local Government under section 2 (d) of the Application section of this part.

Compliance with the QDC

Compliance with this part can be achieved only by:
(a) complying with each component of the *acceptable solution* for the *performance requirement*; or
(b) formulating an *alternative solution* that complies with the *performance requirement* or is shown to be at least equivalent to the *acceptable solution*; or
(c) a combination of (a) and (b).

Note:

See the *Act*, section 14.

Associated requirements

- *Building Act 1975*
- Building Code of Australia (*BCA*)

- *Building Regulation 2006*
- *Plumbing and Drainage Act 2002*
- *Standard Plumbing and Drainage Regulation 2003*
- *Sustainable Planning Act 2009*
- *Sustainable Planning Regulation 2009*

Definitions

Note:

Italicised words within the body of the text, other than legislation titles, are defined below.

(1) The following definitions define particular words used in this part and in sections 2.6 – 2.13 of the *draft national standard*:

acceptable solution see the *Act*, section 14.

Act means the *Building Act 1975.*

alternative solution see the *Act,* schedule 2.

Annual Exceedance Probability means the likelihood of occurrence of a flood of a given size or larger in any one year, usually expressed as a percentage.

approved see the *Standard Plumbing and Drainage Regulation 2003*, Part 4.

BCA see the *Act,* section 12.

building see the *Act,* schedule 2.

class, for a *building* (or part of a *building*), means the classification of the *building* (or part of a *building*) as determined under the *BCA*.

competent person see the *Building Regulation 2006*, section 17(3).

defined flood event (DFE), for a *flood hazard area*, means a flood event during which flood water rises to the *DFL* for the area.

defined flood level (DFL), for a lot located in a *flood hazard area*, means:

(a) the flood level for the area designated by a Local Government under the *Building Regulation 2006*, section 13; or

(b) if a Local Government has not designated a flood level—
  (i) the 1% *Annual Exceedance Probability* flood level for the lot, as determined by a *competent person*; or
  (ii) the highest recorded flood level for the lot.

draft national standard means the draft national Standard for Construction of Buildings in Flood Hazard Areas, prepared by the Australian Building Codes Board, version 7, dated October 2011.

enclosed means non-habitable rooms completely surrounded on all sides by walls that would restrict (but not necessarily totally prevent) flood water from entering the room.

Example - a room surrounded on all sides with a brick veneer wall (including weep holes) and a garage or pedestrian door. However, a room surrounded by cladding incorporating gaps that allow relatively free movement of water would not be considered enclosed.

essential services means *services* related to a *required* fire safety installation.

finished floor level see the *draft national standard*, section 1.7.

flood hazard area means an area, whether or not mapped, designated by a Local Government as a natural hazard management area (flood) under section 13 of the *Building Regulation 2006*.

flood hazard level, for a *flood hazard area*, means the *DFL* plus a *freeboard*.

floor area see the Act, Schedule 2.

freeboard, for a *building*, in relation to water level in a *DFE* means the distance between the *finished floor level* of *habitable room* and the *DFL*, quantified as;

(a) if a Local Government designates a *freeboard* under section 13 of the *Building Regulation 2006*—the level of freeboard declared; or
(b) if a freeboard level is not declared by a Local Government—300mm.

habitable room see the *draft national standard*, section 1.7.

hydrodynamic action see the *draft national standard*, section 1.7.

hydrostatic action see the *draft national standard*, section 1.7.

inactive flow or backwater area means the area declared by a Local Government as an inactive flow or backwater area under section 13 of the *Building Regulation 2006*.

maximum average velocity means the maximum average flow rate of water over a lot during a *DFE*.

performance requirement see:

(a) the *Act*, section 14; and
(b) the definition of ***performance requirement*** in the *Act*, schedule 2.

required means required by this part, another part of the Queensland Development Code or the *BCA*.

services means the following:

(a) lift motors and lift motor rooms for emergency lifts;
(b) electrical switchboards and meters;
(c) back-up power supplies and generators for *essential services*;
(d) sprinkler valve rooms and any associated pumps;
(e) fire indicator panels;
(f) controls for stairwell pressurisation and air-handling systems used for smoke control;
(g) hot water systems; and
(h) gas meters.

wet flood proofing see the *draft national standard*, section 1.7.

(2) To remove any doubt, it is declared that a definition mentioned in this part applies for the purposes of interpreting sections 2.6 – 2.11 and 2.13 of the *draft national standard*.

Draft-Queensland Gov. only

PERFORMANCE REQUIREMENT	ACCEPTABLE SOLUTION

Buildings in flood hazard areas

P1 A *building* located in a *flood hazard area*, must be designed, constructed, connected and anchored so that, in the event of a flood up to the *DFE*, it:

(a) resists flotation, collapse or significant permanent movement, resulting from:

(i) *hydrostatic action*; and

(ii) *hydrodynamic action*; and

(iii) erosion and scouring; and

(iv) wind; and

(v) any other action; and

(b) safeguards occupants and other people against illness and injury caused by flood water affecting the *building*, or the part of the *building*.

A1 The *building* complies with sections 2.6 – 2.11 and 2.13 of the *draft national standard*.

Note:

1 The definitions for this part apply for the purpose of interpreting sections 2.6 – 2.11 and 2.13 of the *draft national standard*.

2 Where A1 does not apply to a *building*, or part of a *building*, (refer to limitations), an *alternative solution* will be required to comply with P1. To formulate an *alternative solution*, the services of an engineer may be required.

P2 A *building* located on a lot in a *flood hazard area* must be designed to reduce the effects of flood water on *services* associated with the *building* in the event of a flood up to the *DFE* for the area.

A2 *Services*, other than electrical meters for class 1 buildings, are:

(a) located above the *flood hazard level;* or

(b) designed, constructed, installed and anchored to resist flood-related actions and other actions during the *DFE*.

Note:

1 Electrical installations must be installed by a licensed electrician. Electrical meters must also be installed in accordance with electrical entity requirements.

Draft for Public Comment

	PERFORMANCE REQUIREMENT		ACCEPTABLE SOLUTION
P3	Drainage outlets associated with the *building* and located on the lot must be designed so that the effects of flood water are reduced in the event of a flood up to the *DFE*.	A3	(1) Drainage outlets for buildings in *flood hazard areas* are protected from backflow by fitting a reflux valve for sewerage on the lot in close proximity to the *building's* drainage connection point or in a location as specified by the Local Government. (2) Reflux valves installed under (1) are accessible for maintenance unless otherwise specified by the Local Government.

Note: Some planning schemes may not permit development be to be carried out on land prone to flooding. Check with the Local Government in the area to determine what land use restrictions apply to the lot.

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DRAFT STANDARD FOR CONSTRUCTION OF BUILDINGS IN FLOOD HAZARD AREAS

VERSION 7

OCTOBER 2011

ABCB Important Disclaimer

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The ABCB gives no warranty or guarantee and accepts no legal liability whatsoever arising from or connected to, the accuracy, reliability, currency or completeness of any material contained in this Standard.

Users should seek appropriate independent professional advice prior to relying on, or entering into any commitment based on material in this Standard in relation to building or related activities. Its interpretation in no way overrides the approvals processes in any jurisdiction.

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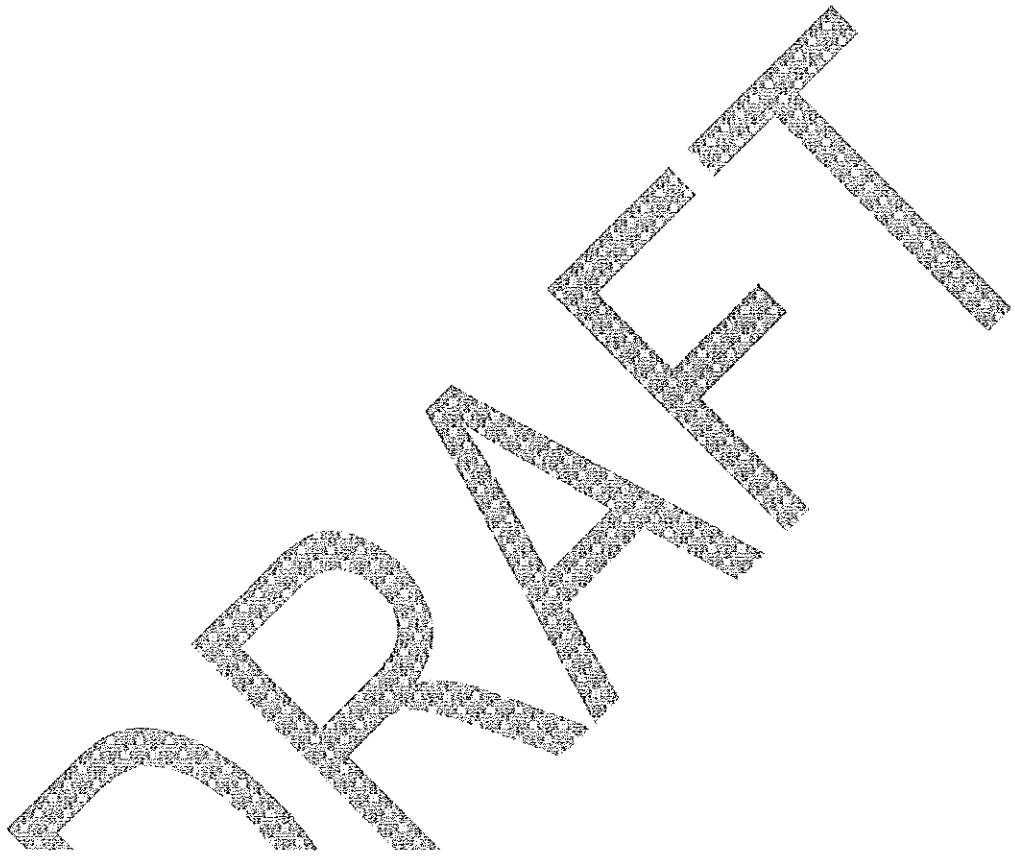
[1] The Australian Building Codes Board (ABCB) is a joint initiative of all three levels of government in Australia and includes representatives from the building and construction industry, and the plumbing industry. The mission of the ABCB is to address issues relating to safety and health, and amenity and sustainability in the design and performance of buildings through the National Construction Code (NCC) Series, and the development of effective regulatory systems and appropriate non-regulatory solutions. This is set out in an inter-government agreement between the Commonwealth, States and Territories.



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Preface

Currently, the National Construction Code (NCC) does not contain detailed construction practice for buildings *in flood hazard areas*. However, although not targeted at technical solutions for building *in flood hazard areas*, the NCC does contain performance provisions requiring all buildings to perform adequately under all reasonably expected design actions, withstand extreme or frequently repeated design actions, and specifically, to resist the action of liquids, ground water and rainwater ponding. The performance requirements with respect to surface water are designed to ensure that if the ponding of surface water occurs then drainage and disposal of surface water must be conveyed to an appropriate outfall and avoid water damaging or entering a building.

In recognition of the absence of technical standards relating to flooding within the NCC, the Australian Government and State and Territory Government Building Ministers responsible for building regulatory matters decided the ABCB should develop a standard for the design and construction of certain new buildings *in flood hazard areas* (the Standard). The Standard aims to reduce the risk of death or injury of building occupants as a result of buildings subjected to certain flood events. It is anticipated that subject to regulation impact in accordance with the Council of Australian Governments (COAG) Best Practice Regulation Guide and ABCB Board approval, the Standard would be referenced in the NCC Volumes One and Two in 2013.

It must also be emphasised that the Standard is not a stand-alone solution to mitigating life safety risk due to flooding. Reducing life safety risk due to flooding requires a comprehensive set of measures that consider flood hazard and function and aim to reduce risk to a manageable level. This may be achieved by limiting development within both hazardous areas and areas (such as floodways) where it may impact on flood behaviour for other developments. Within areas allowable for development, development controls or protection works may be used to reduce risk. This requires a suite of measures which generally involve a combination of effective land use planning considering flood hazard, flood mitigation measures, flood warning and emergency response strategies for flooding, and building standards. The balance of these measures will vary from new development areas to infill or redevelopment areas. Sufficient awareness of the flood risk and the safety measures required by the occupants and those assisting them during a flood emergency are essential pre-requisites.

Therefore, with the application of this Standard within *flood hazard areas*, in the absence of supporting measures, it is not possible to guarantee that a building constructed in accordance with the Standard will eliminate the risk of serious injury or fatality even in the *defined flood event*.

In addition, larger floods than the *defined flood event* (*DFE*) can occur and even floods of the scale of the *DFE* can vary in behaviour and could exceed the design parameters and limitations of this Standard. Availability of assistance from emergency services or other avenues are important considerations not treated in this Standard.

Acknowledgements

The ABCB acknowledges the contribution of members of an expert Reference Group that assisted the development of the Standard.

The following organisations were represented on the Reference Group –

- Australian Government Attorney-General's Department
- Brisbane City Council
- Bureau of Meteorology
- Geoscience Australia
- Gold Coast City Council
- Hawkesbury City Council
- Housing Industry Association
- Insurance Australia Group
- Master Builders Australia
- NSW Department of Planning and Infrastructure
- NSW Office of Environment and Heritage
- Queensland Department of Local Government and Planning
- Risk Frontiers
- Tasmania Department of Justice

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1 Scope and General

1.1 General

The National Construction Code (NCC) is an initiative of the Council of Australian Governments (COAG) developed to incorporate all on-site construction requirements into a single code. The NCC comprises the Building Code of Australia (BCA), Volume One and Two; and the Plumbing Code of Australia (PCA), as Volume Three.

The BCA is produced and maintained by the Australian Building Codes Board (ABCB) on behalf of the Australian Government and each State and Territory Government.

The BCA is a uniform set of technical provisions for the design and construction of buildings and other structures throughout Australia whilst allowing for variations in climate and geological or geographic conditions.

The BCA contains requirements to ensure new buildings and structures, and subject to State and Territory legislation alterations and additions to existing buildings, located in *flood hazard areas* do not collapse during a flood when subjected to flood actions resulting from the *defined flood event.*

The Standard provides additional requirements for buildings *in flood hazard areas* consistent with the objectives of the BCA which primarily aim to protect the lives of occupants of those buildings in events up to and including the *defined flood event. Flood hazard areas* are identified by the relevant State/Territory or Local Government *authority having jurisdiction.*

Section 2 of the Standard contains basic design requirements including a fundamental Performance Requirement that describes the level of performance required for the construction of buildings *in flood hazard areas.*

Section 2 also contains Deemed-to-Satisfy design criteria for the design of buildings *in flood hazard areas.* These provisions only apply if certain limits such as maximum flow velocity and depth of submersion, are not exceeded. This does not mean that buildings cannot be constructed if they fall outside these limits if if it is permissible under a planning scheme or planning instrument to do so. It means that such a proposal would need to be considered as an Alternative Solution under the relevant Performance Requirements and must be assessed accordingly.

The Standard also does not contain provisions that specify particular materials or design solutions which comply with the Performance Requirement. Therefore, in all instances, designers are required to use professional judgment in order to develop designs intended to comply with the Performance Requirement.

It must also be emphasised that the Standard is not a stand-alone solution to mitigating life safety risk due to flooding. Mitigating risk to life in flooding requires a comprehensive set of measures that consider flood hazard and aim to reduce residual flood risk to a manageable level. This set of measures generally involves a combination of effective land use planning considering flood hazard, flood mitigation measures, emergency response strategies for flooding, and building standards.

Therefore, with application of this standard within *flood hazard areas*, in the absence of supporting measures, it is not possible to guarantee that a building constructed in accordance with the Standard will eliminate the risk of serious injury or fatality even in the *defined flood event*.

In addition, larger floods than the *defined flood event* can occur and even floods of the scale of the *defined flood event* can be unpredictable and could exceed the design parameters and limitations in this Standard. Also, assistance from emergency services or other avenues may not be available to individual properties.

It is important to understand that flood is a local hazard whose parameters, including depth and velocity, vary significantly within the flood hazard area. Modelling of flood hazard generally provides information on average velocities across an area for an event rather than velocities at all points across a location. It is possible to have strong local flow velocities not being shown by such modelling.

In addition, there are significant variations in the information available on flooding between areas within a local authority and between local authorities within Australia. This may result from the age of studies, the type of modelling undertaken, the information available to understand flood behaviour, or the reliance of historical flood information or estimates used to provide an understanding of flood risk. This will mean that the information available is not uniform.

Flood investigations may have also resulted in mitigation works which may alter flood behaviour. These are local by nature and their benefits would generally be considered in studies on flooding for the area and considered by the local authority in determining the flood hazard area.

Existing development in more active flow areas, including floodways, is more likely to be subjected to higher velocities of flow than provided for in the Standard and is also more likely to impact upon flood behaviour elsewhere. Any additional development or redevelopment in these areas is also likely to be exposed to more hazardous conditions and therefore would require careful consideration and assessment. Also note that the flow velocities could also be expected to exceed those specified in this Standard in many areas subject to local overland flooding.

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The local authority may need to rely upon its own judgement upon where the Standard applies or request specific information from the proponent. This may limit the application of the Standard by the local authority to *backwater and inactive flow areas* in the *DFE* where it is less likely the velocity nominated in the Standard would be exceeded.

In many cases detailed information on the depth of inundation at the development in question will rely upon the provision of survey advice from the proponent relative to flood level information determined in the *DFE*.

In some cases the local authority may require the proponent to engage a suitably qualified professional to determine the *DFE* and/or to gain a more detailed understanding of flood behaviour at the location. This may include ascertaining the specific design criteria necessary to enable consideration of the development in relation to the Standard and meeting other requirements established by the local authority.

1.2 Scope

The Standard specifies requirements for flood-resistant design and construction of buildings that are subject to the BCA requirements and that are located, in whole or in part, in *flood hazard areas*.

The ABCB has also prepared an Information Handbook which provides additional information relating to the construction of buildings in *flood hazard areas*. The Handbook is available on the ABCB website www.abcb.gov.au.

1.3 Application

1.3.1 Identification of applicable *flood hazard areas*

A *flood hazard area* is an area subject to flooding during the *defined flood event* (*DFE*) as determined by the *authority having jurisdiction*, or where this information is not available, by the proponent in accordance with standards set, or referred to, by the *authority having jurisdiction*.

This Standard does not apply to parts of *flood hazard areas* with the following characteristics:

(a) The part of the *flood hazard areas* is subject to mudslide or landslide during periods of rainfall and runoff.

(b) The part of the *flood hazard areas* is subject to storm surge or coastal wave action.

1.3.2 Identification of applicable buildings

This Standard only applies to new Class 1, 2, 3, 9a health care and 9c buildings and Class 4 parts of buildings and, subject to State and Territory legislation, alterations and additions to existing buildings of these classifications.

1.4 Limitations

The Standard is not intended to –

(a) override or replace any legal rights, responsibilities or requirements; or

(b) override any land use planning controls imposed by the *authority having jurisdiction*; or

(c) address administrative requirements for construction of buildings *in flood hazard areas.*

1.5 Normative References

The following documents are referred to in this Standard:

(a) AS/NZS 1170.0.

(b) AS/NZS 1170.1.

(c) AS/NZS 1170.2.

1.6 Units

Except where specifically noted, this Standard uses the SI units of kilograms, metres, seconds, Pascals and Newtons (kg, m, s, Pa, N).

1.7 Definitions

Defined terms used within the text of the Standard are printed in italics. For the purposes of the Standard the following definitions apply:

Authority having jurisdiction: The relevant State, Territory, or Local Government agency with the statutory responsibility to determine the particular matter.

Defined flood level (DFL): the flood level associated with a *defined flood event (DFE)* relative to a specified datum. The *DFL* plus the *freeboard* determines the extent of the *flood hazard area.*

Defined flood event (DFE): the flood event selected for the management of flood hazard for the location of specific development as determined by the *authority having jurisdiction.*

Finished floor level: the uppermost surface of the finished floor, not including any floor covering such as carpet, tiles and the like.

Flood hazard area: the area (whether or not mapped) encompassing land lower than the *flood hazard level* which has been determined by the *authority having jurisdiction.* The area relates to that part of the allotment on which a building stands or is to be erected.

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Flood hazard level (FHL): the flood level used to determine the height of floors in a building and represents the *defined flood level* (*DFL)* plus the *freeboard.*

Freeboard: the height above the *defined flood level* (*DFL)* as determined by the *authority having jurisdiction*, typically used to compensate for effects such as wave action and localised hydraulic behaviour.

Habitable room: a room used for normal domestic activities, and-

(a) includes a bedroom, living room, lounge room, music room, television room, kitchen, dining room, sewing room, study, playroom, family room, home theatre and sunroom; but

(b) excludes a bathroom, laundry, water closet, pantry, walk-in wardrobe, corridor, hallway, lobby, photographic darkroom, clothes-drying room, vehicle parking area, storage area and other spaces of a specialised nature occupied neither frequently nor for extended periods.

Hydrodynamic action: the action caused by a fluid in motion.

Hydrostatic action: the pressure exerted by a fluid at equilibrium due to the force of gravity.

Inactive flow or backwater area: the part of the *flood hazard area* where the maximum flow velocity is not greater than 1.5m/s. The area does not include areas within or directly adjacent to a river, stream or floodway, where the maximum flow velocity is likely to exceed 1.5m/s.

Wet flood proofing: includes permanent or contingent measures applied to a building that prevent or provide resistance to damage from flooding while allowing floodwaters to enter and leave the building.

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1.8 Notation

The following letters and symbols have the following meanings:

G	permanent action (dead load) (AS/NZS1170.1
Q	imposed action (live load) (AS/NZS 1170.1)
F_I	flood action, resulting from the *DFE*
W_u	ultimate wind action (AS/NZS 1170.2)
Ψ_c	combination factor for imposed action (AS/NZS 1170.0)
D_e	equivalent surcharge depth in metres
C	shape factor
V	velocity of moving water in m/s
g	gravitational acceleration in m/s^2
Pa	Pascal
N	Newton
m	metre
s	second
kg	kilogram

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1.9 Performance-Based Standards

The Standard is presented as a performance-based document. Buildings to be constructed in *flood hazard areas* must be designed to comply with the Performance Requirement in Clause 2.3. The Performance Requirement lists various provisions that must be met during the design process.

The Performance Requirement enables the design of a building to be constructed in *flood hazard areas* to be developed from first principles to maximise its potential to meet specific client needs for a specific site.

1.10 Design Pathways

The Standard provides two pathways for compliance as follows:

(a) Formulating an Alternative Solution which complies with the Performance Requirement. This involves the application of engineering practice from first principles in combination with appropriate design considerations as an alternative to the requirements of Clauses 2.4 to 2.13. An alternative solution requires designers to apply professional judgment on all design issues.

(b) Compliance with the Deemed-to-Satisfy Provisions.

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2 Basic Design Requirements

2.1 Objective

The objective of the Standard is, in the event of a flood, to -

(a) safeguard people from injury caused by structural failure; and

(b) safeguard people from loss of amenity caused by structural behaviour; and

(c) safeguard people from illness or injury caused by utility failure; and

(d) protect other property from physical damage caused by structural failure.

2.2 Functional Statement

A building is to withstand the combination of loads and other actions to which it may be reasonably subjected during a flood event.

2.3 Performance Requirement

(a) A building in a *flood hazard area*, to the degree necessary, must be designed, constructed, connected and anchored to resist flotation, collapse or significant permanent movement resulting from the action of hydrostatic, hydrodynamic, erosion and scour, wind and other actions during the *DFE* or lesser event in accordance with the requirements of this Standard.

(b) The actions and requirements to be considered to satisfy (a) include but are not limited to-

(A) flood actions; and
(B) elevation requirements; and
(C) foundation requirements; and
(D) requirements for enclosures below the *flood hazard level*; and
(E) requirements for structural connections; and
(F) material requirements; and
(G) flood proofing; and
(H) requirements for utilities; and
(I) requirements for egress; and
(J) impacts to other structures and properties.

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Limitations:

Clause 2.3 only applies to-

(a) **Class 1, 2, 3, 9a health care and 9c buildings, and Class 4 parts of buildings; and**

(b) **areas that are not subject to landslip, mudslide, storm surge or coastal wave action.**

2.4 Deemed-to-Satisfy Provisions

Where a building solution is proposed to comply with the Deemed-to-Satisfy Provisions, Performance Requirement 2.3 is satisfied by complying with Clauses 2.5 to 2.13.

2.5 Application

(a) The Deemed-to-Satisfy Provisions only apply to *flood hazard areas* where the maximum flow velocity is not greater than 1.5 m/s.

(b) Where the *authority having jurisdiction* is not able to determine whether the maximum flow velocity is not greater than 1.5 m/s, the Deemed-to-Satisfy Provisions of this Standard can only apply to *inactive flow or backwater areas.*

2.6 Flood Actions

2.6.1 General

(a) Values of flood actions for use in design must be established that are appropriate for the type of structure or structural element, its intended use and exposure to flood action.

(b) The flood actions must include, but not limited to, the followings as appropriate: *hydrostatic actions*, *hydrodynamic actions*, debris actions, wave actions, erosion and scour.

(c) The flood actions must be based on the *DFE.*

2.6.2 Hydrostatic Actions

(a) *Hydrostatic actions* caused by a depth of water to the level of the *DFL* must be applied to all surfaces, both above and below ground level.

(b) Reduced uplift and lateral actions on surfaces of enclosed spaces below the *DFL* must apply only if provisions are made for entry and exit of flood water.

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2.6.3 Hydrodynamic Actions

(a) Dynamic effects of moving water must be determined by a detailed analysis based on the principles of fluid mechanics.

(b) Where water velocities do not exceed 1.5 m/s, the hydrodynamic actions can be approximated into equivalent hydrostatic actions by increasing the *DFL* by an equivalent surcharge depth D_e, equal to

$$D_e = (C\ V^2)/2g$$

Where

V = velocity of moving water in m/s

g = gravitational acceleration (9.8 m/s^2)

C = shape factor (1.25)

(c) This surcharge depth must be added to the *DFL* and applied to the vertical projected area of the building or structure that is perpendicular and upflow to the flow. Surfaces parallel to the flow or downflow will be subjected to the *DFL* hydrostatic pressures only.

2.6.4 Debris Actions

Where required, impact actions caused by objects transported by flood waters striking against buildings and structures must be determined using a rational approach as concentrated loads acting horizontally at the most critical location at or below the *DFL*.

2.6.5 Wave Actions

Where required, wave actions caused by water waves propagating over the water and striking a building or other structure must be determined using a rational approach. Wave actions include wash and wind generated waves but the Standard does not cover coastal waves.

2.6.6 Erosion and Scour

The effects of erosion and scour must be included in the calculation of actions on building foundations and other structures *in flood hazard areas*. The Standard does not cover coastal erosion.

2.6.7 Combinations of Actions

In addition to the combinations specified in AS/NZS 1170.0, the following combinations must be considered for structures located in a *flood hazard area*-

(a) $[1.2G, \psi_c Q, Y_F F_I]$; and

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(b) [0.9G, 0.5W_u, $Y_F F_I$].

Where F_I represents the flood related actions for the *DFE*, including hydrostatic (including buoyancy), hydrodynamic, wave and debris actions as appropriate; and

Y_F is the flood load factor as given in Table 2.6.7.

Table 2.6.7

Defined Flood Event (DFE)	Flood load factor Y_F
DFE based on annual probability of exceedance of not more than-	
1:100	1.0
1:50	1.2
1:25	1.4
DFE based on maximum recorded flood with record length of not less than-	
100 years	1.1
50 years	1.3
25 years	1.5

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2.7 Floor Height Requirements

Unless otherwise specified by the *authority having jurisdiction-*

(a) the *finished floor level* of *habitable rooms* must be above the *FHL;* and .

(b) the *finished floor level* of enclosed non-*habitable rooms* must be no more than 1.0 m below the *DFL*.

2.8 Footing System Requirements

2.8.1 General

The footing system of a structure must provide the required support to prevent flotation, collapse or significant permanent movement resulting from the flood actions specified in Section 2.6.

2.8.2 Geotechnical Considerations

The footing system design must account for instability and decrease in structural capacity associated with soil properties when wet, erosion and scour, liquefaction, and subsidence resulting from the flood actions specified in Section 2.6, depending on the geotechnical characteristics of the site.

2.8.3 Footing System Depth

The footing system depth must be adequate to provide the support required in 2.8.1 taking into account the geotechnical considerations of 2.8.2.

2.8.4 Piers, Posts, Columns or Piles

Piers, posts, columns and piles used to elevate buildings to the required elevation must take account of-

(a) the potential erosion action due to flood; and

(b) the potential debris actions.

2.8.5 Use of Fill

Fill providing support to the footing system must be designed to maintain that support under conditions of flooding, including rapid rise and draw-down of flood waters, prolonged inundation, erosion and scour, without exceeding the maximum design differential movement of the footing system as specified in AS 2870 as appropriate.

2.8.6 Use of Slabs

Slabs must comply with the following-

(a) the slab must be installed on fill in accordance with 2.8.5, or on undisturbed soil of adequate bearing capacity; and

(b) the slab must have adequate strength to resist the design actions even if the supporting soil under the slab is undermined by erosion; and

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(c) the bottom of the slab edge (usually the edge beam or edge footing) must be at or below the depth of expected scour.

2.9 Requirements for Enclosures below the *Flood Hazard Level (FHL)*

Any enclosure below the *FHL* must have openings to allow for automatic entry and exit of floodwater for all floods up to the *FHL*.

2.10 Requirements for Structural Attachments

(a) Erosion control structures that are attached to the foundation or superstructure of the building must be structurally adequate and not reduce the structural capacity of the building during the *DFE*.

(b) Decks, patios, stairways, ramps and the like below the *FHL* that are attached to the building must be structurally adequate and not reduce the structural capacity of the building during the *DFE*.

2.11 Material Requirements

(a) Materials used for structural purposes and located below the *FHL* must be capable of resisting damage, deterioration, corrosion or decay taking into account the likely time the material would be in contact with flood water and the likely time it would take for the material to subsequently dry out.

(b) Materials used for structural purposes include loadbearing columns, bracing members, structural connections, fasteners, wall framing members and the like.

2.12 Requirements for Utilities

2.12.1 General

(a) Utilities and related equipments must not be placed below the *FHL* unless they have been designed specifically to cope with flood water inundation.

(b) Buried systems must be placed at a depth sufficient to prevent damage due to scour and erosion during the *DFE*.

(c) Exposed systems must be designed to withstand the flood related actions (buoyancy, flow, debris and wave) as appropriate.

2.12.2 Electrical

Unless the electrical supply authority determines otherwise-

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(a) Electrical meters and switches must be placed above the *FHL* and made accessible during the *DFE*.

(b) Electrical conduits and cables installed below the *FHL* must be waterproofed or placed in waterproofed enclosures.

2.12.3 Plumbing and drainage

Plumbing and drainage openings below the *FHL* must be protected from backflow.

2.12.4 Mechanical and HVAC systems, tanks and the like

Ductwork, tanks, gas storage cylinders and the like shall be placed above the *FHL* or designed, constructed, installed and anchored to resist all flood-related actions and other actions during the *DFE* with appropriate load factors as given in 2.6.7. Potential buoyancy and other flood related actions on the empty tank during the *DFE* condition shall be considered.

2.13 Requirements for Egress

Egress from a balcony, verandah, deck, door, window or the like must be available to allow a person in the building to be rescued by emergency services personnel, if rescue during a flood event up to the *DFE* may be required.

2.14 Additional State or Territory requirements

State or Territory agencies may have a range of requirements for the location, construction and use of buildings to be constructed *in flood hazard areas*. It is also necessary to determine whether legislation requires –

(a) approval for construction; or

(b) conditions of approval: or

(c) limitations on use.

The ABCB Information Handbook presents an outline of requirements in each State and Territory.

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Department of Local Government and Planning
Building Codes Queensland Division
PO Box 15009
CITY EAST QLD 4002

24 August 2011

Dear Sir/Madam,

Re: Proposal to adopt the draft Standard for Construction of Buildings in Flood Hazard Areas

The following comments are provided in response to Building Newsflash No. 474 and Building Codes Queensland's proposal of early adoption of the draft Standard for Construction of Buildings in Flood Hazard Areas (draft Standard). The comments are made having regard to the draft Standard and the associated Information Handbook as prepared by the Australian Building Code Board.

The early adoption of the draft Standard in Queensland as outlined in the Building Codes Queensland newsflash is not supported and should be reconsidered.

It is considered necessary that opportunity be afforded to review and comment on the draft Standard through the national regulatory impact statement process. The timeframes highlighted for this process may also require extension to provide opportunity to adequately consider the recommendations of the Queensland Floods Commission of Inquiry and the outcomes of the review of State Planning Policy 1/03 - Mitigating the Adverse Impacts of Flood, Bushfire and Landslide in relation to the draft Standard.

Review of the draft Standard has highlighted that aspects of the draft Standard are matters that should be addressed through land use planning rather than through the Building Code. The suitability of land use, the location of buildings and associated design elements, habitable floor levels and associated amenity impacts (including streetscape and heritage character area impacts), redevelopment, and the resolution of existing use rights and approved land uses in flood hazard areas are land use matters and should be addressed through planning scheme measures.

It is noted that Building Codes Queensland has raised concerns regarding a number of recent Ipswich Planning Scheme amendment packages, indicating that aspects of the planning scheme were inconsistent with Section 31 of the Building Act relating to matters regulated through the Building Code rather than a planning scheme.

Whilst not agreeing with this view held by Building Codes Queensland, the proposed draft Standard appears to further confuse the distinction between land use planning matters that should be regulated through the planning scheme, and building work matters that should be regulated through the Building Code. This will create further ongoing conflict when relevant land use planning provisions are proposed to address matters of planning significance.

The draft Standard relies heavily on the availability of detailed flood information and may result in an expectation that local governments will undertake further detailed flood modelling to 'operationalise' the draft Standard. As indicated above, the adoption of the draft Standard should be considered once the Queensland Floods Commission of Inquiry and review of State Planning Policy 1/03 is finalised and can properly inform future flood modelling.

Concern is also raised in relation to the implementation of the draft Standard, particularly where land has existing use rights based on current zoning or has existing development approvals in place. It is unclear how the provisions would be applied to 'like for like' repairs and replacement of flood impacted residential dwellings. The early adoption would need to clarify how these matters will be addressed and provide clarity on implementation.

It should be noted that Ipswich City Council's Temporary Local Planning Instrument 1/2011 - Flooding Regulation (TLPI 1/2011) as approved by the Department of Local Government and Planning has addressed the majority of the aspects considered in the draft Standard as an interim measure ahead of the findings of the Queensland Floods Commission of Inquiry being released and any subsequent changes to State government policy. Consequently, it is again considered that early adoption as proposed is not required and may lead to confusion.

The approach adopted in TLPI 1/2011 allows a flexible approach to be taken on a case by case basis. Concern is raised that the draft Standard will need to be applied in a rigid manner that will either hinder the efforts to repair and reoccupy flood impacted homes, or lead to poor land use planning outcomes.

It is considered that the limited information contained in the newsflash is insufficient to enable a full review of the proposed changes to the Queensland Development Code. Should early adoption be considered, additional information and further opportunity to comment would be required to enable full consideration of the extent of mandatory and non-mandatory components to be included, and any exemptions proposed by Building Codes Queensland.

In particular, the option of providing an exemption by application to local government to deal with issues of applying the draft Standard to building additions requires further explanation.

Should you require any further details regarding these comments, please contact Richard de Vries on telephone number (07) 3810 6179.

Yours sincerely

[redacted]

[redacted]

STRATEGIC PLANNING MANAGER

HINCHINBROOK
SHIRE COUNCIL

Your Ref:
Our Ref: RWC:BKE
J:\LETTERS\DIP - Building Standard.doc
Enquiries: [redacted]

25th August, 2011.

Building Codes Queensland Division,
Department of Infrastructure & Planning,
BRISBANE. QLD. 4001.

buildingcodes@dlgp.qld.gov.au

***ATTENTION:* Flood code feedback.**

Dear Sir / Madam,

DRAFT NATIONAL STANDARD FOR CONSTRUCTION OF BUILDINGS IN FLOOD HAZARD AREAS IN QUEENSLAND

I refer to your email dated 26th July, 2011 advising of the proposed draft Standard for Construction of Buildings in Flood Hazard Areas.

Council at its General Meeting on Tuesday 23rd August, 2011 considered the draft standard, and in the main supports the proposals contained therein. Hinchinbrook Shire and particularly the town of Ingham is very susceptible to frequent flooding of the Herbert River and consequently our Planning Scheme requires habitable floor levels to be constructed 300mm above the 1 in 100 year flood level.

Council does have one issue of concern with the proposed draft and that is Section 2.7 which requires:-

" (b) floors of enclosed non-habitable rooms must be no more than 1 metre below the defined flood level."

This provision would have a great impact in the town of Ingham. Ingham is an old town and the majority of dwellings are of two storey high set construction. The first floor is usually used for garage and storage purposes, and when a major flood occurs in Ingham, residents remove their cars and other items of furniture and personal effects upstairs to the first floor. After the flood the downstairs floor area and walls are washed and hosed out and life returns to normal.

The problem with clause (b) above is that should Ingham be devastated by a major cyclone causing significant damage to these houses requiring their demolition, then clause (b) would require filling of the land otherwise their bottom floor would not meet this requirement. This poses considerable problems for a number of reasons:-

1. Filling has adverse affects on neighbouring properties as it can direct water or flows onto them.
2. From an aesthetic view point, it is disconcerting to see large "turkey mounds" set in amongst existing high set homes.

Council urges you to have some form of relief from this requirement that could for example allow Council to exempt development from this requirement.

I repeat that many of the houses in Ingham have more than 1 metre of water underneath the first floor in a major flood that is a 1 in 15 year event, let alone a 1 in 100 year event.

I would be pleased to provide further information in support of our concerns, and trust that you will take this into consideration and make appropriate changes.

Yours faithfully,

[redacted]

CHIEF EXECUTIVE OFFICER.

Explanatory Notes
Draft Queensland Development Code to adopt the draft Australian Building Codes Board Standard for Construction of Buildings in Flood Hazard Areas

Background

The Australian Building Codes Board (ABCB) has developed a draft national Standard for the Construction of Buildings in Flood Hazard Areas (draft Standard). The ABCB developed the draft Standard and an accompanying Information Handbook with the assistance of a reference group made up of representatives of State and Local governments, the building and engineering industries, and flood and hydrology experts. Copies of the draft Standard and Information Handbook are available online.

The draft Standard provides specific performance requirements and deemed-to-satisfy (DTS) provisions for the design and construction of buildings in designated flood hazard areas. In Queensland, flood hazard areas are designated by Local Governments.

The ABCB intends to release a national regulation impact statement for the draft Standard in late 2011 to be finalised in early 2012. It is intended that the draft Standard be included in the 2013 version of the Building Code of Australia from 1 May 2013.

The Department of Local Government and Planning (DLGP), through Building Newsflash Number 474 issued on 26 July 2011, sought comment on early adoption in Queensland of version 6 of the draft Standard dated July 2011. Following the close of this consultation period DLGP met with representatives of the Building Industry Consultative Group (BICG) to discuss the proposal and consultation results. The BICG includes members of a wide range of key building industry organisations which include the Housing Industry Association, the Queensland Master Builders Association, the Property Council of Australia, the Building Designers Association of Queensland and the Local Government Association of Queensland. DLGP also received submissions from a number of other stakeholders during the consultation process.

Following the consultation period, the DLGP developed a draft Queensland Development Code (QDC) which, if approved by Government, will adopt the draft Standard into building law in Queensland.

Policy objectives and the reasons for them

The QDC was developed to help address the immediate needs associated with constructing new buildings and additions in flood affected areas, and to generally improve the flood resilience of communities across Queensland. For these reasons, it is proposed to adopt the new mandatory part of the QDC in late 2011.

Achievement of policy objectives

The draft QDC has three broad performance requirements, namely, detailed new standards for residential buildings, services for all classes of buildings and prevention of sewage reflux. It will have an effect for all classes of buildings to some extent.

The draft QDC is intended to apply in a practical way to the range of scenarios for buildings in flood hazard areas. Consequently, the draft QDC has a detailed application section with specific inclusions and a list of exclusions. It will generally apply to the construction of new residential buildings (i.e. houses, townhouses, units, hospitals and aged care buildings), raising and relocating houses, additions to existing houses where the addition is greater than 50% of the floor area, and additions to other types of dwellings.

It is not intended to apply to minor alterations to an existing home, such as adding a bedroom or en-suite bathroom, or moving an internal wall. Also, Local Governments will have the ability to provide exemptions from the draft QDC for additions to existing buildings where it is considered impractical or undesirable to do so. For example, this may include where an addition would be required to be raised above the flood level and would be impractical to be used in conjunction with the existing building, which may be at a lower level.

The draft QDC also sets standards for critical building services, such as lift motors and lift motor rooms for emergency lifts, sprinkler alarm rooms, back-up power supplies for essential services, electrical switchboards and meters, hot water systems and fire indicator panels, to be raised above the flood level or designed to resist flood actions in all buildings, other than sheds and garages. This will assist with the safe occupation of buildings during a flood event and with re-occupation after the event.

It may be impractical to apply the QDC requirements for essential services to all new commercial buildings. For this reason, the draft QDC allows building certifiers to specify on the building's certificate of classification that the building does not comply with the services requirements of the QDC because the building is not intended to be occupied during a flood event or in the aftermath of a flood event (i.e. in the period until the building is repaired or assessed to be in a suitable state to be re-occupied).

The draft QDC will also require all new buildings to be protected from sewage backflow by fitting a reflux valve as part of the sewerage system.

Notes on provisions

Purpose

The purpose of the draft QDC is to ensure that:

- the structural integrity of the building is maintained during a flood
- occupants and other persons are safeguarded from injury and illness during and after a flood, and

- essential services and plumbing and drainage associated with the building are protected.

Commencement
Subject to approval by Government, it is anticipated that the draft QDC will commence in late 2011.

Application
Similar to the QDC MP4.1, the draft QDC specifies that it applies to building work highlighted in **Table 1** of the draft QDC.

All performance requirements of the draft QDC will apply to the construction of new class 1, 2, 3, 9a, 9c, or a class 4 part of a building. All performance requirements will also apply where:

- a class 1 building is raised or relocated
- an addition is made to a class 1 building that constitutes 50% of the floor area of the entire building (not including the addition of an extra storey above an existing building)
- an addition is made to a class 2, 3, 9a, 9c building, or a class 4 part of a building.

For additions to a class 1 building where the addition constitutes less than 50% of the floor area of the entire building, only performance requirements 2 and 3 will apply to the building work. This is also the case for the construction of new class 5, 6, 7, 8 or 9b buildings.

The draft QDC will not apply to alterations or floating buildings that comply with performance requirement 3 of QDC MP3.1.

The draft QDC will also not apply to an addition to an existing building where the Local Government provides written notice advising that it is impractical or undesirable for the addition to comply with the QDC if the building would otherwise have been required to comply.

Services (required under performance requirement 2) of class 5, 6, 7, 8 or 9b buildings that would otherwise have been required to comply with the draft QDC will not be required to comply if the building is not intended to be occupied during, or after, a flood of a magnitude up to the defined flood event and this is stated on the certificate of classification for the building. This is because some buildings may be able to be evacuated and not require immediate re-occupation due to the nature of their use. Building certifiers should not approve buildings without essential safety services complying with performance requirement two if the building is intended to be occupied during or in the aftermath of a DFE. Owners and occupiers must ensure essential safety services comply and are fully operational before re-occupying the building after a flood event.

Limitation
As the DTS solutions of the draft Standard only apply to flood hazard areas that are subject to a maximum flow velocity of water not greater than 1.5

metres per second or inactive flow or backwater areas, the draft QDC has adopted these limitations for the acceptable solutions that refer to the draft Standard.

Local Governments will have the ability under the *Building Regulation 2006* to declare the flow velocity/s for an area, or declare areas of backwater or inactive flow, for the purposes of the QDC. Many Local Governments have significant knowledge of local flooding characteristics, which is often developed through flood studies, records of past flood events and experiences with the community response to flooding situations. For example, pictorial records and the performance of surviving buildings and structures may reasonably provide adequate evidence of areas of low flow. Similarly, where a Local Government does not provide a flood level for a lot there may be a local water level gauging station in the same basin that can be used to ascertain the highest recorded flood level for the lot.

Referral agency
A Local Government is a concurrence referral agency for building development applications where the assessment manager proposes to receive written advice from the Local Government under section 2(d) of the Application section of this part. This will enable Local Governments to charge a reasonable fee for providing this service, and also ensures there are appeal rights to the Building and Development Dispute Resolution Committees. It also gives Local Governments the ability to make case by case assessments to determine where it may be impractical or undesirable for an addition to comply with the QDC.

Compliance with the QDC
As with all assessable building work, compliance with the QDC can be achieved in a number of ways, including compliance with acceptable solutions, formulating an alternative solution or a combination of the two. An alternative solution will need to be assessed and approved by the assessment manager.

For further information, see the *Building Act 1975* sections 14 and 26.

Definitions
Some of the definitions used in the draft QDC vary from the draft Standard. Where there is inconsistency between the two documents, the definitions provided for in the QDC prevails over those in the draft Standard.

The main variations to definitions between the draft QDC and the draft Standard are as follows:

- defined flood event (DFE)
- defined flood level (DFL)
- flood hazard area
- flood hazard level
- freeboard
- enclosed
- essential services

- inactive flow or backwater area
- services

The primary reason for alternative definitions of DFE and DFL is due to the new flood mapping that may be adopted under Temporary State Planning Policy 2/11. This mapping does not include information on flood levels and it is intended that a new power will be included in the *Building Regulation 2006* to allow Local Governments to set a flood level for an area that has been designated as a natural hazard management area (flood). This would allow Local Governments to rely on historical data to set a flood level, without the requirement to ensure that the flood level is associated with a specific flood event, as is currently required under the *Building Regulation 2006* and State Planning Policy 1/03.

Where a Local Government does not declare a flood level, the QDC specifies that an assessment manager may use the level associated with a flood having a 1% Annual Exceedance Probability for the lot (as long as this is determined by a 'competent person' under the *Building Act 1975*) or the highest recorded flood level for the lot. However, where deciding to use the highest recorded flood level for the lot, the assessment manager should consider whether this is reasonably in accordance with the level associated with a flood having a 1% Annual Exceedance Probability.

The draft QDC requires a freeboard of 300mm unless a Local Government declares a greater freeboard under section 13 of the *Building Regulation 2006*. An amendment is being proposed to section 13 of the *Building Regulation 2006* to give Local Governments this power.

The definition of inactive flow or backwater area also refers to the *Building Regulation 2006*. These characteristics of a specific area or lot are intended to be declared by a Local Government (as long as the area has first been designated as a natural hazard management area (flood)) where it can reasonably expect that the maximum flow rate is not likely to exceed 1.5 metres per second. It is intended to allow Local Governments to designate areas without needing to specify a flow rate for the area and therefore necessitating the requirement for a flood study. This may apply to areas such as Rosalie where the water rises slowly from drains and also falls away slowly.

Performance Requirements and Acceptable Solutions
There are three performance requirements, each with their associated acceptable solutions, under the draft QDC.

P1 and A1
The first performance requirement relates to the adoption of the draft Standard. It provides the specific requirement for buildings in flood hazard areas to resist forces relevant to flooding, such as hydrostatic and hydrodynamic actions, erosion and scour. The acceptable solution calls up sections 2.6 – 2.11 and 2.13 of the draft national Standard which are within the DTS solutions of the draft Standard. However, it does not call up section

2.12 of the draft Standard as these requirements have been called up under performance requirements 2 and 3 and have been tailored to achieve Queensland specific outcomes.

P2 and A2

The second performance requirement includes provisions for raising building services or otherwise designing, constructing and installing them to resist actions during the DFE. The draft QDC specifies certain services that are considered as being particularly important, both during and after a flood. These services may be critical for building occupant safety or may often be adversely affected during a flood event and require replacement before reoccupation of the building can occur.

The draft Standard provides broad requirements for electrical services to be either located above the flood hazard level or waterproofed in some manner. It does not apply to class 1 buildings, as compliance with the requirement may be contrary to the regulatory requirements of electricity supply authorities.

The draft QDC provides more specific details of the types of electrical and other installations and components requiring protection from flood waters. The draft QDC captures those services considered to be essential to the continued operation of the building so it may still be occupied throughout a flood event. Whenever a building is occupied during a flood event, it is considered critical to ensure life safety systems such as fire detection and alarm systems, smoke handling systems and back-up power supplies continue to function and are accessible.

P3 and A3

Performance requirement three relates to drainage outlets associated with a building. The draft Standard does not provide a specific solution for reducing the effects of flood on a building's sewerage system. The draft QDC aims to provide a specific solution by requiring the installation of reflux valves to directly protect sewerage systems from the effects of flooding.

A reflux valve is required in a location as close as possible to the point of connection into the sewerage infrastructure. This will ensure there is a consistent approach to the location of reflux valves for maintenance and accessibility. In cases where there are difficult or unique circumstances relating to accessibility for maintenance, the draft QDC allows Local Governments the flexibility to specify an alternative.

Comparison Table for differences between draft national Standard and draft QDC		
Draft Standard for Construction of Buildings in Flood Hazard Areas Version 7 - October 2011	**Draft Queensland Development Code MP 3.5 – Construction of Buildings in Flood Hazard Areas – 28 October 2011**	**Comments**
1.7 Definitions ***Defined flood event (DFE)***: the flood event selected for the management of flood hazard for the location of specific development as determined by the *authority having jurisdiction*. ***Defined flood level (DFL)***: the flood level associated with a *defined flood event (DFE)* relative to a specified datum. The *DFL* plus the *freeboard* determines the extent of the *flood hazard area*.	**Definitions** ***defined flood event (DFE)***, for a *flood hazard area*, means a flood event during which flood water rises to the *DFL* for the area. ***defined flood level (DFL)***, for a lot located in a *flood hazard area*, means: (a) the flood level for the area designated by a Local Government under the *Building Regulation 2006*, section 13; or (b) if a Local Government has not designated a flood level— (i) the 1% *Annual Exceedance Probability* flood level for the lot, as determined by a *competent person*; or (ii) the highest recorded flood level for the lot.	**Definitions** Some of the definitions used in the draft QDC vary from the draft Standard. Where there is inconsistency in definitions between the two documents, the definitions in the draft QDC take precedence over those in the draft Standard. The significant differences in definitions between the draft Standard and the draft QDC are detailed in columns one and two of this section and include: • defined flood event (DFE) • defined flood level (DFL) • flood hazard area • flood hazard level • freeboard • enclosed • essential services • inactive flow or backwater area • services The primary reason for the amended definitions of **DFE** and **DFL** is due to the new flood mapping that may be adopted under the Temporary State Planning Policy 2/11. This

Flood hazard area: the area (whether or not mapped) encompassing land lower than the *flood hazard level* which has been determined by the *authority having jurisdiction.* The area relates to that part of the allotment on which a building stands or is to be erected. ***Flood hazard level (FHL)***: the flood level used to determine the height of floors in a building and represents the *defined flood level* (*DFL)* plus the *freeboard.* ***Freeboard***: the height above the *defined flood level* (*DFL)* as determined by the *authority having jurisdiction*, typically used to compensate for effects such as wave action and localised hydraulic behaviour. ***Inactive flow or backwater area***: the part of the *flood hazard area* where the maximum flow velocity is not greater than 1.5m/s. The area does not include areas within or directly adjacent to a river, stream or floodway, where the maximum flow velocity is likely to exceed 1.5m/s.	***flood hazard area*** means an area, whether or not mapped, designated by a Local Government as a natural hazard management area (flood) under section 13 of the *Building Regulation 2006.* ***flood hazard level*** for a *flood hazard area*, means the *DFL* plus a *freeboard.* ***freeboard***, for a *building*, means: in relation to water level in a DFE means the distance between the *finished floor level* of a *habitable room* and the *DFL,* quantified as; (a) if a Local Government designates a *freeboard* under section 13 of the Building Regulation 2006—the level declared; or (b) otherwise—300mm. ***inactive flow or backwater area*** means the area declared by a Local Government as an inactive flow or backwater area under section 13 of the *Building Regulation 2006.*	mapping does not include information on flood levels and it is intended that a new power will be included in the *Building Regulation 2006* to allow Local Governments to set a DFL for an area that has been designated as a natural hazard management area (flood). This would allow Local Governments to rely on historical data to set a DFL, without the requirement to ensure that the DFL is associated with a specific flood event, as is currently required under the *Building Regulation 2006* and State Planning Policy 1/03. Where a Local Government does not declare a DFL, the QDC specifies that an assessment manager may use the level associated with a flood having a 1% Annual Exceedance Probability for the lot (as long as this is determined by a 'competent person' under the *Building Regulation 2006*) or the highest recorded flood level for the lot. However, where deciding to use the highest recorded flood level for the lot, the assessment manager should consider whether this is reasonably in accordance with the level associated with a flood having a 1% Annual Exceedance Probability. The draft QDC requires a **freeboard** of 300mm unless a Local Government declares

Not defined in draft Standard	***enclosed*** means non-habitable rooms completely surrounded on all sides by walls that would restrict (but not necessarily totally prevent) flood water from entering the room. *Example*- a room surrounded on all sides with a brick veneer wall (including weep holes) and a garage or pedestrian door, would be considered enclosed. However, a room surrounded by cladding incorporating gaps that allow relatively free movement of water would not be considered enclosed.	a greater freeboard under section 13 of the *Building Regulation 2006*. An amendment is being proposed to section 13 to give Local Governments this power. The definition of **inactive flow** or **backwater area** also refers to the *Building Regulation 2006*. These characteristics of a specific area or lot are intended to be declared by a Local Government (as long as the area has first been designated as a natural hazard management area (flood)) where it can reasonably expect that the maximum flow rate is not likely to exceed 1.5m/s. It is intended to allow Local Governments to designate areas without needing to specify a flow rate for the area and therefore necessitating the requirement for a flood study. This may apply to areas such as Rosalie where the water rises slowly from drains and also falls away slowly.
Not defined in draft Standard	***essential services*** means services related to a *required* fire safety installation.	
Not defined in draft Standard	***services*** means the following: (a) lift motors and lift motor rooms for emergency lifts; (b) electrical switchboards and meters; (c) back-up power supplies and generators for *essential services*; (d) sprinkler valve rooms and any associated pumps; (e) fire indicator panels; (f) controls for stairwell pressurisation and air-handling systems used for smoke control; (g) hot water systems; and gas meters	The definitions of **'enclosed'**, **'essential services'** and **'services'** were not included in the draft Standard but have been incorporated into the draft QDC with the intention of clarifying the requirements. Some of these definitions also relate to Queensland specific requirements, for example where certain services were considered as being particularly important, both during and after a flood. These services may be critical for building

		occupant safety or may often be adversely affected during a flood event and require replacement before reoccupation of the building can occur.

2.5 Application

(a) The Deemed-to-Satisfy Provisions only apply to *flood hazard areas* where the maximum flow velocity is not greater than 1.5 m/s.

(b) Where the *authority having jurisdiction* is not able to determine whether the maximum flow velocity is not greater than 1.5 m/s, the Deemed-to-Satisfy Provisions of this Standard can only apply to *inactive flow or backwater areas*.

Application

(1) This part applies to the lawful carrying out of building work[1], as indicated by crosses (☒) in the relevant columns in Table 1 below, located wholly or partly within a *flood hazard area*

Table 1 – Application of MP 3.5

Application	Performance Requirements		
	P1	P2	P3
Construction of a new *class* 1, 2, 3, 9a, 9c *building*, or a *class* 4 part of a *building*.	☒	☒	☒
Relocation of a *class* 1 *building*.	☒	☒	☒
Raising a *class* 1 *building*.	☒	☒	☒
Additions to a *class* 1 *building* where the additions constitute 50% or more of the *floor area* of the entire *building*.	☒	☒	☒
Additions to a *class* 2, 3, 9a, 9c *building*, or a *class* 4 part of a *building*.	☒	☒	☒
Additions to a *class* 1 *building* where the		☒	☒

Application

Similar to the QDC MP4.1, the draft QDC specifies that it applies to building work highlighted in Table 1.

All performance requirements of the draft QDC will apply to the construction of a new class 1, 2, 3, 9a, 9c, or a class 4 part of a building. All performance requirements will also apply where:

- a class 1 building is raised or relocated
- an addition is made to a class 1 building that constitutes 50% of the floor area of the entire building (not including the addition of an extra storey above an existing building)
- an addition is made to a class 2, 3, 9a, 9c building, or a class 4 part of a building.

For additions to a class 1 building where the addition constitutes less than 50% of the floor area of the entire building, only performance requirements 2 and 3 will apply to the building work. This is also the case for the construction of new class 5, 6, 7, 8 or 9b buildings.

The draft QDC will not apply to alterations or floating buildings that comply with

additions will constitute less than 50% of the *floor area* of the entire *building*.			
Construction of a new *class* 5, 6, 7, 8 or 9b *building*.		☒	☒

[1]Any plumbing or drainage work included in this part is plumbing and drainage work under the *Plumbing and Drainage Act 2002* (PDA) and is subject to the requirements under the PDA.

(2) Despite sub-section (1), this part does not apply to:

(a) *buildings* with an importance level 4 as specified by the BCA; or

(b) alterations that are not additions to the floor area of an existing *building*; *or*

(c) adding an extra storey above an existing part of the *building* that is not being raised; or

(d) additions to an existing *building* where a Local Government advises, by written notice to the owner, that it is impractical or undesirable for the building work to comply with this part; or

(e) floating *buildings* that are anchored to

performance criteria 3 of QDC MP3.1.

The draft QDC will also not apply to an addition to an existing building where the Local Government provides written advice that it is impractical or undesirable to comply with the QDC if the building would otherwise have been required to comply.

Services (required under performance requirement 2) of class 5, 6, 7, 8 or 9b buildings that would otherwise have been required to comply with the draft QDC will not be required to comply if the building is not intended to be occupied during, or after, a flood of a magnitude up to the defined flood event and this is stated on the certificate of classification for the building. This is because some buildings may be able to be evacuated and not require immediate re-occupation due to the nature of their use. Building certifiers should not approve buildings without essential safety services complying with performance requirement two if the building is intended to be occupied during or in the aftermath of a DFE. Owners and occupiers must ensure essential safety services comply before re-occupying the building after a flood event.

	mooring piles that comply with the mandatory part of the Queensland Development Code 3.1 *performance requirement* 3; or (f) *services* for a new *class* 5, 6, 7, 8 or 9b *building* where the *building's* certificate of classification states that the *building* is not intended to be occupied during, or in the aftermath of a *DFE*; or (g) a *building* located on a lot that is subject to: (i) significant mudslide or significant landslide caused by rainfall or runoff, where it would be reasonable to expect that the mudslide or landslide would affect the part of the lot where the proposed building is to be located; or (ii) storm surge. Note: See the *Act*, sections 36 and section 37. In advising an owner that it is impractical or undesirable for building work to comply with this part, it is intended that the Local Government take into account all relevant matters such as heritage, demolition control precincts, other planning related matters.	

Limitations: Clause 2.3 only applies to - (a) Class 1, 2, 3, 9a health care and 9c buildings, and Class 4 parts of buildings; and (b) areas that are not subject to landslip, mudslide, storm surge or coastal wave action.	**Limitation** (2) The *acceptable solution* A1 for this part only applies to a *building* located on a lot if: (a) the Local Government has specified a predicted *average velocity* for water flowing in the area in which the lot is located that is less than 1.5 metres per second; or (b) it is reasonable to expect the lot to have water flowing over it during the *DFE* at a *maximum average velocity* of 1.5 metres per second; or (c) the lot is located in an *inactive flow or backwater area*.	**Limitation** As the deemed-to-satisfy solutions of the draft Standard only apply to flood hazard areas that are subject to a maximum flow velocity of water not greater than 1.5m/s or inactive flow or backwater areas, the draft QDC has adopted these limitations for the acceptable solutions that refer to the draft Standard. Amendments to the *Building Regulation 2006* will enable Local Governments to declare the maximum flow velocity/s for an area, or declare areas of backwater or inactive flow, for the purposes of the QDC.
2.12.2 Electrical Unless the electrical supply authority determines otherwise- (a) Electrical meters and switches must be placed above the *FHL* and made accessible during the *DFE*. (b) Electrical conduits and cables installed below the *FHL* must be waterproofed or placed in waterproofed enclosures	**A2** *Services*, other than electrical meters for class 1 buildings, are: (a) located above the *flood hazard level;* or (b) designed, constructed, installed and anchored to resist flood-related actions and other actions during the *DFE*. Note:	**Acceptable solution – *services*** The draft Standard provides broad requirements for electrical services to be either located above the *FHL* or waterproofed in some manner. It does not apply to class 1 buildings, as compliance with the requirement may be contrary to the regulatory requirements of electricity supply authorities.

	1 Electrical installations must be installed by a licensed electrician. Electrical meters must also be installed in accordance with electrical entity requirements.	The draft QDC provides more specific details of the types of electrical and other installations and components requiring protection from flood waters. The draft QDC captures those services considered to be essential to the continued operation of the building so it may still be occupied throughout a flood event. Whenever a building is occupied during a flood event, it is considered critical to ensure life safety systems such as fire detection and alarm systems, smoke handling systems and back-up power supplies continue to function and are accessible.

2.12.3 Plumbing and drainage Plumbing and drainage openings below the *FHL* must be protected from backflow.	**A3** (1) Drainage outlets for buildings in *flood hazard areas* are protected from backflow by fitting a reflux valve for sewerage on the lot in close proximity to the building's drainage connection point or in a location as specified by the Local Government. (2) Reflux valves installed as *required* under (1) are accessible for maintenance unless otherwise specified by the local government.	**Acceptable solution – drainage** The draft Standard does not provide a specific solution for reducing the effects of flood on a building's sewerage system. The draft QDC aims to provide a specific solution by requiring the installation of reflux valves to directly protect sewerage systems from the effects of flooding. A reflux valve is required in a location as close as possible to the point of connection into the sewerage infrastructure. This will ensure there is a consistent approach to the location of reflux valves for maintenance and accessibility. In cases where there are difficult or unique circumstances relating to accessibility for maintenance, the draft QDC allows Local Governments to specify an alternative.