

## 8.2.4 Flood and storm tide hazard overlay code

### 8.2.4.1 Application

- (1) This code applies to assessing a material change of use, reconfiguring a lot, operational work or building work within the Flood and storm tide hazard overlay, if:
  - (a) self assessable or assessable development where the code is identified as being applicable in the Assessment criteria for the Overlay Codes contained in the Levels of Assessment Tables in section 5.6;
  - (b) impact assessable development.
- (2) Land in the Flood and storm tide hazard overlay is identified on the Flood and storm tide hazard overlay map in Schedule 2 and includes the:
  - (a) Storm tide – high hazard sub-category;
  - (b) Storm tide – medium hazard sub-category;
  - (c) Flood plain assessment sub-category;
  - (d) 100 ARI Mossman, Port Douglas and Daintree Township Flood Studies sub-category.
- (3) When using this code, reference should be made to Part 5.

Note - The Flood and storm tide hazards overlay maps contained in Schedule 2 identify areas (Flood and storm tide inundation areas) where flood and storm tide inundation modelling has been undertaken by the Council. Other areas not identified by the Flood and inundation hazards overlay maps contained in Schedule 2 may also be subject to the defined flood event or defined storm tide event.

### 8.2.4.2 Purpose

- (1) The purpose of the Flood and storm tide hazard overlay code is to:
  - (a) implement the policy direction in the Strategic Framework, in particular:
    - (i) Theme 1 Settlement pattern: Element 3.4.7 Mitigation of hazards;
    - (ii) Theme 6 Infrastructure and transport: Element 3.9.2 Energy.
  - (b) enable an assessment of whether development is suitable on land within the Flood and storm tide hazard sub-categories.
- (2) The purpose of the code will be achieved through the following overall outcomes:
  - (a) development siting, layout and access responds to the risk of the natural hazard and minimises risk to personal safety;
  - (b) development achieves an acceptable or tolerable risk level, based on a fit for purpose risk assessment;
  - (c) the development is resilient to natural hazard events by ensuring siting and design accounts for the potential risks of natural hazards to property;
  - (d) the development supports, and does not unduly burden disaster management response or recovery capacity and capabilities;
  - (e) the development directly, indirectly and cumulatively avoids an unacceptable increase in severity of the natural hazards and does not significantly increase the potential for damage on site or to other properties;
  - (f) the development avoids the release of hazardous materials as a result of a natural hazard event;
  - (g) natural processes and the protective function of landforms and/or vegetation are maintained in natural hazard areas;
  - (h) community infrastructure is located and designed to maintain the required level of functionality during and immediately after a hazard event.

### 8.2.4.3 Criteria for assessment

Table 8.2.4.3.a – Flood and storm tide hazards overlay code –assessable development

Performance outcomes	Acceptable outcomes
<b>For assessable and self assessable development</b>	
<p><b>PO1</b> Development is located and designed to: ensure the safety of all persons; minimise damage to the development and contents of buildings; provide suitable amenity; minimise disruption to residents, recovery time, and rebuilding or restoration costs after inundation events.</p> <p>Note – For assessable development within the flood plain assessment sub-category, a flood study by a suitably qualified professional is required to identify compliance with the intent of the acceptable outcome.</p>	<p><b>AO1.1</b> Development is sited on parts of the land that is not within the Flood and Storm tide hazards overlay maps contained in Schedule 2;</p> <p>or</p> <p>For dwelling houses,</p> <p><b>AO1.2</b> Development within the Flood and Storm Tide hazards overlay maps (excluding the Flood plain assessment sub-category) is designed to provide immunity to the Defined Inundation Event as outlined within Table 8.2.4.3.b plus a freeboard of 300mm.</p> <p><b>AO1.3</b> New buildings are: (a) not located within the overlay area; (b) located on the highest part of the site to minimise entrance of flood waters; (c) provided with clear and direct pedestrian and vehicle evacuation routes off the site.</p> <p><b>AO1.4</b> In non urban areas, buildings and infrastructure are set back 50 metres from natural riparian corridors to maintain their natural function of reducing velocity of floodwaters.</p>
<b>For assessable development</b>	
<p><b>PO2</b> The development is compatible with the level of risk associated with the natural hazard.</p>	<p><b>AO2</b> The following uses are not located in land inundated by the Defined Flood Event (DFE) / Storm tide: (a) Retirement facility; (b) Community care facility; (c) Child care centre.</p>
<p><b>PO3</b> Development siting and layout responds to flooding potential and maintains personal safety</p>	<p>For Material change of use</p> <p><b>AO3.1</b> New buildings are: (d) not located within the overlay area; (e) located on the highest part of the site to minimise entrance of flood waters; (f) provided with clear and direct pedestrian and vehicle evacuation routes off the site.</p> <p>or</p>

Performance outcomes	Acceptable outcomes
	<p><b>AO3.2</b> The development incorporates an area on site that is at least 300mm above the highest known flood inundation level with sufficient space to accommodate the likely population of the development safely for a relatively short time until flash flooding subsides or people can be evacuated.</p> <p>or</p> <p><b>AO3.3</b> Where involving an extension to an existing dwelling house that is situated below DFE /Storm tide, the maximum size of the extension does not exceed 70m<sup>2</sup> gross floor area.</p> <p>Note – If part of the site is outside the Hazard Overlay area, this is the preferred location of all buildings.</p> <p>For Reconfiguring a lot</p> <p><b>AO3.4</b> Additional lots: (a) are not located in the hazard overlay area; or (b) are demonstrated to be above the flood level identified for the site.</p> <p>Note - If part of the site is outside the Hazard Overlay area, this is the preferred location for all lots (excluding park or other open space and recreation lots).</p> <p>Note – Buildings subsequently developed on the lots will need to comply with the relevant building assessment provisions under the <i>Building Act 1975</i>.</p> <p><b>AO3.5</b> Road and/or pathway layout ensures residents are not physically isolated from adjacent flood free urban areas and provides a safe and clear evacuation route path: (a) by locating entry points into the reconfiguration above the flood level and avoiding culs-de-sac or other non-permeable layouts; and (b) by direct and simple routes to main carriageways.</p> <p><b>AO3.6</b> Signage is provided on site (regardless of whether the land is in public or private ownership) indicating the position and path of all safe evacuation routes off the site and if the site contains, or is within 100m of a floodable waterway, hazard warning signage and depth indicators are also provided at key hazard points, such as at floodway crossings or entrances to low-lying reserves.</p> <p>or</p>

Performance outcomes	Acceptable outcomes
	<p><b>AO3.7</b> There is no intensification of residential uses within the flood affected areas on land situated below the DFE/Storm tide.</p>
	<p>For Material change of use (Residential uses) <b>AO3.1</b> The design and layout of buildings used for residential purposes minimise risk from flooding by providing: (a) parking and other low intensive, non-habitable uses at ground level;</p> <p>Note - The high-set 'Queenslander' style house is a resilient low-density housing solution in floodplain areas. Higher density residential development should ensure only non-habitable rooms (e.g. garages, laundries) are located on the ground floor.</p>
<p><b>PO4</b> Development is resilient to flood events by ensuring design and built form account for the potential risks of flooding.</p>	<p>For Material change of use (Non-residential uses) <b>AO4.2</b> Non residential buildings and structures allow for the flow through of flood waters on the ground floor.</p> <p>Note - Businesses should ensure that they have the necessary contingency plans in place to account for the potential need to relocate property prior to a flood event (e.g. allow enough time to transfer stock to the upstairs level of a building or off site).</p> <p>Note - The relevant building assessment provisions under the <i>Building Act 1975</i> apply to all building work within the Hazard Area and need to take into account the flood potential within the area.</p> <p><b>AO4.3</b> Materials are stored on-site: (a) are those that are readily able to be moved in a flood event; (b) where capable of creating a safety hazard by being shifted by flood waters, are contained in order to minimise movement in times of flood.</p> <p>Notes - (a) Businesses should ensure that they have the necessary contingency plans in place to account for the potential need to relocate property prior to a flood event (e.g. allow enough time to transfer stock to the upstairs level of a building or off site). (b) Queensland Government Fact Sheet 'Repairing your House after a Flood' provides information about water resilient products and building techniques.</p>
<p><b>PO5</b> Development directly, indirectly and cumulatively avoids any increase in water flow velocity or flood level and does not increase the potential flood damage either on site or on other properties.</p> <p>Note – Berms and mounds are considered to be an</p>	<p>For Operational works <b>AO5.1</b> Works in urban areas associated with the proposed development do not involve: (a) any physical alteration to a watercourse or floodway including vegetation clearing; or (b) a net increase in filling (including berms and</p>

Performance outcomes	Acceptable outcomes
<p>undesirable built form outcome and are not supported.</p>	<p>mounds).</p> <p><b>AO5.2</b> Works (including buildings and earthworks) in non urban areas either: (a) do not involve a net increase in filling greater than 50m<sup>3</sup>; or (b) do not result in any reductions of on-site flood storage capacity and contain within the subject site any changes to depth/duration/velocity of flood waters;</p> <p>or</p> <p>(c) do not change flood characteristics outside the subject site in ways that result in: (i) loss of flood storage; (ii) loss of/changes to flow paths; (iii) acceleration or retardation of flows or any reduction in flood warning times elsewhere on the flood plain.</p> <p>For Material change of use</p> <p><b>AO5.3</b> Where development is located in an area affected by DFE/Storm tide, a hydraulic and hydrology report, prepared by a suitably qualified professional, demonstrates that the development maintains the flood storage capacity on the subject site; and (a) does not increase the volume, velocity, concentration of flow path alignment of stormwater flow across sites upstream, downstream or in the general vicinity of the subject site; and (b) does not increase ponding on sites upstream, downstream or in the general vicinity of the subject site.</p> <p>For Material change of use and Reconfiguring a lot</p> <p><b>AO5.4</b> In non urban areas, buildings and infrastructure are set back 50 metres from natural riparian corridors to maintain their natural function of reducing velocity of floodwaters.</p> <p>Note – Fences and irrigation infrastructure (e.g. irrigation tape) in rural areas should be managed to minimise adverse the impacts that they may have on downstream properties in the event of a flood.</p>
<p><b>PO6</b> Development avoids the release of hazardous materials into floodwaters.</p>	<p>For Material change of use</p> <p><b>AO6.1</b> Materials manufactured or stored on site are not hazardous or noxious, or comprise materials that may cause a detrimental effect on the environment if discharged in a flood event;</p>

Performance outcomes	Acceptable outcomes
	<p>or</p> <p><b>AO6.2</b> If a DFE level is adopted, structures used for the manufacture or storage of hazardous materials are: (a) located above the DFE level;</p> <p>or</p> <p>(b) designed to prevent the intrusion of floodwaters.</p> <p><b>AO6.3</b> Infrastructure is designed and constructed to resist hydrostatic and hydrodynamic forces as a result of inundation by the DFE.</p> <p><b>AO6.4</b> If a flood level is not adopted, hazardous materials and their manufacturing equipment are located on the highest part of the site to enhance flood immunity and designed to prevent the intrusion of floodwaters.</p> <p>Note – Refer to <i>Work Health and Safety Act 2011</i> and associated Regulation and Guidelines, the <i>Environmental Protection Act 1994</i> and the relevant building assessment provisions under the <i>Building Act 1975</i> for requirements related to the manufacture and storage of hazardous materials.</p>
<p><b>PO7</b> The development supports, and does not unduly burden, disaster management response or recovery capacity and capabilities.</p>	<p><b>AO7</b> Development does not: (a) increase the number of people calculated to be at risk of flooding; (b) increase the number of people likely to need evacuation; (c) shorten flood warning times; and (d) impact on the ability of traffic to use evacuation routes, or unreasonably increase traffic volumes on evacuation routes.</p>
<p><b>PO8</b> Development involving community infrastructure: (a) remains functional to serve community need during and immediately after a flood event; (b) is designed, sited and operated to avoid adverse impacts on the community or environment due to impacts of flooding on infrastructure, facilities or access and egress routes; (c) retains essential site access during a flood event; (d) is able to remain functional even when other infrastructure or services may be compromised in a flood event.</p>	<p><b>AO8.1</b> The following uses are not located on land inundated during a DFE/Storm tide: (a) community residence; and (b) emergency services; and (c) residential care facility; and (d) utility installations involving water and sewerage treatment plants; and (e) storage of valuable records or items of historic or cultural significance (e.g. archives, museums, galleries, libraries).</p> <p>or</p> <p><b>AO8.2</b></p>

Performance outcomes	Acceptable outcomes
	<p>The following uses are not located on land inundated during a 1% AEP flood event:</p> <ul style="list-style-type: none"> <li>(a) community and cultural facilities, including facilities where an education and care service under the Education and Care Services National Law (Queensland) is operated or child care service under the <i>Child Care Act 2002</i> is conducted,</li> <li>(b) community centres;</li> <li>(c) meeting halls;</li> <li>(d) galleries;</li> <li>(e) libraries.</li> </ul> <p>The following uses are not located on land inundated during a 0.5% AEP flood event.</p> <ul style="list-style-type: none"> <li>(a) emergency shelters;</li> <li>(b) police facilities;</li> <li>(c) sub stations;</li> <li>(d) water treatment plant</li> </ul> <p>The following uses are not located on land inundated during a 0.2% AEP flood event:</p> <ul style="list-style-type: none"> <li>(a) correctional facilities;</li> <li>(b) emergency services;</li> <li>(c) power stations;</li> <li>(d) major switch yards.</li> </ul> <p>and/or</p> <p><b>AO8.3</b> The following uses have direct access to low hazard evacuation routes as defined in Table 8.2.4.3.c:</p> <ul style="list-style-type: none"> <li>(a) community residence; and</li> <li>(b) emergency services; and</li> <li>(c) hospitals; and</li> <li>(d) residential care facility; and</li> <li>(e) sub stations; and</li> <li>(f) utility installations involving water and sewerage treatment plants.</li> </ul> <p><b>AO8.4</b> Any components of infrastructure that are likely to fail to function or may result in contamination when inundated by flood, such as electrical switch gear and motors, telecommunications connections, or water supply pipeline air valves are:</p> <ul style="list-style-type: none"> <li>(a) located above DFE/Storm tide or the highest known flood level for the site;</li> <li>(b) designed and constructed to exclude floodwater intrusion / infiltration.</li> </ul> <p><b>AO8.5</b> Infrastructure is designed and constructed to resist hydrostatic and hydrodynamic forces as a result of inundation by a flood.</p>

Table 8.2.4.3.b - Minimum immunity (floor levels) for development

Minimum immunity to be achieved (floor levels)	Uses and elements of activities acceptable in the event
20% AEP level	<ul style="list-style-type: none"> <li>Parks and open space.</li> </ul>
5% AEP level	<ul style="list-style-type: none"> <li>Car parking facilities (including car parking associated with use of land).</li> </ul>
1% AEP level	<ul style="list-style-type: none"> <li>All development (where not otherwise requiring an alternative level of minimum immunity).</li> </ul>
0.5% AEP level	<ul style="list-style-type: none"> <li>Emergency services (if for a police station);</li> <li>Industry activities (if including components which store, treat or use hazardous materials);</li> <li>Substation;</li> <li>Utility installation.</li> </ul>
0.2% AEP level	<ul style="list-style-type: none"> <li>Emergency services;</li> <li>Hospital;</li> <li>Major electricity infrastructure;</li> <li>Special industry.</li> </ul>

Table 8.2.4.3.c - Degree of flood

Criteria	Low	Medium	High	Extreme
Wading ability	If necessary children and the elderly could wade. (Generally, safe wading velocity depth product is less than 0.25)	Fit adults can wade. (Generally, safe wading velocity depth product is less than 0.4)	Fit adults would have difficulty wading. (Generally, safe wading velocity depth product is less than 0.6)	Wading is not an option.
Evacuation distances	< 200 metres	200-400 metres	400-600 metres	600 metres
Maximum flood depths	< 0.3 metre	< 0.6 metre	< 1.2 metres	1.2 metres
Maximum flood velocity	< 0.4 metres per second	< 0.8 metres per second	< 1.5 metres per second	1.5 metres per second
Typical means of egress	Sedan	Sedan early, but 4WD or trucks later	4WD or trucks only in early stages, boats or helicopters	Large trucks, boats or helicopters
Timing Note: This category cannot be implemented until evacuation times have been established in the Counter Disaster Plan (Flooding)	Ample flood forecasting. Warning and evacuation routes remain passable for twice as long as evacuation time.	Evacuation routes remain trafficable for 1.5 times as long as the evacuation.	Evacuation routes remain trafficable for only up to minimum evacuation time.	There is insufficient evacuation time.

Note: The evacuation times for various facilities or areas would (but not necessarily) be included in the Counter Disaster Plan. Generally safe wading conditions assume even walking surfaces and no obstructions, steps, soft underfoot etc.