

# Flood Compatible Building Guidelines

## 1. What are these guidelines for?

Flooding is a natural hazard that can result in significant financial, environmental and social cost. Ideally, buildings are located to avoid flood prone land. However, where buildings are located on flood prone land it is essential that they are designed to ensure that structures are structurally compatible with flood water during a 100 year Average Recurrent Interval (ARI) flood event. These guidelines specify materials and construction methods which are less likely to be prone to water damage. The guidelines also outline design considerations that can reduce the impact of flooding on a building.

The Cessnock Development Control Plan 2010 (DCP) provides additional controls for building in flood prone areas. If you are lodging a Development Application you will need to comply with the DCP.

## 2. Designing and locating buildings

When renovating or designing a building on flood prone land the following factors should be considered:

- Where possible, buildings should be located on the area of the property that is least affected by flooding
- Ensure long walls are parallel to the direction of water flow and do not block flows
- Remove any obstructions which prevent water draining from under the building
- Design surrounding garden beds so that they do not restrict drainage
- Maximise flow across your property using flood compatible fences
- Do not build on the water course or overland flow path

The location of electrical services, sewerage systems and water tanks need to be carefully considered when designing a development on flood prone land.

**Table 1: Design Factors that can minimise the damage to service from inundation**

Service	Design factors that can minimise damage from inundation
<b>Electrical Services</b>	<ul style="list-style-type: none"> <li>• Mount fixed electrical equipment as high as possible</li> <li>• Raise power points on the wall above the flood planning level</li> <li>• Locate house wiring in the roof space and extend down the wall</li> <li>• Avoid placing house wiring in the slab or under suspended floors</li> <li>• Ensure installation of conduits allows water to drain freely</li> </ul>
<b>Sewerage systems</b>	<ul style="list-style-type: none"> <li>• Install external components that can resist flow and buoyancy forces</li> <li>• Provide a gully trap outside the building and low to the ground</li> <li>• Cover exposed pipes and access cover to tanks and pits</li> <li>• Install a non-return valve in the service connection pipe</li> <li>• Locate valves in a small pit outside between the house and the mains sewer</li> <li>• Ensure the gully trap is well elevated</li> <li>• Place distribution pipes in areas of low flow velocity</li> <li>• Ensure quick drainage of a trench system during high water levels</li> <li>• Remove obstructions that may block a valve</li> </ul>
<b>Water tanks</b>	<ul style="list-style-type: none"> <li>• Locate the inlet to the tank as high as possible</li> <li>• Elevate above ground tanks and hot water heater and ensure supporting structures are flood resistant</li> <li>• Use corrosion resistant materials</li> <li>• All designs should account for a loss of strength under flood conditions</li> <li>• Secure and fasten exposed components and pipes</li> <li>• Ensure tanks are securely fastened to prevent flotation.</li> </ul>

### 3. Construction material

Table 2 provides a summary of building materials and an estimate of their suitability on flood prone land. When building on flood prone land the suitability of the material should be checked with the supplier.

**Table 2: A guide on the suitability of building material on flood prone land**

Building component	Suitable materials/construction methods	Unsuitable materials/construction methods
	When building on flood prone land the suitability of the material should be checked with the supplier	
<b>Foundations</b>	<ul style="list-style-type: none"> <li>Reinforced concrete slab</li> <li>Galvanised steel piers/columns</li> <li>Masonry piers/columns</li> </ul>	<ul style="list-style-type: none"> <li>Timber piers</li> </ul>
<b>Roof</b>	<ul style="list-style-type: none"> <li>Timber trusses with galvanised connections</li> <li>Reinforced concrete</li> <li>Galvanised metal construction</li> </ul>	<ul style="list-style-type: none"> <li>Traditional timber roof frame construction</li> <li>Inaccessible flat roofs</li> <li>Non-galvanised structural steelwork or connections</li> <li>Unsecured roof tiles</li> </ul>
<b>Windows</b>	<ul style="list-style-type: none"> <li>Aluminium frames with stainless steel or brass rollers</li> <li>Timber frame, fully epoxy sealed before assembly with stainless steel or brass fittings</li> </ul>	<ul style="list-style-type: none"> <li>Timber with PVA glues</li> <li>Mild steel fittings</li> <li>Large windows low to the ground</li> </ul>
<b>Walls</b>	<ul style="list-style-type: none"> <li>Reinforced or mass concrete walls</li> <li>Cavity brick walls</li> <li>Fibre cement sheet</li> <li>Face brick or block work</li> <li>Cement render</li> <li>Ceramic wall tiles</li> <li>Galvanised steel frames or sheets</li> <li>Glass and glass blocks</li> <li>Stone, solid or veneer</li> <li>Plastic sheeting or tiles with water proof adhesive</li> <li>Common bricks</li> <li>Stolid wood, fully sealed</li> <li>Stainless steel frames</li> <li>Aluminium frames</li> </ul>	<ul style="list-style-type: none"> <li>Timber frames in areas that are subject to force from fast flowing water</li> <li>Inaccessible openings</li> <li>Brick/block veneer with venting (stud frame)</li> <li>Particle board</li> <li>Fibreboard or strawboard</li> <li>Wallpaper</li> <li>Cloth wall coverings</li> <li>Standard plywood</li> <li>Gypsum plaster</li> <li>Plasterboard</li> <li>Exterior grade plywood</li> <li>Solid wood with allowance for swelling</li> <li>Hardboard</li> <li>Exterior grade particleboard</li> </ul>
<b>Floor</b>	<ul style="list-style-type: none"> <li>Suspended concrete</li> <li>Slab on ground</li> <li>Suspended timber flood</li> <li>Marine grade plywood</li> </ul>	<ul style="list-style-type: none"> <li>Timber floor close to the ground and particle board close to the ground.</li> <li>Standard grade plywood</li> </ul>
<b>Bolts, nails, hinges and fittings</b>	<ul style="list-style-type: none"> <li>Brass, nylon/stainless steel, removable pin hinges</li> <li>Galvanised steel, aluminium</li> </ul>	<ul style="list-style-type: none"> <li>Mild steel</li> </ul>
<b>Doors</b>	<ul style="list-style-type: none"> <li>Solid panel with waterproof adhesive</li> <li>Flush marine ply with closed cell foam</li> <li>Aluminium or galvanised steel fame</li> <li>Flush or single panel marine ply with waterproof adhesive</li> <li>Painted metal construction</li> <li>Timber frame, fully epoxy sealed before assembly</li> </ul>	<ul style="list-style-type: none"> <li>Standard timber frame</li> <li>Standard flush hollow core with PVA adhesive and honeycomb paper core</li> </ul>
<b>Installation</b>	<ul style="list-style-type: none"> <li>Clay/concrete tiles</li> <li>Epoxy or cementitious floor toppings on</li> </ul>	<ul style="list-style-type: none"> <li>Loose fit nylon or acrylic carpet (closed cell rubber underlay)</li> </ul>

Building component	Suitable materials/construction methods	Unsuitable materials/construction methods
	<b>When building on flood prone land the suitability of the material should be checked with the supplier</b>	
	concrete <ul style="list-style-type: none"> <li>• Rubber sheets (chemically set adhesives)</li> <li>• Vinyl sheet (chemically set adhesive)</li> <li>• Terrazzo</li> <li>• Rubber tiles (chemically set adhesives)</li> <li>• Vinyl tiles (chemically set adhesives)</li> <li>• Polished floor and loose rugs</li> <li>• Ceramic tiles</li> </ul>	<ul style="list-style-type: none"> <li>• Wall to wall carpet</li> <li>• Wall to wall seagrass matting</li> <li>• Cork</li> <li>• Linoleum</li> </ul>