

## Flood proofing guidelines

### 1 Construction methods and materials

Construction methods and materials are graded into four classes according to their resistance to floodwaters.

**Suitable** – The materials or products which are relatively unaffected by submersion and unmitigated flood exposure and are the best available for the particular application.

**Mild effects** – Where the most suitable materials or products are unavailable or economic considerations prohibit their use, these materials or products are considered the next best choice to minimise the damage caused by flooding.

**Marked effects** – The materials or products are more liable to damage under flood conditions than ‘mild effects’ materials or products.

**Severe effects** – The materials or products listed here are seriously affected by floodwaters and in general have to be replaced if submerged.

### 2 Electrical and mechanical equipment

For dwellings constructed on flood liable land, the electrical and mechanical material/s, equipment and installation process shall conform to the following requirements.

**Main power supply** – Subject to the approval of the relevant electricity supply authority, the incoming main commercial power service equipment, including all metering equipment, shall be located above the 1:100 Annual Exceedence Probability flood. Means shall be made available to easily disconnect the dwelling from the main power supply.

**Wiring** – All wiring, power outlets, switches, etc, shall, to the maximum extent possible, be located above the 1:100 Annual Exceedence Probability flood, shall be suitable for continuous submergence in water and shall contain no fibrous components. Only submersible-type splices shall be used below the 1:100 Annual Exceedence Probability flood. All conduits located below the 1:100 Annual Exceedence Probability flood shall be so installed that they will be self-draining if subjected to flooding.

**Equipment** – All equipment installed below or partially below the 1:100 Annual Exceedence Probability flood shall be capable of disconnection by a single plug and socket assembly.

**Reconnection** – Should any electrical device and/or part of the wiring be flooded it shall be thoroughly cleaned or replaced and checked by an approved electrical contractor before reconnection.

### 3 Heating and air conditioning systems

Heating and air conditioning systems shall to the maximum extent possible be installed in areas and spaces of the house above the 1:100 Annual Exceedence Probability flood. When this is not feasible every precaution shall be taken to minimise the damage caused by submersion according to the following guidelines.

**Fuel** – Heating systems using gas or oil as a fuel shall have a manually operated valve located in the fuel supply line to enable fuel cut-off.

**Installation** – The heating equipment and fuel storage tanks shall be mounted on and securely anchored to a foundation pad of sufficient mass to overcome buoyancy and prevent movement that could damage the fuel supply line. All storage tanks shall be vented to an elevation of 600mm above the 1:100 Annual Exceedence Probability flood.

**Ducting** – All ductwork located below the 1:100 Annual Exceedence Probability flood shall be provided with openings for drainage and cleaning. Self-draining may be achieved by constructing the ductwork on a suitable grade. Where ductwork must pass through a watertight wall or floor below the 1:100 Annual Exceedence Probability flood, the ductwork shall be protected by a closure assembly operated from above the 1:100 Annual Exceedence Probability flood.

## Table of Flood Proofing Guidelines

Component	Order of preference suitable	Mild effects	Marked effects	Severe effects
Flooring and sub-flooring structure	<ul style="list-style-type: none"> <li>Concrete slab-on-ground monolith construction note: clay filling is not permitted beneath slab-on-ground construction, which could be inundated</li> <li>Suspension reinforced concrete slab</li> </ul>	<ul style="list-style-type: none"> <li>Timber floor (T&amp;G boarding, marine plywood) full epoxy sealed joints</li> </ul>	<ul style="list-style-type: none"> <li>Timber floor (T&amp;G boarding, marine plywood) with ends only epoxy-sealed on joints and provision of side clearance for board swelling</li> </ul>	<ul style="list-style-type: none"> <li>Timber close to ground with surrounding base</li> <li>Timber flooring with ceilings or soffit linings</li> <li>Timber flooring with seal on top only</li> </ul>
Floor covering	<ul style="list-style-type: none"> <li>Clay tiles</li> <li>Concrete, precast or in-situ</li> <li>Epoxy, formed-in-place</li> <li>Rubber sheets or tiles with chemical-set adhesive</li> <li>Asphalt tiles, fixed with water resistant adhesive</li> </ul>	<ul style="list-style-type: none"> <li>Cement/bituminous formed-in-place</li> <li>Cement/latex formed-in-place</li> <li>Rubber tiles with chemical-set adhesive</li> <li>Terrazzo</li> <li>Vinyl tile with chemical-set adhesive</li> <li>Loose rugs</li> <li>Ceramic tiles with acid and alkali-resistant grout</li> </ul>	<ul style="list-style-type: none"> <li>Asphalt tiles with asphaltic adhesive</li> <li>Loose-fit nylon or acrylic carpet with closed cell rubber underlay</li> </ul>	<ul style="list-style-type: none"> <li>Carpeting, glue-down type or fixed with smooth edge on jute felts</li> <li>Chipboard (particle board)</li> <li>Cork</li> <li>Linoleum</li> <li>PVA emulsion cements</li> <li>Vinyl sheets or tiles coated on cork or wood backings</li> <li>Fibre matting (sea-grass matting)</li> </ul>
Wall structure (up to the 1:100 AEP flood)	<ul style="list-style-type: none"> <li>Solid brickwork, blockwork, reinforced concrete or mass concrete</li> </ul>	<ul style="list-style-type: none"> <li>Two skins of brickwork or blockwork with inspection openings</li> </ul>	<ul style="list-style-type: none"> <li>Brickwork or blockwork veneer construction with inspection openings</li> </ul>	<ul style="list-style-type: none"> <li>Inaccessible cavities</li> <li>Large window openings</li> </ul>

Component	Order of preference suitable	Mild effects	Marked effects	Severe effects
Roofing structure (for situations where 1:100 AEP flood is above the ceiling)	<ul style="list-style-type: none"> <li>Reinforced concrete construction</li> <li>Galvanized metal construction</li> </ul>	<ul style="list-style-type: none"> <li>Timber trusses with galvanised fittings</li> </ul>	<ul style="list-style-type: none"> <li>Traditional timber roof construction</li> </ul>	<ul style="list-style-type: none"> <li>Inaccessible flat roof construction</li> <li>Ungalvanised steel work eg lintels, arch bars, tie rods, beams etc</li> <li>Unsecured roof tiles</li> </ul>
Doors	<ul style="list-style-type: none"> <li>Solid panel with waterproof adhesives</li> <li>Flush door with marine ply filled with closed cell foam</li> <li>Painted metal construction</li> <li>Aluminium or galvanised steel frame</li> </ul>	<ul style="list-style-type: none"> <li>Flush panel or single panel with marine plywood and waterproof adhesive</li> <li>T&amp;G line door, framed ledged and braced</li> <li>Painted steel</li> <li>Timber frame fully epoxy-sealed before assembly</li> </ul>	<ul style="list-style-type: none"> <li>Fly-wire doors</li> <li>Standard timber frame</li> </ul>	<ul style="list-style-type: none"> <li>Hollow core ply with PVA adhesives and honey-comb paper core</li> </ul>
Wall and ceiling linings	<ul style="list-style-type: none"> <li>Asbestos-cement board</li> <li>Brick, face and glazed</li> <li>Clay tile glazed in waterproof mortar</li> <li>Concrete block</li> <li>Steel with waterproof applications</li> <li>Stone, natural solid or veneer, waterproof grout</li> <li>Glass blocks</li> <li>Glass</li> <li>Plastic sheeting or wall with waterproof adhesive</li> </ul>	<ul style="list-style-type: none"> <li>Brick, common</li> <li>Plastic wall tiles</li> <li>Metals, non-ferrous</li> <li>Rubber mouldings and trim</li> <li>Wood, solid or exterior grade plywood fully sealed</li> </ul>	<ul style="list-style-type: none"> <li>Chipboard exterior grade</li> <li>Hardboard exterior grade</li> <li>Wood, solid (boards or trim) with allowance for swelling'</li> <li>Wood, plywood exterior grade</li> <li>Fibrous plasterboard</li> </ul>	<ul style="list-style-type: none"> <li>Chipboard</li> <li>Fibreboard panels</li> <li>Mineral fibreboard</li> <li>Paperboard</li> <li>Plasterboard, gypsum plaster</li> <li>Wall coverings (paper, burlap cloth types)</li> <li>Wood, standard plywood strawboard</li> </ul>
Insulation	<ul style="list-style-type: none"> <li>Aluminium frame with stainless steel or brass rollers</li> </ul>	<ul style="list-style-type: none"> <li>Reflective insulation</li> </ul>	<ul style="list-style-type: none"> <li>Bat or blanket types</li> </ul>	<ul style="list-style-type: none"> <li>Open-cell fibre types</li> </ul>

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Windows	<ul style="list-style-type: none"> <li>• Brass, nylon or stainless steel</li> <li>• Removable pin hinges</li> </ul>	<ul style="list-style-type: none"> <li>• Epoxy-sealed timber waterproof glues with stainless steel or brass fittings</li> <li>• Galvanised or painted steel</li> </ul>		<ul style="list-style-type: none"> <li>• Timber with PVA glues mild steel fittings</li> </ul>
Nails, bolts, hinges and fittings		<ul style="list-style-type: none"> <li>• Galvanised steel</li> <li>• Aluminium</li> </ul>		<ul style="list-style-type: none"> <li>• Mild steel</li> </ul>