

## **GUIDELINES for Preparing a Flood Risk Assessment Report**

**This guideline is intended to provide advice to applicants on Preparing a Flood Risk Assessment Report.**

### **What is a Flood Risk Assessment Report?**

A Flood Risk Assessment Report is a document which is to be prepared to enable Council to conduct an adequate environmental assessment of development works which are located on flood affected land.

### **When is a Flood Risk Assessment Report Required?**

A Flood Risk Assessment Report is required for any development within land identified as 'flood affected land' which means land below the 1 per cent annual exceedance probability flood level or the Probable Maximum Flood (PMF) level.

### **Scope of Report**

A Flood risk Assessment Report should reflect the size, type and location of the development, be commensurate to the scope of the works proposed and consider its relationship to surrounding development. The report should also assess the risk from flooding on the proposed development.

### **Technical Requirements of a Flood Risk Assessment Report**

The technical requirements of a Flood Risk Assessment Report are to be provided in four (4) main areas:

#### **1. *Flood Assessment Analysis***

The Flood Assessment Analysis needs to include the following details:

- Detail whether the development is located either wholly or partially on land mapped as being within the 1 in 100 year floodplain.
- Detail whether the development / site as a whole or partially is the site as a whole located on land mapped as being within the possible maximum flood (PMF) level.
- Detail the flood characteristics for the site, depth, velocity and direction and the impact this has on the proposed development.
- Detail the use of the building, main occupants of the development, hours of operation, proposed traffic usage or movement.

Council can provide data on predicted flood behaviour for a specific site. However this data is also likely to be available through the Warringah Council webpage.

For the purposes of these guidelines the 100yr flood outline is shown as the blue hatched area on the Warringah Local Environmental Plan (WLEP) 2000 maps. It is defined as the probability or likelihood that a location will experience a flood of a particular size, in any one year. If a location has a 1% chance of flooding each year, this can also be expressed as having:

- a 1 in 100 chance of flooding in that location in any year;
- betting odds of 100 to 1 against a location being flooded in any year. However, this does not mean that if a location floods one year, it will definitely not flood for the next 99 years. Nor, if it has not flooded for 99 years, will it necessarily flood this year.

A Probable Maximum Flood (PMF) is shown as the purple area on the WLEP 2000 maps. The PMF is the largest flood that could occur. Every property potentially affected by a PMF will have some flood risk, even if it is very small. Accordingly, as required by legislation, Warringah Council provides information and considers all potential flood risks.

## 2. Assessment of Impacts

This section must state compliance with Clause 47 of WLEP 2000 and include the following:

- Detail how the development on flood affected land is to be sited and designed to minimise impacts of flooding on property, having regard to the existing flood regime;
- Detail the impact the development has on the flooding to surrounding properties;
- Detail how the development is not to reduce flood storage area or impact upon the existing flood regime, including calculations;
- Detail how habitable floor areas of buildings are to be set at the Flood Planning Level, a level of at least 500mm above the 1% AEP level (this should be provided in written form and diagrammatically);
- Identify if the development includes fencing and what impacts the fence will have on the existing flood regime;
- Detail how buildings or works affected by flooding are to be constructed of flood compatible building materials. (this should be provided in written form and diagrammatically). Possible Flood Compatible Materials are identified below:-

<b>Building Component</b>	<b>Flood Compatible Material</b>
<b>Flooring and Sub Floor Structure</b>	<ul style="list-style-type: none"> <li>▪ Pier and beam construction or</li> <li>▪ Suspended reinforced concrete slab</li> </ul>
<b>Floor Covering</b>	<ul style="list-style-type: none"> <li>▪ Clay tiles</li> <li>▪ Concrete, precast or in situ</li> <li>▪ Concrete tiles</li> <li>▪ Epoxy formed-in-place</li> <li>▪ Mastic flooring, formed-in-place</li> <li>▪ Rubber sheets or tiles with chemical-set adhesive</li> <li>▪ Silicone floors formed-in-place</li> <li>▪ Vinyl sheets or tiles with chemical set adhesive</li> <li>▪ Ceramic tiles, fixed with mortar or chemical set adhesive</li> <li>▪ Asphalt tiles, fixed with water resistant adhesive</li> </ul>
<b>Wall Structure</b>	<ul style="list-style-type: none"> <li>▪ Solid brickwork, blockwork, reinforced, concrete or mass concrete</li> </ul>
<b>Windows</b>	<ul style="list-style-type: none"> <li>▪ Aluminium Frame with stainless steel rollers or similar</li> <li>▪ Corrosion and water resistant material.</li> </ul>
<b>Doors</b>	<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 material construction</li> <li>▪ Aluminium or galvanised steel frame</li> </ul>
<b>Wall and Ceiling Linings</b>	<ul style="list-style-type: none"> <li>▪ Brick, face or glazed</li> <li>▪ Clay tile glazed in waterproof mortar</li> <li>▪ Concrete</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>
<b>Insulation</b>	<ul style="list-style-type: none"> <li>▪ Foam or closed cell types</li> </ul>
<b>Nails, Bolts, Hinges and Fittings</b>	<ul style="list-style-type: none"> <li>▪ Galvanised</li> <li>▪ Removable pin hinges</li> </ul>
<b>Fences</b>	<ul style="list-style-type: none"> <li>▪ Wooden horizontal slatted fences with capacity to allow flood flow through.</li> </ul>

Note: The above is not an exhaustive list of Flood compatible materials

- Detail how or if the development result in any adverse impacts on the surrounding sites, or upstream and downstream
- Detail if the development may require movement prevention devices and where they are to be located. This includes measures such as bollards and gates which can be engaged in a flood event to prevent movement of vehicles downstream.
- Detail whether hazardous chemicals are to be stored on site and their specific location. If hazardous chemicals are to be stored on site, the details must be provided as to what the potential impacts floods may have on these chemicals.
- Detail inter-relationship between existing and proposed Stormwater Management Systems and how these systems respond to potential floods.
- Provide comment on any relevant Australian Standards and / or best practice principles and ensure consistency with the New South Wales Floodplain Development Manual

### **3. Evacuation**

This section must provide the following:

- Evidence that the development provides flood free evacuation or an area to shelter in place during inundation. If there is an area for shelter in place, details should be provide on the structural integrity of the building to ensure it can withstand the hydraulic forces of the 1% AEP flood.
- A Draft Flood Evacuation Plan. In this regard, a evacuation plan generally details:
  - a) route of evacuation to higher ground and / or point of shelter
  - b) depth of water for a Possible Maximum Flood event surrounding the building
  - c) details of 'last chance' evacuation water levels / times for evacuation prior to floodwaters surrounding the building
  - d) provide details of flood warning systems and protocols
  - e) details of how this information will be distributed and people educated for users of the site.

### **4. Mitigation Measures**

This section is to detail all proposed mitigation measures included as part of the development. This includes the use and location of Flood Compatible Materials.

### **Other General Requirements of Reporting**

All reports are to:

- include an executive summary,
- be professionally prepared,
- include calculation formulae,
- be clearly referenced using an accepted academic referencing system (eg. Harvard),
- provide analysis of development against relevant Commonwealth and State Legislation,
- provide analysis of development against relevant State and Regional Planning Policies,
- provide analysis of development against relevant Local Environment Plan and Policies,
- include a conclusion detailing key points,
- provide development recommendations and construction methodologies and,
- provide qualifications of author.

**For further information contact Natural Environment Unit on 9942 2111 or [via webmail](#).**

## **Definitions**

**Development** means:-

- (a) the use of land, and
- (b) the subdivision of land, and
- (c) the erection of a building, and
- (d) the carrying out of a work, and
- (e) the demolition of a building or work, and
- (f) any other act, matter or thing referred to in section 26 that is controlled by an environmental planning instrument, but does not include any development of a class or description prescribed by the regulations for the purposes of this definition (*Environmental Planning and Assessment Act, 1979*).

**Flood affected land** means land below the 1 per cent annual exceedance probability flood level (Warringah Local Environmental Plan 2000).

**Flood Planning Level (FPL)** is the flood level (derived from significant historical flood events or a flood of a specific AEP) plus a freeboard selected for floodplain risk management purposes, as determined in the management studies and incorporated in management plans.

***The definitions contained are derived from the documentation identified after each definition. Accordingly, the definition contained within the original documentation supersedes the definition contained within this section.***

