

MORUYA FLOODPLAIN CODE



10 July 2012

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1.0 MORUYA FLOODPLAIN CODE

This Development Code has been prepared in accordance with the principles of the *NSW Flood Prone Land Policy* and strategies contained in the *Moruya River Floodplain Management Plan (2004)* and the *State Floodplain Management Manual (2005)*. The primary objective of the NSW Flood Prone Land Policy is to reduce the potential loss of life from flooding, the impact of flooding and flood liability on individual owners and occupiers, and to reduce private and public losses resulting from flooding.

1.1 Aim of Code

The aim of this Code is to inform the community about Council's requirements in relation to the use and development of land potentially affected by floods.

Objectives

- a) To give effect to the Moruya River Floodplain Management Plan 2004;
- b) To support the Moruya Township Development Control Plan
- c) To minimise the impact of flooding and flood liability on individual owners and occupiers;
- d) To reduce private and public losses resulting from flooding;
- e) To ensure every application for construction and development is given a consistent, equitable and merit based assessment that is compatible with the identified flood risk of the area;
- f) To ensure that development does not adversely affect flood behaviour;
- g) To recognise and consider the cumulative impact of development within the floodplain;
- h) Reduce un-necessary risk to life, emergency services or unwarranted public cost;
- i) To ensure that all development identified by this Development Code is complimented by the preparation of a flood evacuation plan.

1.2 Where does this Code apply?

This Code applies to all land identified in Figure 1 (*All Flood Liable Land – Moruya River Floodplain area*) attached to this Development Code.

This area includes all *flood liable land* up to and including the Probable Maximum Flood and some adjacent lands which become isolated during flooding of the Moruya River.

Note: the extent of Flood liable land has been identified through updated modelling prepared in 2011 to consider the NSW Sea Level Rise Policy Statement 2009.

1.3 Relation to Other documents

This Development Code should be read in conjunction with the Moruya Township Development Control Plan 2011 and any associated Codes applying to the land.

1.4 How to use this Code

Applicants must first determine if their property is flood liable land shown in Figure 1 (*All Flood Liable Land – Moruya River Floodplain area*) attached to this Development Code.

Where a flood hazard is identified the relevant development controls outlined in Table 1: Development Requirements must be applied.

1.5 Information to support Development Applications on Flood Liable Land

As a minimum and in addition to the standard DA requirements applicants need to provide the following information:

- The level of the 1% AEP flood event;
- The hydraulic category;
- The flood hazard category;
- A survey plan prepared by a registered surveyor showing the ground levels, floor level and location of any existing or proposed buildings;
- The relevant Flood Planning Level (floor heights);
- Consideration of cumulative impacts on the floodplain and surrounding developments.

You may need to employ a surveyor/engineer to determine these details if they are not available for your proposed development site. Council Staff will inform applicants if there is a requirement for additional information.

Depending on the site specific requirements, applicants may be required to engage a suitably qualified consultant to assess:

- The structural integrity and ability of the development to cope with the physical forces of flooding;
- That the development will not adversely affect flood behaviour or increase the flood hazard, flood level or flood damage to other properties;
- Impacts of any fill proposed to be used at the development site;
- Evidence of a flood evacuation plan.

It is recommended that all development proposals on flood liable land have a pre-lodgement meeting to identify and confirm any issues that will need to be addressed prior to lodging a development application.

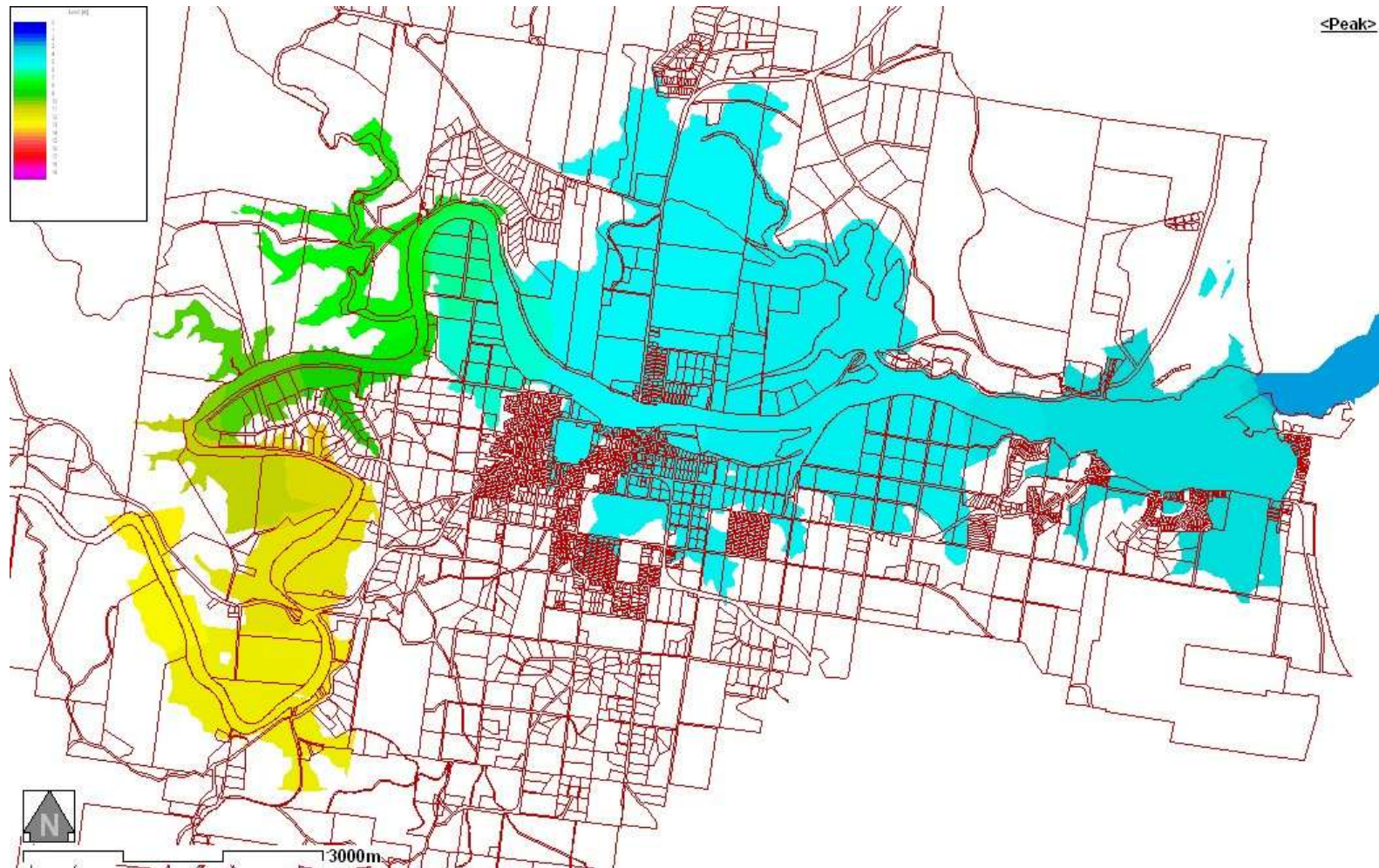
A pre-lodgement meeting can be arranged by contacting a Duty Development Officer on 4474 1231.

2.0 DEVELOPMENT REQUIREMENTS

FLOOD HAZARD CATEGORIES - Rural Floodplain/Non – Rural flood plain				
TYPE OF DEVELOPMENT	LOW	HIGH	VERY HIGH	EXTREME
New Dwellings	Consider on Merits – common controls apply.	Consider on Merits - Low hazard conditions apply plus: report from a qualified consultant detailing impacts on flood behaviour	Inappropriate Development	
Replacement of existing lawful dwellings	Consider on Merits – common controls apply.	Consider on Merits - Low hazard conditions apply plus: report from a qualified consultant detailing impacts on flood behaviour.	Consider on merits - Replacement to original building footprint and resident capacity only. Building must be raised to 500mm above 1% AEP Must not be flood free land available elsewhere on property.	
Additions and renovations to lawful dwellings*	Consider on Merits – common controls apply.	Consider on Merits – conditions apply: Permitted providing no increase in resident capacity*		
Town Centre: as defined in Moruya Township DCP - residential accommodation	Inappropriate Development			
Town Centre: as defined in Moruya Township DCP - Tourist & visitor accommodation	Consider on Merits – common controls apply.	Consider on merits - Low hazard conditions apply plus: report from a qualified consultant detailing impacts on flood behaviour.	Inappropriate Development	
New Commercial Development	Consider on Merits – conditions apply: FPL 300mm above 5%AEP	Consider on Merits – Low hazard conditions apply plus: report from a qualified consultant detailing impacts on flood behaviour	Consider on Merits – Low hazard conditions apply plus: report from a qualified consultant detailing impacts on flood behaviour	Inappropriate Development
Farm Buildings	Consider on Merits – conditions apply	Consider on Merits – conditions apply	Consider on Merits – conditions apply: open storage sheds	Inappropriate Development
Greenfields Sub-Divisions	Consider on Merits – subject to adequate evacuation & consultant’s report detailing impact on flood behaviour. Must have building envelope above 1% flood level.	Inappropriate Development		

Aged Care, places of public assembly and emergency management facilities below the PMF	Inappropriate Development
Development of heritage items where floor level is below the FPL	<ul style="list-style-type: none"> • Consider on merits • Proponent to demonstrate the need to maintain heritage significance to avoid planning controls outlined in this Code; otherwise • Conditions outlined in this Code will apply.
Other development requiring consent: e.g. access roads	Consider on Merits
<p>Common Controls Applying to ALL Developments:</p> <ol style="list-style-type: none"> 1. All building materials (including flooring) below the FPL must be flood compatible (refer to Appendix 1) 2. New buildings will not have any adverse or cumulative impact on flood behaviour 3. All residential development must have a FPL of 500mm above 1% AEP 4. All commercial development must have a FPL 300mm above 5%AEP 5. A survey plan prepared by a registered surveyor showing the ground levels, floor level and location of any existing or proposed buildings 6. A certificate from a registered surveyor is required certifying that floor heights are at the required FPL. This certificate must be produced prior to proceeding beyond construction of the floor level. No building may continue beyond this stage until Council has received this certification. 7. Buildings must be designed to withstand the impacts of flood waters and associated debris concurrent with the flood hazard identified at the proposed development site. A report or building design from a qualified structural engineer demonstrating the ability of the building to cope with a 1% AEP flood event must accompany each application. 8. All developments will demonstrate that adequate flood evacuation procedures are in place. 	
Notes: FPL = Flood Planning Level	
* Additions and renovations	<p>Approved additions and renovations must not increase the resident capacity of the building. The following additions and renovations will not be permitted:</p> <ul style="list-style-type: none"> • Bedrooms • Additional bathrooms (other than ensuites) and kitchens • Increase to original gross floor area over 30m² • Re-cladding other than with original materials or equivalent or a more flood compatible material.
Merit Based Assessment	<ul style="list-style-type: none"> • A merit based assessment does not guarantee approval • All development must comply with the Local Environmental Plan current at the time

Map 1: Flood Liable Land



3.0 DEFINITIONS

3.1 Flood Standard

A Flood Standard is a bench mark flood event that Council uses for planning purposes. Council has adopted the following flood standards for the Moruya town ship:

- 1% Annual Exceedance Probability (AEP) flood event - The 1% Annual Exceedance Probability (AEP) is sometimes referred to as a 1 in 100 year flood. However, it is more accurately described as a percentage meaning that there is a 1% chance of a flood of that size occurring in any one year.; and
- 5% AEP flood event – a flood event that has a 5% chance of occurring in any one year, or sometimes referred to as the 1 in 20 year flood; and
- Probable Maximum Flood (PMF) - the largest flood that could conceivably occur at a particular location, usually estimated from probable maximum precipitation coupled with the worst flood producing catchment conditions.

3.2 Application of Flood Planning Level

3.2.1 Residential Developments

The 1% AEP is the Flood Planning Level for the purposes of assessing residential development in New South Wales. A 500mm freeboard will apply to all residential properties within the flood planning area.

In accordance with Direction Number 15 – Flood Prone Land; issued under Section 117 of the *Environmental Planning & Assessment Act 1979*, flood related development controls will not be applied to residential developments above the 1% Flood Planning Level.

3.2.2 Commercial Developments

The Flood Planning Level for commercial properties will be set at the 5% AEP Flood Planning Levels. A 300mm freeboard will apply to all commercial properties within the flood planning area

3.2.3 Vulnerable Developments

In accordance with the *Guideline on Development Controls on Low Flood Risk Areas – Floodplain Development Manual*, restrictions on the types of developments above the FPL and up to the PMF will apply. These restrictions will apply to vulnerable developments such as: aged care facilities; hospitals; emergency evacuation services, centres and routes; and utility facilities.

3.3 Hydraulic Categories

In line with the NSW State Government *Floodplain Development Manual 2005'* this code will apply three hydraulic categories:

- *Floodway* - where the flood is conveying significant velocity and flow volumes;
- *Flood storage* - area where there is temporary storage of flood waters. (These areas could be subject to high velocity and flows during initial capture and release);
- *Flood fringe* - remaining areas of flood affected land. (These areas could be subject to varying boundary definition subject to differing flood events).

3.4 Hazard category

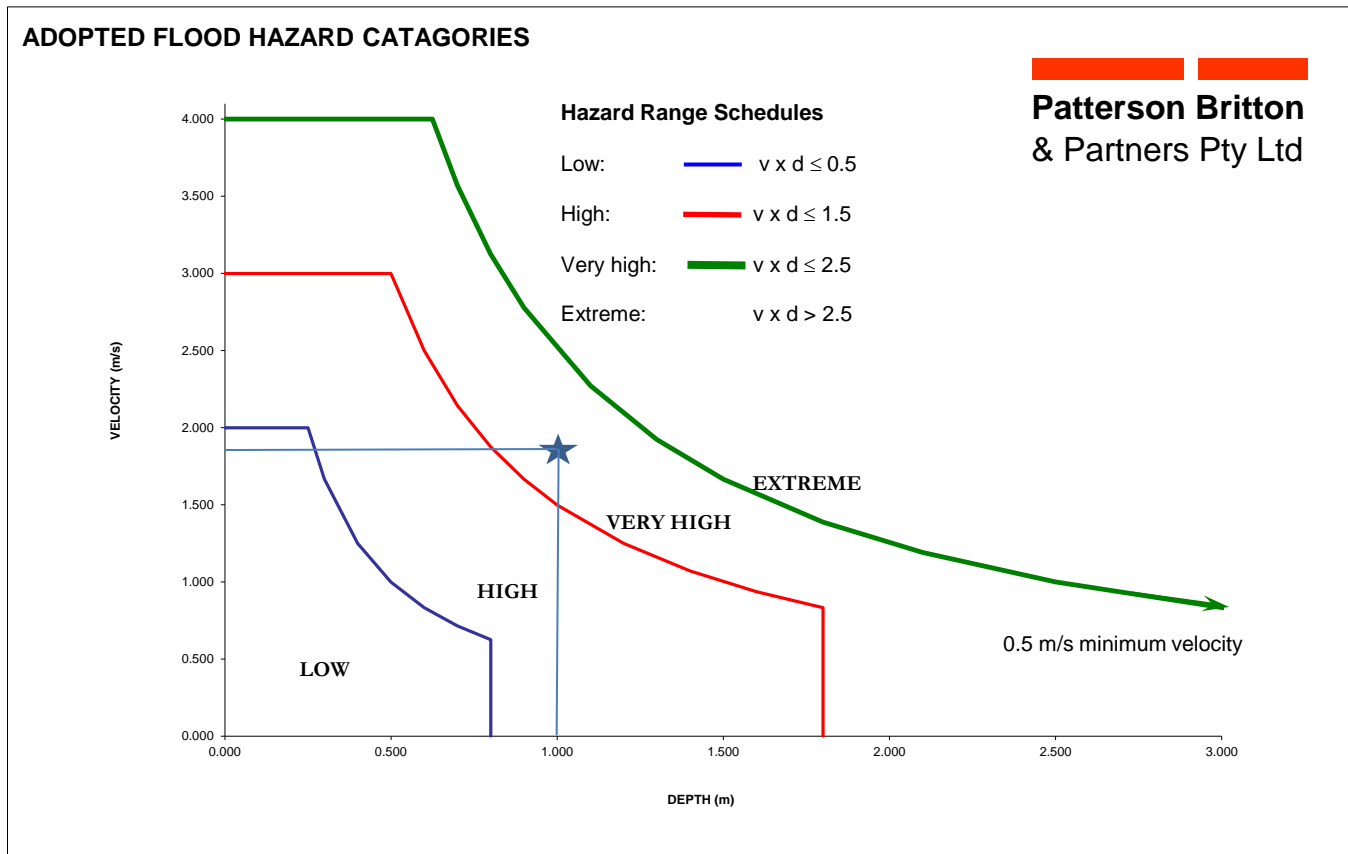
The hazard associated with a particular flood event is a function of the depth and velocity of floodwater. The Flood Hazard is used as an indicator of risk associated with potential land use and includes the implications for evacuation.

The *NSW Floodplain Development Manual (2005)* recommends the adoption of two hazard categories: High and Low. Council has adopted an additional two flood hazards categories for the Moruya floodplain in line with recommendations from the Moruya River Floodplain Management Study: Very High and Extreme.

Council considers the following four hazard categories for planning purposes on the Moruya River Floodplain:

- Extreme
- Very High
- High
- Low.

Figure 1: Adopted Flood Hazard Categories for Moruya River Floodplain



Note: 'v' = velocity, 'd' = depth, '<' = less than, '>' = greater than, '≤' = less than or equal to, '≥' = greater than or equal to, 'v x d' = velocity multiplied by depth.

Example: If you have a velocity (v) of 1.8m/s and a depth (d) of 1m you would calculate your hazard as follows:

$$\begin{aligned}
 H &= v \times d \\
 H &= 1.8 \times 1 \\
 H &= 1.8 \\
 H &= \text{Very High}
 \end{aligned}$$

Table 1: Hazard Description

Hazard Category	Hazard Description
Extreme	Water depths and flow velocities render any form of egress through the flood path extremely hazardous. Conventional structures, mobile homes, caravans can become buoyant and contribute to flood debris.
Very High	Possible danger to personal safety on entering flow path. Evacuation only possible by watercraft. Conventional structures would suffer structural damage.
High	Possible danger to personal safety. Evacuation by any vehicle could be suspect. Able bodied adults would experience difficulty in wading to safety. Potential for significant structural damage to buildings.
Low	Should it be necessary, people and their possessions could be evacuated by higher axle vehicles. Able bodied adults would have little difficulty wading to higher ground.

APPENDIX A – FLOOD COMPATIBLE MATERIALS

TABLE 2 – Flood Compatible Materials

Building Component	Flood Compatible Material
Flooring and Subfloor Structure	<ul style="list-style-type: none"> • concrete slab-on-ground monolith construction • suspension reinforced concrete slab • marine ply on hardwood bearers • marine ply on H5 treated pine bearers in fresh water reaches of river • marine ply on H6 treated pine bearers in salt water reaches of river • all bearers on brick peers.
Doors	<ul style="list-style-type: none"> • solid panel with waterproof adhesives • flush door with marine ply filled with closed cell foam • painted metal construction • aluminium or galvanised steel frame
Floor Covering	<ul style="list-style-type: none"> • clay tiles • concrete, precast or in situ • concrete tiles • epoxy, formed-in-place • mastic flooring, formed in-place • rubber sheets or tiles with chemical-set adhesives • silicone floors formed-in place • vinyl sheets or tiles with chemical-set adhesive • ceramic tiles, fixed with mortar or chemical-set adhesive • asphalt tiles, fixed with water resistant adhesive
Wall & Ceiling Linings	<ul style="list-style-type: none"> • fibro-cement board • brick, face or glazed • clay tile glazed in waterproof mortar • concrete • concrete block • steel with waterproof applications • stone, natural solid or veneer, waterproof grout • glass blocks • glass • plastic sheeting or wall with waterproof adhesive
Wall Structure	<ul style="list-style-type: none"> • solid brickwork, block work, reinforced concrete or mass concrete
Insulation	<ul style="list-style-type: none"> • foam (closed cell types)

Windows	<ul style="list-style-type: none"> aluminium frame with stainless steel rollers or similar corrosion and water resistant material.
Roofing Structure (for situations where the relevant flood level is above the ceiling)	<ul style="list-style-type: none"> reinforced concrete construction galvanised metal construction
Nails, Bolts , Hinges and Fittings	<ul style="list-style-type: none"> brass, nylon or stainless steel removable pin hinges hot dipped galvanised steel wire nails or similar
Electrical and Mechanical Equipment	For dwellings constructed on land to which this Policy applies, the electrical and mechanical materials, equipment and installation should conform to the following requirements.
Heating & Air Conditioning Systems	Heating and air conditioning systems should, to the maximum extent possible, be installed in areas and spaces of the house above the relevant flood level. When this is not feasible every precaution should be taken to minimise the damage caused by submersion according to the following guidelines.
Fuel	Heating systems using gas or oil as a fuel should have a manually operated valve located in the fuel supply line to enable fuel cut-off.
Installation	The heating equipment and fuel storage tanks should 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 should be vented to an elevation of 600 millimetres above the relevant flood level.
Wiring	All wiring, power outlets, switches, etc., should, to the maximum extent possible, be located above the relevant flood level. All electrical wiring installed below the relevant flood level should be suitable for continuous submergence in water and should contain no fibrous components. Earth core linkage systems (or safety switches) are to be installed. Only submersible-type splices should be used below the relevant flood level. All conduits located below the relevant designated flood level should be so installed that they will be self-draining if subjected to flooding.
Ducting	All ductwork located below the relevant flood level should be provided with openings for drainage and cleaning. Self-draining may be achieved by constructing the ductwork on a suitable grade. Where duct work must pass through a watertight wall or floor below the relevant flood level, the ductwork should be protected by a closure assembly operated from above relevant flood level.
Equipment	All equipment installed below or partially below the relevant flood level should be capable of disconnection by a single plug and socket assembly.
Main Power Supply	Subject to the approval of the relevant authority the incoming main commercial power service equipment, including all metering equipment, shall be located above the relevant flood level.

	Means shall be available to easily disconnect the dwelling from the main power supply.
Reconnection	Should any electrical device and/or part of the wiring be flooded it should be thoroughly cleaned or replaced and checked by an approved electrical contractor before reconnection.

APPENDIX B – GLOSSARY OF TERMS

Annual Exceedance Probability (AEP) – the probability of a given flood height being equalled or exceeded in any one year. For example, a 1% AEP flood has a 1% probability or a 1 in 100 chance of occurring or being exceeded in any given year.

Australian Height Datum (AHD) – a common national plane of level corresponding approximately to mean sea level, (the mean between average low and high tides).

Communal Flood Refuge – a flood free area capable of providing communal flood refuge facilities, shelter and emergency assistance for occupants of surrounding flood bound areas. The refuge should be capable of being practically provided with basic needs such as food and clothing from outside the flood affected area.

Development Control Plan– refers to the Eurobodalla Development Control Plan

Development Code - when referred to in this document means the Moruya Floodplain Code.

Extreme Hazard – a situation where water depths and flow velocities render any form of egress through the flood-path extremely hazardous; conventional structures, mobile homes, caravans could become buoyant and contribute to flood debris.

Flood - relatively high stream flow which overtops the natural or artificial banks in any part of a stream, river, estuary, lake or dam, and/or local overland flooding associated with major drainage (refer Section C6 – NSW Floodplain Development Manual 2005) before entering a watercourse, and/or coastal inundation resulting from super-elevated sea levels and/or waves overtopping coastline defences excluding tsunamis.

Flood Liable Land - is synonymous with flood prone land (ie) land susceptible to flooding by the PMF event. Note that the term flood liable land covers the whole floodplain, not just that part below the Flood Planning Level (see flood planning area).

Flood Planning Area - the area of land below the Flood Planning Level and thus subject to flood related development controls.

Flood Behaviour – refers to the characteristics of flooding at a particular location and includes the level of flooding, flood flow velocity and the direction of flood flow.

Flood Planning Level (FPL) – are the combinations of flood levels (derived from significant historical flood events or floods of specific AEPs – e.g. 1%, 5%) and freeboards selected for floodplain risk management purposes, as determined in management studies and incorporated in management plans.

Flood Proofing- a combination of measures incorporated in the design, construction and alteration of individual buildings or structures subject to flooding, to reduce or eliminate flood damages.

Flood Storage Area – those parts of the floodplain lying outside of the designated floodway (refer figure 4.0) but are at a level below the FSRL. These areas are important for the temporary storage of floodwaters during the passage of a flood.

Floodway – those areas of the floodplain where a significant volume of water flows during a flood event, (refer figure 2). Floodways are distinct water flow paths which, even if only partially blocked, would cause a significant redistribution of flood flow, which may in turn adversely affect other areas. Floodways are often, but not necessarily, the areas of deeper flow or the areas where higher velocities occur.

Freeboard – a factor of safety added to the flood standard to achieve the flood planning level. Freeboard provides a factor of safety to compensate for uncertainties in the setting of floor levels. Such uncertainties could include wave action, boat wash, local hydraulic behaviour, levee bank settlement and more ethereal events such as climate change and greenhouse effect.

High Hazard – a situation which could give rise to possible danger to personal safety. Evacuation by any vehicle could be suspect; able-bodied adults would experience difficulty in wading to safety; potential for significant structural damage to buildings.

Low Hazard – a situation where, should it be necessary, people and their possessions could be evacuated by higher axle vehicles. Able-bodied adults would have little difficulty wading to higher ground.

Merit Approach – The merit approach operates at two levels. At the strategic level it allows for the consideration of social, economic, ecological, cultural and flooding issues to determine strategies for the management of future flood risk which are formulated into council plans, policy, and Environmental Planning Instruments. At a site specific level, it involves consideration of the best way of conditioning development allowable under the floodplain risk management plan, local flood risk management policy and Environmental Planning Instruments.

Probable Maximum Flood – the flood situation, calculated to be the maximum which is likely to occur. For the Moruya River catchment this is calculated at a peak discharge three (3) times that of the 1%AEP. (The PMF defines the maximum or full extent of the floodplain, the extreme limits of flood behaviour, and the extent of the associated flood risk. Storm events with rainfall of the order of the PMP, although extremely rare, do occur. It will generally be impossible, in either a physical or economic sense, to provide general protection against such an event).

Probable Maximum Precipitation – the rainfall event likely to precipitate the probable maximum flood situation.

Resident Capacity – the number of people who can reside at a dwelling. This figure can generally be related to the number of bedrooms within a dwelling.

Replacement – the re-building of a lawful dwelling.

Survey Plan - a plan prepared by a registered surveyor.

Very High Hazard – a situation which could give rise to possible danger to personal safety on entering the flood flow path; evacuation only possible by water craft; conventional structures would suffer structural damage.

Attic - means any habitable space, but not a separate dwelling, contained wholly within a roof above the ceiling line of the storey immediately below, except for minor elements such as dormer windows and the like.

Basement - means the space of a building where the floor level of that space is predominantly below ground level (existing) and where the floor level of the storey immediately above is less than 1 metre above ground level (existing).

Business premises - means a building or place at or on which:

(a) an occupation, profession or trade (other than an industry) is carried on for the provision of services directly to members of the public on a regular basis, or

(b) a service is provided directly to members of the public on a regular basis, and may include, without limitation, premises such as banks, post offices, hairdressers, dry cleaners, travel agencies, internet access facilities, medical centres, betting agencies and the like, but does not include sex services premises.

Caravan park - means land (including a camping ground) on which caravans (or caravans and other moveable dwellings) are, or are to be, installed or placed.

Council - means the Eurobodalla Shire Council.

dual occupancy - means 2 dwellings (whether attached or detached) on one lot of land (not being an individual lot in a strata plan or community title scheme), but does not include a secondary dwelling.

Dwelling - means a room or suite of rooms occupied or used or so constructed or adapted as to be capable of being occupied or used as a separate domicile.

dwelling house - means a building containing only one dwelling.

farm building - means a structure the use of which is ancillary to an agricultural use of the landholding on which it is situated and includes a hay shed, stock holding yard, machinery shed, shearing shed, silo, storage tank, outbuilding or the like, but does not include a dwelling.

Fill - means the depositing of soil, rock or other similar extractive material obtained from the same or another site, but does not include:

- (a) the depositing of topsoil or feature rock imported to the site that is intended for use in garden landscaping, turf or garden bed establishment or top dressing of lawns and that does not significantly alter the shape, natural form or drainage of the land, or
- (b) the use of land as a waste disposal facility.

Flood Planning Map - means the Flood Liable Land Map in this Code.

residential accommodation - means a building or place used predominantly as a place of residence, but does not include tourist and visitor accommodation.

tourist and visitor accommodation- means a building or place that provides temporary or short-term accommodation on a commercial basis, and includes hotel or motel accommodation, serviced apartments, bed and breakfast accommodation and backpackers' accommodation.