

Exhibition

Draft Amendment of Tweed Shire Development Control Plan 2008 – Section A3, Development of Flood Liable Land 27 January 2010 – 31 March 2010

In accordance with Clause 18 of the *Environmental Planning and Assessment Regulation 2000*, notice is hereby given of the exhibition of a draft amendment of Tweed Shire Development Control Plan 2008 - Section A3, Development of Flood Liable Land. The purpose of the amendment is to update the currency of Council's flooding information and to ensure consistency with the flood provisions contained within the *Standard Instrument (Local Environmental Plans) Order 2006*.

The draft Plan will be available for inspection from **Wednesday 27 January 2010 to Wednesday 31 March 2010** at the following places:

- Murwillumbah Civic Centre from 8.00am to 4.30pm weekdays;
- Tweed Heads Civic Centre from 8.00am to 4.30pm weekdays;
- Kingscliff Library from 10.00am to 5.00pm Tuesdays, Thursdays & Fridays, from 10.00am to 7.00pm Wednesdays, and from 9.00am to 12 noon Saturdays.

For enquires please contact the Planning Reforms Unit on (02) 6670 2503.

All public submissions must be made in writing and addressed to:

General Manager
Tweed Shire Council
PO Box 816
Murwillumbah NSW 2484

Tweed Development Control Plan
SECTION A3 - Development of Flood Liable Land

DRAFT

Version	Effective	Description	Authorised
1.1	27 August 2008	Implementation of Tweed Valley Floodplain Risk Management Study Part 2 - High Flow Areas and Part 3 - Habitable Land Use on the Floodplain by incorporation of new development controls.	Council Resolution
DRAFT 1.2 FOR EXHIBITION		Amendment to reflect new land zonings, definitions and flood clauses in Tweed LEP 2010	

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A3 - DEVELOPMENT OF FLOOD LIABLE LAND

A3.1 INTRODUCTION

A3.1.1 Aims of this Section

- Present Council's Flood Mitigation Strategy; and
- Set detailed standards for land development in order to minimise the adverse effect of flooding on the community.
- Progressively implement the provisions of the NSW Floodplain Development Manual (April 2005)
- Implement [Part 1 of the Tweed Valley Floodplain Risk Management Plan 2005 – Establish Appropriate Flood Planning Levels for Residential Development.](#)
- Implement [Part 2 of the Tweed Valley Floodplain Risk Management Plan 2005 - Planning Controls for High Flow Areas.](#)
- Implement [Part 3 of the Tweed Valley Floodplain Risk Management Study – Habitable Land Use on the Floodplain](#)
- Implement the [Flood Risk Management Policy](#)

A3.1.2 Land to which the Section applies

This Section applies to all flood liable land within the Shire of Tweed.

A3.1.3 How does this Section relate to other Sections and Environmental Planning Instruments?

Within Part A

This Section is generally consistent with the other Sections from Part A of this DCP. Where there is an inconsistency then the higher standard/requirement shall prevail.

Between Part A and Part B

In the event of any inconsistency between this Section and a Section from Part B of this DCP, the provisions of the Section from Part B shall prevail.

This Section contains development standards and other provisions in respect of floodplain management in Tweed Shire and relates to:

Tweed Local Environmental Plan 2000

which is the principal planning instrument governing development in the Shire.

Where an inconsistency arises between this Section and any environmental planning instrument applying to the same land, the provisions of the environmental planning instrument prevail. An environmental planning instrument means a State Environmental Planning Policy, a Regional Environmental Plan or a Local Environmental Plan.

A3.1.4 How to use this Section

Where a development is proposed in respect of land to which this plan applies, Council shall take the provisions of this Section into consideration in determining the application.

Compliance with the provisions of this Section does not necessarily imply that Council will grant consent to an application. Council must, in relation to development applications, also take into consideration those matters listed under Section 79C of the Environmental Planning and Assessment Act, 1979.

In preparing an application for development there are a number of specific steps that should be followed:

Step 1: Check the zoning of the site under Tweed LEP 2000 to ensure that the proposed development is permissible and to determine what related provisions apply.

Step 2: Establish what other Sections of this DCP or Policies apply to the site.

Step 3: Determine the flood level of the site using this Section and refer to other applicable Sections and Policies to prepare your application. It is these components that Council will use to assess any development proposal.

Step 4: Discuss your final application with Council staff then lodge it for determination.

A3.1.5 Interpretation

For the purposes of this Section:

"Australian Height Datum (A.H.D.)" means the common national plane of level corresponding approximately to mean sea level.

"Average Recurrence Interval (ARI)" - ARI is the long-term average number of years between the occurrence of a flood as big as (or larger than) the selected event.

"caravan parks" means a property used for the placement of caravans (or of caravans and other movable dwellings) as defined by the Tweed LEP.

"compatible development" means development appropriate to both the flood hazard at the development site and to the impact of the development on existing flood levels and flood flows.

"design flood" means the flood selected as a basis for design of mitigation works, normally based on the 1:100 year flood event.

"discharge" means the rate of flow of water measured in terms of volume over time. It is to be distinguished from the speed or velocity of flow which is a measure of how fast the water is moving rather than how much is moving.

"dual occupancy" means any development which results in two (2) dwellings as defined by Tweed LEP.

"flood" means a relatively high stream flow which overlaps the natural or artificial banks in any part of a stream or river.

"flood conveyance zone" means those high flow areas of the Tweed Valley floodplain that are not defined as floodway, but still provide an essential flood water conveyance function.

"flood fringe" means the remaining area of land affected by flooding, after flood storage and floodway areas have been defined.

"flood hazard" means the potential for damage to property or persons due to flooding. In determining whether hazard is high or low account has been taken of the depth and velocity of floodwaters, effective evacuation times and evacuation difficulties including isolation of some areas as floodwaters rise.

"flood liable land", "floodplain", "flood prone land" means area of land which is subject to inundation by floods. For areas of the Tweed Valley, designated on A3 – Maps 1, 2 and 3 it includes land subject to inundation in the probable maximum flood (PMF).

"flood planning levels (FPLs)" are the combinations of flood levels (typically derived from the 100 year ARI flood for habitable purposes) and freeboards selected for floodplain risk management purposes, as determined in management studies and incorporated in management plans.

"flood standard" means the 1:100 year flood which has been selected for planning purposes in the Tweed Shire.

"flood storages" means those parts of the floodplain that are important for the temporary storage of floodwaters during the passage of a flood.

"floodways" means those areas, often aligned with obvious, naturally defined channels, where a significant passage of water flows during floods. They are often the deepest area where the highest velocities occur. Also, they are areas which, even if only partially blocked, would cause a significant redistribution of flood flow, which may in turn adversely affect other areas.

"granny flat" means a "secondary dwelling" as defined by the Tweed LEP.

"habitable area" means a living or working area, such as a lounge room, living room, dining room, rumpus room, kitchen, bedroom, office or the like, and includes rooms constructed and furnished for these purposes. Rooms containing a bath and/or shower are considered habitable. Rooms containing a toilet or basin are not considered habitable if additional to a main bathroom.

"habitable land use" means development that facilitates the occupation or use of buildings or rooms by persons for accommodation. Includes residential accommodation; moveable dwellings; caravan parks; residential care facilities; tourist and visitor accommodation; hospitals; correctional facilities.

"high flow area" means those areas of the Tweed Valley floodplain coloured red in [Figures 1, 2 and 3](#) contained in [Part 2 of the Tweed Valley Floodplain Risk Management Study](#). As defined by Part 2 of the [Tweed Valley Floodplain Risk Management Study](#), flood prone land is classified as being subject to high flow if the product of flood velocity and depth at the peak of the ARI 100 year flood event exceeds 0.3 ($vxd > 0.3$). Areas coloured blue in [Figures 1, 2 and 3](#) are classified as "low flow areas", and have a velocity-depth product less than 0.3. High flow areas convey the majority of flood waters, and consist of floodways and flood conveyance zones.

"high island" means an area above the PMF that is surrounded on its entire perimeter during a PMF event. A high island can either be a natural landform such as a high ridge (local examples are Terranora, Bilambil Heights and Hospital Hill in Murwillumbah); or can be created by raised dwellings, fill pads and upper storey refuges.

“high land” means land that is situated above PMF level.

“high level evacuation route” means a road or footway (as applicable based on the development type), whose entire length has a level (measured at top of kerb for roads) of not less than the design flood level and, which provides a route to enable people to evacuate to land above the PMF. Ideally a high level evacuation route will have a rising grade that ensures users will not be cut off as floodwaters rise. Overland stormwater flow paths on high level evacuation routes must be designed to remain trafficable when conveying the 100 year ARI design stormwater flow. High level evacuation routes should have levels that in combination with effective warning time, development type and flood duration, provide adequate time for evacuation to land above the PMF.

“locality” is as defined by the Geographical Names Board.

"long term resident" in relation to a caravan park, means a person (other than any person who is caretaker, manager or employee of the licensee or anyone living with any such person) whose principal place of residence is a movable dwelling placed in the park.

“low island” means an area that is above the FPL and surrounded on its entire perimeter during and 100 year ARI event, but is inundated by the PMF. When flood levels exceed the FPL, in events up to the PMF, low islands become totally inundated, posing significant risk to isolated residents without flood free access to high land or shelter. Local examples include filled residential estates in Banora Point, West Kingscliff, and Pottsville, and raised dwellings in Chinderah, South Murwillumbah and Rural Villages.

“map” means one of a series of three plans depicting flood levels in the Tweed Valley Flood Study 2005. Coloured areas are predicted to be inundated in a 100 Year ARI flood, hatched areas are additional areas predicted to be inundated in the PMF. Numerical contours are the predicted levels (Metres AHD) for the 100 Year ARI flood. Other flood liable areas (uncoloured or unhatched) on these plans may be outside the hydraulic boundary of the Tweed Valley Flood Study and no information is given of their flood status.

"peak discharge" means the maximum discharge occurring during a flood event.

“PMF refuge” means a habitable area, being an upper storey, mezzanine level or other refuge located above PMF level, to provide residents of developments without high road access for evacuation with a means of sheltering safely in place until flood waters subside. PMF refuges must be structurally safe and accessible by boat during floods up to the PMF and contain sufficient facilities and supplies to sustain occupants for the expected duration of a PMF. PMF refuges are a form of high island, isolated from external essential services.

“probable maximum flood” (PMF) means the largest flood that could conceivably occur at a particular location. The PMF has only been determined for that part of the Tweed Valley shown on A3 – Maps 1, 2 & 3. PMF levels are determined from an independent set of maps held by Council. The PMF has not been determined for any other catchments in Tweed Shire, however for the purposes of development control, an assumed interim PMF level of 2.0m above 100 year ARI flood level will be used in localities east of the Pacific Motorway. For all other localities, PMF levels will be determined on a case by case basis, and may require a separate flood study.

"residential flat building" means a building containing three or more dwellings, as defined by Tweed LEP.

"runoff" means the amount of rainfall which actually ends up as stream flow.

"short term resident" means any person accommodated on a caravan park, other than a long term resident.

"stormwater flooding" means inundation resulting from the incapacity of urban stormwater drainage works to handle runoff.

"urban zoned land" includes residential, business and industrial zones in the Tweed LEP and also includes any associated, adjacent open space and special uses zones and any included/adjacent roads.

A3.2 THE FLOOD MITIGATION STRATEGY

A3.2.1 General

Flooding within the Shire occurs when rainfall exceeds the capacity of creeks and rivers to convey the runoff water to the ocean. Flooding can generate rapid rises in water levels and warning times are often very short. The coastal creeks and the lower reaches of the Tweed River can also be flooded from the affects of a cyclone or its remnant rain depression that creates extraordinarily high tide or ocean levels combined with heavy local rain. Flooding of this type will generally occur with little warning except for weather forecasts predicting cyclones and rain depressions.

Residents in flood prone areas should be very conscious of their situation, be alert during any periods of predicted high rainfalls and be prepared to evacuate all possessions that are located on land liable to flooding.

Information on the flood liability of most urban land within the Shire is available from the Engineering and Operations Division on request.

Council's flood mitigation strategy is to minimise future potential flood damage both by structural protection and by planning controls to ensure that only appropriate compatible development occurs on floodplains in the future.

It is expected that future mitigation works will be limited to possible modifications of the existing levees. The often discussed Flood Storage Dams are not feasible in the Tweed Valley.

In newer release areas, the land should already be filled to the design flood level current at the time of subdivision, however the design flood level changes from time to time as more up to date flood studies are completed. Proponents are advised to obtain a Section 149 Certificate to determine the actual design flood levels of specific parcels of land.

A3.2.2 Rural Areas

Minor flooding is controlled by leveeing and floodgated outlets in many areas on the Tweed River Floodplain downstream of Murwillumbah, where the agricultural use and potential flood damage has justified the expenditure.

Many other areas of the floodplain, adjacent to local creeks and streams, as well as the Tweed River upstream of Murwillumbah, are liable to rapid flood inundation with little warning. Records and information in many of these areas are very limited. Persons proposing new developments on areas near rivers and streams that could be flood liable should seek out and heed reliable local historical information.

A3.2.3 Urban Areas

Levees at Murwillumbah and Tweed Heads South provide structural protection against flood inundation to varying degrees. In other areas, planning controls are used to contain future flood damage.

Council's design flood is based on the 1:100 year frequency event; that is a flood with a 1 in 100 chance of occurring in any one year.

As stated, the urban areas safeguarded by structural controls such as levees are protected to varying degrees. In the event of a flood exceeding the levee height, the protected areas will flood quickly with little warning time and very rapid rises in water levels.

Table 2.1 sets out the degree of protection of structural controls within the Shire.

Locality	Chance of Flooding in Any Year	Anticipated Warning Time	Expected Time to Fill to Levee Height
Murwillumbah - Main Street	1 in 80*	3-4 hrs	3-4 hrs
Murwillumbah - South	1 in 2	3-4 hrs	1-2 hrs
Murwillumbah - East / Dorothy Street	1 in 100	3-4 hrs	1-2 hrs
Tweed Heads South	1 in 20	21 hrs for river flood but possibly very little warning from a Cyclonic Surge	1-2 hrs

Estimate only. The Murwillumbah levee is approximately 200mm lower than the predicted ARI 100 year flood event.

Table 2.1 The Degree of Protection Afforded by Structural Controls of Flooding in Tweed Shire.

Design flood levels

Design flood levels for urban areas are given in Clauses A3.3 - A3.9 of this Section. Design flood level shall be determined by the ARI 100 year flood level contours at 0.1m contour interval shown on A3 – Maps 1, 2 & 3. The design flood level shall be the next highest contour above the subject lot.

A3.2.4 High Flow Areas

The following development controls apply to all land falling within the mapped high flow areas of the Tweed Valley.

Land Zone (from Tweed LEP 2000 and DRAFT Tweed LEP 2010 respectively)	Development Controls
<p>1(a) Rural and 1(b) Agricultural</p> <p>Rural Zones RU1 and RU2 and Residential Zone R5 (Large Lot Residential), and Environmental Protection Zones E1 and E2</p>	<p>Exclude all new residential development from the mapped high flow areas.</p> <p>Other development only permissible within high flow areas if the development will not change ground levels by more than 300mm (for local drainage purposes) or obstruct flood flows.</p> <p>Examples of permissible development include: Buildings with footprints less than 80m², and separated from other structures by no less than 30m; Levees, bunds or road formations no more than 300mm above natural ground level; Wire strand fencing.</p>
<p>2(a) Low Density Residential</p> <p>Rural Zone RU5 (Village) and Residential Zones R1, R2, and R3</p>	<p>Permit residential redevelopment within the mapped high flow areas provided total enclosure below design flood level is less than 50m².</p>
<p>3(c) & 3(d) Business (Commerce and Trade and Waterfront Enterprise)</p> <p>Business Zones B1, B2, B3, B4, B5</p>	<p>Permit development in mapped high flow areas, subject to maximum 50% site coverage for buildings and other obstructions to flow on each lot.</p> <p>At least 50% of any cross section for each lot, transverse to the direction of flood flow, must be preserved clear of flow obstructions down to natural ground level.</p> <p>Fencing must be permeable to allow the passage of flood flows (minimum 90% void space), or be collapsible under flood flow (eg, timber palings).</p>
<p>4(a) Industrial</p> <p>Industrial Zones IN1 and IN4</p>	<p>Exclude all development from Lot 4 DP 591604.</p> <p>Permit development in all remaining mapped high flow areas, subject to maximum fill height to ARI 20 year flood level, and maximum 50% site coverage for buildings and other obstructions to flow.</p> <p>At least 50% of any cross section for each lot, transverse to the direction of flood flow, must be preserved clear of flow obstructions above the ARI 20 year flood level.</p> <p>Fencing must be permeable to allow the passage of flood flows (minimum 90% void space), or be collapsible under flood flow (eg, timber palings).</p>
<p>5(a) Special Uses (School)</p> <p>Special Purpose Zones SP1, SP2, SP3, Recreation Zones RE1 and RE2,</p>	<p>Permit development in mapped high flow areas, subject to maximum 50% site coverage for buildings and other obstructions to flow on each lot.</p> <p>At least 50% of any cross section for each lot, transverse to the direction of flood flow, must be preserved clear of flow obstructions down to natural ground level.</p> <p>Fencing must be permeable to allow the passage of flood flows (minimum 90% void space), or be collapsible under flood flow (eg, timber palings).</p>

Waterway Zones W1, W2 and W3.	Development only permissible if it will not result in significant adverse impact on local flood behaviour or net loss in flood conveyance function, as demonstrated by a hydraulic assessment by a suitably qualified professional. The assessment must consider the impact of the development in isolation as well as in a cumulative development scenario.
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Development controls for high flow areas take precedence over the locality specific clauses in Section A3 of the DCP.

A3.2.5 Emergency Response Provisions

(a) Essential Community Facilities & Critical Services

Critical infrastructure and emergency response facilities in all localities shall comply with the following development controls:

Land Use Risk Class	Development Type	Development Controls	Notes
Critical Development <i>Emergency services facilities and hospitals as defined by Tweed LEP, and critical infrastructure such as major telephone exchanges as per Appendix K3.1 of the Floodplain Development Manual.</i>	New Development	All new critical infrastructure and facilities to be located above PMF level, unless exceptional circumstances can be justified, such as servicing existing flood prone communities where no practical alternative exists. In such cases, and where the development is a habitable land use, adequate PMF refuge must be provided.	Note 1
	Existing Development	Minor expansion of existing facilities permitted without consideration of PMF. Major expansion below PMF level subject to provision of adequate PMF refuge, where the development is a habitable land use.	Note 1

Note 1 - PMF Refuge for Critical Development

The PMF refuge must meet the following minimum requirements:

- Refuge must be above the PMF level.
- Minimum floor level to be PMF level. No freeboard required.
- For extensions to new facilities, minimum floor area of refuge to be no less than 50% of the incremental increase in total floor area located below the PMF due to the extension, or an equivalent area that would comfortably accommodate and service the needs of occupants for a period of not less than one week.
- Refuge must comply with Building Code Australia requirements, with external components rated appropriately for storm, wind and moisture.
- Permanent internal access via permanent staircase, minimum 1.2m wide.

- External access to the refuge must also be provided. Access must remain unobstructed for emergency boat access during flooding (i.e. clear of trees, services).
- Refuge must have natural lighting and ventilation.
- Support structures below PMF level must be capable of withstanding flood forces (water flow, debris impact, and buoyancy) and continuous submergence for up to one week, requiring an engineering certification.
- Refuge must meet all planning and building controls applicable to the site.
- All services provided as part of normal operations are to be continued undiminished during all flood events. This includes food, water, shelter, power via back up generators, medical services and hygiene of residents and facilities. All excess sewage, food and medical waste is to be collected and stored until such time as normal disposal can be undertaken. Facility management must make provision for staff to be rostered on and accommodated for the flood period. All such measures must be detailed in the development's Flood Response Assessment Plan.

(b) Habitable Development

New habitable development in all localities shall comply with the following development controls:

Land Use Risk Class	Development Type	Development Controls	Notes
Sensitive Development <i>Residential care facilities, group homes (that provide accommodation to people with a disability), as defined by the Tweed LEP</i>	New Development	All new sensitive development to have permanent high level road evacuation route(s) to land above PMF level and/or adequate PMF refuge, subject to the recommendations of an acceptable Flood Response Assessment Plan.	Note 1
	Existing Development	Minor expansion of existing facilities permitted without consideration of PMF. Major expansion below PMF level subject to provision of adequate PMF refuge.	Note 2
Residential Development <i>Residential accommodation (except for dwelling houses , secondary dwellings or dual occupancies in Zone RU5 Village, Zone R1 General Residential, Zone R2 Low Density Residential, Zone R3 Medium Density Residential or Zone R5 Large Lot Residential), tourist and visitor accommodation,</i>	New Development (except caravan parks and moveable dwellings)	All new development to have permanent high level road/pedestrian evacuation route(s) to land above PMF level and/or adequate PMF refuge, subject to the recommendations of an acceptable Flood Response Assessment Plan.	Note 3
	Existing Development (except caravan parks and moveable dwellings)	Minor expansion of existing facilities permitted without consideration of PMF. Major expansion below PMF level must meet new development criteria above.	Note 4
	New caravan park development	All new caravan parks and the moveable dwelling sites within to have permanent high level road evacuation route(s) to land above PMF level.	

Land Use Risk Class	Development Type	Development Controls	Notes
<i>caravan parks (including moveable dwellings), correctional facilities, as defined by the Tweed LEP</i>	Development of existing caravan parks	No expansion of existing facilities by the addition of moveable dwelling sites permitted, unless permanent high level road evacuation route to high land external to the site is available, or high land internal to the site can be accessed by the additional sites via road and/or pedestrian routes. Expansion of caravan park amenities and other non-habitable facilities permitted without consideration of PMF.	
Residential Subdivision <i>Urban Residential Subdivision (including small lot rural subdivision where the average lot size, excluding residual and non-residential lots is less than 5000m²), Rural Subdivision,</i>	New Subdivisions	All new subdivisions to have high level road evacuation route(s) to land above PMF level, accessible to all allotments via (as a minimum) pedestrian access at or above 100 year ARI flood level not exceeding 100m in length.	
	Infill Subdivisions (subdivision of land less than 5 hectares in area, surrounded by existing urban development and/or constrained by the urban land form from further expansion)	Infill subdivision permitted subject to the creation of covenants on land titles of all new allotments that cannot achieve suitable high level road/pedestrian evacuation route(s) to land above PMF level, requiring adequate PMF refuges in all future dwellings.	Note 4
Other Habitable Development	All (except for dwelling houses , secondary dwellings or dual occupancies in Zone RU5 Village, Zone R1 General Residential, Zone R2 Low Density Residential, Zone R3 Medium Density Residential or Zone R5 Large Lot Residential)	Flood Response Assessment Plans are required to be submitted with Development Applications for all habitable land uses in the floodplain.	Note 5

Note 1 - Evacuation Versus Shelter in Place for Sensitive Development

Evacuation of occupants is the preferred risk management approach for sensitive developments proposed below PMF level. Adoption of evacuation as the risk management response for a development requires a Flood Response Assessment Plan that specifically addresses the following evacuation requirements:

- Typical demographics of evacuees (age, gender etc)
- Typical medical conditions and/or disabilities of evacuees (dialysis, dementia, paralysis etc)
- Mode of transportation (private bus, ambulance etc)
- Intended evacuation destination
- Level of service provided by evacuation centre (medical, security, accommodation etc)
- Required staffing for evacuation centre to cater for evacuees
- Special supply measures for evacuation centre to cater for evacuees (food, water, waste, medicines etc)

If the above requirements are not able to be satisfied for all future occupants of the development, a PMF refuge shall be provided in accordance with design criteria in Note 2.

Note 2 - PMF Refuge for Sensitive Development

The PMF refuge must meet the following minimum requirements:

- Refuge must be above the PMF level.
- Minimum floor level to be PMF level. No freeboard required.
- For new facilities, minimum floor area of refuge to be no less than 50% of the total floor area located below the PMF, or an equivalent area that would comfortably accommodate and service the needs of the occupants for a period not less than one week. For extensions to new facilities, minimum floor area of refuge to be no less than 50% of the incremental increase in total floor area located below the PMF due to the extension.
- Refuge must comply with Building Code Australia requirements, with external components rated appropriately for storm, wind and moisture.
- Permanent internal access via permanent staircase, minimum 1.2m wide.
- External access to the refuge must also be provided. Access must remain unobstructed for emergency boat access during flooding (i.e. clear of trees, services).
- Refuge must have natural lighting and ventilation.
- Support structures below PMF level must be capable of withstanding flood forces (water flow, debris impact, and buoyancy) and continuous submergence for up to one week, requiring an engineering certification.
- Refuge must meet all planning and building controls applicable to the site.
- All services provided as part of normal operations are to be continued undiminished during all flood events. This includes food, water, shelter, power via back up generators, medical services and hygiene of residents and facilities. All excess sewage, food and medical waste is to be collected and stored until such time as normal disposal can be undertaken. Facility management must make provision for staff to be rostered on and accommodated for the flood period. All such measures must be detailed in the development's Flood Response Assessment Plan.

Note 3 - Evacuation Versus Shelter in Place for Residential Development

Evacuation of occupants is the preferred risk management approach for medium and high density developments proposed below PMF level. Adoption of evacuation as the risk management response for a development requires a Flood Response Assessment Plan that specifically addresses the following evacuation requirements:

- Expected number of occupants/evacuees
- Typical demographics of evacuees (families with children, retirees etc)
- Mode of transportation (private vehicles, bus provided by facility etc)
- Intended evacuation destination
- Level of service provided by evacuation centre (medical, security, accommodation etc)
- Any special requirements for evacuation centre to cater for evacuees (food, water, waste, medicines etc)

If the above requirements are not able to be satisfied for all future occupants of the development, a PMF refuge shall be provided in accordance with design criteria in Note 4.

Note 4 - PMF Refuge for Residential Development

Where PMF refuge is required, the refuge must meet the following minimum requirements:

- Refuge may be an additional second storey, mezzanine level or other raised refuge area above the PMF level. Minimum floor level to be PMF level. No freeboard required.
- Minimum floor area for a refuge is 9m² based on a single bedroom occupancy. Add 4m² for each additional bedroom.
- For unit developments, may provide separate refuges within each unit, sized in accordance with the above bedroom ratio. Alternately provide a communal refuge, accessible internally by all units, floor area no less than 50% of total floor area located below PMF level, or an equivalent area that would comfortably accommodate and service the needs of the occupants for a period not less than one week.
- Refuge must comply with Building Code Australia requirements, with external components rated appropriately for storm, wind and moisture.
- Minimum 2.1m floor to ceiling/roof frame height.
- Refuge must be provided with permanent internal and external access, (may be a fixed ladder).
- The external access must be unobstructed (by trees, chimneys, aerials etc) for emergency boat access during flooding
- Refuge must have natural lighting and ventilation
- Support structures below PMF level must be capable of withstanding flood forces (water flow, debris impact, and buoyancy) and continuous submergence for up to one week, requiring an engineering certification.
- Refuge must meet all planning and building controls applicable to the site.
- Refuge must have a cupboard storage area for flood emergency kit to service all residents with provisions for isolation up to one week, consisting of food and fresh water supplies, first aid kit including medication, battery powered torch, portable radio, spare batteries, candles and water proof matches, plastic bags and rubber gloves. All such measures must be detailed in the development's Flood Response Assessment Plan.

Note 5 - Flood Response Assessment Plan

A Flood Response Assessment Plan provides a means by which a developer can assess and nominate the most applicable flood emergency response option for a habitable development (whether it be avoidance, evacuation, or shelter in place), and for Council officers to consider during assessment of the development application.

The Flood Response Plan is not intended to be a document that provides details for the site specific management of flood preparation and response for a habitable development. Such private flood plans should be developed and implemented by owners and occupants following completion of the development. The SES may provide assistance to occupants in the preparation of private flood plans.

As a minimum requirement, a Flood Response Assessment Plan for a proposed development must provide the following details:

- Expected number of occupants
- Typical demographics of occupants (families with children, retirees etc)
- 100 year ARI flood level and PMF level for the development site (obtainable from Council)
- Nominated Flood Risk Management Approach for the development (avoidance, evacuation, shelter in place. Note that rescue is not an appropriate response for any development type)
- For evacuation, provide detail of nearest evacuation centre (as advised by the NSW State Emergency Service), the intended mode of transport to the centre, and indicative ground/road levels at significant points along the nominated evacuation route.
- Any special requirements for evacuation centre to cater for evacuees (food, water, waste, medicines etc)
- If shelter in place, provide details of refuge in accordance with Note 2 or Note 4 as applicable.

A3.3 LOWER TWEED

Area Included: Urban zoned localities of Banora Point, Terranora, Bilambil, Bilambil Heights, Cobaki Lakes, Tweed Heads West, Tweed Heads and Tweed Heads South, being coloured or hatched (PMF) on A3 – Map 1.

A3.3.1 Flood Levels

Flooding in the Tweed Heads area is complex and major flooding is only expected as a result of an interaction between river flooding and ocean surge conditions. Progressive changes to the hydraulics of the river mouth and land-use have affected the historical flood pattern.

In 1954, which is the highest recorded flood in this locality, inundation levels were experienced in Tweed Heads varying from RL 2.51 metres AHD near the river mouth to RL 2.05 metres AHD in the town centre. On this historical basis, Council originally adopted a flood level of RL 2.19 metres AHD and required residential floors to be above this level. Subsequent analysis resulted in Council revising its policy and specifying a design flood level of RL 2.15 metres AHD and a minimum floor level of RL 2.45 metres AHD for dwellings.

Following further investigations and advice from the Department of Public Works, Council on 5 September 1984, adopted a 1 in 100 year design flood level of RL 2.65 AHD and a minimum floor level of RL 2.95 AHD for dwellings.

The minimum floor level for dwellings is revised in this Section following completion of the Tweed Valley Flood Study 2005 and revised freeboard requirements.

Locality	ARI 100 Year Predicted Flood Level	Design Flood Level		Adopted Min. Floor Level for Residential Development
		Coloured areas	Hatched areas (above ARI 100 years but below PMF)	
Area defined in A3.3	See A3 – Map 1.	Level of next highest flood level contour on A3 – Map 1 or 2.6m AHD whichever is higher	Design flood level of adjacent coloured area	Design Flood Level plus 0.5m

Table 3.1 Flood Levels in Tweed Heads, Tweed Heads West, Tweed Heads South & Banora Point

The subject localities have been identified as comprising flood fringe areas. These categories are shown on an independent series of maps held by Council and available for public examination during normal office hours.

A3.3.2 Development Generally on Flood Liable Land

Filling	All filling is to be graded so that it drains to the street or other approved permanent drainage system.
Building Materials	All materials used below Council's adopted design flood level must not be susceptible to water damage.
Electrical Supply	Subject to the requirements of Northern Rivers Electricity, all electrical wiring, power outlets, switches, etc, should, to the maximum extent possible, be located above the design flood level. All electrical wiring installed below the design flood level should be suitably treated to withstand continuous submergence in water.
Car Parking	Car parking in the form of basement parking will not be approved below the design flood level unless it is protected against the inflow of water to a level of 500 mm above the design flood.
High Flow Areas	Refer to A3.2.4 for development controls applicable to land in mapped high flow areas of the Tweed Valley. The development controls in A3.2.4 take precedence over other controls in A3.3.

A3.3.3 Residential Development on Flood Liable Land

Subdivision	All land, other than public roads and reserves, to be filled to a minimum level of the design flood where an additional allotment is created. This does not apply to consolidations of allotments, boundary adjustments and the like.
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Filling Land to be developed for the purpose of residential flat buildings/dual occupancy shall be filled to a minimum level of the design flood level.

Land to be developed for other residential purposes shall be filled to a level of the road centre line in front of the allotment.

While filling of all allotments to a minimum level of the design flood level is recommended consideration may be given to the erection of single dwellings without filling above the road centre line level provided the habitable area is above Council's adopted minimum floor level.

Development

- (i) Banora Point
- The habitable areas of all residential buildings are to be at a level of not less than Council's adopted minimum floor level for development.
- The area below Council's design flood level is not to be totally enclosed. Consideration will be given on application, to permitting the enclosure of laundry, stairway entry and double garage space, provided that such an enclosure does not significantly restrict flood flows.
- An area of 50m² will generally encompass these facilities. Any larger enclosures will only be considered when the application can demonstrate that the additional area enclosed will not provide any greater restriction to flood flow.
- The free flow of flood water must be a major consideration in the design of any area to be enclosed.
- (ii) Tweed Heads
Tweed Heads West
Tweed Heads South
- The habitable area of all residential buildings is to be at a level of not less than Council's adopted minimum floor level for development.
- Areas for recreational purposes only may be approved below Council's minimum floor level in flood fringe areas provided that furnishings therein are readily removable.
- Movable Dwelling Parks**
- Movable dwelling parks will not be approved unless it can be demonstrated that the land can be filled to a level of not less than the adopted design flood level for the locality without adversely affecting the current flood levels and patterns in the area.

A3.3.4 Commercial And Industrial Development on Flood Liable Land

Development Commercial and industrial development will be required to make adequate provision of flood free storage areas for stock and equipment susceptible to water damage.

Caravan Parks All caravans are to be maintained in a condition that will allow removal of them at short notice.

Each site occupant is to be provided with a flood information leaflet for display in each caravan which sets out information on water depths likely to be experienced in the park, sources of flood information, public warning procedures, evacuation routes and advice on when to take action. Such information will be required to be displayed prominently in the park office, amenities block and ensuite structures.

Strict limitations will be placed on site development and structures in parks that will impede the free flow of floodwater.

New caravan parks or additions to existing caravan parks will not be permitted to accommodate long term residents unless the development site is at a level of not less than the design flood level or it can be shown that the site will be filled to the design flood level without impeding the free flow of floodwater.

Motels The habitable areas of motels are to be at a level of not less than Council's adopted minimum floor level for residential development.

A3.4 CHINDERAH & FINGAL ROAD (South of No 45 Fingal Road)

Area Included: Urban zoned localities of Chinderah and Fingal Head (south of No 45 Fingal Road), being coloured on A3 – Map 1.

A3.4.1 FLOOD LEVELS

The minimum floor level for dwellings is revised in this Section following completion of the Tweed Valley Flood Study 2005 and revised freeboard requirements.

Table 4.1 lists the various flood levels for these localities:

Locality	ARI 100 Year Predicted Flood Level	Design Flood Level		Adopted Min. Floor Level for Residential Development
		Coloured areas	Hatched areas (above ARI 100 years but below PMF)	
Area defined in A3.4	See A3 – Map 1.	Level of next highest flood level contour on A3 – Map 1 or 2.6m AHD whichever is higher	Design flood level of adjacent coloured area	Design Flood Level plus 0.5m

Table 4.1 Flood Levels in Chinderah and Fingal Road

Flooding in these localities has been identified as relatively low velocity flood storage, with small areas of floodway. These categories are shown on an independent series of maps held by Council and available for public examination during normal office hours.

A3.4.2 Development Generally On Flood Liable Land

Building Materials	All building materials used below Council's adopted design flood level must not be susceptible to water damage.
Electrical Supply	Subject to the requirements of Northern Rivers Electricity, all electrical wiring, power outlets, switches, etc, should, to the maximum extent possible, be located above the design flood level. All electrical wiring installed below the design flood level should be suitably treated to withstand continuous submergence in water.
Filling	For drainage purposes only, land will be required to be filled to the approximate level of the centre line of the adjacent road unless adequate alternative stormwater drainage is provided. In areas outside the residential zones, applications for filling above the level of the adjacent road will be considered where the applicant can satisfy Council that there will be no interference to local drainage nor any material adverse affect on adjacent land.
Structures	Where, on flood liable land a proposed development could be damaged by flooding, no work may be commenced until a certificate of structural adequacy with regard to stability as a result of flooding has been submitted to Council by a qualified structural/civil engineer. Fencing must be of a form that will either allow the free passage of flood water or of a light construction such as timber paling that will collapse as a result of any build up of debris or floodwater.
High Flow Areas	Refer to A3.2.4 for development controls applicable to land in mapped high flow areas of the Tweed Valley. The development controls in A3.2.4 take precedence over other controls in A3.4.

A3.4.3 Residential Development On Flood Liable Land

Subdivision	Subdivision to existing roads only, where an additional allotment is created, with a minimum seventeen (17) metre frontage prohibiting battle axe blocks. This clause does not apply to consolidation of existing allotments or boundary adjustments. The habitable areas of all residential buildings are to be at a level of not less than Council's adopted floor level for development.
Development	The area below Council's design flood level is not to be totally enclosed. Consideration will be given on application, to permitting the enclosure of laundry, stairway entry and double garage space, provided that such an enclosure does not significantly restrict flood flows. An area of 50m ² will generally encompass these facilities. Any larger

enclosures will only be considered when the application can demonstrate that the additional area enclosed will not provide any greater restriction to flood flow.

The free flow of flood water must be a major consideration in the design of any area to be enclosed.

In fill development of residentially zoned land will be permitted with the exception of allotments within the extreme hazard zones identified in the Cameron McNamara report of September, 1984.

Movable Dwelling Parks

New movable dwelling parks will not be approved unless it can be demonstrated that the land can be filled to a level of not less than the adopted design flood level for the locality without adversely affecting the current flood levels and patterns in the area.

A3.4.4 Commercial and Industrial Development on Flood Liable Land

Filling

For drainage purposes only, land will be required to be filled to the approximately level of the centre line of the adjacent road unless adequate alternative stormwater drainage is provided.

Development

It is recommended that areas below Council's adopted minimum floor level not be enclosed and that the free flow of floodwaters be permitted at all times.

Commercial and industrial development will be required to make adequate provision of flood free storage areas for stock and equipment susceptible to water damage.

Structures and permanent improvements within the industrial zoned land are to be restricted in site coverage to retain a minimum of 50% of the area available for flood flow.

Caravan Parks

All caravans are to be maintained in a condition that will allow removal of them at short notice.

Each site occupant is to be provided with a flood information leaflet for display in each caravan which sets out information on water depths likely to be experienced in the park, sources of flood information, public warning procedures, evacuation routes and advice on when to take action. Such information will be required to be displayed prominently in the park office amenities blocks and ensuite structures.

Strict limitations will be placed on site development and structures in parks that will impede the free flow of floodwater.

New caravan parks or additions to existing caravan parks will not be permitted to accommodate long term residents unless the development site is at a level of not less than the design flood level or it can be shown that the site will be filled to the design flood level without impeding the free flow of floodwater.

Motels The habitable areas of motels are to be at a level of not less than Council's adopted minimum floor level for residential development.

A3.4.5 Inappropriate Development Of Flood Liable Land

Table 4.2 lists development considered by Council to be inappropriate to the applicable categories of flood hazard in the Chinderah and Fingal Road localities.

Flood Hazard Category	Inappropriate Development
Floodway & High Hazard Flood Storage Areas	Dual Occupancy and Granny Flat, Movable Dwelling Parks and Caravan Parks making provision for long term residents.

Table 4.2 Development considered to be inappropriate to the Flood Hazard of Chinderah and Fingal Road

A3.5 FINGAL HEAD (Except for Section on Fingal Road, South of No 45 Fingal Road)

Area Included: Urban zoned localities of Fingal Head excluding south of No.45 Fingal Road, being coloured on A3 – Map 1.

A3.5.1 Flood Levels

The minimum floor level for dwellings is revised in this Section following completion of the Tweed Valley Flood Study 2005 and revised freeboard requirements.

Table 5.1 lists the flood levels for Fingal Head.

Locality	ARI 100 Year Predicted Flood Level	Design Flood Level		Adopted Min. Floor Level for Residential Development
		Coloured areas	Hatched areas (above ARI 100 years but below PMF)	
Area defined in A3.5	See A3 – Map 1.	Level of next highest flood level contour on A3 – Map 1 or 2.6m AHD whichever is higher	Design flood level of adjacent coloured area	Design Flood Level plus 0.5m

Table 5.1 Flood Levels in Fingal Head

Flooding in this locality has been identified as comprising low and high hazard flood storage areas and floodways. These categories are shown on an independent series of maps held by Council and available for public examination during normal office hours.

A3.5.2 Development Generally On Flood Liable Land

Filling All filling is to be graded so that it drains to the street or other approved permanent drainage systems.

Structures Where, on land within floodways or high hazard flood storage areas a proposed development could be damaged by flooding no work may be commenced until a certificate of structural adequacy with regard to stability as a result of flooding has been submitted to Council by a qualified structural/civil engineer.

Building Materials	All building materials used below Council's adopted design flood level must not be susceptible to water damage.
Electrical Supply	Subject to the requirements of Northern Rivers Electricity, all electrical wiring, power outlets, switches, etc, should, to the maximum extent possible, be located above the design flood level. All electrical wiring installed below the design flood level should be suitably treated to withstand continuous submergence in water.
Car Parking	Car parking in the form of basement parking will not be approved below the design flood level unless it is protected against the inflow of water to a level of 500 mm above the design flood level.
High Flow Areas	Refer to A3.2.4 for development controls applicable to land in mapped high flow areas of the Tweed Valley. The development controls in A3.2.4 take precedence over other controls in A3.5.

A3.5.3 Residential Development On Flood Liable Land

Subdivision	<p>"Subdivision" refers to any additional allotments created and does not apply to consolidations, boundary adjustments and the like.</p> <p>Further subdivision for residential purposes is considered by Council to be inappropriate to the flood hazard of these localities unless it can be shown that the land can be filled to the design flood level without creating any adverse effect.</p>
Development	<p>The habitable areas of all residential buildings are to be at a level of not less than Council's adopted minimum floor level for development.</p> <p>The area below Council's design flood level is not to be totally enclosed. Consideration will be given on application, to permitting the enclosure of laundry, stairway entry and double garage space, provided that such an enclosure does not significantly restrict flood flows.</p> <p>An area of 50m² will generally encompass these facilities. Any larger enclosures will only be considered when the application can demonstrate that the additional area enclosed will not provide any greater restriction to flood flow.</p> <p>The free flow of flood water must be a major consideration in the design of any area to be enclosed.</p>
Movable Dwelling Parks	Movable dwelling parks will not be approved unless it can be demonstrated that the land can be filled to a level of not less than the adopted design flood level for the locality without adversely affecting the current flood levels and patterns in the area.

A3.5.4 Commercial And Industrial Development On Flood Liable Land

Development	Commercial and industrial development will be required to make adequate provision of flood free storage areas for stock and equipment susceptible to water damage.
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It is recommended that areas below Council's adopted minimum floor level not be enclosed and that the free flow of flood waters be permitted at all times.

Caravan Parks All caravans are to be maintained in a condition that will allow removal of them at short notice.

Each site occupant is to be provided with a flood information leaflet for display in each caravan which sets out information on water depths likely to be experienced in the park, sources of flood information, public warning procedures, evacuation routes and advice on when to take action. Such information will be required to be displayed prominently in the park office, amenities blocks and ensuite structures.

Strict limitations will be placed on site development and structures in parks that will impede the free flow of floodwater.

New caravan parks or additions to existing caravan parks will not be permitted to accommodate long term residents unless the development site is at a level of not less than the design flood level or it can be shown that the site will be filled to the design flood level without impeding the free flow of floodwater.

Motels The habitable areas of motels are to be at a level of not less than Council's adopted minimum floor level for residential development.

A3.5.5 Inappropriate Development of Flood Liable Land

Table 5.2 lists development considered by Council to be inappropriate to the relevant categories of flood hazard in these localities.

Flood Hazard Category	Inappropriate Development
Floodway & High Hazard Flood Storage Areas	Dual Occupancy and Granny Flat, Movable Dwelling Parks and Caravan Parks making provision for long term residents.

Table 5.2 Development considered to be inappropriate to the Flood Hazard of Fingal Head

A3.6 THE COASTAL VILLAGES

Area Included: Urban zoned localities of Bogangar, Hastings Point, Pottsville and Wooyung.

A3.6.1 Flood Levels

The following Clauses of this Section deal with the coastal villages of Bogangar, Hastings Point and Pottsville. Table 6.1 lists the various flood levels for these villages. At its meeting of 15 December 2009, a new Coastal Creeks Flood Study was received by Council and is available to the public. A review of design flood levels is pending with reference to this Flood Study for the localities in this section.

Locality	Highest Recorded Flood Level	Predicted High Flood Level	Adopted Design Flood Level	Adopted Min. Floor Level for Residential Development
Bogangar	3.08m AHD	3.37m AHD	3.4m AHD	3.70m AHD
Hastings Point	N.K.	2.04m AHD	2.4m AHD	2.70m AHD
Pottsville Village	2.29m AHD	2.37m AHD	2.40m AHD	2.7m AHD
Pottsville Waters	-	-	2.70m AHD	3.0m AHD
Searanch	-	-	2.70m AHD	3.2m AHD
Black Rocks	-	-	3.0m AHD	3.3m AHD
Tanglewood	-	-	3.55m AHD	3.85m AHD
Wooyung	-	-	3.5m AHD	3.8m AHD

Table 6.1 Flood Levels in the Coastal Villages

Areas within these villages which have historically been or which are expected in the future to be subject to inundation as a consequence of river flooding are shown on an independent series of maps held by Council and available for public examination during normal office hours. These maps have been prepared on the basis of information available to Council. The subject localities have been identified as comprising flood fringe areas.

A3.6.2 Development Generally on Flood Liable Land

Development	Applicants will be required to provide details of studies that demonstrate the proposed development will not adversely affect the current flood patten and levels in the area.
Filling	All filling is to be graded so that it drains to the street or other approved permanent drainage systems.
Building Materials	All building materials used below Council's adopted design flood level must not be susceptible to water damage.
Electrical Supply	Subject to the requirements of Northern Rivers Electricity, all electrical wiring, power outlets, switches, etc, should, to the maximum extent possible, be located above the design flood level. All electrical wiring installed below the design flood level should be suitably treated to withstand continuous submergence in water.
Car Parking	Car parking in the form of basement parking will not be approved below the design flood level unless it is protected against the inflow of water to a level of 500 mm above the design flood level.

A3.6.3 Residential Development On Flood Liable Land

Subdivision	All land, other than public roads and reserves, is to be filled to a minimum level of the design flood where an additional allotment is created and not for consolidations, boundary adjustments and the like.
Filling	Land to be developed for the purpose of residential flat buildings/dual occupancy shall be filled to a minimum level of the design flood level. Land to be developed for other residential purposes shall be filled to a level

of the road centre line in front of the allotment.

While filling of all allotments to a minimum level of the design flood level is recommended consideration may be given to the erection of single dwellings without filling above the road centre line level provided the habitable area is above Council's adopted minimum floor level.

Development The habitable areas of all residential buildings are to be at a level of not less than Council's adopted minimum floor level for development.

Areas for recreational purposes only may be approved below Council's minimum floor level in flood fringe areas provided that furnishings therein are readily removable.

Movable Dwelling Parks Movable dwelling parks will not be approved unless it can be demonstrated that the land can be filled to a level of not less than the adopted design flood level for the locality without adversely affecting the current flood levels and patterns in the area.

A3.6.4 Commercial and Industrial Development on Flood Liable Land

Development Commercial and industrial development will be required to make adequate provision of flood free storage areas for stock and equipment susceptible to water damage.

It is recommended that areas below Council's adopted minimum floor level not be enclosed and that the free flow of flood waters be permitted at all times.

Caravan Parks All caravans are to be maintained in a condition that will allow removal of them at short notice.

Each site occupant is to be provided with a flood information leaflet for display in each caravan which sets out information on water depths likely to be experienced in the park, sources of flood information, public warning procedures, evacuation routes and advice on when to take action. Such information will be required to be displayed prominently in the park office, amenities blocks and ensuite structures.

Strict limitations will be placed on site development and structures in parks that will impede the free flow of floodwater.

New caravan parks or additions to existing caravan parks will not be permitted to accommodate long term residents unless the development site is at a level of not less than the design flood level or it can be shown that the site will be filled to the design flood level without impeding the free flow of floodwater.

Motels The habitable areas of motels are to be at a level of not less than Council's adopted minimum floor level for residential development.

A3.6.5 Inappropriate Development of Flood Liable Land

Table 6.2 lists development considered by Council to be inappropriate to the relevant categories of flood hazard in these localities.

Flood Hazard Category	Inappropriate Development
Floodway & High Hazard Flood Storage Areas	Dual Occupancy and Granny Flat, Movable Dwelling Parks and Caravan Parks making provision for long term residents.

Table 6.2 Development considered to be inappropriate to the flood hazard of these Coastal Villages

A3.7 KINGSCLIFF SOUTH OF WAUGH STREET

Area Included: Urban zoned localities of Kingscliff and Cudgen being coloured and hatched areas on A3 – Map 1.

A3.7.1 Flood Levels

The following Clauses of this Section apply to land east of the proposed Kingscliff Motorway and Table 7.1 lists the identified flood levels for Kingscliff.

The minimum floor level for dwellings is revised in this Section following completion of the Tweed Valley Flood Study 2005 and revised freeboard requirements.

Locality	ARI 100 Year Predicted Flood Level	Design Flood Level		Adopted Min. Floor Level for Residential Development
		Coloured areas	Hatched areas (above ARI 100 years but below PMF)	
Area defined in A3.7	See A3 – Map 1.	Level of next highest flood level contour on A3 – Map 1 or 2.6m AHD whichever is higher	Design flood level of adjacent coloured area	Design Flood Level plus 0.5m

Table 7.1 Flood Levels in Kingscliff

Flooding in this locality has been identified as comprising low and high hazard flood storage areas. These categories are shown on an independent series of maps held by Council and available for public examination during normal office hours.

A3.7.2 Development Generally On Flood Liable Land

Filling	All filling is to be graded so that it drains to the street or other approved permanent drainage systems.
Building Materials	All building materials used below Council's adopted design flood level must not be susceptible to water damage.
Electrical Supply	Subject to the requirements of Northern Rivers Electricity, all electrical wiring, power outlets, switches, etc, should, to the maximum extent possible, be located above the design flood level. All electrical wiring installed below the design flood level should be suitably treated to withstand continuous

submergence in water.

Car Parking	Car parking in the form of basement parking will not be approved below the design flood level unless it is protected against the inflow of water to a level of 500 mm above the design flood level.
High Flow Areas	Refer to A3.2.4 for development controls applicable to land in mapped high flow areas of the Tweed Valley. The development controls in A3.2.4 take precedence over other controls in A3.7.

A3.7.3 Residential Development On Flood Liable Land

Subdivision	All land, other than public roads and reserves, to be filled to a minimum level of the design flood where an additional allotment is created and not for consolidation, boundary adjustments and the like.
Filling	Land to be developed for the purpose of residential flat buildings/dual occupancy shall be filled to a minimum level of the design flood level. While filling of all allotments to a minimum level of the design flood level is recommended consideration may be given to the erection of single dwellings without filling above the road centre line level provided the habitable area is above Council's adopted minimum floor level.
Development	The habitable area of all residential buildings is to be at a level of not less than Council's adopted minimum floor level for development. Areas for recreational purposes only may be approved below Council's minimum floor level in flood fringe areas provided that furnishings therein are readily removable.
Movable Dwelling Parks	Movable dwelling parks will not be approved unless it can be demonstrated that the land can be filled to a level of not less than the adopted design flood level for the locality without adversely affecting the current flood levels and patterns in the area.

A3.7.4 Commercial And Industrial Development On Flood Liable Land

Development	Commercial and industrial development will be required to make adequate provision of flood free storage areas for stock and equipment susceptible to water damage.
Caravan Parks	All caravans are to be maintained in a condition that will allow removal of them at short notice. Each site occupant is to be provided with a flood information leaflet for display in each caravan which sets out information on water depths likely to be experienced in the park, sources of flood information, public warning procedures, evacuation routes and advice on when to take action. Such information will be required to be displayed prominently in the park office, amenities blocks and ensuite structures. Strict limitations will be placed on site development and structures in

parks that will impede the free flow of floodwater.

New caravan parks or additions to existing caravan parks will not be permitted to accommodate long term residents unless the development site is at a level of not less than the design flood level or it can be shown that the site will be filled to the design flood level without impeding the free flow of floodwater.

Motels The habitable areas of motels are to be at a level of not less than Council's adopted minimum floor level for development.

A3.7.5 Inappropriate Development Of Flood Liable Land

Table 7.2 lists development considered by Council to be inappropriate to the relevant categories of flood hazard experienced in Kingscliff.

Flood Hazard Category	Inappropriate Development
Floodway & High Hazard Flood Storage Areas	Dual Occupancy and Granny Flat, Movable Dwelling Parks and Caravan Parks making provision for long term residents.

Table 7.2 Development considered to be inappropriate to the flood hazard in Kingscliff

A3.8 MURWILLUMBAH, CONDONG & TUMBULGUM

Area Included: Urban zoned localities of Tumbulgum, Condong, Murwillumbah, South Murwillumbah, and Bray Park, being coloured or hatched on A3 – Maps 2 and 3.

A3.8.1 Flood Levels

The minimum floor level for dwellings is revised in this Section following completion of the Tweed Valley Flood Study 2005 and revised freeboard requirements.

Table 8.1 lists the various flood levels for these localities.

Locality	ARI 100 Year Predicted Flood Level	Design Flood Level		Adopted Min. Floor Level for Residential Development
		Coloured areas	Hatched areas (above ARI 100 years but below PMF)	
Area defined in A3.8	See A3 – Maps 2 or 3.	Level of next highest flood level contour on A3 Map 2 or A3 – Map 3 or 2.6m AHD whichever is higher	Design flood level of adjacent coloured area	Design Flood Level plus 0.5m

Table 8.1 Flood Levels in Murwillumbah, Condong & Tumbulgum

Flooding in these localities has been identified as comprising low and high hazard flood fringe areas, low and high hazard flood storage areas and floodways. These categories are shown on an independent series of maps held by Council and available for public examination during normal office hours.

A3.8.2 Development Generally on Flood Liable Land

- Filling** Where practicable, all sites will be required to be filled to a level of not less than the level of the centre line of the road in front of the allotment.
- All filling is to be graded so that it drains to the street or other approved permanent drainage systems.
- Structures** Where, on land within floodways or high hazard flood storage areas a proposed development could be damaged by flooding no work may be commenced until a certificate of structural adequacy with regard to stability as a result of flooding has been submitted to Council by a qualified structural/civil engineer.
- Fencing** Fencing must be of a form that will either allow the free passage of flood water or of a light construction such as timber paling that will collapse as a result of any build up of debris or flood water.
- Building Materials** All building materials used below Council's adopted design flood level must not be susceptible to water damage.
- Electrical Supply** Subject to the requirements of Northern Rivers Electricity, all electrical wiring, power outlets, switches, etc, should, to the maximum extent possible, be located above the design flood level. All electrical wiring installed below the design flood level should be suitably treated to withstand continuous submergence in water.
- High Flow Areas** Refer to A3.2.4 for development controls applicable to land in mapped high flow areas of the Tweed Valley. The development controls in A3.2.4 take precedence over other controls in A3.8.

A3.8.3 Residential Development on Flood Liable Land

- Subdivision** "Subdivision" refers to any additional allotments created and does not apply to consolidations, boundary adjustments and the like.
- Further subdivision for residential purposes is considered as inappropriate to the flood hazard of these localities unless it can be shown that the land can be filled to the design flood level without creating any adverse affect.
- Development** The habitable areas of all residential buildings are to be at a level of not less than Council's adopted minimum floor level for development in each locality.
- In those localities from and including South Murwillumbah to Condong and Tumbulgum the area below Council's design flood level is not to be totally enclosed. Consideration will be given on application, to permitting the enclosure of laundry, stairway entry and double garage space, provided that such an enclosure does not significantly restrict flood flows.
- An area of 50m² will generally encompass these facilities. Any larger

enclosures will only be considered when the application can demonstrate that the additional area enclosed will not provide any greater restriction to flood flow.

The free flow of flood water must be a major consideration in the design of any area to be enclosed.

Movable Dwelling Parks

Movable dwelling parks will not be approved unless it can be demonstrated that the land can be filled to a level of not less than the adopted design flood level for the locality without adversely affecting the current flood levels and patterns in the area.

A3.8.4 Commercial and Industrial Development on Flood Liable Land

Subdivision

Industrial subdivision may be approved where it can be demonstrated that the proposed development will not adversely affect the current flood patterns and levels in the locality.

Development

Commercial and industrial development will be required to make adequate provision of flood free storage areas for stock and equipment susceptible to water damage.

Caravan Parks

All caravans are to be maintained in a condition that will allow removal of them at short notice.

Each site occupant is to be provided with a flood information leaflet for display in each caravan which sets out information on water depths likely to be experienced in the park, sources of flood information, public warning procedures, evacuation routes and advice on when to take action. Such information will be required to be displayed prominently in the park office, amenities blocks and ensuite structures.

Strict limitations will be placed on site development and structures in parks that will impede the free flow of floodwater.

New caravan parks or additions to existing caravan parks will not be permitted to accommodate long term residents unless the development site is at a level of not less than the design flood level or it can be shown that the site will be filled to the design flood level without impeding the free flow of floodwater.

Motels

The habitable areas of motels are to be at a level of not less than Council's adopted minimum floor level for residential development.

A3.8.5 Inappropriate Development Of Flood Liable Land

Table 8.2 lists development considered by Council to be inappropriate to the relevant categories of flood hazard in these localities.

Flood Hazard Category	Inappropriate Development
Floodway & High Hazard Flood Storage Areas	Dual Occupancy and Granny Flats in Residential "A" and Rural Village zones; Movable Dwelling Parks and Caravan Parks making provision for long term residents.

Table 8.2 Development considered to be inappropriate to the Flood Hazard of these localities.**A3.9 THE RURAL VILLAGES AND THE CLARRIE HALL DAM CATCHMENT**

Area Included: Urban zoned localities of Uki, Tyalgum, Chillingham, Mooball and Burringbar. Clarrie Hall Catchment and Doon Doon Catchment.

A3.9.1 Flood Levels

The following Clauses of this Section deal with the rural villages of Uki, Tyalgum, Chillingham, Burringbar and Mooball and the catchment area of the Clarrie Hall Dam. Table 9.1 lists the known flood levels for these localities. At its meeting of 15 December 2009, a new Coastal Creeks Flood Study was received by Council and is available to the public. A review of design flood levels is pending with reference to this Flood Study for those localities in this section contained within the study area (Mooball, Burringbar).

Locality	Highest Recorded Flood Level	Predicted High Flood Level	Adopted Design Flood Level	Adopted Min. Floor Level for Residential Development
Bilambil	3.48m AHD	-	3.5m AHD	3.80m AHD
Uki	22.40m AHD	-	22.70m AHD	23.00m AHD
Braeside (Uki)	-	19.7m AHD	19.7m AHD	20.00m AHD
Tyalgum	55.11m AHD	-	55.2m AHD	55.7m AHD
Tyalgum - upstream of bridge	55.8m AHD	-	As determined by the Director, Engineering Services	As determined by the Director, Engineering Services + 500mm
Chillingham Flood Gauge Levels at other locations in village will be supplied by the Shire Engineer	29.9m AHD	-	29.95m AHD	30.25m AHD
Mooball	12.70m AHD		12.70m AHD	13.0m AHD
Catchment Clarrie Hall Dam	-	-	67.10m AHD	67.4m AHD
Doon Doon Catchment	-	-	67.10m AHD	67.40m AHD
Burringbar			16.5m AHD	16.8m AHD
Burringbar Pacific Hwy/ Hunter St			16.5m AHD	16.8m AHD
Terranora/Bilambil Naponyah and Beunavista	-	-	4.1m AHD	4.4m AHD
Other Places	HFL + 300 mm as determined by Council			

Table 9.1 Flood Levels in Rural Areas

Flood records and information in these villages is limited and there is little mapping information available from Council. It is recommended that interested persons seek information on the possible extent of flood affect of any property, if any, by local enquiry.

A3.9.2 Development Generally on Flood Liable Land

Structures	Where, on land within floodways or high hazard flood storage areas a proposed development could be damaged by flooding no work may be commenced until a certificate of structural adequacy with regard to stability as a result of flooding has been submitted to Council by a qualified structural/civil engineer.
Building Materials	All building materials used below Council's adopted design flood level must not be susceptible to water damage.
Electrical Supply	Subject to the requirements of Northern Rivers Electricity, all electrical wiring, power outlets, switches, etc, should, to the maximum extent possible, be located above the design flood level. All electrical wiring installed below the design flood level should be suitably treated to withstand continuous submergence in water.

A3.9.3 Residential Development on Flood Liable Land

Development	The habitable areas of all residential buildings are to be at a level of not less than Council's adopted minimum floor level for development.
Movable Dwelling Parks	Movable dwelling parks will not be approved unless it can be demonstrated that the land can be filled to a level of not less than the adopted design flood level for the locality without adversely affecting the current flood levels and patterns in the area.

A3.9.4 Commercial and Industrial Development on Flood Liable Land

Development	Commercial and industrial development will be required to make adequate provision of flood free storage areas for stock and equipment susceptible to water damage.
Caravan Parks	Caravan parks will not be approved unless it can be demonstrated that the land can be filled to a level of not less than the adopted design flood level for the locality without adversely affecting the current flood levels and patterns in the area.
Motels	The habitable areas of motels are to be at a level of not less than Council's adopted minimum floor level for residential development.

A3.9.5 Inappropriate Development of Flood Liable Land

Table 9.2 lists development considered by Council to be inappropriate to the relevant categories of flood hazard in these localities.

Flood Hazard Category	Inappropriate Development
Floodway & High Hazard Flood Storage Areas	Dual Occupancy and Granny Flats, Movable Dwelling Parks, Caravan Parks and Residential Flat Buildings.

Table 9.2 Development considered to be inappropriate to the Flood Hazard of these Rural Villages.

A3.10 RURAL AREAS

Area Included: Any areas not included in Clauses A3.3 – A3.9 of this Section.

A3.10.1 Flood Levels

Tweed Valley

The minimum floor level for dwellings is amended in this Section following completion of the Tweed Valley Flood Study 2005 and revised freeboard requirements.

Table 10.1 lists the various flood levels for rural areas included in the Tweed Valley Flood Study 2005:

ARI 100 Year Predicted Flood Level	Design Flood Level		Adopted Min. Floor Level for Residential Development
	Coloured areas	Hatched areas on A3 – Maps 1, 2 or 3 (above ARI 100 years but below PMF)	
See A3 – Maps 1, 2 or 3.	Level of next highest flood level contour on A3 – Maps 1, 2 or 3 or 2.6m AHD whichever is higher	Design flood level of adjacent coloured area	Design Flood Level plus 0.5m

Table 10.1 Flood Levels in Rural Areas included in Tweed Valley Flood Study 2005 Other Areas

Table 10.2 lists the various flood levels for other rural localities: At its meeting of 15 December 2009, a new Coastal Creeks Flood Study was received by Council and is available to the public. A review of design flood levels is pending with reference to this Flood Study for rural areas within the study area.

ARI 100 Year Predicted Flood Level	Design Flood Level	Adopted Min. Floor Level for Residential Development
Determined by flood study, modelling or historic observations and deemed satisfactory by Council	Level as determined by first column or 2.6m AHD whichever is higher	Design Flood Level plus 0.5m

Table 10.2 Flood Levels in Rural Areas not included in Tweed Valley Flood Study 2005

A3.10.2 Residential Development on Flood Liable Land

- Subdivision** A flood free dwelling site must exist on each new allotment created. The construction of a flood free dwelling site will be permitted only where it can be demonstrated that such work will not have any adverse effects on floodwaters in the locality.
- Where a flood free access exists to the land being subdivided the proposed subdivision shall, as far as practicable, be designed so that a flood free access is provided to the proposed lot or lots.
- Development** The habitable area of all residential buildings is to be at a level of not less than the level specified in any building approval having regard to the availability of flood information for the particular locality.
- Movable Dwelling Parks** Movable dwelling parks will not be approved unless it can be demonstrated that the land can be filled to a level of not less than the adopted design flood level for the locality without adversely affecting the current flood levels and patterns in the area.
- High Flow Areas** Refer to A3.2.4 for development controls applicable to land in mapped high flow areas of the Tweed Valley. The development controls in A3.2.4 take precedence over other controls in A3.10.

A3.10.3 Commercial and Industrial Development on Flood Liable Land

- Development** Commercial and industrial development will be required to make adequate provision of flood free storage areas for stock and equipment susceptible to water damage.
- Caravan Parks** All caravans are to be maintained in a condition that will allow removal of them at short notice.
- Each site occupant is to be provided with a flood information leaflet for display in each caravan which sets out information on water depths likely to be experienced in the park, sources of flood information, public warning procedures, excavation routes and advice on which to take action. Such information will be required to be displayed prominently in the park office,

amenities blocks and ensuite structures.

Strict limitations will be placed on site development and structures in parks that will impede the free flow of floodwater.

New caravan parks or additions to existing caravan parks will not be permitted to accommodate long term residents unless the development site is at a level of not less than the design flood level or it can be shown that the site will be filled to the design flood level without impeding the free flow of floodwater.

Motels The habitable areas of motels are to be at a level of not less than the flood level that would be specified for residential development having regard to the availability of flood information for the locality.

High Flow Areas Refer to A3.2.4 for development controls applicable to land in mapped high flow areas of the Tweed Valley. The development controls in A3.2.4 take precedence over other controls in A3.10.

A3.10.4 Inappropriate Development Of Flood Liable Land

Table 10.3 lists development considered by Council to be inappropriate to the relevant categories of flood hazard in rural areas.

Flood Hazard Category	Inappropriate Development
Floodway & High Hazard Flood Storage Areas	Movable Dwelling Parks and Caravan Parks making provision for long term residents.

APPENDIX A - HISTORIC FLOOD LEVELS

These are historic flood levels saved from the Flood Level Tables of superseded versions of the original Development Control Plan No 5 relating to development of Flood Liable Land.

Section 3 - Locality	Highest Recorded Flood Level
T. Heads T. Heads West T. Heads South	2.15m AHD
Banora Point Oxley Cove	3.09m AHD
Bimbadeen Ave & Barneys Pt. Bridge to Waugh St	3.09m AHD

Section 4 - Locality	Highest Recorded Flood Level
Chinderah	3.09m AHD
Fingal Rd to Barneys Pt Bridge (Wommin Lake)	2.94m AHD

Section 5 - Locality	Highest Recorded Flood Level
Fingal (Village) & Southward to No 52 (Lot 19) Fingal Road	2.45m AHD

Section 7 - Locality	Highest Recorded Flood Level
Kingscliff	3.09m AHD
Kingscliff West (Section B4)	-

Section 8 Locality	Highest Recorded Flood Level
Tumbulgum	3.94m AHD
Condong	4.05m AHD
Norths Lane (Condong)	-
Mur-bah - Buchanan St to Stand. Sawmill	5.15m AHD
Mur-bah	6.58m AHD
Mur-bah East & Mooball Street	5.40-5.05m AHD
Dorothy/William	4.65m AHD
Mur-bah South	6.53-5.84m AHD
Bray Park	7.40m AHD
Mur-bah South - Sth of Rose Ln	6.30m AHD

Section 8 Locality	Highest Recorded Flood Level
Mur-bah South - Railway Street/ Buchanan Est.	5.25m AHD
Bray Pk/Byangum/River Oak Drive	-
Murwillumbah Bellevue Heights/North Arm Road Department of Housing/ Riveroak Drive	- -
Cobaki	-
Byangum Bridge	-
Dallis Park Bakers Road/ Dallis Court/ Amarillo Drive	- -
Glenock Farm Uki end Murwillumbah end	- -
Murwillumbah Golden Links Haley Place Hall Drive Lundberg Drive Mountain View Retirement Home Reserve Creek Road to Cane Road, Condong Nunderi – (Norths Lane) Murwillumbah Showground/ Dorothy/ William Standard Sawmill to Condong	- - - - - - - 4.65m AHD

APPENDIX B – References

[Part 1 of the adopted Tweed Valley Floodplain Risk Management Plan – Establish Appropriate Flood Planning Levels for Residential Development](#)

[Part 2 of the adopted Tweed Valley Floodplain Risk Management Plan - Planning Controls for High Flow Areas](#)

[Part 2 of the adopted Tweed Valley Floodplain Risk Management Study - High Flow Area Maps](#)

[Part 3 of the adopted Tweed Valley Floodplain Risk Management Study – Habitable Land Use on the Floodplain](#)

[Adopted Flood Risk Management Policy](#)

PMF level maps



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