TWEED SHIRE COUNCIL

Tweed Development Control Plan

SECTION A3 - Development of Flood Liable Land

Version 1.6

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Amendments

Version	Effective	Description	Authorised
Original Version DCP No.5	18 June 1986		Council Resolution
First Amendment	16 September 1987	Changes to caravan park requirements	Council Resolution
Second Amendment	15 June 1988	To reflect changes to recently approved TLEP 1987	Council Resolution
Third Amendment	14 September 1988	Design flood levels at Murwillumbah	Council Resolution
Fourth Amendment	19 December 1990	Amended flood levels	Council Resolution
Fifth Amendment	15 July 1992	Industrial land south of Ozone Street, Chinderah 50% rule	Council Resolution
Sixth Amendment	21 April 1993	Tyalgum flood levels	Council Resolution
Seventh Amendment	6 March 1996	To permit genuine "granny flats" in low flood hazard areas, but prohibit "dual occupancy" and revised schedule of flood levels	Council Resolution
Draft Version 2.2	Not Adopted	Acknowledges the 2001 NSW Government Floodplain Management Manual, addresses issue of PMF, amends definition of Chinderah and Kingscliff areas, defines localities, clarifies filling and structures permitted on residential, rural and industrial land, minor amendments to flood levels and definitions.	
Version 2.3	15 March 2006	Adoption of amended flood planning levels for residential development arising from Tweed Valley Flood Study 2005 and Tweed Valley Floodplain Risk Management Study Part 1 - Flood Planning Levels.	Council Resolution
Original Version DCP Section A3	4 June 2008	Consolidated DCP, DCP No.5 becomes Section A3	Council Resolution
Version 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Draft Version 1.2	Withdrawn	Amendment to reflect new land zonings, definitions and flood clauses in Tweed LEP 2010	Council Resolution

Version 1.3	9 June 2010	Amendment to reflect new land zonings, definitions and flood clauses in Tweed LEP 2010, plus updates to implement Tweed Valley Flood Study Update 2009 and Coastal Creeks Flood Study 2009, including climate change predictions and areas behind levees. Increase all residential freeboard to 0.5m, including those areas outside of flood study areas. Add Seabreeze Levee to structural controls. Backdate amendments table to include DCP5.	Council Resolution 18 May 2010
Version 1.4	23 March 2011	Amendments to flood maps in Appendix C and D, to correct minor mapping errors due to modelling and data anomalies.	Council Resolution 21 December 2010
Version 1.5	10 December 2019	Addition of Section A3.2.7 High Flood Hazard Area controls and Appendix E maps.	Council Resolution 21 November 2019
Current Version 1.6	15 April 2024	Refinement of definitions and controls that define a 'habitable area' for extensions below flood planning level (Clauses A3.1.5 Interpretation and A3.2.4 Design Flood Levels)	Council Resolution 21 March 2024

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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 using this Section:
a) the flood levels pertaining to the site; and
b) whether the site is in a high flood flow area; and
c) whether emergency response provisions are required; and
d) the development controls applying to the subject locality

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 and Coastal Creeks floodplains 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 and the Coastal Creeks floodplains, designated on Flood Maps in Appendix C 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 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.

"greenfield subdivision" means subdivision of urban zoned land 5 hectares or greater in area.

“habitable area” means a room used for normal domestic activities that are only permissible above flood planning level under the controls in this Section. This includes (but is not limited to) a bedroom, living room, lounge room, kitchen, dining room and study.
“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.

“hazard classification” – H1 to H6 hazard classification system from the Australian Disaster Resilience Guideline 7-3 Flood Hazard (AIDR 2017).

"high flow area" means those areas of the Tweed Valley and Coastal Creeks floodplains coloured red in Flood Maps in Appendix C. 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 on the Flood Maps 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 hazard area” refers to land that is classified as having H5 or H6 hazard classification. Where an allotment has varying flood hazard, this definition applies only to those parts of the land classified as H5 or H6. Hazard is assessed on the land’s pre-development state and cannot be varied due to filling or other aspects of a proposed development. Refer to Appendix E for Flood Hazard Maps of the localities of concern.

“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 plans depicting flood levels in the Tweed Valley Flood Study Update 2009 and Coastal Creeks Flood Study 2009. 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 Flood Studies and no information is given of their flood status.

"minor extension or expansion" for of an existing single dwelling, means the addition of not more than 35m^2. For other habitable development, means the addition of not more than 10% of existing gross floor area (or 35m^2, whichever is greater).

“non-habitable area” means a room or space of a specialised nature occupied neither frequently nor for extended periods. These may be permissible below flood planning level, subject to the controls in this Section. This includes (but is not limited to) a bathroom, laundry, water closet, corridor and lobby.

"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. PMF extents and levels are shown for areas of the Tweed Valley and Coastal Creeks floodplains in Flood Maps in Appendix C. For all other localities, PMF levels will be determined on a case by case basis, and may require a separate flood study.

"reduced flood level (RL)" means the level of a point above a surveying datum.

"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 effects 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 Division on request.

Council's flood mitigation strategy is to ensure that only appropriate compatible development occurs on flood prone land in the future, by implementing both structural protection and planning controls, to minimise future potential flood damage and ensure safe occupation without undue reliance on emergency response agencies.

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. In 2009, a levee was retrofitted along Cudgera Creek to protect the Seabreeze Estate at Pottsville. 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.

Council's design flood is based on the 100 year ARI event; that is a flood with a 1 in 100 (or 1%) chance of occurring in any one year.

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	Design Flood Level for Properties Behind Levee
Murwillumbah - Main Street	1 in 80*	3-4 hrs	3-4 hrs	7.0m AHD
Murwillumbah - South	1 in 5^	3-4 hrs	1-2 hrs	Refer Flood Maps Appendix C
Murwillumbah - East	1 in 100#	3-4 hrs	1-2 hrs	Refer Flood Maps Appendix C
Murwillumbah - Dorothy/William Streets	1 in 100#	3-4 hrs	1-2 hrs	4.6m AHD
Tweed Heads South	1 in 20	21 hrs for river flood but possibly very little warning from a Cyclonic Surge	1-2 hrs	Refer Flood Maps Appendix C
Pottsville - Seabreeze Estate	1 in 100 + ~	3-4 hrs	1-2 hrs	Refer Flood Maps Appendix C

* Estimate only. The Murwillumbah levee is approximately 200mm lower than the predicted ARI 100 year flood event.
^ Estimate only. Levee was raised to level of Alma Street in accordance with 1989 Murwillumbah Floodplain management Plan.
# Raised in 2006. Previously provided 1 in 10 year protection.
~ Seabreeze levee designed to June 2005 flood of record plus freeboard.

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

A3.2.4 Design Flood Levels

Design flood levels (DFLs) are determined by 100 year ARI flood level contours at the 0.1m contour interval, based on flood studies (Tweed Valley Flood Study Update 2009 and Coastal Creeks Flood Study 2009) as shown on Flood Maps in Appendix C.

Minimum DFL in Tweed Shire is RL 2.6m AHD.

Land outside the coloured areas of these maps may be at a level that is above the floodplain (that is, not flood liable) or that is outside of the hydraulic boundaries of flood studies (and may be flood liable). Applicants should satisfy themselves as to the flood liability of uncoloured land.

A freeboard of 0.5m shall be added to the DFL, to determine the minimum habitable floor level for development.

Variations to Habitable Floor Levels - For residential development (or residential portions of mixed used development) where the lowest approved existing habitable floor level is below the adopted flood planning level (FPL), "minor extensions" for habitable uses are permissible provided the following can be demonstrated:

1. The extension is not within a high flow area.
2. The extension is not within a high hazard area.
3. The extension does not facilitate the use of the building for dual occupancy or other higher density use where not currently lawful.
4. The extension does not facilitate the future conversion of a non-habitable area to a habitable area. For example, an extension providing a bathroom adjoining a garage or similar, which may facilitate conversion to a bedroom with ensuite, would not be permissible.
5. The extension does not contravene previous conditions of development approval that limit the approved footprint of the building due to flood related controls (such as 50m2 enclosed area provisions).
6. The extension is of a flood resilient design and constructed, finished and furnished with flood compatible materials up to the FPL. Minor extensions will not be granted below FPL where no previous consent has authorised habitable uses. Larger additions require a split-level design and are required to achieve FPL as a minimum finished floor level.

Climate change scenarios were investigated in the Tweed Valley Flood Study Update 2009 and Coastal Creeks Flood Study 2009. A "high level" impact scenario consisting of 0.91m sea level rise and 10% increased rainfall intensity was applied to the 100 year ARI design flood to determine "climate change DFLs". The results are shown on Climate Change Flood Maps in Appendix D.

Climate change DFLs shall be applied to "greenfield subdivision" for residential purposes (defined as subdivision of urban zoned land 5 hectares or greater in area). In particular, development controls requiring filling of residential allotments to a minimum DFL in Sections A3.3-A3.10 (as applicable) shall apply the climate change DFL.

The following flowchart summarises the process for determining DFLs for the localities of Tweed Shire.

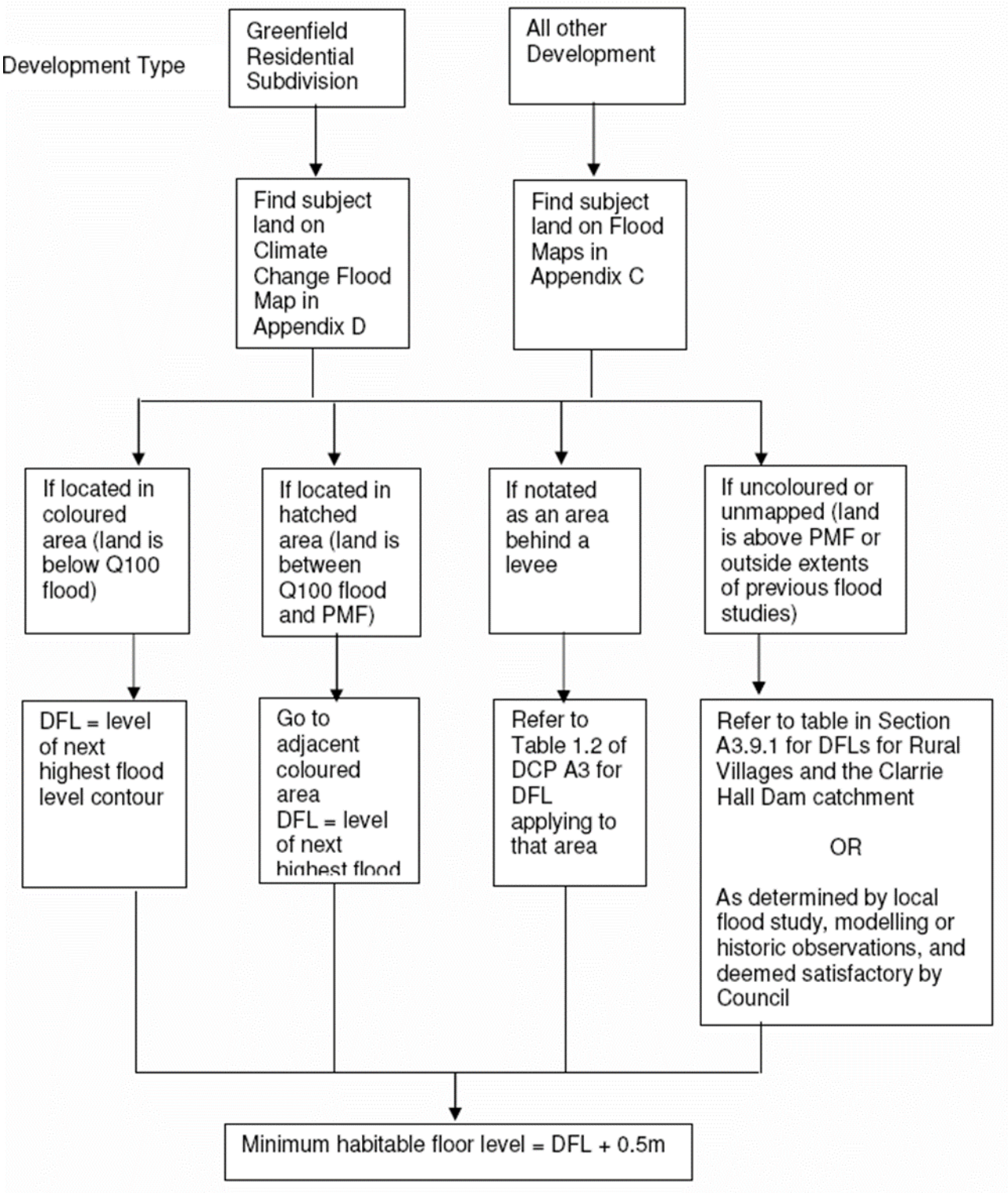

Figure 2.1 Determining Design Flood Levels

A3.2.5 High Flow Areas

The following development controls apply to all land falling within the mapped high flow areas of the Tweed Valley and Coastal Creeks floodplains. High flow area maps are provided in Appendix C.

Development controls for high flow areas take precedence over the locality specific clauses in Section A3 of the DCP.

Land Zone (from Tweed LEP 2000 and DRAFT Tweed LEP 2010 respectively)	**Development Controls**
1(a) Rural and 1(b) Agricultural Rural Zones RU1 and RU2 and Residential Zone R5 (Large Lot Residential), and Environmental Protection Zones E1 and E2	Permit dwelling houses within the mapped high flow areas provided total enclosure below design flood level is 50m^2 or less. Other development, including structures ancillary to a dwelling house, 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. Examples of permissible development include: • Buildings with footprints less than 80m^2, and separated from other structures by no less than 30m, oriented to maximise the through flow of water; • Levees, bunds or road formations no more than 300mm above natural ground level; • Wire strand fencing.
2(a) Low Density Residential Rural Zone RU5 (Village) and Residential Zones R1, R2, and R3	Permit residential development within the mapped high flow areas provided total enclosure below design flood level is 50m^2 or less.
3(c) & 3(d) Business (Commerce and Trade and Waterfront Enterprise) Business Zones B1, B2, B3, B4, B5	Permit development in mapped high flow areas, subject to maximum 50% site coverage for buildings and other obstructions to flow on each lot. 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. Fencing must be permeable to allow the passage of flood flows (minimum 90% void space), or be collapsible under flood flow (e.g. timber palings).
4(a) Industrial Industrial Zones IN1 and IN4	Exclude all development from Lot 4 DP 591604. 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. 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. Fencing must be permeable to allow the passage of flood flows (minimum 90% void space), or be collapsible under flood flow (e.g. timber palings).

5(a) Special Uses (School) Special Purpose Zones SP1, SP2, SP3, Recreation Zones RE1 and RE2,	Permit development in mapped high flow areas, subject to maximum 50% site coverage for buildings and other obstructions to flow on each lot. 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. Fencing must be permeable to allow the passage of flood flows (minimum 90% void space), or be collapsible under flood flow (e.g. timber palings).
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 / flood study by a suitably qualified professional. The assessment must consider the impact of the development in isolation as well as in a cumulative development scenario.

A3.2.6 Emergency Response Provisions

(a) Essential Community Facilities and Critical Services

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

Development controls for emergency response provisions take precedence over the locality specific clauses in Section A3 of the DCP.

Land Use Risk Class	Development Type	Development Controls	Notes
Critical Development *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.*	**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. PMF levels can be determined from Flood Maps in Appendix C.
- 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.

Development controls for emergency response provisions take precedence over the locality specific clauses in Section A3 of the DCP.

Land Use Risk Class	Development Type	Development Controls	Notes
Sensitive Development *Residential care facilities, group homes (that provide accommodation to people with a disability), as defined by the Tweed LEP*	**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
Land Use Risk Class	Development Type	Development Controls	Notes
Residential Development *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, caravan parks (including moveable dwellings), correctional facilities, as defined by the Tweed LEP.* *Note: Above exemption for dwelling houses, secondary dwellings and dual occupancies also applies to mixed use developments where the habitable component contains no more than two (2) habitable units.*	**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.	
	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.	

Land Use Risk Class	Development Type	Development Controls	Notes
Residential Subdivision *Urban Residential Subdivision (including small lot rural subdivision where the average lot size, excluding residual and non-residential lots is less than 5000m^2), Rural Subdivision*	**New Subdivisions** (where total area of urban zoned subdivision land, including residual lots, exceeds 5 hectares)	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 design flood level not exceeding 100m in length.	
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. PMF levels can be determined from Flood Maps in Appendix C.
- 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 residential 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. PMF levels can be determined from Flood Maps in Appendix C.
- 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. Information available on the NSW State Emergency Services (SES) website www.ses.nsw.gov.au may assist 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 (refer to SES Local Flood Plan), 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.

A3.2.7 High Flood Hazard Areas

Lessons learned from the March 2017 Flood and the establishment of Council's two Voluntary House Purchase Schemes has required limitations on further residential development in certain parts of selected high flood risk localities. To address this, Council has adopted the "High Flood Hazard Areas Policy" with the following localities of concern:

- South Murwillumbah
- Bray Park
- Burringbar
- Mooball

This clause aims to implement the Policy.

Objectives:
The objectives of this clause are to:

i. Minimise the flood risk to people and property within high hazard flood areas
ii. Identify the extent and degree of hazard on flood liable land within the localities of concern, by way of maps (refer Appendix E);
iii. Ensure that new dwellings are compatible with the flood hazard of the land, in accordance with Clause 7.3 of the Tweed Local Environmental Plan.

Controls:

a) This part applies to all land mapped as *high hazard* on the flood hazard maps in Appendix E and takes precedence where there may be inconsistency with other parts of this DCP.
b) The development of new or replacement dwelling houses and secondary dwellings will not be supported within an area of high flood hazard
c) Alterations and additions to existing approved dwellings may be considered in all flood hazard areas, subject to other controls in this Section.
d) Ancillary non-habitable development may be considered in all flood hazard areas, subject to other controls in this Section.
e) Subdivision, including boundary adjustments, must not facilitate the creation of any allotments that are conducive to one or more new dwellings in high flood hazard areas.
f) Consolidation of allotments and minor boundary adjustments (e.g. to correct building encroachments, to rationalise boundary alignments) may be considered in all flood hazard areas.

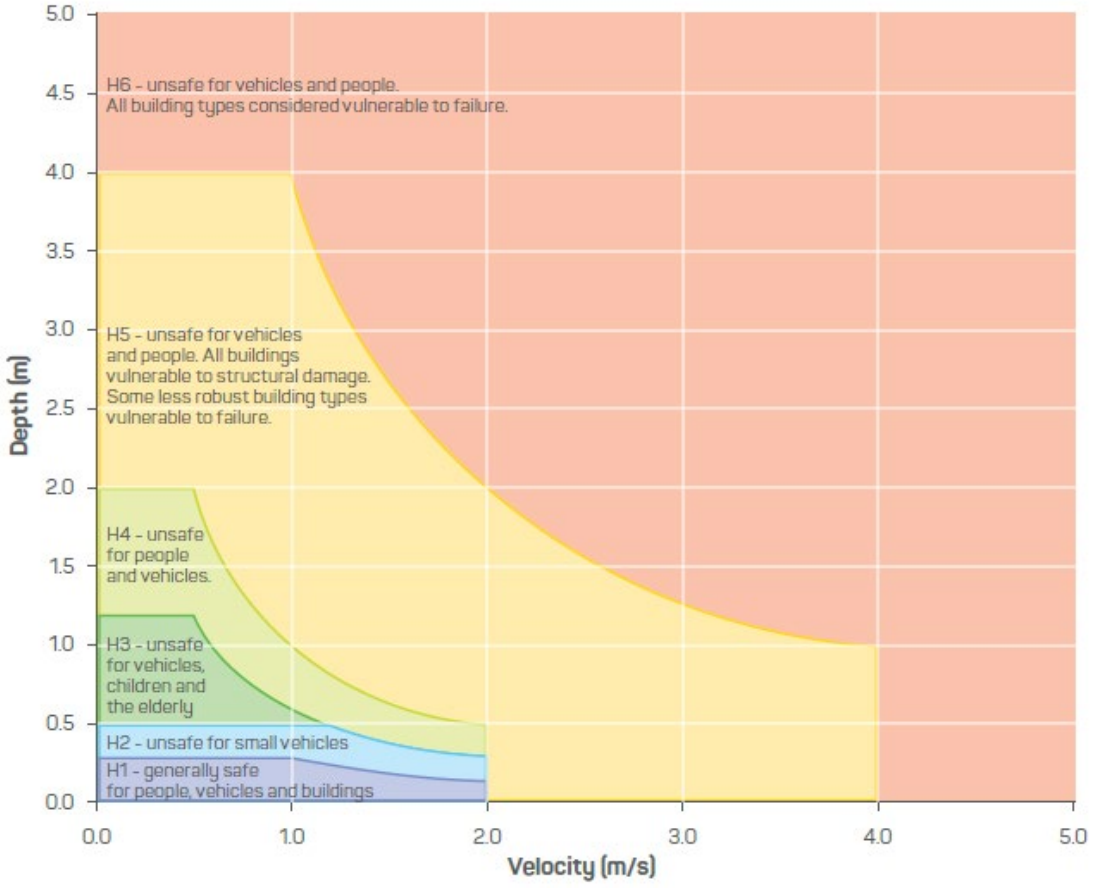

Figure 6: General flood hazard vulnerability curves

Figure 2.2, extract from Australian Disaster Resilience Guideline 7-3 Flood Hazard (AIDR 2017).

A3.3 LOWER TWEED

Area Included: Urban zoned localities of Banora Point, Terranora, Bilambil Heights, Cobaki Lakes, Tweed Heads West, Tweed Heads and Tweed Heads South, being coloured or hatched (PMF) on Flood Maps in Appendix C.

A3.3.1 Flood Behaviour

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 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.

Design flood levels and freeboard requirements for minimum floor levels of dwellings are revised in this Section following completion of the Tweed Valley Flood Study 2005 and its 2009 update.

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

Design Flood Levels	Refer to A3.2.4 for design flood levels for this locality.
High Flow Areas	Refer to A3.2.5 for development controls applicable to land in mapped high flow areas. The development controls in A3.2.5 take precedence over other controls in A3.3.
Emergency Response Provisions	Refer to A3.2.6 for development controls applicable to the provision of adequate emergency response for habitable development. The development controls in A3.2.6 take precedence over other controls in A3.3.
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.

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.
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 minimum 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.

A3.3.4 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 AND 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 or hatched (PMF) on Flood Maps in Appendix C.

A3.4.1 Flood Behaviour

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

Design Flood Levels	Refer to A3.2.4 for design flood levels for this locality.
High Flow Areas	Refer to A3.2.5 for development controls applicable to land in mapped high flow areas. The development controls in A3.2.5 take precedence over other controls in A3.4.
Emergency Response Provisions	Refer to A3.2.6 for development controls applicable to the provision of adequate emergency response for habitable development. The development controls in A3.2.6 take precedence over other controls in A3.4.
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 effect 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.

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 & Development

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

Lots with existing levels less than RL 2.2m AHD may be filled to a maximum height of RL 2.2m AHD.

Development proposals for buildings, structures, stockpiles and/or filling above RL 2.2m AHD shall be considered if accompanied by flood impact modelling, including consideration of a cumulative development scenario provided by Council. The flood assessment must demonstrate that the development, when considered in isolation and cumulatively, will not result in significant adverse impact on local flood behaviour or adjoining land.

The following deemed to comply solution may be implemented on each allotment as an alternative to providing flood modelling:

(i) On each allotment a maximum of 50% of the plan area of the lot may be occupied by structures, buildings, stockpiles and/or fill that exceeds RL 2.2m AHD, and

(ii) On each allotment, flow obstructions (defined as fill, structures, buildings, stockpiles and the like above RL 2.2m AHD) are to be located so that at least 50% of any cross section of the lot, transverse to the direction of flood flow, is clear of flow obstructions. This is to provide a local flood path on each allotment.

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.

A3.4.5 Inappropriate Development of Flood Liable Land

The following table 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.

A3.5 FINGAL HEAD (North of and including No. 45 Fingal Road)

A3.5.1 Flood Behaviour

Area Included: Urban zoned localities of Fingal Head north of and including No.45 Fingal Road, being coloured or hatched (PMF) on Flood Maps in Appendix C.

A3.5.2 Development Generally on Flood Liable Land

Design Flood Levels	Refer to A3.2.4 for design flood levels for this locality.
High Flow Areas	Refer to A3.2.5 for development controls applicable to land in mapped high flow areas. The development controls in A3.2.5 take precedence over other controls in A3.5.
Emergency Response Provisions	Refer to A3.2.6 for development controls applicable to the provision of adequate emergency response for habitable development. The development controls in A3.2.6 take precedence over other controls in A3.5.
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.

A3.5.3 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 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.

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.

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.

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.

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

The following table 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.

A3.6 THE COASTAL VILLAGES

Area Included: Urban zoned localities of South Kingscliff, Salt, Seaside, Casuarina, Kings Forest, Tanglewood, Cabarita Beach, Bogangar, Hastings Point, Koala Beach, Seabreeze, Pottsville, Pottsville Waters, Black Rocks and Wooyung, being coloured or hatched (PMF) on Flood Maps in Appendix C.

A3.6.1 Flood Behaviour

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

Design Flood Levels	Refer to A3.2.4 for design flood levels for this locality.
High Flow Areas	Refer to A3.2.5 for development controls applicable to land in mapped high flow areas. The development controls in A3.2.5 take precedence over other controls in A3.6.
Emergency Response Provisions	Refer to A3.2.6 for development controls applicable to the provision of adequate emergency response for habitable development. The development controls in A3.2.6 take precedence over other controls in A3.6.
Development	Applicants will be required to provide details of studies that demonstrate the proposed development will not adversely affect the current flood patter 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

The following table 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.

A3.7 KINGSCLIFF SOUTH OF WAUGH STREET

Area Included: Urban zoned localities of Kingscliff and Cudgen, being coloured or hatched (PMF) on Flood Maps in Appendix C.

A3.7.1 Flood Behaviour

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

Design Flood Levels	Refer to A3.2.4 for design flood levels for this locality.
High Flow Areas	Refer to A3.2.5 for development controls applicable to land in mapped high flow areas. The development controls in A3.2.5 take precedence over other controls in A3.7.
Emergency Response Provisions	Refer to A3.2.6 for development controls applicable to the provision of adequate emergency response for habitable development. The development controls in A3.2.6 take precedence over other controls in A3.7.
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 500mm above the design flood level.

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

The following table 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.

A3.8 MURWILLUMBAH, CONDONG AND TUMBULGUM

Area Included: Urban zoned localities of Tumbulgum, Condong, Murwillumbah, South Murwillumbah, and Bray Park, being coloured or hatched (PMF) on Flood Maps in Appendix C.

A3.8.1 Flood Behaviour

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

Design Flood Levels	Refer to A3.2.4 for design flood levels for this locality.
High Flow Areas	Refer to A3.2.5 for development controls applicable to land in mapped high flow areas. The development controls in A3.2.5 take precedence over other controls in A3.8.
Emergency Response Provisions	Refer to A3.2.6 for development controls applicable to the provision of adequate emergency response for habitable development. The development controls in A3.2.6 take precedence over other controls in A3.8.
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.

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 effect.

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 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.

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

The following table 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.

A3.9 THE RURAL VILLAGES AND THE CLARRIE HALL DAM CATCHMENT

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

A3.9.1 Flood Behaviour

The following Clauses of this Section deal with the rural villages of Bilambil, Uki, Tyalgum, Chillingham, Burringbar and Mooball and the catchment areas of the Clarrie Hall Dam and Doon Doon Creek. Burringbar and Mooball were included in the Coastal Creeks Flood Study 2009, and design flood levels can be determined from Flood Maps in Appendix C. For other areas included in this Section, Table 9.1 lists the known flood levels for these localities. 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 effect of any property, if any, by local enquiry.

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	4.0m AHD
Uki	22.40m AHD	-	22.7m AHD	23.2m AHD
Braeside (Uki)	-	19.7m AHD	19.7m AHD	20.2m AHD
Tyalgum Tyalgum - upstream of bridge	55.11m AHD 55.8m AHD	- -	55.2m AHD As determined by the Director, Engineering Services	55.7m AHD 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	30.45m AHD
Catchment Clarrie Hall Dam	-	-	67.1m AHD	67.6m AHD
Doon Doon Catchment	-	-	67.1m AHD	67.6m AHD
Terranora/Bilambil Naponyah and Buenavista	-	-	4.1m AHD	4.6m AHD
Other Places	HFL + 500 mm as determined by Council			

Table 9.1 Flood Levels in Rural Areas

A3.9.2 Development Generally on Flood Liable Land

Design Flood Levels Refer to A3.2.4 and Table 9.1 above for design flood levels for this locality.

High Flow Areas	Refer to A3.2.5 for development controls applicable to land in mapped high flow areas (where such information is known). The development controls in A3.2.5 take precedence over other controls in A3.9.
Emergency Response Provisions	Refer to A3.2.6 for development controls applicable to the provision of adequate emergency response for habitable development. The development controls in A3.2.6 take precedence over other controls in A3.9.
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

The following table 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.

A3.10 RURAL AREAS

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

A3.10.1 Flood Behaviour

The Tweed Valley and Coastal Creeks Flood Studies cover large areas of flood prone rural land. Generally these floodplains are broad and flat, and provide significant flood storage and out of river flood flow conveyance paths.

Council holds limited flood records and information for rural areas in the upper Tweed River catchment, including the Rous and Oxley Rivers. In these areas, floodplains are steep and narrow, and are liable to rapid flood inundation with little warning.

Persons proposing new developments in rural areas near rivers, streams and gullies that could be flood liable should seek out and heed reliable local historical information. Catchment flood studies may be required to establish design flood levels, flow rates for structural design, and to assess the potential impact of the development on local flood behaviour.

A3.10.2 Development Generally on Flood Liable Land

Design Flood Levels	Refer to A3.2.4 for design flood levels for this locality.
High Flow Areas	Refer to A3.2.5 for development controls applicable to land in mapped high flow areas. The development controls in A3.2.5 take precedence over other controls in A3.9.
Emergency Response Provisions	Refer to A3.2.6 for development controls applicable to the provision of adequate emergency response for habitable development. The development controls in A3.2.6 take precedence over other controls in A3.10.

A3.10.3 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.

A3.10.4 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, 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.

A3.10.5 Inappropriate Development of Flood Liable Land

The following table 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 3 of the adopted Tweed Valley Floodplain Risk Management Study – Habitable Land Use on the Floodplain
- Adopted Flood Risk Management Policy
- Floodplain Risk Management Guideline - Practical Consideration of Climate Change, 25 October 2007, Department of Environment and Climate Change.
- Floodplain Development Manual - The Management of Flood Liable Land, April 2005, Department of Infrastructure, Planning and Natural Resources.

APPENDIX C - Flood Maps

Note: Flood Maps may also be accessed in electronic and GIS formats on Council's website: www.tweed.nsw.gov.au

APPENDIX D - Climate Change Flood Maps

Note: Climate Change Flood Maps may also be accessed in electronic and GIS formats on Council's website: www.tweed.nsw.gov.au

APPENDIX E - High Flood Hazard Areas Maps

Note: High Flood Hazard Areas Maps may also be accessed in electronic and GIS formats on Council's website: www.tweed.nsw.gov.au

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