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FLOOD IMPACT AND RISK ASSESSMENT

PROPOSED MULTI-STOREY RESIDENTIAL DEVELOPMENT AT

12-16 Florence Street, Tweed Heads

FOR: The Trustee for WAFI PROPERTY TRUST

c/- Dream Build

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Our Ref: N24-092 - FIRA

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This report has been prepared for The Trustee for WAFI PROPERTY TRUST for the purpose of accompanying a development application to Tweed Shire Council. This report must only be used by The Trustee for WAFI PROPERTY TRUST for this purpose and must not be used or relied upon by any other person for any other purpose.

The assessment, conclusions or recommendations in this report are based on conditions encountered and information received at the time of preparing the report and may not be relied upon as site conditions or operations vary over time.

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Summary

This Flood Impact and Risk Assessment (FIRA) has been prepared for the multi-storey residential tower proposed at 12-16 Florence Street, Tweed Heads. The proposed development involves the construction of a 12-storey residential tower (59 units) with two basement levels and a rooftop terrace.

The site is not affected by the design flood event, however is impacted by the larger Probable Maximum Flood event

This report has been prepared to address the following item of SSD-80229208, as summarised below.

Item	SEARs Requirement	Response
19	i. Identify the flood planning area and level as set out in the relevant EPI and other supporting documents to determine: ○ The flood extent and velocity up to the Probable Maximum Flood and risk on-site having regard to adopted flood studies and, floodplain risk management studies and plans ○ The site access and egress routes ○ the potential effects of climate change, ○ any relevant provisions of the NSW Flood Risk Management Manual, and any other relevant guidelines ii. Where the development is occurring on flood prone land a flood impact and risk assessment (FIRA) must be prepared having regard to the *Flood Impact and Risk Assessment – Flood Risk Management Guide LU01*.When determining the scope and category of the FIRA the requirements outlined in the FIRA guide must be considered. iii. Detail any flood risk management measures that are to be incorporated as part of the development having regard to relevant guidelines (including any design solutions, flood modification measures, property modification measures, operational procedures or Flood Emergency Response Plan).	The proposed development will not create any significant adverse impacts to flood behaviour on the subject site and surrounding properties during the defined flood event. Flood risk can be appropriately managed through implementation of NSW & local government policy guidelines and timely evacuation management or shelter in place planning as required. Its is recommended that a Flood Emergency Response Plan (FERP) is prepared prior to occupation to ensure clear direction is able to be given by the building manager/body corporate.

1 INTRODUCTION

1.1 Background

The aim of a FIRA is to support a development proposal which may alter flood behaviour or alter or introduce additional flood risk, to identify and analyse:

- the impacts of the proposed development on the flood risk to the existing community
- the impacts and risks of flooding on the development and its users
- how these impacts can be managed to minimise the growth in risk to the community due to the development

The Development Application (considered State Significant Development) for the subject site is proposing to re-develop the properties at 12-16 Florence Street, Tweed Heads, and construct a new multi-storey residential building (with multi-level basement) on land identified by Tweed Shire Council as Flood affected.

1.2 Location and Land Use

The proposed development site is located at 12-16 Florence Street, Tweed Heads; also known as Lot 1 DP781624, Lot 1 DP419177 & Lot 2 DP300515.

The proposed development lot area is approximately 1,558m^2. The existing site is zoned by TSC as R3 'Medium Density Residential'. At the time of writing this report, the site consists of two residential lots and one commercial lot.

The site is bound by Florence Street to the North, a residential building and motel to the East, a residential block of units to the South and Boyd Street to the West. Refer Figure 1 for further information.

Figure 1 – Indicative site location (Nearmap, 2025)

1.3 FIRA Requirements

State Significant Development (SSD) on flood affected land is required to meet the Planning Secretary's Environmental Assessment Requirements (SEAR's). The scope and scale of the FIRA depend on factors such as:

- Likely impacts of the development on flooding
- The vulnerability of the development or occupants to flooding, or
- Any potential impacts to the community.

The SEAR's specifically the flood risk (item 19 on SSD-80229208), namely:

iv. Identify the flood planning area and level as set out in the relevant EPI and other supporting documents to determine;

- The flood extent and velocity up to the Probable Maximum Flood and risk on-site having regard to adopted flood studies and, floodplain risk management studies and plans
- The site access and egress routes
- the potential effects of climate change,
- any relevant provisions of the NSW Flood Risk Management Manual, and any other relevant guidelines

v. Where the development is occurring on flood prone land a flood impact and risk assessment (FIRA) must be prepared having regard to the *Flood Impact and Risk Assessment – Flood Risk Management Guide LU01*. When determining the scope and category of the FIRA the requirements outlined in the FIRA guide must be considered.

vi. Detail any flood risk management measures that are to be incorporated as part of the development having regard to relevant guidelines (including any design solutions, flood modification measures, property modification measures, operational procedures or Flood Emergency Response Plan).

Due to the sites location and adequate flooding information available from Tweed Shire Council, this FIRA will be based on existing flood assessment requirements *(first FIRA category - section 2.6 of Flood risk management guideline LU01)* and consider the development in accordance with the information within:

- Tweed Shire Council's LEP 2014
- Tweed Shire Council's DCP A3 (V1.6 - current)
- Tweed Shire Council's DCP A3 (V1.7 - draft)
- Tweed Valley Flood Study Update and Expansion (August 2024)
- Draft Interim Flood Planning Levels (V1.0 - Draft)
- Flood risk management manual (NSW government 2023)
- Floodplain Development Manual (NSW Government 2005)

2 AVAILABLE FLOODING INFORMATION

At the time of writing this report, TSC are looking to implement the draft Interim Flood Planning Levels Policy until such time as contemporary flood risk management studies and plans, in accordance with the NSW Flood Risk Management Manual, are competed for the Tweed Valley & Tweed Coastal Creeks (both in progress).

For completeness, both the current and proposed (draft) flood level information has been considered in the following sections of this report.

2.1 Current Council Flood Property Report

The site is shown on TSC flood mapping to not be affected by the Design Flood Event (DFE) which is the equivalent to 1% AEP event. Refer the following figures for the primary source of flooding information.

Figure 2 –Council Property Flood Report Mapping extract

The flood planning levels for the site are shown below in the following figure from the TSC Flood Report from 16 Florence Street, attached in Appendix A. These levels will be referred to as current flood levels in this report.

Planning Levels

Planning Level	Level (m AHD)
Design Flood Level	2.6
Minimum Habitable Floor Level (Flood Planning Level)	3.1
Climate Change Design Flood Level*	3.0
Climate Change Habitable Floor Level*	3.5
High Flow Area	No
High Hazard Area	NA

* Climate Change Levels are compulsory in new urban land release subdivision areas

Flooding Levels

Flood Event	Minimum Level (m AHD)	Maximum Level (m AHD)
20% AEP	N/A	N/A
5% AEP	N/A	N/A
1% AEP	N/A	N/A
Climate Change 2100 1% AEP	N/A	N/A
0.2% AEP	N/A	N/A
Probable Maximum Flood (PMF)	5.6	5.7

Figure 3 – Council Property Flood Report Flood Level extract

2.2 Draft Interim Flood Planning Levels

The following flood levels have been taken from the Draft Interim Flood Planning Level interactive mapping. These levels will be referred to as draft flood levels in this report.

Table 1 – Draft interim Flood Planning Levels

Flood Event	Flood Level	Difference to previous flood model
Design Flood Event	2.90m AHD (0.2% AEP)	+ 0.3m (increase)
Flood Planning Level	3.40m AHD	+ 0.3m (increase)
PMF	4.80m AHD	- 0.9m (decrease)

2.3 Tweed Valley Flood Study Update and Expansion (August 2024) report extracts

Utilising the data available in the *Tweed Valley Flood Study Update and Expansion report (August 2024)*, the site is only affected by the Probable Maximum Flood (PMF) event. The site is only affected by the PMF event, ie: not affected by all other modelled flood events less than the PMF. The property location means that the site is outside the Flood Planning Area, but subject to the PMF event and the associated issues as outlined below.

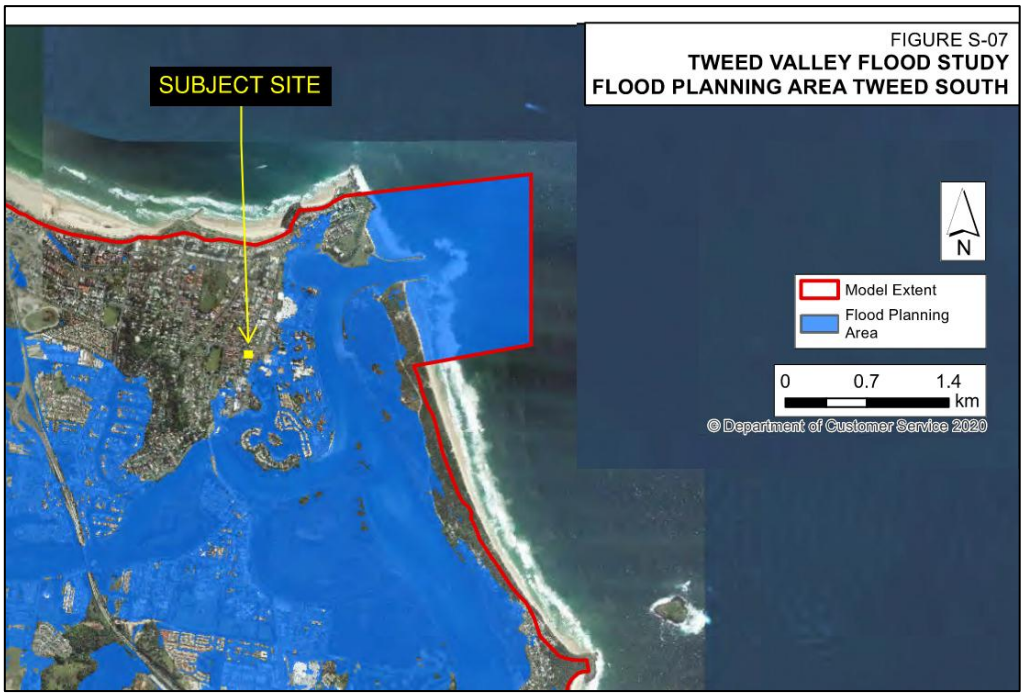


Figure 4 –Flood Planning Area Map extract

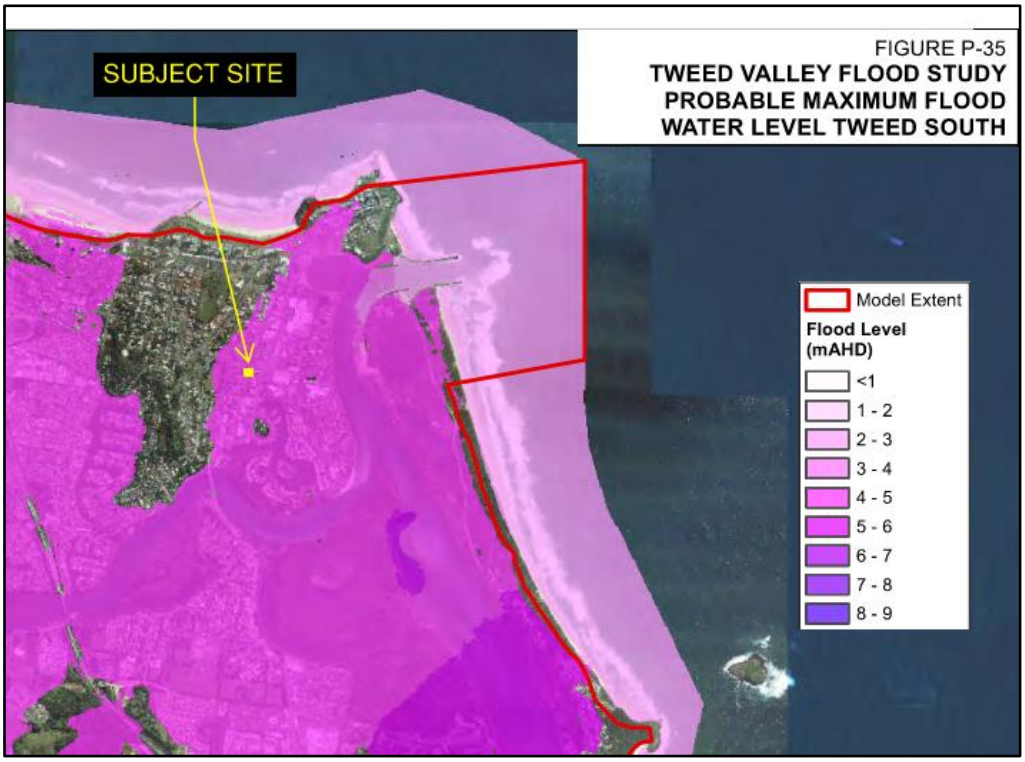


Figure 5 –PMF Flood level map extract

According to section 19 of *Tweed Valley Flood Study Update and Expansion report (August 2024),* "the SES classifies communities according to the impact flooding has on them. Flood affected communities are those in which the normal functioning of services is altered either directly or indirectly because a flood results in the need for external assistance. This impact relates directly to the operational issues of evacuation, resupply and rescue".

As this classification is based on the PMF, the subject site is considered to be Flood Affected (F), Isolated (I) and Submerged (S), refer mapping extract below showing the FIS area mapped in red.

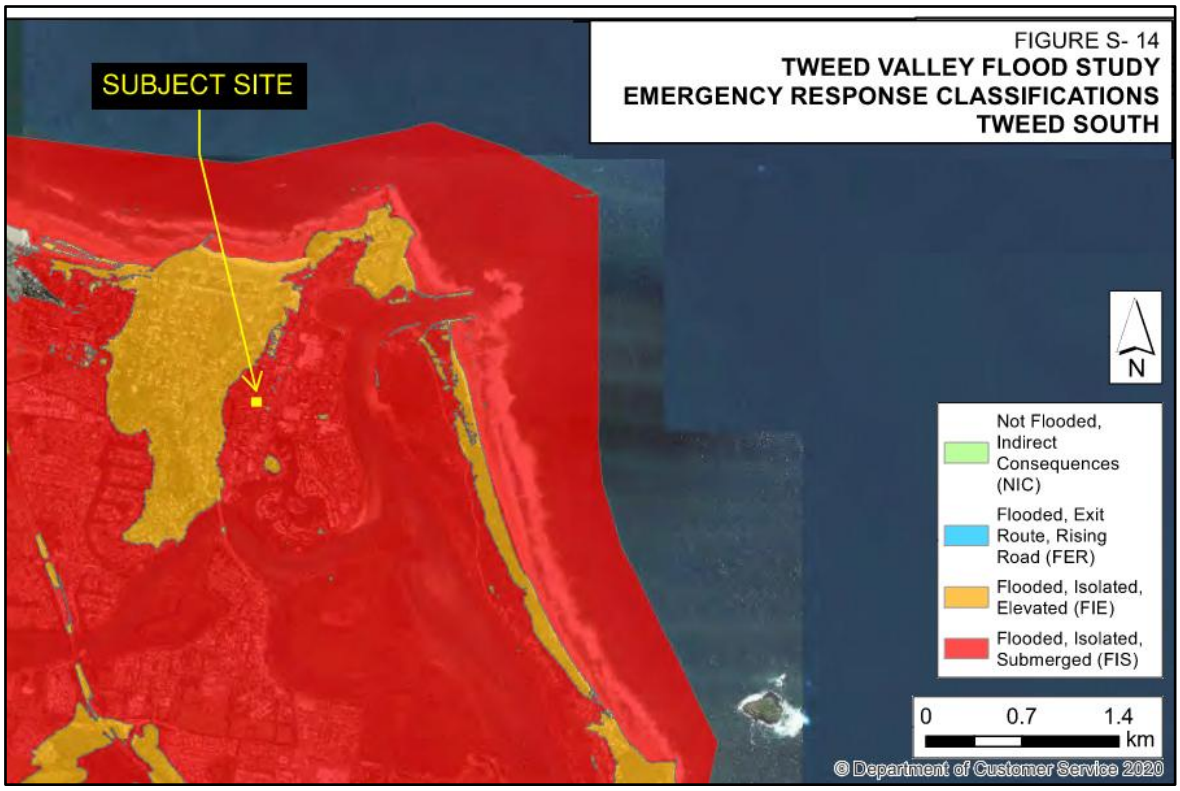


Figure 6 –Emergency Response Classification map extract

The anticipated warning time for a 1 in 20 year flood event is 21 hours *(TSC DCP A3.2.3- Urban areas).* As the site is only affected by the significantly larger PMF event, warning time for the PMF event is expected to be in the order of days rather than hours due to the substanitally low probability of the event occuring and the significant rainfall required, giving the occupants and building manager time for evacuation and flood preparation.

2.4 Geographic & PMF level information

Site survey shows the subject property ground levels between RL3.50-4.00 AHD. Florence street (bordering the north of subject site) gently rises to the west toward the QLD/NSW border (Thompson/Charles Street). LIDAR information shows the natural ground level rising above the PMF flood level AHD approximately 240m to the west of the site (in front of the Tweed heads PCYC). This level algins with the extent of the orange FIE hatch in figure 6 above.

The development site will be affected by flood events that are rarer than the 1% AEP flood event. During the PMF event regional flooding caused by the Tweed River will inundate the site. This regional flood event is expected to peak slowly after the commencement of rain and will inundate the site from the east/south-east.

The table below outlines the relevant PMF levels and the associated inundation depths and evacuation distances to higher ground.

Table 2 – PMF level, depth and evacuation details

PMF event	PMF level	Flood depth on site	Evacuation distance to high ground
Current	5.70m AHD	1.7m-2.2m	239m approx.
Proposed (draft)	4.90m AHD	0.9m-1.4m	227m approx..

Figure 7 –Evacuation Route to land above PMF

3 FLOOD RELATED REQUIREMENTS

The following table outlines the relevant authority requirements and how the proposal addresses the concerns.

Table 3 – Authority Requirement Summary

Authority	Relevant Requirement	Comment
TWEED SHIRE COUNCIL	**DCP section A3.2.6 (V1.6) –** Emergency Response Provisions for Habitable Development - 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.	Florence Street is considered to have rising road access to land above the PMF level and is considered the preferred evacuation route to higher ground. The 2x ground floor units have a proposed finished floor level of RL4.40m AHD. These units are accessed via both stairs and ramped pedestrian access (disabled compliant) from the street level. The ground floor units are inundated by flood waters only during the PMF event by a depth of 0.5m or 1.30m for the draft and current PMF events respectively. Both these ground floor units would need to be evacuated to higher ground prior to the PMF event occurring, subject to a Flood Response Assessment Plan. Apart from the 2x ground floor units, the remainder of the units from level 1 (RL8.20)

Authority	Relevant Requirement	Comment
		and above are physically located above the current and draft PMF flood level of RL5.70 & RL4.90 respectively, providing adequate PMF refuge, subject to a Flood Response Assessment Plan. The proposal generally complies.
	DCP section A3.3.2 (V1.6) – Development Generally on Flood Liable Land requires 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.	Current design flood level = 2.60m AHD Draft design flood level = 2.90m AHD Proposed basement entry level = RL3.60m The proposal provides 0.7m freeboard above the draft design flood (worst case). The proposal complies.
	DCP section A3.3.3 (V1.6) – Residential development on Flood Liable Land requires all habitable areas of all residential buildings are to be at a level of not less than Council's adopted minimum floor level for development.	Current FPL (climate change) = 3.50m AHD Draft Flood Planning Level = 3.40m AHD Proposed development minimum habitable floor level = RL4.40m The proposal complies.
	LEP section 5.21 Flood planning (1) The objectives of this clause are as follows— (a) to minimise the flood risk to life and property associated with the use of land, (b) to allow development on land that is compatible with the flood function and behaviour on the land, taking into account projected changes as a result of climate change, (c) to avoid adverse or cumulative impacts on flood behaviour and the environment, (d) to enable the safe occupation and efficient evacuation of people in the event of a flood. (2) Development consent must not be granted to development on land the consent authority considers to be within the flood planning area unless the consent authority is satisfied the development— (a) is compatible with the flood function and behaviour on the land, and (b) will not adversely affect flood behaviour in a way that results in detrimental increases in the potential flood affectation of other development or properties, and	(a) Site not within flood planning area. Rising road evacuation route & PMF refuge provided. (b) Latest flood modelling considers climate change in relation to flooding. (c) Site is outside flood planning area and does not affect flood behaviour. (d) Rising road evacuation route provided. (a) Site is outside flood planning area and does not affect flood behaviour. (b) Site is outside flood planning area and does not affect flood behaviour

Authority	Relevant Requirement	Comment
	(c) will not adversely affect the safe occupation and efficient evacuation of people or exceed the capacity of existing evacuation routes for the surrounding area in the event of a flood, and (d) incorporates appropriate measures to manage risk to life in the event of a flood, and (e) will not adversely affect the environment or cause avoidable erosion, siltation, destruction of riparian vegetation or a reduction in the stability of river banks or watercourses. (3) In deciding whether to grant development consent on land to which this clause applies, the consent authority must consider the following matters— (a) the impact of the development on projected changes to flood behaviour as a result of climate change, (b) the intended design and scale of buildings resulting from the development, (c) whether the development incorporates measures to minimise the risk to life and ensure the safe evacuation of people in the event of a flood, (d) the potential to modify, relocate or remove buildings resulting from development if the surrounding area is impacted by flooding or coastal erosion.	(c) Rising road evacuation route & PMF refuge provided. (d) PMF refuge provided subject to Flood Response Assessment Plan. (e) Site is outside flood planning area and does not affect flood behaviour. (a) Site is outside flood planning area and does not affect flood behaviour. (b) The building design is generally in keeping with the TSC DCP - Tweed City Centre Plan – Section B2. (c) PMF refuge provided subject to Flood Response Assessment Plan (d) Not applicable The proposal is deemed acceptable.
Flood Risk Management Manual (NSW government 2023)	Applies to all flood liable land in NSW. Consideration of principles and advice within manual is required.	Local council DCP and LEP are considered in line with the principles and advice of this document. The proposal complies with the DCP & LEP.
Floodplain Development Manual (NSW Government 2005)	Applies to all flood liable land in NSW. Consideration of principles and advice within manual is required.	Local council DCP and LEP are considered in line with the principles and advice of this document. The proposal complies with the DCP & LEP.

4 RISK ASSESSMENT

Risk can be analysed via the determination of hazard likelihood and consequence. The greater the consequence and higher the likelihood, the higher the risk. The likelihood and consequence scales are outlined below in Table 4, adapted from Table 12.2.1 Queensland Urban Drainage Manual (QUDM) 2013 provisional edition and Table 5, altered from Table 12.2.2 QUDM 2013 provisional edition to include financial cost consequence.

Table 4 - Risk likelihood scale

Level	Descriptor	Description
A	Almost Certain	The event will occur on an annual basis
B	Likely	The event has occurred several times in recorded history
C	Possible	The event is likely to occur once in 50 years
D	Unlikely	The event had occurred once before
E	Rare	The event has not occurred locally, but has occurred elsewhere
F	*Very rare*	*Never known to have occurred*
G	*Almost incredible*	*Theoretically possible, but not expected to occur*

Table 5 - Risk consequence scale

Level	Descriptor	Description
V	Major	Fatal Injuries, greater than $250,000 of property damage.
IV	Significant	Permanent injury or psychological trauma, $50,000 to $250,000 of property damage.
III	Moderate	Broken bone or open flesh wound, $25,000 to $50,000 of property damage.
II	Minor	Cuts and bruises, $10,000 to $25,000 of property damage.
I	Very Minor	Wet clothes or mild scare or mild trauma, less than $10,000 of property damage.

A consideration of both risk likelihood and consequence can provide a clear indication of the level of risk. A guideline for the quantitative assessment of risk is outlined in

Table 6 and adapted from Table 12.2.3 in QUDM 2013 provisional edition. Though the proposed site is not located within Queensland this rating system will be adopted to gauge and outline the risk associated with flooding on the site.

It is noted that the PMF event is considered to be “Almost incredible” on the risk likelihood scale and is not represented on table 4 & 6. The risk consequence will be extrapolated from the table below.

Table 6 - Risk assessment matric

Likelihood Scale	Consequence				
	I	II	III	IV	V
A	Medium (7)	High (14)	High (17)	Very high (23)	Very high (25)
B	Medium (6)	Medium (9)	High (16)	High (19)	Very high (24)
C	Low (3)	Medium (8)	High (15)	High (18)	High (22)
D	Low (2)	Low (5)	Medium (11)	Medium (13)	High (21)
E	Low (1)	Low (4)	Medium (10)	Medium (12)	High (20)

4.1 Existing Flood Risk

The development site is affected by the PMF flood event. It can be seen from the council flood mapping that the source of flood waters inundates the site from the Tweed River. The maximum flood level for this event on the site is 5.70mAHD (current flood mapping). Flood mapping shows the flow velocity of the PMF flood waters as <0.25m/sec, refer figure below and Appendix B for further details.

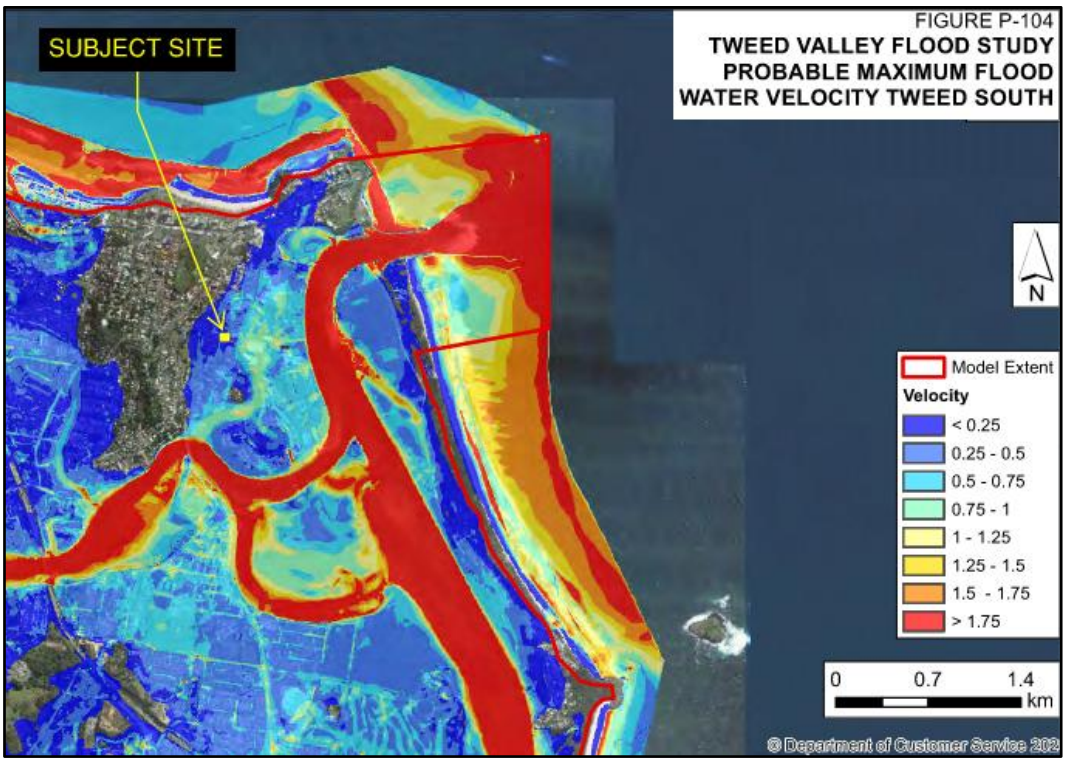


Figure 8 –PMF Flood Velocity Mapping Extract

The floor level of the existing house for 16 Florence Street sits at approximately 4.40mAHD.

The current PMF flood event results in approximately 1.30m of flood water inundation above the existing floor level.

The draft PMF flood event results in approximately 0.5m of flood water inundation above the existing floor level.

This scenario likely results in a medium-high risk consequence for the existing site dwellings assuming some structural damage, potentially loss of life & cut off services (contaminated water supply, flooded sewer system, power outage etc). A summary of the existing flood risk can be seen in the table below.

Table 7 – Existing Flood Risk analysis

Identified Risk	Likelihood	Consequence	Risk Rating
Structural damage	Unlikely (D)	Significant (IV)	Medium (13)
Loss of life	Rare (E)	Major (V)	High (20)
Cut off services	Possible (C)	Minor (II)	Medium (8)

Table 7 indicates the risk rating for the existing site ranging from medium to high. The PMF would be classed as being almost incredible to occur and is theoretically possible but not expected to occur. The loss of life it could pose makes the risk high, though a slightly lesser event could still cause significant structural damage. The effects of an event of similar magnitude could pose downstream risk for the site by cutting off services causing minor consequences. Though unlikely to occur, there is still a significant risk rating on the site that should be mitigated for the proposed development.

4.2 Mitigation Measures

It is noted that the proposed development increases the number of people at risk of the PMF event (through the densification of development ie: 3x existing houses to a 59-unit apartment building) however only 2 of the 59 units are below the PMF level. The mitigation measures considered to reduce the risk posed to the development by a flood event are summarised below:

- Building manager/body corporate to advise evacuation of all goods and vehicles from basement when Major Flood event is predicted (minimise damage to goods & vehicles).
- The building is built to withstand water damage from ground & flood waters.
- Habitable floors are above design flood level.
    - Basement level is set above the Flood Planning Level to ensure there is a physical bund to prevent flood waters filling up the basement
- Rising road evacuation access is available from Florence Street to the west
    - High ground is approximately 240m away from the site.
- PMF refuge is available from level 1 above should evacuation not be possible.

Table 8 - Mitigated flood risk

Identified Risk	Likelihood	Consequence	Risk Rating
Structural damage	Rare (E)	Very Minor (II)	Low (4)
Loss of life	Rare (E)	Major (V)	High (20)
Cancellation of services	Unlikely (D)	Minor (II)	Low (5)

As can be seen in Table 8, with the implementation of the proposed mitigation measures flood risk levels for the site have been lowered or maintained form the existing case. It is noted that the risk of loss of life is still possible and can be adequately addressed through the implementation of a Flood Emergency Response Plan (FERP) during the detailed design phase and enacted by the body corporate or building manager during the operational phase.

5 EMERGENCY SERVICES & EVACUATION DISCUSSION

Tweed Shire Council DCP section A3.2.6 note 3 recommends that evacuation of occupants is the preferred risk management approach for residential developments below the PMF level as stated below:

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*
- *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.

Both (2) ground floor units are accessed via stairs and DDA compliant pedestrian ramps from the street level (Florence St). Should the ground floor adaptable units have disabled occupants or visitors, disabled persons are able to be evacuated easily to the street level prior to a PMF event occurring.

The proposed development can provide PMF refuge for all units (except for the 2x ground floor units) generally in accordance with the requirements above. It is recommended that a Flood Response Assessment Plan be completed as part of the detailed design to ensure all occupants and owners are aware of the protocols and risks associated with flooding.

6 CONCLUSION

This Flood Impact Risk Assessment has identified and assessed the flood risk associated with the proposed residential tower development at 12-16 Florence Street, Tweed Heads.

Flood risk has been identified for only the PMF flood event and mitigation measures have been proposed to reduce or maintain the risk rating from the existing condition. Risks can be further managed through the development & implementation of a Flood Emergency Response Plan (FERP) during the detailed design phase.

7 APPENDICES

Appendix A – TSC Flood Property Report

Property Flood Report

This Property Flood Report tells you what you need to know about this property and its flood risk. It shows house floor and flood levels and provides information on nearby levees and river gauges, if applicable. To understand the terms used, please see the Flood Terms and Definitions section at the end of this report.

Property Address: **12 Florence Street TWEED HEADS 2485**

Lot/Section/Deposited Plan: 1//DP781624

Date Prepared: 17/09/2020

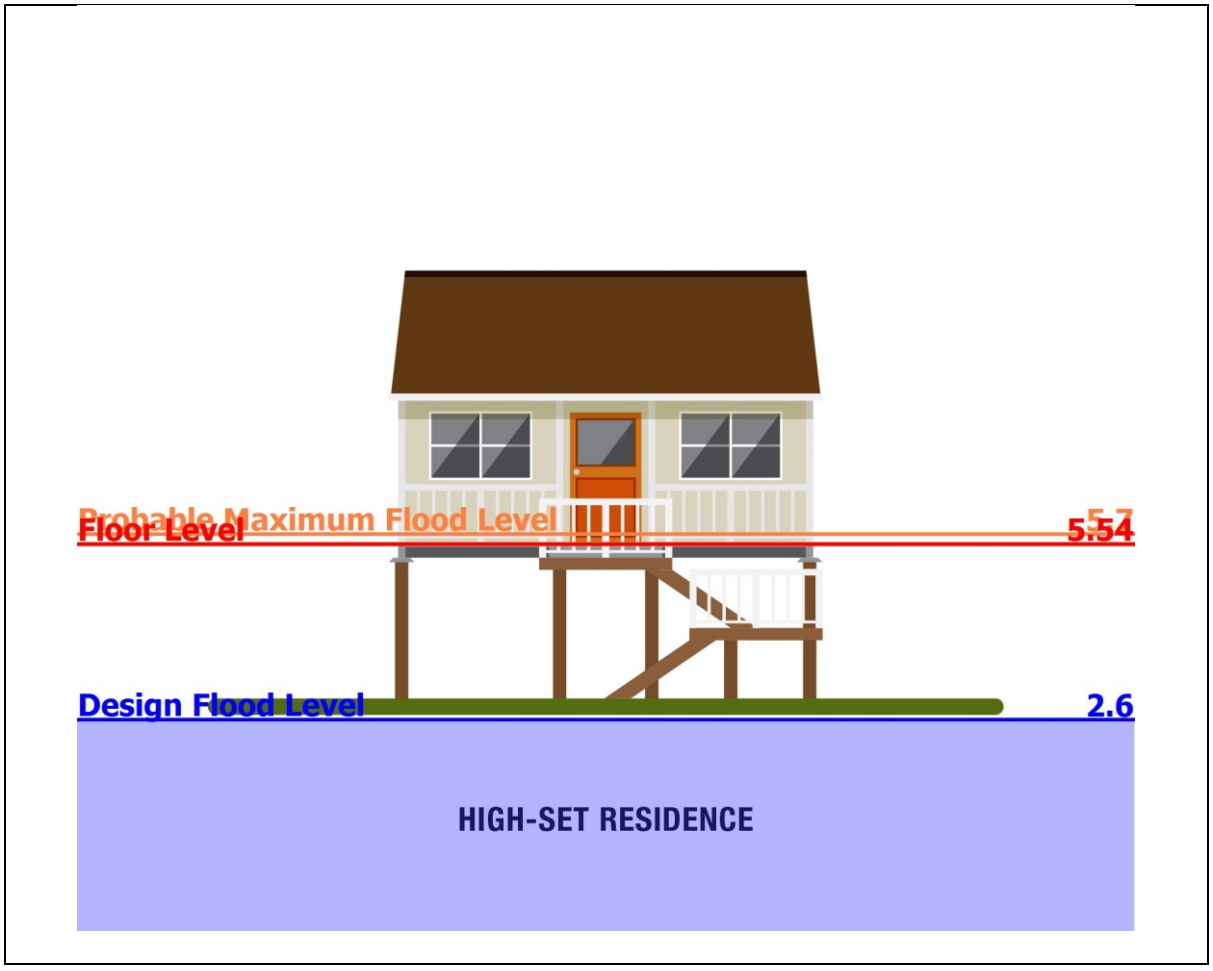


Figure 1: Flood and Floor Levels at 12 Florence Street TWEED HEADS 2485

The house floor level provided above was taken in 2012 and is approximate only. If an accurate floor level is required this should be confirmed by a registered surveyor.

Be Prepared

Flood Warnings are issued by the Bureau of Meteorology (BoM). Warnings and real-time rainfall and river level information can be viewed on the BoM website (www.bom.gov.au).

NSW State Emergency Service (SES) distribute Flood Bulletins which add local consequences and safety information related to Flood Warnings. These products are distributed to community via local media and social media.

Planning now so that you know your risks and what to do if there is a flood can save your life, the lives of your family members, pets and others. It can also minimise damage to your property and possessions. The NSW State Emergency Service has tools available to assist you to prepare. Visit the SES website to start your Home Emergency Plan now.

Website: www.ses.nsw.gov.au

Flood & Storm Emergency: 132 500

Life Threatening Situations: 000

Tweed Shire Council have developed the Tweed Emergency Dashboard for all hazard emergency information. The purpose of this Emergency Dashboard is to provide Tweed residents with links, useful information and contacts in an emergency. Go to: https://emergency.tweed.nsw.gov.au/

Should you require any further information, please contact Council on (02) 6670 2400 or email us at tsc@tweed.nsw.gov.au

Technical Information

The below information is for those who are flood savvy or have a technical need to know more about Council's building development controls, such as surveyors, builders, certifiers, architects and engineers.

Property Address: **12 Florence Street TWEED HEADS 2485**

Lot/Section/Deposited Plan: 1//DP781624

Property Levels

Description	Minimum (m AHD)	Maximum (m AHD)
Approximate Ground Level	3.6	4.0
Approximate Floor Level (2012)	5.540	

Planning Levels

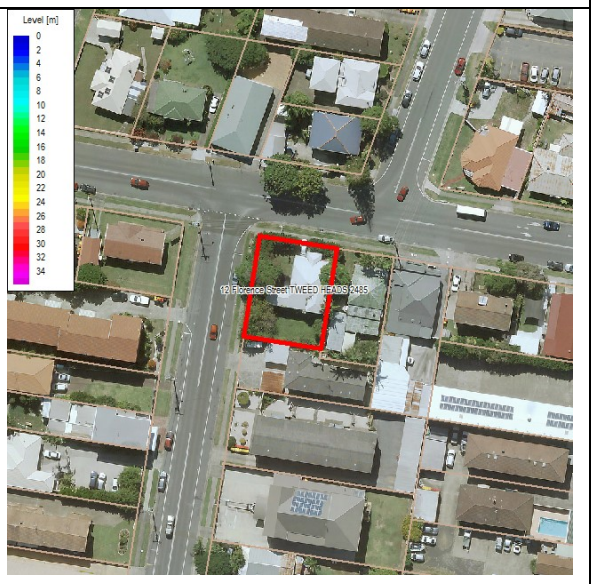
Planning Level	Level (m AHD)
Design Flood Level	2.6
Minimum Habitable Floor Level (Flood Planning Level)	3.1
Climate Change Design Flood Level*	3.0
Climate Change Habitable Floor Level*	3.5
High Flow Area	No
High Hazard Area	NA

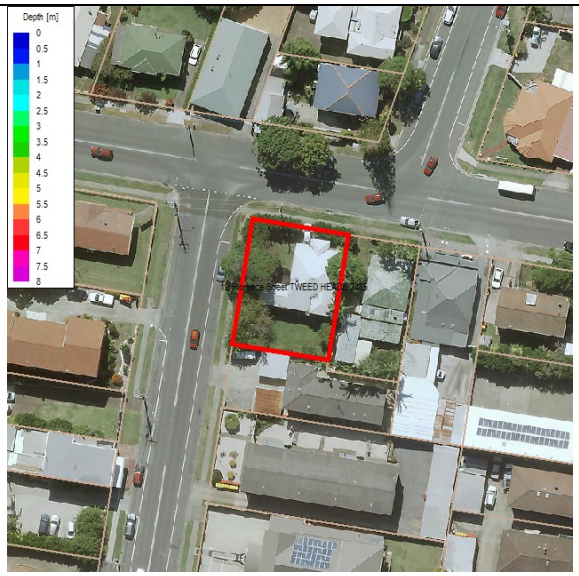
* Climate Change Levels are compulsory in new urban land release subdivision areas

Flooding Levels

Flood Event	Minimum Level (m AHD)	Maximum Level (m AHD)
20% AEP	N/A	N/A
5% AEP	N/A	N/A
1% AEP	N/A	N/A
Climate Change 2100 1% AEP	N/A	N/A
0.2% AEP	N/A	N/A
Probable Maximum Flood (PMF)	5.6	5.7

Mapping

Overview and Floor Level Survey Location	Design Flood (1% AEP) - Height
	

Design Flood (1% AEP) - Depth	High/Low Flow Classification
	

Detailed mapping data, including flood mapping, can be sourced at Council's open data hub: www.tweed.nsw.gov.au/Mapping

For more information on Tweed Shire Flood Planning controls see the Tweed Local Environment Plan and Development Control Plan Section A3 – Development of Flood Liable Land at www.tweed.nsw.gov.au/PlanningPolicies

Information Sources

- **Ground Levels:** 2014 Airborne Laser Survey (LiDAR)
- **Existing Floor Levels:** 2011 and 2012 Floor Level Survey (Tweed Shire Council)
- **Flooding Levels:** Tweed Valley Flood Study Update 2009 and Tweed Byron Coastal Creeks Flood Study 2010 (BMT WBM)

Flood Terms and Definitions

- **Annual Exceedance Probability (AEP):** The probability of a flood event of a given size occurring in any one year, usually expressed as a percentage annual chance.
- **Average Recurrence Interval (ARI):** Similar to AEP. The long-term average number of years between the occurrence of a flood as big as (or larger than) the selected event.
- **metres above Australian Height Datum (m AHD):** The reference level for defining ground levels in Australia. The level of 0.0m AHD is approximately mean sea level.
- **Maximum and Minimum Ground Level** – Highest and lowest ground levels on the property based on available ground level information. A Registered Surveyor can confirm exact ground levels.
- **Surveyed Floor Level** – Approximate floor levels of dwellings, usually taken from the street. These are generally the level of the front step of the habitable level of the building most visible from the street frontage
- **Design Flood Level (DFL)** – A hypothetical flood representing a specific likelihood of occurrence. In Tweed Shire, for residential property, the peak of the modelled 1% AEP (100 Year ARI) flood is the Design Flood Level
- **Minimum Habitable Floor Level** – The minimum level in metres AHD at which habitable areas of development (generally including bedrooms, living rooms, kitchen, study, family and rumpus rooms) must be constructed. In Tweed Shire, this is Design Flood Level plus 0.5m of freeboard. Also known as 'Flood Planning Level'
- **Climate Change Floor Level** – 2100 Climate Change Design Flood Level plus 0.5m of freeboard. Climate Change Design Flood Level is based on reasonable predictions of increased rainfall intensity and sea level rise. See the Tweed Valley Flood Study Update 2009 – Climate Change for more information.
- **Probable Maximum Flood.** An extreme flood deemed to be the largest flood that could conceivably occur at a specific location. It is generally not physically or economically possible to provide complete protection against this flood event, but should be considered for emergency response etc. The PMF defines the extent of flood prone land (i.e. the floodplain).

Disclaimer

Appendix B – TSC Flood modelling mapping extracts

FIGURE 56
TWEED VALLEY FLOOD STUDY
1 % AEP FLOOD HAZARD TWEED SOUTH

SUBJECT SITE

Chinderah

N

Model Extent
Hydraulic Hazard
H1
H2
H3
H4
H5
H6

0 0.7 1.4 km

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FIGURE 63
TWEED VALLEY FLOOD STUDY
0.2 % AEP FLOOD HAZARD TWEED SOUTH

SUBJECT SITE

Chinderah

N

Model Extent
Hydraulic Hazard
H1
H2
H3
H4
H5
H6

0 0.7 1.4
km

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FIGURE P-07
TWEED VALLEY FLOOD STUDY
20 % AEP WATER LEVEL TWEED SOUTH

SUBJECT SITE

Chinderah

Flood Level (mAHD)

- Model Extent
- <1
- 1 - 2
- 2 - 3
- 3 - 4
- 4 - 5
- 5 - 6
- 6 - 7
- 7 - 8
- 8 - 9
- 9 - 10
- 10 - 11
- 11 - 12
- 12 - 13
- 13 - 14
- 14 - 15
- 15 - 16
- 16 - 17
- 17 - 18
- 18 - 19
- 19 - 20
- 20 - 21
- 21 - 22
- 22 - 23
- 23 - 24
- 24 - 25
- 25 - 26
- 26 - 27
- 27 - 28
- 28 - 29
- 29 - 30
- 30 - 31
- >31

N

0 0.7 1.4 km

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FIGURE P-14
TWEED VALLEY FLOOD STUDY
5 % AEP WATER LEVEL TWEED SOUTH

SUBJECT SITE

Chinderah

Flood Level (mAHD)

- Model Extent
- <1
- 1 - 2
- 2 - 3
- 3 - 4
- 4 - 5
- 5 - 6
- 6 - 7
- 7 - 8
- 8 - 9
- 9 - 10
- 10 - 11
- 11 - 12
- 12 - 13
- 13 - 14
- 14 - 15
- 15 - 16
- 16 - 17
- 17 - 18
- 18 - 19
- 19 - 20
- 20 - 21
- 21 - 22
- 22 - 23
- 23 - 24
- 24 - 25
- 25 - 26
- 26 - 27
- 27 - 28
- 28 - 29
- 29 - 30
- 30 - 31
- >31

N

0 0.7 1.4 km

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FIGURE P-21
TWEED VALLEY FLOOD STUDY
1 % AEP WATER LEVEL TWEED SOUTH

SUBJECT SITE

Chinderah

Model Extent

Flood Level (mAHD)

- <1
- 1 - 2
- 2 - 3
- 3 - 4
- 4 - 5
- 5 - 6
- 6 - 7
- 7 - 8
- 8 - 9
- 9 - 10
- 10 - 11
- 11 - 12
- 12 - 13
- 13 - 14
- 14 - 15
- 15 - 16
- 16 - 17
- 17 - 18
- 18 - 19
- 19 - 20
- 20 - 21
- 21 - 22
- 22 - 23
- 23 - 24
- 24 - 25
- 25 - 26
- 26 - 27
- 27 - 28
- 28 - 29
- 29 - 30
- 30 - 31
- >31

N

0 0.7 1.4 km

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FIGURE P-28
TWEED VALLEY FLOOD STUDY
0.2 % AEP WATER LEVEL TWEED SOUTH

SUBJECT SITE

Chinderah

Flood Level (mAHD)

- Model Extent
- <1
- 1 - 2
- 2 - 3
- 3 - 4
- 4 - 5
- 5 - 6
- 6 - 7
- 7 - 8
- 8 - 9
- 9 - 10
- 10 - 11
- 11 - 12
- 12 - 13
- 13 - 14
- 14 - 15
- 15 - 16
- 16 - 17
- 17 - 18
- 18 - 19
- 19 - 20
- 20 - 21
- 21 - 22
- 22 - 23
- 23 - 24
- 24 - 25
- 25 - 26
- 26 - 27
- 27 - 28
- 28 - 29
- 29 - 30
- 30 - 31
- >31

N

0 0.7 1.4 km

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FIGURE P-35
TWEED VALLEY FLOOD STUDY
PROBABLE MAXIMUM FLOOD
WATER LEVEL TWEED SOUTH

SUBJECT SITE

Chinderah

Model Extent

Flood Level (mAHD)

- <1
- 1 - 2
- 2 - 3
- 3 - 4
- 4 - 5
- 5 - 6
- 6 - 7
- 7 - 8
- 8 - 9
- 9 - 10
- 10 - 11
- 11 - 12
- 12 - 13
- 13 - 14
- 14 - 15
- 15 - 16
- 16 - 17
- 17 - 18
- 18 - 19
- 19 - 20
- 20 - 21
- 21 - 22
- 22 - 23
- 23 - 24
- 24 - 25
- 25 - 26
- 26 - 27
- 27 - 28
- 28 - 29
- 29 - 30
- 30 - 31
- >31

N

0 0.7 1.4 km

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FIGURE P-104
TWEED VALLEY FLOOD STUDY
PROBABLE MAXIMUM FLOOD
WATER VELOCITY TWEED SOUTH

FIGURE P-104
ED VALLEY FLOOD STUDY
BABLE MAXIMUM FLOOD
VELOCITY TWEED SOUTH

SUBJECT SITE

N

Model Extent

Velocity

- < 0.25
- 0.25 - 0.5
- 0.5 - 0.75
- 0.75 - 1
- 1 - 1.25
- 1.25 - 1.5
- 1.5 - 1.75
- > 1.75

0 0.7 1.4 km

Chinderah

N

Model Extent

Velocity

- < 0.25
- 0.25 - 0.5
- 0.5 - 0.75
- 0.75 - 1
- 1 - 1.25
- 1.25 - 1.5
- 1.5 - 1.75
- > 1.75

0 0.7 1.4 km

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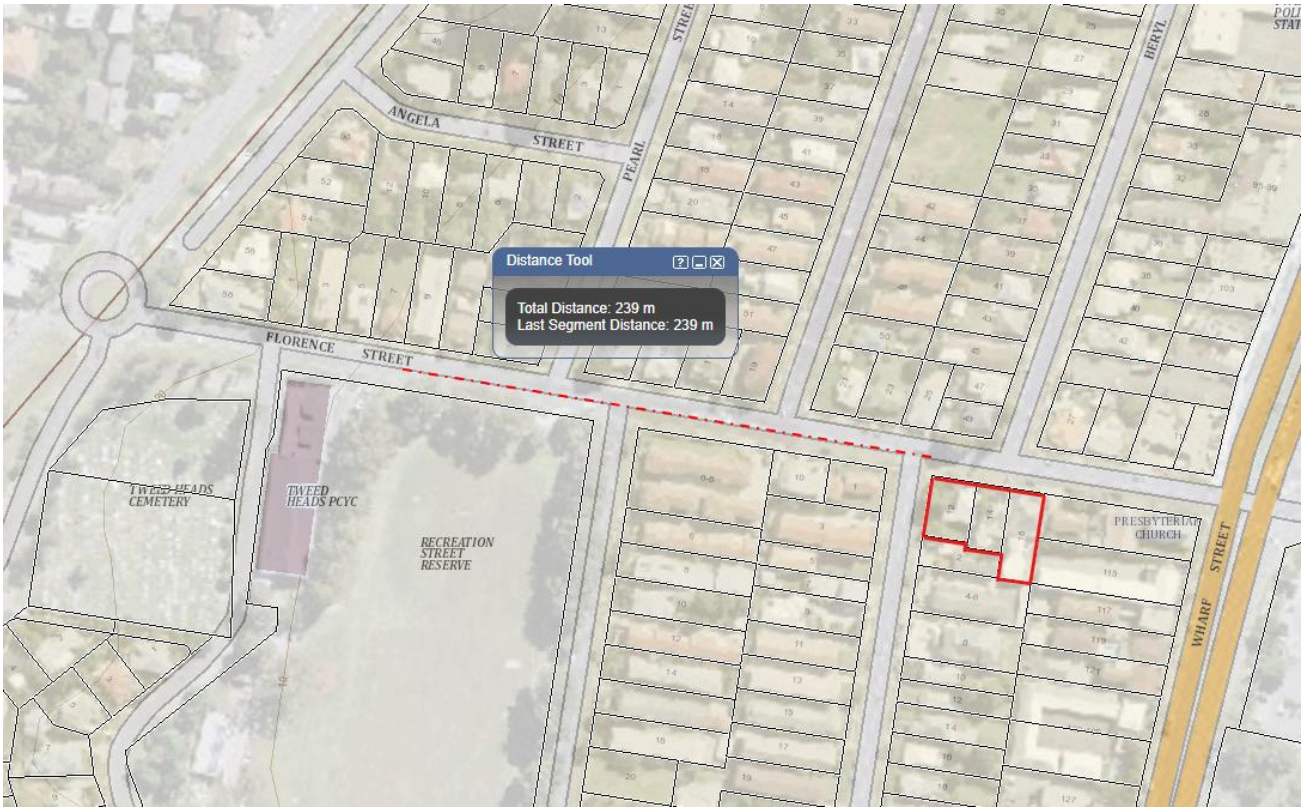
Appendix C –Evacuation Route to land above PMF level



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CLIENT
The Trustee for WAFI PROPERTY TRUST
6/37A KING ROAD
HORNSBY NSW 2077 Country

LEGEND

AMENDMENTS

Rev	Description	By	Check	Date
01	SSD SCOPING SUBMISSION	-	-	3/10/2024
02	For Information	-	-	3/3/2025
03	For Information	-	AH	9/5/2025
04	For Coordination w Landscape	-	AH	16/5/2025
05	Consultant Coordination	-	AH	7/7/2025
06	SDRP-02	AH	AH	29/7/2025
07 - WIP	SSD DRAFT SUBMISSION	AH	GMC	Work in Progress

Work in Progress

PROJECT
FIRENZE
12-16 FLORENCE STREET, TWEED HEADS NSW 2485

PROJECT No
2408A

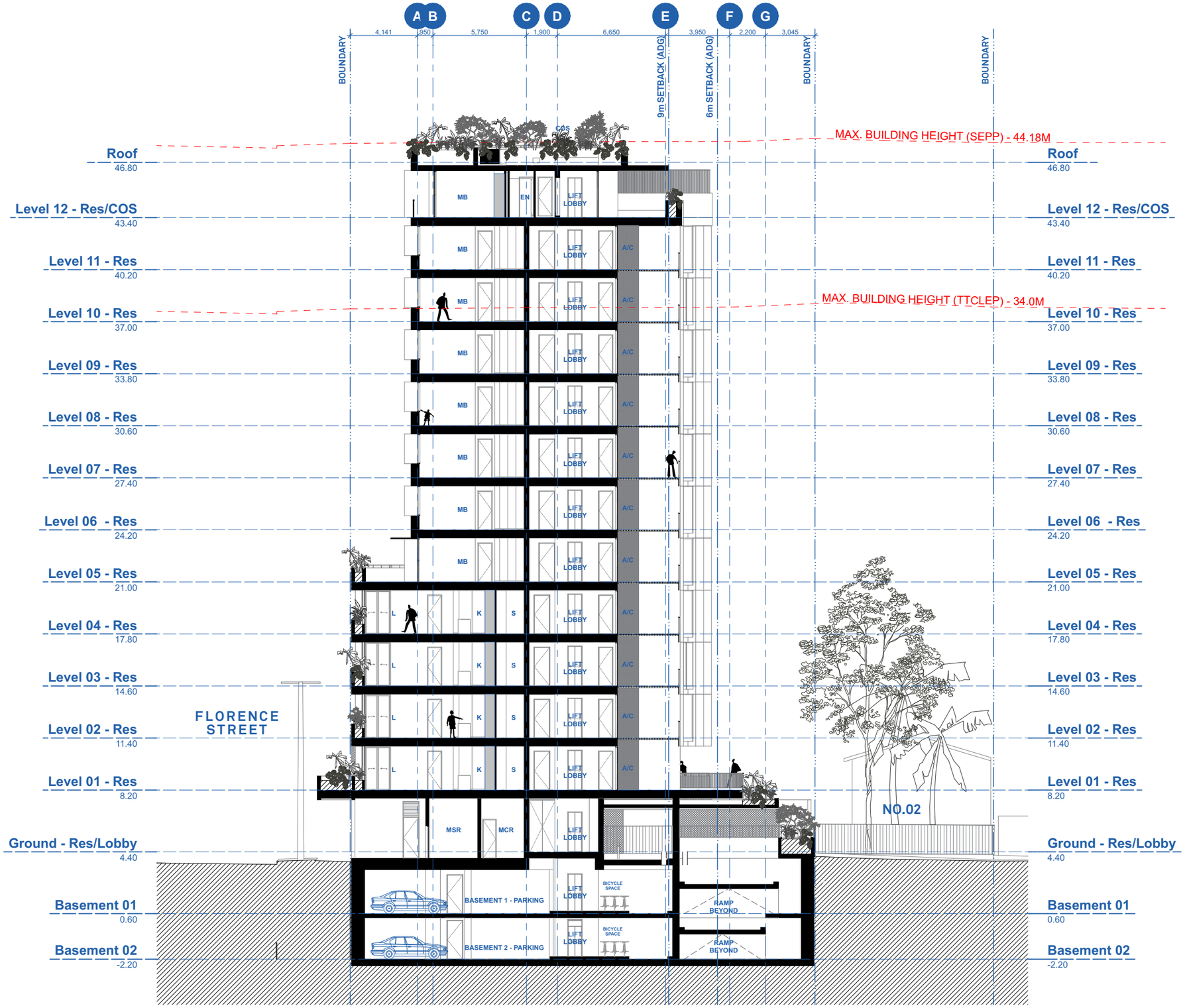
PROJECT STATUS
SSD DRAFT SUBMISSION

DRAWING TITLE
GENERAL ARRANGEMENT PLANS
Ground Level GA

DRAWN AH | SCALE 1:250@A3 | NORTH

DRAWING No
A-DA-110-008

REV
07 - WIP



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LEGEND

AMENDMENTS

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02	For Information	-		3/3/2025
03	For Information	-	AH	9/5/2025
04	For Coordination w Landscape	-	AH	16/5/2025
05	SDRP-02	-	AH	29/7/2025
06 - WIP	SSD DRAFT SUBMISSION	-	GMC	Work in Progress

Work in Progress

PROJECT

FIRENZE

12-16 FLORENCE STREET, TWEED HEADS NSW 2485

PROJECT No

2408A

PROJECT STATUS

SSD DRAFT SUBMISSION

DRAWING TITLE

GENERAL ARRANGEMENT SECTIONS

Section AA

DRAWN	SCALE	NORTH
-	1:250@A3	

DRAWING No

A-DA-130-001

REV

06 - WIP