

Attachment A9

Flood Impact Assessment



Rose Group Pty Ltd

Flood Impact Assessment

51 Riley Street

March 2024

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Author	JR
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Approved	JT

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SYDNEY
P (02) 9659 0005
E sydney@brs.com.au

CENTRAL COAST
P (02) 4325 5255
E coast@brs.com.au

HUNTER
P (02) 4966 8388
E hunter@brs.com.au

COFFS HARBOUR
P (02) 5642 4222
E coffs@brs.com.au

NORTHERN RIVERS
P (02) 6681 6696
E northernrivers@brs.com.au

www.brs.com.au



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1 Introduction

Barker Ryan Stewart Pty Ltd has been engaged by Rose Group Pty to prepare a Flood Impact Assessment and for the proposed development at 51 Riley Street, Woolloomooloo.

This report has been undertaken to assess the likely impact of the proposed redevelopment on the floodplain in the local area, to identify any flood risks associated with the proposal and if identified indicate how these risks can be mitigated.

In preparation of this report, the investigation will consider the following:

1. 6642_51 Riley Street– Architectural Plans Rev 3 prepared by SJB Dated 20/02/2024
2. Detail Site Survey – Denny Linker & Co Dated 26/10/2022
3. The location of the site and its surroundings and the likely impact of flooding on the site.
4. Woolloomooloo Catchment Floodplain Risk Management Plan (WMAWater 2016)
5. Flood modelling results obtained from council for the Woolloomooloo Catchment Floodplain Risk Management Study (WMAWater 2016)
6. Sydney Development Control Plan (2012)
7. Sydney Local Environment Plan (2012)
8. Sydney Interim Floodplain Management Policy
9. Australian Rainfall and Runoff 2019
10. Flood Evacuation procedures as recommended by the SES

2 Site Location and Development Proposal

2.1 Existing Site & Location

The site is located at 51 Riley Street, Woolloomooloo and is presently occupied by a two-storey office building development. The site is fronted by Riley Street to the east, backs onto Busby Lane to the west, and is adjoined to neighbouring commercial buildings on the northern and southern boundaries.

The location of the site is shown in Figure 1 below.

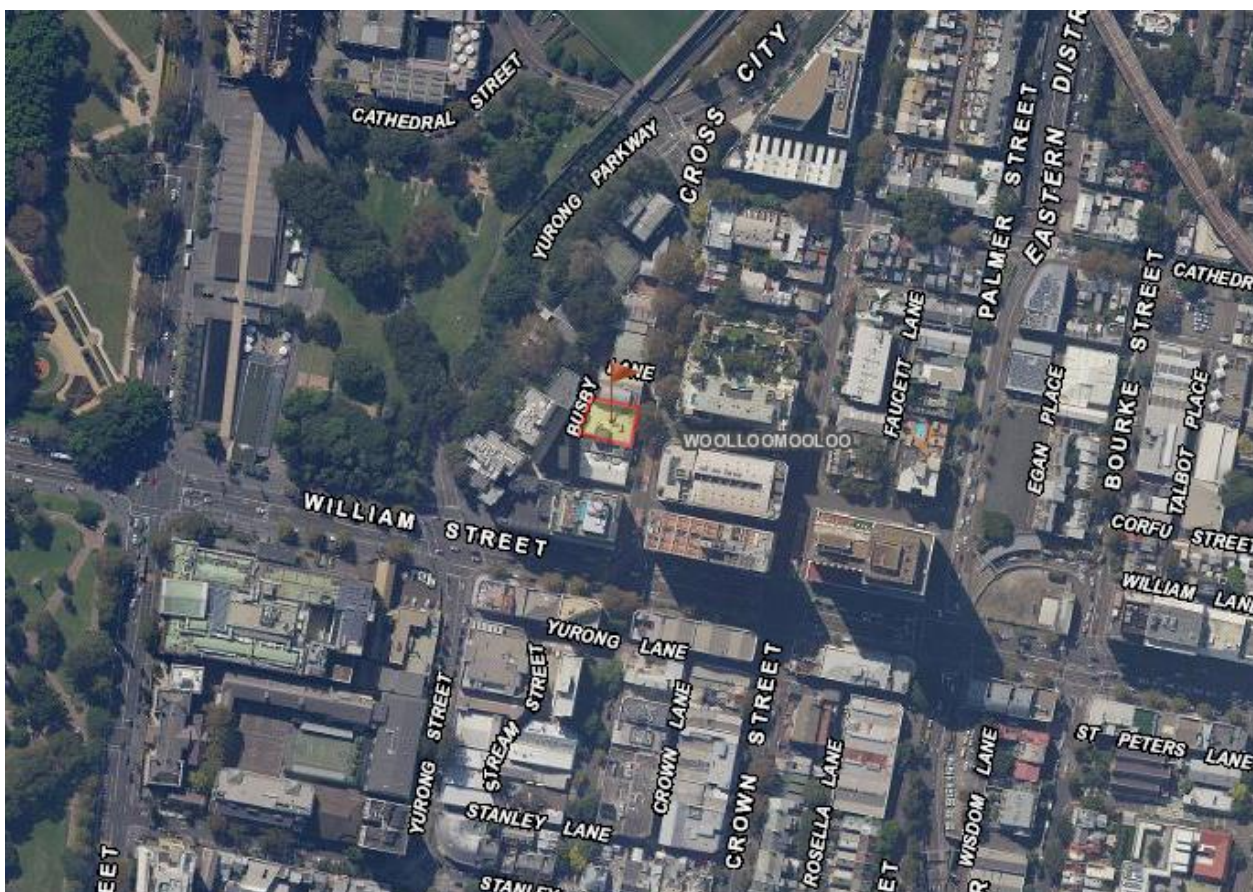


Figure 1. Location of Subject Site (Source: SIXmaps)

The site is currently developed to the boundary along all site fronts, and the surrounding land has a natural fall to the north.

2.2 Proposed Development

This flood impact assessment has been prepared to support a Planning Proposal to amend the Sydney Local Environment Plan 2012 which would support development of the site involving the construction of a multi-storey development consisting of 5 storeys, rooftop and basement parking level. It seeks to stitch together the shopfronts that exist on the block and contribute to the sense of place in this highly diverse, historic and dynamic part of Sydney.

A section view of the of the proposed development is shown below.

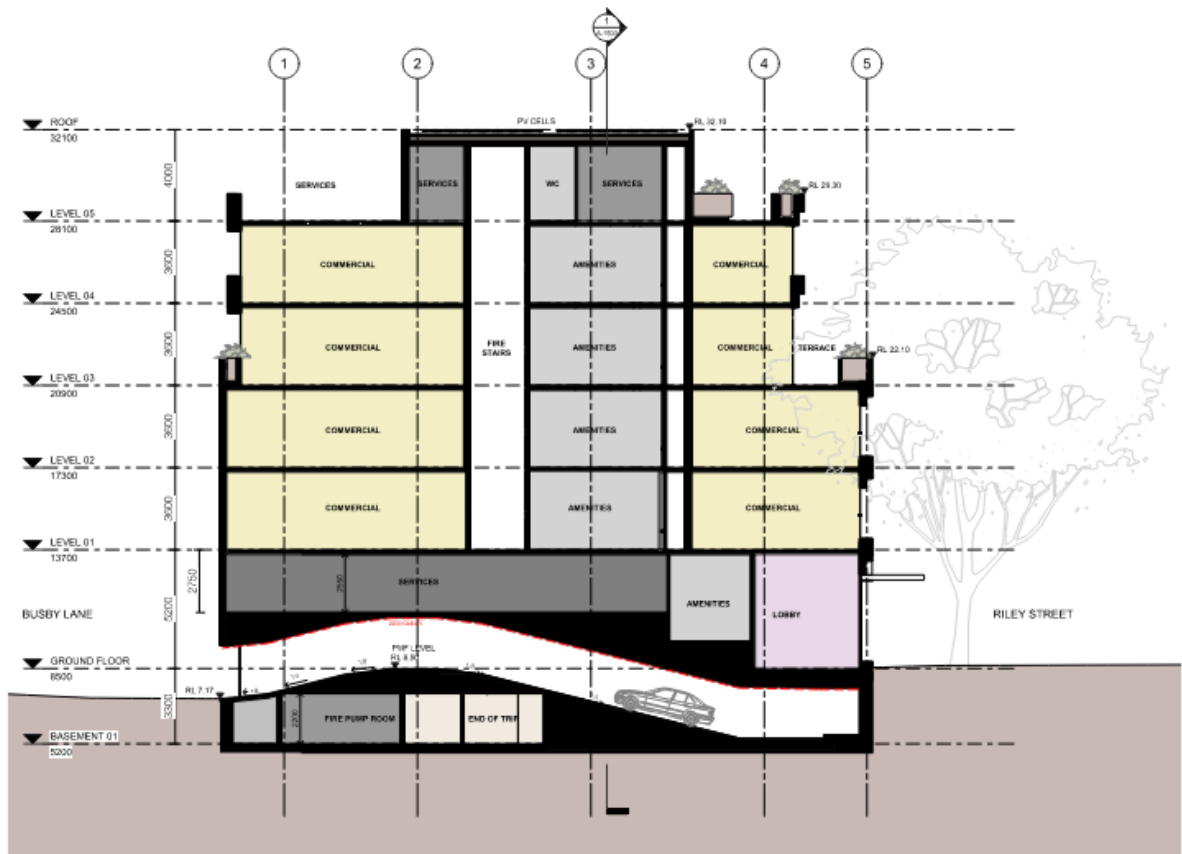


Figure 2. Proposed Development (Source: SJB Plans)

3 Flood Information

3.1 Extent & Land Use

The proposed development is located within the Woolloomooloo catchment which includes the suburbs of Potts Point, Darlinghurst, Sydney, Surry Hills, and Woolloomooloo. The catchment covers an area of approximately 160 hectares. The catchment is fully developed and consists of medium to high-density housing and commercial development with some large open spaces that include Hyde Park, Sandringham Gardens, Fragrance Garden, The Domain Park, the Royal Botanic Gardens, Daffodil Park, and several other smaller parks.

Several studies have been undertaken to determine the impact and nature of flooding on the catchment, the latest being the Woolloomooloo Catchment Floodplain Risk Management Study conducted by WMAWater. This study used TUFLOW software, a powerful one-dimensional (1D) and two-dimensional (2D) computational engine for solving the free surface water flow equations to simulate flood propagation. City of Sydney Council has made available for purchase the results of the TUFLOW modelling which has been presented in Figures 3 and 4.

3.2 Flood Levels

Results from the TUFLOW modelling data supplied by council for both the 1% AEP and the PMF can be seen in Figures 3 and 4 respectively.

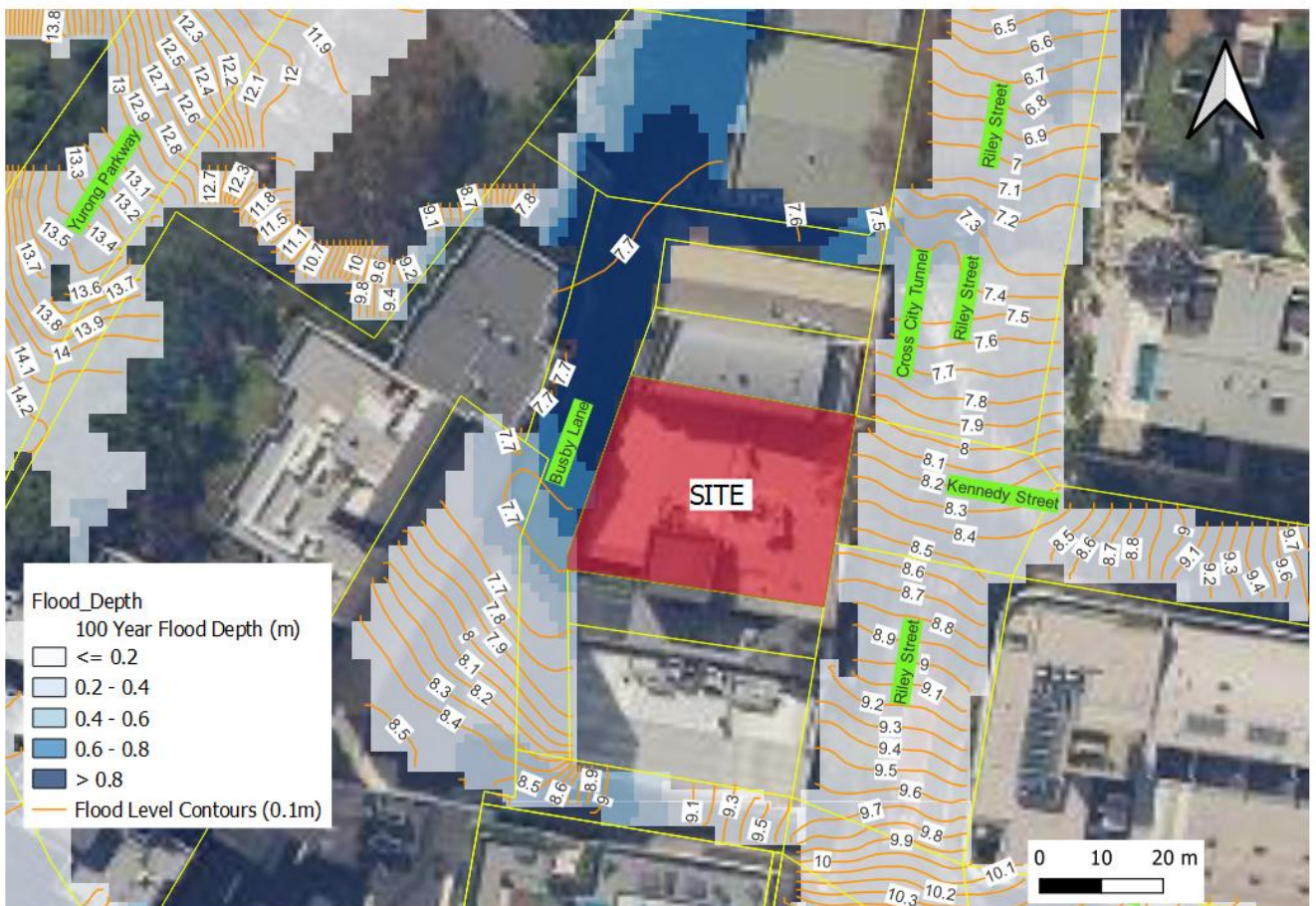


Figure 3. 1% AEP Flood Extent (Flood Levels obtained from Council, Flood depths calculated from supplied DTM)

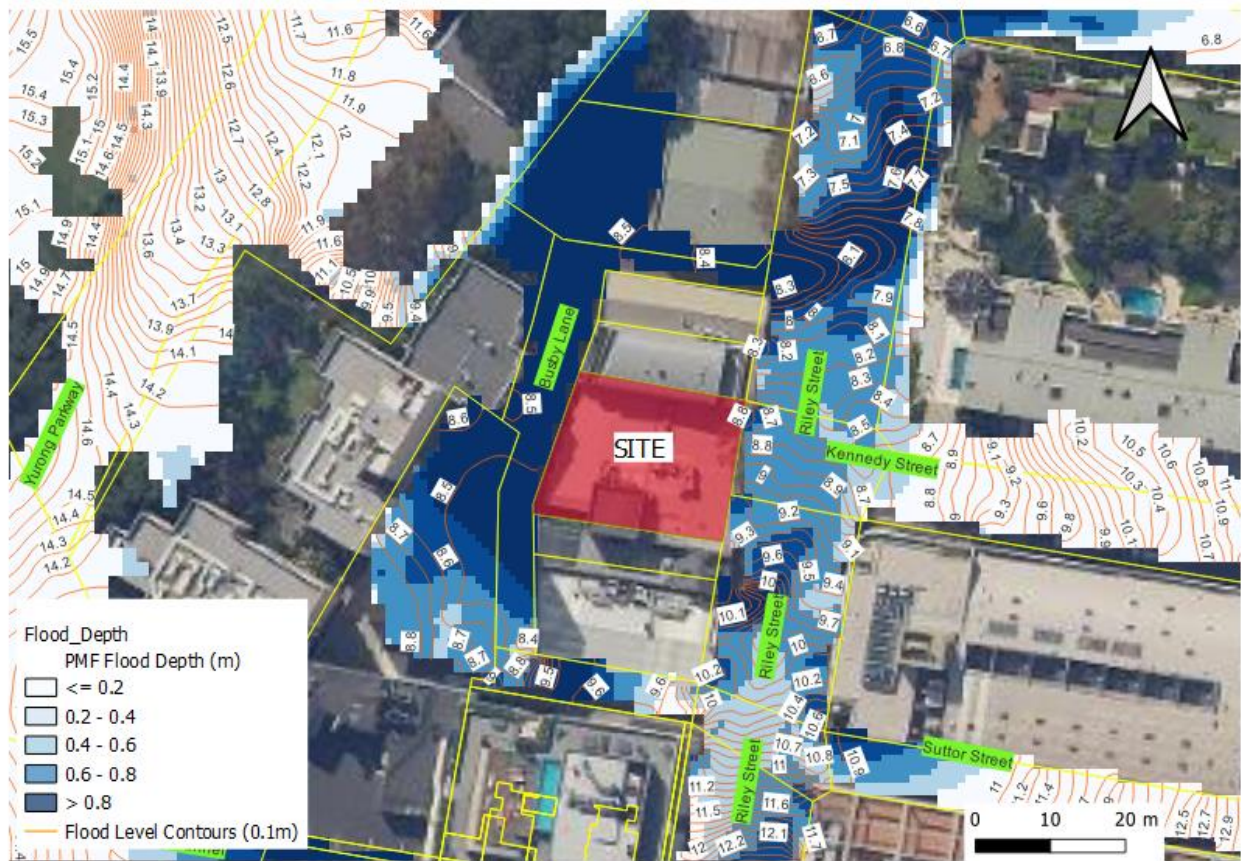


Figure 4. PMF Flood Extent (Flood Levels obtained from Council, Flood depths calculated from supplied DTM)

There is significant overland flows along Riley Street in both the 1% AEP and PMF events. Flood depths in the 1% AEP event can be seen to be below 100mm and as such presents a low hazard. In the PMF event flood depths are up 500mm above the 1% AEP event.

Flood behaviour in Busby Lane is largely controlled by the trapped low point at its northern end, causing flood waters to pond until spilling back onto Riley Street downstream of the site. This results in significant flood depths of up to 1.1m in the 1% AEP event and up to 1.9m in the PMF event.

4 Council Requirements and Controls Legislation Requirements

4.1 Sydney Development Control Plan 2012

- a) Ensure an integrated approach to water management across the City through the use of water sensitive urban design principles.
- b) Encourage sustainable water use practices.
- c) Assist in the management of stormwater to minimise flooding and reduce the effects of stormwater pollution on receiving waterways.
- d) Ensure that development manages and mitigates flood risk, and does not exacerbate the potential for flood damage or hazard to existing development and to the public domain.
- e) Ensure that development above the flood planning level as defined in the Sydney LEP 2012 will minimise the impact of stormwater and flooding on other developments and the public domain both during the event and after the event.
- f) Ensure that flood risk management addresses public safety and protection from flooding.

Comment:

As the development proposes an identical footprint to the existing development currently occupying the site, it can be inferred that any impact on flood hazard, flood levels and behaviour adjacent to the development will be negligible.

4.2 Sydney Interim Floodplain Management Policy

Table 1. Council FFL requirements

Development		Flood Planning Level	Required Level
Industrial or Commercial	Business	Merits approach presented by the applicant with a minimum of the 1% AEP flood level	Riley Street Retail access and Lobby 1%AEP = Level Varies from RL 8.8 to RL 8.1 across frontage. Riley Street Frontage maximum 1% AEP flood depth = 50mm
Below-ground garage/ car park	All other below-ground car parks	1% AEP flood level + 0.5 m or the PMF (whichever is the higher) See note 1	Riley Street PMF = 9.3m Busby Lane PMF = 8.5m

Notes:

- 1) The below ground garage/car park level applies to all possible ingress points to the car park such as vehicle entrances and exits, ventilation ducts, windows, light wells, lift shaft openings, risers, and stairwells.
- 2) Required levels indicated in the last column of Table 1 are the highest flood levels along the entire site frontage. Along Riley Street flood levels vary by approximately 0.7m across the site frontage and so flood depth is a more relevant control for entrance way thresholds.

Comment:

The proposed finished floor levels (F.F.L) on the architectural plans fronting Riley Street are set at RL 8.50 which is designed to provide level access into the building. As flood depths along the Riley Street frontage are less than 50mm for the proposed retail space and Lobby area entrances it is recommended that a 50mm threshold above external footpath levels is provided, where finished levels are below footpath level.

It should also be noted that due to the flood levels presented in the provided TUFLOW modelling being determined using Lidar elevation data (Accuracy within +/- 300mm vertically) in addition to the use of a 2m grid size (not accurately representing kerb flows) within the model, flood levels and depths along Riley Street are to a lower accuracy. It is surmised that actual flood conveyance along Riley Street would be increased with the use of accurate survey data within the model resulting in flood depths even less than those shown in Figure 3. Once detail survey has been undertaken along Riley Street as part of the future development application there may be scope remove the requirement for a 50mm threshold after a more detailed assessment.

PMF levels along Riley Street of RL 9.3 have been considered within the development as any access points to the basement, such as the lift shafts or fire stairwells, have been located on a raised level at RL 9.3 above the lobby and retail area.

PMF level along Busby Lane of RL 8.5 has been considered within the development as any access points to the basement, such as the lift shafts or fire stairwells, have been located at a raised level at RL 8.5. It is to be noted that the fire booster located on the basement level is to have no internal access to the basement, ensuring no flood water can access the basement in a PMF event.

The proposed basement access point on Busby Lane is below the required PMF flood level of RL 8.5m. As a result, an internal driveway crest of RL 8.5 has been provided to ensure flood waters do not enter the basement. Therefore, all access to the basement has been set at or above the PMF level to ensure, no flood water up to and including the PMF will enter the basement.

4.3 Sydney Local Environment Plan 2012

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
 - 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 riverbanks 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.
4. A word or expression used in this clause has the same meaning as it has in the Considering Flooding in Land Use Planning Guideline unless it is otherwise defined in this clause.

Comment: In addition to council requirements, minor additional measures as previously mentioned in the report are to be implemented to allow the proposed development to manage risk to life.

5 Recommendations

Barker Ryan Stewart has assessed the proposed development at 51 Riley Street, Woolloomooloo and concluded that in accordance with council requirements minor additional measures are recommended for the development to reduce risk and effects due to flood behaviour, while also ensuring compliance with the City of Sydney's Interim Floodplain Management Policy.

1. The structures are constructed in accordance with the Sydney Council Development Control plan.
2. All basement access is to be set at/or above the PMF level of RL 8.5 as per 6642_51 Riley Street– Architectural Plans prepared by SJB Dated 20/02/2024
3. The fire booster located on the basement level is to have no internal access to the basement, ensuring no flood water can access the basement.
4. A 50mm threshold is to be provided to the building access along Riley Street
5. A condition is to be placed on any future development application consent stating:
 - a. "All structures are to be certified by a structural engineer as being built of flood compatible building components and capable of withstanding the forces of flood waters up to the 1% AEP ARI event (inclusive of any uplift and carry away forces)."
 - b. "All electrical circuits or conduits located below the FLP are to be made fully flood compatible and suitable for continuous underwater immersion. Conduits are to be self-draining".
6. Ensure that all unrestrained items are moved from the site to higher ground, in the event of rising flood waters.