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20th May 2022

Our Ref: A21Q72-C4/NW

Woolworths Limited
C/- GAC Projects Australia
PO Box 461
BAULKHAM HILLS NSW 2153

Attention: Mr David Lin

Dear Sir,

**RE: PROPOSED WOOLWORTHS NARRABEEN ALTERATIONS AND ADDITIONS WELLINGTON STREET, NARRABEEN, NSW FLOOD PLANNING LETTER**

The following letter has been prepared to discuss the alterations and addition works to the existing Woolworths Narrabeen development and its interaction with the local floodplain. The report has also been prepared to discuss how the existing site and the proposed works relate to the relevant provisions of Council's Planning Requirements for Development on Flood Prone Land. The existing Woolworths Narrabeen development is located between Wellington Street and Lagoon Street and has been in operation for decades in the Narrabeen Lagoon Floodplain.

The letter has been updated to address assessing officer Natural Environment Referral Response – Flood commentary provided by Northern Beaches Council dated 31/03/2022. A copy of the referral response is provided in Appendix 2 of this letter.

To support internal store changes minor external works are proposed to the western building curtilage and carpark. These works consist of minor modifications to the existing carparking, existing building facade and existing trolley storage enclosure to provide a 'direct to boot' servicing area. The modifications to the existing building as well as the external carparking areas are shown on the architectural drawings by MCHP dated 19.04.2022. It should be noted there are no modifications proposed to the existing egress path leading from the ground level to Lagoon Street.

A flood information request was requested from Council to gain an understanding of the local floodplain. Refer below for summary of flood levels provided by the flood information request are listed below:

- 5% AEP max water level: 2.67m AHD
- 1% AEP max water level: 3.03m AHD
- PMF max water level: 4.91m AHD
- Flood planning level of 3.53m AHD (1% AEP max water level + 500m freeboard)

A copy of the flood information request is included in Appendix 1 of this letter.

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Following initial review by Council, the assessing engineering officer noted the need for the proposed works to comply the following flood requirements of the DCP and LEP, refer Appendix 2 for further details.

- *A2: "Development shall not be approved unless it can be demonstrated in a Flood Management Report that in all events up to the 1% AEP event there is no net loss of flood storage".*
- *C1: "New floor levels within the development shall be at or above the Flood Planning Level". The proposed floor level is 2.62m AHD, but it should be at or above the FPL of 3.53m AHD.*

Flood storage loss

The designer recognises the need to provide flood storage up to the 1% AEP event, and also acknowledges that the existing developments surrounding is subject to mainstream flooding in lesser flood events, such as the 5% AEP flood event. As part of the proposed works the designer proposes to provide compensatory flood offset storage to ensure there is no net loss in flood storage. Another consideration is the existing carpark is used as a pedestrian throughfare to the development and efforts should be taken to ensure that that and flood storage offsetting does not impact the hazard classification by increasing either the depth of velocity of flood waters.

The proposed works have been calculated to limit the effectiveness of 16.04m$^3$ of flood storage below the 1% AEP flood level. Detailed calculations are provided on engineering drawing 21Q72_DA_C400 including in Appendix 3 of this letter. Potential flood storage loss was calculated with the following parameters:

- 1% AEP max water level RL3.03m AHD.
- Average RL of existing trolley store RL2.61m AHD
- Average depth of 1% AEP flood waters of 420mm.
- Net plan area loss of 38.136m$^2$.

To offset the flood storage loss the designer proposes to provide an underground storage tank within the existing carpark. The tank is designed to store flood waters and provide the compensatory storage of 18.72m$^3$ and dispose of the floodwater in a controlled manner into the existing stormwater system as the flood peak retreats. The storage tank and all specifications is shown on engineering drawing 21Q72_DA_C400.

No significant increase in the building structure is proposed, the existing trolley storage area which is proposed to be converted into a ‘direct to boot’ service areas is largely in enclosed with dwarf brickwork wall and is part of the existing building structure. With flood offset storage provided, such no significant adverse impact to flood extents, levels, velocities or hazard categories is expected for any storm events.

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Flood immunity to the flood planning level

The existing development's finished flood level is founded at RL 2.62m AHD. Due to operational constraints the 'direct to boot' storage area is required to be founded at a similar level to the existing flood level.

To provide flood immunity to the flood planning level (FPL) of 3.53m AHD the designer proposes to provide flood protection measures such as flood doors and flood barriers. With flood protection measures flood immunity to all external entry points to newly developed portions of the development have been provided to RL3.53m AHD. Similarly, building structure and finishes are proposed to be waterproof and flood resistant to 3.53m AHD, and as such, flood immunity of habitable areas is provided to 3.53 AHD.

Two types of flood protection measures are proposed to be installed to provide flood immunity, they include 24/7 flood doors and automatic self actuating flood gates. These two types of flood protection measures are provided for the following reasons:

- Automatic activation and do not require persons onsite to active of erect.
- Self-actuation not reliant on electricity or manual erection to activate.
- Ongoing and proven use for commercial developments within Northern Beaches Council, refer below of case examples.

The location of the flood protection measures are shown on engineering drawing 21Q72_DA_C400. A short description of the flood protection measures is provided below with detail specification providing in Appendix 4 of this report.

It should be noted that the goal of providing the 'direct to boot' area of the store is to reduce the number of patrons frequenting the development and the time in which patrons spend at the development. As such it is understood that the addition of the 'direct to boot' area marginally reduces the overall exposure from flooding to patrons, and with all other factors remaining constant, the overall risk.

Self-actuating flood barrier

A self-actuation flood barrier is proposed to be provided to span the external entrance to 'direct to boot' area. It is understood that manually deployed, power operated and mechanical type floodgates are not accepted within Northern Beaches Council. We propose a self-actuating concealed flood barrier by AWMA Water Control Solutions or similar, which relies on floatation to be actuated. An excerpt of the AWMA concealed flood barrier can also been seen in Appendix 4. This floatation type flood gates are preferred as they don't rely on power and human intervention to deploy. As they don't have any mechanical/hydraulic parts maintenance is also reduced. The flood gates also don't require tenants to be trained on how to use the flood gates.

The new floodgate will be designed to have a top level of RL3.53 at the Flood planning level.

Recommended provider: AWMA Water Control Solutions and Flood solutions
Case example: Pittwater Place, Mona Vale.

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24/7 Flood doors

Due to the requirement to provide food immunity to all newly developed areas of the site, flood protection is required between newly developed areas and existing areas. To achieve this a 24/7 flood door is required between the existing area and the proposed 'direct to boot' area. The 24/7 flood door is provides full height flood immunity. The 24/7 flood door combines the functions of a normal access door with a flood barrier. The door will be fitted with a door closer to ensure the door is closed immediately after use ensuring the control is active for all flood events.

Recommended provider/supplier: Flood Solutions

Building Material – structure 'direct to boot' servicing area

Often flood affected sites require specific types of materials to be used in construction to ensure that structural integrity of the building is maintained during a flood event. The 'direct to boot' area of site shall ensure that all structures must be designed and constructed to ensure structural integrity up to the Flood Planning Level, taking into account the forces of floodwater, wave action, flowing water with debris, buoyancy and immersion. Structural certification shall be provided confirming the above, and may require the recommendations outlined below.

Various types of loads may need to be considered in the design of flood affected tenancies areas due regard to flood protection. These include:

- Impact loading caused by debris carried by flood waters
- Uplift or buoyancy forces
- Hydrostatic forces
- Hydrodynamic forces

Further Considerations

Reviewing the proposed external alterations and additions works in relation to the information obtained from the flood information request and in the context of Northern Beaches Council's requirements for development on flood prone land, Henry & Hymas Engineers make the following additional consideration:

- The existing development has a floor level RL2.62 which is below the 1% AEP water level of 3.03m AHD. Refer Flood Map B of Appendix 1. The development has been in operation with the floodplain for several decades. The current flood response strategy is understood to be evacuation from the development in the event of flooding via the existing egress route leading directly to Lagoon Street outside of the PMF extent. The proposed 'direct to boot' works are minor in nature do not immediate access or impact the existing response strategy or evacuation route to Lagoon Street.

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Conclusion

Whilst the proposed development is affected by the 1% AEP flood event, based on the aforementioned compensatory flood storage and flood protection measures been provided for new areas of the development the existing Woolworth Development given the flooding scenario, and given the existing development's response to flooding, are in accordance with Council's requirements for development on flood prone land.

We trust this satisfies your requirements in relation to flood planning, feel free to call me on (02) 9417 8400 to discuss further.

Yours faithfully,

**NICHOLAS WETZLAR**
For, and on behalf of,
H & H Consulting Engineers Pty Ltd

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**APPENDIX 1 - Flood Information Request - Northern Beaches Council**

# FLOOD INFORMATION REPORT – COMPREHENSIVE

**Property:** 12 Lagoon Street NARRABEEN NSW 2101
**Lot DP:** Lot 2 DP 527582
Lot 4 DP 656541
Lot A DP 371672
Lot 1 DP 1078838
**Issue Date:** 01/11/2021
**Flood Study Reference:** Narrabeen Lagoon Flood Study 2013, BMT WBM

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## Flood Information for lot [1]:

### Flood Risk Precinct – See Map A

### Flood Planning Area – See Map A

**Maximum Flood Planning Level (FPL) [2, 3, 4]:** 3.53 m AHD

### 1% AEP Flood – See Flood Map B

**1% AEP Maximum Water Level [2, 3]:** 3.03 mAHD

**1% AEP Maximum Depth from natural ground level[3]:** 1.55 m

**1% AEP Maximum Velocity:** 0.39 m/s

**1% AEP Hydraulic Categorisation:** N/A **See Flood Map D**

### Probable Maximum Flood (PMF) – See Flood Map C

**PMF Maximum Water Level [4]:** 4.92 m AHD

**PMF Maximum Depth from natural ground level:** 3.43 m

**PMF Maximum Velocity:** 0.49 m/s

**PMF Hydraulic Categorisation:** N/A **See Flood Map E**

## Flooding with Climate Change (See Flood Map F)

The following is for the 30% Rainfall intensity increase and 0.9m Sea Level Rise Scenario:

**1% AEP Maximum Water Level with Climate change [3]:** 3.90 m AHD

**1% AEP Maximum Depth with Climate Change[3]:** 2.42 m

**1% AEP Maximum Velocity with Climate Change[3]:** m/s

## Flood Life Hazard Category – See Map G

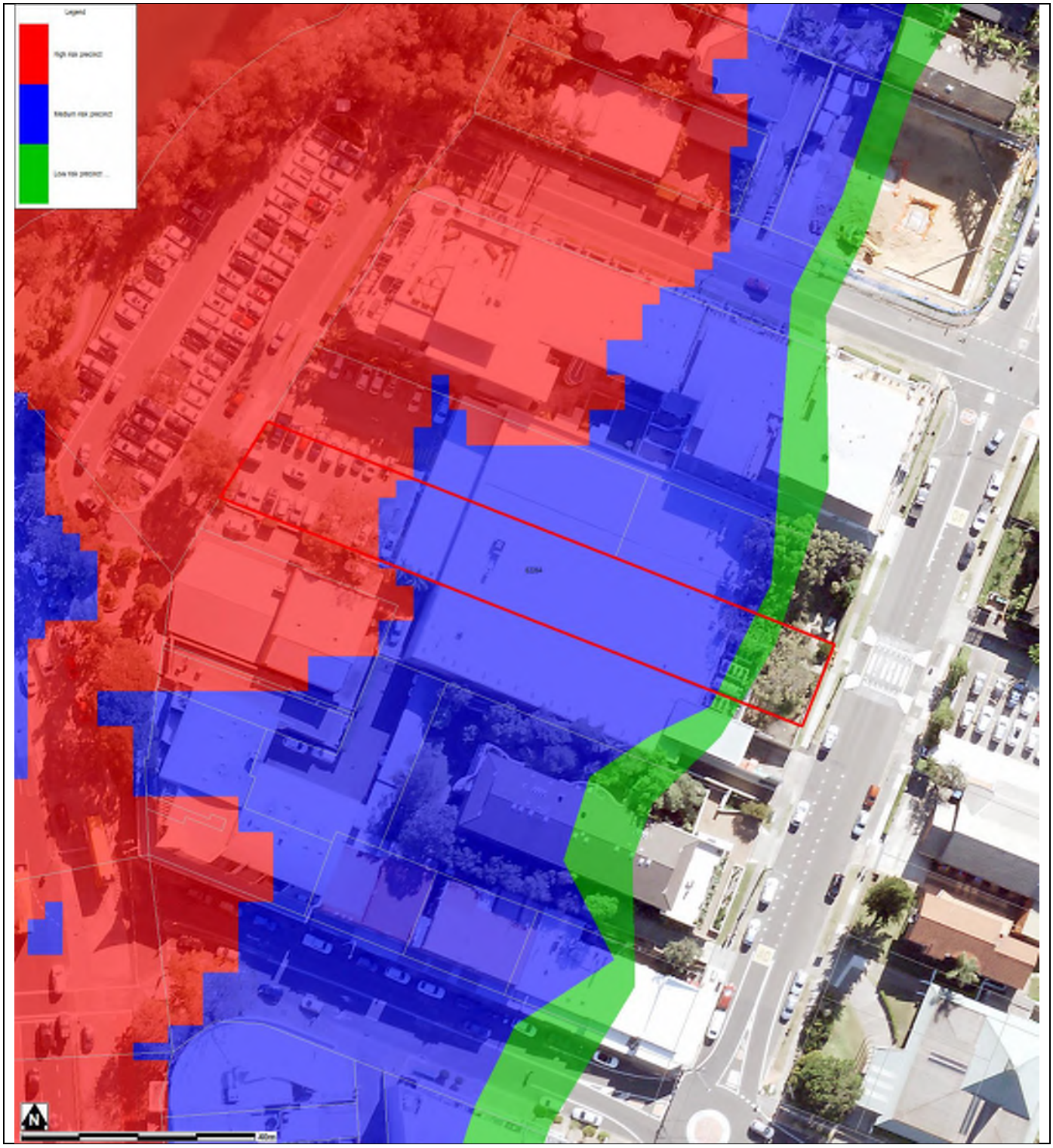
## Indicative Ground Surface Spot Heights – See Map H

[1] The flood information does not take into account any local overland flow issues nor private stormwater drainage systems.
[2] Overland flow/mainstream water levels may vary across a sloping site, resulting in variable minimum floor/ flood planning levels across the site. The maximum Flood Planning Level may be in a different location to the maximum 1% AEP flood level.
[3] Intensification of development in the former Pittwater LGA requires the consideration of climate change impacts which may result in higher minimum floor levels.
[4] Vulnerable/critical developments require higher minimum floor levels using the higher of the PMF or FPL.

**General Notes:**

- All levels are based on Australian Height Datum (AHD) unless otherwise noted.
- This is currently the best available information on flooding; it may be subject to change in the future.
- Council recommends that you obtain a detailed survey of the above property and surrounds to AHD by a registered surveyor to determine any features that may influence the predicted extent or frequency of flooding. It is recommended you compare the flood level to the ground and floor levels to determine the level of risk the property may experience should flooding occur.
- Development approval is dependent on a range of issues, including compliance with all relevant provisions of Northern Beaches Council's Local Environmental Plans and Development Control Plans.
- Please note that the information contained within this letter is general advice only as a detail survey of the property as well as other information is not available. Council recommends that you engage a suitably experienced consultant to provide site specific flooding advice prior to making any decisions relating to the purchase or development of this property.
- The Flood Studies on which Council's flood information is based are available on Council's website.

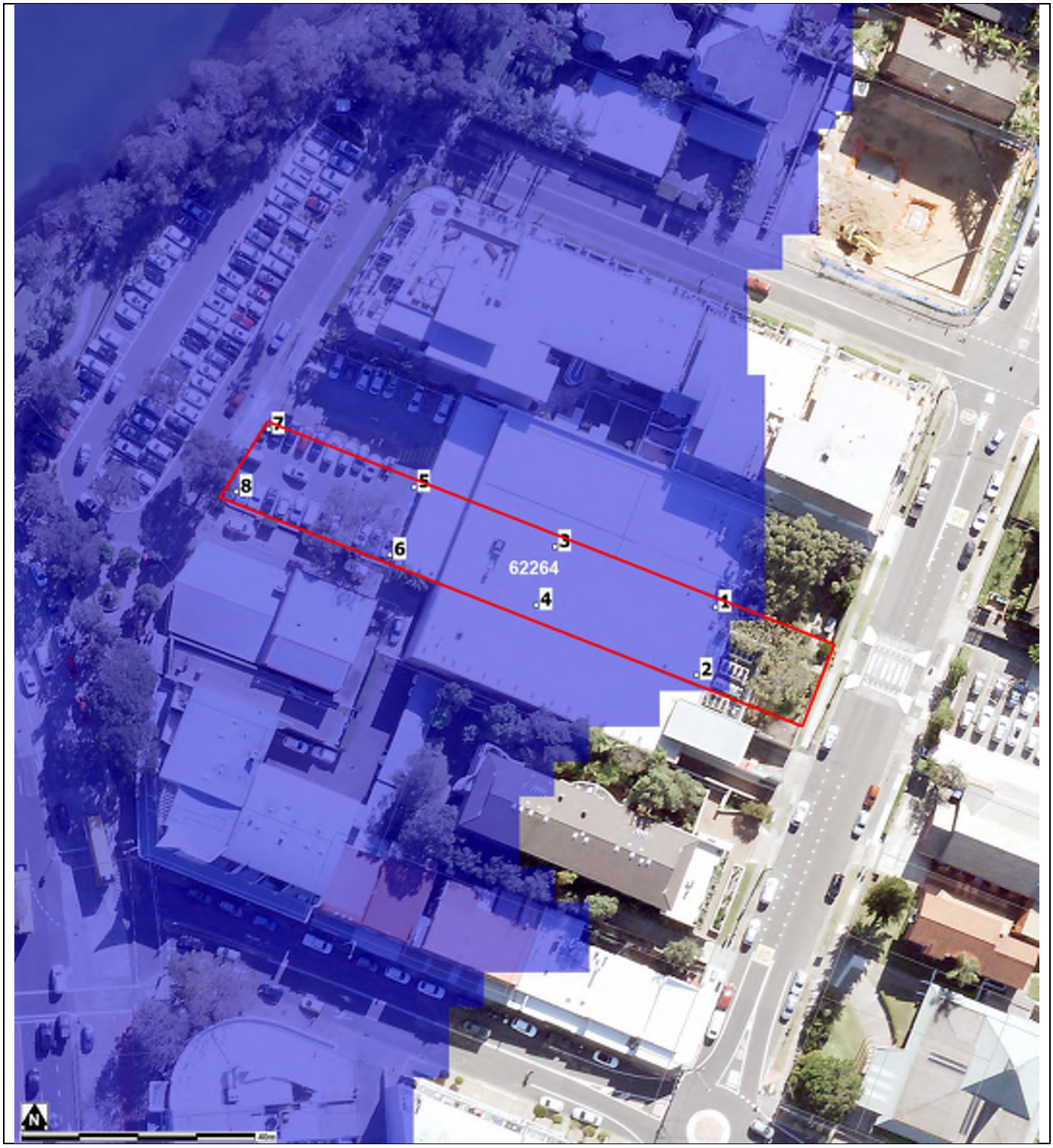
# FLOOD MAP A: FLOOD RISK PRECINCT MAP




Notes:

- **Low Flood Risk precinct** means all flood prone land not identified within the High or Medium flood risk precincts.
- **Medium Flood Risk precinct** means all flood prone land that is (a) within the 1% AEP Flood Planning Area; and (b) is not within the high flood risk precinct.
- **High Flood Risk precinct** means all flood prone land (a) within the 1% AEP Flood Planning Area; and (b) is either subject to a high hydraulic hazard, within the floodway or subject to significant evacuation difficulties (H5 or H6 Life Hazard Classification).
- The **Flood Planning Area** extent is equivalent to the Medium Flood Risk Precinct extent, and includes the High Flood Risk Precinct within it. The mapped extent represents the 1% annual Exceedance Probability (AEP) flood event + freeboard.
- None of these mapped extents include climate change.

# FLOOD LEVEL POINTS




Note: Cadastre Lines (Source: NSW Government Land and Property Information), flood levels/extents (Source: Narrabeen Lagoon Flood Study 2013, BMT WBM) and aerial photography (Source: NearMap 2014) are indicative only.

**Flood Levels**

| ID | 5% AEP Max WL (m AHD) | 5% AEP Max Depth (m) | 1% AEP Max WL (m AHD) | 1% AEP Max Depth (m) | 1% AEP Max Velocity (m/s) | Flood Planning Level (m) | PMF Max WL (m AHD) | PMF Max Depth (m) | PMF Max Velocity (m/s) |
|---|---|---|---|---|---|---|---|---|---|
| **1** | 2.67 | 0.18 | 3.03 | 0.55 | 0.01 | 3.53 | 4.91 | 2.43 | 0.19 |
| **2** | 2.67 | 0.07 | 3.03 | 0.32 | 0.00 | 3.53 | 4.91 | 1.99 | 0.05 |
| **3** | 2.67 | 0.42 | 3.03 | 0.78 | 0.01 | 3.53 | 4.91 | 2.66 | 0.03 |
| **4** | 2.67 | 0.33 | 3.03 | 0.70 | 0.01 | 3.53 | 4.91 | 2.58 | 0.21 |
| **5** | 2.67 | 0.45 | 3.03 | 0.82 | 0.04 | 3.53 | 4.91 | 2.69 | 0.07 |
| **6** | 2.67 | 0.48 | 3.03 | 0.85 | 0.11 | 3.53 | 4.91 | 2.73 | 0.26 |
| **7** | 2.67 | 1.18 | 3.03 | 1.54 | 0.28 | 3.53 | 4.91 | 3.42 | 0.38 |
| **8** | 2.67 | 1.01 | 3.03 | 1.38 | 0.33 | 3.53 | 4.91 | 3.25 | 0.39 |

WL – Water Level
PMF – Probable Maximum Flood
N/A = no peak water level/depth/velocity available in flood event

**Climate Change Flood Levels** (30% Rainfall intensity and 0.9m Sea Level Rise)

| ID | CC 1% AEP Max WL (m AHD) | CC1 % AEP Max Depth (m) |
|---|---|---|
| **1** | 3.90 | 1.42 |
| **2** | 3.90 | 0.98 |
| **3** | 3.90 | 1.66 |
| **4** | 3.90 | 1.57 |
| **5** | 3.90 | 1.69 |
| **6** | 3.90 | 1.72 |
| **7** | 3.90 | 2.41 |
| **8** | 3.90 | 2.25 |

WL – Water Level
PMF – Probable Maximum Flood
N/A = no peak water level/depth/velocity available in flood event.

A variable Flood Planning Level might apply. Freeboard is generally 0.5m above the maximum 1% AEP water level. However for overland flow with a depth less than 0.3m and a VelocityxDepth product less than $0.3m^2/s$, a freeboard of 0.3m may be able to be justified.

# FLOOD MAP B: FLOODING - 1% AEP EXTENT

Notes:

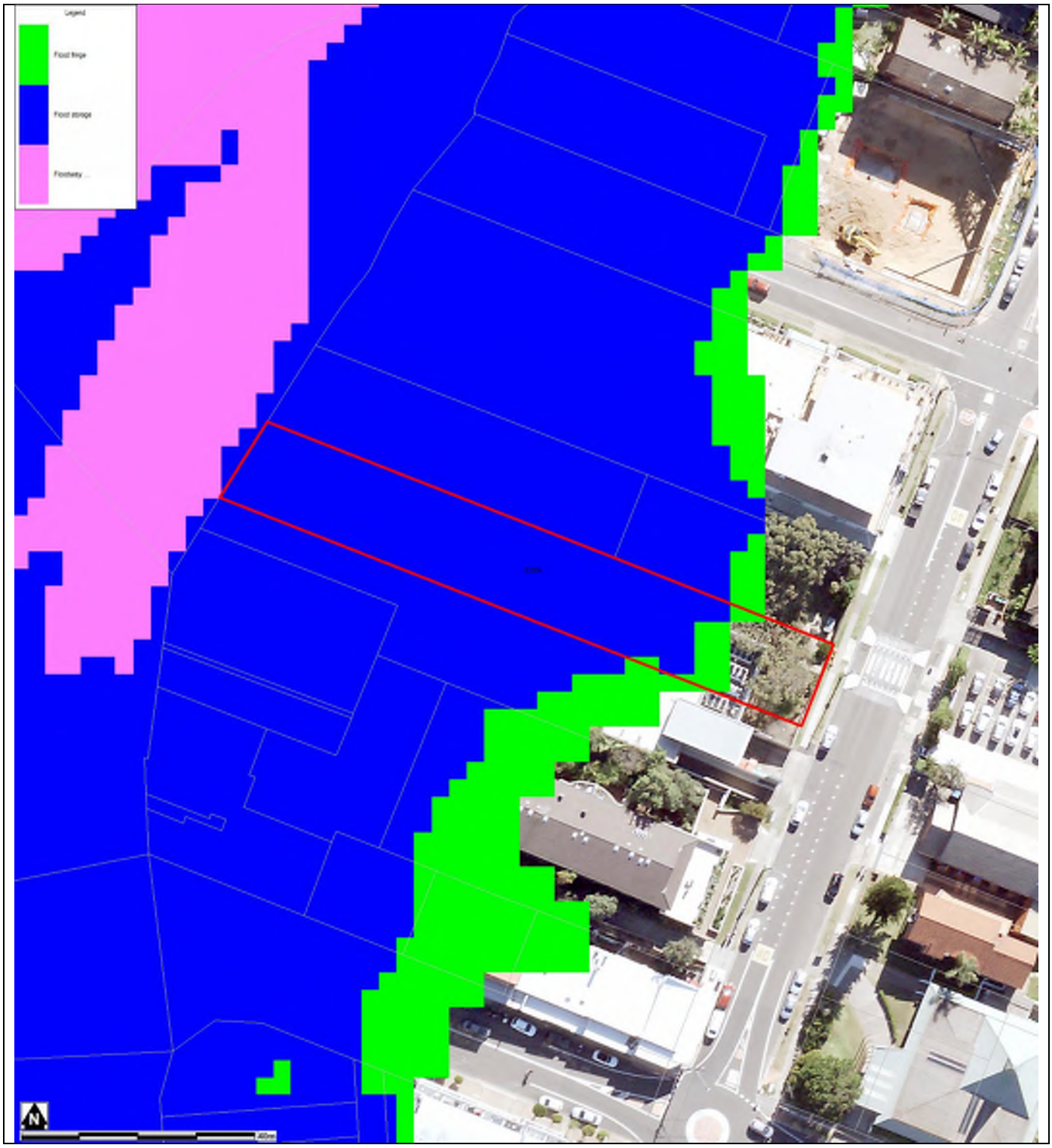
- Extent represents the 1% annual Exceedance Probability (AEP) flood event.
- Flood events exceeding the 1% AEP can occur on this site.
- Extent does not include climate change.
- Cadastre Lines (Source: NSW Government Land and Property Information), flood levels/extents (Source: Narrabeen Lagoon Flood Study 2013, BMT WBM) and aerial photography (Source Near Map 2014) are indicative only.

# FLOOD MAP C: PMF EXTENT MAP

Notes:

- Extent represents the Probable Maximum Flood (PMF)  flood event
- Extent does not include climate change
- Cadastre Lines (Source: NSW Government Land and Property Information), flood levels/extents (Source: Narrabeen Lagoon Flood Study 2013, BMT WBM) and aerial photography (Source: NearMap 2014) are indicative only

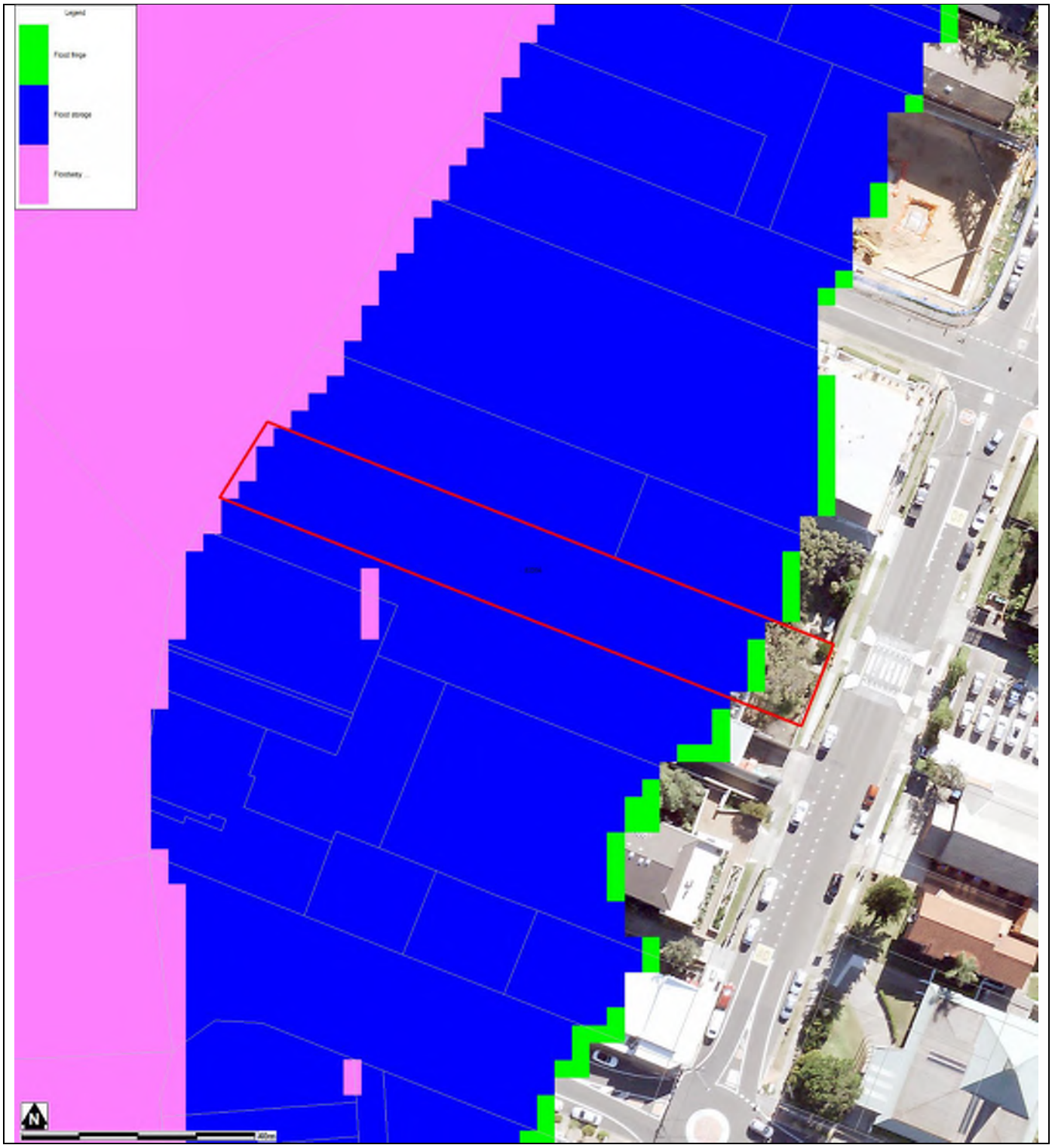
# FLOOD MAP D: 1% AEP FLOOD HYDRAULIC CATEGORY EXTENT MAP




Notes:

- Extent represents the 1% annual Exceedance Probability (AEP) flood event
- Extent does not include climate change
- Cadastre Lines (Source: NSW Government Land and Property Information), flood levels/extents (Source: Narrabeen Lagoon Flood Study 2013, BMT WBM) and aerial photography (Source: NearMap 2014) are indicative only

# FLOOD MAP E: PMF FLOOD HYDRAULIC CATEGORY EXTENT MAP




Notes:

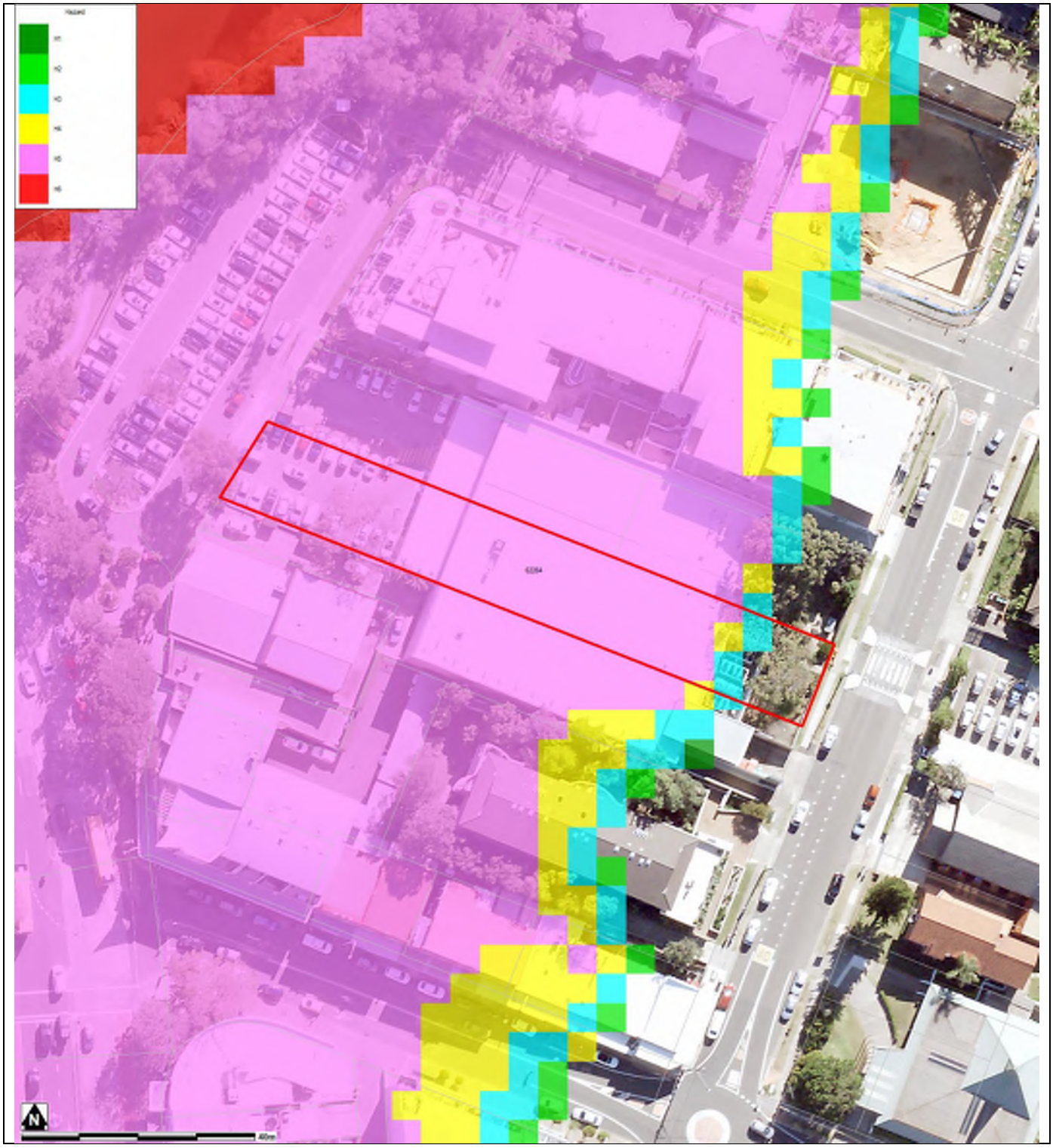
- Extent represents the Probable Maximum Flood (PMF) event
- Extent does not include climate change
- Cadastre Lines (Source: NSW Government Land and Property Information), flood levels/extents (Source: Narrabeen Lagoon Flood Study 2013, BMT WBM) and aerial photography (Source: NearMap 2014) are indicative only

# FLOOD MAP F: FLOODING – 1% AEP EXTENT PLUS CLIMATE CHANGE

Note:

- Extent represents the 1% annual Exceedance Probability (AEP) flood event including 30% rainfall intensity and 0.9m Sea Level Rise climate change scenario
- Flood events exceeding the 1% AEP can occur on this site.
- Cadastre Lines (Source: NSW Government Land and Property Information), flood levels/extents (Source: Narrabeen Lagoon Flood Study 2013, BMT WBM) and aerial photography (Source: NearMap 2014) are indicative only

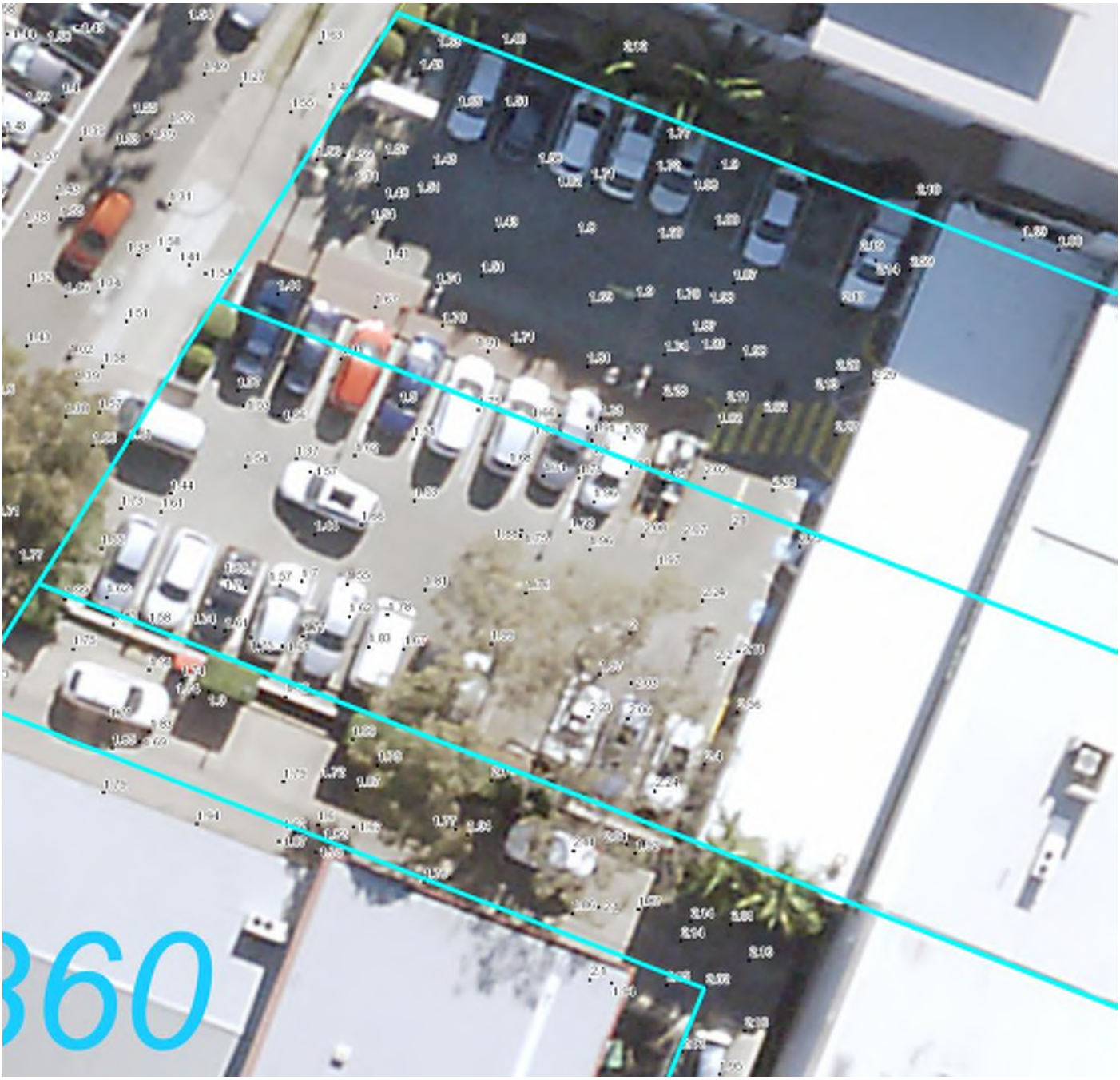
# FLOOD MAP G: FLOOD LIFE HAZARD CATEGORY



Notes:

- Cadastre Lines (Source: NSW Government Land and Property Information), flood levels/extents (Source: Narrabeen Lagoon Flood Study 2013, BMT WBM) and aerial photography (Source Near Map 2014) are indicative only.

# MAP H: INDICATIVE GROUND SURFACE SPOT HEIGHTS



Notes:

- The surface spot heights shown on this map were derived from Airborne Laser Survey and are indicative only.
- Accuracy is generally within ± 0.2m vertically and ± 0.15m horizontally, and Northern Beaches Council does not warrant that the data does not contain errors.
- If accuracy is required, then survey should be undertaken by a registered surveyor.

# Preparation of a Flood Management Report

### Introduction

These guidelines are intended to provide advice to applicants on how to determine what rules apply on flood prone land, and how to prepare a Flood Management Report. The purpose of a Flood Management Report is to demonstrate how a proposed development will comply with flood related planning requirements.

### Planning Requirements for Flood Prone Land

Development must comply with the requirements for developing flood prone land set out in the relevant Local Environment Plan (LEP) and Development Control Plan (DCP). There are separate LEPs and DCPs for each of the former Local Government Areas (LGAs), although preparation of a LGA-wide LEP and DCP is currently under way.

The clauses specific to flooding in the LEPs and DCPs are as follows:

| LEP Clauses | DCP Clauses |
|---|---|
| Manly LEP (2013) – 6.3 Flood Planning | Manly DCP (2013) – 5.4.3 Flood Prone Land |
| Warringah LEP (2011) – 6.3 Flood Planning<br>Warringah LEP (2000) – 47 Flood Affected Land * | Warringah DCP (2011) – E11 Flood Prone Land |
| Pittwater LEP (2014) – 7.3 Flood Planning<br>Pittwater LEP (2014) – 7.4 Flood Risk Management | Pittwater 21 DCP (2014) – B3.11 Flood Prone Land<br>Pittwater 21 DCP (2014) – B3.12 Climate Change |

* The Warringah LEP (2000) is relevant only for the “deferred lands” which affects only a very small number of properties, mostly in the Oxford Falls area.

Development on flood prone land must also comply with Council’s Water Management for Development Policy, and if it is in the Warriewood Release Area, with the Warriewood Valley Water Management Specification. Guidelines for Flood Emergency Response Planning are available for addressing emergency response requirements in the DCP. These documents can be found on Council’s website on the Flooding page.

Note that if the property is affected by estuarine flooding or other coastal issues, these need to be addressed separately under the relevant DCP clauses.

### When is a Flood Management Report required?

A Flood Management Report must be submitted with any Development Application on flood prone land (with exceptions noted below), for Council to consider the potential flood impacts and applicable controls. For Residential or Commercial development, it is required for development on land identified within the Medium or High Flood Risk Precinct. For Vulnerable or Critical development, it is required if it is within any Flood Risk Precinct.

There are some circumstances where a formal Flood Management Report undertaken by a professional engineer may not be required. However the relevant parts of the DCP and LEP would still need to be addressed, so as to demonstrate compliance. Examples where this may apply include:

- If all proposed works are located outside the relevant Flood Risk Precinct extent
- First floor addition only, where the floor level is above the Probable Maximum Flood level
- Internal works only, where habitable floor areas below the FPL are not being increased

Note that development on flood prone land will still be assessed for compliance with the relevant DCP and LEP, and may still be subject to flood related development controls.

**What is the purpose of a Flood Management Report?**

The purpose of a Flood Management Report is to demonstrate how a proposed development will comply with flood planning requirements, particularly the development controls outlined in the relevant LEP and DCP clauses. The report must detail the design, measures and controls needed to achieve compliance, following the steps outlined below.

A Flood Management Report should reflect the size, type and location of the development, proportionate to the scope of the works proposed, and considering its relationship to surrounding development. The report should also assess the flood risk to life and property.

**Preparation of a Flood Management Report**

The technical requirements for a Flood Management Report include (where relevant):

1. Description of development
   - Outline of the proposed development, with plans if necessary for clarity
   - Use of the building, hours of operation, proposed traffic usage or movement
   - Type of use, eg vulnerable, critical, residential, business, industrial, subdivision, etc

2. Flood analysis
   - 1% AEP flood level
   - Flood Planning Level (FPL)
   - Probable Maximum Flood (PMF) level
   - Flood Risk Precinct, ie High, Medium or Low
   - Flood Life Hazard Category
   - Mapping of relevant extents
   - Flood characteristics for the site, eg depth, velocity, hazard and hydraulic category, and the relevance to the proposed development

   If the property is affected by an Estuarine Planning Level (EPL) which is higher than the FPL, then the EPL should be used as the FPL. If the FPL is higher than the PMF level, then the FPL should still be used as the FPL, as it includes freeboard which the PMF does not.

3. Assessment of impacts

- Summary of compliance for each category of the DCP, as per the table below.

| | Compliance | | |
|---|---|---|---|
| | N/A | Yes | No |
| A) Flood effects caused by Development | | | |
| B) Building Components & Structural Soundness | | | |
| C) Floor Levels | | | |
| D) Car parking | | | |
| E) Emergency Response | | | |
| F) Fencing | | | |
| G) Storage of Goods | | | |
| H) Pools | | | |

- Demonstration of how the development complies with any relevant flood planning requirements from the DCP, LEP, Water Management for Development Policy, and if it is in the Warriewood Valley Urban Land Release Area, with the Warriewood Valley Water Management Specification (2001)

- For any non-compliance, a justification for why the development should still be considered.
- Calculations of available flood storage if compensatory flood storage is proposed
- Plan of the proposed development site showing the predicted 1% AEP and PMF flood extents, as well as any high hazard or floodway affectation
- Development recommendations and construction methodologies
- Qualifications of author - Council requires that the Flood Management Report be prepared by a suitably qualified Engineer with experience in flood design / management who has, or is eligible for, membership to the Institution of Engineers Australia
- Any flood advice provided by Council
- Any other details which may be relevant

Further information and guidelines for development are available on Council's website at:

https://www.northernbeaches.nsw.gov.au/planning-and-development/building-and-renovations/development-applications/guidelines-development-flood-prone-land

Council's Flood Team may be contacted on 1300 434 434 or at floodplain@northernbeaches.nsw.gov.au .

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**APPENDIX 2 - Natural Environment Referral Response – Flood dated 31/03/2022 - Northern Beaches Council**

# Natural Environment Referral Response - Flood

| | |
|---|---|
| **Application Number:** | DA2021/2656 |

| | |
|---|---|
| **Date:** | 26/02/2022 |
| **To:** | Dean Pattalis |
| **Land to be developed (Address):** | Lot 2 DP 527582 , 12 Lagoon Street NARRABEEN NSW 2101<br>Lot 4 DP 656541 , 12 Lagoon Street NARRABEEN NSW 2101<br>Lot A DP 371672 , 12 Lagoon Street NARRABEEN NSW 2101<br>Lot 1 DP 1078838 , 12 Lagoon Street NARRABEEN NSW 2101 |

**Reasons for referral**

This application seeks consent for the following:

- All Development Applications on land below the 1 in100 year flood level;
- All Development Applications located on land below the Probable Maximum Flood levels.

And as such, Council's Natural Environment Unit officers are required to consider the likely impacts on drainage regimes.

**Officer comments**

The proposed development includes the building of a "click and collect" facility, attached to the south-eastern part the existing building and extending into the car park. The existing external trolley area in this location (with a much smaller footprint than the proposed development) will be removed as part of these works.

The area is very flood affected, with the following relevant flood information:
5% AEP flood level: 2.67m AHD
1% AEP flood level: 3.03m AHD
Flood Planning Level (FPL): 3.53m AHD
Probable Maximum Flood (PMF) level: 4.91m AHD
Flood Risk Precinct: Most of the car park is in the High Flood Risk Precinct, and most of the existing building is in the Medium Flood Risk Precinct.
Hydraulic Category: The car park is entirely within the Flood Storage Area.

The proposed floor level of the "click and collect" facility is 2.62m AHD (the same as for the existing building), which is not only below the 1% AEP flood level, but also below the 5% AEP flood level.

The proposed development does not comply with the flood requirements of the DCP and LEP, and cannot be supported. In particular, the following requirements have not been met:
A2: "Development shall not be approved unless it can be demonstrated in a Flood Management Report that in all events up to the 1% AEP event there is no net loss of flood storage". The area is currently completely open and available for flood storage. Once enclosed, a large volume of flood storage will be lost. The Flood Management Report has not provided the volume of lost storage, nor even the area of

the proposed development.
C1: "New floor levels within the development shall be at or above the Flood Planning Level". The proposed floor level is 2.62m AHD, but it should be at at or above the FPL of 3.53m AHD.

The proposal is therefore unsupported.

Note: Should you have any concerns with the referral comments above, please discuss these with the Responsible Officer.

**Recommended Natural Environment Conditions:**

Nil.

henry&hymas

**APPENDIX 3 – Civil engineering design drawings by Henry & Hymas Engineers dated 20/05/2022**

# ALTERATIONS AND ADDITIONS - WOOLWORTHS NARRABEEN, 12 LAGOON STREET, NARRABEEN, NSW
# CIVIL ENGINEERING WORKS

## GENERAL NOTES:

1. ALL WORK TO BE CARRIED OUT IN ACCORDANCE WITH NORTHERN BEACHES COUNCIL COURSE OF THE WORKS.
2. ALL NEW WORKS ARE TO MAKE A SMOOTH JUNCTION WITH EXISTING CONDITIONS AND MARRY IN A 'WORKMANLIKE' MANNER.
3. THE CONTRACTOR IS TO VERIFY THE LOCATION OF ALL SERVICES WITH EACH RELEVANT AUTHORITY. ANY DAMAGE TO SERVICES SHALL BE RECTIFIED BY THE CONTRACTOR OR THE RELEVANT AUTHORITY AT THE CONTRACTOR'S EXPENSE. SERVICES SHOWN ON THESE PLANS ARE ONLY THOSE EVIDENT AT THE TIME OF SURVEY OR AS DETERMINED FROM SERVICE DIAGRAMS. H & H CONSULTING ENGINEERS PTY. LTD CANNOT GUARANTEE THE INFORMATION SHOWN NOR ACCEPT ANY RESPONSIBILITY FOR INACCURACIES OR INCOMPLETE DATA.
4. SERVICES & ACCESSES TO THE EXISTING PROPERTIES ARE TO BE MAINTAINED IN WORKING ORDER AT ALL TIMES DURING CONSTRUCTION.
5. ADJUST EXISTING SERVICE COVERS TO SUIT NEW FINISHED LEVELS TO RELEVANT AUTHORITY REQUIREMENTS WHERE NECESSARY.
6. REINSTATE AND STABILISE ALL DISTURBED LANDSCAPED AREAS.
7. MINIMUM GRADE OF SUBSOIL SHALL BE 0.5% (1:200) FALL TO OUTLETS.
8. ALL TEMPORARY SEDIMENT AND EROSION CONTROL DEVICES ARE TO BE CONSTRUCTED, PLACED AND MAINTAINED IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS, EROSION AND SEDIMENTATION CONTROL PLAN AND NORTHERN BEACHES COUNCIL REQUIREMENTS WHERE APPLICABLE.
9. CONTRACTOR TO CHECK AND CONFIRM SITE DRAINAGE CONNECTIONS ACROSS THE VERGE PRIOR TO COMMENCEMENT OF SITE DRAINAGE WORKS.
10. PROPERTIES AFFECTED BY THE WORKS ARE TO BE NOTIFIED IN ADVANCE WHERE DISRUPTION TO EXISTING ACCESS IS LIKELY.

## EXISTING SERVICES & FEATURES

- THE CONTRACTOR SHALL ALLOW FOR THE CAPPING OFF, EXCAVATION AND REMOVAL (IF REQUIRED) OF ALL EXISTING SERVICES IN AREAS AFFECTED BY WORKS WITHIN THE CONTRACT AREA OR AS SHOWN ON THE DRAWINGS UNLESS DIRECTED OTHERWISE BY THE SUPERINTENDENT.
- THE CONTRACTOR SHALL ENSURE THAT AT ALL TIMES SERVICES TO ALL BUILDINGS NOT AFFECTED BY THE WORKS ARE NOT DISRUPTED.
- PRIOR TO COMMENCEMENT OF ANY WORKS THE CONTRACTOR SHALL GAIN APPROVAL OF HIS PROGRAM FOR THE RELOCATION/ CONSTRUCTION OF TEMPORARY SERVICES.
- CONTRACTOR SHALL CONSTRUCT TEMPORARY SERVICES TO MAINTAIN SUPPLY TO EXISTING BUILDING REMAINING IN OPERATION DURING WORKS TO THE SATISFACTION AND APPROVAL OF THE SUPERINTENDENT. ONCE DIVERSION IS COMPLETE AND COMMISSIONED, THE CONTRACTOR SHALL REMOVE ALL SUCH TEMPORARY SERVICES AND MAKE GOOD TO THE SATISFACTION OF THE SUPERINTENDENT.
- INTERRUPTION TO SUPPLY OF EXISTING SERVICES SHALL BE DONE SO AS NOT TO CAUSE ANY INCONVENIENCE TO THE PRINCIPAL. CONTRACTOR TO GAIN APPROVAL FROM THE SUPERINTENDENT FOR TIME OF INTERRUPTION.
- EXISTING SERVICES, BUILDINGS, EXTERNAL STRUCTURES AND TREES SHOWN ON THESE DRAWINGS ARE EXISTING FEATURES PRIOR TO ANY DEMOLITION WORKS.
- EXISTING SERVICES UNLESS SHOWN ON SURVEY PLAN HAVE BEEN PLOTTED FROM SERVICES SEARCH PLANS AND AS SUCH THEIR ACCURACY CANNOT BE GUARANTEED. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COMPLETE A 'DIAL BEFORE YOU DIG' SEARCH AND TO ESTABLISH THE LOCATION AND LEVEL OF ALL EXISTING SERVICES PRIOR TO THE COMMENCEMENT OF ANY WORK. ANY DISCREPANCIES SHALL BE REPORTED TO THE SUPERINTENDENT. CLEARANCES SHALL BE OBTAINED FROM THE RELEVANT SERVICE AUTHORITY.
- ALL BRANCH GAS AND WATER SERVICES UNDER DRIVEWAYS AND BRICK PAVING SHALL BE LOCATED IN Ø80 uPVC SEWER GRADE CONDUITS EXTENDING A MINIMUM OF 500mm BEYOND EDGE OF PAVING.

## LOCALITY SKETCH

SCALE: NTS

| DRAWING SCHEDULE | |
|---|---|
| 21Q72_DA_C000 | COVER SHEET, DRAWING SCHEDULE, NOTES AND LOCALITY SKETCH |
| 21Q72_DA_C101 | DETAIL PLAN |
| 21Q72_DA_C110 | KERBING AND KERB RAMP DETAILS |
| 21Q72_DA_C400 | FLOOD CONTROLS DETAIL PLAN & SECTIONS |
| 21Q72_DA_SE01 | SEDIMENT AND EROSION CONTROL PLAN |
| 21Q72_DA_SE02 | SEDIMENT AND EROSION CONTROL DETAILS |

## SITEWORKS NOTES

- DATUM : A.H.D.
- ORIGIN OF LEVELS : REFER TO BENCH OR STATE SURVEY MARKS WHERE SHOWN ON PLAN.
- CONTRACTOR MUST VERIFY ALL DIMENSIONS AND EXISTING LEVELS ON SITE PRIOR TO THE COMMENCEMENT OF WORK.
- ALL WORKS TO BE UNDERTAKEN IN ACCORDANCE WITH THE DETAILS SHOWN ON THE DRAWINGS & THE DIRECTIONS OF THE SUPERINTENDENT.
- EXISTING SERVICES UNLESS SHOWN ON THE SURVEY PLAN HAVE BEEN PLOTTED FROM SERVICES SEARCH PLANS AND AS SUCH THEIR ACCURACY CANNOT BE GUARANTEED. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ESTABLISH THE LOCATION AND LEVEL OF ALL EXISTING SERVICES PRIOR TO THE COMMENCEMENT OF ANY WORK. ANY DISCREPANCIES SHALL BE REPORTED TO THE SUPERINTENDENT. CLEARANCES SHALL BE OBTAINED FROM THE RELEVANT SERVICE AUTHORITY.
- WHERE NEW WORKS ABUT EXISTING THE CONTRACTOR SHALL ENSURE THAT A SMOOTH EVEN PROFILE, FREE FROM ABRUPT CHANGES IS ACHIEVED.
- THE CONTRACTOR SHALL ARRANGE ALL SURVEY SETOUT TO BE CARRIED OUT BY A REGISTERED SURVEYOR.
- CARE IS TO BE TAKEN WHEN EXCAVATING NEAR EXISTING SERVICES. NO MECHANICAL EXCAVATION IS TO BE UNDERTAKEN OVER TELSTRA OR ELECTRICAL SERVICES. HAND EXCAVATE IN THESE AREAS.
- CONTRACTOR TO OBTAIN AUTHORITY APPROVALS WHERE APPLICABLE.
- MAKE SMOOTH TRANSITION TO EXISTING SURFACES AND MAKE GOOD.
- THESE PLANS SHALL BE READ IN CONJUNCTION WITH APPROVED LANDSCAPE, ARCHITECTURAL, STRUCTURAL, HYDRAULIC AND MECHANICAL DRAWINGS AND SPECIFICATIONS
  OR WRITTEN INSTRUCTIONS THAT MAY BE ISSUED RELATING TO DEVELOPMENT AT THE SITE.
- TRENCHES THROUGH EXISTING ROAD AND CONCRETE PAVEMENTS SHALL BE SAWCUT TO FULL DEPTH OF CONCRETE AND A MINIMUM OF 50mm IN BITUMINOUS PAVING.
- ALL BRANCH GAS AND WATER SERVICES UNDER DRIVEWAYS AND BRICK PAVING SHALL BE LOCATED IN Ø80 uPVC SEWER GRADE CONDUITS EXTENDING A MINIMUM OF 500mm BEYOND EDGE OF PAVING.
- GRADES TO PAVEMENTS TO BE AS IMPLIED BY RL'S ON PLAN . GRADE EVENLY BETWEEN NOMINATED RL'S. AREAS EXHIBITING PONDING GREATER THAN 5mm DEPTH WILL NOT BE ACCEPTED UNLESS IN A DESIGNATED SAG POINT.
- ALL COVERS AND GRATES ETC TO EXISTING SERVICE UTILITIES ARE TO BE ADJUSTED TO SUIT NEW FINISHED SURFACE LEVELS WHERE APPLICABLE.

## SURVEY NOTES

THE EXISTING SITE CONDITIONS SHOWN ON THE FOLLOWING DRAWINGS HAVE BEEN INVESTIGATED BY THE SURVEYOR SPECIFIED IN THE TITLE BLOCK.
THE INFORMATION IS SHOWN TO PROVIDE A BASIS FOR DESIGN. HENRY AND HYMAS PTY. LTD. DOES NOT GUARANTEE THE ACCURACY OR COMPLETENESS OF THE SURVEY BASE OR ITS SUITABILITY AS A BASIS FOR CONSTRUCTION DRAWINGS.
SHOULD DISCREPANCIES BE ENCOUNTERED DURING CONSTRUCTION BETWEEN THE SURVEY DATA AND ACTUAL FIELD DATA, CONTACT HENRY AND HYMAS PTY. LTD. THE FOLLOWING NOTES HAVE BEEN TAKEN DIRECTLY FROM ORIGINAL SURVEY DOCUMENTS.

**FOR DA ONLY**

SURVEY INFORMATION
SURVEYED BY REALSERVE
DATUM: AHD
ORIGIN OF LEVELS: PM 20913

| REVISION | AMENDMENT | DRAWN | DESIGNED | DATE | REVISION | AMENDMENT | DRAWN | DESIGNED | DATE |
|---|---|---|---|---|---|---|---|---|---|
| 02 | ISSUED FOR DEVELOPMENT APPLICATION | MP | NW | 11.05.2022 | | | | | |
| 01 | ISSUED FOR DEVELOPMENT APPLICATION | MP | NW | 07.12.2021 | | | | | |

Client: Woolworths
Architect: MCHP

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Project: ALTERATIONS AND ADDITIONS - WOOLWORTHS NARRABEEN
12 LAGOON STREET, NARRABEEN, NSW

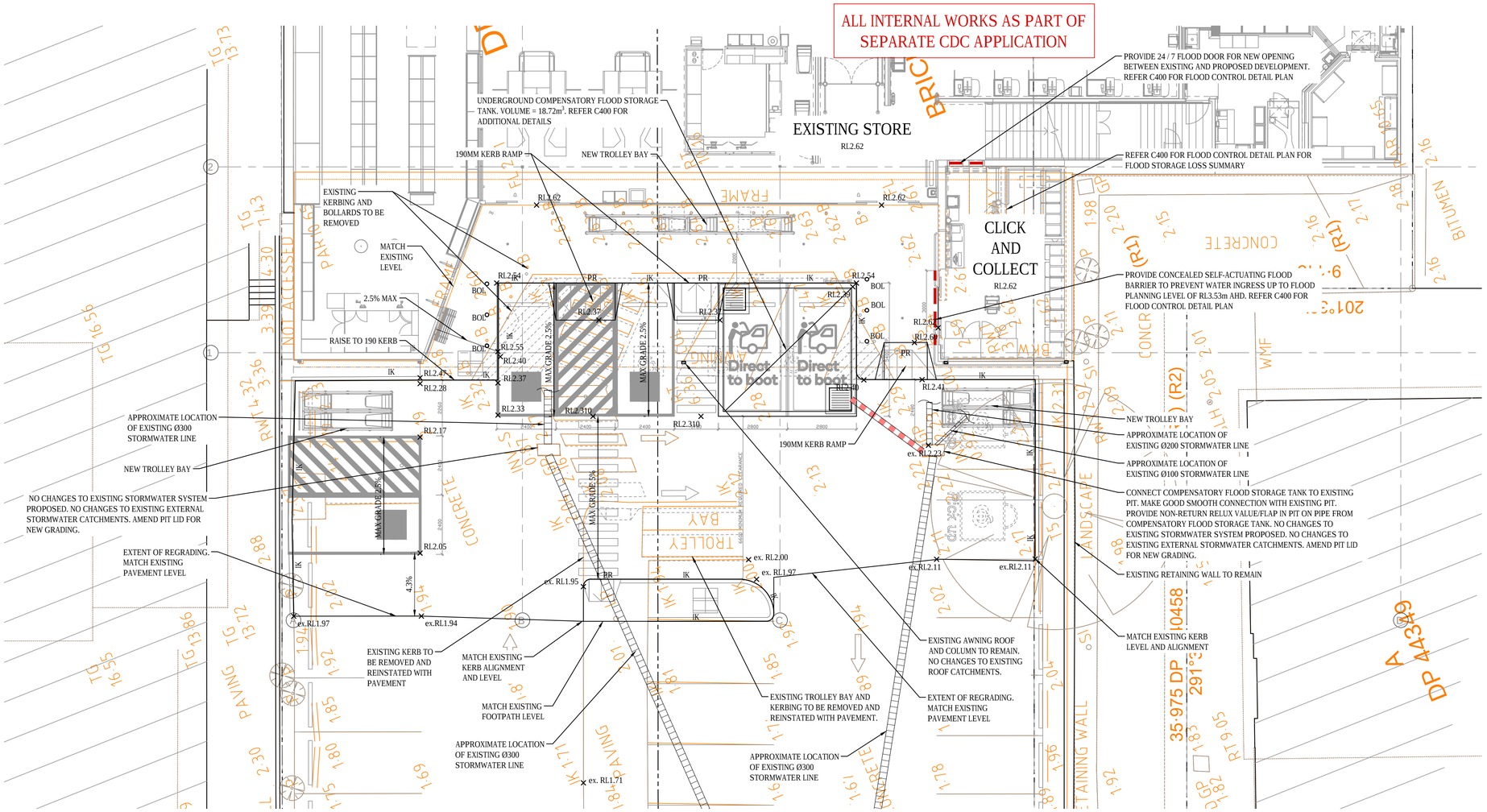
Title: COVER SHEET, DRAWING SCHEDULE, NOTES AND LOCALITY SKETCH

| Drawn | Designed | Date |
|---|---|---|
| M.Pereira | N.Wetzlar | DEC 2021 |
| Checked | Approved | Scale @A1 |
| A.Francis | A.Francis | NTS |

Drawing number: 21Q72_DA_C000
Revision: 02

## LEGEND

| | |
|---|---|
| | EXISTING BOUNDARY |
| RL 4.520 | PROPOSED SPOT LEVEL |
| ex.RL 4.520 | EXISTING SPOT LEVEL |
| IK | PROPOSED INTEGRAL KERB |
| BOL | PROPOSED BOLLARD |
| PR | PROPOSED KERB RAMP |
| | PROPOSED STORMWATER PIPE |
| | PROPOSED SURFACE INLET PITS |




## DETAIL PLAN

SCALE: 1:100

0 2 4 6 8 10m

2 1

SCALE 1:100

**FOR DA ONLY**

SURVEY INFORMATION

SURVEYED BY REALSERVE

DATUM: AHD

ORIGIN OF LEVELS: PM 20913

| REVISION | AMENDMENT | DRAWN | DESIGNED | DATE | REVISION | AMENDMENT | DRAWN | DESIGNED | DATE |
|---|---|---|---|---|---|---|---|---|---|
| 04 | ISSUED FOR DEVELOPMENT APPLICATION | MP | NW | 20.05.2022 | | | | | |
| 03 | ISSUED FOR DEVELOPMENT APPLICATION | MP | NW | 11.05.2022 | | | | | |
| 02 | ISSUED FOR DEVELOPMENT APPLICATION | MP | NW | 20.12.2021 | | | | | |
| 01 | ISSUED FOR DEVELOPMENT APPLICATION | MP | NW | 07.12.2021 | | | | | |

Client: Woolworths

Architect: MCHP

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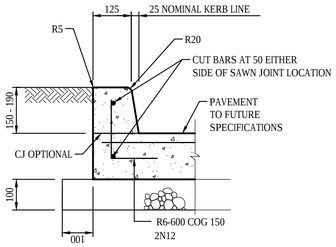
Project: ALTERATIONS AND ADDITIONS - WOOLWORTHS NARRABEEN
12 LAGOON STREET, NARRABEEN, NSW

Title: DETAIL PLAN

| Drawn | Designed | Date |
|---|---|---|
| M.Pereira | N.Wetzlar | NOV 2021 |
| Checked | Approved | Scale @A1 |
| A.Francis | A.Francis | 1:100 |

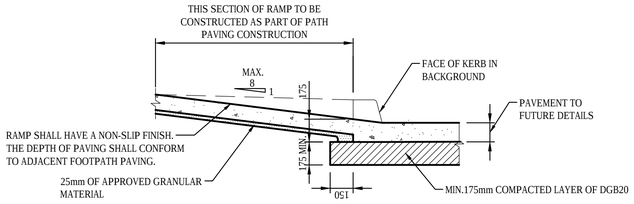
Drawing number: 21Q72_DA_C101

Revision: 04



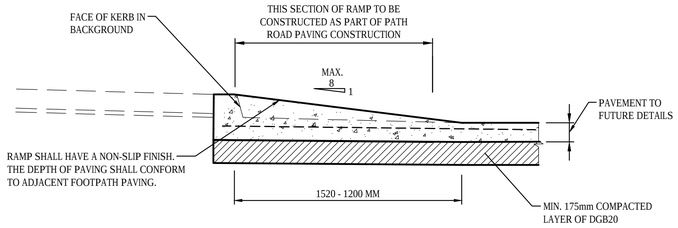

## INTEGRAL KERB (IK)

SCALE 1:10




SECTION 2 / -

SCALE: 1:20




SECTION 2 / -

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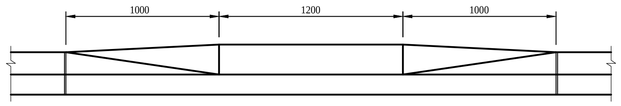
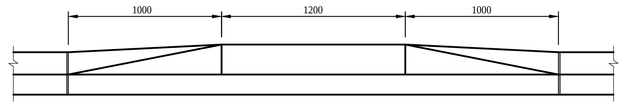



SECTION 1 / -

SCALE: 1:20



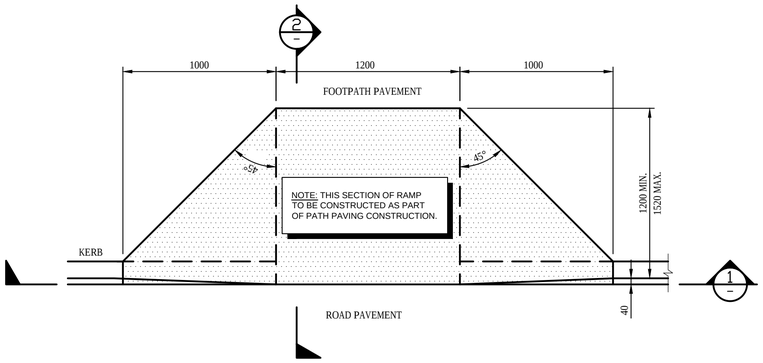

SECTION 1 / -

SCALE: 1:20

## KERBING NOTES:

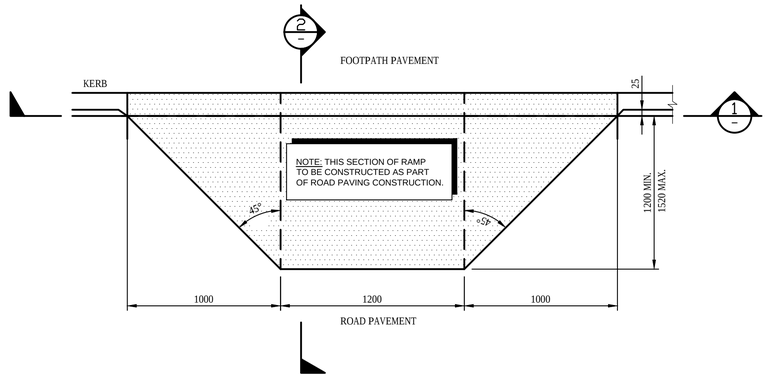
INCLUDES ALL KERBS, GUTTERS, DISH DRAINS, CROSSING AND EDGES.

1. ALL KERBS, GUTTERS, DISH DRAINS AND CROSSING TO BE CONSTRUCTED ON MINIMUM 75mm GRANULAR BASE COURSE COMPACTED TO MINIMUM 98% MODIFIED MAXIMUM DRY DENSITY IN ACCORDANCE WITH AS 1289 5.2.1.
2. EXPANSION JOINTS (EJ) TO BE FORMED FROM 10mm COMPRESSIBLE CORK FILTER BOARD FOR THE FULL DEPTH OF THE SECTION AND CUT TO PROFILE. EXPANSION JOINTS TO BE LOCATED AT DRAINAGE PITS, ON TANGENT POINTS OF CURVES AND ELSEWHERE AT 12m CENTRES EXCEPT FOR INTEGRAL KERBS WHERE THE EXPANSION JOINTS ARE TO MATCH THE JOINT LOCATION IN KERBS.
3. WEAKENED PLANE JOINTS TO BE MIN 3mm WIDE AND LOCATED AT 3m CENTRES EXCEPT FOR INTEGRAL KERBS WHERE WEAKENED PLANE JOINTS ARE TO MATCH THE JOINT LOCATIONS IN SLABS.
4. BROAMED FINISHED TO ALL RAMPED AND VEHICULAR CROSSINGS, ALL OTHER KERBING OR DISH DRAINS TO BE STEEL FLOAT FINISHED.
5. IN THE REPLACEMENT OF KERBS
   EXISTING ROAD PAVEMENT IS TO BE SAWCUT 900mm FROM LIP OF GUTTER.
   UPON COMPLETION OF NEW KERBS, NEW BASE COURSE AND SURFACE IS TO BE LAID 900mm WIDE TO MATCH EXISTING MATERIALS AND THICKNESS.
   EXISTING ALLOTMENT DRAINAGE PIPE ARE TO BE BUILT INTO NEW KERB WITH A 100mm DIA HOLE.
   EXISTING KERBS ARE TO BE COMPLETELY REMOVED WHERE NEW KERBS ARE SHOWN.




## INTERNAL - KERB RAMP DETAIL

SCALE 1:20




## EXTERNAL - KERB RAMP DETAIL

SCALE 1:20

0 200 400 600 800 1000mm
200 100
SCALE 1:10

0 400 800 1200 1600 2000mm
400 200
SCALE 1:20

**FOR DA ONLY**

SURVEY INFORMATION
SURVEYED BY REALSERVE
DATUM: AHD
ORIGIN OF LEVELS: PM 20913

| REVISION | AMENDMENT | DRAWN | DESIGNED | DATE | REVISION | AMENDMENT | DRAWN | DESIGNED | DATE |
|---|---|---|---|---|---|---|---|---|---|
| 02 | ISSUED FOR DEVELOPMENT APPLICATION | MP | NW | 11.05.2022 | | | | | |
| 01 | ISSUED FOR DEVELOPMENT APPLICATION | MP | NW | 07.12.2021 | | | | | |

Client: Woolworths

Architect: MCHP

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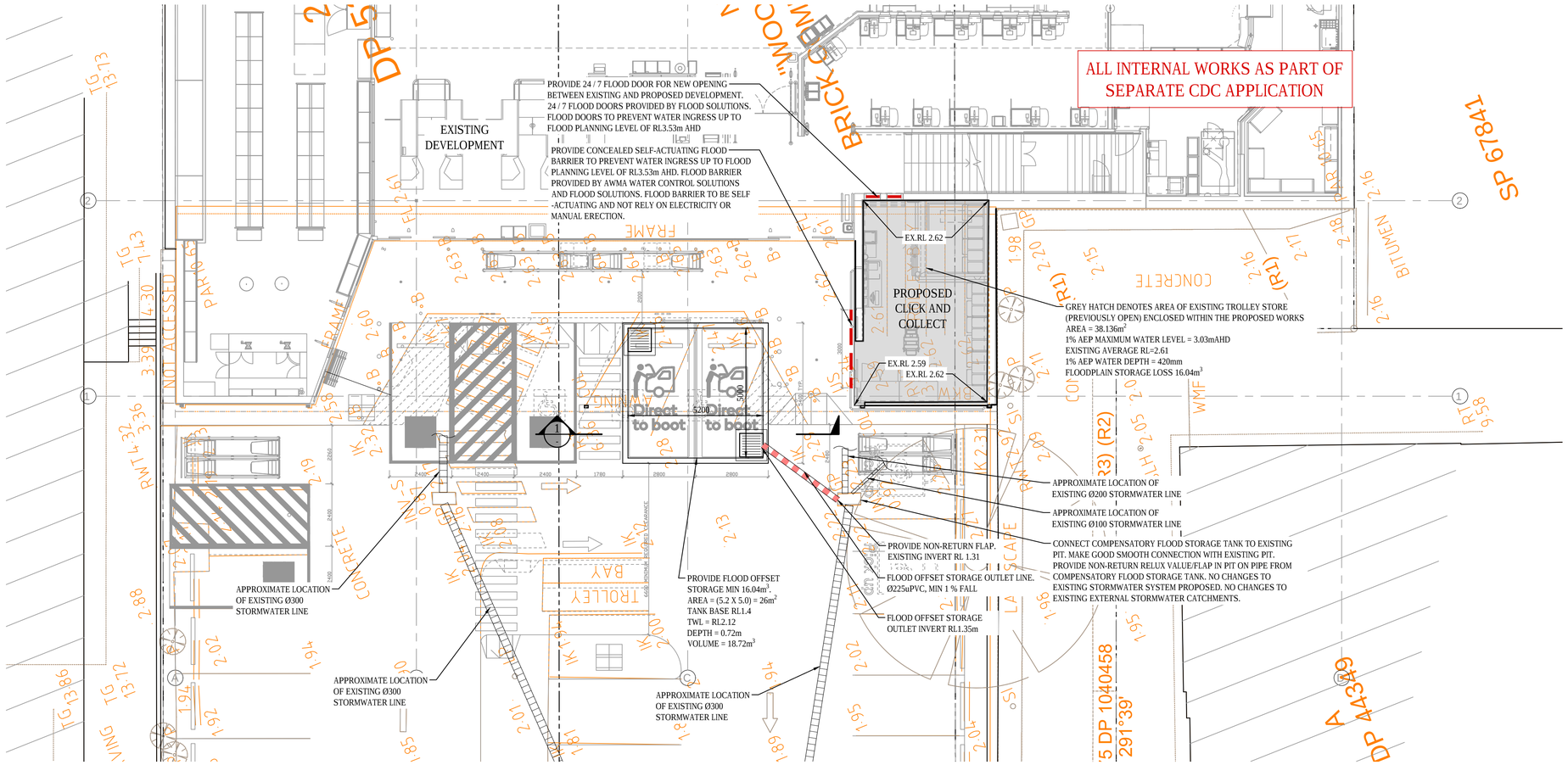
Project: ALTERATIONS AND ADDITIONS - WOOLWORTHS NARRABEEN
12 LAGOON STREET, NARRABEEN, NSW

Title: KERBING AND KERB RAMP DETAILS

| Drawn | Designed | Date |
|---|---|---|
| M.Pereira | N.Wetzlar | NOV 2021 |
| Checked | Approved | Scale @A1 |
| A.Francis | A.Francis | AS NOTED |

Drawing number: 21Q72_DA_C110

Revision: 02

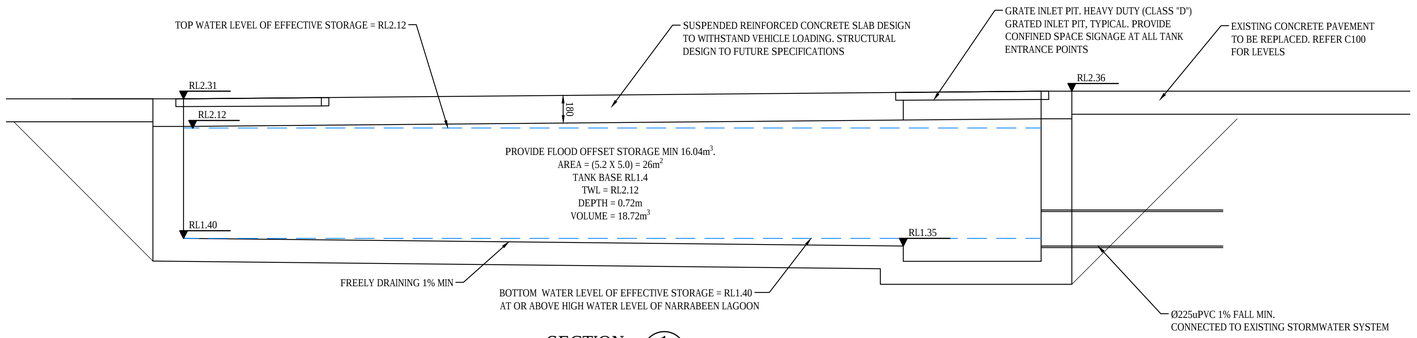



## LEGEND

- EXISTING BOUNDARY
- PROPOSED STORMWATER PIPE
- PROPOSED SURFACE INLET PITS

## FLOOD CONTROLS - DETAIL PLAN

SCALE: 1:100




## SECTION 1

SCALE: 1:20

## CONFINED SPACE DANGER SIGN

DANGER

CONFINED SPACE

NO ENTRY WITHOUT CONFINED SPACE TRAINING

| COLOURS: | | |
|---|---|---|
| | DANGER AND BACKGROUND | WHITE |
| | ELLIPTICAL AREA | RED |
| | RECTANGLE CONTAINING ELLIPSE | BLACK |
| | OTHER LETTERING AND BOARDER | BLACK |

## CONFINED SPACE DANGER SIGN NOTES

A) A CONFINED SPACE DANGER SIGN SHALL BE POSITIONED IN A LOCATION SUCH THAT IT IS CLEARLY VISIBLE TO PERSONS PROPOSING TO ENTER THE BELOW GROUND TANKS/ CONFINED SPACE AT ALL ACCESS POINTS OF THE TANK/ CONFINED SPACE.

B) SIGN TO BE MINIMUM DIMENSIONS:- 300mm x 450mm (LARGE ENTRIES SUCH AS DOORS)
250mm x 180mm (SMALL ENTRIES I.E.. GRATES, MANHOLES)

C) SIGN SHALL BE MANUFACTURED FROM COLOUR BONDED METAL OR POLYPROPYLENE

D) SIGN SHALL BE AFFIXED TO A SURFACE WITH SCREWS AT EACH CORNER.

0 400 800 1200 1600 2000mm
400 200
SCALE 1:20

0 2 4 6 8 10m
2 1
SCALE 1:100

**FOR DA ONLY**

SURVEY INFORMATION
SURVEYED BY REALSERVE
DATUM: AHD
ORIGIN OF LEVELS: PM 20913

| REVISION | AMENDMENT | DRAWN | DESIGNED | DATE | REVISION | AMENDMENT | DRAWN | DESIGNED | DATE |
|---|---|---|---|---|---|---|---|---|---|
| 02 | ISSUED FOR DEVELOPMENT APPLICATION | MP | NW | 20.05.2022 | | | | | |
| 01 | ISSUED FOR DEVELOPMENT APPLICATION | MP | NW | 11.05.2022 | | | | | |

Client: Woolworths

Architect: MCHP

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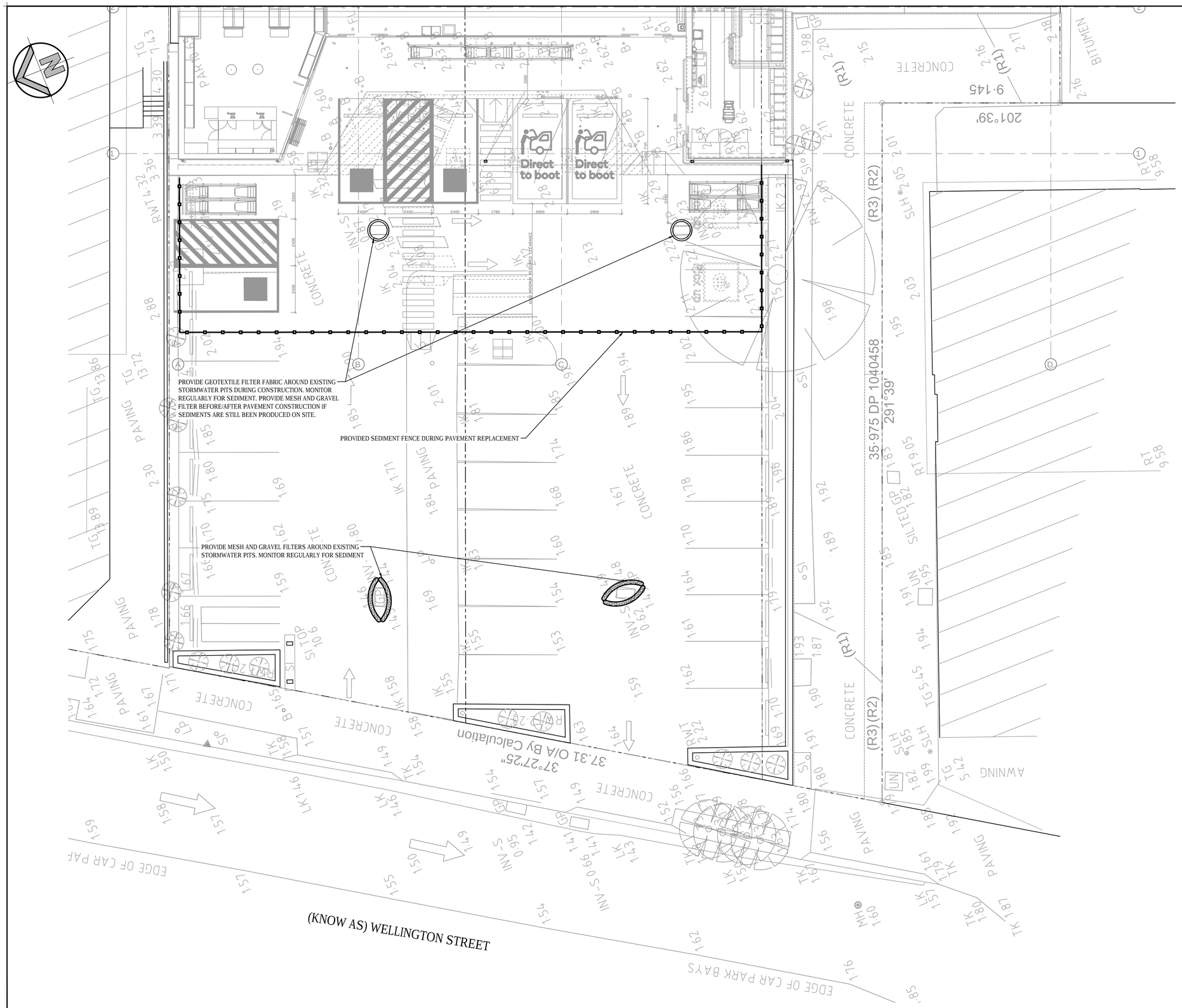
Project: ALTERATIONS AND ADDITIONS - WOOLWORTHS NARRABEEN
12 LAGOON STREET, NARRABEEN, NSW

Title: FLOOD CONTROLS - DETAIL PLAN AND SECTION

| Drawn | Designed | Date |
|---|---|---|
| M.Pereira | N.Wetzlar | NOV 2021 |
| Checked | Approved | Scale @A1 |
| A.Francis | A.Francis | AS NOTED |

Drawing number: 21Q72_DA_C400

Revision: 02




## LEGEND

- PROPOSED BOUNDARY
- PROPOSED SEDIMENTATION FENCE
- GEOTEXTILE INLET FILTER
- PROPOSED MESH & GRAVEL INLET FILTER

## SEDIMENT & EROSION CONTROL NOTES

- ALL SEDIMENT CONTROL DEVICES ARE TO BE CONSTRUCTED, PLACED AND MAINTAINED IN ACCORDANCE WITH NORTHERN BEACHES COUNCIL SPECIFICATIONS AND LANDCOM'S 'SOIL AND CONSTRUCTION' MANUAL.
- ALL PERIMETER & SILTATION CONTROL MEASURES ARE TO BE PLACED PRIOR TO, OR AS THE FIRST STEP IN EARTH WORKS AND/OR CLEARING.
- THE SEDIMENT & EROSION CONTROL PLAN MAY REQUIRE FUTURE ADJUSTMENT TO REFLECT CONSTRUCTION STAGING. IT IS ALSO THE CONTRACTORS RESPONSIBILTY TO PREPARE THEIR OWN SEDIMENT AND EROSION CONTROL PLAN WHICH SUITS THE DESIGNED CONSTRUCTION STAGING.
- FILTRATION BUFFER ZONES ARE TO BE FENCED OFF AND ACCESS PROHIBITED TO ALL PLANT AND MACHINERY.
- ALL TEMPORARY EARTH BERMS, DIVERSIONS & SILT DAM EMBANKMENTS ARE TO BE MACHINE COMPACTED, SEEDED & MULCHED FOR TEMPORARY VEGETATION COVER AS SOON AS THEY HAVE BEEN FORMED.
- ALL SEDIMENT TRAPPING STRUCTURES AND DEVICES ARE TO BE INSPECTED AFTER STORMS FOR STRUCTURAL DAMAGE OR CLOGGING. TRAPPED MATERIAL IS TO BE REMOVED TO A SAFE LOCATION.
- ALL TOPSOIL IS TO BE STOCKPILED ON SITE FOR REUSE (AWAY FROM TREES AND DRAINAGE LINES). MEASURES SHALL BE APPLIED TO PREVENT EROSION OF THE STOCKPILES.
- ALL EARTHWORK AREAS SHALL BE ROLLED EACH EVENING TO SEAL THE EARTHWORKS.
- ALL FILLS ARE TO BE LEFT WITH A LIP AT THE TOP OF THE SLOPE AT THE END. ALL CUT AND FILL SLOPES ARE TO BE SEEDED AND STRAW MULCHED WITHIN 14 DAYS OF COMPLETION OF FORMATION U.N.O. BY LANDSCAPE ARCHITECTS.
- UPON COMPLETION OF ALL EARTHWORKS OR AS DIRECTED BY COUNCIL SOIL CONSERVATION TREATMENTS SHALL BE APPLIED SO AS TO RENDER AREAS THAT HAVE BEEN DISTURBED, EROSION PROOF WITHIN 14 DAYS.
- EROSION AND SILT PROTECTION MEASURES ARE TO BE MAINTAINED AT ALL TIMES.

0 2 4 6 8 10m
2 1
SCALE 1:100

## SEDMENT AND EROSION CONTROL PLAN

SCALE: 1:100

**FOR DA ONLY**

SURVEY INFORMATION
SURVEYED BY REALSERVE
DATUM: AHD
ORIGIN OF LEVELS: PM 20913

| REVISION | AMENDMENT | DRAWN | DESIGNED | DATE | REVISION | AMENDMENT | DRAWN | DESIGNED | DATE |
|---|---|---|---|---|---|---|---|---|---|
| 03 | ISSUED FOR DEVELOPMENT APPLICATION | MP | NW | 11.05.2022 | | | | | |
| 02 | ISSUED FOR DEVELOPMENT APPLICATION | MP | NW | 20.12.2021 | | | | | |
| 01 | ISSUED FOR DEVELOPMENT APPLICATION | MP | NW | 07.12.2021 | | | | | |

Client: Woolworths

Architect: MCHP

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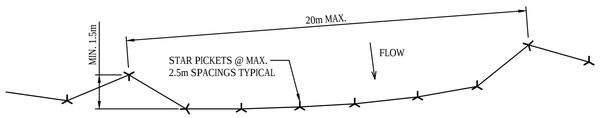
henry&hymas

Project: ALTERATIONS AND ADDITIONS - WOOLWORTHS NARRABEEN
12 LAGOON STREET, NARRABEEN, NSW

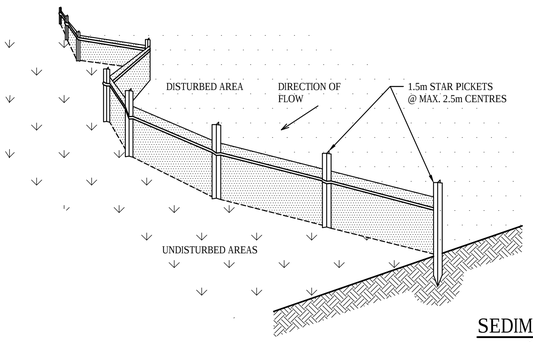
Title: SEDIMENT AND EROSION CONTROL PLAN

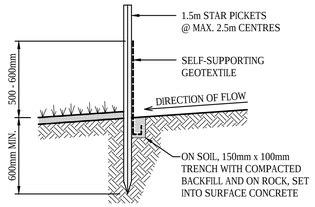
| Drawn | Designed | Date |
|---|---|---|
| M.Pereira | N.Wetzlar | NOV 2021 |
| Checked | Approved | Scale @A1 |
| A.Francis | A.Francis | 1:100 |

Drawing number: 21Q72_DA_SE01
Revision: 03




PLAN




SECTION DETAIL

## SEDIMENT FENCE

SCALE N.T.S.

### SEDIMENT FENCE CONSTRUCTION NOTES:

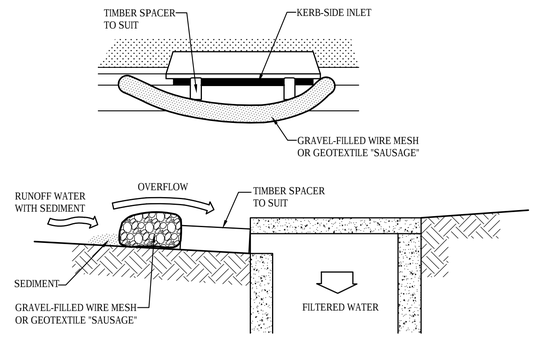
1. CONSTRUCT SEDIMENT FENCES AS CLOSE AS POSSIBLE TO BEING PARALLEL TO THE CONTOURS OF THE SITE, BUT WITH SMALL RETURNS AS SHOWN IN THE DRAWING TO LIMIT THE CATCHMENT AREA OF ANY ONE SECTION. THE CATCHMENT AREA SHOULD BE SMALL ENOUGH TO LIMIT WATER FLOW IF CONCENTRATED AT ONE POINT TO 50 LITRES PER SECOND IN THE DESIGN STORM EVENT, USUALLY THE 10-YEAR EVENT.

2. CUT A 150mm DEEP TRENCH ALONG THE UPSLOPE LINE OF THE FENCE FOR THE BOTTOM OF THE FABRIC TO BE ENTRENCHED.

3. 3. DRIVE 1.5m LONG STAR PICKETS INTO GROUND @ 2.5m INTERVALS (MAX.) AT THE DOWNSLOPE EDGE OF THE TRENCH. ENSURE ANY STAR PICKETS ARE FITTED WITH SAFETY CAPS.

4. 4. FIX SELF-SUPPORTING GEOTEXTILE TO THE UPSLOPE SIDE OF THE POSTS ENSURING IT GOES TO THE BASE OF THE TRENCH. FIX THE GEOTEXTILE WITH WIRE TIES OR AS RECOMMENDED BY THE MANUFACTURER. ONLY USE GEOTEXTILE SPECIFICALLY PRODUCED FOR SEDIMENT FENCING. THE USE OF SHADE CLOTH FOR THIS PURPOSE IS NOT SATISFACTORY.

5. 5. JOIN SECTIONS OF FABRIC AT A SUPPORT POST WITH A 150mm OVERLAP. 6. BACKFILL THE TRENCH OVER THE BASE OF THE FABRIC AND COMPACT IT THOROUGHLY OVER THE GEOTEXTILE.

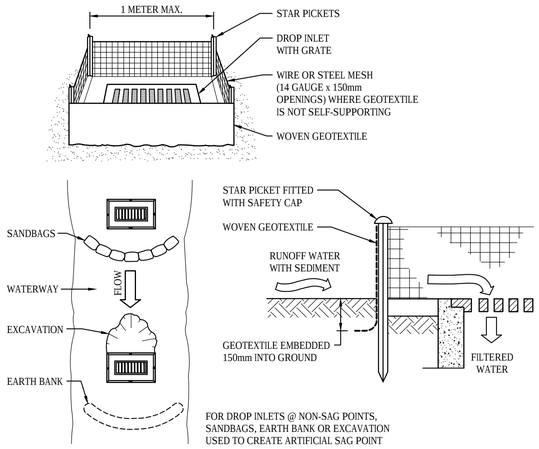



### MESH & GRAVEL INLET FILTER CONSTRUCTION NOTES:

1. FABRICATE A SLEEVE MADE FROM GEOTEXTILE OR WIRE MESH LONGER THAN THE LENGTH OF THE INLET PIT AND FILL IT WITH 25mm TO 50mm GRAVEL.
2. FORM AN ELLIPTICAL CROSS-SECTION ABOUT 150mm HIGH x 400mm WIDE.
3. PLACE THE FILTER AT THE OPENING LEAVING AT LEAST A 100mm SPACE BETWEEN IT AND THE KERB INLET. MAINTAIN THE OPENING WITH SPACER BLOCKS.
4. FORM A SEAL WITH THE KERB TO PREVENT SEDIMENT BYPASSING THE FILTER.
5. SANDBAGS FILLED WITH GRAVEL CAN SUBSTITUTE FOR THE MESH OR GEOTEXTILE PROVIDING THEY ARE PLACED SO THAT THEY CAN FIRMLY ABUT EACH OTHER AND SEDIMENT / LADEN WATERS CANNOT PASS BETWEEN.

## MESH & GRAVEL INLET FILTER

SCALE N.T.S.




### GEOTEXTILE INLET FILTER CONSTRUCTION NOTES:

1. FABRICATE A SEDIMENT BARRIER MADE FROM GEOTEXTILE.
2. PICKET SPACING TO BE MAXIMUM 1.0m.
3. IN WATERWAYS, ARTIFICIAL SAG POINTS CAN BE CREATED WITH SANDBAGS OR EARTH BANKS AS SHOWN IN THE DRAWING.
4. DO NOT COVER THE INLET WITH GEOTEXTILES UNLESS THE DESIGN IS ADEQUATE TO ALLOW FOR ALL WATERS TO BYPASS IT.

## GEOTEXTILE INLET FILTER

SCALE N.T.S.

**FOR DA ONLY**

SURVEY INFORMATION
SURVEYED BY REALSERVE
DATUM: AHD
ORIGIN OF LEVELS: PM 20913

| REVISION | AMENDMENT | DRAWN | DESIGNED | DATE | REVISION | AMENDMENT | DRAWN | DESIGNED | DATE |
|---|---|---|---|---|---|---|---|---|---|
| 02 | ISSUED FOR DEVELOPMENT APPLICATION | MP | NW | 11.05.2022 | | | | | |
| 01 | ISSUED FOR DEVELOPMENT APPLICATION | MP | NW | 07.12.2021 | | | | | |

Client: Woolworths

Architect: MCHP

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| Project | | |
|---|---|---|
| ALTERATIONS AND ADDITIONS - WOOLWORTHS NARRABEEN<br>12 LAGOON STREET, NARRABEEN, NSW | | |
| Title: SEDIMENT AND EROSION CONTROL DETAILS | | |

| Drawn | Designed | Date |
|---|---|---|
| M.Pereira | N.Wetzlar | NOV 2021 |
| Checked: A.Francis | Approved: A.Francis | Scale @A1: NTS |

| Drawing number | Revision |
|---|---|
| 21Q72_DA_SE02 | 02 |

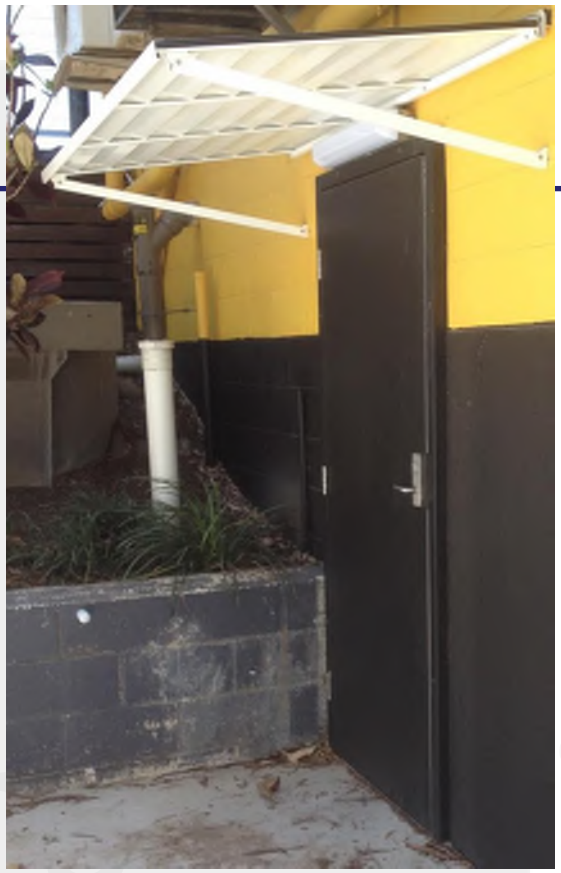
henry&hymas

**APPENDIX 4 – Samples and Specifications for flood measures**

Flooding Solutions
ADVISORY GROUP

# 24/7 FLOOD DOOR PRODUCT INFORMATION

# MODEL: FS-015



# 24/7 FLOOD DOOR
# OPERATION & MAINTENANCE MANUAL

## TABLE OF CONTENTS


| | Page |
|---|---|
| 1. Performance Criteria | 3 |
| 2. Material & References | 4 |
| 3. Maintenance Instructions | 5 |
| 4. Reference Drawings | 6 - 7 |

# 24/7 FLOOD DOOR

# FITTING & MAINTENANCE INSTRUCTIONS

PRODUCT SPECIFICATION:

24/7 FLOOD DOOR

Note: Designed for installation into structural masonry or steel walls to provide a flood water resistant access door.

1. Performance Criteria

- Door Metal Sections

- Door support frames (door jam) are designed to transfer the total developed hydrostatic loads to building structure supporting walls and floors. The modular frame overlaps external wall fabric to ensure the transferred hydrostatic loads are applied evenly over the total perimeter contact between door frame and building structure. Fixing points are provided only for locating and alignment of door frame. The door frame design provides sealing connecting profiles to allow the frame to be totally sealed into the buildings structure.

- Doors are designed to transfer the developed hydrostatic loads to the door frame via the heavy duty ball bearing roll hinges and seals.

- Design safety factor of door elements are rated against design flood levels to maintain a minimum 2:1 relationship. Metal yield strengths are selected based on the total N/m2 able to be developed as a result of design flood height.

- Door water seal performance is based on the intent of the BSI British Standards PAS 118-1:2009 for Flood Protection Products – Specification Part 1: Building Aperture Products.

- Seal performance under design flood levels for water formula.

  Pressure in liquid = depth x density x gravitational acceleration.

  I.e. At 2.5m depth = 24525N/m2
  Design allowance 2.5 times design flood pressure.
  Effective water seal exceeds the intent of design standards allowable leakage rate under design flood level.

- Seal performance under air pressure difference.

Stack Effect

Maximum probable pressure differential at lobby or lower level of buildings due to warmer air purging from top levels of building in winter typically 50Pa. i.e. Higher external air pressure as a result of lower density of warmer air in internal zones of building.

Note: this stack effect is opposite in summer with negative external air pressure relationship to positive internal air pressure.

Fan Pressurization

Ventilation by fans may cause a pressure differential within building zones allowing a possible lower internal air pressure at lower level of buildings. Typically this is equivalent to stack effect pressures to offset a negative pressure differential within internal building zones. Note that 50Pa pressure differentials between building internal zones to external of building are typical maximums. Total N/m2 = 50.

The net effect on door seals is nil as the pressure containment ratings of seals for water containment exceeds that possible of air pressure by a factor of 490 to 1.

---

## 2. Material & References

- Door Support Frame (door jam)
  - Aluminium/zinc coated sheet steel roll formed in heavy duty 2.5mm base steel to AS 1397.

- Door Frame
  - Heavy duty duragal S.H.S – 35mm x 35mm x 3.2mm thick grade C450L0 to AS 1163.

- Door Lining
  - Aluminium/zinc coated sheet steel roll formed in heavy duty 1.6mm base steel to AS 1397.

- Threshold/Lower Door Seal Strike Plate
  - Aluminium/zinc coated sheet steel roll formed in heavy duty 3.0mm base steel to AS 1397.

- Fixing & Hinge Support Blocks
  - Hot rolled structural steel bars and sections to AS 3679 -1990

- Water Seal Retaining Sections
  - Aluminium sections to selected profiles.

- Operation Hinge System
  - Stainless steel KARA SS304/12 ball bearing roll 40mm x 40mm hinge.

- Door Water Seals
- Base: EPDM flat section 10mm x 40mm retained with S/S 40mm x 3mm flat bar.
- Vertical door jam: Rubber EPDM P section no. P107.

- Door Surface Finish
- All surfaces provided with prime coat for finish paint by other.

- Door Locks
- As selected by client.

Notes:
- Door lock compartment sealed as separate section with door lock flange sealed to door fabric.

---

## 3. Maintenance Instructions:

- Lubrication:
- Lubricate flood door hinges.

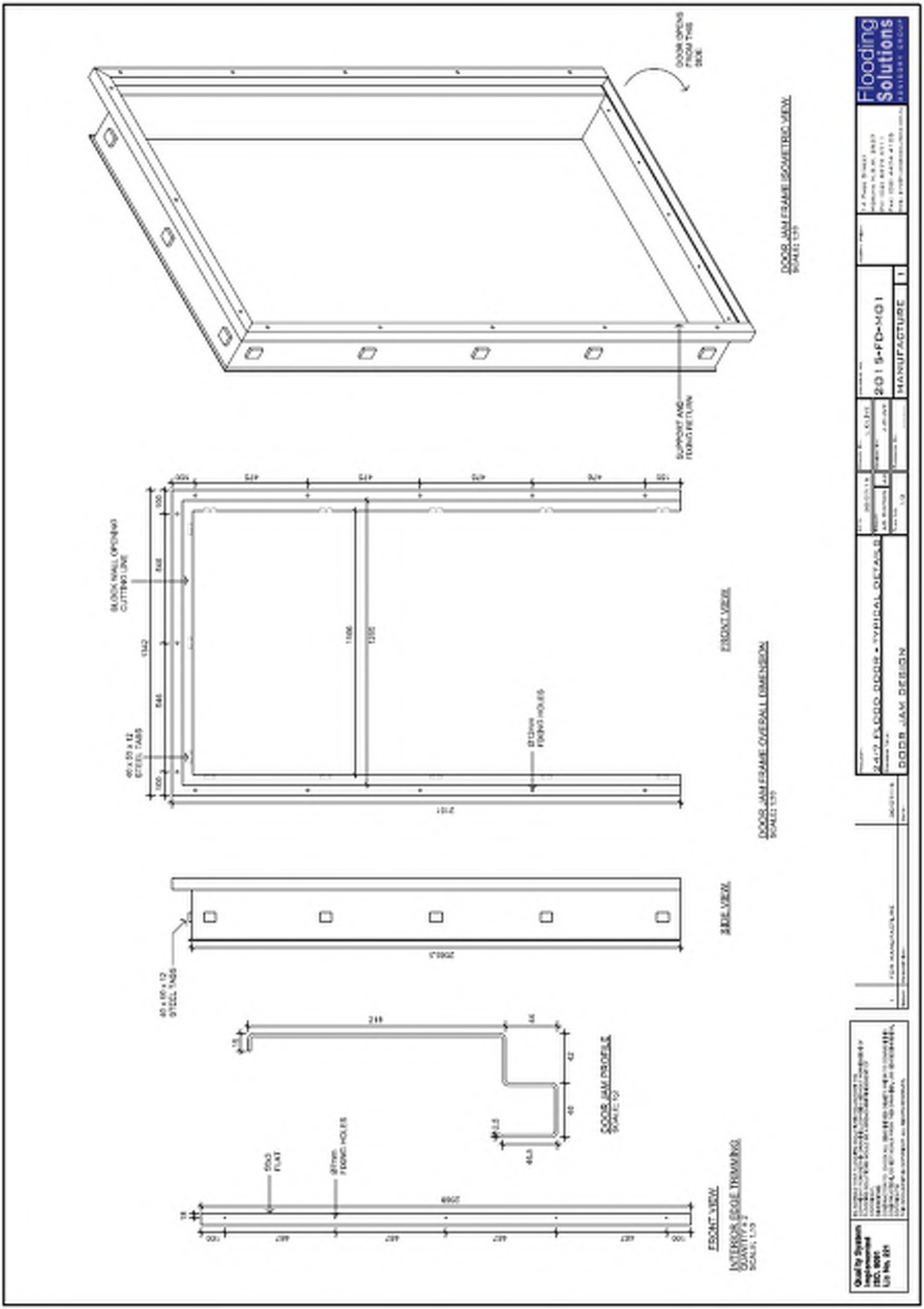
- Seals:
- Check compression seal for adhesion and perishing.
- Check seal for wear or damage.
- Check base seal for wear or damage.
- Replace if any evidence of seal fatigue or damage.
- Replace seal by removing containment plates, remove old seal and install replacement seal.
- Confirm position of seal and tighten containment plate.
- Ensure seal is located in correct position, equal to original seal.

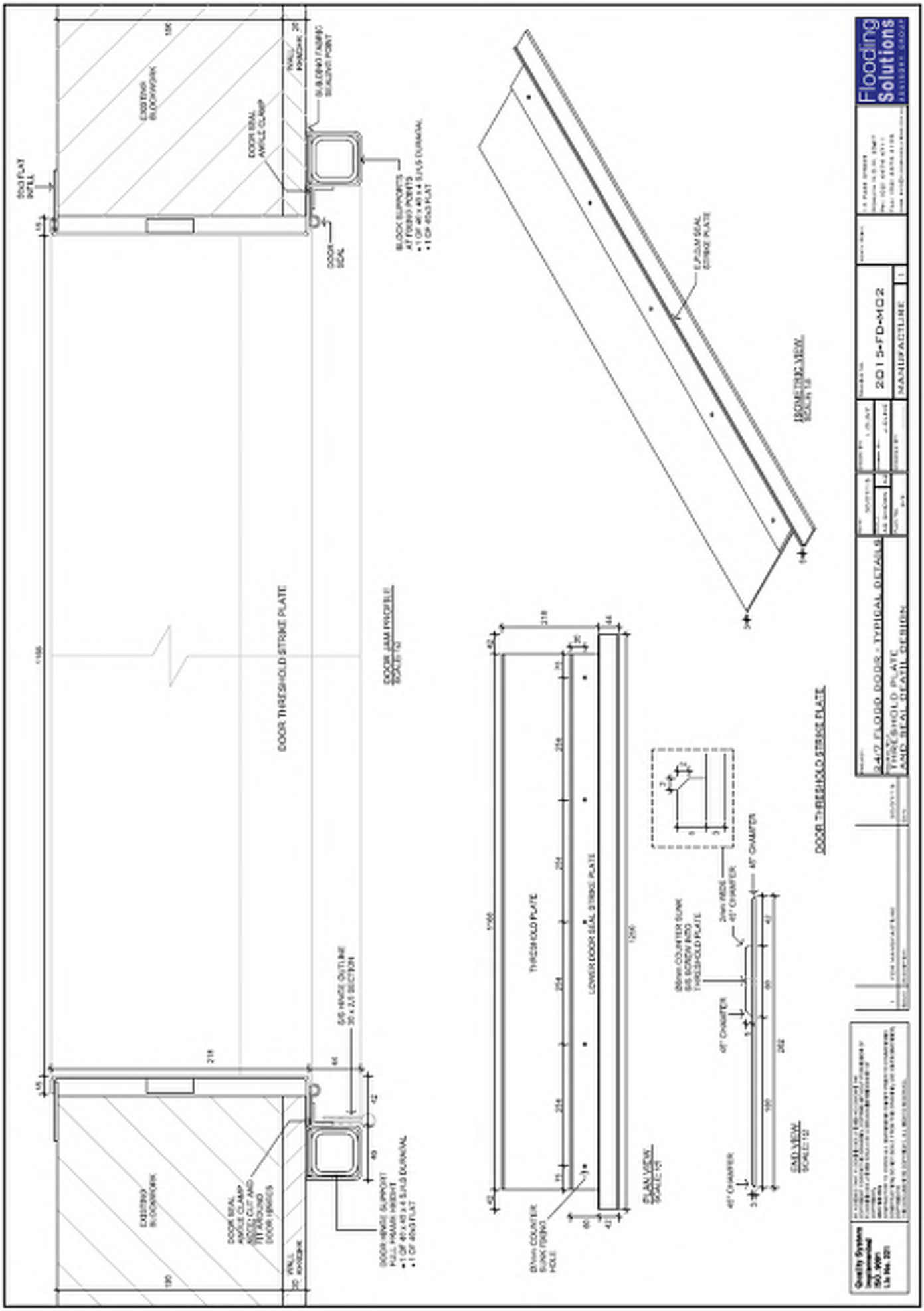
- Finishes:
- Inspect for damage to paint finish, Repair as required.
- Original colour: *TBC*.

- Strike Plates, Frames:
- Inspect for damage and misalignment.
- Replace if seal edge is damaged.

- Fasteners & Mechanical Connections:
- Check all embedded connections, making sure they remain as original design standards.

- Operating equipment:
- Check operating hardware (handles, locks, push bar/closer).


DOOR JAMB FRAME ISOMETRIC VIEW
SCALE 1:10
DOOR OPENS FROM THIS SIDE
SUPPORT AND FIXING RETURN
DOOR JAMB FRAME OVERALL DIMENSION
SCALE 1:10
FRONT VIEW
BLOCK WALL OPENING CUTTING LINE
40 x 50 x 12 STEEL TABS
Ø12mm FIXING HOLES
SIDE VIEW
40 x 50 x 12 STEEL TABS
DOOR JAMB DETAIL
SCALE 1:2
50x3 FLAT
Ø12mm FIXING HOLES
FRONT VIEW
INTERIOR SIDE TRIMMING
QUANTITY 2
SCALE 1:10
Flooding Solutions
24/7 FLOOD DOOR - TYPICAL DETAILS
DOOR JAMB DESIGN
2015-FD-M01
MANUFACTURE
1


DOOR THRESHOLD STRIKE PLATE
DOOR JAMB PROFILE
SCALE 1:2
DOOR SEAL
ANGLE CLAMP
EXISTING BLOCKWORK
FINAL FINISH
DOOR HINGE SUPPORT
FULL FRAME HEIGHT
• 1 OF 40 x 40 x 4 S/LG DURAMAL
• 1 OF 40x3 FLAT
BLOCK SUPPORTS
AT FIXING POINTS
• 1 OF 40 x 40 x 4 S/LG DURAMAL
• 1 OF 40x3 FLAT
EPDM SEAL
STRIKE PLATE
ISOMETRIC VIEW
SCALE 1:5
THRESHOLD PLATE
LOWER DOOR SEAL STRIKE PLATE
PLAN VIEW
SCALE 1:5
END VIEW
SCALE 1:2
DOOR THRESHOLD STRIKE PLATE
Flooding Solutions
24/7 FLOOD DOOR - TYPICAL DETAILS
THRESHOLD PLATE
AND SEAL DEATIL DESIGN
2015-FD-M02
MANUFACTURE

Flooding
Solutions
ADVISORY GROUP

## CONTACT

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203/283 Alfred St **North Sydney** NSW 2060

**Design & Construction:** (+612) 4474 4711
14 Page St **Moruya** NSW 2537

FLOOD FREE

# CONCEALED FLOOD BARRIERS

AWMA's Concealed Flood Barrier is a self-actuating flood defence system that harnesses rising waters to automatically deploy a flood barrier via floatation.

## FEATURES

- The gate is permanently installed below ground level at the isolation point, ready for deployment when required.
- Rising water levels cause an automatic response, elevating the isolation barrier via floatation.
- Gate system retracts below pavement as water levels decrease.
- Suitable for large openings up to 30m wide and 1.6m high.
- Low maintenance design.
- Low aesthetic impact.

## APPLICATIONS

- Basement and carpark access points.
- Pedestrian access and pathways.
- Flood levees.
- Residential and commercial property protection.

FLOOD FREE

# CONCEALED FLOOD BARRIERS

## DESIGN

DESIGN SUPPORT

- AWMA's design team will provide full support to ensure the most appropriate solution is developed and specified during the preliminary design.

SIZES

- Customisable to suit specific site requirements up to 30m wide, 1.6m high.

MATERIALS

- AWMA select materials to meet a minimum design life of 25 years. Where required, AWMA can offer higher grade materials, coatings and protection systems to extend the design life to 100+ years.
- Marine grade aluminium, stainless steel, galvanised steel.
- Materials used in the construction of AWMA's Flood Free range have a high corrosion resistance and can be operated for many years with minimal maintenance.

SEALING

- The seal performance of AWMA Flood Gates exceeds that required by the 'Australian Technical Specification for Fabricated Water Control Infrastructure'.

MAINTENANCE

- The AWMA Flood Gate range has a minimum 25 year design life.
- Minimal maintenance is required ensuring low 'whole of life costs'.

## MANUFACTURE

QUALITY

- All fabrication is in accordance with the 'Australian Technical Specification for Fabricated Water Control Infrastructure'.
- All procedures are in accordance with AWMA's accredited ISO 9001 Quality Management System to ensure each gate is manufactured to a high standard, tested and ready for trouble free operation post approved installation.

## INSTALLATION

MOUNTING OPTIONS

- Barriers are designed to retrofit existing infrastructure or 'green field sites'.
- AWMA offer install supervision for all turn-key installations.

ACTUATION SYSTEMS

- AWMA offer numerous options for operation including manual, mechanical, automated, hydraulic, pneumatic, powered or electrically actuated systems.

OPERATION SYSTEMS

- The AWMA Concealed Flood Barrier is designed to automatically close ahead of rising flood waters.
- No operator intervention is required.
- Variety of audio and visual warning systems available.

## COMMISSIONING

DOCUMENTATION AND TRAINING

- Detailed documentation on operation, testing procedures and maintenance will be provided with all AWMA flood defence systems.
- Comprehensive on and/or off site training available.

awma Water Control Solutions

Certified System Quality ISO 9001 SAI GLOBAL

**FLOODFREE PRODUCTS DESIGNED AND MANUFACTURED BY AWMA WATER CONTROL SOLUTIONS:**

HEAD OFFICE

Phone +61 3 5456 3331 Email info@awmawatercontrol.com.au

118 Roviras Road, PO Box 433, Cohuna Victoria 3568, Australia.

www.awmawatercontrol.com.au

scfb®
self closing flood barrier

# DOCUMENTATION SCFB

## Self Closing Flood Barrier

Dutch design

All SCFB barriers are build en designed by Hyflo B.V. in The Netherlands.

Flooding Solutions
ADVISORY GROUP

Hyflo BV
info@hyflo.nl

## Introduction

### Why flood Protection

Extreme global flooding events are occurring with increasing frequency, affecting both the developed and the developing world with catastrophic results. A confluence of contributory factors, including but not limited to climate change, increasing global population and settlement in vulnerable areas, urbanization and deforestation, is having a profound effect on communities worldwide. Climate change in particular has resulted in an increased severity and intensity of rainfall. The human and economic impact of recent catastrophic flood events, such as in the UK, Germany, Australia, Pakistan, USA, Brazil and India is beyond measure, yet solutions, as the Self Closing Flood Barriers are available to mitigate the impact that flooding brings.

### Self Closing Flood Barrier

The Self Closing Flood Barrier SCFB, is an unique effective flood defense system to protect people and property from inland waterway floods caused by heavy rainfall, gales or rapid melting snow. This system has been developed in the Netherlands to provide optimal protection against extreme high water levels. The barrier systems have proved to be the best flood protection and has already been built and installed in several countries around the globe. In operational use globally since 1998, the SCFB is acclaimed as the world's most effective flood protection system. Its success can be attributed to the simple, but ingenious concept of using the approaching floodwaters to automatically raise the barrier; effectively using the problem to create the solution. With an unblemished 100% track record the SCFB is a highly favorable preference when specifying optimal and cost effective but passive flood defense.

## SCFD

*Private property protection*

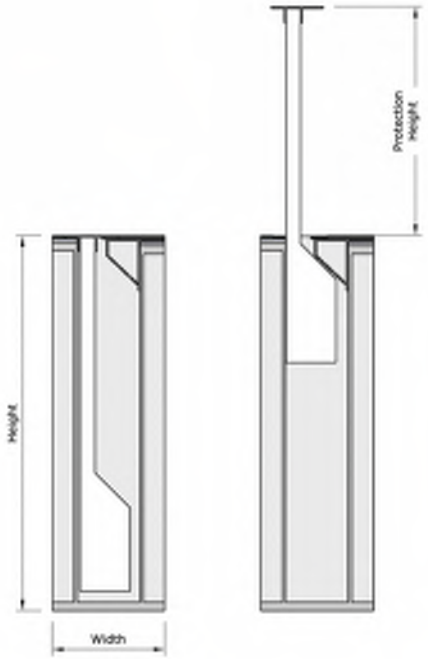
The SCFD is a smaller version from the SCFB and is intended to protect small gates and private property against floods. The working principle is very similar to that of the larger SCFB but in a reduced scale. Because of this reduced scale and the lighter materials the barrier is easy to install and in most circumstances the SCFD does not require a service pit and can be fit with a standard pipe connection to the sewer. The basin from the SCFD is made out of very durable PE-HD material and reinforced with stainless steel.The wall is fabricated in one length and made from a honeycomb profile Depending on the requested length and location Hyflo can advise what the best option is for the specific location.

**SCFD aluminum top**
A15– Access covers and gratings capable of withstanding a 15kN test load. For use in areas where only pedestrians have access.

**SCFD stainless steel top**
B125 – Access covers and gratings capable of withstanding a 125kN test load. For use in car parks and pedestrian areas where only occasional vehicular access is likely.

### Dimensions

The SCFD can be built in length up to 6 meters and in heights till 600mm and 4 meter length till 1200mm height. All SCFD will be build by Hyflo in house to suit the requested lengths and heights and com with an installation schedule for this dimensions.




Standard dimensions

| | Protection Height | Max length | Height | Width | Pipe connection |
|---|---|---|---|---|---|
| SCFD 300 | 300 mm | 6000 mm | 700 mm* | 270 mm | 110 mm |
| SCFD 600 | 600 mm | 6000 mm | 1000 mm* | 270 mm | 110 mm |
| SCFD 900 | 900 mm | 4000 mm | 1400 mm* | 300 mm | 160 mm |
| SCFD1200 | 1200 mm | 4000 mm | 1800 mm* | 300 mm | 160 mm |

## SCFB Steel basin

*Secondary flood protection*

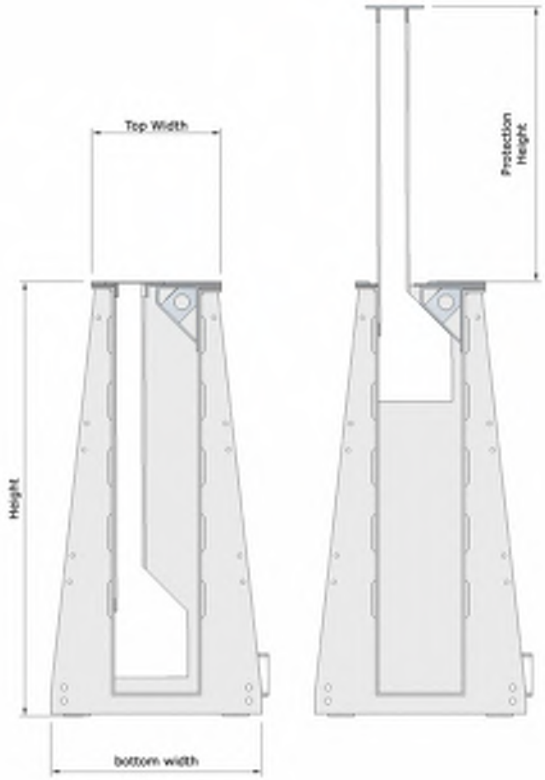
The steel basin is delivered complete with wall, supports blocks, lids, seals and guide rail and is therefor easy to install. The basin undergone a thermal spraying and a coating for a longer life time and for the sustainability of the product can also be build in stainless steel. Depending on the requested length and location Hyflo can advise what the best option is for the specific location.

**SCFB steel Basin reinforced with concrete / concrete basin**
C250 – Access covers and gratings capable of withstanding a 250kN test load. For use in car parks, forecourts, industrial sites and areas with

**SCFB steel Basin reinforced with concrete in combination with Load transfer slap**
D400 – Access covers and gratings capable of withstanding a 400kN test load. For use in areas where cars and lorries have access, including carriageways, hard shoulders and pedestrian areas.

### Dimensions

The SCFB steel basin can be build up to 8 meter in length and sections to require any length. The standard protection heights for the SCFB are 500mm , 1000mm, 1250mm, 1500mm. All SCFB will be build for the requested lengths and heights and come with an installation schedule for this length.




| | Protection Height | Max length | Height | Top width | Bottom Width | Pipe connection |
|---|---|---|---|---|---|---|
| SCFB 500 S | 500 mm | 8000 mm | 1065 mm | 490 mm | 700 mm | 160 mm |
| SCFB 1000 S | 1000 mm | 8000 mm | 1645 mm | 490 mm | 800 mm | 160 mm |
| SCFB 1250 S | 1250 mm | 8000 mm | 1945 mm | 490 mm | 850 mm | 160 mm |
| SCFB 1500 S | 1500 mm | 8000 mm | 2245 mm | 490 mm | 900 mm | 160 mm |

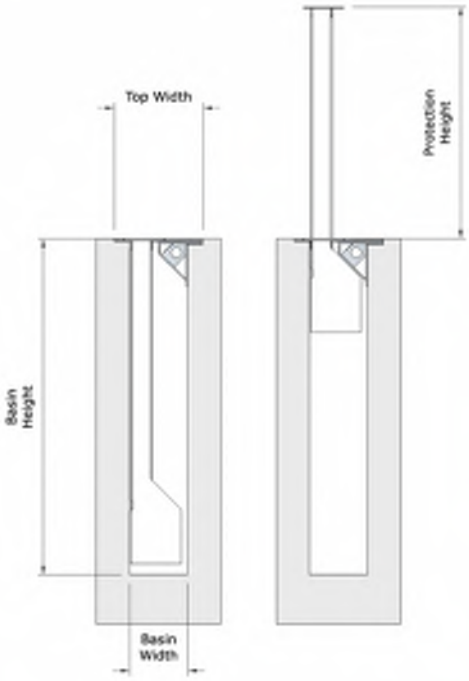
## SCFB concrete

*Primary flood protection*

The SCFB™ can be built at any required length. The basin from the SCFB™ can be built in concrete, galvanized steel or stainless steel. Depending on the requested length and location Hyflo or its dealer can advise what the best option is for the specific location. The floating wall consists of a PUR foam core with a fiberglass or GRP outer layer. The walls are reinforced with composite profiles and textile fiberglass. The wall is fabricated in 1 m lengths (deduction of a notional tolerance) and connected together to form the overall length of the required barrier. The connections of the walls to each other are done by a reinforced rubber* strip and stainless-steel mounting strips. Because of the unique patented design of the SCFB™ and the strength of the floating wall the barrier can be built in every required length.

**SCFB Concrete basin with Load transfer slap**
E600 – Access covers and gratings capable of withstanding a 600kN test load. For use in areas where high wheel loads are imposed such as loading areas, docks or aircraft pavements.

**SCFB Concrete basin with reinforced top**
F900 – Access covers and gratings capable of withstanding a 900kN test load. For use in areas where particularly high wheel loads are imposed such as aircraft pavements.

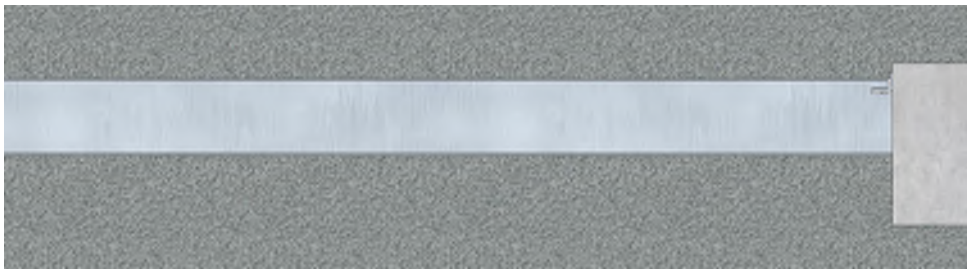



| | Protection Height | Max length | Basin Height | Top width | Basin Width | Pipe connection |
|---|---|---|---|---|---|---|
| SCFB 500 C | 500 mm | ------ | 1000 mm | 490 mm | 320 mm | 160 mm |
| SCFB 1000 C | 1000 mm | ------ | 1550 mm | 490 mm | 320 mm | 160 mm |
| SCFB 1250 C | 1250 mm | ------- | 1860 mm | 490 mm | 320 mm | 160 mm |
| SCFB 1500 C | 1500 mm | ------- | 2160 mm | 490 mm | 320 mm | 160 mm |
| SCFB 2000 C | 2000 mm | ------- | 2700 mm | 570 mm | 400 mm | 220 mm |
| SCFB 3000 C | 2500 mm | -------- | 3250 mm | 570 mm | 400 mm | 220 mm |

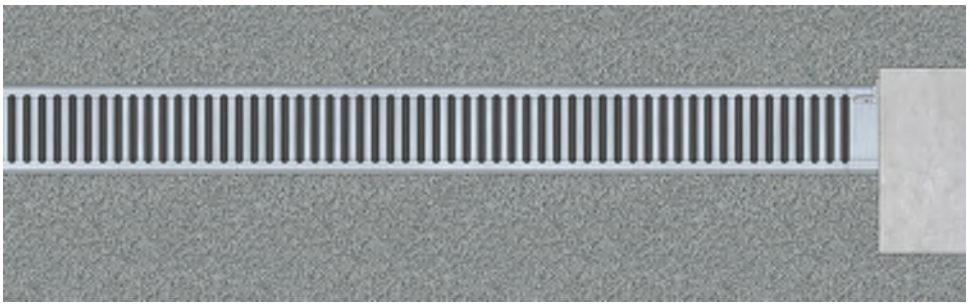
## 2. Top Finish

**Standard top**
Top plate, top strip and lid are visible

**Extended top**
Whith an extended top the top plate en top strip will have an elevation, The pavement can cover the top plate and strip. The lit is the only visible component of the barrier



**Extended top as water runnel**
The lid is replaced for a water inlet lid.

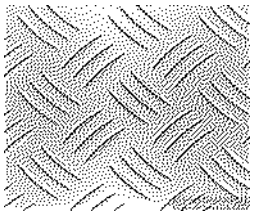


**Invisible top**
For the invisible top we us the extended top and lower the lid this create room to have the same pavement on top of the lid

## 3. Top material

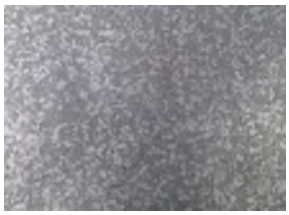
It is possible to choose between different top finishes.

Stainless steel



diamond plating

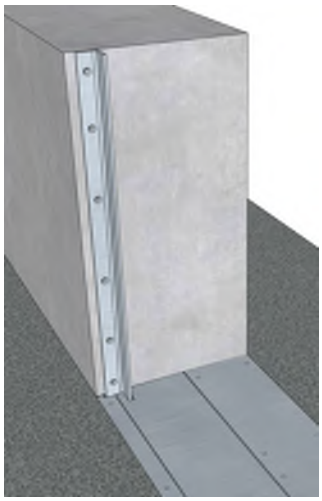
Corten steel



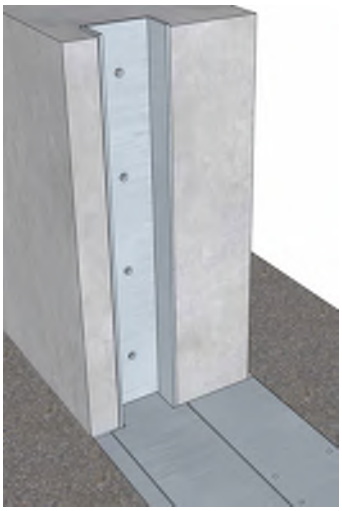
galvanized steel.

## 4. Guide

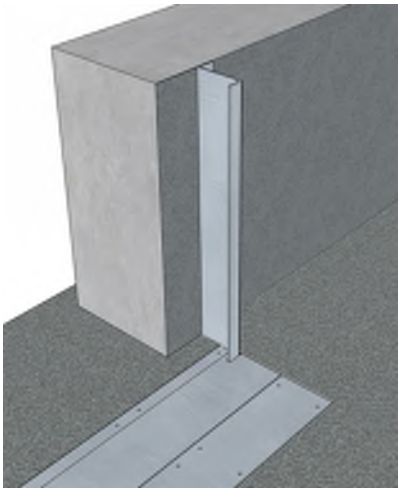
It is possible to choose between guide rails or guide slots as end protection of the SCFB. Guide rails are mounted at the outside of the fixed wall and guide slot can be mounted inside the fixed wall. A good operation of the SCFB relies on a guide rail or guide slot at each end of the barrier to seal against, The Guide also allows the barrier to be guided when rising and falling.



Guide rail



Guide slot



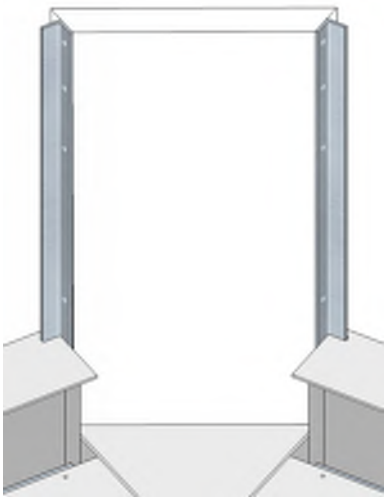
Guide rail front mounting

Where the barrier is fit between two fixed wall a guide rail can be mounted to the fixed wall. If a lot of traffic is passing the barrier it is recommended to use a guide slot that will seal the barrier inside the wall. If the SCFB is just in front if a building or wall a Guide rail for front mounting can be used to overcome the space between the wall and the barrier.

### Guide post

When two lengths of SCFB units have to be connected to each other, or when the barrier has to make an angle, they must be connected with a guide rail. Connecting guide rails can be ordered in all different angles.
Where long lengths of barriers are installed, which cannot be accommodated in one length, guideposts are introduced to break the length up.

The SCFB sections are in standard lengths of 1m, which may be linked together. The use of guideposts can facilitate changes of direction or deviations from a straight line in the run of the barrier. The route of the barrier therefore needs to be defined and divided into suitable section lengths of up to 50 linear meters each.



## 5. Activation.

It is recommended for each SCFB unit to use a service pit to control the water inlet and drain. There are two types of Pits, a standard Pit and one with a pump. Which one is needed depends on the situation where the SCFB will be installed.

When the surface of the area water is normally lower than the bottom of the SCFB the standard Pit or pipe connection is sufficient to drain the SCFB system.

When the surface water is normally higher than the bottom of the SCFB a service pit with a pump is always required. The pump switches on automatically once there is water in the system and prevents the system to come up if there is no need for it.

Also in situations where water subsides slowly, the pump switch on once the flood is below flood level and the SCFB will no longer be an obstacle.

It is recement to have a water supply in the area of the SCFB. It is required for commissioning, testing of the SCFB. The outlet of the pipe connection ore service pit can be closed and the system can be easy flit by the water supply.

Hyflo will design and build the service pit to fit the barrier. The wish of the customer is taken into account so are number of inlets required and the distance between the barrier and the service pit. This way we can guarantee the optimal functioning of the barrier.

Optional:

For longer lengths, it is optional to combine the pipe connection with a pit or pit with pump. This results in a faster process of filling and draining the basin.

It is an option to order an extra switch in the pump. This switch can be connected to an alarm. When the barrier rises, the alarm goes off, so the environment knows that they should pay attention.

## Activation SCFB with pipe connection

When the area water is lower than the bottom of the basin the SCFB can be activated with just a pipe connection.

A pipe connection can also be used for longer lengths combination with a service pit, this results in a faster process of filling the basin.

Depending on the size of the barrier the pipe connections com in the standard dimensions 110mm 160mm.

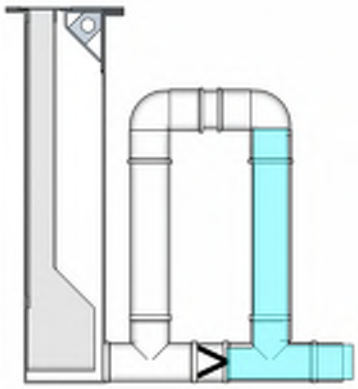


**Image 1.3**
Floodwater rises through storm sewers into the pipe conection

The pipe connection has a check-valve that prevents the flood water going to the basin of the barrier at this point.

This prevents the barrier from coming up early or that the barrier comes up have way.

In a slow up coming flood the barrier will still close in a short time to the end position.

The height of the of the vertical pipes determine the activation level of the SCFB

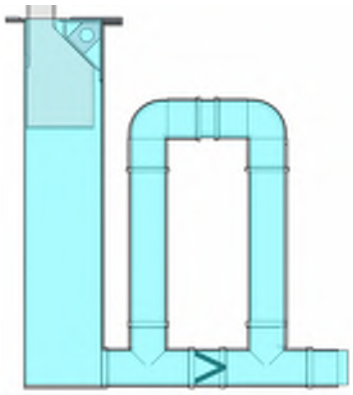


**Image 1.4**

When the flood water surface is coming above the filling pipe (activation level) the water starts to flow into the basin of the SCFB

De basin starts to fill, and the floating wall will raise with the water level.

As the floating wall touches the support block the wall is pushed to the dry side of the barrier the seals now make a watertight connection.

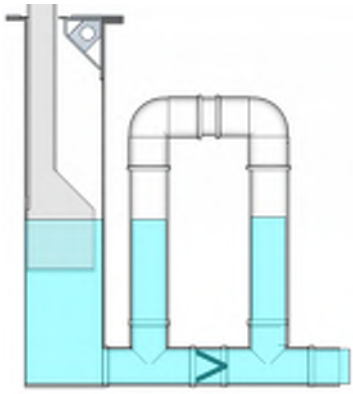


**Image 1.5**

When the flood water recedes the water inside the basin from the SCFB is flows back though the check-valve.

The barrier is sinking back to tis resting position this happens with the same speed as the sinking flood water.

when the drain water level is higher than the bottom of the pit a pomp is used to pomp the water out.

Optional:

For longer lengths, it is optional to combine the pipe connection with a pit or pit with pump. This results in a faster process of filling and draining the basin.

## Activation SCFB with inspection pit

When the area water is lower than the bottom of the basin the SCFB a standard service pit can be activated with just to lower the barrier after a flood.

Depending on the size of the barrier the service pits are standart 300mm ore 400mm with with a pip dimensions of 110mm 160mm.

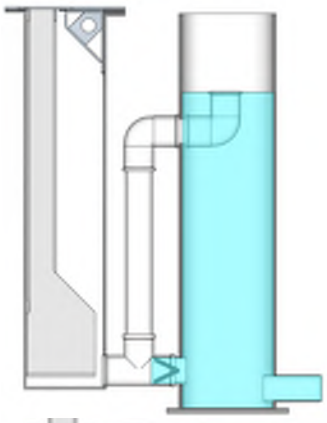


**Image 2.3**
Floodwater rises through storm sewers into the service pit

The service pit has a check-valve that prevents the flood water going to the barrier at this point.

This prevents the barrier from coming up early or that the barrier comes up half way.

In a slow op coming flood the barrier will still close in a short time in the end position.

The height of the of the adjustable vertical pipes inside the pit determine the activation level.

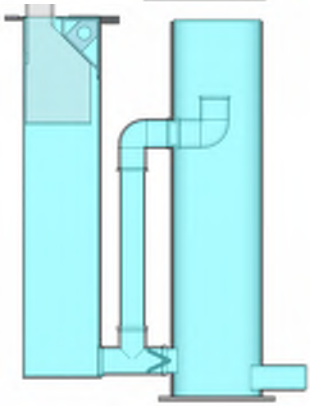
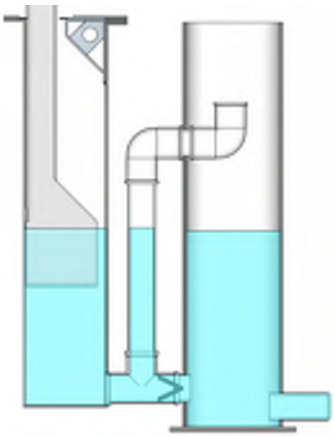


**Image 2.4**

When the flood water surface is coming above the filling pipe (activation level) the water starts to flow into the basin of the SCFB

De basin starts to fill, and the floating wall will raise with the water level.

As the floating wall touches the support block the wall is pushed to the dry side of the barrier the seals now make a watertight connection.



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The barrier is sinking back to tis resting position this happens with the same speed as the sinking flood water.

when the drain water level is higher than the bottom of the pit a pump is used to pump the water out.

Optional:

For longer lengths, it is optional to combine the pipe connection with a pit or pit with pump. This results in a faster process of filling and draining the basin.

It is an option to order an extra switch in the pump. This switch can be connected to an alarm. When the barrier rises, the alarm goes off, so the environment knows that they should pay attention.

## Activation SCFB with inspection pit with pump

When the area water is higher than the bottom of the basin the SCFB a service pit with pump is necessary to lower the barrier after a flood.

The pump with floating switch will switch on when water enters the service pit. This will keep the barrier dry in a not flood situation.

In a flood situation the pump is pumping against the incoming water. When the water level reaches the top of the pit a second switch will turn off the pump.

Depending on the size of the barrier the service pits are standard 300mm or 400mm with pipe dimensions of 110mm 160mm.

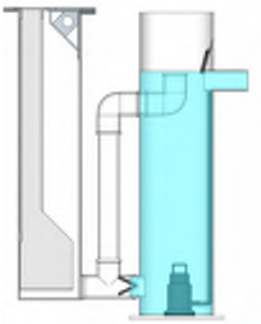
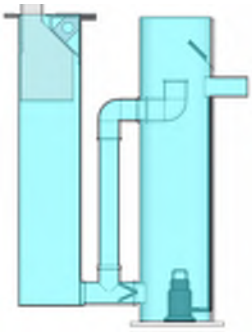


**Image 3.3**
Floodwater rises through storm sewers into the service pit

The service pip has a check-valve that prevents the flood water going to the barrier at this point.

This prevents the barrier from coming up early or that the barrier coms up have way.

In a slow op coming flood the barrier will still close in a short time in the end position.



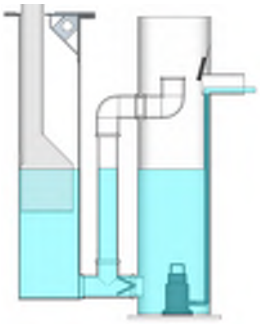
The height of the of the adjustable
vertical pipes inside the pit determine the activation level.

**Image 3.4**

When the flood water surface is coming above the filling pipe (activation level) the water starts to flow into the basin of the SCFB

De basin starts to fill, and the floating wall will raise with the water level.

As the floating wall touches the support block the wall is pushed to the dry side of the barrier the seals make now a watertight connection.



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The barrier is sinking back to tis resting position this happens with the same speed as the sinking flood water.

when the drain water level is higher than the bottom of the pit a pomp is used to pomp the water out.

**6. Optional:**

For longer lengths, it is optional to combine the pipe connection with a pit or pit with pump. This results in a faster process of filling and draining the basin.

It is an option to order an extra switch in the pump. This switch can be connected to an alarm. When the barrier rises, the alarm goes off, so the environment knows that they should pay attention.

## 7. Commissioning

The SCFB should be commissioned after installation; either by the distributor installation team (if supplied and installed by distributor) or by the main contractor if on a supply only contract. A full cycle of operation should be carried out to ensure the barrier rises and falls without snagging at any point of operation.

**Visual Inspection**
The SCFB should be inspected monthly to ensure that there is no debris or refuse trapped along the length of the lid or at the guide rails.

- Cleaning of debris from intake structure gratings. (when present)
- Cleaning of silt in the inspection-pit and control pit. (when present)
- Check all visual bolts and tighten where necessary.

## 8. Maintenance

It is essential to have in place a Maintenance Plan of any Self Closing Flood Barrier. It should be prepared prior to final commissioning of the works.

For the system proposed on this project, the Maintenance Plan should be carried out twice a year and include at least the following:

- Hydrostatic testing of each completes system from intake structure to SCFB Unit(s) by filling with a water hose or waterworks.
- Visual Inspection of seals at the base of the rising barrier during the hydrostatic test.
- Visual inspection of seals at each end of the barrier.
- Check all bolts and tighten where necessary
- Testing of the submersible pump and the switches. (when present)
- Testing and cleaning of non-return flap valve in control-pit etc.
- Verification of alarms (when present)

The frequency of testing may be modified on experience of the system's operation.

Hydrostatic testing of the SCFB unit operation should be carried out preferable on times that there is minimum traffic. The actual test duration is dependent on the filling rate from the water supply.

## PROJECT SUPPORT

### Warranty

Each SCFB installed system carries a warranty against fabrication as well as installation faults. We are only responsible for the good working of the SCFB when above instructions are exercised carefully and according to our advice.

All SCFB installed systems carry a warranty against fabrication/installation faults including any incurring leakages of more than 0.1 l/M/min. AII barriers carry a 10 years' manufacturer guarantee. In the event of a query relating to the installation of an SCFB please feel free to contact the technical department.

### General

HYFLO Self Closing Flood Defense System BV was established in January 2014 to set up a worldwide dealer-network-organization to market and sell the Self Closing Flood Barriers (SCFB) to meet the growing requirement for global solutions to extreme flooding events. HYFLO is located in Kampen, in the Netherlands.

Hyflo can supply all the services required to determine the most appropriate solution for a site. This is from initial contact, specification, survey, quotation, installation, commissioning, and maintenance.

Hyflo will be able to assist with the specification and the provision of data relating to the structural performance of the SCFB.

The barriers are built with a long design life in mind, and spare parts are not normally required. Hyflo hold a stock off spare parts and we keep records of all installations. Should any replacement part be required for any reason, we can arrange for the parts to be supplied or supplied and fitted.

Patent Protection

The Self Closing Flood Barrier SCFB is protected and reserved by international granted patents under number NL1035546 / WO2009139622, current patent applications and Trade Mark number 010390029.

hyflo
self closing flood system

Flooding Solutions
ADVISORY GROUP