



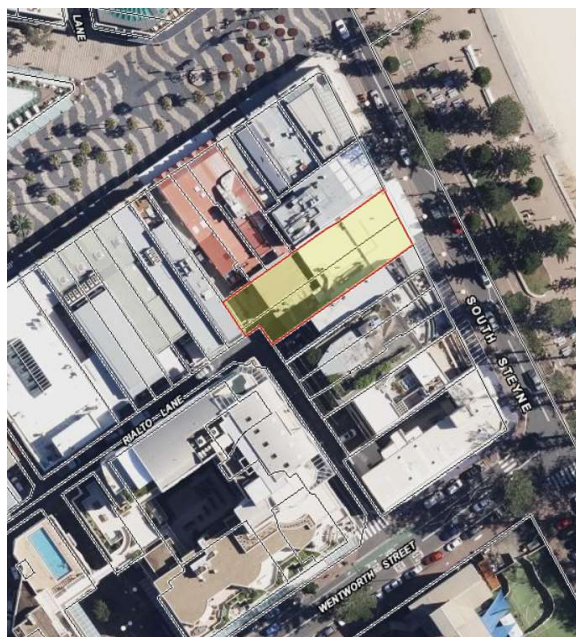
IGS INTEGRATED
GROUP
SERVICES

Fortis

34 - 35 South Steyne, Manly

Flood Impact and Risk Management Report

Date: 13/03/2025



Document Control

Project: Commercial Development
Address: 34-35 South Steyne, Manly

Title of Report: Flood Impact and Risk Management Report

Name of Client: Fortis

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	NAME	DATE	SIGNATURE
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34 – 35 South Steyne, Manly

FLOOD IMPACT AND RISK MANAGEMENT REPORT

IGS is engaged to prepare a Flood Impact and Risk Management report for the site at 34 – 35 South Steyne, Manly. This 690m² property will undergo a knockdown of existing buildings and the construction of a mixed-use commercial development.

This assessment aims to identify the predicted flood levels around the study site and provide advice on Flood Planning Levels (FPL) based on Northern Beaches Council's requirements. The report also assesses compliance with the proposed floor levels for future development at the study site.

The following study establishes design flood data using the "Northern Beaches Councils Waringah DCP 2011" and the "Manly to Seaforth Flood study" by Cardno.

1. DEVELOPMENT SITE

The proposed development (Figure 1), located at 34-35 South Steyne, Manly, consists of a 3-level commercial floor with retail tenancies and 2 basement levels with access from Rialto Lane. The property spans approximately 690 square meters, with the nearest intersection being Wentworth Street. The new proposed development will require a knockdown of the existing commercial buildings.

The following flood impact and risk management report will examine the current flood behaviour relative to the site and propose solutions to mitigate any risks towards the site.

The assessment has been based on the following available information and studies:

- Attachment 1- Site survey by Hill & Blume, Ref: 63293, Issue A, Survey Date: 01 October 2021.
- Attachment 2 - Architectural Plans by Durbach block jagers, Project No. 1728, Rev DA-L.
- Attachment 3 – Flood Planning Level Assessment Plan by IGS.
- Attachment 4 – Flood Gate Product Information.

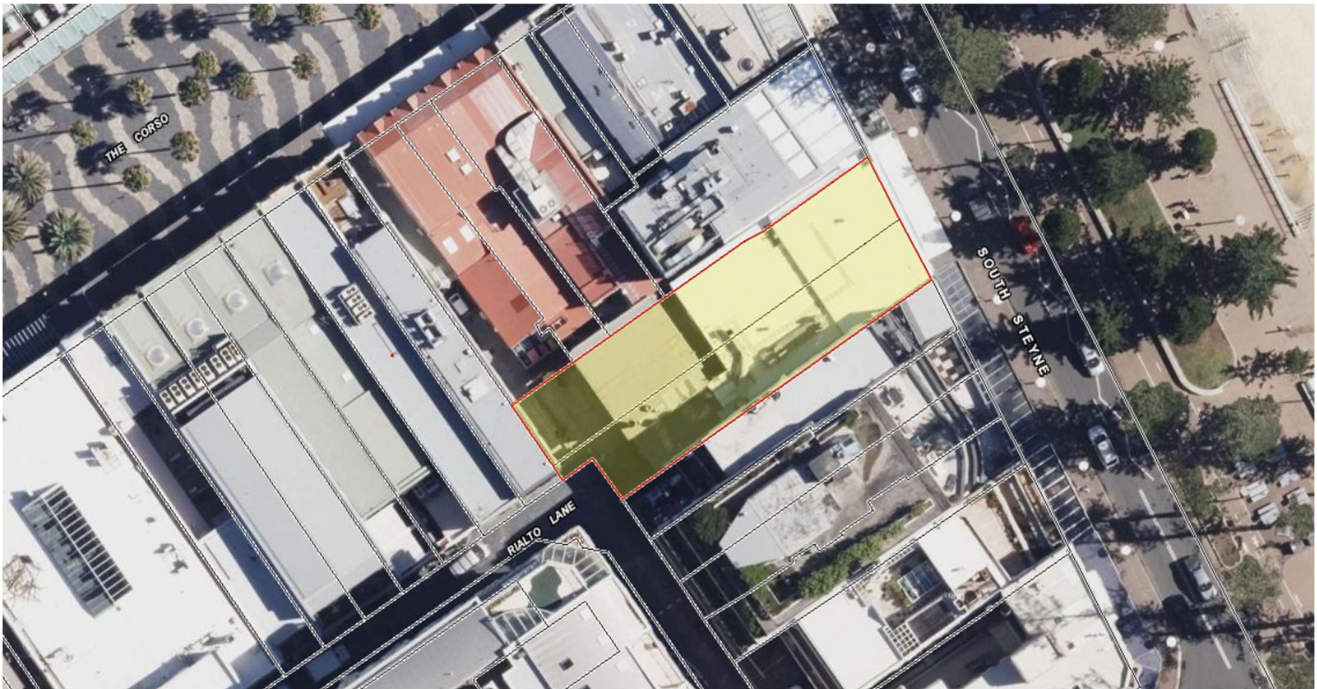


Figure 1: Site Location (Source: Six maps)

2. Existing Flood Behavior

2.1 Existing Model Data

To understand the potential flood liability of the existing site and the impact that the development may have on flood behaviours, it is necessary to define flood behaviours for existing or pre-development conditions. "Manly to Seaforth Flood study" undertook detailed catchment modelling under 'existing' conditions using a TUFLOW hydraulic model to define flood hydraulics (e.g., depths, levels, and velocities) across the catchment. Site-specific flood information was available from the Northern Beaches Council to assist with this report.

The Northern Beaches Council has adopted the Manly to Seaforth Flood study and Manly to Seaforth Floodplain Risk Management Plan, and this study utilises the obtained flood information from the Northern Beaches Council of the study.

2.2 Existing Scenario Flood Assessment

The site is affected as depicted in Northern Beaches Council's Flood Information Report. In accordance with the Northern Beaches Council Flood Hazard Map, the site is identified as a medium-risk precinct. As seen in Figure 2.

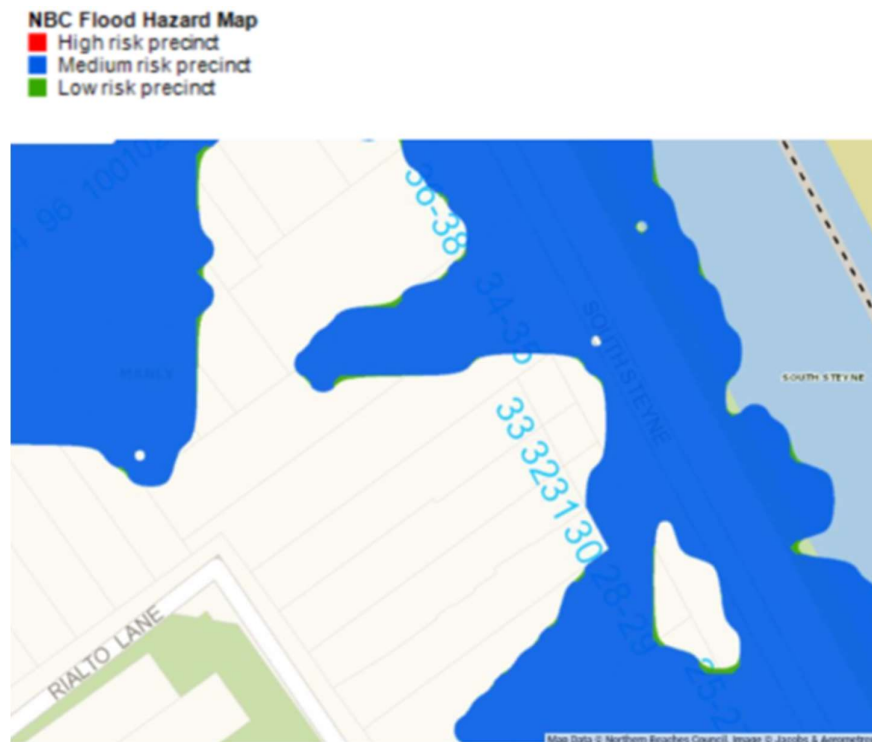


Figure 2: Northern Beaches Council Flood Hazard Map (Manly Development Control Plan 2013)

The site is identified as land within the floodplain based on the Probable Maximum Flood (PMF) event, however, above the 1% AEP flood level – as seen in Figure 3



Figure 3: Basic Information Report North Side & South Side – 1% Provisional Flood Risk Precinct Map (Manly to Seaforth Flood Study 2019)

3. Post – Development Flood Behaviour

3.1 Description of the Proposed Development

The proposed development will incorporate the construction of a new four-storey commercial building with a below-grade basement level comprising of:

- Basement 2: a commercial bin store and multiple designated car parking spaces
- Basement 1: a commercial space, designated plant areas and end-of-trip bathroom facilities
- Ground Floor: a retail area, lobby and external Parking
- Level 1: a commercial space with terraces, a lobby area, and amenities
- Level 2: a commercial space, a lobby area, and amenities
- Level 3: a commercial space, terrace area, and a designated place space

The proposed development will maintain the same 690m².

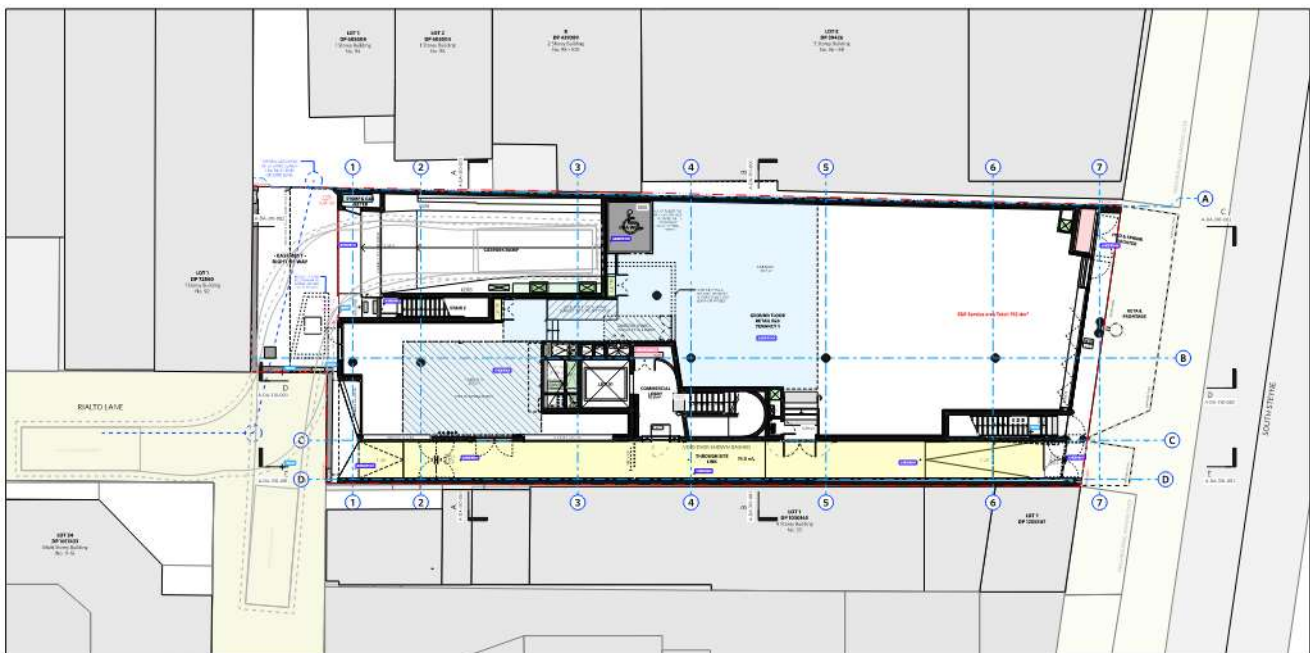


Figure 4: Proposed Ground Floor Plan.

3.2 Flood Planning Requirements

IGS has studied the existing flood behaviour regarding the site at 34-34 South Steyne, Manly. The provisions outlined in section 3.2 have been derived to ensure the site's intended functionality remains uncompromised and safe.

In accordance with the NSW Floodplain Development Manual, the site is subject to development controls as set by Northern Beaches Council for development within floodplains in accordance with their floodplain risk management plans.

These controls have adapted the NSW Floodplain Development Manual's guidelines in the preparation of the Council's flood study(s), risk management study(s) and plan(s), and addressing hydraulic and hazard categorisation and emergency response planning. The requirements for Flood Planning Levels are given as per the Council's development control plan (2013), Specifically Part 5.4.3 Flood Prone Land. Under Table 1: Land use groups, the development is classified in a business or industrial land use category. Below planning considerations are applicable, as highlighted in the medium risk precinct matrix below.

		Medium Flood Risk Precinct				
		Vulnerable & Critical Use	Residential Use	Business & Industrial Use	Recreational & Environmental Use	Subdivision & Civil Works
A	Flood effects caused by Development	A1 A2	A1 A2	A1 A2	A1 A2	A1 A2
B	Building Components & Structural	B1 B2 B3	B1 B2 B3	B1 B2 B3	B1 B2 B3	
C	Floor Levels	C2 C3	C1 C3 C4 C6	C1 C3 C4 C6 C7	C3	C5
D	Car Parking	D1 D2 D3 D4 D7	D1 D2 D3 D4 D5 D6	D1 D2 D3 D4 D5 D6	D1 D2 D3 D4 D5 D6	D1
E	Emergency Response	E1 E2	E1	E1	E1	E3
F	Fencing	F1	F1	F1	F1	F1
G	Storage of Goods	G1	G1	G1	G1	
H	Pools	H1	H1	H1	H1	H1

Submission Requirement	Response
A. Flood Effects Caused by Development	
<p>A1. Development shall not be approved unless it can be demonstrated in a Flood Management Report that it has been designed and can be constructed so that in all events up to the 1% AEP event:</p> <p>(a) There are no adverse impacts on flood levels or velocities caused by alterations to the flood conveyance; and</p> <p>(b) There are no adverse impacts on surrounding properties; and</p> <p>(c) It is sited to minimise exposure to flood hazard.</p> <p>Major developments and developments likely to have a significant impact on the PMF flood regime will need to demonstrate that there are no adverse impacts in the Probable Maximum Flood.</p>	<p>The site is not within the extent of 1% aep storm events.</p>
<p>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.</p> <p>Consideration may be given for exempting the volume of standard piers from flood storage calculations.</p> <p>If Compensatory Works are proposed to balance the loss of flood storage from the development, the Flood Management Report shall include detailed calculations to demonstrate how this is achieved.</p>	<p>The site is not within the extent of 1% aep storm events.</p>
B. Building Components and Structural Soundness	
<p>B1. All buildings shall be designed and constructed with flood compatible materials in accordance with "Reducing Vulnerability of Buildings to Flood Damage: Guidance on Building in Flood Prone Areas", Hawkesbury-Nepean Floodplain Management Steering Committee (2006).</p>	<p>Development proposes concrete structure slabs, shored basement structure and footing system. Boundary walls are to be concrete, other walls are to be steel framed and sheeted and columns are to be concrete. To be determined in detailed design.</p>
<p>B2. All new development 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. Where shelter-in-place refuge is required, the structural integrity for the refuge is to be up to the Probable Maximum Flood level. Structural certification shall be provided confirming the above.</p>	<p>Flood barriers have been proposed up to the PMF. Structural certification shall be provided during detailed design.</p>
<p>B3. All new electrical equipment, power points, wiring, fuel lines, sewerage systems or any other service pipes and connections must be waterproofed and/or located above the Flood Planning Level. All existing electrical equipment and power points located below the Flood Planning Level within the subject structure must have residual current devices installed that turn off all electricity supply to the property when flood waters are detected.</p>	<p>Flood barriers have been proposed which will protect the listed services plant/ equipment.</p>
C. Floor Levels	
<p>C1. New floor levels within the development shall be at or above the Flood Planning Level.</p>	<p>Flood barriers have been proposed to protect new floor levels</p>

<p>C3. All new development must be designed and constructed so as not to impede the floodway or flood conveyance on the site, as well as ensuring no net loss of flood storage in all events up to the 1% AEP event.</p> <p>For suspended pier/pile footings:</p> <p>(a) The underfloor area of the dwelling below the 1% AEP flood level is to be designed and constructed to allow clear passage of floodwaters, taking into account the potential for small openings to block; and</p> <p>(b) At least 50% of the perimeter of the underfloor area is of an open design from the natural ground level up to the 1% AEP flood level; and</p> <p>(c) No solid areas of the perimeter of the underfloor area would be permitted in a floodway</p>	<p>The site is not within the extent of 1% aep storm events.</p>
<p>C4. A one-off addition or alteration below the Flood Planning Level of less than 30 square metres (in total, including walls) may be considered only where:</p> <p>(a) it is an extension to an existing room; and</p> <p>(b) the Flood Planning Level is incompatible with the floor levels of the existing room; and</p> <p>(c) out of the 30 square metres, not more than 10 square metres is below the 1% AEP flood level.</p> <p>This control will not be permitted if this provision has previously been utilised since the making of this Plan.</p> <p>The structure must be floodproofed to the Flood Planning Level, and the Flood Management Report must demonstrate that there is no net loss of flood storage in all events up to the 1% AEP event.</p>	<p>Not applicable</p>
<p>C6. Consideration may be given to the retention of an existing floor level below the Flood Planning Level when undertaking a first floor addition provided that:</p> <p>(a) it is not located within a floodway; and</p> <p>(b) the original foundations are sufficient to support the proposed final structure above them. The Flood Management Report must include photos and the structural certification required as per Control B2 must consider whether the existing foundations are adequate or should be replaced; and</p> <p>(c) none of the structural supports/framing of existing external walls of are to be removed unless the building is to be extended in that location; and</p> <p>(d) the ground floor is floodproofed.</p>	<p>Not applicable</p>
<p>C7. Consideration may be given to a floor level below the Flood Planning Level within the first 5 metres from the street front in an existing business zone provided it can be demonstrated that:</p> <p>(a) The minimum floor level is no lower than the adjacent footpath level, and</p> <p>(b) The maximum internal distance from the front of the building is 5 metres, which can only apply to one side of an individual premises, and</p> <p>(c) The maximum area for the floor area to be below the Flood Planning Level for an individual premises is 30 square metres, and</p> <p>(d) There is direct internal access between areas above and below the Flood Planning Level for each individual premises</p>	<p>Flood barriers have been proposed</p>
<p>D. Car Parking</p>	
<p>D1. Open carpark areas and carports shall not be located within a floodway.</p>	<p>Not applicable</p>
<p>D2. The lowest floor level of open carpark areas and carports shall be constructed no lower than the natural ground levels, unless it can be shown that the carpark or carport is free draining with a grade greater than 1% and that flood depths are not increased.</p>	<p>Not applicable</p>

<p>D3. Carports must be of open design, with at least 2 sides completely open such that flow is not obstructed up to the 1% AEP flood level. Otherwise it will be considered to be enclosed.</p> <p>When undertaking a like-for-like replacement and the existing garage/carport is located on the street boundary and ramping is infeasible, consideration may be given for dry floodproofing up to the 1% AEP flood level.</p>	Not applicable
<p>D4. Where there is more than 300mm depth of flooding in a car park or carport during a 1% AEP flood event, vehicle barriers or restraints are to be provided to prevent floating vehicles leaving the site. Protection must be provided for all events up to the 1% AEP flood event</p>	The site is not within the extent of 1% aep storm events.
<p>D5. Enclosed Garages must be located at or above the 1% AEP level</p>	The site is not within the extent of 1% aep storm events.
<p>D6. All enclosed car parks (including basement carports) must be protected from inundation up to the Flood Planning Level. All access, ventilation, driveway crests and any other potential water entry points to any enclosed car parking shall be above the Flood Planning Level.</p> <p>Where a driveway is required to be raised it must be demonstrated that there is no net loss to available flood storage in any event up to the 1% AEP flood event and no impact on flood conveyance through the site.</p> <p>Council will not accept any options that rely on electrical, mechanical or manual exclusion of the floodwaters from entering the enclosed carpark</p>	<p>A crest has been proposed at the driveway for entry to basement.</p> <p>Site is not affected by flood in a 1% AEP storm event</p>
E. Emergency Response	
<p>E1. If the property is affected by a Flood Life Hazard Category of H3 or higher, then Control E1 applies and a Flood Emergency Assessment must be included in the Flood Management Report.</p> <p>If the property is affected by a Flood Life Hazard Category of H6, then development is not permitted unless it can be demonstrated to the satisfaction of the consent authority that the risk level on the property is or can be reduced to a level below H6 or its equivalent.</p> <p>If the property is flood affected but the Flood Life Hazard Category has not been mapped by Council, then calculations for its determination must be shown in the Flood Management Report, in accordance with the "Technical Flood Risk Management Guideline: Flood Hazard", Australian Institute for Disaster Resilience (2012).</p> <p>Where flood-free evacuation above the Probable Maximum Flood level is not possible, new development must provide a shelter-in-place refuge where:</p> <ul style="list-style-type: none"> a) The floor level is at or above the Probable Maximum Flood level; and b) The floor space provides at least 2m² per person where the flood duration is long (6 or more hours) in the Probable Maximum Flood event, or 1m² per person for less than 6 hours; c) It is intrinsically accessible to all people on the site, plainly evident, and self-directing, with sufficient capacity of access routes for all occupants without reliance on an elevator; and d) It must contain as a minimum: sufficient clean water for all occupants; portable radio with spare batteries; torch with spare batteries; and a first aid kit <p>Class 10 classified buildings and structures (as defined in the Building Codes of Australia) are excluded from this control.</p>	The flood life hazard category for this site is rated H2

<p>In the case of change of use or internal alterations to an existing building, a variation to this control may be considered if justified appropriately by a suitably qualified professional.</p>	
<p>Note that in the event of a flood, occupants would be required to evacuate if ordered by Emergency Services personnel regardless of the availability of a shelter-in-place refuge.</p>	
<p style="text-align: center;">F. Fencing</p>	
<p>F1. Fencing, (including pool fencing, boundary fencing, balcony balustrades and accessway balustrades) shall be designed so as not to impede the flow of flood waters and not to increase flood affectation on surrounding land. At least 50% of the fence must be of an open design from the natural ground level up to the 1% AEP flood level. Less than 50% of the perimeter fence would be permitted to be solid. Openings should be a minimum of 75 mm x 75mm.</p>	<p>The site is not within the extent of 1% aep storm events.</p>
<p style="text-align: center;">G. Storage of Goods</p>	
<p>G1. Hazardous or potentially polluting materials shall not be stored below the Flood Planning Level unless adequately protected from floodwaters in accordance with industry standards.</p>	<p>No hazardous goods are proposed to be stored below the flood level</p>
<p style="text-align: center;">H. Pools</p>	
<p>H1. Pools located within the 1% AEP flood extent are to be in-ground, with coping flush with natural ground level. Where it is not possible to have pool coping flush with natural ground level, it must be demonstrated that the development will result in no net loss of flood storage and no impact on flood conveyance on or from the site.</p> <p>All electrical equipment associated with the pool (including pool pumps) is to be waterproofed and/or located at or above the Flood Planning Level.</p> <p>All chemicals associated with the pool are to be stored at or above the Flood Planning Level.</p>	<p>No pools located on the ground floor. Site is not affected by flood in a 1% AEP storm event</p>

3.3 Flood Planning Levels for Proposed Redevelopment.

Table 1: Flood Planning Assessment from Proposed Redevelopment.

Description	Flood level at PMF storm events (m AHD)	Flood Barrier methodology	Provided Finish Floor level (m AHD)	Compliance
Retail Entry 1	5.12	Flood Gate	5.12	Yes
Basement Entry 1	5.12	Crest	5.12	Yes
Retail Entry 2	5.12	Crest	5.12	Yes
Basement Entry 2/ Lift Shafts	5.12	Crest	5.12	Yes
Basement/ Commercial Entry 1	5.12	Crest	5.12	Yes
Basement/ Commercial Entry 2	5.12	Crest	5.12	Yes
Driveway/ Basement Entry	5.12	Crest	5.12	Yes

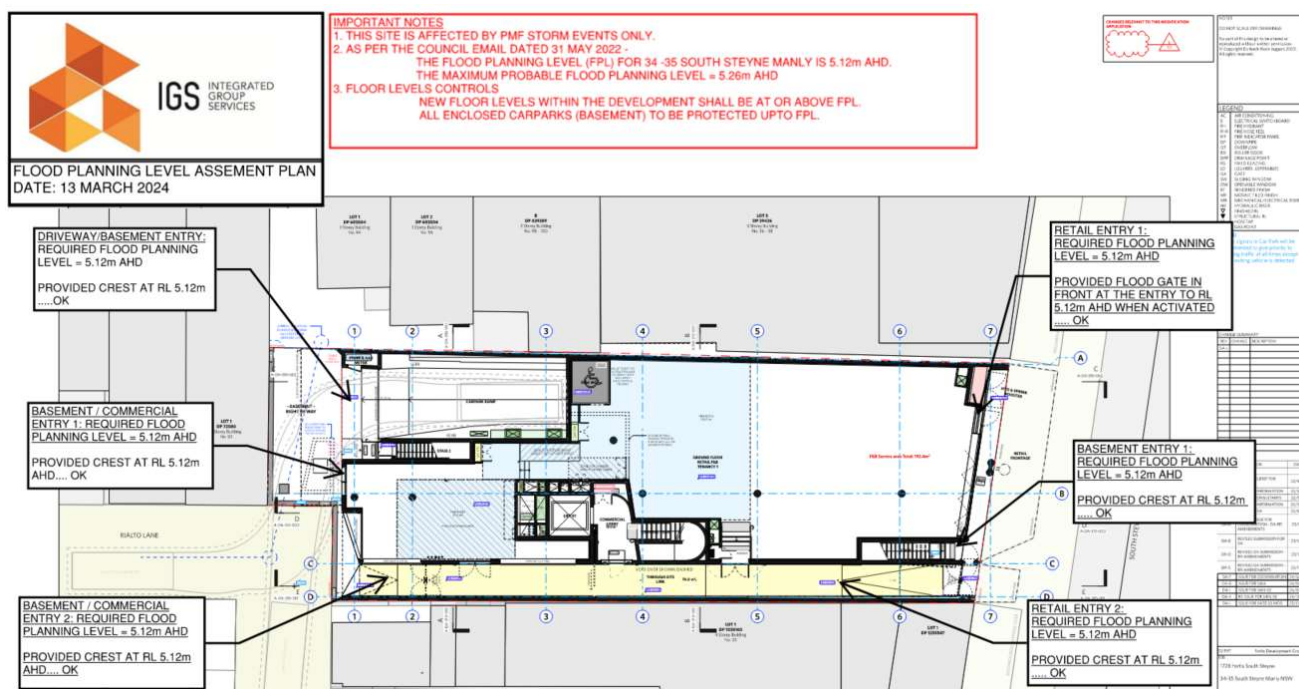


Figure 5: Flood Planning Assessment from proposed Redevelopment.

3.4 Flood Mitigation Measures and Modifications

As discussed in Section 2, the existing site is affected by overland flows during PMF events. Thus, flood mitigation and risk management measures will be required to minimise the adverse effects of flooding.

Flood Gates are provided at the ingress points to avoid potential impacts from the flooding. An HYFLO Passive Self Closing Flood Barrier (SCFD 600) FS-010 has been proposed to be installed at Retail Entry 1 and Basement / Commercial Entry 2 up to RL 5.12m AHD. Refer to product information (Attachment 4) for more information.



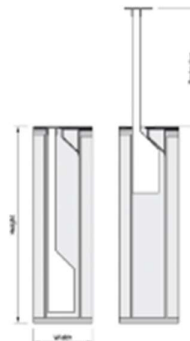
SCFD aluminum top

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 with a height limit of 600mm and 4 meter length up to 1200mm high. All SCFD are designed and built to required lengths and heights.

	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

Figure 6: Flood Gate Specification.

4. Flood Risk Management

4.1 On-Site Refuge and Evacuation

During extreme events, staying on Level 1 of the Building and following directions from SES and other authorities is recommended. During flood events, the basement and Ground floor levels must be avoided and evacuated to the higher grounds.

Flood Evacuation and Warning

This site must be evacuated when NSW SES issues an Evacuation Order. During extreme events, the Bureau of Meteorology will provide warnings through local radio stations, television, and websites, and NSW SES will also provide information on evacuation warnings and evacuation orders.

4.2 Flood Preparedness

Evacuation Warnings and Evacuation Orders are issued to residents and businesses from SES via media, door knocking and /or telephone.

The following measures should be undertaken for flood preparedness:

- A flood emergency kit must be prepared to be used in the event of flooding.
The list of items to be included in the emergency kits can be found on the SES website,
(<https://www.ses.nsw.gov.au/floodsafe/prepare-your-home/emergency-kit/>)

- Portable radio with spare batteries
- Torch with spare batteries
- First aid kit (with supplies necessary for your household)
- Candles and waterproof matches
- Essential papers, including emergency contact numbers
- Copy of any Home Emergency Plans
- Waterproof bag for valuables

When leaving or evacuating your property, place in your emergency kit:

- A good supply of required medications
- Any special requirements and supplies for babies, the disabled, the infirm and/or the elderly
- Appropriate clothing and footwear
- Fresh food and drinking water
- Any list of visitor's logbooks or sign-in books on site.

Keep your emergency kit in a waterproof storage container.

Regularly check your emergency kit (remember to check use-by dates on batteries and gloves) and restock items if needed. Also, keep a list of emergency numbers near your phone or fridge.

Local Flood Safe contacts

Emergency Phone numbers

NSW SES	132 500
Life-threatening emergencies	000 (triple zero)

Phone Numbers

NSW SES Information Line	1800 201 000
Police Assistance line	131 444
Roads and Maritime Services (Live Traffic)	132 701
Northern Beaches Council	1300 434 434
Disaster Welfare Assistance Line	1800 018 444
Department of Primary Industries	1800 814 647
Essential Energy	132 391
Telstra	132 203
Local Land Services	1300 795 299

Local Broadcast radio Stations

ABC Radio Sydney	702AM
2GB	873AM

Websites

NSW SES	www.ses.nsw.gov.au
Northern Beaches Council	https://www.northernbeaches.nsw.gov.au/
Bureau of Meteorology	www.bom.gov.au
Major Roads – Live Traffic	www.livetraffic.com
Local Roads	www.myroadinfo.com.au

Free Smartphone apps

NSW SES apps are available at the app store. Search for Flood Safe and StormSafe.

5. Summary

IGS has completed a Site-Specific Flood Risk Management Report for the proposed development at 34 – 35 South Steyne, Manly. Based on the available information and flood study, the following summary of recommendations is given below:

- It is recommended to take refuge within level 1 of the building and await further instruction from SES/relevant authorities.
- The flood planning levels mentioned in section 3 of this report and as indicated in the architectural plans by Durback Block Jiggers meet the flood planning requirements as per Manly Development Control Plan 2013 DCP. These levels must be maintained to protect the property from flood waters.

This flood impact and risk management plan has identified the flood risks associated with the site and outlined flood mitigation and management strategies that address potential risks and hazards to the occupants and structure of the building.

Based on the incorporated flood planning levels and flood impact and risk management plan, we believe this development application meets all flooding and risk management requirements stipulated within the Manly Development Control Plan 2013 and Northern Beaches Council Building in Flood Prone Land Guidelines.

6. Attachments:

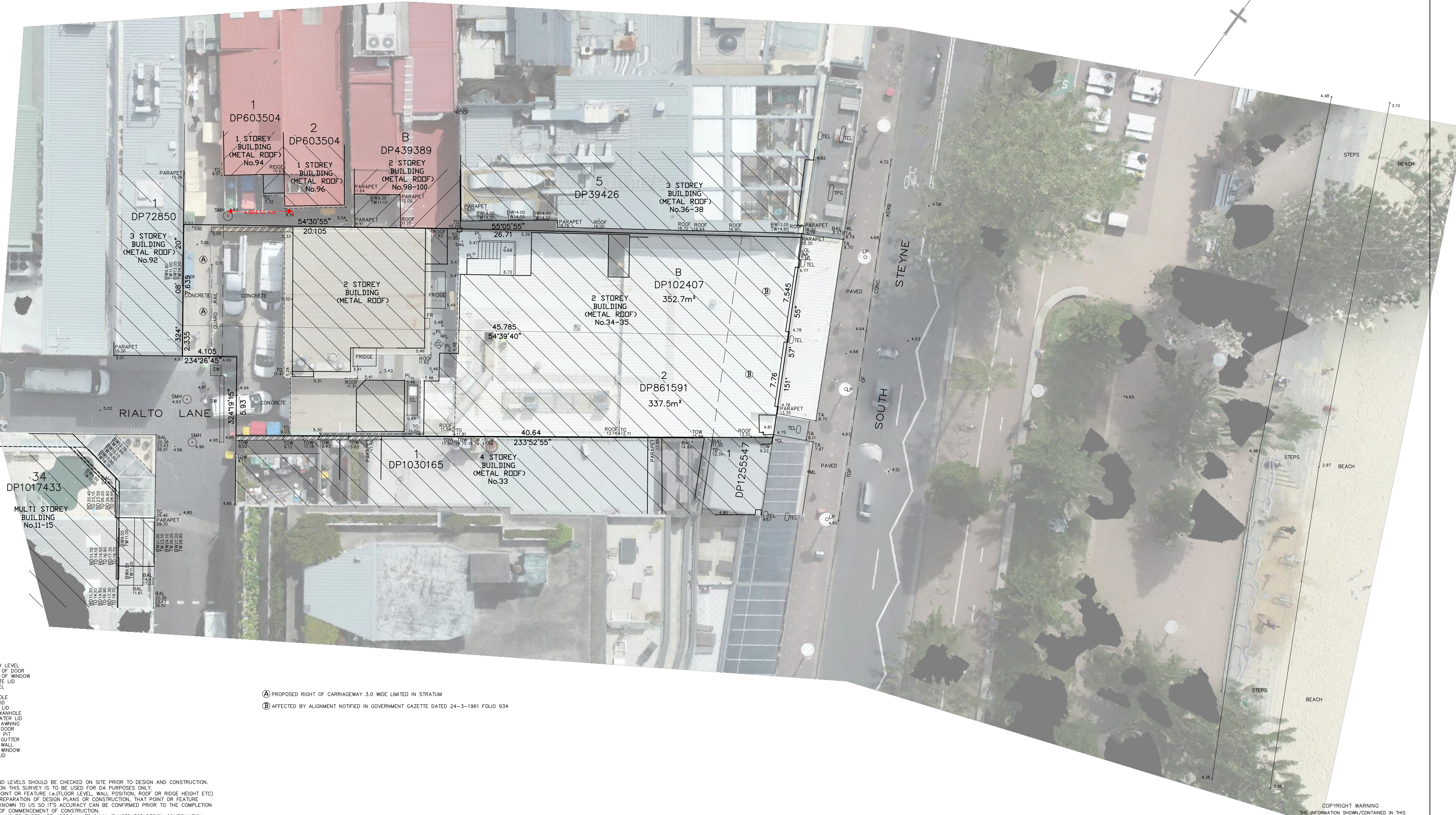
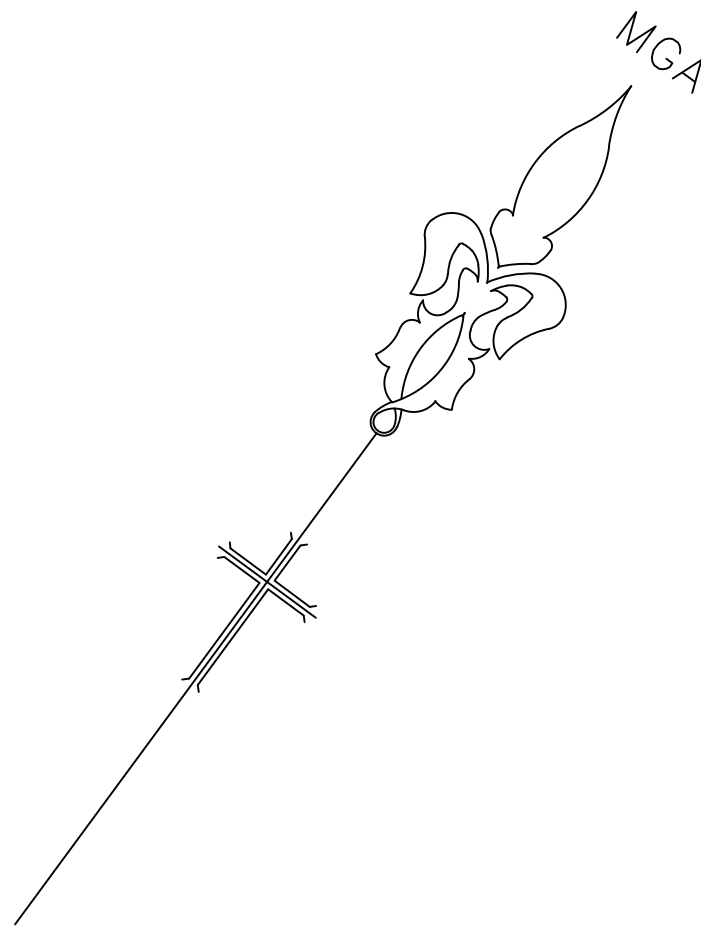
- Attachment 1- Site survey by Hill & Blume, Ref: 63293, Issue A, Survey Date: 01 October 2021.
- Attachment 2 - Architectural Plans by Durback block jiggers, Project No. 1728, Rev DA-L.
- Attachment 3 – Flood Planning Level Assessment Plan by IGS.
- Attachment 4 – Flood Gate Product Information.

7. References

- Manly to Seaforth Flood Study.
- Manly Development Control Plan 2013.
- Manly Local Environmental Plan 2013.
- Northern Beaches Flood Risk Management Policy.
- NSW Floodplain Manual 2005.
- SES website.

SITE PLAN
SHOWING SELECTED LEVELS AND DETAIL
& BOUNDARY IDENTIFICATION SURVEY OVER
LOT B IN DP 102407 & LOT 2 IN DP 861591 BEING No.34-35 SOUTH STEYNE, MANLY.

DATUM : A.H.D.
0 1 2 3 4 5 10
PLOT SCALE 1 : 100 ON A0 SHEET



LEGEND

- BAL BALCONY LEVEL
- BD BOTTOM OF DOOR
- BW BOTTOM OF WINDOW
- CL CONCRETE LID
- FR FIRE REEL
- GL GAS LID
- LP LIGHT POLE
- ML METAL LID
- PL PLASTIC LID
- SMH SEWER MANHOLE
- SW STORMWATER LID
- TA TOP OF ANNING
- TD TOP OF DOOR
- TEL TELSTRA PIT
- TG TOP OF GUTTER
- TOW TOP OF WALL
- TW TOP OF WINDOW
- WL WATER LID

NOTES:

- 1) ALL DIMENSIONS AND LEVELS SHOULD BE CHECKED ON SITE PRIOR TO DESIGN AND CONSTRUCTION.
- 2) THE INFORMATION ON THIS SURVEY IS TO BE USED FOR DA PURPOSES ONLY.
- 3) IF THERE IS ANY POINT OR FEATURE I.E.(FLOOR LEVEL, WALL POSITION, ROOF OR RIDGE HEIGHT ETC) CRITICAL TO THE PREPARATION OF DESIGN PLANS OR CONSTRUCTION, THAT POINT OR FEATURE SHOULD BE MADE KNOWN TO US SO IT'S ACCURACY CAN BE CONFIRMED PRIOR TO THE COMPLETION OF DESIGN PLANS OF COMMENCEMENT OF CONSTRUCTION.
- 4) SOME STRUCTURES AND FEATURES ARE APPROXIMATE ONLY, IF USED FOR DESIGN CONFIRMATION OF ACCURACY SHOULD BE CONFIRMED.
- 5) SURVEY MARKS MUST BE PLACED PRIOR TO CONSTRUCTION OR ERECTION OF FENCES.
- 6) STAIR RISES, STEPS AND LANDINGS HAVE NOT BEEN INDIVIDUALLY LOCATED AND ARE DIAGRAMMATIC ONLY.
- 7) THE RECORDS OF THE SERVICE PROVIDERS HAVE NOT BEEN INVESTIGATED, ONLY THOSE SERVICES THAT ARE VISIBLE AND ACCESSIBLE AT THE DATE OF SURVEY HAVE BEEN SHOWN.
- 8) SERVICES SHOWN ARE INDICATIVE ONLY, OTHER SERVICES MAY EXIST THAT ARE NOT SHOWN, THEREFORE FIELD CONFIRMATION SERVICE LOCATORS SHOULD BE OBTAINED TO CONFIRM EXACT POSITION AND DEPTH.
- 9) SITE AREA SHOWN HAS BEEN CALCULATED BY SURVEY.
- 10) A SITE AND BOUNDARY SURVEY HAS BEEN CARRIED OUT.
- 11) ORIGIN OF LEVELS IS PM 801 RL = 5.111 A.H.D.
- 12) BOTH PROPERTIES ARE AFFECTED BY CROSS EASEMENTS AFFECTING THE PARTY WALL, BETWEEN THE SUBJECT PROPERTIES
- 13) BOTH PROPERTIES ARE AFFECTED BY COVENANT G443702
- 14) BOUNDARY DIMENSIONS, BEARINGS AND AREA FROM UNREGISTERED PLAN

- (A) PROPOSED RIGHT OF CARRIAGEWAY 3.0 WIDE LIMITED IN STRATUM
(B) AFFECTED BY ALIGNMENT NOTIFIED IN GOVERNMENT GAZETTE DATED 24-3-1961 FOLIO 934

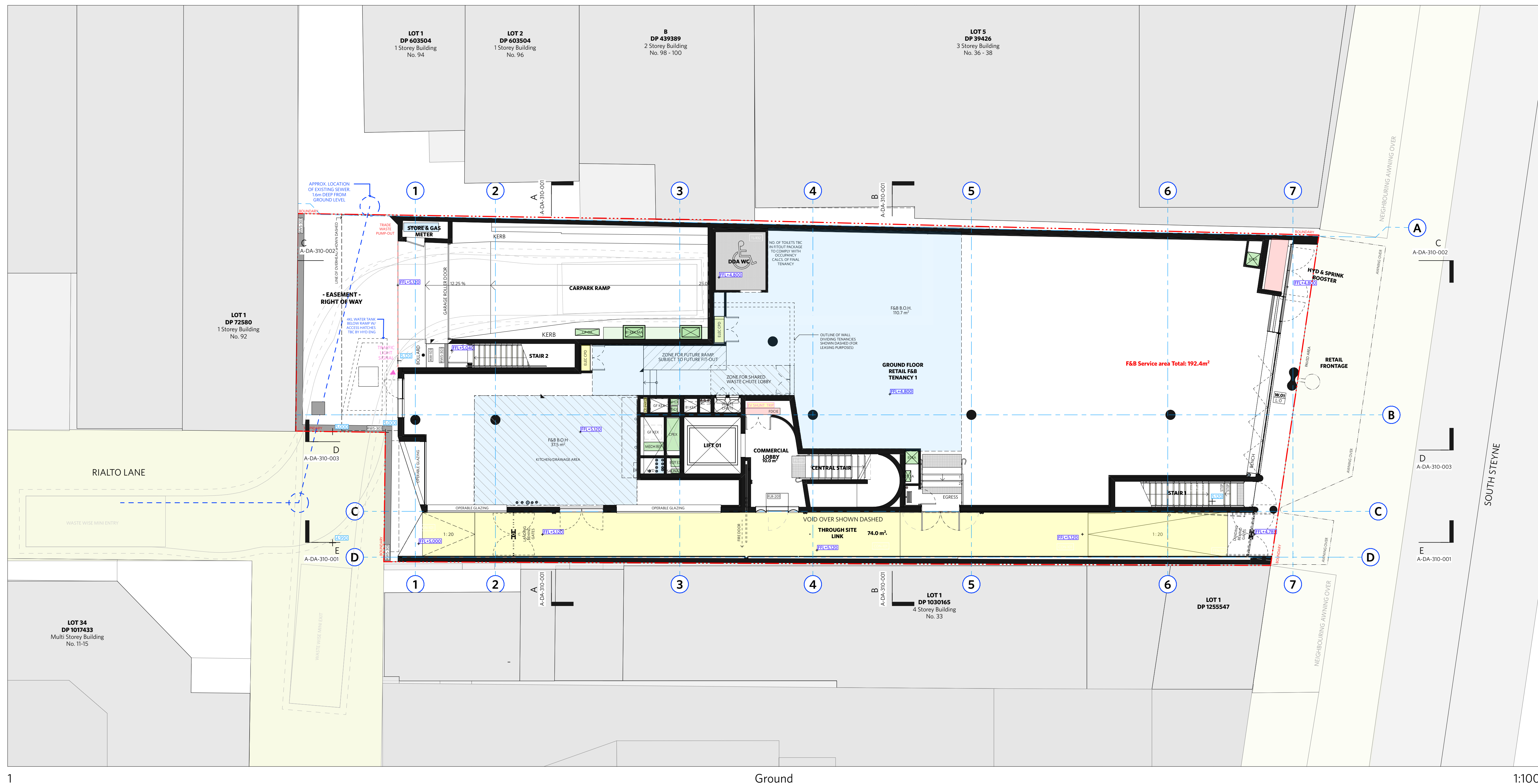


CLIENT: FORTIS
DATE OF SURVEY: 01/10/2021
CAD FILE: 63293001A.DWG
REGISTERED SURVEYOR: PAUL CECHELLERO (ID No.757)
SIGNATURE: *P Cecchellero*

REF No. 63293
ISSUE "A"

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1:10C



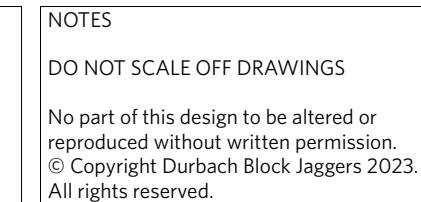
DATE: 13 MARCH 2024

PROVIDED CREST AT RL 5.12m
.....OK

PROVIDED CREST AT RL 5.12m
AHD.... OK

PROVIDED CREST AT RL 5.12m
AHD.... OK

1. THIS SITE IS AFFECTED BY PMF STORM EVENTS ONLY.
2. AS PER THE COUNCIL EMAIL DATED 31 MAY 2022 -
THE FLOOD PLANNING LEVEL (FPL) FOR 34 -35 SOUTH STEYNE MANLY IS 5.12m AHD.
THE MAXIMUM PROBABLE FLOOD PLANNING LEVEL = 5.26m AHD
3. FLOOR LEVELS CONTROLS
NEW FLOOR LEVELS WITHIN THE DEVELOPMENT SHALL BE AT OR ABOVE FPL.
ALL ENCLOSED CARPARKS (BASEMENT) TO BE PROTECTED UPTO FPL.



AC	AIR CONDITIONING
E	ELECTRICAL SWITCHBOARD
FH	FIRE HYDRANT
FHR	FIRE HOSE REEL
FIP	FIRE INDICATOR PANEL
DP	DOWNPIPE
OF	OVERFLOW
RD	ROLLER DOOR
DRP	DRAINAGE POINT
FG	FIXED GLAZING
LO	LOUVRES (OPERABLE)
GA	GATE
SW	SLIDING WINDOW
OW	OPENABLE WINDOW
RF	RENDERED FINISH
MF	MOSAIC TILED FINISH
MR	MECHANICAL/ELECTRICAL RISER
HR	HYDRAULIC RISER
✓	FINISHED RL
✓	STRUCTURAL RL
H	HOSETAP
	GAS POINT

PROVIDED FLOOD GATE IN
FRONT AT THE ENTRY TO RL
5.12m AHD WHEN ACTIVATED
..... OK

PROVIDED CREST AT RL 5.12m
..... OK

PROVIDED CREST AT RL 5.12m
..... OK

5.12m		ON	DI
		CLIENT FOR	22/
		INFORMATION	22/
		CONSULTANTS	22/
		INFORMATION	22/
		DA	22/
DA-W		ISSUE FOR COORDINATION - DA RFI AMENDMENTS	23/
DA-B		REVISED SUBMISSION FOR DA	23/
DA-D		REVISED DA SUBMISSION - RFI AMENDMENTS	23/
DA-E		REVISED DA SUBMISSION - RFI AMENDMENTS	23/
DA-F		ISSUE FOR COORDINATION	24/
DA-G		ISSUE FOR S455	24/
DA-J		ISSUE FOR S455 02	24/
DA-K		RE-ISSUE FOR S455 02	24/
DA-L		ISSUE FOR S.455 03 MOD	25/0

CLIENT	Fortis Development Group
JOB	1728 Fortis South Steyne 34-35 South Steyne Manly NSW

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David Jagers NSW Reg. No 9999

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ND		27.2.25	3/3/20 10:35 a
SCALE			
1:100 @ A1 / 1:200 @ A3			

TITLE	GA Plans Ground Plan
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PROJECT NO.	ISSUE	REV.
1728	S4.55	DA
DRAWING NO.		
A-DA-110-003		

Flooding Solutions

Product Information

HYFLO Passive Self Closing Flood Barriers Model: FS-009 & FS-010



HYFLO

Product Information

Self Closing Flood Barrier (SCFB) FS-009

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 or gales. 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 have already been built and installed in several countries. 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 favourable preference when specifying optimal and cost effective but passive flood defense.



HYFLO Product Information

SCFB FS-009

The SCFB C can be built at any required length. The basin from the SCFB™ is constructed from pre-formed or formed on site concrete. 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 1m 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.



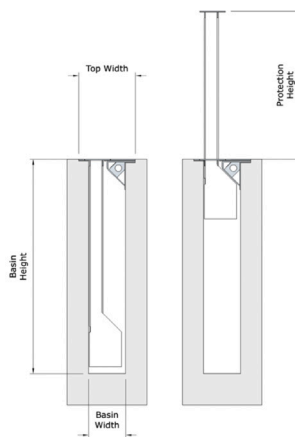
SCFB Concrete basin with Load transfer slap

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	3000 mm	-----	3250 mm	570 mm	400 mm	220 mm

HYFLO

Product Information

Self Closing Flood Door (SCFD) FS-010

The SCFD is a smaller version from the SCFB and is intended to protect small openings and private property against floods. The working principle is very similar to that of the larger SCFB but on a reduced scale. Because of this reduced scale and lighter materials the barrier is easy to install. The SCFD basin is made out of 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, Flooding Solutions can advise what the best option is for the specific location.



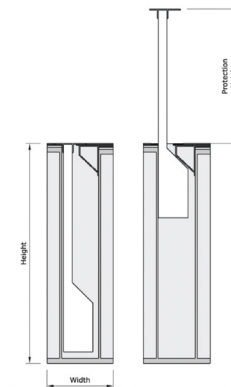
SCFD aluminum top

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

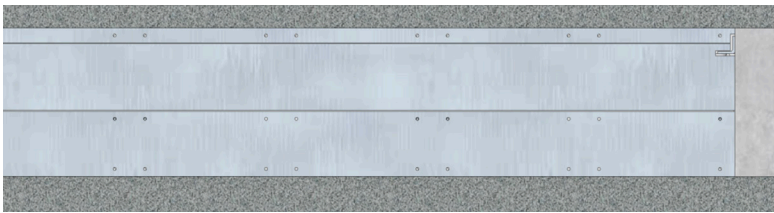
The SCFD can be built in length up to 6 meters with a height limit of 600mm and 4 meter length up to 1200mm high. All SCFD are designed and built to required lengths and heights.

	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

HYFLO

Product Information

Top Finish



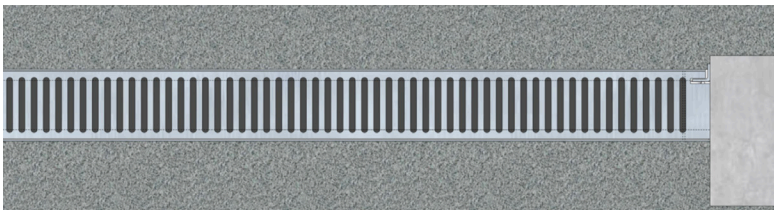
Standard top

Top plate, top strip and lid are visible



Extended top

With an extended top the top plate and top strip will have an elevation, the pavement can cover the top plate and strip. The lid is the only visible component of the barrier.



Extended top as water runnel

The lid is replaced for a water inlet lid.



Invisible top

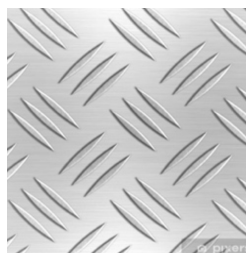
For the invisible top we use the extended top and lower the lid this creates space to “blend” the same pavement on top of the lid

Top material

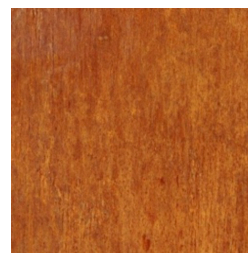
It is possible to choose between different top finishes.



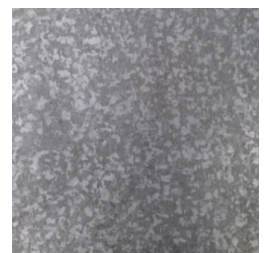
Stainless steel



Diamond plating



Corten steel



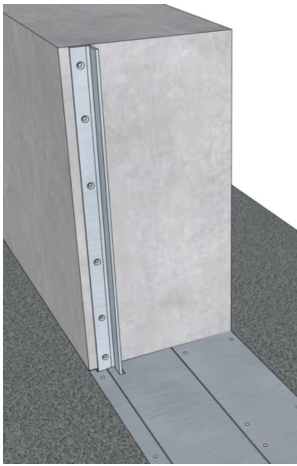
Galvanized steel

HYFLO

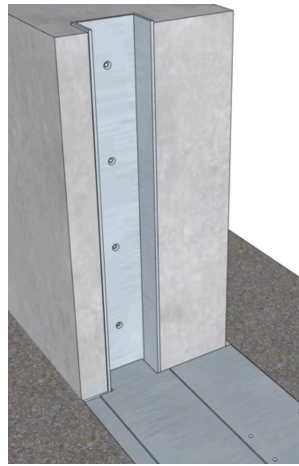
Product Information

Guide

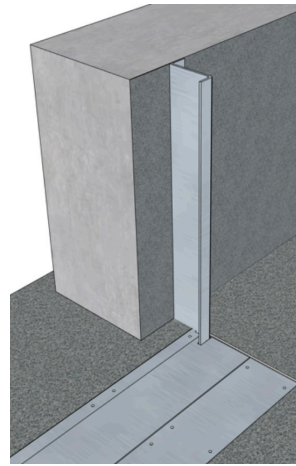
It is possible to choose between guide rails or guide slots as end protection of the SCFB. Guide rails outside of the fixed wall and guide slot can be mounted inside the fixed wall. Good operation of the SCFB relies on a guide rail or guide slot at each end of the barrier to seal against. The guide also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



Guide rail



Guide slot



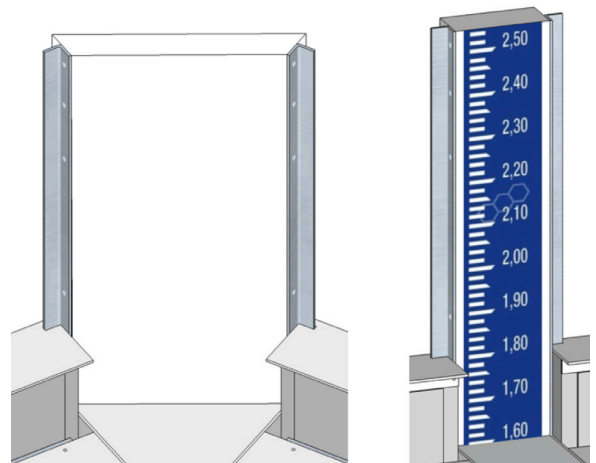
Guide rail front mounting

Where the barrier is to fit between two fixed wall a guide rail can be mounted to the fixed wall. If there is considerable pedestrian traffic it is recommended to use a guide slot to seal the barrier inside the wall.

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.



HYFLO

Product Information

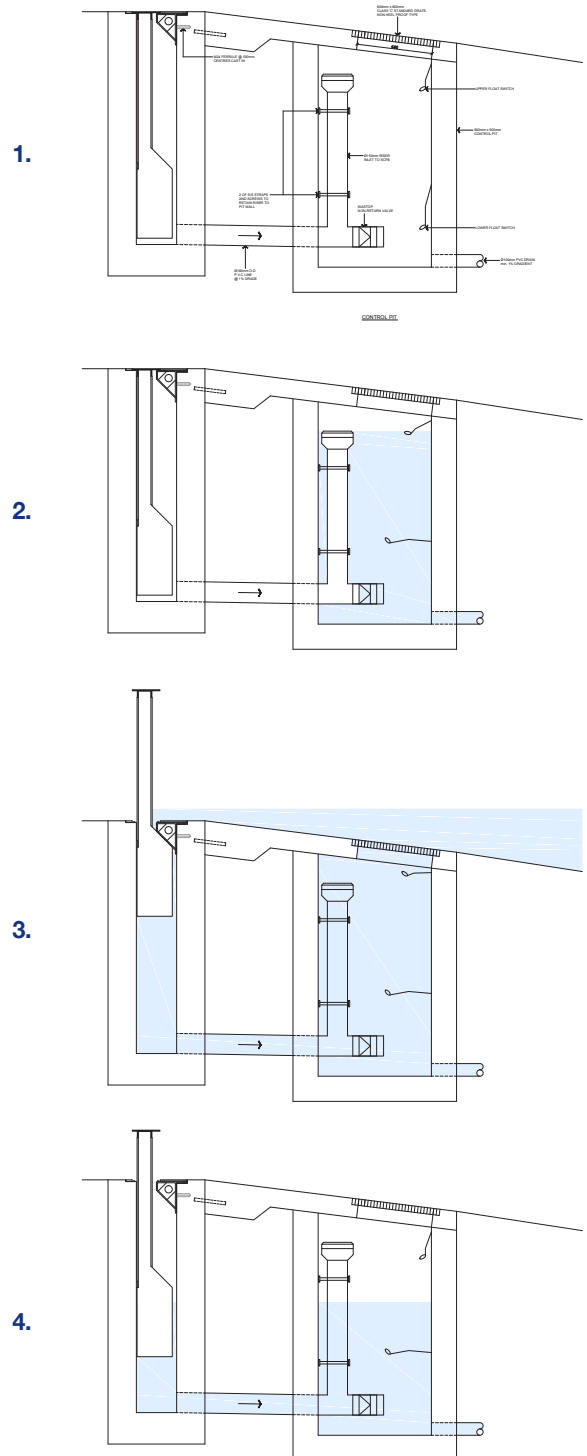
Activation

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 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 deploying if there is no need for it.

Additionally, in situations where water subsides slowly, the pump switches on once the waters are below flood level and the SCFB will therefore no longer be an obstacle.

For commissioning and ongoing testing, it is important to have a water supply in the area of the SCFB. The outlet of the pipe connection or service pit can be temporarily closed and the system can be easily filled by the water supply. FLOODING SOLUTIONS will design and nominate the optimal position for the control pit to ensure an appropriate design for each unique application.



Flooding Solutions

Product Information

HYFLO Passive
Self Closing Flood Barriers
Model: FS-009 & FS-010

Contact

info@floodingsolutions.com.au