100 WALKER STREET, NORTH SYDNEY

STAGE 2 DETAILED DEVELOPMENT APPLICATION CIVIL ENGINEERING REPORT

Prepared for: Pro-Invest Developments
By: **en**struct group pty ltd
Revision: 03

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ISSUE AUTHORISATION

PROJECT: 100 WALKER STREET, NORTH SYDNEY
Project No: 6440

Rev	Date	Purpose of Issue / Nature of Revision	Prepared by	Reviewed by	Issue Authorised by
01	19/11/21	Draft Issue	NKK	PAL	PAL
02	02/12/21	Issue for Development Application	NKK	PAL	PAL
03	17/12/21	Stage 2 Detailed DA	NKK	PAL	PAL

Executive Summary

This Development Application Civil Engineering report has been prepared by **en**struct group to accompany the development application (**DA**) for a proposed mixed use commercial development located at 100 -102 Walker Street, North Sydney (**the site**).

This report has been prepared to address various aspects of civil design, including; stormwater discharge quality and quantity, including rainwater retention and onsite stormwater detention, flood planning levels, bulk earthworks, and construction phase stormwater management.

This report concludes that the proposed mixed use commercial development is suitable and warrants approval subject to the implementation of the following mitigation measures:

- Erosion and sediment control measures
- Onsite stormwater detention tank
- Stormwater quality filters and rainwater re-use
- Adopting a flood planning level above the 1% AEP flood height

Following the implementation of the above mitigation measures, the proposed mixed use commercial development at 100 – 102 Walker Street will be acceptable / appropriate with regards to civil engineering.

Contents

1 Introduction

This report has been prepared to accompany a development application (**DA**) for the re-development of 100-102 Walker Street, North Sydney (**the site**) (herein referred to as 100 Walker Street). The legal description of the site is Lot 1 in Deposited Plan 542915. The site is rectangular in shape with an area of approximately 1,392sqm, a primary frontage to Walker Street of 38.66m to the east and a secondary frontage to Little Spring Street of 38.45m to the west.

The purpose of this report is to address various aspects of civil design, including; stormwater discharge quantity, stormwater quality including rainwater retention and onsite stormwater detention, flood planning levels, bulk earthworks, and construction phase stormwater management.

This Detailed DA seeks consent for a 48-storey commercial building, comprising office and retail land uses. The DA seeks consent for:

- Demolition of existing site and excavation to a depth of RL35 metres.
- The design, construction, and operation of a 48-storey office building (inclusive of two levels of roof plant) with a maximum building height of RL239 metres (to the top of the rooftop feature) and a total gross floor area provision of 42,573sqm. The building will accommodate:
    - 40-storeys of commercial office space including terraces on the eastern elevation and building plant at the Low-rise Deck (Level 17), Mid-rise Deck (Level 31) and rooftop (Level 45 and 46).
    - Retail premises (including food and beverage premises and shops) accommodated on the Lower Ground Floor, Upper Ground Floor and Basement Level B1.
    - Pedestrian access to the site from several entries on Lower Ground and Upper Ground from the Walker Street, Little Spring Street and laneway frontages.
    - Repurposing existing vehicular access on Walker Street and construction of six (6) storey basement to accommodate a total of 74 car parking spaces, 2 loading bays, 4397 bicycle parking spaces, as well as associated end of trip facilities (EOTF), storage, back of house, services and substation.
    - Provision of a rooftop architectural feature to a total height of RL239.0 metres.
    - Landscaping provision across the ground plane and commercial terraces.
    - Public domain improvements to facilitate an improved pedestrian experience at ground plane, including activation of street frontages and provision of a 6m-wide open to the sky public pedestrian laneway (of which 100 Walker Street Project contributes 50% of this 6m wide Laneway) along the full extent of the northern site boundary providing access from Walker Street through to Little Spring Street.
    - The addition of a public lift providing accessible access between Little Spring Street, the Laneway and Walker Street.

1.1 The Site

The land to which this DA relates is known as 100 Walker Street, North Sydney, within the North Sydney Council Local Government Area (**Figure 1**). The site is legally described as Lot 1 in DP542915. The site is rectangular in shape and has an overall area of approximately 1,392 sqm. The site generally grades from the north west corner of the site at RL 56.20m AHD, to the south east at RL 53.50m AHD. The site is bounded by Walker Street to the east, Little Spring Street to the west, and commercial high rise buildings to the north and south.

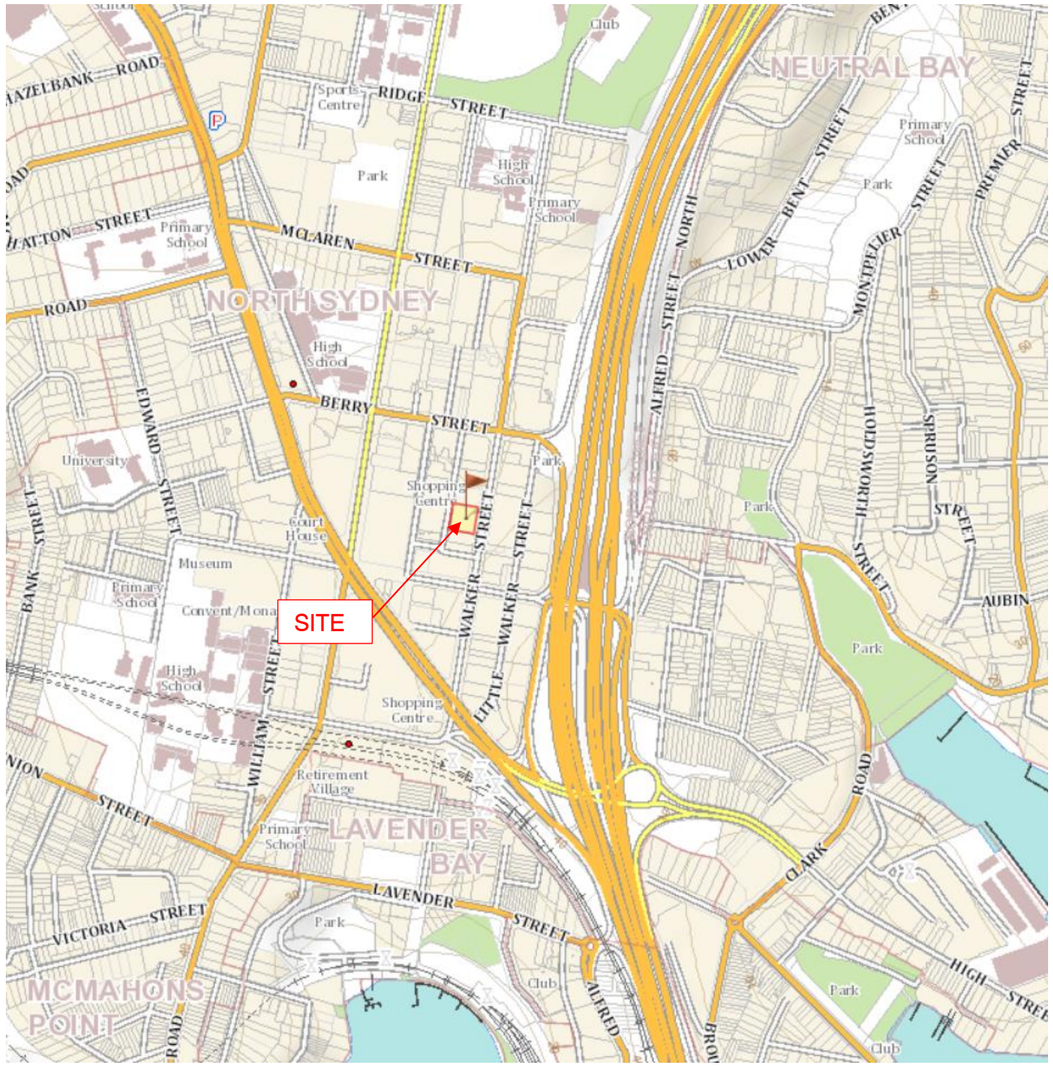

Figure 1: Location Plan (Source: Six Maps)

Figure 2: Site Location (Source: Google Maps)

2 *Existing Site*

The development site currently includes an existing 14 storey commercial building with a below ground basement to approximately RL 44.50m AHD. Vehicle access to the site is provided via both Walker Street and Little Spring Street. The surrounding land to the north, south, east and west comprises of mixed use commercial office developments, typically with ground level lobby areas and retail uses.

Whilst attempts have been made to identify all services which will be impacted from the proposed design via Dial Before You Dig (DBYD), there is still the possibility that unknown services are encountered during any future demolition or construction. DBYD results indicate that no services traverse through the site. No underground services investigation has been undertaken.

2.1 *Existing Stormwater*

Council stormwater kerb inlet pits are currently located in Walker Street. A Sydney Water culvert passes through 88 Walker Street to the south of the development site. Refer to **Figure 3** for existing stormwater drainage pit and pipe locations. Walker Street is lower in level than Little Spring Street, resulting in the south eastern corner being the lowest level of the site. It is proposed that site stormwater discharge can be directly connected to an existing Council kerb inlet pit in Walker Street (**Figure 3**).

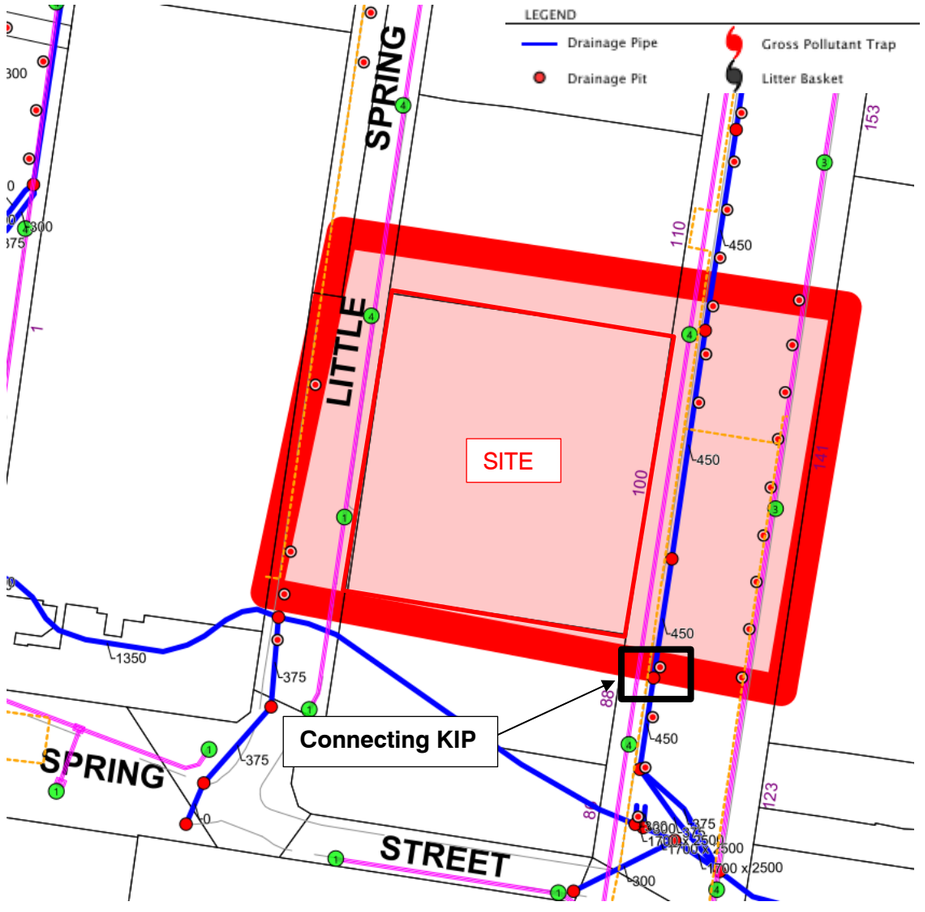

Figure 3: Site Location (Source: Google Maps)

3 *Proposed Development*

The development includes a 48 storey mixed use, high rise building, with a 6 level basement below. Retail stores will be located on the ground floor with commercial office spaces on the higher levels. Pedestrian entrances to the building are located on both Walker Street and Little Spring Street site frontages. Vehicle access is to be through a driveway entrance from Walker Street. The northern portion of the site forms part of the through site link between the site and the adjacent 110 Walker Street.

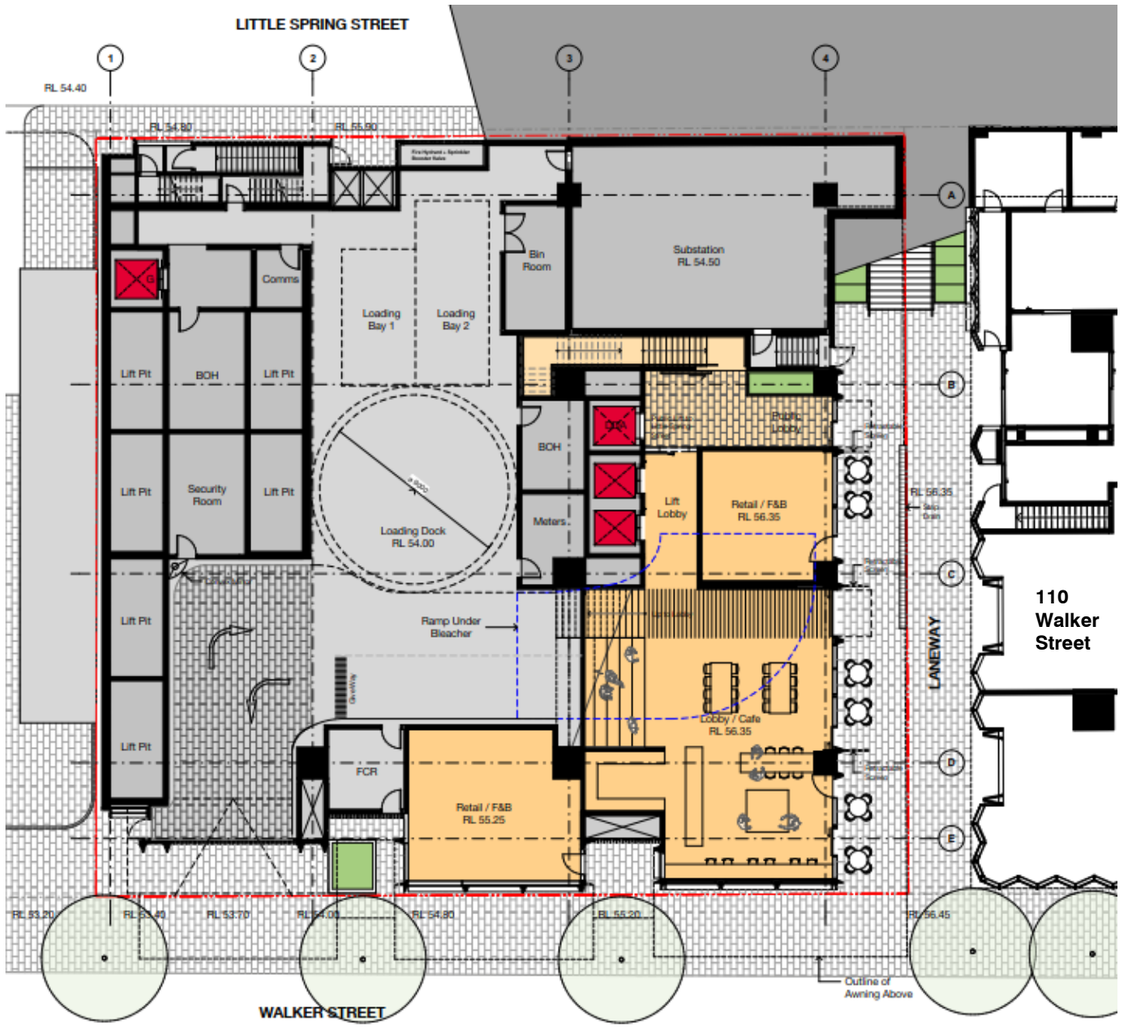

Figure 4: Lower Ground Floor (Source: Bates Smart dated 03.12.21)

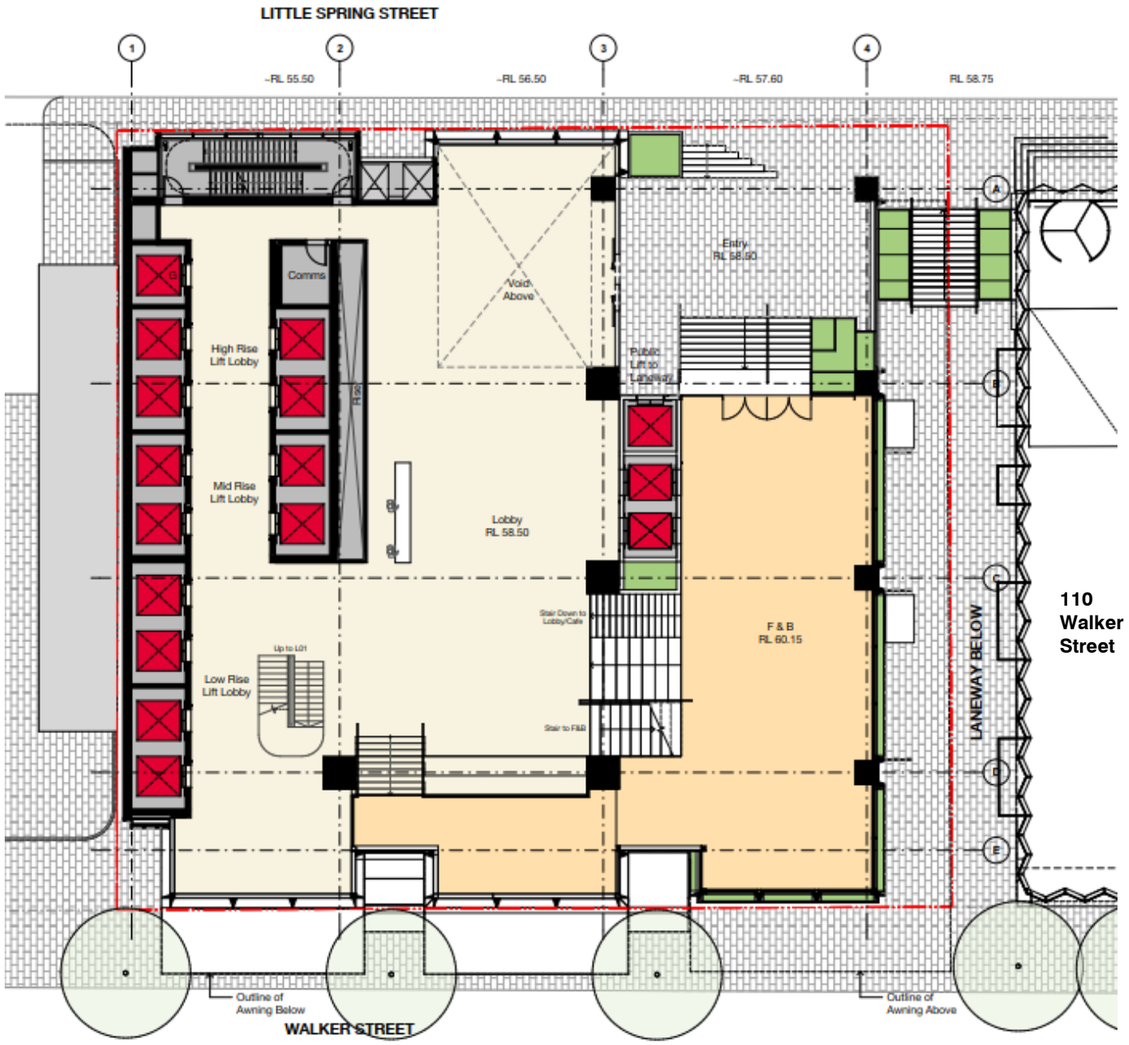

Figure 5: Upper Ground Floor (Source: Bates Smart dated 03.12.21)

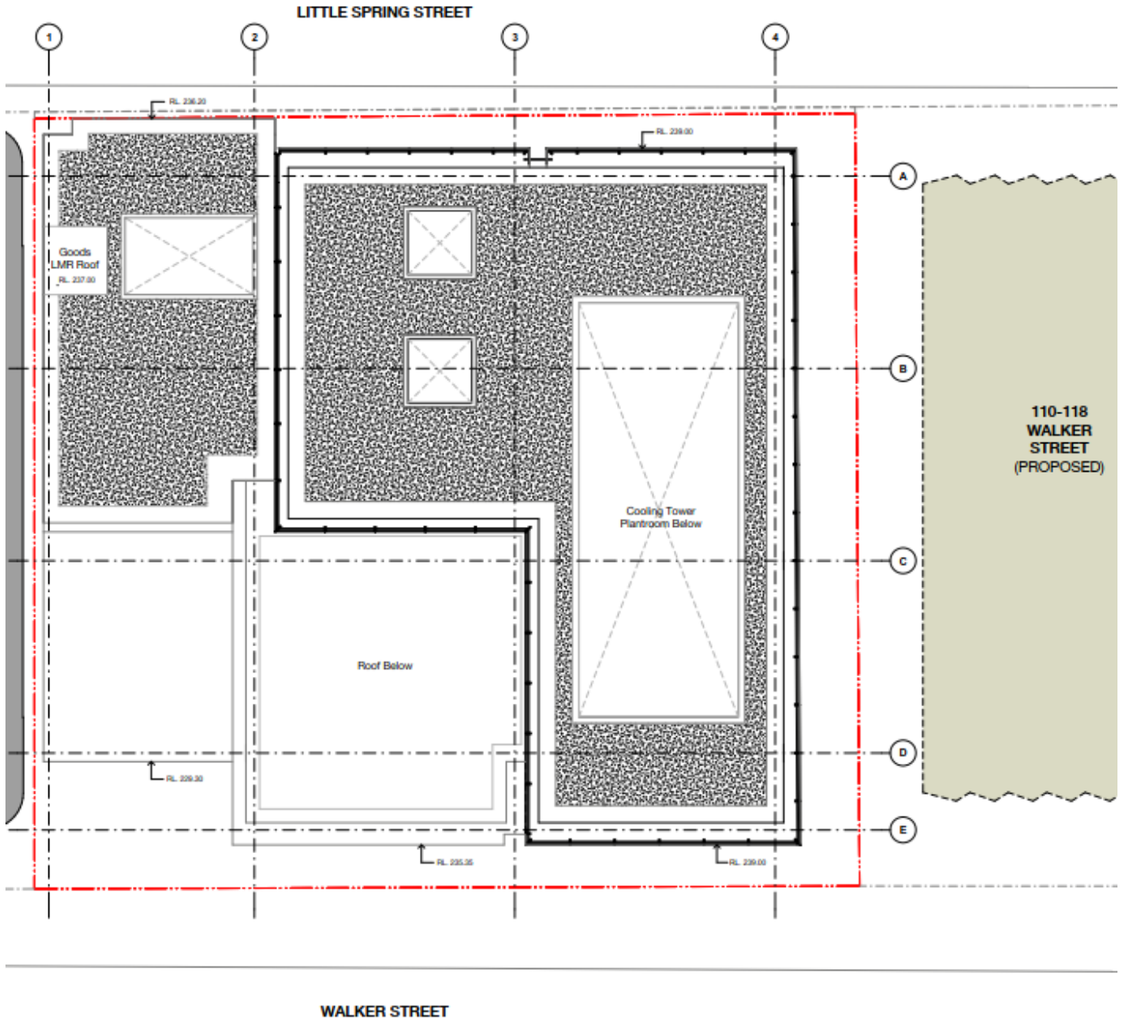

Figure 6: Level 45 Roof Plan (Source: Bates Smart dated 03.12.21)

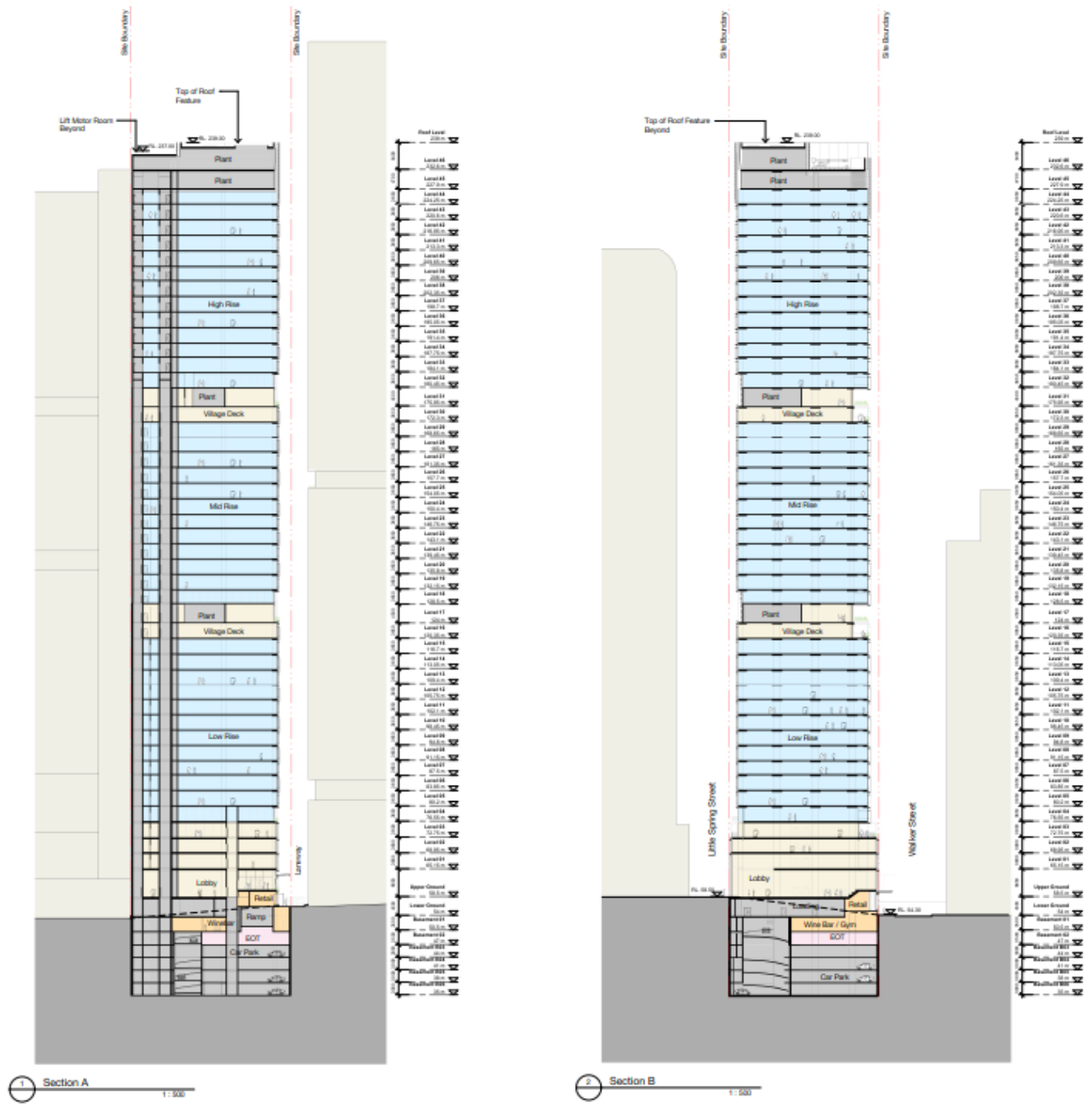

Figure 7: Proposed elevation (Source: Bates Smart dated 03.12.21)

4 Stormwater Design

The stormwater design must be in accordance with the relevant Australian Standards, North Sydney Council Water Management Technical Manual, Sydney Water requirements, Australian Rainfall and Runoff (2019), and the Environment Protection Authority (EPA) of NSW.

4.1 Onsite Stormwater Detention (OSD)

Due to the change in impervious area on the site, OSD is required to manage the stormwater discharge rate from the site. Advice from Council indicates that OSD must be provided for the

proposed development to ensure that the site stormwater discharge rate does not exceed the rate discharging from the pre-development site in all storm events. As a consequence, all stormwater runoff from the building roof for all storms up to the 1% AEP storm is to be retained on the site for gradual release to Council's drainage system.

Stormwater detention can be achieved through the use of an OSD tank. The location and design of the OSD storage must not have a detrimental impact on upstream or adjacent properties. OSD is to be located away from any natural watercourses and Overland Flow Paths (OLFP) from catchments external to the site and are not to be inundated by a natural watercourse or externally sourced OLFP in any events up to and including the 1% AEP storm event.

Whilst there is no preference for OSD Tank construction materials, the tank is to be structurally sound and maintain the ability to hold and retain water prior to its discharge into the connecting stormwater system. The discharge from the OSD system is to be via an orifice plate.

Due to the constraints of the site and the limited free space on ground floor, the OSD tank will be placed on Level 45 of the building (**Figure 8**). The OSD tank will capture all the roof runoff to slow its discharge to ground level and ultimately the existing Council system in Walker Street. The outlet of the OSD tank will discharge to a water quality chamber located in the south east corner of the site fronting Walker Street (**Section 4.2.3**).

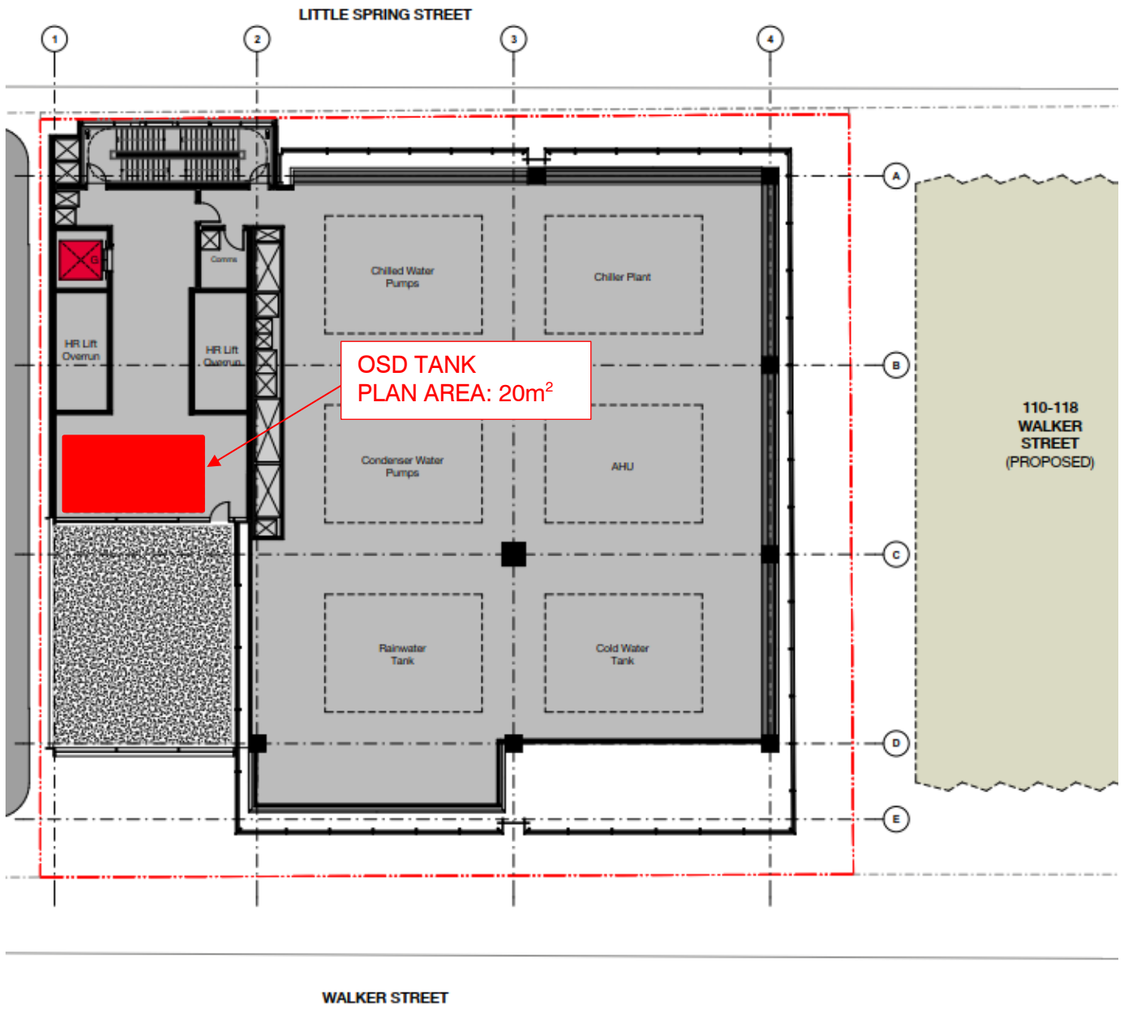

Figure 8: Level 45 plan with OSD location

4.1.1 DRAINS Model

DRAINS Modelling was undertaken to demonstrate the stormwater discharge rate and volume of the required OSD to manage the site stormwater runoff. **Figure 8** and **Figure 9** (overleaf) demonstrate the suitability of an approximate 20m^3 OSD tank in managing the stormwater discharge rate in all storm events, up to and including the 1% AEP storm event, to below the PSD governed by the flowrate of the stormwater in the corresponding storm event for the pre-development site.

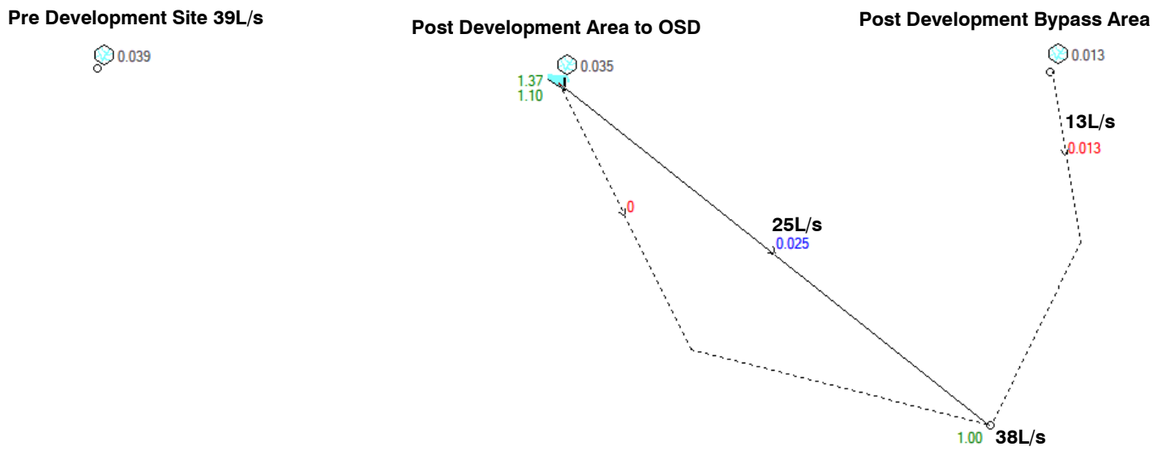

Figure 9: 20% AEP storm event pre and post development flows

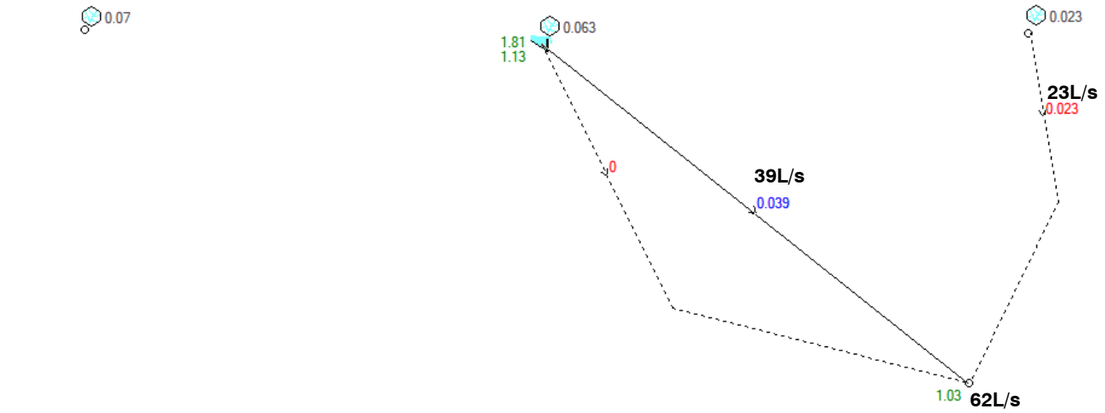

Figure 10: 1% AEP storm event pre and post development flows

The following parameters outlined in **Table 1** were used in the development of the DRAINS model.

Table 1: DRAINS parameters

Catchment area	1,392m²
Roof Area	1,008m²
Bypass Area	384m²
Permissible Site Discharge (PSD)	Flow rate in corresponding storm event for the pre development site
Critical storm duration	5 minute
OSD Volume	20m³
Depth of tank	1m
Plan Area of tank	20m²
Orifice Size	150mm

4.2 Stormwater Quality

The quality of the water discharging from the site will be managed by suitable WSUD measures, such as pit insert filters, gross pollutant traps to remove litter and sediments, and StormFilter Cartridges. The stormwater is to be treated to meet the pollutant reduction and removal targets as required by the North Sydney Local Development Control Plan (DCP) 2013. The removal targets are shown in **Table 2.**

Table 2: Pollutant Reduction Targets

Pollutant	Stormwater Reduction Target
Total Suspended Solids	85% reduction on the Baseline Annual Pollutant Load
Total Phosphorous	65% reduction on the Baseline Annual Pollutant Load
Total Nitrogen	45% reduction on the Baseline Annual Pollutant Load
Gross Pollutants	90% reduction on the Baseline Annual Pollutant Load

A stormwater pollutant capture treatment train for the site will include rainwater collection and re-use, and stormwater StormFilter Cartridges in a water quality chamber, prior to site discharge which will remove gross pollutants, sediments and attached nutrients. These systems are preferred as it will be able to achieve the required pollutant reductions, is easily maintained, and does not require large open areas or pose a risk to safety for the site inhabitants.

The removal rates will also have to be in accordance with:

- The EPA's manual on Managing Urban Stormwater (Treatment Techniques)
- The relevant Australian Standards for pollution control devices.

4.2.1 Rainwater Tanks

Rainwater tanks will be incorporated into the development to assist in rainwater collection and reuse in landscape irrigation, cooling tower make up, and flushing of toilets. Use of rainwater tanks will satisfy Section 2.6.5 Water Conservation P10 of the North Sydney Local DCP 2013. The rainwater reuse and reticulation design will be the responsibility of the Hydraulic Engineer, and sizing is to be confirmed by the project Hydraulic Engineer. The size of the rainwater tank and the re-use demand have been used as an input in the MUSIC stormwater quality model, and will be adjusted to suit the hydraulic design progress. The storage tank will overflow towards the OSD tank.

4.2.2 StormFilter Cartridges

Water quality filters can be used inside OSD tanks or water quality chambers. Cartridges draw stormwater into the filter media to facilitate treatment to reduce contaminants of Nitrogen, Phosphorous and Suspended Solids before discharge from the OSD tank onto the downstream system. Incoming stormwater will be directed into a filtration chamber to be treated by the cartridges (**Figure 11**), prior to discharging into the existing Council stormwater system.

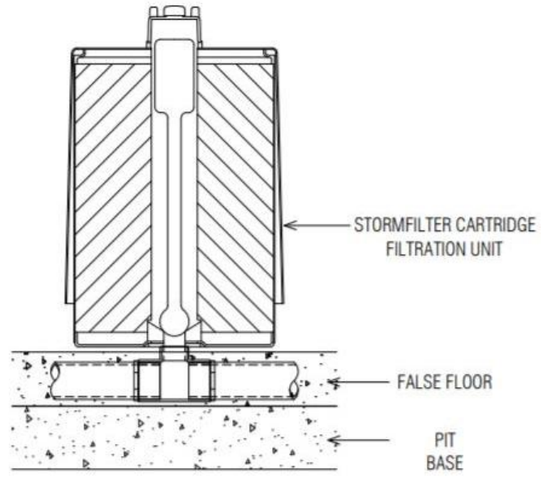

Figure 11: StormFilter Cartridge Detail

4.2.3 MUSIC Model

A preliminary water quality analysis has been undertaken by enstruct to develop the WSUD strategy for the proposed development, and to assess its ability at meeting North Sydney Council water quality targets. The water quality modelling for this study was undertaken using the industry standard software MUSIC (Model for Urban Stormwater Improvement Conceptualisation) Version 6.3.0. The MUSIC model layout representing the proposed WSUD strategy for the development is shown in **Figure 12**.

One (1) 690mm StormFilter cartridges with a treatment flow rate of 0.9L/s each, are required within the stormwater system on site to treat the stormwater and reduce the presence of Phosphorus, Nitrogen, and Total Suspended Solids. Alongside a rainwater tank onsite, this design meets required pollutant reduction targets as demonstrated in **Table 3**.

It is proposed that the StormFilter cartridge is placed within a small 2.5m^2 water quality chamber on the lower ground floor of the site (**Figure 13**). This is to ensure ease of maintenance when required and will treat both the OSD discharge stormwater, and the OSD bypass overland flow.

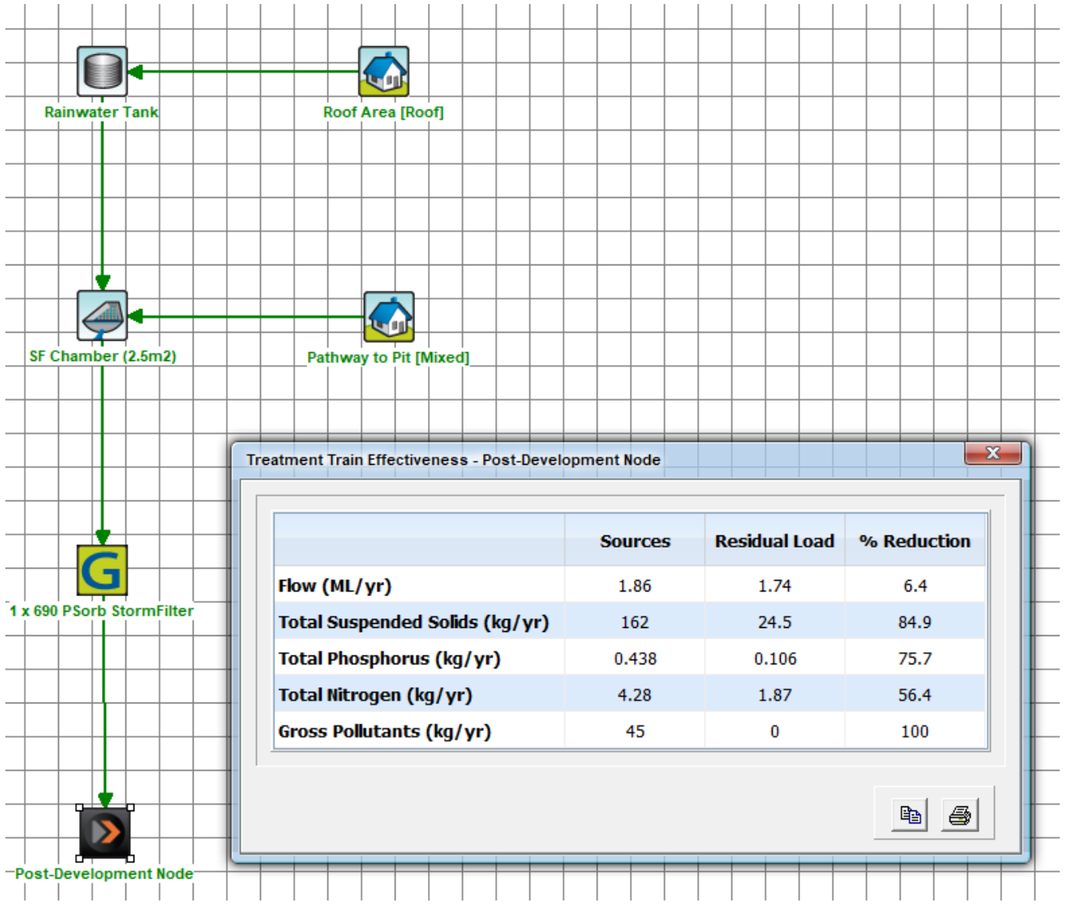

Figure 12: MSUIC Model Pollution Reduction Results

Table 3: Pollutant Reduction Targets

Pollutant	Council Reduction Target	Reduction Result	Pass/Fail
Total Suspended Solids	85%	85%	Pass
Total Phosphorous	65%	76%	Pass
Total Nitrogen	45%	56%	Pass
Gross Pollutants	90%	~100%	Pass

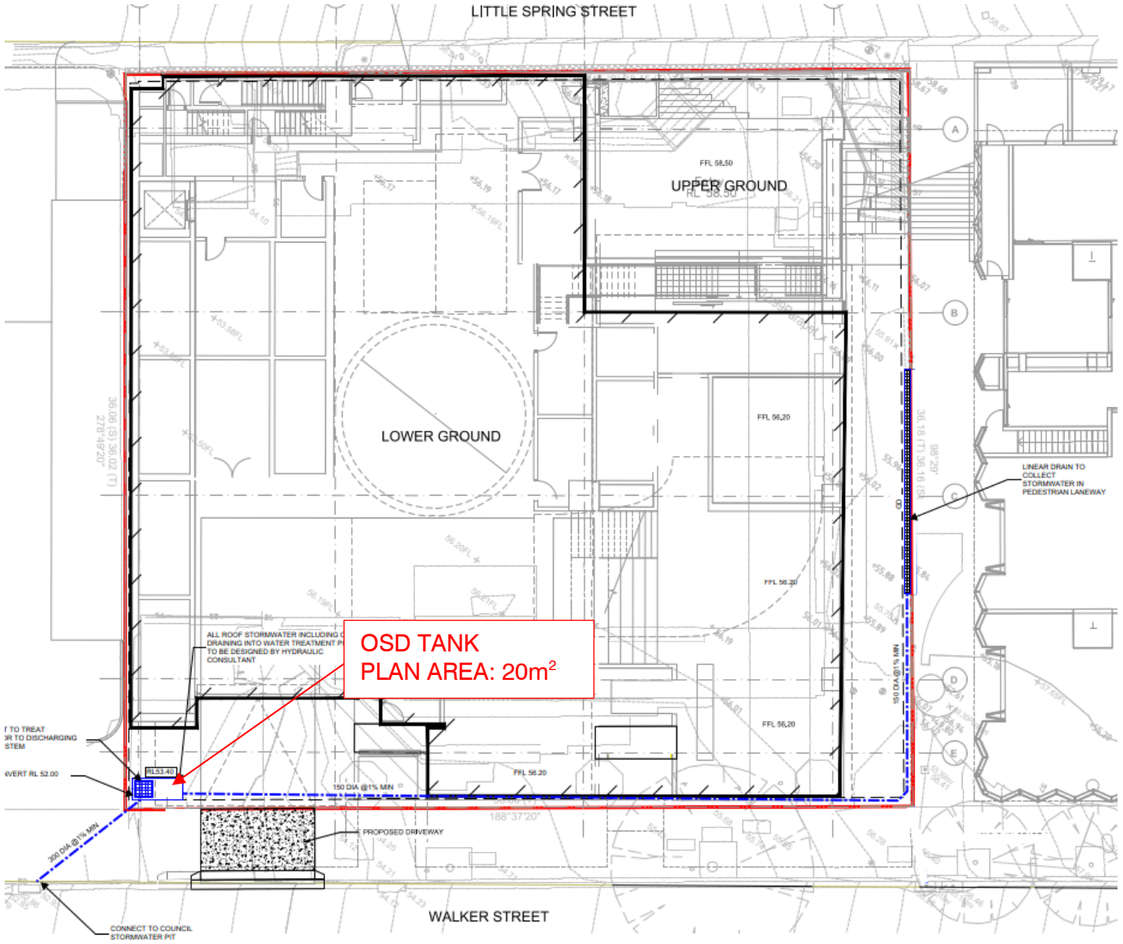

Figure 13: Water Quality Chamber location (Source: enstruct)

5 *Flood Planning*

Likewise to the flood planning advice from North Sydney Council in regards to the adjacent 100 Walker Street site, the PMF as been accepted as the appropriate flood planning level for the site. Refer to **Appendix A** for the correspondence with Council indicating that the PMF flood height is to be adopted as the flood planning level.

5.1 Flood Model

Following this advice, enstruct obtained the LGA-wide flood model from North Sydney Council to understand the flood conditions surrounding the proposed development and its impact on the proposed development. It is understood that this model was prepared as part of the North Sydney LGA Flood Study, prepared by WMA Water and published in 2017. enstruct reviewed Council's flood model and noted areas where the model could be improved and / or brought up to current

standard. To improve the accuracy of the flood model at the subject site, the following changes were made:

- Ground surface – detailed site survey of the area was input to the flood model to represent the terrain more accurately.
- Stormwater network – the sub-surface drainage in Walker Street was shown as a 300mm diameter pipe in the flood model. The detailed survey found the stormwater pipe is 450mm diameter from the top of Walker Street to the culvert near the intersection with Spring Street. The model was updated to reflect this.
- Hydrology – the inflow hydrographs in the Council flood model were based on Australian Rainfall and Runoff (ARR) 1987. Since the flood study was published, ARR has been updated in 2016 and 2019. The model hydrology was updated to ARR 2019 to meet the current industry best practice.

5.2 Hydrology

The DRAINS models used to calculate the flood model inflow hydrographs were included in the flood model package provided by Council. The DRAINS models were updated with revised 2016 IFD data and an ensemble of storms generated as per the methodology outlined in ARR2019.

The North Sydney LGA Flood Study found the critical duration 1% AEP storm on Walker Street was the 25 minute duration storm. To meet the current industry best practice, the flood model was updated to reflect ARR 2019.

ARR 2019 recommends an ensemble approach to flood modelling, where 10 storm events are modelled for each storm duration to represent the variability in observed rainfall patterns. ARR2019 states: “It is not recommended that the temporal pattern that represents the worst (or best) case be used by itself for design. Testing has demonstrated that on most catchments large number of events in the ensemble patterns are clustered around the mean and median”. The recommendation is that the median storm is selected for the purpose of flood analysis.

Undertaking this analysis involved 31 simulations to determine the critical duration storm and the median storm for that duration as per the ARR2019 guidelines. The critical duration storm for a 1% AEP event was found to be the 10-minute storm.

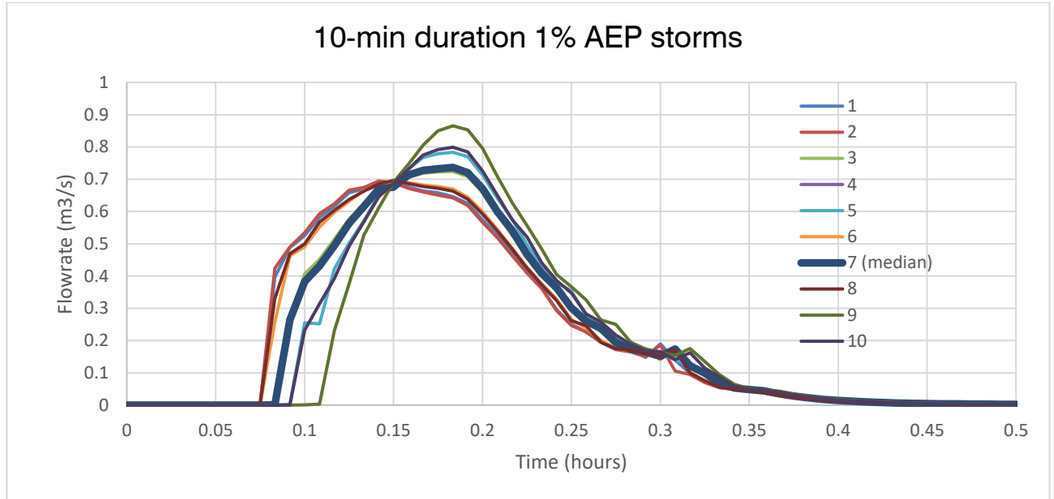

Figure 14: Walker Street Hydrographs

5.3 Results

The original model results have been compared to the model results with the changes outlined earlier in this report; terrain, pipe network, and ARR2019 hydrology.

The results show that the peak flow on Walker Street in the critical duration 1% AEP flood event reduced from 836 L/s to 737 L/s (**Figure 15**).

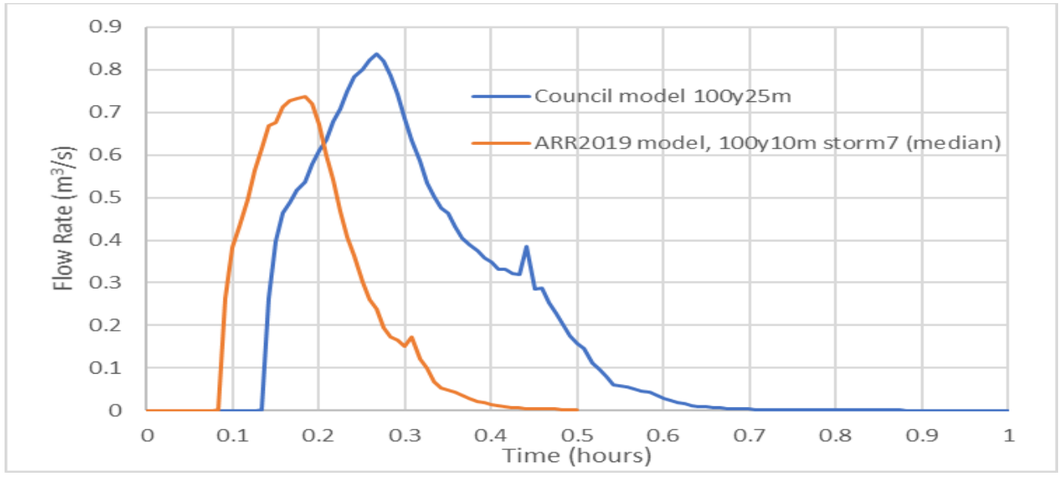

Figure 15: Hydrograph comparison

The following figures – **Figure 16**, **Figure 17**, and **Figure 18** – present the results of the flood analysis, and the impact of the model changes on the flood levels.

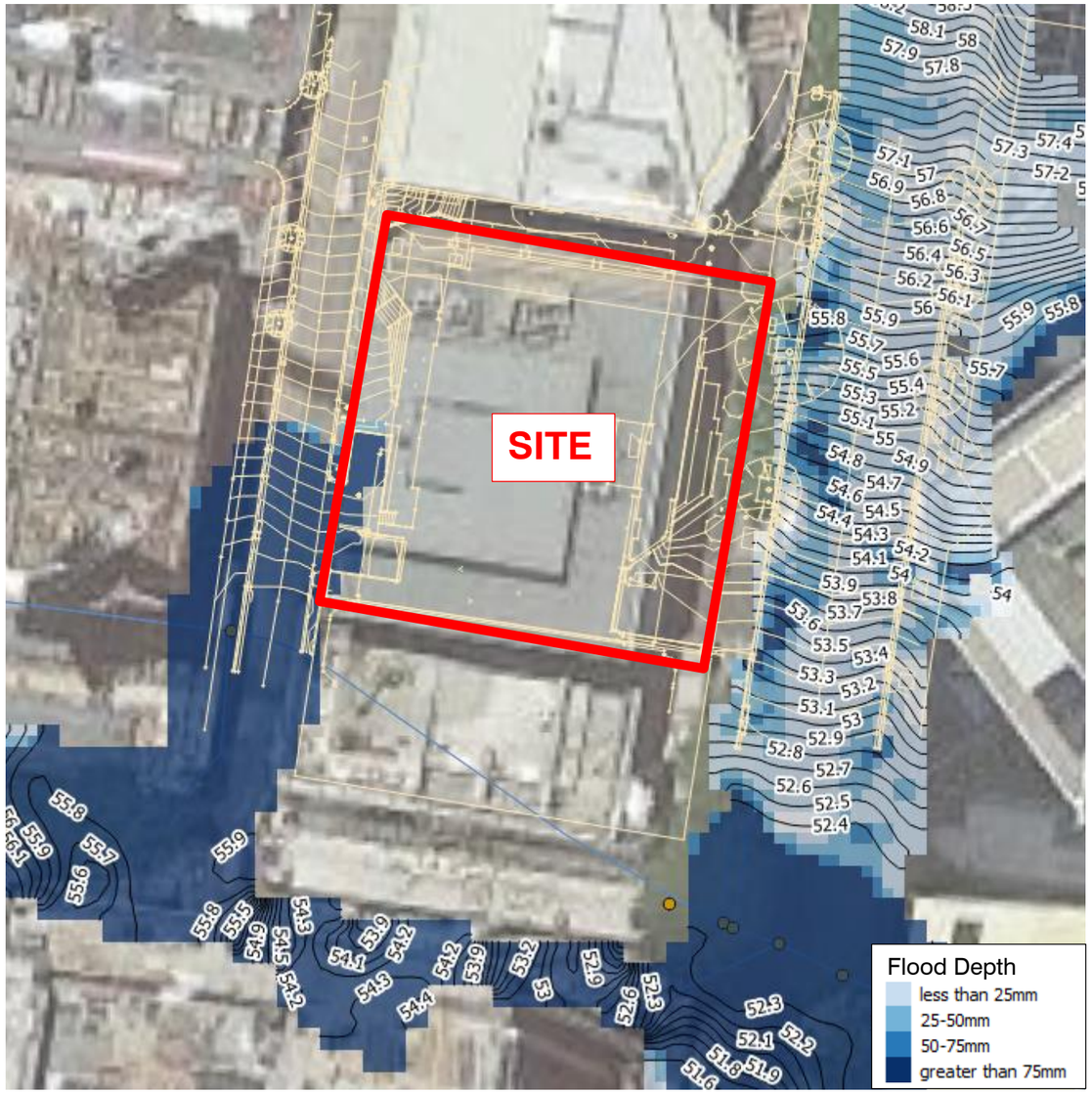

Figure 16: Flood depths and levels in Walker Street during the PMF storm event

Figure 17: Flood depths and levels in Walker Street during the 1% AEP storm event (ARR 2019 Data)

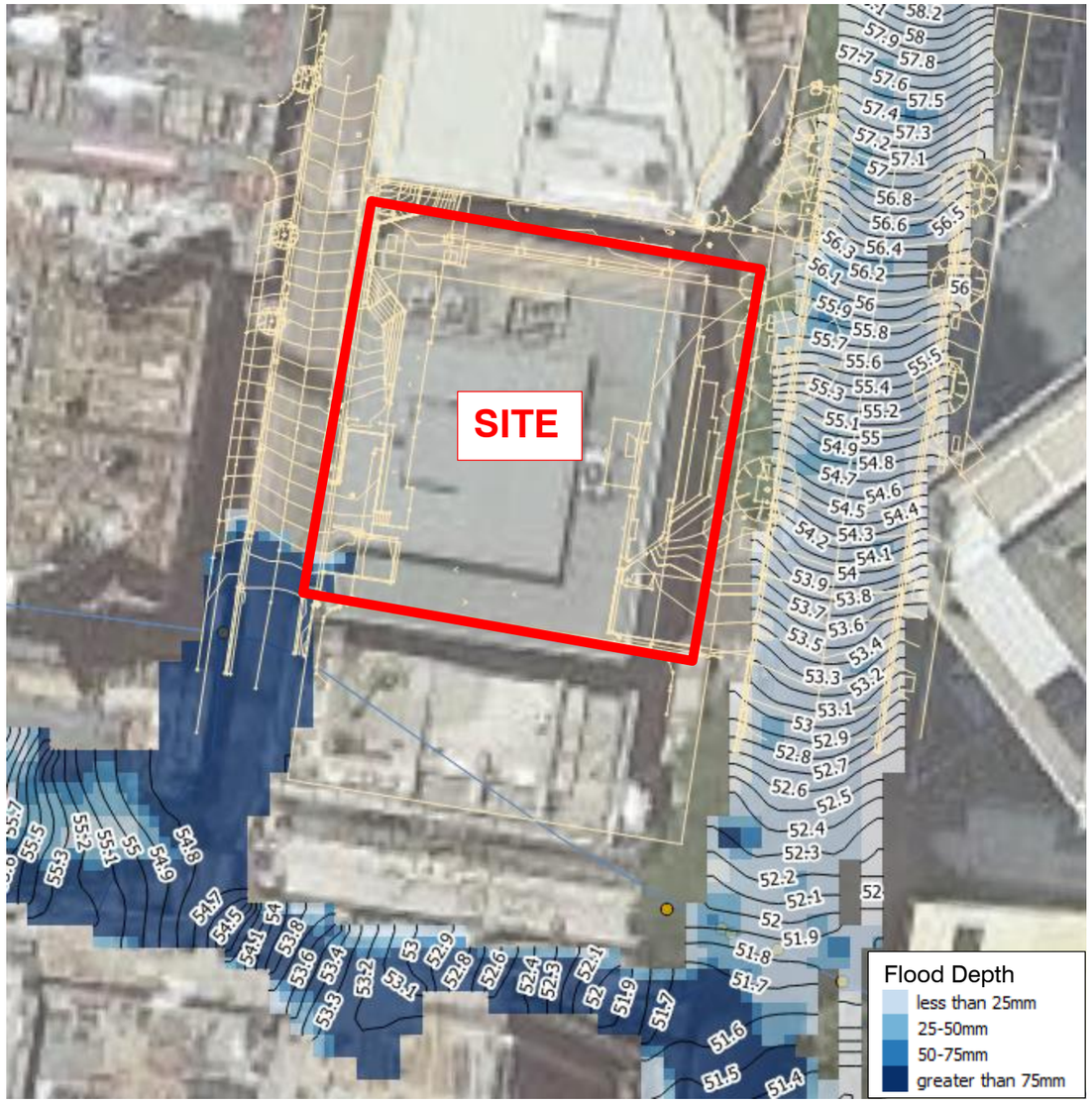

Figure 18: Flood depths and levels in Walker Street during the 1% AEP storm event (Council Model ARR 1994 Data)

5.4 Model terrain representation

While the Tuflow flood model is beneficial in determining the amount of surface water from the catchment flows down Walker Street, it cannot accurately model the flow depth in the kerb and gutter on a steep street such as Walker Street. The Tuflow model terrain is based on a two metre grid, which loses some detail in the terrain, as shown in the half road cross section in **Figure 19**.

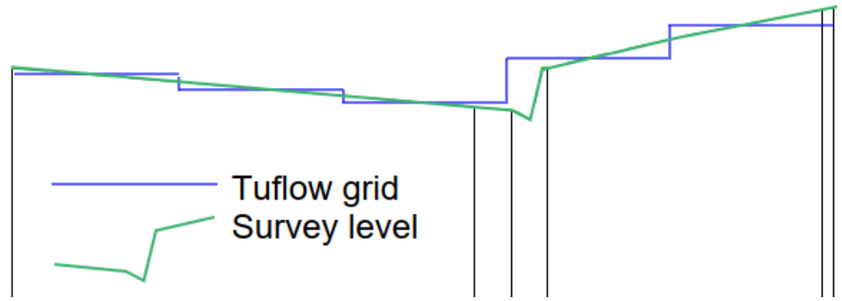

Figure 19: Grid representation of Walker Street cross section

In order to accurately determine the flow depth in the gutter, a DRAINS model was established with the surveyed cross section of the road. The half road section was assumed to take half the flow on Walker Street as output from Tuflow. The results of this analysis are shown in **Table 4**.

Table 4: Overland flow on Walker Street

Storm Event	Flow rate in gutter	Resultant flow depth	Velocity
1% AEP (Original Council model)	418 L/s	88 mm	2.7 m/s
1% AEP (Revised model)	369 L/s	84 mm	2.7 m/s
PMF (Original Council Model)	1,028 L/s	116 mm	3.4 m/s
PMF (Revised model)	997 L/s	115 mm	3.4 m/s

5.5 Walker Street Entry and Flood Freeboard

The Ground Floor retail entrances have been set at 55.25 mAHD and 56.20 mAHD as shown in **Figure 20**. These FFL are sufficiently above PMF flood levels.

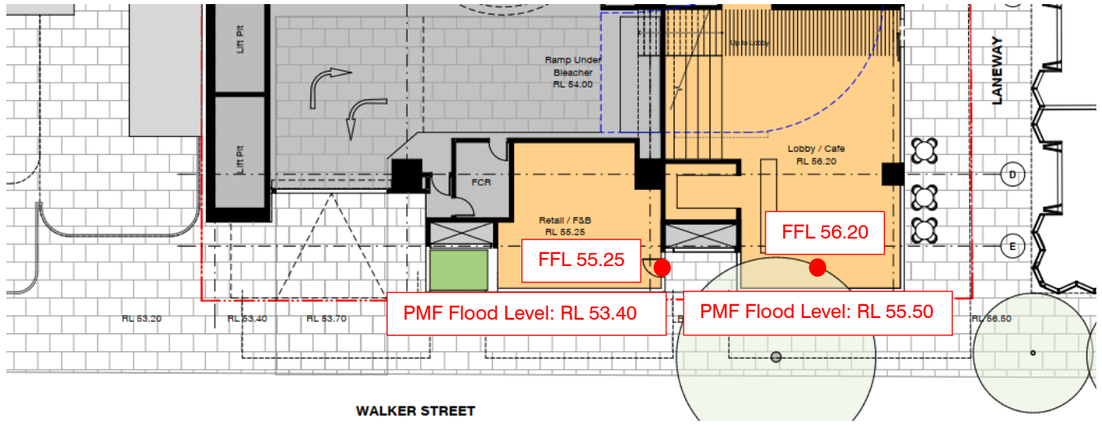

Figure 20: Flood levels at building entrances

5.6 *Little Spring Street*

Stormwater does not enter Little Spring Street from Berry Street. Little Spring Street has a crest approximately 15 metres from the intersection with Berry Street, preventing overland flow from entering Little Spring Street (**Figure 21**).

Figure 21: Little Spring Street facing Berry Street

There is a sag point outside of 88 Walker Street, shown in **Figure 22**. The ground level at the sag point is approximately 54.2 mAHD, and the 1% AEP and PMF flood level is 54.80 mAHD and 55.90 mAHD respectively. The proposed lower ground floor building entrance from Little Spring Street is set at 55.90 mAHD to satisfy the flood planning requirement of being at or above the PMF flood level (**Figure 23**).

Figure 22: Little Spring Street sag point

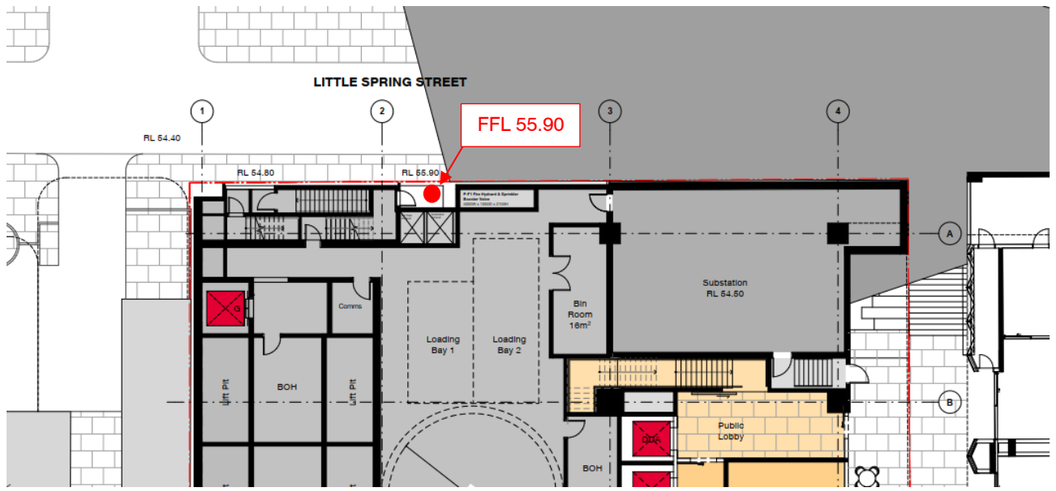

Figure 23: Little Spring Street Entry Levels

5.7 Through Site Link

The existing through site link between 100 Walker Street and 110-120 Walker Street connects Little Spring Street with Walker Street. The link will be enhanced as part of the proposed development, with retail premises opening to the laneway, and an entry to the end of trip facility.

The link is not flood affected for all storms up to and including the PMF event. The laneway will be set at the required RL56.35m AHD and graded down to RL56.20m AHD to match with the existing pathway. Refer **Appendix B** for grading design.

5.8 Walker Street Basement Entry

The steep grade of Walker Street results in shallow flood depths, with the PMF flow contained within the kerb on Walker Street. The driveway crest before descent of the basement entry On Walker Street is to be at a minimum of height equivalent to the PMF flood height in that location. The PMF flood levels are between RL 53.20 and RL53.80 in the driveway location (**Figure 13**). Therefore, the driveway crest is to be a minimum of RL53.80.

5.9 Overland Flow

In the event that the piped in-ground stormwater system fails due to blockage or a large storm event, stormwater flows will be required to be conveyed as overland flow. Where pipe capacity is exceeded i.e. greater than 5% AEP, stormwater will be conveyed as overland flow. Overland flow paths are to be designed to convey, at the minimum, 1% AEP stormwater flows with a Velocity x Depth product of less than 0.4m^2/s. Overland flow of the site generally drains north west to the south east due to the fall of the overall site.

6 Bulk Earthworks

Bulk earthworks are expected to be achieved with excavation in hard sandstone that requires significant staging as part of the building design. Excavation below most of the existing basements is likely to encounter medium to high strength and stronger sandstone. Excavation of medium to high strength rock will require excavators in conjunction with hydraulic rock hammers. During excavation, it will be necessary to use appropriate methods and equipment to keep ground vibrations at adjacent buildings and structures within acceptable limits.

7 Erosion and Sediment Control

The erosion and sediment control measures adopted for the development during the construction phase will be designed in accordance with Council guidelines and Soils and Construction – Managing Urban Stormwater – Landcom.

As the development is involving excavation, a sediment and erosion control plan outlining how sediment and contaminants from construction will be contained and managed has been prepared for the site works, and is included as part of the civil drawing set (**Appendix B**). The plan includes measures such as location of site boundaries, grades and direction of ground fall for overland flow, locations of vegetated areas and impervious areas and specific erosion and sediment controls such as fences surrounding disturbed areas and sandbags around constructed pits.

The contractor will take into account the site works staging including the preferred site access points, site shed locations and temporary stockpile locations in developing and implementing these requirements but will be ultimately responsible for managing temporary stormwater and sediment and erosion control during construction.

Erosion and sediment control will also be further addressed during detailed design and construction of this development.

8 Conclusion

A 20m^3 OSD tank is required on the development site to manage stormwater runoff to discharge into the existing kerb inlet pit in Walker Street at a rate below the prescribed PSD. One (1) 690mm StormFilter cartridge is to be included inside a water quality chamber on the ground floor to treat the stormwater prior to site discharge. This will satisfy North Sydney Council stormwater treatment requirements.

The steep grade of Walker Street results in shallow flood depths, with the PMF flow contained within the kerb on Walker Street. The PMF flood height is to be adopted as the flood planning level.

The Ground Floor retail entrances have been set at 55.25 mAHD and 56.20 mAHD. These FFL are sufficiently above both the PMF flood levels. The driveway levels in Walker Street have been set above the existing top of kerb levels which are above the PMF flood levels.

APPENDIX A

NORTH SYDNEY COUNCIL PMF CORRESPONDENCE

From: Tim Henderson
Sent: Friday, 3 September 2021 11:36 AM
To: Jim Moore
Cc: Phillip Lambley
Subject: RE: 100 Walker Street flood model access [Filed 03 Sep 2021 11:35]

Hi Jim,

Thanks for taking my call to confirm that we can adopt the PMF as the flood planning level for 100 Walker Street (similar to the approach taken for 110 Walker Street)

Regards,
Tim

From: Jim Moore <Jim.Moore@northsydney.nsw.gov.au>
Sent: Friday, 13 August 2021 3:01 PM
To: Tim Henderson <tim.henderson@enstruct.com.au>
Subject: RE: 100 Walker Street flood model access

Hi Tim,

The files have not changed.

Kind regards,

Jim Moore
Engineering Project Manager

P +61 2 9936 8233
E Jim.Moore@northsydney.nsw.gov.au

www.northsydney.nsw.gov.au

From: Tim Henderson <tim.henderson@enstruct.com.au>
Sent: Friday, 13 August 2021 2:58 PM
To: Jim Moore <Jim.Moore@northsydney.nsw.gov.au>
Subject: RE: 100 Walker Street flood model access

CAUTION : **Do not click links or open attachments unless you recognise the sender and know the content is safe.**
Hi Jim,

If nothing has changed, I am happy to use the flood study files sent previously.

Regards,
Tim

Tim Henderson
Associate

enstruct group pty ltd

Ph: +61 2 8904 1444
Level 4, 2 Glen Street, Milsons Point, NSW Australia 2061
tim.henderson@enstruct.com.au

From: Jim Moore <Jim.Moore@northsydney.nsw.gov.au>
Sent: Friday, 13 August 2021 2:56 PM
To: Tim Henderson <tim.henderson@enstruct.com.au>
Subject: RE: 100 Walker Street flood model access

Hi Tim,

Thanks for the signed agreement.

I assume that you don't need me to resend you the flood study files.

Kind regards,

Jim Moore
Engineering Project Manager

P +61 2 9936 8233
E Jim.Moore@northsydney.nsw.gov.au

www.northsydney.nsw.gov.au

From: Tim Henderson <tim.henderson@enstruct.com.au>
Sent: Friday, 13 August 2021 8:28 AM
To: Jim Moore <Jim.Moore@northsydney.nsw.gov.au>
Subject: RE: 100 Walker Street flood model access

CAUTION : **Do not click links or open attachments unless you recognise the sender and know the content is safe.**
Hi Jim,

Signed form attached.

Regards,
Tim

APPENDIX B
CIVIL ENGINEERING DRAWINGS

A1

enstruct

100 WALKER STREET, NORTH SYDNEY

CIVIL ENGINEERING DRAWING LIST:

CV-0000	COVER SHEET
CV-0100	EROSION AND SEDIMENT CONTROL PLAN
CV-0101	EROSION AND SEDIMENT CONTROL DETAIL SHEET
CV-0300	SITE WORKS PLAN
CV-0301	OSD DETAILS

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02	2/12/21	ISSUE FOR DEVELOPMENT APPLICATION	CBH	PAL
01	19/11/21	DRAFT DA SUBMISSION	CBH	PAL

rev	date	description	drn	ch'k

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www.enstruct.com.au

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project: 100 WALKER STREET

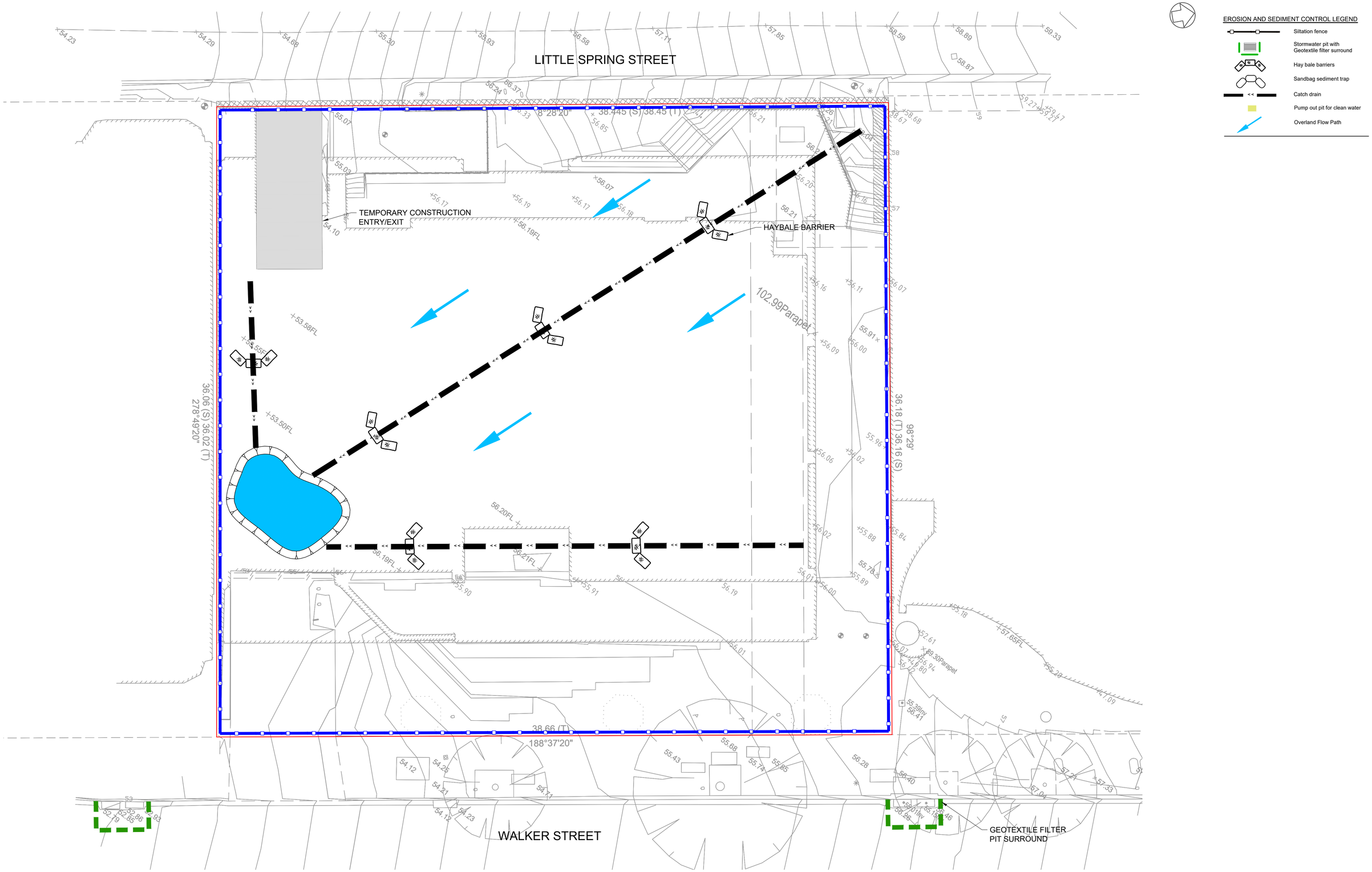
drawing title: COVER SHEET

status: DEVELOPMENT APPLICATION

scale at A1	drawn by	checked	
NTS	CBH	PAL	

project no.	drawing no.	rev.
6440	CV-0000	03

A1



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02	19/11/21	ISSUE FOR DEVELOPMENT APPLICATION	CBH	PAL
01	19/11/21	DRAFT DA SUBMISSION	CBH	PAL

rev	date	description	drn	ch'k

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Telephone (02) 8904 1444
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project: 100 WALKER STREET

drawing title: EROSION AND SEDIMENT CONTROL PLAN

status: DEVELOPMENT APPLICATION

scale at A1	drawn by	checked	
1:100	CBH	PAL	

project no.	drawing no.	rev.
6440	CV-0100	03

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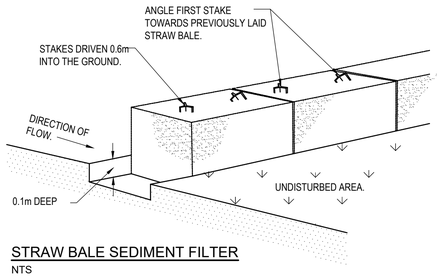
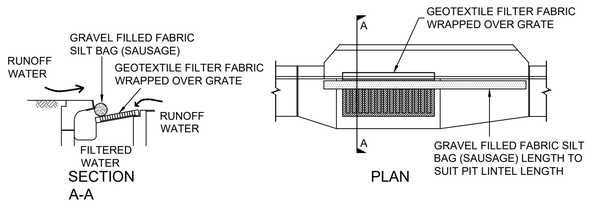
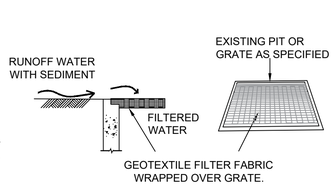


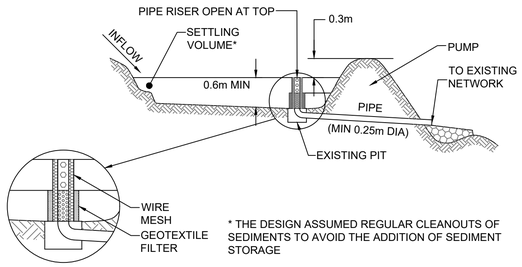
STRAW BALE SEDIMENT FILTER
NTS



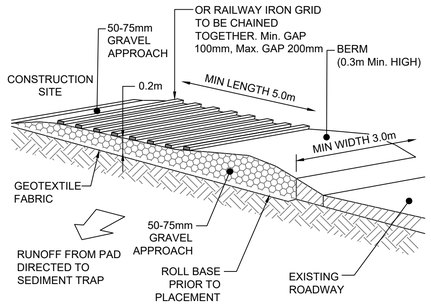
KERB INLET SEDIMENT TRAP
N.T.S



GEOTEXTILE PIT FILTER

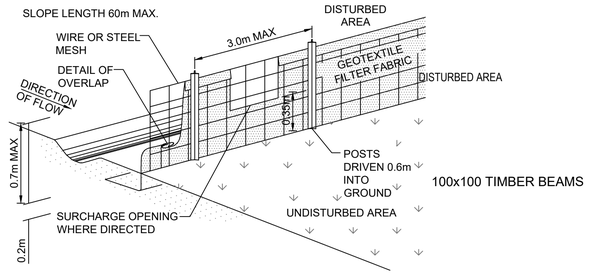


TYPICAL SEDIMENT BASIN (TYP.)
NTS



TEMPORARY CONSTRUCTION EXIT/ENTRANCE
NTS

DRAINAGE AREA 0.6ha MAX. - SLOPE GRADIENT 1:2 MAX.
SLOPE LENGTH 60m MAX.



SEDIMENT FENCE
NTS

NOTE:
POSITION OF SEDIMENT FENCE AS DIRECTED BY SUPERINTENDENT. FENCE TO REMAIN IN PLACE UNTIL EXCAVATION IS BELOW FOOTPATH LEVEL.

INSTALLATION
1. EXCAVATE A TRENCH 200mm DEEP.
2. DRIVE POSTS 500-700mm INTO GROUND AT A MAXIMUM SPACING OF 3.0m CENTRES.
3. PLACE AND FIX SUPPORT MESH (F52) TO POST.
4. LAY BIDIM GEOFABRIC (SF 2000) AGAINST THE SUPPORT MESH AND FIX BY TIE WIRE, STAPLES OR HOG RINGS.
5. PLACE BIDIM IN TRENCH AND BACKFILL WITH SOIL.

EROSION AND SEDIMENT CONTROL NOTES:

1. THE CONTRACTOR SHALL PROVIDE ADEQUATE TRUCK WASH FACILITIES AT THE SITE EXIT AND SHALL CLEAN ALL VEHICLES EXITING THE SITE TO ENSURE MATERIALS AND MUD IS NOT TRANSPORTED AND DEPOSITED OFF SITE. WATER FROM ANY WASHBAY IS TO BE DIVERTED TO THE SEDIMENT FENCE OR TO THE SEDIMENT BASIN PRIOR TO DISCHARGE.
2. NOTWITHSTANDING THE EROSION AND SEDIMENT CONTROL NOTES THE CONTRACTOR SHALL NOTE THEIR OVERARCHING OBLIGATION WITH THE NORTH SYDNEY COUNCIL IN RESPECT OF ENVIRONMENTAL CONTROLS. PARTICULARLY ONGOING TESTING OF DISCHARGE, MAINTENANCE, DREDGING OF SEDIMENTATION PONDS AND FINAL FILTRATION AT OUTLETS.
3. THE CONTRACTOR SHALL TAKE ALL STEPS NECESSARY TO PROTECT THE ENVIRONMENT AND IN PARTICULAR SHALL CONTROL EROSION, SEDIMENTATION AND POLLUTION DURING CONSTRUCTION IN ACCORDANCE WITH THE REQUIREMENTS OF COUNCIL AND THE EROSION AND SEDIMENT CONTROL PLAN.
4. EROSION AND SEDIMENT CONTROL DEVICES ARE TO BE CONSTRUCTED IN ACCORDANCE WITH "MANAGING URBAN STORMWATER - SOILS AND CONSTRUCTION' (2004 - BLUE BOOK), AND CITY OF RYDE COUNCIL'S DCP.
5. EROSION AND SEDIMENT CONTROL DEVICES SHALL BE CONFIRMED IN THE QUALITY PLAN PRODUCED BY THE CONTRACTOR AND SHALL BE IMPLEMENTED AND ADJUSTED TO SUIT CONSTRUCTION ACCESS AND STAGING.
6. FOLLOWING EVERY RAINFALL EVENT EXCEEDING 10mm OR WHEN BASINS ARE GREATER THAN 50% FULL, WATER SHALL BE TESTED FOR COMPLIANCE WITH COUNCIL STANDARDS AND, IF FOUND NOT TO COMPLY, WATER SHALL BE TREATED BY APPROPRIATE FLOCCULATION, FILTRATION OR OTHER APPROVED METHODS.
7. WATER SHALL NOT BE REMOVED FROM SEDIMENT BASIN UNTIL TESTED WATER MEETS COUNCIL WATER QUALITY REQUIREMENTS.
8. CONTRACTOR TO PROVIDE ALL PERIMETER SITE FENCING FOR SECURITY & SAFETY PURPOSES AS REQUIRED.
9. EMPTY SEDIMENT BASIN WITHIN 72 HOURS OF RAINFALL. TREAT WATER AS NECESSARY TO ACHIEVE REQUIRED WATER QUALITY STANDARDS.
10. THIS PLAN IS FOR INFORMATION ONLY. THE CONTRACTOR IS TO ADAPT THIS PLAN TO SUIT STAGING AND CONSTRUCTION SETUP.

EROSION AND SEDIMENT CONTROL PUMP OUT NOTES:

ANY ACCUMULATED WATER CONTAMINATED WITH SEDIMENT, FROM A SEDIMENT BASIN OR EXCAVATION PIT, IS TO BE FLOCCULATED OR FILTERED IN ORDER TO LOWER THE SUSPENDED SOLID LOAD TO LESS THAN 50MG PER LITRE GYPSUM GAS OR OTHER APPROVED FLOCCULANT SHOULD BE APPLIED WITHIN 24 HOURS OF THE END OF THE STORM EVENT. THE GYPSUM MUST BE SPREAD EVENLY OVER THE ENTIRE WATER SURFACE. PUMPING IS NOT TO OCCUR FOR AT LEAST 36 HOURS AND PREFERABLY 48 HOURS AFTER APPLICATION. CLEAN WATER IS TO BE DISCHARGED TO THE WATER TABLE VIA A HALE BAIL SEDIMENT FILTER IN A WAY THAT DOES NOT PICK UP SEDIMENT THAT HAS DROPPED TO THE BOTTOM. GYPSUM IS A HYDRATED FORM OF CALCIUM SULPHATE AND IS AVAILABLE AT MANY SWIMMING POOL SHOPS AND HARDWARE STORES.

rev	date	description	drn	ch'k
2	17/12/21	ISSUE FOR STAGE 2 DETAILED DA	CBH	PAL
1	19/11/21	DRAFT DA SUBMISSION	CBH	PAL

rev	date	description	drn	ch'k

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project: 100 WALKER STREET

drawing title: EROSION AND SEDIMENT CONTROL DETAILS SHEET

status: DEVELOPMENT APPLICATION

scale at A1	drawn by	checked	
NTS	CBH	PAL	

project no.	drawing no.	rev.
6440	CV-0101	02

A1

LITTLE SPRING STREET

WALKER STREET

RL 55.90

FFL 58.50

UPPER GROUND

FFL 56.35

LOWER GROUND

FFL 56.35

RL56.35

RL 56.35

RL56.35

RL56.20

LINEAR DRAIN TO COLLECT STORMWATER IN PEDESTRIAN LANEWAY

OVERLAND FLOW PATH

LOBBY/CAFE FFL 56.35

WATER QUALITY PIT TO TREAT STORMWATER PRIOR TO DISCHARGING INTO COUNCIL'S SYSTEM

WATER QUALITY PIT INVERT RL 52.00

150Ø @ 1% GRADE

300Ø @ 1% GRADE

PROPOSED DRIVEWAY

CONNECT TO COUNCIL STORMWATER PIT

36.06 (S) 36.02 (T)
278°49'20"

36.18 (T) 36.16 (S)
98°32'

188°37'20"

rev	date	description	drn	ch'k
03	17/12/21	ISSUE FOR STAGE 2 DETAILED DA	CBH	PAL
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project
100 WALKER STREET

drawing title
SITE PLAN

status
DEVELOPMENT APPLICATION

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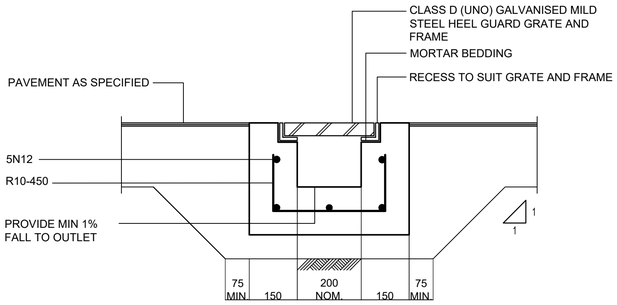
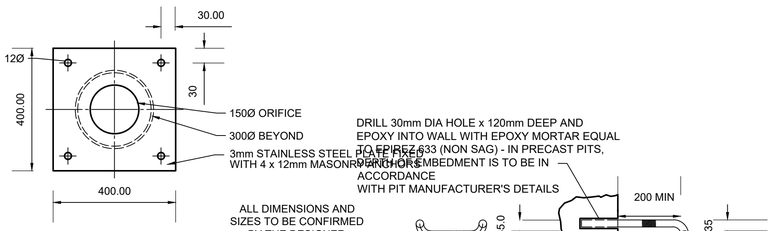
1:100	CBH	PAL	

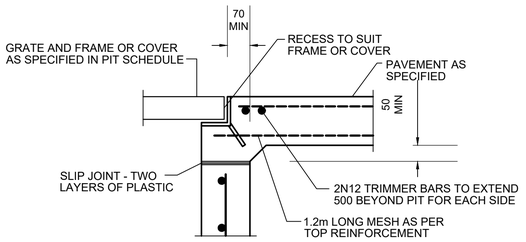
project no.	drawing no.	rev.
6440	CV-0300	03



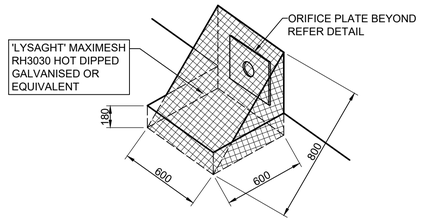
GRATED DRAIN TYPE A (GDA)
SCALE 1:10



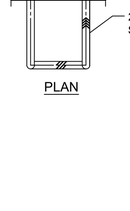
ORIFICE PLATE DETAIL
SCALE 1:10



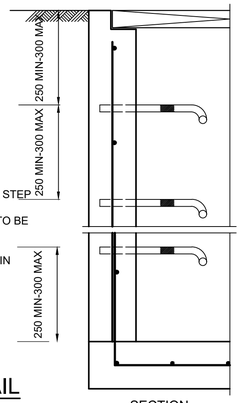
DETAIL D
SCALE 1:10



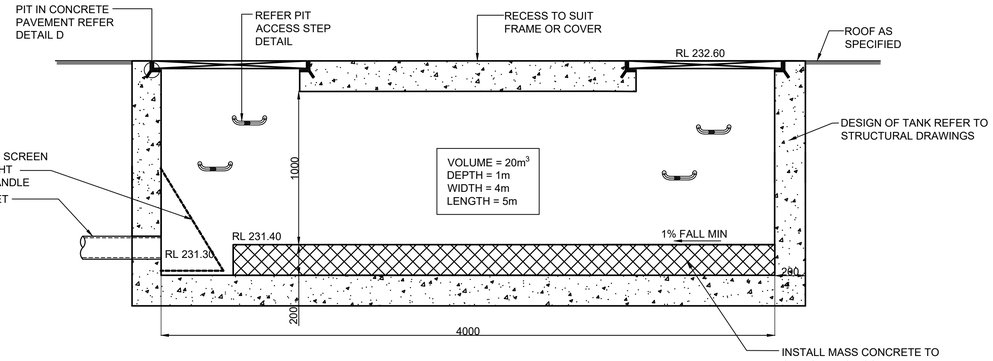
TRASH SCREEN DETAIL



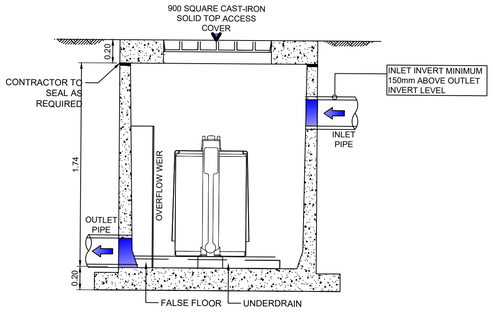
NOTE
1 WHEN POSITIONED IN STRAIGHT ALIGNMENT, STEP TO BE 400 WIDE.
2 STAGGERED STEPS TO BE 200 WIDE. STEPS TO BE STAGGERED 200 CENTRE TO CENTRE FOR ALTERNATE STEPS.
3 SPACING OF STEPS TO BE UNIFORM TO WITHIN ±5mm IN EACH PIT.



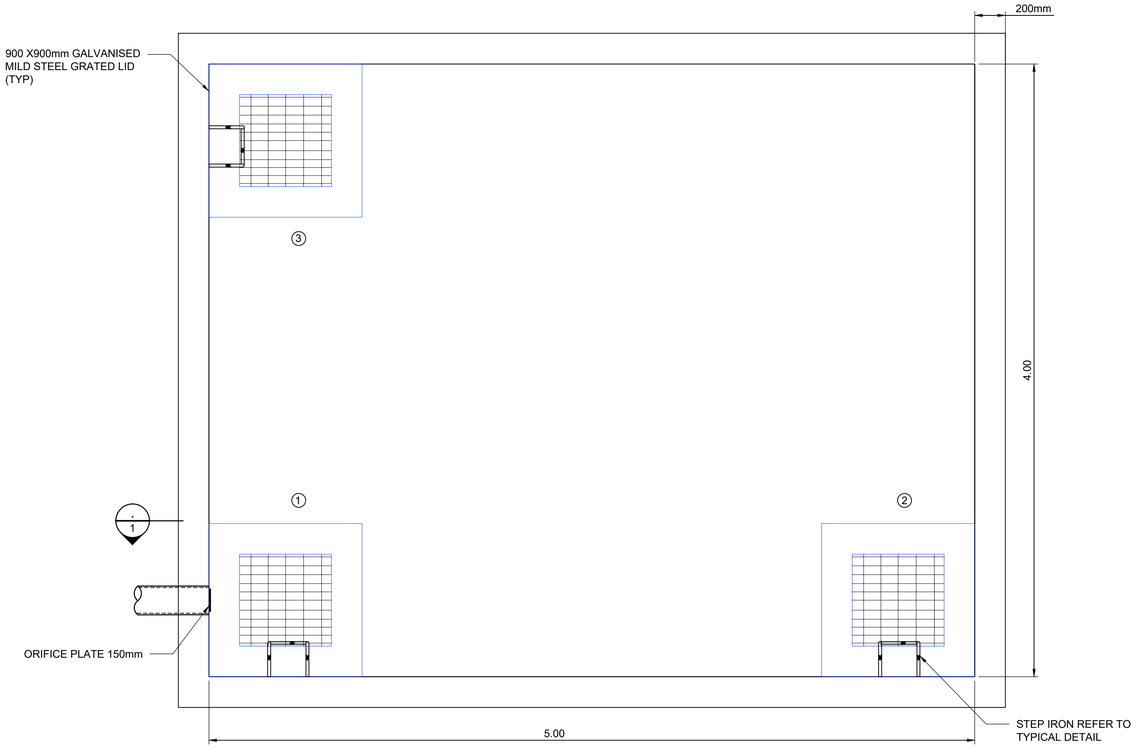
PIT ACCESS STEP DETAIL
SCALE 1:10
TO BE PROVIDED FOR PITS DEEPER THAN 900mm



SECTION THROUGH DETENTION TANK
SCALE 1:20



SECTION THROUGH WATER QUALITY CHAMBER
SCALE 1:20



DETENTION TANK PLAN
SCALE 1:20

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01	19/11/21	DRAFT DA SUBMISSION	CBH	PAL

rev	date	description	drn	ch'k

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Telephone (02) 8904 1444
Facsimile (02) 8904 1555
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project: 100 WALKER STREET

drawing title: DETAILS SHEET

status: DEVELOPMENT APPLICATION

scale at A1	drawn by	checked	
AS SHOWN	CBH	PAL	

project no.	drawing no.	rev.
6440	CV-0301	03