



XAVIER  
KNIGHT



## **CIVIL ENGINEERING DESIGN REPORT**

Project Number 230812 - 849-859 Pacific Highway and 2-8  
Wilson Street, Chatswood

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## QUALITY CONTROL REGISTER

This report has been prepared and checked as per below.

	Name	Signature	Date
Report Author:	Asif Haider		16/06/2025
Checked by:	Duncan Marshall		16/06/2025
Authorised by:	Feris Chehade		16/06/2025

## 1 Document Summary

Project Number: 230812  
Project Name: Wilson Street, Chatswood  
Prepared For: BB Wilson Property Pty Ltd  
Date Prepared: 16/06/2025  
XK Project Director: Feris Chehade

Status	Issue	Date	Prepared By	Approved By
For Approval	A	15.12.2023	Michael Haditio	Scott Sharma
For Approval	B	08.11.2024	Asif Haider	Feris Chehade
For Approval	C	16.06.2025	Asif Haider	Feris Chehade

Revision updates have been coloured in blue for clarity.

## 2 Executive Summary

This Civil Engineering Design Report is prepared by Xavier Knight Consulting Engineers on behalf of BB Wilson Property Pty Ltd to accompany a State Significant Development Application (SSDA) submitted to the Department of Planning, Housing and Infrastructure.

The applicant is proposing to construct a mixed-use development at 849, 853 and 859 Pacific Highway and 2 and 8 Wilson Street, Chatswood. The application seeks consent for the delivery of a 36-storey mixed-use residential tower, comprising:

- Six storey (+ mezzanine) basement;
- Four-storey podium (Ground Level to Level 03);
- Two modulated 35-storey residential buildings (above podium) (Levels 04 – 35) containing live / work studios, affordable housing units & private residential units;
- Public domain works, including landscaping, street trees, and publicly accessible open spaces; and
- Reticulation of site services and infrastructure (electricity, telecommunication, gas, water, and sewer).

This report addresses the stormwater management strategy and flooding for the project in accordance with item 14 and item 15 of the Streamlined SEARs (Secretary's Environmental Assessment Requirements) issued on 9<sup>th</sup> August 2024 (SSD-74319707). Refer to NSW Government Planning website for further information and complete list of requirements.

**Table 1 - SEARs requirements**

<b>SEARs Requirements</b>	<b>Response</b>
<p><b>14. Water Management</b></p> <ul style="list-style-type: none"> <li>• Provide an integrated Water Management Plan for the development that: <ul style="list-style-type: none"> <li>◦ is prepared in consultation with the local council and any other relevant drainage or water authority</li> <li>◦ outlines the water-related servicing infrastructure required by the development (informed by the anticipated annual and ultimate increase in servicing demand) and evaluates opportunities to reduce water demand (such as recycled water provision).</li> <li>◦ details the proposed drainage design (stormwater and wastewater) for the site including any on-site treatment, reuse and detention facilities, water quality management measures and nominated discharge points.</li> <li>◦ demonstrates compliance with the local council or other drainage or water authority requirements and avoids adverse downstream impacts.</li> </ul> </li> <li>• Where drainage infrastructure works are required that would be handed over to the local council, or other drainage or water authority, provide full hydraulic details and detailed plans and specification of proposed works that have been prepared in consultation with, and comply with the relevant standards of, the local council or other drainage or water authority.</li> </ul>	<ul style="list-style-type: none"> <li>• Appendix A shows Stormwater drainage design drawings. These were sent to Council For Approval dated 15.12.2023. Council RFI DA-2024/47 was received on 02.08.2024. Relevant drawings were updated accordingly and resubmitted on 30.08.2024.</li> <li>• Refer to Section 5 and Section 6 of this report for Stormwater Management and Stormwater Quality.</li> <li>• Refer to Section 7 of this report for Soil and Water Management strategy during construction.</li> <li>• All other requirements including but not limited to wastewater are addressed in 'Infrastructure Delivery, Management &amp; Staging Plan' report by JHA Consulting Engineers, rev P2, dated 01/11/2024.</li> </ul>
<p><b>15. Flood Risk</b></p> <ul style="list-style-type: none"> <li>• Identify the flood planning level as set out in the relevant council LEP or SEPP and identify any: <ul style="list-style-type: none"> <li>◦ flood risks on site having regard to adopted flood studies</li> <li>◦ the potential effects of climate change, and o any relevant provisions of the NSW Flood Risk Management Manual.</li> </ul> </li> <li>• Where the development is occurring on flood prone land a flood impact and risk assessment (FIRA) must be prepared having regard to the Flood Impact and Risk Assessment Guideline - LU01 (FIRA guide). When determining the scope and category of the FIRA the requirements outlined in the FIRA guide must be considered.</li> <li>• Detail any flood risk management measures that are to be incorporated as part of the development having regard to relevant guidelines (including any design solutions, flood modification measures, property modification measures, operational procedures or Flood Emergency Response Plan).</li> </ul>	<ul style="list-style-type: none"> <li>• Refer to Section 4 of this report which states that the site is not affected by flooding.</li> </ul>

### 3 Introduction

#### 3.1 BACKGROUND

The project will entail the demolition of the existing structures on the following lots to allow for the construction of new mixed-use development:

- SP1496, address: 849 Pacific Highway, Chatswood;
- SP60178, address: 853 Pacific Highway, Chatswood;
- SP10110, address: 859 Pacific Highway, Chatswood;
- SP52947, address: 2 Wilson Street, Chatswood; and
- DP1189541, address: 8 Wilson Street, Chatswood.

The proposed development consists of 2 towers of 36-storey mixed use residential and commercial development with a 4-storey podium and 6 levels (+mezzanine) of basement. Additionally, the proposal includes public domain works, including landscaping, street trees, and publicly accessible open spaces and reticulation of site services and infrastructure (electricity, telecommunications, gas, water and sewer).

The existing site area of the combined 5 lots amounted to 4,752 m<sup>2</sup>. However, it has been established under the site specific Development Control Plan (DCP) that Transport for NSW (TfNSW) are to acquire an allotment of the existing site fronting Pacific Highway as part of SP2 future road widening act, reducing the effective site area to 4,294 m<sup>2</sup>.

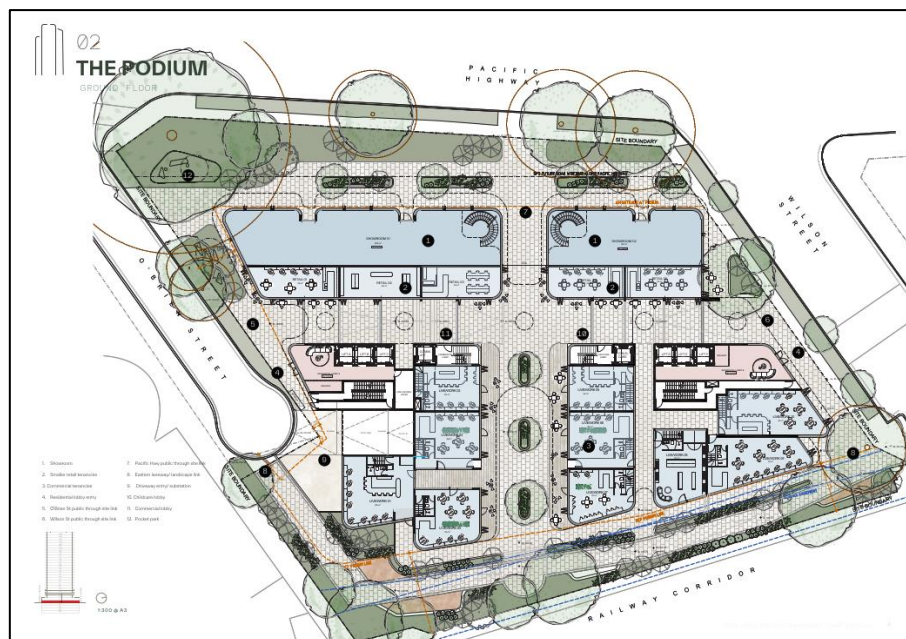


Figure 1 - Proposed Development

#### 3.2 EXISTING CONDITIONS

A detailed survey was conducted by "SDG Pty Ltd" dated 01/11/2023. The existing survey shows the existing residential dwellings and pavement. The site contour generally falls in the South direction with existing sag point identified at O'Brien Street based on the survey documentation prepared. The existing survey has also identified two existing kerb inlet pits along O'Brien Street. Refer to Appendix B for survey plan prepared.

Existing property consists of 4 lots of 3 storey residential dwellings and 1 lot of commercial dwelling.

The overall site is bounded by:

- Wilson Street to the North
- Pacific Highway to the West
- O'Brien Street to the South
- Railway Corridor to the East.

## 4 Flooding

Based on Willoughby council's online Catchment Location Finder, the property is located within Scotts Creek Catchment. Assessment of '2008 Scotts Creek Flood Study' indicated that the site is not flood affected as it is not located within the indicative extent of inundation of Scotts Creek Catchment. The proposed stormwater drainage strategy incorporates flows from upstream catchment discharging to the sag pit in O'Brien Street as shown in Figure 3.



Figure 2 - Subject Site within Scotts Creek Catchment (Lyall and Associates, 2008)

Figure 2 above shows the subject site location and Beauchamp Park location which were part of the Scotts Creek Catchment Flood Study undertaken by Lyall and Associates in 2008. Appendix D shows the indicative extents of inundation within the catchment and demonstrates that the site is not affected by flooding from the flood report. [For further information, refer to Council RFI response by XK, dated 11<sup>th</sup> March 2025 which investigates overland flows and flood conditions on the site.](#)

## 5 Stormwater Drainage

### 5.1 TOPOGRAPHY AND UPSTREAM CATCHMENT

External to the site, the local topography surface contours generated using the GIS software and Digital Elevation Model (DEM) information obtained from NSW Spatial Services shows that the site primarily falls North to South. The high point of the site is located in the North-East corner towards Wilson Street at a level of RL 107.40m AHD and the low point located in the South corner towards O'Brien Street at a level of RL 103.2m AHD.

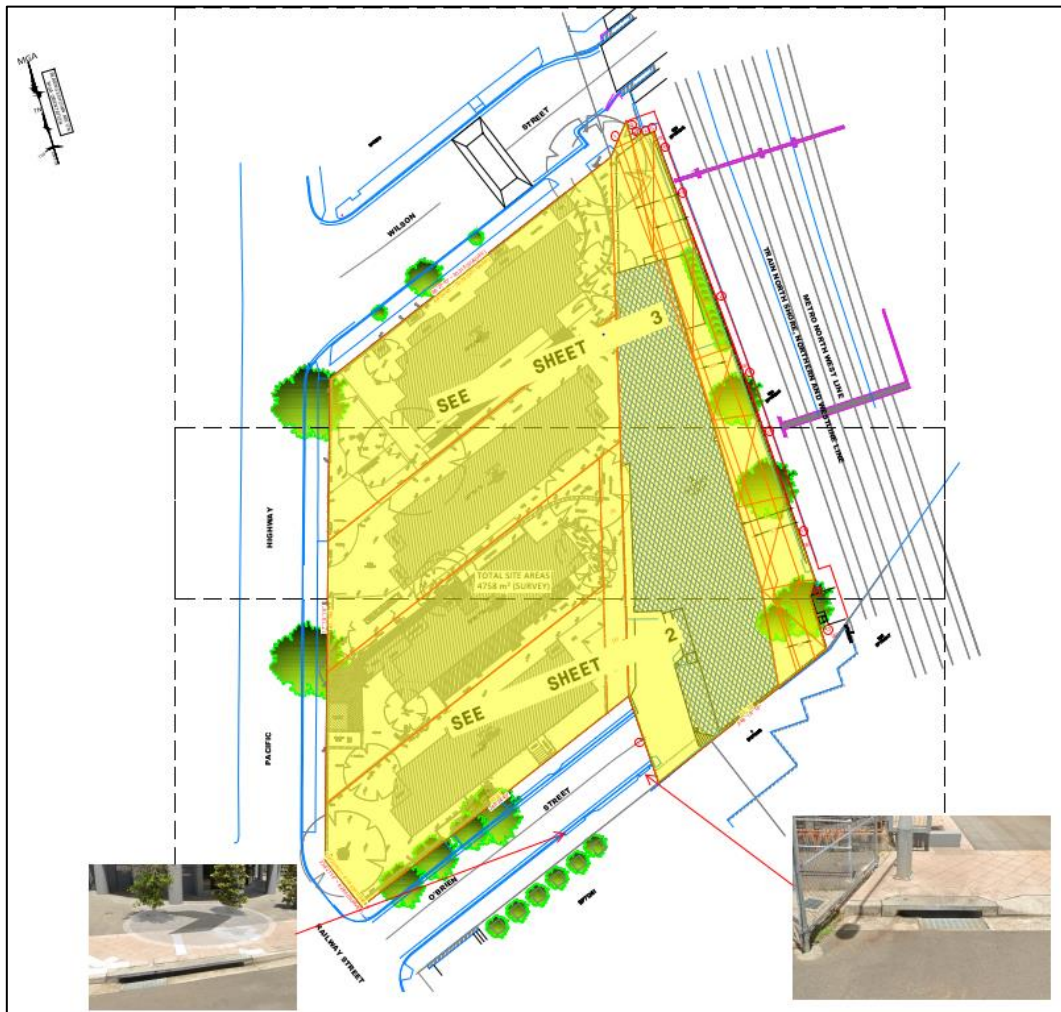


Figure 3 - Existing Stormwater Infrastructure on O'Brien Street

Further investigation has been conducted to determine the likelihood of existing external stormwater catchments on the proposed site. It is shown that the highest point within the local area is located opposite to the proposed site at Wilson Street. Through the review of survey information and DBYD information, no existing stormwater infrastructure systems have been identified along Pacific Highway and Wilson Street, while two existing kerb inlet pits have been identified at O'Brien Street.

### 5.2 UPSTREAM CATCHMENT ANALYSIS

To assess the upstream catchment flow conveyed to O'Brien Street, upstream catchment analysis has been conducted with the catchment area breakdown as seen in . The neighbouring property located opposite the proposed site at Wilson Street (officially registered 871-877 Pacific Highway) is currently being developed, with the proposed stormwater discharge point discharging to Wilson Street based on the approved documentations available in Willoughby Council's DA tracker DA2022/161. Based on the upstream catchment assessment, the upstream catchment flow will be conveyed within the half-road width of Pacific Highway towards O'Brien Street. Refer to Appendix C for DA2022/161 stormwater documentation.



**Figure 4 - Upstream Catchment Breakdown**

DRAINS was used to conduct upstream catchment analysis to determine the existing hydrological condition of the existing drainage system at O'Brien Street. The analysis has been undertaken with the following:

- Assumed that all existing pit and pipe networks have been 50% blocked for the 1% AEP storm event as per Willoughby Council's DCP.
- Assumed that upstream catchment discharge from upstream neighbouring property (871-877 Pacific Highway) has been limited to 16 L/s in accordance with the approved documentations from Willoughby council DA tracker DA2022/161.
- Assumed that post-development site discharge from proposed site has been controlled via proposed detention basin.

As shown in the DRAINS result in , there are no overland flow path during from O'Brien Street during the 100-year storm event, as the top water level during the 100-year storm event (RL 103.26 mAHD) is lower than the lowest kerb height at sag point at RL 103.27 mAHD. Therefore, the upstream catchment flow is completely contained within the sag pit on O'Brien Street. Therefore, it was concluded that the site is not affected by overland flow.





flow conveyed into O'Brien Street. The proposed OSD tank orifice invert level is higher than the downstream tailwater condition during the drowned condition. Hence, the OSD tank orifice is not affected by downstream tailwater condition. Refer to Section 1 for upstream catchment analysis and flows.

**Table 2 - DRAINS Model Results**

Site Area (m <sup>2</sup> )	4,294					
Max PSD (L/s)	73					
Pre-Dev Site Discharge (L/s)	ARI Storm (Years)	Post-Dev Scenario	Post-Dev Bypass Discharge (L/s)	Post-Dev OSD Discharge (L/s)	Post-Dev Basin Discharge (L/s)	Post-Dev Total Peak Discharge (L/s)
154	20	Undrowned	16	48	6	62
		Drowned		48	3	58
223	100	Undrowned	21	58	7	73
		Drowned		58	6	72

As per Section J of BASIX requirements, a rainwater tank of 10,000 L capacity has also been proposed for the site. [To ensure the OSD Basin is not affected by downstream Top Water Level \(TWL\) conditions and to reduce the risk of contamination, a non-return flap valve has been proposed at the proposed Basin's outlet pipe location.](#) Refer to the Civil plans prepared by Xavier Knight in Appendix A for the plans presenting the location and size of stormwater detention tank.

## 5.5 PROPOSED BASEMENT AND BUILDING DRAINAGE

Based on the Geotechnical Investigation Report prepared by 'Fortify Geotech' dated 6 November 2024, no groundwater was encountered during the investigation by the geotechnical engineer. Currently, aside from the minimal groundwater seepage, only a small portion of the exposed driveway is draining to basement, with catchment area of approximately 11 m<sup>2</sup>. It is intended that the proposed basements are designed as drained basement, and all basement drainage to be drained to proposed pump-out pit at the lowest basement level, which will then be discharged to the OSD tank via submersible pumps. Pump-out tank with minimum capacity of 3 m<sup>3</sup> is to be provided as per AS3500.3 requirements. All building drainage are to be designed in detail at CC stage.

## 6 Water Quality

### 6.1 TARGET CRITERIA

In accordance with Willoughby City Council's 'Development Control Plan Part I: Stormwater Management' Section 11 Water Quality, the following reduction in average annual pollutant load reduction need to be achieved:

- Gross Pollutants : 90% reduction
- Total Suspended Solids : 85% reduction
- Total Phosphorus : 60% reduction
- Total Nitrogen : 45% reduction

As per council's requirement, developments with more than 5 parking spaces were also required to provide a treatment system that specifically targets hydrocarbons or incorporates a raingarden/bio-retention system.

### 6.2 PROPOSED WATER QUALITY MEASURES

Rainwater captured from ground floor level and above will pass a series of water quality treatment devices before being discharged to Council's stormwater system. The proposed water quality treatment train consists of a combination of Gross Pollutant Trap; the Cascade separator and OceanGuard baskets by OceanProtect for primary treatment, and Stormfilter cartridges by Ocean Protect for tertiary treatment. The Cascade separator has been proposed as the primary treatment for the property, as it has been specified by the manufacturer that it has the capability to treat hydrocarbons from stormwater run-off.

### 6.3 WATER QUALITY MODELLING AND RESULTS

The stormwater treatment trains were modelled in MUSIC 6.3, and it has been demonstrated that the targets required by Council are able to be achieved. Refer to drawing C150 of Civil plans prepared by Xavier Knight in Appendix A below for MUSIC catchment area breakdown and results.

## 7 Soil and Water Management

Willoughby City Council's 'Development Control Plan Part I: Stormwater Management' required a Soil and Water Management Plan for sites with disturbed area of more than 2,500 m<sup>2</sup>.

As detailed in Managing Urban Stormwater – Soils and Construction Volume 1 (Landcom 2004) also known as Bluebook. A soil erosion hazard assessment has been conducted and the site was found to be of low erosion hazard.

Refer to the drawings C300 and C305 from Civil plans prepared by Xavier Knight in Appendix A for the plans presenting the above design intent.

## 8 Conclusion

Xavier Knight has prepared the stormwater management strategy in accordance with relevant local government standards and guidelines. Further detailed design and coordination will be undertaken at Construction Certificate Stage. The site is not impacted by flooding in any storm event as the upstream catchment is captured by the sag pit in O'Brien Street. The soil and water management strategy has been prepared in accordance with the Bluebook. Therefore, stormwater aspects of item 14 and flooding from item 15 of SEARS have been addressed.

### Disclaimer

Xavier Knight Consulting Engineers gives notice that the particulars set out in this report are for the exclusive use of the Client and no responsibility or liability is accepted as a result of the use of this report by any other party. This report shall not be construed as a certificate or warranty.

For and behalf of the Xavier Knight team.

Kind regards,



Feris Chehade  
Project Director

## 9 Appendices

### 9.1 APPENDIX A - CIVIL ENGINEERING DESIGN PLAN FOR DA

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# PROPOSED MIXED USE DEVELOPMENT

## 2-8 WILSON STREET & 849-859 PACIFIC HIGHWAY, CHATSWOOD NSW 2067



LOCALITY PLAN  
SOURCE: NEAR MAPS - 01.12.2023  
NOT TO SCALE

DRAWING SCHEDULE	
DRAWING NO.	DRAWING NAME
C000	COVER SHEET
C100	GENERAL ARRANGEMENT PLAN
C101	STORMWATER MANAGEMENT PLAN - GROUND FLOOR SHEET 1
C102	STORMWATER MANAGEMENT PLAN - GROUND FLOOR SHEET 2
C150	CATCHMENT PLAN AND MUSIC RESULTS
C200	STORMWATER DRAINAGE DETAILS - SHEET 1
C201	STORMWATER DRAINAGE DETAILS - SHEET 2
C202	STORMWATER DRAINAGE DETAILS - SHEET 3
C300	SOIL AND WATER MANAGEMENT PLAN
C305	SOIL AND WATER MANAGEMENT DETAILS

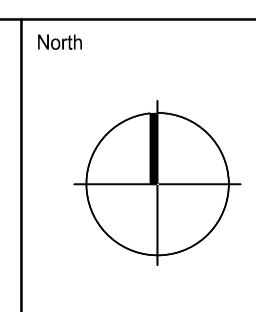
**PRINTING NOTE:**  
THIS DRAWING TO BE PRINTED IN COLOUR.

**FOR APPROVAL**

Rev	Description	Eng	Draft	Date
A	ISSUE FOR APPROVAL	MH	MH	15.12.2023

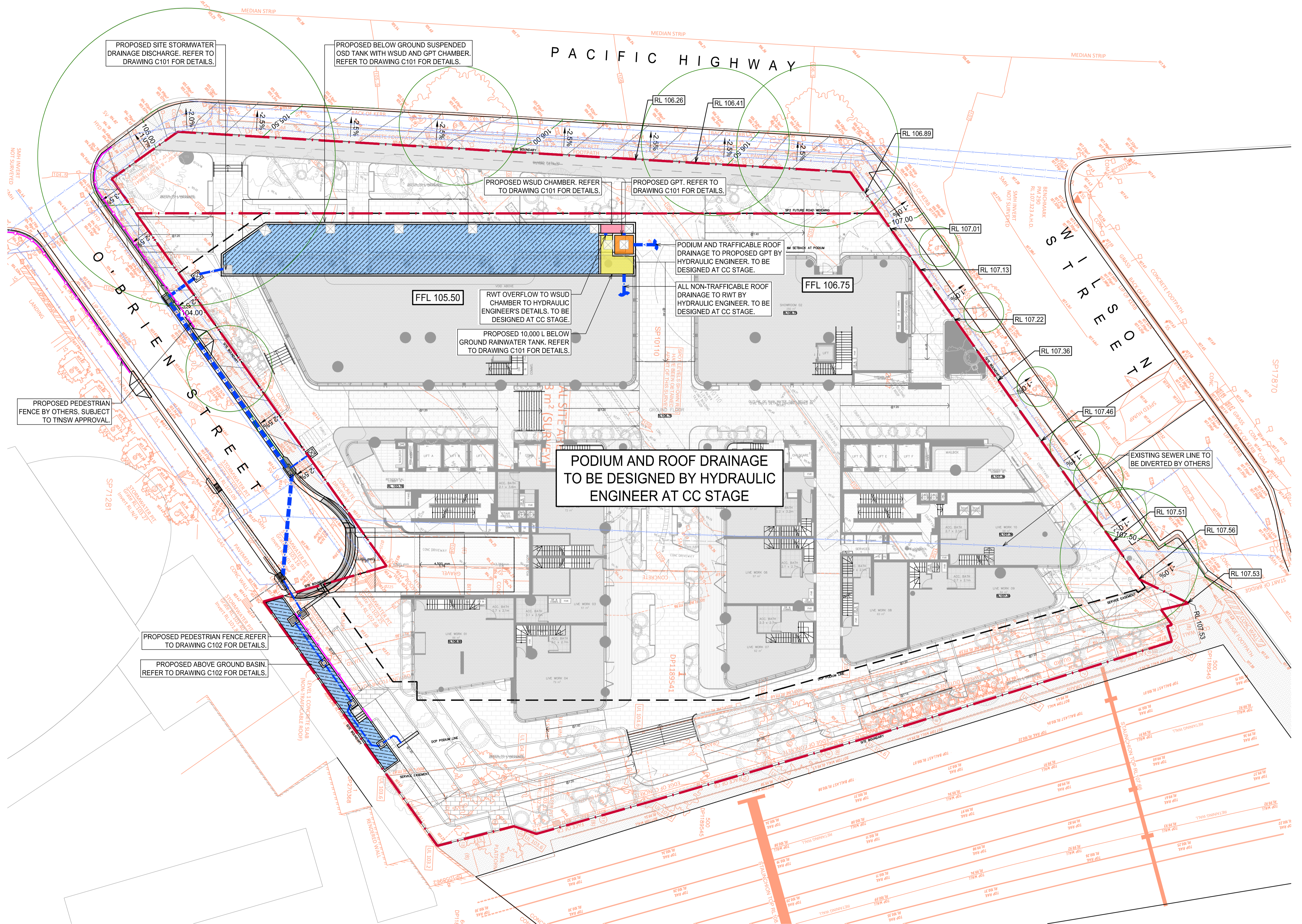


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A : Level 7, 210 Clarence Street, Sydney NSW 2000  
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Project	PROPOSED MIXED USE DEVELOPMENT 2-8 WILSON STREET & 849-859 PACIFIC HIGHWAY, CHATSWOOD NSW		
Sheet Subject	COVER SHEET		

Scale at A1	Drawn	Approved
	MH	SS
Job No	Drawing No	Revision
230812	C000	A



**LEGEND**

- SITE BOUNDARY
- EXISTING CONTOUR
- PROPOSED MAJOR CONTOUR (0.5m)
- PROPOSED MINOR CONTOUR (0.1m)
- PROPOSED STORMWATER PIPE
- EXISTING STORMWATER PIPE
- SUBSOIL PIPE
- OUTLINE OF LEVEL BELOW
- GRATED SURFACE INLET PIT
- SEALED JUNCTION PIT
- GTD
- STORMWATER PIT NAME
- FINISHED RL
- OVERLAND FLOW DIRECTION
- EXISTING ELECTRICAL LINE
- EXISTING GAS LINE
- EXISTING TELECOMMUNICATION LINE
- EXISTING SEWER LINE
- EXISTING WATER LINE
- EXISTING FIBRE OPTIC LINE
- EXISTING OVERHEAD POWER LINE
- EXISTING TRAFFIC LINE
- PROPOSED PEDESTRIAN FENCE

- NOTES:**
1. ALL DIMENSIONS ARE IN mm UNLESS NOTED OTHERWISE.
  2. ALL REDUCED LEVELS ARE IN m/AHD.
  3. SURVEY INFORMATION OBTAINED FROM SDG'S DRAWING TITLED 'DETAIL AND LEVEL SURVEY OF LOT 1 IN DP1189541, SP1496 SP60178, SP10110 AND PART OF SP52947, REF. 9062 ISSUE A DATED 01/11/2023.
  4. PROPOSED STORMWATER PIPES TO HAVE MINIMUM PIPE FALLS AS PER BELOW:
    - A. DIAMETER ≤ 150mm: 1.0% FALL.
    - B. DIAMETER ≥ 225mm: 0.5% FALL.
  5. SLAB/PAVEMENT TO HAVE MINIMUM 1% FALL TOWARDS STORMWATER INLETS AS PER AS2890 REQUIREMENTS.
  6. ALL WORKS OUTSIDE THE SITE BOUNDARY ARE TO BE PROPOSED AS PART OF A SEPARATE APPLICATION AND ARE SHOWN INDICATIVELY ONLY.
  7. GRATE AND FRAME OF STORMWATER COMPONENTS INCLUDING PITS, GTD, GPT, RWO AND PD ARE TO BE LIGHT DUTY OR CLASS B IN LANDSCAPE AREA U.N.O.
  8. GRATE AND FRAME OF STORMWATER COMPONENTS INCLUDING PITS, GTD, GPT, RWO AND PD ARE TO BE HEAVY DUTY OR CLASS D IN VEHICULAR TRAFFIC AREA U.N.O.

**STORMWATER DRAINAGE CONCEPT**

PROPOSED SITE STORMWATER DRAINAGE TO DRAIN IN ACCORDANCE WITH C150 CATCHMENT AREA PLAN. BELOW GROUND ON-SITE DETENTION TANK AND ABOVE GROUND BASIN HAVE BEEN PROPOSED TO PROVIDE MINIMUM REQUIRED SITE STORAGE AND LIMIT POST-DEVELOPMENT ALLOWED PERMISSIBLE SITE DISCHARGE IN ACCORDANCE WITH WILLOUGHBY COUNCIL'S TECHNICAL STANDARD CLAUSE 6.2 TABLE 1 AND TABLE 2.

TOTAL SITE AREA = 4294 m<sup>2</sup>  
 SSR = 360 m<sup>3</sup>/Ha  
 PSD = 170 L/s/Ha

SITE AREA DRAINING TO ABOVE GROUND BASIN = 187 m<sup>2</sup>  
 REQUIRED STORAGE = 6.7 m<sup>3</sup>  
 REQUIRED ABOVE GROUND STORAGE (20% EXTRA) = 8.1 m<sup>3</sup>

SITE AREA DRAINING TO OSD TANK = 4107 m<sup>2</sup>  
 REQUIRED STORAGE = 148 m<sup>3</sup>  
 SITE AREA BYPASSING OSD TANK = 323 m<sup>2</sup>  
 IMPERVIOUS AREA BYPASSING OSD TANK = 258 m<sup>2</sup>  
 (6% TOTAL SITE)

DRAINS MODEL HAS BEEN PREPARED TO ENSURE THAT PSD IS ACHIEVED AND STORAGE REQUIRED TO REDUCE THE OUTFLOW.

**FOR APPROVAL**

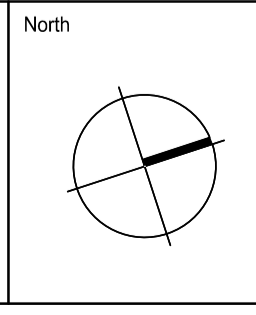
A1 ..... 1:200

Rev	Description	Eng	Draft	Date
B	ISSUE FOR APPROVAL	AH	AH	16.06.2025
A	ISSUE FOR APPROVAL	MH	MH	15.12.2023

Architect

Client

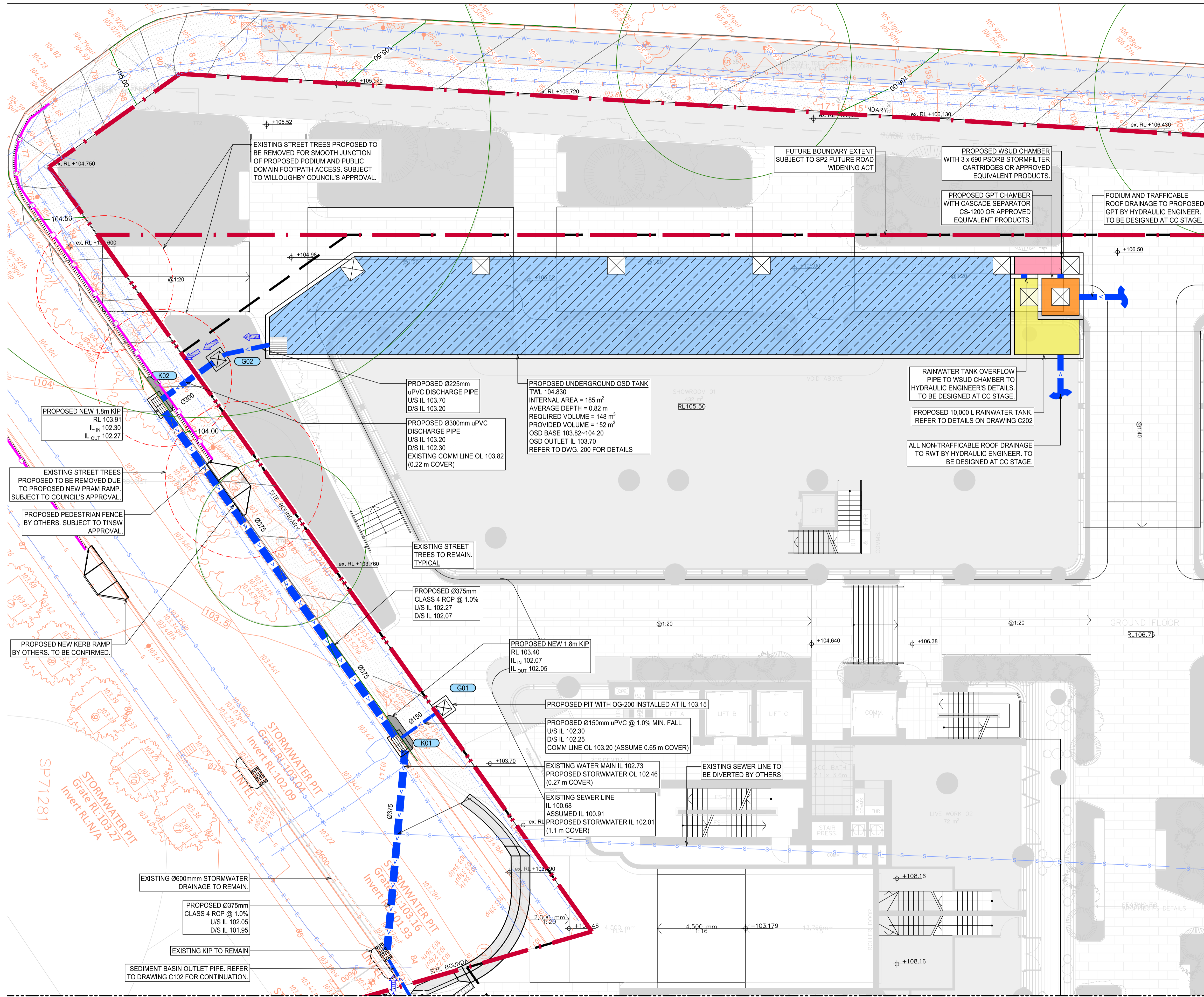
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Project  
**PROPOSED MIXED USE DEVELOPMENT**  
 2-8 WILSON STREET & 849-859 PACIFIC HIGHWAY, CHATSWOOD NSW

Sheet Subject  
**GENERAL ARRANGEMENT PLAN**

Scale at A1	Drawn	Approved
1:200	AH	FC
Job No	Drawing No	Revision
230812	C100	B



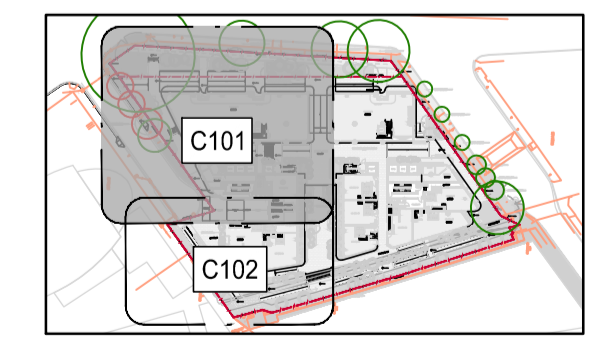
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  8. GRATE AND FRAME OF STORMWATER COMPONENTS INCLUDING PITS, GTD, GPT, RWO AND PD ARE TO BE HEAVY DUTY OR CLASS D IN VEHICULAR TRAFFIC AREA U.N.O.

PIT SCHEDULE				
PIT ID	PIT TYPE	COVER LEVEL (mAHD)	PIT IL (mAHD)	DEPTH TO IL (m)
K01	1.8m KIP WITH CLASS D GRATE	103.40	102.05	1.35
K02	1.8m KIP WITH CLASS D GRATE	103.91	102.27	1.64
G01*	900x900 JP CLASS B LID	103.60	102.30	1.30
G02	900x900 JP CLASS B LID	104.17	103.20	0.97

NOTES: PROVIDE OCEANGUARD WITH 200 MICRON FILTRATION BAGS OG-200 FOR PITS MARKED WITH \* \* \*



KEY PLAN NOT TO SCALE

STORMWATER MANAGEMENT PLAN - GROUND FLOOR SHEET 1  
SCALE 1:100

A1	1:200
Architect	
Client	
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North	
Project PROPOSED MIXED USE DEVELOPMENT 2-8 WILSON STREET & 849-859 PACIFIC HIGHWAY, CHATSWOOD NSW	
Sheet Subject STORMWATER MANAGEMENT PLAN - GROUND FLOOR SHEET 1	
Scale at A1 1:100	Drawn MH
Approved SS	
Job No 230812	Drawing No C101
Revision A	

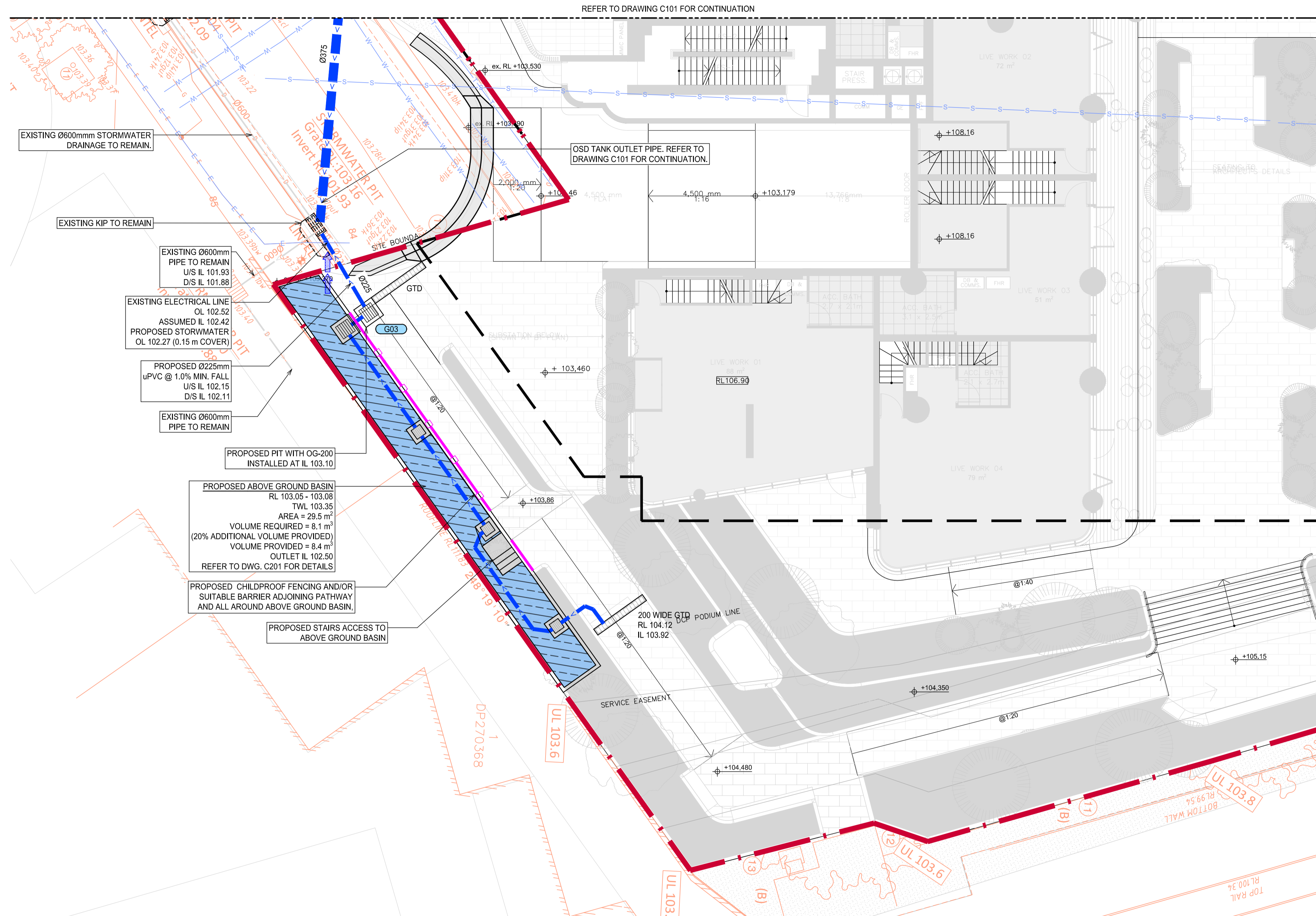
A	15.12.2023
ISSUE FOR APPROVAL	
Rev	Description

MH	15.12.2023
Eng	
Draft	
Date	






# FOR APPROVAL



STORMWATER MANAGEMENT PLAN - GROUND FLOOR SHEET 2  
SCALE 1:100

LEGEND

- SITE BOUNDARY
- EXISTING CONTOUR
- PROPOSED MAJOR CONTOUR (0.5m)
- PROPOSED MINOR CONTOUR (0.1m)
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- EXISTING STORMWATER PIPE
- SUBSOIL PIPE
- OUTLINE OF LEVEL BELOW
- GRATED SURFACE INLET PIT
- SEALED JUNCTION PIT
- GRATED DRAIN
- STORMWATER PIT NAME
- FINISHED RL
- OVERLAND FLOW DIRECTION
- EXISTING ELECTRICAL LINE
- EXISTING GAS LINE
- EXISTING TELECOMMUNICATION LINE
- EXISTING SEWER LINE
- EXISTING WATER LINE
- EXISTING FIBRE OPTIC LINE
- EXISTING OVERHEAD POWER LINE
- EXISTING TRAFFIC LINE
- PROPOSED PEDESTRIAN FENCE

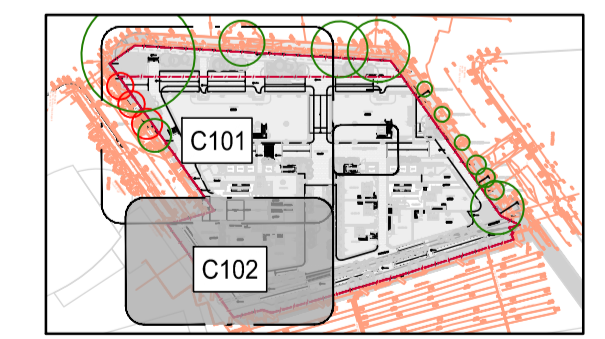
NOTES:

1. ALL DIMENSIONS ARE IN mm UNLESS NOTED OTHERWISE.
2. ALL REDUCED LEVELS ARE IN mAHD.
3. SURVEY INFORMATION OBTAINED FROM SDG'S DRAWING TITLED 'DETAIL AND LEVEL SURVEY OF LOT 1 IN DP1189541, SP1496 SP60178, SP10110 AND PART OF SP52947, REF. 9062 ISSUE A DATED 01/11/2023.
4. PROPOSED STORMWATER PIPES TO HAVE MINIMUM PIPE FALLS AS PER BELOW:
  - A. DIAMETER ≤ 150mm: 1.0% FALL.
  - B. DIAMETER ≥ 225mm: 0.5% FALL.
5. SLAB/PAVEMENT TO HAVE MINIMUM 1% FALL TOWARDS STORMWATER INLETS AS PER AS2890 REQUIREMENTS.
6. ALL WORKS OUTSIDE THE SITE BOUNDARY ARE TO BE PROPOSED AS PART OF A SEPARATE APPLICATION AND ARE SHOWN INDICATIVELY ONLY.
7. GRATE AND FRAME OF STORMWATER COMPONENTS INCLUDING PITS, GTD, GPT, RWO AND PD ARE TO BE LIGHT DUTY OR CLASS B IN LANDSCAPE AREA U.N.O.
8. GRATE AND FRAME OF STORMWATER COMPONENTS INCLUDING PITS, GTD, GPT, RWO AND PD ARE TO BE HEAVY DUTY OR CLASS D IN VEHICULAR TRAFFIC AREA U.N.O.

PIT SCHEDULE

PIT ID	PIT TYPE	COVER LEVEL (mAHD)	PIT IL (mAHD)	DEPTH TO IL (m)
G03*	900x900 GSIP CLASS B GRATE	103.40	102.15	1.25

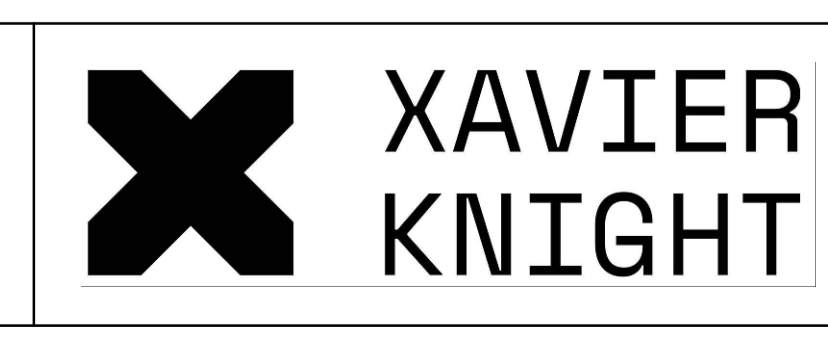
NOTES: PROVIDE OCEANGUARD WITH 200 MICRON FILTRATION BAGS OG-200 FOR PITS MARKED WITH " \* "



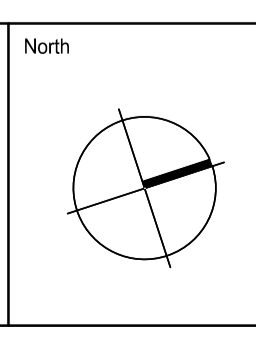
KEY PLAN  
NOT TO SCALE

FOR APPROVAL

A1		1:100	
Rev	Description	Eng	Date
A	ISSUE FOR APPROVAL	MH	15.12.2023



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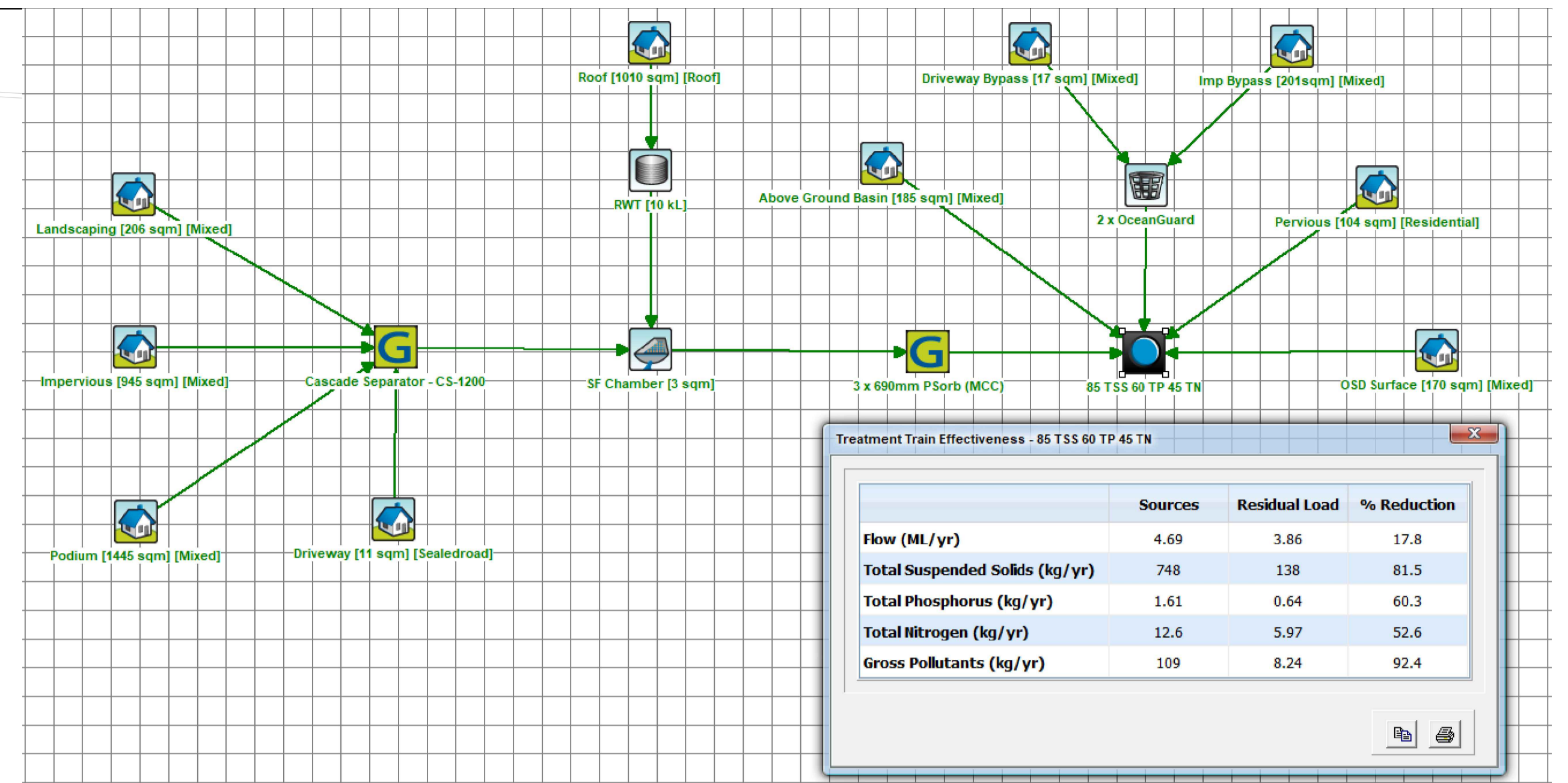
Project  
PROPOSED MIXED USE DEVELOPMENT  
2-8 WILSON STREET & 849-859 PACIFIC HIGHWAY, CHATSWOOD NSW

Sheet Subject  
STORMWATER MANAGEMENT PLAN -  
GROUND FLOOR SHEET 2

Scale at A1 1:100	Drawn MH	Approved SS
Job No 230812	Drawing No C102	Revision A



CATCHMENT AREA BREAKDOWN  
SCALE 1:200



TREATMENT TRAIN AND MUSIC RESULT  
NTS

**WATER QUALITY TARGET**  
AS PER WILLOUGHBY COUNCIL'S DCP PART 1 - STORMWATER MANAGEMENT 2023, THE FOLLOWING AVERAGE ANNUAL POLLUTANT LOAD REDUCTION NEED TO BE ACHIEVED FOR MAJOR DEVELOPMENTS:

- 90% GROSS POLLUTANTS
- 85% TOTAL SUSPENDED SOLIDS (TSS)
- 60% TOTAL PHOSPHORUS (TP)
- 45% TOTAL NITROGEN (TN)
- HYDROCARBONS TREATMENT.

CASCADE SEPARATOR BY OCEAN PROTECT OR OTHER SIMILAR PRODUCTS HAVE BEEN SPECIFIED FOR PRIMARY TREATMENT DUE TO ITS FEATURE OF TREATING HYDROCARBONS ALONGSIDE THE OTHER POLLUTANTS.

**LEGEND**

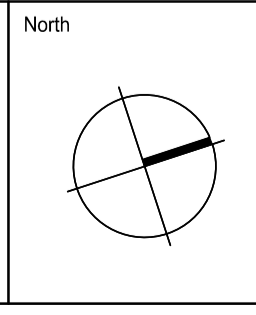
- NON-TRAFFICABLE ROOF DRAINING TO RAINWATER TANK THEN WSUD SYSTEM = 1,010 m<sup>2</sup>
- TRAFFICABLE ROOF DRAINING TO WSUD SYSTEM = 1,445 m<sup>2</sup>
- IMPERVIOUS DRAINING TO WSUD SYSTEM AND OSD = 945 m<sup>2</sup>
- PERVIOUS AREA DRAINING TO WSUD SYSTEM AND OSD = 206 m<sup>2</sup>
- DRIVEWAY AREA DRAINING TO WSUD SYSTEM AND OSD = 11 m<sup>2</sup>
- AREA DRAINING TO ABOVE GROUND BASIN = 185 m<sup>2</sup> (45% IMPERVIOUS)
- IMPERVIOUS AREA BYPASSING WSUD SYSTEM = 371 m<sup>2</sup>
- PERVIOUS AREA BYPASSING WSUD SYSTEM = 104 m<sup>2</sup>
- DRIVEWAY AREA BYPASSING WSUD SYSTEM = 17 m<sup>2</sup>
- AREA SUBJECT TO SP2 FUTURE ROAD WIDENING ACT = 464 m<sup>2</sup>

**FOR APPROVAL**

A1		1:200	
Rev	Description	Eng	Date
A	ISSUE FOR APPROVAL	MH	15.12.2023



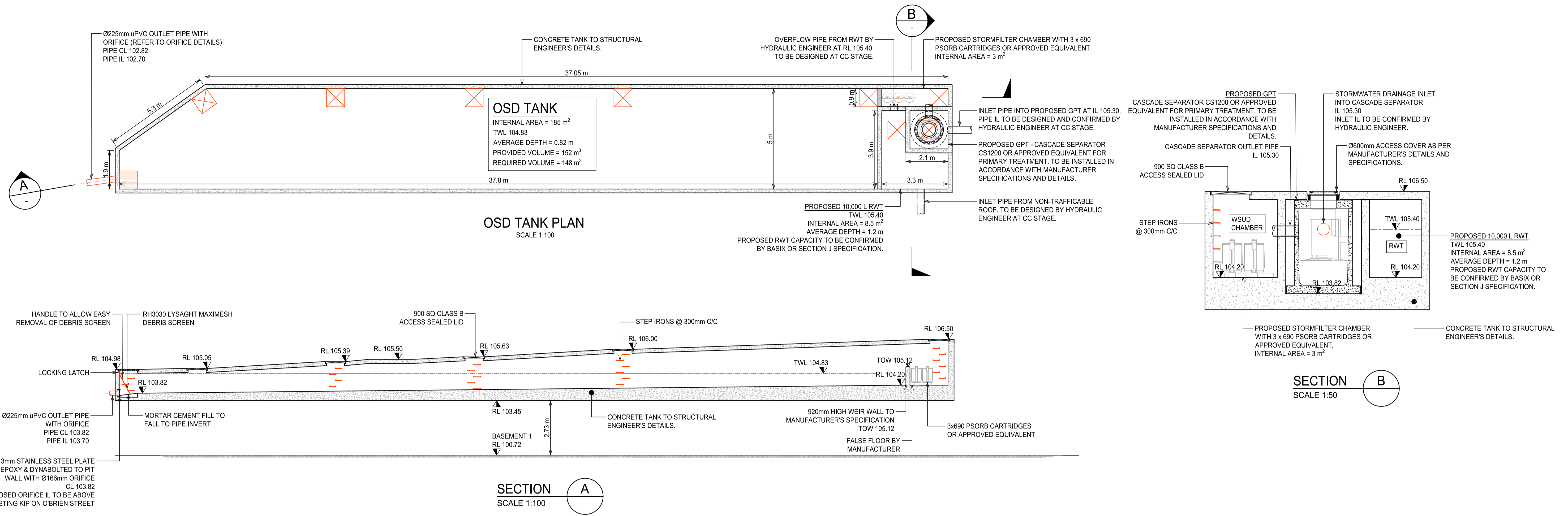
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Project  
**PROPOSED MIXED USE DEVELOPMENT**  
2-8 WILSON STREET & 849-859 PACIFIC HIGHWAY, CHATSWOOD NSW

Sheet Subject  
**CATCHMENT PLAN AND MUSIC RESULTS**

Scale at A1	Drawn	Approved
AS SHOWN	MH	SS
Job No	Drawing No	Revision
230812	C150	A



**DETENTION TANK SUMMARY**

AS PER WILLOUGHBY COUNCIL'S DCP PART 1 - STORMWATER MANAGEMENT 2023 APPENDIX 2, THE SITE IS LOCATED WITHIN ZONE 2, THEREFORE, THE FOLLOWING SSR AND PSD PARAMETERS ARE ADOPTED IN ACCORDANCE WITH TABLE 1 AND TABLE 2:

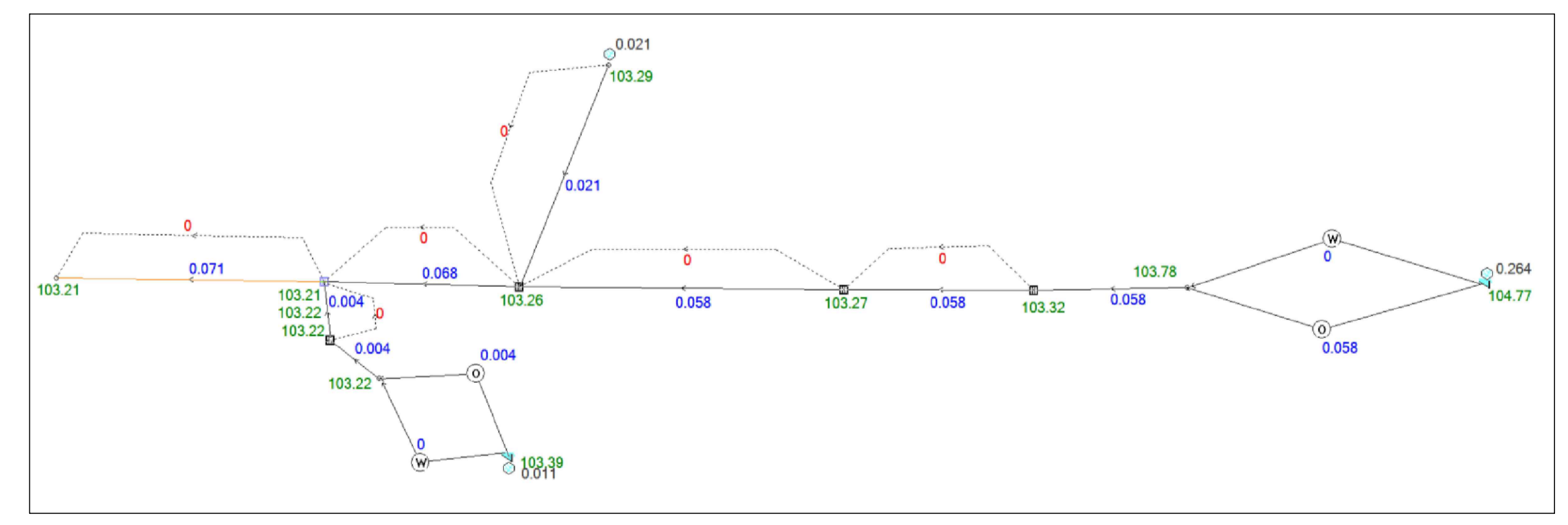
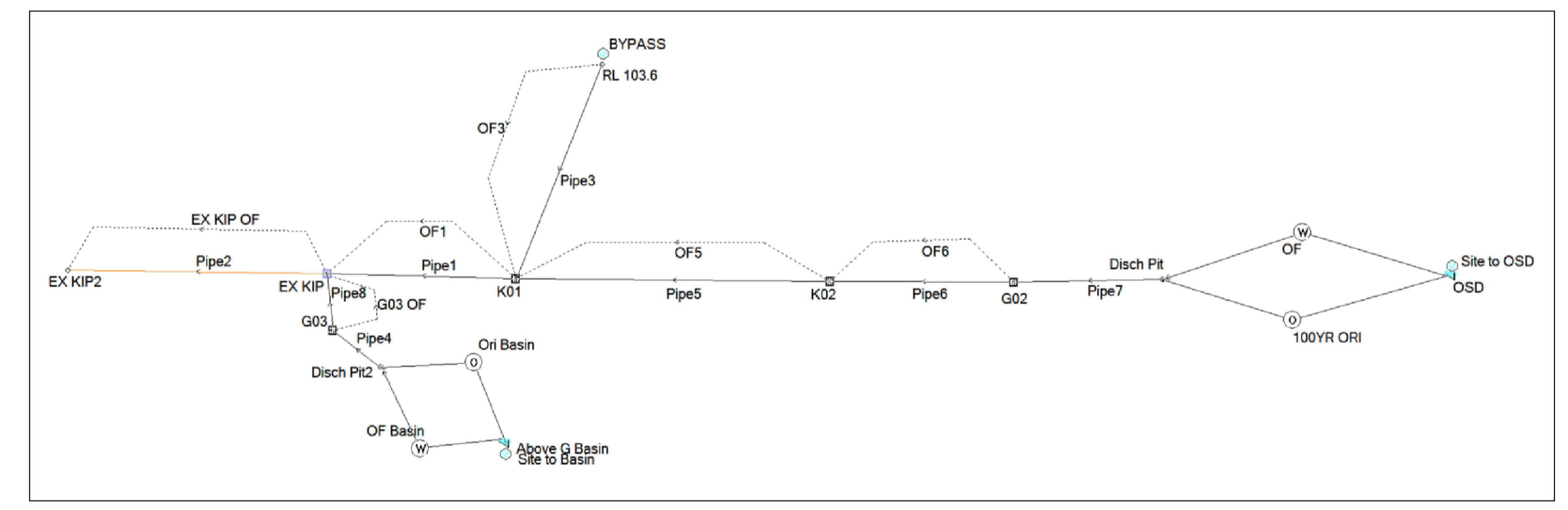
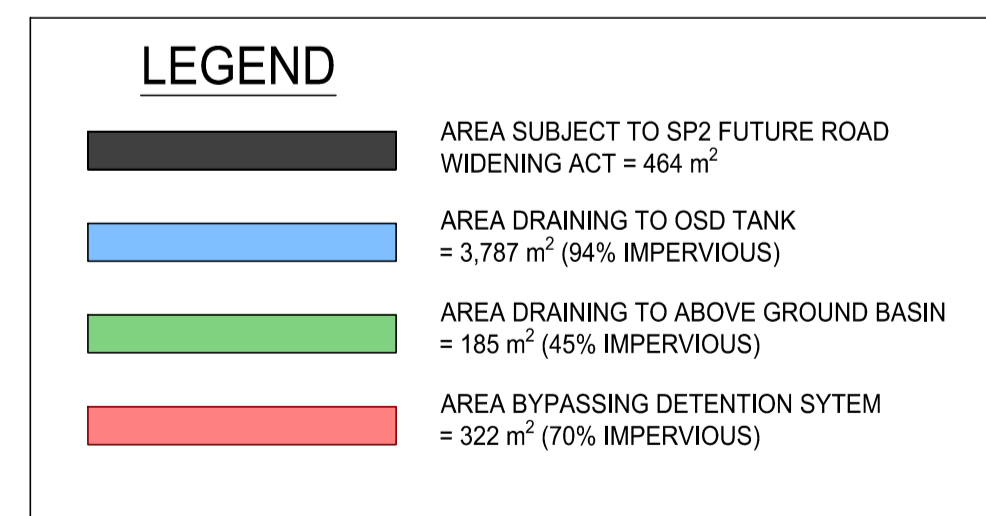
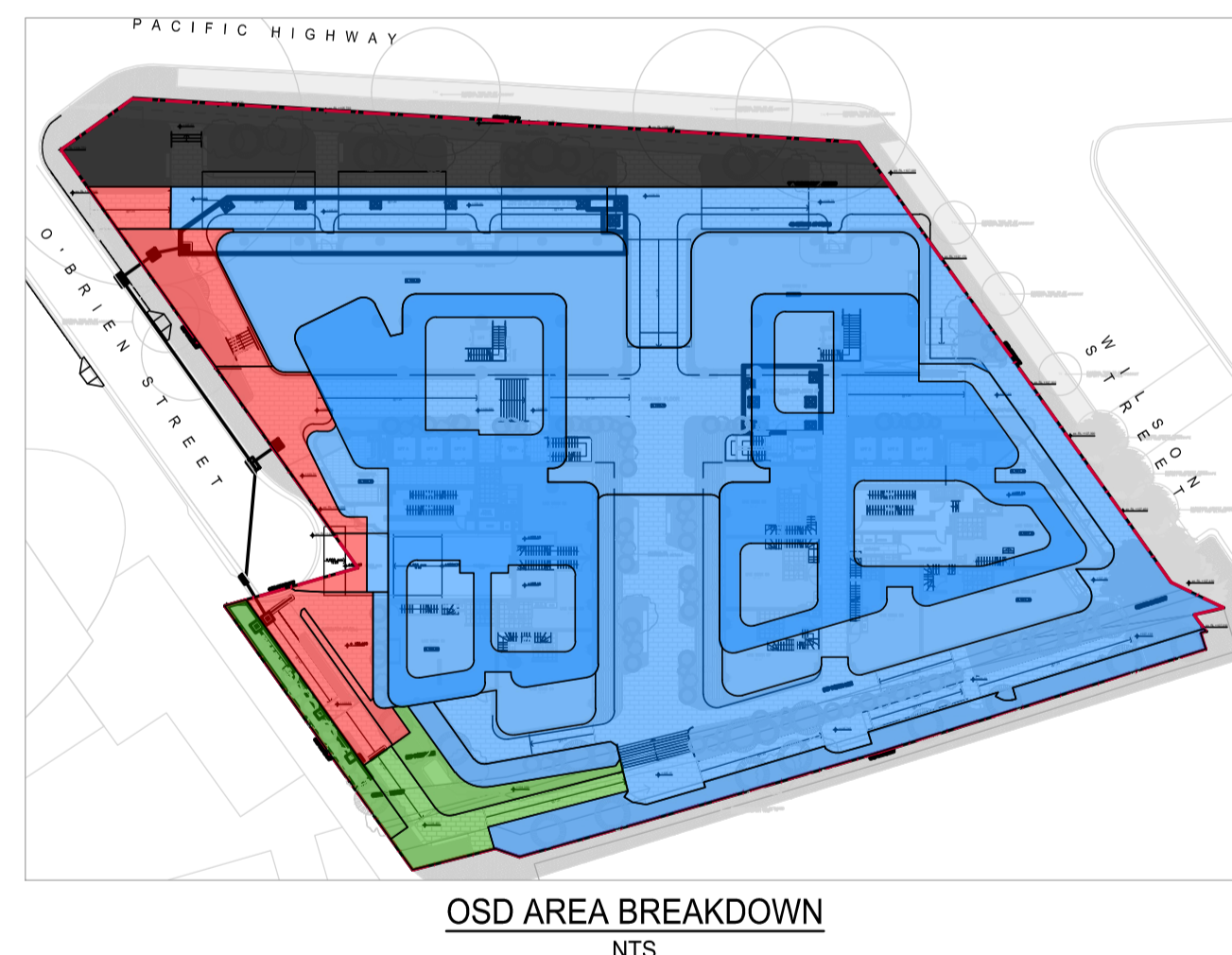
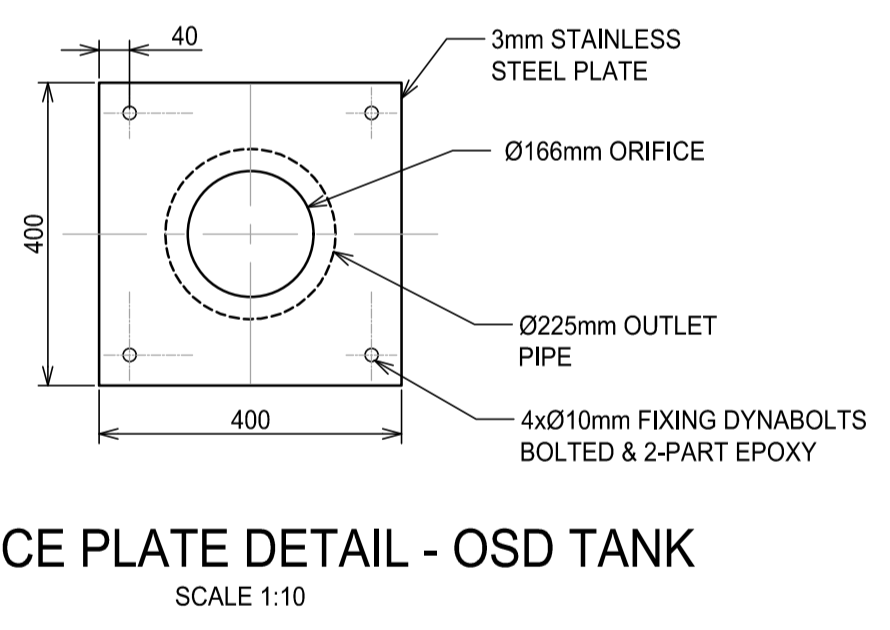
- SSR = 360 m³ / Ha
- PSD = 170 L/s / Ha

TOTAL SITE AREA = 4294 m²  
 MAX PSD = 73 L/s  
 MIN. SSR = 155 m³

TOTAL SITE DISCHARGE HAS BEEN LIMITED TO 73 L/s AS SHOWN IN DRAINS MODEL BELOW.

THE FOLLOWING DETENTION TANK SIZE HAS BEEN PROVIDED:

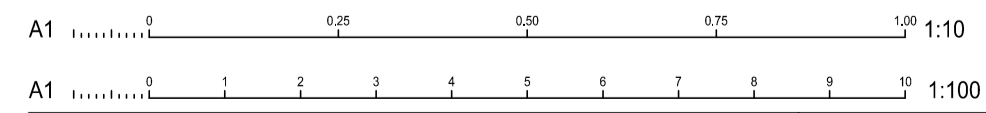
- OSD TANK = 152 m³
- ABOVE GROUND BASIN = 8.4 m³ (20% EXTRA)



CATCHMENT BREAKDOWN			
SITE AREA	4294 m²		
POST-DEV	AREA (m²)	IMPERVIOUS (m²)	PERVIOUS (m²)
SITE TO OSD	3787	3551	206
SITE TO BASIN	185	85	100
SITE BYPASS	322	218	104

PRE-DEV SITE DISCHARGE (m³/s)	STORM ARI (YEARS)	POST-DEV SCENARIO	POST-DEV BYPASS DISCHARGE (m³/s)	POST-DEV OSD DISCHARGE (m³/s)	POST-DEV BASIN DISCHARGE (m³/s)	POST-DEV PEAK DISCHARGE (m³/s)	MAX SITE PSD (m³/s)
0.154	20	UN-DROWNED	0.016	0.048	0.006	0.061	0.073
		DROWNED	0.016	0.048	0.003	0.058	
0.223	100	UN-DROWNED	0.021	0.058	0.007	0.073	0.073
		DROWNED	0.021	0.058	0.006	0.072	

DRAINS MODEL DROWNED-UNDROWNED PSD RESULTS COMPARISON



**FOR APPROVAL**

Rev	Description	Eng	Draft	Date
B	ISSUE FOR APPROVAL	AH	AH	30.08.2024
A	ISSUE FOR APPROVAL	MH	MH	15.12.2023

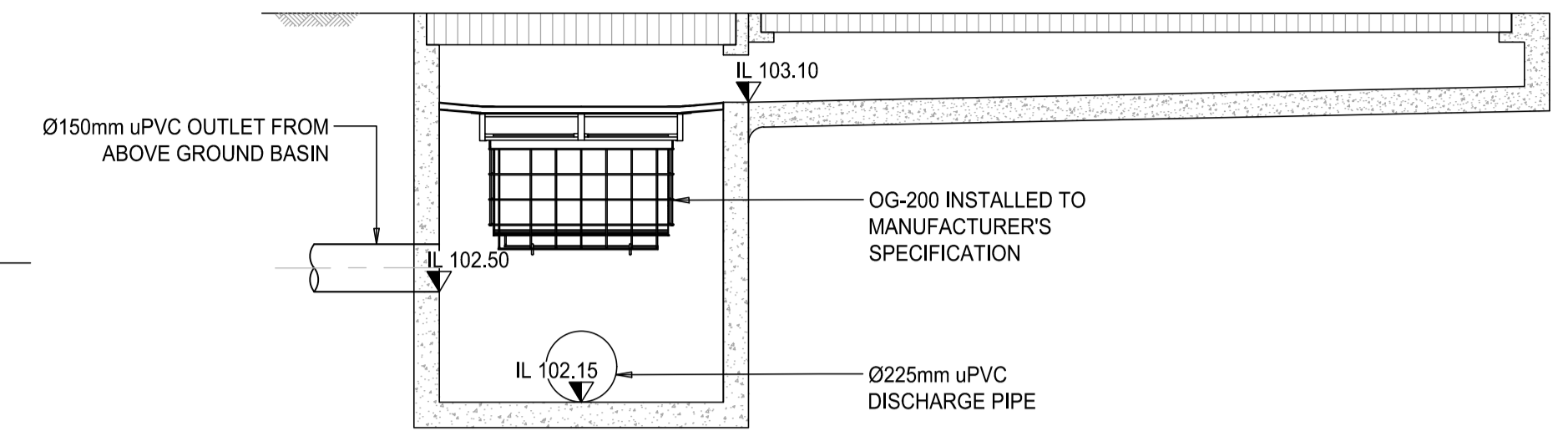
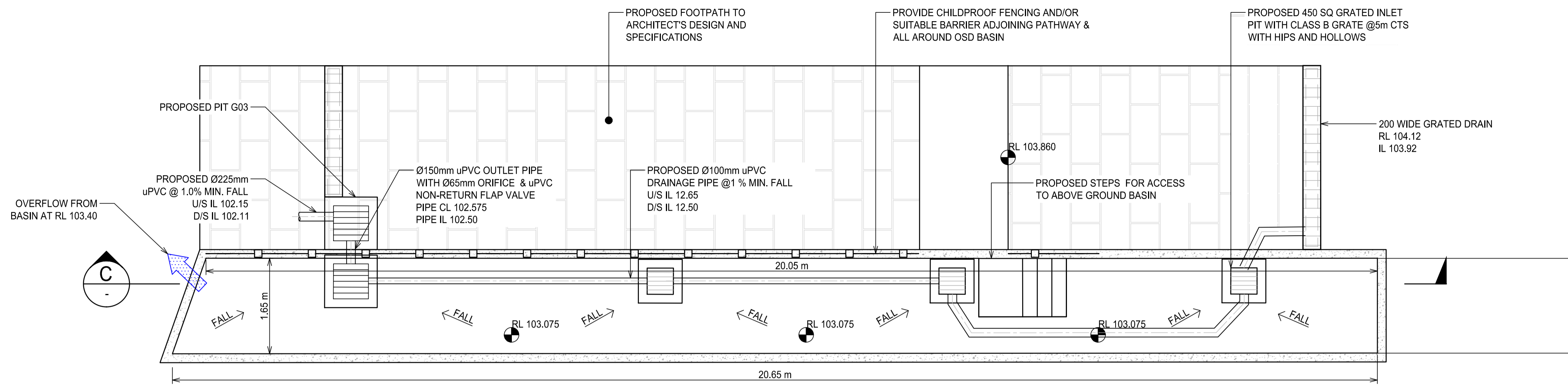


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Project: PROPOSED MIXED USE DEVELOPMENT  
 2-8 WILSON STREET & 849-859 PACIFIC HIGHWAY, CHATSWOOD NSW

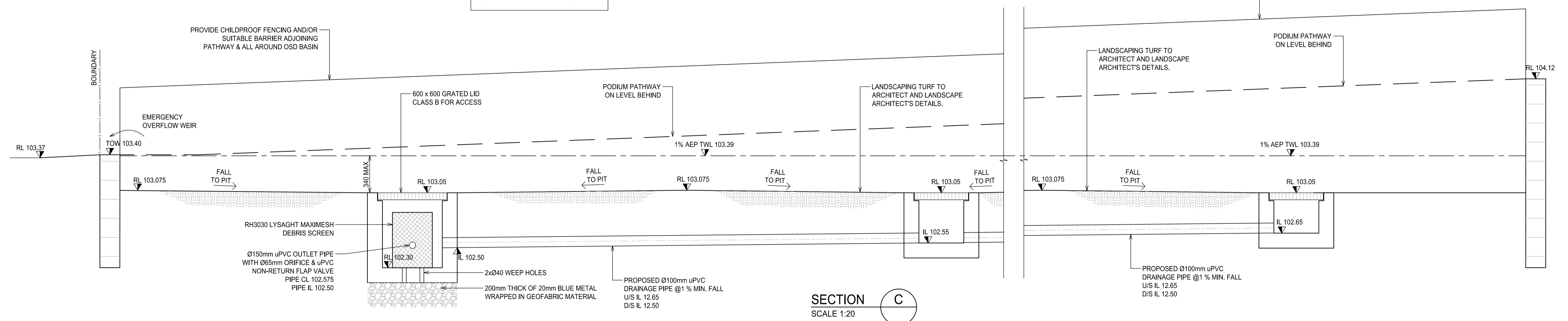
Sheet Subject: STORMWATER DRAINAGE DETAILS - SHEET 1

Scale at A1	Drawn	Approved
AS SHOWN	AH	FC
Job No	Drawing No	Revision
230812	C200	B

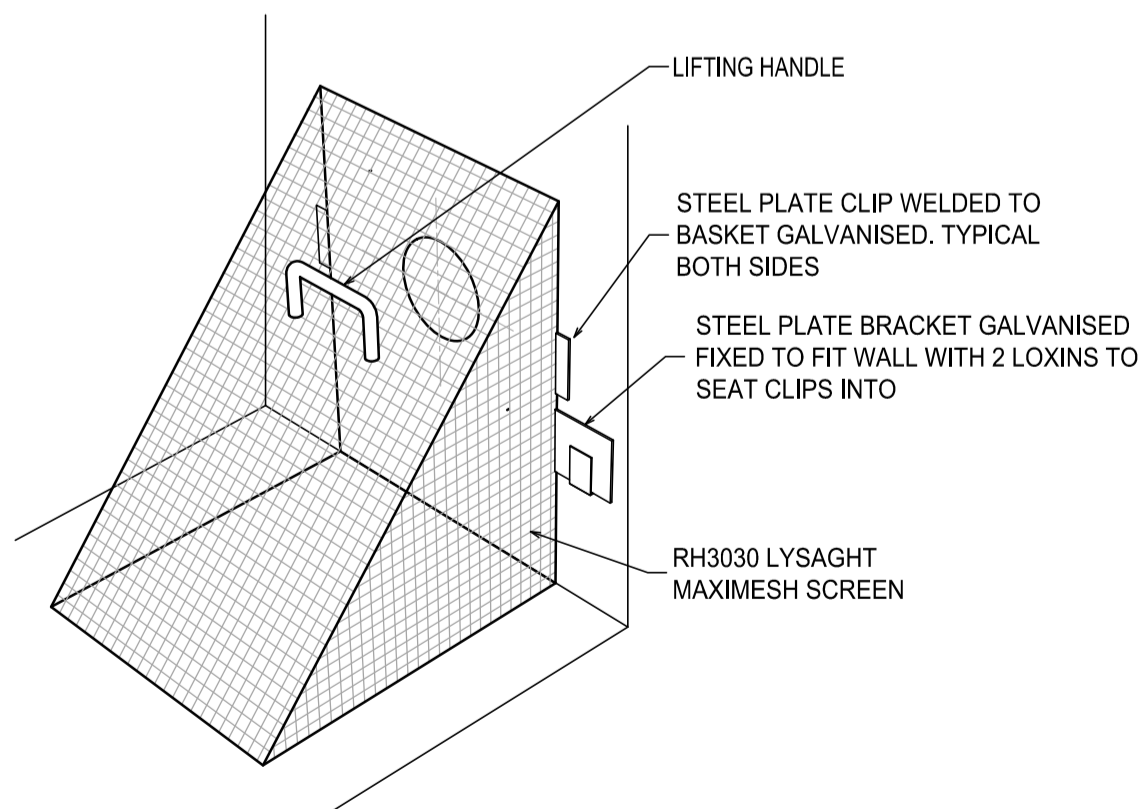


PIT G03 INSERT CONFIGURATION  
GRATED DRAIN WITH STORMWATER PIT  
SCALE 1:20

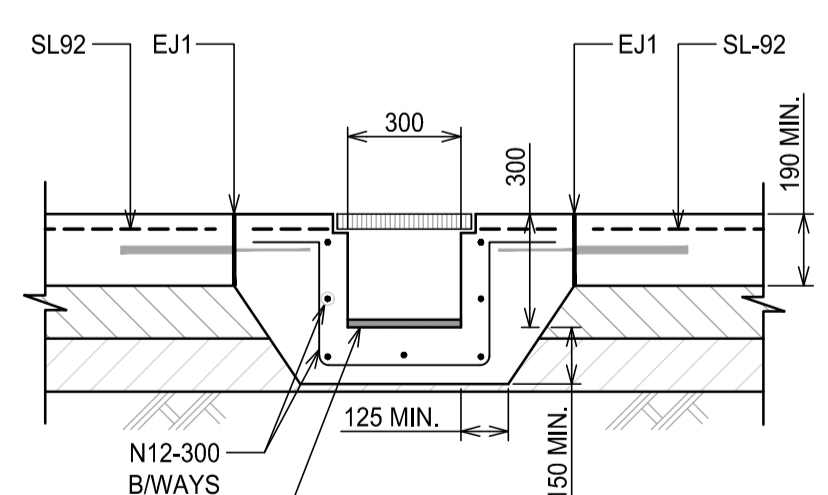
**ABOVE GROUND BASIN**  
 INTERNAL AREA = 29.5 m<sup>2</sup>  
 TWL 103.35  
 AVERAGE DEPTH = 0.285 m  
 PROVIDED VOLUME = 8.4 m<sup>3</sup>  
 REQUIRED VOLUME = 8.1 m<sup>3</sup>  
 (ADDITIONAL 20% CAPACITY)



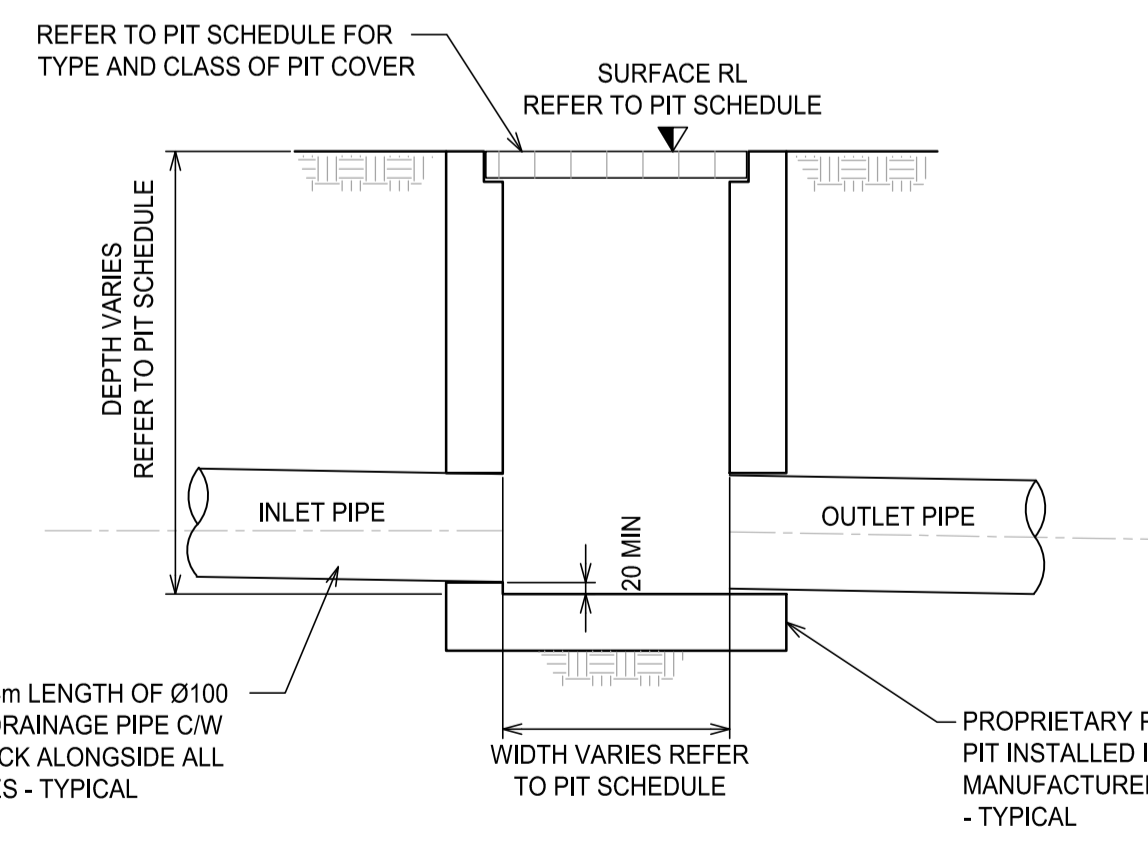
SECTION C  
SCALE 1:20



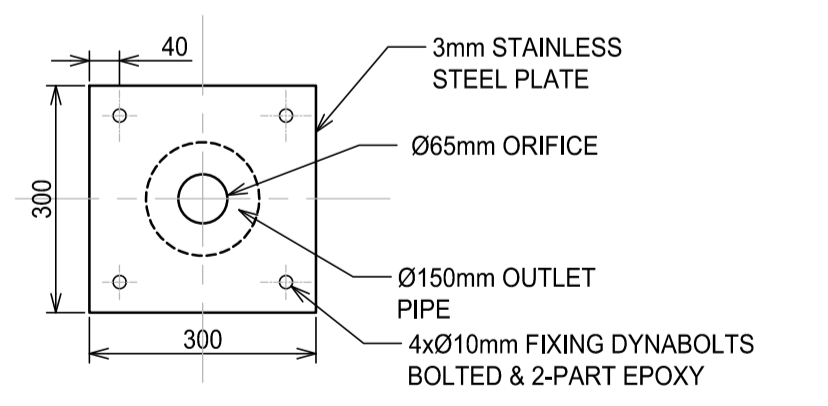
DEBRIS SCREEN  
SCALE 1:20



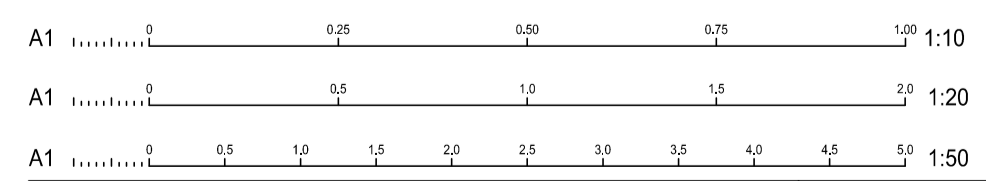
GRATED TRENCH DRAIN DETAIL (TYPICAL)  
SCALE 1:20



STORMWATER DRAINAGE PIT  
- PRECAST PIT  
SCALE 1:20



ORIFICE PLATE DETAIL - BASIN  
SCALE 1:10



Rev	Description	Eng	Draft	Date
C	ISSUE FOR APPROVAL	AH	AH	16.06.2025
B	ISSUE FOR APPROVAL	AH	AH	30.08.2024
A	ISSUE FOR APPROVAL	MH	MH	15.12.2023



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North

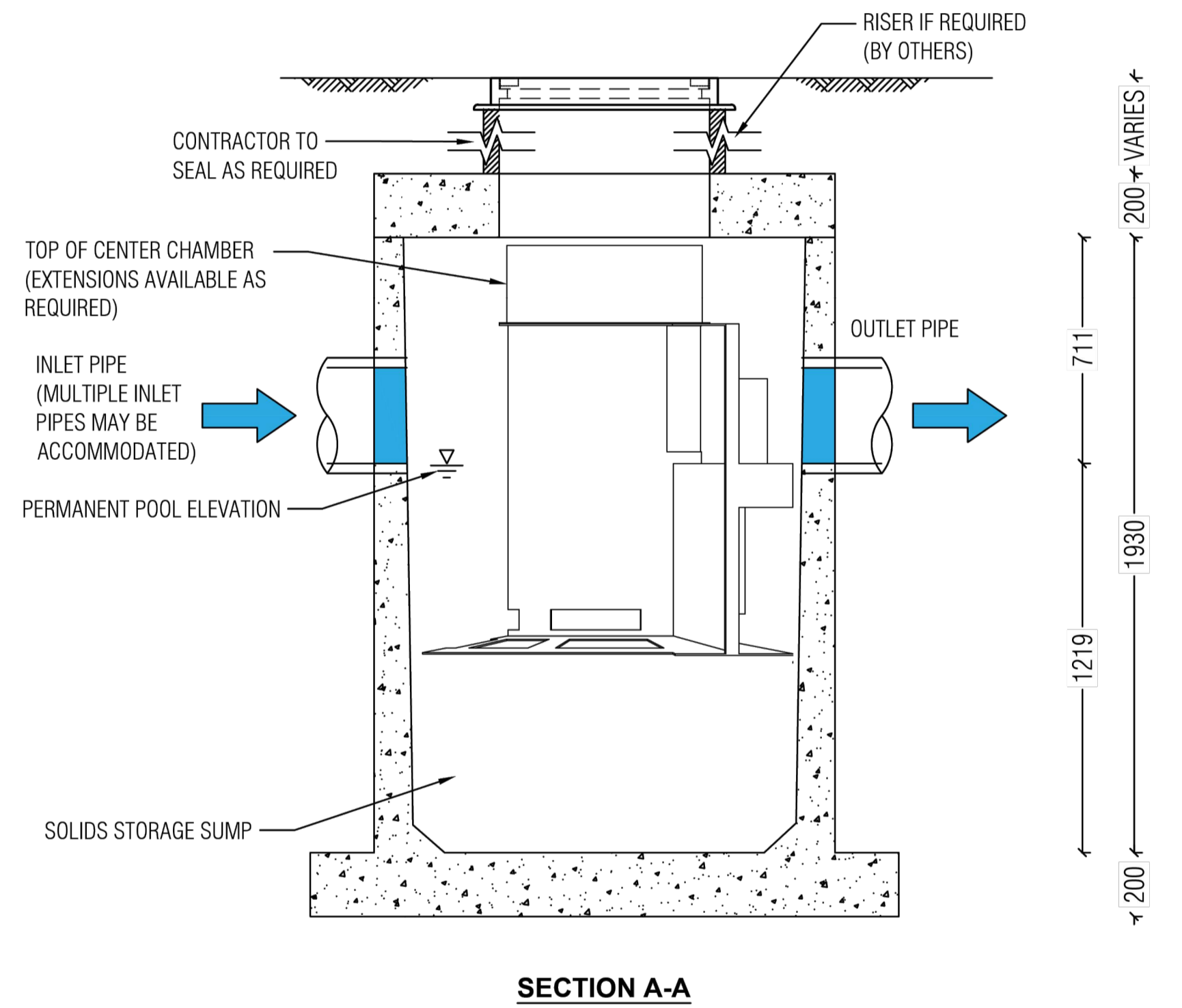
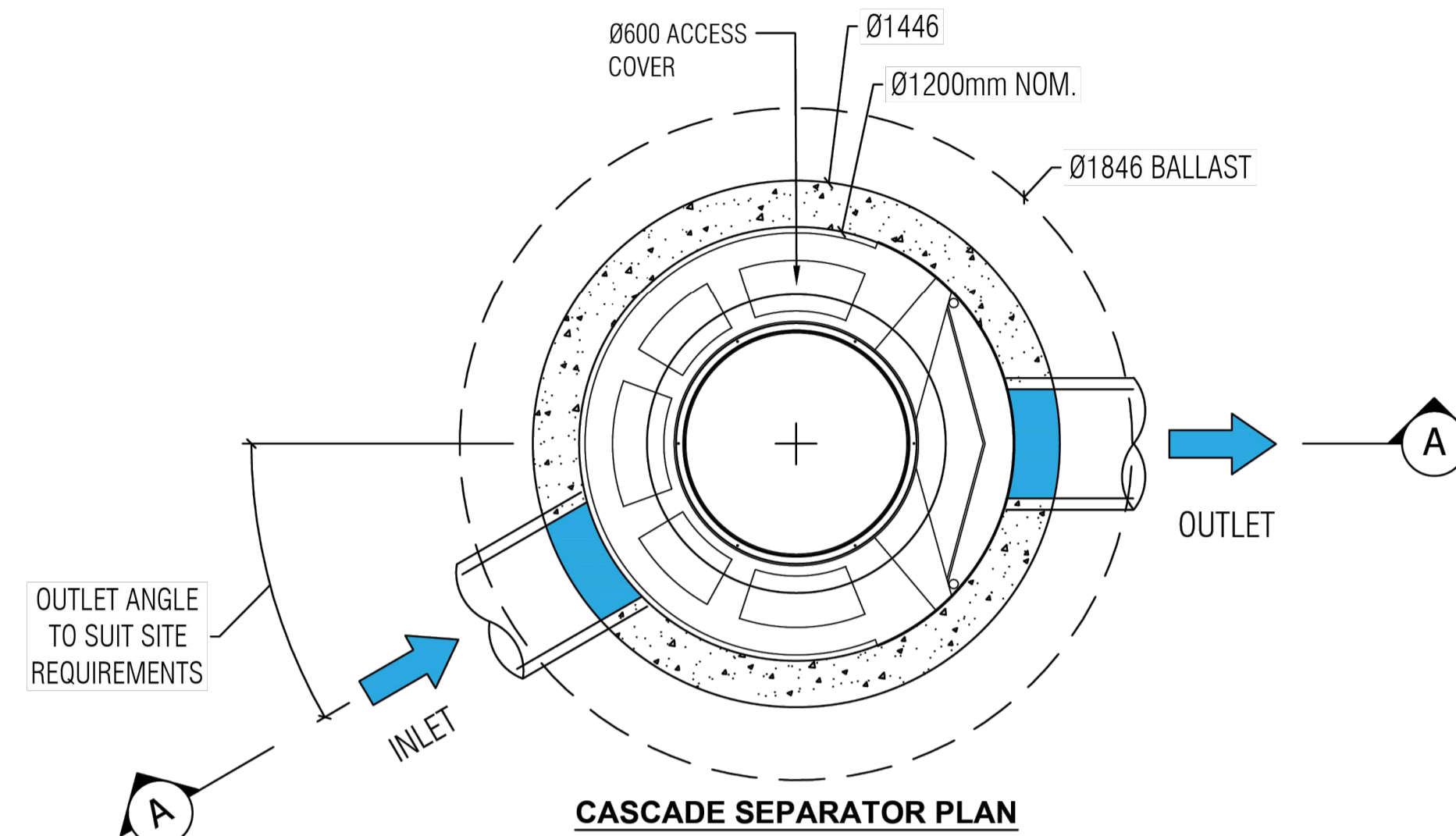
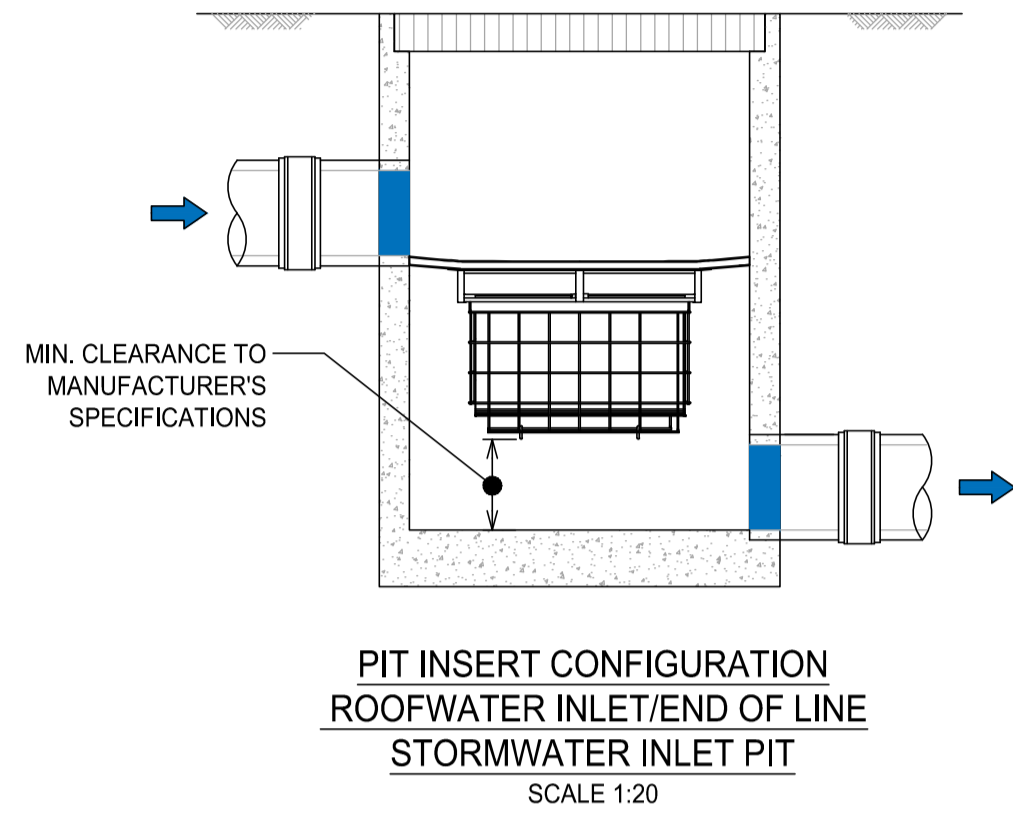
Project  
**PROPOSED MIXED USE DEVELOPMENT**  
 2-8 WILSON STREET & 849-859 PACIFIC HIGHWAY, CHATSWOOD NSW

Sheet Subject  
**STORMWATER DRAINAGE DETAILS - SHEET 2**

Scale at A1	Drawn	Approved
AS SHOWN	AH	FC
Job No	Drawing No	Revision
230812	C201	C

**FOR APPROVAL**

NOT FOR CONSTRUCTION

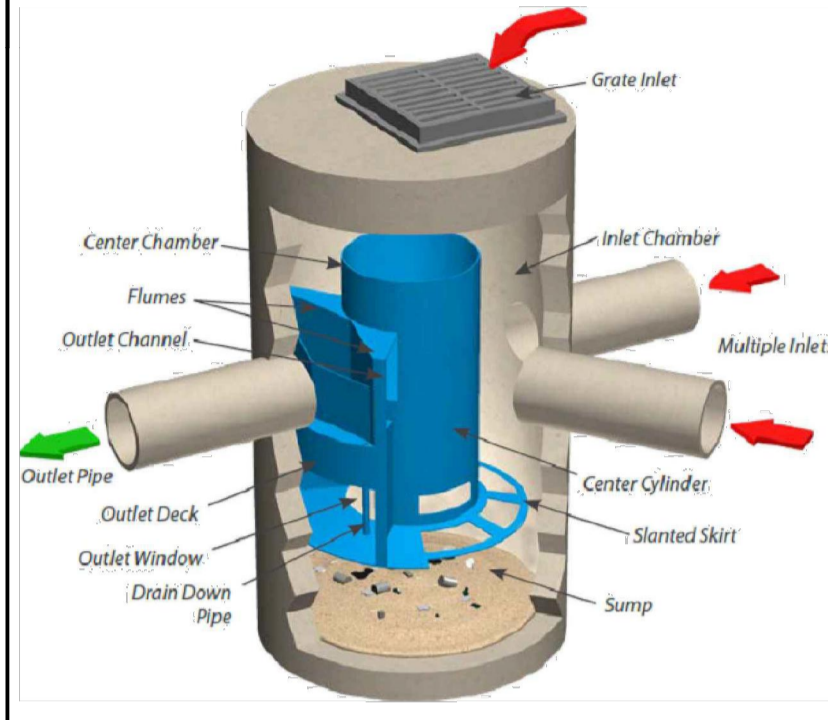


LAST MODIFIED: 16-03-20

CASCADE SEPARATOR DESIGN TABLE

TO BE INSTALLED ONLINE THE TOTAL INLET PIPE FLOW RATE MUST BE LESS THAN THE SPECIFIED UNITS LISTED MAXIMUM TOTAL FLOW RATE; THE UNIT MUST BE PLACED OFFLINE WHERE THE INLET FLOW RATE EXCEEDS THIS VALUE.

TREATABLE FLOWRATE [L/s]	51
MAXIMUM TOTAL FLOWRATE [L/s]	280
WEIR HEIGHT [mm]	440



SITE SPECIFIC DATA REQUIREMENTS

TOTAL FLOWRATE THROUGH INLET [L/S]	[ ]		
PIPE DATA:	I.L.	MATERIAL	DIAMETER
INLET PIPE	[ ]	[ ]	[ ]
OUTLET PIPE	[ ]	[ ]	[ ]
UPPER TANK WEIGHT	650kg		
LOWER TANK WEIGHT	3800kg		

NOTE: TANK SUPPLIED IN TWO PARTS; PARTS A & B TO BE JOINED ON SITE

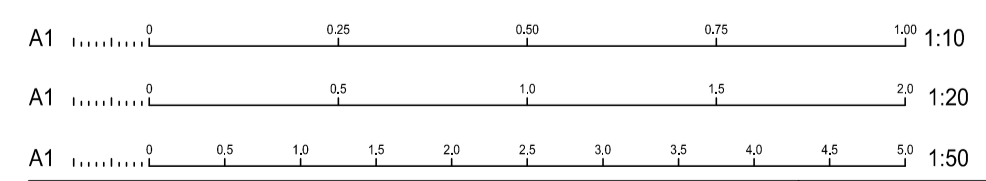
- GENERAL NOTES
- CASCADE SEPARATOR WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF THE PROJECT.
  - PRECAST STRUCTURE SUPPLIED WITH CORE HOLES TO SUIT OUTER DIAMETER OF NOMINATED PIPE SIZE / MATERIAL.
  - PRECAST STRUCTURE SHALL MEET W80 WHEEL LOAD RATING ASSUMING A MAXIMUM EARTH COVER OF 2.0m AND A GROUND WATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER TO CONFIRM ACTUAL GROUNDWATER ELEVATION.
  - PRECAST STRUCTURE SHALL BE DESIGNED FOR DURABILITY WITH A B2 EXPOSURE CLASSIFICATION AS PER AS3600:2018, SPECIFICALLY TABLE 4.10.3.3. CONCRETE CHARACTERISTIC STRENGTH > 50MPa AND CONCRETE COVER 30mm
  - PRECAST STRUCTURE SHALL BE DESIGNED FOR LOADS IN ACCORDANCE WITH AS 5100.2
  - CONCRETE TO COMPLY WITH SPECIFICATION RMS R53, PRODUCTION ASSESSMENT
  - TOLERANCES TO AS3610
  - ALL WATER QUALITY TREATMENT DEVICES REQUIRE PERIODIC MAINTENANCE. REFER TO OPERATION AND MAINTENANCE MANUAL FOR GUIDELINES AND ACCESS REQUIREMENTS.
  - SITE SPECIFIC PRODUCTION DRAWING WILL BE PROVIDED ON PLACEMENT OF ORDER.
  - DRAWING NOT TO SCALE.
- INSTALLATION NOTES
- ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE SPECIFIC DESIGN CONSIDERATION AND SHALL BE SPECIFIED BY THE SITE CIVIL ENGINEER.
  - CONTRACTOR TO PROVIDE ALL EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STRUCTURE (LIFTING DETAIL PROVIDED SEPARATELY).
  - CONTRACTOR TO INSTALL AND LEVEL THE STRUCTURE, APPLY SEALANT TO ALL JOINTS AND TO PROVIDE, INSTALL AND GROUT INLET AND OUTLET PIPES.
  - CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.
  - CONTRACTOR TO TAKE APPROPRIATE MEASURES TO PROTECT SCREEN & SEPARATION CYLINDER COMPONENTS DURING INSTALLATION



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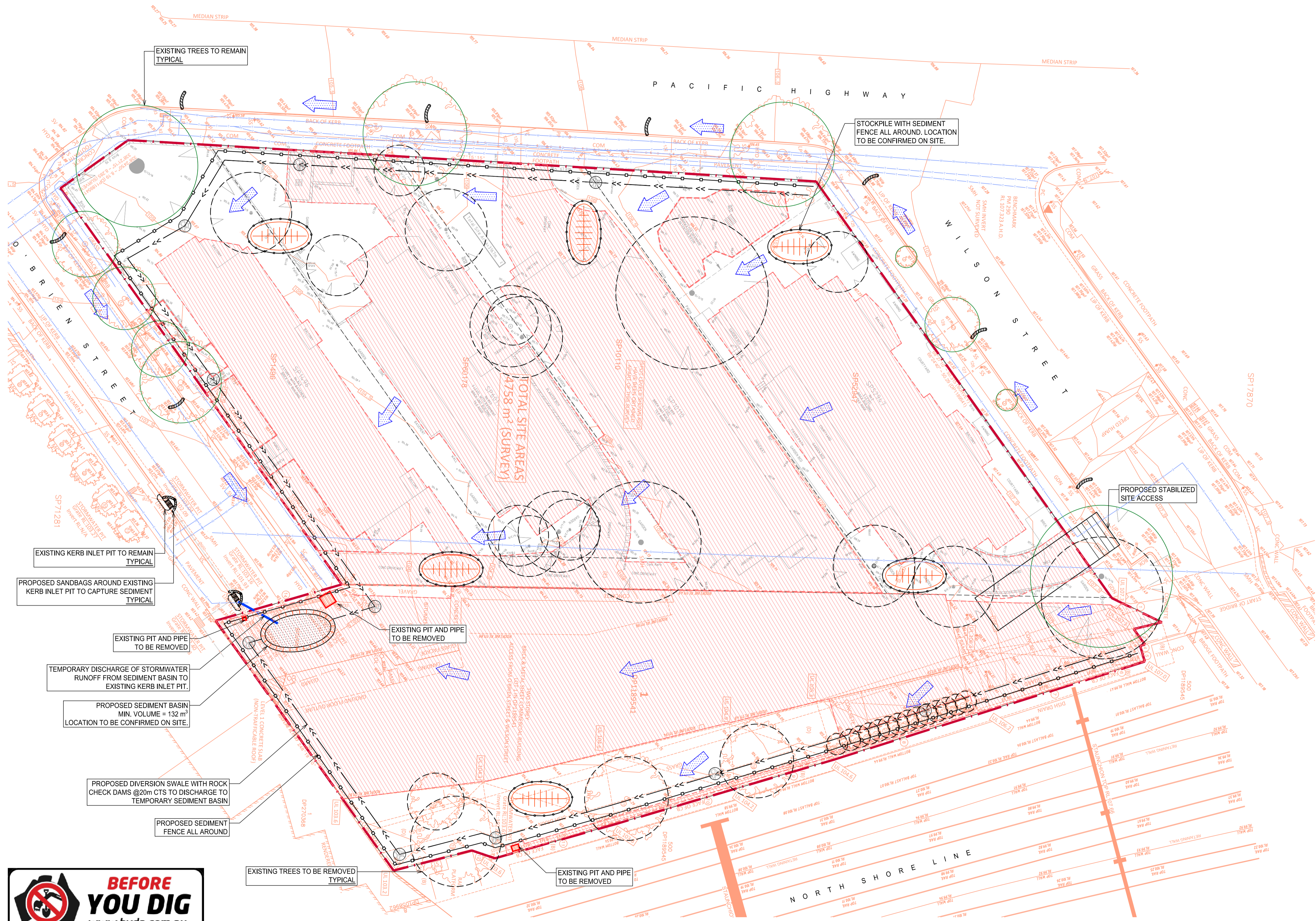
CASCADE SEPARATOR -  
PRODUCT DETAILS  
NTS



Architect	Client
 pbd architects	 Billbergia creating communities®
B ISSUE FOR APPROVAL AH AH 28.08.2024 A ISSUE FOR APPROVAL MH MH 15.12.2023 Rev Description Eng Draft Date	 XAVIER KNIGHT T : 02 8810 5800 E : info@xavierknight.com.au A : Level 7, 210 Clarence Street, Sydney NSW 2000 xavierknight.com.au This drawing is copyright and is the property of XAVIER KNIGHT CONSULTING ENGINEERS Pty. Ltd. and must not be used without authorisation.
Project PROPOSED MIXED USE DEVELOPMENT 2-8 WILSON STREET & 849-859 PACIFIC HIGHWAY, CHATSWOOD NSW	North Job No 230812 Drawing No C202 Revision B

Scale at A1	Drawn	Approved
AS SHOWN	MH	SS
Job No	Drawing No	Revision
230812	C202	B

FOR APPROVAL



- ### LEGEND
- SITE BOUNDARY
  - EXISTING STRUCTURES TO BE DEMOLISHED
  - SEDIMENT FENCE
  - TEMPORARY CATCH DRAIN
  - TEMPORARY DRAINAGE PIPE
  - SAND BAG
  - FLOW DIRECTION
  - EXISTING SEWER LINE
  - EXISTING WATER MAIN
  - EXISTING TELECOMMUNICATION LINE
  - EXISTING GAS MAIN
  - EXISTING ELECTRICAL MAIN
  - ROCK CHECK DAM
  - PROPOSED STOCKPILE LOCATION WITH SEDIMENT FENCE
  - SEDIMENT BASIN
  - STABILISED SITE ACCESS
  - EXISTING TREE TO BE REMOVED
  - TREE PROTECTION ZONE

### SEDIMENT BASIN CALCULATION

SOIL TYPE: TYPE D OR F (ASSUMED)

RAINFALL DEPTH = 69.9 mm (2-YR ARI, 6 HR EVENT)  
 CV = 0.79 (TABLE F2)

$A = 0.475 \text{ Ha}$   
 $R_{75\%,5DAY} = 23.4 \text{ mm [TABLE 6.3A]}$

SETTLING ZONE =  $10 \times CV \times A \times R = 87.81 \text{ m}^3$

SEDIMENT STORAGE ZONE =  $43.90 \text{ m}^3$  (50 PERCENT OF SETTLING ZONE CAPACITY)

TOTAL SEDIMENT BASIN VOLUME =  $131.71 \text{ m}^3$

### RUSLE CALCULATION NOTE:

REVISED UNIVERSAL SOIL LOSS EQUATION:  
 $A = R * K * LS * P * C$  (t/ha/yr)  
 $R = 164.74 (1.1177)^S * S^{0.6444}$   
 WHERE  $S = 11.65 \text{ mm/h}$   
 $R = 2930.41$   
 $K = 0.08$  (ASSUMED)  
 $LS = 1.15$  (BASED ON 5% SLOPE FOR 75m)  
 $P = 1.3$   
 $C = 1.0$

$A = 350.48 \text{ t/ha/yr}$   
 SITE AREA =  $0.475 \text{ Ha}$

SOIL LOSS =  $350.48 \text{ t/ha/yr} > 350 \text{ t/ha/yr}$

HENCE, PER TABLE 4.2 OF LANDCOM BLUE BOOK, EROSION HAZARD = LOW HAZARD



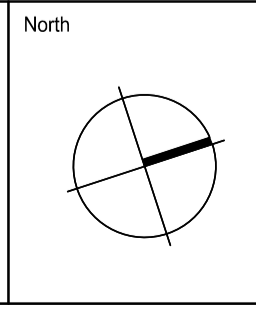
**PRINTING NOTE:**  
 THIS DRAWING TO BE PRINTED IN COLOUR.

SOIL AND WATER MANAGEMENT PLAN  
 SCALE 1:200

Architect	Client																
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Rev	Description	Eng	Draft	Date													
A	ISSUE FOR APPROVAL	MH	MH	15.12.2023													
Job No	Drawing No	Revision															
230812	C300	A															



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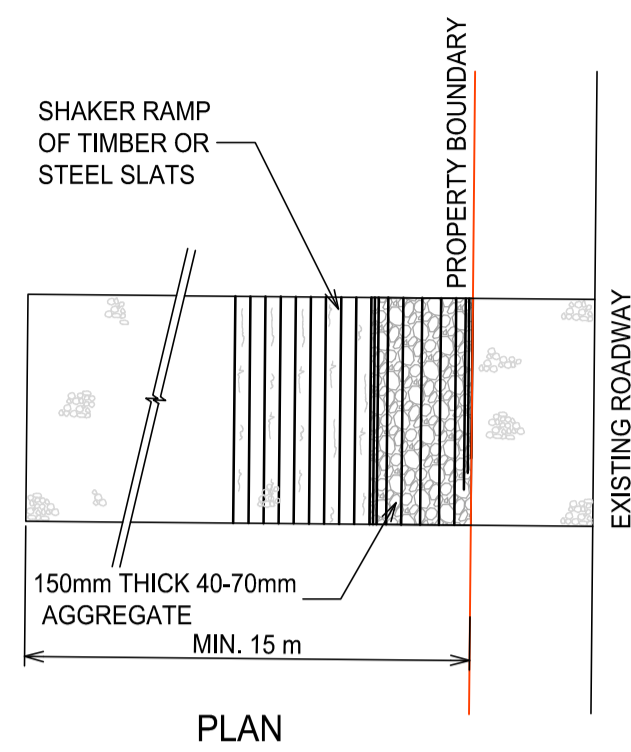


Project  
**PROPOSED MIXED USE DEVELOPMENT**  
 2-8 WILSON STREET & 849-859 PACIFIC HIGHWAY, CHATSWOOD NSW

Sheet Subject  
 SOIL AND WATER MANAGEMENT PLAN

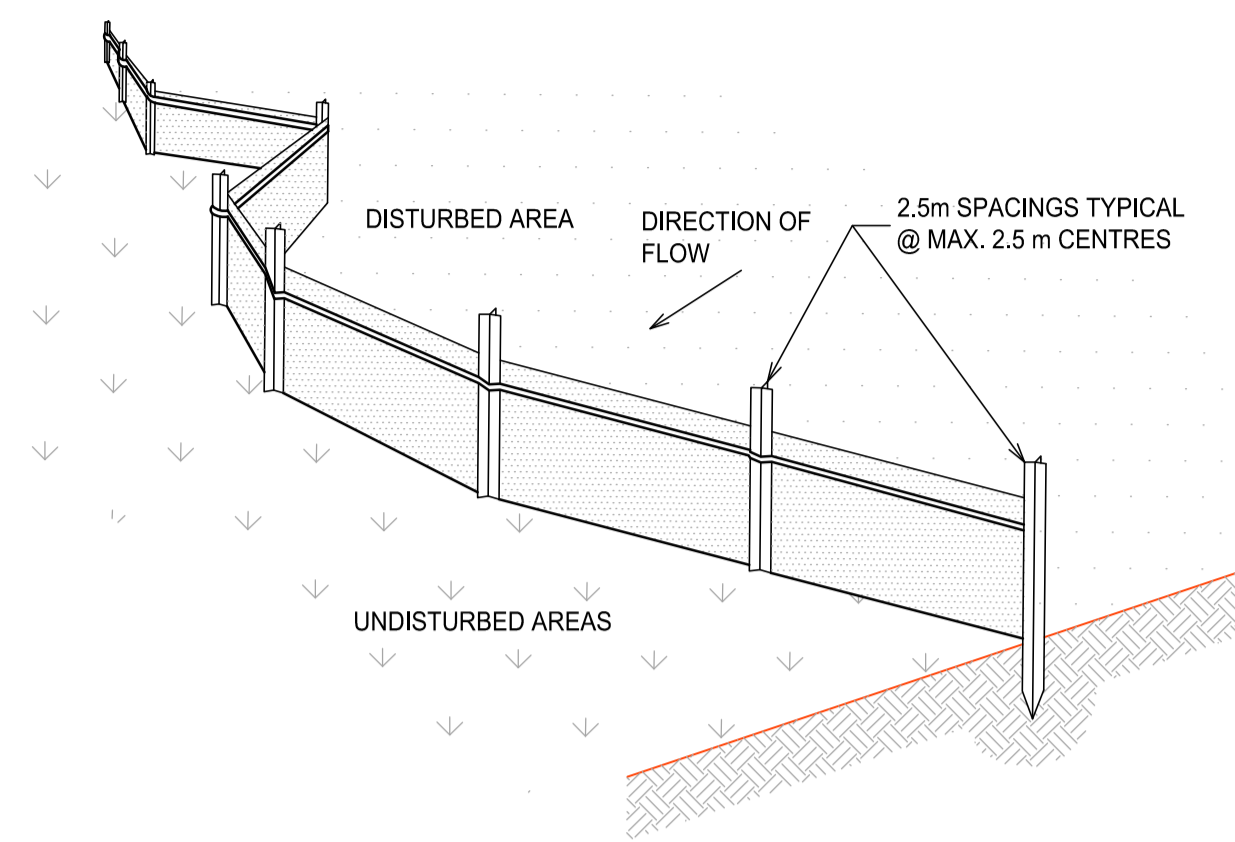
**FOR APPROVAL**

Scale at A1	Drawn	Approved
1:200	MH	SS
Job No	Drawing No	Revision
230812	C300	A



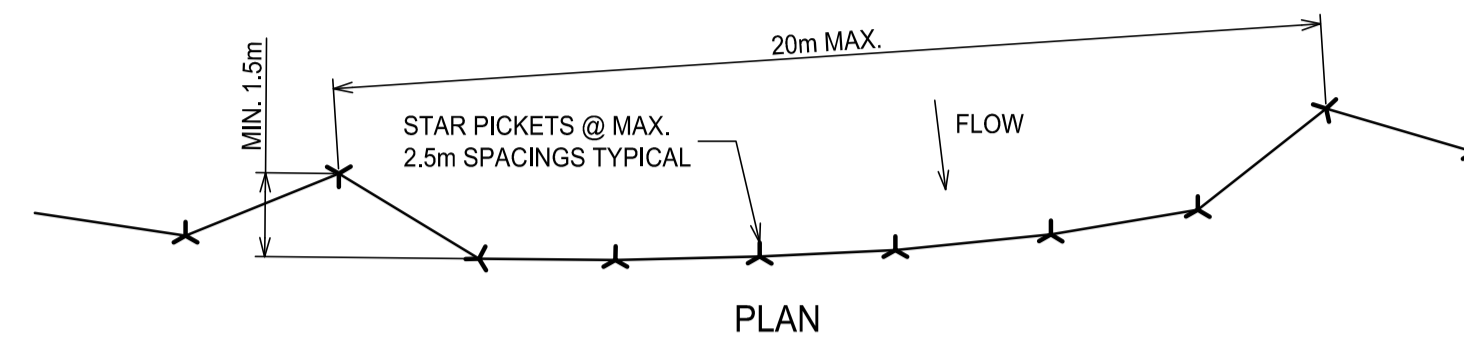
**STABILISED SITE ACCESS WITH SHAKER RAMP**

SCALE N.T.S.



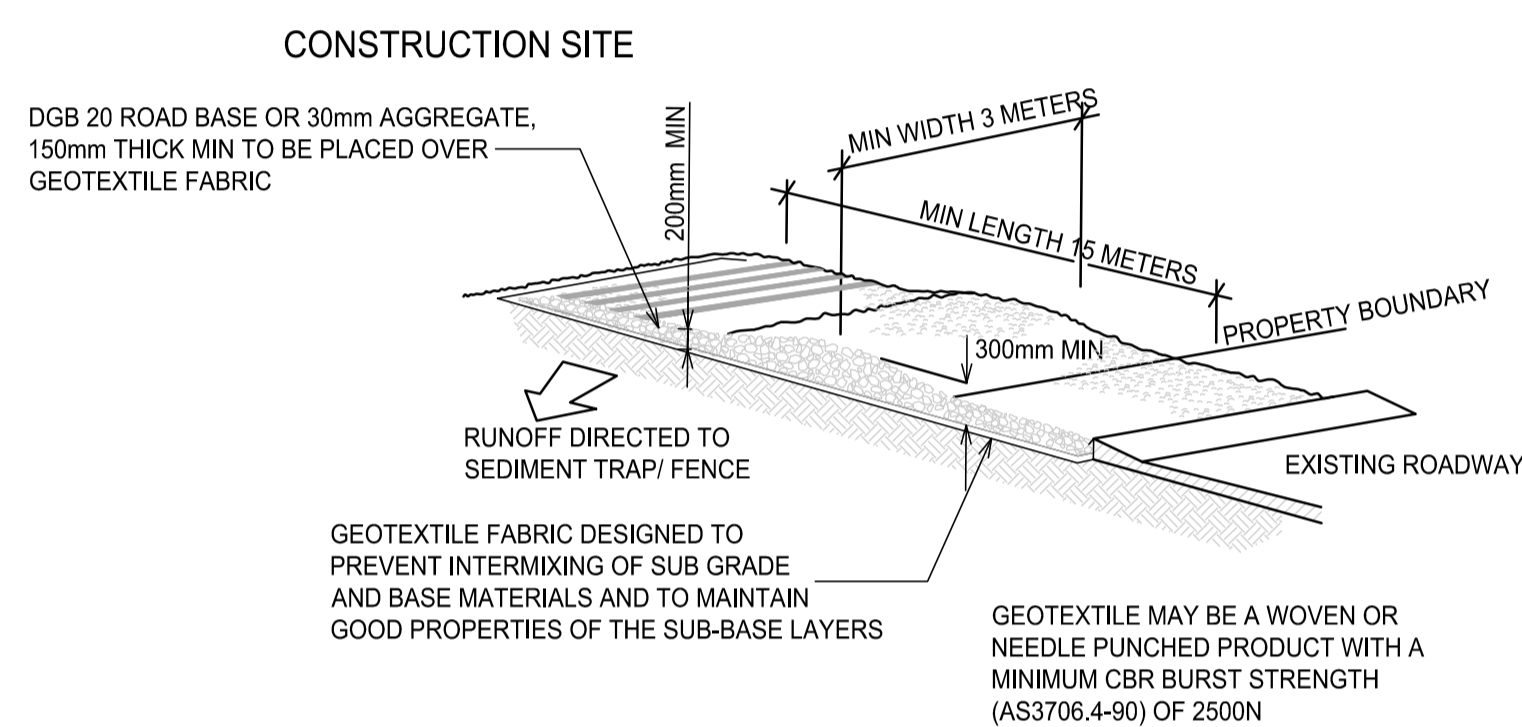
**SEDIMENT FENCE**

SCALE N.T.S.



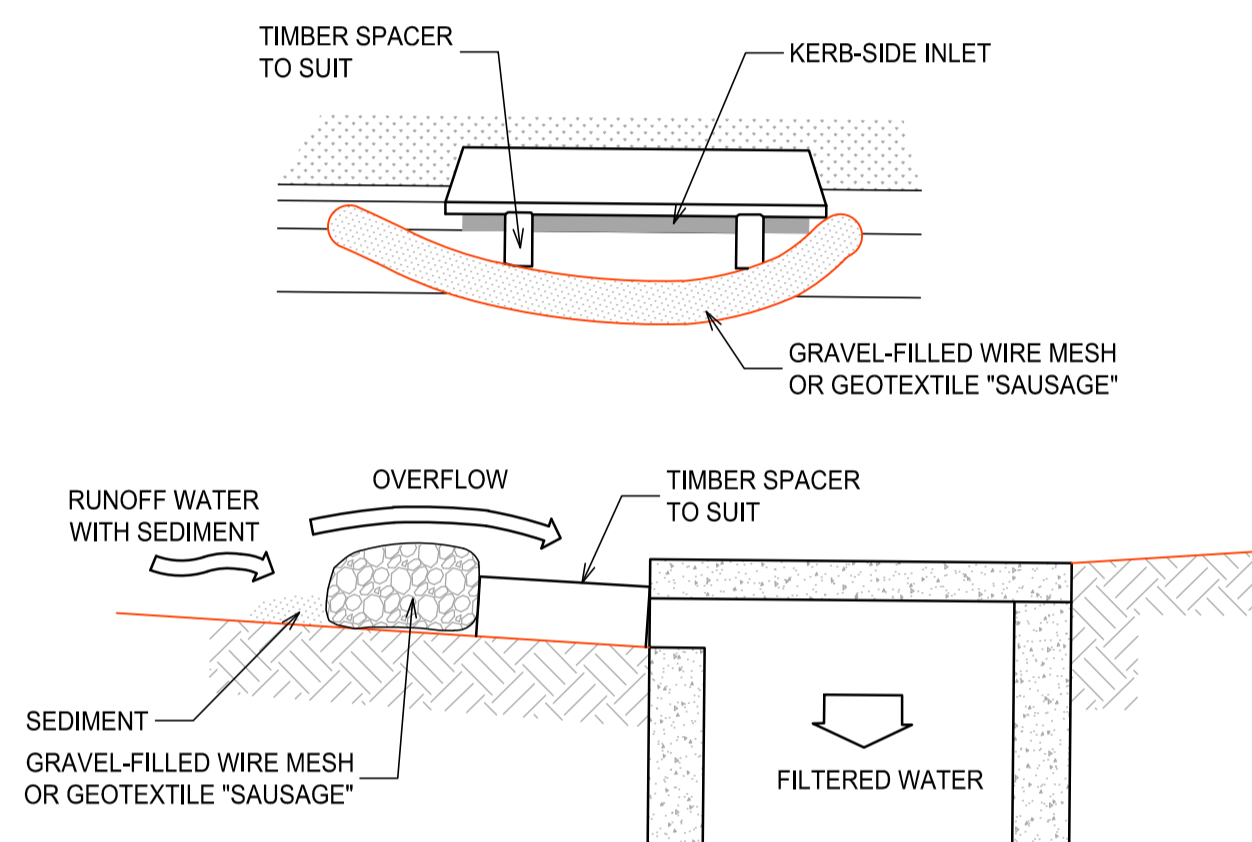
**SEDIMENT FENCE CONSTRUCTION NOTES:**

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



**STABILISED SITE ACCESS WITH SHAKER RAMP**

SCALE N.T.S.



**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.

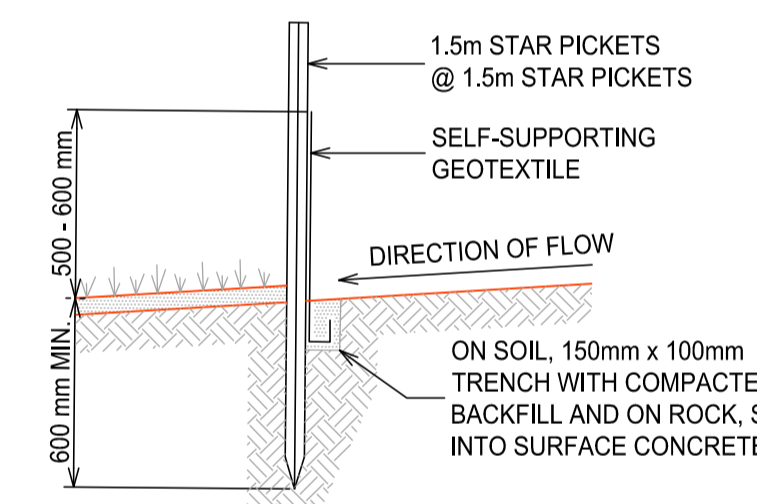
**MESH & GRAVEL INLET FILTER**

SCALE N.T.S.

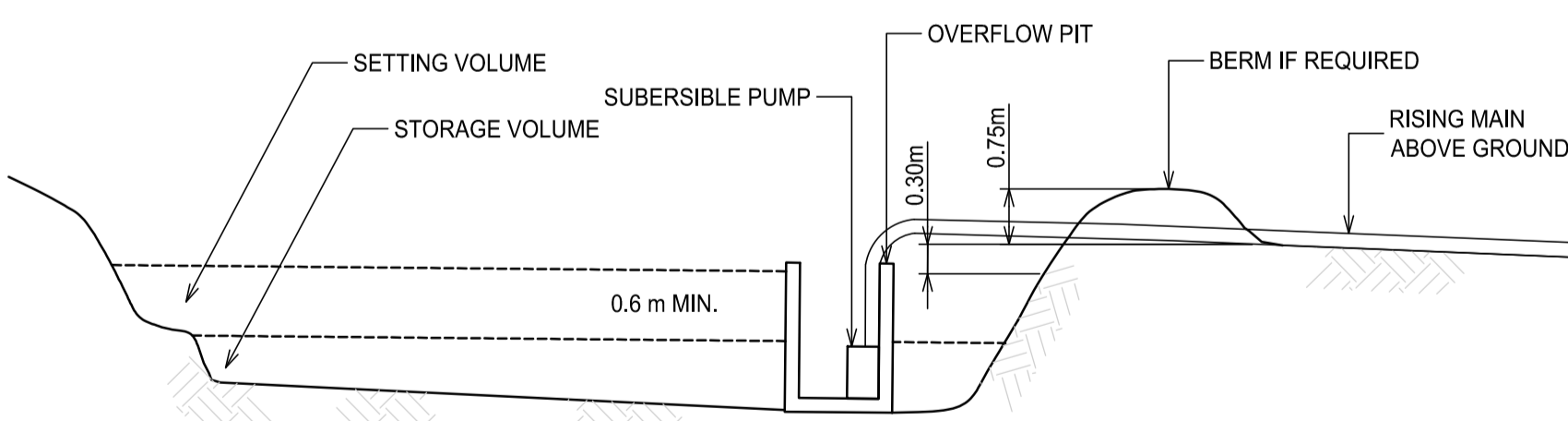
- NOTES:**
1. PROVIDE THREE LAYERS OF SANDBAGS WITH THEIR ENDS OVERLAPPED AND ALSO OVERLAPPING ONTO THE KERB.
  2. CREATE A GAP IN THE SANDBAGS TO ACT AS A SPILLWAY.
  3. SANDBAG BARRIER TO BE MIN. 2m FROM THE INLET AND EXTEND MIN. 0.9m OUT FROM THE KERB.

**GULLY INLET SANDBAG PROTECTION DETAIL**

SCALE N.T.S.

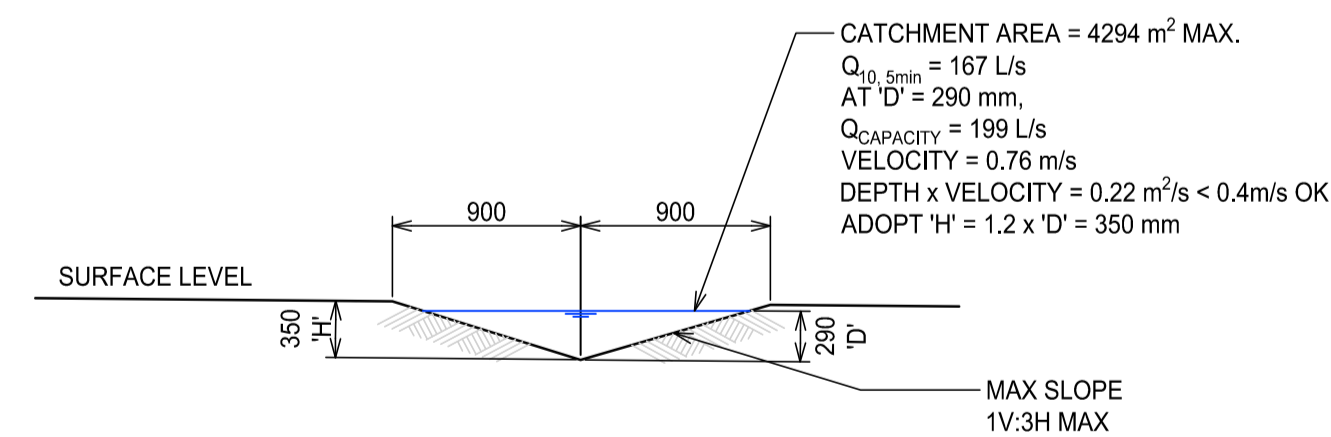


**SECTION DETAIL**

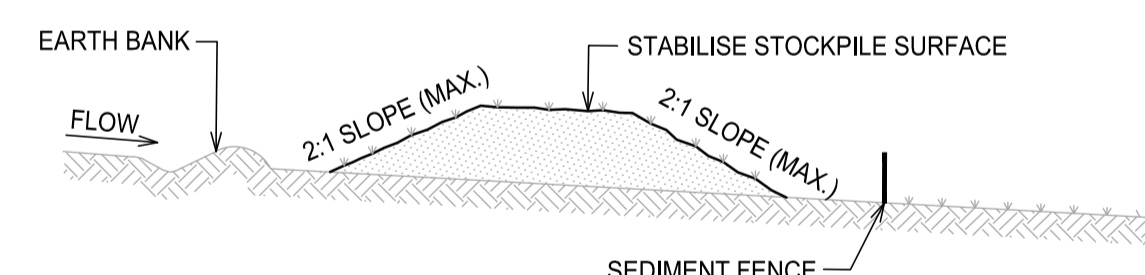


**TYPICAL SEDIMENT BASIN**

SCALE N.T.S.



**TYPICAL SECTION THROUGH CATCH DRAIN**



**STOCKPILE CONSTRUCTION NOTES:**

1. PLACE STOCKPILES MORE THAN 2 (PREFERABLY 5) METRES FROM EXISTING VEGETATION, CONCENTRATED WATER FLOW, ROADS AND HAZARD AREAS.
2. CONSTRUCT ON THE CONTOUR AS LOW, FLAT, ELONGATED MOUNDS.
3. WHERE THERE IS SUFFICIENT AREA, TOPSOIL STOCKPILES SHALL BE LESS THAN 2 METRES IN HEIGHT.
4. WHERE THEY ARE TO BE PLACED FOR MORE THAN 10 DAYS, STABILISE FOLLOWING THE APPROVED E.S.C.P. OR S.W.M.P. TO REDUCE THE C-FACTOR TO LESS THAN 0.10.
5. CONSTRUCT EARTH BANKS ON THE UPSLOPE SIDE TO DIVERT WATER AROUND STOCKPILES AND SEDIMENT FENCES 1 TO 2 METRES DOWNSLOPE.

**STOCKPILES**

SCALE N.T.S.

**GENERAL INSTRUCTIONS:**

1. THIS SOIL AND WATER MANAGEMENT WORKS FOR THE SITE SHALL BE CARRIED OUT IN ACCORDANCE WITH THE REQUIREMENTS OF "MANAGING URBAN STORMWATER - SOILS AND CONSTRUCTION, 4TH EDITION (2004)" BY LANDCOM.
2. AS REQUIRED BY COUNCIL, SEDIMENT CONTROL MEASURES WILL BE REQUIRED DURING THE CONSTRUCTION OF ALL DEVELOPMENTS/BUILDING WORKS. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY THAT THE WORKS ARE CARRIED OUT IN ACCORDANCE WITH THE SOIL AND WATER MANAGEMENT PLAN AND COUNCIL'S REQUIREMENTS.
3. THE CONTRACTOR SHALL ENSURE THAT ALL SUBCONTRACTORS ARE INFORMED OF THEIR RESPONSIBILITIES IN MINIMISING THE POTENTIAL FOR SOIL EROSION AND POLLUTION TO DOWNSLOPE AREAS.
4. THE NON-DISTURBED PORTION OF THE CATCHMENT OUTSIDE OF OPERATING AREA IS TO BYPASS THE BASINS BY MEANS OF LINED CATCH DRAINS.
5. WHERE PRACTICABLE, THE SOIL EROSION HAZARD SHALL BE KEPT AS LOW AS POSSIBLE. LIMITATIONS TO ACCESS ARE TO BE VIA STANLEY LANE UNLESS OTHERWISE APPROVED BY COUNCIL.
6. ENSURE THAT ALL DRAINS ARE OPERATING EFFECTIVELY AND SHALL MAKE ANY NECESSARY REPAIRS. REMOVE TRAPPED SEDIMENT WHERE THE CAPACITY OF THE TRAPPING DEVICE FALLS BELOW 60%.
7. CONSTRUCT ADDITIONAL EROSION OR SEDIMENT CONTROL WORKS AS MAY BE APPROPRIATE TO ENSURE THE PROTECTION OF DOWNSLOPE LANDS AND WATERWAYS.
8. MAINTAIN EROSION AND SEDIMENT CONTROL MEASURES IN A FULLY FUNCTIONING CONDITION AT ALL TIMES UNTIL THE SITE IS REHABILITATED.
9. REMOVE TEMPORARY SOIL CONSERVATION STRUCTURES AS THE LAST ACTIVITY IN THE REHABILITATION PROGRAM.

**CONSTRUCTION SEQUENCE:**

WORKS SHALL BE UNDERTAKEN IN THE FOLLOWING SEQUENCE:

1. INSTALL SEDIMENT FENCING AND CUT DRAINS TO MEET THE REQUIREMENTS OF THE SOIL AND WATER MANAGEMENT PLAN. WASTE COLLECTION BINS SHALL BE INSTALLED ADJACENT TO SITE OFFICE.
2. CONSTRUCT STABILISED SITE ACCESS IN ACCORDANCE WITH COUNCIL'S REQUIREMENTS.
3. REDIRECT CLEAN WATER AROUND THE CONSTRUCTION SITE.
4. INSTALL SEDIMENT CONTROL PROTECTION MEASURES AT ALL NATURAL AND MAN-MADE DRAINAGE STRUCTURES. MAINTAIN UNTIL ALL THE DISTURBED AREAS ARE STABILISED.
5. CLEAR AND STRIP THE WORK AREAS. MINIMISE THE DAMAGE TO THE GRASS AND LOW GROUND COVER OF NON-DISTURBED AREAS.
6. ANY DISTURBED AREAS, OTHER THAN BUILDING PAD AREAS, SHALL IMMEDIATELY BE COVERED WITH SITE TOPSOIL WITHIN 7 DAYS OF CLEARING. BUILDING PAD AREAS SHALL BE COVERED WITH BITUMEN EMULSION AS SPECIFIED.
7. APPLY PERMANENT STABILISATION TO SITE (LANDSCAPING).

**FOR APPROVAL**

Architect	Client
<p>A ISSUE FOR APPROVAL</p>	<p>15.12.2023</p>
<p>Rev Description</p>	<p>Eng Draft Date</p>

Architect	Client
<p>A ISSUE FOR APPROVAL</p>	<p>15.12.2023</p>
<p>Rev Description</p>	<p>Eng Draft Date</p>

Architect	Client
<p>A ISSUE FOR APPROVAL</p>	<p>15.12.2023</p>
<p>Rev Description</p>	<p>Eng Draft Date</p>

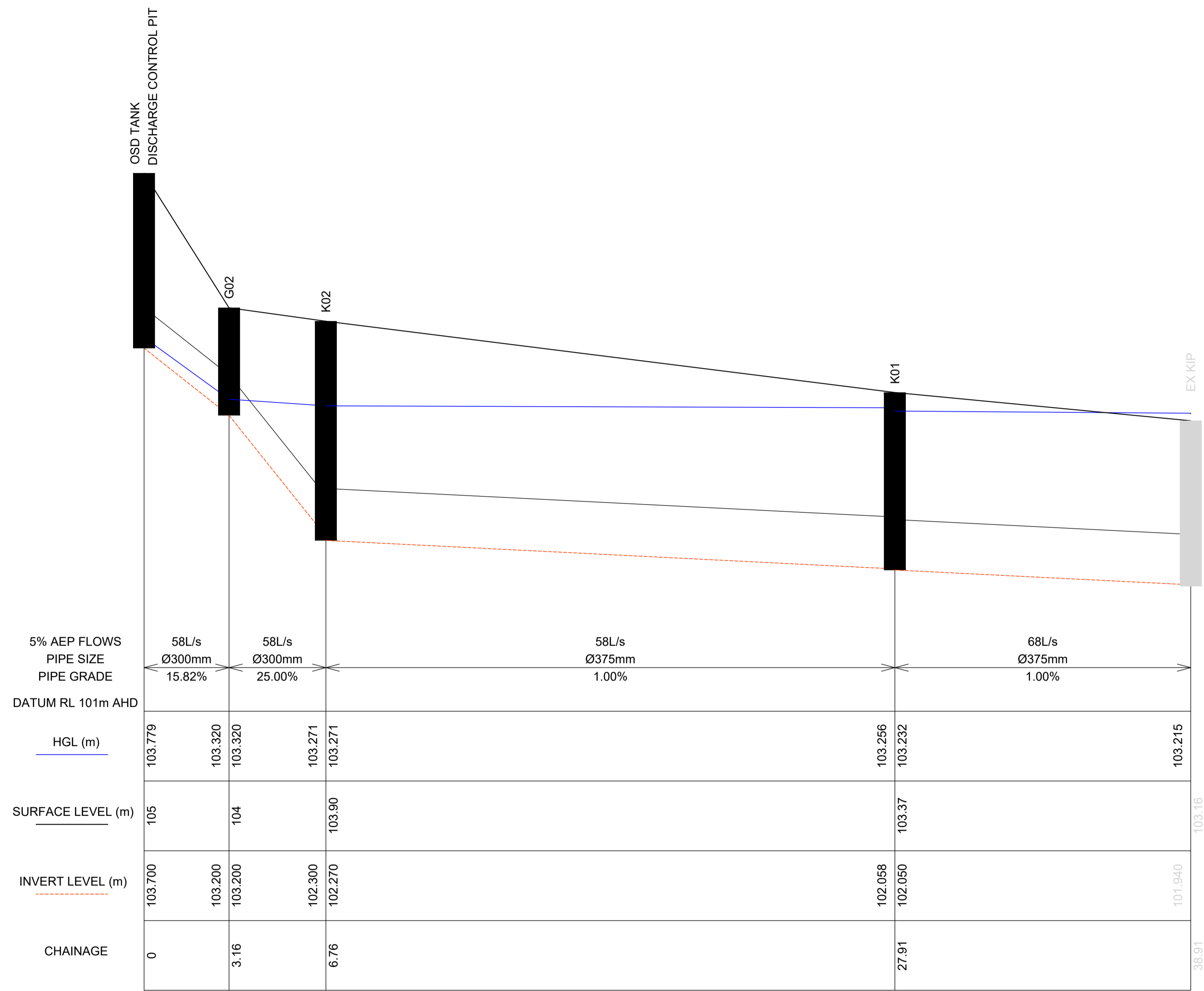
Architect	Client
<p>A ISSUE FOR APPROVAL</p>	<p>15.12.2023</p>
<p>Rev Description</p>	<p>Eng Draft Date</p>

Architect	Client
<p>A ISSUE FOR APPROVAL</p>	<p>15.12.2023</p>
<p>Rev Description</p>	<p>Eng Draft Date</p>

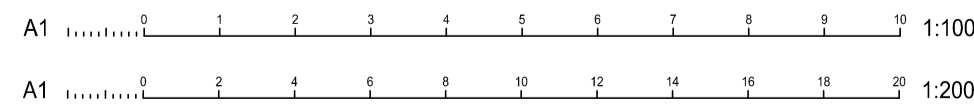
Architect	Client
<p>A ISSUE FOR APPROVAL</p>	<p>15.12.2023</p>
<p>Rev Description</p>	<p>Eng Draft Date</p>

Architect	Client
<p>A ISSUE FOR APPROVAL</p>	<p>15.12.2023</p>
<p>Rev Description</p>	<p>Eng Draft Date</p>

Architect	Client
<p>A ISSUE FOR APPROVAL</p>	<p>15.12.2023</p>
<p>Rev Description</p>	<p>Eng Draft Date</p>



OSD TANK OUTLET  
SCALE 100V:200H



**FOR APPROVAL**

Rev	Description	Eng	Draft	Date
A	ISSUE FOR APPROVAL	AH	AH	30.08.2024



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 xavierknight.com.au  
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North

Project  
**PROPOSED MIXED USE DEVELOPMENT**  
 2-8 WILSON STREET & 849-859 PACIFIC HIGHWAY, CHATSWOOD NSW

Sheet Subject  
**STORMWATER LONGITUDINAL SECTION - SHEET 1**

Scale at A1	Drawn	Approved
AS SHOWN	AH	FC
Job No	Drawing No	Revision
230812	C307	A

## Appendix 5 – Onsite stormwater detention system design checklist

Table 17 Onsite stormwater detention system design checklist

Item	Description	Response
1	Has a spillway with an overland flow route been provided?	<input checked="" type="radio"/> yes / no
2	Has the minimum freeboard been provided between habitable floor levels and the 1:100yr flood level? See Section 10 of Willoughby City Council's Floodplain Management – technical standard 3 for freeboard requirements.	<input checked="" type="radio"/> yes / no
3	Has a minimum of 300mm freeboard been provided between the habitable floor levels and the OSD design storage topwater level?	<input checked="" type="radio"/> yes / no
4	Above ground storage maximum depth <ul style="list-style-type: none"> <li>• over driveways and carparking (mm)</li> <li>• maximum depth over landscaping or garden areas (mm)</li> <li>• minimum below ground storage (m<sup>3</sup>)</li> </ul>	- mm <u>300</u> mm <u>0.36</u> m <sup>3</sup>
5	Below ground OSD tanks must be accessible for maintenance in line with AS 286,5 – Safe Working in Confined Spaces. Have step irons been provided for tanks deeper than 900mm?	<input checked="" type="radio"/> yes / no
6	Total impervious area including driveways, carports, pathways and swimming pools not incorporating high-level overflow system (m <sup>2</sup> )	<u>0</u> m <sup>2</sup>
7	Existing, and proposed surface levels and contours have been provided (contours extend 5m beyond property boundary)	<input checked="" type="radio"/> yes / no
8	Location of all trees has been provided	<input checked="" type="radio"/> yes / no
9	Calculated volume of storage according to Part I Section 2.2 (m <sup>3</sup> )	<u>3.1</u> m <sup>3</sup>
10	Calculated permissible site discharge according to Table 8 (l/s)	<u>3</u> l/s
11	Calculated orifice diameter (65mm minimum) (mm)	<u>65</u> mm
12	Type of mesh screen provided	<u>RH 3030</u>
13	Does the major overland flow path within the site for runoff from all impervious areas drain to the OSD system or has the pipe network been designed for the 1% AEP storm event?	<input checked="" type="radio"/> yes / no
14	Direct connections to the council drainage system have been checked against backwater effect and drowned orifice?	<input checked="" type="radio"/> yes / no
15	Is the base of the OSD tank graded flush with the orifice invert level?	yes / <input checked="" type="radio"/> no
16	Has a minimum 1125mm × 75mm × 4 RHS been provide for a discharge through the street kerb?	<input checked="" type="radio"/> yes / no
17	All levels have been given to Australian Height Datum (AHD)	<input checked="" type="radio"/> yes / no

**Name of design engineer:** Michael Januar Haditio

**Qualifications of the design engineer:** Bachelor of Civil Engineering (Honours)

## Appendix 5 – Onsite stormwater detention system design checklist

**Table 17 Onsite stormwater detention system design checklist**

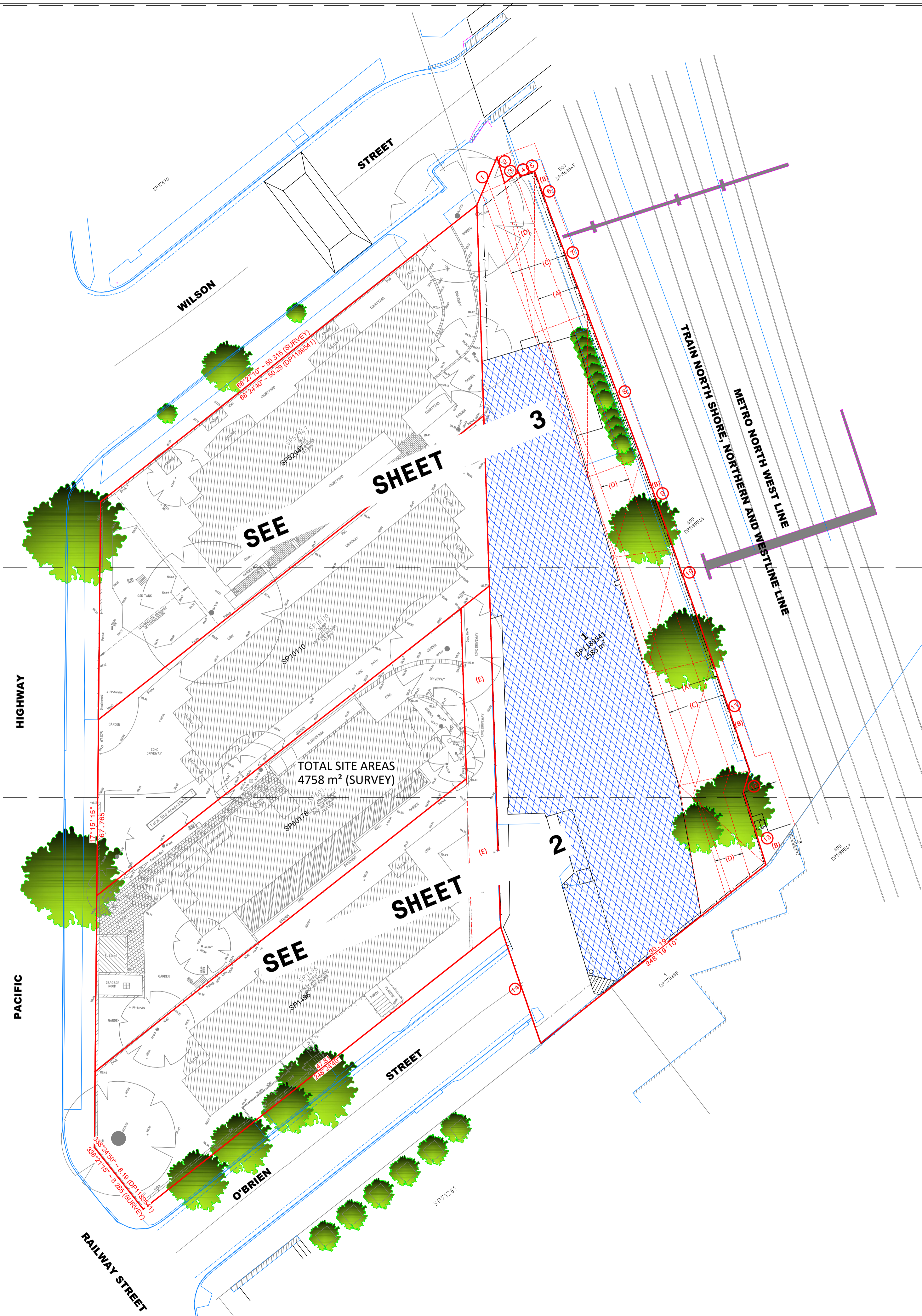
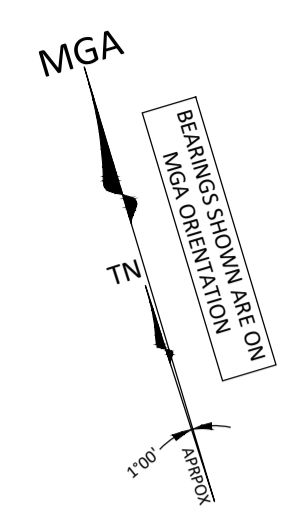
Item	Description	Response
1	Has a spillway with an overland flow route been provided?	<input checked="" type="radio"/> yes / no
2	Has the minimum freeboard been provided between habitable floor levels and the 1:100yr flood level? See Section 10 of Willoughby City Council's Floodplain Management – technical standard 3 for freeboard requirements.	<input checked="" type="radio"/> yes / no
3	Has a minimum of 300mm freeboard been provided between the habitable floor levels and the OSD design storage topwater level?	<input checked="" type="radio"/> yes / no
4	Above ground storage maximum depth <ul style="list-style-type: none"> <li>• over driveways and carparking (mm)</li> <li>• maximum depth over landscaping or garden areas (mm)</li> <li>• minimum below ground storage (m<sup>3</sup>)</li> </ul>	- mm - mm - m <sup>3</sup>
5	Below ground OSD tanks must be accessible for maintenance in line with AS 286,5 – Safe Working in Confined Spaces. Have step irons been provided for tanks deeper than 900mm?	<input checked="" type="radio"/> yes / no
6	Total impervious area including driveways, carports, pathways and swimming pools not incorporating high-level overflow system (m <sup>2</sup> )	<u>0</u> m <sup>2</sup>
7	Existing, and proposed surface levels and contours have been provided (contours extend 5m beyond property boundary)	<input checked="" type="radio"/> yes / no
8	Location of all trees has been provided	<input checked="" type="radio"/> yes / no
9	Calculated volume of storage according to Part I Section 2.2 (m <sup>3</sup> )	<u>148</u> m <sup>3</sup>
10	Calculated permissible site discharge according to Table 8 (l/s)	<u>70</u> l/s
11	Calculated orifice diameter (65mm minimum) (mm)	<u>66</u> mm
12	Type of mesh screen provided	<u>RH3030</u>
13	Does the major overland flow path within the site for runoff from all impervious areas drain to the OSD system or has the pipe network been designed for the 1% AEP storm event?	<input checked="" type="radio"/> yes / no
14	Direct connections to the council drainage system have been checked against backwater effect and drowned orifice?	<input checked="" type="radio"/> yes / no
15	Is the base of the OSD tank graded flush with the orifice invert level?	<input checked="" type="radio"/> yes / no
16	Has a minimum 1125mm × 75mm × 4 RHS been provide for a discharge through the street kerb?	yes / no
17	All levels have been given to Australian Height Datum (AHD)	<input checked="" type="radio"/> yes / no

**Name of design engineer:** Michael Januar Haditio

**Qualifications of the design engineer:** Bachelor of Civil Engineering (Honours)

## 9.2 APPENDIX B – EXISTING SITE SURVEY

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TOTAL SITE AREAS  
4758 m<sup>2</sup> (SURVEY)

SEE SHEETS 2 & 3 FOR UNDERGROUND SERVICE LINES, TREE INFORMATION & EASEMENT DETAILS

SEE SHEET 4 FOR UNDERGROUND SERVICE TABLES

No.	BEARING	DISTANCE
1	39°37'10"	5.455
2	180°30'50"	2.835
3	68°25'10"	1.88
4	178°31'50"	0.485
5	87°13'30"	1.62
6	176°43'10"	4.93
7	176°06'	11
8	176°15'10"	16.155
9	177°13'40"	10.205
10	177°31'40"	12.19
11	177°55'	12.365
12	212°50'20"	2.39
13	179°18'50"	7.955
14	357°41'50"	12.91

Schedule of Easements & Restrictions	
No	Description
(A)	EASEMENT FOR GROUND SUPPORT (SOIL) VARIABLE WIDTH (LIMITED IN STRATUM) (DP1189541)
(B)	EASEMENT FOR SUPPORT 1 WIDE & VARIABLE WIDTH (DP1189541)
(C)	EASEMENT FOR GROUND SUPPORT (REINFORCING SYSTEMS IN SOIL) 6 WIDE & VARIABLE WIDTH (LIMITED IN STRATUM) (DP1189541)
(D)	EASEMENT FOR ACCESS 3 WIDE (AR288094)
(E)	RIGHT OF WAY 3.05 WIDE (550481)
NOTE:	
UL107.3	DENOTES UPPER LIMIT RL FOR STRATUM OF EASEMENTS SHOWN (4) AND (C)

**WARNING**  
THE SURVEY INFORMATION RELATING TO SP52947, SP10110, SP60178 & SP1496 (SHOWN GREY) WAS TAKEN FROM THE DETAIL AND LEVEL PLAN PREPARED BY BURTON & FIELD DRAWING REF. E5380-78240 DATED 08/10/2020. THIS SURVEY HAS NOT BEEN VERIFIED SDG TAKES NO RESPONSIBILITY FOR THE ACCURACY OF THE INFORMATION TAKEN FROM THIS PLAN.

**GENERAL NOTES**  
ONLY TREES GREATER THAN 2 METRES IN HEIGHT ARE SHOWN ON THIS PLAN AND THEIR POSITIONS ARE DIAGRAMMATIC ONLY AND MAY REQUIRE ADDITIONAL SURVEY WHERE CRITICAL TO DESIGN.  
CONTOURS ARE INDICATIVE AT GROUND FORM ONLY. SPOT LEVELS ONLY SHOULD BE USED FOR CALCULATIONS OF QUANTITIES WITH CAUTION.  
LEVELS ARE ON AUSTRALIAN HEIGHT DATUM (AHD).  
ALL SETOUT LEVELS MUST BE REFERRED TO THE BENCH MARK SHOWN ON THIS PLAN.

**BOUNDARY NOTES**  
A BASIC BOUNDARY SURVEY HAS BEEN DONE SUITABLE FOR DA LODGEMENT PURPOSES.  
BOUNDARIES HAVE NOT BEEN MARKED.  
SURVEY INFORMATION NOTES  
THE ORIGIN OF COORDINATES COMES FROM PM290 RL03.323 CLASS LA POSITIONAL UNCERTAINTY (PU) 0.02 (MGA2020) ADOPTED FROM SCIMS DATED 02/11/2023.  
THE ORIGIN OF LEVELS COMES FROM PM290 RL107.323 CLASS LA POSITIONAL UNCERTAINTY (PU) 0.02 ADOPTED FROM SCIMS DATED 02/11/2023.  
THE ORIENTATION OF THIS PLAN IS MGA NORTH WHICH HAS BEEN DETERMINED BY DP1189451.

**CERTIFICATE OF TITLE NOTES**  
THE FOLLOWING INFORMATION RELATES TO THE RESPECTIVE CERTIFICATE OF TITLE OF EACH LOT:  
- LOT 1 IN DP1189541  
(CT EDITION 7 DATED 16/10/2023 SEARCH DATE 07/11/2023)  
- AFFECTED BY:  
- EASEMENT FOR GROUND SUPPORT (SOIL) VARIABLE WIDTH (LIMITED IN STRATUM) SHOWN AS (A) (DP1189541)  
- EASEMENT FOR GROUND SUPPORT (REINFORCING SYSTEMS IN SOIL) 6 METRES WIDE AND VARIABLE WIDTH (LIMITED IN STRATUM) SHOWN AS (C) (DP1189541)  
- EASEMENT FOR ACCESS 3 WIDE SHOWN AS (D) (AR288094)  
- BENEFITED BY:  
- EASEMENT FOR SUPPORT 1 METRE WIDE AND VARIABLE WIDTH SHOWN AS (B) (DP1189541)  
- CP/SP1496  
(CT EDITION 4 DATED 17/10/2023 SEARCH DATE 07/11/2023)  
- AFFECTED BY:  
- RIGHT OF WAY 3.05 WIDE SHOWN AS (E) (550481)  
- CP/SP60178  
(CT EDITION 6 DATED 17/10/2023 SEARCH DATE 07/11/2023)  
- AFFECTED BY:  
- RESTRICTION(S) ON THE USE OF LAND (SP60178)  
- POSITIVE COVENANT (SP60178)  
- BENEFITED BY:  
- RIGHT OF WAY 3.05 WIDE SHOWN AS (E) (550481)  
- CP/SP10110  
(CT EDITION 6 DATED 17/10/2023 SEARCH DATE 07/11/2023)  
- BENEFITED BY:  
- RIGHT OF WAY 3.05 WIDE SHOWN AS (E) (550481)  
- CP/SP52947  
(CT EDITION 10 DATED 17/10/2023 SEARCH DATE 07/11/2023)  
- AFFECTED BY:  
- POSITIVE COVENANT (SP52947)  
- RESTRICTION(S) ON THE USE OF LAND (SP52947)

COVENANTS AND RESTRICTIONS NOTED ON THE TITLE HAVE NOT BEEN INVESTIGATED. THESE SHOULD BE INVESTIGATED PRIOR TO DESIGN TO ENSURE ANY FUTURE DEVELOPMENT COMPLIES.  
BY LAWS RELATING TO EACH OF THE SCHEMES HAVE NOT BEEN INVESTIGATED.

**SERVICES NOTES**  
ONLY THOSE SERVICES VISIBLE AT THE TIME OF SURVEY HAVE BEEN LOCATED AND ARE QUALITY LEVEL A AS DEFINED BY AS 5488.1:2019.  
UNDERGROUND SERVICES HAVE BEEN LOCATED FOR BY 'ON POINT LOCATING' ON 31/10/2023 AND 01/11/2023 USING EQUIPMENT AS NOTED ON REPORT PROVIDED DATED 31/10/2023 AND 01/11/2023. THE SERVICE POSITION IS SHOWN ON THE PLAN AND THEIR RESPECTIVE DEPTH AND QUALITY ARE AS STATED IN THE TABLE.  
UNDERGROUND SERVICES HAVE BEEN PLOTTED FROM 'DIAL-BEFORE-YOU-DIG' PLANS, ARE QUALITY LEVEL D AS DEFINED BY AS 5488.1:2019 AND ARE ONLY CURRENT AT THE DATE OF SEARCH.  
ALL RELEVANT AUTHORITIES MUST BE CONTACTED TO DETERMINE THE FULL EXTENT OF SERVICES PRIOR TO ANY PLANNING OR WORKS NEAR THE SITE.

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**PROJECT:**  
DETAIL AND LEVEL SURVEY OF  
LOT 1 IN DP1189541, SP1496,  
SP60178, SP10110 AND PART OF SP52947  
  
849-859 PACIFIC HIGHWAY, 2 WILSON STREET  
& LOT 1 O'BRIEN STREET  
CHATSWOOD

**CLIENT:** BB WILSON PROPERTY PTY LTD  
**FILE:** 9062 - Detail & Level - Rev A - 849-859 Pacific Highway, 2 Wilson Street & Lot 1 O'Brien Street Chatswood  
**LGA:** WILLOUGHBY  
**REF:** 9062      **CONTOURS:** 0.5m  
**ISSUE:** A      **DATUM:** AHD  
**SURVEY DATE:** 01/11/2023      **AZIMUTH:** MGA2020  
**SCALE:** 1:250      **SHEET** 1 OF 4 SHEETS



SDG Pty Ltd  
abn 85 213 523 621  
Suite 1, 3 Railway Street, Baulkham Hills NSW 2153  
t: (02) 9630 7955 w: sdg.net.au  
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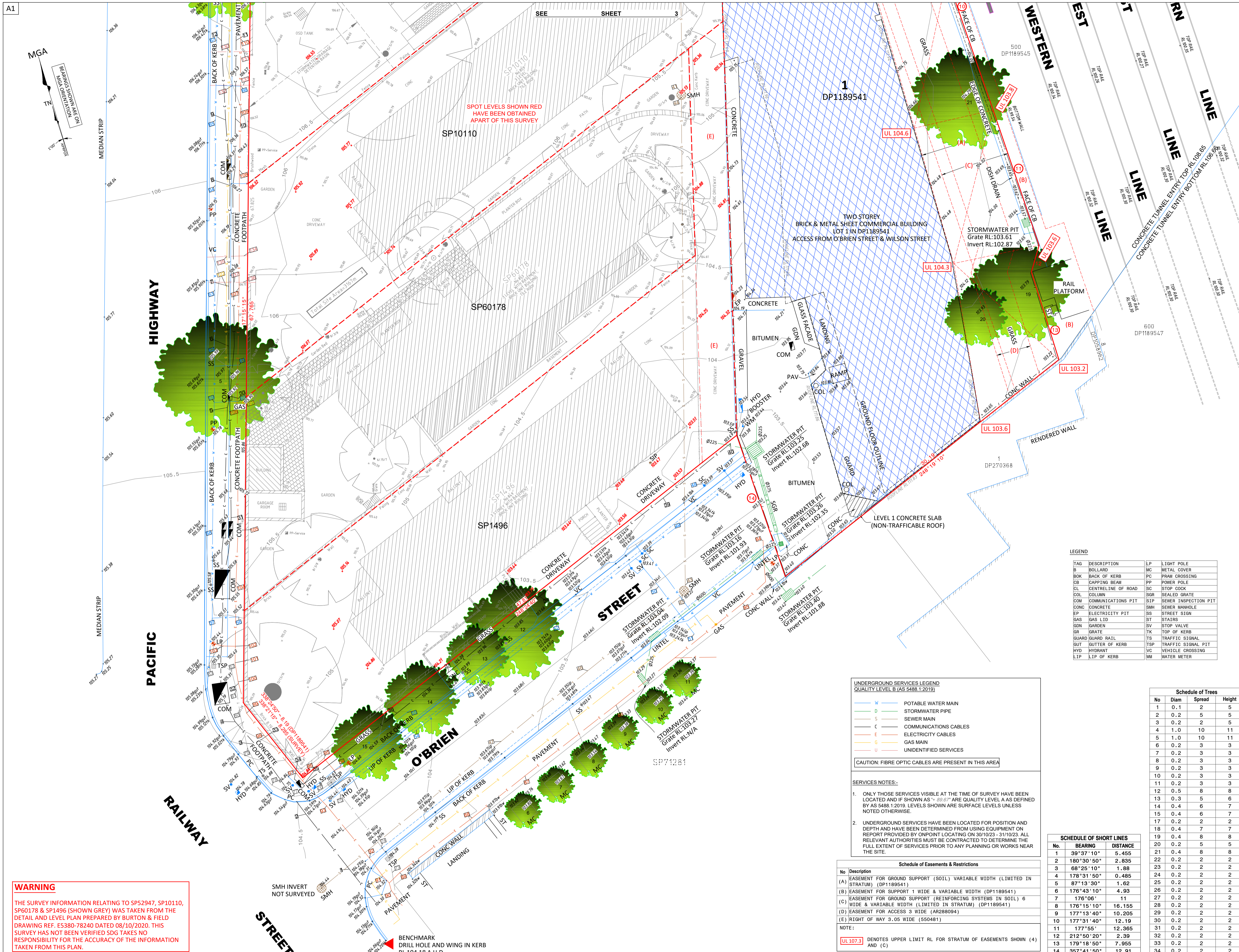
ISSUE	DATE	AMENDMENT	SURV	CHK
A	01/11/23	ORIGINAL ISSUE	PQ	MT



MICHAEL TRIFIRO ID: SU008624  
REGISTERED LAND SURVEYOR



A1



**GENERAL NOTES**

ONLY TREES GREATER THAN 2 METRES IN HEIGHT ARE SHOWN ON THIS PLAN AND THEIR POSITIONS ARE DIAGRAMMATIC ONLY AND MAY REQUIRE ADDITIONAL SURVEY WHERE CRITICAL TO DESIGN.

CONTOURS ARE INDICATIVE AT GROUND FORM ONLY. SPOT LEVELS ONLY SHOULD BE USED FOR CALCULATIONS OF QUANTITIES WITH CAUTION.

LEVELS ARE ON AUSTRALIAN HEIGHT DATUM (AHD).

ALL SETOUT LEVELS MUST BE REFERRED TO THE BENCH MARK SHOWN ON THIS PLAN.

**BOUNDARY NOTES**

A BASIC BOUNDARY SURVEY HAS BEEN DONE SUITABLE FOR DA LODGEMENT PURPOSES.

BOUNDARIES HAVE NOT BEEN MARKED.

**SURVEY INFORMATION NOTES**

THE ORIGIN OF COORDINATES COMES FROM PM290 E331528.198 N6259353.120 CLASS B POSITIONAL UNCERTAINTY (PU) 0.02 (MGA2020) ADOPTED FROM SCIMS DATED 02/11/2023.

THE ORIGIN OF LEVELS COMES FROM PM290 RL107.323 CLASS LA POSITIONAL UNCERTAINTY (PU) 0.02 ADOPTED FROM SCIMS DATED 02/11/2023.

THE ORIENTATION OF THIS PLAN IS MGA NORTH WHICH HAS BEEN DETERMINED BY DP1189541.

**CERTIFICATE OF TITLE NOTES**

THE FOLLOWING INFORMATION RELATES TO THE RESPECTIVE CERTIFICATE OF TITLE OF EACH LOT:

- LOT 1 IN DP1189541 (CT EDITION 7 DATED 16/10/2023 SEARCH DATE 07/11/2023)
  - AFFECTED BY:
    - EASEMENT FOR GROUND SUPPORT (SOIL) VARIABLE WIDTH (LIMITED IN STRATUM) SHOWN AS (A) (DP1189541)
    - EASEMENT FOR GROUND SUPPORT (REINFORCING SYSTEMS IN SOIL) 6 METRES WIDE AND VARIABLE WIDTH (LIMITED IN STRATUM) SHOWN AS (C) (DP1189541)
    - EASEMENT FOR ACCESS 3 WIDE SHOWN AS (D) (AR288094)
  - BENEFITED BY:
    - EASEMENT FOR SUPPORT 1 METRE WIDE AND VARIABLE WIDTH SHOWN AS (B) (DP1189541)
- CP/SP1496 (CT EDITION 4 DATED 17/10/2023 SEARCH DATE 07/11/2023)
  - AFFECTED BY:
    - RIGHT OF WAY 3.05 WIDE SHOWN AS (E) (550481)
- CP/SP6178 (CT EDITION 6 DATED 17/10/2023 SEARCH DATE 07/11/2023)
  - AFFECTED BY:
    - RESTRICTION(S) ON THE USE OF LAND (SP6178)
    - POSITIVE COVENANT (SP6178)
  - BENEFITED BY:
    - RIGHT OF WAY 3.05 WIDE SHOWN AS (E) (550481)
- CP/SP10110 (CT EDITION 6 DATED 17/10/2023 SEARCH DATE 07/11/2023)
  - AFFECTED BY:
    - RIGHT OF WAY 3.05 WIDE SHOWN AS (E) (550481)
- CP/SP52947 (CT EDITION 10 DATED 17/10/2023 SEARCH DATE 07/11/2023)
  - AFFECTED BY:
    - POSITIVE COVENANT (SP52947)
    - RESTRICTION(S) ON THE USE OF LAND (SP52947)

COVENANTS AND RESTRICTIONS NOTED ON THE TITLE HAVE NOT BEEN INVESTIGATED. THESE SHOULD BE INVESTIGATED PRIOR TO DESIGN TO ENSURE ANY FUTURE DEVELOPMENT COMPLIES.

BY LAWS RELATING TO EACH OF THE SCHEMES HAVE NOT BEEN INVESTIGATED.

**SERVICES NOTES**

ONLY THOSE SERVICES VISIBLE AT THE TIME OF SURVEY HAVE BEEN LOCATED AND ARE QUALITY LEVEL A AS DEFINED BY AS 5488.1:2019.

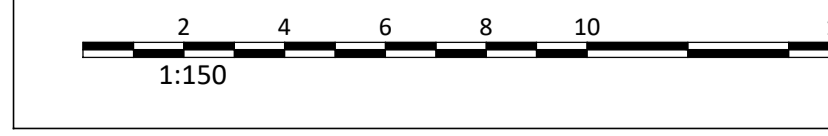
UNDERGROUND SERVICES HAVE BEEN LOCATED FOR BY 'ON POINT LOCATING' ON 31/10/2023 AND 01/11/2023 USING EQUIPMENT AS NOTED ON REPORT PROVIDED DATED 31/10/2023 AND 01/11/2023. THE SERVICE POSITION IS SHOWN ON THE PLAN AND THEIR RESPECTIVE DEPTH AND QUALITY ARE AS STATED IN THE TABLE.

UNDERGROUND SERVICES HAVE BEEN PLOTTED FROM 'DIAL-BEFORE-YOU-DIG' PLANS, ARE QUALITY LEVEL D AS DEFINED BY AS 5488.1:2019 AND ARE ONLY CURRENT AT THE DATE OF SEARCH.

ALL RELEVANT AUTHORITIES MUST BE CONTACTED TO DETERMINE THE FULL EXTENT OF SERVICES PRIOR TO ANY PLANNING OR WORKS NEAR THE SITE.

**WARNING**

THE SURVEY INFORMATION RELATING TO SP52947, SP10110, SP6178 & SP1496 (SHOWN GREY) WAS TAKEN FROM THE DETAIL AND LEVEL PLAN PREPARED BY BURTON & FIELD DRAWING REF. E5380-78240 DATED 08/10/2020. THIS SURVEY HAS NOT BEEN VERIFIED SDG TAKES NO RESPONSIBILITY FOR THE ACCURACY OF THE INFORMATION TAKEN FROM THIS PLAN.



**LEGEND**

TAG	DESCRIPTION	LP	LIGHT POLE
B	BOLLARD	MC	METAL COVER
BOK	BACK OF KERB	PC	PRISM CROSSING
CB	CAPPING BEAM	PP	POWER POLE
CL	CENTRELINE OF ROAD	SC	STOP COCK
COL	COLUMN	SGR	SEALED GRATE
COM	COMMUNICATIONS PIT	SIP	SEWER INSPECTION PIT
CONC	CONCRETE	SMH	SEWER MANHOLE
EP	ELECTRICITY PIT	SS	STREET SIGN
GAS	GAS LID	ST	STAIRS
GDN	GARDEN	SV	STOP VALVE
GR	GRATE	TK	TOP OF KERB
GUARD	GUARD RAIL	TS	TRAFFIC SIGNAL
GUT	GUTTER OF KERB	TSP	TRAFFIC SIGNAL PIT
HYD	HYDRANT	VC	VEHICLE CROSSING
LIP	LIP OF KERB	WM	WATER METER

**UNDERGROUND SERVICES LEGEND**  
QUALITY LEVEL B (AS 5488.1:2019)

W	POTABLE WATER MAIN
D	STORMWATER PIPE
S	SEWER MAIN
C	COMMUNICATIONS CABLES
E	ELECTRICITY CABLES
G	GAS MAIN
U	UNIDENTIFIED SERVICES

CAUTION: FIBRE OPTIC CABLES ARE PRESENT IN THIS AREA

**SERVICES NOTES:**

- ONLY THOSE SERVICES VISIBLE AT THE TIME OF SURVEY HAVE BEEN LOCATED AND IF SHOWN AS 'U' ARE QUALITY LEVEL A AS DEFINED BY AS 5488.1:2019. LEVELS SHOWN ARE SURFACE LEVELS UNLESS NOTED OTHERWISE.
- UNDERGROUND SERVICES HAVE BEEN LOCATED FOR POSITION AND DEPTH AND HAVE BEEN DETERMINED FROM USING EQUIPMENT ON REPORT PROVIDED BY ONPOINT LOCATING ON 30/10/23 - 31/10/23. ALL RELEVANT AUTHORITIES MUST BE CONTACTED TO DETERMINE THE FULL EXTENT OF SERVICES PRIOR TO ANY PLANNING OR WORKS NEAR THE SITE.

**Schedule of Easements & Restrictions**

No	Description
(A)	EASEMENT FOR GROUND SUPPORT (SOIL) VARIABLE WIDTH (LIMITED IN STRATUM) (DP1189541)
(B)	EASEMENT FOR SUPPORT 1 WIDE & VARIABLE WIDTH (DP1189541)
(C)	EASEMENT FOR GROUND SUPPORT (REINFORCING SYSTEMS IN SOIL) 6 METRES WIDE & VARIABLE WIDTH (LIMITED IN STRATUM) (DP1189541)
(D)	EASEMENT FOR ACCESS 3 WIDE (AR288094)
(E)	RIGHT OF WAY 3.05 WIDE (550481)

NOTE:  
UL 107.3 DENOTES UPPER LIMIT RL FOR STRATUM OF EASEMENTS SHOWN (4) AND (C)

**SCHEDULE OF SHORT LINES**

No.	BEARING	DISTANCE
1	39°37'10"	5.455
2	180°30'50"	2.835
3	68°25'10"	1.88
4	178°31'50"	0.485
5	87°13'30"	1.62
6	176°43'10"	4.93
7	176°06'	11
8	176°15'10"	16.155
9	177°13'40"	10.205
10	177°31'40"	12.19
11	177°55'	12.365
12	212°50'20"	2.39
13	179°18'50"	7.955
14	357°41'50"	12.91

**Schedule of Trees**

No	Diam	Spread	Height
1	0.1	2	5
2	0.2	5	5
3	0.2	2	5
4	1.0	10	11
5	1.0	10	11
6	0.2	3	3
7	0.2	3	3
8	0.2	3	3
9	0.2	3	3
10	0.2	3	3
11	0.2	3	3
12	0.5	8	8
13	0.3	5	6
14	0.4	6	7
15	0.4	6	7
17	0.2	2	2
18	0.4	7	7
19	0.4	8	8
20	0.2	5	5
21	0.4	8	8
22	0.2	2	2
23	0.2	2	2
24	0.2	2	2
25	0.2	2	2
26	0.2	2	2
27	0.2	2	2
28	0.2	2	2
29	0.2	2	2
30	0.2	2	2
31	0.2	2	2
32	0.2	2	2
33	0.2	2	2
34	0.2	2	2

ISSUE	DATE	AMENDMENT	SURV	CHK
A	01/11/23	ORIGINAL ISSUE	PQ	MT

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**GDA2020**

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MICHAEL TRIFIRO ID: SU008624  
REGISTERED LAND SURVEYOR

**PROJECT:**

DETAIL AND LEVEL SURVEY OF  
LOT 1 IN DP1189541, SP1496,  
SP6178, SP10110 AND PART OF SP52947

849-859 PACIFIC HIGHWAY, 2 WILSON STREET  
& LOT 1 O'BRIEN STREET  
CHATSWOOD

**CLIENT:** BB WILSON PROPERTY PTY LTD

**FILE:** 9062 - Detail & Level - Rev A - 849-859 Pacific Highway,  
2 Wilson Street & Lot 1 O'Brien Street Chatswood

**LGA:** WILLOUGHBY

**REF:** 9062      **CONTOURS:** 0.5m

**ISSUE:** A      **DATUM:** AHD

**SURVEY DATE:** 01/11/2023      **AZIMUTH:** MGA2020

**SCALE:** 1:150      **SHEET 2 OF 4 SHEETS**

**UNDERGROUND SERVICES LEGEND**  
QUALITY LEVEL B (AS 5488.1:2019)

W	POTABLE WATER MAIN
S	SEWER MAIN
D	STORMWATER PIPE
C	COMMUNICATIONS CABLES
E	ELECTRICITY CABLES
G	GAS MAIN
U	UNIDENTIFIED SERVICES

CAUTION: FIBRE OPTIC CABLES ARE PRESENT IN THIS AREA

**Schedule of Easements & Restrictions**

No	Description
(A)	EASEMENT FOR GROUND SUPPORT (SOIL) VARIABLE WIDTH (LIMITED IN STRATUM) (DP1189541)
(B)	EASEMENT FOR SUPPORT 1 WIDE & VARIABLE WIDTH (DP1189541)
(C)	EASEMENT FOR GROUND SUPPORT (REINFORCING SYSTEMS IN SOIL) 6 WIDE & VARIABLE WIDTH (LIMITED IN STRATUM) (DP1189541)
(D)	EASEMENT FOR ACCESS 3 WIDE (AR288094)
(E)	RIGHT OF WAY 3.05 WIDE (550481)

NOTE:  
UL 107.3 DENOTES UPPER LIMIT RL FOR STRATUM OF EASEMENTS SHOWN (4) AND (C)

**WARNING**

THE SURVEY INFORMATION RELATING TO SP52947, SP10110, SP60178 & SP1496 (SHOWN GREY) WAS TAKEN FROM THE DETAIL AND LEVEL PLAN PREPARED BY BURTON & FIELD DRAWING REF. E5380-78240 DATED 08/10/2020. THIS SURVEY HAS NOT BEEN VERIFIED SDG TAKES NO RESPONSIBILITY FOR THE ACCURACY OF THE INFORMATION TAKEN FROM THIS PLAN.

- SERVICES NOTES:-**
- ONLY THOSE SERVICES VISIBLE AT THE TIME OF SURVEY HAVE BEEN LOCATED AND IF SHOWN AS "B" OR "D" ARE QUALITY LEVEL A AS DEFINED BY AS 5488.1:2019. LEVELS SHOWN ARE SURFACE LEVELS UNLESS NOTED OTHERWISE.
  - UNDERGROUND SERVICES HAVE BEEN LOCATED FOR POSITION AND DEPTH AND HAVE BEEN DETERMINED FROM USING EQUIPMENT ON REPORT PROVIDED BY ONPOINT LOCATING ON 30/10/2023. ALL RELEVANT AUTHORITIES MUST BE CONTACTED TO DETERMINE THE FULL EXTENT OF SERVICES PRIOR TO ANY PLANNING OR WORKS NEAR THE SITE.

**SCHEDULE OF SHORT LINES**

No.	BEARING	DISTANCE
1	39°37'10"	5.455
2	180°30'50"	2.835
3	68°25'10"	1.88
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11	177°55'	12.365
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14	357°41'50"	12.91

**Schedule of Trees**

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1	0.1	2	5
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4	1.0	10	11
5	1.0	10	11
6	0.2	3	3
7	0.2	3	3
8	0.2	3	3
9	0.2	3	3
10	0.2	3	3
11	0.2	3	3
12	0.5	8	8
13	0.3	5	6
14	0.4	6	7
15	0.4	6	7
16	0.2	2	2
17	0.2	2	2
18	0.4	7	7
19	0.4	8	8
20	0.2	5	5
21	0.4	8	8
22	0.2	2	2
23	0.2	2	2
24	0.2	2	2
25	0.2	2	2
26	0.2	2	2
27	0.2	2	2
28	0.2	2	2
29	0.2	2	2
30	0.2	2	2
31	0.2	2	2
32	0.2	2	2
33	0.2	2	2
34	0.2	2	2

**GENERAL NOTES**

ONLY TREES GREATER THAN 2 METRES IN HEIGHT ARE SHOWN ON THIS PLAN AND THEIR POSITIONS ARE DIAGRAMMATIC ONLY AND MAY REQUIRE ADDITIONAL SURVEY WHERE CRITICAL TO DESIGN.

CONTOURS ARE INDICATIVE AT GROUND FORM ONLY. SPOT LEVELS ONLY SHOULD BE USED FOR CALCULATIONS OF QUANTITIES WITH CAUTION.

LEVELS ARE ON AUSTRALIAN HEIGHT DATUM (AHD).

ALL SETOUT LEVELS MUST BE REFERRED TO THE BENCH MARK SHOWN ON THIS PLAN.

**BOUNDARY NOTES**

A BASIC BOUNDARY SURVEY HAS BEEN DONE SUITABLE FOR DA LODGEMENT PURPOSES.

BOUNDARIES HAVE NOT BEEN MARKED.

**SURVEY INFORMATION NOTES**

THE ORIGIN OF COORDINATES COMES FROM PM290 E331528.198 NG259353.120 CLASS B POSITIONAL UNCERTAINTY (PU) 0.02 (MGA2020) ADOPTED FROM SCIMS DATED 02/11/2023.

THE ORIGIN OF LEVELS COMES FROM PM290 RL107.323 CLASS LA POSITIONAL UNCERTAINTY (PU) 0.02 ADOPTED FROM SCIMS DATED 02/11/2023.

THE ORIENTATION OF THIS PLAN IS MGA 2015 WHICH HAS BEEN DETERMINED BY DP1189451.

**CERTIFICATE OF TITLE NOTES**

THE FOLLOWING INFORMATION RELATES TO THE RESPECTIVE CERTIFICATE OF TITLE OF EACH LOT:

- LOT 1 IN DP1189541 (CT EDITION 7 DATED 16/10/2023 SEARCH DATE 07/11/2023) - AFFECTED BY:
  - EASEMENT FOR GROUND SUPPORT (SOIL) VARIABLE WIDTH (LIMITED IN STRATUM) SHOWN AS (A) (DP1189541)
  - EASEMENT FOR GROUND SUPPORT (REINFORCING SYSTEMS IN SOIL) 6 METRES WIDE AND VARIABLE WIDTH (LIMITED IN STRATUM) SHOWN AS (C) (DP1189541)
  - EASEMENT FOR ACCESS 3 WIDE SHOWN AS (D) (AR288094)
- CP/SP1496 (CT EDITION 4 DATED 17/10/2023 SEARCH DATE 07/11/2023) - AFFECTED BY:
  - RIGHT OF WAY 3.05 WIDE SHOWN AS (E) (550481)
- CP/SP60178 (CT EDITION 6 DATED 17/10/2023 SEARCH DATE 07/11/2023) - AFFECTED BY:
  - RESTRICTION(S) ON THE USE OF LAND (SP60178)
  - POSITIVE COVENANT (SP60178)
- CP/SP10110 (CT EDITION 6 DATED 17/10/2023 SEARCH DATE 07/11/2023) - AFFECTED BY:
  - RIGHT OF WAY 3.05 WIDE SHOWN AS (E) (550481)
- CP/SP52947 (CT EDITION 10 DATED 17/10/2023 SEARCH DATE 07/11/2023) - AFFECTED BY:
  - POSITIVE COVENANT (SP52947)
  - RESTRICTION(S) ON THE USE OF LAND (SP52947)

COVENANTS AND RESTRICTIONS NOTED ON THE TITLE HAVE NOT BEEN INVESTIGATED. THESE SHOULD BE INVESTIGATED PRIOR TO DESIGN TO ENSURE ANY FUTURE DEVELOPMENT COMPLIES.

BY LAWS RELATING TO EACH OF THE SCHEMES HAVE NOT BEEN INVESTIGATED.

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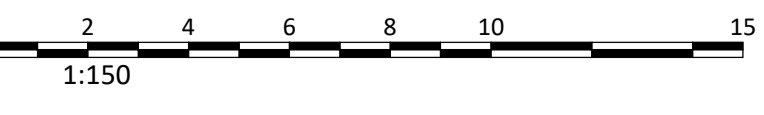
UNDERGROUND SERVICES HAVE BEEN LOCATED FOR BY 'ON POINT LOCATING' ON 31/10/2023 AND 01/11/2023 USING EQUIPMENT AS NOTED ON REPORT PROVIDED DATED 31/10/2023 AND 01/11/2023. THE SERVICE POSITION IS SHOWN ON THE PLAN AND THEIR RESPECTIVE DEPTH AND QUALITY ARE AS STATED IN THE TABLE.

UNDERGROUND SERVICES HAVE BEEN PLOTTED FROM 'DIAL-BEFORE-YOU-DIG' PLANS, ARE QUALITY LEVEL D AS DEFINED BY AS 5488.1:2019 AND ARE ONLY CURRENT AT THE DATE OF SEARCH.

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**LEGEND**

TAG	DESCRIPTION	LP	LIGHT POLE
B	BOLLARD	MC	METAL COVER
BOK	BACK OF KERB	PC	PRISM CROSSING
CB	CAPPING BEAM	PP	POWER POLE
CL	CENTRE LINE OF ROAD	SC	STOP COCK
COL	COLLUM	SGR	SEALED GRATE
COM	COMMUNICATIONS PIT	SIP	SEWER INSPECTION PIT
CONC	CONCRETE	SMH	SEWER MANHOLE
EP	ELECTRICITY PIT	SS	STREET SIGN
GAS	GAS LID	ST	STAIRS
GDN	GARDEN	SV	STOP VALVE
GR	GRATE	TK	TOP OF KERB
GUARD	GUARD RAIL	TSP	TRAFFIC SIGNAL
GUT	GUTTER OF KERB	TVP	TRAFFIC SIGNAL PIT
HYD	HYDRANT	VC	VEHICLE CROSSING
LIP	LIP OF KERB	VM	WATER METER



**ISSUE**

ISSUE	DATE	AMENDMENT	SURV	CHK
A	01/11/23	ORIGINAL ISSUE	PQ	MT



MICHAEL TRIFIRO ID: SU008624  
REGISTERED LAND SURVEYOR

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**PROJECT:**  
DETAIL AND LEVEL SURVEY OF  
LOT 1 IN DP1189541, SP1496,  
SP60178, SP10110 AND PART OF SP52947

849-859 PACIFIC HIGHWAY, 2 WILSON STREET  
& LOT 1 O'BRIEN STREET  
CHATSWOOD

**CLIENT:** BB WILSON PROPERTY PTY LTD

**FILE:** 9062 - Detail & Level - Rev A - 849-859 Pacific Highway, 2 Wilson Street & Lot 1 O'Brien Street Chatswood

**LGA:** WILLOUGHBY

REF: 9062	CONTOURS: 0.5m
ISSUE: A	DATUM: AHD
SURVEY DATE: 01/11/2023	AZIMUTH: MGA2020
SCALE: 1:150	SHEET 3 OF 4 SHEETS



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t: (02) 9630 7955 w: sdg.net.au  
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GENERAL NOTES

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THE ORIGIN OF LEVELS COMES FROM PM290 RL107.323 CLASS LA POSITIONAL UNCERTAINTY (PU) 0.02 ADOPTED FROM SCIMS DATED 02/11/2023.

THE ORIENTATION OF THIS PLAN IS MGA NORTH WHICH HAS BEEN DETERMINED BY DP1189451.

CERTIFICATE OF TITLE NOTES

THE FOLLOWING INFORMATION RELATES TO THE RESPECTIVE CERTIFICATE OF TITLE OF EACH LOT:

- LOT 1 IN DP1189541 (CT EDITION 7 DATED 16/10/2023 SEARCH DATE 07/11/2023)
  - AFFECTED BY:
    - EASEMENT FOR GROUND SUPPORT (SOIL) VARIABLE WIDTH (LIMITED IN STRATUM) SHOWN AS (A) (DP1189541)
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    - EASEMENT FOR ACCESS 3 WIDE SHOWN AS (D) (AR288094)
  - BENEFITED BY:
    - EASEMENT FOR SUPPORT 1 METRE WIDE AND VARIABLE WIDTH SHOWN AS (B) (DP1189541)
- CP/SP1496 (CT EDITION 4 DATED 17/10/2023 SEARCH DATE 07/11/2023)
  - AFFECTED BY:
    - RIGHT OF WAY 3.05 WIDE SHOWN AS (E) (S50481)
- CP/SP60178 (CT EDITION 6 DATED 17/10/2023 SEARCH DATE 07/11/2023)
  - AFFECTED BY:
    - RESTRICTION(S) ON THE USE OF LAND (SP60178)
    - POSITIVE COVENANT (SP60178)
  - BENEFITED BY:
    - RIGHT OF WAY 3.05 WIDE SHOWN AS (E) (S50481)
- CP/SP10110 (CT EDITION 6 DATED 17/10/2023 SEARCH DATE 07/11/2023)
  - BENEFITED BY:
    - RIGHT OF WAY 3.05 WIDE SHOWN AS (E) (S50481)
- CP/SP52947 (CT EDITION 10 DATED 17/10/2023 SEARCH DATE 07/11/2023)
  - AFFECTED BY:
    - POSITIVE COVENANT (SP52947)
    - RESTRICTION(S) ON THE USE OF LAND (SP52947)

COVENANTS AND RESTRICTIONS NOTED ON THE TITLE HAVE NOT BEEN INVESTIGATED. THESE SHOULD BE INVESTIGATED PRIOR TO DESIGN TO ENSURE ANY FUTURE DEVELOPMENT COMPLIES.

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SERVICES NOTES

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**PROJECT:**

DETAIL AND LEVEL SURVEY OF  
 LOT 1 IN DP1189541, SP1496,  
 SP60178, SP10110 AND PART OF SP52947

849-859 PACIFIC HIGHWAY, 2 WILSON STREET  
 & LOT 1 O'BRIEN STREET  
 CHATSWOOD

**CLIENT:** BB WILSON PROPERTY PTY LTD

**FILE:** 9062 - Detail & Level - Rev A - 849-859 Pacific Highway, 2 Wilson Street & Lot 1 O'Brien Street Chatswood

**LGA:** WILLOUGHBY

**REF:** 9062      **CONTOURS:** 0.5m

**ISSUE:** A      **DATUM:** AHD

**SURVEY DATE:** 01/11/2023      **AZIMUTH:** MGA2020

**SCALE:** N/A      **SHEET** 4 OF 4 SHEETS



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 t: (02) 9630 7955 w: sdg.net.au  
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 under Professional Standards Legislation

SERVICES-COMMUNICATIONS			
No	Surface RL	Approx Depth	Service RL
1	104.30	0.90	103.40
2	104.54	0.90	103.64
3	105.04	0.70	104.34
4	105.15	0.60	104.55
5	105.85	0.50	105.35
6	106.01	0.40	105.61
7	106.07	0.40	105.67
8	106.26	0.50	105.76
9	106.42	0.30	106.12
10	106.48	0.60	105.88
11	106.61	0.60	106.01
12	106.56	0.30	106.26
13	106.86	0.40	106.46
14	106.86	0.60	106.26
15	107.48	0.80	106.68
16	107.53	0.80	106.73
17	107.46	0.30	107.16
18	107.53	0.30	107.23
19	107.55	0.60	106.95
20	107.52	0.50	107.02
21	107.56	0.60	106.96
22	107.61	0.80	106.81
23	107.64	0.80	106.84
24	107.62	0.30	107.32
25	107.70	0.20	107.50
26	107.66	0.70	106.96
27	107.62	0.60	107.02
28	107.55	0.50	107.05
29	107.44	0.60	106.84
30	105.90	0.40	105.50
31	105.64	0.30	105.34
32	105.34	0.40	104.94
33	105.06	0.40	104.66
34	104.84	0.40	104.44
35	104.74	0.30	104.44
36	104.44	0.40	104.04
37	104.10	0.40	103.70
38	103.74	0.40	103.34
39	103.51	0.40	103.11
40	103.42	0.60	102.82

SERVICES-SEWER			
No	Surface RL	Approx Depth	Service RL
41	105.14	2.80	102.34
42	107.38	4.10	103.28
43	103.23	2.61	100.62
44	105.13	2.90	102.23
45	103.21	2.63	100.58
46	103.33	1.50	101.83
47	103.65	1.90	101.75
138	107.38	0.98	106.40
139	107.37	3.94	103.43
140	107.36	3.83	103.53

SERVICES-GAS			
No	Surface RL	Approx Depth	Service RL
121	105.90	0.50	105.40
122	106.07	0.50	105.57
123	106.72	0.50	106.22
124	106.84	0.70	106.14
125	107.02	0.50	106.52

SERVICES-POTABLE WATER			
No	Surface RL	Approx Depth	Service RL
48	103.41	0.50	102.91
49	103.36	0.70	102.66
50	103.32	0.70	102.62
51	103.31	0.60	102.71
52	103.58	0.70	102.88
53	103.86	0.70	103.16
54	104.07	0.70	103.37
55	104.33	0.70	103.63
56	105.50	0.30	105.20
57	105.46	0.60	104.86
58	105.60	0.70	104.90
59	105.89	0.70	105.19
60	105.90	0.40	105.50
61	105.98	0.30	105.68
62	105.99	0.70	105.29
63	106.01	0.60	105.41
64	106.23	0.60	105.63
65	106.39	0.60	105.79
66	106.52	0.30	106.22
67	106.52	0.60	105.92
68	106.74	0.40	106.34
69	106.84	0.60	106.24
70	106.74	0.80	105.94
71	107.22	0.80	106.42
72	107.45	0.80	106.65

SERVICES-TRAFFIC			
No	Surface RL	Approx Depth	Service RL
73	104.32	0.60	103.72
74	104.17	0.50	103.67
75	104.40	0.50	103.90
76	104.58	0.40	104.18
77	104.59	0.30	104.29
78	104.84	0.30	104.54
79	104.99	0.50	104.49
80	105.19	0.60	104.59
81	105.31	0.50	104.81
82	105.36	0.45	104.91
83	105.31	0.45	104.86

SERVICES-UNIDENTIFIED			
No	Surface RL	Approx Depth	Service RL
126	107.29	0.60	106.69
127	107.34	0.60	106.74
128	107.23	0.60	106.63
129	107.30	0.60	106.70
130	106.57	0.50	106.07
131	106.61	0.50	106.11
132	106.50	0.50	106.00
133	106.53	0.50	106.03
134	106.15	0.40	105.75
135	106.07	0.40	105.67
136	106.12	0.30	105.82
137	106.09	0.30	105.79

**WARNING**

ALL SERVICES LEVELS ARE OBVERT LEVELS WITH THE EXCEPTION OF SEWER AND DRAINAGE

FOR PIPE SIZES REFER TO BYDA PLANS AND WHERE PIPE SIZING AND LEVELS ARE CRITICAL TO DESIGN, POTHOLES SHOULD BE UNDERTAKEN

ISSUE	DATE	AMENDMENT	SURV	CHK
A	01/11/23	ORIGINAL ISSUE	PQ	MT



MICHAEL TRIFIRO ID: SU008624  
 REGISTERED LAND SURVEYOR

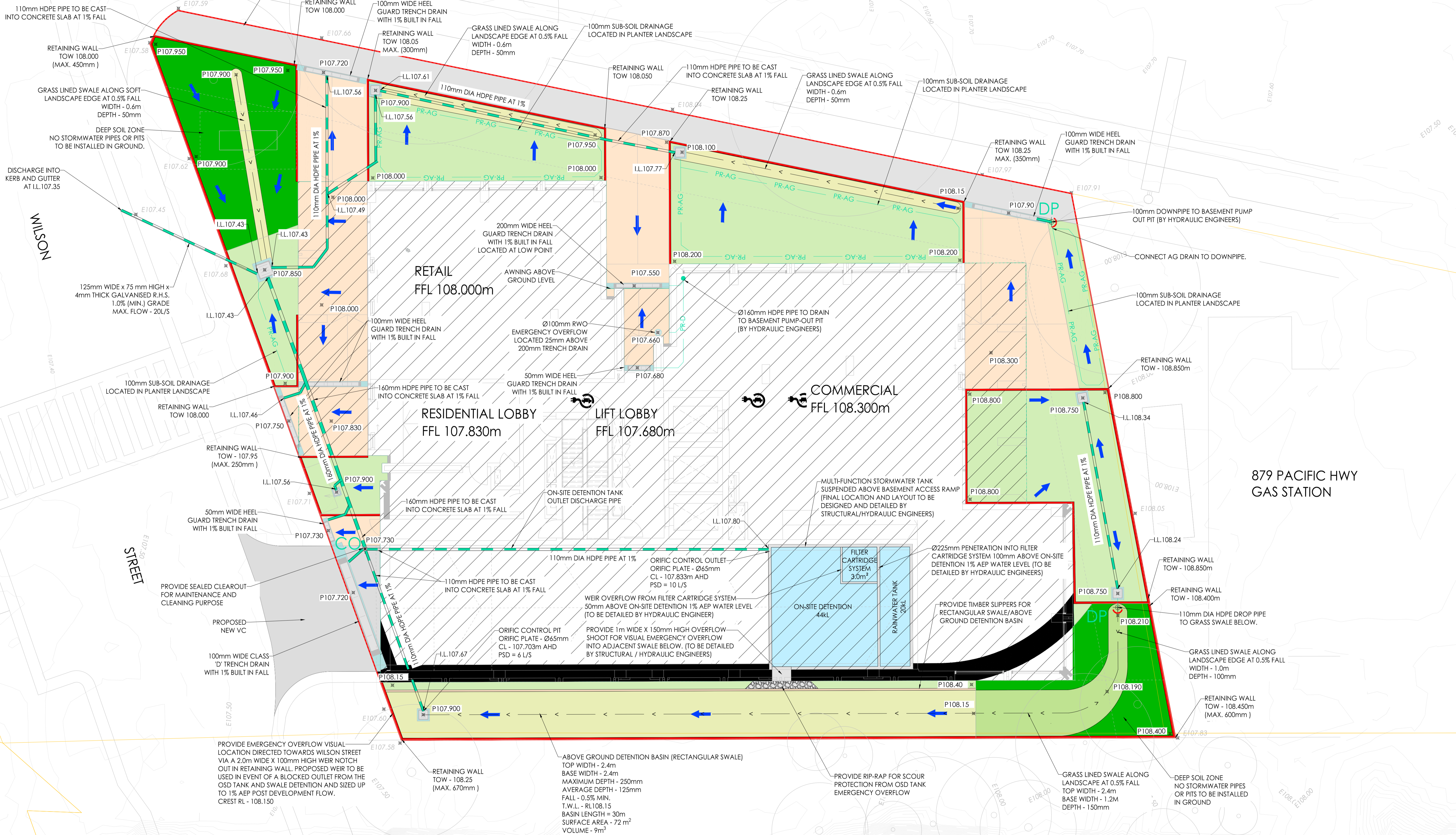
### 9.3 APPENDIX C – DA2022/161 STORMWATER DESIGN DOCUMENTATION

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## **A. PROPOSED STORMWATER DRAINAGE SYSTEM**

PACIFIC HIGHWAY

EXISTING PROPERTY BOUNDARY



879 PACIFIC HWY GAS STATION

NORTHSHORE RAILWAY LINE



**Note for Contractors**  
 The works described on this drawing must be undertaken by competent Contractors with an appropriate level of experience who have prepared appropriate Safe Work Method Statements (SWMS) relating to these works. The contractor is responsible for the management of all risks associated with the construction activities stated on this drawing.

This drawing should not be issued in part and must be read in conjunction with all appropriate specifications, notes pages, details and authority drawings as appropriate.

Deal before you dig. BEWARE OF UNDERGROUND SERVICES. The location of underground services are approximate only and their exact position should be proven on site. No guarantee is given that existing services are shown.

NOT FOR CONSTRUCTION

**Goldfields** **CJ ARMS** **CIVIL SITWORKS**

Project: PACIFIC NORTH  
 Client: GOLDFIELDS GROUP  
 Approval: DA APPROVAL

Drawn By: VE  
 Checked By: VE  
 Drawn Scale: 1:100 @ A1  
 Date of Issue: 08.12.2021

Project Number: 15094  
 Origin: CJA  
 Zone: 00  
 Level: 00  
 File Type: DWG  
 Rev: C  
 Number: C-6000  
 Revision: P03

www.cjarms.com

Rev	Date	By	Check	Description
P01	08.12.2021	VE	VE	ISSUED FOR DA APPROVAL
P02	09.03.2022	VE	VE	ISSUED FOR DA APPROVAL
P03	10.05.2022	VE	VE	ISSUED FOR DA APPROVAL

Document Set ID: 6556282

Version: 1, Version Date: 05/05/2022

**B. DRAINS INPUT AND RESULTS EXPORT**

PIT / NODE DETAILS

Name	Type	Family	Size	Ponding Volume (cu.m)	Pressure Change Coeff. Ku	Surface Elev (m)	Max Pond Depth (m)	Base Inflow (cu.m/s)	Blocking Factor	x	y	Bolt-down lid	Part Full Shock Loss	Inflow Hydrograph	Pit is New	Internal Width (mm)	Inflow is Misaligned (m)	Minor Safe Pond Depth (m)	Major Safe Pond Depth (m)	Safe Depth (m)
Pit3	Sag	CoS	Trachyte 1	0.3	1.5	107.85	0.1	0	0	655.556	-310.417	No	75	1 x Ku	No	New		0.1	0.1	0.1
Kerb Outle	Node					107.35		0		537.5	-314.583		74	No						
N4	Node					108		0		818	-245		14	No						
N5	Node					108		0		761	-478		25	No						
N2208	Node					107.8		0		613.194	-293.75		234863	No						

DETENTION BASIN DETAILS

Name	Elev	Surf. Area	Not Used	Outlet Type	K	Dia(mm)	Centre RL	Pit Family	Pit Type	x	y	HED	Crest RL	Crest Length
OSD	107.6	35		Orifice		65	107.632				797	-374	No	5
	109.1	35												
Swale-Basi	107.54	0.2		Orifice		65	107.572			740.972	-244.444	No		234844
	107.79	0.2												
	107.8	60												
	107.95	60												

SUB-CATCHMENT DETAILS

Name	Pit or Node	Total Area (ha)	Paved Area %	Grass Area %	Supp Area %	Paved Time (min)	Grass Time (min)	Supp Time (min)	Paved Length (m)	Grass Length (m)	Supp Length (m)	Paved Slope(%)	Grass Slope %	Supp Slope %	Paved Rough	Grass Rough	Supp Rough	Lag Time or Factor	Gutter Length (m)	Gutter Slope %	Gutter FlowFactor	Rainfall Multiplier
C1 - Roof	OSD	0.0847	100	0	0	5	0	0	0										0			1
N/E Catchr	N4	0.0224	0	80	20	0	5	5											0			1
S/W Lands	N5	0.0289	16.8	75.9	7.3	5	5	5											0			1

PIPE DETAILS

Name	From	To	Length (m)	U/S IL (m)	D/S IL (m)	Slope (%)	Type	Dia (mm)	I.D. (mm)	Rough	Pipe Is	No. Pipes	Chg From	At Chg	Chg (m)	RI (m)	Chg (m)	RL (m)	etc (m)
Pipe1	OSD	Pit3	20	107.6	107.43	0.85	uPVC, not i	225	242	0.012	NewFixed	1	OSD		0				
Circular	Pit3	Kerb Outle	5	107.43	107.35	1.6	rhs	0.125W x 0.075H		0.011	Existing	1	Pit3		0				
Pipe4	N5	Pit3	30	107.58	107.43	0.5	uPVC, not i	150	154	0.012	New	1	N5		0				
Pipe19	Swale-Basi	Pit3	22	107.54	107.43	0.5	uPVC, not i	150	154	0.012	NewFixed	1	Swale-Basi		0				

DETAILS of SERVICES CROSSING PIPES

Pipe	Chg (m)	Bottom Elev (m)	Height of S Chg (m)	Bottom Elev (m)	Height of S Chg (m)	Bottom Elev (m)	Height of S etc (m)
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CHANNEL DETAILS

Name	From	To	Type	Length (m)	U/S IL (m)	D/S IL (m)	Slope (%)	Base Width (m)	L.B. Slope (1:?)	R.B. Slope (1:?)	Manning n	Depth (m)	Roofed
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OVERFLOW ROUTE DETAILS

Name	From	To	Travel Time (min)	Spill Level (m)	Crest Length (m)	Weir Coeff. C	Cross Section	Safe Depth Major (m)	SafeDepth Minor (m)	Safe Depth DxV (sq.m/sec)	Bed Slope (%)	D/S Area Contributing %	id	U/S IL	D/S IL	Length (m)
OF5112	Pit3	Kerb Outle	0.1				4 m wide p	0.3	0.15	0.4	5	0	1796815	107.85	107.45	5
OF1	N4	Swale-Basi	0.9				Swale with	0.45	0.3	0.4	0.5	50	71	108.1	107.95	30
OF3	Swale-Basi	N2208	0.1	107.95	2	1.6	Channel se	0.12	0.05	1	5	0	104	107.95	107.7	5

PIPE COVER DETAILS

Name	Type	Dia (mm)	Safe Cover	Cover (m)
Pipe1	uPVC, not i	242	0.3	-0.25 Unsafe
Circular	rhs	0	0.1	-0.08 Unsafe
Pipe4	uPVC, not i	154	0.3	0.26 Unsafe
Pipe19	uPVC, not i	154	0.3	-0.16 Unsafe

This model has no pipes with non-return valves

DRAINS results prepared from Version 2020.061

PIT / NODE DETAILS

Version 8

Name	Max HGL	Max Pond HGL	Max Surfacc Flow (cu.m/s)	Max Pond Volume (cu.m)	Min Freeboard (m)	Overflow (cu.m/s)	Constraint
Pit3	107.84	107.85	0	0	0.01	0	Inlet Capacity
Kerb Outlet	107.42		0.004				
N4	108.2		0.012				
N5	107.96		0.017				

SUB-CATCHMENT DETAILS

Name	Max Flow Q (cu.m/s)	Paved Max Q (cu.m/s)	Grassed Max Q (cu.m/s)	Paved Tc (min)	Grassed Tc (min)	Supp. Tc (min)	Due to Storm
C1 - Roof	0.045	0.045	0	5	0	0	5% AEP, 5 min burst, Storm 1
N/E Catchn	0.009	0	0.009	0	0	5	5% AEP, 15 min burst, Storm 3
S/W Landsc	0.012	0.002	0.01	5	5	5	5% AEP, 15 min burst, Storm 5

PIPE DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Max U/S HGL (m)	Max D/S HGL (m)	Due to Storm
Pipe1	0.009	0.2	108.383	107.842	5% AEP, 1.5 hour burst, Storm 7
Circular	0.015	1.58	107.65	107.425	5% AEP, 20 min burst, Storm 3
Pipe4	0.013	0.68	107.963	107.842	5% AEP, 15 min burst, Storm 3
Pipe19	0.007	0.35	107.857	107.842	5% AEP, 10 min burst, Storm 4

CHANNEL DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Due to Storm

OVERFLOW ROUTE DETAILS

Name	Max Q U/S	Max Q D/S	Safe Q	Max D	Max DxV	Max Width	Max V	Due to Storm
OF5112	0	0	1.401	0	0	0	0	0
OF1	0.008	0.008	0.157	0.101	0.03	0.81	0.54	5% AEP, 10 min burst, Storm 7
OF3	0	0	0.04	0	0	0	0	0

#### DETENTION BASIN DETAILS

Name	Max WL	MaxVol	Max Q Total	Max Q Low Level	Max Q High Level
OSD	108.5	31.4	0.009	0.009	0
Swale-Basii	107.86	3.8	0.007	0.007	0

Run Log for 15094\_DRAINS\_Pacific\_22112021\_2 run at 10:40:43 on 25/11/2021 using version 2020.061

No water upwelling from any pit.

Freeboard was less than 0.15m at Pit3

Flows were safe in all overflow routes.

DRAINS results prepared from Version 2020.061

PIT / NODE DETAILS

Version 8

Name	Max HGL	Max Pond HGL	Max Surfacc Flow (cu.m/s)	Max Pond Volume (cu.m)	Min Freeboard (m)	Overflow (cu.m/s)	Constraint
Pit3	107.87	107.85	0	0	0	0.006	Outlet System
Kerb Outlet	107.42		0.012				
N4	108.21		0.017				
N5	108.14		0.023				

SUB-CATCHMENT DETAILS

Name	Max Flow Q (cu.m/s)	Paved Max Q (cu.m/s)	Grassed Max Q (cu.m/s)	Paved Tc (min)	Grassed Tc (min)	Supp. Tc (min)	Due to Storm
C1 - Roof	0.06	0.06	0	5	0	0	0 1% AEP, 5 min burst, Storm 1
N/E Catchn	0.012	0	0.012	0	0	5	5 1% AEP, 10 min burst, Storm 1
S/W Landsc	0.017	0.003	0.014	5	5	5	5 1% AEP, 10 min burst, Storm 1

PIPE DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Max U/S HGL (m)	Max D/S HGL (m)	Due to Storm
Pipe1	0.01	0.22	108.672	107.868	1% AEP, 45 min burst, Storm 10
Circular	0.015	1.64	107.665	107.425	1% AEP, 20 min burst, Storm 3
Pipe4	0.017	0.9	108.141	107.868	1% AEP, 10 min burst, Storm 1
Pipe19	0.006	0.34	107.92	107.868	1% AEP, 2 hour burst, Storm 8

CHANNEL DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Due to Storm

OVERFLOW ROUTE DETAILS

Name	Max Q U/S	Max Q D/S	Safe Q	Max D	Max DxV	Max Width	Max V	Due to Storm
OF5112	0.006	0.006	1.401	0.005	0.03	0.47	6.1	1% AEP, 20 min burst, Storm 3
OF1	0.012	0.011	0.461	0.114	0.04	0.91	0.58	1% AEP, 10 min burst, Storm 7
OF3	0	0	0.81	0	0	0	0	

#### DETENTION BASIN DETAILS

Name	Max WL	MaxVol	Max Q Total	Max Q Low Level	Max Q High Level
OSD	108.84	43.4	0.01	0.01	0
Swale-Basii	107.93	7.8	0.006	0.006	0

Run Log for 15094\_DRAINS\_Pacific\_22112021\_2 run at 10:51:57 on 25/11/2021 using version 2020.061

Upwelling occurred at: Pit3

Flows were safe in all overflow routes.

## 9.4 APPENDIX D – INDICATIVE EXTENTS OF INUNDATION WITHIN SCOTTS CREEK CATCHMENT

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**NOTE**

THE EXTENTS OF FLOODING SHOWN WERE DETERMINED FROM SURVEYED CROSS SECTIONS OF THE CREEK AND FLOODPLAIN AND AVAILABLE CONTOUR DATA AND ARE APPROXIMATE ONLY. THE EXTENT OF INUNDATION OF INDIVIDUAL ALLOTMENTS NEAR THE FLOOD FRINGE MUST BE CONFIRMED BY SITE SPECIFIC SURVEY.

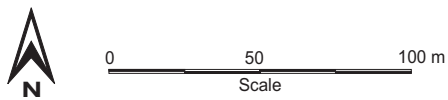
**LEGEND**

- - - - - PMF
- 100 YEAR ARI
- 20 YEAR ARI
- 5 YEAR ARI
- 1261.47 HEC-RAS CROSS SECTION AND RIVER STATION NUMBER

**SCOTTS CREEK FLOOD STUDY**

Figure 6.2a

INDICATIVE EXTENTS OF INUNDATION  
5, 20, 100 YEAR ARI AND EXTREME FLOOD EVENTS  
HAVILAH STREET TO PENSHURST STREET





**NOTE**

THE EXTENTS OF FLOODING SHOWN WERE DETERMINED FROM SURVEYED CROSS SECTIONS OF THE CREEK AND FLOODPLAIN AND AVAILABLE CONTOUR DATA AND ARE APPROXIMATE ONLY. THE EXTENT OF INUNDATION OF INDIVIDUAL ALLOTMENTS NEAR THE FLOOD FRINGE MUST BE CONFIRMED BY SITE SPECIFIC SURVEY.

**LEGEND**

- - - PMF
- 100 YEAR ARI
- 20 YEAR ARI
- 5 YEAR ARI
- 831.74 HEC-RAS CROSS SECTION AND RIVER STATION NUMBER

**SCOTTS CREEK FLOOD STUDY**

Figure 6.2b

INDICATIVE EXTENTS OF INUNDATION 5, 20, 100 YEAR ARI AND EXTREME FLOOD EVENTS PENSHERST STREET TO EASTERN VALLEY WAY

