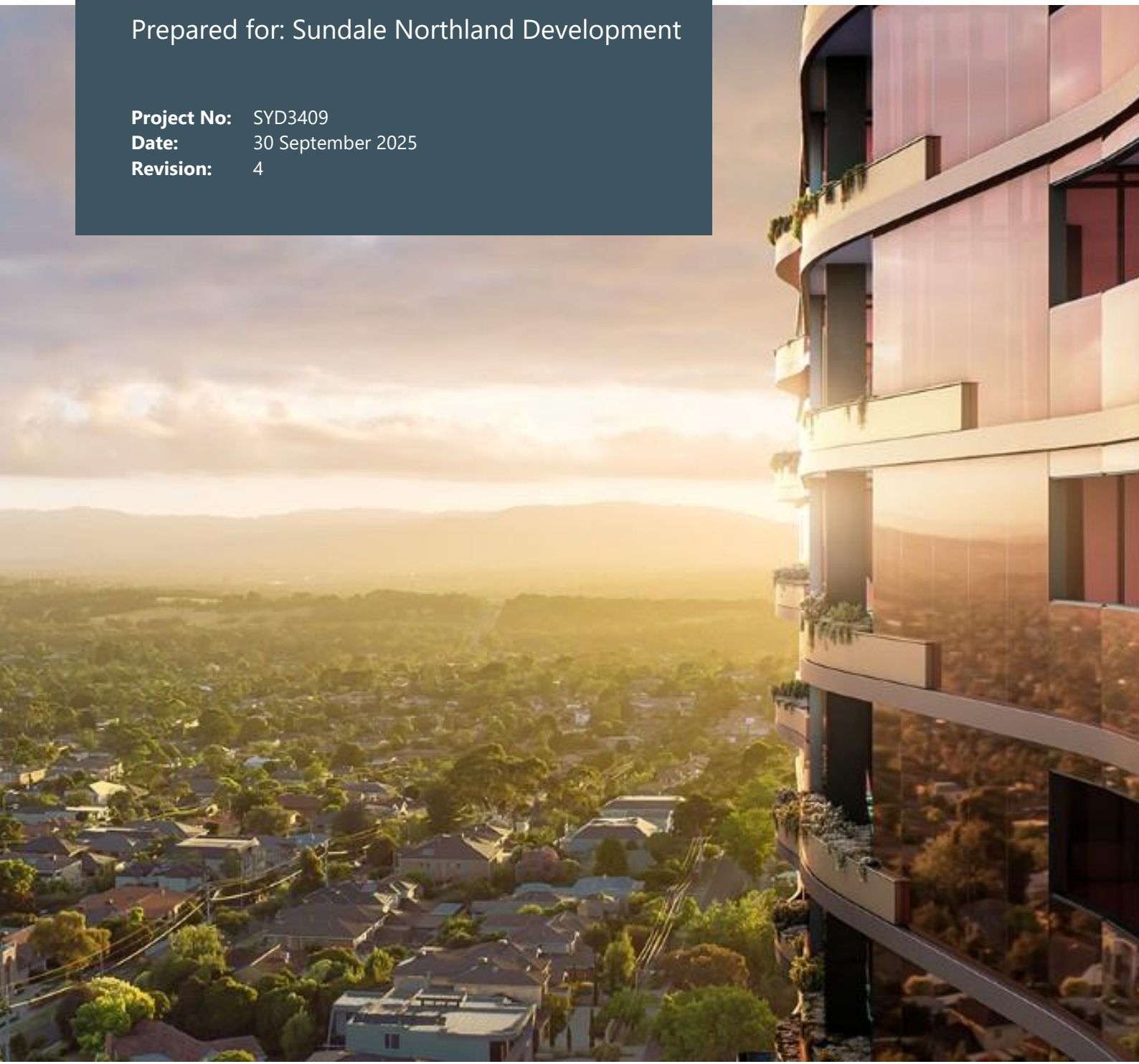


12-16 Bent Street

SEAR's Stormwater Design Report

Prepared for: Sundale Northland Development

Project No: SYD3409
Date: 30 September 2025
Revision: 4



Project: 12-16 Bent Street
Location: 12-16 Bent Street
 Lindfield NSW 2070
Prepared by: ADP Consulting Pty Ltd
 Level 6, 33 Erskine Street
 Sydney NSW 2000
Project No: SYD3409
Revision: 4
Date: 30 September 2025

Rev	Date	Comment	Author	Signature	Technical Review	Signature	Authorisation & QA	Signature
1	28/02/25		KC		SS		SS	
2	17/03/25		KC		SS		SS	
3	01/08/25		KC		SS		SS	
4	30/09/25		KC		SS		SS	

Project Team

Client / Principal Sundale Northland Development

Architect PTW Architects



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1. SEARs Items

This report is prepared for addressing the Secretary's Environmental Assessment Requirements (SEARs) item for the redevelopment to create high density housing at 12-16 Bent St, Lindfield.

SEARs Item	Refer to section
14. Stormwater and Wastewater	
Provide an Integrated Water Management Plan for the development that:	
Is prepared in consultation with the local council and any other relevant drainage or water authority.	2.1 Proposed Stormwater Design
Details the proposed drainage design for the site including any on-site treatment, reuse and detention facilities, water quality management measures, and the nominated discharge points.	2.1 Proposed Stormwater Design
	2.2 Stormwater On-Site Detention
	2.3 Stormwater Quality
	2.4 Water Quality Treatment Train
	2.5 Water Quality Modelling
Demonstrates compliance with the local council or other drainage or water authority requirements and avoids adverse impacts on any downstream properties.	2.1 Proposed Stormwater Design
	2.2 Stormwater On-Site Detention
	2.6 Soil and Water Management
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, the local council or other drainage or water authority.	2.1 Proposed Stormwater Design
	2.2 Stormwater On-Site Detention

15. Flooding Risk

Identify any flood risk on-site having regard to adopted flood studies, the potential effects of climate change, and any relevant provisions of the NSW Floodplain Development Manual specifically:

2.7 Proposed Flood Measures

Assess the impacts of the development, including any changes to flood risk on-site or off-site, and detail design solutions and operational procedures to mitigate flood risk where required.

2.7 Proposed Flood Measures

2. Civil Engineering Design

2.1 Proposed Stormwater Design

In accordance with Ku-ring-gai Council requirements, the stormwater drainage system(s) have been designed to cater for a 1% Annual Exceedance Probability (AEP) storm.

The Civil/Stormwater management drawings in this package present the strategy and overall design intent of stormwater conveyance across the site.

The discharge of stormwater from the site into the Councils drainage system in Bent St is to be controlled by gravity and an On-Site Detention (OSD) tank sized for storm events up to the 1% AEP. Runoff from the site is to be discharged into existing Council drainage systems at two separate points. Runoff generated by properties upstream of the site is diverted to the existing overland flow channel on 18-20 Bent St, and stormwater from the roof, building and ground will be directed to drains on Bent St. For the location of discharge points, refer to civil package in Appendix A.

2.2 Stormwater On-Site Detention

In accordance with the Technical Guideline for Water Management, designed by Ku-ring-gai Council, the permitted site discharge (PSD) and minimum OSD Storage Volume are determined by the Council designated drainage catchment of the site. Using the Ku-ring-gai OSD Calculation Spread Sheet the allowable PSD and minimum OSD Volume for the development were found, as summarised below in Table 1.

Table 1 Permitted Site Discharge and On-Site Detention Tank Calculation

Catchment Name	Catchment Discharge Rate (l/sec/m ²)	Catchment Storage Rate (m ³ /m ²)	Site Area (m ²)	Total Impervious Area (m ²)	Impervious Area Bypassing (m ²)	PSD (l/sec)	Site Storage Required (m ³)
Lady Game Creek (LG1)	0.0147	0.0287	4324.0	3020.0	601	30.80	74.46

An access grate at the OSD discharge control pit has been provided, in the event of any blockages to the discharge pit and pipe system to Bent St. In case of emergencies or when storms larger than the 1% AEP event occur, an open grate has been provided to allow stormwater to escape and flow overland towards Bent Street.

2.3 Stormwater Quality

The specified quality by Ku-ring-gai Council for captured stormwater is to be set as follows:

- > 70% reduction in gross pollutant
- > 85% reduction in total suspended solids (TSS)
- > 65% reduction in total phosphorus (TP)
- > 45% reduction in total nitrogen (TN)

2.4 Water Quality Treatment Train

The design strategy for the water quality treatment solution on the site is to connect stormwater to proprietary water quality treatment devices located within the Water Quality Chamber of the OSD tank after first being filtered through pollutant traps. Non-trafficable roof area will drain to the rainwater tank prior to discharging to the OSD, while trafficable roof runoff is diverted directly into the water quality chamber. Runoff generated by areas along the north and west site frontages is first treated by gross pollutant traps before entering the WQC and OSD.

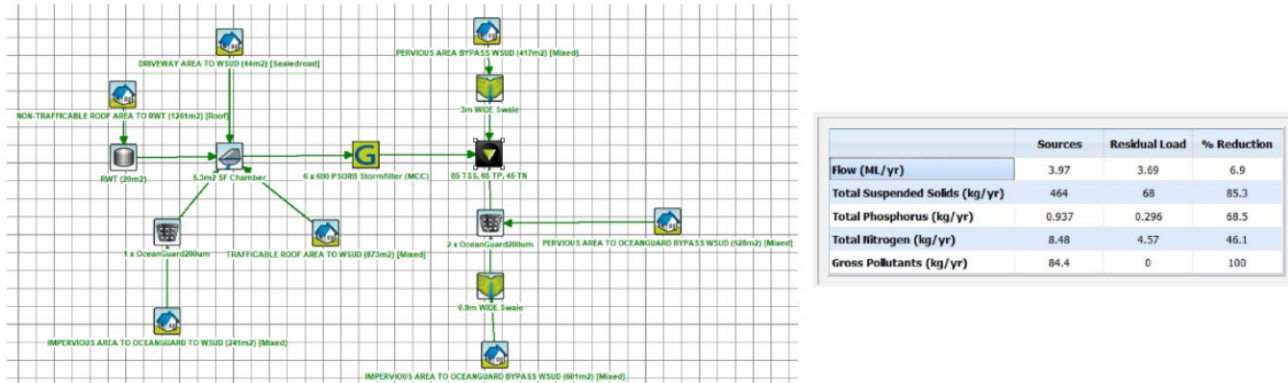
The following Water Sensitive Urban Design (WSUD) measures have been adopted for the site:

- > Rainwater Tank – an underground rainwater tank harvesting rainwater for reuse prior to discharge into the OSD proprietary system. All non-trafficable roof rainwater shall be routed to this tank and be made available for reuse in irrigation, meeting the demand for 300 kL/year as per Ku-ring-gai Council's MUSIC modelling guidelines. The tank is to have a 20 kL capacity to achieve the water quality target and 55% reduction on runoff days.
- > Gross Pollutant Trap – two Ocean Guard OG-200 gross pollutant traps have been proposed prior to the WQC to treat runoff from trafficable surfaces. Another Ocean Guard OG-200 is to be used to trap pollutants from the south and east site frontages before discharging to the Council stormwater system.
- > Tertiary treatment filter cartridges – six 690 Ocean Protect StormFilter cartridges have been proposed within the WQC to retain challenging pollutants.

2.5 Water Quality Modelling

Conceptual modelling of water quality was undertaken using MUSIC software. The overall MUSIC analysis results are shown below:

Figure 2 MUSIC Treatment Train & Results



The above result has considered a total of 20 kL of rainwater storage for landscaping irrigation, with the reuse rate to be confirmed at CC stage.

Some of the site areas have been designed to bypass the water treatment devices. Refer to the catchment area drawing in **Appendix A** for more detail.

Refer to **Appendix A** for full MUSIC analysis.

2.6 Soil and Water Management

As required by Ku-ring-gai Council sediment and water control measures will be required during the construction of all development works. These works shall be carried out in accordance with the requirements of "Managing Urban Stormwater – Soils and Construction, 4th Edition (2004)" by Landcom. Therefore, the following sediment control measures shall be adopted:

- > Stabilised Site Access with Shaker Ramp
- > Mesh & Gravel Inlet Filter
- > Stockpiles
- > Gully Inlet Sandbag Protection Detail
- > Typical Sediment Basin
- > Sediment Fence

2.7 Proposed Flood Measures

A site-specific flood study has been conducted to identify the proposed development flood impact and behaviour. This report has considered existing flood studies and flood hazards to propose a flood mitigation scheme to protect the proposed development from flood risk. As part of this scheme a new overland flow path along the south and east setbacks, connecting to the existing overland flow path on 18-20 Bent St has been proposed (refer to **Appendix A**).



Appendix A – Stormwater Management Plan

PROPOSED RESIDENTIAL FLAT DEVELOPMENT 12-16 BENT STREET, LINDFIELD NSW 2070



LOCALITY PLAN
SOURCE: [SIXMAPS] - 24.01.2025
NOT TO SCALE

DRAWING SCHEDULE	
DRAWING NO.	DRAWING TITLE
CE000	COVER SHEET
CE100	STORMWATER MANAGEMENT PLAN - BASEMENT 3
CE101	STORMWATER MANAGEMENT PLAN - BASEMENT 2
CE102	STORMWATER MANAGEMENT PLAN - BASEMENT 1
CE103	STORMWATER MANAGEMENT PLAN - GROUND FLOOR
CE104	STORMWATER MANAGEMENT PLAN - LEVEL 1
CE105	STORMWATER MANAGEMENT PLAN - LEVEL 2
CE150	MUSIC CATCHMENTS AND RESULTS
CE200	STORMWATER DETAILS - SHEET 1
CE201	STORMWATER DETAILS - SHEET 2
CE202	STORMWATER DETAILS - SHEET 3
CE300	SOIL AND WATER MANAGEMENT PLAN
CE350	SOIL AND WATER MANAGEMENT DETAILS









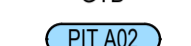
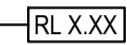



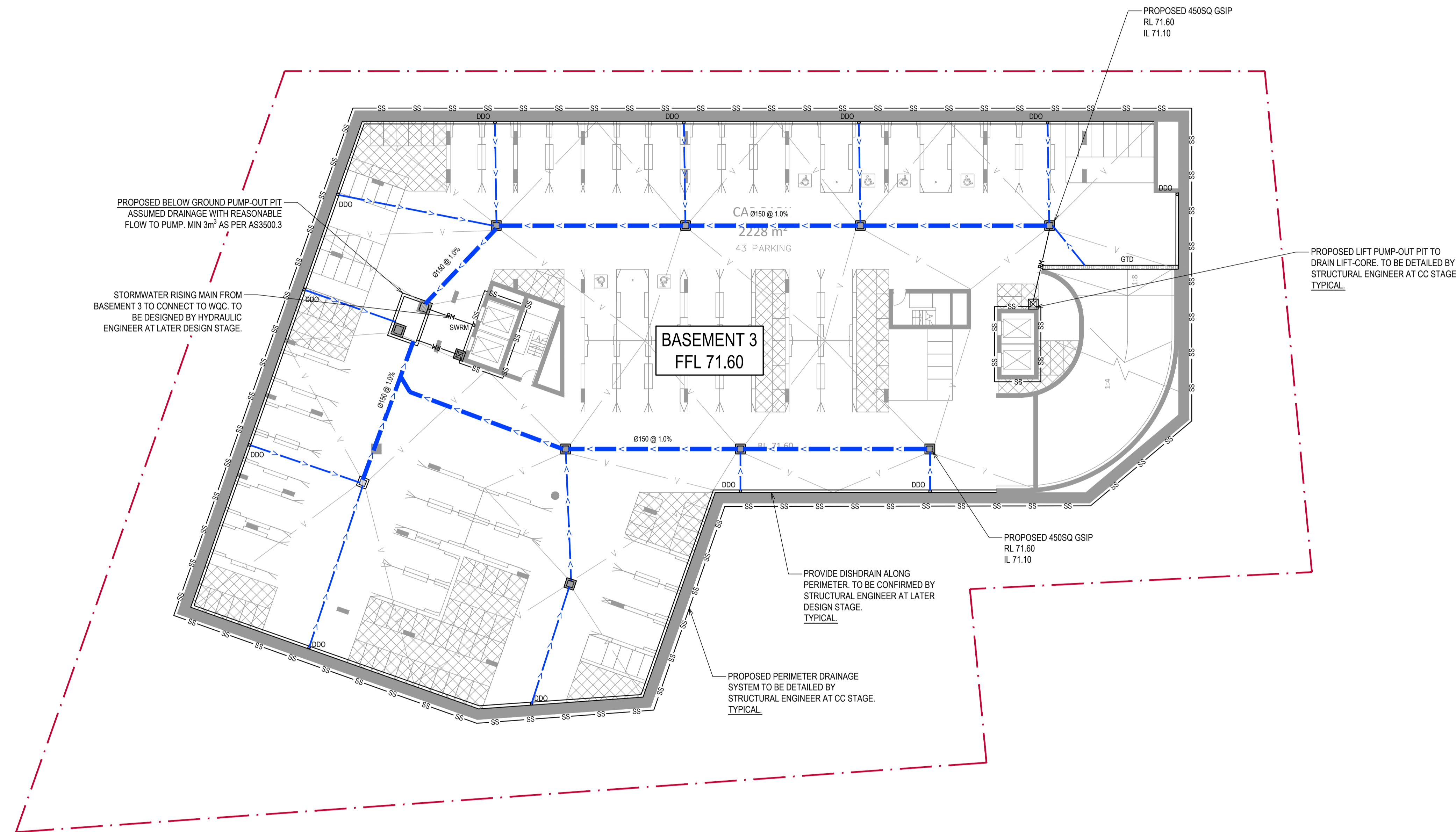
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APPROVAL

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E	ISSUE FOR SSDA APPROVAL	KC	30.09.2025	SUNDALE NORTHLAND DEVELOPMENT 5 BELMORE STREET, BURWOOD NSW 2134	ADP Consulting : Engineering	12-16 BENT ST, LINDFIELD	CIVIL ENGINEERING SERVICES	KC	KC	SS	SEP 2025	@	A1
D	ISSUE FOR SSDA APPROVAL	KC	30.07.2025	PTW ARCHITECTS 88 PHILIP STREET, SYDNEY NSW 2000		12-16 BENT STREET, LINDFIELD NSW 2070	COVER SHEET	Job Number	Drawing Number	Revision	North Point		
C	ISSUE FOR SSDA APPROVAL	KC	04.07.2025			SYD3409	CE000	E					
B	ISSUE FOR SSDA APPROVAL	KC	14.03.2025										
A	ISSUE FOR SSDA APPROVAL	KC	24.01.2025										

LEGEND

-  SITE BOUNDARY
-  PROPOSED STORMWATER PIPE
-  SUBSOIL PIPE
-  SUBSOIL PIPE
-  OUTLINE OF LEVEL BELOW
-  GRATED SURFACE INLET PIT
-  SEALED JUNCTION PIT
-  GRATED DRAIN
-  STORMWATER PIT NAME
-  FINISHED RL
-  STORMWATER RISING MAIN



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- NOTES:**
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 2. ALL REDUCED LEVELS ARE IN mAHD.
 3. SURVEY INFORMATION OBTAINED FROM MITCH AYRES SURVEYING'S DRAWING TITLED 'BOUNDARY DETAIL AND LEVEL SURVEY AT NO 12-16 BENT STREET LINDFIELD', DATED 08/07/2023.
 4. PROPOSED STORMWATER PIPES TO HAVE MINIMUM PIPE FALLS AS PER BELOW:
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 - B. DIAMETER = 225mm: 0.5% FALL
 5. SLAB/PAVEMENT TO HAVE MINIMUM 1% FALL TOWARDS STORMWATER INLETS AS PER AS2890 REQUIREMENTS.

APPROVAL

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C	ISSUE FOR SSDA APPROVAL
B	ISSUE FOR SSDA APPROVAL
A	ISSUE FOR SSDA APPROVAL

Initial	Date
KC	30.09.2025
KC	30.07.2025
KC	04.07.2025
KC	14.03.2025
KC	18.02.2025
KC	24.01.2025

Client
SUNDALE NORTHLAND DEVELOPMENT
5 BELMORE STREET, BURWOOD NSW 2134

Architect
PTW ARCHITECTS
88 PHILIP STREET, SYDNEY NSW 2000

Building Services Consultants

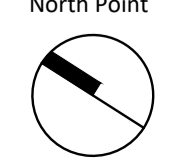
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
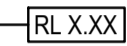

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Member Firm

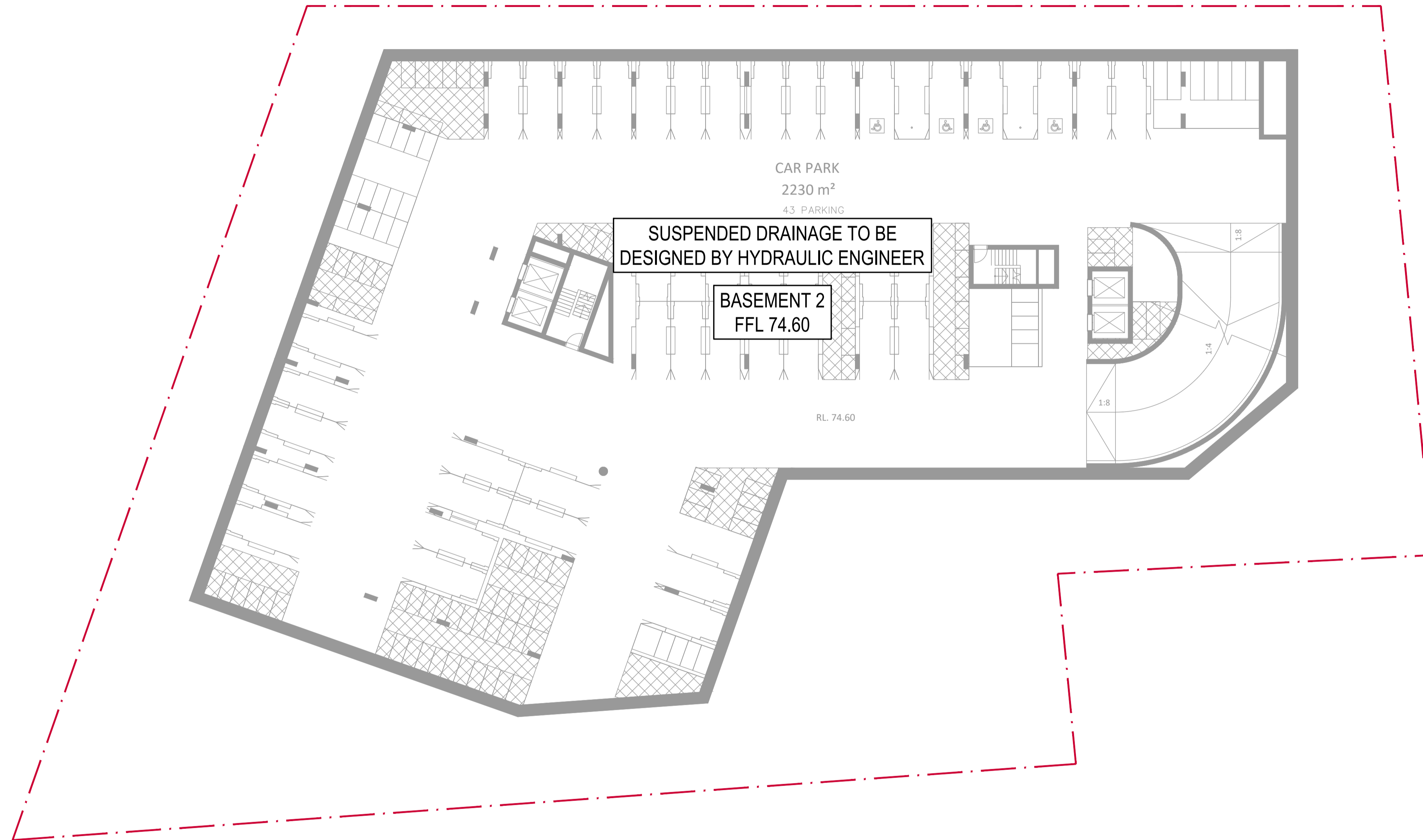
Project
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12-16 BENT STREET, LINDFIELD NSW 2070

Drawing Title
CIVIL ENGINEERING SERVICES
STORMWATER MANAGEMENT PLAN - BASEMENT 3

Drafted	Designed	Approved	Date	Scale	Sheet Size
KC	KC	SS	SEP 2025	1:200 @	A1
Job Number	Drawing Number	Revision	North Point		
SYD3409	CE100	F			

LEGEND

-  SITE BOUNDARY
-  PROPOSED STORMWATER PIPE
-  SUBSOIL PIPE
-  SUBSOIL PIPE
-  OUTLINE OF LEVEL BELOW
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Revision	Description
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D	ISSUE FOR SSDA APPROVAL
C	ISSUE FOR SSDA APPROVAL
B	ISSUE FOR SSDA APPROVAL
A	ISSUE FOR SSDA APPROVAL

Initial	Date	Client
KC	30.09.2025	SUNDALE NORTHLAND DEVELOPMENT 5 BELMORE STREET, BURWOOD NSW 2134
KC	30.07.2025	Architect
KC	04.07.2025	PTW ARCHITECTS 88 PHILIP STREET, SYDNEY NSW 2000
KC	18.02.2025	
KC	24.01.2025	

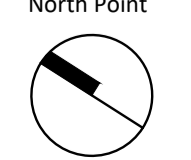
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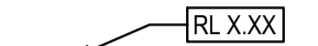

Project
12-16 BENT ST, LINDFIELD 12-16 BENT STREET, LINDFIELD NSW 2070

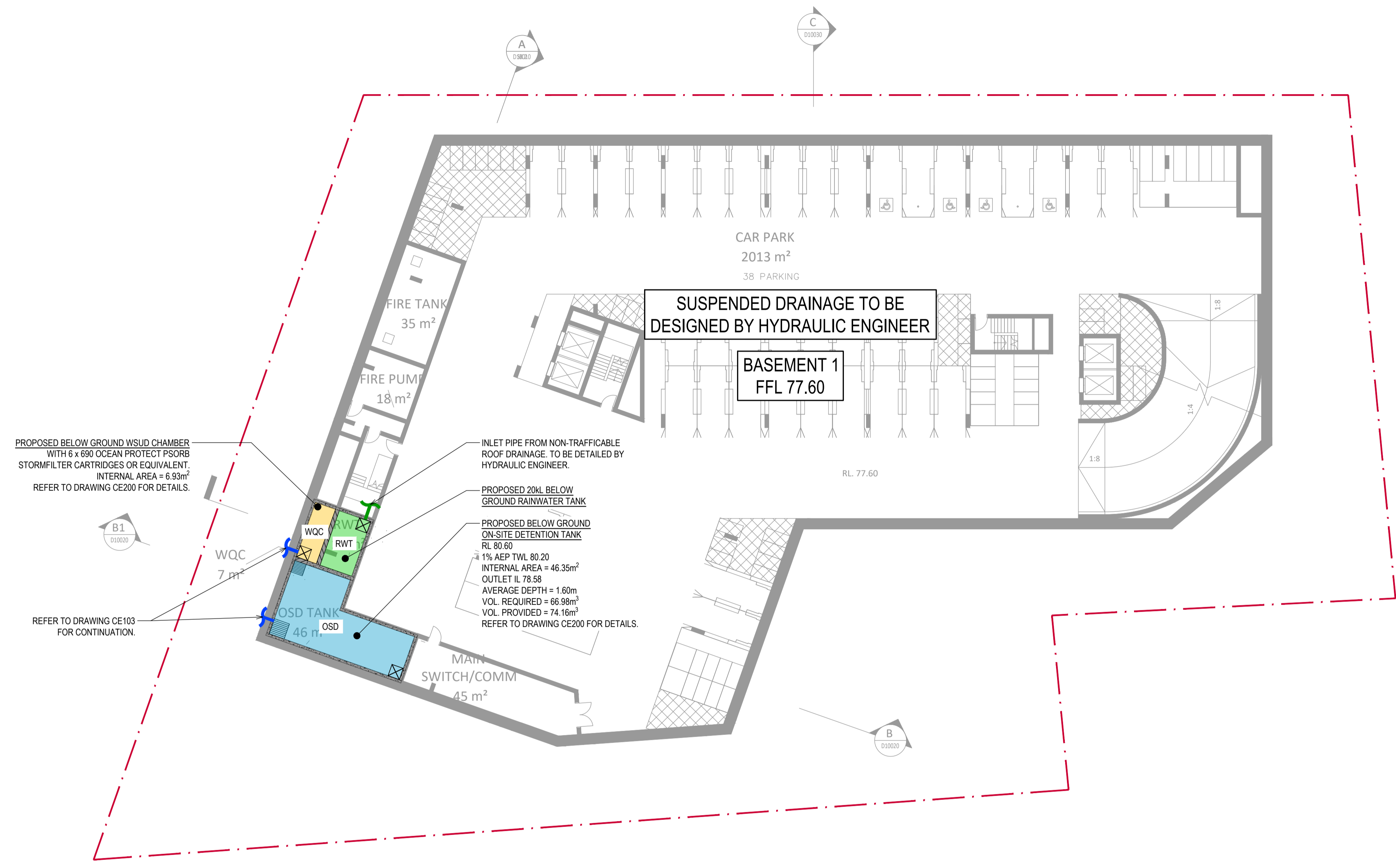
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CIVIL ENGINEERING SERVICES STORMWATER MANAGEMENT PLAN - BASEMENT 2

Drafted	Designed	Approved	Date	Scale	Sheet Size
KC	KC	SS	SEP 2025	1:200 @	A1
Job Number	Drawing Number	Revision	North Point		
SYD3409	CE101	E			

APPROVAL

LEGEND

-  SITE BOUNDARY
-  PROPOSED STORMWATER PIPE
-  SUBSOIL PIPE
-  SUBSOIL PIPE
-  OUTLINE OF LEVEL BELOW
-  GRATED SURFACE INLET PIT
-  SEALED JUNCTION PIT
-  GRATED DRAIN
-  STORMWATER PIT NAME
-  FINISHED RL
-  STORMWATER RISING MAIN



PROPOSED BELOW GROUND WSUD CHAMBER WITH 6 x 690 OCEAN PROTECT PSORB STORMFILTER CARTRIDGES OR EQUIVALENT. INTERNAL AREA = 6.93m². REFER TO DRAWING CE200 FOR DETAILS.

REFER TO DRAWING CE103 FOR CONTINUATION.

INLET PIPE FROM NON-TRAFFICABLE ROOF DRAINAGE. TO BE DETAILED BY HYDRAULIC ENGINEER.

PROPOSED 20KL BELOW GROUND RAINWATER TANK

PROPOSED BELOW GROUND ON-SITE DETENTION TANK
 RL 80.60
 1% AEP TWL 80.20
 INTERNAL AREA = 46.35m²
 OUTLET IL 78.58
 AVERAGE DEPTH = 1.60m
 VOL. REQUIRED = 66.98m³
 VOL. PROVIDED = 74.16m³
 REFER TO DRAWING CE200 FOR DETAILS.

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A	ISSUE FOR SSDA APPROVAL

Initial	Date
KC	30.09.2025
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Client
 SUNDALE NORTHLAND DEVELOPMENT
 5 BELMORE STREET, BURWOOD NSW 2134

Architect
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 88 PHILIP STREET, SYDNEY NSW 2000

Building Services Consultants

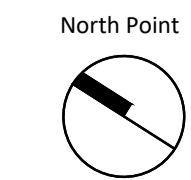
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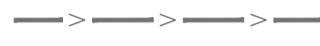
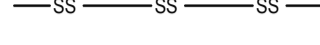


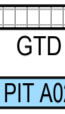
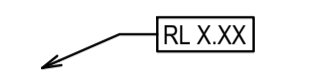

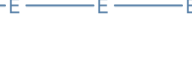





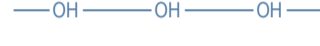
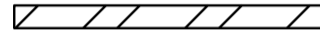




Project
 12-16 BENT ST, LINDFIELD
 12-16 BENT STREET, LINDFIELD NSW 2070

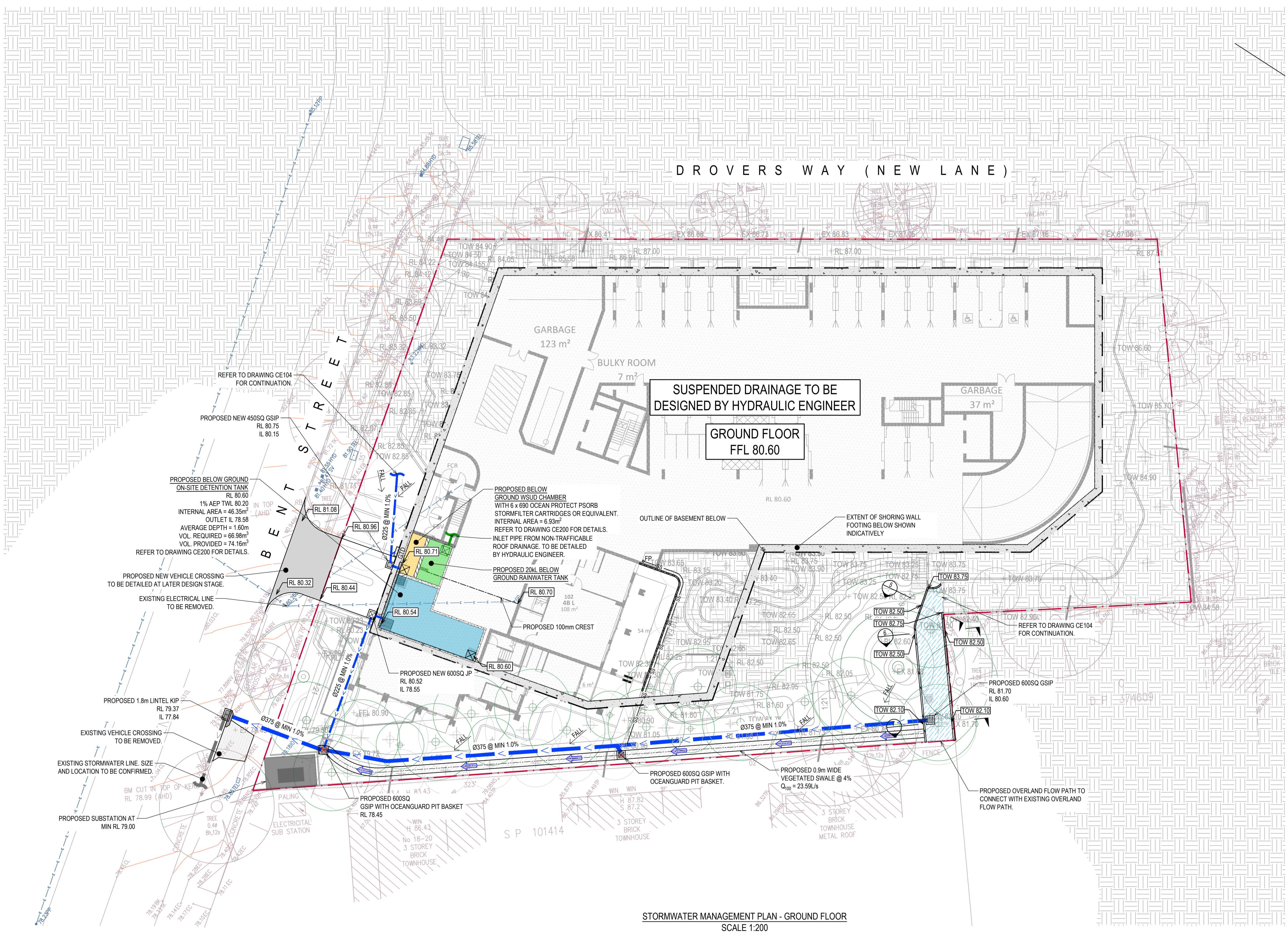
Drawing Title
 CIVIL ENGINEERING SERVICES
 STORMWATER MANAGEMENT PLAN - BASEMENT 1

Drafted	Designed	Approved	Date	Scale	Sheet Size
KC	KC	SS	SEP 2025	1:200 @	A1
Job Number	Drawing Number	Revision	North Point		
SYD3409	CE102	F			

APPROVAL

LEGEND

-  SITE BOUNDARY
-  35.50 EXISTING CONTOUR (0.Xm)
-  PROPOSED STORMWATER PIPE
-  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
-  RETAINING WALL
-  FLUSHING POINT
-  PROPOSED OVERLAND FLOW PATH



STORMWATER MANAGEMENT PLAN - GROUND FLOOR
SCALE 1:200

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Revision	Description
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Building Services Consultants

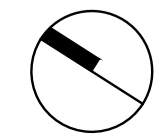
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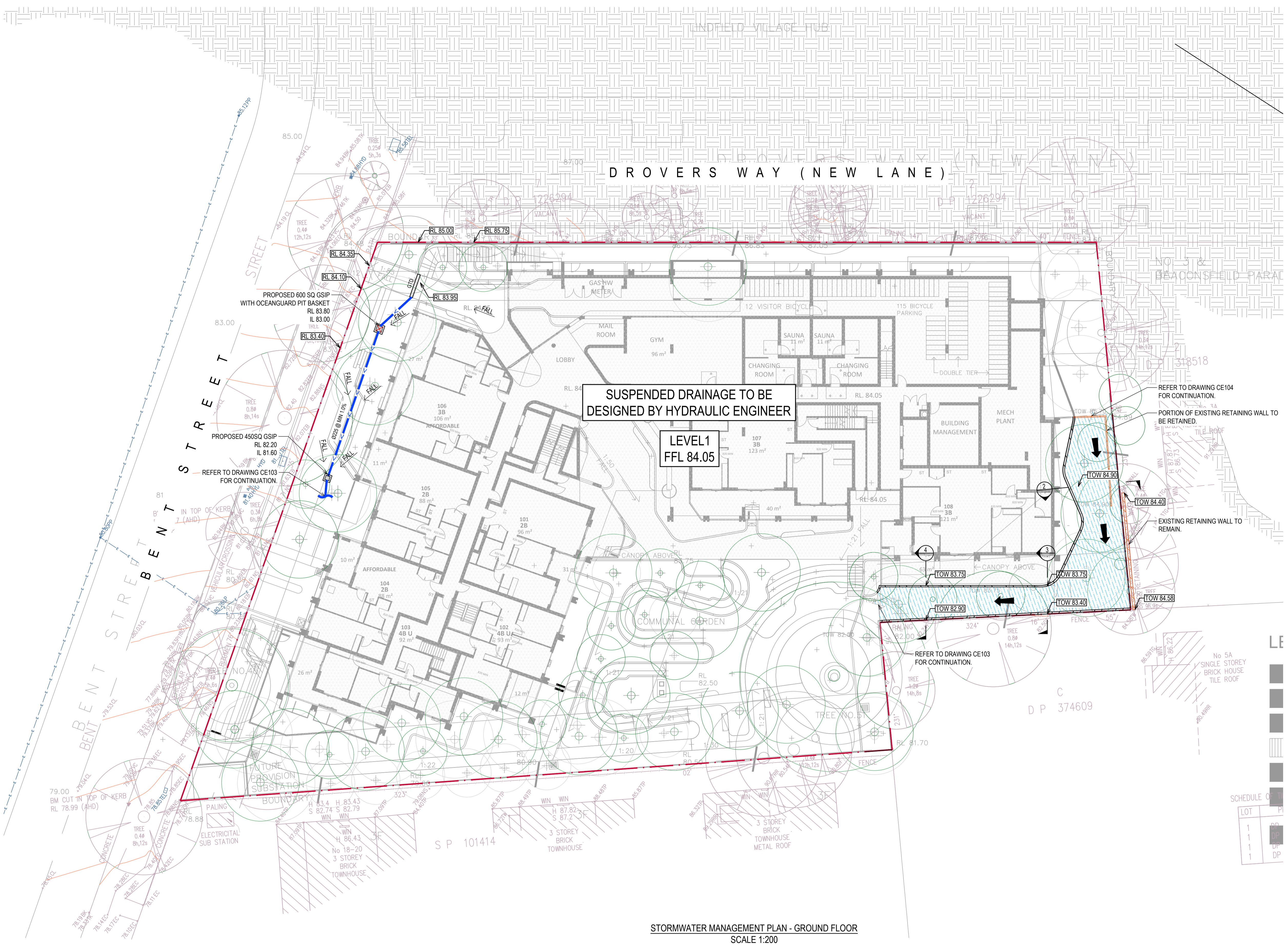


Project
12-16 BENT ST, LINDFIELD 12-16 BENT STREET, LINDFIELD NSW 2070

Drawing Title
CIVIL ENGINEERING SERVICES STORMWATER MANAGEMENT PLAN - GROUND FLOOR

Drafted	Designed	Approved	Date	Scale	Sheet Size
KC	KC	SS	SEP 2025	1:200 @	A1
Job Number	Drawing Number	Revision	North Point		
SYD3409	CE103	F			

APPROVAL



LEGEND

- SITE BOUNDARY
- 35.50 EXISTING CONTOUR (0.Xm)
- PROPOSED STORMWATER PIPE
- 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
- RETAINING WALL
- FLUSHING POINT
- PROPOSED OVERLAND FLOW PATH

SUSPENDED DRAINAGE TO BE DESIGNED BY HYDRAULIC ENGINEER

**LEVEL 1
FFL 84.05**

STORMWATER MANAGEMENT PLAN - GROUND FLOOR
SCALE 1:200

PRINTING NOTE:
THIS DRAWING TO BE PRINTED IN COLOUR.

- NOTES:**
1. ALL DIMENSIONS ARE IN mm UNLESS NOTED OTHERWISE.
 2. ALL REDUCED LEVELS ARE IN mAHD.
 3. SURVEY INFORMATION OBTAINED FROM MITCH AYRES SURVEYING'S DRAWING TITLED 'BOUNDARY DETAIL AND LEVEL SURVEY AT NO 12-16 BENT STREET LINDFIELD', DATED 08/07/2023.
 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.

A1 1:200

Revision	Description
F	ISSUE FOR SSDA APPROVAL
E	ISSUE FOR SSDA APPROVAL
D	ISSUE FOR SSDA APPROVAL
C	ISSUE FOR SSDA APPROVAL
B	ISSUE FOR SSDA APPROVAL
A	ISSUE FOR SSDA APPROVAL

Initial	Date	Client
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KC	30.07.2025	
KC	04.07.2025	
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Project
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Drawing Title
CIVIL ENGINEERING SERVICES
STORMWATER MANAGEMENT PLAN - LEVEL 1

Drafted	Designed	Approved	Date	Scale	Sheet Size
KC	KC	SS	SEP 2025	1:200 @	A1
Job Number	Drawing Number	Revision	North Point		
SYD3409	CE104	F			

APPROVAL



LEGEND

- SITE BOUNDARY
- 35.50 EXISTING CONTOUR (0.1m)
- PROPOSED STORMWATER PIPE
- 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
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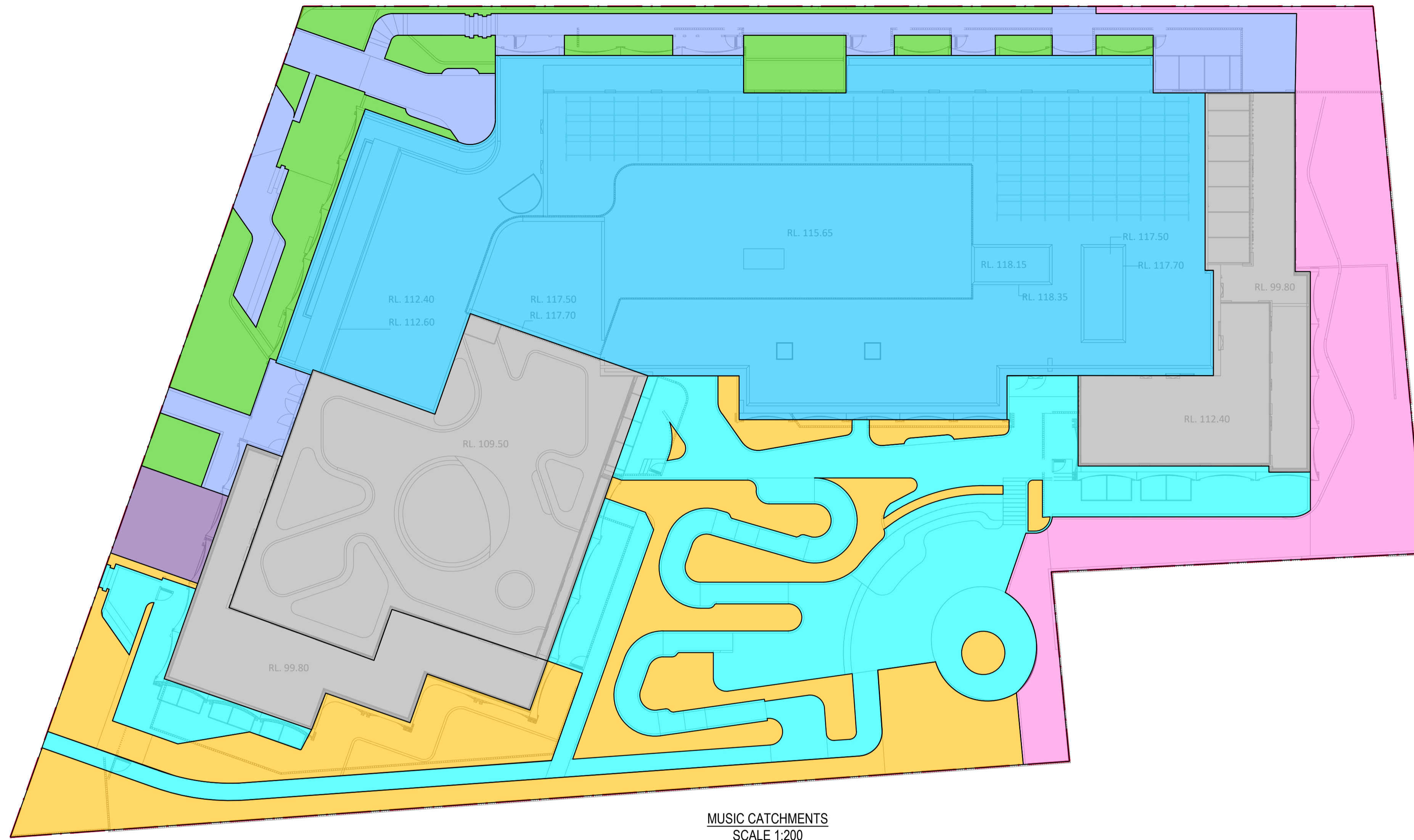
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Project
12-16 BENT ST, LINDFIELD
12-16 BENT STREET, LINDFIELD NSW 2070

Drawing Title
CIVIL ENGINEERING SERVICES
STORMWATER MANAGEMENT PLAN - LEVEL 2

APPROVAL

Drafted	Designed	Approved	Date	Scale	Sheet Size
KC	KC	SS	SEP 2025	1:200 @	A1
Job Number	Drawing Number	Revision	North Point		
SYD3409	CE105	F			



MUSIC CATCHMENTS
SCALE 1:200

LEGEND

[Grey Box]	TRAFFICABLE ROOF AREA DRAINING TO WSUD	= 823 m ²
[Blue Box]	NON-TRAFFICABLE ROOF AREA DRAINING TO RAINWATER TANK	= 1320 m ²
[Light Blue Box]	IMPERVIOUS AREA DRAINING TO OCEANGUARD THEN WSUD	= 235 m ²
[Purple Box]	DRIVEWAY AREA DRAINING TO WSUD	= 41 m ²
[Cyan Box]	IMPERVIOUS AREA DRAINING TO OCEANGUARD AND BYPASSING WSUD	= 647 m ²
[Yellow Box]	PERVIOUS AREA DRAINING TO OCEANGUARD AND BYPASSING WSUD	= 574 m ²
[Pink Box]	PERVIOUS AREA BYPASSING WSUD	= 407 m ²
[Green Box]	PERVIOUS AREA DRAINING TO WSUD	= 275 m ²

WATER BALANCE MODEL SUMMARY

IN ACCORDANCE KU-RING-GAI COUNCIL DCP PART 24C.4 TABLE 24C.4-1 THE DEVELOPMENT FALLS UNDER TYPE 5 CATEGORY AND MINIMUM RAINWATER TANK STORAGE IS REQUIRED TO ACHIEVE 50% REDUCTION IN RUNOFF DAYS, OR COMPLIANCE WITH BASIX, WHICHEVER IS THE GREATER.

BASED ON KU-RING-GAI COUNCIL MUSIC LINK REPORT AND WATER BALANCE MODEL 20,000 L RAINWATER TANK IS REQUIRED TO ACHIEVE THE WATER QUALITY TARGET AND 50% REDUCTION IN RUNOFF DAYS. THE FOLLOWING RAINWATER TANK RE-USE VALUES HAVE BEEN ADOPTED:

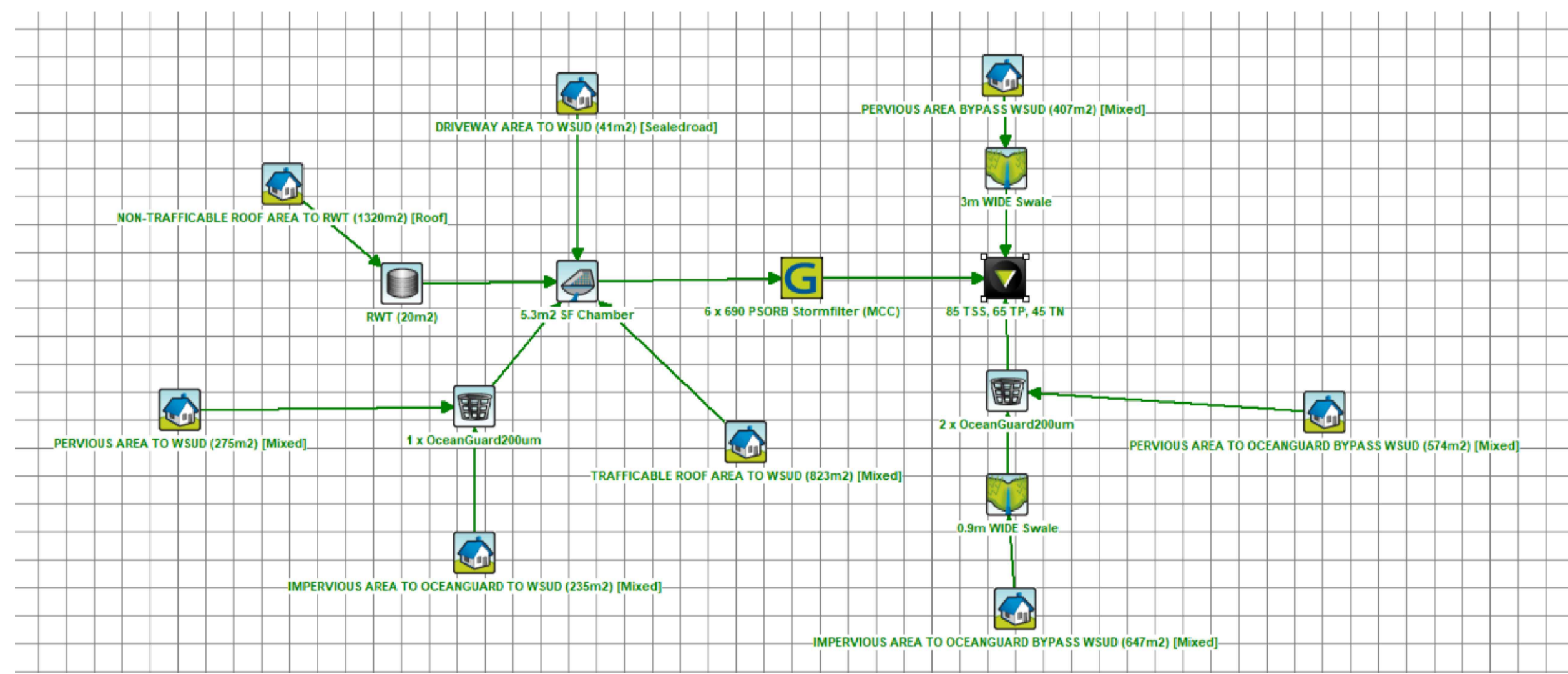
- ANNUAL DEMAND/OUTDOOR DEMAND FOR IRRIGATION PURPOSES = 300 KL/YEAR (BASED ON 100 KL/YEAR/LOT AS PER KU-RING-GAI COUNCIL'S MUSIC MODELLING GUIDELINES).
- DAILY DEMAND/INDOOR DEMAND ESTIMATED AS 208L/DAY (BASED ON 76 KL/YEAR/LOT AS PER KU-RING-GAI COUNCIL'S MUSIC MODELLING GUIDELINES) AND IS TO BE CONFIRMED BY ESD OR BASIX AT LATER DESIGN STAGE.

BASED ON RAINWATER TANK CAPACITY AND RE-USE VALUES ABOVE, 55% REDUCTION IN RUNOFF DAYS ARE ACHIEVED.

WATER QUALITY TARGETS

IN ACCORDANCE KU-RING-GAI COUNCIL DCP PART 24 - WATER MANAGEMENT, THE FOLLOWING POLLUTANT LOAD REDUCTION TARGETS WOULD NEED TO BE ACHIEVED:

- 85% TOTAL SUSPENDED SOLIDS
- 65% TOTAL PHOSPHORUS
- 45% TOTAL NITROGEN



MUSIC TREATMENT TRAIN AND RESULTS

	Sources	Residual Load	% Reduction
Flow (ML/yr)	4.17	3.9	6.6
Total Suspended Solids (kg/yr)	479	69.6	85.5
Total Phosphorus (kg/yr)	0.98	0.313	68.1
Total Nitrogen (kg/yr)	8.84	4.79	45.8
Gross Pollutants (kg/yr)	85.5	0	100

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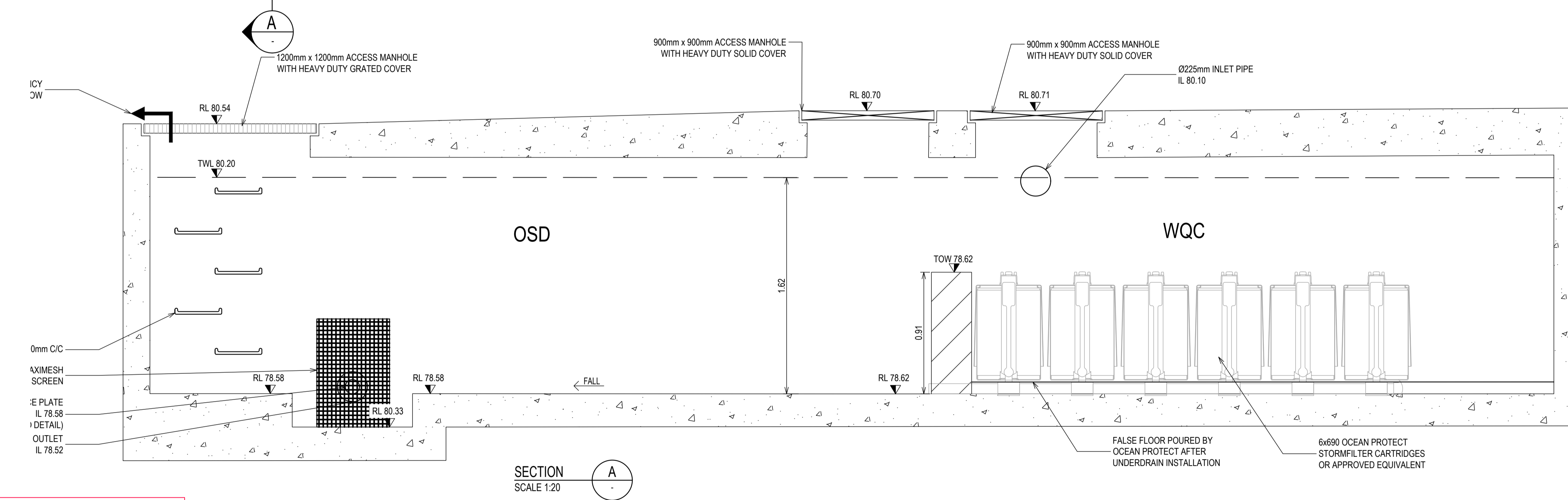
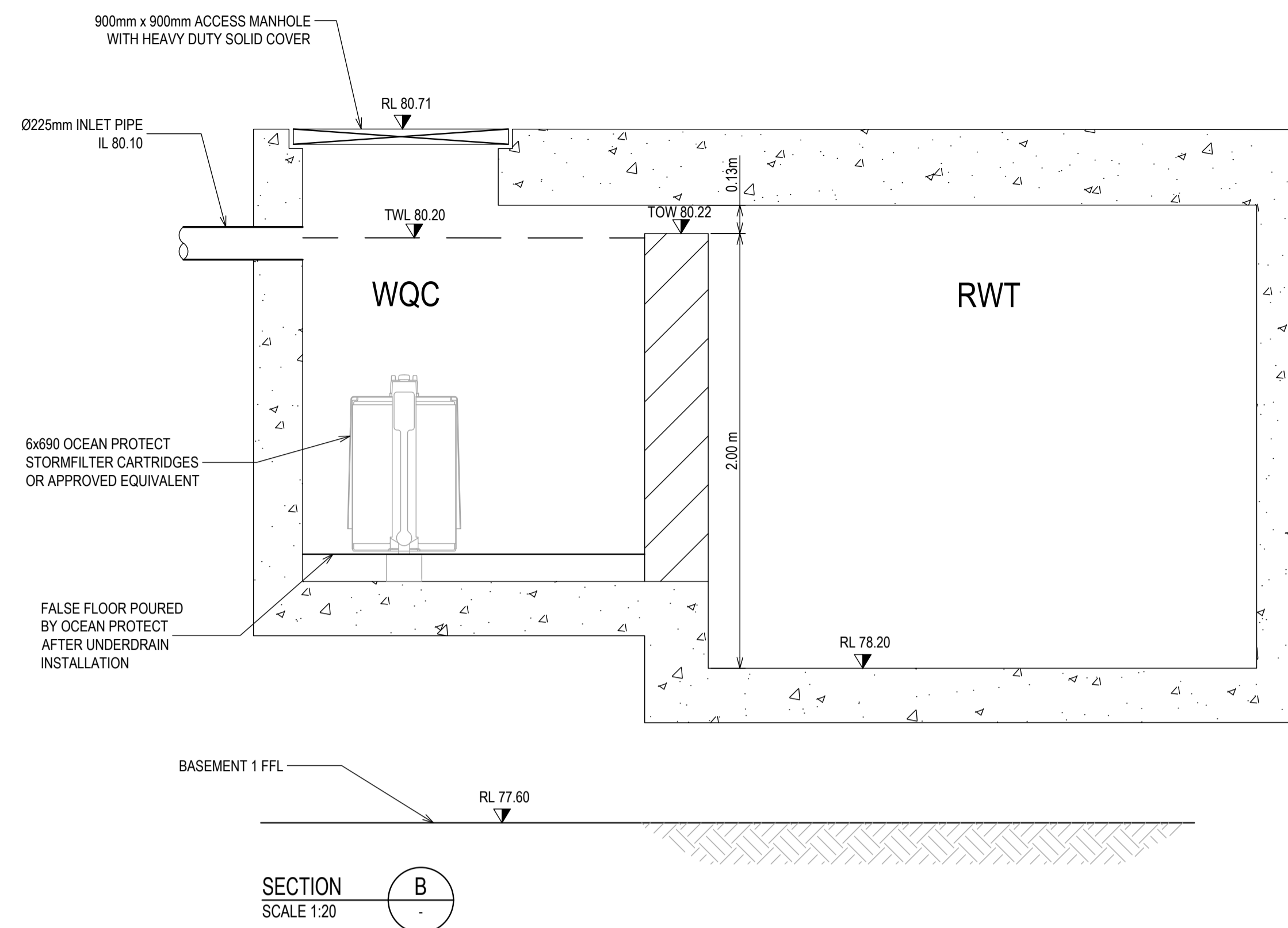
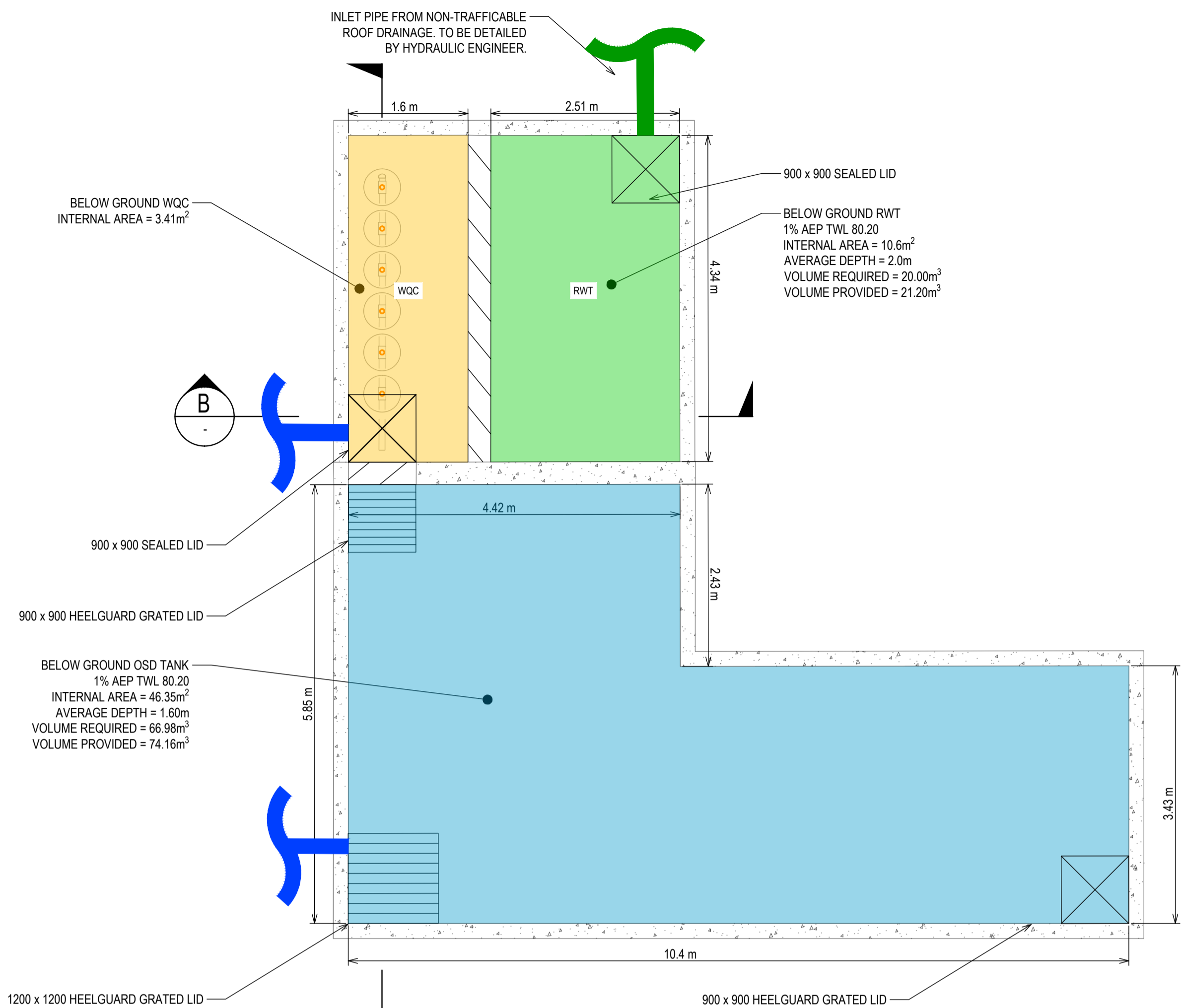
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Project
12-16 BENT ST, LINDFIELD
12-16 BENT STREET, LINDFIELD NSW 2070

Drawing Title
CIVIL ENGINEERING SERVICES
MUSIC CATCHMENTS AND RESULTS

APPROVAL

Drafted	Designed	Approved	Date	Scale	Sheet Size
KC	KC	SS	SEP 2025	1:200 @	A1
Job Number	Drawing Number	Revision	North Point		
SYD3409	CE150	F			

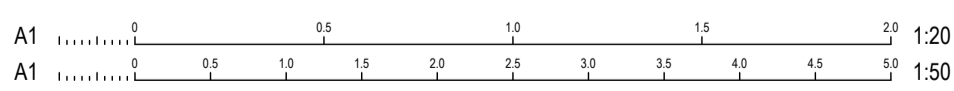


KU-RING-GAI OSD CALCULATION

ADDRESS: 12-16 BENT STREET, LINDFIELD

CATCHMENT DETAILS		LADY GAME CREEK	
1	CATCHMENT NAME:		
2	CATCHMENT DISCHARGE RATE	=	0.0147 l/sec/m ² A
3	CATCHMENT STORAGE RATE	=	0.0287 m ³ /m ² B
SITE DETAILS			
4	SITE AREA = 4324 m ²	60% OF SITE AREA	= 2593.2 m ² C
5	AREA(S) NOT DRAINING TO THE DETENTION SYSTEM	=	1815 m ²
6	TOTAL IMPERVIOUS AREA	=	3128 m ² D
7	IMPERVIOUS AREA BYPASSING DETENTION SYSTEM	=	601 m ² E
PERMITTED SITE DISCHARGE			
8	C [2593.2 m ²] x A [0.0147 l/sec/m ²]	=	38.12 l/sec FLOW 1
9	ADJUSTMENT FOR ANY UNCONTROLLED IMPERVIOUS FLOW E/	=	0.1921355 <0.25 F
10	FLOW 1 [38.12] l/sec x F [0.008]	=	7.32 l/sec FLOW 2
11	FLOW 1 [38.12] l/sec - FLOW 2 [0.305] l/sec	=	30.80 l/sec PSD
SITE STORAGE REQUIREMENT			
12	C [2593.2 m ²] x B [0.0287 m ³ /m ²]	=	74.42 m ³ SSR1
13	IF STORAGE IS IN LANDSCAPED BASIN SS1 x 1.2	=	89.31 m ³ SSR2
OUTLET CONTROL			
14	HEIGHT DIFFERENCE BETWEEN TOP WATER SURFACE LEVEL AND THE CENTRE OF ORIFICE	=	1.6 m G
15	ORIFICE DIAMETER	$21.8 \times \sqrt{\frac{PSD}{G}}$	= 107.57 mm OD
RAINWATER TANK OFFSET			
UP TO 10% OF THE TOTAL SSR CAN BE OFFSET BY		0.9 x SSR [74.42]	= 66.982356 m ³ SSR
PSD	=	PERMITTED SITE DISCHARGE	
SSR1	=	SITE STORAGE REQUIREMENT (EXCEPT FOR LANDSCAPED BASINS)	
SSR2	=	SITE STORAGE REQUIREMENT (LANDSCAPED BASINS)	
OD	=	ORIFICE DIAMETER	

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Architect
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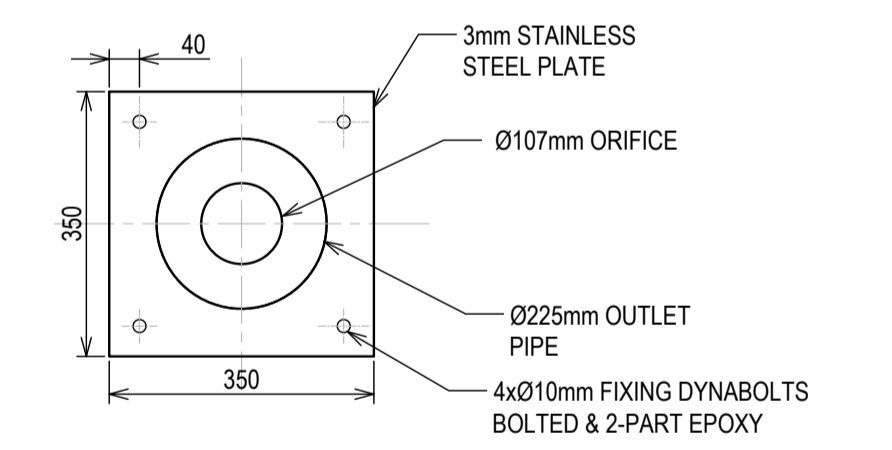
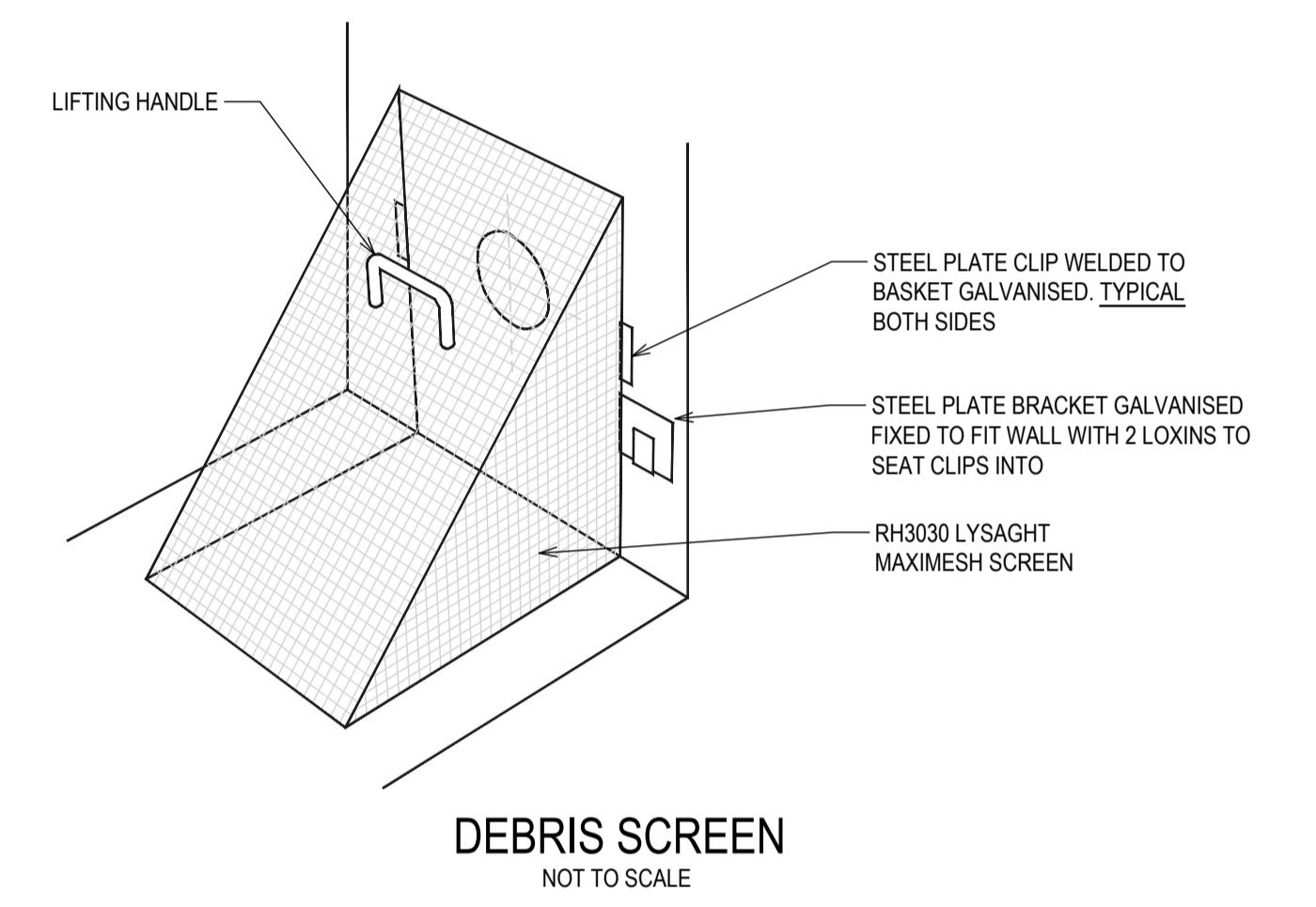
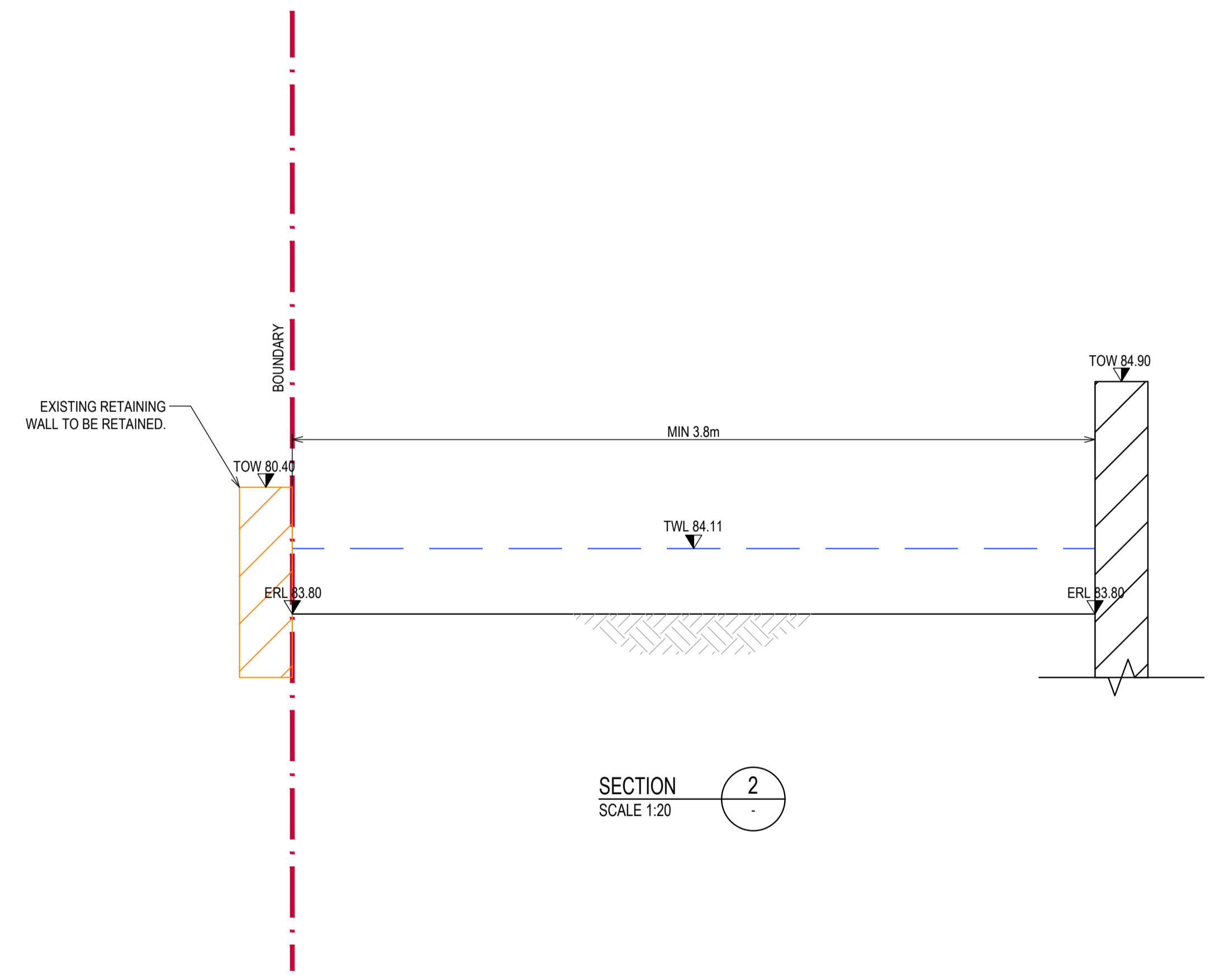
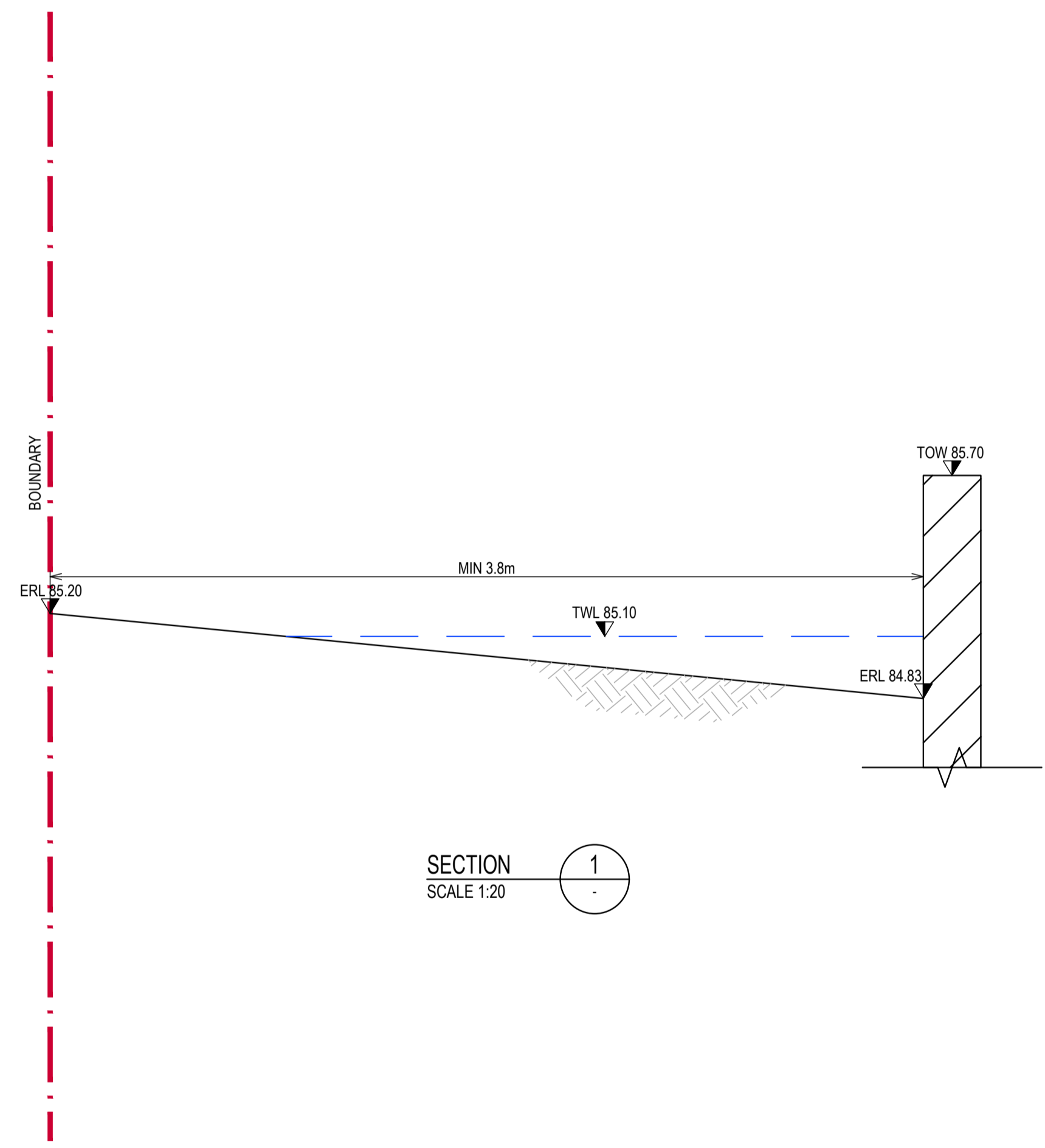
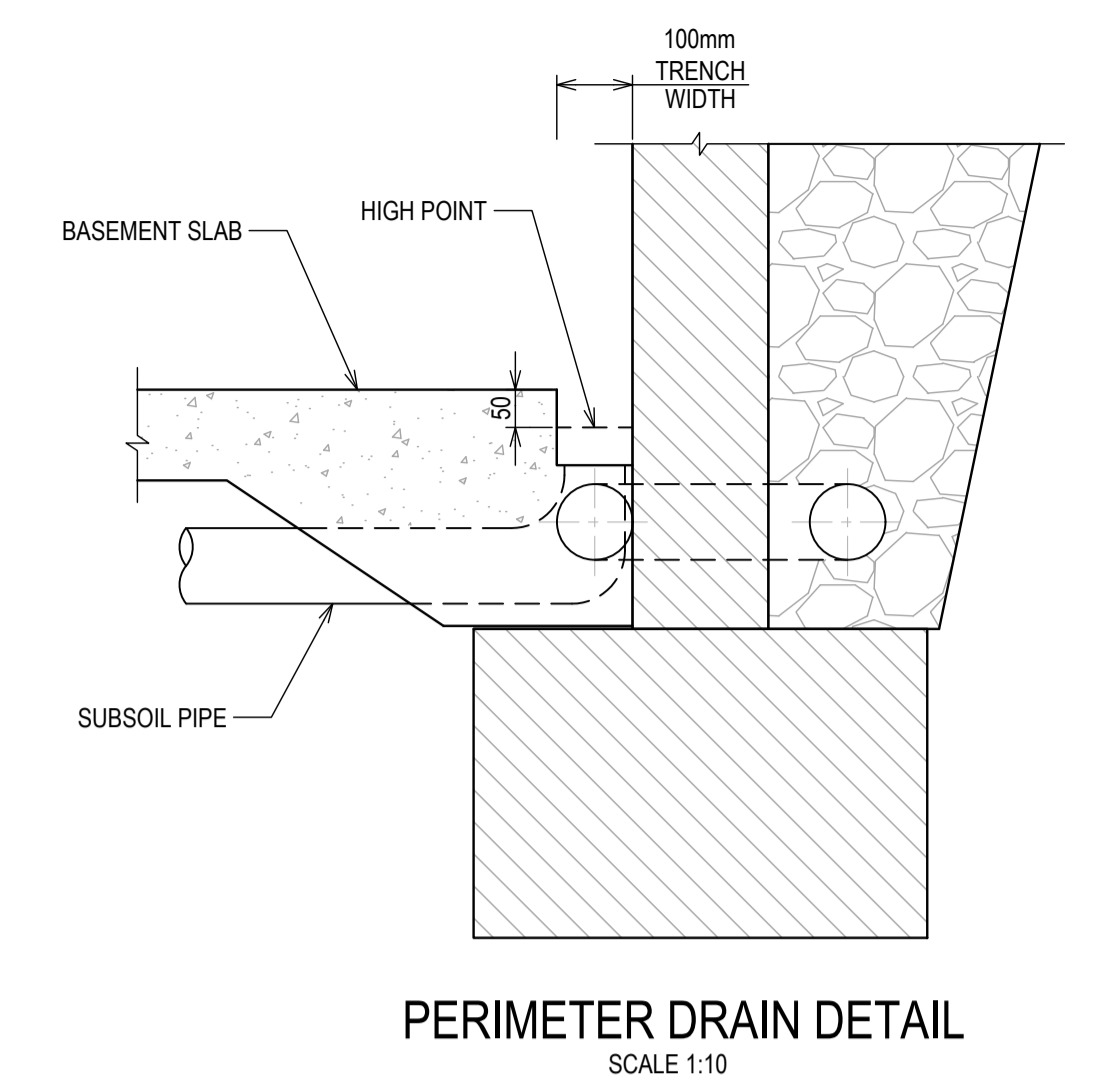
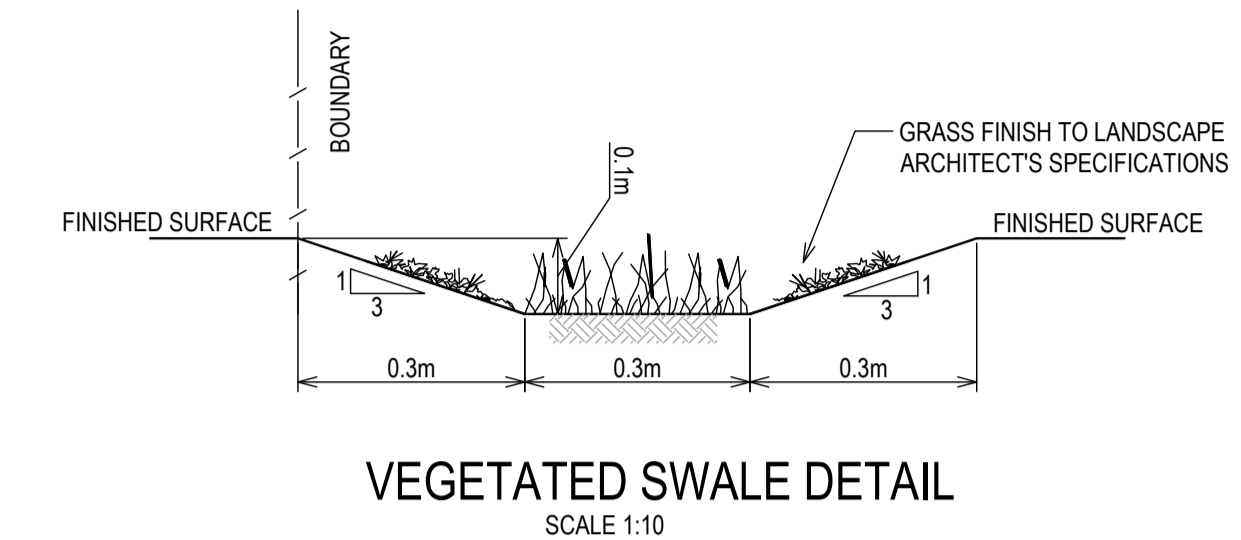
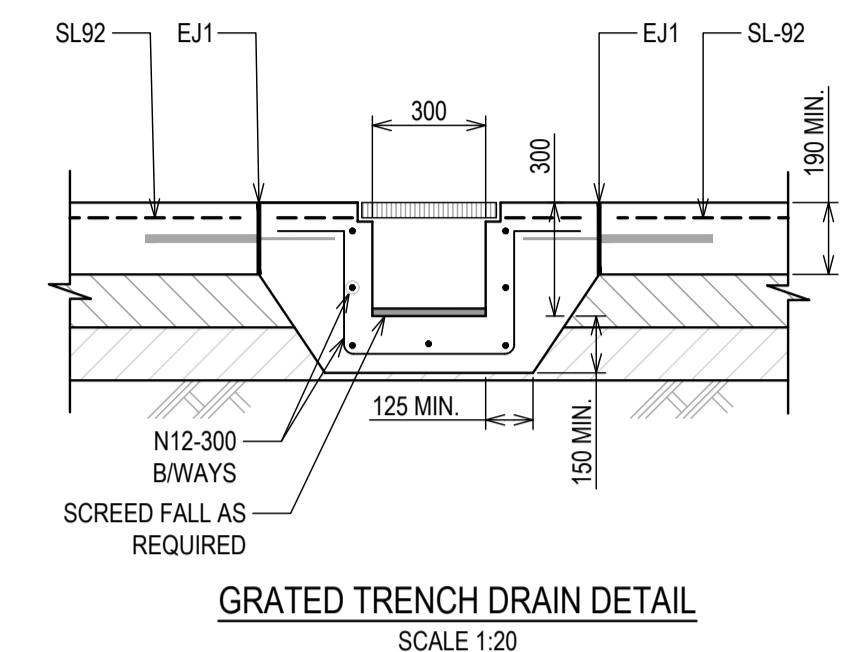
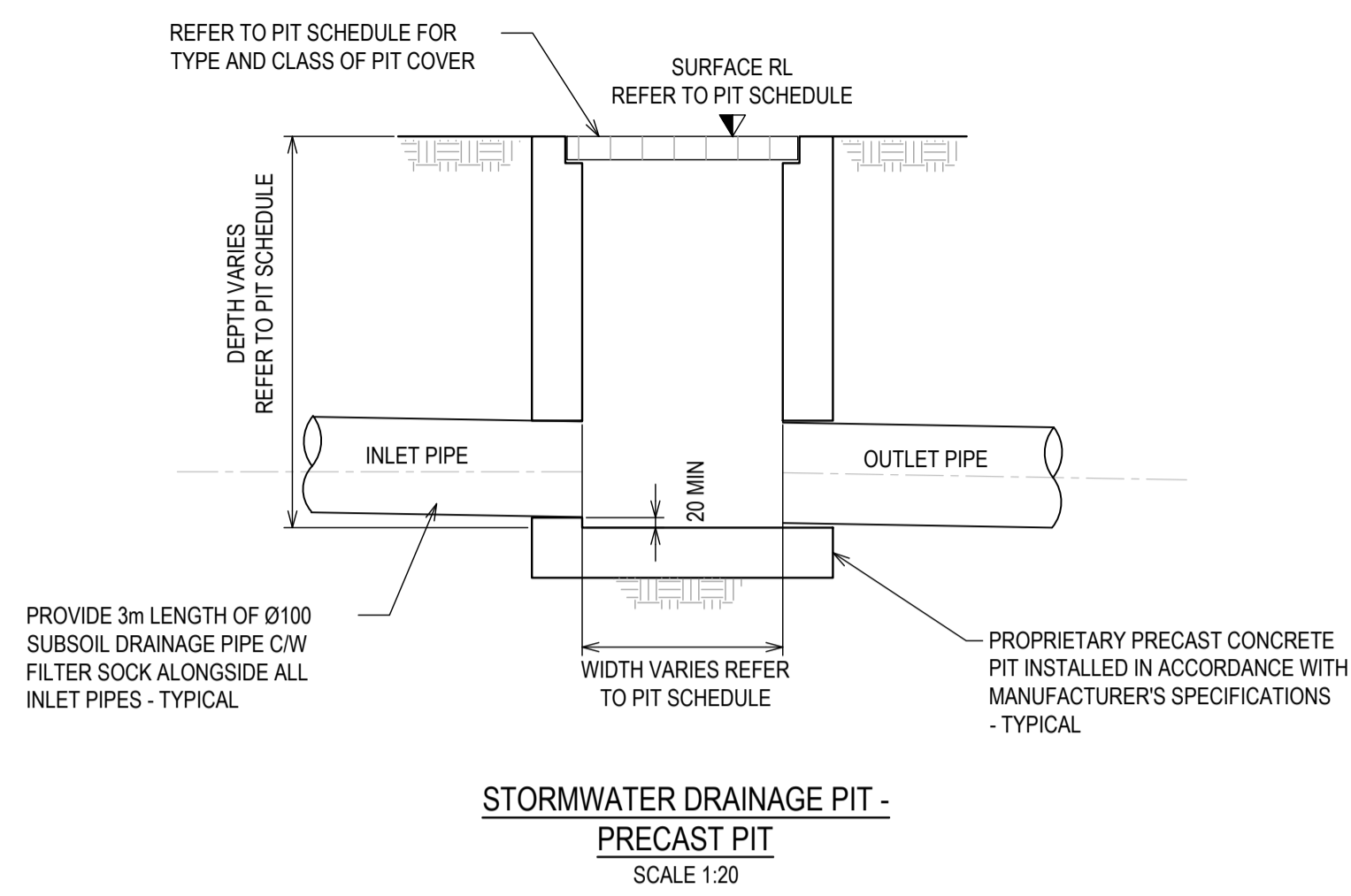
CONSULT AUSTRALIA
Member Firm

Project
12-16 BENT ST, LINDFIELD
12-16 BENT STREET, LINDFIELD NSW 2070

Drawing Title
CIVIL ENGINEERING SERVICES
STORMWATER DETAILS - SHEET 1

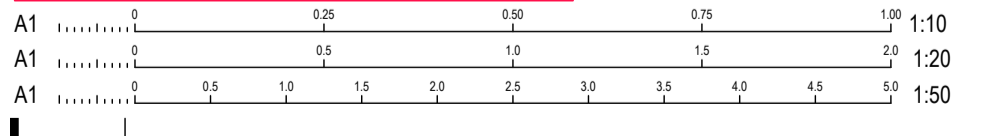
APPROVAL

Drafted	Designed	Approved	Date	Scale	Sheet Size
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SYD3409	CE200	F			



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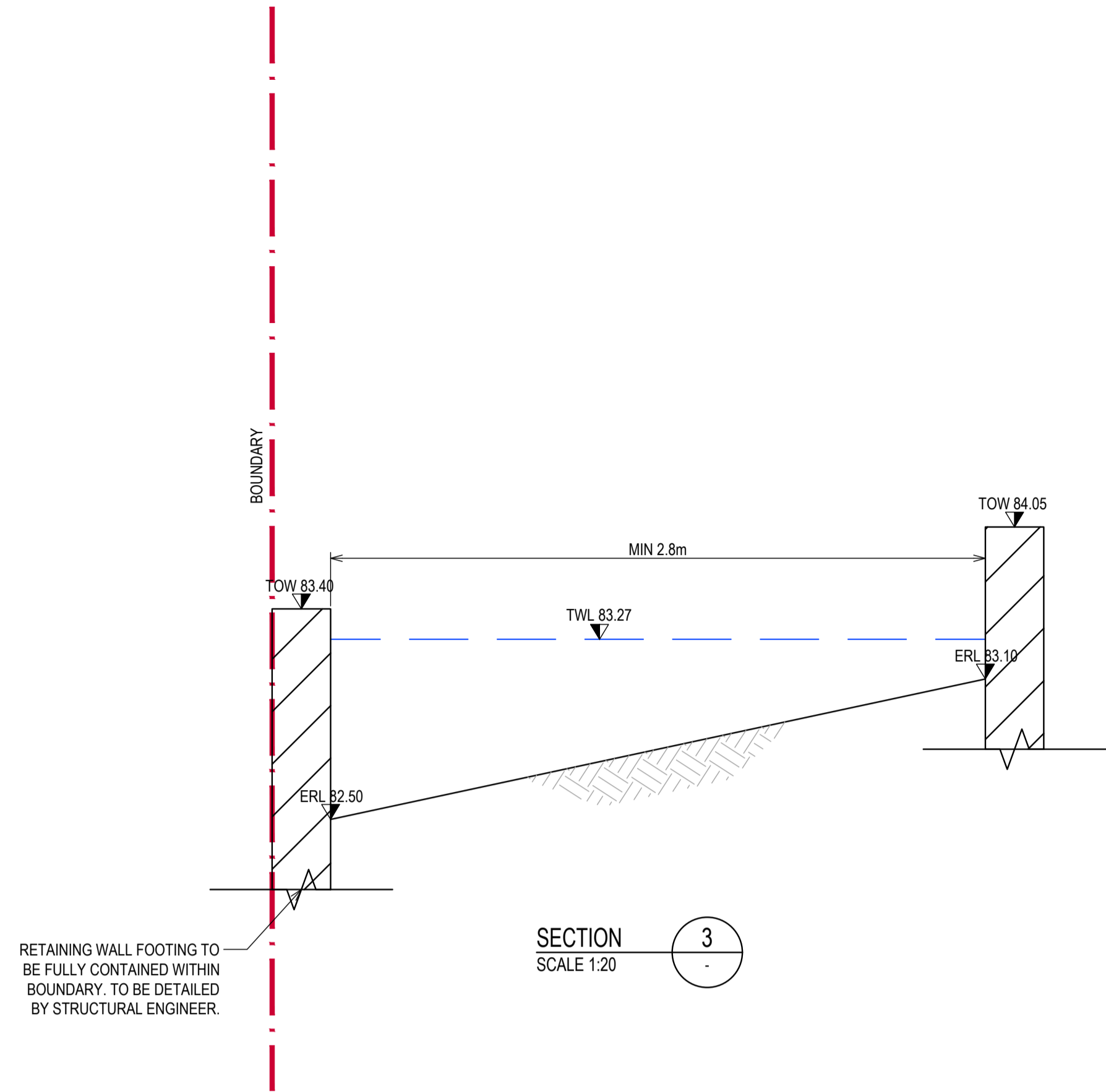
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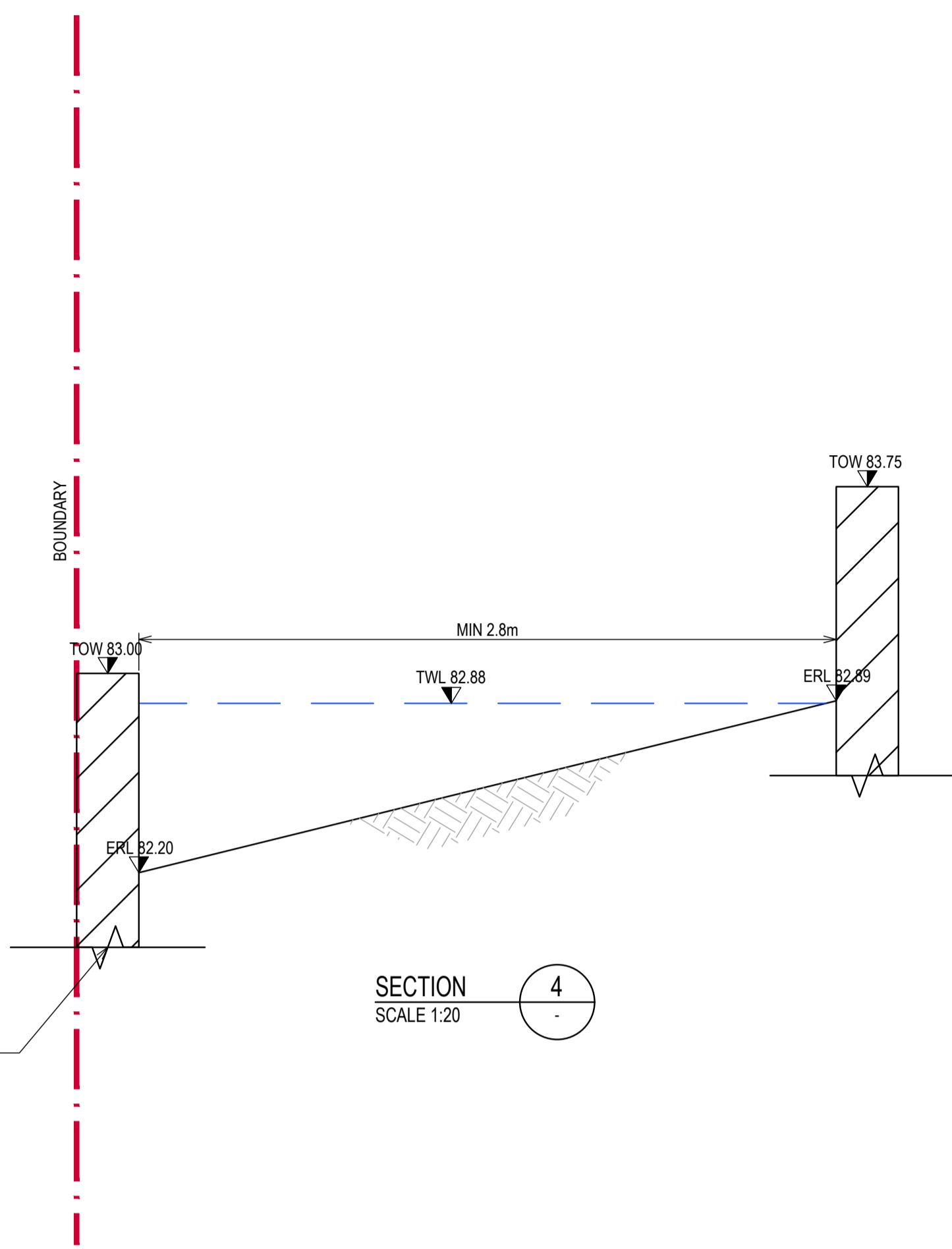
Drawing Title
CIVIL ENGINEERING SERVICES
STORMWATER DETAILS - SHEET 2

Drafted	Designed	Approved	Date	Scale	Sheet Size
KC	KC	SS	SEP 2025	AS SHOW	A1
Job Number	Drawing Number	Revision	North Point		
SYD3409	CE201	E			

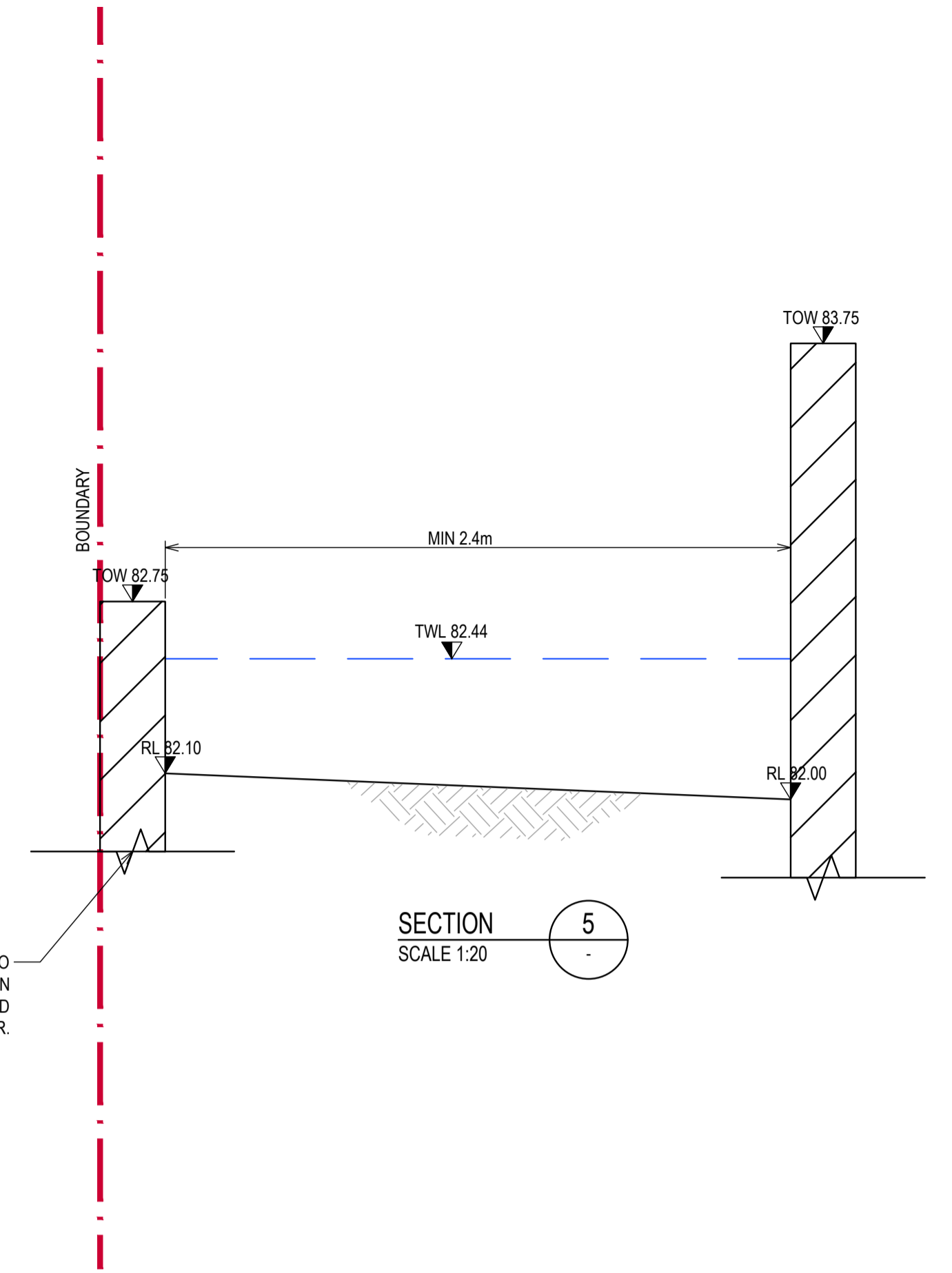
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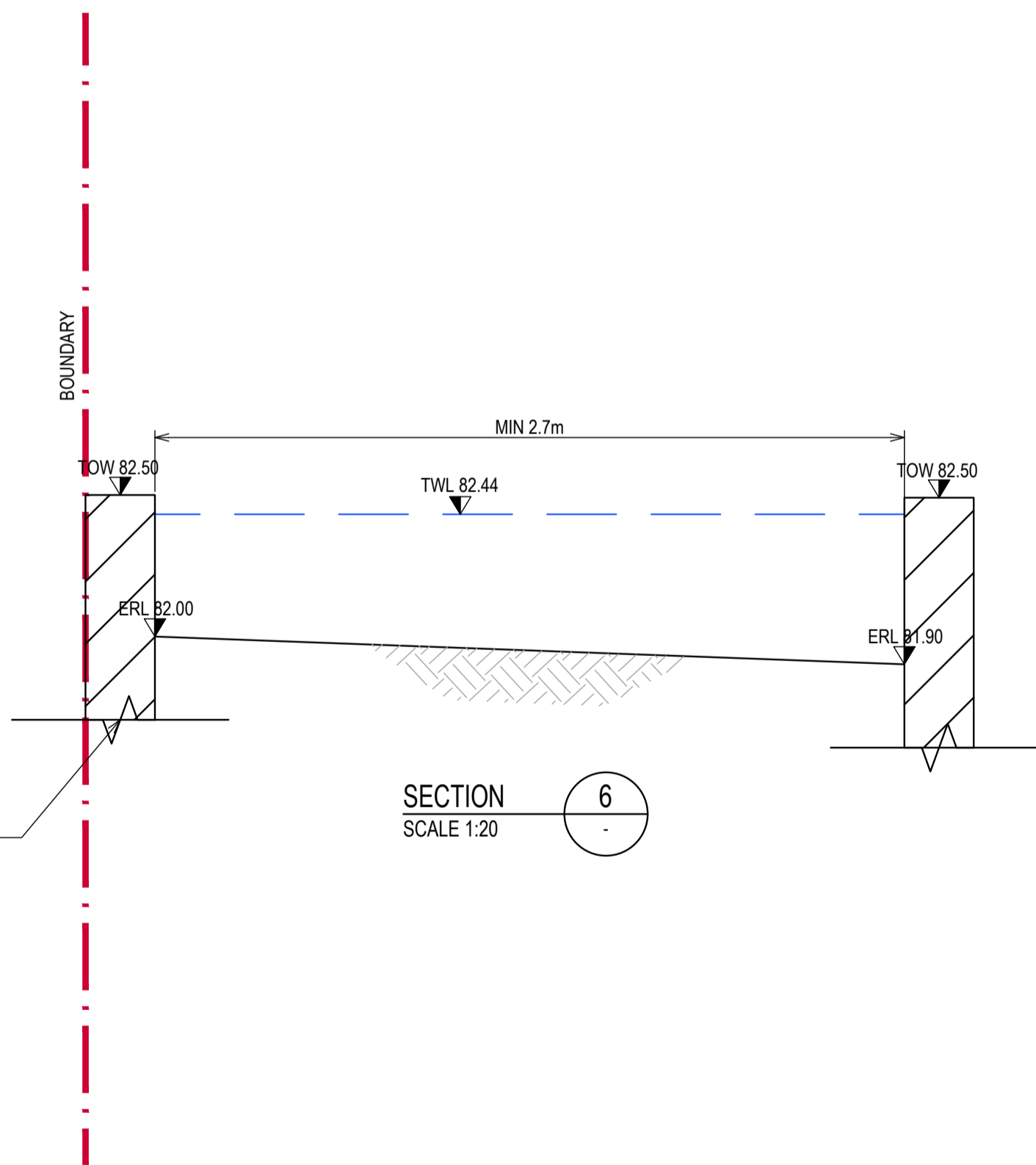
SECTION 3
SCALE 1:20



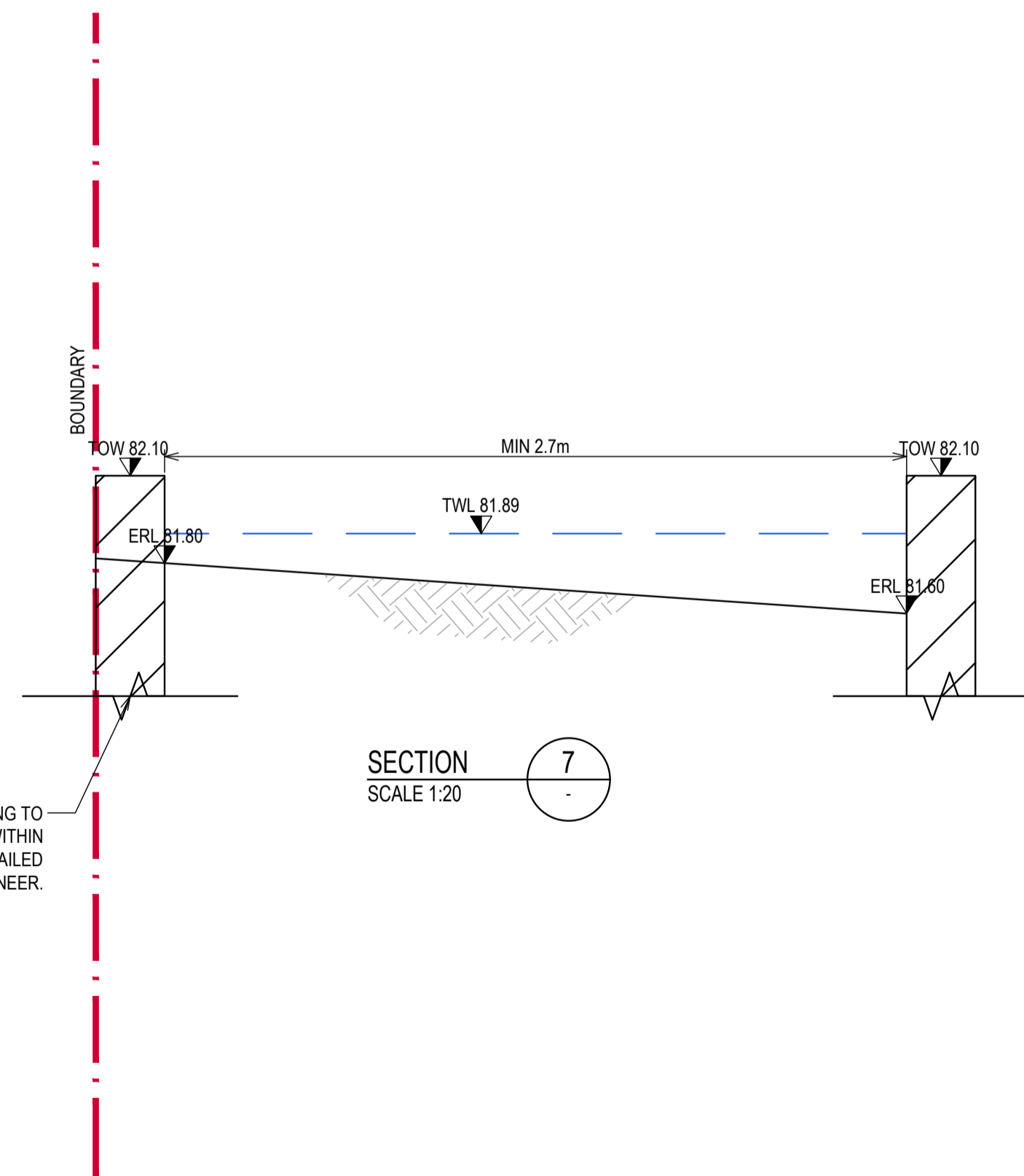
SECTION 4
SCALE 1:20



SECTION 5
SCALE 1:20



SECTION 6
SCALE 1:20



SECTION 7
SCALE 1:20

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A1 0 5 10 15 20 1:20

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88 PHILIP STREET, SYDNEY NSW 2000

Building Services Consultants



Project
12-16 BENT ST, LINDFIELD
12-16 BENT STREET, LINDFIELD NSW 2070

Drawing Title
CIVIL ENGINEERING SERVICES
STORMWATER DETAILS - SHEET 3

Drafted	Designed	Approved	Date	Scale	Sheet Size
KC	KC	SS	SEP 2025	1:20 @	A1
Job Number	Drawing Number	Revision	North Point		
SYD3409	CE202	F			

APPROVAL

LEGEND

	SITE BOUNDARY
	EXISTING CONTOUR (0.0Xm)
	EXISTING STRUCTURES TO BE DEMOLISHED
	SEDIMENT FENCE
	TEMPORARY CATCH DRAIN
	TEMPORARY DRAINAGE PIPE
	SAND BAG
	FLOW DIRECTION
	ROCK CHECK DAM
	EXISTING SEWER LINE
	EXISTING WATER MAIN
	EXISTING TELECOMMUNICATION LINE
	EXISTING GAS MAIN
	EXISTING ELECTRICAL MAIN
	PROPOSED STOCKPILE LOCATION WITH SEDIMENT FENCE
	SEDIMENT BASIN
	STABILISED SITE ACCESS
	EXISTING TREE TO REMAIN
	EXISTING TREE TO BE REMOVED

RUSLE CALCULATION

REVISED UNIVERSAL SOIL LOSS EQUATION:
 $R = 164.74 \cdot (1.1177)^S \cdot S^{0.8444}$
 $R = 2718$
 WHERE,
 $S = 11.2 \text{ mm/hr}$
 $A = R \cdot K \cdot LS \cdot P \cdot C \text{ (t/ha/yr)}$
 $A = 749.08 \text{ t/ha/yr}$
 WHERE,
 $K = 0.08 \text{ (ASSUMED)}$
 $LS = 750 / (1.3 \cdot R \cdot K)$
 $LS = 2.65$
 $P = 1.3$
 $C = 1$
 SITE AREA = 0.4324 ha
 THEREFORE, AS PER TABLE 4.2 OF LANDCOM BLUE BOOK
 EROSION HAZARD = HIGH HAZARD

SEDIMENT BASIN CALCULATION

SOIL TYPE ASSUMED TO BE TYPE D OR F
 RAINFALL DEPTH = 67.4 mm (2yR ARI, 6hr EVENT)
 $CV = 0.79 \text{ (TABLE F.2)}$
 $A = 0.4324 \text{ ha}$
 $R_{1\% \text{ DAY}} = 23.4 \text{ mm (TABLE 6.3A)}$
 $\text{SETTLING ZONE} = 10 \cdot CV \cdot A \cdot R$
 $= 79.93 \text{ m}^3$
 $\text{SEDIMENT STORAGE ZONE} = 39.97 \text{ m}^3$
 (50% OF SETTLING ZONE CAPACITY)
 $\text{TOTAL SEDIMENT BASIN VOLUME} = 119.90 \text{ m}^3$

NOTES:
 THE EROSION AND SEDIMENT CONTROL PLAN IS A CONCEPT PLAN DEMONSTRATING AN APPROACH TO EROSION & SEDIMENTATION CONTROL FOR THE SITE. IT IS THE CONTRACTOR RESPONSIBILITY TO PROVIDE AN EROSION & SEDIMENT CONTROL PLAN (ESCP) AND A COMPLETED DESIGN CERTIFICATE FROM A CPESC PRIOR TO COMMENCEMENT OF WORK. CERTIFICATION MUST BE UNDERTAKEN BY A SUITABLY QUALIFIED, EXPERIENCE PROFESSIONAL NOT DIRECTLY EMPLOYED BY THE PRINCIPAL.

- NOTES:
- ALL DIMENSIONS ARE IN mm UNLESS NOTED OTHERWISE.
 - ALL REDUCED LEVELS ARE IN mAHD.
 - SURVEY INFORMATION OBTAINED FROM MITCH AYRES SURVEYING'S DRAWING TITLED 'BOUNDARY DETAIL AND LEVEL SURVEY AT NO 12-16 BENT STREET LINDFIELD', DATED 08/07/2023.
 - NO WORKS ARE TO OCCUR OUTSIDE THE SITE PROPERTY BOUNDARY UNLESS PRIOR APPROVAL IS PROVIDED BY COUNCIL.
 - REFER TO DRAWING CE350 FOR EROSION AND SEDIMENT CONTROL CONSTRUCTION SEQUENCE AND GENERAL INSTRUCTIONS NOTES.

SOIL AND WATER MANAGEMENT PLAN
 SCALE 1:200

PRINTING NOTE:
 THIS DRAWING TO BE PRINTED IN COLOUR.

Revision	Description
E	ISSUE FOR SSSA APPROVAL
D	ISSUE FOR SSSA APPROVAL
C	ISSUE FOR SSSA APPROVAL
B	ISSUE FOR SSSA APPROVAL
A	ISSUE FOR SSSA APPROVAL

Initial	Date	Client
KC	30.09.2025	SUNDALE NORTHLAND DEVELOPMENT 5 BELMORE STREET, BURWOOD NSW 2134
KC	30.07.2025	
KC	04.07.2025	Architect PTW ARCHITECTS 88 PHILIP STREET, SYDNEY NSW 2000
KC	14.03.2025	
KC	24.01.2025	

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Project
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Drawing Title
CIVIL ENGINEERING SERVICES
 SOIL AND WATER MANAGEMENT PLAN

APPROVAL

Drafted	Designed	Approved	Date	Scale	Sheet Size
KC	KC	SS	SEP 2025	1:200 @	A1
Job Number	Drawing Number	Revision	North Point		
SYD3409	CE300	E			

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