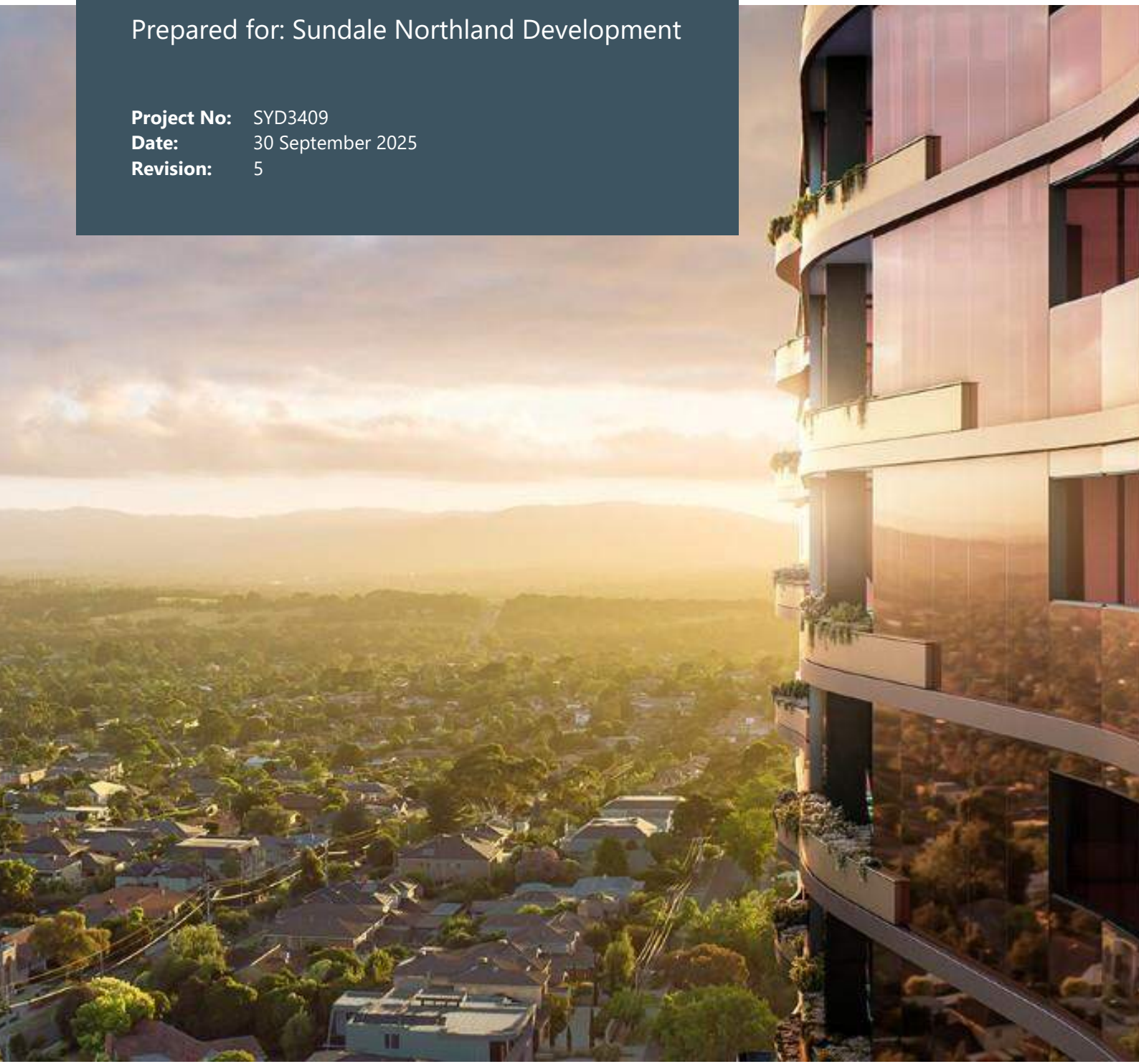


# 12-16 Bent Street, Lindfield

## Flood Impact Risk Assessment

Prepared for: Sundale Northland Development

**Project No:** SYD3409  
**Date:** 30 September 2025  
**Revision:** 5



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**Project:** 12-16 Bent Street, Lindfield  
**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:** 5  
**Date:** 30 September 2025

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Rev	Date	Comment	Author	Signature	Technical Review	Signature	Authorisation & QA	Signature
1	28/02/25		AA		SS		SS	
2	17/03/25		AA		SS		SS	
3	04/07/25		KC		SS		SS	
4	04/08/25		KC		SS		SS	
5	30/09/25		KC		SS		SS	

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**Project Team**

**Client / Principal** Sundale Northland Development

**Architect** PTW Architects

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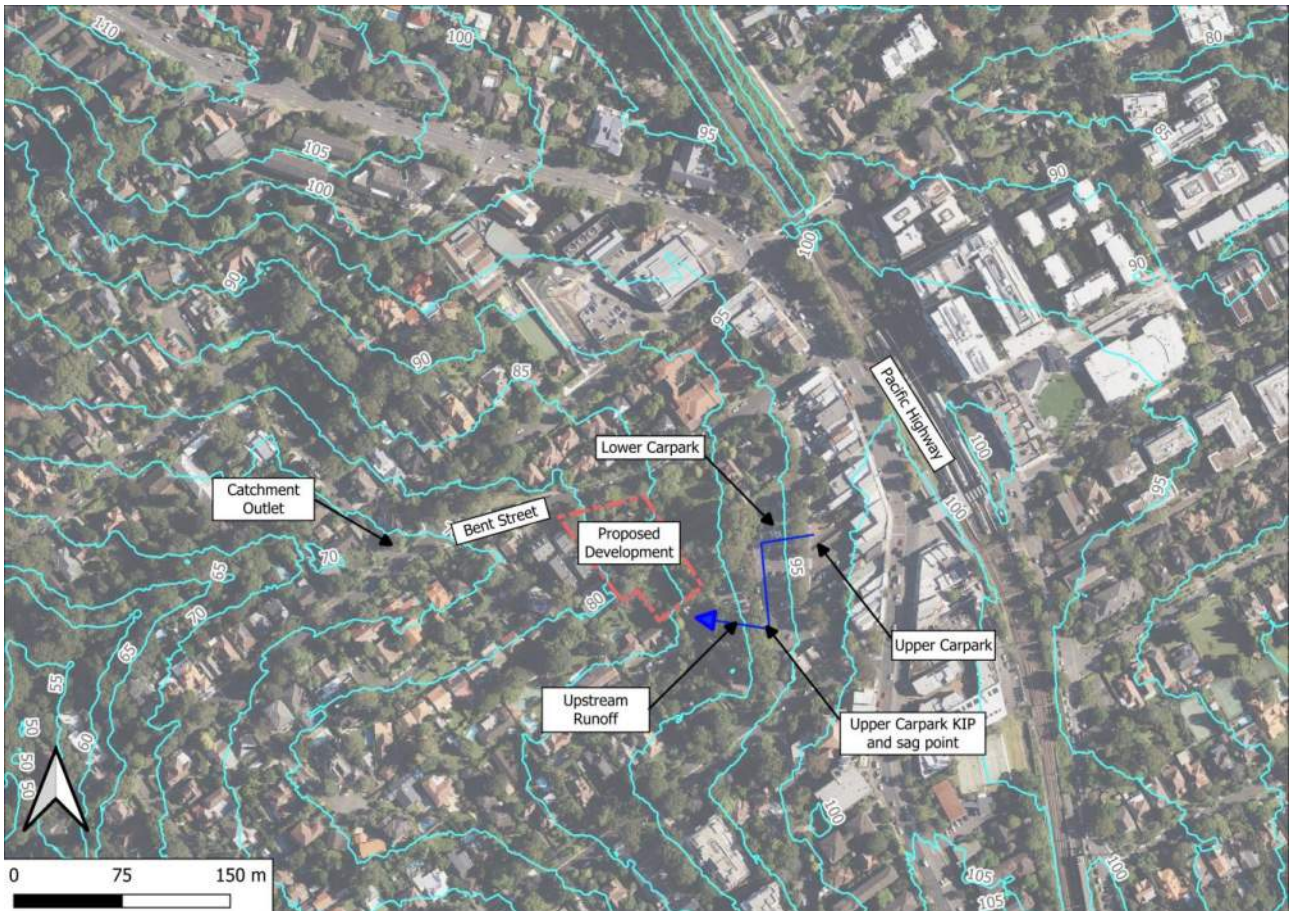
# 1. Introduction

This Flood Impact Risk Assessment (FIRA) has been prepared in accordance with FIRA technical guideline LU01 to support the State Significant Development Application for the development known as 12-16 Bent Street, Lindfield. This report addresses Item 19 of the Planning Secretary’s Environmental Assessment Requirements (SEARs), maps the flood behaviour in both existing and proposed scenarios across a range of flood events (10% AEP, 5% AEP, 1% AEP, 0.5% AEP, 0.2% AEP and PMF) and outlines site flood evacuation.

## 1.1 Site Context

The proposed building footprint will cover 5 existing lots, currently containing two single storey houses and a tennis court. The proposed site is bordered by Bent Street to the North and by residential developments to the West and South. The lot bounding the site to the East is currently vacant, but it is understood that Council intends to construct the new “Drovers Way” at that location. See Appendix A for the site survey prepared by Mitch Ayres Surveying, Ref. 220415 Dated 08/07/2023. KRG council Dial Before You Dig (DBYD) mapping confirm Council stormwater assets running adjacent to the southwest corner of the development and through the neighbouring properties 18-20 Bent Street as shown on Appendix B.

Figure 1 Site Context



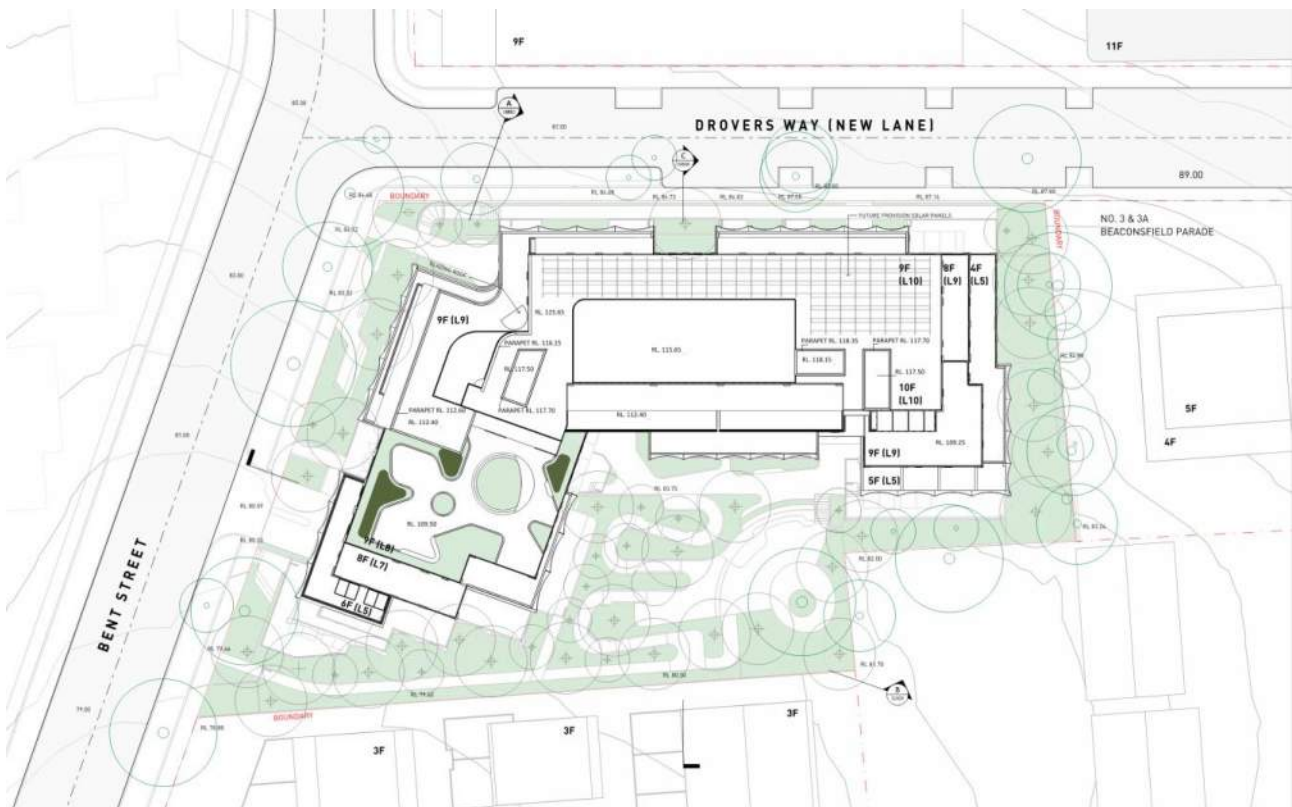
## 1.2 Existing Flood Studies

There are no current Council flood studies that cover the proposed site. However, it is understood that Ku-Ring-Gai Council is currently developing a flood study for the Lane Cove southern catchments that will cover the subject area.

## 1.3 Proposed Development

The existing residential developments will be demolished and replaced with a new 10 level residential building with a 3-level basement. A proposed driveway off Bent Street provides access to the basement while significant setbacks on all sides of the development provides space for landscaping and footpaths. Although a new lane (Drivers Way) is shown on architectural plans, it will be constructed as part of a future development and has not been included as part of this assessment. Refer to Appendix C and figure below for Architectural Plans.

Figure 2 Proposed Site Plan

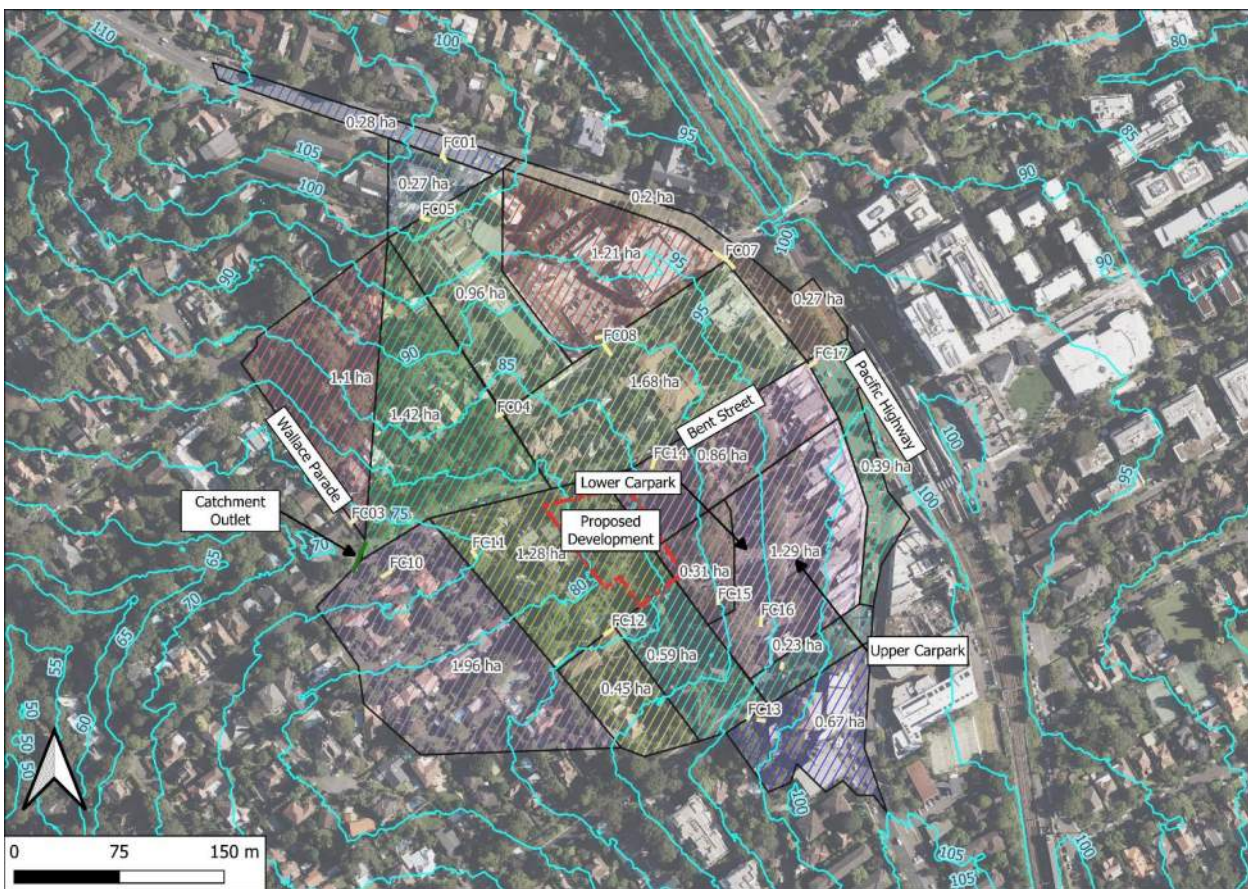


## 2. Flood Modelling

### 2.1 Catchment Area

LiDAR data with 1m resolution has been obtained from NSW Spatial Services in order to determine the topography of the area surrounding the site and delineate catchments affecting the development. For the purpose of this report, the catchment outlet was chosen at the corner of the intersection of Bent Street with Wallace Parade, approximately 135m west of the site. The total catchment area was found to be approximately 15.42 ha.

Figure 3 Catchment Map



The upstream catchments directly affecting the site lie to the east and south of the development with contours falling from high points on Pacific Highway towards Bent Street. To the east of the site, much of the catchment is comprised of impervious commercial developments as well as two paved car parks. The two car parking areas were investigated in Google Street View and it was found that the larger “Upper Carpark” area is elevated over the smaller “Lower Carpark” area, with a kerb separating both, preventing any runoff from flowing directly from the Upper Carpark to the Lower Carpark as shown in Figure 3 below. An exiting kerb inlet pit (KIP) was identified at the Upper Carpark low point as shown in Figure 4 below. During a major event, it is expected that runoff from the upper car park will collect at the KIP location then overtop the kerb and continue flowing northwest between the residential developments and is expected to follow the alignment of Council’s underground drainage system as shown in Appendix B.

Figure 4 Upper and Lower Carpark



Figure 5 Sag Point Kerb Inlet Pit at Upper Carpark



## 2.2 Hydrological Model

A DRAINS model was developed for the 19 sub-catchments and an ILSAX analysis was run to generate 19 hydrographs which were then input into the TUFLOW model.

### 2.2.1 Rainfall Intensity

Site specific Infiltration-Frequency-Duration (IFD) data and 10 ensemble temporal patterns have been obtained from the Bureau of Meteorology and AR&R Datahub in accordance with ARR 2019. A temporal pattern was selected to produce peak flows greater than or equal to the median storm. This data was used to generate flows from each sub-catchment.

Probable Maximum Precipitation was estimated using the Generalised Short Duration Method.

### 2.2.2 Climate Change

Climate Change has been assessed and modelled as part of this study using the 2060, SSP2-4.5 scenario, representing a 30% increase of rainfall intensities and applied to the 10% AEP, 5% AEP and 1% AEP flood events. No climate change factors have been applied to storm events greater than the 1% AEP (0.5% AEP, 0.2% AEP, and PMF).

Sea level rise as a result of climate change was assessed and found to not impact flood behaviour surrounding the proposed site.

## 2.3 Hydraulic Modelling

### 2.3.1 Digital Elevation Model

A 1 metre DEM obtained from NSW Spatial Services was used to represent the existing ground surface for the hydraulic model. This resolution is fine enough to represent roads and overland flow paths and did not result in excessive run time.

### 2.3.2 Land Use

Land use throughout the site has been determined through satellite imagery. The following land use roughness coefficients have been adopted in accordance with ARR 2019.

Table 1 Manning's Roughness Coefficient 'n'

Land Use Type	
Residential areas	0.04
Paved roads	0.02
Proposed open channel (vegetated)	0.038

### 2.3.3 Buildings

Building footprints have been determined using satellite imagery and modelled as inactive areas within the TUFLOW model.

### 2.3.4 Stormwater Drainage

Existing and proposed stormwater drainage infrastructure has been modelled as 50% blocked in TUFLOW, as specified by KRG DCP Section 24D.2. Only the existing drainage within Bent St and proposed connection have been modelled, see figure below.

Figure 6 Modelled Stormwater Infrastructure



### 2.3.5 Upstream Boundary Condition

The stormwater hydrographs extracted from the Hydrologic Model were used as inputs for the TUFLOW model. The hydrographs were applied using 2d QT (Flow vs. Time) boundaries at the sub-catchment outlets to represent the overland flow paths affecting the site.

### 2.3.6 Downstream Boundary Condition

2d HQ (Stage vs. Discharge) boundaries were digitised on the corner of the intersection of Bent Street with Wallace Parade approximately 135m west of the site as shown in Figure 1. The HQ boundary utilizes a stage-discharge curve that TUFLOW automatically creates based on the underlying topography.

## 2.4 Results

The results discussed below are generally in reference to the 1% AEP flood event unless noted otherwise. TUFLOW output maps for the full range of flood events (10% AEP, 5% AEP, 1% AEP, 0.5% AEP, 0.2% AEP and PMF) can be found in Appendix D.

### 2.4.1 Existing Flood Behaviour

Flood modelling of the current scenario indicates that runoff approaches 12-16 Bent Street from the southeast and traverses the site before flowing west towards the eastern boundary of 18-20 Bent Street. An existing diversion channel at 18-20 Bent Street diverts runoff impacting the neighbouring site from the southeast. However, flows entering 18-20 Bent St from the northeast boundary are not diverted and run through the existing complex.

Along the northern frontage of 12-16 Bent Street, runoff is contained within Bent Street, except for an isolated area at the western corner that experiences minimal nuisance runoff with depths below 60 mm. Consequently, the northern portion of the site is classified as flood-free.

The existing overland flow path within 18-20 Bent St was modelled in TUFLOW using a 1D channel analysis of typical cross-sections extracted from the DA package prepared by Dawes Consulting Engineers.

### 2.4.2 Design Approach

The neighbouring development at 18-20 Bent Street includes a diversion channel to redirect all runoff approaching the site from the southeast.

In order to maintain the existing flood behaviour, it is proposed to construct a similar overland flow path to divert flows entering the proposed site and divert them along the southern and western setbacks towards the existing channel on 18-20 Bent St.

Additionally, a 375mm diameter stormwater pipe and a single 600mm x 600mm grated surface inlet pit is to be provided within the proposed channel. This stormwater line drains west towards Bent St, connecting into the existing below-ground road drainage.

Refer to Civil drawings in Appendix E for details.

### 2.4.3 Proposed Flood Behaviour

Under the proposed scenario, the proposed building footprint will block the upstream catchment runoff from running west through the development. Instead, floodwaters entering 12-16 Bent Street from the southeast will be diverted along the southern and western setbacks of the proposed site before discharging into the established channel at 18-20 Bent Street. The proposed 375mm stormwater line will bring a portion of floodwaters towards the below ground system in Bent St.

Nuisance runoff at the northern portion of the site will remain unchanged. The proposed extent of the overland flow path, along with the calculated water levels, is detailed in Appendices D and E.

Drawings CE201 and CE202 provide sectional views of the proposed overland flow path, including dimensions and water levels. As indicated in Drawing CE103, tree protection zones (TPZs) within the flow path make re-grading works impractical. Instead, it has been proposed for walls to be constructed to contain the runoff, with footings constructed to span over the TPZ.

Sections 1 and 2 demonstrate the existing ground sloping from the boundary towards the proposed building. A retaining wall for the proposed building is designed to act as a flood barrier, preventing water ingress. The retaining wall is to be waterproofed at least 300 mm above the Top Water Level (TWL) in compliance with KRG DCP Section 24D.3 for flows below 20 m<sup>3</sup>/s. As floodwaters are effectively diverted away from the building, the nominated habitable floor levels (FFL) of 80.60, 84.05, and 87.20, as shown in the architectural plans, are deemed acceptable.

At Sections 4, 5, 6, and 7, the ground slopes away from the building. To manage runoff, a wall has been proposed to contain flows within the designated overland flow path. Flood mapping in Appendix D identifies a high hazard category for flows through these sections, attributed to the depth and velocity of water resulting from site topography and slope. To mitigate risks during major flood events, it is proposed to install fencing along the overland flow path as a safety measure.

The proposed overland flow path was modelled in TUFLOW using a 1D channel analysis of typical cross-sections.

#### **2.4.4 Flood Level Impact**

The effect of the proposed development on surrounding developments have been analysed to determine the changes (Afflux) in flood level. Afflux maps are available in Appendix D.

It has been found that there are minor increases (~20mm) to the flood levels at the upstream end of the 18-20 Bent St overland flow path. All other increases in flood levels are limited within the proposed site and channel. These increases within the neighbouring channel are caused by the diversion of flows previously hitting the neighbouring site from the east, into the existing channel. However, as the channel has been designed with this flow behaviour in mind, this proposed flood behaviour will not negatively affect the neighbouring development. Additionally, the diversion of the aforementioned flow path prevents floodwaters from impacting the neighbouring building faces, moving floodwaters into the controlled flow path and representing an overall improvement in the flood hazard for the adjacent site.

Floodwaters produced under the climate change factors outlined in earlier sections are contained within the proposed and existing overland flow paths, with the exception of one section of the neighbouring channel, where floodwaters overtop the channel wall at depths of <10mm. This results in a small newly wet area on 22 Bent St, however as flood depths in this newly wet area are <10mm this has been deemed acceptable.

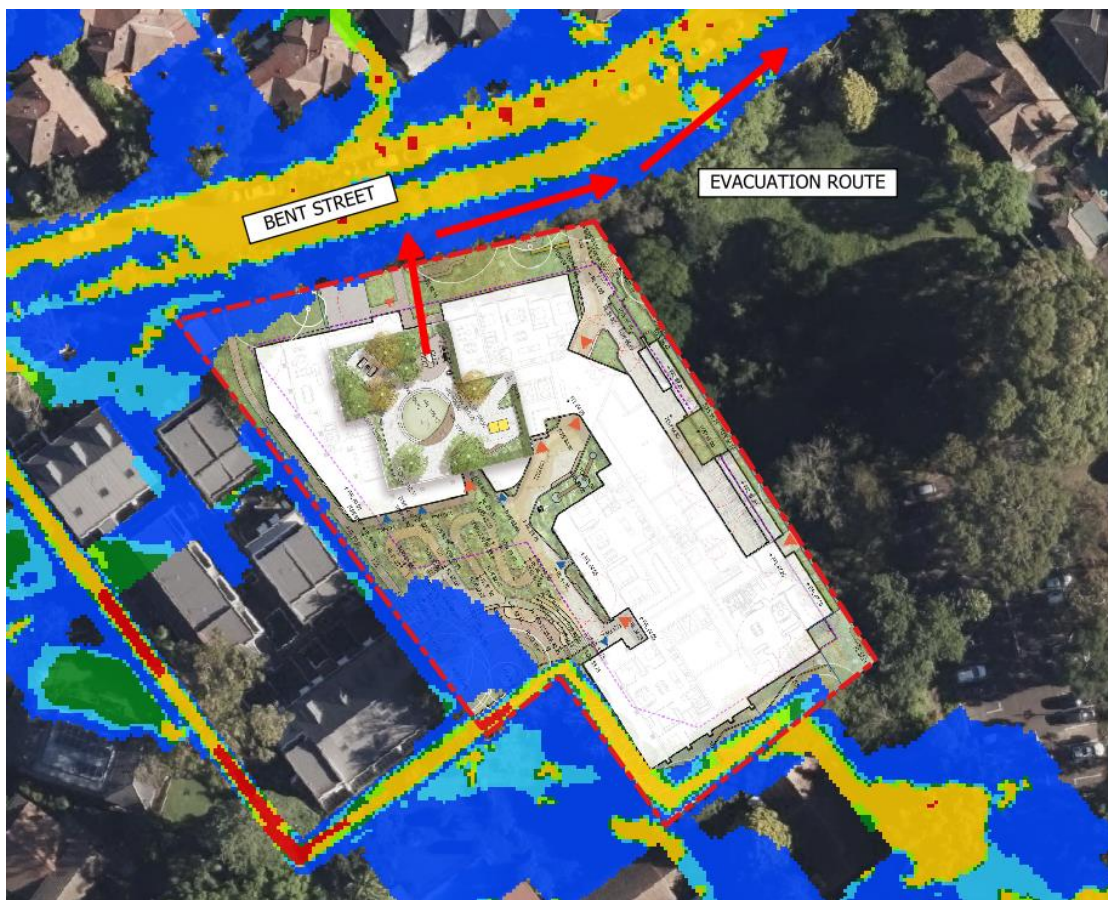
### 3. Evacuation

The PMF event has been modelled and used to inform the worst case evacuation strategy outlined in this section.

The critical PMP event was found to be the 15-minute storm burst, producing a flood event that occurs within 6 hours of the storm burst. Classifying the PMF event impacting the site as a flash flood, as is typical of urban catchments affected by overland flow flooding.

As Bent St falls steeply to the west, floodwaters running within the road reserve reach high velocities and correspondingly high hazard categories (H5). However, the footpath verge experiences low hazard (H1) floodwaters and occupants may evacuate northeast along Bent St to reach higher grounds. This strategy is in line with the evacuation strategy for Overland Escape Routes outlined in the Flood Emergency Response Planning – Classification of Communities (DECC, 2007). As the proposed development will be impacted by the PMF event, the proposed development shall be designed and certified by a structural engineer to withstand the flood and debris forces of the PMF flood.

Figure 7 PMF Evacuation Route



## 4. Response to CPHR/DPHI RFI

Comments received from the Department of Planning, Housing and Infrastructure/Conservation Programs, Heritage and Regulations are attached in Appendix F. ADP responses are outlined below.

Table 2 CPHR/DPHI RFI Response

Comment No.	Response
1	<p>An assessment of the pre and post development flood behaviour for the full range of flood events has been completed to demonstrate no adverse impacts on neighbouring developments.</p> <p>The proposed overland flow path does not negatively impact the adjoining development and improves the flood hazard experienced by the neighbouring development.</p> <p><u>Refer to Section 2.4 for details.</u></p>
2	<p>An assessment of the pre and post development flood behaviour for the full range of flood events has been completed to demonstrate no adverse impacts on neighbouring developments.</p> <p>The proposed overland flow path does not negatively impact the adjoining development and improves the flood hazard experienced by the neighbouring development.</p> <p><u>Refer to Section 2.4 for details.</u></p>
3	<p>An assessment of the flood hazard in adjoining roadways has been conducted and safe access/egress is maintained in all storm events.</p> <p><u>Refer to Section 2.4 and 3 for details.</u></p>
4	<p>Climate change impacts have been modelled using the 2060 SSP2-4.5 scenario as part of this assessment and included as part of design considerations.</p> <p>Floodwaters are wholly contained within both the existing and neighbouring channels, with the exception of a single channel section in the adjoining property, where floodwaters overtop at depths &lt; 10mm.</p> <p><u>Refer to Section 2.2.2 and 2.4 for details.</u></p>
5	<p>The proposed overland flow path has been modelled using a 1D analysis of channel cross-sections that accurately represents the proposed geometry and vegetation.</p> <p>Proposed retaining walls have been shifted to sit entirely within the proposed site boundary.</p> <p><u>Refer to Section 2.3.3, 2.4 and Appendix E for details.</u></p>

## 5. Conclusion

ADP Consulting has prepared this report to support the State Significant Development Application for 12-16 Bent Street, Lindfield.

The proposed development was found to be impacted by upstream runoff approaching from the southeast. The flood mitigation measures proposed as part of this report aim to preserve this behaviour. With the design intent for that development to collect all runoff approaching from the southeast, including runoff passing through 12-16 Bent Street, and channel it through an overland flow path toward Bent Street.

The 1% AEP flood extents for the existing scenario were determined using TUFLOW. It was found that upstream catchment flow affects the southern boundary of the site, while the northern portion remains flood-free.

Due to the presence of TPZs along the proposed overland flow path, excavation to create channels was avoided. Instead, walls are proposed to contain runoff within the flow path. Wall footings will be designed to span over the TPZs, with all works within TPZs to be supported by the project arborist.

The proposed building's retaining walls will prevent floodwaters from entering the structure, making the nominated habitable floor level (FFL) of 80.60, 84.05, and 87.20 acceptable. The tops of the retaining walls adjacent to the overland flow paths are to be waterproofed at least 300 mm above the top water level (TWL) to comply with KRG DCP Section 24D.3 for flows below 20 m<sup>3</sup>/s.

Flood mapping indicates that the channel exhibits a high hazard category due to site topography. Since re-grading the overland flow path is not feasible, it is recommended to install safety fencing along the edges of the flow path to mitigate risks during major flood events.

Evacuation from the site during flooding events up to the PMF is to be via foot, moving northeast along Bent Street within the footpath verge. In line the evacuation strategy for Overland Escape Routes outlined in the Flood Emergency Response Planning – Classification of Communities (DECC, 2007).

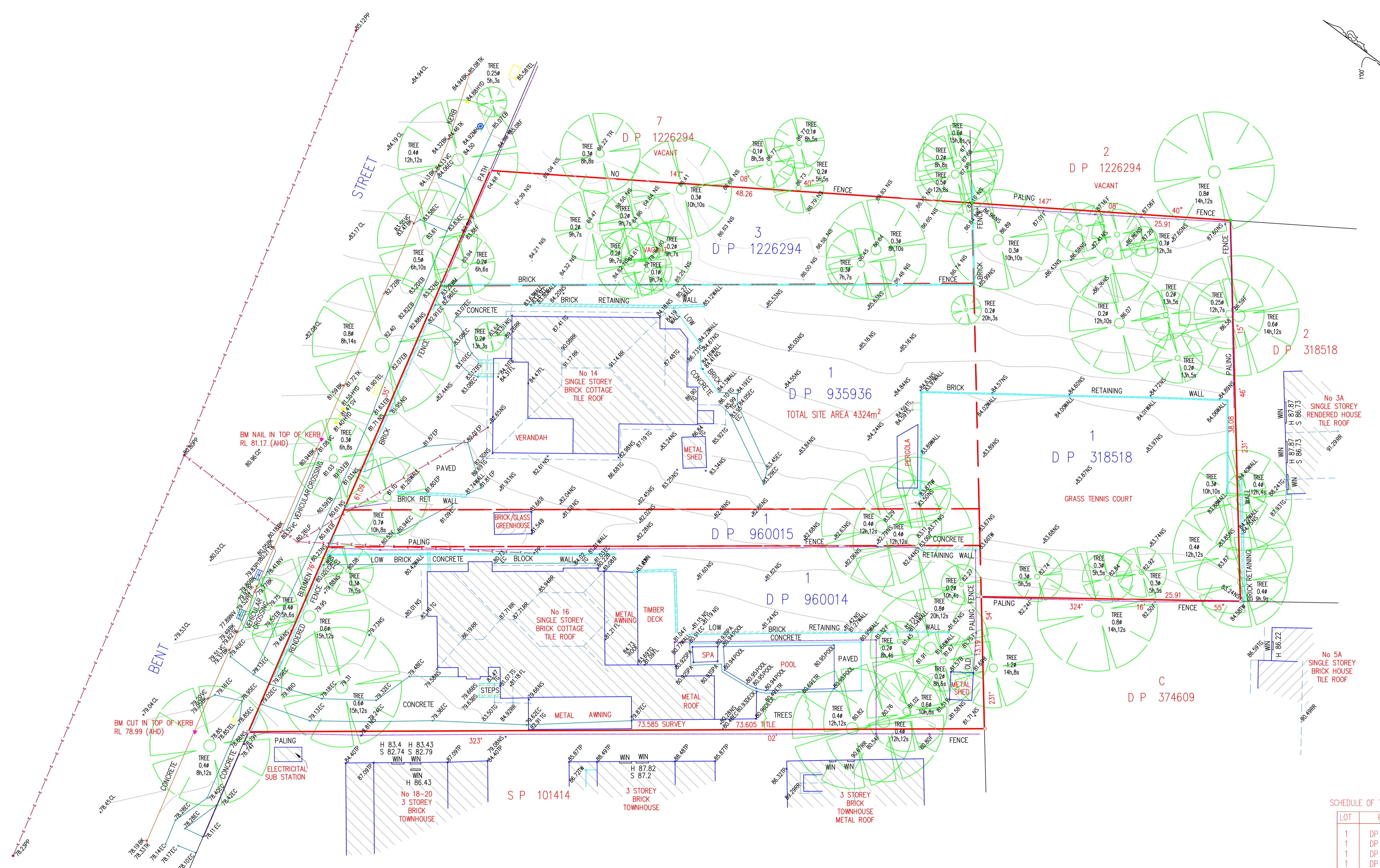
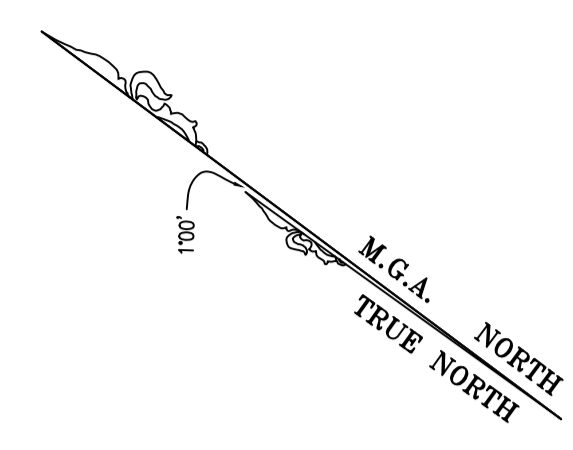
I have examined the site, existing improvements and proposed development. In accordance with accepted engineering practice, I have undertaken a flood study of the adjacent drainage system and can confirm the accuracy of my calculated results. I declare that the proposed development will be safeguarded from flooding and flood damage associated with the design flood standard as defined in Part 24 of the Ku-ring-gai DCP and will not adversely affect any other structures or properties

This report was prepared for and on behalf of the ADP Consulting team.



# Appendix A

## Survey



SCHEDULE OF TILT DETAILS

LOT	PLAN
1	DP 935936
1	DP 318518
1	DP 960015
1	DP 960014

SURVEY ON MGA 2020 COORDINATES

**LEGEND**

AWN - AWNING	NS - NATURAL SURFACE
BALC - BALCONY	PC - PAVEMENT CROSSING
BK - BOTTOM OF KERB	RR - ROOF RIDGE
BLD - BUILDING	SGN - SIGN POST
BOL - BOLLARD	SIL - SOLAR PANEL
BM - BENCH MARK	TEL - TELESTRIP PIT
BS - BOTTOM OF STEPS	TF - TOP OF FENCE
BT - BOTTOM OF TOWER	TRK - TOP OF ROOF
CL - CENTRELINE	TR - TOP OF RUTTER
CD - DRAIN	THR - TOP OF HANDRAIL
E - ELECTRICAL BOX	TK - TOP OF KERB
EC - EDGE OF BITUMEN	TRDGE - TOP OF RIDGE
ED - EDGE OF CONCRETE	TP - TOP OF PARAPET
F - FENCE	TR - TREE
EG - EDGE OF GARDEN	TS - TOP OF STEPS
FL - FLOOR LEVEL	TW - TOP OF WALL
FD - FOOTDRIFT	US - UNDERSIDE
H - HEAD	WIN - WINDOW
HD - HEAD LEVEL	WM - WATER METER
IN - INVERT LEVEL	
ID - INVERT INSPECTION PIT	
MA - MANHOLE	

**TYPICAL NOTES**

- ORIGIN OF LEVELS SSM 163244 RL 87.02 (AHD)
- BEARINGS ARE ON MGA NORTH
- A SUITABLE BOUNDARY SURVEY HAS BEEN UNDERTAKEN
- BOUNDARY SHOULD BE MARKED PRIOR TO CONSTRUCTION OCCURRING ON OR NEAR THE BOUNDARY
- SERVICES SHOWN ARE BASED ON VISIBLE SURFACE INDICATORS EVIDENT AT THE DATE OF SURVEY AND THE RELEVANT SERVICE DIAGRAMS OF THE VARIOUS AUTHORITIES. ALL SERVICES MUST BE VERIFIED ON SITE PRIOR TO ANY WORK BEING UNDERTAKEN. MITCH AYRES SURVEYING PTY LTD BEARS NO RESPONSIBILITY FOR THE ACCURACY OR COMPLETENESS OF THE SERVICES SHOWN HEREON.
- RIDGE, EAVE & GUTTER HEIGHTS HAVE BEEN OBTAINED BY AN INDIRECT METHOD AND ARE ACCURATE FOR PLANNING PURPOSES ONLY.
- ADJOINING BUILDINGS AND DWELLINGS HAVE BEEN PLOTTED FOR DIAGRAMMATIC PURPOSES ONLY AND SPECIFIC DETAILS, IF CRITICAL, WILL REQUIRE FURTHER SURVEY.
- THE DIAMETER (Ø), SPREAD (S) & HEIGHT (H) OF EACH TREE IS INDICATIVE ONLY AND SPECIFIC DETAILS, IF CRITICAL, WILL REQUIRE FURTHER SURVEY.
- CONTOURS ARE AN INDICATION OF THE TOPOGRAPHY ONLY. SPOT LEVELS SHOULD BE USED IF DETAILED DESIGN IS TO BE UNDERTAKEN.
- CONTOUR INTERVAL: 0.5 METRE MINOR & 1 METRE MAJOR INTERVAL.

**SERVICES NOTES**

- ALL UNDERGROUND SERVICE INFORMATION INCLUSIVE OF GENERAL POSITION AND SURFACE COVER DEPTHS NOTED ON THE PLAN ARE APPROXIMATELY ONLY.
- ALL UNDERGROUND SERVICE INFORMATION HAS BEEN COMPILED FROM SERVICE AUTHORITY PLANS PROVIDED BY THE AUTHORITIES.
- THE LOCATION OF SERVICES BETWEEN SURVEYED POINTS (AS INDICATED) HAVE BEEN SHOWN DIAGRAMMATICALLY USING THE SERVICE DIAGRAMS AS PROVIDED. THE EXACT LOCATION OF THESE SERVICES BETWEEN THE SURVEYED POINTS MUST BE VERIFIED PRIOR TO ANY EXCAVATION OR PALING. NO WARRANTY IS GIVEN AGAINST THE POSSIBILITY OF THE EXISTENCE OF FURTHER UNIDENTIFIED SERVICES.
- ALL CONTRACTORS, TRADESMEN, BUILDING & PROJECT CONSULTANTS MUST CONTACT THE VARIOUS AUTHORITIES, IN ACCORDANCE WITH STANDARD TASK BEFORE 'YOU DIG' PROCEDURES PRIOR TO UNDERTAKING ANY WORKS WITHIN THE VICINITY OF THE SERVICE LINES TO VERIFY THE POSITION OF THE SERVICE LINES.

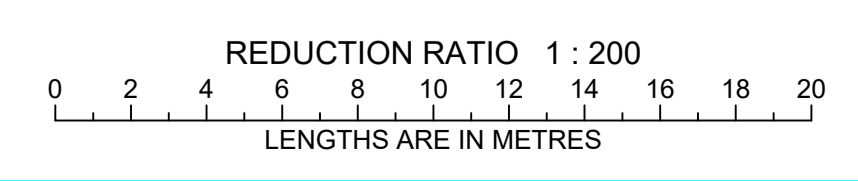


**CLIENT:**  
SUNDALE NORTHLAND DEVELOPMENT PTY LTD

**TITLE No:** SEE SCHEDULE  
**DATUM:** AHD  
**DATE OF SURVEY:** 26/04/2022  
**SURVEYOR:** M.A.  
**DRAFTER:** PH

**REF:** 220415  
**ISSUE:** 1  
**ISSUE DATE:** 3/05/2022  
**SHEET SIZE:** A1  
**SHEET 1 OF 1 SHEETS**

ISSUE	DATE	AMENDMENT	BY
2	22/06/2022	MGA 2020 COORDINATES	CG
3	8/07/2023	SURVEY OF NO. 12 ADDED	MKA



**BOUNDARY DETAIL & LEVEL SURVEY AT No 12-16 BENT STREET LINDFIELD**

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web site: www.mitchayresurveying.com.au



# **Appendix B**

## **BYDA Map**



Proposed Development  
12-16 Bent Street

Tile No: 1



Legend | Scale: 1:1000



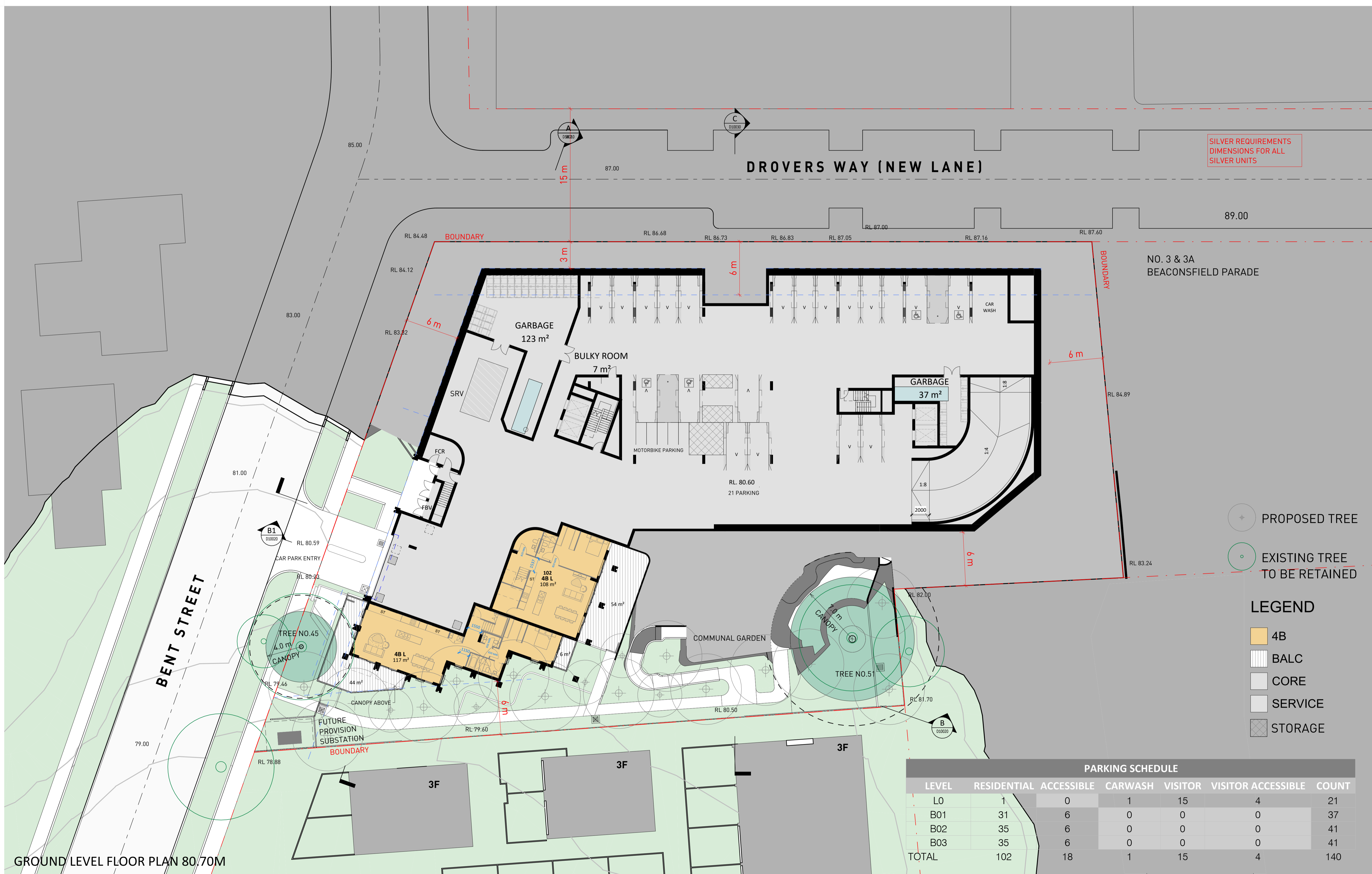
- |                 |                             |               |
|-----------------|-----------------------------|---------------|
| Recycled Main   | Irrigation Power            | Rock Anchor   |
| Stormwater Main | House Service Connection    | Survey Marker |
| Stormwater Pit  | Communication Cable         | Easement      |
| Sewer Main      | Electrical (Lighting) Cable | Land Parcel   |

DISCLAIMER: While reasonable measures has been taken to ensure the accuracy of the information contained in this plan response, neither Ku-ring-gai Council or PelicanCorp shall have any liability whatsoever in relation to any loss, damage, cost or expense arising from the use of this plan response or the information contained in it or the completeness or accuracy of such information. Use of such information is subject to and constitutes acceptance of these terms.



# **Appendix C**

## **Architectural Plans**



SILVER REQUIREMENTS  
DIMENSIONS FOR ALL  
SILVER UNITS

- PROPOSED TREE
- EXISTING TREE TO BE RETAINED

**LEGEND**

- 4B
- BALC
- CORE
- SERVICE
- STORAGE

PARKING SCHEDULE						
LEVEL	RESIDENTIAL	ACCESSIBLE	CARWASH	VISITOR	VISITOR ACCESSIBLE	COUNT
L0	1	0	1	15	4	21
B01	31	6	0	0	0	37
B02	35	6	0	0	0	41
B03	35	6	0	0	0	41
<b>TOTAL</b>	<b>102</b>	<b>18</b>	<b>1</b>	<b>15</b>	<b>4</b>	<b>140</b>

GROUND LEVEL FLOOR PLAN 80/70M

**Key Plan:**

**Drawing Disclaimer:**  
Do not scale from drawings. Verify all dimensions on site before commencing work. Copying or reproduction of this drawing is strictly prohibited without the consent of PTW Architects.

**Note:**  
PTW's responsibility for any external building element is strictly limited to that provided for by our relevant scope of Services. Others, including suitably qualified experts as may be required or as is appropriate, carry responsibility for any checking of or other work associated with any design, materials selection, construction or installation of any cladding, facade or external building element.

Rev	Amendment	By	Chk*	Date
A03	RESPONSE TO SDRP	TT	GC	19.09.25
A02	RESPONSE TO SDRP	TT	GC	18.07.25
A01	DA SUBMISSION	TT	MS	03.03.25

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ABN 23 000 454 624  
trading as PTW Architects

**NSW Nominated Architects**  
5 Parsons Architect No.6098  
D Jones Architect No.4778  
N Marojevic Architect No.11274

**PTW**

Scale: 1:200 @ A1

**Title**  
B1-GENERAL ARRANGEMENT PLANS  
GROUND LEVEL FLOOR PLAN

**Project** PA030530.01  
**BENT STREET LINDFIELD**  
12-16 BENT STREET, LINDFIELD, NSW  
2070

**Status**  
DEVELOPMENT APPLICATION

**Drawing Number**  
AR-DA-B10030

**Revision**  
A03

25/09/2025 6:11:32 PM

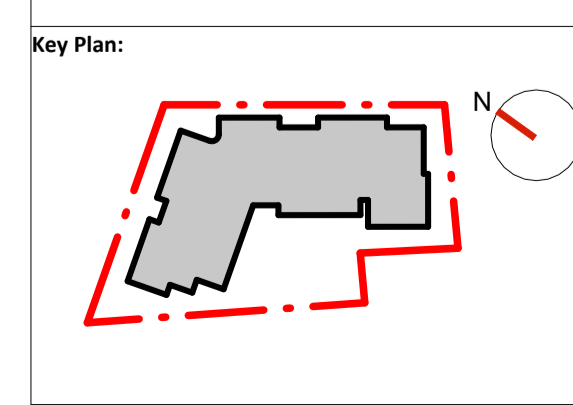


LEVEL 1 FLOOR PLAN 83.85M

SILVER REQUIREMENTS DIMENSIONS FOR ALL SILVER UNITS

LEGEND

- 2B
- 3B
- 4B U
- BALC
- CORE
- LOBBY + AMENITIES
- SERVICE



**Key Plan:**

**Drawing Disclaimer:**  
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**Note:**  
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Rev	Amendment	By	Chk*	Date
A03	RESPONSE TO SDRP	TT	GC	19.09.25
A02	RESPONSE TO SDRP	TT	GC	18.07.25
A01	DA SUBMISSION	TT	MS	03.03.25

**Consultants**  
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HATCH  
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CLOUSTON ASSOCIATES  
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T: (02) 8272 4999

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**Architect**  
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[ptw.com.au](http://ptw.com.au)

Peddie Thorp & Walker P/L  
ABN 23 000 454 624  
trading as PTW Architects

NSW Nominated Architects  
S Parsons Architect No.6098  
D Jones Architect No.4778  
N Marojevic Architect No.11274

**PTW**

Scale: 1:200 @ A1

Project: PA030530.01  
**BENT STREET LINDFIELD**  
12-16 BENT STREET, LINDFIELD, NSW  
2070

Status: DEVELOPMENT APPLICATION

Title: B1-GENERAL ARRANGEMENT PLANS  
**LEVEL 01 FLOOR PLAN**

Drawing Number: **AR-DA-B10040**

Revision: **A03**

Date: 25/09/2025 6:12:36 PM



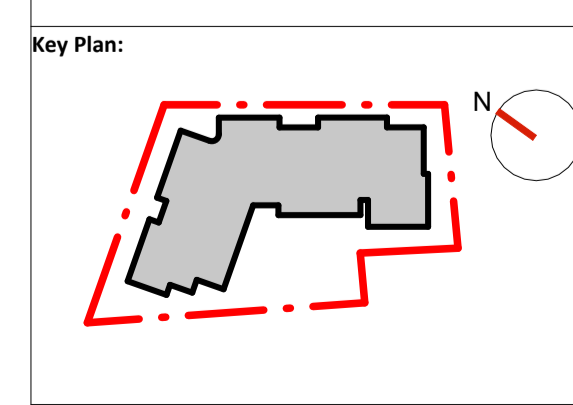
SILVER REQUIREMENTS  
DIMENSIONS FOR ALL  
SILVER UNITS

- PROPOSED TREE
- EXISTING TREE TO BE RETAINED

**LEGEND**

- 1B
- 2B
- 3B
- BALC
- CORE
- SERVICE

LEVEL 2 FLOOR PLAN 87.00M



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A03	RESPONSE TO SDRP	TT	GC	19.09.25
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S Parsons Architect No.6098  
D Jones Architect No.4778  
N Marojevic Architect No.11274



0 1 2 5 10 15m  
1:200 @ A1

Project PA030530.01  
**BENT STREET LINDFIELD**  
12-16 BENT STREET, LINDFIELD, NSW  
2070

Status  
DEVELOPMENT APPLICATION

Title  
B1-GENERAL ARRANGEMENT PLANS  
LEVEL 02 FLOOR PLAN

Drawing Number  
AR-DA-B10050

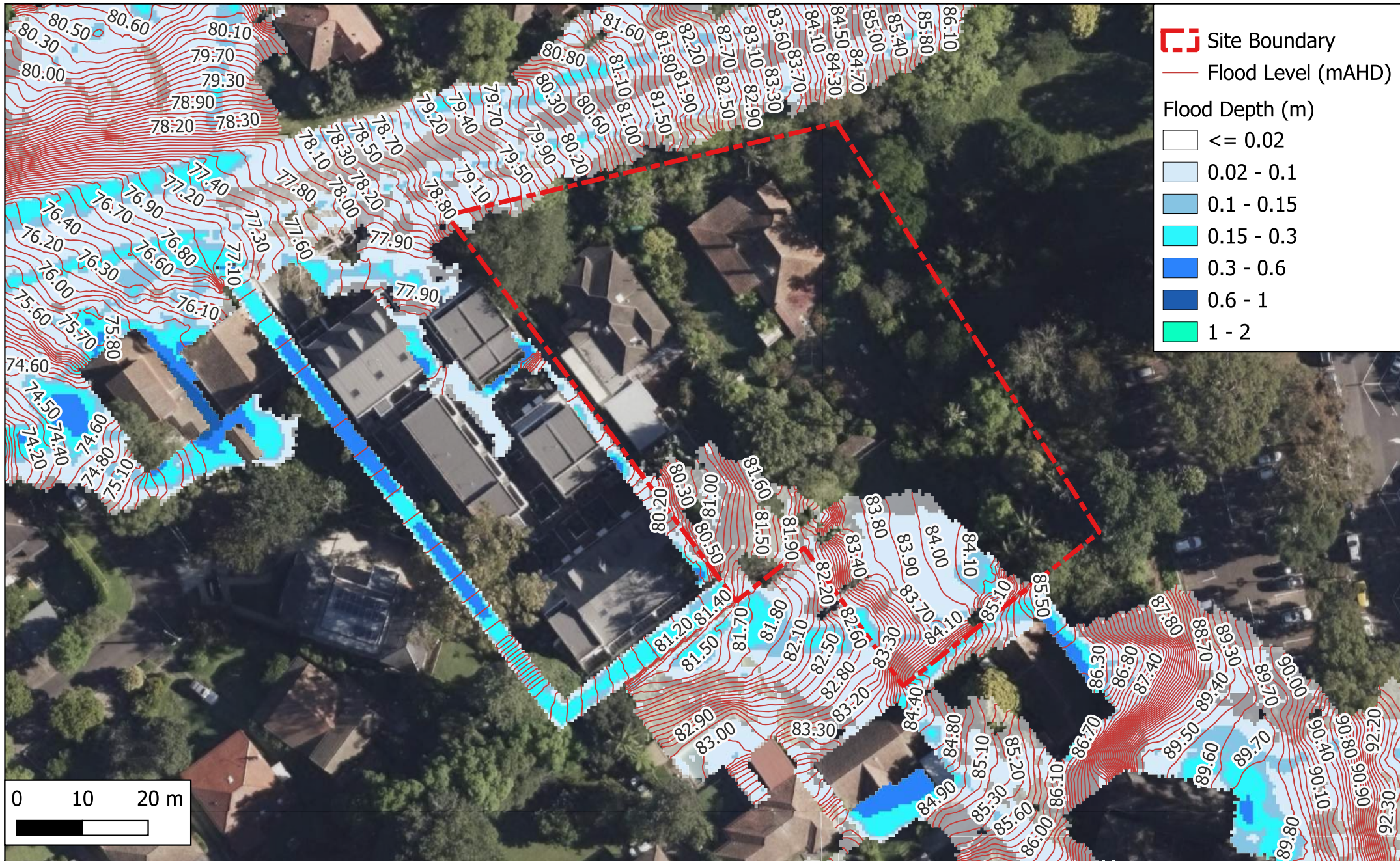
Revision  
A03



# **Appendix D**

## **Flood Maps**



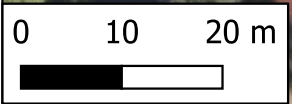


**Site Boundary**  
 Site Boundary

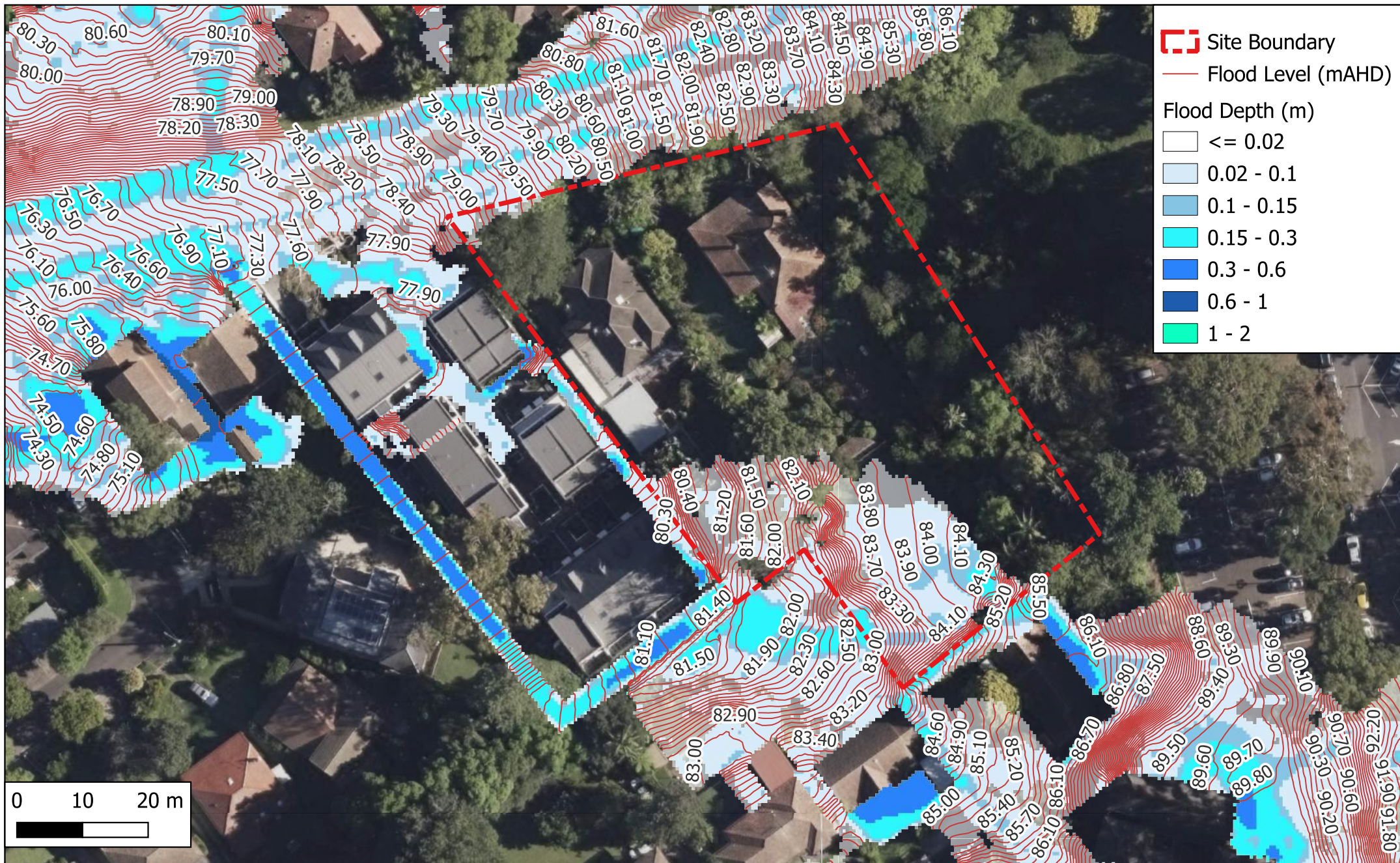
**Flood Level (mAHD)**  
 Flood Level (mAHD)

**Flood Depth (m)**

- <= 0.02
- 0.02 - 0.1
- 0.1 - 0.15
- 0.15 - 0.3
- 0.3 - 0.6
- 0.6 - 1
- 1 - 2



Revision	Description	Initial	Date	Northland Development	 An <b>ayesa</b> company <a href="http://www.adpconsulting.com">www.adpconsulting.com</a> <a href="mailto:adpconsulting@adpconsulting.com.au">adpconsulting@adpconsulting.com.au</a>	SSDA	CIVIL ENGINEERING SERVICES	Drafted:	KC
				PTW Architects		12-16 Bent Street, Lindfield NSW 2070	Existing Scenario 5% AEP Climate Change Flood Depths	Designed:	KC
							SCALE : 1:750	Approved:	SS
A	ISSUE FOR APPROVAL	KC	30/07/2025					Job Number: SYD3409 Revision: A Date: JULY 2025	



Revision	Description	Initial	Date
A	ISSUE FOR APPROVAL	KC	30/07/2025

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CIVIL ENGINEERING SERVICES  
Existing Scenario 1% AEP Climate Change  
Flood Depths  
SCALE : 1:750

Drafted: KC  
Designed: KC  
Approved: SS

Job Number: SYD3409  
Revision: A  
Date: JULY 2025



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SSDA

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NSW 2070


CIVIL ENGINEERING SERVICES

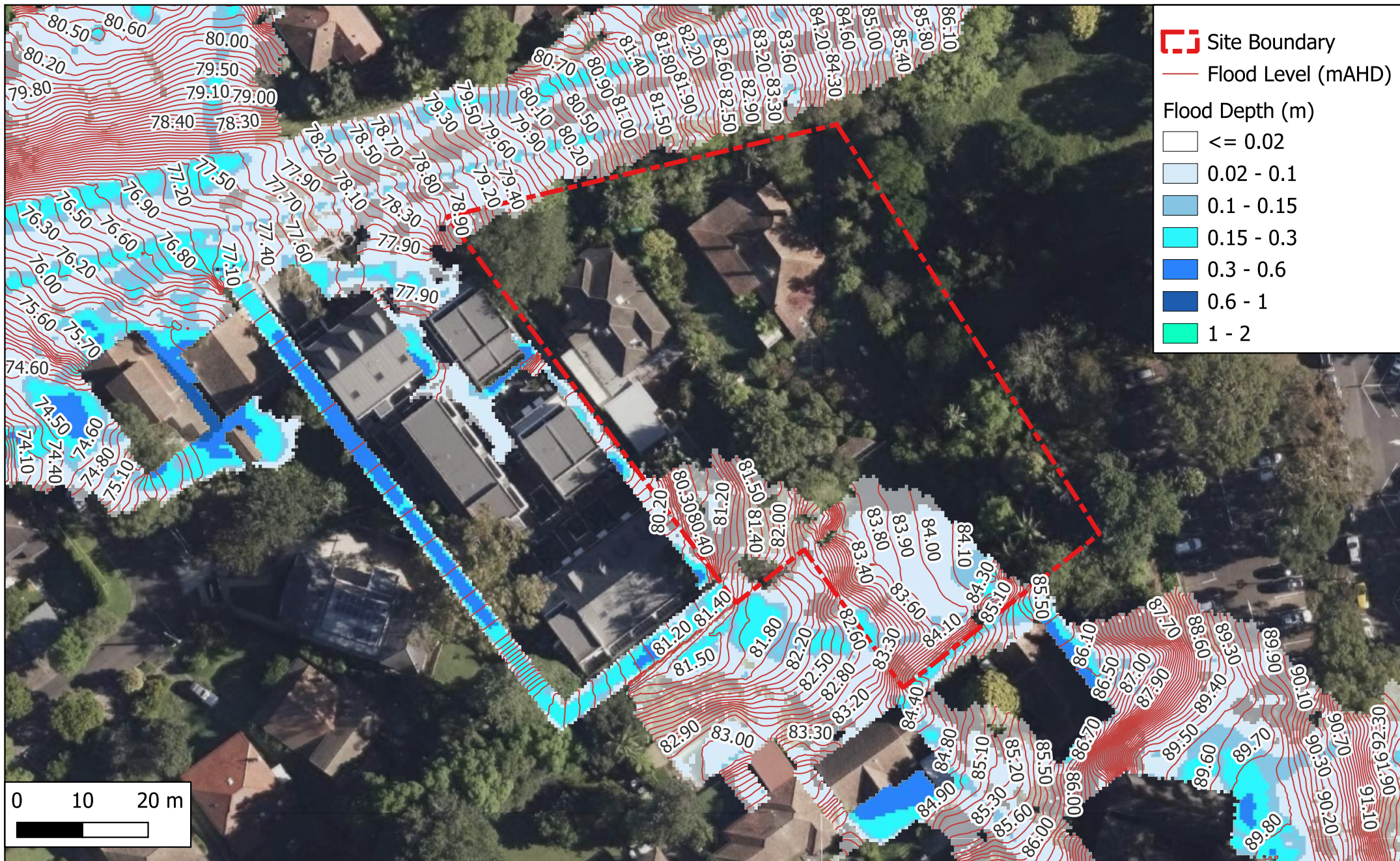
Existing Scenario 1% AEP Flood Depths

SCALE : 1:750

Drafted: KC  
 Designed: KC  
 Approved: SS

Job Number: SYD3409  
 Revision: A  
 Date: JULY 2025

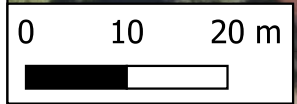




**Site Boundary**  
 — Flood Level (mAHD)

**Flood Depth (m)**

- ≤ 0.02
- 0.02 - 0.1
- 0.1 - 0.15
- 0.15 - 0.3
- 0.3 - 0.6
- 0.6 - 1
- 1 - 2



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				PTW Architects		12-16 Bent Street, Lindfield NSW 2070	Existing Scenario 0.5% AEP Flood Depths	Designed:	KC
							SCALE : 1:750	Approved:	SS
A	ISSUE FOR APPROVAL	KC	30/07/2025					Job Number: SYD3409 Revision: A Date: JULY 2025	

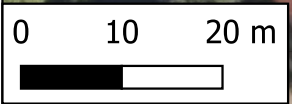




**Site Boundary**  
 — Flood Level (mAHD)

**Flood Depth (m)**

- <= 0.02
- 0.02 - 0.1
- 0.1 - 0.15
- 0.15 - 0.3
- 0.3 - 0.6
- 0.6 - 1
- 1 - 2



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A	ISSUE FOR APPROVAL	KC	30/07/2025

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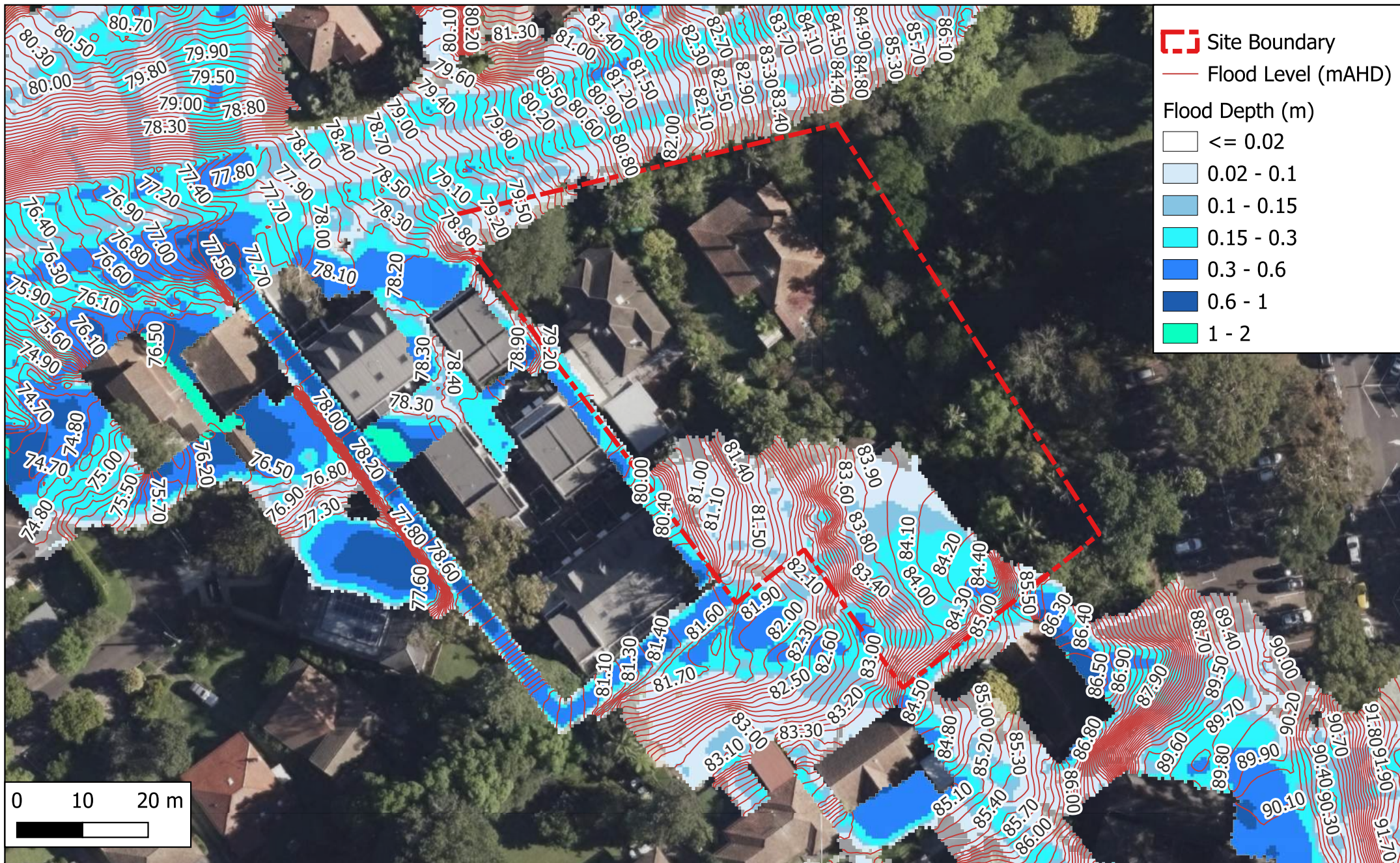
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CIVIL ENGINEERING SERVICES  
 Existing Scenario 0.2% AEP Flood Depths  
 SCALE : 1:750

Drafted: KC  
 Designed: KC  
 Approved: SS

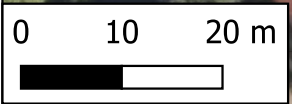
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 Revision: A  
 Date: JULY 2025



**Site Boundary**  
 — Flood Level (mASL)

**Flood Depth (m)**

- ≤ 0.02
- 0.02 - 0.1
- 0.1 - 0.15
- 0.15 - 0.3
- 0.3 - 0.6
- 0.6 - 1
- 1 - 2



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 SCALE : 1:750

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 Designed: KC  
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CIVIL ENGINEERING SERVICES  
 Proposed Scenario 10% AEP Climate Change  
 Flood Depths  
 SCALE : 1:750

Drafted: KC  
 Designed: KC  
 Approved: SS

Job Number: SYD3409  
 Revision: A  
 Date: JULY 2025

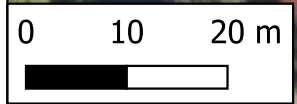




**Site Boundary**  
 — Flood Level (mAHD)

**Flood Depth (m)**

- <= 0.02
- 0.02 - 0.1
- 0.1 - 0.15
- 0.15 - 0.3
- 0.3 - 0.6
- 0.6 - 1
- 1 - 2



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				PTW Architects		Job Number: SYD3409 Revision: A Date: JULY 2025			
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CIVIL ENGINEERING SERVICES  
Proposed Scenario 1% AEP Climate Change  
Flood Depths  
SCALE : 1:750

Drafted: KC  
Designed: KC  
Approved: SS

Job Number: SYD3409  
Revision: A  
Date: JULY 2025



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Proposed Scenario 1% AEP Flood Depths  
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Date: JULY 2025



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CIVIL ENGINEERING SERVICES  
 Proposed Scenario 0.5% AEP Flood Depths  
 SCALE : 1:750

Drafted: KC  
 Designed: KC  
 Approved: SS

Job Number: SYD3409  
 Revision: A  
 Date: JULY 2025



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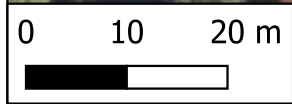
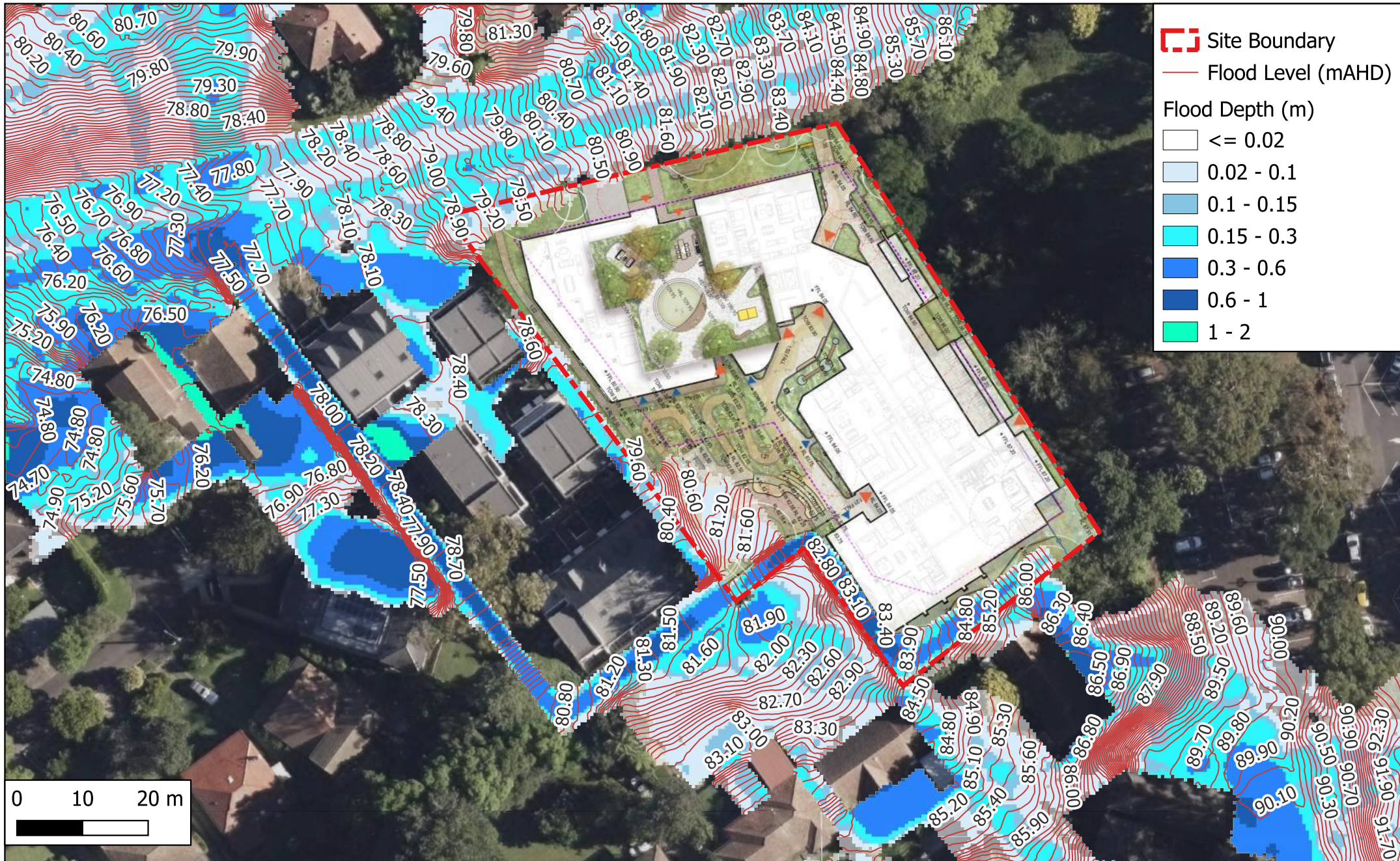
SSDA  
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CIVIL ENGINEERING SERVICES  
Proposed Scenario 0.2% AEP Flood Depths  
SCALE : 1:750

Drafted: KC  
Designed: KC  
Approved: SS

Job Number: SYD3409  
Revision: A  
Date: JULY 2025





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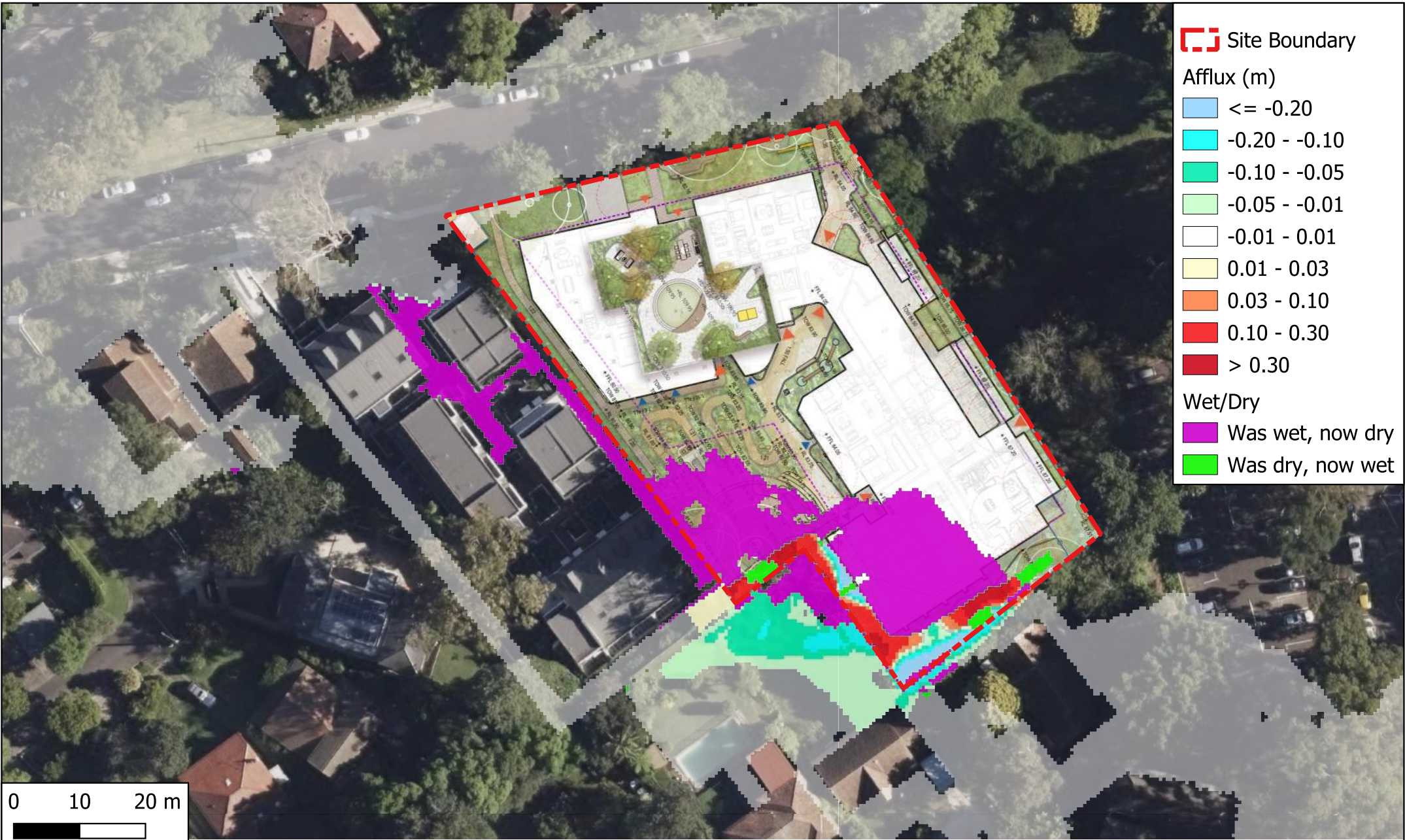
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CIVIL ENGINEERING SERVICES  
Proposed Scenario PMF Depths  
SCALE : 1:750

Drafted: KC  
Designed: KC  
Approved: SS

Job Number: SYD3409  
Revision: A  
Date: JULY 2025



Site Boundary

Afflux (m)

- <= -0.20
- 0.20 - -0.10
- 0.10 - -0.05
- 0.05 - -0.01
- 0.01 - 0.01
- 0.01 - 0.03
- 0.03 - 0.10
- 0.10 - 0.30
- > 0.30

Wet/Dry

- Was wet, now dry
- Was dry, now wet

0 10 20 m

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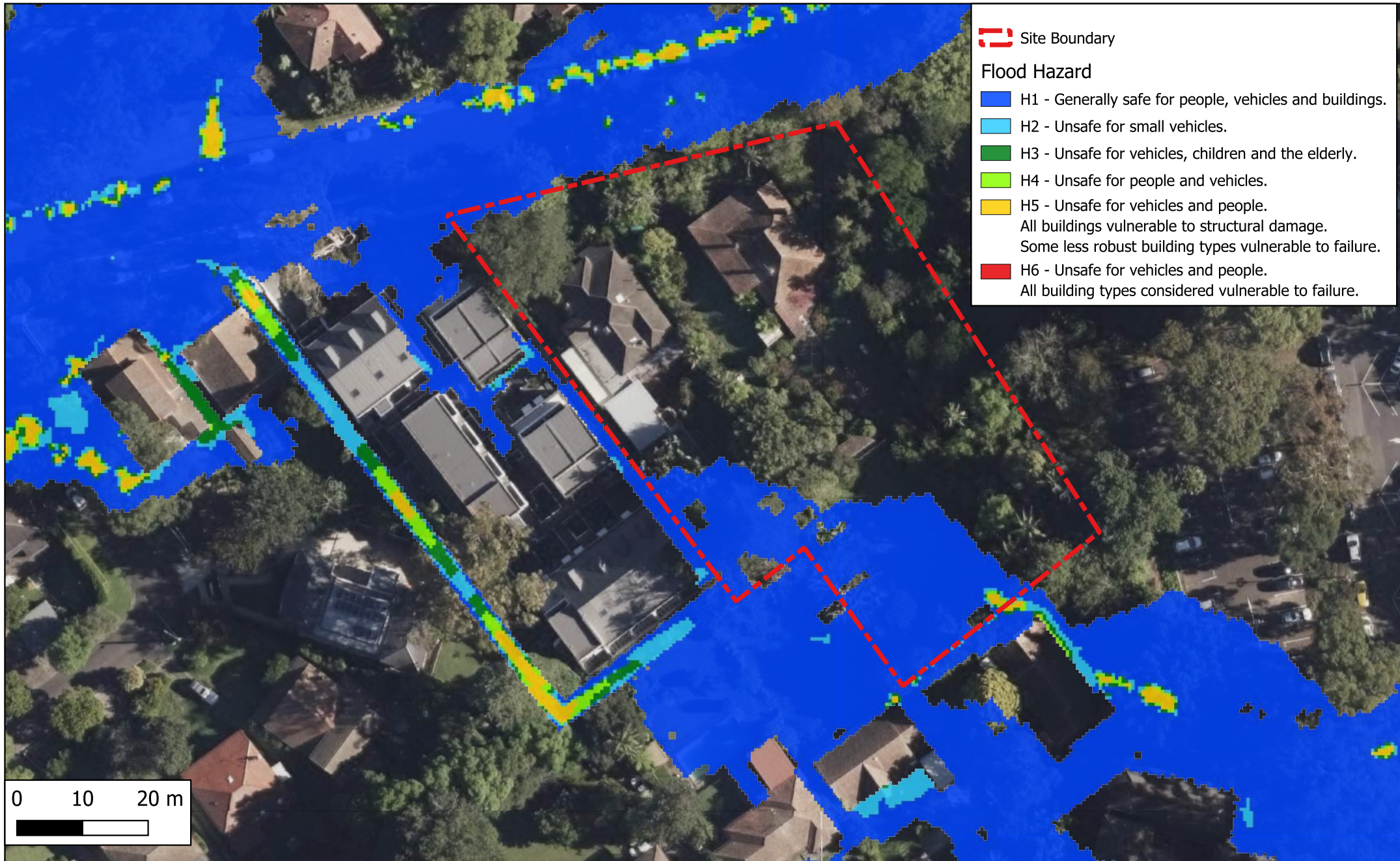
CIVIL ENGINEERING SERVICES

Proposed Scenario 1% AEP Flood Level  
Impact (Afflux)

SCALE : 1:750







Drafted: KC  
Designed: KC  
Approved: SS

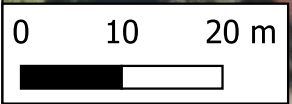
Job Number: SYD3409  
Revision: A  
Date: JULY 2025



 Site Boundary

**Flood Hazard**

-  H1 - Generally safe for people, vehicles and buildings.
-  H2 - Unsafe for small vehicles.
-  H3 - Unsafe for vehicles, children and the elderly.
-  H4 - Unsafe for people and vehicles.
-  H5 - Unsafe for vehicles and people.  
All buildings vulnerable to structural damage.  
Some less robust building types vulnerable to failure.
-  H6 - Unsafe for vehicles and people.  
All building types considered vulnerable to failure.



Revision	Description	Initial	Date
A	ISSUE FOR APPROVAL	KC	30/07/2025

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 NSW 2070

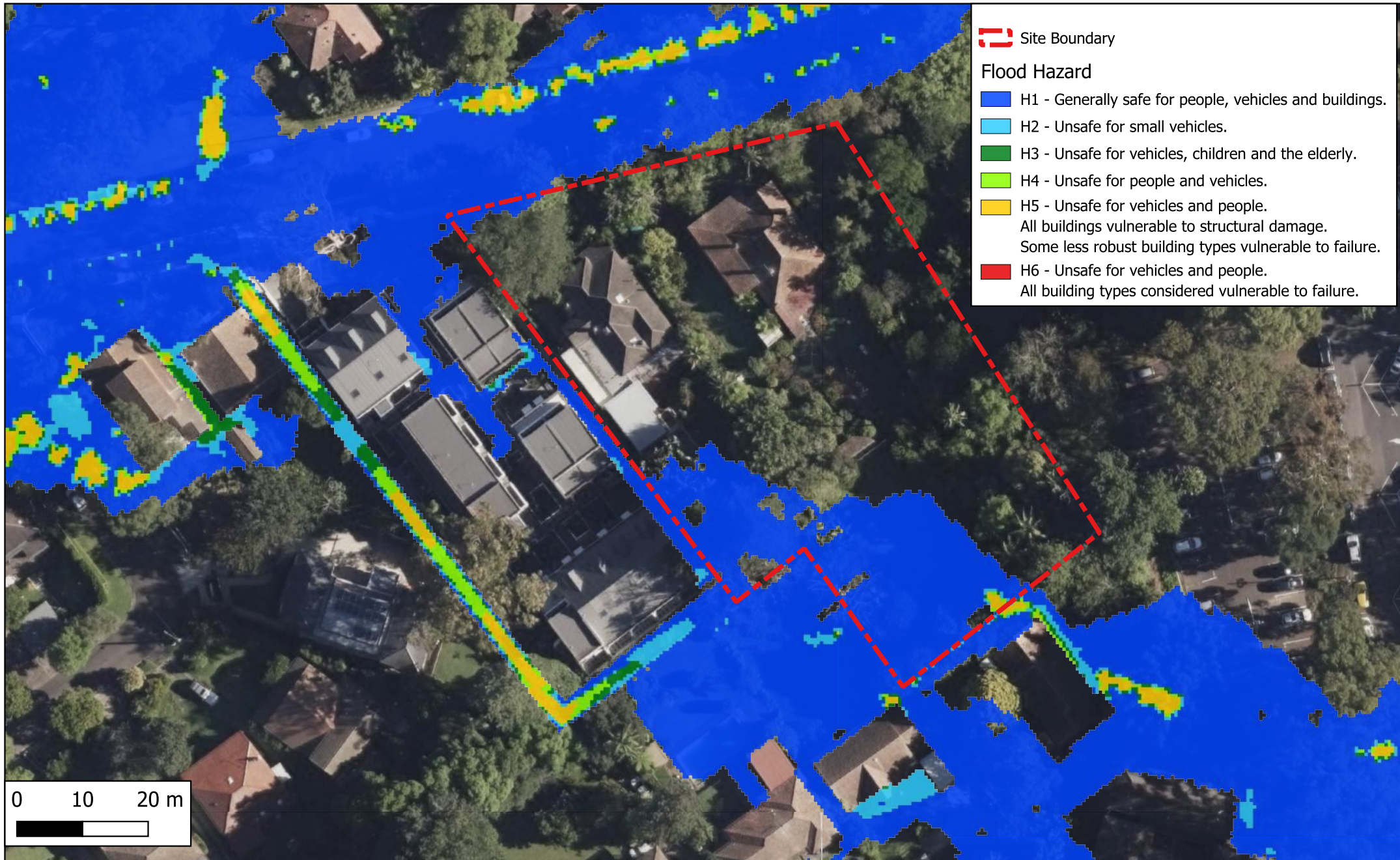
CIVIL ENGINEERING SERVICES  
 Existing Scenario 10% AEP Climate Change  
 Flood Hazard  
 SCALE : 1:750

Drafted: KC  
 Designed: KC  
 Approved: SS

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Job Number: SYD3409  
 Revision: A  
 Date: JULY 2025

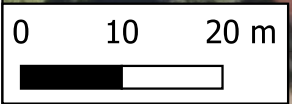






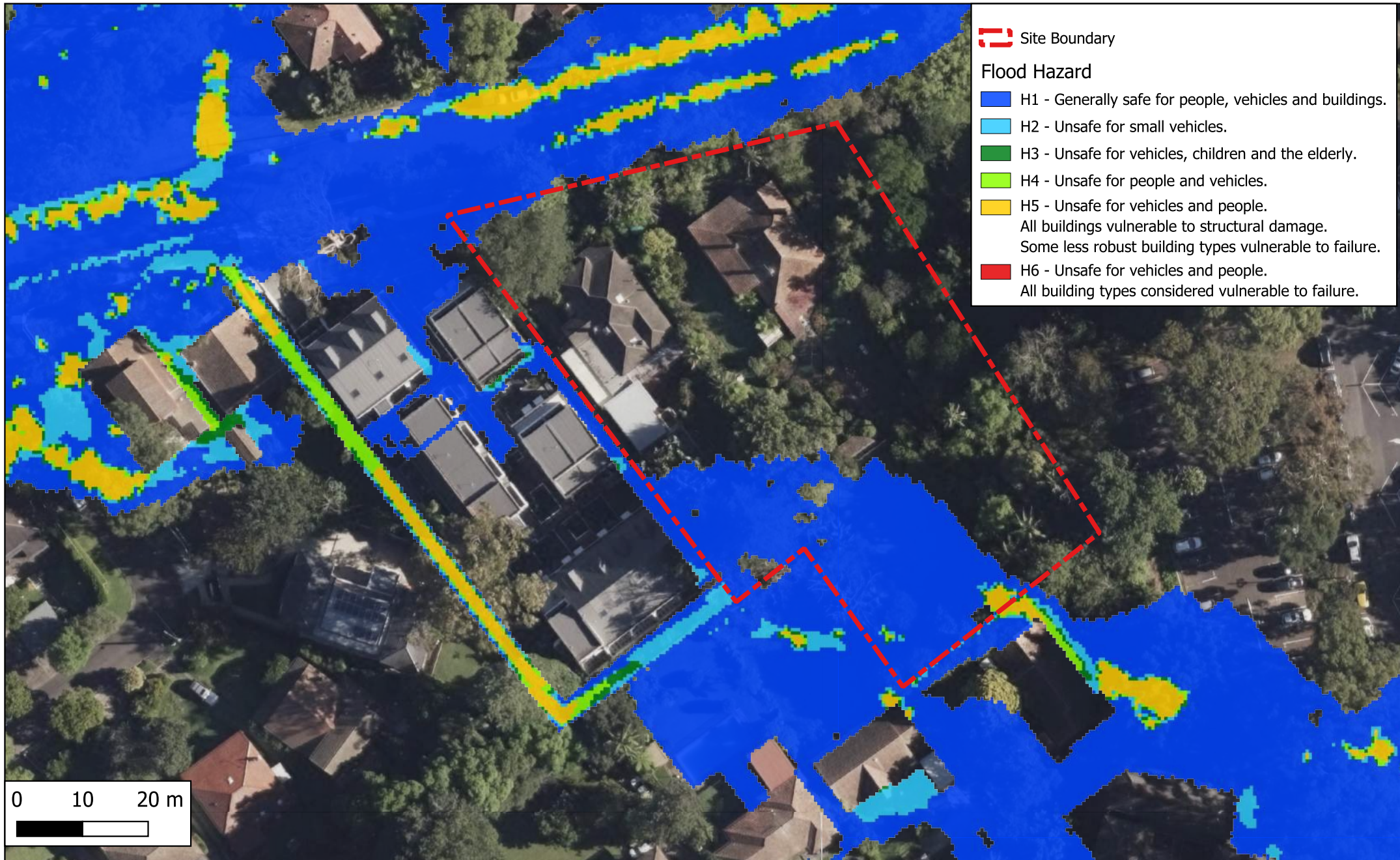
 Site Boundary

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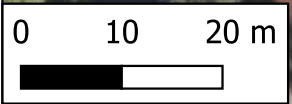
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				PTW Architects		12-16 Bent Street, Lindfield NSW 2070	Existing Scenario 5% AEP Climate Change Flood Hazard	SCALE : 1:750	Designed:	KC
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A	ISSUE FOR APPROVAL	KC	30/07/2025						Job Number: SYD3409 Revision: A Date: JULY 2025	




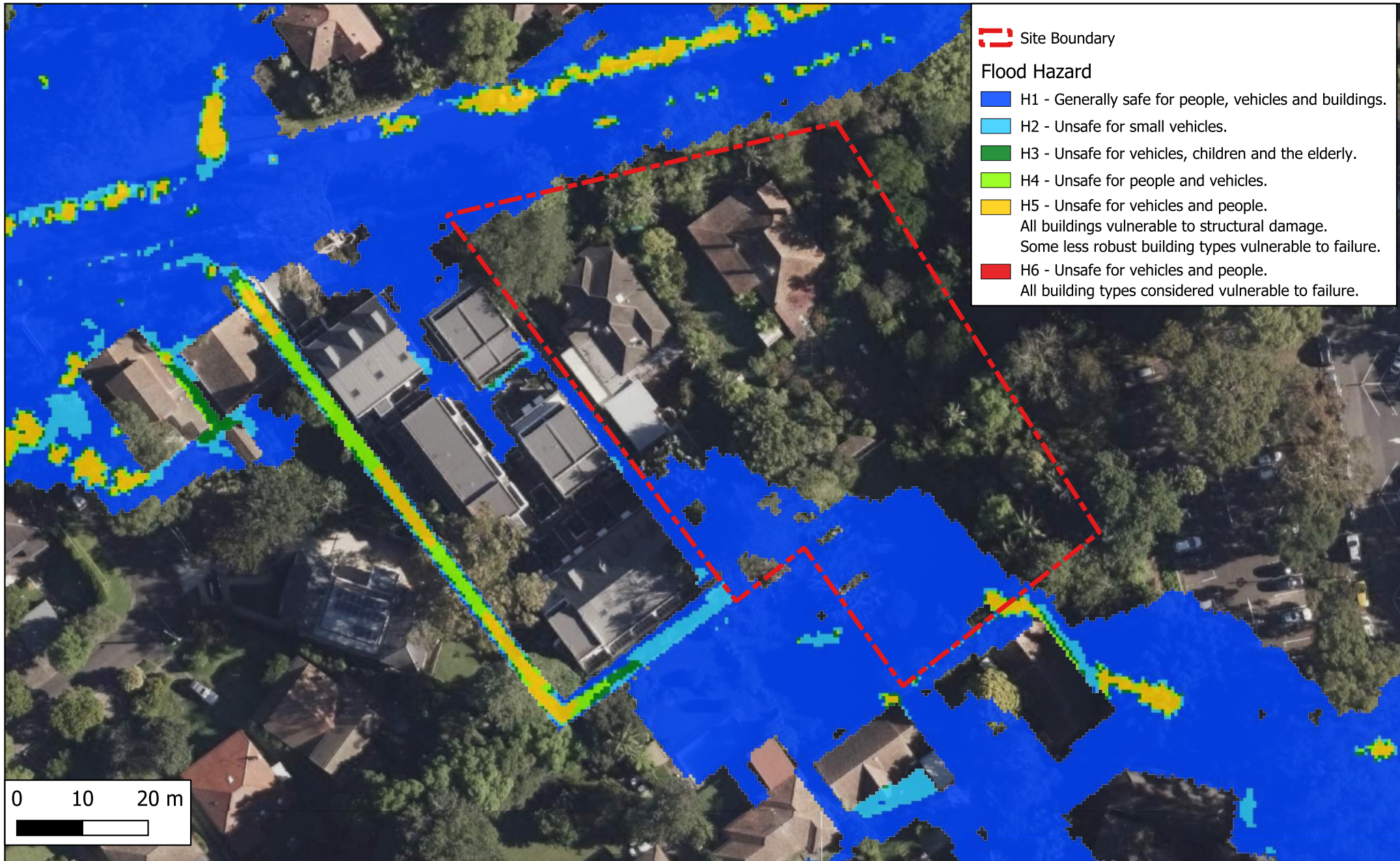
 Site Boundary


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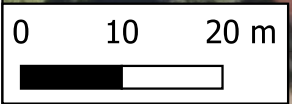
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						12-16 Bent Street, Lindfield NSW 2070	Existing Scenario 1% AEP Climate Change Flood Hazard	SCALE : 1:750	Designed:	KC
				PTW Architects					Approved:	SS
A	ISSUE FOR APPROVAL	KC	30/07/2025						Job Number: SYD3409 Revision: A Date: JULY 2025	




 Site Boundary

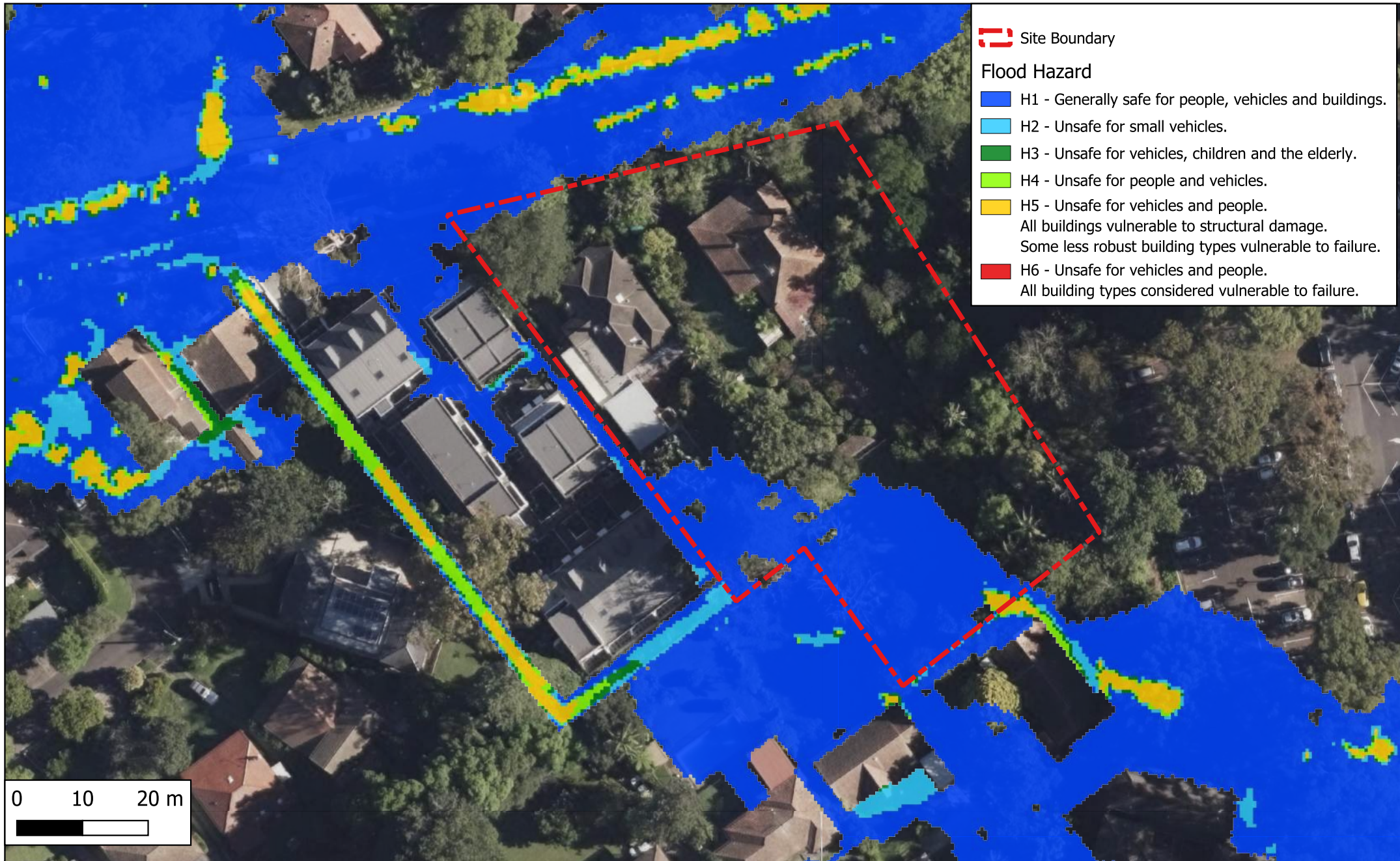
**Flood Hazard**


-  H1 - Generally safe for people, vehicles and buildings.
-  H2 - Unsafe for small vehicles.
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-  H6 - Unsafe for vehicles and people.  
All building types considered vulnerable to failure.









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				PTW Architects		12-16 Bent Street, Lindfield NSW 2070	Existing Scenario 1% AEP Flood Hazard	Designed:	KC
							SCALE : 1:750	Approved:	SS
A	ISSUE FOR APPROVAL	KC	30/07/2025					Job Number: SYD3409 Revision: A Date: JULY 2025	

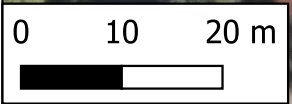






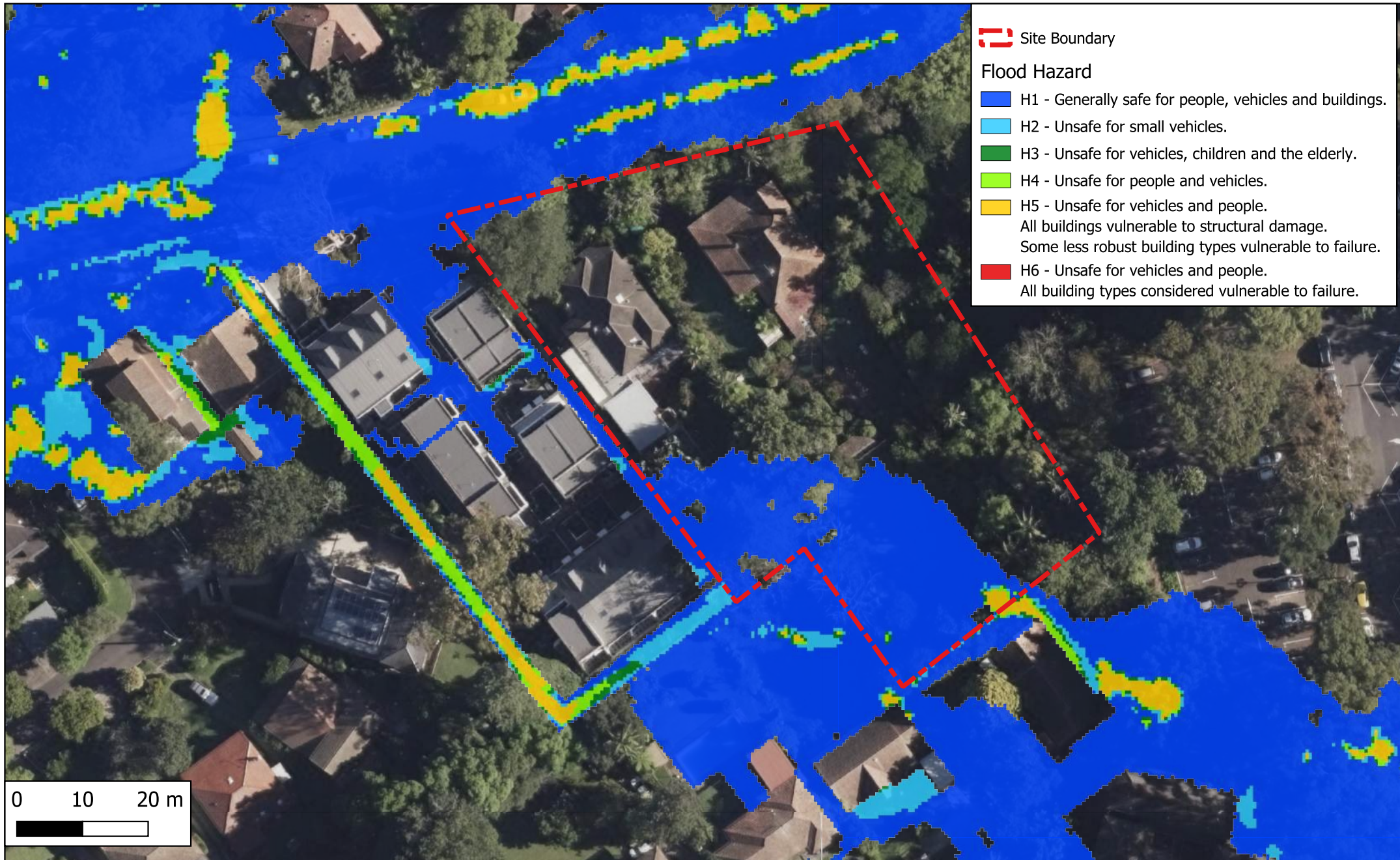
 Site Boundary

**Flood Hazard**

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-  H2 - Unsafe for small vehicles.
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-  H4 - Unsafe for people and vehicles.
-  H5 - Unsafe for vehicles and people.  
All buildings vulnerable to structural damage.  
Some less robust building types vulnerable to failure.
-  H6 - Unsafe for vehicles and people.  
All building types considered vulnerable to failure.









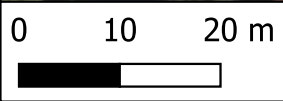
Revision	Description	Initial	Date	Northland Development	 An <b>ayesa</b> company <a href="http://www.adpconsulting.com">www.adpconsulting.com</a> <a href="mailto:adpconsulting@adpconsulting.com.au">adpconsulting@adpconsulting.com.au</a>	SSDA	CIVIL ENGINEERING SERVICES	Drafted:	KC	
				PTW Architects		12-16 Bent Street, Lindfield NSW 2070	Existing Scenario 0.5% AEP Flood Hazard	SCALE : 1:750	Designed:	KC
									Approved:	SS
A	ISSUE FOR APPROVAL	KC	30/07/2025						Job Number: SYD3409 Revision: A Date: JULY 2025	




 Site Boundary

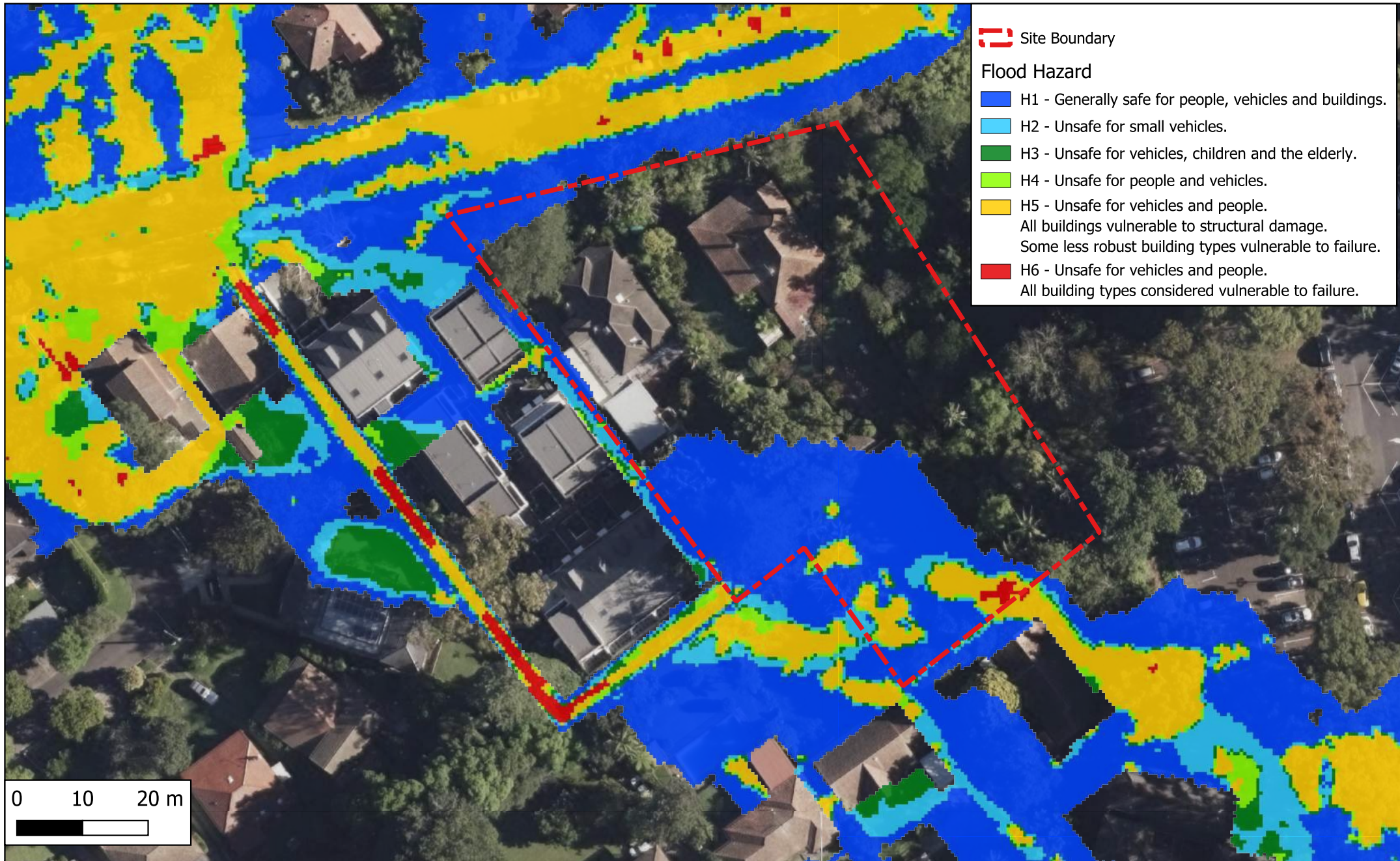
**Flood Hazard**


-  H1 - Generally safe for people, vehicles and buildings.
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Revision	Description	Initial	Date	Northland Development	 An <b>ayesa</b> company <a href="http://www.adpconsulting.com">www.adpconsulting.com</a> <a href="mailto:adpconsulting@adpconsulting.com.au">adpconsulting@adpconsulting.com.au</a>	SSDA	CIVIL ENGINEERING SERVICES	Drafted:	KC
				PTW Architects		12-16 Bent Street, Lindfield NSW 2070	Existing Scenario 0.2% AEP Flood Hazard	Designed:	KC
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A	ISSUE FOR APPROVAL	KC	30/07/2025					Job Number: SYD3409 Revision: A Date: JULY 2025	

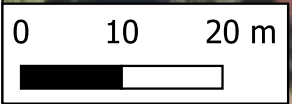





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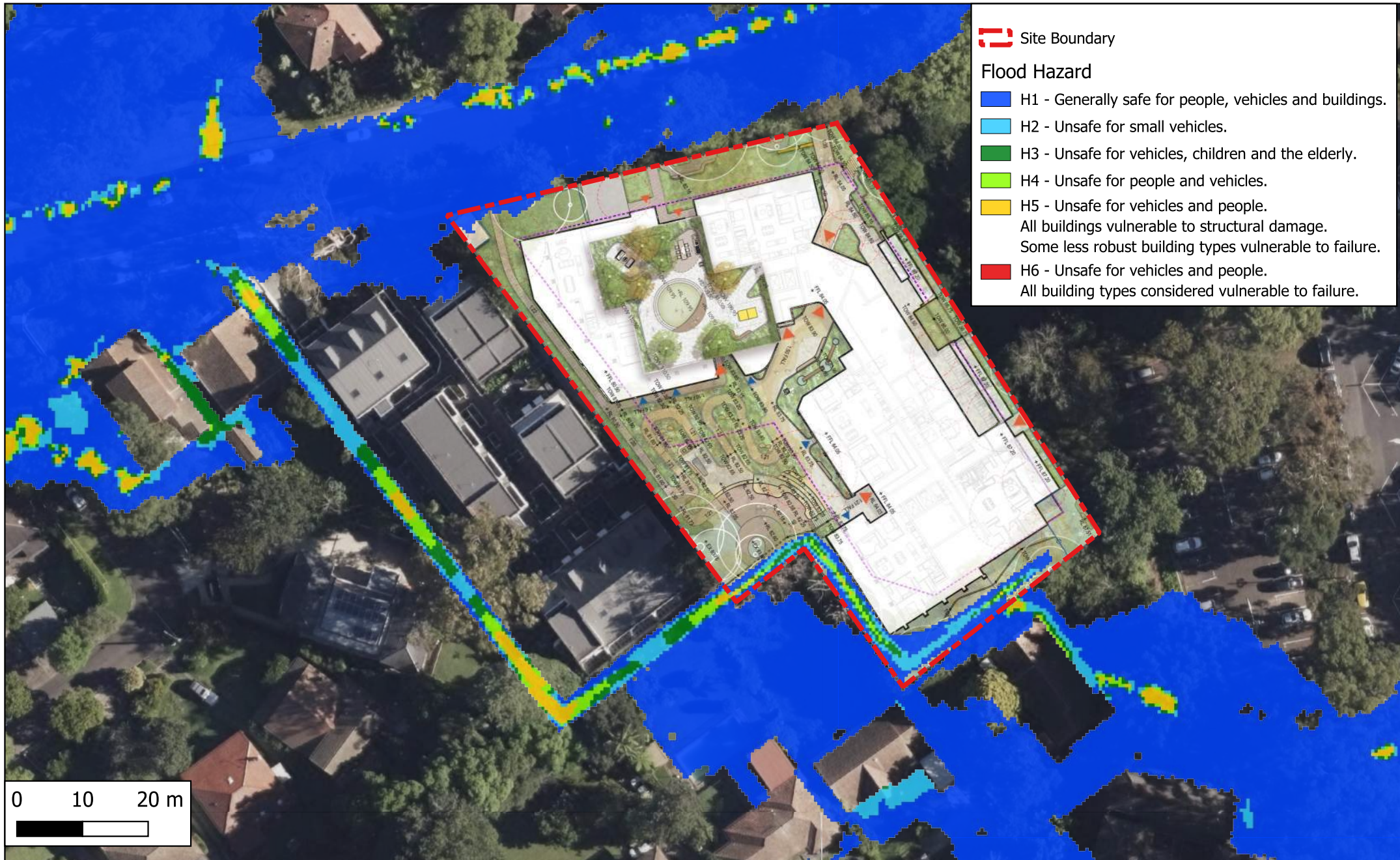
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Revision	Description	Initial	Date	Northland Development	 An <b>ayesa</b> company <a href="http://www.adpconsulting.com">www.adpconsulting.com</a> <a href="mailto:adpconsulting@adpconsulting.com.au">adpconsulting@adpconsulting.com.au</a>	SSDA	CIVIL ENGINEERING SERVICES	Drafted:	KC
				PTW Architects		12-16 Bent Street, Lindfield NSW 2070	Existing Scenario PMF Hazard	Designed:	KC
							SCALE : 1:750	Approved:	SS
A	ISSUE FOR APPROVAL	KC	30/07/2025						

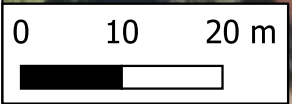





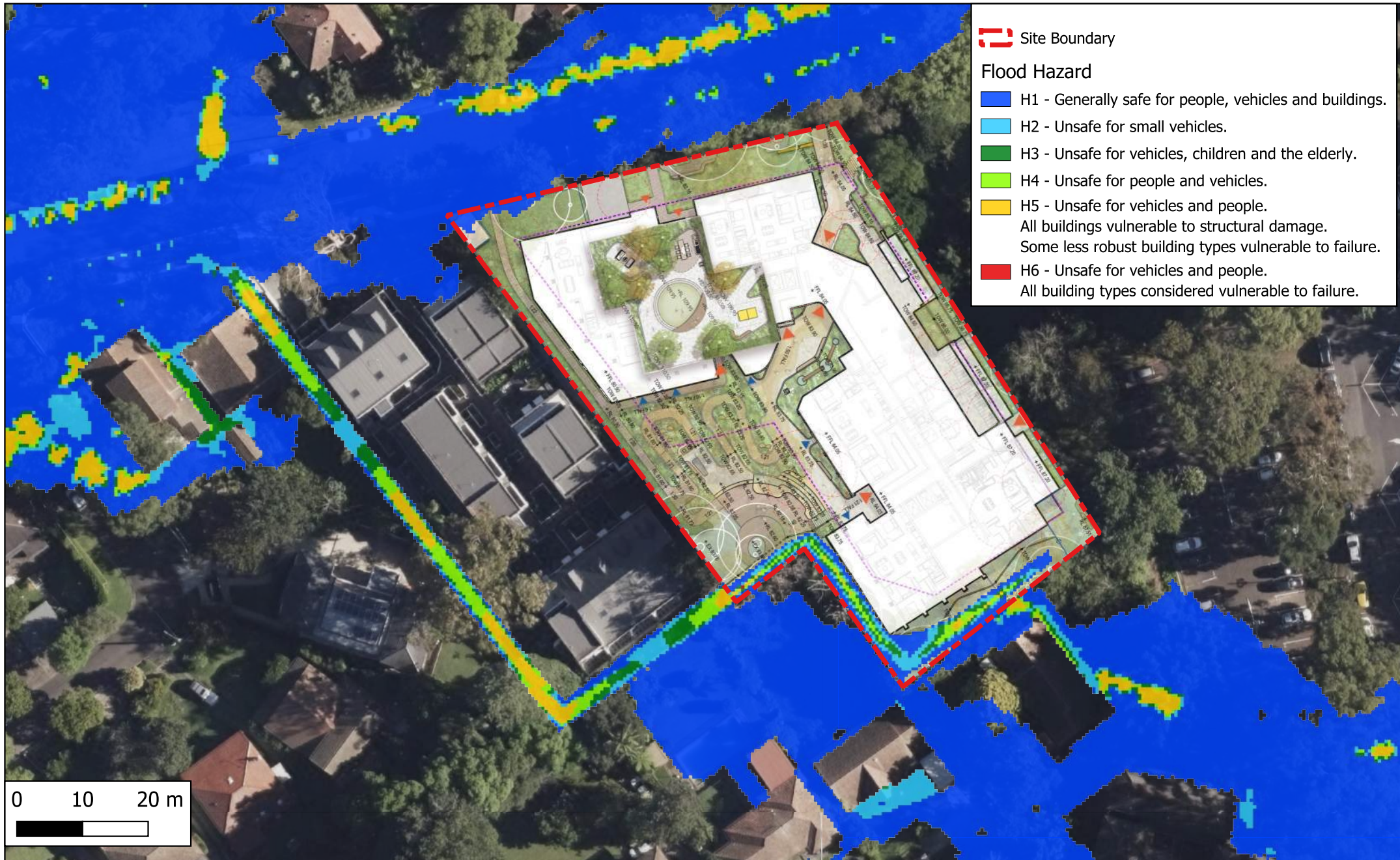
 Site Boundary

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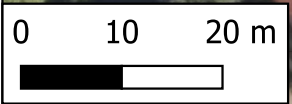
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				PTW Architects		12-16 Bent Street, Lindfield NSW 2070	Proposed Scenario 10% AEP Flood Climate Change Hazard	Designed:	KC
							SCALE : 1:750	Approved:	SS
A	ISSUE FOR APPROVAL	KC	30/07/2025					Job Number: SYD3409 Revision: A Date: JULY 2025	




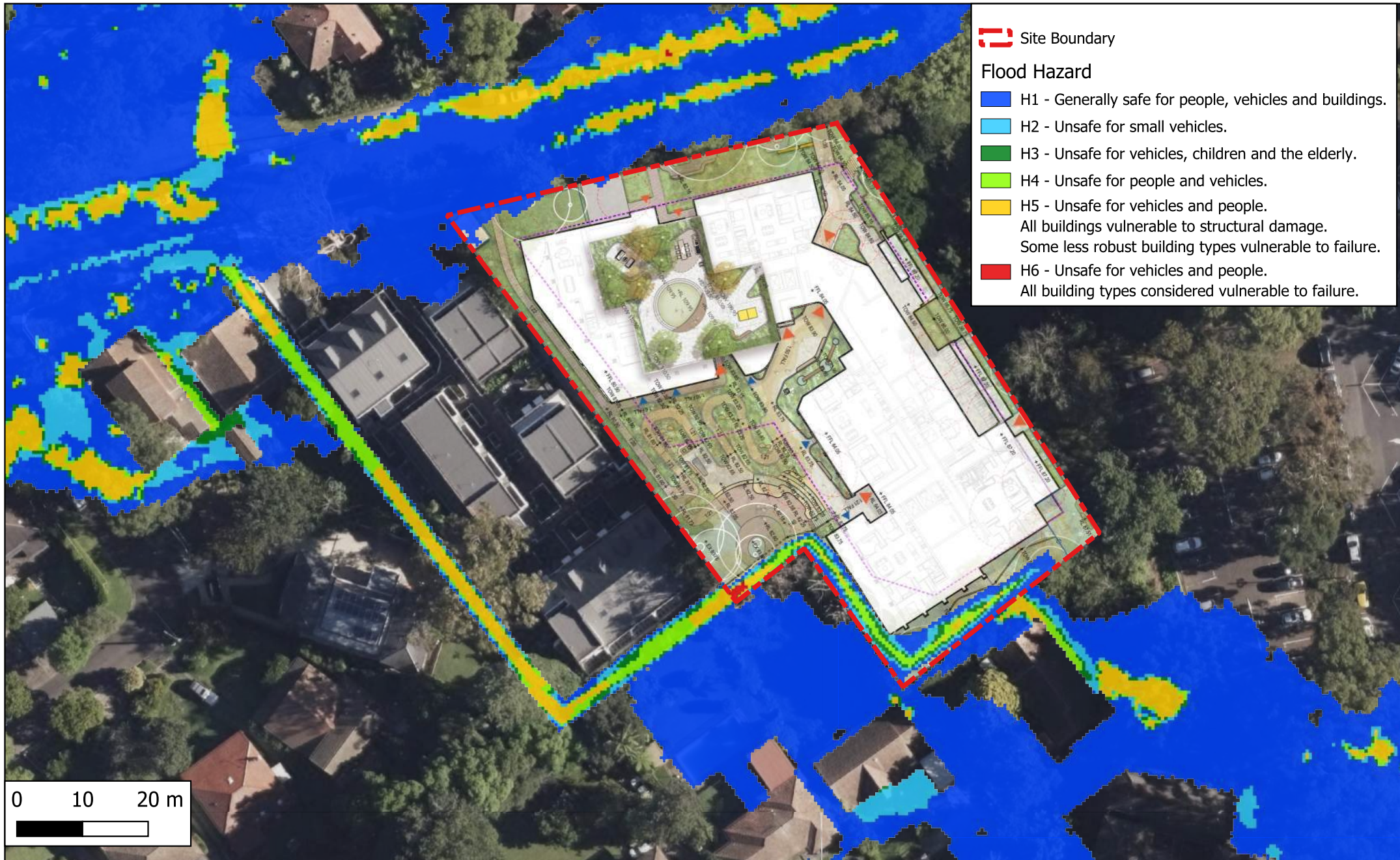
 Site Boundary

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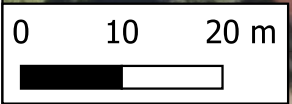
Revision	Description	Initial	Date	Northland Development	 An <b>ayesa</b> company <a href="http://www.adpconsulting.com">www.adpconsulting.com</a> <a href="mailto:adpconsulting@adpconsulting.com.au">adpconsulting@adpconsulting.com.au</a>	SSDA	CIVIL ENGINEERING SERVICES	Drafted:	KC	
				PTW Architects		12-16 Bent Street, Lindfield NSW 2070	Proposed Scenario 5% AEP Climate Change Flood Hazard	SCALE : 1:750	Designed:	KC
									Approved:	SS
A	ISSUE FOR APPROVAL	KC	30/07/2025						Job Number: SYD3409 Revision: A Date: JULY 2025	




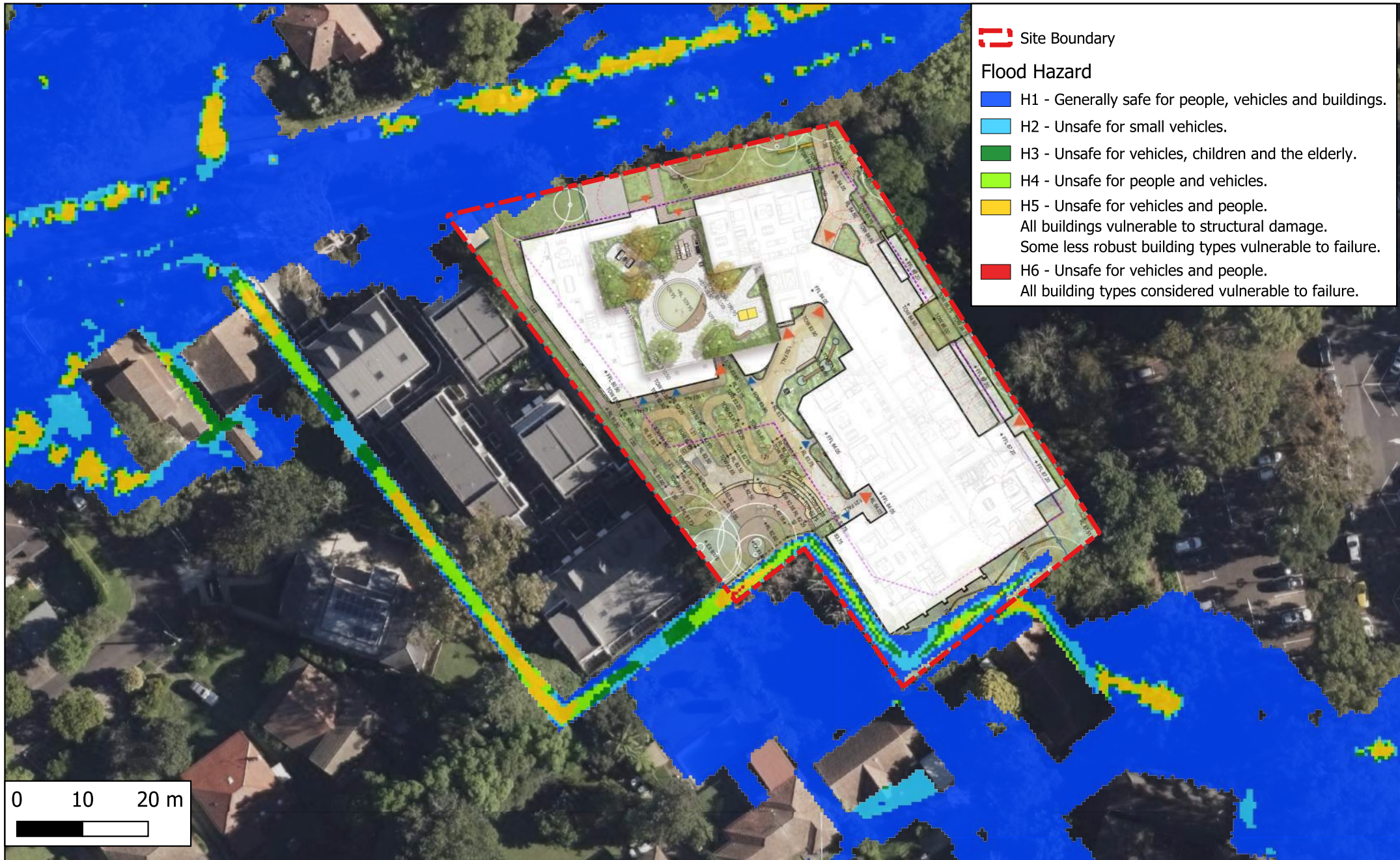
 Site Boundary

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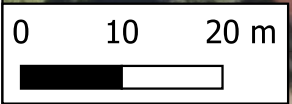
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				PTW Architects		12-16 Bent Street, Lindfield NSW 2070	Proposed Scenario 1% AEP Climate Change Flood Hazard	Designed:	KC
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A	ISSUE FOR APPROVAL	KC	30/07/2025					Job Number: SYD3409 Revision: A Date: JULY 2025	




 Site Boundary

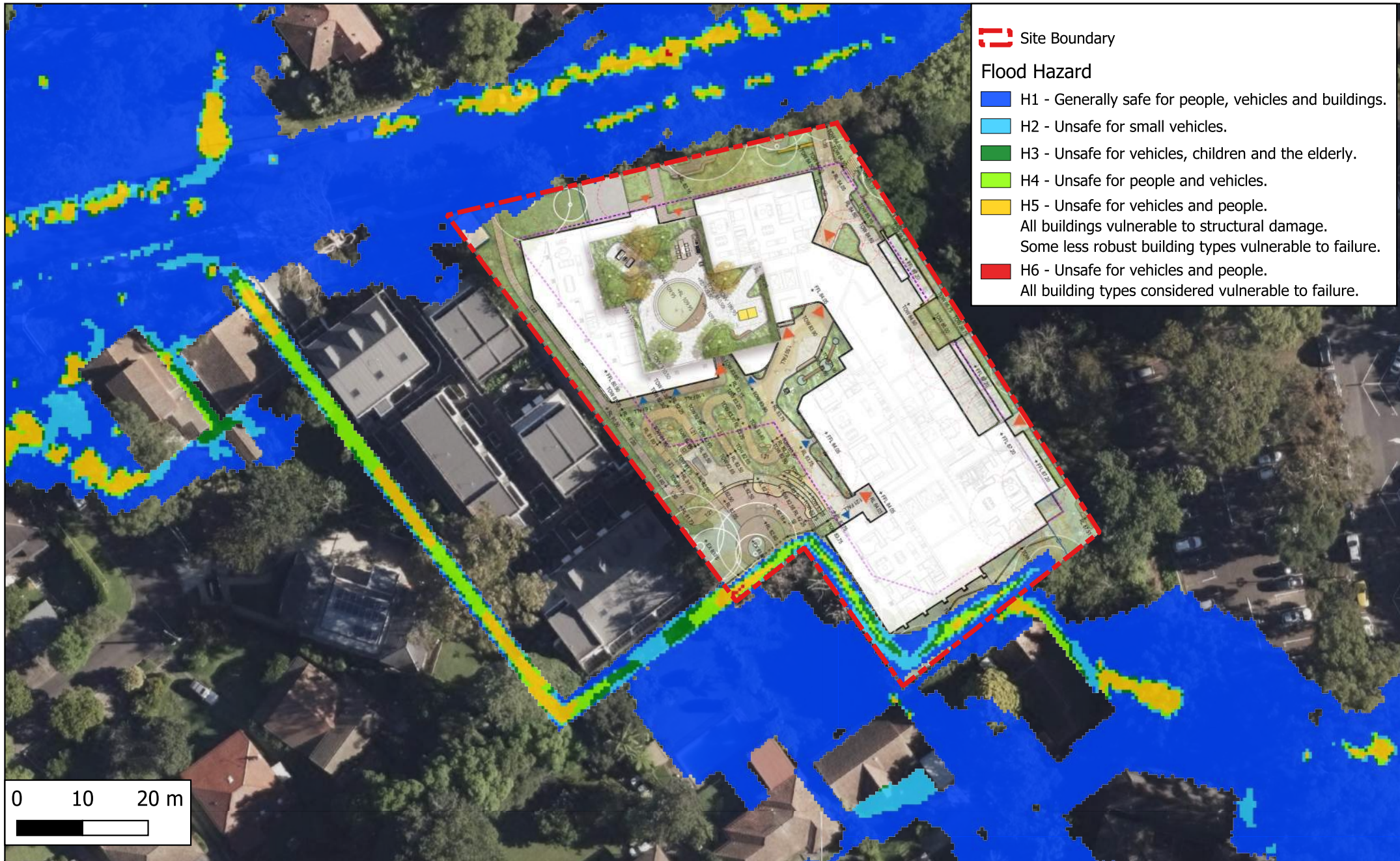
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				PTW Architects		12-16 Bent Street, Lindfield NSW 2070	Proposed Scenario 1% AEP Flood Hazard	Designed:	KC
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A	ISSUE FOR APPROVAL	KC	30/07/2025					Job Number: SYD3409 Revision: A Date: JULY 2025	

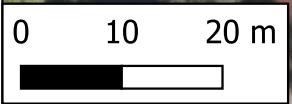





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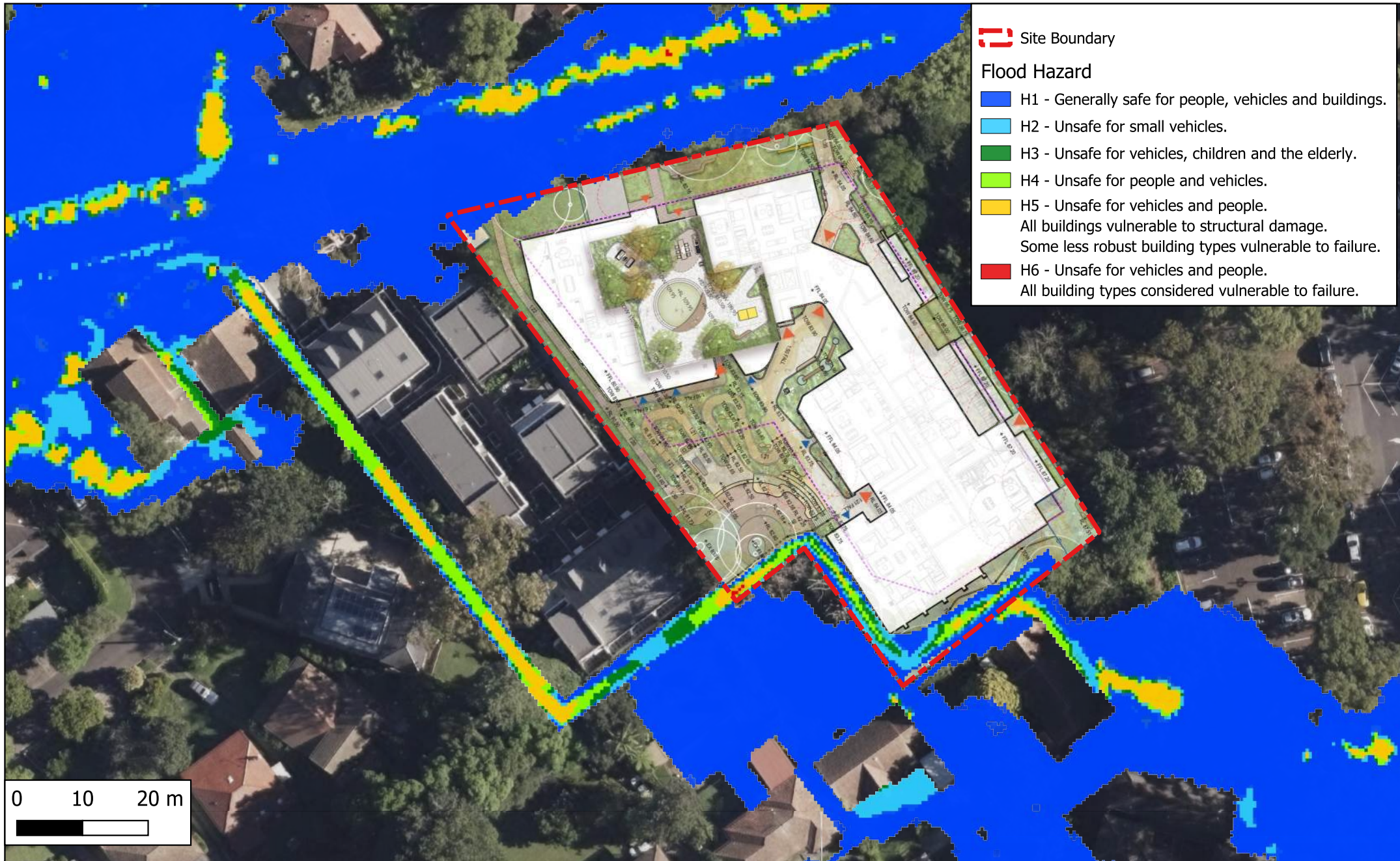
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				PTW Architects		12-16 Bent Street, Lindfield NSW 2070	Proposed Scenario 0.5% AEP Flood Hazard	Designed:	KC
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A	ISSUE FOR APPROVAL	KC	30/07/2025					Job Number: SYD3409 Revision: A Date: JULY 2025	

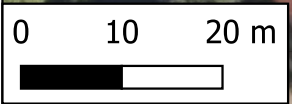




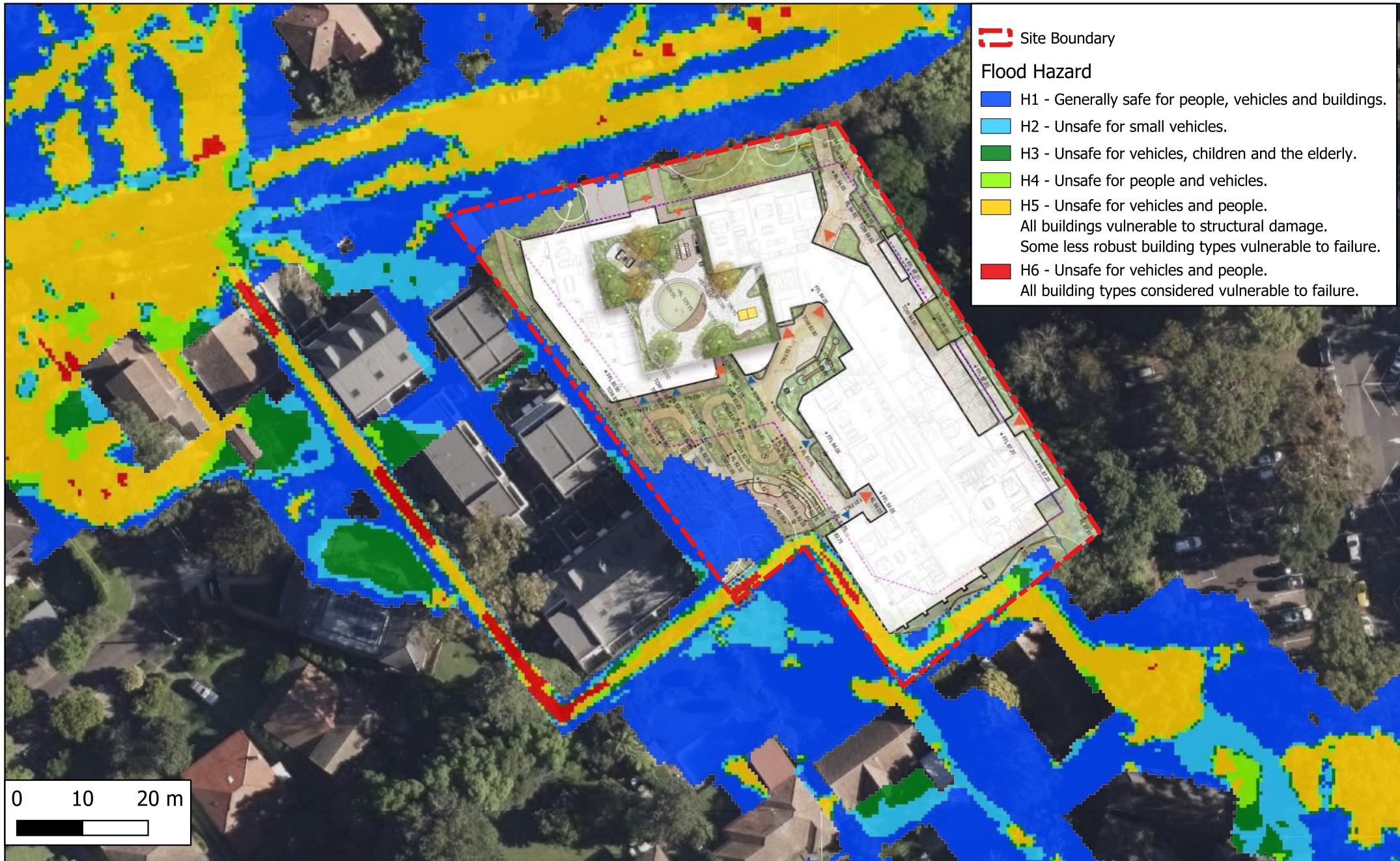
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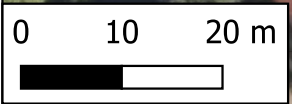
Revision	Description	Initial	Date	Northland Development	 An <b>ayesa</b> company <a href="http://www.adpconsulting.com">www.adpconsulting.com</a> <a href="mailto:adpconsulting@adpconsulting.com.au">adpconsulting@adpconsulting.com.au</a>	SSDA	CIVIL ENGINEERING SERVICES	Drafted:	KC
				PTW Architects		12-16 Bent Street, Lindfield NSW 2070	Proposed Scenario 0.2% AEP Flood Hazard	Designed:	KC
							SCALE : 1:750	Approved:	SS
A	ISSUE FOR APPROVAL	KC	30/07/2025						Job Number: SYD3409 Revision: A Date: JULY 2025




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				PTW Architects		12-16 Bent Street, Lindfield NSW 2070	Proposed Scenario PMF Hazard	SCALE : 1:750	Designed:	KC
									Approved:	SS
A	ISSUE FOR APPROVAL	KC	30/07/2025						Job Number: SYD3409 Revision: A Date: JULY 2025	



# **Appendix E**

## **Civil Stormwater Plans**

# 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









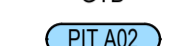
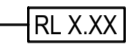



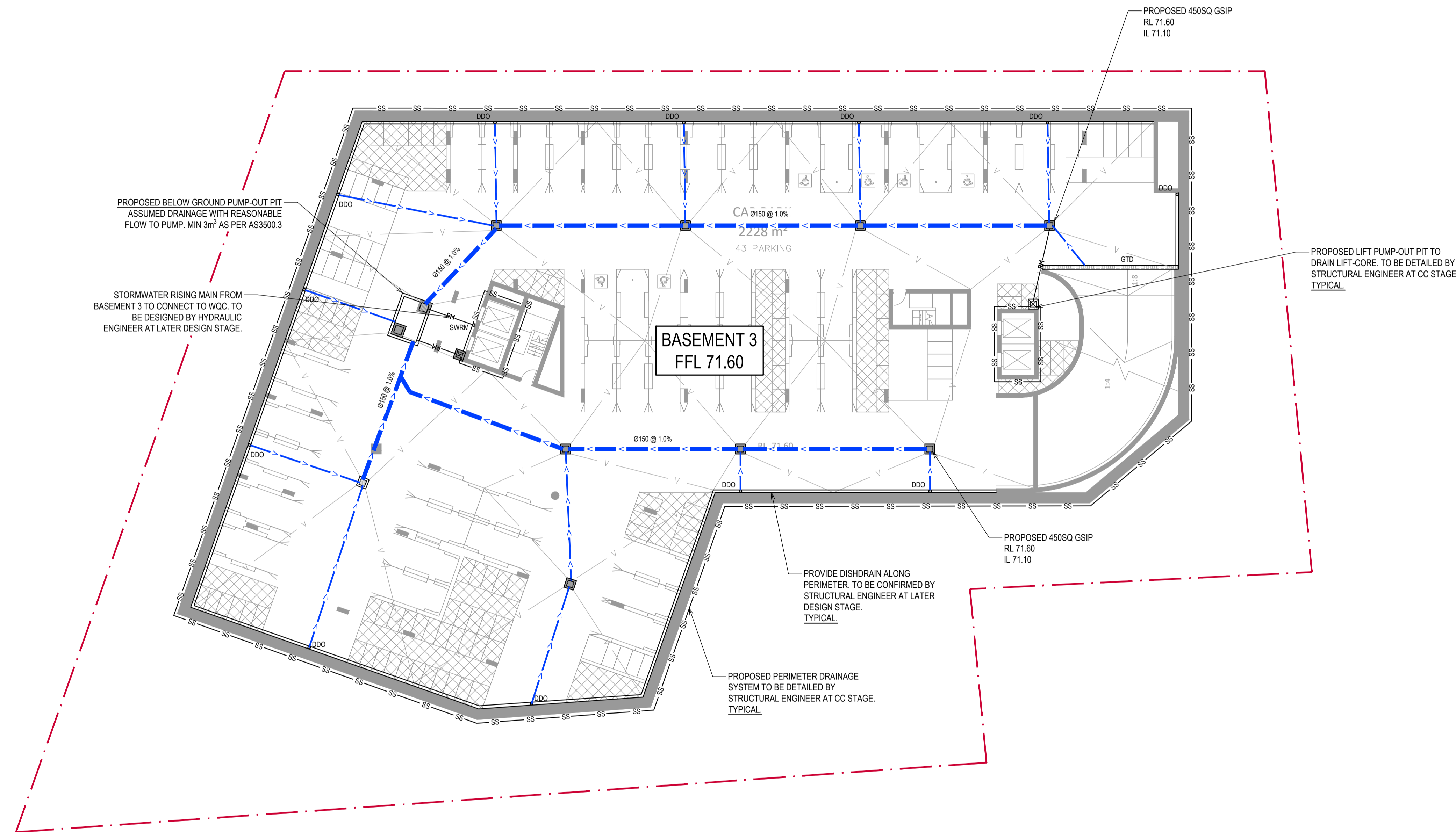
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E	ISSUE FOR SSDA APPROVAL	KC	30.09.2025	<b>SUNDALE NORTHLAND DEVELOPMENT</b> 5 BELMORE STREET, BURWOOD NSW 2134	<b>ADP</b> Consulting : Engineering	12-16 BENT ST, LINDFIELD 12-16 BENT STREET, LINDFIELD NSW 2070	<b>CIVIL ENGINEERING SERVICES</b> COVER SHEET	KC	KC	SS	SEP 2025	@	A1
D	ISSUE FOR SSDA APPROVAL	KC	30.07.2025	<b>PTW ARCHITECTS</b> 88 PHILIP STREET, SYDNEY NSW 2000				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										

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



**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.

**APPROVAL**

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
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

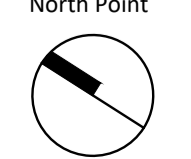
**ADP**  
Consulting : Engineering

Melbourne Sydney Brisbane  
www.adpconsulting.com.au adpconsulting@adpconsulting.com.au











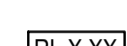
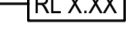




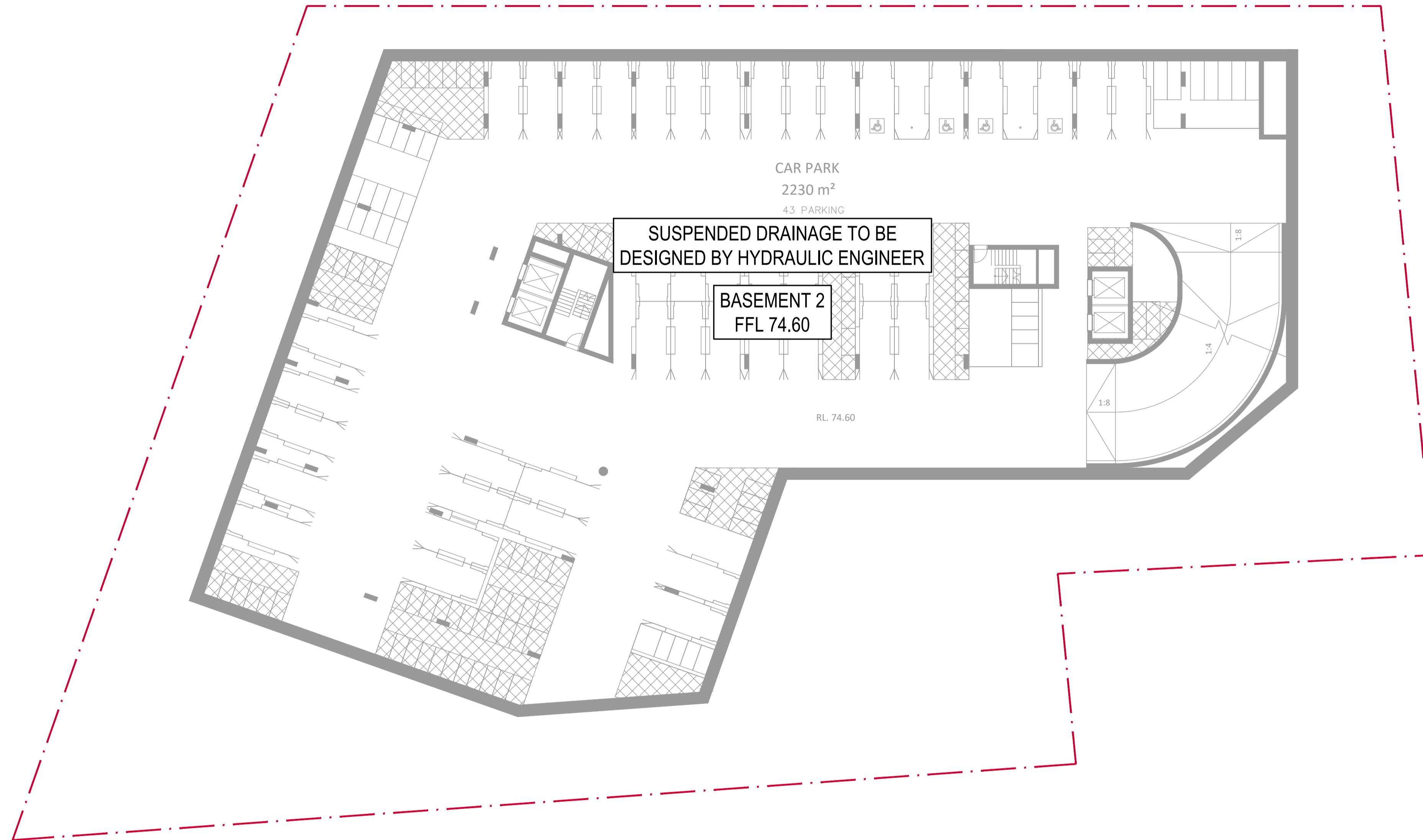
Project  
**12-16 BENT ST, LINDFIELD**  
12-16 BENT STREET, LINDFIELD NSW 2070

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
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-  GRATED SURFACE INLET PIT
-  SEALED JUNCTION PIT
-  GRATED DRAIN
-  GTD
-  PIT A02
-  STORMWATER PIT NAME
-  FINISHED RL
-  SWRM
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  5. SLAB/PAVEMENT TO HAVE MINIMUM 1% FALL TOWARDS STORMWATER INLETS AS PER AS2890 REQUIREMENTS.

**PRINTING NOTE:  
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PRINTED IN COLOUR.**

A1 1:200

Revision	Description
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
KC	30.09.2025	<b>SUNDALE NORTHLAND DEVELOPMENT</b> 5 BELMORE STREET, BURWOOD NSW 2134
KC	30.07.2025	Architect
KC	04.07.2025	<b>PTW ARCHITECTS</b> 88 PHILIP STREET, SYDNEY NSW 2000
KC	18.02.2025	
KC	24.01.2025	

Building Services Consultants

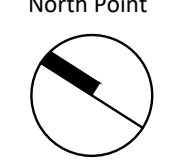


Melbourne Sydney Brisbane  
www.adpconsulting.com.au adpconsulting@adpconsulting.com.au











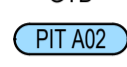
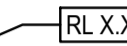

Project
12-16 BENT ST, LINDFIELD 12-16 BENT STREET, LINDFIELD NSW 2070

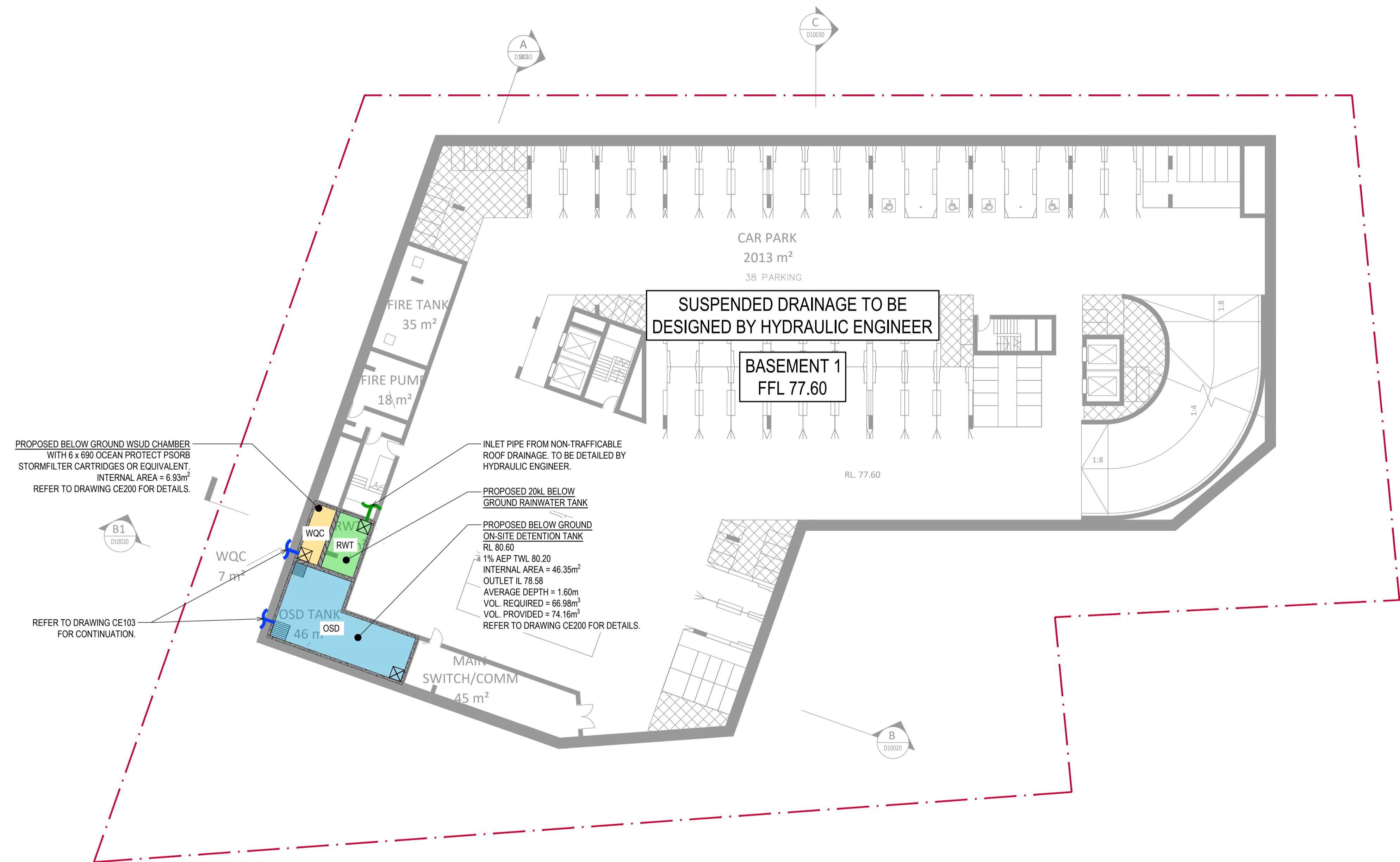
Drawing Title
<b>CIVIL ENGINEERING SERVICES</b> STORMWATER MANAGEMENT PLAN - BASEMENT 2

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



- 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:
    - 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.

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

A1 1:200

Revision	Description
F	ISSUE FOR SSDA APPROVAL
E	ISSUE FOR SSDA APPROVAL
D	ISSUE FOR SSDA APPROVAL
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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

**ADP**  
Consulting : Engineering

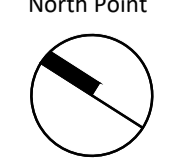
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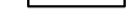











**Project**  
12-16 BENT ST, LINDFIELD  
12-16 BENT STREET, LINDFIELD NSW 2070

**Drawing Title**  
**CIVIL ENGINEERING SERVICES**  
STORMWATER MANAGEMENT PLAN - BASEMENT 1

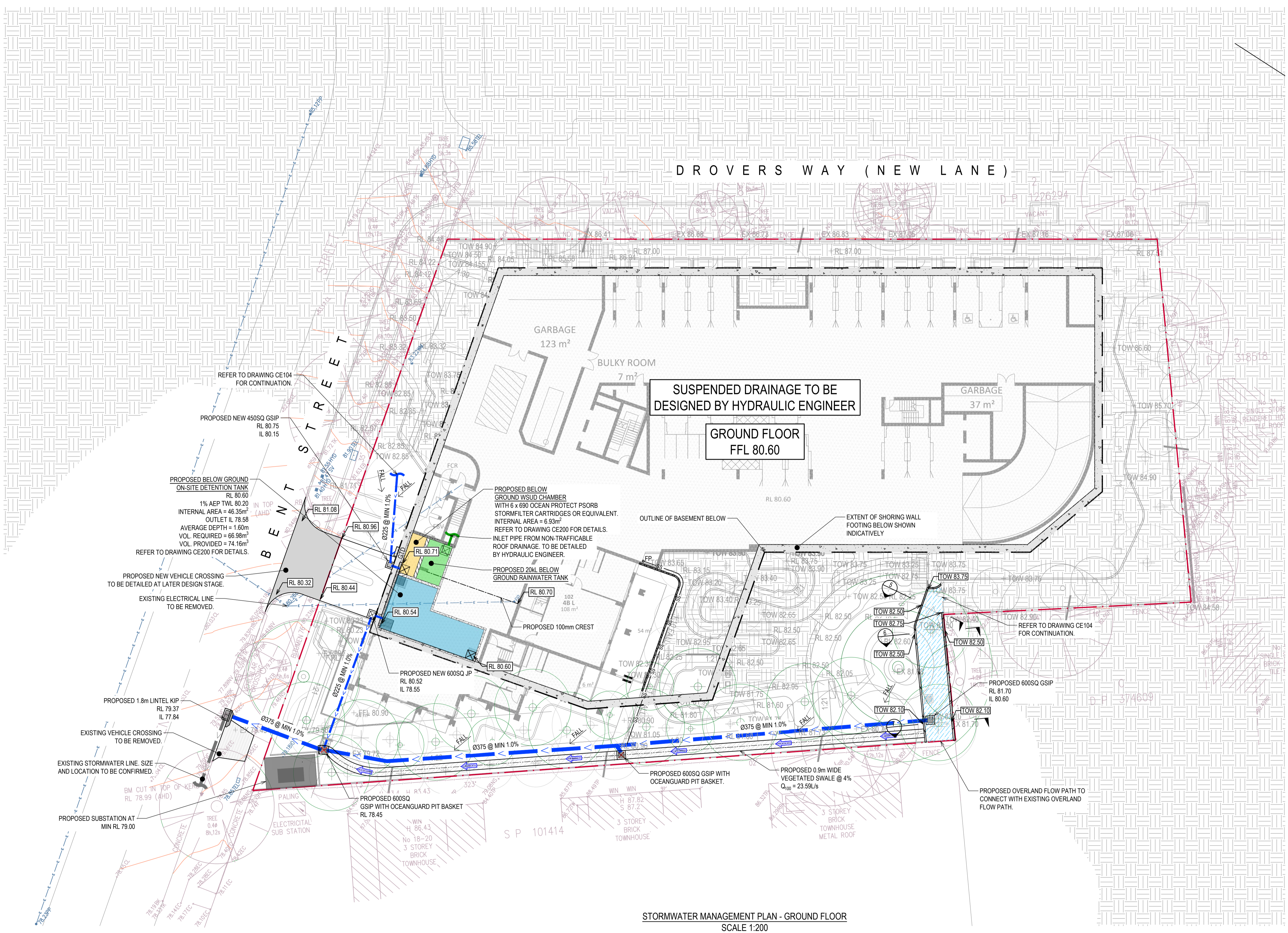
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KC	KC	SS	SEP 2025	1:200 @	A1
Job Number	Drawing Number	Revision	North Point		
SYD3409	CE102	F			

**APPROVAL**

**LEGEND**

-  SITE BOUNDARY
-  35.50 EXISTING CONTOUR (0.1m)
-  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
-  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

**DROVERS WAY (NEW LANE)**



**STORMWATER MANAGEMENT PLAN - GROUND FLOOR**  
SCALE 1:200

- NOTES:**
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  2. ALL REDUCED LEVELS ARE IN mAHD.
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A1 1:200

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Building Services Consultants

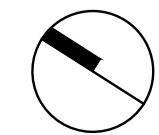
**ADP**  
Consulting : Engineering

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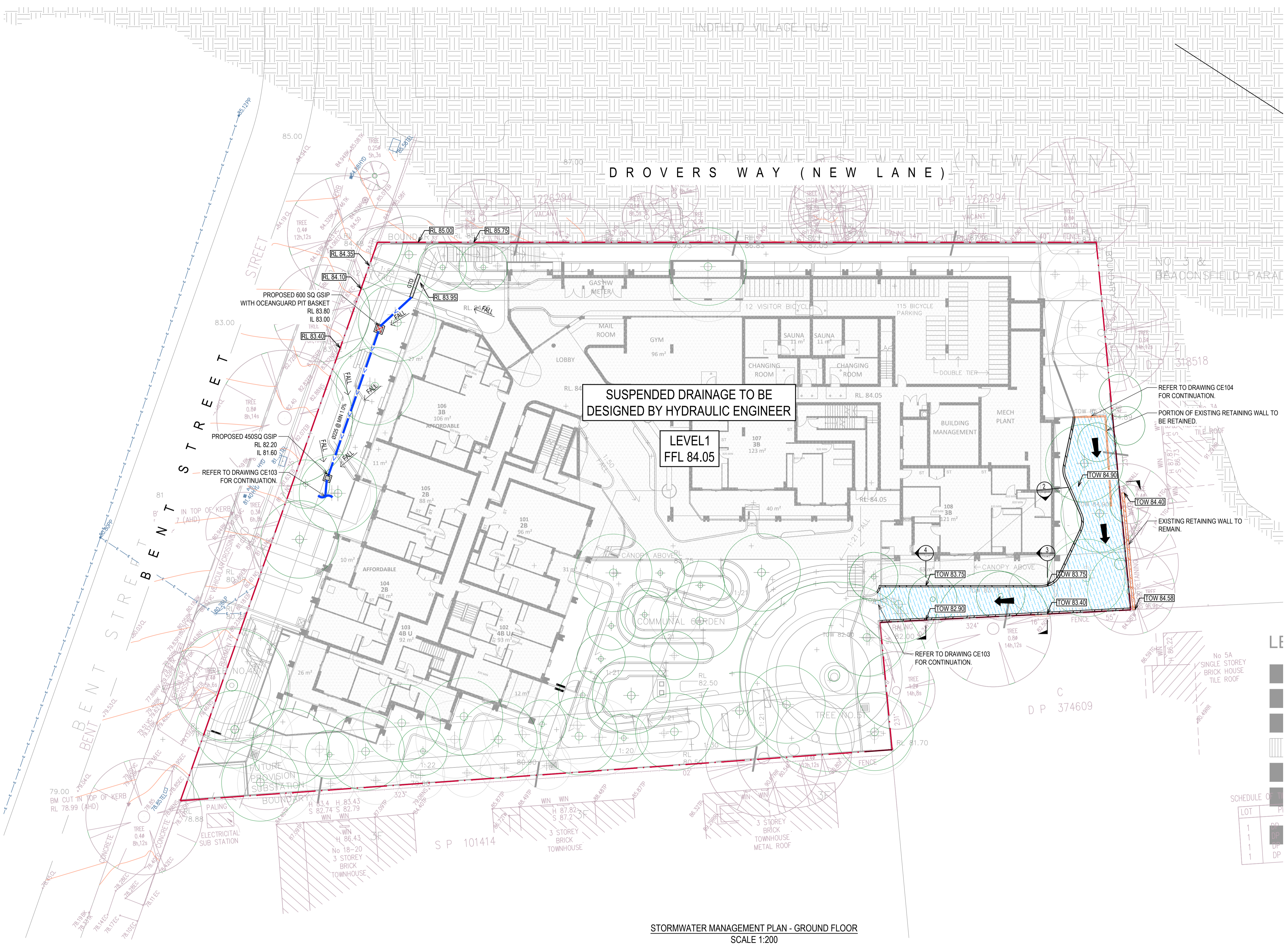


Project  
**12-16 BENT ST, LINDFIELD**  
12-16 BENT STREET, LINDFIELD NSW 2070

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
	EXISTING CONTOUR (0.5m)
	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

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A1 1:200

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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 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			



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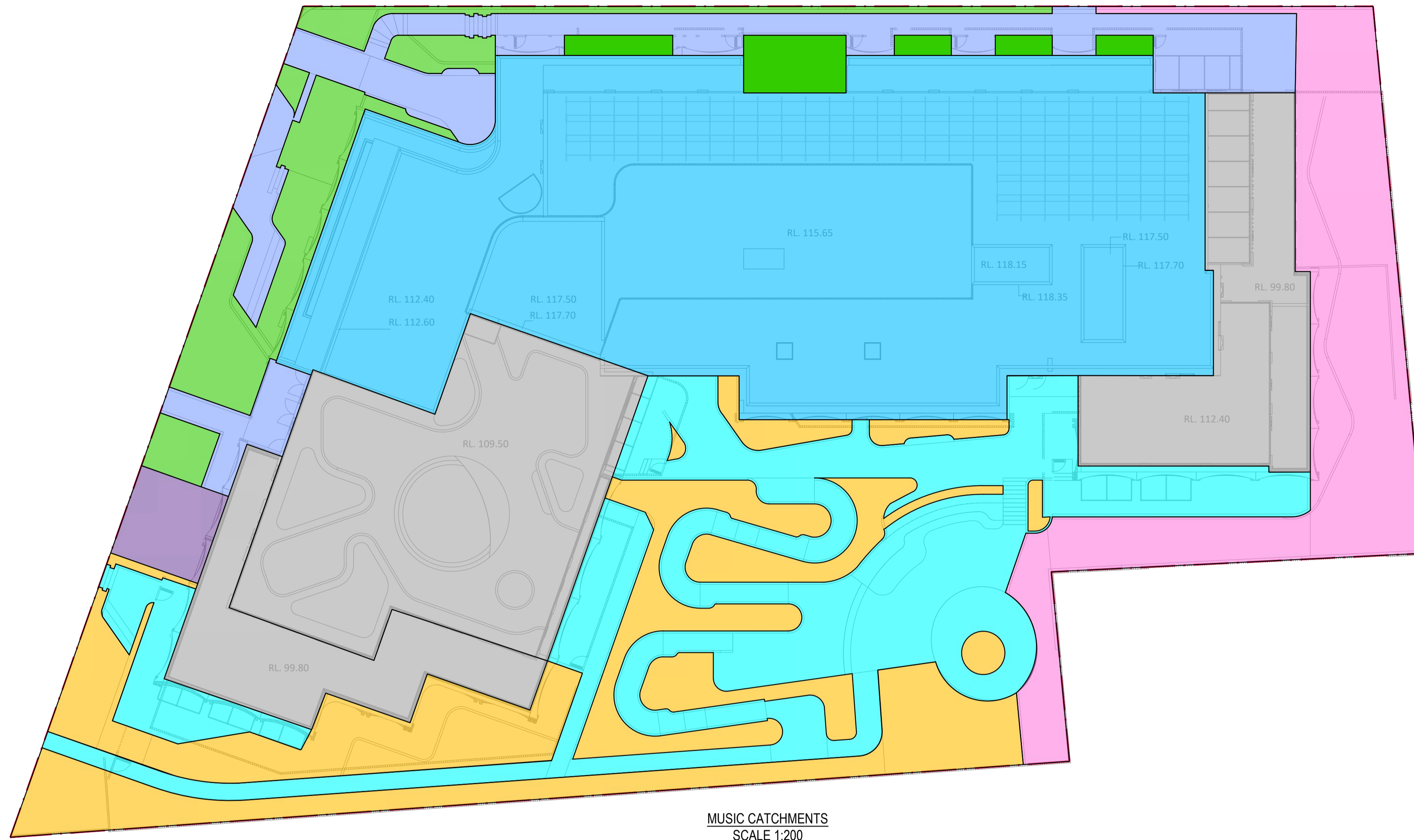
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Project  
**12-16 BENT ST, LINDFIELD**  
12-16 BENT STREET, LINDFIELD NSW 2070

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			



### LEGEND

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

### 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.

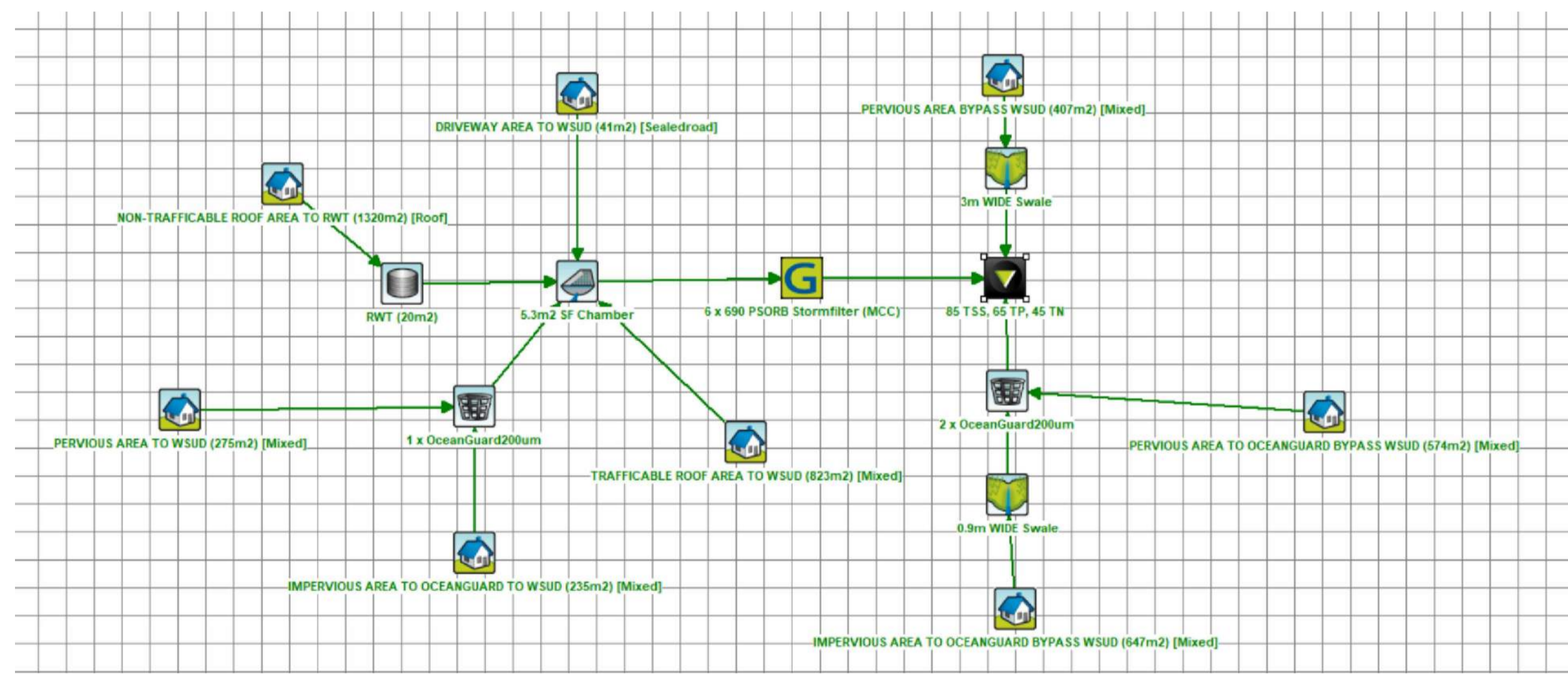
BASED ON RAINWATER TANK CAPACITY AND RE-USE VALUES ABOVE, 55% REDUCTION IN RUNOFF DAYS ARE ACHIEVED.

### 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 CATCHMENTS  
SCALE 1:200



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

MUSIC TREATMENT TRAIN AND RESULTS

**PRINTING NOTE:**  
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A1 1:200

Revision	Description
F	ISSUE FOR SSDA APPROVAL
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Building Services Consultants

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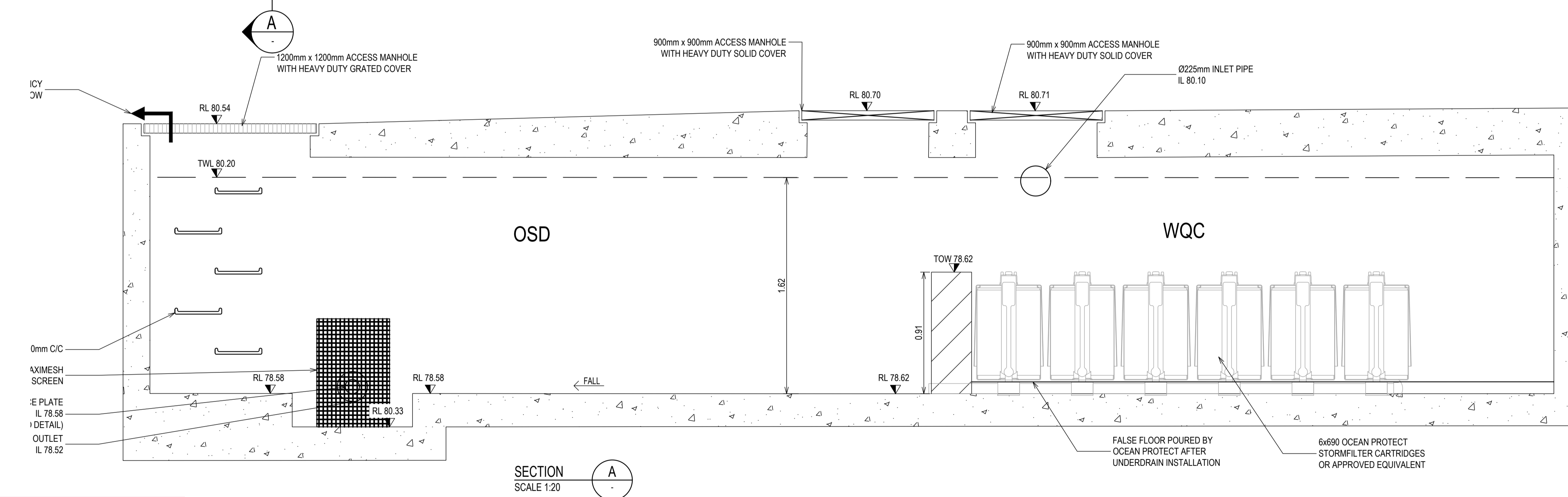
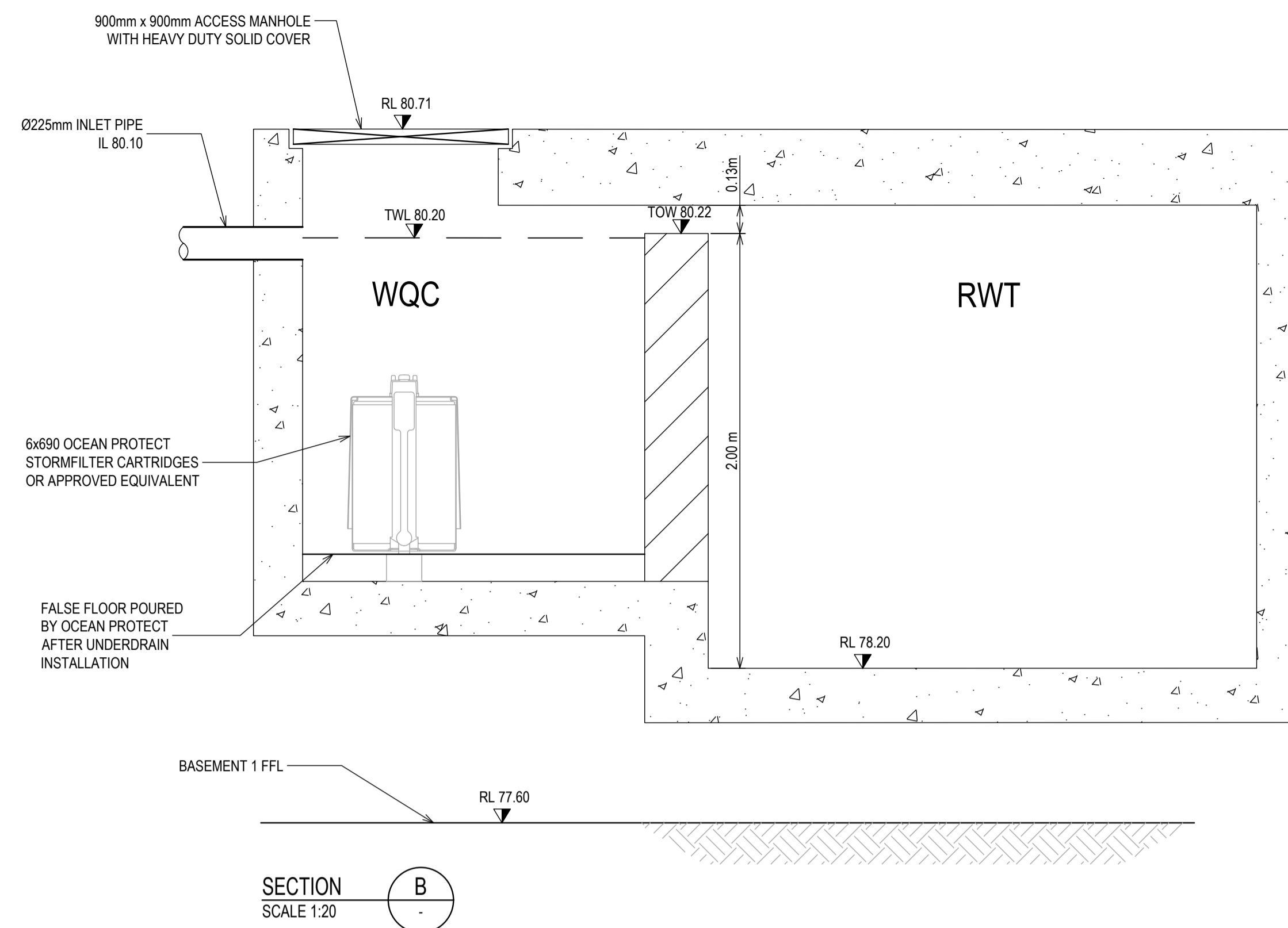
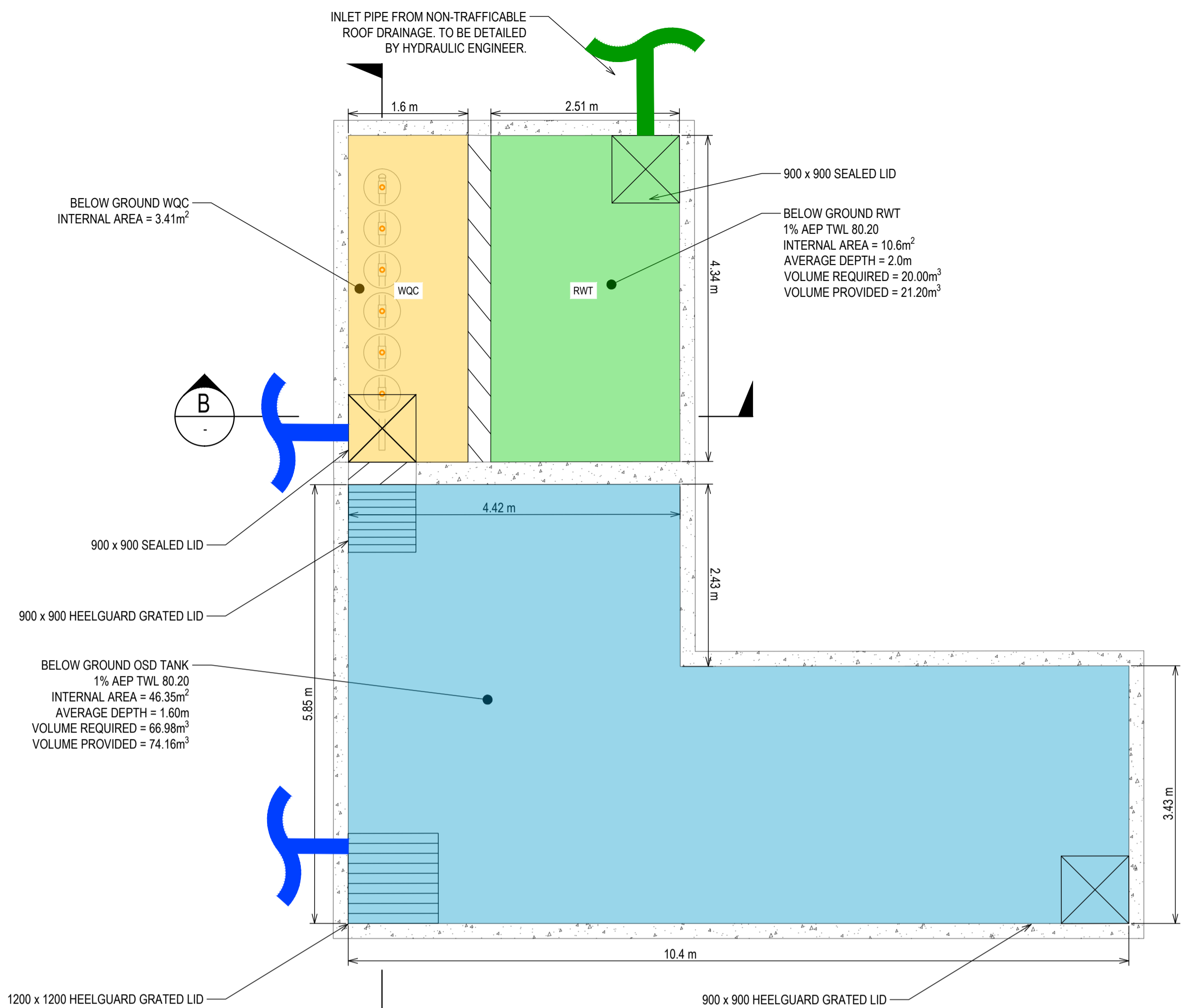
Project  
12-16 BENT ST, LINDFIELD  
12-16 BENT STREET, LINDFIELD NSW 2070

Drawing Title  
**CIVIL ENGINEERING SERVICES**  
MUSIC CATCHMENTS AND RESULTS

## APPROVAL

Drafted	Designed	Approved	Date	Scale	Sheet Size
KC	KC	SS	SEP 2025	1:200 @	A1

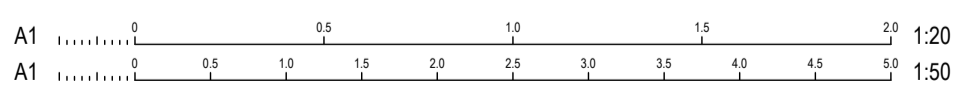
Job Number	Drawing Number	Revision	North Point
SYD3409	CE150	F	



KU-RING-GAI OSD CALCULATION			
ADDRESS: 12-16 BENT STREET, LINDFIELD			
CATCHMENT DETAILS			
1	CATCHMENT NAME:		LADY GAME CREEK
2	CATCHMENT DISCHARGE RATE	=	0.0147 l/sec/m <sup>2</sup> A
3	CATCHMENT STORAGE RATE	=	0.0287 m <sup>3</sup> /m <sup>2</sup> B
SITE DETAILS			
4	SITE AREA	= 4324 m <sup>2</sup>	60% OF SITE AREA = 2593.2 m <sup>2</sup> C
5	AREA(S) NOT DRAINING TO THE DETENTION SYSTEM	=	1815 m <sup>2</sup>
6	TOTAL IMPERVIOUS AREA	=	3128 m <sup>2</sup> D
7	IMPERVIOUS AREA BYPASSING DETENTION SYSTEM	=	601 m <sup>2</sup> E
PERMITTED SITE DISCHARGE			
8	C [2593.2 m <sup>2</sup> ] x A [0.0147 l/sec/m <sup>2</sup> ]	=	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 <sup>2</sup> ] x B [0.0287 m <sup>3</sup> /m <sup>2</sup> ]	=	74.42 m <sup>3</sup> SSR1
13	IF STORAGE IS IN LANDSCAPED BASIN SS1 x 1.2	=	89.31 m <sup>3</sup> 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 <sup>3</sup> SSR
PROVIDED RWT VOLUME			
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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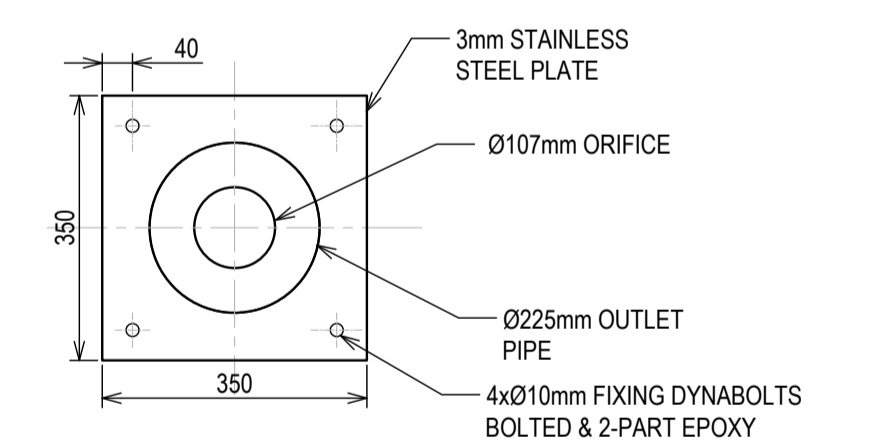
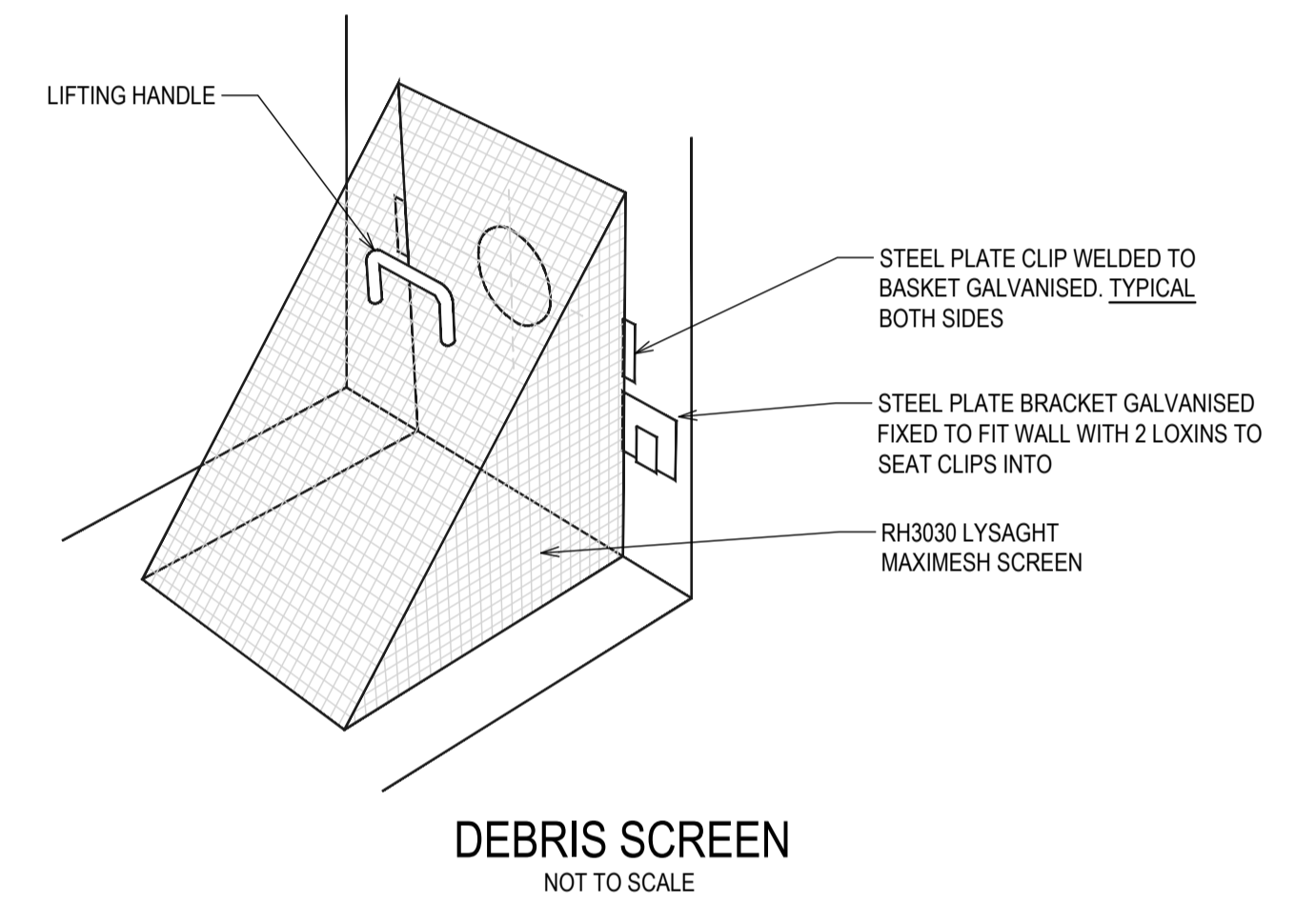
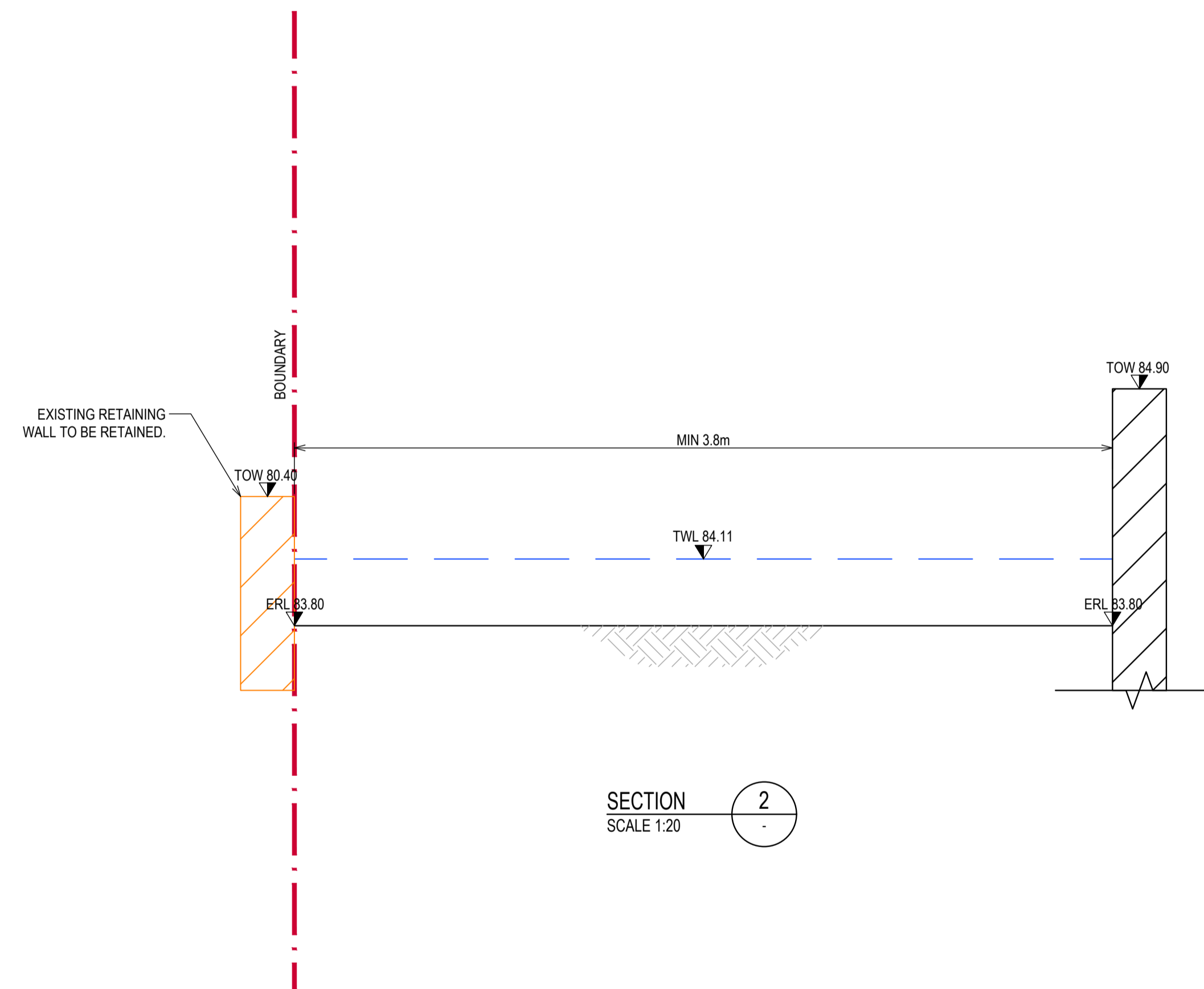
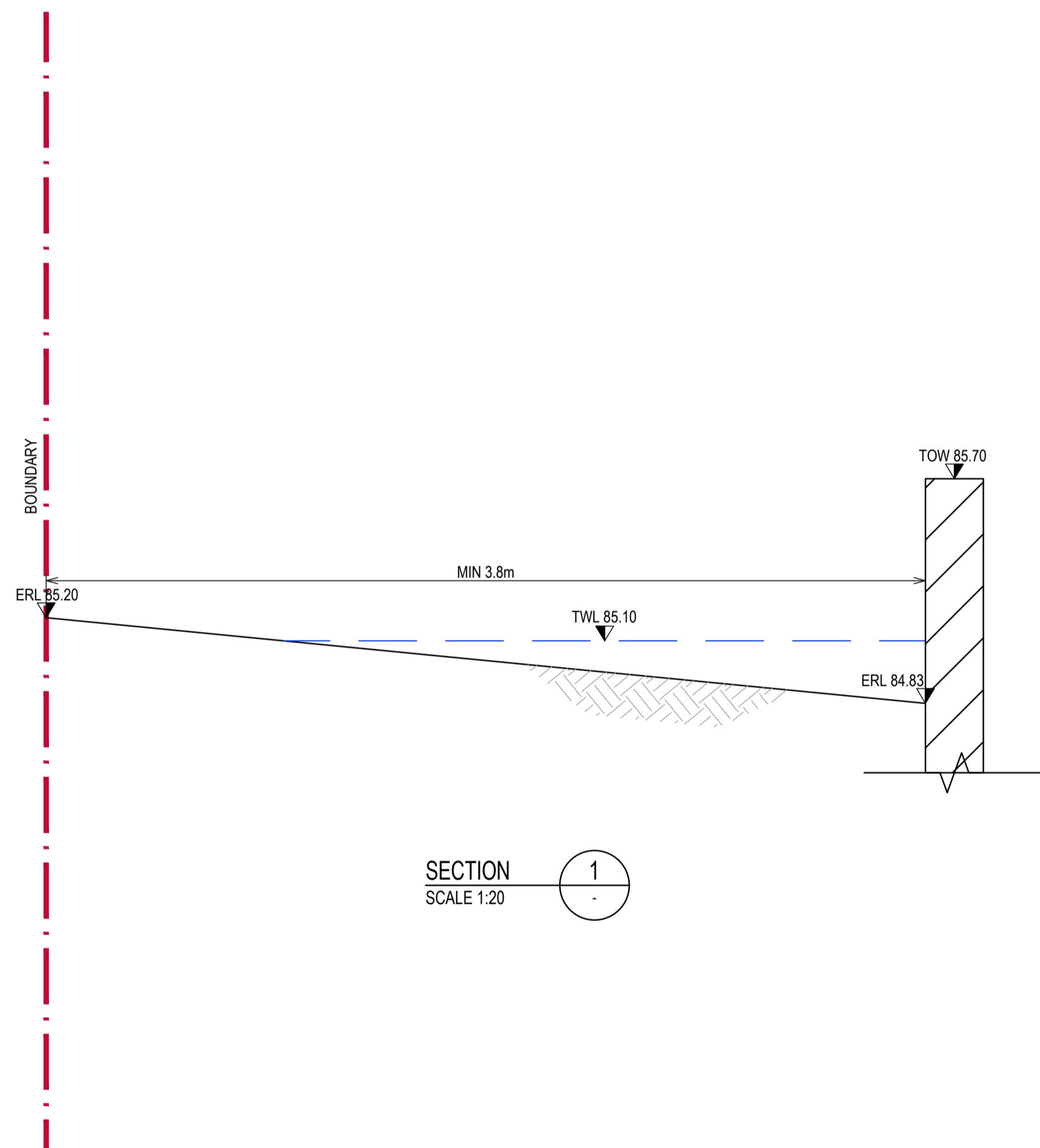
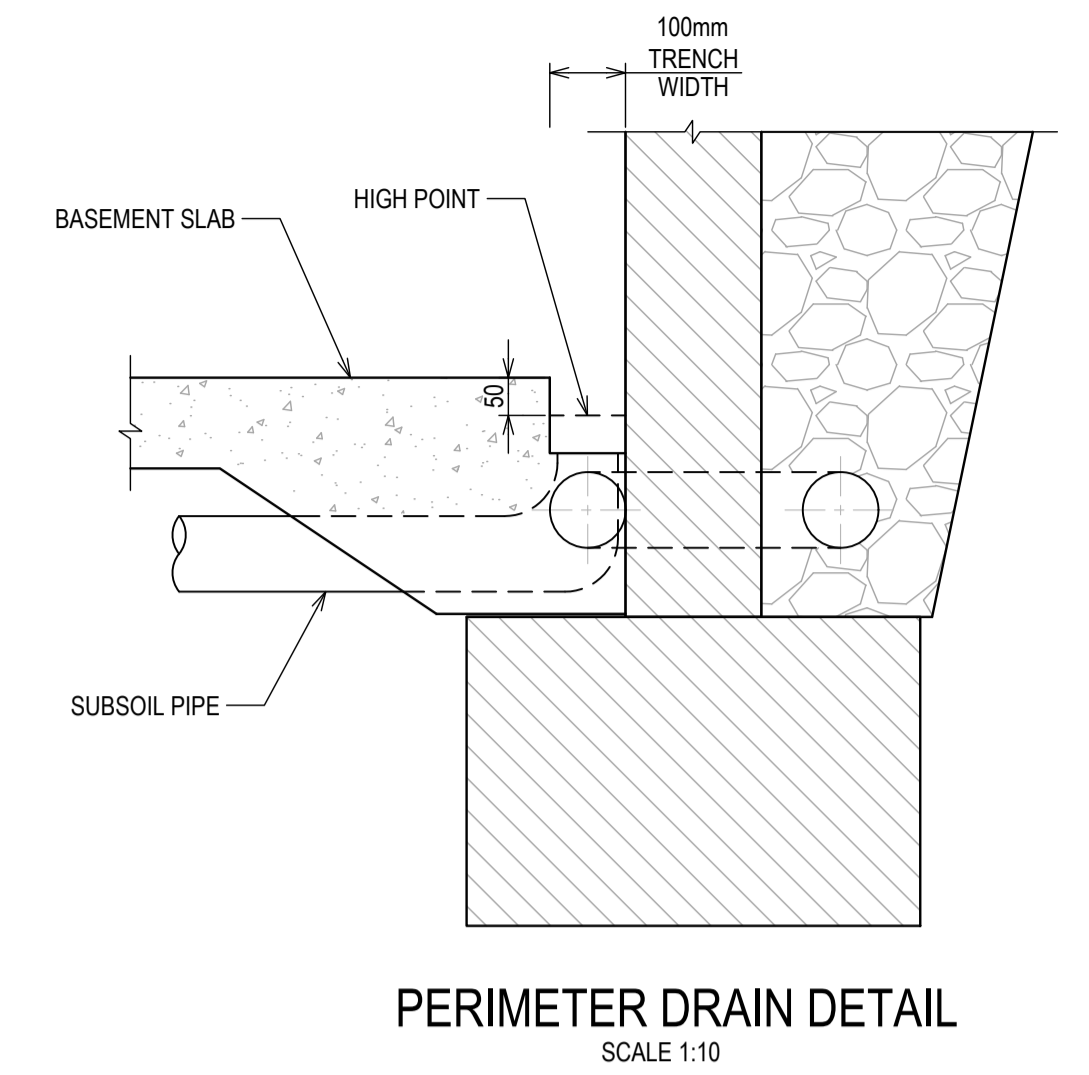
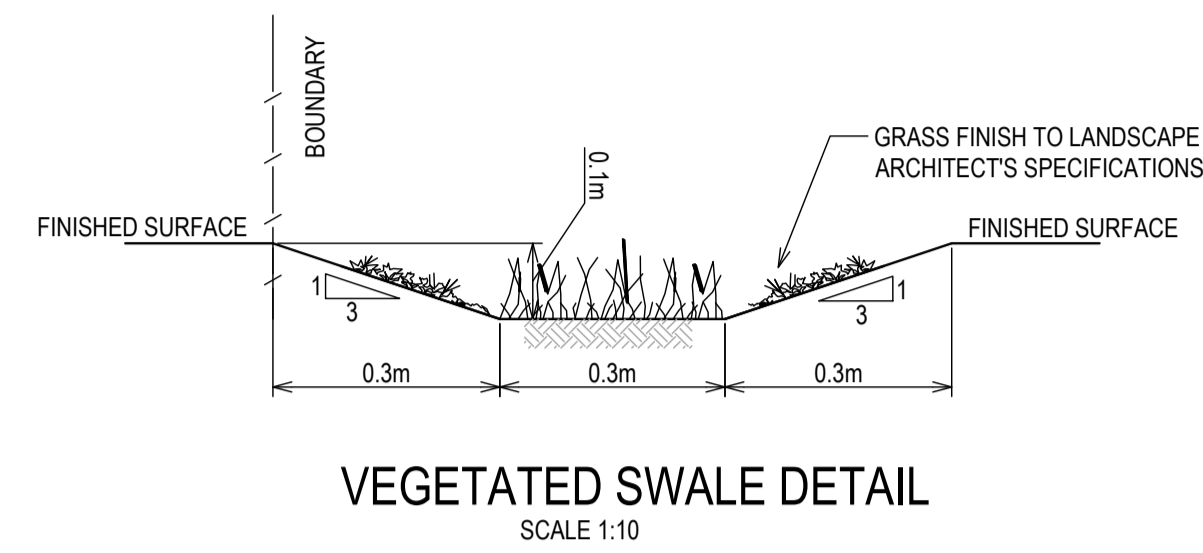
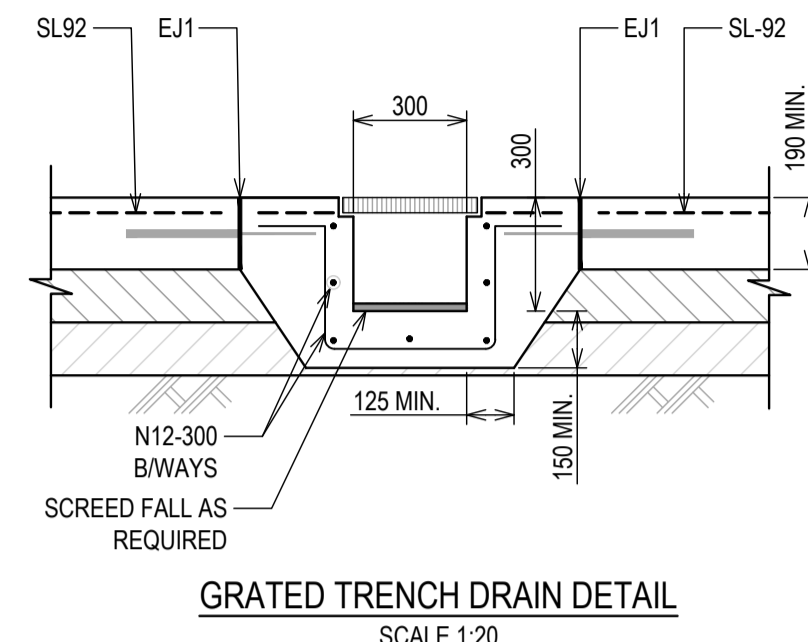
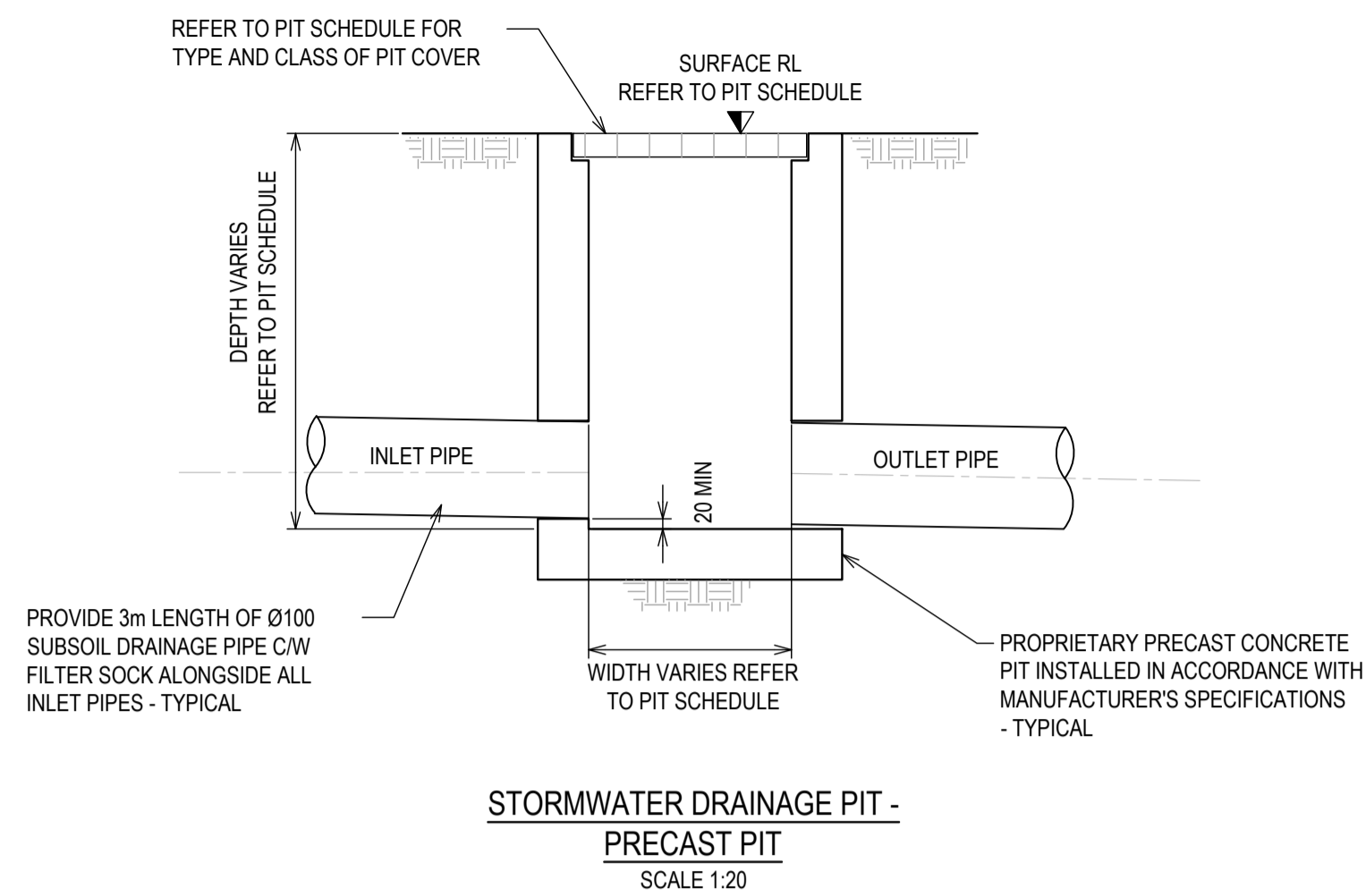
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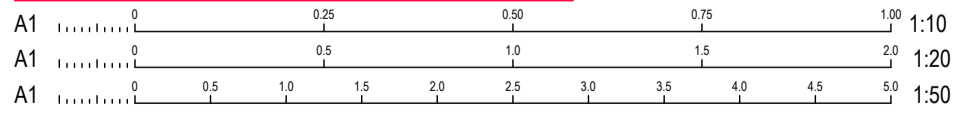
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**CIVIL ENGINEERING SERVICES**  
STORMWATER DETAILS - SHEET 1

Drafted	Designed	Approved	Date	Scale	Sheet Size
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  4. ALL PROPOSED RETAINING WALLS TO BE DETAILED BY STRUCTURAL ENGINEER AT LATER DESIGN STAGE.
  5. PROPOSED WALL FOOTINGS TO SPAN OVER THE TPZ AND SRZ. ALL WORKS WITHIN TPZ TO BE SUPPORTED BY PROJECT ARBORIST.

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KC	14.03.2025
KC	18.02.2025
KC	24.01.2025

**Client**  
SUNDALE NORTHLAND DEVELOPMENT  
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**Architect**  
PTW ARCHITECTS  
88 PHILIP STREET, SYDNEY NSW 2000

Building Services Consultants

**ADP**  
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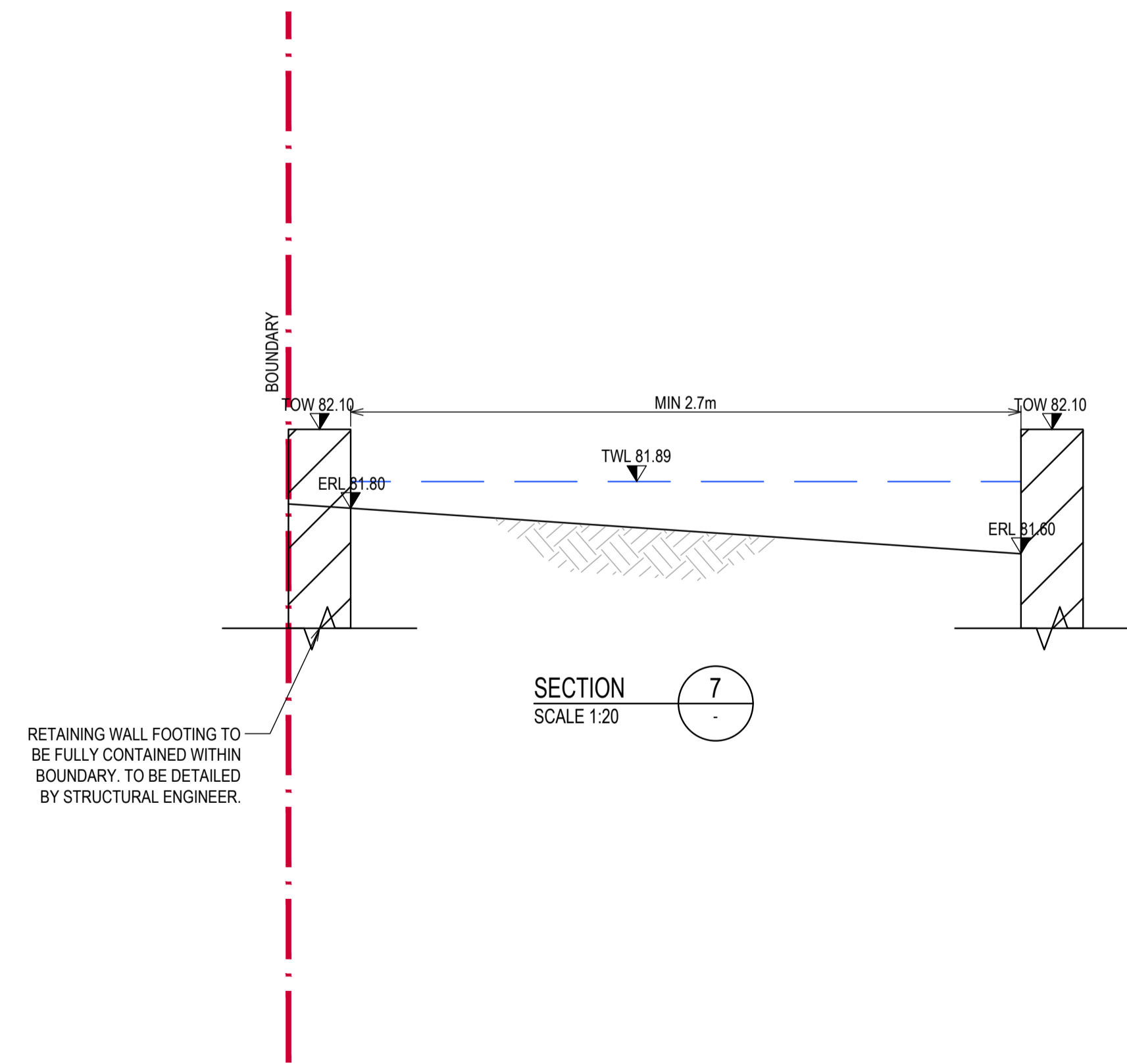
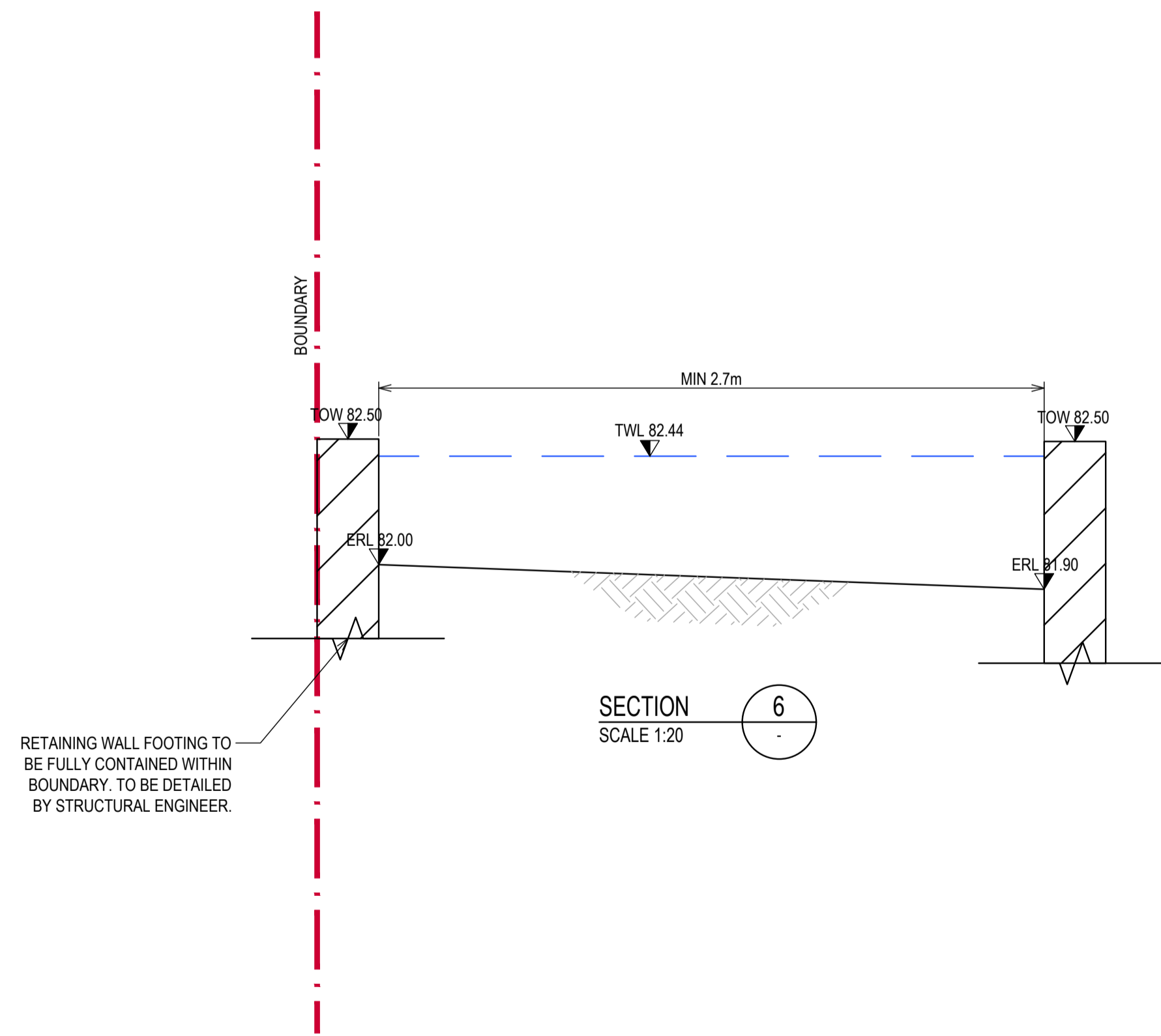
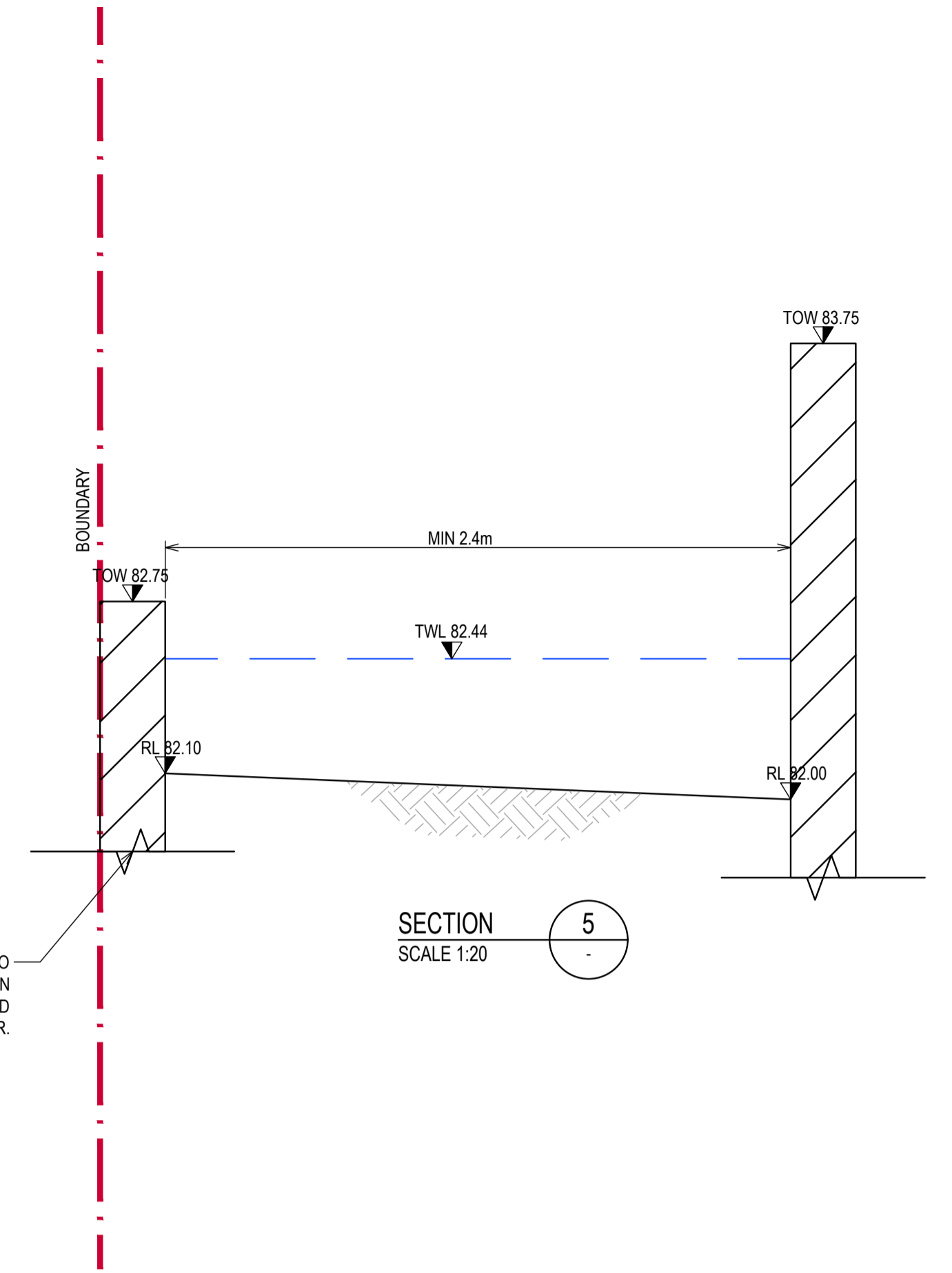
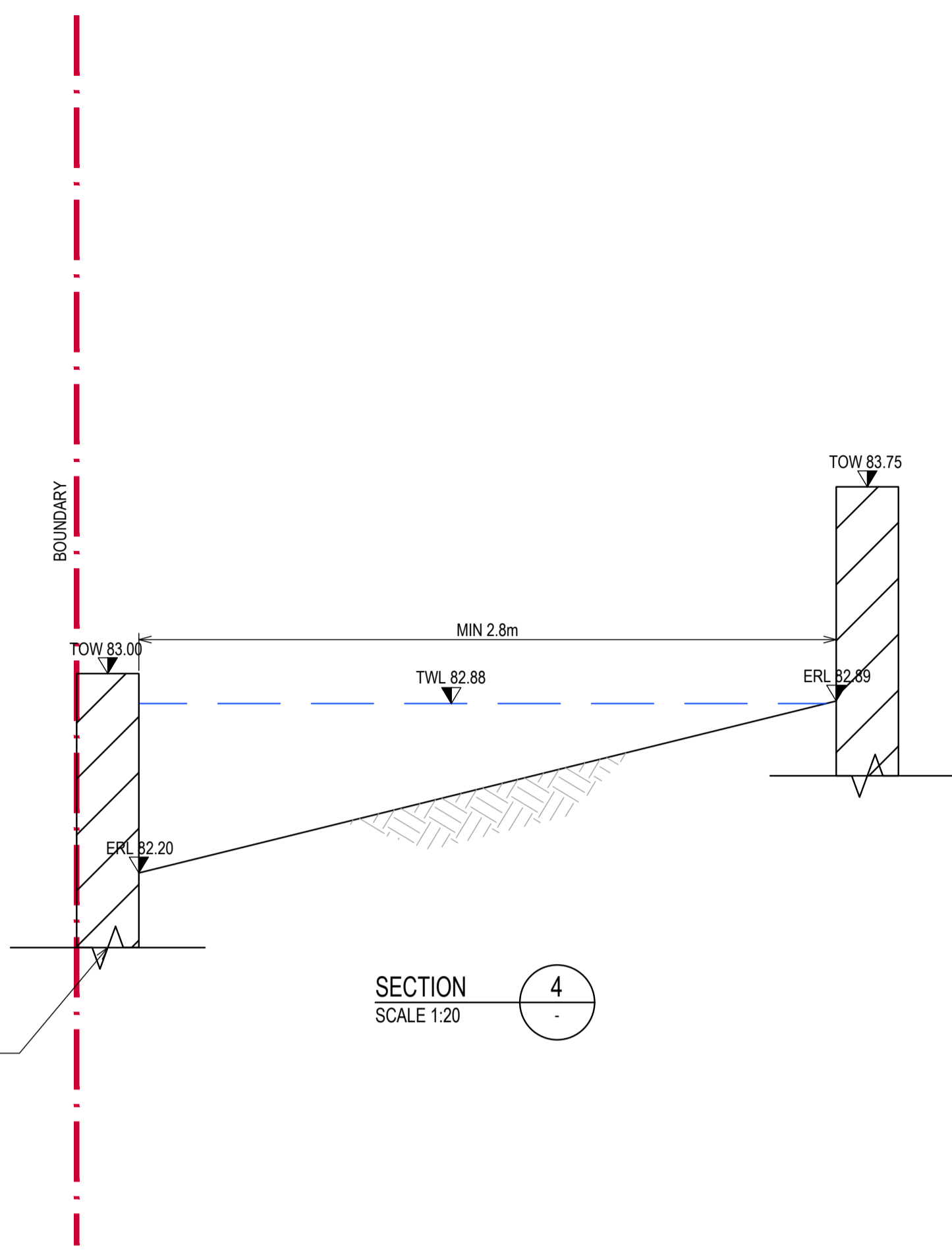
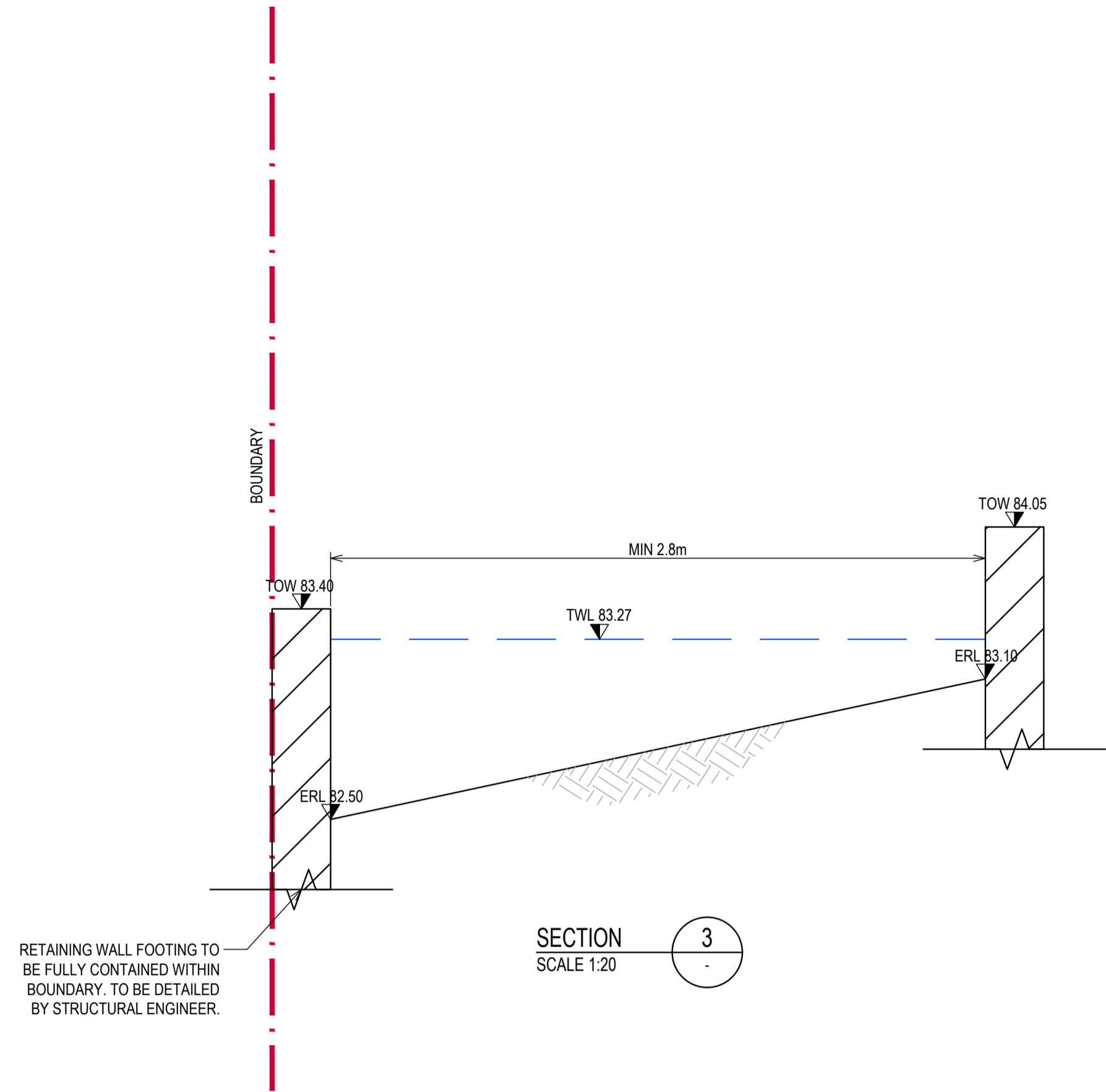
CONSULT AUSTRALIA  
Member Firm

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

**Drawing Title**  
CIVIL ENGINEERING SERVICES  
STORMWATER DETAILS - SHEET 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			

**APPROVAL**



- 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. ALL PROPOSED RETAINING WALLS TO BE DETAILED BY STRUCTURAL ENGINEER AT LATER DESIGN STAGE.
  5. PROPOSED WALL FOOTINGS TO SPAN OVER THE TPZ AND SRZ. ALL WORKS WITHIN TPZ TO BE SUPPORTED BY PROJECT ARBORIST.

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

**APPROVAL**

A1 0 5 10 15 20 1:20

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
KC	30.09.2025
KC	30.07.2025
KC	04.07.2025
KC	14.03.2025
KC	18.02.2025
KC	24.01.2025

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**Architect**  
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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			

### 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)  
 $CV = 0.79 \text{ (TABLE F.2)}$

$A = 0.4324 \text{ ha}$   
 $R_{1\%5DAY} = 23.4 \text{ mm (TABLE 6.3A)}$

SETTLING ZONE =  $10 \cdot CV \cdot A \cdot R$   
 $= 79.93 \text{ m}^3$

SEDIMENT STORAGE ZONE =  $39.97 \text{ m}^3$   
 (50% OF SETTLING ZONE CAPACITY)

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.

A1 1:200

Revision	Description
E	ISSUE FOR SSSA APPROVAL
D	ISSUE FOR SSSA APPROVAL
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Project  
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 12-16 BENT STREET, LINDFIELD NSW 2070

Drawing Title  
**CIVIL ENGINEERING SERVICES**  
 SOIL AND WATER MANAGEMENT PLAN

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			

APPROVAL





# **Appendix F**

## **CPHR/DPHI RFI**



Joina Matthew  
Senior Planning Officer  
Department of Planning, Housing and Infrastructure  
4 Parramatta Square, 12 Darcy Street  
PARRAMATTA NSW 2150

30 May 2025

**Subject: CPHR Advice – Environmental Impact Statement - Residential flat building with infill affordable housing, Bent Street Lindfield (SSD-78156462) (Ku-ring-gai)**

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Dear Joina,

Thank you for your referral received on 23 April 2025 seeking advice from the Conservation Programs, Heritage and Regulation (CPHR) Group of the NSW Department of Climate Change, Energy, the Environment and Water (DCCEEW) on the Environmental Impact Statement for the Residential flat building with infill affordable housing, Bent Street Lindfield (SSD-78156462) (Ku-ring-gai).

CPHR has reviewed the *Environmental Impact Statement* (prepared by Willowtree Planning, 16 April 2025) and supporting studies against the Secretary's Environmental Assessment Requirements (SEARs) and provides detailed flood comments at **Attachment A**.

In summary:

- The *Flood Report* (ADP Consulting Engineering, 17 March 2025, Rev 2) has not provided the flood information required in the Secretary's Environmental Assessment Requirements (SEARs) and has relied on a drainage design prepared in 2015 for an adjacent development, without justification.
- The Flood Report and the adjacent development drainage design are not adequate to assess flood risk or flood impact of the proposed development.
- A Flood Impact Risk Assessment (FIRA) should be prepared in accordance with requirements of [Flood Impact and Risk assessment technical guideline LU01](#) to compare pre and post development flood behaviour and to ensure the proposed development does not result in any adverse offsite impacts.

Biodiversity

The development is consistent with the Biodiversity Development Assessment Report (BDAR) waiver granted by CPHR on 27 March 2025. Please note, if the proposed development is changed so that it is no longer as described in Schedule 1 of the determination, the applicant will need to lodge a new BDAR waiver request or prepare a BDAR.

If you have any further questions about this issue, please direct them to the Greater Sydney Branch Mailbox at [rog.gsrplanning@environment.nsw.gov.au](mailto:rog.gsrplanning@environment.nsw.gov.au).

Yours sincerely



Louisa Clark  
Director, Greater Sydney Branch  
**Regional Delivery**  
**Conservation Programs, Heritage and Regulation**

**Attachment A – CPHR’S advice – Environmental Impact Statement - Residential flat building with infill affordable housing, Bent Street Lindfield (SSD-78156462) (Ku-ring-gai)**

Documents Reviewed

In preparing this advice CPHR has reviewed the following information:

- *Environmental Impact Statement* (Willowtree Planning, 16th April 2025) (EIS)
- *Flood Report* (ADP Consulting Engineering, 17th March 2025, Rev 2) (Flood Report)
- *Stormwater Design Report* (ADP Consulting, 17th March 2025, Rev 2)
- *Stormwater Design Drawings* (ADP Consulting, Revision B).

Key Assessment Issues

	<b>Issue</b>	<b>Description of issue</b>
1.	Address the relevant provisions of the <a href="#">NSW Flood Risk Management Manual 2023</a> , and any other relevant guidelines	<p>No flood modelling has been provided for the pre-development site conditions or for the proposed development.</p> <p>CPHR notes that an overland flow path was provided for an adjoining development, and the same approach has been adopted for this SSD, without any justification.</p> <p>Insufficient information has been provided to assess the flood impacts of the proposed development and to determine if adverse offsite impacts will occur.</p> <p><b>CPHR recommendation:</b></p> <ul style="list-style-type: none"> <li>• Compare pre and post development flood behaviour and demonstrate that the development has no adverse offsite impacts a Flood Impact and Risk Assessment (FIRA) should be prepared in accordance with the requirements of <a href="#">Flood Impact and Risk assessment technical guideline LU01</a>.</li> </ul>
	Extent and Timing	Pre-determination
2.	Flood extent and velocity for flood events up to and including the Probable Maximum Flood (PMF) event have not been provided and risk on-site having regard to adopted flood studies and, floodplain risk management studies and plans	<p>The Flood Report has not carried out any flood modelling for the pre-development or post-development conditions.</p> <p>Ku-ring-gai Council does not have existing flood planning information for this site; however, Council is currently undertaking the Lane Cove Southern Catchment Flood Study which includes the proposed site.</p> <p>The site receives overland flow from upstream catchments. An overland flow path was provided for an adjoining development, and the same approach has been adopted for this SSD, without any justification.</p> <p><b>CPHR recommendation:</b></p> <p>A flood model is developed to:</p> <ul style="list-style-type: none"> <li>○ assess the existing overland flow flood behaviour within the site and surrounding areas for the full range of flood events</li> <li>○ assess post development condition flood behaviour for the full range of flood events</li> </ul>

		<ul style="list-style-type: none"> <li>○ address any impacts and risks of the development on flooding and on the future residents of the proposed development.</li> </ul>
	Extent and Timing	Pre-determination
3.	Site access and egress routes have not been addressed	<p>The proposed development seeks to replace two homes with a 10- storey apartment block containing 115 apartments and 4 levels of basement carparking for 176 vehicles. This is a significant increase in site occupancy and the number of vehicles accessing and egressing the site.</p> <p>Serviceability and flood hazard in the adjacent roadway has not been determined and therefore flood free access and egress cannot be assessed.</p> <p><b>CPHR recommendation:</b></p> <ul style="list-style-type: none"> <li>• The FIRA includes an assessment of flood hazard in the adjoining roadways to ensure safe access and egress from the site is available in all flood events.</li> </ul>
	Extent and Timing	Pre-determination
4.	The impact of climate change has not been considered	<p>The impacts of climate change on flood levels have not been modelled. Further, overland flow paths for the subject development are based on work undertaken for the neighbouring development that has been designed for the expected 1% Annual Exceedance Probability (AEP) flow in 2015 only and may not be adequate into the future.</p> <p><b>CPHR recommendation:</b></p> <ul style="list-style-type: none"> <li>• The impact of climate change on flood levels be included in the flood modelling</li> </ul>
	Extent and Timing	Pre-determination
5.	Flood risk management measures - the proposed mitigation option is unlikely to be feasible	<p>The development proposes to re-route overland flow via a flow path along the rear and side boundary constrained between two retaining walls. The area is shown on the site survey and contains numerous large trees, some of which are located on the boundary line. The Flood Report indicates that the trees are to be retained. Therefore, regrading of the flow path is not possible.</p> <p>The stormwater design drawings indicate that the retaining wall will be supported on footings which take regard of tree root zones. Some of the footings are shown extending over the common boundary. It is considered unlikely that the wall can be installed as shown without significant damage to the trees. Any footings located outside the boundary would require boundary realignment or easements. Water is required to negotiate right angle bends to follow the proposed flow path and may overflow to neighbouring properties.</p> <p><b>CPHR recommendations:</b></p> <ul style="list-style-type: none"> <li>• Redesign of the proposed flow path is required to demonstrate that it can be installed within the property boundary. The flood</li> </ul>

		<p>model will need to reflect hydraulic behaviour due to vegetation retained and right angle bends in the flow path.</p> <ul style="list-style-type: none"><li>• The proposed overland flow path approach proposed for this development needs to be modelled and assessed in the FIRA.</li></ul>
	Extent and Timing	Pre-determination

**End of Submission**

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