HYDRACOR
CONSULTING ENGINEERS

Integrated Water Management Report

For a Proposed Residential Development

Prepared for: **CPDM Pty Ltd**

Project address: **No.'s 1 - 3 Reid Street & No.'s 2 – 4 Woodside Avenue, Lindfield**

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Annexure B HYDRACOR Consulting Engineers Pty Ltd Flood Impact & Risk Assessment, Reference CC240140, Version 6.0, dated 18 June 2026

Annexure C HYDRACOR Consulting Engineers Pty Ltd Letter, dated 12 February 2026

1 Glossary

Terminology in this Glossary has been derived or adapted from the Flood Risk Management Manual (NSW DPE 2023b) where appropriate.

Annual Exceedance Probability (AEP)	The chance of a flood of a given or larger size occurring in any one year, expressed as a percentage.
Australian Height Datum (AHD)	A common national surface level datum approximately corresponding to mean sea level.
Average recurrence interval (ARI)	The long-term average number of years between the occurrence of a flood as big as or larger than the selected event.
Catchment	The land area draining through the mainstream, as well as tributary streams, to a particular site. It always relates to an area above a specific location.
Design flood	A flood event to be considered in the design process.
Flood	Relatively high stream flow which overtops the natural or artificial banks in any part of a stream, river, estuary, lake or dam, and/or local overland flooding associated with major drainage before entering a watercourse, and/or coastal inundation resulting from super-elevated sea levels and/or waves overtopping coastline defences excluding tsunami.
Flood hazard	A measure of the floodwaters potential to cause harm or loss. Full definitions of hazard categories are provided in Appendix L of the Floodplain Development Manual (NSW Government, 2005). In summary: ▪ High: conditions that pose a possible danger to personal safety; evacuation by trucks difficult; able-bodied adults would have difficulty wading to safety; potential for significant structural damage to buildings. ▪ Low: conditions such that people and their possessions could be evacuated by trucks; able-bodied adults would have little difficulty wading to safety.

Flood planning area	The area of land below the FPL and thus subject to flood related development controls.
Flood planning levels (FPLs)	Combinations of flood levels (derived from significant historical flood events or floods of specific ARIs) and freeboards selected for floodplain risk management purposes, as determined in management studies and incorporated in management plans.
Floodplain, flood-prone land	Land susceptible to inundation by the probable maximum flood (PMF) event, i.e. the maximum extent of flood liable land.
Floodplain risk management options	The measures that might be feasible for the management of a particular area of the floodplain.
Freeboard	Provides reasonable certainty that the risk exposure selected in deciding on a particular flood chosen as the basis for the FPL is actually provided. It is a factor of safety typically used in relation to the setting of floor levels, levee crest levels, etc.
Geographical information systems (GIS)	A system of software and procedures designed to support the management, manipulation, analysis and display of spatially referenced data.
Hydraulics	The term given to the study of water flow in a river, channel or pipe, in particular, the evaluation of flow parameters such as stage and velocity.

Hydraulic category	A classification of floodwater hydraulic behaviour. The categories are: ▪ Floodway: those areas of the floodplain where a significant discharge of water occurs during floods. They are often aligned with naturally defined channels. Floodways are areas that, even if only partially blocked, would cause a significant redistribution of flood flow, or a significant increase in flood levels. ▪ Flood storage: those parts of the floodplain that are important for the temporary storage of floodwaters during the passage of a flood. Loss of flood storage can increase the severity of flood impacts by reducing natural flood attenuation. ▪ Flood fringe: remaining area of flood-prone land after floodway and flood storage areas have been defined.
Hydrograph	A graph that shows how the discharge changes with time at any particular location.
Hydrology	The term given to the study of the rainfall and runoff process as it relates to the derivation of hydrographs for given floods.
Local overland flooding	Inundation by local runoff rather than overbank discharge from a stream, river, estuary, lake or dam.
Mainstream flooding	Inundation of normally dry land occurring when water overflows the natural or artificial banks of a stream, river, estuary, lake or dam.
Peak discharge	The maximum discharge occurring during a flood event.
Probable maximum flood (PMF)	The PMF is the largest flood that could conceivably occur at a particular location.
Probable Maximum Precipitation (PMP)	The PMP is the greatest depth of precipitation for a given duration meteorologically possible over a given size storm area at a particular location.
Probability	A statistical measure of the expected frequency or occurrence of flooding.

Risk	Chance of something happening that will have an impact. It is measured in terms of consequences and likelihood. For this study, it is the likelihood of consequences arising from the interaction of floods, communities and the environment.
Runoff	The amount of rainfall that actually ends up as stream or pipe flow, also known as rainfall excess.

2 Introduction

This Integrated Water Management Plan supports a State Significant Development Application (**SSDA**) for submission to the Department of Planning, Housing and Infrastructure (**DPHI**) pursuant to Part 8 of the *Environmental Planning and Assessment Regulation 2021* (EP&A Regulation).

HYDRACOR Consulting Engineers Pty Ltd (**HYDRACOR**) has been commissioned to prepare the Integrated Water Management Report in accordance with the requirements of Ku-ring-gai Council Development Control Plan (**DCP**) Part 24 and Ku-ring-gai Local Environmental Plan (**LEP**) 2015 Clause 5.21.

The SEARs (Secretary's Environmental Assessment Requirements) have been issued for the subject site.

In the preparation of this report HYDRACOR has relied upon certain data and information contained within the following documents:

- Architectural Plans prepared by PBD Architects.
- Site Survey prepared by Total Surveying Solutions, Job No. 240624, dated 11 September 2024.

The purpose of this report is to provide Department of Planning, Housing and Infrastructure (DPHI) with sufficient information to assess the proposed development.

2.1 Purpose of this Report

This Integrated Water Management Plan supports a SSDA submitted to the Department of Planning, Housing and Infrastructure (DPHI) pursuant to part 8 of the EP&A Regulation.

This report has been prepared to specifically respond to the Secretary's Environmental Assessment Requirements (SEARs) issued for the SSDA on 22 January 2025 which states that the environmental impact statement (EIS) is to address the following requirements:

Table 1: SEARs Requirements

SEARs Requirement	Where addressed in this report
11. Water Management ▪ Detail the proposed drainage design and servicing infrastructure to be incorporated as part of the development (stormwater and wastewater). ▪ Demonstrate how the development complies with council's drainage requirements and identify proposed stormwater treatment and water quality management measures to minimise adverse environmental impacts	Section 4
19. Flood Risk	Section 5

▪ Identify the flood planning area and level as set out in the relevant EPI and other supporting documents to determine;
  o The flood extent and velocity up to the Probable Maximum Flood and risk on-site having regard to adopted flood studies and, floodplain risk management studies and plans
  o The site access and egress routes
  o The potential effects of climate change,
  o Any relevant provisions of the NSW Flood Risk Management Manual, and any other relevant guidelines
▪ Where the development is occurring on flood prone land a flood impact and risk assessment (FIRA) must be prepared having regard to the *Flood Impact and Risk Assessment – Flood Risk Management Guide LU01*. When determining the scope and category of the FIRA the requirements outlined in the FIRA guide must be considered.
▪ Detail any flood risk management measures that are to be incorporated as part of the development having regard to relevant guidelines (including any design solutions, flood modification measures, property modification measures, operational procedures of Flood Emergency Response Plan).	

3 The Site and Proposal

3.1 Site Location and Description

The subject site is bound by Lindfield Avenue to the west, Reid Street to the North, and Woodside Avenue to the south in Lindfield. The subject site comprises the properties known as:

- Lot 99 DP 6608 (No. 1) Reid Street, Lindfield.
- Lot 98 DP 6608 (No. 3) Reid Street, Lindfield.
- Lot 100 DP 794252 (No. 2) Woodside Avenue, Lindfield.

- Lot 104 DP 6608 (No. 4) Woodside Avenue, Lindfield.

The subject site is presently developed comprising an area of 3,852 square metres. Current improvements include residential brick buildings. The subject site is currently zoned R2 Low Density Residential under the provisions of Ku-ring-gai LEP 2015 and lies within the Lindfield Transport Oriented Development Area (TOD). The subject site falls towards the Woodside Avenue frontage. Existing ground surface elevations are generally within the range of RL 91.75 m AHD at the north-eastern corner falling to RL 87.80 m AHD at the Woodside Avenue frontage.

3.2 Overview of this Proposal

The proposal seeks consent for the demolition of existing site structures, tree removal and the construction of a nine-storey residential flat building. The principal features of the application are depicted on Architectural Plans prepared by PBD Architects.

4 Water Management

4.1.1 On-Site Detention Requirement

The application requires the inclusion of an on-site stormwater detention system designed in accordance with the requirements of Ku-ring-gai Council's Development Control Plan Part 24 and Technical Guideline for Water Management.

In accordance with the requirements outlined in Council's policy we have prepared a Stormwater Management Plan which details the on-site stormwater detention system.

In this regard we refer to the Stormwater Management Plan, prepare by HYDRACOR, Reference CC240140, Sheets C3, C5 & C7-C8, Revision D, dated 14 April 2026 (copies enclosed under Annexure A).

Referring to these documents, the design principles and compliance with the Council requirements are presented on sheet C2.

4.1.2 Stormwater Quality

The application requires the inclusion of stormwater quality devices will meet the performance objectives outlined in Ku-ring-gai Council's Development Control Plan Part 24 Clause C.6.

The performance targets for the water quality reductions are as follows:

- 70% reduction in total gross pollutants (GP),
- 85% reduction in total suspended solids (TSS),
- 68% reduction in total phosphorus (TP),
- 45% reduction in total nitrogen (TN).

Based on the foregoing water quality modelling of the proposed development was undertaken using the Model for Urban Stormwater Improvement Conceptualisation (MUSIC). MUSIC software was adopted to assess the pollutant generation for the post-developed conditions, and the effectiveness of the proposed treatment train.

The proposed measures include a 25kL rainwater tank for re-use, seven (7) underground stormwater filtration cartridges and two (2) gully pit insert/baskets.

The location and details of the proposed treatment train are depicted in the Stormwater Management Plans prepared by HYDRACOR, Reference CC240140, Sheets C2 – C5 & C7 – C8, Revision D, dated 14 April 2026 (copies enclosed under Annexure A).

Referring to these documents the Stormwater Quality Report and MUSIC modelling results are depicted on sheets C10 – C12.

4.1.3 Stormwater Drainage

The application requires the inclusion of a stormwater drainage system designed in accordance with the requirements outlined in AS3500.3 and of Ku-ring-gai Council's Development Control Plan Part 24.

In response to the stormwater requirements including the lawful point of discharge in Woodside Avenue, we refer to the details depicted in the Stormwater Management Plans prepared by HYDRACOR, Reference CC240140, Sheets C2 – C9, Revision D, dated 14 April 2026 (copies enclosed under Annexure A).

We also note a drainage upgrade and realignment of the council drainage system within Reid Street and Lindfield Avenue has been proposed in this application. In this regard, we refer to the details depicted in the concept public domain works are depicted on Concept Civil Engineering Drawings, prepared by HYDRACOR, Reference CC240140, Sheets R1 – F10, Revision E, dated 13 April 2026 (copies enclosed in the Flood Impact and Risk Assessment under Annexure B).

5 Flood Risk

5.1 Flood Characteristics

The site is located within the upper reaches of Gordon Creek and is impacted by overland flows described in 'Middle Harbour Southern Catchments Flood Study' prepared by BMT, project No. S20504, Revision 03, dated 10 February 2023 (BMT 2023).

5.1.1 Overland Flood Characteristics

HYDRACOR undertook a site-specific overland flow assessment in the vicinity of the subject site. In this regard a site-specific two-dimensional model was developed using TUFLOW software and the details are depicted in the Flood Impact and Risk Assessment prepared by HYDRACOR, Reference CC240140, Version 6.0, dated 18 June 2026 (copies enclosed under Annexure B).

5.2 Flood Risk Management

Based on the findings of the site-specific overland flow assessment in relation to the requirements of Ku-ring-gai Council and Flood Risk Management Manual (NSW DPE) dated 2023, we have developed a flood mitigation strategy to protect the site and all proposed buildings up to and including the Flood Planning Level (FPL) as well as manage flood risk on site during all flood events up to the PMF.

In response to the requirements of Council's flood related controls, we refer to the details depicted in the Flood Impact and Risk Assessment prepared by HYDRACOR, Reference CC240140, Version 6.0, dated 18 June 2026 (copies enclosed under Annexure B).

6 Response to RFI from Department of Planning, Housing and Infrastructure (DPHI) dated 3 March 2026

The applicant has received a request for additional information provided by the Department of Planning, Housing and Infrastructure (**DPHI**). In this regard we refer to DPHI correspondence, dated 3 March 2026 and specifically the comments under Section headed Stormwater and Flooding which states:

"19. There is an existing easement for drainage benefiting adjoining land that burdens the site. The proposal seeks to divert the existing stormwater infrastructure around the site. You are requested to clarify whether the existing easement is to be extinguished, varied or relocated as part of the proposal. Evidence confirming that the easement can be lawfully extinguished or varied, including confirmation of the consent of all benefited parties or details of the proposed legal mechanism, must be provided."

Response:

In this regard, we refer to letter prepared by HYDRACOR, Reference CC240140, dated 12 February 2026 (copy enclosed under Annexure C) for correspondence with Council Engineers.

"26. Update the Flood Impact Risk Assessment (FIRA) to directly address the provisions of Clause 5.21 of the Ku-ring-gai Local Environmental Plan (LEP).

Response:

In this regard, we refer to Flood Impact and Risk Assessment prepared by HYDRACOR, Reference CC240140, Version 6.0, Section 8.7, dated 18 June 2026 (copy enclosed under Annexure B) for details.

7 Response to RFI from Department of Planning, Housing and Infrastructure (DPHI) dated 17 July 2025

The applicant has received a request for additional information provided by the Department of Planning, Housing and Infrastructure (**DPHI**). In this regard we refer to DPHI correspondence, dated 17 July 2025 and specifically the comments under Section headed Flood Risk which states:

"19. The Integrated Water Management Report (IWMR) recommends flood mitigation works including upgrades to Council's stormwater drainage system and reconstruction of the southern verge in Reid Street.

Provide confirmation that these works have been discussed with and agreed to by Council. The mitigation measures table should also be updated to reference any required flood mitigation measures."

Response:

In this regard, we refer to letter prepared by HYDRACOR, Reference CC240140, dated 12 February 2026 (copy enclosed under Annexure C) for correspondence with Council Engineers. In regard to the flood mitigation measures, we refer to the Flood Impact and Risk Assessment Report prepared by HYDRACOR, Reference CC240140, Version 6.0, Section 8.1, dated 18 June 2026 (copy enclosed under Annexure B) for details.

8 Response to RFI from Conservation Programs, Heritage and Regulation (CPHR) Group of the NSW Department of Climate Change, Energy, The Environment and Water (DCCEEW)

The applicant has received a request for additional information provided by the Conservation Programs, Heritage and Regulation (CPHR) Group of the NSW Department of Climate Change, Energy, the Environment and Water (**DCCEEW**). In this regard we refer to DCCEEW correspondence, reference DOC25/569108, dated 15 August 2025 and specifically the comments under Section headed Flooding which states:

"1. Flood Model verification – The FIRA establishes a direct rainfall TUFLOW model for the hydrology and hydraulic assessment. However, the FIRA has not provided information on the verification of this model with Ku-ring-gai Council's Middle Harbour Southern Catchments Flood Study."

Response:

In this regard, we refer to the Flood Impact and Risk Assessment Report prepared by HYDRACOR, Reference CC240140, Version 6.0, Section 5.1, dated 18 June 2026 (copy enclosed under Annexure B) for model comparison and verification.

"2. Impact of development on surrounding areas – The flood modelling results presented in the FIRA show significant impacts on adjacent areas, particularly Reid Street and Lindfield Avenue. This increases the hazard categories for these public roads, exposing the community to significant flood risks."

Response:

During the pre-development scenario, we note during the 5% AEP flood event, Lindfield Avenue is not trafficable in both directions with high hazard conditions (H3-H5). We further note the sag in Reid Street has local occurrence of high hazard (H3-H5). During the post-development scenario, we note hazard classification of Lindfield Avenue has been reduced to H1 and will be trafficable by vehicles. We note the sag in Reid Street has been reduced from high hazard (H3-H5) to low hazard (H1).

For the 1% AEP and PMF flood event, Lindfield Avenue will remain non-trafficable during both pre and post development scenario (H3-H5). We do note the extent of high flood hazard classification (H3-H5) in Lindfield Avenue and Woodside Avenue has been reduced during the 1% AEP flood event.

There are minor occurrences of a shift in hazard location or change in extents along Lindfield Avenue, however, we note there are reduction in hazard classification at the intersection of Lindfield and Woodside Avenue.

Thus, we note the proposed development does not impact on the existing trafficability of any surrounding roads during all flood events up to and including the PMF event.

"3. Increased risk of flooding in rarer events/emergency management – The Middle Harbour Southern Catchments Flood Study shows that the site is constrained by overland flooding. Under existing conditions, the site primarily functions as a flood storage area during a 1% annual exceedance probability (AEP) flood event. In a 0.2% AEP flood event, a new flow path is created through the site towards Woodside Avenue. In the probable maximum flood (PMF) event, a major floodway (flow path runs through the site from the north towards Woodside Avenue.

As the proposed development would intensify the site's land use, the site will be exposed to increased flood risks during rarer flood events.

In a post-development scenario, the site will be completely isolated by floodwater in the PMF event.

Section 9 of the FIRA indicates that a shelter-in-place (SIP) is proposed, stating, "During flood events resulting in flood levels above the Flood Planning Level the ground floor units and basement will need to be evacuated via vertical evacuation to the upper floors."

The development should align with the existing emergency management strategy for the area. As Council has not identified SIP through the flood management process for this location, SIP is not supported."

Response:

In relation to the criteria contained in the guidelines, we refer to the Flood Emergency Response Plan prepared by Water Technology (Refer to Annexure D in the Flood Impact and Risk Assessment) which provides additional detail regarding how the site is better suited to a shelter-in-place flood risk mitigation strategy than an evacuation strategy as the flood duration for urban overland catchments are typically less than six hours and is considered flash flooding. We further note the surrounding roads reach up to hazard classification H5 during the PMF event deeming it unsuitable for evacuation. We note that revised modelling has been undertaken with such that PMF floodwaters are largely redirected along Reid Street towards Lindfield Avenue via the proposed flood deflection walls in Reid Street as well as a deflection wall within the subject site along the eastern footpath. We note the construction of the proposed flood deflection walls will be required to adequately protect the ground floor units to the PMF level such that a shelter in place strategy can be adopted.

9 Response to RFI from NSW State Emergency Services (SES) dated 3 March 2026

The applicant has received a further request for additional information provided by the NSW State Emergency Services (**SES**) which specifically states:

"1. Reiterate we do not support the proposal in its current form, as it would result in an increased number of individuals being exposed to significant flood risks. Furthermore, the proposal does not sufficiently demonstrate that these risks have been appropriately mitigated. We note no substantial amendments have been made and no changes to the flood risk have been demonstrated."

Response:

Refer to comments under Section 8, Item 3.

"2. Reiterate the proponent should ensure the proposal does not result in an increase in flood risk on the existing development and roadways. The proposal significantly increases the risk to the community by increasing the level of hazard on Reid Street from H1 to H5. Considerations of the increased risk to the community as a result of this increase to hazard should not be limited to road trafficability."

Response:

Refer to comments under Section 8, Item 3.

"3. Reiterate the Department of Planning, Housing and Infrastructure (DPHI) should be satisfied the proposed use of Shelter-in-Place is consistent with the Shelter-in Place Guideline and sufficient to manage risk to life prior to granting consent. The proposal has not demonstrated consistency with the Shelter-in-Place Guideline (NSW Government, 2024), specifically:

> *a. Consideration 8c the development is not subject to high hazard flooding or surrounding roadways are not subject to high hazard flooding has not been satisfied as the Response to Submissions Report states "the surrounding roads are hazard classification H5 during the PMF event."*

Response:

Refer to comments under Section 8, Item 3.

"4. Recommend all basement entry points, including ramp, vents, etc, should be situated above the Probable Maximum Flood (PMF). The strategy of sheltering in place above a flooded basement represents significant risk to the occupants."

Response:

We note all basement openings are required to be minimum at the 1% AEP level plus 150mm freeboard in accordance with Ku-ring-gai Council DCP Part 24. We note all proposed openings to the basement (ramps/vent openings/driveway crest/landings) are now at the corresponding PMF level to reduce risk to the future occupants.

10 Response to RFI from NSW State Emergency Services (SES) dated 4 August 2025

The applicant has received a request for additional information provided by the NSW State Emergency Services (**SES**). In this regard we refer to SES correspondence, reference ID 3224, dated 4 August 2025 and specifically:

"Recommend ensuring that the current proposal does not result in an increase in flood risk on the existing development and roadways."

Response:

Refer to comments under Section 8, Item 2.

"Recommend careful consideration of the suitability of the Shelter-in-Place strategy. As surrounding sites area affected by H5 hazard as frequently as the 5% AEP event, and the site itself reaches H5 flooding during the PMF, with little warning time available, Shelter-in-Place may pose a risk to both the occupants and the buildings. This site may not satisfy Shelter-In-Place consideration 8(c) ensuring addressing the Shelter-In-Place Guideline."

Response:

Refer to comments under Section 8, Item 3.

"Recommend undertaking additional modelling to understand the duration of inundation on site and duration of flooding on adjacent roads, including consideration for other recent and approved future development in the area."

Response:

Refer to comments under Section 8, Item 3.

"Recommend ensuring that all openings to the basement (ramp, vents, etc) are situated above the Probable Maximum Flood (PMF) and/or the 1% AEP plus freeboard whichever is greater, or reconsidering basement carparking if this is not feasible to reduce risk to life and property. Mapping provided in the Flood Impact and Risk Assessment appears to show flood water entering the basement ramp in the 1% AEP and larger flood events."

Response:

We note SES recommendations; nonetheless, all basement openings are required to be minimum at the 1% AEP level plus 150mm freeboard in accordance with Ku-ring-gai Council DCP Part 24. We note all proposed openings to the basement (ramps/vent openings/driveway crest/landings) are currently at the corresponding 1% AEP water level plus 150mm freeboard.

"Recommend relocation of the substation and waste areas to be above the PMF and/or the 1% AEP plus freeboard whichever is greater."

Response:

Refer to comments under Section 9, Item 4.

"Recommend seeking advice from the Conservation Programs/ Heritage and Regulation section of the NSW Department of Climate Change, Energy, the Environment and Water (DCCEEW) regarding the impact of the proposed development on flood behaviour and adjacent Areas."

Response:

Refer to Section 8.

11 Conclusion

A residential development is proposed at the site known as No.'s 1-3 Reid Street & No.'s 2-4 Woodside Avenue, Lindfield. The Department of Planning, Housing and Infrastructure has issued a SEARs (Secretary's Environmental Assessment Requirements) for the development.

The stormwater management strategy including on-site stormwater detention, stormwater quality and stormwater drainage, is designed in accordance with the relevant requirements of Ku-ring-gai Council Development Control Plan Part 24 and AS 3500.3.

Based on our assessment of the available sources of flood information outlined in Section 5, it is anticipated the site will be flood free during flood events up to the 1% AEP storm event and have appropriate mitigation measures for the PMF event.

Based on the foregoing, it is our view that the proposed development sufficiently demonstrates compliance with the objectives of SEARs (Secretary's Environmental Assessment Requirements, Ku-ring-gai Council Development Control Plan Part 24 and Ku-ring-gai Council Local Environmental Plan (LEP) 2015 Clause 5.21.

12 References

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Bureau of Meteorology (BoM). (2020). *Service Level Specification for Flood Forecasting and Warning Services for New South Wales and the Australian Capital Territory – Version 3.13*. Melbourne, VIC: Author.

Hawkesbury-Nepean Floodplain Management Steering Committee (HNFMSC). (2006). *Reducing Vulnerability of Buildings to Flood Damage: Guidance on Building in Flood Prone Areas*. Available from http://www.ses.nsw.gov.au/content/documents/pdf/resources/Building_Guidelines.pdf

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Ku-ring-gai Council. (2022). *Ku-ring-gai Development Control Plan.*

Ku-ring-gai Local Environmental Plan 2015.

Annexure A HYDRACOR Consulting Engineers Pty Ltd Stormwater Management Plans, Reference CC240140, Sheets C1 – C12, Revision D, dated 14 April 2026

PROPOSED DEVELOPMENT
(No.1-3) REID STREET & (2-4) WOODSIDE AVENUE, LINDFIELD
STORMWATER MANAGEMENT PLANS

LEGEND

	DENOTES ON-SITE DETENTION TANK
	DENOTES ON-SITE RETENTION TANK
	DENOTES DWELLING FOOTPRINT
SW	DENOTES 100mm DIA. STORMWATER/SURFACE WATER SYSTEM PIPE AT 1% MIN. GRADE U.N.O.
RW	DENOTES 100mm DIA. FULLY SEALED RAINWATER SYSTEM PIPE U.N.O.
150 RW	DENOTES RAINWATER PIPE AND DIA. WHEN PIPE EXCEEDS 100mm DIA.
150 SW	DENOTES STORMWATER/SURFACE WATER PIPE AND DIA. WHEN PIPE EXCEEDS 100mm DIA.
W/RM	DENOTES RISING MAIN AND PIPE DIA. U.N.O.
100 SS	DENOTES SUBSOIL DRAINAGE LINE AND DIA. WRAPPED IN GEOFABRIC U.N.O.
DP	DENOTES DOWNPIPE
IO	DENOTES INSPECTION OPENING WITH SCREW DOWN LID AT FINISHED SURFACE LEVEL
CO	DENOTES INSPECTION OPENING WITH SCREW DOWN LID AT FINISHED SURFACE LEVEL FOR SYSTEM FLUSHING PURPOSES
	STORMWATER PIT - SOLID COVER
	STORMWATER PIT - GRATED INLET
	DENOTES GRATED DRAIN
	DENOTES ABSORPTION TRENCH
	NON RETURN VALVE
	PUMP
	STOP VALVE (ISOLATION VALVE)
	240v REQUIRED
IL23.31	DENOTES LEVEL OF INLET /OUTLET OF STORMWATER PIPE. NOTE: UNLESS NOTED OTHERWISE, THE BASE OF THE PIT IS THE SAME AS THE PIPE INLET/OUTLET.

DIAL BEFORE YOU DIG

BEFORE YOU DIG byda.com.au

IMPORTANT: THE CONTRACTOR IS TO MAINTAIN A CURRENT SET OF "DIAL BEFORE YOU DIG" DRAWINGS ON SITE AT ALL TIMES.

GENERAL NOTES

1. THESE PLANS SHALL BE READ IN CONJUNCTION WITH OTHER RELEVANT CONSULTANTS' PLANS, SPECIFICATIONS, CONDITIONS OF DEVELOPMENT CONSENT AND CONSTRUCTION CERTIFICATE REQUIREMENTS. WHERE DISCREPANCIES ARE FOUND HYDRACOR CONSULTING ENGINEERS PTY LTD MUST BE CONTACTED IMMEDIATELY FOR VERIFICATION
2. WHERE THESE PLANS ARE NOTED FOR DEVELOPMENT APPLICATION PURPOSES ONLY, THEY SHALL NOT BE USED FOR OBTAINING A CONSTRUCTION CERTIFICATE NOR USED FOR CONSTRUCTION PURPOSES
3. SUBSOIL DRAINAGE SHALL BE DESIGNED AND DETAILED BY THE STRUCTURAL ENGINEER. SUBSOIL DRAINAGE SHALL NOT BE CONNECTED INTO THE STORMWATER SYSTEM IDENTIFIED ON THESE PLANS UNLESS APPROVED BY HYDRACOR CONSULTING ENGINEERS PTY LTD.

STORMWATER CONSTRUCTION NOTES

1. ALL WORK SHALL BE CARRIED OUT IN ACCORDANCE WITH AS/NZS 3500 (CURRENT EDITION) AND THE REQUIREMENTS OF THE LOCAL COUNCIL'S POLICIES AND CODES
2. THE MINIMUM SIZES OF THE STORMWATER DRAINS SHALL NOT BE LESS THAN DN90 FOR CLASS 1 BUILDINGS AND DN100 FOR OTHER CLASSES OF BUILDING OR AS REQUIRED BY THE REGULATORY AUTHORITY
3. THE MINIMUM GRADIENT OF STORMWATER DRAINS SHALL BE 1%, UNLESS NOTED OTHERWISE
4. COUNCIL'S TREE PRESERVATION ORDER IS TO BE STRICTLY ADHERED TO. NO TREES SHALL BE REMOVED UNTIL PERMIT IS OBTAINED
5. PUBLIC UTILITY SERVICES ARE TO BE ADJUSTED AS NECESSARY AT THE CLIENT'S EXPENSE
6. ALL PITS TO BE BENCHED AND STREAMLINED. PROVIDE STEP IRONS FOR ALL PITS OVER 1.2m DEEP
7. MAKE SMOOTH JUNCTION WITH ALL EXISTING WORK
8. VEHICULAR ACCESS AND ALL SERVICES TO BE MAINTAINED AT ALL TIMES TO ADJOINING PROPERTIES AFFECTED BY CONSTRUCTION
9. SERVICES SHOWN ON THESE PLANS HAVE BEEN LOCATED FROM INFORMATION SUPPLIED BY THE RELEVANT AUTHORITIES AND FIELD INVESTIGATIONS AND ARE NOT GUARANTEED COMPLETE NOR CORRECT. IT IS THE CLIENT & CONTRACTOR'S RESPONSIBILITY TO LOCATE ALL PRIOR TO CONSTRUCTION
10. ANY VARIATION TO THE WORKS AS SHOWN ON THE APPROVED DRAWINGS ARE TO BE CONFIRMED BY HYDRACOR CONSULTING ENGINEERS PTY LTD PRIOR TO THEIR COMMENCEMENT

RAINWATER RE-USE SYSTEM NOTES

1. RAINWATER SUPPLY PLUMBING TO BE CONNECTED TO OUTLETS WHERE REQUIRED BY BASIX CERTIFICATE (BY OTHERS)
2. TOWN WATER CONNECTION TO RAINWATER TANK TO BE TO THE SATISFACTION OF THE REGULATORY AUTHORITY. THIS MAY REQUIRE PROVISION OF:
   2.1. PERMANENT AIR GAP
   2.2. BACKFLOW PREVENTION DEVICE
3. NO DIRECT CONNECTION BETWEEN TOWN WATER SUPPLY AND THE RAIN WATER SUPPLY
4. AN APPROVED STOP VALVE AND/OR PRESSURE LIMITING VALVE AT THE RAINWATER TANK
5. PROVIDE APPROPRIATE FLOAT VALVES AND/OR SOLENOID VALVES TO CONTROL TOWN WATER SUPPLY INLET TO TANK IN ORDER TO ACHIEVE THE TOP-UP INDICATED ON THE TYPICAL DETAIL
6. ALL PLUMBING WORKS ARE TO BE CARRIED OUT BY LICENSED PLUMBERS IN ACCORDANCE WITH AS/NZS3500.1 NATIONAL PLUMBING AND DRAINAGE CODE
7. PRESSURE PUMP ELECTRICAL CONNECTION TO BE CARRIED OUT BY A LICENSED ELECTRICIAN
8. ONLY ROOF RUN-OFF IS TO BE DIRECTED TO THE RAINWATER TANK . SURFACE WATER INLETS ARE NOT TO BE CONNECTED
9. PIPE MATERIALS FOR RAINWATER SUPPLY PLUMBING ARE TO BE APPROVED MATERIALS TO AS/NZS3500 PART 1 SECTION 2 AND TO BE CLEARLY AND PERMANENTLY IDENTIFIED AS 'RAINWATER'. THIS MAY BE ACHIEVED FOR BELOW GROUND PIPES USING IDENTIFICATION TAPE (MADE IN ACCORDANCE WITH AS2648) OR FOR ABOVE GROUND PIPES BY USING ADHESIVE PIPE MARKERS (MADE IN ACCORDANCE WITH AS1345)
10. EVERY RAINWATER SUPPLY OUTLET POINT AND THE RAINWATER TANK ARE TO BE LABELED 'RAINWATER' ON A METALLIC SIGN IN ACCORDANCE WITH AS1319
11. ALL INLETS AND OUTLETS TO THE RAINWATER TANK ARE TO HAVE SUITABLE MEASURES PROVIDED TO PREVENT MOSQUITO AND VERMIN ENTRY

SHEET INDEX

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STORMWATER DRAINAGE SUMMARY	SHEET C2
STORMWATER MANAGEMENT PLAN - GROUND (PART 1)	SHEET C3
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STORMWATER MANAGEMENT PLAN - BASEMENT 1	SHEET C5
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STORMWATER MANAGEMENT DETAILS SHEET No.1	SHEET C7
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STORMWATER MANAGEMENT DETAILS SHEET No.3	SHEET C9
STORMWATER QUALITY REPORT SHEET 1 OF 3	SHEET C10
STORMWATER QUALITY REPORT SHEET 2 OF 3	SHEET C11
STORMWATER QUALITY REPORT SHEET 3 OF 3	SHEET C12

LOCALITY MAP

DEVELOPMENT APPLICATION ISSUE
NOT FOR CONSTRUCTION

DRAWINGS MUST BE PRINTED IN COLOUR

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Issue	Description	Date	Drawn	Approved
D	UPDATED TO SUIT LATEST ARCHITECTURAL PLANS & RE-ISSUED FOR SSDA	14.04.26	RH	BK
C	UPDATED TO SUIT LATEST ARCHITECTURAL PLANS & RE-ISSUED FOR DEVELOPMENT APPROVAL	16.01.26	RH	BK
B	RE - ISSUED FOR DEVELOPMENT APPROVAL	04.04.25	LW	BK
A	ISSUED FOR DEVELOPMENT APPROVAL	28.03.25	RH	BK

1cm at full size

North

Client: CPDM Pty Ltd
SUITE G02, GROUND FLOOR
22 ATCHINSON ST, ST LEONARDS

Architect: PBD ARCHITECTS

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Project: PROPOSED RESIDENTIAL DEVELOPMENT
No.1 - 3 REID STREET
No.2 - 4 WOODSIDE AVENUE
LINDFIELD

Drawing Title: COVER SHEET & NOTES

Drawn	Date	Scale A1	Q.A. Check	Date
LW	MARCH 2025	AS SHOWN	BAK	14.04.26
Designed	Project No.		Dwg. No.	Issue
BK	CC240140		C1	D

KU-RING-GAI DCP PART 24 STORMWATER DRAINAGE SUMMARY

SITE AREA . . . . . 3852 m²

PRE-DEVELOPED IMPERVIOUS AREA . . . . . N/A m²

POST DEVELOPED IMPERVIOUS AREA 2265

DESIGN SUMMARY IN RESPONSE TO THE KU-RING-GAI DCP PART 24 - WATER MANAGEMENT:

- STORMWATER DISCHARGE (24B.5)

  ON-SITE DETENTION / RAINWATER TANK OVERFLOW AND SURFACE

  PITS TO DISCHARGE TO WOODSIDE AVENUE

- STREAM FLOW CONTROLS PART 24 CLAUSE 24.C3

  PROPOSAL

  PROVISION OF 25,000 LITRE MINIMUM RAINWATER TANK

  REFER TO SHEET C3, C7 & C8

- ON-SITE DETENTION PART 24 CLAUSE 24.C5

  REFER TO CALCULATION SHEET.

  PROPOSAL

  PROVISION OF 75,000 LITRE MIN. ON-SITE DETENTION TANK

  REFER TO SHEET C3, C7 & C8

- WATER QUALITY PART 24 CLAUSE 24.C6

  PROPOSAL

  PROVISION OF: 25,000 LITRE MIN. RAINWATER TANK REQUIRED
  NOTE: 28,000 LITRES PROVIDED

  7 x OCEANPROTECT FILTERS

  2 x OCEANGUARD

  REFER TO SHEETS C10 - C12

CATCHMENT DETAIL ON-SITE DETENTION CALCULATION SHEET - 24R.4

1. CATCHMENT NAME GC1
2. CATCHMENT DISCHARGE RATE 0.0128 l/sec/m² **A**
3. CATCHMENT STORAGE RATE 0.0336 m³/m² **B**

SITE DETAILS

4. SITE AREA (m²) 3852 60% OF SITE AREA m² 2311 **C**
5. AREA(S) NOT DRAINING TO THE DETENTION SYSTEM N/A m²
6. TOTAL IMPERVIOUS AREA (ROOFS, DRIVEWAYS, PAVING, FUTURE DEV.) 2265 m² **D**
7. IMPERVIOUS AREA BYPASSING DETENTION SYSTEM 0 m² **E**

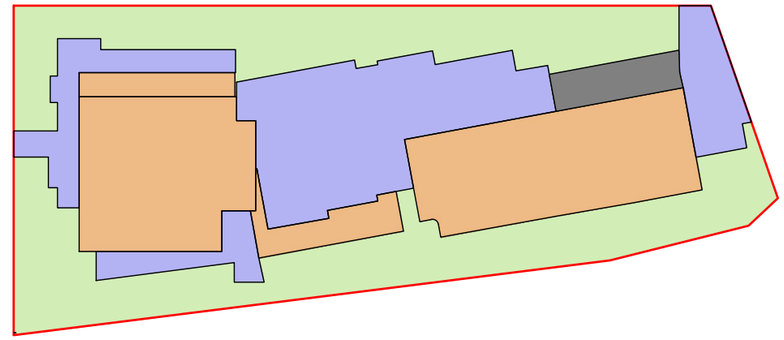
PERMITTED SITE DISCHARGE

8. C[2311 m²] x A [0.0128 l/sec/m²] = 29.5 l/sec **Flow 1**
9. ADJUSTMENT FOR ANY UNCONTROLLED IMPERVIOUS FLOW E / D= - (<0.25) **F**
10. FLOW 1 [- l/sec x F [-] = - l/sec **Flow 2**
11. FLOW 1 [-] - FLOW 2 [-] = - l/sec **PSD**

SITE STORAGE REQUIREMENT

12. C [2311 m²] x B [0.0336 m³/m²] = 77.6 m³ **SSR1**
13. IF THE STORAGE IS IN A LANDSCAPED BASIN, SSR1 x 1.2 = m³ N/A **SSR2**

- RAINWATER TANK OFFSET APPLIED (10% OF THE ON SITE RETENTION TO BE DISCOUNTED)
- ADJUSTED ON SITE DETENTION VOLUME = (77.6m³ - 2.8m³ = 74.8m³ REQUIRED)
- 75m³ PROVIDED



IMPERVIOUS PAVEMENT AREAS DIRECTED TO OSD TANK (AREA =996m²)

BASEMENT PUMP-OUT AREA DIRECTED TO OSD TANK (AREA = 91m²)

ROOF AREA DIRECTED TO OSD TANK VIA OSR TANK (RAINWATER) (AREA = 1178m²)

LANDSCAPE TO OSD TANK (AREA = 1587m²)

TOTAL CATCHMENT DIRECTED TO OSD TANK = 3852m² (100%)

SUMMARY
SITE AREA = 3852
TOTAL IMPERVIOUS AREA = 2265m² (58.8%)
TOTAL AREA BEING DIRECTED TO OSD SYSTEM = 3852m²

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0 1cm at full size 10cm

North

Client: CPDM Pty Ltd
SUITE G02, GROUND FLOOR
22 ATCHINSON ST, ST LEONARDS

Architect: PBD ARCHITECTS

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Project: PROPOSED RESIDENTIAL DEVELOPMENT
No.1 - 3 REID STREET
No.2 - 4 WOODSIDE AVENUE
LINDFIELD

Drawing Title: STORMWATER DRAINAGE SUMMARY

Drawn	Date	Scale A1	Q.A. Check	Date
LW	MARCH 2025	AS SHOWN	BAK	14.04.26
Designed	Project No.		Dwg. No.	Issue
BK	CC240140		C2	D

DESIGN NOTES:

1. TOP OF GRATE LEVELS HAVE BEEN DETERMINED FROM THE SURVEY DETAIL PROVIDED. FOLLOWING EARTHWORKS AND BENCHING, VALIDITY OF GRATE LEVELS SHOULD BE ASSESSED AND ADJUSTED AS REQUIRED TO MEET THE INTENT OF THE DESIGN. WHERE IN DOUBT CONTACT THE DESIGN ENGINEER.

2. DOWNPIPES CONVEYING ROOF WATER TO DISCHARGE TO RAINWATER TANK INDEPENDANT OF ANY OTHER STORMWATER SYSTEM ON SITE. REFER TO HYDRAULIC SERVICES PLANS AT CC STAGE FOR LOCATION OF ALL BUILDING DOWNPIPES. THE HYDRAULIC ENGINEER SHOULD ALLOW TO TIE IN AS REQUIRED TO THE STORMWATER CONCEPT SHOWN ON THESE PLANS. TYP UNO.

3. FULLY SEALED ROOF DRAINAGE SYSTEM SHOWN THUS:
   ARW — OR — RW
   DENOTES DRAINAGE SYSTEM TO BE FULLY SEALED FROM ROOF GUTTERS TO OSR TANK. SEAL ALL PIPEWORK FROM TANK TO ROOF USING SOLVENT WELDED JOINTS. RAINWATER SYSTEM SHALL COLLECT ROOF WATER ONLY. NO ADDITIONAL PITS FOR COLLECTION OF SURFACE WATER WILL BE PERMITTED FOR THE ROOF WATER SYSTEM TYP.

4. DOWNPIPES, PIPES & STORMWATER FEATURES LOCATED WITHIN THE BUILDING ENVELOPE ARE SHOWN ON THIS PLAN FOR APPROVAL PURPOSES ONLY. FINAL PIPE ALIGNMENTS LOCATED WITHIN THE BUILDING ENVELOPE SHALL BE COORDINATED & DOCUMENTED AT CC STAGE BY THE HYDRAULIC ENGINEER AND SHOULD ALLOW TO TIE IN WITH THE STORMWATER CONCEPT SHOWN ON THESE PLANS.

5. CONSTRUCT PIPES AS CLOSE AS PRACTICABLE TO BUILDING TO MINIMISE DISTURBANE ON EXISTING TREE ROOTS. HAND DIG TRENCH UNDER THE SUPERVISION OF THE CONSULTING ARBORIST. DO NOT SEVER ROOTS >30mm WITHIN CANOPY OF TREES TO BE RETAINED. TREE PROTECTION MEASURES TO BE CARRIED OUT IN ACCORDANCE WITH KU-RING-GAI COUNCIL SPECIFICATIONS. FINAL ALIGNMENT TO BE CONFIRMED ON SITE BY ARBORIST.

NOTE: REFER TO ARCHITECTS DRAWINGS FOR TREES TO BE REMOVED & RETAINED. TREES SHOWN THUS: ARE TO BE RETAINED

OUTLINE OF BASEMENT SHORING WALL UNDER SHOWN THUS:

ROOF WATER LINE TO OSR TANK. REFER TO NOTE 2 & 3 TYP UNO

SURFACE WATER ROOFWATER

EXISTING 750 DIA STORMWATER LINE TO BE DECOMMISSIONED

SURFACE STORMWATER LINE TO OSD TANK. REFER TO NOTE 4

600 SQ SW PIT WITH GRATED INLET RL 90.00

600 SQ SW PIT WITH GRATED INLET RL 89.40

PROPOSED FLOOD DEFLECTION WALL

GROUND FLOOR
FFL RL.90.800

G.01 3BED
G.02 1BED
G.03 3BED
G.04 3BED
G.05 1BED
G.08 3BED
G.09 3BED
G.10 1BED

REID STREET

WARNING
LOCATION AND DEPTH OF ALL UNDERGROUND SERVICES TO BE INVESTIGATED WITH THE RELEVANT AUTHORITIES PRIOR TO COMMENCING WORK

BENCHMARK NAIL IN KERB RL 89.44 AHD

FOR CONTINUATION REFER TO SHEET C4

STORMWATER MANAGEMENT PLAN
SCALE - 1:100/A1, 1:200/A3

0 1 2 4 6 8 10m

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A	ISSUED FOR DEVELOPMENT APPROVAL	28.03.25	RH	BK

1cm at full size 10cm

North

Client
CPDM Pty Ltd
SUITE G02, GROUND FLOOR
22 ATCHINSON ST, ST LEONARDS

Architect
PBD ARCHITECTS

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Project
PROPOSED RESIDENTIAL DEVELOPMENT
No.1 - 3 REID STREET
No.2 - 4 WOODSIDE AVENUE
LINDFIELD

Drawing Title
STORMWATER MANAGEMENT PLAN - GROUND (PART 1)

Drawn	Date	Scale A1	Q.A. Check	Date
LW	MARCH 2025	AS SHOWN	BAK	14.04.26
Designed	Project No.		Dwg. No.	Issue
BK	CC240140		C3	D

OUTLINE OF BASEMENT SHORING WALL WALL UNDER SHOWN THUS: — —

EXTERNAL SURFACE WATER DRAINAGE SYSTEM / FINAL PIPE ALIGNMENT TO BE DETERMINED AT CC STAGE TYP UNO

CONSTRUCT 200 WIDE GRATED BOX DRAIN MIN 150 DEEP.
GRADE FROM INVERT TO OUTLET AT A MINIMUM GRADE OF 2%.
TOP OF GRATE 88.00 (VARIES)
GRATE LEVELS TO BE CONFIRMED FROM CROSS OVER LEVELS PROVIDED BY COUNCIL.

DISCHARGE STORMWATER TO PROPOSED CULVERT / COUNCIL STORMWATER NETWORK TO THE SATISFACTION OF COUNCIL. MAKE GOOD EXISTING CONSTRUCTION.
INVERT LEVEL OF OUTLET SHALL BE SITE CONFIRMED PRIOR TO COMMENCEMENT OF WORK.
DESIGN INVERT: IL 85.35 NOM.

CROSSOVER AND DRIVEWAY TO BE IN ACCORDANCE WITH COUNCIL REQUIREMENTS. THE LEVELS AND DESIGN OF THE CROSSOVER AND DRIVEWAY SHALL BE BY OTHERS.

IL U/S 85.50
375Ø
1.0% MIN
16m
IL D/S 85.35

OVERFLOW PIT WITH SOLID BOLT DOWN COVER - RL 87.77
INVERT OF OUTLET IL 85.50

600 SQ SW PIT WITH GRATED INLET RL 87.80

600 SQ SW PIT WITH GRATED INLET RL 88.00

600 SQ SW PIT WITH GRATED INLET RL 89.40

600 SQ SW PIT WITH GRATED INLET RL 88.60

EXISTING 1050 DIA STORMWATER LINE TO BE DECOMISSIONED

SURFACE STORMWATER LINE TO OSD TANK. REFER TO NOTE 4

ROOF WATER LINE TO OSR TANK. REFER TO NOTE 2 & 3 TYP UNO

ON SITE RETENTION
PROVIDE OSR WITH :-
OSR STORAGE VOLUME: 28m³
TOP STORED WATER LEVEL - RL 87.50
AVG DEPTH OF WATER 1.825m
REFER TO SHEET C7 & C8 FOR DETAILS

ON-SITE DETENTION (OSD) & WATER QUALITY TANK
PROVIDE OSD WITH :-
OSD STORAGE VOLUME: 75m³
TOP STORED WATER LEVEL - 87.25
AVG DEPTH OF WATER 1.65m
REFER TO SHEET C7 & C8 FOR DETAILS

REFER TO CIVIL ENGINEERING PLANS PREPARED BY HYDRACOR CONSULTING ENGINEERS FOR EXTENT OF PROPOSED PUBLIC DOMAIN / FLOOD MITIGATION WORKS ISSUED UNDER SEPARATE COVER, REFERENCE DD240140'R' SERIES

WARNING
LOCATION AND DEPTH OF ALL UNDERGROUND SERVICES TO BE INVESTIGATED WITH THE RELEVANT AUTHORITIES PRIOR TO COMMENCING WORK

NOTE: REFER TO ARCHITECTS DRAWINGS FOR TREES TO BE REMOVED & RETAINED. TREES SHOWN THUS: ◯ ARE TO BE RETAINED

FOR CONTINUATION REFER TO SHEET C3

BENCHMARK NAIL IN KERB RL 89.44 AHD

LINDFIELD AVENUE

WOODSIDE AVENUE

STORMWATER MANAGEMENT PLAN
SCALE - 1:100/A1, 1:200/A3

0 1 2 4 6 8 10m

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A	ISSUED FOR DEVELOPMENT APPROVAL	28.03.25	RH	BK

North

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SUITE G02, GROUND FLOOR
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ENGINEERS | CIVIL | FLOOD STUDIES | STORMWATER | HYDRAULIC

Project: PROPOSED RESIDENTIAL DEVELOPMENT
No.1 - 3 REID STREET
No.2 - 4 WOODSIDE AVENUE
LINDFIELD

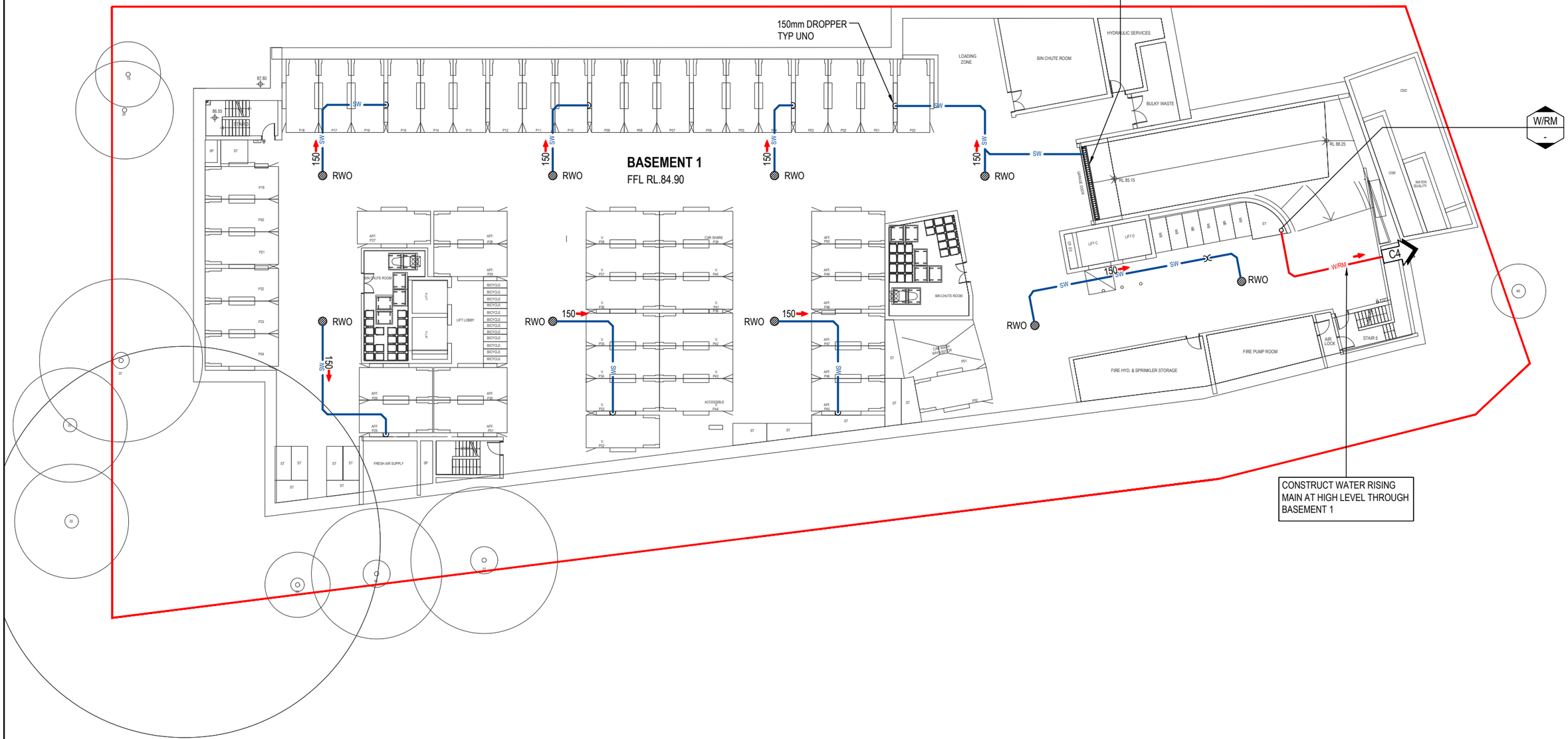
Drawing Title: STORMWATER MANAGEMENT PLAN - GROUND (PART 2)

Drawn	Date	Scale A1	Q.A. Check	Date
LW	MARCH 2025	AS SHOWN	BAK	14.04.26
Designed	Project No.		Dwg. No.	Issue
BK	CC240140		C4	D

WARNING
LOCATION AND DEPTH OF ALL UNDERGROUND SERVICES TO BE INVESTIGATED WITH THE RELEVANT AUTHORITIES PRIOR TO COMMENCING WORK

CONSTRUCT 200 WIDE GRATED BOX DRAIN MIN 150 DEEP.
GRADE FROM INVERT TO OUTLET AT A MINIMUM GRADE OF 2%.
TOP OF GRATE 84.90

150mm DROPPER TYP UNO



CONSTRUCT WATER RISING MAIN AT HIGH LEVEL THROUGH BASEMENT 1

STORMWATER MANAGEMENT PLAN

SCALE - 1:150/A1, 1:300/A3

0 1 2 4 6 8 10m

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1cm at full size 0 10cm

North

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Project
PROPOSED RESIDENTIAL DEVELOPMENT
No.1 - 3 REID STREET
No.2 - 4 WOODSIDE AVENUE
LINDFIELD

Drawing Title
STORMWATER MANAGEMENT PLAN - BASEMENT 1

Drawn	Date	Scale A1	Q.A. Check	Date
RH	MARCH 2025	AS SHOWN	BAK	14.04.26
Designed	Project No.		Dwg. No.	Issue
BK	CC240140		C5	D

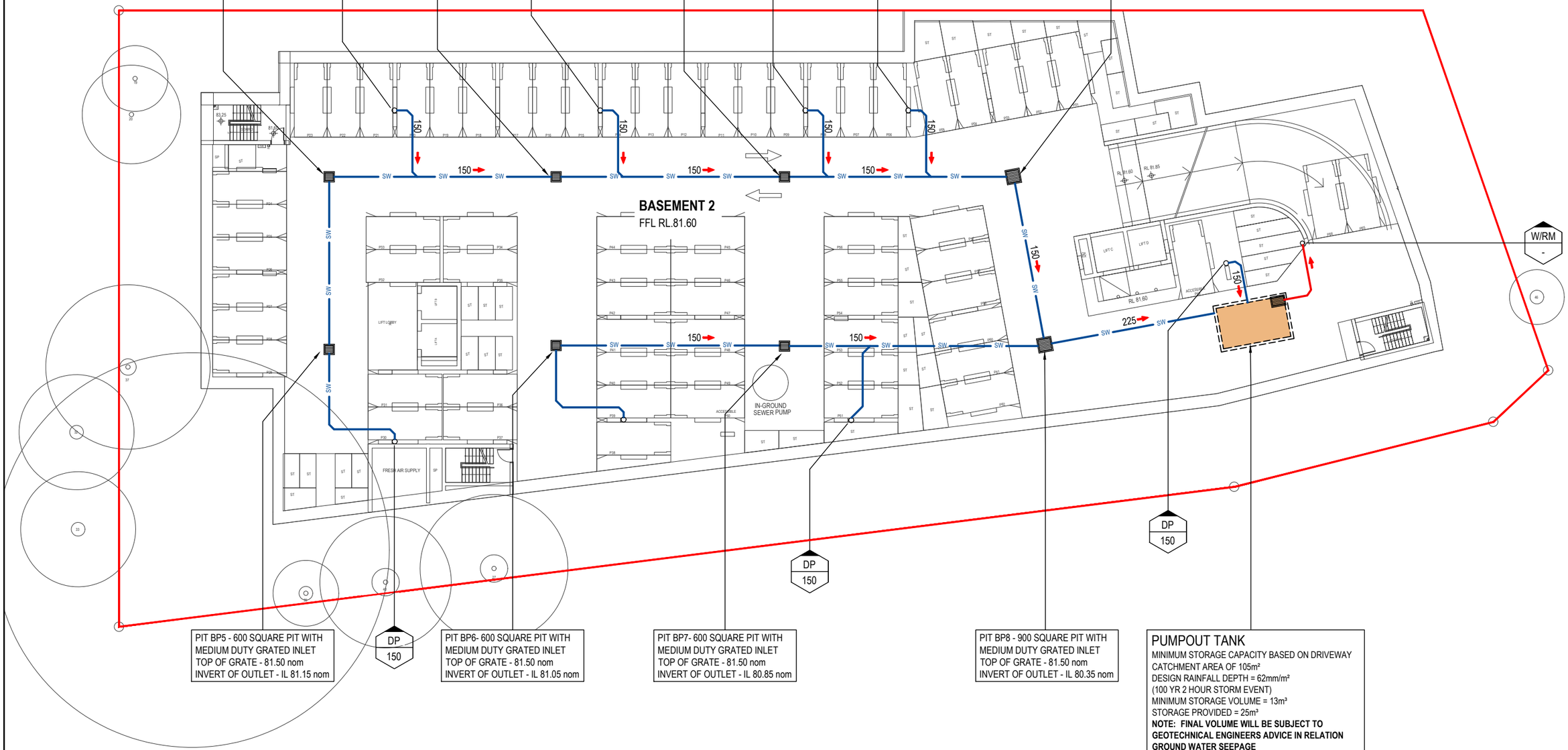
PIT BP1 - 600 SQUARE PIT WITH
MEDIUM DUTY GRATED INLET
TOP OF GRATE - 81.50 nom
INVERT OF OUTLET - IL 81.00 nom

PIT BP2 - 600 SQUARE PIT WITH
MEDIUM DUTY GRATED INLET
TOP OF GRATE - 81.50 nom
INVERT OF OUTLET - IL 80.80 nom

PIT BP3 - 600 SQUARE PIT WITH
MEDIUM DUTY GRATED INLET
TOP OF GRATE - 81.50 nom
INVERT OF OUTLET - IL 80.65 nom

PIT BP4 - 900 SQUARE PIT WITH
MEDIUM DUTY GRATED INLET
TOP OF GRATE - 81.50 nom
INVERT OF OUTLET - IL 80.50 nom

WARNING
LOCATION AND DEPTH OF ALL UNDERGROUND SERVICES TO BE INVESTIGATED WITH THE RELEVANT AUTHORITIES PRIOR TO COMMENCING WORK



PIT BP5 - 600 SQUARE PIT WITH
MEDIUM DUTY GRATED INLET
TOP OF GRATE - 81.50 nom
INVERT OF OUTLET - IL 81.15 nom

PIT BP6- 600 SQUARE PIT WITH
MEDIUM DUTY GRATED INLET
TOP OF GRATE - 81.50 nom
INVERT OF OUTLET - IL 81.05 nom

PIT BP7- 600 SQUARE PIT WITH
MEDIUM DUTY GRATED INLET
TOP OF GRATE - 81.50 nom
INVERT OF OUTLET - IL 80.85 nom

PIT BP8 - 900 SQUARE PIT WITH
MEDIUM DUTY GRATED INLET
TOP OF GRATE - 81.50 nom
INVERT OF OUTLET - IL 80.35 nom

PUMPOUT TANK

MINIMUM STORAGE CAPACITY BASED ON DRIVEWAY
CATCHMENT AREA OF 105m²
DESIGN RAINFALL DEPTH = 62mm/m²
(100 YR 2 HOUR STORM EVENT)
MINIMUM STORAGE VOLUME = 13m³
STORAGE PROVIDED = 25m³
NOTE: FINAL VOLUME WILL BE SUBJECT TO GEOTECHNICAL ENGINEERS ADVICE IN RELATION GROUND WATER SEEPAGE

STORMWATER MANAGEMENT PLAN

SCALE - 1:150/A1, 1:300/A3

0 1 2 4 6 8 10m

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Issue	Description	Date	Drawn	Approved
D	UPDATED TO SUIT LATEST ARCHITECTURAL PLANS & RE-ISSUED FOR SSDA	14.04.26	RH	BK
C	UPDATED TO SUIT LATEST ARCHITECTURAL PLANS & RE-ISSUED FOR DEVELOPMENT APPROVAL	16.01.26	RH	BK
B	RE - ISSUED FOR DEVELOPMENT APPROVAL	04.04.25	LW	BK
A	ISSUED FOR DEVELOPMENT APPROVAL	28.03.25	RH	BK

0 10m at full size 100m

North

Client
CPDM Pty Ltd
SUITE G02, GROUND FLOOR
22 ATCHINSON ST, ST LEONARDS

Architect
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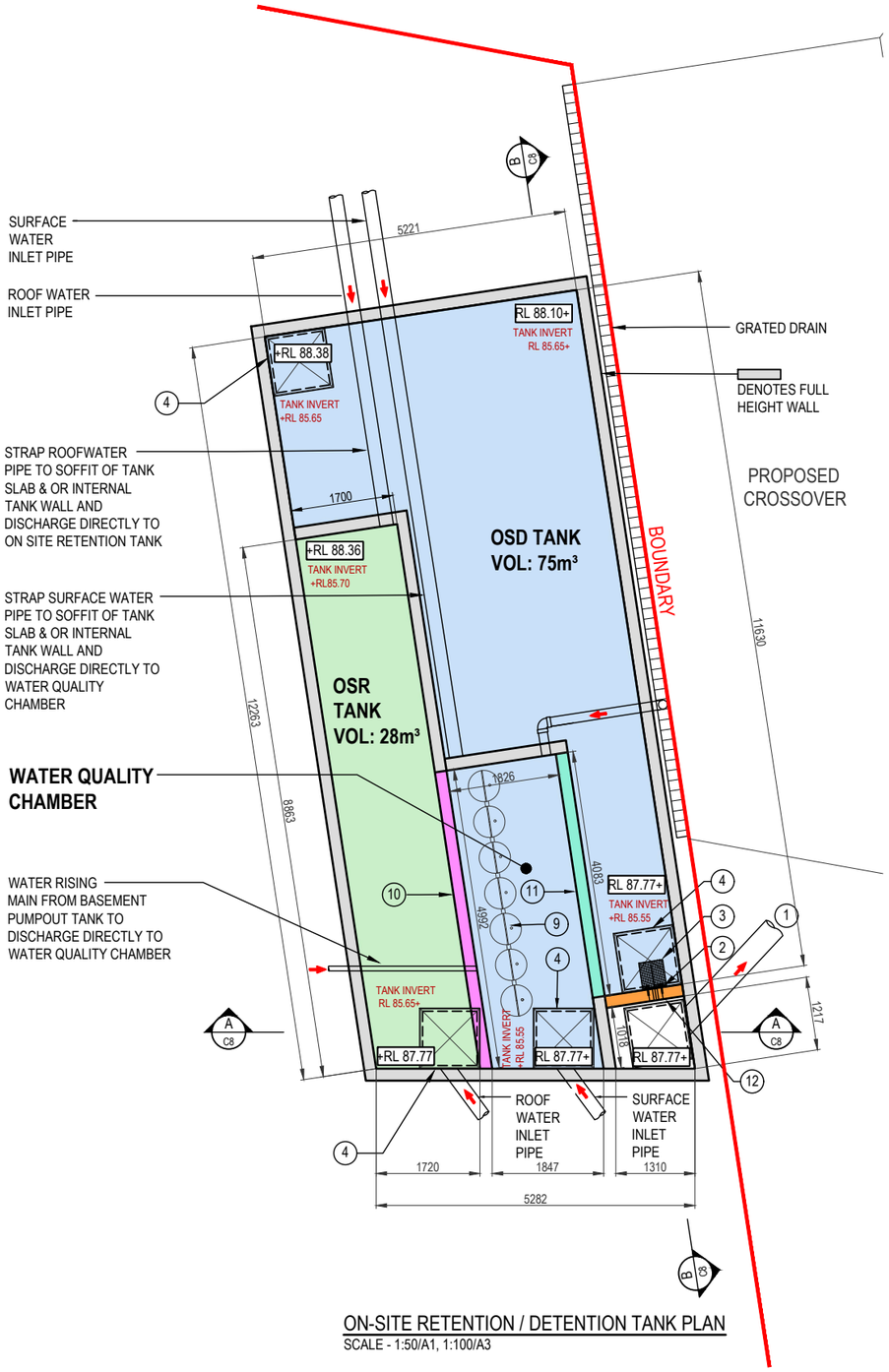
Project
PROPOSED RESIDENTIAL DEVELOPMENT
No.1 - 3 REID STREET
No.2 - 4 WOODSIDE AVENUE
LINDFIELD

Drawing Title
STORMWATER MANAGEMENT PLAN - BASEMENT 2

Drawn	Date	Scale A1	Q.A. Check	Date
RH	MARCH 2025	AS SHOWN	BAK	14.04.26

Designed	Project No.	Dwg. No.	Issue
BK	CC240140	C6	D

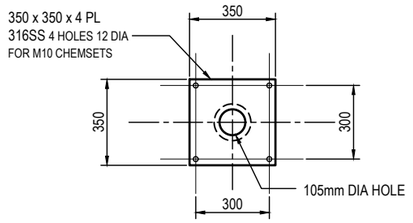


ON-SITE RETENTION / DETENTION TANK PLAN

SCALE - 1:50/A1, 1:100/A3

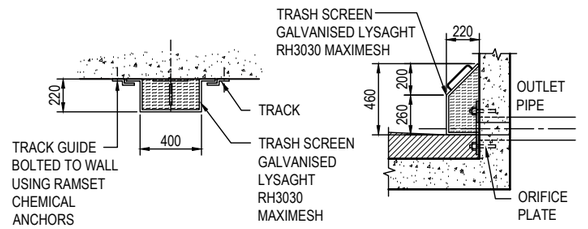
LEGEND

1	375 DIA OUTLET PIPE	8	PROVIDE GALVANISED STEP IRONS AT 300mm CENTRES WHERE DEPTH EXCEEDS 1100mm IN ACCORDANCE WITH THE AUST. STANDARDS AT ALL ACCESS POINTS OF THE TANK, TYP.
2	350 x 350 x 4 PL 316SS 4 HOLES 12 DIA FOR M10 CHEMSETS	9	7 x 690 HIGH OCEAN PROTECT FILTERS
3	TRASH SCREEN LYSAGHT RH3030 GALV. REMOVABLE WITH HANDLE	10	OSR OVERFLOW WEIR SHOWN THUS: TOP OF WEIR RL 87.50
4	900 x 900 SOLID COVER BOLTED DOWN	11	WATER QUALITY CHAMBER WEIR SHOWN THUS: TOP OF WEIR RL 86.47
5	RE-USE PUMP TO MANUFACTURERS SPECIFICATIONS	12	OSD OVERFLOW CHAMBER WEIR SHOWN THUS: TOP OF WEIR RL 87.25
6	NON-RETURN VALVE		
7	PVC PIPE CLASS '16' RISING MAIN BY OTHERS		



ORIFICE PLATE DETAIL

NTS



TRASH SCREEN

NTS

PROVIDE CONFINED SPACE SIGNAGE AT ENTRY POINTS INTO TANK.

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A	ISSUED FOR DEVELOPMENT APPROVAL	28.03.25	RH	BK

North

1cm at full size

Client: CPDM Pty Ltd

SUITE G02, GROUND FLOOR
22 ATCHINSON ST, ST LEONARDS

Architect: PBD ARCHITECTS

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Project: PROPOSED RESIDENTIAL DEVELOPMENT

No.1 - 3 REID STREET
No.2 - 4 WOODSIDE AVENUE
LINDFIELD

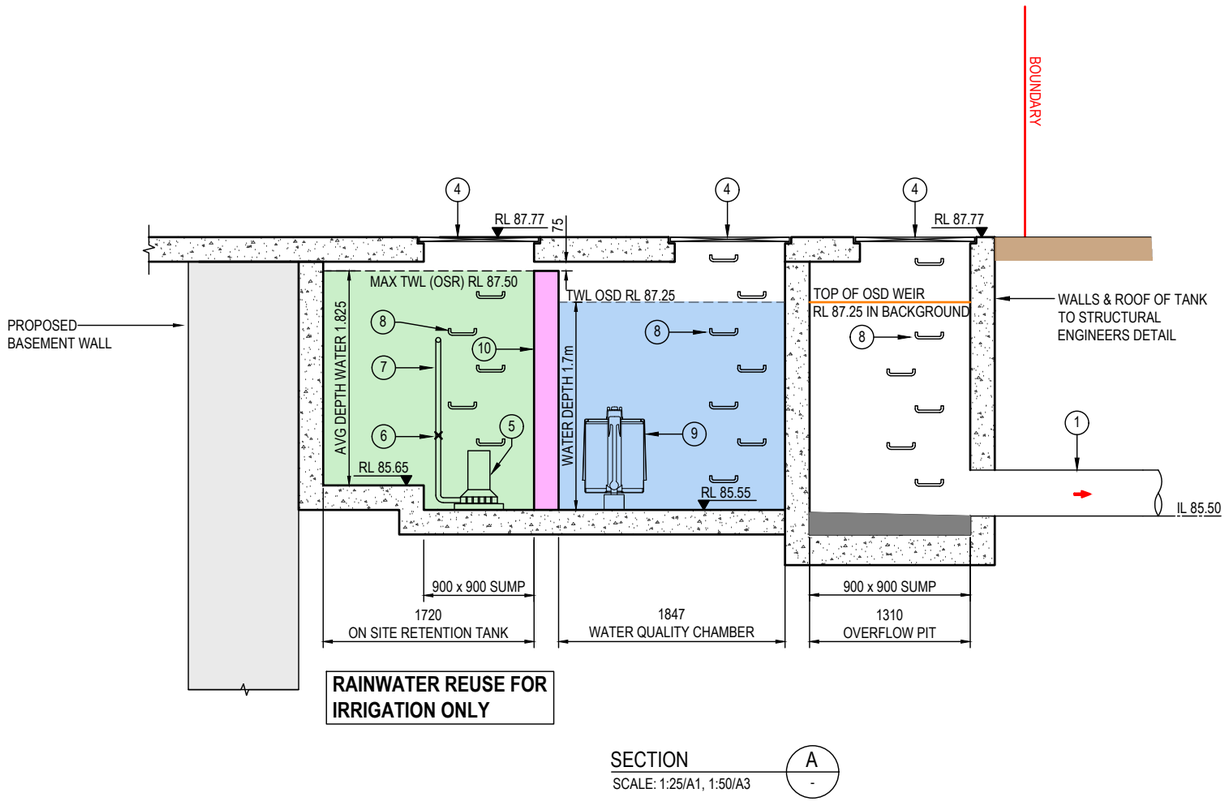
Drawing Title: STORMWATER MANAGEMENT DETAIL SHEET No. 1

Drawn	Date	Scale A1	Q.A. Check	Date
RH	MARCH 2025	AS SHOWN	BAK	14.04.26

Designed	Project No.	Dwg. No.	Issue
BK	CC240140	C7	D

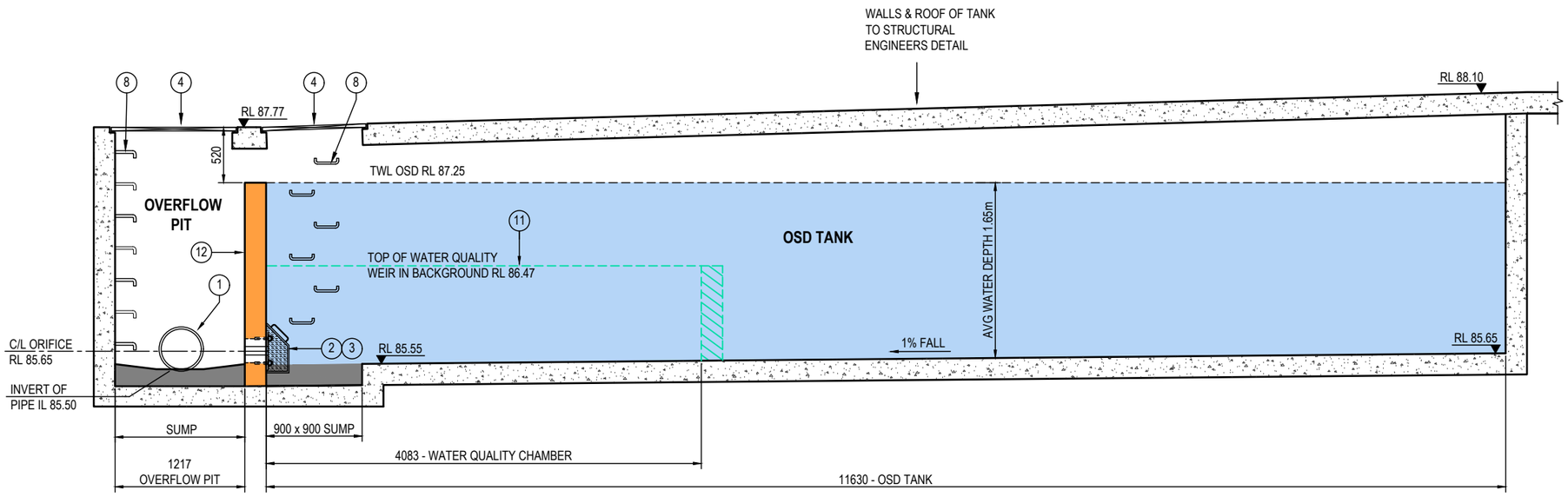
LEGEND

(1)	375 DIA OUTLET PIPE	(8)	PROVIDE GALVANISED STEP IRONS AT 300mm CENTRES WHERE DEPTH EXCEEDS 1100mm IN ACCORDANCE WITH THE AUST. STANDARDS AT ALL ACCESS POINTS OF THE TANK, TYP.
(2)	350 x 350 x 4 PL 316SS 4 HOLES 12 DIA FOR M10 CHEMSETS	(9)	7 x 690 HIGH OCEAN PROTECT FILTERS
(3)	TRASH SCREEN LYSAGHT RH3030 GALV. REMOVABLE WITH HANDLE	(10)	OSR OVERFLOW WEIR SHOWN THUS: TOP OF WEIR RL 87.50
(4)	900 x 900 SOLID COVER BOLTED DOWN	(11)	WATER QUALITY CHAMBER WEIR SHOWN THUS: TOP OF WEIR RL 86.47
(5)	RE-USE PUMP TO MANUFACTURERS SPECIFICATIONS	(12)	OSD OVERFLOW CHAMBER WEIR SHOWN THUS: TOP OF WEIR RL 87.25
(6)	NON-RETURN VALVE		
(7)	PVC PIPE CLASS '16' RISING MAIN BY OTHERS		



SECTION A
SCALE: 1:25/A1, 1:50/A3

PROVIDE CONFINED SPACE SIGNAGE
AT ENTRY POINTS INTO TANK.



SECTION B
SCALE: 1:25/A1, 1:50/A3

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A	ISSUED FOR DEVELOPMENT APPROVAL	28.03.25	RH	BK

North

0 1cm at full size 10cm

Client
CPDM Pty Ltd
SUITE G02, GROUND FLOOR
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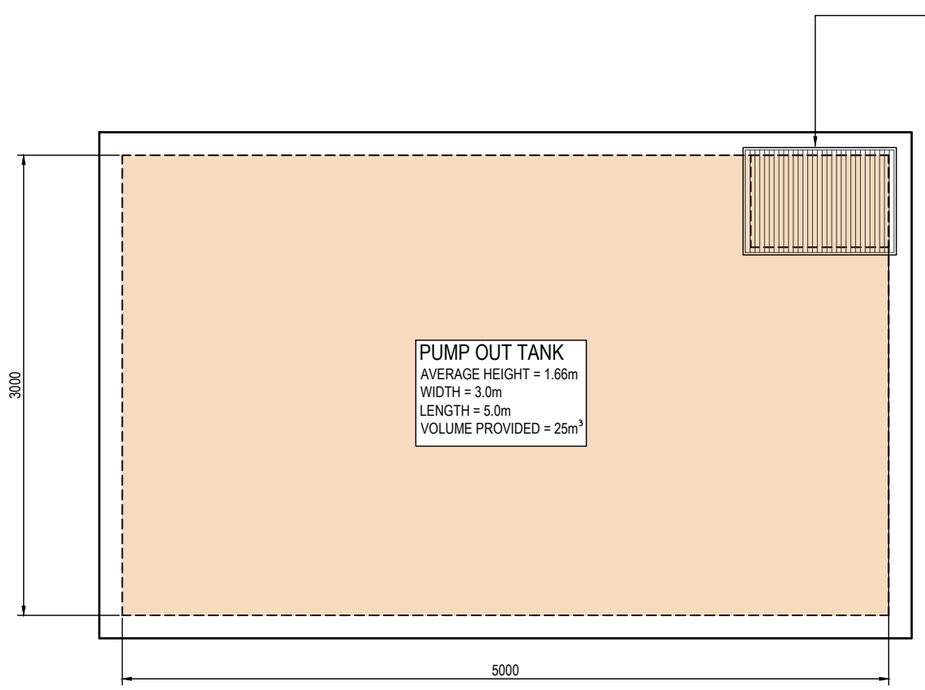
No.2 - 4 WOODSIDE AVENUE
LINDFIELD

Drawing Title
STORMWATER MANAGEMENT DETAIL SHEET No. 2

Drawn	Date	Scale A1	Q.A. Check	Date
RH	MARCH 2025	AS SHOWN	BAK	14.04.26
Designed	Project No.		Dwg. No.	Issue
BK	CC240140		C8	D



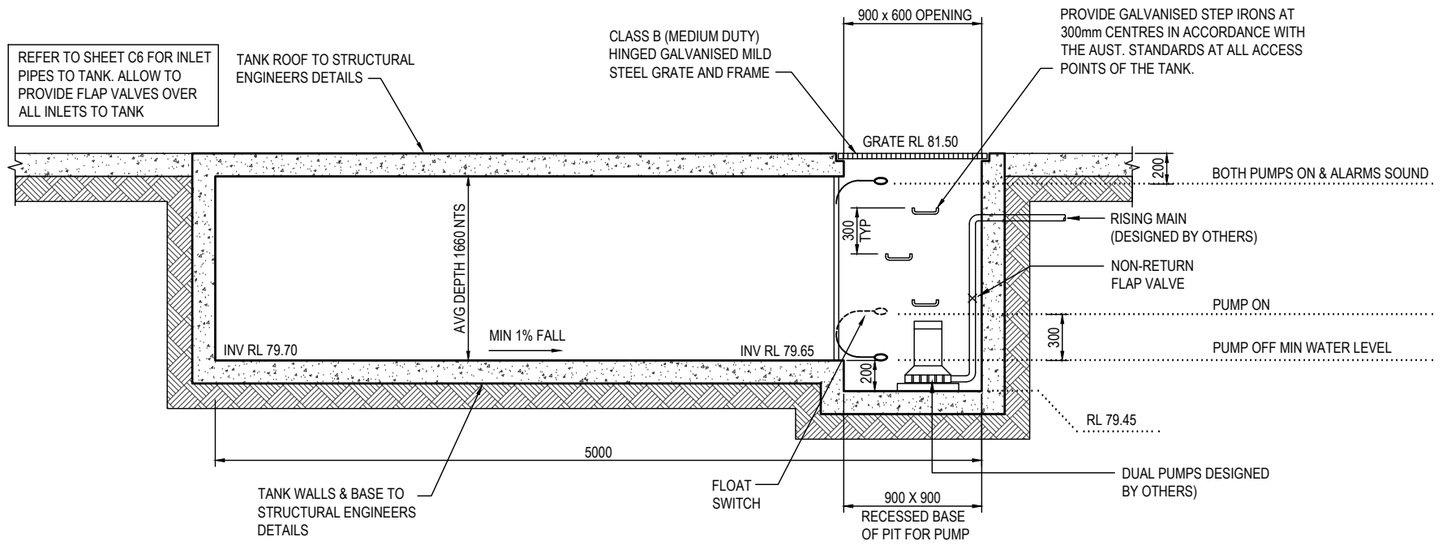
PUMP OUT TANK PLAN
SCALE 1:20/A1, 1:40/A3

PROVIDE CONFINED SPACE SIGNAGE
AT ENTRY POINTS INTO TANK.

STANDARD PUMP OUT DESIGN NOTES

THE PUMP SYSTEM SHALL BE OPERATED IN THE FOLLOWING MANNER:-

1. THE PUMPS SHALL BE PROGRAMMED TO WORK ALTERNATELY TO ALLOW BOTH PUMPS TO HAVE AN EQUAL OPERATION LOAD AND PUMP LIFE
2. A FLOAT SHALL BE PROVIDED TO ENSURE THAT THE MINIMUM REQUIRED WATER LEVEL IS MAINTAINED WITHIN THE SUMP AREA OF THE BELOW GROUND TANK. IN THIS REGARD THIS FLOAT WILL FUNCTION AS AN OFF SWITCH FOR THE PUMPS AT THE MINIMUM WATER LEVEL. THE SAME FLOAT SHALL BE SET TO TURN ONE OF THE PUMPS ON UPON WATER LEVEL IN THE TANK RISING TO APPROXIMATELY 300mm ABOVE THE MINIMUM WATER LEVEL. THE PUMP SHALL OPERATE UNTIL THE TANK IS DRAINED TO THE MINIMUM WATER LEVEL.
3. A SECOND FLOAT SHALL BE PROVIDED AT A HIGH LEVEL, WHICH IS APPROXIMATELY THE ROOF LEVEL OF THE BELOW GROUND TANK. THIS FLOAT SHALL START THE OTHER PUMP THAT IS NOT OPERATING AND ACTIVATE THE ALARM.
4. AN ALARM SYSTEM SHALL BE PROVIDED WITH A FLASHING STROBE LIGHT AND A PUMP FAILURE WARNING SIGN WHICH ARE TO BE LOCATED AT THE DRIVEWAY ENTRANCE TO THE BASEMENT LEVEL. THE ALARM SYSTEM SHALL BE PROVIDED WITH A BATTERY BACK-UP IN CASE OF POWER FAILURE.
5. A CONFINED SPACE DANGER SIGN SHALL BE PROVIDED AT ALL ACCESS POINTS TO THE PUMP OUT STORAGE TANK.



TYPICAL SECTION THROUGH PUMP OUT TANK
SCALE 1:20/A1, 1:40/A3

PUMP-OUT TANK MAINTENANCE SCHEDULE

MAINTENANCE CONTRACT

NOTE: A 24 HOUR X 12 MONTHLY EMERGENCY AND MAINTENANCE CONTRACT SHALL BE OBTAINED FROM A COMPANY CAPABLE OF EXECUTING THE WORK AND SHALL BE KEPT IN FORCE BY THE PROPERTY OWNER(S) FOR THE LIFE OF THE BUILDING.

THE MAINTENANCE CONTRACT SHALL BE CARRIED OUT EVERY THREE (3) MONTHS AND SHALL INCLUDE THE FOLLOWING ACTIVITIES:

1. CLEAN OUT ALL PITS OF SILT AND DEBRIS.
2. CHECK AND CLEAN OUT, IF NECESSARY, ALL PIPELINES.
3. CHECK:
   - 3.1. PUMPS FOR WEAR
   - 3.2. PUMP OIL SEALS
   - 3.3. PUMP STRAINER AND CLEAN
4. CARRY OUT ROUTINE MAINTENANCE TO PUMPS AS RECOMMENDED BY THE MANUFACTURER.
5. CHECK OPERATIONAL SEQUENCE OF LEVEL SWITCHES, PUMPS AND CONTROL PANEL.
6. THE EMERGENCY CONTRACT SHALL PROVIDE FOR A 24 HOUR X 7 DAY PER WEEK SERVICE.

THE CONTRACTOR SHALL PROVIDE A NAME PLATE STATING NAME, WORKING HOURS, TELEPHONE NUMBER AND OUT OF HOURS NUMBER AND SUCH NAME PLATE SHALL BE FIXED TO THE FRONT OF THE CONTROL PANEL.

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North

1cm at full size 10cm

Client: CPDM Pty Ltd
SUITE G02, GROUND FLOOR
22 ATCHINSON ST, ST LEONARDS

Architect: PBD ARCHITECTS

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Project: PROPOSED RESIDENTIAL DEVELOPMENT
No.1 - 3 REID STREET
No.2 - 4 WOODSIDE AVENUE
LINDFIELD

Drawing Title: STORMWATER MANAGEMENT DETAIL SHEET No. 3

Drawn	Date	Scale A1	Q.A. Check	Date
RH	MARCH 2025	AS SHOWN	BAK	14.04.26

Designed	Project No.	Dwg. No.	Issue
BK	CC240140	C9	D

STREAM FLOW CONTROL REPORT

INTRODUCTION & METHODOLOGY

WE REFER TO KU-RING-GAI COUNCIL DEVELOPMENT CONTROL PLAN AND SPECIFICALLY CLAUSE 24C.3 SECTION 4 WHICH REQUIRES THE ASSESSMENT OF A RAINWATER TANK SYSTEM WHICH PROVIDES A 50% REDUCTION IN RUNOFF DAYS. IN ORDER TO DETERMINE THE RAINWATER TANK VOLUME REQUIRED TO MEET THE 50% REDUCTION TARGET A WATER BALANCE MODEL WAS DEVELOPED TO REPRESENT THE WATER TRANSPORTATION PROCESS IDENTIFIED IN FIGURE 1 BELOW.

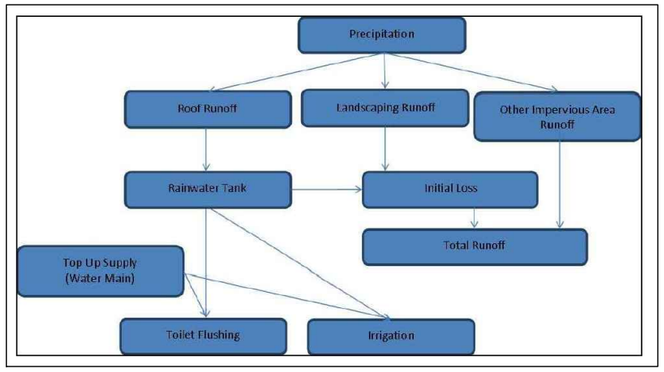

FIGURE 1. WATER BALANCE MODEL SUMMARY

THE METHODOLOGY ADOPTED, ASSESSES THE STORMWATER RUNOFF DIRECTED TO THE TANK ON A DAILY BASIS AND THE DAILY DRAWDOWN ASSOCIATED WITH DOMESTIC USAGE. THE MODELLING PRODUCES A DAILY TIME SERIES FOR THE AVAILABLE STORAGE IN THE TANK, DAILY MAINS WATER TOP UP, SPILL DURING STORMS, AND THE STORAGE LEVEL IN THE TANK.

WATER BALANCE SUMMARY

Post-development site (no management measures)			Post-development site (with management measures)		
areas			**areas**		
total area	3852	m^2	total area	3852	m^2
impervious area draining to re-use	0	m^2	impervious area draining to re-use	1261	m^2
pervious area	1423	m^2	pervious area	1423	m^2
impervious area graded to landscaping	0	m^2	impervious area graded to landscaping	1168	m^2
impervious area bypassing reuse & landscapir	2429	m^2	impervious area bypassing reuse & landscapir	0	m^2
reuse			**reuse**		
reuse tank volume	0	m^3	reuse tank volume	25	m^3
initial fraction full of reuse tanks	1		initial fraction full of reuse tanks	0.5	
daily reuse	0	m^3	daily reuse	0	m^3
irrgiation use per week	0	m	irrgiation use per week	0.02	m
losses			**losses**		
pervious area loss (mm)	13	mm	pervious area loss (mm)	13	mm
impervious area loss (mm) **	0.5	mm	impervious area loss (mm) **	0.5	mm
area to re-use loss (mm) *	0.5	mm	area to re-use loss (mm) *	0.5	mm
statistics			**statistics**		
Number of runoff days	3552		Number of runoff days	1733	
number of tank spill days	0		number of tank spill days	1218	
total runoff volume	116,148.24		total runoff volume	87,154.32	
number of simulated days	11323		number of simulated days	11323	
number of rain events	4595		number of rain events	4595	
days reuse demand met	0		days reuse demand met	9880	
number of irrigation days	0		number of irrigation days	1618	
			reduction in runoff days	**51.2%**	
			reduction in runoff volume	**25.0%**	

WATER BALANCE DATA SUMMARY

AS SHOWN ABOVE REUSE IS ONLY REQUIRED TO CONNECT TO IRRIGATION ONLY TO ACHIEVE COMPLIANCE WITH COUNCIL'S REQUIREMENTS FOR RUNOFF REDUCTION.

CONCLUSION

BASED ON THE FOREGOING A MINIMUM TOTAL RAINWATER TANK VOLUME OF 25kL IS REQUIRED TO REDUCE RUNOFF DAYS BY 51.2%.

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0 10cm at full size 10cm

North

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Project
PROPOSED RESIDENTIAL DEVELOPMENT
No.1 - 3 REID STREET
No.2 - 4 WOODSIDE AVENUE
LINDFIELD

Drawing Title
STORMWATER QUALITY REPORT SHEET 1 OF 3

Drawn	Date	Scale A1	Q.A. Check	Date
RH	MARCH 2025	AS SHOWN	BAK	14.04.26
Designed	**Project No.**		**Dwg. No.**	**Issue**
BK	CC240140		C10	D

STORMWATER QUALITY REPORT

1 INTRODUCTION

A CATCHMENT BASED WATER QUALITY MODEL WAS DEVELOPED TO ASSESS THE STORMWATER RUNOFF QUALITY IN ACCORDANCE WITH THE REQUIREMENTS OF KU-RING-GAI DEVELOPMENT CONTROL PLAN PART 24 CLAUSE 24C.6 'STORMWATER QUALITY CONTROL.' IN THIS REGARD WE REFER TO THE PRESCRIBED TARGETS TABLED FOLLOWING:

TABLE 1 - STORMWATER POLUTANT REDUCTION TARGETS (MUSIC v6.3.0)

STORMWATER POLLUTANT	REDUCTION TARGETS
GROSS POLLUTANT	70%
TOTAL SUSPENDED SOLIDS (TSS)	85%
TOTAL PHOSPHORUS (TP)	65%
TOTAL NITROGEN (TN)	45%

2 STUDY METHODOLOGY

THE OBJECTIVES OF THIS REPORT ARE TO:

- ASSESS THE RUNOFF QUALITY FOR THE UNTREATED POST DEVELOPED SCENARIO AND IDENTIFY STORMWATER QUALITY CONTROLS LIKELY TO IMPACT ON RUNOFF QUALITY.
- ASSESS THE STORMWATER QUALITY FOR THE POST DEVELOPED SCENARIO INCLUDING THE MEASURES PROPOSED TO MEET THE POLLUTANT REMOVAL TARGETS .

THE REPORT IS BASED ON THE APPLICATION OF MUSIC SOFTWARE (MODEL FOR URBAN STORMWATER IMPROVEMENT CONCEPTUALISATION). IN THIS REGARD THE MODEL IS DEFINED AS FOLLOWS:

- A STORMWATER QUALITY MODEL TO CONVERT RAINFALL AND EVAPOTRANSPIRATION INTO RUNOFF.
- ESTIMATION OF STORMWATER FLOW AND POLLUTION GENERATION BY SIMULATING THE PERFORMANCE OF STORMWATER TREATMENT DEVICES INDIVIDUALLY AND AS PART OF A TREATMENT TRAIN.

THE MODEL DEFINES WATER QUALITY PROFILES FOR BOTH TREATED AND UNTREATED POST DEVELOPED SCENARIOS. THE TREATED POST DEVELOPED MODEL INCLUDES PARAMETERS WHICH REPRESENT THE WATER QUALITY MEASURES.

3 STORMWATER QUALITY MODELLING

3.1 GENERAL

THE FOLLOWING PARAMETERS WERE ASSESSED FOR THE HYDROLOGICAL MODELLING ASSOCIATED WITH THE CATCHMENT.

- RAINFALL/RUNOFF AND EVAPOTRANSPIRATION.
- SUB CATCHMENT DIVERSIONS.
- LAND USE (PERVIOUS AND IMPERVIOUS)

3.2 RAINFALL/RUNOFF AND EVAPOTRANSPIRATION

COUNCIL'S MUSIC-LINK DATA VERSION 6.35 WAS UTILISED IN THIS STUDY. THEREFORE DAILY RAINFALL DATA WAS OBTAINED FROM THE SYDNEY OBSERVATORY HILL RAINFALL STATION WITH 6 min TIMESTEP, STATION NO. 066062. THE DEFAULT KU-RING-GAI COUNCIL MUSIC LINK MONTHLY AVERAGE POTENTIAL EVAPOTRANSPIRATION DATA WAS ALSO UTILISED IN THIS STUDY.
THE DETAILS ARE SUMMARISED IN TABLE 3.1 AND 3.2

TABLE 3.1 - DETAILS OF DAILY RAINFALL DATA

STATION	NAME	PERIOD	TIMESTEP
066062	SYDNEY OBSERVATORY HILL	01/01/1963-31/12/1993	6 min

TABLE 3.2 - SUMMARY OF POTENTIAL EVAPOTRANSPIRATION (PET)

JAN	FEB	MAR	APR	MAY	JUN
180	135	128	85	58	43
JUL	AUG	SEP	OCT	NOV	DEC
43	58	88	127	152	163

3.3 CATCHMENT DEFINITION

THE POST DEVELOPED CATCHMENT CHARACTERISTICS ARE IDENTIFIED IN TABLE 3.3.

TABLE 3.3 - POST DEVELOPMENT SUB CATCHMENT DETAILS

SUB CATCHMENT ID	SUB CATCHMENT AREA (ha)	% IMPERVIOUS AREA	% PERVIOUS AREA
ROOF TO OSR	0.126	100	0
DRIVEWAY TO OSD	0.006	100	0
LANDSCAPE TO OSD	0.142	0	100
IMPERVIOUS TO OSD AND TREATMENT	0.111	100	0

4 MUSIC MODEL

THE MUSIC MODEL IS BASED ON A 6 min RAINFALL-RUNOFF MODEL IN CONJUNCTION WITH REPRESENTATIVE BASEFLOW AND STORMFLOW EVENT MEAN CONCENTRATIONS (EMCs).

4.1 WATER QUALITY PARAMETERS

THE ADOPTED VALUES OF VARIOUS MUSIC RAINFALL AND RUNOFF PARAMETERS ARE SUMMARISED IN TABLE 4.1 AS PER THE DEFAULT NODE VALUES WHEN ADOPTING THE KU-RING-GAI COUNCIL MUSIC LINK.

TABLE 4.1 - ADOPTED MUSIC RAINFALL/RUNOFF PARAMETERS

PARAMETER	VALUE
IMPERVIOUS AREA PROPERTIES	
RAINFALL THRESHOLD (mm/DAY)	1.0 (0.3 ROOFS)
PERVIOUS AREA PROPERTIES	
SOIL STORAGE CAPACITY (mm)	170
SOIL INITIAL STORAGE (% OF CAPACITY)	30
FIELD CAPACITY (mm)	70
INFILTRATION CAPACITY COEFFICIENT - a	210
INFILTRATION CAPACITY EXPONENT - b	4.70
GROUNDWATER PROPERTIES	
INITIAL DEPTH (mm)	10
DAILY RECHARGE RATE (%)	50
DAILY BASEFLOW RATE (%)	5
DAILY DEEP SEEPAGE RATE (%)	0

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Issue	Description	Date	Drawn	Approved
D	UPDATED TO SUIT LATEST ARCHITECTURAL PLANS & RE-ISSUED FOR SSDA	14.04.26	RH	BK
C	UPDATED TO SUIT LATEST ARCHITECTURAL PLANS & RE-ISSUED FOR DEVELOPMENT APPROVAL	16.01.26	RH	BK
B	RE - ISSUED FOR DEVELOPMENT APPROVAL	04.04.25	LW	BK
A	ISSUED FOR DEVELOPMENT APPROVAL	28.03.25	RH	BK

North

1 0 1cm at full size 10cm

Client: CPDM Pty Ltd
SUITE G02, GROUND FLOOR
22 ATCHINSON ST, ST LEONARDS

Architect: PBD ARCHITECTS

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No.1 - 3 REID STREET
No.2 - 4 WOODSIDE AVENUE
LINDFIELD

Drawing Title: STORMWATER QUALITY REPORT SHEET 2 OF 3

Drawn	Date	Scale A1	Q.A. Check	Date
RH	MARCH 2025	AS SHOWN	BAK	14.04.26
Designed	Project No.		Dwg. No.	Issue
BK	CC240140		C11	D

4.1 WATER QUALITY PARAMETERS CONT.

STORMWATER QUALITY IS CHARACTERISED USING EVENT MEAN CONCENTRATION (EMCs) UNDER STORM AND BASE FLOW CONDITIONS. THE VALUE OF WATER QUALITY PARAMETERS ADOPTED IN THIS STUDY IS SUMMARISED IN TABLE 4.2

TABLE 4.2 - ADOPTED MUSIC WATER QUALITY PARAMETERS

LAND-USE CATEGORY		Log_{10}TSS (mg/L)		Log_{10}TP (mg/L)		Log_{10}TN (mg/L)	
		STORM FLOW	BASE FLOW	STORM FLOW	BASE FLOW	STORM FLOW	BASE FLOW
GENERAL URBAN	MEAN	2.15	1.20	-0.60	-0.85	0.30	0.11
	STD DEV	0.32	0.17	0.25	0.19	0.19	0.12
ROADS	MEAN	2.43	1.20	-0.3	-0.85	0.34	0.11
	STD DEV	0.32	0.17	0.25	0.19	0.19	0.12
ROOFS	MEAN	1.30	1.10	-0.89	-0.82	0.30	0.32
	STD DEV	0.32	0.17	0.25	0.19	0.19	0.12

4.2 STORMWATER TREATMENT MEASURES

THE PROPOSED STORMWATER TREATMENT MEASURES INCLUDED IN THE POST DEVELOPED MODEL ARE AS FOLLOWS:

- 25,000 LITRE OSR TANK (FOR IRRIGATION ONLY)
- 7 X OCEAN PROTECT STORMFILTERS (PSORB 690)
- 2 X OCEANGUARDS
- THE SCHEMATIC LAYOUT FOR THE POST DEVELOPED MUSIC MODEL IS DEPICTED IN FOLLOWING FIGURE 1

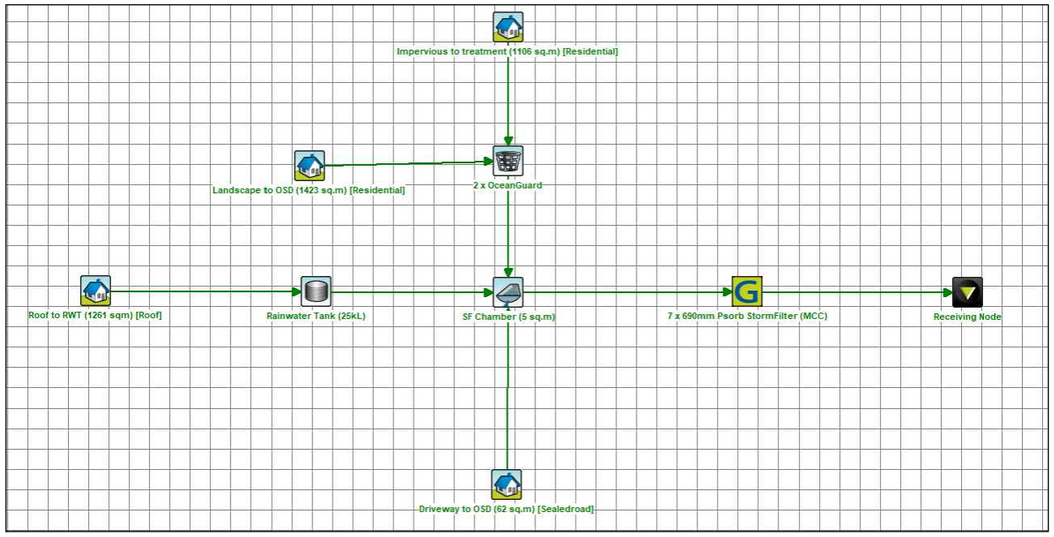

FIGURE 1 - MUSIC MODEL SCHEMATIC

5 RESULTS & CONCLUSION

BASED ON THE FOREGOING THE PROPOSED STORMWATER QUALITY TREATMENT MEASURES MEET THE REQUIRED TARGETS OF KU-RING-GAI COUNCIL.

REFER TO THE ASSOCIATED MUSIC LINK REPORT: 'CC240140 musicLink Report.pdf' AS PREPARED BY HYDRACOR CONSULTING ENGINEERS PTY LTD FOR FURTHER INFORMATION.

TABLE 5.1 - TREATMENT TRAIN EFFECTIVENESS

Treatment Train Effectiveness - Receiving Node

	Sources	Residual Load	% Reduction
Flow (ML/yr)	3.63	3.15	13.2
Total Suspended Solids (kg/yr)	363	32.9	91
Total Phosphorus (kg/yr)	0.817	0.19	76.7
Total Nitrogen (kg/yr)	7.62	3.17	58.4
Gross Pollutants (kg/yr)	71.7	0	100

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North

1cm at full size

Client: CPDM Pty Ltd
SUITE G02, GROUND FLOOR
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Project: PROPOSED RESIDENTIAL DEVELOPMENT
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LINDFIELD

Drawing Title: STORMWATER QUALITY REPORT SHEET 3 OF 3

Drawn	Date	Scale A1	Q.A. Check	Date
RH	MARCH 2025	AS SHOWN	BAK	14.04.26
Designed	Project No.		Dwg. No.	Issue
BK	CC240140		C12	D

Annexure B HYDRACOR Consulting Engineers Pty Ltd Flood Impact & Risk Assessment, Reference CC240140, Version 6.0, dated 18 June 2026

HYDRACOR
CONSULTING ENGINEERS

Flood Impact and Risk Assessment

For a Proposed Residential Flat Building

Prepared for: **CPDM Pty Ltd**

Project address: **No.'s 1 - 3 Reid Street and No.'s 2 - 4 Woodside Avenue, Lindfield, NSW 2070**

Document No.: **CC240140_FIRA**

Version No.: **6.0**

Dated: **18 June 2026**

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VERSION HISTORY

Version	Date	Purpose	Prepared By	Approved By
1.0	31.03.2025	Draft Flood Impact and Risk Assessment	Nathan Broadbent	
2.0	07.04.2025	Flood Impact and Risk Assessment	Nathan Broadbent	Bruce Kenny
3.0	24.11.2025	Flood Impact and Risk Assessment	Nathan Broadbent/Isaac Kan	Bruce Kenny
4.0	18.12.2025	Flood Impact and Risk Assessment	Isaac Kan	Bruce Kenny
5.0	14.04.2026	Flood Impact and Risk Assessment	Isaac Kan	Bruce Kenny
6.0	18.06.2026	Flood Impact and Risk Assessment	Isaac Kan	Bruce Kenny

Review Panel	
Division/Office	**Name**
Central Coast	Bruce Kenny

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Annexures

Annexure A HYDRACOR Consulting Engineers Pty Ltd Flood Plans, Reference CC240140F, Sheets F1 to F35, Revision J, dated 15 June 2026

Annexure B Concept Civil Engineering Drawings prepared by HYDRACOR Consulting Engineers Pty Ltd, reference CC240140R, sheets R1 to R10, Revision E, dated 13 April 2026

Annexure C HYDRACOR Consulting Engineers Pty Ltd Flood Mitigation Plans, Reference CC240140FM, sheets FM1 to FM3, Revision A, dated 22 May 2026

Annexure D Flood Emergency Response Plan prepared by Water Technology Pty Ltd, Document Number 2605135_R01_V01, dated 16 June 2026

1 Introduction

HYDRACOR Consulting Engineers Pty Ltd (**HYDRACOR**) has been commissioned to prepare a Flood Impact and Risk Assessment (**FIRA**) for a State Significant Development Application (**SSDA**) in accordance with the requirements of Ku-ring-gai Development Control Plan (**DCP**) Part 24 D.2, Ku-ring-gai Local Environmental Plan (**LEP**) 2015 and NSW Flood Risk Management Manual (NSW DPE, 2023b). The Flood Impact and Risk Assessment is supported by a flood study which investigates flood behaviour throughout the overland flooding catchment impacting the subject site. This includes the analysis of:

- Surface runoff across the catchment.
- Flooding towards the lower part of the catchment.
- Backwater flooding impact on the subject site.

A two-dimensional computer model of the catchment was established to analyse flood behaviour under existing and proposed catchment conditions. The model provides information on the extent of flood inundation, flood depths and flood velocities throughout the catchment for the 1% AEP, 5% AEP, 1% AEP with Climate Change and Probable Maximum Flood (PMF) flood events. Results from this study form the technical basis for the subsequent flood risk management plan which identifies problem areas and investigates options to reduce the risk of flooding.

In the preparation of this report HYDRACOR has relied upon certain data and information contained within the following documents:

- Architectural Plans prepared by PBD Architects, Job No. 2421.
- Site Survey prepared by Total Surveying Solutions, Job No. 240624, dated 11 September 2024.
- 'Australian Disaster Resilience Guideline 7-3: Flood Hazard.' published by the Australian Institute for Disaster Resilience (AIDR), dated 2017.
- 'NSW Flood Risk Management Manual' published by NSW Department of Planning and Environment (NSW DPE), dated June 2023.

The purpose of this report is to provide the Department of Planning, Housing and Infrastructure (DPHI) pursuant to Part 8 of the *Environmental Planning and Assessment Regulation 2021* (EP&A Regulation), or their representatives with sufficient information to assess the proposed development in relation to flood risk management.

2 Site Description

The subject site is bound by the Lindfield Avenue to the west, Reid Street to the North and Woodside Avenue to the south in Lindfield. The subject site comprises the properties known as:

- Lot 99 DP 6608 (No. 1) Reid Street, Lindfield.

- Lot 98 DP 6608 (No. 3) Reid Street, Lindfield.
- Lot 100 DP 794252 (No. 2) Woodside Avenue, Lindfield.
- Lot 104 DP 6608 (No. 4) Woodside Avenue, Lindfield.

The subject site comprises a total area of 3,852 square metres and currently supports low density residential development. The subject site is currently zoned R2 Low Density Residential under the provisions of Ku-ring-gai LEP 2015 and lies within the Lindfield Transport Oriented Development Area (TOD). The subject site falls towards the Woodside Avenue frontage. Existing ground surface elevations are generally within the range of RL 91.75 m AHD at the north-eastern corner falling to RL 87.80 m AHD at the Woodside Avenue frontage.

3 Existing Flood Characteristics

The site is located within an overland flow catchment draining towards Gordon Creek, which discharges into Middle Harbour. The local overland flow catchment consists of northern and western sub catchments which converge near the site's southern boundary. Flows from the western catchment pond upstream of the railway embankment during significant rainfall and are controlled by a 1,650 dia. pipe which connects to the Lindfield Avenue stormwater drainage system. The northern catchment is smaller than the western catchment and generates flood behaviour typical of an urban catchment. Floodwaters within Lindfield Avenue are generally shallow with high velocities resulting in isolated occurrences of high hazard near the Reid Street intersection and becoming high hazard for the full road width near the Woodside Avenue intersection.

The northern and western sub catchments comprise areas of approximately 11 ha and 20 ha respectively.

Land use within the overland flow catchment is largely a mix of low, medium or high-density residential development.

During the 5% AEP flood event, overland flows leaving Reid Street enter the site from the north and drain towards Woodside Avenue. 5% AEP floodwater depths are generally less than 200 mm deep and resulting low hazard floodwaters (H1-H2) conditions. At the southern end of the site in Woodside Avenue, 5% AEP floodwater create conditions that fall generally within the hazard classification H1-H2. We note there are local occurrences of high hazard conditions (H3-H5) in Lindfield Avenue in areas of high velocity.

During the 1% AEP flood event, overland flows leaving Reid Street enter the site from the north and drain towards Woodside Avenue. 1% AEP floodwater depths are generally less than 200 mm deep and resulting low hazard floodwaters (H1-H2) conditions, however, obstructions such as buildings cause local upstream flood depths to reach up to 400 mm. At the southern end of the site in Woodside Avenue, 1% AEP floodwaters create conditions that fall generally within the hazard classification H1-H2 with local occurrences of H4 and H5 in areas of higher velocity. The occurrence of higher hazard floodwaters does not impact the site's vehicular access or egress via Woodside Avenue travelling in a northeasterly direction. Access to the site via Lindfield Avenue may be limited.

During the Probable Maximum Flood (PMF) overland flows impacting the site result in depths of up to 500 mm generally and up to 900 mm upstream of obstructions. PMF floodwaters create conditions on the site that fall generally within the flood hazard vulnerability classification range of H1-H4. There is a local occurrence of H5 floodwater near the sites northern boundary where floodwater velocities are high leaving the Reid Street roadway. At the southern end of the site in Woodside Avenue, PMF floodwaters create conditions that fall generally within the hazard classification H1-H5. Vehicular access to the site via Woodside Avenue will be limited. Evacuation of the site on foot is likely possible for able bodied adults. Children and the elderly may require assistance if evacuation during a peak PMF event is required.

4 Proposed Flood Mitigation Strategy

The flood mitigation strategy for the site has been designed with a goal to minimise flood risk on the site without adversely impacting adjoining land over a range of flood events. This strategy is achieved by the following design elements:

- A significant upgrade to Council's stormwater drainage system, extending from Reid Street to Woodside Avenue via Lindfield Avenue.
- Reconstruction of the southern verge in Reid Street to provide minimum building floor levels and flood protection levels in accordance Council requirements.
- Design the proposed building to remain stable during a PMF event allowing on-site refuge.

The concept public domain works are depicted on Concept Civil Engineering Drawings (refer CC240140/R1-R10/E, copy enclosed under Annexure B).

The proposed building flood mitigation strategy is depicted on the Flood Mitigation plans (refer CC240140/FM1-FM3/A, copy enclosed under Annexure C).

A Flood Emergency Response Plan (FERP) has been prepared by Water Technology (copy enclosed under Annexure D) for details on why the site is best suited to adopt a shelter-in-place strategy during extreme flood events.

5 Available Data

This flood study used topographic, and flood related data obtained from a number of sources. The origin and types of information underpinning the assumptions used in this study are presented below.

5.1 Published Flood Data and Model Validation

Flood behaviour within the catchment is the subject of Ku-ring-gai Councils 'Middle Harbour Southern Catchments Flood Study', Project No. S20504, Version 3, dated 10 February 2023.

Under pre-development conditions, the flood depths and levels reported in Council's flood study is consistent with the results produced by the HYDRACOR flood study, with reported flood depths generally within the range 50 mm-100 mm for the 1% AEP flood event. We note the primary difference between flood extents is due to the Council flood study utilising 2013 LiDAR whilst the HYDRACOR model utilises 2020 LiDAR.

We also note recent kerb and gutter works in Reid Street were completed in late 2022 and included in the HYDRACOR model. A comparison of post-development flood behaviour to Council's flood study results is not relevant due to the extent of proposed work included in the HYDRACOR flood model.

Notwithstanding, we refer to Council's Flood Maps (H3, H5 & H8) which outlines flood behaviour impacting the site with reference to the above sources of flood information.

On this basis, Table 1 provides a comparison of results from the Council Flood study and the results produced by the HYDRACOR flood study.

Table 1 - Flood model validation

Source	Council Flood Study – Depth	HYDRACOR Flood Study - Depth	Difference in depth (m)
5% AEP flood event (Reid Street frontage)	Up to 150mm	Up to 200mm	HYDRACOR model 0.05 m higher
5% AEP flood event (Woodside Avenue Sag)	Up to 500mm	Up to 400mm	Council model 0.1 m higher
5% AEP flood event (Lindfield Avenue frontage of the site)	Up to 150mm	Up to 200mm	HYDRACOR model 0.05 m higher
5% AEP flood event (within the site)	Up to 150mm (with up to 400mm against building obstructions)	Up to 200mm (with up to 400mm against building obstructions)	HYDRACOR model 0.05 m higher
1% AEP flood event (Reid Street frontage)	Up to 250mm	Up to 250mm	No difference
1% AEP flood event (Woodside Avenue Sag)	Up to 500mm	Up to 450mm	Council model 0.05 m higher
1% AEP flood event (Lindfield Avenue frontage of the site)	Up to 250mm	Up to 300mm	HYDRACOR model 0.05 m higher
1% AEP flood event (within the site)	Up to 250mm (with up to 400mm against building obstructions)	Up to 300mm (with up to 400mm against building obstructions)	HYDRACOR model 0.05 m higher

PMF flood event (Reid Street frontage)	Up to 500mm	Up to 500mm	No difference
PMF flood event (Woodside Avenue Sag)	Up to 1.0m	Up to 850mm	Council model 0.15 m higher
PMF flood event (Lindfield Avenue frontage of the site)	Up to 500mm	Up to 650mm	HYDRACOR model 0.15 m higher
PMF flood event (within the site)	Up to 500mm (with up to 1.0m against building obstructions)	Up to 600mm (with up to 1.0m against building obstructions)	HYDRACOR model 0.1 m higher

Based on the good correlation of pre-development flood behaviour between the HYDRACOR flood model and Council's flood study, it is our view that the HYDRACOR flood study is valid and fit for purpose.

5.2 Survey and Level Data

Survey information adopted for this study has been collated from the following sources:

- GIS layers of cadastre and satellite imagery provided by NSW Spatial Services.
- High resolution aerial imagery provided by NearMap.
- Site survey prepared by Total Surveying Solutions (TSS) Jon. No. 240624-1 Revision 00, dated 11 September 2024.
- LiDAR survey provided by NSW Spatial Services consisting of tiles:
    - Sydney202006-LID1-AHD_3306262_56_0002_0002_1m
    - Sydney202005-LID1-AHD_3306260_56_0002_0002_1m
    - Sydney202005-LID1-AHD_3286260_56_0002_0002_1m

This section describes the adopted hydrologic modelling approach and hydrologic model development.

5.3 Hydrologic Modelling Approach

Hydrologic modelling was undertaken within TUFLOW using the Direct Rainfall ('rainfall on the grid') methodology. In the hydraulic model, rainfall is applied directly to the 2D terrain, and the hydraulic model automatically routes the flow as determined by the elevation and roughness grids and any included 1D pipeline network.

Direct rainfall modelling is a relatively new feature of hydraulic modelling, and it is still being tested on a number of catchments to ensure it is reliably representing the flood behaviour of a given catchment. Runoff is generated over the entire catchment, rather than the more traditional approach of calculating an inflow hydrograph and lumping this in at an assumed location(s).

This ‘direct rainfall’ approach means the whole catchment will be ‘wet’ and the hydraulic modelling results need to be filtered to show only those cells that genuinely represent areas of catchment flooding. This was achieved by only mapping inundation at cells with a flood depth greater than 0.05 m for all simulations.

Direct rainfall was applied to the area indicated as ‘2D model domain’ in TUFLOW model plan (refer CC240140/F1/J, copy enclosed under Annexure A). The design storm events applied to the catchment are the design storm events described in Section 3.2. During hydrologic and hydraulic modelling of the catchment, a 20% blockage was applied to all on-grade stormwater inlets and a 50% blockage for all sag stormwater inlet structures.

5.4 Design Storm Event Data

This study uses design rainfall intensity-frequency-duration (IFD) data, derived for the latitude and longitude of the study area. This design rainfall data was issued by the Hydrometeorological Advisory Service of the Australian Bureau of Meteorology.

The IFD data provides rainfall burst depths of design storm events for recurrence intervals up to and including the 1% AEP event.

Rainfall burst depths, temporal patterns and aerial reduction factors (ARFs) were developed for the 1% and 5% AEP storm events using techniques described in Australian Rainfall and Runoff (Ball et al. 2019).

Pre-burst rainfall was developed in accordance with techniques described in Australian Rainfall and Runoff, advice provided in NSW OEH (2019) and values provided by the ARR DataHub. Note that for burst durations of less than 1 hour, the 1-hour pre-burst ratio was adopted. Pre-burst rainfall was applied uniformly over a 30-minute period.

Design storm rainfall pre-burst, burst and total storm depths for the full range of storm events considered are presented in Table 2.

Table 2: Design 1% AEP storm rainfall depths (mm)

	1% AEP		5% AEP	
Duration	Pre-burst	Burst	Pre-burst	Burst
5 min	9.0	22.2	8.4	16.6
10 min	14.4	35.6	13.6	26.8
15 min	18.0	44.5	17.0	33.5
20 min	20.7	51	19.4	38.3
25 min	22.7	56.1	21.4	42.1
30 min	24.4	60.3	23.0	45.3
45 min	28.4	70.1	26.6	52.4
1 hour	31.4	77.5	29.3	57.7
1.5 hour	31.0	89.3	28.3	66.2
2 hour	32.0	99.2	28.0	73.3
3 hour	33.7	116	27.9	85.5
4.5 hour	35.0	138	29.5	101

Probable maximum precipitation (PMP) depths and temporal patterns were derived in accordance with guidance provided in BoM (2003). Based on the typical slopes within the study area, a terrain category of smooth was adopted. Pre-burst rainfall was not applied to PMP totals. Design PMP depths for the full range of storm events considered in this study are presented in Table 3.

Table 3: Design PMP depths (mm)

Duration	PMP	Duration	PMP	Duration	PMP
15 min	170	1.5 hour	460	4 hour	750
30 min	250	2 hour	540	5 hour	830
45 min	310	2.5 hour	600	6 hour	880
1 hour	360	3 hour	660		

5.5 Design Rainfall Losses

Design rainfall losses were modelled using an Initial Loss/Continuing Loss (IL/CL) infiltration model. Initial losses and continuing loss rates were defined for each land use category and are based on loss rates adopted in Ball et al. (2019), the ARR DataHub and advice provided in NSW OEH (2019). Design rainfall loss parameters are provided in Table .

Land use categories were assigned to areas of the catchment based on examination of aerial photography and satellite imagery. These land use categories were used to assign roughness and rainfall loss parameters during modelling. Further detail on the modelling of hydraulic roughness within the catchment is provided in Section 6.3.3.

Table 4: Loss model parameters

Land use	Initial loss (mm)	Continuing loss (mm/hr)
Road and hardstand	0	0
Railway	0	0
Residential	15.2	0.8
Buildings	0	0
Parks and recreation	38	0.8

During all PMF simulations, initial and continuing losses were reduced to zero to reflect a completely saturated catchment.

5.6 Critical Duration

In accordance with the procedure described in Australian Rainfall and Runoff, an ensemble of 10 temporal patterns was run through the hydrologic model for storm durations 10 minute to 4.5 hours. The median water profile was determined for each duration.

A maximum water level profile was determined for the hydrologic model domain. The maximum profile was determined from the pool of median water levels profiles and the 5-minute duration water level profile. The duration resulting in the highest median water level at a given point in the hydrologic model domain was taken to be the critical duration storm event for that location.

The 15-minute duration storm event was found to be the design duration for 1% AEP and 5% AEP simulations.

The critical duration PMP event was selected as the duration producing the highest PMF level at the site. In this regard, the 15-minute PMP event was found to produce the highest peak flow rate and water level arriving at the site.

6 Hydraulic Modelling

A TUFLOW 1D/2D was used to hydraulically route flows through the catchment and to derive flow depths, velocities and hazards for the 1% AEP, 5% AEP and PMF flood events. This section describes the hydraulic modelling approach and hydraulic model development.

6.1 Choice of Hydraulic Model

Different hydraulic modelling approaches can be applied according to the floodplain's hydraulic characteristics and the objectives of the study. The simpler methods lump the left and right overbank floodplain areas and the main channel into a one-dimensional (1D) representation. This approach is relatively simple and computationally fast and is generally appropriate for modelling flows through pipe networks and straight sections of formed open channel. The main limitation of such 1D modelling approaches is that flow is assumed to occur in a linear direction, and the water levels across the floodplain are assumed to be at the same level as the main channel.

A more detailed two-dimensional (2D) approach is recommended in areas where significant differences can occur between the channel flood level and the floodplain flood levels. This approach is also preferable where separate flow paths and flow around catchment obstructions occur, as is the case in this study. This is a more complex analysis, which requires greater data requirements and computational resources.

The TUFLOW 1D/2D model was chosen to model the catchment hydraulics. This modelling system dynamically couples the one-dimensional and two-dimensional flow paths in the floodplain.

6.2 TUFLOW 1D Model Domain

The extent of 1D networks features included in the 1D/2D model under existing and proposed conditions are depicted on '1D network plan' (refer CC240140/F3/J copy enclosed under Annexure A).

The details of the existing stormwater system were obtained from various sources including site survey, physical inspection, nearby development applications, and Council resources.

The details of the proposed stormwater trunk drainage realignment are depicted on Concept Civil Engineering Drawings (refer CC240140/R6-R10/E, copy enclosed under Annexure C).

6.3 TUFLOW 2D Model Domain

The 2D hydraulic model domain covers the area indicated as '2D model domain' in TUFLOW model plan (refer CC240140/F1/J, copy enclosed under Annexure A). A nested square grid was utilised for this study with cell sizes ranging from 0.5 m to 2 m (refer CC240140/F2/J copy enclosed under Annexure A). Each grid element contains information on ground topography (see Section 6.3.1), surface resistance to flow (see Section 6.3.3) and initial water level.

Linear features that potentially influence flow behaviour, such as gullies and levees were incorporated into the topography using 3D 'breaklines' to ensure that these were accurately represented in the model.

It is noted that although brick walls and fences could also significantly affect local overland flow paths, these have not been explicitly incorporated into the model in urban areas unless deemed critical to the study and were instead considered in the setting of appropriate Manning's 'n' values for these areas.

6.3.1 Topography

A 1 m grid Digital Elevation Model (DEM) was generated for the catchment using ALS survey data. This DEM was used to represent ground elevations throughout the catchment. The ALS LiDAR data was supplemented with site survey and road design issued by Council for works within Reid Street.

Under proposed condition, ground surface levels within Reid Street were modified in accordance with Concept Civil Engineering Drawings (refer CC240140/R2-R5/E, copy enclosed under Annexure C).

6.3.2 Building Footprint

Building outlines were determined from site survey and aerial photographs.

Buildings were modelled by raising the existing level by 0.3 m and by adjusting the Manning's 'n' hydraulic roughness value (see Section 6.3.3). Under proposed conditions, the buildings were modelled in accordance with the buildings depicted on Architectural Plans prepared by PBD Architects.

6.3.3 Hydraulic Roughness

Hydraulic roughness in TUFLOW is modelled using the Manning's 'n' roughness co-efficient. Land use categories were assigned to areas of the catchment based on examination of aerial photography and satellite imagery and used to assign hydraulic roughness parameters. Table 5 overleaf lists the adopted Manning's n values for each land use. The values in this study are consistent with the adopted values use in Council's flood study for the catchment. Also refer to CC240140/F2/J (copy enclosed under Annexure A) which illustrates the roughness values adopted catchment wide.

Table 5: Adopted roughness parameters

Material Description	Depth Varying Manning's 'n' Values							
	$Depth_1$ (m)	'n_1'	$Depth_2$ (m)	'n_2'	$Depth_3$ (m)	'n_3'	$Depth_4$ (m)	'n_4'
Buildings	0.15	0.025	0.2	0.5	-	-	-	-
Railway	0.06 for all depths							
Residential (without explicit building consideration)	0.08 for all depths							
Residential (with explicit building consideration)	0.07 for all depths							
Road and hardstand	0.02 for all depths							

6.4 Boundary Conditions

This section describes the boundary conditions imposed upon the hydraulic model. Typical model boundary conditions include flows entering the model domain from upstream, backwater effects from hydraulic controls such as chokes and streams downstream, and the flow predicted through the model domain by a separate hydrologic model.

6.4.1 Stage-Discharge Boundary

A stage-discharge (water level versus flowrate) curve was adopted as the downstream boundary condition in the locations denoted 'Downstream boundary (HQ) in TUFLOW model plan (refer CC240140/F1/J, copy enclosed under Annexure A . This stage-discharge relationship was generated by TUFLOW by specifying a water surface slope.

7 Flood Model Results

This section summarises the results of the hydrologic and hydraulic modelling of the overland flood behaviour within the catchment.

7.1 Design Flowrates

The design flowrate for the 1% and 5% AEP and PMF scenarios were recorded across the sag in Reid Street at the upstream end of the site. The peak overland flow rate and the peak flowrate within the Reid Street piped drainage system are reported in Table 6.

Table 6: Peak design flow rates

Flood Event	5% AEP	1% AEP	PMF peak flow rate (m^3/s)
Peak flow rate (m^3/s)	1.8	2.9	19.2
Peak flow conveyed by piped system in Reid Street (m^3/s)	1.03	1.19	1.23

7.2 Flood Hazard

The degree of provisional hazard attributed to flooding at the subject site is a function of hydraulic hazard (relating to the depth and velocity of floodwaters). The true hazard attributed to flood behaviour is based on provisional hazard ratings which have been adjusted to account for the following factors:

- Size of flood.
- Effective warning time.
- Flood awareness.
- Rate of rise of floodwater.
- Duration of flooding.
- Evacuation problems.
- Effective flood access.
- Type of development.

Provisional flood hazard has been determined using the provisional hydraulic categories described in the hazard vulnerability classification system described in Australian Disaster Resilience Guideline 7-3: Flood Hazard (AIDR 2017), refer Section 7.2.1.

7.2.1 AIDR Guideline 7-3

'Australian Disaster Resilience Guideline 7-3: Flood Hazard' (AIDR 2017) assigns hazard vulnerability classifications based on the depth and velocity of floodwaters, accounting for the vulnerability of the community and community assets to damage or danger when interacting with floodwaters. The relationship between depth, velocity and hazard vulnerability classification is depicted in Figure 6 of AIDR (2017), reproduced in Figure 1 and summarised in Table 7.

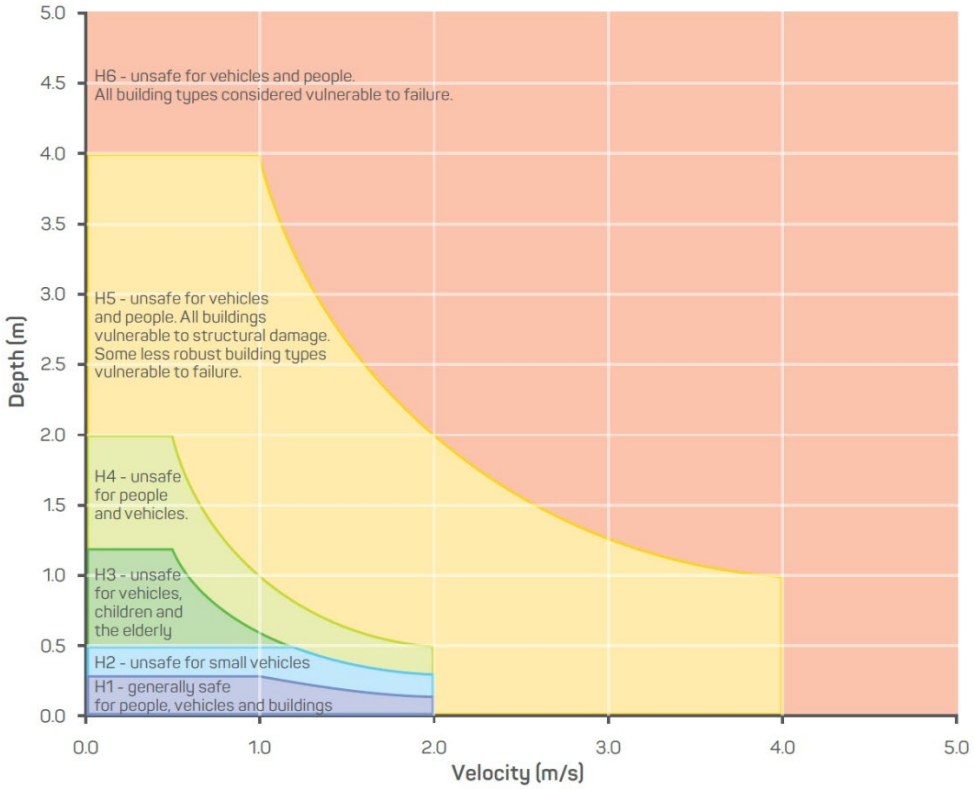

Figure 1: Hazard vulnerability classification (AIDR 2017)

Table 7: Description of hazard vulnerability classifications (AIDR 2017)

Classification	Description
H1	Generally safe for all people, vehicles and buildings.
H2	Unsafe for small vehicles. Generally safe for people and buildings.
H3	Unsafe for vehicles, children and the elderly. Generally safe for able-bodied adults.
H4	Unsafe for vehicles and people.
H5	Unsafe for vehicles and people. All building types 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.

7.3 Design Flood Characteristics

The water level, depth, velocity and hazard of the 5% and 1% AEP and PMF floodwaters in the vicinity of the subject site were mapped for both pre- and post-development scenarios. Additionally, the catchments sensitivity to increase rainfall was assessed whereby an additional 20% was applied to current climate 1% AEP flood depths. This represents future climate conditions. In this regard, the following maps are enclosed under Annexure A .

- Pre-development 5% AEP flood depth and level plan (refer CC240140/F4/J)

- Pre-development 5% AEP flood velocity plan (refer CC240140/F5/J)
- Pre-development 5% AEP flood hazard vulnerability classification plan (refer CC240140/F6/J)
- Post-development 5% AEP flood depth and level plan (refer CC240140/F7/J)
- Post-development 5% AEP flood velocity plan (refer CC240140/F8/J)
- Post-development 5% AEP flood hazard vulnerability classification plan (refer CC240140/F9/J)
- Pre-development 1% AEP flood depth and level plan (refer CC240140/F10/J)
- Pre-development 1% AEP flood velocity plan (refer CC240140/F11/J)
- Pre-development 1% AEP flood hazard vulnerability classification plan (refer CC240140/F12/J)
- Post-development 1% AEP flood depth and level plan (refer CC240140/F13/J)
- Post-development 1% AEP flood velocity plan (refer CC240140/F14/J)
- Post-development 1% AEP flood hazard vulnerability classification plan (refer CC240140/F15/J)
- Pre-development PMF depth and level plan (refer CC240140/F22/J)
- Pre-development PMF velocity plan (refer CC240140/23/J)
- Pre-development PMF hazard vulnerability classification plan (refer CC240140/F24/J)
- Post-development PMF depth and level plan (refer CC240140/F25/J)
- Post-development PMF velocity plan (refer CC240140/F26/J)
- Post-development PMF hazard vulnerability classification plan (refer CC240140/F27/J)

For a description of existing overland flow behaviour occurring near at the site and surrounds, refer to Section 3.

Under proposed conditions, 5% AEP floodwaters are largely captured by the proposed stormwater upgrades in Reid Street (refer to Section 7.2) which are designed to prevent 1% AEP floodwaters from entering the site. The minor flows unable to be captured by the proposed stormwater upgrades will breach out of Reid Street at the western end of the street and travel down Lindfield Avenue to Woodside Avenue. The site is deemed to be flood free during the 5% AEP flood event following the construction of the proposed flood mitigation works and stormwater upgrades. Under proposed conditions, we note Lindfield Avenue and Woodside Avenue are now largely trafficable (H1-H2) classification during the 5% AEP flood event.

Under proposed conditions, 1% AEP floodwaters are once again largely captured by the proposed stormwater upgrades in Reid Street. Generally, it is our view that flood behaviour under proposed conditions is consistent with the flood behaviour simulated under existing conditions on public roads and within private land, particularly in relation to flood hazard. Under proposed conditions, we note the extent of high flood hazard classification (H3-H5) in Lindfield Avenue and Woodside Avenue has been reduced during the 1% AEP flood event.

Under proposed conditions, PMF floodwaters are largely redirected along Reid Street towards Lindfield Avenue via the proposed flood deflection walls in Reid Street as well as a deflection wall within the subject site along the eastern footpath. We note the construction of the proposed flood deflection walls will be required to adequately protect the ground floor units to the PMF level such that a shelter in place strategy can be adopted.

7.4 Sensitivity Assessment – Climate Change / Increased Rainfall

To assess the catchment response to an increase in rainfall, 1% AEP rainfall depths were increase by 20% and simulated for both pre- and post-development scenarios. A 20% increase in rainfall is approximately equal to an RCP 8.5, year 2090 climate scenario (19.7%) based on ARR 2019 procedures.

- Pre-development 1% AEP (+20% increased rainfall) flood depth and level plan (refer CC240140/F16/J).
- Pre-development 1% AEP (+20% increased rainfall) flood velocity plan (refer CC240140/F17/J).
- Pre-development 1% AEP (+20% increased rainfall) flood hazard vulnerability classification plan (refer CC240140/F18/J).
- Post-development 1% AEP (+20% increased rainfall) flood depth and level plan (refer CC240140/F19/J).
- Post-development 1% AEP (+20% increased rainfall) flood velocity plan (refer CC240140/F20/J).
- Post-development 1% AEP (+20% increased rainfall) flood hazard vulnerability classification plan (refer CC240140/F21/J).

7.5 Impact of the Proposed Development

The impact of the proposed development and flood mitigation works on design floodwater levels and hazard are depicted in the following maps presented in Annexure A:

- 5% AEP post-development water level difference plan (refer CC240140/F28/J)
- 5% AEP post-development hazard difference plan (refer CC240140/F29/J)
- 1% AEP post-development water level difference plan (refer CC240140/F30/J)
- 1% AEP post-development hazard difference plan (refer CC240140/F31/J)
- 1% AEP post-development water level difference plan (+20% increased rainfall) (refer CC240140/F32/J)
- 1% AEP post-development hazard difference plan (+20% increased rainfall) (refer CC240140/F33/J)
- PMF post-development water level difference plan (refer CC240140/F34/J)
- PMF post-development hazard difference plan (refer CC240140/F35/J)

The impact of the proposed works and the proposed development is considered minor and within reasonable tolerances for all simulated flood events.

There are minor occurrences of a shift in hazard location or change in extents along Lindfield Avenue, however, it is deemed to be a transfer of water as opposed to a significant impact.

It is our view that there is no considerable change in hazard classification and levels within Reid Street and Lindfield Avenue remaining non-trafficable for vehicles for the PMF storm event.

8 Flood Risk Management

Based on the foregoing, we offer the following response, having due regard for the requirements of Ku-ring-gai DCP Part 24D and NSW Flood Risk Management Manual (NSW DPE 2023b).

8.1 Floor Level

In accordance with Ku-ring-gai DCP Part 24D.3. residential developments are required to provide a minimum of 300 mm freeboard to the applicable 1% AEP flood level.

Due to the nature of the site, surrounding topography and the overland flows occurring near the site, the applicable Flood Planning Level (FPL) varies significantly and generally decreases in level from north to south across the site.

The proposed building flood mitigation strategy is depicted on the Flood Mitigation plans (refer CC240140/FM1-FM3/A, copy enclosed under Annexure C).

A summary of flood level protection requirements is provided in Table 8.

Table 8. Flood level compliance

GF Unit / Building Element	Applicable 1% AEP flood level (m AHD)	Flood Planning Level (FPL) (m AHD)	Freeboard provided to 1% AEP flood level (m)	Floor level or Protection level proposed (m AHD)
G.01 & G.10 (northern end)	92.3 – 91.6 (in Reid Street)	We note the flood deflection walls are set to the PMF flood levels in Reid Street (varies). Refer to the concept public domain works are depicted on Concept Civil Engineering Drawings (refer CC240140/R1-R10/E, copy enclosed under Annexure B).		
G.09 (western side)	90.9 – 90.2	91.2 – 90.5	0.3	To be protected by way of landscape features or graded landscape area.
G.03 (western side)	90.0	90.3	0.3	Protected by planter wall RL 90.3 min.
G.04 (western side)	89.6	89.9	0.3	Protected by planter wall RL 89.9 min.

G.08 (western side)	88.8 – 88.2	89.1 – 88.5	0.3	To be protected by way of landscape features or graded landscape area.
G.07 (western side)	88.8 – 88.2	89.1 – 88.5	0.3	To be protected by way of landscape features or graded landscape area.
Southwestern fire stairs – basement entrance	88.1	The fire stairs entrance shall be protected to the PMF flood level at RL 88.4		
Basement crest	88.2	The basement is to be protected via a driveway crest level provided at the PMF flood level at RL 88.4		
Electrical Substation	88.6	Proposed electrical substation base to be protected by a raised platform at the PMF flood level at RL 88.8		
Building A - Western pedestrian entrance	90.2	The western pedestrian entrance to the basement shall be protected to the PMF flood level at RL 90.8		
G.01 – G.07 (eastern side)	To be protected by a flood deflection wall set to the PMF flood levels (TOW varies from 91.6 – 89.2).			

8.2 Building Components and Method

The proposed building and any building element to be constructed below the Flood Planning Level that is not protected by a purpose-built flood protection structure is to be constructed from flood compatible materials to the applicable FPL. Extensive guidance on flood compatible building materials and methods is provided in 'Reducing Vulnerability of Buildings to Flood Damage: Guidance on Building in Flood Prone Areas' (HNFMSC 2006) and 'Construction of Buildings in Flood Hazard Areas' Standard and Information Handbook (ABCB 2012a,b).

Connection to mains power supply, including metering equipment should be located above the applicable FPL. All electrical wiring, switches and outlets should, where possible be located above the applicable FPL. Earth core leakage systems or safety switches are to be installed. All electrical installations below the applicable FPL, including wiring, connections and conduit, should be suitable for submergence in water or appropriately waterproofed. Conduits shall be installed so they will be self-draining in the event of flooding.

Heating and air-conditioning systems, including fuel supply and ducting, should be installed above the applicable FPL. Where this is not possible, they should be installed in such a manner as to minimise damage from submersion.

This may be achieved through measures such as access for cleaning and draining of water after flood events, manually operated cut off valves for fuel supply lines and ducts, securely fastening heating equipment and fuel storage tanks to prevent buoyancy and movement and venting of fuel supply tanks at the applicable FPL + 0.6m.

We note that many of the aforementioned flood compatible building features may not be relevant if the proposed buildings and basement are flood protected in accordance with this report. Full extent of compatible materials and building techniques required are to be determined at Construction Certificate stage.

8.3 Fencing

We recommend that any new fencing constructed below the applicable FPL not specifically designed to alter floodwater behaviour on the site be designed to accommodate the unimpeded passage of flood waters in accordance with Ku-ring-gai DCP Part 24D.3.

In regard to the western boundary fence along Lindfield Avenue and accessway balustrade located near the south-eastern boundary, at least 50% of the fence must be of an open design from the natural ground level to depths up to 200mm. Less than 50% of the fence would be permitted to be solid. Fence openings should be a minimum of 75 mm x 75 mm.

8.4 Evacuation

The NSW SES is responsible for providing flood updates and issuing Evacuation Warnings and Evacuation Orders. Evacuation Warnings are issued when the NSW SES issues a “Watch and Act: Prepare to evacuate” warning and provide advance notice of a possible need to evacuate and give residents time to prepare for evacuation. Evacuation Orders are issued when the NSW SES issues an “Emergency Warning: Evacuate now” or “Emergency Warning: Evacuate [before time]” warning, and notify residents that evacuation is necessary and they must leave now in order to reach safety before roads are cut. Evacuation Orders are not always preceded by an Evacuation Warning.

Flood information issued by the NSW SES may be received by local, radio and television news, SMS messaging, Facebook and door-knocking in affected communities, or through the NSW SES website. The timing for evacuation of persons is to be established in consultation with the NSW SES.

The site has reliable pedestrian and vehicular access to Woodside Avenue and Reid Street (H1 Hazard classification) during the 1% AEP flood event. Pedestrian access to Reid Street is available during the PMF event. Pedestrian and Vehicular access is not available to Woodside Avenue during the PMF event

In the event that the 1% AEP flood event is expected to be exceeded, strategies should be adopted in accordance with NSW Government operational guidelines and NSW SES Emergency Evacuation operational guidelines.

Refer to the Flood Emergency Response Plan (**FERP**) prepared by Water Technology for details on why the site is best suited to adopt a shelter-in-place strategy (copy enclosed under Annexure D).

Based on the foregoing, it is our view that the proposed development can satisfy the requirements of Ku-ring-gai DCP Part 24D and the intent of NSW Flood Risk Management Manual (NSW DPE 2023).

8.5 Response to Ku-ring-gai DCP Part 24D.2 and Part 24D.3

This section presents a response outlining the level of compliance of the proposed development with the flood specific controls provided in Ku-ring-gai Council DCP Part24 summarised in Table 9 and Table 10.

Table 9: Compliance with Ku-ring-gai DCP Part 24D.2

Ku-ring-gai Council DCP Requirements	Response	Complies
1. Where a Catchment Flood Study has been completed and the site is identified on the Flood Planning Area map any development proposal is to demonstrate:	The subject site is located within Ku-ring-gai Councils 'Middle Harbour Southern Catchments Flood Study', Project No. S20504, Version 3, dated 10 February 2023. This assessment has developed a detailed flood model to analyse site-specific behaviour.	
i) Development is confined to a part of the site which is flood free; or	The proposed building footprint is situated within the predominantly post-development flood-free extents of the site during the 1% AEP flood event.	Y
ii) All dwellings are set at or above the specific freeboard; and	The proposed flood mitigation works provides 300mm freeboard above the 1% AEP flood level as well as the PMF flood level satisfying FPL requirements for overland flows of less than 20 m^3/s as per Ku-ring-gai Part 24D.3. For a detailed description of floor level compliance, refer to Section 8.1.	Y
iii) Development will not exacerbate flooding depth, extent or flow velocities on adjoining properties; and	The site-specific flood model confirms that the proposed development will not adversely increase flood depths and extents on adjoining properties. For a detailed description of the impact on overland flow behaviour occurring near the site and surrounds, refer to Section 7.5.	Y
iv) Any part of the dwelling house or any ancillary development that is erected at or below the flood planning level is to be constructed of flood compatible material and able to withstand the forces exerted during a flood by water, debris and buoyancy up to the flood planning level.	Any building element to be constructed below the Flood Planning Level that is not protected by a purpose-built flood protection structure is to be constructed from flood compatible materials to the applicable FPL. For a detailed description of building components and methods, refer to Section 8.2.	Y

Table 10: Compliance with Ku-ring-gai DCP Part 24D.3

Ku-ring-gai Council DCP Requirements	Response	Complies
3. Where the design flood standard is less than 20 m^3/s, or identified as overland flow on the Flood Planning Area Map* the minimum floor of all enclosed areas and structures, including all habitable floor areas is to be either:	Overland flows within the vicinity of the subject site are less than 20 m^3/s.	Y
i) 300mm above the design flood standard level; or	The proposed flood mitigation works provides 300mm freeboard above the 1% AEP flood level as well as the PMF flood level satisfying FPL requirements for overland flows of less than 20 m^3/s as per Ku-ring-gai Part 24D.3. For a detailed description of floor level compliance, refer to Section 8.1.	Y
ii) 300mm above the highest existing ground level along the associated overland flow path; or	Not applicable	Not applicable
iii) whichever is the greater, except in the case of garages, where the minimum height is to be 150mm instead of 300mm	Proposed driveway entrance in Reid Street is protected by a driveway crest which maintains minimum 300 mm freeboard above the 1% AEP flood level and is protected to the PMF level. For a detailed description of floor level compliance, refer to Section 8.1.	Y

8.6 Response to Ku-ring-gai LEP Cl 5.21

This section presents a response outlining the level of compliance of the proposed development with the flood specific controls provided in Ku-ring-gai Council LEP Clause 5.21 (2-3) summarised in Table 11.

Table 11: Compliance with Ku-ring-gai LEP Clause 5.21

Ku-ring-gai Council LEP Clause 5.21 Requirements	Response	Complies
(2) Development consent must not be granted to development on land the consent authority considers to be within the flood planning area unless the consent authority is satisfied the development:		
(a) is compatible with the flood function and behaviour on the land; and	The proposed development is protected from overland flows up to the 1% AEP event with flood deflection walls in Reid Street protected to the PMF event. The site-specific flood model confirms that the proposed development will not adversely impact on flood function and behaviour on the land. Refer to Section 7.3 for detailed description on flood behaviour.	Y
(b) will not adversely affect flood behaviour in a way that results in detrimental increases in the potential flood affectation of other development or properties; and	The site-specific flood model confirms that the proposed development will not detrimentally increase flood behaviour on adjoining properties. Refer to Section 7.5 for detailed description on impacts.	Y
(c) will not adversely affect the safe occupation and efficient evacuation of people or exceed the capacity of existing evacuation routes for the surrounding area in the event of a flood; and	Pedestrian access and egress are available to and from the site from Reid Street up to the 1% AEP event. Pedestrian and vehicular access and egress is available to and from the site from Woodside Avenue up to the 1% AEP event. Occupants can shelter in place during an extreme event. We note a shelter in place flood risk strategy is deemed suitable for the site as the flood duration for the PMF event is less than six hours and the building is flood protected up to the PMF event.	Y
(d) incorporates appropriate measures to manage risk to life in the event of a flood; and	The proposed development is protected from overland flows up to the 1% AEP event with flood deflection walls in Reid Street protected to the PMF event.	Y

	Occupants can shelter in place during an extreme event. We note a shelter in place flood risk strategy is deemed suitable for the site as the flood duration for the PMF event is less than six hours and the building is flood protected up to the PMF event.	
(e) will not adversely affect the environment or cause avoidable erosion, siltation destruction of riparian vegetation or a reduction in the stability of riverbanks or watercourses.	Appropriate erosion and sediment control measures have been designed to prevent soil erosion. No riparian land or watercourses has been proposed to be removed by the proposal.	Y
(3) In deciding whether to grant development consent on land to which this clause applies, the consent authority must consider the following matters:		
(a) the impact of the development on projected changes to flood behaviour as a result of climate change,	We refer to Section 7.4, where the 1% AEP flood level will increase by approximately up to 50mm within the vicinity of the subject site based on a 20% increase in rainfall intensities. In this regard, the proposed ground floor level and associated flood protection measure are to be set at the PMF level.	Y
(b) the intended design and scale of buildings resulting from the development,	The site-specific flood model has confirmed that the proposed development is compatible with the flood characteristics of the surrounding location.	Y
(c) whether the development incorporates measures to minimise the risk to life and ensure the safe evacuation of people in the event of a flood,	The proposed development is protected from overland flows up to the 1% AEP event with flood deflection walls in Reid Street protected to the PMF event. Occupants can shelter in place during an extreme event. We note a shelter in place flood risk strategy is deemed suitable for the site as the flood duration for the PMF event is less than six hours and the building is flood protected up to the PMF event.	Y
(d) the potential to modify, relocate or remove buildings from development if the surrounding area is impacted by flooding or coastal erosion.	The proposed development aligns with the site's existing flood behaviour ensuring there will be no need to relocate any buildings.	Y

8.7 Response to Ku-ring-gai LEP Cl 6.5

This section presents a response outlining the level of compliance of the proposed development with the flood specific controls provided in Ku-ring-gai Council LEP Clause 6.5 summarised in Table 12.

Table 12: Compliance with Ku-ring-gai LEP Clause 6.5

Ku-ring-gai Council LEP Clause 6.5 Requirements	Response	Complies
(1) The objective of this clause is to avoid or minimise the adverse impacts of urban stormwater on the land on which development is to be carried out, adjoining properties, native bushland, waterways and groundwater systems.	We refer to the details depicted in the Stormwater Management Plans prepared by HYDRACOR Consulting Engineers Pty Ltd (**Stormwater Plans**) which have been prepared due regard to the objectives of this clause.	
(2) Before granting development consent to development on any land to which this Plan applies, the consent authority must be satisfied that:		
(a) Water sensitive urban design principles are incorporated into the design of the development; and	The stormwater plans include details which demonstrate compliance with the principles of water sensitive urban design requirements.	Y
(b) Riparian, stormwater and flooding measures are integrated; and	The proposed development is protected from overland flows up to the 1% AEP event with flood deflection walls in Reid Street protected to the PMF event.	Y
(c) The stormwater management system includes all reasonable actions to avoid any adverse impacts on the land to which the development is to be carried out, adjoining properties, native bushland, waterways and groundwater systems; and	The stormwater plans demonstrate an outcome can be achieved which will minimise any adverse impacts of urban stormwater on the land on which development is to be carried out, adjoining properties, native bushland, waterways and groundwater systems.	Y
(d) if a potential adverse environmental impact cannot be feasibly avoided, the development minimises and mitigates the adverse impacts of stormwater runoff on adjoining properties, native bushland, waterways and groundwater systems.	No adverse environmental impacts are anticipated.	Y
(3) For the purposes of subclause (2)(a), the **water sensitive urban design principles** are:		

(a) protection and enhancement of water quality, by improving the quality of stormwater runoff from urban catchments,	The stormwater plans include details which demonstrate compliance with the principles of water sensitive urban design requirements.	Y
(b) minimisation of harmful impacts of urban development on water balance and on surface and groundwater flow regimes,	The stormwater plans include details which demonstrate minimise impacts on water balance, surface and groundwater flow regimes.	Y
(c) integration of stormwater management systems into the landscape in a manner that provides multiple benefits, including water quality protection, stormwater retention and detention, public open space, and recreational and visual amenity,	The stormwater plans include details to control stormwater run-off to meet the requirements outlined in the DCP.	Y
(d) retention, where practical, of on-site stormwater for use as an alternative supply to mains water, groundwater or river water.	The stormwater plans include details in regard to rainwater re-use as an alternative supply to mains water.	Y

9 Conclusion

A site-specific flood study has been prepared for a residential State Significant Development Application (**SSDA**) in accordance with the requirements of Ku-ring-gai Development Control Plan (**DCP**) Part 24 D.2, Ku-ring-gai Local Environmental Plan (**LEP**) 2015 and principles of the NSW Flood Risk Management Manual (NSW DPE, 2023b).

The results of the site-specific flood study were relied upon to prepare this Flood Impact and Risk Assessment.

Based on the foregoing, a flood mitigation strategy has been developed to:

- Protect the site and all proposed buildings up to and including the Flood Planning Level (**FPL**) as defined in Ku-ring-gai DCP.
- Manage flood risk on the site during all flood events.

The flood mitigation works required to achieve satisfactory flood risk mitigation outcome are depicted on Flood Mitigation Plans (refer CC240140/FM1-FM3/A, copy enclosed under Annexure C) and Concept Civil Engineering Drawings (refer CC240140/R1-R10/E, copy enclosed under Annexure B).

The proposed development and associated flood mitigation works do not result in significant adverse impacts on adjoining properties or public roads.

A Flood Emergency Response Plan (FERP) has been prepared by Water Technology (copy enclosed under Annexure D) for details on why the site is best suited to adopt a shelter-in-place strategy during extreme flood events. We note a shelter in place flood risk strategy is deemed suitable for the site as the flood duration for the PMF event is less than six hours and the building is flood protected up to the PMF event.

Based on the foregoing, it is our view that the proposed development can satisfy the requirements of Ku-ring-gai DCP Part 24D and the intent of NSW Flood Risk Management Manual (NSW DPE, 2023b).

10 References

Australian Building Codes Board (ABCB). (2012a). *Construction of Buildings in Flood Hazard Areas: Information Handbook*. Version 2012.3.

Australian Building Codes Board (ABCB). (2012b). *Construction of Buildings in Flood Hazard Areas: Standard*. Version 2012.2.

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11 Glossary

Terminology in this Glossary has been derived or adapted from the Flood Risk Management Manual (NSW DPE 2023b) where appropriate.

Annual Exceedance Probability (AEP)	The chance of a flood of a given or larger size occurring in any one year, expressed as a percentage.
Australian Height Datum (AHD)	A common national surface level datum approximately corresponding to mean sea level.
Average recurrence interval (ARI)	The long-term average number of years between the occurrence of a flood as big as or larger than the selected event.
Catchment	The land area draining through the main stream, as well as tributary streams, to a particular site. It always relates to an area above a specific location.
Design flood	A flood event to be considered in the design process.
Flood	Relatively high stream flow which overtops the natural or artificial banks in any part of a stream, river, estuary, lake or dam, and/or local overland flooding associated with major drainage before entering a watercourse, and/or coastal inundation resulting from super-elevated sea levels and/or waves overtopping coastline defences excluding tsunami.
Flood hazard	A measure of the floodwaters potential to cause harm or loss. Full definitions of hazard categories are provided in Appendix L of the Floodplain Development Manual (NSW Government, 2005). In summary: ▪ High: conditions that pose a possible danger to personal safety; evacuation by trucks difficult; able-bodied adults would have difficulty wading to safety; potential for significant structural damage to buildings. ▪ Low: conditions such that people and their possessions could be evacuated by trucks; able-bodied adults would have little difficulty wading to safety.
Flood planning area	The area of land below the FPL and thus subject to flood related development controls.
Flood planning levels (FPLs)	Combinations of flood levels (derived from significant historical flood events or floods of specific ARIs) and freeboards selected for floodplain risk management purposes, as determined in management studies and incorporated in management plans.
Floodplain, flood-prone land	Land susceptible to inundation by the probable maximum flood (PMF) event, i.e. the maximum extent of flood liable land.

Floodplain risk management options	The measures that might be feasible for the management of a particular area of the floodplain.
Freeboard	Provides reasonable certainty that the risk exposure selected in deciding on a particular flood chosen as the basis for the FPL is actually provided. It is a factor of safety typically used in relation to the setting of floor levels, levee crest levels, etc.
Geographical information systems (GIS)	A system of software and procedures designed to support the management, manipulation, analysis and display of spatially referenced data.
Hydraulics	The term given to the study of water flow in a river, channel or pipe, in particular, the evaluation of flow parameters such as stage and velocity.
Hydraulic category	A classification of floodwater hydraulic behaviour. The categories are: • Floodway: those areas of the floodplain where a significant discharge of water occurs during floods. They are often aligned with naturally defined channels. Floodways are areas that, even if only partially blocked, would cause a significant redistribution of flood flow, or a significant increase in flood levels. • Flood storage: those parts of the floodplain that are important for the temporary storage of floodwaters during the passage of a flood. Loss of flood storage can increase the severity of flood impacts by reducing natural flood attenuation. • Flood fringe: remaining area of flood-prone land after floodway and flood storage areas have been defined.
Hydrograph	A graph that shows how the discharge changes with time at any particular location.
Hydrology	The term given to the study of the rainfall and runoff process as it relates to the derivation of hydrographs for given floods.
Local overland flooding	Inundation by local runoff rather than overbank discharge from a stream, river, estuary, lake or dam.
Mainstream flooding	Inundation of normally dry land occurring when water overflows the natural or artificial banks of a stream, river, estuary, lake or dam.
Peak discharge	The maximum discharge occurring during a flood event.
Probable maximum flood (PMF)	The PMF is the largest flood that could conceivably occur at a particular location.

Probable Maximum Precipitation (PMP)	The PMP is the greatest depth of precipitation for a given duration meteorologically possible over a given size storm area at a particular location.
Probability	A statistical measure of the expected frequency or occurrence of flooding.
Risk	Chance of something happening that will have an impact. It is measured in terms of consequences and likelihood. For this study, it is the likelihood of consequences arising from the interaction of floods, communities and the environment.
Runoff	The amount of rainfall that actually ends up as stream or pipe flow, also known as rainfall excess.

Annexure A HYDRACOR Consulting Engineers Pty Ltd Flood Plans, Reference CC240140F, Sheets F1 to F35, Revision J, dated 15 June 2026

Legend

- Site
- 2D model domain
- ALS Contours (2.0 m AHD Interval)
- Downstream model boundary

Flood inundation extents

- 5% AEP
- 1% AEP
- Probable Maximum Flood

PACIFIC HWY

LINDFIELD AVENUE

HIGHGATE ROAD

WOODSIDE AVENUE

Title: TUFLOW MODEL PLAN

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LINDFIELD

Client: CPDM DM Pty Ltd

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Legend

- Site
- 2D model domain
- Downstream model boundary

Model cell size

- 0.5 m
- 1 m
- 2 m

PACIFIC HWY

LINDFIELD AVENUE

HIGHGATE ROAD

WOODSIDE AVENUE

Title: MODEL CELL SIZE PLAN

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Title: EXISTING AND PROPOSED 1D NETWORK PLAN

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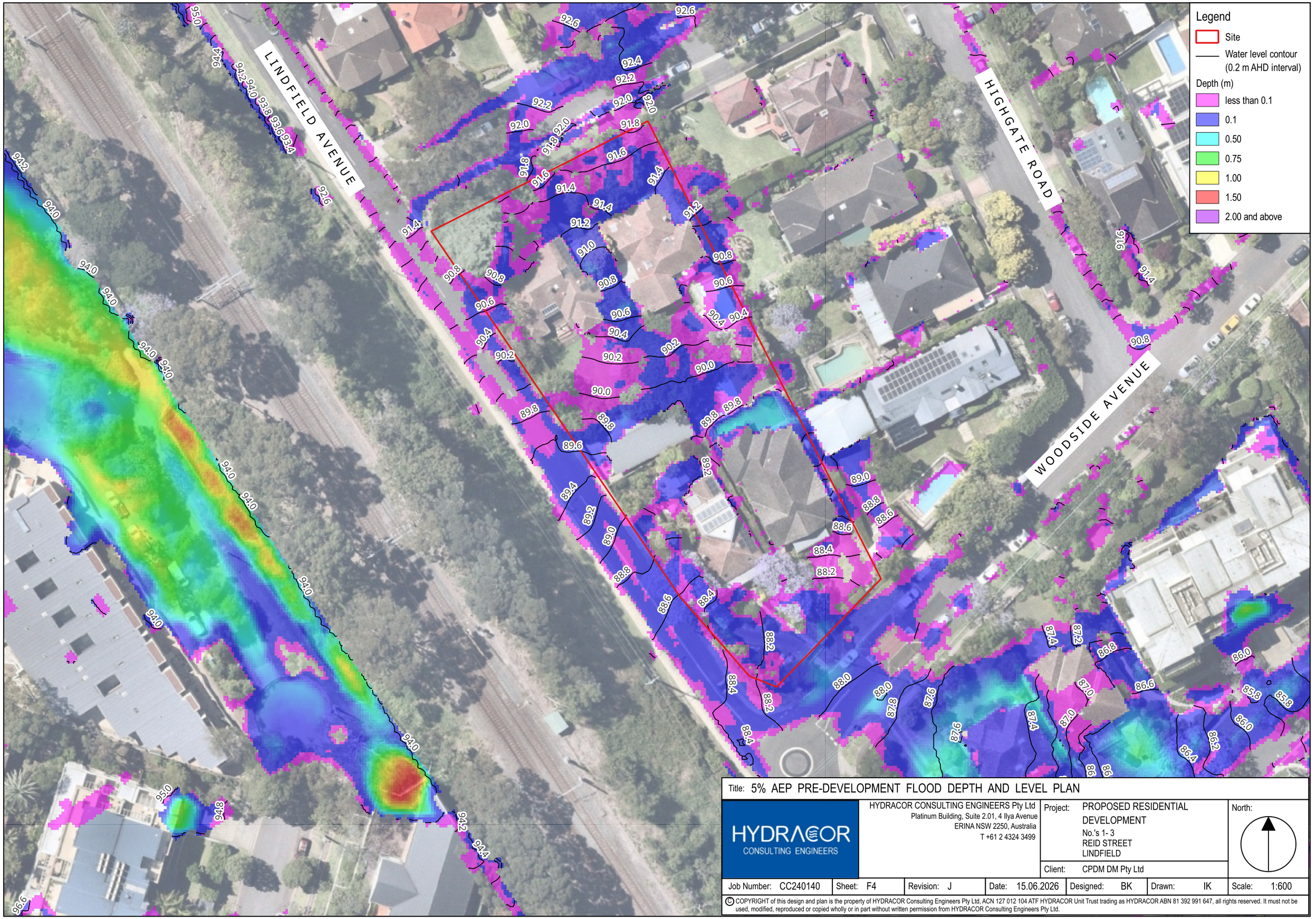

Title: 5% AEP PRE-DEVELOPMENT FLOOD DEPTH AND LEVEL PLAN

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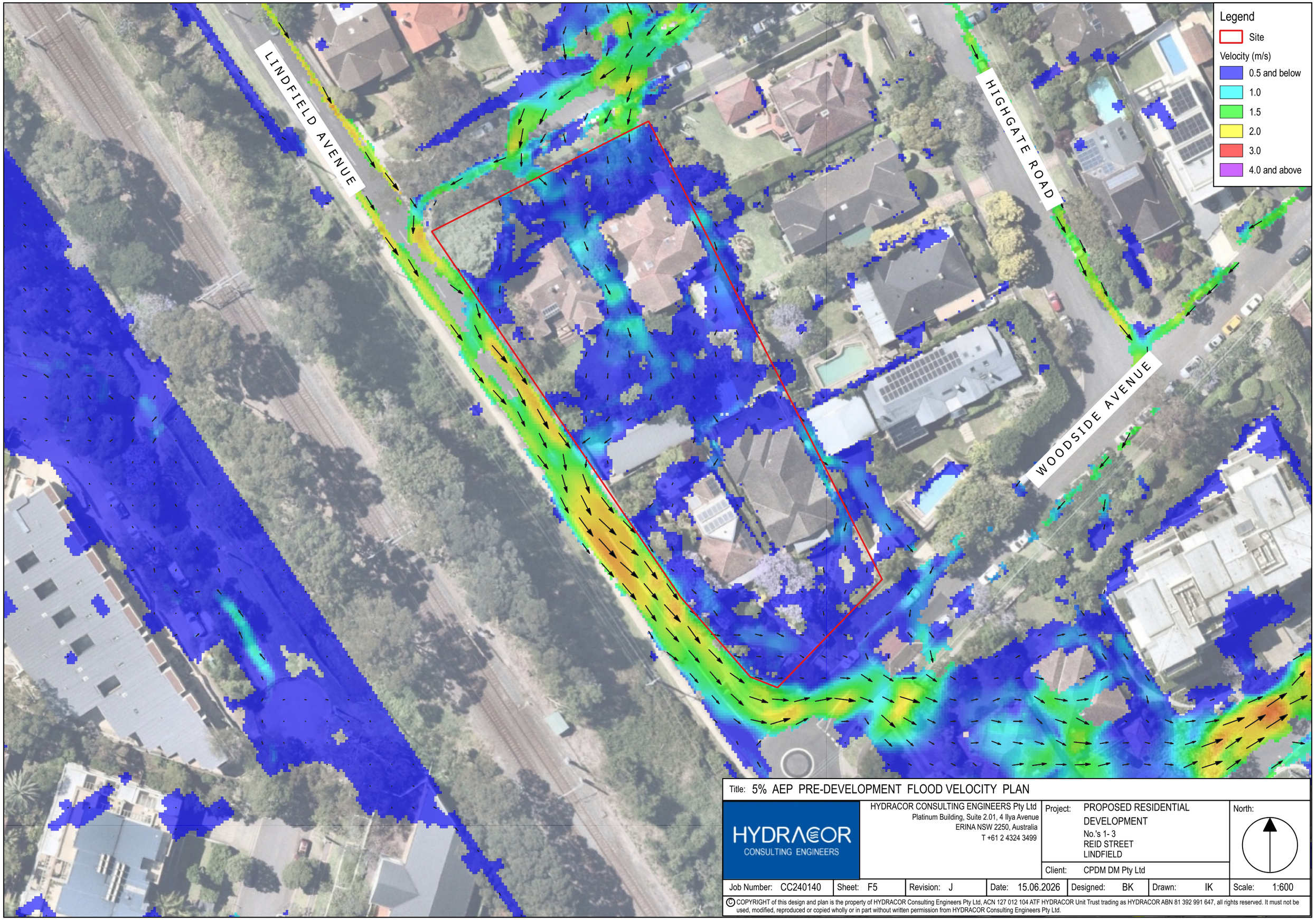

Title: 5% AEP PRE-DEVELOPMENT FLOOD VELOCITY PLAN

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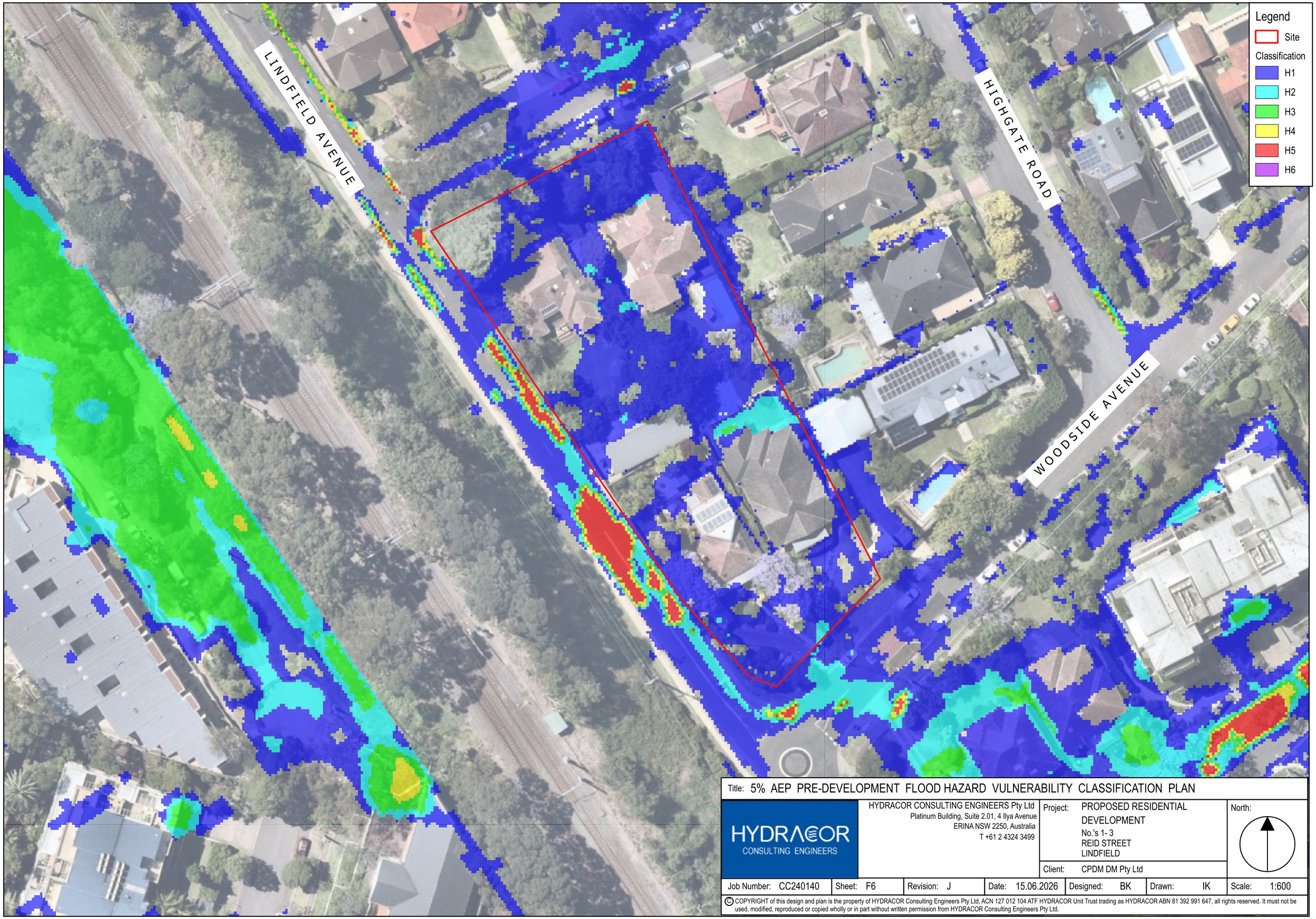

Title: 5% AEP PRE-DEVELOPMENT FLOOD HAZARD VULNERABILITY CLASSIFICATION PLAN

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Title: 5% AEP POST-DEVELOPMENT FLOOD DEPTH AND LEVEL PLAN

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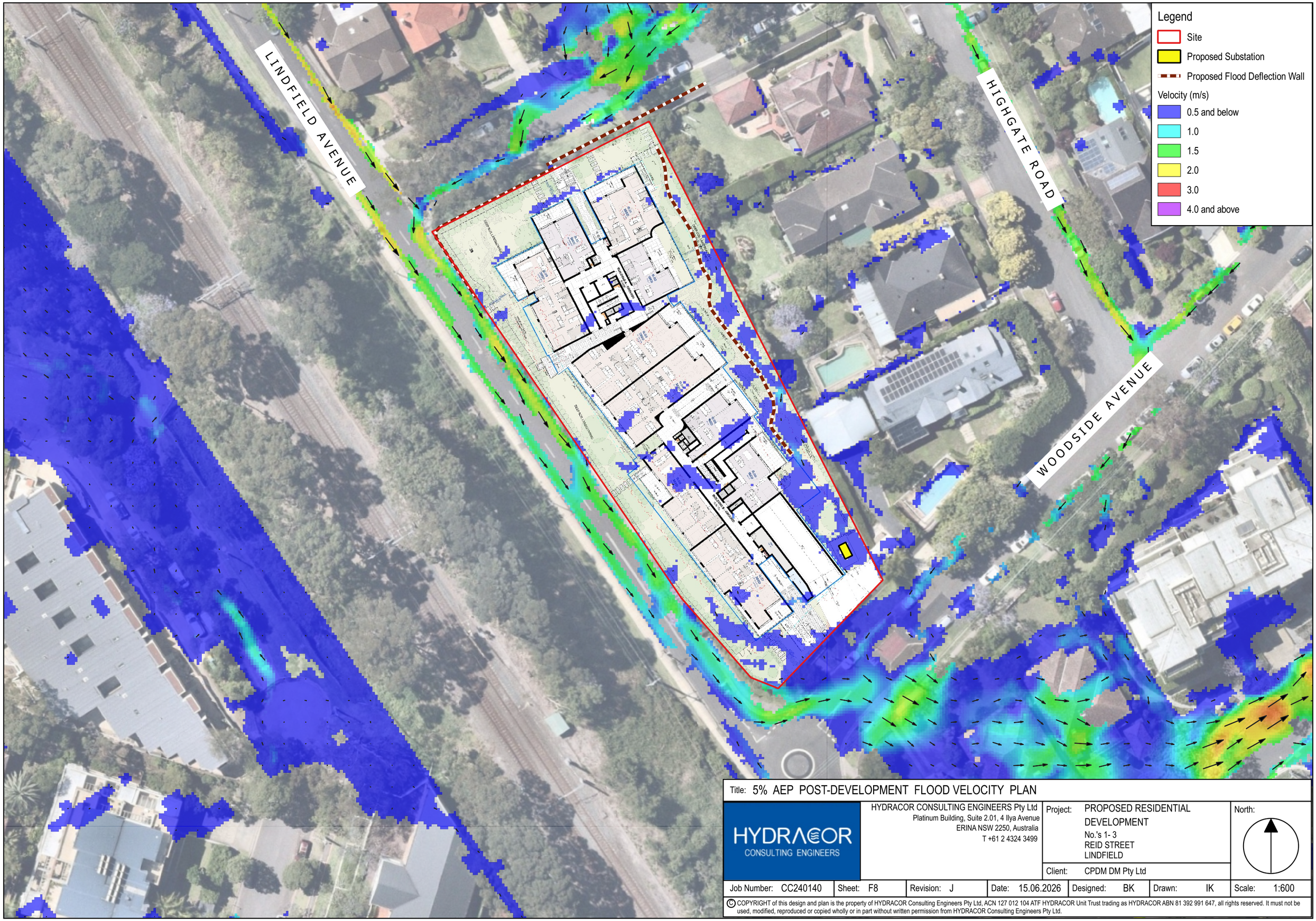

Title: 5% AEP POST-DEVELOPMENT FLOOD VELOCITY PLAN

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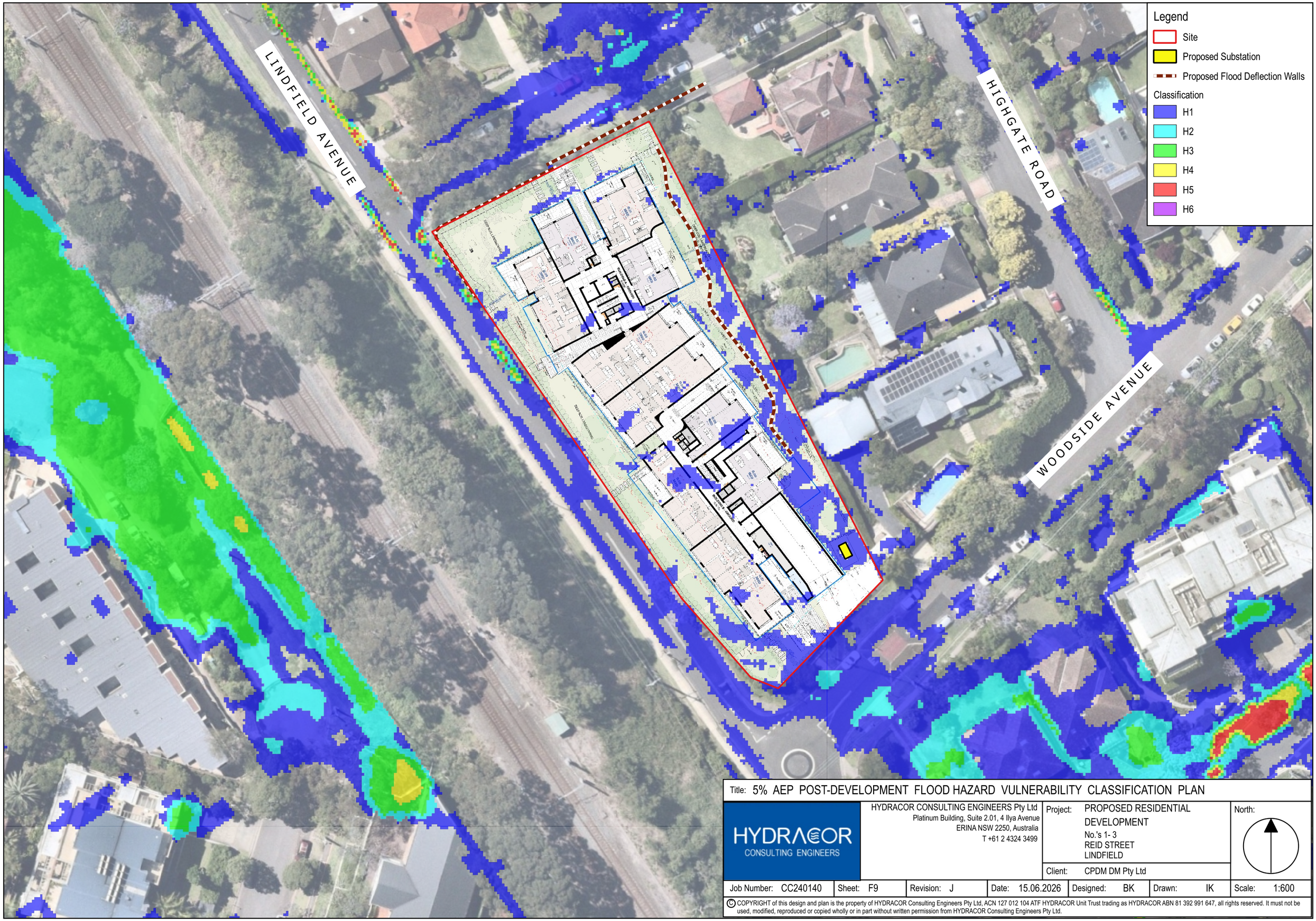

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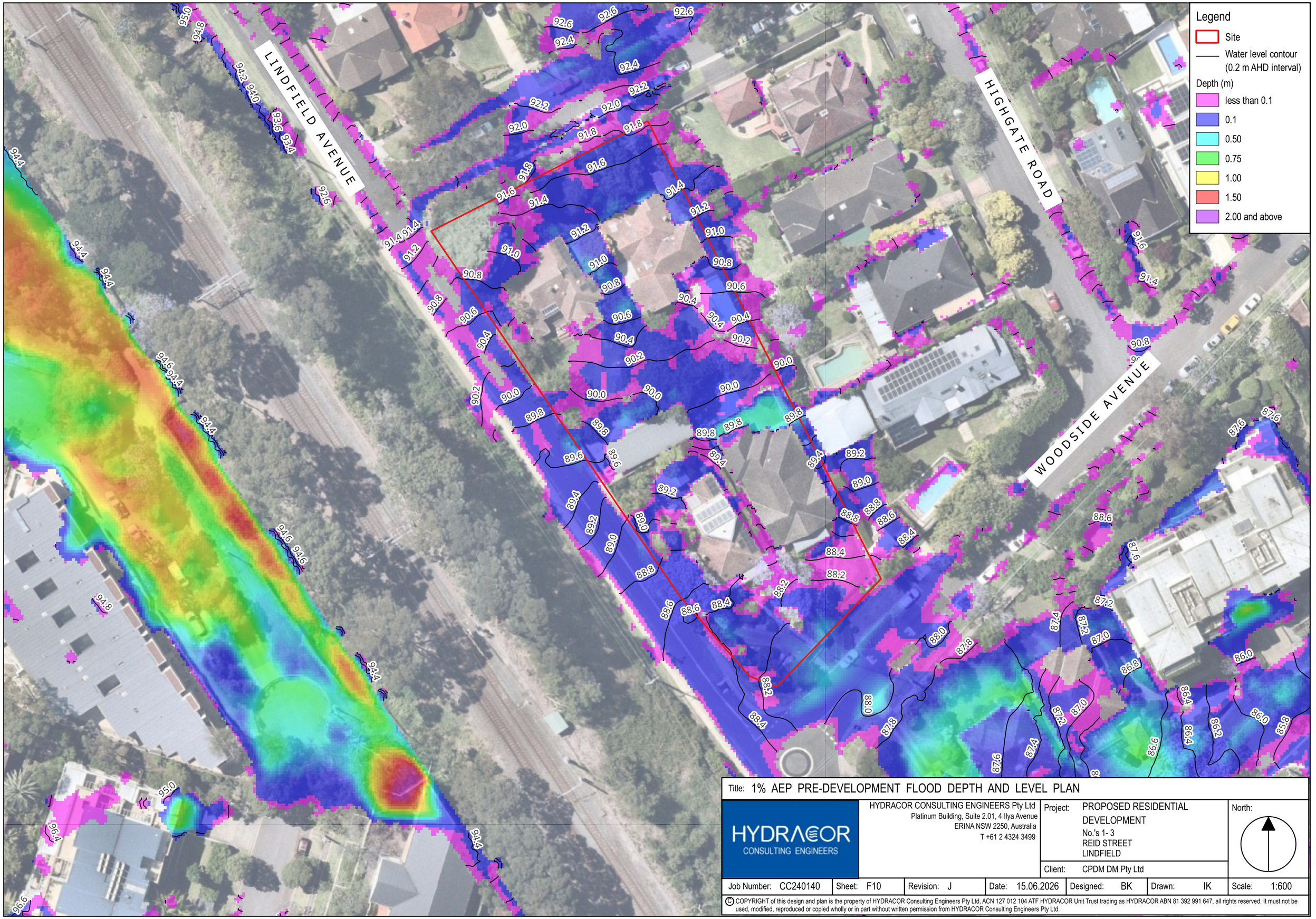

Title: 1% AEP PRE-DEVELOPMENT FLOOD DEPTH AND LEVEL PLAN

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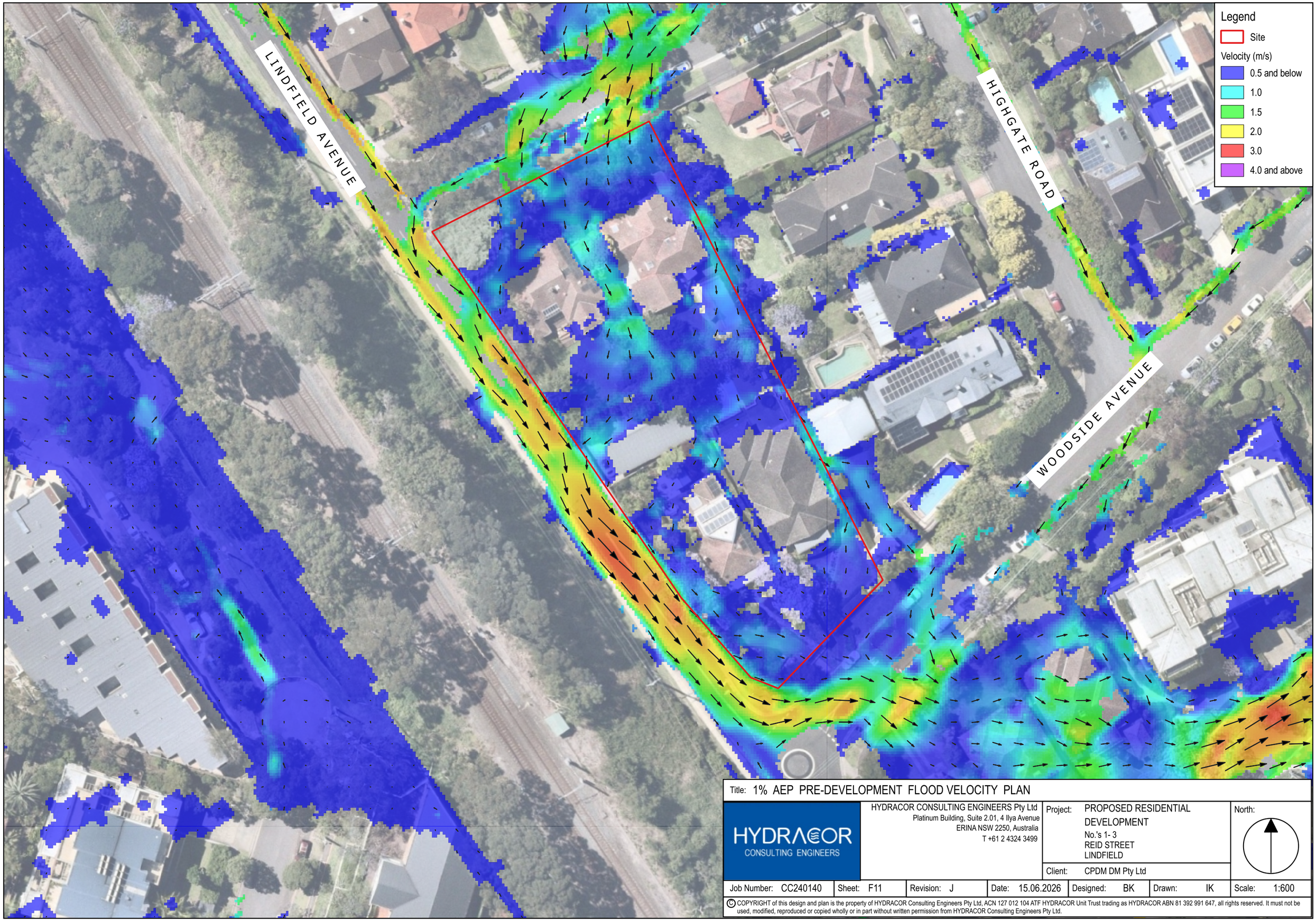

Title: 1% AEP PRE-DEVELOPMENT FLOOD VELOCITY PLAN

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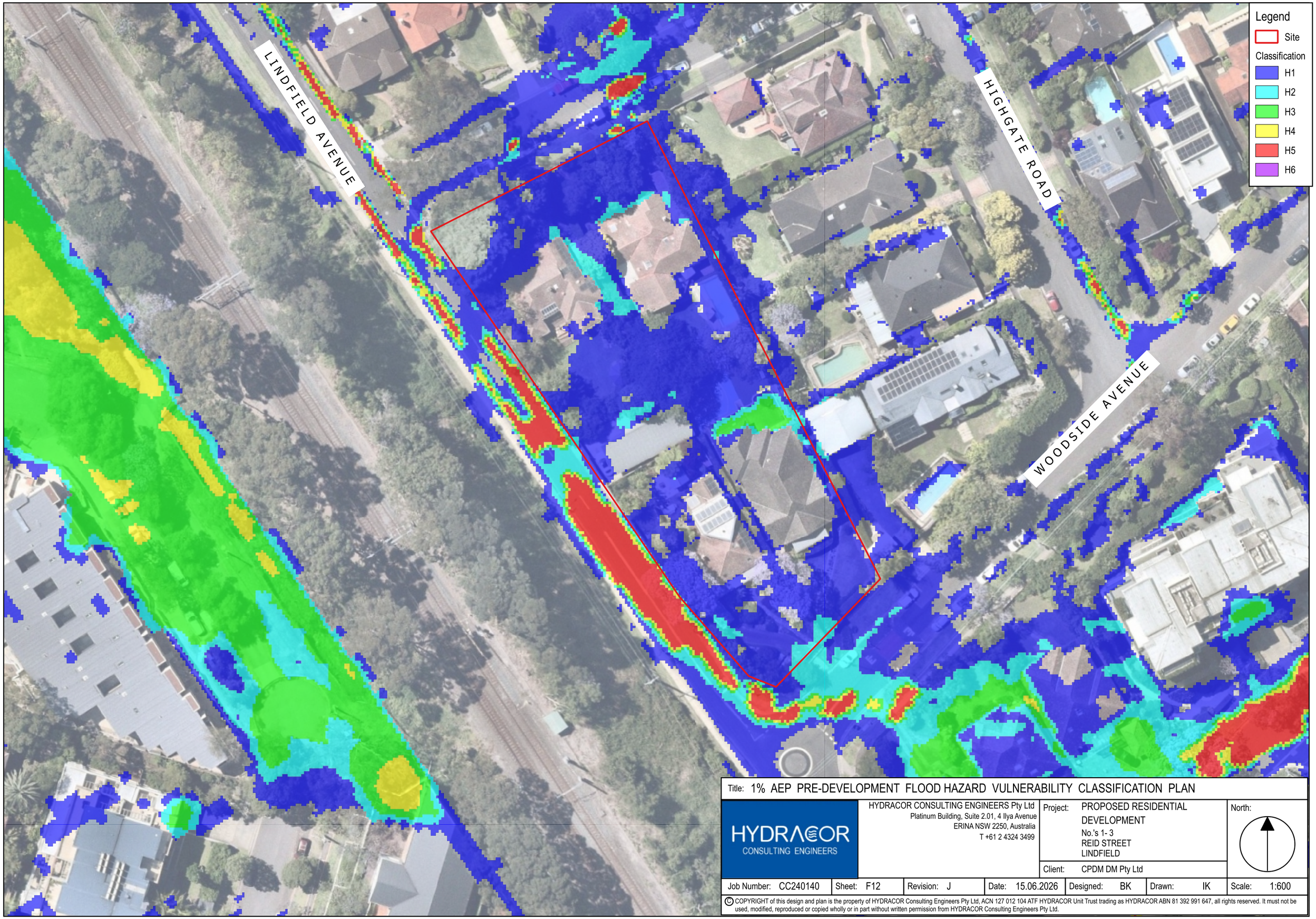

Title: 1% AEP PRE-DEVELOPMENT FLOOD HAZARD VULNERABILITY CLASSIFICATION PLAN

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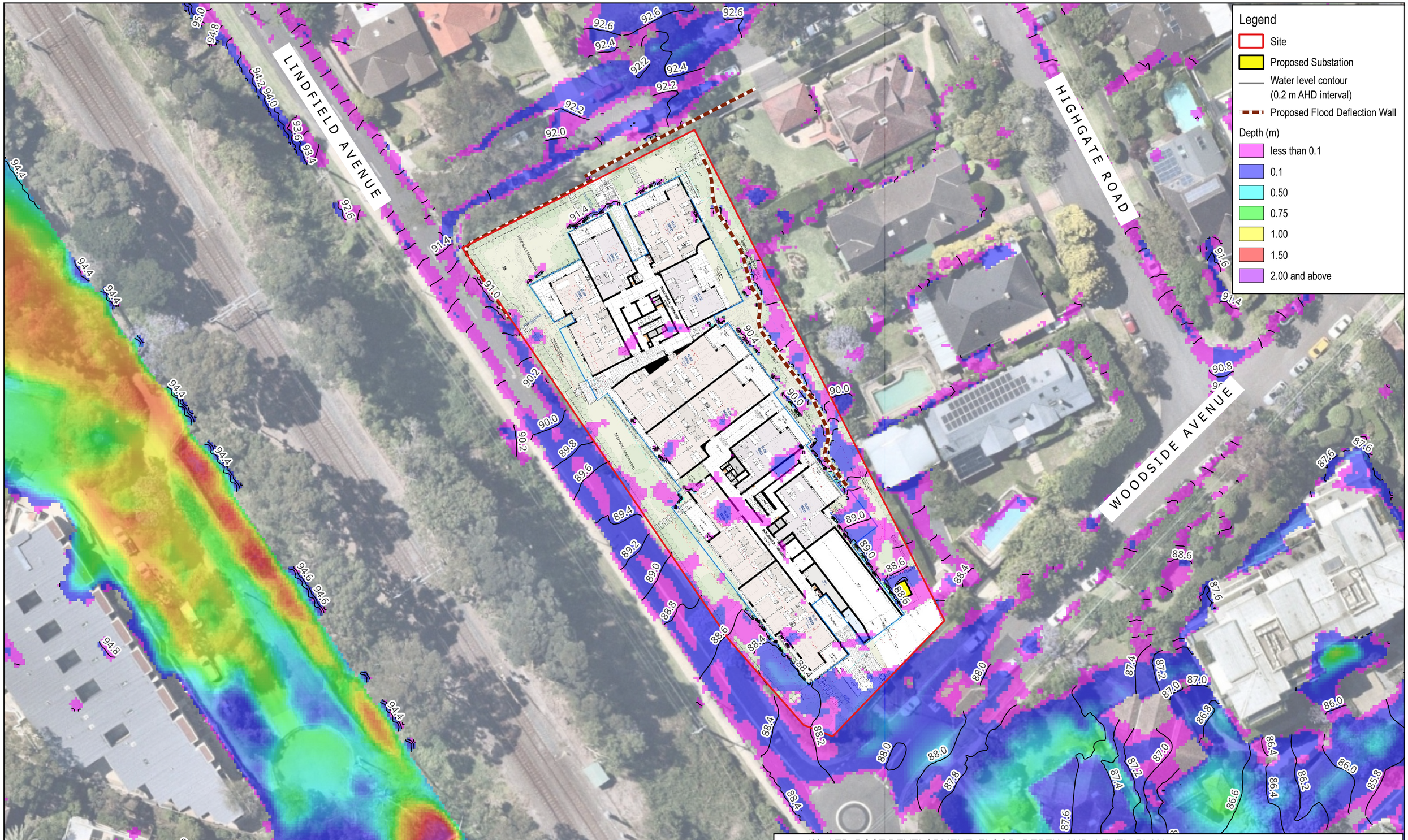

Title: 1% AEP POST-DEVELOPMENT FLOOD DEPTH AND LEVEL PLAN

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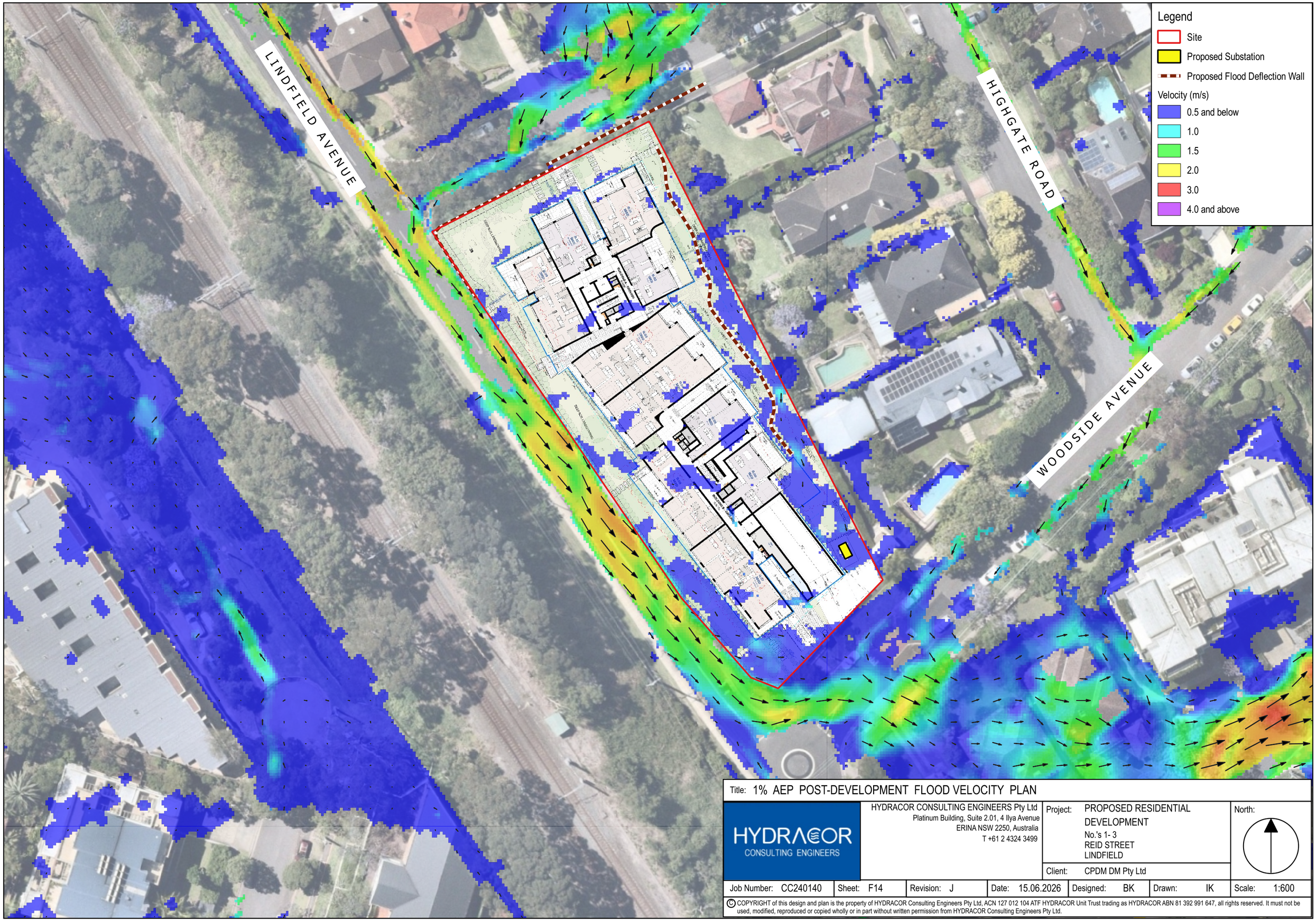

Title: 1% AEP POST-DEVELOPMENT FLOOD VELOCITY PLAN

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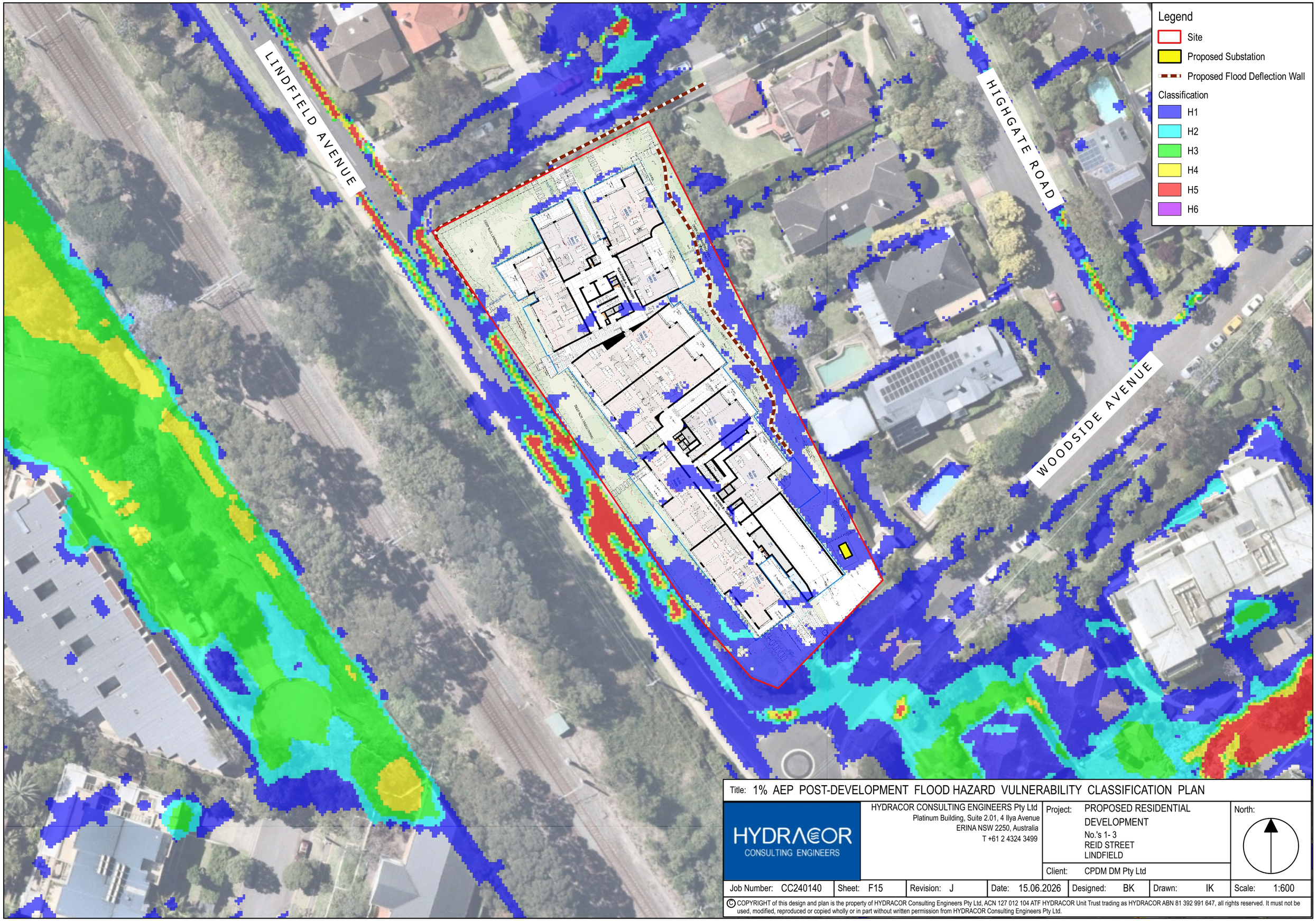

Title: 1% AEP POST-DEVELOPMENT FLOOD HAZARD VULNERABILITY CLASSIFICATION PLAN

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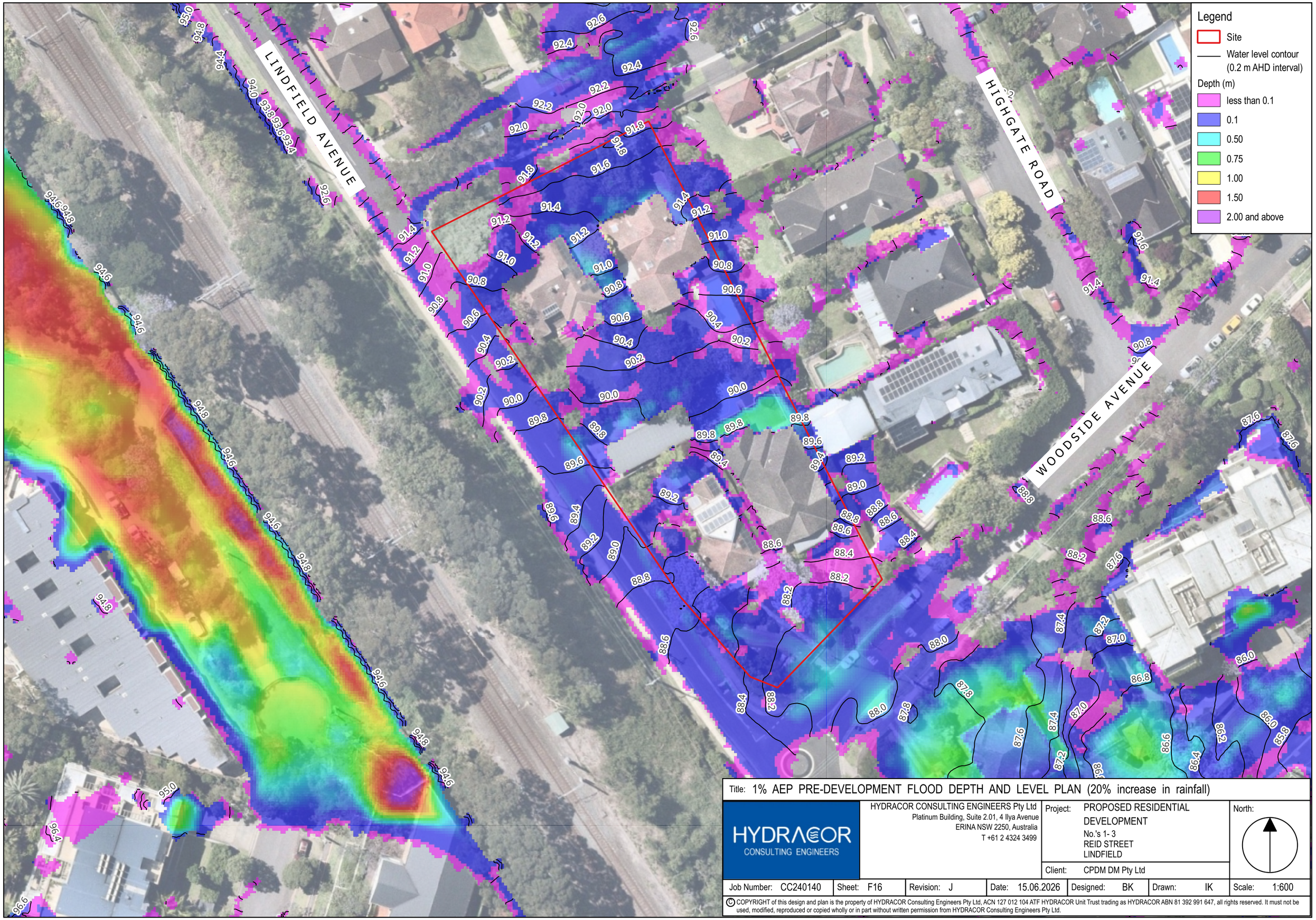

Title: 1% AEP PRE-DEVELOPMENT FLOOD DEPTH AND LEVEL PLAN (20% increase in rainfall)

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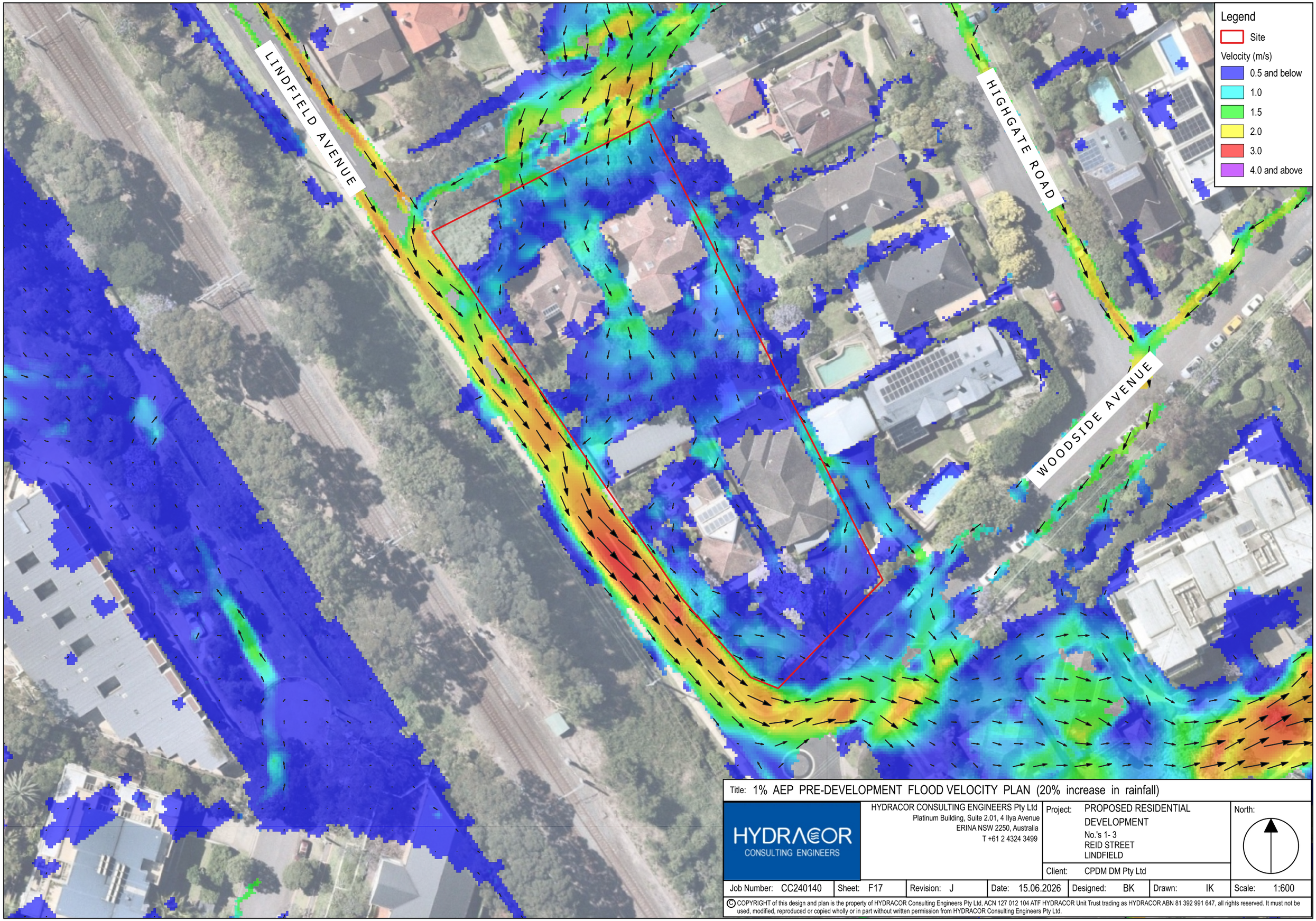

Title: 1% AEP PRE-DEVELOPMENT FLOOD VELOCITY PLAN (20% increase in rainfall)

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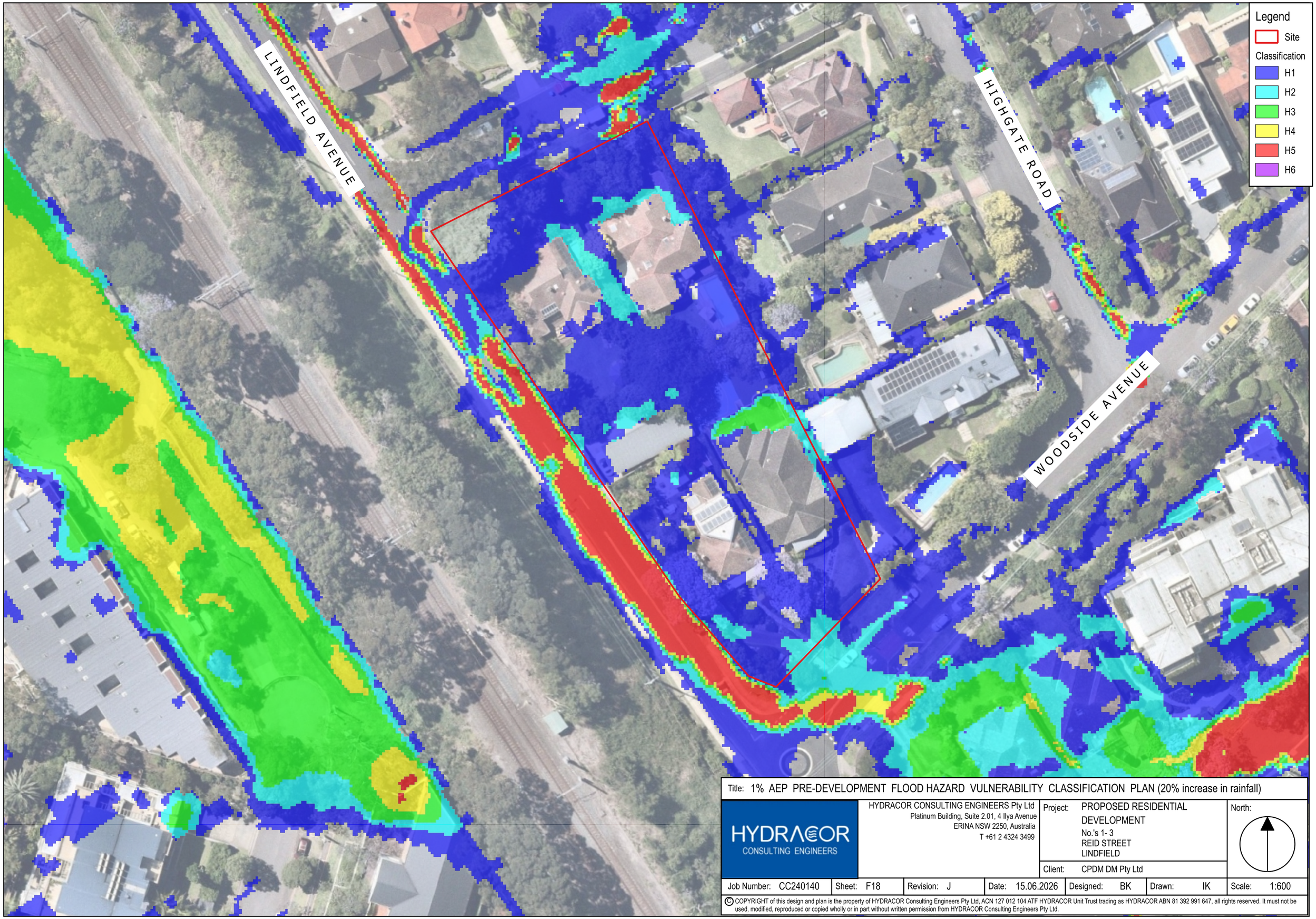

Title: 1% AEP PRE-DEVELOPMENT FLOOD HAZARD VULNERABILITY CLASSIFICATION PLAN (20% increase in rainfall)

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Project: PROPOSED RESIDENTIAL DEVELOPMENT
No.'s 1- 3
REID STREET
LINDFIELD

Client: CPDM DM Pty Ltd

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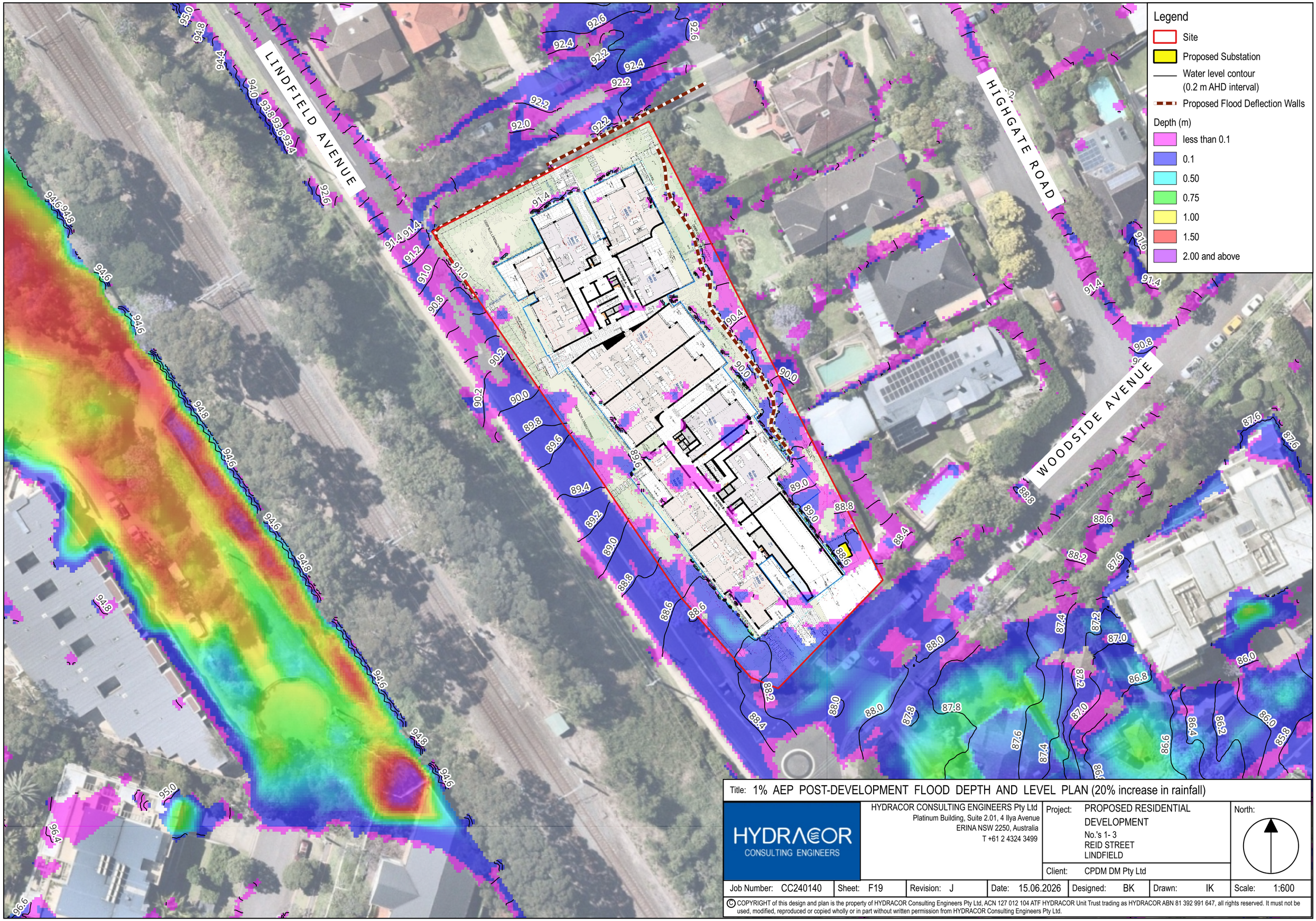

Title: 1% AEP POST-DEVELOPMENT FLOOD DEPTH AND LEVEL PLAN (20% increase in rainfall)

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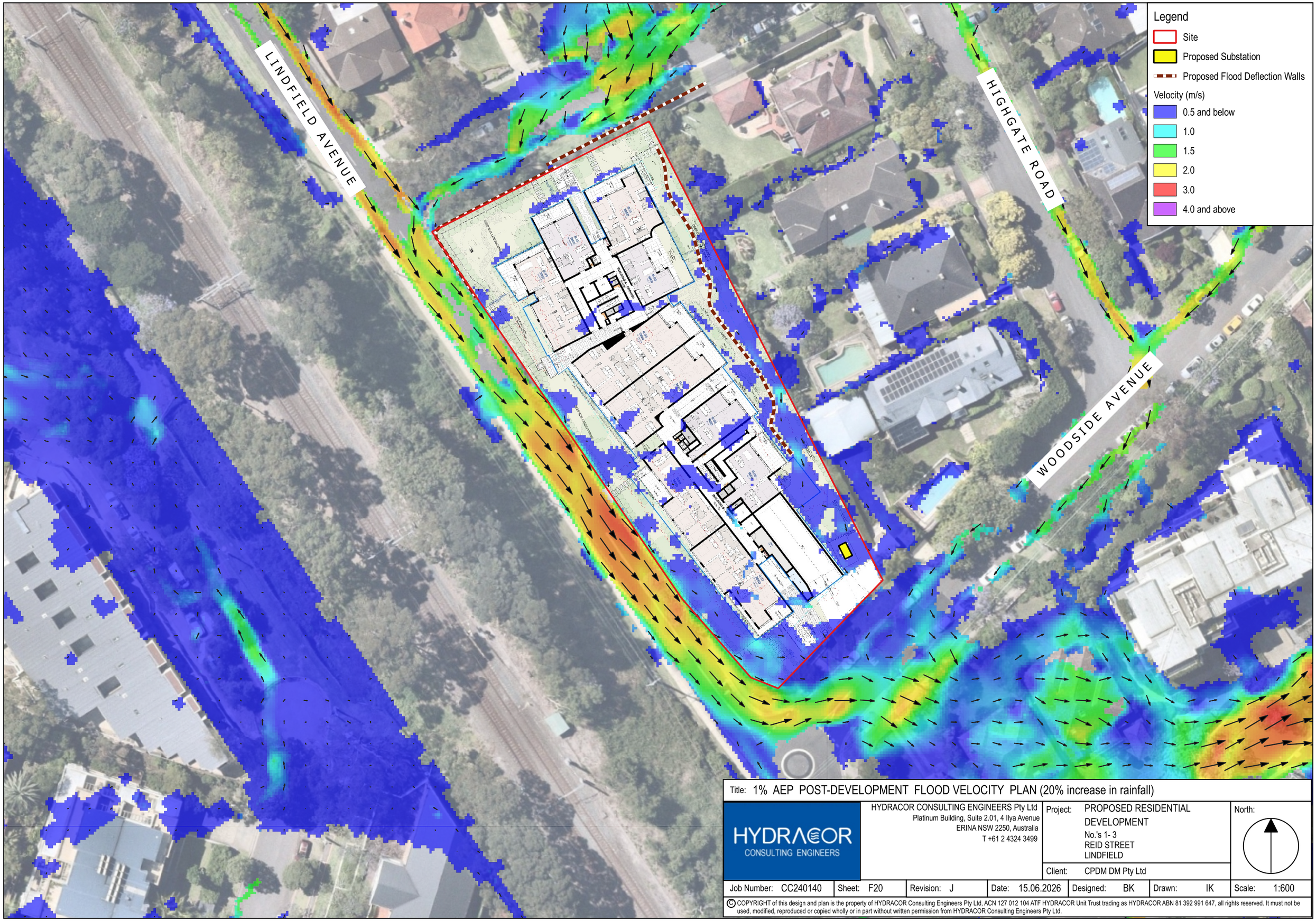

Title: 1% AEP POST-DEVELOPMENT FLOOD VELOCITY PLAN (20% increase in rainfall)

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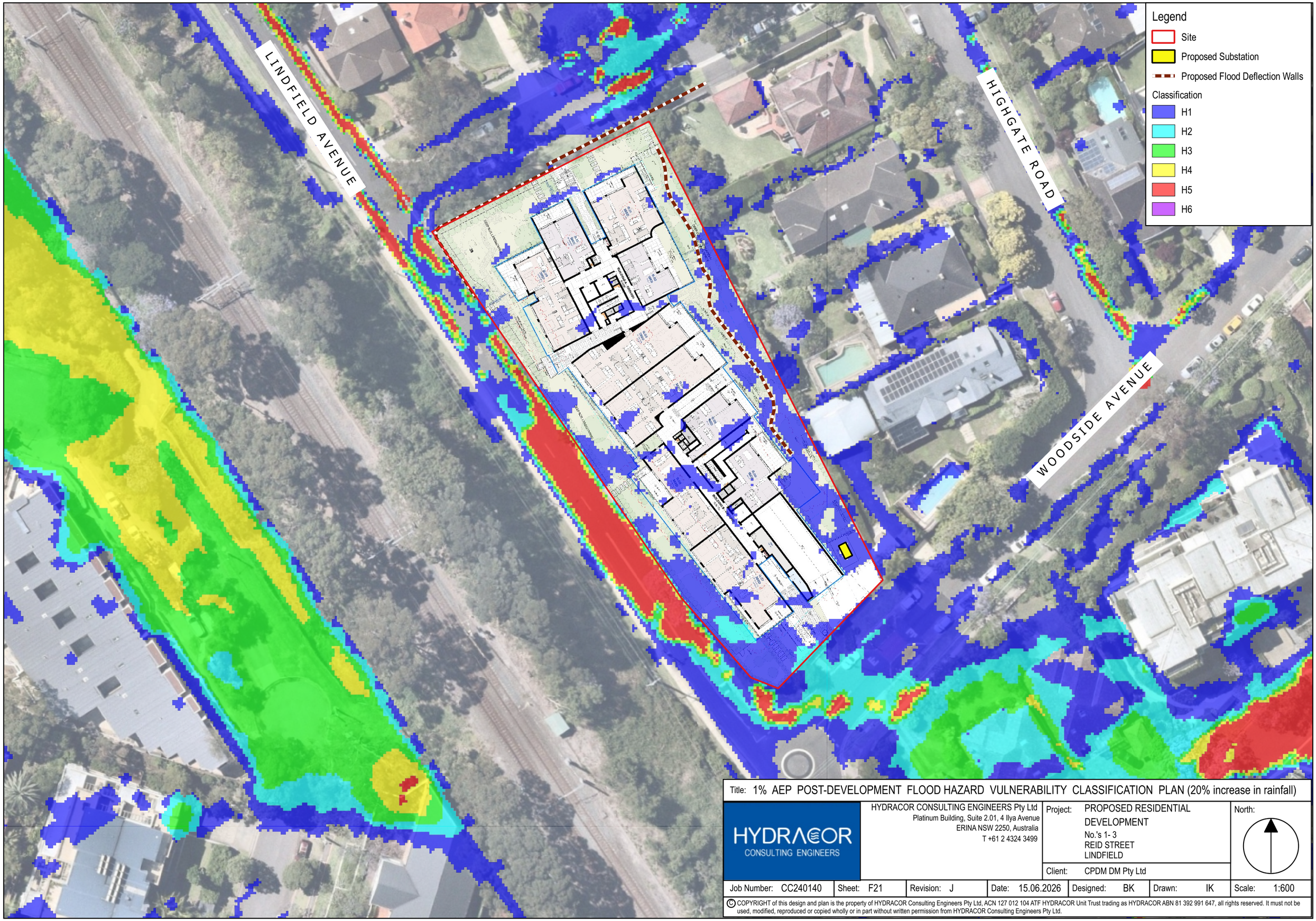

Title: 1% AEP POST-DEVELOPMENT FLOOD HAZARD VULNERABILITY CLASSIFICATION PLAN (20% increase in rainfall)

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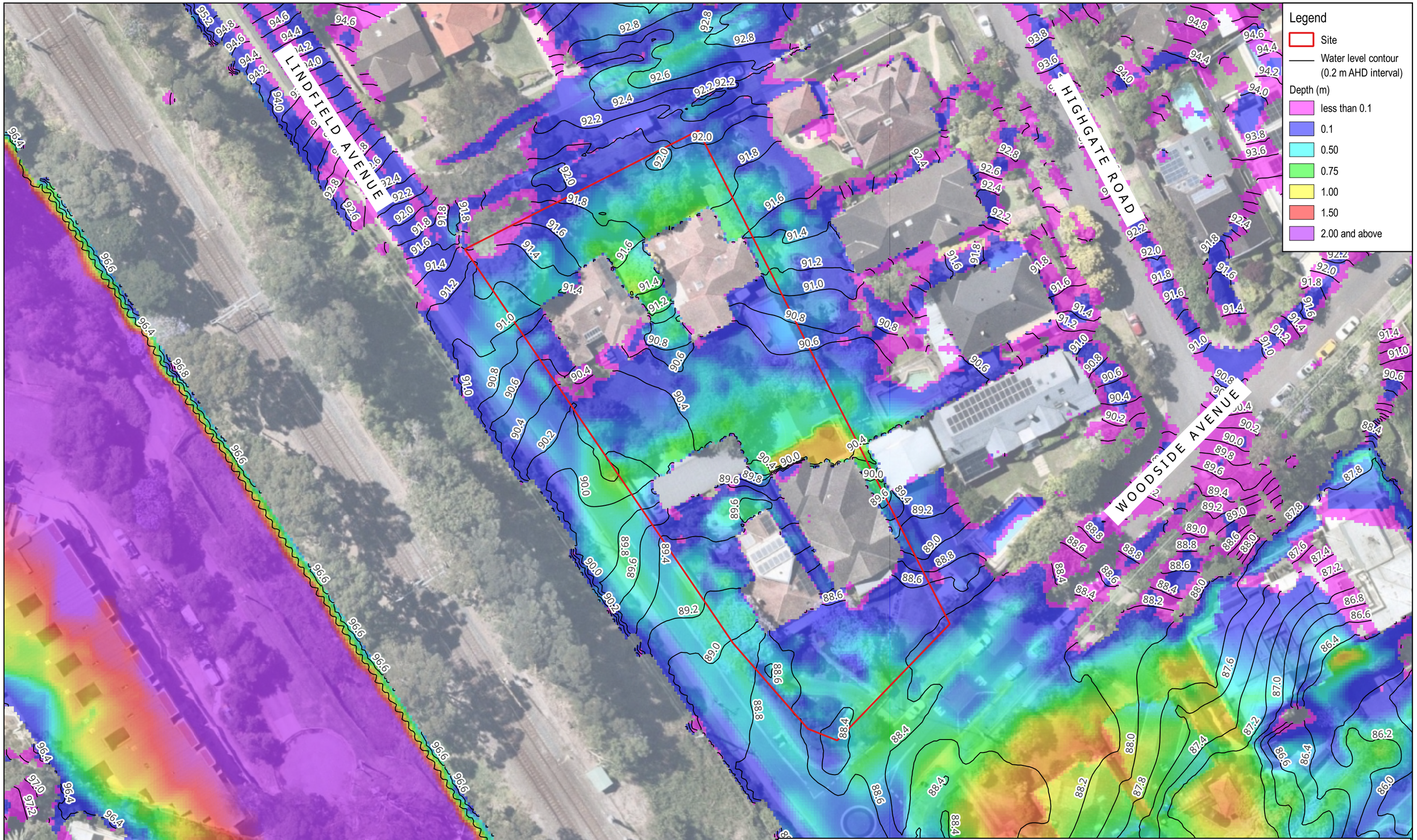

Title: PMF PRE-DEVELOPMENT FLOOD DEPTH AND LEVEL PLAN

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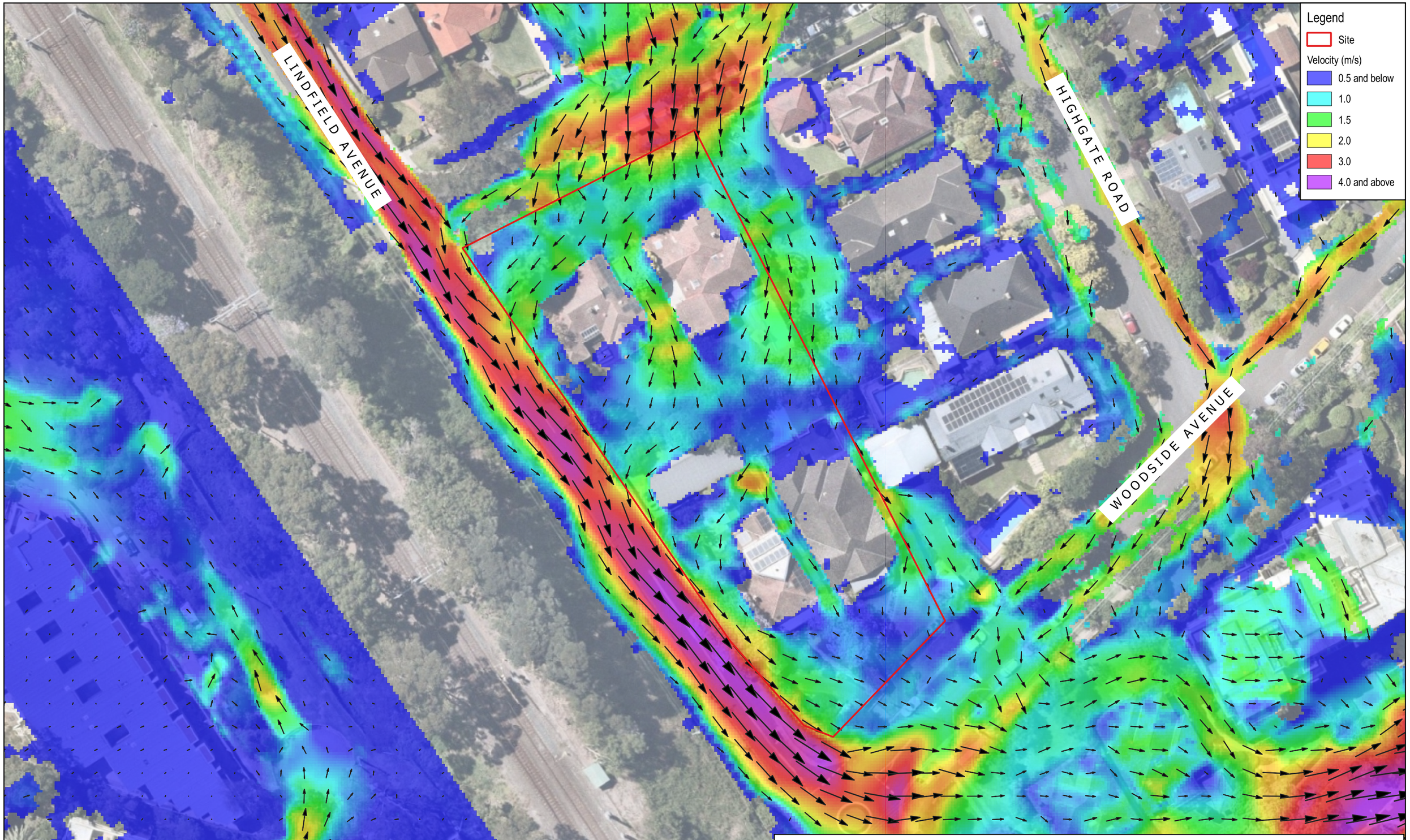

Title: PMF PRE-DEVELOPMENT FLOOD VELOCITY PLAN

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No.'s 1- 3
REID STREET
LINDFIELD

Client: CPDM DM Pty Ltd

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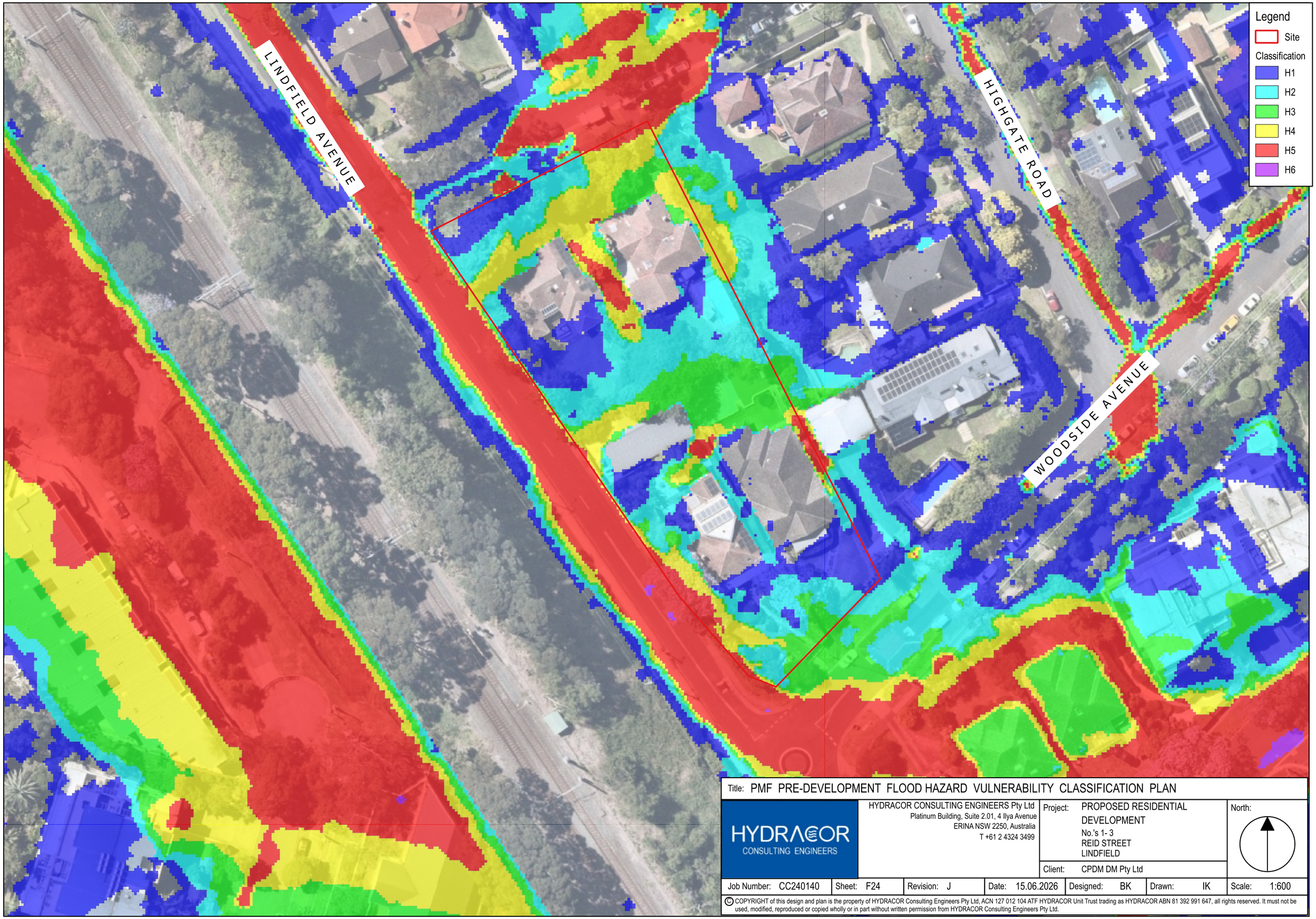

Title: PMF PRE-DEVELOPMENT FLOOD HAZARD VULNERABILITY CLASSIFICATION PLAN

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No.'s 1- 3
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LINDFIELD

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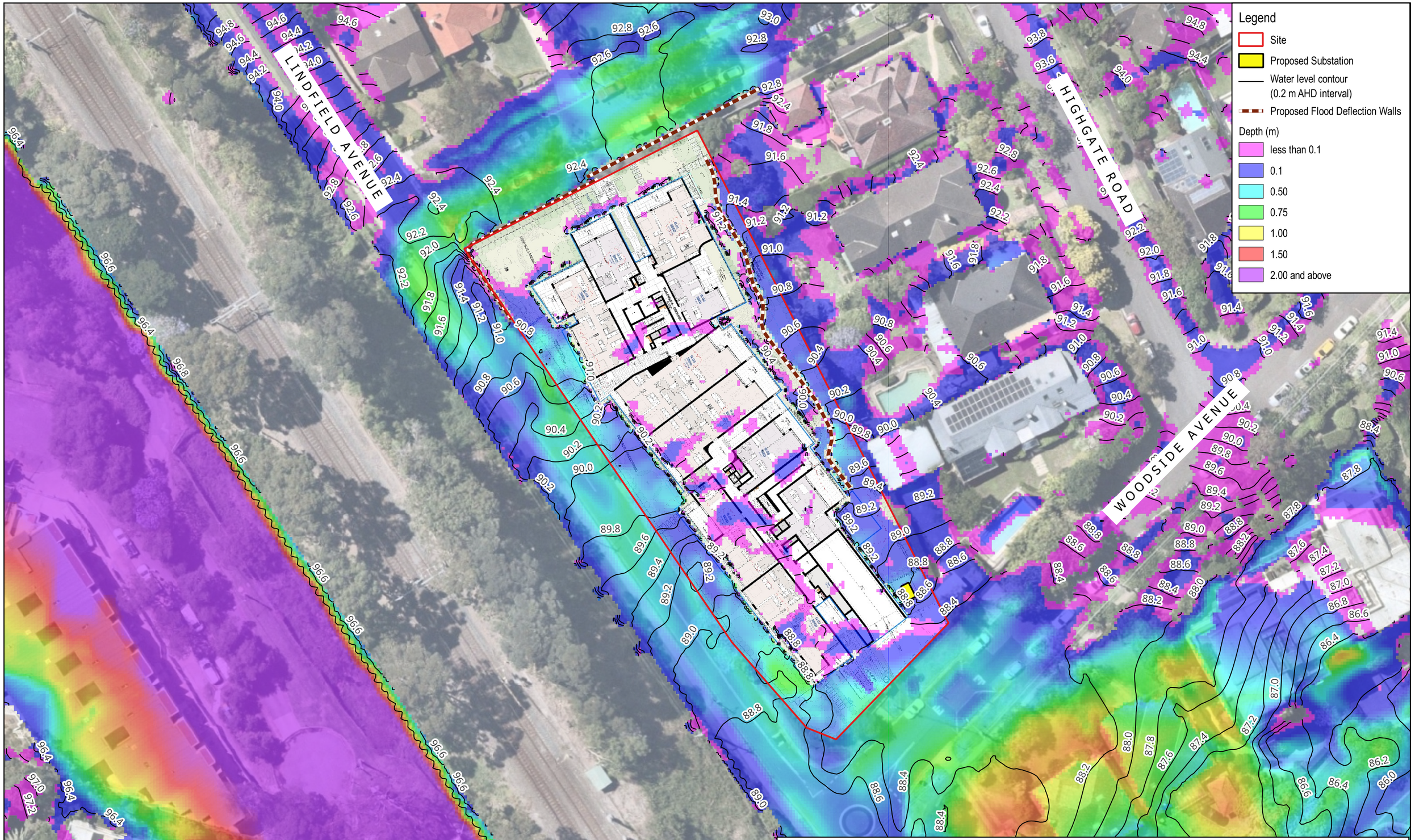

Title: PMF POST-DEVELOPMENT FLOOD DEPTH AND LEVEL PLAN

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No.'s 1- 3
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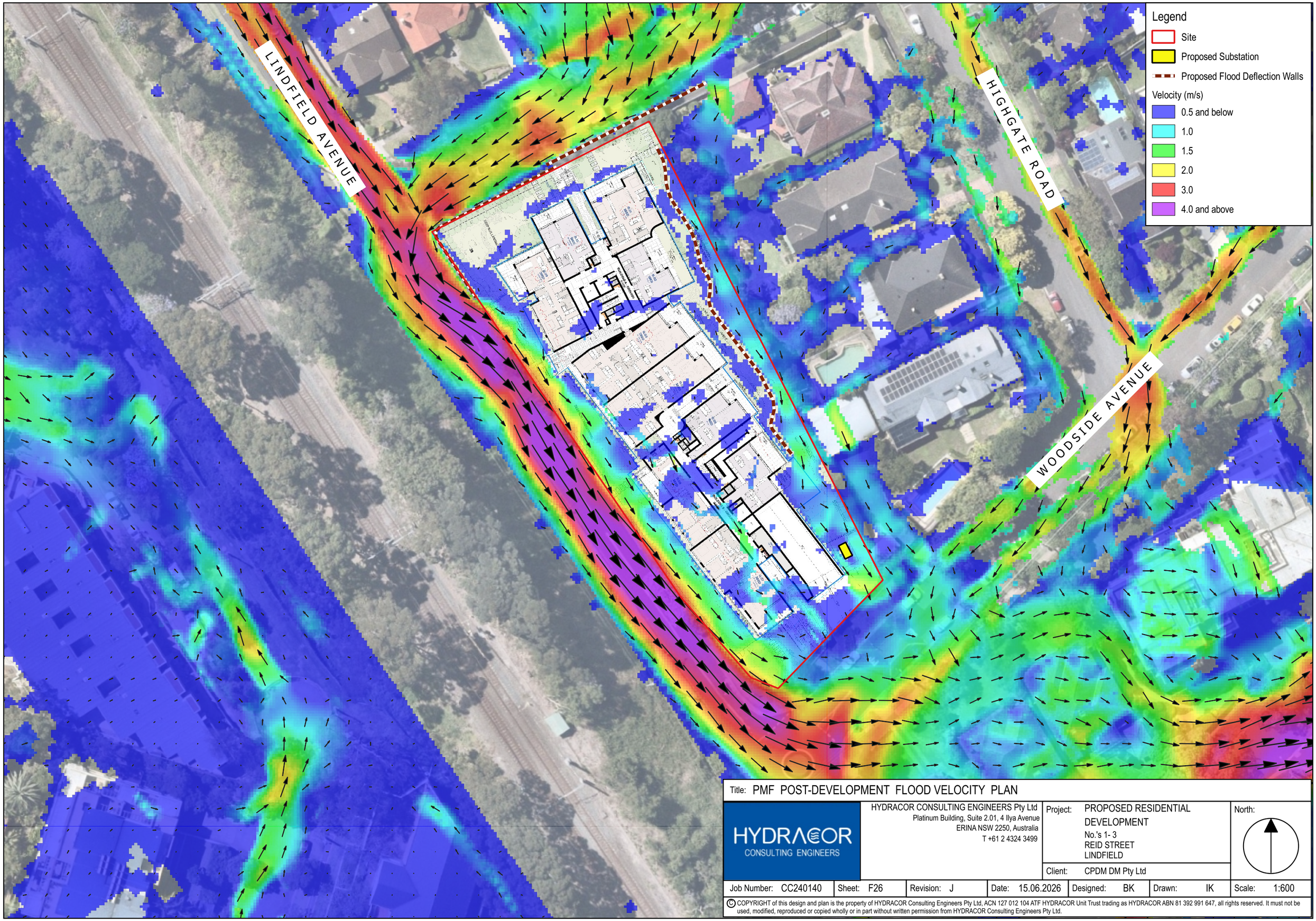

Title: PMF POST-DEVELOPMENT FLOOD VELOCITY PLAN

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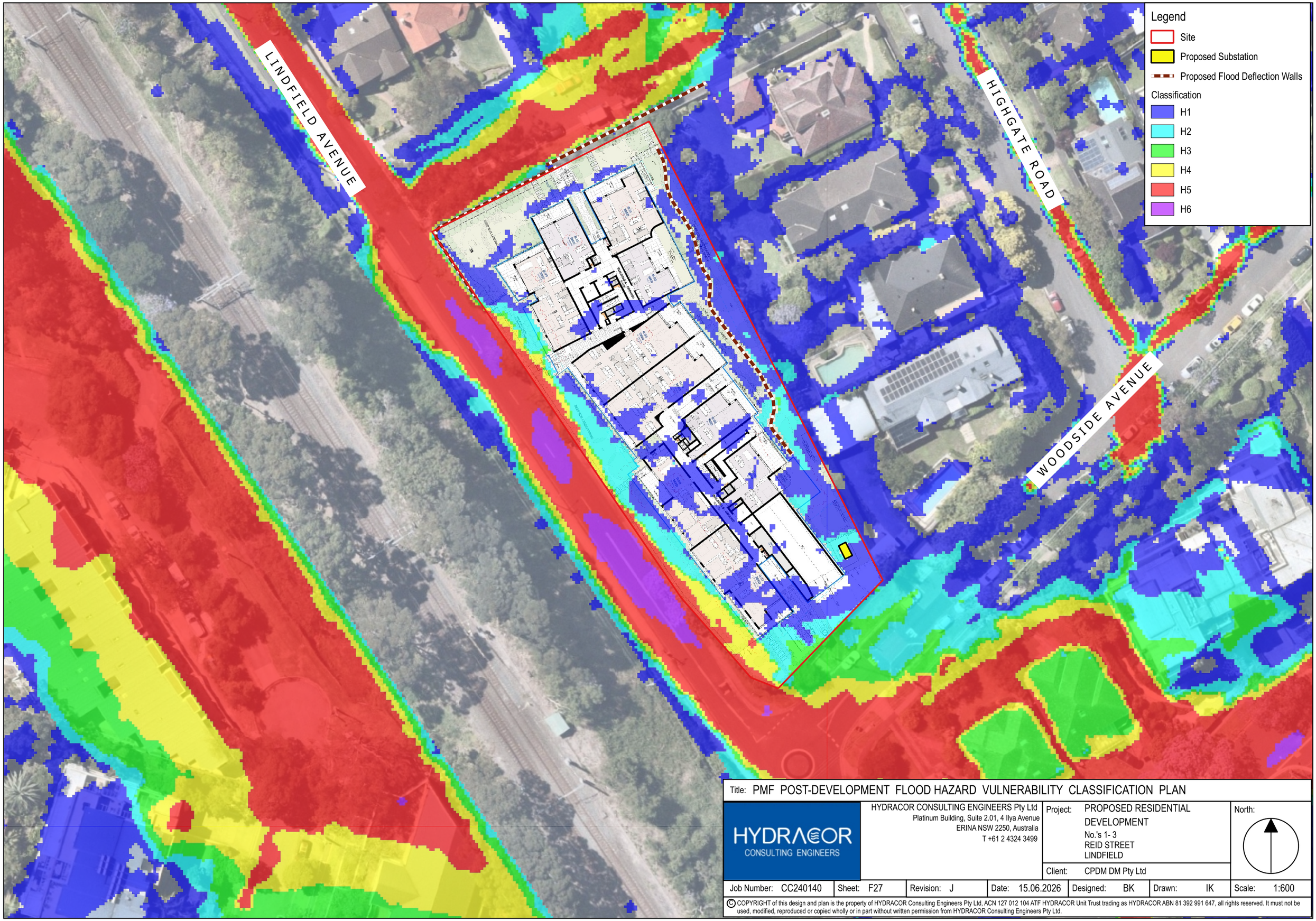

Title: PMF POST-DEVELOPMENT FLOOD HAZARD VULNERABILITY CLASSIFICATION PLAN

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REID STREET
LINDFIELD

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Title: 5% AEP POST-DEVELOPMENT FLOOD LEVEL DIFFERENCE PLAN

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Title: 5% AEP POST-DEVELOPMENT FLOOD HAZARD DIFFERENCE PLAN

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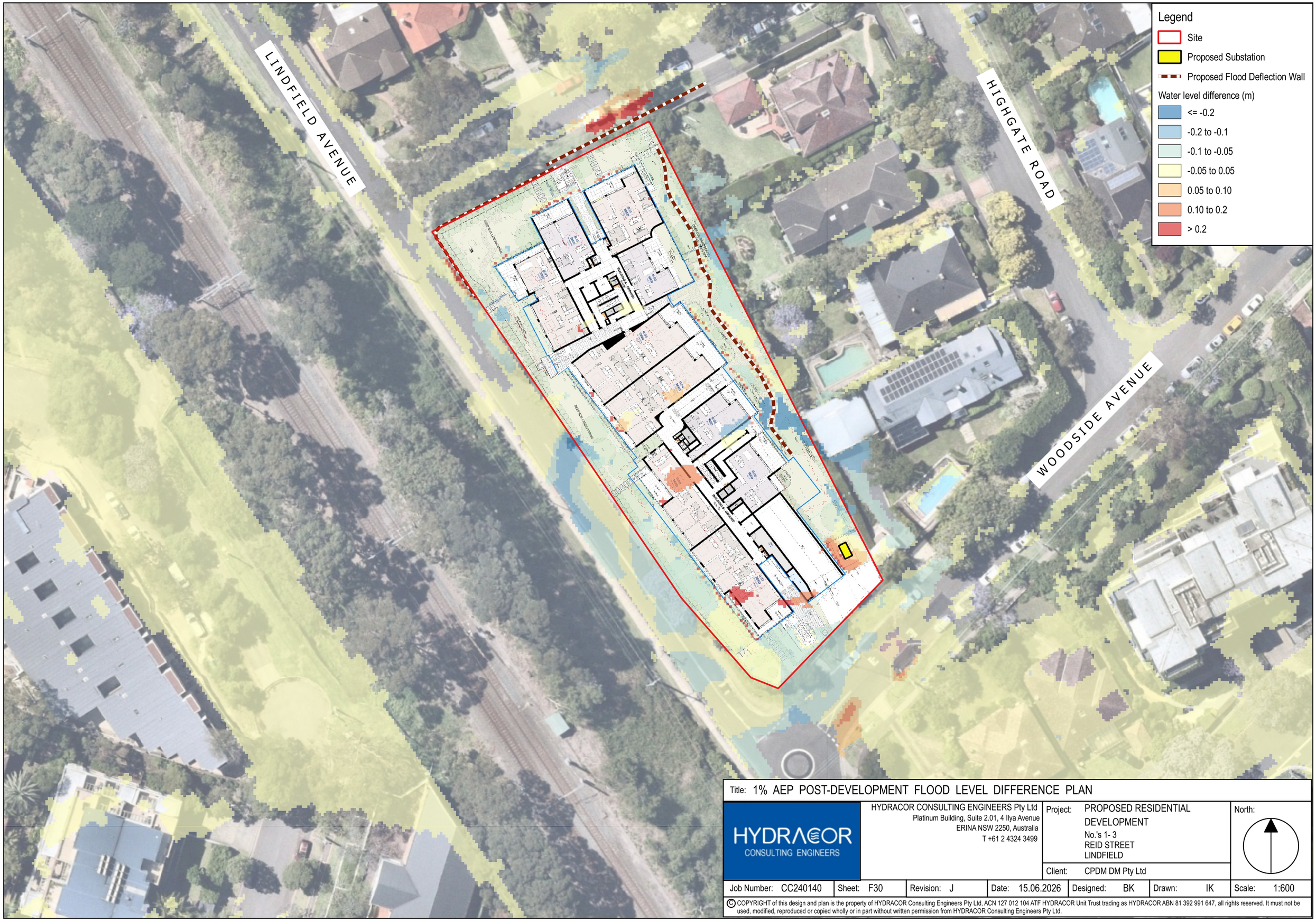

Title: 1% AEP POST-DEVELOPMENT FLOOD LEVEL DIFFERENCE PLAN

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No.'s 1- 3
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Title: 1% AEP POST-DEVELOPMENT FLOOD HAZARD DIFFERENCE PLAN

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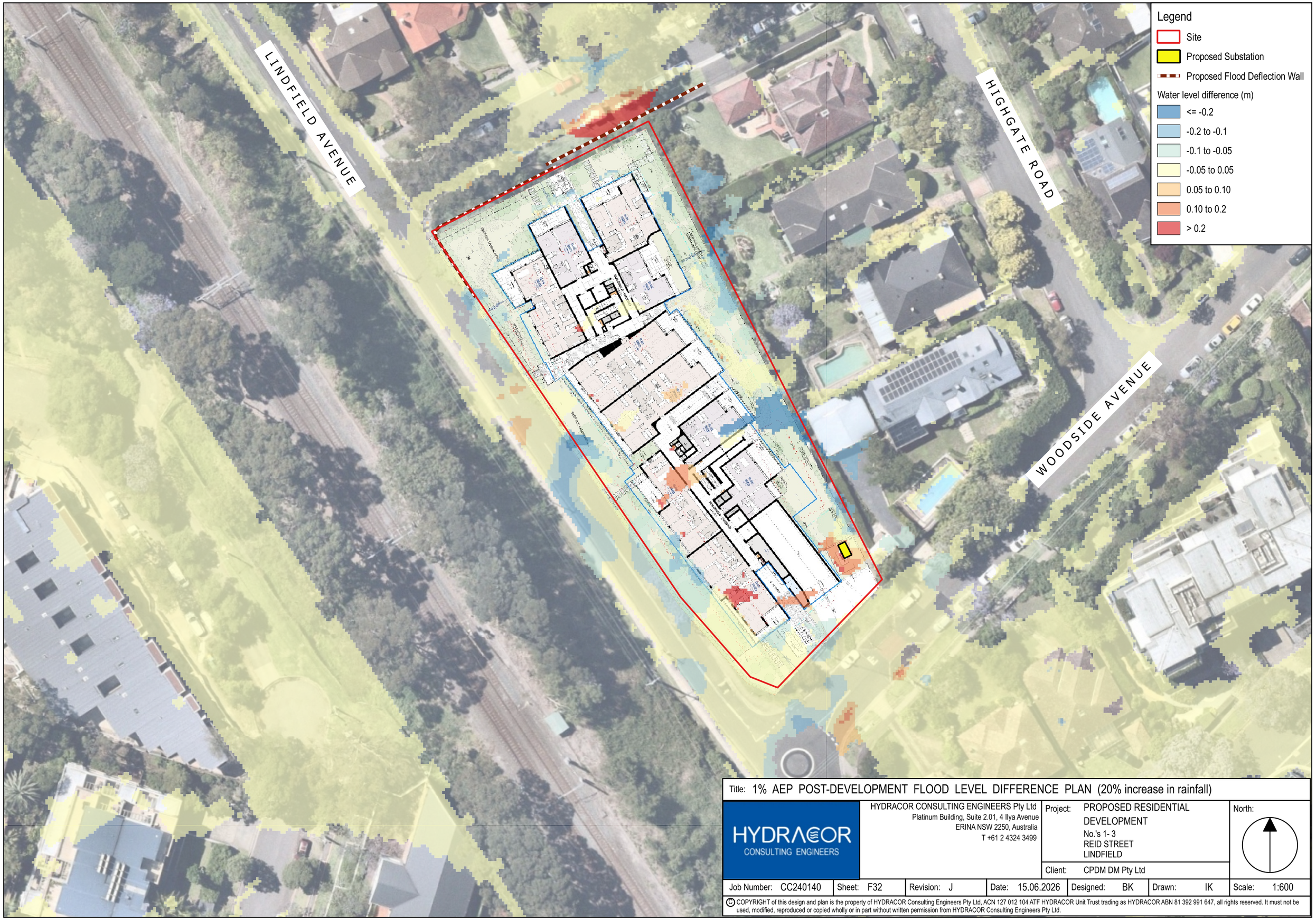

Title: 1% AEP POST-DEVELOPMENT FLOOD LEVEL DIFFERENCE PLAN (20% increase in rainfall)

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Title: 1% AEP POST-DEVELOPMENT FLOOD HAZARD DIFFERENCE PLAN (20% increase in rainfall)

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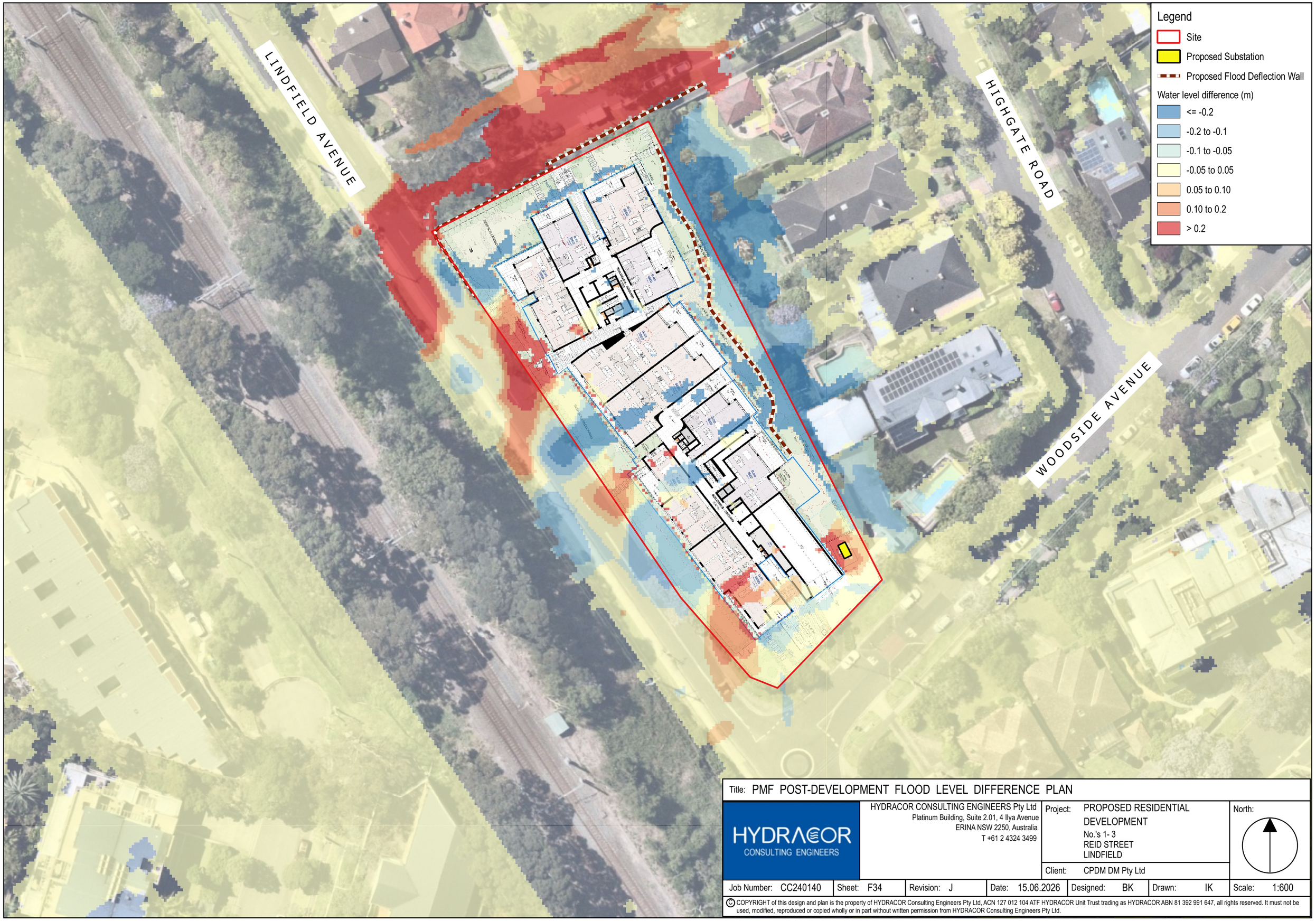

Title: PMF POST-DEVELOPMENT FLOOD LEVEL DIFFERENCE PLAN

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Title: PMF POST-DEVELOPMENT FLOOD HAZARD DIFFERENCE PLAN

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Annexure B Concept Civil Engineering Drawings prepared by HYDRACOR Consulting Engineers Pty Ltd, reference CC240140R, sheets R1 to R10, Revision E, dated 13 April 2026

PROPOSED PUBLIC DOMAIN FLOOD MITIGATION WORKS
No. 1-3 REID ST & 2-4 WOODSIDE AVE, LINDFIELD
CONCEPT CIVIL ENGINEERING DRAWINGS

GENERAL NOTES

1. ALL WORK TO BE CARRIED OUT IN ACCORDANCE WITH THE LOCAL COUNCIL'S RELEVANT CIVIL CONSTRUCTION SPECIFICATION AND STANDARDS AND TO THE SATISFACTION OF COUNCIL'S AND/OR THE PRINCIPAL CERTIFYING AUTHORITY'S INSPECTOR OF WORKS. ANY DISCREPANCY, VARIATION OR ADDITIONAL WORKS SHALL BE APPROVED BY THE BUILDER'S REPRESENTATIVE AND COUNCIL'S REPRESENTATIVE BEFORE PROCEEDING WITH SUCH WORKS.
2. THE LOCAL COUNCIL'S AND THE PRINCIPAL CERTIFYING AUTHORITY'S INSPECTOR OF WORKS IS TO BE NOTIFIED AT LEAST 48 HOURS PRIOR TO THE COMMENCEMENT OF WORKS. THE CONTRACTOR IS TO ESTABLISH THE INSPECTOR'S INSPECTION SCHEDULE REQUIREMENTS AND ENSURE THAT EACH IDENTIFIED STAGE OF WORKS IS ACCORDINGLY INSPECTED.
3. THESE DRAWINGS ARE A DIAGRAMMATIC REPRESENTATION OF WORK TO BE CARRIED OUT ONLY AND DIMENSIONS ARE NOT TO BE SCALED.
4. ALL LEVELS SHALL BE OBTAINED FROM ESTABLISHED BENCH MARKS ONLY. DATUM USED ON THESE DRAWINGS IS AUSTRALIAN HEIGHT DATUM (AHD) UNLESS NOTED OTHERWISE.
5. EROSION AND SEDIMENT CONTROL
   - 5.1. EROSION AND SEDIMENT CONTROL MEASURES ARE TO BE INSTALLED IN ACCORDANCE WITH THE APPROVED EROSION AND SEDIMENT CONTROL PLAN AND TO THE SATISFACTION OF THE PRINCIPAL CERTIFYING AUTHORITY'S INSPECTOR OF WORKS.
   - 5.2. EROSION CONTROL MEASURES ARE TO BE INSTITUTED PRIOR TO THE COMMENCEMENT OF ANY WORKS AND ARE TO BE MAINTAINED BY THE CONTRACTOR FOR THE DURATION OF WORKS.
   - 5.3. THE EXTENT OF DISTURBED SURFACES IS TO BE MINIMISED AS MUCH AS PRACTICABLE DURING THE COURSE OF WORKS.
   - 5.4. ALL FOOTPATHS, FILL BATTERS AND DISTURBED AREAS ARE TO BE TOPSOILED AND TURFED, OR STABILISED BY OTHER APPROVED MEANS, AS SOON AS PRACTICABLE.
6. ALL PUBLIC UTILITY SERVICES ARE TO BE LOCATED ON-SITE BY THE CONTRACTOR PRIOR TO THE COMMENCEMENT OF WORKS. ANY SERVICES SHOWN ON THIS PLAN HAVE BEEN LOCATED FROM INFORMATION SUPPLIED BY SURVEY PLANS AND/OR RELEVANT AUTHORITIES. THE PRESENCE, LOCATION AND EXTENT OF SERVICES SHOWN ARE NOT GUARANTEED COMPLETE OR CORRECT. ANY ADJUSTMENTS OR REPAIRS REQUIRED TO SERVICES ARE TO BE UNDERTAKEN AT THE CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE RELEVANT AUTHORITY.
7. NO TREES PROTECTED UNDER THE LOCAL COUNCIL'S TREE PRESERVATION ORDER ARE TO BE REMOVED UNLESS APPROVED BY DEVELOPMENT CONSENT OR PERMIT OBTAINED FROM COUNCIL.
8. THE CONTRACTOR IS TO ENSURE THAT ALL WORKS ARE CARRIED OUT IN ACCORDANCE WITH THE WORK HEALTH AND SAETY ACT.
9. THE CONTRACTOR IS TO OBTAIN FROM THE BUILDER AND BE AWARE OF THE RELEVANT CONDITIONS OF DEVELOPMENT CONSENT AND/OR CIVIL WORKS APPROVAL.
10. THE CONTRACTOR MUST ENSURE APPROVAL OF MATERIALS BY THE INSPECTOR OF WORKS PRIOR TO DELIVERY TO SITE.
11. WORK INVOLVING THE USE OF MECHANICAL PLANT AND EQUIPMENT IS TO BE UNDERTAKEN ONLY DURING THE HOURS SPECIFIED BY THE LOCAL COUNCIL'S REQUIREMENTS.
12. SMOOTH TRANSITIONS ARE TO BE PROVIDED BETWEEN ALL NEW WORKS AND EXISTING WORKS.
13. WHERE FILL IS PROPOSED ON NATURAL SURFACE SLOPES EXCEEDING ONE (V) IN FOUR (H) (1:4) GRADIENT, BENCHES ARE TO BE CUT TO PREVENT SLIPPING OF FILL MATERIAL AS REQUIRED BY THE LOCAL COUNCIL'S AND/OR THE PRINCIPAL CERTIFYING AUTHORITY'S INSPECTOR OF WORKS. SEE NOTE 22.
14. ALL BATTERS ARE TO BE SCARIFIED TO ASSIST WITH ADHESION OF TOPSOIL TO THE BATTER FACE.
15. INSITU DENSITY TESTS ARE TO BE CARRIED OUT ON ALL SIGNIFICANT FILLS, ROAD SUBGRADES AND PAVEMENT COURSES AS DIRECTED BY THE INSPECTOR OF WORKS. ALL TESTS ARE TO BE CARRIED OUT BY A REGISTERED N.A.T.A. GEOTECHNICAL LABORATORY.
16. ANY WORKS REQUIRING INTERFERENCE TO ADJOINING LOTS ARE TO BE CONSENTED TO IN WRITING BY THE OWNER OF THE RELEVANT LOT PRIOR TO THE COMMENCEMENT OF THOSE WORKS.
17. UPON COMPLETION OF WORKS, ALL RUBBISH, CONSTRUCTION BUILDINGS AND FENCES ETC ARE TO BE REMOVED.
18. PRIOR TO THE COMMENCEMENT OF EARTHWORKS, ALL VEGETATION AND OTHER DELETERIOUS MATERIALS ARE TO BE REMOVED. REMOVAL OF TREES REQUIRES APPROVAL FROM COUNCIL AND THE INSPECTOR OF WORKS.
19. EXISTING TOPSOIL FROM THE SITE IS TO BE STRIPPED AND STOCKPILED FOR LATER RE-USE. REFER TO LANDSCAPING PLANS FOR ANY SPECIAL REQUIREMENTS.
20. FOLLOWING STRIPPING, THE EXPOSED SUBGRADE MATERIALS ARE TO BE INSPECTED TO IDENTIFY ANY UNSOUND AREAS. SUCH AREAS TO BE REMOVED AND REINSTATED TO THE SATISFACTION OF THE INSPECTOR OF WORKS.
21. THE CONTRACTOR IS RESPONSIBLE FOR SETOUT AND LEVEL CONTROL. ANY DISCREPANCIES BETWEEN DESIGN DRAWINGS AND SITE CONDITIONS IS TO BE RESOLVED BY THE INSPECTOR OF WORKS PRIOR TO CONTINUING WORKS.
22. ALL EARTHWORKS SHOULD BE UNDERTAKEN IN ACCORDANCE WITH AS3798-2007. THE GEOTECHNICAL ENGINEER TO IS HAVE A LEVEL 2 RESPONSIBILITY AS DEFINED IN SECTION 8 OF AS 3798-2007 AND SHALL CERTIFY AT THE END OF THE WORKS THAT EARTHWORKS COMPLY WITH THE REQUIREMENTS OF THE SPECIFICATIONS AND DRAWINGS.
23. PROVIDE SMOOTH TRANSITION AT ALL CHANGES IN GRADE UNLESS OTHERWISE SPECIFIED.
24. THE PROJECT ARCHITECT IS TO INSPECT THE WORKS FOLLOWING COMPLETION OF BULK EARTHWORKS AND PRIOR TO COMMENCEMENT OF DETAIL EARTHWORKS.

CIVIL LEGEND

PROPOSED IN CIVIL SITEWORKS PACKAGE HEREWITH

+FSL 4.060	FINISHED SURFACE LEVEL
CH 3900	CENTRELINE CHAINAGE
	STORMWATER DRAINAGE LINE
IL 5.0	INVERT LEVEL UPSTREAM
450Ø RCP '4'	PIPE SIZE, MATERIAL AND CLASS
1.0% 10.0m	PIPE GRADE AND LENGTH
IL 4.9	INVERT LEVEL DOWNSTREAM
P06	STORMWATER DRAINAGE PIT WITH NUMBER (REFER STORMWATER DRAINAGE STRUCTURES SCHEDULE)
	STORMWATER DRAINAGE HEADWALL (REFER STORMWATER DRAINAGE STRUCTURES SCHEDULE)
KO	KERB ONLY
DD	DISH DRAIN
K&G	KERB AND GUTTER
IJ	ISOLATION JOINT
DJ	DOWELLED CONSTRUCTION JOINT
SJ	SAWN CONTRACTION JOINT
	DIRECTION OF OVERLAND FLOW
ST	CIVIL SITEWORKS SETOUT POINT LABEL
T T	DENOTES EXISTING UNDERGROUND TELSTRA SERVICE LINE
W W	DENOTES EXISTING UNDERGROUND WATER SERVICE LINE
E E	DENOTES EXISTING OVERHEAD ELECTRICITY LINE
G G	DENOTES EXISTING UNDERGROUND GAS LINE

IMPORTANT: THE CONTRACTOR IS TO MAINTAIN A CURRENT SET OF "DIAL BEFORE YOU DIG" DRAWINGS ON SITE AT ALL TIMES.

DIAL BEFORE YOU DIG www.1100.com.au

SHEET INDEX

COVER SHEET & NOTES	SHEET R1
REID STREET VERGE PLAN	SHEET R2
REID STREET BACK OF KERB LONG SECTION	SHEET R3
REID STREET VERGE CROSS SECTIONS - SHEET 1 OF 2	SHEET R4
REID STREET VERGE CROSS SECTIONS - SHEET 2 OF 2	SHEET R5
STORMWATER REALIGNMENT OVERVIEW PLAN	SHEET R6
STORMWATER REALIGNMENT PLAN - SHEET 1 OF 3	SHEET R7
STORMWATER REALIGNMENT PLAN - SHEET 2 OF 3	SHEET R8
STORMWATER REALIGNMENT PLAN - SHEET 3 OF 3	SHEET R9
PROPOSED CULVERT DRAINAGE LONG SECTION	SHEET R10

LOCALITY MAP

DRAWINGS MUST BE PRINTED IN COLOUR

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Issue	Description	Date	Drawn	Approved
E	ISSUED FOR APPROVAL	13.04.26	IK	BK
D	ISSUED FOR APPROVAL	17.12.25	IK	BK
-	NIL ISSUE	-	-	-
B	ISSUED FOR INFORMATION	27.11.25	MG	BK

North

Client: CPDM Pty Ltd
SUITE G02, GROUND FLOOR
22 ATCHINSON ST, ST LEONARDS

Architect: PBD ARCHITECTS

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ENGINEERS | CIVIL | FLOOD STUDIES | STORMWATER | HYDRAULIC

Project: PROPOSED PUBLIC DOMAIN FLOOD MITIGATION WORKS
No. 1 - 3 REID STREET
No. 2 - 4 WOODSIDE AVENUE
LINDFIELD

Drawing Title: COVER SHEET & NOTES

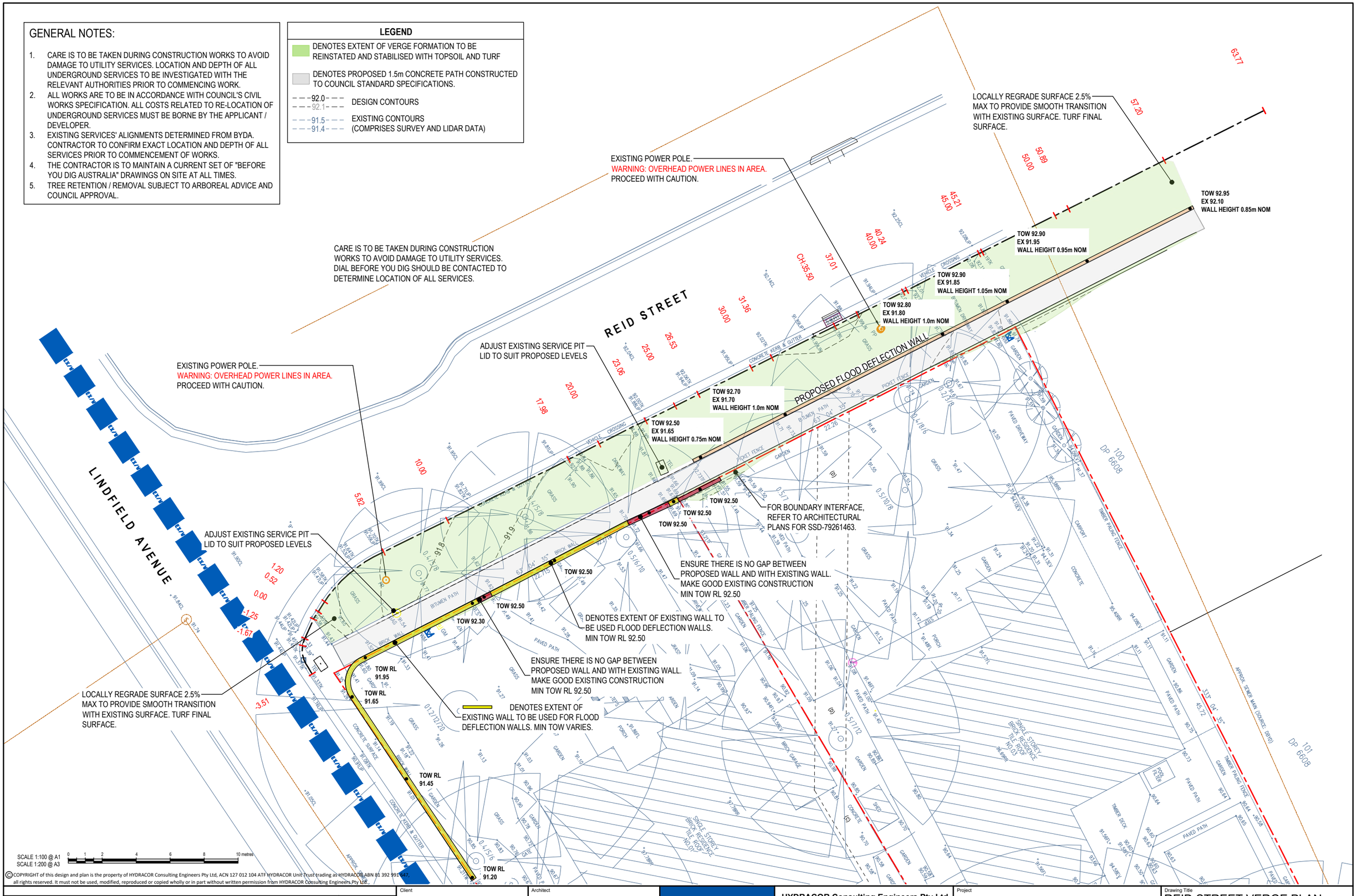
Drawn	Date	Scale A1	Q.A. Check	Date
MG	MAR 2025	AS SHOWN	-	-
Designed	Project No.		Dwg. No.	Issue
BK	CC240140		R1	E

GENERAL NOTES:

1. CARE IS TO BE TAKEN DURING CONSTRUCTION WORKS TO AVOID DAMAGE TO UTILITY SERVICES. LOCATION AND DEPTH OF ALL UNDERGROUND SERVICES TO BE INVESTIGATED WITH THE RELEVANT AUTHORITIES PRIOR TO COMMENCING WORK.
2. ALL WORKS ARE TO BE IN ACCORDANCE WITH COUNCIL'S CIVIL WORKS SPECIFICATION. ALL COSTS RELATED TO RE-LOCATION OF UNDERGROUND SERVICES MUST BE BORNE BY THE APPLICANT / DEVELOPER.
3. EXISTING SERVICES' ALIGNMENTS DETERMINED FROM BYDA. CONTRACTOR TO CONFIRM EXACT LOCATION AND DEPTH OF ALL SERVICES PRIOR TO COMMENCEMENT OF WORKS.
4. THE CONTRACTOR IS TO MAINTAIN A CURRENT SET OF "BEFORE YOU DIG AUSTRALIA" DRAWINGS ON SITE AT ALL TIMES.
5. TREE RETENTION / REMOVAL SUBJECT TO ARBOREAL ADVICE AND COUNCIL APPROVAL.

LEGEND

- DENOTES EXTENT OF VERGE FORMATION TO BE REINSTATED AND STABILISED WITH TOPSOIL AND TURF
- DENOTES PROPOSED 1.5m CONCRETE PATH CONSTRUCTED TO COUNCIL STANDARD SPECIFICATIONS.
- 92.0 DESIGN CONTOURS
- 91.5 EXISTING CONTOURS (COMPRISES SURVEY AND LIDAR DATA)



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E	ISSUED FOR APPROVAL	13.04.26	IK	BK
D	ISSUED FOR APPROVAL	17.12.25	IK	BK
C	ISSUED FOR CO-ORDINATION	02.12.25	IK	BK
B	ISSUED FOR INFORMATION	27.11.25	MG	BK

1cm at full size 10cm

North

Client: CPDM Pty Ltd
SUITE G02, GROUND FLOOR
22 ATCHINSON ST, ST LEONARDS

Architect: PBD ARCHITECTS

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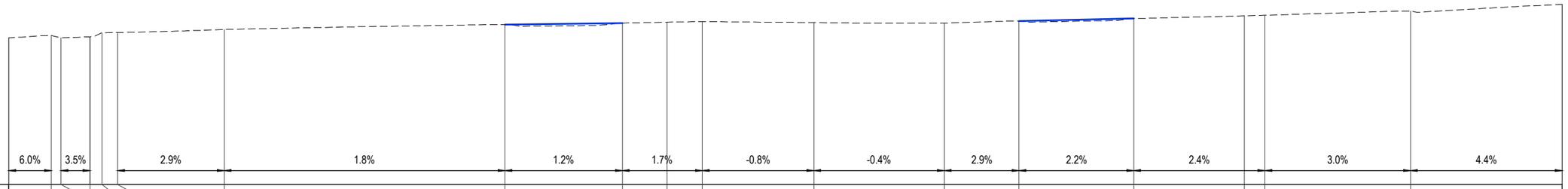
ENGINEERS | CIVIL | FLOOD STUDIES | STORMWATER | HYDRAULIC

Project: PROPOSED PUBLIC DOMAIN FLOOD MITIGATION WORKS
No. 1 - 3 REID STREET
No. 2 - 4 WOODSIDE AVENUE
LINDFIELD

Drawing Title: REID STREET VERGE PLAN

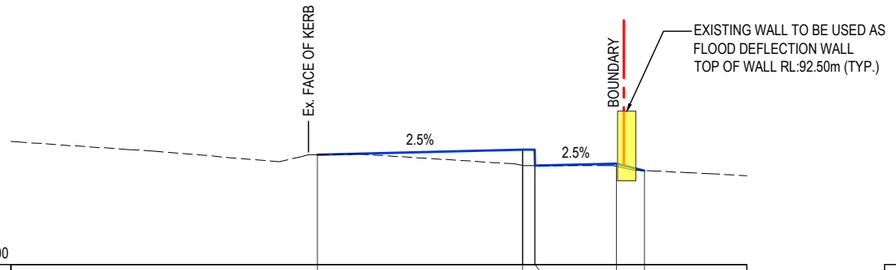
Drawn	Date	Scale	A1	Q.A. Check	Date
MG	MAR 2025	1:100		-	-
Designed	Project No.			Dwg. No.	Issue
BK	CC240140			R2	E



| DATUM R.L 85.0 | | |

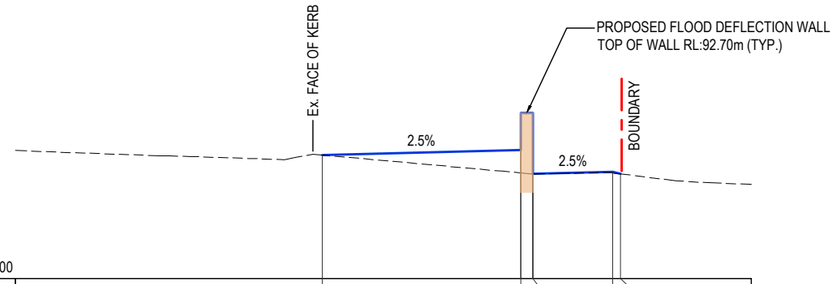
NOTE:
FOR BOUNDARY INTERFACE, REFER TO ARCHITECTURAL PLANS FOR SSD-79261463.

EXISTING KERB AND GUTTER LEVELS TO REMAIN IN REID ST. ONLY TIE IN WORKS REQUIRED WITHIN PAVEMENT.



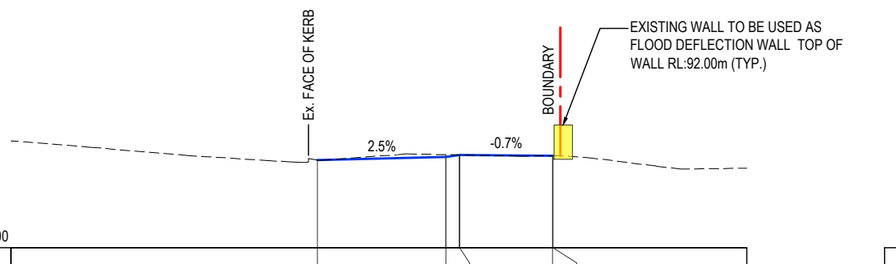
R.L. 90.00										
DESIGN	91.79		91.87	91.61	91.65	91.53				
SURVEY	91.79		91.62	91.61	91.60	91.53				
OFFSETS	0.00		3.34	3.54	4.87	5.33				

CH: 10.0



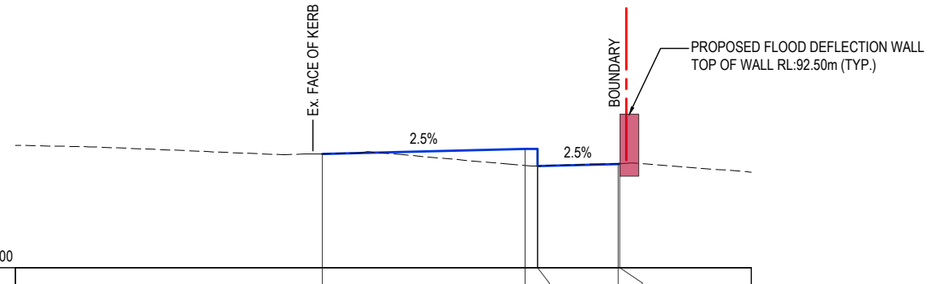
R.L. 90.00										
DESIGN	92.02		92.10	91.71	91.74	91.71				
SURVEY	92.02		91.72	91.71	91.72	91.71				
OFFSETS	0.00		3.24	3.44	4.74	4.86				

CH: 30.0



R.L. 90.00										
DESIGN	91.43		91.48	91.50	91.50	91.50				
SURVEY	91.43		91.52	91.51	91.50	91.50				
OFFSETS	0.00		2.08	2.30	3.79	3.80				

CH: 0



R.L. 90.00										
DESIGN	91.86		91.94	91.66	91.69	91.70				
SURVEY	91.86		91.66	91.66	91.70	91.70				
OFFSETS	0.00		3.31	3.51	4.83	4.85				

CH: 20.0

SCALE 1:50 @ A1
SCALE 1:100 @ A3
0 0.5 1 2 3 4 5 metres

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-	NIL ISSUE	-	-	-
B	ISSUED FOR INFORMATION	27.11.25	MG	BK

0 1cm at full size 10cm

North

Client
CPDM Pty Ltd

SUITE G02, GROUND FLOOR
22 ATCHINSON ST, ST LEONARDS

Architect
PBD ARCHITECTS

HYDRACOR CONSULTING ENGINEERS

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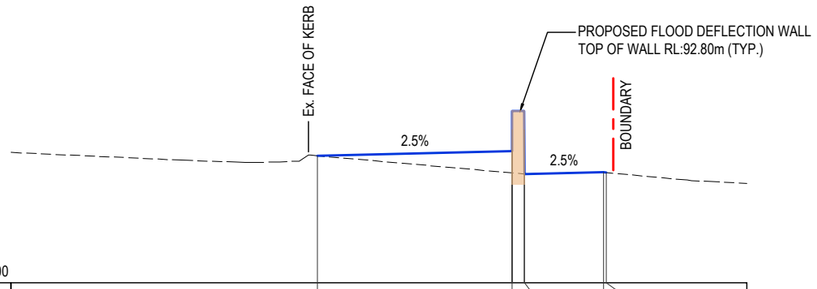
Project
PROPOSED PUBLIC DOMAIN FLOOD MITIGATION WORKS
No. 1 - 3 REID STREET
No. 2 - 4 WOODSIDE AVENUE
LINDFIELD

Drawing Title
REID STREET VERGE CROSS SECTIONS - SHEET 1 OF 2

Drawn	Date	Scale A1	Q.A. Check	Date
MG	MAR 2025	1:100	-	-
Designed	Project No.		Dwg. No.	Issue
BK	CC240140		R4	E

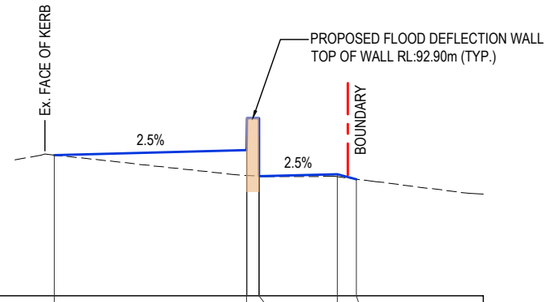
NOTE:
FOR BOUNDARY INTERFACE, REFER TO ARCHITECTURAL PLANS FOR SSD-79261463.

EXISTING KERB AND GUTTER LEVELS TO REMAIN IN REID ST. ONLY TIE IN WORKS REQUIRED WITHIN PAVEMENT.



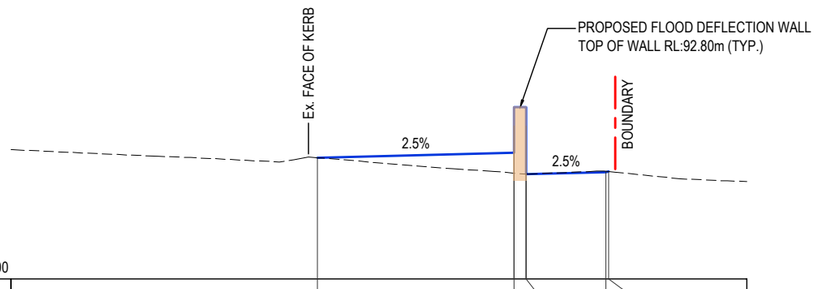
R.L. 90.00							
DESIGN	92.07	92.15	91.78	91.81	91.80		
SURVEY	92.07	91.79	91.78	91.80	91.80		
OFFSETS	0.00	3.17	3.37	4.66	4.71		

CH: 40.0



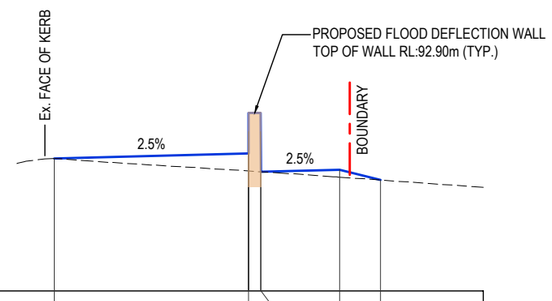
R.L. 90.00							
DESIGN	92.30	92.37	91.95	91.98	91.90		
SURVEY	92.30	91.96	91.95	91.94	91.90		
OFFSETS	0.00	3.14	3.34	4.62	4.93		

CH: 50.0



R.L. 90.00							
DESIGN	91.98	92.06	91.71	91.74	91.75		
SURVEY	91.98	91.73	91.71	91.76	91.75		
OFFSETS	0.00	3.20	3.40	4.70	4.75		

CH: 35.5



R.L. 90.00							
DESIGN	92.16	92.24	91.94	91.98	91.81		
SURVEY	92.16	91.96	91.94	91.86	91.81		
OFFSETS	0.00	3.17	3.37	4.65	5.32		

CH: 45.0

SCALE 1:50 @ A1
SCALE 1:100 @ A3
0 0.5 1 2 3 4 5 metres

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D	ISSUED FOR APPROVAL	17.12.25	IK	BK
-	NIL ISSUE	-	-	-
B	ISSUED FOR INFORMATION	27.11.25	MG	BK

0 1cm at full size 10cm

North

Client
CPDM Pty Ltd
SUITE G02, GROUND FLOOR
22 ATCHINSON ST, ST LEONARDS

Architect
PBD ARCHITECTS

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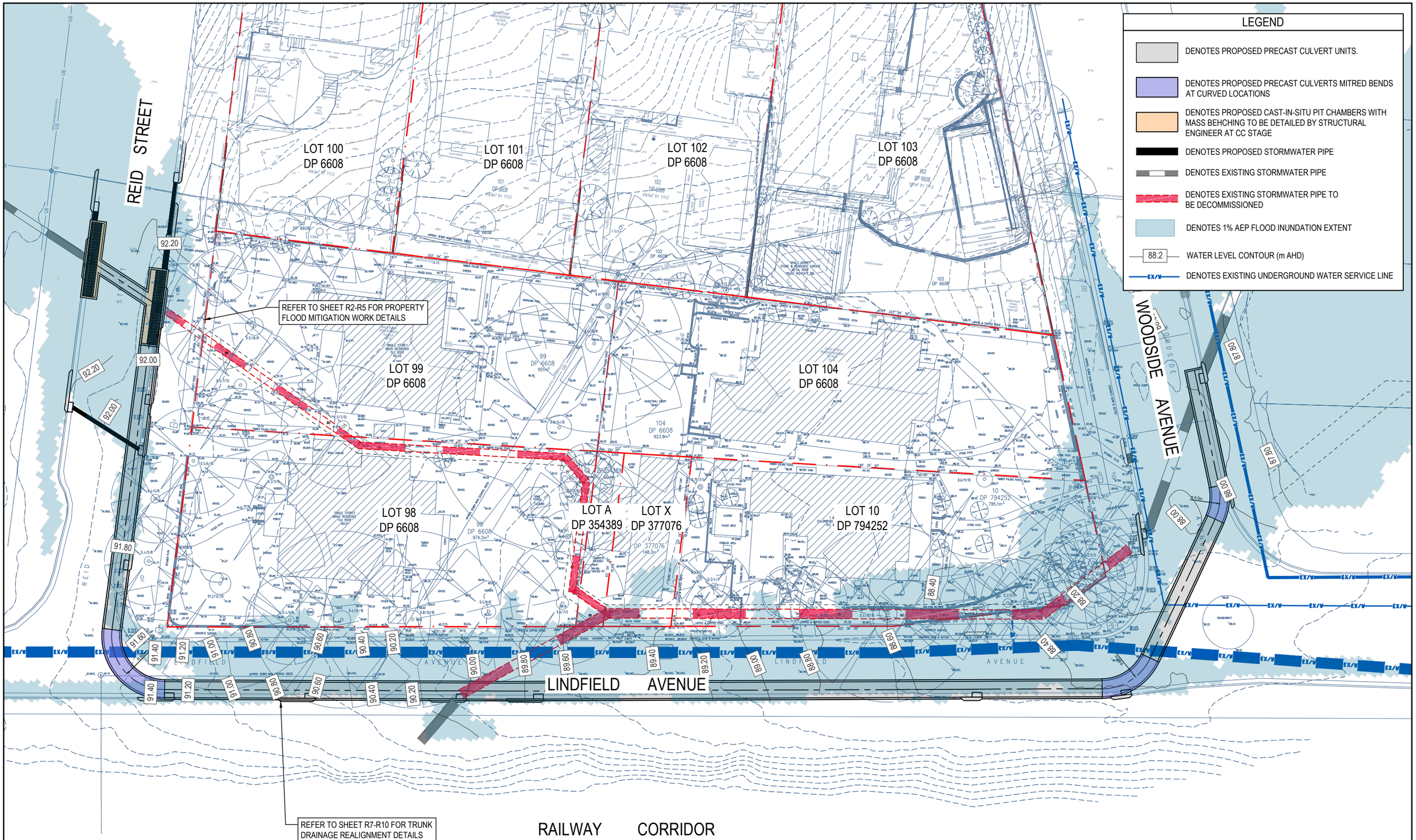
ENGINEERS | CIVIL | FLOOD STUDIES | STORMWATER | HYDRAULIC

Project
PROPOSED PUBLIC DOMAIN FLOOD MITIGATION WORKS
No. 1 - 3 REID STREET
No. 2 - 4 WOODSIDE AVENUE
LINDFIELD

Drawing Title
REID STREET VERGE CROSS SECTIONS - SHEET 2 OF 2

Drawn	Date	Scale A1	Q.A. Check	Date
MG	MAR 2025	1:200	-	-
Designed	Project No.		Dwg. No.	Issue
BK	CC240140		R5	E



STORMWATER REALIGNMENT OVERVIEW PLAN

SCALE - 1:200/A1, 1:400/A3

0 2 4 8 12 16 20m

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D	ISSUED FOR APPROVAL	17.12.25	IK	BK
-	NIL ISSUE	-	-	-
-	NIL ISSUE	-	-	-

1:0 10cm at full size 100cm

North

Client: CPDM Pty Ltd
SUITE G02, GROUND FLOOR
22 ATCHINSON ST, ST LEONARDS

Architect: PBD ARCHITECTS

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Project: PROPOSED PUBLIC DOMAIN FLOOD MITIGATION WORKS
No. 1 - 3 REID STREET
No. 2 - 4 WOODSIDE AVENUE
LINDFIELD

Drawing Title: STORMWATER REALIGNMENT OVERVIEW PLAN

Drawn	Date	Scale A1	Q.A. Check	Date
MG	MAR 2025	1:200	-	-
Designed	**Project No.**		**Dwg. No.**	**Issue**
BK	CC240140		R6	E

DRAINAGE LEGEND

- DENOTES PROPOSED PRECAST CULVERT UNITS.
- DENOTES PROPOSED PRECAST CULVERTS MITRED BENDS AT CURVED LOCATIONS
- DENOTES PROPOSED CAST-IN-SITU PIT CHAMBERS WITH MASS BEHCHING TO BE DETAILED BY STRUCTURAL ENGINEER AT CC STAGE
- DENOTES PROPOSED STORMWATER PIPE
- DENOTES EXISTING STORMWATER PIPE
- DENOTES EXISTING STORMWATER PIPE TO BE DECOMMISSIONED

PIT P4
PROPOSED 4.2m KERB INLET PIT WITH HEAVY DUTY GRATED INLET CONSTRUCTED TO COUNCIL STANDARDS
TOP OF GRATE - 92.00 nom

PIT P1
REPLACE EXISTING KERB INLET PIT WITH 4.2m LONG LINTEL AND 10000 x 1200 CUSTOM HEAVY DUTY GRATED INLET
CONSTRUCT CAST IN SITU CHAMBER TO SUIT PROPOSED CULVERT CONNECTION TO BE DETAILED BY STRUCTURAL ENGINEER AT CC STAGE.
PROVIDE MASS CONCRETE BENCHING.
TOP OF GRATE - 92.33 NOM.

IL U/S 90.35
600Ø RCP CLASS 4
5.0% MIN
1.0m
IL D/S 90.30

PIT P1A
REPLACE EXISTING KERB INLET PIT WITH 4.2m KERB INLET PIT WITH HEAVY DUTY GRATED INLET CONSTRUCTED TO COUNCIL STANDARDS
TOP OF GRATE - 92.15 nom

PIT P2A
REPLACE EXISTING KERB INLET PIT WITH 4.2m KERB INLET PIT WITH HEAVY DUTY GRATED INLET CONSTRUCTED TO COUNCIL STANDARDS
TOP OF GRATE - 92.15 nom

IL U/S 90.40
600Ø RCP CLASS 4
1.0% MIN
2.8m
IL D/S 90.35

IL U/S 90.20
450Ø RCP CLASS 4
5.0% MIN
8.8m
IL D/S 89.75

IL U/S 90.50
450Ø RCP CLASS 4
1.0% MIN
6.0m
IL D/S 90.40

REFER TO CULVERT REALIGNMENT LONG SECTION ON SHEET R10

PIT P2B
PROPOSED 4.2m KERB INLET PIT WITH HEAVY DUTY GRATED INLET CONSTRUCTED TO COUNCIL STANDARDS
TOP OF GRATE - 92.05 nom

PIT P2
REPLACE EXISTING KERB INLET PIT WITH 4.2m LONG LINTEL AND 10000 x 1200 CUSTOM HEAVY DUTY GRATED INLET
CONSTRUCT CAST IN SITU CHAMBER TO SUIT PROPOSED CULVERT CONNECTION TO BE DETAILED BY STRUCTURAL ENGINEER AT CC STAGE.
PROVIDE MASS CONCRETE BENCHING.
TOP OF GRATE - 91.99 nom.

PIT P3
PROPOSED 4.2m KERB INLET PIT WITH HEAVY DUTY GRATED INLET CONSTRUCTED TO COUNCIL STANDARDS
TOP OF GRATE - 91.90 nom

PIT P4
PROPOSED 4.2m KERB INLET PIT WITH HEAVY DUTY GRATED INLET CONSTRUCTED TO COUNCIL STANDARDS
TOP OF GRATE - 91.85 nom

PIT P5
PROPOSED 3.0m KERB INLET PIT WITH HEAVY DUTY GRATED INLET CONSTRUCTED TO COUNCIL STANDARDS
TOP OF GRATE - 91.60 nom

PIT P6
PROPOSED 3.6m KERB INLET PIT WITH HEAVY DUTY GRATED INLET CONSTRUCTED TO COUNCIL STANDARDS
TOP OF GRATE - 91.25 nom

JOINS SHEET R8

EXISTING 750 Ø
EXISTING 750 DIA STORMWATER PIPE TO BE DECOMMISSIONED
PROPOSED RCBC 1200 x 750
PROPOSED RCBC 1800 x 1200
PROPOSED RCBC 1800 x 1200
REID STREET
LINDFIELD AVENUE
CH 0
CH 9.10
CH 20.00
CH 40.00
CT 46.21
R 6.0m
CT 55.38
CH 60.00
DP 6608
DP 6608
DP 6608

JOINS SHEET R7

PIT P7
PROPOSED 3.6m KERB INLET PIT WITH HEAVY DUTY GRATED INLET CONSTRUCTED TO COUNCIL STANDARDS
TOP OF GRATE - 90.57 nom

REFER TO CULVERT REALIGNMENT LONG SECTION ON SHEET R10

PIT P8
REPLACE EXISTING KIP WITH PROPOSED 3.6m KERB INLET PIT WITH HEAVY DUTY GRATED INLET CONSTRUCTED TO COUNCIL STANDARDS
DECOMMISSION DOWNSTREAM AND MAKE GOOD EXISTING Ø1050 DIA CONNECTION
TOP OF GRATE - 89.99 nom

PIT P9
PROPOSED 3.6m KERB INLET PIT WITH HEAVY DUTY GRATED INLET CONSTRUCTED TO COUNCIL STANDARDS
TOP OF GRATE - 89.63 nom

PROPOSED RCBC 1800 x 1200

EXISTING. 1050 Ø

EXISTING 1050 DIA STORMWATER PIPE TO BE DECOMMISSIONED

EXISTING 750 DIA STORMWATER PIPE TO BE DECOMMISSIONED

LINDFIELD AVENUE

CH 0.00

CH 120.00

JOINS SHEET R9

DRAINAGE LEGEND

- DENOTES PROPOSED PRECAST CULVERT UNITS.
- DENOTES PROPOSED PRECAST CULVERTS MITRED BENDS AT CURVED LOCATIONS
- DENOTES PROPOSED CAST-IN-SITU PIT CHAMBERS WITH MASS BEHCHING TO BE DETAILED BY STRUCTURAL ENGINEER AT CC STAGE
- DENOTES PROPOSED STORMWATER PIPE
- DENOTES EXISTING STORMWATER PIPE
- DENOTES EXISTING STORMWATER PIPE TO BE DECOMMISSIONED

SCALE 1:100 @ A1
SCALE 1:200 @ A3
0 1 2 4 6 8 10 metres

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Issue	Description	Date	Drawn	Approved
E	ISSUED FOR APPROVAL	13.04.26	IK	BK
D	ISSUED FOR APPROVAL	17.12.25	IK	BK
-	NIL ISSUE	-	-	-
-	NIL ISSUE	-	-	-

0 10cm at full size 100cm

North

Client
CPDM Pty Ltd
SUITE G02, GROUND FLOOR
22 ATCHINSON ST, ST LEONARDS

Architect
PBD ARCHITECTS

HYDRACOR CONSULTING ENGINEERS
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ENGINEERS | CIVIL | FLOOD STUDIES | STORMWATER | HYDRAULIC

Project
PROPOSED PUBLIC DOMAIN FLOOD MITIGATION WORKS
No. 1 - 3 REID STREET
No. 2 - 4 WOODSIDE AVENUE
LINDFIELD

Drawing Title
STORMWATER REALIGNMENT PLAN - SHEET 2 OF 3

Drawn	Date	Scale A1	Q.A. Check	Date
MG	MAR 2025	1:100	-	-
Designed	Project No.		Dwg. No.	Issue
BK	CC240140		R8	E

JOINS SHEET R8

VIEW PLAN

CH 120.00

CH 140.00

CH 160.00

CT 162.15

CT 168.93

CT 180.00

CT 186.21

CT 190.08

CH 200.00

CH 203.37

LINDFIELD AVENUE

WOODSIDE AVENUE

PROPOSED RCBC
1800 x 1200

EXISTING 1050 DIA STORMWATER PIPE TO BE DECOMMISSIONED

EXISTING. 1050 Ø

R 6.0m

PIT P10
PROPOSED 1.8m KERB INLET PIT WITH HEAVY DUTY GRATED INLET CONSTRUCTED TO COUNCIL STANDARDS
TOP OF GRATE - 88.47 nom

PIT P11
REPLACE EXISTING KIP WITH PROPOSED 1.8m KERB INLET PIT WITH HEAVY DUTY GRATED INLET CONSTRUCTED TO COUNCIL STANDARDS
TOP OF GRATE - 88.42 nom

PIT EX1
REPLACE EXISTING KIP WITH PROPOSED 4.2m KERB INLET PIT WITH HEAVY DUTY GRATED INLET CONSTRUCTED TO COUNCIL STANDARDS
TOP OF GRATE - 87.60 nom

PIT P12
REPLACE EXISTING KIP WITH PROPOSED 1.8m KERB INLET PIT WITH HEAVY DUTY GRATED INLET CONSTRUCTED TO COUNCIL STANDARDS
TOP OF GRATE - 87.75 nom

PIT P13
REPLACE EXISTING KIP WITH PROPOSED 1.8m KERB INLET PIT WITH HEAVY DUTY GRATED INLET CONSTRUCTED TO COUNCIL STANDARDS
MAKE GOOD EXISTING CONSTRUCTION.
INVERT LEVEL OF OUTLET SHALL BE SITE CONFIRMED PRIOR TO COMMENCEMENT OF WORKS
TOP OF GRATE - 87.86 nom

REFER TO CULVERT REALIGNMENT LONG SECTION ON SHEET R10

DRAINAGE LEGEND

- DENOTES PROPOSED PRECAST CULVERT UNITS.
- DENOTES PROPOSED PRECAST CULVERTS MITRED BENDS AT CURVED LOCATIONS
- DENOTES PROPOSED CAST-IN-SITU PIT CHAMBERS WITH MASS BEHCHING TO BE DETAILED BY STRUCTURAL ENGINEER AT CC STAGE
- DENOTES PROPOSED STORMWATER PIPE
- DENOTES EXISTING STORMWATER PIPE
- DENOTES EXISTING STORMWATER PIPE TO BE DECOMMISSIONED

SCALE 1:100 @ A1
SCALE 1:200 @ A3
0 1 2 4 6 8 10 metres

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D	ISSUED FOR APPROVAL	17.12.25	IK	BK
-	NIL ISSUE	-	-	-
-	NIL ISSUE	-	-	-

1cm at full size 10cm

North

Client: CPDM Pty Ltd
SUITE G02, GROUND FLOOR
22 ATCHINSON ST, ST LEONARDS

Architect: PBD ARCHITECTS

HYDRACOR CONSULTING ENGINEERS
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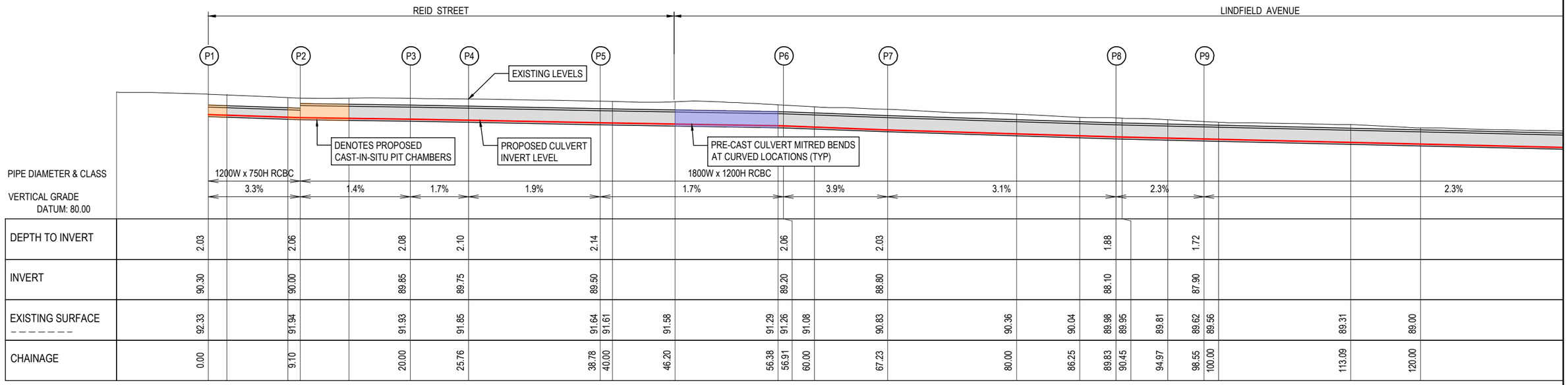
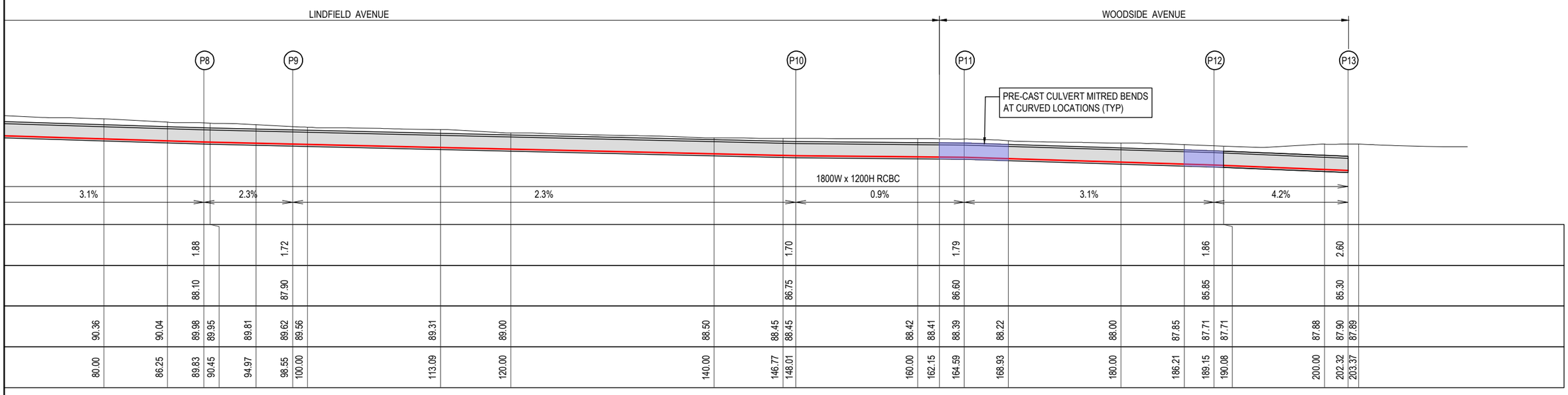
ENGINEERS | CIVIL | FLOOD STUDIES | STORMWATER | HYDRAULIC

Project: PROPOSED PUBLIC DOMAIN FLOOD MITIGATION WORKS
No. 1 - 3 REID STREET
No. 2 - 4 WOODSIDE AVENUE
LINDFIELD

Drawing Title: STORMWATER REALIGNMENT PLAN - SHEET 3 OF 3

Drawn	Date	Scale A1	Q.A. Check	Date
MG	MAR 2025	1:100	-	-
Designed	Project No.		Dwg. No.	Issue
BK	CC240140		R9	E





PROPOSED CULVERT DRAINAGE LONG SECTION

VERT & HORI SCALE - 1:200/A1, 1:400/A3

0 2 4 8 12 16 20m

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-	NIL ISSUE	-	-	-

0 1cm at full size 10cm

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Client: CPDM Pty Ltd
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22 ATCHINSON ST, ST LEONARDS

Architect: PBD ARCHITECTS

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ENGINEERS | CIVIL | FLOOD STUDIES | STORMWATER | HYDRAULIC

Project: PROPOSED PUBLIC DOMAIN FLOOD MITIGATION WORKS
No. 1 - 3 REID STREET
No. 2 - 4 WOODSIDE AVENUE
LINDFIELD

Drawing Title: PROPOSED CULVERT DRAINAGE LONG SECTION

Drawn	Date	Scale A1	Q.A. Check	Date
MG	MAR 2025	1:200	-	-
Designed	Project No.		Dwg. No.	Issue
BK	CC240140		R10	E

Annexure C HYDRACOR Consulting Engineers Pty Ltd Flood Mitigation Plans, Reference CC240140FM, sheets FM1 to FM3, Revision A, dated 22 May 2026

PROPOSED DEVELOPMENT
(No.1-3) REID STREET & (2-4) WOODSIDE AVENUE, LINDFIELD
FLOOD MITIGATION PLANS

GENERAL NOTES

1. ALL WORK TO BE CARRIED OUT IN ACCORDANCE WITH THE LOCAL COUNCIL'S RELEVANT CIVIL CONSTRUCTION SPECIFICATION AND STANDARDS AND TO THE SATISFACTION OF COUNCIL'S AND/OR THE PRINCIPAL CERTIFYING AUTHORITY'S INSPECTOR OF WORKS. ANY DISCREPANCY, VARIATION OR ADDITIONAL WORKS SHALL BE APPROVED BY THE BUILDER'S REPRESENTATIVE AND COUNCIL'S REPRESENTATIVE BEFORE PROCEEDING WITH SUCH WORKS.
2. THE LOCAL COUNCIL'S AND THE PRINCIPAL CERTIFYING AUTHORITY'S INSPECTOR OF WORKS IS TO BE NOTIFIED AT LEAST 48 HOURS PRIOR TO THE COMMENCEMENT OF WORKS. THE CONTRACTOR IS TO ESTABLISH THE INSPECTOR'S INSPECTION SCHEDULE REQUIREMENTS AND ENSURE THAT EACH IDENTIFIED STAGE OF WORKS IS ACCORDINGLY INSPECTED.
3. THESE DRAWINGS ARE A DIAGRAMMATIC REPRESENTATION OF WORK TO BE CARRIED OUT ONLY AND DIMENSIONS ARE NOT TO BE SCALED.
4. ALL LEVELS SHALL BE OBTAINED FROM ESTABLISHED BENCH MARKS ONLY. DATUM USED ON THESE DRAWINGS IS AUSTRALIAN HEIGHT DATUM (AHD) UNLESS NOTED OTHERWISE.
5. EROSION AND SEDIMENT CONTROL
   - 5.1. EROSION AND SEDIMENT CONTROL MEASURES ARE TO BE INSTALLED IN ACCORDANCE WITH THE APPROVED EROSION AND SEDIMENT CONTROL PLAN AND TO THE SATISFACTION OF THE PRINCIPAL CERTIFYING AUTHORITY'S INSPECTOR OF WORKS.
   - 5.2. EROSION CONTROL MEASURES ARE TO BE INSTITUTED PRIOR TO THE COMMENCEMENT OF ANY WORKS AND ARE TO BE MAINTAINED BY THE CONTRACTOR FOR THE DURATION OF WORKS.
   - 5.3. THE EXTENT OF DISTURBED SURFACES IS TO BE MINIMISED AS MUCH AS PRACTICABLE DURING THE COURSE OF WORKS.
   - 5.4. ALL FOOTPATHS, FILL BATTERS AND DISTURBED AREAS ARE TO BE TOPSOILED AND TURFED, OR STABILISED BY OTHER APPROVED MEANS, AS SOON AS PRACTICABLE.
6. ALL PUBLIC UTILITY SERVICES ARE TO BE LOCATED ON-SITE BY THE CONTRACTOR PRIOR TO THE COMMENCEMENT OF WORKS. ANY SERVICES SHOWN ON THIS PLAN HAVE BEEN LOCATED FROM INFORMATION SUPPLIED BY SURVEY PLANS AND/OR RELEVANT AUTHORITIES. THE PRESENCE, LOCATION AND EXTENT OF SERVICES SHOWN ARE NOT GUARANTEED COMPLETE OR CORRECT. ANY ADJUSTMENTS OR REPAIRS REQUIRED TO SERVICES ARE TO BE UNDERTAKEN AT THE CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE RELEVANT AUTHORITY.
7. NO TREES PROTECTED UNDER THE LOCAL COUNCIL'S TREE PRESERVATION ORDER ARE TO BE REMOVED UNLESS APPROVED BY DEVELOPMENT CONSENT OR PERMIT OBTAINED FROM COUNCIL.
8. THE CONTRACTOR IS TO ENSURE THAT ALL WORKS ARE CARRIED OUT IN ACCORDANCE WITH THE WORK HEALTH AND SAETY ACT.
9. THE CONTRACTOR IS TO OBTAIN FROM THE BUILDER AND BE AWARE OF THE RELEVANT CONDITIONS OF DEVELOPMENT CONSENT AND/OR CIVIL WORKS APPROVAL.
10. THE CONTRACTOR MUST ENSURE APPROVAL OF MATERIALS BY THE INSPECTOR OF WORKS PRIOR TO DELIVERY TO SITE.
11. WORK INVOLVING THE USE OF MECHANICAL PLANT AND EQUIPMENT IS TO BE UNDERTAKEN ONLY DURING THE HOURS SPECIFIED BY THE LOCAL COUNCIL'S REQUIREMENTS.
12. SMOOTH TRANSITIONS ARE TO BE PROVIDED BETWEEN ALL NEW WORKS AND EXISTING WORKS.
13. WHERE FILL IS PROPOSED ON NATURAL SURFACE SLOPES EXCEEDING ONE (V) IN FOUR (H) (1:4) GRADIENT, BENCHES ARE TO BE CUT TO PREVENT SLIPPING OF FILL MATERIAL AS REQUIRED BY THE LOCAL COUNCIL'S AND/OR THE PRINCIPAL CERTIFYING AUTHORITY'S INSPECTOR OF WORKS. SEE NOTE 22.
14. ALL BATTERS ARE TO BE SCARIFIED TO ASSIST WITH ADHESION OF TOPSOIL TO THE BATTER FACE.
15. INSITU DENSITY TESTS ARE TO BE CARRIED OUT ON ALL SIGNIFICANT FILLS, ROAD SUBGRADES AND PAVEMENT COURSES AS DIRECTED BY THE INSPECTOR OF WORKS. ALL TESTS ARE TO BE CARRIED OUT BY A REGISTERED N.A.T.A. GEOTECHNICAL LABORATORY.
16. ANY WORKS REQUIRING INTERFERENCE TO ADJOINING LOTS ARE TO BE CONSENTED TO IN WRITING BY THE OWNER OF THE RELEVANT LOT PRIOR TO THE COMMENCEMENT OF THOSE WORKS.
17. UPON COMPLETION OF WORKS, ALL RUBBISH, CONSTRUCTION BUILDINGS AND FENCES ETC ARE TO BE REMOVED.
18. PRIOR TO THE COMMENCEMENT OF EARTHWORKS, ALL VEGETATION AND OTHER DELETERIOUS MATERIALS ARE TO BE REMOVED. REMOVAL OF TREES REQUIRES APPROVAL FROM COUNCIL AND THE INSPECTOR OF WORKS.
19. EXISTING TOPSOIL FROM THE SITE IS TO BE STRIPPED AND STOCKPILED FOR LATER RE-USE. REFER TO LANDSCAPING PLANS FOR ANY SPECIAL REQUIREMENTS.
20. FOLLOWING STRIPPING, THE EXPOSED SUBGRADE MATERIALS ARE TO BE INSPECTED TO IDENTIFY ANY UNSOUND AREAS. SUCH AREAS TO BE REMOVED AND REINSTATED TO THE SATISFACTION OF THE INSPECTOR OF WORKS.
21. THE CONTRACTOR IS RESPONSIBLE FOR SETOUT AND LEVEL CONTROL. ANY DISCREPANCIES BETWEEN DESIGN DRAWINGS AND SITE CONDITIONS IS TO BE RESOLVED BY THE INSPECTOR OF WORKS PRIOR TO CONTINUING WORKS.
22. ALL EARTHWORKS SHOULD BE UNDERTAKEN IN ACCORDANCE WITH AS3798-2007. THE GEOTECHNICAL ENGINEER TO IS HAVE A LEVEL 2 RESPONSIBILITY AS DEFINED IN SECTION 8 OF AS 3798-2007 AND SHALL CERTIFY AT THE END OF THE WORKS THAT EARTHWORKS COMPLY WITH THE REQUIREMENTS OF THE SPECIFICATIONS AND DRAWINGS.
23. PROVIDE SMOOTH TRANSITION AT ALL CHANGES IN GRADE UNLESS OTHERWISE SPECIFIED.
24. THE PROJECT ARCHITECT IS TO INSPECT THE WORKS FOLLOWING COMPLETION OF BULK EARTHWORKS AND PRIOR TO COMMENCEMENT OF DETAIL EARTHWORKS.

CIVIL LEGEND

PROPOSED IN CIVIL SITEWORKS PACKAGE HEREWITH

+ FSL 4.060	FINISHED SURFACE LEVEL
CH 3900	CENTRELINE CHAINAGE
	STORMWATER DRAINAGE LINE
IL 5.0	INVERT LEVEL UPSTREAM
450Ø RCP '4'	PIPE SIZE, MATERIAL AND CLASS
1.0% 10.0m	PIPE GRADE AND LENGTH
IL 4.9	INVERT LEVEL DOWNSTREAM
P06	STORMWATER DRAINAGE PIT WITH NUMBER (REFER STORMWATER DRAINAGE STRUCTURES SCHEDULE)
	STORMWATER DRAINAGE HEADWALL (REFER STORMWATER DRAINAGE STRUCTURES SCHEDULE)
KO	KERB ONLY
DD	DISH DRAIN
K&G	KERB AND GUTTER
IJ	ISOLATION JOINT
DJ	DOWELLED CONSTRUCTION JOINT
SJ	SAWN CONTRACTION JOINT
	DIRECTION OF OVERLAND FLOW
ST	CIVIL SITEWORKS SETOUT POINT LABEL
T T	DENOTES EXISTING UNDERGROUND TELSTRA SERVICE LINE
W W	DENOTES EXISTING UNDERGROUND WATER SERVICE LINE
E E	DENOTES EXISTING OVERHEAD ELECTRICITY LINE
G G	DENOTES EXISTING UNDERGROUND GAS LINE

IMPORTANT: THE CONTRACTOR IS TO MAINTAIN A CURRENT SET OF "DIAL BEFORE YOU DIG" DRAWINGS ON SITE AT ALL TIMES.

DIAL BEFORE YOU DIG www.1100.com.au

SHEET INDEX

COVER SHEET & NOTES	SHEET FM1
FLOOD MITIGATION PLAN SHEET No.1	SHEET FM2
FLOOD MITIGATION PLAN SHEET No.2	SHEET FM3

LOCALITY MAP

DEVELOPMENT APPLICATION ISSUE
NOT FOR CONSTRUCTION

DRAWINGS MUST BE PRINTED IN COLOUR

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Issue	Description	Date	Drawn	Approved
A	ISSUED FOR APPROVAL	22.05.26	IK	BK

1cm at full size

North

Client: CPDM Pty Ltd
SUITE G02, GROUND FLOOR
22 ATCHINSON ST, ST LEONARDS

Architect: PBD ARCHITECTS

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ENGINEERS | CIVIL | FLOOD STUDIES | STORMWATER | HYDRAULIC

Project: PROPOSED RESIDENTIAL DEVELOPMENT
No.1 - 3 REID STREET
No.2 - 4 WOODSIDE AVENUE
LINDFIELD

Drawing Title: COVER SHEET & NOTES

Drawn	Date	Scale A1	Q.A. Check	Date
IK	APRIL 2026	AS SHOWN	-	-
Designed	Project No.		Dwg. No.	Issue
BK	CC240140		FM1	A

LEGEND

DESIGNATION	DESCRIPTION
1	DENOTES FLOOD DEFLECTION WALL. TOW VARIES FROM RL 91.60 TO 89.20
2	DENOTES FLOOD DEFLECTION WALL. TOW VARIES FROM RL 91.50 TO 88.40
3	DENOTES EXTENT OF STEP AMD LANDINGS RL 90.80 (PMF LEVEL)
4	DENOTES EXTENT OF STEP AMD LANDINGS RL 89.90 (PMF LEVEL)
5	DENOTES EXTENT OF STEP AMD LANDINGS RL 88.40 (PMF LEVEL)
6	DENOTES EXTENT OF STEP AMD LANDINGS RL 88.50 (PMF LEVEL)
7	DENOTES ELECTRICAL SUBSTATION BASE TO BE ON A RAISED PLATFORM TO RL 88.80 (PMF LEVEL)
8	DENOTES DRIVEWAY CREST LOCATION. CREST TO BE AT RL 88.40
9	PROVIDE OPEN STYLE FENCING WITH MIN 100mm GAP AT BASE OF FENCE
10	PROVIDE OPEN STYLE FENCING WITH MIN 200mm GAP AT BASE OF FENCE

REID STREET

UNIT G.01 3BED FFL RL.90.80

UNIT G.02 1BED FFL RL.90.80

GROUND FLOOR FFL RL.90.800

UNIT G.03 FFL RL.90.80 G.03 3BED

UNIT G.04 FFL RL.88.40 G.04 3BED

UNIT G.05 FFL RL.88.40 G.05 1BED

UNIT G.08 FFL RL.88.40 G.08 3BED

UNIT G.09 G.09 3BED FFL RL.90.80

UNIT G.10 G.10 1BED FFL RL.90.80

EXISTING 750 DIA STORMWATER LINE TO BE DECOMISSIONED

APPROX. SEWER MAIN (SOURCE: DBYD)

FOR CONTINUATION REFER TO SHEET FM3

REFER TO CIVIL ENGINEERING PLANS PREPARED BY HYDRACOR CONSULTING ENGINEERS FOR EXTENT OF PROPOSED PUBLIC DOMAIN / FLOOD MITIGATION WORKS ISSUED UNDER SEPARATE COVER, REFERENCE CC240140'R' SERIES

WARNING
LOCATION AND DEPTH OF ALL UNDERGROUND SERVICES TO BE INVESTIGATED WITH THE RELEVANT AUTHORITIES PRIOR TO COMMENCING WORK

NOTE: REFER TO ARCHITECTS DRAWINGS FOR TREES TO BE REMOVED & RETAINED. TREES SHOWN THUS: ARE TO BE RETAINED

FLOOD MITIGATION PLAN - SHEET No.1
SCALE - 1:100/A1, 1:200/A3
0 1 2 4 6 8 10m

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Architect: PBD ARCHITECTS

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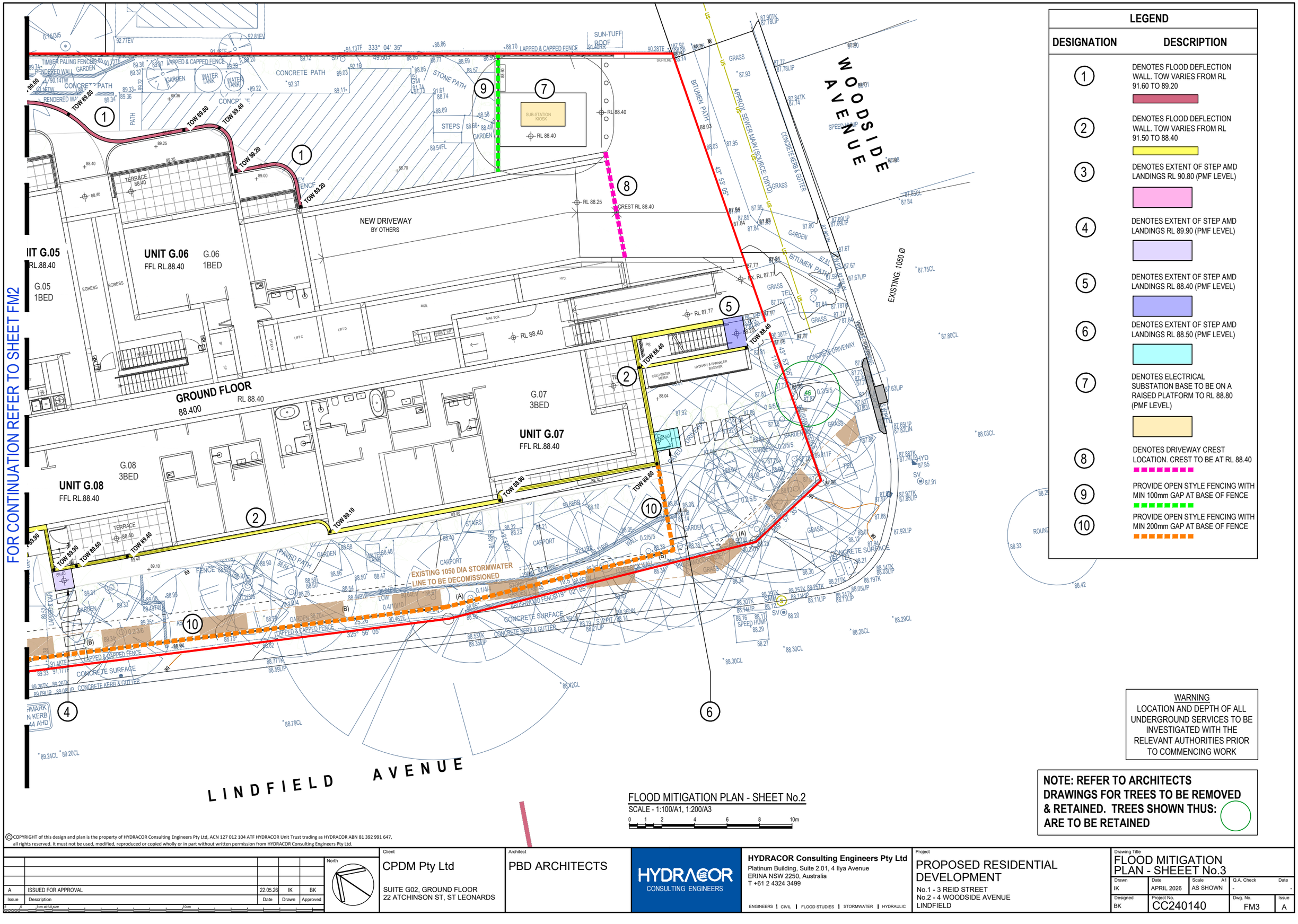
ENGINEERS | CIVIL | FLOOD STUDIES | STORMWATER | HYDRAULIC

Project: PROPOSED RESIDENTIAL DEVELOPMENT
No.1 - 3 REID STREET
No.2 - 4 WOODSIDE AVENUE
LINDFIELD

Drawing Title: FLOOD MITIGATION PLAN SHEET No. 1

Drawn	Date	Scale A1	Q.A. Check	Date
IK	APRIL 2026	AS SHOWN	-	-
Designed	Project No.	Dwg. No.	Issue	
BK	CC240140	FM2	A	



LEGEND

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WARNING
LOCATION AND DEPTH OF ALL UNDERGROUND SERVICES TO BE INVESTIGATED WITH THE RELEVANT AUTHORITIES PRIOR TO COMMENCING WORK

NOTE: REFER TO ARCHITECTS DRAWINGS FOR TREES TO BE REMOVED & RETAINED. TREES SHOWN THUS: ARE TO BE RETAINED

FLOOD MITIGATION PLAN - SHEET No.2
SCALE - 1:100/A1, 1:200/A3
0 1 2 4 6 8 10m

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1cm at full size 10cm

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Project: PROPOSED RESIDENTIAL DEVELOPMENT
No.1 - 3 REID STREET
No.2 - 4 WOODSIDE AVENUE
LINDFIELD

Drawing Title: FLOOD MITIGATION PLAN - SHEEET No.3

Drawn	Date	Scale A1	Q.A. Check	Date
IK	APRIL 2026	AS SHOWN	-	-
Designed	Project No.	Dwg. No.	Issue	
BK	CC240140	FM3	A	

Annexure D Flood Emergency Response Plan prepared by Water Technology Pty Ltd, Document Number 2605135_R01_V01, dated 16 June 2026

WATER TECHNOLOGY
WATER, COASTAL & ENVIRONMENTAL CONSULTANTS

Flood Emergency Response Plan

1-3 Reid Street and 2-4 Woodside Avenue

Woodside Residence DM Pty Ltd

16 June 2026

Document Status

Version	Document Type	Reviewed By	Approved By	Date Issued
R01_V01	Report	Rhiannon Garrett	Rhiannon Garrett	16/06/2026

Project Details

Project Name	1-3 Reid Street and 2-4 Woodside Avenue
Client	Woodside Residence DM Pty Ltd
Client Project Manager	Isaac Kan
Water Technology Project Manager	Isaac Boehme
Water Technology Project Director	Rhiannon Garrett
Authors	Isaac Boehme, Danni-Elle Clowes
Document Number	26050135_R01_V01

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Wangaratta VIC 3677
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ACN 093 377 283
ABN 60 093 377 283

ACKNOWLEDGEMENT OF COUNTRY

The Board and employees of Water Technology acknowledge and respect the Aboriginal and Torres Strait Islander Peoples as the Traditional Custodians of Country throughout Australia. We specifically acknowledge the Traditional Custodians of the land on which our offices reside and where we undertake our work.

We respect the knowledge, skills and lived experiences of Aboriginal and Torres Strait Islander Peoples, who we continue to learn from and collaborate with. We also extend our respect to all First Nations Peoples, their cultures and to their Elders, past and present.

Artwork by Maurice Goolagong 2023. This piece was commissioned by Water Technology and visualises the important connections we have to water, and the cultural significance of journeys taken by traditional custodians of our land to meeting places, where communities connect with each other around waterways.

The symbolism in the artwork includes:

- Seven circles representing each of the States and Territories in Australia where we do our work.
- Blue dots between each circle representing the waterways that connect us.
- The animals that rely on healthy waterways for their home
- Black and white dots representing all the different communities that we visit in our work.
- Hands that are for the people we help on our journey.

CONTENTS

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1 INTRODUCTION

1.1 Context and Background

It is understood that HYDRACOR Consulting Engineers (HYDRACOR) have prepared an Integrated Water Management and Flood Impact and Risk Assessment (FIRA) for the proposed residential development across 2-4 Woodside Avenue and 1-3 Reid Street, Lindfield (dated 18th December 2025), prepared in response to RFIs from relevant authorities. The prepared FIRA indicates minor impacts and addresses the intensification of the site's land use and subsequent increased risk during rare design storm events via a proposed shelter-in-place (SIP) strategy. An overview of HYDRACORs previously submitted study is provided in a later section of this report.

Water Technology understands that HYDRACORs response to an RFI provided by the NSW SES FIRA also demonstrated consistency with the NSW DPHI's Shelter In Place Guideline for Flash Flooding, although there continues to be a return of RFIs from the relevant authorities regarding risk matters for the site. To pre-emptively address potential future concerns with the application, it is intended a detailed FERP be prepared to strengthen the understanding of risk and emergency management procedures for the site.

Figure 1-1 Site Plan (PBD Architects, DA004 Issue 03)

A review of the Ku-Ring-Gai Council online flood and overland flow mapping portal (Figure 1-2) shows that the site is not considered to be affected by flooding from Gordon Creek, owing to its position in the upper reaches of the catchment.

The online mapping does, however, indicate that the site is affected by an overland flow path which flows directly through the subject site from north to south. Owing to this, the focus of the HYDRACOR study and this subsequent FERP will focus on the exposure of the proposed development to overland flow only.

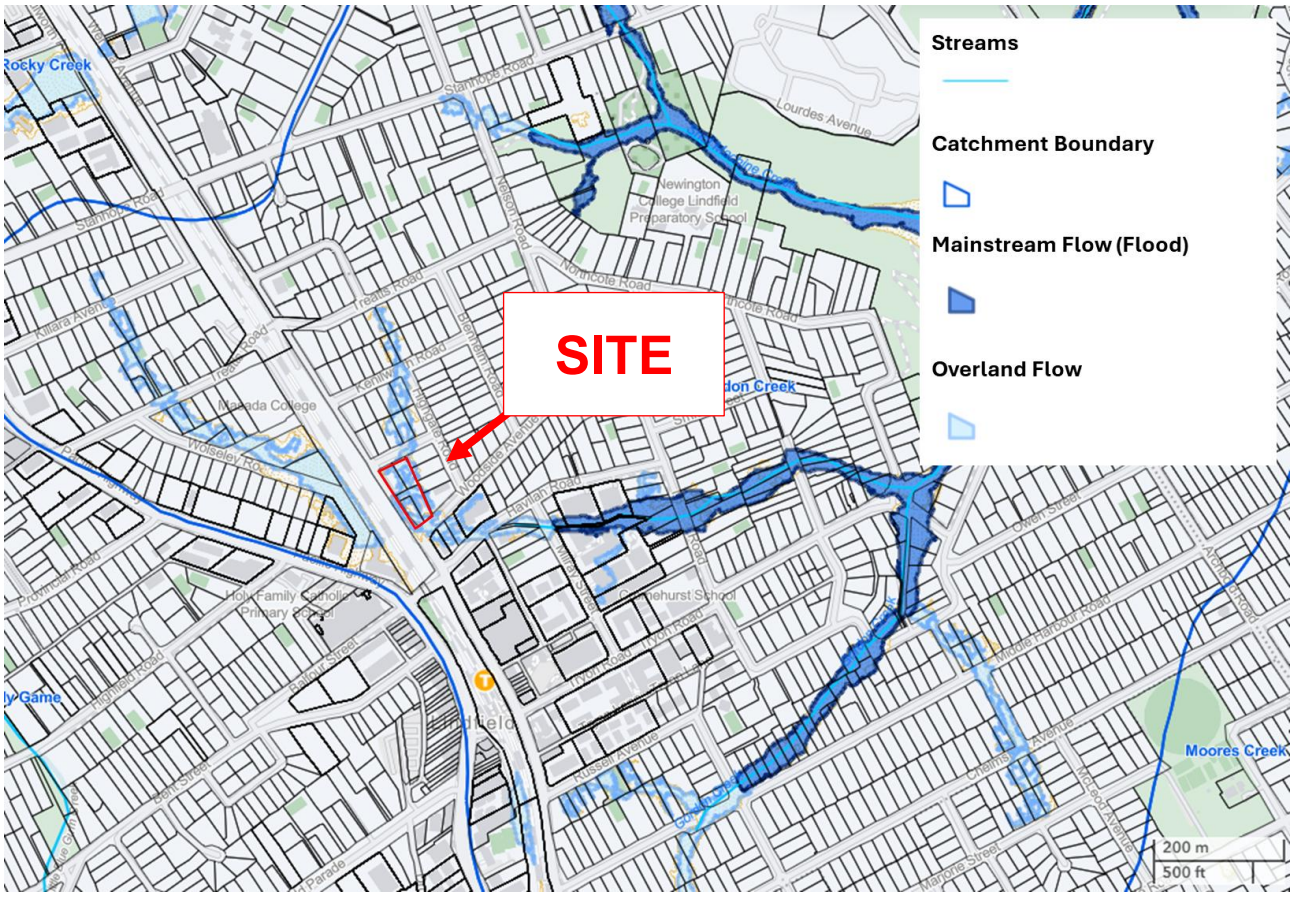

Figure 1-2 Ku-Ring-Gai Council Flood and Overland Flow Mapping

1.2 Summary of Hydracor Integrated Water Management Report

The Flood Impact and Risk Assessment (FIRA) forms part of the Integrated Water Management Plan which was prepared by Hydracor to support a State Significant Development Application (SSDA) submitted to the Department of Planning, Housing and Infrastructure (DPHI) in accordance with Part 8 of the Environmental Planning and Assessment Regulation 2021. The purpose of the Integrated Water Management Plan was to provide information to enable the Department to assess the proposed development in relation to risk management.

As part of the FIRA, a site specific overland flow assessment was undertaken for the subject site. A 1D/2D hydraulic model of the catchment was developed using TUFLOW to analyse overland flow behaviour within the vicinity of the development.

The model was used to simulate overland flow conditions under pre- and post-development catchment scenarios and to determine the extent of inundation, depths, and velocities across the modelled area. Modelling was undertaken for a range of design events including the 5% AEP, the 1% AEP event (with and without climate change provisions), and the Probable Maximum Flood (PMF). The modelling outputs were used to form the basis for the flood risk management strategy developed for the site.

Hydrologic modelling for the assessment was undertaken within the TUFLOW model using a direct rainfall ("rain-on-grid") methodology. Under this approach rainfall is applied directly to the 2D terrain and the model routes runoff based on the elevation and surface roughness of the terrain together with any included 1D pipe network. The direct rainfall approach generates runoff across the entire catchment area, resulting in the modelled area becoming 'wet'. To ensure that mapped results represent areas of meaningful inundation, the outputs were filtered to only include cells where the simulated depths exceeded 0.05m.

The critical duration storm event for each location was defined as the duration producing the highest median water level at that location. Based on the HYDRACOR modelling results, a 15-minute storm duration was identified for all design storm events.

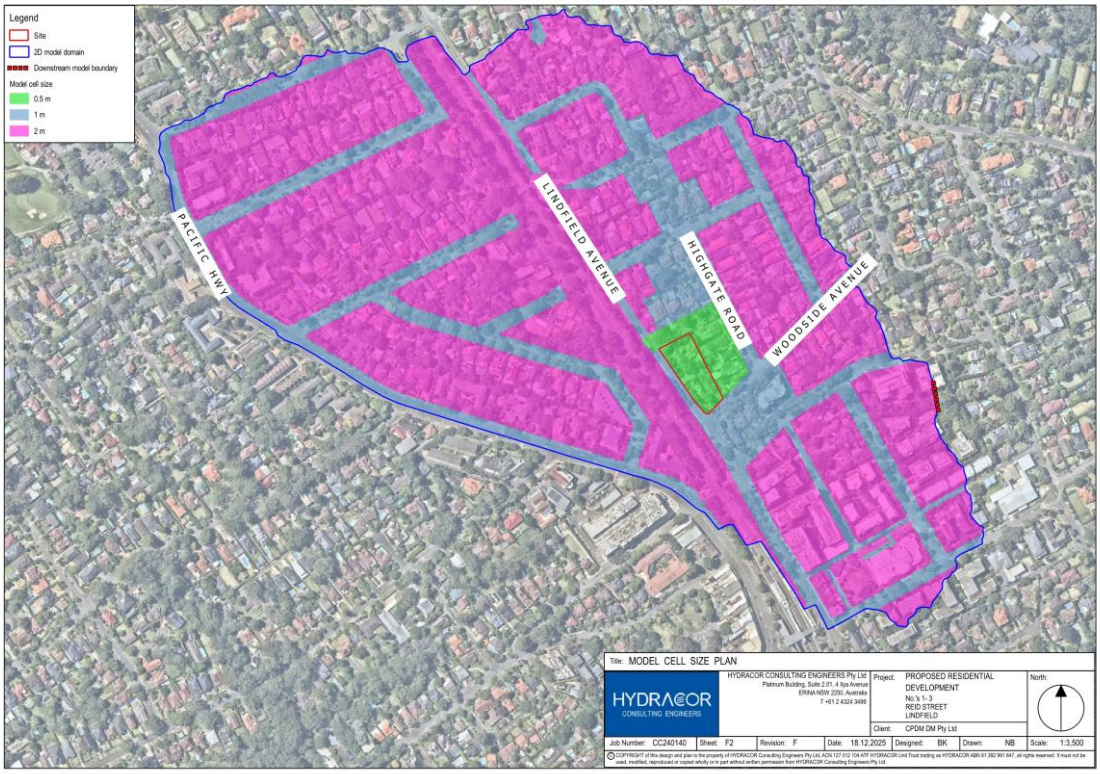

Figure 1-3 TUFLOW Model Cell Size Plan (Hydracor, 2025)

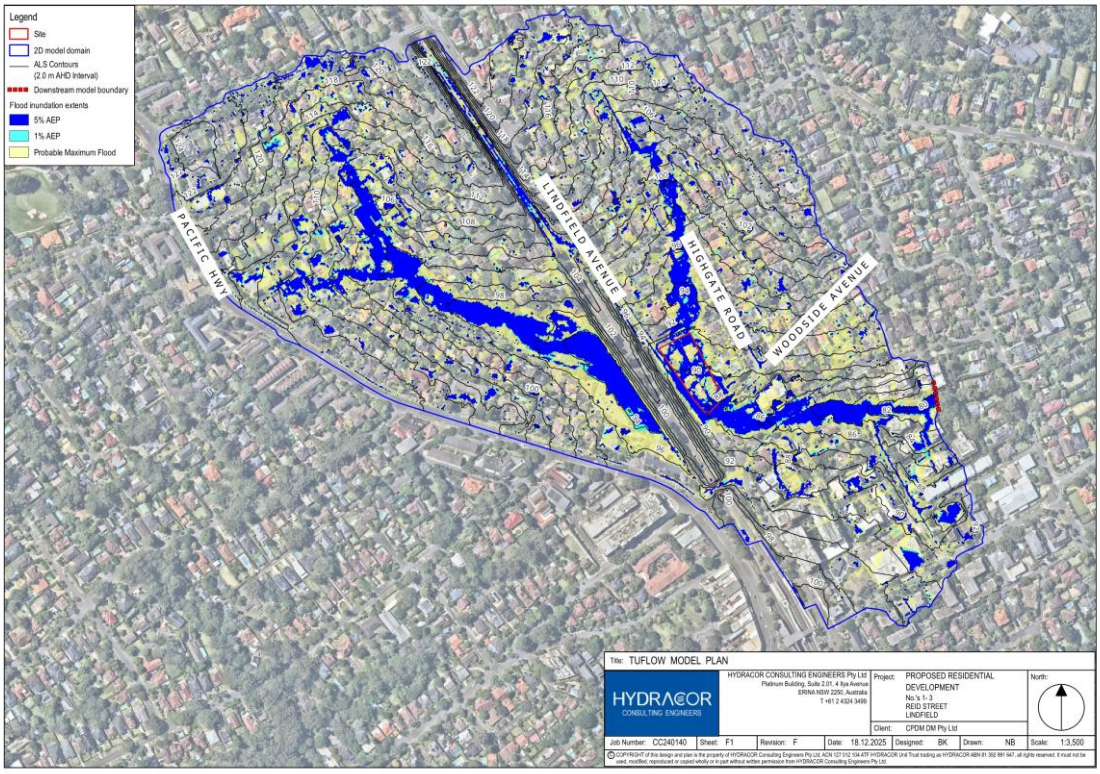

Figure 1-4 TUFLOW Model Plan (Hydracor, 2025)

1.3 Scope of This FERP

To support the ongoing planning and approval process, this new and more detailed FERP has been prepared in support of the development application. This FERP will supplement the draft HYDRACOR flood assessment within the Integrated Water Management Plan and will provide additional detail regarding the management of risk at the site.

The intent of this FERP is to provide clearer operational guidance and more detailed procedures to assist building management, occupants and emergency services in responding to rainfall events affecting the site. The plan will also provide further information to assist the relevant authorities in reviewing the proposed flood emergency management arrangements for the development.

The primary focus of this FERP is managing flood risk to life, with some measures to reduce risk to property. It details the most appropriate flood emergency management strategy for the site. It does not include measures to reduce the risks of flooding to corporate property or profitability.

Water Technology have adopted the hydraulic modelling results and technical findings presented in HYDRACORs flood study and impact assessment, which have formed the basis for the overland flow assessment and FERP. [1]

A key assumption of this FERP is that the hydrologic and hydraulic modelling undertaken using TUFLOW was prepared in accordance with relevant guidelines, standards and accepted modelling practices, and that the results presented are suitable for use in informing emergency planning for the development.

This FERP is also noted to consider the response planning for inundation at the site resulting from the external overland flow path which flows through and around the site, and is not intended to guide the design of local site-based drainage. Inundation resulting from local site-based rainfall is to be managed separately to this FERP.

Owing to the above, the preparation of this FERP does not involve a review, verification or recalibration of the supplied HYDRACOR model data.

Mapping and images of the site locality, view of the site frontage, and site topography are also shown in Figure 1-5 to Figure 1-8.

[1] Based on HYDRACOR model reference: **CC240140_post_021**

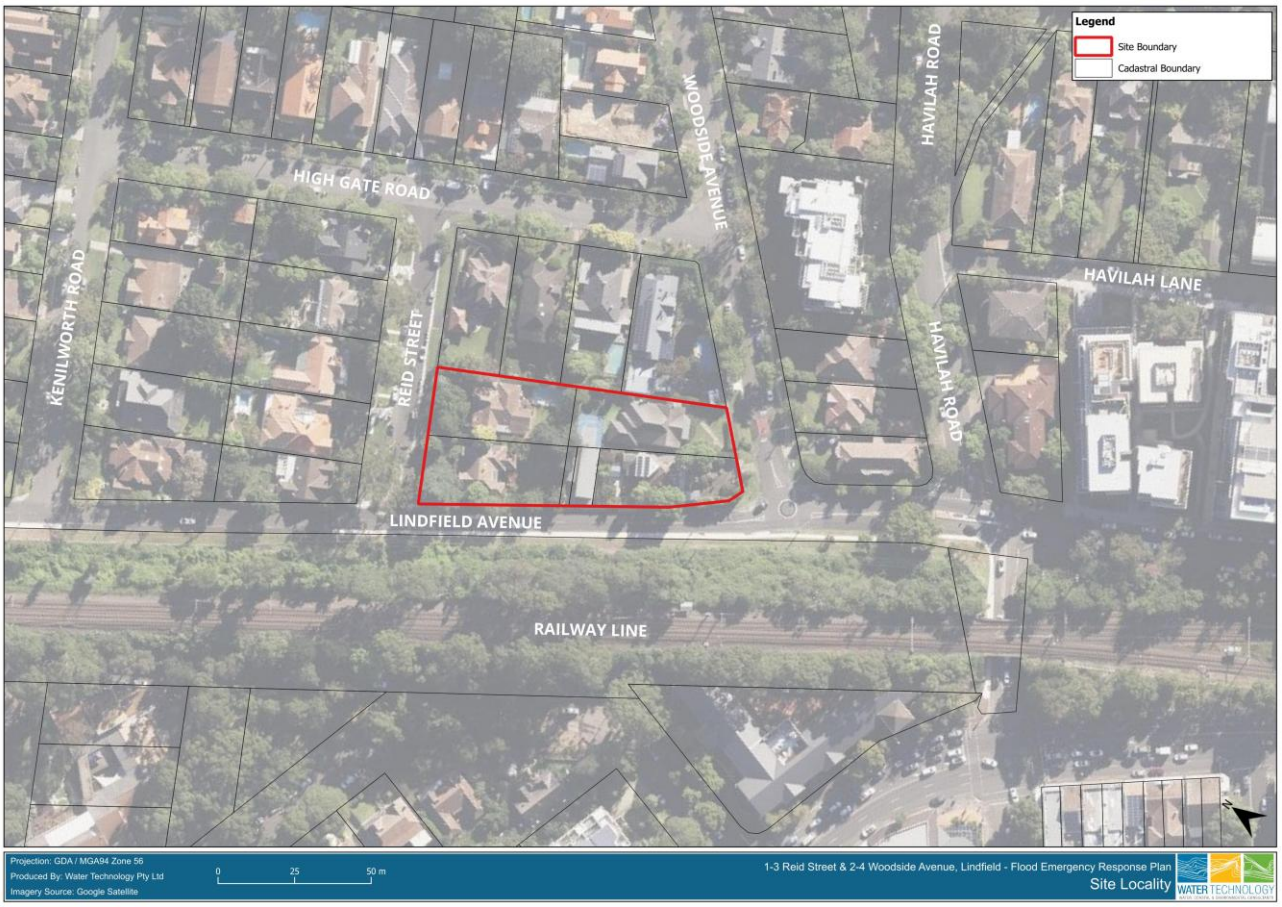

Figure 1-5 Site Locality

Figure 1-6 Current Site (From Intersection of Lindfield Avenue and Woodside Avenue, Google Maps)

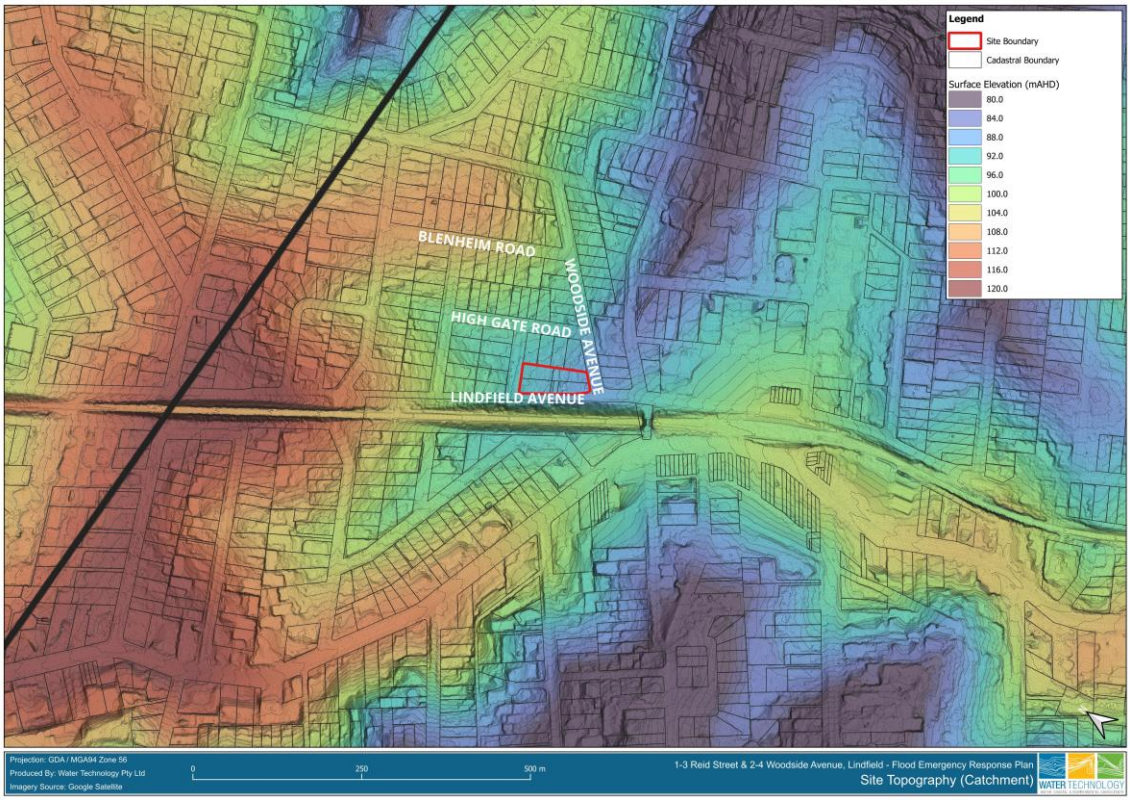

Figure 1-7 Catchment Topography

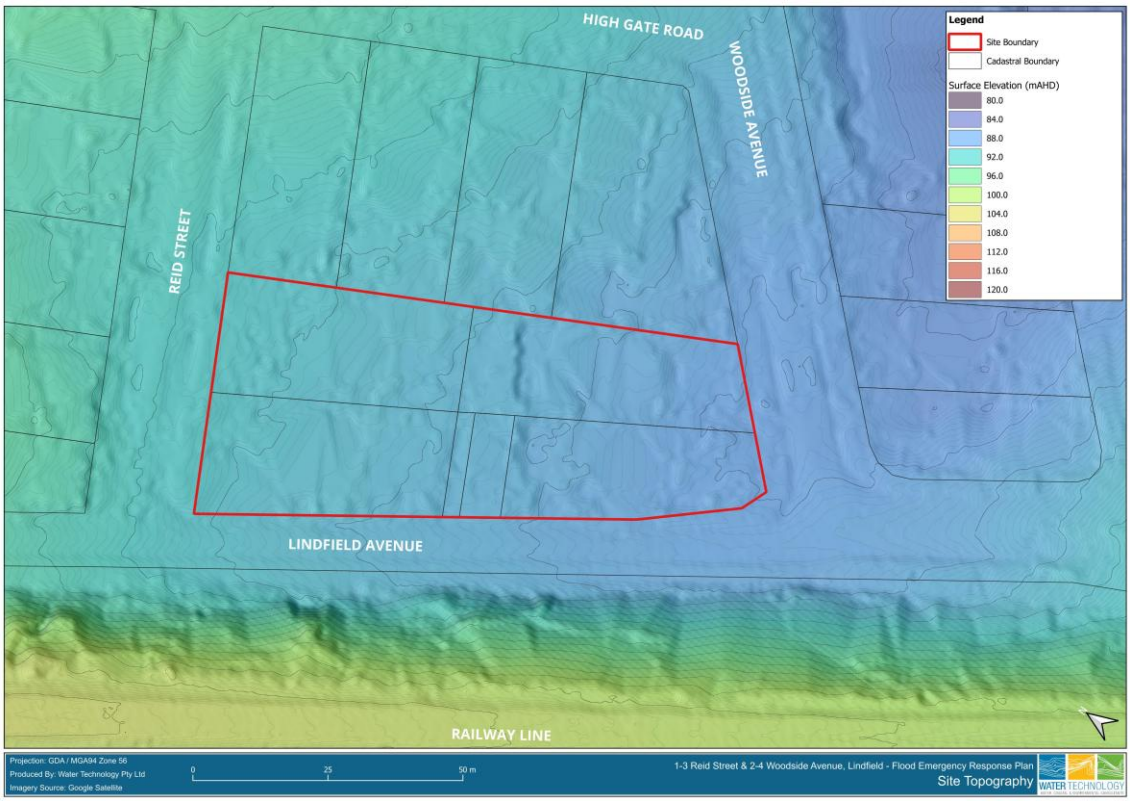

Figure 1-8 Site Topography

1.4 Description of Proposed Development

The proposed development comprises a residential apartment building with eight levels above ground level and basement parking. A mix of dwelling types is proposed throughout the development. Further details regarding the unit mix and occupancy assumptions adopted for this assessment are provided later in this report.

The proposed floor levels for each of the basement and residential levels are summarised in Table 1-1. It is noted that the ground floor does have residential use.

The ground floor plan is shown in Figure 1-9 and the fencing diagram is shown in **Error! Reference source not found.**. The ground floor plan shows the key floor levels for each apartment unit on this floor, and the fencing diagram has been used to extract the levels of the proposed flood deflection walls which envelop the building footprint.

The proposed flood deflection walls, whether against the building itself or offset (along the footpath to the east), are expected to offer protection of the building from the external overland flow path which flows from the north, in events up to and including the Probable Maximum Flood (PMF).

Table 1-1 South and North Building Floor Levels

Level	Height (mAHD) North Building "A"	Height (mAHD) South Building "B"
Basement 2	81.60	
Basement 1	84.90	
Driveway Crest	88.40	
Top of Stair 5	88.25 (Landing Denoted As 88.40, PMF Level)*	
Ground Floor	90.80	88.40
Level 1	93.95	91.55
Level 2	97.10	94.70
Level 3	100.25	97.85
Level 4	103.40	101.00
Level 5	106.55	104.15
Level 6	109.70	107.30
Level 7	112.85	110.45
Level 8	116.00	113.60
Roof	119.15	116.75

** Note: The extent of the steps and landing for Stair 5 is denoted as being 88.40mAHD (PMF Level) as per Flood Mitigation Plan – Sheet No. 3 (HYDRACOR, Issue A)*

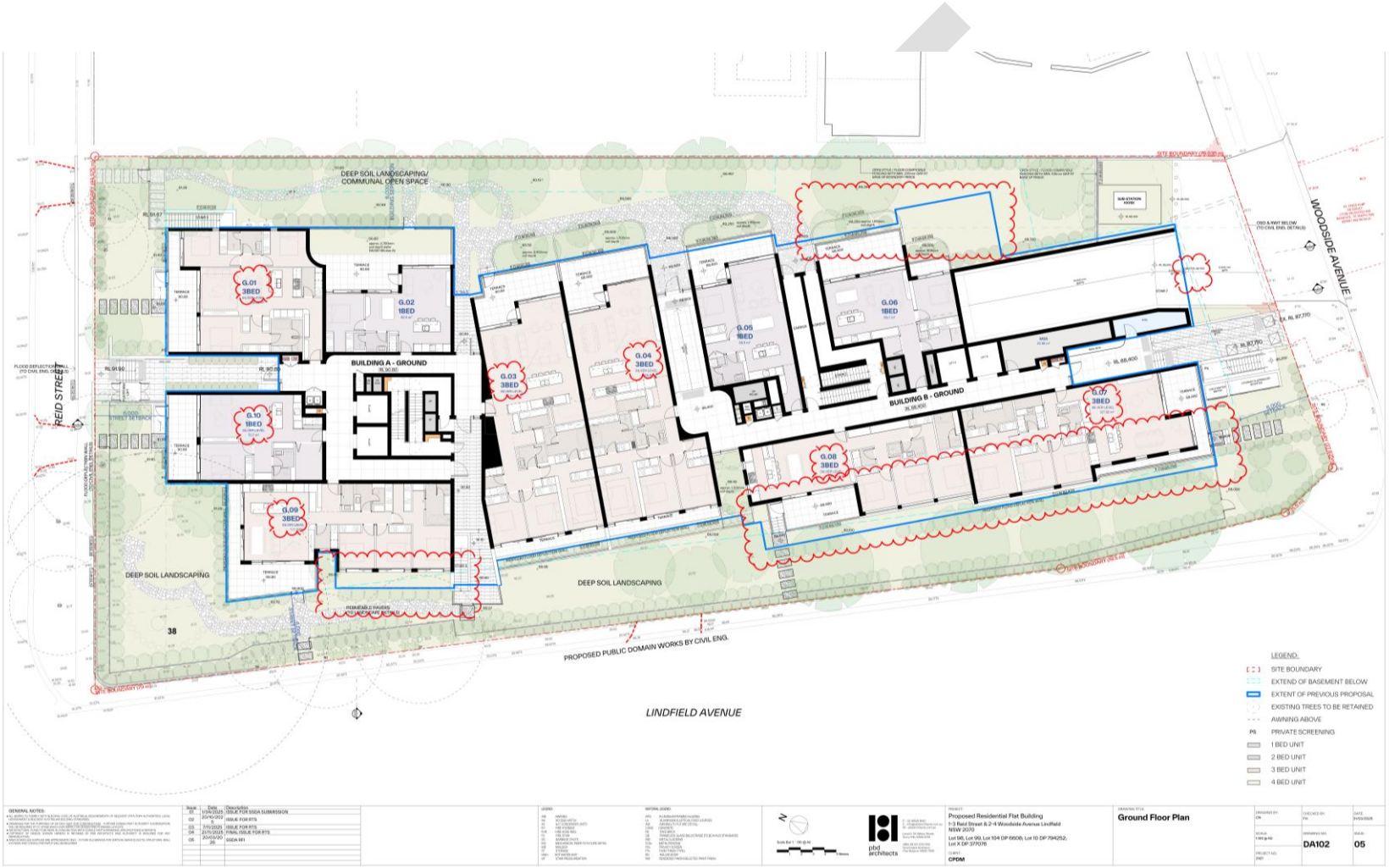

Figure 1-9 Ground Floor Plan (PBD Architects, DA004 Issue 03)

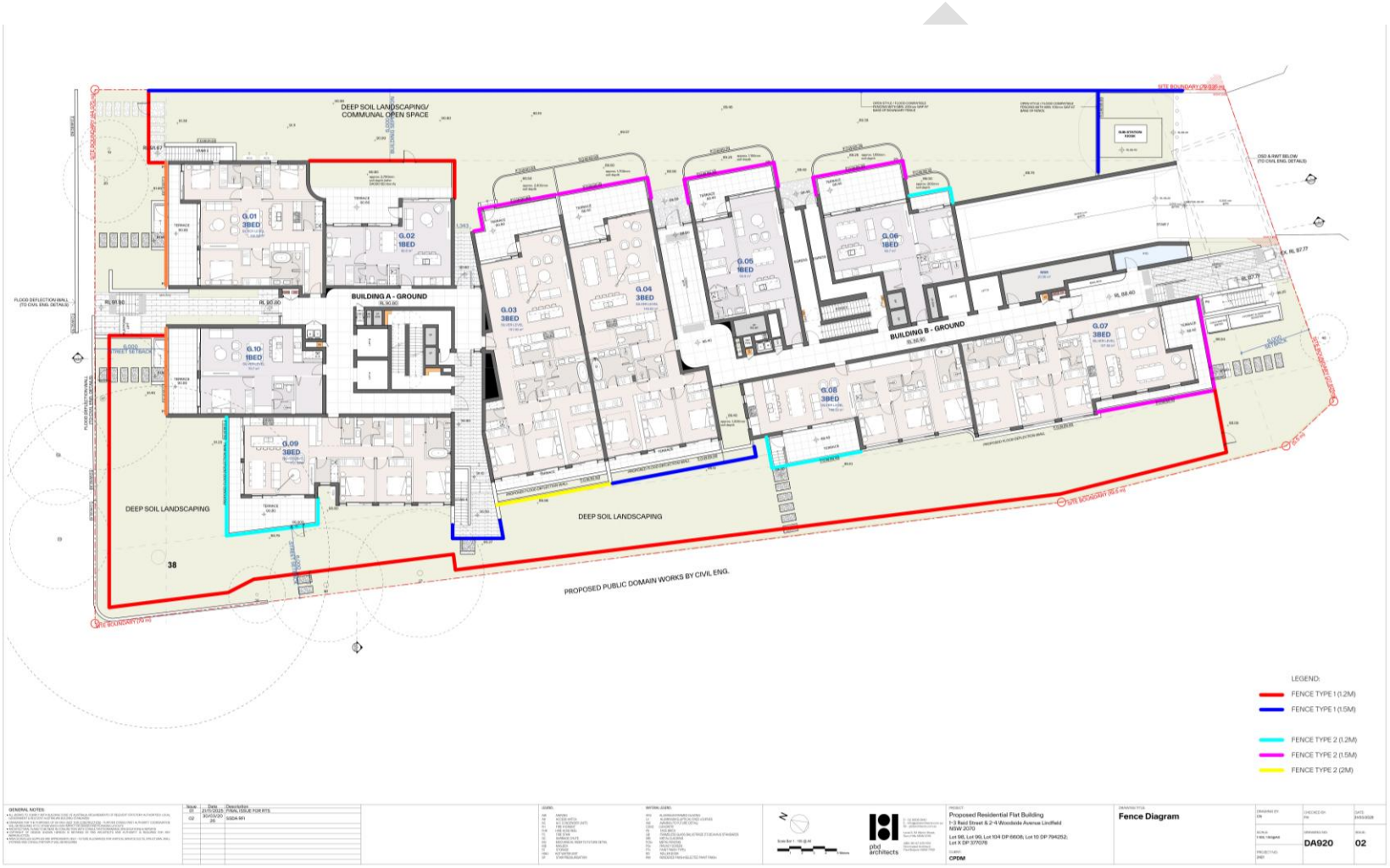

Figure 1-10 Fence Diagram (PBD Architects, DA004 Issue 03)

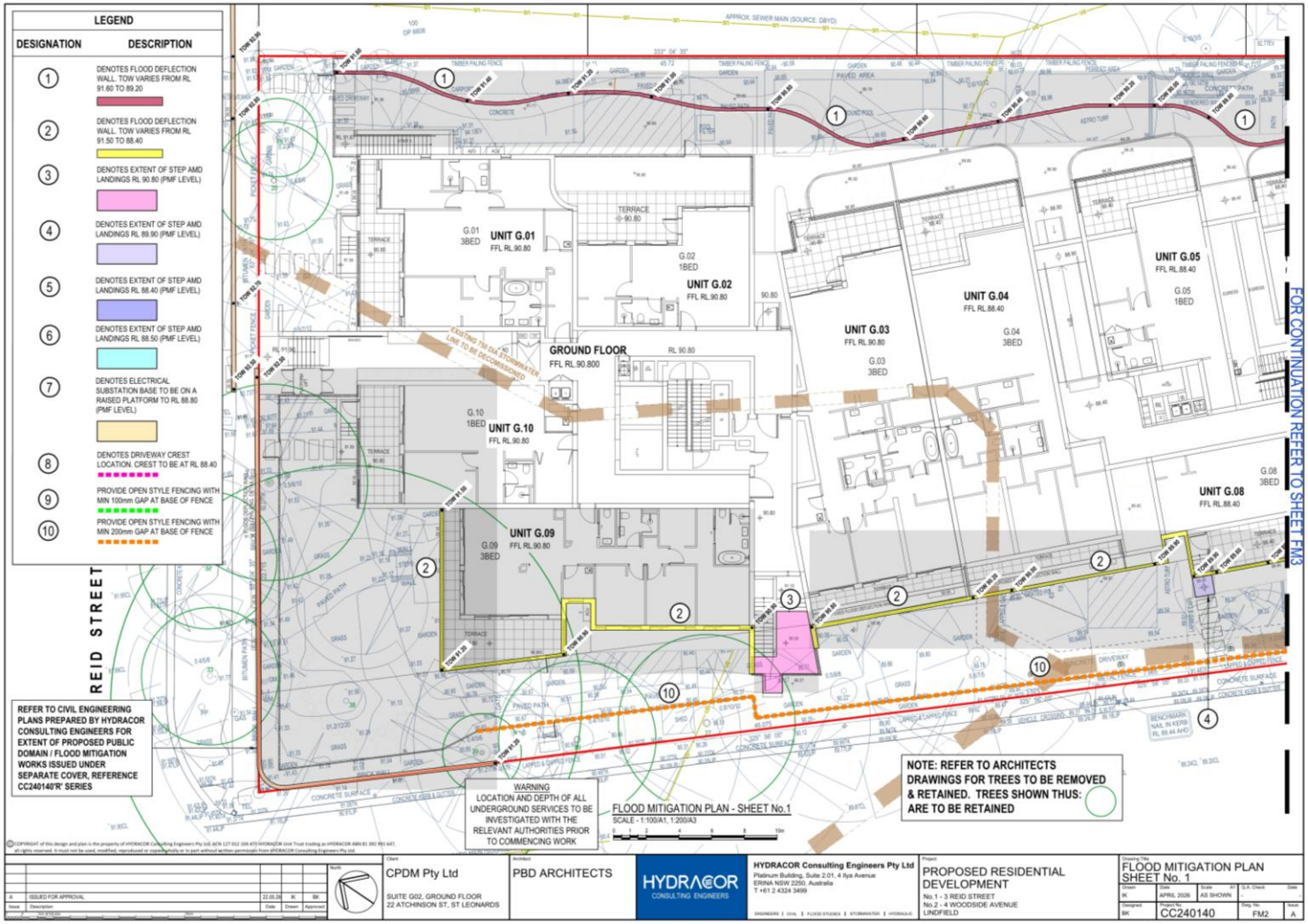

Figure 1-11 Flood Mitigation Plan – Sheet No. 1 (HYDRACOR, Issue A)

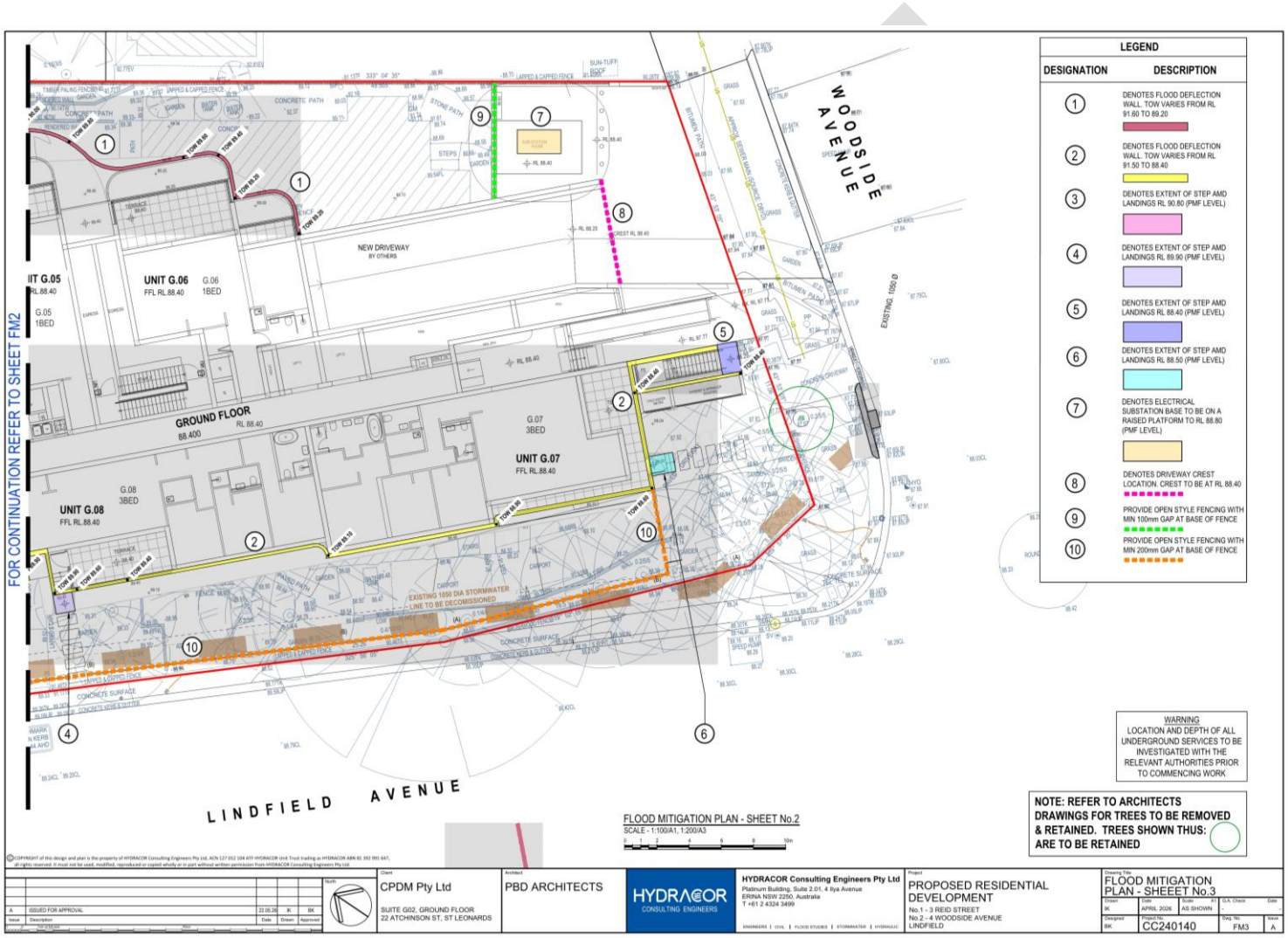

Figure 1-12 Flood Mitigation Plan – Sheet No. 3 (HYDRACOR, Issue A)

1.5 Site Use

As a residential development, the building is expected to be occupied on a 24-hour basis, with residents potentially present at any time of the day or night. While the building is not anticipated to be continuously staffed, building management personnel may be present during normal operating hours to undertake management and maintenance activities.

A breakdown of the proposed residential unit types and vehicle parking provisions are summarised in Table 1-2 and Table 1-3, respectively. There are 89 apartments proposed and there could be up to 118 cars on site at any given time, in addition to 6 motorbikes and 99 bicycles.

Table 1-2 Summary of Unit Types and Amounts

Level	1 Bed	2 Bed	3 Bed	4 Bed	TOTAL
Ground Floor	4		6		**10**
Level 1	2	4	6		**12**
Level 2		6	6		**12**
Level 3		6	6		**12**
Level 4		4	6		**10**
Level 5		4	6		**10**
Level 6		3	5	1	**9**
Level 7		3	5	1	**9**
Level 8			3	1	**4**
TOTAL	**6**	**31**	**50**	**2**	**89**

Table 1-3 Summary of Parking Types and Amounts

Item	Quantity
Residential Parking	104
Visitor Parking (1 per 6 Apartments)	13
Car Share Parking (1 per 90 Apartments)	1
Total Car Parking Spaces	**118**
Resident Bicycle Parking (1 per Apartment)	89
Visitor Bicycle Parking (1 per 10 Apartments	10
Motorbike Parking	6
Total Bike Parking Spaces	**105**

2 FLOOD RISKS

2.1 Flood-Generating Weather

Coastal areas of eastern Australia mostly receive flooding rains from so-called "east coast lows" that develop from time to time over the adjacent Tasman Sea. These are intense depressions off the coast and can produce thunderstorm activity associated with troughs.

Depressions can develop at any time of year but are most likely when sea surface temperatures are high and the air is humid. Therefore, these events usually occur in the summer months and over the first half of the year. In Lindfield, March historically records the highest average number of wet days, corresponding to late-summer and early-autumn weather patterns in eastern NSW.

Flooding can also be a winter-spring phenomenon, associated with unusually frequent or active extra-tropical depressions and fronts. However, some major events have occurred in the summer half-year as systems of tropical origin extend or move south. Flooding is usually associated with southward-moving tropical systems, but in the cooler months it may occur when well-developed cloud bands extend across the interior from the oceans north and northwest of Australia. East Coast Lows are historically prevalent in the winter months.

Rainfall patterns are also dependent on longer term weather patterns. Flooding is more prevalent in a La Niña year when rainfall is significantly greater than the mean average rainfall. Thunderstorms, which generally occur during the summer, can also result in localised flooding which could impact specifically on the site.

In summary, there are many different weather events which could cause intense rainfall in Lindfield leading to flooding. There is no strong seasonality associated with flooding in Lindfield and an event could occur at any time of day or night and on any day of the year.

2.2 The Meaning of Flood Probability

Flood probability can be expressed in more than one way. For example, a flood may be described as having a 100-year Average Recurrence Interval (ARI). This means that over many thousands of years, a flood of this magnitude would occur on average once in 100 years. This does not mean that a flood of this size only occurs once every 100 years. It is possible to have floods of this size in consecutive years or even 2 in the same year, to be followed by several hundred years without flood events this large.

Another way of expressing flood probability is in terms of Annual Exceedance Probability (AEP). A 100-year ARI flood has roughly a 1 in 100 AEP. That is, each year and every year it has a 1 in 100 or 1% chance of being reached or exceeded. This is perhaps a more helpful way of thinking about flood probabilities. A flood with a 1% AEP has about a 1 in 2 chance of being reached or exceeded in the average person’s lifetime. There were 4 floods of about this size on the Georges River between 1860 and 1889 but there has not been another since. This underlines the randomness of flood frequency.

Bigger floods can and do occur. There were several floods with greater than a 1% AEP experienced in NSW between 2020 and 2023. A flood with a 1 in 500 (0.2%) AEP has about a 1 in 6 chance of being reached or exceeded in the average person’s lifetime, the same as tossing a die and getting a 6. This was about the frequency of the Lismore flood in 2022 and of the Taree flood in 2025. The Eugowra flood in 2022 was larger than a 1 in 5,000 (0.02%) AEP event, which has about a 1 in 60 chance of being reached or exceeded in the average person’s lifetime.

The largest flood that can occur is referred to as the Probable Maximum Flood (PMF). Although it has a very low probability of occurring in any one year (1 in 10,000 or less), events approaching a PMF have been recorded. Flooding may occur at any time of year and at any time of day.

2.3 Comments On Hydraulic Model Results Interpretation

The hydraulic model has been developed to assess overland flow behaviour and the interaction of floodwaters across the broader site and surrounding catchment. As a rain-on-grid model, rainfall is applied uniformly across the model surface, and runoff is routed based on the represented topography and hydraulic controls.

While the proposed building footprint is represented as a physical obstruction to external overland flow paths originating outside of the site, the model does not explicitly simulate the collection, conveyance and discharge of rainfall that falls directly onto the building roof. Consequently, model outputs may show shallow inundation or ponding within the building footprint where rainfall is applied to areas occupied by the structure. Examples of this are shown in Figure 2-1.

These mapped inundation extents within the building footprint are not considered representative of actual flood behaviour. In reality, the building roof would intercept rainfall and direct runoff to the site's roof drainage system, preventing the accumulation of water within the footprint of the structure.

Accordingly, any inundation shown within the building footprint should be regarded as a modelling artefact associated with the rain-on-grid methodology and should be excluded from the assessment of flood impacts and flood behaviour across the site.

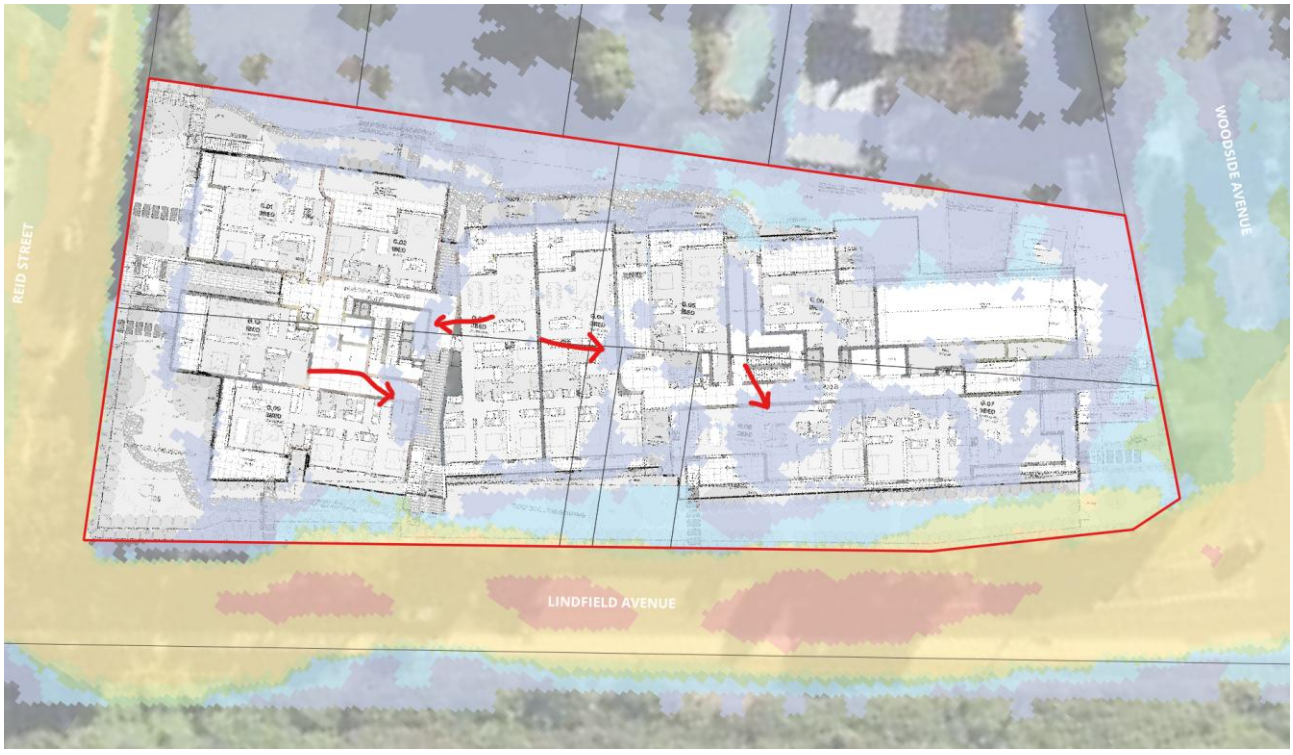

Figure 2-1 Examples of Model Artifact Ponding Within Building Footprint

2.4 Description of Overland Flow Conditions

The analysis in this section is based on the hydraulic model outputs supplied by HYDRACOR.

Under pre-development conditions, an overland flow path discharges directly through the site which inundates it in all assessed design events (from at least the 5% AEP design event, although it is possible inundation would occur in smaller, more frequent events).

For reference, the post-development 1% AEP and PMF water surface level maps are shown in Figure 2-2 and Figure 2-3, respectively. This shows that in a PMF event, the proposed building footprint becomes entirely surrounded by overland flow, cutting off access to the site.

Additionally, The Australian Emergency Management Institute (refer to Figure 2-4) hazard categorisation is useful for estimating vehicle and pedestrian safety, and considers the peak flood depth and velocity.

Mapping of the 1% AEP and PMF peak hazard categorisation is shown in Figure 2-5 and Figure 2-6.

When considering the proposed design, the HYDRACOR hydraulic modelling demonstrates the following:

- There are proposed flood protection works along the northern site boundary, adjacent to Reid Street. These works effectively protect the site from the northern external flow path in events up to and including the 1% AEP (climate change) event, as shown in the HYDRACOR flood assessment.
  - The modelling shows the works along the northern site boundary are ‘breached’ in the PMF. Essentially, the external flow path is re-routed around the flood protection works and continues to enter the site further downstream along the eastern boundary.
  - The flows which enter the site along the eastern boundary are limited to the H1 hazard category in the PMF event and does not interact with the building footprint owing to the proposed flood deflection wall which runs alongside the footpath, offset from the building by between 2-3m. This flood deflection wall along the site’s eastern footpath is intended to offer protection of the building from these flows.
- Owing to the proposed flood protection works along the northern site boundary, the residual, redirected water instead flows downstream along Reid Street (west) towards the intersection with Lindfield Avenue. At this intersection, the flows break out and flow downstream along Lindfield Avenue and also enter the site further downstream along the western boundary.
  - The flows which enter the site along the western boundary are modelled to have hazard categories between H1 to H3-H5. The area mapped as H5 in the PMF does not directly interact with the building footprint in this instance.
  - In anticipation of this worst case scenario, the proposed flood deflection wall which runs alongside along the western side of the building is intended to deflect this flow away from the building footprint to prevent inundation of the ground floor units.

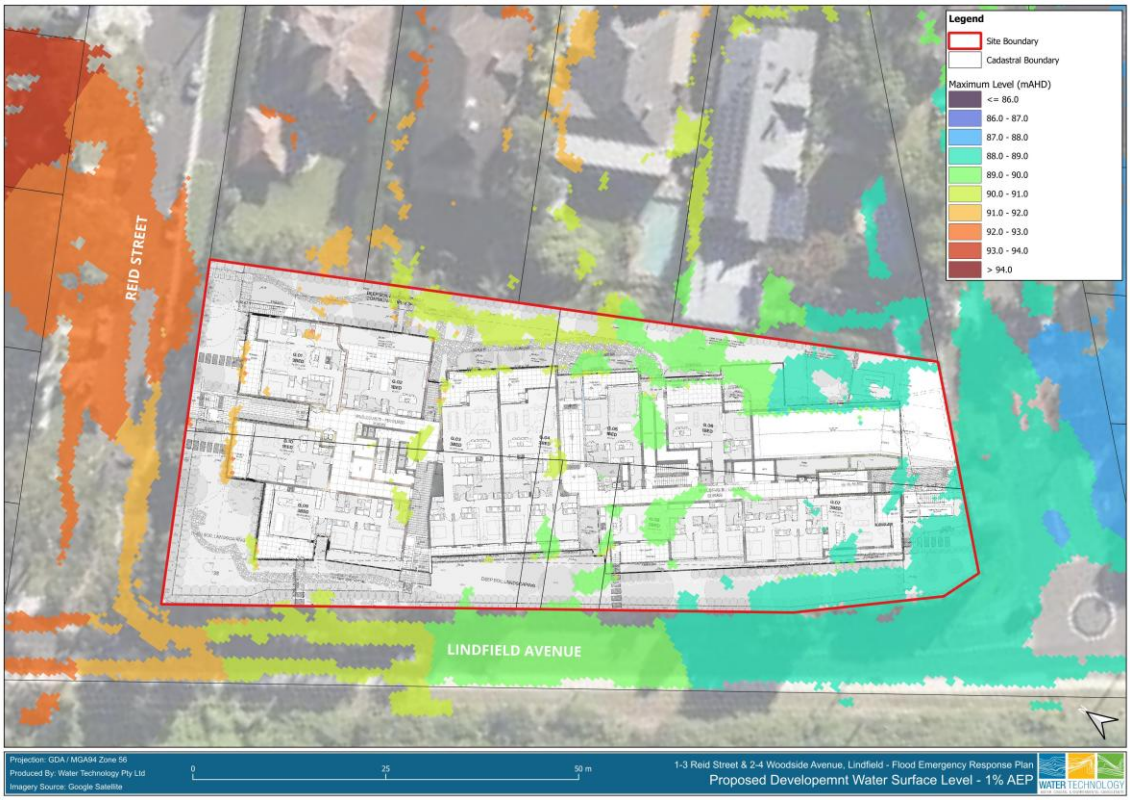

Figure 2-2 Proposed Development Water Surface Level – 1% AEP

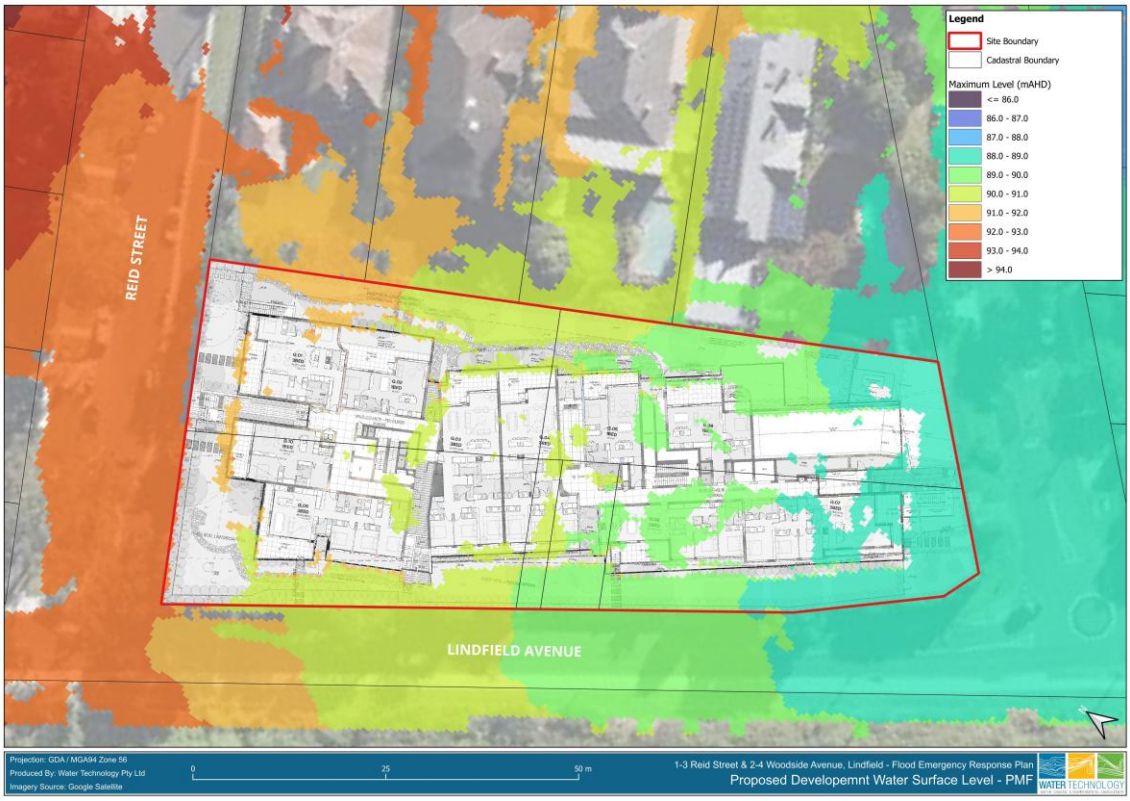

Figure 2-3 Proposed Development Water Surface Level – PMF

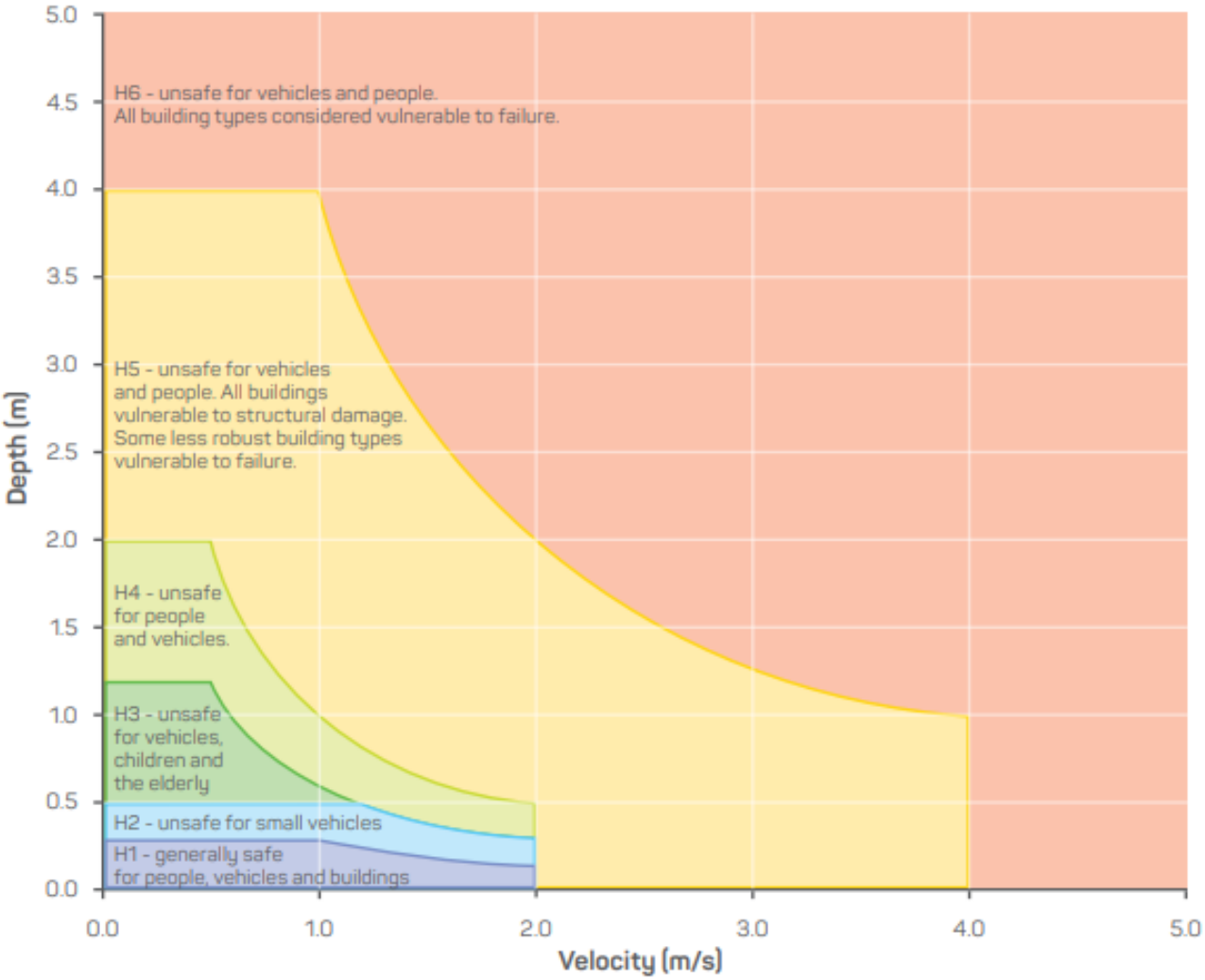

Figure 2-4 Australian Emergency Management Institute Hazard Categories

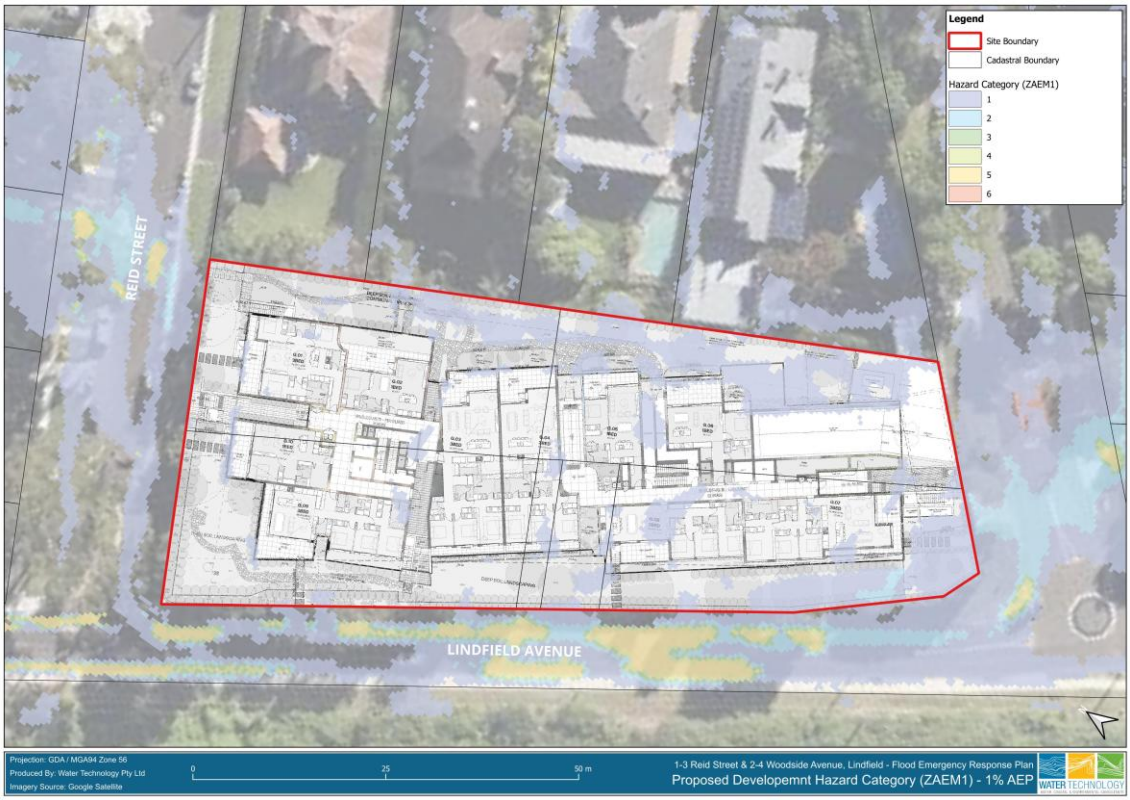

Figure 2-5 Proposed Development Hazard Category (ZAEM1) – 1% AEP

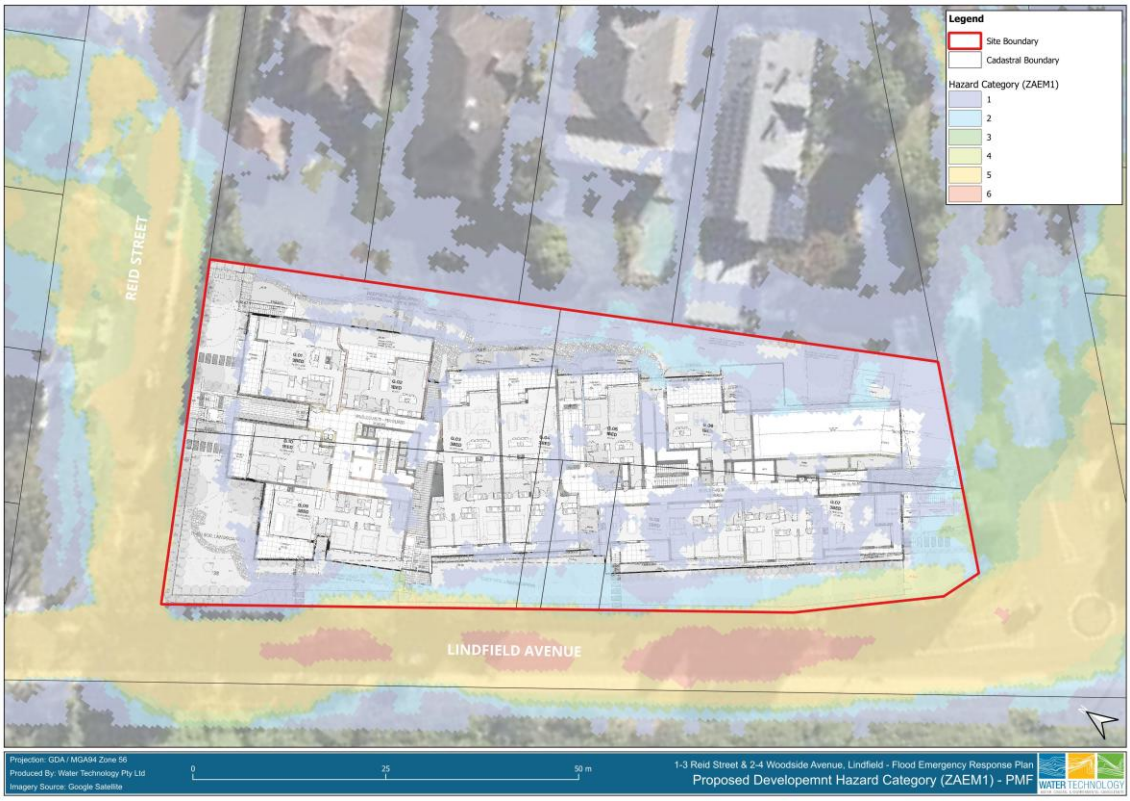

Figure 2-6 Proposed Development Hazard Category (ZAEM1) – PMF

2.4.1 Time to Inundation and Duration of Inundation

The rate of rise and duration of inundation has been extracted at a reporting location which is positioned adjacent to the Woodside Avenue driveway, which is generally representative of the timing in this area. This location is critical as it dictates accessibility of the site since any attempt to evacuate would realistically be towards Woodside Avenue. This location (model reference G10.1) is shown in Figure 2-7 and the water surface level timeseries for the 5% AEP, 1% AEP, 1% AEP (Climate Change), and PMF events at this location are also shown in Figure 2-8.

The time to inundation has been calculated from the model simulation start time (0-hours) to the time of first inundation (depth >0m) at the reporting location. The duration of inundation has been calculated as the model simulation time during which the reporting location is inundated, until the water surface level recedes. For the purpose of this exercise, the time to inundation and duration of inundation has been calculated in reference to 1) the driveway crest level, 2) the Woodside Avenue Centreline immediately across from the driveway, and 3) 300mm above the Woodside Avenue Centreline.

The results suggest that in an event rising as fast as the 15-minute duration PMF the site could become isolated within 4 – 8 minutes of the start of rainfall and could remain isolated for up to 23 minutes (Figure 2-8).

Table 2-1 Critical Storm Duration Time To Inundation (Hours)

Reference Location	5% AEP	1% AEP	1% AEP (CC)	PMF
Woodside Ave (87.95mAHD)	0.74 (44-minutes)	0.66 (40-minutes)	0.64 (38-minutes)	0.07 (4-minutes)
Woodside Ave (+300mm) (88.25mAHD)	-	-	-	0.11 (6-minutes)
Driveway Crest (88.40mAHD)	-	-	-	0.13 (8-minutes)

Table 2-2 Critical Storm Duration of Inundation (Hours)

Reference Location	5% AEP	1% AEP	1% AEP (CC)	PMF
Woodside Ave (87.95mAHD)	0.06 (4-minutes)	0.19 (12-minutes)	0.24 (14-minutes)	0.38 (23-minutes)
Woodside Ave (+300mm) (88.25mAHD)	-	-	-	0.19 (12-minutes)
Driveway Crest (88.40mAHD)	-	-	-	0.13 (8-minutes)

Figure 2-7 Reporting Location G10.1

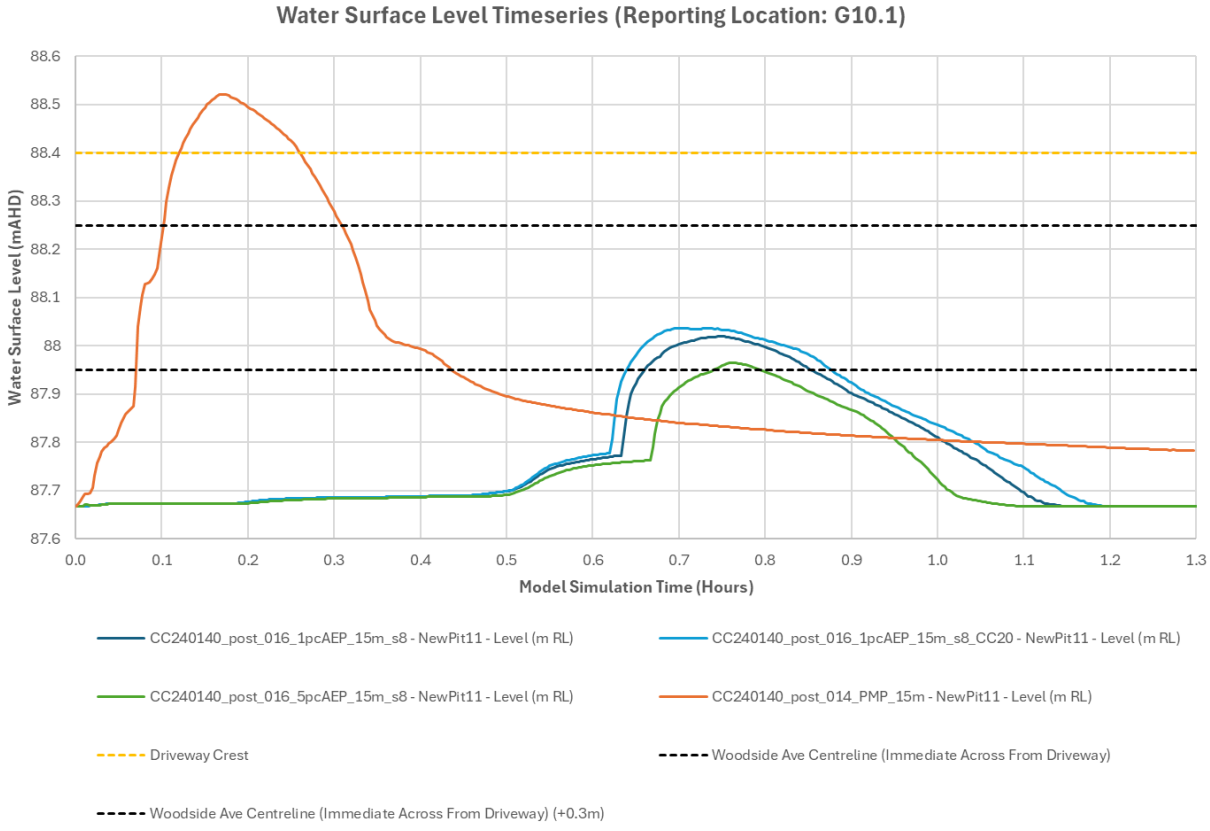

Figure 2-8 Critical Storm Duration Water Surface Level Timeseries (Reporting Location G10.1)

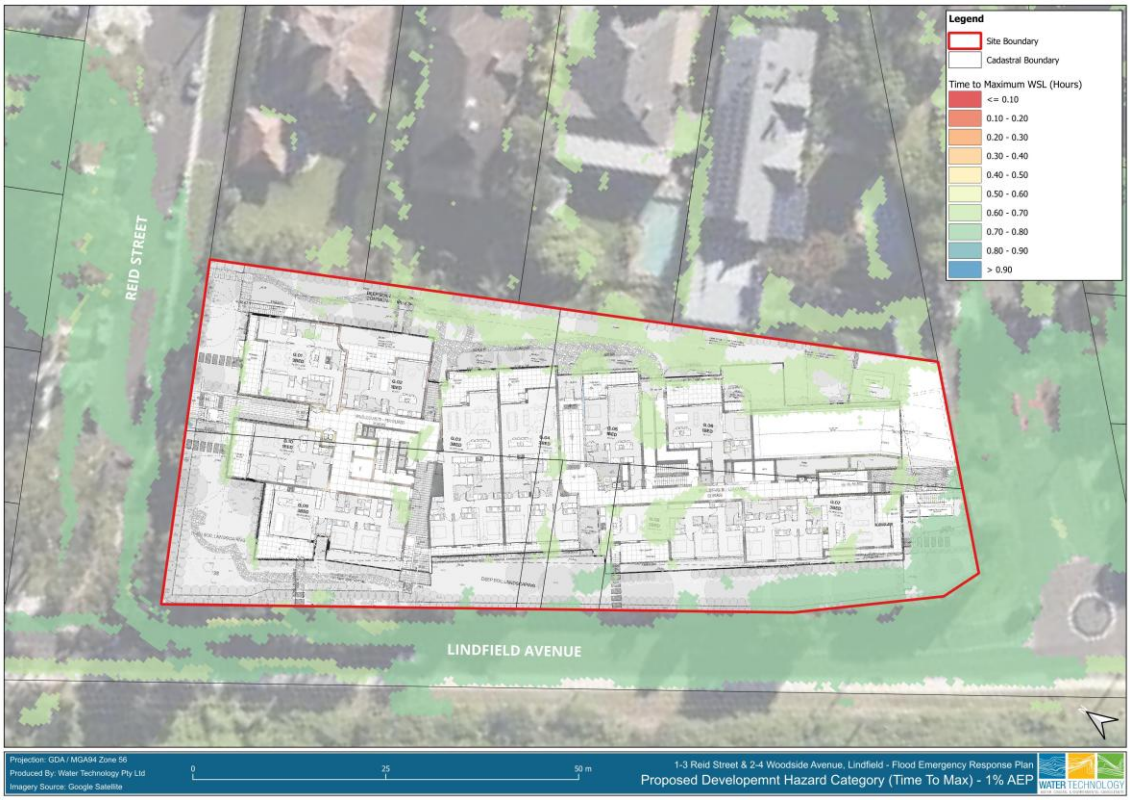

Figure 2-9 Proposed Development Time To Maximum Level (T-max) – 1% AEP

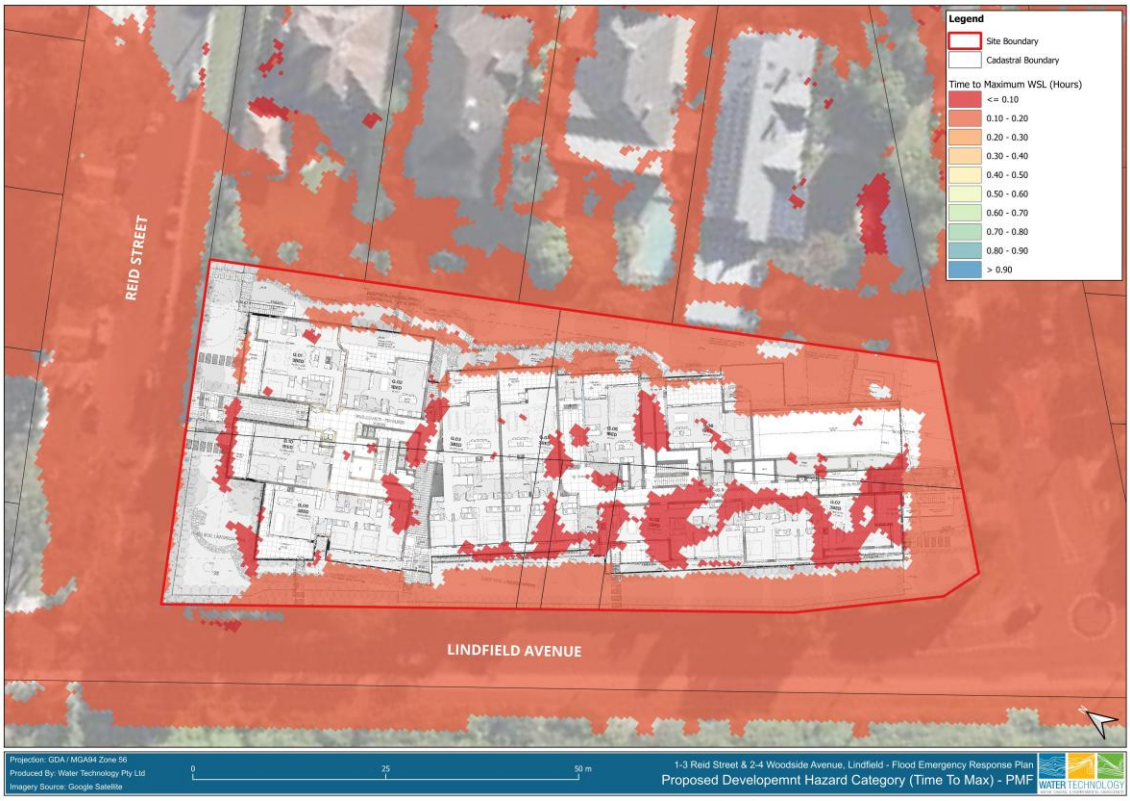

Figure 2-10 Proposed Development Time To Maximum Level (T-max) – PMF

The time to inundation and durations in Table 2-1 and Table 2-2 are based on the 15-minute duration overland PMF as this was the only duration of the PMF for which model results were available. However, it is possible that longer duration PMFs could isolate the site for a longer period of time. Longer duration PMFs would need to be modelled to confirm the maximum duration of isolation due to overland flows, although the duration is unlikely to exceed several hours.

2.4.2 Estimated Rate of Rise

The rate of rise of floodwaters has been estimated by calculating the time to peak inundation from the starting point of initial inundation (i.e., rise over time).The time to initial and peak inundation and the initial and peak water surface level used to estimate the rate of rise, and the estimated rate of rise itself, is summarised in Table 2-3.

It is important to note that the rate of rise has been estimated based on the supplied model results, which considers only the 15-minute design storm for the 5% AEP, 1% AEP, 1% AEP (climate change), and PMF events.

Considering this, the estimated rate of rise for the more frequent 5% AEP event (0.42m/hour) is the slowest compared to 0.47m/hour for the 1% AEP and 0.57m/hour for the 1% AEP (climate change) event.

The hydraulic modelling for the PMF event shows the fastest estimated rate of rise at 4.18m/hour.

Table 2-3 Critical Storm Duration Estimated Rate of Rise

Reference Location	5% AEP	1% AEP	1% AEP (CC)	PMF
Time To Maximum Inundation (Hours)	0.76 (46-minutes)	0.75 (45-minutes)	0.75 (45-minutes)	0.17 (11-minutes)
Initial WSL (mAHD)	87.67	87.67	87.67	87.67
Maximum WSL (mAHD)	87.99	88.05	88.10	88.38
Estimated Rate of Rise (m/Hour)	0.42	0.47	0.57	4.18

2.4.3 Site Inundation and Isolation

It has been established previously in this document that the proposed flood deflection walls along the site's northern boundary, adjacent to Reid Street, are expected to offer protection up to the 1% AEP (climate change) event (meaning the northern external flow path should not flow directly into the site and will instead be redirected towards Lindfield Street), although under PMF conditions the northern external flow path continues to enter the site further downstream along the site's eastern boundary.

- Note: It is possible that design events of magnitude greater than the 1% AEP (climate change) and up to the PMF may still enter the site downstream along the site's eastern boundary.
- Owing to the potential for events greater in magnitude than the 1% AEP (climate change) to generate enough flow to directly inundate the site from the north, it is anticipated that rainfall intensities greater than, or depths of similar magnitudes over similarly short timer periods, has the potential to generate catchment flows which directly inundate parts of the site.
- It is important to understand that the hydraulic modelling is prepared on the basis of theoretical design storm events to reflect flow generating conditions, although in reality storm events may occur in a different manner.
- Notwithstanding this, the modelling shows that events with an intensity greater than 20.8mm/hour or storm depth of 13.5mm over a short duration (in the case of this assessment, 15-minutes) could be considered as a possible trigger for implementing an emergency action plan.

In all assessed design events (5% AEP, 1% AEP, 1% AEP (climate change), and PMF) for the 15-minute critical duration, Woodside Avenue is inundated in some capacity. The modelling indicates that inundation of Woodside Avenue is as follows:

- In the 5% AEP event, Woodside Avenue hazard is limited to a H1 category,
- In the 1% AEP event, Woodside Avenue hazard is mostly H1 with isolated areas of H2, although access to the site is still viable.
- In the 1% AEP (climate change) event, Woodside Avenue is similarly mostly H1 with isolated areas of H2-H5, although access to the site is still viable.
- In the PMF event, Woodside Avenue experiences inundation up to H2-H3 at the main site access and Woodside Avenue itself experiences up to H5 to the immediate south of the site.

It is approximately the 1% AEP or greater when Woodside Avenue hazards begin to exceed H2.

2.5 Summary of Overland Flow Conditions and Implications For Evacuation

The catchment exhibits a rapid flash flooding response, characterised by short times to peak and limited warning time between the onset of intense rainfall and the development of hazardous flood conditions. Under these circumstances, floodwaters can rise quickly and inundate key access routes before a full evacuation can be safely initiated and completed.

The limited flood warning and response time significantly constrains the practicality and reliability of an evacuation-based emergency response. While evacuation may remain an option under certain circumstances where sufficient lead time is available, the rapid onset nature of inundation means there is a heightened risk that evacuation routes could become unnecessarily unsafe before all occupants have reached a place of safety. Consequently, a shelter-in-place strategy represents the most practical and dependable flood emergency response approach.

3 FORECASTS AND WARNINGS

3.1 Bureau of Meteorology (BoM)

The Bureau of Meteorology (BoM) has warning products that could provide an indication of an increased flood threat. These are summarised in Table 3-1.

Table 3-1 Warning products provided by the BoM

Bom Product	Description	Warning Lead-Time	Where The Product Can Be Accessed	What To Monitor For
Severe Weather Warnings	Issued for potentially hazardous or dangerous weather that is not solely related to severe thunderstorms, tropical cyclones or bushfires. The warnings describe the area under threat and the expected weather hazards. Warnings are issued with varying lead-times, depending on the weather situation. Occasionally, severe weather may occur without the relevant warning having been issued by the BoM.	1 – 24 hours	Issued directly to the media when there is a high probability of flash flooding. Can be found at: https://www.bom.gov.au/weather-and-climate/warnings-and-alerts BOM Weather app	Severe Weather Warnings with reference to intense rainfall or flooding for the Sydney Metropolitan Forecast Area
Severe Thunderstorm Warnings	Issued for events that may produce heavy rainfall with the potential to result in flash flooding. As severe thunderstorms can develop quickly, these warnings may not provide much warning time.	As little as minutes, but generally a few hours.	Issued directly to the media when there is a high probability of flash flooding. Can be found at: https://www.bom.gov.au/weather-and-climate/warnings-and-alerts BOM Weather app	Severe Thunderstorm Warnings for the broader Sydney metropolitan or Sydney Metropolitan Forecast Area
Rainfall Maps	Coarse forecast rainfall maps which can be used to estimate the amount of rain expected to fall over the next 4 days, as well as the next 24 hours.	1 – 4 days	Can be found at: https://www.bom.gov.au/location/australia/new-south-wales/metropolitan/o117098338-lindfield	Intense or prolonged rainfall in the broader Sydney metropolitan or specifically Lindfield - Roseville region.

Bom Product	Description	Warning Lead-Time	Where The Product Can Be Accessed	What To Monitor For
Rainfall Forecasts	Rainfall forecasts which can be used to estimate the amount of rain expected to fall within 3-hour windows over the next 7 days.	Up to 7 days	BOM Weather app (up to 3 days) BoM website (up to 7 days): https://www.bom.gov.au/location/australia/new-south-wales/metropolitan/o117098338-lindfield	Intense or prolonged rainfall in the broader Sydney metropolitan or specifically Lindfield - Roseville region.
Radar Service	Shows current rainfall locations and intensities.	90 minutes (BoM Weather App only)	Can be found at: https://www.bom.gov.au/location/australia/new-south-wales/metropolitan/o117098338-lindfield BOM Weather app	Intense or prolonged rainfall in the broader Sydney metropolitan or specifically Lindfield - Roseville region.
Flood Watch	Provide early advice regarding the potential for flooding in a particular area. May refer to possible local flooding, but will not be issues solely on the basis of overland flooding.	24 – 96 hours	Issued directly to the media when there is potential of flooding. Can be found at: https://www.bom.gov.au/weather-and-climate/warnings-and-alerts BOM Weather app	Flood Watches with reference to local flooding in the Northern Sydney Flood Watch Area.
Flood Warning	Issued when there is greater certainty that flooding is expected. Issued for waterways that take more than 6 hours to respond to rainfall	Unlikely to be issued for Gordon Creek	Issued directly to the media when there is potential of flooding. Can be found at: https://www.bom.gov.au/weather-and-climate/warnings-and-alerts and https://www.ses.nsw.gov.au/ BOM Weather app or the Hazards Near me app	Unlikely to be issued for Gordon Creek or local flooding. Use SES website or Hazards Near Me app.

The BOM Weather app can be set to show only the relevant warnings that apply to the area set by the user, as well as three-hourly rainfall forecasts. The use of this app is particularly recommended because it provides most of the available BoM data that can be used to inform the emergency plan on mobile devices, and the BoM warnings can be prioritised as push notifications.

Importantly, the BoM Severe Weather Warnings, Severe Thunderstorm Warnings and Flood Watches may occasionally be issued without necessarily being followed by the event that they are predicting or may not be issued at all ahead of an actual thunderstorm or flood event.

As such, these warnings are to be considered an indication - not a certainty - that a flood affecting the site might occur. Similarly, the lack of such warnings does not mean that a flood event affecting the site within the following hours or days is impossible.

The BoM also issues Flood Warnings when there is greater certainty that flooding is expected. However, these warnings are only issued for waterways that take more than 6 hours to respond to rainfall. Given the potential fast rate of rise of local floodwaters in the area, the BoM likely would not issue Flood Warnings relevant to the site.

Rainfall forecasts on the BOM Weather app give an indication of the amount of rain that will fall within a 3-hour windows over the next 3 days. BoMs 3-hour forecast windows do not provide a 15-minute resolution for rainfall forecasts. Therefore, as a conservative compromise, and for the purpose of defining a trigger for flood emergency response actions, this report assumes that the total rain that the BoM app indicates could possibly fall within a 3-hour period *could fall within any* 15-minute period within that window.

It is acknowledged that the modelling which informs this FERP establishes the 1% AEP event equivalent as a reasonable trigger for flood emergency response actions.

The latest available BoM IFD [2] indicates that the equivalent 1% AEP 15-minute duration storm depth is 44.5mm.

It should be noted that there is significant uncertainty associated with rainfall forecasts, particularly with regard to the depth of rainfall expected. Therefore, rainfall forecasts should not be relied upon as sole triggers for flood emergency response actions.

In summary, Severe Weather Warnings and Flood Watches provide anywhere between 1 hour to 4 days of warning time that flooding may occur. These types of warnings can be issued several times per year. Rainfall forecasts can provide up to 7 days of warning time that a rainfall event that could produce flooding may occur, although they do not provide any certainty that flooding will eventuate.

[2] Accessed 12 June 2026

3.2 NSW State Emergency Service

The NSW State Emergency Service (SES) is also likely to issue warnings using the Australian Warning System (AWS) which is a nationally consistent, 3-tiered approach designed to provide clear warnings and lead people to act ahead of severe weather events. The warning system comprises warning levels, action statements, hazard icons, colours and shapes. The 3 warning levels and corresponding actions are:

- **Advice** - an incident has started. Stay up to date in case the situation changes.
  - Stay informed.
  - Monitor conditions.
  - Reduced threat: return with caution.
- **Watch and Act** - conditions are changing and you need to start acting now.
  - Do not enter floodwater.
  - Prepare to evacuate.
  - Prepare to isolate.
  - Avoid the area.
- **Emergency Warning** - the highest level of warning. You may be in danger and need to act immediately.
  - Evacuate now / Evacuate before [time]
  - Shelter now
  - Move to higher ground.

NSW SES warnings can be monitored through the **Hazards Near Me** app and it is possible to set it to receive notifications for a particular location.

3.3 Observations

The preceding sections have set out multiple warnings and observations which can be used to alert the building to the possibility of flooding. However, each relies on technologies which are not fail safe and during a major flood electricity and telecommunications systems may fail.

It would also be possible to observe what is happening around the site and use visual cues to indicate potential overland flood behaviour. The observation of intense rainfall at the site would suggest that overland flooding may soon isolate the site, as would the observation of floodwaters in Lindfield Avenue. The observation of floodwaters in front of the driveway would indicate that the site has become isolated.

4 EMERGENCY MANAGEMENT CONSIDERATIONS

4.1 Flood Emergency Response Strategy

This Flood Emergency Response Plan recognises that protection of life is of critical and primary importance. Consistent with any emergency protocol, the protection of all lives is the first priority, the comfort of residents, staff and visitors is second, and protection of site property is third.

Generally speaking, there are 2 main types of responses to a flood emergency. These are to either:

- Evacuate off-site away from the building/s to an area above the reach of floodwaters in the PMF. This is the NSW SES preferred response, provided that the risks of evacuating are deemed acceptable; or
- Take Shelter in Place (SIP), which is to evacuate vertically within the site to higher floor levels and wait until floodwaters have receded and the emergency has passed. SIP may be considered an alternative to evacuation only when the risks of evacuating are higher than the risks of SIP. SIP requires suitable access to a suitable shelter above the PMF level. The shelter must be protected from the weather, be structurally stable in a PMF and have sufficient floor area for all people likely to be on site at any one time. Additional requirements to increase the comfort of the people taking shelter may be needed depending on the specific circumstances.

Given that the site can be isolated by floodwaters within 8 minutes of the start of rainfall with little or no warning, the primary flood emergency response strategy is for site occupants to shelter in place in their own homes. They should remain in their units before, during, and after a major rainfall event.

This strategy is based on the rapid onset and short duration of inundation at the site, flood protection of all ground floor units to events up to and including the PMF event owing to the implementation of various flood deflection walls, as well as the limited reliability of off-site evacuation owing to the rapid and short nature of events.

The following sections describe in more detail the analysis that was undertaken to inform the identification of the proposed emergency response strategy.

4.2 Evacuation Capability Assessment

The first step to developing a flood emergency response strategy is to assess whether a safe evacuation of the site can be obtained under all circumstances. Namely, evacuation to a location outside the floodplain must be possible in the worst-case scenario of a flood rising as fast as the PMF, when the site is at full capacity. If evacuation is possible in the worst-case scenario, it is possible in all scenarios. This is the reason why the PMF is adopted as the industry-standard event when considering risk to life and flood emergency response.

In order for occupants of the proposed development to evacuate off site by vehicle they would need to exit onto Woodside Avenue via the driveway. There may be less than 8 minutes of lead warning time before the road in front of the driveway becomes flooded, isolating the site.

The estimated time necessary to safely evacuate the site by vehicle is 3 hours and 10 minutes.

This is calculated using the NSWSES Timeline Evacuation Model (Opper et al., 2009), which requires that the calculated evacuation time includes:

- One hour of “warning acceptance factor” (time required for residents to decide to evacuate after an evacuation order has been communicated to them)
- One hour of “warning lag factor” (time required for residents to gather their belongings and leave)
- A standard vehicular evacuation rate of 600 cars per lane per hour
- One hour of Traffic Safety Factor (to account for delays due to road congestion and accidents).

If a public address (PA) system, audible in all parts of both buildings during heavy rain, is installed on site this will allow instructions to be disseminated quickly and without the necessity of door knocking all residences. Ten minutes should be allowed in the timeline for Flood Wardens to disseminate instructions to site occupants.

With the warning acceptance factor, warning lag factor, traffic safety factor and instruction dissemination time, it would take a minimum of 3 hours and 10 minutes to evacuate the site by vehicle. **This is 3 hours in excess of the warning time that may be available**. Therefore, vehicular evacuation from the site is not an appropriate flood emergency response strategy.

The above does not consider the travel time of vehicles evacuating the site or other vehicles that may be evacuating along the same route at the same time. This would increase the time required to evacuate the site, making vehicular evacuation an even less suitable flood emergency response strategy.

4.3 Shelter in Place

The NSW Department of Planning, Housing, and Infrastructure (DPHI) has published the Shelter In place Guideline For Flash Flooding (2025), which is intended to provide a framework for site-specific and risk-based assessments regarding shelter-in-place emergency management strategies for developments in flash flood environments. Owing to the relatively short time to inundation, rapid estimated rate of rise upon initial inundation, and short duration of inundation expected to occur within this catchment and surrounding the site, the principles of this guideline are relevant to this FERP.

The definition of a shelter-in-place strategy is the internal movement of a building's occupants to an area within the building above the PMF level before the property becomes inundated by floodwaters. The following section aims to address the guideline's key principles for a feasible shelter-in-place strategy.

4.3.1 Why Shelter-In-Place Is Appropriate

1. Does shelter in place align with existing emergency management strategies for the area, as determined through the flood risk management process and by the NSW SES?

Shelter-in-place aligns with the emergency management approach identified in the Middle Harbour Southern Catchments Flood Study 2023, which forms the basis of flood risk management for the area. The study identifies that flooding is characterised by steep, highly urbanised catchments that respond rapidly to intense, short duration rainfall, resulting in limited warning time and short-lived inundation. It further notes that:

- Isolation of properties may occur during major events, but typically for only a few hours.
- There is minimal requirement for evacuation up to and including the PMF, except in localised areas adjacent to major flow paths.

At the subject site, the primary overland flow path is redirected around the development for all events up to and including the 1% AEP (climate change) event, with meaningful inundation of the site only occurring during events greater than the 1% AEP (climate change) event and up to the PMF. Accordingly, the proposed shelter-in-place strategy is consistent with the flood study findings.

In addition, the Hornsby Ku-ring-gai Flood Emergency Sub Plan (NSW SES, 2021) states that:

> *1.6.1 The protection and preservation of human life (including the lives of responders and the community) is the highest priority.*

The proposed development prioritises the protection and preservation of human life. As the local streets can be subject to hazardous flash flooding with little warning, or in some circumstances potentially with no warning time, the most appropriate flood emergency response strategy for the site is for site occupants to shelter in place in their dwellings beyond the reach of the PMF. This strategy prevents site occupants from coming into contact with hazardous floodwaters.

The NSW SES flood plan for Hornsby Ku-ring-gai also states:

> *1.6.2 Evacuation is the primary response strategy for people impacted by flooding.*

However, given the potential for flash flooding in the local street's evacuation is not suitable as a primary flood emergency response strategy for the site as it would require site occupants to evacuate into potentially flooded streets. This would not be conducive to the protection and preservation of human life and would place site occupants at unnecessary risk. This is also the case for many sites within the Middle Harbour Southern Catchments due to the flash flooding behaviour described in the Middle Harbour Southern Catchments Flood Study.

2. Has evacuation off-site (the primary emergency management strategy) been investigated and determined to be unachievable?

The evacuation capability assessment in Section 4.2 demonstrates that in many cases there would be insufficient time available for evacuation of the proposed development.

Inundation surrounding the site is expected to occur quickly following the onset of rainfall and the rapid rate of rise limits the window for safe evacuation. The hydraulic modelling indicates that evacuation from the site towards Woodside Avenue is technically achievable during events up to and including the 1% AEP (climate change) event. However, for rarer events such as the PMF, Woodside Avenue becomes non-trafficable. It would not be possible during a rainfall event for site occupants to determine the magnitude of flooding that will eventuate and therefore evacuation would not be an appropriate flood emergency response strategy as it would risk site occupants exiting the site into hazardous floodwaters.

3. Does the development include medical centres, emergency service and community facilities, and sensitive and hazardous land uses, some of which may not be suitable for shelter in place?

The development comprises a residential apartment building and does not include medical or aged care facilities, emergency service infrastructure, or hazardous or sensitive land uses. The absence of vulnerable or special-needs occupants supports the suitability of a shelter-in-place strategy.

4. Shelter in place for greenfield development is not supported.

The development is not greenfield. It is located within an established, urbanised catchment that is already subject to the flash flood behaviour described in the adopted flood study. The strategy therefore represents an adaptation to an existing flood regime, rather than introducing new risk to undeveloped land.

5. Whether there is existing government developed flood warning systems that give advanced detailed forecasts of flash flooding to allow sufficient time to evacuate to the proposed refuge locations.

There are no government developed flood warning systems for flash flooding in the overland flow catchment. Owing to this, the design of the building and landscaping ensures no external flow path to enter the ground floor (or any other) residential units up to and including the PMF.

6. Can the community effectively be informed of the risks associated with the emergency management strategy?

The risks associated with the emergency management strategy can be communicated through standard emergency alert systems (BoM and NSW SES) and site-specific emergency management procedures and resident information. The key behavioural message should be consistent and clear; remain indoors during forecasted intense rainfall events and do not attempt evacuation through flash flood conditions once inundation begins.

Actions for informing residents and staff of the flood risks at the site and the risks of isolation are set out in Section 5.3 of this FERP.

7. Detailed assessment of evacuation off-site (the primary emergency management strategy) to determine that evacuation off-site is not achievable.

The evacuation capability assessment in Section 4.2 demonstrates that in many cases there would be insufficient time available for evacuation of the proposed development.

Due to the expected rapid onset of heavy rainfall and subsequent inundation it is not reasonably expected there will be sufficient time to prepare and implement an evacuation following the onset of severe rainfall. Considering the rates of rise expected surrounding the site, attempting evacuation during active flash flooding presents unacceptable and unnecessary risk.

Given that off-site evacuation would need to occur before any visible flood hazard is present, it is not considered a practical or reliable primary strategy for extreme events. Accordingly, shelter-in-place should be considered as the safer and more dependable approach for PMF-scale events.

8. The flood behaviour at the site, with consideration of climate change and assessment of the potential maximum duration of isolation up to and including the PMF to identify that: a. flash flooding is the only flood risk present at the site, whether it be from overland flooding, local creek or riverine flooding, and b. the flooding occurs within less than 6 hours from the commencement of causative rain and the duration of shelter in place due to isolation by floodwaters is less than 12 hours from the commencement of rainfall, and c. the development is not subject to high hazard flooding.

Flash flooding by overland flows is the only flood risk present at the site. Flood modelling demonstrates that flooding at the site is limited to short duration, intense overland flow events where the time to inundation is less than 6-hours from the onset of rainfall (4 – 8 minutes in the critical duration PMF). In the 15-minute duration PMF the site would remain isolated for 23 minutes. Longer duration PMFs would need to be modelled to confirm the maximum duration of isolation due to overland flows. However, the duration of isolation is unlikely to exceed the 12 hour threshold set out by DPHI in the Guideline. Therefore, shelter-in-place is an appropriate flood emergency response strategy given the flood behaviour at the site.

4.3.2 Proposed Shelter-In-Place Strategy

A staged approach is proposed which ensures that evacuation is not attempted during hazardous flash flood conditions and that occupants can safely shelter in place within the building. The proposed procedure is outlined below.

1. **Receipt of Severe Weather / Heavy Rainfall Warning**

   Upon receipt of a Bureau of Meteorology or NSW SES warning for heavy rainfall or potential flash flooding, building management and occupants should be alert. If it is raining Flood Wardens will visually monitor Lindfield Avenue and Woodside Avenue for floodwaters every **2 hours**. If intense rainfall is observed, they will increase the frequency of visual monitoring to every **20 minutes**.

2. **Preparation for Shelter in Place**

   If the BoM Weather App indicates there is a rainfall event expected with 44.5mm total depth or greater within a 3-hour window, site occupants should be advised to remain on site and avoid unnecessary off site travel. Occupants should avoid using the landscaped area along Lindfield Avenue.

   All occupants should prepare to shelter in place within their own dwelling by:

   a. Monitoring weather conditions and official alerts.

   b. Preparing essential items (food, water, medication, charging phones/devices).

   c. Remaining within their dwelling and avoiding all unnecessary outdoor movement for the duration of the event.

3. **Monitoring of Local Flood Conditions**

   During the rainfall event, conditions surrounding the site should be monitored, including:

   a. Road conditions along Woodside Avenue.

   b. Overland flow overtopping from Reid Street into the site.

   c. Any observed ponding or flow accumulation adjacent to building.

   Any observed overland flow entering the site or ponding or flow accumulation adjacent to the building would indicate and event comparable to or greater than the 1% AEP event is occurring. Occupants on all floors, including the ground floor, should remain sheltered in place within their dwellings.

4. **Trigger for Shelter in Place at Dwelling Level**

   If overland flow is observed to enter the site from the north, ponding or flow accumulation adjacent to the building is occurring or floodwaters are observed on woodside Avenue in front of the driveway, then the rainfall event should be considered severe enough to warrant the Shelter in Place strategy.

   Occupants on all floors should remain within their own dwelling for the duration of the severe storm event. Ground floor apartments are protected from the external overland flow path by deflection walls designed to prevent the external overland flow path from reaching the building in all events up to and including the PMF. The expected time to inundation and duration of inundation is short, with water surface levels anticipated to recede within less than a few hours. Lifts should not be used during severe weather events under any circumstances.

5. **Contingency - Internal Relocation (Levee Failure)**

The site benefits from protection via the flood deflection walls, and failure of these walls represents an unlikely scenario. However, in the improbable event that a deflection wall failure or overtopping occurs and ground-level inundation begins to affect the building beyond the capacity of the flood deflection walls, ground floor occupants have the option to temporarily relocate internally via the stairwells to upper floors if needed.

In this contingency scenario, occupants might:

a. Use the internal stairwells only - lifts must not be used.

b. Temporarily relocate upon instruction from building management or emergency services.

c. Remain within the building on Levels 1 - 8 and continue to shelter in place until floodwaters have receded and all-clear advice has been received from the NSW SES or emergency services.

This contingency is not anticipated to be required as there is proposed protection of the ground floor up to the PMF level under normal conditions, and as such is provided as a precautionary and secondary measure only.

4.4 Flood Risk Management Features

This Flood Emergency Response Plan assumes that the following features are integrated into the design, construction and operation of the site to minimise the risk to life from flooding. It is a responsibility of the owners and operators of the site to ensure that these features are installed and adequately maintained so that they remain fit for purpose at all times.

- The flood deflection walls protect all habitable floor levels from flooding in events up to and including the PMF.
- The basement will be protected from flooding up to and above the PMF level by a driveway crest, raised stairway landings and flood deflection walls.
- The external pathway between Building A and Building B will be flood free in all events up to and including the PMF. Any water ponding between the deflection wall and the building itself is a result of localised rainfall-runoff (which is a site drainage matter and not relevant pertinent to flood management matters).
- The building will remain structurally stable during a PMF.
- A number of staff and residents are to be nominated as Flood Wardens. One will be nominated as Chief Flood Warden, preferably a staff member.
- There will be at least one Flood Warden in each building at all times.
- Flood Wardens are subscribed to the BoM Weather App and the NSW Hazards Near Me App
- The Chief Flood Warden (or Flood Warden on site) is to have access at all times, to a laptop/tablet/smartphone with 4G/5G internet access and at least 24 hours of battery capacity
- Flood Wardens are to have smartphones or other portable methods of communicating with each other (e.g. radio) and with the Chief Flood Warden. These systems will have a minimum of 24 hours battery capacity (this can be achieved through the use of power banks
- Flood warning signage will be installed throughout the building. Signage will indicate:
  - Follow the instructions of Flood Wardens in the event of a flood.
  - In the event of a flood shelter in your home.
  - It is never safe to walk or drive through floodwaters.
- Flood signage should be installed throughout the basement showing flood evacuation arrows towards Stair 4. Anybody in the basement during a flood should exit the basement via Stair 4.
- A barrier will be located across the vehicular entry to the basement (e.g., a boom gate) to prevent vehicles from exiting into potentially hazardous floodwaters
- A public address (PA) system, audible in all parts of both buildings during heavy rain, will be installed on site. This will allow instructions to be disseminated quickly and without the necessity of door knocking. This will be used in communicating flood emergency messages to site occupants and must have back-up power supply that does not rely on grid power.
- There is a recommended 6-hour back-up power supply that will ensure the flood refuge has working power facilities. This 6-hour duration has been adopted on the basis that overland flow flooding in this catchment is typically fast-moving and short in duration, often receding within a few hours. While this is considered a reasonable assumption given the local flood behaviour, it is acknowledged that further analysis may be required to confirm the actual period of site isolation under a range of longer-duration storm events.
- Flood emergency response drills will be conducted annually.
- A hard copy of this FERP is to be kept in each of the residential apartment buildings

- The following are to be kept in each building:
  - An emergency kit
  - First aid kit
  - A defibrillator
  - A laptop/tablet/smartphone with 4G/5G internet access and at least 24 hours of battery capacity (can be achieved via power banks)
  - Portable radio with batteries,
  - Torches with spare batteries,
  - Shelf-stable food/snacks

5 FLOOD EMERGENCY RESPONSE PLAN (FERP)

5.1 Priorities

This FERP recognises that protection of life is of critical and primary importance. This FERP is principally concerned with the safety and comfort of all occupants on site. All flood emergency responses recommended in this FERP are to recognise the primacy of life and wellbeing over protection of property.

Nonetheless, it is recommended that the building management and staff take all necessary measures outside of this FERP to manage the risks which flooding poses to the site and its property.

The FERP sets emergency management prevention, preparedness and response measures that are relevant to a flood emergency. It does not cover broader emergency management guidance for any other type of hazard that could affect the site.

5.2 Roles and Responsibilities

5.2.1 NSW State Emergency Services (NSWSES)

The NSWSES is the lead combat agency for flooding in NSW. It can command resources from other government organisations including local councils, Transport for NSW and the Police to assist in flood operations under its command.

Under the State Emergency and Rescue Management Act, 1989, the NSWSES has the power to direct any citizen or organisation to take actions in response to flooding. This includes the power to order evacuations.

Any flood response directive issued by the NSWSES or by delegated authority to others acting on its behalf must be followed by site management and staff. This includes any order to evacuate the site or not evacuate the site, irrespective of what decisions have been made by management in accordance with this FERP.

5.2.2 Building Owner

The organisation which owns the building will be responsible for ensuring that:

- all flood management features listed in section 4.4 of this report are implemented and are regularly assessed, serviced and repaired so that they remain fit for purpose at all times.
- the public address system is kept in working order and assessed annually.
- the Chief Flood Warden and Flood Wardens are familiar with this FERP.
- the FERP is reviewed and updated every 5 years, or following a flood that triggers sheltering in place.
- the FERP is kept up to date.
- Flood Wardens are appointed from among the staff and residents and are given flood risk management responsibilities and have sufficient training to implement this FERP.
- all staff are given induction and training into their flood emergency response responsibilities
- all site occupants are informed of the site flood risks, this FERP and their responsibilities during a flood emergency (refer to Section 5.2.5) and are encouraged to keep non-perishable food and drinks in their dwellings
- flood signage is visible and legible.
- there are at least 2 adequately trained Flood Wardens on site at all times.

- support the Chief Flood Warden and Flood Wardens in their duties.
- an annual audit is undertaken of the resources necessary to implement the FERP.
- post-flood site clean-up and recovery
- there are sufficient financial, human and other resources to maintain and implement the FERP.

5.2.3 Building Manager / Chief Flood Warden

The Building Manager will be the Chief Flood Warden who will be responsible for:

- being familiar with all flood emergency management procedures set out in this document and with BoM warnings, NSW SES warnings and rainfall data.
- ensuring that all staff and Flood Wardens are aware of the flood emergency response procedures set out in Chapter 5 and Appendix A of this FERP.
- ensuring that all Flood Wardens know how to monitor flood forecasts and external water levels.
- organising training for themselves and Flood Wardens in the implementation of the flood emergency management procedures set out in Chapter 5 and Appendix A of this FERP.
- subscribing themselves and Flood Wardens to the BOM Weather App and the Hazards Near Me App to receive severe weather warnings, flood watches, flood warnings, rainfall notifications and AWS warnings direct to their mobile devices
- an annual drill is undertaken involving all staff and Flood Wardens nominated in the FERP.
- keeping a fully charged and functional mobile phone/laptop/tablet with 4G/5G internet access and at least 24 hours of battery charge on site at all times
- ensuring there are at least 2 adequately trained Flood Wardens on site at all times.
- monitoring weather forecasts, flood warnings and AWS warnings through the Bureau of Meteorology website, BoM Weather app and the Hazards Near Me app every morning
- keeping soft and hard copies of the FERP on site and readily accessible to the Flood Wardens at all times,
- implementing this FERP in the event of a flood or delegating that task to an on-duty Flood Warden
- directing other staff to implement various aspects of this FERP, as required
- consulting with emergency service organisations and other external stakeholders, as required.
- reporting annually, and as requested, to the building owner on implementation and maintenance of the FERP.

The Chief Flood Warden may delegate the above tasks to others but bears ultimate responsibility for their implementation. If the Building Manager is not present on site a delegate from among the nominated Flood Wardens will take on the responsibilities of the Chief Flood Warden.

5.2.4 Flood Wardens

Flood Wardens should be selected from among the staff and residents. If expedient, Fire Wardens should also be appointed as Flood Wardens. All Flood Wardens will be responsible for:

- ensuring that they are aware of the flood emergency response procedures set out in this FERP.
- ensuring they know how to monitor rainfall forecasts, severe weather warnings, flood warnings and external water levels.
- ensuring a soft and hard copy of the FERP is on site and to report absences to the Chief Flood Warden
- implementing the procedures in this FERP during and after a flood.

Flood Wardens may delegate any of the actions set out in this FERP that need to be taken during or after a flood but bear ultimate responsibility for their implementation.

5.2.5 Residents and Visitors

Residents and visitors are to follow the directions of the Flood Wardens during a flood emergency.

5.3 Flood Emergency Response Triggers and Actions

Management actions which are applicable to the entire site are included in the following sections. **Appendix A summarises all of the following actions as a check list to be used before, during and after a flood**. Appendix C provides an emergency contact list to be completed and kept updated by the Chief Flood Warden.

The flood emergency response operations are divided into four phases:

- Prevent – this applies at all times.
- Prepare – this occurs when flooding of the site may be about to happen.
- Respond – this occurs when a flood of the site is ongoing.
- Recover – this occurs after a flood event.

5.3.1 Prevent: Before a Flood

TRIGGER FOR ACTION — Always

ACTIONS:

- The building owner will ensure all flood management features listed in section 4.4 of this report are implemented and are regularly assessed, serviced and repaired so that they remain fit for purpose at all times.
- The building owner the public address system is kept in working order and assessed annually.
- The building owner will ensure the Chief Flood Warden and Flood Wardens are familiar with this FERP.
- The building owner will ensure the FERP is reviewed and updated every 5 years, or following a flood that triggers sheltering in place.
- The building owner will ensure the FERP is kept up to date.
- The building owner will ensure Flood Wardens are appointed from among the staff and residents and are given flood risk management responsibilities and have sufficient training to implement this FERP.
- The building owner will ensure all staff are given induction and training into their responsibilities during a flood emergency
- The building owner will ensure all site occupants are informed of the site flood risks, this FERP and their responsibilities during a flood emergency (refer to Section 5.2.5) and are encouraged to keep non-perishable food and drinks in their dwellings
- The building owner will ensure flood signage is visible and legible.
- The building owner and Chief Flood Warden will ensure there are at least 2 adequately trained Flood Warden on site at all times.
- The building owner will support the Chief Flood Warden and Flood Wardens in their duties.
- The building owner will ensure an annual audit is undertaken of the resources necessary to implement the FERP.
- The Chief Flood Warden will ensure an annual drill is undertaken involving all staff and Flood Wardens nominated in the FERP.
- The building owner will ensure there are sufficient financial, human and other resources to maintain and implement the FERP.

- The Chief Flood Warden will ensure they are familiar with all flood emergency management procedures set out in this document, with BoM warnings, NSW SES warnings and rainfall data.
- The Chief Flood Warden will ensure all staff and Flood Wardens are aware of the flood emergency response procedures set out in Chapter 5 and Appendix A of this FERP.
- The Chief Flood Warden will subscribe themselves and Flood Wardens to the BOM Weather App and the Hazards Near Me App to receive severe weather warnings, flood watches, flood warnings, rainfall notifications and AWS warnings direct to their mobile devices
- The Chief Flood Warden will ensure all Flood Wardens know how to monitor flood forecasts and external water levels.
- The Chief Flood Warden will organise training for themselves and Flood Wardens in the implementation of the flood emergency management procedures set out in Chapter 5 and Appendix A of this FERP.
- The Chief Flood Warden will keep a fully charged and functional mobile phone/laptop/tablet with 4G/5G internet access and at least 24 hours of battery charge on site at all times.
- The Chief Flood Warden will monitor weather forecasts, flood warnings and AWS warnings through the Bureau of Meteorology website, BoM Weather app and the Hazards Near Me app every morning
- The Chief Flood Warden will keep soft and hard copies of the FERP on site and readily accessible to the Flood Wardens at all times.
- Flood Wardens will report absences of the FERP to the Chief Flood Warden
- The Chief Flood Warden will direct other staff to implement various aspects of this FERP, as required.
- The Chief Flood Warden will consult with emergency service organisations and other external stakeholders, as required.
- The Chief Flood Warden will report annually, and as requested, to the building owner on implementation and maintenance of the FERP.
- Flood Wardens will ensure they are aware of the flood emergency response procedures set out in this FERP.
- Flood Wardens will ensure they know how to monitor rainfall forecasts, severe weather warnings, flood warnings and external water levels

5.3.2 Prepare: When a Flood is Possible

TRIGGER FOR ACTION:

BoM issues a Severe Weather or Thunderstorm Warning for the Sydney area

OR

Intense rainfall is observed on site

ACTIONS:

- If it is raining the Chief Flood Warden or delegate will visually monitor the adjacent roads for floodwaters every **2 hours.**
- If intense rainfall is observed at the site, the Chief Flood Warden or delegate will visually monitor the adjacent roads for floodwaters every **20 minutes.**
- The Chief Flood Warden or delegate will monitor the Bureau of Meteorology rainfall forecasts and rainfall gauge levels, the NSW SES website, and Hazards Near Me app every **hour** and tune into ABC Radio 702
- The Chief Flood Warden will notify the Flood Wardens of the possibility of flooding and remind them of actions and procedures to follow should evacuation be required.

TRIGGER FOR ACTION:

If the BoM Weather App indicates there is a rainfall event expected with at least 44.5mm total storm depth or greater within a 3-hour window.

OR

NSW SES Hazard Watch Map/Hazards Near Me App issues a Watch and Act for flooding applicable to the site

ACTIONS:

- The Chief Flood Warden or delegate will announce via the PA system:
  - Flooding in local roads is possible.
  - Where possible please remain in your home and avoid unnecessary off-site travel.
  - Please prepare any essential items you may require if the site becomes temporarily isolated by floodwaters, such as food, water, medications or charging any phones or other devices.
  - Please do not use the landscaped area along Lindfield Avenue.
  - It is never safe to walk or drive through floodwaters of any depth.

  The announcement is to be repeated several times per day until the triggers above have subsided.
- The Chief Flood Warden or delegate will check to ensure that nobody is in the landscaped area along Lindfield Avenue

During the relevant 3-hour period the Chief Flood Warden or delegate will visually monitor the adjacent roads for floodwaters every **20 minutes**.

5.3.3 Respond: During a Flood

TRIGGER FOR ACTION:

Floodwaters are observed entering the site from Reid Street, ponding or accumulating adjacent to the buildings or on Woodside Avenue in front of the driveway

OR

NSW SES issues an Emergency Warning – Shelter Now

ACTIONS:

- The Chief Flood Warden or delegate will initiate sheltering on site
- The Chief Flood Warden or delegate will announce via the PA system:
  - Local flooding is impacting local streets.
  - The site is now isolated by floodwaters.
  - It is no longer safe to leave the site.
  - Everyone should stay in the building on the ground floor and above. Residents, please remain in your units
  - The basement car park has been closed, and vehicles are not to leave the site. Vehicles will be protected from flood waters
  - If you are currently in the basement, please follow the flood evacuation arrows to make your way upstairs via Stair 4
  - Please do not use the lifts
  - The site is not anticipated to remain isolated for very long; we will let you know when it is safe to leave
  - Remember it is never safe to walk or drive through floodwaters.
- Flood Wardens will close the lobby and building entrances.
- Flood Wardens will close the barrier across the driveway
- If safe to do so, the Flood Wardens will sweep the basement to ensure no one remains on this lower level
- There should be at least one Flood Warden sheltering in each building

TRIGGER FOR ACTION (precautionary measure only):

A flood deflection wall is observed to fail or be overtopped by flooding

OR

Floodwaters are observed entering the ground floor or the basement

ACTIONS:

- The Chief Flood Warden or delegate will announce via the PA system:
  - It is possible floodwaters may enter the ground floor
  - Anybody currently on the ground floor or in the basement must immediately make their way upstairs to Level 1 or above via the stairs
  - Please do not use the lifts
  - If you are currently in the basement, please follow the flood evacuation arrows to make your way upstairs via Stair 4

5.3.4 Recover: After a Flood

TRIGGER FOR ACTION:

Emergency Services give the all-clear.

ACTIONS:

- The Chief Flood Warden will advise those sheltering on site it is safe to leave.
- The Chief Flood Warden will ensure that no visitors or patrons return to the site while flooding is still occurring or recently occurred.
- Visitors can return to site only after the all-clear has been given by emergency services. The Chief Flood Warden will ensure they do not return to site until that time.
- If there are any concerns regarding the structural stability of the buildings, the building owners will organise for a structural engineer to assess any damage and the structural integrity of the building
- A hazard assessment will be undertaken by the Chief Flood Warden for the clean-up. Safe work methods statements will be prepared and personal protective equipment supplied consistent with the known hazards which can be associated with floods:
  - Slips, trips and falls,
  - Sharp debris,
  - Venomous animals,
  - Contaminated water and sediments.
- Plumbing and gas to be checked by licensed plumber and defects rectified
- Electrical to be checked by licensed electrician and defects rectified.
- Before the re-commencement of site activities, a de-brief will be held with the building owners, the Chief Flood Warden and key persons and may involve NSW SES flood personnel/volunteers. The flood event and response, including the use of this FERP and any emergency procedures will be reviewed.
- Changes may be made to this FERP and the requirements for future emergency response should the review identify any improvements which may be made.

6 SUMMARY

6.1 Project Summary

The Flood Emergency Response Plan (FERP) has been developed to support the proposed residential development at 2-4 Woodside Avenue and 1-3 Reid Street, Lindfield, building on HYDRACOR's Flood Impact and Risk Assessment. While the site is not subject to mainstream flooding from Gordon Creek due to its upstream location, it is affected by overland flow that can occur rapidly and may temporarily isolate the site and surrounding roads. Previous assessments identified that extreme events could impact lower levels and require evacuation.

Based on additional modelling, the introduction of a levee designed above the Probable Maximum Flood level is expected to prevent inundation of the ground floor. As a result, the primary emergency response strategy has been refined to a shelter-in-place approach for all residents, with vertical evacuation to upper levels only required as a contingency in the unlikely event of levee failure. This approach aligns with relevant guidelines and has been formalised to address regulatory feedback and strengthen the site's flood risk management and emergency preparedness.

6.2 FERP Overview

The Flood Emergency Response Plan (FERP) outlines a structured four-phase framework: Prevent, Prepare, Respond, and Recover, to effectively manage flood risk across the site. The plan ensures continuous preparedness, a transparent escalation pathway based on forecast warnings and observed conditions, a coordinated on-site response prioritising life safety, and a controlled, risk-managed recovery following emergency service clearance.

The Key parts of the FERP are noted below:

- Prevent (ongoing preparedness and risk reduction), Prepare (activation in response to formal warnings), Respond (management during active flooding), and Recover (post-event restoration and review).
- Activation occurs following a Bureau of Meteorology (BoM) Severe Weather Warning for possible flooding, or the observation of intense rainfall on site. During this phase, the Chief Flood Warden undertakes regular monitoring of forecasts, rainfall, and alerts (including ABC Radio 702).
- Well-defined roles and responsibilities for the building owner, Chief Flood Warden, and Flood Wardens, supported by training programs, regular drills, and regular plan reviews.
- Emphasis on shelter-in-place protocols, controlled building closure and strict prohibition of entering floodwaters once conditions become unsafe.

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APPENDIX A
FLOOD EMERGENCY RESPONSE PLAN ACTION CHECKLIST

Stage	Trigger for Action	Action	Who is Responsible	What is Needed
Before a flood	Always	The building owner will ensure all flood management features listed in section 4.4 of this report are implemented and are regularly assessed, serviced and repaired so that they remain fit for purpose at all times.	Building Owner	Flood Emergency Response Plan
		The building owner the public address system is kept in working order and assessed annually.	Building Owner	Flood Emergency Response Plan
		The building owner will ensure the Chief Flood Warden and Flood Wardens are familiar with this FERP.	Building Owner /Chief Flood Warden	Flood Emergency Response Plan
		The building owner will ensure the FERP is reviewed and updated every 5 years, or following a flood that triggers sheltering in place.	Building Owner /Chief Flood Warden	Flood Emergency Response Plan
		The building owner will ensure the FERP is kept up to date.	Building Owner /Chief Flood Warden	Flood Emergency Response Plan
		The building owner will ensure Flood Wardens are appointed from among the staff and residents and are given flood risk management responsibilities and have sufficient training to implement this FERP.	Building Owner /Chief Flood Warden	N/A
		The building owner will ensure all staff are given induction and training into their responsibilities during a flood emergency	Building Owner /Chief Flood Warden	Public address system, boom gates
		The building owner will ensure all site occupants are informed of the site flood risks, this FERP and their responsibilities during a flood emergency (refer to Section 5.2.5) and are encouraged to keep non-perishable food and drinks in their dwellings	Building Owner /Chief Flood Warden	BoM Weather app, Hazards Near Me app, Mobile phones / Computers with 4g/5g internet
		The building owner will ensure flood signage is visible and legible.	Building Owner /Chief Flood Warden	Signage
		The building owner and Chief Flood Warden will ensure there are at least 2 adequately trained Flood Warden on site at all times.	Building Owner /Chief Flood Warden	Flood Emergency Response Plan

Stage	Trigger for Action	Action	Who is Responsible	What is Needed
		The building owner will support the Chief Flood Warden and Flood Wardens in their duties.	Building Owner /Chief Flood Warden	N/A
		The building owner will ensure an annual audit is undertaken of the resources necessary to implement the FERP.	Building Owner /Chief Flood Warden	Flood Emergency Response Plan
		The Chief Flood Warden will ensure an annual drill is undertaken involving all staff and Flood Wardens nominated in the FERP.	Building Owner /Chief Flood Warden	Flood Emergency Response Plan
		The building owner will ensure there are sufficient financial, human and other resources to maintain and implement the FERP.	Building Owner /Chief Flood Warden	Flood Emergency Response Plan
		The Chief Flood Warden will ensure they are familiar with all flood emergency management procedures set out in this document, with BoM warnings, NSW SES warnings and rainfall data.	Chief Flood Warden	Flood Emergency Response Plan (Chapter 5 and Appendix A), BoM Weather app, Hazards Near Me app, Mobile phones / Computers with 4g/5g internet
		The Chief Flood Warden will ensure all staff and Flood Wardens are aware of the flood emergency response procedures set out in Chapter 5 and Appendix A of this FERP.	Chief Flood Warden	Mobile phones / Computers with 4g/5g internet
		The Chief Flood Warden will subscribe themselves and Flood Wardens to the BOM Weather App and the Hazards Near Me App to receive severe weather warnings, flood watches, flood warnings, rainfall notifications and AWS warnings direct to their mobile devices	Chief Flood Warden	Flood Emergency Response Plan (Chapter 5 and Appendix A), BoM Weather app, Hazards Near Me app, Mobile phones / Computers with 4g/5g internet
		The Chief Flood Warden will ensure all Flood Wardens know how to monitor flood forecasts and external water levels.	Chief Flood Warden	Flood Emergency Response Plan (Chapter 5 and Appendix A), BoM Weather app, Hazards Near Me app, Mobile phones / Computers with 4g/5g internet

Stage	Trigger for Action	Action	Who is Responsible	What is Needed
		The Chief Flood Warden will organise training for themselves and Flood Wardens in the implementation of the flood emergency management procedures set out in Chapter 5 and Appendix A of this FERP.	Chief Flood Warden	Flood Emergency Response Plan
		The Chief Flood Warden will keep a fully charged and functional mobile phone/laptop/tablet with 4G/5G internet access and at least 24 hours of battery charge on site at all times.	Chief Flood Warden	Mobile phones / Computers with 4g/5g internet
		The Chief Flood Warden will monitor weather forecasts, flood warnings and AWS warnings through the Bureau of Meteorology website, BoM Weather app and the Hazards Near Me app every morning	Chief Flood Warden	BoM Weather app, Hazards Near Me app, Mobile phones / Computers with 4g/5g internet
		The Chief Flood Warden will keep soft and hard copies of the FERP on site and readily accessible to the Flood Wardens at all times.	Chief Flood Warden	Flood Emergency Response Plan
		Flood Wardens will report absences of the FERP to the Chief Flood Warden	Chief Flood Warden	Flood Emergency Response Plan
		The Chief Flood Warden will direct other staff to implement various aspects of this FERP, as required.	Chief Flood Warden	Flood Emergency Response Plan
		The Chief Flood Warden will consult with emergency service organisations and other external stakeholders, as required.	Chief Flood Warden	Flood Emergency Response Plan
		The Chief Flood Warden will report annually, and as requested, to the building owner on implementation and maintenance of the FERP.	Chief Flood Warden	Flood Emergency Response Plan
		Flood Wardens will ensure they are aware of the flood emergency response procedures set out in this FERP.	Chief Flood Warden/ Flood Wardens	Flood Emergency Response Plan
		Flood Wardens will ensure they know how to monitor rainfall forecasts, severe weather warnings, flood warnings and external water levels	Chief Flood Warden/ Flood Wardens	BoM Weather app, Hazards Near Me app, Mobile phones / Computers with 4g/5g internet

Stage	Trigger for Action	Action	Who is Responsible	What is Needed
When a flood is possible	**BoM issues a Severe Weather or Thunderstorm Warning for the Sydney area** **OR** **If the BoM Weather App indicates there is a rainfall event expected with at least 44.5mm total storm depth or greater within a 3-hour window** **OR** **NSW SES Hazard Watch Map/Hazards Near Me App issues a Watch and Act for flooding applicable to the site**	If it is raining the Chief Flood Warden or delegate will visually monitor the adjacent roads for floodwaters every 2 hours.	Chief Flood Warden/Delegate	BoM Weather app, Hazards Near Me app, Mobile phones / Computers with 4g/5g internet
		If intense rainfall is observed at the site, the Chief Flood Warden or delegate will visually monitor the adjacent roads for floodwaters every 20 minutes.	Chief Flood Warden/Delegate	BoM Weather app, Hazards Near Me app, Mobile phones / Computers with 4g/5g internet
		The Chief Flood Warden or delegate will monitor the Bureau of Meteorology rainfall forecasts and rainfall gauge levels, the NSW SES website, and Hazards Near Me app every hour and tune into ABC Radio 702	Chief Flood Warden/Delegate	BoM Weather app, Hazards Near Me app, Mobile phones / Computers with 4g/5g internet
		The Chief Flood Warden will notify the Flood Wardens of the possibility of flooding and remind them of actions and procedures to follow should evacuation be required.	Chief Flood Warden	N/A
		The Chief Flood Warden or delegate will announce via the PA system:	Chief Flood Warden/Delegate	BoM Weather app, Hazards Near Me app, Mobile phones / Computers with 4g/5g internet
		The Chief Flood Warden or delegate will check to ensure that nobody is in the landscaped area along Lindfield Avenue	Chief Flood Warden/Delegate	N/A

Stage	Trigger for Action	Action	Who is Responsible	What is Needed
During a flood	**Floodwaters are observed entering the site from Reid Street, ponding or accumulating adjacent to the buildings or on Woodside Avenue in front of the driveway** **OR** **NSW SES issues an Emergency Warning – Shelter Now** **OR**	The Chief Flood Warden or delegate will initiate sheltering on site	Chief Flood Warden/Delegate	N/A
		The Chief Flood Warden or delegate will announce via the PA system: ■ Local flooding is impacting local streets. ■ The site is now isolated by floodwaters. ■ It is no longer safe to leave the site. ■ Everyone should stay in the building on the ground floor and above. Residents, please remain in your units ■ The basement car park has been closed, and vehicles are not to leave the site. Vehicles will be protected from flood waters ■ If you are currently in the basement, please follow the flood evacuation arrows to make your way upstairs via Stair 4 ■ Please do not use the lifts ■ The site is not anticipated to remain isolated for very long; we will let you know when it is safe to leave ■ Remember it is never safe to walk or drive through floodwaters.	Chief Flood Warden/Delegate	Public Address System
		Flood Wardens will close the lobby and building entrances.	Flood Wardens	N/A
		Flood Wardens will close the barrier across the driveway	Flood Wardens	N/A
		If safe to do so, the Flood Wardens will sweep the basement to ensure no one remains on this lower level	Flood Wardens	N/A
		There should be at least one Flood Warden sheltering in each building	Chief Flood Warden/Delegate	BoM Weather app, Hazards Near Me app, Mobile phones / Computers with 4g/5g internet

Stage	Trigger for Action	Action	Who is Responsible	What is Needed
After a flood	**Emergency Services give the all-clear**	The Chief Flood Warden will advise those sheltering on site it is safe to leave	Chief Flood Warden	Public address system
		The Chief Flood Warden will ensure that no visitors or patrons return to the site while flooding is still occurring or recently occurred	Chief Flood Warden	N/A
		Visitors can return to site only after the all-clear has been given by emergency services. The Chief Flood Warden will ensure they do not return to site until that time	Chief Flood Warden	N/A
		If there are any concerns regarding the structural stability of the buildings, the building owners will organise for a structural engineer to assess any damage and the structural integrity of the building	Building Owner	Flood Emergency Contact List (Appendix C)
		A hazard assessment will be undertaken by the Chief Flood Warden for the clean-up. Safe work methods statements will be prepared and personal protective equipment supplied consistent with the known hazards which can be associated with floods: ■ Slips, trips and falls, ■ Sharp debris, ■ Venomous animals, ■ Contaminated water and sediments.	Chief Flood Warden	N/A
		Before the re-commencement of site activities, a de-brief will be held with the building owners, the Chief Flood Warden and key persons and may involve NSW SES flood personnel/volunteers. The flood event and response, including the use of this FERP and any emergency procedures will be reviewed.	Chief Flood Warden/Building Owners	Flood Emergency Response Plan
		Changes may be made to this FERP and the requirements for future emergency response should the review identify any improvements which may be made	Chief Flood Warden/Building Owners	Flood Emergency Response Plan
		Plumbing and gas to be checked by licensed plumber and defects rectified	Building Owner	Flood Emergency Contact List (Appendix C)
		Electrical to be checked by licensed electrician and defects rectified.	Building Owner	Flood Emergency Contact List (Appendix C)

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APPENDIX B
FLOOD EMERGENCY ITEMS

Item	Date Checked
Fully charged mobile phone, tablet or laptop with 4G/5G internet access capabilities and at least 24 hours of independent power supply (battery capacity or portable power bank)	
Soft and hard copies of up-to-date primary contact lists	
Flood Emergency Kit - a plastic container clearly marked including: ■ Printed copy of the latest version of this FERP ■ Battery operated torches with in-date batteries in each and a set of in-date spare batteries for each ■ A battery-operated portable radio to listen to ABC radio (702 AM) for flood and other warning broadcasts. This must have in-date batteries and a set of in-date spare batteries. ■ First aid kit	

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APPENDIX C
FLOOD EMERGENCY CONTACT LIST

Name	Organisation	Role	Contact Details
		Chief Flood Warden	
		Flood Warden	
		Flood Warden… (as required)	
	Emergency Services	Fire/ ambulance/ police	000
	State Emergency Service	SES Local Controller	132 500
	Ku-ring-gai Council	Customer Service Centre	02 9424 0000
	Royal North Shore Hospital	Medical	02 9926 7111
		Electricity Supplier	
		Gas Supplier	
	Sydney Water	Water and Sewage Supplier	132090
		Telecommunications	
		Waste Collection	
		Water Pumping Services	

This list is to be completed and kept updated by the Chief Flood Warden at all times once operational.

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Melbourne
15 Business Park Drive
Notting Hill VIC 3168

Melbourne – CBD
Suite 904, Carlow House, 289 Flinders Lane
Melbourne VIC 3000

Brisbane
Level 5, 43 Peel Street
South Brisbane QLD 4101

Brisbane – Camp Hill
2a/4 Newman Avenue
Camp Hill QLD 4152

Sydney
Suite 3, Level 1, 20 Wentworth Street
Parramatta NSW 2150

Ballina
Unit 1b/1 Hogan Street
Ballina NSW 2478

Adelaide
2/39-40 Greenhill Road
Wayville SA 5034

Perth
Level 1, 21 Adelaide Street
Fremantle WA 6160

New Zealand
4 Williamson Avenue
Ponsonby New Zealand 1021

Wangaratta
First Floor, 40 Rowan Street
Wangaratta VIC 3677

Geelong
1/5 Bridge Street
Newtown VIC 3220

Wimmera
597 Joel South Road
Stawell VIC 3380

Gold Coast
Suite 37, Level 4, 194 Varsity Parade
Varsity Lakes QLD 4227

Darwin
Unit 40/29 Woods Street
Darwin City NT 0800

Sunshine Coast
4C ‘Regatta Corporate’, 2 Innovation Parkway
Birtinya QLD 4575

1300 198 413

watertech.com.au

Annexure C HYDRACOR Consulting Engineers Pty Ltd Letter, dated 12 February 2026

HYDRACOR
CONSULTING ENGINEERS

Our Reference: CC240140/BAK:pm
Your Reference:

12 February 2026

Mr Michael Gee
CPDM Pty Ltd
Suite G02, Ground Floor
22 Atchinson Street
ST LEONARDS NSW 2065

Dear Mr Gee,

Re: Residential Development
Response to Department of Planning, Housing and Infrastructure Correspondence dated 17 July 2025
Property: No.'s 1 – 3 Reid Street and No.'s 2 – 4 Woodside Avenue, Lindfield

We refer to the Department of Planning, Housing and Infrastructure correspondence in relation to this matter, reference SSD-79261463, dated 17 July 2025, and specifically item 19 which states:

"Flood Risk

19. *The Integrated Water Management Report (IWMR) recommends flood mitigation works including upgrades to Council's stormwater drainage system and reconstruction of the southern verge in Reid Street.*

    Provide confirmation that these works have been discussed with and agreed to by Council. The mitigation measures table should be also updated to reference any required flood mitigation measures."

In the preparation of our response to item 19 we refer to the following documents:

- Proposed Public Domain Flood Mitigation Works prepared by HYDRACOR Consulting Engineers Pty Ltd, Reference CC240140R, Sheets R1 – R10, Revision D, dated 16 January 2026 (copies enclosed).

Suite 2.01, Level 2
4 Ilya Avenue
ERINA NSW 2250

PO Box 3772
Fountain Plaza
ERINA NSW 2250

T 02 4324 3499

CIVIL ENGINEERING
FLOOD STUDIES
STORMWATER
HYDRAULIC
DEVELOPMENT CONSULTANTS

- Site Flood Mitigation Strategy Requirements prepared by HYDRACOR Consulting Engineers Pty Ltd, Reference CC240140, Sheet FMS1, Revision C, dated 18 December 2025 (copy enclosed).
- Flood Maps prepared by HYDRACOR Consulting Engineers Pty Ltd, Reference CC240140F, Sheets F1 – F35, Revision F, dated 18 December 2025.
- Stormwater Management Plans prepared by HYDRACOR Consulting Engineers Pty Ltd, Reference CC240140C, Sheets C1 – C12, Revision C, dated 16 January 2026.
- Letter from Department of Planning, Housing & Infrastructure dated 17 July 2025.

Based on the foregoing we offer the following comments in response to item 19.

We confirm having met with Ku-ring-gai Council on 29 January 2026 to review the abovementioned documents. These documents detail the proposed flood mitigation and public domain works. We confirm that during the course of the design and documentation of these documents we attended the subject site with Council and then by a series of emails and discussions developed the proposed concept.

We refer to our email correspondence addressed to Ku-ring-gai Council dated 29 January 2026 (copy enclosed) confirming lodgement to Council of these documents.

We also refer to the Ku-ring-gai Council correspondence dated 30 January 2026 (copy enclosed) which, amongst other matters, notes the concept design depicted on the abovementioned documents is agreed in principle.

Based on the foregoing we are of the opinion that the Applicant has satisfied the requirement of item 19 in relation to obtaining an agreement with Council for the proposed flood mitigation works, including upgrades to Council's stormwater drainage system and reconstruction of the southern verge in Reid Street.

Should you have any further queries in relation to this matter please do not hesitate to contact our office.

Yours faithfully,

HYDRACOR Consulting Engineers Pty Ltd

Bruce Kenny

Director

Encl.
1. Flood Mitigation Plans, reference CC240140R, sheets R1 – R10, revision D
2. Flood Mitigation Strategy, reference CC240140, sheet FMS1, revision C
3. Email Correspondence with Ku-ring-gai Council dated 29 and 30 January 2026

PROPOSED PUBLIC DOMAIN FLOOD MITIGATION WORKS
No. 1-3 REID ST & 2-4 WOODSIDE AVE, LINDFIELD
CONCEPT CIVIL ENGINEERING DRAWINGS

GENERAL NOTES

1. ALL WORK TO BE CARRIED OUT IN ACCORDANCE WITH THE LOCAL COUNCIL'S RELEVANT CIVIL CONSTRUCTION SPECIFICATION AND STANDARDS AND TO THE SATISFACTION OF COUNCIL'S AND/OR THE PRINCIPAL CERTIFYING AUTHORITY'S INSPECTOR OF WORKS. ANY DISCREPANCY, VARIATION OR ADDITIONAL WORKS SHALL BE APPROVED BY THE BUILDER'S REPRESENTATIVE AND COUNCIL'S REPRESENTATIVE BEFORE PROCEEDING WITH SUCH WORKS.
2. THE LOCAL COUNCIL'S AND THE PRINCIPAL CERTIFYING AUTHORITY'S INSPECTOR OF WORKS IS TO BE NOTIFIED AT LEAST 48 HOURS PRIOR TO THE COMMENCEMENT OF WORKS. THE CONTRACTOR IS TO ESTABLISH THE INSPECTOR'S INSPECTION SCHEDULE REQUIREMENTS AND ENSURE THAT EACH IDENTIFIED STAGE OF WORKS IS ACCORDINGLY INSPECTED.
3. THESE DRAWINGS ARE A DIAGRAMMATIC REPRESENTATION OF WORK TO BE CARRIED OUT ONLY AND DIMENSIONS ARE NOT TO BE SCALED.
4. ALL LEVELS SHALL BE OBTAINED FROM ESTABLISHED BENCH MARKS ONLY. DATUM USED ON THESE DRAWINGS IS AUSTRALIAN HEIGHT DATUM (AHD) UNLESS NOTED OTHERWISE.
5. EROSION AND SEDIMENT CONTROL
   - 5.1. EROSION AND SEDIMENT CONTROL MEASURES ARE TO BE INSTALLED IN ACCORDANCE WITH THE APPROVED EROSION AND SEDIMENT CONTROL PLAN AND TO THE SATISFACTION OF THE PRINCIPAL CERTIFYING AUTHORITY'S INSPECTOR OF WORKS.
   - 5.2. EROSION CONTROL MEASURES ARE TO BE INSTITUTED PRIOR TO THE COMMENCEMENT OF ANY WORKS AND ARE TO BE MAINTAINED BY THE CONTRACTOR FOR THE DURATION OF WORKS.
   - 5.3. THE EXTENT OF DISTURBED SURFACES IS TO BE MINIMISED AS MUCH AS PRACTICABLE DURING THE COURSE OF WORKS.
   - 5.4. ALL FOOTPATHS, FILL BATTERS AND DISTURBED AREAS ARE TO BE TOPSOILED AND TURFED, OR STABILISED BY OTHER APPROVED MEANS, AS SOON AS PRACTICABLE.
6. ALL PUBLIC UTILITY SERVICES ARE TO BE LOCATED ON-SITE BY THE CONTRACTOR PRIOR TO THE COMMENCEMENT OF WORKS. ANY SERVICES SHOWN ON THIS PLAN HAVE BEEN LOCATED FROM INFORMATION SUPPLIED BY SURVEY PLANS AND/OR RELEVANT AUTHORITIES. THE PRESENCE, LOCATION AND EXTENT OF SERVICES SHOWN ARE NOT GUARANTEED COMPLETE OR CORRECT. ANY ADJUSTMENTS OR REPAIRS REQUIRED TO SERVICES ARE TO BE UNDERTAKEN AT THE CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE RELEVANT AUTHORITY.
7. NO TREES PROTECTED UNDER THE LOCAL COUNCIL'S TREE PRESERVATION ORDER ARE TO BE REMOVED UNLESS APPROVED BY DEVELOPMENT CONSENT OR PERMIT OBTAINED FROM COUNCIL.
8. THE CONTRACTOR IS TO ENSURE THAT ALL WORKS ARE CARRIED OUT IN ACCORDANCE WITH THE WORK HEALTH AND SAETY ACT.
9. THE CONTRACTOR IS TO OBTAIN FROM THE BUILDER AND BE AWARE OF THE RELEVANT CONDITIONS OF DEVELOPMENT CONSENT AND/OR CIVIL WORKS APPROVAL.
10. THE CONTRACTOR MUST ENSURE APPROVAL OF MATERIALS BY THE INSPECTOR OF WORKS PRIOR TO DELIVERY TO SITE.
11. WORK INVOLVING THE USE OF MECHANICAL PLANT AND EQUIPMENT IS TO BE UNDERTAKEN ONLY DURING THE HOURS SPECIFIED BY THE LOCAL COUNCIL'S REQUIREMENTS.
12. SMOOTH TRANSITIONS ARE TO BE PROVIDED BETWEEN ALL NEW WORKS AND EXISTING WORKS.
13. WHERE FILL IS PROPOSED ON NATURAL SURFACE SLOPES EXCEEDING ONE (V) IN FOUR (H) (1:4) GRADIENT, BENCHES ARE TO BE CUT TO PREVENT SLIPPING OF FILL MATERIAL AS REQUIRED BY THE LOCAL COUNCIL'S AND/OR THE PRINCIPAL CERTIFYING AUTHORITY'S INSPECTOR OF WORKS. SEE NOTE 22.
14. ALL BATTERS ARE TO BE SCARIFIED TO ASSIST WITH ADHESION OF TOPSOIL TO THE BATTER FACE.
15. INSITU DENSITY TESTS ARE TO BE CARRIED OUT ON ALL SIGNIFICANT FILLS, ROAD SUBGRADES AND PAVEMENT COURSES AS DIRECTED BY THE INSPECTOR OF WORKS. ALL TESTS ARE TO BE CARRIED OUT BY A REGISTERED N.A.T.A. GEOTECHNICAL LABORATORY.
16. ANY WORKS REQUIRING INTERFERENCE TO ADJOINING LOTS ARE TO BE CONSENTED TO IN WRITING BY THE OWNER OF THE RELEVANT LOT PRIOR TO THE COMMENCEMENT OF THOSE WORKS.
17. UPON COMPLETION OF WORKS, ALL RUBBISH, CONSTRUCTION BUILDINGS AND FENCES ETC ARE TO BE REMOVED.
18. PRIOR TO THE COMMENCEMENT OF EARTHWORKS, ALL VEGETATION AND OTHER DELETERIOUS MATERIALS ARE TO BE REMOVED. REMOVAL OF TREES REQUIRES APPROVAL FROM COUNCIL AND THE INSPECTOR OF WORKS.
19. EXISTING TOPSOIL FROM THE SITE IS TO BE STRIPPED AND STOCKPILED FOR LATER RE-USE. REFER TO LANDSCAPING PLANS FOR ANY SPECIAL REQUIREMENTS.
20. FOLLOWING STRIPPING, THE EXPOSED SUBGRADE MATERIALS ARE TO BE INSPECTED TO IDENTIFY ANY UNSOUND AREAS. SUCH AREAS TO BE REMOVED AND REINSTATED TO THE SATISFACTION OF THE INSPECTOR OF WORKS.
21. THE CONTRACTOR IS RESPONSIBLE FOR SETOUT AND LEVEL CONTROL. ANY DISCREPANCIES BETWEEN DESIGN DRAWINGS AND SITE CONDITIONS IS TO BE RESOLVED BY THE INSPECTOR OF WORKS PRIOR TO CONTINUING WORKS.
22. ALL EARTHWORKS SHOULD BE UNDERTAKEN IN ACCORDANCE WITH AS3798-2007. THE GEOTECHNICAL ENGINEER TO IS HAVE A LEVEL 2 RESPONSIBILITY AS DEFINED IN SECTION 8 OF AS 3798-2007 AND SHALL CERTIFY AT THE END OF THE WORKS THAT EARTHWORKS COMPLY WITH THE REQUIREMENTS OF THE SPECIFICATIONS AND DRAWINGS.
23. PROVIDE SMOOTH TRANSITION AT ALL CHANGES IN GRADE UNLESS OTHERWISE SPECIFIED.
24. THE PROJECT ARCHITECT IS TO INSPECT THE WORKS FOLLOWING COMPLETION OF BULK EARTHWORKS AND PRIOR TO COMMENCEMENT OF DETAIL EARTHWORKS.

CIVIL LEGEND

PROPOSED IN CIVIL SITEWORKS PACKAGE HEREWITH

+FSL 4.060	FINISHED SURFACE LEVEL
CH 3900	CENTRELINE CHAINAGE
	STORMWATER DRAINAGE LINE
IL 5.0	INVERT LEVEL UPSTREAM
450Ø RCP '4'	PIPE SIZE, MATERIAL AND CLASS
1.0% 10.0m	PIPE GRADE AND LENGTH
IL 4.9	INVERT LEVEL DOWNSTREAM
P06	STORMWATER DRAINAGE PIT WITH NUMBER (REFER STORMWATER DRAINAGE STRUCTURES SCHEDULE)
	STORMWATER DRAINAGE HEADWALL (REFER STORMWATER DRAINAGE STRUCTURES SCHEDULE)
KO	KERB ONLY
DD	DISH DRAIN
K&G	KERB AND GUTTER
IJ	ISOLATION JOINT
DJ	DOWELLED CONSTRUCTION JOINT
SJ	SAWN CONTRACTION JOINT
	DIRECTION OF OVERLAND FLOW
ST	CIVIL SITEWORKS SETOUT POINT LABEL
T T	DENOTES EXISTING UNDERGROUND TELSTRA SERVICE LINE
W W	DENOTES EXISTING UNDERGROUND WATER SERVICE LINE
E E	DENOTES EXISTING OVERHEAD ELECTRICITY LINE
G G	DENOTES EXISTING UNDERGROUND GAS LINE

IMPORTANT: THE CONTRACTOR IS TO MAINTAIN A CURRENT SET OF "DIAL BEFORE YOU DIG" DRAWINGS ON SITE AT ALL TIMES.

DIAL BEFORE YOU DIG www.1100.com.au

SHEET INDEX

COVER SHEET & NOTES	SHEET R1
REID STREET VERGE PLAN	SHEET R2
REID STREET BACK OF KERB LONG SECTION	SHEET R3
REID STREET VERGE CROSS SECTIONS - SHEET 1 OF 2	SHEET R4
REID STREET VERGE CROSS SECTIONS - SHEET 2 OF 2	SHEET R5
STORMWATER REALIGNMENT OVERVIEW PLAN	SHEET R6
STORMWATER REALIGNMENT PLAN - SHEET 1 OF 3	SHEET R7
STORMWATER REALIGNMENT PLAN - SHEET 2 OF 3	SHEET R8
STORMWATER REALIGNMENT PLAN - SHEET 3 OF 3	SHEET R9
PROPOSED CULVERT DRAINAGE LONG SECTION	SHEET R10

LOCALITY MAP

DRAWINGS MUST BE PRINTED IN COLOUR

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Issue	Description	Date	Drawn	Approved
D	ISSUED FOR APPROVAL	17.12.25	IK	BK
-	NIL ISSUE	-	-	-
B	ISSUED FOR INFORMATION	27.11.25	MG	BK
A	ISSUED FOR COUNCIL APPROVAL IN PRINCIPLE	31.03.25	MG	BK

0 1cm at full size 10cm

North

Client: CPDM Pty Ltd
SUITE G02, GROUND FLOOR
22 ATCHINSON ST, ST LEONARDS

Architect: PBD ARCHITECTS

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Project: PROPOSED PUBLIC DOMAIN FLOOD MITIGATION WORKS
No. 1 - 3 REID STREET
No. 2 - 4 WOODSIDE AVENUE
LINDFIELD

Drawing Title: COVER SHEET & NOTES

Drawn	Date	Scale A1	Q.A. Check	Date
MG	MAR 2025	AS SHOWN	Q.A.	Q.A. DATE

Designed	Project No.	Dwg. No.	Issue
BK	CC240140	R1	D

GENERAL NOTES:

1. CARE IS TO BE TAKEN DURING CONSTRUCTION WORKS TO AVOID DAMAGE TO UTILITY SERVICES. LOCATION AND DEPTH OF ALL UNDERGROUND SERVICES TO BE INVESTIGATED WITH THE RELEVANT AUTHORITIES PRIOR TO COMMENCING WORK.
2. ALL WORKS ARE TO BE IN ACCORDANCE WITH COUNCIL'S CIVIL WORKS SPECIFICATION. ALL COSTS RELATED TO RE-LOCATION OF UNDERGROUND SERVICES MUST BE BORNE BY THE APPLICANT / DEVELOPER.
3. EXISTING SERVICES' ALIGNMENTS DETERMINED FROM BYDA. CONTRACTOR TO CONFIRM EXACT LOCATION AND DEPTH OF ALL SERVICES PRIOR TO COMMENCEMENT OF WORKS.
4. THE CONTRACTOR IS TO MAINTAIN A CURRENT SET OF "BEFORE YOU DIG AUSTRALIA" DRAWINGS ON SITE AT ALL TIMES.
5. TREE RETENTION / REMOVAL SUBJECT TO ARBOREAL ADVICE AND COUNCIL APPROVAL.

LEGEND

DENOTES EXTENT OF VERGE FORMATION TO BE REINSTATED AND STABILISED WITH TOPSOIL AND TURF

DENOTES PROPOSED 1.5m CONCRETE PATH CONSTRUCTED TO COUNCIL STANDARD SPECIFICATIONS.

92.0 / 92.1 — DESIGN CONTOURS

91.5 / 91.4 — EXISTING CONTOURS (COMPRISES SURVEY AND LIDAR DATA)

REID STREET

LINDFIELD AVENUE

PROPOSED FLOOD DEFLECTION WALL

CARE IS TO BE TAKEN DURING CONSTRUCTION WORKS TO AVOID DAMAGE TO UTILITY SERVICES. DIAL BEFORE YOU DIG SHOULD BE CONTACTED TO DETERMINE LOCATION OF ALL SERVICES.

EXISTING POWER POLE.
WARNING: OVERHEAD POWER LINES IN AREA.
PROCEED WITH CAUTION.

EXISTING POWER POLE.
WARNING: OVERHEAD POWER LINES IN AREA.
PROCEED WITH CAUTION.

ADJUST EXISTING SERVICE PIT LID TO SUIT PROPOSED LEVELS

ADJUST EXISTING SERVICE PIT LID TO SUIT PROPOSED LEVELS

LOCALLY REGRADE SURFACE 2.5% MAX TO PROVIDE SMOOTH TRANSITION WITH EXISTING SURFACE. TURF FINAL SURFACE.

LOCALLY REGRADE SURFACE 2.5% MAX TO PROVIDE SMOOTH TRANSITION WITH EXISTING SURFACE. TURF FINAL SURFACE.

TOW 92.60
EX 92.10
WALL HEIGHT 0.50m NOM

TOW 92.60
EX 91.95
WALL HEIGHT 0.65m NOM

TOW 92.50
EX 91.80
WALL HEIGHT 0.7m NOM

TOW 92.30
EX 91.70
WALL HEIGHT 0.6m NOM

TOW 92.30
EX 91.65
WALL HEIGHT 0.65m NOM

TOW 92.30

TOW 92.30

TOW 92.30

TOW 92.30

TOW 92.10

TOW 92.10

EX TOW
RL 91.95

EX TOW
RL 91.65

EX TOW
RL 91.45

EX TOW
RL 91.20

FOR BOUNDARY INTERFACE, REFER TO ARCHITECTURAL PLANS FOR SSD-79261463.

ENSURE THERE IS NO GAP BETWEEN PROPOSED WALL AND WITH EXISTING WALL. MAKE GOOD EXISTING CONSTRUCTION MIN TOW RL 92.30

DENOTES EXTENT OF EXISTING WALL TO BE USED FLOOD DEFLECTION WALLS. MIN TOW RL 92.30

ENSURE THERE IS NO GAP BETWEEN PROPOSED WALL AND WITH EXISTING WALL. MAKE GOOD EXISTING CONSTRUCTION MIN TOW RL 92.10

DENOTES EXTENT OF EXISTING WALL TO BE USED FOR FLOOD DEFLECTION WALLS. MIN TOW VARIES.

100 DP 6608

101 DP 6608

SCALE 1:100 @ A1
SCALE 1:200 @ A3
0 1 2 4 6 8 10 metres

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Issue	Description	Date	Drawn	Approved
D	ISSUED FOR APPROVAL	17.12.25	IK	BK
C	ISSUED FOR CO-ORDINATION	02.12.25	IK	BK
B	ISSUED FOR INFORMATION	27.11.25	MG	BK
A	ISSUED FOR COUNCIL APPROVAL IN PRINCIPLE	31.03.25	MG	BK

0 1cm at full size 10cm

North

Client
CPDM Pty Ltd

SUITE G02, GROUND FLOOR
22 ATCHINSON ST, ST LEONARDS

Architect
PBD ARCHITECTS

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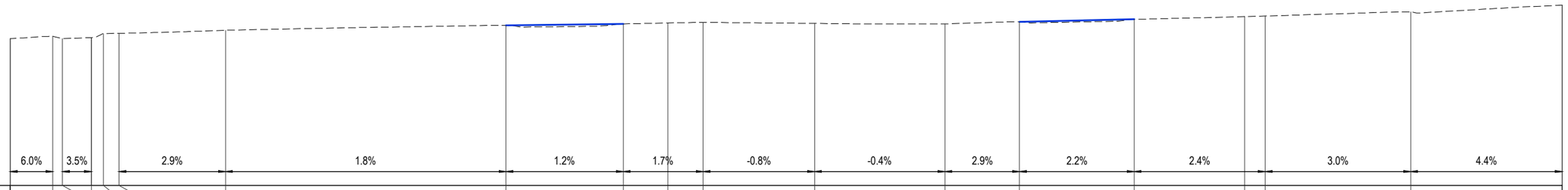
Project
PROPOSED PUBLIC DOMAIN FLOOD MITIGATION WORKS
No. 1 - 3 REID STREET
No. 2 - 4 WOODSIDE AVENUE
LINDFIELD

Drawing Title
REID STREET VERGE PLAN

Drawn	Date	Scale A1	Q.A. Check	Date
MG	MAR 2025	1:100	Q.A.	Q.A. DATE
Designed	Project No.		Dwg. No.	Issue
BK	CC240140		R2	D



DATUM R.L 85.0																									
DESIGN LEVEL									91.92	91.98						92.07	92.18							
EXISTING SURFACE	91.34	91.45	91.34	91.39	91.56	91.57	91.71	91.92	91.98	92.02	92.04	92.00	91.98	92.07	92.18	92.30	92.32	92.50	92.79					
CHAINAGE	-3.51	-1.67	-1.25	0.00	0.52	1.20	5.82	17.98	23.06	25.00	26.53	31.36	37.01	40.24	45.21	50.00	50.89	57.20	63.77					

REID ST BACK OF EXISTING KERB LONG SECTION

SCALE:
HORIZ 1:100
VERT. 1:100

NOTE:
DESIGN SURFACE EQUALS
EXISTING BACK OF KERB LEVELS

SCALE 1:100 @ A1
SCALE 1:200 @ A3
0 1 2 4 6 8 10 metres

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0 1cm at full size 10cm

North

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Architect
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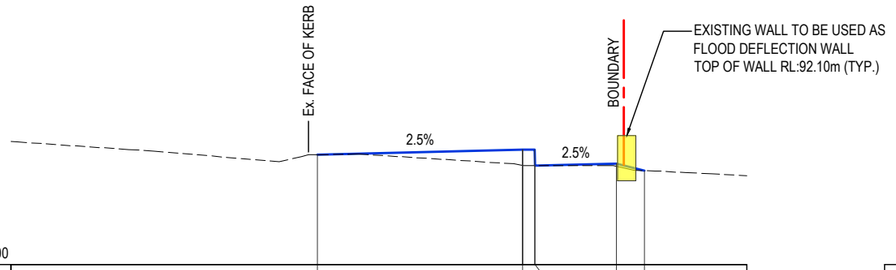
Project
PROPOSED PUBLIC DOMAIN FLOOD MITIGATION WORKS
No. 1 - 3 REID STREET
No. 2 - 4 WOODSIDE AVENUE
LINDFIELD

Drawing Title
REID ST BACK OF KERB LONG SECTION

Drawn	Date	Scale A1	Q.A. Check	Date
MG	MAR 2025	1:100	Q.A.	Q.A. DATE
Designed	Project No.		Dwg. No.	Issue
BK	CC240140		R3	D

NOTE:
FOR BOUNDARY INTERFACE, REFER TO ARCHITECTURAL PLANS FOR SSD-79261463.

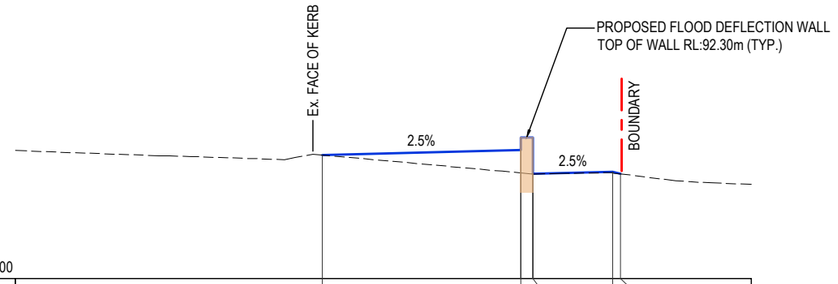
EXISTING KERB AND GUTTER LEVELS TO REMAIN IN REID ST. ONLY TIE IN WORKS REQUIRED WITHIN PAVEMENT.



R.L. 90.00

DESIGN	91.79		91.87	91.61		91.65	91.53			
SURVEY	91.79		91.62	91.61		91.60	91.53			
OFFSETS	0.00		3.34	3.54		4.87	5.33			

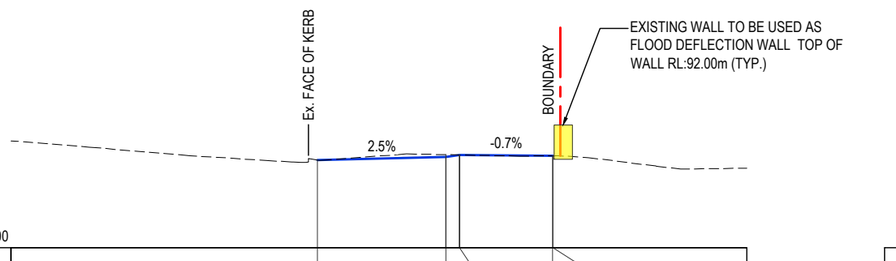
CH: 10.0



R.L. 90.00

DESIGN	92.02		92.10	91.71		91.74	91.71			
SURVEY	92.02		91.72	91.71		91.72	91.71			
OFFSETS	0.00		3.24	3.44		4.74	4.86			

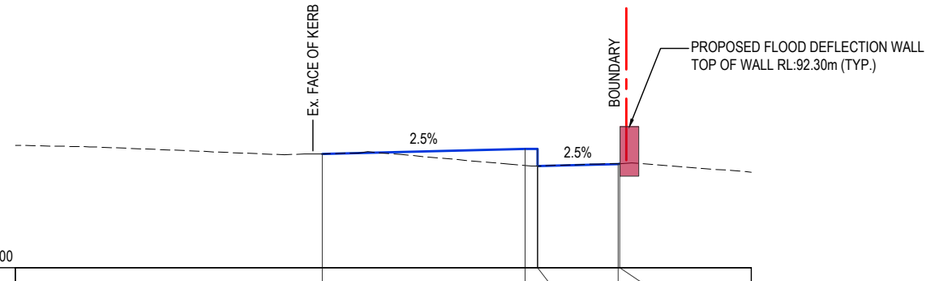
CH: 30.0



R.L. 90.00

DESIGN	91.43		91.48	91.50		91.50	91.50			
SURVEY	91.43		91.52	91.51		91.50	91.50			
OFFSETS	0.00		2.08	2.30		3.79	3.80			

CH: 0



R.L. 90.00

DESIGN	91.86		91.94	91.66		91.69	91.70			
SURVEY	91.86		91.66	91.66		91.70	91.70			
OFFSETS	0.00		3.31	3.51		4.83	4.85			

CH: 20.0

SCALE 1:50 @ A1
SCALE 1:100 @ A3
0 0.5 1 2 3 4 5 metres

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Architect
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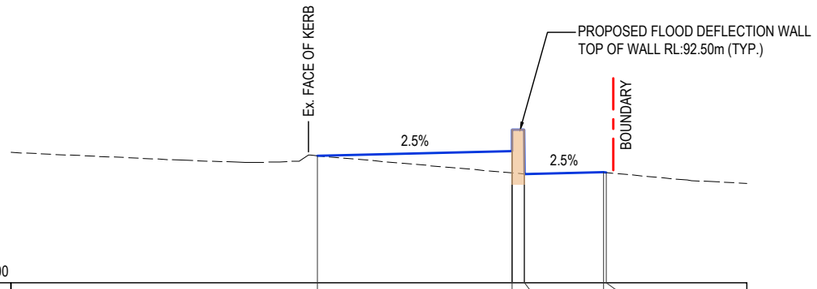
Project
PROPOSED PUBLIC DOMAIN FLOOD MITIGATION WORKS
No. 1 - 3 REID STREET
No. 2 - 4 WOODSIDE AVENUE
LINDFIELD

Drawing Title
REID STREET VERGE CROSS SECTIONS - SHEET 1 OF 2

Drawn	Date	Scale A1	Q.A. Check	Date
MG	MAR 2025	1:100	Q.A.	Q.A. DATE
Designed	Project No.		Dwg. No.	Issue
BK	CC240140		R4	D

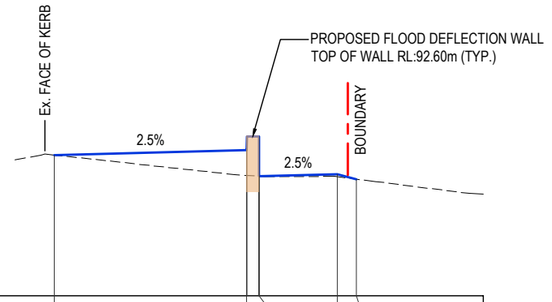
NOTE:
FOR BOUNDARY INTERFACE, REFER TO ARCHITECTURAL PLANS FOR SSD-79261463.

EXISTING KERB AND GUTTER LEVELS TO REMAIN IN REID ST. ONLY TIE IN WORKS REQUIRED WITHIN PAVEMENT.



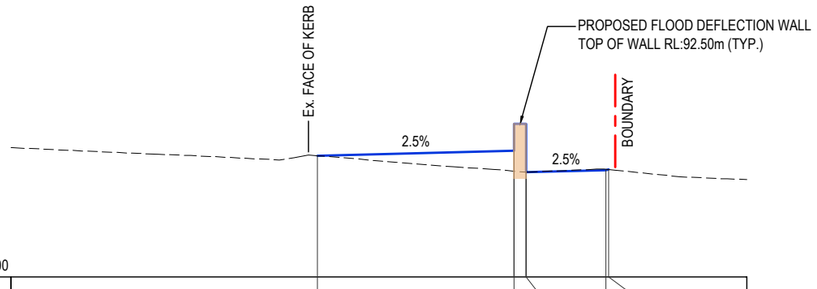
R.L. 90.00						
DESIGN	92.07	92.15	91.78	91.81	91.80	
SURVEY	92.07	91.79	91.78	91.80	91.80	
OFFSETS	0.00	3.17	3.37	4.66	4.71	

CH: 40.0



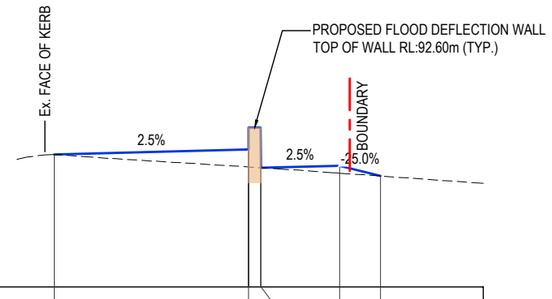
R.L. 90.00						
DESIGN	92.30	92.37	91.95	91.98	91.90	
SURVEY	92.30	91.96	91.95	91.94	91.90	
OFFSETS	0.00	3.14	3.34	4.62	4.93	

CH: 50.0



R.L. 90.00						
DESIGN	91.98	92.06	91.71	91.74	91.75	
SURVEY	91.98	91.73	91.71	91.76	91.75	
OFFSETS	0.00	3.20	3.40	4.70	4.75	

CH: 35.5



R.L. 90.00						
DESIGN	92.16	92.24	91.94	91.98	91.81	
SURVEY	92.16	91.96	91.94	91.86	91.81	
OFFSETS	0.00	3.17	3.37	4.65	5.32	

CH: 45.0

SCALE 1:50 @ A1
SCALE 1:100 @ A3
0 0.5 1 2 3 4 5 metres

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Issue	Description	Date	Drawn	Approved
D	ISSUED FOR APPROVAL	17.12.25	IK	BK
-	NIL ISSUE	-	-	-
B	ISSUED FOR INFORMATION	27.11.25	MG	BK
A	ISSUED FOR COUNCIL APPROVAL IN PRINCIPLE	31.03.25	MG	BK

0 10cm at full size 20cm

North

Client
CPDM Pty Ltd
SUITE G02, GROUND FLOOR
22 ATCHINSON ST, ST LEONARDS

Architect
PBD ARCHITECTS

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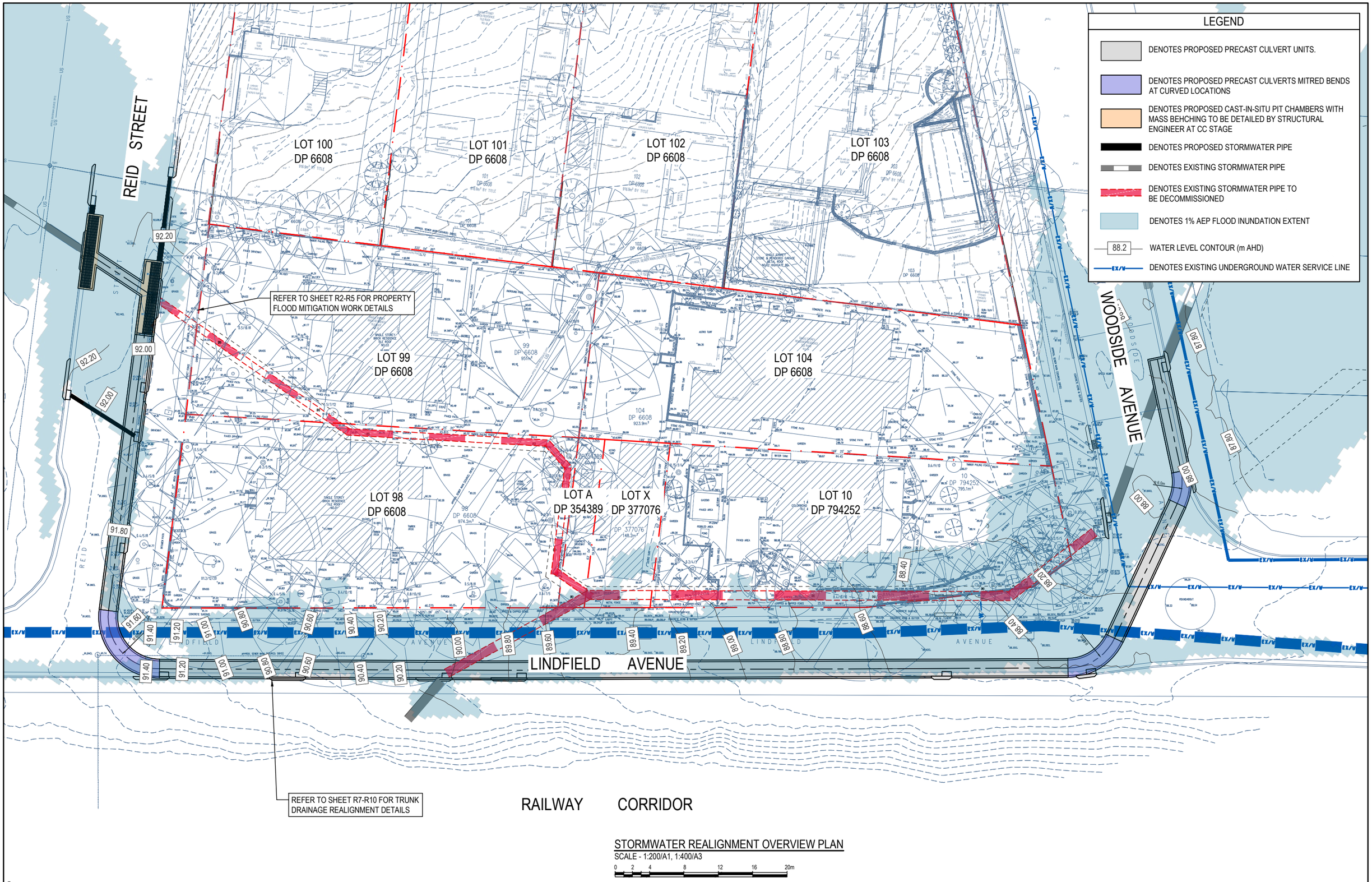
Project
PROPOSED PUBLIC DOMAIN FLOOD MITIGATION WORKS
No. 1 - 3 REID STREET
No. 2 - 4 WOODSIDE AVENUE
LINDFIELD

Drawing Title
REID STREET VERGE CROSS SECTIONS - SHEET 2 OF 2

Drawn	Date	Scale A1	Q.A. Check	Date
MG	MAR 2025	1:200	Q.A.	Q.A. DATE
Designed	Project No.		Dwg. No.	Issue
BK	CC240140		R5	D



STORMWATER REALIGNMENT OVERVIEW PLAN

SCALE - 1:200/A1, 1:400/A3

0 2 4 8 12 16 20m

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Issue	Description	Date	Drawn	Approved
D	ISSUED FOR APPROVAL	17.12.25	IK	BK
-	NIL ISSUE	-	-	-
-	NIL ISSUE	-	-	-
A	ISSUED FOR COUNCIL APPROVAL IN PRINCIPLE	31.03.25	MG	BK

1:0 10cm at full size 100cm

North

Client: CPDM Pty Ltd
SUITE G02, GROUND FLOOR
22 ATCHINSON ST, ST LEONARDS

Architect: PBD ARCHITECTS

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Project: PROPOSED PUBLIC DOMAIN FLOOD MITIGATION WORKS
No. 1 - 3 REID STREET
No. 2 - 4 WOODSIDE AVENUE
LINDFIELD

Drawing Title: STORMWATER REALIGNMENT OVERVIEW PLAN

Drawn	Date	Scale A1	Q.A. Check	Date
MG	MAR 2025	1:200	-	-

Designed	Project No.	Dwg. No.	Issue
BK	CC240140	R6	D

DRAINAGE LEGEND

- DENOTES PROPOSED PRECAST CULVERT UNITS.
- DENOTES PROPOSED PRECAST CULVERTS MITRED BENDS AT CURVED LOCATIONS
- DENOTES PROPOSED CAST-IN-SITU PIT CHAMBERS WITH MASS BEHCHING TO BE DETAILED BY STRUCTURAL ENGINEER AT CC STAGE
- DENOTES PROPOSED STORMWATER PIPE
- DENOTES EXISTING STORMWATER PIPE
- DENOTES EXISTING STORMWATER PIPE TO BE DECOMMISSIONED

PIT P4
PROPOSED 4.2m KERB INLET PIT WITH HEAVY DUTY GRATED INLET CONSTRUCTED TO COUNCIL STANDARDS
TOP OF GRATE - 92.00 nom

PIT P1
REPLACE EXISTING KERB INLET PIT WITH 4.2m LONG LINTEL AND 10000 x 1200 CUSTOM HEAVY DUTY GRATED INLET
CONSTRUCT CAST IN SITU CHAMBER TO SUIT PROPOSED CULVERT CONNECTION TO BE DETAILED BY STRUCTURAL ENGINEER AT CC STAGE.
PROVIDE MASS CONCRETE BENCHING.
TOP OF GRATE - 92.33 NOM.

IL U/S 90.35
600Ø RCP CLASS 4
5.0% MIN
1.0m
IL D/S 90.30

PIT P1A
REPLACE EXISTING KERB INLET PIT WITH 4.2m KERB INLET PIT WITH HEAVY DUTY GRATED INLET CONSTRUCTED TO COUNCIL STANDARDS
TOP OF GRATE - 92.15 nom

PIT P2A
REPLACE EXISTING KERB INLET PIT WITH 4.2m KERB INLET PIT WITH HEAVY DUTY GRATED INLET CONSTRUCTED TO COUNCIL STANDARDS
TOP OF GRATE - 92.15 nom

IL U/S 90.40
600Ø RCP CLASS 4
1.0% MIN
2.8m
IL D/S 90.35

IL U/S 90.20
450Ø RCP CLASS 4
5.0% MIN
8.8m
IL D/S 89.75

IL U/S 90.50
450Ø RCP CLASS 4
1.0% MIN
6.0m
IL D/S 90.40

REFER TO CULVERT REALIGNMENT LONG SECTION ON SHEET R10

PIT P2B
PROPOSED 4.2m KERB INLET PIT WITH HEAVY DUTY GRATED INLET CONSTRUCTED TO COUNCIL STANDARDS
TOP OF GRATE - 92.05 nom

PIT P2
REPLACE EXISTING KERB INLET PIT WITH 4.2m LONG LINTEL AND 10000 x 1200 CUSTOM HEAVY DUTY GRATED INLET
CONSTRUCT CAST IN SITU CHAMBER TO SUIT PROPOSED CULVERT CONNECTION TO BE DETAILED BY STRUCTURAL ENGINEER AT CC STAGE.
PROVIDE MASS CONCRETE BENCHING.
TOP OF GRATE - 91.99 nom.

PIT P3
PROPOSED 4.2m KERB INLET PIT WITH HEAVY DUTY GRATED INLET CONSTRUCTED TO COUNCIL STANDARDS
TOP OF GRATE - 91.90 nom

PIT P4
PROPOSED 4.2m KERB INLET PIT WITH HEAVY DUTY GRATED INLET CONSTRUCTED TO COUNCIL STANDARDS
TOP OF GRATE - 91.85 nom

PIT P5
PROPOSED 3.0m KERB INLET PIT WITH HEAVY DUTY GRATED INLET CONSTRUCTED TO COUNCIL STANDARDS
TOP OF GRATE - 91.60 nom

PIT P6
PROPOSED 3.6m KERB INLET PIT WITH HEAVY DUTY GRATED INLET CONSTRUCTED TO COUNCIL STANDARDS
TOP OF GRATE - 91.25 nom

EXISTING 750 Ø
EXISTING 750 DIA STORMWATER PIPE TO BE DECOMMISSIONED
PROPOSED RCBC 1200 x 750
PROPOSED RCBC 1800 x 1200
PROPOSED RCBC 1800 x 1200
REID STREET
LINDFIELD AVENUE
CH 0
CH 9.10
CH 20.00
CH 40.00
CT 46.21
R 6.0m
CT 55.38
CH 60.00
JOINS SHEET R8

SCALE 1:100 @ A1
SCALE 1:200 @ A3
0 1 2 4 6 8 10 metres

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D	ISSUED FOR APPROVAL	17.12.25	IK	BK
-	NIL ISSUE	-	-	-
-	NIL ISSUE	-	-	-
A	ISSUED FOR COUNCIL APPROVAL IN PRINCIPLE	31.03.25	MG	BK

0 10m at full size 20m

North

Client: CPDM Pty Ltd
SUITE G02, GROUND FLOOR
22 ATCHINSON ST, ST LEONARDS

Architect: PBD ARCHITECTS

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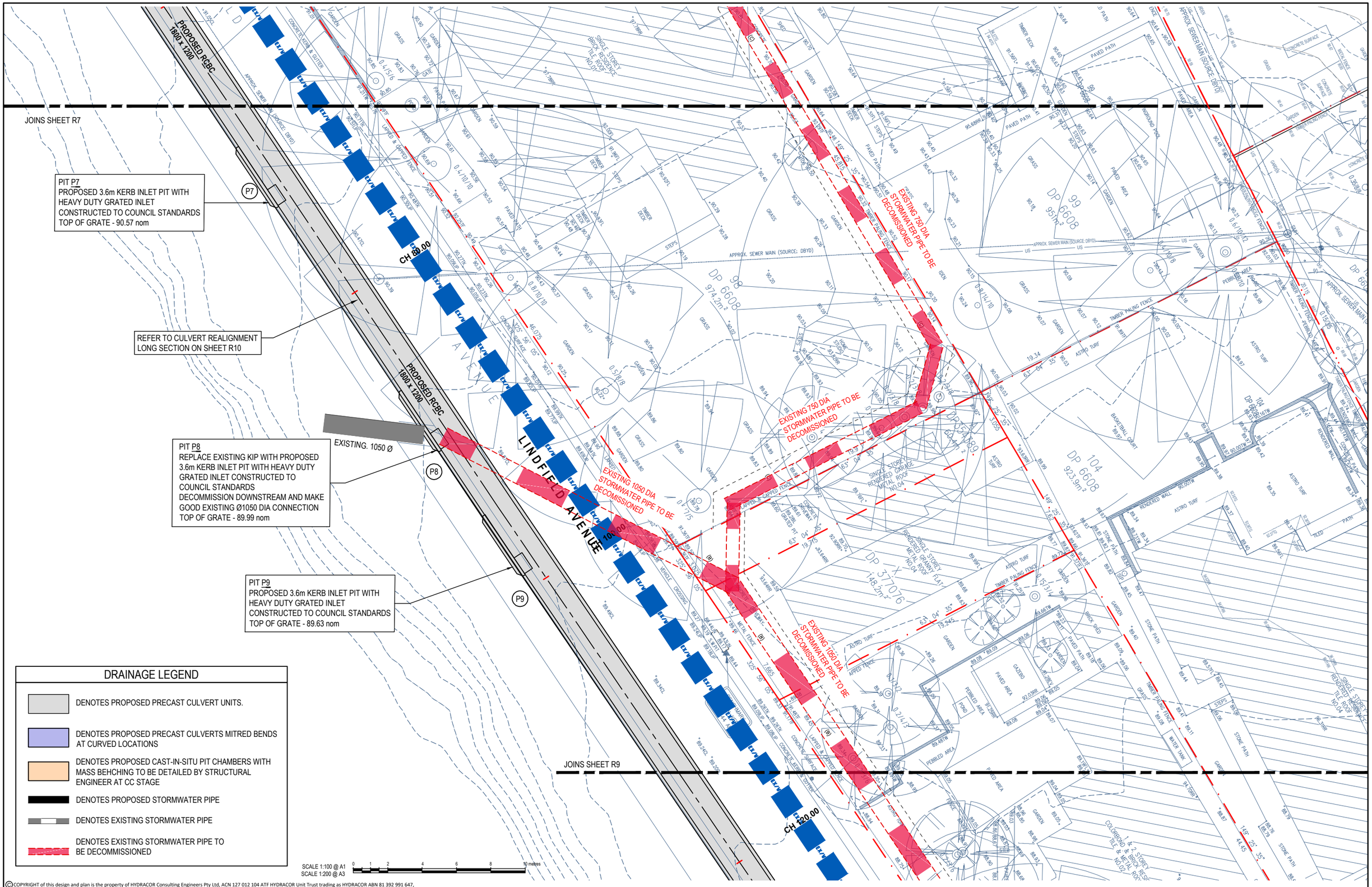
Project: PROPOSED PUBLIC DOMAIN FLOOD MITIGATION WORKS
No. 1 - 3 REID STREET
No. 2 - 4 WOODSIDE AVENUE
LINDFIELD

Drawing Title: STORMWATER REALIGNMENT PLAN - SHEET 1 OF 3

Drawn	Date	Scale A1	Q.A. Check	Date
MG	MAR 2025	1:100	-	-
Designed	Project No.		Dwg. No.	Issue
BK	CC240140		R7	D



DRAINAGE LEGEND

- DENOTES PROPOSED PRECAST CULVERT UNITS.
- DENOTES PROPOSED PRECAST CULVERTS MITRED BENDS AT CURVED LOCATIONS
- DENOTES PROPOSED CAST-IN-SITU PIT CHAMBERS WITH MASS BEHCHING TO BE DETAILED BY STRUCTURAL ENGINEER AT CC STAGE
- DENOTES PROPOSED STORMWATER PIPE
- DENOTES EXISTING STORMWATER PIPE
- DENOTES EXISTING STORMWATER PIPE TO BE DECOMMISSIONED

SCALE 1:100 @ A1
SCALE 1:200 @ A3
0 1 2 4 6 8 10 metres

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Issue	Description	Date	Drawn	Approved
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-	NIL ISSUE	-	-	-
-	NIL ISSUE	-	-	-
A	ISSUED FOR COUNCIL APPROVAL IN PRINCIPLE	31.03.25	MG	BK

0 10cm at full size 100cm

North

Client
CPDM Pty Ltd
SUITE G02, GROUND FLOOR
22 ATCHINSON ST, ST LEONARDS

Architect
PBD ARCHITECTS

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Project
PROPOSED PUBLIC DOMAIN FLOOD MITIGATION WORKS
No. 1 - 3 REID STREET
No. 2 - 4 WOODSIDE AVENUE
LINDFIELD

Drawing Title
STORMWATER REALIGNMENT PLAN - SHEET 2 OF 3

Drawn	Date	Scale A1	Q.A. Check	Date
MG	MAR 2025	1:100	-	-
Designed	Project No.	Dwg. No.	Issue	
BK	CC240140	R8	D	

JOINS SHEET R8

VIEW PLAN

CH 120.00

CH 140.00

CH 160.00

CH 180.00

CH 190.00

CH 200.00

CH 203.37

CT 162.15

CT 168.93

CT 186.21

R 6.0m

R 6.0m

LINDFIELD AVENUE

WOODSIDE AVENUE

PROPOSED RCBC
1800 x 1200

EXISTING 1050 DIA STORMWATER PIPE TO BE DECOMMISSIONED

EXISTING 1050 DIA STORMWATER PIPE TO BE DECOMMISSIONED

EXISTING. 1050 Ø

EXISTING. 1050 Ø

PIT EX1
REPLACE EXISTING KIP WITH PROPOSED 4.2m KERB INLET PIT WITH HEAVY DUTY GRATED INLET CONSTRUCTED TO COUNCIL STANDARDS
TOP OF GRATE - 87.60 nom

PIT P10
PROPOSED 1.8m KERB INLET PIT WITH HEAVY DUTY GRATED INLET CONSTRUCTED TO COUNCIL STANDARDS
TOP OF GRATE - 88.47 nom

PIT P11
REPLACE EXISTING KIP WITH PROPOSED 1.8m KERB INLET PIT WITH HEAVY DUTY GRATED INLET CONSTRUCTED TO COUNCIL STANDARDS
TOP OF GRATE - 88.42 nom

PIT P12
REPLACE EXISTING KIP WITH PROPOSED 1.8m KERB INLET PIT WITH HEAVY DUTY GRATED INLET CONSTRUCTED TO COUNCIL STANDARDS
TOP OF GRATE - 87.75 nom

PIT P13
REPLACE EXISTING KIP WITH PROPOSED 1.8m KERB INLET PIT WITH HEAVY DUTY GRATED INLET CONSTRUCTED TO COUNCIL STANDARDS
MAKE GOOD EXISTING CONSTRUCTION.
INVERT LEVEL OF OUTLET SHALL BE SITE CONFIRMED PRIOR TO COMMENCEMENT OF WORKS
TOP OF GRATE - 87.86 nom

REFER TO CULVERT REALIGNMENT LONG SECTION ON SHEET R10

DRAINAGE LEGEND

- DENOTES PROPOSED PRECAST CULVERT UNITS.
- DENOTES PROPOSED PRECAST CULVERTS MITRED BENDS AT CURVED LOCATIONS
- DENOTES PROPOSED CAST-IN-SITU PIT CHAMBERS WITH MASS BEHCHING TO BE DETAILED BY STRUCTURAL ENGINEER AT CC STAGE
- DENOTES PROPOSED STORMWATER PIPE
- DENOTES EXISTING STORMWATER PIPE
- DENOTES EXISTING STORMWATER PIPE TO BE DECOMMISSIONED

SCALE 1:100 @ A1
SCALE 1:200 @ A3
0 1 2 4 6 8 10 metres

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Issue	Description	Date	Drawn	Approved
D	ISSUED FOR APPROVAL	17.12.25	IK	BK
-	NIL ISSUE	-	-	-
-	NIL ISSUE	-	-	-
A	ISSUED FOR COUNCIL APPROVAL IN PRINCIPLE	31.03.25	MG	BK

1cm at full size 10cm

North

Client
CPDM Pty Ltd
SUITE G02, GROUND FLOOR
22 ATCHINSON ST, ST LEONARDS

Architect
PBD ARCHITECTS

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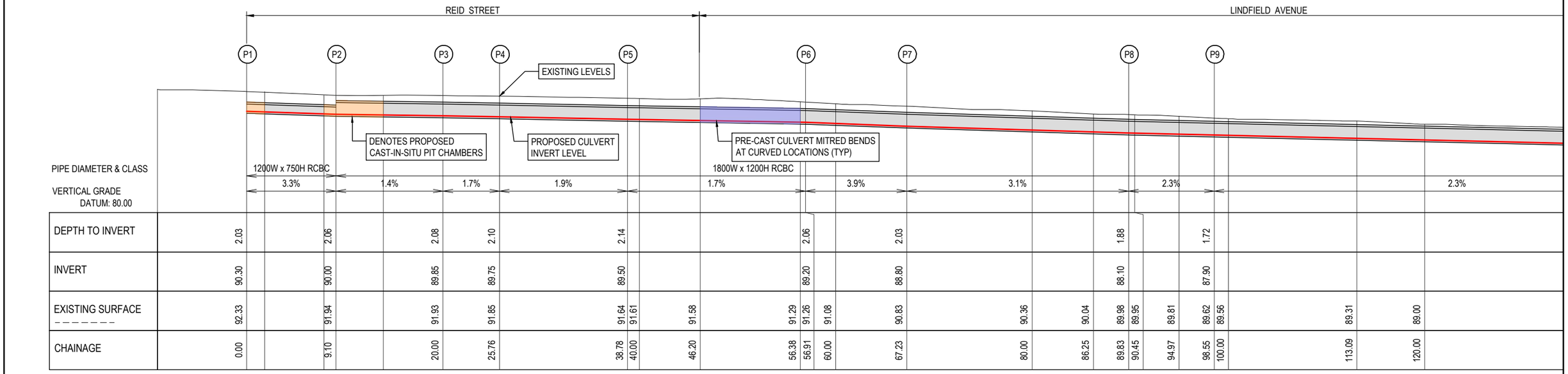
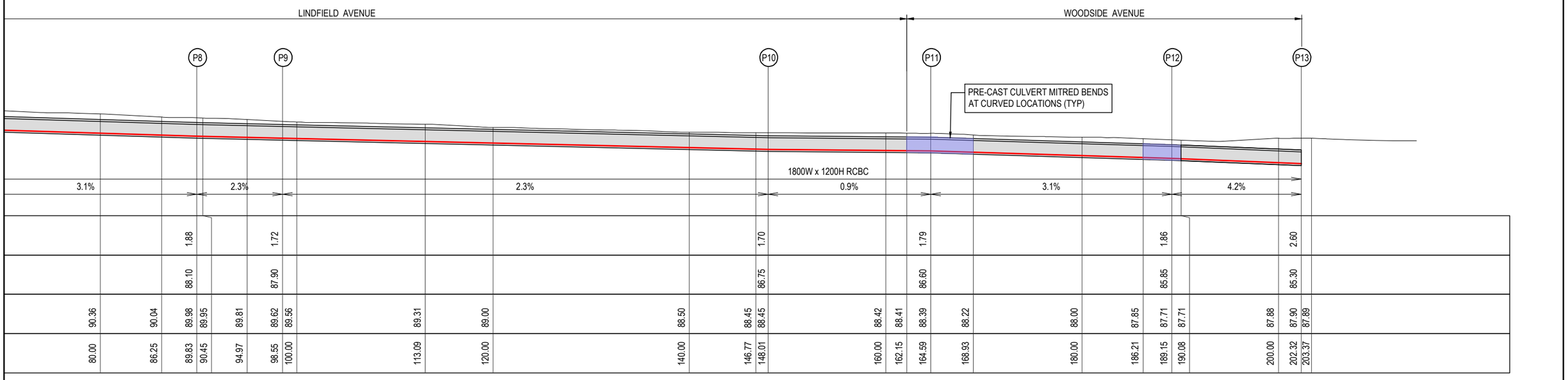
Project
PROPOSED PUBLIC DOMAIN FLOOD MITIGATION WORKS
No. 1 - 3 REID STREET
No. 2 - 4 WOODSIDE AVENUE
LINDFIELD

Drawing Title
STORMWATER REALIGNMENT PLAN - SHEET 3 OF 3

Drawn	Date	Scale A1	Q.A. Check	Date
MG	MAR 2025	1:100	-	-
Designed	Project No.		Dwg. No.	Issue
BK	CC240140		R9	D





PROPOSED CULVERT DRAINAGE LONG SECTION

VERT & HORI SCALE - 1:200/A1, 1:400/A3

0 2 4 8 12 16 20m

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-	NIL ISSUE	-	-	-
-	NIL ISSUE	-	-	-
A	ISSUED FOR COUNCIL APPROVAL IN PRINCIPLE	31.03.25	MG	BK

0 1cm at full size 10cm

North

Client: CPDM Pty Ltd
SUITE G02, GROUND FLOOR
22 ATCHINSON ST, ST LEONARDS

Architect: PBD ARCHITECTS

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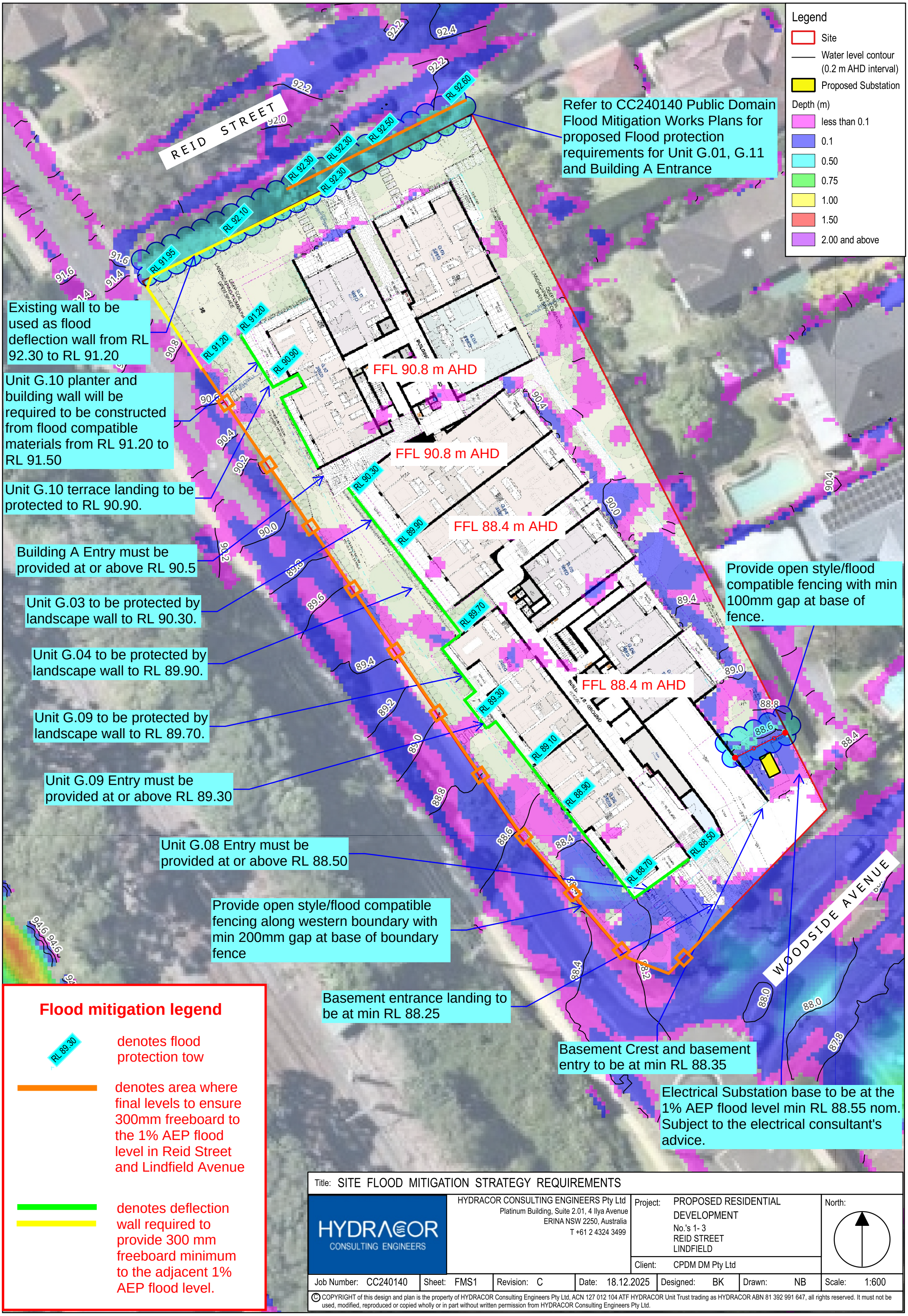
Project: PROPOSED PUBLIC DOMAIN FLOOD MITIGATION WORKS
No. 1 - 3 REID STREET
No. 2 - 4 WOODSIDE AVENUE
LINDFIELD

Drawing Title: PROPOSED CULVERT DRAINAGE LONG SECTION

Drawn	Date	Scale A1	Q.A. Check	Date
MG	MAR 2025	1:200	-	-
Designed	Project No.		Dwg. No.	Issue
BK	CC240140		R10	D



Flood mitigation legend

RL 89.30 — denotes flood protection tow

denotes area where final levels to ensure 300mm freeboard to the 1% AEP flood level in Reid Street and Lindfield Avenue

denotes deflection wall required to provide 300 mm freeboard minimum to the adjacent 1% AEP flood level.

Title: SITE FLOOD MITIGATION STRATEGY REQUIREMENTS

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Project: PROPOSED RESIDENTIAL DEVELOPMENT
No.'s 1- 3
REID STREET
LINDFIELD

Client: CPDM DM Pty Ltd

North:

Job Number:	Sheet:	Revision:	Date:	Designed:	Drawn:	Scale:
CC240140	FMS1	C	18.12.2025	BK	NB	1:600

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Bruce Kenny

From:	Jim Turner <turner@krg.nsw.gov.au>
Sent:	Friday, 30 January 2026 4:25 PM
To:	Bruce Kenny
Cc:	Rong Zhang
Subject:	RE: Stormwater Upgrade Works - No.'s 1-3 Reid Street & No.'s 2- 4 Woodside Avenue

Hello Bruce

I refer to the below email and the meeting at Council regarding possible developments for :

- 2 to 8 Highgate Road Lindfield and noted that this site doesn't have a road water easement in the site and that it can drain to Woodside Avenue, subject to OSD and other design requirements.
- 1 to 3 Reid Street and 2 to 4 Woodside Avenue Lindfield and noted there are overland flow and road water easements affecting these properties and make the following comments.

The following files were reviewed and comments are:

CC240140C reviewed

CC240140F Pages 28-35 Changes in flood levels and velocities, some increase in Reid Street, small increase in Lindfield Avenue.

CC240140FMS1 reviewed

CC240140R pages 6-9 proposed stormwater alterations.

The design is accepted in principle, subject to final design being approved under Roads Act, approval from Sydney Water for work near their water mains, approval from TfNSW if required for work near the railway and further refined drainage and flooding analysis of the further refined design to determine if the increases in CC240140F can be reduced.

Please contact me if further information is required.

If you have any further questions please contact Jim Turner on phone 02 9424 0954 or email turner@krg.nsw.gov.au I may not answer your email on Wednesday. After 30 January 2026, please include krg@krg.nsw.gov.au and CC ggrewal@krg.nsw.gov.au in replies as there will be long delays in my answering emails.

Thanks

Jim Turner | Senior Civil Asset Engineer | Ku-ring-gai Council
P: 02 9424 0954 | M: 0419 236 604
E: turner@krg.nsw.gov.au | krg.nsw.gov.au

Check out Ku-ring-gai Council's new website at
krg.nsw.gov.au
Tell us what you think!

From: Bruce Kenny <BKenny@hydracor.com.au>
Sent: Thursday, 29 January 2026 5:53 PM
To: Jim Turner <turner@krg.nsw.gov.au>
Cc: Bruce Kenny <BKenny@hydracor.com.au>
Subject: RE: Stormwater Upgrade Works - No.'s 1-3 Reid Street & No.'s 2- 4 Woodside Avenue

Jim,

We refer to our meeting held in Council chambers earlier today.

During our meeting, we provided copies of the following documents which relate to the properties known as No.'s 1-3 Reid Street & No.'s 2- 4 Woodside Avenue. We have attached copies of these documents in the Dropbox link below.

- Proposed Public Domain Flood Mitigation Works - CC240140R Sheets R1 – R10 Rev D dated 16 January 2026
- Site Flood Mitigation Strategy Requirements – CC240140 Sheet FMS1 Rev C dated 18 December 2025
- Flood Maps – CC240140F Sheet F1 – F35 Rev F dated 18 December 2025
- Stormwater Management Plans – CC240140C Sheets C1 – C12 Rev C dated 16 January 2026
- Letter from Department of Planning, Housing & Infrastructure dated 17 July 2025

We note that these documents provide concept details of the proposed flood mitigation measures within the subject site and within the Council public domain. We have also included our detail flood mapping which support the hydraulic performance of the system in relation to Council controls.

We refer to the correspondence prepared by the Department of Planning, Housing & Infrastructure dated 17 July 2025 and specifically paragraph 19 which states:

Flood risk

19. The Integrated Water Management Report (IWMR) recommends flood mitigation works including upgrades to Council's stormwater drainage system and reconstruction of the southern verge in Reid Street.

    Provide confirmation that these works have been discussed with and agreed to by Council. The mitigation measures table should also be updated to reference any required flood mitigation measures.

We refer to the comments under paragraph 19 and seek confirmation from Council that we have discussed the concept design details and flood mitigation measures outlined in the attached documents.

In this regard we understand that subject to detail design the proposed stormwater upgrade in the road reserve and footpath reserve depicted on the above-mentioned plan can be agreed in principle and consequently can be deemed adequate for their intended purpose.

In this regard we look forward to your response.

Link:

https://www.dropbox.com/scl/fo/buo1jrll8xx7senmk2tgp/AN0ZgpoTGarsZkO4EbK5n0E?rlkey=01ypmd2906wtm7fmmiag8rphi&st=xznhes5s&dl=0

Regards,

Bruce Kenny

Director

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HYDRACOR has proudly provided comprehensive support in Flooding, Stormwater, and Civil components for Australia's first 25hours Hotel at 1-11 Oxford Street, Paddington. Transforming the historic West Olympia Theatre, the hotel will feature a rooftop bar, eclectic dining options, live music facilities, wellness offerings and ground-floor retail. Our engineering work ensures top standards, contributing to this prime investment in Australia's hotel market.

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