HYDRACOR
CONSULTING ENGINEERS

Integrated Water Management Report

For a Proposed Residential Development

Prepared for: **Werona Ave Residence Holdings Pty Ltd**

Project address: **No.'s 21- 25 McIntosh Street & No. 55 Werona Avenue, Gordon**

Document No.: **CC250085_Integrated Water Management Report**

Version No.: **2.0**

Dated: **11 March 2026**

HCE

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

Disclaimer

This Report has been prepared in accordance with the scope of services described in the agreement between HYDRACOR Consulting Engineers Pty Limited and the Client. The Report relies upon data, surveys, measurements and results based on instructions from, and in consultation with, the Client. Except as otherwise stated, HYDRACOR Consulting Engineers Pty Limited has not attempted to verify the accuracy or completeness of any information provided by the Client. If the information is subsequently determined to be false, inaccurate or incomplete then it is possible that changes may be required to the Report. Changes in circumstances or facts, the passage of time, manifestation of latent conditions or impacts of future events may also impact on the accuracy, completeness or currency of the information or material set out in this Report. This Report has been prepared solely for use by the Client, HYDRACOR Consulting Engineers Pty Limited accepts no responsibility for its use by any third parties without the specific authorisation of HYDRACOR Consulting Engineers Pty Limited. HYDRACOR Consulting Engineers Pty Limited reserves the right to alter, amend, discontinue, vary or otherwise change any information, material or service at any time without subsequent notification. All access to, or use of, the information or material is at the user's risk and HYDRACOR Consulting Engineers Pty Limited accepts no responsibility for the results of any actions taken on the basis of information or material provided, nor for its accuracy, completeness or currency. For the reasons outlined above, however, no other warranty or guarantee, whether expressed or implied, is made as to the data, observations and findings expressed in this Report, to the extent permitted by law.

VERSION HISTORY

Version	Date	Purpose	Prepared By	Approved By
1.0	21/05/2025	Issued for Approval	Isaac Kan	Bruce Kenny
2.0	11/03/2026	Revised Issue for Approval	Isaac Kan	Bruce Kenny

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

Table of Contents

Annexures

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 Report supports a State Significant Development Application (**SSDA**) SSD-83478456 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 (**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 PMDL Architects, Project No. 2438, received 16 May 2025.
- Site Survey prepared by Burton & Field, Job Reference. E7363-86993, Revision A dated 19 July 2024.

The purpose of this report is to provide DPHI with sufficient information to assess the proposed development.

2.1 Purpose of this Report

This Report supports a SSDA submitted to the 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 6 May 2025 which states that the environmental impact statement (**EIS**) is to address the following requirements:

Table 1: SEARs Requirements.

SEARs Requirement	Referenced 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 ▪ 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,	Section 5

floodplain risk management studies and plans ○ The site access and egress routes ○ The potential effects of climate change, ○ 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 site is located on the northern side of McIntosh Street in Gordon. The subject site comprises the properties known as:

- Lot A DP 339345 (No. 21) McIntosh Street, Gordon.
- Lot 5 DP 651557 (No. 23) McIntosh Street, Gordon.
- Lot 1 DP 167505 (No. 25) McIntosh Street, Gordon.
- Lot 11 DP 1078667 (No. 55) Werona Avenue, Gordon.

The site is developed and comprises a combined area of 7776 square metres. Current improvements include residential buildings. The site is zoned R2 Low Density Residential under the provisions of Ku-ring-gai LEP 2015 and lies within the Gordon Transport Oriented Development Area (TOD).

The existing site ground surface falls towards the northern corner of 25 McIntosh Street. Existing ground surface elevations are generally within the range of RL 117.80 m AHD at the existing crossover of 55 Werona Avenue falling to RL 107.00 m AHD at the northern boundary of No. 25 McIntosh Street.

3.2 Overview of this Proposal

The proposal seeks consent for the demolition and removal of existing improvements and associated ancillary works and the construction of residential flat buildings with in-fill affordable housing.

The features of the proposed buildings are depicted on the Architectural Plans prepared by PMDL Architects, Project No. 2438.

4 Water Management

4.1.1 On-Site Detention Requirement

The DCP 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 amongst other items details the on-site stormwater detention system.

In this regard we refer to the Stormwater Management Plans, prepared by HYDRACOR, Reference CC250085, Sheets C1 – C17, revision C, dated 11 March 2026 (**Stormwater Plans**). This Report annexes copies of the Stormwater Plans under Annexure A.

We refer to the Stormwater Plans and specifically Sheets C2, C4 – C5 and C9 – C11 which provide details of the proposed on-site stormwater detention system.

We note the details depicted on the above-mentioned plans have been prepared in accordance with the relevant controls outlined in the DCP and LEP.

4.1.2 Stormwater Quality

The DCP requires the inclusion of stormwater quality devices will meet the performance objectives outlined in the DCP 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 an 80kL rainwater tank for re-use, eight (8) underground stormwater filtration cartridges and four (4) gully pit insert/baskets.

The location and details of the proposed treatment train are depicted in the Stormwater Plans and specifically Sheets C2, C5 - C6 and C9 – C10.

The Stormwater Quality Report and MUSIC modelling results are presented in the Stormwater Plans and specifically Sheets C12 – C14.

4.1.3 Stormwater Drainage

The DCP requires the inclusion of a stormwater drainage system designed in accordance with the requirements outlined in AS3500.3 and DCP Part 24.

We refer to the details depicted in the Stormwater Plans and specifically sheets C2 – C8.

The lawful point of discharge is achieved with a connection into the existing Council stormwater infrastructure in Rosedale Road. In this regard we refer to the Stormwater Plans and specifically sheets C5, C7 and C8 which detail the proposed amplification of the Council stormwater system.

5 Flood Risk

5.1 Flood Characteristics

The site is located within the upper reaches of Rocky Creek and is located within the 'Draft Middle Harbour Northern Catchments Flood Study' prepared by BMT, project No. A10091, Revision 00, dated 14 July 2023 (BMT 2023) (**Flood Study**) which is yet to be adopted by Ku-ring-gai Council.

Based on the information outlined in the Flood Study, we have determined the site is flood free during all flood events up to and including the Probable Maximum Flood (PMF) event (Copies of Flood Study mapping are enclosed under Annexure B).

5.2 Flood Risk Management

Based on the outcomes of our Flooding assessment in relation to the requirements outlined in the DCP and the Flood Risk Management Manual (NSW DPE), dated 2023 we have determined the site is not subject to flood related controls.

6 Conclusion

A residential development is proposed at the site known as No.'s 21 - 25 McIntosh Street and No. 55 Werona Avenue Gordon. The DPHI has issued a SEARs (Secretary's Environmental Assessment Requirements) for the development.

The stormwater management design and documentation comprising the on-site stormwater detention system, stormwater quality measures and the stormwater drainage network are compliant 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 all flood events and consequently will not be subject to flood related controls

Based on the foregoing, it is our view that the findings and outcomes of this Report demonstrate 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.

7 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.

Australian Institute for Disaster Resilience (AIDR). (2017). *Australian Disaster Resilience Guideline 7-3: Flood Hazard*. East Melbourne, VIC: Author.

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

NSW DPE. (2023a). *Flood Impact and Risk Assessment: Flood Risk Management Guide LU01*. Sydney, NSW: Author.

NSW DPE. (2023b). *Flood Risk Management Manual: the management of flood liable land*. Sydney, NSW: Author.

BMT. (2023). Draft *Middle Harbour Northern Catchments Flood Study (A10091)*. NSW: Author.

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 CC250085, sheets C1 – C17, Revision E, dated May 2026

PROPOSED DEVELOPMENT
No.'s 21- 25 McINTOSH STREET & No. 55 WERONA AVENUE, GORDON
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

LOCALITY PLAN
NOT TO SCALE

DRAWINGS MUST BE PRINTED IN COLOUR

Issue	Description	Date	Drawn	Approved
E	REVISED ARCHITECTURAL & LANDSCAPING	01.04.26	LW	BK
D	REVISED COUNCIL DRAINAGE SYSTEM UPGRADE	19.03.26	LW	BK
C	REVISED PIPE DESIGN DOWN ROSEDALE ROAD	11.03.26	LW	BK
B	ISSUED FOR REVIEW	05.03.26	LW	BK

1cm at full size

North

Client: WERONA AVE RESIDENCE HOLDING PTY LTD

Architect: PMDL

HYDRACOR CONSULTING ENGINEERS
HYDRACOR Consulting Engineers Pty Ltd
Platinum Building, Suite 2.01, 4 Ilya Avenue
ERINA NSW 2250, Australia
T +61 2 4324 3499
ENGINEERS | CIVIL | FLOOD STUDIES | STORMWATER | HYDRAULIC

Project: PROPOSED RESIDENTIAL DEVELOPMENT
No.25, 23 & 21 MCINTOSH STREET
No.55 WERONA AVENUE
GORDON

Drawing Title: COVER SHEET & NOTES

Drawn	Date	Scale A1	Q.A. Check	Date
IK	MAY 2025	AS SHOWN	-	-

Designed	Project No.	Dwg. No.	Issue
BK	CC250085	C1	E

KU-RING-GAI DCP PART 24 STORMWATER DRAINAGE SUMMARY

SITE AREA . . . . . 7776 m²

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

POST DEVELOPED IMPERVIOUS AREA . . . . . 4133 m²

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 ROSEDALE ROAD

- STREAM FLOW CONTROLS PART 24 CLAUSE 24.C3

  PROPOSAL

  PROVISION OF 80,000 LITRE MIN. RAINWATER TANK.

  REFER TO SHEET C4, C5, C9, C10 & C11

- ON-SITE DETENTION PART 24 CLAUSE 24.C5

  REFER TO CALCULATION SHEET.

  PROPOSAL

  PROVISION OF 161,000 LITRE MIN. ON-SITE DETENTION TANK

  REFER TO SHEETC4, C5, C9, C10 & C11

- WATER QUALITY PART 24 CLAUSE 24.C6

  PROPOSAL

  PROVISION OF: 80,000 LITRE MINIMUM RAINWATER TANK

  8 X OCEAN PROTECT STORMFILTERS (FULL HEIGHT)

  4 X OCEAN PROTECT OCEANGUARD INSERTS

  REFER TO SHEETS C4, C5, C9, C10 & C11

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

1. CATCHMENT NAME RC1
2. CATCHMENT DISCHARGE RATE 0.0124 l/sec/m² **A**
3. CATCHMENT STORAGE RATE 0.0345 m³/m² **B**

SITE DETAILS

4. SITE AREA (m²) 7776 60% OF SITE AREA m² 4666 **C**
5. AREA(S) NOT DRAINING TO THE DETENTION SYSTEM N/A m²
6. TOTAL IMPERVIOUS AREA (ROOFS, DRIVEWAYS, PAVING, FUTURE DEV.) 4133 m² **D**
7. IMPERVIOUS AREA BYPASSING DETENTION SYSTEM 0 m² **E**

PERMITTED SITE DISCHARGE

8. C[4666 m²] x A [0.0124 l/sec/m²] = 57.9 l/sec **Flow 1**
9. ADJUSTMENT FOR ANY UNCONTROLLED IMPERVIOUS FLOW E / D= N/A (<0.25) **F**
10. FLOW 1 [- l/sec x F [-] = - l/sec **Flow 2**
11. FLOW 1 [57.9] - FLOW 2 [N/A] = 57.9 l/sec **PSD**

SITE STORAGE REQUIREMENT

12. C [4666 m²] x B [0.0345 m³/m²] = 161 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 = 161m³ REQUIRED
- 154m³ PROVIDED

Issue	Description	Date	Drawn	Approved
E	REVISED ARCHITECTURAL & LANDSCAPING	01.04.26	LW	BK
D	REVISED COUNCIL DRAINAGE SYSTEM UPGRADE	19.03.26	LW	BK
C	REVISED PIPE DESIGN DOWN ROSEDALE ROAD	11.03.26	LW	BK
B	ISSUED FOR REVIEW	05.03.26	LW	BK

1 0 1cm at full size 10cm

North

Client: WERONA AVE RESIDENCE HOLDING PTY LTD

Architect: PMDL

HYDRACOR CONSULTING ENGINEERS

HYDRACOR Consulting Engineers Pty Ltd
Platinum Building, Suite 2.01, 4 Ilya Avenue
ERINA NSW 2250, Australia
T +61 2 4324 3499

ENGINEERS | CIVIL | FLOOD STUDIES | STORMWATER | HYDRAULIC

Project: PROPOSED RESIDENTIAL DEVELOPMENT
No.25, 23 & 21 MCINTOSH STREET
No.55 WERONA AVENUE
GORDON

Drawing Title: STORMWATER DRAINAGE SUMMARY

Drawn	Date	Scale A1	Q.A. Check	Date
IK	MAY 2025	AS SHOWN	-	-
Designed	**Project No.**		**Dwg. No.**	**Issue**
BK	CC250085		C2	E

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

STREET

MCINTOSH

PIT BP18 - 450 SQUARE PIT WITH MEDIUM DUTY GRATED INLET
TOP OF GRATE - 102.60 nom
OUTLET - IL 102.20

PIT BP7 - 900 SQUARE PIT WITH MEDIUM DUTY GRATED INLET
TOP OF GRATE - 102.60 nom
OUTLET - IL 101.60

PIT BP6 - 600 SQUARE PIT WITH MEDIUM DUTY GRATED INLET
TOP OF GRATE - 102.60 nom
OUTLET - IL 101.70

PIT BP5 - 600 SQUARE PIT WITH MEDIUM DUTY GRATED INLET
TOP OF GRATE - 102.60 nom
OUTLET - IL 101.80

PIT BP4 - 600 SQUARE PIT WITH MEDIUM DUTY GRATED INLET
TOP OF GRATE - 102.60 nom
OUTLET - IL 101.90

PIT BP3 - 600 SQUARE PIT WITH MEDIUM DUTY GRATED INLET
TOP OF GRATE - 102.60 nom
OUTLET - IL 102.00

PIT BP2 - 450 SQUARE PIT WITH MEDIUM DUTY GRATED INLET
TOP OF GRATE - 102.60 nom
OUTLET - IL 102.10

PIT BP1 - 450 SQUARE PIT WITH MEDIUM DUTY GRATED INLET
TOP OF GRATE - 102.60 nom
OUTLET - IL 102.20

PIT BP17 - 450 SQUARE PIT WITH MEDIUM DUTY GRATED INLET
TOP OF GRATE - 102.60 nom
OUTLET - IL 102.10

PIT BP16 - 600 SQUARE PIT WITH MEDIUM DUTY GRATED INLET
TOP OF GRATE - 102.60 nom
OUTLET - IL 102.00

PIT BP8 - 900 SQUARE PIT WITH MEDIUM DUTY GRATED INLET
TOP OF GRATE - 102.60 nom
OUTLET - IL 101.50

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

PIT BP9 - 900 SQUARE PIT WITH MEDIUM DUTY GRATED INLET
TOP OF GRATE - 102.60 nom
OUTLET - IL 101.40

PIT BP10 - 600 SQUARE PIT WITH MEDIUM DUTY GRATED INLET
TOP OF GRATE - 102.60 nom
OUTLET - IL 101.70

PIT BP11 - 600 SQUARE PIT WITH MEDIUM DUTY GRATED INLET
TOP OF GRATE - 102.60 nom
OUTLET - IL 101.80

PIT BP12 - 600 SQUARE PIT WITH MEDIUM DUTY GRATED INLET
TOP OF GRATE - 102.60 nom
OUTLET - IL 101.90

PIT BP13 - 600 SQUARE PIT WITH MEDIUM DUTY GRATED INLET
TOP OF GRATE - 102.60 nom
OUTLET - IL 102.00

PIT BP14 - 450 SQUARE PIT WITH MEDIUM DUTY GRATED INLET
TOP OF GRATE - 102.60 nom
OUTLET - IL 102.10

PIT BP15 - 450 SQUARE PIT WITH MEDIUM DUTY GRATED INLET
TOP OF GRATE - 102.60 nom
OUTLET - IL 102.20

BASEMENT 2
FFL RL.102.74

BICYCLE STORAGE

CLEANERS

STORMWATER MANAGEMENT PLAN - BASEMENT 2

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

0 2 4 8 12 16 20m

Issue	Description	Date	Drawn	Approved
E	REVISED ARCHITECTURAL & LANDSCAPING	01.04.26	LW	BK
D	REVISED COUNCIL DRAINAGE SYSTEM UPGRADE	19.03.26	LW	BK
C	REVISED PIPE DESIGN DOWN ROSEDALE ROAD	11.03.26	LW	BK
B	ISSUED FOR REVIEW	05.03.26	LW	BK

1cm at full size

North

Client
WERONA AVE RESIDENCE HOLDING PTY LTD

Architect
PMDL

HYDRACOR CONSULTING ENGINEERS
HYDRACOR Consulting Engineers Pty Ltd
Platinum Building, Suite 2.01, 4 Ilya Avenue
ERINA NSW 2250, Australia
T +61 2 4324 3499
ENGINEERS | CIVIL | FLOOD STUDIES | STORMWATER | HYDRAULIC

Project
PROPOSED RESIDENTIAL DEVELOPMENT
No.25, 23 & 21 MCINTOSH STREET
No.55 WERONA AVENUE
GORDON

Drawing Title
STORMWATER MANAGEMENT PLAN - BASEMENT 2

Drawn	Date	Scale A1	Q.A. Check	Date
IK	MAY 2025	AS SHOWN	-	-
Designed	Project No.		Dwg. No.	Issue
BK	CC250085		C3	E

TANK NOTE

THE ON SITE DETENTION / RETENTION TANK IS SHOWN BASED ON FINISHED SURFACE LEVELS AND A STRUCTURAL SLAB THICKNESS OF 200mm AS DETAILED BY THE ARCHITECT. SHOULD ANY OF THESE PARAMETERS CHANGE, THE OSD TANK SHOULD BE RE-ASSESSED TO ENSURE SITE STORAGE VOLUMES ARE ACHIEVED. REFER TO SHEET C2 FOR SITE STORAGE REQUIREMENT AND COUNCIL'S ON SITE DETENTION CALCULATION.

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

STREET

MCINTOSH

DENOTES 150Ø SEALED AERIAL LINE STORMWATER PIPE (UNDER SLAB). INSTALLED IN ACCORDANCE WITH AS3500.3. TYP. UNO.

DENOTES 150Ø DROPPER. TYP. UNO

BICYCLE STORAGE
STORAGE
RECYCLE
MSB
WASTE ROOM
FIRE WATER TANK
FIRE PUMP
FIRE EXIT
BULKY WASTE
LOADING BAY
CLEANERS
WASTE ROOM
WATER PUMP
BICYCLE STORAGE
WASTE ROOM
STORAGE
B1 007 RECYCLE 67.15 m²
Shared Area
VISITOR
Bollard
1:6.5
1:13
RL 105.85
RL 105.84
1:13.33
1:14.85
1:9.25

BASEMENT 1
FFL RL.105.84

SO
150

DENOTES COLUMN UNDER SLAB. TYP. UNO

DENOTES SURFACE OUTLET. TYP. UNO

ON-SITE DETENTION (OSD) / RAINWATER RE-USE TANK (OSR)
UNDER BASEMENT DRIVEWAY
REFER TO DETAILS ON SHEET C9 - C11.
REFER TO TANK NOTE ON THIS SHEET.

CONSTRUCT 200 WIDE GRATED BOX DRAIN MIN 150 DEEP INVERT TO GRADE TO OUTLET AT A MINIMUM GRADE OF 2%.
TOP OF GRATE 105.84 nom

STORMWATER MANAGEMENT PLAN - BASEMENT 1

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

0 2 4 8 12 16 20m

Issue	Description	Date	Drawn	Approved
E	REVISED ARCHITECTURAL & LANDSCAPING	01.04.26	LW	BK
D	REVISED COUNCIL DRAINAGE SYSTEM UPGRADE	19.03.26	LW	BK
C	REVISED PIPE DESIGN DOWN ROSEDALE ROAD	11.03.26	LW	BK
B	ISSUED FOR REVIEW	05.03.26	LW	BK

1cm at full size

North

Client: WERONA AVE RESIDENCE HOLDING PTY LTD

Architect: PMDL

HYDRACOR Consulting Engineers Pty Ltd
Platinum Building, Suite 2.01, 4 Ilya Avenue
ERINA NSW 2250, Australia
T +61 2 4324 3499

ENGINEERS | CIVIL | FLOOD STUDIES | STORMWATER | HYDRAULIC

Project: PROPOSED RESIDENTIAL DEVELOPMENT
No.25, 23 & 21 MCINTOSH STREET
No.55 WERONA AVENUE
GORDON

Drawing Title: STORMWATER MANAGEMENT PLAN - BASEMENT 1

Drawn	Date	Scale A1	Q.A. Check	Date
IK	MAY 2025	AS SHOWN	-	-

Designed	Project No.	Dwg. No.	Issue
BK	CC250085	C4	E

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

STREET

MCINTOSH

900 SQ SWP WITH OCEANGUARD INSERT
RL 108.50
IL 107.80

OUTLINE OF BASEMENT BELOW SHOWN DASHED

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

SURFACE STORMWATER LINE TO OSD TANK.

600 SQ SWP
RL 109.65
IL 108.97

LOCATE STORMWATER PIPES AS CLOSE AS PRACTICABLE TO BUILDING TO MINIMISE ROOT DISTURBANCE OF EXISTING TREES.

PIT P2
KERB INLET PIT WITH 2.4m LINTEL
TOP OF GRATE - 107.60 nom

IL U/S 104.70
375Ø RCP
0.5%
7.20m
IL D/S 104.66

PIPE EXTENSION WITHIN ROAD IS SUBJECT TO FINAL APPROVAL & ROADWORKS APPLICATION REFER TO SHEET C7 & C8 FOR PROPOSED DRAINAGE ALIGNMENT

PIT P1
1200 SQUARE PIT WITH BOLT DOWN/WATER TIGHT SOLID COVER
TOP OF COVER - 108.50 nom

375 DIA MIN.

IL U/S 104.75
375Ø RCP
0.5%
10.20m
IL D/S 104.70

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

COMBINED OSD / OSR TANK
ON SITE DETENTION - OSD
TOP STORED WATER LEVEL - RL 108.20
STORAGE VOLUME PROVIDED - 154m³

ON SITE RETENTION - OSR
TOP STORED WATER LEVEL - RL 104.75
STORAGE VOLUME PROVIDED - 80m³

450 DIA MIN.

900 SQ SWP
RL 110.00
IL 107.40

LANDSCAPE DRAINAGE OVER BASEMENT SUBJECT TO BE COORDINATED WITH THE LANDSCAPE ARCHITECT, SERVICES AND STRUCTURE AT CC STAGE.

GROUND FLOOR
FFL RL. 109.84

900 SQ SWP WITH OCEANGUARD INSERT
RL 109.15
IL 107.30

900 SQ SWP WITH OCEANGUARD INSERT
RL 109.20
IL 108.45

200W x 100D GRATED DRAIN
RL 110.10 NOM

200W x 100D GRATED DRAIN
RL 110.20 NOM

200W x 100D GRATED DRAIN
RL 111.40 NOM

200W x 100D GRATED DRAIN
RL 111.60 NOM

200W x 100D GRATED DRAIN
RL 112.00 NOM

600 SQ SWP WITH OCEANGUARD INSERT
RL 112.40
IL 111.70

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:
RW RW 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. 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.

STORMWATER MANAGEMENT PLAN - GROUND FLOOR SHEET No. 1

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

0 1 2 4 6 8 10m

Issue	Description	Date	Drawn	Approved
E	REVISED ARCHITECTURAL & LANDSCAPING	01.04.26	LW	BK
D	REVISED COUNCIL DRAINAGE SYSTEM UPGRADE	19.03.26	LW	BK
C	REVISED PIPE DESIGN DOWN ROSEDALE ROAD	11.03.26	LW	BK
B	ISSUED FOR REVIEW	05.03.26	LW	BK

1cm at full size

North

Client
WERONA AVE RESIDENCE HOLDING PTY LTD

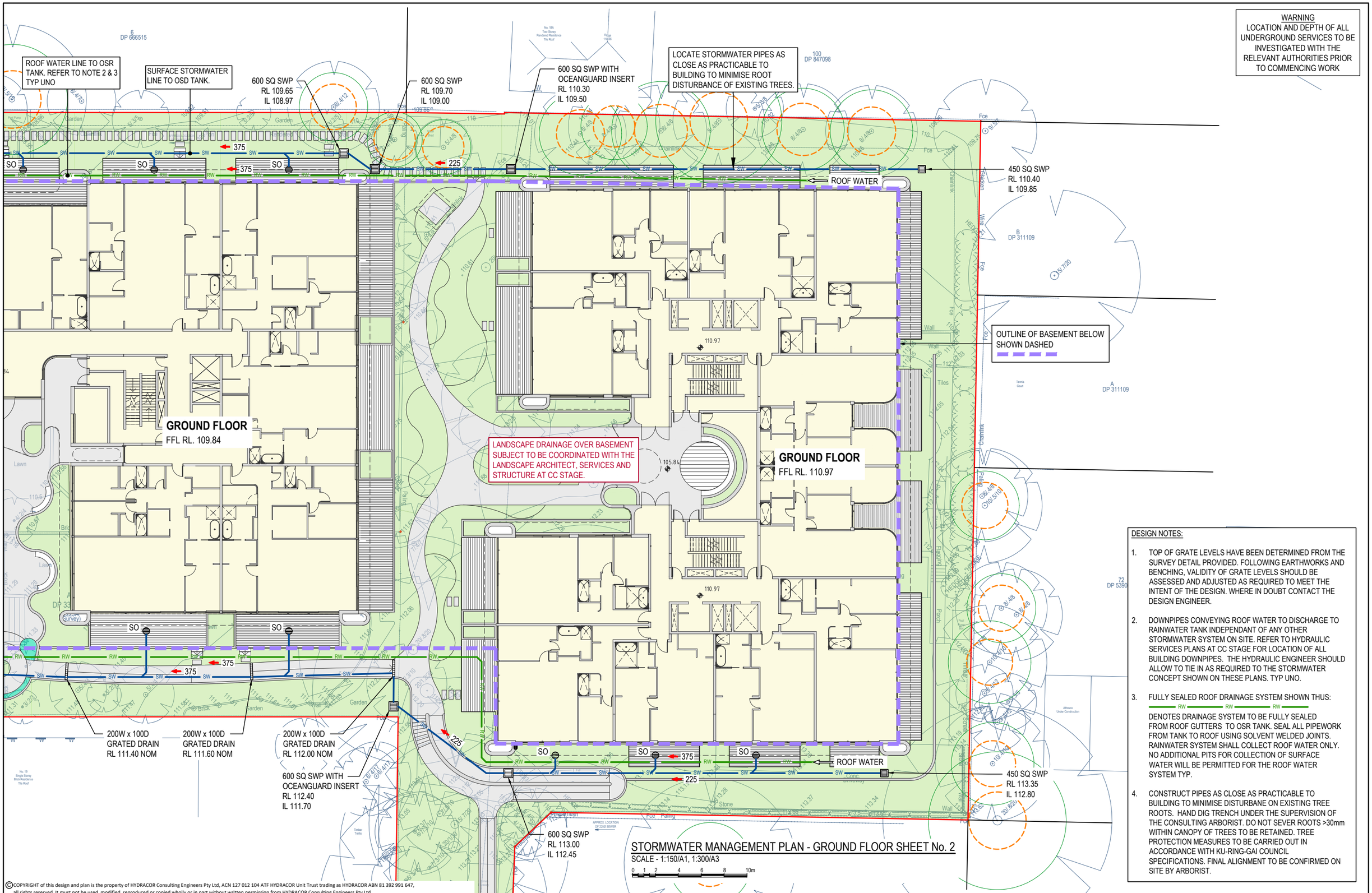
Architect
PMDL

HYDRACOR CONSULTING ENGINEERS
HYDRACOR Consulting Engineers Pty Ltd
Platinum Building, Suite 2.01, 4 Ilya Avenue
ERINA NSW 2250, Australia
T +61 2 4324 3499
ENGINEERS | CIVIL | FLOOD STUDIES | STORMWATER | HYDRAULIC

Project
PROPOSED RESIDENTIAL DEVELOPMENT
No.25, 23 & 21 MCINTOSH STREET
No.55 WERONA AVENUE
GORDON

Drawing Title
STORMWATER MANAGEMENT PLAN - GROUND SHEET No. 1

Drawn	Date	Scale A1	Q.A. Check	Date
IK	MAY 2025	AS SHOWN	-	-
Designed	Project No.		Dwg. No.	Issue
BK	CC250085		C5	E



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

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: RW RW 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. 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.

STORMWATER MANAGEMENT PLAN - GROUND FLOOR SHEET No. 2

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

0 1 2 4 6 8 10m

Issue	Description	Date	Drawn	Approved
E	REVISED ARCHITECTURAL & LANDSCAPING	01.04.26	LW	BK
D	REVISED COUNCIL DRAINAGE SYSTEM UPGRADE	19.03.26	LW	BK
C	REVISED PIPE DESIGN DOWN ROSEDALE ROAD	11.03.26	LW	BK
B	ISSUED FOR REVIEW	05.03.26	LW	BK

1cm at full size

North

Client
WERONA AVE RESIDENCE HOLDING PTY LTD

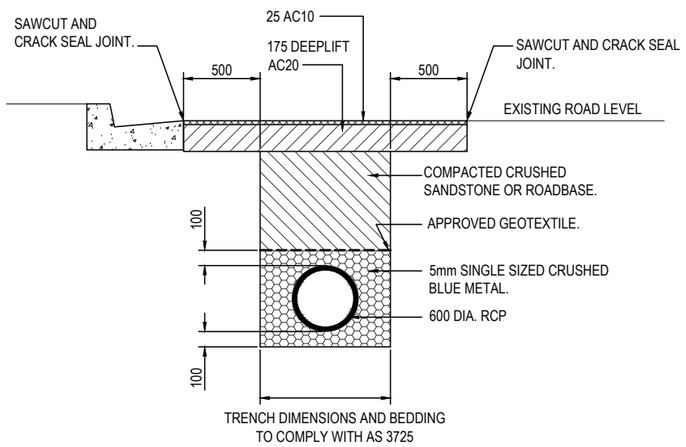
Architect
PMDL

HYDRACOR Consulting Engineers Pty Ltd
Platinum Building, Suite 2.01, 4 Ilya Avenue
ERINA NSW 2250, Australia
T +61 2 4324 3499
ENGINEERS | CIVIL | FLOOD STUDIES | STORMWATER | HYDRAULIC

Project
PROPOSED RESIDENTIAL DEVELOPMENT
No.25, 23 & 21 MCINTOSH STREET
No.55 WERONA AVENUE
GORDON

Drawing Title
STORMWATER MANAGEMENT PLAN - GROUND SHEET No. 2

Drawn	Date	Scale A1	Q.A. Check	Date
IK	MAY 2025	AS SHOWN	-	-
Designed	Project No.		Dwg. No.	Issue
BK	CC250085		C6	E



ROADWAY PIPE TRENCH BACKFILL DETAIL.
SCALE - 1:20/A1, 1:40/A3

ROSEDALE ROAD

No.22
MCINTOSH STREET
LOT B
DP334299

No.24
MCINTOSH STREET
LOT A
DP380382

IL U/S 104.66
375Ø RCP
3.0%
63.75m
IL D/S 102.75

PIT P2
KERB INLET PIT WITH 2.4m
LINTEL
TOP OF GRATE - 107.60 nom

PIT P3
KERB INLET PIT WITH 2.4m
LINTEL
TOP OF GRATE - 103.75 nom

MCINTOSH STREET

COMBINED OSD / OSR TANK
ON SITE DETENTION - OSD
TOP STORED WATER LEVEL - RL 108.40
STORAGE VOLUME PROVIDED - 154m³

ON SITE RETENTION - OSR
TOP STORED WATER LEVEL - RL 105.00
STORAGE VOLUME PROVIDED - 80m³

P2

IL U/S 104.70
375Ø RCP
0.5%
7.20m
IL D/S 104.66

P1

IL U/S 104.75
375Ø RCP
0.5%
10.20m
IL D/S 104.70

PIT P1 - BOUNDARY PIT
1200 SQUARE PIT WITH BOLT
DOWN/WATER TIGHT SOLID COVER
TOP OF GRATE - 108.50 nom

OSD / OSR

107.50
107.00
106.50
106.00
105.50
105.00
104.50
104.00
103.50
108.00
108.50
109.00
109.50

No.19
MCINTOSH STREET
LOT B
DP339345

GROUND FLOOR
FFL RL. 109.84

No.27
MCINTOSH STREET
LOT 6
DP666515

No.29
MCINTOSH STREET
LOT 1
DP971475

No.31
MCINTOSH STREET
LOT A
DP310486

ROAD DRAINAGE PLAN - SHEET No.1
SCALE 1:150/A1, 1:300/A3
0 8 10m

Issue	Description	Date	Drawn	Approved
E	REVISED ARCHITECTURAL & LANDSCAPING	01.04.26	LW	BK
D	REVISED COUNCIL DRAINAGE SYSTEM UPGRADE	19.03.26	LW	BK
C	REVISED PIPE DESIGN DOWN ROSEDALE ROAD	11.03.26	LW	BK
B	ISSUED FOR REVIEW	05.03.26	LW	BK

1cm at full size

North

Client
WERONA AVE RESIDENCE HOLDING PTY LTD

Architect
PMDL

HYDRACOR Consulting Engineers Pty Ltd
Platinum Building, Suite 2.01, 4 Ilya Avenue
ERINA NSW 2250, Australia
T +61 2 4324 3499

ENGINEERS | CIVIL | FLOOD STUDIES | STORMWATER | HYDRAULIC

Project
PROPOSED RESIDENTIAL DEVELOPMENT
No.25, 23 & 21 MCINTOSH STREET
No.55 WERONA AVENUE
GORDON

Drawing Title
ROAD DRAINAGE PLAN
SHEET No.1

Drawn	Date	Scale A1	Q.A. Check	Date
IK	MAY 2025	AS SHOWN	-	-
Designed	**Project No.**		**Dwg. No.**	**Issue**
BK	CC250085		C7	E

No.26
MCINTOSH STREET
LOT 2
DP534472

No.28
MCINTOSH STREET
LOT 3
DP523186

No.30
MCINTOSH STREET
LOT 2
DP523186

No.34
MCINTOSH STREET
LOT 1
DP523186

No.36
MCINTOSH STREET
LOT D
DP376412

PIT P3
KERB INLET PIT WITH 2.4m LINTEL
TOP OF GRATE - 103.75 nom

IL U/S 102.75
375Ø RCP
10.0%
54.50m
IL D/S 97.25

PIT P4
KERB INLET PIT WITH 2.4m LINTEL
TOP OF GRATE - 98.25 nom

PIPE LOCATED 800mm MIN AWAY FROM GUTTER LIP TO MINIMISE DISTURBANCE TO EXISTING TREE ROOT SYSTEM. EXTENT OF OFFSET TO BE DETERMINED BY PROJECT ARBORIST. REFER TO ROADWAY PIPE TRENCH BACKFILL DETAIL FOR EXTENT OF WORKS.

IL U/S 97.25
375Ø RCP
8.0%
52.00m
IL D/S 93.00

PIT EX1 - EXISTING KERB INLET
TOP OF GRATE - 94.00 nom
OUTLET - IL 93.00 nom
RECONSTRUCT AND EXTEND EXISTING PIT CHAMBER. EXACT DEPTH AND LOCATION OF EXISTING PIT TO BE SITE VERIFIED BEFORE THE COMMENCEMENT OF WORKS.

MCINTOSH STREET

P3 P4 EX1

104.00 103.50 103.00 102.50 102.00 101.50 101.00 100.50 100.00 99.50 99.00 98.50 98.00 97.50 97.00 96.50 96.00 95.50 95.00 94.50

APPROX LOCATION OF EXISITING STORMWATER PIPE PLOTTED FROM DBYD. EXACT LOCATION, DEPTH AND SIZE OF PIPE TO BE SITE DETERMINED BEFORE THE COMMENCEMENT OF WORKS

No.31
MCINTOSH STREET
LOT A
DP310486

No.33
MCINTOSH STREET
LOT B
DP310486

No.35
MCINTOSH STREET
LOT 1
DP115027

No.37
MCINTOSH STREET
LOT 2
DP115027

No.39
MCINTOSH STREET
LOT 1
DP628611

No.41
MCINTOSH STREET
LOT B
DP315799

No.43
MCINTOSH STREET
LOT 1
DP350104

ROAD DRAINAGE PLAN - SHEET No.2
SCALE - 1:150/A1, 1:300/A3
0 1 2 4 6 8 10m

Issue	Description	Date	Drawn	Approved
E	REVISED ARCHITECTURAL & LANDSCAPING	01.04.26	LW	BK
D	REVISED COUNCIL DRAINAGE SYSTEM UPGRADE	19.03.26	LW	BK
C	REVISED PIPE DESIGN DOWN ROSEDALE ROAD	11.03.26	LW	BK
B	ISSUED FOR REVIEW	05.03.26	LW	BK

1cm at full size

North

Client
WERONA AVE RESIDENCE HOLDING PTY LTD

Architect
PMDL

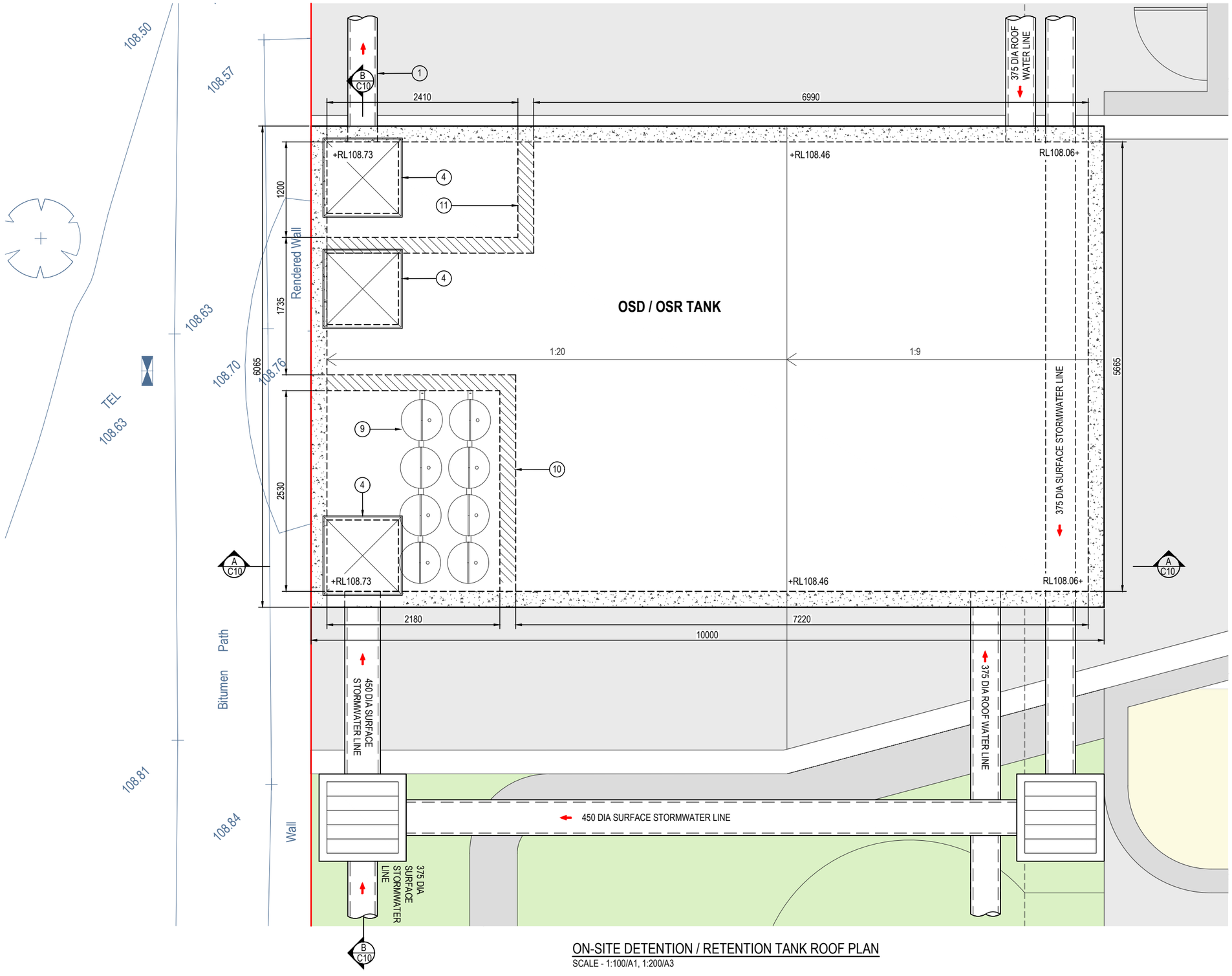
HYDRACOR CONSULTING ENGINEERS
HYDRACOR Consulting Engineers Pty Ltd
Platinum Building, Suite 2.01, 4 Ilya Avenue
ERINA NSW 2250, Australia
T +61 2 4324 3499
ENGINEERS | CIVIL | FLOOD STUDIES | STORMWATER | HYDRAULIC

Project
PROPOSED RESIDENTIAL DEVELOPMENT
No.25, 23 & 21 MCINTOSH STREET
No.55 WERONA AVENUE
GORDON

Drawing Title
ROAD DRAINAGE PLAN
SHEET No.2

Drawn	Date	Scale A1	Q.A. Check	Date
IK	MAY 2025	AS SHOWN	-	-

Designed	Project No.	Dwg. No.	Issue
BK	CC250085	C8	E



LEGEND

1	375 DIA OUTLET PIPE
2	350 x 350 x 4 PL 316SS 4 HOLES 12 DIA FOR M10 CHEMSETS
3	TRASH SCREEN LYSAGHT RH3030 GALV. REMOVABLE WITH HANDLE
4	900 x 900 SOLID COVER BOLTED DOWN
5	RE-USE PUMP TO MANUFACTURERS SPECIFICATIONS
6	NON-RETURN VALVE
7	PVC PIPE CLASS '16' RISING MAIN BY OTHERS
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.
9	8 x 690 HIGH OCEAN PROTECT FILTERS
10	WATER QUALITY CHAMBER WEIR
11	OSD OVERFLOW CHAMBER WEIR

ON-SITE DETENTION / RETENTION TANK ROOF PLAN

SCALE - 1:100/A1, 1:200/A3

Issue	Description	Date	Drawn	Approved
E	REVISED ARCHITECTURAL & LANDSCAPING	01.04.26	LW	BK
D	REVISED COUNCIL DRAINAGE SYSTEM UPGRADE	19.03.26	LW	BK
C	REVISED PIPE DESIGN DOWN ROSEDALE ROAD	11.03.26	LW	BK
B	ISSUED FOR REVIEW	05.03.26	LW	BK

1 0 10cm at full size 10cm

North

Client: WERONA AVE RESIDENCE HOLDING PTY LTD

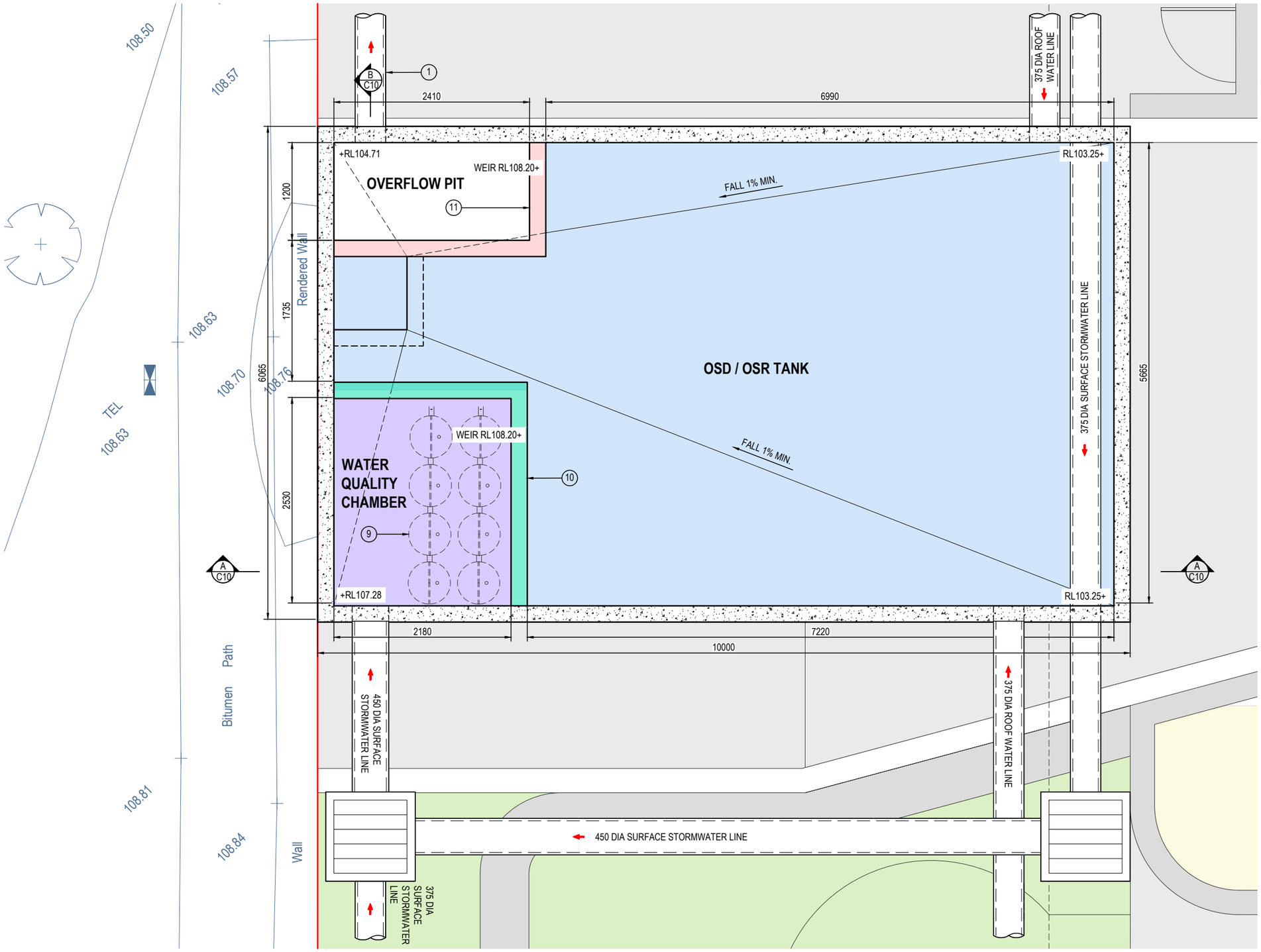
Architect: PMDL

HYDRACOR CONSULTING ENGINEERS
HYDRACOR Consulting Engineers Pty Ltd
Platinum Building, Suite 2.01, 4 Ilya Avenue
ERINA NSW 2250, Australia
T +61 2 4324 3499
ENGINEERS | CIVIL | FLOOD STUDIES | STORMWATER | HYDRAULIC

Project: PROPOSED RESIDENTIAL DEVELOPMENT
No.25, 23 & 21 MCINTOSH STREET
No.55 WERONA AVENUE
GORDON

Drawing Title: ONSITE DETENTION/RETENTION TANK ROOF PLAN

Drawn	Date	Scale A1	Q.A. Check	Date
IK	MAY 2025	AS SHOWN	-	-
Designed	Project No.		Dwg. No.	Issue
BK	CC250085		C9	E



LEGEND

1	375 DIA OUTLET PIPE
2	350 x 350 x 4 PL 316SS 4 HOLES 12 DIA FOR M10 CHEMSETS
3	TRASH SCREEN LYSAGHT RH3030 GALV. REMOVABLE WITH HANDLE
4	900 x 900 SOLID COVER BOLTED DOWN
5	RE-USE PUMP TO MANUFACTURERS SPECIFICATIONS
6	NON-RETURN VALVE
7	PVC PIPE CLASS '16' RISING MAIN BY OTHERS
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.
9	8 x 690 HIGH OCEAN PROTECT FILTERS
10	WATER QUALITY CHAMBER WEIR
11	OSD OVERFLOW CHAMBER WEIR

OSD TANK WALL LEGEND

- FULL HEIGHT WALL
- WATER QUALITY CHAMBER - TOP OF WEIR RL 108.20
- OVERFLOW PIT - TOP OF WEIR RL 108.20

ON-SITE DETENTION / RETENTION TANK BASE PLAN

SCALE - 1:100/A1, 1:200/A3

Issue	Description	Date	Drawn	Approved
E	REVISED ARCHITECTURAL & LANDSCAPING	01.04.26	LW	BK
D	REVISED COUNCIL DRAINAGE SYSTEM UPGRADE	19.03.26	LW	BK
C	REVISED PIPE DESIGN DOWN ROSEDALE ROAD	11.03.26	LW	BK
B	ISSUED FOR REVIEW	05.03.26	LW	BK

1:1 0 1cm at full size 10cm

North

Client: WERONA AVE RESIDENCE HOLDING PTY LTD

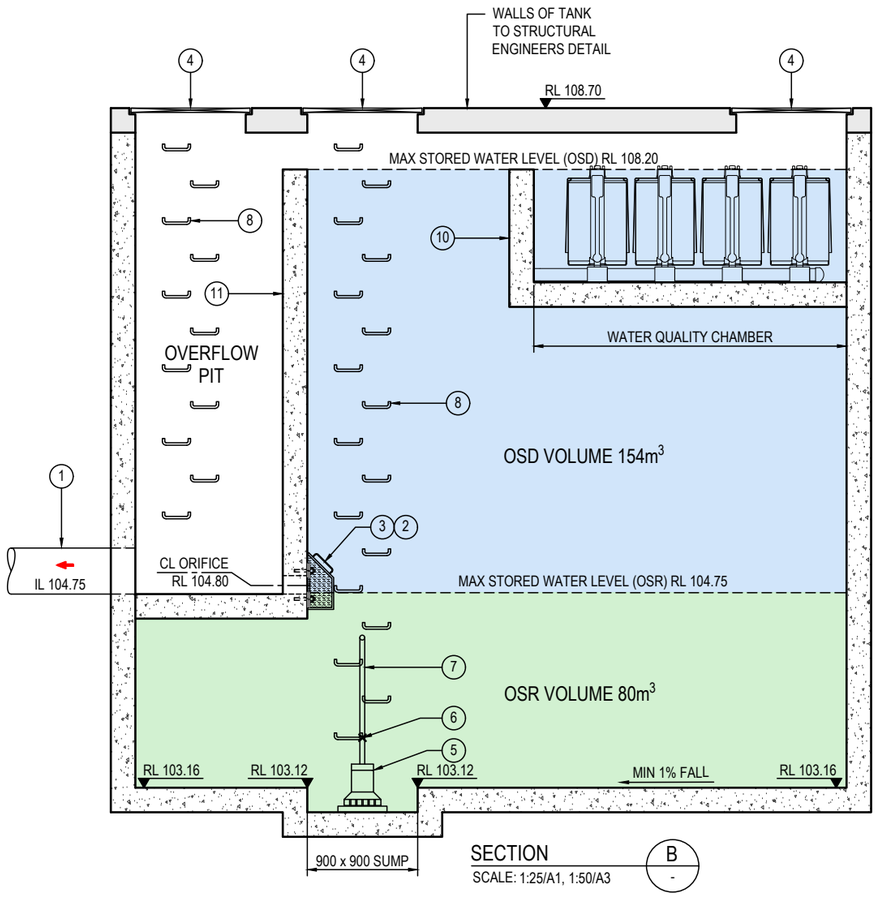
Architect: PMDL

HYDRACOR CONSULTING ENGINEERS
HYDRACOR Consulting Engineers Pty Ltd
Platinum Building, Suite 2.01, 4 Ilya Avenue
ERINA NSW 2250, Australia
T +61 2 4324 3499
ENGINEERS | CIVIL | FLOOD STUDIES | STORMWATER | HYDRAULIC

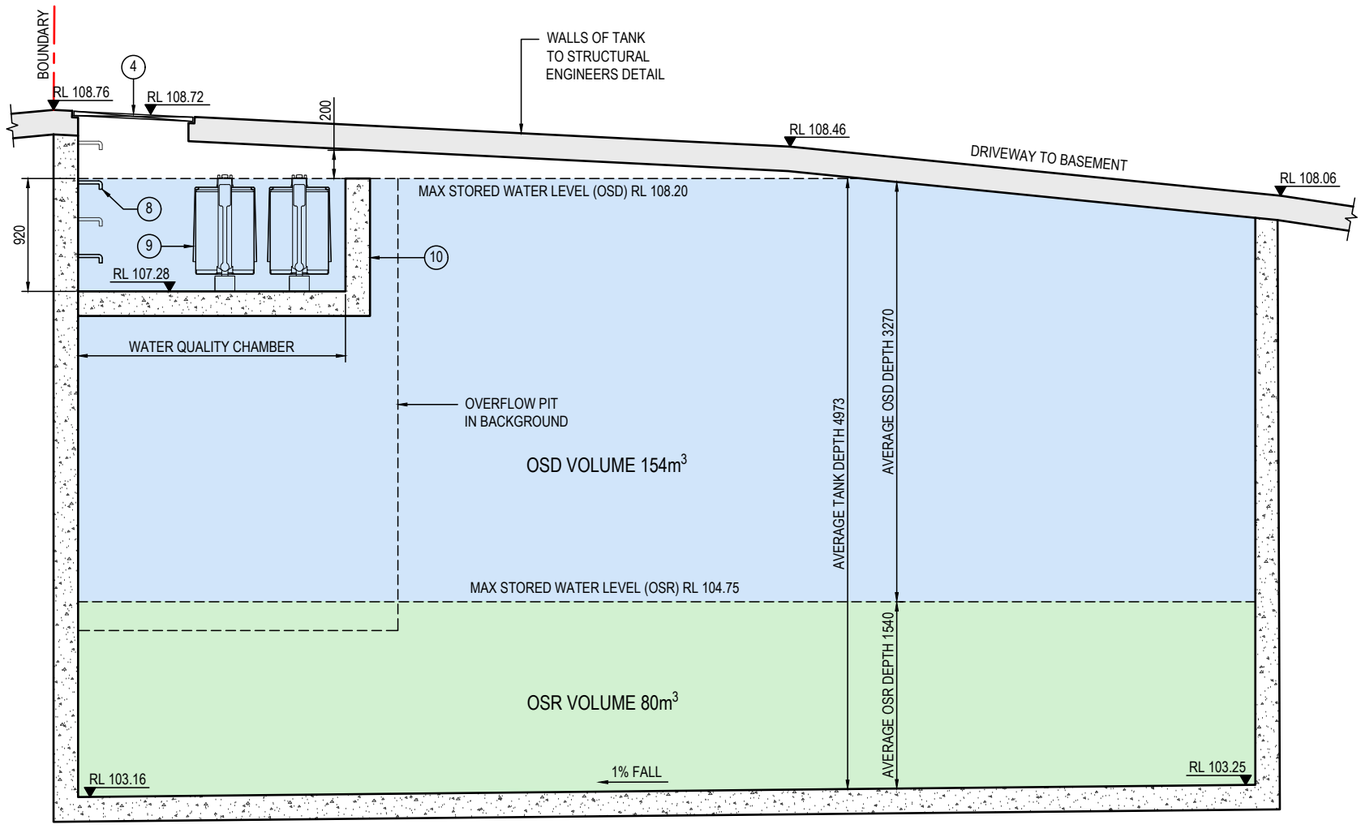
Project: PROPOSED RESIDENTIAL DEVELOPMENT
No.25, 23 & 21 MCINTOSH STREET
No.55 WERONA AVENUE
GORDON

Drawing Title: ONSITE DETENTION/RETENTION TANK BASE PLAN

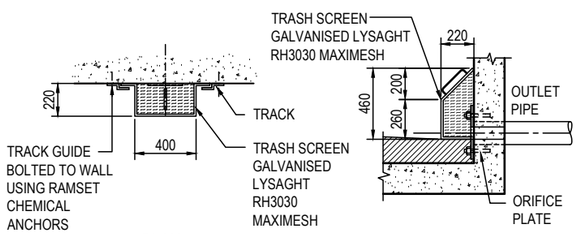
Drawn	Date	Scale A1	Q.A. Check	Date
IK	MAY 2025	AS SHOWN	-	-
Designed	**Project No.**		**Dwg. No.**	**Issue**
BK	CC250085		C10	E



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



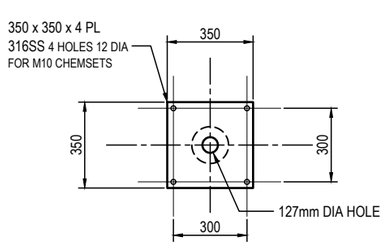
SECTION A
SCALE: 1:25/A1, 1:50/A3



PLAN

SIDE VIEW CROSS SECTION

TRASH SCREEN
SCALE NTS



ORIFICE PLATE DETAIL
NTS

LEGEND

1. 375 DIA OUTLET PIPE
2. 350 x 350 x 4 PL 316SS 4 HOLES 12 DIA FOR M10 CHEMSETS
3. TRASH SCREEN LYSAGHT RH3030 GALV. REMOVABLE WITH HANDLE
4. 900 x 900 SOLID COVER BOLTED DOWN
5. RE-USE PUMP TO MANUFACTURERS SPECIFICATIONS
6. NON-RETURN VALVE
7. PVC PIPE CLASS '16' RISING MAIN BY OTHERS
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.
9. 6 x 690 HIGH OCEAN PROTECT FILTERS
10. WATER QUALITY CHAMBER WEIR
11. OSD OVERFLOW CHAMBER WEIR

Issue	Description	Date	Drawn	Approved
E	REVISED ARCHITECTURAL & LANDSCAPING	01.04.26	LW	BK
D	REVISED COUNCIL DRAINAGE SYSTEM UPGRADE	19.03.26	LW	BK
C	REVISED PIPE DESIGN DOWN ROSEDALE ROAD	11.03.26	LW	BK
B	ISSUED FOR REVIEW	05.03.26	LW	BK

1cm at full size

North

Client: WERONA AVE RESIDENCE HOLDING PTY LTD

Architect: PMDL

HYDRACOR Consulting Engineers Pty Ltd
Platinum Building, Suite 2.01, 4 Ilya Avenue
ERINA NSW 2250, Australia
T +61 2 4324 3499

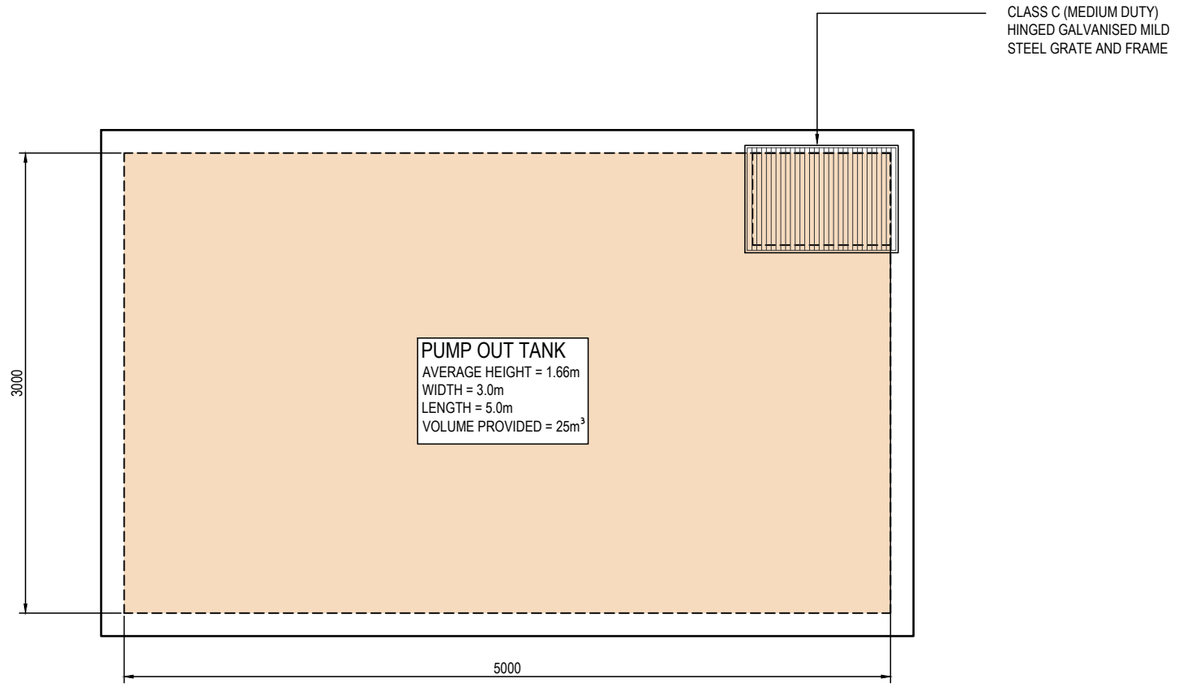
ENGINEERS | CIVIL | FLOOD STUDIES | STORMWATER | HYDRAULIC

Project: PROPOSED RESIDENTIAL DEVELOPMENT
No.25, 23 & 21 MCINTOSH STREET
No.55 WERONA AVENUE
GORDON

Drawing Title: STORMWATER MANAGEMENT DETAILS - SHEET No.1

Drawn	Date	Scale A1	Q.A. Check	Date
IK	MAY 2025	AS SHOWN	-	-

Designed	Project No.	Dwg. No.	Issue
BK	CC250085	C11	E

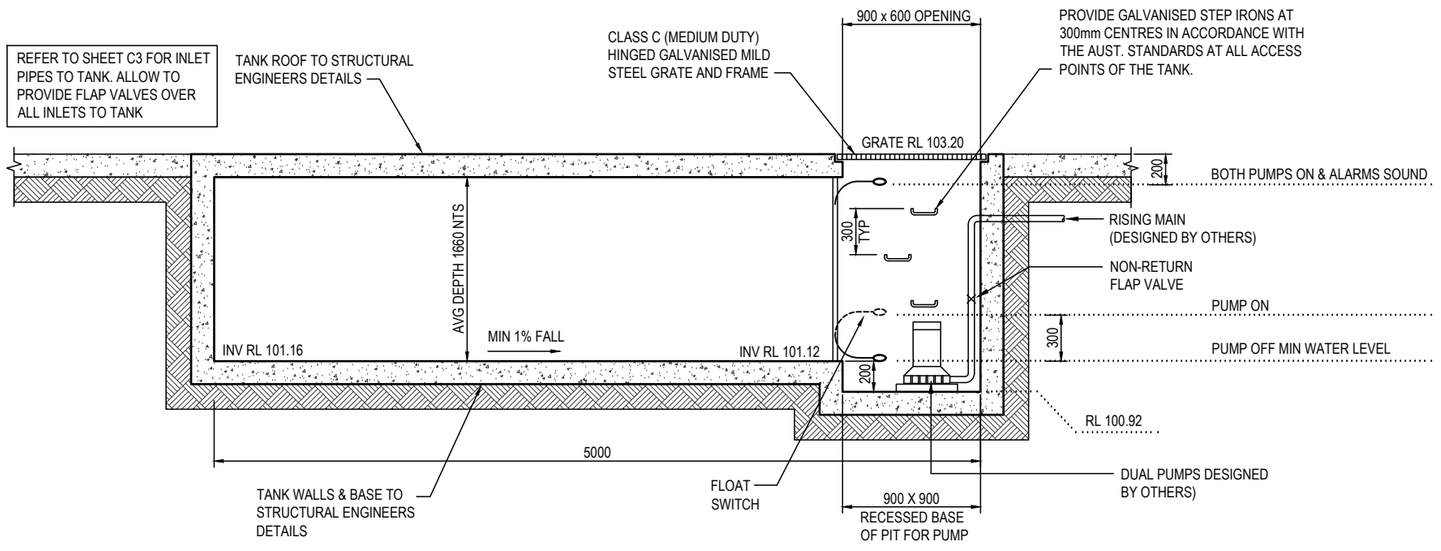


PUMP OUT TANK PLAN
SCALE 1:20/A1, 1:40/A3

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.

Issue	Description	Date	Drawn	Approved
E	REVISED ARCHITECTURAL & LANDSCAPING	01.04.26	LW	BK
D	REVISED COUNCIL DRAINAGE SYSTEM UPGRADE	19.03.26	LW	BK
C	REVISED PIPE DESIGN DOWN ROSEDALE ROAD	11.03.26	LW	BK
B	ISSUED FOR REVIEW	05.03.26	LW	BK

North

0 10m at full size 10m

Client: WERONA AVE RESIDENCE HOLDING PTY LTD

Architect: PMDL

HYDRACOR CONSULTING ENGINEERS
HYDRACOR Consulting Engineers Pty Ltd
Platinum Building, Suite 2.01, 4 Ilya Avenue
ERINA NSW 2250, Australia
T +61 2 4324 3499
ENGINEERS | CIVIL | FLOOD STUDIES | STORMWATER | HYDRAULIC

Project: PROPOSED RESIDENTIAL DEVELOPMENT
No.25, 23 & 21 MCINTOSH STREET
No.55 WERONA AVENUE
GORDON

Drawing Title: STORMWATER MANAGEMENT DETAILS - SHEET No.2

Drawn	Date	Scale A1	Q.A. Check	Date
IK	MAY 2025	AS SHOWN	-	-
Designed	Project No.		Dwg. No.	Issue
BK	CC250085		C12	E

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.

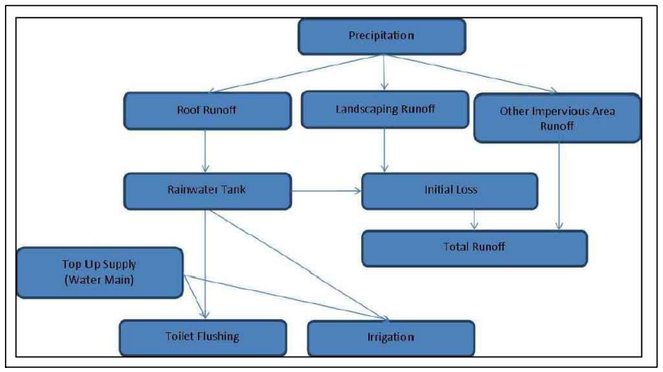


FIGURE 1. WATER BALANCE MODEL SUMMARY

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	7776	m^2		total area	7776	m^2
impervious area draining to re-use	0	m^2		impervious area draining to re-use	2621	m^2
pervious area	3643	m^2		pervious area	3643	m^2
impervious area graded to landscaping	0	m^2		impervious area graded to landscaping	1512	m^2
impervious area bypassing reuse & landscapin	4133	m^2		impervious area bypassing reuse & landscapin	0	m^2
reuse				**reuse**		
reuse tank volume	0	m^3		reuse tank volume	80	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	0.015	m
losses				**losses**		
pervious area loss (mm)	12	mm		pervious area loss (mm)	12	mm
impervious area loss (mm) **	1	mm		impervious area loss (mm) **	1	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	3070			Number of runoff days	1531	
number of tank spill days	0			number of tank spill days	1025	
total runoff volume	215,449.16			total runoff volume	160,451.15	
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	10295	
number of irrigation days	0			number of irrigation days	1618	
				reduction in runoff days	**50.1%**	
				reduction in runoff volume	**25.5%**	

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 80kL IS REQUIRED TO REDUCE RUNOFF DAYS BY 50.1%.

Issue	Description	Date	Drawn	Approved
E	REVISED ARCHITECTURAL & LANDSCAPING	01.04.26	LW	BK
D	REVISED COUNCIL DRAINAGE SYSTEM UPGRADE	19.03.26	LW	BK
C	REVISED PIPE DESIGN DOWN ROSEDALE ROAD	11.03.26	LW	BK
B	ISSUED FOR REVIEW	05.03.26	LW	BK

1cm at full size

North

Client: WERONA AVE RESIDENCE HOLDING PTY LTD

Architect: PMDL

HYDRACOR CONSULTING ENGINEERS
HYDRACOR Consulting Engineers Pty Ltd
Platinum Building, Suite 2.01, 4 Ilya Avenue
ERINA NSW 2250, Australia
T +61 2 4324 3499
ENGINEERS | CIVIL | FLOOD STUDIES | STORMWATER | HYDRAULIC

Project: PROPOSED RESIDENTIAL DEVELOPMENT
No.25, 23 & 21 MCINTOSH STREET
No.55 WERONA AVENUE
GORDON

Drawing Title: STORMWATER QUALITY REPORT - SHEET No.1

Drawn	Date	Scale	Q.A. Check	Date
IK	MAY 2025	AS SHOWN (A1)	-	-

Designed	Project No.	Dwg. No.	Issue
BK	CC250085	C13	E

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	0.262	100	0
DRIVEWAY TO PUMP OUT	0.010	100	0
IMPERVIOUS AREA TO WQ FILTERS	0.141	100	0
LANDSCAPE TO OSD	0.365	0	100

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

Issue	Description	Date	Drawn	Approved
E	REVISED ARCHITECTURAL & LANDSCAPING	01.04.26	LW	BK
D	REVISED COUNCIL DRAINAGE SYSTEM UPGRADE	19.03.26	LW	BK
C	REVISED PIPE DESIGN DOWN ROSEDALE ROAD	11.03.26	LW	BK
B	ISSUED FOR REVIEW	05.03.26	LW	BK

1cm at full size

North

Client: WERONA AVE RESIDENCE HOLDING PTY LTD

Architect: PMDL

HYDRACOR CONSULTING ENGINEERS
HYDRACOR Consulting Engineers Pty Ltd
Platinum Building, Suite 2.01, 4 Ilya Avenue
ERINA NSW 2250, Australia
T +61 2 4324 3499
ENGINEERS | CIVIL | FLOOD STUDIES | STORMWATER | HYDRAULIC

Project: PROPOSED RESIDENTIAL DEVELOPMENT
No.25, 23 & 21 MCINTOSH STREET
No.55 WERONA AVENUE
GORDON

Drawing Title: STORMWATER QUALITY REPORT - SHEET No.2

Drawn	Date	Scale A1	Q.A. Check	Date
IK	MAY 2025	AS SHOWN	-	-
Designed	Project No.		Dwg. No.	Issue
BK	CC250085		C14	E

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:

- 80,000 LITRE OSR TANK (FOR IRRIGATION ONLY)
- 8 X OCEAN PROTECT STORMFILTERS (690 PSORB)
- 4 X OCEANGUARDS
- THE SCHEMATIC LAYOUT FOR THE POST DEVELOPED MUSIC MODEL IS DEPICTED IN FOLLOWING FIGURE 1

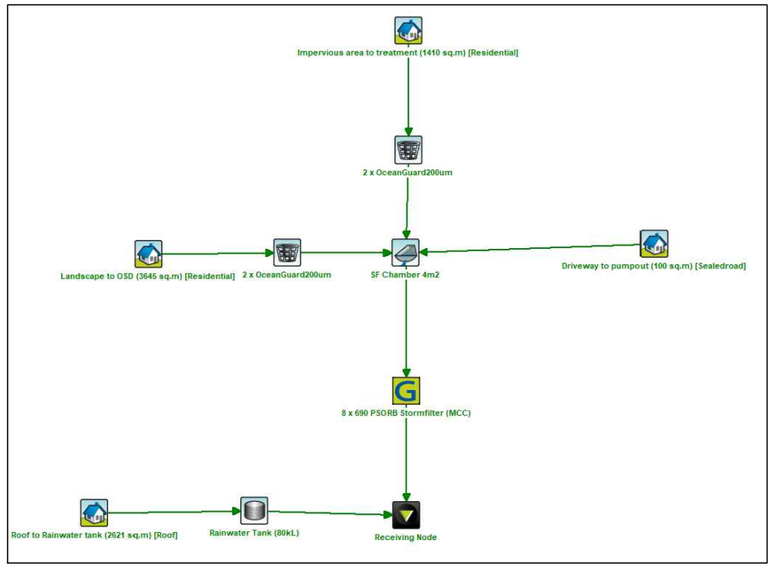


FIGURE 1 - MUSIC MODEL SCHEMATIC

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: 'CC250085 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)	6.65	5.47	17.7
Total Suspended Solids (kg/yr)	586	84.2	85.6
Total Phosphorus (kg/yr)	1.42	0.492	65.3
Total Nitrogen (kg/yr)	13.7	7.05	48.5
Gross Pollutants (kg/yr)	116	0	100

Issue	Description	Date	Drawn	Approved
E	REVISED ARCHITECTURAL & LANDSCAPING	01.04.26	LW	BK
D	REVISED COUNCIL DRAINAGE SYSTEM UPGRADE	19.03.26	LW	BK
C	REVISED PIPE DESIGN DOWN ROSEDALE ROAD	11.03.26	LW	BK
B	ISSUED FOR REVIEW	05.03.26	LW	BK

North

Client: WERONA AVE RESIDENCE HOLDING PTY LTD

Architect: PMDL

HYDRACOR CONSULTING ENGINEERS

HYDRACOR Consulting Engineers Pty Ltd
Platinum Building, Suite 2.01, 4 Ilya Avenue
ERINA NSW 2250, Australia
T +61 2 4324 3499
ENGINEERS | CIVIL | FLOOD STUDIES | STORMWATER | HYDRAULIC

Project: PROPOSED RESIDENTIAL DEVELOPMENT
No.25, 23 & 21 MCINTOSH STREET
No.55 WERONA AVENUE
GORDON

Drawing Title: STORMWATER QUALITY REPORT - SHEET No.3

Drawn	Date	Scale A1	Q.A. Check	Date
IK	MAY 2025	AS SHOWN	-	-
Designed	Project No.		Dwg. No.	Issue
BK	CC250085		C15	E

EROSION & SEDIMENT LEGEND

1. INSTALL SEDIMENT FENCING REFER DETAIL SD 6-8, SHEET C17. WHERE UNDER CANOPY AREAS OF TREES TO BE RETAINED, FENCING NOT TO BE DUG INTO THE GROUND BUT INSTEAD ATTACHED TO GROUND BY TIGHTLY PACKED SANDBAGS.

2. NOTE: PROVIDE PROTECTION TO DRAINAGE PITS FOLLOWING PIT INSTALLATION. REFER DETAIL SD6-12 ON SHEET C17

3. THE EXISTING CROSSOVER & LAYBACK ARE TO BE RETAINED FOR SITE ACCESS UNTIL REASONABLE COMPLETION OF CONSTRUCTION WORKS

4. STOCKPILE IN ACCORDANCE WITH DETAIL SD 4-1, REFER TO SHEET C17. LOCATION MAY BE ALTERED PENDING CONSTRUCTION STAGING

5. WASTE STORAGE AREA PROVIDE SOLID AND LIQUID WASTE RECEPTACLE BINS

6. BARRIER FENCING OR UTILISE EXISTING BOUNDARY FENCE — B — B —

7. PROPOSED DISTURBED AREA

8. SITE ACCESS PROVIDE LARGE COARSE DIA AGGREGATE OR RECYCLED CONCRETE. IN ACCORDANCE WITH DETAIL SD 6-14, SHEET C17

9. PROVIDE LIFT WELL PUMPOUT. TO BE CONFIRMED AT CC STAGE DISCHARGE TO BE CONTROLLED PUMP OUT FOLLOWING FLOCCULATION

10. PROVIDE TEMPORARY PUMP OUT AND RISING MAIN TO OUTLET. —— W/RM ——

TEMPORARY RISING MAIN TO DISCHARGE TO KERB AND GUTTER IN MCINTOSH STREET

STOCKPILE

W/RM

EROSION & SEDIMENT CONTROL PLAN

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

0 2 4 8 12 16 20m

Issue	Description	Date	Drawn	Approved
E	REVISED ARCHITECTURAL & LANDSCAPING	01.04.26	LW	BK
D	REVISED COUNCIL DRAINAGE SYSTEM UPGRADE	19.03.26	LW	BK
C	REVISED PIPE DESIGN DOWN ROSEDALE ROAD	11.03.26	LW	BK
B	ISSUED FOR REVIEW	05.03.26	LW	BK

1cm at full size

North

Client: WERONA AVE RESIDENCE HOLDING PTY LTD

Architect: PMDL

HYDRACOR Consulting Engineers Pty Ltd
Platinum Building, Suite 2.01, 4 Ilya Avenue
ERINA NSW 2250, Australia
T +61 2 4324 3499

ENGINEERS | CIVIL | FLOOD STUDIES | STORMWATER | HYDRAULIC

Project: PROPOSED RESIDENTIAL DEVELOPMENT
No.25, 23 & 21 MCINTOSH STREET
No.55 WERONA AVENUE
GORDON

Drawing Title: EROSION & SEDIMENT CONTROL PLAN

Drawn	Date	Scale A1	Q.A. Check	Date
IK	MAY 2025	AS SHOWN	-	-

Designed	Project No.	Dwg. No.	Issue
BK	CC250085	C16	E

EROSION AND SEDIMENT CONTROL NOTES

GENERAL INSTRUCTIONS

1. THIS SOIL AND WATER MANAGEMENT PLAN IS TO BE READ IN CONJUNCTION WITH OTHER ENGINEERING PLANS RELATING TO THIS DEVELOPMENT.
2. CONTRACTORS WILL ENSURE THAT ALL SOIL AND WATER MANAGEMENT WORKS ARE UNDERTAKEN AS INSTRUCTED IN THIS SPECIFICATION AND CONSTRUCTED FOLLOWING THE GUIDELINES OF "MANAGING URBAN STORMWATER SOILS AND CONSTRUCTION", DEPT OF HOUSING, 1998 (BLUE BOOK).
3. ALL SUBCONTRACTORS WILL BE INFORMED OF THEIR RESPONSIBILITIES IN REDUCING THE POTENTIAL FOR SOIL EROSION AND POLLUTION TO DOWNSLOPE AREAS.

LAND DISTURBANCE INSTRUCTIONS

4. DISTURBANCE TO BE NO FURTHER THAN 5 (PREFERABLY 2) METRES FROM THE EDGE OF ANY ESSENTIAL ENGINEERING ACTIVITY AS SHOWN ON APPROVED PLANS. ALL SITE WORKERS WILL CLEARLY RECOGNISE THESE ZONES THAT, WHERE APPROPRIATE, ARE IDENTIFIED WITH BARRIER FENCING (UPSLOPE) AND SEDIMENT FENCING (DOWNSLOPE) OR SIMILAR MATERIALS.
5. ACCESS AREAS ARE TO BE LIMITED TO A MAXIMUM WIDTH OF 10 METRES THE SITE MANAGER WILL DETERMINE AND MARK THE LOCATION OF THESE ZONES ON-SITE. ALL SITE WORKERS WILL CLEARLY RECOGNISE THESE BOUNDARIES THAT, WHERE APPROPRIATE, ARE IDENTIFIED WITH BARRIER FENCING (UPSLOPE) AND SEDIMENT FENCING (DOWNSLOPE) OR SIMILAR MATERIALS.
6. ENTRY TO LANDS NOT REQUIRED FOR CONSTRUCTION OR ACCESS IS PROHIBITED EXCEPT FOR ESSENTIAL THINNING OF PLANT GROWTH.
7. WORKS ARE TO PROCEED IN THE FOLLOWING SEQUENCE:
   - A) INSTALL ALL BARRIER AND SEDIMENT FENCING WHERE SHOWN ON THE PLAN.
   - B) CONSTRUCT THE STABILISED SITE ACCESS.
   - C) CONSTRUCT DIVERSION DRAINS AS REQUIRED.
   - D) INSTALL MESH AND GRAVEL INLETS FOR ANY ADJACENT KERB INLETS.
   - E) INSTALL GEOTEXTILE INLET FILTERS AROUND ANY ON-SITE DROP INLET PITS.
   - F) CLEAR SITE AND STRIP AND STOCKPILE TOPSOIL IN LOCATIONS SHOWN ON THE PLAN.
   - G) UNDERTAKE ALL ESSENTIAL CONSTRUCTION WORKS ENSURING THAT ROOF AND/OR PAVED AREA STORMWATER SYSTEMS ARE CONNECTED TO PERMANENT DRAINAGE AS SOON AS PRACTICABLE.
   - H) GRADE LOT AREAS TO FINAL GRADES AND APPLY PERMANENT STABILISATION (LANDSCAPING) WITHIN 20 DAYS OF COMPLETION OF CONSTRUCTION WORKS.
   - I) REMOVE TEMPORARY EROSION CONTROL MEASURES AFTER THE PERMANENT LANDSCAPING HAS BEEN COMPLETED.
5. ENSURE THAT SLOPE LENGTHS DO NOT EXCEED 80 METRES WHERE PRACTICABLE. SLOPE LENGTHS ARE DETERMINED BY SILTATION FENCING AND CATCH DRAIN SPACING.
6. ON COMPLETION OF MAJOR WORKS LEAVE DISTURBED LANDS WITH A SCARIFIED SURFACE TO ENCOURAGE WATER INFILTRATION AND ASSIST WITH KEYING TOPSOIL LATER.

SITE MAINTENANCE INSTRUCTIONS

7. THE SITE SUPERINTENDENT WILL INSPECT THE SITE AT LEAST WEEKLY AND AT THE CONCLUSION OF EVERY STORM EVENT TO:
   - A) ENSURE THAT DRAINS OPERATE PROPERLY AND TO EFFECT ANY NECESSARY REPAIRS.
   - B) REMOVE SPILLED SAND OR OTHER MATERIALS FROM HAZARD AREAS, INCLUDING LANDS CLOSER THAN 5 METRES FROM AREAS OF LIKELY CONCENTRATED OR HIGH VELOCITY FLOWS ESPECIALLY WATERWAYS AND PAVED AREAS.
   - C) REMOVE TRAPPED SEDIMENT WHENEVER THE DESIGN CAPACITY OF THAT STRUCTURE HAS BEEN EXCEEDED.
   - D) ENSURE REHABILITATED LANDS HAVE EFFECTIVELY REDUCED THE EROSION HAZARD AND TO INITIATE UPGRADING OR REPAIR AS NECESSARY.
   - E) CONSTRUCT ADDITIONAL EROSION AND/OR SEDIMENT CONTROL WORKS AS MIGHT BECOME NECESSARY TO ENSURE THE DESIRED PROTECTION IS GIVEN TO DOWNSLOPE LANDS AND WATERWAYS. MAKE ONGOING CHANGES TO THE PLAN WHERE IT PROVES INADEQUATE IN PRACTICE OR IS SUBJECTED TO CHANGES IN CONDITIONS ON THE WORK-SITE OR ELSEWHERE IN THE CATCHMENT.
   - F) MAINTAIN EROSION AND SEDIMENT CONTROL STRUCTURES IN A FULLY FUNCTIONING CONDITION UNTIL ALL EARTHWORK ACTIVITIES ARE COMPLETED AND THE SITE IS REHABILITATED.
8. THE SITE SUPERINTENDENT WILL KEEP A LOGBOOK MAKING ENTRIES AT LEAST WEEKLY, IMMEDIATELY BEFORE FORECAST RAIN AND AFTER RAINFALL. ENTRIES WILL INCLUDE:
   - A) THE VOLUME AND INTENSITY OF ANY RAINFALL EVENTS.
   - B) THE CONDITION OF ANY SOIL AND WATER MANAGEMENT WORKS.
   - C) THE CONDITION OF VEGETATION AND ANY NEED TO IRRIGATE.
   - D) THE NEED FOR DUST PREVENTION STRATEGIES.
   - E) ANY REMEDIAL WORKS TO BE UNDERTAKEN.

   THE LOGBOOK WILL BE KEPT ON-SITE AND MADE AVAILABLE TO ANY AUTHORISED PERSON UPON REQUEST. IT WILL BE GIVEN TO THE PROJECT MANAGER AT THE CONCLUSION OF THE WORKS.

SEDIMENT CONTROL INSTRUCTIONS

9. SEDIMENT FENCES WILL BE INSTALLED AS SHOWN ON THE PLAN AND ELSEWHERE AT THE DISCRETION OF THE SITE SUPERINTENDENT TO CONTAIN SOIL AS NEAR AS POSSIBLE TO THEIR SOURCE.
10. SEDIMENT FENCES WILL NOT HAVE CATCHMENT AREAS EXCEEDING 900 SQUARE METRES AND HAVE A STORAGE DEPTH OF AT LEAST 0.6 METRES.
11. SEDIMENT REMOVED FROM ANY TRAPPING DEVICES WILL BE RELOCATED WHERE FURTHER POLLUTION TO DOWNSLOPE LANDS AND WATERWAYS CANNOT OCCUR.
12. STOCKPILES ARE NOT TO BE LOCATED WITHIN 5 METRES OF HAZARD AREAS INCLUDING AREAS OF HIGH VELOCITY FLOWS SUCH AS WATERWAYS, PAVED AREAS AND DRIVEWAYS.
13. WATER WILL BE PREVENTED FROM DIRECTLY ENTERING THE PERMANENT DRAINAGE SYSTEM UNLESS THE CATCHMENT AREA HAS BEEN PERMANENTLY LANDSCAPED AND/OR WATER HAS BEEN TREATED BY AN APPROVED DEVICE.
14. TEMPORARY SEDIMENT TRAPS WILL REMAIN IN PLACE UNTIL AFTER THE LANDS THEY ARE PROTECTING ARE COMPLETELY REHABILITATED.
15. ACCESS TO SITES SHOULD BE STABILISED TO REDUCE THE LIKELIHOOD OF VEHICLES TRACKING SOIL MATERIALS ONTO PUBLIC ROADS AND ENSURE ALL-WEATHER ENTRY/EXIT.

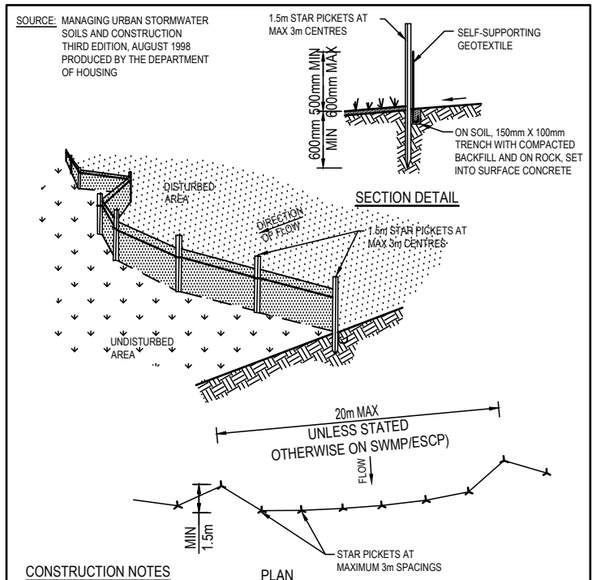
SOIL EROSION CONTROL INSTRUCTIONS

16. EARTH BATTERS WILL BE CONSTRUCTED WITH AS LOW A GRADIENT AS PRACTICABLE BUT NO STEEPER, UNLESS OTHERWISE NOTED, THAN:
    - 2(H):1(V) WHERE SLOPE LENGTH LESS THAN 12 METRES
    - 2.5(H):1(V) WHERE SLOPE LENGTH BETWEEN 12 AND 16 METRES.
    - 3(H):1(V) WHERE SLOPE LENGTH BETWEEN 16 AND 20 METRES.
    - 4(H):1(V) WHERE SLOPE LENGTH GREATER THAN 20 METRES.
17. ALL WATERWAYS, DRAINS, SPILLWAYS AND THEIR OUTLETS WILL BE CONSTRUCTED TO BE STABLE IN AT LEAST THE 1:20 YEAR ARI, TIME OF CONCENTRATION STORM EVENT.
18. WATERWAYS AND OTHER AREAS SUBJECT TO CONCENTRATED FLOWS AFTER CONSTRUCTION ARE TO HAVE A MAXIMUM GROUNDCOVER C-FACTOR OF 0.05 (70% GROUND COVER) WITHIN 10 WORKING DAYS FROM COMPLETION OF FORMATION. FLOW VELOCITIES ARE TO BE LIMITED TO THOSE SHOWN IN TABLE 5-1 OF "MANAGING URBAN STORMWATER - SOILS AND CONSTRUCTION", DEPT OF HOUSING 1998 (BLUE BOOK). FOOT AND VEHICULAR TRAFFIC WILL BE PROHIBITED IN THESE AREAS.
19. STOCKPILES AFTER CONSTRUCTION ARE TO HAVE A MAXIMUM GROUND-COVER C-FACTOR OF 0.1 (60% GROUND-COVER) WITHIN 10 WORKING DAYS FROM COMPLETION OF FORMATION.
20. ALL LANDS, INCLUDING WATERWAYS AND STOCKPILES, DURING CONSTRUCTION ARE TO HAVE A MAXIMUM GROUND-COVER C-FACTOR OF 0.15 (50% GROUND COVER) WITHIN 20 WORKING DAYS FROM INACTIVITY EVEN THOUGH WORKS MAY CONTINUE LATER.
21. FOR AREAS OF SHEET FLOW USE THE FOLLOWING GROUND COVER PLANT SPECIES FOR TEMPORARY COVER: JAPANESE MILLET 20 KG/HA AND OATS 20 KG/HA.
22. PERMANENT REHABILITATION OF LANDS AFTER CONSTRUCTION WILL ACHIEVE A GROUND-COVER C-FACTOR OF LESS THAN 0.1 AND LESS THAN 0.05 WITHIN 60 DAYS. NEWLY PLANTED LANDS WILL BE WATERED REGULARLY UNTIL AN EFFECTIVE COVER IS ESTABLISHED AND PLANTS ARE GROWING VIGOROUSLY. FOLLOW-UP SEED AND FERTILISER WILL BE APPLIED AS NECESSARY.
23. REVEGETATION SHOULD BE AIMED AT RE-ESTABLISHING NATURAL SPECIES. NATURAL SURFACE SOILS SHOULD BE REPLACED AND NON-PERSISTENT ANNUAL COVER CROPS SHOULD BE USED.

WASTE CONTROL INSTRUCTIONS

24. ACCEPTABLE BINS WILL BE PROVIDED FOR ANY CONCRETE AND MORTAR SLURRIES, PAINTS, ACID WASHING, LIGHTWEIGHT WASTE MATERIALS AND LITTER. CLEARANCE SERVICES WILL BE PROVIDED AT LEAST WEEKLY. DISPOSAL OF WASTE WILL BE IN A MANNER APPROVED BY THE SITE SUPERINTENDENT.
25. ALL POSSIBLE POLLUTANT MATERIALS ARE TO BE STORED WELL CLEAR OF ANY POORLY DRAINED AREAS, FLOOD PRONE AREAS, STREAMBANKS, CHANNELS AND STORMWATER DRAINAGE AREAS. STORE SUCH MATERIALS IN A DESIGNATED AREA UNDER COVER WHERE POSSIBLE AND WITHIN CONTAINMENT BUNDS.
26. ALL SITE STAFF AND SUB-CONTRACTORS ARE TO BE INFORMED OF THEIR OBLIGATION TO USE WASTE CONTROL FACILITIES PROVIDED.
27. ANY DE-WATERING ACTIVITIES ARE TO BE CLOSELY MONITORED TO ENSURE THAT WATER IS NOT POLLUTED BY SEDIMENT, TOXIC MATERIALS OR PETROLEUM PRODUCTS.
28. PROVIDE DESIGNATED VEHICULAR WASHDOWN AND MAINTENANCE AREAS WHICH ARE TO HAVE CONTAINMENT BUNDS.

SOURCE: MANAGING URBAN STORMWATER SOILS AND CONSTRUCTION THIRD EDITION, AUGUST 1998 PRODUCED BY THE DEPARTMENT OF HOUSING

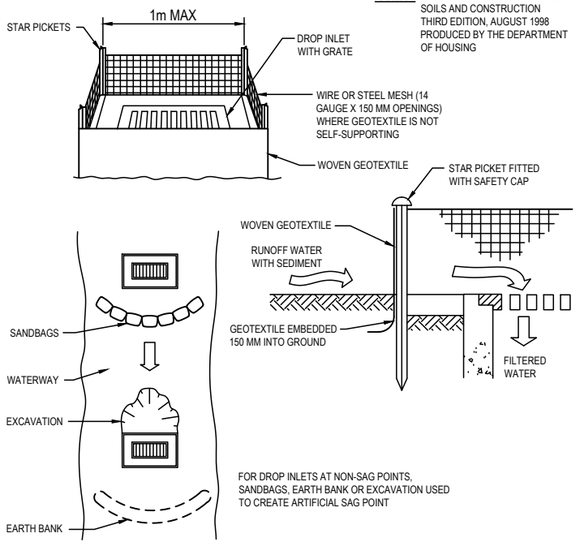


CONSTRUCTION NOTES

1. CONSTRUCT SEDIMENT FENCE AS CLOSE AS POSSIBLE TO PARALLEL TO THE CONTOURS OF THE SITE.
2. DRIVE 1.5 METRE LONG STAR PICKETS INTO GROUND, 3 METRES APART.
3. DIG A 150 MM DEEP TRENCH ALONG THE UPSLOPE LINE OF THE FENCE FOR THE BOTTOM OF THE FABRIC TO BE ENTRENCHED.
4. BACKFILL TRENCH OVER BASE OF FABRIC.
5. FIX SELF-SUPPORTING GEOTEXTILE TO UPSLOPE SIDE OF POSTS WITH WIRE TIES OR AS RECOMMENDED BY GEOTEXTILE MANUFACTURER.
6. JOIN SECTIONS OF FABRIC AT A SUPPORT POST WITH A 150 MM OVERLAP.

SEDIMENT FENCE SD 6-8

SOURCE: MANAGING URBAN STORMWATER SOILS AND CONSTRUCTION THIRD EDITION, AUGUST 1998 PRODUCED BY THE DEPARTMENT OF HOUSING

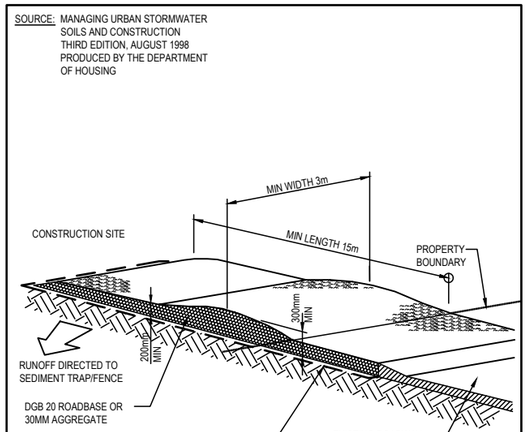


CONSTRUCTION NOTES:

1. FABRICATE A SEDIMENT BARRIER FROM GEOTEXTILE OR STRAW BALES.
2. SUPPORT GEOTEXTILE WITH MESH TIED TO POSTS AT 1 METRE CENTRES.
3. DO NOT COVER INLET WITH GEOTEXTILE.
4. CONSTRUCTION DETAILS ARE SIMILAR TO TYPICAL SEDIMENT FENCING DETAIL.

GEOTEXTILE INLET FILTER SD 6-12

SOURCE: MANAGING URBAN STORMWATER SOILS AND CONSTRUCTION THIRD EDITION, AUGUST 1998 PRODUCED BY THE DEPARTMENT OF HOUSING

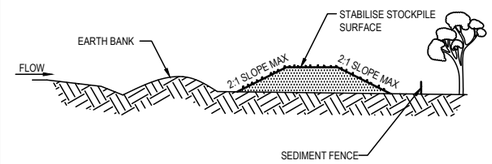


CONSTRUCTION NOTES:

1. STRIP TOPSOIL AND LEVEL SITE.
2. COMPACT SUBGRADE.
3. COVER AREA WITH NEEDLE-PUNCHED GEOTEXTILE.
4. CONSTRUCT 200MM THICK PAD OVER GEOTEXTILE USING ROADBASE OR 30MM AGGREGATE. MINIMUM LENGTH 15M OR TO BUILDING ALIGNMENT. MINIMUM WIDTH 3 METRES.
5. CONSTRUCT HUMP IMMEDIATELY WITHIN BOUNDARY TO DIVERT WATER TO A SEDIMENT FENCE OR OTHER SEDIMENT TRAP.

STABILISED SITE ACCESS SD 6-14

SOURCE: MANAGING URBAN STORMWATER SOILS AND CONSTRUCTION THIRD EDITION, AUGUST 1998 PRODUCED BY THE DEPARTMENT OF HOUSING



CONSTRUCTION NOTES:

1. LOCATE STOCKPILE AT LEAST 5 METRES FROM EXISTING VEGETATION, CONCENTRATED WATER FLOWS, ROADS AND HAZARD AREAS.
2. CONSTRUCT ON THE CONTOUR AS A LOW, FLAT, ELONGATED MOUND.
3. WHERE THERE IS SUFFICIENT AREA TOPSOIL STOCKPILES SHALL BE LESS THAN 2 METERS IN HEIGHT.
4. REHABILITATE IN ACCORDANCE WITH THE SWMP/ESCP.
5. CONSTRUCT EARTH BANK (STANDARD DRAWING 5-2) ON THE UPSLOPE SIDE TO DIVERT RUN OFF AROUND THE STOCKPILE AND A SEDIMENT FENCE (STANDARD DRAWING 6-7) 1 TO 2 METRES DOWNSLOPE OF STOCKPILE.

STOCKPILES SD 4-1

Issue	Description	Date	Drawn	Approved
E	REVISED ARCHITECTURAL & LANDSCAPING	01.04.26	LW	BK
D	REVISED COUNCIL DRAINAGE SYSTEM UPGRADE	19.03.26	LW	BK
C	REVISED PIPE DESIGN DOWN ROSEDALE ROAD	11.03.26	LW	BK
B	ISSUED FOR REVIEW	05.03.26	LW	BK

North

0 10cm at full size 10cm

Client: WERONA AVE RESIDENCE HOLDING PTY LTD

Architect: PMDL

HYDRACOR CONSULTING ENGINEERS

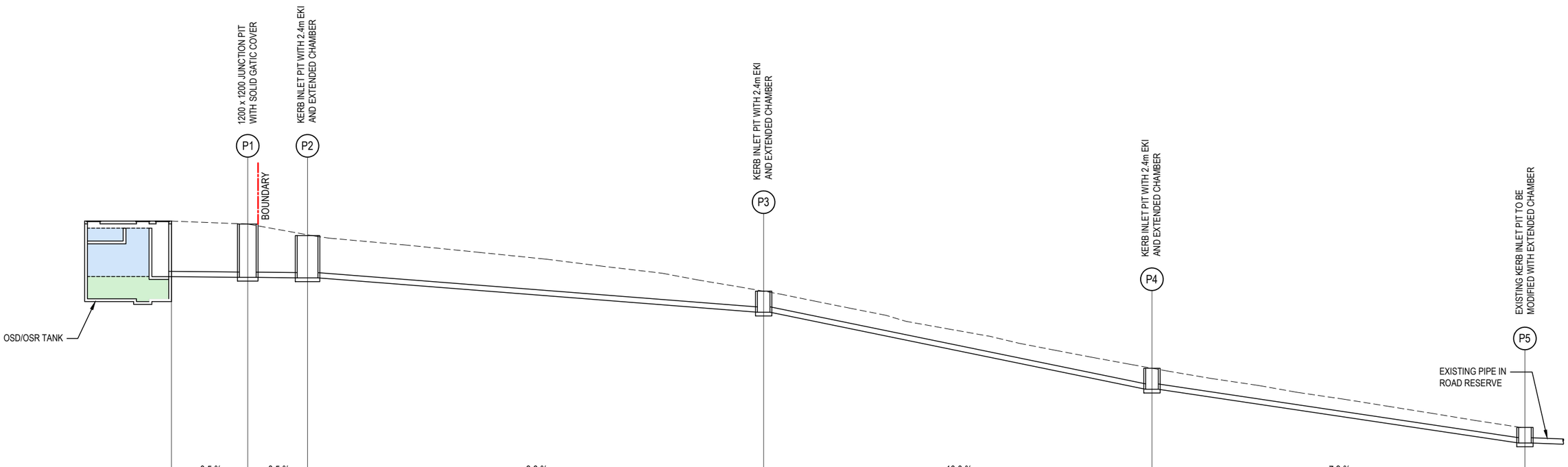
HYDRACOR Consulting Engineers Pty Ltd
Platinum Building, Suite 2.01, 4 Ilya Avenue
ERINA NSW 2250, Australia
T +61 2 4324 3499

ENGINEERS | CIVIL | FLOOD STUDIES | STORMWATER | HYDRAULIC

Project: PROPOSED RESIDENTIAL DEVELOPMENT
No.25, 23 & 21 MCINTOSH STREET
No.55 WERONA AVENUE
GORDON

Drawing Title: EROSION & SEDIMENT CONTROL NOTES & DETAILS

Drawn	Date	Scale A1	Q.A. Check	Date
IK	MAY 2025	NTS	-	-
Designed	Project No.		Dwg. No.	Issue
BK	CC250085		C17	E



VERTICAL GRADE		-0.5 %	-0.5 %	-3.8 %	-10.0 %	-7.3 %
PIPE SIZE & CLASS		Ø375 RCP CLASS 4	Ø375 RCP CLASS 4	Ø375 RCP CLASS 4	Ø375 RCP CLASS 4	Ø375 RCP CLASS 4
DATUM 86.40						
TOP OF COVER	108.70	108.50	107.72	103.70	98.20	93.98
INVERT LEVEL	104.75	104.68	104.64	102.20	96.70	92.87
CHAINAGE	0.00	10.88	19.40	84.48	139.88	193.10

DRAINAGE LONGSECTION BEWTEEN PITS P1 & P5

VERTICAL SCALE
1:150 @ A1 0 1 2 4 6 8 10m
1:300 @ A3

HORIZONTAL SCALE
1:300 @ A1 0 2 4 10 15 20 30 metres
1:600 @ A3

Issue	Description	Date	Drawn	Approved
E	REVISED ARCHITECTURAL & LANDSCAPING	01.04.26	LW	BK
D	REVISED COUNCIL DRAINAGE SYSTEM UPGRADE	19.03.26	LW	BK
-	NIL ISSUE	-	-	-
-	NIL ISSUE	-	-	-

North

1cm at full size 10cm

Client: WERONA AVE RESIDENCE HOLDING PTY LTD

Architect: PMDL

HYDRACOR CONSULTING ENGINEERS
HYDRACOR Consulting Engineers Pty Ltd
Platinum Building, Suite 2.01, 4 Ilya Avenue
ERINA NSW 2250, Australia
T +61 2 4324 3499
ENGINEERS | CIVIL | FLOOD STUDIES | STORMWATER | HYDRAULIC

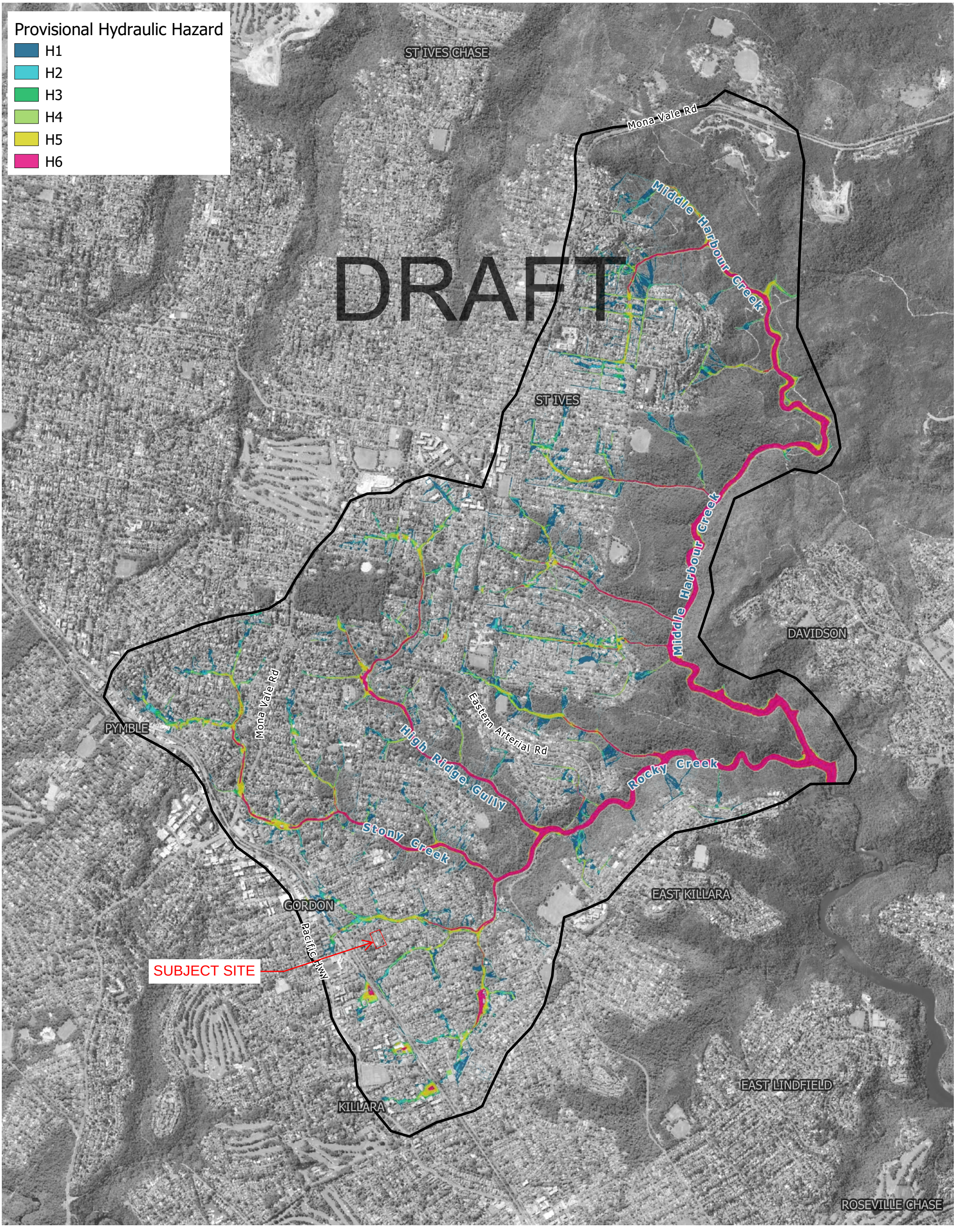
Project: PROPOSED RESIDENTIAL DEVELOPMENT
No.25, 23 & 21 MCINTOSH STREET
No.55 WERONA AVENUE
GORDON

Drawing Title: DRAINAGE LONGSECTION

Drawn	Date	Scale A1	Q.A. Check	Date
IK	MAY 2025	AS SHOWN	-	-

Designed	Project No.	Dwg. No.	Issue
BK	CC250085	C18	E

Annexure B Flood mapping extracted from 'Draft Middle Harbour Northern Catchments Flood Study' prepared by BMT, revision 00, dated 14 July 2023



Legend

Study Area

Title: Provisional Hydraulic Hazard - PMF Event

Drawing: F-27

Rev: A

BMT endeavours to ensure that the information provided in this map is correct at the time of publication. BMT does not warrant, guarantee or make representations regarding the currency and accuracy of information contained in this map.

0 500 1,000 m

BMT
www.bmt.org

Filepath: S:\WATER\PROJECTS\A10091.000_MiddleHarbour_NorthernCatchments_FS\QGIS\Generator_FIA\Project\Figure_Generator.qgz