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INTERGRATED WATER CYCLE MANAGEMENT REPORT COPE Warehouse Orchard Hills 2748

**For DA
January 2025
Revision 05**

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1. INTRODUCTION

1.1 General

The COPE Sensitive Freight development application is seeking approval to construct a warehouse and distribution building on 221-227 Luddenham Road, Orchard Hills (the site), situated within the Alspeck Industrial Business Park (AIBP) at 221-235 Luddenham Road, Orchard Hills.

The AIBP Planning Proposal was lodged to Penrith City Council (PCC) in December 2022 and expected to be finalised in February 2024. The AIBP Planning Proposal amended the Penrith Local Environmental Plan (LEP) 2010 through rezoning the central and eastern portions of the AIBP site to E4 General Industrial which permits the development and operation of warehouse and distribution uses.

The COPE project area is situated within the western portion of the AIBP site, and has a direct interface with an electrical easement to the north-west, and two future basins along the northern and western boundaries of the site. The proposed development has a direct interface with the north-south internal local road, which provides access to Patons Lane and Luddenham Road.

This Integrated Water Cycle Management Report has been prepared to supplement the Development Application (DA) for the proposed COPE Warehouse Works located on Luddenham Road, Orchard Hills NSW. Refer to the architectural site plan included within Appendix B for a demonstration of the proposed development and the site.

The proposed works are to consist of the following:

- Recessed and on-grade loading docks
- Warehouse building and office building
- Associated landscaping and carparking
- Weighbridge and truck wash bay

Refer to Figure 1.1 below showing the proposed arrangement of the buildings, car park and landscaping..

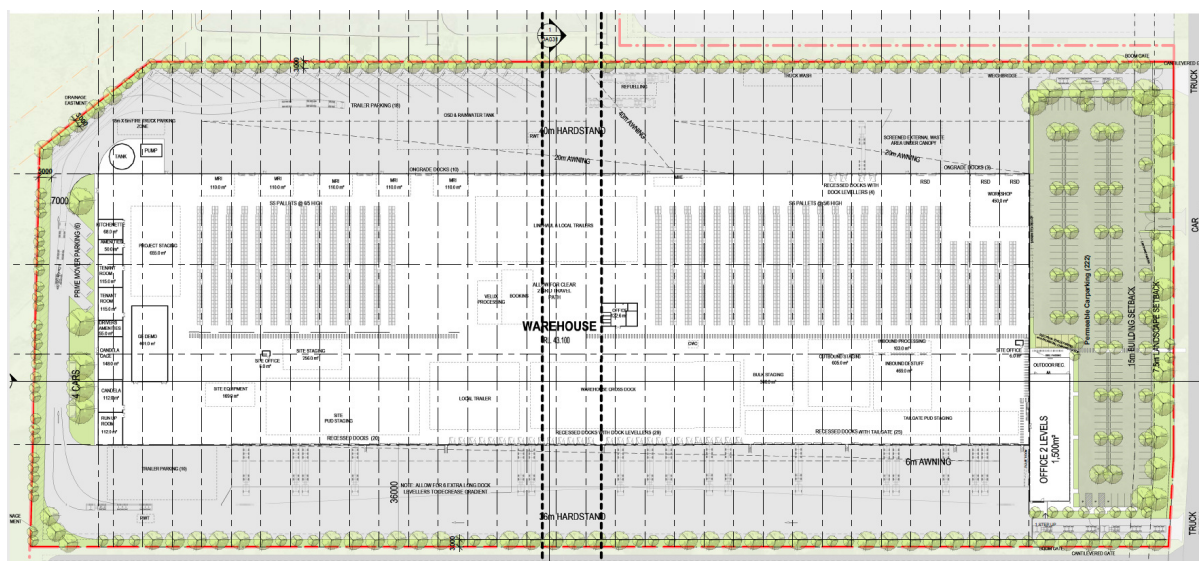


Figure 1.1 Locality Sketch

The following Engineering matters have been addressed in this report:



- Water Sensitive Urban Design (WSUD)
- Stormwater Detention
- Sediment and Erosion Control

The purpose of this report is to summarise the stormwater design, as well as the hydraulic and water quality modelling in order to illustrate that the proposed design is in accordance with engineering best practice principals and Penrith City Council's development control plan.

A full set of DA Drawings is provided in Appendix A of this report.

1.2 Engineering Objectives/ Principles

The stormwater network has been designed to safely convey minor storm events via a pit and pipe stormwater system with provision for larger, more infrequent storm events overland via an overland flow route. The minor storm event for this development is the 1:20yr ARI storm and the major storm event is the 1:100yr ARI storm. This is as per Council's development control plan (DCP).

In order to ensure no negative impact on downstream ecosystems and waterways, stormwater from the subject site is proposed to be managed through the implementation of water quality system, detention and sediment and erosion control. Refer to sections 2.1, 2.2, 2.3 and Appendix A for further details.

1.3 Council Policies

The civil engineering component of the aforementioned project has been designed in accordance with the following council codes and policies:

- Penrith City Council Development Control Plan 2014 – E17 Luddenham Road Industrial Business Park
- Penrith City Council Development Control Plan 2014
- Penrith City Council Stormwater Drainage Specifications for Building Developments 2018
- Penrith City Council WSUD Technical Guidelines 2015

E18 Luddenham Road Industrial Business Park

Penrith City Council have developed a sub section in the Penrith City Council DCP 2014 with controls specifically tailored for all developments covered by the Luddenham Road Industrial Business Park Precinct. In the event of any inconsistency between this section and the rest of the DCP, the requirements of Section E18 prevail. The stormwater controls are shown in Section 17.6 – Integrated Water Cycle Management of the Penrith City Council Development Control Plan 2014 Section E18 Luddenham Road Industrial Business Park.

1.4 The Site & Its Context

The site is located within the North Western Catchment of the Alspec Industrial Business Park Precinct and is identified as Pad 4a on the architectural masterplan for the subdivision. The site will be prepared to the bulk earthworks levels as indicated within the subdivision works DA drawings (refer to report titled '19221 Alspec Industrial Business Park - Integrated Water Cycle Management Report[06] combined.pdf').

The pre-developed site is predominately pervious in the form of agricultural farm land, consisting of a rectangular network of fenced yards for horse and sheep agistment. The subject site is located within the Wianamatta – South Creek



Catchment area and is approximately 8.0170 hectares, with the entirety of the site proposed to be developed as a part of this project. The site grades in a north westerly direction towards an existing watercourse.

A downstream gross pollution trap and bio-retention basin has been included within the subdivision design that caters for the subject site. Council's water quality targets have therefore been satisfied via this downstream infrastructure, however on lot on-site detention will be required for the subject site. The design is to comply with the assumptions outlined in the aforementioned Integrated Water Cycle Management Report for the subdivision works.

2. STORMWATER MANAGEMENT

2.1 Introduction

2.1.1 Background

Stormwater controls are proposed to be implemented that ensure that the development does not adversely impact on stormwater flows and water quality of the stormwater system downstream of the site.

The principles and operation of the proposed stormwater system for the development including water quality measures and the components of the internal drainage system are detailed on the Development Application Drawings included in Appendix A.

2.1.2 Key Issues

The key issues and the proposed mitigation measures to be implemented as part of the proposed development are:

- **Stormwater Quantity** - The increased impervious surfaces (such as roads, roofs, driveways, etc) associated with the development will result in an increase in peak stormwater flows from the site during storm events. On-site Stormwater Detention (OSD) is proposed for the development to ensure that runoff from the development is appropriately managed in accordance with Council's requirements. The site stormwater system has been designed to safely convey the flows through the site and within the capacity of the downstream system. The design and operation of the proposed stormwater system is described in Section 2.2 below.
- **Water Quality** - Urban developments have the potential to increase gross pollutants, sediments, hydrocarbons and nutrient concentrations in stormwater runoff. To limit impact on the downstream water quality, water quality measures at source and end of line treatments will be provided. Section 2.3 further describes the specific implementation of these measures for the proposed development.

2.2 Stormwater Quantity

As per Penrith City Council's engineering specifications, on-site detention will be required for the site to ensure post-developed flows are reduced to pre-developed flows for the 20 and 100yr ARI storm event.

An on-site detention tank has been proposed to reduce post developed flows to their pre developed flows counterparts. 2435m³ of detention storage will be required, this will be provided in the form of an underground tank, with two orifice plates (with a 400mm opening and 500mm opening) to control the flow discharge rates.

The pre-developed flows for the subject site has been co-ordinated with the Integrated Water Cycle Report for the subdivision works, which considers the flood modelling undertaken by Arcadis. Refer to the below pre-developed flow calculations, which the on-site detention system has been sized in accordance with.

Subject Site Area	= 8.0170 hectares
Reduce post developed flows in critical 5% AEP storm to	= 0.078m ³ /s/ha



Reduce post developed flows in critical 1% AEP storm to

- = 0.626m³/s
- = 0.125m³/s/ha
- = 1.00m³/s

Refer to the table below for a summary of the pre and post developed flows for the relevant storm events. Refer to Appendix A for sections and details of the on-site detention tank, and the DRAINS model included in the DA submission for a full analysis of the hydraulics of the site.

Storm event	Pre-developed Flows (m3/s)	Post – Developed Flows (m3/s)
20year ARI storm	0.626	0.583
100year ARI storm	1.00	0.947

Table 2.2 Catchment Flows

The proposed development meets Penrith City Council's stormwater detention requirements as shown by the table above.

The stormwater system is proposed to discharge towards a downstream storage basin of which stores stormwater runoff for the entirety of the North Western Catchment of the Alspec Industrial Business Park Precinct. For more details refer to the "19221 Alspec Industrial Business Park - Integrated Water Cycle management Report".

Stormwater Easement

It should be noted that a portion of Pad 4b and Pad 4c, located south of the development, is proposed to drain through the site as part of the civil design of the overall Alspec Industrial Business Park Precinct. A stormwater easement containing a 750mm diameter pipe is proposed as part of the works for the subject site to cater for these upstream catchments. Refer to the civil drawings included in Appendix A, in addition to the DRAINS model and the Integrated Water Cycle Management Report for the subdivision works for further details.

2.3 Water Quality

Council's requirements also dictate that the stormwater be treated before discharging from the site. The requirements dictate that the post developed pollutants be reduced by the following factors:

- Total Nitrogen to be reduced by 65%
- Total Phosphorus to be reduced by 80%
- Total Suspended Solids to be reduced by 90%
- Gross Pollutants to be reduced by 90%

The above targets have been satisfied through the downstream infrastructure proposed as part of the subdivision works. A CDS 2028 gross pollutant trap and a 7000m² end of line bio-retention basin has been proposed to treat all stormwater runoff in the North Western Catchment of the Alspec Industrial Business Park Precinct. For more details refer to the "19221 Alspec Industrial Business Park - Integrated Water Cycle management Report".

Water Conservation

Council's DCP requires 80% of non-potable demand to be provided through rainwater or stormwater harvesting storages. Refer to the MUSIC model submitted as a part of this development application and the table below which demonstrates the reuse rates that have been achieved for the development.

Storage	Reuse Rate (%)	Demand Calculations
55kL Rainwater Tank (South)	80.6%	Tank to be connected to 2158m ² of irrigation area at 600mm/yr to generate a total demand of 1295kL/yr.



55kL Rainwater Tank (North)	80.8%	Reuse for truck wash purposes. Expected 10 trucks to be washed per week to generate a total demand of 0.5kL/day Tank to be connected to 1853m ² of irrigation area at 600mm/yr to generate a total demand of 1112kL/yr.
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Table 2.3 Water Conservation Summary

Life Cycle Cost Analysis

A life cycle cost analysis of the overall treatment train was exported from the MUSIC model, refer to the below figure for more information. An annual inflation rate of 2.5% was adopted. The life cycle cost analysis was taken over a span of 50 years of which includes installation, maintaining and decommissioning of the treatment train. The total life cycle cost of the two rainwater tanks from the year 2023 is \$99,319. The estimates annual payment cost is \$1,986/year. Refer to the MUSIC model for more details.

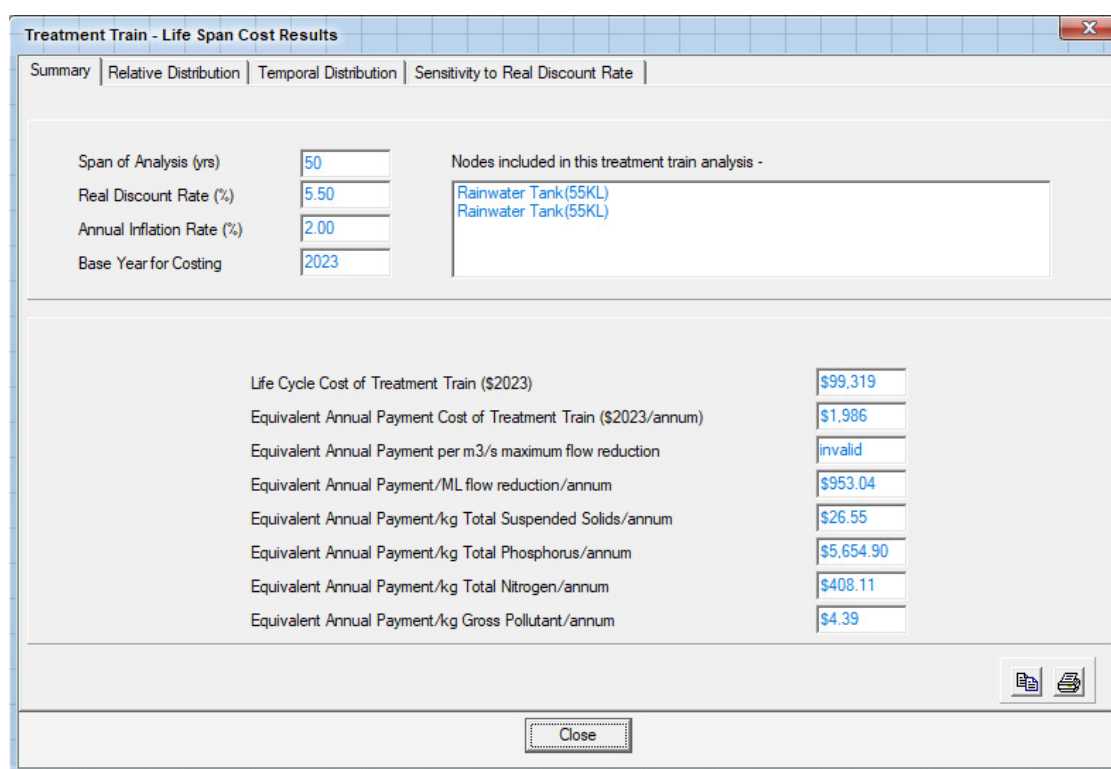


Figure 2.3 Life Cycle Cost Summary

Mean Annual Runoff Volume (MARV)

As per the E18 Luddenham Road Industrial Business Park DCP, the subject site is required to satisfy the MARV stormwater controls, as outlined in Table E18.7 of the aforementioned DCP. Refer to the table below outlining the requirements.

Option 1: Mean Annual Runoff Volume (MARV) Approach	
MARV	≤ 2 ML/ha/year at the point of discharge to the local waterway
90%ile flow	1000 to 5000 L/ha/day at the point of discharge to the local waterway
50%ile flow	5 to 100 L/ha/day at the point of discharge to the local waterway
10%ile flow	0 L/ha/day at the point of discharge to the local waterway

Table 2.4.1: MARV Targets



The downstream storage basin, which is proposed as part of the subdivision works, caters for all lots which discharge towards the north-west part of the overall site. The Integrated Water Cycle Management Report prepared as part of the subdivision DA, summarises the MUSIC modelling completed as part of the subdivision design and confirms that the subject site has been adequately allowed for from a MARV standpoint.

3. SEDIMENT AND EROSION CONTROL

Sediment and Erosion Control measures have been implemented to ensure that site run-off is appropriately treated of sediments in accordance with the Penrith City Council's guidelines and the Blue Book "Managing Urban Stormwater-Soils and Construction, 4th Edition (2004) by Landcom. Catch Drains have been designed to collect site run-off during construction. Since the site is more than 2000m², a sediment basin has been designed. The sediment control measures to be implemented have formed part of the subdivision works design.

The sediment basins are required to be high efficiency basins, as per the Wianamatta technical guidelines. A 514m³ Type B basin, with an automated flocculation system has been proposed. This basin includes 351m³ of settling volume and 163m³ of sediment storage volume. The basins are to discharge stormwater with PH levels between 6.5-8.5, and allow a maximum total suspended solid fraction (TSS) of 50mg/L. Refer to the calculations on drawing SE01 in appendix A for further details.

4. CONCLUSION

Appropriate stormwater management practices are proposed to be implemented that minimise the impact of development on the existing stormwater system in terms of water quality whilst ensuring safe and efficient conveyance of runoff and the provision of adequate freeboard to habitable dwellings. The design is in accordance with both Penrith City Council's requirements and best practice principles; hence it can be ensured that there will be minimal impact on the existing environment as a result of the proposed development.

To summarise, the following key Council DCP requirements have been satisfied as part of the civil engineering design:

- On-site detention and the reduction of post-developed flows
- Water quality measures to manage stormwater pollutants including nitrogen, phosphorus, suspended solids and gross pollutants.
- Mean Annual Run-off Volume from the subject site.
- Sediment and Erosion Control.
- Water Conservation



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REFERENCES

- Penrith City Council Development Control Plan 2014 – E18 Luddenham Road Industrial Business Park
- Penrith City Council Development Control Plan 2014
- Penrith City Council Stormwater Drainage Specifications for Building Developments 2018
- Penrith City Council WSUD Technical Guidelines 2015
- Blue Book “Managing Urban Stormwater- Soils and Construction, 4th Edition Landcom 2004
- 19221 Alspec Business Park - Integrated Water Cycle Management Report[02], Henry & Hymas 2023



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APPENDIX A – Civil DA Drawings

SURVEY INFORMATION SURVEYED BY WATSDON BUCHAN DATUM: A.H.D. 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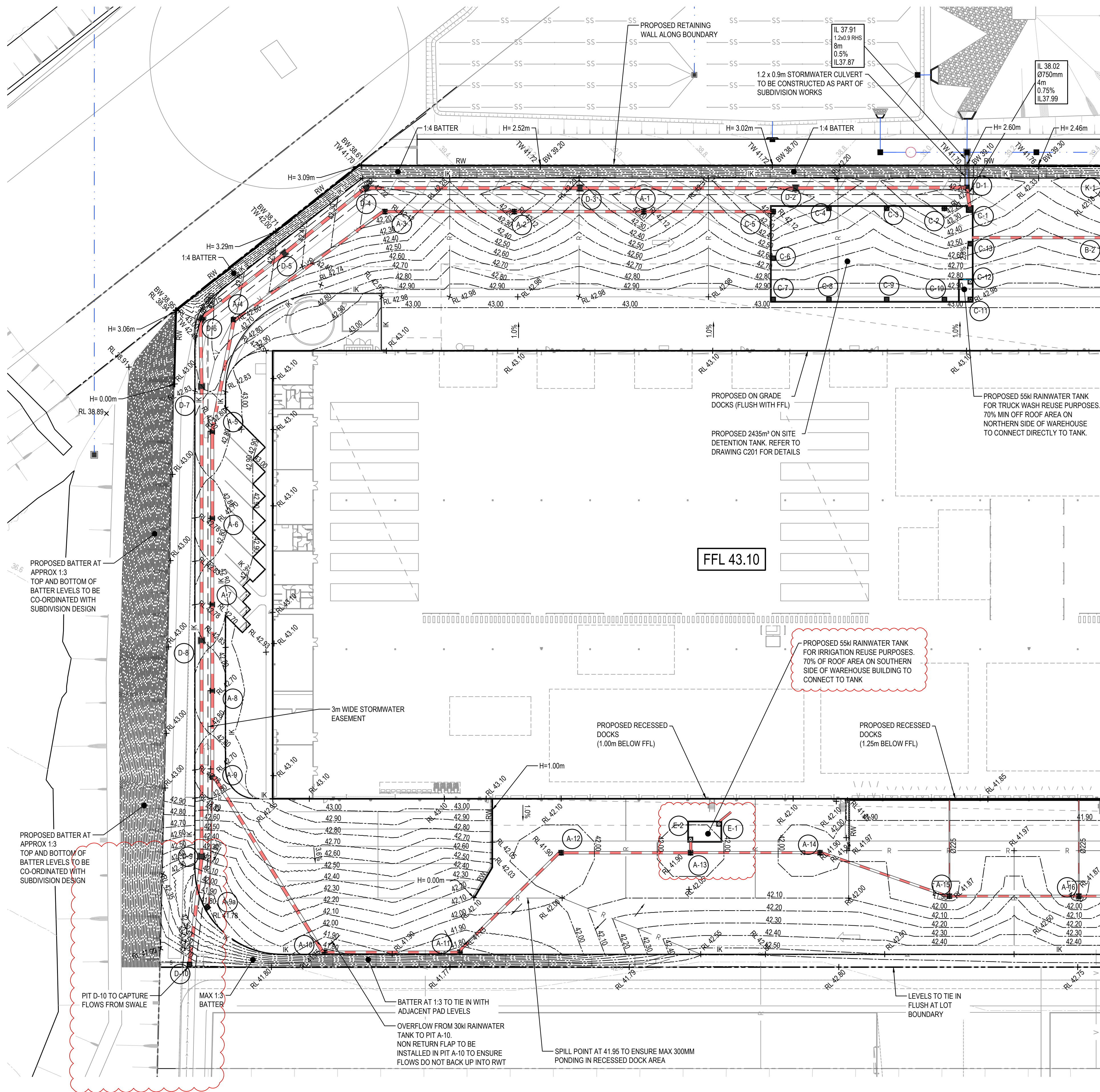


	PROPOSED RIDGE LINE
	PROPOSED VALLEY LINE
	PROPOSED SUBSOIL LINE
	PROPOSED STORMWATER PIPE
	SUBDIVISION STORMWATER PIPE
	STORMWATER UPSTREAM INVERT RL STORMWATER PIPE DIAMETER & CLASS STORMWATER PIPE LENGTH STORMWATER PIPE GRADE STORMWATER DOWNSTREAM INVERT RL
	PROPOSED SURFACE INLET PITS
	PROPOSED JUNCTION PITS PROPOSED LINTEL ONGRADE & SAG PITS
	LINE LETTER PIT NUMBER
	PROPOSED BATTER LINE
	PROPOSED KERB ONLY PROPOSED RETAINING WALL
	PROPOSED CONTOURS EXISTING CONTOURS
	PROPOSED SPOT LEVEL TOP OF WALL LEVEL BOTTOM OF WALL LEVEL EXISTING SPOT LEVEL
	PROPOSED EASEMENT
	PROPOSED FALL
	PROPOSED HEIGHT OF WALL
	PROPOSED INTERMEDIATE RISER (IR)
	PROPOSED FLUSHING POINT (FP)
	PROPOSED DOWNPIPE (DP)
	PROPOSED HEADWALL
	PROPOSED SEDIMENT BASIN
	EXISTING STORMWATER
	EXISTING WATER LINE
	EXISTING ELECTRICAL LINE
	EXISTING GAS LINE
	EXISTING SEWER LINE

GENERAL ARRANGEMENT PLAN
SCALE: 1:3000

FOR DA ONLY

[illegible]



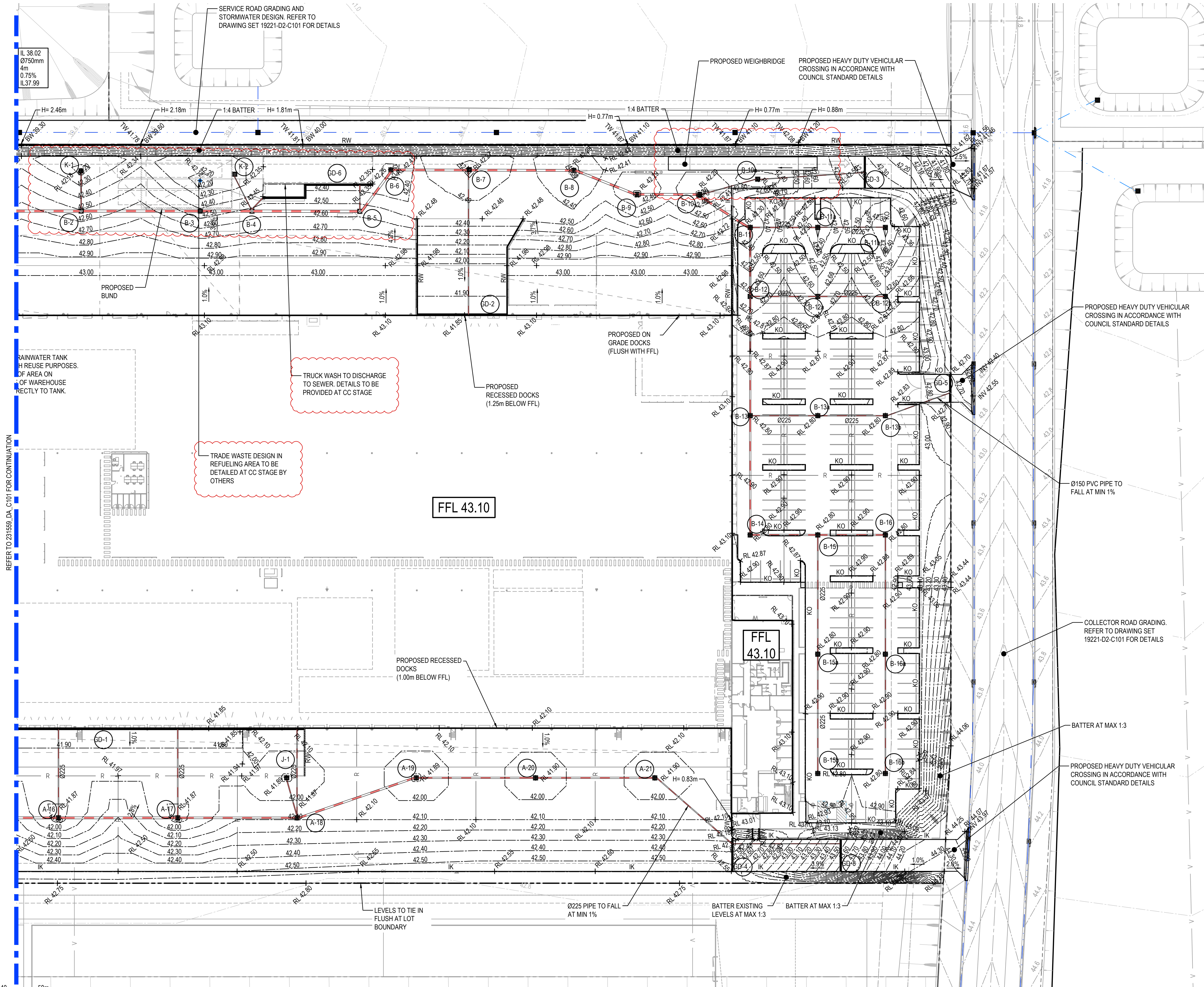
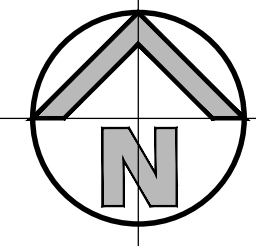
DETAIL PLAN
SCALE: 1:500

FOR DA ONLY

SURVEY INFORMATION SURVEYED BY WATSDON BUCHAN DATUM: A.H.D. ORIGIN OF LEVELS: SSM 22740 RL+1.10	07	ISSUED FOR DA ONLY	NH	NH	07.11.2024						Client	Suite 2/01 828 Pacific Highway Gordon NSW 2072	Telephone +61 2 9417 8400 Facsimile +61 2 9417 8337 Email email@hhconsult.com.au Web www.henryandhymas.com.au	 henry&hymas	Project	PROPOSED COPE WAREHOUSE DEVELOPMENT LUDDENHAM ROAD, ORCHARD HILLS NSW 2748	Drawn M.Barrozo	Designed N.Heazlewood	Date OCTOBER 2023
	06	ISSUED FOR DA ONLY	MS	NH	11.09.2024						Architect	HBB PROPERTY				Checked N.Heazlewood	Approved A.Francis	Scale @A3 1:500	
	04	ISSUED FOR DA ONLY	MP	NH	16.02.2024						 nettletontribe								
	05	ISSUED FOR DA ONLY	AF	NH	05.12.2023														
	03	ISSUED FOR DA ONLY	MP	NH	13.11.2023	10	ISSUED FOR DA ONLY	NH	NH	15.01.2025									
	02	PRELIMINARY	NH	NH	16.10.2023	09	ISSUED FOR DA ONLY	NH	NH	19.12.2024									
01	ISSUED FOR CO-ORDINATION	NH	NH	12.10.2023	08	ISSUED FOR DA ONLY	NH	NH	18.12.2024										
REVISION	AMENDMENT	DRAWN	DESIGNED	DATE	REVISION	AMENDMENT	DRAWN	DESIGNED	DATE	This drawing and design remains the property of Henry & Hymas and may not be copied in whole or in part without the prior written approval of Henry & Hymas.			DRAWING TO BE PRINTED IN COLOUR						

231559_DA_C101

10



0 10 20 30 40 50m
10 8 6 4 2
SCALE 1:500

DETAIL PLAN
SCALE: 1:500

FOR DA ONLY

SURVEY
INFORMATION
SURVEYED BY
WATSDON BUCHAN

DATUM: A.H.D.
ORIGIN OF LEVELS: SSM 22740 RL41.10

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE	REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
06	ISSUED FOR DA ONLY	NH	NH	15.01.2025					
05	ISSUED FOR DA ONLY	MP	NH	16.02.2024					
04	ISSUED FOR DA ONLY	AFa	NH	05.12.2023					
03	ISSUED FOR DA ONLY	MP	NH	13.11.2023					
02	PRELIMINARY	NH	NH	16.10.2023					
01	ISSUED FOR CO-ORDINATION	NH	NH	12.10.2023					

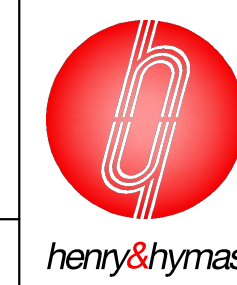
Client
HBB PROPERTY
Architect
nettletontribe

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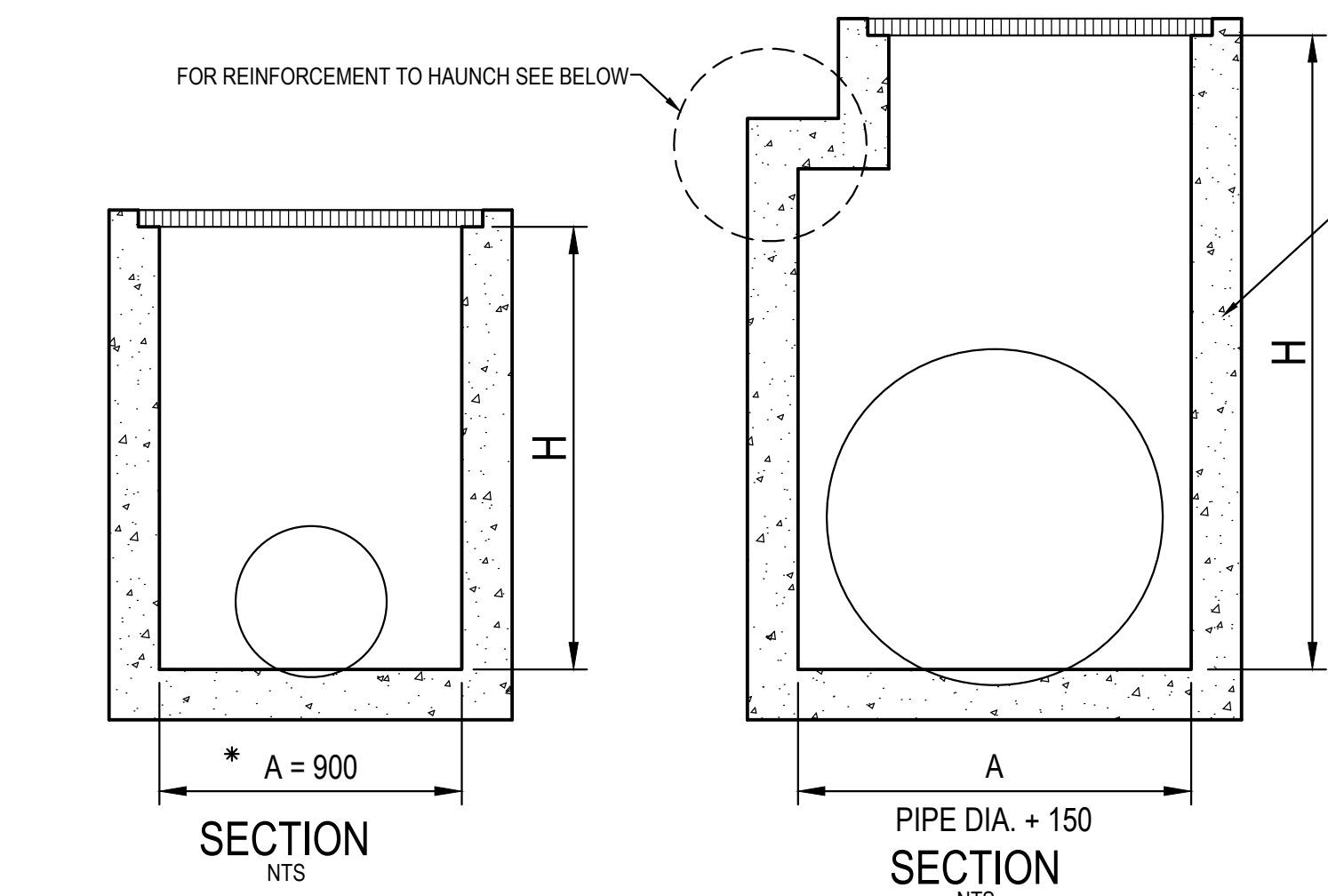


Project
**PROPOSED COPE WAREHOUSE DEVELOPMENT
LUDDENHAM ROAD, ORCHARD HILLS NSW 2748**
Title
**DETAIL PLAN
SHEET 2 OF 2**

Drawn	Designed	Date
M.Barrozo	N.Heazlewood	OCTOBER 2023
Checked	Approved	Scale (BA1)
N.Heazlewood	A.Francis	1:500
Drawing number		Revision
231559_DA_C102		06

IT IS THE CONTRACTORS RESPONSIBILITY TO SELECT PIT CHAMBER SIZE WITH REGARDS TO PIPE SIZE, DEPTH TO INVERT AND SKEW ANGLE. REFER SKETCHES BELOW.

- 1 SELECT PIT CHAMBER USING THE STEPS BELOW.
- 2 SELECT PIT CHAMBER SIZE DEPENDING ON THE PIPE DIAMETERS.
- 3 CHECK PIT CHAMBER SIZE TO SATISFY DEPTH TO INVERT REQUIREMENTS.
- 4 CHECK PIT CHAMBER DIMENSIONS TO SATISFY THE SKEW ANGLE IN THE TABLE.

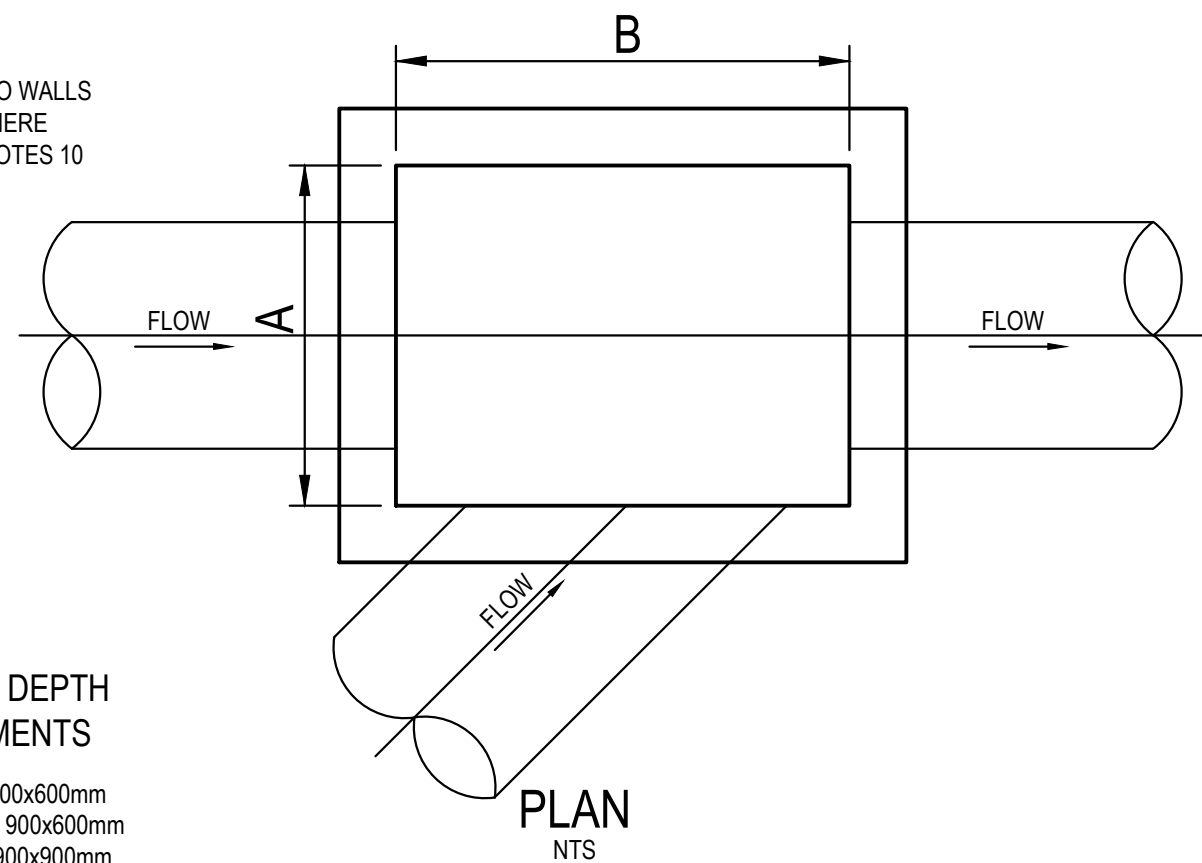


*A = 600 FOR PIPES UP TO 375 DIA.

- 1 PIT CHAMBER DIMENSIONS FOR PIPES UP TO 600 DIA.

2 PIT SIZE & DEPTH REQUIREMENTS

H = 0-900mm - AxB = 600x600mm
H = 900-1200mm - AxB = 900x600mm
H = >1200mm - AxB = 900x900mm



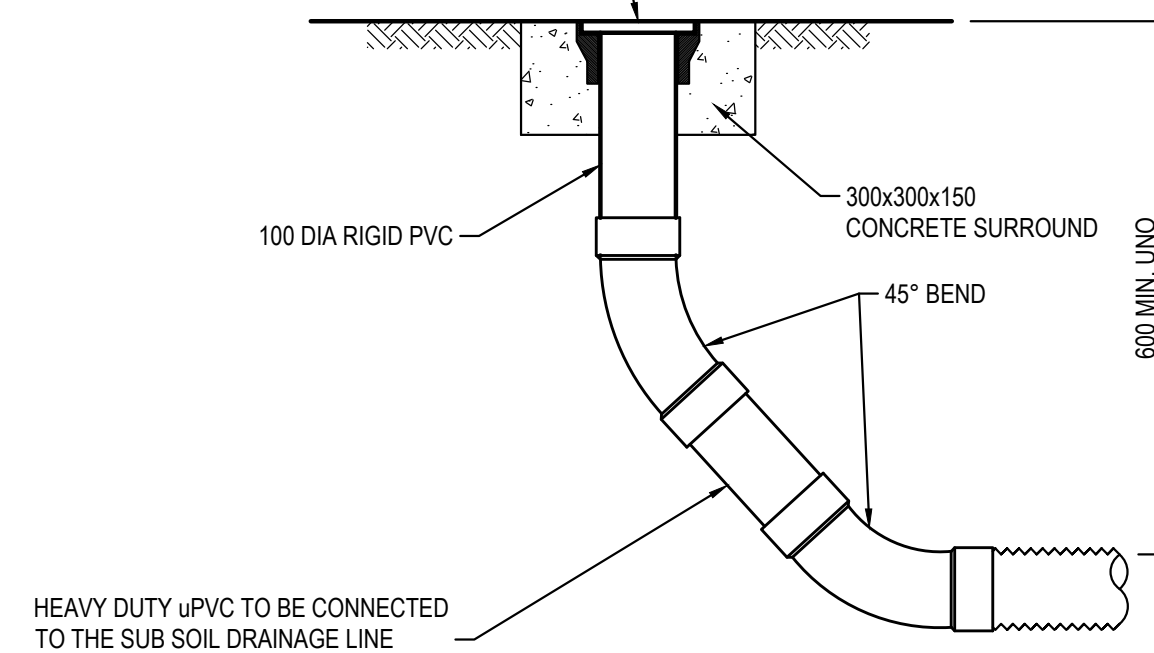
- 3 PIT CHAMBER FOR SIDE ENTRY ON SKEW

FOR B = 600mm - MAX. SIDE ENTRY PIPE AT 45° SKEW = 225mm
FOR B = 900mm - MAX. SIDE ENTRY PIPE AT 45° SKEW = 375mm
FOR B = 1200mm - MAX. SIDE ENTRY PIPE AT 45° SKEW = 600mm
FOR B = 1500mm - MAX. SIDE ENTRY PIPE AT 45° SKEW = 825mm
FOR B = 1900mm - MAX. SIDE ENTRY PIPE AT 45° SKEW = 1050mm

TABLE 1		TABLE 2	
SIEVE SIZE (MM)	WEIGHT PASING (%)	SIEVE SIZE (MM)	WEIGHT PASING (%)
75.0	100	19.0	100
9.5	100 TO 50	2.36	100 TO 50
2.36	100 TO 30	0.60	90 TO 20
0.60	50 TO 15	0.30	60 TO 10
0.075	25 TO 0	0.15	25 TO 0
		0.075	10 TO 0

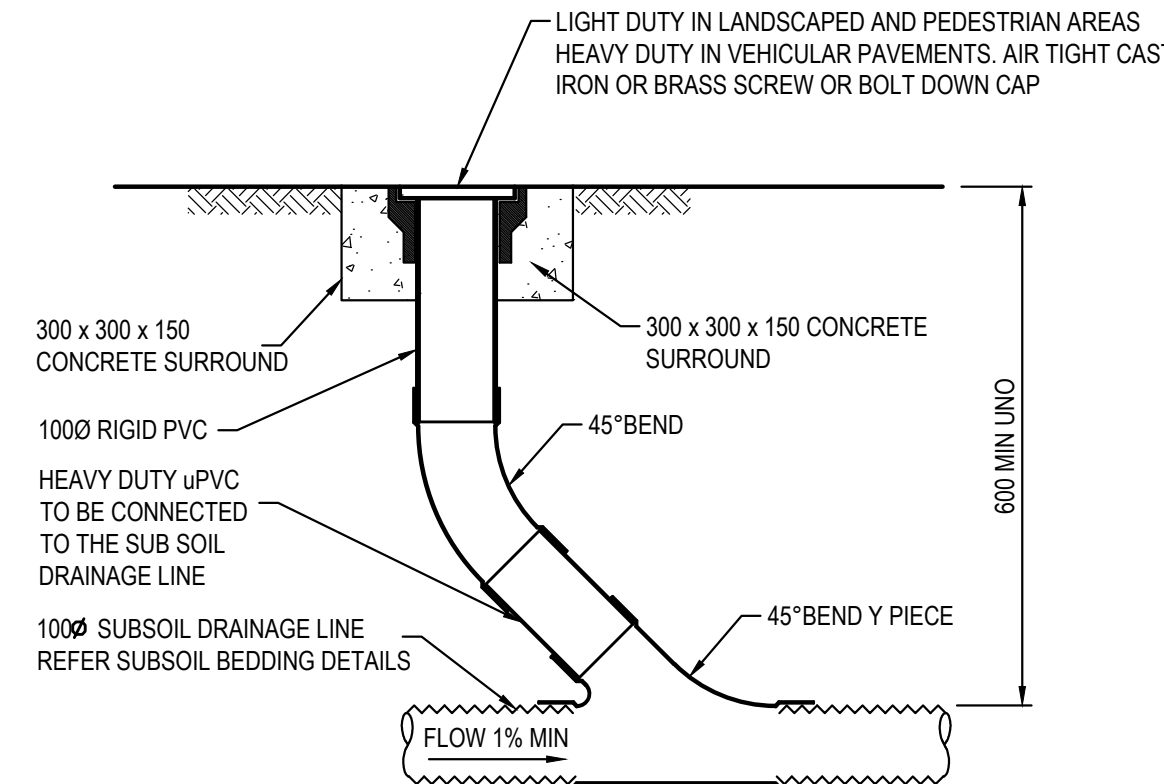
TABLE 3				
SUPPORT TYPE	BED ZONE X	HAUNCH ZONE Y	BED AND HAUNCH ZONES COMPACTION	MAX BEDDING FACTOR
HS1	100 IF D<=1500, OR 150 IF D>=1500	0.1D	50	2.0
HS2		0.3D	60	2.5
HS3		0.3D	70	4.0

LIGHT DUTY IN LANDSCAPED AND PEDESTRIAN AREAS
HEAVY DUTY IN VEHICULAR PAVEMENTS.
AIR TIGHT CAST IRON OR BRASS SCREW OR BOLT DOWN CAP.



FLUSHING POINT (FP)

SCALE 1:10
NOTE: SLOTTED RIGID PVC PIPE AND FITTINGS MAY BE USED



INTERMEDIATE RISER (IR)

SCALE 1:10
NOTE: SLOTTED RIGID PVC PIPE AND FITTINGS MAY BE USED

PIT LID AND HEADWALL SCHEDULE

PIT/STRUCTURE NUMBER										DESCRIPTION
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	PROPOSED 900x900 SURFACE INLET PIT WITH HINGED GRADED LID HEAVY DUTY CLASS "D" IN ACCORDANCE WITH PENRITH CITY COUNCIL COUNCIL'S REQUIREMENTS.
A-11	A-12	A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	
A-21	A-22	B-3	B-6	B-7	B-8	B-9	B-10	B-11		
B-12	B-13	B-14	B-15	B-16						
C-1	C-2	C-3	C-4	C-5	C-6					
C-7	C-8	C-9	C-10	C-11	C-12	C-13	C-14	C-15	C-16	
D-1	D-2	D-3	D-4	D-5	D-6	D-7	D-8	D-9	D-10	PROPOSED 250mm WIDE GRADED DRAIN HEAVY DUTY CLASS "D" IN ACCORDANCE WITH PENRITH CITY COUNCIL COUNCIL'S REQUIREMENTS.
E-1	E-2	E-3	E-4	E-5	E-6	E-7	E-8	E-9	E-10	PROPOSED JUNCTION PIT WITH 900x900 HEAVY DUTY SEALED LID CLASS "D" IN ACCORDANCE WITH PENRITH CITY COUNCIL COUNCIL'S REQUIREMENTS.
F-1	F-2	F-3	F-4	F-5	F-6	F-7	F-8	F-9	F-10	PROPOSED 1200x1200 SURFACE INLET PIT WITH HINGED GRADED LID HEAVY DUTY CLASS "D" IN ACCORDANCE WITH PENRITH CITY COUNCIL COUNCIL'S REQUIREMENTS.
G-1	G-2	G-3	G-4	G-5	G-6	G-7	G-8	G-9	G-10	PROPOSED 1500x1500 SURFACE INLET PIT WITH HINGED GRADED LID HEAVY DUTY CLASS "D" IN ACCORDANCE WITH PENRITH CITY COUNCIL COUNCIL'S REQUIREMENTS.
H-1	H-2	H-3	H-4	H-5	H-6	H-7	H-8	H-9	H-10	PROPOSED 1200x1200 SEALED JUNCTION PIT WITH HEAVY DUTY CLASS "D" LID IN ACCORDANCE WITH PENRITH CITY COUNCIL COUNCIL'S REQUIREMENTS.
I-1	I-2	I-3	I-4	I-5	I-6	I-7	I-8	I-9	I-10	PROPOSED 600x600 WITH HEAVY DUTY CLASS "D" LID GRADED INLET IN ACCORDANCE WITH PENRITH CITY COUNCIL COUNCIL'S REQUIREMENTS.

NOTE:

ALL STORMWATER INLET PITS TO BE FITTED WITH OCEANGUARD PIT BASKET FOR WATER QUALITY TREATMENT PURPOSES

DRAINAGE NOTES:

1. ALL STORMWATER WORK TO COMPLY WITH AS 3500 PART 3.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE MINIMUM COVER OF 600mm ON ALL PIPES.
3. PROTECTION OF PIPES DUE TO LOADS EXCEEDING W7 WHEEL LOAD SHALL BE THE CONTRACTOR'S RESPONSIBILITY.
4. BEDDING TYPE SHALL BE TYPE H2 FOR RCP. WHERE NECESSARY THE OVERLAY ZONE SHALL BE REDUCED TO ACCOMMODATE PAVEMENT REQUIREMENTS. REFER TO THIS DRAWING FOR DETAILS.
5. MINIMUM COVER OVER EXISTING PIPES FOR PROTECTION DURING CONSTRUCTION SHALL BE 800mm.
6. NO CONSTRUCTION LOADS SHALL BE APPLIED TO PLASTIC PIPES.
7. FINISHED SURFACE LEVELS SHOWN ON LAYOUT PLAN DRGS TAKE PRECEDENCE OVER DESIGN DRAINAGE SURFACE LEVELS.
8. ALL PIPES UP TO AND INCLUDING 300 DIA. SHALL BE SOLVENT OR RUBBER RING JOINTED PVC CLASS SH PIPE TO AS1260. ALL OTHER PIPES TO BE RCP USING CLASS 2 RUBBER RING JOINTED PIPE. HARDIES FRC PIPE MAY BE USED IN LIEU OF RCP IF DESIRED IN GROUND. ALL AERIAL PIPES TO BE PVC CLASS SH.
9. ALL PITS IN NON TRAFFICABLE AREAS TO BE PREFABRICATED POLYESTER CONCRETE "POLYCRETE" WITH "LIGHT DUTY" CLASS B GALV. MILD STEEL GRATING AND FRAME.
ALL PITS IN TRAFFICABLE AREAS (CLASS "D") LOADING MAX) TO HAVE 150mm THICK CONCRETE WALLS AND BASE CAST IN-SITU f_c=32 MPa. REINFORCED WITH N12-200 BOTH LOADING WAYS CENTRALLY PLACE. U.N.O. ON SEPARATE DESIGN DRAWINGS IN THIS SET. GALV. MILD STEEL GRATING AND FRAME TO SUIT DESIGN LOADING. PRECAST PITS, RECTANGULAR OR CIRCULAR IN SHAPE, MAY BE USED IN LIEU AND SHALL COMPLY WITH RELEVANT AUSTRALIAN STANDARDS.
10. ALL PITS, GRATINGS AND FRAMES SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURERS SPECIFICATION AND TO BE IN ACCORDANCE WITH AS3500.3 AND AS3996.
11. PIT CHAMBER DIMENSIONS ARE TO BE SELECTED TO SATISFY THE FOLLOWING:
 - PIPE SIZE
 - DEPTH TO INVERT
 - SKEW ANGLEREFER TYPICAL PIT CHAMBER DETAILS BELOW
IF PIT LID SIZE IS SMALLER THAN THE PIT CHAMBER SIZE THEN THE PIT LID IS TO BE CONSTRUCTED ON THE CORNER OF THE PIT CHAMBER WITH THE STEP IRONS DIRECTLY BELOW. ALTERNATIVELY THE PIT LID TO BE USED, IS TO BE THE SAME SIZE AS THE PIT CHAMBER.
12. FOR PIPE SIZES GREATER THAN Ø300mm, PIT FLOOR IS TO BE BENCH TO FACILITATE FLOW.
13. GALVANISED STEP IRONS SHALL BE PROVIDED AT 300 CTS FOR PITS HAVING A DEPTH EXCEEDING 1200mm. SUBSOIL DRAINAGE PIPE SHALL BE PROVIDED IN PIPE TRENCHES ADJACENT TO INLET PIPES. (MINIMUM LENGTH 3m).
14. ALL SUBSOIL PIPES SHALL BE 100mm SLOTTED PVC IN A FILTER SOCK, UNO, WITH 3m INSTALLED UPSTREAM OF ALL PITS.
15. ALL PIPEWORK SHALL HAVE MINIMUM DIAMETER 100.
16. MINIMUM GRADE FOR ROOFWATER DRAINAGE LINES SHALL BE 1%.
17. ALL PIPE JUNCTIONS AND TAPER UP TO AND INCLUDING 300 DIA. SHALL BE VIA PURPOSE MADE FITTINGS.
18. ALL ROOF DRAINAGE TO BE INSTALLED IN ACCORDANCE WITH AS3500, PART 3. TESTING TO BE UNDERTAKEN AND REPORTS PROVIDED TO THE SUPERINTENDENT.
19. LOCATION OF THE DIRECT DOWN PIPE CONNECTIONS MAY VARY ON SITE TO SUIT SITE CONDITIONS, WHERE CONNECTION SHOWN ON LONG SECTIONS CHAINAGES ARE INDICATIVE ONLY.
20. PITS IN EXCESS OF 1.5 m DEEP TO HAVE WALL AND FLOOR THICKNESS INCREASED TO 200mm. REINFORCED WITH N12@200 CTS CENTRALLY PLACED BOTH WAYS THROUGHOUT U.N.O.ON SEPARATE DESIGN DRAWINGS IN THIS SET. IF DEPTH EXCEEDS 5m CONTACT ENGINEER.
21. SUBSOIL DRAINAGE LINES FOR LANDSCAPE AREA NOT SHOWN ON THESE DRAWINGS. REFER TO LANDSCAPING PLANS FOR DETAILS.
22. ALL STORMWATER PITS TO HAVE Ø100 uPVC SLOTTED SUBSOIL PIPES CONNECTED TO THEM. THESE SUBSOILS TO EXTEND 3m UPSTREAM OF THE PIT AT A MINIMUM GRADE.

FOR DA ONLY

SURVEY INFORMATION
SURVEYED BY
WATSDON BUCHAN

DATUM: A.H.D.
ORIGIN OF LEVELS: SSM 22740 RL41.10

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE	REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
04	ISSUED FOR DA ONLY	NH	NH	15.01.2025					
03	ISSUED FOR DA ONLY	MP	NH	16.02.2024					
02	ISSUED FOR DA ONLY	MP	NH	13.11.2023					
01	PRELIMINARY	MB	NH	16.10.2023					

Client
HBB PROPERTY
nettletontribe

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Project

**PROPOSED COPE WAREHOUSE DEVELOPMENT
LUDDENHAM ROAD, ORCHARD HILLS NSW 2748**

Title

**STORMWATER MISCELLANEOUS DETAILS
AND PIT LID SCHEDULE**

Drawn

M.Barrozo

Checked
N.Heazlewood

Approved
A.Francis

Scale @A1

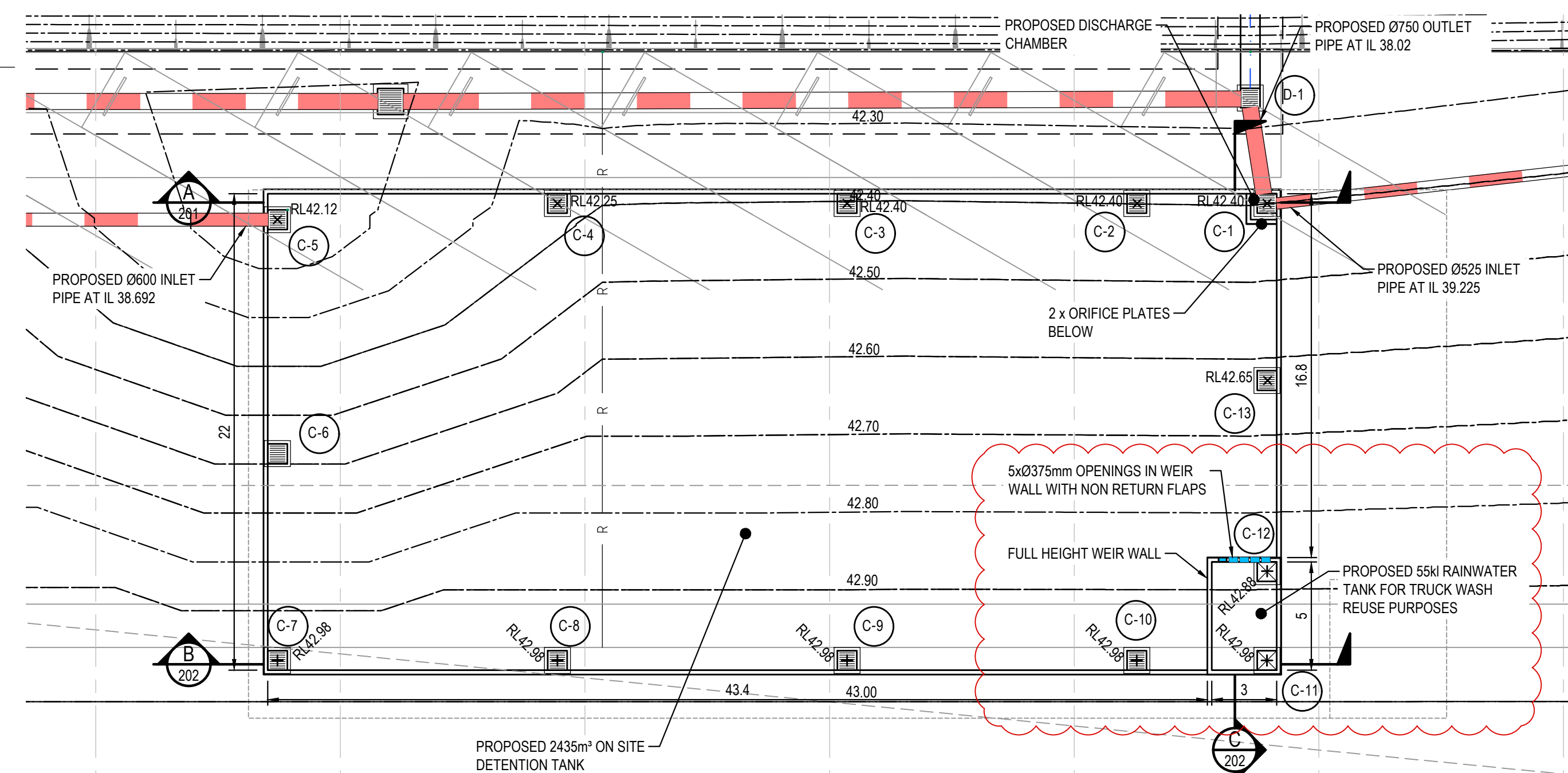
AS NOTED

Revision

231559_DA_C200

Revision

04

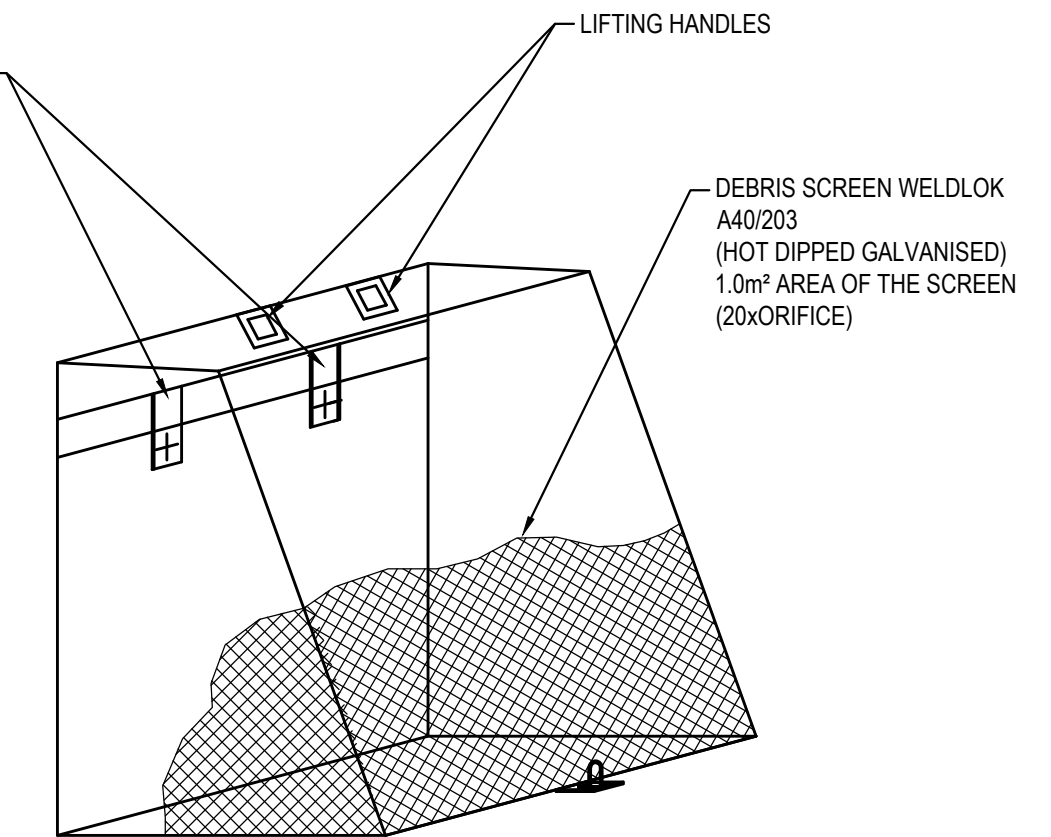


DANGER

CONFINED SPACE

**NO ENTRY WITHOUT
CONFINED SPACE
TRAINING**

SCREEN TYPE WELDLOK A40/203 IS RECOMENDED FOR ORIFICES LARGER THAN 150mm AND SCREEN AREA 20 x THE ORIFICE AREA FOR THAT TYPE OF SCREEN - REFER UPRCT SECTION 4-13



50 TYP.

5mm STAINLESS STEEL PLATE

Ø5000 OPENING

900

900

FIX TO TANK WALL USING 4M10 MASONRY ANCHORS NON REMOVABLE.

50 TYP.

5mm STAINLESS STEEL PLATE

Ø400 OPENING

750

Ø400

750

FIX TO TANK WALL USING 4M10 MASONRY ANCHORS NON REMOVABLE

SECTION A-A

SCALE: 1:50

ON SITE DETENTION TANK
TOTAL FOOTPRINT = 1000m²
TOTAL VOLUME = 2435m³

PROPOSED Ø600 INLET
PIPE AT IL 38.692

C-5 RL42.12

C-4 RL42.25

C-3 RL42.40

C-2 RL42.40

C-1 RL42.40

ORIFICE PLATE WITH Ø500
OPENING AT IL 40.40
REFER TO DETAILS

STEP IRONS @ 300 CTS
REFER TO TYPICAL
DETAILS ON DWG.C200.
(TYPICAL)

PROPOSED DISCHARGE
CHAMBER

TRASH SCREEN
REFER TO DETAIL

ORIFICE PLATE WITH Ø400
OPENING AT IL 38.23
REFER TO DETAILS

MASS CONCRETE INFILL AFTER
INSTALLATION OF ORIFICE PLATE

TWL 40.95

TWL 41.00

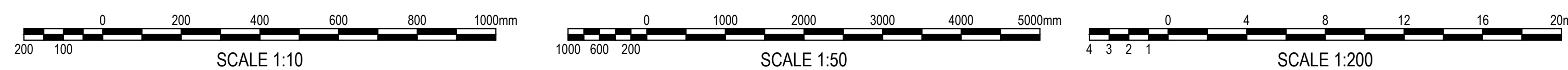
RL38.69

RL38.23

RL38.02

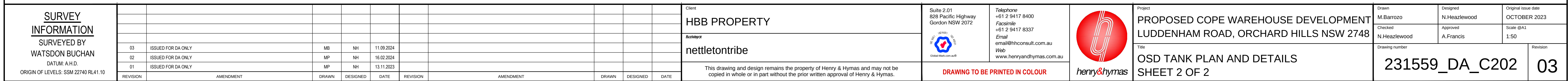
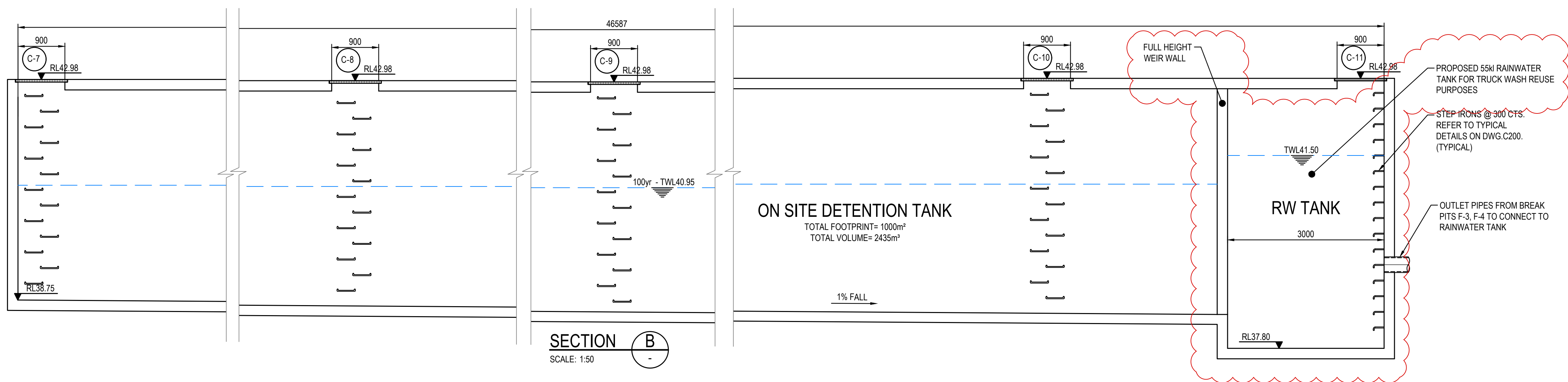
1% FALL

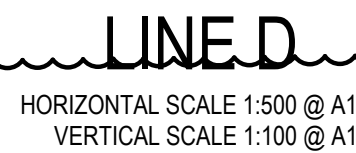
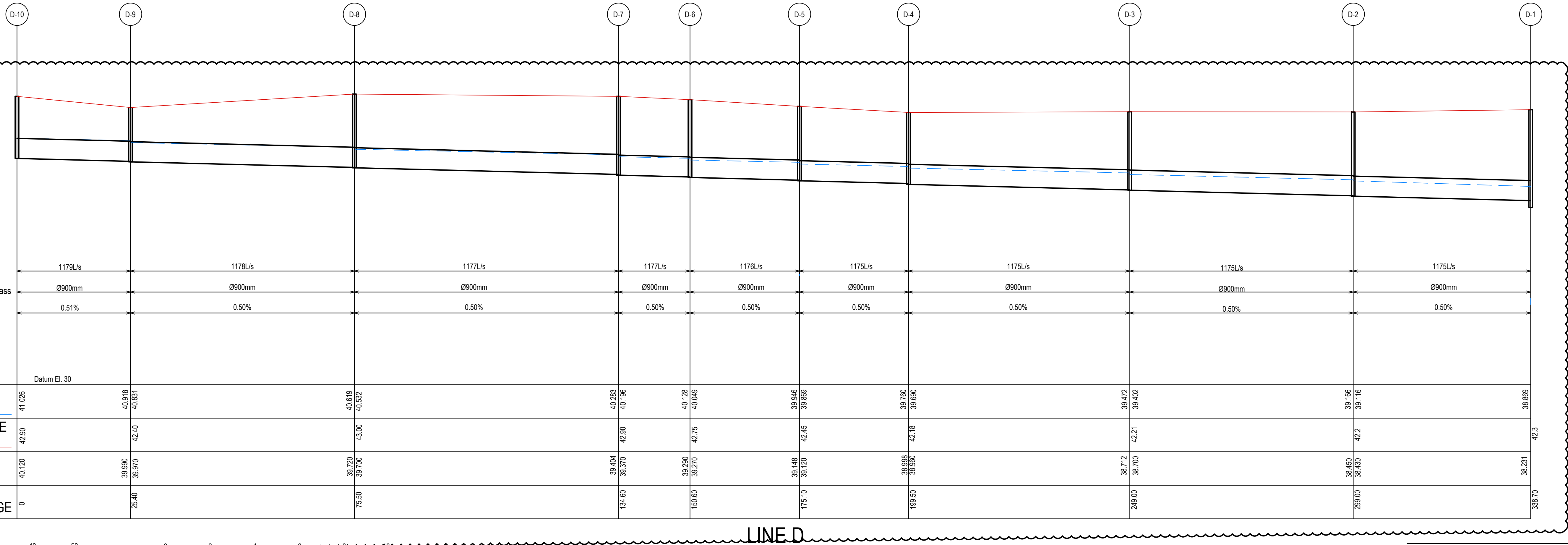
SECTION A
SCALE: 1:50



FOR DA ONLY

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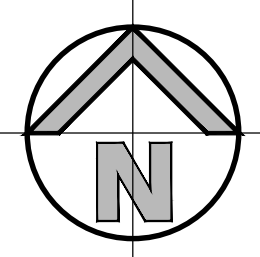




FOR DA ONLY

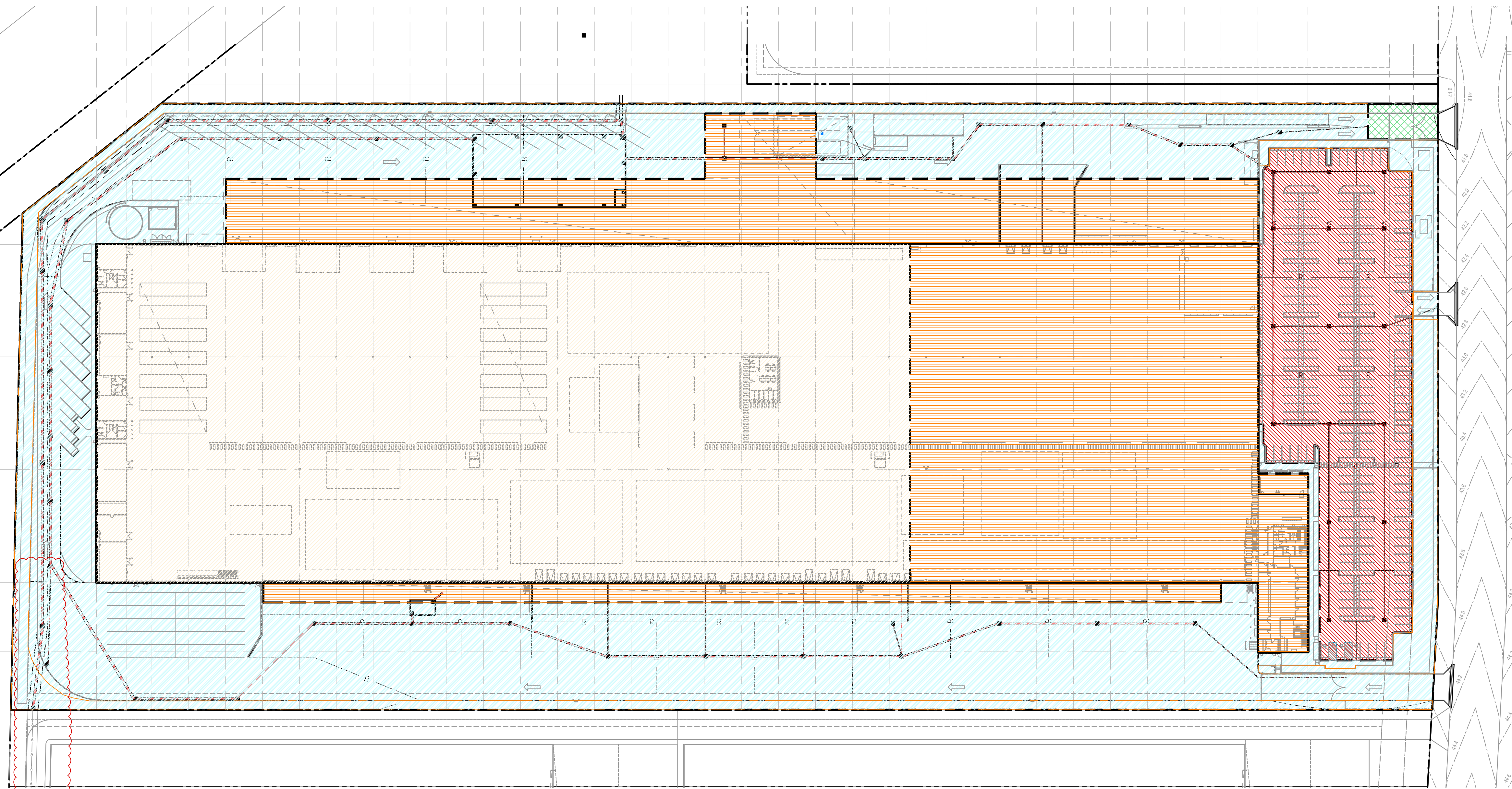
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EXTERNAL AREA TO OSD TANK
AREA = 27267m² (78% IMPERVIOUS)



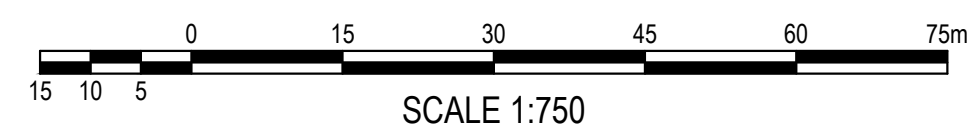
NOTE:

MINIMUM OF 70% OF MAIN WAREHOUSE ROOF AREA TO BE CONNECTED
TO RAINWATER TANKS. OFFICE ROOF AREA TO BYPASS RAINWATER
TANK. AWNINGS TO BYPASS RAINWATER TANK



STORMWATER CATCHMENT PLAN

SCALE: 1:750



FOR DA ONLY

SURVEY INFORMATION SURVEYED BY WATSDON BUCHAN DATUM: A.H.D. ORIGIN OF LEVELS: SSM 22740 RL41.10	07	ISSUED FOR DA ONLY	NH	NH	24.10.2024																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
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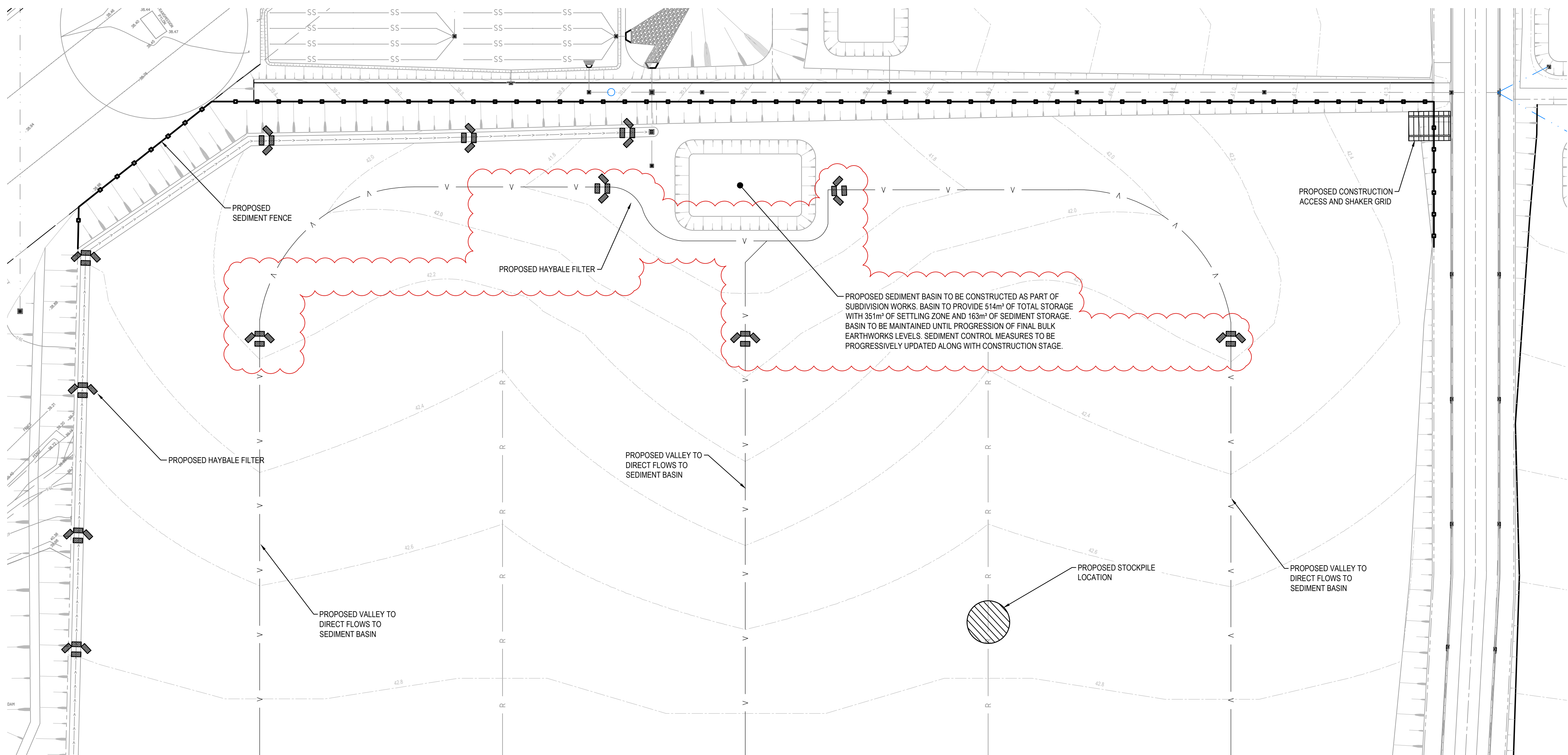
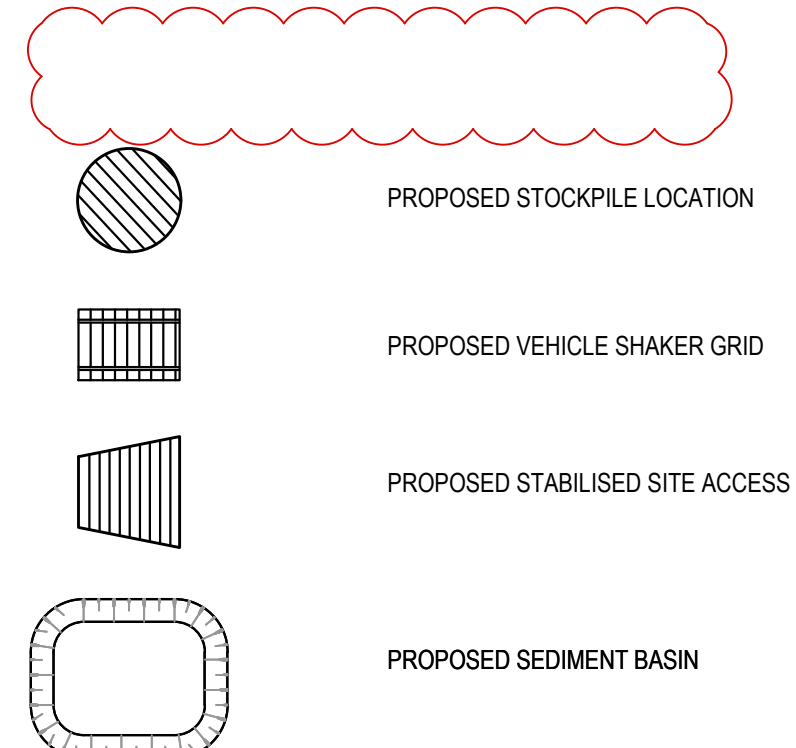


Diagram illustrating the proposed catch diversion drain (CD) and traffic manoeuvring (TM) for the proposed sedimentation fence.

- SITE BOUNDARY
- PROPOSED SEDIMENTATION FENCE
- TM → TM
- PROPOSED TRAFFIC MANOEUVRING
- CD → CD
- PROPOSED CATCH DIVERSION DRAIN

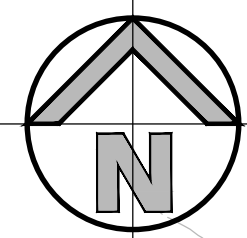


- ALL SEDIMENT CONTROL DEVICES ARE TO BE CONSTRUCTED, PLACED AND MAINTAINED IN ACCORDANCE WITH PENNETH CITY COUNCIL'S SPECIFICATIONS, LANDSCAPE SOIL AND CONSTRUCTION MANUAL AND IECA (2008) APPENDIX B (JUNE 2018).
- ALL PERIMETER & SILTATION CONTROL MEASURES ARE TO BE PLACED PRIOR TO, OR AS THE FIRST STEP IN EARTH WORKS AND/OR CLEARING.
- THE SEDIMENT & EROSION CONTROL PLAN MAY REQUIRE FUTURE ADJUSTMENT TO REFLECT CONSTRUCTION STAGING. IT IS ALSO THE CONTRACTORS RESPONSIBILITY TO PREPARE THEIR OWN SEDIMENT AND EROSION CONTROL PLAN WHICH SUITS THE DESIGNED CONSTRUCTION STAGING.
- FILTRATION BUFFER ZONES ARE TO BE FENCED OFF AND ACCESS PROHIBITED TO ALL PLANT AND MACHINERY.
- ALL TEMPORARY EARTH HERMS, DIVERSIONS & SILT DAM EMBANKMENTS ARE TO BE MACHINE COMPACTED, SEEDED & MULCHED FOR TEMPORARY VEGETATION COVER AS SOON AS THEY HAVE BEEN FORMED.
- ALL SEDIMENT TRAPPING STRUCTURES AND DEVICES ARE TO BE INSPECTED AFTER STORMS FOR STRUCTURAL DAMAGE OR CLOGGING. TRAPPED MATERIAL IS TO BE REMOVED TO A SAFE LOCATION.
- ALL TOPSOIL IS TO BE STOCKPILED ON SITE FOR REUSE (AWAY FROM TREES AND DRAINAGE LINES). MEASURES SHALL BE APPLIED TO PREVENT EROSION OF THE STOCKPILES.
- ALL EARTHWORK AREAS SHALL BE ROLLED EACH EVENING TO SEAL THE EARTHWORKS.
- ALL FILLS ARE TO BE LEFT WITH A LIP AT THE TOP OF THE SLOPE AT THE END. ALL CUT AND FILL SLOPES ARE TO BE SEEDED AND STRAW MULCHED WITHIN 14 DAYS OF COMPLETION OF FORMATION U.N.O. BY LANDSCAPE ARCHITECTS.
- UPON COMPLETION OF ALL EARTHWORKS OR AS DIRECTED BY COUNCIL. SOIL CONSERVATION TREATMENTS SHALL BE APPLIED SO AS TO REPAIR AREAS THAT HAVE BEEN DISTURBED. EROSION PROOF WITHIN 14 DAYS.
- EROSION AND SILT PROTECTION MEASURES ARE TO BE MAINTAINED AT ALL TIMES.

BASIN TYPE:	TYPE B
TOTAL BASIN VOLUME:	514m ³
TOTAL SETTLING VOLUME:	351m ³
SETTLING ZONE SURFACE AREA:	702m ²
SETTLING ZONE DEPTH:	0.5m
SEDIMENT STORAGE ZONE DEPTH:	0.3m
50% OF Q _{avg} :	0.059m ³ /s
LOT AREA:	80244m ²
BASIN (WIDTH)LENGTH:	1/3
FLOCCULATION SYSTEM:	AUTOMATIC
ACCEPTABLE PH RANGE OF STORMWATER DISCHARGED:	6.5 - 8.5
MAX TSS (mg/L) OF STORMWATER:	50mL/L

FOR DA ONLY

[illegible]



LEGEND

--- EXISTING BOUNDARY
--- 52.40 BE CONTOURS

DEPTH RANGE				
Lower_value	Upper_value	Colour		
-20	to -10	Meters		
-10	to -8	Meters		
-8	to -7	Meters		
-7	to -6	Meters		
-6	to -5	Meters		
-5	to -4	Meters		
-4	to -3	Meters		
-3	to -2	Meters		
-2	to -1	Meters		
-1	to -.1	Meters		
-.1	to -.05	Meters		
-.05	to 0	Meters		
0	to .05	Meters		
.05	to .1	Meters		
.1	to .2	Meters		
.2	to .4	Meters		
.4	to .6	Meters		
.6	to .8	Meters		
.8	to 1	Meters		
1	to 2	Meters		
2	to 4	Meters		
4	to 6	Meters		
6	to 10	Meters		
10	to 20	Meters		

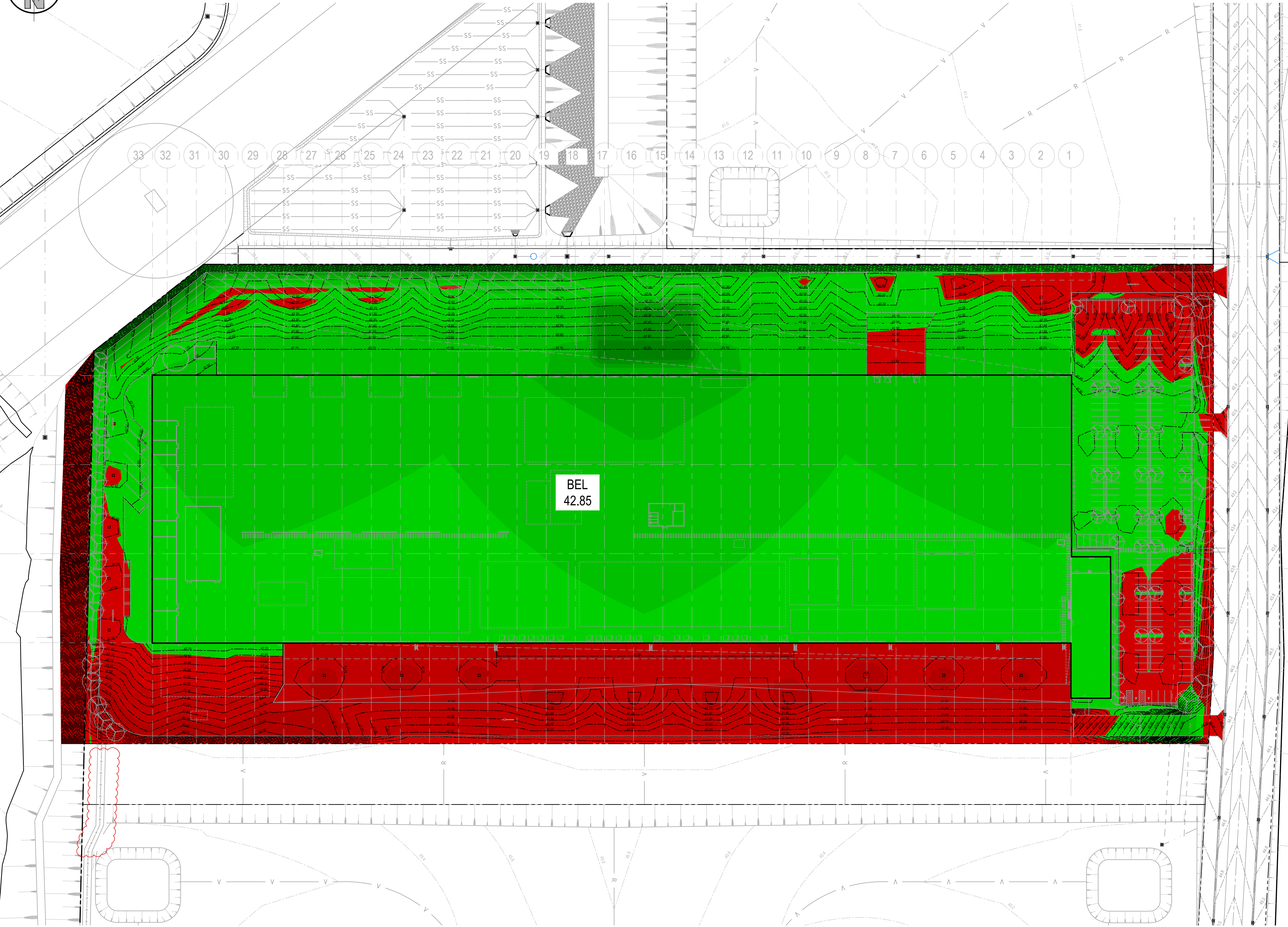
EARTHWORKS QUANTITIES

(APPROXIMATE ONLY)
NOT TO BE USED FOR CONTRACTUAL PURPOSES. TENDERERS TO DETERMINE VOLUMES USING THEIR OWN METHOD OF CALCULATION.

- EARTHWORKS QUANTITIES -	
TOTAL AREA (81,848 m²)	
CUT	13,338 m³
FILL	34,098 m³
EXCESS OF FILL OVER CUT	20,760 m³
EXCAVATION FOR SERVICE TRENCHES NOT INCLUDED IN CALCULATION	
EXCAVATION FOR RETAINING WALLS NOT INCLUDED IN CALCULATION	
NO TOPSOIL STRIPPING. BULK EARTHWORKS VOLUME CALCULATED AGAINST THE DESIGN BULK SURFACE FOR THE SUBDIVISION WORKS DA DESIGN.	

PAVEMENT THICKNESS "INCLUDING BEDDING THICKNESS"		
BUILDING SLAB	250	mm
HARDSTAND	300	mm
AC CARPARK	350	mm
LANDSCAPING	300	mm

FOR DA ONLY



BULK EARTH WORKS CUT & FILL PLAN

SCALE: 1:750

SURVEY
INFORMATION
SURVEYED BY
WATSDON BUCHAN
DATUM: A.H.D.
ORIGIN OF LEVELS: SSM 22740 RL41.10

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE	REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
04	ISSUED FOR DA ONLY	NH	SC	14.01.2025					
03	ISSUED FOR DA ONLY	SC	SC	16.02.2024					
02	ISSUED FOR DA ONLY	AFe	NH	05.12.2023					
01	ISSUED FOR DA ONLY	MP	NH	13.11.2023					

Client
HBB PROPERTY
Architect
nettletontribe

This drawing and design remains the property of Henry & Hymas and may not be copied in whole or in part without the prior written approval of Henry & Hymas.

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Project
**PROPOSED COPE WAREHOUSE DEVELOPMENT
LUDDENHAM ROAD, ORCHARD HILLS NSW 2748**

Title
BULK EARTHWORKS CUT & FILL PLAN

Drawn
M.Barrozo
Designed
N.Heazlewood
Date
OCTOBER 2023

Checked
N.Heazlewood
Approved
A.Francis
Scale (B1)
1:750

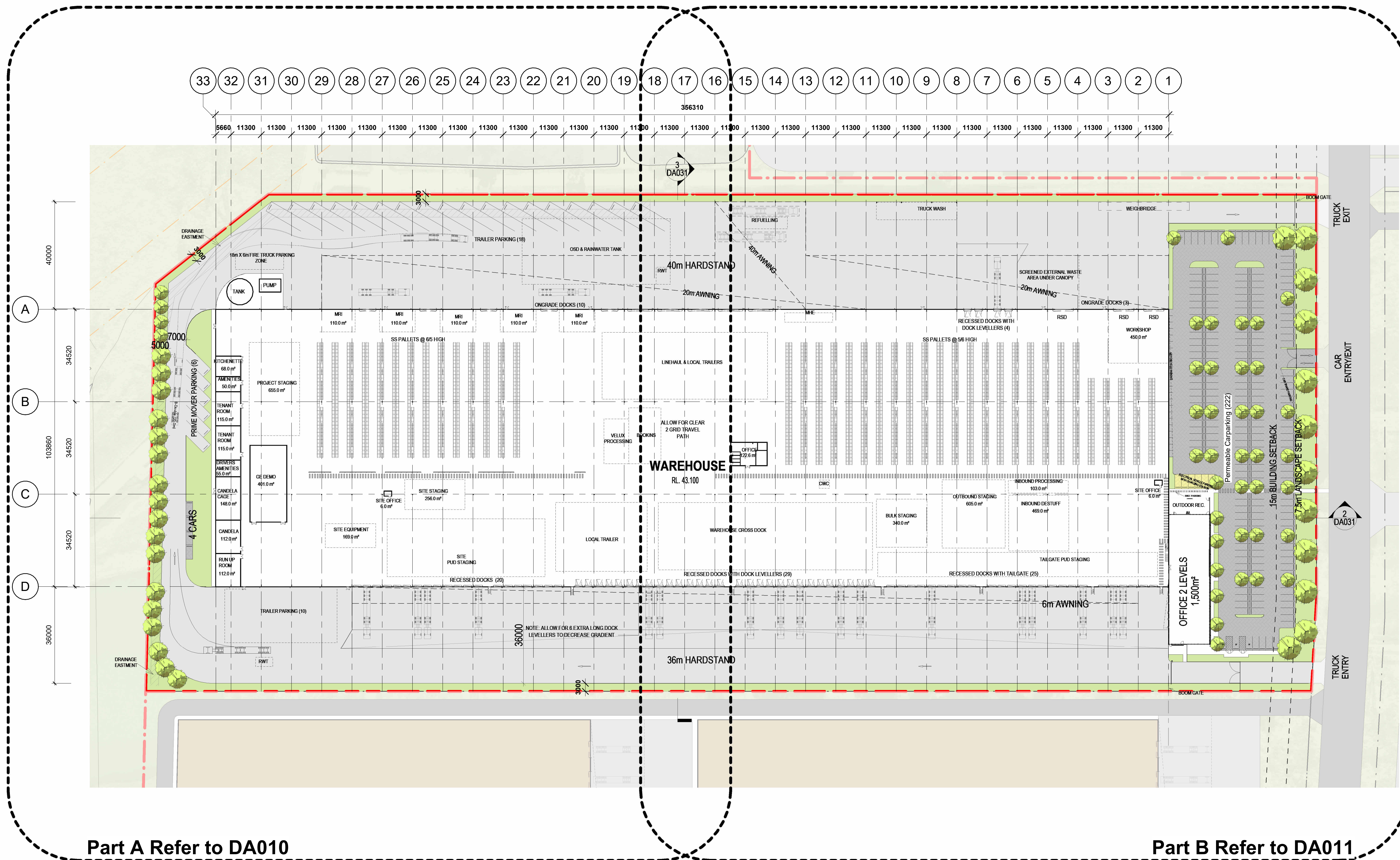
Drawing number
231559_DA_BE01
Revision
04

DRAWING TO BE PRINTED IN COLOUR



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APPENDIX B – Architectural Plans



221-227 Luddenham Road, Orchard Hills NSW	
DAD05	5-Feb-24
SITE AREA (m2)	80,170
Warehouse Area (m2)	37,000
Office Area (m2)	1,500
Total Building Area (m2)	38,500
FSR	0.48:1
Carpark Achieved	222
Heavy Duty Area (m2)	29,636
Light Duty Area (m2)	5,869
Permeable Carpark (m2)	5,869
Landscape Area (m2)	6,138
Total Landscape Area (m2)	12,007
Landscape Rate	15.0%

1 Site Plan



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APPENDIX C – Maintenance Plans



OceanGuard™

Operations & Maintenance Manual

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 Personnel health and safety 3

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Maintenance Services 6

Introduction

The primary purpose of stormwater treatment devices is to capture and prevent pollutants from entering waterways, maintenance is a critical component of ensuring the ongoing effectiveness of this process. The specific requirements and frequency for maintenance depends on the treatment device and pollutant load characteristics of each site. This manual has been designed to provide details on the cleaning and maintenance processes as recommended by the manufacturer.

The OceanGuard technology is a gully pit basket designed to fit within new and existing gully pits to remove pollution from stormwater runoff. The system has a choice of Filtration liners, designed to remove gross pollutants, total suspended solids and attached pollutants as either a standalone technology or as part of a treatment train with our StormFilter or Jellyfish Filtration products. OceanGuard pit baskets are highly effective, easy to install and simple to maintain.

Why do I need to perform maintenance?

Adhering to the maintenance schedule of each stormwater treatment device is essential to ensuring that it functions properly throughout its design life.

During each inspection and clean, details of the mass, volume and type of material that has been collected by the device should be recorded. This data will assist with the revision of future management plans and help determine maintenance interval frequency. It is also essential that qualified and experienced personnel carry out all maintenance (including inspections, recording and reporting) in a systematic manner.

Maintenance of your stormwater management system is essential to ensuring ongoing at-source control of stormwater pollution. Maintenance also helps prevent structural failures (e.g. prevents blocked outlets) and aesthetic failures (e.g. debris build up), but most of all ensures the long term effective operation of the OceanGuard.

Health and Safety

Access to pits containing an OceanGuard typically requires removing (heavy) access covers/grates, but typically it is not necessary to enter into a confined space. Pollutants collected by the OceanGuard will vary depending on the nature of your site. There is potential for these materials to be harmful. For example, sediments may contain heavy metals, carcinogenic substances or sharp objects such as broken glass and syringes. For these reasons, there should be no primary contact with the waste collect and all aspects of maintaining and cleaning your OceanGuard require careful adherence to Occupational Health and Safety (OH&S) guidelines.

It is important to note that the same level of care needs to be taken to ensure the safety of non-work personnel, as a result it may be necessary to employ traffic/pedestrian control measures when the device is situated in, or near areas with high vehicular/pedestrian activity.

Personnel health and safety

Whilst performing maintenance on the OceanGuard pit insert, precautions should be taken in order to minimise (or when possible prevent) contact with sediment and other captured pollutants by maintenance personnel. In order to achieve this the following personal protective equipment (PPE) is recommended:

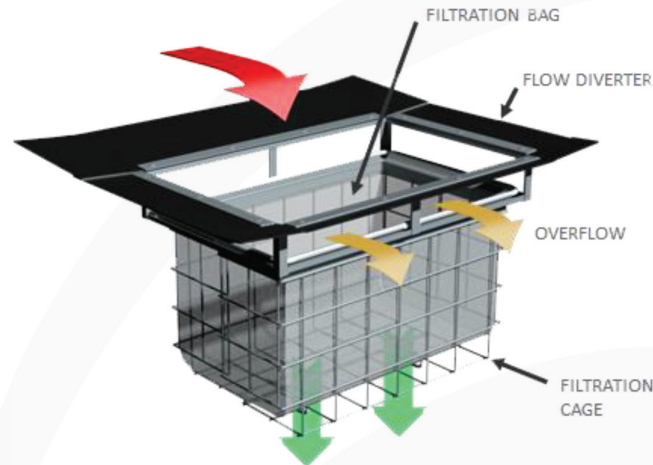
- Puncture resistant gloves
- Steel capped safety boots,
- Long sleeve clothing, overalls or similar skin protection
- Eye protection
- High visibility clothing or vest

During maintenance activities it may be necessary to implement traffic control measures. Ocean Protect recommend that a separate site specific traffic control plan is implemented as required to meet the relevant governing authority guidelines.

The OceanGuard pit insert is designed to be maintained from surface level, without the need to enter the pit. However depending on the installation configuration, location and site specific maintenance requirements it may be necessary to enter a confined space occasionally. It is recommended that all maintenance personnel evaluate their own needs for confined space entry and compliance with relevant industry regulations and guidelines. Ocean Protect maintenance personnel are fully trained and carry certification for confined space entry.

How does it Work?

OceanGuard is designed to intercept stormwater as it enters the stormwater pits throughout a site. The OceanGuard has diversion panels that sit flush with the pit walls, this ensures that as stormwater enters at the top of the pit it is directed to the middle of the insert where the Filtration bag is situated. The filtration bag allows for screening to occur removing 100% of pollutants greater than the opening of the filtration material (200micron, 1600micron bags available).



During larger rain events the large flows overflow slots in the flow diverter of the OceanGuard ensure that the conveyance of stormwater is not impeded thus eliminating the potential for surface flooding. As the flow subsides, the captured pollutants are held in the OceanGuard Filtration bag dry. The waste then starts to dry which reduces the magnitude of organic material decomposition transitioning between maintenance intervals.

Maintenance Procedures

To ensure that each OceanGuard pit insert achieves optimal performance, it is advisable that regular maintenance is performed. Typically the OceanGuard requires 2-4 minor services annually, pending the outcome of these inspections additional maintenance servicing may be required.

Primary Types of Maintenance

The table below outlines the primary types of maintenance activities that typically take place as part of an ongoing maintenance schedule for the OceanGuard.

	Description of Typical Activities	Frequency
Minor Service	Filter bag inspection and evaluation Removal of capture pollutants Disposal of material	2-4 Times Annually
Major Service	Filter Bag Replacement Support frame rectification	As required

Maintenance requirements and frequencies are dependent on the pollutant load characteristics of each site. The frequencies provided in this document represent what the manufacturer considers to be best practice to ensure the continuing operation of the device is in line with the original design specification.

Minor Service

This service is designed to return the OceanGuard device back to optimal operating performance. This type of service can be undertaken either by hand or with the assistance of a Vacuum unit.

Hand Maintenance

1. Establish a safe working area around the pit insert
2. Remove access cover/grate
3. Use two lifting hooks to remove the filtration bag
4. Empty the contents of the filtration bag into a disposal container
5. Inspect and evaluate the filtration bag
6. Inspect and evaluate remaining OceanGuard components (i.e. flow diverter, filtration cage and supporting frame)
7. Rejuvenate filtration bag by removing pollutant build up with a stiff brush, additionally the filtration bag can be washed using high pressure water
8. Re-install filtration bag and replace access cover/grate

Vacuum Maintenance

1. Establish a safe working area around the pit insert
2. Remove access cover/grate
3. Vacuum captured pollutants from the filtration bag
4. Remove filtration bag
5. Inspect and evaluate the filtration bag
6. Inspect and evaluate remaining OceanGuard components (i.e. flow diverter, filtration cage and supporting frame)
7. Rejuvenate filtration bag by removing pollutant build up with a stiff brush, additionally the filtration bag can be washed using high pressure water
8. Re-install filtration bag and replace access cover/grate

Major Service (Filter Bag Replacement)

For the OceanGuard system, a major service is a reactionary process based on the outcomes from the minor service.

Trigger Event from Minor Service	Maintenance Action
Filtration bag inspection reveals damage	Replace the filtration bag ^[1]
Component inspection reveals damage	Perform rectification works and if necessary replace components ^[1]

[1] Replacement filtration bags and components are available for purchase from Ocean Protect.

Additional Reasons of Maintenance

Occasionally, events on site can make it necessary to perform additional maintenance to ensure the continuing performance of the device.

Hazardous Material Spill

If there is a spill event on site, all OceanGuard pits that potentially received flow should be inspected and cleaned. Specifically all captured pollutants from within the filtration bag should be removed and disposed in accordance with any additional requirements that may relate to the type of spill event. All filtration bags should be rejuvenated (replaced if required) and re-installed.

Blockages

The OceanGuards internal high flow bypass functionality is designed to minimise the potential of blockages/flooding. In the unlikely event that flooding occurs around the stormwater pit the following steps should be undertaken to assist in diagnosing the issue and implementing the appropriate response.

1. Inspect the OceanGuard flow diverter, ensuring that they are free of debris and pollutants
2. Perform a minor service on the OceanGuard
3. Remove the OceanGuard insert to access the pit and inspect both the inlet and outlet pipes, ensuring they are free of debris and pollutants

Major Storms and Flooding

In addition to the scheduled activities, it is important to inspect the condition of the OceanGuard pit insert after a major storm event. The inspection should focus on checking for damage and higher than normal sediment accumulation that may result from localised erosion. Where necessary damaged components should be replaced and accumulated pollutants disposed.

Disposal of Waste Materials

The accumulated pollutants found in the OceanGuard must be handled and disposed of in a manner that is in accordance with all applicable waste disposal regulations. When scheduling maintenance, consideration must be made for the disposal of solid and liquid wastes. If the filtration bag has been contaminated with any unusual substance, there may be additional special handling and disposal methods required to comply with relevant government/authority/industry regulations.

Maintenance Services

With over a decade and a half of maintenance experience Ocean Protect has developed a systematic approach to inspecting, cleaning and maintaining a wide variety of stormwater treatment devices. Our fully trained and professional staff are familiar with the characteristics of each type of system, and the processes required to ensure its optimal performance.

Ocean Protect has several stormwater maintenance service options available to help ensure that your stormwater device functions properly throughout its design life. In the case of our OceanGuard system we offer long term pay-as-you-go contracts, pre-paid once off servicing and replacement filter bags.

For more information please visit www.OceanProtect.com.au



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Rainwater Tank– Maintenance Schedule		
Item	Action	Frequency
Roof, gutters and downpipes		
Roof and gutters	Response: Clean roof and gutters. Remove moss, lichen and debris. Information: Leaves and debris may need to be removed from roofs, gutters, first flush devices, tank inlets and outlets monthly where overhanging vegetation is present. Where overhanging vegetation is not present, an annual or 6 monthly clean may be sufficient. Commence with 3 monthly inspections and adjust as required.	6 months
Downpipes and screens	Response: Manual removal of debris. Information: Leaves and debris may need to be removed from roofs, gutters, first flush devices, tank inlets and outlets monthly where overhanging vegetation is present. Where overhanging vegetation is not present, an annual or 6 monthly clean may be sufficient. Commence with 3 monthly inspections and adjust as required.	6 months
First flush device	Response: Manual removal of debris. Information: Leaves and debris may need to be removed from roofs, gutters, first flush devices, tank inlets and outlets monthly where overhanging vegetation is present. Where overhanging vegetation is not present, an annual or 6 monthly clean may be sufficient. Commence with 3 monthly inspections and adjust as required.	6 months
Tank Inlet		
Screen	Response: Remove grate and screen. Clean and repair as required. Information: Remove grate and screen and examine for rust or corrosion, especially at corners or welds. Depending on the type of screen, replacement may be as simple as just placing another screen on the existing fitting with no tools required.	6 months
Tank		
Overflow	Response: Repair overflow as necessary, remove debris and ensure adequate connection to stormwater drain. Information: If the overflow was previously not connected to a stormwater drain, check that erosion has not been caused.	6 months
Body integrity	Response: Remove grate to inspect internal walls. Check the condition of the tank walls and roof to ensure no holes, cracks or spalling have arisen due to tank deterioration. Contact licensed plumber to repair any defects or leaks as necessary. Information: Do not enter tank without confined space certification. Secure any open access covers to prevent risk of entry.	6 months
Base stability	Response: Contact licensed plumber if integrity is questionable. Information: If tank is on a stand or concrete slab, check structural integrity of support.	6 months
Sludge	Response: Siphon the bottom portion of the sediment from the tank or empty and rinse the tank by opening the cleaning outlet and allowing the water and sludge to pass out. Ensure sludge is appropriately disposed of. Information: First flush systems and mesh screens on tank inlets will reduce the amount of sediment and debris entering the tank thereby extending the time required before desludging is needed.	6 months

	For large tanks, it is recommended a professional tank cleaner be employed as confined space entry may be required. Plastic tanks should be tied down prior to being emptied if strong winds are present. Waste must be transported to a waste facility that is appropriately licensed to accept such waste (if there is no opportunity for reuse onsite). A pit is considered a confined space, requiring safety equipment and training.	
Mains backup, flow meter and backflow		
Potable mains backup device	Response: Contact licensed plumber to rectify any malfunction, in line with manufacturer's instructions. Information: A licensed plumber will be able to advise of Sydney Water's requirements.	6 months
Backflow prevention device	Response: Contact licensed plumber to rectify any malfunction, in line with manufacturer's instructions. Information: A licensed plumber will be able to advise of Sydney Water's requirements.	6 months
Flow meter	Response: Contact licensed plumber to rectify any malfunction, in line with manufacturer's instructions. Information: Flow meters are an easy way to tell if the system is working. Frequent flow readings ensure issues are detected early.	6 months
Valves		
Valves	Response: Contact licensed plumber to rectify any malfunction, in line with manufacturer's instructions. Information: A licensed plumber will be able to advise of Sydney Water's requirements.	6 months