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STORMWATER MANAGEMENT REPORT

FOR

PROPOSED DEVELOPMENT

175-177 CLEVELAND STREET

AND 6-8 WOODBURN STREET

REDFERN

Prepared by Richard Yates BE(Hons) MIEAUST NER 620330

SEPTEMBER 2022

Version 2

Ref: 6325SWRPT Version 1: 26/02/2021

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1. INTRODUCTION

This report has been prepared for the Development Approval submission for the proposed new building works at the combined sites of 175-177 Cleveland Street and 6-8 Woodburn Street Redfern.

This report describes the water management cycle for the proposed development at the above address. This report has been prepared to address the requirements of the City of Sydney Council Development Control Plan DCP 2012.

This report describes the assessment methods for determining the quantity of stormwater affected by the development and the quality of the stormwater discharged from the site. It describes the strategy for improving the quality of the discharged water in line with the requirements of the pollution reduction targets nominated in the DCP as well as the On site detention volume required by the DCP.

This report has been prepared for Development Approval submission. This report and the attached drainage drawings may require refinement during assessment and detailed design resolution however the basic concept should remain unchanged.

1.1 Reference Documents

The following documents have been referenced in the design of the Stormwater Management for the site:

- Architectural Drawings prepared by Shapiro Architects
- Survey prepared by RealServe Ref 79177JP dated 7/7/21
- Geotechnical Report prepared by Environmental Investigations Australia Ref E22434 GA 18 March 2015.
- City of Sydney Council DCP 2012
Section 3.7
- City of Sydney Stormwater Drainage Manual February 2017
- Sydney Water On Site Detention Policy Version 1 18/02/2020
- Sydney City Interim Floodplain Management Policy May 2014
- Blackwattle Bay Catchment Flood Study September 2015

2. STORMWATER MANAGEMENT

2.1 Site General Information

The site at 175-177 Cleveland Street and 6-8 Woodburn Street Redfern is located with street frontage to Cleveland Street to the north, Eveleigh Street to the west and Woodburn Street to the east.

A Sydney Trains corridor is located approximately 20m to the east.

The site is located close to the local high point of Cleveland Street being the bridge over the railway.

The site slopes down from north to south and east to west.

Stormwater drainage assets exist in/under the Cleveland Street kerb and gutter. A kerb inlet pit is located in the site frontage at the western side of the block.

The site is currently fully paved or roofed. The stormwater currently discharges from the roof to both Eveleigh Street and Woodburn Street kerbs.

The nearest piped assets for stormwater drainage are in Eveleigh Street to the west the intersection of Eveleigh Street and Hudson Street, a distance of approximately 40 metres.

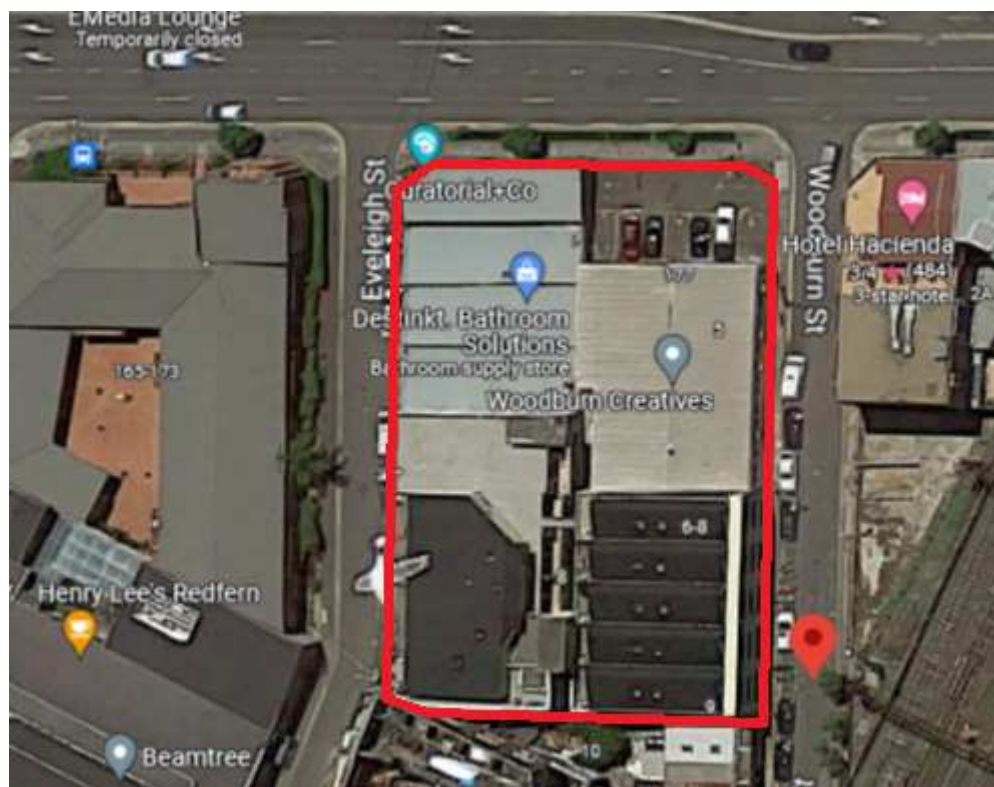


Figure 2.1 Lot and Amalgamated Site Boundaries (Approximate) Photo ex Google Earth

2.2 Council DCP Guidelines

The City of Sydney DCP 2012 nominates controls for the site generally and specifically the controls relating to stormwater management:

DCP Section 3.7 City of Sydney Stormwater Drainage Manual
Sydney Water On Site Detention Policy

3. FLOODING MANAGEMENT

3.1 Reference Documents

The City of Sydney have commissioned WMA Water to undertake a flood study of the Blackwattle Bay catchments. This study investigates the flooding affects on a 35 Hectare area of the City of Sydney LGA that drains either directly or via trunk drainage to Blackwattle Bay.

The flood study is titled:

Blackwattle Bay Catchment Flood Study Final Report dated Sept. 2015

3.2 Flood Study Review

The site is not identified as being flood affected. No specific flood controls are required for this site.

A site specific flood study is not required (Ref DCP2012 3.7.1)

3.3 Council Controls for Floor Levels

While the site is not deemed flood affected, the City of Sydney Interim Floodplain Management Policy of May 2014 identifies a requirement of 300mm clearance above the surrounding surface for entrances to underground carpark. Refer page 14 of the Policy.

4. STORMWATER QUANTITY CONTROL

4.1 General

The object of the stormwater quantity controls is to limit post development discharge peak flows in order to minimise flooding from stormwater run-off due to development. On site detention is usually utilised to manage the peak flows.

4.2 Proposed System

The proposed drainage system is designed to collect and convey water from the impervious surfaces, roof areas and lower courtyard of the development through piped drainage to discharge points in the Eveleigh Street kerb.

Prior to discharge the collected water will be filtered to achieve water pollution reduction targets and retained for a throttled release via On Site Detention (OSD).

Overland flow paths are provided for the major storm events or in the event of system blockages.

There are no existing stormwater drainage pipes within Eveleigh Street. The OSD and ground floor external areas are well below the existing drainage pipe in Cleveland Street.

Discharge to Kerb and Gutter is permitted in the DCP Refer 6.2 of Stormwater Drainage Manual where no trunk drainage exists. There are limitations on the permissible site discharge rate when this option is employed. The OSD volume has been increased to accommodate the reduced PSD nominated by Council.

Automated watering systems for the planters and gardens shall be on a timed system to prevent runoff leaving the site outside the accepted hours of 12am to 4am.

4.3 On Site Detention

On Site Detention is required for a development of this type is determined in the DCP.

The City of Sydney Stormwater Drainage Manual nominates that On Site Detention (OSD) volumes and peak discharges are to be determined by Sydney Water Ref 5.1 of the Manual.

An application was made to Sydney Water for this information via email. The Sydney Water requirements for OSD are as follows:

Minimum Volume	31m ³
Maximum Discharge	74L/s

Discharge is via Kerb and gutter which is permitted under the stormwater policy provided that the PSD is limited to 25L/s. This discharge total consists of the sum of the runoff through the OSD and the ground floor runoff bypassing the OSD.

The PSD of the OSD is limited for the 5% AEP. This requires additional volume of the OSD beyond that nominated by Sydney Water. The Volume of the 5%AEP chamber is 45 cubic metres. This volume discharges into a small discharge chamber at the outlet of the OSD. The internal 45 cubic metre volume overflows into this discharge chamber in the 1% AEP event. Discharge is limited to 74L/s via a second orifice.

Water that accumulates on cars entering the basement or from ingress around edge drains and the like is collected in a pump out pit. The pump out pit discharges to the OSD on a timed float switch. Pump out times are initially restricted to between midnight and 4am to prevent dry weather discharge to kerb and gutter. A high volume float switch will be required to ensure overflow of the tank is prevented.

Dual pumps are provided and an excess storage volume is provided.

4.4 OSD Summary Table

Site Area Total	=	2130 m ²
Impervious Area	=	2030 m ²
Pervious Area	=	100 m ²
Site Storage Requirement (SSD)	=	31 m ³ per Sydney Water
Permissible Site Discharge (PSD)	=	74 L/s per Sydney Water
Permissible Site Discharge (PSD Kerb and Gutter)	=	25L/s (5% AEP)
Area Draining to OSD	=	1630m ²
Area Bypassing OSD	=	400m ²
Peak Discharge of Bypass for 5% AEP	=	9L/s (less than 25L/s)
Peak Discharge for OSD for 5% AEP	=	16L/s
Peak Discharge of OSD plus Bypass for 5% AEP	=	25L/s for 5% AEP
Orifice Size for stage 1 OSD	=	63mm
OSD Peak Discharge 1% AEP	=	74L/s
Orifice size for second stage OSD	=	140mm

4.5 Pipeline Modelling (DRAINS)

The internal drainage (roof downpipes and balcony drainage) has been set out conceptually and will be subject to refinement during design development in concert with other services and structure. The Drainage train has been simply modelled in DRAINS to confirm OSD volumes and discharge rates for the minor storm event (5% AEP and 25L/s) and the major storm event (1% AEP).

The drains model has incorporated the catchment area that currently drains to the OSD basin and the area bypassing the OSD. The volume required in the DRAINS model is larger than that nominated by Sydney Water given the reduction in the PSD to kerb and gutter. The drains data and outputs are included in the appendix of this report.

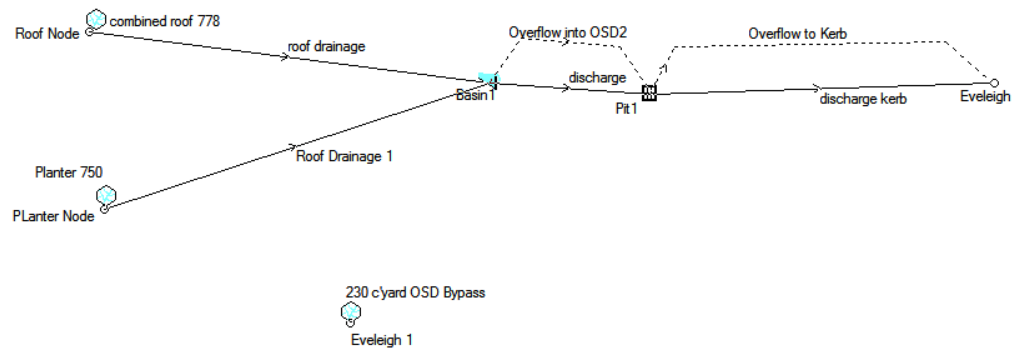


Figure 4.1 DRAINS Model Screen shot

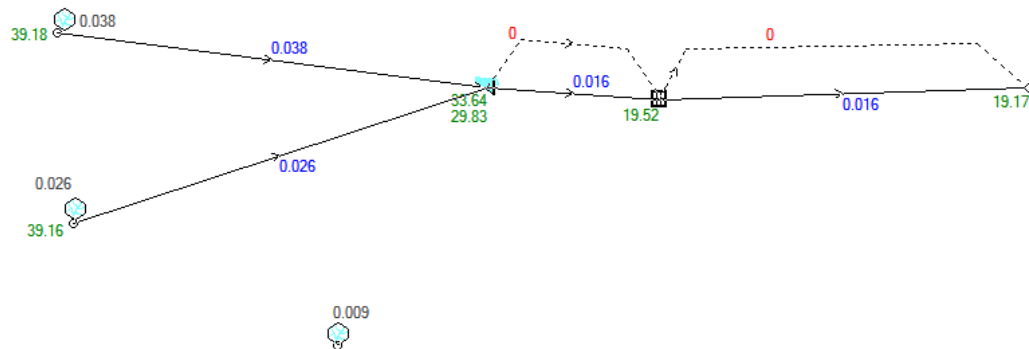


Figure 4.2 DRAINS Model Screen shot AEP 5% Flows

5. STORMWATER QUALITY CONTROL

5.1 General

City of Sydney DCP 2012 (3.7.3) nominates that sites of area exceeding 1000m² shall satisfy the pollution reduction targets nominated in the DCP. This pollution reduction is achieved through inclusion of Water Sensitive Urban Design principles (WSUD).

The Water Sensitive Urban Design Approach is aimed at maintaining the water quality standards prescribed in the DCP through the life of the development without imposing undue cost on the building owner.

For pollution protection during construction, a silt and sedimentation plan is provided to isolate the excavated works that are prone to silt laden runoff.

5.2 Controls

The proposed WSUD treatment train for the site incorporates the following measures:

Spel Stormsack filters for ground level pits: These proprietary items consist of a fine micron mesh inserted into inlet pits to filter water at the pit, the ground floor drains. The drop in baskets contain a high flow bypass.

The drop in baskets are readily accessible for maintenance and are modelled in MUSIC. 5 were nominated in the MUSIC model for the purposes of costing.

Filter systems such as Spelfilter cartridges within the OSD (As modelled) contain filter cartridges designed to absorb nutrient loads and sediment. The filter systems are scaleable to suit volume demands and maintained yearly through replacement of removable filter cartridges.

The Spel Stormsacks require annual cleaning and flushing. Spelfilter Cartridges require annual maintenance with filter replacements every 3-5 years to maintain performance.

Access to the OSD is required to maintain the Spelfilter cartridges, therefore location beneath the access grates in the roof of the OSD.

Manufacturer's details are included in the appendix of this report. Equivalent systems can be utilised where the performance requirements are met.

5.3 Modelling Procedure

The Treatment train is modelled using MUSIC software (Model for Urban Stormwater Conceptualisation) provided by ewater.

Music modelling parameters as set out in the City of Sydney WSUD Technical Guidelines

The pollutant reduction targets as nominated in SYDNEY DCP 2012-3.7.3 are as follows:

- 90% reduction in the post development baseline annual pollutant load of total gross pollutants
- 85% reduction in the post development mean annual load of total suspended solids
- 65% reduction in the post development mean annual load of total phosphorous
- 45% reduction in the post development mean annual load of total nitrogen

Proprietary systems where proposed have been modelled using manufacturers supplied music node data.

The Music modelling confirms the reduction targets can be met utilising the WSUD approach nominated

The modelling has been verified through MusicLink for City of Sydney Council. This is attached to the appendix.

6. WSUD RESULTS

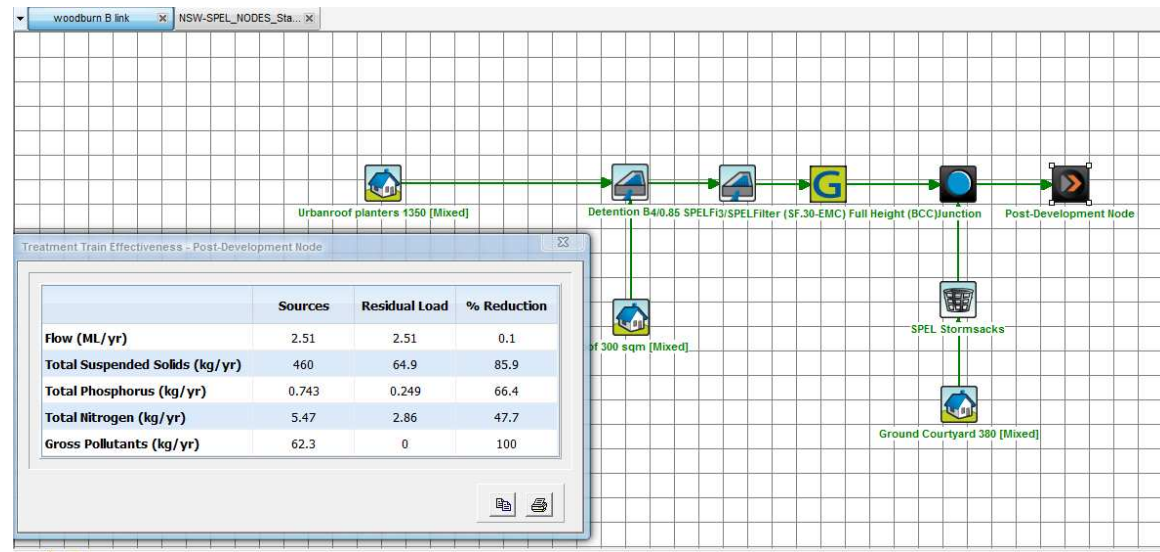


Figure 6.1 MUSIC Screenshot with results.

This screenshot illustrates the treatment train for the site along with the compliance with the pollution reduction targets.

7. SUMMARY

The required On Site Detention tank is located at the lowest point in the site to facilitate drainage through the kerb and gutter into Eveleigh Street.

A small area of site bypasses the OSD and discharges into the kerb and gutter.

The total site discharge for the 1%AEP is limited to that nominated by Sydney Water. The kerb discharge is limited to a rate acceptable to City of Sydney Council (25L/s for the 5%AEP). The OSD volume provided exceeds the requirements of Sydney Water in order to maintain the low discharge rate for Kerb discharge.

WSUD measures consisting of filter drains and an in tank filter cartridge meet the pollution reduction targets required by the DCP and are verified through MUSIC Link.

APPENDIX

1. SURVEY
2. STORMWATER CONCEPT DRAWINGS
3. SYDNEY WATER EMAIL ADVICE OSD
4. MUSIC LINK VERIFICATION
5. DRAINS DATA
6. WSUD FILTER DATA SHEETS

APPENDIX 1:

SURVEY

APPENDIX 2:

STORMWATER CONCEPT DRAWINGS

APPENDIX 3:

SYDNEY WATER EMAIL ADVICE OSD

APPENDIX 4:

MUSIC LINK VERIFICATION



NOTES:

NOTES:

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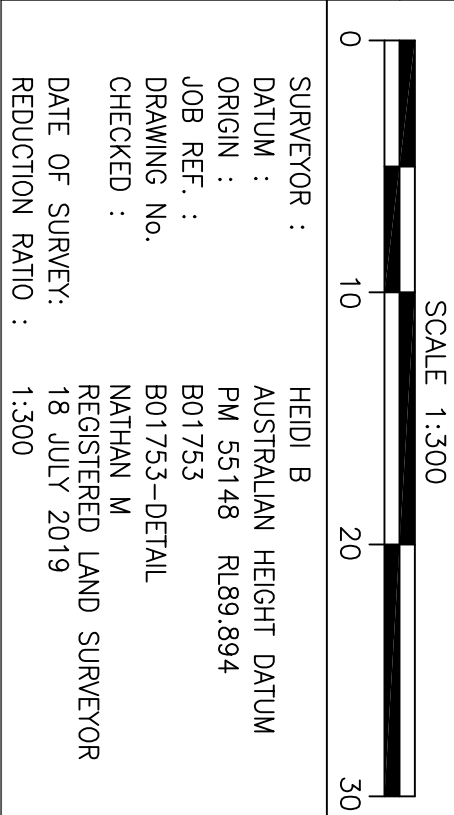
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- ELP - ELECTRIC LIGHT POLE
HYD - HYDRANT
INV - INVERT KERB
TK - TOP KERB
PP - POWER POLE
SMH - SEWER MANHOLE
SP - SIGN POST
SV - STOP VALVE
TEL - TELSTRA PIT
PC - PRAM CROSSING
VC - VEHICLE CROSSING
WM - WATER METER



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REV	AMENDMENTS DATE

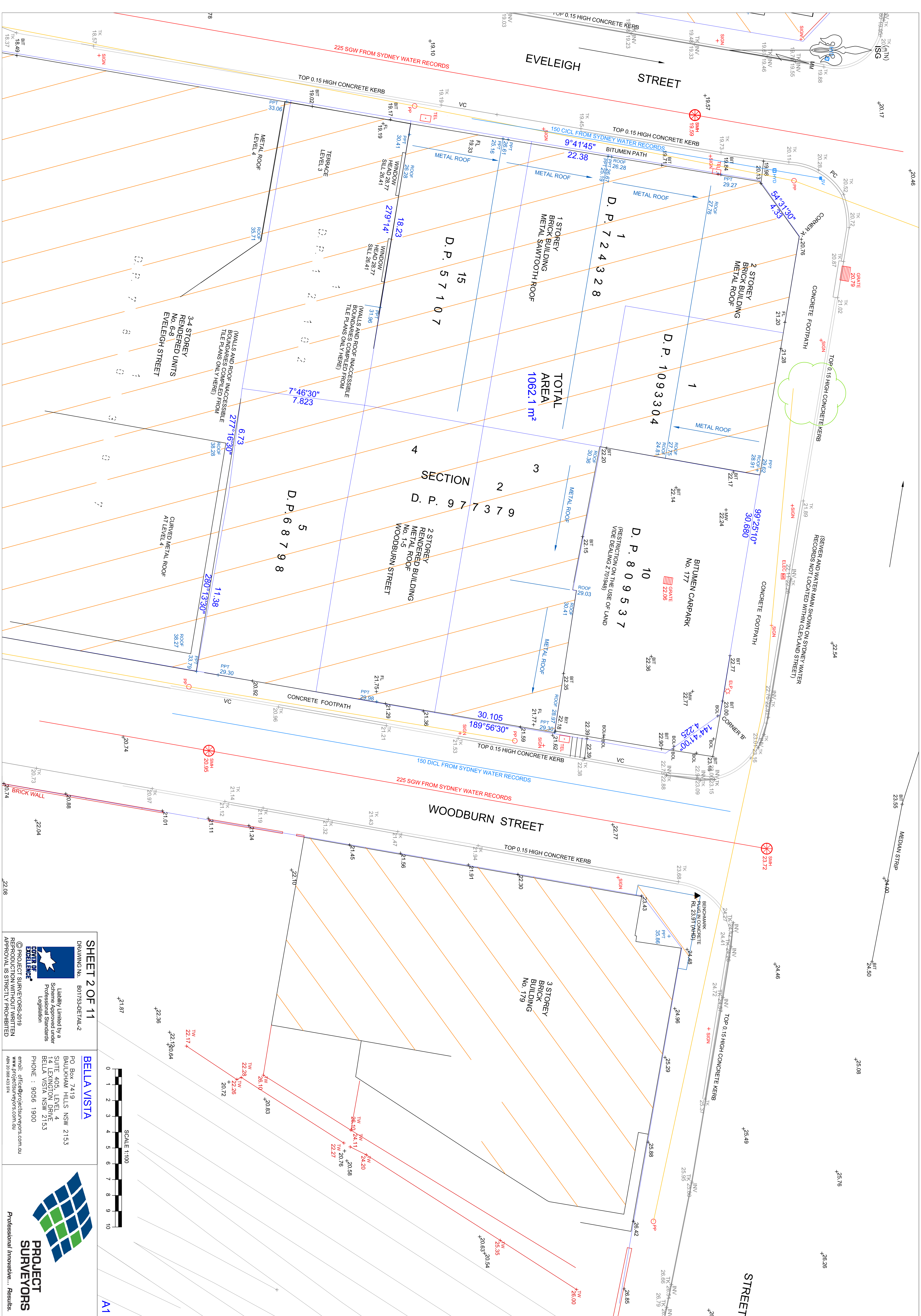
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PLAN OF: CLEVELAND STREET
REDTERRN
BEING: MULTIPLE LOTS
SHOWING: GENERAL DETAIL AND
SITE LEVELS
PURPOSE: ARCHITECTURAL DESIGN
COUNCIL SUBMISSION
SHEET 1 OF 11

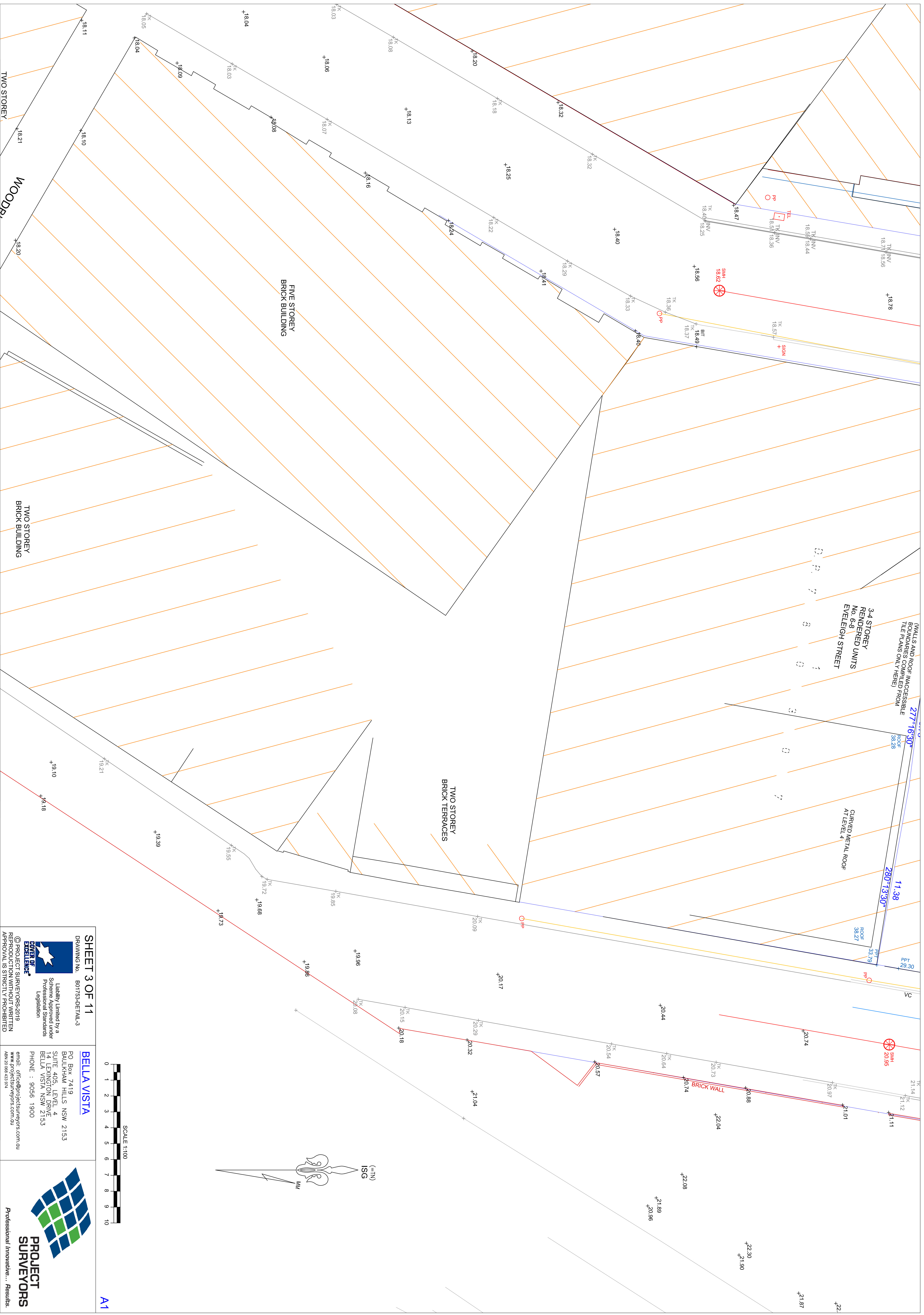


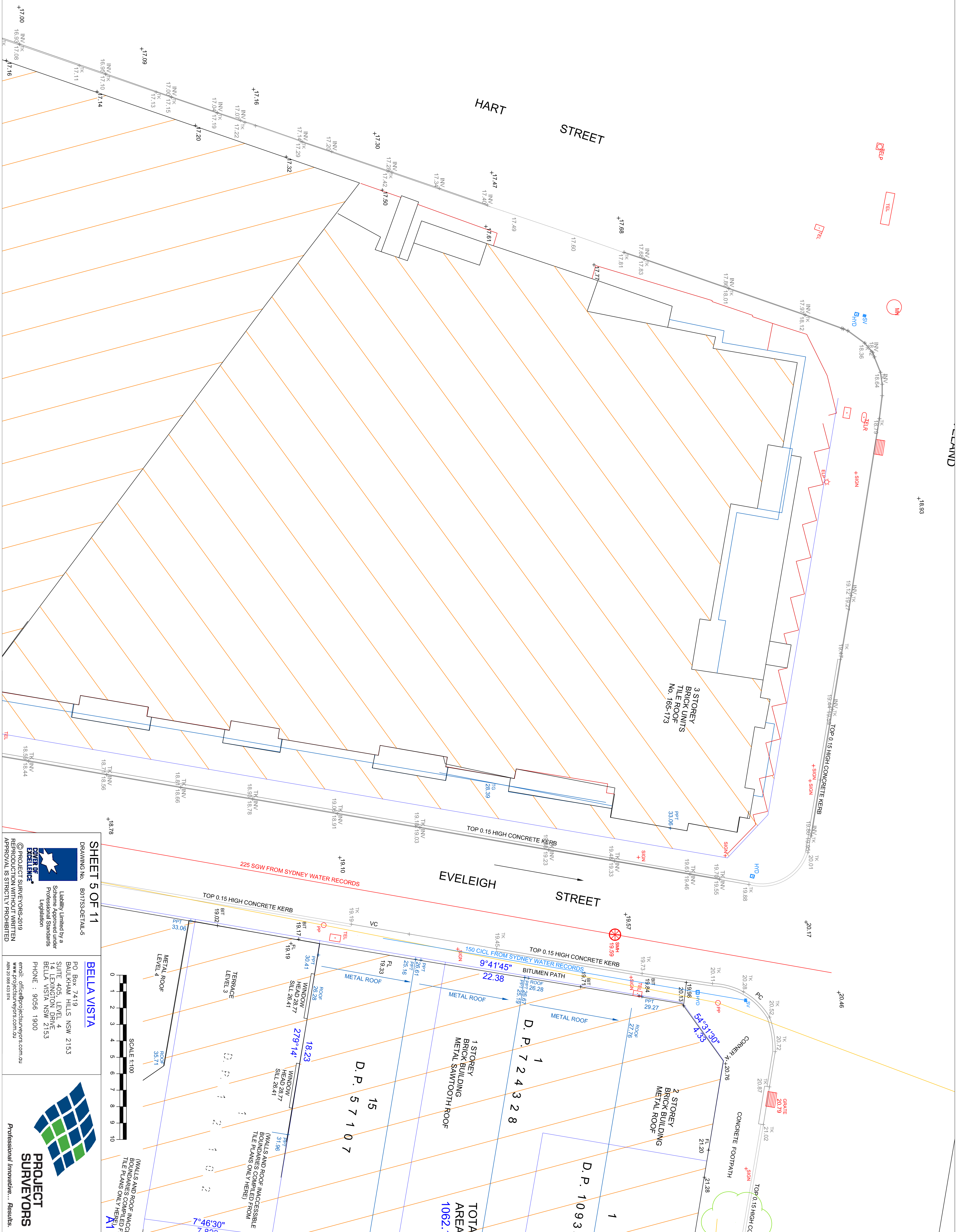
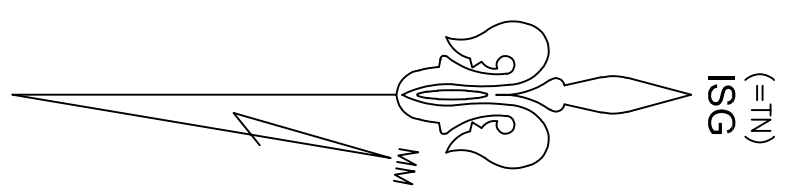
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BAULKHAM HILLS NSW 2153
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14 LEXINGTON DRIVE
BELLA VISTA NSW 2153
PHONE : 9056 1900

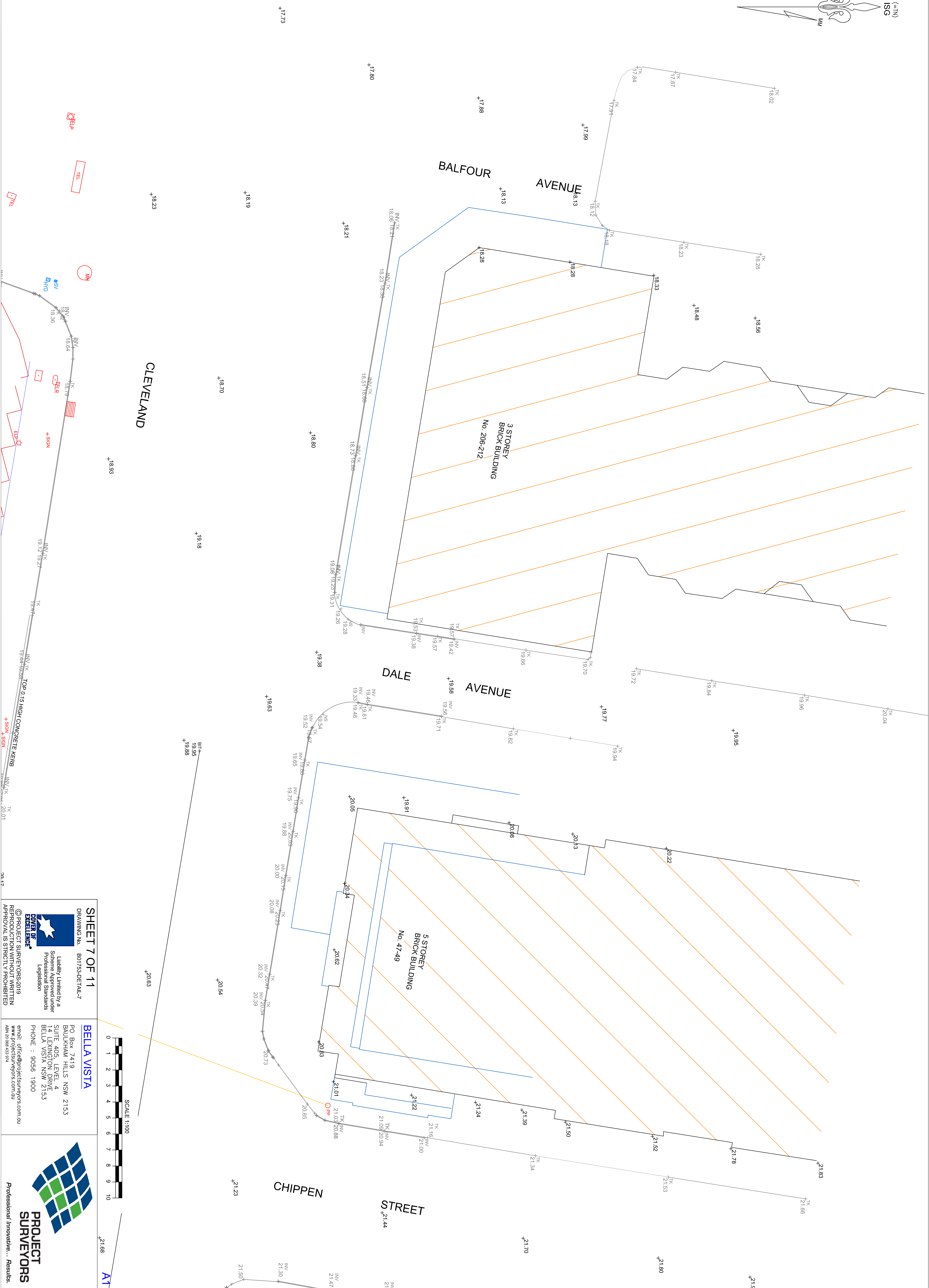
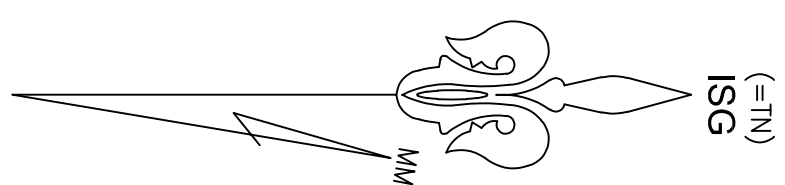
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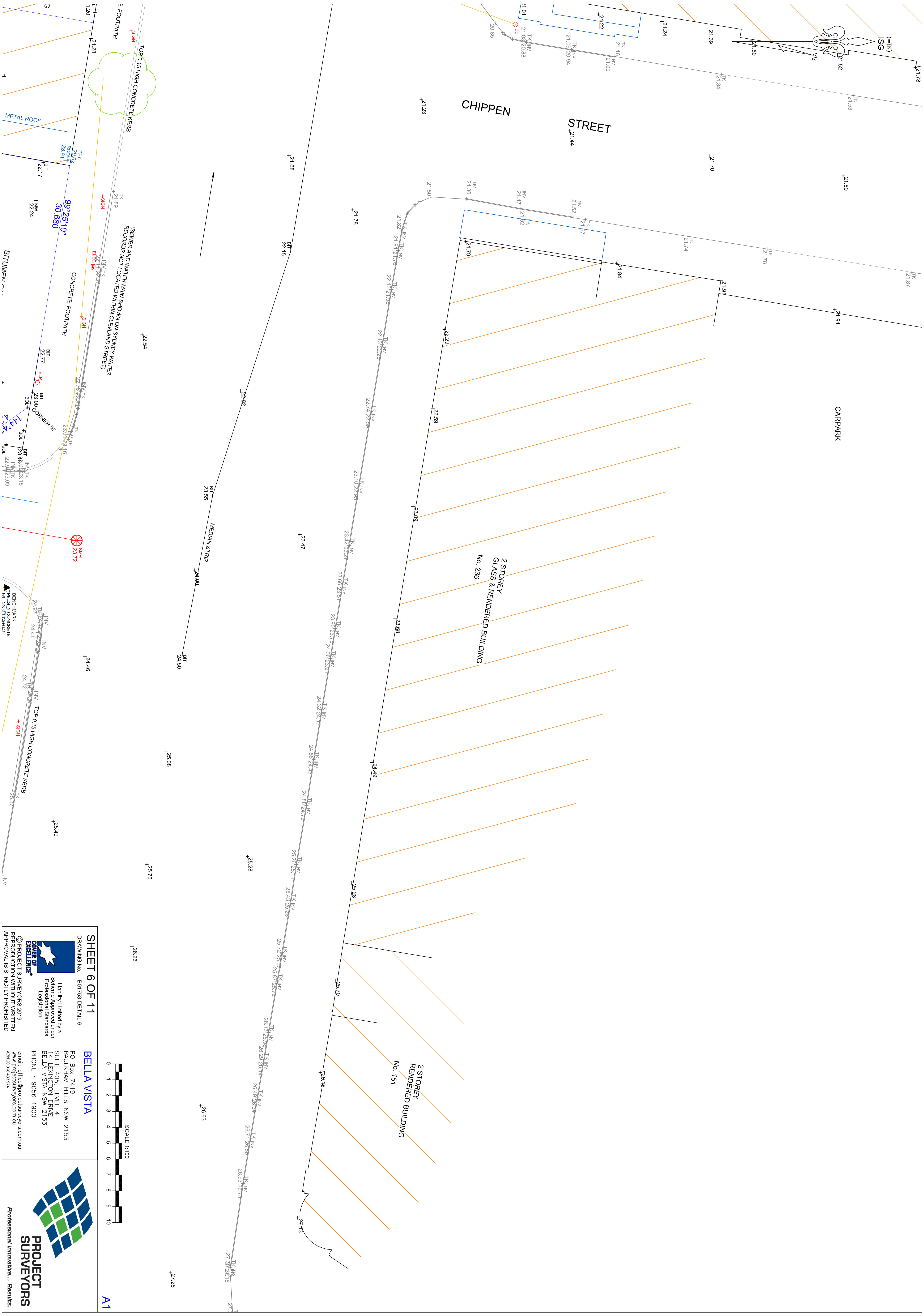


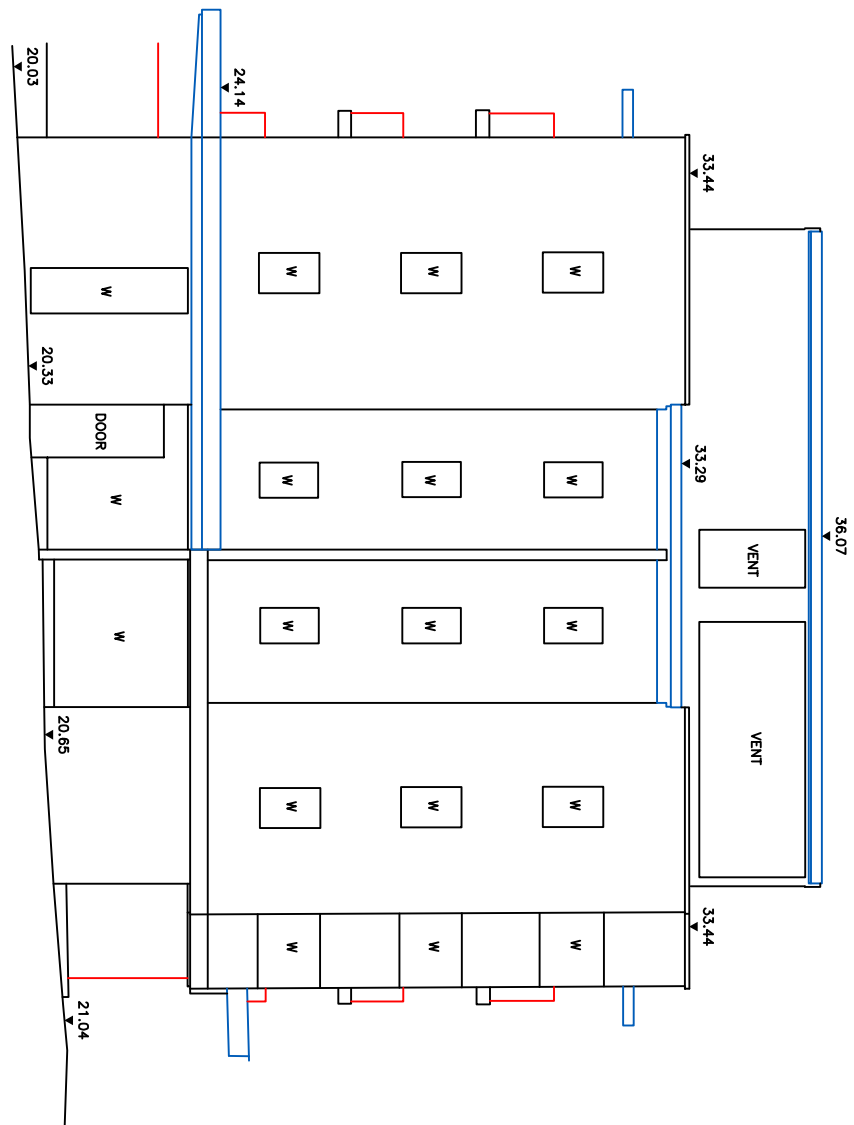






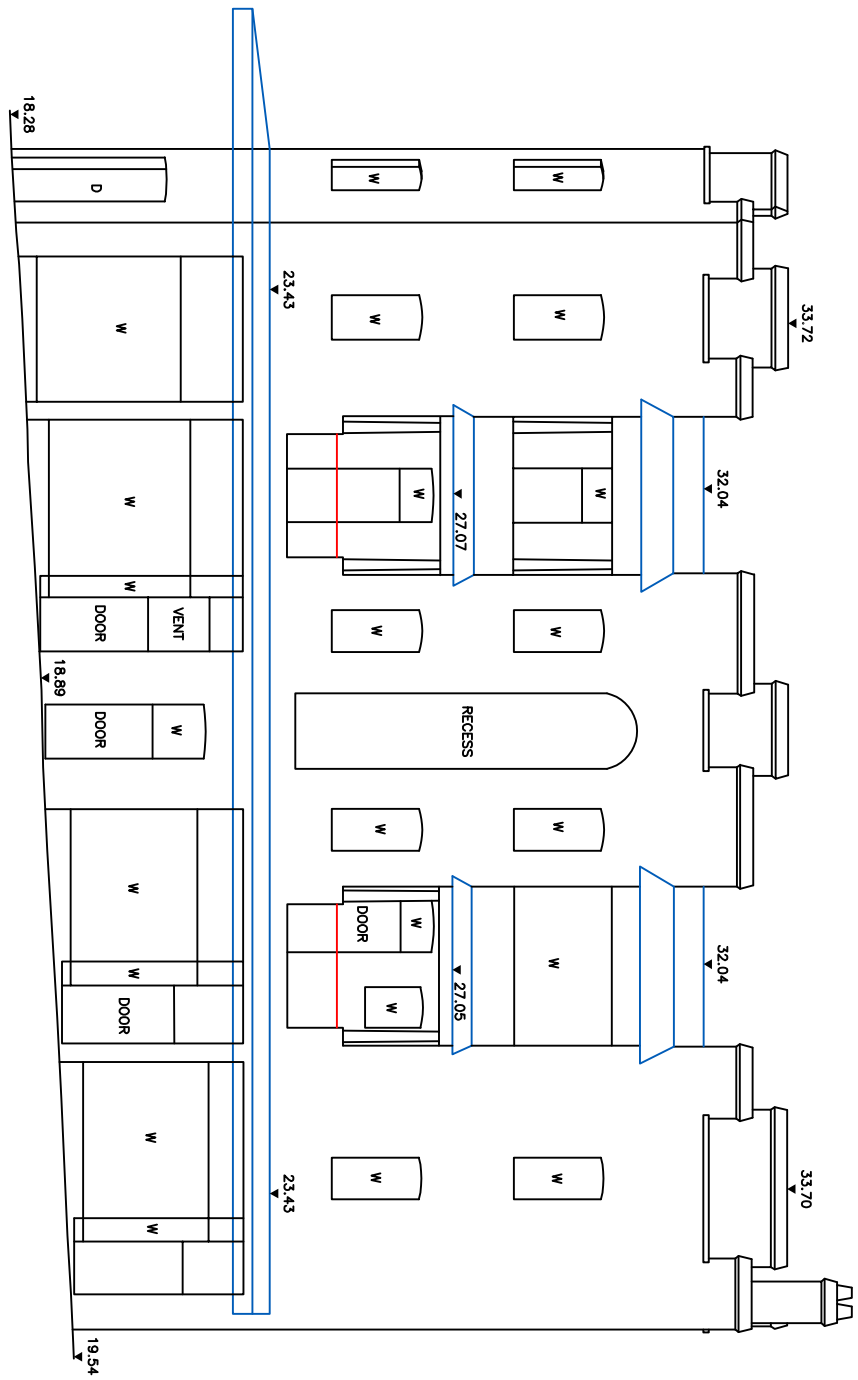






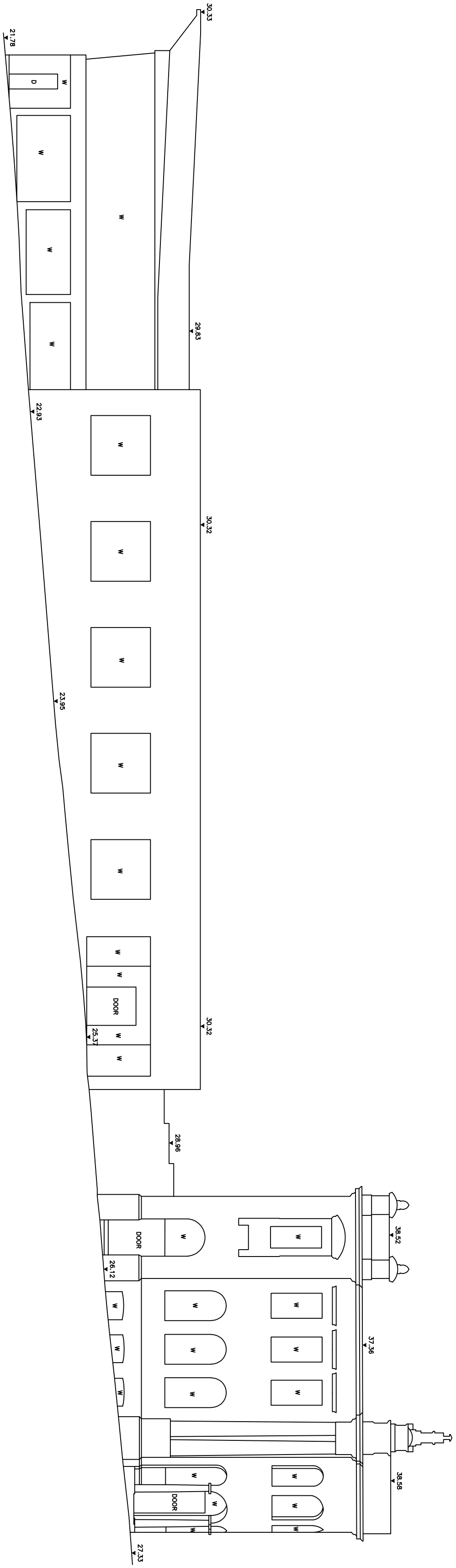
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SOUTH – 49 CHIPPEN STREET



DATUM LINE RL: 5.0

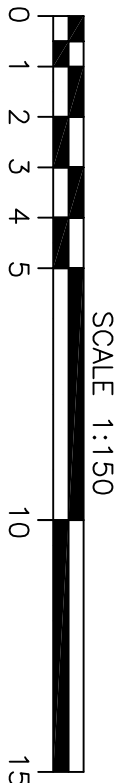
SOUTH – 212 CLEVELAND STREET



DATUM LINE RL: 5.0

SOUTH – 232 CLEVELAND STREET

SCALE 1:150



A1

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W - WINDOW

SHEET 8 OF 11
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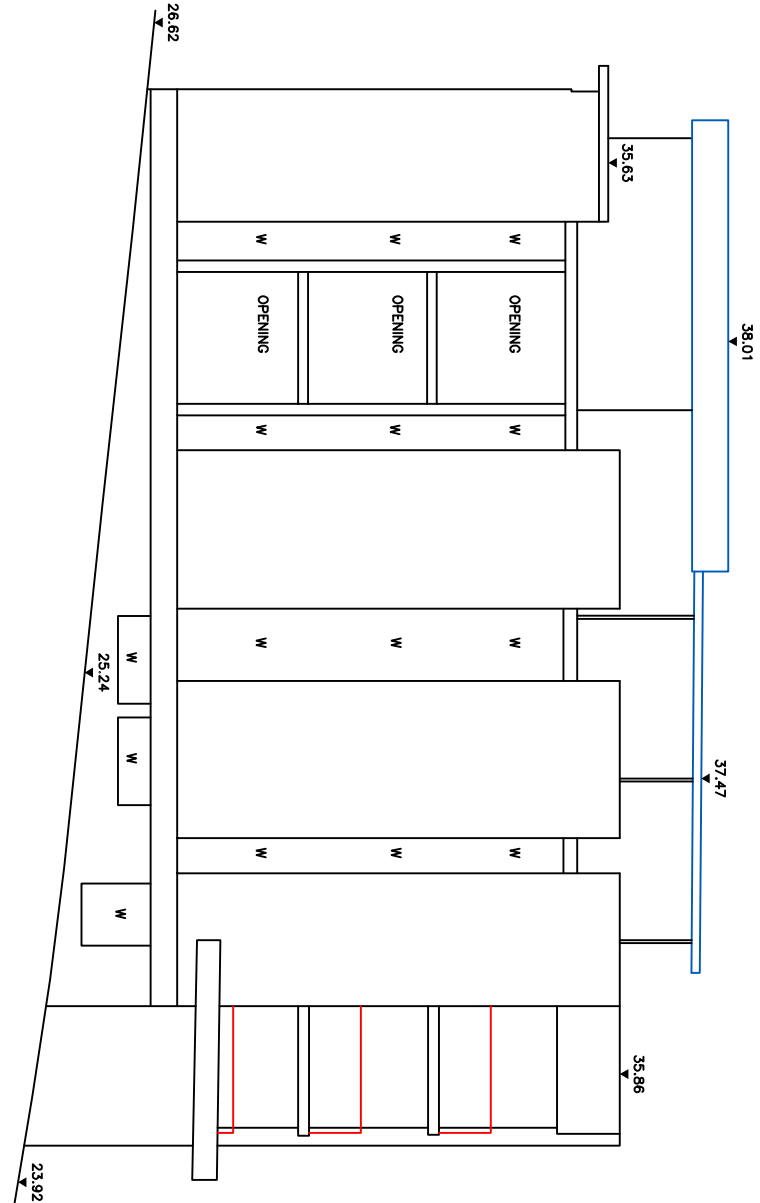
BELLA VISTA

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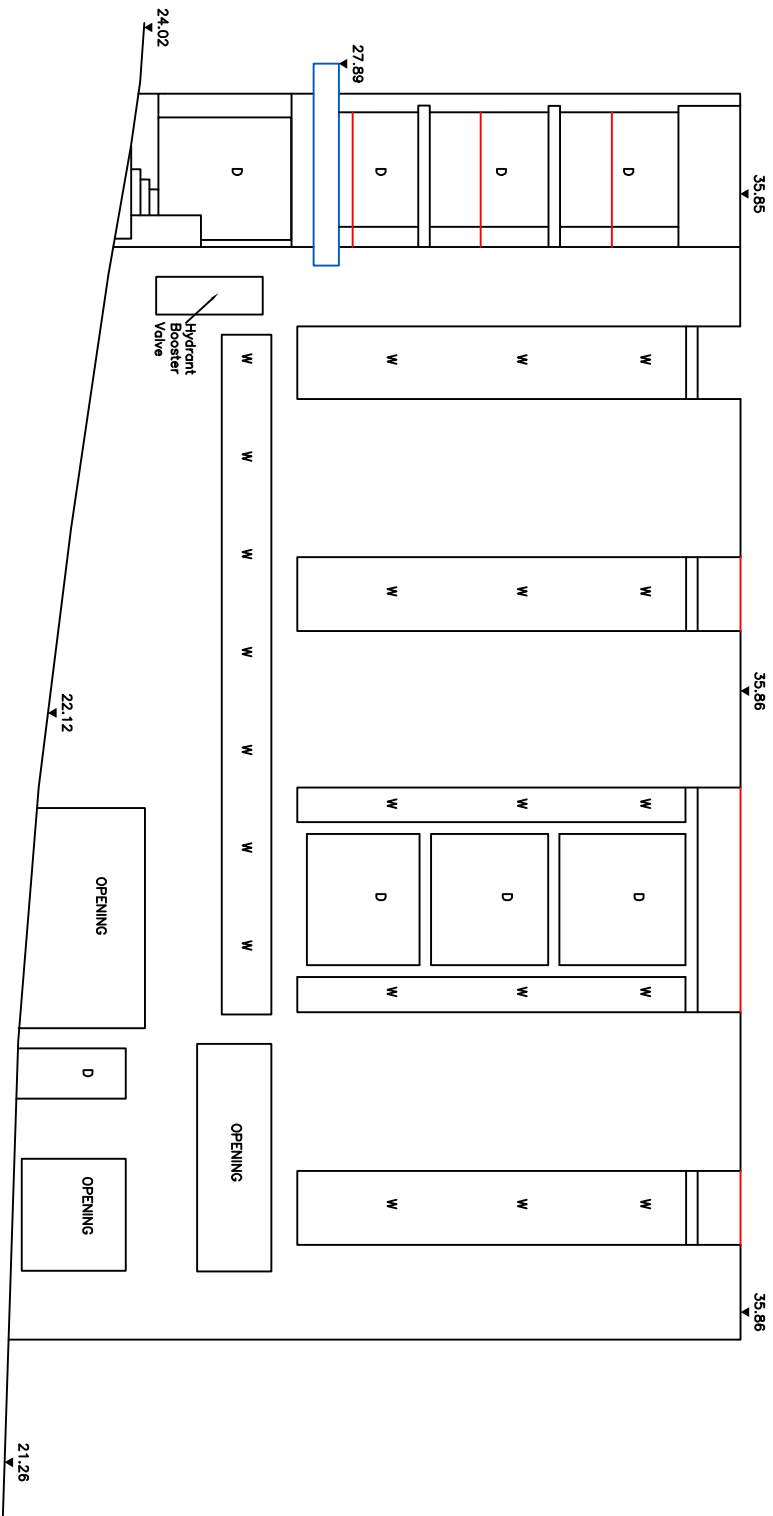
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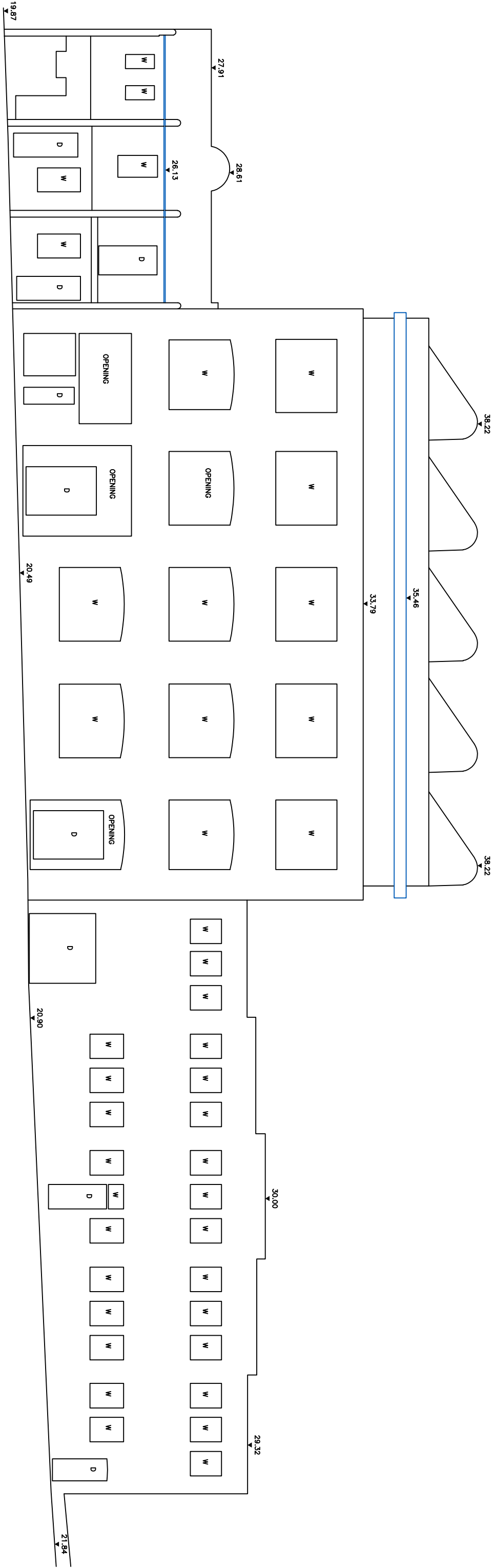
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Professional Innovation... Results.



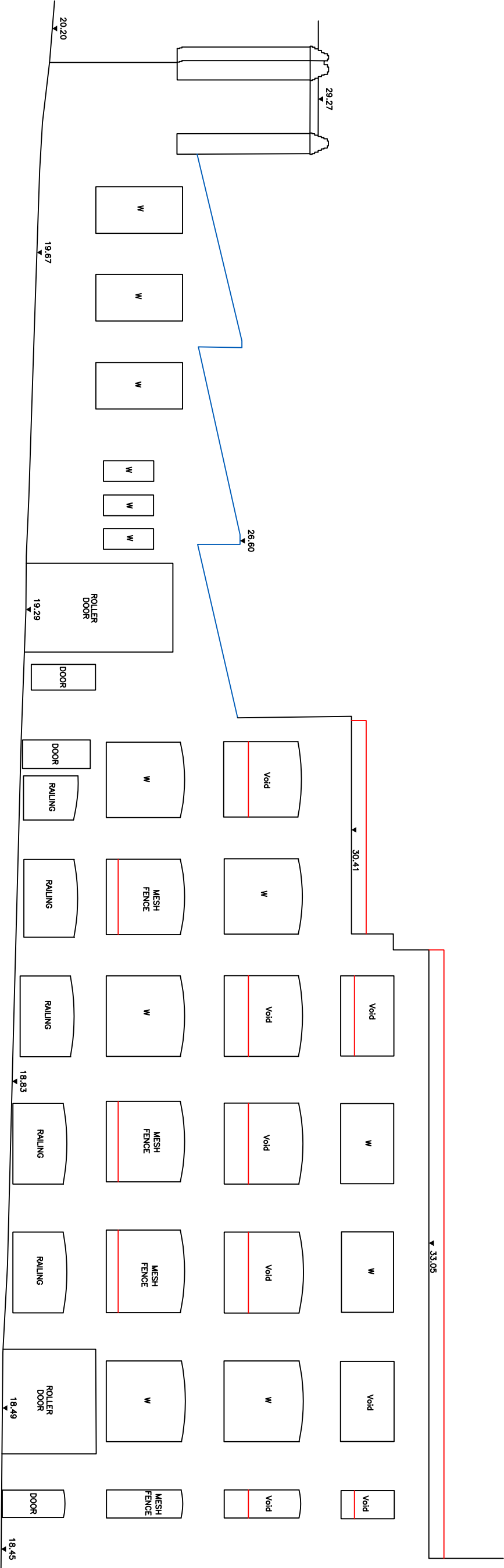
NORTH – 179 CLEVELAND STREET



WEST – 179 CLEVELAND STREET



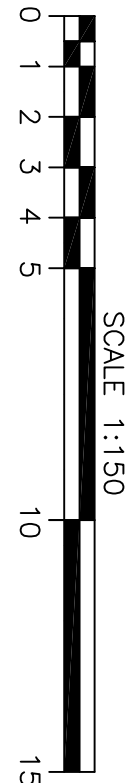
EAST – 6–8 WOODBURN STREET



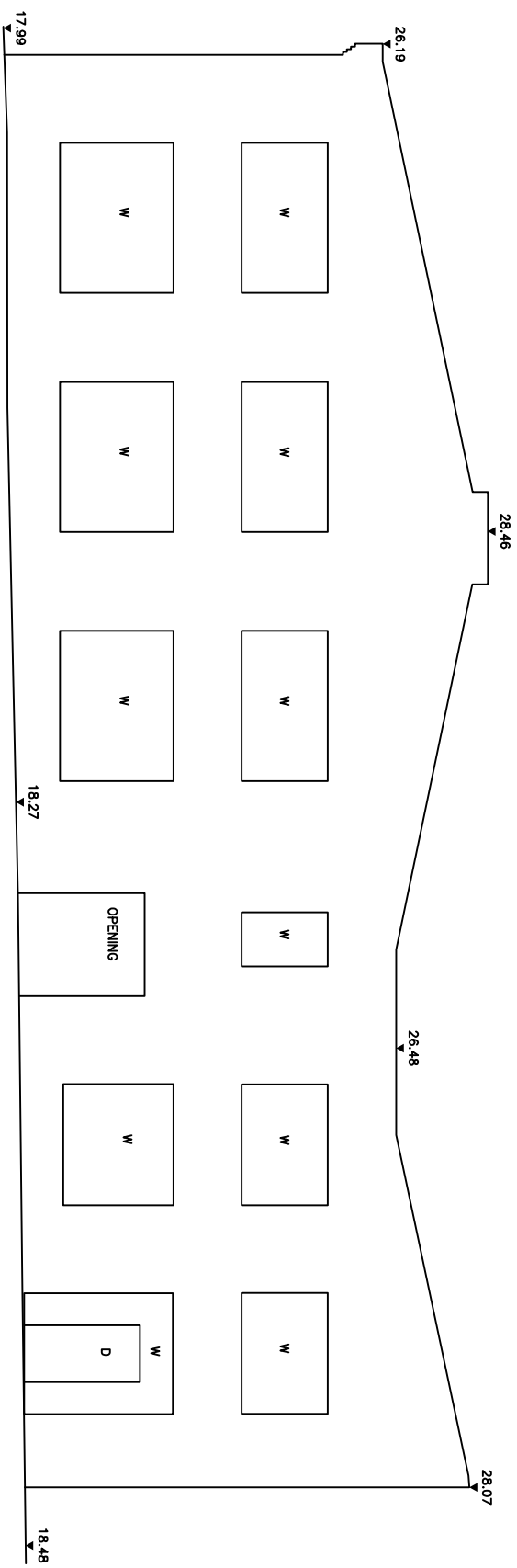
WEST – 6–8 WOODBURN STREET

LEGEND
D - DOOR
W - WINDOW

SCALE 1:150

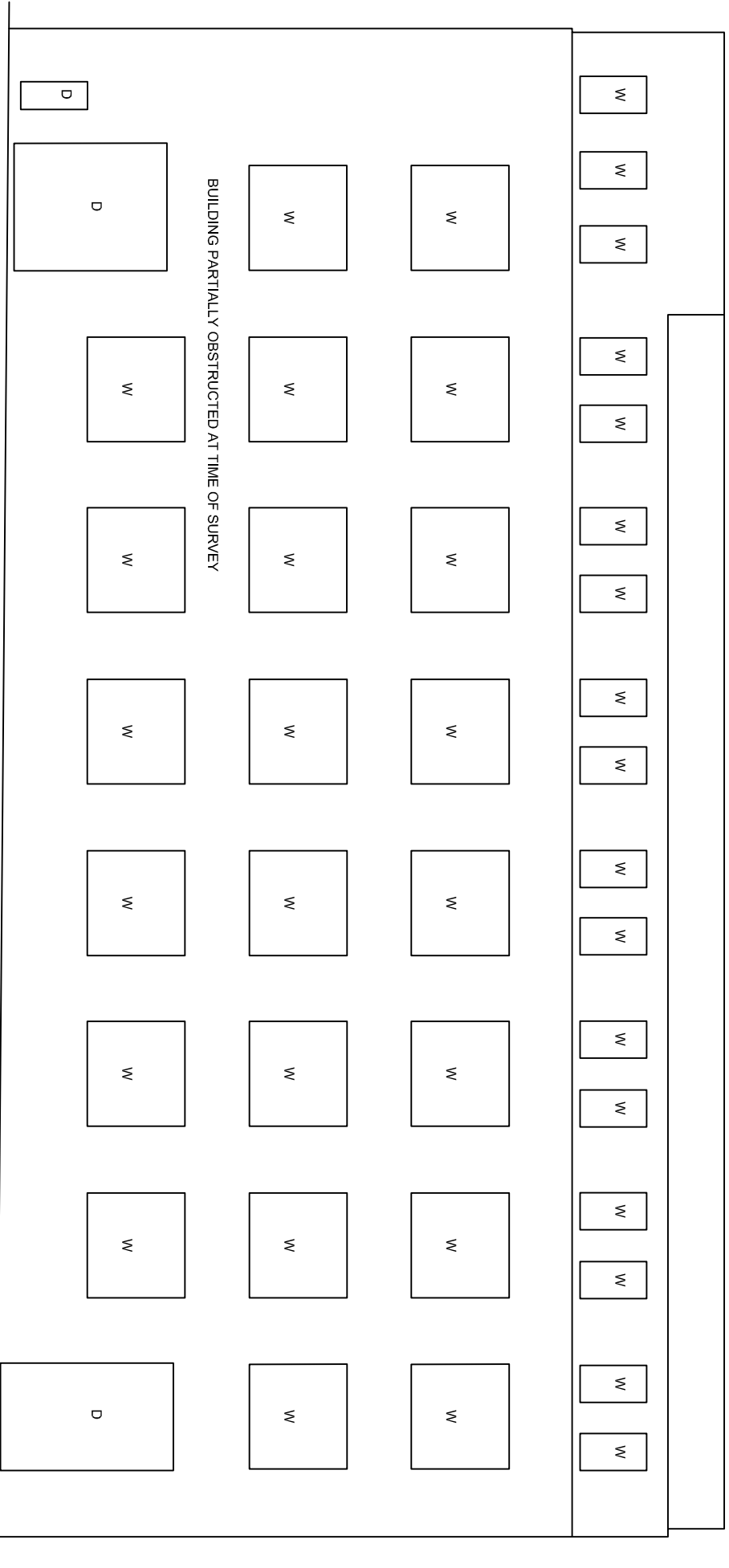


A1



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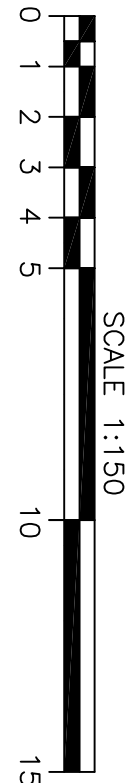
EAST – 16 EVELEIGH STREET



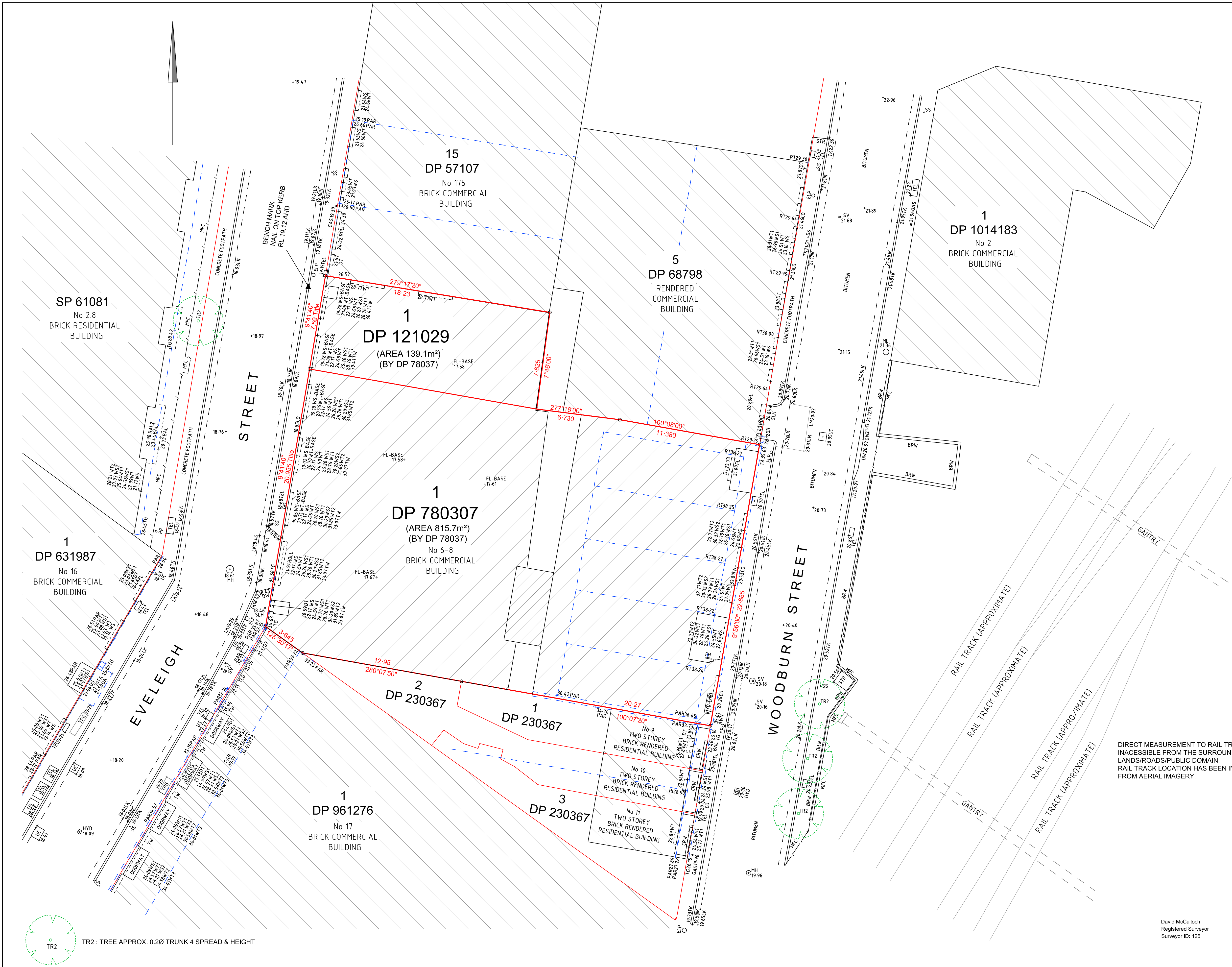
DATUM LINE RL: 5.0

WEST – 13 EVELEIGH STREET

LEGEND
D - DOOR
W - WINDOW



A1



GENERAL / SPECIFIC NOTES

THESE NOTES ARE AN INTEGRAL PART OF THIS PLAN. THE INFORMATION SHOWN ON THIS PLAN OR IN THE ASSOCIATED CAD FILE IS SUPPLIED ON THE CONDITION THAT THESE GENERAL NOTES ARE ALWAYS SHOWN/KEPT ON ANY COPY OR EXTRACT OF THE HARD COPY/DATA FILE.

LEVELS ARE BASED ON AUSTRALIAN HEIGHT DATUM (AHD) THE ORIGIN OF WHICH IS PM 46916 RL 28.577 AHD (SOURCE: SCIMS 06-07-2021).

THE LOCATION OF PROPERTY BOUNDARIES HAVE BEEN COMPILED FROM SURVEY MEASUREMENTS & REGISTERED PLANS OBTAINED FROM NSW LAND REGISTRY SERVICES & REPRESENT TITLE DIMENSIONS.

ANY CONSTRUCTION OR WORKS RELYING ON CRITICAL SETBACKS FROM BOUNDARIES WILL REQUIRE ADDITIONAL BOUNDARY SURVEY & PLACEMENT OF BOUNDARY/SETOUT MARKS PRIOR TO COMMENCEMENT OF ANY WORKS. REALSERVE WILL NOT BE HELD RESPONSIBLE FOR ANY ISSUES RESULTING FROM NON COMPLIANCE WITH THIS ADVICE.

NO EASEMENTS HAVE BEEN INVESTIGATED OR SHOWN AS PART OF TIS SURVEY.

REFER TO THE SUBJECT CERTIFICATES OF TITLE AND DEPOSITED PLANS FOR THE LOCATION & NATURE OF ANY EASEMENTS, RESTRICTIONS OR COVENANTS

THE LOCATION OF ADJOINING BUILDING/LAND FEATURES HAVE BEEN OBTAINED WHERE VISIBLE FROM THE SUBJECT PROPERTY & PUBLIC DOMAIN. ANY ADDITIONAL INFORMATION REQUIRED IS SUBJECT TO ADDITIONAL SURVEY & ACCESS BEING GRANTED TO ADJOINING PROPERTIES.

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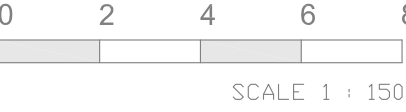
THE RECORDS OF THE SERVICE AUTHORITIES HAVE NOT BEEN INVESTIGATED. ONLY THOSE SERVICES VISIBLE / APPARENT AT THE TIME OF SURVEY HAVE BEEN SHOWN.

SCHEDULE OF ABBREVIATIONS

- APPROX. - APPROXIMATE
AWN - AWNING
BAL - BALCONY
BASE - BASEMENT
BIT - BITUMEN
BRW - BRICK RETAINING WALL
CO - CONCRETE
CRW - CONCRETE RETAINING WALL
DT - DOOR TOP
DW - DRIVEWAY
ELP - POWER POLE/LIGHT
FHR - FIRE HOSE REEL
FL - FLOOR LEVEL
GAS - GAS LID
GB - GUTTER BOX
HYD - HYDRANT
IK - INVERT KERB
INV - INVERT PIT
LK - LIP KERB
LM - LINE MARKING (APPROX SPACING)
MFC - METAL FENCE
MH - MANHOLE (SERVICE)
PAR - PARAPET
PP - POWER POLE
RI - ROOF RIDGE (APPROX)
ROLL - ROLLER SHUTTER
RT - ROOF TOP (APPROX.)
SLH - SEWER LAMP HOLE
SS - SIGNAGE
STR - STAIR
SV - STOP VALVE
TA - TOP AWNING
TEL - TELSTRA/COMMS LID-PIT
TG - TOP GUTTER (APPROX HEIGHT)
TK - TOP KERB (GENERALLY 0.15 HIGH)
TPG - TPG PIT
TW - TOP WALL
UA - UNDERSIDE AWNING
UC - UNCLASSIFIED SERVICES
US - UNDERSIDE STRUCTURE
WS - WINDOW SILL
WT - WINDOW TOP
1 - FIRST FLOOR
2 - SECOND FLOOR

DIRECT MEASUREMENT TO RAIL TRACKS IS INACCESSIBLE FROM THE SURROUNDING LANDS/ROADS/PUBLIC DOMAIN. RAIL TRACK LOCATION HAS BEEN INTERPOLATED FROM AERIAL IMAGERY.

David McCulloch
Registered Surveyor
Surveyor ID: 125



Australia New Zealand		Building Measurement Specialist Consulting Land Surveyors 3D Laser Scanning		DATE	REV	COMMENTS	PLAN PREPARED FOR: EG FUNDS MANAGEMENT	DATUM : A.H.D	SCALE : 1:150 @ A1	DATE : 07-07-2021	DESCRIPTION: PLAN SHOWING SELECT FEATURE & LEVELS OVER LOT 1 IN DP 780307, LOT 1 DP 121029 & ADJACENT LANDS No. 6-8 WOODBURN STREET, REDFERN NSW
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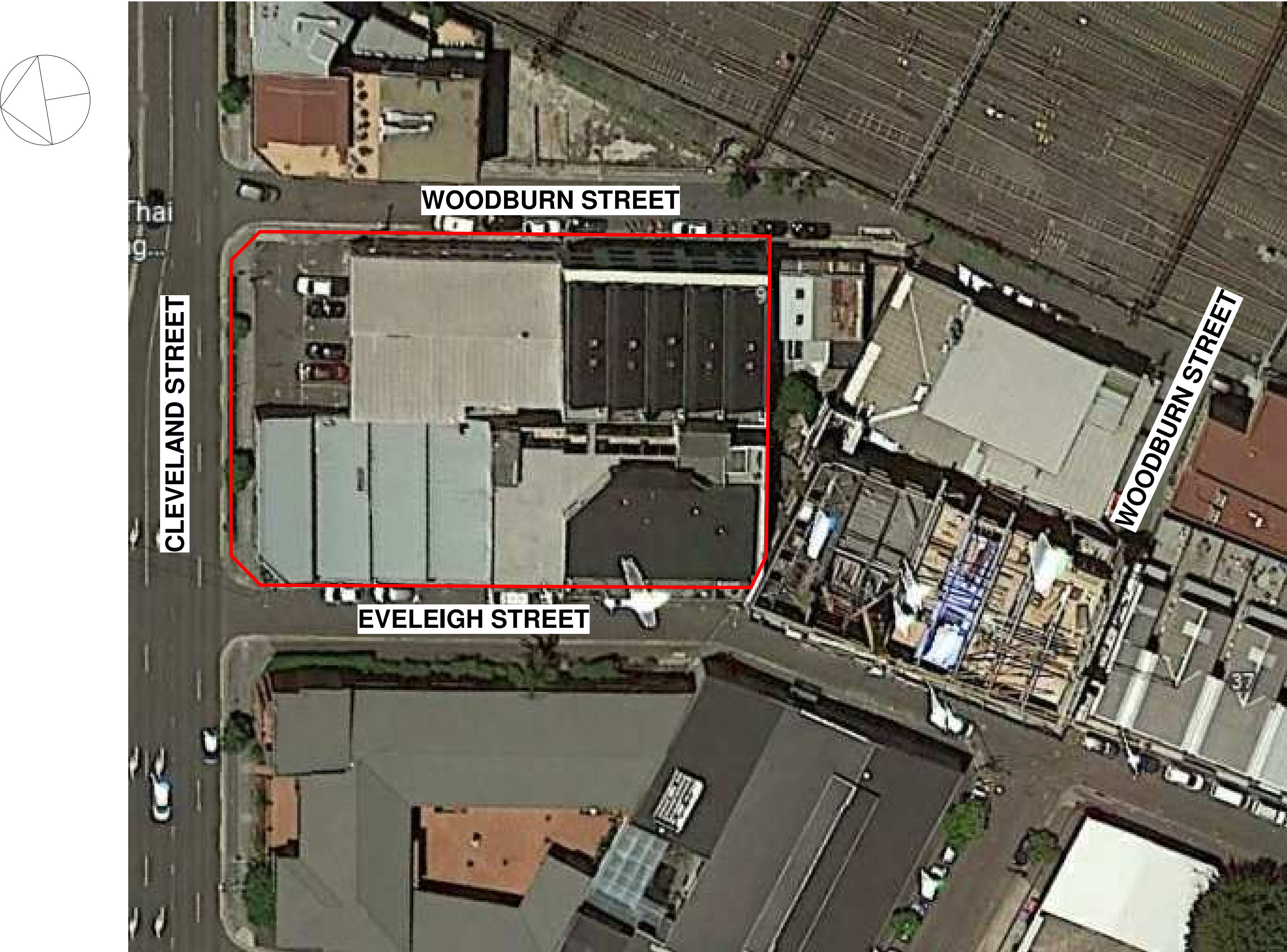
DOCUMENTATION OF CIVIL WORKS

PROPOSED CO-LIVING DEVELOPMENT

175-177 CLEVELAND STREET & 6-8 WOODBURN STREET, REDFERN

JAMES TAYLOR AND ASSOCIATES

SUITE 301, 115 MILITARY ROAD NEUTRAL BAY NSW 2089 A.C.N. 002 376 454
Tel: (02) 9969 1999 Email: mail@jamestaylorassociates.com.au



LOCALITY PLAN

GENERAL

- G1.

THESE DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DOCUMENTS INCLUDING ALL WORKING DRAWINGS, MAIN CONTRACT, SPECIFICATIONS AND WRITTEN INSTRUCTIONS AS MAY BE ISSUED PRIOR TO OR DURING THE COURSE OF CONSTRUCTION. ALL DISCREPANCIES AND VARIATIONS SHALL BE REFERRED TO THE ENGINEER BEFORE PROCEEDING WITH THE WORK.
- G2.

ALL CIVIL WORK SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF ALL RELEVANT AND CURRENT S.A.A. CODES.
- G3.

CIVIL DRAWINGS SHALL NOT BE SCALED IN ORDER TO OBTAIN DIMENSIONS. DIMENSIONS WHERE SHOWN ON CIVIL DRAWINGS SHALL BE CO-ORDINATED WITH ALL OTHER RELEVANT DRAWINGS.
- G4.

DURING CONSTRUCTION, THE STRUCTURE SHALL BE MAINTAINED IN A STABLE CONDITION AND NO PART SHALL BE OVERSTRESSED.

STORMWATER NOTES

1.
- ALL STORMWATER WORKS ARE TO BE UNDERTAKEN GENERALLY IN ACCORDANCE WITH AS 3500 (LATEST EDITION) STORMWATER DRAINAGE.
2.
- UNLESS OTHERWISE APPROVED ALL DRAINAGE PIPES SHALL BE APPROVED SPIGOT AND SOCKET RCP PIPES WITH RUBBER RING JOINTS, CLASS '2'.
3.
- ALL PIPE JUNCTIONS UP TO AND INCLUDING 450DIA AND ALL TAPERS SHALL BE VIA PURPOSE MADE FITTINGS.
4.
- THE CONTRACTOR IS TO SUPPLY AND INSTALL ALL FITTINGS AND SPECIALS INCLUDING VARIOUS PIPE ADAPTORS TO ENSURE PROPER CONNECTION TO DISSIMILAR PIPEWORK.
5.
- ALL CONNECTIONS TO EXISTING DRAINAGE PITS SHALL BE MADE IN A TRADESMAN-LIKE MANNER AND THE INTERNAL WALL OF THE PIT AT THE POINT OF ENTRY SHALL BE CEMENT RENDERED WITH A NON SHRINK EPDXY GROUT TO ENSURE A SMOOTH FINISH.
6.
- STEP IRONS AT SPACINGS OF 0.3M ARE TO BE PROVIDED IN DRAINAGE PITS MORE THAN 1.0M DEEP.
7.
- PROVIDE 3.0M LENGTH OF 100DIA SUBSOIL DRAINAGE PIPE WRAPPED IN FABRIC SOCK AT UPSTREAM END OF EACH PIT.
8.
- ALL CONCRETE USED IN DRAINAGE PITS SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 32MPA.
9.
- THE EXCAVATED TRENCH WIDTH FOR PIPE LAYING MUST BE AT LEAST 300mm WIDER THAN THE OUTER DIAMETER OF THE PIPE. PIPES ARE TO BE LAID CENTRALLY WITHIN THE EXCAVATED TRENCH.
10.
- ALL PIPES ARE TO BE LAID ON A MINIMUM BEDDING OF 75mm OF SAND GRADED IN ACCORDANCE WITH AS 3500.3 (LATEST EDITION). BEDDING SHALL BE COMPACTED TO AT LEAST 90% OF THE MAXIMUM DRY DENSITY.
11.
- BACKFILL FOR STORMWATER PITS AND PIPES SHALL BE COMPACTED TO AT LEAST 95% (98% UNDER ROADS) OF THE MAXIMUM DRY DENSITY AND GRADED IN ACCORDANCE WITH AS 3500.3 (LATEST EDITION).
12.
- BACKFILL MATERIAL SHALL BE INSPECTED AND APPROVED BY THE SUPERINTENDENT PRIOR TO PLACING AND COMPACTION.
13.
- UNLESS OTHERWISE SPECIFIED PIPE TRENCH TO BE TYPE H2.
14.
- THE CONTRACTOR SHALL ENSURE THAT ANY EXISTING STRUCTURES LOCATED ADJACENT TO EXCAVATED TRENCHES ARE SUPPORTED OR PROTECTED TO PREVENT DAMAGE TO OR MOVEMENT OF THESE STRUCTURES
15.
- UNLESS SPECIFIED ALL DRAINAGE GRATES TO BE CLASS C HEAVY DUTY GALVANISED MILD STEEL TO AS 3996 (LATEST EDITION).
16.
- CHASES SHALL BE FORMED WHERE NECESSARY TO PREVENT SOCKETS, FLANGES OR THE LIKE FROM BEARING ON THE TRENCH BOTTOM OR THE UNDERLAY.
17.
- MATERIAL SHALL BE PLACED IN THE PIPE SURROUND IN LAYERS NOT MORE THAN 200mm LOOSE THICKNESS AND COMPACT WITHOUT DAMAGING OR DISPLACING THE PIPEWORK. CARE TO BE TAKEN IN VICINITY OF EXISTING SERVICES.
18.
- UPVC PIPES SHALL CONFORM IN ALL RESPECTS WITH THE REQUIREMENTS OF AS1254 (LATEST EDITION). THE CLASS OF PIPES SHALL BE UPVC "STORMWATER HD" DESIGNED FOR SOLVENT WELD SPIGOT AND SOCKET CONNECTION UNLESS NOTED OTHERWISE.
19.
- UPVC PIPES SHALL BE SUPPLIED WITH SUFFICIENT QUANTITIES OF SOLVENT FOR MAKING OF THE PIPE JOINTS.
20.
- UPVC PIPES SHALL BE TRANSPORTED, HANDLED AND STACKED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
21.
- UPVC PIPE LAYING SHALL BEGIN AT THE DOWNSTREAM END OF THE LINE WITH THE SOCKET END OF THE PIPE FACING UPSTREAM. WHEN THE PIPES ARE LAID, THE BARREL OF EACH PIPE SHALL BE IN CONTACT WITH THE BEDDING MATERIAL THROUGHOUT ITS FULL LENGTH.
22.
- THE UPVC PIPE ENDS SHALL BE THOROUGHLY CLEANED BEFORE THE JOINT IS MADE. JOINTING SHALL BE IN ACCORDANCE WITH THE MANUFACTURERS DIRECTIONS USING JOINTING SOLVENT AND PRIMER.

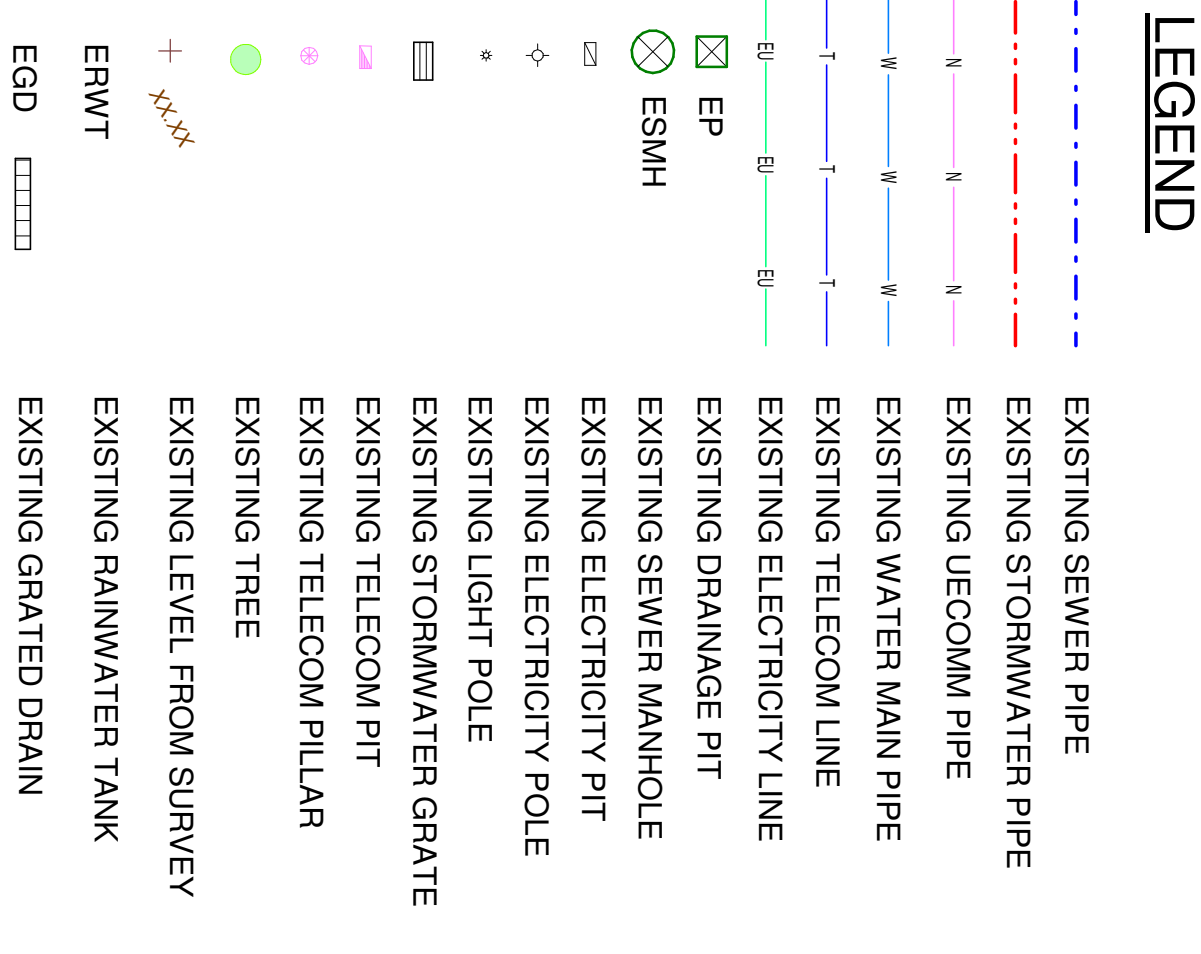
DRAWING LIST

Sheet Number	Sheet Name
C01	COVER SHEET
C05	SITE PLAN
C06	EXISTING SERVICES PLAN
C10	STORMWATER CATCHMENT PLAN - SITE
C11	STORMWATER DRAINAGE PLAN - BASEMENT
C12	PUMP OUT PIT DETAILS
C13	STORMWATER DRAINAGE PLAN - GF
C14	STORMWATER DRAINAGE PLAN - LEVEL 1
C15	STORMWATER DRAINAGE PLAN - LEVEL 2
C16	STORMWATER DRAINAGE PLAN - LEVEL 3
C17	STORMWATER DRAINAGE PLAN - LEVEL 4
C18	STORMWATER DRAINAGE PLAN - LEVEL 5
C19	STORMWATER DRAINAGE PLAN - LEVEL 6
C20	STORMWATER DRAINAGE PLAN - ROOF
C21	STORMWATER SECTIONS SHEET 1
C30	SILT & SEDIMENT CONTROL PLAN

						ARCHITECT MARK SHAPIRO ARCHITECTS markshapiro.com.au EMAIL mark@markshapiro.com.au PHONE 0421 996 467	CLIENT EG FUNDS MANAGEMENT ADDRESS LEVEL 21, GOVERNOR PHILLIP TOWER, 1 FARRER PLACE, SYDNEY, 2000	PROJECT PROPOSED CO-LIVING DEVELOPMENT 175-177 CLEVELAND ST & 6-8 WOODBURN ST, REDFERN	James Taylor & Associates Civil & Structural Consulting Engineers SUITE 301, 115 MILITARY ROAD NEUTRAL BAY NSW 2089 A.B.N. 33 102 603 558 TEL: 02 9969 1999 EMAIL: mail@jamestaylorassociates.com.au	DESIGN RY CHKD. APPRD. SCALE As indicated	DRAWN HL	PROJECT NO. 6394 DRAWING NO. C01	REV A
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BY	CHKD	DESCRIPTION	DATE	REV									

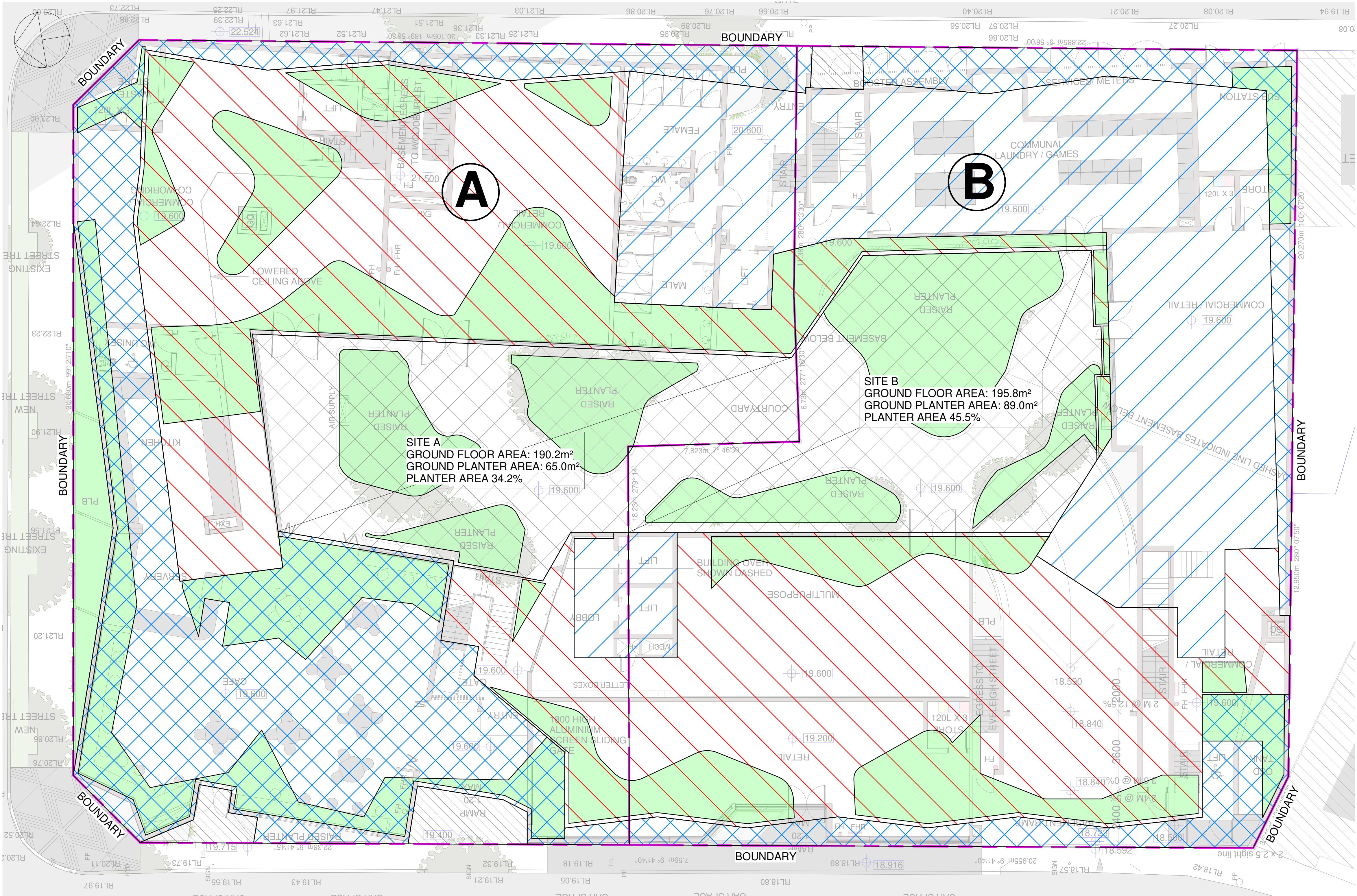


SCALE 1 : 200 @A1



REFERENCE DOCUMENT

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REALSERVE
REF: 79177JP
DATE: 07-07-2021
2. SURVEY DRAWING PREPARED BY
PROJECT SURVEYORS
JOB REF: 801753
DATE OF SURVEY: 18-07-2019
3. DBVD DRAWING PREPARED BY
CITY OF SYDNEY
SEQUENCE NO: 212822038
4. DBVD DRAWING PREPARED BY
SYDNEY WATER
DBVD JOB NO: 321 990507
DBVD SEQUENCE NO: 212822056
DATE: 22/06/2022
5. DBVD DRAWING PREPARED BY
TPG
ENQUIRY NUMBER: 212822051
6. DBVD DRAWING PREPARED BY
AUSGRID
DISTRIBUTION - 212822054
DATE: 22 JUNE 2022
7. DBVD DRAWING PREPARED BY
UECCOM
SEQUENCE NO: 212822050
DATE: 22/06/2022



STORMWATER CATCHMENT PLAN - SITE
SCALE 1 : 100 @A1

- ROOF 1 AREA
- ROOF 2 AREA
- ROOF 3 AREA
- PLANTER AREA
- GROUND AREA
- EXTERNAL GROUND PAVED AREA

SITE A

SITE A AREA: 1062.4m²

ROOF 1 AREA: 93.1m²
ROOF 2 AREA: 403.5m²
ROOF 3 AREA: 334.0m²
TOTAL ROOF AREA: 830.6m²

PLANTER AREA ROOF 2: 153.4m²
PLANTER AREA ROOF 3: 94.8m²
PLANTER AREA GROUND: 65.0m²

GROUND AREA: 190.2m²

EXTERNAL GROUND PLANTER
AREA: 23.1m²

EXTERNAL GROUND PAVED
AREA: 18.5m²

SITE B

SITE B AREA: 968.0m²

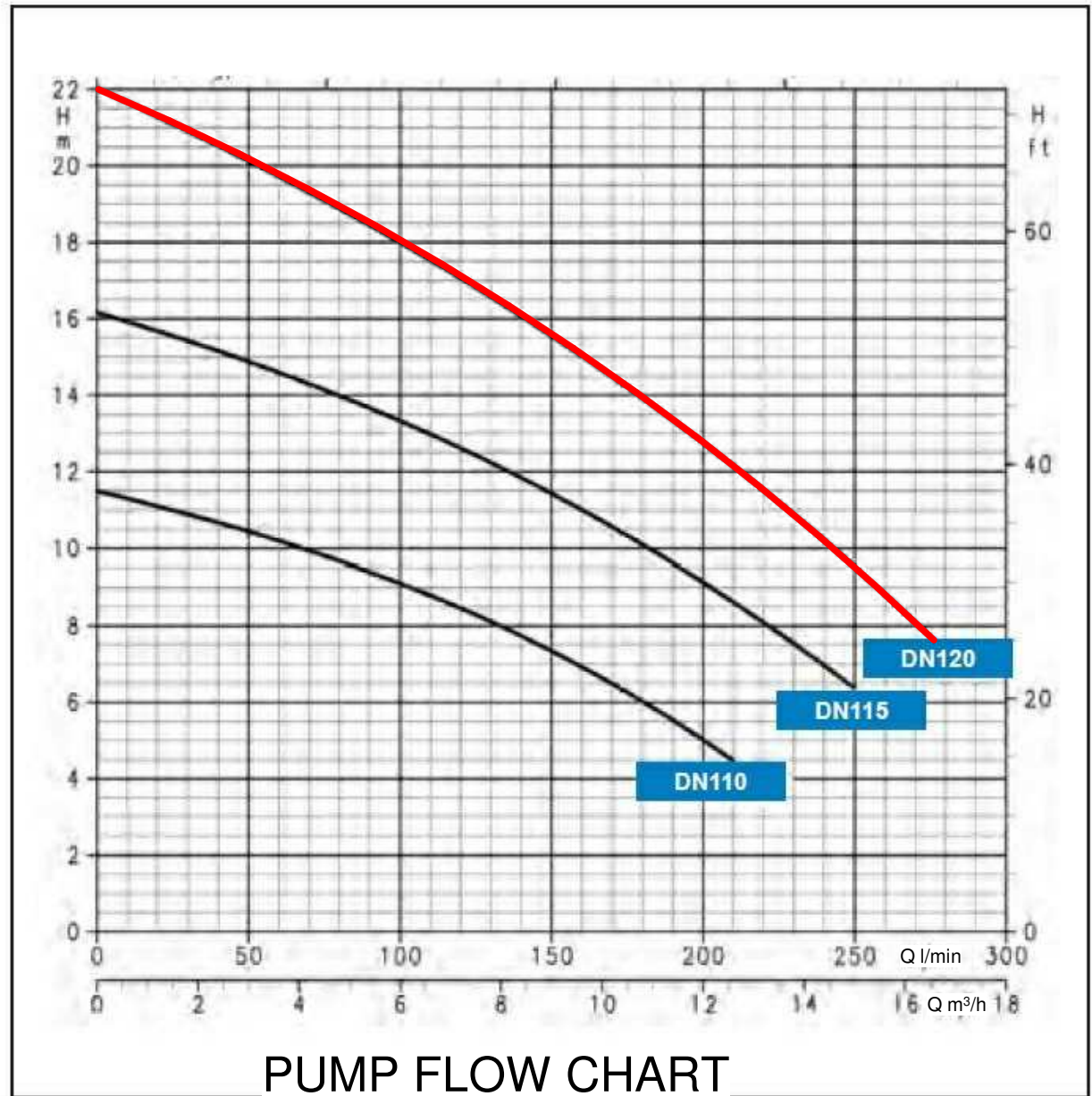
ROOF 1 AREA: 301.5m²
ROOF 2 AREA: 354.4m²
ROOF 3 AREA: 111.5m²
TOTAL ROOF AREA: 767.4m²

PLANTER AREA ROOF 2: 96.5m²
PLANTER AREA ROOF 3: 19.7m²
PLANTER AREA GROUND: 89.0m²

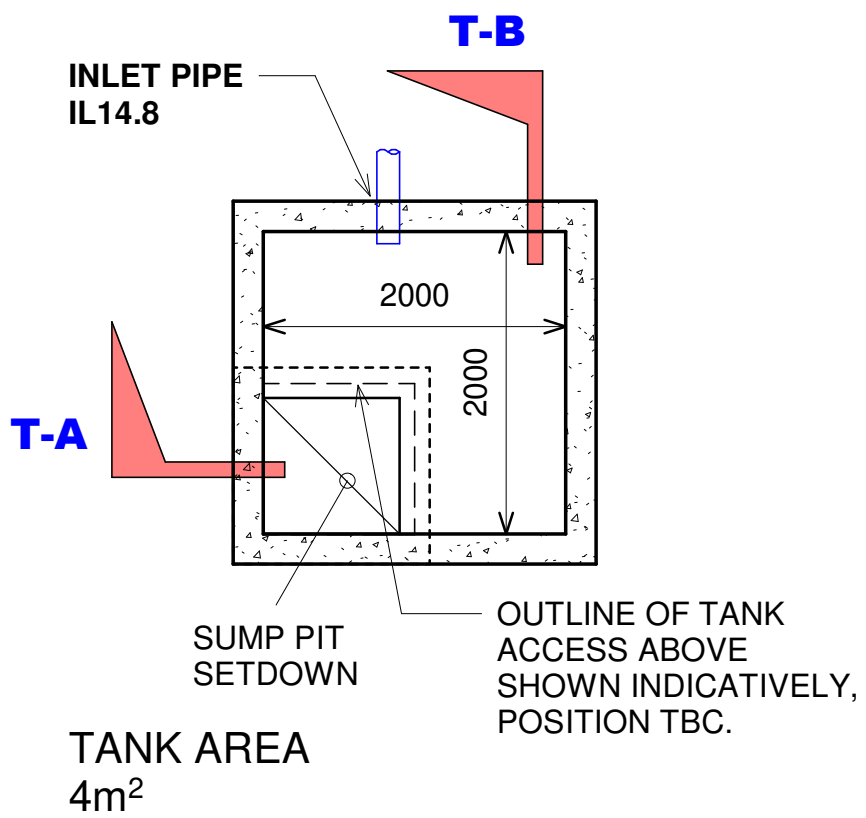
GROUND AREA: 195.8m²

EXTERNAL GROUND PAVED
AREA: 4.8m²

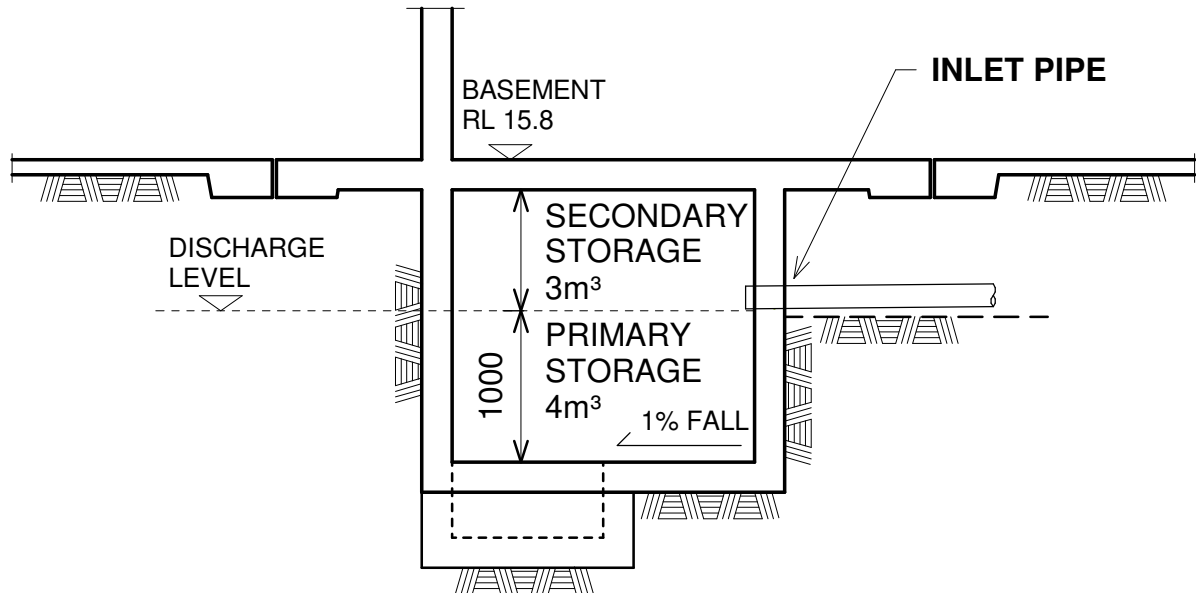
					ARCHITECT MARK SHAPIRO ARCHITECTS markshapiro.com.au EMAIL mark@markshapiro.com.au PHONE 0421 996 467		CLIENT EG FUNDS MANAGEMENT ADDRESS LEVEL 21, GOVERNOR PHILLIP TOWER, 1 FARRER PLACE, SYDNEY, 2000		PROJECT PROPOSED CO-LIVING DEVELOPMENT 175-177 CLEVELAND ST & 6-8 WOODBURN ST, REDFERN STORMWATER CATCHMENT PLAN - SITE		James Taylor & Associates Civil & Structural Consulting Engineers SUITE 301, 115 MILITARY ROAD NEUTRAL BAY NSW 2089 A.B.N. 33 102 603 558 TEL: 02 99691999 EMAIL: mail@jamestaylorassociates.com.au		DESIGN	RY	DRAWN	HL	PROJECT NO. 6394		
											CHKD.						DRAWING NO. C10		REV A
											APPRD.								
HL BY	R.Y. CHKD	FOR DA DESCRIPTION		14.09.2022 DATE	A REV							SCALE 1 : 100		DATE					



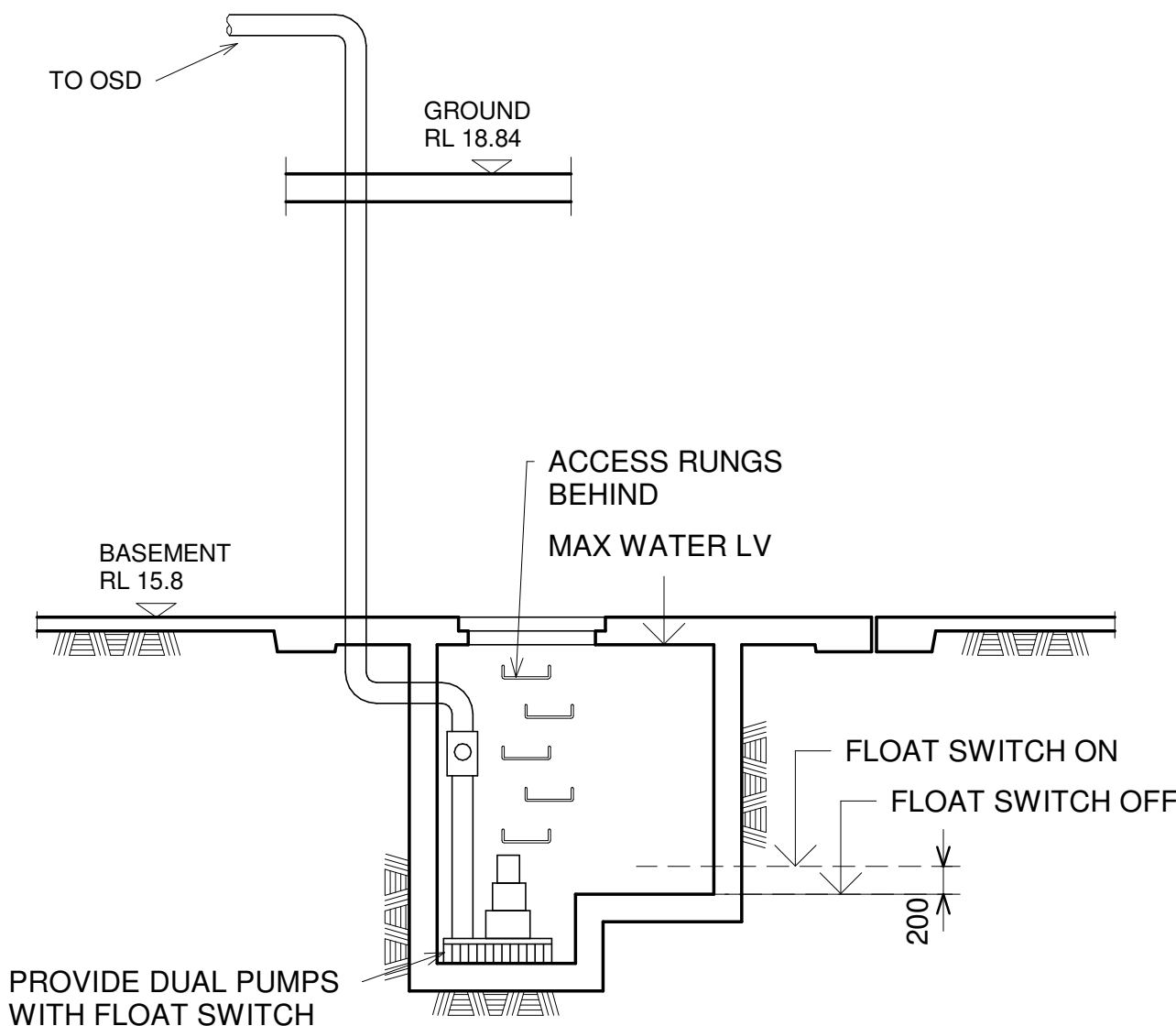
PUMP FLOW CHART
NOT TO SCALE
USE LOWARA XYLEM DN120 PUMP



PUMP OUT PIT 7
VOLUME REQUIRED 4m³ TO SATISFY 90 MIN ARI 100 STORM.
PUMP REQUIRED LIMITED TO ARI 100 5 MIN PSD=4L/S



SECTION T-B



SECTION T-A

HL	R.Y.	FOR DA	14.09.2022	A	
BY	CHKD	DESCRIPTION	DATE	REV	

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175-177 CLEVELAND ST & 6-8 WOODBURN ST, REDFERN
PUMP OUT PIT DETAILS

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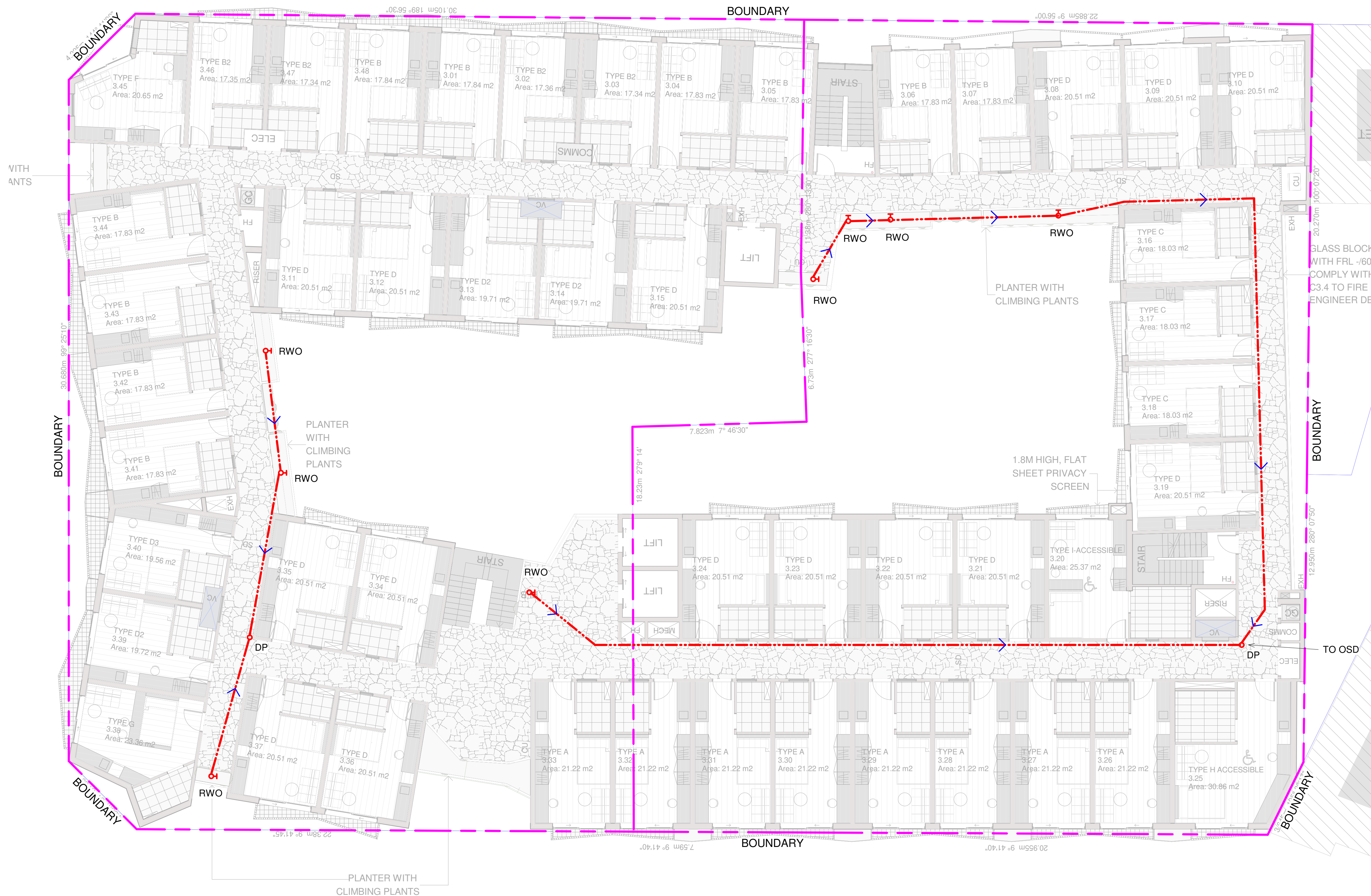
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CHKD.			
APPRD.			
SCALE	As indicated	DATE	

PROJECT NO.
6394
DRAWING NO.
C12
REV
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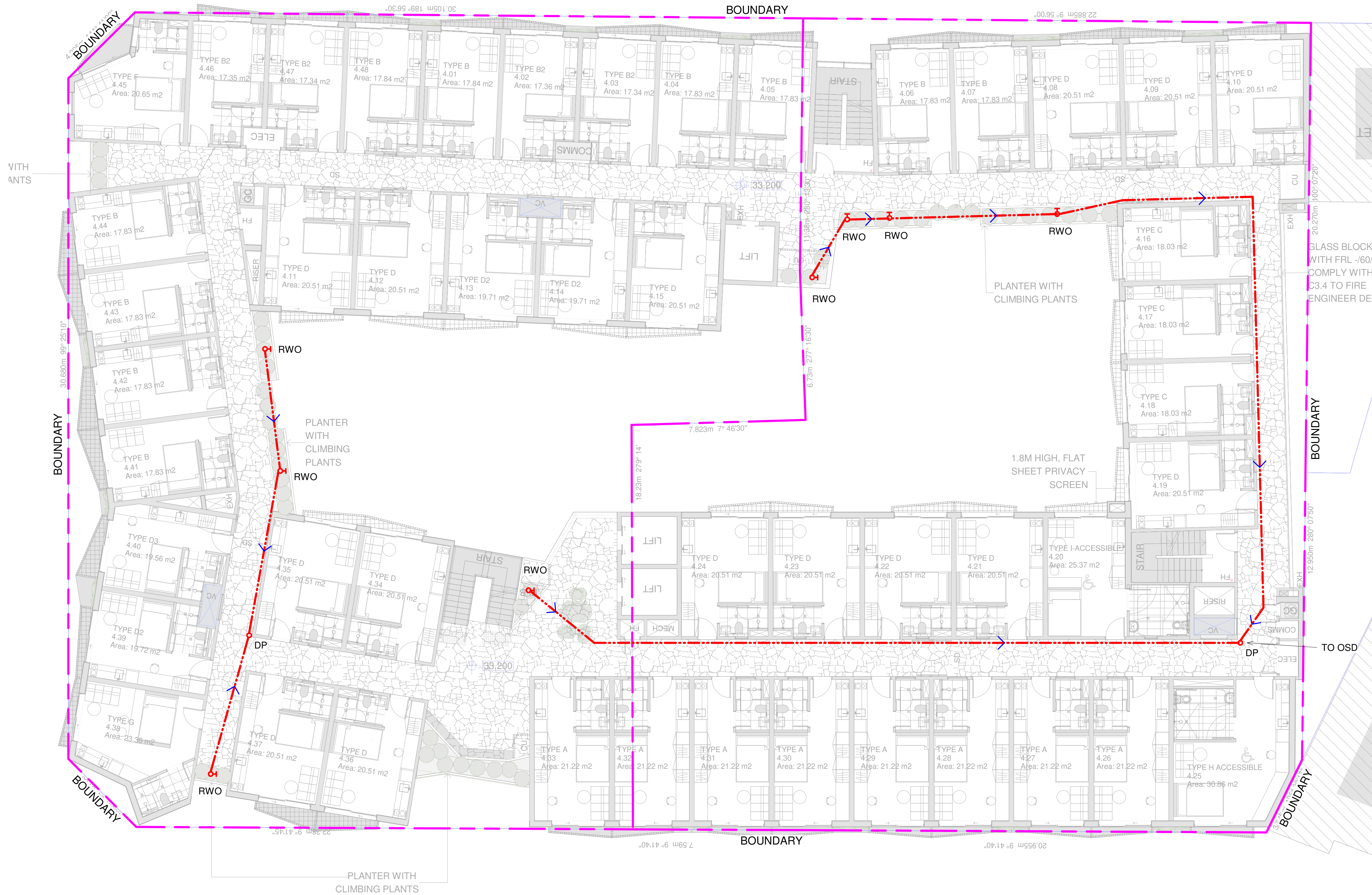
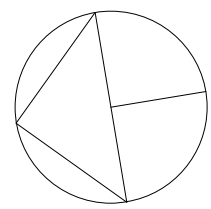
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				MARK SHAPIRO ARCHITECTS		EG FUNDS MANAGEMENT		PROPOSED CO-LIVING DEVELOPMENT		Civil & Structural Consulting Engineers										6394	
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				EMAIL: mark@markshapiro.com.au		LEVEL 21, GOVERNOR PHILLIP TOWER,		STORMWATER DRAINAGE PLAN -		TEL: 02 99691999		A.B.N. 33 102 603 558								DRAWING NO.	
				PHONE: 0421 996 467		1 FARRER PLACE, SYDNEY, 2000		LEVEL 2		EMAIL: mail@jamestaylorassociates.com.au		COPYRIGHT: THIS DESIGN AND PLANS ARE NOT TO BE USED OR REPRODUCED WHOLLY OR IN PART WITHOUT WRITTEN PERMISSION FROM JAMES TAYLOR AND ASSOCIATES								REV	
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RY				CHKD		DATE		A													
				DESCRIPTION										SCALE 1 : 100		DATE				C15	



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LEGEND

- EXISTING SEWER PIPE
- EXISTING STORMWATER PIPE
- PROPOSED SEWER PIPE
- PROPOSED STORMWATER PIPE
- PROPOSED AGRICULTURAL DRAIN
- EXISTING PIT
- PROPOSED SEWER MANHOLE
- PROPOSED GRATED DRAIN
- PROPOSED STORMWATER PIT
- DOWNPIPE
- RAIN WATER OUTLET
- RAINWATER TANK
- ON SITE DETENTION TANK
- EXISTING LEVEL FROM SURVEY
- PROPOSED LEVEL BY ARCHITECT
- OVERLAND FLOW

NOTES:

- DP, RWO & PIT SIZES, LOCATIONS & NUMBERS INDICATIVE ONLY & SUBJECT TO FINAL ARCHITECTURAL SETOUT
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STORMWATER DRAINAGE PLAN - LEVEL 4

SCALE 1 : 100 @A1

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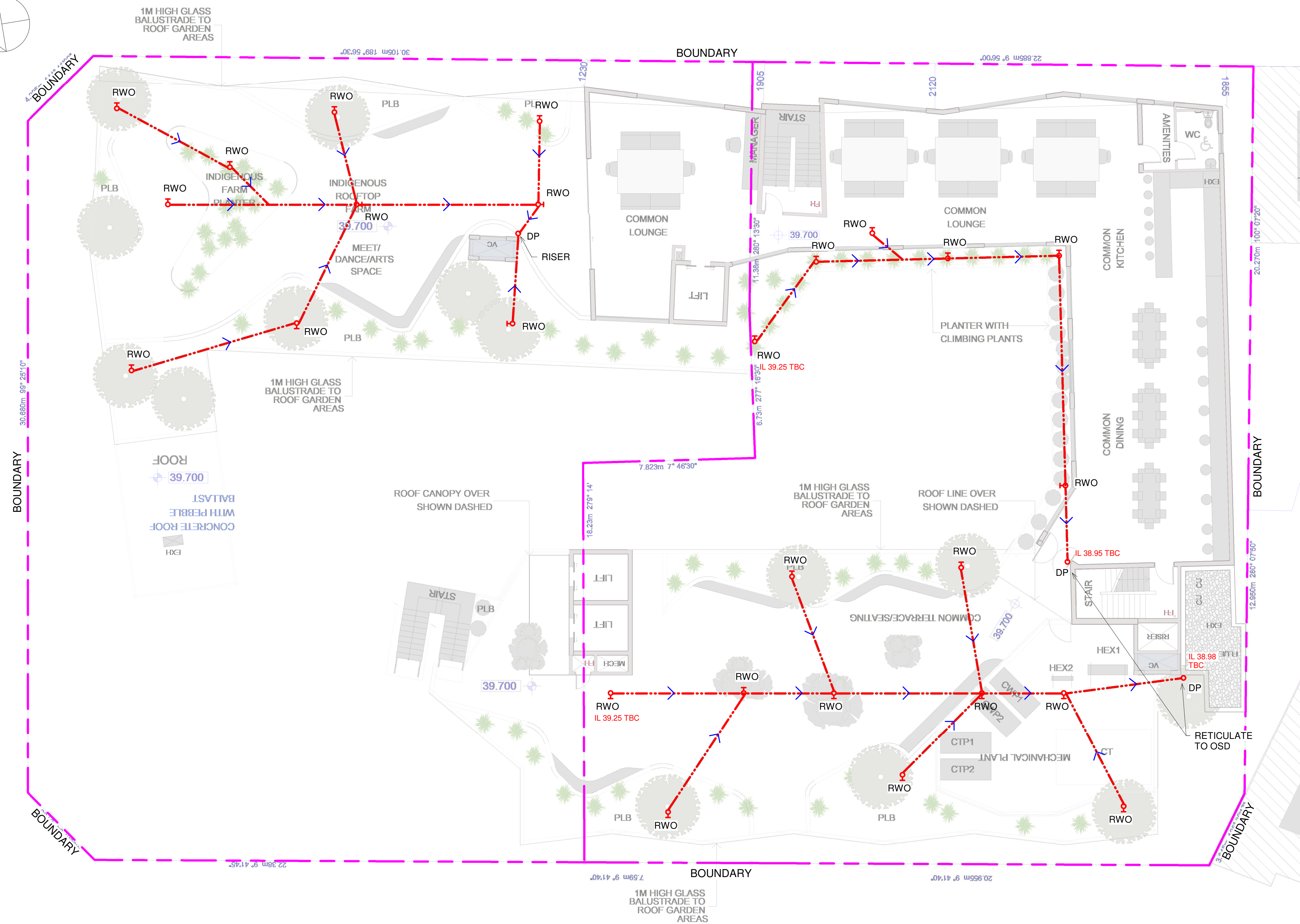
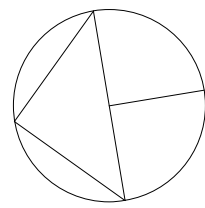
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STORMWATER DRAINAGE PLAN - LEVEL 4

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				REV A



LEGEND

- EXISTING SEWER PIPE
- EXISTING STORMWATER PIPE
- PROPOSED SEWER PIPE
- PROPOSED STORMWATER PIPE
- PROPOSED AGRICULTURAL DRAIN
- EXISTING PIT
- PROPOSED SEWER MANHOLE
- PROPOSED GRATED DRAIN
- PROPOSED STORMWATER PIT
- DOWNPIPE
- RAIN WATER OUTLET
- RAINWATER TANK
- ON SITE DETENTION TANK
- EXISTING LEVEL FROM SURVEY
- PROPOSED LEVEL BY ARCHITECT
- OVERLAND FLOW

NOTES:

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STORMWATER DRAINAGE PLAN - LEVEL 6

SCALE 1 : 100 @A1

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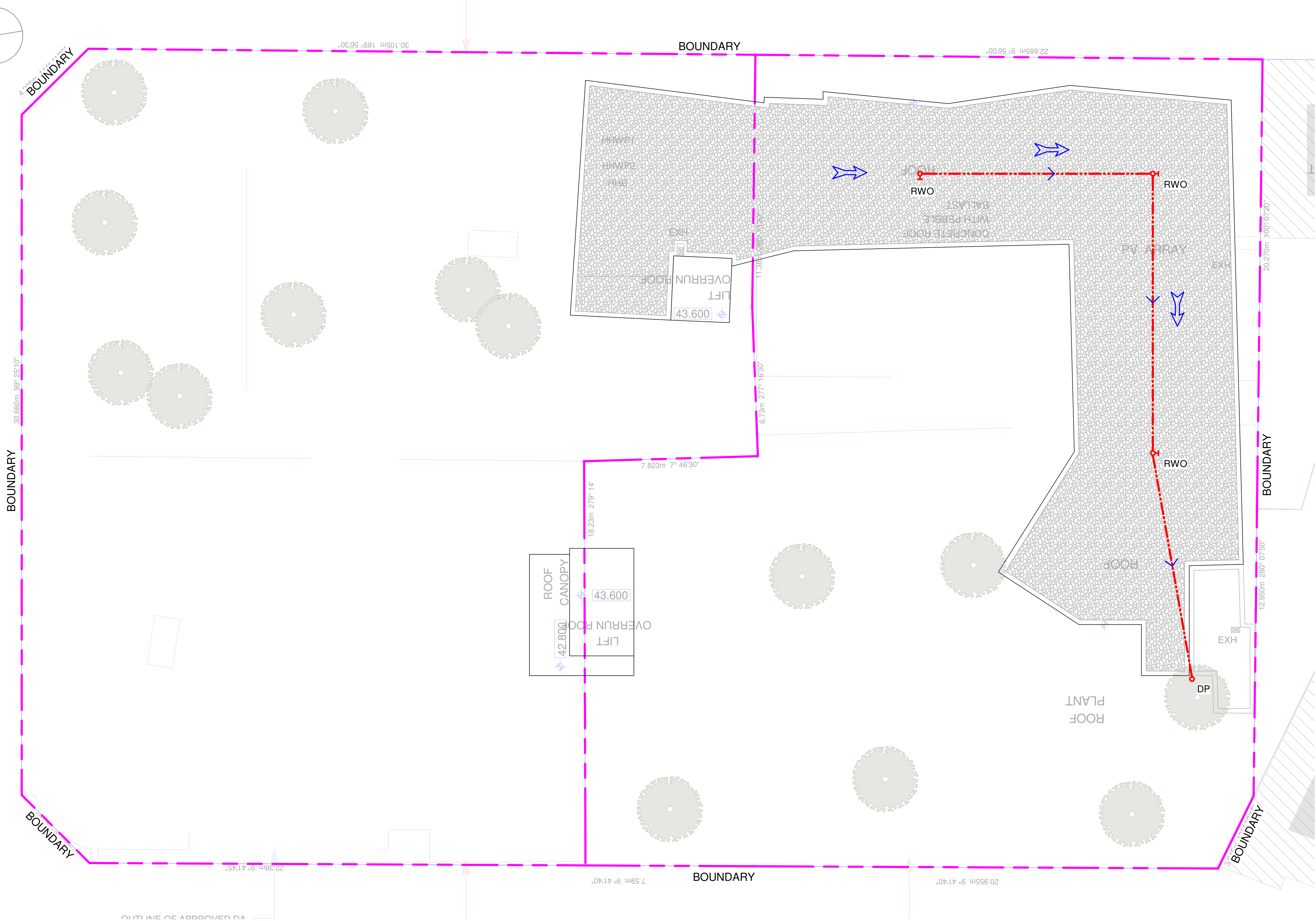
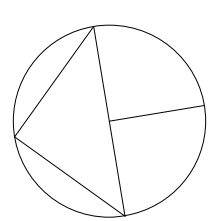
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**STORMWATER DRAINAGE PLAN -
LEVEL 6**

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APPRD.				DRAWING NO.
SCALE 1 : 100	DATE			C19
				REV
				A



LEGEND

- EXISTING SEWER PIPE
- EXISTING STORMWATER PIPE
- PROPOSED SEWER PIPE
- PROPOSED STORMWATER PIPE
- PROPOSED AGRICULTURAL DRAIN
- EP EXISTING PIT
- SMH PROPOSED SEWER MANHOLE
- GD PROPOSED GRATED DRAIN
- P PROPOSED STORMWATER PIT
- DP DOWNPIPE
- RWO RAIN WATER OUTLET
- RWT RAINWATER TANK
- OSD ON SITE DETENTION TANK
- + XXXX EXISTING LEVEL FROM SURVEY
- + RL XX.XXX PROPOSED LEVEL BY ARCHITECT
- OVERLAND FLOW

NOTES:

- DP, RWO & PIT SIZES, LOCATIONS & NUMBERS INDICATIVE ONLY & SUBJECT TO FINAL ARCHITECTURAL SETOUT
- ALL WORKS TO BE IN ACCORDANCE WITH AS3500.3.2

STORMWATER DRAINAGE PLAN - ROOF

SCALE 1 : 100 @A1

NOTE: PLAN IS SCHEMATIC AND SUBJECT TO DETAILED DESIGN

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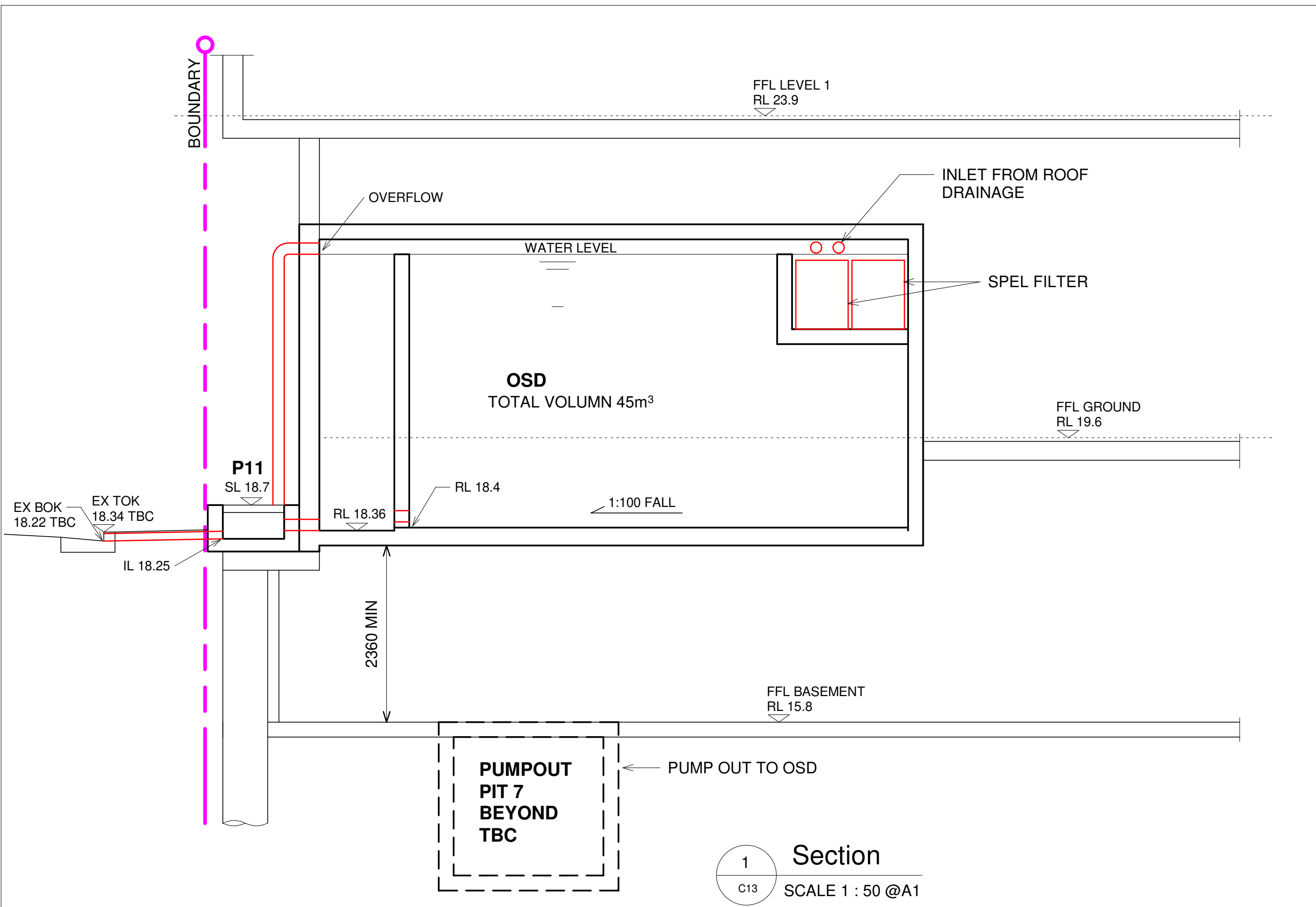
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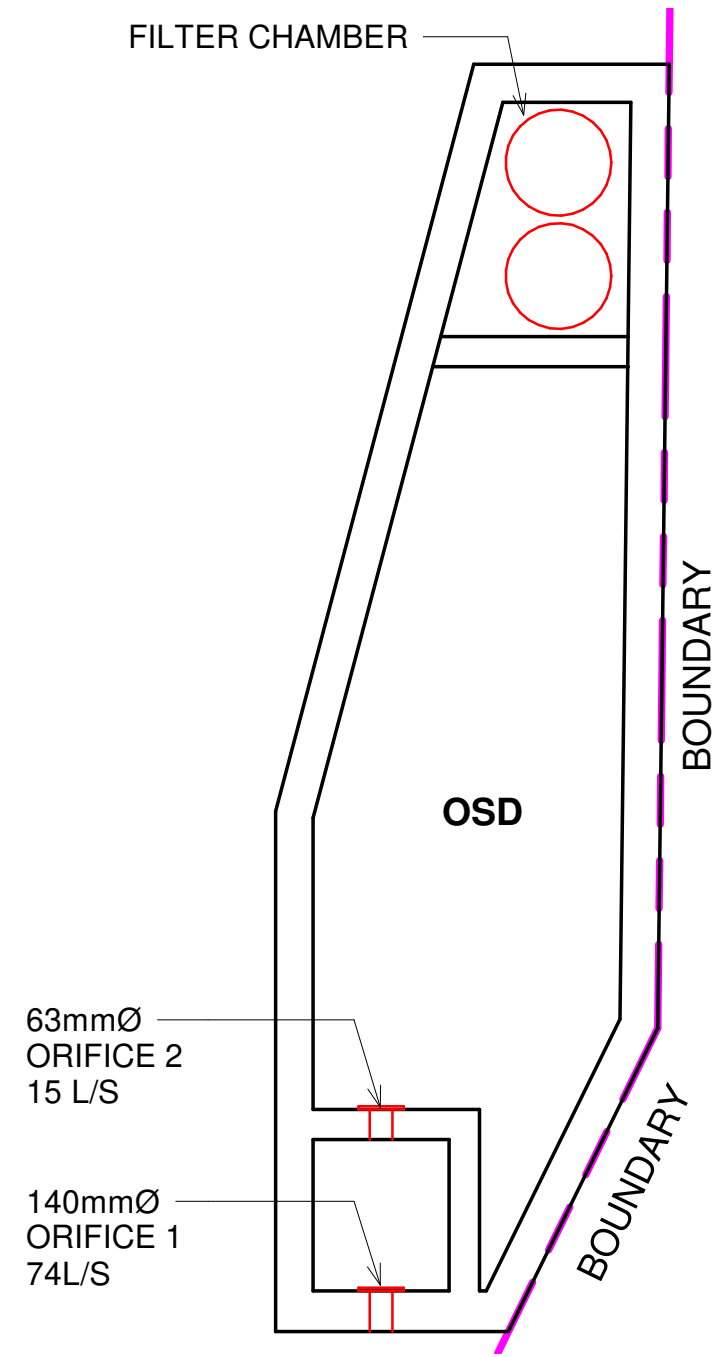
PROJECT
PROPOSED CO-LIVING DEVELOPMENT
175-177 CLEVELAND ST & 6-8 WOODBURN ST, REDFERN
STORMWATER DRAINAGE PLAN - ROOF

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APPRD.				DRAWING NO.	REV
SCALE 1 : 100		DATE		C20	A



1 Section
C13 SCALE 1 : 50 @A1

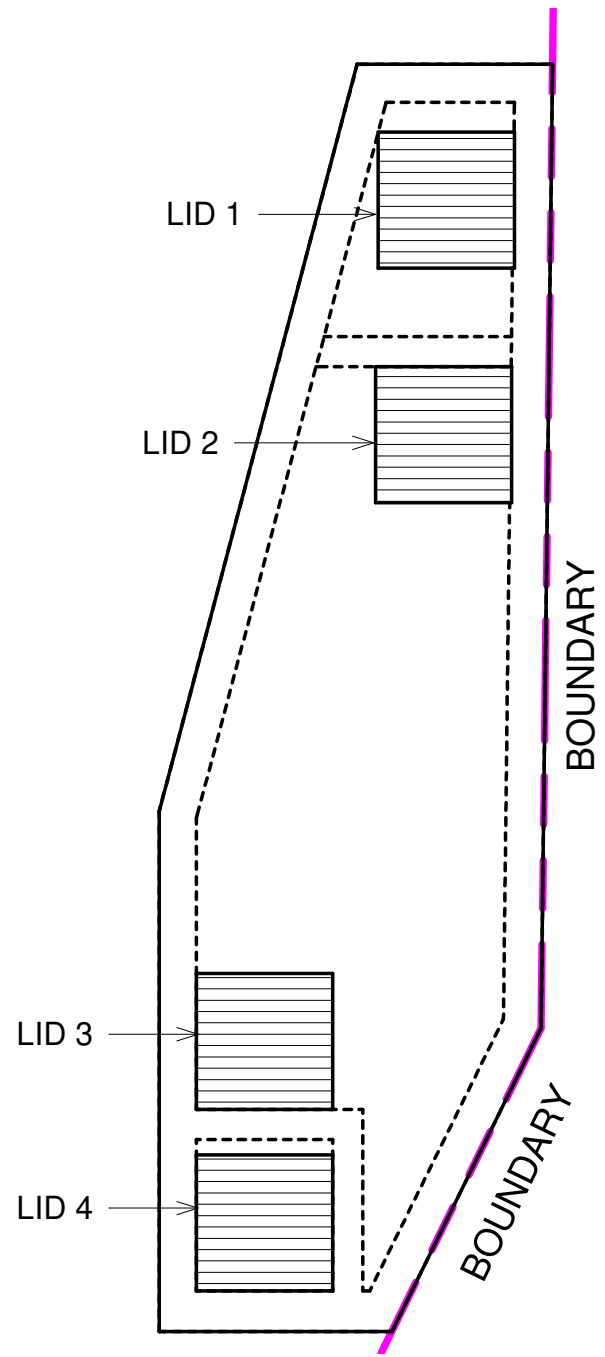


OSD PLAN
SCALE 1 : 50 @A1

OSD INFORMATION

SYDNEY WATER REQUIREMENTS
OSD VOLUME: 31m³ MIN
PSD: 74L/S

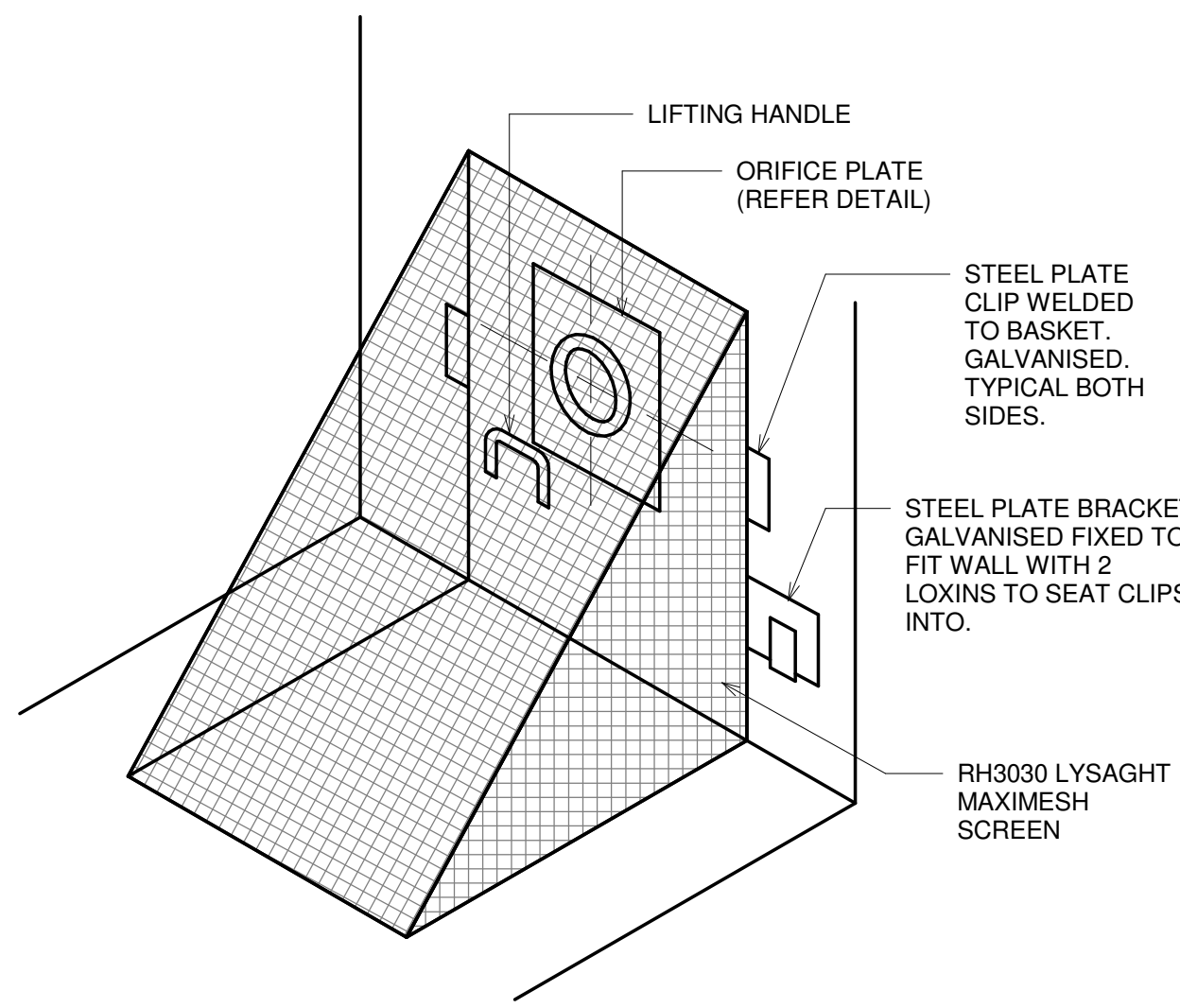
SYDNEY COUNCIL REQUIREMENTS
FOR KERB DISCHARGE
PSD: 25L/S



OSD ROOF PLAN

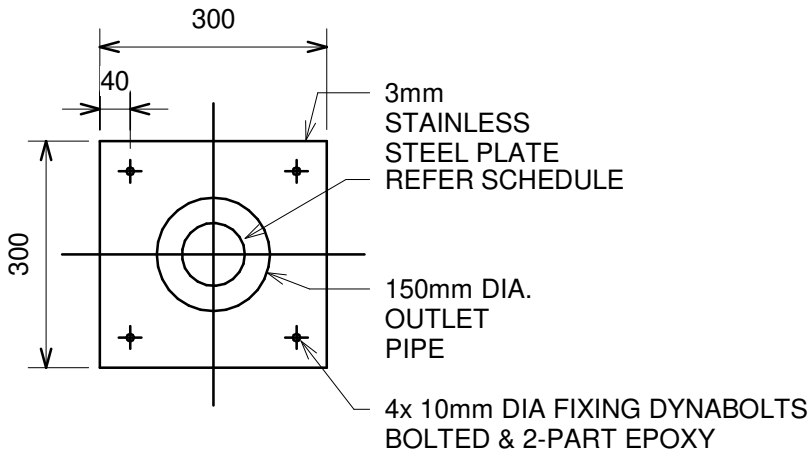
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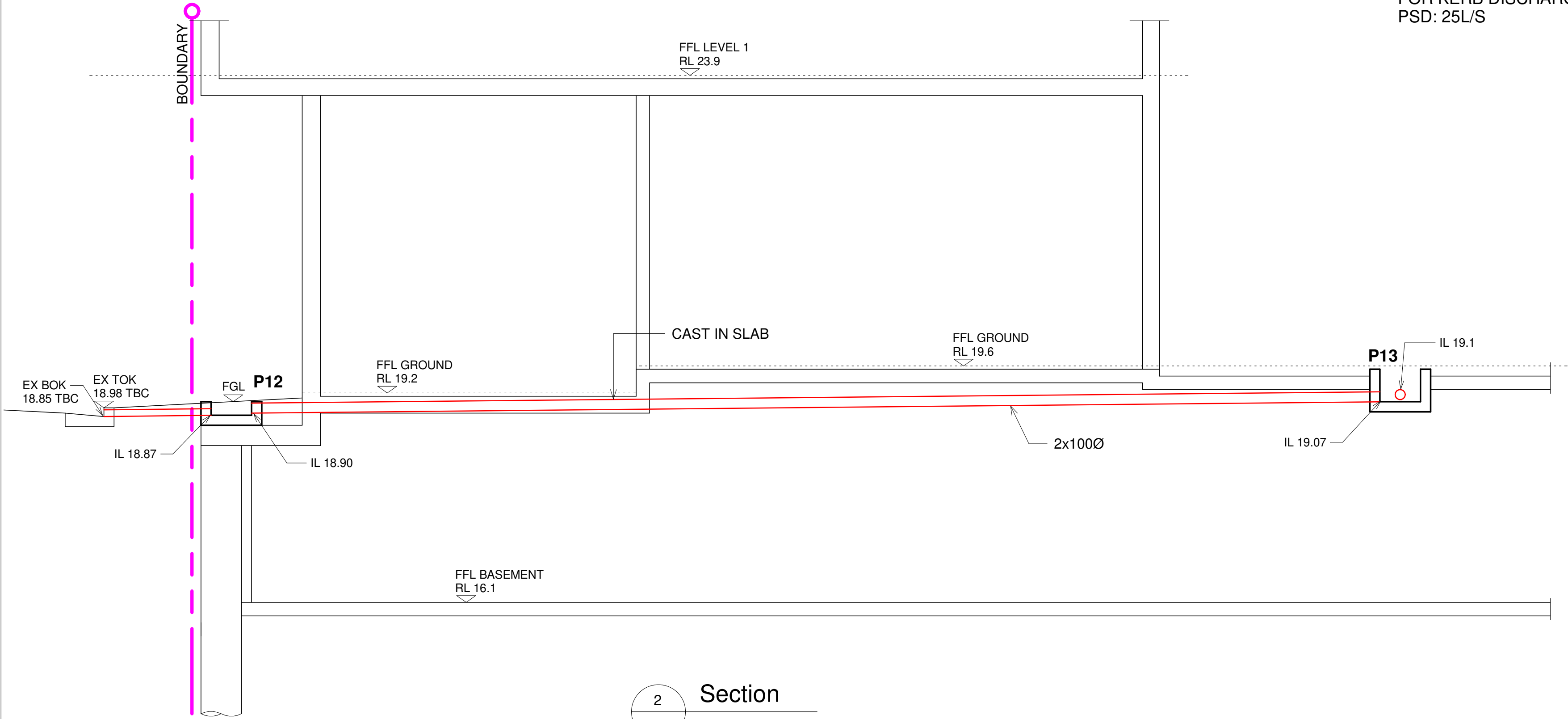
GROSS POLLUTANT TRAP

NOT TO SCALE



ORIFICE PLATE

1:10



2 Section
C13 SCALE 1 : 50 @A1

OSD NOTE

OSD VOLUMES HAVE BEEN CALCULATED BASED ON CITY OF SYDNEY DCP. NO IN GROUND STORMWATER DRAINAGE IS LOCATED ADJACENT TO THE SITE IN EVELEIGH STREET. SITE LEVELS PRECLUDE FULL DRAINAGE TO CLEVELAND STREET. KERB DISCHARGE REQUIRED. COUNCIL LIMITS PSD TO 25L/S FOR AED 5% (1 IN 20 STORM). PSD CONSISTS OF OSD DISCHARGE PLUS GROUND FLOOR DRAINAGE EXCLUDING DEEP SOIL. GROUND FLOOR DRAINAGE 10L/S. OSD PSD 15L/S. OSD CONTAINS TWO CHAMBERS AND 2 ORIFICE PLATES. THE MAIN CHAMBER DISCHARGES THROUGH ORIFICE 1 LIMITING FLOW TO 15L/S UNDER THE 5% AEP STORM EVENT. THE OVERFLOW DISCHARGES INTO THE HIGH OUTPUT CHAMBER WITH ORIFICE 2 LIMITING FLOW TO 74L/S UNDER THE 1%AEP STORM EVENT AS NOMINATED BY SYDNEY WATER. OSD VOLUME OF 45 CUBIC METRES HAS BEEN CALCULATED BASED ON DRAINS MODELLING. LOWER BASEMENT DRAINAGE IS PUMPED TO THE OSD FOR DISCHARGE BASED ON A TIMED FLOAT SWITCH FOR STORM EVENTS LIMITING DISCHARGE TO HOURS AGREED BY CITY OF SYDNEY COUNCIL. THE MAIN OSD CONTAINS A FILTER CHAMBER TO REMOVE POLUTANTS. THIS CHAMBER FORMS PART OF THE OSD VOLUME.

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Subject: RE: Re[2]: [External] 6-8 WoodBurn Street Redfern OSD SSR requirements
From: "Stormwater" <Stormwater@sydneywater.com.au>
Sent: 19/07/2022 3:53:30 PM
To: "Richard Yates" <ryates@jamestaylorassociates.com.au>;
CC: "Tom Cook" <tcook@mecone.com.au>; "Mark Shapiro" <mark@markshapiro.com.au>; "Helen Li" <hli@jamestaylorassociates.com.au>;

Richard

The On Site Detention requirements for the 2,017 square meters site at 1 -5 & 6 - 8 Woodburn Street, 175 - 177 Cleveland Street, Redfern, are as follows:

- On Site Detention 31 cubic meters
- Permissible Site Discharge 74 L/s

The approval for the On Site Detention would only be given as part of the Section 73 application for this development. The On Site Detention is to be designed according to the above values and submitted to Sydney Water for approval with the Section 73 application. The following details are to be included in your submission for On Site Detention approval:

- Location of the On Site Detention in relation to the development
- Location of the On Site Detention in relation to overall stormwater network of the property
- Plan and Elevation of the On Site Detention tank with all dimensions
- Orifice plate calculation

Best Regards

Planning and Technical
City Growth and Development
Business Development

Level 13, 1 Smith Street
Parramatta NSW 2150



We're working on something big

Every drop brings us one step closer to transforming
our customers' online experience with Sydney Water



Sydney Water respectfully acknowledges the traditional custodians of the land and waters on which we work, live and learn. We pay respect to Elders past and present.

[Read more](#) about our commitment to reconciliation.



From: Richard Yates <ryates@jamestaylorassociates.com.au>
Sent: Tuesday, 19 July 2022 10:35 AM
To: Stormwater <Stormwater@sydneywater.com.au>
Cc: Tom Cook <tcook@mecone.com.au>; Mark Shapiro <mark@markshapiro.com.au>; Helen Li <hli@jamestaylorassociates.com.au>
Subject: Re[2]: [External] 6-8 WoodBurn Street Redfern OSD SSR requirements

Hello Sydney Water, thanks for the prompt response.
The site is a combined site incorporating the following:
1 -5 & 6 - 8 Woodburn Street, 175 - 177 Cleveland Street, Redfern

Thanks for checking.

Regards

--

Richard Yates

James Taylor and Associates

Civil and Structural Consulting Engineers

T +61 2 9969 1999

M +61 413 996933

www.jamestaylorassociates.com.au

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----- Original Message -----

From "Stormwater" <Stormwater@sydneywater.com.au>
To ""Richard Yates"" <ryates@jamestaylorassociates.com.au>
Cc "Tom Cook" <tcook@mecone.com.au>; "Mark Shapiro" <mark@markshapiro.com.au>;
"Helen Li" <hli@jamestaylorassociates.com.au>
Date 19/07/2022 10:26:13 AM
Subject RE: [External] 6-8 WoodBurn Street Redfern OSD SSR requirements

Richard,

According to our records, the total site area of 6 -8 Woodburn Street Redfern is in the order of 960 square meters. You have indicated that the total site area as 2,017 square meters.

Any specific reasons regarding discrepancy in site area or Could you please reconfirm that the total site area of 2,017 square meters as per your email is correct.

Best Regards

Planning and Technical

City Growth and Development

Business Development

Level 13, 1 Smith Street
Parramatta NSW 2150



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of the land and waters on which we work, live and learn. We pay
respect to Elders past and present.

[Read more](#) about our commitment to reconciliation.



From: Richard Yates <ryates@jamestaylorassociates.com.au>

Sent: Tuesday, 19 July 2022 9:59 AM

To: Stormwater <Stormwater@sydneywater.com.au>

Cc: Tom Cook <tcook@mecone.com.au>; Mark Shapiro <mark@markshapiro.com.au>; Helen Li
<hli@jamestaylorassociates.com.au>

Subject: [External] 6-8 WoodBurn Street Redfern OSD SSR requirements

CAUTION: This email originated from outside the organisation. Do not click links or
open attachments unless you recognise the sender and know the content is safe.

Hello. We are preparing DA documentation for the stormwater drainage at the proposed development at 6-8 WoodburnStreet Redfern.

We understand that as part of the City of Sydney LGA, the OSD requirements are set by Sydney Water.

Can you please confirm the requirements for the site, OSD volume, PSD and SSR.

The total site area is 2017 sq metres. Pre and post development impervious rates remain basically the same at 100%. However approx 15% of this will be via planter on roofs or podium slabs.

Can you please confirm what is required?

Thank you

--

Richard Yates

James Taylor and Associates

Civil and Structural Consulting Engineers

T +61 2 9969 1999

M +61 413 996933

www.jamestaylorassociates.com.au

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MUSIC-*link* Report

Project Details		Company Details	
Project:	Woodburn Street 6394	Company:	James Taylor & Associates
Report Export Date:	15/09/2022	Contact:	Richard Yates
Catchment Name:	woodburn B link	Address:	Suite 301/115 Military Rd Neutral Bay
Catchment Area:	0.203ha	Phone:	02 99691999
Impervious Area*:	99.62%	Email:	ryates@jamestaylorassociates.com.au
Rainfall Station:	66062 SYDNEY		
Modelling Time-step:	6 Minutes		
Modelling Period:	1/01/1982 - 31/12/1986 11:54:00 PM		
Mean Annual Rainfall:	1278mm		
Evapotranspiration:	1265mm		
MUSIC Version:	6.3.0		
MUSIC-link data Version:	6.34		
Study Area:	City of Sydney Clay Soil		
Scenario:	City Of Sydney Development		

* takes into account area from all source nodes that link to the chosen reporting node, excluding Import Data Nodes

Treatment Train Effectiveness		Treatment Nodes		Source Nodes	
Node: Post-Development Node	Reduction	Node Type	Number	Node Type	Number
Flow	0.119%	Detention Basin Node	2	Urban Source Node	3
TSS	85.5%	Generic Node	1		
TP	66.4%	GPT Node	1		
TN	47.5%				
GP	100%				

Comments

Passing Parameters

Node Type	Node Name	Parameter	Min	Max	Actual
Detention	4/0.85 SPEL Filter Vault Full Height	% Reuse Demand Met	None	None	0
Detention	Detention Basin	% Reuse Demand Met	None	None	0
GPT	SPEL Stormsacks	Hi-flow bypass rate (cum/sec)	None	99	0.045
Post	Post-Development Node	% Load Reduction	None	None	0.119
Post	Post-Development Node	GP % Load Reduction	90	None	100
Post	Post-Development Node	TN % Load Reduction	45	None	47.5
Post	Post-Development Node	TP % Load Reduction	65	None	66.4
Post	Post-Development Node	TSS % Load Reduction	85	None	85.5
Urban	Ground Courtyard 380	Area Impervious (ha)	None	None	0.037
Urban	Ground Courtyard 380	Area Pervious (ha)	None	None	0.000
Urban	Ground Courtyard 380	Total Area (ha)	None	None	0.038
Urban	Roof 300 sqm	Area Impervious (ha)	None	None	0.029
Urban	Roof 300 sqm	Area Pervious (ha)	None	None	0.000
Urban	Roof 300 sqm	Total Area (ha)	None	None	0.03
Urban	Urbanroof planters 1350	Area Impervious (ha)	None	None	0.134
Urban	Urbanroof planters 1350	Area Pervious (ha)	None	None	0.000
Urban	Urbanroof planters 1350	Total Area (ha)	None	None	0.135

Only certain parameters are reported when they pass validation

PIT / NODE DETAILS

Name	Type	Family	Size	Ponding Volume (cu.m)	Pressure Change Coeff. Ku	Surface Elev (m)	Max Pond Depth (m)	Base Inflow (cu.m/s)	Blocking Factor	x	y	Bolt-down lid	id	Part Full Shock Loss	Inflow Hydrograph	Pit is	Internal Width (mm)	Inflow is Misaligned	Minor Safe Pond Depth (m)	Major Safe Pond Depth (m)
Eveleigh 1	Node					19.1		0		695.706	-366.948		1836457		No					
Roof Node	Node					39.3		0		655.092	-321.799		1836491		No					
Pit1	OnGrade	GP 900x900	GP 900x900		1.5	20		0	0	742.245	-331.366	No	683	1 x Ku	No	New				
Eveleigh	Node					19.1		0		795.617	-329.784		1836446		No					
PLanter	No Node					39.3		0		657.417	-349.320		4901423		No					

DETENTION BASIN DETAILS

Name	Elev	Surf. Area	Not Used	Outlet Type	K	Dia(mm)	Centre RL	Pit Family	Pit Type	x	y	HED	Crest RL	Crest Length	id
Basin1	29.8	12		Orifice		63	29.9			717.281	-329.667	No			658
	30	12													
	34	12													
	35	12													

SUB-CATCHMENT DETAILS

Name	Pit or Node	Total Area (ha)	Paved Area %	Grass Area %	Supp Area %	Paved Time (min)	Grass Time (min)	Supp Time (min)	Paved Length (m)	Grass Length (m)	Supp Length (m)	Paved Slope(%)	Grass Slope %	Supp Slope %	Paved Rough	Grass Rough	Supp Rough	Lag Time or Factor	Gutter Length (m)	Gutter Slope %	Gutter FlowFactor	Rainfall Multiplier
230 c'yard	Eveleigh 1	0.0230	60.0	5.0	35.0	5	15	8										0				1
combined r	Roof Node	0.0778	90.0	3.0	7.0	5	15	8										0				1
Planter 75C	PLanter No	0.0750	50.0	5.0	45.0	5	15	8										0				1

PIPE DETAILS

Name	From	To	Length (m)	U/S IL (m)	D/S IL (m)	Slope (%)	Type	Dia (mm)	I.D. (mm)	Rough	Pipe Is	No. Pipes	Chg From	At Chg	Chg (m)	RI (m)	Chg (m)	RL (m)	etc (m)
roof draina	Roof Node	Basin1	50	39.100	31.300	15.60	uPVC, not	150	154	0.012	NewFixed	1	Roof Node	0					
discharge	Basin1	Pit1	11	29.800	19.400	94.55	uPVC, not	150	154	0.012	NewFixed	1	Basin1	0					
discharge k	Pit1	Eveleigh	15	19.400	19.100	2.00	uPVC, not	225	242	0.012	New	1	Pit1	0					
Roof Draini	PLanter No	Basin1	50	39.100	31.300	15.60	uPVC, not	150	154	0.012	NewFixed	1	PLanter No	0					

DETAILS of SERVICES CROSSING PIPES

Pipe	Chg (m)	Bottom Elev (m)	Height of S (m)	Chg (m)	Bottom Elev (m)	Height of S (m)	Chg (m)	Bottom Elev (m)	Height of S etc (m)
------	---------	-----------------	-----------------	---------	-----------------	-----------------	---------	-----------------	---------------------

CHANNEL DETAILS

Name	From	To	Type	Length (m)	U/S IL (m)	D/S IL (m)	Slope (%)	Base Width (m)	L.B. Slope (1:?)	R.B. Slope (1:?)	Manning n	Depth (m)	Roofed
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OVERFLOW ROUTE DETAILS

Name	From	To	Travel Time (min)	Spill Level (m)	Crest Length (m)	Weir Coeff. C	Cross Section	Safe Depth Major Stori (m)	SafeDepth Minor Stori (m)	Safe DxV (sq.m/sec)	Bed Slope (%)	D/S Area Contributing %	id
Overflow ir	Basin1	Pit1	0.1	35.000	2	1	4 m wide p	0.3	0.15	0.4	1	5	2096425
Overflow tr	Pit1	Eveleigh	0.1				4 m wide p	0.3	0.15	0.4	1	5	2228405

PIPE COVER DETAILS

Name	Type	Dia (mm)	Safe Cover	Cover (m)
roof draina	uPVC, not	154	0.3	-1.66 Unsafe
discharge	uPVC, not	154	0.3	-0.16 Unsafe
discharge k	uPVC, not	242	0.3	-0.25 Unsafe
Roof Draini	uPVC, not	154	0.3	-1.66 Unsafe

This model has no pipes with non-return valves

DRAINS results prepared from Version 2019.09

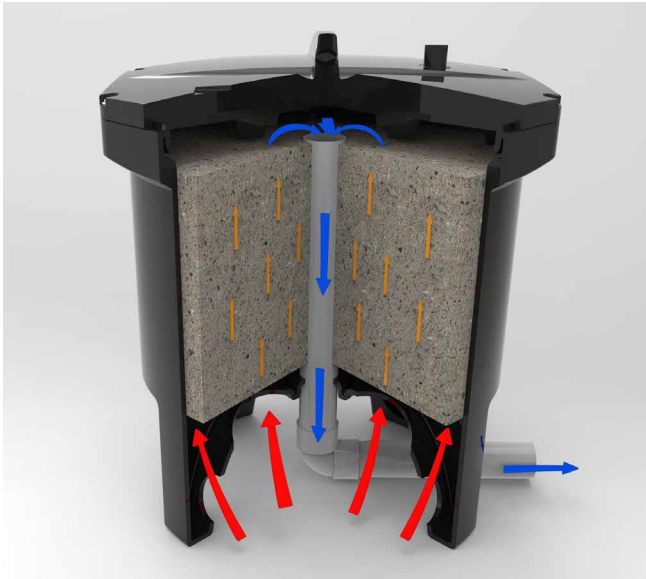
PIT / NODE DETAILS				Version 8				
Name	Max HGL	Max Pond HGL	Max Surface Flow Arriving (cu.m/s)	Max Pond Volume (cu.m)	Min Freeboard (m)	Overflow (cu.m/s)	Constraint	
Roof Node	39.18		0.048					
Pit1	19.52		0.000		0.48	0.000	None	
Eveleigh	19.17		0.000					
PLanter No	39.16		0.034					
SUB-CATCHMENT DETAILS								
Name	Max Flow Q (cu.m/s)	Paved Max Q (cu.m/s)	Grassed Max Q (cu.m/s)	Paved Tc (min)	Grassed Tc (min)	Supp. Tc (min)	Due to Storm	
230 c'yard	0.009	0.008	0.003	5.00	15.00	8.00	5% AEP, 15 min burst, Storm 3	
combined r	0.038	0.038	0.001	5.00	15.00	8.00	5% AEP, 5 min burst, Storm 1	
Planter 75C	0.026	0.018	0.012	5.00	15.00	8.00	5% AEP, 20 min burst, Storm 10	
PIPE DETAILS								
Name	Max Q (cu.m/s)	Max V (m/s)	Max U/S HGL (m)	Max D/S HGL (m)	Due to Storm			
roof drain	0.038	3.83	39.181	33.636	5% AEP, 5 min burst, Storm 1			
discharge	0.016	1.09	31.192	19.516	5% AEP, 1 hour burst, Storm 9			
discharge k	0.016	1.41	19.516	19.173	5% AEP, 1 hour burst, Storm 9			
Roof Drain	0.026	3.47	39.165	33.636	5% AEP, 20 min burst, Storm 10			
CHANNEL DETAILS								
Name	Max Q (cu.m/s)	Max V (m/s)	Due to Storm					
OVERFLOW ROUTE DETAILS								
Name	Max Q U/S	Max Q D/S	Safe Q	Max D	Max DxV	Max Width	Max V	Due to Storm
Overflow in	0	0	0.908	0	0	0	0	
Overflow to	0	0	0.908	0	0	0	0	
DETENTION BASIN DETAILS								
Name	Max WL	MaxVol	Max Q Total	Max Q Low Level	Max Q High Level			
Basin1	33.64	46.0	0.016	0.016	0.000			

Run Log for Woodburn august 2022 15psd.drn run at 16:55:31 on 15/9/2022
No water upwelling from any pit. Freeboard was adequate at all pits.
Flows were safe in all overflow routes.

SPELFilter®

Cartridge filter for tertiary stormwater treatment





APPLICATIONS

- Car Parks and Shopping Centres
- Council Depots
- Industrial Estates
- Heavy Vehicle Maintenance
- Airport Aprons & Tarmacs
- Transport Depots & Loading Bays
- Tunnels
- Highways & Transport Corridors
- Recycling Yards

SPELFilter is a cartridge filter system that incorporates an upflow treatment process that maximises surface treatment area. Flow through the filter cartridges utilises a self-regulating siphon which results in a low maintenance and high performance stormwater treatment. The automatic backwash at the end of each storm event further lengthens the lifespan of the filter.

Hydraulic pressure forces water through the filter media — causing a constant velocity throughout the filter area realising a consistent media contact time and therefore treatment.

Upon completion of a treatment cycle, the filter backwashes and effectively dislodges particulates from the filtration layers. This re-establishes filter media porosity. The dislodged particles then accumulate away from the filter media allowing easy removal during maintenance.

FEATURES

The media cartridge provides a significantly greater surface contact area to footprint ratio than other filters. With a flow rate of 3L/s per cartridge and underground installation, the SPELFilter provides excellent removal efficiency whilst maintaining site surface yield.

- No moving parts, generating a true siphon effect
- 91% TSS, 75% TP and 58% TN removal
- Small footprint
- Inorganic filter media (doesn't leach nutrients)
- Can be deployed in various drainage structures such as manholes & vaults
- Contains no moving parts





HOW IT WORKS

The SPELFilter has an upflow treatment process, that maximises surface area. The benefit is excellent pollutant removal in a small footprint.

Hydraulic pressure forces water through the filter media, discharges through the centre tube and out through the outlet collection manifold.

Upon completion of a treatment cycle, each cartridge backwashes and effectively dislodges particulates from the filtration layers. This reestablishes filter media porosity. The dislodged particles accumulate on the vault floor for easy removal during maintenance. SPELFilter's design has no moving parts and generates a true siphon effect.

A SPEL Stormceptor Class 1 upstream of the SPELFilter in the treatment train greatly increases the life cycle interval of the SPELFilter as the SPEL Stormceptor Class1 removes the larger gross pollutants, coarse sediments, total suspended solids and hydrocarbons, enabling the SPELFilter to target fine particulate matter and nutrients.



BENEFITS

PROVEN SAND FILTER PERFORMANCE

The uniform size silica-sand filter media provides for higher removal efficiencies than coarser types of media. SPELFilter media is inorganic – it doesn't leach nitrogen and other nutrients.

Each SPELFilter automatically backflushes under gravity. The backflush clears most sediment particles from out of the media and back into the vault floor, which allows the hydraulic conductivity from degrading throughout its service life. No moving parts are involved, which increases reliability. The SPELFilter cartridge design life is in excess of 5 years.



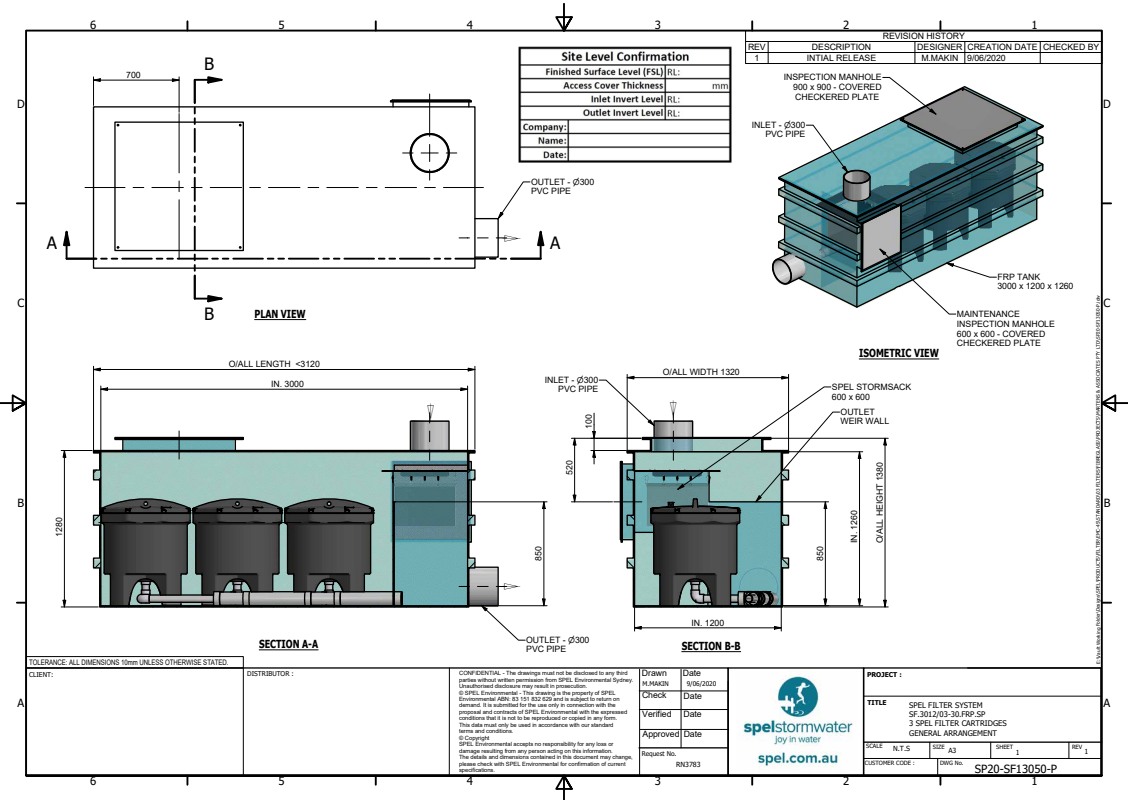
FLEXIBILITY

Due to the greater surface area and high flow capacity, combined with the modular cartridge design, the SPELFilter systems can be deployed in a variety of structures including manholes, precast vaults, or cast-in-place structures.

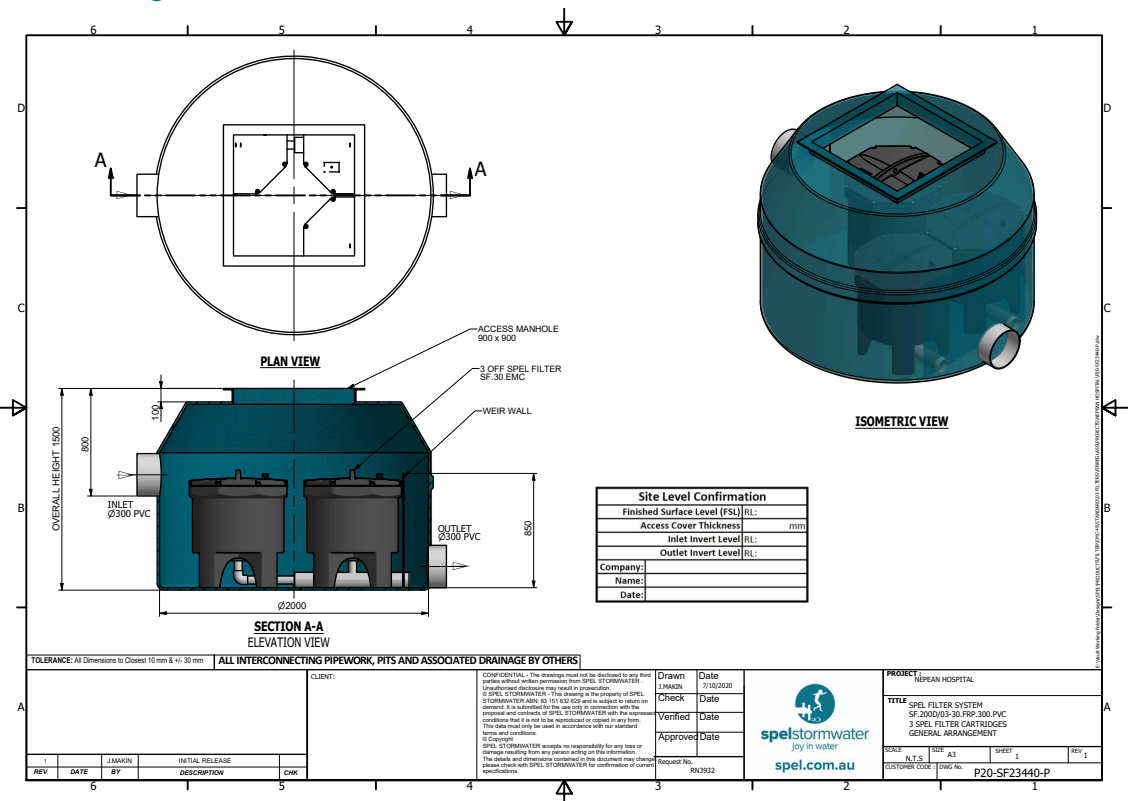
Each system is optimised to suit your specific site and local authority requirements by qualified and experienced professionals.

DRAWINGS

Rectangle Fibreglass Installation

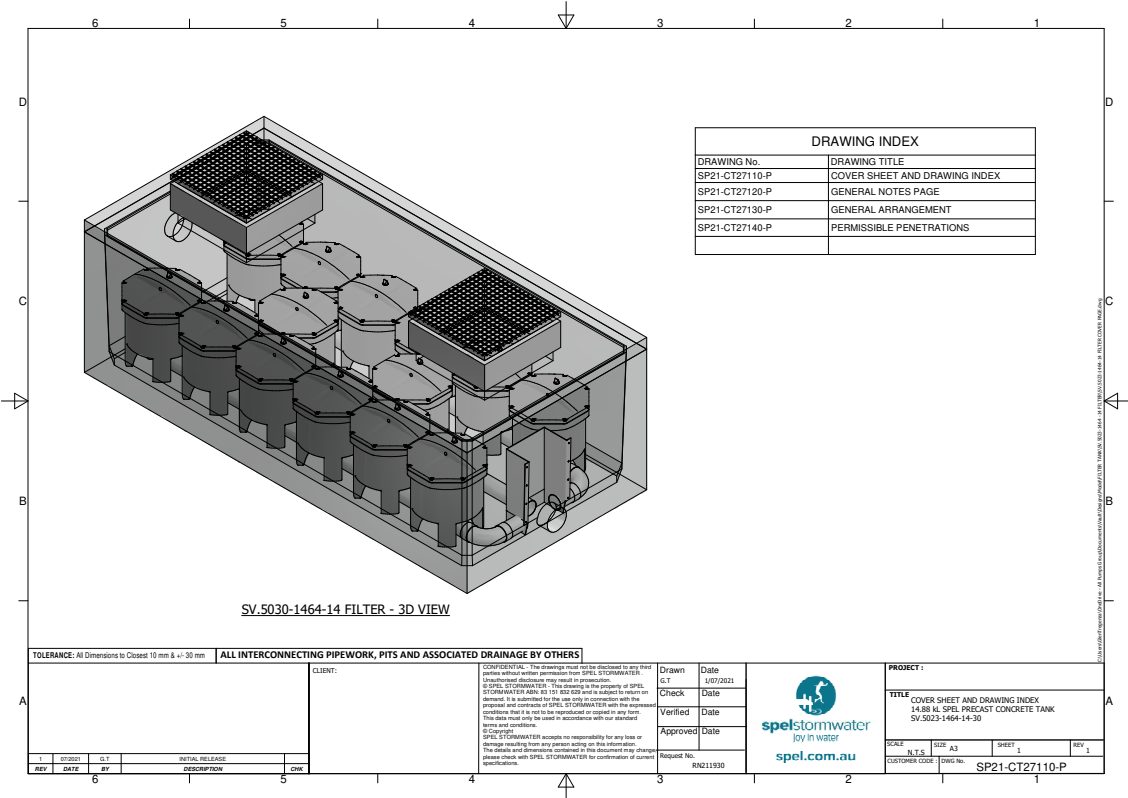


Round Fibreglass Tank Installation

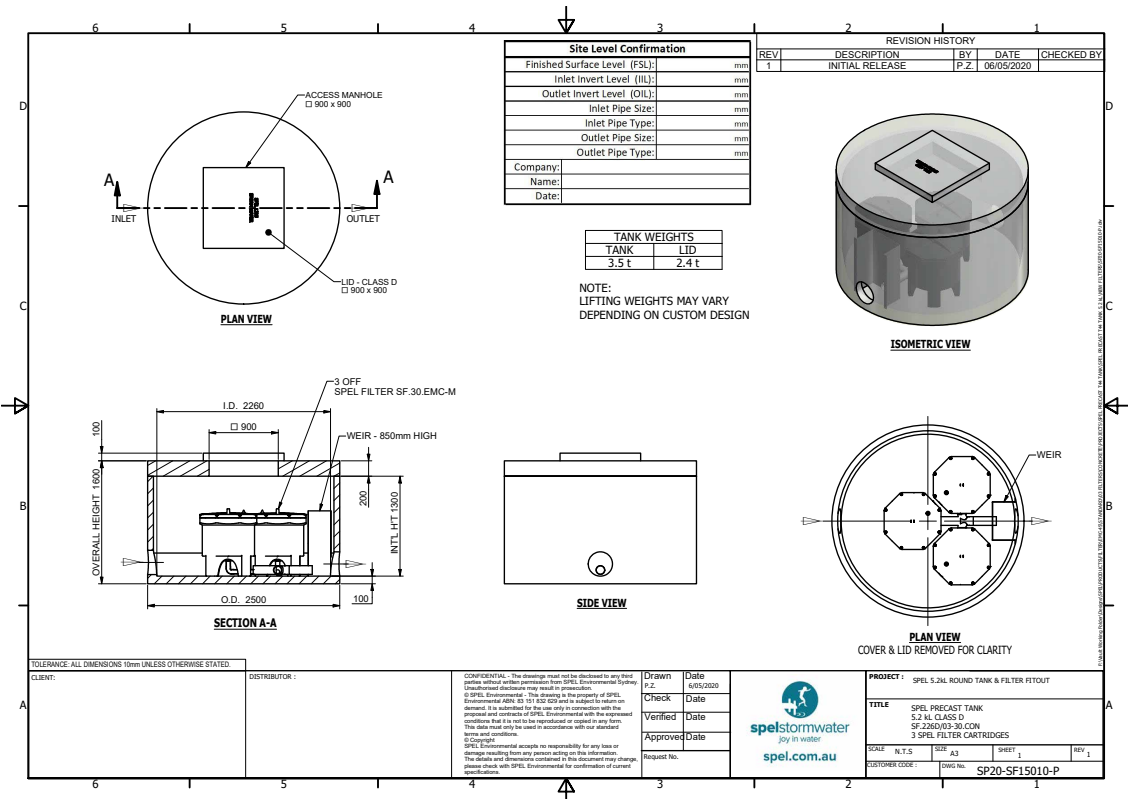


DRAWINGS

Rectangle Concrete Installation

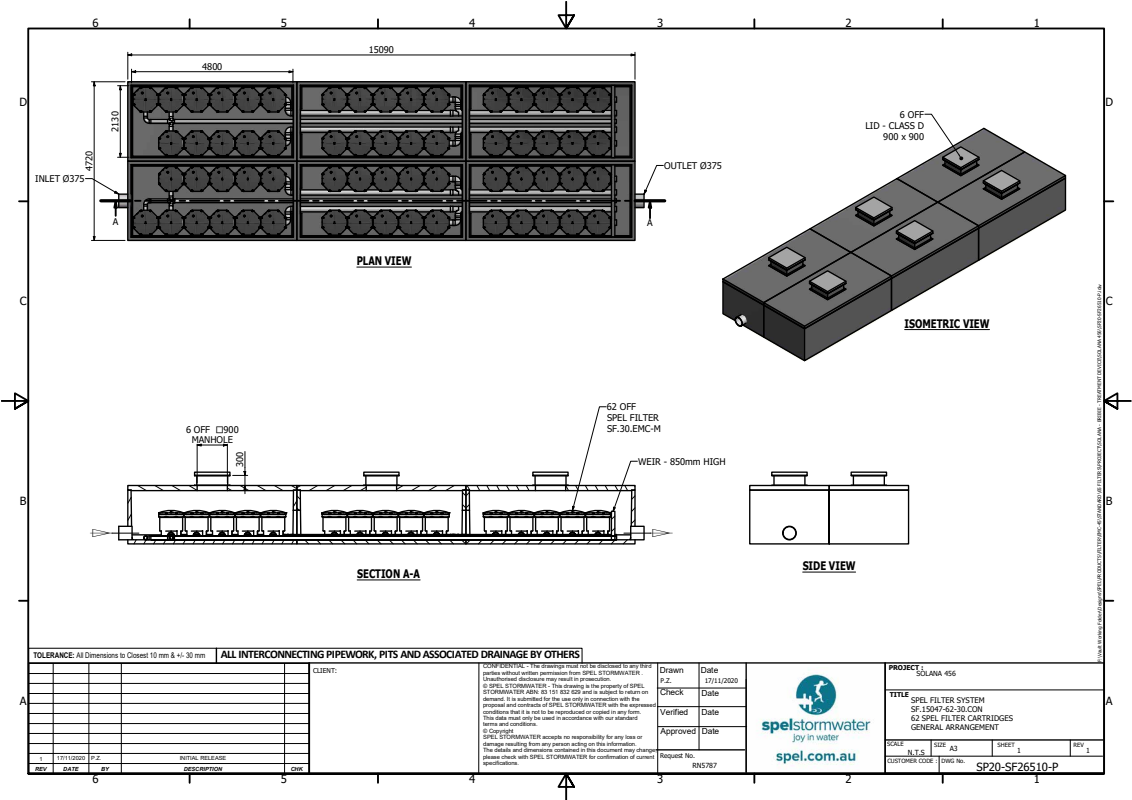


Round Concrete Tank Installation

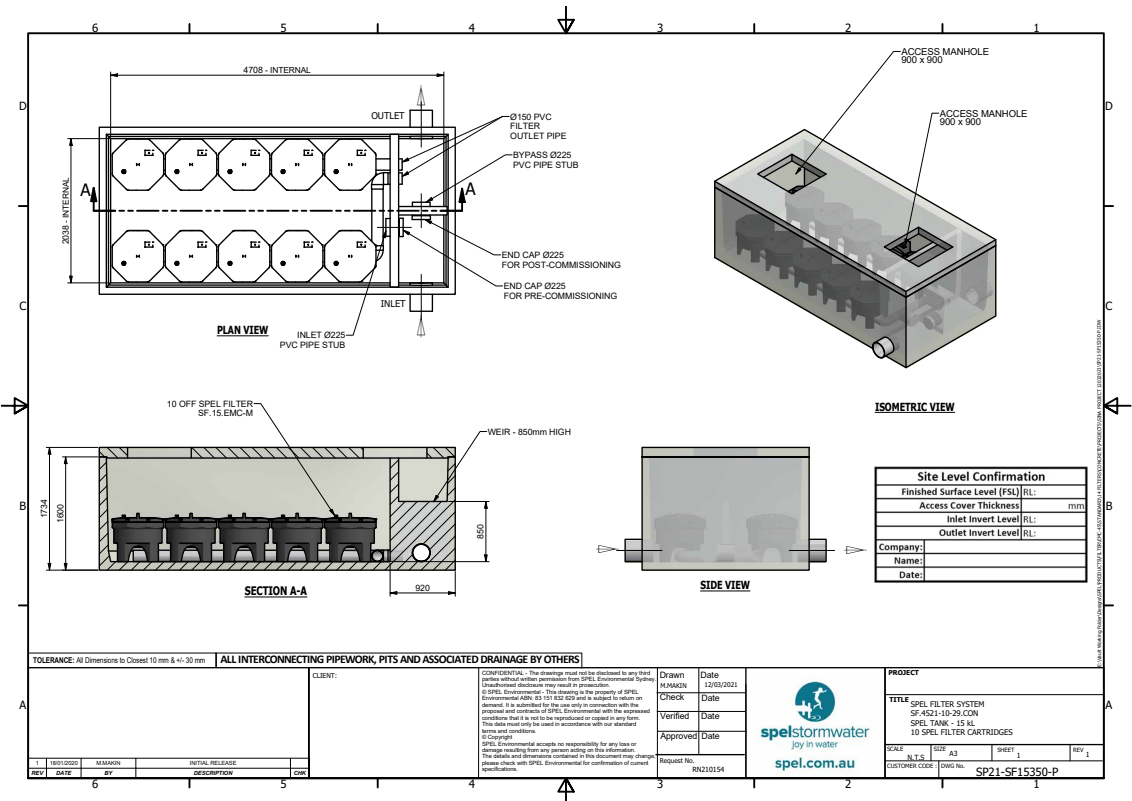


DRAWINGS

Modular Filtration Tank Installation



Internal Bypass Arrangement Tank

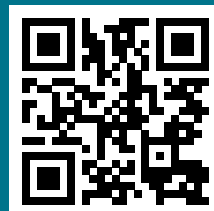


SPELFilter[®]

Cartridge filter for tertiary stormwater treatment

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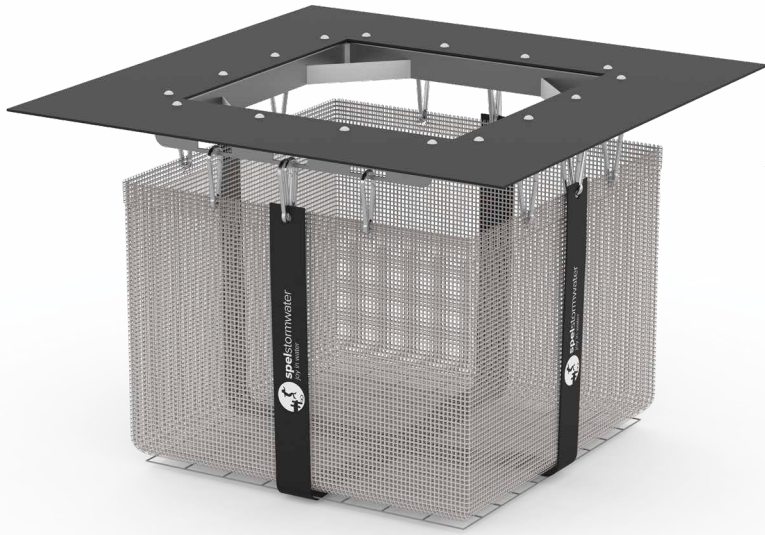
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SPEL Stormsack

At Source Gross Pollutant Trap





APPLICATIONS

- Council storm drain retrofits
- Commercial / retail / residential
- Litter prone urban areas
- Scrap metal / solid waste / oil storage
- Part of treatment train
- Construction sediment / erosion
- <200 micron capture



BENEFITS

- Can be modelled in MUSIC in conjunction with bio-retention
- Low cost gross pollutant capture
- Quick & easy installation
- Simple maintenance
- At source capture
- Adjusts to custom pit sizes

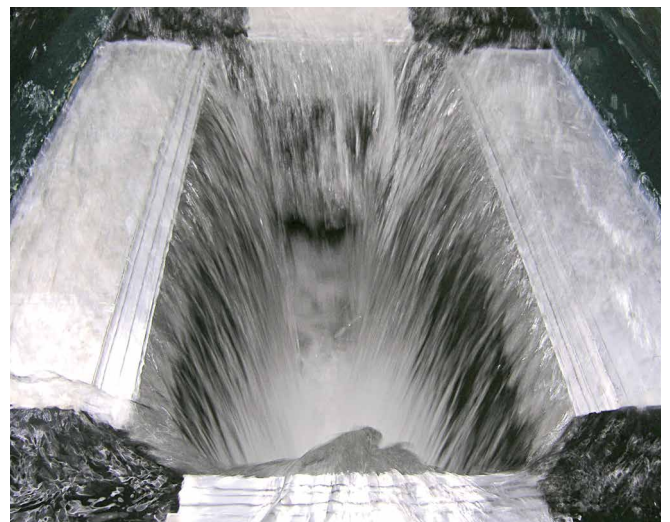
The SPEL Stormsack is specifically designed for the capture of gross pollutants: sediment, litter, and oil and grease. Ideally suited for storm drain retrofits, the SPEL Stormsack's unique design allows maintenance to be performed using conventional vacuum suction equipment.

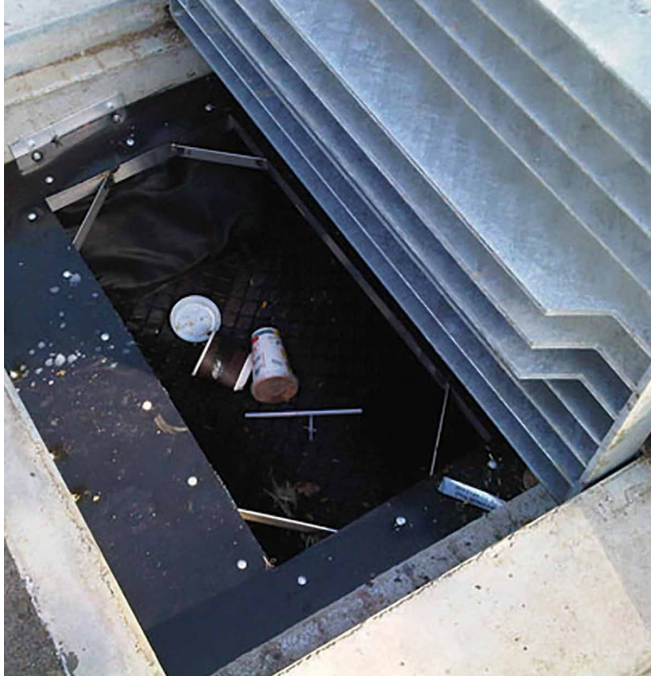
SPEL Stormsack filtration solutions are highly engineered water quality devices that are deployed directly in the stormwater system to capture contaminants close the surface for ease of maintenance. Easily retrofitted into new or existing structures, SPEL Stormsack filtration technology is a decentralized approach to stormwater treatment that essentially repurposes traditional site infrastructure and customizes it to meet specific site water quality goals. In this way, it satisfies important objectives of today's LID (Low Impact Development) criteria.

From an operations perspective, catch basins with SPEL Stormsack filters are also easier and quicker to clean out because pollutants are trapped just under the grate.

The SPEL Stormsack was introduced to the Australian market in 2012 and field testing is underway at several locations in South-east Queensland. Laboratory testing has shown capture of 99.99% of gross pollutants up to the bypass flow rate.* Further results will be provided as they become available.

Recommended minimum clearance from bottom of SPEL Stormsack to inside bottom of vault is 50mm. Typical frame adjustability range of 127mm in each direction.





HOW IT WORKS

This technology is a post developed stormwater treatment system. The SPEL Stormsack provides effective filtration of solid pollutants and debris typical of urban runoff, while utilising the existing or new storm drain infrastructure. The Stormsack is designed to rest on the flanges of conventional catch basin frames and is engineered for most hydraulic and cold climate conditions.

Installation procedures shall include removing the storm grate, cleaning the ledge of debris and solids, measuring catch basin clear opening and adjusting flanges to rest on grate support ledge. Install SPEL Stormsack with splash guard under curb opening so the adjustable flanges are resting on the grate support ledge. Install corner filler pieces. Reinstall storm grate directly on support flanges rise shall be no more than 3mm.

Maintenance: Typically the SPEL Stormsack is serviceable from the street level, and therefore maintenance does not require confined space entry into the catch basin structure. The unit is designed to be maintained in place with a vacuum hose attached to a sweeper or a vactor truck. Use only SPEL replaceable parts.

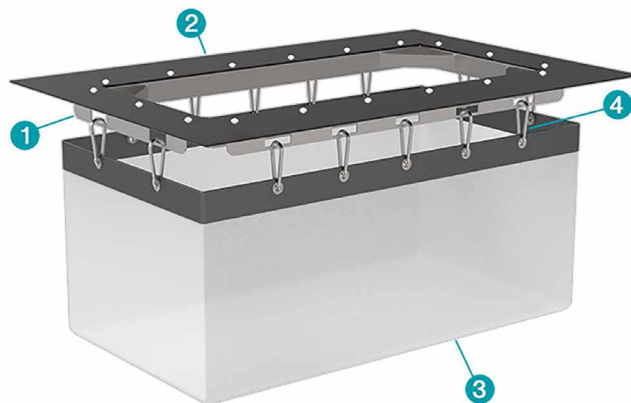
FEATURES

Pollutant	Efficiency
Gross Pollutants (GP)	100%
Total Suspended Solids (TSS)	61%
Total Phosphorus (TP)	28%
Total Nitrogen (TN)	45%

*Contact Spel to confirm approved performance for the project LGA

Application	Regulatory Issue	Target Pollutants
Council Storm Drain Retrofits	At-source litter capture	Sediment, Litter, O&G
Commercial/Retail/Residential	Stormwater Compliance	Sediment, Litter, O&G
Litter Prone Urban Areas	Cost effective litter control	Litter \geq 5 mm
Scrap Metal/Solid Waste/Oil Storage/Etc	Industrial Multi-Sector General Permit	Gross Pollutants, O&G
Part of Treatment Train	Council Stormwater Quality Improvement Targets	Sediment, Litter, O&G
Construction Sediment/Erosion	Sediment Control Plan	Sediment/Erosion Control

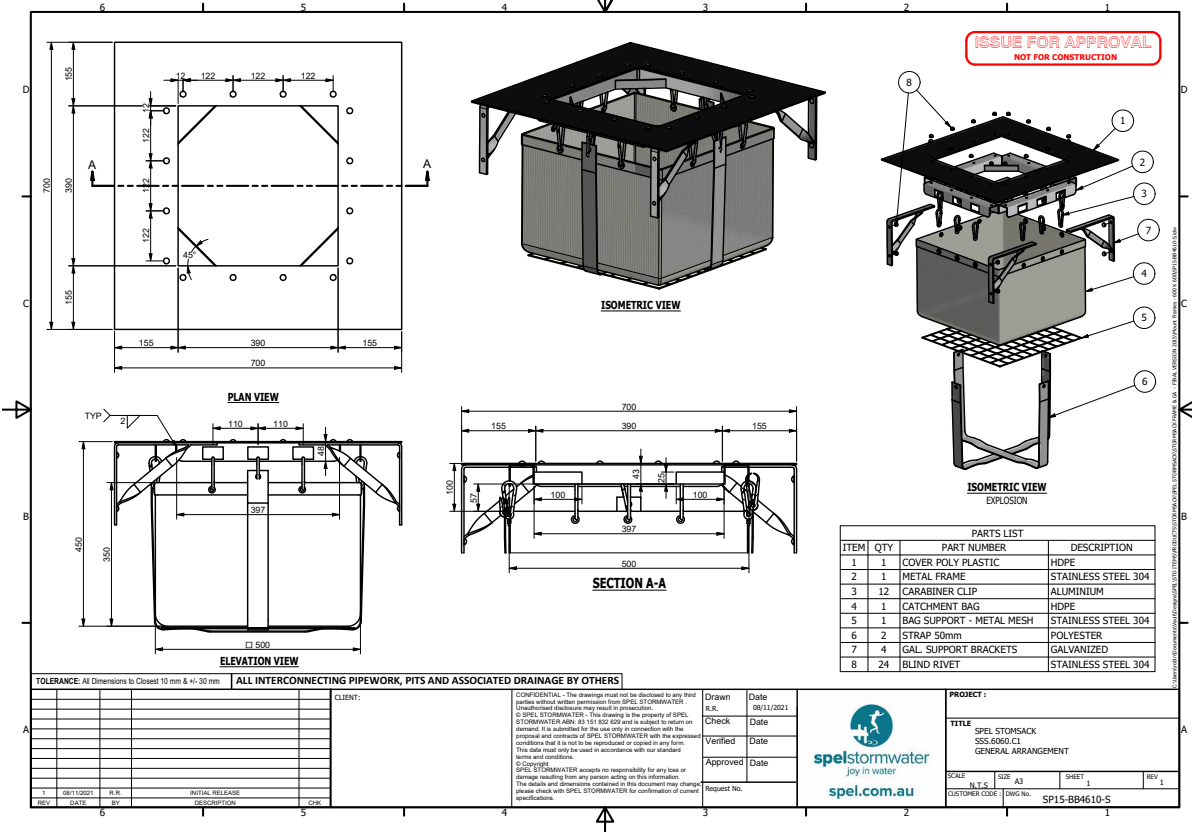
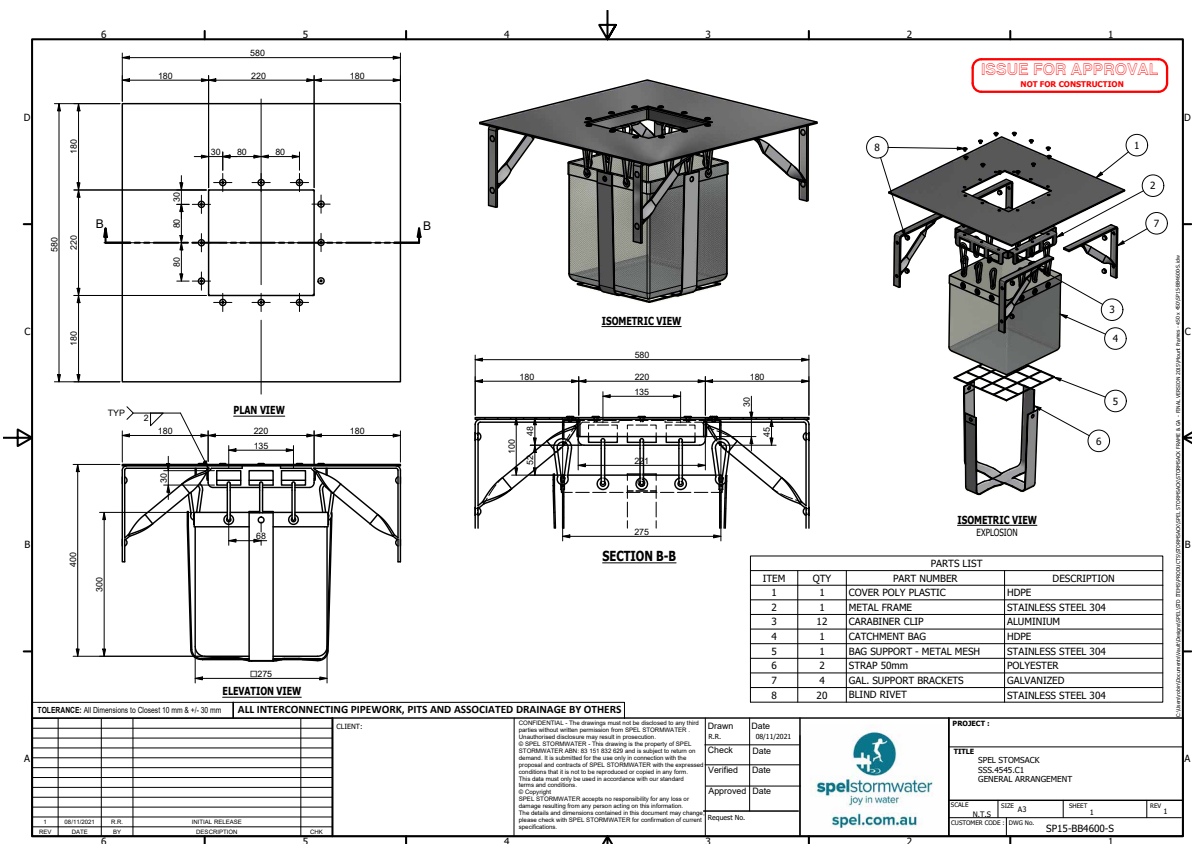
Features	
1.	1. Ultra-Durable Aluminium Frame <ul style="list-style-type: none"> Available in 450x450mm, 600x600mm, 600x900mm and 900x900mm sizes Custom pit arrangements upon request
2.	Black Poly Surround riveted to Frame <ul style="list-style-type: none"> Can be cut to suit on site
3.	Reinforced Stormsack Bag <ul style="list-style-type: none"> Bag has sewed eyelets Square bottom design for even distribution
4.	Karabiners attach Bag to Frame for easy service & replacement
5.	Aluminium Support Angles & Fixings



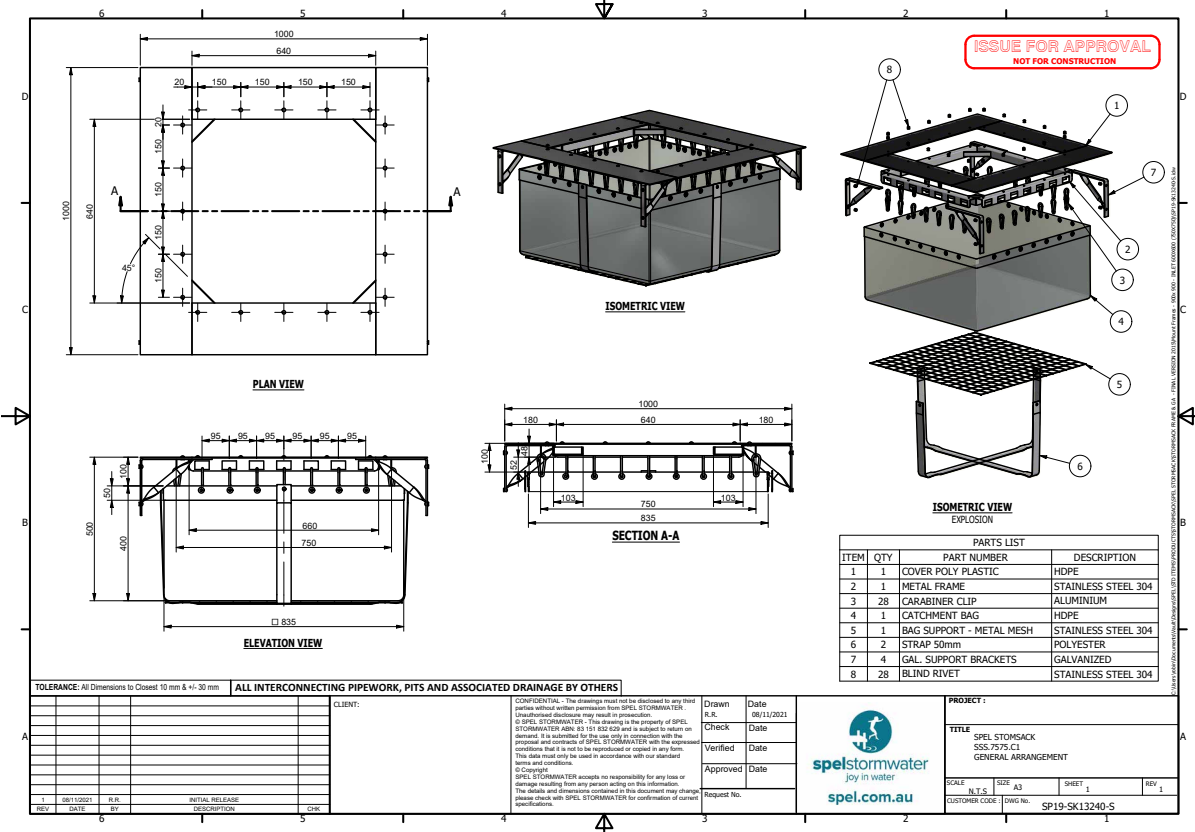
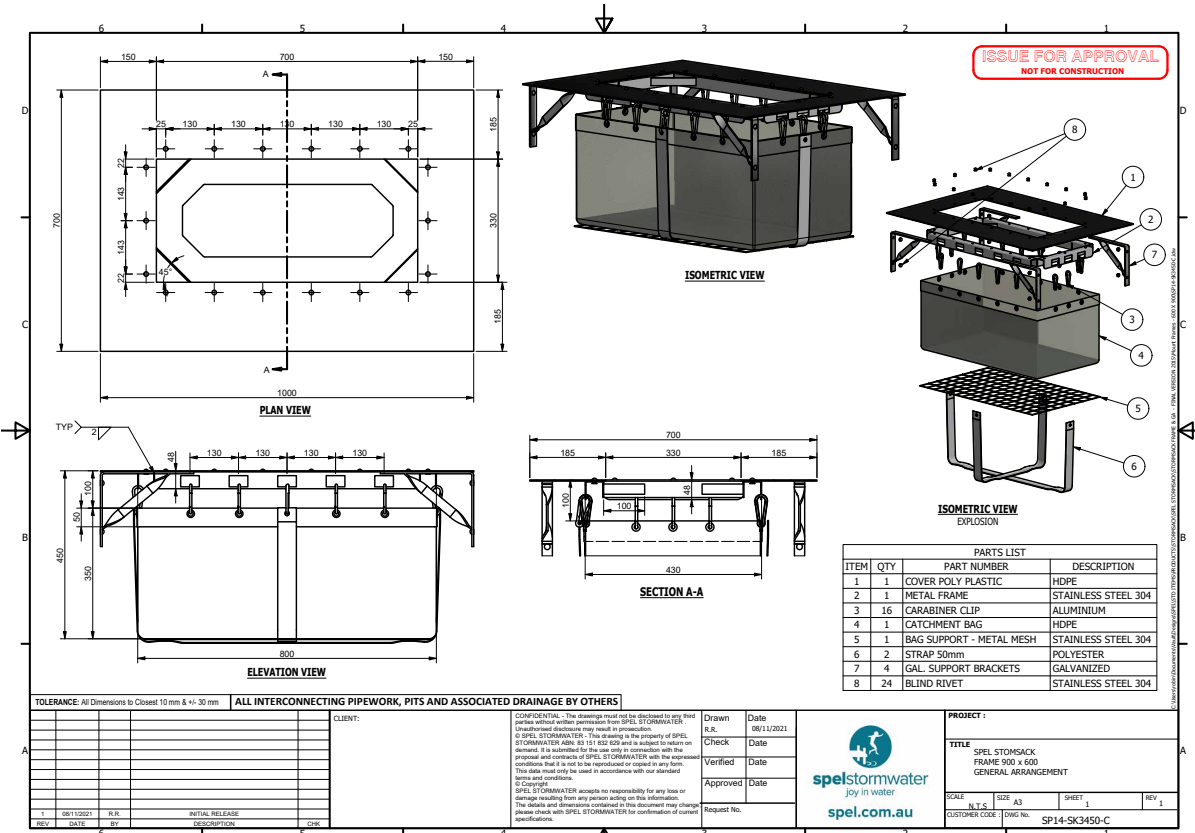
Standard SPEL Stormsack to suit Pit Sizes
450x450mm
600x600mm
900x600mm
900x900mm

Custom sizes (i.e. 1200x900mm) can be manufactured on short lead times

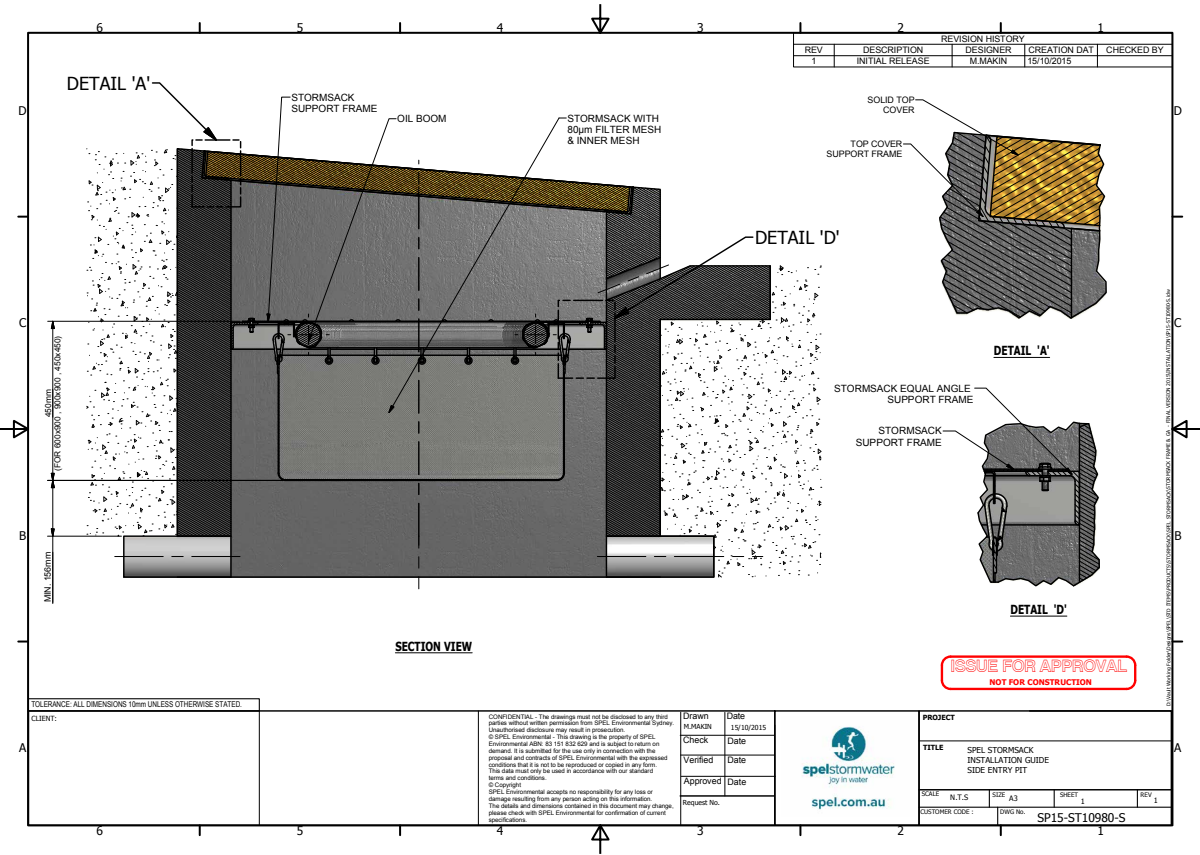
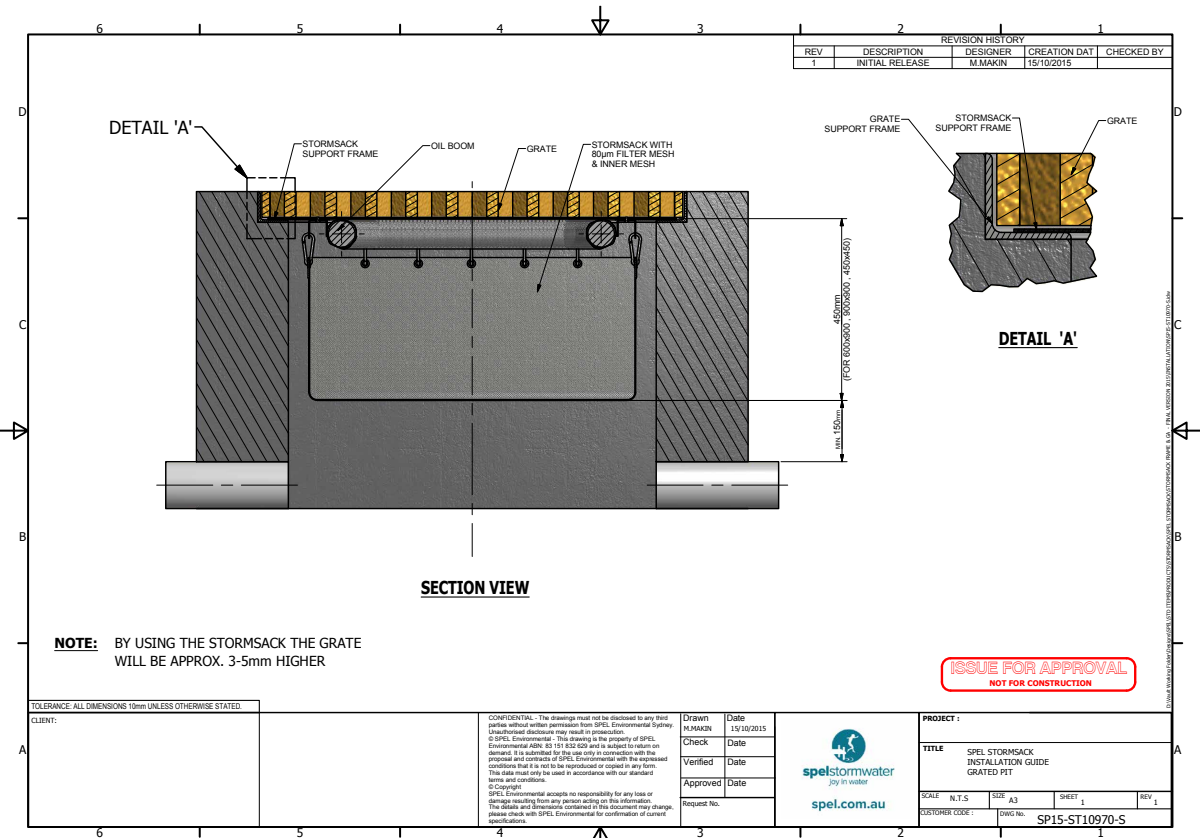
TECHNICAL DRAWINGS



TECHNICAL DRAWINGS



INSTALLATION DETAILS

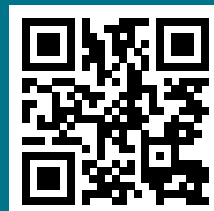


SPEL Stormsack

At Source Gross Pollutant Trap

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