

31th March 2023

Gennadi Belousov
Arch Idea Group
95 Lindrum Road,
Frankston VIC 3199

Our ref: 2168

Your ref:

Dear Gennadi,

Re: 5-17 Maxwell Drive

Please see below basis of design report for the water and sewer infrastructure for the proposed 25-unit development at 5-17 Maxwell Drive, Bridgewater.

1 Project Background

IPD Consulting Pty Ltd (IPD) has been engaged to provide a design solution for new sewer and water property connections to service a 25-unit development in accordance with TasWater specifications.

2 Water Connection Design

IPD allowed for 20 Equivalent Tenements based on Arch Idea Group drawing DA02 and in accordance with Appendix A of TasWater Supplement to the Water Supply Code of Australia (cited 0.8 ET per 3+ bedroom unit). As per AS/NZS 3500.1, the corresponding Peak Simultaneous Demand is 2.64L/s.

A DN50 high-hazard water meter with RPZD device is proposed to service the development. Using this size water meter, velocity through the assembly is limited to 1.3m/s and head loss of approx. 6kPa. This proposal is consistent with the requirements of TasWater Water Metering Guidelines and TasWater Boundary Backflow Containment Selection Requirements.

DN75 PN16 Polyethylene pipe is proposed for the internal potable reticulation water network to service the units within the site.

3 Sewer Connection Design

IPD assessed the viability of the gravity sewer network but was unable to suitably grade sewer to a TasWater sewer connection point. Due to the low elevation of the lot development compared to the existing connection point, a pumped system was determined to be the only viable option and has been designed generally in accordance with Tas Water's requirements, although noting it is intended to be owned and managed by the Body Corporate.

As per Appendix B of TasWater Supplement to the Gravity Code of Australia (cited 1 ET per 3+ bedroom unit), the proposed plan represents 25 Equivalent Tenements for Sewer. In accordance with the Gravity Sewage Code of Australia Table 5.6, DN150 Sewer property connection is required to meet TasWater's requirements.

4 Rising Main Design

4.1 Rising main Criteria

IPD undertook an assessment of the development site using TasWater Supplement to WSA 04-2005 and WSA 07-2007 to design the rising main. The rising main design criteria for each of these documents is summarised below as shown in Table 1.

	Pipe Diameter	Velocity
TasWater Supplement to WSA04-2005	Min. Internal diameter – 80mm	≤2m/s before discharge to the receiver ≤3m/s at an ultimate flow
WSA 07-2007 Pressure Sewerage Code of Australia	Min. DN40 for Property discharge (1 – 2 pumps connected)	Min 0.6m/s & Max 2.5m/s For grinder pump pressure sewers

Table 1: TasWater supplement and WSA07-2007 rising main requirements.

IPD proposed a DN75 PN16 PE rising main. As the proposed pump station is considered to be a private asset, a pipe size larger than the minimum pipe size required by WSA07-2007 has been adopted in order to achieve a desirable rising main velocity of 1.2m/s and limit detention times to less than 2 hours.

4.2 Sewerage Emergency Storage

IPD assessed the need for sewer emergency storage in case of an overflow event. Average Dry Weather Flow (ADWF) is used to determine design flow based on Table 6.2 Design Flow Requirements, TasWater Supplement to WSA 04-2005.

The detention time of 8 hours is suggested by the Sewage Pumping Station Environmental Guidelines 2019 (EPA) for a high location sensitivity rating of the development location.

The resulting emergency storage requirement is 3888L. IPD propose a 4000L PE Netco tank to meet this requirement.

4.3 Wet Well Design.

Based on Taswater's DWG TWS-M-002 Sewage Pump Station Wet Well Level Settings, the depth of the wet well is determined by the invert level of the gravity sewer network. IPD assessed the wet well depth based on a gravity sewer grading from the most disadvantaged unit connected to the proposed wet well location.

- **Key Design Constraint:**

Units 16 to 18, and Units 19 & 20 are considered the most disadvantaged units since they contain a basement at FL 6.36 and FL 5.64, respectively. To service the basement of these units, the wet well inflow pipe inverts are estimated in table 2 based on the minimum pipe grade requirement of to AS3500.2 table 3.2.

	Unit 19-20	Unit 16-18
FFL (Basement)	5.64m	6.36m

Pipe Invert at inlet manhole before wet well		
Min. Grade 1.65% for DN100	IL 4.6	IL 4.93
Min. Grade 1% for DN150	IL 4.8	IL 5.3

Table 2: Pipe invert levels to the inlet manhole in the worst case.

The overall lowest required wet well invert level of RL4.8m for DN150 at 1% grade was adopted.

5 Proposed Netco Infrastructure

As per Netco Proposal 44205, the pump station comes with a 14000L pump chamber for the pump and a 4000L medium-density PE storage chamber for overflow, which has been sized by IPD suitable for 8-hour emergency storage. It allows 2(No) Heavy-duty manual submersible 2.1kW Sulzer grinder-style pumps feeding 100m of DN75 PN16 PE rising main. Selection Parameters are as shown in table 3.

	Details
Pump Duty	3.4L/s at 11.63m Total dynamic head
Static Head	9.12m
Rising main length	100m
Rising main size	75mm OD PN16 PE
Pump configuration	Dual pumps, Guide rail mounting
Pumped medium	Sewage

Table 3: Netco selection parameters.

6 Key Assumptions

- The site will undergo earthworks to achieve the design levels specified by Arch Idea Group.
- The pump hydraulic (static and minimum Invert levels) are based on the 3D surface provided by Arch Idea Group.

7 Discussion and Conclusion

As demonstrated in this report, the proposed multi-unit development is able to be serviced for water and sewer.

On this basis, IPD considers the proposed water and sewer connection system adequate to achieve the conditions required by TasWater and kindly request a planning permit be issued to the applicant.

We trust that the above letter provides the information you require. If you require any further information or clarification on any aspect of the above, please don't hesitate to contact me on Mob: 0467 246 156 or Email: dmayne@ipdconsulting.com.au

Yours faithfully

IPD Consulting Pty Ltd



Duncan Mayne

Civil Engineer

References

TasWater Supplement to WSAA Sewage Pumping Station Code of Australia

TasWater Supplement to Sewerage Code of Australia - MRWA Edition

TasWater Supplement to WSAA Water Supply Code of Australia - MRWA Edition

Tasmanian Sewage Pump Station Environmental Guidelines

TasWater Water Metering Guidelines.

TasWater Boundary Backflow Containment Selection Requirements – Draft

WSA 04-2005 Sewage Pumping Station Code of Australia

WSA 07-2007 Pressure Sewerage Code of Australia

NETCO Proposal Ref: 44205.

5-17 Maxwell Drive

SEWER FLOW ESTIMATION

Client Name: Micheal Ta
Job Number: 2168

Assessment By: SMF Date: 28/02/2023
Reviewed By: SMF Date: 28/02/2023

Dry Weather Flow Estimations

Parameter	Symbols	Value	Units	Formulas	Reference
Residential equivalent tenements	ET _R	25	-	-	ET Estimation Calculation
Commercial equivalent tenements	ET _C	0	-	-	ET Estimation Calculation
Loading rate	R	450	L/ET/day	-	TasWater Technical Addendum 01
Gross plan area of catchment	A	0.69	ha	-	Catchment Map

Calculations

Parameter	Symbols	Value	Units	Formulas	Reference
Total equivalent tenements	ET _T	25	-	ET _R + ET _C	-
Dry weather peaking factor	d	8.36	-	$d = 0.01(\log A)^4 - 0.19(\log A)^3 + 1.4(\log A)^2 - 4.66(\log A) + 7.57$	WSA 02-2014-3.1 Appendix C

Results

Parameter	Symbols	Value	Units	Formulas	Reference
Average dry weather flow	ADWF	0.135	L/s	ET _T *R*0.000012	TasWater Technical Addendum 01
Peak dry weather flow	PDWF	1.128	L/s	d*ADWF	TasWater Technical Addendum 01

Ground Water Infiltration

Parameter	Symbols	Value	Units	Formulas	Reference
Portion Wet	P _w	70%	%	-	Design Assumptions - Section 5.5.5.2 of TasWaters Supplement

Result

Parameter	Symbols	Value	Units	Formulas	Reference
Groundwater infiltration	GW _I	0.01	L/s	0.025*P _w *A	WSA 02-2014-3.1 Appendix C

Peak Rainfall Dependent Inflow Estimation

Parameter	Symbols	Value	Units	Formulas	Reference
Portion Impervious	P _i	57%	%	-	Design Assumptions - Section 5.5.5.2 of TasWater Supplement
Average people per household	A _p	3	EP/ET	-	Design Assumptions - Section 5.5.5.2 of TasWater Supplement
IIF leakage severity coefficient	C	1.6	-	-	Design Assumptions - Section 5.5.5.2 of TasWater Supplement
Average recurrence interval	ARI	10	years	-	Design Assumptions - Section 5.5.5.2 of TasWater Supplement
Rainfall intensity	I _{1,2}	12.8	mm/hr	-	Bureau of Meteorology
Percentage Industrial	P	0.0%	%	-	Ratio of industrial development in whole catchment

Calculations

Parameter	Symbols	Value	Units	Formulas	Reference
Residential area	A _{res}	0.69	ha	(1-P)*A	-
Industrial area	A _{ind}	0.00	ha	P*A	-
Residential effective area	A _{eff,res}	0.59	ha	IF(D>150,A _{res} ,A _{res} *SQRT(D/150))	WSA 02-2014-3.1 Appendix C
Industrial effective area	A _{eff,ind}	0.00	ha	A _{ind} *(1-0.75*P _i)	WSA 02-2014-3.1 Appendix C
Size Factor	F _{size}	1.63	-	(40/A)^0.12	WSA 02-2014-3.1 Appendix C
Containment frequency	X	1.00	-	LOG ₁₀ (ARI)	WSA 02-2014-3.1 Appendix C
Containment Factor	F _{cont}	1.50	-	0.77*(10 ^{0.43X} /10 ^{0.14X^2})	WSA 02-2014-3.1 Appendix C
Total effective area	A _{eff,tot}	0.59	ha	A _{eff,res} + A _{eff,ind}	WSA 02-2014-3.1 Appendix C
Adjusted rainfall intensity	I _{adjusted}	31.28	mm/hr	I*F _{size} *F _{cont}	WSA 02-2014-3.1 Appendix C
Development density	D	108.70	EP/ha	EP/ha	WSA 02-2014-3.1 Appendix C

Result

Parameter	Symbols	Value	Units	Formulas	Reference
Rainfall dependent inflow	RDI	0.82	L/s	0.028*A _{eff,tot} *C*I _{adjusted}	WSA 02-2014-3.1 Appendix C

Design Flowrate Estimation

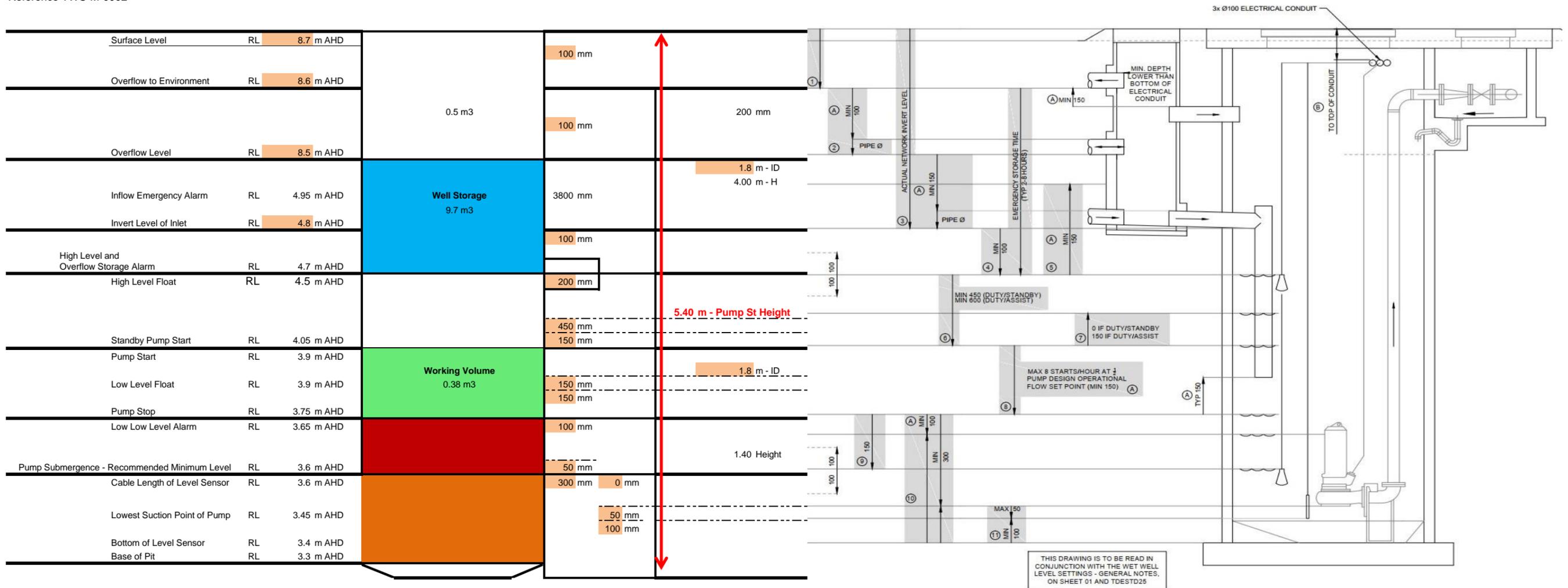
Parameter	Symbols	Value	Units	Formulas	Reference
Design flowrate	Q	1.96	L/s	PDWF + GW _I + RDI	WSA 02-2014-3.1 Appendix C

TasWater Supplement to WSA 02-2014-3.1 Design Assumptions - Section 5.5.5.2

Parameter	Value	Units	Notes
k	1.5	mm	
d/D	0.7	-	
EP/ET	3	-	
Industrial/Commercial	75	EP/HA	
ADWF ¹	150	L/d/EP	new residences (post 2014)
	180	L/d/EP	existing residences (prior to 2014)
Median lot area	700	m ²	
Net/gross lot area	70%	-	
Sewer below water table	70%	Portion _{wet}	
Soil aspect	0.8	S _{aspect}	
Network defects aspect	0.6	N _{aspect}	
Leakage severity, C	1.4	S _{aspect} + N _{aspect}	
ARI	5	years	
Portion _{impervious}	0.2	-	Default value of 0.2 unless known

1. Superseded by Technical Addendum 01 - Revision 1

5-17 Maxwell
Pump Station Design Levels
Revision A - 28/02/23
 Reference TWS-M-0002



Pump Flow Rate	3.4 L/s
Required Working Volume	204 L
Pump Operational Duration at No Flow	112.266 s
PDWF	0.14 L/s
Pump Operational Duration at PDWF	116.908 s
Operational storage fill time at PDWF	2827.43 s
Cycle Time at PDWF	2944.34 s
No. starts per hour at PDWF	1.22268

Storage Volume/Pump Flow Rate
 Storage Volume/Pump Flow Rate
 Storage Volume/ PDWF

ADWF/PDWF case by case	
Flow (l/s)	Detention Time (hr)
0.14	8
Required Emergency Storage	
3.89 m3	

	L/s
ADWF	0.135
PDWF	1.128
PWWF	1.96

Pipe:	
Pipe Diameter	0.061 m
Pipe Length	100 m

Manhole Upstream			
Surface Level- RL	8.700 m AHD	Overflow Depth	0.100
Overflow Level - RL	8.600 m AHD	Detention Depth	3.800
Invert Level	4.800 m AHD	Emergency Storage	2.98 m3
MH Diameter	1.000 m		

System Storage	
MHs	2.98 m3
Pipes	0.29 m3
Well Storage	9.67 m3
System Storage	12.94 m3
Req. Additional Emergency Storage	-9.05 m3
Available Emergency Storage	0 m3

OK

5-17 MAXWELL DRIVE

MAXWELL DRIVE, BRIDGEWATER, TAS

FOR ARCH IDEA GROUP



LOCALITY PLAN
SCALE - N.T.S

DRAWING LIST		
DRAWING NUMBER	DRAWING TITLE	REVISION
2168-01	COVER SHEET	B
2168-02	PLAN VIEW & LONGSECTION	B

WARNING
BEWARE OF UNDERGROUND SERVICES
THE LOCATION OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY AND THE EXACT POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL SERVICES ARE SHOWN.



FOR DA APPROVAL

								PROJECT NAME 5-17 MAXWELL DRIVE	
								DRAWING TITLE COVER SHEET	
B	28.03.23	FOR DA APPROVAL	JN	DM				SCALE AT A3 N.T.S	DRAWING NUMBER 2168-01
A	20.02.23	PRELIMINARY	JN	DM				SHEET 1 OF 2	DISCIPLINE CI
REV	DATE	DESCRIPTION	DRN	CHK	APPROVED	MW	20.02.23		REVISION B

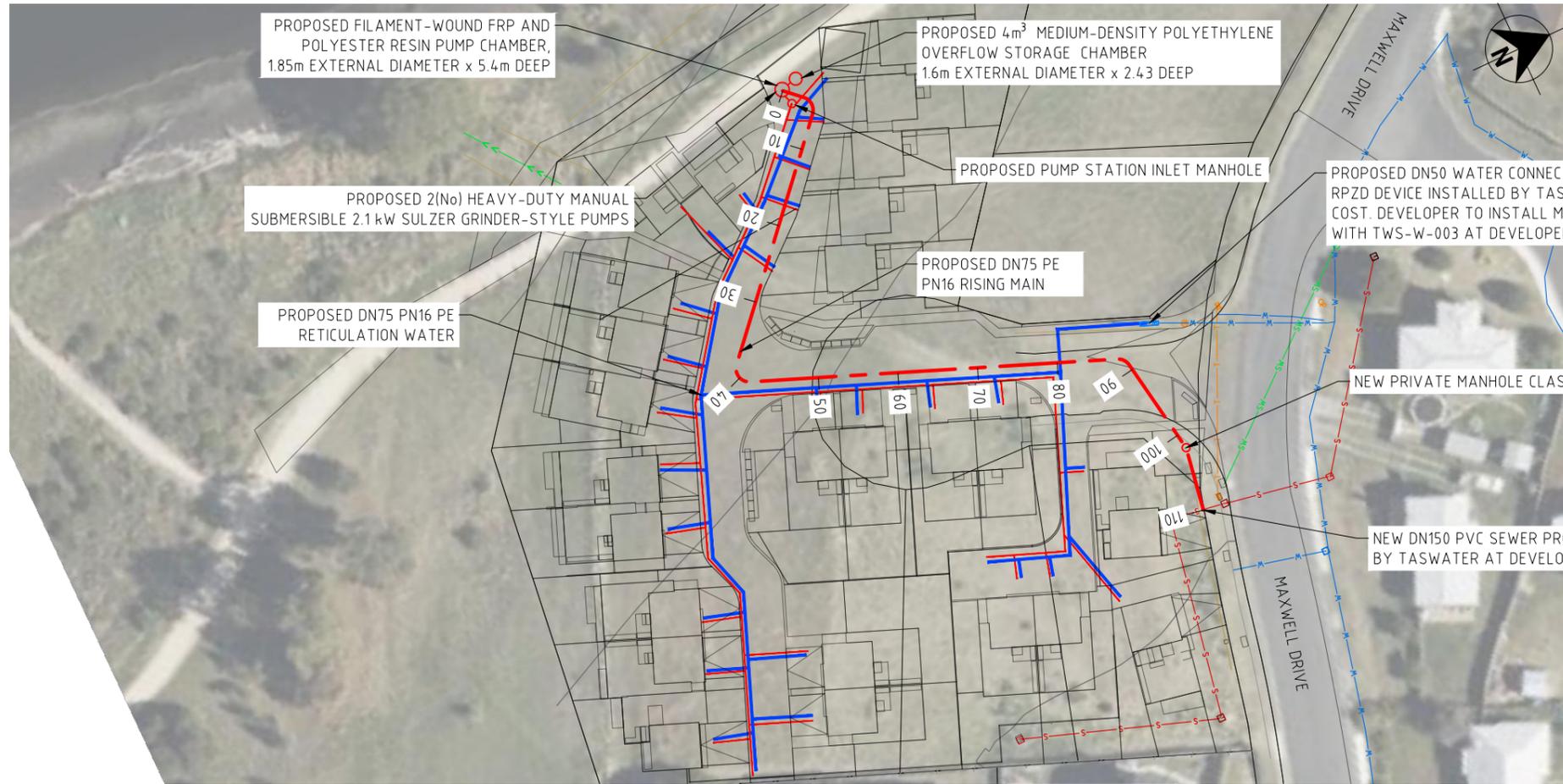
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DIMENSIONS IN MILLIMETRES
DRAWING PRACTICES TO AS1100 - 1992
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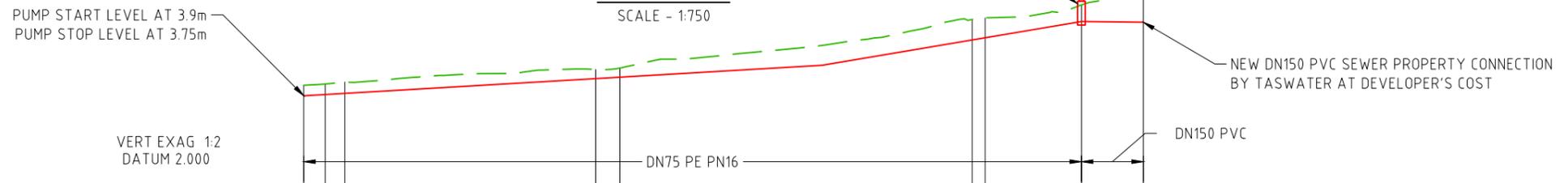
NOTES:

- REFER NETCO PROPOSAL REF 44205 FOR DETAILS ON PROPOSAL PUMPS, PUMP STATION AND EMERGENCY STORAGE.



PLAN VIEW

SCALE - 1:750



PIPE GRADE %	2.9%										8.5%				-0.6%							
PIPE INVERT LEVEL	8.000	8.083	8.158	8.294	8.589	8.883	9.126	9.178	9.219	9.472	9.767	10.175	11.020	11.661	11.805	11.866	12.711	12.870	12.825			
EXISTING LEVELS	8.697	8.776	8.843	8.909	9.008	9.387	9.641	9.727	9.728	9.733	9.820	10.407	10.902	11.464	12.295	13.005	13.077	13.111	13.120	13.597	13.959	14.647
DEPTH TO INVERT	-0.697	-0.693	-0.751	-0.714	-0.798	-0.757	-0.601	-0.556	-0.601	-0.934	-1.136	-1.288	-1.274	-1.344	-1.306	-1.254	-0.886	-1.089	-1.822			
CHAINAGE	0.00	2.81	5.38	10.00	20.00	30.00	38.23	40.00	41.41	50.00	60.00	70.00	80.00	87.58	89.28	90.00	100.00	101.89	110.00			

RISING MAIN LONGSECTION

SCALE - 1:750

LEGEND

- PROPOSED RISING MAIN
- PROPOSED WATER LINE
- PROPOSED SEWER LINE
- EX. WATER MAIN
- EX. SEWER MAIN



The Essential First Step.

WARNING

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FOR DA APPROVAL

REV	DATE	DESCRIPTION	DRN	CHK	APPROVED	DATE
B	28.03.24	FOR DA APPROVAL	JN	DM		20.02.23
A	20.02.23	PRELIMINARY	JN	DM		20.02.23

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PROJECT NAME 5-17 MAXWELL DRIVE		DRAWING TITLE PLAN VIEW & LONGSECTION	
SCALE AT A3 A.S.	DRAWING NUMBER 2168-02	SHEET 2 OF 2	DISCIPLINE CI
REVISION B			

PROJECTS/268 - MICHAEL TA - 5-17 MAXWELL DRIVE/03 - DESIGN/37 CAD/06/2023 - 5-17 MAXWELL DRIVE_REV14



NOTES:

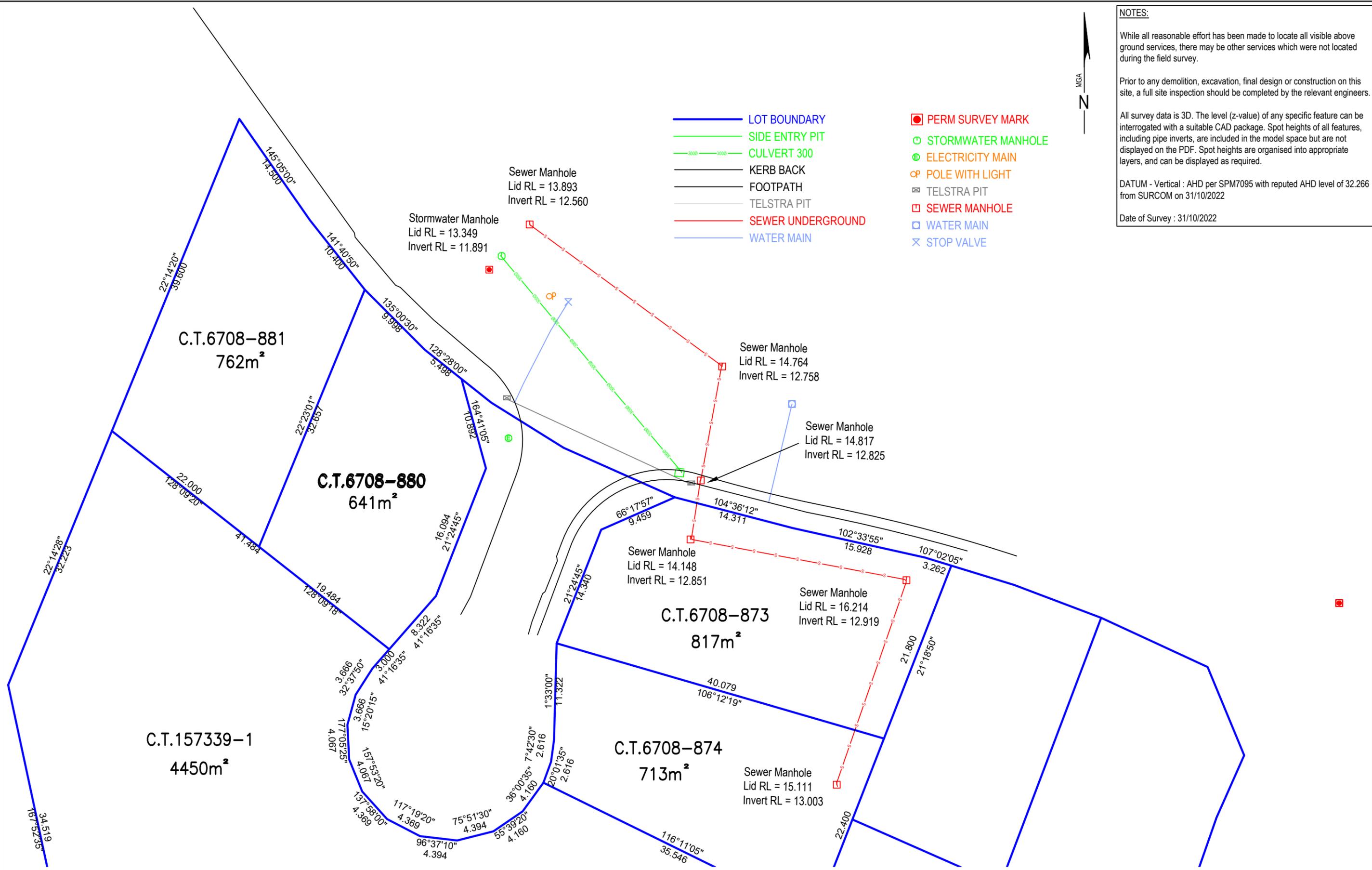
While all reasonable effort has been made to locate all visible above ground services, there may be other services which were not located during the field survey.

Prior to any demolition, excavation, final design or construction on this site, a full site inspection should be completed by the relevant engineers.

All survey data is 3D. The level (z-value) of any specific feature can be interrogated with a suitable CAD package. Spot heights of all features, including pipe inverts, are included in the model space but are not displayed on the PDF. Spot heights are organised into appropriate layers, and can be displayed as required.

DATUM - Vertical : AHD per SPM7095 with reputed AHD level of 32.266 from SURCOM on 31/10/2022

Date of Survey : 31/10/2022



AMENDMENTS		
No.	Revision/Issue	Date

LEARY COX & CRIPPS
LAND & ENGINEERING SURVEYORS

Unit G04 40 Mollie Street,
HOBART TAS 7000
P 03 6118 2030
E admin@lccsurvey.com

Project Name and Address
**5-17 Maxwell Drive
Bridgewater, 7030**

Drawing Title
DETAIL PLAN

Client
Cuze Pty Ltd
CT. 157339 / 1

SCALE
0 5 10 15
1:400 at A3

Contour Interval
N/A

Date
16/11/2022

FILE REF:
13108

SHEET 1 of 1

DRAWN LH
CHKD DC

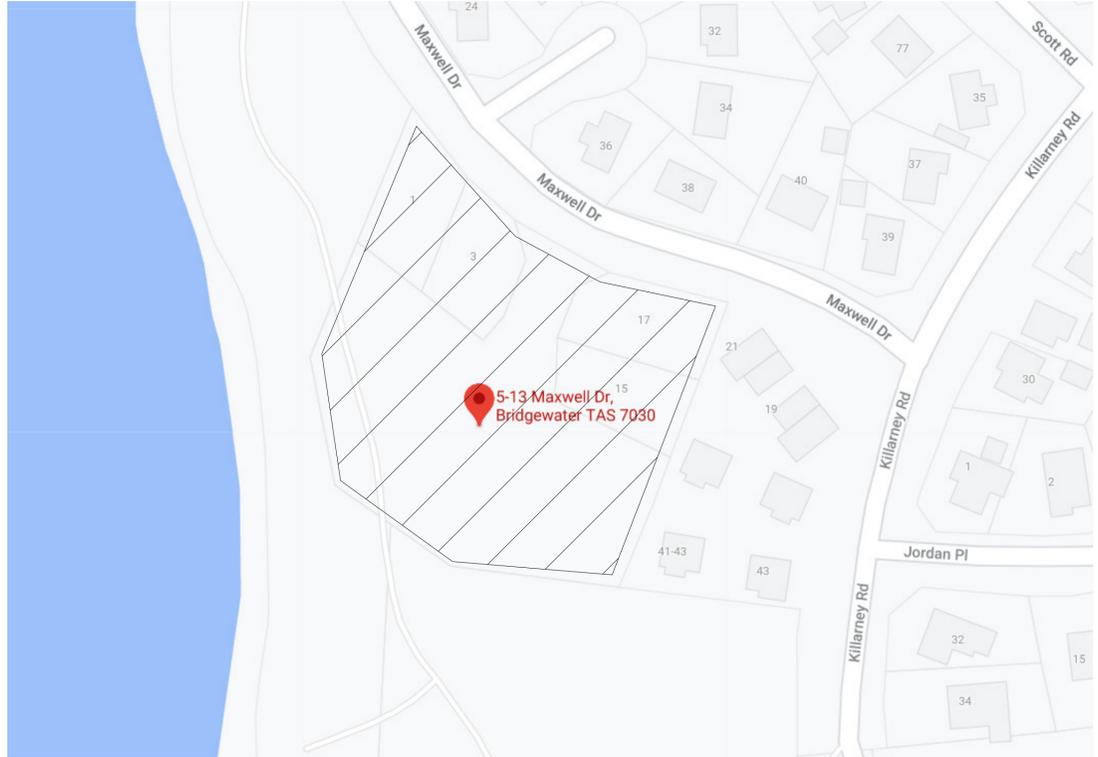
Geocivil Ref 1310801
AutoCAD Ref 1310801
DATUM Horz: MGA2020
Vert: AHD

DEVELOPMENT OF MULTI UNITS
5-13 MAXWELL DR BRIDGEWATER TAS 7030
REF NO : DA2022/134

LEGEND	
PDS	- PRIVATE OPEN SPACE
RWT	- RAIN WATER TANK
DP	- DOWN PIPE
IL	- INVERTED LEVEL
FL	- FINISHED FLOOR LEVEL
ID	- INSPECTION OPENING
EP	- EXISTING COUNCIL SW PIT
FSL	- FINISH SURFACE LEVEL
GSL	- GROUND SURFACE LEVEL
— SW —	- COUNCIL STORM WATER PIPE
— — — —	- UPVC STORM WATER PIPES
— D —	- CHARGED PIPE
→	- FLOW DIRECTION
→	- FINISHED SURFACE SLOPE
— AG —	- AGGI PIPE

NOTE:

- PROVIDE 100 MM DIA UPVC PIPE SEWER GRADE WHERE NO SIZE IS SPECIFIED FROM DOWN PIPES, WITH INSPECTION OPENINGS.
- MIN FALL TO 100 & 150 DIA STORMWATER PIPE IS TO BE 1 IN 100
- DP-DENOTES POSSIBLE DOWN PIPE LOCATIONS. REFER TO ARCHITECTURAL DRAWINGS FOR SIZE, STYLE & CORRECT LOCATIONS. ALL WATER TANKS, DOWN PIPES AND STORMWATER DRAINAGE ARE TO BE INSTALLED IN ACCORDANCE WITH B.C.A. AND PLUMBING INDUSTRY ASSOCIATION STANDARDS CURRENT AT THE TIME OF CONSTRUCTION.
- ONSITE DETENTION WORK TO BE DONE IN ACCORDANCE WITH BRIGHTON COUNCIL SPECIFICATIONS & STANDARD DRAWINGS.
- PRIOR TO THE COMMENCEMENT OF ANY STORMWATER DRAINAGE WORKS, THE CONTRACTOR SHALL VERIFY THE INVERT LEVEL (SHOWN ON THIS DRAWING) AT THE DOWNSTREAM END OF THE DOCUMENTED OUTFALL DRAIN. IF THAT LEVEL VARIES FROM THAT SHOWN ON THE DRAWING, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE PROJECT MANAGER.
- PITS WITHIN LANDSCAPE AREA TO HAVE SOLID LIDS UNLESS LOCALIZED PONDING IS LIKELY TO OCCUR.
- ALL INTERNALS DRAINAGE WORKS MUST BE IN ACCORDANCE WITH AS/NZS 3500.3:201998 STORMWATER DRAINAGE- ACCEPTABLE SOLUTIONS.
- THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, LOCATION AND LEVEL OF ALL EXISTING SERVICES ON SITE PRIOR TO COMMENCING CONSTRUCTION. ALLOW FOR ANY PROTECTION TO EXISTING SERVICES REQUIRED BY AUTHORITIES. ANY SERVICE DAMAGED BY THE CONTRACTOR SHALL BE REINSTATED BY HIM AT HIS OWN EXPENSE.
- PROVIDE 90MM DIA AGG DRAIN ALONG THE RETAINING WALL, WITHIN THE PROPERTY BOUNDARY AT 1 IN 100 MIN SLOPE.
- ALL VEHICLES CROSSING TO COMPLY WITH RELEVANT AUTHORITY SPECIFICATIONS.
- ALL DISTURBED AREAS TO BE COVERED WITH 100MM TOP SOIL AND SEEDED WITH GRASS AS DIRECTED. NO TOPSOIL TO BE REMOVED FROM THE SITE.
- CARE MUST BE TAKEN WHEN BREAKING INTO COUNCIL DRAINS, KERBS AND CHANNELS AND FOOTPATHS AND IT IS THE CONTRACTORS' RESPONSIBILITY TO ENSURE THESE ARE REINSTATED TO THE SATISFACTION OF THE COUNCIL. ALL REQUIRED PERMITS MUST BE OBTAINED PRIOR TO COMMENCEMENT OF WORKS.
- WHERE PIPES ARE LOCATED UNDER CAR PARK AND ROADWAY, TRENCHES ARE TO BE BACK FILLED WITH CLASS 3/4 STABILIZED CRUSHED ROCK COMPACTED IN 150MM LAYERS DENSITY OF 98% MODIFIED COMPACTION. TRENCH TO BE BACK FILLED TO SUB GRADE LEVEL.
- PROPOSED VEHICULAR CROSSING MUST BE FULLY CONSTRUCTED TO THE SATISFACTION OF RESPONSIBLE AUTHORITY.
- PRIOR TO COMMENCEMENT OF THIS DEVELOPMENT, BUILDING PERMIT MUST BE OBTAIN FROM REGISTERED BUILDING SURVEYOR.
- IT IS THE RESPONSIBILITY OF THE OWNER/DEVELOPER AND BUILDING SURVEYOR TO ENSURE THAT ALL BUILDING DEVELOPMENT WORKS APPROVED BY ANY BUILDING PERMIT IS CONSISTENT WITH THE PLANNING PERMIT.
- BEFORE REMOVING/PRUNING ANY VEGETATION FROM THE SITE, THE DEVELOPER SHOULD CONSULT COUNCIL'S VEGETATION MANAGEMENT OFFICE TO VERIFY IF A LOCAL LAWS PERMITS IS REQUIRED FOR THE REMOVAL OF SUCH VEGETATION.
- THE NATURE STRIP, KERB AND CHANNEL VEHICLE CROSSOVER AND FOOTPATH MUST BE REINSTATED TO THE SATISFACTION OF THE RESPONSIBLE AUTHORITY.



LOCATION MAP (NTS)

CONCRETE

CONCRETE CRUSHING STRENGTH AT 28 DAYS SHALL BE AT LEAST :-
 PAVING WORKS 32 MPA
 DRAINAGE WORKS 25 MPA
 REINSTATEMENT AND CLEANUP

CONTRACTOR SHALL REINSTATE ALL EXISTING ASSETS AFFECTED BY THE WORKS AND CLEAN UP TO THE SATISFACTION OF THE RELEVANT AUTHORITIES AND THE ENGINEER

SUBSURFACE DRAINAGE

- PROVIDE 90MM DIA AGI DRAIN ALONG THE RETAINING WALL, WITHIN THE PROPERTY BOUNDARY AT 1 IN 100 MIN SLOPE.
- PROVIDE SCORIA ROCK AROUND AGI PIPE AND ALSO AGI PIPE TO HAVE SILT SOCK.
- CONNECT THE AGI PIPE TO NEAREST DOWNSTREAM PIT

BUILDER MUST ENSURE AND DO NOT UNDERMINE THE BOUNDARY FENCE. PART OF AGI PIPE & RETAINING WALL MUST NOT ENCROACH IN TO THE ADJOIN PROPERTY AND COMPLETELY LOCATED WITHIN THE PROPERTY BOUNDARY.

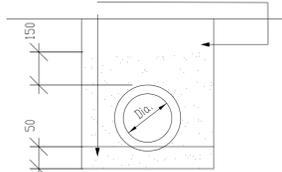
AGI PIPES TO BE PLACED AT BACK OF RETAINING WALL (HIGHER SIDE)

CONCRETE

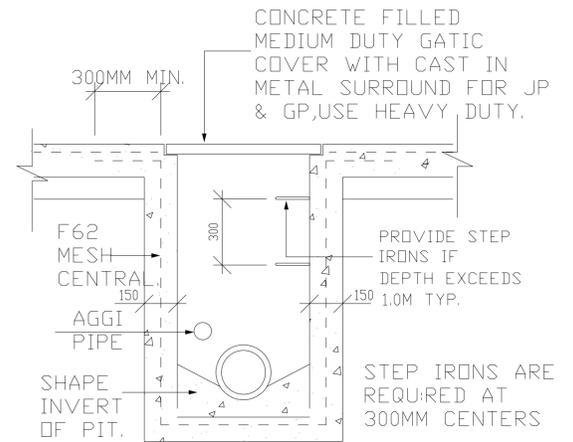
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 DRAINAGE WORKS 25 MPA
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CONTRACTOR SHALL REINSTATE ALL EXISTING ASSETS AFFECTED BY THE WORKS AND CLEAN UP TO THE SATISFACTION OF THE RELEVANT AUTHORITIES AND THE ENGINEER

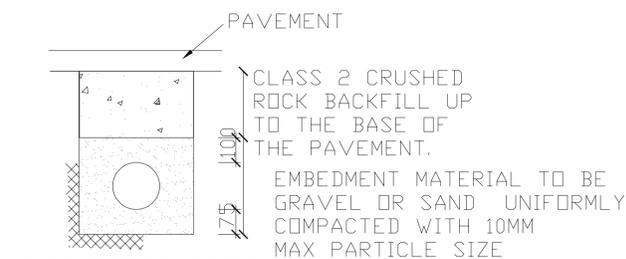
EXCAVATED MATERIAL FROM SITE TO BE COMPACTED IN 150MM LAYERS TO THE DENSITY OF THE ADJACENT SOIL CRUSHED ROCK GRADE 2A CONSOLIDATED IN 150MM LAYERS.



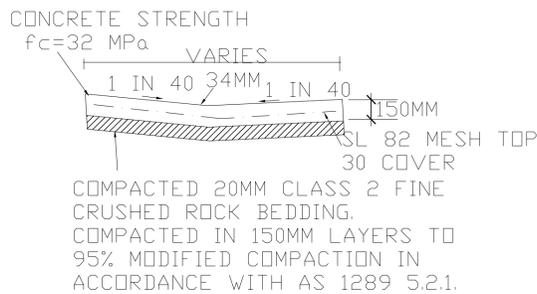
PIPE TRENCH DETAIL UNDER LANDSCAPE (NTS)



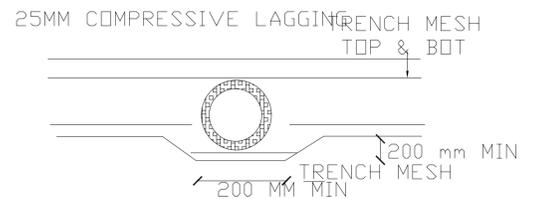
JUNCTION / GRATED PIT DETAIL (NTS)



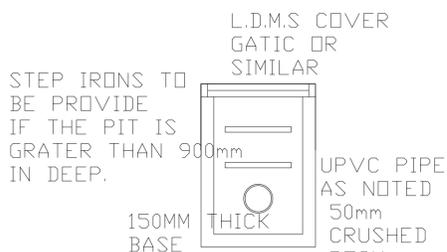
TYPICAL TRENCH DETAILS UNDER THE PAVEMENT (NTS)



TYPICAL CONCRETE DRIVEWAY CROSS SECTION (NTS)



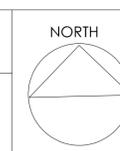
PIPE PENETRATION DETAILS THROUGH FOOTING



TYPICAL PIT SECTION (NTS)

CONTRACTION JOINT REQUIRED EVERY 1500MM. EXPANSION JOINTS ARE REQUIRED AT THE CORNERS, AT EVERY CHANGE OF GRADE, AT EVERY CHANGE IN PAVEMENT THICKNESS AND AT EVERY 15M INTERVALS. EXPANSION JOINT RESIN BONDED CORK STRIP TO BE PLACED AT THE BUILDING/PAVEMNET INTERFACE. SAW CUT 3MM WIDE 40MM DEEP FOR CONSTRUCTION JOINT. 2-3 DAYS AFTER POURING, AT FIVE METER MAXIMUM GRID.

DESIGN	U.W.	DRAWING TITLE
CHECK	R.K.	STORMWATER DRAINAGE PLAN - GENERAL NOTES
SCALE	1:200(A1)	AND SECTION DETAILS
JOB No	5659	PROJECT TITLE
DRG No	D0	DEVELOPMENT OF MULTI UNITS AT
REV	B	5-13 MAXWELL DR BRIDGEWATER TAS 7030
DATE	01/09/2022	



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BOX GUTTER NOTES:

1. UNO MINIMUM BOX GUTTER SIZE IS 300MM X 150MM.
2. RAINHEAD TO BE PROVIDED PARALLEL TO THE FLOW DIRECTION IN THE BOX GUTTER.
3. IF RAINHEAD IS PROVIDED PERPENDICULAR TO THE FLOW DIRECTION, THEN MINIMUM 150MM SUMP TO BE PROVIDED IN THE BOX GUTTER WITH VERTICAL OUTLET PIPE. AND THEN THE VERTICAL OUTLET PIPE CAN BE CONNECTED TO RAIN HEAD.
4. PROVIDE BULKHEAD TO HIDE THE VERTICAL PIPE IF REQUIRED. (TYPICAL FOR ALL BOX GUTTERS).

DOWN PIPE LOCATIONS ARE INDICATIVE ONLY AND CAN BE CHANGED TO SUIT SITE CONDITIONS AT THE PLUMBER'S DISCRETION. SPREADER DOWNPIPES TO BE INSTALLED FOR UPPER STOREY UNITS AT CONVENIENT. PROVIDE BOX GUTTER IF REQUIRED TO MANUFACTURER REQUIREMENTS.

1. PROVIDE 100 MM DIA PIPE WHERE NO SIZE IS SPECIFIED FROM DOWN PIPES, WITH INSPECTION OPENINGS.
2. MIN FALL TO 100 & 150 DIA STORMWATER PIPE IS TO BE 1 IN 100

WORKS WITHIN THE ROAD RESERVE REQUIRE SEPARATE ROAD OPENING PERMIT & ALL WORK NEED TO COUNCIL SATISFACTION AND RESPONSIBLE AUTHORITY SATISFACTION

THE POSITION OF & DEPTH OF ALL EXISTING UNDERGROUND SERVICES (E.G DRAINAGE, ELECTRICITY, PHONE SEWER ECT.) TO BE DETERMINED PRIOR TO COMMENCEMENT OF CONSTRUCTION AND ANY DISCREPANCIES BROUGHT TO THE ATTENTION OF THIS OFFICE.

ALL INTERNAL DRAINAGE WORKS MUST BE IN ACCORDANCE WITH AS/NZS 3500.3:2018 STORMWATER DRAINAGE

TPZ ONLY HAND EXCAVATION OR BORING IS PERMITTED WITHIN THE TPZ/ EXISTING TREE CANOPY.

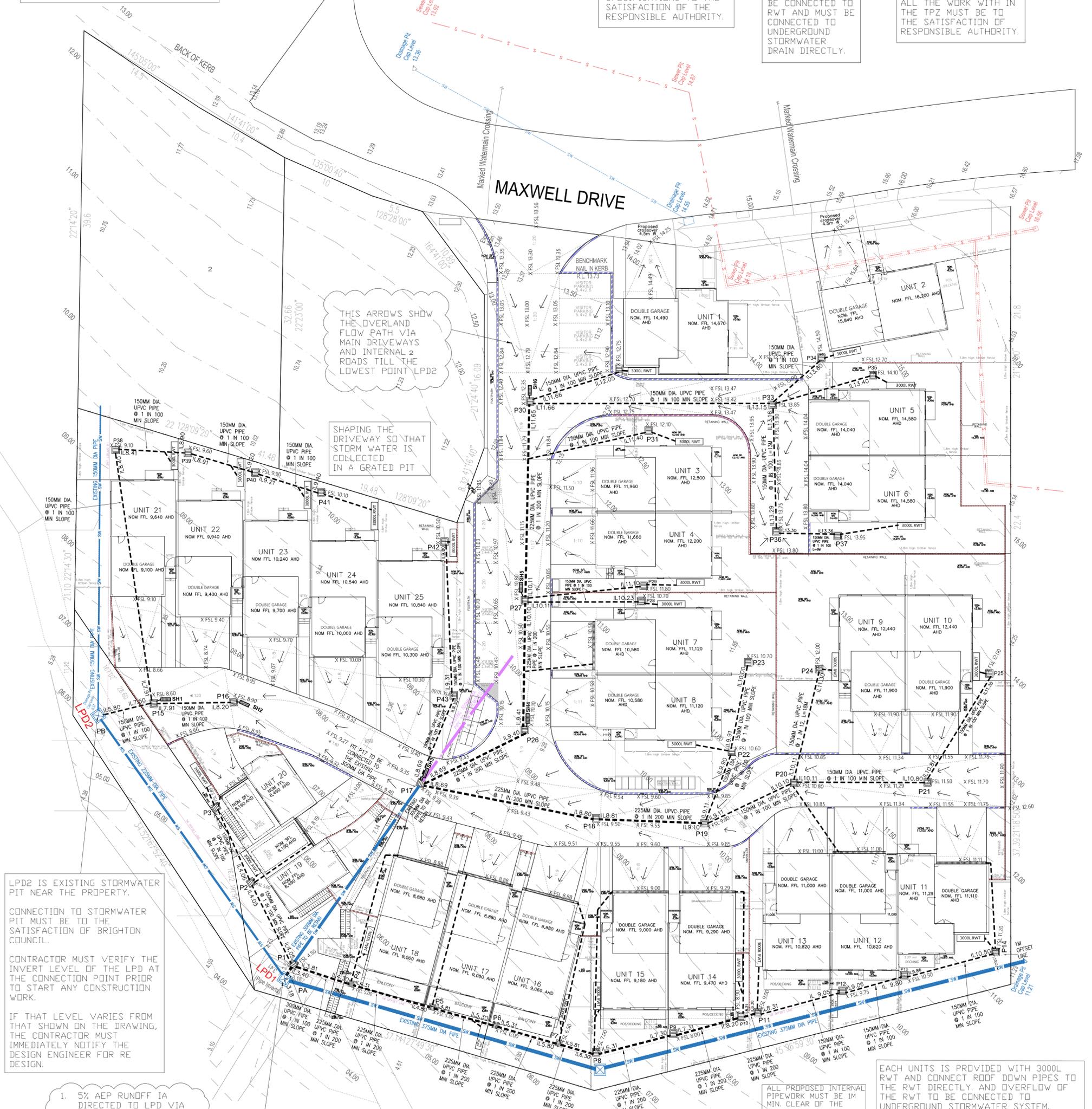
ROOT DIA >30MM MUST NOT BE CUT.

ALL THE WORK WITH IN THE TPZ MUST BE TO THE SATISFACTION OF RESPONSIBLE AUTHORITY.

INFORMATION FROM "1100 DIAL BEFORE YOU DIG" SERVICE & RELAY AUTHORTITIES SHOULD BE OBTAINED IN WRITING BEFORE ANY CONSTRUCTION IS COMMENCED.

VEHICLE CROSSINGS SHALL BE CONSTRUCTED TO BRIGHTON COUNCIL'S STANDARDS AND SPECIFICATIONS TO THE SATISFACTION OF THE RESPONSIBLE AUTHORITY.

BALCONY FLOOR WAIST MUST NOT BE CONNECTED TO RWT AND MUST BE CONNECTED TO UNDERGROUND STORMWATER DRAIN DIRECTLY.



THIS ARROWS SHOW THE OVERLAND FLOW PATH VIA MAIN DRIVEWAYS AND INTERNAL 2 ROADS TILL THE LOWEST POINT LPD2

SHAPING THE DRIVEWAY SO THAT STORM WATER IS COLLECTED IN A GRATED PIT

LPD2 IS EXISTING STORMWATER PIT NEAR THE PROPERTY.

CONNECTION TO STORMWATER PIT MUST BE TO THE SATISFACTION OF BRIGHTON COUNCIL.

CONTRACTOR MUST VERIFY THE INVERT LEVEL OF THE LPD AT THE CONNECTION POINT PRIOR TO START ANY CONSTRUCTION WORK.

IF THAT LEVEL VARIES FROM THAT SHOWN ON THE DRAWING, THE CONTRACTOR MUST IMMEDIATELY NOTIFY THE DESIGN ENGINEER FOR RE DESIGN.

1. 5% AEP RUNOFF IA DIRECTED TO LPD VIA INTERNAL PIPE AND PITS LAYOUTS SHOWN ON THE PLAN.
2. OVERLAND FLOW PATH IS PROVIDED VIA MAIN DRIVEWAYS (INTERNAL ROADS TILL THE LOWEST POINT LPD2).

LPD1 IS EXISTING CHANNEL TO THE WATER WAY FROM THE PROPERTY.

CONNECTION TO CHANNEL DRAIN MUST BE TO THE SATISFACTION OF BRIGHTON COUNCIL.

CONTRACTOR MUST VERIFY THE INVERT LEVEL OF THE LPD AT THE CONNECTION POINT PRIOR TO START ANY CONSTRUCTION WORK.

IF THAT LEVEL VARIES FROM THAT SHOWN ON THE DRAWING, THE CONTRACTOR MUST IMMEDIATELY NOTIFY THE DESIGN ENGINEER FOR RE DESIGN.

1M OFFSET LINE SHOWING SETBACK FROM EXISTING COUNCIL STORMWATER MAIN

UNIT 1 - UNIT 25 : USE 3000L RWT FOR TOILET FLUSHING AND GARDEN USE.

OVERFLOW OF THE RAINWATER TANK MUST BE CONNECTED TO THE NEAREST PIT (TYPICAL FOR EACH TANK)

ALL PROPOSED INTERNAL PIPEWORK MUST BE 1M MIN. CLEAR OF THE EXISTING PUBLIC STORMWATER MAINS.

EACH UNITS IS PROVIDED WITH 3000L RWT AND CONNECT ROOF DOWN PIPES TO THE RWT DIRECTLY. AND OVERFLOW OF THE RWT TO BE CONNECTED TO UNDERGROUND STORMWATER SYSTEM.

DESCRIPTIONS	IMPERVIOUS AREA (M2)	TREATMENT TYPE	TREATMENT SIZE (L/ITEMS)
ROOF TREATED	1300	RAINWATER TANK (RWT)	3000 x 25 = 75000
ROAD+DRIVEWAY TREATED	900	SPELL HYDRO CHANNEL (SH)	1 x 6 = 6



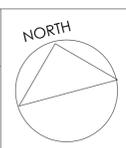
TYPICAL DETAILS OF GRATED PIT LOCATED BEFORE THE LPD (NTS)
TO BE FITTED WITH 'ECODOL' LITTER BASKET FITTED WITH A REACTIVE FILTER MEDIA PILLOW

ECODOL LITTER BASKET TO BE PROVIDED IN PITS P1 AND P15 PRIOR TO CONNECT THE SITE RUNOFF FROM THE DEVELOPMENTS TO PUBLIC STORMWATER SYSTEM TO REMOVE HYDROCARBONS AS REQUESTED BY LOCAL COUNCIL.

DESIGN	U.W.
CHECK	R.K.
SCALE	1:200(A1)
JOB No	5659
DRG No	D1
REV	B
DATE	01/09/2022

DRAWING TITLE
STORMWATER DRAINAGE PLAN

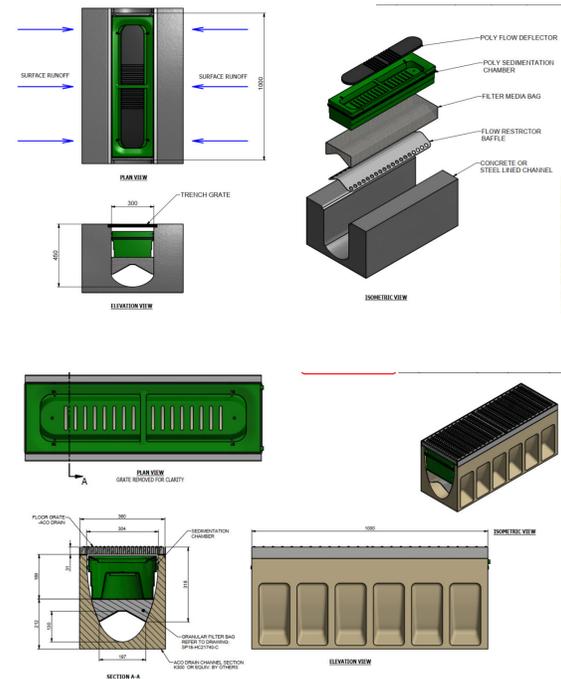
PROJECT TITLE
DEVELOPMENT OF MULTI UNITS AT 5-13 MAXWELL DR BRIDGEWATER TAS 7030



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STDRMWATER PIT DETAILS						
PIT NO	INT SIZE (mm x mm)		DEPTH (mm)	SURFACE LEVEL (m)	IL OF PIT (m)	REMARKS
P 1	900	X 900	1100	4.50	3.40	GRATED PIT, CLASS A GRATE, ECOCELL LITTER BASKET TO BE PROVIDED
P 2	600	X 600	700	5.00	4.30	GRATED PIT, CLASS A GRATE
P 3	600	X 600	700	5.89	5.19	GRATED PIT, CLASS A GRATE
P 4	600	X 600	700	5.00	4.30	GRATED PIT, CLASS A GRATE
P 5	600	X 600	700	5.50	4.80	GRATED PIT, CLASS A GRATE
P 6	600	X 600	700	6.00	5.30	GRATED PIT, CLASS A GRATE
P 7	600	X 600	700	6.50	5.80	GRATED PIT, CLASS A GRATE
P 8	600	X 600	700	7.00	6.30	GRATED PIT, CLASS A GRATE
P 9	600	X 600	700	8.00	7.30	GRATED PIT, CLASS A GRATE
P 10	600	X 600	700	8.90	8.20	GRATED PIT, CLASS A GRATE
P 11	600	X 600	700	9.00	8.30	GRATED PIT, CLASS A GRATE
P 12	600	X 600	700	9.75	9.05	GRATED PIT, CLASS A GRATE
P 13	600	X 600	700	10.50	9.80	GRATED PIT, CLASS A GRATE
P 14	600	X 600	700	11.20	10.50	GRATED PIT, CLASS A GRATE
P 15	900	X 900	1100	8.60	7.50	GRATED PIT, HEAVY DUTY CLASS D GRATE, ECOCELL LITTER BASKET TO BE PROVIDED
P 16	600	X 600	700	8.90	8.20	GRATED PIT, HEAVY DUTY CLASS D GRATE
P 17	900	X 900	1880	9.38	7.50	GRATED PIT, HEAVY DUTY CLASS D GRATE DEPTH TBC
P 18	600	X 600	700	9.50	8.80	GRATED PIT, HEAVY DUTY CLASS D GRATE
P 19	600	X 600	700	9.80	9.10	GRATED PIT, HEAVY DUTY CLASS D GRATE
P 20	600	X 600	700	10.80	10.10	GRATED PIT, HEAVY DUTY CLASS D GRATE
P 21	600	X 600	700	11.50	10.80	GRATED PIT, HEAVY DUTY CLASS D GRATE
P 22	600	X 600	700	10.60	9.90	GRATED PIT, CLASS A GRATE
P 23	600	X 600	700	10.70	10.00	GRATED PIT, CLASS A GRATE
P 24	600	X 600	700	12.00	11.30	GRATED PIT, CLASS A GRATE
P 25	600	X 600	700	12.00	11.30	GRATED PIT, CLASS A GRATE
P 26	600	X 600	700	10.10	9.40	GRATED PIT, HEAVY DUTY CLASS D GRATE
P 27	600	X 600	700	10.80	10.10	GRATED PIT, HEAVY DUTY CLASS D GRATE
P 28	600	X 600	470	10.70	10.23	GRATED PIT, CLASS A GRATE
P 29	600	X 600	700	11.80	11.10	GRATED PIT, CLASS A GRATE
P 30	600	X 600	700	12.35	11.65	GRATED PIT, HEAVY DUTY CLASS D GRATE
P 31	600	X 600	700	12.10	11.40	GRATED PIT, CLASS A GRATE
P 32	600	X 600	700	12.75	12.05	GRATED PIT, CLASS A GRATE
P 33	600	X 600	700	13.85	13.15	GRATED PIT, HEAVY DUTY CLASS D GRATE
P 34	600	X 600	700	14.50	13.80	GRATED PIT, CLASS A GRATE
P 35	600	X 600	700	14.10	13.40	GRATED PIT, CLASS A GRATE
P 36	600	X 600	460	13.75	13.29	GRATED PIT, HEAVY DUTY CLASS D GRATE
P 37	600	X 600	590	13.95	13.36	GRATED PIT, HEAVY DUTY CLASS D GRATE
P 38	600	X 600	700	9.10	8.40	GRATED PIT, CLASS A GRATE
P 39	600	X 600	700	9.60	8.90	GRATED PIT, CLASS A GRATE
P 40	600	X 600	700	9.90	9.20	GRATED PIT, CLASS A GRATE
P 41	600	X 600	700	10.10	9.40	GRATED PIT, CLASS A GRATE
P 42	600	X 600	700	10.50	9.80	GRATED PIT, CLASS A GRATE
P 43	600	X 600	700	10.00	9.30	GRATED PIT, CLASS A GRATE

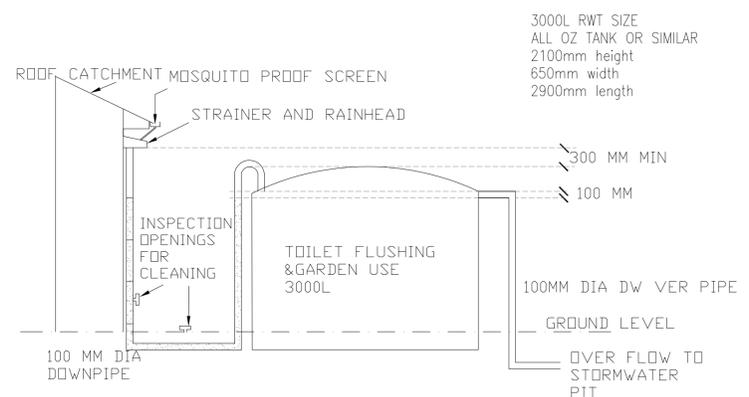
DESCRIPTIONS	IMPERVIOUS AREA (M2)	TREATMENT TYPE	TREATMENT SIZE (L/ITEMS)
ROOF TREATED	1300	RAINWATER TANK (RWT)	3000 X 25 = 75000
ROAD+DRIVEWAY TREATED	900	SPELL HYDRO CHANNEL (SH)	1 X 6 = 6



SPELL HYDRO CHANNEL MAINTENANCE

THE SEDIMENTATION BOX TAKES ROUGH CLEANING ALL SOLIDS SUCH AS STONES, LEAVES, AND SUSPENDED PARTICLES ON. THE RUBBER LIP ENSURES SEALING AROUND THE EDGES - FOR THE RELIABLE DIFFERENTIATION FOR SUBSEQUENT FILTRATION. THE PRETREATED RAINWATER PASSES THROUGH THE GRANULAR-FILTER-PAD AND THE ORGANIC AND INORGANIC POLLUTANTS WILL BE FILTERED FROM THE WATER. THE FILTERED WATER FLOWS OVER THE BAFFLE INTO THE FREE FLOW AREA OF THE CHANNEL AND IS DISCHARGED PER NORMAL SITE REQUIREMENTS.

GRANULAR FILTER BAG NEED CLANING DNECE DT TWICE A YEAR AND NEED TO BE REPLACED EVERY 4-5 YEARS.

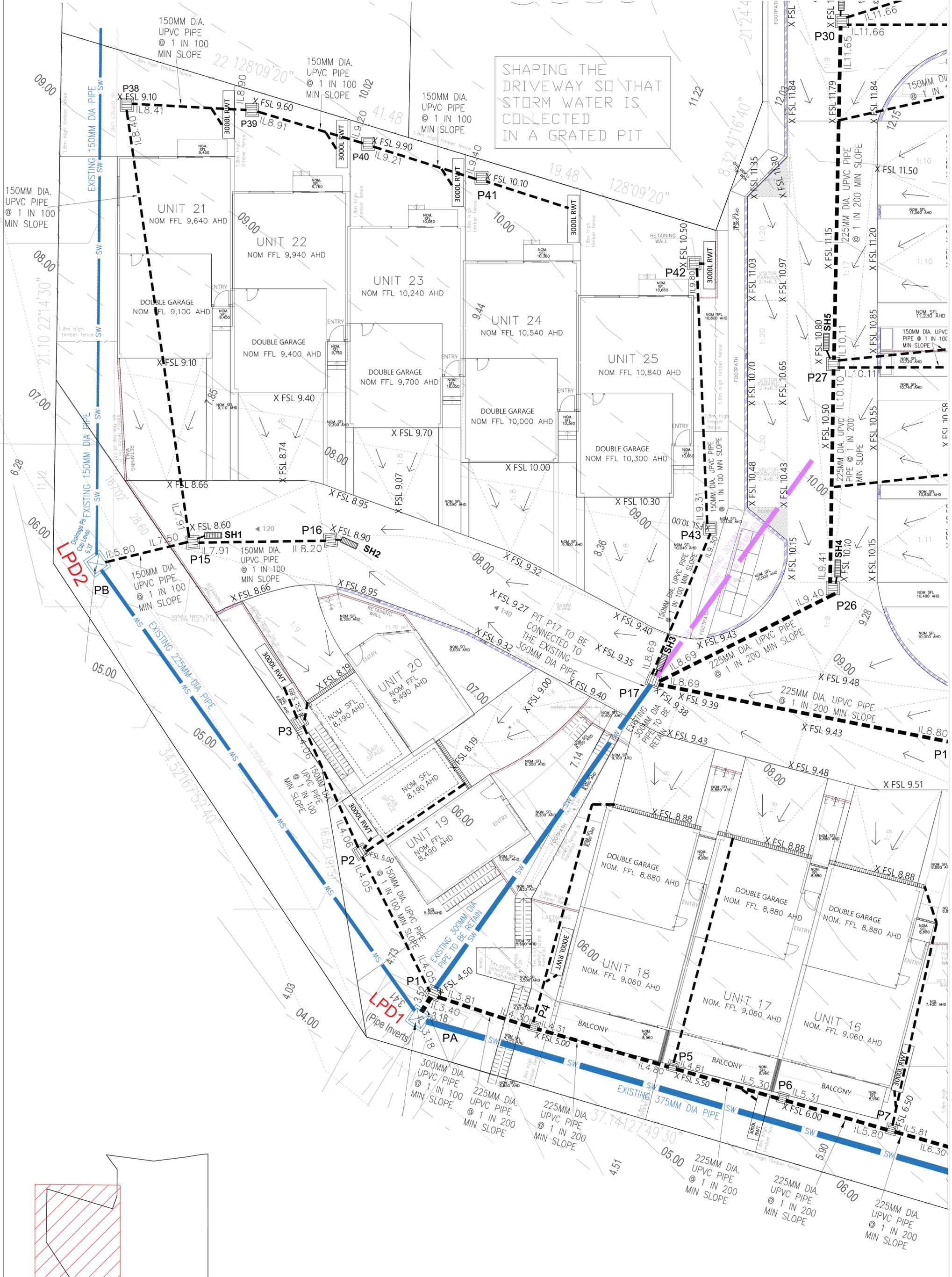


RAINWATER TANK SYSTEM (NTS)

DESIGN	U.W.
CHECK	R.K.
SCALE	1:200(A1)
JOB No	5659
DRG No	D2
REV	B
DATE	01/09/2022

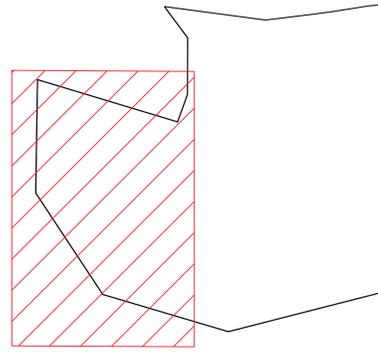
DRAWING TITLE
STORMWATER DRAINAGE PLAN - PIT TABLE AND SECTION DETAILS
PROJECT TITLE
DEVELOPMENT OF MULTI UNITS AT
5-13 MAXWELL DR BRIDGEWATER TAS 7030

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SHAPING THE DRIVEWAY SO THAT STORM WATER IS COLLECTED IN A GRATED PIT

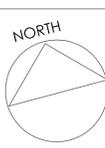
PIT P17 TO BE CONNECTED TO THE EXISTING 300MM DIA PIPE



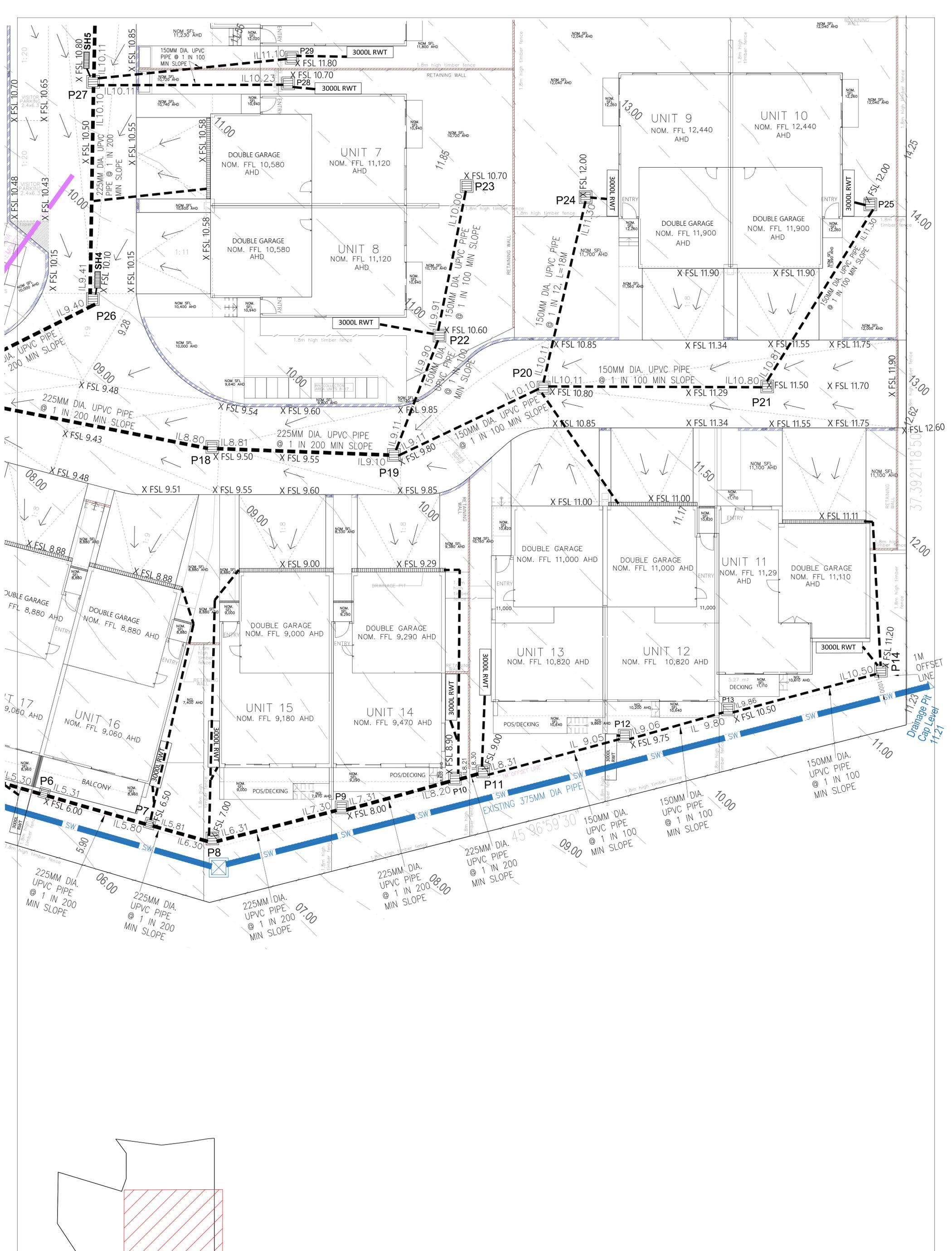
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CHECK	R.K.
SCALE	1:100(A1)
JOB No	5659
DRG No	D3
REV	B
DATE	01/09/2022

DRAWING TITLE
STORMWATER DRAINAGE PLAN

PROJECT TITLE
DEVELOPMENT OF MULTI UNITS AT
5-13 MAXWELL DR BRIDGEWATER TAS 7030

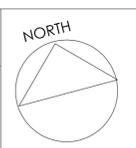


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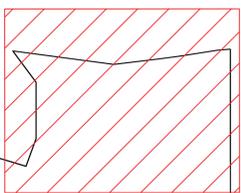
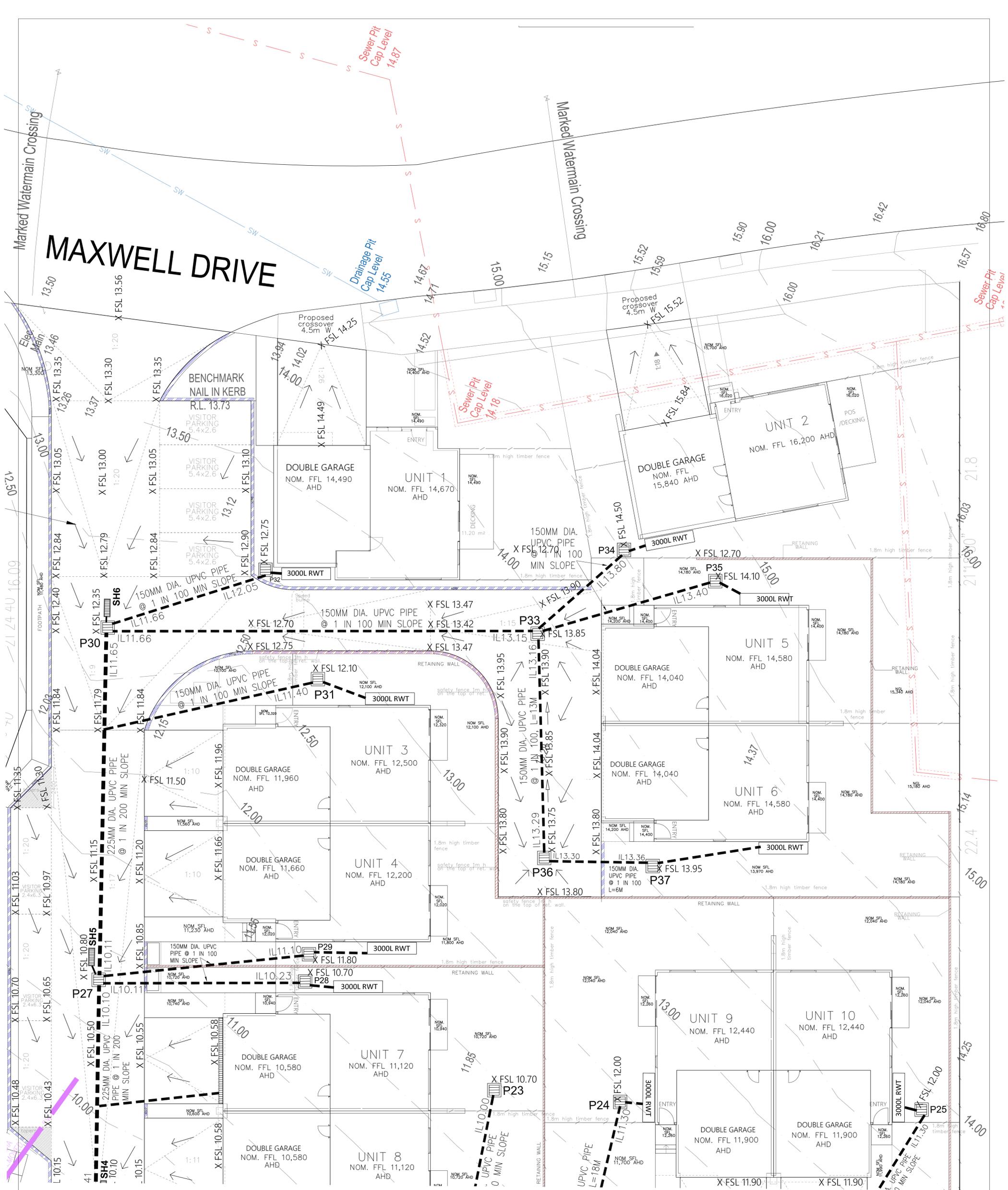
DESIGN	U.W.
CHECK	R.K.
SCALE	1:100(A1)
JOB No	5659
DRG No	D4
REV	B
DATE	01/09/2022

DRAWING TITLE
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PROJECT TITLE
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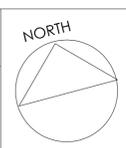
MAXWELL DRIVE



DESIGN	U.W.
CHECK	R.K.
SCALE	1:100(A1)
JOB No	5659
DRG No	D5
REV	B
DATE	01/09/2022

DRAWING TITLE
STORMWATER DRAINAGE PLAN

PROJECT TITLE
DEVELOPMENT OF MULTI UNITS AT
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