

STORMWATER CONCEPT PLAN

RES. ALTS & ADS + SHED

259 AUMUNA RD, TERRY HILLS

GENERAL					
1.	THIS PLAN IS TO BE USED IN CONJUNCTION WITH ARCHITECTURAL, STRUCTURAL, & LANDSCAPING PLANS. ANY DISCREPANCIES OR OMISSIONS ARE TO BE REFERRED TO THE ENGINEER FOR RESOLUTION PRIOR TO COMMENCING WORK.				
2.	ALL MATERIALS AND WORKMANSHIP IS TO MEET AS 3500.3:2015 STORMWATER DRAINAGE, BCA AND LOCAL COUNCIL DEVELOPMENT POLICIES, CONSENTS AND REQUIREMENTS.				
3.	IT IS THE CONTRACTORS RESPONSIBILITY TO VERIFY ALL DIMENSIONS AND DRAINAGE LEVELS ON SITE PRIOR TO COMMENCEMENT OF WORKS. THIS INCLUDES EXISTING SERVICES AND/OR OTHER STRUCTURES THAT MAY AFFECT/BE AFFECTED BY THIS DESIGN PRIOR TO CONSTRUCTION.				
4.	THIS DRAWING IS NOT TO BE USED FOR SET-OUT PURPOSES. ALL SURVEY INFORMATION, PROPOSED BUILDING LEVELS, FINISHED SURFACE LEVELS AND SITE DETAILS SHOWN IN THESE DRAWINGS ARE ESTABLISHED UPON LEVELS/DETAILS SUPPLIED BY OTHERS.				
5.	FLOOR WASTE & DOWNPIPE LOCATIONS ARE INDICATIVE ONLY. ULTIMATE FLOOR WASTE & DOWNPIPE LOCATION, SIZE, & QUANTITY ARE TO BE DETERMINED BY BUILDER IN ACCORDANCE WITH RELEVANT AUSTRALIAN STANDARDS.				
6.	IT IS THE BUILDERS RESPONSIBILITY TO LOCATE AND LEVEL ALL EXISTING SERVICES OR OTHER STRUCTURES WHICH MAY AFFECT/BE AFFECTED BY THIS DESIGN PRIOR TO COMMENCEMENT OF WORKS.				
7.	ANY SUBSTITUTION OF MATERIALS SHALL BE APPROVED BY THE ENGINEER AND INCLUDED IN THE DEVELOPMENT APPLICATION.				
8.	CONTRACTORS ARE TO INVESTIGATE ALL EXISTING SERVICES AND APPLY FOR "DIAL BEFORE YOU DIG" PRIOR TO COMMENCEMENT OF CONSTRUCTION.				

COMPLIANCE	
1.	THESE PLANS WERE PREPARED IN ACCORDANCE WITH COUNCIL'S POLICIES AND REQUIREMENTS, BASIX REQUIREMENTS, AS 3500:2013, ARR (2016), ARQ (2006), BCA (2015), RELEVANT LEGISLATION, AND NSW MUSIC MODELLING GUIDELINES.
SCOPE OF WORKS	
1.	MANAGEMENT DESIGN, CALCULATION AND DOCUMENTATION FOR THE FOLLOWING (WHERE APPLICABLE): ROOFED, IMPERVIOUS AND PERVIOUS AREAS; RAINWATER REUSE SYSTEM; DETENTION; AND STORMWATER DISPOSAL.
RAINWATER RE-USE SYSTEM	
1.	ALL GUTTERS TO BE FITTED WITH LEAF GUARDS AND SUBJECT TO REGULAR INSPECTION / CLEAN OUT.
2.	MIN. TANK SIZE TO BE THAT SPECIFIED WITHIN DETAIL AND PLAN.
3.	TANKS ARE TO BE INSTALLED BY A LICENSED PLUMBER IN ACCORDANCE WITH MANUFACTURES SPECIFICATIONS, AS3500 AND COUNCIL REQUIREMENTS.
4.	RAINWATER RETENTION FOR RE-USE AS SPECIFIED BY BASIX CERTIFICATE.

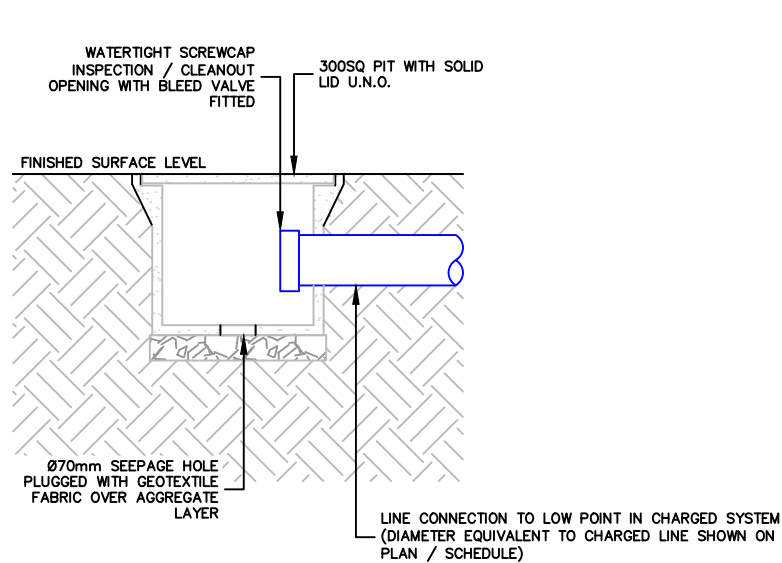
MINIMUM PIPE COVER		
O.L OF PIPE TO F.S.L		
LOCATION	MIN. COVER (mm)	
	CAST IRON, DUCTILE IRON, GALV. STEEL	OTHER AUTHORISED PRODUCTS ⁽¹⁾
1. NOT SUBJECT TO VEHICULAR LOADING:		
a. WITHOUT PAVEMENT-		
i. FOR SINGLE DWELLINGS	100	100
ii. FOR ITEMS OTHER THAN i.	100	300
b. WITH PAVEMENT OF BRICK OR UNREINFORCED CONCRETE	100 ⁽²⁾	100 ⁽²⁾
2. SUBJECT TO VEHICULAR LOADING:		
a. OTHER THAN ROADS-		
i. WITHOUT PAVEMENT	300	450
ii. WITH PAVEMENT OF:		
- REINFORCED CONCRETE FOR HEAVY VEHICULAR LOADINGS	Ø (2X3)	100 (2X3)
- BRICK/UNREINFORCED CONCRETE FOR LIGHT VEHICULAR LOADING	Ø (2X3)	75 (2X3)
b. ROADS-		
i. SEALED	600	750 ⁽³⁾
ii. UNSEALED	600	750 ⁽³⁾
3. SUBJECT TO CONSTRUCTION EQUIPMENT OR IN EMBANKMENT CONDITIONS	600	750 ⁽³⁾
⁽¹⁾ INCLUDES OVERLAY ABOVE TOP OF THE PIPE NOT LESS THAN 50mm THICK		
⁽²⁾ BELOW THE UNDERSIDE OF THE PAVEMENT		
⁽³⁾ SUBJECT TO COMPLIANCE WITH AS 1762, AS 2033, AS 2566.1, AS 3725, AS 4060		

DRAINAGE LINES	
1.	MINIMUM PIPE GRADE AS SPECIFIED IN TABLE BELOW. MINIMUM DIAMETER IS TO BE (U.N.O): a. Ø100mm WHERE LINE RECEIVES ROOF WATER. b. Ø150mm WHERE LINE RECEIVES RUN-ON FROM PAVED/UNPAVED EXTERNAL SURFACES
2.	PIPE EMBEDMENT IS TO BE IN ACCORDANCE WITH LOCAL AUTHORITY SPEC., AS 3500.3, AS 2032 FOR PVC, & AS 3725 FOR FCR/RCP PIPEWORK.
3.	SUBSOIL DRAINAGE SHALL BE PROVIDED TO ALL RETAINING WALLS AND EMBANKMENTS WITH THE LINES FEEDING INTO THE STORMWATER DRAINAGE SYSTEM.

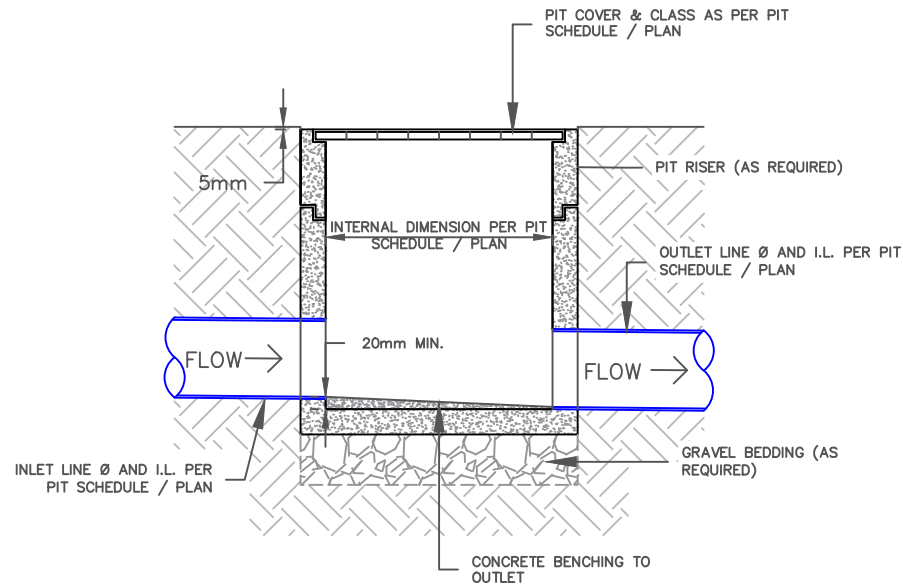
MINIMUM SITE PIPE GRADIENT (U.N.O)			MINIMUM INTERNAL DIMENSIONS FOR STORMWATER PITS		
DIAMETER Ø (mm)	MIN. GRADE	MIN. % SLOPE	DEPTH TO I.L OF OUTLET (mm)	MIN. INTERNAL DIMENSIONS (mm)	
				WIDTH	LENGTH
≤ Ø150	1:100	1%	≤ 600	450	450
225	1:200	0.5%	> 600 TO ≤ 900	600	600
300	1:250	0.4%	> 600 TO ≤ 900	600	900
375	1:300	0.33%	> 1200	900	900

PITS	
1.	ALL PITS TO BE FITTED WITH APPROVED GALVANISED STEEL GRATES AND TO BE SUITABLE FOR THE FOLLOWING LOAD RATING (U.N.O): a. CLASS-B MIN. FOR LANDSCAPED AREAS b. CLASS-C WHERE SUBJECT TO VEHICULAR TRAFFIC
2.	ALL PITS FITTED WITH CHILDPROOF SPRING LOCKING J-BOLTS.
3.	GRATED COVERS OF PITS > 600SQ mm ARE TO BE HINGED & OFFSET FROM OBSTRUCTIONS TO ALLOW FOR FULL OPENING.
4.	PROVIDE STEP IRONS TO STORMWATER PITS > 1200mm IN DEPTH.
5.	PIT BASES ARE TO BE BENCHD LEVEL TO THE I.L OF THE OUTLET PIPE (NO SUMP U.N.O), WITH A MIN. FALL OF 20mm BETWEEN THE INLET AND OUTLET PIPE I.Ls. ALL PIPES SHOULD BE CUT FLUSH WITH THE WALL OF THE PITS.
6.	PRECAST PITS ARE TO BE SET ON A 75mm CONCRETE BASE AND BACKFILLED WITH CONCRETE TO HALF THE PIT'S HEIGHT.
7.	WATER SHOULD NOT BE PERMITTED TO POND WITHIN THE DRAINAGE SYSTEM.

ABBREVIATIONS			
A.H.D	AUSTRALIAN HEIGHT DATUM	N.T.S	NOT TO SCALE
A.R.I	AVERAGE RECURRENCE INTERVAL	O.F	OVERFLOW
C.O	CLEAN-OUT PIT	O.L	OBVERT LEVEL
DP	DOWNPIPE	O.S.D	ON-SITE DETENTION
D/S	DOWNSTREAM	R.C.P	REINFORCED CONCRETE PIPE
FF	FIRST FLUSH DEVICE	R.H.S	RECTANGULAR HOLLOW SECTION
F.F.L	FINISHED FLOOR LEVEL	R.L	REDUCED LEVEL
F.G.L	FINISHED GARAGE LEVEL	R.W.T	RAIN-WATER TANK
F.W	FLOOR WASTE	S.L	SURFACE LEVEL
G.S.I.P	GRATED SURFACE INLET PIT	SQ	SQUARE
H.G.L	HYDRAULIC GRADE LINE	TYP.	TYPICAL
I.L	INVERT LEVEL	T.W.L	TOP WATER LEVEL
I.P	INSPECTION POINT	U/S	UPSTREAM
N.S.L	NATURAL SURFACE LEVEL	U.N.O	UNLESS NOTED OTHERWISE



CHARGED LINE CLEAN-OUT PIT (CO) – TYPICAL SECTION DETAIL
SCALE: N.T.S.



GRATED SURFACE INLET PIT (GSIP) – TYPICAL SECTION DETAIL
SCALE: N.T.S.

ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.					
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ENVIRONMENTAL FLOOD STORMWATER GEOTECHNICAL ACOUSTICS WASTEWATER

BROADCAST CONSULTING PTY LTD | ACN 622 508 187

PROJECT DESCRIPTION	RES. ALTS & ADS + SHED	SHEET	TITLE PAGE & GENERAL NOTES
PROJECT SITE	259 AUMUNA RD, TERRY HILLS	PLAN	STORMWATER CONCEPT PLAN
LGA	NORTHERN BEACHES COUNCIL	CLIENT	R. SLOSS C/O: BLUE SKY BUILDING DESIGN

PROJECT ID

1381-SW

SCALE

NTS @ A3

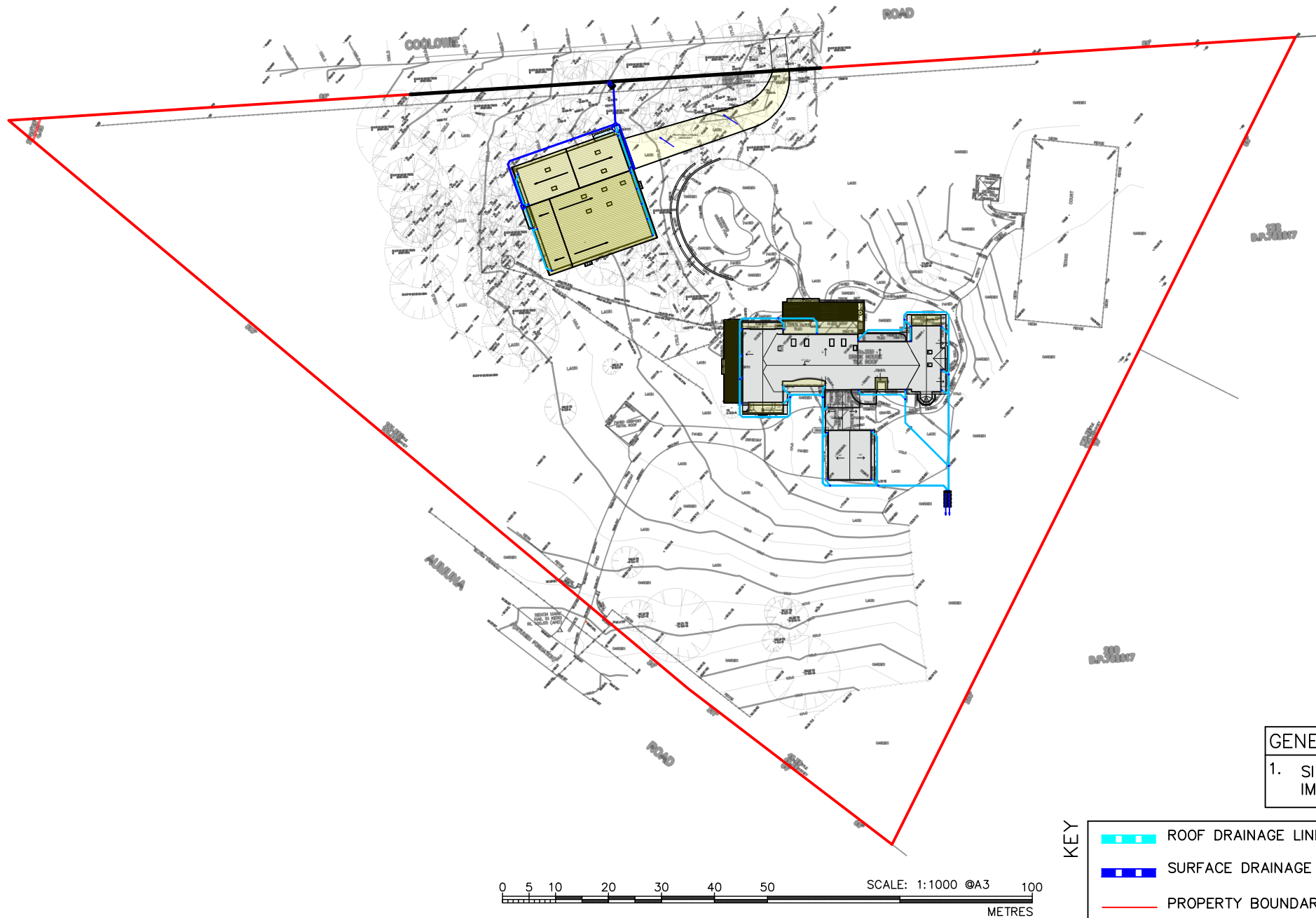
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SHEET NO.

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BMCC CATCHMENT AREA CHECK & MIN. RETENTION CALCULATIONS								
ZONING	SITE AREA	IMPERVIOUS AREA			MIN. TANK SIZE FOR REUSE (RETENTION) ^{1,2}	MAX. ALLOWABLE SITE COVERAGE ³	STORMWATER QUALITY (WSUD) CHECK	ON-SITE DETENTION CHECK
		PRE-DEV	POST-DEV	CHANGE ^{1,2}				
B7	2026.87m ²	1585.105m ² (78.2%)	1556.27m ² (76.78%)	-28.84m ²	NIL	1621.5m ² (80%)	PROPOSED IMPERVIOUS AREA INCREASE <250m2 (-28.8m2), THEREFORE <u>WSUD NOT WARRANTED</u> PER C10, C6.1.3 2015DCP.	INCREASE IN IMPERVIOUS AREA <100m2, THEREFORE <u>NO OSD WARRANTED</u> AS PER SECTION C1, CLAUSE C6.2 OF BMCC DCP (2015).
NOTES 1. 4,000L PER 100m ² OF "PROPOSED ADDITIONAL IMPERVIOUS AREA" AS PER C6.1.3.C2.(a) BMCC DCP (2015) FOR E3/E4 ZONING. 2. 1,000L PER 100m ² OF "PROPOSED ADDITIONAL IMPERVIOUS AREA" AS PER C6.1.3.C2.(b) BMCC DCP (2015) FOR DEVELOPMENT WITHIN OTHER ZONES. 3. WITHOUT REQUIRING SECTION C9 STORMWATER QUALITY MEASURES AS PER SECTION B2.4 OF BMCC DCP (2015) AND BMCC LEP CLAUSE 4.4A (2015).								



CATCHMENT AREA CALCULATIONS [M ²]			
I.D	DEVELOPMENT CONDITION		
	PRE-DEV.	POST-DEV.	ΔMP
LOT	18082.0		698.840
IMPERVIOUS	1697.4 (9.39%)	2396.2 (13.25%)	

GENERAL NOTES – LGA CONTROLS & OSD WARRANT

1. SITE LOCATED IN REGION 2 OF NBC WMDP2020 MAP2. TOTAL IMPERVIOUS AREA < 40% OF SIDE, THEREFORE OSD WARRANTED.

KEY	ROOF DRAINAGE LINE	SURFACE FLOW DIRECTION
	SURFACE DRAINAGE LINE	GRATED SURFACE INLET PIT (G.S.I.P)
	PROPERTY BOUNDARY	VERTICAL RISER / VERTICAL DROPPER
	CLEAN OUT PIT	DOWNPIPE / SPREADER TYPE 1

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LGA	NORTHERN BEACHES COUNCIL	CLIENT	R. SLOSS C/O: BLUE SKY BUILDING DESIGN

PROJECT ID

1381-SW

SCALE

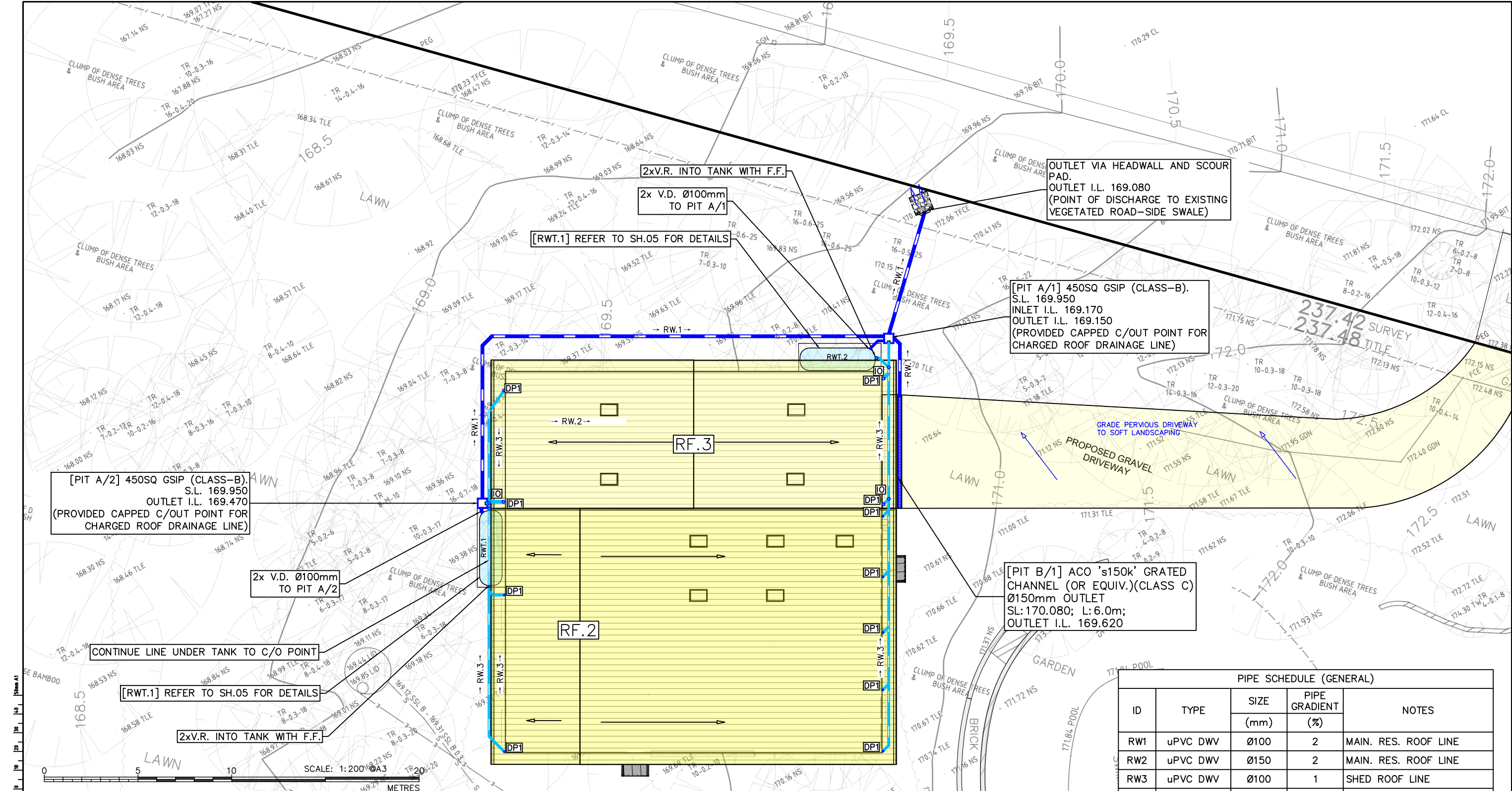
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[PIT A/2] 450SQ GSIP (CLASS-B).
S.L. 169.950
OUTLET I.L. 169.470
(PROVIDED CAPPED C/OUT POINT FOR CHARGED ROOF DRAINAGE LINE)

2x V.D. Ø100mm
TO PIT A/2

CONTINUE LINE UNDER TANK TO C/O POINT

[RWT.1] REFER TO SH.05 FOR DETAILS

2x V.R. INTO TANK WITH F.F.

2x V.R. INTO TANK WITH F.F.

2x V.D. Ø100mm
TO PIT A/1

[RWT.1] REFER TO SH.05 FOR DETAILS

OUTLET VIA HEADWALL AND SCOUR
PAD.
OUTLET I.L. 169.080
(POINT OF DISCHARGE TO EXISTING
VEGETATED ROAD-SIDE SWALE)

[PIT A/1] 450SQ GSIP (CLASS-B).
S.L. 169.950
INLET I.L. 169.170
OUTLET I.L. 169.150
(PROVIDED CAPPED C/OUT POINT FOR CHARGED ROOF DRAINAGE LINE)

[PIT B/1] ACO 's150k' GRATED
CHANNEL (OR EQUIV.)(CLASS C)
Ø150mm OUTLET
SL: 170.080; L: 6.0m;
OUTLET I.L. 169.620

ROOF & EAVES GUTTER SCHEDULE								
ROOF I.D.	DESCRIPTION	MATERIAL	PITCH	DOWNSPIE / SPREADER I.D.	MIN. NO. OF DPs / SPs	MIN. GUTTER CROSS-SECTIONAL AREA (A _e)(mm ²)	GUTTER GRADE	DESIGN STORM
RF.1	MAIN RES. + GARAGE	COLORBOND	18–30°	DP.1/SP.1	22	8,000mm ²	≥1:500	5%AEP
RF.2	SHED 1ST FLR	COLORBOND	5–7°	DP.1/SP.1	7	7,900mm ²	≥1:500	5%AEP
RF.3	SHED GND FLR	COLORBOND	7°	DP.1/SP.1	4	8,200mm ²	≥1:500	5%AEP

DOWNPIPE & SPREADER SCHEDULE			
I.D.	MINIMUM DIMENSIONS (INTERNAL) (mm)		DESIGN STORM
	CIRCULAR	RECTANGULAR / SQUARE	
DP.1	Ø100	100 X 75	5%AEP

PIPE SCHEDULE (GENERAL)				
ID	TYPE	SIZE (mm)	PIPE GRADIENT (%)	NOTES
RW1	uPVC DWV	Ø100	2	MAIN. RES. ROOF LINE
RW2	uPVC DWV	Ø150	2	MAIN. RES. ROOF LINE
RW3	uPVC DWV	Ø100	1	SHED ROOF LINE
RW4	uPVC DWV	Ø150	1	SHED ROOF LINE
SW1	uPVC DWV	Ø150	1–10	SURFACE LINE

ROOF DRAINAGE LINE

SURFACE DRAINAGE LINE

PROPERTY BOUNDARY

CLEAN OUT PIT

SURFACE FLOW DIRECTION

GRATED SURFACE INLET PIT (G.S.I.P)

VERTICAL RISER / VERTICAL DROPPER

DOWNSPIE / SPREADER TYPE 1

○ VR ○ VD

○ DP.1 ○ SP.1

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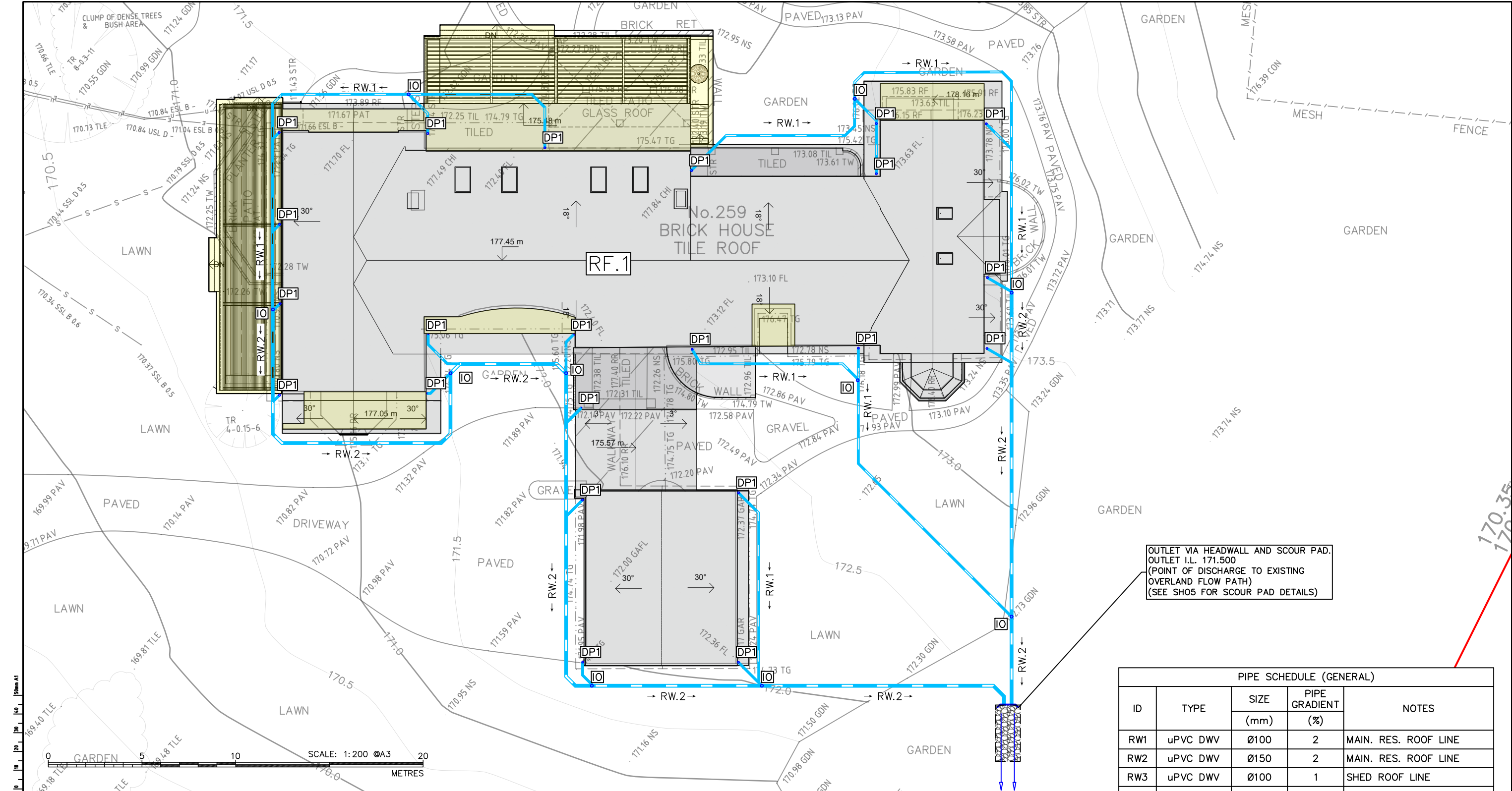
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SHEET NO.

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OUTLET VIA HEADWALL AND SCOUR PAD.
OUTLET I.L. 171.500
(POINT OF DISCHARGE TO EXISTING
OVERLAND FLOW PATH)
(SEE SH05 FOR SCOUR PAD DETAILS)

PIPE SCHEDULE (GENERAL)				
ID	TYPE	SIZE	PIPE GRADIENT	NOTES
		(mm)	(%)	
RW1	uPVC DWV	Ø100	2	MAIN. RES. ROOF LINE
RW2	uPVC DWV	Ø150	2	MAIN. RES. ROOF LINE
RW3	uPVC DWV	Ø100	1	SHED ROOF LINE
RW4	uPVC DWV	Ø150	1	SHED ROOF LINE
SW1	uPVC DWV	Ø150	1-10	SURFACE LINE

ROOF & EAVES GUTTER SCHEDULE								
ROOF I.D.	DESCRIPTION	MATERIAL	PITCH	DOWNPIPE / SPREADER I.D.	MIN. NO. OF DPs / SPs	MIN. GUTTER CROSS-SECTIONAL AREA (A _g)(mm ²)	GUTTER GRADE	DESIGN STORM
RF.1	MAIN RES. + GARAGE	COLORBOND	18-30°	DP.1/SP.1	22	8,000mm ²	≥1:500	5%AEP
RF.2	SHED 1ST FLR	COLORBOND	5-7°	DP.1/SP.1	7	7,900mm ²	≥1:500	5%AEP
RF.3	SHED GND FLR	COLORBOND	7°	DP.1/SP.1	4	8,200mm ²	≥1:500	5%AEP

DOWNPIPE & SPREADER SCHEDULE			
I.D.	MINIMUM DIMENSIONS (INTERNAL) (mm)		DESIGN STORM
	CIRCULAR	RECTANGULAR / SQUARE	
DP.1	Ø100	100 x 75	5%AEP

ROOF DRAINAGE LINE

SURFACE DRAINAGE LINE

PROPERTY BOUNDARY

CLEAN OUT PIT

SURFACE FLOW DIRECTION

GRATED SURFACE INLET PIT (G.S.I.P)

o VR

o VD

VERTICAL RISER / VERTICAL DROPPER

o DP.1

o SP.1

DOWNPIPE / SPREADER TYPE 1

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LGA	NORTHERN BEACHES COUNCIL	CLIENT	R. SLOSS C/O: BLUE SKY BUILDING DESIGN

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SCALE

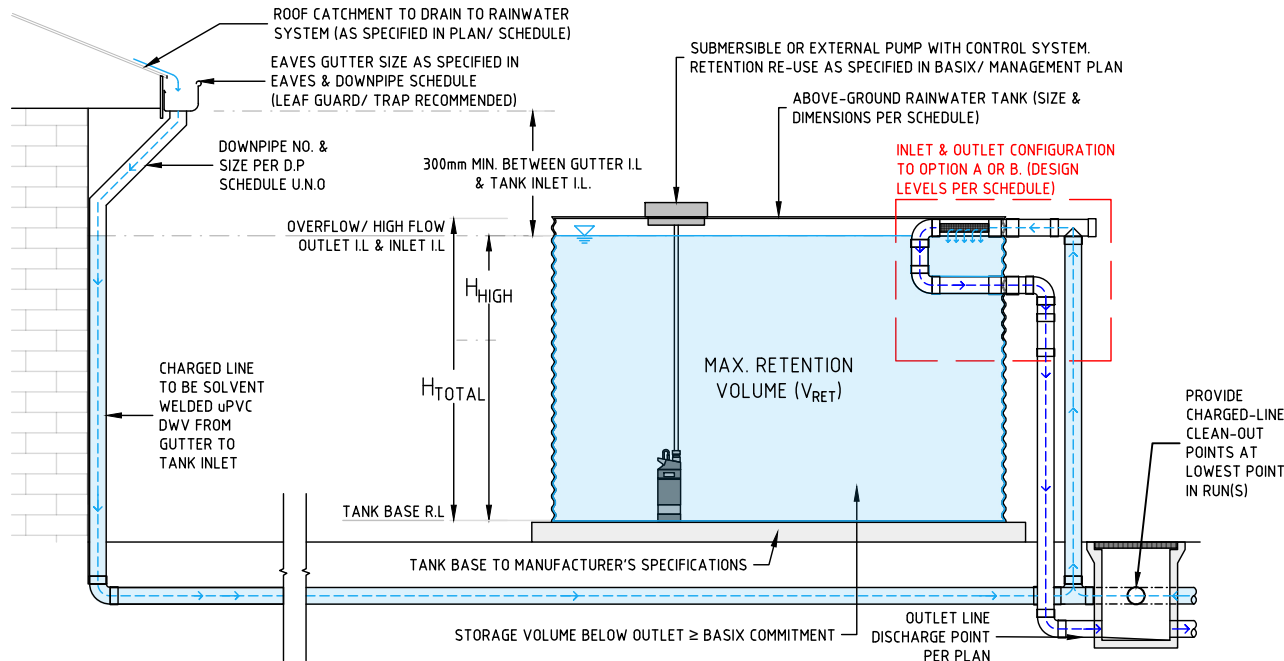
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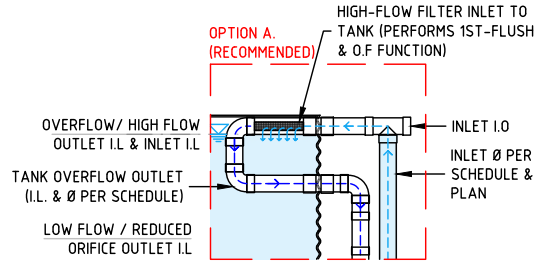


TYPICAL DETAIL - CHARGED LINE TO ABOVE GROUND RAINWATER TANK (RWT)

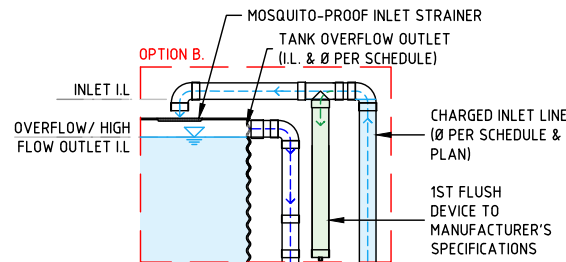
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NOTES FOR CHARGED SYSTEM:

1. PLAN, DETAILS, & DIAGRAM ARE TO BE READ IN CONJUNCTION WITH MANUFACTURER SPECIFICATIONS FOR ALL PRODUCTS.
2. INLET/OUTLET CONFIGURATION CAN BE PROVIDED AT EITHER OR BOTH SIDES OF THE TANK(S).
3. AN OUTLET MUST BE PROVIDED WITH EACH INLET PIPE U.N.O.

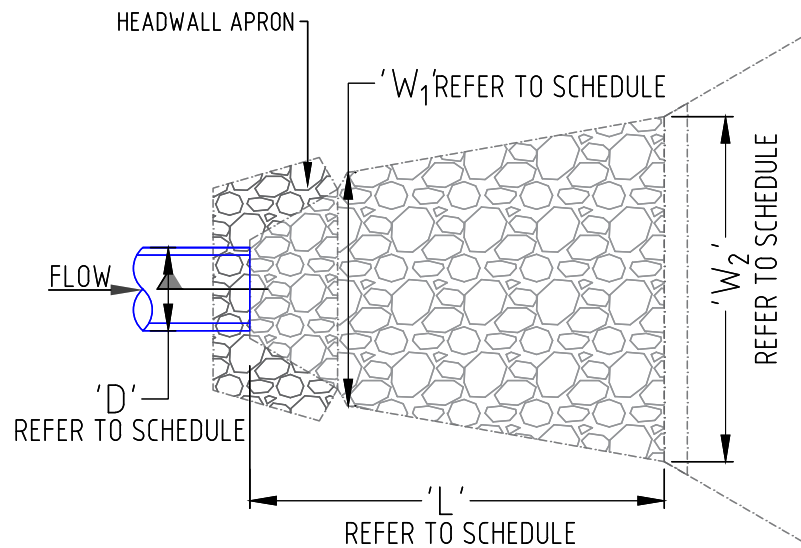


Ⓐ HIGH FLOW TANK INLET WITH FILTER & INBUILT HIGH FLOW BYPASS



Ⓑ CONVENTIONAL TANK INLET & OUTLET WITH EXTERNAL 1ST-FLUSH

RAINWATER TANK SCHEDULE		
SYSTEM ID	RWT 1	RWT 2
TYPE	TANKWORKS SLIMLINR 5000 ABOVE GROUND CORRUGATED	TANKWORKS SLIMLINR 5000 ABOVE GROUND CORRUGATED
TANK EFFECTIVE VOLUME (kL)	5.696	5.696
TANK DIMENSIONS (m)	H: 1.860, W: 1.15, L: 3.3	H: 1.860, W: 1.15, L: 3.3
TANK BASE R.L. (m, AHD)	169.950	169.950
OVERFLOW OUTLET HEIGHT 'OF _{HIGH} '	(m)	1.75
	I.L. (m, AHD)	171.700
OVERFLOW OUTLET DIAMETER (mm)	2x Ø100	2x Ø100
RETENTION VOLUME BELOW OUTLET (kL)	5.36	5.36
AIR VOID VOLUME (kL)	0.33	0.33
COMMENTS	2x Ø100 INLET. 2xØ100 OVERFLOW TO PIT A/2. RETENTION RE-USE PER BASIX.	2x Ø100 INLET. 2xØ100 OVERFLOW TO PIT A/1. RETENTION RE-USE PER BASIX.

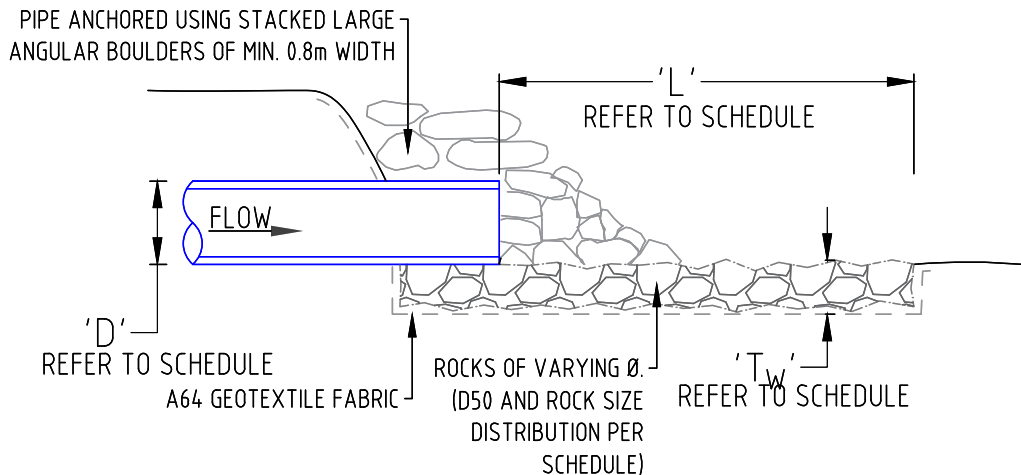


TYPICAL OUTLET TO ROCK SCOUR PAD LAYOUT

NTS

NOTES:

1. HEADWALL APRON MAY BE OF CONCRETE-PRECAST OR STACKED ROCK CONSTRUCTION (AS SHOWN). WHERE STACKED ROCK, MINIMUM 0.8m WIDTH ROCKS ARE TO BE USED.
2. ROCK IS TO BE GRADED IN ACCORDANCE WITH ROCK SIZES NOMINATED IN SCHEDULE.



OUTLET TO ROCK SCOUR PAD SECTION A-A

NTS

OUTLET SCOUR PAD SCHEDULE		
ID		MAIN RES. OUTLET
DESIGN DISCHARGE 'QD' [m ³ /s]		0.015
DESIGN VELOCITY 'VD' [m/s]		0.05
OUTLET 'D' [mm]		2xØ150
TANK BASE R.L. (m, AHD)		34.600
ROCK PROPERTIES	ROCK FINISH	ANGULAR
	MEAN ROCK SIZE 'D50' [mm]	100
	SIZE DISTRIBUTION 'D50/D90'	0.67
	D90 [mm]	150
PAD DIMENSIONS	MIN. PAD THICKNESS 'TMIN' [mm]	200
	PAD LENGTH 'L' [m]	3.0
	WIDTH 'W1' [m]	1.34
	WIDTH 'W1' [m]	1.34

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LGA	NORTHERN BEACHES COUNCIL	CLIENT	R. SLOSS C/O: BLUE SKY BUILDING DESIGN

PROJECT ID: 1381-SW
SCALE: NTS @ A3
N/A @ A1
SHEET NO.: 5 of 5