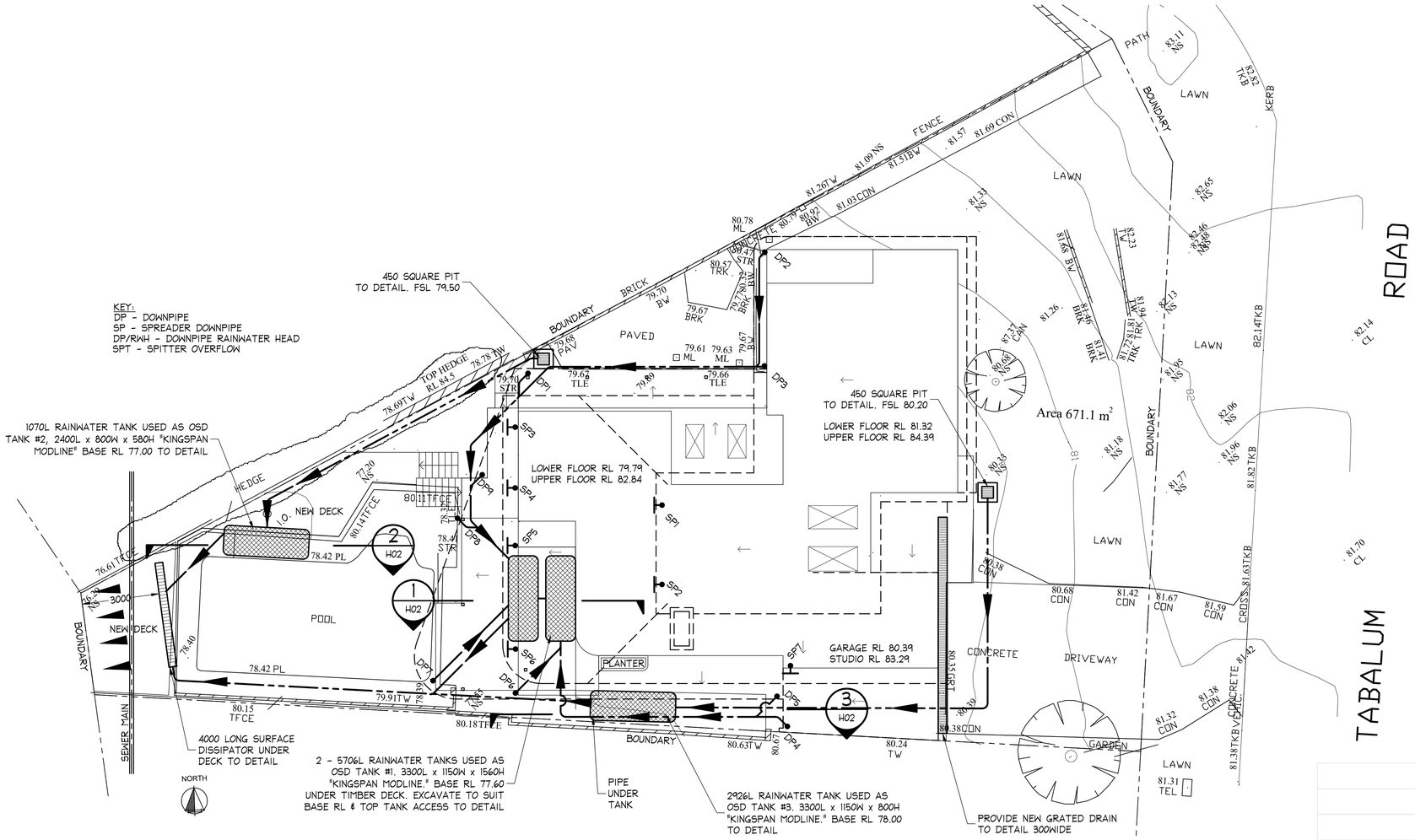


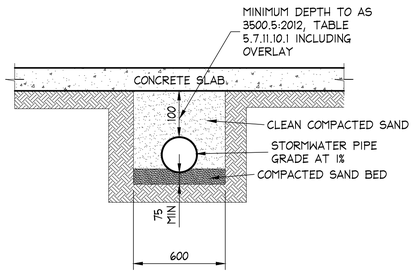
CONCEPT STORMWATER MANAGEMENT PLAN

SCALE = 1 : 100

LEVELS TAKEN FROM SURVEY BY GEOFF SWALWELL SURVEYORS P/L, REF:2262, DATED 13-02-2025
ALL DRAINAGE LOCATIONS ARE INDICATIVE ONLY. LOCATION MAY VARY TO SUIT SITE CONSTRAINTS.

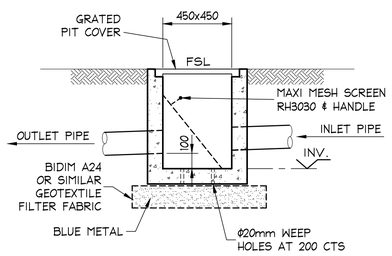
STORMWATER NOTES:

1 - ALL PIPES TO BE 100mm ϕ SEWER GRADE uPVC UNLESS NOTED OTHERWISE.
2 - ALL PIPES TO BE uPVC TO AS 1254-2002 UNLESS NOTED OTHERWISE.
3 - ALL PIPES TO BE LAID AT 1 % MINIMUM GRADE UNLESS NOTED OTHERWISE.
4 - ALL PIPES SHALL BE LAID ON A 75mm SAND BED, COMPACTED TO 100% S.M.D.D. BELOW PAVEMENTS.
(NO COMPACTION REQUIRED BELOW LANDSCAPING)
COVER TO SURFACE FROM TOP OF PIPE TO BE AS PER AS3500.
BACKFILL TO BE ADEQUATELY CONSOLIDATED AROUND PIPES BY METHOD OF RAMMING AND WATERING IN. TRENCHES TO BE FILLED WITH GRANULAR MATERIAL AS SPECIFIED.
5 - DOWN PIPE LOCATIONS ARE INDICATIVE ONLY. LOCATIONS TO BE CONFIRMED WITH ARCHITECT PRIOR TO COMMENCEMENT WITH WORK.
6 - PROVIDE CLEANING EYES AT ALL DOWNPIPES.
7 - ALL PITS TO BE PRECAST, PREFORMED OR HDPE, IN ACCORDANCE WITH LOCAL COUNCIL SPECIFICATIONS.
8 - ALL PITS GREATER THAN 1000mm DEEP SHALL HAVE STEP IRONS AS PER COUNCIL STANDARDS.
9 - ALL WORK TO BE IN ACCORDANCE WITH LOCAL COUNCIL STANDARDS AND SPECIFICATIONS.
10 - PRIOR TO COMMENCING ANY SITE WORKS THE CONTRACTOR SHALL IMPLEMENT EROSION CONTROL MEASURES TO EPA GUIDELINES AND COUNCIL SPECIFICATIONS. ALL MEASURES TO REMAIN IN PLACE UNTIL COMPLETION AND STABILIZATION OF THE SITE TO COUNCIL SATISFACTION.
11 - ALL LEVELS SHOWN ARE TO AHD
12 - ENSURE THAT ALL PITS AND STORMWATER PIPES ARE LOCATED CLEAR FROM TREE ROOT SYSTEMS.
13 - ALL EXISTING EARTHENWARE PIPES TO BE UPGRADED TO uPVC.
14 - ALL WORKS TO BE IN ACCORDANCE WITH AS 3500.3-2021 NATIONAL PLUMBING DRAINAGE CODE PART 3 - STORMWATER DRAINAGE & NCC 2022.



TYPICAL TRENCHING DETAIL

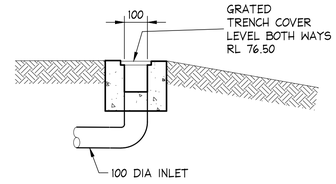
SCALE = 1 : 20



PRECAST OR HDPE PIT
REFER STORMWATER NOTES

450x450 PIT DETAIL

SCALE = 1 : 20



SURFACE DISSIPATOR/ LEVEL SPREADER DETAIL

SCALE = NTS

PRECAST OR HDPE GRATED DRAIN ALTERNATIVE

ONSITE DETENTION SYSTEM SUMMARY NOTES - NORTHERN BEACHES COUNCIL

COUNCIL'S " WATER MANAGEMENT FOR DEVELOPMENT POLICY, 26 FEBRUARY 2021" USED		
SECTION 5.5 - FOR REGION 3 - SOUTHERN CATCHMENTS		
TOTAL SITE AREA	671.1 m^2	
PREDEVELOPMENT IMPERVIOUS AREA	408.1 m^2	61%
POST DEVELOPMENT IMPERVIOUS AREA	434.9 m^2	65%
DESIGN METHOD USED -	DRAINS	
PROPERTY DRAINS TO REAR		

ABOVE GROUND OSD TANK #1 IS TO BE PROVIDED TO CAPTURE ALL ROOF WATER - 300 SQUARE METRES
ABOVE GROUND OSD TANK #2 & #3 ARE TO BE PROVIDED TO CAPTURE SURFACE WATER WHERE POSSIBLE AND DETAIN THAT AREA BACK TO "STATE OF NATURE" CONDITIONS

PREDEVELOPMENT RUNOFF FOR SITE	19 l/s - PER APPENDIX 14 PAGE 86	
TOTAL VOLUME OF OSD REQUIRED	13.7 m^3	
ORIFICE DIAMETER TANK #1	50 mm	
ORIFICE DIAMETER TANK #2	60 mm	
ORIFICE DIAMETER tANK #3	60 mm	

Gutter Calculations -20 yr ARI Storm

Northern Beaches Council
21 Tabalum Rd Balgowlah Heights
Alterations & Additions

to AS 3500 - 2021 & AS 3500.5 2012 & BCA2016					$^{20}I_5$	From	Downpipe
Eaves	Horizontal	slope		Gutter		Figure	From
	Area A_h	factor	Area A_c	Slope	from	5.6.4.1.a	Table 5.6.4.7.1
Gutters		From		steeper	Council	gutter	size reqd
		Fig 5.6.3.2		than	Appendix 12	area reqd	mm
	m^2		m^2	1 in	mm/hr	mm^2	
DP1	25.7	1.01	26.0	500	201	5500	100x50 or 90 dia
DP2	39.3	1.01	39.7	500	201	7800	100x75 or 100 dia
DP3	39.3	1.01	39.7	500	201	7800	100x75 or 100 dia
DP4	40.5	1.01	40.9	500	201	8000	100x75 or 100 dia
DP5	21	1.01	21.2	500	201	4700	100x50 or 90 dia
DP6	33.5	1.01	33.8	500	201	6700	100x75 or 100 dia
DP7	33.5	1.01	33.8	500	201	6700	100x75 or 100 dia
DP8	33.6	1.01	33.9	500	201	6700	100x75 or 100 dia
DP9	33.6	1.01	33.9	500	201	6700	100x75 or 100 dia
total	300.0						
Eaves Gutters - 150 Half Round					Area	9000	mm^2
All underground Pipes to be 100 Dia Sewer Grade PVC UNO							
All Downpipes to run to OSD Tank #1							

GUTTER CALCULATIONS

A1

NOTES:

1. ALL DIMENSIONS TO BE VERIFIED ON SITE BEFORE COMMENCING WITH WORK.
2. FOR GENERAL NOTES AND DRAWING SCHEDULE REFER TO DRAWING NUMBER: S01.

CHARTERED PROFESSIONAL ENGINEERS MEMBER

DOCUMENT CERTIFICATION

Date : JUNE 2025

Bruce Lewis .....

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E : bruce@peninsulaconsulting.com.au
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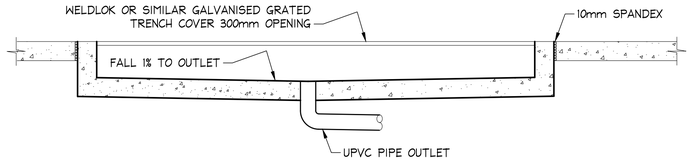
Project:
PROPOSED WORKS
at: 21 TABALUM ROAD, BALGOWLAH HEIGHTS
for: SUSAN WOODS

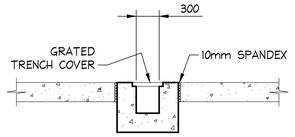
Drawing Title:
STORMWATER MANAGEMENT PLAN & DETAILS

Job No:	Drawing No:	Rev:
25-0506	H01	A



LONGITUDINAL SECTION TYPICAL GRATED DRAIN

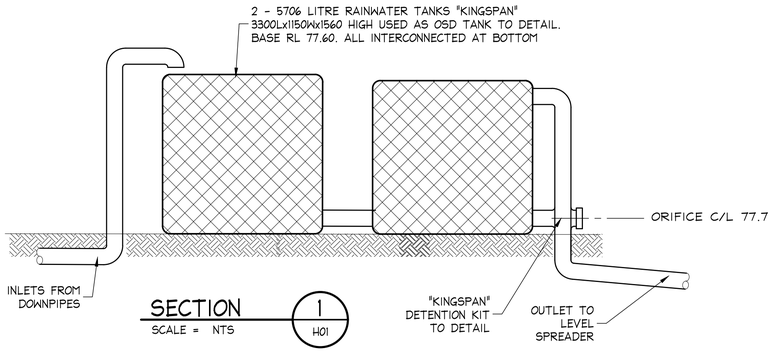
SCALE = 1 : 20



TYPICAL GRATED DRAIN

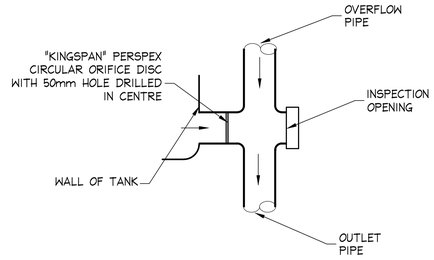
SCALE = NTS

PRECAST OR HDPE GRATED DRAIN
ALTERNATIVE



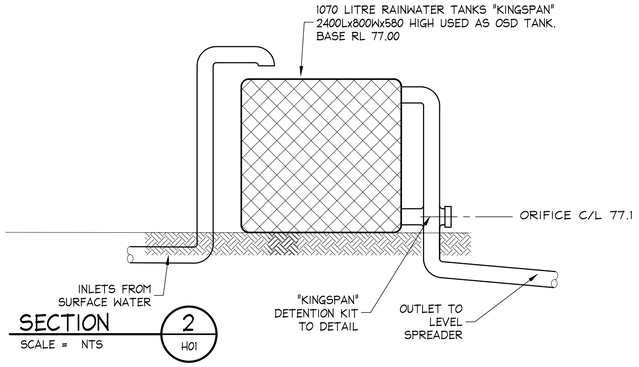
DIAGRAMMATIC "KINGSPAN" TANKS LAYOUT TANK #1

NOT TO SCALE



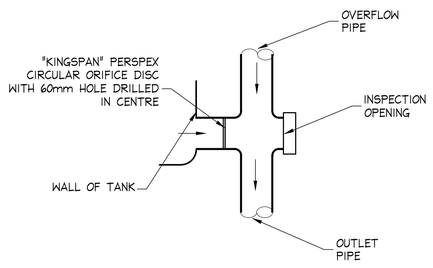
"KINGSPAN" DETENTION KIT #1

SCALE 1:10



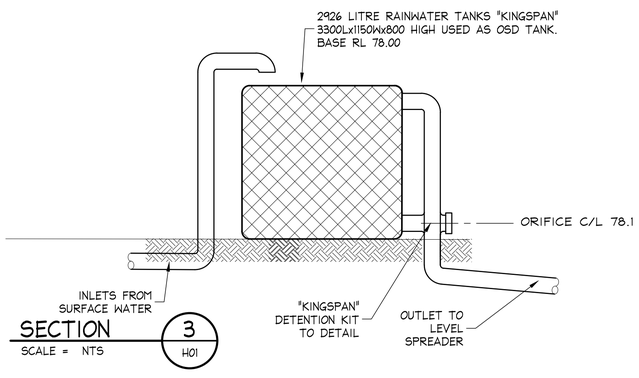
DIAGRAMMATIC "KINGSPAN" TANK LAYOUT TANK #2

NOT TO SCALE



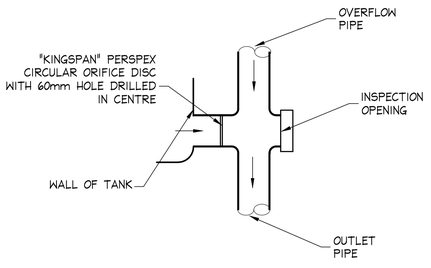
"KINGSPAN" DETENTION KIT #2

SCALE 1:10



DIAGRAMMATIC "KINGSPAN" TANK LAYOUT TANK #3

NOT TO SCALE



"KINGSPAN" DETENTION KIT #3

SCALE 1:10

Northern Beaches Council [Region 3]

21 Tabalum Rd Balgowlah Heights

Alterations & Additions

On Site Drainage Calculations

	m^2		
Site Area	671.1		
Under Northern Beaches Council Conditions, "Water Management for Development Policy" revised 26/2/2021			
for Region 3 - Southern Catchments - Section 9.3.3.2 & Section 5.1 applies			
Property drains toward rear			
Area Calculation - Proposed	m^2	Area Calculation - Existing	m^2
Existing & New Roofs	300.0	Existing Roofs	287.3
Driveway	50.9	Driveway	52.1
New North Timber Deck - 50% Impervious	6.7		
New West Timber Deck - 50% Impervious	8		
Side Paving	35.1	Side Paving	33.7
Pool Surround	34.2	Pool Surround	35
Total Impervious	434.9	Total Impervious	408.1
Percent Impervious	65%	Percent Impervious	61%
Additional Impervious	27		
Slope of block	14	%	
The OSD was determined , with the following parameters			
Above Ground OSD Tank/s are to be provided to capture all roof water - 300 m^2			
and control that area of impervious back to "state of nature"			
OSD Tanks are to be installed under rear Deck - base RL - 77.60 -Tank 1			
and under Pool Deck - base RL 77.00 - Tank 2			
and also on south elevation - base RL - 78.00 -Tank 3			
Permissable Site Discharge	19	L/sec - per Appendix 14 page 86	
Area Contributing to Tank 1	m^2		
New & Existing Roof	300.0		
Percent Impervious	100%		
Maximum Actual Area of OSD Surface	7.4	m^2	
Top Water Level Available of OSD Tank	79.62	mAHD	
Maximum Available Depth of OSD Tank	2.02	m	
Bottom Water Level Available of OSD Tank	77.60	mAHD	
this was then inputted into *DRAINS*			
maximum Detention Volume from *DRAINS*	10.4	m^3	
Orifice Diameter	50	mm	
Area Contributing to Tank 2	m^2		
North Side Area	71.2		
Percent Impervious	47%		
Maximum Actual Area of OSD Surface	3.7	m^2	
Top Water Level Available of OSD Tank	78.48	mAHD	
Maximum Available Depth of OSD Tank	1.48	m	
Bottom Water Level Available of OSD Tank	77.00	mAHD	
this was then inputted into *DRAINS*			
maximum Detention Volume from *DRAINS*	2.5	m^3	
Orifice Diameter	60	mm	
Area Contributing to Tank 3	m^2		
Front Area	169.6		
Percent Impervious	30%		
Maximum Actual Area of OSD Surface	7.4	m^2	
Top Water Level Available of OSD Tank	80.02	mAHD	
Maximum Available Depth of OSD Tank	2.02	m	
Bottom Water Level Available of OSD Tank	78.00	mAHD	
this was then inputted into *DRAINS*			
maximum Detention Volume from *DRAINS*	0.8	m^3	
Orifice Diameter	60	mm	
Area Outside OSD	m^2		
Rear Area	130.3		
Less Pool Water	41.0	drains to sewer	
Net Area	89.3		
Percent Impervious	55%		

ON SITE DRAINAGE CALCULATIONS

A1

NOTES:

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Narraweena, NSW, 2099
Ph: 0424 253 818
E : bruce@peninsulaconsulting.com.au
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Project:

PROPOSED WORKS
at: 21 TABALUM ROAD,
BALGOWLAH HEIGHTS
for: SUSAN WOODS

Drawing Title:

STORMWATER MANAGEMENT
CALCULATIONS & DETAILS

Job No:	Drawing No:	Rev:
25-0506	H02	A

Northern Beaches Council [Region 3]

21 Tabalum Rd Balgowlah Heights

Alterations & Additions

On Site Drainage Calculations

DRAINS Data

PIT / NODE DETAILS

Name	Type
N1	Node
N0	Node

DETENTION BASIN DETAILS

Name	Elev	Surf. Area	Outlet Type	Dia(mm)	Centre RL
Tank 1	77.6	7.4	Orifice	50	77.7
	79.62	7.4			
Tank 3	78	3.7	Orifice	60	78.1
	80.02	3.7			
Tank 2	77	3.7	Orifice	60	77.1
	78.48				

SUB-CATCHMENT DETAILS

Name	Pit or Node	Total Area (ha)	EIA %	Perv Area %	RIA %	EIA Time (min)	Perv Time (min)	RIA Time (min)
Cat Tank1	Tank 1	0.03	100	0	0	5	5	5
Cat1	N1	0.0089	55	45	0	5	5	5
Cat Tank 3	Tank 3	0.0169	30	70	0	5	5	5
Cat Tank 2	Tank 2	0.0071	47	53	0	5	5	5

PIPE DETAILS

Name	From	To	Length (m)	U/S IL (m)	D/S IL (m)	Slope (%)	Type	Dia (mm)
Pipe 1	Tank 1	N1	14	77.65	76.2	10.36	uPVC	100
Pipe 0	N1	N0	1	76.2	76.1	10	uPVC	100
Pipe 3	Tank 3	N1	20	78.05	76.2	9.25	uPVC	100
Pipe 2	Tank 2	N1	5	77.05	76.2	17	uPVC	100

DRAINS DATA

Northern Beaches Council [Region 3]

21 Tabalum Rd Balgowlah Heights

Alterations & Additions

On Site Drainage Calculations

DRAINS Results

PIT / NODE DETAILS

Name	Max HGL	Max Pond HGL	Max Surface Flow Arriving (cu.m/s)
N1	76.28		0.008
N0	76.18		0

SUB-CATCHMENT DETAILS

Name	Max Flow Q (cu.m/s)	EIA Max Q (cu.m/s)	Remaining Max Q (cu.m/s)	EIA Tc (cu.m/s)	RIA Tc (min)	PA Tc (min)	Due to Storm (min)
Cat Tank1	0.022	0.022	0	5	5	5	1% AEP, 5 min burst, Storm 1
Cat1	0.006	0.004	0.003	5	5	5	1% AEP, 10 min burst, Storm 1
Cat Tank 3	0.011	0.004	0.008	5	5	5	1% AEP, 10 min burst, Storm 1
Cat Tank 2	0.005	0.002	0.002	5	5	5	1% AEP, 10 min burst, Storm 1

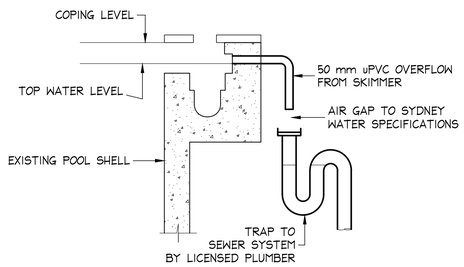
PIPE DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Max U/S HGL (m)	Max D/S HGL (m)	Due to Storm
Pipe 1	0.006	0.88	78.765	76.279	1% AEP, 25 min burst, Storm 1
Pipe 0	0.018	2.64	76.279	76.179	1% AEP, 20 min burst, Storm 4
Pipe 3	0.006	0.84	78.514	76.279	1% AEP, 20 min burst, Storm 4
Pipe 2	0.003	0.66	77.105	76.279	1% AEP, 15 min burst, Storm 8

DETENTION BASIN DETAILS

Name	Max WL	MaxVol	Max Q Total
Tank 1	79.01	10.4	0.006
Tank 3	78.67	2.5	0.006
Tank 2	77.23	0.8	0.003
		13.7	

DRAINS RESULTS



POOL OVERFLOW SECTION AT SKIMMER

SCALE = 1 : 20

A1

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