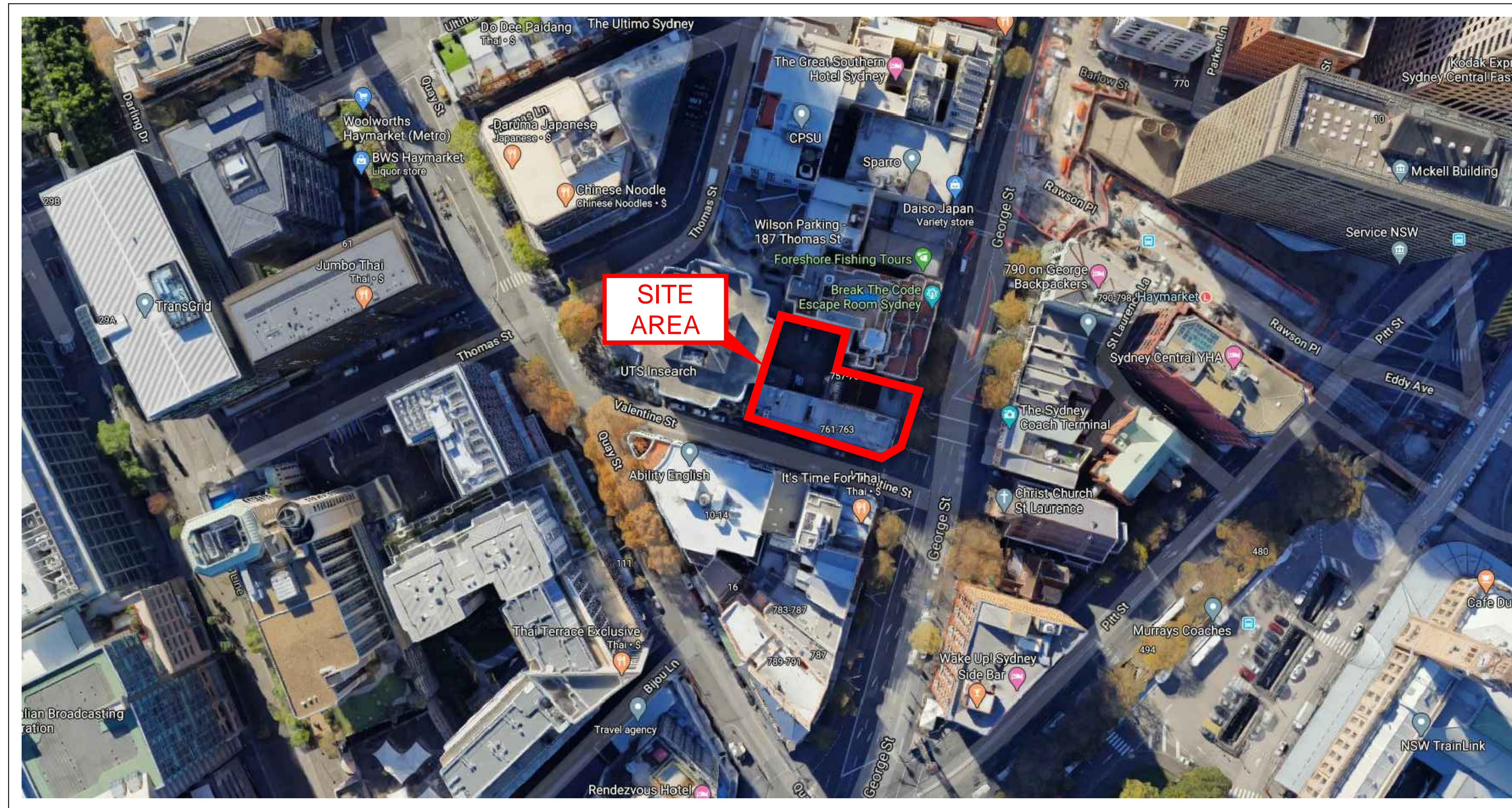


Attachment A18

**Stormwater Concept Plan
757-763 George Street, Haymarket**

757-763 GEORGE STREET, HAYMARKET PROPOSED MIXED-USE DEVELOPMENT

STORMWATER CONCEPT PLANS



LOCALITY PLAN
N.T.S.

DRAWING INDEX	
Drawing No.	DESCRIPTION
000	COVER SHEET PLAN
101	STORMWATER CONCEPT PLAN BASEMENT LEVEL 2 SHEET 1 OF 2
102	STORMWATER CONCEPT PLAN BASEMENT LEVEL 2 SHEET 2 OF 2
103	STORMWATER CONCEPT PLAN BASEMENT LEVEL 1
104	STORMWATER CONCEPT PLAN GROUND LEVEL
105	STORMWATER CONCEPT PLAN ROOF PLAN
106	WSUD DETAILS AND CALCULATION SHEETS
107	MISCELLANEOUS DETAILS SHEET

NOT FOR CONSTRUCTION

Issue	Description	Date	Design	Checked
A	ISSUE FOR PLANNING PROPOSAL	29/09/2020	AGN	JSF

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Client
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Council
City of Sydney Council

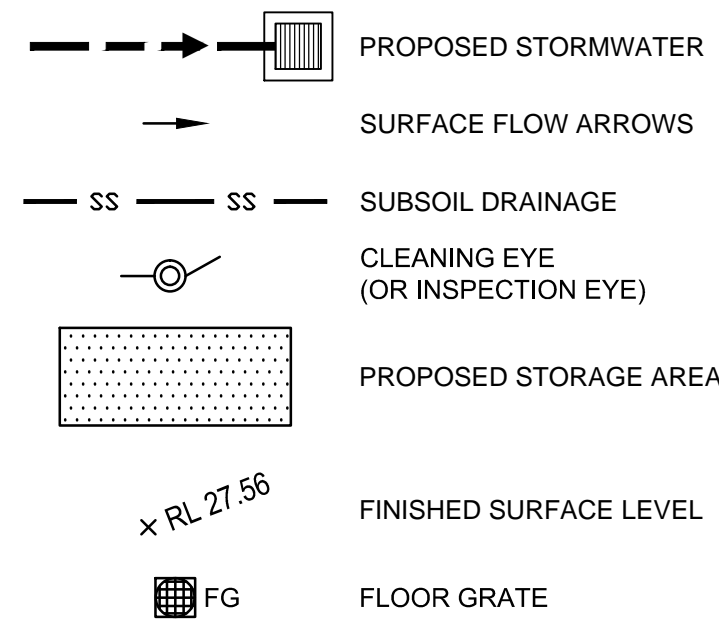
Scale

AUSTRALIAN CONSULTING ENGINEERS.
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Project
**757-763 GEORGE STREET, HAYMARKET
PROPOSED MIXED-USE DEVELOPMENT
STORMWATER CONCEPT PLANS
PLANNING PROPOSAL**

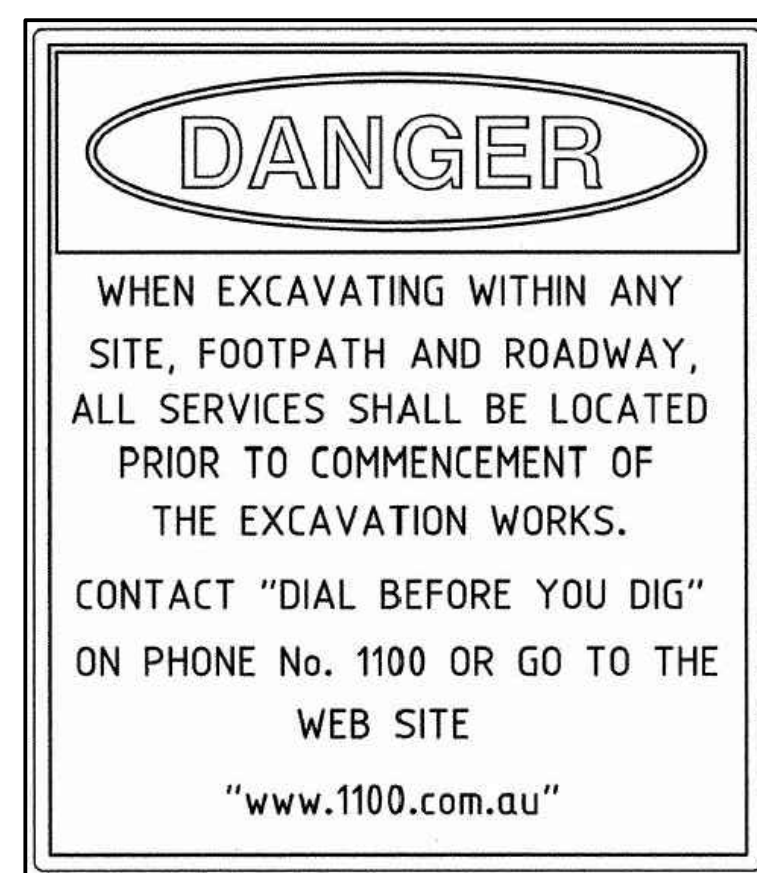
Drawing Title
COVER SHEET PLAN
Scale
N.T.S.
Project No.
200144
Dwg. No.
000
Issue
A

LEGEND



STANDARD PUMP OUT DESIGN NOTES

- THE PUMP OUT SYSTEM SHALL BE DESIGN TO BE OPERATED IN THE FOLLOWING MANNER:
- 1 - THE PUMP SHALL BE PROGRAMMED TO WORK ALTERNATELY TO ALLOW BOTH PUMPS TO HAVE AN EQUAL OPERATION LOAD AND PUMP LIFE.
 - 2 - A FLOAT SHALL BE PROVIDED TO ENSURE OF THE MINIMUM REQUIRED WATER LEVEL IS MAINTAINED WITHIN THE SUMP AREA OF THE BELOW GROUND TANK. IN THIS REGARD THIS FLOAT WILL FUNCTION AS AN OFF SWITCH FOR THE PUMPS AT THE MINIMUM WATER LEVEL. THE SAME FLOAT SHALL BE SET TO TURN ONE OF THE PUMPS ON UPON THE WATER LEVEL IN THE TANK RISING TO APPROXIMATELY 300mm ABOVE THE MINIMUM WATER LEVEL. THE PUMP SHALL OPERATE UNTIL THE TANK IS DRAINED TO THE MINIMUM WATER LEVEL.
 - 3 - A SECOND FLOAT SHALL BE PROVIDE AT A HIGH LEVEL, WHICH IS APPROXIMATELY THE ROOF LEVEL OF THE BELOW GROUND TANK. THIS FLOAT SHALL START THE OTHER PUMP THAT IS NOT OPERATING AND ACTIVATE THE ALARM.
 - 4 - AN ALARM SYSTEM SHALL BE PROVIDE WITH A FLASHING STROBE LIGHT AND A PUMP FAILURE WARNING SIGN WHICH ARE TO BE LOCATED AT THE DRIVEWAY ENTRANCE TO THE BASEMENT LEVEL THE ALARM SYSTEM SHALL BE PROVIDED WITH A BATTERY BACK-UP IN CASE OF POWER FAILURE.
 - 5 - A CONFINED SPACE DANGER SIGN SHALL BE PROVIDED AT ALL ACCESS POINT TO THE PUMP-OUT STORAGE TANK IN ACCORDANCE WITH THE UPPER PARRAMATA RIVER CATCHMENT TRUST OSD HANDBOOK.



BASEMENT PUMP OUT FAILURE WARNING SIGN

SIGN SHALL BE PLACED IN A CLEAR AND VISIBLE LOCATION WHERE VEHICLES ENTER THE BASEMENT

COLOURS:
"WARNING" = RED
BORDER AND OTHER LETTERING = BLACK

CONFINED SPACE DANGER SIGN

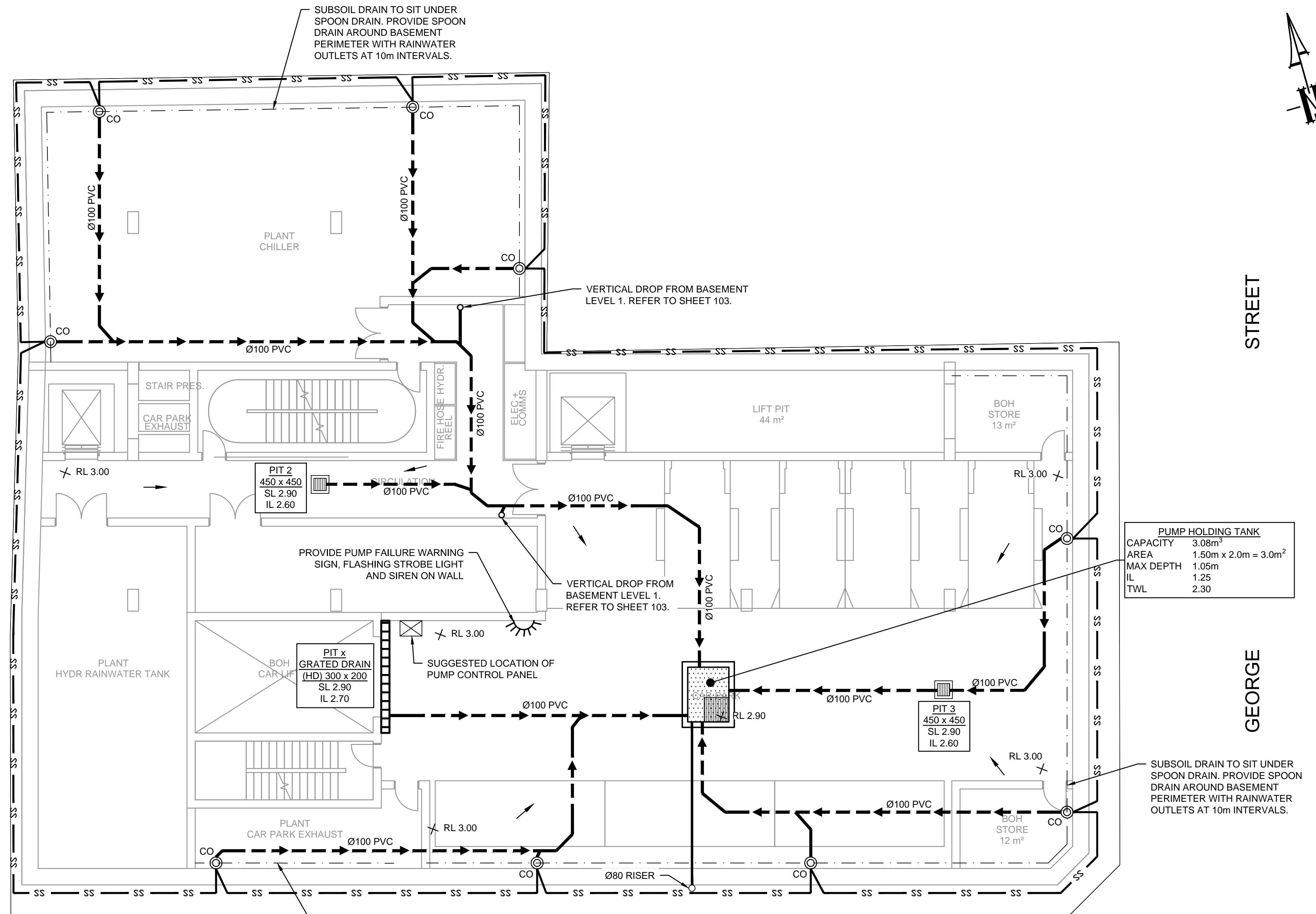
A) A CONFINED SPACE DANGER SIGN SHALL BE POSITIONED IN A LOCATION AT ALL ACCESS POINTS, SUCH THAT IT IS CLEARLY VISIBLE TO PERSONS PROPOSING TO ENTER THE BELOW GROUND TANK/S CONFINED SPACE.

B) MINIMUM DIMENSIONS OF THE SIGN - 300mm x 450mm (LARGE ENTRIES, SUCH AS DOORS) -250mm x 180mm (SMALL ENTRIES SUCH AS GRATES & MANHOLES)

C) THE SIGN SHALL BE MANUFACTURED FROM COLOUR BONDED ALUMINUM OR POLYPROPYLENE

D) SIGN SHALL BE AFFIXED USING SCREWS AT EACH CORNER OF THE SIGN

COLOURS:
"DANGER" & BACKGROUND = WHITE
ELLIPTICAL AREA = RED
RECTANGLE CONTAINING ELLIPSE = BLACK
BORDER AND OTHER LETTERING = BLACK



PUMP HOLDING TANK

CAPACITY	3.08m ³
AREA	1.50m x 2.0m = 3.0m ²
MAX DEPTH	1.05m
IL	1.25
TWL	2.30

VALENTINE STREET

STREET

GEORGE STREET

BASEMENT 2 PLAN
SCALE 1:100

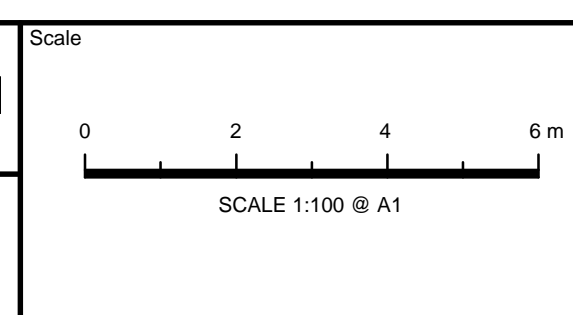
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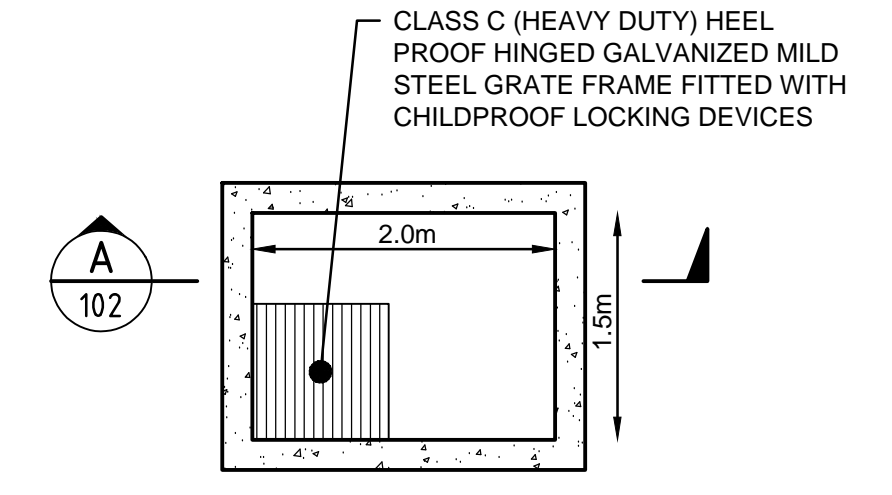
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Project
757-763 GEORGE STREET, HAYMARKET PROPOSED MIXED-USE DEVELOPMENT STORMWATER CONCEPT PLANS PLANNING PROPOSAL

Drawing Title
STORMWATER CONCEPT PLAN BASEMENT LEVEL 2 SHEET 1 OF 2

Scale	A1	Project No.	Dwg. No.	Issue
1:100		200144	101	A

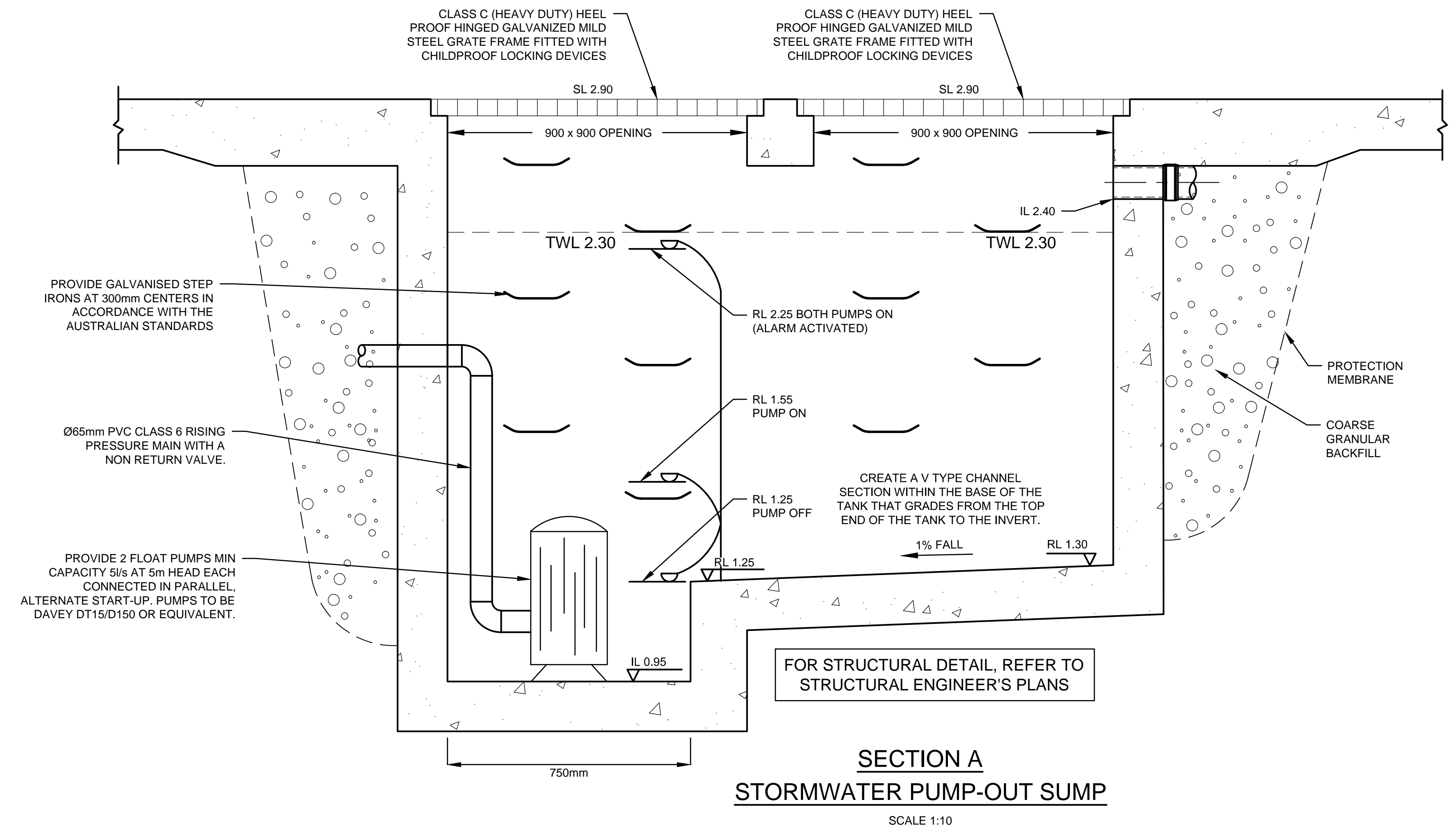
PUMP-OUT SUMP:
 MAX TANK DEPTH (UPSTREAM) 1.0m
 MAX TANK DEPTH (DOWNSTREAM) 1.05m
 WIDTH 2.0m
 LENGTH 4.0m
 VOLUME PROVIDED 8.20m³



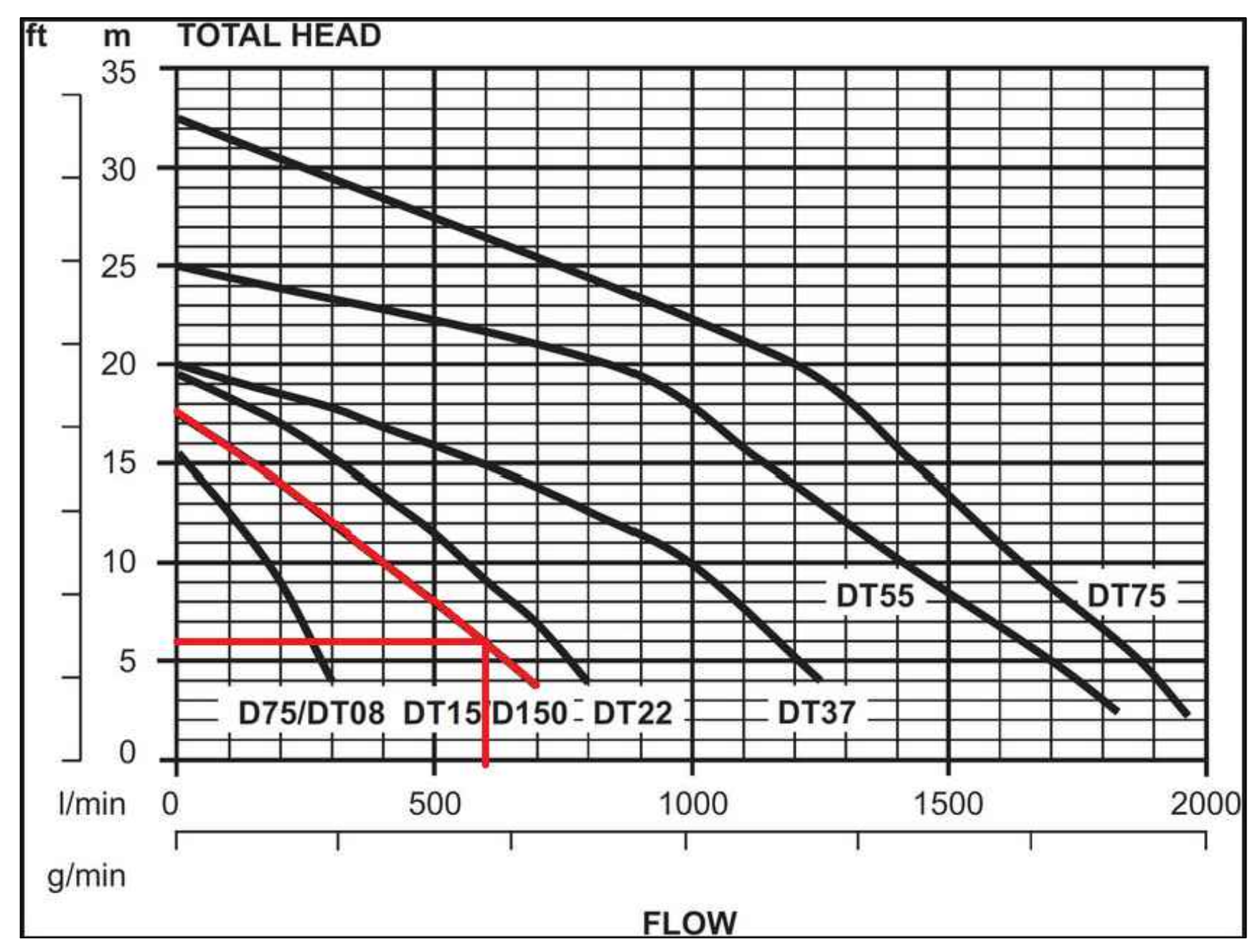
NOTE:
 1- FOR ALL THE STRUCTURAL DETAILS, REFER TO STRUCTURAL ENGINEER'S PLAN.
 2- ALL THE AG LINES BEHIND BASEMENT WALLS TO BE CONNECTED TO PUMP-OUT SUMP.

PUMP-OUT SUMP DETAIL
PLAN VIEW
 SCALE 1:50

SINCE THE ROOF OCCUPIES THE MAIN ENTRANCE TO THE BASEMENT, NO FLOWS ARE ASSUMED TO ENTER THE BASEMENT. IN THE UNLIKELY CASE OF EMERGENCY, A 3.0m³ PUMP OUT TANK IS PROVIDED.



SECTION A
STORMWATER PUMP-OUT SUMP
 SCALE 1:10



PUMP CALCULATIONS												
Project Address:		757-763 George Street, Haymarket										
$HL = (3.35 \times 10e6 \times Q / (d^2.63 \times C))^1.852$				$h1 = kv^2 / 2g$				$H(\text{total head}) = Hf + h1 + \text{Elevation Head (static head)}$				
HL(m/100m), Q(L/s), d(mm)				k(cum), v(m/s), g=9.8(m/s ²)				Elevation Head(m)= 10 Pipe Length(m)= 10				
d(mm)= 80				v(m/s)= 0.00				Hazen - Williams C= 145				
				Bend Losses, Kb= 3.06				Hazen-Williams Constant				
				Valve Losses, Kv= 2.13				125-140 Commercial steel pipe				
				Entry/Exit Losses, Ke= 5.00				135-140 Bitumen Lined Cast iron pipe				
				Cum Losses, K= 10.19				140-145 Copper Tube				
								145-150 PVC				
Start Flow= 0												
Increment= 1												
Q(L/s)		0	1	2	3	4	5	6	7	8	9	10
HL(m/100m)		0.00	0.06	0.23	0.50	0.85	1.28	1.79	2.38	3.05	3.80	4.61
Hf(m)	HL x pipe Length/100	0.00	0.01	0.02	0.05	0.08	0.13	0.18	0.24	0.31	0.38	0.46
v(m/s)	Q(L/s) / area of pipe crossing section	0.00	0.20	0.40	0.60	0.80	0.99	1.19	1.39	1.59	1.79	1.99
h1(m)	k(cum) x v(m/s) ² / 2xg	0.00	0.02	0.08	0.19	0.33	0.51	0.74	1.01	1.32	1.67	2.06
H(m)	=Hf+h1+Elevation Head	10.00	10.03	10.11	10.23	10.41	10.64	10.92	11.25	11.62	12.05	12.52

UNDERGROUND PUMP - OUT SUMP STAGED STORAGE CALCULATIONS

DEPTH (mm)	AREA (m ²)	CUMULATIVE VOLUME (m ³)
0	3.00	0
100	3.00	0.225
200	3.00	0.525
300	3.00	0.825
400	3.00	1.125
500	3.00	1.425
600	3.00	1.725
700	3.00	2.025
800	3.00	2.325
900	3.00	2.625
1000	3.00	2.925
1050	3.00	3.075

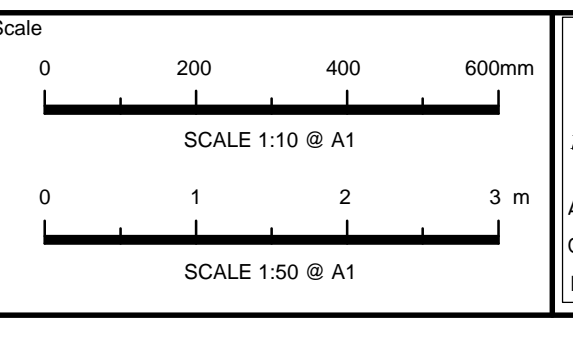
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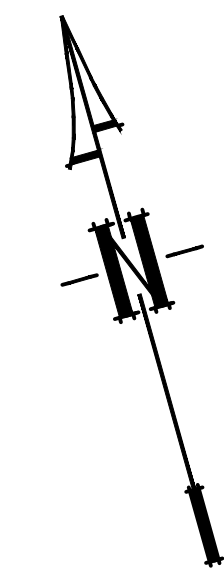
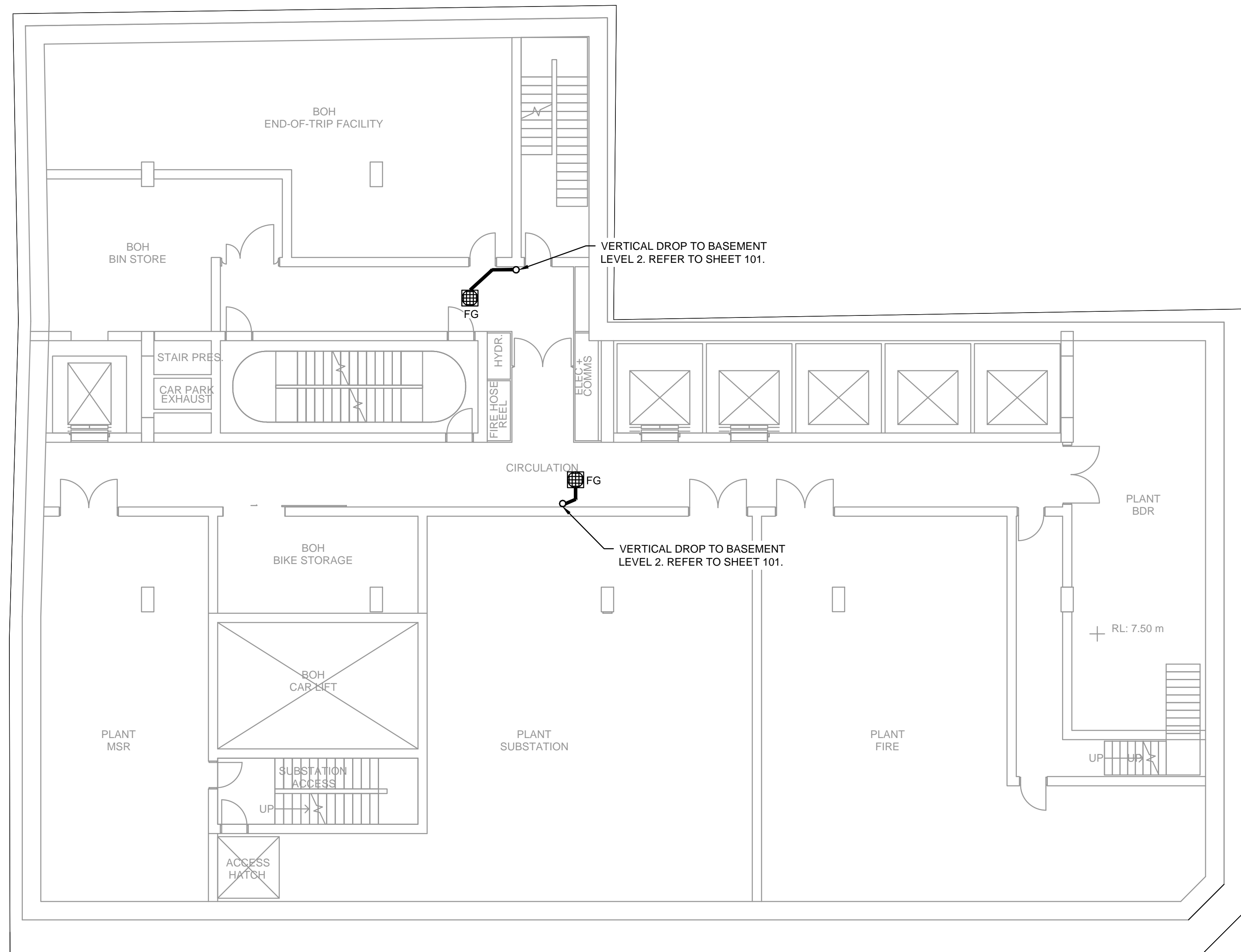
Client
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 Council
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Project
757-763 GEORGE STREET, HAYMARKET PROPOSED MIXED-USE DEVELOPMENT STORMWATER CONCEPT PLANS
PLANNING PROPOSAL

Drawing Title
STORMWATER CONCEPT PLAN BASEMENT LEVEL 2 SHEET 2 OF 2
 Scale As Shown Project No. 200144 Dwg. No. 102 Issue A



STREET

GEORGE

VALENTINE

STREET

BASEMENT 1 PLAN
SCALE 1:100

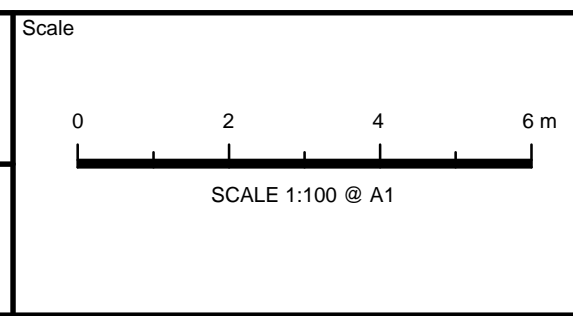
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[Signature]

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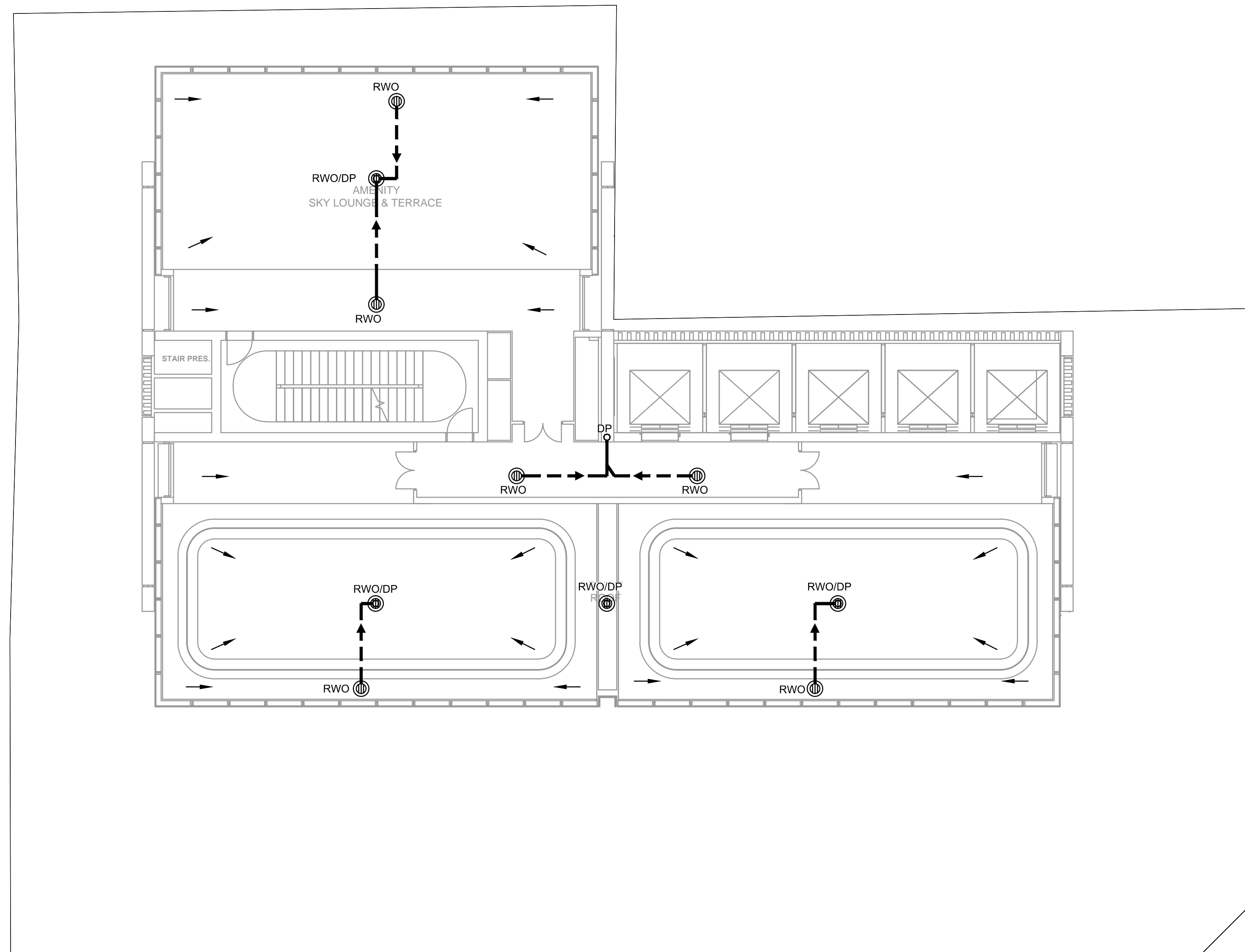
Client
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Council
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Drawing Title		Scale	Project No.	Dwg. No.	Issue
STORMWATER CONCEPT PLAN BASEMENT LEVEL 1 SHEET 1 OF 2		1:100	200144	103	A



STREET

GEORGE

VALENTINE

STREET

PIPES NOTE:
 Ø65 PVC @ MIN 1.0%
 Ø90 PVC @ MIN 1.0%
 Ø100 PVC @ MIN 1.0%
 Ø150 PVC @ MIN 1.0%
 Ø225 PVC @ MIN 0.5%
 Ø300 PVC @ MIN 0.4%
 UNLESS NOTED OTHERWISE

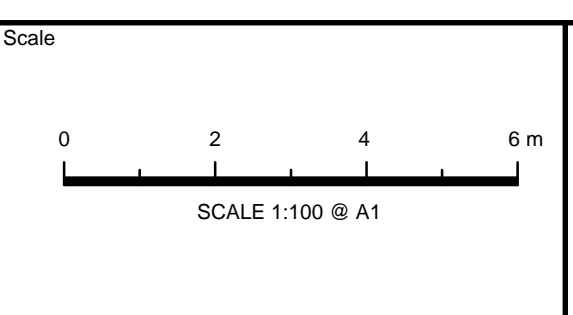
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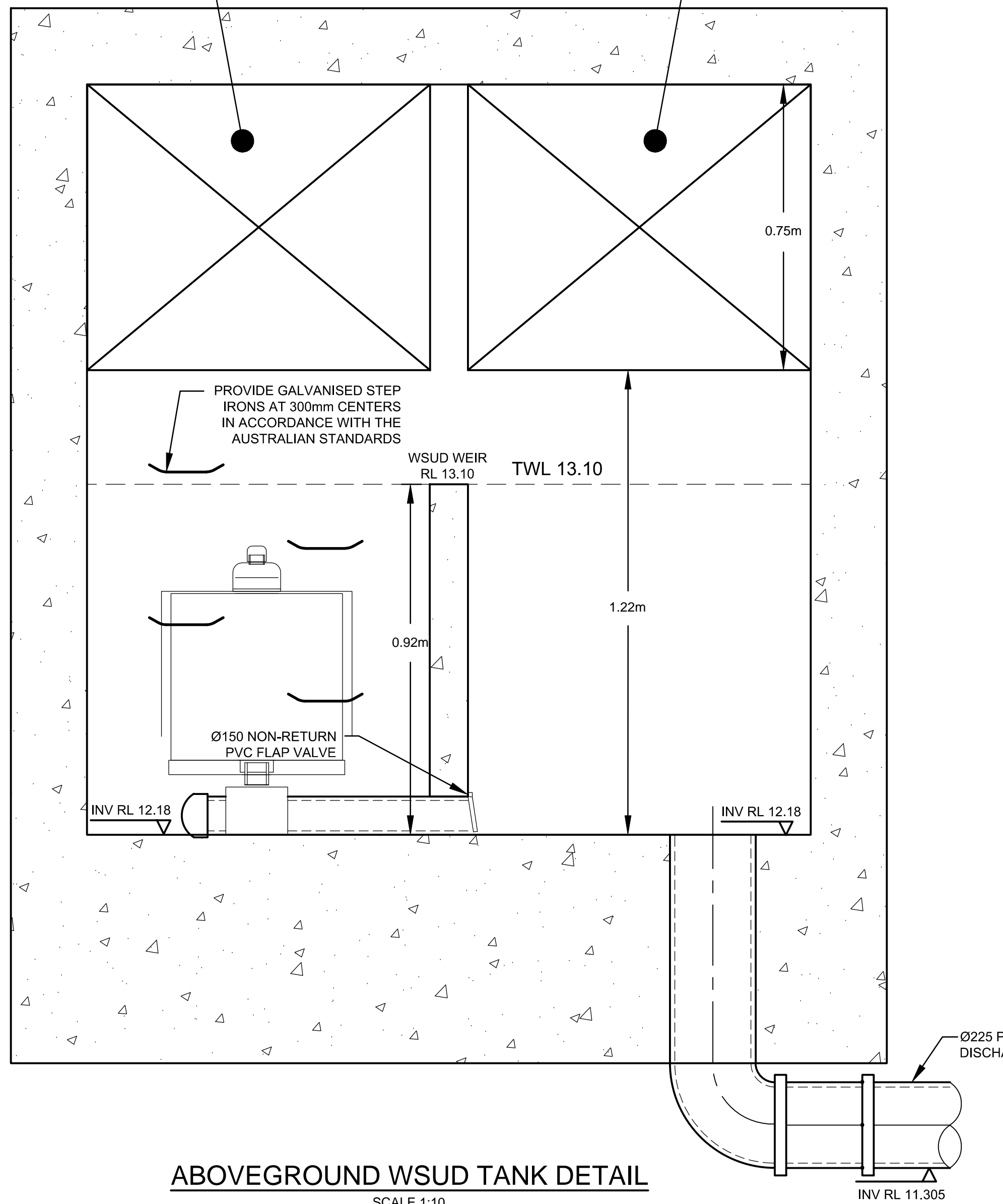
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Drawing Title		Scale	A1	Project No.	Dwg. No.	Issue
STORMWATER CONCEPT PLAN ROOF PLAN		1:100		200144	105	A

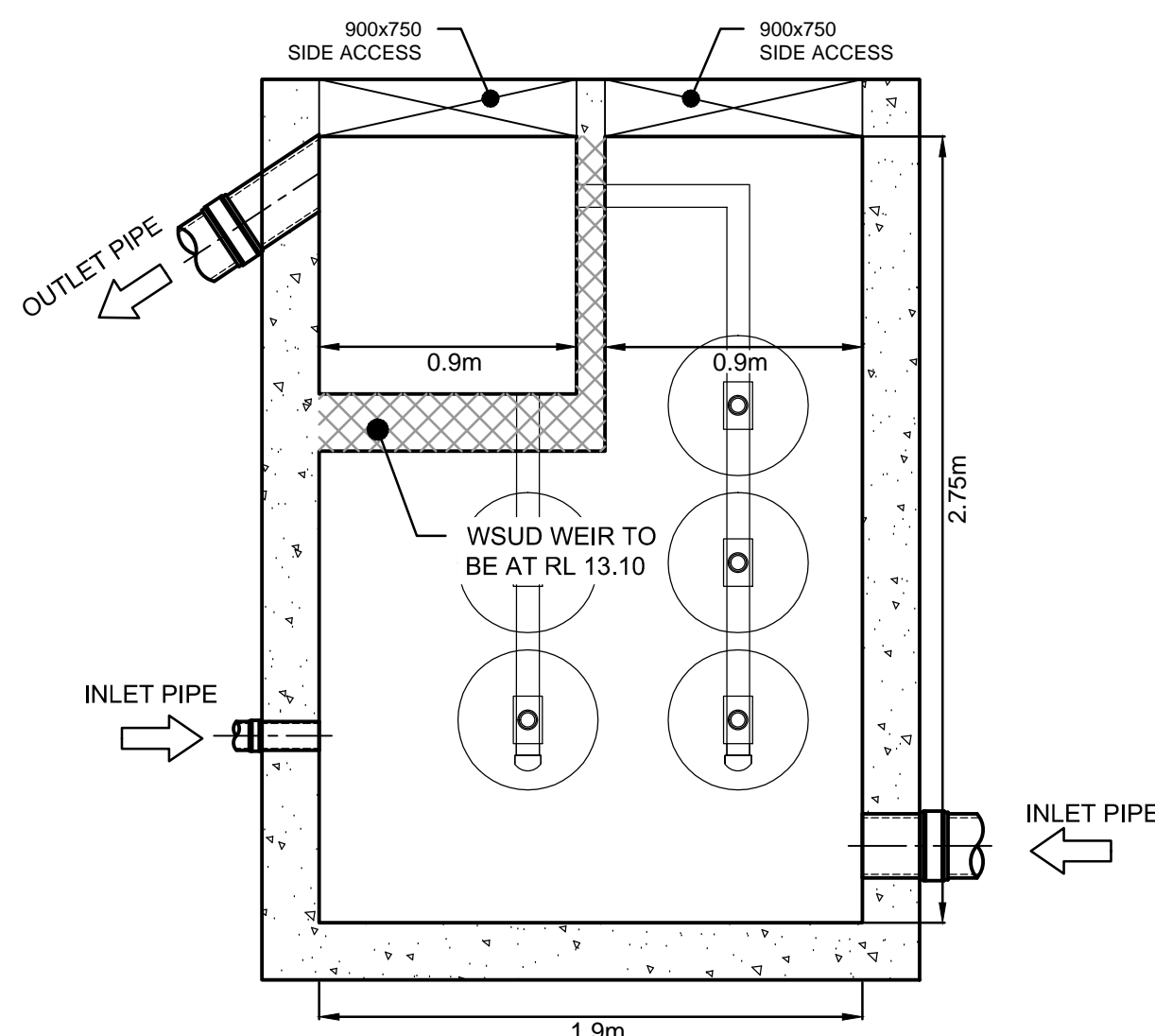
900x750 SIDE ACCESS

900x750 SIDE ACCESS



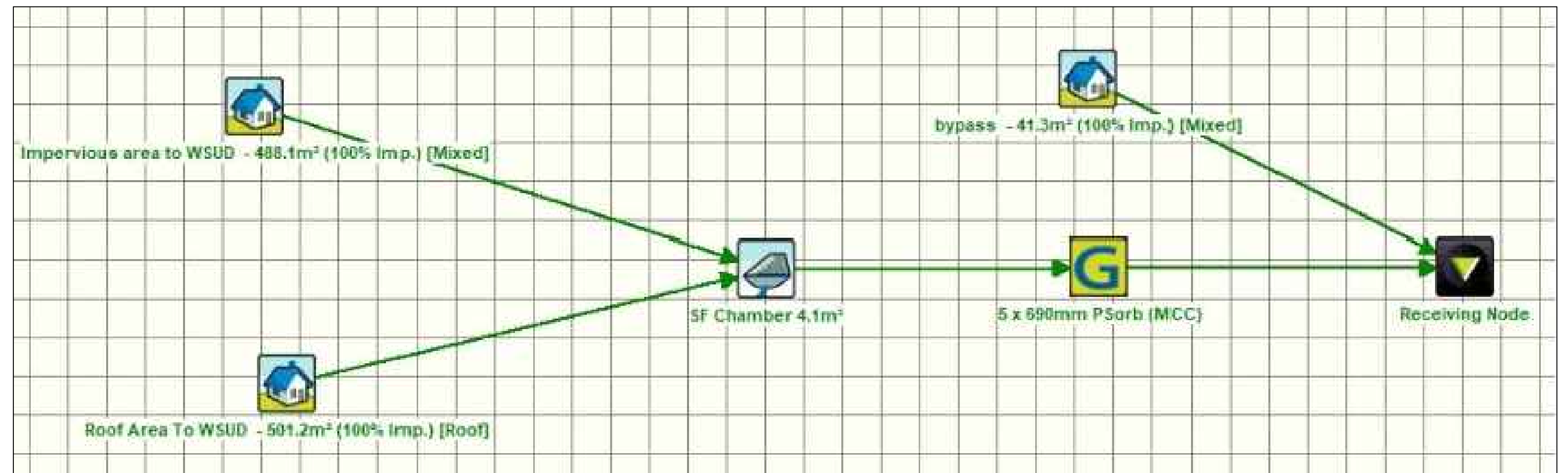
ABOVEGROUND WSUD TANK DETAIL

SCALE 1:10



UNDERGROUND OSD/WSUD TANK DETAIL PLAN VIEW

SCALE 1:25



WSUD MUSIC MODEL

Treatment Train Effectiveness - Receiving Node			
	Sources	Residual Load	% Reduction
Flow (ML/yr)	1.19	1.19	0
Total Suspended Solids (kg/yr)	127	18.6	85.4
Total Phosphorus (kg/yr)	0.27	0.0553	79.5
Total Nitrogen (kg/yr)	2.61	1.25	52
Gross Pollutants (kg/yr)	28.5	1.12	96.1

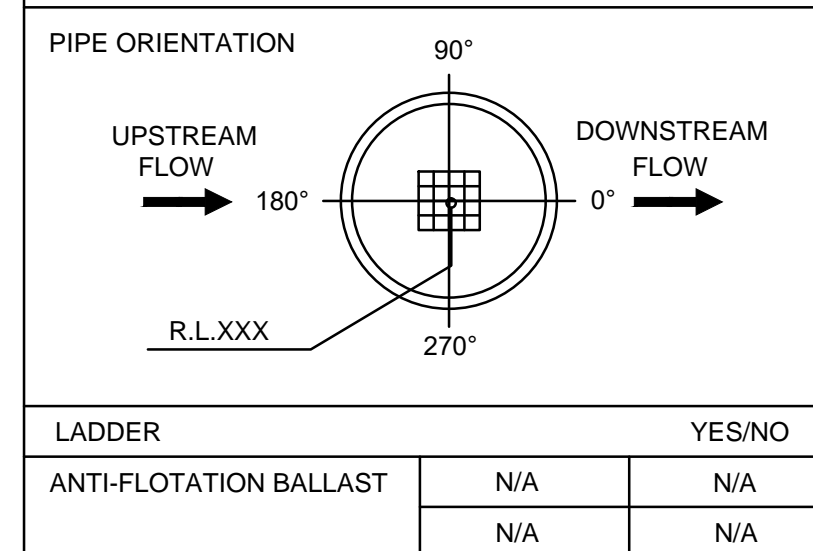
WSUD MUSIC RESULT

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID	1
WATER QUALITY FLOW RATE (L/S)	-
PEAK FLOW RATE (L/S)	-
RETURN PERIOD OF PEAK FLOW (yrs)	-
# OF CARTRIDGES REQUIRED (8-22)	5
CARTRIDGE HEIGHT (310, 460 or 690mm)	690
MEDIA TYPE (PERLITE, PERLITE/ZEOLITE OR ZPG)	ZPG

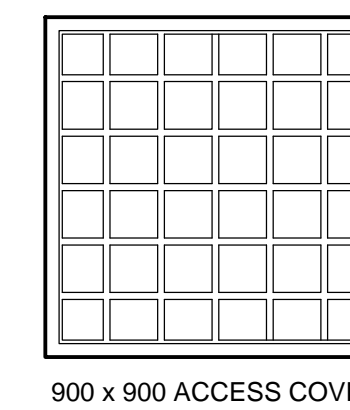
PRECAST VAULT WEIGHT	- kg
PRECAST LID WEIGHT	- kg

PIPE DATA:	ILL.	MATERIAL	DIAMETER
INLET PIPE #1	N/A	PVC	N/A
INLET PIPE #2	N/A	N/A	N/A
OUTLET PIPE	N/A	PVC	N/A



STORMFILTER TABLE

N.T.S.



900 x 900 ACCESS COVER

STORMFILTER DESIGN TABLE

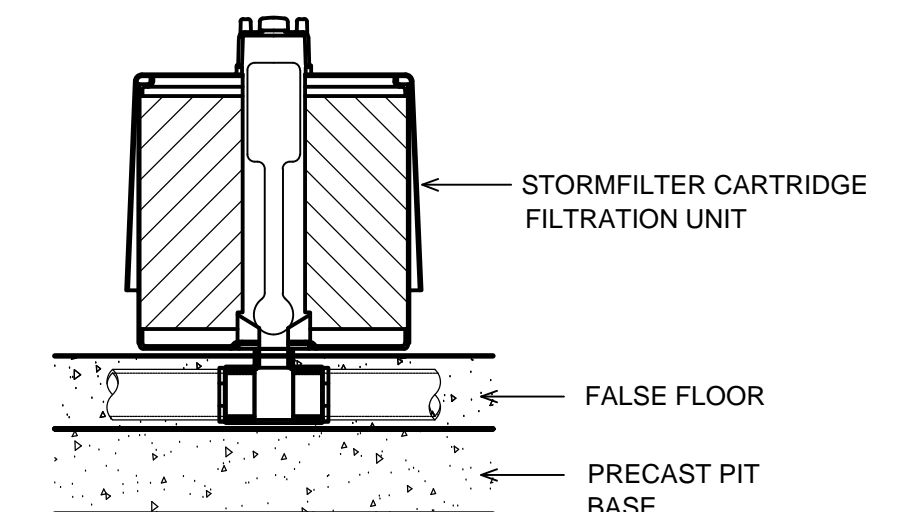
- STORMFILTER TREATMENT CAPACITY VARIES BY NUMBER OF FILTER CARTRIDGES INSTALLED AND BY REGION SPECIFIC INTERNAL FLOW CONTROLS. CONVEYANCE CAPACITY IS RATED AT 80L/S.
- ALL PARTS PROVIDED AND INTERNAL ASSEMBLY BY STORMWATER360 AUSTRALIA UNLESS OTHERWISE NOTED.

CARTRIDGE HEIGHT	690	460	310			
SYSTEM HYDRAULIC DROP (H - REQ'D. MIN)	930	700	550			
TREATMENT BY MEDIA SURFACE AREA L/S/m2	1.4	0.7	1.4	0.7	1.4	0.7
CARTRIDGE FLOW RATE (L/s)	1.42	0.71	0.95	0.47	0.63	0.32

GENERAL NOTES

- INLET AND OUTLET PIPING SHALL BE SPECIFIED BY SITE CIVIL ENGINEER (SEE PLANS) AND PROVIDED BY CONTRACTOR. STORMFILTER IS PROVIDED WITH OPENINGS AT INLET AND OUTLET LOCATIONS.
- IF THE PEAK FLOW RATE, AS DETERMINED BY THE SITE CIVIL ENGINEER, EXCEEDS THE PEAK HYDRAULIC CAPACITY OF THE PRODUCT, AN UPSTREAM BYPASS STRUCTURE IS REQUIRED. PLEASE CONTACT STORMWATER360 FOR OPTIONS.
- THE FILTER CARTRIDGE(S) ARE SIPHON-ACTUATED AND SELF-CLEANING. THE STANDARD DETAIL DRAWING SHOWS THE MAXIMUM NUMBER OF CARTRIDGES. THE ACTUAL NUMBER SHALL BE SPECIFIED BY THE SITE CIVIL ENGINEER ON SITE PLANS OR IN DATA TABLE BELOW. PRECAST STRUCTURE TO BE CONSTRUCTED IN ACCORDANCE WITH AS3600.
- FOR SHALLOW, LOW DROP OR SPECIAL DESIGN CONSTRAINTS, CONTACT STORMWATER360 FOR DESIGN OPTIONS.
- ALL WATER QUALITY PRODUCTS REQUIRE PERIODIC MAINTENANCE AS OUTLINED IN THE O&M GUIDELINES. PROVIDE MINIMUM CLEARANCE FOR MAINTENANCE ACCESS.
- STRUCTURE AND ACCESS COVERS DESIGNED TO MEET AUSTRROADS T44 LOAD RATING WITH 0.2m FILL MAXIMUM.
- THE STRUCTURE THICKNESSES SHOWN ARE FOR REPRESENTATIONAL PURPOSES AND VARY REGIONALLY.
- ANY BACKFILL DEPTH, SUB-BASE, AND OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY SITE CIVIL ENGINEER.
- STORMFILTER BY STORMWATER360:
SYDNEY (AU) PHONE: (02) 9525 5833,
BRISBANE (AU) PHONE: (07) 3272 1872.

SYSTEM HYDRAULIC DROP
CARTRIDGE FLOW RATE



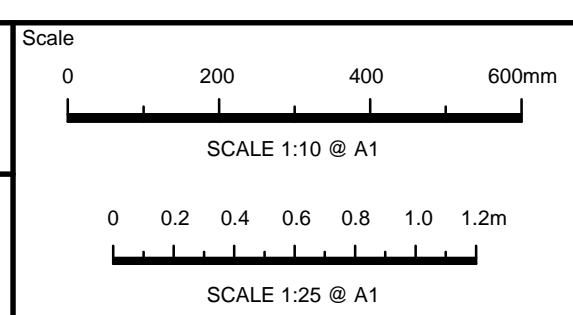
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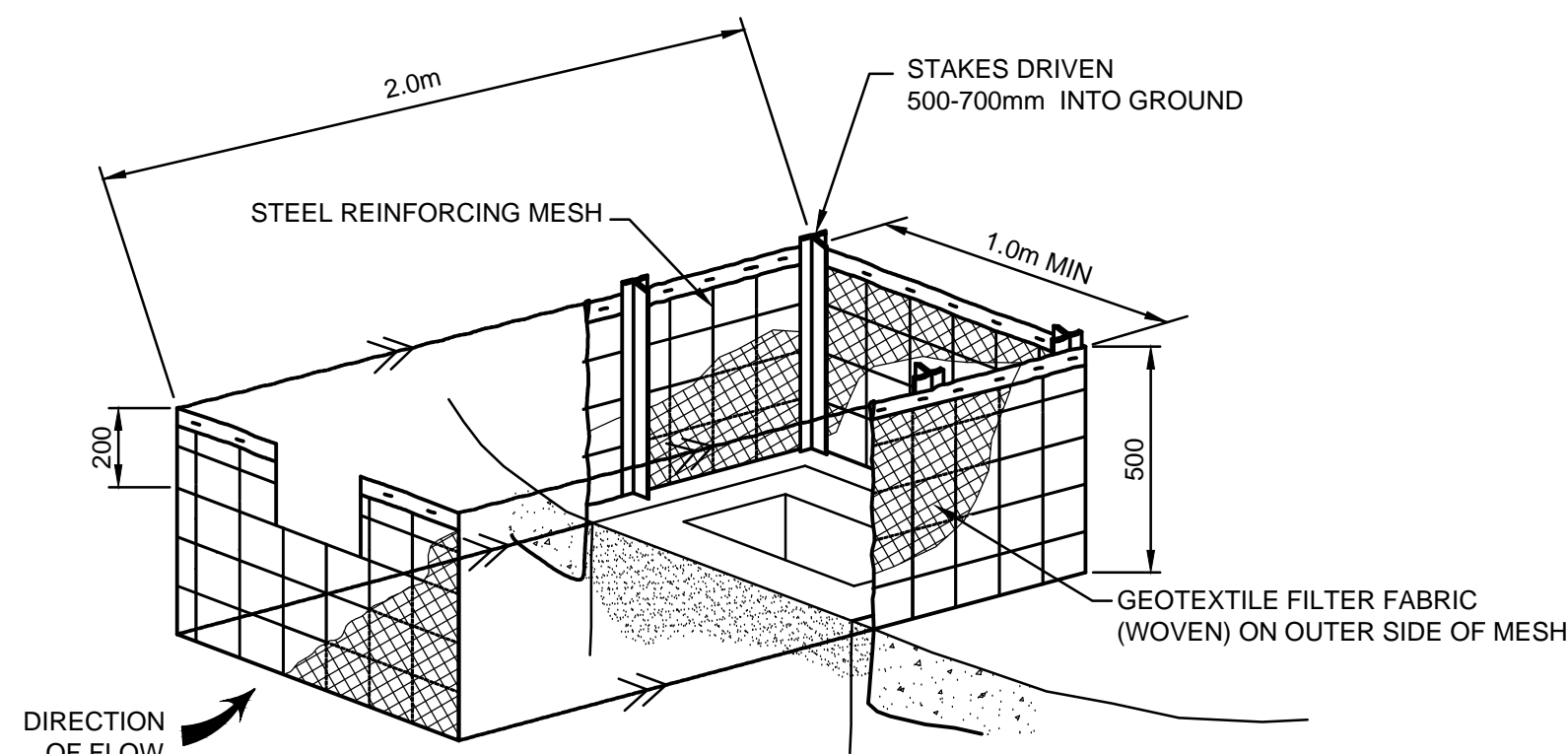
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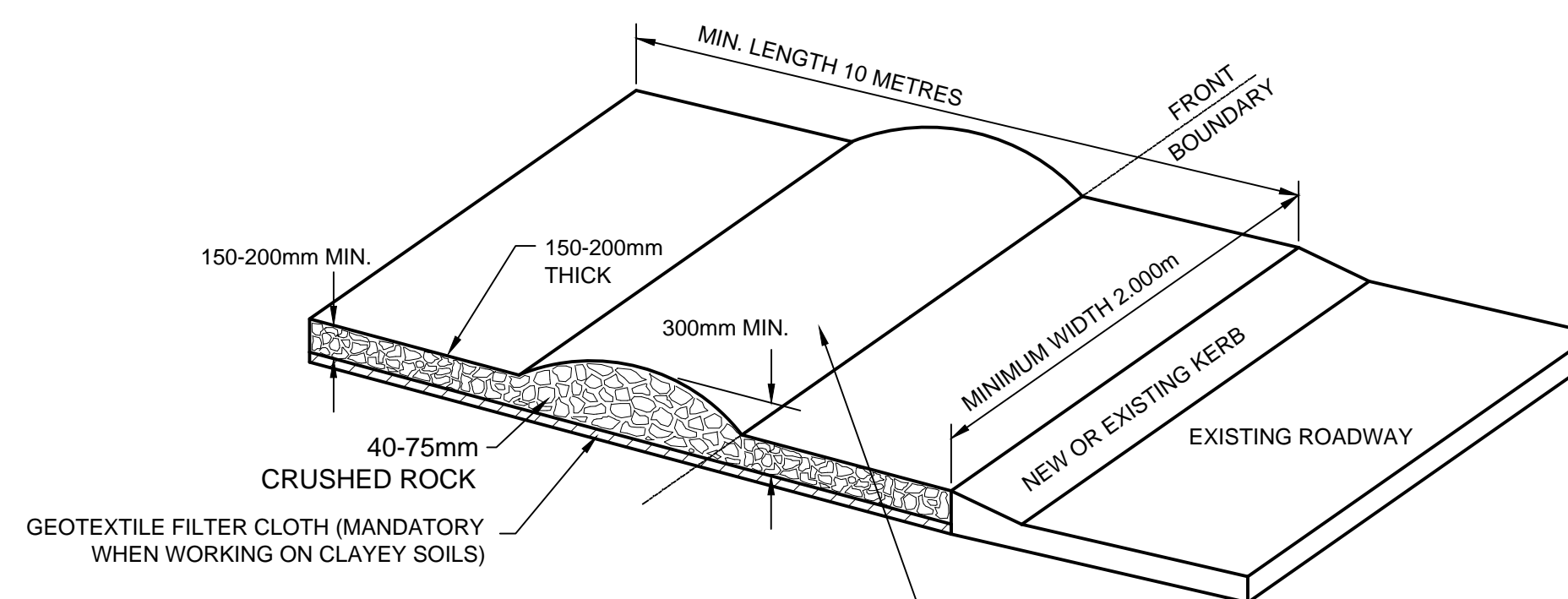
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Scale	A1	Project No.	Dwg. No.
As Shown		200144	106
			Issue
			A

SEDIMENT & EROSION NOTES

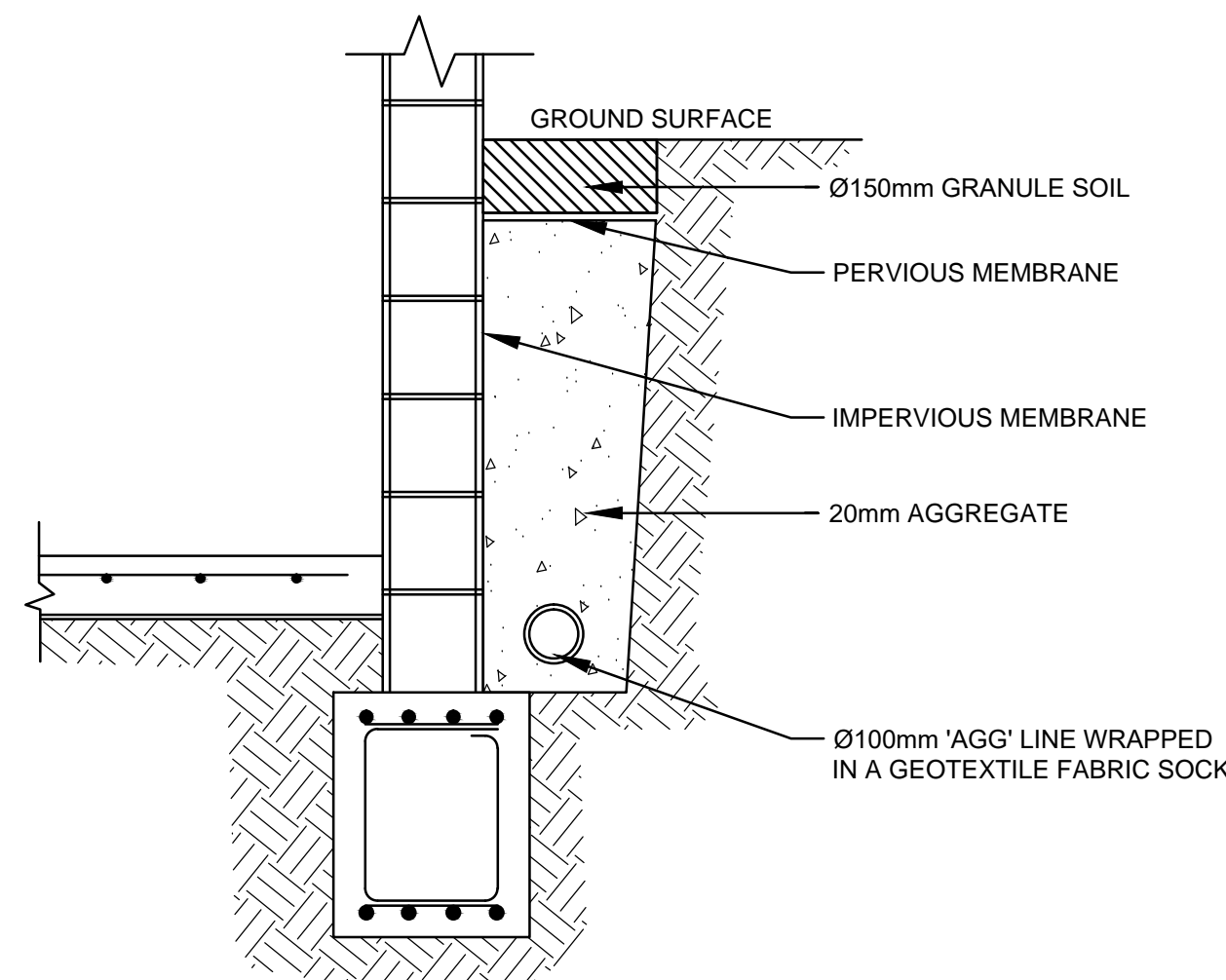
1. IMMEDIATELY FOLLOWING SETTING OUT OF THE WORKS, BUT PRIOR TO COMMENCEMENT OF ANY CLEARING OR EARTHWORKS, THE CONTRACTOR AND SUPERINTENDENT SHALL WALK THE SITE TO NOMINATE THE LOCATIONS AND TYPES OF SEDIMENT AND EROSION CONTROL MEASURES TO BE ADOPTED. THESE MEASURES SHALL BE IMPLEMENTED PRIOR TO ANY CLEARING OR EARTHWORKS AND MAINTAINED UNTIL THE WORKS ARE COMPLETED AND NO LONGER POSE AN EROSION HAZARD, UNLESS OTHERWISE APPROVED BY THE SUPERINTENDENT.
2. IMMEDIATELY FOLLOWING SETTING OUT OF THE WORKS, BUT PRIOR TO COMMENCEMENT OF ANY CLEARING OR EARTHWORKS, THE CONTRACTOR AND SUPERINTENDENT SHALL WALK THE SITE TO IDENTIFY AND MARK TREES WHICH ARE TO BE PRESERVED. NOTWITHSTANDING THE ABOVE, THE CONTRACTOR SHALL TAKE ALL REASONABLE PRECAUTIONS TO MINIMISE DISTURBANCE TO EXISTING VEGETATION AND GROUND COVER OUTSIDE THE MINIMUM AREAS REQUIRED TO COMPLETE THE WORKS AND SHALL BE RESPONSIBLE FOR RECTIFICATION, AT ITS OWN COST, OF ANY DISTURBANCE BEYOND THOSE AREAS.
3. PROVIDE GULLY GRATE INLET SEDIMENT TRAPS AT ALL GULLY PITS.
4. PROVIDE SILT FENCING ALONG PROPERTY LINE AS DIRECTED BY SUPERINTENDENT.
5. ADDITIONAL CONTROL DEVICES TO BE PLACED WHERE DIRECTED BY THE PRINCIPLE.
6. ALTERNATIVE DESIGNS TO BE APPROVED BY SUPERINTENDENT PRIOR TO CONSTRUCTION.
7. WASH DOWN/RUMBLE AREA TO BE CONSTRUCTED WITH PROVISIONS RESTRICTING ALL SILT AND TRAFFICKED DEBRIS FROM ENTERING THE STORMWATER SYSTEM.
8. NO WORK OR STOCKPILING OF MATERIALS TO BE PLACED OUTSIDE OF SITE WORK BOUNDARY.
9. APPROPRIATE EROSION AND SEDIMENT CONTROLS TO BE USED TO PROTECT STOCKPILES AND MAINTAINED THROUGH OUT CONSTRUCTION.
10. IT IS THE CONTRACTORS RESPONSIBILITY TO TAKE DUE CARE OF NATURAL VEGETATION. NO CLEARING IS TO BE UNDERTAKEN WITHOUT PRIOR APPROVAL FROM THE SUPERINTENDENT.
11. TO AVOID DISTURBANCE TO EXISTING TREES, EARTHWORKS WILL BE MODIFIED AS DIRECTED ON-SITE BY THE SUPERINTENDENT.
12. THE LOCATION OF EROSION AND SEDIMENTATION CONTROLS WILL BE DETERMINED ON SITE BY THE SUPERINTENDENT.
13. ACCESS TRACKS THROUGH THE SITE WILL BE LIMITED TO THOSE DETERMINED BY THE SUPERINTENDENT AND THE CONTRACTOR PRIOR TO ANY WORK COMMENCING.
14. ALL SETTING OUT IS THE RESPONSIBILITY OF THE CONTRACTOR PRIOR TO WORKS COMMENCING ON SITE. THE SUPERINTENDENT'S SURVEYOR SHALL PEG ALL ALLOTMENT BOUNDARIES, PROVIDE COORDINATE INFORMATION TO THESE PEGS AND PLACE BENCH MARKS. THE CONTRACTOR SHALL SET OUT THE WORKS FROM AND MAINTAIN THESE PEGS.
15. PLANS ARE MINIMUM REQUIREMENTS AND ARE TO BE USED AS A GUIDE ONLY. EXACT MEASURES USED SHALL BE DETERMINED ON SITE IN CONJUNCTION WITH PROGRAM OF CONTRACTORS WORKS etc.



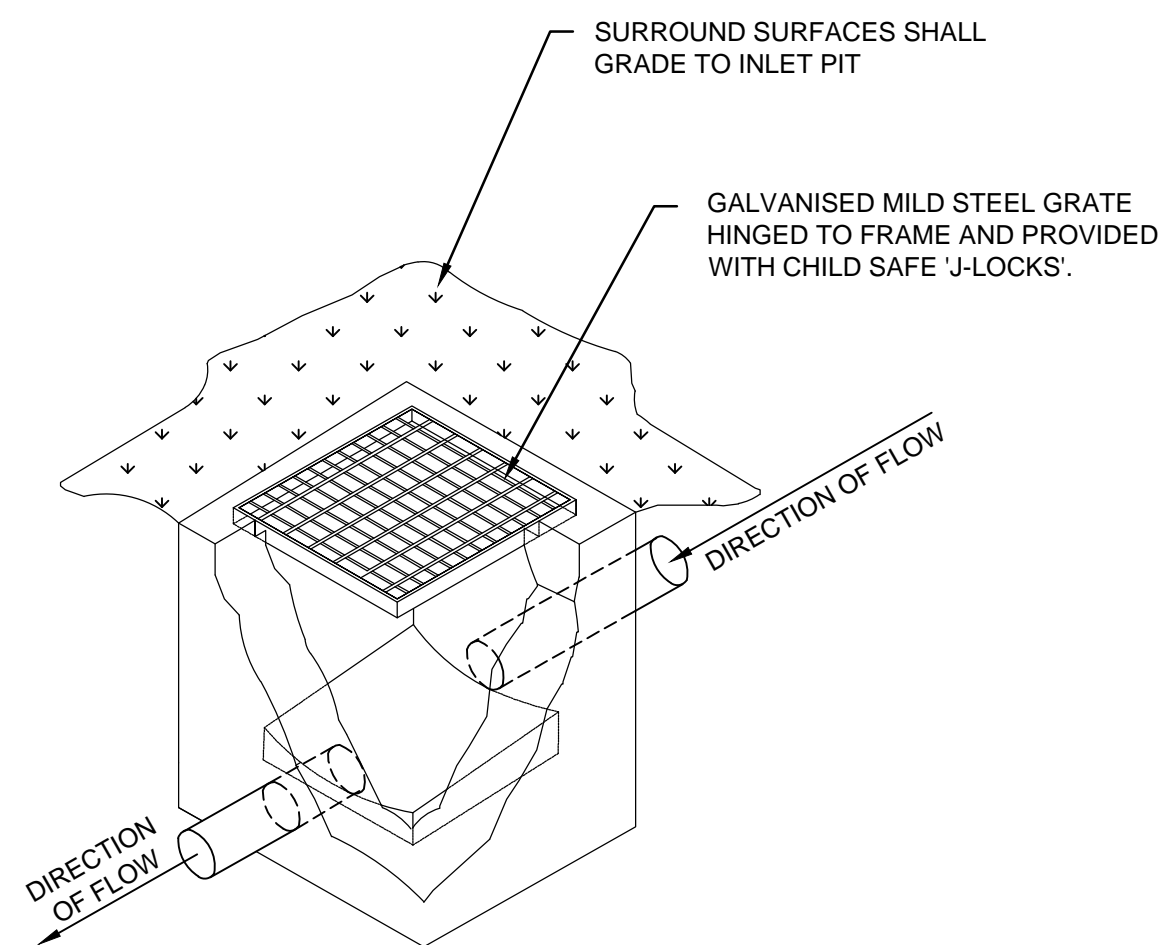
FIELD INLET SEDIMENT TRAP
N.T.S.



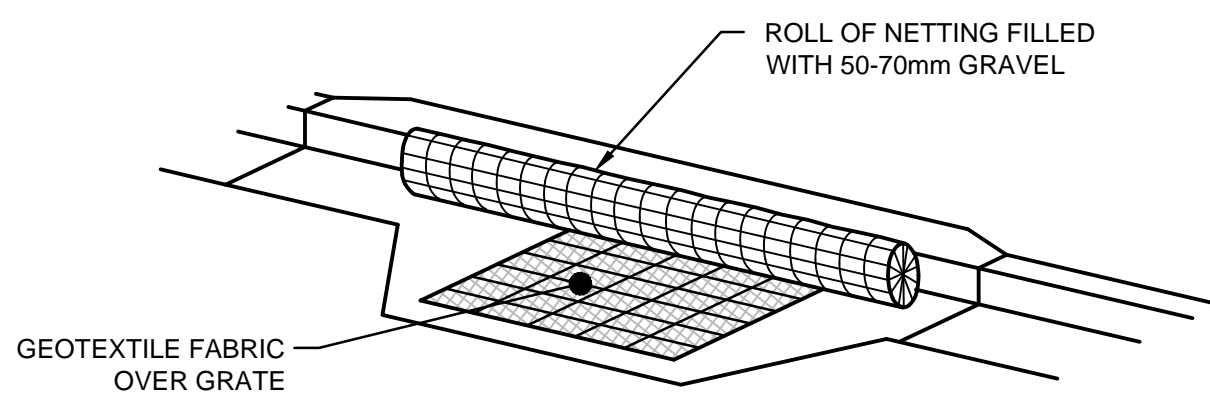
SHAKEDOWN DEVICE
N.T.S.



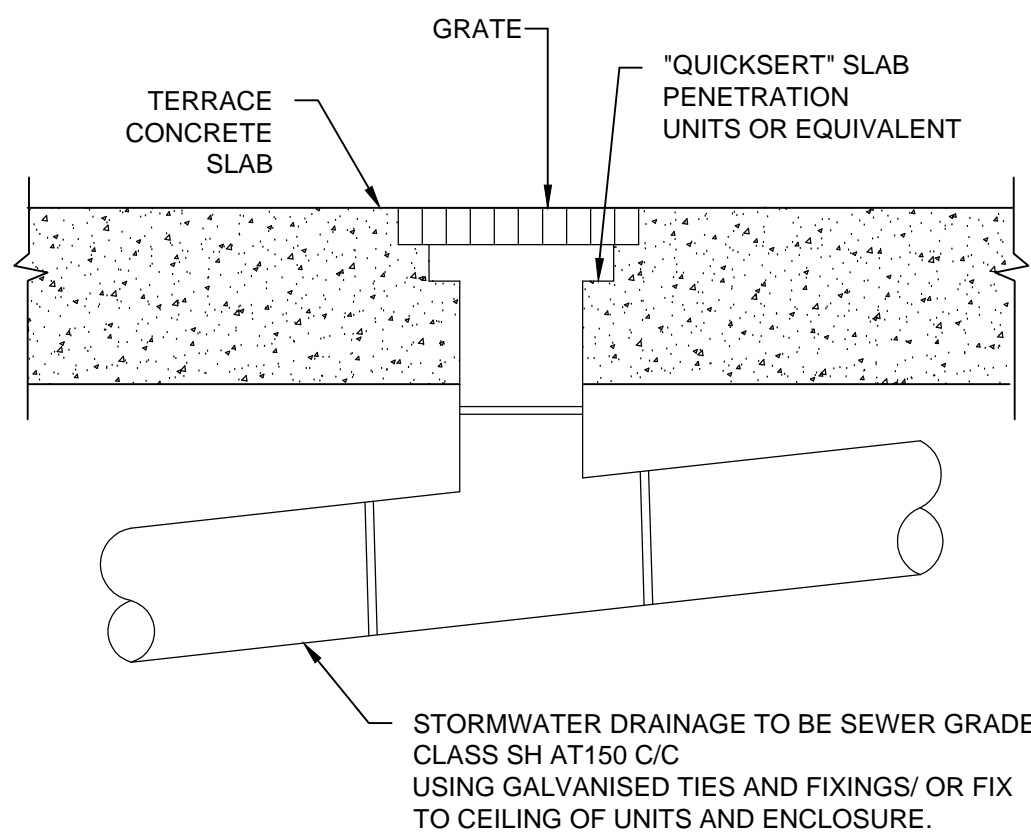
TYPICAL SUBSOIL DRAIN
N.T.S.



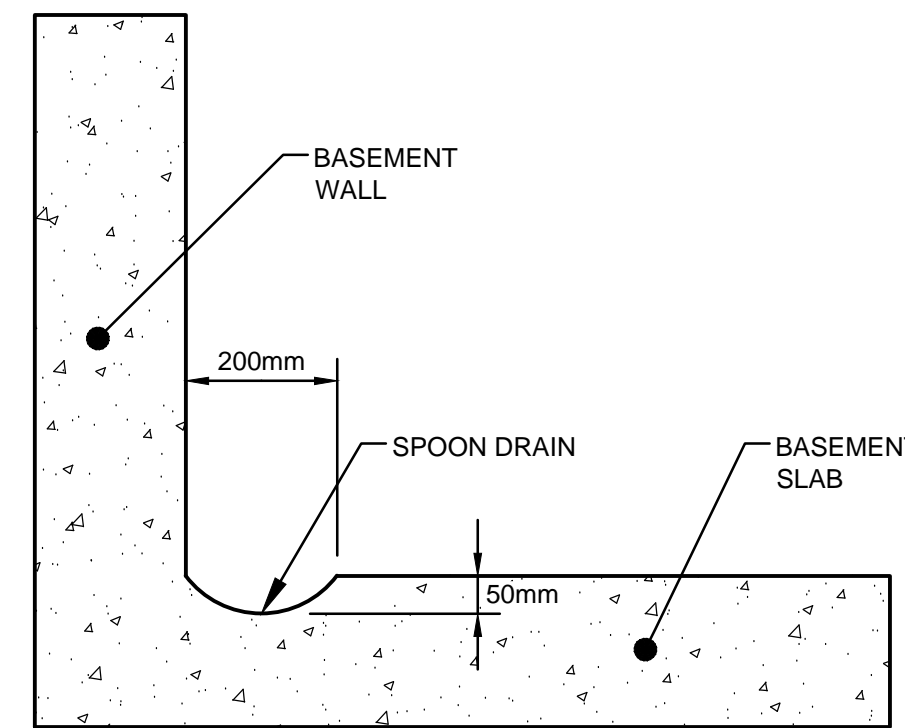
TYPICAL GRATED INLET PIT DETAIL
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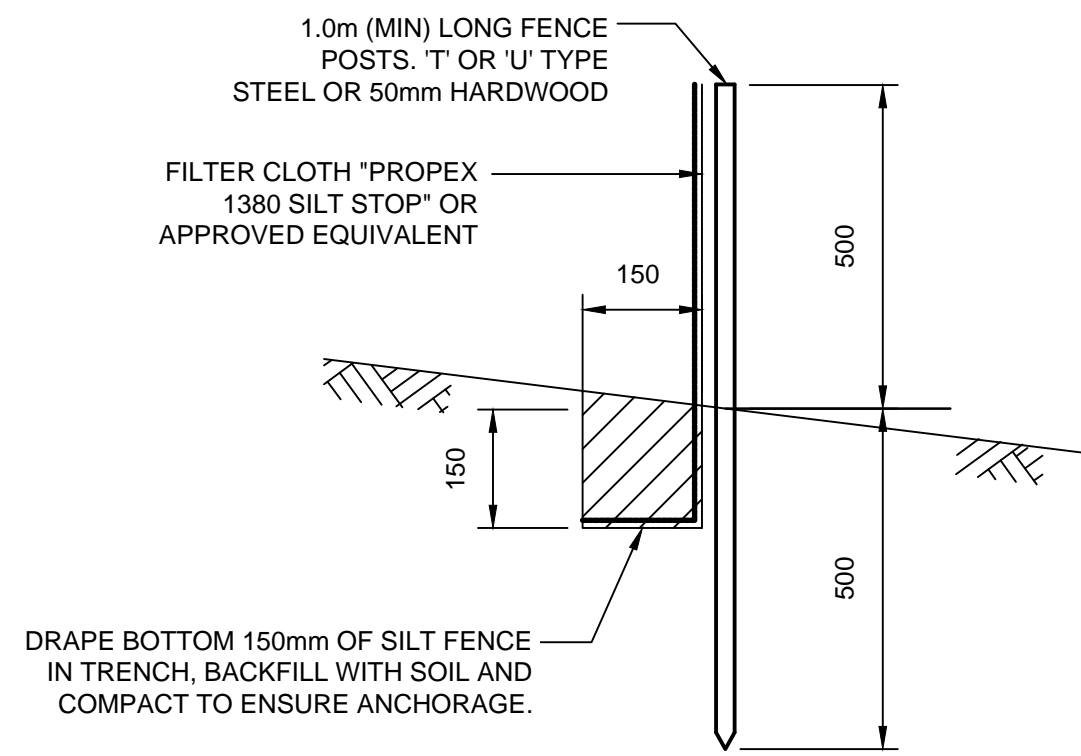
KERB INLET PROTECTION SAG GULLIES
N.T.S.



RAINWATER OUTLET DETAIL
N.T.S.



SPOON DRAIN SECTION DETAIL
SCALE 1:10



SILT FENCE DETAIL
N.T.S.

SILT FENCE NOTES:

1. FILTER CLOTH TO BE FASTENED SECURELY TO POSTS WITH GALVANISED WIRE TIES, STAPLES OR ATTACHMENT BELTS.
2. POSTS SHOULD NOT BE SPACED MORE THAN 3.0m APART.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVERLAPPED BY 150mm AND FOLDED.
4. FOR EXTRA STRENGTH TO SILT FENCE, WOVEN WIRE (14mm GAUGE, 150mm MESH SPACING) TO BE FASTENED SECURELY BETWEEN FILTER CLOTH AND POSTS BY WIRE TIES OR STAPLES.
5. INSPECTIONS SHALL BE PROVIDED ON A REGULAR BASIS, ESPECIALLY AFTER RAINFALL AND EXCESSIVE SILT DEPOSITS REMOVED WHEN 'BULGES' DEVELOP IN SILT FENCE.
6. SEDIMENT FENCES SHALL BE CONSTRUCTED WITH SEDIMENT TRAPS AND EMERGENCY SPILLWAYS AT SPACINGS NO GREATER THAN 40m ON FLAT TERRAIN DECREASING TO 20m SPACINGS ON STEEP TERRAIN.

NOT FOR CONSTRUCTION

Issue	Description	Date	Design	Checked
A	ISSUE FOR PLANNING PROPOSAL	29/09/2020	AGN	JSF

Certification By: Dr. Anthony Hasham (NFER)
[Signature]

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Project
757-763 GEORGE STREET, HAYMARKET PROPOSED MIXED-USE DEVELOPMENT STORMWATER CONCEPT PLANS PLANNING PROPOSAL

Drawing Title
MISCELLANEOUS DETAILS SHEET
Scale: A1 Project No: 200144 Dwg. No: 107 Issue: A