

118-120 STATION STREET, PENRITH PROPOSED MIXED USE DEVELOPMENT

STORMWATER CONCEPT PLANS



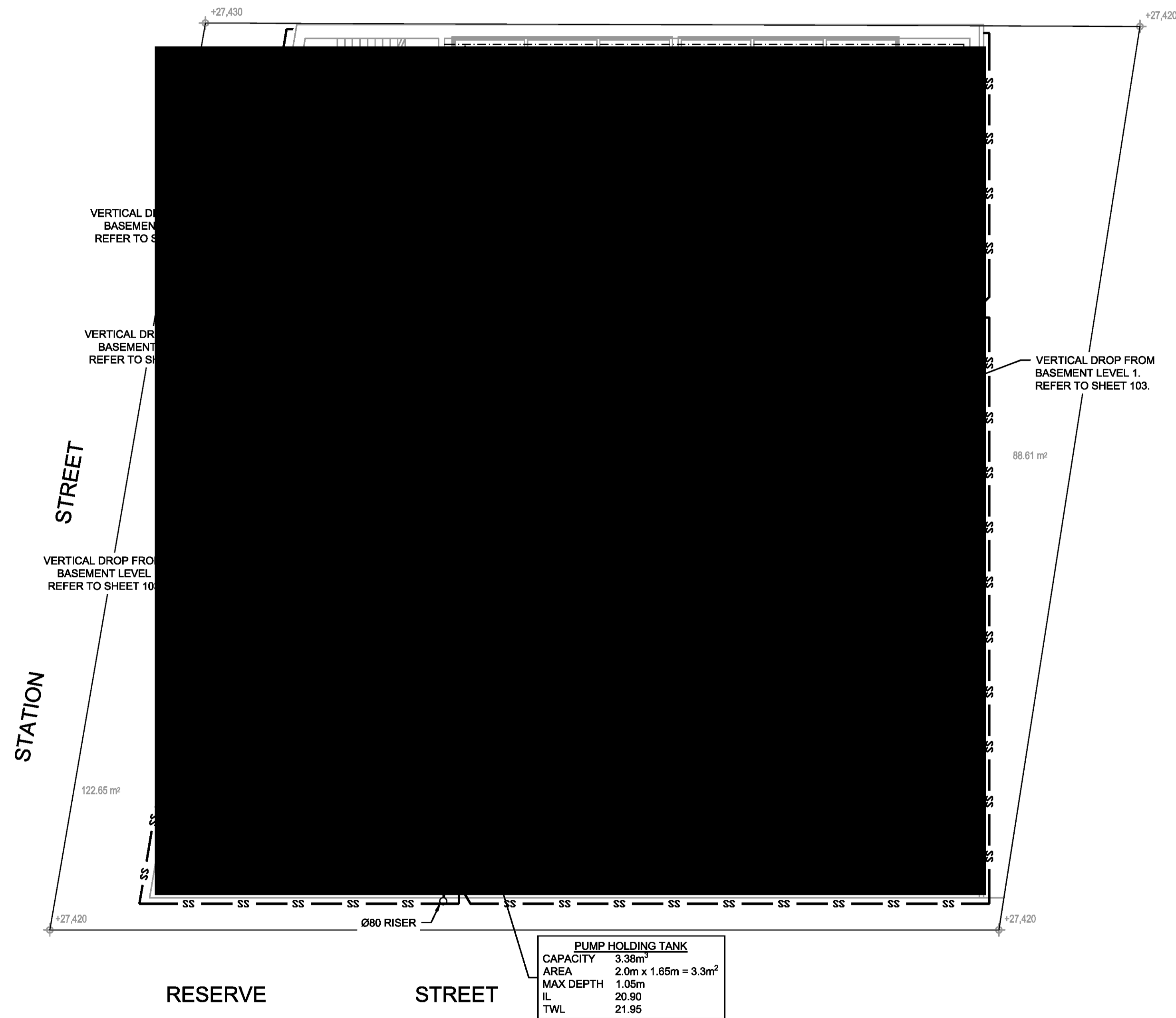
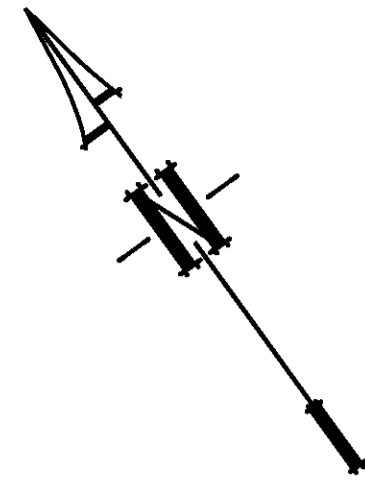
LOCALITY PLAN
N.T.S

DRAWING INDEX

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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
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104	STORMWATER CONCEPT PLAN
105	ON-SITE DETENTION DETAILS AND CALCULATION SHEETS SHEET 1 OF 2
106	ON-SITE DETENTION DETAILS AND CALCULATION SHEETS SHEET 2 OF 2
107	MISCELLANEOUS DETAILS SHEET

NOT FOR CONSTRUCTION

Certification By: Dr. Anthony Hasham (NPER) Architect ARCHITECTURE DESIGN STUDIO (NSW) PTY LTD				Scale Council Penrith Council		AUSTRALIAN CONSULTING ENGINEERS.		Project 118-120 STATION STREET, PENRITH PROPOSED MIXED USE DEVELOPMENT STORMWATER CONCEPT PLANS DEVELOPMENT APPLICATION		Drawing Title COVER SHEET PLAN	
A ISSUE FOR DEVELOPMENT APPLICATION				Date 11/09/2020		Design EHZ		Checked JSF		Scale N.T.S.	
Issue Description				Date		Design		Checked		Project No. 200763	
Form at full size				10cm		20cm		Dwg. No. 000		Issue A	



BASEMENT LEVEL 2 PLAN
SCALE 1:100

PUMP HOLDING TANK	
CAPACITY	3.38m ³
AREA	2.0m x 1.65m = 3.3m ²
MAX DEPTH	1.05m
IL	20.90
TWL	21.95

LEGEND

- PROPOSED STORMWATER
- SURFACE FLOW ARROWS
- SUBSOIL DRAINAGE
- CLEANING EYE (OR INSPECTION EYE)
- PROPOSED STORAGE AREA
- FINISHED SURFACE LEVEL
- GRATED DRAIN
- FLOOR GRATE

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

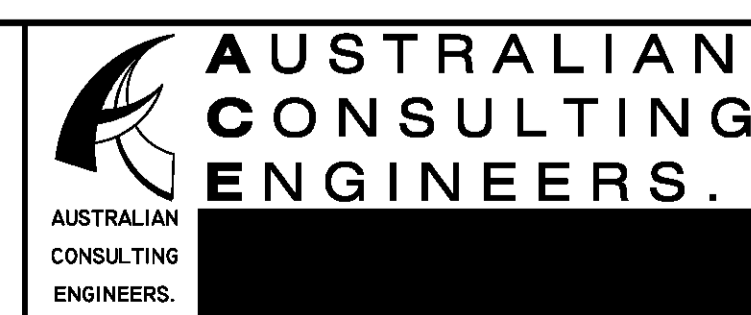
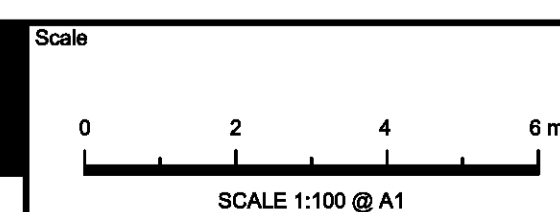
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Council
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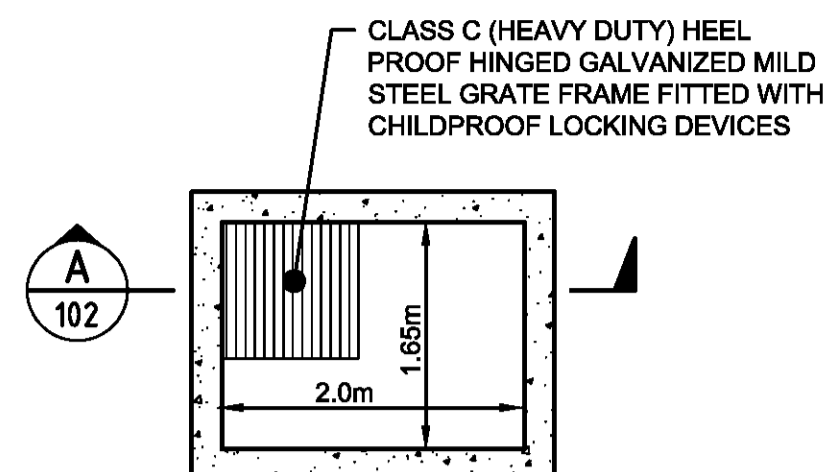
Penrith Council



Project
118-120 STATION STREET, PENRITH PROPOSED MIXED USE DEVELOPMENT STORMWATER CONCEPT PLANS DEVELOPMENT APPLICATION

Scale	A1	Project No.	Dwg. No.	Issue
1:100		200763	101	A

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

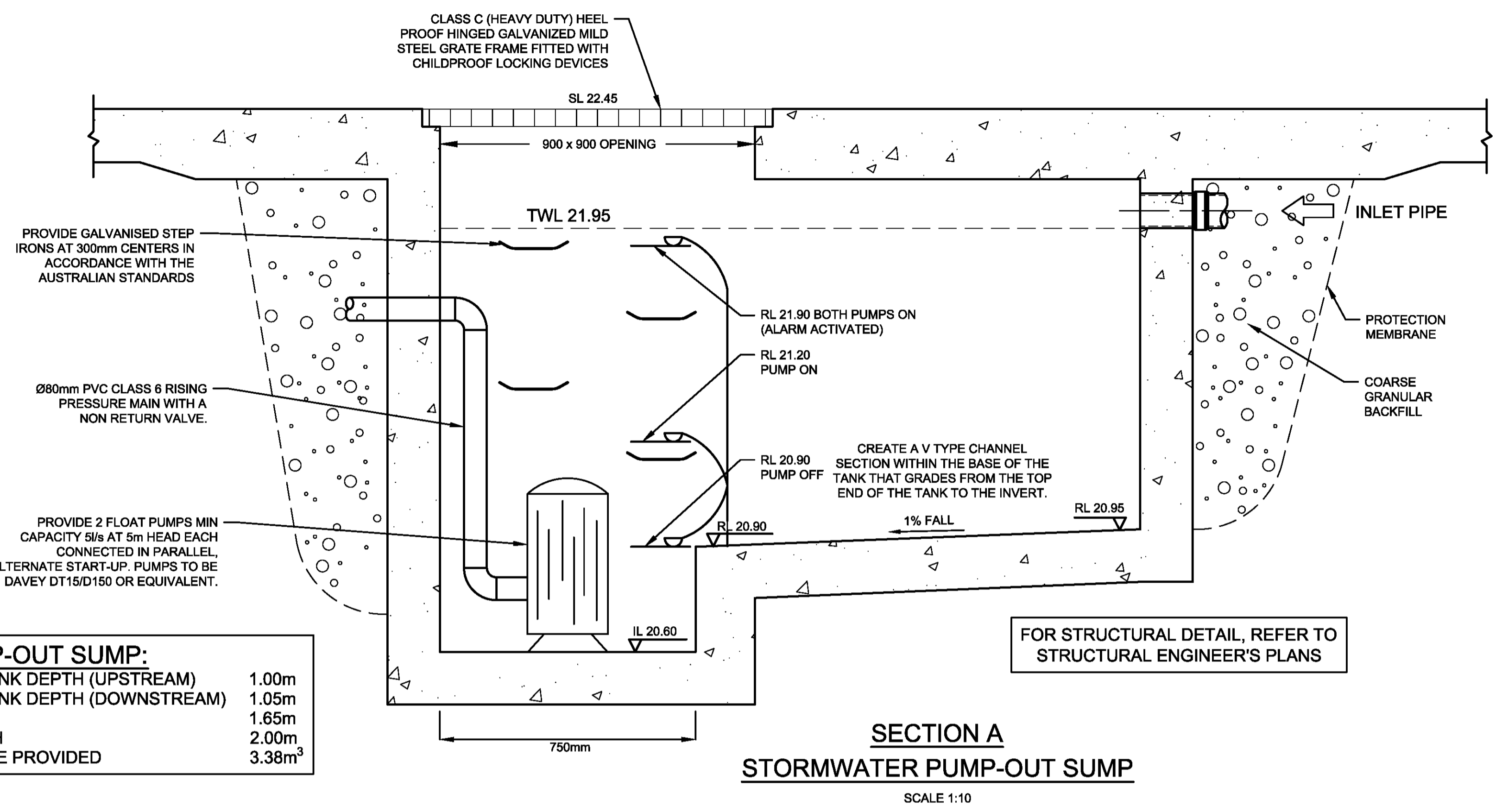


NOTE:
 1- FOR ALL THE STRUCTURAL DETAILS, REFER TO STRUCTURAL ENGINEER'S PLAN.
 2- ALL THE AG LINES BEHIND BASEMENT WALLS TO BE CONNECTED TO PUMP-OUT SUMP.

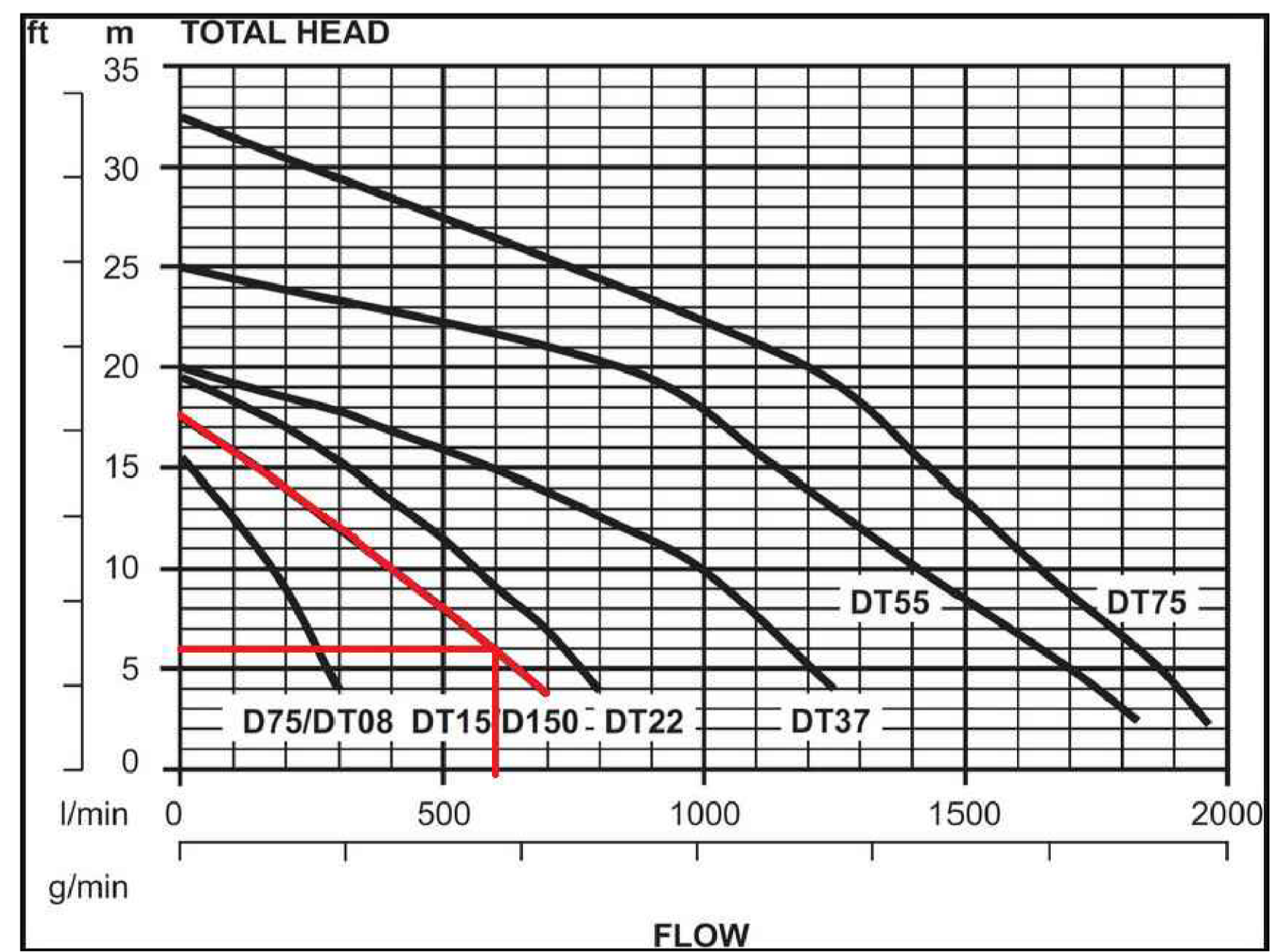
**PUMP-OUT SUMP DETAIL
 PLAN VIEW**
 SCALE 1:50

**PUMP STORAGE VOLUME
 CALCULATION**

- $i_{100, 90 \text{ min}} = 55.75 \text{ mm/hour}$
- PUMP STORAGE CATCHMENT AREA: $A = 38.2 \text{ m}^2 = 0.00382 \text{ ha}$
- $Q = C \times I \times A / 360$ WHERE $C = 1.0$ (REFER TO AS3500.3.5.4.6 (a))
 $= 1.0 \times 55.75 \times 0.00382 / 360$
 $= 0.00059 \text{ m}^3/\text{s}$
 $= 0.59 \text{ L/s}$
- THEREFORE, THE PUMP HOLDING TANK VOLUME IS:
 $V = 0.59 \times 1.5 \times 3600$
 $= 3.19 \text{ m}^3$
- TOTAL REQUIRED VOLUME IS 3.19 m^3



PUMP-OUT SUMP:
 MAX TANK DEPTH (UPSTREAM) 1.00m
 MAX TANK DEPTH (DOWNSTREAM) 1.05m
 WIDTH 1.65m
 LENGTH 2.00m
 VOLUME PROVIDED 3.38m³



PUMP CALCULATIONS

Project Address: 118 - 120 Station Street, Penrith

$$HL = (3.35 \times 10^{-6} \times Q / (d^{2.63 \times C}))^{1.852}$$

$$h1 = kv^2 / 2g$$

HL(m/100m), Q(L/s), d(mm) k(cum), v(m/s), g=9.8(m/s²)

d(mm)= 80 v(m/s)= 0.00

Bend Losses, $K_b = 3.06$
 Valve Losses, $K_v = 2.13$
 Entry/Exit Losses, $K_e = 5.00$
 Cum Losses, $K = 10.19$

Elevation Head(m)= 10 Pipe Length(m)= 10

Hazen - Williams C= 145 Hazen-Williams Constant

	125-140 Commercial steel pipe
	135-140 Bitumen Lined Cast iron pipe
	140-145 Copper Tube
	145-150 PVC

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)	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)	0.00	0.20	0.40	0.60	0.80	0.99	1.19	1.39	1.59	1.79	1.99
h1(m)	0.00	0.02	0.08	0.19	0.33	0.51	0.74	1.01	1.32	1.67	2.06
H(m)	10.00	10.03	10.11	10.23	10.41	10.64	10.92	11.25	11.62	12.05	12.52

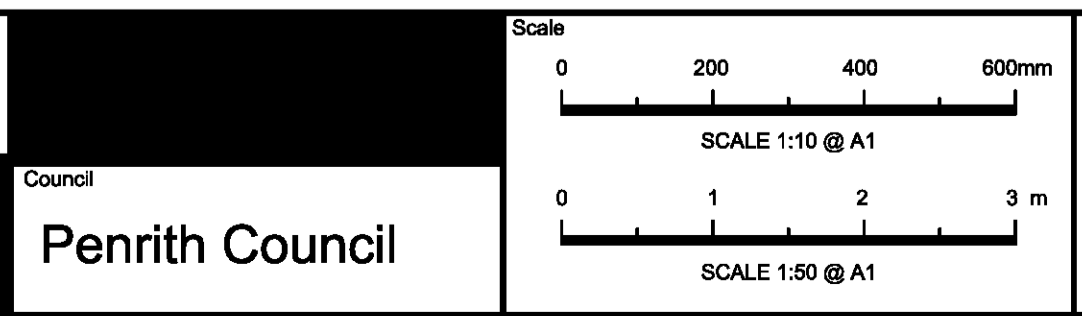
**UNDERGROUND PUMP - OUT SUMP
 STAGED STORAGE CALCULATIONS**

DEPTH (mm)	AREA (m ²)	CUMULATIVE VOLUME (m ³)
0	3.3	0
100	3.3	0.2475
200	3.3	0.5775
300	3.3	0.9075
400	3.3	1.2375
500	3.3	1.5675
600	3.3	1.8975
700	3.3	2.2275
800	3.3	2.5575
900	3.3	2.8875
1000	3.3	3.2175
1050	3.3	3.3825

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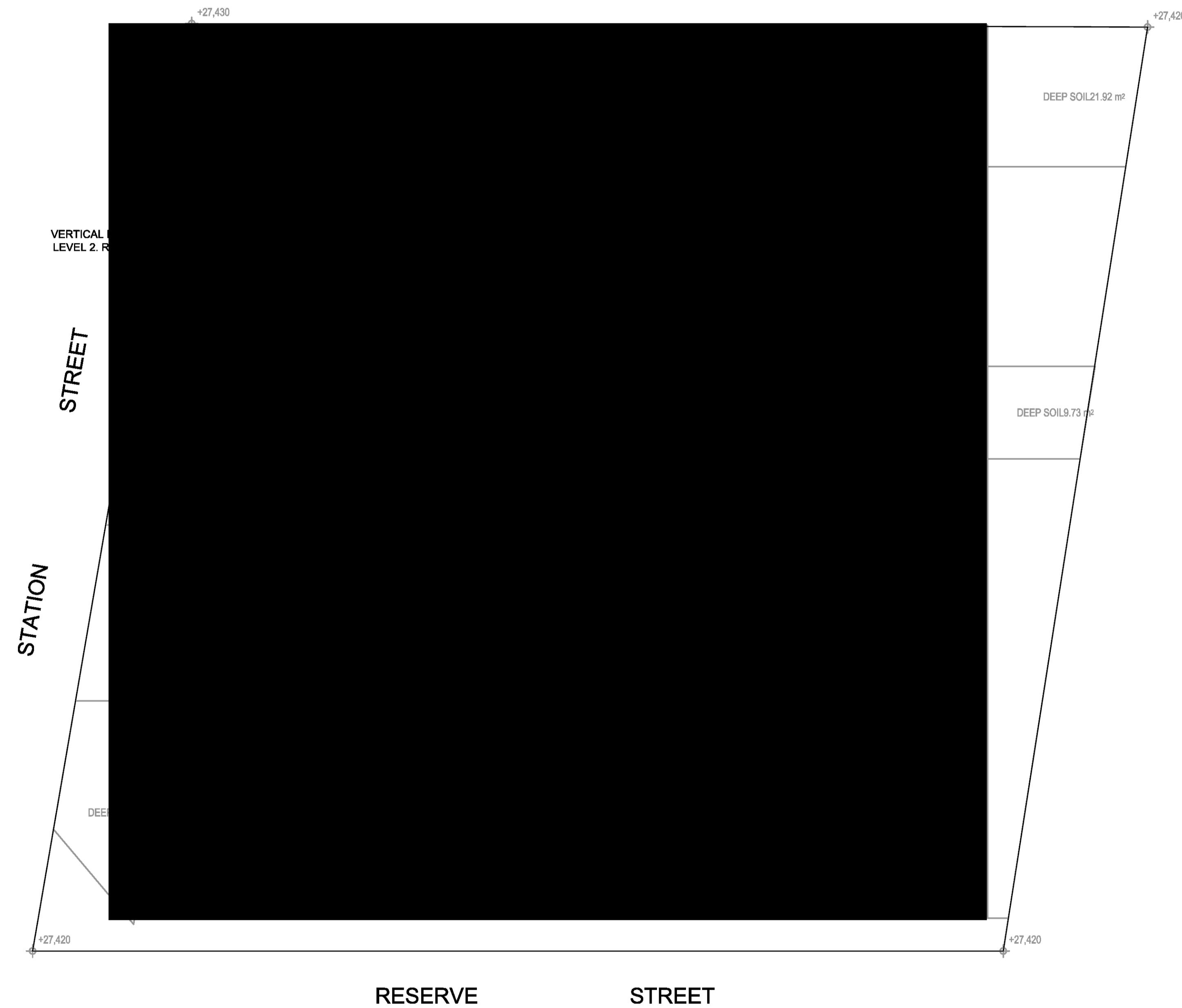
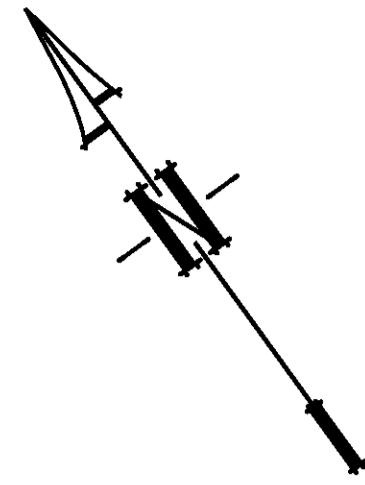
Council
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**AUSTRALIAN
 CONSULTING
 ENGINEERS.**

Project
**118-120 STATION STREET, PENRITH
 PROPOSED MIXED USE DEVELOPMENT
 STORMWATER CONCEPT PLANS
 DEVELOPMENT APPLICATION**

Drawing Title
**STORMWATER CONCEPT PLAN
 BASEMENT LEVEL 2
 SHEET 2 OF 2**
 Scale A1 Project No. 200763 Dwg. No. 102 Issue A



BASEMENT LEVEL 1 PLAN
SCALE 1:100

LEGEND

- PROPOSED STORMWATER
- SURFACE FLOW ARROWS
- SUBSOIL DRAINAGE
- CLEANING EYE (OR INSPECTION EYE)
- PROPOSED STORAGE AREA
- FINISHED SURFACE LEVEL (x RL 27.56)
- GRATED DRAIN
- FLOOR GRATE (FG)

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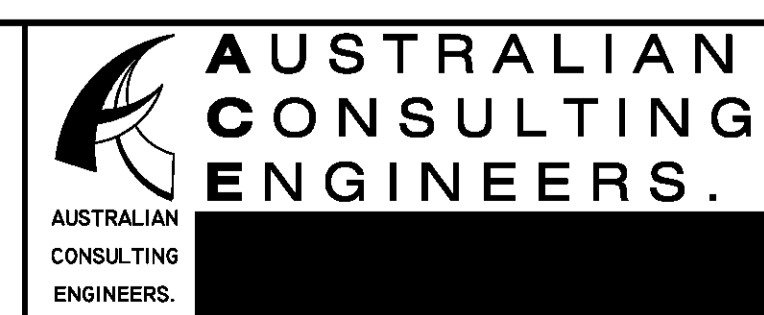
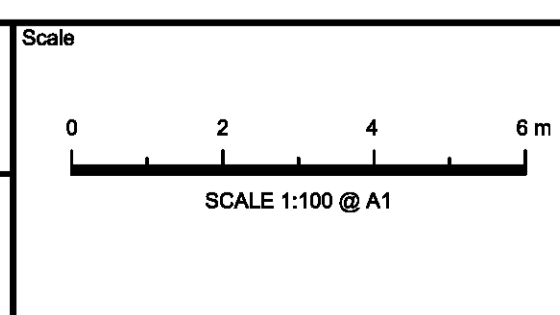
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A	ISSUE FOR DEVELOPMENT APPLICATION	11/09/2020	EHZ	JSF

Certification By: Dr. Anthony Hasham (NPER) Architect
ARCHITECTURE DESIGN STUDIO (NSW) PTY LTD

Client: **Mr. David Reeve**
 Council: **Penrith Council**



Project: **118-120 STATION STREET, PENRITH PROPOSED MIXED USE DEVELOPMENT STORMWATER CONCEPT PLANS DEVELOPMENT APPLICATION**

Scale	A1	Project No.	Dwg. No.	Issue
1:100		200763	103	A

GENERAL NOTES

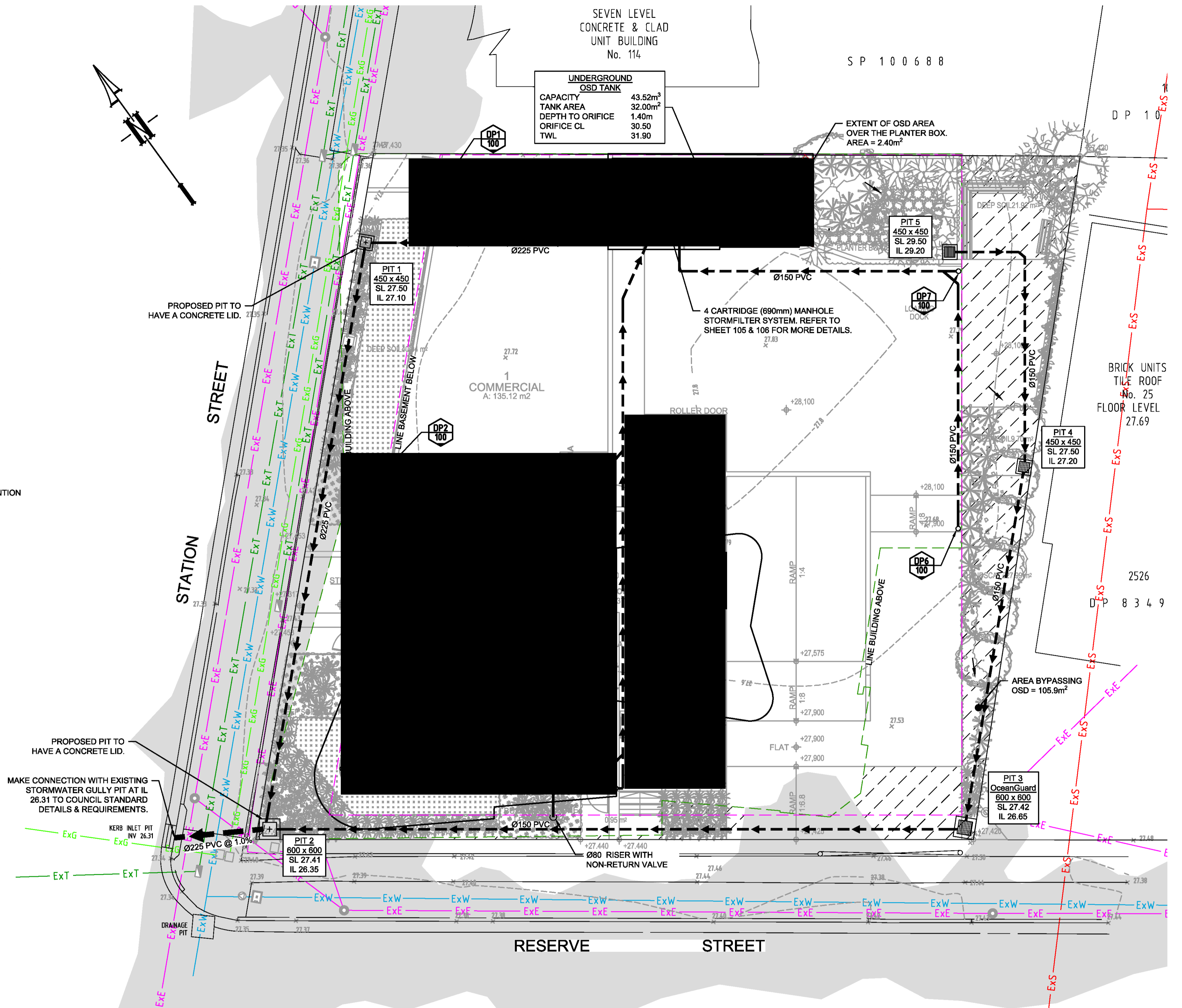
- ALL THE CLEANING EYES (OR INSPECTION EYES) FOR THE UNDERGROUND PIPES HAVE TO BE TAKEN UP TO THE FINISHED GROUND LEVEL FOR EASY IDENTIFICATION AND MAINTENANCE PURPOSES
- ALL LEVELS SHALL RELATE TO THE ESTABLISHED BENCH MARK.
- THE BUILDER SHALL ENSURE THAT THE STORMWATER ENGINEERS DRAWINGS CORRESPOND TO THE ARCHITECTURAL, STRUCTURAL AND LANDSCAPING DRAWINGS. IF THERE EXISTS ANY DISCREPANCIES BETWEEN THE DRAWINGS, THE BUILDER SHALL REPORT THE DISCREPANCIES TO THE ENGINEER PRIOR TO COMMENCEMENT OF ANY WORKS
- ALL MULCHING TO BE USED WITHIN THE AREA DESIGNATED AS ONS-SITE DETENTION STORAGE SHALL BE OF A NON-FLOTABLE MATERIAL SUCH AS DECORATIVE RIVER GRAVEL. PINE BARK MULCHING SHALL NOT BE USED WITHIN THE DETENTION STORAGE AREA.
- ALL RETAINING WALLS SHALL BE CONSTRUCTED COMPLETELY WITHIN THE PROPERTY BOUNDARY LIMITS TO DETAILS PREPARED BY THE STRUCTURAL ENGINEER. WALLS FORMING THE ON-SITE DETENTION SYSTEM SHALL BE OF MASONRY/BRICK CONSTRUCTION AND WATER TIGHT.
- ALL SUB-SOIL DRAINAGE SHALL BE A MINIMUM OF 65MM DIA AND SHALL BE PROVIDED WITH A FILTER SOCK. THE SUBSOIL DRAINAGE SHALL BE INSTALLED IN ACCORDANCE WITH DETAILS TO BE PROVIDED BY THE LANDSCAPE ARCHITECT.
- PRIOR TO COMMENCING ANY WORKS, THE BUILDER SHALL ENSURE THAT THE INVERT LEVELS OF WHERE THE SITE STORMWATER SYSTEM CONNECTS INTO THE COUNCIL'S KERB/DRAINAGE SYSTEM MATCHED THE DESIGN LEVELS. ANY DISCREPANCIES SHALL BE REPORTED TO THE DESIGN ENGINEER IMMEDIATELY.
- ALL LINES ARE TO BE Ø90 uPVC 1.0% GRADE UNLESS NOTED OTHERWISE. CHARGED LINES TO BE SEWERGRADE & SEALED.
- EXISTING SERVICES LOCATIONS SHOWN INDICATIVE ONLY.
- IT IS THE CONTRACTORS RESPONSIBILITY TO LOCATE & LEVEL ALL EXISTING SERVICES PRIOR TO THE COMMENCEMENT OF ANY EARTHWORKS.
- ALL PIPES TO HAVE MIN 150mm COVER IF LOCATED WITHIN PROPERTY.
- ALL PITS IN DRIVEWAYS TO BE 450x450 CONCRETE AND ALL PITS IN LANDSCAPED AREAS TO BE 450x450 PLASTIC.
- PITS LESS THAN 450 DEEP MAY BE BRICK, PRECAST OR CONCRETE.
- ALL BALCONIES AND ROOFS TO BE DRAINED AND TO HAVE SAFETY OVERFLOWS IN ACCORDANCE WITH RELEVANT AUSTRALIAN STANDARDS.
- ALL EXTERNAL SLABS TO BE WATERPROOFED.
- ALL GRATES TO HAVE CHILD PROOF LOCKS.
- ALL DRAINAGE WORKS TO AVOID TREE ROOTS.
- ALL DP'S TO HAVE LEAF GUARDS.
- ALL EXISTING LEVELS TO BE CONFIRMED BY BUILDER PRIOR TO CONSTRUCTION.
- ALL WORK WITHIN COUNCIL RESERVE TO BE INSPECTED BY COUNCIL PRIOR TO CONSTRUCTION.
- COUNCIL'S ISSUED FOOTWAY DESIGN LEVELS TO BE INCORPORATED INTO THE FINISHED LEVELS ONCE ISSUED BY COUNCIL.
- ALL WORK SHALL BE IN ACCORDANCE WITH B.C.A. AND A.S.3500.3.
- REFER TO LANDSCAPE ARCHITECT'S DRAWINGS FOR LANDSCAPING.
- ALL WALLS FORMING THE DETENTION BASINS SHALL BE CONSTRUCTED WHOLLY WITHIN THE PROPERTY BOUNDARIES OF THE SITE BEING DEVELOPED.
- OSD WARNING SIGN AND SAFETY FENCING SHALL BE PROVIDED TO ABOVE GROUND OSD STORAGE AREA IN ACCORDANCE WITH COUNCIL'S REQUIREMENTS.
- ENSURE THAT NON FLOATABLE MULCH IS USED IN DETENTION BASINS, ie, USE DECORATIVE ROCK MULCH OR EQUIVALENT.
- THE OSD BASIN / TANK IS TO BE BUILT TO THE CORRECT LEVELS & SIZE AS PER THIS DESIGN. ANY VARIATIONS ARE TO BE DONE UNDER CONSULTATION FROM OUR OFFICE ONLY. ANY AMENDMENTS WITHOUT OUR APPROVAL WOULD RESULT IN ADDITIONAL FEES FOR REDESIGN AT OC STAGE OR IF A SOLUTION CANNOT BE FOUND, RECONSTRUCTION IS REQUIRED UNDER THE CONTRACTOR'S EXPENSES
- ALL PIPES IN BALCONIES TO BE Ø65 uPVC IN CONCRETE SLAB. CONTRACTOR TO PROVIDE A BREAK / OPEN VOID IN RAIL / BALLUSTRADE FOR STORMWATER EMERGENCY OVERFLOW. ALL ENCLOSED AREAS / PLANTER BOXES TO BE FITTED WITH FLOOR WASTES & DRAINED TO OSD. DOWNPIPES TO BE CHECKED BY ARCHITECT & PLUMBER PRIOR TO CONSTRUCTION.

LEGEND

- PROPOSED STORMWATER BYPASSING OSD
- PROPOSED STORMWATER DRAINING TO RWT
- PROPOSED STORMWATER DRAINING TO OSD
- EXISTING SEWER MAIN (FROM RECORDS)
- EXISTING WATER (FROM RECORDS)
- EXISTING POWER (FROM RECORDS)
- EXISTING GAS (FROM RECORDS)
- EXISTING TELSTRA (FROM RECORDS)
- GUTTER DOWNPIPE
- DOWNPIPE NUMBER AND SIZE
- SURFACE FLOW ARROWS
- DESIGN SURFACE LEVEL
- EXISTING SURFACE LEVEL
- PROPOSED OSD STORAGE
- AREA BYPASSING OSD
- PROPOSED WSUD / BIO-RETENTION AREA / POND
- 100yr ARI FLOODING
- Ø65 RISER WITH NON-RETURN VALVE

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

ROOF NOTE:
 IT IS CONTRACTOR'S RESPONSIBILITY TO ENSURE MINIMUM 30 TO 40MM OF PONDING IS ACHIEVED OVER THE RAINWATER OUTLETS BY GRADING CATCHMENTS' SURFACES AT MINIMUM 0.5% FALL FOR PAVED SURFACES AND MINIMUM 1% FALL FOR OTHER SURFACES.

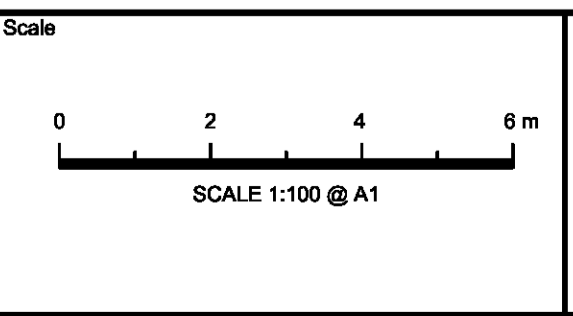


GROUND FLOOR PLAN
SCALE 1:100

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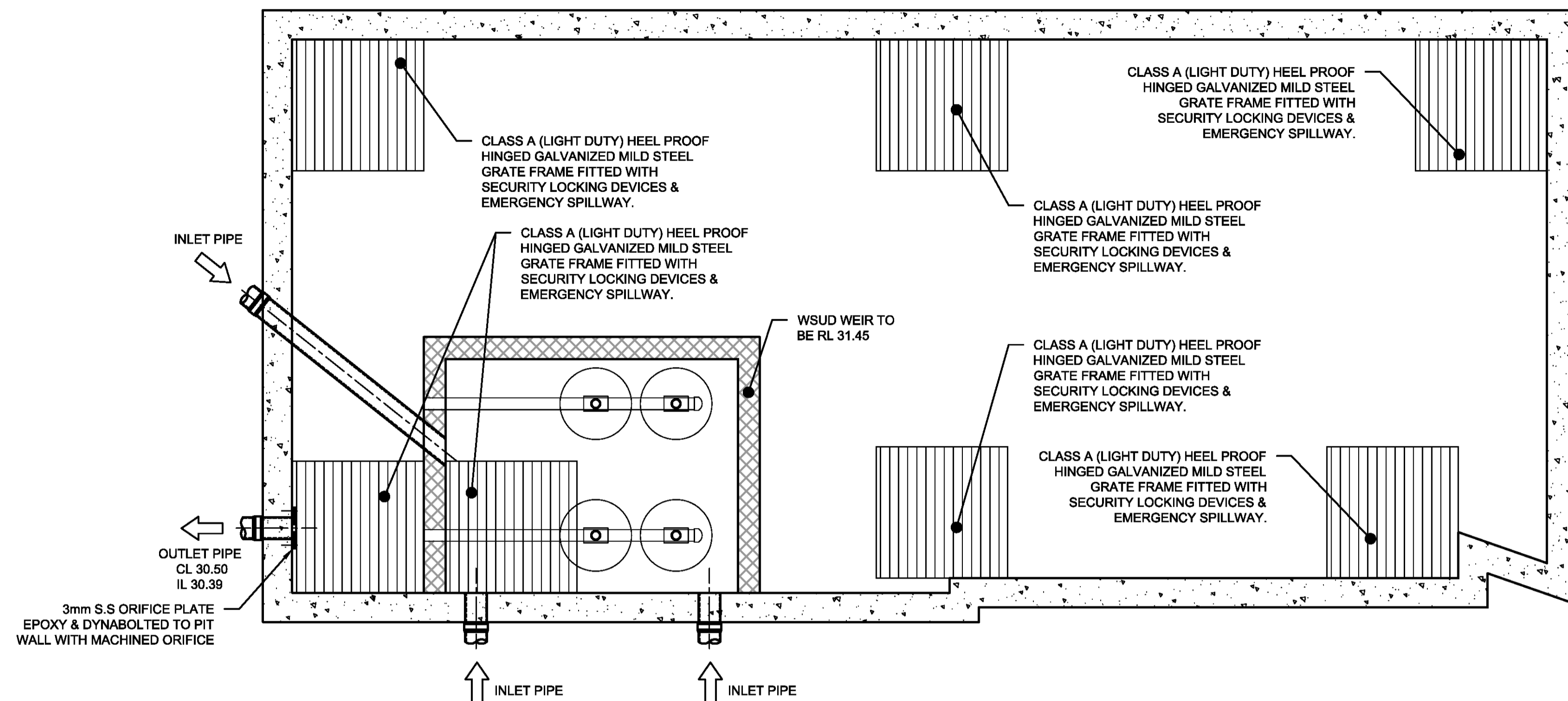


AUSTRALIAN CONSULTING ENGINEERS.
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Project
118-120 STATION STREET, PENRITH PROPOSED MIXED USE DEVELOPMENT STORMWATER CONCEPT PLANS DEVELOPMENT APPLICATION

Drawing Title
STORMWATER CONCEPT PLAN

Scale	A1	Project No.	200763	Dwg. No.	104	Issue	A
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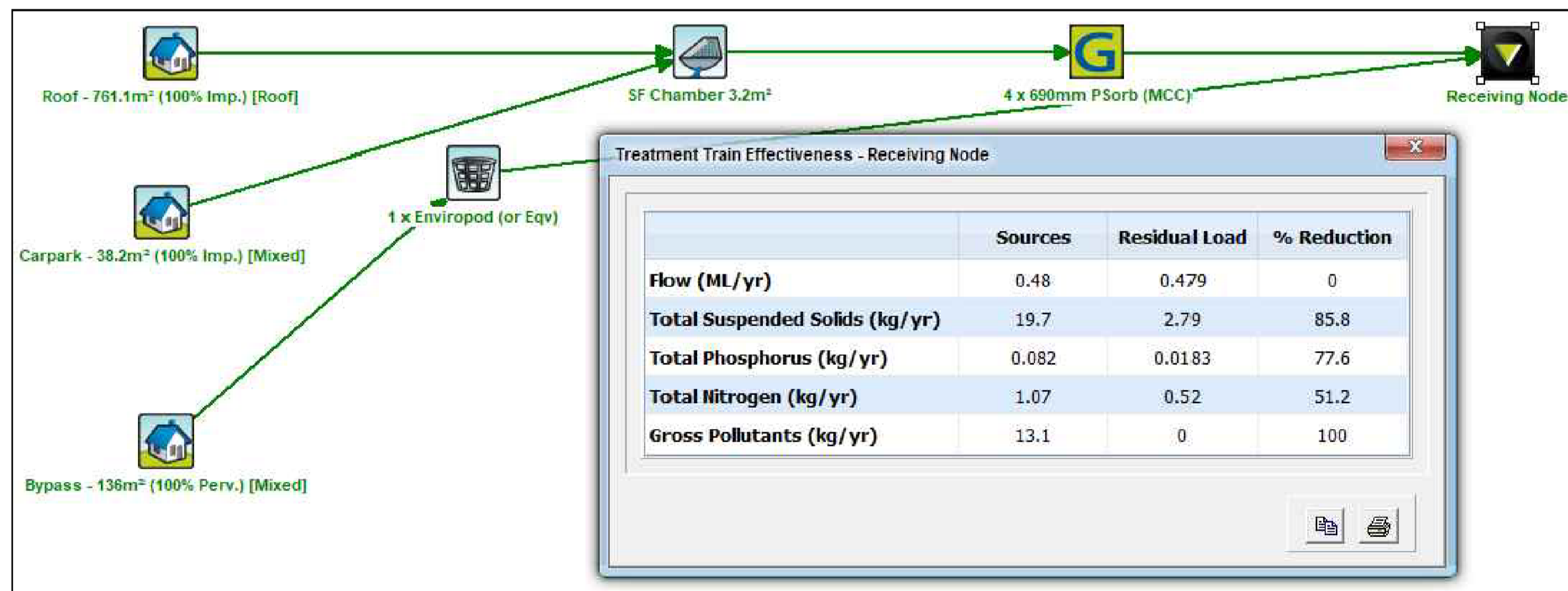


**UNDERGROUND OSD TANK
PLAN VIEW**
SCALE 1:25

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 80LS.
- THE STANDARD CONFIGURATION IS SHOWN. ACTUAL CONFIGURATION OF THE SPECIFIED STRUCTURE(S) PER CIVIL ENGINEER WILL BE SHOWN ON SUBMITTAL DRAWING(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/m ²	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



WSUD RESULTS

SITE SPECIFIC DATA REQUIREMENTS	
STRUCTURE ID	1
WATER QUALITY FLOW RATE (L/S)	3.3
PEAK FLOW RATE (L/S)	83
RETURN PERIOD OF PEAK FLOW (yrs)	XXX
# OF CARTRIDGES REQUIRED (8-22)	12
CARTRIDGE HEIGHT (310, 460 or 690mm)	690
MEDIA TYPE (PERLITE, PERLITE/ZEOLITE OR ZPG)	ZPG
PRECAST VAULT WEIGHT	2524 kg
PRECAST LID WEIGHT	547 kg
PIPE DATA:	I.L. MATERIAL DIAMETER
INLET PIPE #1	PVC
INLET PIPE #2	N/A
OUTLET PIPE	PVC
PIPE ORIENTATION	90°
UPSTREAM FLOW	180°
DOWNSTREAM FLOW	0°
R.L. XXX	270°
LADDER	YES/NO
ANTI-FLOTATION BALLAST	N/A
	N/A

STORMFILTER TABLE
N.T.S.

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 RATINGS 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.

OSD CALCULATIONS:

SITE AREA = 935.3 m²
= 0.09353 ha

PSD = 49.9 l/s/ha
SSR = 440.5 m³/ha

THEREFORE:
PSD = 49.9 x 0.09353
= 4.67 l/s

SSR = 440.5 x 0.09353
= 41.20 m³

ORIFICE CALCULATIONS:

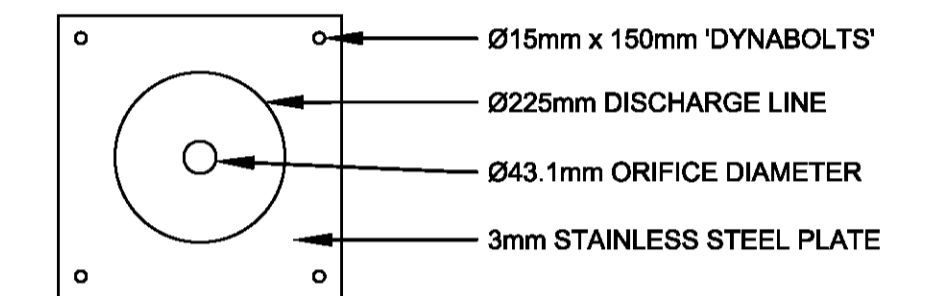
$Q = C \times A \times (2 \times g \times h)^{0.5}$

SO: $A = Q / (C \times \sqrt{2 \times g \times h})$
= 0.00467 / (0.61 x sqrt(2 x 9.81 x 1.40))
= 0.001461 m²

THEREFORE:
 $d = \sqrt{4 \times A / \pi}$
= sqrt(4 x 0.001461 / 3.14159)
= 43.1 mm

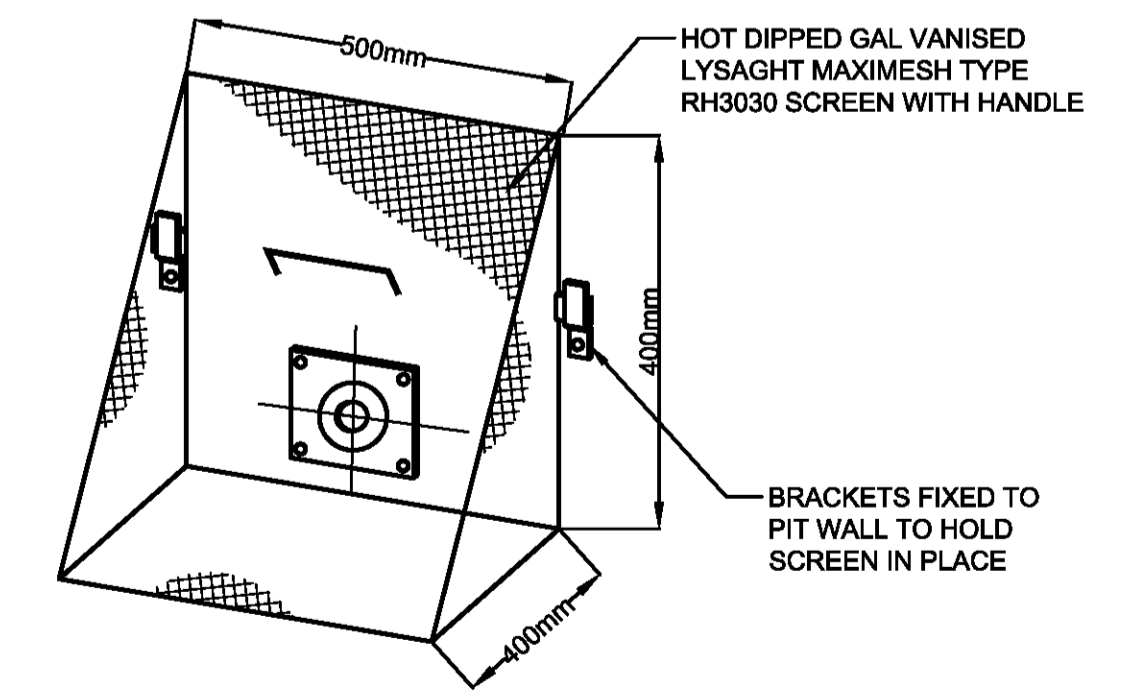
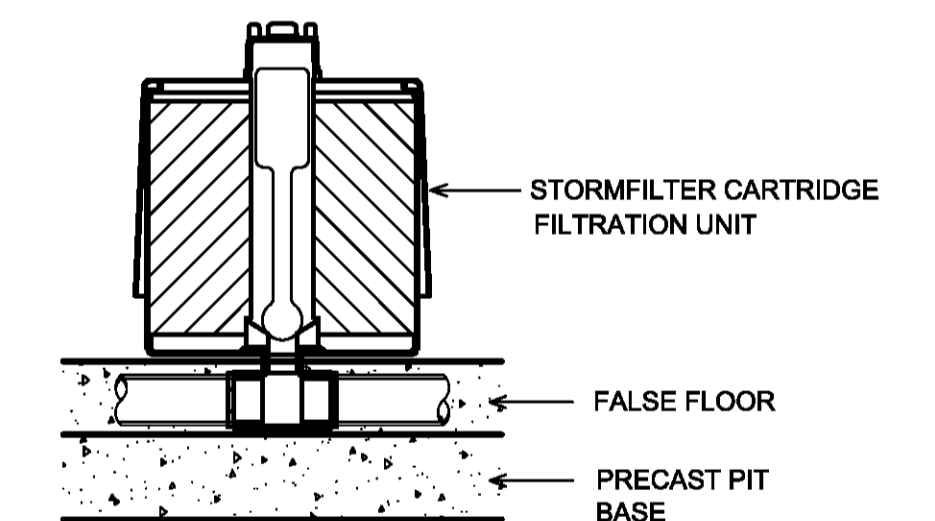
**UNDERGROUND OSD TANK
STAGED STORAGE CALCULATIONS**

DEPTH (mm)	AREA (m ²)	CUMULATIVE VOLUME (m ³)
0	32.00	0
100	32.00	1.92
200	32.00	5.12
300	32.00	8.32
400	32.00	11.52
500	32.00	14.72
600	32.00	17.92
700	32.00	21.12
800	32.00	24.32
900	32.00	27.52
1000	32.00	30.72
1100	32.00	33.92
1200	32.00	37.12
1300	32.00	40.32
1400	32.00	43.52



ORIFICE PLATE DETAIL
SCALE 1:10

**SYSTEM HYDRAULIC DROP
CARTRIDGE FLOW RATE**



TRASH SCREEN DETAIL
N.T.S.

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Issue	Description	Date	Design	Checked
A	ISSUE FOR DEVELOPMENT APPLICATION	11/09/2020	EHZ	JSF

Council
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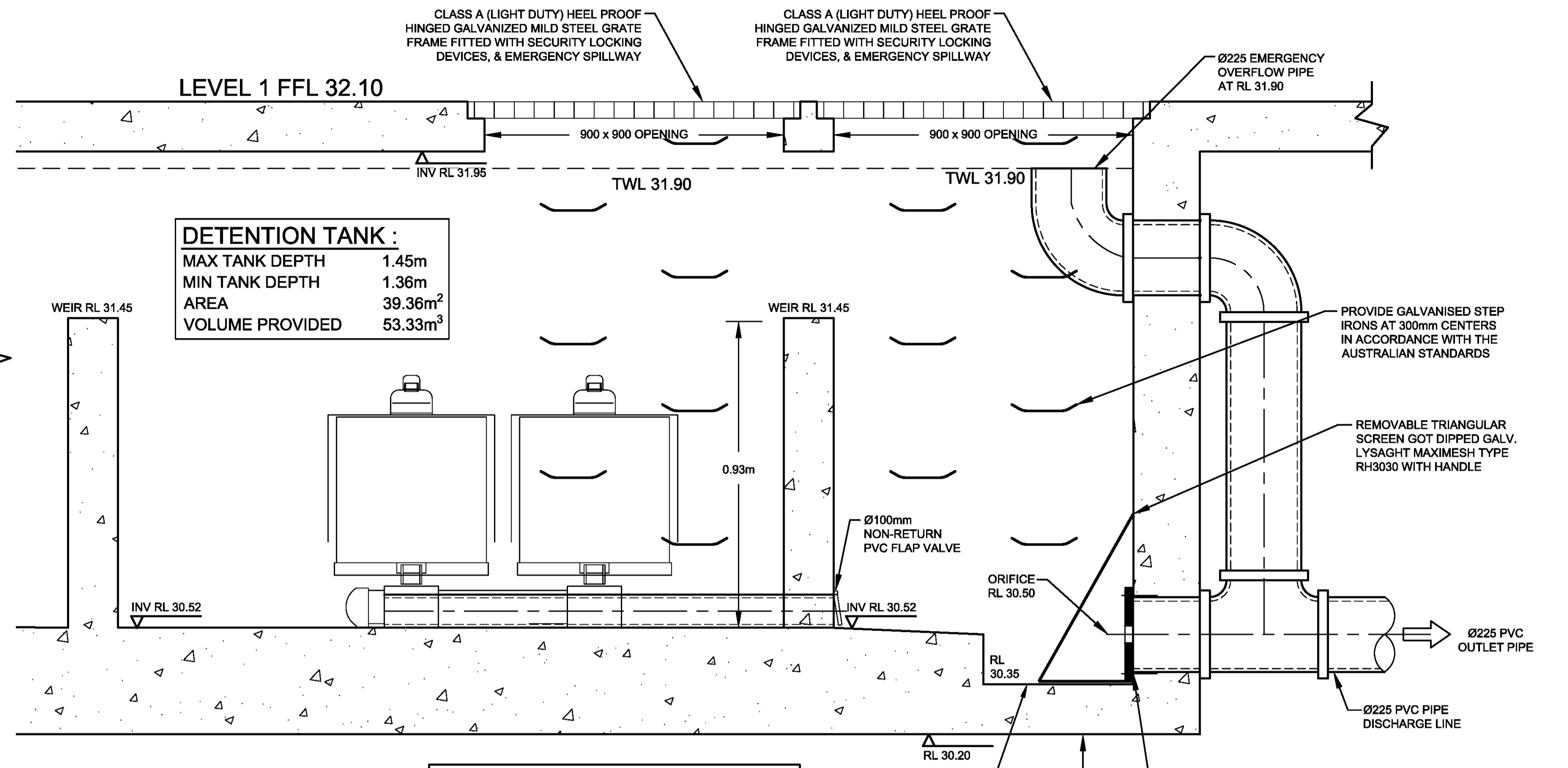
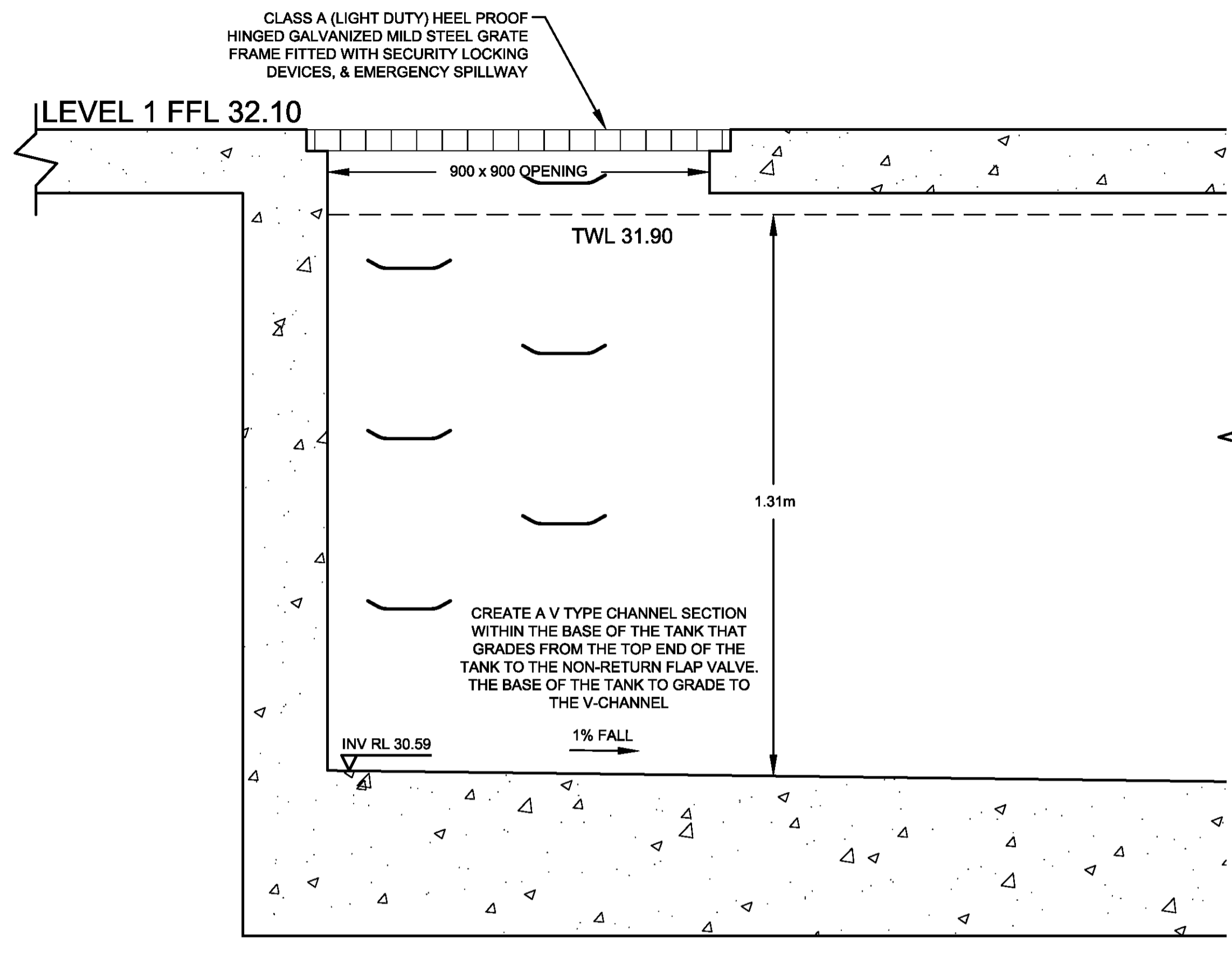
Scale
0 0.2 0.4 0.6 0.8 1.0 1.2m
SCALE 1:25 @ A1

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Project
118-120 STATION STREET, PENRITH
PROPOSED MIXED USE DEVELOPMENT
STORMWATER CONCEPT PLANS
DEVELOPMENT APPLICATION

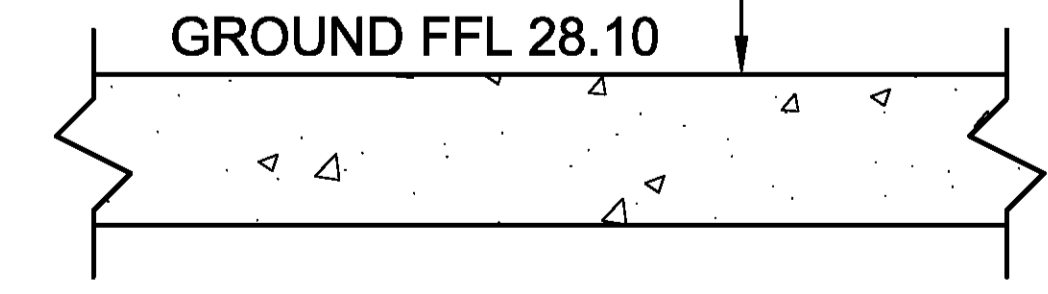
Drawing Title
ON-SITE DETENTION DETAILS AND CALCULATION SHEETS SHEET 1 OF 2

Scale A1 Project No. 200763 Dwg. No. 105 Issue A



SUSPENDED OSD TANK DETAIL
SCALE 1:10

FOR OSD TANK STRUCTURAL DETAIL REFER TO STRUCTURAL ENGINEER'S DETAILS

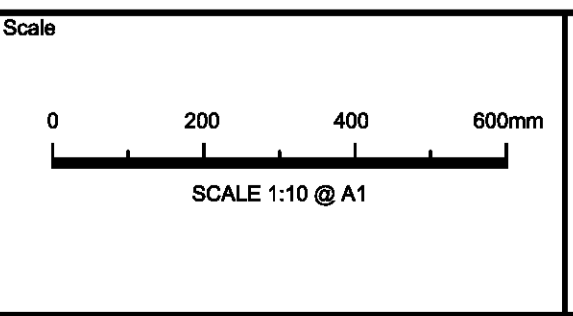


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Project
118-120 STATION STREET, PENRITH PROPOSED MIXED USE DEVELOPMENT STORMWATER CONCEPT PLANS DEVELOPMENT APPLICATION

Drawing Title
ON-SITE DETENTION DETAILS AND CALCULATION SHEETS SHEET 2 OF 2

Scale
As Shown

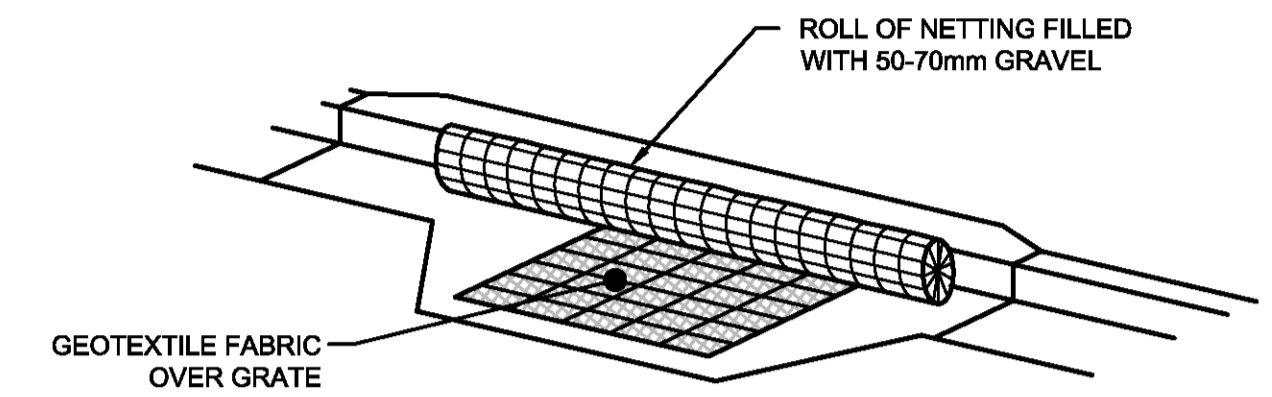
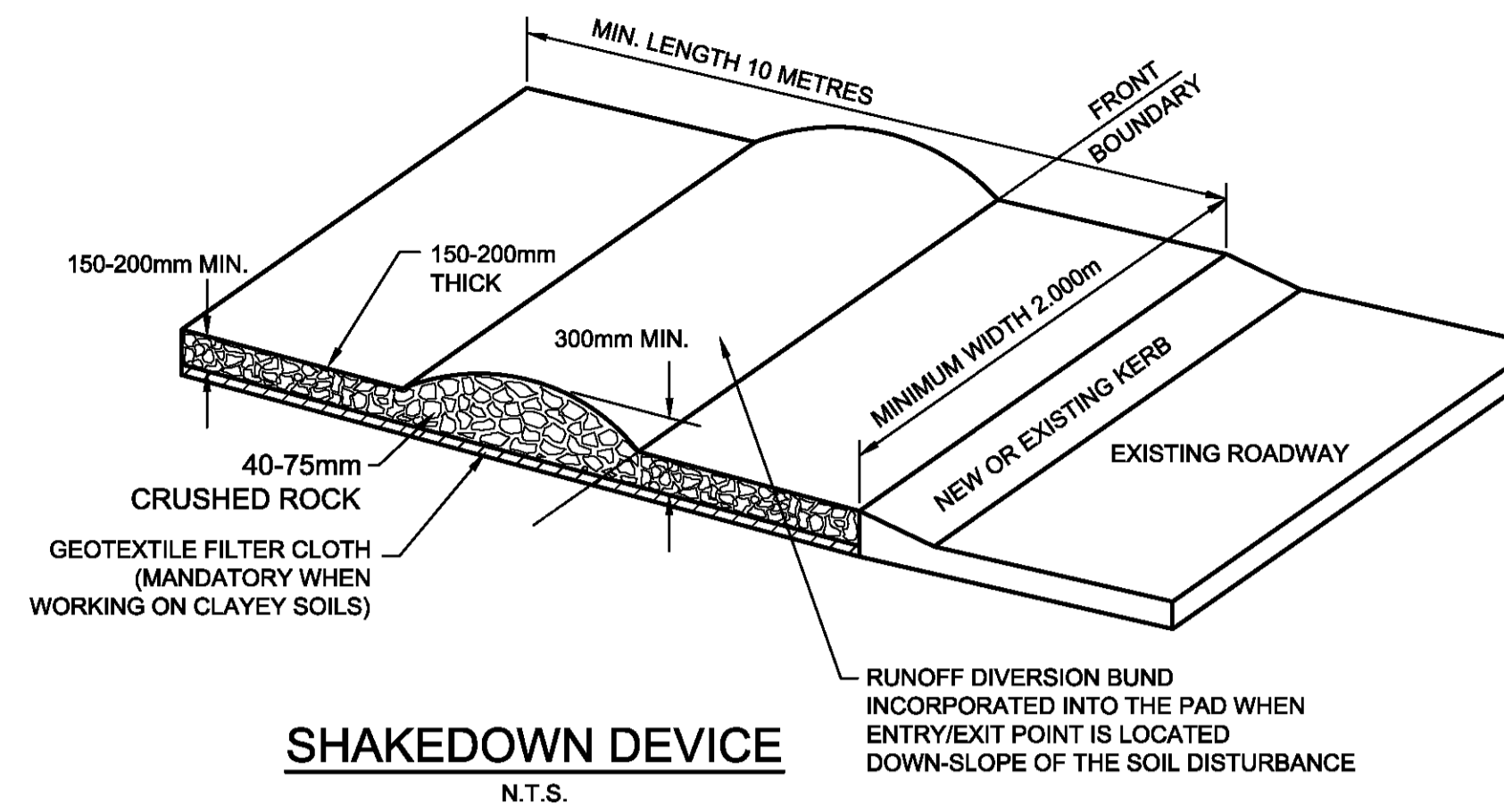
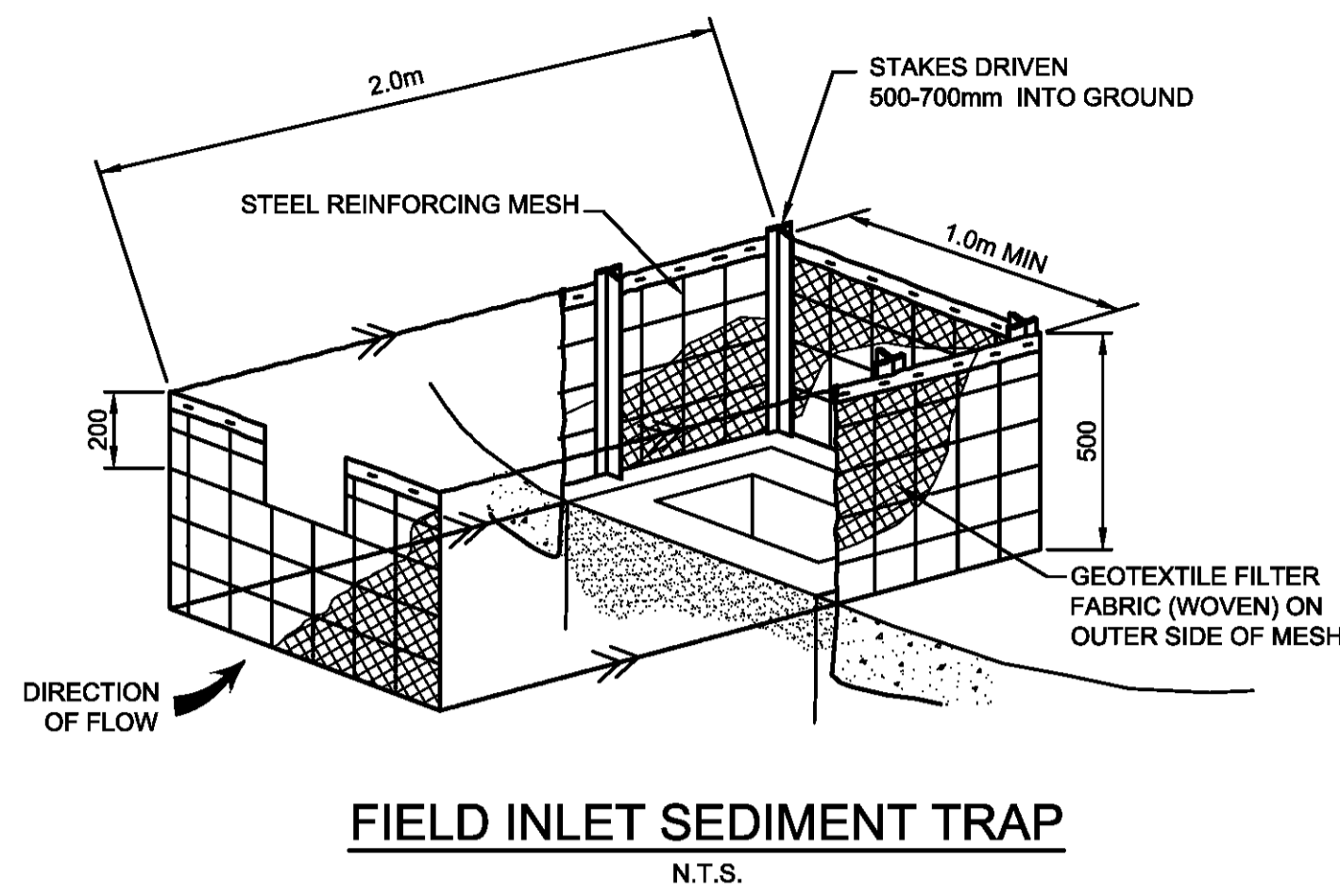
Project No.
200763

Dwg. No.
106

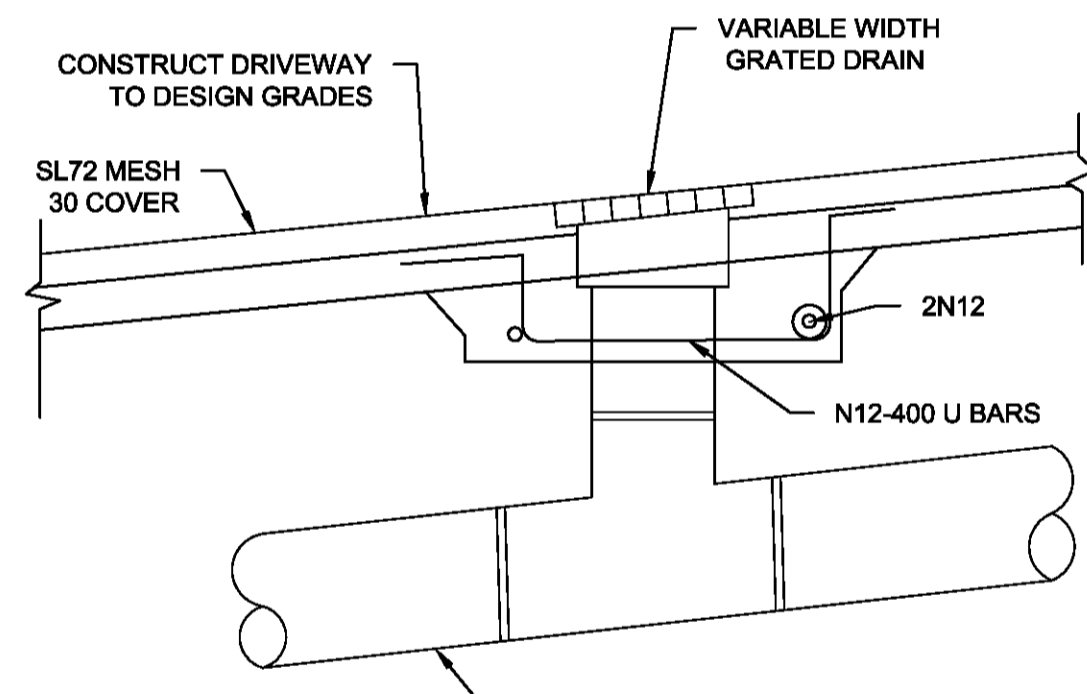
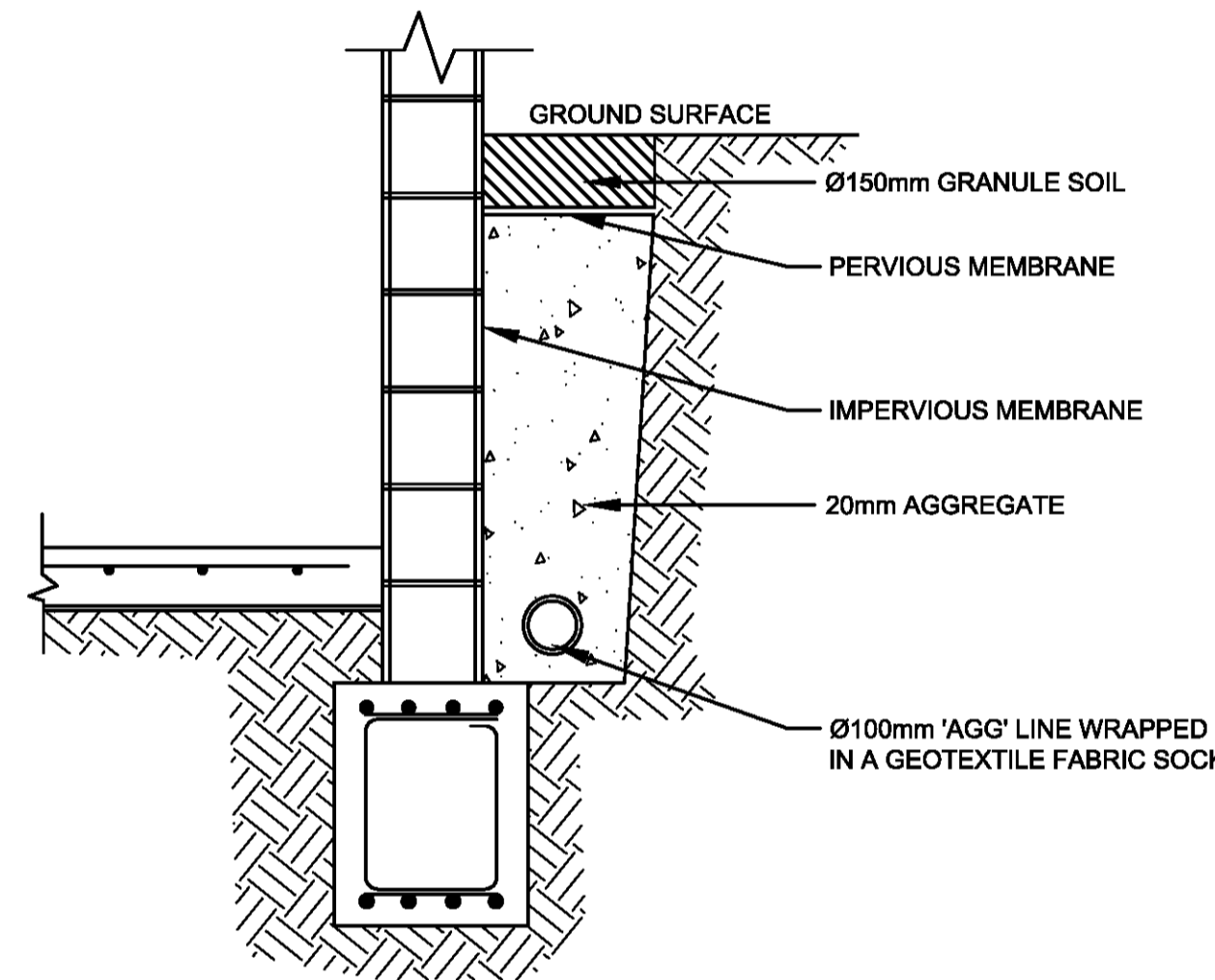
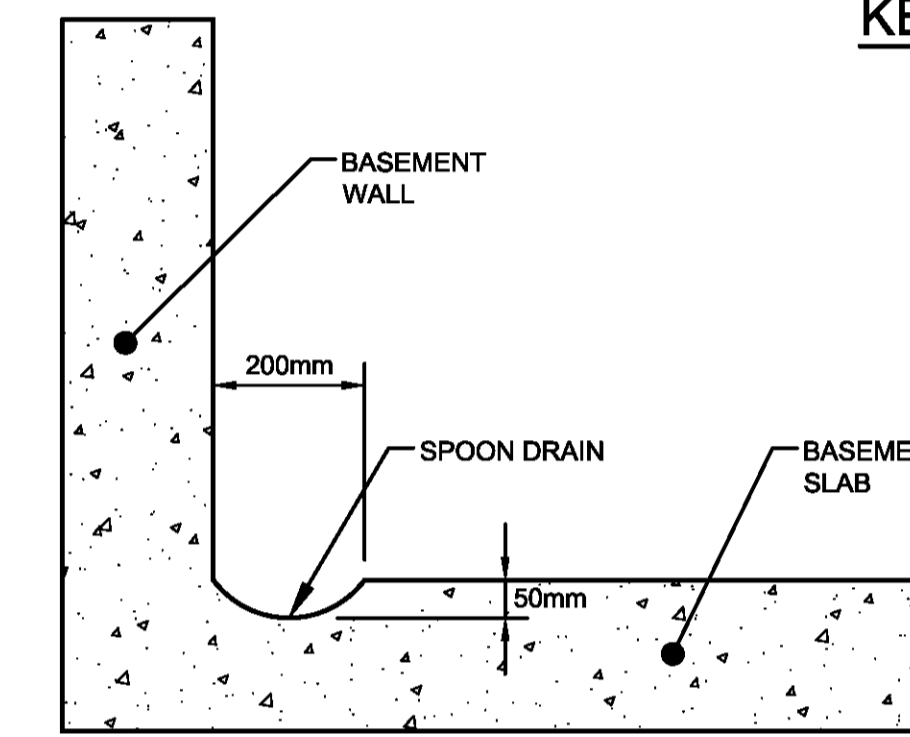
Issue
A

SEDIMENT & EROSION NOTES

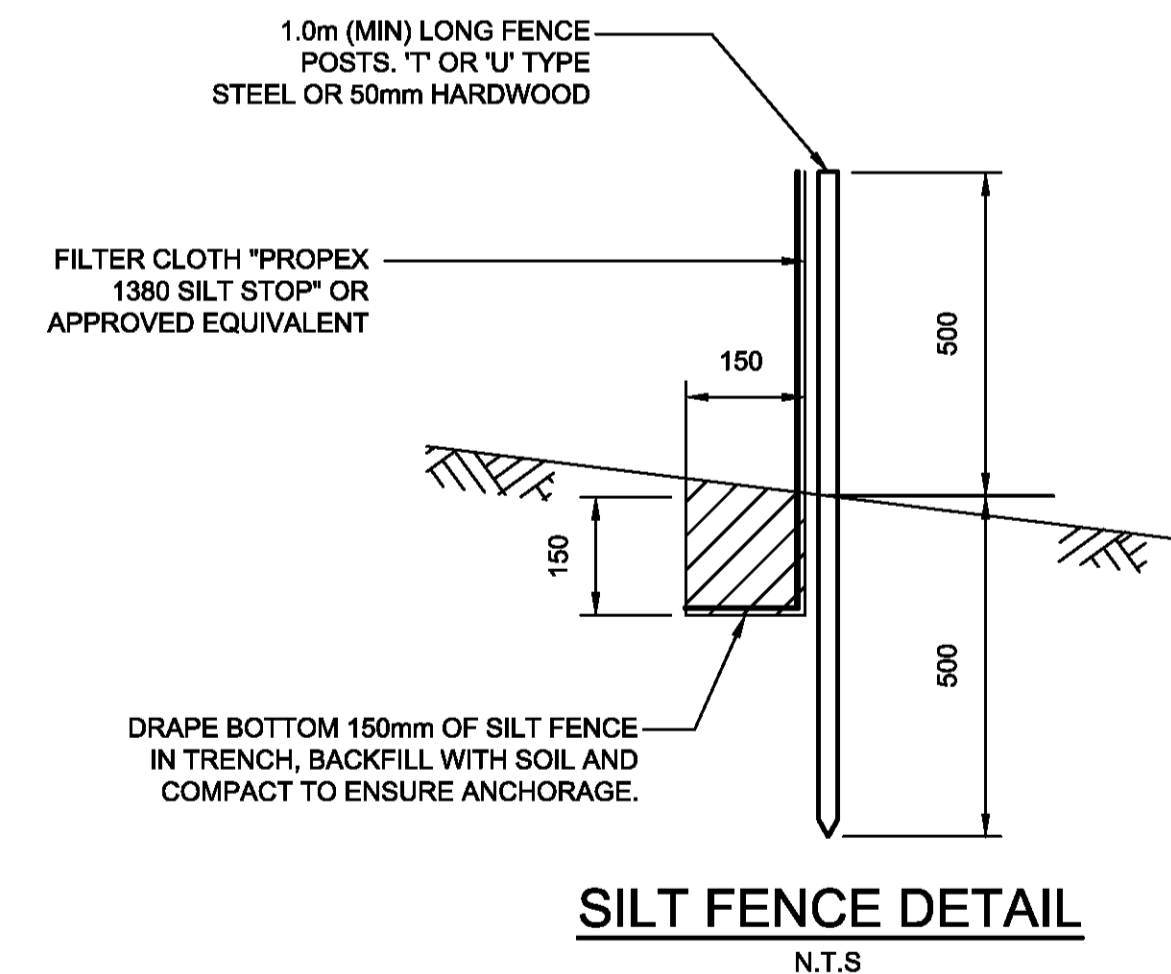
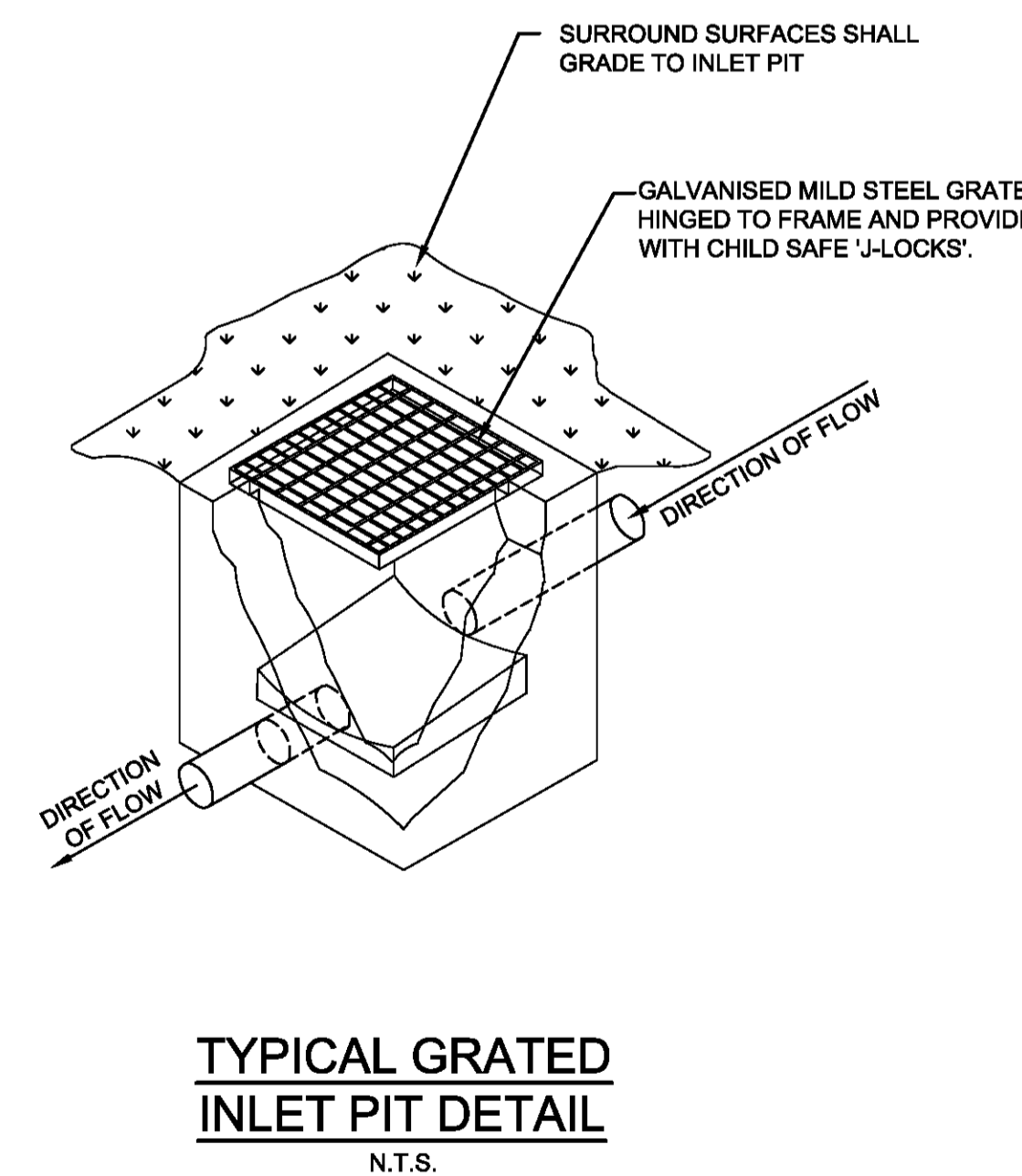
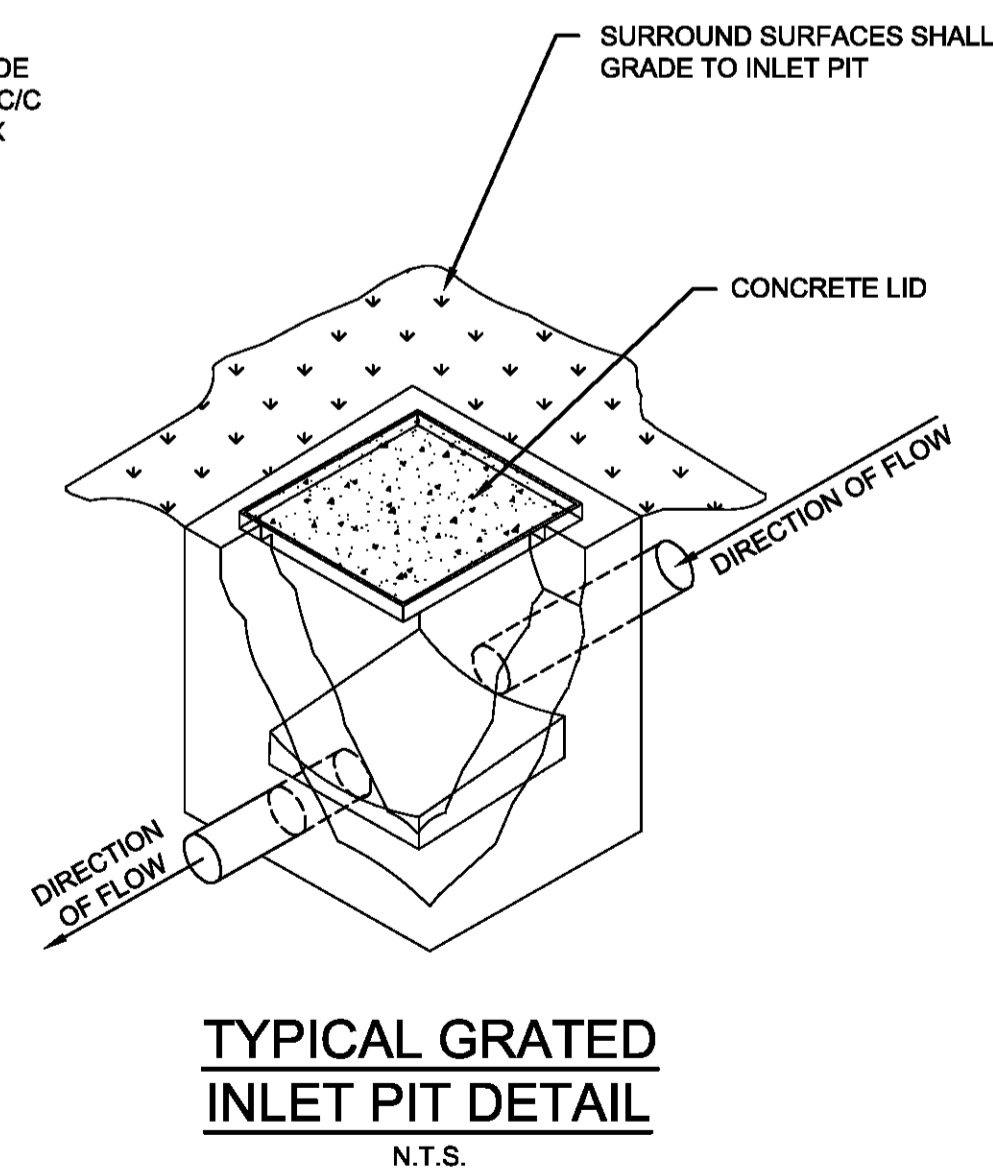
1. IMMEDIATELY FOLLOWING SETTING OUT OF THE WORKS, BUT PRIOR TO COMMENCEMENT OF ANY CLEARING OR EARTHWORKS, THE CONTRACTOR AND SUPERINTENDENT SHALL WALK THE SITE TO NOMINATE THE LOCATIONS AND TYPES OF SEDIMENT AND EROSION CONTROL MEASURES TO BE ADOPTED. THESE MEASURES SHALL BE IMPLEMENTED PRIOR TO ANY 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 PITTS.
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.



KERB INLET PROTECTION SAG GULLIES N.T.S.



STORMWATER DRAINAGE TO BE SEWER GRADE CLASS SH STRAP TO BASEMENT WALL AT 150 C/C USING GALVANISED TIES AND FIXINGS/ OR FIX TO CEILING OF UNITS AND ENCLOSURE.



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.

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Issue	Description	Date	Design	Checked	

Certification By: Dr. Anthony Hasham (NPER) Architect
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Scale
 0 200 400 600mm
 SCALE 1:10 @ A1

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Project
118-120 STATION STREET, PENRITH PROPOSED MIXED USE DEVELOPMENT STORMWATER CONCEPT PLANS DEVELOPMENT APPLICATION

Drawing Title
MISCELLANEOUS DETAILS SHEET
 Scale A1 Project No. 200763 Dwg. No. 107 Issue A