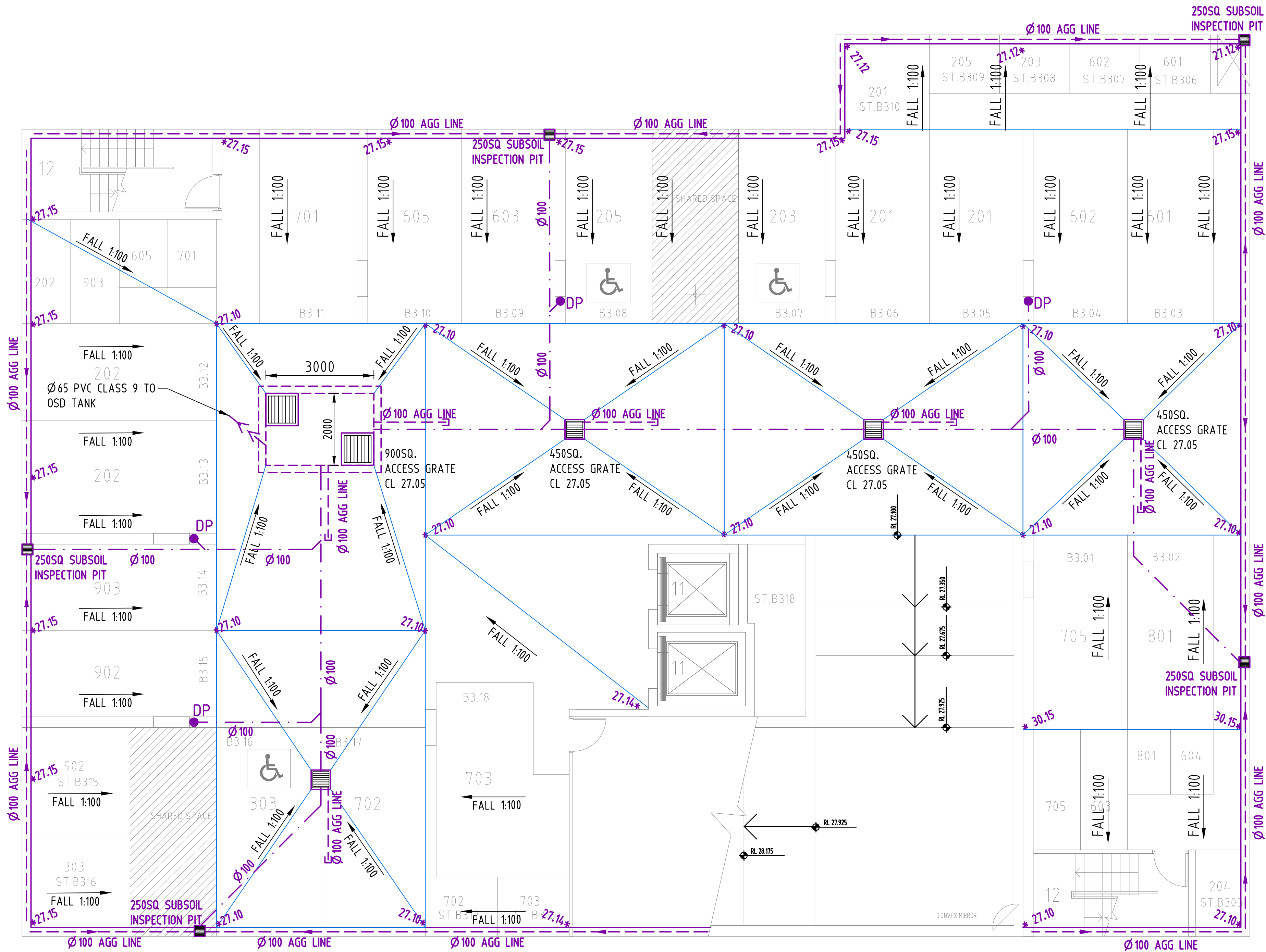


BASEMENT 3 DRAINAGE PLAN SCALE - 1:100

- * DENOTES PROPOSED LEVEL
- × DENOTES EXISTING LEVEL
- DENOTES DOWNPIPE
- PROPOSED RAINWATER PIPE
- - - PROPOSED STORMWATER PIPE

BASEMENT PUMPING WELL CALCULATIONS

Provide two centrifugal drainage SUMP pumps with single phase electric motor capable of discharging 2.8L/s each against a total head of (13.3m) with 10 starts per hour maximum.
Class 1 Zone 2 certified pumps for hazardous areas is required
Switching shall provide for alternative operation of the pumps, high level switch ON/OFF, 2nd pump, and a red light alarm placed prominently in the basement area activated by high level switch ON.

Garage Holding Tank
Area draining to the garage pumping well is the driveway to the basement (50m²)
Storage must be provided for a blackout of at least 2hrs, the 100yrs ARI 2hr storm runoff is:
 $Q = F \times C \times I \times A$
 $= 1/3600 \times 1 \times 60 \times 50$
 $= 0.83 \text{ L/s}$

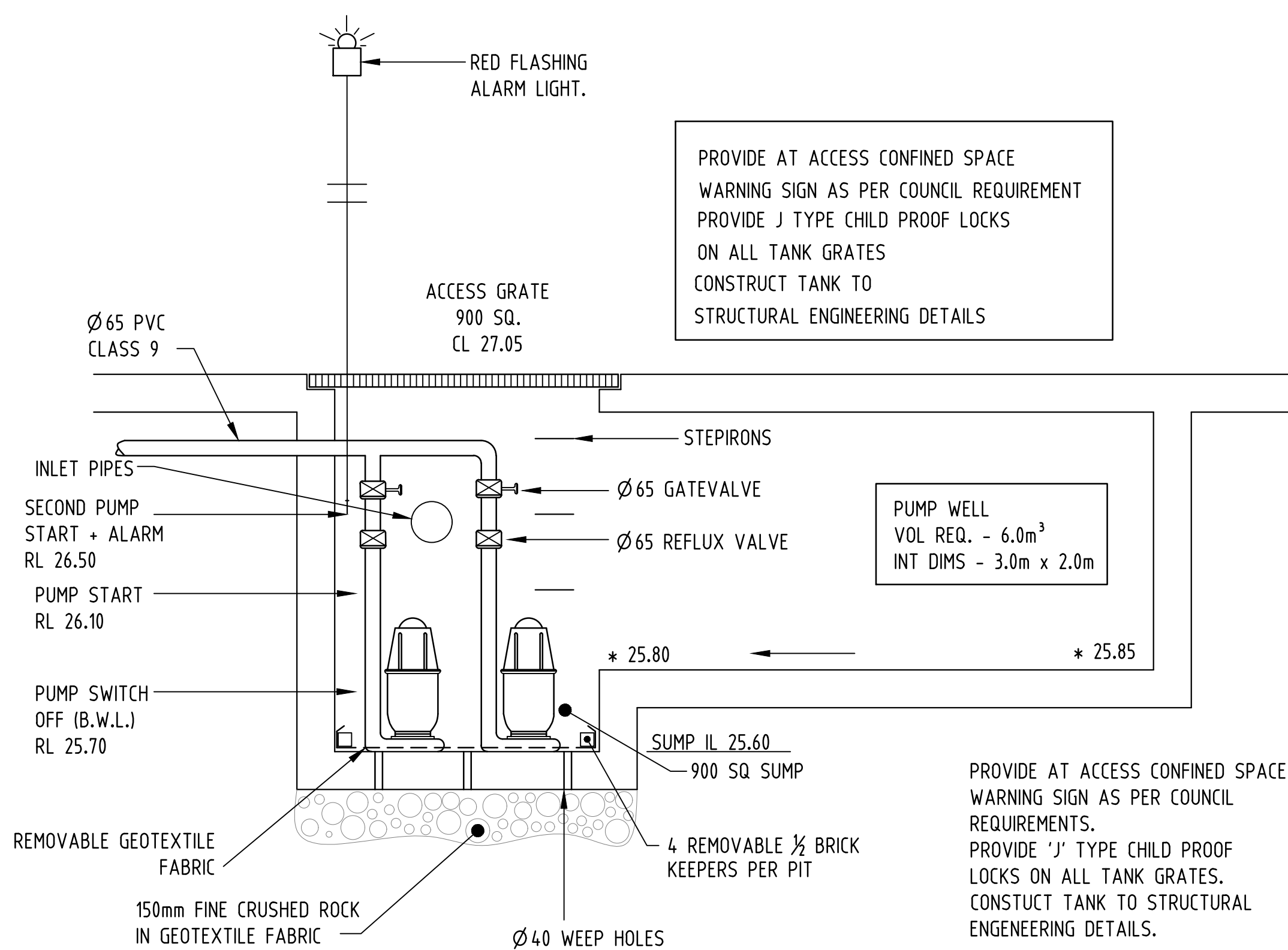
Volume accumulated:
 $V = (0.83 \text{ L/s} \times 2\text{hrs} \times 3600\text{s})/1000$
 $= 6.00 \text{ m}^3$

Let the maximum discharge be for the 10 min 100yrs ARI storm. In the event of a stronger storm such as a 5min 100yrs ARI, The standby pump will operate with the duty pump to discharge the extra runoff. In case of a break down, storage is provided in the basement for the excess runoff.
 $Q = F \times C \times I \times A$
 $= 1/3600 \times 1 \times 207 \times 50$
 $= 2.8 \text{ L/s}$

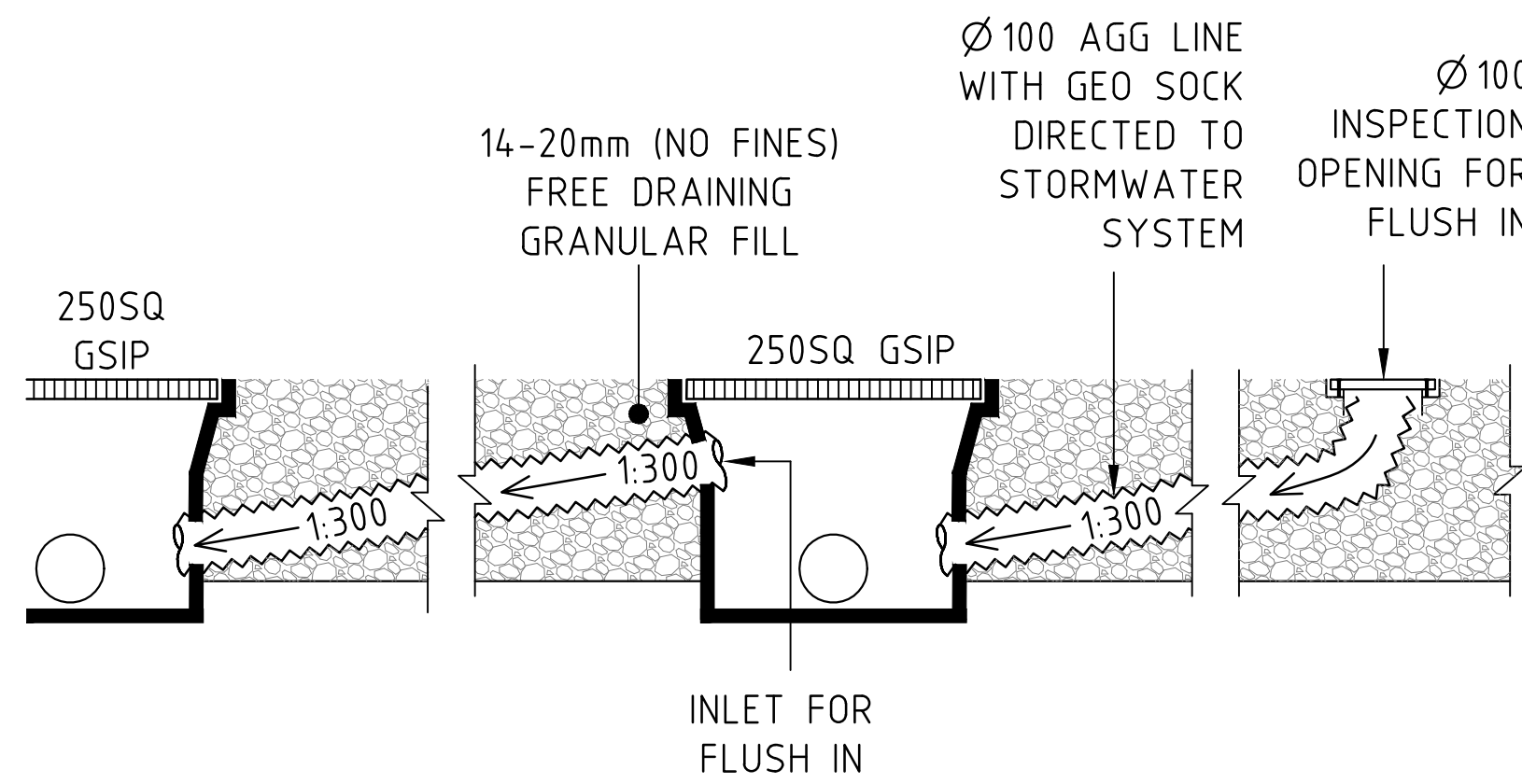
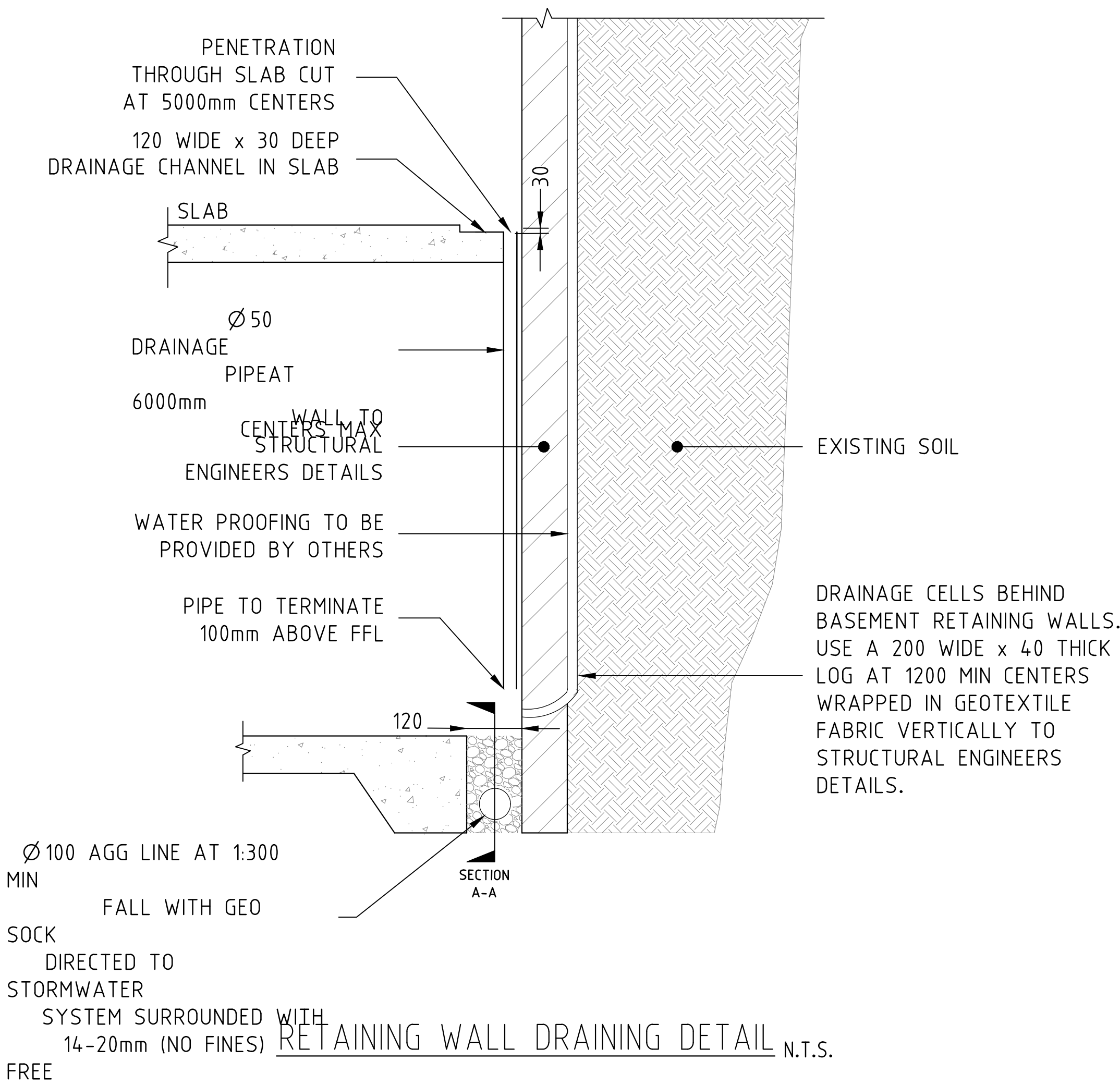
A Control volume is required to prevent the pump from starting too often (< 10/hr)
 $CV = 900 \times Qp/n$
 $= (900 \times 2.8) / (10 \times 1000)$
 $= 0.25 \text{ m}^3$

Garage Pumping Duty Calculation.(Q = 2.8 L/s)

ITEM	HEAD
Static Adjustment	11.2m
65mm Pump Fittings EL 25m (1.2m/100)	0.8m
65mm PVC Class 9 EL 30m (1.2m/100)	0.7m
Sundries(about 10%)	0.6m
Total	13.3m



BASEMENT PUMPING SYSTEM N.T.S.



SECTION A-A RETAINING WALL DRAINING DETAIL N.T.S.

NOT FOR CONSTRUCTION

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JOHN ROMANOUS & ASSOCIATES CONSULTING CIVIL & STRUCTURAL ENGINEERS PTY. LTD. ACN 054 595 005 SUITE 2D / 322 KINGSGROVE RD, KINGSGROVE NSW 2208 Ph (02) 83 87 68 26					
PROPOSED DEVELOPMENT AT: 153-159 PENSURST ST, NARWEE NSW 2209					
STORMWATER DRAINAGE PLANS & DETAILS					
DRAWN	CHECKED	SCALE	DATUM	DRAWING No.	REV.
JDR	D.M.ROMANOUS (B.E., M.I.E.AUST.	AS SHOWN @A1	A.H.D	2517 - S1/4	A



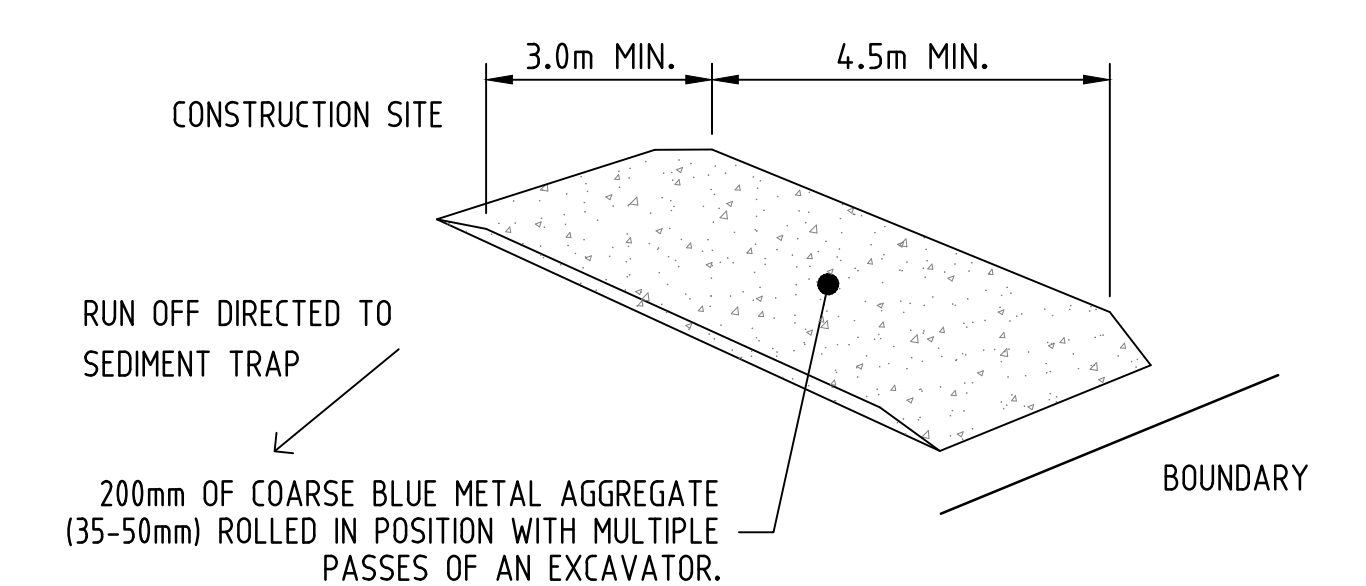
DISTURBED AREA

BLUE METAL WRAPPED IN GEOTEXTILE FABRIC

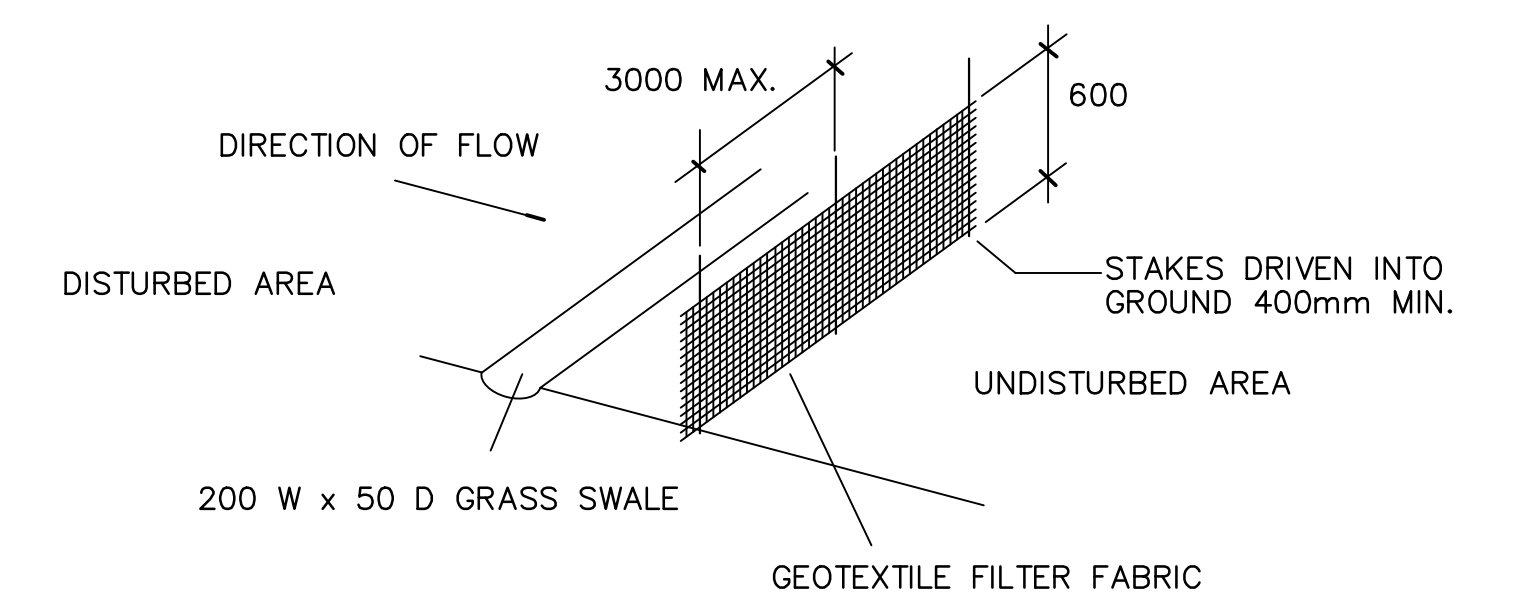
SEDIMENT BARRIER N.T.S.



1. ALL SERVICES ARE TO BE LOCATED IN THE FIELD IN CONJUNCTION WITH A RESPONSIBLE OFFICER OF EACH LEVANT AUTHORITY PRIOR TO COMMENCEMENT OF CONSTRUCTION.
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3. ALL PITS ARE TO HAVE A GALVANISED GRATE AND FRAME. FRAME TO BE CAST INTEGRALLY WITH THE PIT.
4. ALL PITS ARE TO BE BENCH TO HALF PIPE LEVEL.
5. PROVIDE STEP IRONS WHERE PIT IS DEEPER THAN 1m. AT 450mm CENTERS.
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7. DRAINAGE PIPE SIZES ARE 100mm DIAMETER UNLESS OTHERWISE NOTED.
8. ALL BARE SOIL AREAS ARE TO BE PROTECTED FROM EROSION BY TEMPORARY MEASURES AND REVEGETATED AT THE CESSATION OF CONSTRUCTION.
9. THE DOWNHILL BOUNDARY OF THE SITE IS TO BE PROTECTED BY HAY BALES OR A FILTER FABRIC FENCE DURING CONSTRUCTION AS SHOWN IN THE ATTACHED DETAILS.
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14. IF IN DOUBT, ASK THE SUPERINTENDENT WHO SHALL CONSULT THE DESIGNER.

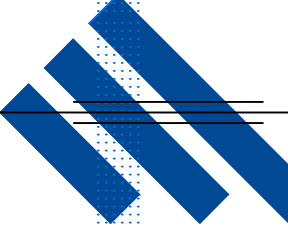


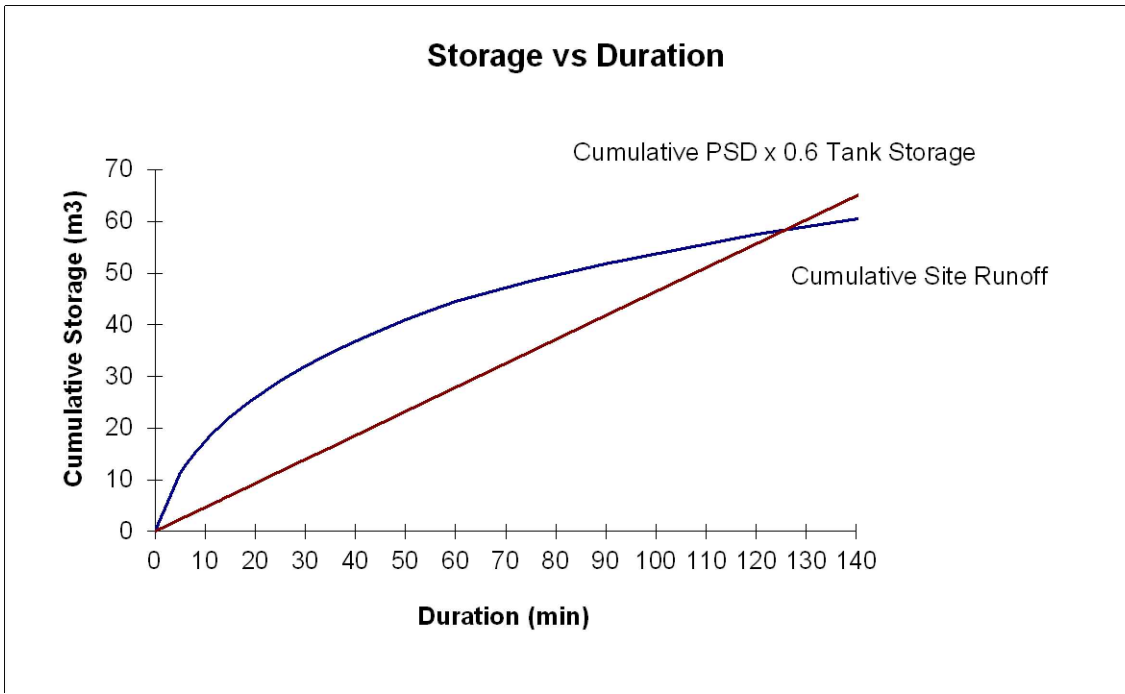
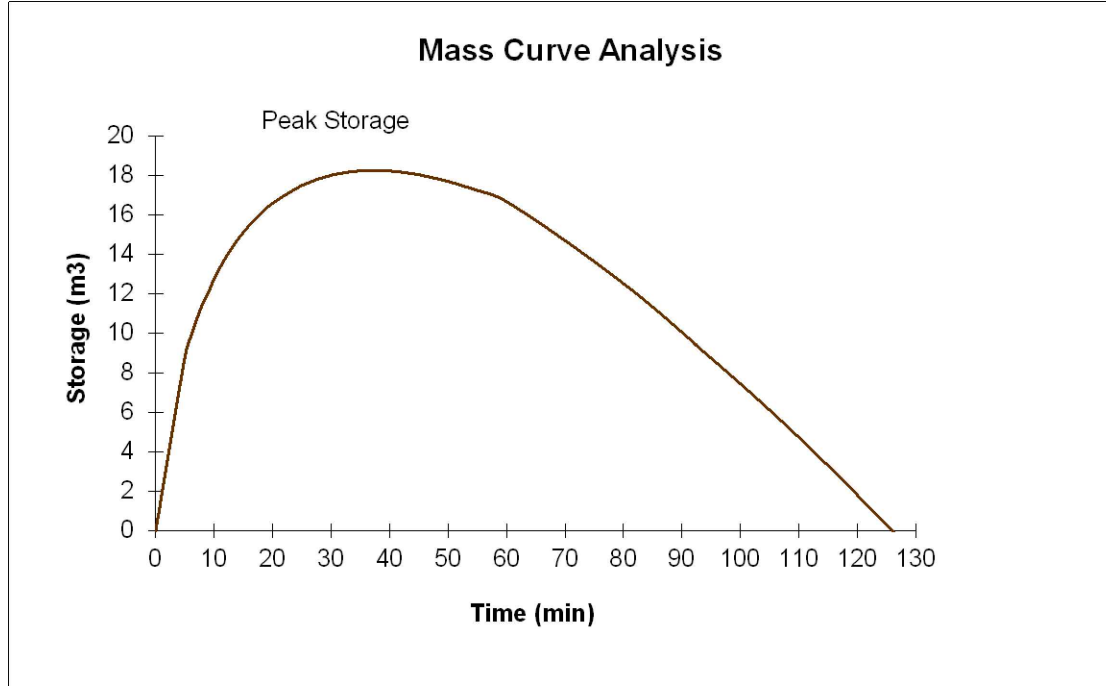
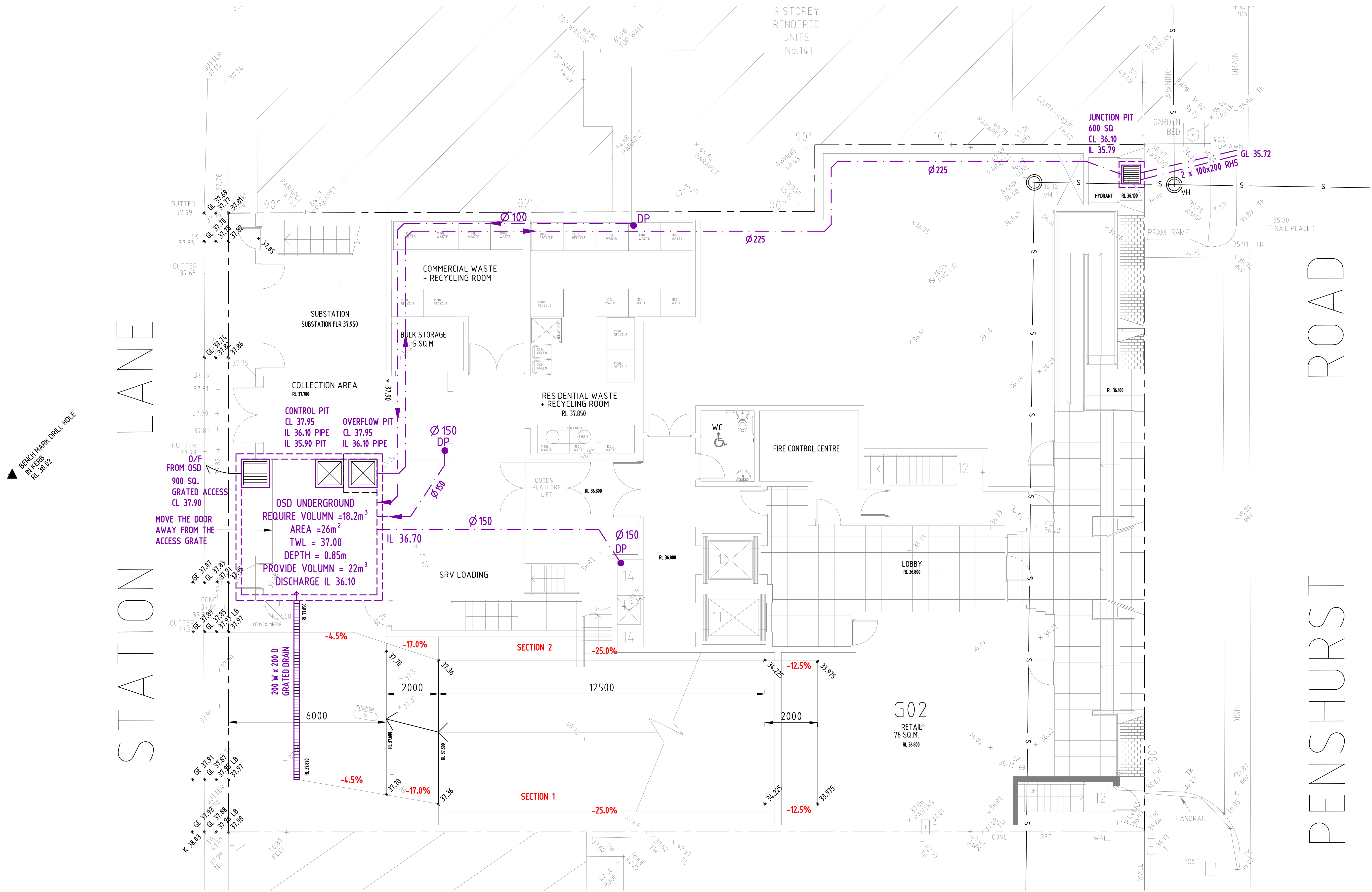
CONSTRUCTION ENTRY/EXIT DETAIL N.T.S



SEDIMENT FENCE DETAIL N.T.S.

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Detention Sizing Mass Curve Analysis				
Total A	860 m ²			
PSD	150 L/s/ha			
Qmax	7.74 L/s OSD Sizing	12.90 L/s Orifice Sizing		
Imp Area	860 m ²			
Fraction impervious	1.00			
10yr ARI 1hr duration	58			
C10	0.5389			
C10	0.9			
Area not inc	0			
Duration min	Runoff (L)	Pump out	Storage(m³)	Intensity (mm/hr)
0	0	0	0	
5	11.2	2.3	8.9	173.47
6	12.6	2.8	9.8	183.2
7	14.0	3.3	10.7	154.6
8	15.2	3.7	11.5	147.24
9	16.3	4.2	12.1	140
10	17.4	4.6	12.8	135.15
11	18.5	5.1	13.4	130.1
12	19.4	5.6	13.9	125.54
13	20.4	6.0	14.3	121.42
14	21.2	6.5	14.7	117.65
15	22.1	7.0	15.1	114.19
16	22.9	7.4	15.5	111
17	23.7	7.9	15.8	108.04
18	24.4	8.4	16.1	105.29
20	25.9	9.3	16.6	100.33
25	29.1	11.6	17.5	90.28
30	32.0	13.9	18.0	82.57
35	34.5	16.3	18.2	76.41
40	36.8	18.6	18.2	71.34
45	38.9	20.9	18.0	67.09
50	40.9	23.2	17.7	63.46
55	42.8	25.5	17.2	60.31
60	44.5	27.9	16.7	57.55
75	48.5	34.8	15.6	50.09
90	51.8	41.8	10.0	44.65
120	57.5	55.7	1.8	37.16
180	66.4	83.6	-17.2	28.59
240	73.4	111.5	-38.0	23.72
300	79.5	139.3	-59.9	20.53

DESIGN SUMMARY

QUANTITY	VALUE
SITE AREA	860m ²
IMPERVIOUS POST-DEVELOPMENT	100%
AREA DRAINED TO THE CONTROL PIT (%)	100%
PERMISSIBLE SITE DISCHARGE @ 10yr. ARI.	12.90L/s
REQUIRED STORAGE @ 10yr. ARI.	18.20m ³
STORAGE PROVIDED DESIGN	22.00m ³

On Site-Defention (Contributing Area 100 % of site)

CONTROL PIPE IL RL. 36.10

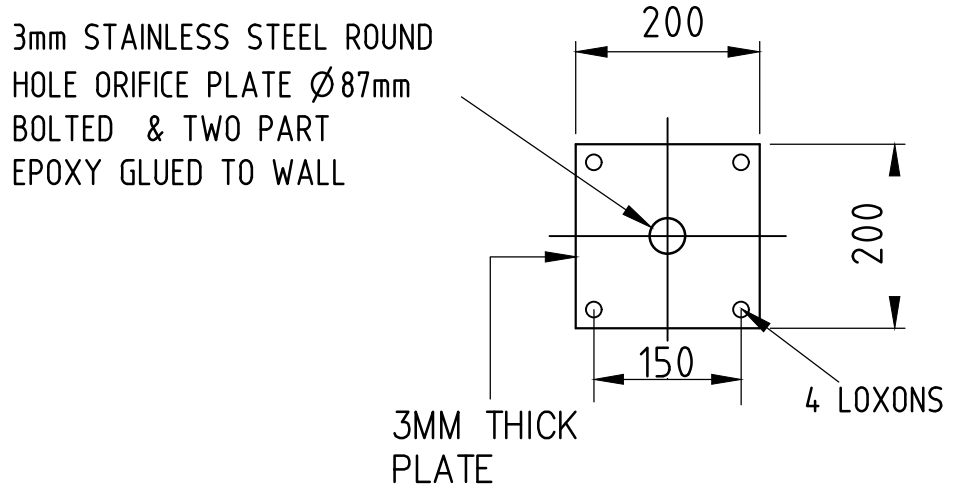
ORIFICE PLATE DIAMETER 87mm

$Q_{max} = C_d \times A \times (2 \times g \times h)^{0.5}$ $C_d = 0.80$
 $Q_{max} = 1.67 \times \text{weir Length} \times (\text{Flow depth over weir})^{1.5}$

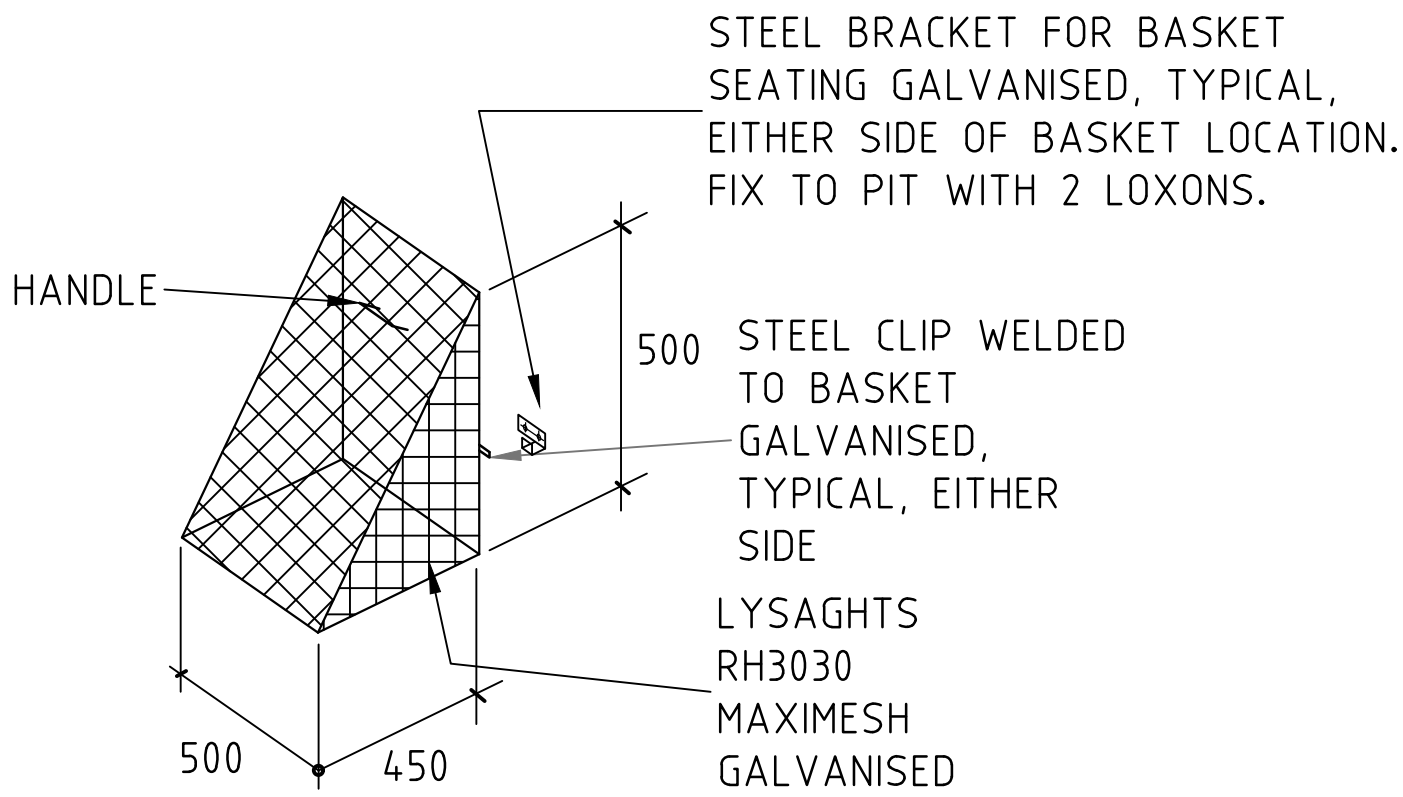
ARI	Required Discharge (L/s)	Required Volume (m ³)	Top Water Level (RL)	Control Discharge 10ARI (L/s)	O/F Discharge 100ARI (L/s)	Total Discharge (L/s)
10	12.90	18.20	37.00	12.90	60-12.9=47.1	60.00

GROUND FLOOR DRAINAGE PLAN SCALE - 1:100

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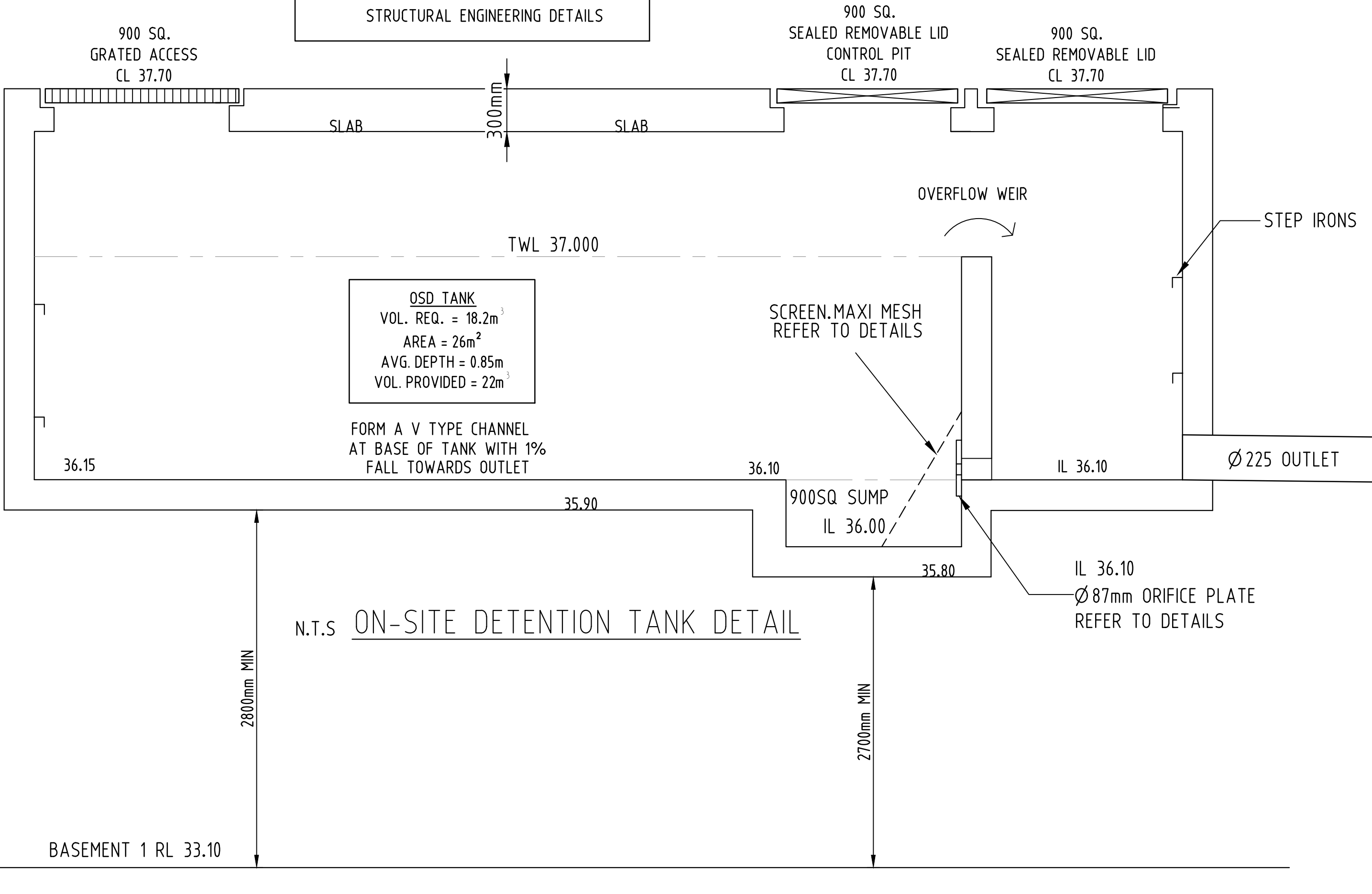


ORIFICE PLATE N.T.S

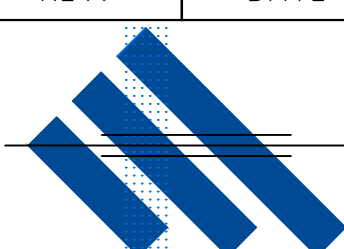


SCREEN DETAIL N.T.S

PROVIDE AT ACCESS CONFINED SPACE
WARNING SIGN AS PER COUNCIL REQUIREMENT
PROVIDE J TYPE CHILD PROOF LOCKS
ON ALL TANK GRATES
CONSTRUCT TANK TO
STRUCTURAL ENGINEERING DETAILS



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