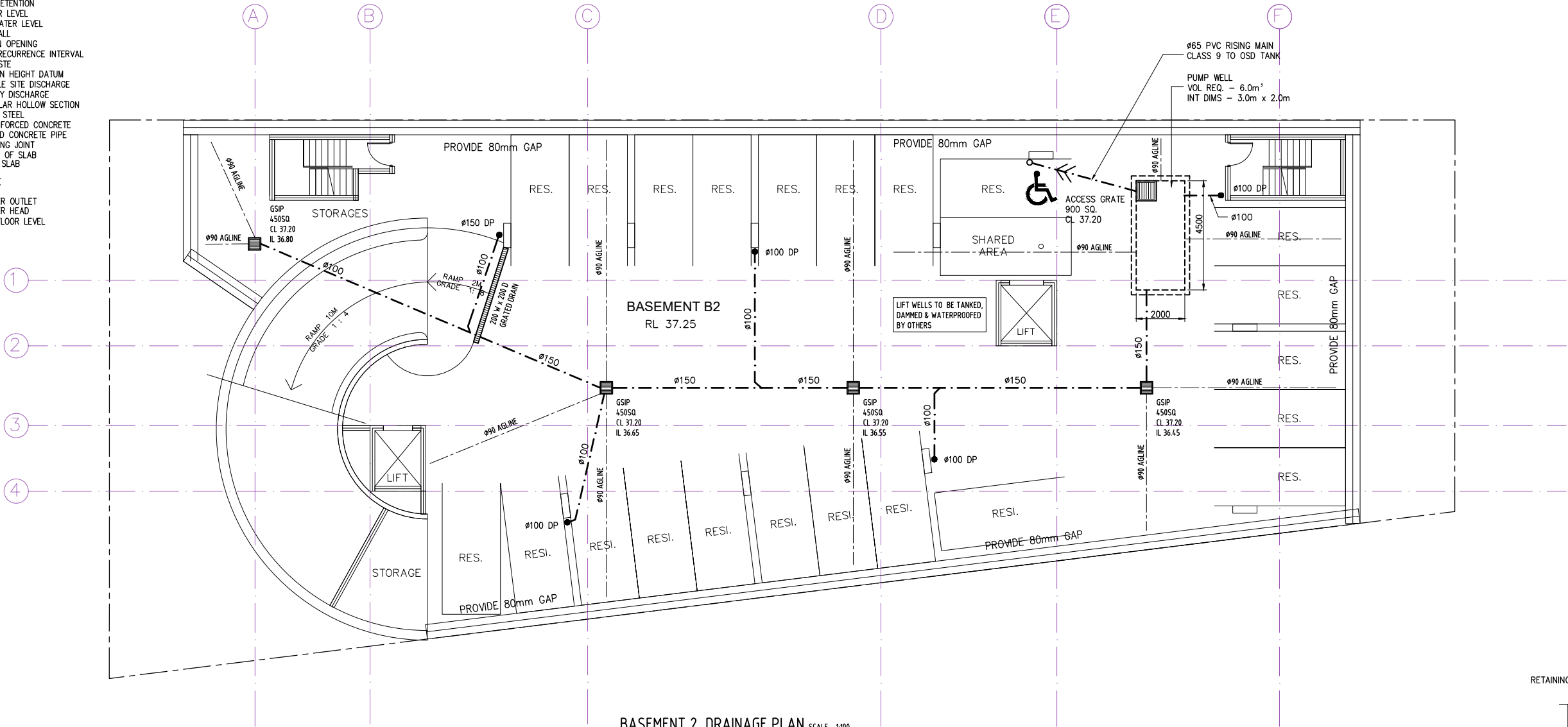


LEGEND

- RL REDUCED LEVEL
CL COVER LEVEL
IL INVERT LEVEL
GSP GRATED SURFACE INLET PIT
OSD ON-SITE DETENTION
TWL TOP WATER LEVEL
BWL BOTTOM WATER LEVEL
TW TOP OF WALL
IO INSPECTION OPENING
ARI AVERAGE RECURRENCE INTERVAL
FW FLOOR WASTE
AHD AUSTRALIAN HEIGHT DATUM
PSD PERMISSIBLE SITE DISCHARGE
HED HIGH EARLY DISCHARGE
RHS RECTANGULAR HOLLOW SECTION
SS STAINLESS STEEL
FRC FIBER REINFORCED CONCRETE
RCP REINFORCED CONCRETE PIPE
RRJ RUBBER RING JOINT
U/S UNDERSIDE OF SLAB
O/S OVER THE SLAB
O/F OVERFLOW
DP DOWN PIPE
DROPPER
RWO RAIN WATER OUTLET
RWH RAIN WATER HEAD
FFL FINISHED FLOOR LEVEL



BASEMENT 2 DRAINAGE PLAN SCALE - 1:100

- ALL GUTTERS TO BE MINI-LINE MINIMUM SIZE TO ARCHITECTURAL SPECIFICATION OR AS NOTED ON PLAN.
ALL GUTTERS TO BE PROVIDED WITH LEAF GUARD.
ALL BALCONIES ARE TO HAVE A 65mm DIAMETER OVERFLOW PIPE OR AND 80mm SQUARE OPENING ACTING AS AN OVERFLOW.
ALL DOWNPIPES TO BE 100mm DIAMETER OR 100 x 75mm MIN. TO ARCHITECTURAL SPECIFICATIONS OR AS NOTED ON PLAN.
PROVIDE AG. LINES BEHIND ALL RETAINING WALLS AND SUBSOIL DRAINAGE AS PER STRUCTURAL ENGINEERING DETAILS. ALL LINES TO DRAIN TO PITS.

- * DENOTES PROPOSED LEVEL
X 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 (5.5m) 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 (72m²)
Storage must be provided for a blackout of at least 2hrs, the 100yrs ARI 2hr storm runoff is:
 $Q = F \times C \times I \times A$
 $= 1/3600 \times 1 \times 60 \times 72$
 $= 1.20 \text{ L/s}$

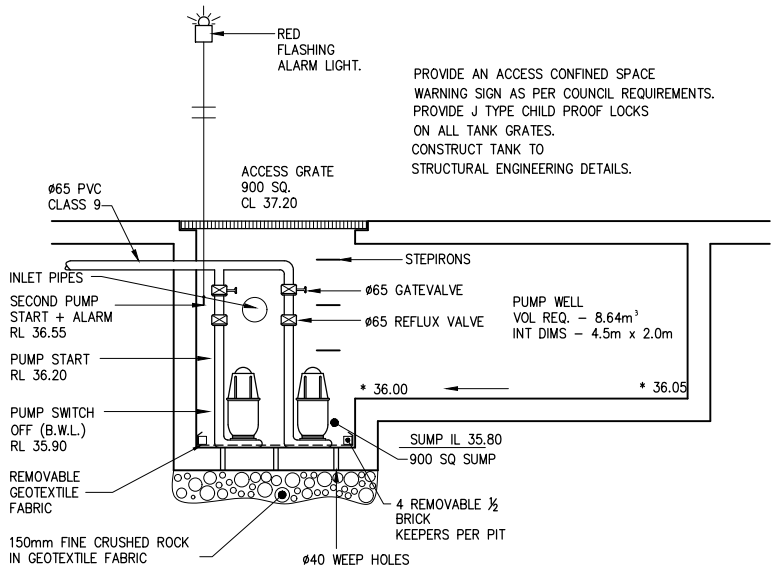
Volume accumulated:
 $V = (1.20 \text{ L/s} \times 2 \text{ hrs} \times 3600 \text{ s}) / 1000$
 $= 8.64 \text{ m}^3$

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.
 $Q = F \times C \times I \times A$
 $= 1/3600 \times 1 \times 207 \times 72$
 $= 4.14 \text{ L/s}$

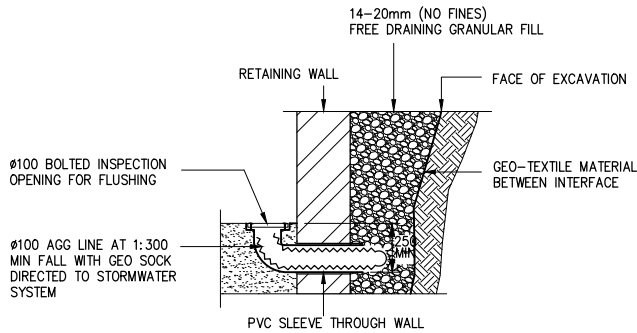
A Control volume is required to prevent the pump from starting too often (< 10/hr)
 $CV = 900 \times Q_p / n$
 $= (900 \times 4.14) / (10 \times 1000)$
 $= 0.38 \text{ m}^3$

Garage Pumping Duty Calculation.(Q = 4.14 L/s)

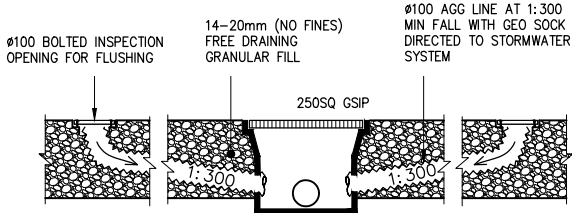
ITEM	HEAD
Static Adjustment	8.5m
65mm Pump Fittings EL 25m (1.2m/100)	0.3m
65mm PVC Class 9 EL 30m (1.2m/100)	0.4m
Sundries(about 10%)	0.5m
Total	10.0m



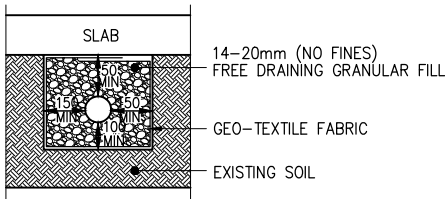
BASEMENT PUMPING SYSTEM N.T.S.



I.O. THROUGH WALL DRAINAGE DETAIL N.T.S.



I.O. TO INSPECTION PIT DETAIL N.T.S.



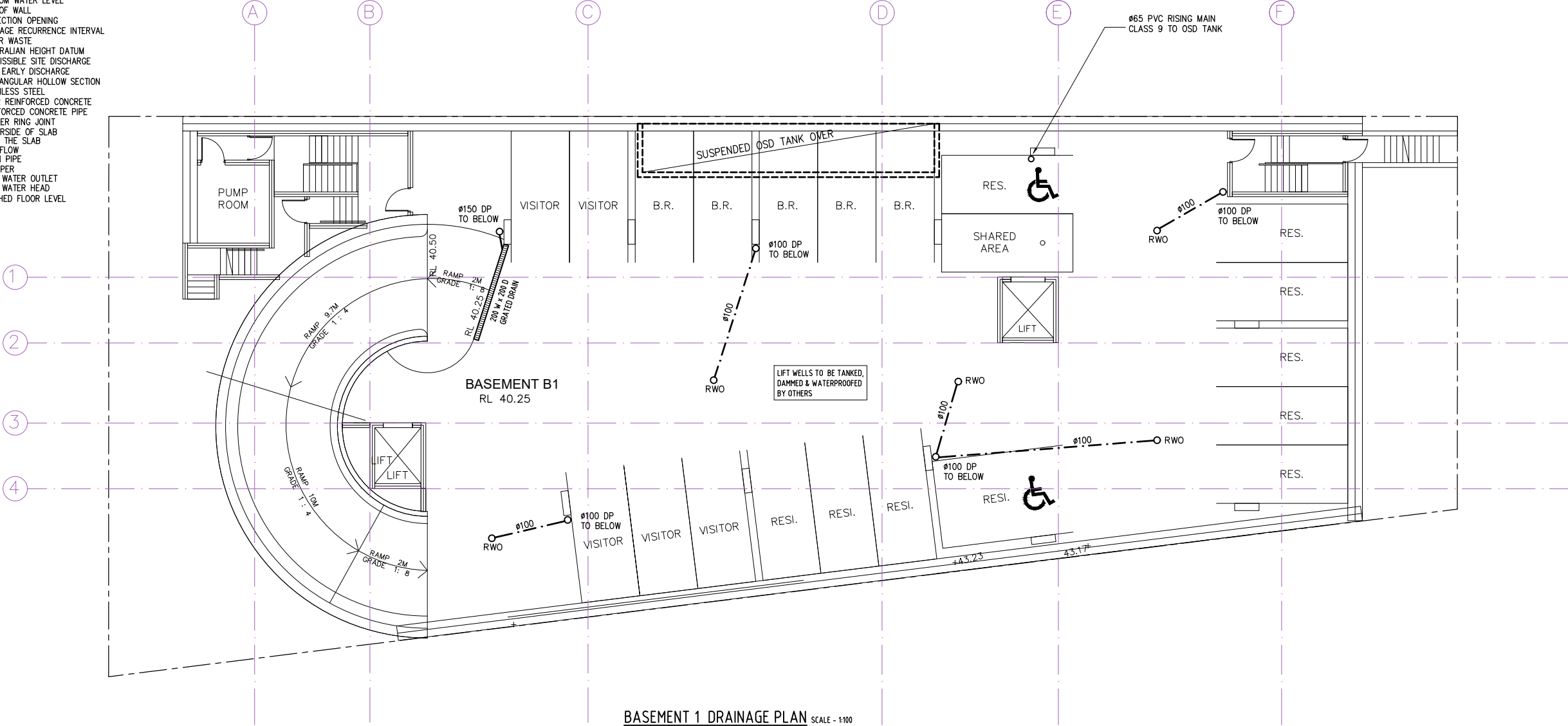
STORMWATER TRENCH DETAILS N.T.S.

NOT FOR CONSTRUCTION

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B			
A	10.11.2021	ISSUED FOR APPROVAL	AV
REV.	DATE	AMENDMENT DESCRIPTION	DRAWN
JOHN ROMANOUS & ASSOCIATES PTY. LTD. CONSULTING CIVIL & STRUCTURAL ENGINEERS SUITE 2D / 322 KINGSGROVE RD, KINGSGROVE NSW 2208 Ph (02) 83 87 68 26			
PROPOSED DEVELOPMENT AT: 51 DRUMMOND ST, BELMORE (CONCEPT)			
BASEMENT 2 DRAINAGE PLAN AND DETAILS			
DRAWN	CHECKED	SCALE	DATUM
AV	D.M.ROMANOUS (B.E., M.A.E.AUST.	AS SHOWN @A1	A.H.D
2276 - S1/5			REV. A

LEGEND

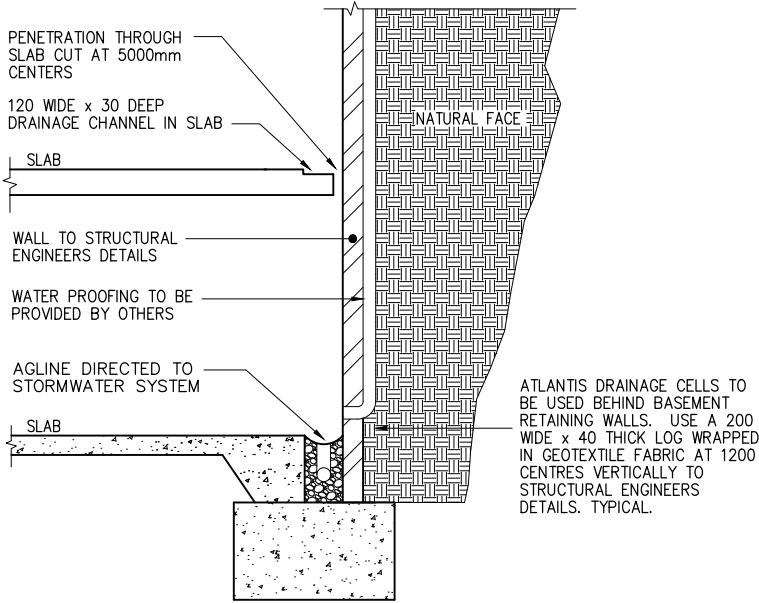
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U/S UNDERSIDE OF SLAB
O/S OVER THE SLAB
DP DOWN PIPE
DROPPER
RWO RAIN WATER OUTLET
RWH RAIN WATER HEAD
FFL FINISHED FLOOR LEVEL



BASEMENT 1 DRAINAGE PLAN SCALE - 1:100

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- - - PROPOSED STORMWATER PIPE



ATLANTIS WALL DRAIN DETAIL N.T.S.

NOTES – CHARGED LINE

THE FOLLOWING MAINTENANCE WORK MUST BE UNDERTAKEN TO ENSURE THE DRAINAGE SYSTEM FUNCTIONS SATISFACTORY.
- INSPECTION/FLUSH LINE/CLEANING WITH WATER EVERY 6 MONTHS AND AFTER HEAVY RAINFALL.
- INSPECTION/CLEANING GUTTERS AT LEAST ONCE A YEAR AND AFTER HEAVY RAINFALL OR STRONG WIND.
THE ABOVE IS FOR GUIDANCE ONLY. AN ASSESSMENT OF MAINTENANCE REQUIREMENTS SHOULD BE UNDERTAKEN WHEN IN SERVICE.
ALL DOWN PIPES MUST BE uPVC WITH CEMENT SOLVENT SEALED JOINTS TO 1000mm ABOVE THE PERMANENT WATER LINE, OR ALL THE WAY UP TO THE UNDERSIDE OF THE EAVES. A SQUARE/CIRCULAR SECTION MAY THEN OCCUR. (REFER DETAILS)
PROVIDE AN INSPECTION OPENING (IO.) AND 2mm SLOW RELEASE HOLE AT THE END OF THE CHARGED LINE. (REFER DETAILS)

NOT FOR CONSTRUCTION

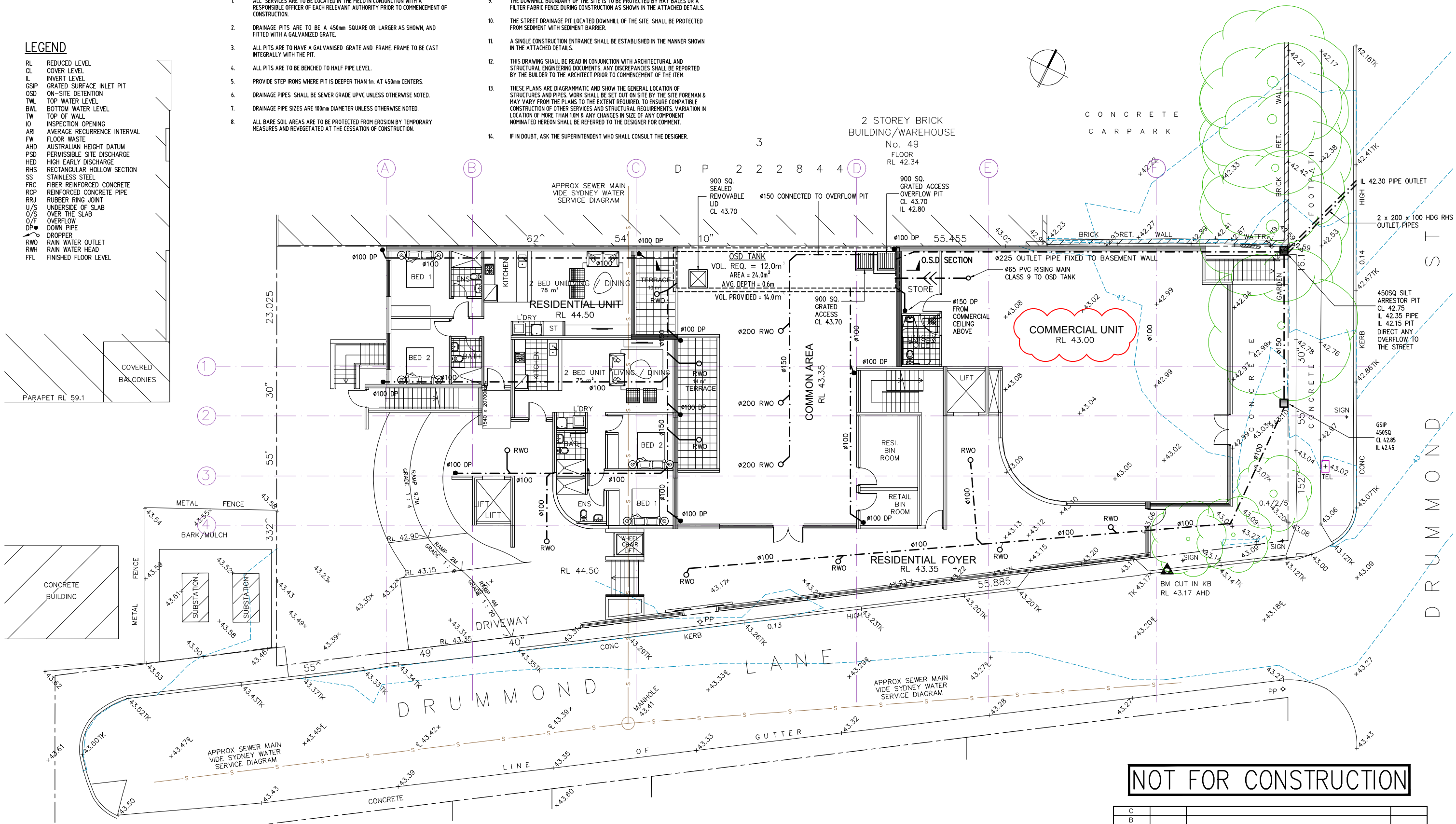
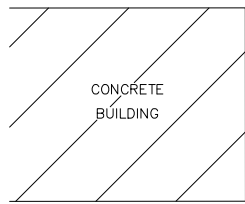
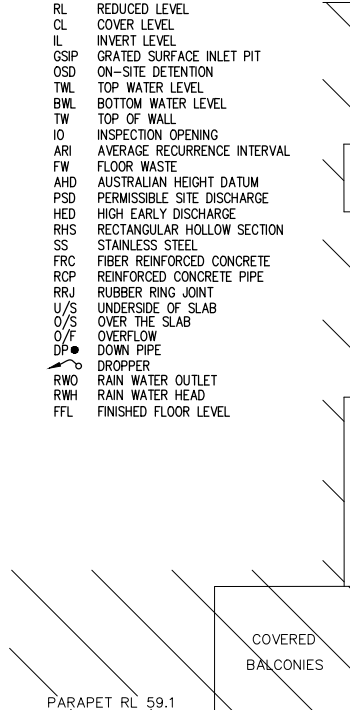
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A	10.11.2021	ISSUED FOR APPROVAL		AV
REV.	DATE	AMENDMENT DESCRIPTION		DRAWN
JOHN ROMANOUS & ASSOCIATES PTY. LTD. CONSULTING CIVIL & STRUCTURAL ENGINEERS ACN 054 595 005 SUITE 2D / 322 KINGSGROVE RD, KINGSGROVE NSW 2208 Ph (02) 83 87 68 26				
PROPOSED DEVELOPMENT AT: 51 DRUMMOND ST, BELMORE (CONCEPT)				
BASEMENT 1 DRAINAGE PLAN AND DETAILS				
DRAWN	CHECKED	SCALE	DATUM	DRAWING No.
AV	D.M.ROMANOUS (B.E., M.A.E.AUST.	AS SHOWN @A1	A.H.D	2276 – S2/5
				REV. A

GENERAL NOTES:

- ALL SERVICES ARE TO BE LOCATED IN THE FIELD IN CONJUNCTION WITH A RESPONSIBLE OFFICER OF EACH RELEVANT AUTHORITY PRIOR TO COMMENCEMENT OF CONSTRUCTION.
- DRAINAGE PITS ARE TO BE A 450mm SQUARE OR LARGER AS SHOWN, AND FITTED WITH A GALVANIZED GRATE.
- ALL PITS ARE TO HAVE A GALVANISED GRATE AND FRAME. FRAME TO BE CAST INTEGRALLY WITH THE PIT.
- ALL PITS ARE TO BE BENCH TO HALF PIPE LEVEL.
- PROVIDE STEP IRONS WHERE PIT IS DEEPER THAN 1m. AT 450mm CENTERS.
- DRAINAGE PIPES SHALL BE SEWER GRADE UPVC UNLESS OTHERWISE NOTED.
- DRAINAGE PIPE SIZES ARE 100mm DIAMETER UNLESS OTHERWISE NOTED.
- ALL BARE SOIL AREAS ARE TO BE PROTECTED FROM EROSION BY TEMPORARY MEASURES AND REVEGETATED AT THE CESSATION OF CONSTRUCTION.
- 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.
- THE STREET DRAINAGE PIT LOCATED DOWNHILL OF THE SITE SHALL BE PROTECTED FROM SEDIMENT WITH SEDIMENT BARRIER.
- A SINGLE CONSTRUCTION ENTRANCE SHALL BE ESTABLISHED IN THE MANNER SHOWN IN THE ATTACHED DETAILS.
- THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ARCHITECTURAL AND STRUCTURAL ENGINEERING DOCUMENTS. ANY DISCREPANCIES SHALL BE REPORTED BY THE BUILDER TO THE ARCHITECT PRIOR TO COMMENCEMENT OF THE ITEM.
- THESE PLANS ARE DIAGRAMMATIC AND SHOW THE GENERAL LOCATION OF STRUCTURES AND PIPES. WORK SHALL BE SET OUT ON SITE BY THE SITE FOREMAN & MAY VARY FROM THE PLANS TO THE EXTENT REQUIRED. TO ENSURE COMPATIBLE CONSTRUCTION OF OTHER SERVICES AND STRUCTURAL REQUIREMENTS. VARIATION IN LOCATION OF MORE THAN 1.0M & ANY CHANGES IN SIZE OF ANY COMPONENT NOMINATED HEREON SHALL BE REFERRED TO THE DESIGNER FOR COMMENT.
- IF IN DOUBT, ASK THE SUPERINTENDENT WHO SHALL CONSULT THE DESIGNER.

LEGEND

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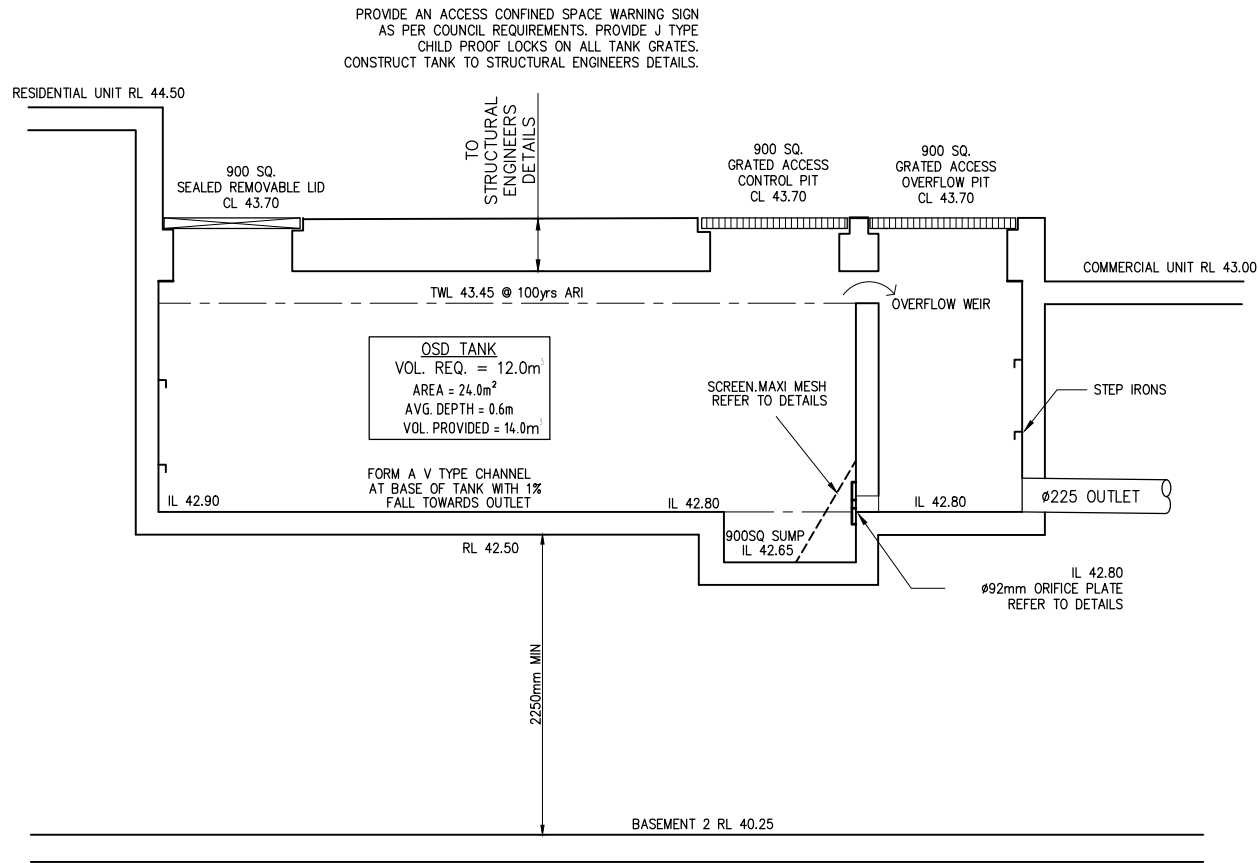


GROUND FLOOR DRAINAGE PLAN SCALE - 1:100

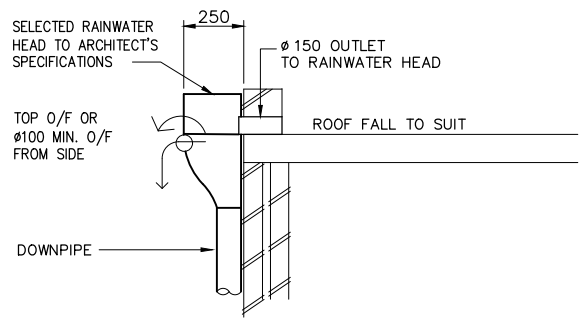
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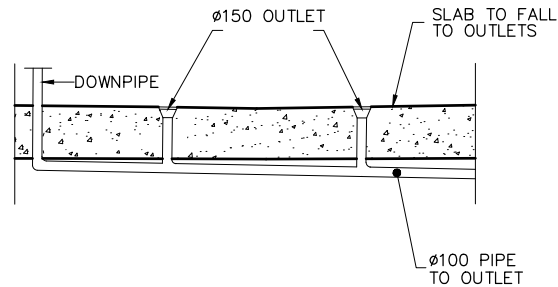
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JOHN ROMANOUS & ASSOCIATES CONSULTING CIVIL & STRUCTURAL ENGINEERS PTY. LTD. ACN 054 595 005 SUITE 2D / 322 KINGSGROVE RD, KINGSGROVE NSW 2208 Ph (02) 83 87 68 26			
PROPOSED DEVELOPMENT AT: 51 DRUMMOND ST, BELMORE (CONCEPT)			
GROUND FLOOR DRAINAGE PLAN AND DETAILS			
DRAWN	CHECKED	SCALE	DATUM
AV	D.M.ROMANOUS (B.E., M.A.E.AUST.	AS SHOWN @A1	A.H.D
DRAWING No. 2276 - S3/5			REV. A



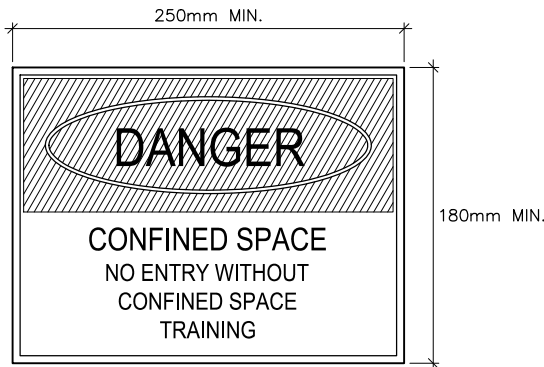
ON-SITE DETENTION TANK DETAIL N.T.S



TYPICAL RAIN WATER HEAD DETAIL N.T.S



TERRACE OUTLET DETAIL (FW) N.T.S.



COLOURS:
'DANGER' AND BACKGROUND - WHITE
ELLIPTICLE AREA - RED
RECTANGLE CONTAINING ELLIPSE - BLACK
OTHER LETTERING AND BORDER - BLACK

CONFINED SPACE DANGER SIGN N.T.S

- 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.
- MINIMUM DIMENSIONS OF THE SIGN
 - 300mm x 450mm (LARGE ENTRIES, SUCH AS DOORS)
 - 250mm x 180mm (SMALL ENTRIES SUCH AS GRATES & MANHOLES)
- THE SIGN SHALL BE MANUFACTURED FROM COLOUR BONDED ALUMINUM OR POLYPROPYLENE.
- SIGN SHALL BE AFIXED USING SCREWS AT EACH CORNER OF THE SIGN.

DESIGN SUMMARY

QUANTITY	VALUE
SITE AREA	1086m ²
IMPERVIOUS POST-DEVELOPMENT	87%
AREA DRAINED TO THE CONTROL PIT (%)	80%
PERMISSIBLE SITE DISCHARGE @ 10yr. ARI.	16.3L/s
REQUIRED STORAGE @ 10yr. ARI.	12.0m ³
STORAGE PROVIDED DESIGN	12.0m ³

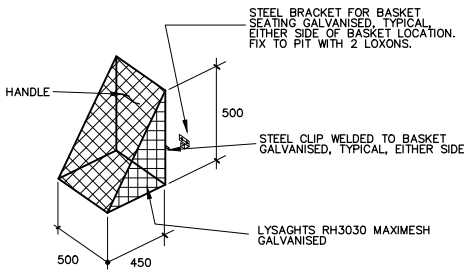
On Site-Detention (Contributing Area 80% of site)

ORIFICE IL RL. 42.80
ORIFICE PLATE DIAMETER 92mm

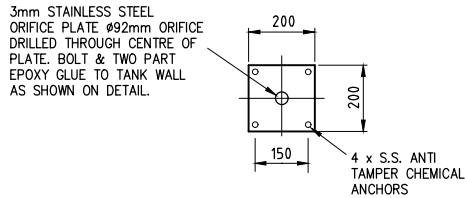
$$Q_{max} = C_d \times A \times (2 \times g \times h)^{0.5} \quad C_d = 0.60$$

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	13.7	12.00	43.45	13.7	0	13.7

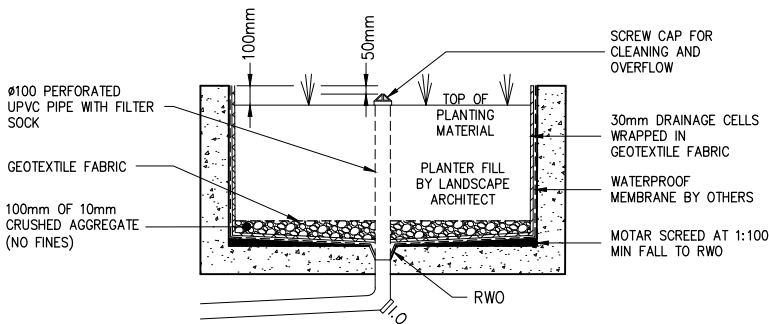
PSD HAS BEEN REDUCED TO 13.7 L/s TO ALLOW FOR AREA NOT DIRECTED TO THE OSD.



SCREEN DETAIL N.T.S



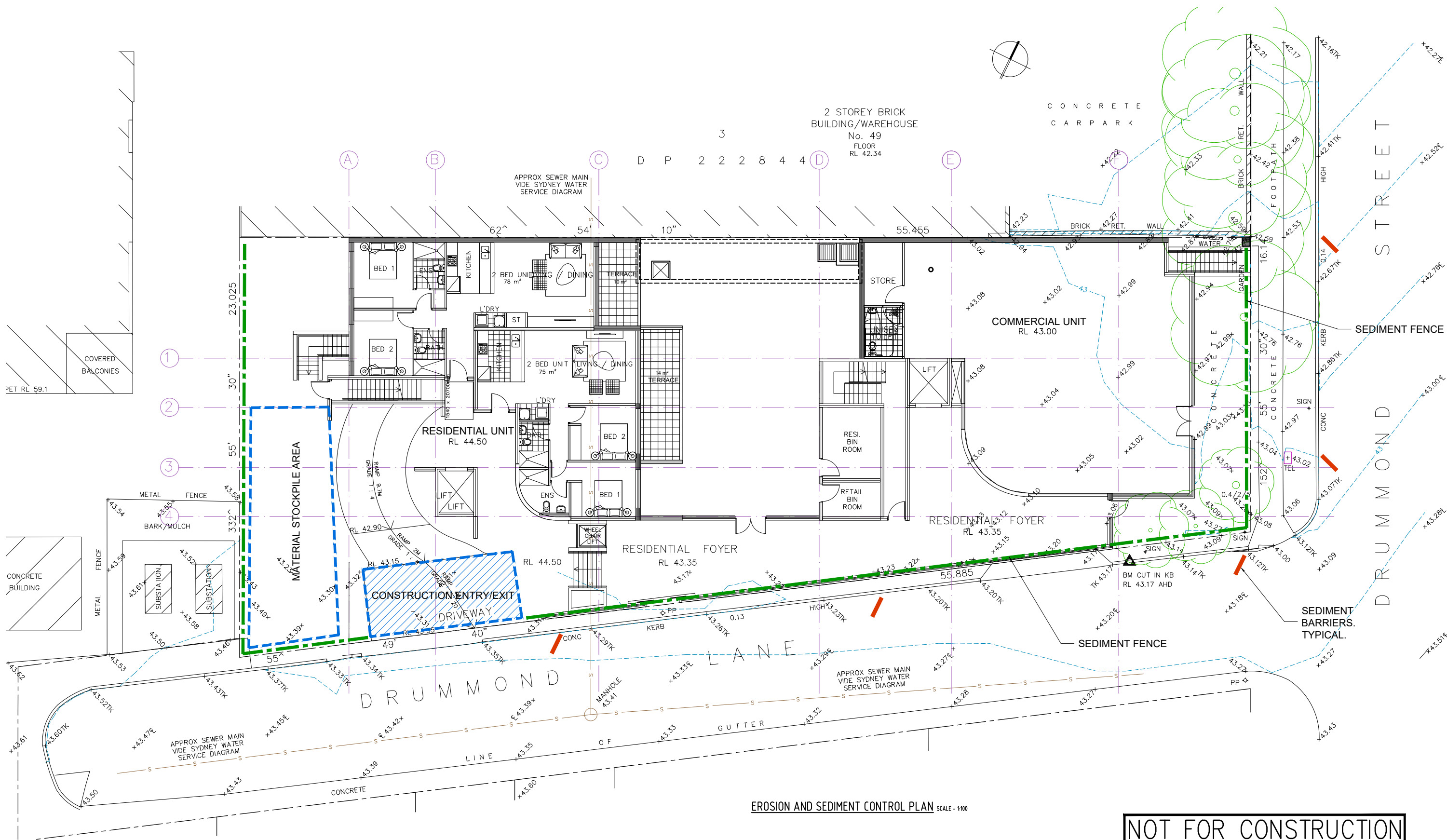
ORIFICE PLATE N.T.S



TYPICAL PLANTER DETAIL N.T.S.

NOT FOR CONSTRUCTION

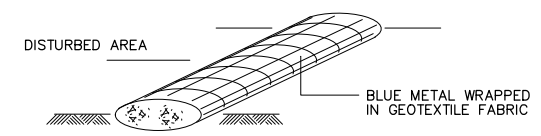
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DRAINAGE DETAILS			
DRAWN	CHECKED	SCALE	DATUM
AV	D.M.ROMANOUS (B.E., M.Eng., AUST.)	AS SHOWN @A1	A.H.D
DRAWING No. 2276 - S4/5			REV. A



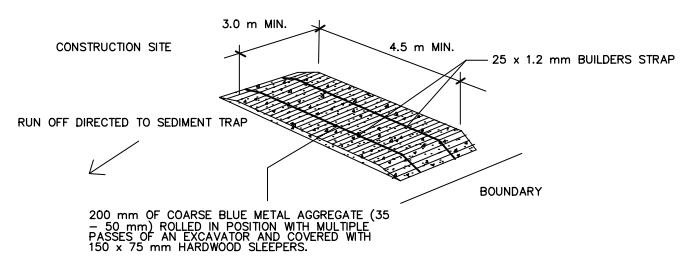
EROSION AND SEDIMENT CONTROL PLAN SCALE - 1:100

NOT FOR CONSTRUCTION

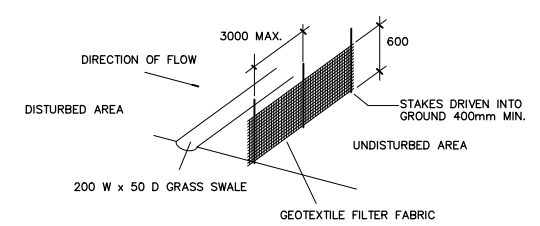
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SEDIMENT BARRIER N.T.S.



CONSTRUCTION ENTRY/EXIT DETAIL N.T.S.



SEDIMENT FENCE DETAIL N.T.S.