

STORMWATER DRAWINGS

FOR

17-23 GOULBURN STREET, LIVERPOOL, NSW

SYMBOLS

RL	PIT SURFACE LEVEL
IL	INVERT LEVEL
TK	TOP OF KERB
SV SV	STORMWATER DRAINAGE PIPE
RVT	DOWNPIPE TO RAINWATER TANK
SV	OVERFLOW PIPE FROM RAINWATER TANK
100	100 SUBSOIL PIPE
FW	FLOOR WASTE 150X150
FW	FLOOR WASTE 150
RWO	RAINWATER OUTLET 300
DP	DOWN PIPE
CO	CLEAN OUT
IO	INSPECTION OPENING
VD	VERTICAL DROP
VR	VERTICAL RISER
CONCRETE COVER JUNCTION PIT	
GRATED INLET PIT	
WIDE GRATED DRAIN	
OVERLAND FLOW PATH	

NOTES

- ALL LINES ARE TO BE MIN. 100 UPVC @ MIN 1.0% GRADE UNLESS NOTED OTHERWISE.
- IT IS THE CONTRACTORS RESPONSIBILITY TO LOCATE & LEVEL ALL EXISTING SERVICES PRIOR TO THE COMMENCEMENT OF ANY EARTHWORKS. ALL DESIGN LEVELS SHOWN ON PLAN SHALL BE VERIFIED ON SITE PRIOR TO THE COMMENCEMENT OF ANY WORK.
- ALL PIPES TO HAVE MIN 200mm COVER IF LOCATED WITHIN PROPERTY.
- ALL PITS IN DRIVEWAYS BE HEAVY DUTY GRATES. DIRECT SURFACE FLOW TO ALL GRATED SURFACE INLET PITS.
- ALL WORK DO BE DONE IN ACCORDANCE WITH AS/NZ 3500.3.2:1998 AND COUNCIL SPECIFICATIONS.
- LOCATION OF DOWNPIPES & FLOOR WASTES ARE INDICATIVE ONLY. DOWNPIPE & FLOOR WASTE SIZE, LOCATION & QUANTITY TO BE DETERMINED BY BUILDER & IN ACCORDANCE WITH RELEVANT AUSTRALIAN STANDARDS.
- THIS PLAN IS TO BE READ IN CONJUNCTION WITH THE ARCHITECTURAL, LANDSCAPE AND STRUCTURAL PLANS.
- ANY DISCREPANCIES OR OMISSIONS SHALL BE REFERRED TO THE DESIGN ENGINEER FOR RESOLUTION.
- ALL PITS OR GRATES IN TRAFFICABLE AREAS TO BE HEAVY DUTY.
- ALL GUTTERS WILL BE FITTED WITH LEAF GUARDS AND SHOULD BE INSPECTED AND CLEANED TO ENSURE LEAF LITTER CANNOT ENTER THE DOWNPIPES
- PROVIDE EMERGENCY OVERFLOW TO ALL PLANTER BOX AND BALCONIES.
- ALL PITS WITH DEPTH MORE THAN 1M MUST HAVE IRON STEPS.
- PROVIDE STORMWATER GRATE 200Wx200D AT THE BASE OF ALL MECHANICAL SHAFTS AND UNCOVERED STAIRS OR OPENINGS.
- ENSURE ALL DRAINAGE WORKS ARE AWAY FROM TREE ROOTS

LEGEND

REFER TO AS.3500.PART 3 TABLE 7.2
P1 : 100Ø UPVC PIPE AT 1.0% MIN. GRADE
P2 : 150Ø UPVC PIPE AT 1.0% MIN. GRADE
P3 : 225Ø UPVC PIPE AT 0.5% MIN. GRADE
P4 : 300Ø UPVC PIPE AT 0.4% MIN. GRADE
P5 : 375Ø UPVC PIPE AT 0.4% MIN. GRADE



AS 3500.3- TABLE 8.2
SIZE OF MINIMUM INTERNAL DIMENSIONS FOR STORMWATER AND INLET PITS

DEPTH OF INVERT OF OUTLET	MINIMUM INTERNAL DIMENSIONS (mm)		
	RECTANGULAR		CIRCULAR DIAMETER
	WIDTH	LENGTH	
≤600	450	450	600
>600 ≤900	600	600	900
>900 ≤1200	600	900	1000
>1200	900	900	1000

DRAWING SCHEDULE

DRAWING No.	DRAWING TITLE
D00	COVER SHEET, LEGEND & DRAWING SCHEDULE
D01	LOWER BASEMENT STORMWATER DRAINAGE PLAN
D02	UPPER BASEMENT STORMWATER DRAINAGE PLAN
D03	GROUND FLOOR STORMWATER DRAINAGE PLAN (SHEET 1 OF 2)
D04	GROUND FLOOR STORMWATER DRAINAGE PLAN (SHEET 2 OF 2)
D05	SITE STORMWATER DRAINAGE DETAILS 1
D06	SITE STORMWATER DRAINAGE DETAILS 2
D07	MUSIC MODEL AREA BREAKUP
D08	EROSION AND SEDIMENT CONTROL PLAN & DETAILS

A1 1 2 3 4 5 6 7 8 9 10										ARCHITECT										PROJECT										SHEET SUBJECT										PROJECT 17-23 GOULBURN STREET, LIVERPOOL, 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NOV 2015	M.L.	M.L.	O.C.
SCALE @ A1		JOB No	
1:100		150937	
AUTHORISED		DWG No	REV
Dr. Anthony Hasham		D01	A

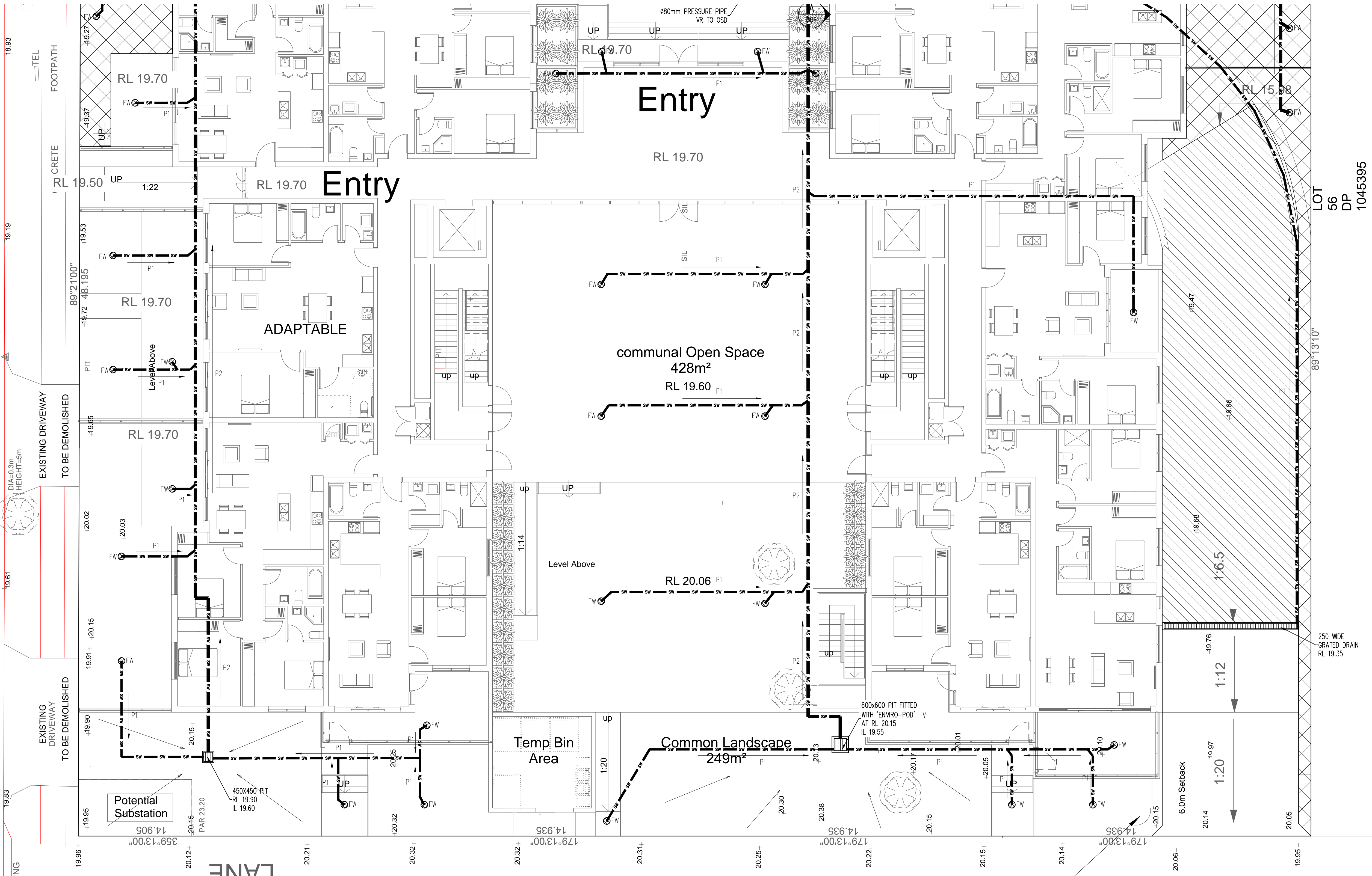


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1:100	150937		
AUTHORISED	DWG No		REV
Dr. Anthony Hasham	D02		A

STREET

LACHLAN

REFER TO D04 FOR CONTINUATION



ALL ROOF WATER TO BE CONNECTED TO RAIN WATER TANK PRIOR TO CONNECTION TO STORMFILTER CHAMBER/OSD.

ALL ENCLOSED AREAS/ PLANTER BOXES TO BE FITTED WITH FLOOR WASTES (FWs) AND DRAINED TO STORMFILTER CHAMBER PRIOR TO DRAINING TO OSD.

ALL INCOMING PIPES DRAINING TO OSD MUST BE DRAINED TO STORMFILTER CHAMBER PRIOR TO DRAINING TO OSD

DOWN PIPES TO BE CHECKED BY ARCHITECT AND PLUMBER PRIOR CONSTRUCTION.

AREA DRAINING TO BASEMENT = 155m²

AREA BYPASSING OSD = 196m² (6.8%)

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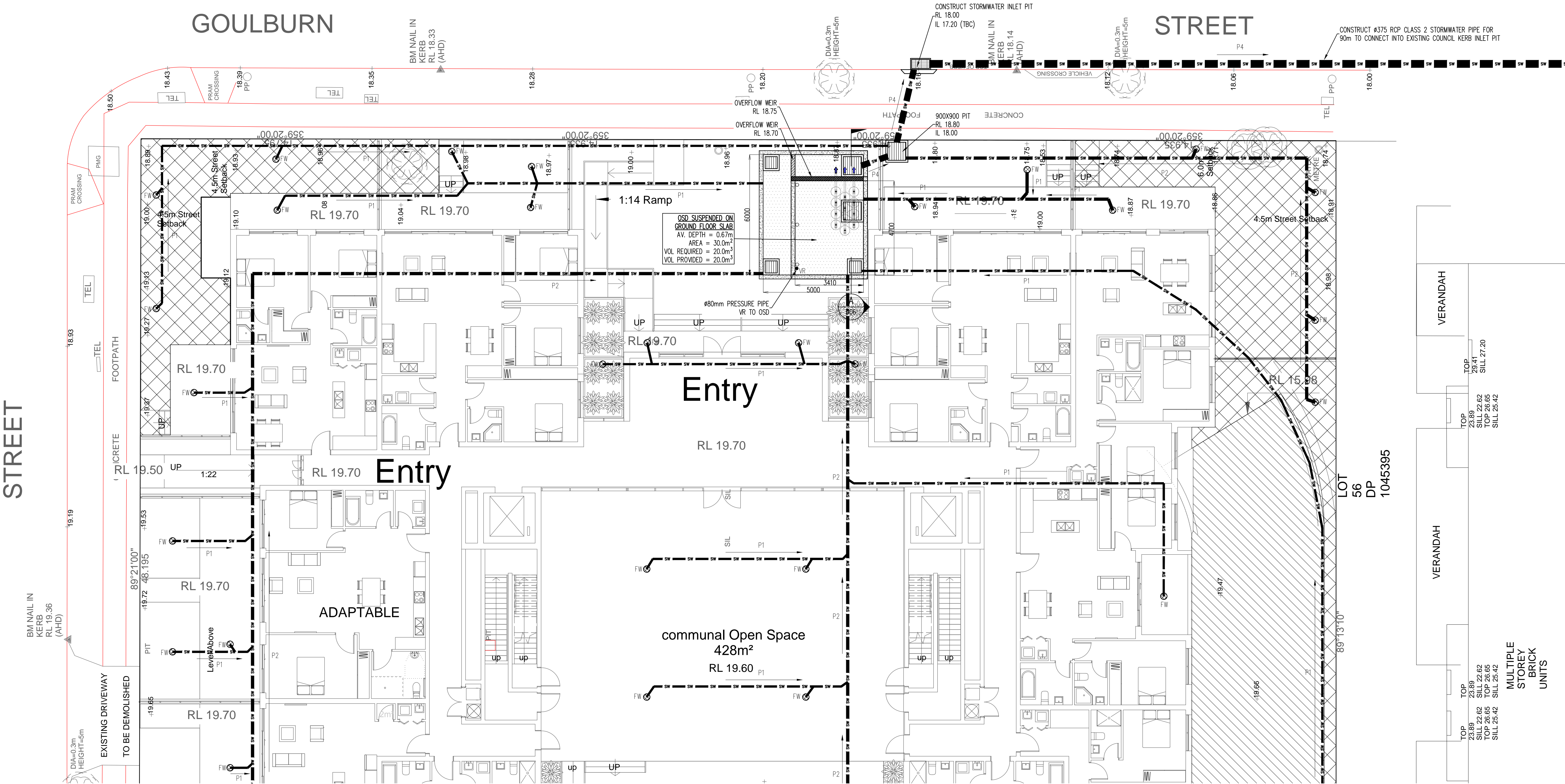
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A	FOR D.A. APPROVAL	O.C.	M.L.	16.11.15										

ARCHITECT

GUS FARES ARCHITECTS PTY LTD

ACN 112691237
Tel 02 9635 3638 Mob 0413 331 144
Suite 22, 103 George Street,
Parramatta NSW 2150
email: gus@faresearchitects.com web: www.gfaresearchitects.com
Nominated Architect: Chasson Fares Reg 5089

AUSTRALIAN CONSULTING ENGINEERS.

PTY LTD - A.C.N. 084 059 941
SHOP 2-141 CONCORD RD NORTH STRATHFIELD NSW 2157
PH: (02) 9763 1500 FX: (02) 9763 1515
EMAIL: info@aceeng.com.au

PROJECT

RESIDENTIAL FLAT BUILDING
17-23 GOULBURN STREET,
LIVERPOOL, NSW

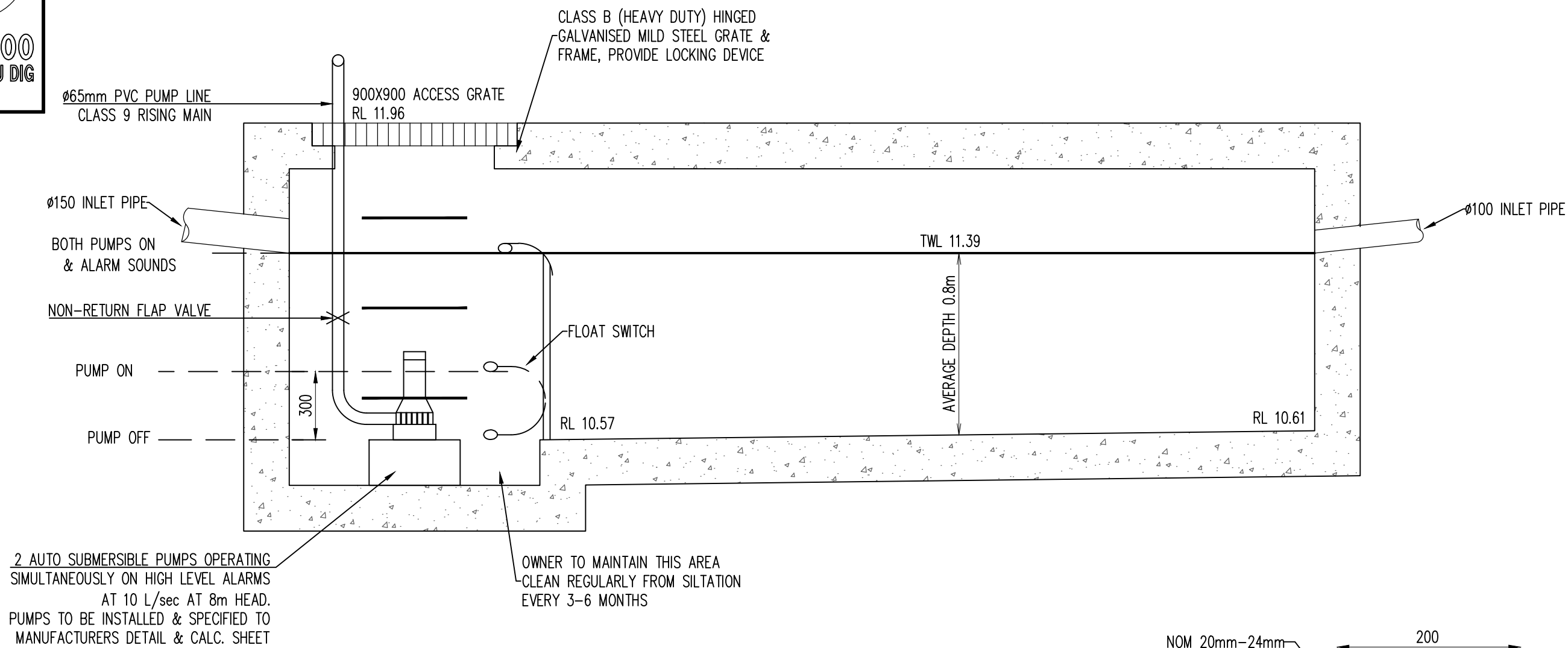
SHEET SUBJECT

GROUND FLOOR STORMWATER
DRAINAGE PLAN (SHEET 2 OF 2)

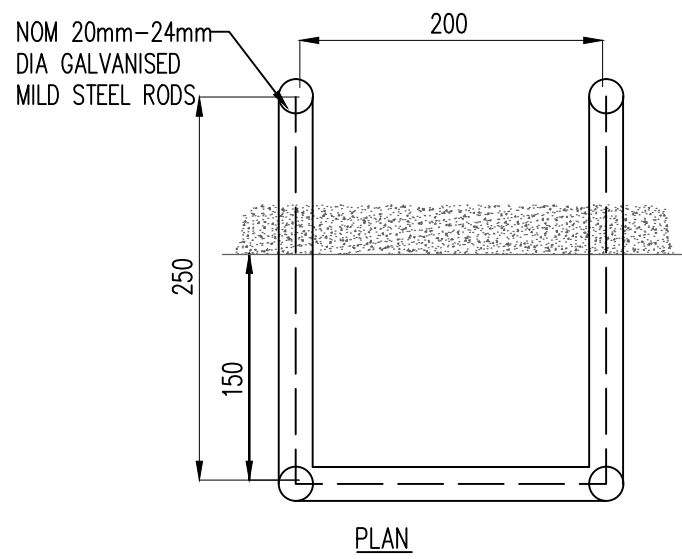
ARCH. REF:

PROJECT 17-23 GOULBURN STREET, LIVERPOOL, NSW

DATE	NOV 2015	DRAWN	M.L.	DESIGNED	M.L.	CHECKED	O.C.
SCALE	1:100	JOB No	150937				
AUTHORISED	Dr. Anthony Hasham		DWG No	D04		REV	A



A
D01 TYPICAL SECTION THROUGH PUMP PIT
SCALE 1:20



DETAIL
STEP IRONS
1:5

PUMP SPECIFICATIONS STANDARD PUMP-OUT NOTES

- THE PUMP-OUT SYSTEM IS DESIGNED TO WORK IN THE FOLLOWING MANNER -
1. THE PUMPS SHALL BE PROGRAMMED TO WORK ALTERNATELY SO AS TO ALLOW BOTH PUMPS TO HAVE EQUAL OPERATION LOAD & PUMP LIFE.
 2. A LOW LEVEL FLOAT SHALL BE PROVIDED TO ENSURE THAT 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.
 3. A SECOND FLOAT SHALL BE PROVIDED AT A HIGHER LEVEL, APPROXIMATELY 300mm ABOVE THE MINIMUM WATER LEVEL, WHEREBY ONE OF THE PUMPS WILL OPERATE & DRAIN THE TANK TO THE LEVEL OF THE LOW LEVEL FLOAT.
 4. A THIRD FLOAT SHALL BE PROVIDED AT A HIGH LEVEL, WHICH IS APPROXIMATELY THE ROOF LEVEL OF THE BELOW GROUND TANK. THIS FLOAT SHOULD START THE OTHER PUMP THAT IS NOT OPERATING & ACTIVATE THE ALARM.
 5. AN ALARM SYSTEM SHALL BE PROVIDED WITH A FLASHING STROBE LIGHT & 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.

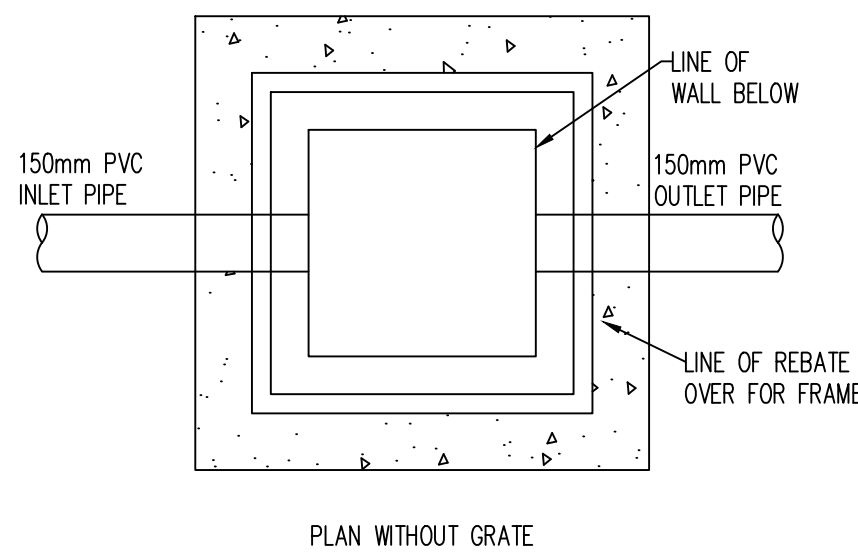
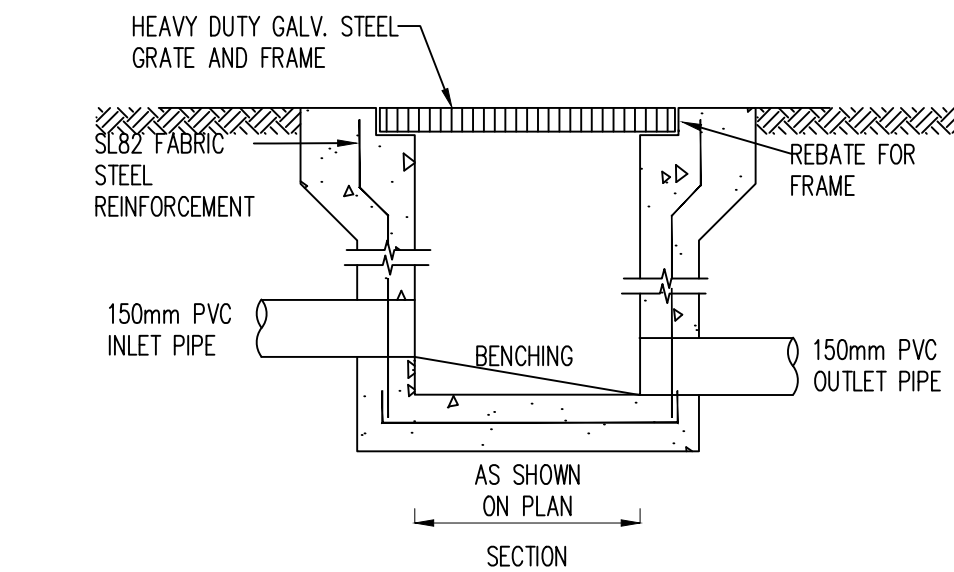
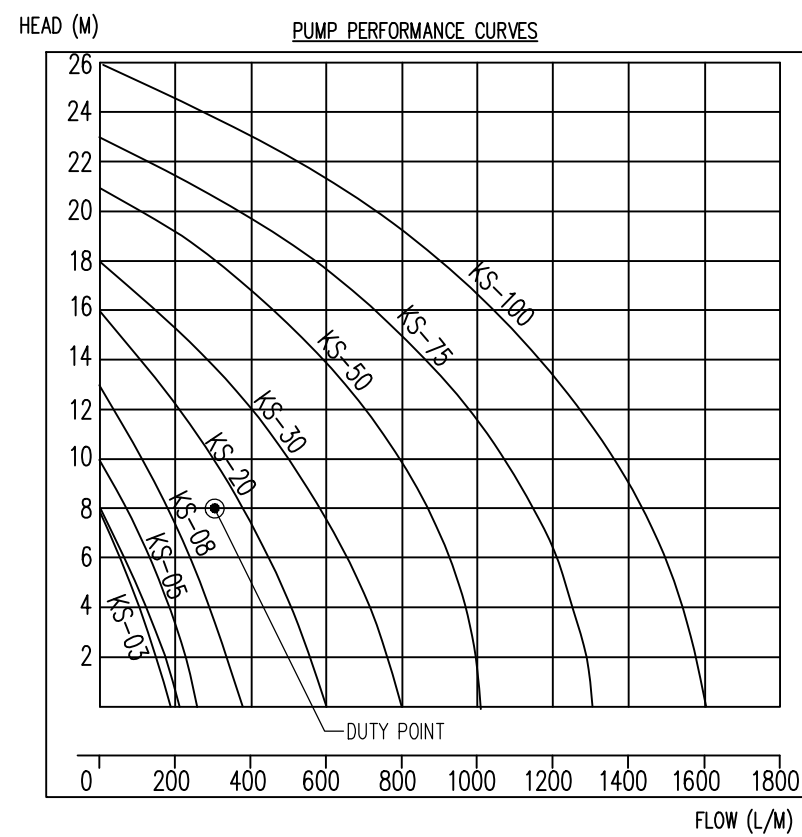
PUMP WELL DETAILS

AREA DRAINING TO SUMP= 155m²

SUMP SIZE BASED ON 100 YEAR 2 HR STORM, I= 45.4 mm/hr,
 $Q = CIA/3600 = 1 \times 45.4 \times 155 / 3600 = 1.95 \text{ L/sec}$
VOLUME REQUIRED = $1.95 \times (2 \times 60 \times 60) = 14040 \text{ L} = 14.04 \text{ m}^3$
STORAGE PROVIDED $4.5 \times 4.0 \times 0.8 = 14.40 \text{ m}^3$

PUMP OUT RATE BASED ON 100YR 6MIN STORM, I=208 mm/hr
 $Q = CIA/3600 = 1 \times 208 \times 155 / 3600 = 8.95 \text{ L/sec}$
(MIN RATE REQUIRED AS PER AS3500.3 IS 10 L/sec)
USE DUAL PUMPS SIMULTANEOUSLY AT 5 L/sec

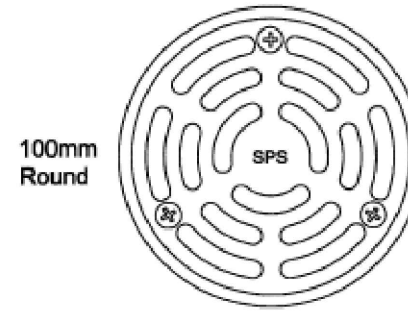
DUAL KS-20 PUMP OR EQUIVALENT TO BE INSTALLED IN SUMP AND CONNECTED TO CONTROL PANEL WHICH WILL ALLOW FOR THE PUMPS TO OPERATE SIMULTANEOUSLY ON HIGH LEVEL ALARMS AT 5.0 L/sec (PER PUMP) AT 8m HEAD



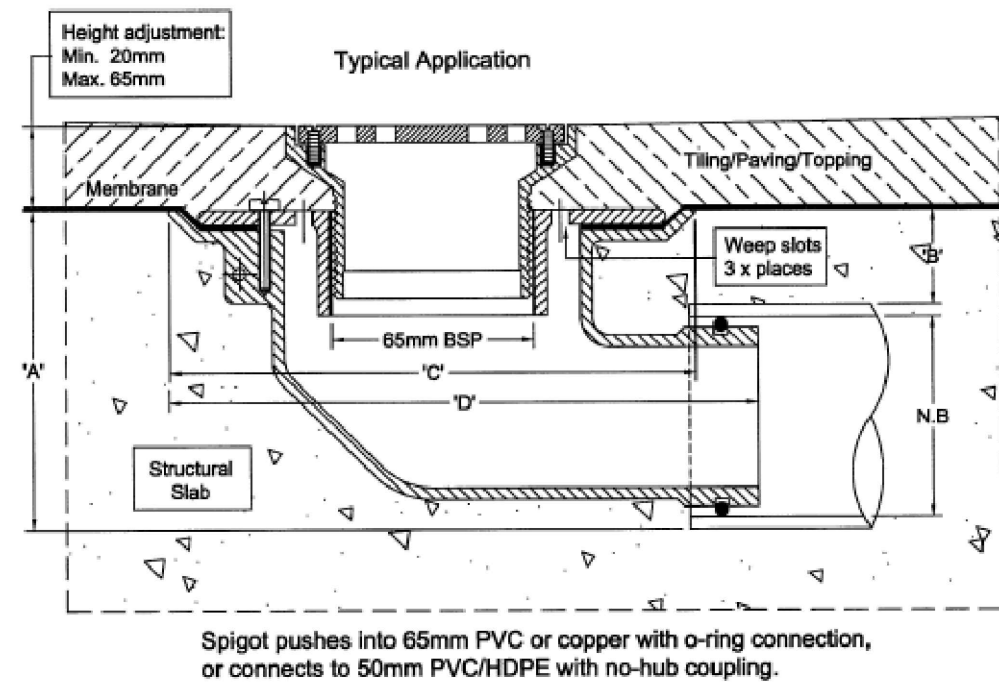
DETAIL
STORMWATER PIT
SCALE NTS

SPS 100mm Round Vari-Level Side Outlet Drain 65/50mm outlet

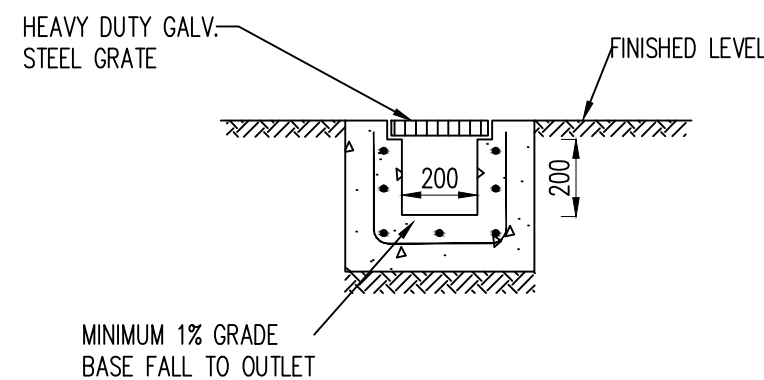
Specification code:
R100B/C90 (brass grate, ABS lower body)
R100N/C90 (nickel bronze grate, ABS lower body)
R100S4/C90 (polished 304 stainless steel, ABS lower body)
R100S/C90 (satin 316 stainless steel grate, ABS lower body)



- Round grate available in nickel bronze, 304 & 316 stainless Steel. Bronze non-stock option.
- ABS 90° Body and Reversible Membrane Clamp Collar with female 65mm BSP thread.



N.B.	A	B	C	D
50	100	40	180	200
65	105	37	180	200



DETAIL
GRADED TRENCH DRAIN
SCALE 1:20

WARNING
PUMP OUT SYSTEM
FAILURE IN BASEMENT
WHEN LIGHT IS FLASHING
AND SIREN SOUNDING

COLOURS :
WARNING - RED
BORDER AND OTHER - BLACK

NOTES:

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

A SUITABLE ALARM SYSTEM POSITIONED AT ENTRANCE OF BASEMENT CARPARK TO PROVIDE A FLOOD WARNING IN CASE OF PUMP FAILURE (TO COUNCILS SPEC).

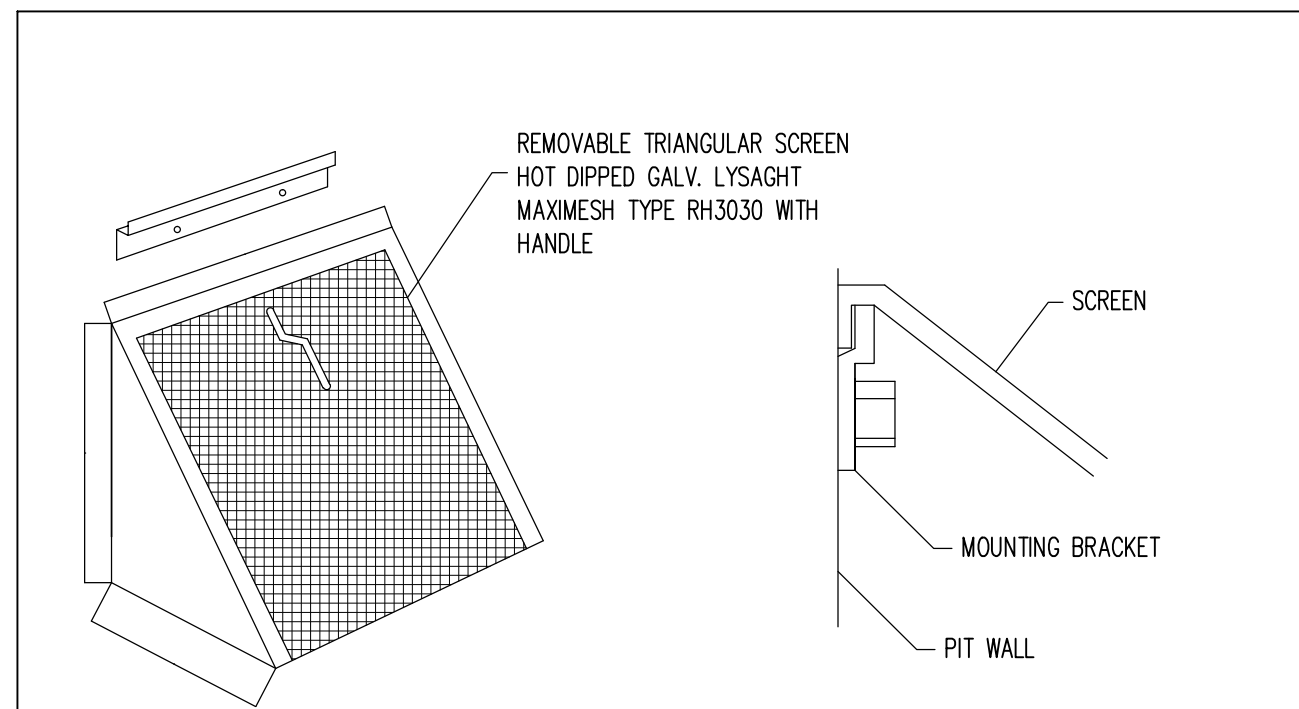
DANGER

**CONFINED SPACE
NO ENTRY WITHOUT
CONFINED SPACE
TRAINING**

WIDTH 200MM

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

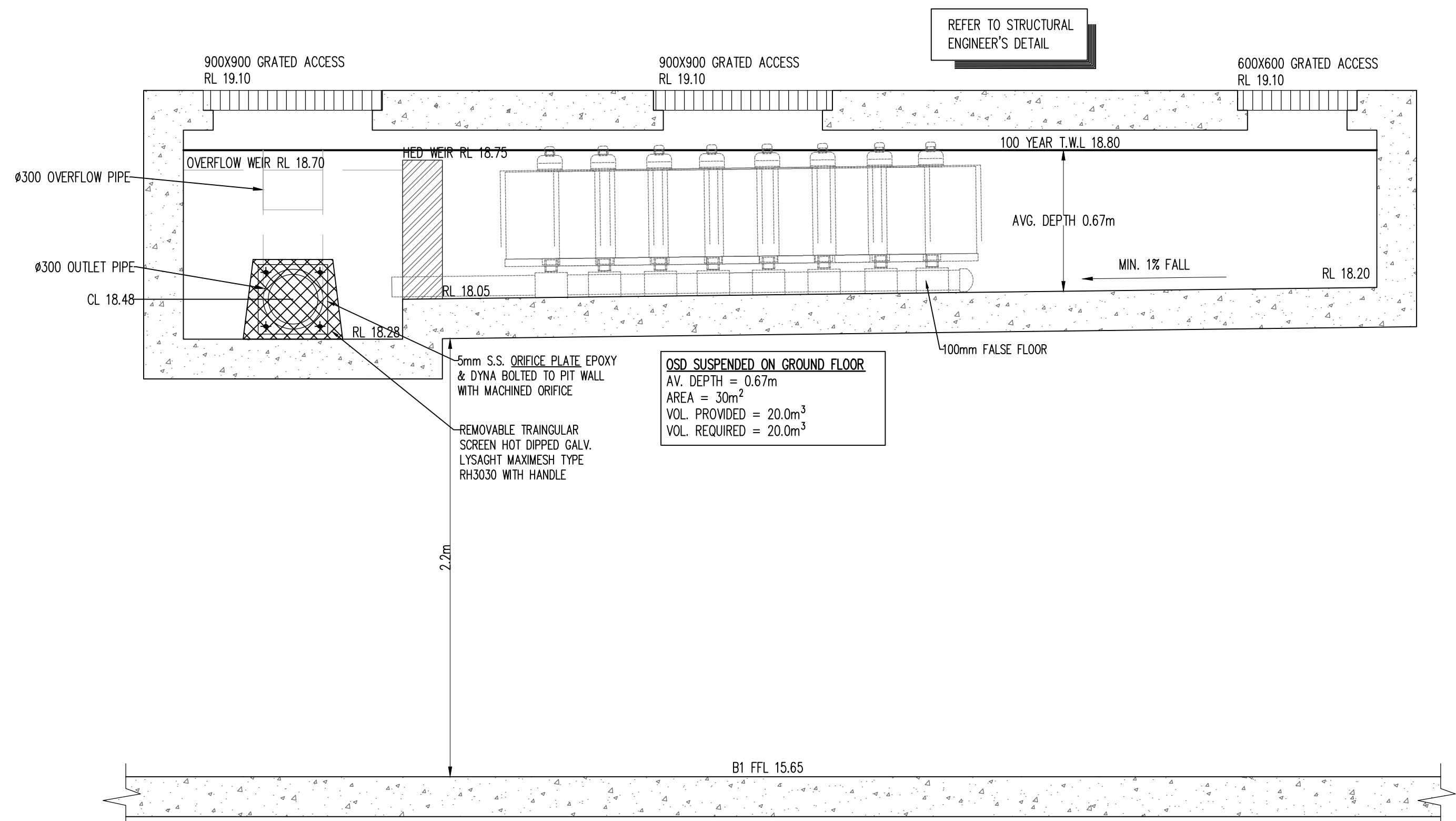
MATERIALS:
POLYPROPYLENE



DETAIL
MULTI PURPOSE FILTER SCREEN

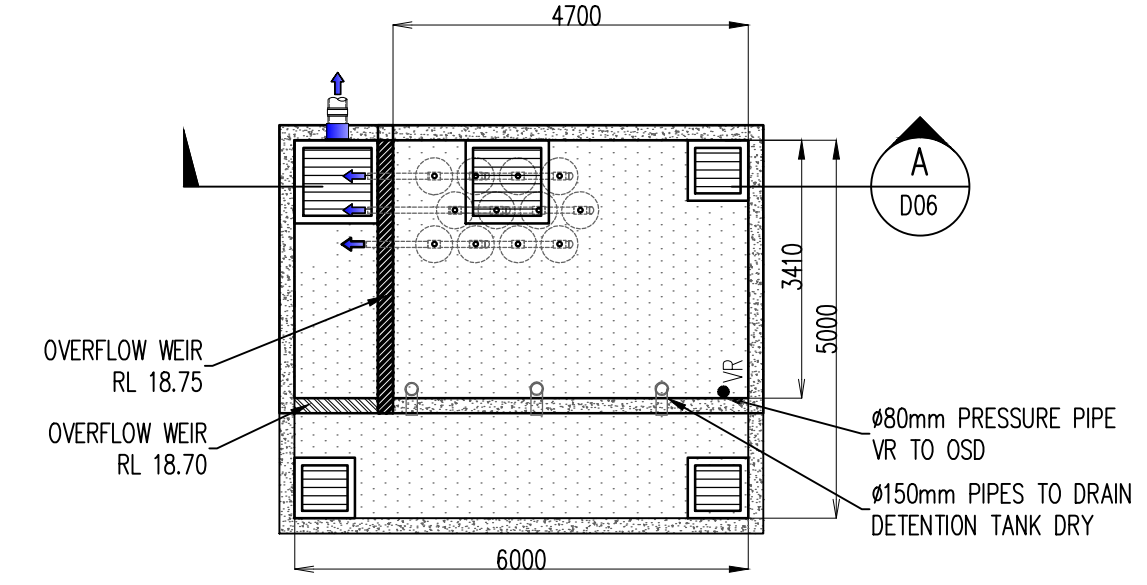
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										 ACN 112691237 Tel 02 9635 3638 Mob: 0413 331 144 Suite 22, 103 George Street, Parramatta NSW 2150 email: gus@fares.com web: www.fares.com Nominated Architect: Gussan Fares Reg 0088										 PTV LTD - A.C.N. 084 059 941 SHOP 2-141 CONCORD RD NORTH STRATHFIELD NSW 2137 PH: (02) 9763 1500 FX: (02) 9763 1515 EMAIL: info@aceengr.com.au										RESIDENTIAL FLAT BUILDING 17-23 GOULBURN STREET, LIVERPOOL, NSW										SITE STORMWATER DRAINAGE DETAILS 1										17-23 GOULBURN STREET, LIVERPOOL, NSW																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
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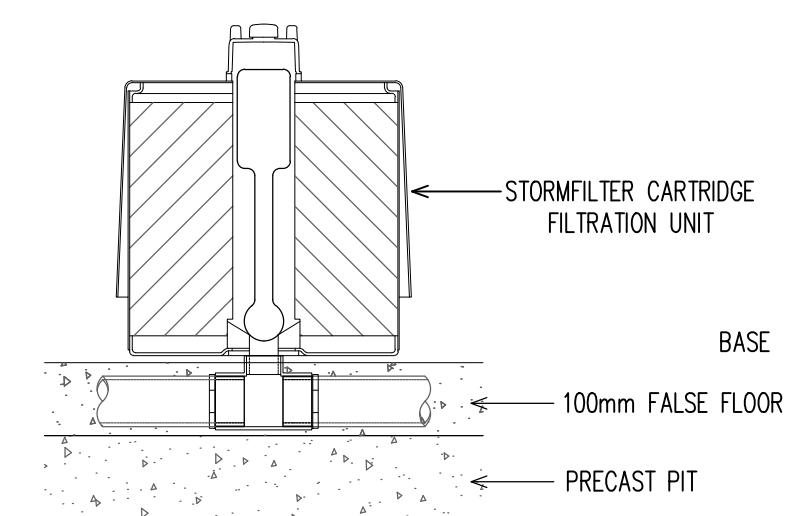


OSD SUSPENDED ON GROUND FLOOR
AV. DEPTH = 0.67m
AREA = 30m²
VOL. PROVIDED = 20.0m³
VOL. REQUIRED = 20.0m³

SECTION THROUGH O.S.D.
SCALE 1:20



STORMFILTER LAYOUT PLAN IN OSD
SCALE 1:100



STORMFILTER CARTRIDGE DETAIL

TYPE A ENVIROPODS

A-TYPE UNIT CONFIGURATIONS

UNIT TYPE	STRUT TYPE	TOP TYPE	CAGE TYPE (HEIGHT mm)	RING TYPE	BAG TYPE (HEIGHT mm)
A1	A	A	A1(600)	A	A1(600)
A3	A	A	A3(300)	A	A3(300)
A5	A	A	N/A	A	A5(170)

NOTE: UNIT TYPES A5 ARE INSTALLED WITHOUT ANY CAGES. USE ONLY STRUT, TOP, BAG & RING.

A-TYPE ALUMINIUM STRUT

A1(600MM) TO A3(300MM) CAGES - PLAN

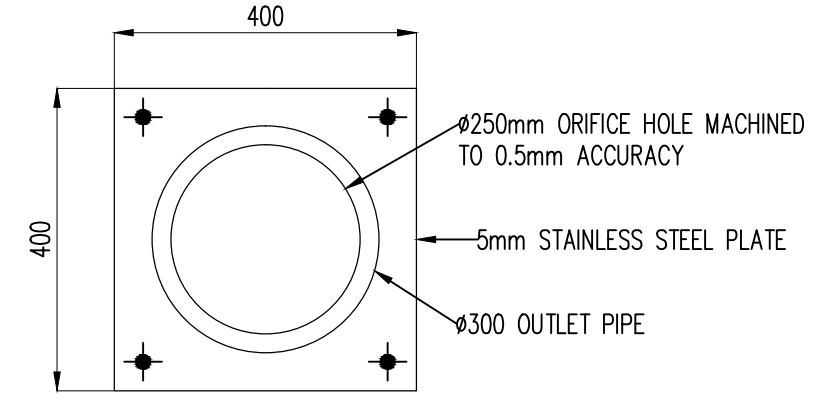
A1(600MM) TO A3(300MM) CAGES - SECTION

A-TYPE TOP

A-TYPE RING

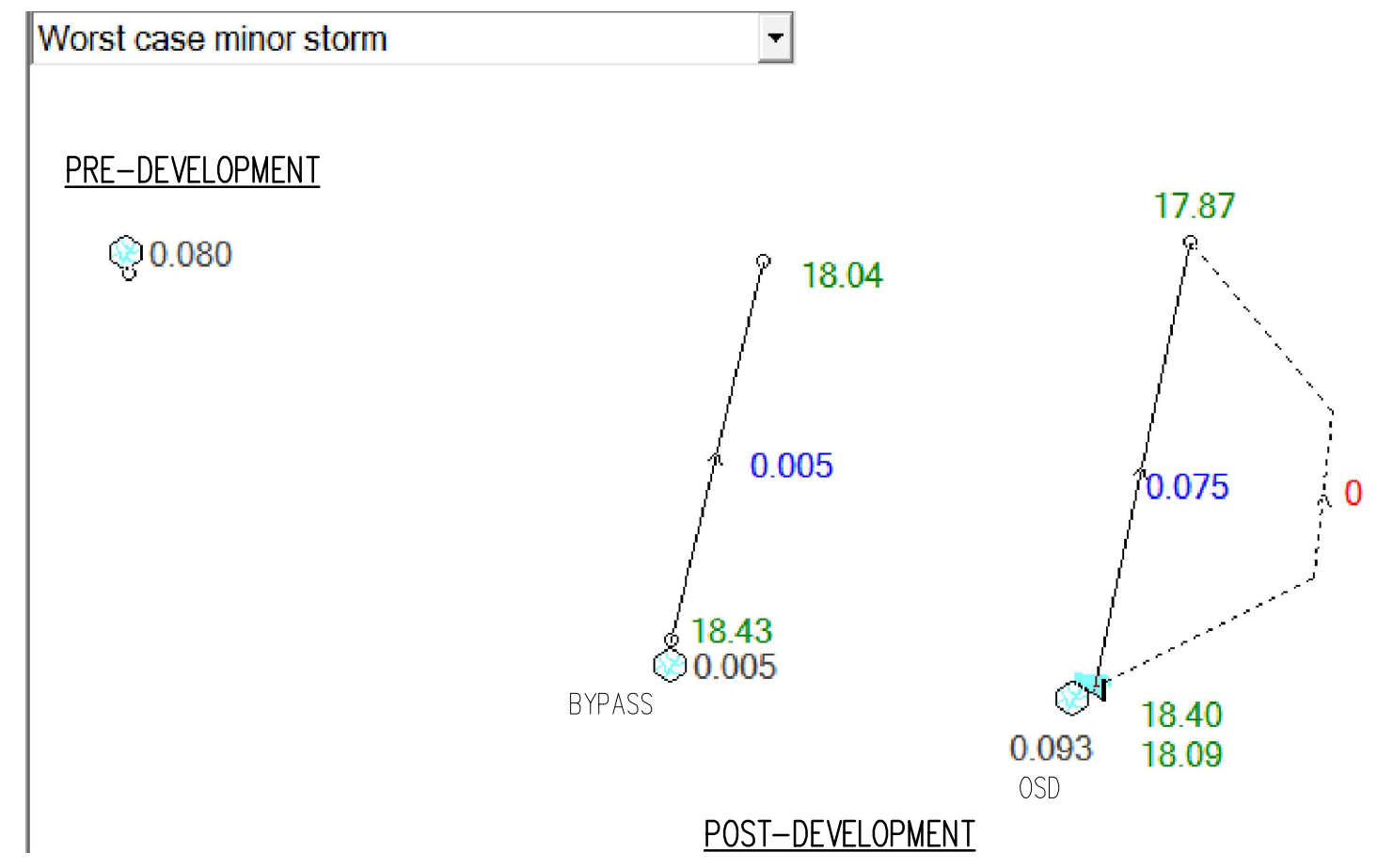
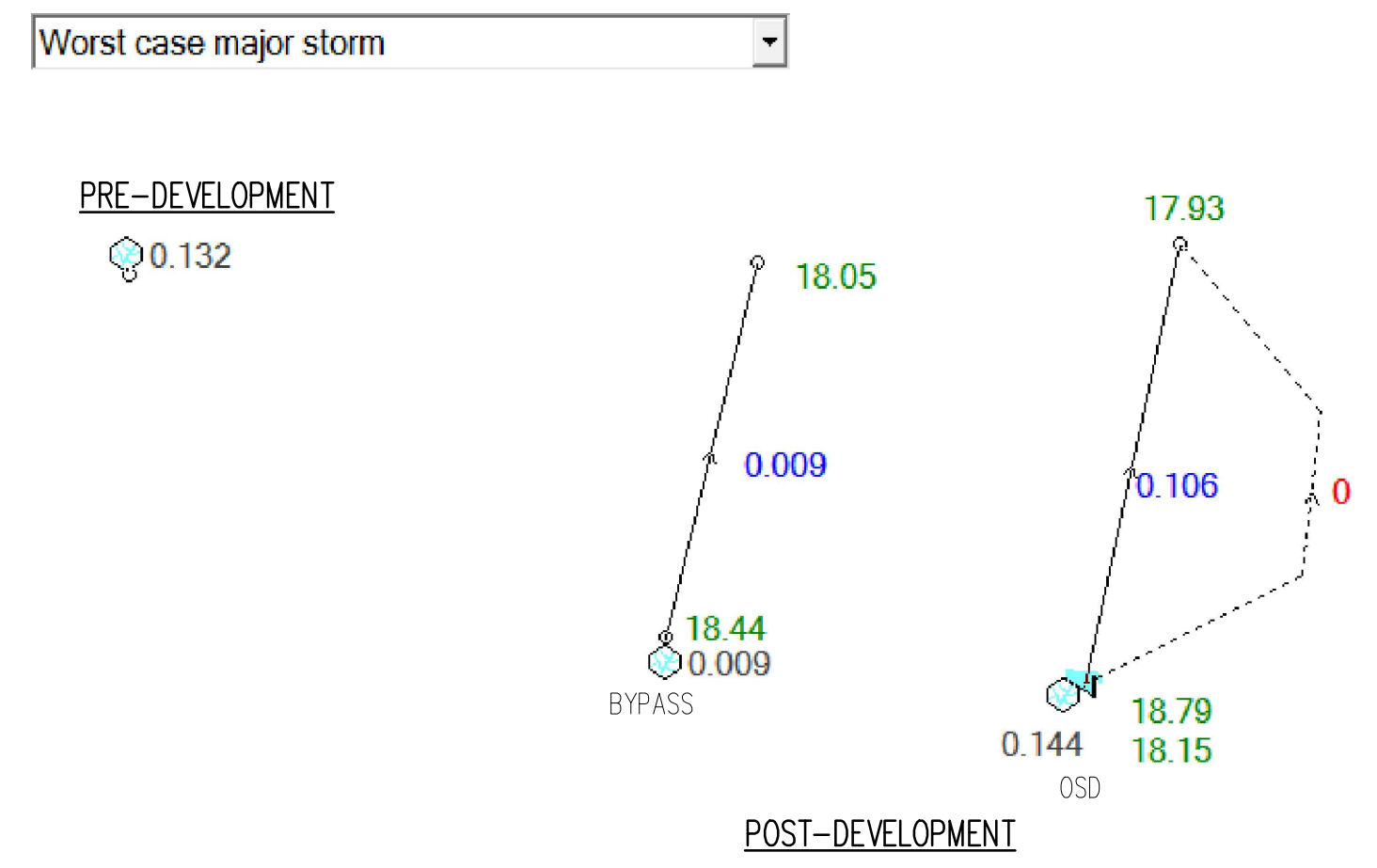
CARTRIDGE HEIGHT	460	
SYSTEM HYDRAULIC DROP (H - REQ'D. MIN.)	700	
TREATMENT BY MEDIA SURFACE AREA L/S/m2	1.4	0.7
CARTRIDGE FLOW RATE (L/s)	0.95	0.47

STORM EVENT	PRE-DEVELOPMENT	POST-DEVELOPMENT
MAJOR STORM (100 YEAR ARI)	132 L/s	OSD= 106 L/s + BYPASS= 9 L/s =115 L/s
MODERATE STORM (20 YEAR ARI)	108 L/s	OSD=93 L/s + BYPASS= 7 L/s = 100 L/s
MINOR STORM (5 YEAR ARI)	80 L/s	OSD=75 L/s + BYPASS= 5 L/s = 80 L/s



OSD ORIFICE PLATE ELEVATION
SCALE 1:10

- GENERAL NOTES**
1. 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.
 2. 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.
 3. 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. CONCRETE STRUCTURE TO BE PROVIDED BY OTHERS.
 4. SEE STORMFILTER DESIGN TABLE FOR REQUIRED HYDRAULIC DROP. FOR SHALLOW, LOW DROP OR SPECIAL DESIGN CONSTRAINTS, CONTACT STORMWATER360 FOR DESIGN OPTIONS.
 5. ALL WATER QUALITY PRODUCTS REQUIRE PERIODIC MAINTENANCE AS OUTLINED IN THE O&M GUIDELINES. PROVIDE MINIMUM CLEARANCE FOR MAINTENANCE ACCESS.
 6. STRUCTURE AND ACCESS COVERS DESIGNED BY OTHERS. ACCESS COVERS TO BE A MINIMUM 900X900 ABOVE CARTRIDGES.
 7. THE STRUCTURE THICKNESSES SHOWN ARE FOR REPRESENTATIONAL PURPOSES AND VARY REGIONALLY.
 8. ANY BACKFILL DEPTH, SUB-BASE, AND OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY SITE CIVIL ENGINEER.
 9. CARTRIDGE HEIGHT AND ASSOCIATED DESIGN PARAMETERS PER STORMFILTER DESIGN TABLE.
 10. STORMFILTER BY STORMWATER360: SYDNEY (AU) PHONE: 1300 354 722 www.stormwater360.com.au

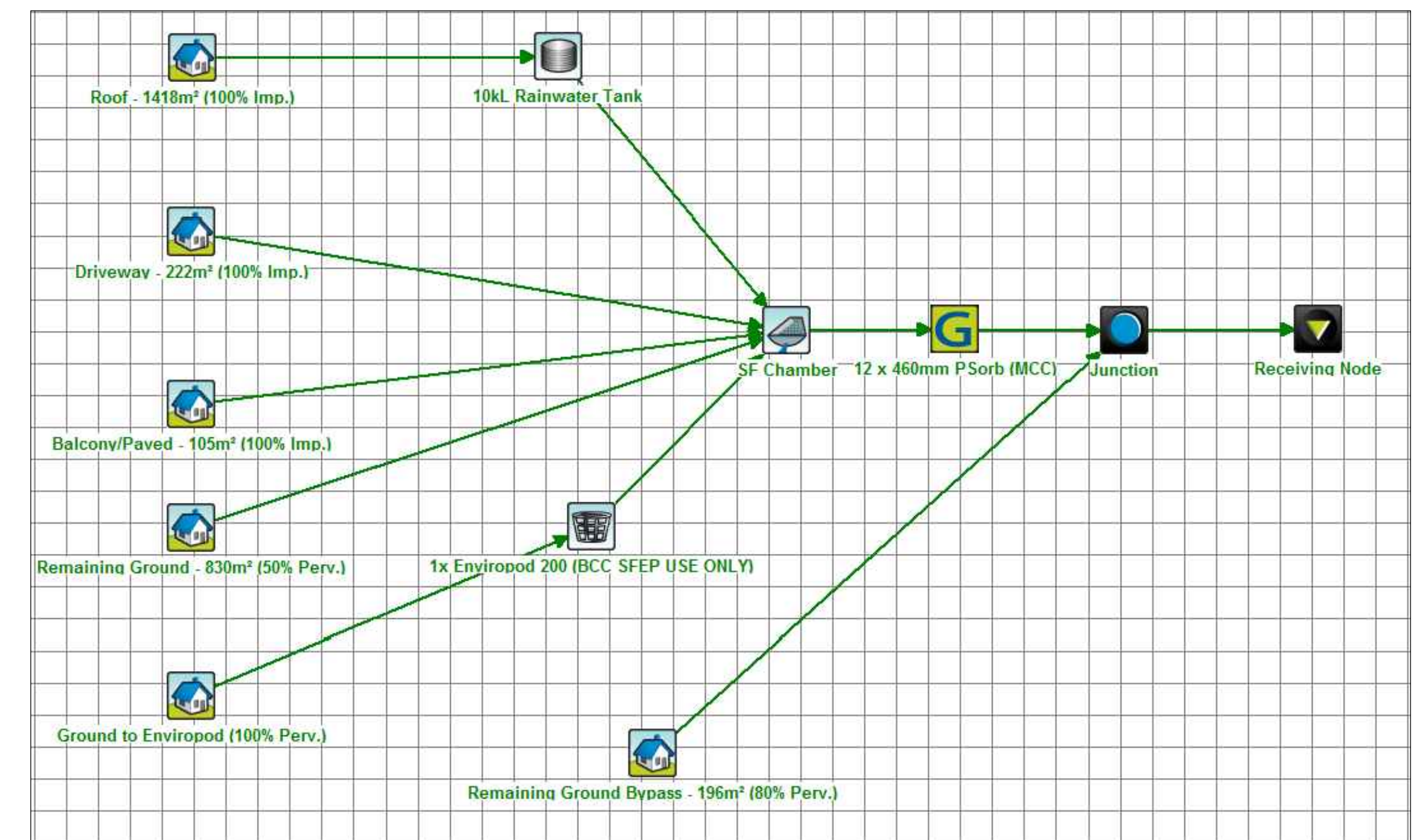
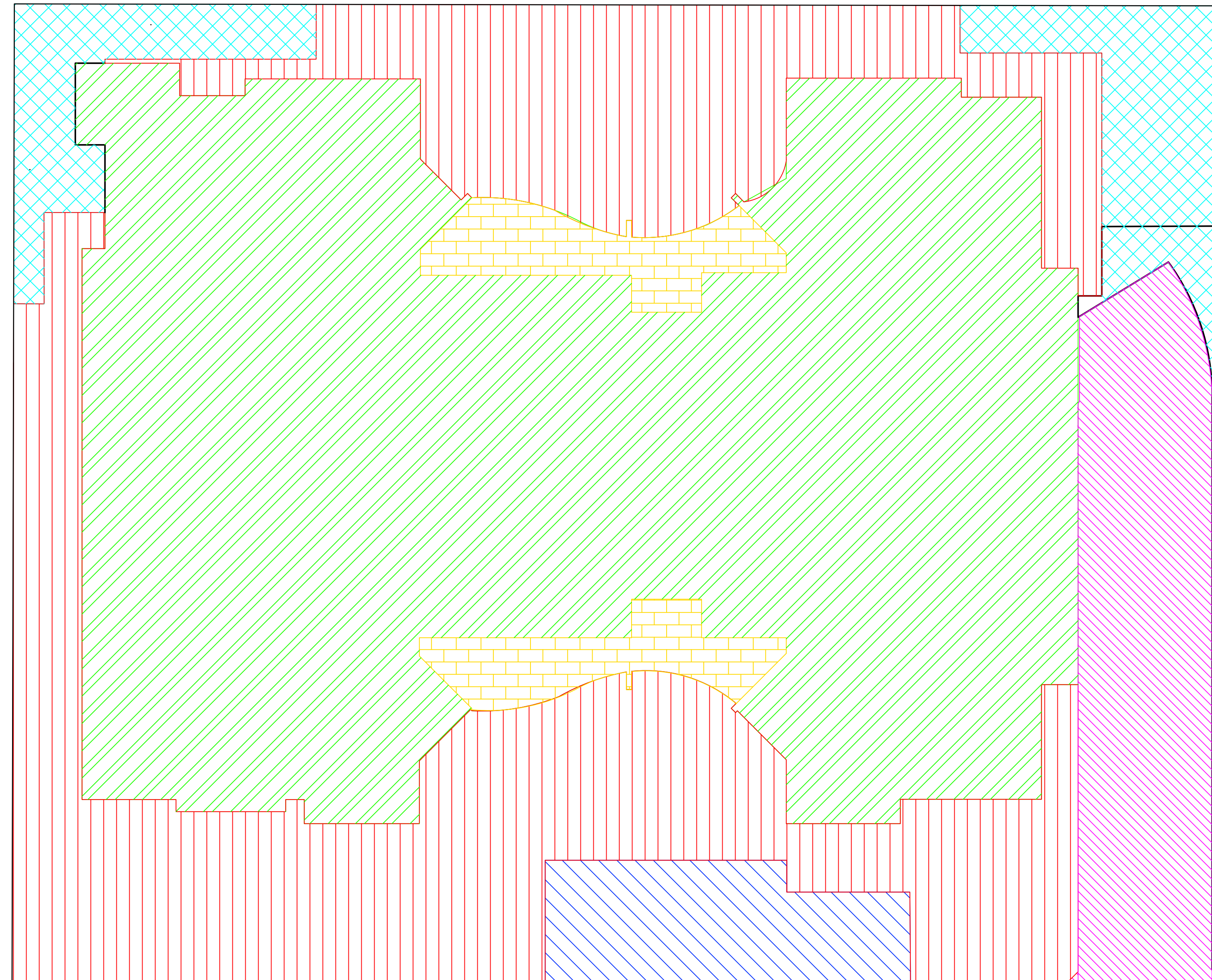


SITE SPECIFIC DATA REQUIREMENTS	
STRUCTURE ID	150937
WATER QUALITY FLOW RATE (L/S)	23.5
PEAK FLOW RATE (L/S)	177.1
RETURN PERIOD OF PEAK FLOW (yrs)	100
# OF CARTRIDGES REQUIRED	12
CARTRIDGE HEIGHT (310/460/690mm)	460
MEDIA TYPE (PERLITE/ZEOLITE/ZPG)	ZPG

MAINTENANCE ACTION	FREQUENCY	RESPONSIBILITY	PROCEDURE
Outlets			
Inspect & remove any blockage of orifices	Six monthly	Owner	Remove grate & screen to inspect orifice. See plan for location of outlets
Check attachment of orifice plates to wall of chamber and/or pit (gaps less than 5 mm)	Annually	Maintenance Contractor	Remove grate and screen. Ensure plates are mounted securely, tighten fixings if required. Seal gaps as required.
Check orifice diameters are correct and retain sharp edges	Five yearly	Maintenance Contractor	Compare diameter to design (see Work-as-Executed) and ensure edge is not pitted or damaged.
Inspect screen and clean	Six monthly	Owner	Remove grate(s) and screens if required to clean them.
Check attachment of screens to wall of chamber or pit	Annually	Maintenance Contractor	Remove grate(s) and screen(s). Ensure screen fixings are secure. Repair as required.
Check screen(s) for corrosion	Annually	Maintenance Contractor	Remove grate(s) and examine screen(s) for rust or corrosion, especially at corners or welds.
Inspect walls (internal and external, if appropriate) for cracks or spalling	Annually	Maintenance Contractor	Remove grate(s) to inspect internal walls. Repair as required. Clear vegetation from external walls if necessary and repair as required.
Inspect outlet sumps & remove any sediment/sludge	Six monthly	Owner	Remove grate(s) and screen(s). Remove sediment/sludge build-up and check orifices are clear.
Inspect grate(s) for damage or blockage	Six monthly	Owner	Check both sides of a grate for corrosion, (especially corners and welds) damage or blockage.
Inspect outlet pipe & remove any blockage	Six monthly	Maintenance Contractor	Remove grate(s) and screen(s). Ventilate underground storage if present. Check orifices and remove any blockages in outlet pipe. Flush outlet pipe to confirm it drains freely. Check for sludge/debris on upstream side of return line.
Check step irons for corrosion	Annually	Maintenance Contractor	Remove grate. Examine step irons and repair any corrosion or damage.
Check fixing of step irons is secure	Six monthly	Maintenance Contractor	Remove grate(s) and ensure fixings are secure prior to placing weight on step iron.
Storage			
Inspect storage & remove any sediment/sludge in pit	Six monthly	Owner	Remove grate(s) and screen(s). Remove sediment/sludge build-up.
Inspect internal walls of storage (and external, if appropriate) for cracks or spalling	Annually	Maintenance Contractor	Remove grate(s) to inspect internal walls. Repair as required. Clear vegetation from external walls if necessary and repair as required.
Inspect & remove any debris/litter/mulch etc blocking grates	Six monthly	Owner	Remove blockages from grate(s) and check if storage is blocked.
Inspect areas draining to the storage(s) & remove debris/mulch/litter etc likely to block screens/grates	Six monthly	Owner	Remove debris and floatable material likely to be carried to grates.
Compare storage volume to volume approved. (Rectify if loss > 5%)	Annually	Maintenance Contractor	Compare actual storage available with Work-as-Executed plans. If volume loss is greater than 5%, arrange for reconstruction to replace the volume lost. Council to be notified of the proposal.
Inspect storages for subsidence near pits	Annually	Maintenance Contractor	Check along drainage lines and at pits for subsidence likely to indicate leakages.

SAMPLE OSD MAINTENANCE SCHEDULE UPRCT HANDBOOK, 2005

MUSIC MODEL



- AREA BYPASSING OSD (80% PERV.) = 196m² (6.8%)
- ROOF AREA (100% IMPERV.) = 1418m²
- BALCONY AREA (100% IMPERV.)= 105m²
- GROUND FLOOR AREA (50% PERV.) = 830m²
- GROUND AREA TO ENVIROPOD (100% PERV.) = 100m²
- DRIVEWAY AREA (100% IMPERV.) = 222m²

[illegible]

