

STORMWATER MANAGEMENT PLANS (DA SUBMISSION)

PROPOSED RESIDENTIAL FLAT BUILDING

No.56 BEANE STREET, GOSFORD

LOT 30 DP:1250970

DRAINAGE NOTES

PIPE SIZE:
THE MINIMUM PIPE SIZE SHALL BE:

- 90mm DIA WHERE THE LINE ONLY RECEIVES ROOFWATER RUNOFF; OR
- 100mm DIA WHERE THE LINE RECEIVES RUNOFF FROM PAVED OR UNPAVED AREAS ON THE PROPERTY

THE MINIMUM PIPE VELOCITY SHOULD BE 0.6 m/s AND A MAXIMUM PIPE VELOCITY OF 6.0 m/s DURING THE DESIGN STORM.

PIPE GRADE:
THE MINIMUM PIPE GRADE SHALL BE:

- 1.0% FOR PIPES LESS THAN 225mm DIA
- 0.5% FOR ALL LARGER PIPES

PIPES WITH A GRADIENT GREATER THAN 20% WILL REQUIRE ANCHOR BLOCKS AT THE TOP AND BOTTOM OF THE INCLINED SECTION; AND AT INTERVALS NOT EXCEEDING 3.0m

ANCHOR BLOCKS ARE DESIGNED ACCORDING TO CLAUSE 3.5.3 OF AS3500.3-1990

DEPTH OF COVER FOR PVC PIPES:
MINIMUM PIPE COVER SHALL BE AS FOLLOWS:

LOCATION	MINIMUM COVER
NOT SUBJECT TO VEHICLE LOADING	100mm SINGLE RESIDENTIAL 300mm ALL OTHER DEVELOPMENTS
SUBJECT TO VEHICLE LOADING UNDER A SEALED ROAD	450mm WHERE NOT IN A ROAD 600mm
UNSEALED ROAD	750mm
PAVED DRIVEWAY	100mm PLUS DEPTH OF CONCRETE

SEE AS2032 INSTALLATION OF UPVC PIPES FOR FURTHER INFORMATION.

CONCRETE PIPE COVER SHALL BE IN ACCORDANCE WITH AS3725-1989 LOADS ON BURIED CONCRETE PIPES, HOWEVER A MINIMUM COVER OF 450mm WILL APPLY.

WHERE INSUFFICIENT COVER IS PROVIDED, THE PIPE SHALL BE COVERED AT LEAST 50mm THICK OVERLAY AND SHALL THEN BE PAVED WITH AT LEAST:

- 150mm REINFORCED CONCRETE WHERE SUBJECT TO HEAVY VEHICLE TRAFFIC;
- 75mm THICKNESS OF BRICK OR 100mm OF CONCRETE PAVING WHERE SUBJECT TO LIGHT VEHICLE TRAFFIC; OR
- 50mm THICK BRICK OR CONCRETE PAVING WHERE NOT SUBJECT TO VEHICLE TRAFFIC.

CONNECTIONS TO STORMWATER DRAINS UNDER BUILDINGS:
SHALL BE CARRIED OUT IN ACCORDANCE WITH SECTION 3.10 OF AS3500.3-1990

ABOVE GROUND PIPEWORK:
SHALL BE CARRIED OUT IN ACCORDANCE WITH SECTION 6 OF AS3500.3-1990

PIT SIZES AND DESIGN:

DEPTH (mm)	MINIMUM PIT SIZE (mm)
UP TO 450mm	450 x 450
450mm TO 600mm	600 x 600
600mm TO 900mm	600 x 900
900mm TO 1500mm	900 x 900 (WITH STEP IRONS)
1500mm TO 2000mm	1200 x 1200 (WITH STEP IRONS)

ALL PIPES SHOULD BE CUT FLUSH WITH THE WALL OF THE PIT.

PITS GREATER THAN 600mm DEEP SHALL HAVE A MINIMUM ACCESS OPENING OF 600 x 600mm

THE GRATED COVERS OF PITS LARGER THAN 600 x 600mm ARE TO BE HINGED TO PREVENT THE GRATE FROM FALLING INTO THE PIT.

THE BASE OF THE DRAINAGE PITS SHOULD BE AT THE SAME LEVEL AS THE INVERT OF THE OUTLET PIPE. RAINWATER SHOULD NOT BE PERMITTED TO POND WITHIN THE STORMWATER SYSTEM

- TRENCH DRAINS:**
CONTINUOUS TRENCH DRAINS ARE TO BE OF WIDTH NOT LESS THAN 150mm AND DEPTH NOT LESS THAN 100mm. THE BARS OF THE GRATING ARE TO BE PARALLEL TO THE DIRECTION OF SURFACE FLOW.
- STEP IRONS:**
PITS BETWEEN 1.2m AND 6m ARE TO HAVE STEP IRONS IN ACCORDANCE WITH AS1657. FOR PITS GREATER THAN 6m OTHER MEANS OF ACCESS MUST BE PROVIDED.
- PVC PITS:**
PVC PITS WILL ONLY BE PERMITTED IF THEY ARE NOT A GREATER SIZE THAN 450 x 450mm (MAXIMUM DEPTH 450mm) AND ARE HEAVY DUTY
- IN-SITU PITS:**
IN-SITU PITS ARE TO BE CONSTRUCTED ON A CONCRETE BED OF AT LEAST 150mm THICK. THE WALLS ARE TO BE DESIGNED TO MEET THE MINIMUM REQUIREMENTS OF CLAUSE 4.6.3 OF AS3500.4-1990. PITS DEEPER THAN 1.8m SHALL BE CONSTRUCTED WITH REINFORCED CONCRETE.
- GRATES:**
GRATES ARE TO BE GALVANISED STEEL GRID TYPE. GRATES ARE TO BE OF HEAVY-DUTY TYPE IN AREAS WHERE THEY MAY BE SUBJECT TO VEHICLE LOADING.

GENERAL NOTES

- FINAL LOCATION OF NEW DOWNPIPES TO BE DETERMINED BY BUILDER/ARCHITECT AT TIME OF CONSTRUCTION.
- THESE DRAWINGS TO BE READ IN CONJUNCTION WITH ARCHITECTS AND OTHER CONSULTANTS DRAWINGS. ANY DISCREPANCIES TO BE REFERRED TO THE ENGINEER BEFORE PROCEEDING WITH WORK.
- ALL MATERIALS AND WORKMANSHIP TO BE IN ACCORDANCE WITH AS/NZS 3500.3:2003 STORMWATER DRAINAGE, BCA AND LOCAL COUNCIL POLICY/CONSENT/REQUIREMENTS.
- ALL DIMENSIONS AND LEVELS TO BE VERIFIED BY BUILDER ON-SITE PRIOR TO COMMENCEMENT OF WORKS. THESE DRAWINGS ARE NOT TO BE SCALED FOR DIMENSIONS NOR TO BE USED FOR SETOUT PURPOSES.
- ALL SURVEY INFORMATION AND PROPOSED BUILDING AND FINISHED SURFACE LEVELS SHOWN IN THESE DRAWINGS ARE BASED ON LEVELS OBTAINED FROM DRAWINGS BY OTHERS. THESE DRAWINGS DEPICT THE DESIGN OF SURFACE STORMWATER RUNOFF DRAINAGE SYSTEMS ONLY AND DO NOT DEPICT ROOF DRAINAGE OR SUBSOIL DRAINAGE SYSTEMS UNLESS NOTED OTHERWISE. THE DESIGN OF ROOF AND SUBSOIL DRAINAGE SYSTEMS IS THE RESPONSIBILITY OF OTHERS.
- ALL STORMWATER DRAINAGE PIPES ARE TO BE uPVC AT MINIMUM 1% GRADE UNLESS NOTED OTHERWISE.
- IT IS THE CONTRACTORS RESPONSIBILITY TO LOCATE AND LEVEL ALL EXISTING SERVICES OR OTHER STRUCTURES WHICH MAY AFFECT/BE AFFECTED BY THIS DESIGN PRIOR TO COMMENCEMENT OF WORKS.
- ALL PITS WITHIN DRIVEWAYS TO BE 150mm THICK CONCRETE OR EQUAL.
- THIS PLAN IS THE PROPERTY OF QUANTUM ENGINEERS AND MAY NOT BE USED OR REPRODUCED WITHOUT WRITTEN PERMISSION FROM QUANTUM ENGINEERS.

PLAN NOTES

- ROOF DRAINAGE NOTE:** AS 3500 ROOF DRAINAGE REQUIRES EAVES GUTTERS TO BE SIZED FOR 20 YEAR 5 MIN. STORM = 205mm/hr. FOR EAVES GUTTERS, AS 3500.3:2003 THEN HAS THE FOLLOWING REQUIREMENTS:
 - FOR TYPICAL STANDARD QUAD GUTTER WITH $A_e = 6000\text{mm}^2$ AND GUTTER SLOPE 1:500 AND STEEPER, THIS REQUIRES ONE DOWNPIPE PER 30m^2 ROOF AREA. DOWNPIPES TO BE MINIMUM 90mm DIA. OR 100 x 50mm FOR GUTTERS SLOPE 1:500 AND STEPPER.
 - OVERFLOW METHOD TO FIGURE G1 OF AS 3500.3:2003 IT IS THE RESPONSIBILITY OF THE PLUMBER AND / OR BUILDER TO COMPLY WITH THIS. THIS DRAWING SHOWS PRELIMINARY LOCATIONS / NUMBERS OF DOWNPIPES ONLY WHICH ARE TO BE VERIFIED BY BUILDER / PLUMBER
- TREE PRESERVATION:** IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO OBTAIN ANY PRIOR APPROVAL REQUIRED FROM COUNCIL WITH RESPECT TO POTENTIAL IMPACT ON TREES FOR ANY WORKS SHOWN ON THIS DRAWING PRIOR TO THE COMMENCEMENT OF THOSE WORKS
- ALL ROOF GUTTERS TO HAVE OVERFLOW PROVISION IN ACCORDANCE WITH AS 3500.3:2003 AND SECTIONS 3.5.3, 3.7.5 AND APPENDIX G OF AS 3500.3:2003
- THIS DRAWING IS NOT TO BE USED FOR SET-OUT PURPOSES - REFER TO ARCHITECTURAL DRAWINGS
- LOCATION OF SURFACE STORMWATER GRATED INLET PITS MAY BE VARIED OR NEW PITS INSTALLED AT THE CONSTRUCTION STAGE PROVIDED DESIGN INTENT OF THIS DRAWING IS MAINTAINED

STORMWATER LEGEND

SURFACE INLET PIT		GRATED TRENCH DRAIN	
SURFACE INLET PIT (WITH OCEANGUARD 200)		ABSORPTION TRENCH	
ACCESS GRATE (WITH OCEANGUARD 200)		PROPOSED ROOF GUTTER FALL	
ACCESS GRATE (TO HED PIT)		PROPOSED DOWNPIPE SPREADER	
450 SQUARE INTERVAL	450 X 450	STORMWATER PIPE 100mm DIA. MIN. UNO	
GRATE LEVEL = 75.50	SL 75.50	SUBSOIL PIPE	
INVERT LEVEL = RL 75.20	IL 75.20	EXISTING STORMWATER PIPE	
PROPOSED DOWNPIPE 90mm DIA. OR 100mm x 50mm MIN.		INSPECTION RISER	
		RAINWATER HEAD	

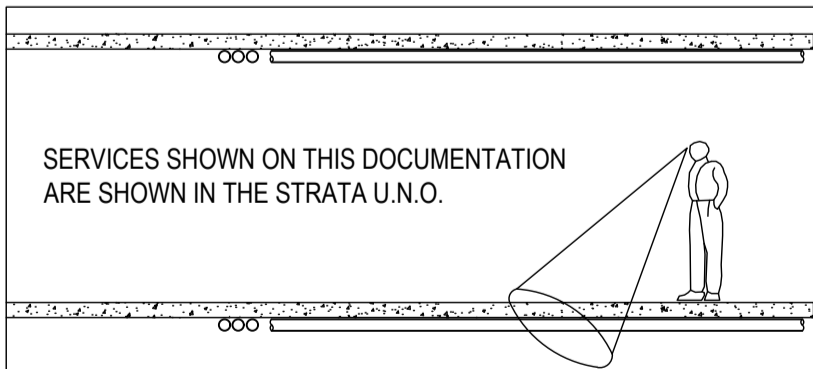
UNDERGROUND SERVICES LEGEND

E	E	UNDERGROUND ELECTRICITY CABLES	} APPROXIMATE POSITION ONLY VIA DIAL BEFORE YOU DIG PLANS. WHERE CRITICAL TO DESIGN UNDERGROUND SERVICES SHOULD BE LOCATED BY GROUND PENETRATING RADAR PRIOR TO DESIGN OR EXCAVATION.
G	G	UNDERGROUND GASMAIN	
NBN	NBN	UNDERGROUND NBN NETWORK CABLE	
O	O	UNDERGROUND OPTUS CABLES	
S	S	UNDERGROUND SEWERMAIN	
T	T	UNDERGROUND TELSTRA COMMUNICATIONS CABLES	
W	W	UNDERGROUND SYDNEY WATER LINE	

STORMWATER DRAWINGS LIST

6/12/2019

DRAWING No.	DRAWING TITLE	REVISION
D1	DETAILS, NOTES & LEGEND	A
D2	LOWER GROUND FLOOR PLAN & DETAILS	A
D3	SITE / LEVEL 1 FLOOR PLAN	A
D4	ROOF PLAN	A
D5	COMBINED STORMFILTER / OSD & RAINWATER TANK DETAILS / CALCULATIONS	A
D6	WATER QUALITY CATCHMENT DETAILS & CALCULATIONS	A
D7	SEDIMENT CONTROL PLAN	A
D8	STORMWATER & SEDIMENT CONTROL DETAILS	A



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DRAWINGS TO BE READ IN CONJUNCTION WITH ARCHITECTS PLANS.
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ALL WORK IS TO BE UNDERTAKEN IN ACCORDANCE WITH:
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APPROVED BY
ROBERT ELTOBBAGI
MIEAust CPENG

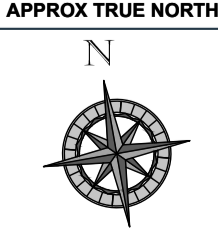
CLIENT
MONO CONSTRUCTIONS

ARCHITECT
STANTON DAHL ARCHITECTS
REF No.2421.19



DRAWING TITLE
DETAILS, NOTES & LEGEND

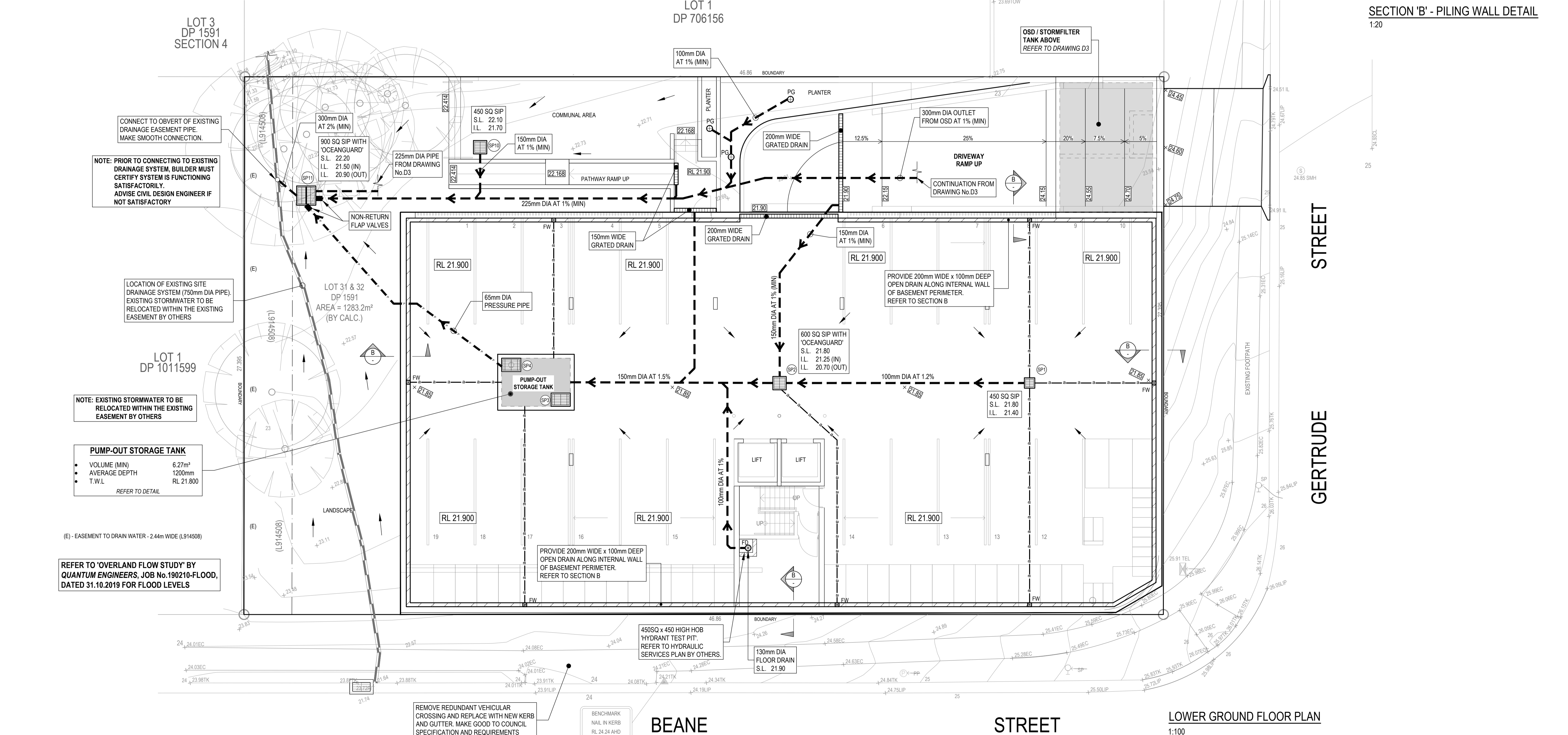
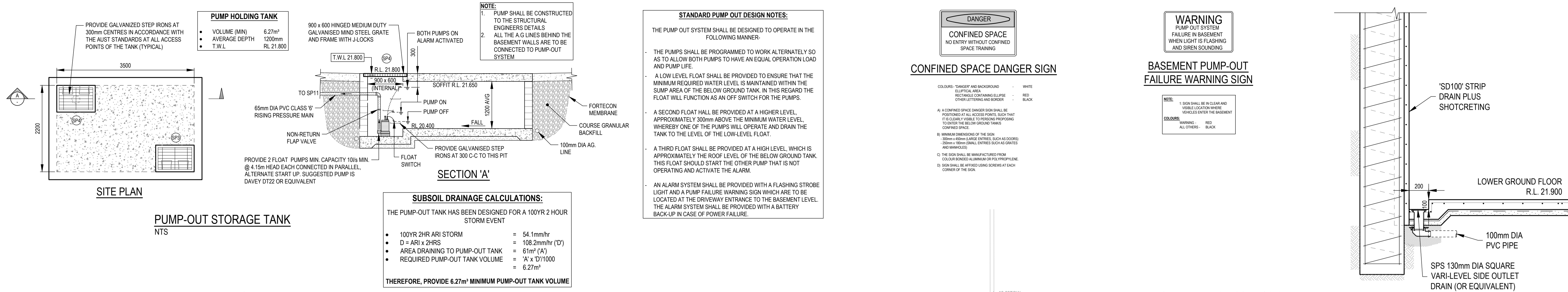
PROPOSED RESIDENTIAL FLAT BUILDING
Lot 30, 56 BEANE STREET
GOSFORD



REVISION	DRAWN	DESCRIPTION	DATE
A	J.FISHER	ISSUED FOR DA	06.12.2019

**ISSUED FOR
DEVELOPMENT APPLICATION**

DESIGNED BY	No. IN SET	JOB NUMBER
J.FISHER	8	190210-SW
SCALE - SIZE	REVISION	DRAWING No.
-	A	D1



LGA: CENTRAL COAST COUNCIL
CODE: GOSFORD DCP 2013 CHAPTER 6.7

STORMWATER RETENTION VOLUME:
V = STORMWATER RETENTION VOLUME
A = 1283.2m² TOTAL SITE AREA
F = 80% FRACTION IMPERVIOUS AREA (1026.4m²)
V = 0.01 x A x (0.02F)²
V = 32.85m³

TOTAL STORMWATER RETENTION VOLUME = 32.85m³

STORMWATER DETENTION VOLUME:
LIMIT POST DEVELOPMENT FLOW FROM THE PROPOSED DEVELOPMENT SITE TO LESS THAN OR EQUAL
TO PREDEVELOPMENT FLOWS FOR ALL STORM EVENTS UP TO AND INCLUDING 1% YEP STORM EVENT

50% OFFSET FROM RAINWATER TANK (32.85m³ x 0.5) = 16.43m³

OSD VOLUME REQUIRED ACCORDING TO 'DRAINS' MODEL = 29.7m³ (REFER TO 'DRAINS' DETAILS ON D5)

THEREFORE,

FINAL OSD VOLUME (WITH RAINWATER OFFSET) = 29.7m³ - 16.43m³ = 13.27m³

DRAINAGE PIPE LEGEND

- DRAINAGE PIPES VIA GRAVITY
- CHARGED DRAINAGE PIPES
- DRAINAGE PIPES TO RAINWATER TANK
- PRESSURE PIPE (65mm)

NOTE: ALL PIPES TO BE 100mm DIA UNO

DOWNPIPE LEGEND

- INDICATES DOWNPIPE TO RWT
- INDICATES DOWNPIPE DIAMETER
- INDICATES DOWNPIPE DIRECTLY TO OSD SYSTEM
- INDICATES DOWNPIPE DIAMETER
- DOWNPIPE PENETRATING FLOOR SLAB
- DOWNPIPE COMMENCING BELOW FLOOR SLAB

BELOW GROUND OSD / STORMFILTER TANK

- OSD TANK:
- STORAGE VOLUME (MIN) 13.27m³
 - STORAGE VOLUME (PROVIDED) 15.18m³
 - SURFACE AREA 13.80m²
 - AVERAGE DEPTH 1100mm
 - T.W.L. RL 24.05
- STORMFILTER CHAMBER:
- PROVIDE 2 STORMFILTERS (690mm CARTRIDGES)
- REFER TO DETAIL ON DRAWING No.D5

BELOW GROUND RAINWATER RE-USE TANK

- STORAGE VOLUME (MIN) 32.85m³
 - SURFACE AREA (MIN) 11.73m²
 - AVERAGE DEPTH 2800mm
 - T.W.L. RL 24.15
- REFER TO DETAIL ON DRAWING ON D5

HATCHED AREA
TO BY-PASS OSD
TOTAL AREA
= 429m² (33.4%)

REFER TO 'DRIVEWAY PLAN' BY QUANTUM ENGINEERS,
JOB No.190210-CW, REV B, DATED 06.12.2019 FOR
DRIVEWAY GRADES AND LEVELS.
PUBLIC DOMAIN AREA SUBJECT TO FUTURE DESIGN TO
CONVEY MINOR LOCAL OVERLAND FLOW.

REFER TO 'OVERLAND FLOW STUDY' BY
QUANTUM ENGINEERS, JOB No.190210-FLOOD,
DATED 31.10.2019 FOR FLOOD LEVELS

SITE / LEVEL 1 FLOOR PLAN

1:100



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CLIENT

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REF No.2421.19

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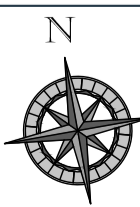
DRAWING TITLE

SITE / LEVEL 1 FLOOR PLAN

PROPOSED RESIDENTIAL FLAT BUILDING

Lot 30, 56 BEANE STREET
GOSFORD

APPROX TRUE NORTH



REVISION

A

DRAWN

J.FISHER

DESCRIPTION

ISSUED FOR DA

DATE

06.12.2019

**ISSUED FOR
DEVELOPMENT APPLICATION**

DESIGNED BY

J.FISHER

SCALE - SIZE

AS NOTED - A1

No. IN SET

8

REVISION

A

JOB NUMBER

190210-SW

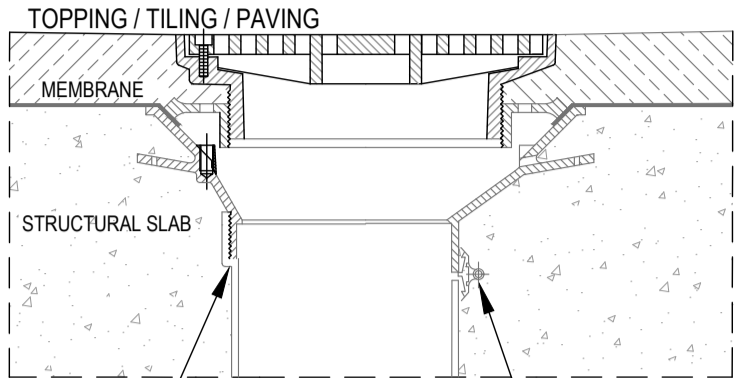
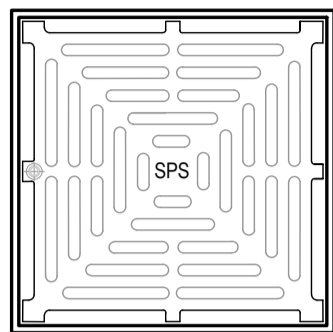
DRAWING No.

D3

SPS 225mm Square Vari-Level Floor Drain
With Side-Outlet Lower Body

SPECIFICATION CODE:
Q225AB/C150 (ALUMINIUM-BRONZE GRATE, CI LOWER BODY)
Q225N/C150 (NICKEL-BRONZE GRATE, CI LOWER BODY)
Q225S/C150 (316 STAINLESS STEEL GRATE, CI LOWER BODY)
FOR A 100MM OUTLET, USE SUFFIX 'C100' NOT 'C150'

HEIGHT ADJUSTMENT:
MIN. 32mm
MAX. 80mm**

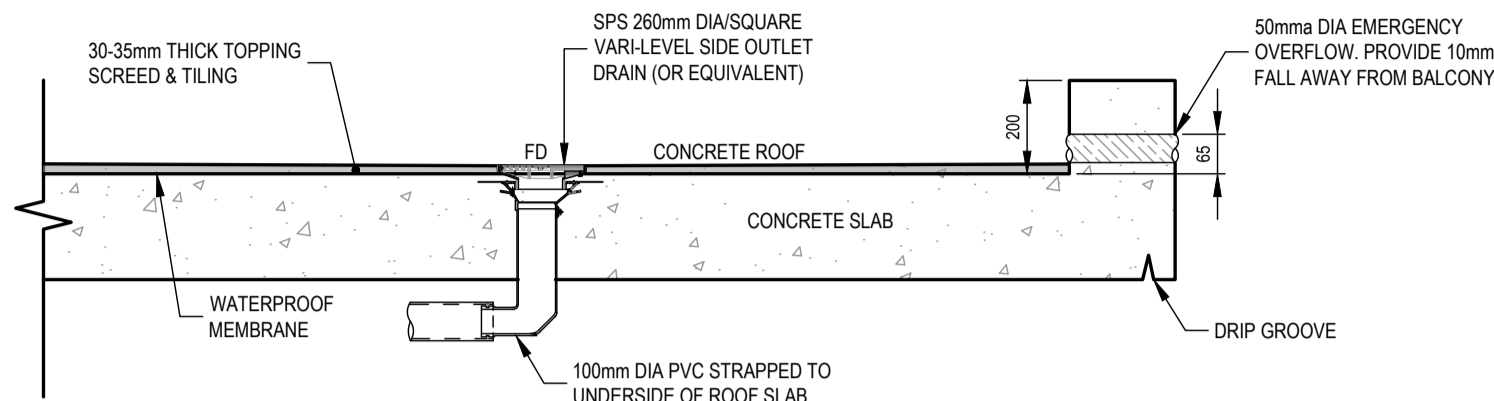


150mm OUTLET SHOWN
WITH OPTIONAL
TAILPIECE CONNECTOR

100mm OUTLET SHOWN
WITH OPTIONAL
COUPLING CONNECTOR

FLOOR DRAIN (SPS) - FD

NTS

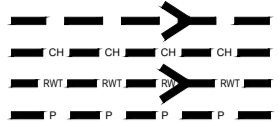


ROOF DRAINAGE DETAIL

NTS

DRAINAGE PIPE LEGEND

- DRAINAGE PIPES VIA GRAVITY
- CHARGED DRAINAGE PIPES
- DRAINAGE PIPES TO RAINWATER TANK
- PRESSURE PIPE (65mm)

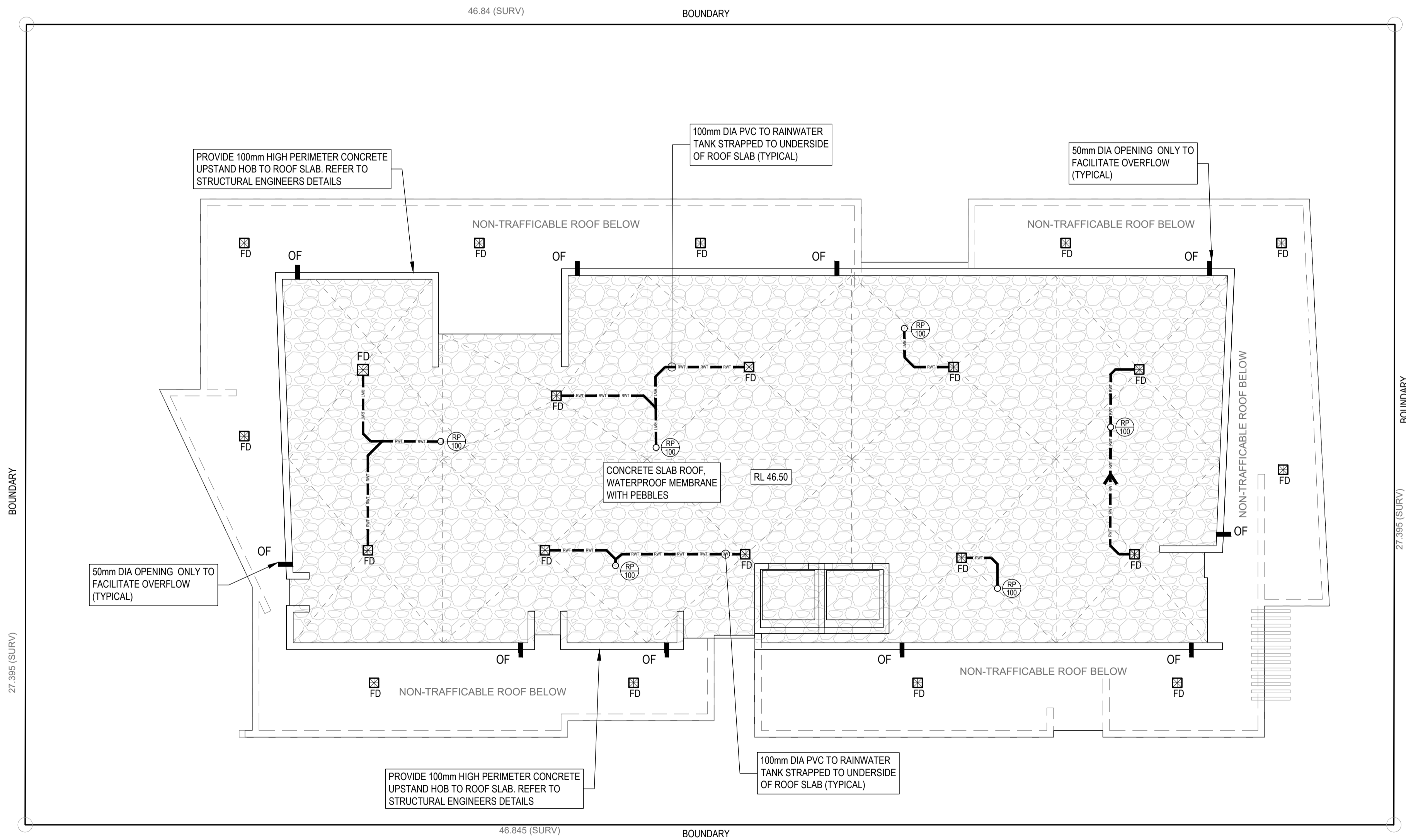


NOTE: ALL PIPES TO BE 100mm DIA UNO

DOWNPIPE LEGEND

- INDICATES DOWNPIPE TO RWT
- INDICATES DOWNPIPE DIAMETER
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- INDICATES DOWNPIPE DIAMETER
- DOWNPIPE PENETRATING FLOOR SLAB
- DOWNPIPE COMMENCING BELOW FLOOR SLAB

PROVIDE 50mm DIA OVERFLOW PIPE TO ALL TERRACES



BEANE STREET

STREET

STREET

GERTRUDE

ROOF PLAN

1:100



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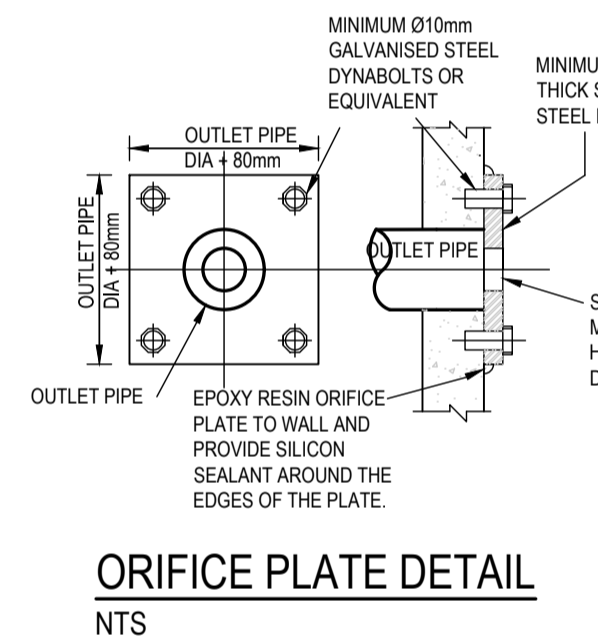
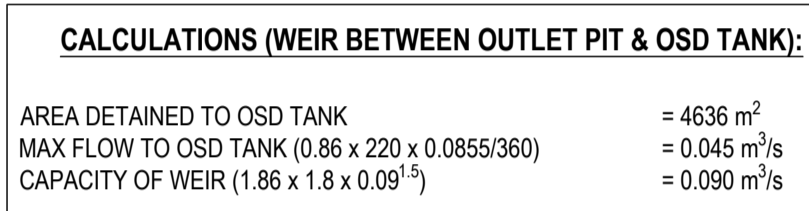
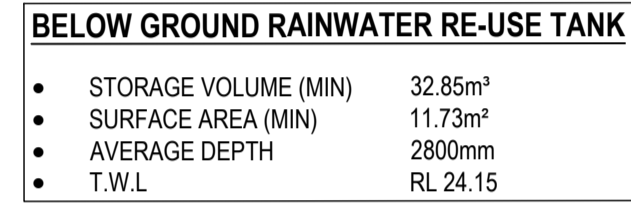
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Lot 30, 56 BEANE STREET
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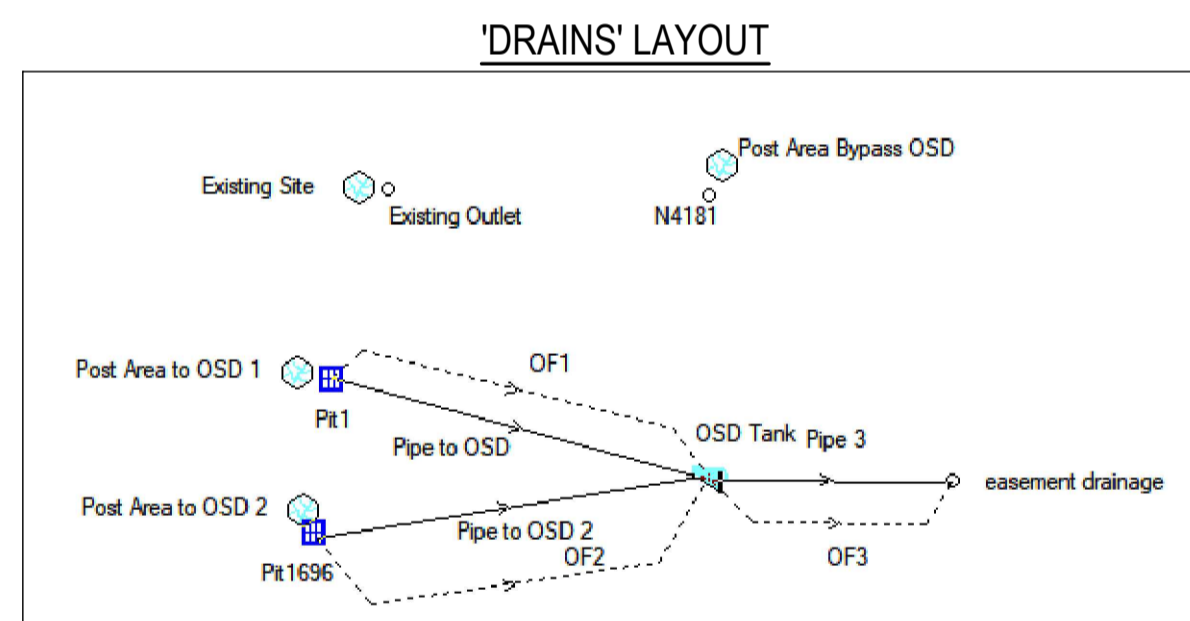
REVISION	DRAWN	DESCRIPTION	DATE
A	J.FISHER	ISSUED FOR DA	06.12.2019

**ISSUED FOR
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J.FISHER	8	190210-SW
SCALE - SIZE	REVISION	DRAWING No.
AS NOTED - A1	A	D4

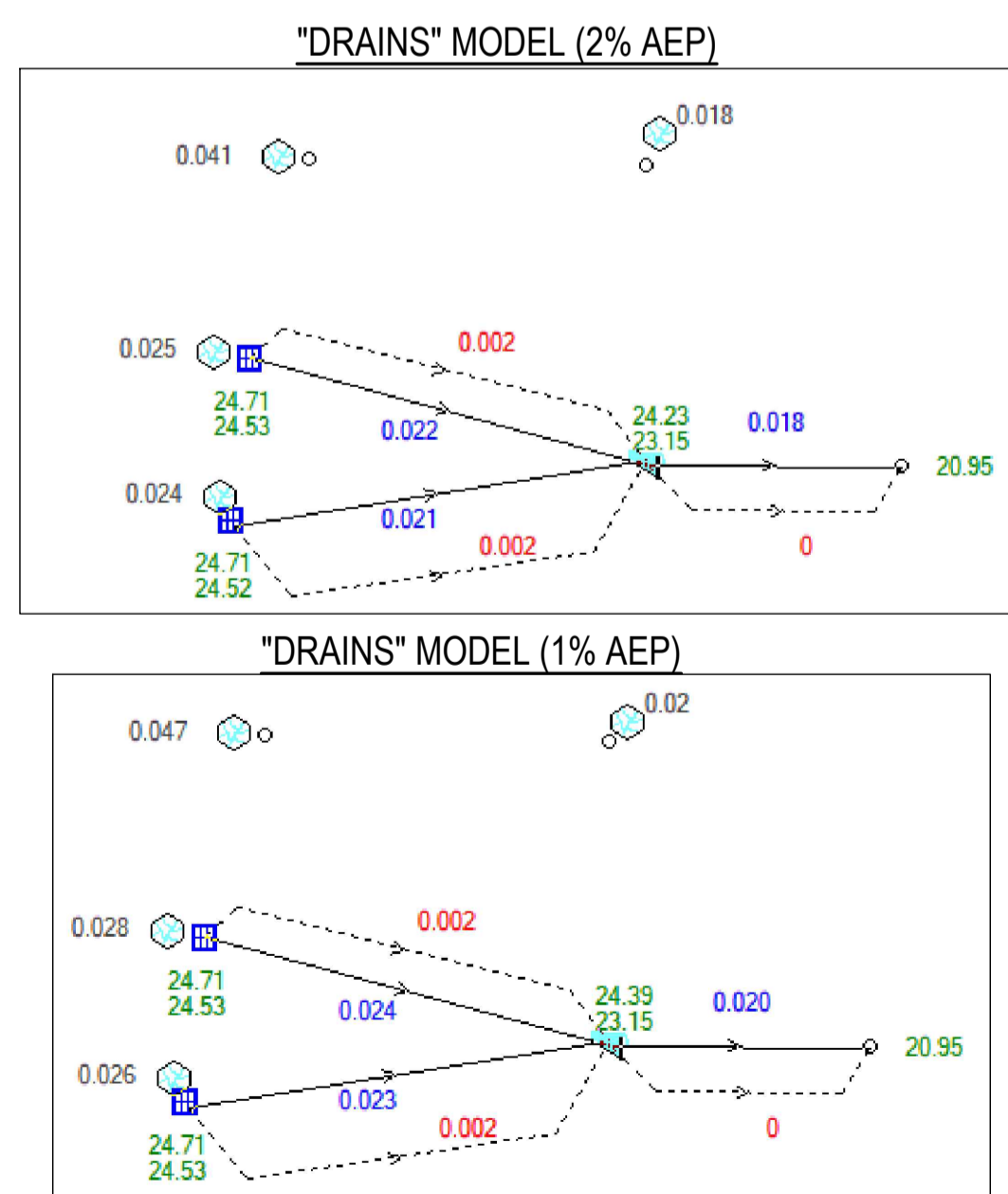
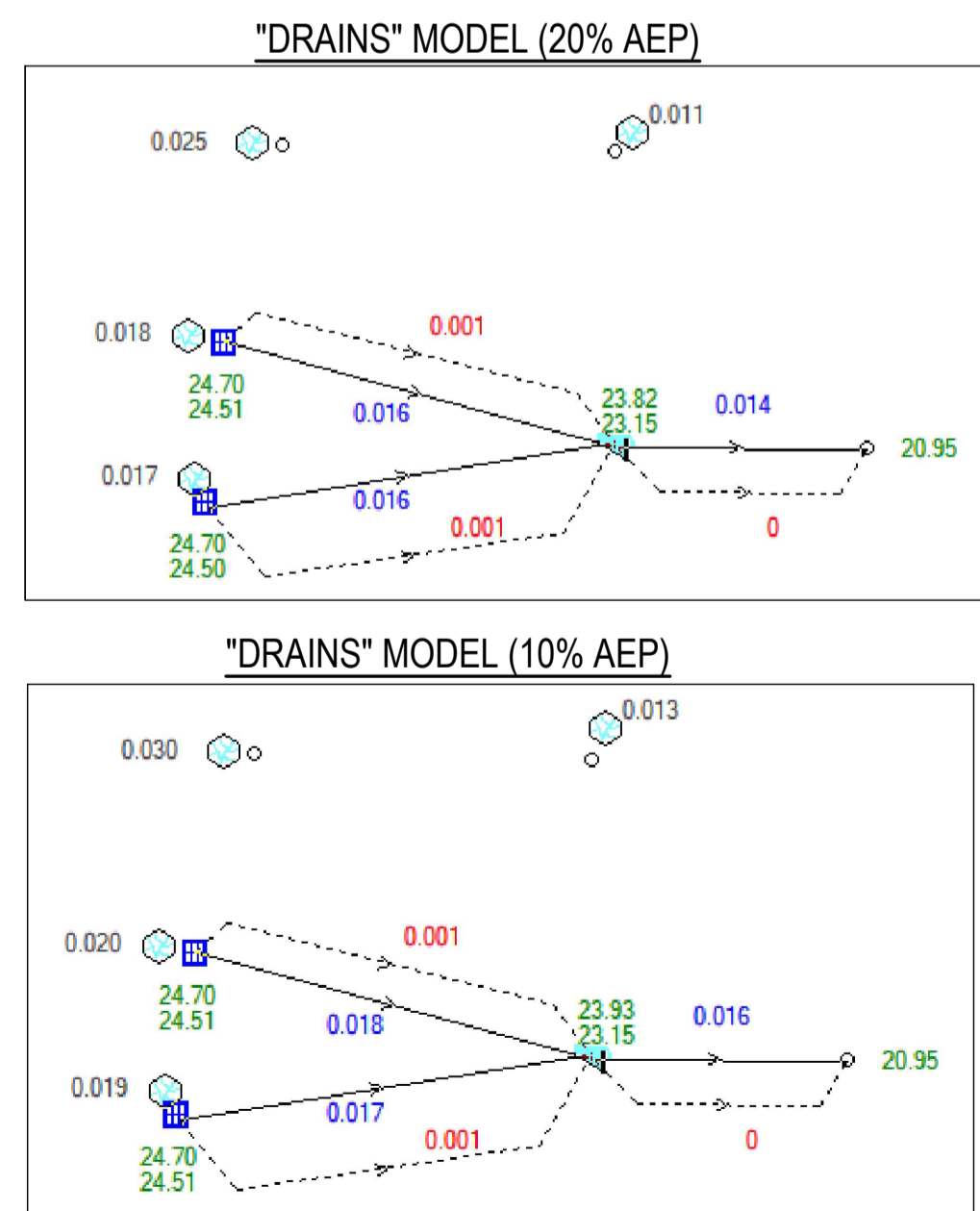


PIT / NODE DETAILS																										
Name	Type	Family	Size	Ponding Volume (cu.m)	Pressure Change Coeff.	Surface Area (sq.m)	Max Pond Base Depth (m)	Inflow (cu.m/s)	Blocking Factor	x	y	Bolt-down lid	Part Full Shock Loss	Inflow Hydrograph	Pit is	Internal Width (mm)	Inflow Misalign	Minor Safe Pond Dep.	Major Safe Pond Depth (m)							
Existing O Node						382.93																				
Pit1 Sag easement Node N4181	Sag	Downpipe	Downpipe	1	1.5	24.7	0.2	0	0	707.137	-408.34	3	No		New		No	0.3	0.3							
Pit1696	Node	Downpipe	Downpipe	1	1.5	24.7	0.2	0	0	691.062	-462.796	No	110	1 x Ku												
						21.67				871.202	-492.581		154	No												
										800.116	-498.491		909271	No												
										685.532	-507.292	No	934835	1 x Ku				99999								
DETENTION BASIN DETAILS																										
Name	Elev	Surf. Area Not Used	Outlet Typ	K	Dia(mm)	Centre RL	Pit Family	Pit Type	x	y	HED	Crest RL	Crest Length													
OSD Tank	23.1	23	Orifice		92	23.22				800.775	-492.535	No				117										
	24.4	23																								
SUB-CATCHMENT DETAILS																										
Name	Pit or Node	Total Area (ha)	Paved Area (%)	Grass Area (%)	Supp Area (%)	Paved Time (min)	Grass Time (min)	Supp Time (min)	Paved Length (m)	Grass Length (m)	Supp Length (m)	Paved Slope(%)	Grass Slope %	Supp Slope %	Paved Rough	Grass Rough	Supp Rough	Lag Time or Factor	Gutter Length (m)	Gutter Slope %	Gutter FlowRate	Rainfall Multiplier				
Existing S1 Existing O		0.1283	0	100	0	10	20	0														1				
Post Area Pit1		0.0423	100	0	0	5	10	0														1				
Post Area N4181		0.046	41	59	0	10	20	0														1				
Post Area Pit1696		0.04	100	0	0	5	10	0														1				
PIPE DETAILS																										
Name	From	To	Length (m)	U/S/L (mm)	D/S/L (mm)	Slope	Type	i.D. (mm)	Rough	Pipe Is	No. Pipes	Chg From	At Chg	Chg (m)	RI (m)	Chg (m)	RL (m)	etc (m)								
Pipe 2 to OS Pit1	OSD Tank	OSD Tank	40	24.4	23.1	3.25 uPVC	unc	225	242	0.08 NewFixed	1	Pit1	0													
Pipe 3 OSD Tank easement	OSD Tank	OSD Tank	45	23.1	20.9	4.89 uPVC	unc	225	242	0.08 NewFixed	1	OSD Tank	0	0	186.6	9.58	186.6									
Pipe 2 to OS Pit1696	OSD Tank	OSD Tank	40	24.4	23.1	3.25 uPVC	unc	225	242	0.08 NewFixed	1	Pit1696	0													
DETAILS OF SERVICES CROSSING PIPES																										
Pipe	Chg Bottom (m)	Height of Elev(m)	Chg Bottom Elev(m)	Height of (m)	Chg Bottom Elev(m)	Height of etc (m)																				
Pipe 3	1.2	185.3	0.3	10.78	181.3	0.4	11.34	181.5	0.15																	
OVERFLOW ROUTE DETAILS																										
Name	From	To	Travel Time (min)	Spill Level (m)	Crest Length (m)	Weir Coeff.	Cross Section	Safe Major Sto (m)	Dept Minor Sto (m)	Safe Dept Div (m)	Bed Slope (sq.m/sec)	D/S Area Contributing %	id	U/S/L	D/S/L	Length (m)										
OF1	Pit1	OSD Tank	0.4				4 m wide	0.3	0.15	0.4	0.75	0	145	24.7	24.4	40										
OF3	OSD Tank easement	OSD Tank	0.2	24.4	1.8		1.7 m wide	0.3	0.15	0.4	6.07	0	158	24.4	21.67	45										
OF2	Pit1696	OSD Tank	0.4				4 m wide	0.3	0.15	0.4	0.75	0	934864	24.7	24.4	40										



PSD COMPUTATION SUMMARY			
LGA:	CENTRAL COAST COUNCIL		
DURATION: 100 YEAR ARI	PRE-DEVELOPMENT FLOW		0.0470 m ³ /s
	POST-DEVELOPMENT BY-PASS FLOW		0.0200 m ³ /s
	Hence, PERMISSIBLE SITE DISCHARGE:		27.00 L/s
	DRAINS' MODELLING - resulting discharge rate		20.00 L/s
DURATION: 50 YEAR ARI	PRE-DEVELOPMENT FLOW		0.0410 m ³ /s
	POST-DEVELOPMENT BY-PASS FLOW		0.0180 m ³ /s
	Hence, PERMISSIBLE SITE DISCHARGE:		23.00 L/s
	DRAINS' MODELLING - resulting discharge rate		18.00 L/s
DURATION: 20 YEAR ARI	PRE-DEVELOPMENT FLOW		0.0360 m ³ /s
	POST-DEVELOPMENT BY-PASS FLOW		0.0160 m ³ /s
	Hence, PERMISSIBLE SITE DISCHARGE:		20.00 L/s
	DRAINS' MODELLING - resulting discharge rate		17.00 L/s
DURATION: 10 YEAR ARI	PRE-DEVELOPMENT FLOW		0.0300 m ³ /s
	POST-DEVELOPMENT BY-PASS FLOW		0.0130 m ³ /s
	Hence, PERMISSIBLE SITE DISCHARGE:		17.00 L/s
	DRAINS' MODELLING - resulting discharge rate		16.00 L/s
DURATION: 5 YEAR ARI	PRE-DEVELOPMENT FLOW		0.0250 m ³ /s
	POST-DEVELOPMENT BY-PASS FLOW		0.0110 m ³ /s
	Hence, PERMISSIBLE SITE DISCHARGE:		14.00 L/s
	DRAINS' MODELLING - resulting discharge rate		14.00 L/s
Hence, OSD REQUIRED VOLUME =29.7m3/s			
and			
Orifice Diameter = 92mmdia			

DRAINAGE results prepared from Version 2019.09									
PIT / NODE DETAILS			Version 8						
Name	Max HGL	Max Pond HGL	Max Surface Flow Arising (cu.m/s)	Max Pond Mis Volume (cu.m)	Overflow Freeboard (m)	Constraint			
P14	24.53	24.71	0.028	0	0.17	0.002 Inlet Capacity			
sewerage drainage	20.95		0						
P11696	24.53	24.71	0.026	0	0.17	0.002 Inlet Capacity			
SUB-CATCHMENT DETAILS									
Name	Max Flow Q (cu.m/s)	Paved Max Q (cu.m/s)	Grassed Max Q (cu.m/s)	Tc (min)	Grassed Tc (min)	Supp. Tc (min)	Due to Storm		
Existing Site	0.047	0	0.047	10	20		O&A&R 100 year, 1.5 hours storm, average 66.8 mm/h, Zone 1		
Post Area to OSD 1	0.028	0.028	0	5	10		O&A&R 100 year, 5 minutes storm, average 249 mm/h, Zone 1		
Post 100 year Bypass OSD	0.021	0.021	0.01	10	20		O&A&R 100 year, 2 hours storm, average 56.7 mm/h, Zone 1		
Post Area to OSD 2	0.026	0.026	0	5	10		O&A&R 100 year, 5 minutes storm, average 249 mm/h, Zone 1		
Dufflow Values for Total Catchment (0.10 impervious + 0.16 pervious + 0.26 total ha)									
Storm	Total Rainfall (cu.m)	Total Runoff (cu.m (Runoff %))	Impervious Runoff (cu.m (Runoff %))	Pervious Runoff (cu.m (Runoff %))					
AR&R 100 year, 5 minutes storm, average 249 mm/h, Zone 1	31.38	34.81 (66.7%)	32.90 (95.2%)	14.46 (44.9%)					
AR&R 100 year, 10 minutes storm, average 194 mm/h, Zone 1	83.08	61.55 (74.1%)	31.74 (96.9%)	29.81 (59.2%)					
AR&R 100 year, 15 minutes storm, average 165 mm/h, Zone 1	105.58	81.86 (77.5%)	40.61 (97.6%)	41.24 (64.3%)					
AR&R 100 year, 20 minutes storm, average 146 mm/h, Zone 1	123.87	98.37 (79.5%)	47.86 (97.3%)	50.51 (67.3%)					
AR&R 100 year, 25 minutes storm, average 131 mm/h, Zone 1	139.67	111.69 (80.0%)	54.05 (98.2%)	57.64 (68.1%)					
AR&R 100 year, 30 minutes storm, average 120 mm/h, Zone 1	153.47	123.60 (80.5%)	59.49 (98.3%)	62.10 (69.0%)					
AR&R 100 year, 45 minutes storm, average 97.4 mm/h, Zone 1	187.41	152.81 (81.6%)	72.87 (98.6%)	80.06 (72.5%)					
AR&R 100 year, 1 hour storm, average 83.6 mm/h, Zone 1	214.41	176.22 (82.2%)	83.52 (98.6%)	92.70 (71.4%)					
AR&R 100 year, 1.5 hours storm, average 66.8 mm/h, Zone 1	259.28	212.71 (82.7%)	100.34 (99.1%)	112.73 (72.2%)					
AR&R 100 year, 2 hours storm, average 56.7 mm/h, Zone 1	291.14	241.44 (82.9%)	113.76 (99.1%)	127.68 (72.4%)					
PIPE DETAILS									
	Max Q (cu.m/s)	Max V (m/s)	Max U/S HGL (m)	Max D/S HGL (m)	Due to Storm				
Pipe 2	0.024	2.36	24.466	24.393	AR&R 100 year, 15 minutes storm, average 165 mm/h, Zone 1				
Pipe 3	0.02	2.65	25.133	20.953	AR&R 100 year, 2 hours storm, average 56.7 mm/h, Zone 1				
Pipe to OSD 2	0.023	2.33	24.464	24.393	AR&R 100 year, 15 minutes storm, average 165 mm/h, Zone 1				
OVERFLOW ROUTE DETAILS									
Name	Max Q/U/S (cu.m/s)	Max Q/D/S (cu.m/s)	Safe Q (cu.m/s)	Max D (m)	Max Ov/D (m)	Max Wtd/Max V (m/s)	Due to Storm		
OF1	0.002	0.002	1.485	0.006	0.01	0.6	1.17	AR&R 100 year, 15 minutes storm, average 165 mm/h, Zone 1	
OF2	0.002	0.002	1.485	0.006	0.01	0.57	1.19	AR&R 100 year, 15 minutes storm, average 165 mm/h, Zone 1	
DEFINITION BASIN DETAILS									
Name	Max WL	Max Vol	Total Max Q	Max Q Low Level	Max Q High Level				
OSD Tank	24.39	29.7		0.02	0.02	0			
CONTINUITY CHECK for AR&R 100 year, 1.5 hours storm, average 66.8 mm/h, Zone 1									
Note	Inflow (cu.m)	Outflow (cu.m)	Storage Change (cu.m)	%					
Existing Outlet	92.75	92.75	0	0					
P11	41.96	41.82	0	0.3					
OSD Tank	81.36	79.39	1.97	0					
sewerage drainage	79.39	79.39	0	0					
N4181	38.31	38.33	0	0					
P11696	38.67	39.54	0	0.3					
Run									



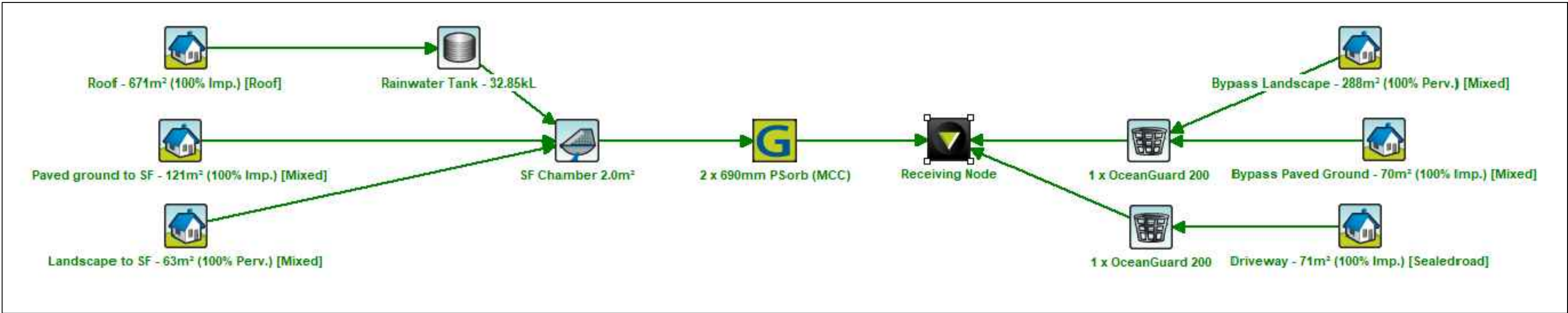
STORMFILTER DESIGN TABLE			
STORMFILTER TREATMENT CAPACITY VARIES BY NUMBER OF FILTER CARTRIDGES INSTALLED. THE STANDARD CONFIGURATION IS SHOWN. ACTUAL CONFIGURATION OF THE SPECIFIED STRUCTURE(S) PER CERTIFYING ENGINEER WILL BE SHOWN ON SUBMITTAL DRAWINGS. FILTER CARTRIDGES SHALL BE MEDIA FILLED, PASSIVE, SIPHON ACTUATED, RADIAL FLOW, AND SELF-CLEANING. RADIAL MEDIA DEPTH SHALL BE 170mm.			
CARTRIDGE NAME / SIPHON HEIGHT (mm)	690	460	310
CARTRIDGE PHYSICAL HEIGHT (mm)	840	600	600
TYPICAL WEIR HEIGHT (H) (mm)	920	690	540
CARTRIDGE FLOW RATE FOR ZPG MEDIA (L/s)	1.6	1.1	0.7
CARTRIDGE FLOW RATE FOR PSORB MEDIA (L/s)	0.9	0.46	0.39

GENERAL NOTES

1. INLET AND OUTLET PIPES TO BE IN ACCORDANCE WITH APPROVED PLANS.
2. A HIGH FLOW BYPASS ARRANGEMENT OR DISSIPATION STRUCTURE MAY BE REQUIRED TO MINIMISE RE-SUSPENSION OF SOLIDS OR ANY SIGNIFICANT INERTIAL FORCES ON THE CARTRIDGES.
3. ALL WATER QUALITY TREATMENT DEVICES REQUIRE PERIODIC MAINTENANCE. REFER TO OPERATION AND MAINTENANCE MANUAL FOR GUIDELINES AND ACCESS REQUIREMENTS.
4. SITE SPECIFIC PRODUCTION DRAWING WILL BE PROVIDED ON PLACEMENT OF ORDER.
5. THE INVERT LEVEL OF THE INLET PIPE MUST BE GREATER THAN THE RL OF THE FALSE FLOOR WITHIN THE CARTRIDGE CHAMBER.
6. CONCRETE STRUCTURE AND ACCESS COVERS DESIGNED AND PROVIDED BY OTHERS. ACCESS COVERS TO BE A MINIMUM 900 X 900 ABOVE CARTRIDGES. OH&S REGARDING ACCESS COVERS AND TANK ACCESS TO BE ASSESSED BY OTHERS ON SITE.
7. THE STRUCTURE THICKNESSES SHOWN ARE FOR REPRESENTATIONAL PURPOSES.
8. DRAWINGS NOT TO SCALE.

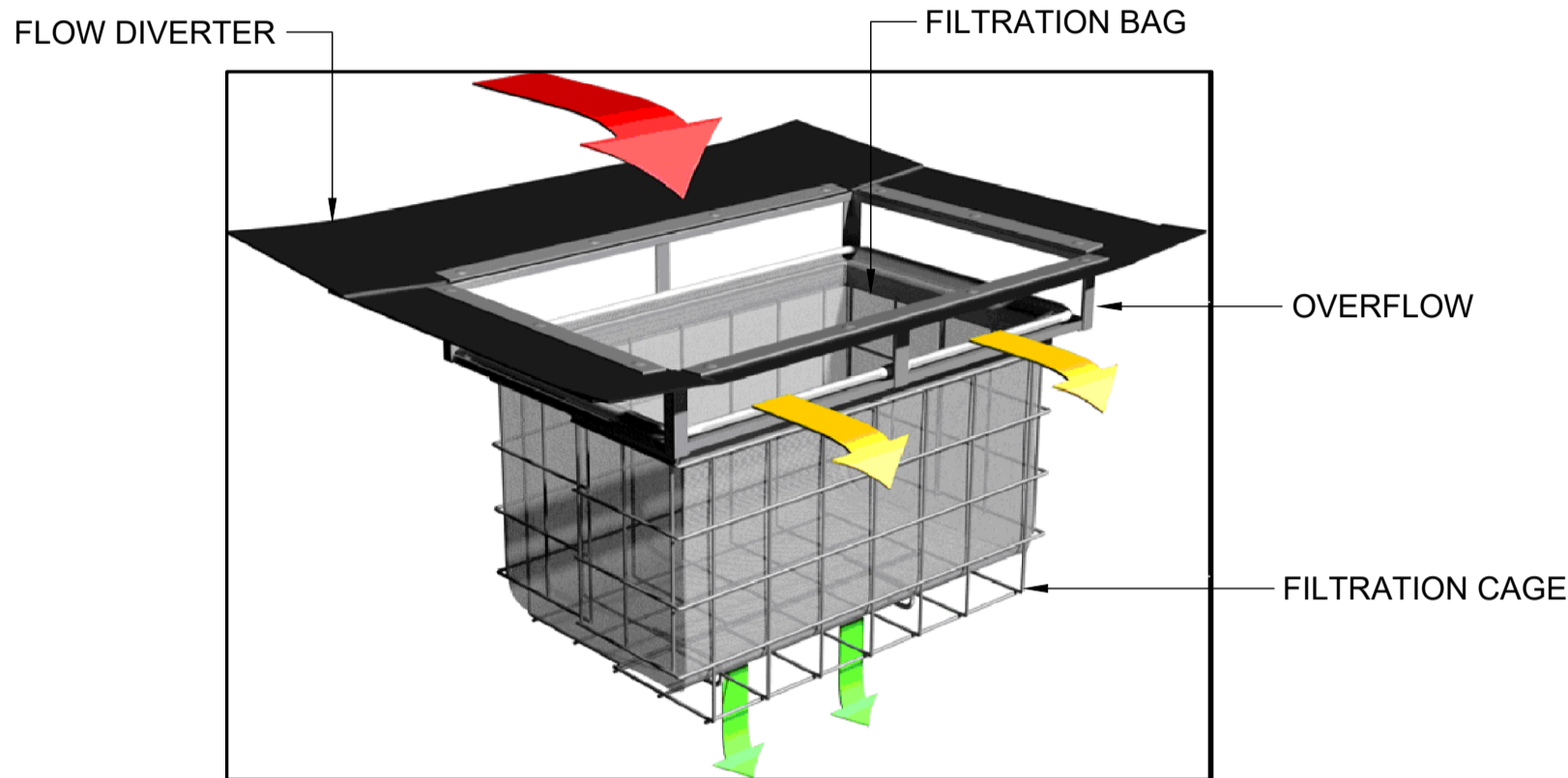
INSTALLATION NOTES

1. UNDERDRAIN AND FALSE FLOOR INSTALLED BY OCEAN PROTECT.

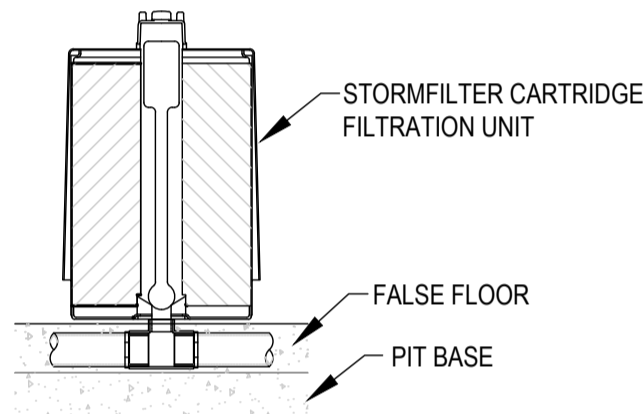


MUSIC MODELLING RESULT

	SOURCES	RESIDUAL LOADS	% REDUCTION
FLOW (ML/yr)	1.2	0.97	18.8
TOTAL SUSPENDED SOLIDS (kg/yr)	110	19.5	82.2
TOTAL PHOSPHORUS (kg/yr)	0.264	0.101	61.7
TOTAL NITROGEN (kg/yr)	2.64	1.21	54.2
GROSS POLLUTANTS (kg/yr)	26.6	2.99E-5	100

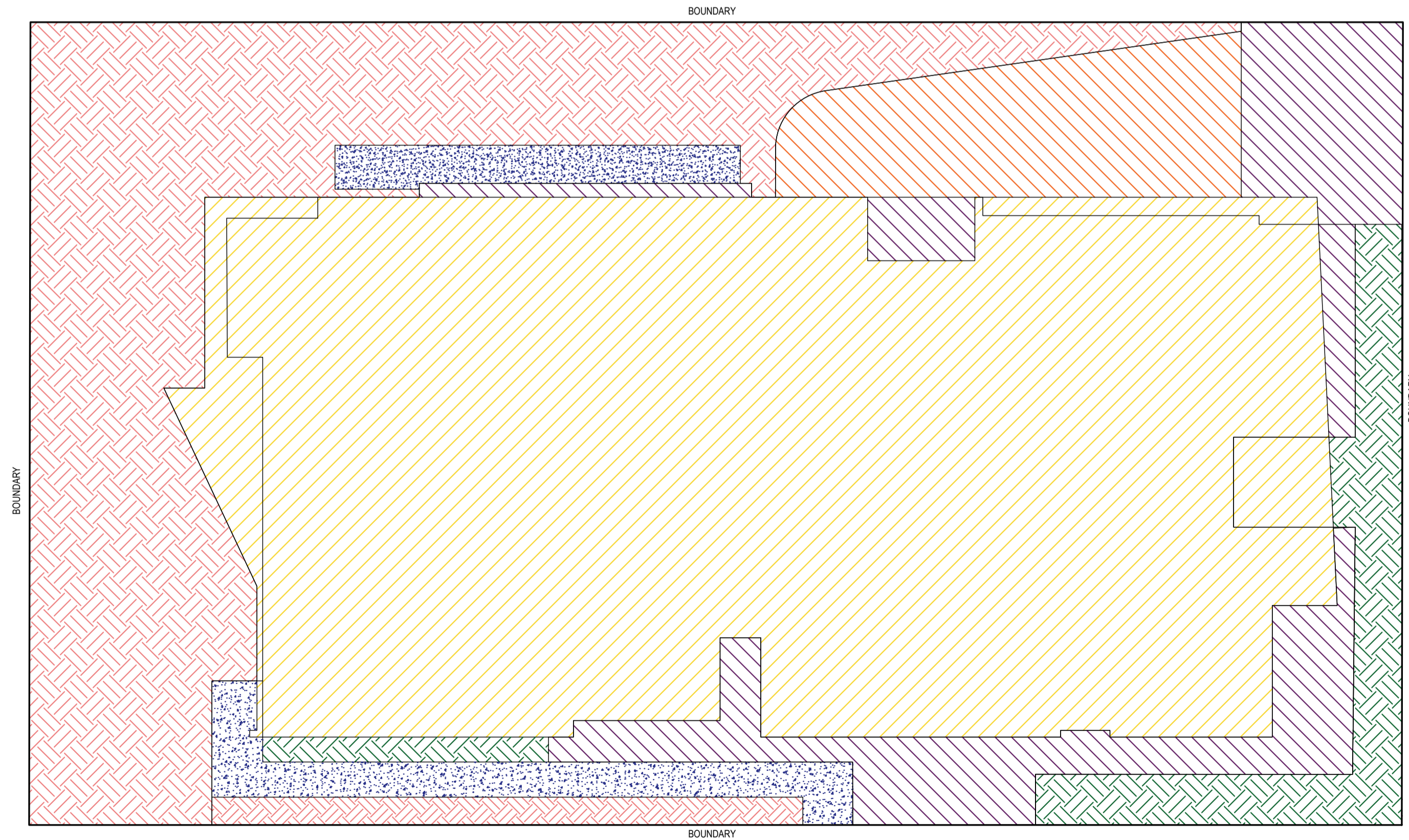


'OCEANGUARD' DETAIL

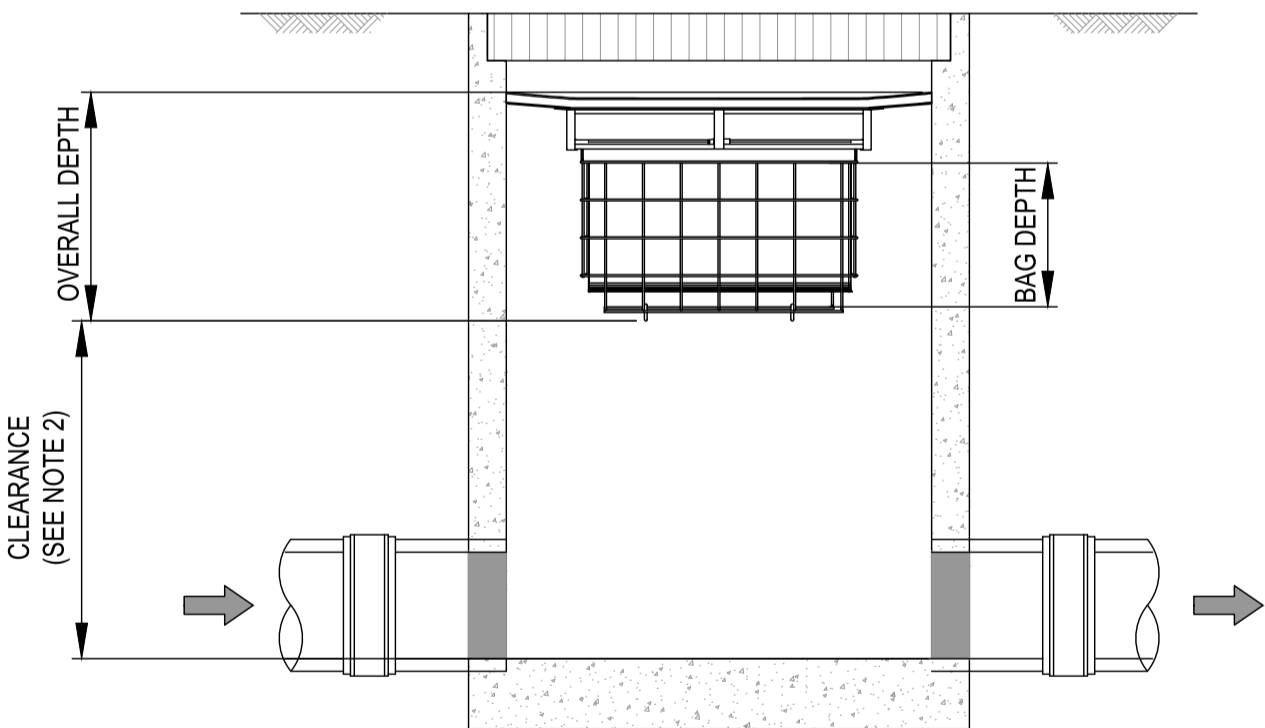


STORMFILTER
CARTRIDGE DETAIL
NTS

LEGEND	
SITE AREA: 1283.2m²	
	- ROOF AREA DRAINING TO STORMFILTER TANK = 670.9m²
	- PAVED AREA DRAINING TO STORMFILTER TANK = 120.5m²
	- PERVIOUS AREA DRAINING TO STORMFILTER TANK = 62.6m²
	- PERVIOUS AREA TO BY-PASS STORMFILTER TANK = 287.9m²
	- IMPERVIOUS AREA TO BY-PASS STORMFILTER TANK = 69.9m²
	- DRIVEWAY AREA TO BY-PASS STORMFILTER TANK = 71.4m²



WATER QUALITY CATCHMENT AREA
NTS



SIP WITH OCEANGUARD DETAIL
NTS

GENERAL NOTES

1. THE MINIMUM CLEARANCE DEPENDS ON THE CONFIGURATION (SEE NOTE 2) AND THE LOCAL COUNCIL REQUIREMENTS.
2. CLEARANCE FOR ANY PIT WITHOUT AN INLET PIPE (ONLY USED FOR SURFACE FLOW) CAN BE AS LOW AS 50mm. FOR OTHER PITS, THE RECOMMENDED CLEARANCE SHOULD BE GREATER OR EQUAL TO THE PIPE OBVERT SO AS NOT TO INHIBIT HYDRAULIC CAPACITY.
3. OCEAN PROTECT PROVIDES TWO FILTRATION BAG TYPES: 200 MICRON BAGS FOR HIGHER WATER QUALITY FILTERING AND A COARSE BAG FOR TARGETING GROSS POLLUTANTS.
4. DRAWINGS NOT TO SCALE.



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ALL WORK IS TO BE UNDERTAKEN IN ACCORDANCE WITH:
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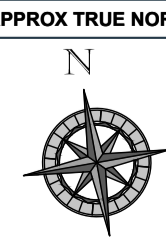
CLIENT
MONO CONSTRUCTIONS

ARCHITECT
STANTON DAHL ARCHITECTS
REF No.2421.19



DRAWING TITLE
WATER QUALITY CATCHMENT DETAILS & CALCULATIONS

PROPOSED RESIDENTIAL FLAT BUILDING
Lot 30, 56 BEANE STREET
GOSFORD



REVISION	DRAWN	DESCRIPTION	DATE
A	J.FISHER	ISSUED FOR DA	06.12.2019

ISSUED FOR DEVELOPMENT APPLICATION			
DESIGNED BY	No. IN SET	JOB NUMBER	
J.FISHER	8	190210-SW	
SCALE - SIZE	REVISION	DRAWING No.	
AS NOTED - A1	A	D6	

DUST CONTROL:

• NOTE: DURING EXCAVATION, DEMOLITION AND CONSTRUCTION, ADEQUATE MEASURES SHALL BE TAKEN TO PREVENT DUST FROM AFFECTING THE AMENITY OF THE NEIGHBORHOOD.

THE FOLLOWING MEASURES MUST BE ADOPTED:

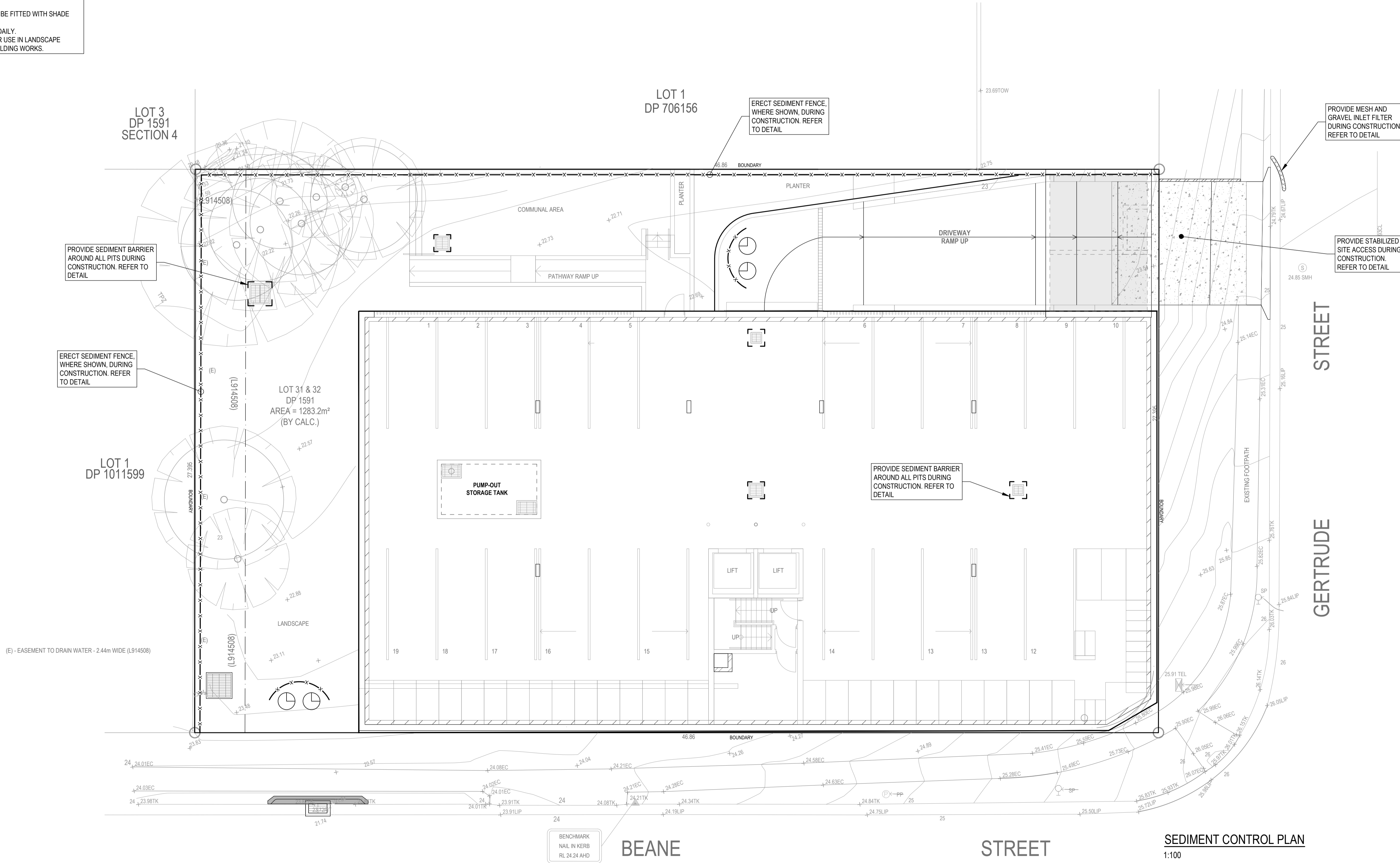
1. PHYSICAL BARRIERS SHALL BE ERECTED AT RIGHT ANGLES TO PREVENT WIND DIRECTION OR SHALL BE PLACED AROUND OR OVER DUST SOURCES TO PREVENT WIND OR ACTIVITY FROM GENERATING DUST.
2. EARTHWORKS AND SCHEDULING ACTIVITIES SHALL BE MANAGED TO COINCIDE WITH THE NEXT STAGE OF DEVELOPMENT TO MINIMISE THE AMOUNT OF TIME THE SITE IS LEFT TO CUT OR EXPOSED.
3. ALL MATERIALS SHALL BE STORED OR STOCKPILED AT THE BEST LOCATIONS.
4. THE GROUND SURFACE SHOULD BE DAMPENED SLIGHTLY TO PREVENT DUST FROM BECOMING AIRBORNE BUT SHOULD NOT BE WET TO THE EXTENT THAT RUN-OFF OCCURS.
5. ALL VEHICLES CARRYING SOIL OR RUBBLE TO OR FROM THE SITE SHALL AT ALL TIMES BE COVERED TO PREVENT THE ESCAPE OF DUST.
6. ALL EQUIPMENT WHEELS SHALL BE WASHED BEFORE EXISTING THE SITE USING MANUAL OR AUTOMATED SPRAYERS AND DRIVE - THROUGH WASHING BAYS.
7. GATES SHALL BE CLOSED BETWEEN VEHICLE MOVEMENTS SHALL BE FITTED WITH SHADE CLOTH.
8. CLEANING OF FOOTPATHS AND ROADWAYS SHALL CARRIED OUT DAILY.
9. ALL BUILDERS REFUSE, SPOIL AND/OR MATERIAL UNSUITABLE FOR USE IN LANDSCAPE AREAS SHALL BE REMOVED FROM SITE ON COMPLETION OF THE BUILDING WORKS.

NOTES:

1. ALL EROSION AND SEDIMENT CONTROL MEASURES TO BE INSPECTED AND MAINTAINED DAILY BY SITE MANAGER IN ACCORDANCE WITH COUNCIL REQUIREMENTS.
2. ALL STOCKPILES TO BE CLEAR FROM DRAINS, GUTTERS AND FOOTPATHS.
3. DRAINAGE IS TO BE CONNECTED TO STORMWATER SYSTEM AS SOON AS POSSIBLE.
4. ROADS AND FOOTPATH TO BE SWEEPED DAILY AS REQUIRED BY COUNCIL.
5. IF YOU DO NOT COMPLY WITH COUNCIL REQUIREMENTS & DOCUMENTATION, YOU MAY BE LIABLE TO PROSECUTION FROM GOVERNMENT AUTHORITIES.

LEGEND:

- UNDISTURBED VEGETATION
- SEDIMENT FENCE
- STOCK PILES
- STABILIZED SITE ACCESS
- MESH & GRAVEL INLET FILTER
- WATER DIVERSION
- STORMWATER PIT WITH SEDIMENT BARRIER



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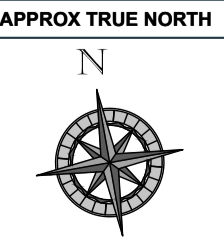
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DRAWINGS TO BE READ IN CONJUNCTION WITH ARCHITECTS PLANS.
ALL EXISTING GROUND LEVELS & TRENDS ARE APPROXIMATELY ONLY TO BE VERIFIED ON SITE BY BUILDER.
ALL WORK IS TO BE UNDERTAKEN IN ACCORDANCE WITH:
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APPROVED BY
ROBERT ELTOBBAGI
MIEAust CPEng

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MONO CONSTRUCTIONS
ARCHITECT
STANTON DAHL ARCHITECTS
REF No 2421.19



DRAWING TITLE
SEDIMENT CONTROL PLAN
PROPOSED RESIDENTIAL FLAT BUILDING
Lot 30, 56 BEANE STREET
GOSFORD

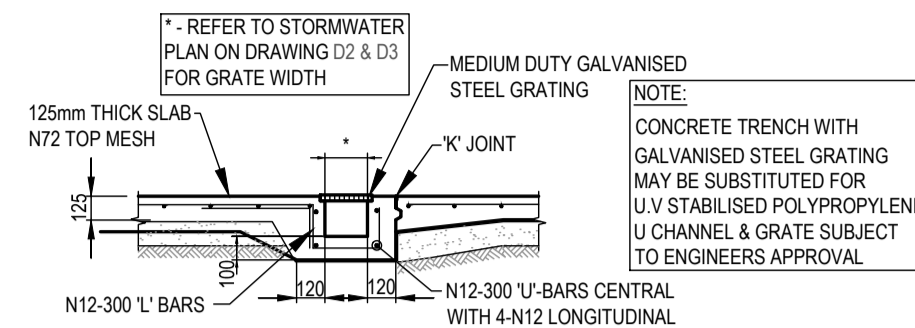


REVISION	DRAWN	DESCRIPTION	DATE
A	J.FISHER	ISSUED FOR DA	06.12.2019

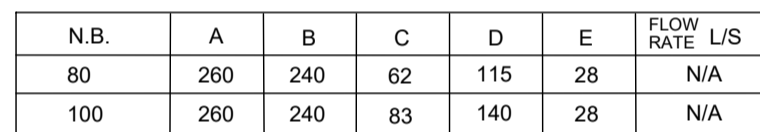
ISSUED FOR DEVELOPMENT APPLICATION			
DESIGNED BY	No. IN SET	JOB NUMBER	
J.FISHER	8	190210-SW	
SCALE - SIZE	REVISION	DRAWING No.	
1:100 - A1	A	D7	



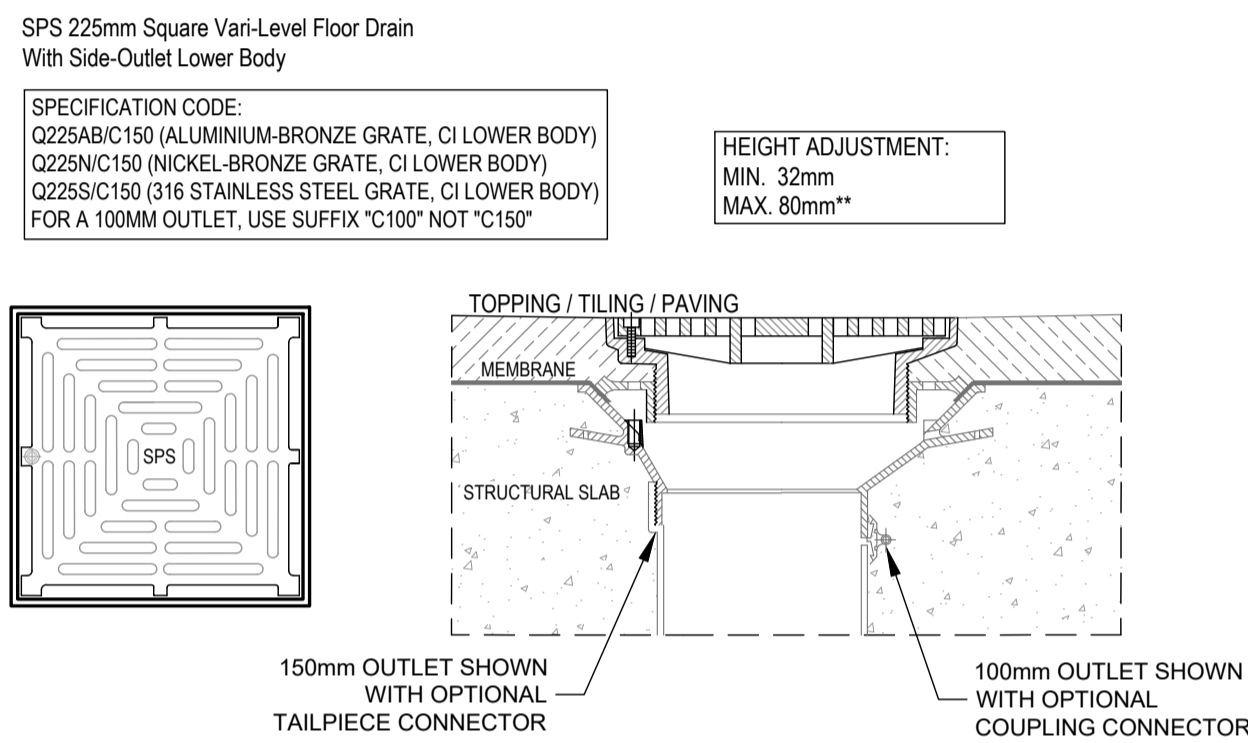
NOTE:
ALL PROPOSED SITE PITS ARE TO BE CONSTRUCTED IN CONCRETE CAST IN SITU. PLASTIC OR BRICK PITS ARE NOT ACCEPTABLE. HOWEVER, 'COUNCIL MAY CONSIDER PRE-CAST UNITS IF THE UNITS ARE PLACED ON A SOLID BASE OF GRAVEL OR CONCRETE OF 75mm THICK AND BACKFILL UP TO HALF THE DEPTH OF THE PIT SURROUND WITH CONCRETE.



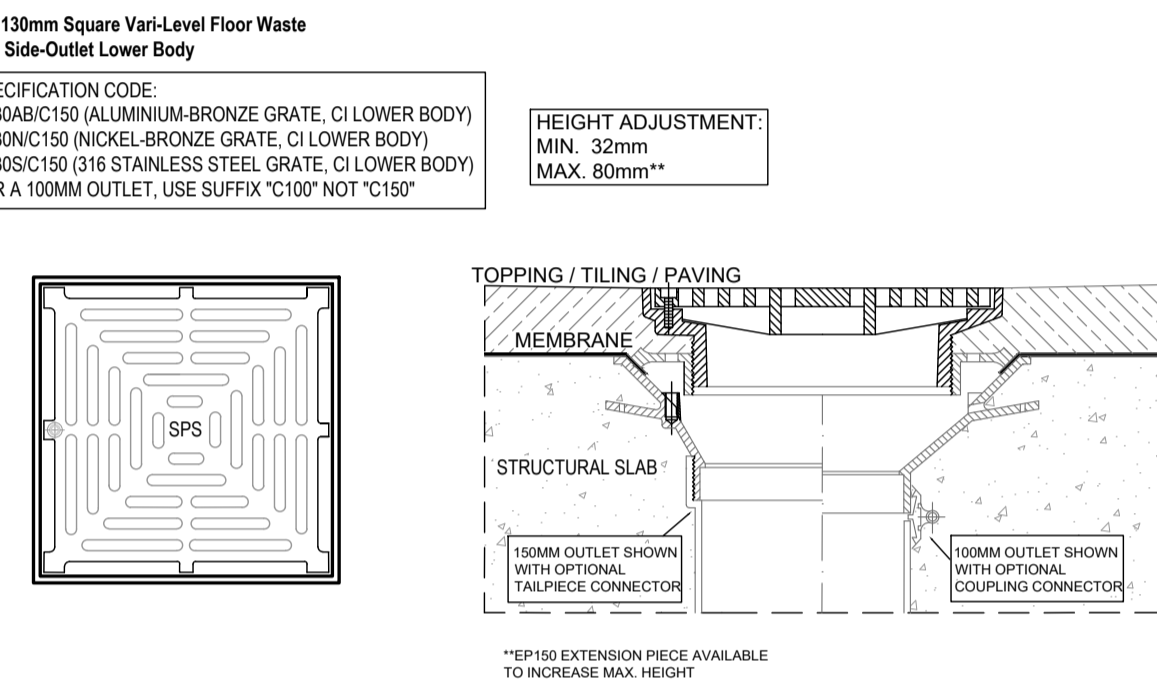
GRATED DRAIN
NTS



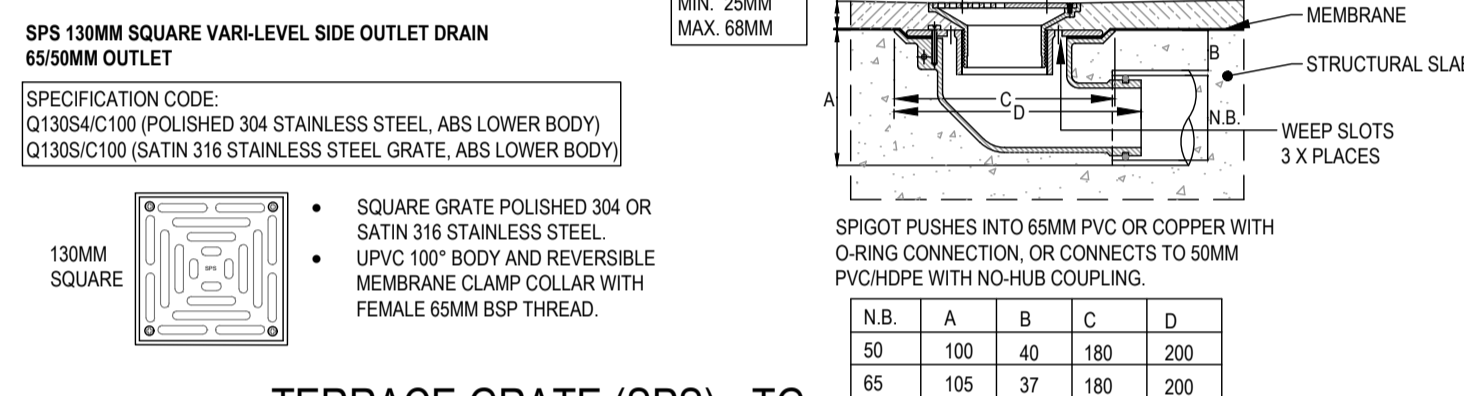
PLANTER GRATE (SPS) - PG
NTS



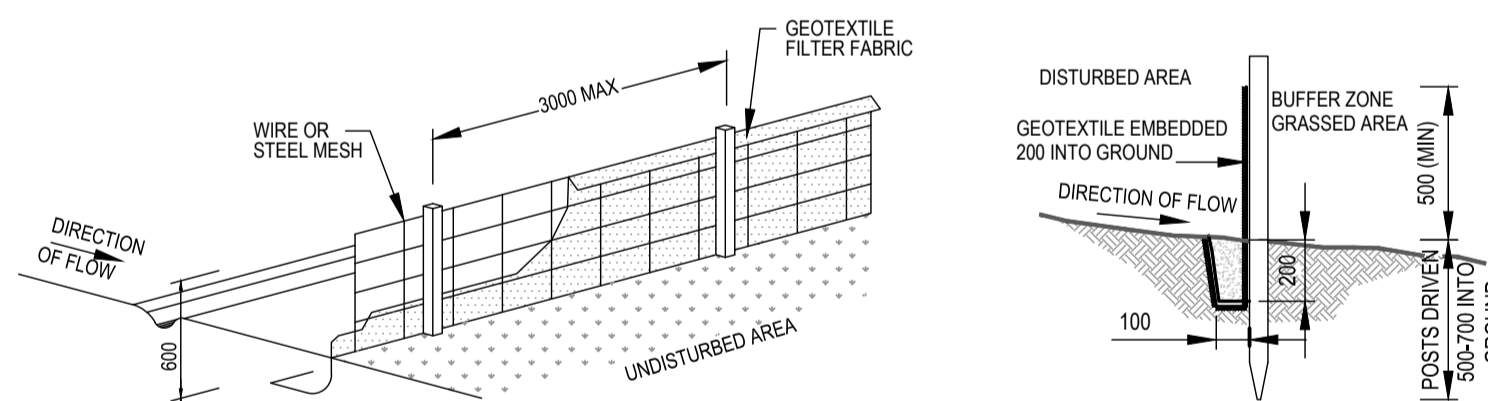
FLOOR DRAIN (SPS) - FD
NTS



FLOOR WASTE (SPS) - FW
NTS



TERRACE GRATE (SPS) - TG
NTS

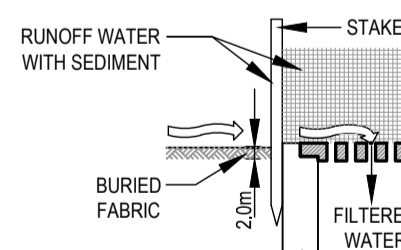


SEDIMENT FENCE DETAIL

- ### CONSTRUCTION NOTES:
1. CONTRACT STRUCTURE DESIGNS AS CLOSE AS POSSIBLE TO BEING PARALLEL TO THE CONTOURS OF THE SITE, BUT WITH SMALL RETURNS AS SHOWN IN THE DRAWING TO LIMIT THE CATCHMENTS AREA OF ANY ONE SECTION. THE CATCHMENTS AREA SHOULD BE SMALL ENOUGH TO LIMIT THE CONCENTRATION OF DEBRIS TO ONE SECTION AND TO BE REMOVED BY THE SECOND IN THE DESIGN STORM EVENT, USUALLY THE 10 YEAR EVENT.
 2. CUT A 150mm DEEP TRENCH ALONG THE UPSLOPE LINE OF THE FABRIC FOR THE BOTTOM OF THE FABRIC TO BE ENTRENCHED.
 3. STAKE OUT THE STARS AT 5m INTERVALS (MAX) ALONG THE UPSLOPE EDGE OF THE TRENCH. ENSURE ANY STAR KNOTS ARE FITTED WITH SAFETY CAPS.
 4. FIX SELF SUPPORTING GEOTEXTILE TO THE UPSLOPE SIDE OF THE POSTS DURING IT GOES TO THE BASE OF THE TRENCH. FIX THE GEOTEXTILE WITH STAPLES OR ANOTHER MEANS OF FIXING. THE MANUFACTURER ONLY USES GEOTEXTILE SPECIFICALLY PRODUCED FOR SEDIMENT FENCING. THE USE OF SHADE CLOTH FOR THIS PURPOSE IS NOT SATISFACTORY.
 5. JOIN SECTIONS OF FABRIC AT A SUPPORT POST WITH 150mm overlap TRENCH. SHOW THE TRENCH TO BE 150mm DEEP. THE FABRIC AND COMPACT THOROUGHLY OVER THE GEOTEXTILE.

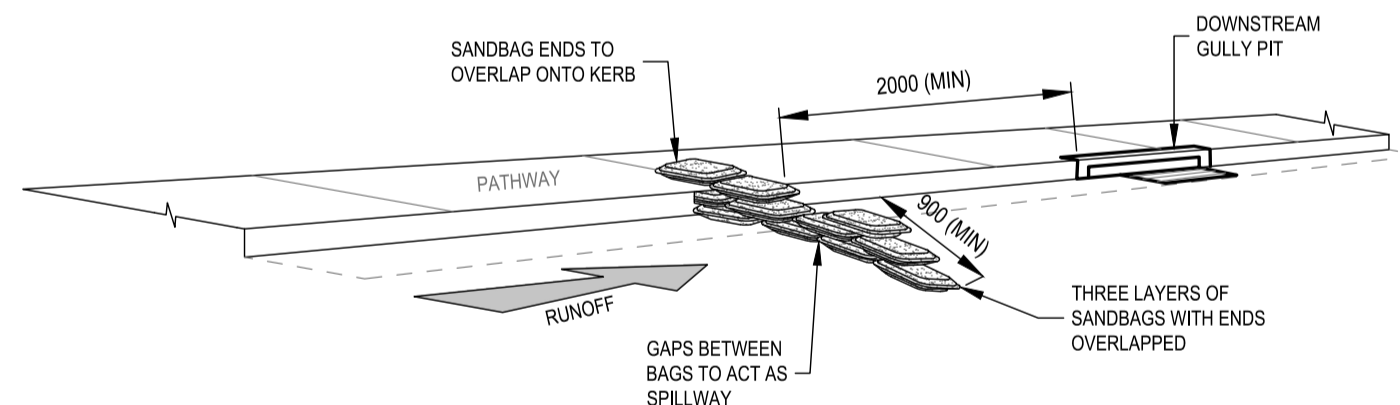


- NOTE:**
1. PLACE STOCKPILES MORE THAN 2 (PREFERABLY 5) METRES FROM EXISTING VEGETATION, CONCENTRATED WATER FLOW, ROADS AND HAZARD AREAS.
 2. CONSTRUCT ON THE CONTOUR AS LOW, FLAT, ELONGATED MOUNDS.
 3. WHERE THERE IS SUFFICIENT AREA, TOPSOIL STOCKPILES SHALL BE LESS THAN 2 METRES IN HEIGHT.
 4. WHERE THEY ARE TO BE IN PLACE FOR MORE THAN 10 MONTHS, STABILIZE FOLLOWING THE APPROVED ESCP OR SWMP TO REDUCE THE C-FACTOR TO LESS THAN 0.10.
 5. CONSTRUCT EARTH BANKS (LOW FLOW) ON THE UPSLOPE SIDE TO DIVERT WATER AROUND STOCKPILES AND SEDIMENT FENCES 1 TO 2 METRES ON THE DOWNSLOPE.

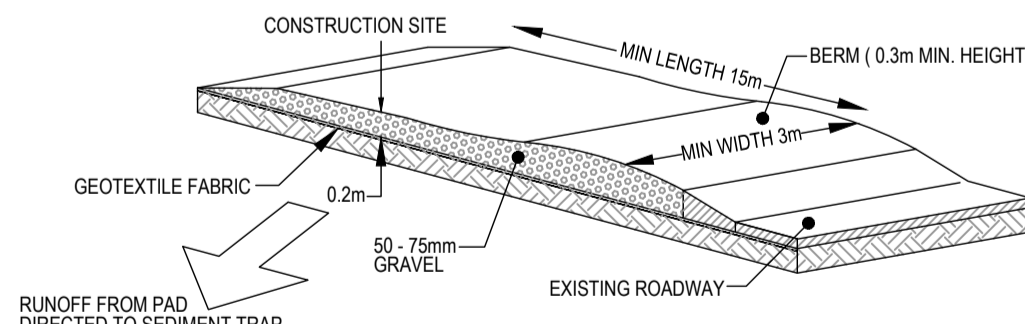


SEDIMENT BARRIER AROUND PIT

- CONSTRUCTION NOTES:**
1. FABRICATE A SEDIMENT BARRIER MADE FROM GEOTEXTILE OR STRAW BALES.
 2. FOLLOW STRAW FILTER AND SEDIMENT FENCE FOR INSTALLATION PROCEDURES FOR THE STRAW BALES OR GEOFABRIC. REDUCE THE PICKET SPACING TO 1 METRE CENTRES.
 3. IN WATERWAYS, ARTIFICIAL SAG POINTS CAN BE CREATED WITH SANDBAGS OR EARTH BANKS AS SHOWN IN THE DRAWING.
 4. DO NOT COVER THE INLET WITH GEOTEXTILE UNLESS THE DESIGN IS ADEQUATE TO ALLOW FOR ALL WATERS TO BYPASS IT.



SANDBAG - KERB SEDIMENT TRAP



STABILIZED SITE ACCESS

- CONSTRUCTION NOTES:**
1. STRIP THE TOPSOIL, LEVEL THE SITE AND COMPACT THE SUBGRADE
 2. COVER THE AREA WITH NEEDLE-PUNCHED GEOTEXTILE
 3. CONSTRUCT A 200mm THICK PAD OVER THE GEOTEXTILE USING ROAD GRAVEL
 4. ENSURE THE STRUCTURE IS AT LEAST 15m LONG OR TO BUILD ALIGNMENT AND AT LEAST 3 METRES WIDE.
 5. WHERE A SEDIMENT FENCE JOINS ONTO THE STABILIZED ACCESS, CONSTRUCT A HUMP IN THE STABILIZED ACCESS TO DIVERT WATER TO THE SEDIMENT FENCE.