PROPOSED MIXED USE DEVELOPMENT AT:
46-52 FERDELL ST, SOUTH GRANVILLE, 2142
STORMWATER DRAINAGE DRAWING PACKAGE

GENERAL NOTES

THIS PLAN IS A CONCEPT PLAN ONLY FOR STORMWATER DISPOSAL & EROSION CONTROL. IT IS NOT SUITABLE FOR CONSTRUCTION. THIS PLAN SHOULD BE ADAPTED BY THE BUILDER DURING DEMOLITION, EXCAVATION & CONSTRUCTION PHASES TO ENSURE ADEQUATE PERFORMANCE.

ALL DRAINAGE LAYOUT & DETAILS ARE DIAGRAMMATIC & INDICATIVE ONLY. ACTUAL LOCATION, SIZES, LEVELS & GRADES MAY ALTER WHEN DETAIL DESIGN WORKS ARE DOCUMENTED.

DRAINAGE NOTES:

ALL PIPES TO BE LAID ON 75mm SAND BED WITH THE BARRELS FULLY SUPPORTED

100mm AND 150mm DIAMETER PIPES TO BE LAID ON MINIMUM 1% GRADE

MINIMUM DEPTH OF COVER FOR PIPES NOT SUBJECT TO VEHICULAR LOADING TO BE 300mm

ALL DRAINAGE PIPES LAID UNDER PAVEMENT SHALL BE REINFORCED CONCRETE WITH RUBBER RING JOINTS

BACKFILL TRENCHES WITH COMPACTED SAND OR APPROVED AGGREGATE MATERIAL

ALL PITS TO HAVE 600x600mm INTERNAL DIMENSIONS (U.N.O.)

SILT ARRESTORS TO HAVE 900x900mm INTERNAL DIMENSIONS

HEAVY DUTY GRATES AND COVERS ARE TO BE PROVIDED IN TRAFFICABLE AREAS

PIT GRATE TO BE TYPE WELDLOK OR APPROVED EQUIVALENT

ALL PITS SHALL BE PROVIDED WITH A LOCKING CLIP

ALL PITS SHALL BE MAINTAINED REGULARLY

TOP OF BENCHING SHALL BE TO THE HALF OF THE OUTLET PIPE DIAMETER

MAXIMUM FRONT ENTRY PIPE:–
STRAIGHT ENTRY – ø750
SKEW ENTRY 45° – ø525

ø100 SUBSOIL DRAINAGE PIPE 3000mm LONG WRAPPED IN FABRIC SOCK TO BE PROVIDED ADJACENT TO INLET PIPES

COMPRESSIVE STRENGTH f'c FOR CAST IN SITU CONCRETE TO BE A MINIMUM OF 20MPa AT 28 DAYS

PROVIDE CLEANING EYES TO ALL DOWNPIPES NOT DIRECTLY CONNECTED TO PITS

ISOLATED JOINTS TO BE PROVIDED TO ISOLATE CONCRETE PAVEMENTS FROM PITS

ALL TRENCH GRATES PROVIDED SHALL HAVE A MINIMUM CLEAR WIDTH OF 200mm

STORMWATER DRAINAGE CONNECTIONS TO THE MAIN SYSTEM SHALL BE TO THE REQUIREMENTS AND THE SATISFACTION OF LOCAL COUNCIL

DRAWING REGISTER		
NUMBER	NAME	REVISION
SW01	COVER SHEET	01
SW02	EROSION & SEDIMENT CONTROL PLAN	01
SW03	LEVEL 3 DRAINAGE PLAN	01
SW04	LEVEL 2 DRAINAGE PLAN	01
SW05	LEVEL 1 DRAINAGE PLAN	01
SW06	SITE DRAINAGE PLAN	01
SW07	OSD DETAILS	01
SW08–A	MUSIC MODEL	01
SW08–B	MUSIC MODEL – AREA BREAKDOWN	01
SW09–A	EXISTING PIPE CAPACITY CALCULATION (PRE–DEVELOPMENT)	01
SW09–B	EXISTING PIPE CAPACITY CALCULATION (POST–DEVELOPMENT)	01
	OSD – DRAINAGE DESIGN SUMMARY	08/05/2024
	OCEAN PROTECT – STORMFILTER DETENTION TANK	
	STORMFILTER FLOW CALCULATION	
	OCEAN PROTECT – FILTERRA BIOSCAPE SYSTEM	
	OCEAN PROTECT – OCEANGUARD	

EROSION & SEDIMENTATION CONTROL NOTES

CONTRACTOR SHALL PROVIDE SEDIMENT FENCING MATERIAL DURING CONSTRUCTION TO THE LOW SIDE OF THE WORKS. TIE SEDIMENT FENCING MATERIAL TO CYCLONE WIRE SECURITY FENCE. SEDIMENT CONTROL FABRIC SHALL BE AN APPROVED MATERIAL (EG. HUMES PROPEX SILT STOP) STANDING 300mm ABOVE GROUND & EXTENDING 150mm BELOW GROUND.

EXISTING DRAINS LOCATED WITHIN THE SITE SHALL ALSO BE ISOLATED BY SEDIMENT FENCING MATERIAL.

NO PARKING OR STOCKPILING OF MATERIALS IS PERMITTED ON THE LOWER SIDE OF THE SEDIMENT FENCE.

GRASS VERGES SHALL BE MAINTAINED AS MUCH AS PRACTICAL TO PROVIDE A BUFFER ZONE TO THE CONSTRUCTION SITE.

CONSTRUCTION ENTRY/EXIT SHALL BE VIA THE LOCATION NOTED ON THE DRAWING. CONTRACTOR SHALL ENSURE ALL DROPPABLE SOIL & SEDIMENT IS REMOVED PRIOR TO CONSTRUCTION TRAFFIC EXITING SITE. CONTRACTOR SHALL ENSURE ALL CONSTRUCTION TRAFFIC ENTERING & LEAVING THE SITE DO SO IN A FORWARD DIRECTION.

AUTHORITY STORMWATER NOTES:

IT IS THE CONTRACTOR'S RESPONSIBILITY TO CHECK ALL SET OUT AND LEVELS PRIOR TO COMMENCEMENT OF WORKS AND TO REPORT ANY DISCREPANCIES FOUND TO THE SUPERINTENDANT.

ALL SET OUT DIMENSIONS ARE TO FACE OF KERB, CENTERLINE OF FENCE/BOLARD/PIPE.

SMOOTH ALL TRANSITIONS BETWEEN NEW AND EXISTING WORK IN BOTH LEVEL AND ALIGNMENT.

IT IS THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE ALL SAFETY FENCES, WARNING SIGNS, TRAFFIC DIVERSIONS AND THE LIKE DURING CONSTRUCTION. ALL WORKS TO COMPLY WITH OCCUPATIONAL HEALTH AND SAFETY REQUIREMENTS AND OTHER RELEVANT AUTHORITY SAFETY REQUIREMENTS.

NO TREES SHALL BE REMOVED, CUTBACK OR RELOCATED WITHOUT THE WRITTEN INSTRUCTION FROM THE SUPERINTENDENT.

THE CONTRACTOR SHALL PROVIDE CERTIFICATION OF COMPACTION AND PAVEMENT THICKNESS FROM A NATA REGISTERED TESTING AUTHORITY. MINIMUM THREE TESTS PER LAYER AS FOLLOWS

PIPE BACKFILL	DENSITY INDEX 75
SELECT FILL	95% STANDARD
SELECT FILL (LESS THAN 300mm BELOW BASE COURSE)	98% MODIFIED
BASE COURSE	100% MODIFIED

THE AUSPEC SPECIFICATION SHALL BE THE SPECIFICATION FOR THESE WORKS.

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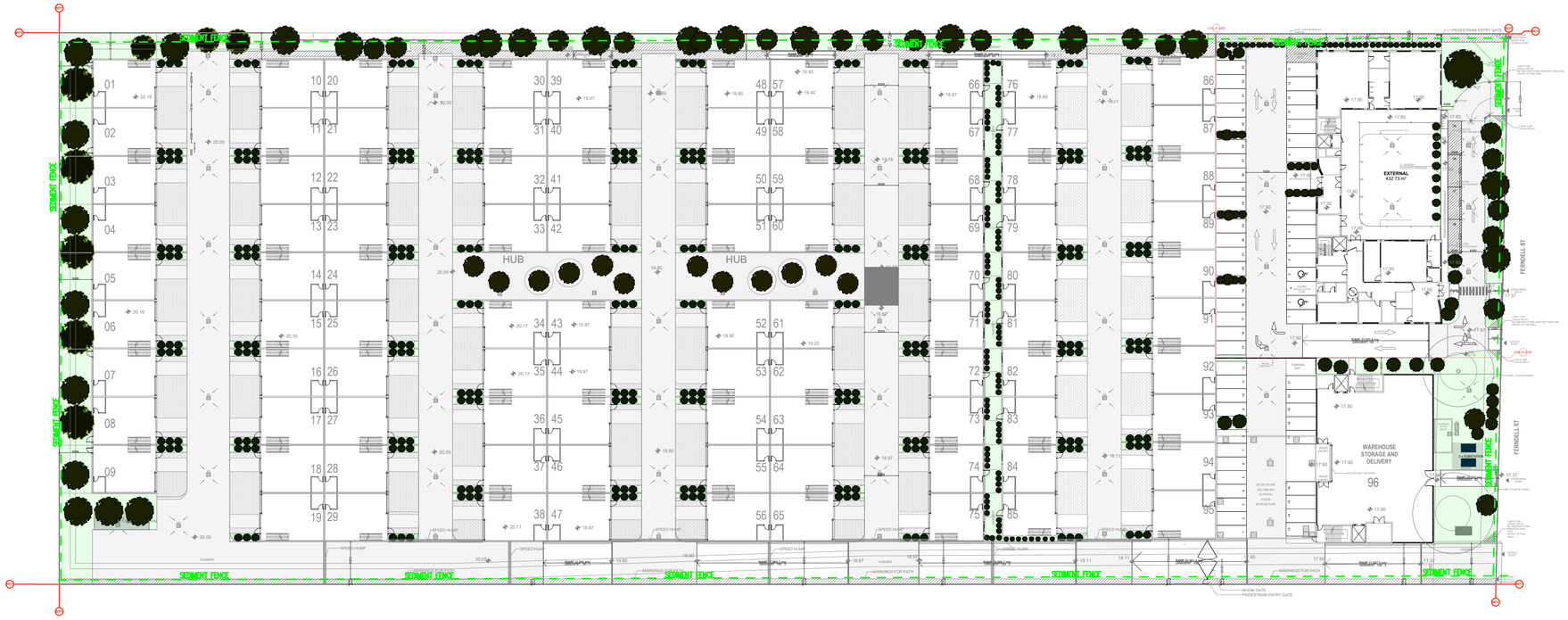
Drawn by:	A.A.							Title: COVER SHEET	Scale @A1: NTS
Revision:	01								Drg No. SW01



SEDIMENT CONTROL

NOTES

1. THESE DRAWINGS ARE TO BE READ IN CONJUNCTION WITH THE ARCHITECTURAL DRAWINGS, STRUCTURAL DRAWINGS AND THE SPECIFICATON.

2. PRIOR TO COMMENCEMENT OF WORKS THE CONTRACTOR SHALL SATISFY HIMSELF OF THE CORRECT LOCATION OF EXISTING SERVICES WHETHER INDICATED OR NOT ON THE PLANS. ANY DAMAGE TO EXISTING SERVICES SHALL BE RECTIFIED AT THE CONTRACTORS EXPENSE.

3. TRAFFIC MANAGEMENT MEASURES HAVE TO BE IMPLEMENTED AND MAINTAINED DURING CONSTRUCTON, ALL IN ACCORDANCE WITH COUNCIL'S REQUIREMENTS. THE CONTRACTOR SHALL MAINTAIN SAFE PEDESTRIAN ACCESS ALONG THE FOOTPATH.

4. THE CONTRACTOR SHALL EFFECT TEMPORARY DRAINAGE MEASURES TO AVOID LOCALISEDPONDING OF SURFACE RUN-OFF.

5. REFER TO ARCHITECT'S DRAWINGS FOR ALL DETAILS (LEVELS, GRADING ETC.) OF DRIVEWAYS, CONCRETE ANDPAVED AREAS, AND RETAINING WALL TYPES AND LOCATIONS.

6. REFER TO LANDSCAPE ARCHITECT'S DRAWINGS FOR DETAILS AND EXTENT OF ALL LANDSCAPED AREAS.

7. ALL SWDPIPES ARE UPVC AT 1.0% MINIMUM GRADE (UNO).

8. SWDPITS CAN BE PRE-CAST SIZED AS FOLLOWS:
   450mm SQ. UP TO 600mm DEEP
   600mm SQ. UP TO 1000mm DEEP

9. ALL PITS LOCATED IN TRAFFICABLE AREAS, (IE, DRIVEWAYS) TO HAVE MEDIUM DUTY GRATED COVERS SUITABLE FOR WITHSTANDING LOADS ASSOCIATED WITH SMALL TRUCKS.

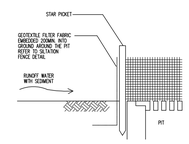
10. PROVIDE STEP IRONS TO ALL PITS GREATER THAN 1.2m DEEP.

11. THE CONTRACTOR SHALL IMPLEMENT ALL SOIL EROSION AND SEDIMENT CONTROL MEASURES PRIOR TO COMMENCEMENT OF WORKS.

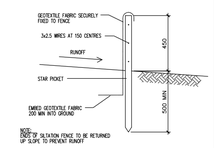
12. TOPSOIL SHALL BE STRIPPED ON STOCKPILED OUTSIDE HAZARD AREAS SUCH AS DRAINAGE LINES. THIS TOPSOIL IS TO BE RESPREAD LATER ON AREAS TO BE REVEGETATED.

13. THE CONTRACTOR SHALL REGULARLY MAINTAIN ALL SEDIMENT AND EROSION CONTROL DEVICES AND REMOVE ACCUMULATED SILT FROM SUCH DEVICES. ALL SILT REMOVED SHALL BE DISPOSED OF AS DIRECTED BY THE SUPERINTENDENT. THE PERIOD FOR MAINTAINING THESE DEVICES SHALL BE AT LEAST UNTIL ALL DISTURBED AREAS ARE REVEGETATED AND FURTHER AS MAY BE DIRECTED BY THE SUPERINTENDENT OR COUNCIL.

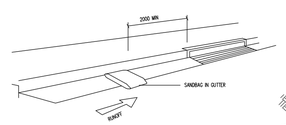
14. THE CONTRACTOR SHALL MAINTAIN DUST CONTROL UNTIL FINAL COMPLETION OF WORKS.



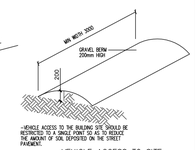
GEOTEXTILE FILTER PIT SURROUND
NTS



SILTATION FENCE DETAIL
NTS



SANDBAG KERB INLET SEDIMENT TRAP
NTS



VEHICLE ACCESS TO SITE
NTS

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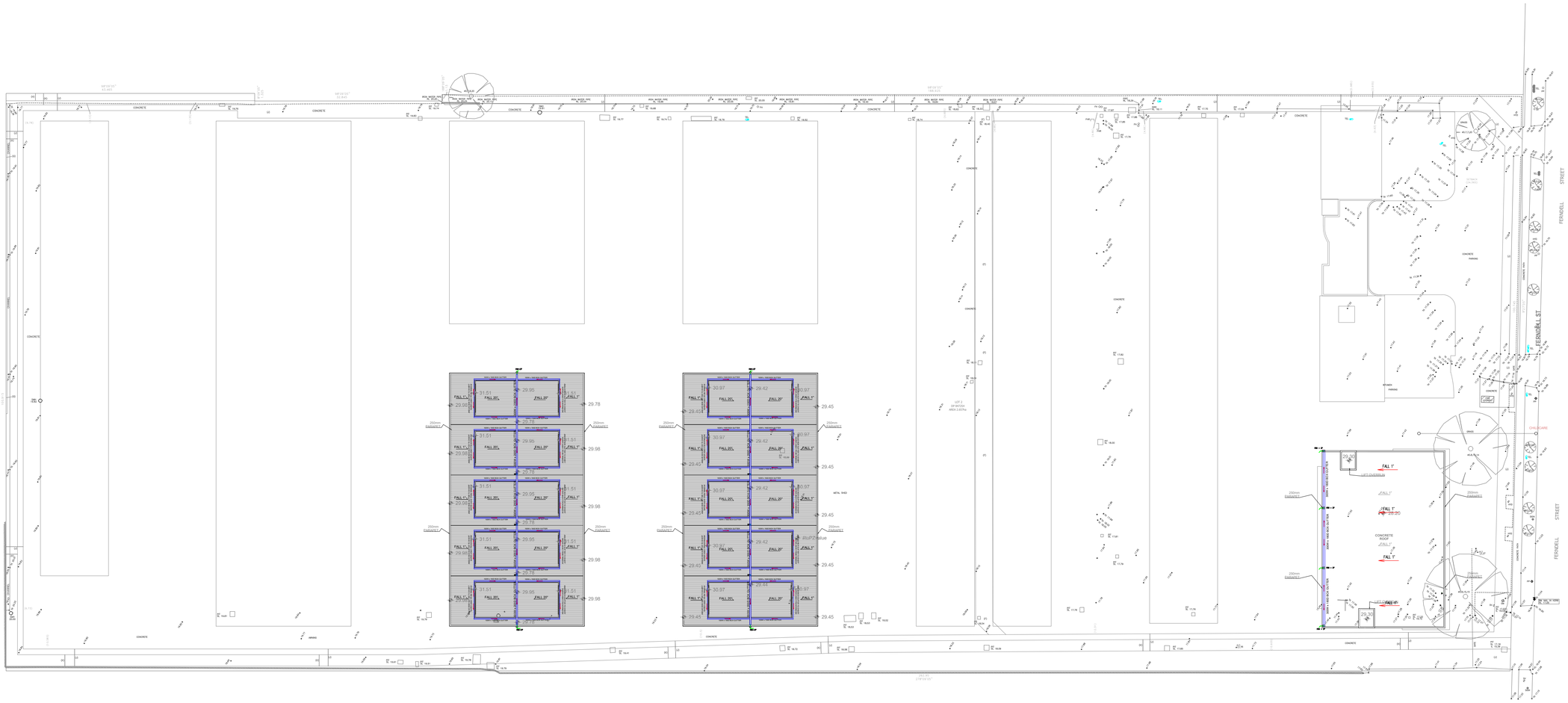
Drawn by:	A.A.								
Revision:	01								



LEGEND:

- 'DP' DOWNPIPE – ø150MM UPVC
- 'RWH' RAINWATER HEAD
- BOXED GUTTER
- DP – ø150mm UPVC

GENERAL NOTES:

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE BUILDING CODE OF AUSTRALIA AND AS3500.3, COUNCILS STANDARD SPECIFICATIONS CODES.
2. THIS PLAN IS TO BE READ IN CONJUNCTION WITH THE ARCHITECTURAL, LANDSCAPE AND STRUCTURAL PLANS.
3. MINIMUM GRADES FOR ALL PIPE SHOULD BE 1%, UNO.
4. DIRECT SURFACE FLOW TO ALL GRATED SURFACE INLET PITS.
5. ALL DESIGN LEVELS SHOWN ON PLAN SHALL BE VERIFIED ON SITE PRIOR TO THE COMMENCEMENT OF ANY WORK.
6. ANY DISCREPANCIES OR OMISSIONS SHALL BE REFERRED TO THE DESIGN ENGINEER FOR RESOLUTION.

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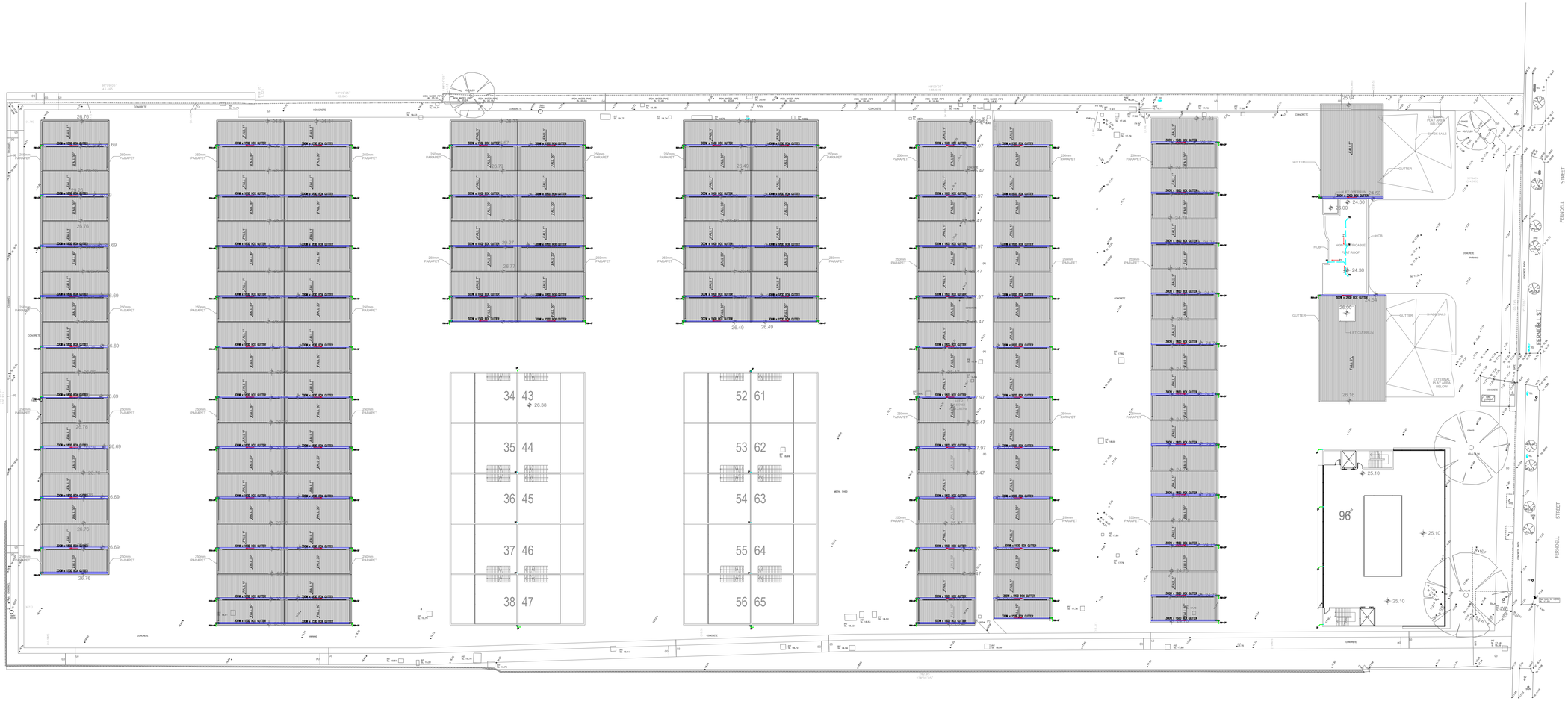
Drawn by:	A.A.								
Revision:	01								



LEGEND:

- 'DP' DOWNPIPE – ø150MM UPVC
- 'FW' FLOOR WASTE
- 'RWH' RAINWATER HEAD
- BOXED GUTTER
- DP – ø150mm UPVC
- "P1" ø100mm UPVC @ MIN 0.5% GRADE

GENERAL NOTES:

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE BUILDING CODE OF AUSTRALIA AND AS3500.3, COUNCILS STANDARD SPECIFICATIONS CODES.
2. THIS PLAN IS TO BE READ IN CONJUNCTION WITH THE ARCHITECTURAL, LANDSCAPE AND STRUCTURAL PLANS.
3. MINIMUM GRADES FOR ALL PIPE SHOULD BE 1%, UNO.
4. DIRECT SURFACE FLOW TO ALL GRATED SURFACE INLET PITS.
5. ALL DESIGN LEVELS SHOWN ON PLAN SHALL BE VERIFIED ON SITE PRIOR TO THE COMMENCEMENT OF ANY WORK.
6. ANY DISCREPANCIES OR OMISSIONS SHALL BE REFERRED TO THE DESIGN ENGINEER FOR RESOLUTION.

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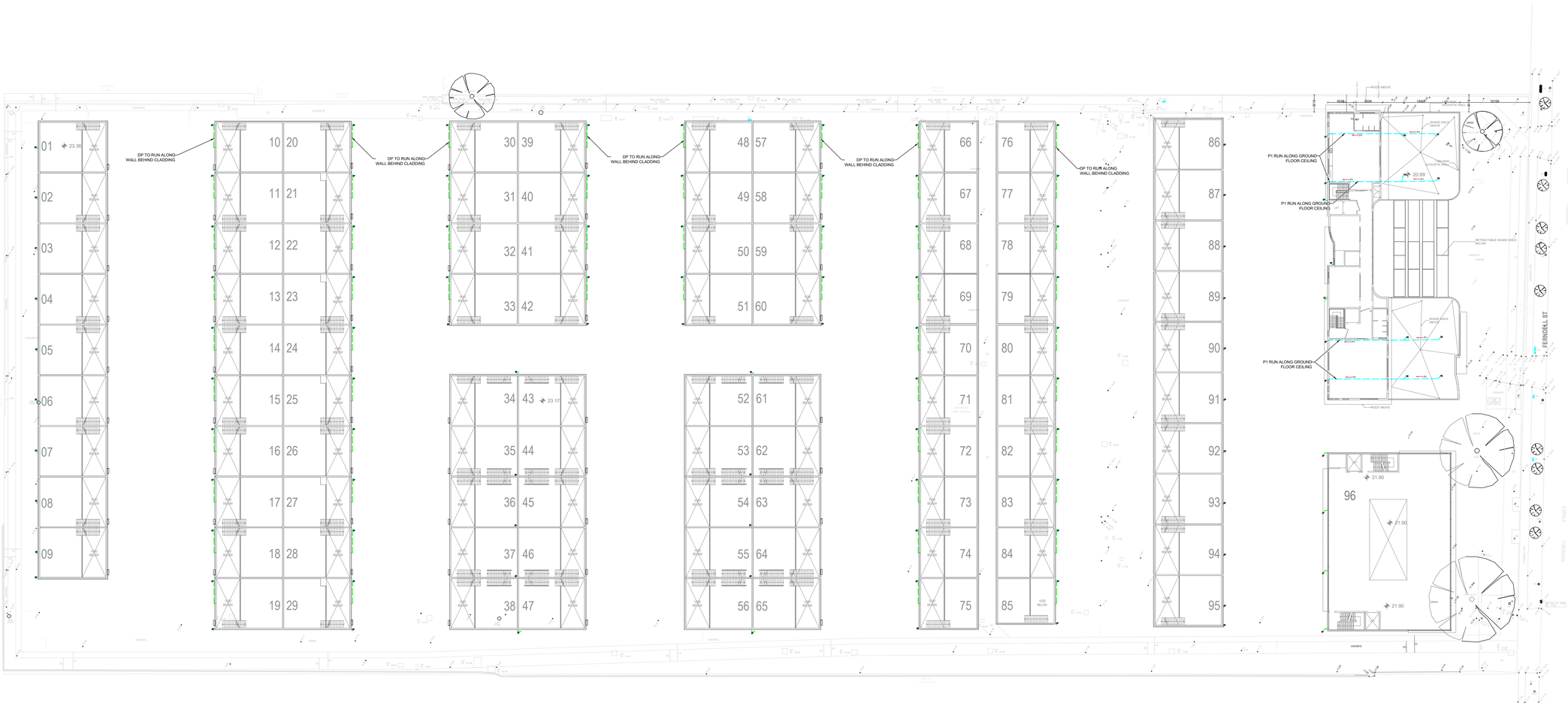
Drawn by:	A.A.								
Revision:	01								



LEGEND:

- 'DP' DOWNPIPE – ø150MM UPVC
- 'FW' FLOOR WASTE
- DP – ø150mm UPVC
- "P1" ø100mm UPVC @ MIN 0.5% GRADE

GENERAL NOTES:

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE BUILDING CODE OF AUSTRALIA AND AS3500.3, COUNCILS STANDARD SPECIFICATIONS CODES.
2. THIS PLAN IS TO BE READ IN CONJUNCTION WITH THE ARCHITECTURAL, LANDSCAPE AND STRUCTURAL PLANS.
3. MINIMUM GRADES FOR ALL PIPE SHOULD BE 1%, UNO.
4. DIRECT SURFACE FLOW TO ALL GRATED SURFACE INLET PITS.
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NOTES:

DP NOTE: DP FOR UNITS 10–33, 39–42, 48–51, 57–60, 66–85 TO RUN ALONG WALL BEHIND CLADDING AT THIS LEVEL ONLY BEFORE COMING DOWN TO GROUND LEVEL.

P1 NOTE: P1 TO RUN ALONG GROUND FLOOR CEILING TO EXTERIOR WALL FROM FIRST FLOOR SURFACE DRAINAGE (FLOOR WASTE) BEFORE COMING DOWN TO GROUND LEVEL ALONG EXTERIOR WALL

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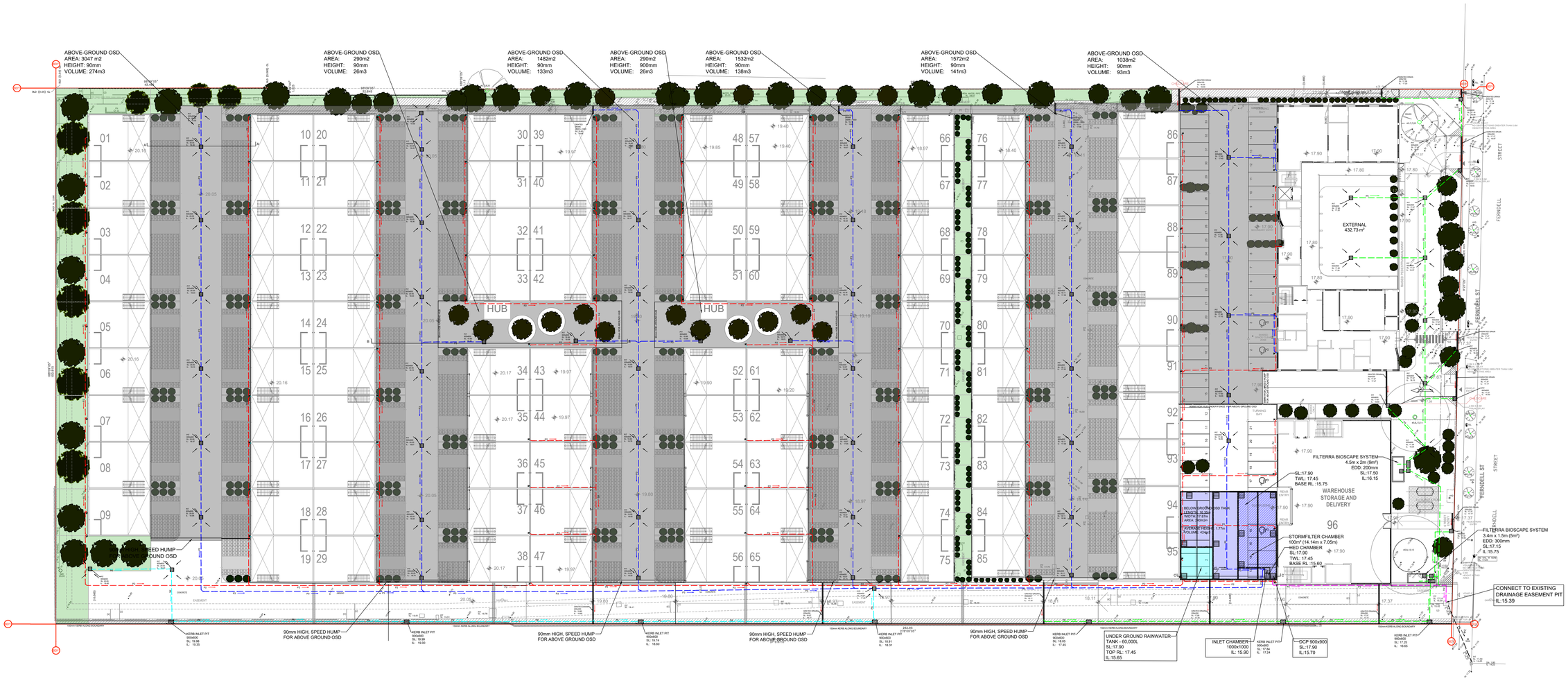
Drawn by:	A.A.								
Revision:	01								



LEGEND:

- 'DP' DOWNPIPE – ø150MM UPVC
- "P2" ø200mm UPVC @ MIN 1% GRADE (DP TO RWT)
- "P3" ø150mm UPVC @ MIN 0.5% GRADE (SURFACE PITS TO OSD)
- "P4" ø300mm UPVC @ MIN 1% GRADE (OSD TO EASEMENT PIT)
- "P5" ø150mm UPVC @ MIN 1% GRADE (SURFACE PITS / KIP TO P4 VIA FILTERRA)
- "P6" ø150mm UPVC @ MIN 1% GRADE (KERB INLET PITS TO OSD)
- "P7" ø100mm UPVC @ MIN 1% GRADE (RAINWATER TANK OVERFLOW TO STORMFILTER CHAMBER)
- "P8" EXISTING ø900mm PIPE (EASEMENT PIT TO COUNCIL KIP)
- ABOVE GROUND OSD AREA
- BELOW GROUND OSD AREA
- BELOW GROUND RAINWATER TANK
- LANDSCAPE OSD BYPASS

GENERAL NOTES:

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE BUILDING CODE OF AUSTRALIA AND AS3500.3, COUNCILS STANDARD SPECIFICATIONS CODES.
2. THIS PLAN IS TO BE READ IN CONJUNCTION WITH THE ARCHITECTURAL, LANDSCAPE AND STRUCTURAL PLANS.
3. MINIMUM GRADES FOR ALL PIPE SHOULD BE 1%, UNO.
4. DIRECT SURFACE FLOW TO ALL GRATED SURFACE INLET PITS.
5. ALL DESIGN LEVELS SHOWN ON PLAN SHALL BE VERIFIED ON SITE PRIOR TO THE COMMENCEMENT OF ANY WORK.
6. ANY DISCREPANCIES OR OMISSIONS SHALL BE REFERRED TO THE DESIGN ENGINEER FOR RESOLUTION.
7. ALL SURFACE DRAINAGE PITS & GRATED STRIP DRAINS TO HAVE OCEANGUARD INSERTS. REFER TO OCEANGUARD SPECIFICATION DRAWINGS BY OCEANPROTECT & MUSIC MODEL FOR DETAILS.
8. ALL EXISTING GRATED PITS TO BE CLOSED TO PREVENT SURFACE RUNOFF TO THESE PITS. ALL SURFACE DRAINAGE TO BE DRAINED TO PROPOSED DRAINAGE PITS TO COMPLY WITH WSUD POLICY

OSD NOTES:

TOTAL SITE AREA: 2.657 H
AREA DRAINING TO OSD: 2.2665 H (85.3%)
BYPASS AREA: 3905m² (14.7%)

TOTAL OSD VOLUME REQUIRED AS PER COUNCIL:
(REFER TO DRAINAGE DESIGN SUMMARY):
552.42 X 2.2665 = 1252.06m³

ABOVE GROUND OSD VOLUME PROVIDED – 829m³
BELOW GROUND OSD VOLUME PROVIDED – 424m³
TOTAL OSD VOLUME PROVIDED – 1253m³

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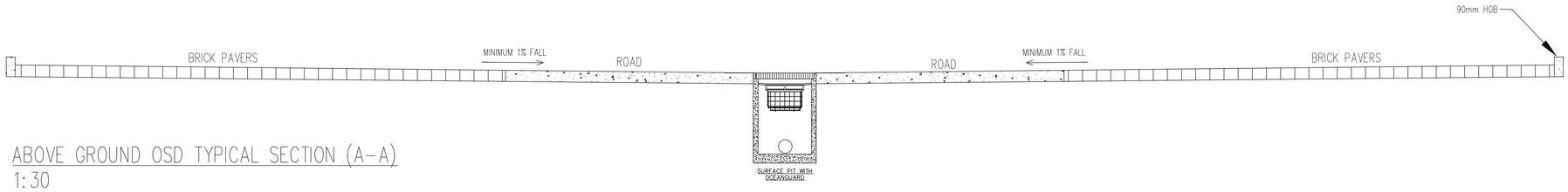
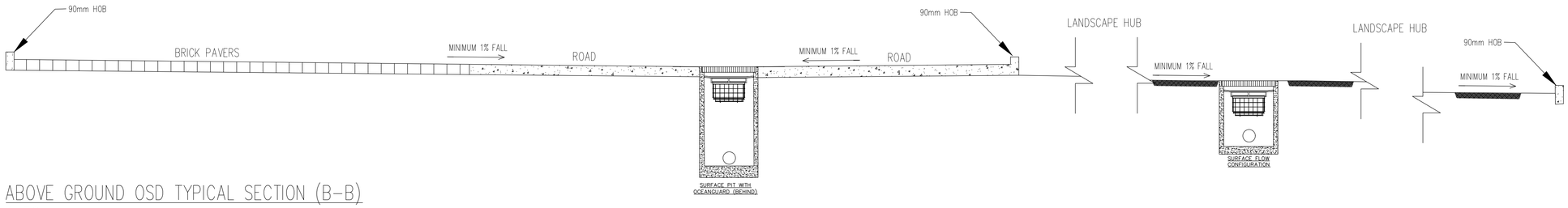
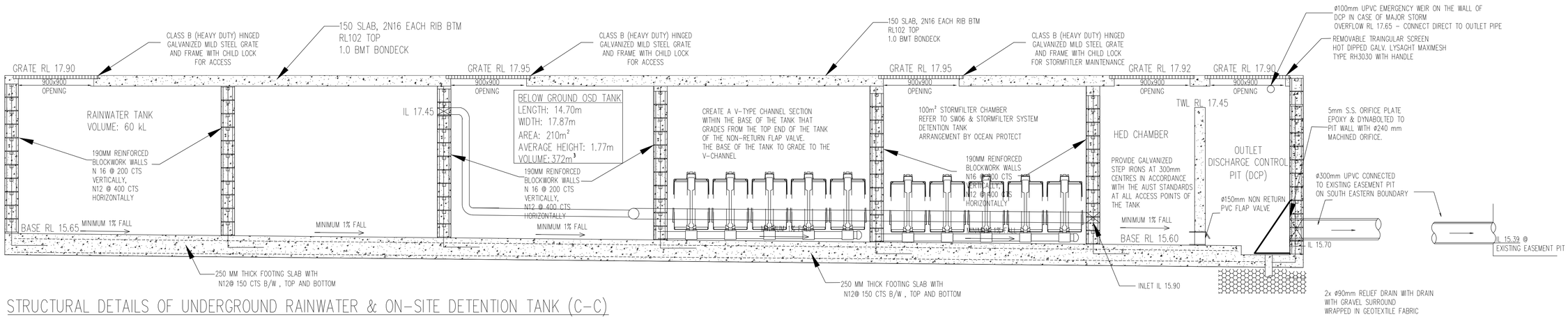
Drawn by:	A.A.							Title: SITE DRAINAGE PLAN	Scale @A1: 1:400
Revision:	01								Drg No. SW06



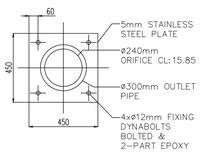
ABOVE GROUND OSD TYPICAL SECTION (A–A)
1:30



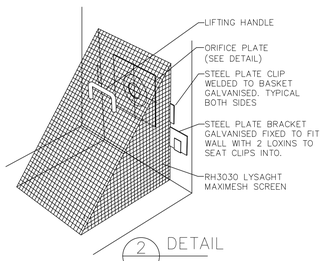
ABOVE GROUND OSD TYPICAL SECTION (B–B)
1:30



STRUCTURAL DETAILS OF UNDERGROUND RAINWATER & ON-SITE DETENTION TANK (C–C)
1:30



1 DETAIL
ORIFICE PLATE
SCALE 1:20



2 DETAIL
DEBRIS SCREEN
NOT TO SCALE

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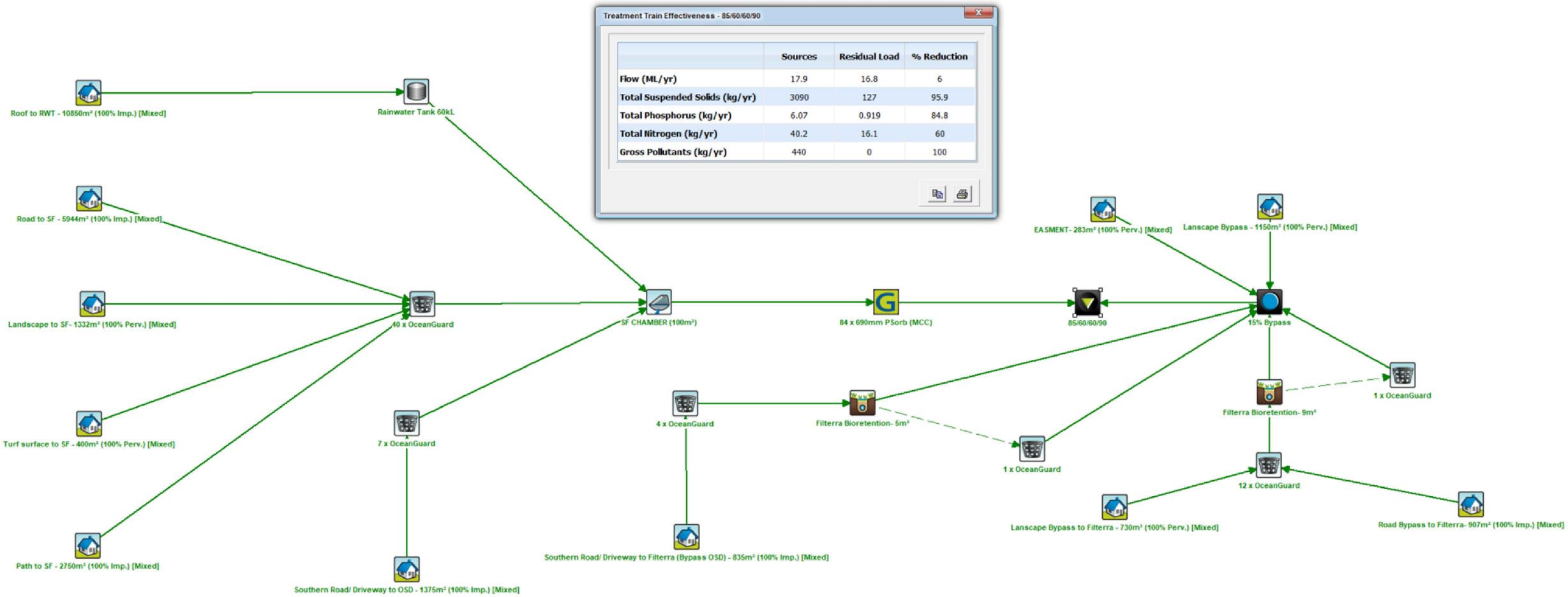
Drawn by:	A.A.							Title: **OSD DETAILS**	Scale @A1: 1:30
Revision:	01								Drg No. SW07



Treatment Train Effectiveness - 85/60/60/90

	Sources	Residual Load	% Reduction
Flow (ML/yr)	17.9	16.8	6
Total Suspended Solids (kg/yr)	3090	127	95.9
Total Phosphorus (kg/yr)	6.07	0.919	84.8
Total Nitrogen (kg/yr)	40.2	16.1	60
Gross Pollutants (kg/yr)	440	0	100

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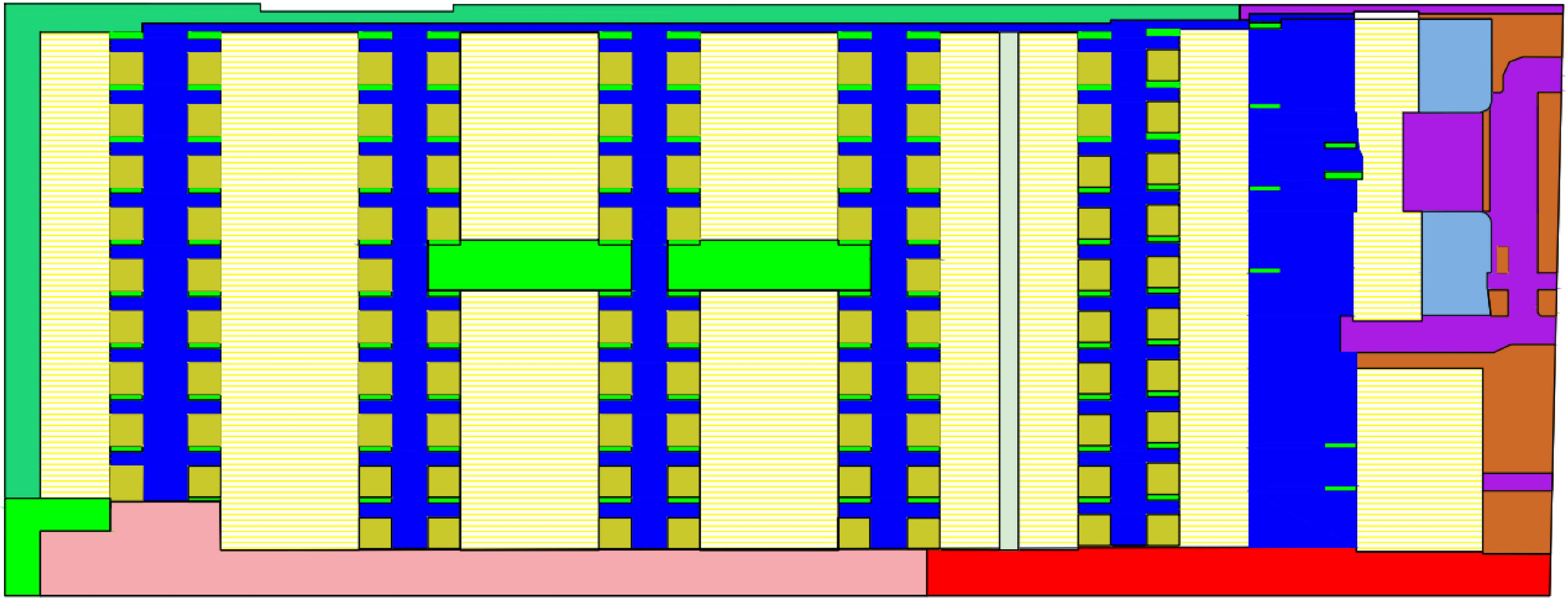
Drawn by:	A.A.							Title: **MUSIC MODEL**	Scale @A1: NTS
Revision:	01								Drg No. SW08-A



ROOF TO RWT: 10850m²

PATH TO SF CHAMBER: 2750m²

LANDSCAPE TO SF CHAMBER: 1332m²

ROAD/FOOTPATH TO SF CHAMBER: 5944m²

TURF SURFACE TO SF CHAMBER: 400m²

LANDSCAPE BYPASS 1150m²

SOUTHERN ROAD TO OSD 1375m²

ROAD/PATH BYPASS TO FILTERRA: 907m²

LANDSCAPE BYPASS TO FILTERRA: 730m²

TOTAL AREA: 26556m²

EASMENT 283m²

SOUTHERN ROAD BYPASS TO FILTERRA 835m²

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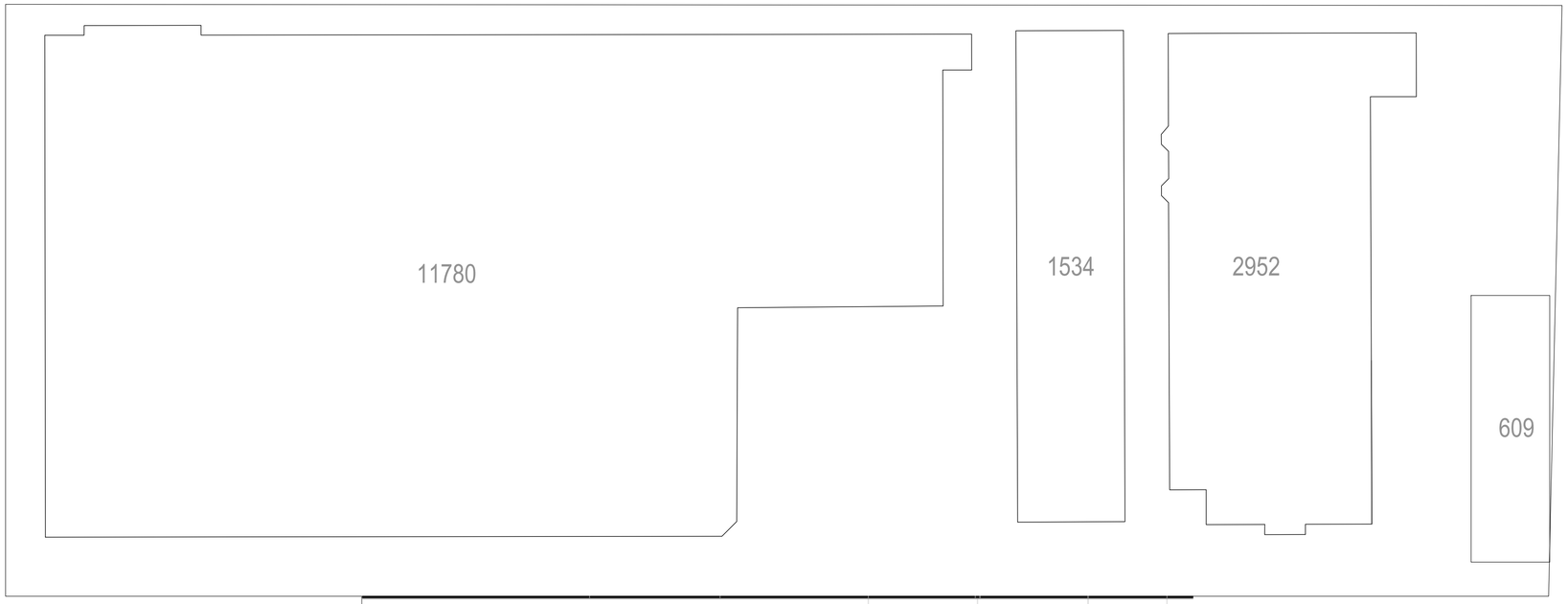
Drawn by:	A.A.								
Revision:	01								



PRE DEVELOPMENT

TOTAL SITE AREA : 26556

TOTAL GREEN AREA : 609 SQM

BUILDING FOOTPRINT AREA: 16266 SQM

DRIVEWAY AND CARPARK AREA: 8675 SQM

AREA DRAINING TO PIPE: 25500 SQM

PIPE CAPACITY CALCULATION: PRE DEVELOPMENT

Pipe capacity calculation for 900 mm dia pipe(ARI 1 to 5)

Address:	otal Building footprir	Green Area	Total Drive way / car park		Source
46-52 Ferndell St, South Granville	16266	609	8675	sqm	Arch, Plan

Total Area draining to Pipe (m^2) = 25550.00

Runoff Coefficient, C (5 yrs) = 0.86

Rain fall Data for the site from BOM

Storm Duration T (min)	I 5 yrs (mm/hr)	V of Hydrograph (m^3)	Inflow Peak discharge (L/s)
1	185	67.75	1129.17
2	143	104.74	872.82
3	135	148.32	823.99
4	129	188.97	787.37
5	124	227.05	756.85
10	101	369.88	616.46
15	84.2	462.53	513.92
20	72.1	528.08	440.07
25	63.2	578.62	385.75
30	56.3	618.54	343.63
45	43	708.63	262.46
60	35.3	775.65	215.46
90	26.7	880.02	162.97
120	22	966.81	134.28
180	17	1120.62	103.76

Q	**1129.17**	L/s		
V	**6**	m/s (should be from 0.6 to 6 m/s)		
Q=VA				
A (Full)	0.188194676			
d Full)	**489.5067962**	mm	< 900 mm	Existing pipe from site to Council
			OK	
Mannings n for RC pipe	**0.013**			
Existing pipe dia	**900**	mm		
Pipe length	**11.4**	m		
Upstream IL	**15.36**	m		
Downstream IL	**14.71**	m		
Hydraulic Radius, R (Full Flow)	225	mm		
Slope, S	0.057017544			
Pipe flow Velocity	6.794892325	m/s, By Manning's formula		

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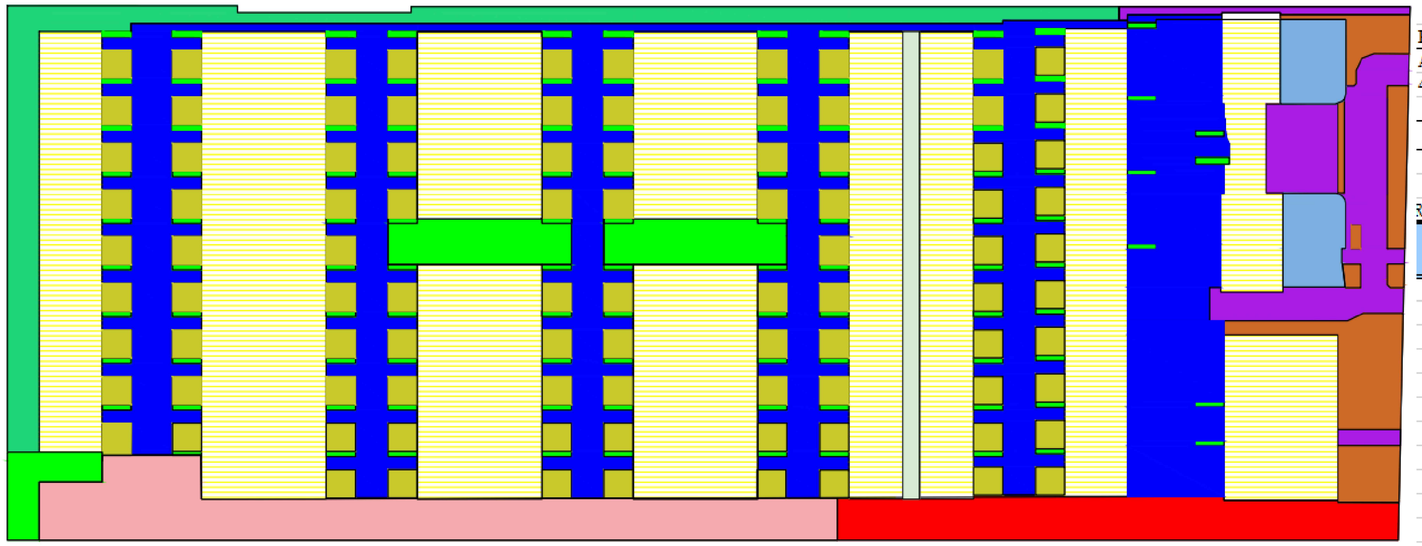
Drawn by:	A.A.						
Revision:	01						

Job: STORMWATER MANAGEMENT DRAWING PACKAGE FOR DA	Date: 08-05-2024	
Title: EXISTING PIPE CAPACITY CALCULATION (PRE DEVELOPMENT)	Scale @A1: 1:500	
	Drg No. SW09-A	



ROOF TO RWT: 10850m²
PATH TO SF CHAMBER: 2750m²
LANDSCAPE TO SF CHAMBER: 1332m²
ROAD/FOOTPATH TO SF CHAMBER: 5944m²
TURF SURFACE TO SF CHAMBER: 400m²
LANDSCAPE BYPASS 1150m²
SOUTHERN ROAD TO OSD 1375m²
ROAD/PATH BYPASS TO FILTERRA: 907m²
LANDSCAPE BYPASS TO FILTERRA: 730m²
TOTAL AREA: 26556m²
EASMENT 283m²
SOUTHERN ROAD BYPASS TO FILTERRA 835m²

POST DEVELOPMENT

TOTAL SITE AREA : 26556

TOTAL GREEN AREA : 3495 SQM

ROOF AREA: 10850 SQM

DRIVEWAY, CARPARK, PATH, TURF AREA: 12211 SQM

AREA DRAINING TO PIPE: 26556 SQM

PIPE CAPACITY CALCULATION: POST DEVELOPMENT

Pipe capacity calculation for 900 mm dia pipe(ARI 1 to 5)

Address:	Total Building footprint	Green Area	Driveway, carpar, path, turf		Source
46-52 Ferndell St, South Granville	10850	3495	12211	sqm	Arch. Plan

Total Area draining to Pipe (m^2) = 26556.00

Runoff Coefficient, C (5 yrs) = 0.86

Rain fall Data for the site from BOM

Storm Duration T (min)	I 5 yrs (mm/hr)	V of Hydrograph (m^3)	Inflow Peak discharge (L/s)
1	185	70.42	1173.63
2	143	108.86	907.18
3	135	154.16	856.43
4	129	196.41	818.37
5	124	235.99	786.65
10	101	384.44	640.74
15	84.2	480.74	534.16
20	72.1	548.88	457.40
25	63.2	601.40	400.94
30	56.3	642.89	357.16
45	43	736.53	272.79
60	35.3	806.19	223.94
90	26.7	914.67	169.38
120	22	1004.88	139.57
180	17	1164.75	107.85

Q	**1173.63**	L/s		
V	**6**	m/s (should be from 0.6 to 6 m/s)		
Q=VA				
A (Full)	0.195604611			
d Full)	**499.0506247**	mm	< 900 mm	Existing pipe from site to Council
			OK	
Mannings n for RC pipe	**0.013**			
Existing pipe dia	**900**	mm		
Pipe length	**11.4**	m		
Upstream IL	**15.36**	m		
Downstream IL	**14.71**	m		
Hydraulic Radius, R (Full Flow)	225	mm		
Slope, S	0.057017544			
Pipe flow Velocity	6.794892325	m/s, By Manning's formula		

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Drawn by:	A.A.						
Revision:	01						

Job: STORMWATER MANAGEMENT DRAWING PACKAGE FOR DA

Title: EXISTING PIPE CAPACITY CALCULATION (POST DEVELOPMENT)

Date: 08-05-2024

Scale @A1: 1:500

Drg No. SW09-B

Note: Area drained to site storage must now be 85% not 75% as shown in this example[i]

DRAINAGE DESIGN SUMMARY **SUB/DA No.**_____

Project: TRADEMASTER Location: 46-52 Ferndell St, South Granville

Designed by: Ertaz Chowdhury Company: Australia Wide Consulting Services P/L Phone:_____

SITE AREA 2.657 ha *See Section 4.1.5 for dual occupancy			[A]
Basic storage volume	470 x [A] 2.657	= 1248.79 m^3	[B]
Basic discharge	= 0.08 x [A] 2.657	= 0.21256 m^3/s	[C]
Area of site drained to storage (Must be as much as possible and not be less than 75% of the total site without written Council approval).		= 2.2665 ha	[D]
[D/ [A] + [2.2665]/[2.657] x 100		= 85.3 %	[E]
Storage per ha. of contributing area = [B]/[D]		= 550.98	[F]
Enter *volume/PSD adjustment chart* (Fig 5.1} using [F], and Read new PSD in litres/second/ha.		= 66.3 l/s/ha	[G]
Determine PSD =[G] x [D] 66.3 x 2.2665		= 150.27 l/s	[H]
Maximum head to orifice centre		= 1.60 m	[K]
Weir flow to storage	$Q^{Weir} = CL(H^{Weir})^{1.5}$ $\therefore H^{Weir}$	= 0.15 m	[I]
Selected orifice diameter: $d = (0.464 \times Q / \sqrt{h})^{0.5} = (0.464 \times [H]/\sqrt{[K]})^{0.5}$		= 0.24 m	[J]
Maximum discharge		= 150.27 l/s	[L]
Head for high early discharge		= 1.45 m	[M]
High early discharge $\{[L] \times \sqrt{[M] / [K]}\}$ (min 75% of [L])		= 143.05 l/s	[N]
Approximate mean discharge = ([L)] + [N]) /2		= 146.66 l/s	[P]
Average discharge/ha = [P] / [D] = 146.66 / 2.2665		= 64.71 l/s/ha	[Q]
Enter *volume/P.S.D. adjustment chart* (Fig 5.1) using [Q] And read off final storage volume per hectare		= 552.42 m^3/ha	[R]
Determine final SSR = [R] x [D] = 552.42 x 2.2665		= 1252.06 m^3	[S]
Primary storage proportion = [S] x _____%		= m^3	[T]
Secondary storage proportion = [S] x _____%		= m^3	[U]
Tertiary storage proportion [S] x _____%		= m^3	[V]
Check [T] + [U] + [V] = [S]		= m^3	

Orifice diameter 200mm used based on 112.92 l/s discharge rate from STORMFILTER

SIGNATURE:_____ **DATE:** 08/05/2024

[i] Area draining changed in revision 2 of third edition

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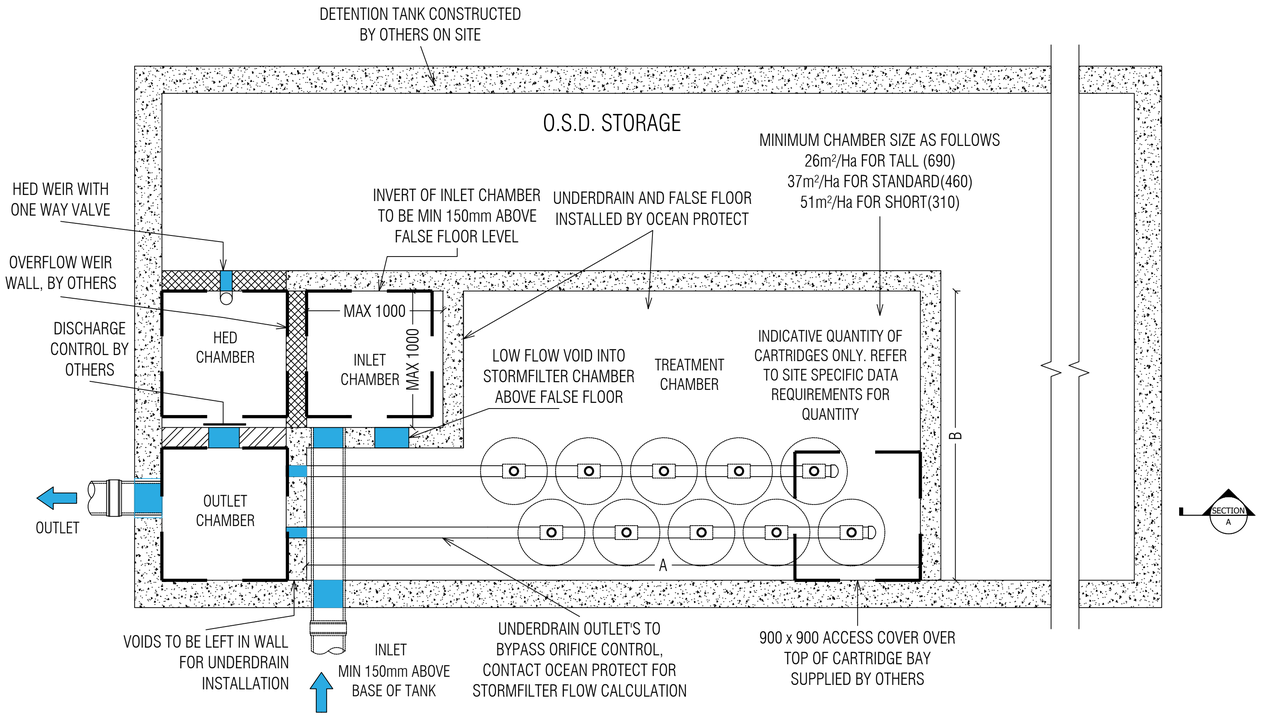
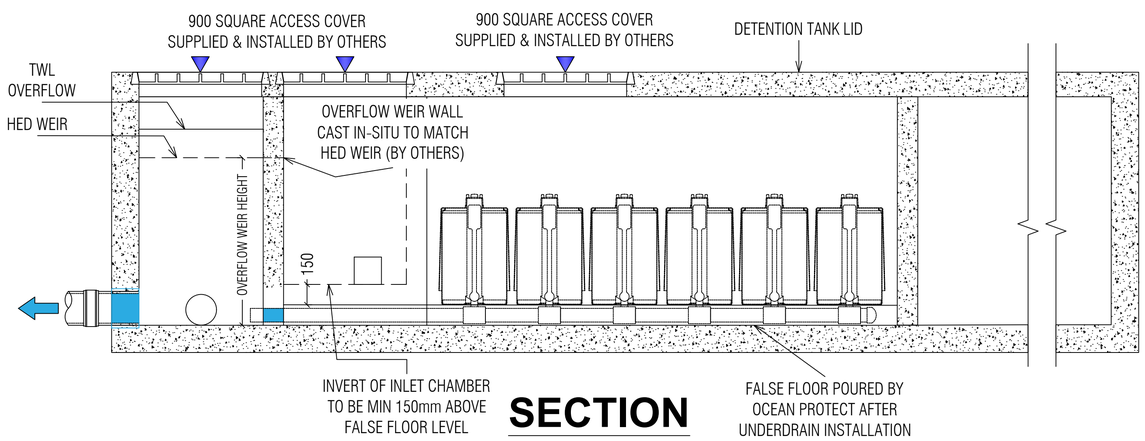


PLAN LAYOUT

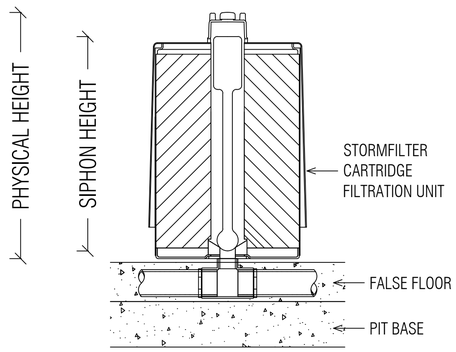


SECTION

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 DRAWING(S).
- FILTER CARTRIDGES SHALL BE MEDIA-FILLED, PASSIVE, SIPHON ACTUATED, RADIAL FLOW, AND SELF-CLEANING. RADIAL MEDIA DEPTH SHALL BE 178mm.

CARTRIDGE NAME / SIPHON HEIGHT (mm)	690	460	310
CARTRIDGE PHYSICAL HEIGHT (mm)	840	600	600
TYPICAL MINIMUM 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



STORMFILTER CARTRIDGE DETAIL

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID	[ ]
NUMBER OF CARTRIDGES REQ'D	[84]
SIPHON HEIGHT (310 / 460 / 690)	[690]
MEDIA TYPE (ZPG / PSORB)	[60]
WATER QUALITY FLOW RATE (L/S)	[0.9]
DIMENSION A	[14.14m]
DIMENSION B	[7.05m]

TOTAL CARTRIDGE BAY AREA (A x B) TO MATCH AREA REQUIRED BY MUSIC MODELLING OR COUNCIL SPECIFIC REQUIREMENTS

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.

OCEAN PROTECT
PHONE: 1300 354 722
www.oceanprotect.com.au

OCEAN PROTECT
SINGLE ORIFICE WITH A HED WEIR
STORMFILTER DETENTION TANK
CUMBERLAND COUNCIL SPECIFICATION DRAWING

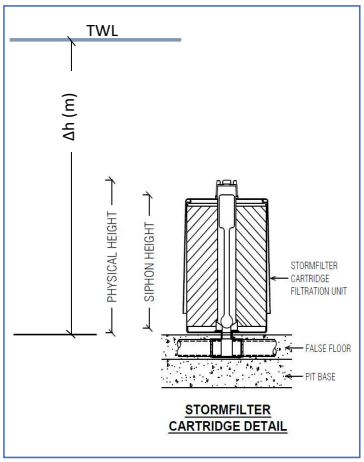
LAST MODIFIED: 10-09-20

StormFilter Flow Calculator - Psorb Media

The equation below defines the relationship between the diameter of the orifice plate, the flow rate through the cartridge and head.

Q = (0.111d^2.06h^0.5)/60
where d = Restrictor Disc Diameter
Δh = head

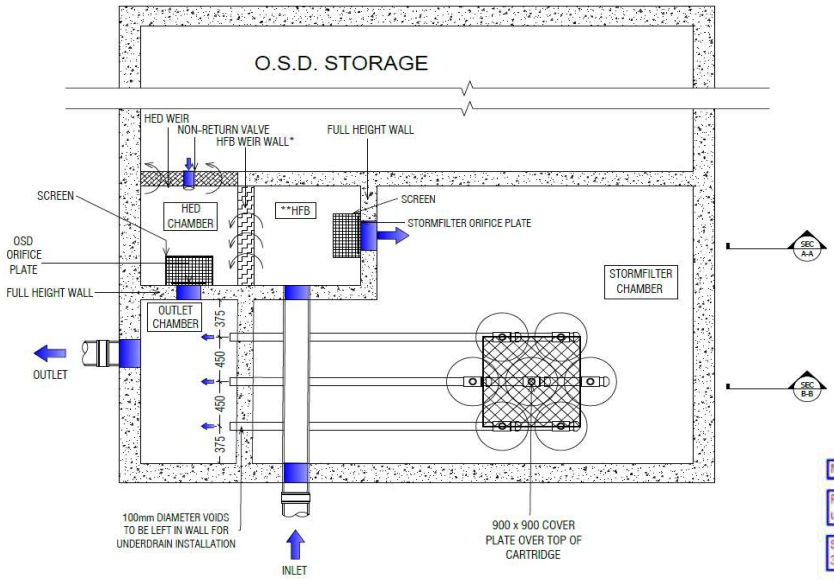
Cartridge Name	690
Cartridge Quantity	84
Δh (m)	1.71
Total Q at head	**112.92**



Design Process (Parramatta Council)

Step 1: Read through the design process
Step 2: Configure your tank to suit
Step 3: Complete the calculation steps
Step 4: Produce the data table and copy the table above

- Incoming flow connects to a HFB (High Flow Bypass) pit or sometimes called an inlet chamber.
- The HFB is ≤ 1m2.
- An orifice diverts up to the 3mth flow to the SF (StormFilter) chamber based on the available head in the HFB i.e. OSD TWL to SF orifice centreline.
- The floor of the HFB (equivalent to the 3mth orifice centreline) is to be approx. 150mm above the false floor in the SF chamber.
- The HFB overflows to the HED.
- The HFB overflow weir (which is essentially the SF weir) is to be equal or greater than the HED weir. If the HED weir is lower than the minimum SF driving head, the SF weir needs to be adopted.
- The SF chamber should hold the 3mth flow volume (based on 43.4m/hr intensity). The chamber dimensions are therefore to be based on the available water depth.
- All walls around the SF to be at the 100yr TWL.
- The StormFilter underdrains are free draining and connect to the Overflow pit downstream of the HED chamber. A calculation needs to be performed to determine the max flow through the cartridges during the 100yr storm.
- The HED orifice has been adjusted to account for the flow through the StormFilters at the 100yr event.



PLAN LAYOUT

MUSIC High Flow Bypass

Peak Flow through Carts, use spreadsheet

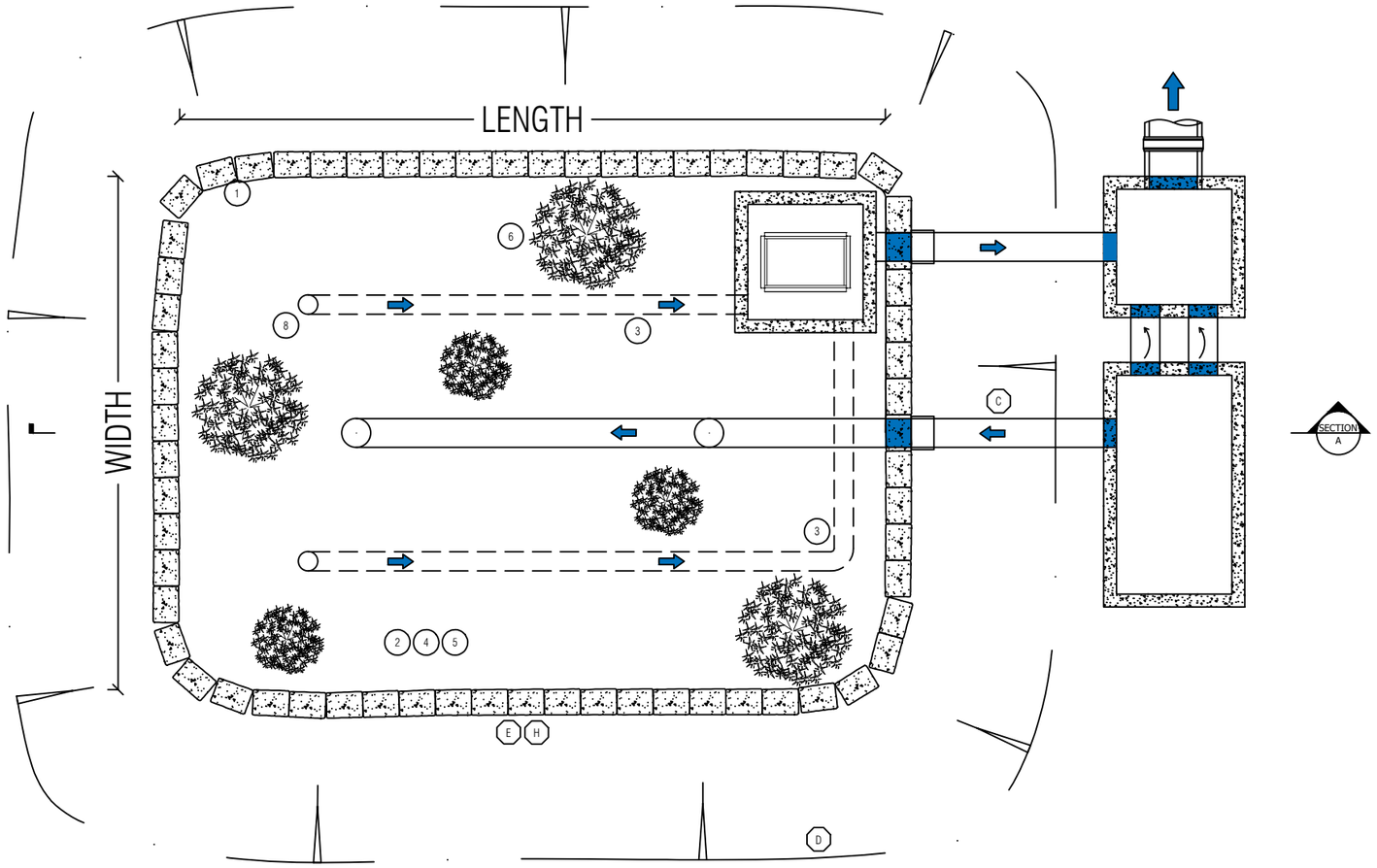
Simple Rational Calc 3mth Intensity is 43.4mm/hr

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

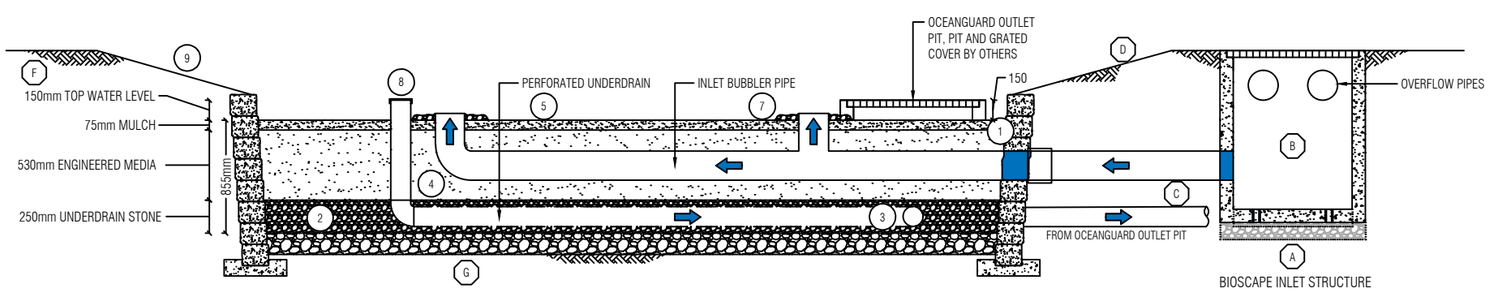
* HFB WEIR WALL HEIGHT GREATER THAN OR EQUAL TO THE HED WEIR HEIGHT EXCEPT WHEN THE HED WALL HEIGHT IS LOWER THAN IS REQUIRED FOR PROPER FUNCTION OF STORMFILTERS

**HFB - HIGH FLOW BYPASS CHAMBER NO GREATER THAN 1M X 1M

NOT FOR CONSTRUCTION



PLAN



SECTION A-A

(PLANTING NOT SHOWN FOR CLARITY)

SITE SPECIFIC REQUIREMENTS		
COUNT	DESCRIPTION	INSTALLED BY
$5m^2+9m^2$	FILTERRA SURFACE AREA (m^2)	OCEAN PROTECT
	MULCH VOLUME (m^3)	OCEAN PROTECT
	FILTERRA MEDIA DEPTH (mm)	OCEAN PROTECT
	VOLUME OF UNDERDRAIN STONE (m^3)	OCEAN PROTECT
	FILTERRA LINER (m)	OCEAN PROTECT

PLANTING SCHEDULE	
COUNT	FILTERRA BIOSCAPE SYSTEM PLANT PALETTE

GENERAL NOTES

- CONTRACTOR SHALL CONTACT OCEAN PROTECT TO COORDINATE DELIVERY AND INSTALLATION OF FILTERRA BIOSCAPE SYSTEM. OCEAN PROTECT ACTIVIATION CAN ONLY OCCUR ONCE CONTRACTOR RESPONSIBILTIES ARE COMPLETE.
- PERFORM FILTERRA BIOSCAPE SYSTEM EXCAVATION ONLY AFTER ALL THE CONTRIBUTING DRAINAGE AREAS ARE PERMANENTLY STABILISED. IF FILTERRA BIOSCAPE SYSTEM IS IN AN AREA PREVIOUSLY USED AS EROSION AND SEDIMENT CONTROL FACILITIES PLEASE CONTACT OCEAN PROTECT. DO NOT STOCKPILE MATERIALS OR STORE EQUIPMENT IN THIS AREA. CONTRACTOR SHALL TAKE APPROPRIATE MEASURES TO PREVENT CONSTRUCTION-RELATED EROSION RUNOFF FROM ENTERING THE FILTERRA MEDIA BAY.
- FILTERRA SHALL BE INSTALLED OFFLINE AS EARLY AS POSSIBLE AFTER SITE STABILISATION TO ALLOW FOR SOIL MATURITY AND SYSTEM ESTABLISHMENT.
- CONTRACTOR SHALL COORDINATE WITH OCEAN PROTECT BEFORE THE FILTERRA BIOSCAPE SYSTEM IS EXCAVATED TO MINIMISE THE TIME BETWEEN EXCAVATION AND COMPLETION OF THE FILTERRA BIOSCAPE SYSTEM. ONCE EXCAVATED, ANY STANDING WATER THAT ACCUMULATES IN THE EXCAVATED AREA MUST BE REMOVED BY THE CONTRACTOR BEFORE OCEAN PROTECT CAN COMMENCE THE FILTERRA BIOSCAPE SYSTEM. ANY ADDITIONAL EXCAVATION WILL BE THE RESPONSIBILITY OF THE CONTRACTOR.
- CONTRACTOR SHALL PROVIDE ACCESS TO THE EXCAVATED AREA(S) FOR OCEAN PROTECT TO USE DURING THE CONSTRUCTION OF THE FILTERRA BIOSCAPE SYSTEM(S). ACCESS SHALL NOT PROHIBIT LIGHT DUTY EQUIPMENT THAT MAY BE USED TO INSTALL THE COMPONENTS (STONE, MEDIA, ETC). THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY RE-STABILIZATION THAT MAY BE REQUIRED AFTER THE FILTERRA BIOSCAPE SYSTEM INSTALLATION/ACTIVATION.
- OCEAN PROTECT AND/OR ITS REPRESENTATIVES SHALL BE RESPONSIBLE FOR THE LIST ENTITLED 'OCEAN PROTECT INSTALLATION RESPONSIBILITIES'.
- NO FLOW SHALL ENTER THE FILTERRA SYSTEM UNLESS OCEAN PROTECT HAS ACTIVATED THE SYSTEM AND CONFIRMED ESTABLISHMENT
- IF FILTERRA IS WITHIN AN OVERLAND FLOW PATH, PLEASE CONTACT OCEAN PROTECT

CONTRACTOR WORKS AND INSTALLATION RESPONSIBILITIES

A. CONTRACTOR TO PLACE FILTERRA INLET STRUCTURE ON BEDDING AS SPECIFIED BY THE ENGINEER. OCEAN PROTECT SUGGESTS AS A MINIMUM TO USE 150MM BEDDING STONE ON COMPACTED SUB-GRADE TO 90% DENSITY. UNSUTIABLE MATERIAL SHALL BE REPLACED AS ADVISED BY THE ENGINEER.

B. CONTRACTOR SHALL PROVIDE AND INSTALL DRAINAGE ITEMS TO, FROM AND INCLUDING THE INLET AND OUTLET STUCTURES AS PER THE APPROVED SITE PLANS.

C. OCEAN PROTECT CAN PROVIDE COUPLERS AT THE FILTERRA INTERFACE FOR CONNECTION TO THE INLET DIVERSION PIPES. ALL DRAINAGE TO AND FROM THE FILTERRA MUST ALLOW FOR POSITIVE FLOW.

D. CONTRACTOR TO PROVIDE BATTER ACCORDING TO DIMENSION AND SLOPE SHOWN ON PLANS. SLOPE FROM SHOULDER TO FILTERRA BIOSCAPE SYSTEM SURFACE PERIMETER SHALL NOT EXCEED 3:1. TURF IS REQUIRED TO STABILISE SIDE SLOPES SHOWN ON DETAIL AND ON PLAN SHEETS.

E. CONTRACTOR TO EXCAVATE MEDIA AREA CORRESPONDING TO THE SIZE OF THE FILTERRA BIOSCAPE SYSTEM SURFACE AREA AS SHOWN ON DETAIL AND ON PLAN SHEETS.

F. CONTRACTOR SHALL EXCAVATE VERTICALLY FROM BOTTOM OF UNDERDRAIN STONE OR DRAINAGE STONE IF REQUIRED, TO ELEVATION OF MULCH AS SHOWN ON THIS DETAIL.

G. CONTRACTOR TO CONFIRM DEPTH OF EXCAVATION. IF THE EXCAVATION HAS BEEN MADE TOO DEEP AND ADDTITIONAL UNDERDRAIN STONE NEEDS TO BE USED TO RAISE THE BASE OF THE FILTERRA, THIS COST SHALL BE TAKEN ON BY THE CONTRACTOR.

H. RETAINING WALLS AND ADDITIONAL EROSION CONTROL AROUND THE FILTERRA BIOSCAPE SYSTEM. RETAINED OFFLINE FROM FILTERRA

OCEAN PROTECT SUPPLY AND INSTALLATION RESPONSIBILITIES

1. GEOTEXTILE FABRIC ALONG THE PERIMETER OF THE FILTERRA BIOSCAPE SYSTEM EXCAVATION.
2. UNDERDRAIN STONE. TYPICALLY 250mm THICK (50mm UNDER THE PIPING 150mm AROUND THE PIPING AND 50mm ABOVE THE PIPING)
3. 150mm UNDERDRAIN PIPING UNLESS OTHERWISE APPROVED BY OCEAN PROTECT, ASSOCIATED PIPING AND FITTINGS/ELBOWS TO CONNECT TO THE PIPING/FITTING(S) THAT IS PROVIDED BY CONTRACTOR (SEE CONTRACTOR INSTALLATION RESPONSIBILITIES THIS DETAIL).
4. 530mm FILTERRA MEDIA.
5. 75mm DOUBLE SHREDDED HARDWOOD MULCH OVER ENTIRE FILTERRA BIOSCAPE SYSTEM SURFACE AREA.
6. PLANTINGS OF PLANTS SELECTED BY ENGINEER THAT MATCH OCEAN PROTECTS APPROVED PLANTING LIST.
7. FLOW DISSIPATION APRON AROUND ALL FLOW ENTRY POINTS AS DESIGNED AND INDICATED ON THIS DETAIL
8. CLEAN-OUT ADAPTER,PLUG AND PIPING.
9. ACTIVATING THE SYSTEM

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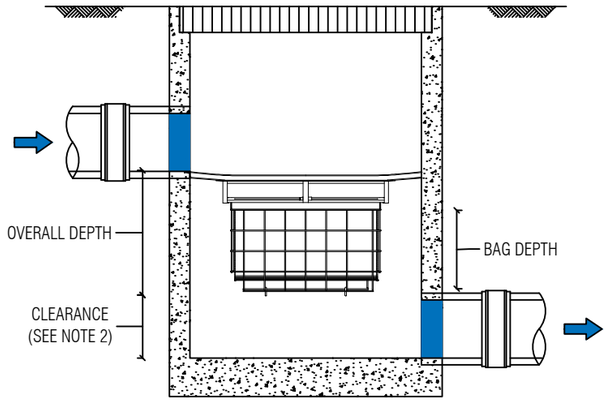
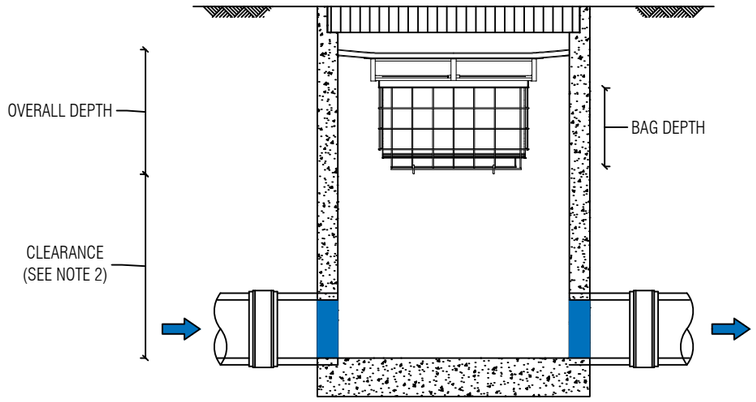
FILTERRA BIOSCAPE SYSTEM
WITH BIOSCAPE INLET STRUCTURE
SPECIFICATION DRAWING

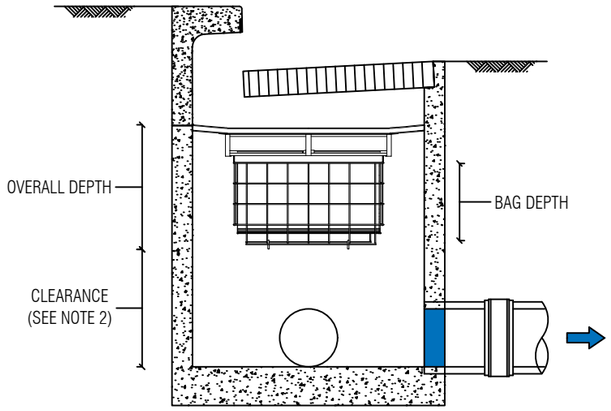
LAST MODIFIED: 24-05-19



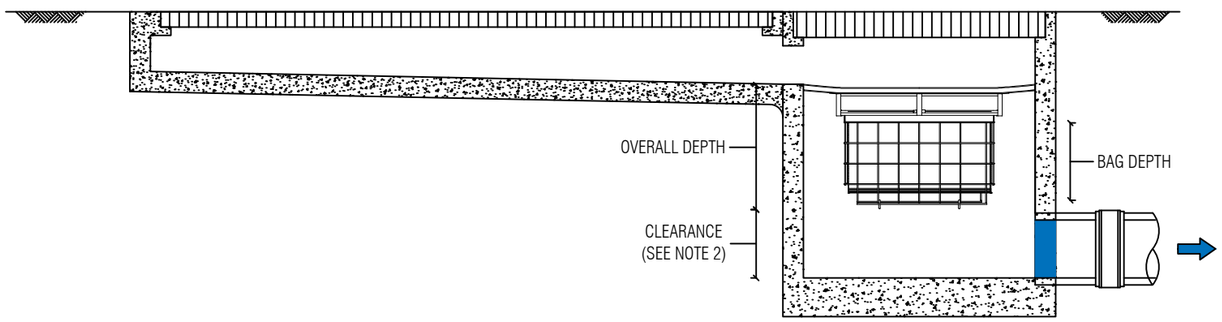
PIPE FLOW CONFIGURATION



SURFACE FLOW CONFIGURATION



SURFACE FLOW CONFIGURATION

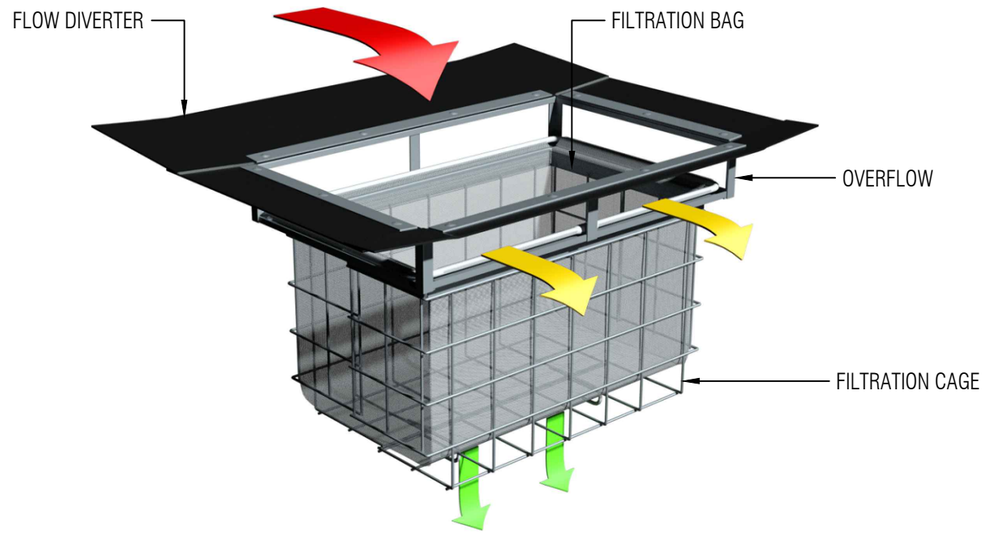


GRATED STRIP DRAIN CONFIGURATION

PLAN ID	MAXIMUM PIT PLAN DIMENSIONS
S	450mm x 450mm
M	600mm x 600mm
L	900mm x 900mm
XL	1200mm x 1200mm

DEPTH ID	BAG DEPTH	OVERALL DEPTH
1	170	270
2	300	450
3	600	700

		DEPTH ID		
		1	2	3
PLAN ID	S	■		
	M	■	■	
	L	■	■	■
	XL	■	■	■



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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SPECIFICATION DRAWING

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