

LOCKWOOD AVENUE

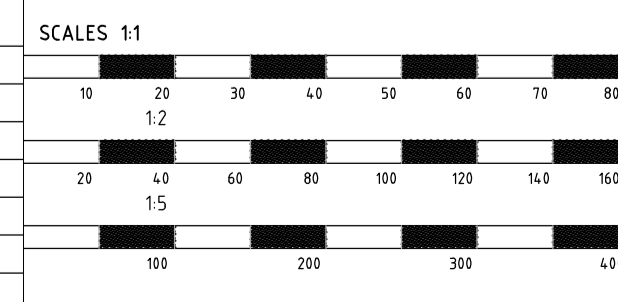
GLENROSE PLACE



BASEMENT 4 STORMWATER DRAINAGE
SCALE 1:200

ISSUE	NOTES	DATE	ISSUED BY	CHECKED BY
A	ISSUED FOR DA	27.11.19	N.E.	K.E.

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CLIENT
PLATINUM PROPERTY GROUP

PROJECT
28 LOCKWOOD AVE, BELROSE

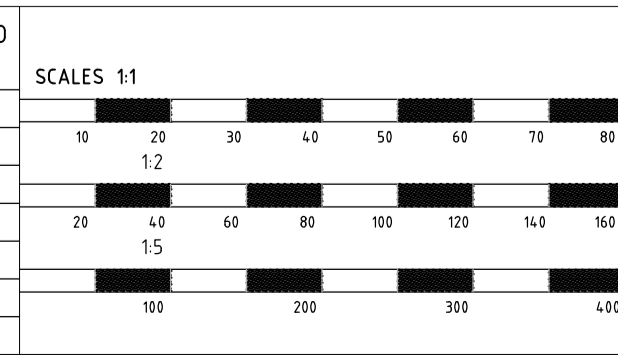
DRAWING TITLE
BASEMENT 4 STORMWATER DRAINAGE PLAN

NUMBER IN SET	JOB NO
AS SHOWN	190390
DESIGN	SHEET NUMBER
K.E.	D01
DRAWN	CHECK
N.E.	K.E.
	REV
	A
	DATE
	NOVEMBER 2019



BASEMENT 3 STORMWATER DRAINAGE PLAN
SCALE 1:200

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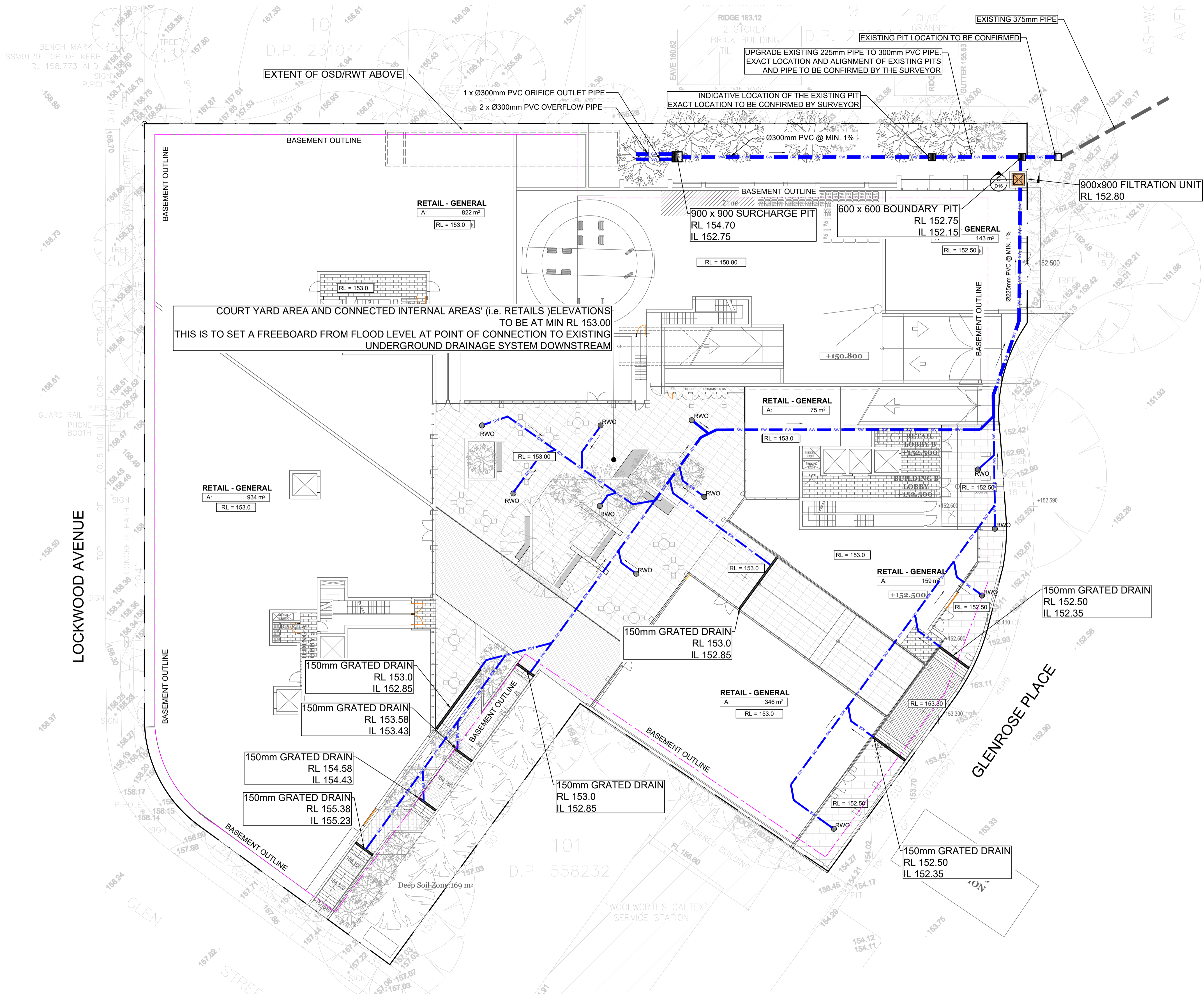
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PROJECT
28 LOCKWOOD AVE, BELROSE

NUMBER IN SET	JOB NO	
AS SHOWN	190390	
DESIGN	SHEET NUMBER	
K.E.	D02	
DRAWN	CHECK	REV.
N.E.	K.E.	A
	DATE	
	NOVEMBER 2019	

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BASEMENT 2 STORMWATER DRAINAGE PLAN
SCALE 1:200

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PROJECT 28 LOCKWOOD AVE, BELROSE	NUMBER IN SET AS SHOWN	JOB NO 190390
DRAWING TITLE BASEMENT 2 STORMWATER DRAINAGE PLAN	DESIGN K.E.	CHECK K.E.
	DRAWN N.E.	DATE NOVEMBER 2019

RAIN WATER FROM ROOF AREAS TO BE CAPTURED BY DOWNPIPES AND TO BE CONNECTED TO RAIN WATER TANK.

DETAILED DESIGN AT CC STAGE

RWT
TWL 155.0
AREA = 4.50 m²
AVERAGE DEPTH = 2.595m
VOLUME REQUIRED = 10.0 m³
VOLUME PROVIDED = 11.67 m³

OSD
TWL 154.90
AREA = 60.00 m²
AVERAGE DEPTH = 1.90m
VOLUME REQUIRED = 95.6 m³
VOLUME PROVIDED = 114.0 m³



LOWER GROUND FLOOR STORMWATER DRAINAGE PLAN
SCALE 1:200

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28 LOCKWOOD AVE, BELROSE	AS SHOWN	190390
DRAWING TITLE	SCALE	SHEET NUMBER
LOWER GROUND FLOOR STORMWATER DRAINAGE PLAN	AS SHOWN	D04
DESIGN	CHECK	REV.
K.E.	K.E.	A
DRAWN	DATE	
N.E.	NOVEMBER 2019	



GROUND FLOOR STORMWATER DRAINAGE PLAN
SCALE 1:200

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DRAWING TITLE	DESIGN	CHECK	REV.
GROUND FLOOR STORMWATER DRAINAGE PLAN	K.E.	K.E.	A

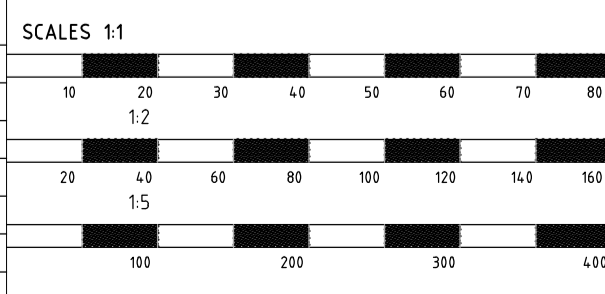
LOCKWOOD AVENUE

GLENROSE PLACE



ROOF STORMWATER DRAINAGE PLAN
SCALE 1:200

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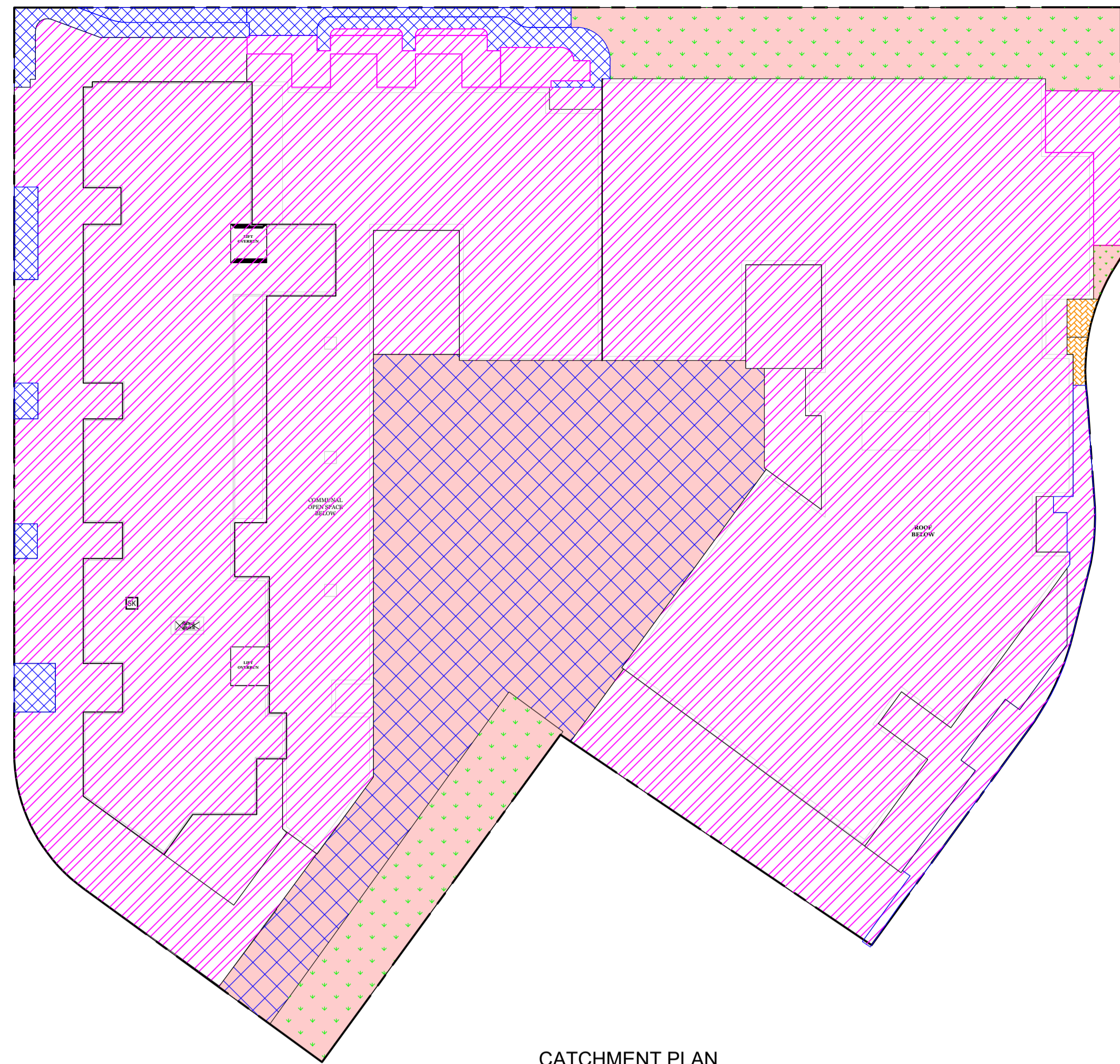
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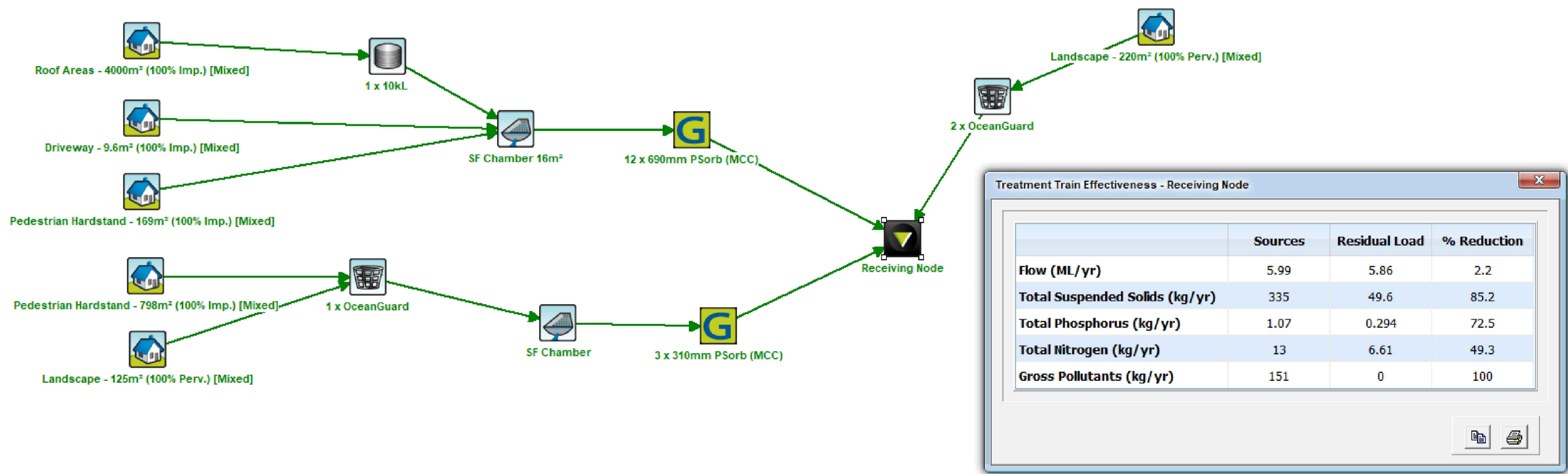
PROJECT 28 LOCKWOOD AVE, BELROSE	NUMBER IN SET	JOB NO 190390
DRAWING TITLE ROOF STORMWATER DRAINAGE PLAN	SCALE AS SHOWN	SHEET NUMBER D08
DRAWN N.E.	DESIGN K.E.	CHECK K.E.
		REV. A
		DATE NOVEMBER 2019



CATCHMENT PLAN

TOTAL SITE AREA: 5322.00 m²

ROOF:	4000.41 m ²	
DRIVEWAY:	9.6 m ²	
HARDSTAND:	168.91 m ²	
TOTAL AREA BYPASSING OSD:	1143.08 m ²	
IMPERVIOUS:	798.44 m ²	
PERVIOUS:	344.64m ²	



Treatment Train Effectiveness - Receiving Node

	Sources	Residual Load	% Reduction
Flow (ML/yr)	5.99	5.86	2.2
Total Suspended Solids (kg/yr)	335	49.6	85.2
Total Phosphorus (kg/yr)	1.07	0.294	72.5
Total Nitrogen (kg/yr)	13	6.61	49.3
Gross Pollutants (kg/yr)	151	0	100

MUSIC MODEL RESULTS

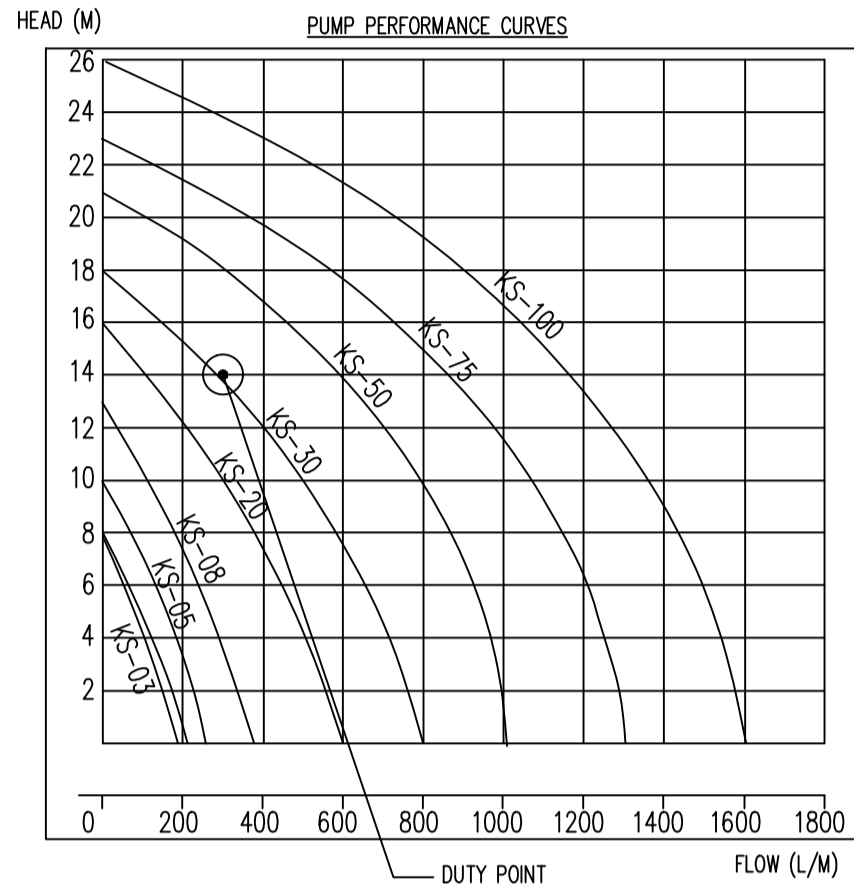
ISSUE	NOTES	DATE	ISSUED BY	CHECKED BY	<p>SCALES 1:1</p>	<p>ARCHITECT</p> <p>DKO ARCHITECTURE (NSW) PTY LTD</p>	<p>Lvl 2, 19 Harris Street Pymont, NSW 2009</p> <p>T 02 9817 2611 E info@mydconsulting.com</p>	<p>CLIENT</p> <p>PLATINUM PROPERTY GROUP</p>	<p>PROJECT</p> <p>28 LOCKWOOD AVE, BELROSE</p>	<p>NUMBER IN SET</p> <p>AS SHOWN</p>	<p>JOB NO</p> <p>190390</p>	<p>SHEET NUMBER</p> <p>D10</p>	<p>DESIGN</p> <p>K.E.</p>	<p>CHECK</p> <p>K.E.</p>	<p>REV.</p> <p>A</p>	<p>DRAWN</p> <p>N.E.</p>	<p>DATE</p> <p>NOVEMBER 2019</p>
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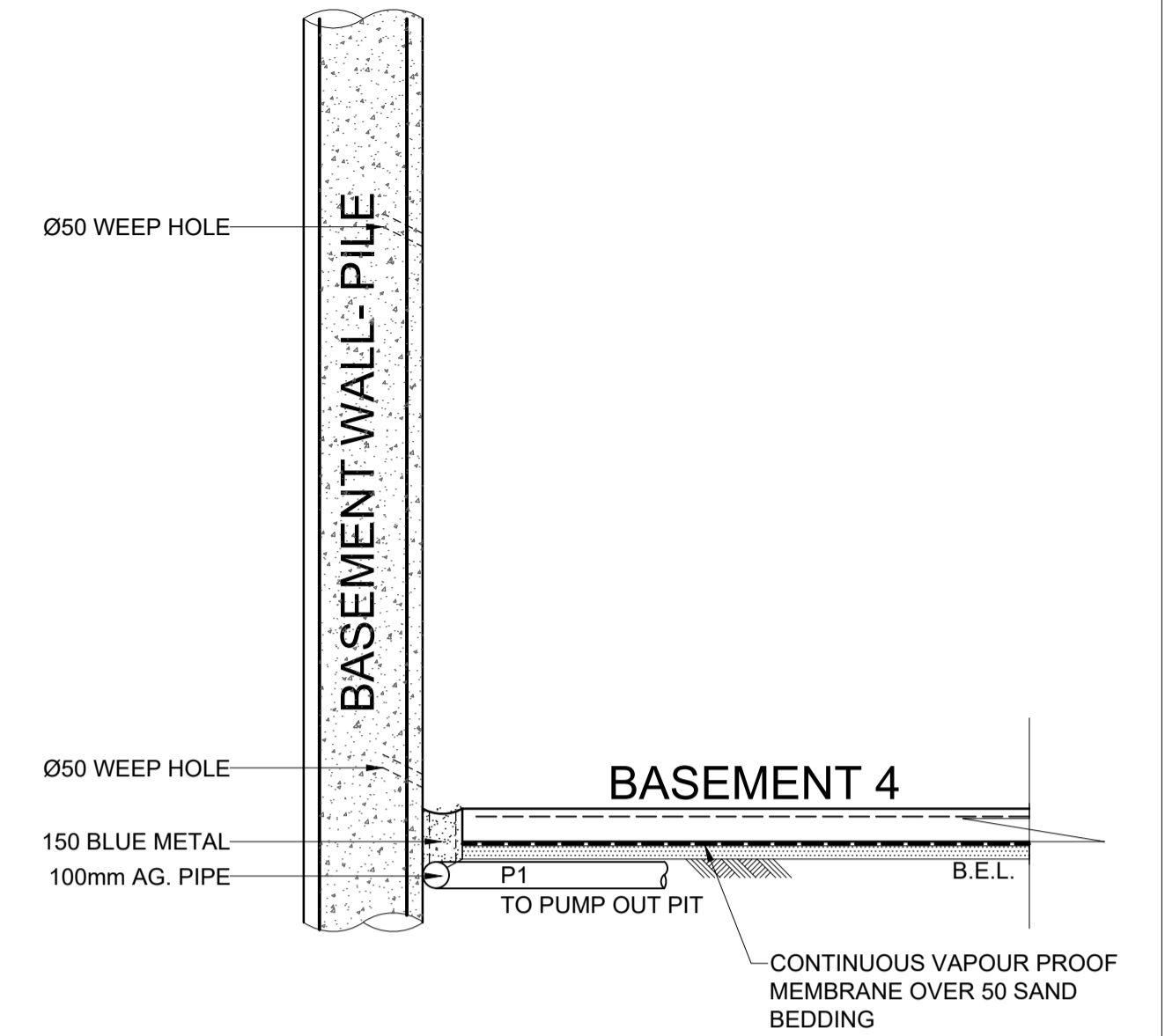
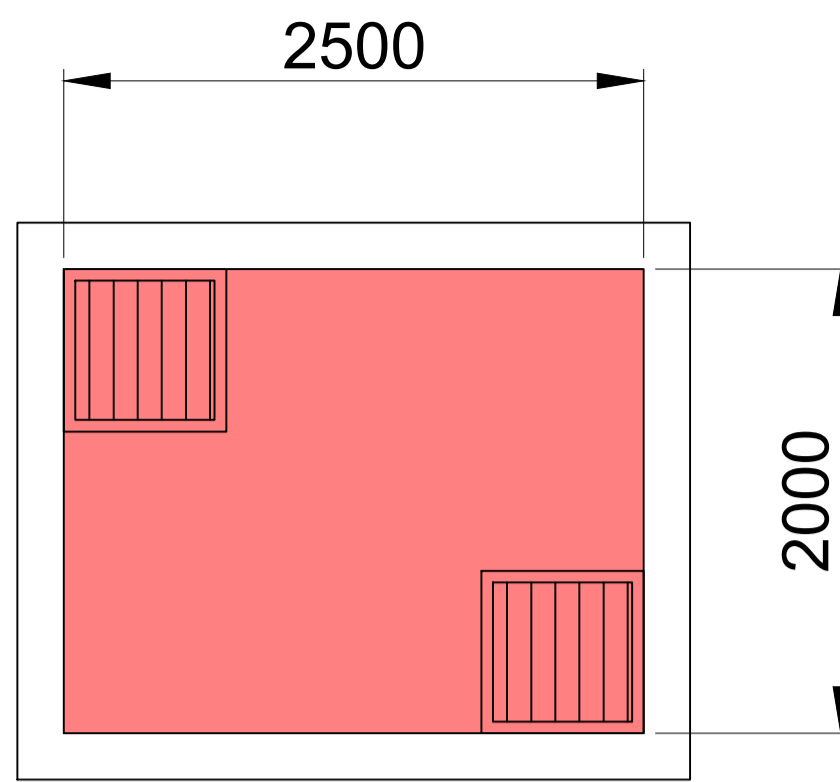
PUMP SPECIFICATIONS STANDARD PUMP-OUT NOTES

THE PUMP-OUT SYSTEM IS DESIGNED TO WORK IN THE FOLLOWING MANNER -

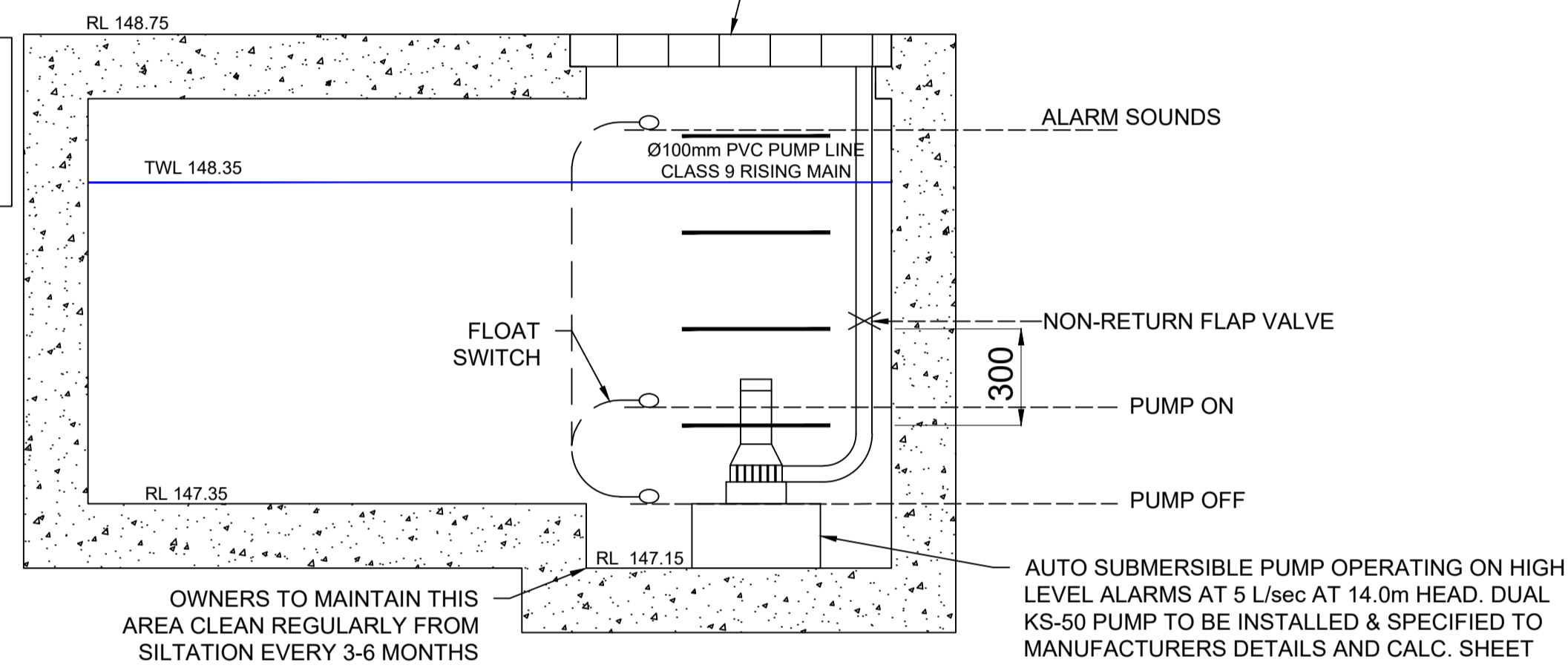
1. A LOW LEVEL FLOAT SHALL BE PROVIDED TO ENSURE THAT THE MINIMUM REQUIRED WATER LEVEL IS MAINTAINED WITHIN THE SUMP AREA OF THE BELOW GROUND TANK. IN THIS REGARD THIS FLOAT WILL FUNCTION AS AN OFF SWITCH FOR THE PUMP.
2. A SECOND FLOAT SHALL BE PROVIDED AT A HIGHER LEVEL, APPROXIMATELY 300mm ABOVE THE MINIMUM WATER LEVEL, WHEREBY THE PUMP WILL OPERATE & DRAIN THE TANK TO THE LEVEL OF THE LOW LEVEL FLOAT.
3. A THIRD FLOAT SHALL BE PROVIDED AT A HIGH LEVEL, WHICH IS APPROXIMATELY THE ROOF LEVEL OF THE BELOW GROUND TANK. THIS FLOAT SHOULD ACTIVATE THE ALARM.
4. 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.



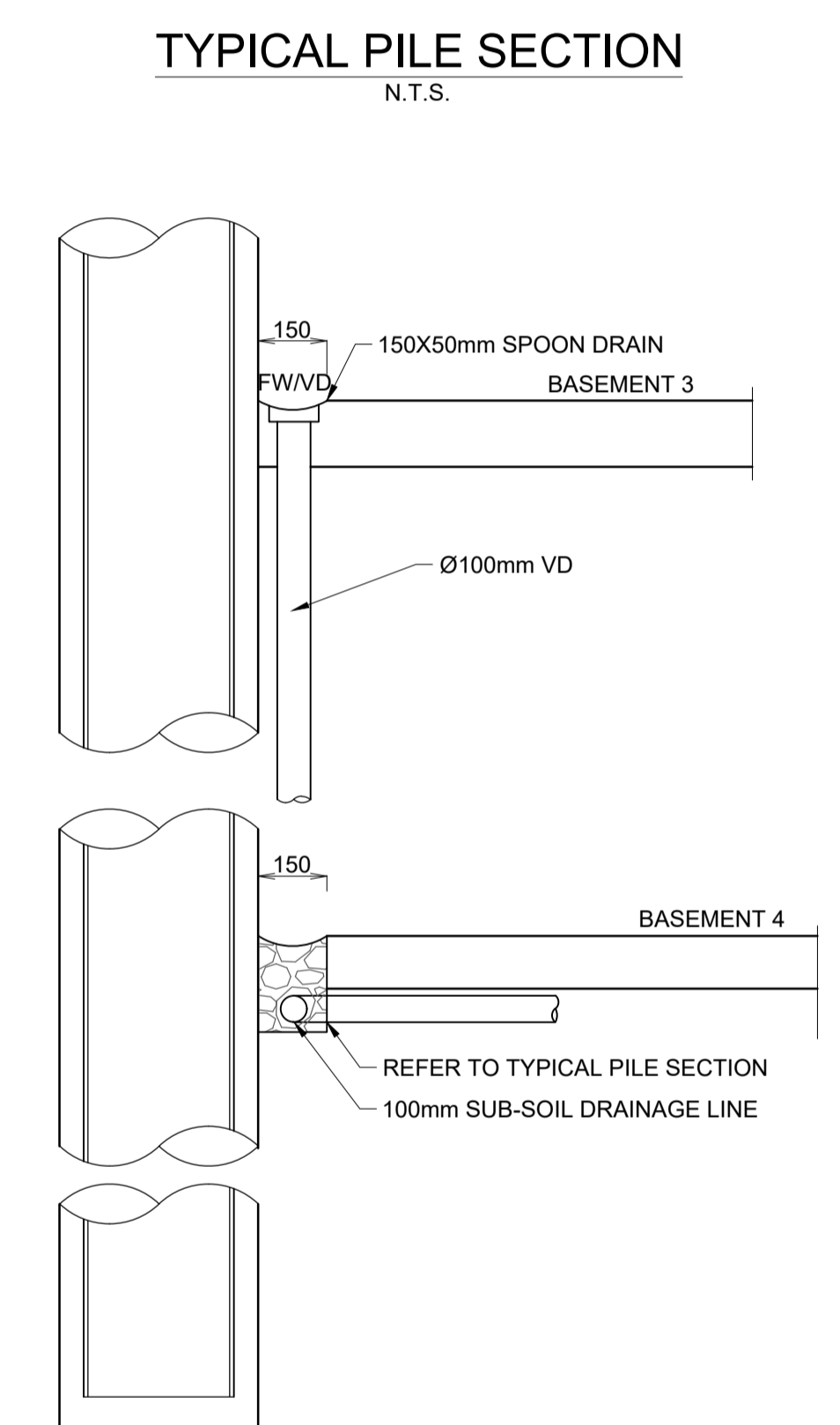
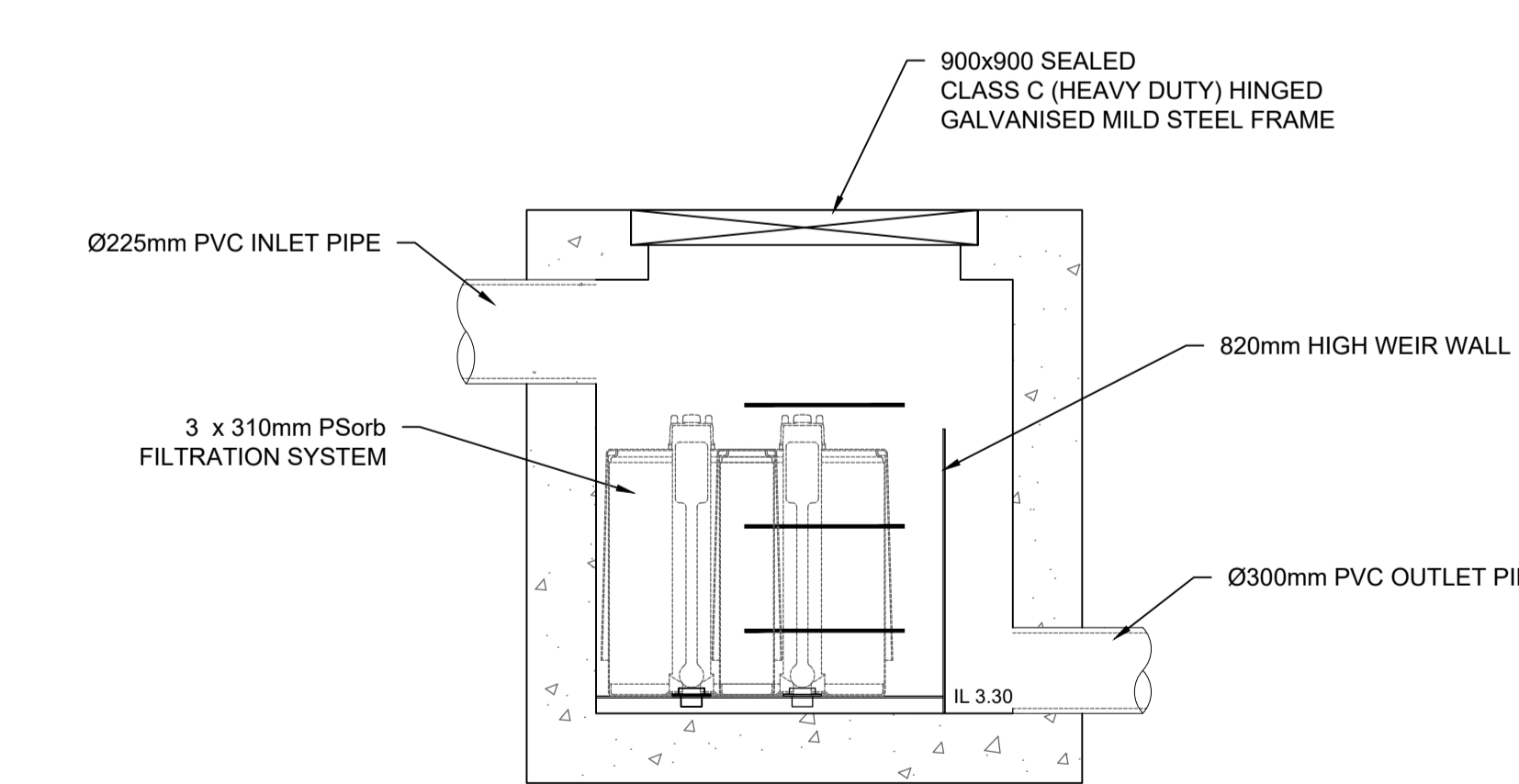
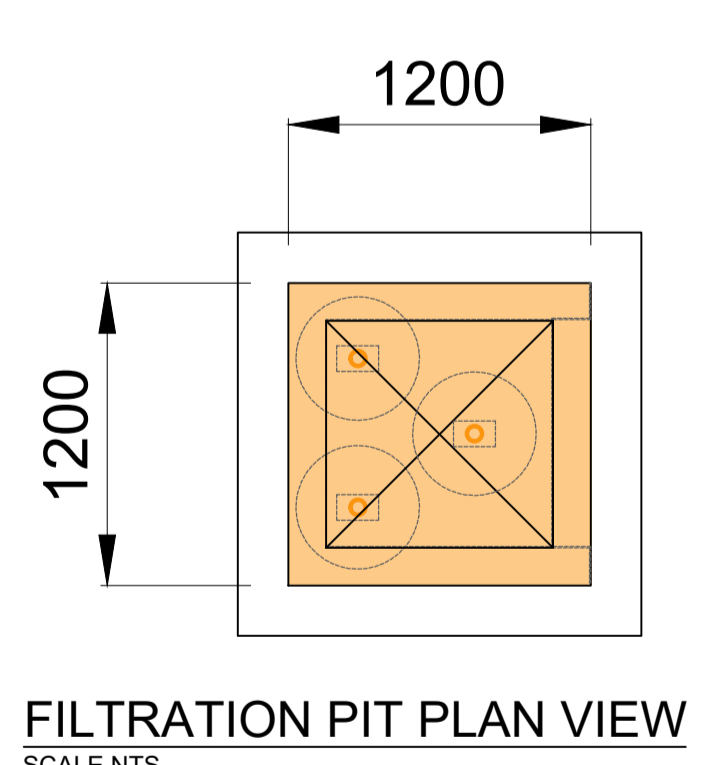
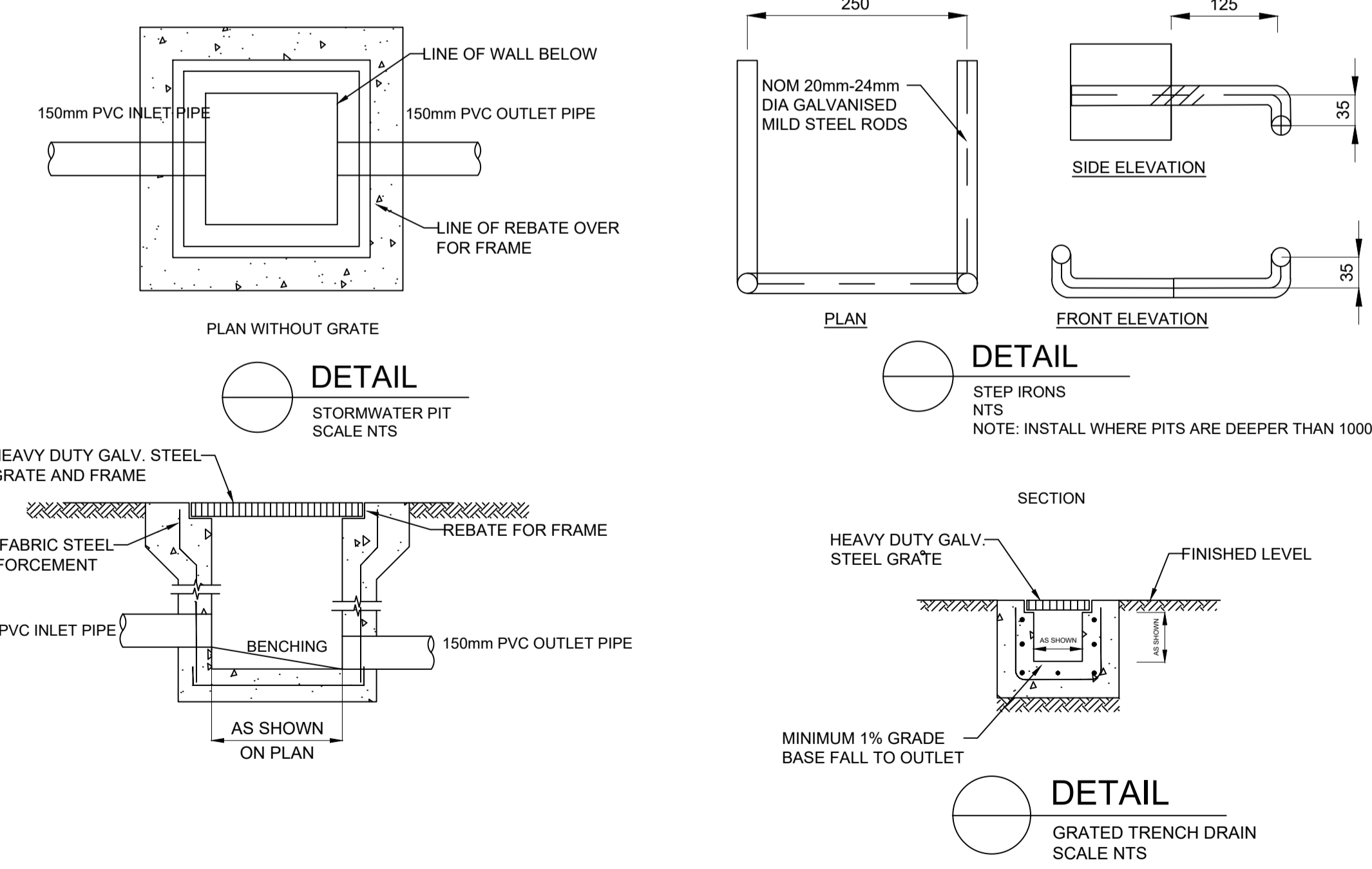
PUMP WELL DETAILS
 AREA DRAINING TO SUMP = 10.00m²
 SUMP SIZE BASED ON 100 YEAR 2 HR STORM, I = 49.3 mm/hr,
 $Q = CIA/3600 = 1 \times 10 \times 49.30/3600 = 0.137 \text{ L/sec}$
 VOLUME REQUIRED = $0.137 \times (2 \times 60 \times 60) = 0.986 \text{ m}^3$
 MIN. VOLUME REQUIRED = 0.986 m³
 MIN. VOLUME REQUIRED BY AS 3500 = 3.00 m³
 STORAGE PROVIDED $2.5 \times 2.0 \times 1.0 = 5.00 \text{ m}^3$
 PUMP RATE BASED ON 100 YEAR 5 MIN STORM, I = 262mm/hr,
 $Q = CIA/3600 = 1 \times 10 \times 262 / 3600 = 0.727 \text{ L/sec}$
 MIN. PUMP OUT RATE REQUIRED BY AS 3500.3 = 10.0 L/sec
 DUAL KS-50 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 5.0L/sec (PER PUMP) AT 14.0m HEAD



PUMP OUT PIT
 TWL 148.35
 AREA = 5.0m²
 AVERAGE DEPTH = 1.00m
 VOLUME PROVIDED = 5.0m³
 VOLUME REQUIRED = 3.0m³



Type	Output		Outlet		Rated Head Capacity		Maximum Head Capacity		Weigh Kg	Dimension		
	HP	kW	mm	Inch	M	LPM	M	LPM		L(mm)	W(mm)	H(mm)
KS-03	1/3	0.25	40	1 1/2"	3	130	8	180	9	188	141	305
KS-04	1/2	0.4	50	2"	5	150	8	220	11	208	140	359
KS-05	1/2	0.4	50	2"	5	160	10	260	14	230	156	375
KS-08	1	0.75	50	2"	6	240	13	380	21	290	180	425
KS-20	2	1.5	80	3"	10	300	16	600	31	278	182	475
KS-30	3	2.2	80	3"	10	500	18	800	42	390	250	450
KS-50	5	3.7	100	4"	10	800	21	1100	48	450	240	530
KS-75	7 1/2	5.6	100	4"	15	800	23	1300	60	550	310	590
KS-100	10	7.5	150	6"	18	900	25	1600	70	550	310	610



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A	ISSUED FOR DA	27.11.19	N.E.	K.E.	1:1	DKO ARCHITECTURE (NSW) PTY LTD	PLATINUM PROPERTY GROUP	28 LOCKWOOD AVE, BELROSE	AS SHOWN	190390
						myd CONSULTING ENGINEERS			DESIGN	SHEET NUMBER
						Lvl 2, 19 Harris Street Pyrmont, NSW 2009			K.E.	D16
						T 02 9817 2611 E info@mydconsulting.com			CHECK	REV.
								STORMWATER DRAINAGE SECTIONS AND DETAILS SHEET 1	K.E.	A
								DATE	NOVEMBER 2019	
								AT DWG SHEET		

OSD DESIGN DETAILS

BASED ON WARRINGAH COUNCIL'S ON-SITE STORMWATER DETENTION TECHNICAL SPECIFICATION AN OSD SYSTEM IS REQUIRED FOR THE PROPOSED DEVELOPMENT.

TOTAL SITE AREA: 5322.0 m²

PRE-DEVELOPMENT CATCHMENT CONDITIONS:

IMPERVIOUS AREA = 1490.36 m²
 PERVIOUS AREA = 3831.64 m²

POST DEVELOPMENT CATCHMENT CONDITIONS:

TOTAL AREA DRAINING TO OSD = 4178.92m²

- ROOF AREA (IMPERVIOUS) = 4000.41 m²
- DRIVEWAY AREA (IMPERVIOUS) = 9.6 m²
- HARDSTAND AREA (IMPERVIOUS) = 168.91 m²

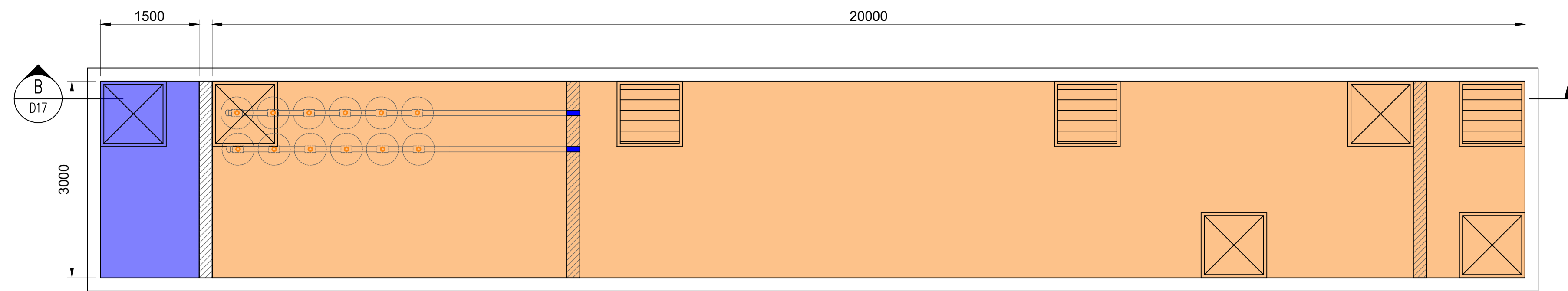
TOTAL AREA BYPASSING OSD = 1143.08m²

- IMPERVIOUS AREA(BYPASSING) = 798.44m²
- PERVIOUS AREA (BYPASSING) = 344.64m²

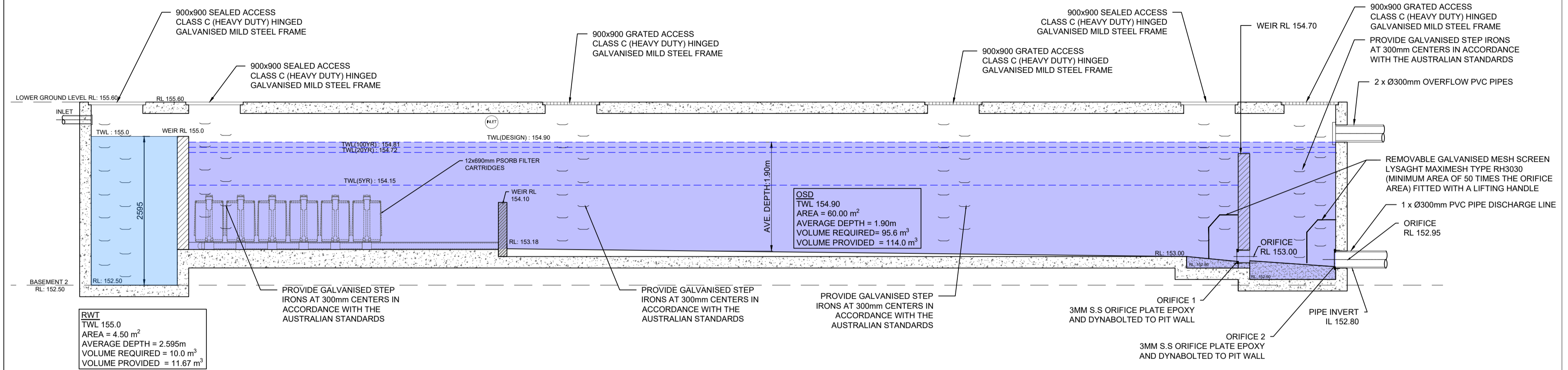
ACCORDING TO SECTION 4 (DETAILED DESIGN) OF THE DESIGN MANUAL MAXIMUM 20% OF THE HARDSTAND AREA WILL BE ALLOWED TO BYPASS THE OSD SYSTEM. WITH THIS REGARDS AND BASED ON SITE CATCHMENT ANALYSIS, ONLY 15% OF THE SITE'S HARDSTAND AREA WILL BYPASS THE PROPOSED OSD SYSTEM.

TO SIZE THE OSD SYSTEM, A DRAINS MODEL HAS BEEN CREATED USING ILSAX METHOD. BASED ON THE DESIGN POLICY THE RUN-OFF FROM THE SITE AFTER DEVELOPMENT IS NOT TO EXCEED THE RUN-OFF FROM THE TOTAL SITE PRIOR TO THE DEVELOPMENT FOR ALL STORM DURATIONS INCLUDING 5YEAR, 20 YEAR AND 100 YEAR ARI STORM EVENTS. THE PSD IS ALSO TO BE CALCULATED BASED ON THE ASSUMPTION OF PRE-DEVELOPMENT CONDITION AS "STATE OF NATURE" (i.e. 100% PERVIOUS).

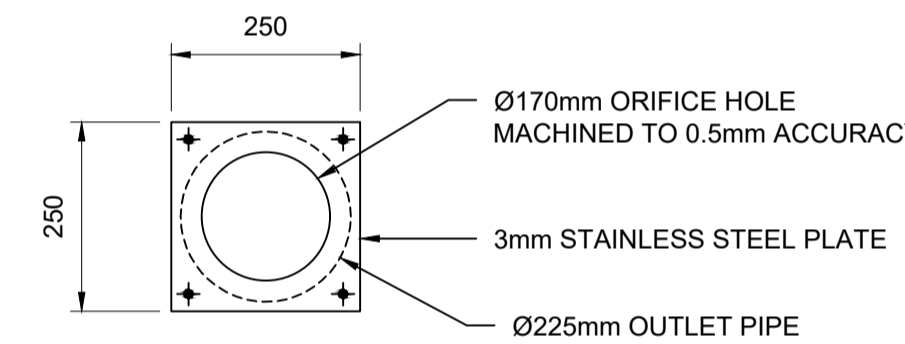
IN ORDER TO REACH AN OPTIMUM DESIGN, TWO-STAGE ORIFICE AND WEIR WALL METHODOLOGY ADOPTED TO SIZE OSD VOLUME AND CALCULATE THE SITE'S PSD VALUES FOR DESIGN STORM EVENTS.



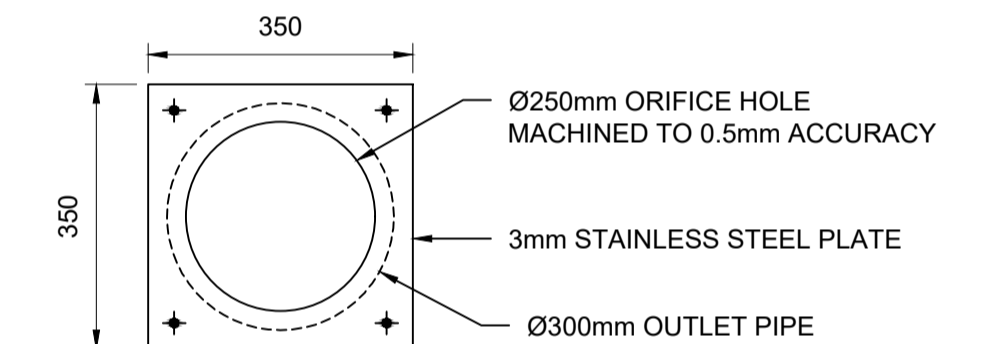
OSD TANK PLAN VIEW
SCALE NTS



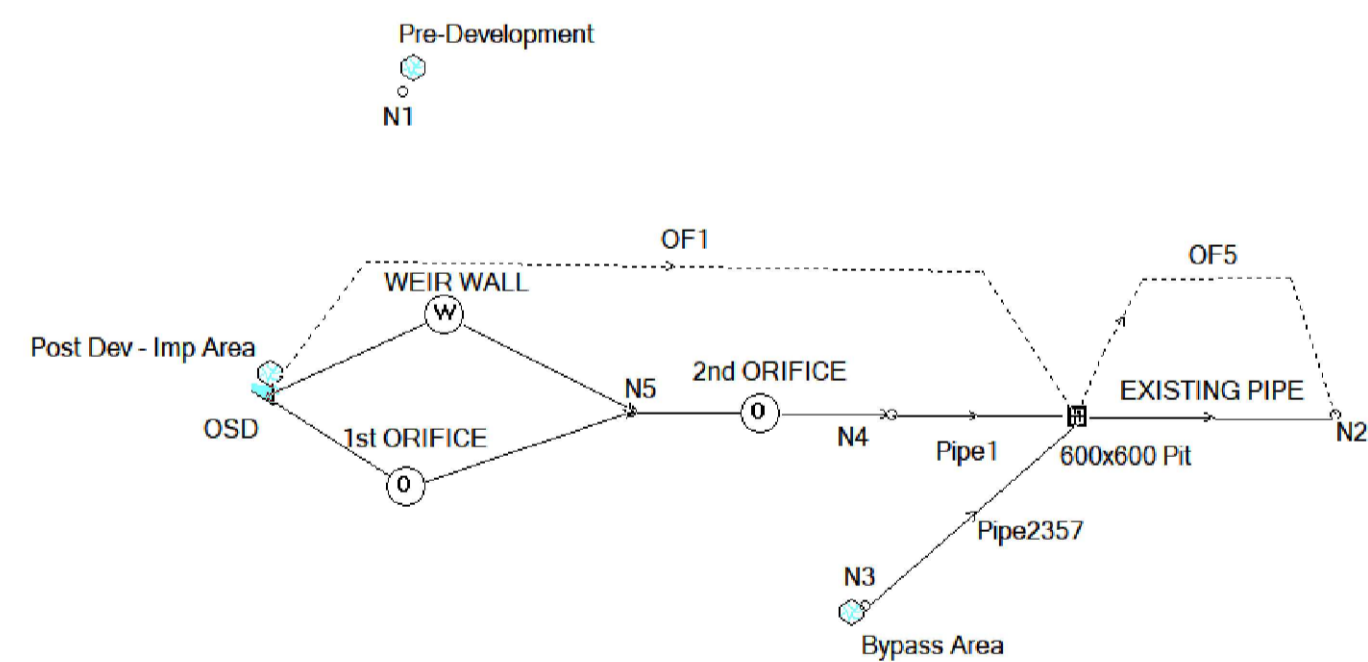
B SECTION THROUGH OSD
D17 SCALE NTS



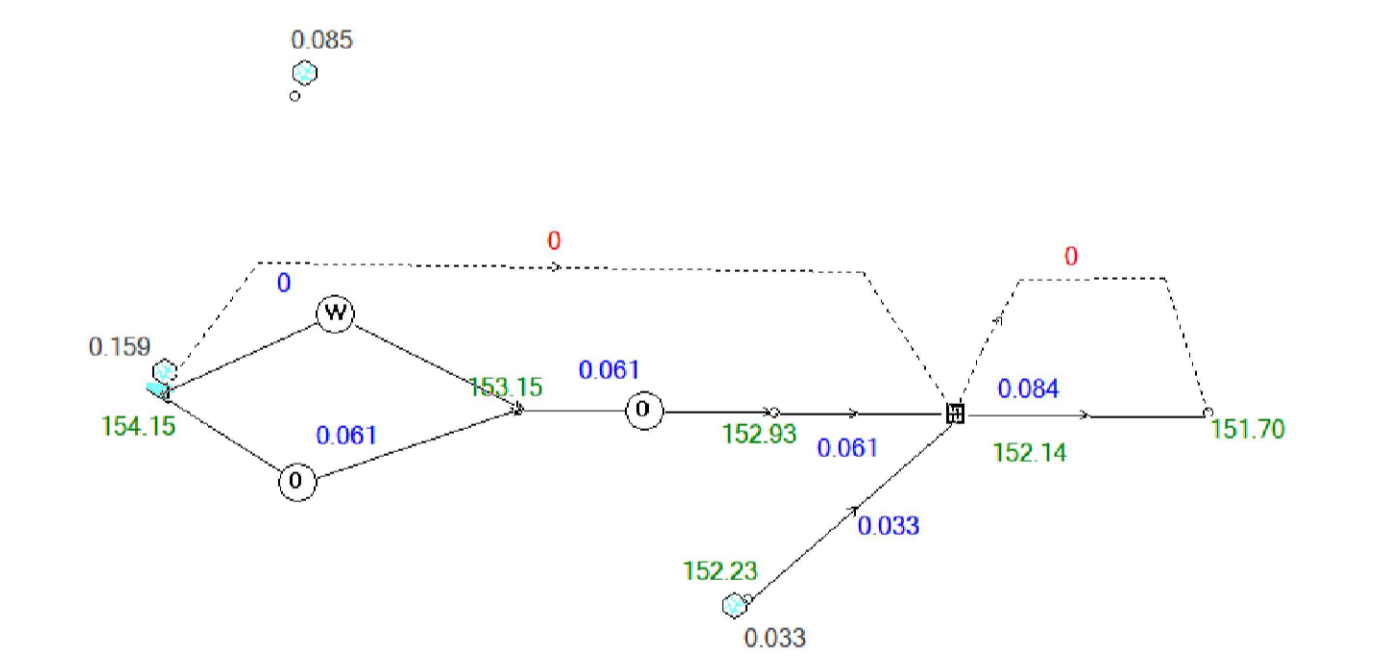
ORIFICE 1 PLATE ELEVATION
SCALE NTS



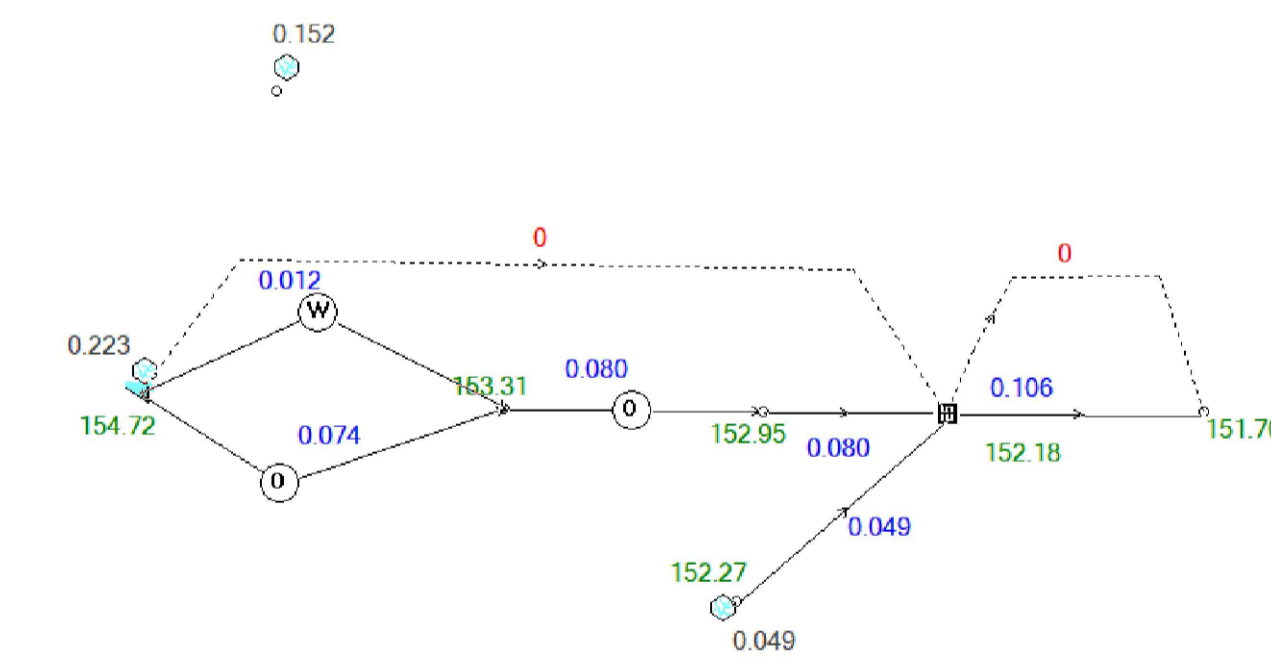
ORIFICE 2 PLATE ELEVATION
SCALE NTS



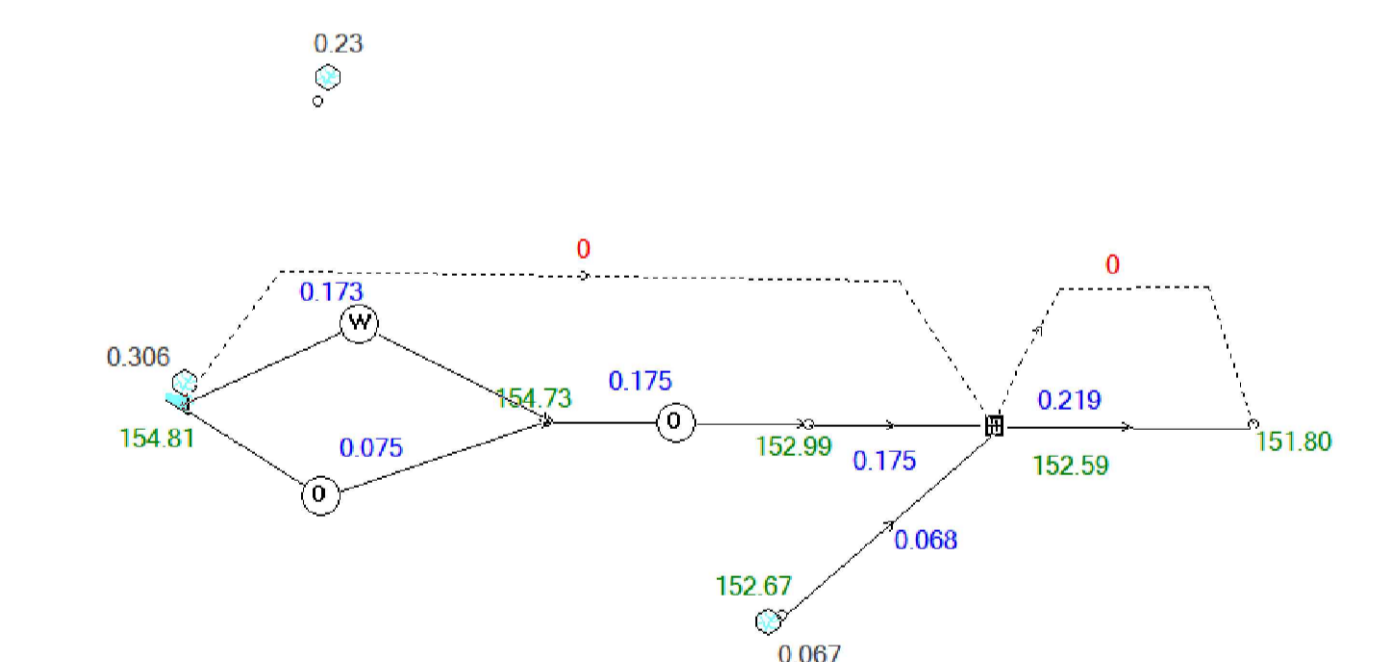
DRAINS MODEL



5 YEAR ARI (20% AEP) POST DEVELOPMENT - DRAINS MODEL



20 YEAR ARI (5% AEP) POST DEVELOPMENT - DRAINS MODEL



100 YEAR ARI (1% AEP) POST DEVELOPMENT - DRAINS MODEL

ON-SITE DETENTION DRAINS DESIGN SUMMARY				
STORM EVENT	PRE-DEVELOPMENT (l/s)	OSD OUTFLOW + BYPASS (l/s)	OSD VOL. (m ³)	Top Water Level (m AHD)
5 YR ARI (20% AEP)	85	84	58.7	154.15
20 YR ARI (5% AEP)	152	106	90.5	154.72
100 YR ARI (1% AEP)	230	219	95.6	154.81

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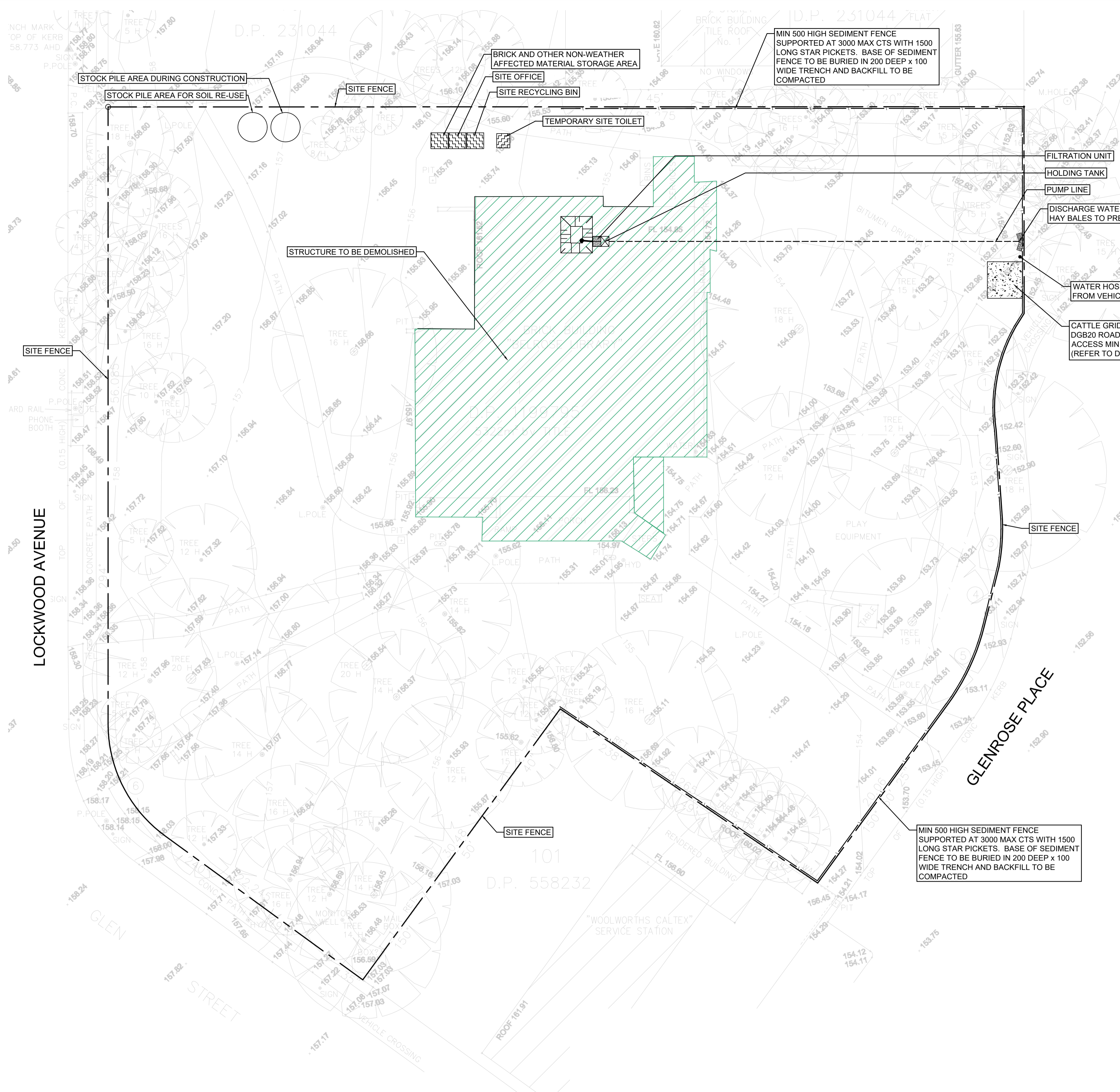
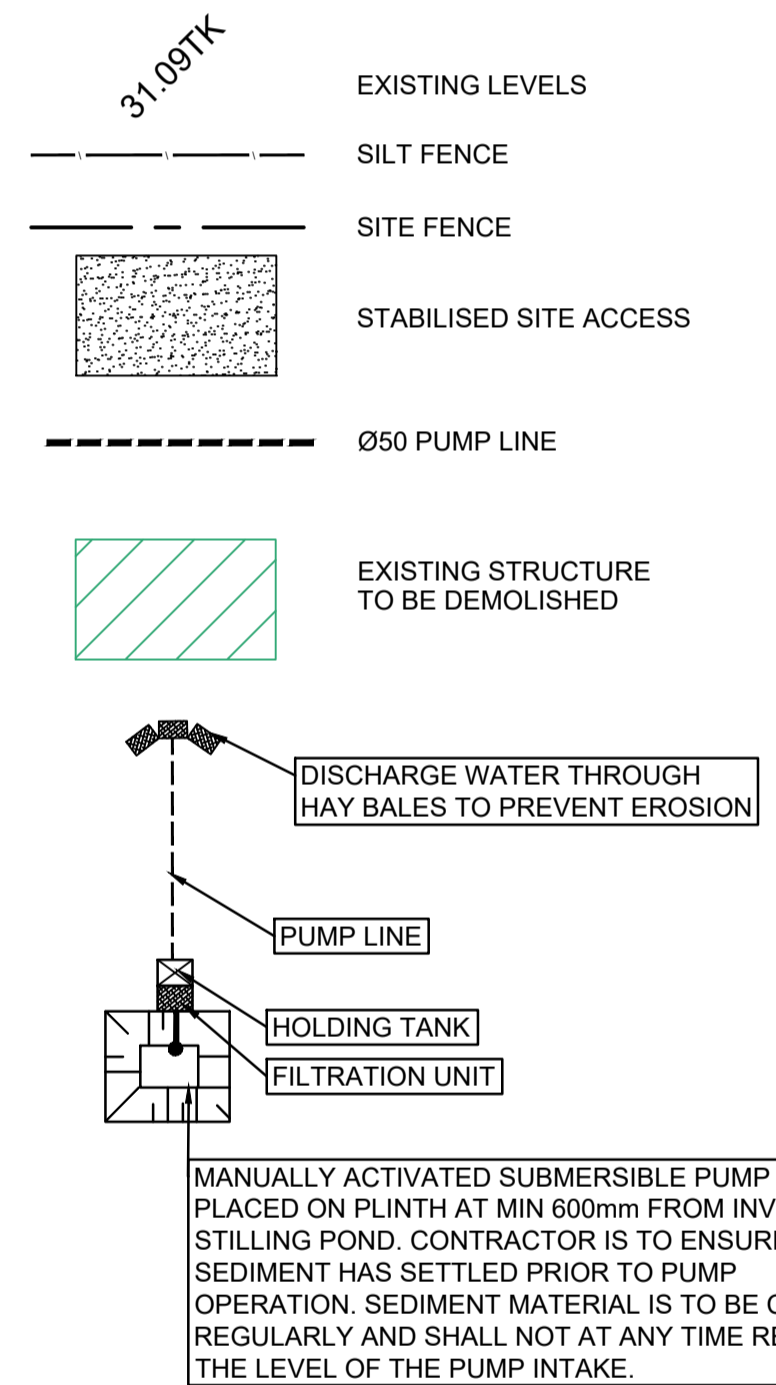
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28 LOCKWOOD AVE, BELROSE	AS SHOWN	190390	
DRAWING TITLE	DESIGN	CHECK	REV.
STORMWATER DRAINAGE SECTIONS AND DETAILS SHEET 2	K.E.	K.E.	A
	DRAWN	DATE	
	N.E.	NOVEMBER 2019	

EROSION CONTROL NOTES

- ALL EROSION & SEDIMENT CONTROL MEASURES ARE TO BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH 'MANAGING URBAN STORMWATER, 3RD EDITION' PRODUCED BY THE NSW DEPARTMENT OF HOUSING.
- ALL EROSION AND SILTATION CONTROL DEVICES ARE TO BE PLACED PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION AND REMOVED REGULARLY DURING CONSTRUCTION
- ALL TREES ARE TO BE PRESERVED UNLESS INDICATED OTHERWISE ON THE ARCHITECT'S OR LANDSCAPE ARCHITECT'S DRAWINGS. EXISTING GRASS COVER SHALL BE MAINTAINED EXCEPT IN AREAS CLEARED FOR BUILDINGS, PAVEMENTS ETC- CONTRACTOR TO MINIMISE DISTURBED AREAS.
- INSTALL TEMPORARY SEDIMENT BARRIERS TO ALL INLET PITS LIKELY TO COLLECT SILT LADDED WATER
- NOT WITHSTANDING DETAILS SHOWN, IT IS THE CONTRACTORS SOLE RESPONSIBILITY TO ENSURE THAT ALL SITE ACTIVITIES COMPLY WITH THE REQUIREMENTS OF THE CLEAN WATERS ACT.
- ALL DISTURBED AREAS AND STOCKPILES TO BE STABILISED WITHIN 14 DAYS. ALL STOCKPILES TO BE CLEAR FROM DRAINS, GUTTERS AND FOOTPATHS.
- TOPSOIL TO BE STRIPPED, STOCKPILED AND RE-SPREAD ON COMPLETION OF EARTHWORKS. NONE TO BE REMOVED.
- NO DISTURBANCE OF SITE PERMITTED OTHER THAN IMMEDIATE AREA OF THE WORKS.
- DRAINAGE IS TO BE CONNECTED TO STORMWATER SYSTEM AS SOON AS POSSIBLE.

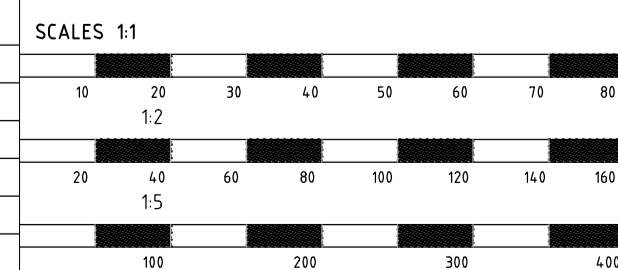
NON-COMPLIANCE MAY RESULT IN A \$1500 FINE

SYMBOLS



EROSION AND SEDIMENT CONTROL PLAN
SCALE 1:200

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EROSION AND SEDIMENT CONTROL PLAN SHEET 1	K.E.	K.E.	A
DRAWN	DATE		
N.E.	NOVEMBER 2019		

General Instructions:

SWM01
These plans present a conceptual soil and water management plan (SWMP) only and shows a possible way of managing soil and erosion. The contractor shall be responsible for the establishment and management of the site and preparing a detailed plan and obtaining approval from the relevant authority prior to the commencement of any works.

SWM02
This plan is to be read in conjunction with the engineering plans and any other plans, written instructions, specification or documentation that may be issued and relating to development of the subject site.

SWM03
The contractor will ensure that all soil and water management works are consistent with 'Managing Urban Stormwater - Soils and Construction' - also known as 'The Blue Book'.

SWM04
All builders and sub-contractors shall be informed of their responsibilities in minimising the potential for soil erosion and pollution to downslope lands and waterways.

Erosion Control:

SWM05
Water shall be prevented from entering the permanent drainage system until sediment concentration is less than or equal to 50mg/L, ie the catchment area has been permanently landscaped and/or any likely sediment has been filtered through and approved structure.

SWM06
Any sand used in the concrete curing process (spread the surface will be removed as soon as possible and within 10 working days from placement).

SWM07
Acceptable receptors will be constructed for concrete and mortar slurries, paints, acid washings, light-weight waste materials and litter.

SWM08
'Sediment' fencing will be installed as indicated on the plans and at the direction of site superintendent to ensure containment of sediment. The sediment fencing will outlet or overflow under stabilised conditions into the sediment basin, to safely convey water into a suitable filtering system should the pores in the fabric block.

SWM09
The sediment basins will be constructed with the minimum wet sediment capacity of CUM cubic meters and designed to remain stable in at least the 1 in CDSE year critical duration storm event. Artificial flocculation of the finer particles may not be necessary in this instance.

SWM10
Stockpiles should not be located within 5m of trees and hazard areas, including likely areas of concentrated or high velocity flows such as waterways, drainage lines, paved areas and driveways. Where they are within 5m from such areas, special sediment control measures should be taken to minimise possible pollution to downstream waters. Measure should also be applied to prevent the erosion of the stockpile.

SWM11
All cut and fill batters are to be seeded and mulched within 14 days of completion of formation.

SWM12
Any existing trees which form part of the final landscaping plan will be protected from construction activities by -
a. Protecting them with barrier fencing or similar materials installed outside the drip line,
b. Ensuring that nothing is nailed to them,
c. Prohibiting paving grading sediment wash or placing of stockpiles within the drip line except under the following conditions:
1. Encroachment only occurs on one side and no closer to the trunk than either 1.5 metres or half the distance between the outer edge of the drip line and the trunk, whichever ever is the greater.
2. A drainage system that allows air and water to circulate through the root zone (e.g. a gravel bed) is placed under all fill layers of more than 300 millimetres depth,
3. Care is taken.

SWM13
During windy weather, large disturbed unprotected areas should be kept moist (not wet) by sprinkling with water to keep dust under control.

SWM14

Temporary protection from erosive forces will be undertaken on lands where final shaping has not been completed but works are unlikely to proceed for periods of two months or more (eg. on top soil stockpiles). This may be achieved with a vegetative cover. A recommended listing of plant species for Soil and Water Management Notes:

- temporary cover is -
i) autumn/winter sowing -oats/ryecorn at 20kg/ha
-japanese millet at 10kg/ha
ii) spring/summer sowing -japanese millet at 20kg/ha
-oats/ryecorn at 10 kg/ha

SWM15

Diversion banks/ channels will be rehabilitated as soon as possible and within 5 working days from their final shaping. Other than in the winter months, suitable materials include turf grasses such as Couch or kikuyu. During winter, or at other times when temporary rehabilitation (more than 3 months) is required, it is suggested that hessian cloth is used but only if laced with appropriate pegs and an anionic bitumen emulsion. Foot and vehicular traffic should be kept away from these areas.

SWM16

Undertake site development works in accordance with the engineering plans. Where possible, phase development so that land disturbance is confined to areas of workable size.

Construction Sequence

SWM17

Where practical, the soil erosion hazard on the site should be kept as low as possible. To this end, works should be undertaken in the FOLLOWING SEQUENCE -

- Install inlet sediment traps to all gully pits fronting the site,
- Install a 1.8m chain wire fence around the boundaries and attach hessian cloth or similar to it on the windward side (ties at the top, centre and bottom and at 1m intervals or as instructed by the superintendent),
- Install geofabric sediment fence and sediment traps around all permanent stormwater reticulation structures as shown on the plan,
- Construct stabilised construction entrance as shown on the plan or to location as determined by superintendent,
- Install diversion banks along the boundary where required, rehabilitate disturbed lands downslope from the basins within 20 working days,
- Ensure that the sediment basin is directed onto a turfed area and drains to a suitable location. A temporary stormwater line may be necessary to convey the flows to this location. Construct diversion channels at the boundary to drain into the sediment basin as shown on plans.
- At completion stabilise site and decommission sediment basin and all erosion control devices.

SWM18

Temporary soil and water management structures will be removed only after the lands they are protecting are rehabilitated.

SWM19

Final site landscaping will be undertaken as soon as possible and within 20 working days from completion of construction activities.

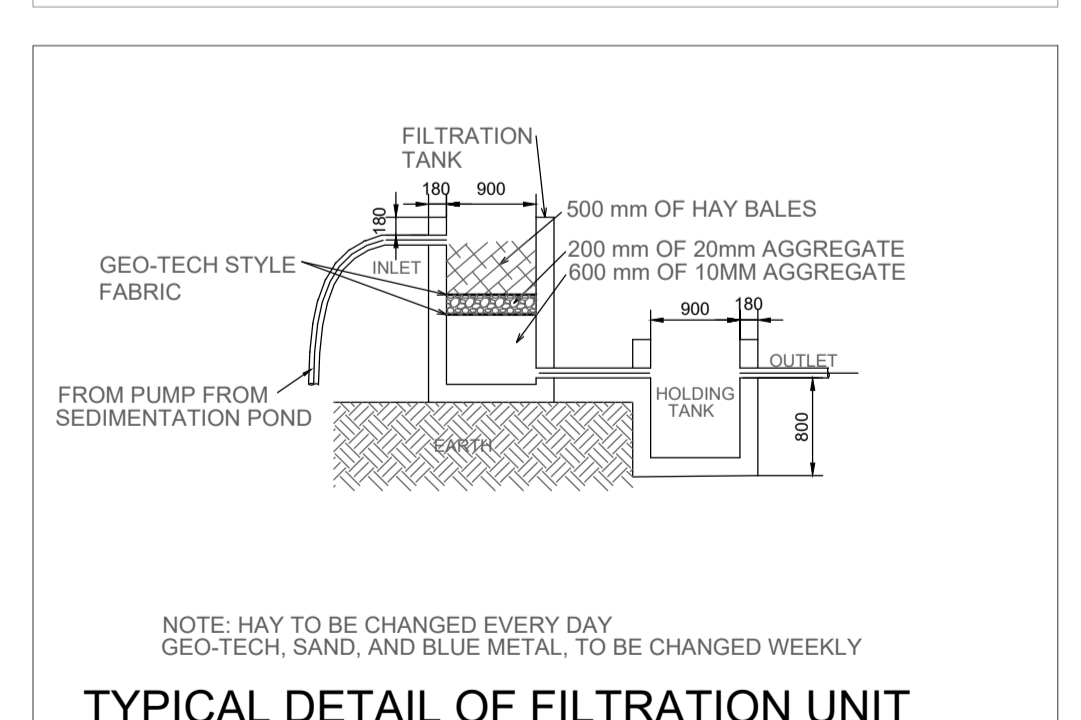
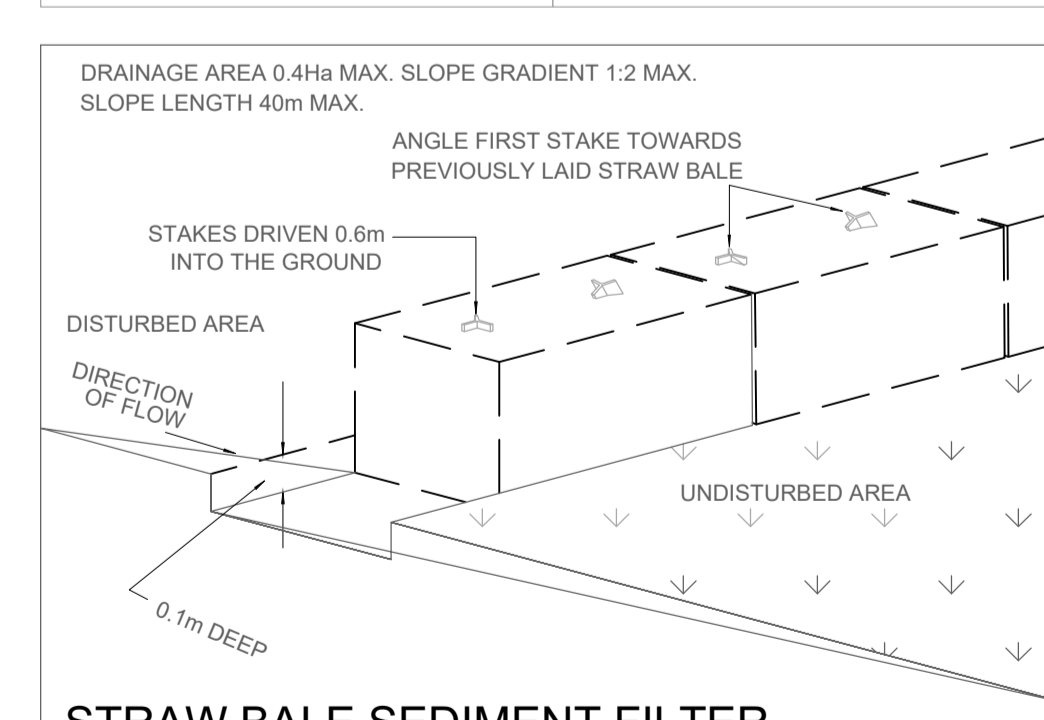
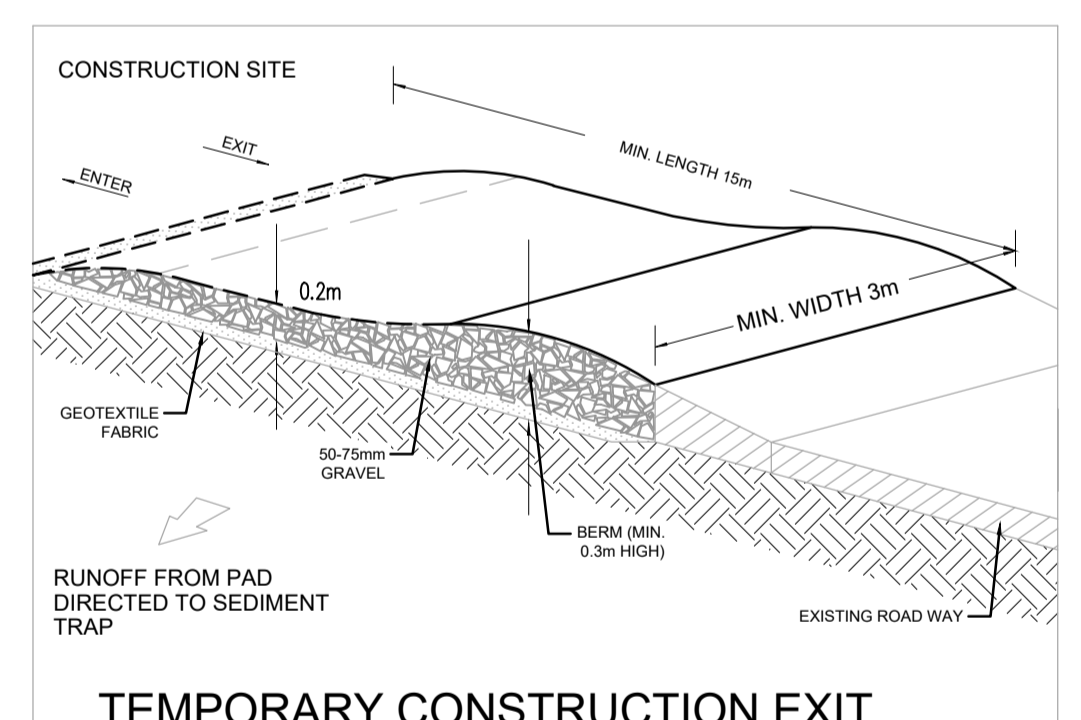
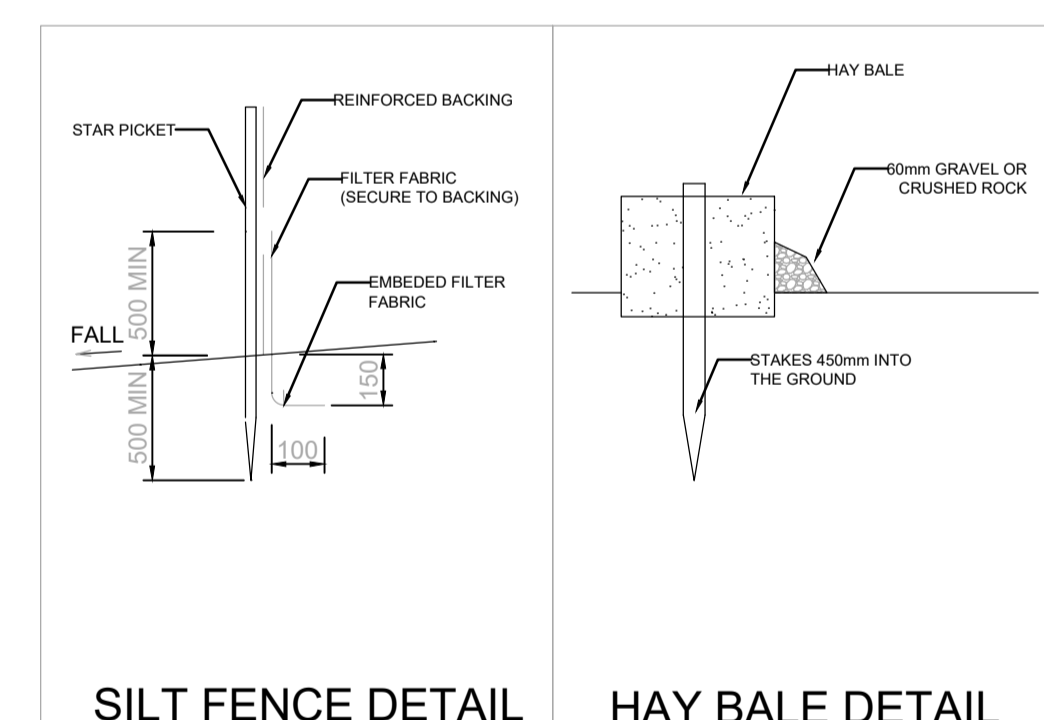
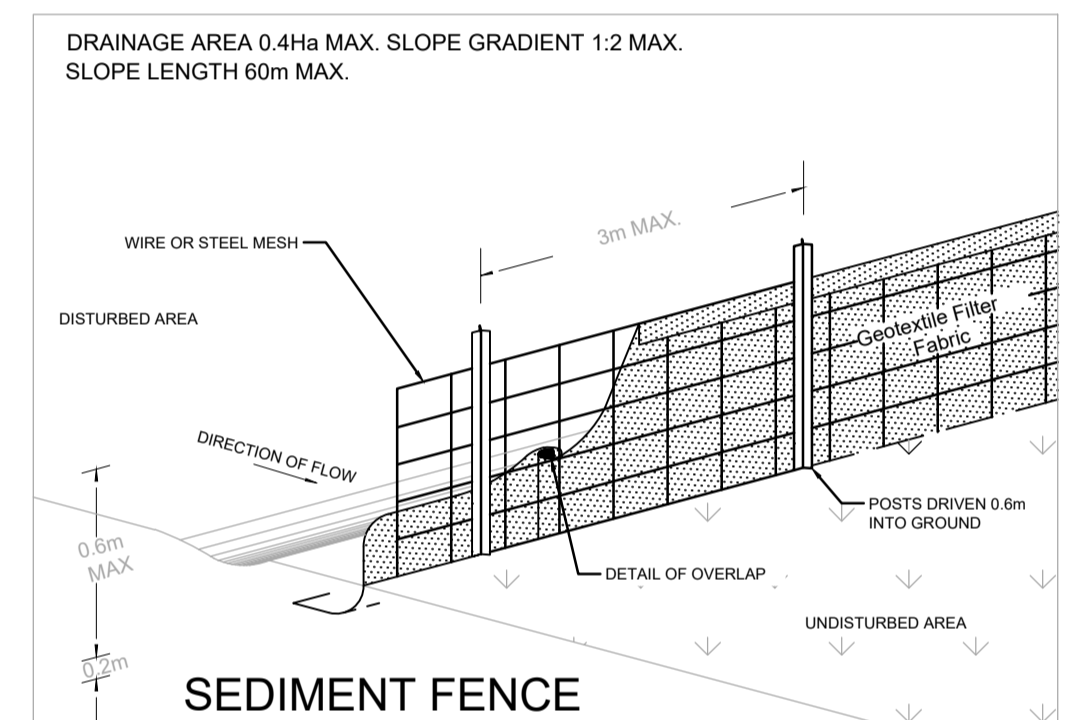
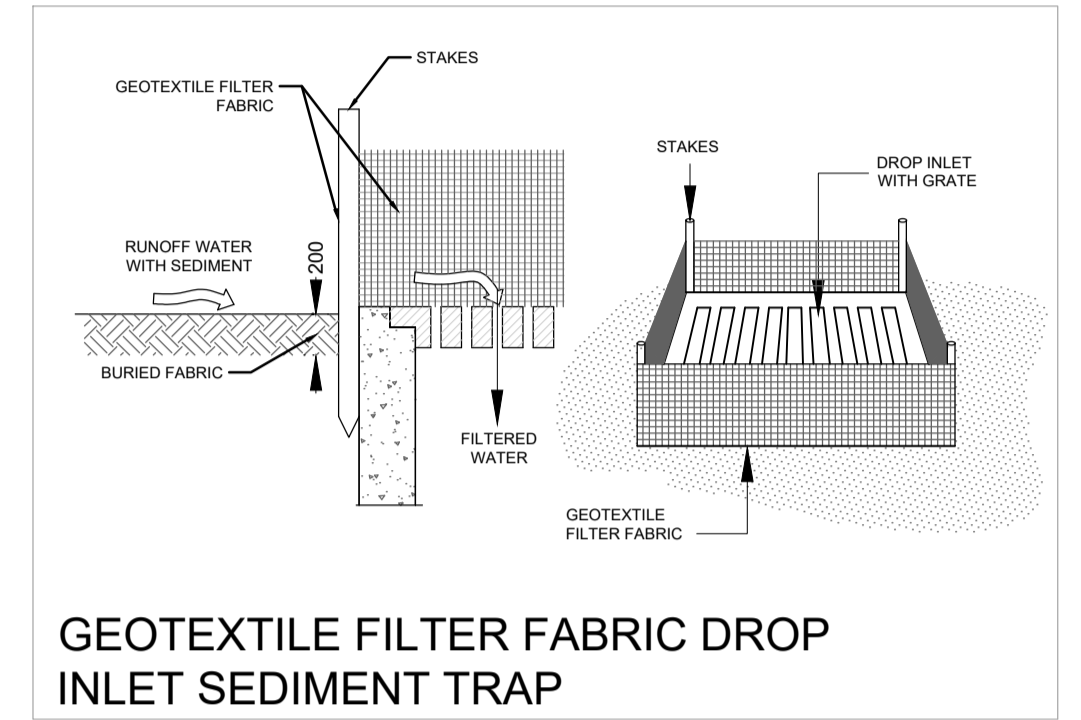
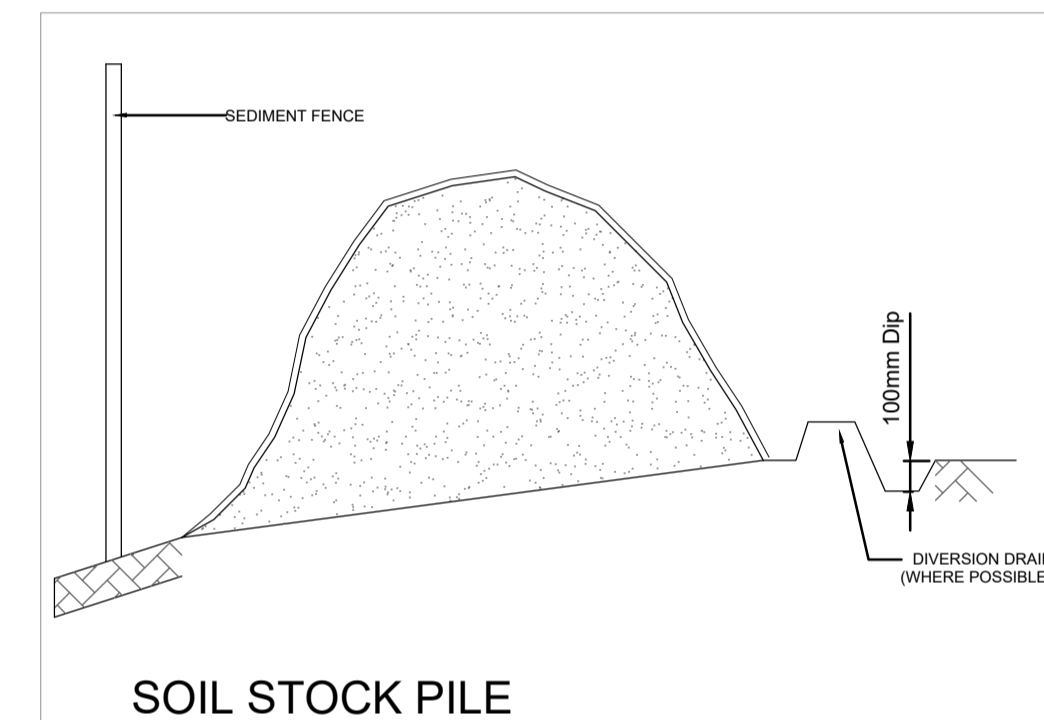
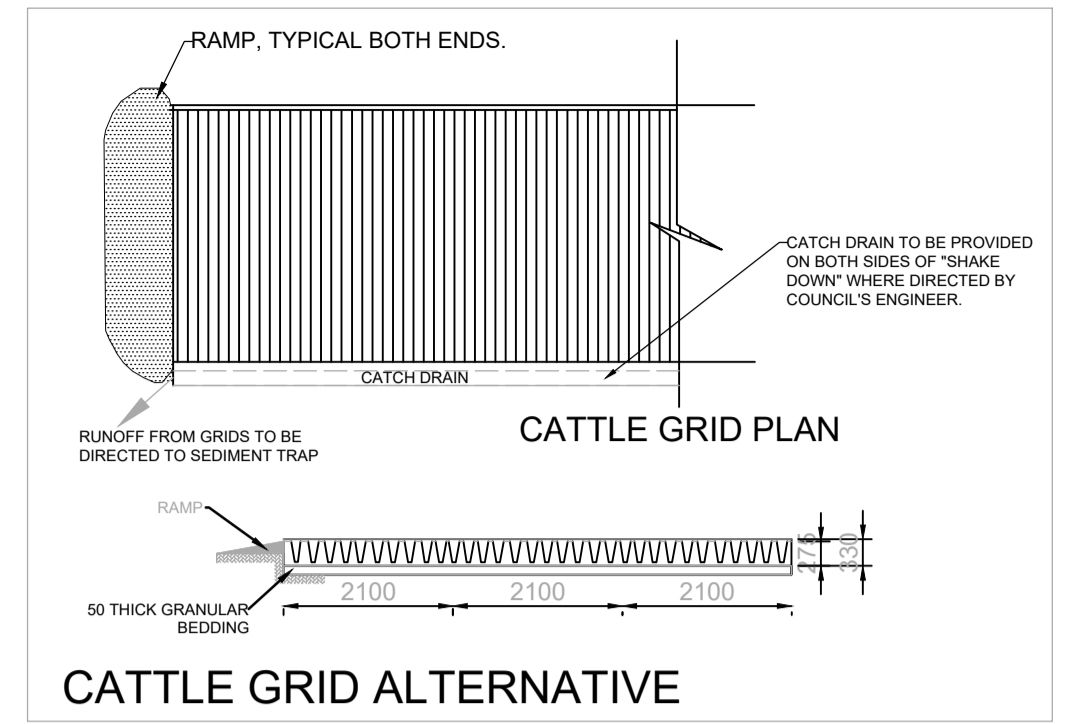
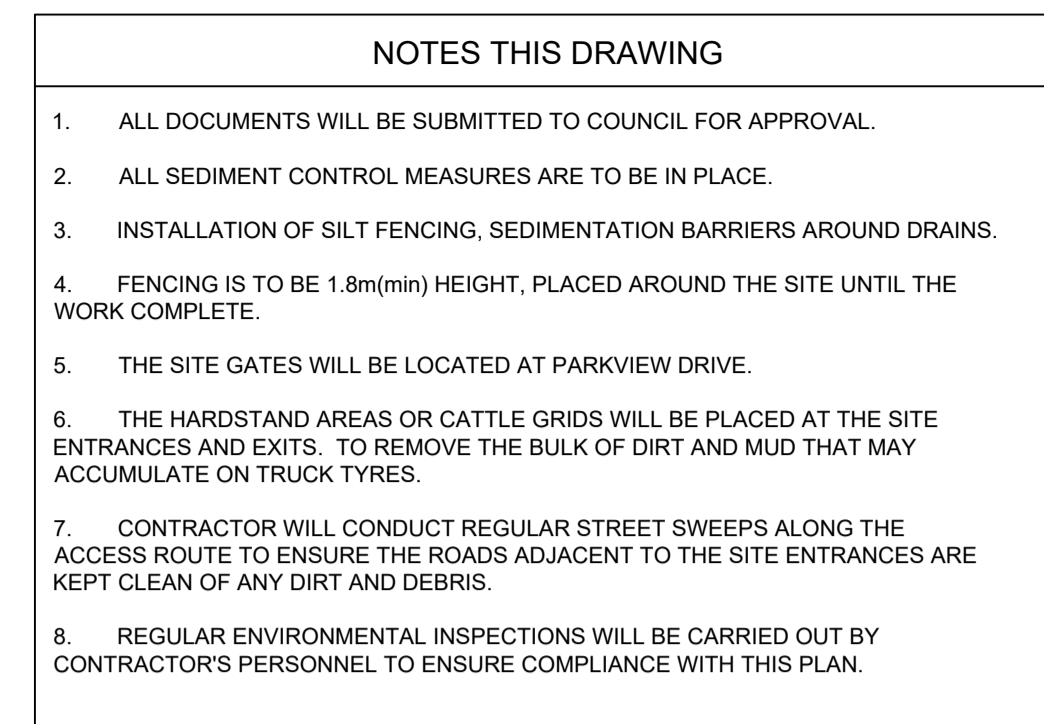
Site Inspection and Maintenance

SWM 20

- At least weekly and after every rain fall event, the contractor will inspect the site and ensure that -
- Drains and all sediment control devices operate effectively and initiate repair or maintenance as required,
 - Receptors for concrete and mortar slurries, paints, acid washings, light-weight waste materials and litter are to be emptied as necessary. Disposal of waste shall be in a manner approved by the superintendent,
 - Spill sand (or other materials) is removed from hazard areas, including likely areas of concentrated or high velocity flows such as waterways, gutters, paved areas and driveways,
 - Sediment is removed from basins and / or traps when less than 20m³ of trapping capacity remain per 1000m² of distributed lands, and or less than 500 depth remains in the settling zone. Any collected sediment will be disposed in areas where further pollution to down slope lands and waterways is unlikely,
 - Rehabilitated lands have effectively reduced the erosion hazard and initiate upgrading or repair as appropriate.

SWM 21

The contractor shall provide all monitoring control and testing.



ISSUE	NOTES	DATE	ISSUED BY	CHECKED BY
A	ISSUED FOR DA	27.11.19	N.E.	K.E.

DO NOT SCALE OFF DRAWINGS
FIGURED DIMENSIONS TO BE USED, ALL DIMENSIONS TO BE CHECKED ON SITE

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PLATINUM PROPERTY GROUP

PROJECT
28 LOCKWOOD AVE, BELROSE

DRAWING TITLE
EROSION AND SEDIMENT CONTROL PLAN SHEET 2

NUMBER IN SET	JOB NO	
AS SHOWN	190390	
DESIGN	CHECK	REV.
K.E.	K.E.	A
DRAWN	DATE	
N.E.	NOVEMBER 2019	