

23 March, 2021

Re: DESIGN CERTIFICATION OF 90 LAWRENCE ST, FRESHWATER

I am a chartered professional engineer in both civil and structural colleges. I am a competent person in structural and civil design, being listed in the National Professional Engineering Register (NPER) and as such can certify the Stormwater drawings number **035-W21**.

The basis on which this certificate is given and the extent to which relevant Specifications, rules, codes of practice or other publications have been relied upon is as follows:

- AS3500.3-2018
- Building Code of Australia-2019
- Council DCP and SEPP (CL 3.5)

Approved Principle Engineer,

A handwritten signature in blue ink, appearing to read "Hussein Naji".

Hussein Naji
BE(Hons) MIEAust CPEng NPER (No: 3154929)

GENERAL

G1 ALL WORK SHALL BE CARRIED OUT IN ACCORDANCE WITH COUNCIL'S REQUIREMENTS, BUILDING CODE OF AUSTRALIA, NSW CODE OF PRACTICE AND THE TO THE RELEVANT SERVICE CODES.

G2 THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH ALL ARCHITECTURAL AND OTHER CONSULTANTS' DRAWINGS AND SPECIFICATIONS AND WITH SUCH OTHER WRITTEN INSTRUCTIONS AS MAY BE ISSUED DURING THE COURSE OF THE CONTRACT. ALL DISCREPANCIES SHALL BE REFERRED TO THE SUPERINTENDENT FOR DECISION BEFORE PROCEEDING WITH THE WORK.

G3 ALL DIMENSIONS SHOWN ON THE DRAWINGS ARE IN MILLIMETERS (U.N.O.), DIMENSIONS SHALL NOT BE OBTAINED BY SCALING OF THESE DRAWINGS. USE FIGURED DIMENSIONS ONLY.

G4 BENCHMARKS HAVE BEEN ESTABLISHED WHERE INDICATED IN THE DRAWINGS. ALL LEVELS ARE TO AUSTRALIAN HEIGHT DATUM (A.H.D.). THE CONTRACTOR SHALL UNDERTAKE ALL NECESSARY SURVEY WORK TO ENSURE THAT THE WORKS ARE CONSTRUCTED TO DESIGN LINE AND LEVEL.

G5 SETTING OUT DIMENSIONS AND LEVELS SHOWN ON THE DRAWINGS SHALL BE VERIFIED BY THE CONTRACTOR.

G6 ALL MATERIALS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE RELEVANT AUSTRALIAN CODES AND THE BY-LAWS AND ORDINANCES OF THE RELEVANT BUILDING AUTHORITIES.

G7 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 WORK HEALTH AND SAFETY REQUIREMENTS AND OTHER RELEVANT AUTHORITY SAFETY REQUIREMENTS.

G8 NO TREES SHALL BE REMOVED. CUTBACK OR RELOCATED WITHOUT THE WRITTEN INSTRUCTION FROM THE SUPERINTENDENT/COUNCIL.

G9 WHERE NEW WORKS ABUT EXISTING THE CONTRACTOR SHALL ENSURE THAT A SMOOTH EVEN PROFILE, FREE FROM ABRUPT CHANGES IS OBTAINED.

G10 ALL WORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH THE DETAILS SHOWN ON THE DRAWINGS AND THESE SPECIFICATIONS.

G11 DESIGN LEVELS GIVEN ARE TO FINISHED SURFACE LEVEL AND INCLUSIVE OF TOPSOIL. (TOPSOIL DEPTH VARIES)

G12 THE CONTRACTOR SHALL ARRANGE ALL SURVEY SETOUT TO BE CARRIED OUT BY A N.A.T.A. REGISTERED SURVEYOR.

G13 CARE IS TO BE TAKEN WHEN EXCAVATING NEAR EXISTING SERVICES. NO MECHANICAL EXCAVATIONS ARE TO BE UNDERTAKEN OVER TELECOMMUNICATIONS OR ELECTRICAL SERVICES. HAND EXCAVATE IN THESE AREAS.

G14 THE LOCATIONS OF UNDERGROUND SERVICES SHOWN ON THE DRAWING HAVE BEEN PLOTTED FROM DIAGRAMS PROVIDED BY SER VICE AUTHORITIES. THIS INFORMATION HAS BEEN PREPARED SOLELY FOR THE AUTHORITIES OWN USE AND MAY NOT NECESSARILY BE UPDATED OR ACCURATE.

G15 THE POSITION OF SER VICES AS RECORDED BY THE AUTHORITY AT THE TIME OF INSTALLATION MAY NOT REFLECT CHANGES IN THE PHYSICAL ENVIRONMENT SUBSEQUENT TO INSTALLATION.

G16 HORIZON CONSULTANTS DOES NOT GUARANTEE THAT THE SER VICES INFORMATION SHOWN ON THE DRAWING SHOWS MORE THAN THE PRESENCE OR ABSENCE OF SERVICES. AND WILL ACCEPT NO LIABILITY FOR INACCURACIES IN THE SER VICES INFORMATION SHOWN FROM ANY CAUSE WHATSOEVER.

G17 IT IS THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN FROM THE UTILITY SERVICES AUTHORITIES A CURRENT COPY OF UNDERGROUND SERVICES SEARCH FOR THE LOCATION OF ALL EXISTING SERVICES PRIOR TO COMMENCEMENT OF ANY WORK AND NOTIFY ANY CONFLICT WITH THE DRAWINGS IMMEDIATELY. CLEARANCE SHALL BE OBTAINED FROM THE RELEVANT REGULATORY AUTHORITY. CONTRACTOR TO KEEP COPY OF UNDERGROUND SERVICES SEARCH ON SITE AT ALL TIMES. ANY DAMAGES TO SERVICES OR SER VICES ADJUSTMENTS SHALL BE CARRIED OUT BY THE CONTRACTOR OR RELEVANT AUTHORITY AT THE CONTRACTOR'S EXPENSE.

G18 VISIT THE SITE BEFORE SUBMITTING THE FINAL TENDER PRICE TO ASSESS "ON SITE" CONDITIONS. FAILURE TO DO SO WILL FORFEIT ANY CLAIM FOR NOT BEING AWARE OF CONDITIONS AFFECTING THE TENDER.

G19 THE CONTRACTOR SHALL PREPARE ACCURATE WORK-AS-EXECUTEO DRAWINGS FOLLOWING THE COMPLETION OF ALL WORKS.

G20 IT IS THE CONTRACTOR'S RESPONSIBILITY TO HAVE IN PLACE & MAINTAIN TRAFFIC FACILITIES AT ALL TIMES DURING CONSTRUCTION

RESTORATION

R1 RESTORE ALL TRAFFIC AREAS TO PRE-EXISTING CONDITIONS.

R2 FOR ALL SURFACES OTHER THAN IN TRAFFIC AREAS RESTORE DISTURBED SURFACES TO PRE-EXISTING CONDITIONS AND COMPACT AS SPECIFIED.

APPROVALS

AP1 THE AS-BUILT WORKS SHALL BE INSPECTED BY THE ENGINEER. MINIMUM 48 HOURS NOTICE SHALL APPLY TO ALL INSPECTIONS.

AP2 THE DESIGN PLANS HEREIN ARE SUBJECT TO LOCAL COUNCIL APPROVAL PRIOR TO CONSTRUCTION. OBTAIN EXPRESS IN WRITING ADVICE TO PROCEED FROM PROJECT SUPERINTENDENT PRIOR TO COMMENCEMENT.

AP3 SUBMIT WORK-AS-EXECUTEO DRAWINGS IN DWG FORMAT AND HARD COPY FORMAT UNDERTAKEN BY A REGISTERED SURVEYOR. VERIFY ALL CONSTRUCTION WORKS SHOWN HEREON.

AP4 CERTIFY THAT THE AS-BUILT SYSTEM HAS BEEN BUILT IN ACCORDANCE WITH THE APPROVED PLANS ISSUED FOR CONSTRUCTION.

AP5 ALLOW FOR SUB GRADE AND PAVEMENT THICKNESS TO BE VERIFIED BY THE GEOTECHNICAL ENGINEER AFTER INSPECTION OF PRELIMINARY BOXING.

AP6 ALLOW FOR ANY SUBGRADE REPLACEMENT WORK TO BE DETERMINED AS REQUIRED BY GEOTECHNICAL ENGINEER AT THE TIME OF PAVEMENT CONSTRUCTION.

AP3 SUBMIT WORK-AS-EXECUTEO DRAWINGS IN DWG FORMAT AND HARD COPY FORMAT UNDERTAKEN BY A REGISTERED SURVEYOR. VERIFY ALL CONSTRUCTION WORKS SHOWN HEREON.

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KERB AND GUTTER

KG1 ALL KERB AND GUTTER SHALL COMPLY WITH AS2876-2000,'CONCRETE KERBS AND CHANNELS-MANUALLY OR MACHINE PLACED'.

KG2 CONCRETE CHARACTERISTICS SHALL BE IN ACCORDANCE WITH THE CONCRETE NOTES.

KG3 CONTROL JOINTS SHALL BE FORMED AT A MAXIMUM SPACING OF 3m.

KG4 THE CONTRACTOR SHALL LIAISE WITH RELEVANT AUTHORITIES TO DETERMINE THEIR REQUIREMENTS FOR THE KERBS AND GUTTERS.

KG5 ALL KERB & GUTTER IS TO BE MACHINE LAID UNLESS OTHER WISE APPROVED BY THE SUPERINTENDENT

MISCELLANEOUS

MI GEOTEXTILE FABRIC MATERIAL TO BE BIDIM A14 OR APPROVED EQUIVALENT AND SHALL COMPLY WITH AS370S-1011"GEOTEXTILES - IDENTIFICATION, MARKING AND GENERAL DATA'.

KERB INLET PITS

K1 COMPRESSIVE STRENGTH (F^c) FOR CAST IN SITU CONCRETE SHALL BE A MINIMUM 15MPa AT 18 DAYS.

K2 100 DIA SUBSOIL DRAINAGE PIPE 3000mm LONG WRAPPED IN FABRIC SOCK SHALL BE PROVIDED ON THE UPSTREAM SIDE OF PIT, ADJACENT TO INLET PIPES.

K3 ALL PITS SHALL BE PROVIDED WITH A LOCKING CLIP.

K4 PIT GRATE SHALL BE "WELDLCK" GULLY GRATE GGTB-SS OR EQUAL (APPROVED BY COUNCIL) WITH SKIRT FOR INDUSTRIAL ROADS. WITH 41xS EDGE BARS. GRATE TO BE CAST IRON HEAVY DUTY. THEFT RESISTANT SWING AND BICYCLE SAFE

K5 DURING INSTALLATION OF GRATE & FRAME. CONTRACTOR SHALL ENSURE CLEARANCE BETWEEN LINTEL & OPENED GRATE

STORMWATER

SI ALL WORK SHALL BE CARRIED OUT IN ACCORDANCE AS3500.3-2003 'STORMWATER DRAINAGE'.

S2 FOR STORMWATER DRAINAGE PIPES THAT EXCEED 1:5 GRADE. REINFORCED CONCRETE ANCHOR BLOCKS SHALL BE INSTALLED. ANCHOR BLOCKS TO BE CONSTRUCTED TO SPECIFICATIONS SET OUT IN AS3500.3-2003 SECTION 8.10

S3 EXISTING SERVICES SHOWN IN APPROXIMATE LOCATIONS ONLY. CONFIRM EXACT LOCATIONS ON SITE PRIOR TO COMMENCING WORK.

S4 COORDINATE THE INSTALLATION OF NEW SERVICES WITH ALL NEW & EXISTING SER VICES & STRUCTURAL PROVISIONS AS DETERMINED ON SITE.

S5 ALL PIPEWORK TO BE SUPPORTED IN ACCORDANCE WITH AS3500.3-2003.

S6 ALL PIPEWORK IS TO BE TESTED IN ACCORDANCE WITH THE REQUIREMENTS AS SET DOWN IN AS3500.3-2003. ALL IN-GROUND PIPEWORK TO BE INSPECTED BY THE SUPERINTENDENT UNDER TEST CONDITIONS PRIOR TO BACKFILLING. BACKFILLING AND BEADING TO AS3500.1-2003.

S7 PIPES SHALL BE TRUE TO GRADES SHOWN AND ALIGNED SO THAT THE CENTER OF THE INLET PIPE INTERSECTS WITH THE CENTER OF THE OUTLET PIPE AT THE DOWNSTREAM FACE OF THE PIT.

S8 BED ALL PIPES FIRMLY AND EVENLY WITH IMPORTED FILL ONLY. THICKNESS OF BEDDING LAYER SHALL BE 75mm IN SOIL AND 100mm IN ROCK.

S9 LAY AND JOINT ALL PIPES IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND AS3725-2007,"DESIGN FOR INSTALLATION OF BURIED CONCRETE PIPES".

SI0 ALLOW TO TEST ALL PIPES AND PITS TO LOCAL AUTHORITY'S REQUIREMENTS.

SI11 EXCAVATE TRENCHES AND STOCKPILE ALL MATERIAL FOR INSPECTION WITH REGARD TO REUSE FOR TRENCH BACKFILL. REMAINING MATERIAL TO BE REMOVED FROM SITE.

SI2 BACKFILL PIPES WITH IMPORTED FILL. PROVIDE 200mm SIDE SUPPORT AND 150mm OVERLAY ABOVE PIPE CROWN. TRENCH FILL ABOVE THE EMBEDMENT ZONE TO THE UNDERSIDE OF THE ROAD PAVEMENT OR THE FOOTWAY SHALL BE AS FOLLOW,-

UNDER ROADWAY

TRENCH FILL MATERIAL SHALL CONSIST OF IMPORTED FILL AS SPECIFIED HEREIN OF EITHER HIGH GRADE COMPACTION SAND OR APPROVED CRUSHED ROAD GRAVEL CONFORMING TO RMS QA SPECIFICATION 3051 OR SIMILAR.

OTHER THAN ROADWAY

TRENCH MATERIAL EXCAVATED SHALL CONSIST OF SELECT FILL AS SPECIFIED HEREIN AND SHALL NOT CONTAIN MORE THAN 10% OF STONES OF SIZE BETWEEN 25mm AND 75mm AND NONE LARGER THAN 75mm. PRIOR TO USE OF THE EXCAVATED MATERIAL IT SHALL BE INSPECTED AND APPROVED BY THE ENGINEER

SI3 COMPACT BEDDING. EMBEDMENT AND TRENCH FILL MATERIALS AS FOLLOW,- EMBEDMENT; FOR GRANULAR FILL MATERIAL (NON-COHESIVE SOILS e.g. COARSE AGGREGATE FILL, THE DENSITY INDEX (ID) SHALL BE NOT LESS THAN 70%.

TRENCH FILL,-

FOR GRANULAR MATERIAL (NON COHESIVE SOILS). THE DENSITY INDEX (ID) SHALL BE NOT LESS THAN 70%. FOR NON-GRANULAR FILL MATERIAL (COHESIVE SOILS). THE DRY DENSITY RATIO (RD) SHALL BE NOT LESS THAN 95%.

SI4 EXISTING SERVICES

UTILITY INFORMATION SHOWN ON THE PLANS IS NOT INTENDED TO DEPICT MORE THAN THE PRESENCE OF ANY SERVICES. ACTUAL LOCATIONS SHOULD BE VERIFIED BY HAND EXCAVATION PRIOR TO CONSTRUCTION.

SI5 THE CONTRACTOR SHALL ALLOW FOR THE CAPPING OFF, EXCAVATION AND REMOVAL (IF REQUIRED) OF ALL EXISTING SERVICES IN AREAS AFFECTED BY THE WORKS.

SI6 THE CONTRACTOR SHALL ENSURE THAT SER VICES TO ALL BUILDINGS NOT AFFECTED BY THE WORKS ARE NOT DISRUPTED AT ALL TIMES. THE CONTRACTOR SHALL CONSTRUCT TEMPORARY Y SER VICES TO MAINTAIN EXISTING SUPPLY TO BUILDINGS REMAINING WHERE REQUIRED. ONCE THE WORKS ARE COMPLETE AND COMMISSIONED THE CONTRACTOR SHALL REMOVE ALL SUCH TEMPORARY SERVICES AND MAKE GOOD ALL DISTURBED AREAS.

SI7 DRAINAGE PIPES

EXISTING PIPES WHICH FORM NO PART OF THE DRAINAGE SYSTEM SHALL BE REMOVED OR SEALED AS INDICATED ON THE PLANS. PIPES UP TO 300mm DIAMETER SHALL BE SEWER GRADE uPVC WITH SOLVENT WELDED JOINTS (U.N.O.). ALL PIPE JUNCTIONS AND TAPERS SHALL BE VIA PURPOSE MADE FITTINGS.

SI8 WHERE DOWNPIPES PASS UNDER FLOOR SLABS, SEWER GRADE uPVC WITH RUBBER RING JOINTS ARE TO BE USED.

SI9 MINIMUM GRADE TO DRAINAGE PIPES TO BE 1% (U.N.O.), MIN. SIZE 100mm DIAMETER (U.N.O.).

S20 PIPES LARGER THAN OR EQUAL TO 300mm DIAMETER TO BE REINFORCED CONCRETE RUBBER RING JOINTED TYPE (CLASS 2) MANUFACTURED TO AS4058 (U.N.O.).

S21 PIPE INSTALLATION UNDER TRAFFICABLE AREAS SHALL BE IN ACCORDANCE WITH CONCRETE PIPE ASSOCIATION OF AUSTRALIA PUBLICATION "CONCRETE PIPE SELECTION & INSTALLATION" TYPE H53 SUPPORT.

S22 EQUIVALENT STRENGTH FRC PIPES MAY BE USED SUBJECT TO AUTHORITY APPROVAL.

S23 MINIMUM PIPE COVER TO BE 600mm UNDER TRAFFICABLE AREAS AND 300mm ELSEWHERE (U.N.O.).

S24 CONTRACTOR TO SUPPLY AND INSTALL ALL FITTINGS AND SPECIALS INCLUDING VARIOUS PIPE ADAPTORS TO ENSURE PROPER CONNECTION BETWEEN DISSIMILAR PIPEWORKS.

S25 STORMWATER DRAINAGE CONNECTIONS TO COUNCIL'S SYSTEM SHALL BE TO THE REQUIREMENTS AND THE SATISFACTION OF LOCAL COUNCIL.

S30 BENCHING TO BE HALF OUTGOING PIPE DEPTH. CONCRETE FOR BENCHING TO BE 20MPa MASS CONCRETE.

S31 APPROVED PRECAST PITS MAY BE USED.

S32 100mm DIAMETER HOLE FOR SUBSOIL DRAINAGE OUTLET TO BE LOCATED 100mm ABOVE INVERT OF ALL INLET PIPES. SUBSOIL DRAINAGE TO EXTEND FOR A DISTANCE OF 3m UPSTREAM OF PIT (AT EACH INLET TRENCH) WITH THE UPSTREAM END SEALED.

S33 ALL CONNECTIONS TO EXISTING DRAINAGE PITS SHALL BE MADE IN TRADESMAN-LIKE MANNER AND THE INTERNAL WALL OF THE PIT AT THE POINT OF ENTRY SHALL BE CEMENT RENDERED TO ENSURE A SMOOTH FINISH.

S34 PIT GRATE. FRAMES AND SOLID COVERS SHALL BE CLASS B IN NON TRAFFIC AREAS AND CLASS D IN TRAFFICABLE AREAS IN ACCORDANCE WITH AS3996.

S35 ALL GRATES SHALL BE PROVIDED WITH A LOCKING CLIP.

S36 MAXIMUM FRONT ENTRY PIPE,-
STRAIGHT ENTRY - 750 DIAMETER
SKEW ENTRY 45 DEGREES - 525 DIAMETER

S37 PIT GRATING TO BE GALVANISED STEEL TYPE "WELDLCK" OR APPROVED EQUIVALENT.

S38 SUBSOIL DRAINAGE
SUBSOIL PIPES SHALL BE LAID AT A MIN GRADE OF 0.5% (U.N.O.).

S39 ADDITIONAL SUBSOIL DRAINAGE SHALL BE LAID TO SUIT SITE CONDITIONS AND GROUNDWATER PRESENCE AS DIRECTED.

S40 SUBSOIL PIPES SHALL BE LAID BEHIND KERBS IN CUT AREAS OF THE SITE.

S41 SUBSOIL DRAINAGE SHALL CONSIST OF A SLOTTED 100mm DIAMETER PLASTIC PIPE WRAPPED IN GEOTEXTILE AND PLACED A MINIMUM OF 650mm BELOW THE FINISHED SURFACE LEVEL AND COVERED WITH 500mm OF 20mm GRAVEL. PROVIDE A MINIMUM OF 150mm GRAVEL AROUND SUBSOIL PIPE. TRENCH TO BE LINED WITH GEOTEXTILE FABRIC TYPE BIDIM A24

S42 GRATES TO PITS IN FOOTPATH AREAS SHALL BE HEEL SAFE COMPLYING WITH THE DISABLED ACCESS CODE

EROSION CONTROL

EC1 BEFORE EARTHWORKS CAN COMMENCE THE EROSION & SEDIMENT CONTROL MEASURES MUST BE IN PLACE.

EC2 DURING THE CONSTRUCTION PERIOD, THESE CONTROL MEASURES WILL NEED TO BE INSPECTED & MAINTAINED REGULARLY. ESPECIALLY AFTER STORM EVENTS. BY THE CONTRACTOR.

EC3 ALL WORK IS TO BE CARRIED OUT TO PREVENT EROSION. CONTAMINATION & SEDIMENTATION OF THE STORAGE SITE, SURROUNDING AREAS & DRAINAGE SYSTEMS.

EC4 MINIMIZE DISTURBED AREA COVERED WITH NATURAL VEGETATION. ONLY THOSE AREAS DIRECTLY REQUIRED FOR CONSTRUCTION ARE TO BE DISTURBED.

EC5 INSTALL EROSION/SEDIMENT CONTROL MEASURES PRIOR TO COMMENCEMENT OF CONSTRUCTION OR EXCAVATION OPERATIONS.

EC6 PROVIDE SILT FENCE/STRAW BAIL BARRIERS TO THE LOW SIDE OF ALL EXPOSED EARTH EXCAVATIONS. 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.

EC7 ISOLATE EXISTING STORMWATER PITS WITH STRAW BALES OR SILT TRAPS TO FILTER ALL INCOMING FLOWS.

EC8 DO NOT STOCKPILE EXCAVATED MATERIAL ON THE ROAD WAY.
EC9 DIVERT CLEAN WATER FROM UNDISTURBED AREAS AROUND THE WORKING AREAS.

EC10 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 AND LEAVING THE SITE DO SO IN A FORWARD DIRECTION.

EC11 TREAT THE STORMWATER RUNOFF WITH SUSPENDED SOLIDS SO THE DISCHARGE WATER QUALITY TO COUNCIL STORMWATER DRAINAGE SYSTEM HAS A MAXIMUM CONCENTRATION OF SUSPENDED SOLIDS THAT DOES NOT EXCEED 50 MILLIGRAMS PER LITTER IN ACCORDANCE WITH THE PROTECTION OF THE ENVIRONMENT OPERATION ACT (POED 1997) AND SHALL BE APPROVED BY LOCAL COUNCIL

EC12 ADOPT TEMPORARY MEASURES AS MAY BE NECESSARY FOR EROSION AND SEDIMENT CONTROL, INCLUDING BUT NOT LIMITED TO THE FOLLOWING;-
- DRAINS: TEMPORARY DRAINS AND CATCH DRAINS
- SPREADER BANKS OR OTHER STRUCTURES: TO DISPERSE CONCENTRATED RUNOFF
- SILT TRAPS: CONSTRUCTION AND MAINTENANCE OF SILT TRAPS TO PREVENT DISCHARGE OF SCOURED MATERIAL TO DOWNSTREAM AREAS.

EC13 AFTER RAIN, INSPECT, CLEAN AND REPAIR IF REQUIRED TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES.

EC14 REMOVE TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES WHEN THEY ARE NO LONGER REQUIRED.

EC15 COMPLY WITH THE REQUIREMENTS OF LANDCOM'S MANAGEMENT URBAN STORMWATER
- SOIL AND CONSTRUCTION ' THE BLUE BOOK' LATEST EDITION

EC16 THE EROSION AND SEDIMENT CONTROL PLAN PROVIDES IS ONLY INDICATIVE. THE CONTRACTOR SHOULD PREPARE A DETAILED ESCP SUITABLE FOR THE SPECIFIC SITE CONDITIONS.

DRAWING SCHEDULE				
1	GENERAL NOTES			
2	STORMWATER PLAN			
3	STORMWATER DETAILS			
4	RWT/OSD DETAILS			

No.	DESCRIPTION	APPROVED & DATE
B	SECOND ISSUE	HN 30/03/21
A	FIRST ISSUE	HN 22/03/21

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P 9635 9890

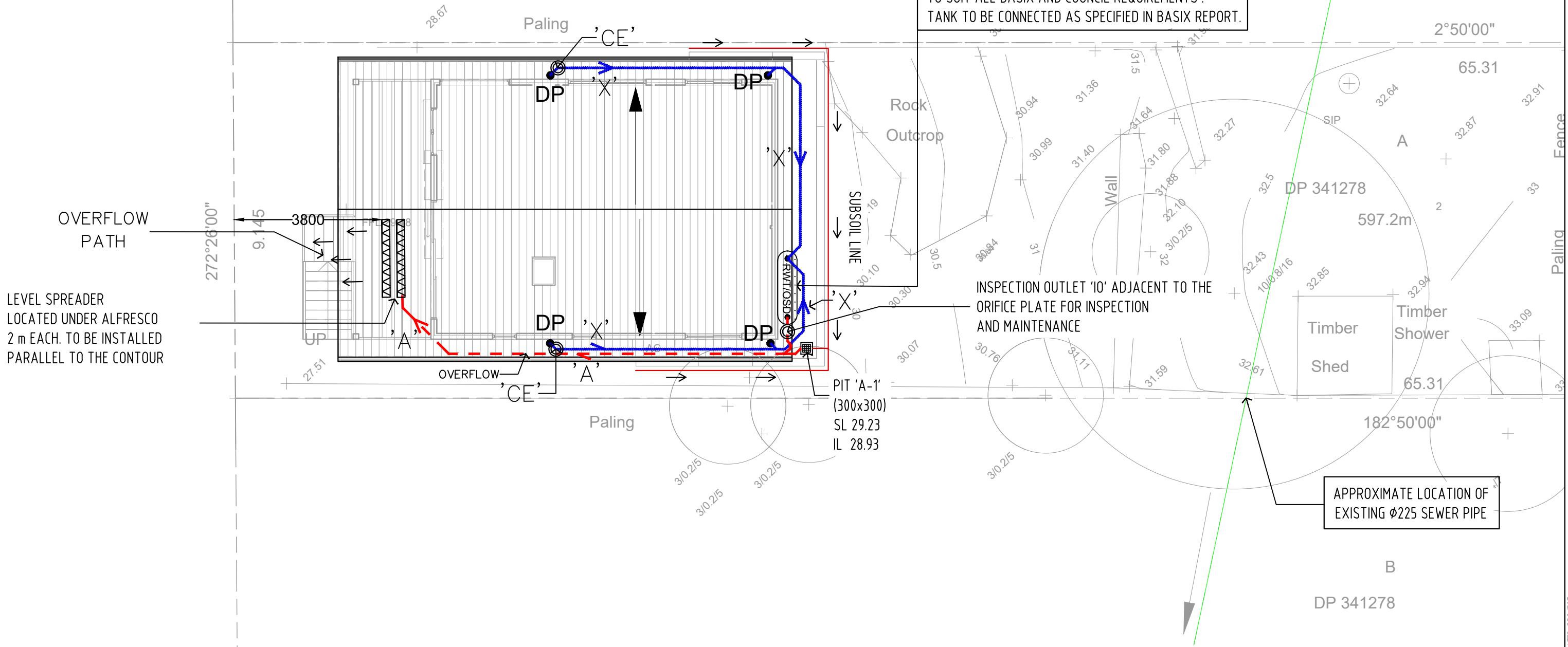
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PROJECT LOCATION		90 LAWRENCE ST, FRESHWATER NORTHERN BEACHES COUNCIL			
STATUS	FOR-DA	GENERAL NOTES			
CHECKED	HN				
DESIGNED	SU				
DATE OF ISSUE	30/03/2021				
		JOB NUMBER	REVISION	SIZE	SHEET
		035-W21	B	A3	1



PROVIDE A MINIMUM OF 3000 L RWT/OSD
(1000L FOR RWT + 2000L FOR OSD)
ESS3000 - ENVIRO SUPER SLIM 3,000 LITERS
H:1.99m
W:0.64m
L: 2.94m
TO SUIT ALL BASIX AND COUNCIL REQUIREMENTS.
TANK TO BE CONNECTED AS SPECIFIED IN BASIX REPORT.



LEVEL SPREADER
LOCATED UNDER ALFRESCO
2 m EACH. TO BE INSTALLED
PARALLEL TO THE CONTOUR

PIPE SCHEDULE				
TAG	SIZE	MATERIAL	GRADE	TYPE
'A'	100 Ø	P.V.C	1% MIN	GRAVITY
'B'	150 Ø	P.V.C	1% MIN	GRAVITY
'X'	100 Ø	P.V.C	CHARGED	TO RWT/PIT
'D'	200 X 100	GAL STEEL	1% MIN	TO KERB

STORMWATER LAYOUT PLAN

SCALE 1:100
DO NOT SCALE DRAWING

LEGEND			
P1	PIT LABEL	*15.00	EXISTING LEVEL
	SURFACE PIT	+R.L 15.00	PROPOSED LEVEL
	300SQ/300 DIA FLOOR GULLY	● DP	DOWNPIPE
	100/150 DIA GARDEN GULLY	● RWH	RAINWATER HEAD WITH DP
	CHARGED LINE PIPE		SPREADER
	GRAVITY PIPE		CLEANING EYE
S.L	SURFACE LEVEL		SEDIMENT FENCE
I.L	INVERT LEVEL		AG LINE
F.L.L	FINISHED FLOOR LEVEL		OVERLAND FLOW
G.F.L	GARAGE FLOOR LEVEL		

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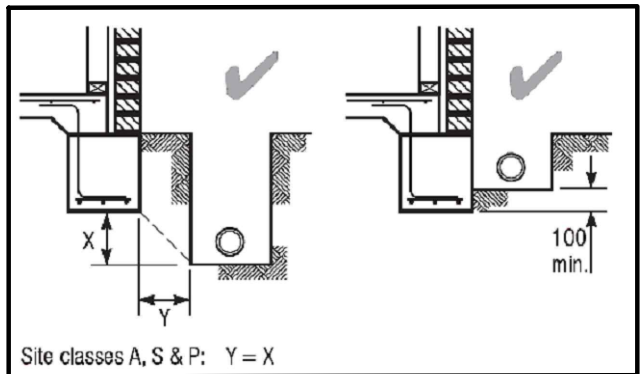
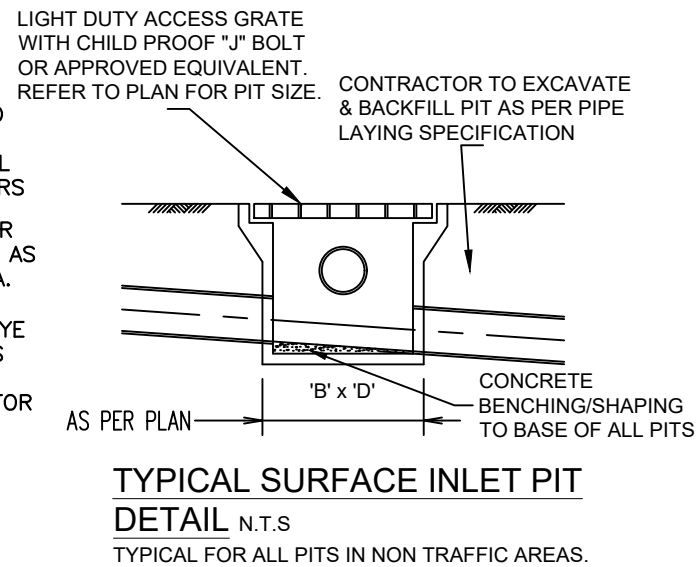
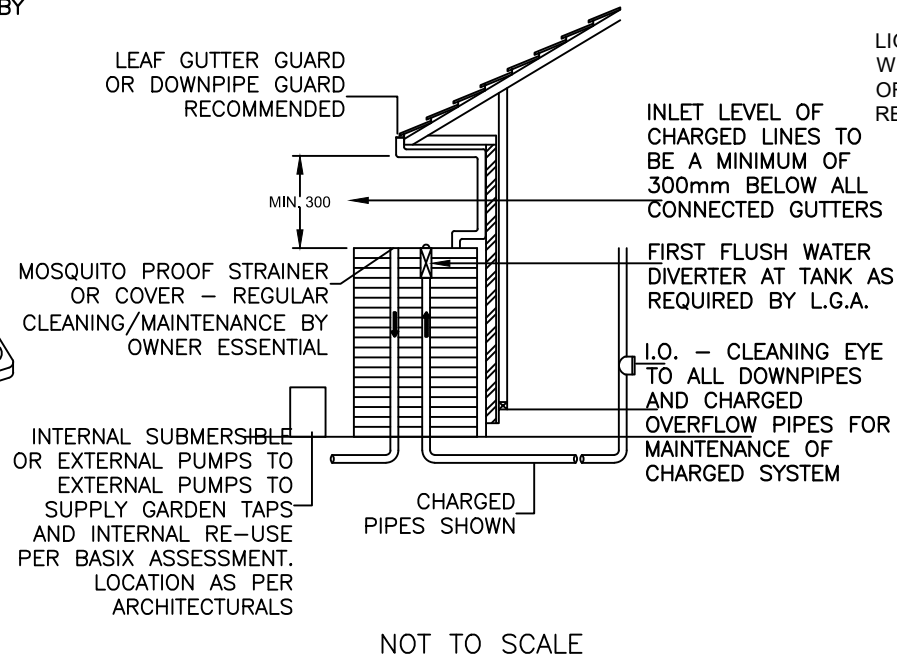
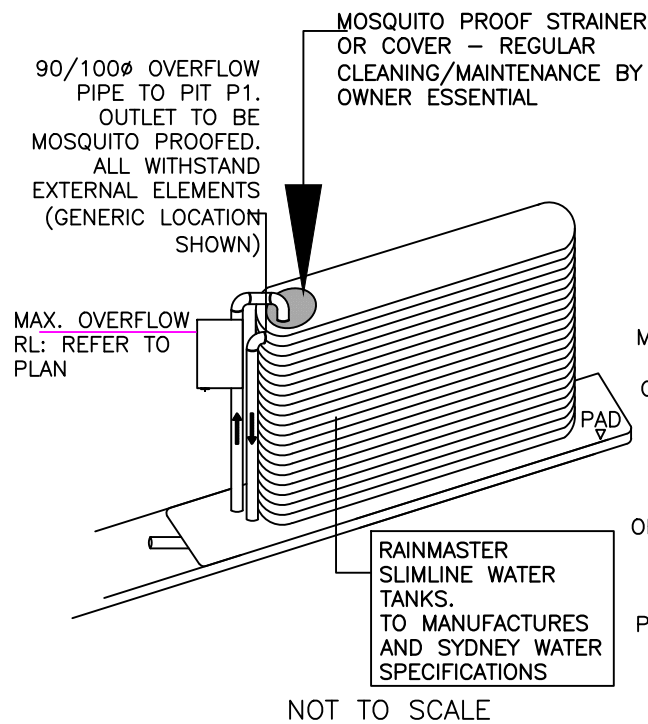
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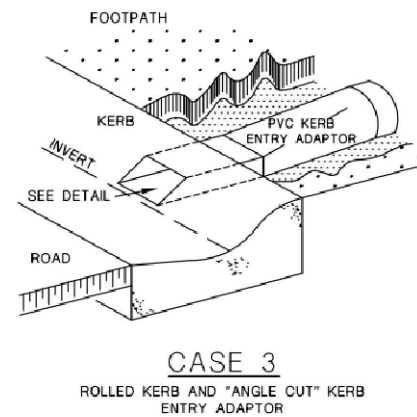
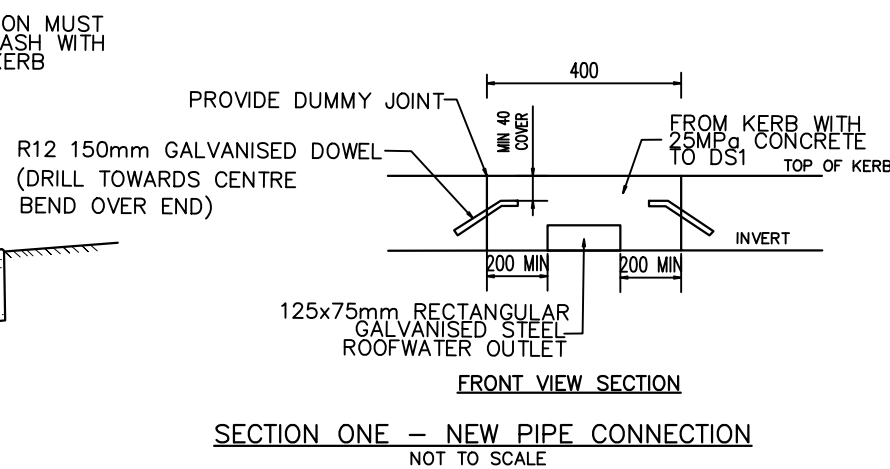
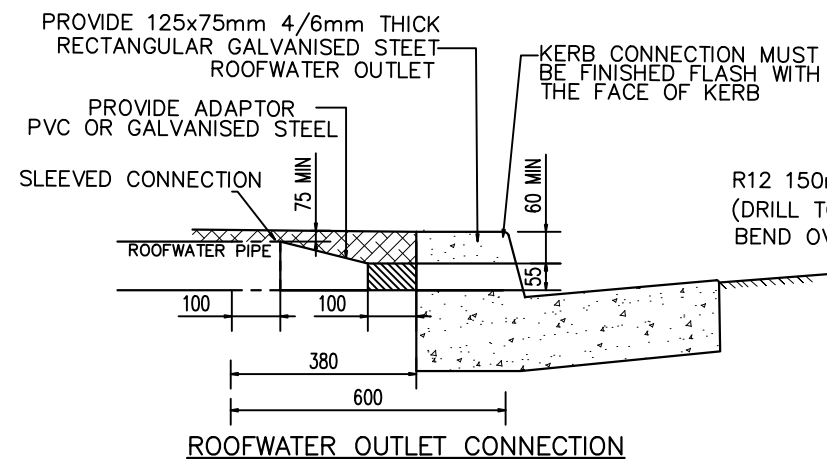
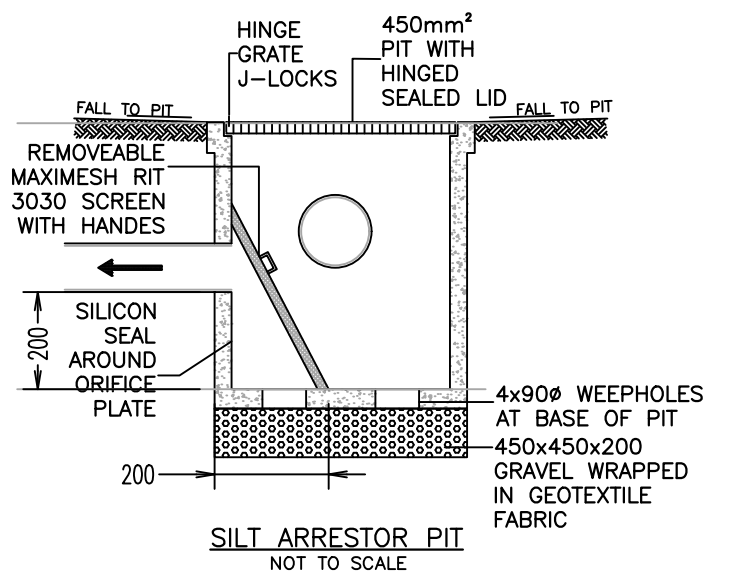
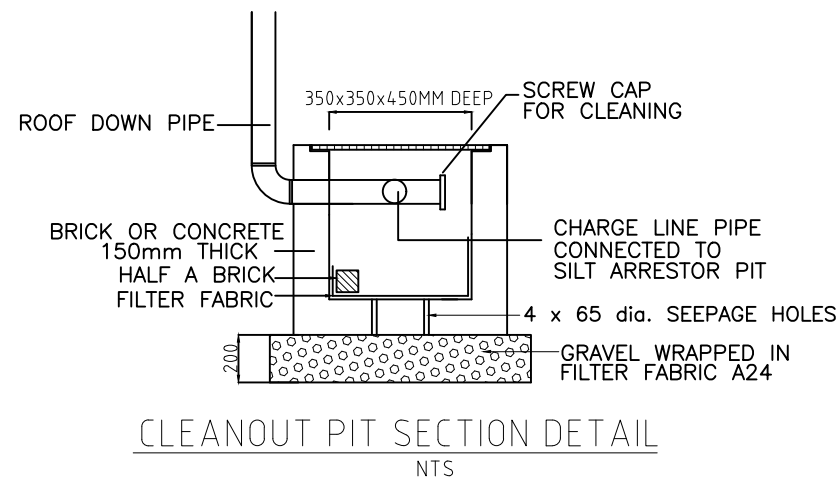
THE DRAWING IS CONFIDENTIAL AND SHALL ONLY BE USED FOR THE PURPOSE OF THE NOMINATED PROJECT



RAINWATER RECYCLING TANKS

- TANK SHAPE AND DEVICES ARE DIGRAMATIC ONLY
- ANY MODIFICATIONS TO TANK VOLUME, INLET, OUTLET, OR OTHER DETAILS MUST BE APPROVED BY ENGINEER
- STORMWATER LINES FROM DOWNPIPES FROM ROOF AREAS ONLY TO RAINWATER TANKS
- TANK TO COMPLY WITH AS1546.1, AND INSTALLED IN ACCORDANCE WITH MANUFACTURES INSTALLATION
- FIRST FLUSH WATER DIVERTER TO COMPLY WITH SYDNEY WATER & COUNCIL DCP'S. AN APPROVED SWITCH SYSTEM SIMILAR TO "RAINBANK" TO BE USED VIA MAINS. PUMPS TO MANUFACTURES SPECIFICATIONS
- ALL JOINTS TO BE SOLVANT WELDED
- ALL EXPOSED PIPEWORK TO BE PAINTED TO WITHSTAND EXTERNAL ELEMENTS
- CLIENT TO BE RESPONSIBLE FOR MAINTENANCE SYSTEM OF CHARGED PIPELINES
- STRUCTURAL DETAILS FOR TANKS BASE BY QUALIFIED STRUCTURAL ENGINEER, AS REQUIRED BY MANUFACTURER

ENSURE ALL DRAINAGE WORKS ARE AWAY FROM TREE ROOTS



NOTES FOR KERB CONNECTION

1. ENSURE THAT ALL CONNECTIONS ARE WATER TIGHT.
2. FOR TRAFFICABLE AREA SUCH AS DRIVERWAYS, USE RECTANGULAR GALVANISED STEEL ROOFWATER OUTLET FOR FULL LENGTH, EG. BOUNDARY TO KERB.
3. ALL DEMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SHOWN.

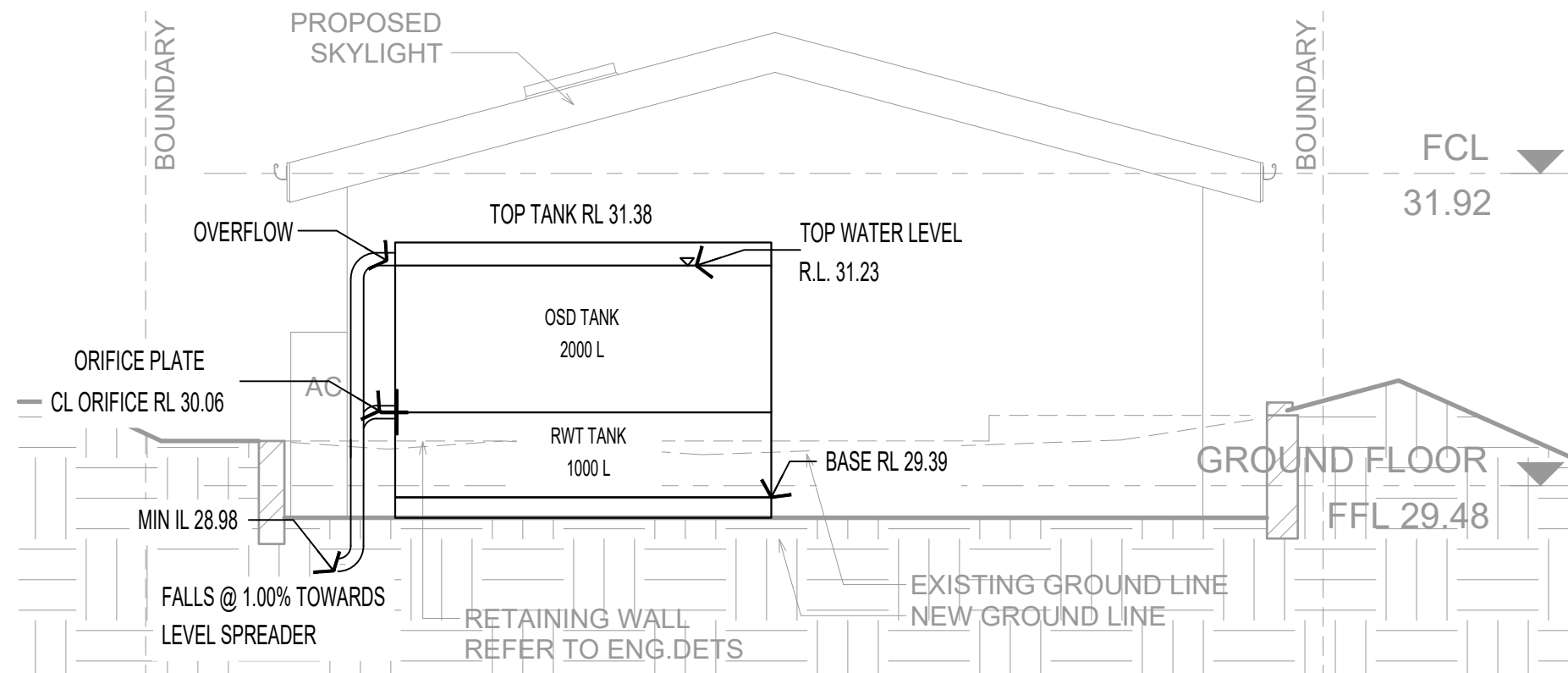
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CHECKED	HN				
DESIGNED	SU	JOB NUMBER	REVISION	SIZE	SHEET
DATE OF ISSUE	30/03/2021	035-W21	B	A3	3



OSD / RAIN WATER TANK DETAILS

N.T.S

OSD STORAGE

ADDITIONAL HARD (IMPERVIOUS) SURFACE AREA = 88m^2

$I = 264\text{mm/h}$ (5 MIN, 100 YEARS)

$Q = C I A$

$Q = 1 ((0.264)/3600) (88)$

$Q = 6.453 \text{ L/s}$

MINIMUM CAPACITY (OSD)

$V = Q \times T$

$= 6.453 \times 5 \times 60$

$= 1935.9 \text{ L}$

PROVIDE 2000L OF OSD TANK
THEREFORE, VOLUME IS SATISFACTORY.

OSD ORIFICE SIZE

$h = 1.170\text{m}$

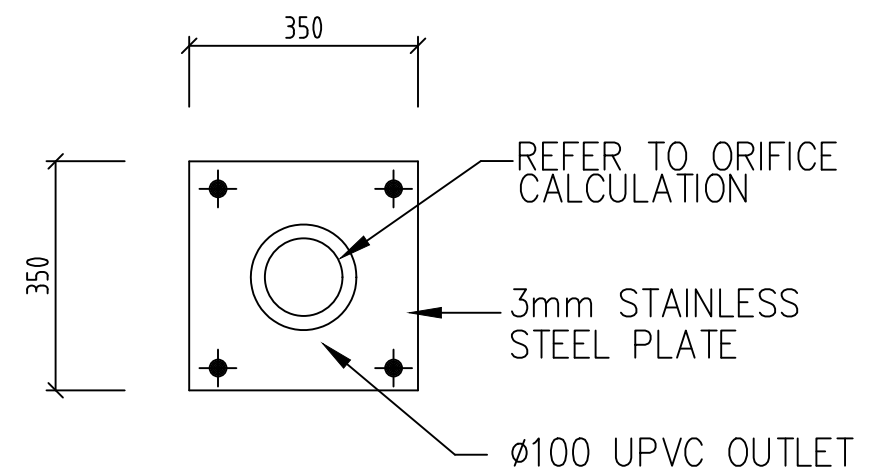
$I = 151 \text{ mm/h}$ (5 MIN, 5 YEARS)

$PSD = C I A$

$= 1 ((151)/3600) (88)$

$= 3.69 \text{ L/s}$

THEREFORE,
PROVIDE A 36mm ORIFICE HOLE
(ONSITE STORMWATER DETENTION
SPESIFICATION, TABLE 3. ORIFICE SIZED
ACCORDING TO DEPTH OF PONDING AND
PSD)



TYPICAL ORIFICE PLATE ELEVATION

N.T.S

No.	DESCRIPTION	APPROVED & DATE
B	SECOND ISSUE	HN 30/03/21
A	FIRST ISSUE	HN 22/03/21

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PROJECT LOCATION	90 LAWRENCE ST, FRESHWATER NORTHERN BEACHES COUNCIL			
STATUS	FOR-DA	RWT/OSD DETAILS		
CHECKED	HN			
DESIGNED	SU	JOB NUMBER	REVISION	SIZE
DATE OF ISSUE	30/03/2021	035-W21	B	A3
				SHEET
				4