

STORMWATER SERVICES

3 HOLDSWORTH AVE, ST LEONARDS 2065

DRAWING SCHEDULE

DRG NO.	DRAWING TITLE	SCALE
S-001	COVER SHEET, LEGEND, NOTES & DRAWING INDEX	NTS
S-002	CATCHMENT PLAN	1:100
S-003	EROSION AND SEDIMENT CONTROL PLAN	1:100
S-101	BASEMENT 4 - STORMWATER MANAGEMENT PLAN	1:100
S-102	BASEMENT 3 - STORMWATER MANAGEMENT PLAN	1:100
S-103	BASEMENT 2 - STORMWATER MANAGEMENT PLAN	1:100
S-104	BASEMENT 1 - STORMWATER MANAGEMENT PLAN	1:100
S-105	LOWER GROUND FLOOR - STORMWATER MANAGEMENT PLAN	1:100
S-106	UPPER GROUND FLOOR - STORMWATER MANAGEMENT PLAN	1:100
S-107	UPPER GROUND FLOOR - STORMWATER MANAGEMENT PLAN	1:100
S-201	ON-SITE DETENTION DETAIL SHEET	AS SHOWN
S-202	MUSIC MODEL DETAIL SHEET	AS SHOWN

GENERAL NOTES

STANDARD COUNCIL DESIGNS
DESIGN AND CONSTRUCTION DETAILS NOT SHOWN ON THESE DRAWINGS ARE AVAILABLE FROM THE NORTH SYDNEY COUNCIL DCP AT:
<https://www.northsydney.nsw.gov.au/development-regulatory-documents-policies-plans/development-control-plan>

- OTHER NOTES RELATING TO CIVIL ENGINEERING FOR THIS PROJECT - SHOWN ON THIS SHEET INCLUDE
 - PRELIMINARIES
 - CIVIL WORKS - GENERAL
 - MINOR CONCRETE WORKS
 - STORMWATER DRAINAGE
 - UNBOUND PAVING MATERIALS
 - ASPHALT PAVING WORKS
- TRAFFIC MANAGEMENT SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE STATE ROAD AND TRAFFIC AUTHORITY AND LOCAL GOVERNMENT REQUIREMENTS

PRELIMINARIES

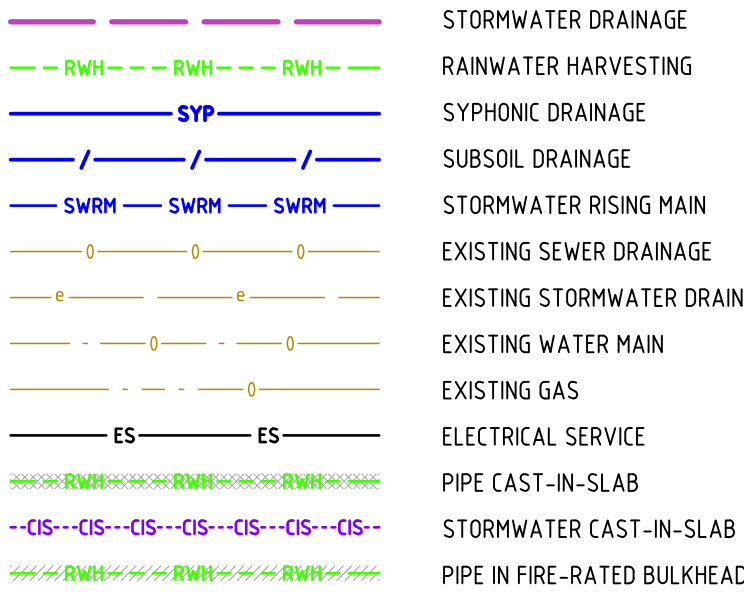
- THE CONTRACTOR SHALL ALLOW FOR PROVIDING MATERIALS AND WORK WHICH IS INCIDENTAL TO THE ITEMS SPECIFIED AND WHICH WOULD BE NECESSARY TO ACHIEVE THE RESULTS REQUIRED BY THE DRAWINGS.
- THE CONTRACTOR WILL BE DEEMED TO HAVE INSPECTED THE SITE OF THE WORKS, ASSESSED AVAILABLE ACCESS INQUIRED INTO THE LOCATION OF AUTHORITIES UNDERGROUND ASSETS, EXAMINED THE GEOTECHNICAL REPORT AND THE NATURE OF THE GROUND AND OBTAINED THE LOCAL CLIMATE AND RAINFALL INFORMATION.
- THE CONTRACTOR SHALL BE DEEMED TO HAVE ALLOWED IN HIS CONTRACT SUM FOR EXCAVATION IN ALL MATERIALS.
- SAFETY REQUIREMENTS THE CONTRACTOR SHALL ENSURE THAT ALL TIMES, THE MEANS AND METHODS OF CARRYING OUT THE WORK TO BE UNDERTAKEN CONFORM WITH THE STANDARDS AND REQUIREMENTS OF THE OCCUPATIONAL HEALTH AND SAFETY ACT APPLICABLE AT THE DATE OF EXECUTION OF THE WORK, AND ANY OTHER APPLICABLE LEGISLATION, CODES OF PRACTICE AND STANDARDS.
- ALL PERSONNEL WORKING ADJACENT TO A TRAFFICABLE ROAD OR FORMATION SHALL WEAR RED SAFETY VESTS.
- THE CONTRACTOR SHALL PROTECT THE PUBLIC FROM DANGERS INHERENT IN EXCAVATIONS, OBSTRUCTIONS, WORKING PLANT AND FALLING OBJECTS. SUCH MEASURES THAT ARE TAKEN SHALL BE ADEQUATE TO MAINTAIN THE SAFETY OF THE PUBLIC DURING PERIODS OUTSIDE NORMAL WORKING HOURS ON SITE.
- THE CONTRACTOR SHALL ENSURE THAT ALL TRENCH EXCAVATION FOR INSTALLATION OF PIPEWORKS (OR OTHER WORKS) OF DEPTHS GREATER THAN 15 METRES MUST BE CONTINUOUSLY SUPERVISED BY A MINE MANAGER AND AT ALL TIMES BE ADEQUATELY SUPPORTED.
- ALL WORK WITHIN ROAD RESERVES, PUBLIC PROPERTY OR PRIVATE PROPERTY - SHALL BE EXECUTED STRICTLY IN ACCORDANCE WITH THE REQUIREMENTS OF THE RELEVANT AUTHORITY OR LAND OWNER
- CONTRACTOR SHALL OBTAIN FROM THE RELEVANT AUTHORITIES, DETAILS OF ALL EXISTING SERVICES WITHIN THE VICINITY OF THE WORKS AND SHALL BE HELD SOLELY RESPONSIBLE FOR ANY DAMAGE CAUSED TO EXISTING SERVICES DURING THE EXECUTION OF THE WORKS.
- THE CONTRACTOR SHALL COMPLY WITH AND GIVE NOTICES REQUIRED BY ANY ACTS OF PARLIAMENT, ORDNANCE, REGULATION OR BY-LAW OF ANY AUTHORITY HAVING JURISDICTION OVER THE WORKS AND SHALL PAY ALL FEES OR CHARGES LEGALLY DEMANDED UNDER ANY SUCH ACT OF PARLIAMENT, ORDNANCE, REGULATION OR BY-LAW
- PRIOR TO WORKS, THE CONTRACTOR SHALL UNDERTAKE A DILAPIDATION SURVEY, TO REPORT EXISTING DEFECTS IN ROADS, FOOT PATHS, KERB CROSSINGS, CHANNELS, NATURE STRIPS, ETC. THE REPORT SHALL BE PREPARED IN DUPLICATE BY THE CONTRACTOR AND A COPY SENT TO THE SUPERINTENDENT

STORMWATER DRAINAGE

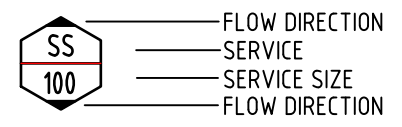
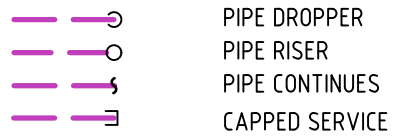
- ALL WORKMANSHIP AND MATERIALS SHALL COMPLY WITH THE CURRENT EDITIONS OF THE FOLLOWING AUSTRALIAN STANDARDS:
 - AS 1260 UNPLASTICISED PVC (UPVC) PIPES AND FITTINGS FOR SEWERAGE APPLICATIONS.
 - AS 1597 PRECAST REINFORCED CONCRETE BOX CULVERTS
 - PART 1 - SMALL CULVERTS (NOT EXCEEDING 1200mm WIDTH AND 900mm DEPTH).
 - AS 1631 CAST IRON NON-PRESSURE PIPES AND PIPE FITTINGS
 - AS 1650 GALVANISED COATINGS
 - AS1657 SAA CODE FOR FIXED PLATFORMS, WALKWAYS, STAIRWAYS AND LADDERS
 - AS2032 CODE OF PRACTICE FOR INSTALLATION OF UPVC PIPE SYSTEMS
 - AS 2439 PERFORATED PLASTICS DRAINAGE AND EFFLUENT PIPE FITTINGS
 - PART 1 - PERFORATED DRAINAGE PIPE AND ASSOCIATED FITTINGS
 - AS3500-3 NATIONAL PLUMBING AND DRAINAGE CODE, PART 3 STORMWATER DRAINAGE
 - AS 3725 LOADS, ON BURIED CONCRETE PIPES
 - AS 3994 METAL ACCESS COVERS, ROAD GRATES AND FRAMES
 - AS 4058 PRECAST CONCRETE PIPES (PRESSURE AND NON-PRESSURE)
 - AS 4139 FIBRE REINFORCED CONCRETE PIPES AND FITTINGS
- THE CONTRACTOR SHALL COMPLY WITH THE 'MINES (TRENCHES) REGULATIONS 1987 FOR ALL SHORING, SUPPORT OF TRENCHES, QUALIFICATIONS OF PERSONNEL AND NOTIFICATION TO THE RESPONSIBLE AUTHORITY.
- TRENCHES MUST BE KEPT CLEAR OF WATER AT ALL TIMES AND TIMBERED WHERE NECESSARY TO PREVENT COLLAPSE.
- SUITABLE SAFETY BARRIERS SHALL BE PROVIDED AROUND THE EXCAVATION AT ALL TIMES. THE BARRIERS SHALL BE SUITABLY DEFINED BY APPROVED LIGHTING DURING THE APPROPRIATE LIGHT UP TIME FOR THE AREA.
- PIPES SHALL BEAR EVENLY ON THE BED PREPARED AS SPECIFIED ABOVE AND LAID WITH THE SOCKETS POINTED UPGRADE. ALL PIPES SHALL BE LAID IN STRAIGHT LINES TO TRUE INVERT LEVELS AND GRADES AS SHOWN ON PLANS. EACH PIPE SHALL BE SEPARATELY BONED BETWEEN ACCURATELY ESTABLISHED GRADE POINTS. THE CONTRACTOR SHALL ADHERE TO THE DRAWINGS AND SHALL NOT BE PERMITTED TO VARY THE LINE, LEVELS OR LOCATION OF THE DRAIN WITHOUT THE SUPERINTENDENT'S WRITTEN APPROVAL.
- ALL PIPE JOINTING SHALL BE CARRIED OUT IN ACCORDANCE WITH THE MANUFACTURERS WRITTEN SPECIFICATIONS FOR THE TYPE OF PIPE BEING USED.
- WHERE ANY PIPE IS CUT INTO A LARGER PIPE, SUCH CONNECTION SHALL BE NEATLY MADE AND NO PART OF THE PIPE OR DOWNPIPE SHALL BE ALLOWED TO PROJECT. ANY CUT-IN JUNCTION SHALL BE MADE TO THE TOP HALF OF THE LARGER PIPE. SUCH JUNCTION TO CONCRETE PIPES SHALL BE SURROUNDED WITH A NEAT COLLAR OF CEMENT MORTAR AS DIRECTED OR AS DETAILED ON THE DRAWINGS. JUNCTIONS BETWEEN PVC PIPES SHALL USE PROPRIETY FITTINGS INTENDED FOR THE PURPOSE.
- THE ENDS OF PIPES WHICH CONNECT WITH SIDE ENTRY, JUNCTION OR OTHER PITS SHALL BE NEATLY CUT TO FIT THE INNER FACE OF THE CONCRETE. WHERE UPVC PIPES ENTER OR LEAVE PITS, RUBBER RING JOINT MANHOLE COUPLING SHALL BE CAST INTO THE PIT WALL. BEDDING, HAUNCH AND OVERLAY MATERIALS SHALL CONFORM TO THE DETAILS SHOWN ON THE DRAWINGS.
- ALL PITS AND END WALLS SHALL BE CONSTRUCTED IN THE POSITIONS AND TO THE LEVELS SHOWN ON THE DRAWINGS OR AS DIRECTED BY THE SUPERINTENDENT.
- PIT COVERS SHALL BE PLACED IN ACCORDANCE WITH THE DETAIL SITE PLANS AND PIT SCHEDULE (IF PROVIDED) IN REGARD TO TYPE, SIZE, LOCATION AND LEVEL. THE BASE OF EACH PIT SHALL BE INFILLED AND SHAPED WITH CONCRETE OR CEMENT MORTAR TO PROVIDE A SMOOTH FLOW PATH.
- ALL DOWNPIPES SHALL BE CONNECTED TO AT THE END OF A PIPE OR ELBOW AND WHICH THEY SHALL ENTER CENTRALLY. WHERE PVC DOWNPIPES AND UNDERGROUND DRAINAGE ARE USED, THE DOWNPIPES SHALL BE CONNECTED TO THE UNDERGROUND DRAINS WITH SUITABLE STANDARD FITTINGS, BENDS ETC AND WITH SOLVENT JOINTS. THE CONTRACTOR SHALL LAY AND GRADE DRAINS FROM DOWNPIPES TO COMPLY WITH THE REQUIREMENTS FOR PIPE MATERIAL AND COVER REQUIRED BY AS 3500.3. WHERE THE REQUIREMENTS OF AS 3500.3 CANNOT BE MET THE CONTRACTOR SHALL REFER THE MATTER TO THE SUPERINTENDENT
- SUPPLY APPARATUS AND MATERIALS NECESSARY FOR, AND CARRY OUT THE TESTS REQUIRED BY THE SPECIFICATION OR REGULATORY AUTHORITIES, IN THE PRESENCE OF THE SUPERINTENDENT AND THE RELEVANT AUTHORITY. LEAVE PIPE JOINTS EXPOSED TO ENABLE OBSERVATION DURING THE TESTS. ENSURE PVC SOLVENT CEMENT JOINTS HAVE BEEN CURED FOR AT LEAST 24 HOURS BEFORE TESTING.
- THE CONTRACTOR SHALL PRESSURE TEST WITH WATER, ALL STORMWATER PIPEWORK UNDER THE STRUCTURE, IN ACCORDANCE WITH AS 3500.3.

LEGEND

PIPE SERVICES



SYMBOLS



ABBREVIATIONS, SYMBOLS AND LINETYPES IN THE LEGEND MAY NOT APPEAR ELSEWHERE ON THE DRAWINGS. THIS LEGEND SHOULD BE USED AS A GUIDE ONLY

MINOR CONCRETE WORKS

- ALL WORKMANSHIP AND CONCRETE MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE FOLLOWING AUSTRALIAN STANDARDS AS APPLICABLE:
 - AS 1012 METHODS OF TESTING CONCRETE
 - AS 2758.1 DENSE NATURAL AGGREGATES
 - AS 147K CHEMICAL ADMIXTURES FOR USE IN CONCRETE
 - AS1379 READY MIXED CONCRETE
 - AS3972 PORTLAND AND BLENDED CEMENTS
 - AS 1302 STEEL REINFORCING BARS FOR CONCRETE
 - AS 1301 HARD DRAWN STEEL REINFORCING WIRE FOR CONCRETE
 - AS 1304 HARD DRAWN STEEL WIRE REINFORCING FABRIC FOR CONCRETE
- THE WATER USED SHALL BE FREE OF ALL SUBSTANCES HARMFUL TO CONCRETE AND ITS REINFORCEMENT. ADMIXTURES SHALL NOT BE USED WITHOUT WRITTEN PERMISSION FROM THE SUPERINTENDENT. ALL CONCRETE SHALL BE READY MIXED CONCRETE.
- UNLESS OTHERWISE SPECIFIED, SHOWN ON THE DRAWINGS, OR DIRECTED BY THE SUPERINTENDENT, REINFORCEMENT FOR CONCRETE SHALL BE FREE FROM ANY COATING WHICH WILL REDUCE, OR PREVENT BONDING OF THE CONCRETE TO THE STEEL.
- UNLESS NOTED OTHERWISE, ALL CONCRETE SHALL BE GRADE 25 WITH A MAXIMUM 80mm SLUMP UNLESS NOTED OTHERWISE ON THE DRAWINGS.
- TWO 12mm DIAMETER DIAGONAL CORNER BARS 1200 LONG ARE REQUIRED AT ALL RE-ENTRANT CORNERS OF OPENINGS IN PAVEMENT SLABS AND FOOTPATHS.
- UNLESS OTHERWISE SHOWN ON THE DRAWINGS, THE MINIMUM CLEAR COVER TO REINFORCEMENT SHALL BE 2 TIMES THE DIAMETER OF THE BARS OR 40mm, WHICHEVER IS GREATER.
- ALL KERBS, KERB & GUTTER, SPOON DRAINS ETC. SHALL BE LAID OVER 100mm MINIMUM DEPTH OF COMPACTED CLASS 2 CRUSHED ROCK, UNLESS SHOWN OTHERWISE ON THE DETAIL DRAWINGS
- JOINTS - GENERAL. THE JOINTS IN THE NEW WORK SHALL COINCIDE WITH THOSE IN ABUTTING CONCRETE PAVING, OR OTHER JOINTED WORK, WHICH IS EITHER EXISTING OR PROPOSED. IF THE SPACING OF THE JOINTS IN EXISTING OR PROPOSED WORK IS VERY MUCH GREATER THAN THAT SPECIFIED FOR THE NEW WORK THEN ONE OR MORE EQUALLY SPACED JOINTS SHALL BE MADE IN THE NEW WORK BETWEEN EXISTING OR PROPOSED JOINTS SUCH THAT THE SPECIFIED SPACING WILL BE RETAINED AS NEARLY AS POSSIBLE.
- EDGINGS: JOINTS SHALL BE CONSTRUCTED AT REGULAR INTERVALS NOT EXCEEDING 3 METRES, WHEN USING AN EXTRUSION MACHINE. THE JOINTS SHALL BE MADE BY A METHOD APPROVED BY THE SUPERINTENDENT. WHEN USING FORMWORK, THEY SHALL CONSIST OF 3mm THICK STEEL PLATE PROFILED TO MATCH THE ITEM BEING CONSTRUCTED AND SHALL HAVE AN AREA NOT LESS THAN 75% OF THE SECTION BEING CONSTRUCTED, AS SOON AS IT IS PRACTICABLE AFTER THE FINISHING OF ANY WORK, THE TEMPLATES SHALL BE REMOVED AND THE RESULTANT GAP FINISHED WITH A GROOVING TOOL TO A DEPTH OF NOT LESS THAN 25MM TO PRODUCE A NEAT GROOVE WITH ROUNDED ARISING. JOINTS SHALL BE AT REGULAR INTERVALS AND THE SPACING BETWEEN JOINTS SHALL NOT EXCEED 3 METRES WITHOUT THE APPROVAL OF THE SUPERINTENDENT.
- PROVIDE EXPANSION JOINTS AT 30 METRE MAXIMUM CENTRES AND OR COINCIDE WITH THE JOINT SPACING IN THE ADJACENT ROWS OR FOOTPATHS. EXPANSION JOINTS SHALL ALSO BE PLACED AT EACH TANGENT POINT (START AND END OF HORIZONTAL CURVES) AND EACH SIDE OF LAYBACKS OR THE LIKE. THE EXPANSION JOINTS SHALL CONSIST OF 15MM THICK PREFORMED CORK TO THE FULL SHAPE OF THE ABUTTING KERB OR KERB AND GUTTER.
- NO EXPANSION OR OTHER CONSTRUCTION JOINT SHALL BE MADE WITHIN A DISTANCE OF 3 METRES OF ANY RETURN IN THE KERBS OR FINISHING POINT OF THE CHANNEL.
- FOOTPATHS AND SURFACING - EXPANSION JOINTS SHALL BE PLACED AT INTERVALS NOT EXCEEDING 15m, ON EITHER SIDE OF VEHICLE CROSSINGS, AND AT JUNCTIONS WITH BRIDGES.
- EXPANSION JOINTS SHALL BE 15mm WIDE AND FILLED WITH AN APPROVED CORK FILLER EXTENDING FOR THE FULL WIDTH AND FULL DEPTH OF THE PAVING. THE FILLER SHALL BE PLACED IN POSITION BEFORE CONCRETE IS LAY, AND SHALL BE HELD FIRMLY IN POSITION DURING THE PLACING OF THE CONCRETE. WHERE POSSIBLE IT SHALL BE GLUED WITH AN APPROVED WATERPROOF GLUE TO THE EXISTING FACE OF THE JOINT. DUMMY JOINTS AT LEAST 20mm DEEP AND 5mm WIDE SHALL BE FORMED WITH A CUTTING TOOL AT 2m INTERVALS OR AS AND WHERE DIRECTED BY THE SUPERINTENDENT.
- CONCRETE CONCRETE SHALL NOT BE PLACED UNTIL THE SUPERINTENDENT HAS INSPECTED BOTH FORMWORK AND REINFORCEMENT IN PLACE AND GIVEN HIS CONSENT TO PROCEED. 48 HOURS NOTICE SHALL BE GIVEN TO THE SUPERINTENDENT BEFORE PLACEMENT OF ANY CONCRETE HAS COMMENCED. CONCRETE SHALL NOT BE PLACED UNDER WATER OR DROPPED THROUGH A DISTANCE GREATER THAN 1.5M WITHOUT THE CONSENT OF THE SUPERINTENDENT.
- DURING AND IMMEDIATELY AFTER THE PLACING OPERATION CONCRETE SHALL BE THOROUGHLY COMPACTED BY TAMPING, VIBRATION OR OTHER MEANS APPROVED BY THE SUPERINTENDENT.
- THE CONCRETE SHALL BE SPRAYED WITH AN APPROVED CURING MEMBRANE SUCH AS CONCRETE WB IN STRICT ACCORDANCE WITH THE MANUFACTURERS SPECIFICATION.
- EXPOSED SURFACES. ALL EDGINGS SHALL BE RENDERED AND HAVE A STEEL TROWEL FINISH.
- FRESH FOOTPATH AND SURFACING CONCRETE SHALL BE COMPACTED AND WORKED UNTIL ALL THE COARSE AGGREGATE IS BELOW THE SURFACE THE MORTAR COMES TO THE TOP. IT SHALL THEN BE STRUCK OFF AND FINISHED WITH A WOODEN FLOAT.
- AS SOON AS THE CONCRETE HAS SET SUFFICIENTLY, SUITABLE FILLING SHALL BE PLACED AND THOROUGHLY COMPACTED BEHIND AND UP TO THE LEVEL OF THE TOP OF THE KERB.

UNBOUND PAVING MATERIALS (BASE AND SUB-BASE - CRUSHED ROCK)

- ALL WORKMANSHIP AND MATERIALS SHALL COMPLY WITH THE CURRENT EDITIONS OF THE FOLLOWING RTA AND AUSTRALIAN STANDARDS.
 - AUSTRALIAN STANDARDS
 - AS 1141 METHODS OF SAMPLING AND TESTING AGGREGATES
 - AS 1289 TESTING OF SOILS FOR ENGINEERING PURPOSES
 - RTA
 - GA SPECIFICATIONS R71-R84
 - GA SPECIFICATIONS 3051-3151
- THE SOURCE QUARRY SHALL BE AN APPROVED SUPPLIER TO THE RTA. THE CRUSHED ROCK SHALL COMPLY WITH THE RELEVANT RTA SPECIFICATIONS. THE RTA PROVISIONS FOR SOUNDNESS AND ABRASION REQUIREMENTS SHALL APPLY. THE GRADING OF THE CRUSHED ROCK BY MASS SHALL COMPLY WITH THE RELEVANT RTA SPECIFICATION.
- WHERE IT IS SPECIFIED THAT WATER SHALL BE ADDED TO THE CRUSHED ROCK PRIOR TO DELIVERY, SUCH WATER SHALL BE CLEAR AND SUBSTANTIALLY FREE FROM DETRIMENTAL IMPURITIES SUCH AS SOILS, SALTS, ACIDS, ALKALIS AND VEGETABLE SUBSTANCES.
- WHERE SPECIFIED CEMENT SHALL COMPLY WITH THE REQUIREMENTS OF EITHER AUSTRALIAN STANDARD SPECIFICATION AS1315-PORTLAND CEMENT OR AS1317-BLENDED CEMENT.
- THE SUBGRADE, OR PREVIOUS PAVEMENT COURSE, SHALL HAVE BEEN TESTED AND ACCEPTANCE CRITERIA MET BEFORE THE PLACING OF THE NEXT COURSE WILL BE PERMITTED. CRUSHED ROCK MATERIAL SHALL NOT BE PLACED ON A WATERLOGGED SUBGRADE OR LOWER COURSE.

CIVIL WORKS - GENERAL

- THE CONTRACTOR SHALL LIAISE DIRECTLY WITH ALL SERVICE AUTHORITIES INVOLVED AND SHALL COMPLY WITH ALL THEIR REGULATIONS AND REQUIREMENTS.
- ALL LEVELS SHOWN ARE TO AUSTRALIAN HEIGHT DATUM, UNLESS STATED OTHERWISE. ALL COORDINATES SHOWN ARE TO AUSTRALIAN MAP GRID, UNLESS STATED OTHERWISE.
- SERVICE INFORMATION SHOWN IS BASED ON PLANS SUPPLIED AND IS APPROXIMATE ONLY. ACTUAL LOCATION CAN ONLY BE DETERMINED BY EXCAVATION. THE CONTRACTOR SHALL LIAISE WITH SERVICE AUTHORITIES FOR SERVICE LOCATIONS. THE CONTRACTOR SHALL PROTECT ALL SERVICES AND SHALL RECTIFY ANY DAMAGE AT HIS EXPENSE.
- ALL WORKS IN PUBLIC LANDS SHALL BE TO THE APPROVAL AND SATISFACTION OF THE RELEVANT AUTHORITY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND OBTAINING RELEVANT AUTHORITY WRITTEN APPROVAL OF THE WORKS.
- EXISTING SURFACE CONTOURS SHOWN ARE INTERPOLATED FROM SPOT HEIGHTS AND ARE APPROXIMATE ONLY.
- UNLESS OTHERWISE NOTED ALL VEGETATION SHALL BE STRIPPED TO A MINIMUM DEPTH OF 150mm UNDER ALL PAVEMENT AND BUILDING AREAS.
- PRIOR TO PLACEMENT OF ANY FILLS, PAVEMENT OR BUILDINGS, THE EXPOSED SUB-GRADE SHALL BE COMPACTED TO THE SPECIFIED STANDARD MAXIMUM DRY DENSITY FOR THE DEPTH SPECIFIED, ANY SOFT SPOTS SHALL BE REMOVED AND REPLACED WITH APPROVED FILL AND COMPACTED AS SPECIFIED. SUB-GRADE SHALL BE PROOF ROLLED, AS SPECIFIED.
- ALL FILL REQUIRED SHALL BE APPROVED FILL MATERIAL AND SHALL BE COMPACTED IN 150MM MAXIMUM COMPACTED THICKNESS LAYERS TO THE DENSITIES SPECIFIED, UNLESS SHOWN OTHERWISE ON THE DRAWINGS.
- THE CONTRACTOR SHALL KEEP THE SITE WELL DRAINED AND COMPLETELY FREE OF STANDING WATER AT ALL TIMES.
- GRADE EVENING BETWEEN FINISHED SURFACE SPOT LEVELS (FINISHED SURFACE CONTOURS ARE SHOWN FOR CLARITY ONLY.) WHERE FINISHED SURFACE SPOT LEVELS ARE NOT SHOWN THE SURFACE SHALL BE GRADED SMOOTHLY SO THAT IT WILL DRAIN FREELY, AND TO MATCH THE LEVELS OF ADJACENT SURFACES OR STRUCTURES.
- ALL CONCRETE STORMWATER PIPES SHALL BE CLASS 4 (UNO) WITH RUBBER RING JOINTS IN ACCORDANCE WITH AS 4058 OR AS 4139 AND ALL PVC STORMWATER PIPES SHALL BE SEWER GRADE IN ACCORDANCE WITH AS 1260.
- ALL DIMENSIONS AND SET OUTS SHOWN ARE EITHER TO FACE OF BUILDING, GRID LINES OR FACE OF KERB INVERT (LINE OF KERB) UNLESS SHOWN OTHERWISE.
- ALL SURFACE DAMAGED DUE TO CONSTRUCTION WORK SHALL BE REINSTATED TO THE SATISFACTION OF THE SUPERINTENDENT.
- SAW CUT EXISTING KERB OR KERB & GUTTER AND PAVING WHERE NEW WORKS ARE TO MATCH EXISTING WORKS.
- A DETAIL LEVEL AND FEATURE SURVEY HAS BEEN UNDERTAKEN FOR THIS SITE.

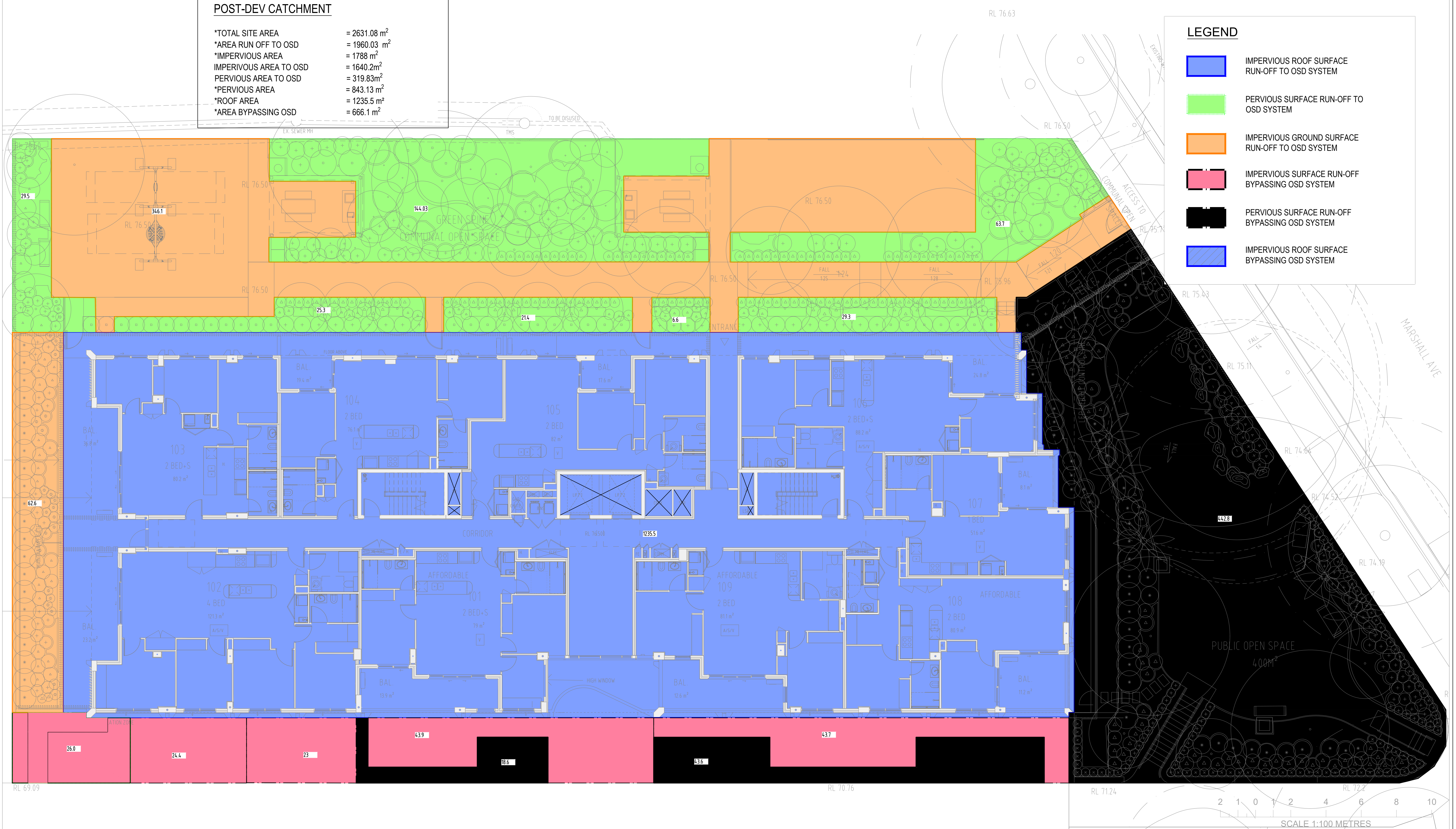
REV	DESCRIPTION	DATE	REV	DESCRIPTION	DATE	Client	Architect	Hydraulic Consultant	Project	Drawing Title	Scale:	Drawn:
01	DA APPLICATION	12.11.24				NEW GOLDEN ST LEONARDS PTY LTD	PTW ARCHITECTS	TDL ENGINEERING CONSULTING PTY LTD	3 HOLDSWORTH AVENUE, ST LEONARDS 2065	STORMWATER SERVICES COVER SHEET, LEGEND, NOTES & DRAWING INDEX	NTS	YS
											Project No:	JL
											Drg No:	TL
											NOT FOR CONSTRUCTION	P1

POST-DEV CATCHMENT

*TOTAL SITE AREA	= 2631.08 m ²
*AREA RUN OFF TO OSD	= 1960.03 m ²
*IMPERVIOUS AREA	= 1788 m ²
IMPERVIOUS AREA TO OSD	= 1640.2m ²
PERVIOUS AREA TO OSD	= 319.83m ²
*PERVIOUS AREA	= 843.13 m ²
*ROOF AREA	= 1235.5 m ²
*AREA BYPASSING OSD	= 666.1 m ²

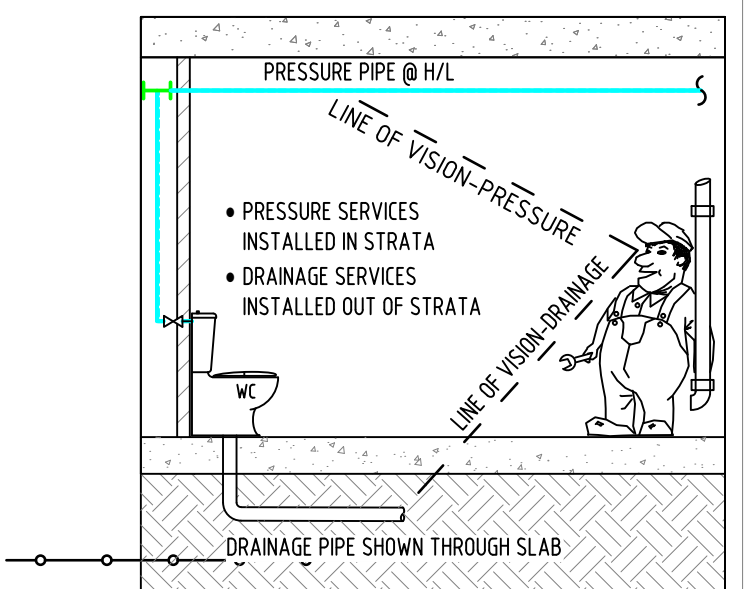
LEGEND

- IMPERVIOUS ROOF SURFACE RUN-OFF TO OSD SYSTEM
- PERVIOUS SURFACE RUN-OFF TO OSD SYSTEM
- IMPERVIOUS GROUND SURFACE RUN-OFF TO OSD SYSTEM
- IMPERVIOUS SURFACE RUN-OFF BYPASSING OSD SYSTEM
- PERVIOUS SURFACE RUN-OFF BYPASSING OSD SYSTEM
- IMPERVIOUS ROOF SURFACE BYPASSING OSD SYSTEM



REV	DESCRIPTION	DATE	REV	DESCRIPTION	DATE	Client	Architect	Hydraulic Consultant	Project	Drawing Title	Scale:	1:100	Drawn:	YS
01	DA APPLICATION	12.11.24				NEW GOLDEN ST LEONARDS PTY LTD	PTW ARCHITECTS	TDL ENGINEERING CONSULTING PTY LTD	3 HOLDSWORTH AVENUE, ST LEONARDS 2065	STORMWATER SERVICES CATCHMENT PLAN	Project No:	24014	Designed:	JL
						Suite 11/30 Atchison St, St Leonards NSW 2065	Level 11, 88 Phillip Street, Sydney 2000	60/14 Narabang Way, Belmore, NSW 2085			Drg No:	S-002	Verified:	TL
							T: +61 2 9232 5877	Telephone : +61 2 9986 1355			NOT FOR CONSTRUCTION		Revision:	P1
							W: ptw.com.au	Email : office@tdlengineering.com.au						

PIPED SERVICES ASPECT



LEGEND

TEMPORARY CHAIN WIRE FENCING

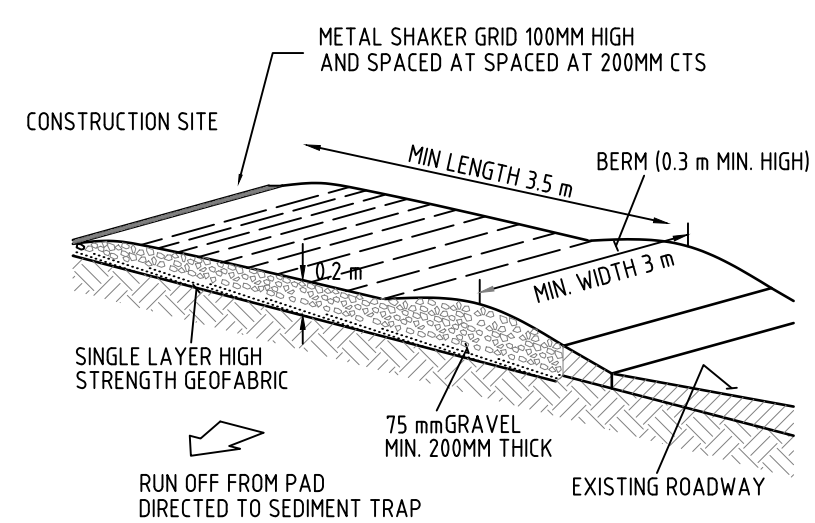
SILT FENCE

FLOCCULATION/SEDIMENT CONTROL PIT

TREE PROTECTION ZONE - TREE TO BE PRESERVED

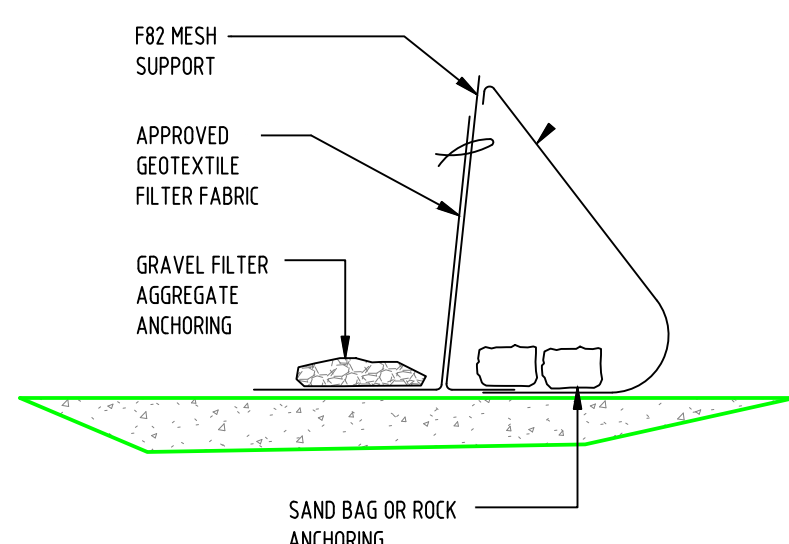
TREE PROTECTION ZONE - TREE TO BE DEMOLISHED

SEDIMENT SAND BAG



TEMPORARY CONSTRUCTION EXIT

NTS

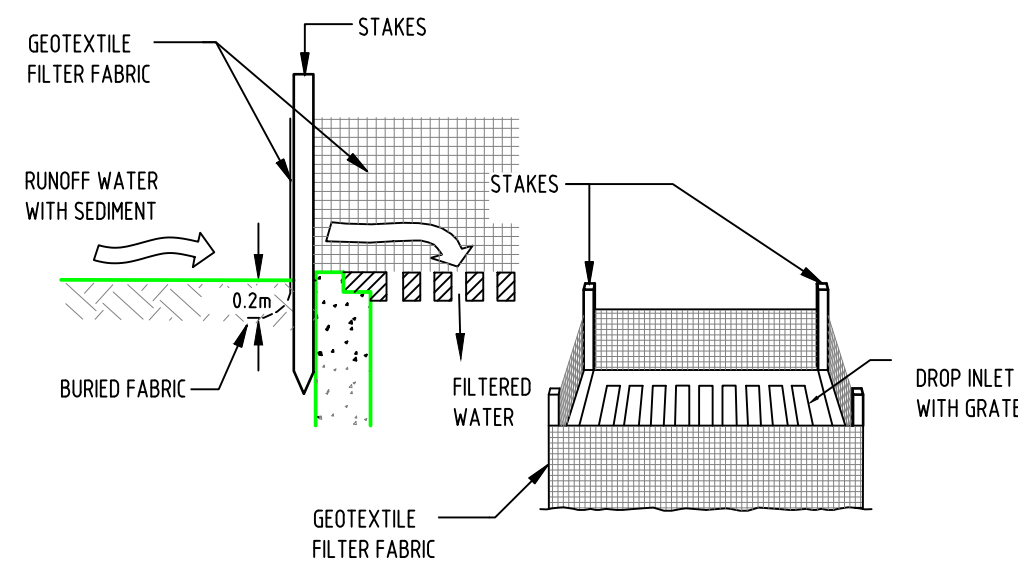


SEDIMENT FENCE CONSTRUCTION NOTES

- CONSTRUCT SEDIMENT FENCE AS CLOSE AS POSSIBLE TO PARALLEL TO THE CONTOURS OF THE SITE.
- FIX SELF-SUPPORTING GEOTEXTILE TO UPSLOPE SIDE OF POSTS WITH WIRE TIES OR AS RECOMMENDED BY GEOTEXTILE MANUFACTURER.
- JOIN SECTIONS OF FABRIC AT A SUPPORT WITH A 150mm OVERLAP.
- REFER TO DETAIL SD 6-9 "BLUE BOOK"

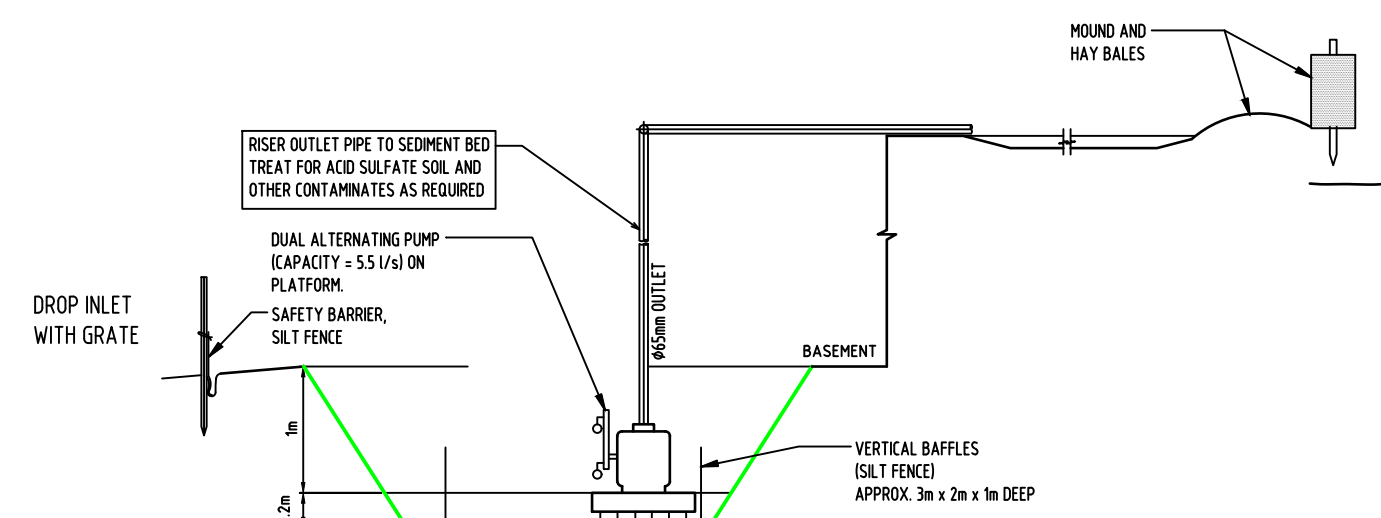
SILT FENCE BARRIER DETAIL (ON CONCRETE)

NTS



GEOTEXTILE FILTER FABRIC DROP INLET SEDIMENT TRAP

NTS

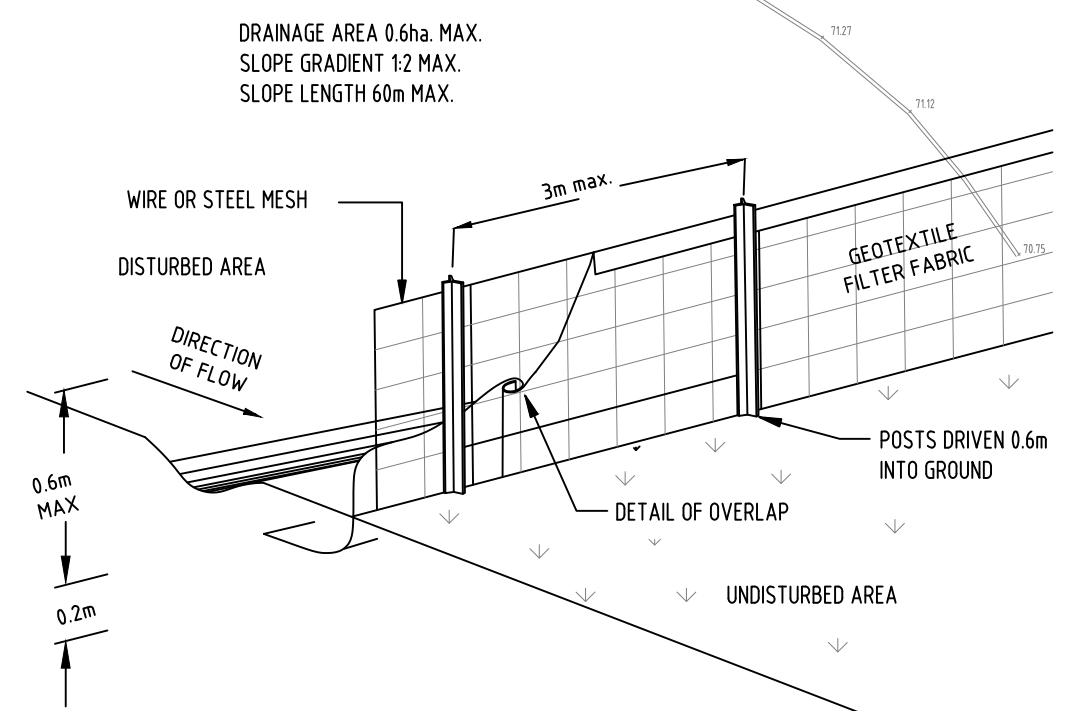


TEMPORARY PUMP OUT SUMP AND SEDIMENTATION POND (FOR SITE SURFACE RUN OFF)

NTS

TREATMENT PROCEDURES:

- LOWER SUSPENDED SOLIDS TO LESS THAN 50mg/L WITHIN 24 HOURS OF FILLING. DOSE WITH GYPSUM AS REQUIRED (REFER TO APPENDIX E, SECTION 6.4 OF THE "SOILS & CONSTRUCTION, LANDCOM" MANUAL).
- ALLOW WATER TO STAND FOR A MINIMUM OF 48 HOURS FOR FLOCCULATED PARTICLES TO SETTLE.
- EMPTY BASIN WITHIN 5 DAYS OF A STORM EVENT.
- CLEAN OUT POND EVERY 8 WEEKS OR WHEN AVERAGE DEPTH OF TRAPPED SEDIMENT REACHES 0.3m.
- OTHER FLOCCULATION AGENTS MAY BE USED AFTER APPROVAL FROM COUNCIL IS OBTAINED.



SEDIMENT SILT FENCE

NTS

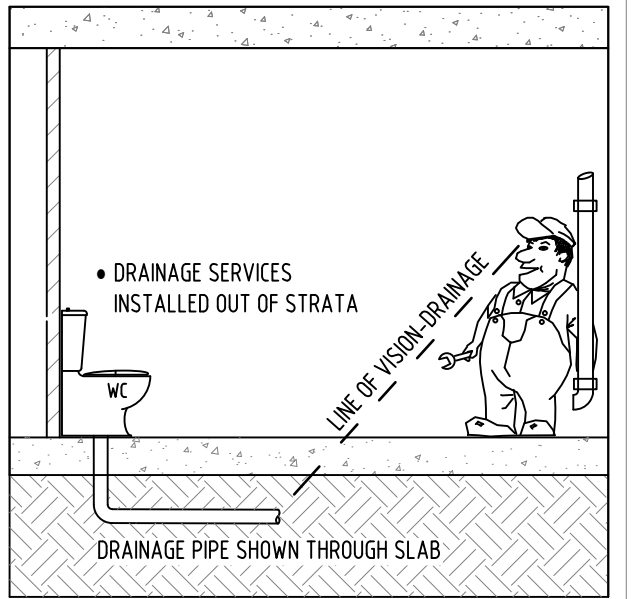
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SCALE 1:100 METRES

REV	DESCRIPTION	DATE	REV	DESCRIPTION	DATE	Client	Architect	Hydraulic Consultant	Project	Drawing Title	Scale:	Drawn:	YS
01	DA APPLICATION	12.11.24				NEW GOLDEN ST LEONARDS PTY LTD	PTW ARCHITECTS	TDL ENGINEERING CONSULTING PTY LTD	3 HOLDSWORTH AVENUE, ST LEONARDS 2065	STORMWATER SERVICES EROSION AND SEDIMENT CONTROL PLAN	1:200	Drawn:	YS
						Suite 11/30 Atchison St, St Leonards NSW 2065	Level 11, 88 Phillip Street, Sydney 2000 T: +61 2 9232 5877 W: ptw.com.au	60/14 Narabang Way, Belmore, NSW 2085 Telephone : +61 2 9986 1355 Email : office@tdeengineering.com.au			Project No: 24014	Designed: JL	
											Drg No: S-003	Verified: TL	
											NOT FOR CONSTRUCTION	Revision: P1	

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PIPED SERVICES ASPECT



PIT SCHEDULE

PIT No.	TYPE	RL	INVERT	DEPTH
B01	600X600 CLASS D GRATED SWP	56.80	55.71	1.09
B02	600X600 CLASS D GRATED SWP	56.80	55.88	0.92
B03	600X600 CLASS D GRATED SWP	56.80	56.05	0.75
B04	450X450 CLASS D GRATED SWP	56.80	56.15	0.65
B05	450X450 CLASS D GRATED SWP	56.80	56.25	0.55
B06	450X450 CLASS D GRATED SWP	56.80	56.15	0.65
B07	450X450 CLASS D GRATED SWP	56.80	56.25	0.55

GENERAL NOTES

- TYPICALLY, ALL DRAINAGE SERVICES SHOWN IN PLAN ARE DRAWN "OUT OF STRATA" BELOW SLAB, UNO. REFER TITLE BLOCK SERVICES ASPECT DETAIL.
- ANY DRAINAGE PIPEWORK CAST INTO STRUCTURAL SLAB TO BE HDPE, OR WRAPPED IN SYDNEY WATER APPROVED IMPERVIOUS COMPRESSIBLE LINER IN POLYURETHANE OR EQUAL TO ABELFLEX (TYPICAL THROUGHOUT).
- ALL CAST-IN CONCRETE PVC PIPE TO BE WATER FILLED DURING CONCRETE POUR, TYPICAL ALL FLOORS.
- ALL STORMWATER PITS TO BE SPARGED UP AND BENCHED.
- FALLS TO PITS AT GRADE 1:200.
- PROVIDE CHILD-PROOF LATCHES TO ALL PIT LOCATIONS.
- THE FLOOR SLAB MUST BE SCANNED ULTRASONICALLY PRIOR TO ANY ADDITIONAL CORE HOLES PROPOSED AFTER INITIAL POUR, AND NEW PENETRATIONS APPROVED BY THE SUPERINTENDENT.
- IF ANY DISCREPANCIES OCCUR BETWEEN DESIGN AND FORMED ARCHITECTURAL/STRUCTURAL ELEMENTS, PLEASE CONTACT TDL ENGINEERING FOR RESOLUTION.
- ALL GRAVITY DRAINAGE PIPE TO BE NOMINAL DWV GRADE SNG PVC-U.
- BUILDER TO INSTALL CORE DRAIN TO THE EXTERNAL SHORING WALL PERIMETERS TO THE DIRECTION OF THE STRUCTURAL/GEOTECHNICAL ENGINEERS ADVICE.
- 300mm SECTIONS OF DRAINAGE CELL TO BE INSTALLED TO STRUCTURAL ENGINEERS' LOCATIONS AT OUTSIDE OF SHOTCRETE WALL WITH 50MM WEEP HOLE PER SECTION TO DISCHARGE OVER PERIMETER DRAIN (DETAIL C-202).

PIPE SIZING AND GRADING

UNLESS NOTED OTHERWISE, THE FOLLOWING MINIMUM PIPE GRADES APPLY TO ALL GRAVITY FED DRAINAGE SHOWN IN PLAN, UNO -

- STORMWATER DRAINAGE
 - $\phi 50\text{mm}$ - $\phi 150\text{mm}$ @ 1% OR 1:100 GRADE.
 - $\phi 225\text{mm}$ @ 0.5% OR 1:200 GRADE.
 - $\phi 300\text{mm}$ @ 0.4% OR 1:250 GRADE.
- SUBSOIL DRAINAGE
 - $\phi 100$ HARD PIPE - 1% OR 1:100 GRADE.

PUMP PIT VOLUME CALCULATIONS:

IMPERVIOUS AREA DRAINING TO BASEMENT = 51.2M² (WIND DRIVEN RAIN INTO CAR PARK ENTRY - LOWER GROUND LEVEL)
PUMP DUTY BASED ON 100 YR 2 HOUR STORM EVENT.
INTENSITY = 60.4MM/HR
VOLUME REQUIRED = 51.2M² X (60.4 X 2)/1000 = 6.2M³

GROUND WATER SEEPAGE OF 0.49ML/YR OVER 180 DAYS FOR THE SITE DURING BUNSTRUCTION. SEE DEWATERING PLAN BY EIA/STRAILIA REF 26068/GT2 ROZ DATED 31.01.24.
SEEPAGE DURING OPERATION ESTIMATED AT 1ML/YEAR.

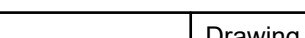
SEEPAGE RATE = $\frac{1\text{ML}}{365} = 2.74\text{M}^3$ (24 HOUR STORAGE).

TOTAL VOLUME = 6.2 + 2.74 = 8.94M³
PUMP OUT TANK VOLUME TO BE 10.075M³

PUMP DUTY BASED ON 100 5 YEARS STORM EVENT INTENSITY BEING 259.9MM/HR
PUMP OUT RATE -
Q1 = CIA/3600 = 10X259.9X51.2/3600 = 3.70L/S
Q2 = SEEPAGE RATE = 0.032L/S
Q = Q1 + Q2 = 3.732L/S

MINIMUM PUMP OUT RATE OF 5L/S APPLIES (PER PUMP - DUTY/DUTY)
PUMPS DUTY TO BE 5.5L/S @ 16mm PER PUMP.

2 1 0 1 2 4 6 8 10
SCALE 1:100 METRES

REV		DESCRIPTION	DATE	REV	DESCRIPTION	DATE	Client	Architect	Hydraulic Consultant		Project	Drawing Title	Scale:	1:100	Drawn:	YS
01	DA APPLICATION	12.11.24				Project No:							24014	Designed:	JL	
						Drg No:							S-101	Verified:	TL	
						NOT FOR CONSTRUCTION							Revision:	P1		
						Copyright © TDL Engineering Consulting Pty. Ltd. Reproduction or transmission of this drawing without expressed consent is an infringement of the Copyright Act 1968. All dimensions to be verified and discrepancies reported prior to commencement of related works.										
NEW GOLDEN ST LEONARDS PTY LTD							Suite 11/30 Atchison St, St Leonards NSW 2065	PTW ARCHITECTS	Level 11, 88 Phillip Street, Sydney 2000 T: +61 2 9232 5877 W: ptw.com.au	 60/14 Arabang Way, Belmore, NSW 2065 Telephone: +61 2 9986 1355 Email: office@tdeengineering.com.au	3 HOLDSWORTH AVENUE, ST LEONARDS 2065	STORMWATER SERVICES BASEMENT 4 STORMWATER MANAGEMENT PLAN				

Regulated Design Record

Project Address: 3 HOLDSWORTH AVE, ST LEONARDS 2065

Project Title: -

Consent No: DA187/2021

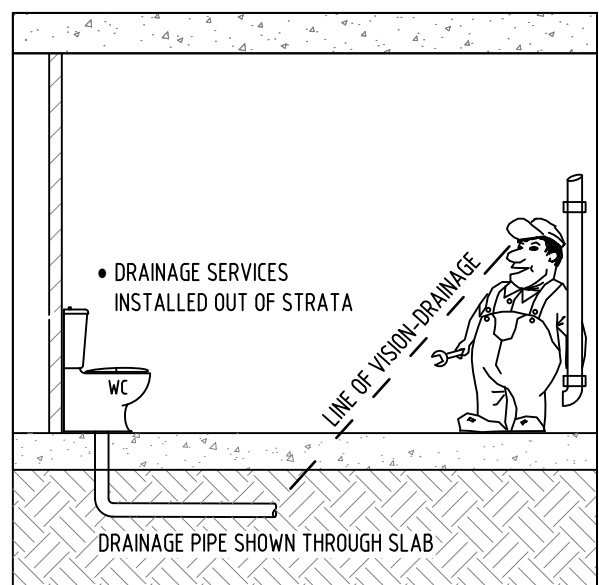
Body Corporate Reg No:

Drawing Title: BASEMENT 2 - SWMP

Drawing No: S-103

Rev.	Date	Description	DP Full Name	Reg No
			TROY LITTLEFIELD	DEP0000208

PIPED SERVICES ASPECT



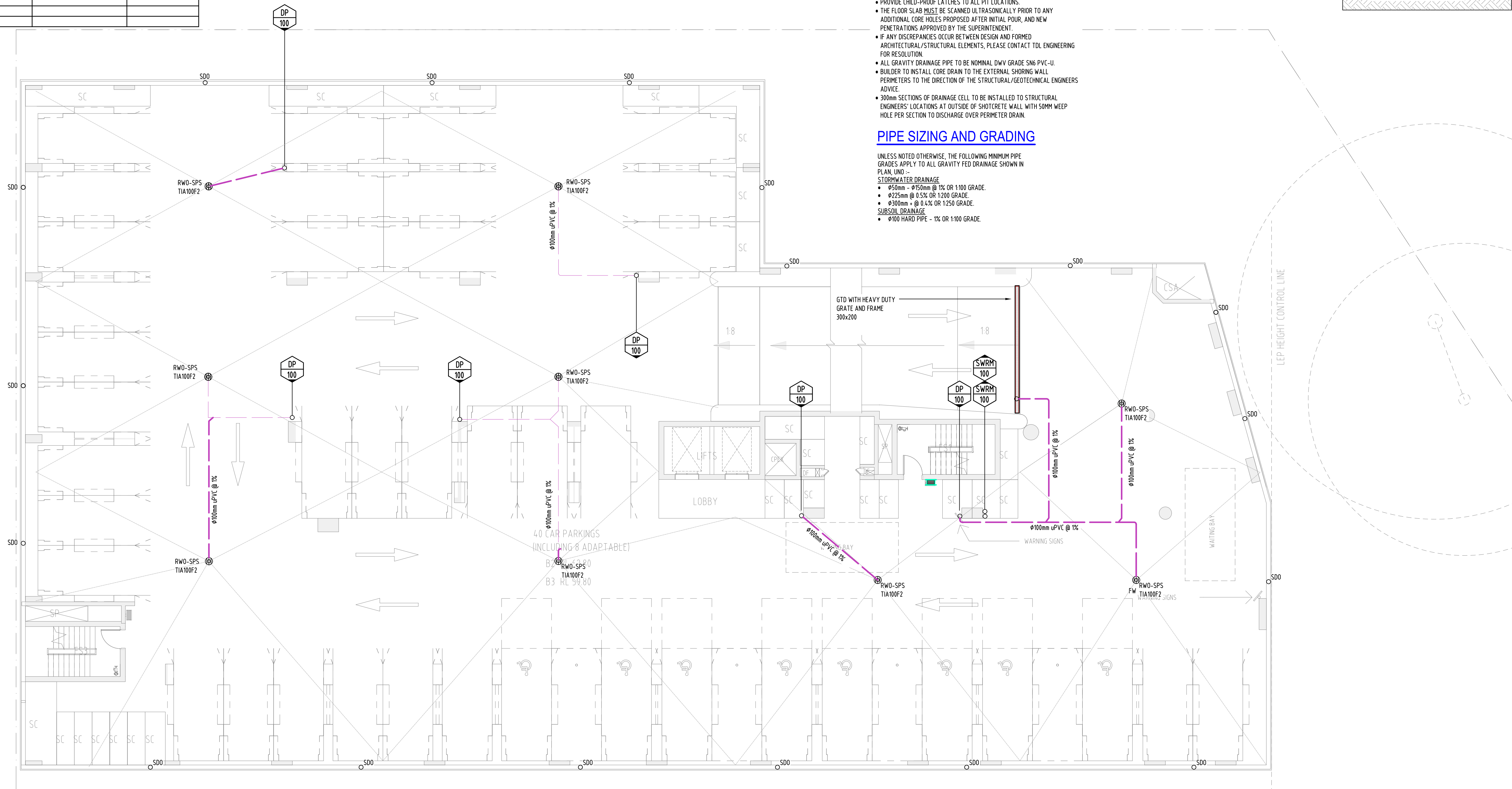
GENERAL NOTES

- TYPICALLY, ALL DRAINAGE SERVICES SHOWN IN PLAN ARE DRAWN "OUT OF STRATA" BELOW SLAB, UNO. REFER TITLE BLOCK SERVICES ASPECT DETAIL.
- ANY DRAINAGE PIPEWORK CAST INTO STRUCTURAL SLAB TO BE HDPE, OR WRAPPED IN STONEY WATER APPROVED IMPERVIOUS COMPRESSIBLE LINER IN POLYURETHANE OR EQUAL TO ABLEFLEX (TYPICAL THROUGHOUT).
- ALL CAST-IN CONCRETE PVC PIPE TO BE WATER FILLED DURING CONCRETE POUR, TYPICAL ALL FLOORS.
- ALL STORMWATER PITS TO BE SPARGED UP AND BENCHED.
- SLAB FALLS TO PITS AT GRADE 1:100.
- PROVIDE CHILD-PROOF LATCHES TO ALL PIT LOCATIONS.
- THE FLOOR SLAB MUST BE SCANNED ULTRASONICALLY PRIOR TO ANY ADDITIONAL CORE HOLES PROPOSED AFTER INITIAL POUR, AND NEW PENETRATIONS APPROVED BY THE SUPERINTENDENT.
- IF ANY DISCREPANCIES OCCUR BETWEEN DESIGN AND FORMED ARCHITECTURAL/STRUCTURAL ELEMENTS, PLEASE CONTACT TDL ENGINEERING FOR RESOLUTION.
- ALL GRAVITY DRAINAGE PIPE TO BE NOMINAL DWV GRADE SNG PVC-U.
- BUILDER TO INSTALL CORE DRAIN TO THE EXTERNAL SHORING WALL PERIMETERS TO THE DIRECTION OF THE STRUCTURAL/GEOTECHNICAL ENGINEERS ADVICE.
- 300mm SECTIONS OF DRAINAGE CELL TO BE INSTALLED TO STRUCTURAL ENGINEERS' LOCATIONS AT OUTSIDE OF SHOTCRETE WALL WITH 50MM WEEP HOLE PER SECTION TO DISCHARGE OVER PERIMETER DRAIN.

PIPE SIZING AND GRADING

UNLESS NOTED OTHERWISE, THE FOLLOWING MINIMUM PIPE GRADES APPLY TO ALL GRAVITY FED DRAINAGE SHOWN IN PLAN, UNO -

- STORMWATER DRAINAGE
 - Ø50mm - Ø150mm @ 1% OR 1:100 GRADE.
 - Ø225mm @ 0.5% OR 1:200 GRADE.
 - Ø300mm + @ 0.4% OR 1:250 GRADE.
- SUBSOIL DRAINAGE
 - Ø100 HARD PIPE - 1% OR 1:100 GRADE.



2 1 0 1 2 4 6 8 10
SCALE 1:100 METRES

REV	DESCRIPTION	DATE	REV	DESCRIPTION	DATE	Client	Architect	Hydraulic Consultant	Project	Drawing Title	Scale:	1:100	Drawn:	YS
01	DA APPLICATION	12.11.24				NEW GOLDEN ST LEONARDS PTY LTD	PTW ARCHITECTS	TDL ENGINEERING CONSULTING PTY LTD	3 HOLDSWORTH AVENUE, ST LEONARDS 2065	STORMWATER SERVICES BASEMENT 2 STORMWATER MANAGMENT PLAN	Project No:	24014	Designed:	JL
						Suite 11/30 Atchison St, St Leonards NSW 2065	Level 11, 88 Phillip Street, Sydney 2000	60/14 Narabang Way, Belmore, NSW 2065			Drg No:	S-103	Verified:	TL
							T: +61 2 9232 5877 W: ptw.com.au	Telephone: +61 2 9986 1353 Email: office@tldengineering.com.au			NOT FOR CONSTRUCTION		Revision:	P1

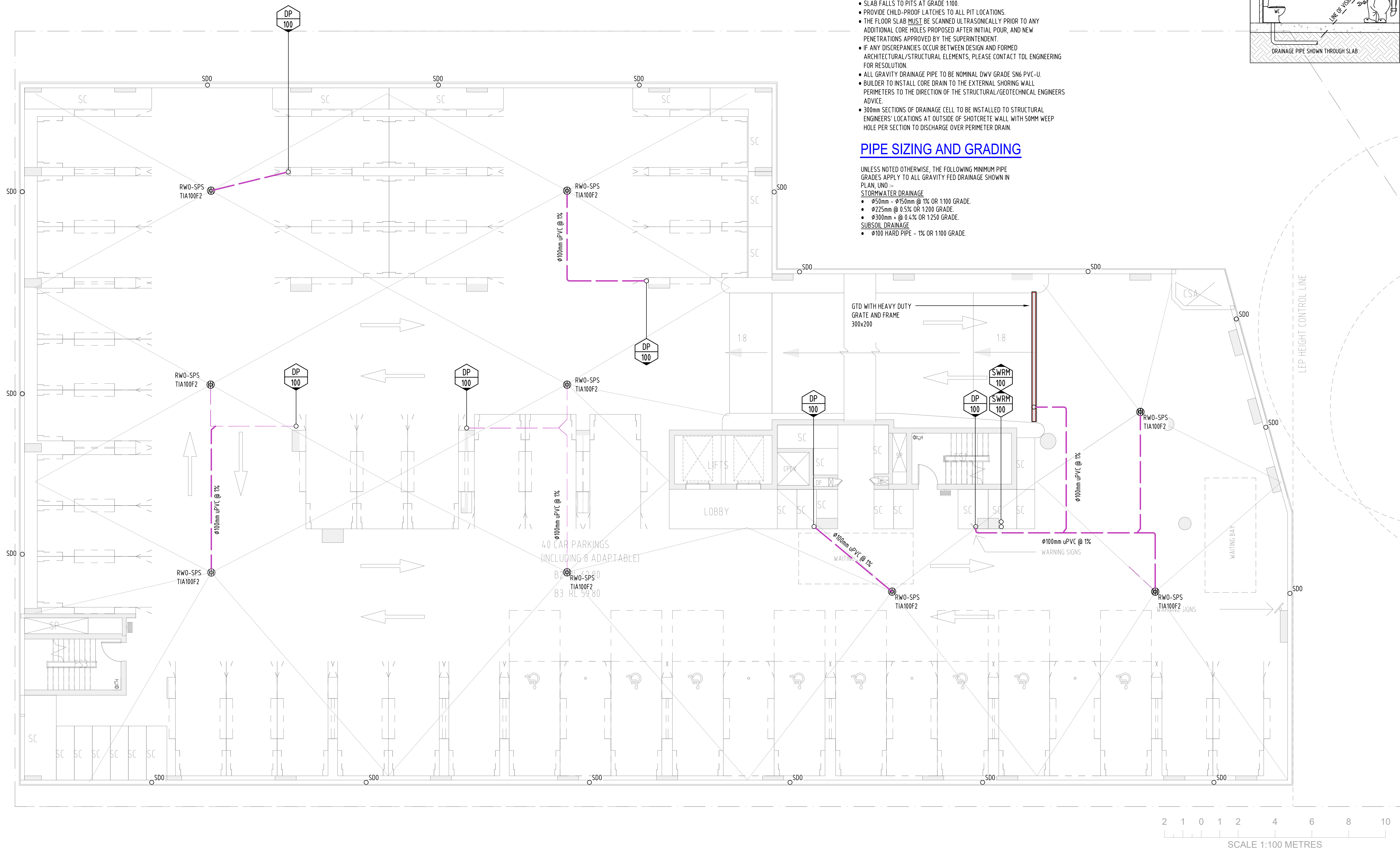
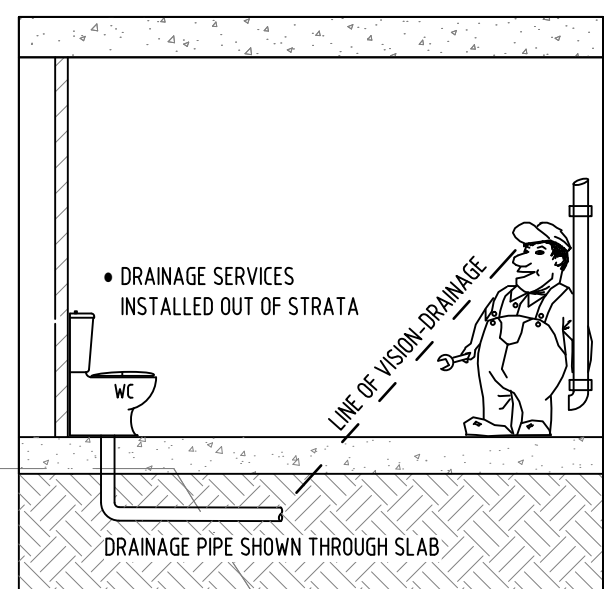
GENERAL NOTES

- TYPICALLY, ALL DRAINAGE SERVICES SHOWN IN PLAN ARE DRAWN "OUT OF STRATA" BELOW SLAB, UNO. REFER TITLE BLOCK SERVICES ASPECT DETAIL.
- ANY DRAINAGE PIPEWORK CAST INTO STRUCTURAL SLAB TO BE HDPE, OR WRAPPED IN SYDNEY WATER APPROVED IMPERVIOUS COMPRESSIBLE LINER IN POLYURETHANE OR EQUAL TO ABELFLEX (TYPICAL THROUGHOUT).
- ALL CAST-IN CONCRETE PVC PIPE TO BE WATER FILLED DURING CONCRETE POUR, TYPICAL ALL FLOORS.
- ALL STORMWATER PITS TO BE SPARGED UP AND BENCHED.
- SLAB FALLS TO PITS AT GRADE 1:100.
- PROVIDE CHILD-PROOF LATCHES TO ALL PIT LOCATIONS.
- THE FLOOR SLAB MUST BE SCANNED ULTRASONICALLY PRIOR TO ANY ADDITIONAL CORE HOLES PROPOSED AFTER INITIAL POUR, AND NEW PENETRATIONS APPROVED BY THE SUPERINTENDENT.
- IF ANY DISCREPANCIES OCCUR BETWEEN DESIGN AND FORMED ARCHITECTURAL/STRUCTURAL ELEMENTS, PLEASE CONTACT TDL ENGINEERING FOR RESOLUTION.
- ALL GRAVITY DRAINAGE PIPE TO BE NOMINAL DWV GRADE S86 PVC-U.
- BUILDER TO INSTALL CORE DRAIN TO THE EXTERNAL SHORING WALL PERIMETERS TO THE DIRECTION OF THE STRUCTURAL/GEOTECHNICAL ENGINEERS ADVICE.
- 300mm SECTIONS OF DRAINAGE CELL TO BE INSTALLED TO STRUCTURAL ENGINEERS' LOCATIONS AT OUTSIDE OF SHOTCRETE WALL WITH 50MM WEEP HOLE PER SECTION TO DISCHARGE OVER PERIMETER DRAIN.

PIPE SIZING AND GRADING

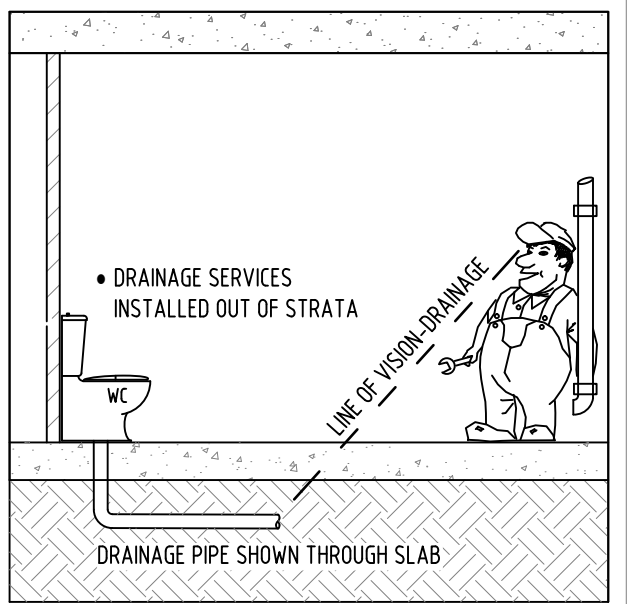
- UNLESS NOTED OTHERWISE, THE FOLLOWING MINIMUM PIPE GRADES APPLY TO ALL GRAVITY FED DRAINAGE SHOWN IN PLAN, UNO --
- STORMWATER DRAINAGE**
- $\phi 50\text{mm}$ - $\phi 150\text{mm}$ @ 1% OR 1:100 GRADE.
 - $\phi 225\text{mm}$ @ 0.5% OR 1:200 GRADE.
 - $\phi 300\text{mm}$ - $\phi 0.4\%$ OR 1:250 GRADE.
- SUBSOIL DRAINAGE**
- $\phi 100$ HARD PIPE - 1% OR 1:100 GRADE.

PIPED SERVICES ASPECT



REV	DESCRIPTION	DATE	REV	DESCRIPTION	DATE	Client	Architect	Hydraulic Consultant	Project	Drawing Title	Scale:	1:100	Drawn:	YS
01	DA APPLICATION	12.11.24				NEW GOLDEN ST LEONARDS PTY LTD	PTW ARCHITECTS	TDL ENGINEERING CONSULTING PTY LTD	3 HOLDSWORTH AVENUE, ST LEONARDS 2065	STORMWATER SERVICES BASEMENT 3 STORMWATER MANAGMENT PLAN	Project No:	24014	Designed:	JL
						Suite 11/30 Atchison St, St Leonards NSW 2065	Level 11, 88 Phillip Street, Sydney 2000 T: +61 2 9232 5877 W: ptw.com.au	60/14 Narabang Way, Belmore, NSW 2065 Telephone: +61 2 9986 1355 Email: office@tldengineering.com.au			Drg No:	H-102	Verified:	TL
											NOT FOR CONSTRUCTION		Revision:	P1

PIPED SERVICES ASPECT



PIT SCHEDULE

PIT No.	TYPE	RL	INVERT	DEPTH
LG01	600X600 CLASS D GRATED SWP	68.90	68.40	0.50
LG02	600X600 CLASS D GRATED SWP	69.00	68.47	0.53
LG3	900X900 CLASS B GRATED SWP	71.02	68.95	2.25

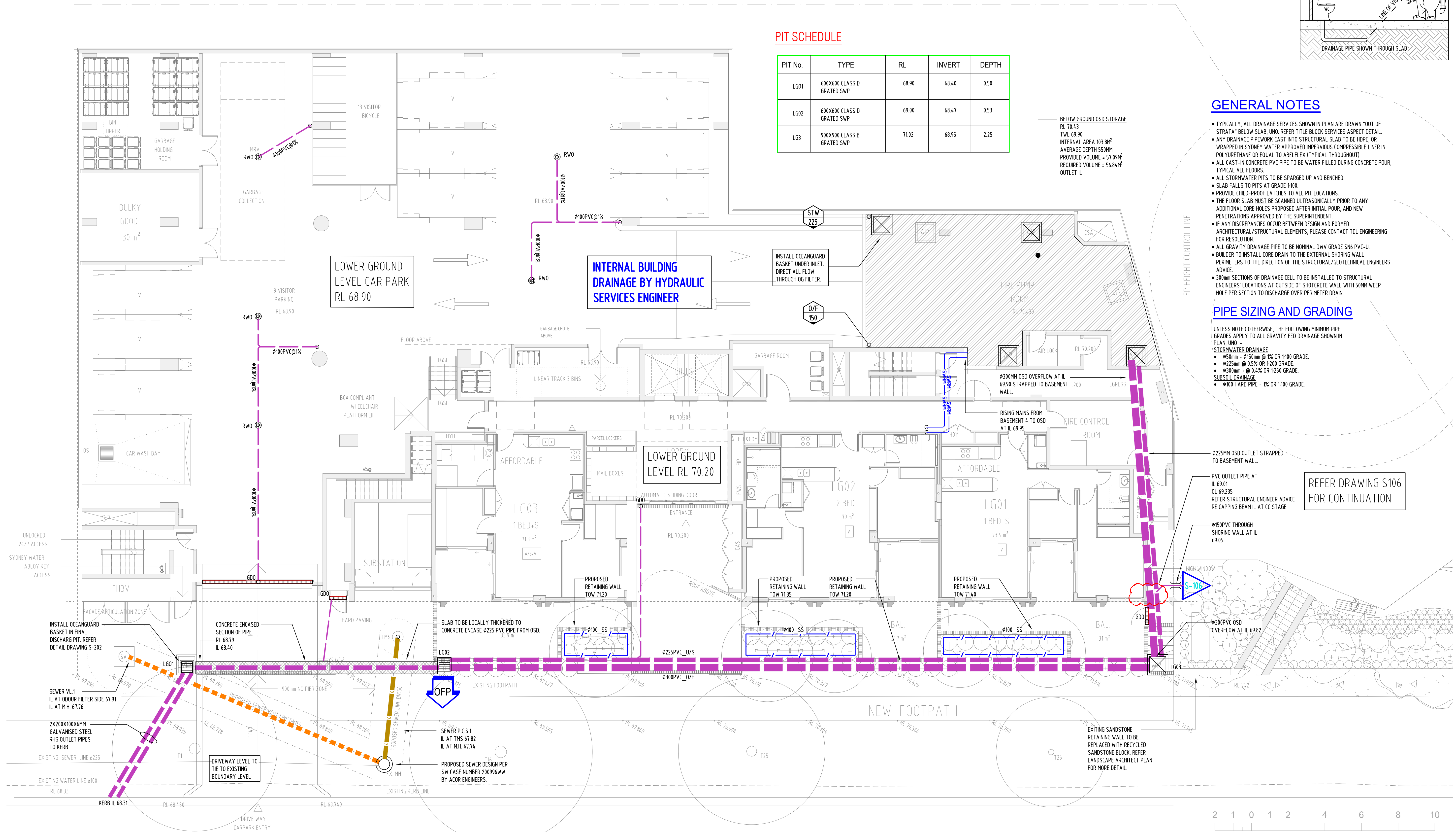
GENERAL NOTES

- TYPICALLY, ALL DRAINAGE SERVICES SHOWN IN PLAN ARE DRAWN "OUT OF STRATA" BELOW SLAB, UNO. REFER TITLE BLOCK SERVICES ASPECT DETAIL.
- ANY DRAINAGE PIPEWORK CAST INTO STRUCTURAL SLAB TO BE HOPE, OR WRAPPED IN SYDNEY WATER APPROVED IMPERVIOUS COMPRESSIBLE LINER IN POLYURETHANE OR EQUAL TO ABELFLEX (TYPICAL THROUGHOUT).
- ALL CAST-IN CONCRETE PVC PIPE TO BE WATER FILLED DURING CONCRETE POUR, TYPICAL ALL FLOORS.
- ALL STORMWATER PITS TO BE SPARGED UP AND BENCHED.
- SLAB FALLS TO PITS AT GRADE 1:100.
- PROVIDE CHILD-PROOF LATCHES TO ALL PIT LOCATIONS.
- THE FLOOR SLAB MUST BE SCANNED ULTRASONICALLY PRIOR TO ANY ADDITIONAL CORE HOLES PROPOSED AFTER INITIAL POUR, AND NEW PENETRATIONS APPROVED BY THE SUPERINTENDENT.
- IF ANY DISCREPANCIES OCCUR BETWEEN DESIGN AND FORMED ARCHITECTURAL/STRUCTURAL ELEMENTS, PLEASE CONTACT TDL ENGINEERING FOR RESOLUTION.
- ALL GRAVITY DRAINAGE PIPE TO BE NOMINAL DWV GRADE SNE PVC-U.
- BUILDER TO INSTALL CORE DRAIN TO THE EXTERNAL SHORING WALL PERIMETERS TO THE DIRECTION OF THE STRUCTURAL/GEOTECHNICAL ENGINEERS ADVICE.
- 300mm SECTIONS OF DRAINAGE CELL TO BE INSTALLED TO STRUCTURAL ENGINEERS' LOCATIONS AT OUTSIDE OF SHOTCRETE WALL WITH 50MM WEEP HOLE PER SECTION TO DISCHARGE OVER PERIMETER DRAIN.

PIPE SIZING AND GRADING

- UNLESS NOTED OTHERWISE, THE FOLLOWING MINIMUM PIPE GRADES APPLY TO ALL GRAVITY FED DRAINAGE SHOWN IN PLAN, UNO -
- STORMWATER DRAINAGE
- 50mm - 150mm @ 1% OR 1:100 GRADE.
 - 225mm @ 0.5% OR 1:200 GRADE.
 - 300mm @ 0.4% OR 1:250 GRADE.
- SUBSOIL DRAINAGE
- 100 HARD PIPE - 1% OR 1:100 GRADE.

REFER DRAWING S106 FOR CONTINUATION



REV	DESCRIPTION	DATE	REV	DESCRIPTION	DATE
01	DA APPLICATION	12.11.24			

Client

**NEW GOLDEN ST
LEONARDS PTY LTD**

Suite 11/30 Atchison St, St Leonards
NSW 2065

Architect

PTW ARCHITECTS

Level 11, 88 Phillip Street, Sydney 2000
T: +61 2 9232 5877
W: ptw.com.au

Hydraulic Consultant

**TDL ENGINEERING
CONSULTING PTY LTD**

60/14 Narabang Way, Belmore, NSW 2065
Telephone : +61 2 9886 1355
Email : office@tdeengineering.com.au

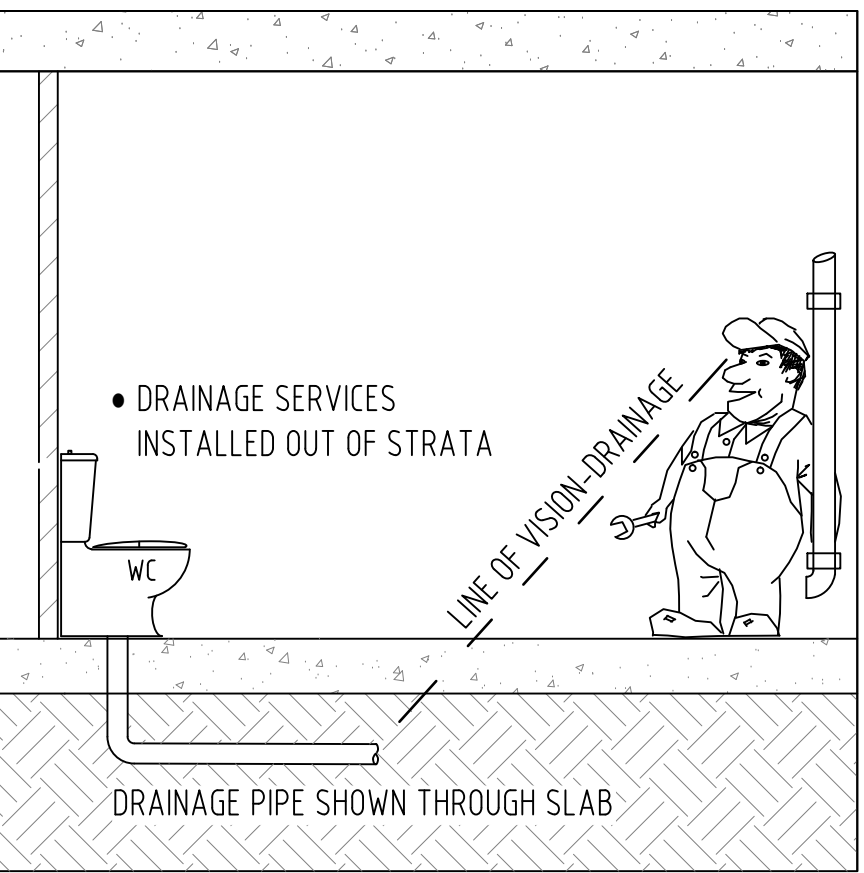
Project

**3 HOLDSWORTH
AVENUE, ST LEONARDS
2065**

Drawing Title

**STORMWATER SERVICES
LOWER GROUND FLOOR
STORMWATER MANAGEMENT
PLAN**

Scale:	1:100	Drawn:	YS
Project No:	24014	Designed:	JL
Drg No:	S-105	Verified:	TL
NOT FOR CONSTRUCTION		Revision:	P1



TYPICALLY, ALL DRAINAGE SERVICES SHOWN IN PLAN ARE DRAIN "OUT OF STRUCTURE" BELOW SLAB, AND REFER TITLE BLOCK SERVICES APPROPRIATE. ANY DRAINAGE PIPEWORK CAST INTO STRUCTURAL SLAB TO BE HDPE OR WRAPPED IN SPODNEY WATER APPROVED IMPERVIOUS COMPRESSIBLE LINER IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. ALL DRAINAGE PIPES SHALL BE INSTALLED TO ABLEFLOW (WATER FILLING THROUGHOUT) UNTIL CAST-IN CONCRETE CURE. PVP PIPE TO BE WATER FILLED DURING CONCRETE POUR.

TYPICAL ALL FLOORS:

- ALL STORMWATER PITS TO BE SPARGED UP AND BENCHED.
- SLAB FILL TO PITS AT GRADE 1:10.
- PROVIDE CHLOR-PROOF LATHES TO ALL PIT LOCATIONS.

THE FLOOR SLAB SHALL BE SCANNED ULTRASONICALLY PRIOR TO ANY ADDITIONAL CONCRETE PROPOSED AFTER INITIAL POUR, AND NEW PENETRATIONS APPROVED BY THE SUPERINTENDENT.

IF ANY DISCREPANCIES OCCUR BETWEEN DESIGN AND FORMED ARCHITECTURAL/STRUCTURAL ELEMENTS, PLEASE CONTACT TOL ENGINEERING FOR RESOLUTION.

- ALL GRAVITY DRAINAGE PIPES TO BE NOMINAL DWG GRADING SNG PVC-U.
- BURIED TO INSTALL CORE DRAIN TO THE EXTERNAL SHINGING WALL.
- PROTECTORS TO THE DIRECTION OF THE STRUCTURAL/GEOTECHNICAL ENGINEERS' ADVISE.

300mm SECTIONS OF DRAINAGE CELL TO BE INSTALLED TO STRUCTURAL ENGINEERS' LOCATIONS AT OUTSIDE OF SHOROTRE WALL WITH 50MM WEEP HOLE PER SECTION TO DISCHARGE OVER PERIMETER DRAIN.

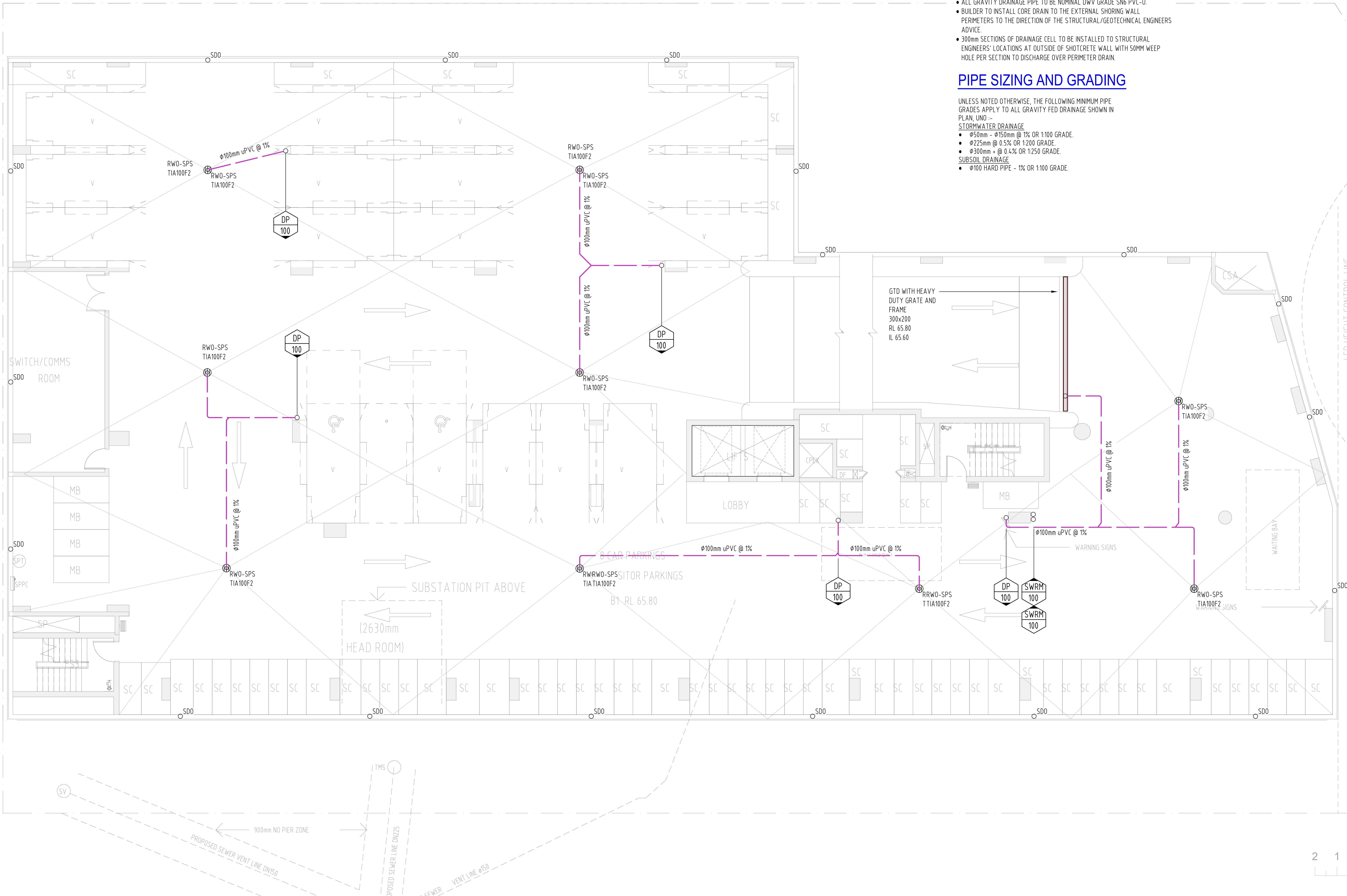
UNLESS NOTED OTHERWISE, THE FOLLOWING MINIMUM PIPE GRADES APPLY TO ALL GRAVITY FEED DRAINAGE SHOWN IN PLAN, UNO -

STORMWATER DRAINAGE

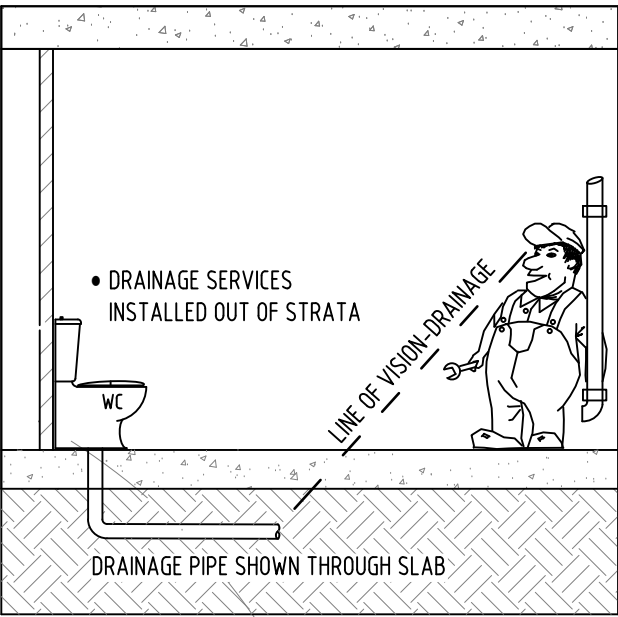
- Ø50mm - Ø150mm @ 1% OR 1:100 GRADE.
- Ø225mm @ 0.5% OR 1:200 GRADE.
- Ø300mm @ 0.4% OR 1:250 GRADE.

SUBSOIL DRAINAGE

- Ø100 HARD PIPE - 1% OR 1:100 GRADE.

[illegible]

PIPED SERVICES ASPECT



PIT SCHEDULE

PIT No.	TYPE	RL	INVERT	DEPTH
B08	600x600 GSIP CLASS B GRATE	73.80	72.90	0.90
B09	600x600 GSIP CLASS B GRATE	74.40	73.80	0.60

GENERAL NOTES

- TYPICALLY, ALL DRAINAGE SERVICES SHOWN IN PLAN ARE DRAWN "OUT OF STRATA" BELOW SLAB, UNO. REFER TITLE BLOCK SERVICES ASPECT DETAIL.
- ANY DRAINAGE PIPEWORK CAST INTO STRUCTURAL SLAB TO BE HDPE, OR WRAPPED IN SYDNEY WATER APPROVED IMPERVIOUS COMPRESSIBLE LINER IN POLYURETHANE OR EQUAL TO ABLEFLEX (TYPICAL THROUGHOUT).
- ALL CAST-IN CONCRETE PVC PIPE TO BE WATER FILLED DURING CONCRETE POUR, TYPICAL ALL FLOORS.
- ALL STORMWATER PITS TO BE SPARGED UP AND BENCHED.
- FALLS TO PITS AT GRADE 1:200.
- PROVIDE CHILD-PROOF LATCHES TO ALL PIT LOCATIONS.
- THE FLOOR SLAB MUST BE SCANNED ULTRASONICALLY PRIOR TO ANY ADDITIONAL CORE HOLES PROPOSED AFTER INITIAL POUR, AND NEW PENETRATIONS APPROVED BY THE SUPERINTENDENT.
- IF ANY DISCREPANCIES OCCUR BETWEEN DESIGN AND FORMED ARCHITECTURAL/STRUCTURAL ELEMENTS, PLEASE CONTACT TDL ENGINEERING FOR RESOLUTION.
- ALL GRAVITY DRAINAGE PIPE TO BE NOMINAL DWV GRADE S_{N6} PVC-U.
- BUILDER TO INSTALL CORE DRAIN TO THE EXTERNAL SHORING WALL PERIMETERS TO THE DIRECTION OF THE STRUCTURAL/GEOTECHNICAL ENGINEERS ADVICE.
- 300mm SECTIONS OF DRAINAGE CELL TO BE INSTALLED TO STRUCTURAL ENGINEERS' LOCATIONS AT OUTSIDE OF SHOTCRETE WALL WITH 50MM WEEP HOLE PER SECTION TO DISCHARGE OVER PERIMETER DRAIN (DETAIL C-202).

PIPE SIZING AND GRADING

- UNLESS NOTED OTHERWISE, THE FOLLOWING MINIMUM PIPE GRADES APPLY TO ALL GRAVITY FED DRAINAGE SHOWN IN PLAN, UNO -
- STORMWATER DRAINAGE
- Ø50mm - Ø150mm @ 1% OR 1:100 GRADE.
 - Ø225mm @ 0.5% OR 1:200 GRADE.
 - Ø300mm + @ 0.4% OR 1:250 GRADE.
- SUBSOIL DRAINAGE
- Ø100 HARD PIPE - 1% OR 1:100 GRADE.

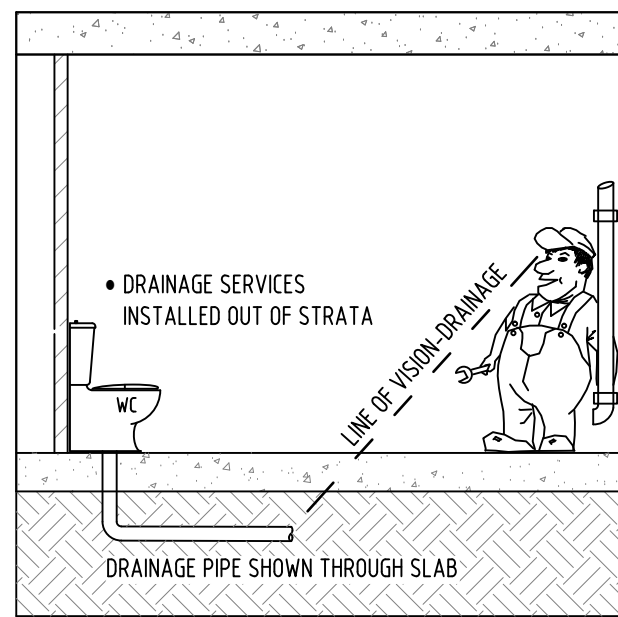
INTERNAL BUILDING
DRAINAGE BY HYDRAULIC
SERVICES ENGINEER

REV	DESCRIPTION	DATE	REV	DESCRIPTION	DATE	Client	Architect	Hydraulic Consultant		Project	Drawing Title	Scale:	1:100	Drawn:	YS						
01	DA APPLICATION	12.11.24				NEW GOLDEN ST LEONARDS PTY LTD Suite 11/30 Atchison St, St Leonards NSW 2065	PTW ARCHITECTS Level 11, 88 Phillip Street, Sydney 2000 T: +61 2 9232 5877 W: ptw.com.au	 60/14 Raresbang Way, Belmore, NSW 2085 Telephone : +61 2 9986 1355 Email : office@tdlengineering.com.au		3 HOLDSWORTH AVENUE, ST LEONARDS 2065	HYDRAULIC SERVICES UPPER GROUND FLOOR STORMWATER MANAGEMENT PLAN	Project No:	24014	Designed:	JL						
																Drg No:	S-106	Verified:	TL		
						Copyright © TDL Engineering Consulting Pty. Ltd. Reproduction or transmission of this drawing without expressed consent is an infringement of the Copyright Act 1968. All dimensions to be verified and discrepancies reported prior to commencement of related works.															
												NOT FOR CONSTRUCTION		Revision:	P1						

PIT SCHEDULE

PIT No.	TYPE	RL	INVERT	DEPTH
C01	450x450 CLASS B GRATED SWP	76.43	75.83	0.60
C02	450x450 CLASS B GRATED SWP	76.20	75.60	0.60
C03	450x450 CLASS B GRATED SWP	76.20	75.60	0.60
C04	450x450 CLASS B GRATED SWP	76.20	75.60	0.60
C05	450x450 CLASS B GRATED SWP	76.20	75.60	0.60
C06	600x600 CLASS B GRATED SWP	76.20	75.50	0.70
C07	450x450 CLASS B GRATED SWP	76.43	75.83	0.60
C08	450x450 CLASS B GRATED SWP	75.80	75.35	0.45
C09	450x450 CLASS B GRATED SWP	76.00	75.50	0.50
C10	450x450 CLASS B GRATED SWP	75.80	75.30	0.50

PIPED SERVICES ASPECT

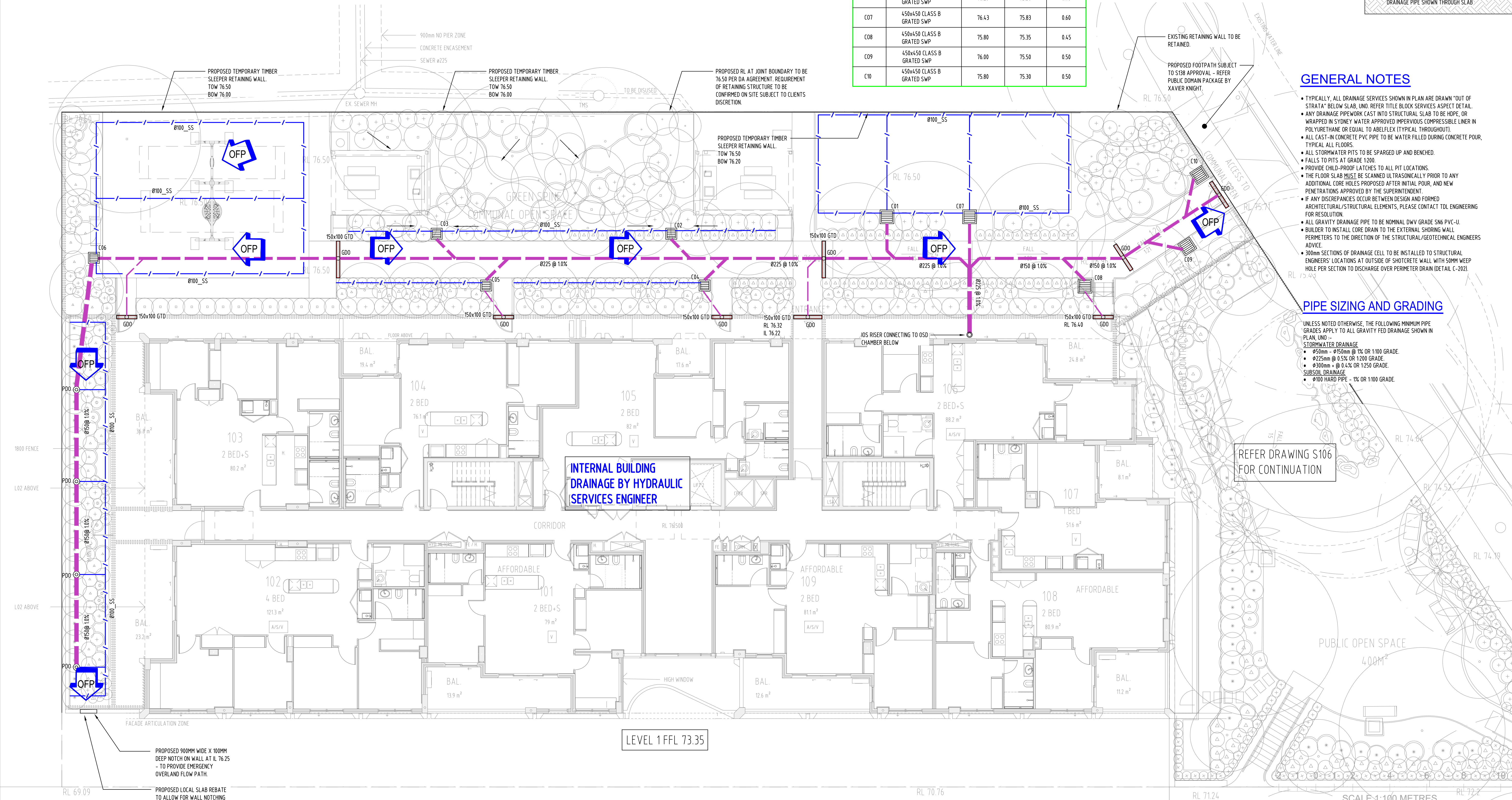


GENERAL NOTES

- TYPICALLY, ALL DRAINAGE SERVICES SHOWN IN PLAN ARE DRAWN "OUT OF STRATA" BELOW SLAB, UNO. REFER TITLE BLOCK SERVICES ASPECT DETAIL.
- ANY DRAINAGE PIPEWORK CAST INTO STRUCTURAL SLAB TO BE HDPE, OR WRAPPED IN SYDNEY WATER APPROVED IMPERVIOUS COMPRESSIBLE LINER IN POLYURETHANE OR EQUAL TO ABELFLEX (TYPICAL THROUGHOUT).
- ALL CAST-IN CONCRETE PVC PIPE TO BE WATER FILLED DURING CONCRETE POUR, TYPICAL ALL FLOORS.
- ALL STORMWATER PITS TO BE SPARGED UP AND BENCHED.
- FALLS TO PITS AT GRADE 1:200.
- PROVIDE CHILD-PROOF LATCHES TO ALL PIT LOCATIONS.
- THE FLOOR SLAB MUST BE SCANNED ULTRASONICALLY PRIOR TO ANY ADDITIONAL CORE HOLES PROPOSED AFTER INITIAL POUR, AND NEW PENETRATIONS APPROVED BY THE SUPERINTENDENT.
- IF ANY DISCREPANCIES OCCUR BETWEEN DESIGN AND FORMED ARCHITECTURAL/STRUCTURAL ELEMENTS, PLEASE CONTACT TOL ENGINEERING FOR RESOLUTION.
- ALL GRAVITY DRAINAGE PIPE TO BE NOMINAL DWV GRADE SNG PVC-U.
- BUILDER TO INSTALL CORE DRAIN TO THE EXTERNAL SHORING WALL PERIMETERS TO THE DIRECTION OF THE STRUCTURAL/GEOTECHNICAL ENGINEERS ADVICE.
- 300mm SECTIONS OF DRAINAGE CELL TO BE INSTALLED TO STRUCTURAL ENGINEERS' LOCATIONS AT OUTSIDE OF SHOTCRETE WALL WITH 50MM WEEP HOLE PER SECTION TO DISCHARGE OVER PERIMETER DRAIN (DETAIL C-202).

PIPE SIZING AND GRADING

- UNLESS NOTED OTHERWISE, THE FOLLOWING MINIMUM PIPE GRADES APPLY TO ALL GRAVITY FED DRAINAGE SHOWN IN PLAN, UNO -:-
- STORMWATER DRAINAGE
- Ø150mm - Ø150mm @ 1% OR 1:100 GRADE.
 - Ø225mm @ 0.5% OR 1:200 GRADE.
 - Ø300mm @ 0.4% OR 1:250 GRADE.
- SUBSOIL DRAINAGE
- Ø100 HARD PIPE - 1% OR 1:100 GRADE.

REFER DRAWING S106
FOR CONTINUATION

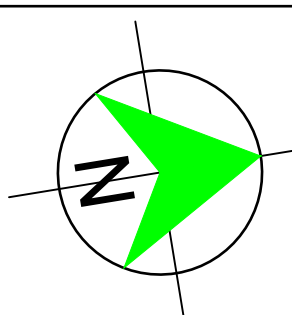
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01	DA APPLICATION	12.11.24			

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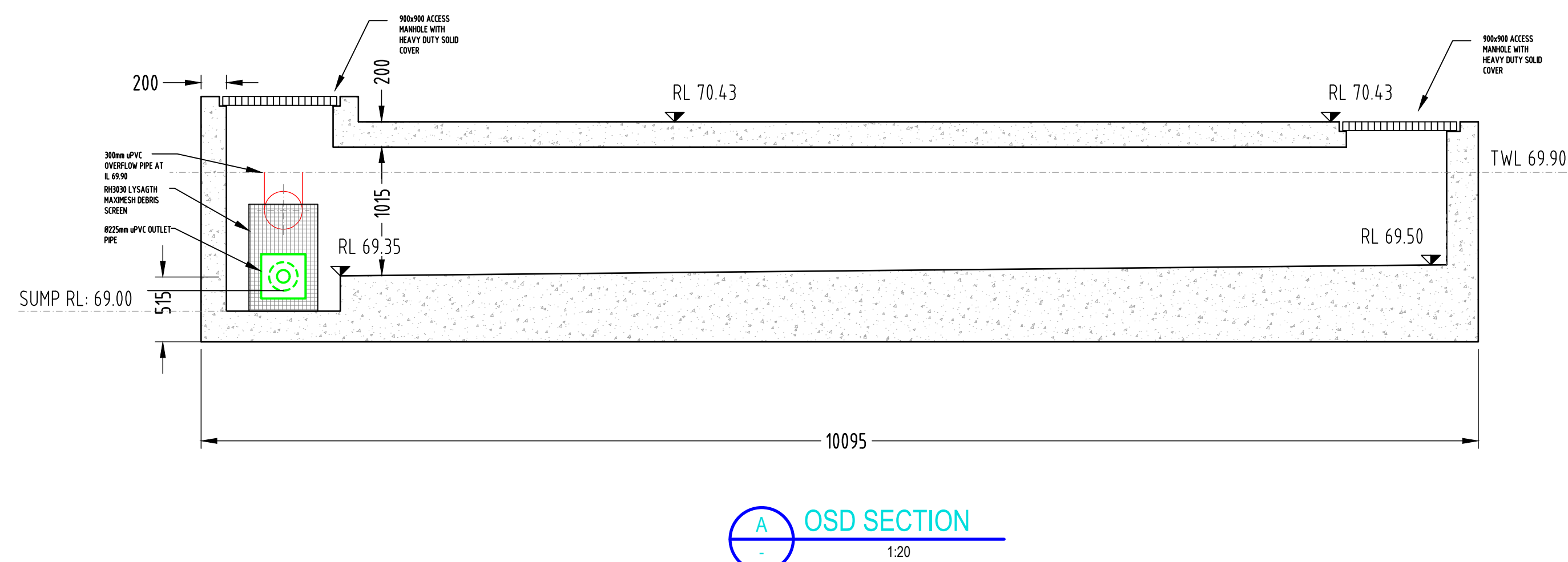
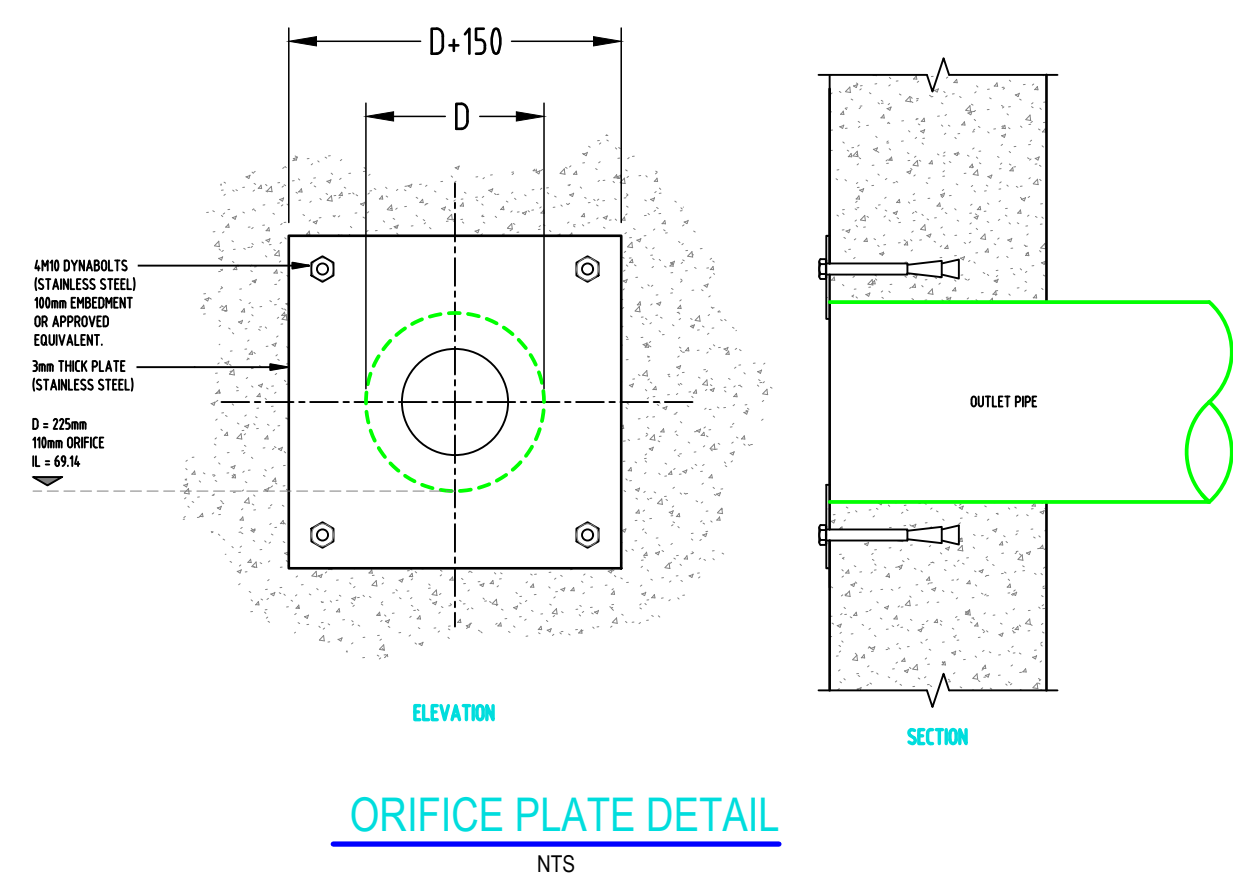
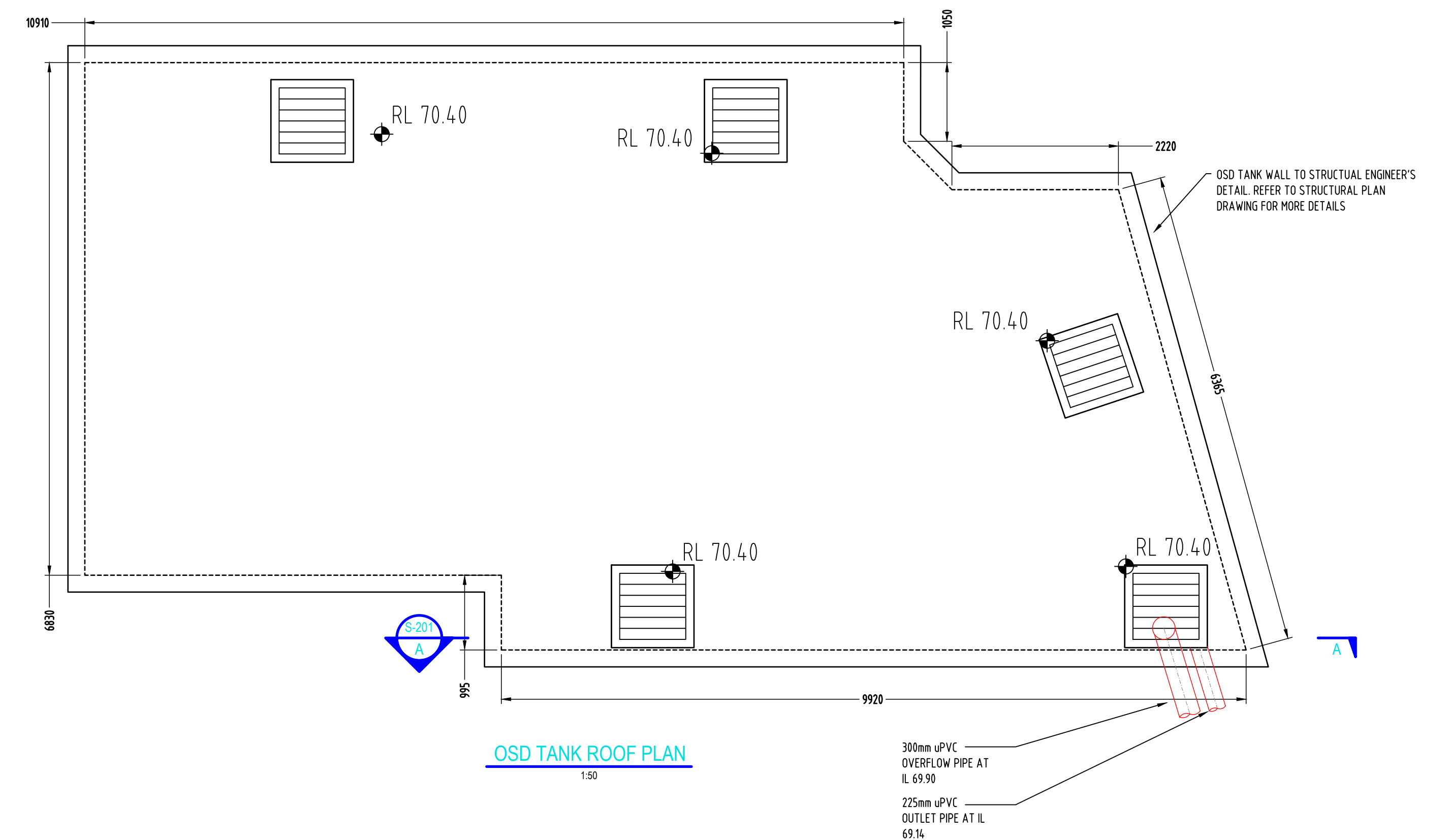
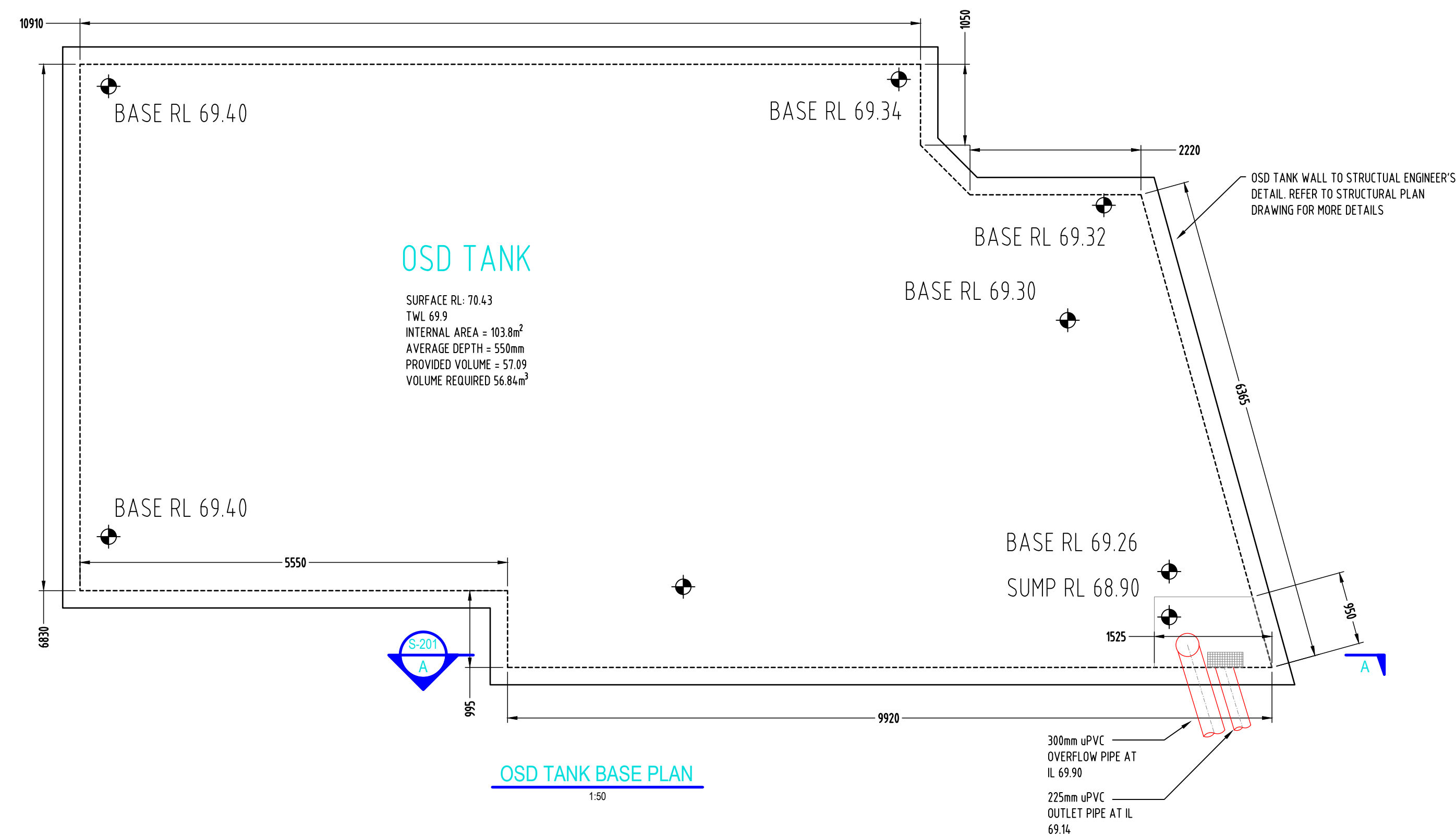
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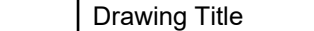
Project
**3 HOLDSWORTH
AVENUE, ST LEONARDS
2065**

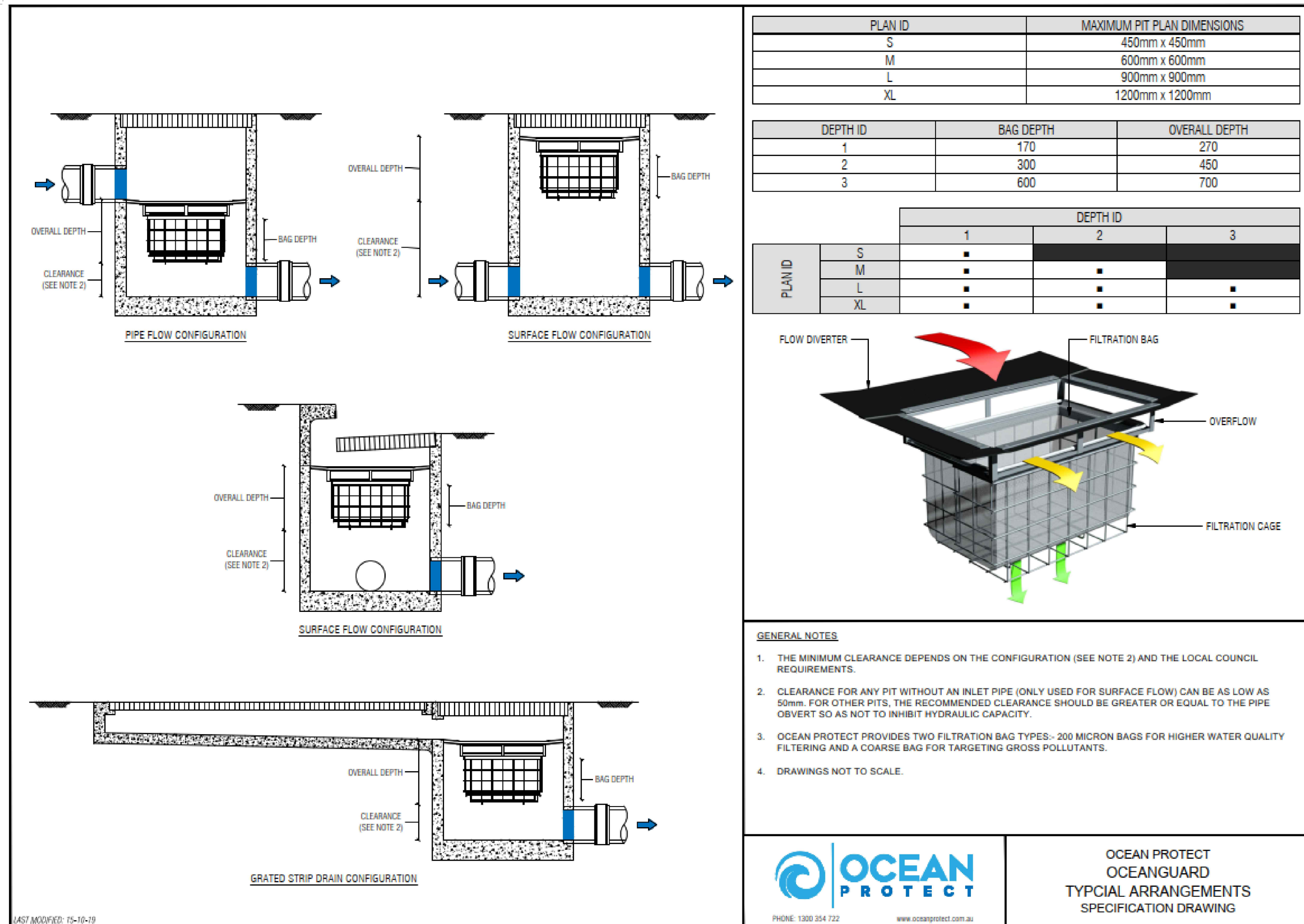
Drawing Title
**HYDRAULIC SERVICES
LEVEL 1 STORMWATER
MANAGMENT PLAN**

Scale:	1:100	Drawn:	YS
Project No:	24014	Designed:	JL
Drg No:	S-107	Verified:	TL
NOT FOR CONSTRUCTION		Revision:	P1



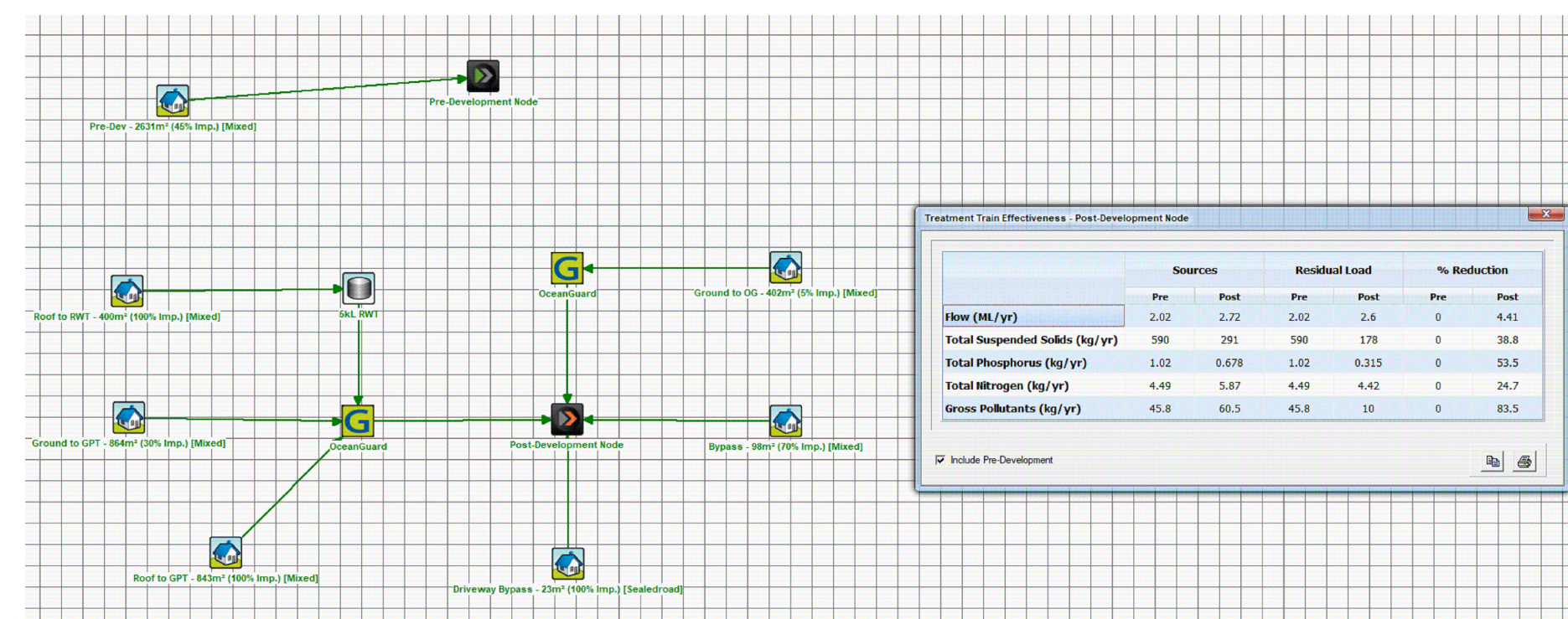
ONSITE DETENTION CALCULATION SHEET			
DEVELOPMENT TYPE		RESIDENTIAL DEVELOPMENT	
ADDRESS		3 HOLDSWORTH AVENUE, ST LEONARDS	
Site Area	2631	m ²	[A]
Total Impervious area (roofs, driveways, hardstand...)	1548	m ²	[B]
Total area draining to the storage Facility (impervious and pervious)	1982	m ²	[C]
New Impervious area bypassing the Storage Facility	247	m ²	[D]
	$\frac{[B] + [D]}{[B]}$	1.16	[E]
	<i>cannot be greater than 1.25</i>		
Permitted Site Discharge (PSD) rate per m ²			
If [D] = 0 then PSD = 0.014 L/sec/m ²			
If [D] ≠ 0 then PSD = 0.014x [E] ^{-1.37} L/sec/m ²			
		0.0114 l/sec/m ²	[F]
Permitted Site Discharge (l/s) [C]x[F]	22.654	l/sec	
Storage volume per m ²			
[G] = 0.0255 m ³ /m ² for all Catchments	0.026	m ³ /m ²	[G]
Site Storage Requirement ([C]+[D])x[G]	56.84	m ³	
Outlet control -Using a Sharp Edge Orifice Plate			
Hieght difference between top water level and centre of Orifice (m)	0.79	m	[H]
Orifice Diameter (mm)	$21.9 \times \sqrt{\frac{PSD}{[H]}}$	110	mm

REV	DESCRIPTION	DATE	REV	DESCRIPTION	DATE	Client NEW GOLDEN ST LEONARDS PTY LTD Suite 11/30 Atchison St, St Leonards NSW 2065	Architect PTW ARCHITECTS Level 11, 88 Phillip Street, Sydney 2000 T: +61 2 9232 5877 W: ptw.com.au	Hydraulic Consultant TDL ENGINEERING CONSULTING PTY LTD 60/14 Harbord Way, Belmore, NSW 2065 Telephone : +61 2 9986 1355 Email : office@tdlengineering.com.au		Project 3 HOLDSWORTH AVENUE, ST LEONARDS 2065	Drawing Title STORMWATER SERVICES OSD DETAIL AND SECTIONS	Scale:	AS SHOWN	Drawn:	YS
01	DA APPLICATION	12.11.24										Project No:	24014	Designed:	JL
												Drg No:	S-201	Verified:	TL
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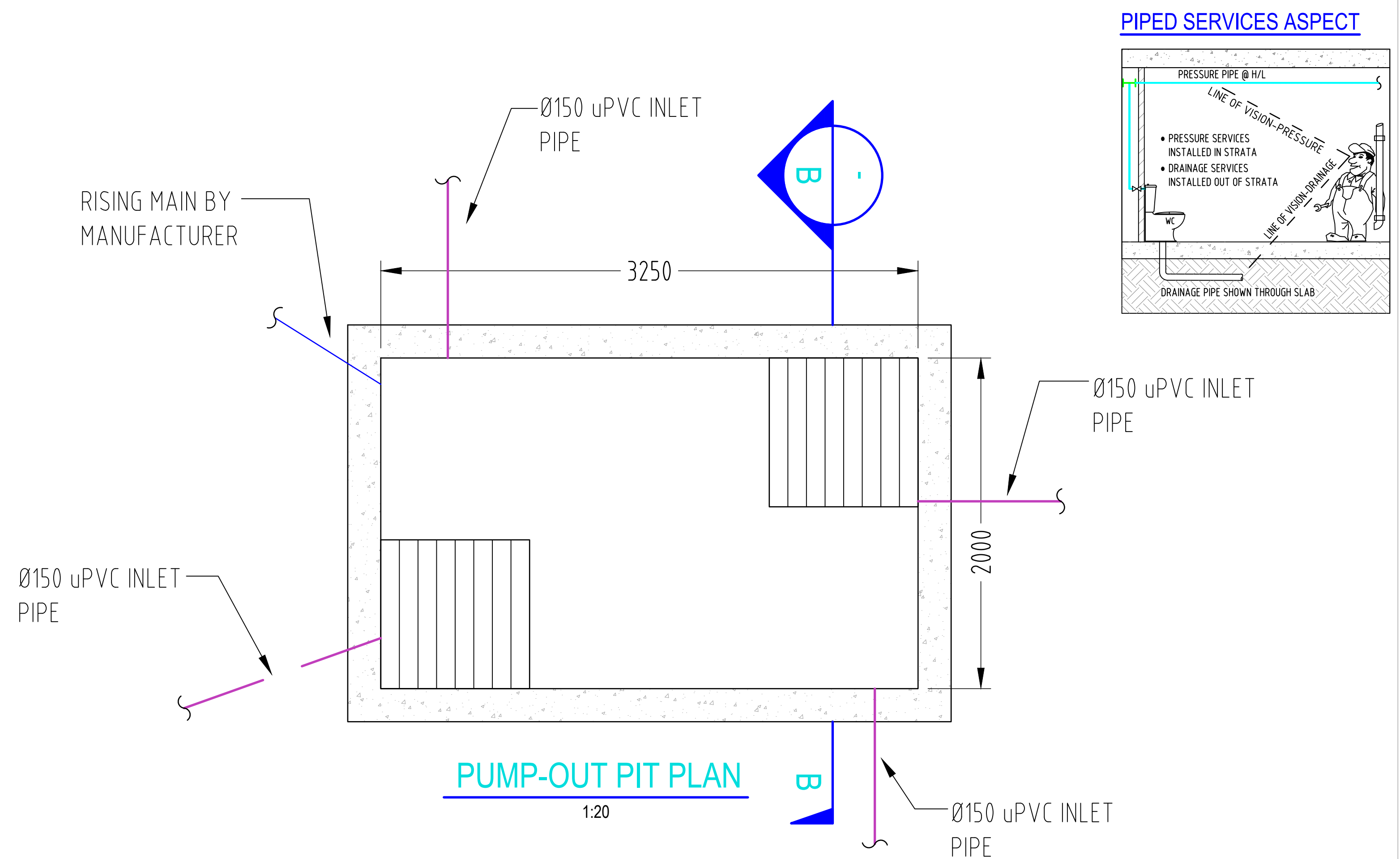
OCEANGAURD BASKET DETAIL

NTS



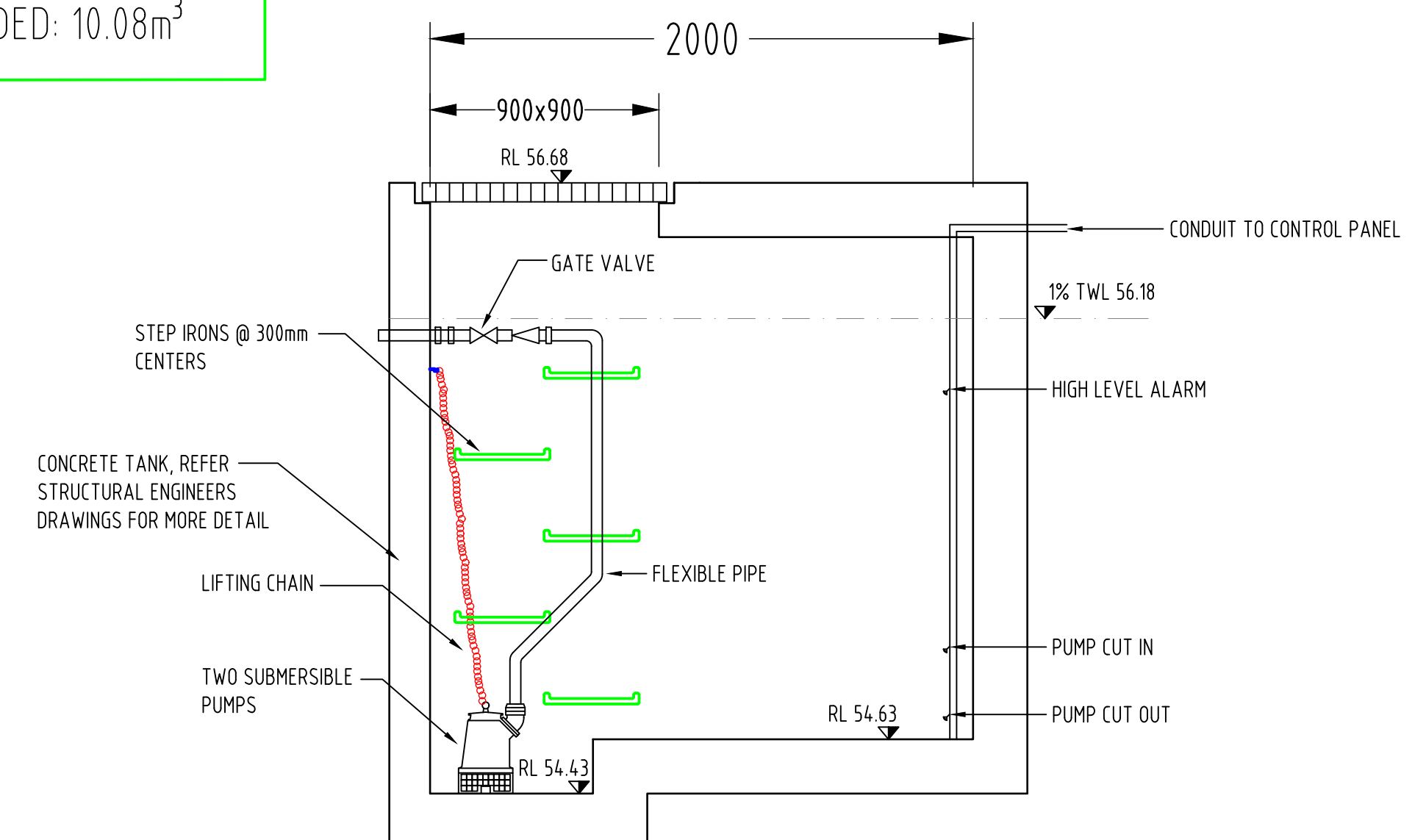
WATER QUALITY TREATMENT TRAIN MODEL

NTS



PUMP OUT TANK

WATER PONDING DEPTH: 1.55m
WIDTH: 2.00m
LENGTH: 3.250m
VOLUME PROVIDED: 10.08m³



REV	DESCRIPTION	DATE	REV	DESCRIPTION	DATE	Client	Architect	Hydraulic Consultant	Project	Drawing Title	Scale:	AS SHOWN	Drawn:	YS
01	DA APPLICATION	12.11.24				NEW GOLDEN ST LEONARDS PTY LTD	PTW ARCHITECTS	TDL ENGINEERING CONSULTING PTY LTD	3 HOLDSWORTH AVENUE, ST LEONARDS 2065	STORMWATER SERVICES MUSIC MODEL DETAIL SHEET	Project No:	24014	Designed:	JL
						Suite 11/30 Atchison St, St Leonards NSW 2065	Level 11, 88 Phillip Street, Sydney 2000 T: +61 2 9232 5877 W: ptw.com.au	60/14 Narabang Way, Belmore, NSW 2065 Telephone: +61 2 9986 1355 Email: office@tdeengineering.com.au			Drg No:	S-202	Verified:	TL
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