

CIVIL DESIGN

FOR PROPOSED DEVELOPMENT AT

20-22 Mindaire St, 30 Pinaroo Pl Lane Cove North, NSW

GENERAL NOTES

- ALL WORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH THE NOMINATED OR APPLICABLE COUNCIL SPECIFICATION.
- THE CONTRACTOR SHOULD REPORT ANY DISCREPANCIES ON THE DRAWINGS TO THE ENGINEER RESPONSIBLE FOR THE DESIGN.
- IT IS THE RESPONSIBILITY OF THE TENDERER TO SEEK CLARIFICATION WHERE DOCUMENTATION IS CONFLICTING OR UNCLEAR, WHERE NO CLARITY IS OBTAINED, THE TENDERER IS TO ALLOW FOR BOTH INTERPRETATIONS IN THEIR PRICING.
- CONTRACTOR IS NOT TO ENTER UPON NOR DO ANY WORK WITHIN ADJACENT LANDS WITHOUT THE PERMISSION OF THE OWNER.
- SURPLUS EXCAVATED MATERIAL SHALL BE PLACED WHERE DIRECTED OR REMOVED FROM SITE.
- ALL NEW WORKS SHALL MAKE A SMOOTH JUNCTION WITH EXISTING.
- ALL DRAINAGE LINES THOUGH ADJACENT LOTS SHALL BE CONTAINED WITHIN EASEMENTS CONFORMING TO COUNCIL'S STANDARDS.
- PRIOR TO COMMENCEMENT OF WORK, THE CONTRACTOR SHALL PROVIDE A TRAFFIC MANAGEMENT PLAN PREPARED BY AN ACCREDITED PERSON IN ACCORDANCE WITH RMS REQUIREMENTS, FOR ANY WORK ON OR ADJACENT TO PUBLIC ROADS, PLAN TO BE SUBMITTED TO COUNCIL & RMS AS REQUIRED.
- THESE PLANS SHALL BE A READ IN CONJUNCTION WITH OTHER RELEVANT CONSULTANTS' PLANS, SPECIFICATIONS, CONDITIONS OF DEVELOPMENT CONSENT AND CONSTRUCTION CERTIFICATE REQUIREMENTS.
- THE BUILDER/CONTRACTOR SHALL LOCATE ALL EXISTING PUBLIC UTILITY SERVICES WITHIN THE AREA DESIGNATED AS ROAD RESERVE PRIOR TO THE COMMENCEMENT OF ANY WORKS. ALL LOCATIONS AND LEVELS OF SERVICES SHALL BE REPORTED TO THE STORMWATER ENGINEER PRIOR TO THE COMMENCEMENT OF ANY WORKS TO ENSURE THERE ARE NO OBSTRUCTIONS IN THE LINE OF THE DRAINAGE DISCHARGE PIPES.
- THE BUILDER IS TO VERIFY ALL LEVELS ON SITE PRIOR TO COMMENCING CONSTRUCTION.
- ALL THE CLEANING EYES (OR INSPECTION EYES) FOR THE UNDERGROUND PIPES HAVE TO BE TAKEN UP TO THE FINISHED GROUND LEVEL FOR EASY IDENTIFICATION AND MAINTENANCE PURPOSES.
- ALL TERRACE FLOOR AND PLANTER GRATES TO HAVE FIRE COLLARS FITTED.
- ALL PITS HAVING AN INTERNAL DEPTH THAT EXCEEDS 1.0m SHALL BE PROVIDED WITH GALVANIZED STEEL IRONS AT 300 mm CENTRES PLACED IN A STAGGERED PATTERN AND SHALL BE IN ACCORDANCE WITH THE AUSTRALIAN STANDARDS AS4198-1994.
- BE LOCATED PRIOR TO THE COMMENCEMENT OF ANY WORKS ON SITE DETENTION STORAGE SHALL BE OF A NON-FLOATABLE MATERIAL SUCH AS DECORATIVE RIVER GRAVEL, BARK MULCHING SHALL NOT BE USED WITHIN THE DETENTION STORAGE AREA.
- PRIOR TO COMMENCING ANY WORKS ON THE SITE, THE BUILDER SHALL ENSURE THAT THE INVERT LEVELS OF WHERE THE SITE STORMWATER SYSTEM CONNECTION INTO COUNCIL'S KERB/DRAINAGE SYSTEM MATCH THE DESIGN LEVELS. ANY DISCREPANCIES SHALL BE REPORTED TO THE DESIGN ENGINEER IMMEDIATELY.
- GREENVIEW IS NOT RESPONSIBLE FOR THE ACCURACY OF ANY SURVEY INFORMATION PROVIDED ON THIS DRAWING.
- ALL LEVELS SHOWN ARE EXPECTED TO BE TO A H.D.
- ALL CHANGES AND LEVELS ARE IN METERS, AND DIMENSIONS IN MILLIMETRES, UNLESS NOTED OTHERWISE.
- THE SURVEY INFORMATION ON THIS DRAWING HAS BEEN PROVIDED BY THE ARCHITECT.
- CONTRACTORS SHALL ARRANGE FOR THE WORKS TO BE SET OUT BY A REGISTERED SURVEYOR.
- W.A.E DRAWINGS BY A REGISTERED SURVEYOR ARE REQUIRED PRIOR TO CERTIFICATION OF DRAINAGE.
- WHERE THESE PLANS ARE NOTED FOR DEVELOPMENT APPLICATION PURPOSES ONLY, THEY SHALL NOT BE USED FOR OBTAINING A CONSTRUCTION CERTIFICATE NOR USED FOR CONSTRUCTION PURPOSES WITHOUT WRITTEN APPROVAL.
- WATER TREATMENT DEVICES TO STRICTLY COMPLY WITH MANUFACTURING SPECIFICATIONS.

RAINWATER REUSE SYSTEM NOTES

- RAINWATER SUPPLY PLUMBING TO BE CONNECTED TO OUTLETS WHERE REQUIRED BY BASIX CERTIFICATE (BY OTHERS).
- NO DIRECT CONNECTION BETWEEN TOWN WATER SUPPLY AND THE RAINWATER SUPPLY.
- PROVIDE AN APPROVED STOP VALVE AND/OR PRESSURE LIMITING VALVE AT THE RAINWATER TANK.
- PROVIDE AT LEAST ONE EXTERNAL HOSE COCK ON THE TOWN WATER SUPPLY FOR FIRE FIGHTING.
- PROVIDE APPROPRIATE FLOAT VALVE AND/OR SOLENOID VALVES TO CONTROL TOWN WATER SUPPLY INLET TO TANK IN ORDER TO ACHIEVE THE TOP-UP INDICATED ON THE TYPICAL DETAIL.
- ALL PLUMBING WORKS ARE TO BE CARRIED OUT BY LICENSED PLUMBERS IN ACCORDANCE WITH AS/NZS3500.1 NATIONAL PLUMBING AND DRAINAGE CODE.
- PRESSURE PUMP ELECTRICAL CONNECTION TO BE CARRIED OUT BY A LICENSED ELECTRICIAN.
- ONLY ROOF RUN-OFF IS TO BE DIRECTED TO THE RAINWATER TANK SURFACE WATER INLETS ARE NOT TO BE CONNECTED.
- PIPE MATERIALS FOR RAINWATER SUPPLY PLUMBING ARE TO BE APPROVED MATERIALS TO AS/NZS3500.1 PART 1 SECTION 2 AND TO BE CLEARLY AND PERMANENTLY IDENTIFIED AS RAINWATER. THIS MAY BE ACHIEVED FOR BELOW GROUND PIPES USING IDENTIFICATION TAPE (MADE IN ACCORDANCE WITH AS2648) OR FOR ABOVE GROUND PIPES BY USING ADHESIVE PIPE MARKERS (MADE IN ACCORDANCE WITH AS1345).
- EVERY RAINWATER SUPPLY OUTLET POINT AND THE RAINWATER TANK ARE TO BE LABELLED 'RAINWATER' ON A METALLIC SIGN IN ACCORDANCE WITH AS1319.
- ALL INLETS AND OUTLETS TO THE RAINWATER TANK ARE TO HAVE SUITABLE MEASURES PROVIDED TO PREVENT MOSQUITO AND VERMIN ENTRY.
- ALL DOWNPIPES CHARGED TO THE RAINWATER TANK ARE TO BE SEALED UP TO GUTTER LEVEL AND BE PRESSURE TESTED AND CERTIFIED.
- TOWN WATER CONNECTION TO RAINWATER TANK TO BE TO THE SATISFACTION OF THE REGULATORY AUTHORITY. THIS MAY REQUIRE PROVISION OF:
 - PERMANENT AIR GAP
 - BACKFLOW PREVENTION DEVICE

SAFETY IN DESIGN NOTES

THERE ARE INHERENT RISKS WITH CONSTRUCTING, MAINTAINING, OPERATING, DEMOLISHING, DISMANTLING AND DISPOSING. WE NOTE THIS DESIGN IS TYPICAL OF SIMILAR DESIGNS, AS FAR AS IS REASONABLY PRACTICABLE RISKS HAVE BEEN ELIMINATED OR MINIMISED THROUGH THE DESIGN PROCESS. HAZARD CONTROLS MUST STILL BE IMPLEMENTED BY THE CONTRACTOR, OWNER OR OPERATOR TO ENSURE THE SAFETY OF WORKERS. GREENVIEW ASSESSMENT DID NOT IDENTIFY ANY UNIQUE RISKS ASSOCIATED WITH THE DESIGN.

EARTHWORK NOTES

- IT IS THE CONTRACTORS RESPONSIBILITY TO LOCATE AND LEVEL ALL EXISTING SERVICES PRIOR TO THE COMMENCEMENT OF ANY EARTHWORKS.
- THE CONTRACTOR SHALL CLEAR THE SITE BY REMOVING ALL RUBBISH, FENCES AND DEBRIS ETC. TO THE EXTENT OF THE PROPOSED DEVELOPED AREA.
- PROVIDE PROTECTION BARRIERS TO PROTECTED/SENSITIVE AREAS PRIOR TO ANY BULK EXCAVATION.
- OVER FULL AREA OF EARTHWORKS, CLEAR VEGETATION, RUBBISH, SLABS ETC. AND STRIP TOP SOIL, AVERAGE 200mm THICK. REMOVE FROM SITE, EXCEPT TOP SOIL FOR RE-USE.
- CUT AND FILL OVER THE SITE TO LEVELS REQUIRED.
- PRIOR TO ANY FILLING IN AREAS OF CUT OR IN EXISTING GROUND, PROOF ROLL THE EXPOSED SURFACE WITH A ROLLER OF MINIMUM WEIGHT OF 5 TONNES WITH A MINIMUM OF 10 PASSES.
- EXCAVATE AND REMOVE ANY SOFT SPOTS ENCOUNTERED DURING PROOF ROLLING AND REPLACE WITH APPROVED FILL COMPACTED IN LAYERS. THE WHOLE OF THE EXPOSED SUBGRADE AND FILL SHALL BE COMPACTED TO 98% STANDARD MAXIMUM DRY DENSITY AT OPTIMUM MOISTURE CONTENT $\pm 2\%$.
- FOR ON SITE FILLING AREAS, THE CONTRACTOR SHALL TAKE LEVELS OF EXISTING SURFACE AFTER STRIPPING TOPSOIL AND PRIOR TO COMMENCING FILL OPERATIONS.
- WHERE HARD ROCK IS EXPOSED IN THE EXCAVATED SUB-GRADE, THIS WILL BE INSPECTED AND A DECISION MADE ON THE LEVEL TO WHICH EXCAVATION IS TAKEN.
- FILL IN 200mm MAXIMUM (LOOSE THICKNESS) LAYERS TO UNDERSIDE OF SUBGRADE USING THE BEST AVAILABLE MATERIAL AND COMPACTED TO 98% STANDARD (AS 1289 5.1.1). MAXIMUM DRY DENSITY AT OPTIMUM MOISTURE CONTENT $\pm 2\%$ SHOULD THERE BE INSUFFICIENT MATERIAL FROM SITE EXCAVATIONS, IMPORT AS NECESSARY CLEAN GRANULAR FILL TO APPROVE.
- COMPACTION TESTING SHALL BE CARRIED OUT AT THE RATE OF 2 TESTS PER 1000SQ METRES PER LAYER BY A REGISTERED NATA LABORATORY. THE COSTS OF TESTING AND RE-TESTING ARE TO BE ALLOWED FOR BY THE BUILDER.
- BATTERS TO BE AS SHOWN, OR MAXIMUM 1 VERT : 4 HORIZ.
- ALL CONDUITS AND MAINS SHALL BE LAID PRIOR TO LAYING FINAL GRADE PIPE.
- ALL BATTERS AND FOOTPATHS ADJACENT TO ROADS SHALL BE TOP SOILED WITH 150mm APPROVED LOAM AND SEEDED UNLESS OTHERWISE SPECIFIED.

DRAINAGE INSTALLATION

RCP CONVENTIONAL

INSTALLATIONS & ROAD CROSSINGS

- SUPPLY & INSTALLATION OF DRAINAGE WORKS TO BE IN ACCORDANCE WITH THESE DRAWINGS, THE COUNCIL SPECIFICATION AND THE CURRENT APPLICABLE AUSTRALIAN STANDARDS.
- BACKFILL SHALL BE PLACED & COMPACTED IN ACCORDANCE WITH THE SPECIFICATION. A GRANULAR GRAVEL AGGREGATE MATERIAL (<10mm) BACKFILL IS RECOMMENDED FOR THE BEDDING, HAUNCH SUPPORT AND SIDE ZONE DUE TO ITS SELF COMPACTING ABILITY.
- A MINIMUM OF 150mm CLEARANCE IS TO BE PROVIDED BETWEEN THE OUTSIDE OF THE PIPE BARREL AND THE TRENCH WALL FOR PIPES < 600 DIA. 200mm MINIMUM CLEARANCE FOR PIPES 600 TO 1200 DIA AND 60mm CLEARANCE FOR PIPES > 1200 DIA.
- BEDDING OF THE PIPELINES IS TO BE TYPE 'HS2' IN ACCORDANCE WITH THE STANDARDS AND AS FOLLOWS:

a. COMPACTED GRANULAR MATERIAL IS TO COMPLY WITH THE FOLLOWING GRADINGS:

M	19	2.3600	0.6000	0.3000	0.1500	0.0750
% MASS PASSING	100	50-100	20-90	10-60	0-25	0-10

-AND THE MATERIAL PASSING THE 0.075 SIEVE HAVING LOW PLASTICITY AS DESCRIBED IN APPENDIX D OF AS1726.

b. BEDDING DEPTH UNDER THE PIPE TO BE 100mm.

c. BEDDING MATERIAL TO BE EXTENDED FROM THE TOP OF THE BEDDING ZONE UP TO 0.3 TIMES PIPE OUTSIDE DIAMETER. THIS REPRESENTS THE 'HAUNCH ZONE'.

d. THE BEDDING & HAUNCH ZONE MATERIAL IS TO BE COMPACTED TO A MINIMUM RELATIVE COMPACTION OF 98% WITHIN ROAD RESERVES AND TRAFFICABLE AREAS AND 95% ELSEWHERE FOR COHESIVE MATERIAL OR A MINIMUM DENSITY INDEX OF 70% IN ACCORDANCE WITH THE STANDARDS FOR COHESIONLESS MATERIAL.

e. COMPACTION TESTING SHALL BE CARRIED OUT BY AN APPROVED ORGANISATION WITH A NATA CERTIFIED LABORATORY FOR ALL DRAINAGE LINES LAID WHOLLY OR IN PART UNDER THE KERB & GUTTER OR PAVEMENT

ROOF DRAINAGE

- ALL ROOF DRAINAGE IS TO BE DESIGNED AND INSTALLED IN ACCORDANCE WITH THE CURRENT APPLICABLE AUSTRALIAN STANDARDS INCLUDING AS3500.3, NCC AND COUNCIL'S SPECIFICATIONS.
- DOWNPIPES SHOWN ARE INDICATIVE ONLY. REFER ARCHITECTURALS FOR FINAL LOCATIONS.
- ALL DOWNPIPES TO BE CONSTRUCTED OF ONE MATERIAL FOR AESTHETICS REASONS AND PAINTED TO PROTECT THEM AGAINST ULTRA-VIOLET LIGHT DAMAGE, UNLESS APPROVED OTHERWISE BY THE PROJECT ARCHITECT.
- ALL DOWNPIPES TO HAVE LEAF GUARDS.
- ALL EAVES GUTTERS ARE TO BE DESIGNED TO THE 5% AEP (20YR) STORM EVENTS UNO
- ALL EAVES GUTTER OVERFLOWS ARE TO BE IN ACCORDANCE WITH AS3500.3 G3
- ALL BOX GUTTERS ARE TO BE DESIGNED TO CATER TO THE 1% AEP (100YR) STORM EVENTS UNO
- IN ACCORDANCE WITH AS3500.3 CLAUSE 3.7.6 G, BOX GUTTERS SHALL:
 - BE STRAIGHT (WITHOUT CHANGE IN DIRECTION)
 - HAVE A HORIZONTAL CONSTANT WIDTH BASE (SOLE) WITH VERTICAL SIDES IN A CROSS-SECTION
 - HAVE A CONSTANT LONGITUDINAL SLOPE BETWEEN 1:200 AND 1:40.
 - DISCHARGE AT THE DOWNSTREAM END WITHOUT CHANGE OF DIRECTION (I.E. NOT TO THE SIDE); AND
 - BE SEALED TO THE RAINHEADS AND SUMPS
- GREENVIEW RECOMMENDS THAT THE BUILDER VERIFIES THAT ANY AND ALL BOX GUTTERS HAVE BEEN DESIGNED BY A QUALIFIED CIVIL ENGINEER PRIOR TO THE COMMENCEMENT OF WORKS.
- GREENVIEW RECOMMENDS A SPECIFIC INSPECTION AND CERTIFICATION BY A QUALIFIED CIVIL ENGINEER OF ANY AND ALL BOX GUTTERS INSTALLED ON THE PROJECT PRIOR TO OCCUPATION CERTIFICATE
- ALL DOWNPIPES ARE TO BE PIPE CONNECTED INTO THE FORMAL RAINWATER OR STORMWATER LINE UNLESS SPECIFICALLY NOTED ON THE DRAWINGS OTHERWISE.

STORMWATER DRAINAGE NOTES

- STORMWATER DRAINAGE SHALL BE GENERALLY IN ACCORDANCE WITH CURRENT AUSTRALIAN STANDARDS INCLUDING AS3500.3, NCC AND COUNCIL'S SPECIFICATION.
- MINIMUM PIT DIMENSIONS ARE TO BE IN ACCORDANCE WITH AS3500.3 TABLE 7.5.2.1 WHICH PROVIDES GUIDANCE ACCORDING TO PIT DEPTH U.N.O.

TABLE 7.5.2.1

MINIMUM INTERNAL DIMENSIONS FOR STORMWATER AND INLET PITS

Depth to invert of outlet	Minimum internal dimensions mm		
	Rectangular	Length	Circular
	Width		Diameter
≤450	350	350	—
≤600	450	450	600
>600 ≤900	600	600	900
>900 ≤1200	600	900	1000
>1200	900	900	1000

- PIPES OF 225mm DIA. AND UNDER SHALL BE UPVC
- PIPES OF 300mm DIA. AND OVER SHALL BE FRC OR CONCRETE CLASS 2 RUBBER RING JOINTED UNO.
- ALL FRC OR RCP STORMWATER PIPES WITHIN ROAD RESERVE AREAS TO BE CLASS 3 U.N.O. BY COUNCIL'S SPECIFICATION.
- PIPES SHALL GENERALLY BE LAID AT THE GRADES INDICATED ON THE DRAWINGS.
- MINIMUM COVER TO PIPES 300mm DIA. AND OVER GENERALLY SHALL BE 600mm IN CARPARK & ROADWAY AREAS UNO
- ALL PIPES LOCATED IN LANDSCAPE AREAS TO HAVE 300mm COVER, WHERE NOT POSSIBLE AND COVER IS BETWEEN 150mm AND 300mm USE SEWER GRADE PIPE.
- PIPES 225mm DIA AND OVER SHALL BE LAID AT 0.5% MIN. GRADE U.N.O.
- PIPES UP TO 150mm DIA SHALL BE LAID AT 1.0% MIN. GRADE U.N.O
- BACKFILL TRENCHES WITH APPROVED FILL COMPACTED IN 200mm LAYERS TO 98% OF STANDARD DENSITY.
- ANY PIPES OVER 16% GRADE SHALL HAVE CONCRETE BULKHEADS AT ALL JOINTS
- THE MINIMUM SIZES OF THE STORMWATER DRAINAGE PIPES SHALL NOT BE LESS THAN 90mm DIA FOR CLASS 1 BUILDINGS AND 100mm DIA FOR OTHER CLASSES OF BUILDING OR AS REQUIRED BY THE REGULATORY AUTHORITY.
- BUILD INTO UPSTREAM FACE OF ALL PITS A 3.0m SUBSOIL LINE FALLING TO GRADE PIPE.
- ALL LANDSCAPED PITS TO BE MIN 450 SQUARE U.N.O OR LARGER AS REQUIRED BY AS3500.3 TABLE 7.5.2.1
- GREENVIEW RECOMMENDS ALL COURTYARDS TO HAVE 450 SQUARE PLASTIC PIT INSTALLED WITH A 150mm DIA. CONNECTION TO FORMAL DRAINAGE SYSTEM.
- ALL DRIVEWAY PITS TO BE MIN 600 SQUARE U.N.O OR LARGER AS REQUIRED BY AS3500.3 TABLE 7.5.2.1
- ALL PLANTER BOXES AND BALCONIES TO BE CONNECTED TO THE PROPOSED STORMWATER DRAINAGE LINE.
- ALL STORMWATER DRAINAGE WORK TO AVOID TREE ROOTS. WHERE NOT POSSIBLE, ALL EXCAVATIONS IN VICINITY OF TREE ROOTS ARE TO BE HAND DUG.
- GEOTEXTILE FABRIC TO BE PLACED UNDER RIP RAP SCOUR PROTECTION WHERE APPLICABLE.
- ALL BASES OF PITS TO BE BENCHED (TO HALF PIPE DEPTH) TO THE INVERT OF THE OUTLET PIPE AND PROVIDE GALVANISED ANGLE SURROUNDINGS TO GRATE.
- ANY VARIATION TO THAT WORKS AS SHOWN ON THE APPROVED DRAWINGS ARE TO BE CONFIRMED BY THE ENGINEER PRIOR TO THE COMMENCEMENT.
- ALL BALCONIES AND ROOFS TO BE DRAINED AND TO HAVE SAFETY OVERFLOWS IN ACCORDANCE WITH RELEVANT AUSTRALIAN STANDARDS.
- ALL GRATES TO HAVE CHILDPROOF LOCKS
- ALL WORK WITHIN COUNCIL RESERVE AREAS TO BE INSPECTED BY COUNCIL PRIOR TO BACKFILLING.
- COUNCIL'S ISSUED DRAWING DESIGN LEVELS TO BE INCORPORATED INTO THE FINISHED LEVELS ONCE ISSUED BY COUNCIL.
- WATER PROOF ALL CONCRETE BALCONIES & ROOFS TO ARCHITECTS DETAILS
- ALL BALCONIES TO HAVE FLOOR WASTE AND 1% FALL WITH SAFETY OVERFLOW.
- ALL SUBSOIL DRAINAGE SHALL BE A MINIMUM OF Ø65mm AND SHALL BE PROVIDED WITH A FILTER SOCK. THE SUBSOIL DRAINAGE SHALL BE INSTALLED IN ACCORDANCE WITH DETAILS TO BE PROVIDED BY THE LANDSCAPE CONSULTANT.
- SUBSOIL DRAINAGE PIPES AND FITTINGS SHALL BE PERFORATED PLASTIC TO CURRENT AUSTRALIAN STANDARDS. LAY PIPES ON FLOOR OF TRENCH GRADED AT 1% MIN. AND OVERLAY WITH FILTER MATERIAL EXTENDING TO WITHIN 200mm OF SURFACE. PROVIDE FILTER FABRIC OF PERMEABLE POLYPROPYLENE BETWEEN FILTER MATERIAL AND TOPSOIL. PROVIDE FLUSHING EYES AT HIGH POINTS OR TO COUNCILS REQUIREMENTS.
- ALL GRATES IN AREAS OF FREQUENT PEDESTRIAN TRAFFIC (IE FOOTPATHS, WALKWAYS, ETC.) TO BE HEELPROOF GRATE.
- REFER ARCHITECTS DETAIL FOR GRATE FINISH (IE STAINLESS STEEL OR GALVANISED).
- GRATES TO BE IN ACCORDANCE WITH TABLE BELOW:

PIT GRATE INLINE TYPE

GRATE TYPE	TRAFFIC CONDITIONS
A - EXTRA LIGHT DUTY	FOOTWAYS AND AREAS ACCESSIBLE ONLY TO PEDESTRIANS AND PEDAL CYCLISTS.
B - LIGHT DUTY	FOOTWAYS THAT CAN BE MOUNTED BY VEHICLES.
C - MEDIUM DUTY	MALLS AND PEDESTRIAN AREAS OPEN TO SLOW MOVING COMMERCIAL VEHICLES.
D - HEAVY DUTY	CARRIAGEWAYS OF ROADS AND AREAS OPEN TO COMMERCIAL VEHICLES.

TABLE AS PER AS3696 - 2006. ENGINEER TO BE NOTIFIED IF LOAD CONDITIONS LISTED ABOVE ARE EXCEEDED.

- COVER TO PIPE TO BE AS PER TABLE BELOW:

COVER TABLE

LOCATION	PIPE TYPE	COVER
LANDSCAPE	PVC	300
LANDSCAPE (SINGLE DWELLING)	PVC	100
UNDER TRAFFICABLE AREA	PVC	100 BELOW UNDERSIDE OF PAVEMENT
CONCRETE	STEEL	NIL BELOW UNDERSIDE OF PAVEMENT
ROADS	RCP	500 BELOW UNDERSIDE OF PAVEMENT

STORMWATER DRAINAGE NOTES CONTINUED

- GREENVIEW'S STORMWATER SYSTEM HAS BEEN DESIGNED TO CAPTURE SURFACE RUNOFF FROM THE SITE ITSELF BUT DOES NOT INCORPORATE SPECIFIC GROUNDWATER CAPTIVITY. IN SOME CASES, GROUNDWATER INUNDATION MAY BE A SIGNIFICANT SOURCE OF WATER DURING A STORM EVENT. GREENVIEW RECOMMENDS THAT ALL RETAINING WALLS CLOSE TO HABITABLE AREAS BE FITTED WITH AN IMPERMEABLE MEMBRANE AND SUBSOIL DRAINAGE TO PREVENT GROUNDWATER INGRESS.
- GREENVIEW RECOMMENDS ALL IN-GROUND STORMWATER PIPE RUNS ARE SET OUT BY THE BUILDER PRIOR TO COMMENCEMENT OF WORKS. WHERE 300MM COVER IS NOT ACHIEVED, NOTIFY ENGINEER.
- WHERE STORMWATER DRAINAGE WORKS ARE TO BE UNDERTAKEN PRIOR TO THE CONSTRUCTION OF THE BUILDING, THE BUILDER IS TO SET OUT THE FLOOR LEVELS AND ENSURE PROPER STORMWATER DRAINAGE LEVELS AND BUILDING LEVELS ARE COMPATIBLE. NOTIFY ENGINEER IMMEDIATELY IF ANY DISCREPANCIES.

ON-SITE DETENTION

- ON-SITE DETENTION (OSD) TANKS ARE TO BE DESIGNED AND INSTALLED IN ACCORDANCE WITH THE CURRENT APPLICABLE AUSTRALIAN STANDARDS INCLUDING AS3500.3, NCC AND COUNCIL'S SPECIFICATIONS.
- IT IS CRITICAL THAT THE MINIMUM OSD VOLUME AS CALCULATED BY THE DESIGN AND NOTED ON THESE PLANS IS ACHIEVED ON SITE. VOLUMES TO BE VERIFIED BE REGISTERED SURVEYOR AND NOTED IN THE WAE SURVEY PRIOR TO CERTIFICATION.
- OSD VOLUME MAY BE ACHIEVED IN BELOW GROUND TANK, OR ABOVE GROUND PONDING, OR RAINWATER TANK OFFSET, OR INFLTRATION/ABSORPTION SYSTEM. EACH COUNCIL HAS SPECIFIC GUIDELINES FOR HOW STORMWATER FLOWS ARE TO BE CONTROLLED AND DISCHARGED.
- PONDING AND OVERFLOW LEVELS FROM THE OSD SHALL BE NOT LESS THAN 300mm BELOW ADJACENT HABITABLE FLOOR LEVELS OF BUILDINGS AND NOT LESS THAN 150mm BELOW NON-HABITABLE FLOOR LEVELS (AS3500.1 CLAUSE 7.10.1)

BELOW GROUND OSD TANKS

- THE HYDRAULIC CONTROL FOR THE STORAGE (USUALLY ORIFICE PLATE) SHALL BE FIRMLY FIXED IN PLACE TO PREVENT REMOVAL OR TAMPERING. A PLATE OF 3mm TO 5mm THICK STAINLESS STEEL WITH A CIRCULAR HOLE SHALL BE USED. PROVIDE:
 - IT IS MACHINED TO 0.5mm ACCURACY
 - IT RETAINS A SHARP EDGE; AND
 - THE ORIFICE DIAMETER IS NOT LESS THAN 25mm (AS 3500.3 CLAUSE 7.10.2)
- INSPECTION / ACCESS POINTS ARE PROVIDED ABOVE THE LOCATION OF THE OUTLET WITH DIMENSIONS AT LEAST 600mm x 600mm OR 600mm DIAMETER FOR STORAGE UP TO 800mm DEEP AND 600mm x 900mm FOR DEEPER STORAGE. THERE SHALL BE NO IMPEDIMENT TO THE REMOVAL OF DEBRIS THROUGH THIS OPENING. INSPECTION SHALL BE POSSIBLE WITHOUT RESIDENTS OR OWNERS HAVING TO REMOVE HEAVY ACCESS COVERS (AS3500.3 CLAUSE 7.10.2.b.i)
- WHERE STORAGE ARE NOT DEEP ENOUGH TO WORK IN (<1.5m DEEP), ACCESS SHALL BE PROVIDED AT INTERVALS OF APPROXIMATELY 10m TO ALLOW THE SYSTEM TO BE FLUSHED TO THE STORAGE OUTLET- ACCESS SHALL BE PROVIDED AT THE OUTLET (AS3500.3 CLAUSE 7.10.2.b.ii)
- A SUMP SHALL BE PROVIDED AT THE OUTLET, SET BELOW THE LEVEL OF THE MAIN STORAGE TO COLLECT DEBRIS. WHERE A DISCHARGE CONTROL PIT IS INCLUDED IN THE STORAGE- THIS SHALL CONTAIN A SUMP SET A MINIMUM OF 1.5 TIMES THE DIAMETER OF THE ORIFICE OF THE OUTLET BELOW THE CENTRE OF THE ORIFICE. SUMPS SHALL BE PROVIDED WITH WEED HOLES TO DRAIN OUT TO THE SURROUNDING SOIL, AND SHALL BE FOUNDED ON A COMPACTED GRANULAR BASE.
- WHERE THE DEPTH OF THE TANK EXCEEDS 1.2m, A LADDER IN ACCORDANCE WITH AS3500.3 CLAUSE 7.5.5.4 SHALL BE INSTALLED.
- BELOW GROUND OSD SYSTEMS SHALL CONFORM WITH AS2865.
- IN ACCORDANCE WITH AS3500.3 CLAUSE 7.10.2.D SCREENS (TRASH RACKS) WITH THE FOLLOWING CHARACTERISTICS SHOULD BE PROVIDED TO COVER EACH ORIFICE OUTLET:
 - FOR ORIFICES UP TO 150mm DIA., A FINE APERTURE-EXPANDED METAL MESH SCREEN WITH A MINIMUM AREA OF 1 TIMES THE AREA OF THE ORIFICE. FOR LARGER DIA. ORIFICES, A COARSER GRID MESH WITH A MINIMUM AREA OF 20 TIMES THE ORIFICE AREA MAY BE USED AS AN ALTERNATIVE.
 - STEEL SCREENS SHOULD BE STAINLESS STEEL OR HOT-DIP GALVANIZED
 - WHERE APERTURE-EXPANDED MESH SCREENS ARE EMPLOYED, THEY SHOULD BE POSITIONED SO THAT THE OVAL-SHAPED HOLES ARE HORIZONTAL, WITH THE PROTRUDING UP ANGLE UPWARDS AND FACING DOWNSTREAM. A HANDLE MAY BE FITTED TO ENSURE CORRECT ORIENTATION AND EASY REMOVAL FOR MAINTENANCE.
 - SCREENS SHOULD BE PLACED SUCH THAT THE 45 DEGREES TO THE HORIZONTAL IN SHALLOW STORAGE UP TO 600mm DEEP, IN DEEPER OR MORE REMOTE LOCATIONS, THE MINIMUM ANGLE SHOULD BE 60 DEGREES TO THE HORIZONTAL.
- IF THE BELOW GROUND OSD STORAGE IS SEALED, A VENT SHOULD BE PROVIDED TO EXPEL ANY NOXIOUS GASES (AS3500.3 CLAUSE 7.10.2.D.B).
- THE STORAGE SHOULD BE DESIGNED TO FILL WITHOUT CAUSING OVERFLOWS IN UPSTREAM CONDUITS DUE TO BACKWATER EFFECTS (AS3500.3 CLAUSE 7.10.2.D.C)
- BELOW GROUND STORAGE SHALL BE CONSTRUCTED OF CONCRETE, MASONRY, ALUMINIUM/ZINC AND ALUMINIUM/ZINC/MAGNESIUM ALLOY-COATED STEEL, ZINC-COATED STEEL, GALVANISED IRON OR PLASTICS (AS3500.3 7.10.3)

ABOVE GROUND OSD TANKS

- WHERE ABOVE-GROUND OSD SYSTEMS ARE PROPOSED TO BE LOCATED IN LANDSCAPED AREAS THE FOLLOWING CRITERIA IS RECOMMENDED IN ACCORDANCE WITH AS3500.3:
 - A DESIRABLE MINIMUM SLOPE FOR SURFACES DRAINING TO AN OUTLET TO BE 1:60. AND AN ABSOLUTE MINIMUM SLOPE TO BE 1:100.
 - THE DESIRABLE MAXIMUM DEPTH OF PONDING UNDER DESIGN CONDITIONS TO BE 300mm.
 - STORAGE VOLUMES IN LANDSCAPING AREAS TO BE INCREASED BY 20% TO ALLOW FOR VEGETATION GROWTH, CONSTRUCTION INACCURACIES AND POSSIBLE FILLING.
 - SUBSOIL DRAINS TO BE PROVIDED AROUND OUTLETS TO PREVENT THE GROUND BECOMING SATURATED DURING PROLONGED WET WEATHER; AND
 - WHERE THE STORAGE IS LOCATED IN AREAS WHERE FREQUENT PONDING WOULD CAUSE MAINTENANCE PROBLEMS OR INCONVENIENCE, THE FIRST 10% TO 20% OF THE STORAGE SHOULD BE IN AN AREA THAT CAN TOLERATE FREQUENT INUNDATION, SUCH AS A PAVED OUTDOOR ENTERTAINMENT AREA, A SMALL UNDERGROUND TANK, A PERMANENT WATER FEATURE OR A ROCKERY.
- WHERE ABOVE-GROUND OSD SYSTEMS ARE PROPOSED TO BE LOCATED IN DRIVEWAY AND CAR PARK STORAGE, THE FOLLOWING CRITERIA IS RECOMMENDED IN ACCORDANCE WITH AS3500.3 N12.B:
 - DEPTHS OF PONDING TO NOT EXCEED 200mm UNDER DESIGN CONDITIONS
 - TRANSVERSE PAVING SLOPES WITHIN STORAGE TO BE NOT LESS THAN 1:40. AND
 - WHERE THE STORAGE IS LOCATED IN COMMONLY USED AREAS WHERE PONDING WOULD CAUSE INCONVENIENCE, PART OF THE STORAGE SHOULD BE PROVIDED IN AN AREA OR FORM THAT WILL NOT CAUSE A NUISANCE.

MAINTENANCE SCHEDULE: ON SITE DETENTION (OSD)

ALL OSD MAINTENANCE TASKS SHOULD BE UNDERTAKEN AFTER A SIGNIFICANT STORM EVENT

6 MONTHLY

ELEMENT	TASK	DESCRIPTION / ACTION
ORIFICE PLATE	INSPECT FOR BLOCKAGE	CHECK PLATE FOR BLOCKAGE AND CLEAN
TRASH SCREEN	CHECK / CLEAN	CHECK AND CLEAN TRASH SCREEN
PIT SUMP	CHECK FOR SEDIMENT	CHECK FOR SEDIMENT / LITTER / SLUDGE AND CLEAN-OUT
GRATED LIDS	CHECK FOR DAMAGE	CHECK FOR CORROSION OR OTHER DAMAGE AND REPAIR / REPLACE AS NEEDED
	CLEAR BLOCKAGES	CHECK AND CLEAR BLOCKAGES
STORAGE LIDS	CHECK	REMOVE DEBRIS / MULCH / LITTER / SEDIMENT
OUTLET PIPES	CHECK FOR BLOCKAGES	CHECK / CLEAN / FLUSH OUTLET PIPES, REMOVE ANY BLOCKAGES
STEP IRONS	CHECK FIXING	ENSURE STEP-IRON FIXINGS ARE SECURE AND REPAIR AS NEEDED

ANNUALLY

ELEMENT	TASK	DESCRIPTION / ACTION
ORIFICE PLATE	CHECK ATTACHMENT	ENSURE PLATE IS MOUNTED SECURELY, TIGHTEN AND SEAL GAPS AS REQUIRED
TRASH SCREEN	CHECK ATTACHMENT	ENSURE PLATE IS MOUNTED SECURELY, TIGHTEN AND SEAL GAPS AS REQUIRED
	CHECK CORROSION	CHECK TRASH SCREEN FOR CORROSION, ESPECIALLY AT CORNERS NEAR WELDS AND REPAIR / REPLACE AS NEEDED
STEP IRONS	CHECK FOR CORROSION	EXAMINE STEP IRONS AND REPAIR ANY DAMAGE
INTERNAL WALLS	CHECK	CHECK FOR CRACKS / SPALLING AND REPAIR AS NEEDED
OSD SURROUNDS	CHECK FOR SUBSIDENCE	CHECK FOR SUBSIDENCE (WHICH MAY INDICATE LEAKS) AND REPAIR AS NEEDED

5-YEARLY

ELEMENT	TASK	DESCRIPTION / ACTION
ORIFICE PLATE	CHECK ORIFICE PLATE	CHECK ORIFICE SIZE AGAINST WAE AND CHECK FOR FITTING / SCARRING. REPLACE IF NECESSARY

COLOUR LEGEND

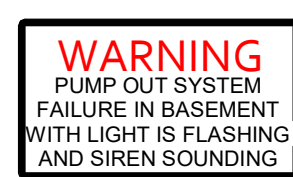
NEW (REFER TO SCHEDULES FOR COLOUR DEFINITION)

EXISTING

REMOVED OR RELOCATED

GREENVIEW CIVIL SHEET LIST		
No.	SHEET NAME	REV.
C01	NOTES & LEGENDS	2
C02	BASEMENT 2 DRAINAGE PLAN	2
C03	BASEMENT 1 DRAINAGE PLAN	2
C04	GROUND FLOOR DRAINAGE PLAN	2
C05	SITE STORMWATER DETAILS SHEET 1	2

RECOMMENDED SAFETY SIGNS



BASEMENT PUMP OUT FAILURE WARNING SIGN

- SIGN SHALL BE PLACED IN A CLEAR AND VISIBLE LOCATION WHERE VEHICLES ENTER THE BASEMENT



CONFINED SPACE DANGER SIGN

- A CONFINED SPACE DANGER SIGN SHALL BE POSITIONED IN A LOCATION AT ALL ACCESS POINTS, SUCH THAT IT IS CLEARLY VISIBLE TO PERSONS PROPOSING TO ENTER THE BELOW GROUND TANKS CONFINED SPACE.
 - MINIMUM DIMENSIONS OF THE SIGN
 - 300mm x 450mm (LARGE ENTRIES, SUCH AS DOORS)
 - 250mm x 180mm (SMALL ENTRIES SUCH AS GRATES & MANHOLES)
- THE SIGN SHALL BE MANUFACTURED FROM COLOUR BONDED ALUMINIUM OR POLYPROPYLENE
- SIGN SHALL BE AFFIXED USING SCREWS AT EACH CORNER OF THE SIGN.

EXISTING SERVICES



ABBREVIATIONS

DP	DOWN PIPE
FF	PROPOSED FINISHED FLOOR LEVEL
GL	PROPOSED PIT SURFACE LEVEL
IL	PROPOSED PIT INVERT LEVEL
IO	INSPECTION OPENING
KGP	KERB & GUTTER
P	FINISHED PAVEMENT LEVEL
RCP	REINFORCED CONCRETE PIPE
RLG	ROLL KERB & GUTTER
RWO	FINISHED SURFACE LEVEL
RWT	RAINWATER DRAINAGE OUTLET
TK	PROPOSED RAINWATER TANK
TOW	TOP OF NEW KERB LEVEL
TWL	TOP OF NEW RETAINING WALL LEVEL
uPVC	TOP OF WATER LEVEL
VD	RIGID PVC PIPE
	VERTICAL DROPPER

PROPOSED DEVELOPMENT

20-22 Mindaire St, 30 Pinaroo Pl Lane Cove North, NSW

Blue CHP Limited

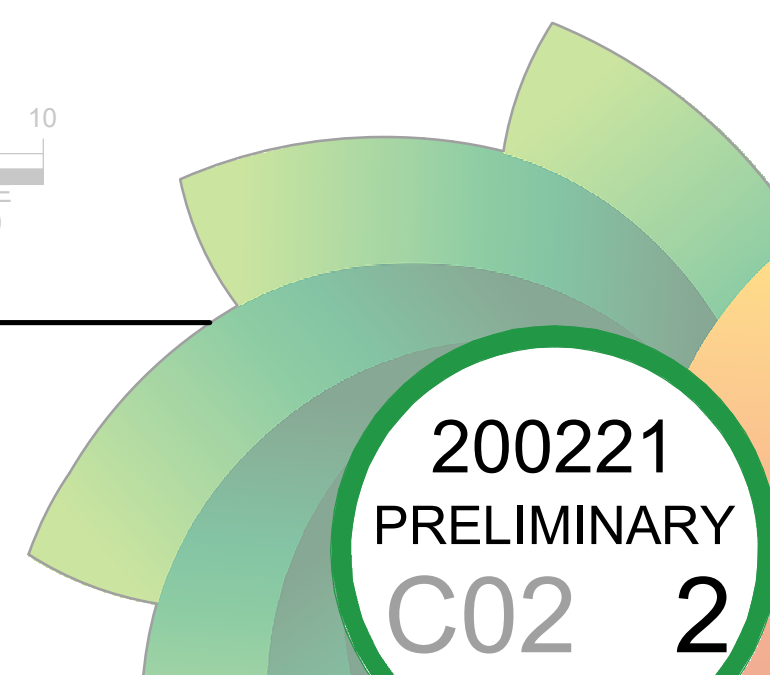
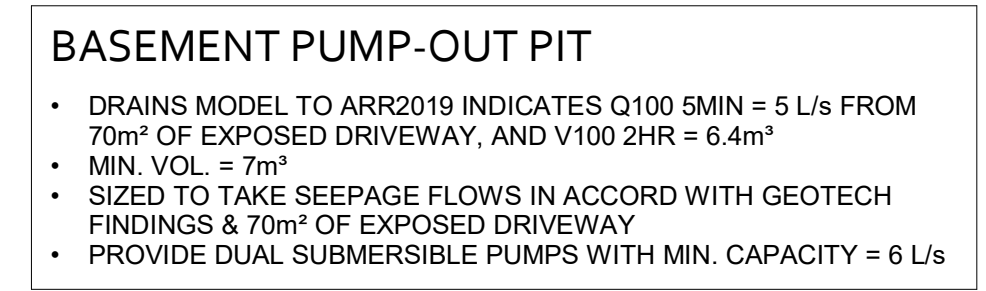


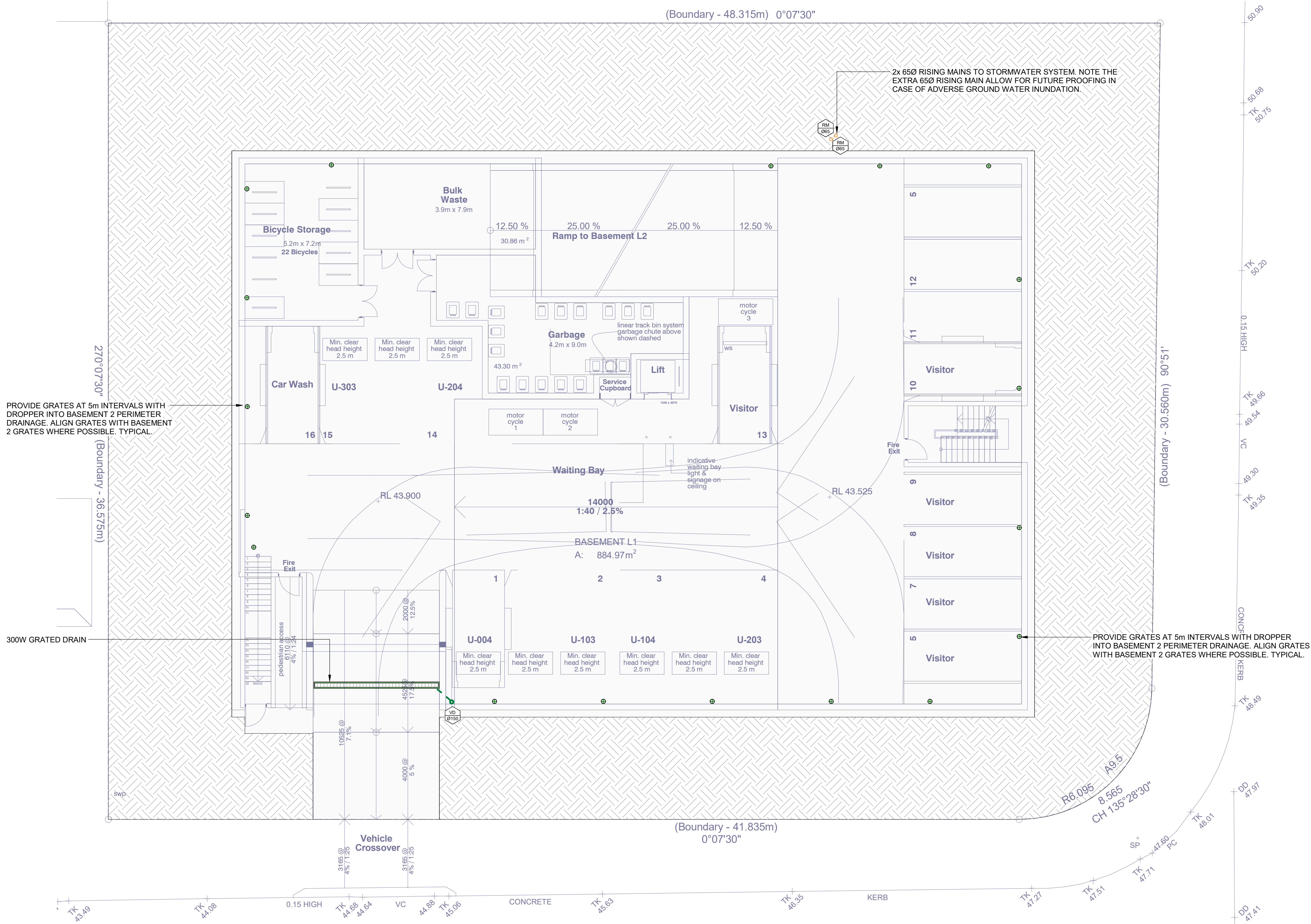
CIVIL DESIGN

NOTES & LEGENDS

REV.	DATE	BY	DESCRIPTION
2	18.11.20	JPS	ISSUED FOR APPROVAL
1	14.05.20	JPS	ISSUED FOR APPROVAL

200221
PRELIMINARY
C01 2





LEGEND		
	•	HARDSTAND
	•	EARTH

CIV - FIXTURES SCHEDULE		
	TYPE	DESCRIPTION
		GRADED STORMWATER PIT
		PERIMETER GRATES
		PERIMETER STRIP DRAIN
		RAINWATER OUTLET
	300W	GRADED STRIP DRAIN

CIV - STORMWATER SERVICES		
	TYPE	DESCRIPTION
	RM	RISING MAIN
	SS	SUB SOIL DRAINAGE
	STW	STORMWATER

BASEMENT 1 DRAINAGE PLAN
Scale: 1 : 100

- 1. ALL PIPES TO BE 100mmØ @ 1% MINIMUM UNLESS KNOWN OTHERWISE
- 2. ALL BASES OF PITS TO BE BENCHMARKED (TO HALF PIPE DEPTH) TO THE INVERT OF THE OUTLET PIPE WITH ALL PIPES CUT FLUSH WITH SIDE OF PIT, TO ALLOW SMOOTH FLOW OF STORMWATER
- 3. PROVIDE GALVANISED ANGLE SURROUNDINGS TO GRATE WHERE IN TRAFFICABLE AREAS.

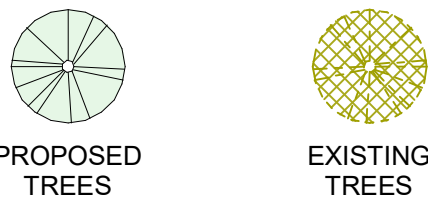
GROUND FLOOR DRAINAGE PLAN

Scale: 1 : 100

1. ALL NEW WORKS SHALL MAKE A SMOOTH JUNCTION WITH EXISTING.
2. THE BUILDER/CONTRACTOR SHALL LOCATE ALL EXISTING PUBLIC UTILITY SERVICES WITHIN THE SITE, FOOTPATH AREA AND ROAD RESERVE PRIOR TO THE COMMENCEMENT OF ANY WORKS. ALL LOCATIONS AND LEVELS OF SERVICES SHALL BE REPORTED TO THE STORMWATER ENGINEER PRIOR TO THE COMMENCEMENT OF ANY WORKS TO ENSURE THERE ARE NO OBSTRUCTIONS IN THE LINE OF THE DRAINAGE DISCHARGE PIPES.
3. PRIOR TO COMMENCING ANY WORKS ON THE SITE, THE BUILDER SHALL ENSURE THAT THE INVERT LEVELS OF WHERE THE SITE STORMWATER SYSTEM CONNECTION INTO COUNCIL'S KERB/DRAINAGE SYSTEM MATCH THE DESIGN LEVELS. ANY DISCREPANCIES SHALL BE REPORTED TO THE DESIGN ENGINEER IMMEDIATELY.
4. ALL STORMWATER DRAINAGE WORK TO AVOID TREE ROOTS. WHERE NOT POSSIBLE, ALL EXCAVATIONS IN VICINITY OF TREE ROOTS ARE TO BE HAND DUG.
5. ALL BASES OF PITS TO BE BENCHMARKED (TO HALF PIPE DEPTH) TO THE INVERT OF THE OUTLET PIPE WITH ALL PIPES CUT FLUSH WITH SIDE OF PIT, TO ALLOW SMOOTH FLOW OF STORMWATER.
6. PROVIDE GALVANISED ANGLE SURROUNDINGS TO GRATE WHERE IN TRAFFICABLE AREAS.
7. PROVIDE 100mm GAP IN BASE OF FENCE FOR EMERGENCY OVERFLOWS.
8. PROVIDE SUBSOIL DRAINAGE AND OUTLETS TO ALL ON PODIUM PLANTER BOXES. OUTLET PIPES NOT SHOWN FOR CLARITY OF DOCUMENTATION.
9. ALL DOWNPIPES ARE TO BE PIPE CONNECTED INTO THE FORMAL RAINWATER OR STORMWATER LINE UNLESS SPECIFICALLY NOTED ON THE DRAWINGS OTHERWISE.

GENERAL LEGEND

LANDSCAPE
LANDSCAPE ON PODIUM SLAB
HARDSTAND
ROOF AREA TO DRAIN

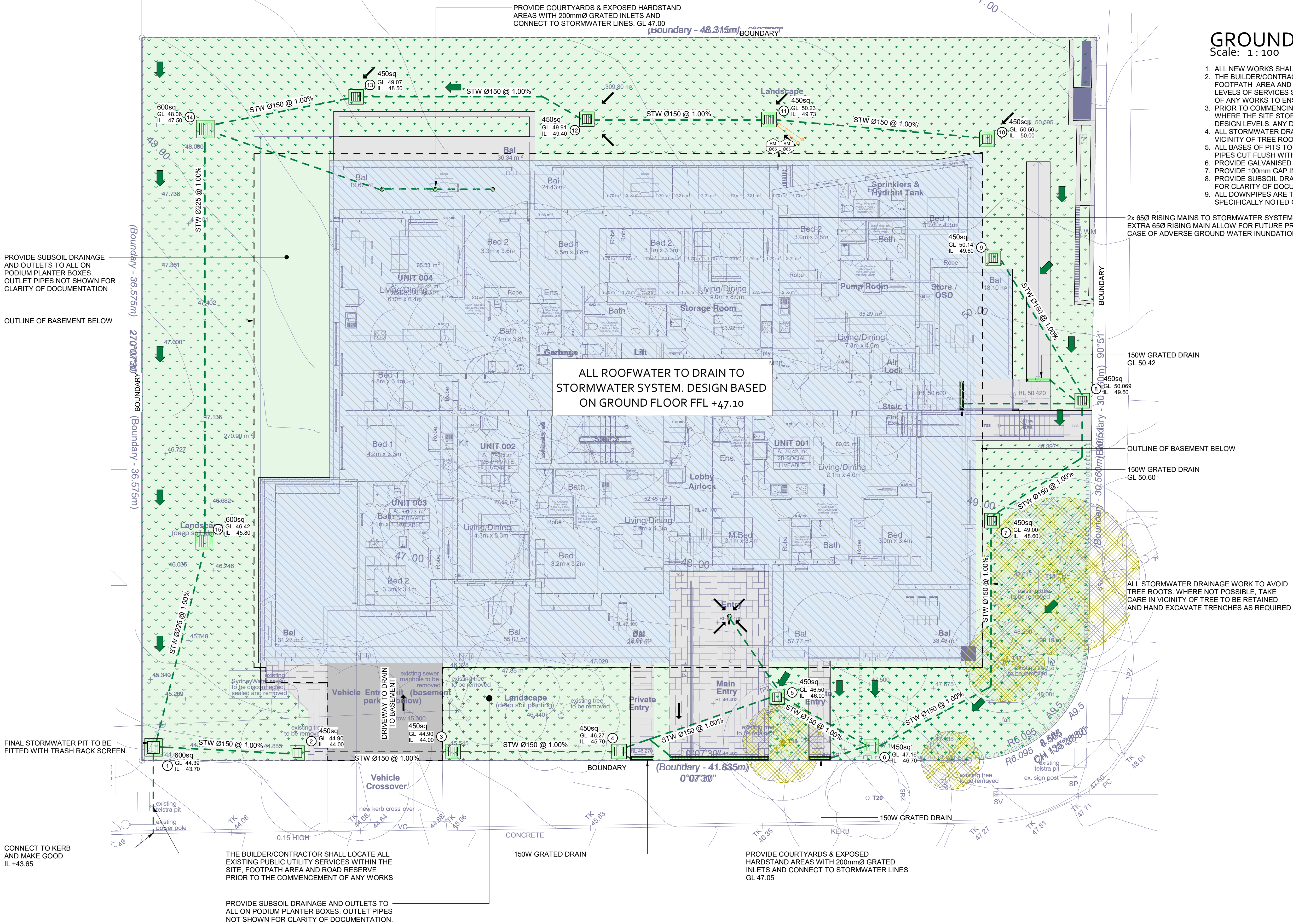


CIV - FIXTURES SCHEDULE		
	TYPE	DESCRIPTION
		GRATED STORMWATER PIT
		PERIMETER GRATES
		PERIMETER STRIP DRAIN
		RAINWATER OUTLET
	300W	GRATED STRIP DRAIN

CIV - STORMWATER SERVICES		
	TYPE	DESCRIPTION
	RM	RISING MAIN
	SS	SUB SOIL DRAINAGE
	STW	STORMWATER

OSD CALCULATIONS

- SITE IS WITHIN STRINGYBARK CK OSD EXEMPTION AREA. THUS NO OSD IS REQUIRED UNDER LANE COVER DCP2010 PART O 'STORMWATER MANAGEMENT'
- SITE AREA = 1751m²
- POST DEVELOPMENT IMPERVIOUS% = 57% AS PER ARCHITECTURAL CALCULATIONS



REV.	DATE	BY	DESCRIPTION
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PROPOSED DEVELOPMENT

20-22 Mindaire St, 30 Pinaroo PI Lane Cove North, NSW

Blue CHP Limited

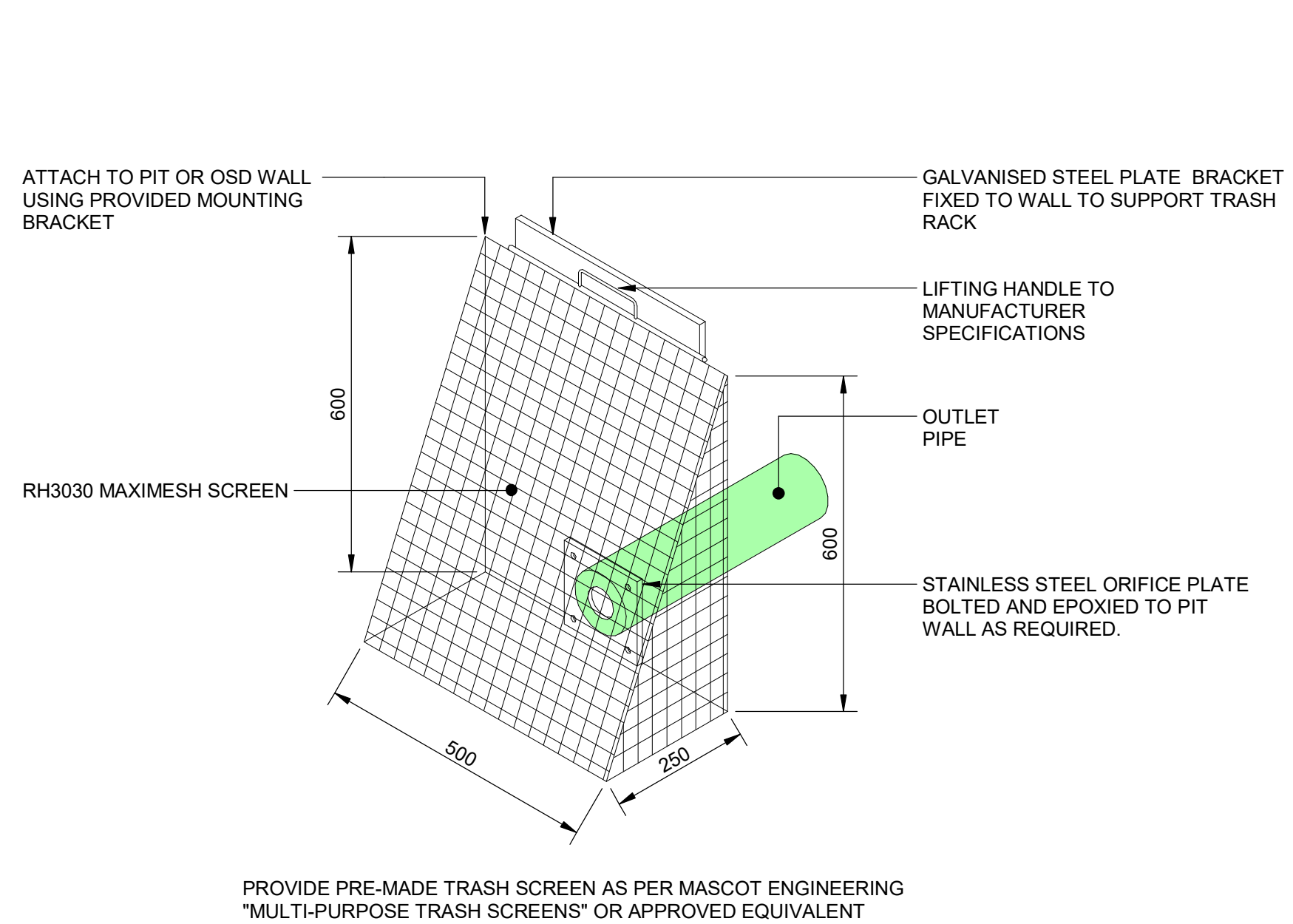


DESIGN: BV DRAWN: JPS CHECKED: AMcK SIZE: A1 SCALE: As indicated

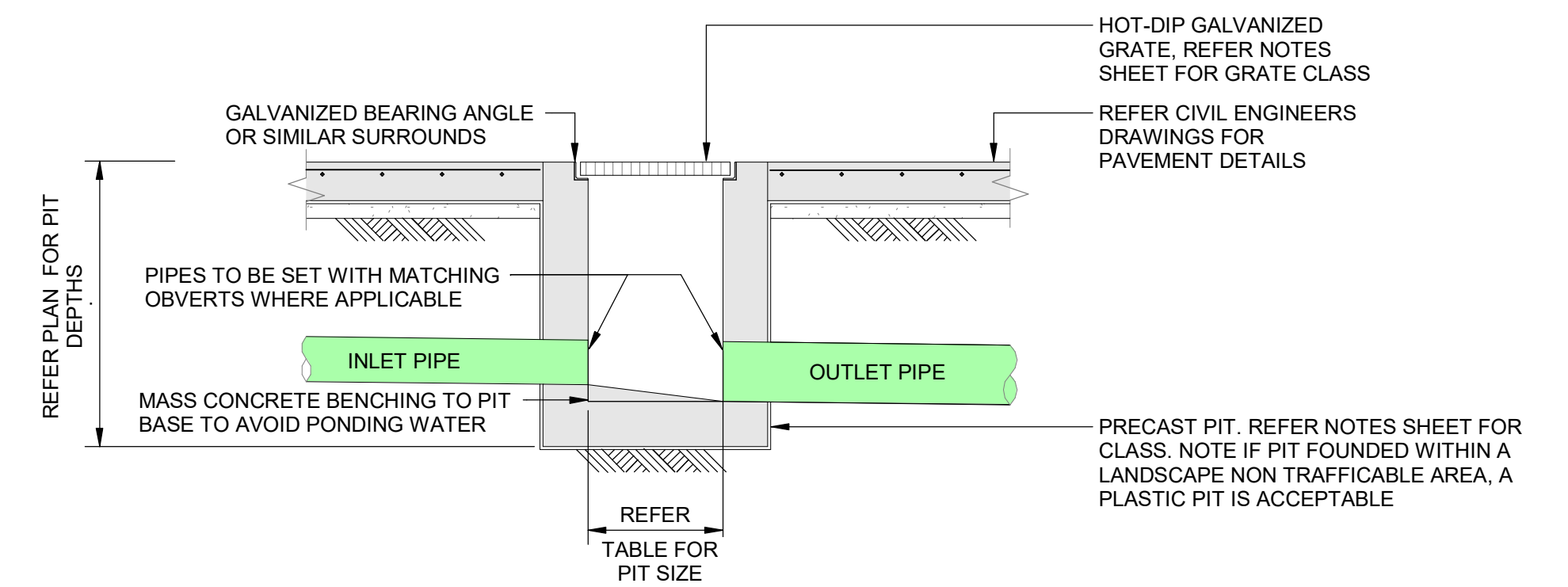
CIVIL DESIGN

GROUND FLOOR DRAINAGE PLAN

200221 PRELIMINARY C04 2



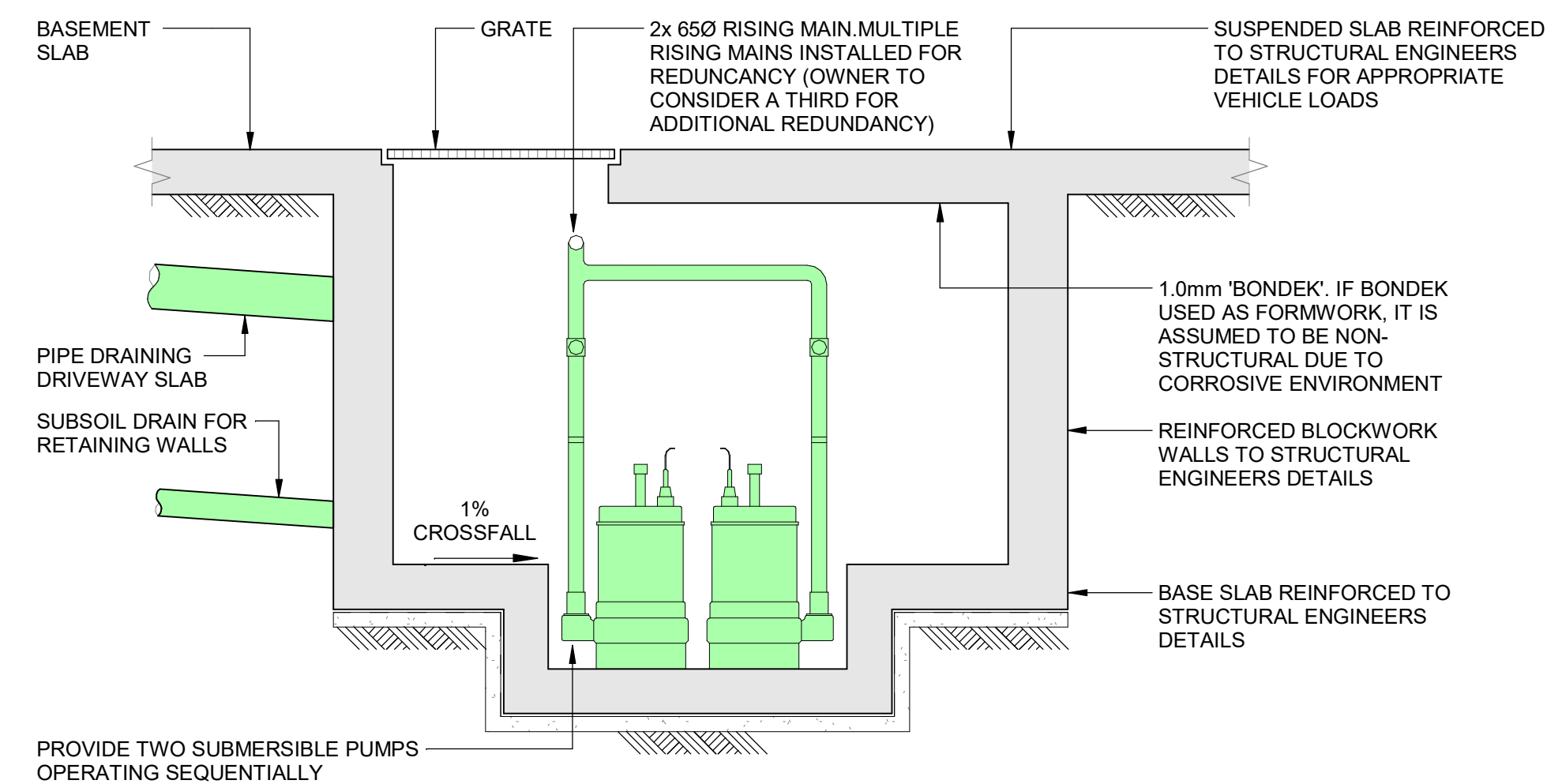
TYPICAL TRASH SCREEN DETAIL
Scale: 1 : 10



1. ENSURE CLIMB IRONS ARE PROVIDED UNDER LID AT 300 CTS TO COUNCIL'S SPECIFICATIONS WHERE PIT DEPTH IS DEEPER THAN 1000.
2. GREENVIEW RECOMMENDS THE PLUMBER PROVIDES 90Dia x 3000 LONG SUBSOIL DRAINAGE STUB PIPE SURROUNDED WITH 100mm THICKNESS OF NOMINAL 20mm COARSE FILTER MATERIAL WRAPPED IN GEOTEXTILE FILTER FABRIC. (BIDUM A24 OR APPROVED SIMILAR). TO BE PARALLEL TO UPSTREAM SIDE OF EACH INLET PIPE.

PIT SIZE	
DEPTH	PIT DIMENSION
0 - 600	450 mm x 450 mm
600 - 900	600 mm x 600 mm
900 - 1200	600 mm x 900 mm
1200 +	900 mm x 900 mm

TYPICAL CONCRETE INLET PIT - CONCRETE SURFACE
Scale: 1 : 20



NOTES:
1. REFER TO HYDRAULIC ENGINEERS DETAILS FOR PUMP SPECIFICATIONS.

BASEMENT PUMPOUT TANK DETAIL
Scale: 1 : 20

PROPOSED DEVELOPMENT			
20-22 Mindaire St, 30 Pinaroo PI Lane Cove North, NSW			
Blue CHP Limited			
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CIVIL DESIGN

SITE STORMWATER DETAILS SHEET 1

200221
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C05 2