

STORMWATER MANAGEMENT

38 UNDERCLIFF RD, FRESHWATER, NSW, 2096



STORMWATER

- ALL WORKS ARE TO BE UNDERTAKEN IN ACCORDANCE WITH THE FOLLOWING AUSTRALIAN STANDARDS AS2032, AS3500 AND AS3725 AS A MINIMUM.
- THESE PLANS ARE TO BE READ IN CONJUNCTION WITH THE FOLLOWING:
 - ARCHITECTURAL PLANS BY MHNDUNION, REVISION: PR01, DATED 02.10.24 , CONTACT: (02) 9101 1111
 - SURVEY PREPARED BY CMS SURVEYORS PTY LTD, DRAWING NO. 14689CDETAIL, DATE OF SURVEY: 3.09.24, CONTACT: 02 9971 4802
- ALL PIPES LESS THAN OR EQUAL TO Ø300mm IN SIZE ARE TO BE SOLVENT WELD-JOINTED UPVC CLASS SN8 U.N.O.
- ALL PIPES Ø375mm OR GREATER IN SIZE ARE TO BE MIN. CLASS 2 REINFORCED CONCRETE PIPE (RCP) OR FIBRE REINFORCED CONCRETE (FRC) RUBBER RING JOINTED (RRJ) U.N.O.
- ALL PIPES ARE TO BE LAID AT MIN. 1.0% GRADE U.N.O.
- PIPE BEDDING IS TO BE HS2 UNDER ROADS AND TRAFFICKED AREAS AND SHALL BE H2 IN LANDSCAPED AND PEDESTRIAN TRAFFICKED AREAS U.N.O.
- ALL PIPE BENDS AND JUNCTIONS ARE TO BE MADE WITH EITHER PURPOSE MADE FITTINGS OR STORMWATER DRAINAGE PITS.
- MINIMUM COVER FROM THE OBVERT OF THE STORMWATER PIPE OF 300mm IS TO BE PROVIDED IN LANDSCAPED AREAS AND 600mm IN VEHICULAR TRAFFICKED AREAS U.N.O.
- WHERE MINIMUM COVER CANNOT BE ACHIEVED CONCRETE ENCASEMENT OF THE AFFECTED PIPE IS MAY BE UNDERTAKEN WITH 20MPa CONCRETE WITH A MIN. COVER OF 150mm TO ALL SIDES OF THE PIPE. THE CONTRACTOR SHALL CONFIRM THIS REQUIREMENT WITH THE ENGINEER OR SUPERINTENDENT.
- LAID PIPELINES ARE TO HAVE THE FOLLOWING CONSTRUCTED TOLERANCES:
 - HORIZONTAL-1:300 ANGULAR DEVIATION FROM REQUIRED ALIGNMENT;
 - VERTICAL-1:300 ANGULAR DEVIATION FROM REQUIRED ALIGNMENT.
- ALL DRAINAGE PITS ARE TO BE CAST IN-SITU, PRECAST DRAINAGE PITS MAY BE USED WITH APPROVAL FROM THE ENGINEER. THE CONTRACTOR SHALL SUBMIT A PRECAST PIT INSTALLATION WORK METHOD STATEMENT FOR ASSESSMENT BY THE ENGINEER FOR APPROVAL.
- DRAINAGE PIT COVERS ARE TO BE EITHER GALVANISED STEEL OR CAST IRON CLASS 'B' IN LANDSCAPED AND PEDESTRIAN TRAFFICKED AREAS AND CLASS 'D' IN ALL VEHICULAR TRAFFICKED AREAS U.N.O.
- DRAINAGE PIT COVERS ARE TO BE 'HEELSAFE' TYPE IN ALL PEDESTRIAN TRAFFICKED AREAS U.N.O.
- EXISTING STORMWATER PIT LOCATIONS AND INVERT LEVELS TO BE CONFIRMED PRIOR TO COMMENCING WORKS ON SITE.
- PROVIDE CLEANING EYES (RODDING POINTS) TO PIPES AT ALL CORNERS AND T-JUNCTIONS WHERE NO PITS ARE PRESENT.
- DOWN PIPES CONNECTED DIRECT TO PIPES TO BE CONNECTED AT 45° TO THE FLOW DIRECTION WITH A CLEANING EYE PROVIDED AT GROUND LEVEL.

SITE WORKS - ACCESS AND SAFETY

- ALL WORKS ARE TO BE UNDERTAKEN IN A SAFE MANNER IN ACCORDANCE WITH ALL STATUTORY AND INDUSTRIAL RELATION REQUIREMENTS.
- ACCESS TO ADJACENT BUILDINGS AND PROPERTIES SHALL BE MAINTAINED AT ALL TIMES.
- WHERE NECESSARY SAFE PASSAGE SHALL BE PROVIDED FOR VEHICLES AND PEDESTRIANS THROUGH OR ADJACENT TO THE SITE.

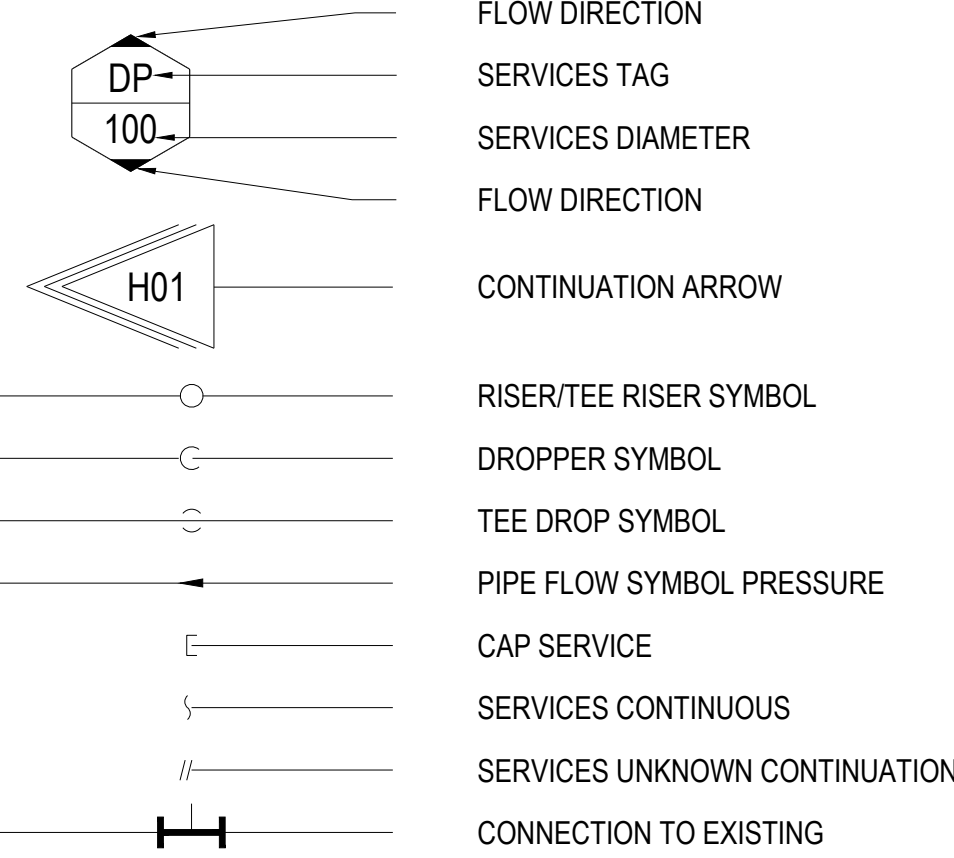
SITE WORKS - GENERAL

- ALL WORKS ARE TO BE UNDERTAKEN IN ACCORDANCE WITH LOCAL COUNCIL, AUSTRALIAN AND AUTHORITY STANDARDS.
- ALL TRENCHING WORKS ARE TO BE RESTORED TO ORIGINAL CONDITION.
- THE INTEGRITY OF ALL EXISTING AND NEW SERVICES IS TO BE MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD.
- ALL PLANS ARE TO BE READ IN CONJUNCTION WITH APPROVED ARCHITECTS, STRUCTURAL ENGINEERS AND OTHER CONSULTANT'S PLANS. ANY DISCREPANCIES ARE TO BE NOTIFIED TO THE ENGINEER FOR CLARIFICATION.
- THE ENGINEER SHALL BE GIVEN A MIN. OF 48 HOURS NOTICE FOR ALL STORMWATER DRAINAGE AND PAVEMENT INSPECTIONS. CONCRETE SHALL NOT BE DELIVERED UNTIL ENGINEERS APPROVAL IS OBTAINED.

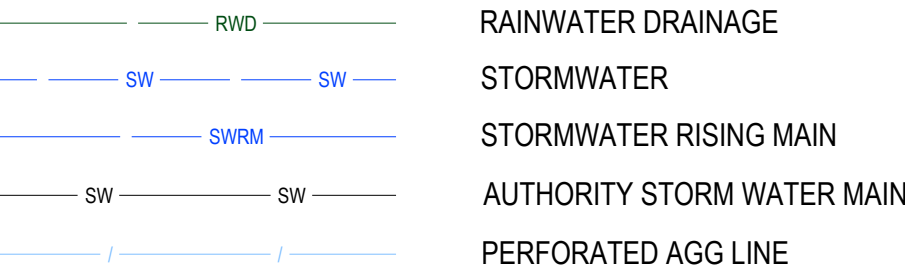
DESIGN NOTES

- ALL WORKS TO BE IN ACCORDANCE WITH NORTHERN BEACHES COUNCIL'S STANDARD SPECIFICATIONS, NORTHERN BEACHES PUBLIC SPACE VISION & DESIGN GUIDELINES, AND TO THE SUPERVISING ENGINEERS SATISFACTION.
- PROVIDED 2,500 LITRES RAINWATER TANK FOR IRRIGATION AND AS PER BASIX REQUIREMENTS.
- THIS SITE HAS A TOTAL AREA OF 576.6 m2. AS PER NORTHERN BEACHES COUNCIL THIS SITE WILL REQUIRE AN OSD SYSTEM OF 1.35m3.
- PROPOSED NEW KERB DISCHARGE POINTS ALONG MOORE LANE TO DISPOSE STORMWATER FROM THE SITE. REFER TO SW100 STORMWATER MANAGEMENT PLAN FOR MORE DETAILS.
- THE CONTRACTOR SHALL IMPLEMENT SEDIMENT AND EROSION CONTROL MEASURES AS NECESSARY AND TO THE SATISFACTION OF COUNCIL PRIOR TO COMMENCEMENT OF CONSTRUCTION AND DURING CONSTRUCTION.
- DEPTH AND LOCATION OF SEWER AND SERVICES TO BE CONFIRMED PRIOR TO COMMENCEMENT OF DRAINAGE WORKS.
- STORMWATER PLANS ARE SUBJECTED TO COUNCIL APPROVAL

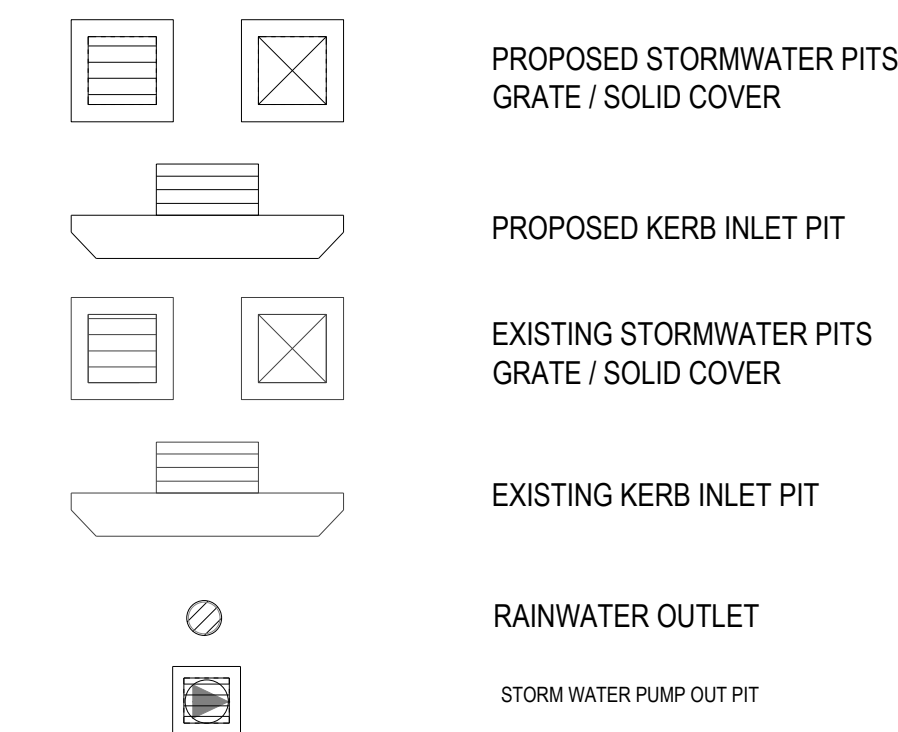
LEGEND - GENERAL SYMBOLS



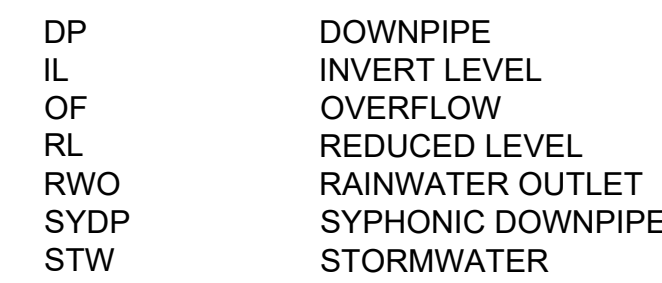
LEGEND STORMWATER SERVICES



LEGEND - STORMWATER SYMBOLS



LEGEND - ABBREVIATIONS



LOCATION PLAN
NOT TO SCALE

STORMWATER MANAGEMENT DRAWING LIST

- SW000 - STORMWATER LEGEND AND COVER SHEET
SW001 - SPECIFICATION SHEET
- SW100 - GARAGE LEVEL
SW101 - GROUND FLOOR
SW102 - FIRST FLOOR
SW103 - SECOND FLOOR
SW104 - ROOF PLAN
- SW201 - RWT DETAIL SHEET



AMENDMENTS/REVISIONS				AMENDMENTS/REVISIONS			
Rev	Description	Initials	Date	Rev	Description	Initials	Date
01	DA ISSUE	MS	11.10.24				
02	DA ISSUE	MS	16.10.24				

CLIENT

ARCHITECT
MHNDUNION 29 HUTCHINSON STREET SURRY HILLS SYDNEY NSW 2010 T +61 2 9101 1111 F +61 2 9101 1100 www.mhndu.com <small>MHND Design Union Pty Ltd ABN 94 003 717 092</small>

CONSULTANT
IGS INTEGRATED GROUP SERVICES <small>Phone +61 2 8488 4500 Fax +61 2 9475 4588 Address 192-200 Euston road, Alexandria NSW Web www.igs.com.au</small>

PROJECT
38 UNDERCLIFF ROAD FRESHWATER, NSW 2096

DRAWING TITLE
STORMWATER MANAGEMENT COVER SHEET

FOR APPROVAL NOT TO BE USED FOR CONSTRUCTION PURPOSES					
DRAWN	DESIGNED	CHECKED	SCALE (AT FULL SIZE)	DATE	
MS	PS	PS	NTS @ A1	Oct-24	
PROJECT No.			DRAWING No.	REVISION	
EN-N24_XX			SW000	02	

GENERAL NOTES

- G1. ALL LEVELS SHALL BE OBTAINED FROM ESTABLISHED BMS OR SSM.
- G2. CONTRACTOR MUST VERIFY ALL DIMENSIONS AND EXISTING LEVELS ON SITE PRIOR TO COMMENCEMENT OF WORK.
- G3. ALL WORKS ARE TO BE UNDERTAKEN IN ACCORDANCE WITH COUNCIL'S SPECIFICATIONS, AND THE DIRECTIONS OF THE SUPERINTENDENT.
- G4. DIMENSIONS MUST NOT BE SCALED FROM DRAWINGS.
- G5. CONTRACTOR TO ENSURE THAT ALL ROADWORKS ARE SMOOTHLY TRANSITIONED TO EXISTING LEVELS FREE FROM ABRUPT CHANGES.
- G6. THE CONTRACTOR SHALL ARRANGE ALL SURVEY SETOUT TO BE CARRIED OUT BY A REGISTERED SURVEYOR. FURTHER, THE LOCATION OF RECOVERY MARKS SHOULD BE VERIFIED AND CONFIRMED BY THE CONTRACTOR AND ANY DISCREPANCIES SHOULD BE CLARIFIED IN WRITING WITH THE SUPERINTENDENT PRIOR TO THE COMMENCEMENT OF WORK.
- G7. AT COMPLETION OF WORKS ALL ADJOINING DISTURBED AREAS ARE TO BE REINSTATED TO THE 'AS FOUND' CONDITION.
- G8. THE CONTRACTOR SHALL ENSURE ALL AREAS DRAIN WITH A MINIMUM FALL OF 1% (1:100) GRADE TO OUTLETS UNLESS INDICATED OTHERWISE. NO WORKS SHALL CAUSE PONDING OF STORMWATER ON UPSTREAM PROPERTIES OR CONCENTRATE RUNOFF ONTO DOWNSTREAM PROPERTIES.
- G9. THESE PLANS SHALL BE READ IN CONJUNCTION WITH APPROVED LANDSCAPE, ARCHITECTURAL, ELECTRICAL, RETICULATION, WATER & SEWER DRAWINGS AND SPECIFICATIONS AND OTHER WRITTEN INSTRUCTIONS AS MAY BE ISSUED.
- G10. THE CONTRACTOR SHALL ENSURE THAT ALL PAVEMENTS GRADE EVENLY BETWEEN NOMINATED RL'S ON PLAN AND NO POND OF WATER OCCURS.
- G11. ALL DIMENSIONS ARE IN METERS UNLESS STATED OTHERWISE. ALL LEVELS ARE EXPRESSED IN METERS.
- G12. DURING CONSTRUCTION THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE STRUCTURE IN A STABLE CONDITION AND ENSURING NO PART SHALL BE OVERSTRESSED UNDER CONSTRUCTION ACTIVITIES.
- G13. WORKMANSHIP AND MATERIALS ARE TO BE IN ACCORDANCE WITH THE RELEVANT CURRENT S.A.A. CODES INCLUDING ALL AMENDMENTS, AND THE LOCAL STATUTORY AUTHORITIES, EXCEPT WHERE VARIED BY THE CONTRACT DOCUMENTS.
- G14. THE APPROVAL OF A SUBSTITUTION SHALL BE SOUGHT FROM THE ENGINEER BUT IS NOT AN AUTHORIZATION FOR AN EXTRA. ANY EXTRAS INVOLVED MUST BE TAKEN UP WITH THE SUPERINTENDENT BEFORE THE WORK COMMENCES.
- G15. THE CONTRACTOR IS TO EMPLOY A QUALIFIED GEOTECHNICAL ENGINEER AS REQUIRED FOR ALL GEOTECHNICAL ASPECTS OF THE BUILDING WORKS. REFER TO FOUNDATION, GROUNDWORKS AND RETENTION/SHORING NOTES. REFER ALSO TO THE GEOTECHNICAL REPORT FOR THIS PROJECT.

INADEQUATE FOUNDATION MATERIAL

IF ANY AREA OF THE FOUNDATION CONTAINS MATERIAL THAT IS INADEQUATE TO SUPPORT THE PROPOSED DRAINAGE STRUCTURE OR WHERE THE SIDES OF TRENCHES FOR DRAINAGE STRUCTURES ARE COMPOSED OF MATERIAL WHICH REQUIRES REMOVAL AND REPLACEMENT, REMOVE AND REPLACE THIS MATERIAL. DISPOSE OF SUCH MATERIAL IN ACCORDANCE WITH SPECIFICATION TFNSW D&C R44.

GENERAL EARTHWORKS

- E1. THE SITE OF THE WORKS SHALL BE PREPARED BY STRIPPING ALL EXISTING TOPSOIL, FILL AND VEGETATION.
- E2. COMPACT SUBGRADE TO 98% OF THE STANDARD MAXIMUM DRY DENSITY WHEN TESTED IN ACCORDANCE WITH AUSTRALIAN STANDARD AS 1289 TESTS E.1.1, OR E.1.2. THE EXPOSED SUBGRADE SHOULD BE PROOF ROLLED TO DETECT ANY SOFT OR WET AREAS WHICH SHOULD BE LOCALLY EXCAVATED AND BACK FILLED WITH SELECTED MATERIAL. THE BACK FILLING MATERIAL SHALL BE IMPORTED GRANULAR FILL OF LOW PLASTICITY, PREFERABLY CRUSHED SANDSTONE, AND TO BE PLACED IN LAYERS NOT EXCEEDING 300mm LOOSE THICKNESS AND COMPACTED TO 98% OF STANDARD MAXIMUM DRY DENSITY WITHIN 2% OF STANDARD OPTIMUM MOISTURE CONTENT. SITE WORKS ARE TO BE BATTERED TO ADJACENT PROPERTY LEVELS.
- E3. NO STORMWATER IS TO POND ON ADJOINING PROPERTIES. THE SITE SHALL BE GRADED AND DRAINED SO THAT STORMWATER WILL BE DIRECTED AWAY FROM THE BUILDING PLATFORM. STORMWATER DRAINAGE SHALL BE PROVIDED AND MAINTAINED THROUGHOUT THE COURSE OF CONSTRUCTION. ALL STORMWATER RUNOFF SHALL BE GRADED AWAY FROM THE DWELLING AND DISPOSED OF VIA SURFACE CATCHDRAINS AND STORMWATER COLLECTION PITS.
- E4. ENSURE ALL RETAINING WALLS ARE CONSTRUCTED WITH ADEQUATE SUBSOIL DRAINAGE.

GROUND WORKS & EXCAVATION

- GW1. ALL GROUND WORKS & EXCAVATION SHALL BE IN ACCORDANCE WITH GEOTECHNICAL REPORT.
- GW2. SEPARATE AND REMOVE ALL TOPSOIL, NON SOIL MATERIAL, CONCRETE, VEGETATION, BRICKBATS, TIMBER, ROOT AFFECTED SOIL AND EXISTING STORE TOPSOIL, IF REQUIRED.
- GW3. ALL EXCAVATIONS SHALL BE FINISHED CLEAN AND HORIZONTAL AND SHALL NOT UNDERMINE FOOTINGS, WALLS etc...
- GW4. PROOF ROLL WITH AN 8 TONNE ROLLER, REPLACE ANY SOFT MATERIAL WITH APPROVED FILL AND RE-COMPACT. GEOTECHNICAL ENGINEER TO APPROVE.
- GW5. THE FILL IS TO BE PLACED AND COMPACTED IN LAYERS OF MAXIMUM LOOSE THICKNESS 300mm.
- GW6. TOP LAYER OF PAVED AREAS TO BE COMPACTED TO MINIMUM 98% STANDARD MAXIMUM DRY DENSITY. GEOTECHNICAL ENGINEER TO VERIFY.
- GW7. ALL PERMANENT EMBANKMENTS TO BE COMPACTED IN 200 mm LAYERS AS PER NOTE GW6 AND AT A MAXIMUM SLOPE OF 1 VERTICAL TO 2.5 HORIZONTAL UNLESS NOTED OTHERWISE. SHOULD DRAINAGE BE REQUIRED THEN SUBMIT DETAILS TO THE ENGINEER.
- GW8. ALL GROUND WORKS SHALL BE TESTED BY AN APPROVED GEOTECHNICAL ENGINEER TO A LEVEL 1 STANDARD IN ACCORDANCE WITH AS 3798 - 1996.
- GW9. ALL EXCAVATIONS TO BE INSPECTED AT REGULAR INTERVALS BY A GEOTECHNICAL ENGINEER.
- GW10. REFER TO ARCHITECTURAL DRAWINGS TO CONFIRM SETOUT OF BUILDINGS, CARPARKS ETC.
- GW11. THE LEVELS SHOWN ARE ONLY RELEVANT TO THE PLAN UPON WHICH THEY ARE SHOWN.
- GW12. ALL CONTOURS AND LEVELS USED TO PRODUCE EARTHWORK DETAILS HAVE BEEN BASED ON SURVEYOR AND ARCHITECTS SURVEY INFORMATION.
- GW13. ALL FINISHED FLOOR LEVELS ARE TO BE CONFIRMED BY ARCHITECT.
- GW14. ALL EXISTING SERVICES ARE TO BE CAPPED OFF PRIOR TO ANY WORKS.
- GW15. A PRE-CONSTRUCTION MEETING SHALL BE HELD BETWEEN THE CONTRACTOR, THE GEOTECHNICAL ENGINEER, AND THE EARTHWORKS CONTRACTOR TO UNDERSTAND POTENTIAL DIFFICULTIES AND TO ORGANISE TESTING PROCEDURES. THE CONTRACTOR SHALL CONFIRM TO THE ENGINEER THAT THE MEETING HAS BEEN HELD.

DRAINAGE NOTES

- D1. PITS GREATER THAN 1.2m DEEP TO BE FITTED WITH STEEL IRONS.
- D2. DRAINAGE PIPES SHALL BE BACKFILLED WITH COMPACTED CLEAN SHARP SAND TO 200 ABOVE PIPE OBVERT. ADDITIONAL BACKFILL UNDER ROADS SHALL CONSIST OF CLASS 2 F.C.R. MATERIAL COMPACTED IN 200mm LAYERS TO 98% SMDD. UNDER LANDSCAPED AREAS ADDITIONAL BACKFILL SHALL CONSIST OF GRANULAR MATERIAL COMPACTED IN 200mm LAYERS TO 95% SMDD. A 3m LENGTH OF 100 Ø SLOTTED AGRICULTURAL LINE SURROUNDED BY GEOTECH STOCKING SHALL BE PROVIDED ON THE UPSTREAM SIDE OF ALL PITS.
- D3. CONCRETE STORMWATER PIPES TO BE CLASS '3' UNDER ROADS AND CLASS '2' IN NON-TRAFFICED AREAS. ALL PIPES GREATER THAN 300Ø ARE TO BE RUBBER RING JOINTS U.N.O.
- D4. CONCRETE PITS GREATER THAN 1.0m DEEP TO BE REINFORCED WITH N12-200 EACH WAY CENTRED, MIN. 300 LAP. CONCRETE - Fc 25MPa
- D5. 100Ø, 150Ø, 225Ø & 300Ø uPVC PIPES TO BE SEWER GRADE PIPE UNDER TRAFFICABLE PAVEMENT. MIN. 400 COVER UNDER NON-TRAFFICABLE PAVEMENT.
- D6. PIT COVERS & GRATED DRAINS IN TRAFFICABLE PAVEMENT TO BE AS 3996 CLASS D 'HEAVY DUTY' & IN NON-TRAFFICABLE AREAS TO BE AS 3996 CLASS C 'LIGHT DUTY'.

UTILITY SERVICES

- S1. CONDUITS TO BE PROVIDED FOR WATER AND ENERGY AUTHORITIES, TELSTRA AND OTHER SERVICES AS REQUIRED.
- S2. THE LOCATIONS OF UNDERGROUND SERVICES SHOWN ON THESE DRAWINGS HAVE BEEN PLOTTED FROM SURVEY AND AUTHORITY INFORMATION. THE SERVICE INFORMATION HAS BEEN PREPARED ONLY TO SHOW THE APPROXIMATE POSITIONS OF ANY KNOWN SERVICES AND MAY NOT BE AS CONSTRUCTED OR ACCURATE.
- S3. VAN DER MEER CANNOT GUARANTEE THAT THE SERVICES INFORMATION SHOWN ON THESE DRAWINGS, ACCURATELY INDICATES THE PRESENCE OR ABSENCE OF SERVICES OR THEIR LOCATION AND WILL ACCEPT NO LIABILITY FOR INACCURACIES IN THE SERVICES INFORMATION SHOWN ARISING FROM ANY CAUSE WHATSOEVER.
- S4. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ESTABLISH THE LOCATION AND LEVEL OF ALL EXISTING SERVICES PRIOR TO THE COMMENCEMENT OF ANY WORK. ANY DISCREPANCIES SHALL BE REPORTED TO THE SUPERINTENDENT. CLEARANCES SHALL BE OBTAINED FROM THE RELEVANT SERVICE AUTHORITY.
- S5. CONTRACTORS SHALL TAKE DUE CARE WHEN EXCAVATING ON SITE INCLUDING HAND EXCAVATION WHERE NECESSARY.
- S6. CONTRACTORS ARE TO CONTACT THE RELEVANT SERVICE AUTHORITY PRIOR TO COMMENCEMENT OF EXCAVATION OR FUTURE WORKS.
- S7. CONTRACTORS ARE TO UNDERTAKE A SERVICES SEARCH PRIOR TO COMMENCEMENT OF WORKS ON SITE. SEARCH RESULTS ARE TO BE KEPT ON SITE AT ALL TIMES.
- TELSTRA - DUTY OF CARE NOTE:
- TELSTRA'S PLANS SHOW ONLY THE PRESENCE OF CABLES AND PLANT. THEY ONLY SHOW THEIR POSITION RELATIVE TO ROAD BOUNDARIES, PROPERTY FENCES ETC. AT THE TIME OF INSTALLATION AND TELSTRA DOES NOT WARRANT OR UPHOLD THAT SUCH PLANS ARE ACCURATE THEREAFTER DUE TO CHANGES THAT MAY OCCUR OVER TIME. DO NOT ASSUME DEPTH OR ALIGNMENT OF CABLES OR PLANT AS THESE VARY SIGNIFICANTLY.
- THE CONTRACTOR HAS A DUTY OF CARE WHEN EXCAVATING NEAR TELSTRA CABLES AND PLANT. BEFORE USING MACHINE EXCAVATORS TELSTRA PLANT MUST FIRST BE PHYSICALLY EXPOSED BY SOFT DIG POT HOLING TO IDENTIFY ITS LOCATION. TELSTRA WILL SEEK COMPENSATION FOR DAMAGES CAUSED TO ITS PROPERTY AND LOSSES CAUSED TO TELSTRA AND ITS CUSTOMERS.
- ELECTRICAL & GAS NETWORK:
- A MINIMUM OF 30 DAYS PRIOR TO COMMENCEMENT OF EXCAVATION WORKS THE SUBCONTRACTOR MUST CONTACT DIAL BEFORE YOU DIG.

MARKER TAPE

MARKER TAPE MUST CONFORM TO AS 2648.1, BE SUITABLY IDENTIFIED WITH WRITTEN WARNINGS AND CONTAIN A 0.7mm STAINLESS STEEL (AISI GRADE 316) CONDUCTOR WIRE, LAMINATED BETWEEN THE TWO LAYERS OF PLASTIC COMPRISING THE MARKER TAPE, SUITABLE FOR LOCATING THE MARKER TAPE WITH CABLE LOCATION EQUIPMENT.

THE MARKER TAPES FOR ELECTRICAL AND COMMUNICATIONS CONDUITS MUST BE IN ORANGE AND WHITE COLOUR RESPECTIVELY.

PROTECTION OF COMPLETED WORKS AND EXISTING UTILITIES

TAKE ALL NECESSARY PRECAUTIONS TO PROTECT OTHER COMPLETED WORKS AND AVOID INTERFERENCE WITH OTHER EXISTING SURFACE AND UNDERGROUND UTILITY SERVICES DURING CONSTRUCTION OF THE CABLEWAY.

BEFORE COMMENCING ANY EXCAVATION WORK, DETERMINE AND MARK ON THE GROUND THE LOCATIONS OF ALL EXISTING UTILITY SERVICES ADJACENT TO OR INTERSECTING THE CABLEWAY ROUTE.

WHERE CATHODIC PROTECTION HAS BEEN PROVIDED TO EXISTING METAL CONDUITS (FOR CARRYING DRINKING WATER, GAS, SEWAGE, ETC) AND METAL ARMOUR ON HIGH VOLTAGE CABLES OR OTHER STRUCTURES, USE SUITABLE EXCAVATION AND INSTALLATION METHODS TO PREVENT ANY DAMAGE OR DISTURBANCE TO THESE INSTALLATIONS.

OPEN TRENCHING

SAFETY CONSIDERATIONS

CARRY OUT THE TRENCHING AND ASSOCIATED BACKFILLING PROGRESSIVELY SO THAT TRENCHES ARE OPEN FOR THE MINIMUM PRACTICABLE TIME. DO NOT LEAVE TRENCHES OPEN OVERNIGHT UNLESS APPROVED SPECIFICALLY BY THE PRINCIPAL.

SHORE UP THE SIDES OF TRENCHES SECURELY TO PREVENT COLLAPSE, PARTICULARLY WHERE EXCAVATION IS IN PROXIMITY TO BUILDINGS OR OTHER STRUCTURES.

ERECT SUITABLE BARRICADES AROUND THE EXCAVATION AND COVER THE EXCAVATION WHERE ACCESS IS REQUIRED ACROSS THEM.

ROAD CROSSINGS BY OPEN TRENCHING

IF CROSSINGS AT ROADS, WHERE DAYTIME TRAFFIC FLOW MUST BE MAINTAINED, ARE DONE BY OPEN TRENCHING, CARRY OUT ANY EXCAVATION AND BACKFILLING AS NIGHT WORK.

LAY STEEL PLATES COMPLYING WITH SPECIFICATION TFNSW 3368 OVER THE OPEN TRENCHES IF THE ROAD IS TO BE OPEN TO TRAFFIC DURING DAYTIME.

BASE OF TRENCHES OR EXCAVATIONS

THE BOTTOM OF TRENCHES OR EXCAVATIONS MUST BE OF EVEN GRADIENT, AND FREE FROM STONES, SHARP OBJECTS AND OTHER FOREIGN MATERIAL.

SOIL AND GRAVEL MATERIALS

BEDDING AND SUPPORT FILL MATERIAL

1. TYPE BH SELECT FILL
- TYPE BH SELECT FILL FOR BED AND HAUNCH ZONES MUST HAVE THE FOLLOWING PROPERTIES:
- a). A PARTICLE SIZE DISTRIBUTION, DETERMINED BY TEST METHOD TFNSW T201, WITHIN THE LIMITS SET OUT IN TABLE 6 IN AS 3725 (OR TABLE 5.1 IN AS 1597.2); AND
- b). A PLASTICITY INDEX, DETERMINED BY TEST METHOD TFNSW T109, OF NOT MORE THAN 6.
2. TYPE SO SELECT FILL
- TYPE SO SELECT FILL FOR SIDE AND OVERLAY ZONES OF PIPES AND BOX CULVERTS AND ADJACENT TO OTHER DRAINAGE STRUCTURES MUST HAVE THE FOLLOWING PROPERTIES:
- a). A MAXIMUM PARTICLE DIMENSION OF 53mm; AND
- b). A PLASTICITY INDEX, AS DETERMINED BY TEST METHOD TFNSW T109, OF BETWEEN 2 AND 12.

BACKFILLING AND COMPACTION

1. BACKFILLING
- BACKFILL THE SIDE AND OVERLAY ZONES OF BOX CULVERTS (AS SHOWN IN FIGURE 1.1 OF AS 1597.2) WITH TYPE SO SELECT FILL.
- FOR PIPES AND BOX CULVERTS LOCATED WITHIN A ROCK FILL EMBANKMENT, PROVIDE A MINIMUM THICKNESS OF 1000mm OF TYPE SO SELECT FILL WITHIN THE SIDE AND OVERLAY ZONES, SEPARATED FROM THE SURROUNDING ROCK FILL BY A GEOTEXTILE COMPLYING WITH SPECIFICATION TFNSW D&C R63.
- OUTSIDE THE SIDE AND OVERLAY ZONES, BACKFILL WITH GENERAL FILL MATERIAL EXCAVATED FROM CUTTINGS OR OTHER SUITABLE MATERIAL.
- UNLESS OTHERWISE SPECIFIED, PLACE FILL MATERIAL FOR THE FOUNDATIONS, BEDDING, SUPPORT AND GENERAL BACKFILL IN LAYERS NOT EXCEEDING 150mm COMPACTED THICKNESS. COMPACT THE FILL MATERIAL TO THE REQUIREMENTS OF CLAUSE 4.9.2 OF THIS SPECIFICATION.
- DO NOT CARRY OUT BACKFILLING AGAINST CAST-IN-PLACE BOX CULVERTS UNTIL THE COMPRESSIVE STRENGTH OF THE CONCRETE HAS REACHED AT LEAST 75% OF THE SPECIFIED 28 DAY STRENGTH, AND AGAINST OTHER CONCRETE DRAINAGE STRUCTURES UNTIL AT LEAST 7 DAYS HAS ELAPSED AFTER PLACING THE LAST CONCRETE IN THE STRUCTURE, UNLESS ACCEPTED OTHERWISE BY THE PROJECT VERIFIER.
- WHEN BACKFILLING AGAINST BOX CULVERTS, THE DIFFERENCE IN LEVEL OF THE BACKFILL ON OPPOSING SIDES OF THE CULVERT MUST NOT EXCEED 500mm TO MINIMIZE DIFFERENTIAL LOADING ON THE STRUCTURE. COMPACT FIRST THE FILL PLACED IMMEDIATELY NEXT TO THE STRUCTURE, AND THEN PROGRESSIVELY WORK OUTWARDS TOWARDS THE FACE OF THE EXCAVATION, TO PREVENT WEDGE ACTION BETWEEN THE EXCAVATION AND THE WALLS OF THE STRUCTURE.
2. COMPACTION
- PROVIDE, AS PART OF THE PROJECT QUALITY PLAN, PROCEDURES FOR ACHIEVING ADEQUATE COMPACTION OF THE SELECT FILL IN BED, HAUNCH, SIDE AND OVERLAY ZONES AROUND PIPES IN THE TRENCHES.
- COMPACT THE FOUNDATIONS AND FILL MATERIAL PLACED TO ACHIEVE THE MINIMUM CHARACTERISTIC VALUE OF RELATIVE COMPACTION FOR THE PARTICULAR TYPE OF MATERIAL, AS SHOWN IN TABLE R11.2.
- CONTROL THE MOISTURE CONTENT OF THE FOUNDATIONS AND FILL MATERIAL TO PREVENT LOSS OF DENSITY AND STRENGTH IN NEARBY EARTHWORKS THROUGH OVER WETTING.

EXCAVATION FOR PIPE INSTALLATION

EXCAVATE TRENCHES FOR PIPE INSTALLATION TO THE WIDTHS SHOWN IN TFNSW STANDARD DRAWING R0240 - 01, OR AS 3725 IF NOT SHOWN ON THE DESIGN DOCUMENTATION DRAWINGS, DO NOT EXCAVATE MORE THAN 50mm BEYOND THE SPECIFIED WIDTH OF THE TRENCH FOR THE PART OF THE TRENCH BELOW THE LEVEL OF THE TOP OF THE PIPE, ON EITHER SIDE OF THE TRENCH, AS THIS MAY AFFECT THE DESIGN PIPE LOAD CLASS. (REFER TO STANDARD DRAWING R0240 - 01.)

FOR PIPES UNDER EMBANKMENTS:

1). WHERE "EMBANKMENT CONDITION" INSTALLATION IS SPECIFIED, CONSTRUCT FIRST THE EMBANKMENT TO A HEIGHT OF AT LEAST 0.7 TIMES THE EXTERNAL DIAMETER OF THE PIPE ABOVE THE TOP OF THE BED ZONE, AND FOR A MINIMUM LATERAL DISTANCE PAST THE BOUNDARY OF THE TRENCH OF 2.5 TIMES THE EXTERNAL DIAMETER OF THE PIPE;

2). WHERE "TRENCH CONDITION" INSTALLATION IS SPECIFIED, CONSTRUCT FIRST THE EMBANKMENT TO THE LEVEL OF THE UNDERSIDE OF THE SELECTED MATERIAL ZONE;

PRIOR TO EXCAVATING THE TRENCH AND INSTALLATION OF THE PIPES

PROVIDE AN ALTERNATIVE FLOW CHANNEL WHERE APPROPRIATE.

EXCAVATION FOR DRAINAGE STRUCTURES OTHER THAN PIPES

FOR DRAINAGE STRUCTURES OTHER THAN PIPES, EXTEND THE EXCAVATION SO THAT, FOR ALL POINTS ON THE WALLS OF THE STRUCTURE, THE CLEAR WIDTH BETWEEN THE STRUCTURE WALL AND THE FACE OF THE EXCAVATION IS AT LEAST 300mm.

WHEN EXCAVATING FOR CONSTRUCTION OF BOX CULVERTS AND ROCK IS ENCOUNTERED OVER PART OF THE FOUNDATION, EXCAVATE THE WHOLE OF THE FOUNDATION AREA TO A DEPTH OF 300mm BELOW THE LEVEL OF THE BOTTOM OF THE BLINDING LAYER AND REPLACE IT WITH TYPE BH SELECT FILL, COMPACTED TO THE REQUIREMENTS OF CLAUSE 4.9.2.

C1 SCHEDULE OF HOLD POINTS AND WITNESS POINTS

CLAUSE	TYPE	DESCRIPTION
2.4.1	HOLD	SUBMISSION OF CERTIFIED PRODUCT DRAWINGS AND DETAILS OF METHODS FOR MANUFACTURE, TESTING AND INSTALLATION, PRIOR TO THE SUPPLY OF PRECAST CONCRETE MEMBERS SUBJECT TO TRAFFIC AND/OR EARTH PRESSURE LOADING, OR WATER RETAINING STRUCTURES WITH CAPACITY GREATER THAN 25,000 LITERS.
2.6	HOLD	SUBMISSION OF CERTIFICATE OF CONFORMITY PRIOR TO INCORPORATION INTO THE PROJECT WORKS OF ANY SUPPLIED MANUFACTURED DRAINAGE PRODUCT.
4.1.1	HOLD	NOTIFICATION OF SET OUT OF DRAINAGE SYSTEM.
4.2.1	HOLD	NOTIFICATION THAT 0.5% MINIMUM GRADE CANNOT BE ACHIEVED FOR SECTION OF OPEN DRAINS.
4.3	WITNESS	EXCAVATION FOR PIPE INSTALLATION AND OTHER DRAINAGE STRUCTURES
4.3.3	WITNESS	REPLACEMENT OF INADEQUATE FOUNDATION MATERIAL.
4.7.2	WITNESS	CONSTRUCTION OF DRAINAGE STRUCTURES OTHER THAN PIPES AND BOX CULVERTS.
4.11	HOLD	PROTECTIVE MEASURES FOR PIPES AND BOX CULVERT STRUCTURES FROM HEAVY CONSTRUCTION PLANT OR VEHICLES.

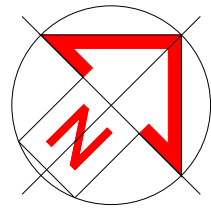
C2 SCHEDULE OF IDENTIFIED RECORDS

THE RECORDS LISTED BELOW ARE IDENTIFIED RECORDS FOR THE PURPOSES OF TFNSW D&C Q6.

CLAUSE	DESCRIPTION OF IDENTIFIED RECORD
2.4.1	PRODUCT DRAWINGS AND METHODS FOR MANUFACTURE, TESTING AND INSTALLATION OF PRECAST DRAINAGE STRUCTURES OTHER THAN PIPES AND BOX CULVERTS.
2.6	CERTIFICATE OF CONFORMITY, STARTING THAT THE SUPPLIED MANUFACTURED PRODUCT CONFORM TO THE REQUIREMENTS OF THIS SPECIFICATION
5.2	REPORT ON CCTV INSPECTIONS OF DRAINAGE STRUCTURES.

TABLE R 11.2 - MINIMUM CHARACTERISTIC VALUE OF RELATIVE COMPACTION

DESCRIPTION OF MATERIAL	MIN. RELATIVE COMPACTION
TRIMMED SURFACE OF EXCAVATED OPEN DRAINS A DEPTH OF 150mm, BEFORE PLACING LINING OR SPREADING TOPSOIL FOR VEGETATION OR FILL MATERIAL IN EMBANKMENTS OF OPEN DRAINS.	95%
MATERIAL IN TRENCH BASE OR FOUNDATION TO A DEPTH OF 150mm BELOW THE BOTTOM OF THE BED ZONE OR BLINDING LAYER, AND MATERIAL REPLACING INADEQUATE FOUNDATION MATERIAL.	95%
SELECT FILL IN THE BED, HAUNCH, SIDE AND OVERLAY ZONES ADJACENT TO PIPE CULVERTS, AND GENERAL BACKFILL MATERIAL.	95%
SELECT FILL IN THE SIDE AND OVERLAY ZONES OF BOX CULVERTS	98%
BACKFILL MATERIAL WITHIN THE SELECTED MATERIAL ZONE OF THE ADJOINING EARTHWORKS (REFER SPECIFICATION TFNSW D&C R44).	102%



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ARCHITECT

MHNDUNION

29 HUTCHINSON STREET
SURREY HILLS SYDNEY NSW 2010
T +61 2 9101 1111
F +61 2 9101 1100
www.mhndu.com
MHND Design Union Pty Ltd ABN 94 003 717 002

CONSULTANT

IGS INTEGRATED GROUP SERVICES

Phone +61 2 8488 4500 Fax +61 2 9475 4588
Address 192-200 Euston Road, Alexandria NSW
www.igs.com.au

Nominated Architect
Brian Meyerson NSW
Registration Number 4907

PROJECT

38 UNDERCLIFF ROAD
FRESHWATER, NSW 2096

DRAWING TITLE

STORMWATER MANAGEMENT
COVER SHEET

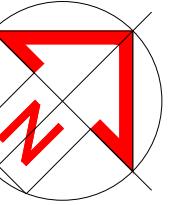
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MS	PS	PS	NTS @ A1	Oct-24

PROJECT No: EN-N24_XX

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REVISION: 02



- PLEASE NOTE:
1. ROOF DRAINAGE SYSTEM TO BE FURTHER COORDINATED DURING CC STAGE
 2. PITS, DOWN PIPES, OUTLETS, AND RAINWATER TANK LOCATION MAY ALTER TO SUIT SITE CONDITIONS AND DESIGN AT A LATER STAGE
 3. ENSURE NO DAMAGE OCCURS TO TREE ROOTS DURING CONSTRUCTION PHASE
 4. ANY STORMWATER DRAINAGE WITHIN THE TPZ SHALL BE CONSTRUCTED VIA MANUAL HAND DIG METHODS

PROVIDE OSD & RAINWATER TANK WITH EFFECTIVE CAPACITY OF MIN 4000L
OSD VOLUME PROVIDED: 1350L
RAIN WATER TANK VOLUME: 2500L
2400L x 1000W x 1860H

PROVIDE 100 DIA OVERFLOW FROM RAINWATER TANK AT HIGH LEVEL TO BOUNDARY PIT
IL (OUTLET): 19.5 (APPROX.)

PROVIDE 2 x 1000 AGG LINE WRAPPED IN GEO FAB WITHIN FREE DRAINING BLUE METAL AGGREGATE

PROVIDE 2 x 1000 AGG LINE WRAPPED IN GEO FAB WITHIN FREE DRAINING BLUE METAL AGGREGATE

PROVIDE OSD & RAINWATER TANK WITH EFFECTIVE CAPACITY OF MIN 4000L
OSD VOLUME PROVIDED: 1350L
RAIN WATER TANK VOLUME: 2500L
2400L x 1000W x 1860H

PROVIDE 100 DIA OVERFLOW FROM RAINWATER TANK AT HIGH LEVEL TO BOUNDARY PIT
IL (OUTLET): 19.5 (APPROX.)

PROVIDE 450 SQ GRATED SILT ARRESTOR BOUNDARY PIT
SL: 17.5 (APPROX.)
IL (OUTLET): 17.35
IL (PIT): 17.10 (APPROX.)

PROVIDE 450 SQ SEALED CONCRETE JUNCTION PIT
SL: 17.90 (APPROX.)
INV: 17.60 (APPROX.)

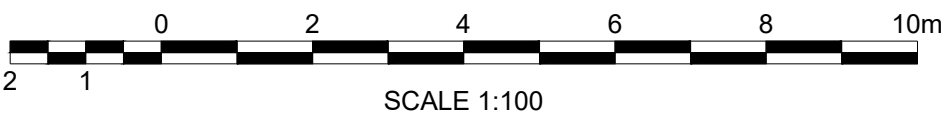
PROVIDE LINEAR DRAIN ACROSS GARAGE ENTRY
SL: 17.72
INV: 17.62 (APPROX.)

PROVIDE 450 SQ GRATED SILT ARRESTOR BOUNDARY PIT
SL: 17.65 (APPROX.)
IL (OUTLET): 17.45
IL (PIT): 17.25 (APPROX.)

PROVIDE LINEAR DRAIN ACROSS GARAGE ENTRY
SL: 17.47
INV: 17.37 (APPROX.)

PROVIDE 125 x 75 x 4.0 HOT. DIP. GALV. RHS TO STREET GUTTER
SL: 17.42
INV: 17.35 (APPROX.)

PROVIDE 125 x 75 x 4.0 HOT. DIP. GALV. RHS TO STREET GUTTER
SL: 17.40
INV: 17.33 (APPROX.)



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ARCHITECT
MHNDUNION
29 HUTCHINSON STREET
SURRY HILLS SYDNEY NSW 2010
T +61 2 9101 1111
F +61 2 9101 1100
www.mhndu.com
MHN Design Union Pty Ltd ABN 94 003 717 092

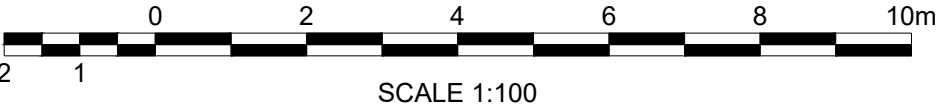
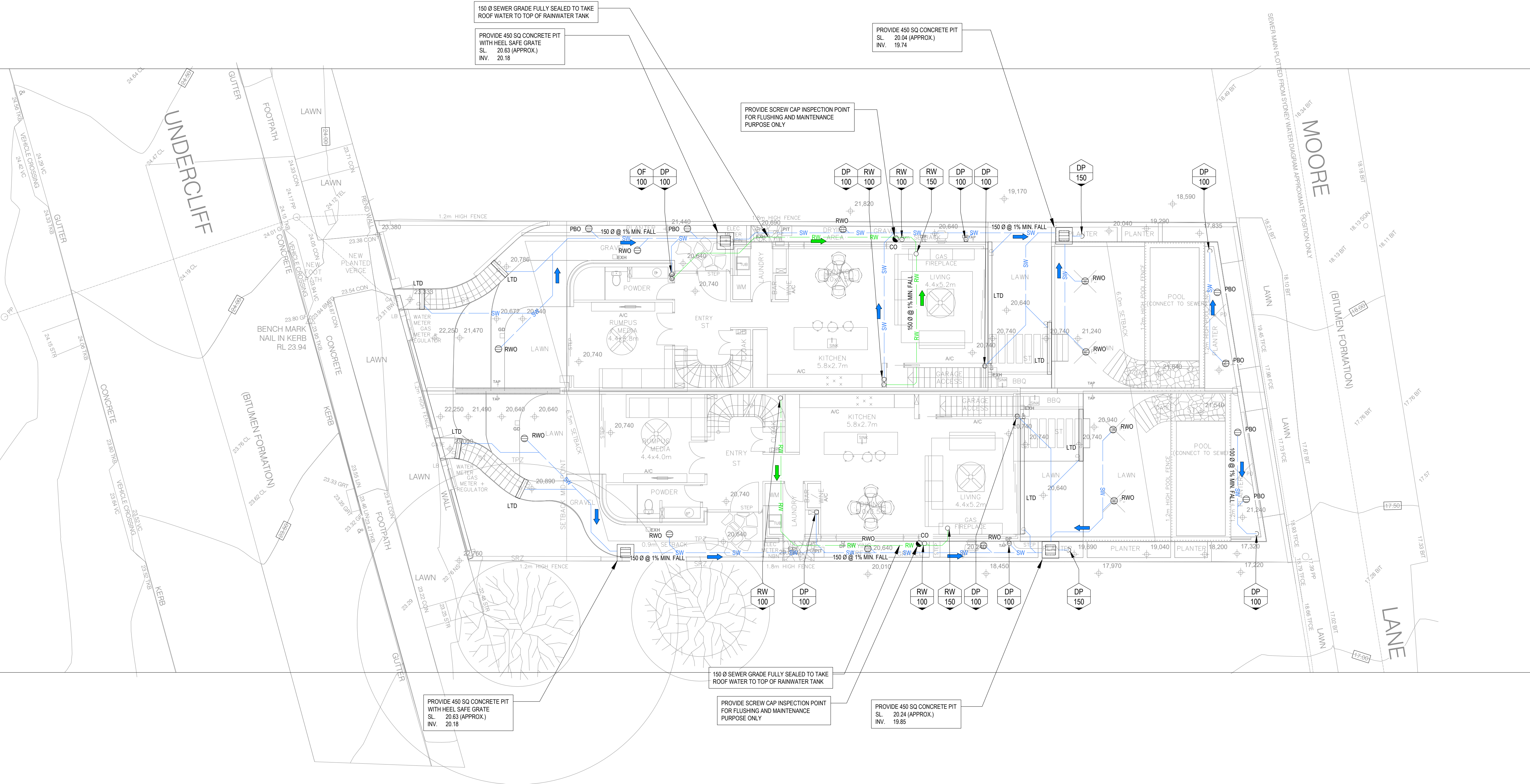
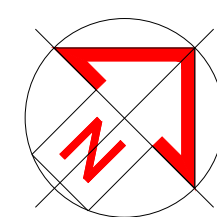
CONSULTANT
**IGS** INTEGRATED GROUP SERVICES
Phone +61 2 8488 4500 Fax +61 2 9475 4588
Address 192-200 Euston road, Alexandria NSW
Web www.igs.com.au

PROJECT
38 UNDERCLIFF ROAD
FRESHWATER, NSW 2096

DRAWING TITLE
STORMWATER MANAGEMENT
GARAGE LEVEL

FOR APPROVAL NOT TO BE USED FOR CONSTRUCTION PURPOSES				
DRAWN	DESIGNED	CHECKED	SCALE (AT FULL SIZE)	DATE
MS	PS	PS	1:100 @ A1	Oct-24
PROJECT No.			DRAWING No.	REVISION
EN-N24_XX			SW100	02

- PLEASE NOTE:
1. ROOF DRAINAGE SYSTEM TO BE FURTHER COORDINATED DURING CC STAGE
 2. PITS, DOWN PIPES, OUTLETS, AND RAINWATER TANK LOCATION MAY ALTER TO SUIT SITE CONDITIONS AND DESIGN AT A LATER STAGE
 3. ENSURE NO DAMAGE OCCURS TO TREE ROOTS DURING CONSTRUCTION PHASE
 4. ANY STORMWATER DRAINAGE WITHIN THE TPZ SHALL BE CONSTRUCTED VIA MANUAL HAND DIG METHODS



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MHNDUNION

29 HUTCHINSON STREET
SURRY HILLS SYDNEY NSW 2010
T +61 2 9101 1111
F +61 2 9101 1100
www.mhndu.com

Nominated Architect
Brian Meyerson NSW
Registration Number 4907

CONSULTANT

IGS INTEGRATED GROUP SERVICES

Phone +61 2 8488 4500 Fax +61 2 9475 4588
Address 192-200 Euston Road, Alexandria NSW
Web www.igs.com.au

PROJECT

38 UNDERCLIFF ROAD
FRESHWATER, NSW 2096

DRAWING TITLE

STORMWATER MANAGEMENT
GROUND FLOOR

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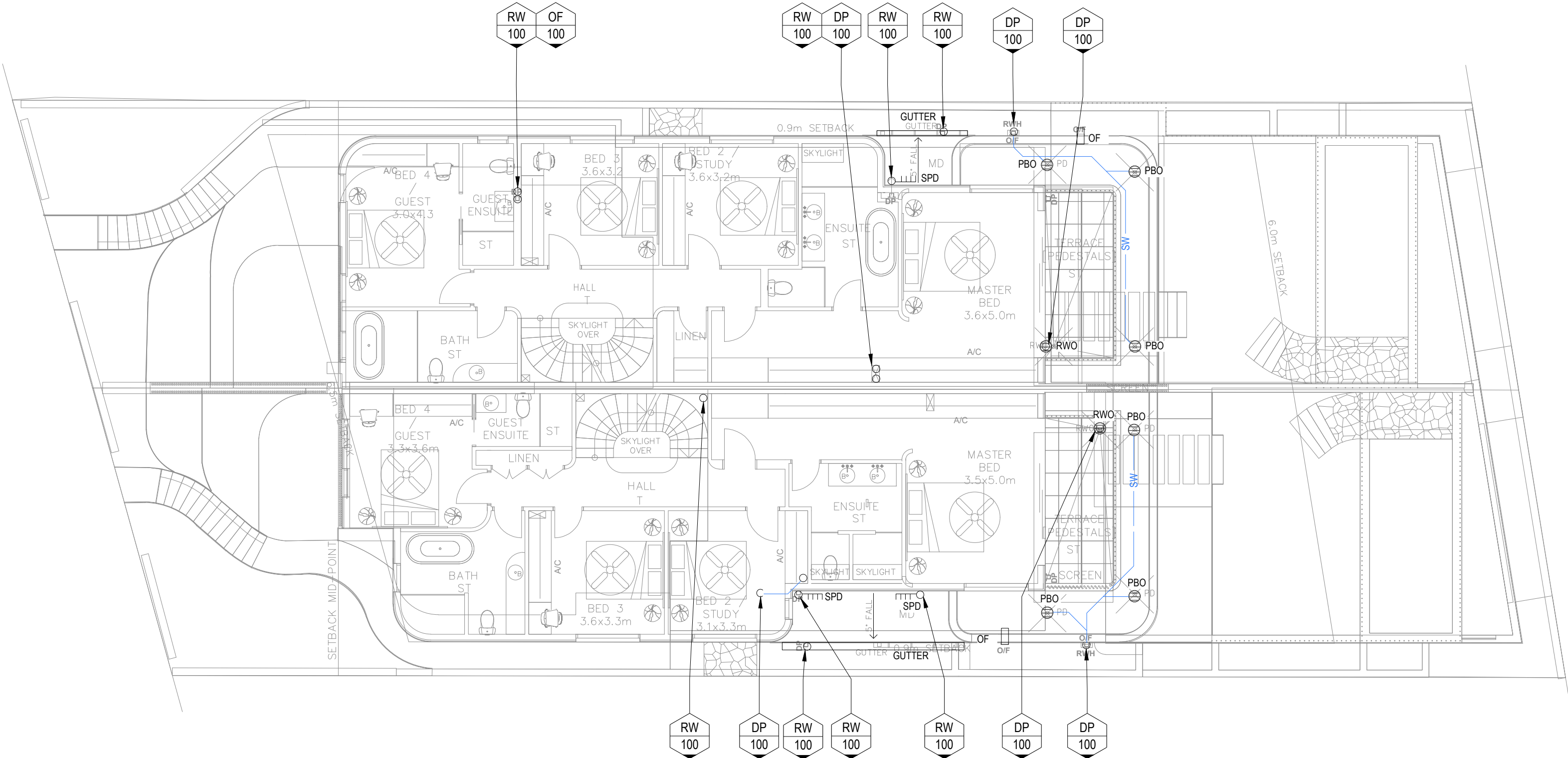
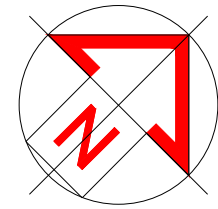
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MS	PS	PS	1:100 @ A1	Oct-24

PROJECT No. EN-N24_XX

DRAWING No. SW101

REVISION 02

- PLEASE NOTE:
1. ROOF DRAINAGE SYSTEM TO BE FURTHER COORDINATED DURING CC STAGE
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ARCHITECT
MHNDUNION
29 HUTCHINSON STREET
SURRY HILLS SYDNEY NSW 2010
T +61 2 9101 1111
F +61 2 9101 1100
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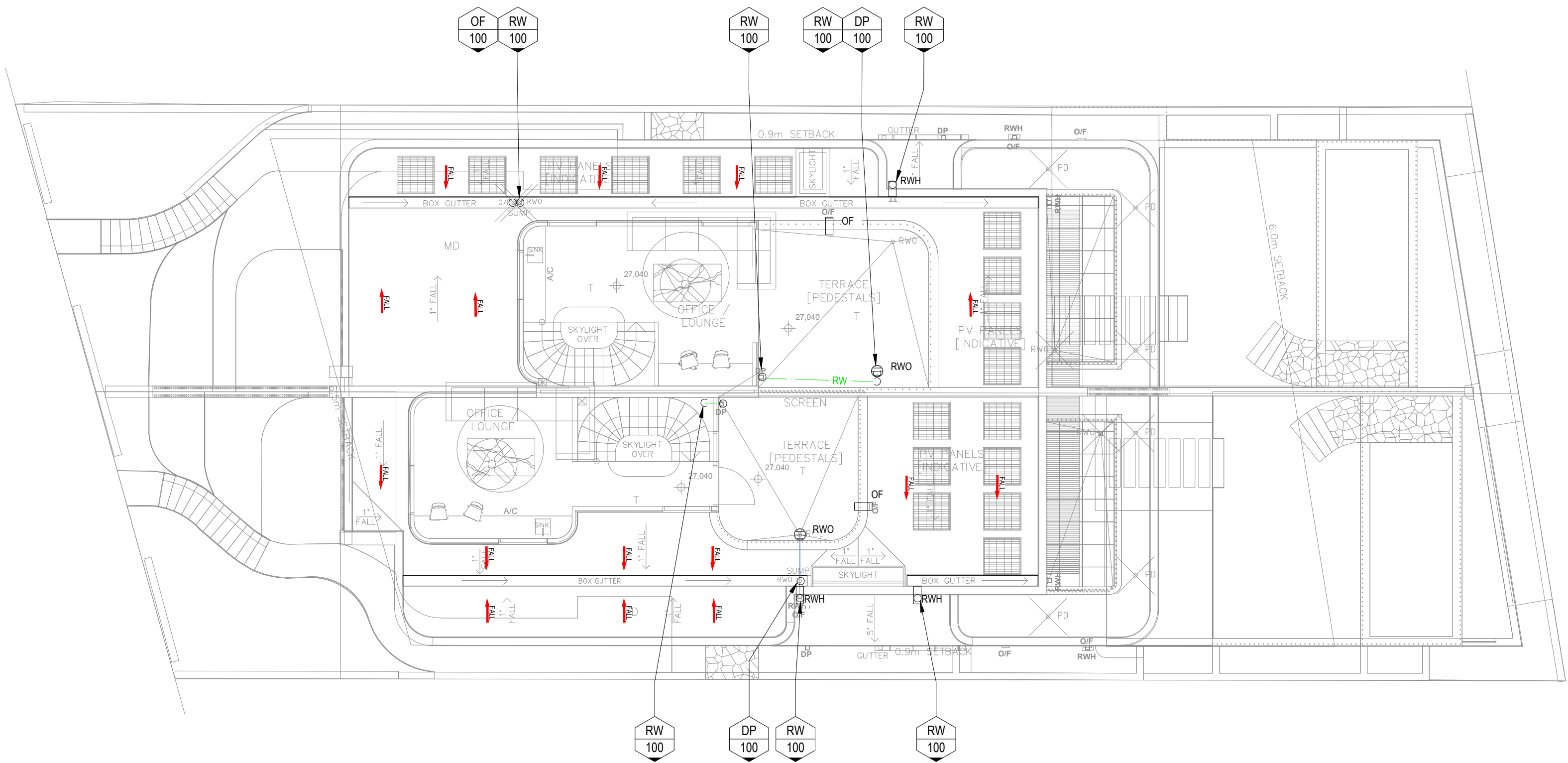
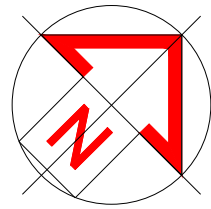
CONSULTANT
**IGS** INTEGRATED GROUP SERVICES
Phone +61 2 8488 4500 Fax +61 2 9475 4588
Address 192-200 Euston road, Alexandria NSW
Web www.igs.com.au

PROJECT
38 UNDERCLIFF ROAD
FRESHWATER, NSW 2096

DRAWING TITLE
STORMWATER MANAGEMENT
FIRST FLOOR

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MS	PS	PS	1:100 @ A1	Oct-24		
PROJECT No.			DRAWING No.	REVISION		
EN-N24_XX			SW102	02		

- PLEASE NOTE:
1. ROOF DRAINAGE SYSTEM TO BE FURTHER COORDINATED DURING CC STAGE
 2. PITS, DOWN PIPES, OUTLETS, AND RAINWATER TANK LOCATION MAY ALTER TO SUIT SITE CONDITIONS AND DESIGN AT A LATER STAGE
 3. ENSURE NO DAMAGE OCCURS TO TREE ROOTS DURING CONSTRUCTION PHASE
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MHNDUNION
29 HUTCHINSON STREET
SURRY HILLS SYDNEY NSW 2010
T +61 2 9101 1111
F +61 2 9101 1100
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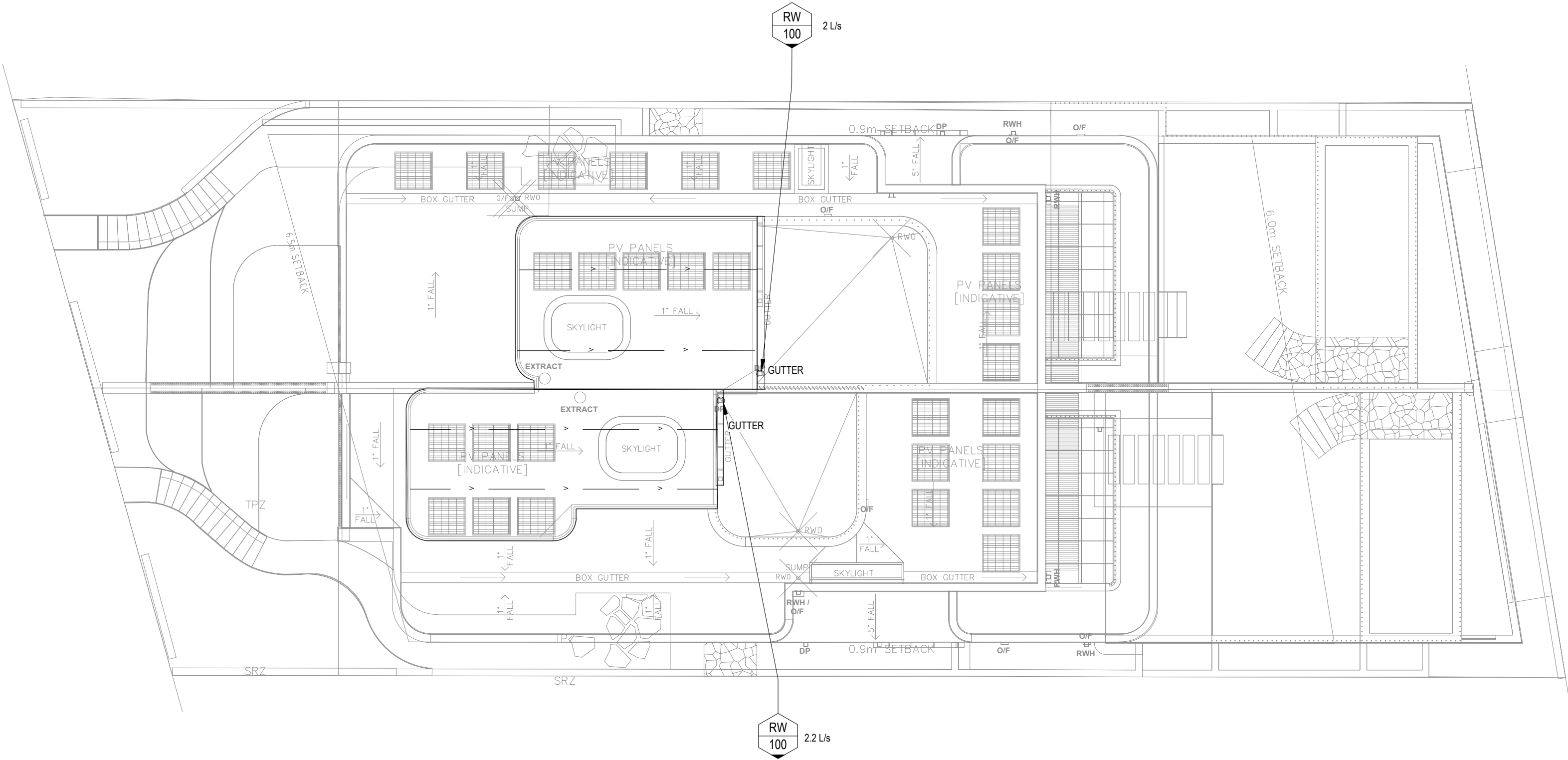
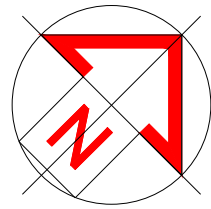
CONSULTANT
**IGS** INTEGRATED GROUP SERVICES
Phone +61 2 8488 4500 Fax +61 2 9475 4588
Address 192-200 Euston road, Alexandria NSW
Web www.igs.com.au

PROJECT
38 UNDERCLIFF ROAD
FRESHWATER, NSW 2096

DRAWING TITLE
STORMWATER MANAGEMENT
SECOND FLOOR

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PROJECT No.			DRAWING No.	REVISION
EN-N24_XX			SW103	02

- PLEASE NOTE:
1. ROOF DRAINAGE SYSTEM TO BE FURTHER COORDINATED DURING CC STAGE
 2. PITS, DOWN PIPES, OUTLETS, AND RAINWATER TANK LOCATION MAY ALTER TO SUIT SITE CONDITIONS AND DESIGN AT A LATER STAGE
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MHNDUNION

29 HUTCHINSON STREET
SURRY HILLS SYDNEY NSW 2010
T +61 2 9101 1111
F +61 2 9101 1100
www.mhndu.com
MHND Design Union Pty Ltd ABN 94 003 717 092

Nominated Architect
Brian Meyerson NSW
Registration Number 4907

CONSULTANT

 **IGS** INTEGRATED GROUP SERVICES

Phone +61 2 8488 4500 Fax +61 2 9475 4588
Address 192-200 Euston road, Alexandria NSW
Web www.igs.com.au

PROJECT

38 UNDERCLIFF ROAD
FRESHWATER, NSW 2096

DRAWING TITLE

STORMWATER MANAGEMENT
ROOF

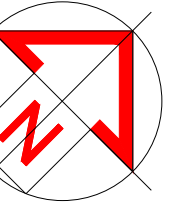
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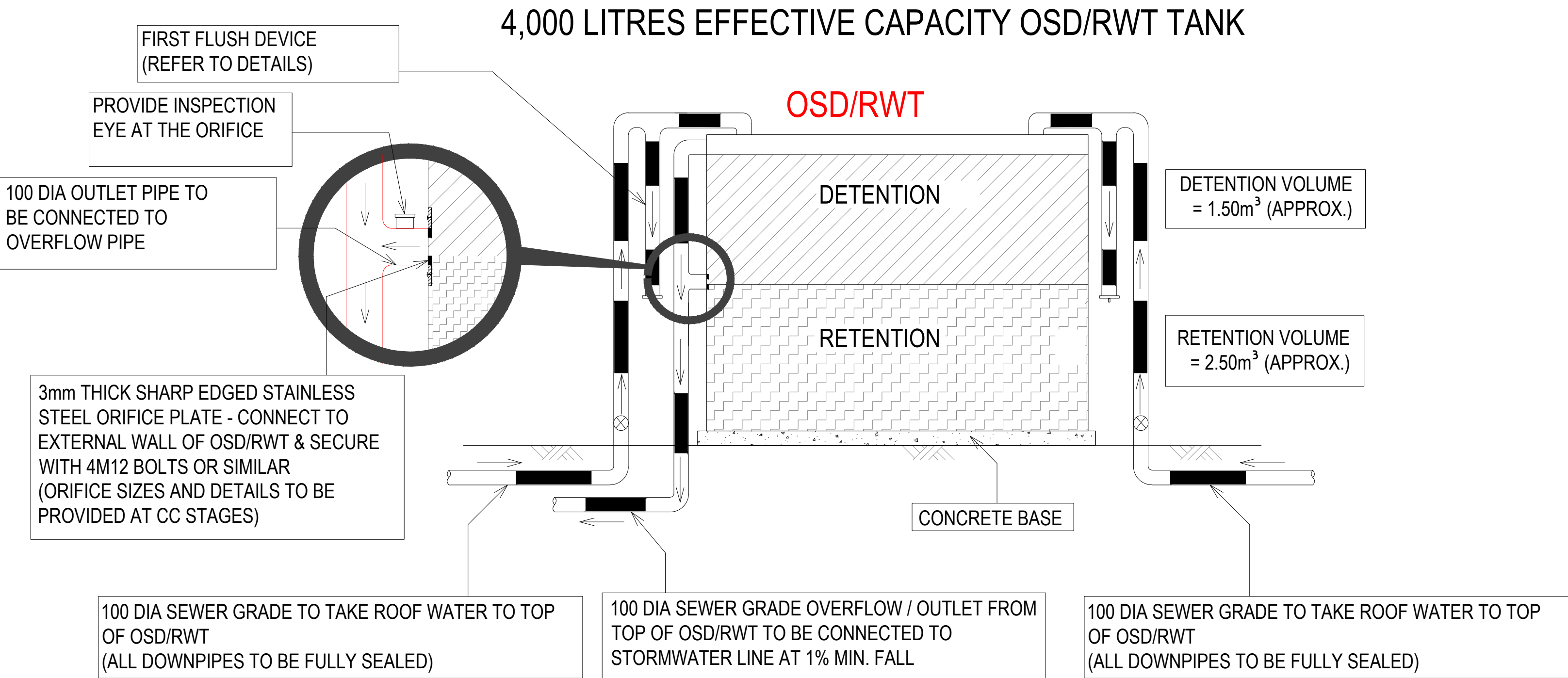
DRAWING No. SW104

REVISION 02

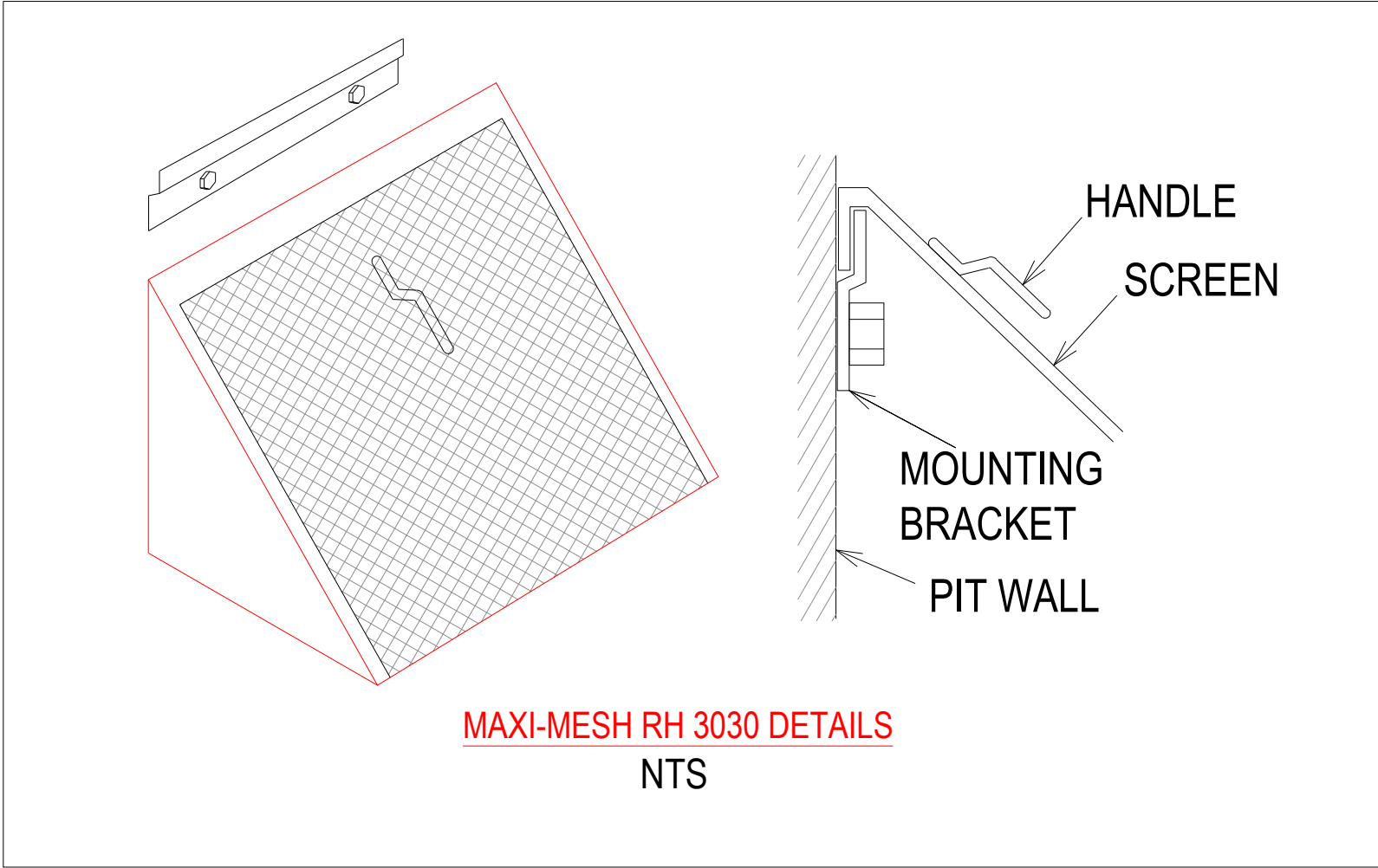


IMPORTANT NOTES:

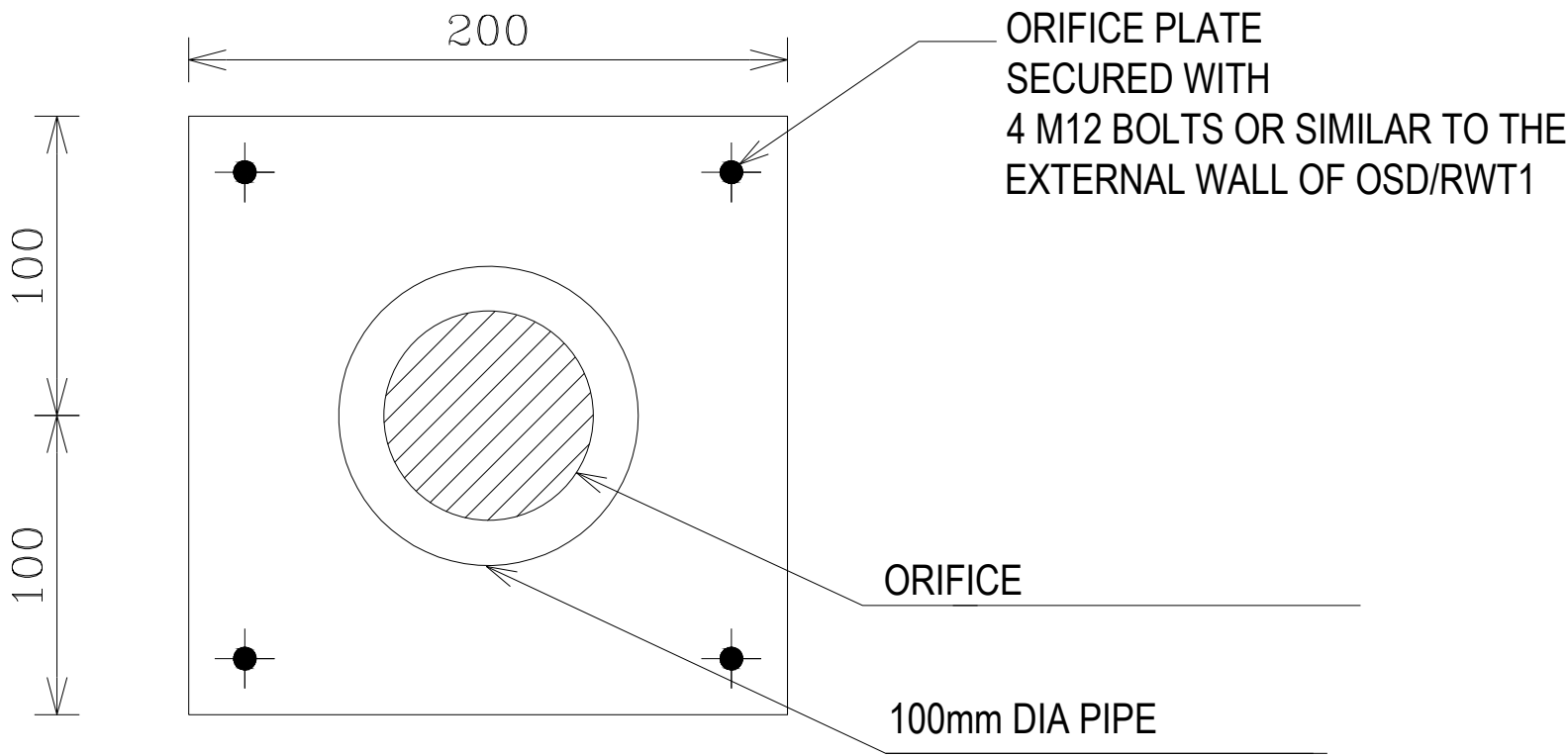
1. RAINWATER TANKS ARE FROM KINGSPAN WATER OR SIMILAR. PH: 1300 736 562
2. A FIRST FLUSH DEVICE IN ACCORDANCE WITH THE MANUFACTURERS REQUIREMENTS SHALL BE FITTED TO THE SYSTEM TO DIVERT THE FIRST 0.5mm OF RUN-OFF FROM THE AREA DRAINING AWAY FROM THE STORAGE TANK. (eg.0.5 l/m²)



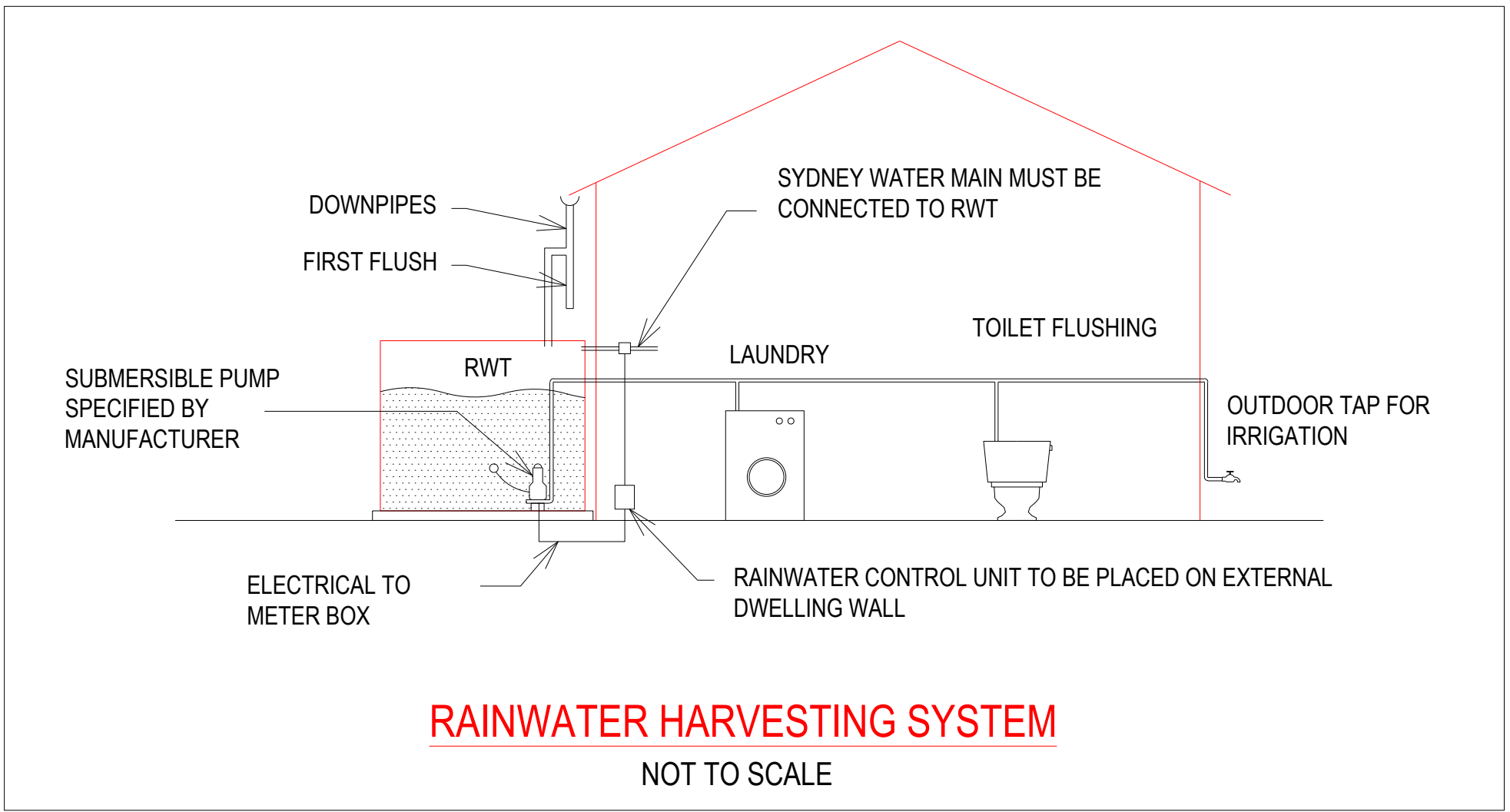
OSD/RWT DETAILS (TYPICAL)
NTS



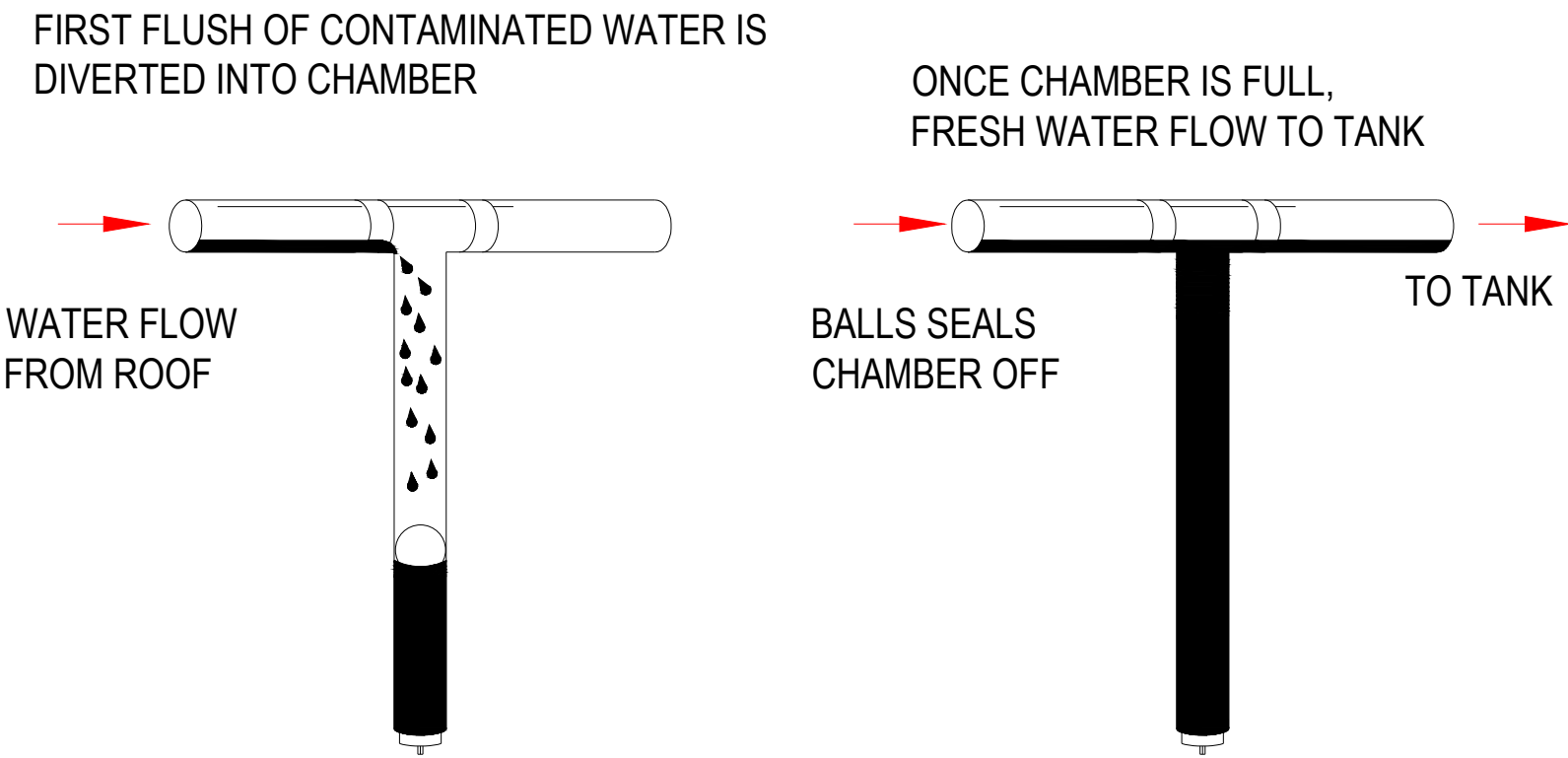
MAXI-MESH RH 3030 DETAILS
NTS



ORIFICE DETAILS
(OSD/RWT)
NTS



RAINWATER HARVESTING SYSTEM
NOT TO SCALE



FIRST FLUSH DETAILS
NTS

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ARCHITECT
MHNDUNION
29 HUTCHINSON STREET
SUNRISE HILLS SYDNEY NSW 2010
T +61 2 9101 1111
F +61 2 9101 1100
www.mhndu.com
MHN Design Union Pty Ltd. ABN 54 053 717 682

CONSULTANT
 **IGS** INTEGRATED GROUP SERVICES
Phone +61 2 8488 4500 Fax +61 2 9475 4588
Address 192-200 Euston road, Alexandria NSW
Web www.igs.com.au

PROJECT
38 UNDERCLIFF ROAD
FRESHWATER, NSW 2096

DRAWING TITLE
STORMWATER MANAGEMENT
RAINWATER TANK & PIT DETAILS
DETAIL SHEET

FOR APPROVAL				
NOT TO BE USED FOR CONSTRUCTION PURPOSES				
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