

# NSW RFS: MONARO FIRE CONTROL CENTRE

11 GEEBUNG STREET, POLO FLAT, NSW 2630  
CIVIL ENGINEERING PACKAGE: 90% DESIGN DEVELOPMENT



LOCALITY PLAN

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## CIVIL DRAWING SCHEDULE

| DWG No. | DRAWING TITLE                                       |
|---------|---|
| C0000   | COVER SHEET, DRAWING SCHEDULE AND LOCALITY PLAN     |
| C0101   | SPECIFICATION NOTES - SHEET 01                      |
| C0102   | SPECIFICATION NOTES - SHEET 02                      |
| C0103   | SPECIFICATION NOTES - SHEET 03                      |
| C0201   | GENERAL ARRANGEMENT PLAN                            |
| C1001   | SEDIMENT AND SOIL EROSION CONTROL PLAN - SHEET 01   |
| C1002   | SEDIMENT AND SOIL EROSION CONTROL PLAN - SHEET 02   |
| C1101   | SEDIMENT AND SOIL EROSION CONTROL DETAILS           |
| C2001   | BULK CUT AND FILL PLAN                              |
| C3001   | SITEWORKS AND STORMWATER MANAGEMENT PLAN - SHEET 01 |
| C3002   | SITEWORKS AND STORMWATER MANAGEMENT PLAN - SHEET 02 |
| C6101   | DETAILS - SHEET 01                                  |
| C6102   | DETAILS - SHEET 02                                  |
| C6103   | DETAILS - SHEET 03                                  |
| C6104   | DETAILS - SHEET 04                                  |

PRINT IN **COLOUR**  
NOT FOR CONSTRUCTION

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JOB MANAGER: N. SUTHERLAND  
VERIFIER:

| REVISION | DESCRIPTION                       | ISSUED | VER'D | APP'D | DATE     |
|----------|-----------------------------------|--------|-------|-------|----------|
| 01       | ISSUED FOR 90% DESIGN DEVELOPMENT | EE     |       | JD    | 28.09.23 |
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|---|---|--|---|--|---|
| <br>DRAWING NOT TO BE USED FOR CONSTRUCTION UNLESS VERIFICATION SIGNATURE HAS BEEN ADDED | <br>THE COPYRIGHT OF THIS DRAWING REMAINS WITH NORTHROP CONSULTING ENGINEERS PTY LTD | <p>ALL DIMENSIONS TO BE VERIFIED ON SITE BEFORE COMMENCING WORK. NORTHROP ACCEPTS NO RESPONSIBILITY FOR THE USABILITY, COMPLETENESS OR SCALE OF DRAWINGS TRANSFERRED ELECTRONICALLY. THIS DRAWING MAY HAVE BEEN PREPARED USING COLOUR, AND MAY BE INCOMPLETE IF COPIED TO BLACK &amp; WHITE.</p> <br>Sydney<br>Level 11 345 George Street, Sydney NSW 2000<br>Ph (02) 9241 4188 Fax (02) 9241 4324<br>Email sydney@northrop.com.au ABN 81 094 433 100 | PROJECT<br>NSW RURAL FIRE SERVICE: MONARO<br>FIRE CONTROL CENTRE<br><br>11 GEEBUNG STREET,<br>POLO FLAT, NSW 2630 | DRAWING TITLE<br>CIVIL ENGINEERING PACKAGE<br><br>COVER SHEET, DRAWING<br>SCHEDULE AND LOCALITY PLAN | JOB NUMBER<br>222002-07<br><br>DRAWING NUMBER<br>C0000<br>REVISION<br>01<br>DRAWING SHEET SIZE = A1 |
|   |   |  |   |  |   |



NOTE: ALL CIVIL ENGINEERING CONSTRUCTION WORKS TO BE CARRIED OUT IN ACCORDANCE WITH SNOWY MONARO REGIONAL COUNCIL DEVELOPMENT GUIDELINES. THE AFOREMENTIONED GUIDELINES INCLUSIVE OF ALL SPECIFICATIONS TAKE PRECEDENCE OVER NOTES PROVIDED BELOW.

| SURVEY  |
|---|
| SURVEY SUPPLIED BY: KLEVEN SPAIN SURVEY CONSULTANTS   |
| 11. REF. NUMBER: SM489  |
| 12. DRAWING TITLE: CONTOUR & DETAIL SURVEY GEEBUNG STREET POLO FLAT   |
| 13. REVISION DATE: 01/12/2022   |
| 14. REVISION NUMBER: 01   |
| 13. GEOCENTRIC DATUM OF AUSTRALIA: GDA 2020   |
| 14. SURVEYOR: J. KLEVEN   |
| 15. APPROVED: J. KLEVEN   |
| 2. ALL UTILITY SERVICES INDICATED ON THE DRAWINGS ORIGINATE FROM SUPPLIED DATA OR DIAL BEFORE YOU DIG SEARCHES, THEREFORE THEIR ACCURACY AND COMPLETENESS IS NOT GUARANTEED. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO DETERMINE AND CONFIRM 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. NOTE SERVICE AUTHORITY REQUIREMENTS FOR LOCATING OF SERVICES PRIOR TO COMMENCEMENT OF WORKS. |
| 3. NORTHROP TAKE NO RESPONSIBILITY FOR THE ACCURACY AND/OR USE OF THIS SURVEY AND ITS CONTENTS.   |

| TREE PROTECTION  |
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| 1. REFER TO LANDSCAPE / ARCHITECTS/NORTHROPS PLAN FOR TREES TO BE RETAINED AND PROTECTED.  |
| 2. ANY EXISTING/PROPOSED TREES WHICH FORM PART OF THE FINAL LANDSCAPING PLAN SHALL BE PROTECTED FROM CONSTRUCTION ACTIVITIES BY:   |
| 2.1. PROTECTING THEM WITH BARRIER FENCING OR SIMILAR MATERIALS INSTALLED OUTSIDE THE DRIP LINE.  |
| 2.2. ENSURING THAT NOTHING IS NAILED TO ANY PART OF THE TREE. CARE IS TAKEN NOT TO CUT ROOTS UNNECESSARILY. COUNCILS AND/OR INDEPENDENT ARBORISTS TO BE CONSULTED WHERE TREE ROOTS ARE TO BE REMOVED AND/OR CUT. |

| EXISTING SERVICES   |
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| 1. ALL UTILITY SERVICES INDICATED ON THE DRAWINGS ORIGINATE FROM SUPPLIED DATA OR DIAL BEFORE YOU DIG SEARCHES, THEREFORE THEIR ACCURACY AND COMPLETENESS IS NOT GUARANTEED. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO DETERMINE AND CONFIRM 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. NOTE SERVICE AUTHORITY REQUIREMENTS FOR LOCATING OF SERVICES PRIOR TO COMMENCEMENT OF WORKS. |
| 2. CARE TO BE TAKEN WHEN EXCAVATING NEAR EXISTING SERVICES. NO MECHANICAL EXCAVATIONS ARE TO BE UNDERTAKEN OVER COMMUNICATION, GAS OR ELECTRICAL SERVICES. HAND EXCAVATION ONLY IN THESE AREAS.   |
| 3. THE CONTRACTOR SHALL PROTECT AND MAINTAIN ALL EXISTING SERVICES THAT ARE TO BE RETAINED IN THE VICINITY OF THE PROPOSED WORKS. ANY AND ALL DAMAGE TO THESE SERVICES AS A RESULT OF THESE WORKS SHALL BE REPAIRED BY THE CONTRACTOR UNDER THE DIRECTION OF THE SUPERINTENDENT AT THE CONTRACTORS EXPENSE.   |
| 4. THE CONTRACTOR SHALL ALLOW IN THE PROGRAM FOR THE ADJUSTMENT (IF REQUIRED) OF EXISTING SERVICES IN AREAS AFFECTED BY WORKS.  |
| 5. THE CONTRACTOR SHALL ALLOW IN THE PROGRAM FOR THE CAPPING OFF, EXCAVATION AND REMOVAL (IF REQUIRED) OF EXISTING SERVICES IN AREAS AFFECTED BY WORKS UNLESS DIRECTED OTHERWISE ON THE DRAWINGS OR BY THE SUPERINTENDENT.  |
| 6. THE CONTRACTOR SHALL ENSURE THAT AT ALL TIMES SERVICES TO ALL BUILDINGS ARE NOT AFFECTED BY THE WORKS AND ARE MAINTAINED AND NOT DISRUPTED.  |
| 7. PRIOR TO COMMENCEMENT OF ANY WORKS THE CONTRACTOR SHALL GAIN APPROVAL OF THE PROGRAM FOR THE RELOCATION AND/OR CONSTRUCTION OF TEMPORARY SERVICES AND FOR ANY ASSOCIATED INTERRUPTION OF SUPPLY.   |
| 8. THE CONTRACTOR SHALL CONSTRUCT TEMPORARY SERVICES TO MAINTAIN EXISTING SUPPLY TO BUILDINGS REMAINING IN OPERATION DURING WORKS TO THE SATISFACTION AND APPROVAL OF THE SUPERINTENDENT. ONCE DIVERSION IS COMPLETE AND COMMISSIONED THE CONTRACTOR SHALL REMOVE ALL SUCH TEMPORARY SERVICES AND MAKE GOOD TO THE SATISFACTION OF THE SUPERINTENDENT.  |
| 9. THE CONTRACTOR IS TO ALLOW TO POTHOLE ANY SERVICES WITHIN A PUBLIC RESERVE WITHIN THE EXTENT OF WORKS (E.G. STORMWATER CROSSINGS).   |

| ACCESS AND SAFETY  |
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| 1. THE CONTRACTOR SHALL COMPLY WITH ALL STATUTORY AND INDUSTRIAL REQUIREMENTS FOR PROVISION OF A SAFE WORKING ENVIRONMENT INCLUDING TRAFFIC CONTROL.   |
| 2. THE CONTRACTOR SHALL PROVIDE TRAFFIC MANAGEMENT PLANS FOR THE PROPOSED WORKS COMPLETED BY A SUITABLY QUALIFIED PERSON AND APPROVED BY COUNCIL / REGULATORY AUTHORITY. WORK IS NOT TO COMMENCE ON SITE PRIOR TO APPROVAL OF TRAFFIC MANAGEMENT SCHEME. |
| 3. THE CONTRACTOR SHALL ENSURE THAT AT ALL TIMES ACCESS TO BUILDINGS ADJACENT THE WORKS IS NOT DISRUPTED.  |
| 4. WHERE NECESSARY THE CONTRACTOR SHALL PROVIDE SAFE PASSAGE OF VEHICLES AND/OR PEDESTRIANS THROUGH OR BY THE SITE.  |
| 5. THE CONTRACTOR SHALL ENSURE PUBLIC ACCESS EXTERNAL TO THE SITE IS IN ACCORDANCE WITH COUNCILS / AUTHORITY / SITE MANAGERS REQUIREMENTS.   |

| SEDIMENT AND SOIL EROSION   |
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| 1. THE SEDIMENT & EROSION CONTROL PLAN PRESENTS CONCEPTS ONLY. THE CONTRACTOR SHALL AT ALL TIMES BE RESPONSIBLE FOR THE ESTABLISHMENT & MANAGEMENT OF A DETAILED SCHEME MEETING COUNCILS AND OTHER REGULATORY AUTHORITY REQUIREMENTS AND MAKE PAYMENT OF ALL FEES.  |
| 2. THE CONTRACTOR SHALL INSTIGATE ALL SEDIMENT AND EROSION CONTROL MEASURES IN ACCORDANCE WITH STATUTORY REQUIREMENTS AND IN PARTICULAR THE 'BLUE BOOK' (MANAGING URBAN STORMWATER SOILS AND CONSTRUCTION), PRODUCED BY LANDCON AND COUNCILS POLICIES. THESE MEASURES ARE TO BE INSPECTED AND MAINTAINED ON A DAILY BASIS.              |
| 3. THE CONTRACTOR SHALL ENSURE THAT ALL SOIL AND WATER MANAGEMENT WORKS ARE LOCATED AS INSTRUCTED IN THE DRAWINGS AND ADHERE TO ALL REGULATORY AUTHORITY REQUIREMENTS.  |
| 4. THE CONTRACTOR SHALL INFORM ALL SUB CONTRACTORS OF THEIR RESPONSIBILITIES IN MINIMISING THE POTENTIAL FOR SOIL EROSION AND POLLUTION TO DOWNSTREAM LANDS AND WATERWAYS.  |
| 5. WHERE PRACTICAL, THE SOIL EROSION HAZARD ON THE SITE SHALL BE KEPT AS LOW AS POSSIBLE. TO THIS END, WORKS SHOULD BE UNDERTAKEN IN THE FOLLOWING SEQUENCE.  |
| 5.1. CONSTRUCT TEMPORARY STABILISED SITE ACCESS INCLUSIVE OF SHAKE DOWN / WASH PAD.   |
| 5.2. INSTALL ALL TEMPORARY SEDIMENT FENCES AND BARRIER FENCES. WHERE FENCES ADJACENT EACH OTHER, THE SEDIMENT FENCE CAN BE INCORPORATED INTO THE BARRIER FENCE.   |
| 5.3. INSTALL SEDIMENT CONTROL MEASURES AS OUTLINED ON THE APPROVED PLANS.   |
| 6. UNDERTAKE SITE DEVELOPMENT WORKS SO THAT LAND DISTURBANCE IS CONFINED TO AREAS OF MINIMUM WORKABLE SIZE.   |
| 7. AT ALL TIMES AND IN PARTICULAR DURING WINDY AND DRY WEATHER, LARGE UNPROTECTED AREAS WILL BE STABILISED / KEPT MOIST (NOT WET) TO KEEP DUST UNDER CONTROL ENSURING CONFORMITY TO REGULATORY AUTHORITY REQUIREMENTS.  |
| 8. ANY SAND USED IN THE CONCRETE CURING PROCESS (SPREAD OVER THE SURFACE) SHALL BE REMOVED AS SOON AS POSSIBLE AND WITHIN 10 WORKING DAYS FROM PLACEMENT.   |
| 9. WATER SHALL BE PREVENTED FROM ENTERING THE PERMANENT DRAINAGE SYSTEM UNLESS THE CATCHMENT AREA HAS BEEN STABILISED AND/OR ANY LIKELY SEDIMENT BEEN FILTERED OUT.   |
| 10. TEMPORARY SOIL AND WATER MANAGEMENT STRUCTURES SHALL BE REMOVED ONLY AFTER THE LANDS THEY ARE PROTECTING ARE STABILISED / REHABILITATED.  |
| 11. ALLOW FOR GRASS STABILISATION OF EXPOSED AREAS, OPEN CHANNELS AND ROCK BATTERS DURING ALL PHASES OF CONSTRUCTION.   |
| 12. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSPECTED TO ENSURE THAT THEY OPERATE EFFECTIVELY. REPAIRS AND/OR MAINTENANCE SHALL BE UNDERTAKEN REGULARLY AND AS REQUIRED, PARTICULARLY FOLLOWING RAIN EVENTS.   |
| 13. RECEPTORS FOR CONCRETE AND MORTAR SLURRIES, PAINTS, ACID WASHINGS, LIGHT-WEIGHT WASTE MATERIALS AND LITTER SHALL BE DISPOSED OF IN ACCORDANCE WITH REGULATORY AUTHORITY REQUIREMENTS. CONTRACTOR TO PAY ALL FEES AND PROVIDE EVIDENCE OF SAFE DISPOSAL.   |
| 14. IF A TEMPORARY SEDIMENT BASIN IS REQUIRED, ENSURE SAFE BATTER SLOPES IN ACCORDANCE WITH THE GEOTECHNICAL REPORT. MAINTAIN ADEQUATE STORAGE VOLUME IN ACCORDANCE WITH PLANS. TEMPORARY PUMP 'CLEAN FLOCCULATED' WATER TO AUTHORITIES STORMWATER SYSTEM. ENSURE WHOLE DISTURBED SITE RUN-OFF IS DIRECTED TO TEMPORARY SEDIMENT BASIN. |

| EARTHWORKS   |
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| 1. AT THE COMMENCEMENT OF FILLING OPERATIONS FOR BULK EARTHWORKS A GEOTECHNICAL ENGINEER IS TO VISIT THE SITE & CONFIRM THE SUITABILITY OF THE METHODOLOGY OF ACHIEVING THE REQUIRED COMPACTION EARTHWORKS REQUIREMENTS.   |
| 2. STRIP TOPSOIL, VEGETABLE MATTER AND RUBBLE TO EXPOSE NATURALLY OCCURRING MATERIAL AND STOCKPILE ON SITE AS DIRECTED BY THE SUPERINTENDENT.  |
| 3. WHERE FILLING IS REQUIRED TO ACHIEVE DESIGN SUBGRADE, PROOF ROLL EXPOSED NATURAL SURFACE WITH A MINIMUM OF TEN PASSES OF A VIBRATING ROLLER (MINIMUM STATIC WEIGHT OF 10 TONNES) IN THE PRESENCE OF THE SUPERINTENDENT OR CERTIFYING ENGINEER.  |
| 4. THE CONTRACTOR IS TO ALLOW FOR A SUITABLY QUALIFIED GEOTECHNICAL ENGINEER TO PROVIDE ADVICE AND CERTIFICATION OF ANY WORKS ASSOCIATED WITH TREATING OR MANAGING UNSUITABLE GROUND CONDITIONS THROUGHOUT THE CONTRACT (e.g. STABILITY OF EXCAVATIONS, POOR SUBGRADE, THE EXISTING QUARRY AREA etc).  |
| 5. ALL SOFT, WET OR UNSUITABLE MATERIAL IS TO BE REMOVED AS DIRECTED BY THE SUPERINTENDENT AND REPLACED WITH APPROVED MATERIAL SATISFYING THE REQUIREMENTS BELOW.  |
| 6. PROVIDE CERTIFICATES VERIFYING THE QUALITY OF IMPORTED MATERIAL FOR THE SUPERINTENDENTS APPROVAL.   |
| 7. ALL FILL MATERIAL SHALL BE PLACED IN MAXIMUM 200mm THICK LAYERS (LOOSE) AND COMPACTED AT OPTIMUM MOISTURE CONTENT (+ OR - 2%) TO ACHIEVE A DRY DENSITY DETERMINED IN ACCORDANCE WITH AS1289.2.11, AS1289.5.7.1 AND AS1289.5.8.8 OF NOT LESS THAN THE FOLLOWING STANDARD MINIMUM DRY DENSITY:  |
| LOCATION   |
| LANDSCAPED AREAS   |
| ROADS  |
| PAVED AREAS  |
| COMPACTION REQUIREMENT   |
| 98% SMD  |
| 100% SMD (IN ACCORDANCE WITH COUNCIL SPECIFICATIONS)   |
| 100% SMD (IN ACCORDANCE WITH COUNCIL SPECIFICATIONS)   |
| 8. TESTING OF THE SUBGRADE SHALL BE CARRIED OUT BY AN APPROVED N.A.T.A. REGISTERED LABORATORY AT THE CONTRACTORS EXPENSE UNLESS AGREED DIFFERENTLY WITH THE PRINCIPAL.   |
| 9. ALLOW THE FOLLOWING COMPACTION TESTING BY N.A.T.A. REGISTERED LABORATORY FOR PLATFORMS AND FILL LAYERS IN ACCORDANCE WITH THE LATEST VERSION OF AS3798. (MINIMUM 3 TESTS PER LAYER) OR 1 TEST PER MATERIAL TYPE PER 2500sq.m OR 1 TEST.   |
| 10. WHERE TEST RESULTS ARE BELOW THE SPECIFIED COMPACTION, RECOMPACT (TYPING FIRST AS NECESSARY) AND RETEST UNTIL SPECIFIED COMPACTION STANDARDS ARE ACHIEVED, OTHERWISE SUBGRADE REPLACEMENT IS REQUIRED IF COMPACTION STANDARDS ARE NOT ACHIEVED.  |
| 11. ALLOW FOR EXCAVATION IN ALL MATERIALS AS FOUND U.N.O. NO ADDITIONAL PAYMENTS WILL BE MADE FOR EXCAVATION IN WET OR HARD GROUND.  |
| 12. WHERE THERE IS INSUFFICIENT EXCAVATED MATERIAL SUITABLE FOR FILLING OR SUBGRADE REPLACEMENT, THE CONTRACTOR IS TO ALLOW TO IMPORT FILL. IMPORTED FILL SHALL COMPLY WITH THE FOLLOWING:   |
| 12.1. BE OF VIRGIN EXCAVATED NATURAL MATERIAL OR   |
| 12.2. CONTRACTOR TO PROVIDE EVIDENCE IMPORT IS SUITABLE FOR USE  |
| 12.3. PLASTICITY INDEX BETWEEN 2-15% AND CBR > 8   |
| 12.4. FREE FROM ORGANIC AND PERISHABLE MATTER  |
| 12.5. MAXIMUM SIZE 50mm, PASSING 75 MICRON SIEVE (<25%)  |
| 13. THE CONTRACTOR SHALL PROGRAM THE EARTHWORKS OPERATION SO THAT THE WORKING AREAS ARE ADEQUATELY DRAINED DURING THE PERIOD OF CONSTRUCTION. THE SURFACE SHALL BE GRADED AND SEALED OFF TO REMOVE DEPRESSIONS, ROLLERS MARKS AND SIMILAR WHICH WOULD ALLOW WATER TO POND AND PENETRATE THE UNDERLYING MATERIAL. ANY DAMAGE RESULTING FROM THE CONTRACTOR NOT OBSERVING THESE REQUIREMENTS SHALL BE RECTIFIED AT THEIR COST. |
| 14. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE AND MAINTAIN THE INTEGRITY OF ALL SERVICES, CONDUITS AND PIPES DURING CONSTRUCTION, SPECIFICALLY DURING THE BACKFILLING AND COMPACTION PROCEDURE. ANY AND ALL DAMAGE TO NEW OR EXISTING SERVICES AS A RESULT OF THESE WORKS SHALL BE REPAIRED BY THE CONTRACTOR AT NO ADDITIONAL COST.  |
| DEEP EXCAVATIONS   |
| 15. PRIOR TO THE COMMENCEMENT OF EXCAVATION WORKS GREATER THAN 15m IN DEPTH, THE CONTRACTOR SHALL OBTAIN THE SERVICES OF A SUITABLY QUALIFIED GEOTECHNICAL ENGINEER TO DETERMINE THE STABILITY OF MATERIAL BEING EXCAVATED AND BENCHING REQUIREMENTS / MINIMUM BATTER SLOPES.  |
| 16. THE CONTRACTOR MUST PROVIDE THE SUPERINTENDENT AND OR THE DESIGN ENGINEER WITH A COPY OF THE GEOTECHNICAL ENGINEERS REPORT PRIOR TO PRACTICAL COMPLETION.  |
| 17. THE CONTRACTOR IS TO PROVIDE SAFETY BARRIERS, FENCING AND THE LIKE IN ACCORDANCE WITH OH&S AND REGULATORY AUTHORITY REQUIREMENTS AND TO ENSURE THE WORK SITE IS SAFE AT ALL TIMES.   |

| LANDSCAPING   |
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| 1. REFER TO DRAWINGS BY OTHERS FOR DETAILS OF PROPOSED LANDSCAPING TREATMENT.   |
| 2. IF NO LANDSCAPING PLANS EXIST OR PLANS DO NOT SPECIFY GENERAL SURFACE STABILISATION THEN ALL DISTURBED SURFACE TO BE TEMPORARILY STABILISED WITH HYDROMULCH UPON COMPLETION OF WORKS. A 500mm STRIP OF TURF (CT2 COUCH) IS TO BE PLACED BEHIND ALL NEW KERB. |

| STORMWATER DRAINAGE   |
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| 1. ALL PIPES SHALL BE CLASS 2 RUBBER-RING JOINTED RCP U.N.O. WHERE uPVC PIPES HAVE BEEN SPECIFIED, THE FOLLOWING CLASS PIPEWORK IS TO BE ADOPTED U.N.O. Ø100mm OR LESS TO BE CLASS 'SN10' AND ABOVE Ø100mm TO BE CLASS 'SN8'. CLASS 4 PIPES ARE TO BE USED WHERE COVER OVER THE PIPE IS BELOW 600mm AND BENEATH A TRAFFICABLE PAVEMENT. |
| 2. uPVC STORMWATER LINES PASSING UNDER FLOOR SLABS TO BE CONCRETE ENCASED.  |
| 3. FRC PIPES EQUAL TO THAT OF THE STEEL REINFORCED CONCRETE PIPE CLASS SPECIFIED ON THE DRAWINGS MAY BE USED SUBJECT TO APPROVAL FROM THE SUPERINTENDENT.   |
| 4. ALL PIPE ARE TO BE LAID AT 1.0% MIN GRADE U.N.O.   |
| 5. <u>COVERS</u>  |
| 5.1. USE HOT DIPPED GALVANISED COVERS AND GRATES COMPLYING WITH RELEVANT COUNCIL AND AUSTRALIAN STANDARDS.  |
| 5.2. ALL COVERS AND GRATES TO BE POSITIONED IN A FRAME AND MANUFACTURED AS A UNIT.  |
| 5.3. ALL COVERS AND GRATES TO BE FITTING WITH POSITIVE COVER LIFTING KEYS   |
| 5.4. OBTAIN SUPERINTENDENTS APPROVAL FOR THE USE OF CAST IRON SOLID COVERS AND GRATES. CAST IRON SOLID COVERS (IF APPROVED) TO CONSIST OF CROSS-WEBBED, CELLULAR CONSTRUCTION WITH THE RIBS UPPERMOST TO ALLOW INFILLING WITH CONCRETE. INSTALL POSITIVE COVER LIFTING KEYS AND PLASTIC PLUGS.  |
| 5.5. UNLESS DETAILED OR SPECIFIED OTHERWISE, COVERS AND GRATES TO BE CLASS 'D' IN VEHICULAR PAVEMENTS AND CLASS 'B' ELSEWHERE.  |
| 5.6. ALL GRATED TRENCH DRAINS SHOULD BE 'CLASS D' CAST IRON WITHIN VEHICULAR PAVEMENTS AND CLASS 'B' HEEL SAFE WITHIN PEDESTRIAN PAVEMENTS.   |
| 6. ALL PIPE BENDS, JUNCTIONS, ETC ARE TO BE PROVIDED USING PURPOSE MADE FITTINGS OR STORMWATER PITS.  |
| 7. ALL CONNECTIONS TO EXISTING DRAINAGE STRUCTURES SHALL BE MADE IN A TRADESMAN-LIKE MANNER AND CEMENT RENDERED TO ENSURE A SMOOTH FINISH.  |
| 8. ENSURE PIPEWORK DOES NOT PROTRUDE BEYOND THE INSIDE FACE OF THE PIT WALL. PIPEWORK IS TO FINISH FLUSH WITH INTERNAL WALL (UNLESS OTHERWISE NOTED OR DETAILED). CONNECTION TO BE RENDERED AND MADE NEAT ON THE INSIDE FACE OF THE PIT   |
| 9. THE CONTRACTOR SHALL SUPPLY AND INSTALL ALL FITTINGS AND SPECIALS INCLUDING VARIOUS PIPE ADAPTORS TO ENSURE PROPER CONNECTION BETWEEN DISSIMILAR PIPEWORK.   |
| 10. U.N.O. MATERIAL USED FOR BEDDING OF PIPES SHALL BE APPROVED NON-COHESIVE GRANULAR MATERIAL HAVING HIGH PERMEABILITY AND HIGH STABILITY WHEN SATURATED AND FREE OF ORGANIC AND CLAY MATERIAL.  |
| 11. BEDDING SHALL BE U.N.O TYPE HS2 UNDER ROADS AND H2 UNDER GENERAL AREAS IN ACCORDANCE WITH CURRENT RELEVANT INDUSTRY STANDARDS AND GUIDELINES.   |
| 12. THE CONTRACTOR SHALL ENSURE AND PROTECT THE INTEGRITY OF ALL STORMWATER PIPES DURING CONSTRUCTION. ANY AND ALL DAMAGE TO THESE PIPES AS A RESULT OF THESE WORKS SHALL BE REPAIRED BY THE CONTRACTOR UNDER THE DIRECTION OF THE SUPERINTENDENT AND AT NO EXTRA COST TO THE CONTRACT.   |
| 13. NOTE THAT THE PIT COVER LEVEL NOMINATED IN GUTTERS ARE TO THE INVERT OF THE GUTTER WHICH ARE 40mm LOWER THAN THE PAVEMENT LEVEL AT LIP OF GUTTER. REFER KERB DETAILS FOR CONFIRMATION.  |
| 14. <u>SUBSOIL DRAINAGE</u>   |
| 15. Ø100mm SUBSOIL DRAINAGE LINES WITH NON-WOVEN GEOTEXTILE FILTER SOCK SURROUND SHALL BE CONNECTED TO A STORMWATER DRAINAGE PIT (AT MIN 1% LONGITUDINAL GRADE) AND PROVIDED IN THE FOLLOWING LOCATIONS;  |
| 15.1. THE HIGH SIDE OF PROPOSED TRAFFICKED PAVEMENT AREAS.  |
| 15.2. ALL PLANTER AND TREE BEDS PROPOSED ADJACENT TO PAVEMENT AREAS.  |
| 15.3. BEHIND RETAINING WALLS (IN ACCORDANCE WITH RETAINING WALL DETAILS).   |
| 15.4. UPSTREAM OF STORMWATER PITS   |
| 15.5. BENEATH FLEXIBLE PAVEMENT ALONG A SAG PROFILE   |
| 15.6. ALL OTHER AREAS SHOWN ON DRAWINGS.  |
| 15.7. CONTRACTOR IS TO MAKE ALLOWANCE IN BOTH TENDER AND CONSTRUCTION COSTING TO ALLOW FOR SUBSURFACE DRAINAGE BEHIND ALL RETAINING WALLS / ABOVE LOCATIONS AND TO MAKE CONNECTION TO STORMWATER SYSTEM.  |
| 16. WHERE SUBSOIL DRAINAGE PASSES BENEATH BUILDINGS / PAVED AREAS AND/OR PAVEMENTS, CONTRACTOR TO ENSURE Ø100mm CLASS 'SN10' uPVC DRAINAGE LINE IS USED AND THAT PROPRIETARY FITTINGS ARE USED TO RECONNECT SUBSOIL DRAINAGE LINE.  |
| 17. THE CONTRACTOR SHALL INSTALL INSPECTION OPENINGS / CLEAROUTS TO ALL SUBSOIL DRAINAGE LINES AND DOWNPIPE LINES AS SPECIFIED ON DRAWINGS AND IN ACCORDANCE WITH COUNCIL SPECIFICATIONS. HOWEVER AS A MINIMUM THEY ARE TO BE PLACED AT MAXIMUM 30m CENTRES AND AT ALL UPSTREAM ENDPOINTS.  |
| 18. PROVIDE 3.0m LENGTH OF Ø100 SUBSOIL DRAINAGE LINE WRAPPED IN NON-WOVEN GEOTEXTILE FILTER FABRIC TO THE UPSTREAM SIDE OF STORMWATER PITS, LAID IN STORMWATER PIPE TRENCHES AND CONNECTED TO DRAINAGE PIT.  |
| 19. IN AREAS WHERE DUMPED / HAND PLACED ROCK IS USED AS A MEANS OF SCOUR PROTECTION, CONTRACTOR IS TO EXCAVATE A MINIMUM OF 100mm FROM PROPOSED SURFACE, LEVEL AND COMPACT SUBGRADE AS SPECIFIED. ROCK TO THEN BE PLACED ON GEOTEXTILE FILTER FABRIC A34.   |
| 20. THE CONTRACTOR IS TO ENSURE THAT A MINIMUM 150mm CLEARANCE IS PROVIDED BETWEEN THE INTERNAL FACE OF PIPE AND ADJACENT INTERNAL PIT WALLS  |
| 21. WHERE TRENCHES ARE IN ROCK, THE PIPE SHALL BE BEDDED ON A MIN 50mm CONCRETE BED (OR 75mm THICK BED OF 12mm BLUE METAL) UNDER THE BARREL OF THE PIPE. THE PIPE COLLAR AT NO POINT SHALL BEAR ON THE ROCK. (E.G. CLEAN 5-12mm AGGREGATE)  |

| PRECAST STORMWATER PITS  |
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| 1. THE USE OF PRE-CAST STORMWATER DRAINAGE PITS IS NOT ACCEPTED WITHOUT CONFIRMATION BETWEEN NORTHROP ENGINEERS AND THE CONTRACTOR REGARDING QUALITY CONTROL AND CERTIFICATION OF FINISHES.  |
| 2. REFER MANUFACTURERS SPECIFICATIONS FOR INSTALLATION GUIDELINES.   |
| 3. PRECAST PIT TO BE PLACED ON MINIMUM 150mm THICK CONCRETE PAD AND BED MINIMUM 50mm WHILST CONCRETE IS STILL PARTIALLY WET.   |
| 4. ENSURE PENETRATION IS CORED THROUGH PIT FACE TO ALLOW CONNECTION AND IS NOT OVERSIZED.  |
| 5. ENSURE A SEALED FINISH AT PIPE CONNECTIONS BY HAND-APPLYING MINIMUM 150mm THICK CONCRETE AROUND PIPE AT THE EXTERNAL FACE OF THE PIT. ENSURE CONCRETE DOES NOT AFFECT THE INTEGRITY OF THE SUBSOIL DRAINAGE CONNECTED TO THE PIT.     |
| 6. ENSURE A SMOOTH SEALED FINISH AT PIPE CONNECTIONS BY HAND APPLYING CONCRETE AROUND THE PIPE ON THE INTERNAL FACE OF THE PIT TO FILL IN ANY VOIDS CREATED WHEN PENETRATION FOR THE PIPE WAS CORED.                                     |
| 7. ENSURE PIPEWORK DOES NOT PROTRUDE BEYOND THE INSIDE FACE OF THE PIT WALL. PIPEWORK IS TO FINISH FLUSH WITH INTERNAL WALL (UNLESS OTHERWISE NOTED OR DETAILED). CONNECTION TO BE RENDERED AND MADE NEAT ON THE INSIDE FACE OF THE PIT. |
| 8. ENSURE THE OUTLET PIPE IS CONNECTED AT THE INVERT LEVEL OF THE PIT TO DRAIN ALTERNATIVELY FILL THE BASE OF THE PIT WITH MASS CONCRETE (MIN 50mm THICK) OR APPROVED GROUTING COMPOUND (LESS THAN 50mm THICK) TO DRAIN.                 |
| 9. PROVIDE CONCRETE BENCHING TO SIDES OF PIT TO SUIT PIPE DIAMETER. HEIGHT TO MATCH MINIMUM 1/3 PIPE DIAMETER.   |

| SIGNAGE AND LINEMARKING   |
|---|
| 1. ALL SIGNAGE TO BE INSTALLED IN ACCORDANCE WITH AUSTRALIAN STANDARDS 1742 / TNSW STANDARDS AND SPECIFICATIONS.  |
| 2. LINE MARKING AND PAINT SHALL BE IN ACCORDANCE WITH AS1742.3 AND TNSW STANDARDS.  |
| 3. PAINT SHALL BE TYPE 3 CLASS 'A' AND THE COLOUR SHALL BE WHITE AND NOT SUBJECT TO DISCOLOURATION BY BITUMEN FROM ROAD SURFACE. ALL PAINT TO BE APPLIED BY MECHANICAL SPRAYER. LINE MARKING SHALL BE APPLIED AT A WET THICKNESS OF BETWEEN 0.35mm AND 0.40mm |
| 4. PAINT SHALL BE APPLIED AT A WET THICKNESS OF BETWEEN 0.35mm AND 0.40mm.  |
| 5. CARPARK LINEMARKING TO BE 80mm WIDE.   |
| 6. WHEEL STOPS TO BE PROVIDED FOR PARKING SPOTS ADJACENT TO A WALL WITHIN 1.1m OF THE FACE OF KERB IN ACCORDANCE WITH AS1428.1  |
| 7. REFER TO AUSTRROADS FOR REMOVAL OF LINEMARKING.  |


| SITEWORKS  |
|--|
| 1. ALL WORKS TO BE IN ACCORDANCE WITH RELEVANT LOCAL COUNCIL / REGULATORY AUTHORITIES REQUIREMENTS, ALL SPECIFICATIONS AND AUSTRALIAN STANDARDS. CONFLICTS BETWEEN SAID DOCUMENTS SHALL BE REFERRED TO THE SUPERINTENDENT FOR DIRECTION.   |
| 2. THE CONTRACTOR IS TO REVIEW THE DRAWINGS PRIOR TO PRICING AND COMMENCEMENT AND REPORT ANY DISCREPANCIES TO NORTHROP   |
| 3. ANY PRODUCTS SPECIFIED OR USED TO BE VERIFIED BY THE CONTRACTOR AS BEING SAFE AND APPROPRIATE FOR USE. NORTHROP DO NOT TAKE ANY RESPONSIBILITY FOR THE USE OF UNSAFE PRODUCTS   |
| 4. THE CONTRACTOR IS TO DESIGN, OBTAIN APPROVALS AND CARRY OUT REQUIRED TEMPORARY TRAFFIC CONTROL PROCEDURES DURING CONSTRUCTION IN ACCORDANCE WITH ALL REGULATORY AUTHORITIES, INCLUSIVE OF LOCAL COUNCIL REGULATIONS AND REQUIREMENTS.   |
| 5. THE CONTRACTOR IS TO OBTAIN ALL AUTHORITY APPROVALS AS REQUIRED PRIOR TO COMMENCEMENT OF WORKS.   |
| 6. RESTORE ALL PAVED, COVERED, GRASSED AND LANDSCAPED AREAS TO THEIR ORIGINAL CONDITION OR AS DIRECTED BY THE SITE SUPERINTENDENT ON COMPLETION OF WORKS. WHERE PLANTING OF NEW GRASS IS NECESSARY REFER TO LANDSCAPE ARCHITECT AND / OR ARCHITECT DOCUMENTATION.  |
| 7. ON COMPLETION OF ANY TRENCHING WORKS, ALL DISTURBED AREAS SHALL BE RESTORED TO THEIR ORIGINAL CONDITION OR AS DIRECTED BY THE SITE SUPERINTENDENT, INCLUDING KERBS, FOOTPATHS, CONCRETE AREAS, GRAVEL, GRASSED AREAS AND ROAD PAVEMENTS.  |
| 8. THE CONTRACTOR SHALL ARRANGE ALL SURVEY SETOUT TO BE CARRIED OUT BY A REGISTERED SURVEYOR PRIOR TO COMMENCEMENT OF WORKS. THE CONTRACTOR IS TO ENSURE THAT SURVEY BOUNDARIES ARE DERIVED FROM A CADASTRAL SURVEY RATHER THAN A DETAIL SURVEY.   |
| 9. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND EXISTING LEVELS ONSITE PRIOR TO LODGMET OF TENDER AND ONSITE WORKS. THE PRICE AS TENDERED SHALL BE INCLUSIVE OF ALL WORKS SHOWN ON THE TENDER PROJECT DRAWINGS. ADDITIONAL PAYMENTS FOR WORKS SHOWN ON THE TENDER PROJECT DRAWINGS WILL NOT BE APPROVED. |
| 10. DO NOT OBTAIN DIMENSIONS BY SCALING DRAWINGS.  |
| 11. IN CASE OF DOUBT OR DISCREPANCY PRIOR TO SUPERINTENDENT FOR CLARIFICATION OR CONFIRMATION REFER TO THE COMMENCEMENT OF CONSTRUCTION.   |
| 12. WHERE NEW WORKS ABUT EXISTING THE CONTRACTOR SHALL ENSURE THAT A SMOOTH EVEN PROFILE, FREE FROM ABRUPT CHANGES IS OBTAINED. MAKE SMOOTH TRANSITION TO EXISTING FEATURES AND MAKE GOOD WHERE JOINED.  |
| 13. TRENCHES THROUGH EXISTING ROAD AND CONCRETE PAVEMENTS SHALL BE SAWCUT TO FULL DEPTH OF CONCRETE AND A MIN 50mm IN BITUMINOUS PAVING.   |
| 14. ALL CIVIL ENGINEERING DESIGN HAS BEEN DOCUMENTED UNDER THE ASSUMPTION THAT ALL NECESSARY SITE CONTAMINATION REMEDIATION WORKS HAVE BEEN SATISFACTORILY COMPLETED (IF APPLICABLE) AND THAT THE SITE IS NOT AFFECTED BY ANY SOIL STRATA OR GROUNDWATER TABLE CONTAMINATION.                              |
| 15. NOTES ON DETAILS PROVIDED TAKE PRECEDENCE OVER SPECIFICATION NOTES UNLESS IN CONTRADICTION WITH COUNCIL/AUTHORITY SPECIFICATIONS/DETAILS. CONTRACTOR TO CONSULT WITH NORTHROP FOR ANY DISCREPANCIES.   |
| 16. IF THE CONTRACTOR DISCOVERS HAZARDOUS/CONTAMINATED MATERIAL THE CONTRACTOR SHALL CONSULT WITH AN ENVIRONMENTAL SPECIALIST.   |
| 17. THE CONTRACTOR IS RESPONSIBLE FOR DEALING WITH COMMUNITY COMPLAINTS ASSOCIATED WITH THE WORKS UNDER THE CONTRACT AND TO COMPENSATE FOR/RECTIFY ANY DAMAGE REASONABLY CAUSED BY THE CONTRACTOR.   |
| 18. THE TERM 'MAKE GOOD' OR 'MAKE NEAT' IS IN REFERENCE TO THE SATISFACTION OF NORTHROP OR CERTIFYING ENGINEER. THE CONTRACTOR IS TO SEEK CLARIFICATION FROM NORTHROP OR THE CERTIFYING ENGINEER IF NECESSARY.   |
| 19. TOLERANCES TO BE IN ACCORDANCE WITH COUNCIL REQUIREMENTS.  |
| <u>SERVICE TRENCHES</u>  |
| 20. SAWCUT EXISTING SURFACES PRIOR TO EXCAVATION. BACKFILL ALL TRENCHES UNDER EXISTING ROADS, PAVEMENTS AND PATHS WITH STABILISED SAND 5% CEMENT OR DGS40 MATERIAL (5% CEMENT) COMPACTED IN 200mm THICK LAYERS TO 98% MMD TO UNDERSIDE OF PAVEMENT.  |
| 21. BACKFILL ALL TRENCHES NOT UNDER ROADS, PAVEMENTS, PATHS AND BUILDINGS WITH APPROVED EXCAVATED OR IMPORTED MATERIAL COMPACTED TO 95% SMD.   |

PRINT IN COLOUR  
NOT FOR CONSTRUCTION

JOB MANAGER: N. SUTHERLAND  
DESIGNED: J. DI FONZO  
DRAWN: E. EAGER  
VERIFIER:

| REVISION | DESCRIPTION                       | ISSUED | VER'D | APP'D | DATE     |
|----------|-----------------------------------|--------|-------|-------|----------|
| 01       | ISSUED FOR 90% DESIGN DEVELOPMENT | EE     |       | JD    | 28.09.23 |
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| DRAWING TITLE<br>CIVIL ENGINEERING PACKAGE |
| SPECIFICATION NOTES<br>- SHEET 01          |

|                         |
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| DRAWING SHEET SIZE = A1 |



NOTE: ALL CIVIL ENGINEERING CONSTRUCTION WORKS TO BE CARRIED OUT IN ACCORDANCE WITH SNOWY MONARO REGIONAL COUNCIL DEVELOPMENT GUIDELINES. THE FOREMENTIONED GUIDELINES INCLUSIVE OF ALL SPECIFICATIONS TAKE PRECEDENCE OVER NOTES PROVIDED BELOW.

JOB MANAGER: N. SUTHERLAND VERIFIER: J. DI FONZO DESIGNED: E. EAGER DRAWN: E. EAGER

# ENGINEERING CERTIFICATION

1. TO CERTIFY THE CONSTRUCTED CIVIL WORKS, A QUALIFIED EXPERIENCED ENGINEER IS TO VISIT THE SITE TO OBSERVE CONSTRUCTION TECHNIQUES AND VARIOUS ELEMENTS THAT MAY BE CONCEALED WHEN THE WORKS ARE COMPLETE.
2. THIS SPECIFICATION ALLOWS FOR CERTIFICATION OF WORKS CONTROLLED BY A PRIVATE CERTIFIER FOR LAND DEVELOPMENT WORKS. THIS SPECIFICATION DOES NOT COVER CERTIFICATION REQUIREMENTS FOR AUTHORITIES SUCH AS COUNCIL, TNSW OR WATER NSW. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO DETERMINE AND PROVIDE ALL PROJECT SPECIFIC CONSTRUCTION COMPLIANCE (WORKS AS EXECUTED) INFORMATION TO THE SATISFACTION OF THE STAKEHOLDER / AUTHORITY. DISCREPANCIES BETWEEN THIS SPECIFICATION AND SPECIFICATIONS OF OTHER EXTERNAL STAKEHOLDERS / AUTHORITIES IS TO BE REPORTED TO THE SUPERINTENDENT FOR CLARIFICATION.
3. THE CONTRACTOR IS TO AGREE WITH THE ENGINEER AN APPROPRIATE SITE VISIT SCHEDULE AND FEE ARRANGEMENT PRIOR TO COMMENCEMENT OF THE WORKS. THE CONTRACTOR SHALL ENSURE THAT THE ENGINEER CAN SAFELY ACCESS ALL CIVIL ELEMENTS TO BE REVIEWED. SITE VISITS ARE CONDUCTED DURING NORMAL BUSINESS HOURS. WE REQUIRE TWO (2) WORKING DAY NOTICE FOR ANY SITE VISIT.
4. TO PROVIDE CERTIFICATION THE ENGINEER MUST VISIT THE SITE TO OBSERVE.
  - 4.1. PAVEMENTS
    - 4.1.1. POOR SUBGRADE CONDITIONS
    - 4.1.2. PROOF ROLLING OF SUB-GRADE
    - 4.1.3. PLACEMENT OF SUB-BASE COURSE, BASE COURSE AND WEARING COURSE.
    - 4.1.4. PLACEMENT OF STEEL REINFORCEMENT ,DOWELS AND JOINT CRADLES PRIOR TO POURING OF CONCRETE
  - 4.2. EARTHWORKS
    - 4.2.1. TOPSOIL STRIP
    - 4.2.2. EARTHWORKS BATTER
    - 4.2.3. FILLING
  - 4.3. STORMWATER DRAINAGE
    - 4.3.1. DRAINAGE TRENCHES PRIOR TO BACKFILLING
    - 4.3.2. LEGAL POINT OF CONNECTION PRIOR TO BACKFILLING
    - 4.3.3. ANY OTHER DRAINAGE STRUCTURE THAT MAY BE CONCEALED DURING THE COURSE OF THE WORKS
  - 4.4. CONCRETE STRUCTURES
    - 4.4.1. PLACEMENT OF ANY STEEL REINFORCEMENT PRIOR TO CONSTRUCTION.
5. THE CONTRACTOR SHALL PROVIDE SURVEYED LEVELS, PREPARED BY A QUALIFIED SURVEYOR FOR SUBGRADE, SUB-BASE COURSE, BASE COURSE AND WEARING COURSE.
6. THE CONTRACTOR SHALL PROVIDE WORKS AS EXECUTED (WAE) DOCUMENTATION PREPARED BY A QUALIFIED PRACTISING SURVEYOR. THE WAE DRAWINGS SHALL CLEARLY SHOW, STORMWATER GRATE/ COVER LEVELS, STORMWATER PIT INVERT LEVELS AND CORRESPONDING INVERT LEVELS OF ANY INCOMING OR OUTGOING PIPES, DIAMETER OF ALL PIPES, DIMENSIONS AND VOLUME OF ON-SITE DETENTION FACILITIES, INVERT LEVELS OF ORIFICE PLATES, OVERFLOW WEIRS, BASE OF TANK FINISHED LEVELS OF PAVEMENTS. THE WAE SHALL SHOW WHERE THE SIZE OR ALIGNMENT OF CIVIL ENGINEERING ELEMENTS WHEN THEY DEViate FROM THE DESIGN DOCUMENTATION.
7. THE WAE DRAWINGS SHALL BE STAMPED WITH THE FOLLOWING STATEMENT "THESE WAE DRAWINGS HAVE BEEN PREPARED BY [COMPANY NAME] AND ARE A TRUE AND ACCURATE REPRESENTATION OF THE CONSTRUCTED WORKS". EACH DRAWING SHALL BE SIGNED AND DATED BY THE SURVEYOR WHO PREPARED THE DRAWINGS.

THESE WAE DRAWINGS HAVE BEEN PREPARED BY [COMPANY NAME] AND ARE A TRUE AND ACCURATE REPRESENTATION OF THE CONSTRUCTED WORKS.

SIGNED..... DATE.....

NAME.....

POSITION.....

8. WAE SHALL BE PROVIDED IN BOTH AUTOCAD AND PDF FORMAT. NORTHROP CONSULTING ENGINEERS WILL PROVIDE ENGINEERING PLANS TO THE CONTRACTOR IN AUTOCAD FORMAT TO AID PREPARATION OF WAE DOCUMENTATION.
9. IF THE WORKS ARE SUBJECT TO APPROVAL BY THE UPPER PARRAMATTA RIVER CATCHMENT TRUST (UPRCT) THE CONTRACTOR IS TO ABIDE BY THE UPRCT APPROVAL CHECKLIST.
10. CONTRACTOR IS TO UNDERTAKE A CCTV INSPECTION OF ALL STORMWATER DRAINAGE PIPELINES AND PROVIDE TO THE ENGINEER FOR APPROVAL.
11. THE CONTRACTOR SHALL PROVIDE ALL RELEVANT TEST CERTIFICATES PROGRESSIVELY THROUGHOUT THE DURATION OF THE WORKS. ALL TEST CERTIFICATES SHALL BE PREPARED BY A NATA REGISTERED LABORATORY. TEST CERTIFICATES ARE REQUIRED FOR PROOF ROLLING, SUBGRADE COMPACTION, COMPACTION OF PAVEMENT LAYERS, COMPACTION OF FILLING OPERATIONS, CONCRETE SLUMP TEST, AND CONCRETE STRENGTH TESTS. THE CONTRACT SHALL PROVIDE ALL RELEVANT VALIDATIONS BY A GEOTECHNICAL ENGINEER FOR ALL IMPORTED FILL
12. EACH TEST CERTIFICATE WILL NOMINATE THE DATE AND TIME OF THE TEST AND PROVIDE A LOCATION OF WHERE THE TEST SAMPLE WAS TAKEN FROM.
13. THE CONTRACTOR SHALL ARRANGE FOR THE ENGINEER TO CONDUCT A FINAL VISIT TO REVIEW OF THE CONSTRUCTED WORKS. THIS WILL REVIEW WILL NOT TAKE PLACE UNTIL THE WAE DOCUMENTATION AND RELEVANT TEST CERTIFICATES HAVE BEEN RECEIVED.
14. IF DEFECTIVE OR INCOMPLETE WORK IS FOUND DURING THE FINAL INSPECTION ANOTHER INSPECTION MAY BE REQUIRED AT THE CONTRACTORS EXPENSE TO VERIFY THE RECTIFICATION WORKS HAVE BEEN COMPLETED.

| BITUMEN SEALING |   |  |  |  |  |
|-----------------|---|--|--|--|--|
| 1.              | <b>PAVEMENT PREPARATION</b>   |  |  |  |  |
| 1.1.            | THE SURFACE TO BE SEALED SHALL BE DRY AND BROOMED BEFORE COMMENCEMENT OF WORK TO ENSURE COMPLETE REMOVAL OF ALL SUPERFICIAL, FOREIGN OR LOOSE MATTER.   |  |  |  |  |
| 1.2.            | IF APPROVED BY THE MANAGING CONTRACTOR, ALL DEPRESSIONS OR UNEVEN AREAS ARE TO BE TACK-COATED AND BROUGHT TO GENERAL LEVEL OF PAVEMENT WITH ASPHALT CONCRETE BEFORE SEALING COMMENCES.  |  |  |  |  |
| 2.              | <b>MATERIALS</b>  |  |  |  |  |
| 2.1.            | BINDER SHALL BE CLASS 170 TO AS 2008 OR APPROVED PROPRIETARY MATERIAL FOR PRIMING AND PRIME SEALING.  |  |  |  |  |
| 2.2.            | AGGREGATE SHAPE, DURABILITY AND WET TO DRY STRENGTH SHALL COMPLY TO AS2758 FOR CLASS 'N' AGGREGATES. A 20kg SAMPLE TO BE APPROVED BY THE MANAGING CONTRACTOR PRIOR TO USE.  |  |  |  |  |
| 2.3.            | AGGREGATES SHALL BE DELIVERED UNIFORMLY PRECOATED. EXCESSIVE PRECOATING WILL RESULT IN AGGREGATES BEING REJECTED.   |  |  |  |  |
| 2.4.            | FOR TWO COAT FLUSH SEALS, THE SIZE OF THE AGGREGATE FOR THE SECOND COAT, WHILE NORMALLY HALF THAT OF THE FIRST COAT, SHALL BE DIMENSIONALLY COMPATIBLE WITH THAT OF THE FIRST COAT.   |  |  |  |  |
| 2.5.            | PRECOATING AGENTS SHALL BE COMPATIBLE WITH THE AGGREGATES AND BINDER TO BE USED.  |  |  |  |  |
| 3.              | <b>DESIGN</b>   |  |  |  |  |
| 3.1.            | DESIGN OF SPRAYED BITUMINOUS SEALS SHALL BE CARRIED OUT IN ACCORDANCE WITH THE AUSTRROADS (NAASRA) PUBLICATION "PRINCIPLES AND PRACTICE OF BITUMINOUS SURFACING, VOLUME 1 - SPRAYED WORK".  |  |  |  |  |
| 3.2.            | WHERE NOT INDICATED ON THE DRAWINGS, PRIMES AND PRIMER SEALS SHALL BE DESIGNED TO REMAIN INTACT UNTIL FINAL SEALING TAKES PLACE, HAVING REGARD FOR THE TRAFFIC AND CLIMATIC CONDITIONS.   |  |  |  |  |
| 3.3.            | UNLESS OTHERWISE SPECIFIED, BINDER APPLICATION RATES SHALL BE SELECTED TO FILL 85% OF THE THEORETICAL VOIDS OF THE MAT.   |  |  |  |  |
| 4.              | <b>BITUMEN FLUSH SEALING</b>  |  |  |  |  |
| 4.1.            | BITUMEN FLUSH SEALS SHALL BE EITHER SINGLE OR DOUBLE COAT AS SHOWN ON THE DRAWINGS. eg 14/7 INDICATES A DOUBLE COAT FLUSH SEAL USING TWO APPLICATIONS OF BITUMEN AND AGGREGATE. THE FIRST AGGREGATE LAYER BEING OF 14mm NOMINAL SIZE, THE SECOND 7mm. |  |  |  |  |
| 4.2.            | COVER AGGREGATE SHALL BE SPREAD IMMEDIATELY AFTER SPRAYING OF BINDER. IN NO CASE SHALL SPREADING BE DELAYED MORE THAN 8 MINUTES.  |  |  |  |  |
| 5.              | <b>RECORDS</b>  |  |  |  |  |
| 5.1.            | ALL SPRAY RECORDS AND AGGREGATE SUPPLY TONNAGE RECEIPTS SHALL BE RETAINED AND PASSED ON TO THE CONSULTING ENGINEER AS PART OF QUALITY ASSURANCE PROCEDURES.   |  |  |  |  |
| 5.2.            | GENERALLY FLUSH SEALING SHALL BE CARRIED OUT COMPLETE AND IN ACCORDANCE WITH THE RELEVANT TNSW STANDARD.  |  |  |  |  |

| ASPHALTIC CONCRETE |  |  |  |  |  |
|--------------------|--|--|--|--|--|
| 1.                 | <b>GENERAL</b>   |  |  |  |  |
| 1.1.               | ALL ASPHALTIC CONCRETE (AC) WORK TO BE PREPARED AND CARRIED OUT IN ACCORDANCE WITH GOOD ASPHALTIC PAVING PRACTICE AS DESCRIBED IN AS2150-2005 "ASPHALT (HOT-MIXED) PAVING - GUIDE TO GOOD PRACTICE" AND CURRENT TNSW SPECIFICATIONS. |  |  |  |  |
| 2.                 | <b>PAVEMENT PREPARATION</b>  |  |  |  |  |
| 2.1.               | THE FINISHED PAVEMENT SURFACE TO BE SEALED SHALL BE WITHIN +/- 2% OF THE OPTIMUM AND BROOMED BEFORE COMMENCEMENT OF WORK TO ENSURE COMPLETE REMOVAL OF ALL SUPERFICIAL FOREIGN MATTER.   |  |  |  |  |
| 2.2.               | PRIME ALL SURFACES TO BE SEALED. ALLOW PRIME TO SETTLE FOR A MINIMUM OF 3 DAYS BEFORE APPLYING TACK COAT AND ASPHALT.  |  |  |  |  |
| 2.3.               | SWEEP PRIMED SURFACES BEFORE APPLYING TACK COAT.   |  |  |  |  |
| 2.4.               | ALL DEPRESSIONS OR UNEVEN AREAS ARE TO BE TACK-COATED AND BROUGHT UP TO GENERAL LEVEL OF PAVEMENT WITH ASPHALTIC CONCRETE BEFORE LAYING OF MAIN COURSE.  |  |  |  |  |
| 2.5.               | ALL DEFECTS IN THE BASE COURSE INCLUDING CRACKS, SURFACE DEFORMATION AND THE LIKE SHALL BE REPAIRED AS DIRECTED BY THE SUPERINTENDENT PRIOR TO PLACEMENT OF TACK COAT AND/OR AC COURSES.   |  |  |  |  |
| 3.                 | <b>PLACEMENTS</b>  |  |  |  |  |
| 3.1.               | ALL ASPHALT SHALL BE PLACED UTILISING APPROVED MECHANICAL PAVING MACHINES. DO NOT HAND PLACE ASPHALT WITHOUT PRIOR APPROVAL FROM ENGINEER.   |  |  |  |  |
| 4.                 | <b>JOINTS</b>  |  |  |  |  |
| 4.1.               | THE DENSITY AND SURFACE FINISH AT JOINTS SHALL BE SIMILAR TO THOSE OF THE REMAINDER OF THE LAYER.  |  |  |  |  |
| 5.                 | <b>COMPACTION</b>  |  |  |  |  |
| 5.1.               | ALL COMPACTION SHALL BE UNDERTAKEN USING SELF PROPELLED ROLLERS.   |  |  |  |  |
| 5.2.               | INITIAL ROLLING SHALL BE COMPLETED BEFORE THE MIX TEMPERATURE FALLS BELOW 105°C USING A STEEL DRUM ROLLER HAVING A MINIMUM WEIGHT OF 8 TONNES AND A MAXIMUM UNIT LOAD ON THE REAR DRUM EQUIVALENT TO 55kN/m WIDTH OF DRUM.           |  |  |  |  |
| 5.3.               | SECONDARY ROLLING SHALL BE COMPLETED BEFORE THE MIX TEMPERATURE FALLS BELOW 90°C USING A PNEUMATIC TYRED ROLLER OF AT LEAST 10 TONNES MASS. A MINIMUM TYRE PRESSURE OF 550kPa AND A MINIMUM TOTAL LOAD OF 1 TONNE ON EACH TYRE.      |  |  |  |  |
| 5.4.               | ROLLED SURFACES SHALL BE SMOOTH AND FREE OF UNDULATIONS. BONY AND/OR UNEVEN SURFACES WILL BE REJECTED.   |  |  |  |  |
| 5.5.               | PROVIDE 2 No. MINIMUM COMPACTION TESTS.  |  |  |  |  |
| 6.                 | <b>FINISHED SURFACE PROPERTIES</b>   |  |  |  |  |
| 6.1.               | FINISHED SURFACES SHALL BE SMOOTH, DENSE AND TRUE OF SHAPE AND SHALL NOT VARY MORE THAN:   |  |  |  |  |
| 6.1.1.             | 3mm FROM THE SPECIFIED PLAN LEVEL AT ANY POINT.  |  |  |  |  |
| 6.1.2.             | 3mm FROM THE BOTTOM OF A STRAIGHT EDGE LAID TRANSVERSELY.  |  |  |  |  |
| 6.1.3.             | 5mm FROM THE BOTTOM OF A STRAIGHT EDGE LAID LONGITUDINALLY.  |  |  |  |  |
| 6.1.4.             | MINUS 0 TO PLUS 2mm ADJACENT TO OTHER ELEMENTS SUCH AS KERBS AND THE LIKE TO AVOID POOLING OF SURFACE WATER.   |  |  |  |  |
| 6.1.5.             | MINUS 0 FROM THE SPECIFIED THICKNESS.  |  |  |  |  |
| 7.                 | DO NOT STORE PLANT EQUIPMENT OR TRAFFIC NEWLY LAID ASPHALTIC CONCRETE PAVEMENTS WITHOUT PRIOR APPROVAL FROM THE ENGINEER.  |  |  |  |  |
| 8.                 | DO NOT APPLY MARKING PAINTS UNTIL ASPHALT HAS CURED IN ACCORDANCE WITH PAINT MANUFACTURERS SPECIFICATIONS.   |  |  |  |  |

| PAVEMENTS   |  |  |  |  |  |
|---|--|--|--|--|--|
| ALL PAVEMENT MATERIALS SHALL COMPLY WITH CURRENT TNSW SPECIFICATIONS. PROVIDE MECHANICAL ANALYSIS FOR EACH BATCH OF PAVEMENT MATERIAL TO ENSURE CONFORMITY. |  |  |  |  |  |
| 1.  | <b>COMPACTION STANDARDS</b>  |  |  |  |  |
| BASE  | 98% MODIFIED MAXIMUM DRY DENSITY   |  |  |  |  |
| SUBBASE   | 98% MODIFIED MAXIMUM DRY DENSITY   |  |  |  |  |
| SUBGRADE  | 100% STANDARD MAXIMUM DRY DENSITY  |  |  |  |  |
| 2.  | THE CONTRACTOR SHALL CONFIRM THE DESIGN CBR WITH A MINIMUM OF 3 TESTS TAKEN AT SUBGRADE LEVEL. WHERE DISCREPANCY IS FOUND, CONTACT THE DESIGN ENGINEER.  |  |  |  |  |
| 3.  | ALLOW FOR COMPACTION TESTING BY A N.A.T.A. REGISTERED LABORATORY FOR BASE LAYER, SUBBASE LAYER AND SUBGRADE LAYER IN ACCORDANCE WITH THE LATEST VERSION OF AS3798 FOR PAVEMENTS (MINIMUM 2 TESTS PER LAYER). ALLOW FOR AT LEAST TWO SUCCESSFUL COMPACTION TESTS IN EACH LAYER. |  |  |  |  |
| 4.  | MATCH NEW PAVEMENTS NEATLY AND FLUSH WITH EXISTING   |  |  |  |  |
| 5.  | AFTER BASE IS APPROVED, SWEEP CLEAN AND PRIME AT NOMINAL RATE OF 1.0L PER 1.0 sq.m.  |  |  |  |  |
| 6.  | <b>PAVEMENT HOLD POINTS</b>  |  |  |  |  |
| 6.1.  | SUB-GRADE PROOF ROLL PRIOR TO SET-UP AND FORM FOR CONCRETE POUR.   |  |  |  |  |
| 6.2.  | INSPECTION OF FORMWORK / STEEL PRIOR TO CONCRETE POUR.   |  |  |  |  |

CONCRETE PAVEMENTS

1.

THIS SECTION REFERS TO CIVIL CONCRETE WORKS AND DOES NOT INCLUDE STRUCTURAL ELEMENTS SUCH AS BUILDINGS, BELOW GROUND STRUCTURES OR RETAINING WALLS.

2.

ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH AS3600 CURRENT EDITION WITH AMENDMENTS, EXCEPT WHERE VARIED BY THE CONTRACT DOCUMENTS.

3.

CONCRETE QUALITY AND REINFORCING COVER

ALL REQUIREMENTS OF THE CURRENT ACSE CONCRETE SPECIFICATION DOCUMENT 1 SHALL APPLY TO THE FORMWORK, REINFORCEMENT AND CONCRETE UNLESS NOTED OTHERWISE.

| ELEMENT                      | CONCRETE STRENGTH f'c (MPa) | SPECIFIED SLUMP | NOMINAL AGGREGATE SIZE | MAX. 56 DAY DRYING SHRINKAGE | COVER (mm) |
|------------------------------|-----------------------------|-----------------|------------------------|------------------------------|------------|
| KERBS AND PATHS              | 25                          | 60              | 20                     | 650microns                   | TOP 40     |
| PITS AND VEHICULAR PAVEMENTS | 32                          | 80              | 20                     | 650microns                   | TOP 40     |

4.

CONCRETE PROPERTIES SHALL BE VARIED FROM NORMAL CLASS AS FOLLOWS

4.1.

MINIMUM CEMENT CONTENT 250 kg/m³

4.2.

MAXIMUM 56 DAY SHRINKAGE STRAIN = AS NOMINATED ABOVE

4.3.

PRIOR TO COMMENCEMENT CONCRETE SUPPLIER TO PROVIDE DRYING SHRINKAGE TEST RESULTS FROM PRODUCTION ASSESSMENT AS EVIDENCE THAT SPECIFIED DRYING SHRINKAGE LIMITS CAN BE ACHIEVED USING NORMAL MIX DESIGN.

5.

ALL REINFORCEMENT SHALL BE FIRMLY SUPPORTED ON MILD STEEL PLASTIC TIPPED CHAIRS. PLASTIC CHAIRS OR CONCRETE CHAIRS AT NOT GREATER THAN 1m CENTRES BOTH WAYS. BARS SHALL BE TIED AT ALTERNATE INTERSECTIONS.

6.

CEMENT TYPE SHALL BE (ACSE SPECIFICATION) TYPE SL.

7.

PROJECT CONTROL TESTING SHALL BE CARRIED OUT IN ACCORDANCE WITH AS 1379. TEST CYLINDERS ARE TO BE KEPT ON SITE.

8.

ALL COMPRESSIVE STRENGTH TEST REPORTS SHALL BE SUBMITTED TO THE CIVIL ENGINEER FOR REVIEW.

9.

ALL CONCRETE IS TO BE CONTINUOUSLY CURED FOR A MINIMUM PERIOD OF 10 DAYS AFTER PLACING. CURING TO COMMENCE IMMEDIATELY AFTER FINISHING. SPRAY ON CURING COMPOUNDS TO COMPLY WITH AS3799.

10.

PLACE CONCRETE CONTINUOUSLY BETWEEN CONSTRUCTION JOINTS SHOWN ON PLAN. DO NOT BREAK OR INTERRUPT SUCCESSIVE POURS SUCH THAT COLD JOINTS OCCUR. ANY REVISIONS OR ADDITIONS TO CONSTRUCTION JOINTS SHOWN ON PLAN REQUIRE APPROVAL FROM THE CIVIL ENGINEER.

11.

FALLS IN SLAB AS SHOWN ON PLAN MAINTAIN MINIMUM SLAB THICKNESS AS SHOWN.

12.

NO ADMIXTURES SHALL BE USED IN CONCRETE UNLESS APPROVED IN WRITING BY THE DESIGN ENGINEER.

13.

THE FINISHED CONCRETE SHALL BE A DENSE HOMOGENOUS MASS, COMPLETELY FILLING THE FORMWORK, THOROUGHLY EMBEDDING THE REINFORCEMENT AND FREE OF STONE POCKETS.

14.


FABRIC SHALL BE LAPPED IN ACCORDANCE WITH THE FOLLOWING DETAIL:



NOTE: ALL CIVIL ENGINEERING CONSTRUCTION WORKS TO BE CARRIED OUT IN ACCORDANCE WITH SNOWY MONARO REGIONAL COUNCIL DEVELOPMENT GUIDELINES. THE AFOREMENTIONED GUIDELINES INCLUSIVE OF ALL SPECIFICATIONS TAKE PRECEDENCE OVER NOTES PROVIDED BELOW.

| SCOUR PROTECTION ROCK |   |
|-----------------------|---|
| 1.                    | ROCK USED IN THE SCOUR PROTECTION SHALL CONSIST OF MATERIAL WHICH COMPLIES WITH THESE NOTES AND THE DRAWINGS. THIS REQUIREMENT APPLIES TO BOTH IMPORTED ROCK AND IN-SITU ROCK WHICH IS RE-USED.   |
| 2.                    | INDIVIDUAL ROCKS SHALL BE FREE FROM CRACKS, CLEAVAGE PLANES, SEAMS AND DEFECTS WHICH WOULD RESULT IN THE BREAKDOWN OF THE ROCK IN SERVICE.  |
| 3.                    | ROCK UNITS SHALL BE EITHER SEDIMENTARY RACK ONLY OR IGNEOUS ROCK ONLY AND AS A MINIMUM, SHALL SATISFY THE FOLLOWING CRITERIA: <ul style="list-style-type: none"><li>• ROCK SHALL BE ROUGH AND ANGULAR</li><li>• ROCK SHALL HAVE A MINIMUM DRY DENSITY OF 2200 kg/m</li><li>• IGNEOUS ROCK SHALL HAVE NO MORE THAN 10% (BY VOLUME) OLIVINE MATERIAL AND SHALL EXHIBIT NO ZONES OF SECONDARY ALTERATION SUCH AS CHLORITISATION. SEDIMENTARY ROCK SHALL HAVE A MINIMUM SODIUM SULPHATE SOUNDNESS WEIGHT LOSS NOT EXCEEDING 25%</li><li>• ROCK SHALL HAVE A SATURATED POINT LOAD STRENGTH INDEX (IS50) NO LESS THAN 5.0 MPa FOR IGNEOUS ROCK AND 1.5 MPa FOR SEDIMENTARY ROCK</li><li>• THE RATIO OF THE MAXIMUM DIMENSION TO THE MINIMUM DIMENSION, MEASURED AT RIGHT ANGLES TO THE MAXIMUM DIMENSION SHALL NOT EXCEED 2.5</li></ul> |
| 4.                    | THE ROCK UNITS SHALL BE PLACED SUCH THAT THE SPECIFIED REQUIREMENTS FOR SIZE, FINISHED SIDE SLOPES, TOP AND TOE LEVELS AND DENSITY REQUIREMENTS, ARE SATISFIED. IN ADDITION, ROCKS SHALL BE WEDGED AND LOCKED TOGETHER SUCH THAT THEY ARE NOT FREE TO MOVE. ROCK UNITS SHALL NOT BE ROLLED OR DROPPED INTO POSITION, THEY SHALL BE PLACED.  |
| 5.                    | THE METHOD OF ROCK PLACEMENT SHALL BE SUCH AS TO MINIMISE ITS BREAKDOWN ON HANDLING AND THE PRODUCTION OF FINES.  |
| 6.                    | A NON-WOVEN GEOTEXTILE (BIDIM A64 OR EQUIVALENT) SHALL BE PLACED UNDERNEATH AND BEHIND ALL ROCK ARMOUR AND EXTEND 0.5m ABOVE THE EXTENT OF THE WORKS OR AS OTHERWISE SHOWN ON THE DRAWINGS. THE GEOTEXTILE IS TO BE LAID ON A NEATLY TRIMMED BATTER THAT IS FREE OF HOLLOWES OR SHARP OBJECTS.  |
| 7.                    | GEOTEXTILE LAYERS SHALL EITHER OVERLAP ON ANOTHER BY 1000mm OR BE SEWN TOGETHER (WITH A NON-BIODEGRADABLE THREAD) WITH AN OVERLAP OF 100mm.   |
| 8.                    | ROCK SUB-ARMOUR SHALL BE PLACED UPON THE GEOTEXTILE IN A LAYER NO LESS THAN 150mm THICK UNLESS NOTED OTHERWISE ON DRAWINGS.   |
| 9.                    | ROCK ARMOUR SHALL BE SELECTIVELY HAND PLACED UPON THE SUB-ARMOUR TO ENSURE A SNUG FIT SUCH THAT INDIVIDUAL ROCKS ARE NOT TO MOVE. THE PLACING OF ANY ARMOUR ROCK SHALL BE COMPLETED IN SUCH A MANNER TO MINIMISE THE DISTURBANCE OR DISLODGEEMENT OF THE SUB-ARMOUR.  |
| 10.                   | THE ROCK ARMOUR SHALL BE NO LESS THAN 375mm THICK UNLESS NOTED OTHERWISE ON THE DRAWINGS.   |
| 11.                   | THE ARMOUR ROCK AND SUB-ARMOUR ROCK SHALL BE PLACED TO THE CONSTRUCTION TOLERANCES SHOWN ON THE DRAWINGS.   |
| 12.                   | AT LEAST FOURTEEN (14) DAYS PRIOR TO THE SUPPLY OF ANY ROCK, THE CONTRACTOR SHALL PROVIDE DOCUMENTATION TO DEMONSTRATE THAT THE ROCK TO BE SUPPLIED COMPLIES WITH THE REQUIREMENTS OF THE SPECIFICATION.  |

| 3D INFORMATION DISCLAIMER   |  |
|---|--|
| PLEASE BE ADVISED 12D DESIGN FILE, IF SUPPLIED, IS DEEMED TO BE AN ACCURATE REFLECTION OF NORTHRUP'S DESIGN AT THE TIME OF FINAL DESIGN DEVELOPMENT AND MAY NOT FULLY REFLECT THE DESIGN SURFACE AS PRESENTED. HOWEVER THIS INFORMATION SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO INCORPORATION IN THE CONSTRUCTION WORKS. |  |
| YOU ARE FURTHER ADVISED THAT ISSUED HARDCOPY/PDF PLANS AND DOCUMENTS TAKE PRECEDENCE OVER THE SUPPLIED ELECTRONIC INFORMATION AND ANY INCONSTANCIES SHOULD IMMEDIATELY BE REPORTED TO NORTHRUP CONSULTING ENGINEERS FOR VERIFICATION PRIOR TO THEIR INCORPORATION IN THE WORKS.   |  |
| NORTHRUP CONSULTING ENGINEERS TAKES NO RESPONSIBILITY FOR USE OF NON-VERIFIED 3D DESIGN INFORMATION USED IN THE WORKS.  |  |
| THE USE OF THE 3D MODEL INFORMATION SHALL CONSTITUTE ACKNOWLEDGMENT AND ACCEPTANCE OF THE ABOVE STATEMENTS BY THE RECIPIENT.  |  |

| SAFETY IN DESIGN  |  |
|---|--|
|  | THE FOLLOWING ITEMS HAVE BEEN IDENTIFIED AS SAFETY RISKS |
|   | <div>S01</div> INTERCEPTION OF EXISTING SERVICES         |
|   | <div>S02</div> FALL DURING CONSTRUCTION                  |
|   | <div>S03</div> VEHICULAR TRAFFIC                         |
|   | <div>S04</div> DEEP TRENCHES                             |

| TfNSW WORKS |   |
|-------------|---|
| 1.          | ALL WORKS WITHIN TfNSW JURISDICTION TO COMPLY WITH TfNSW STANDARDS AND SPECIFICATIONS. FOR REMAINING WORKS, THE ATTACHED SPECIFICATIONS APPLY. ANY CONTRADICTIONS WITHIN TO BE REFERRED TO THE SUPERINTENDENT ONSITE TO SEEK FURTHER CLARIFICATION. |




| STANDARD DETAILS   |                  |   |
|--|------------------|---|
| ANY DISCREPANCIES TO BE REPORTED IMMEDIATELY TO NORTHRUP ENGINEERS FOR CLARIFICATION |                  |   |
| TfNSW STANDARD DETAILS   |                  |   |
| COMPONENT  | DWG REFERENCE    | DRAWING TITLE                                 |
| KERB 'SA TYPE'   | MD.R15.A01.A     | STANDARD KERB & GUTTER SHAPES                 |
|  |                  |   |
|  |                  |   |
|  |                  |   |
|  |                  |   |
| COUNCIL DETAILS - CLARENCE VALLEY COUNCIL  |                  |   |
| COMPONENT  | DWG REFERENCE    | DRAWING TITLE                                 |
| CONCRETE DRIVEWAY  | B.C.C A(BS) 103S | STD INDUSTRIAL & COMMERCIAL FOOTWAY CROSSINGS |
|  |                  |   |
|  |                  |   |
|  |                  |   |

| SEDIMENT BASIN MANAGEMENT |  |
|---------------------------|--|
| 1.                        | PRIOR TO ANY FORECAST WEATHER EVENT, LIKELY TO RESULT IN SEDIMENT LADEN RUNOFF ON THE SITE, ANY EXISTING DETENTION BASINS/TRAPS SHALL BE DEWATERED TO PROVIDE SUFFICIENT CAPACITY TO CAPTURE SEDIMENT LADEN WATER FROM THE SITE.   |
| 2.                        | ANY SEDIMENT LADEN WATER CAPTURED ON-SITE MUST BE TREATED TO ENSURE IT WILL ACHIEVE COUNCIL'S WATER QUALITY OBJECTIVES PRIOR TO ITS RELEASE FROM SITE. A SAMPLE OF THE RELEASED TREATED WATER MUST BE KEPT ON-SITE IN A CLEAR CONTAINER WITH THE SAMPLE DATE RECORDED.   |
| 3.                        | NO ALUMINIUM BASED PRODUCTS MAY BE USED TO TREAT TURBID WATER (FLOCCULATING/COAGULANTS) ON-SITE WITHOUT THE PRIOR WRITTEN PERMISSION FROM AN APPROPRIATE COUNCIL OFFICER. THE APPLICANT MUST HAVE DEMONSTRATED ABILITY TO USE SUCH PRODUCTS CORRECTLY AND WITHOUT ENVIRONMENTAL HARM PRIOR TO ANY APPROVAL.  |
| 4.                        | THE CHEMICAL/AGENT (FLOCCULATING/COAGULANTS) USED IN TYPE D AND TYPE F BASINS TO TREAT TURBID WATER CAPTURED IN THE BASIN MUST BE APPLIED IN CONCENTRATIONS SUFFICIENT TO ACHIEVE COUNCIL'S WATER QUALITY OBJECTIVES (TSS < 50mg/L, TURBIDITY < 60 NTU, 6.5 < pH < 8.5) WITHIN THE 5-DAY RAINFALL DEPTH USED TO CALCULATE THE CAPACITY OF THE BASIN, AFTER A RAINFALL EVENT. |
| 5.                        | ALL MANUFACTURERS INSTRUCTIONS MUST BE FOLLOWED FOR THE USE OF ANY CHEMICALS/AGENTS USED ON-SITE, EXCEPT WHERE APPROVED BY THE RESPONSIBLE PERSON OR AN APPROPRIATE COUNCIL OFFICER.   |
| 6.                        | SUFFICIENT QUANTITIES OF CHEMICALS/AGENTS TO TREAT TURBID WATER (FLOCCULATING/COAGULANTS) MUST BE PLACED SUCH THAT WATER ENTERING THE BASINS/SEDIMENT TRAP MIXES WITH THE CHEMICALS/AGENTS AND IS CARRIED INTO THE BASIN/TRAP.   |
| 7.                        | ANY BASIN MUST BE DEWATERED AS SOON AS PRACTICAL, ONCE WATER CAPTURED IN THE BASIN ACHIEVES COUNCIL'S WATER QUALITY OBJECTIVES.  |
| 8.                        | INSPECT THE SEDIMENT BASINS AFTER EACH RAINFALL EVENT AND/OR WEEKLY. ENSURE THAT ALL SEDIMENT IS REMOVED ONCE THE SEDIMENT STORAGE ZONE IS FULL. ENSURE THAT OUTLET AND EMERGENCY SPILLWAY WORKS ARE MAINTAINED IN A FULLY OPERATIONAL CONDITION AT ALL TIMES.   |

| SEDIMENT BASIN SIZING CALCULATION |  |
|-----------------------------------|--|
| 1.                                | THE SITE IS LOCATED WITHIN THE GOROKAN SOIL LANDSCAPE AND PRIMARILY CONSISTS OF SANDS AND SANDY CLAYS (AS PER THE SITE SPECIFIC GEOTECHNICAL INVESTIGATION), WHICH HAS THE FOLLOWING PROPERTIES (IN ACCORDANCE WITH TABLE C17 OF THE "BLUE BOOK"): |

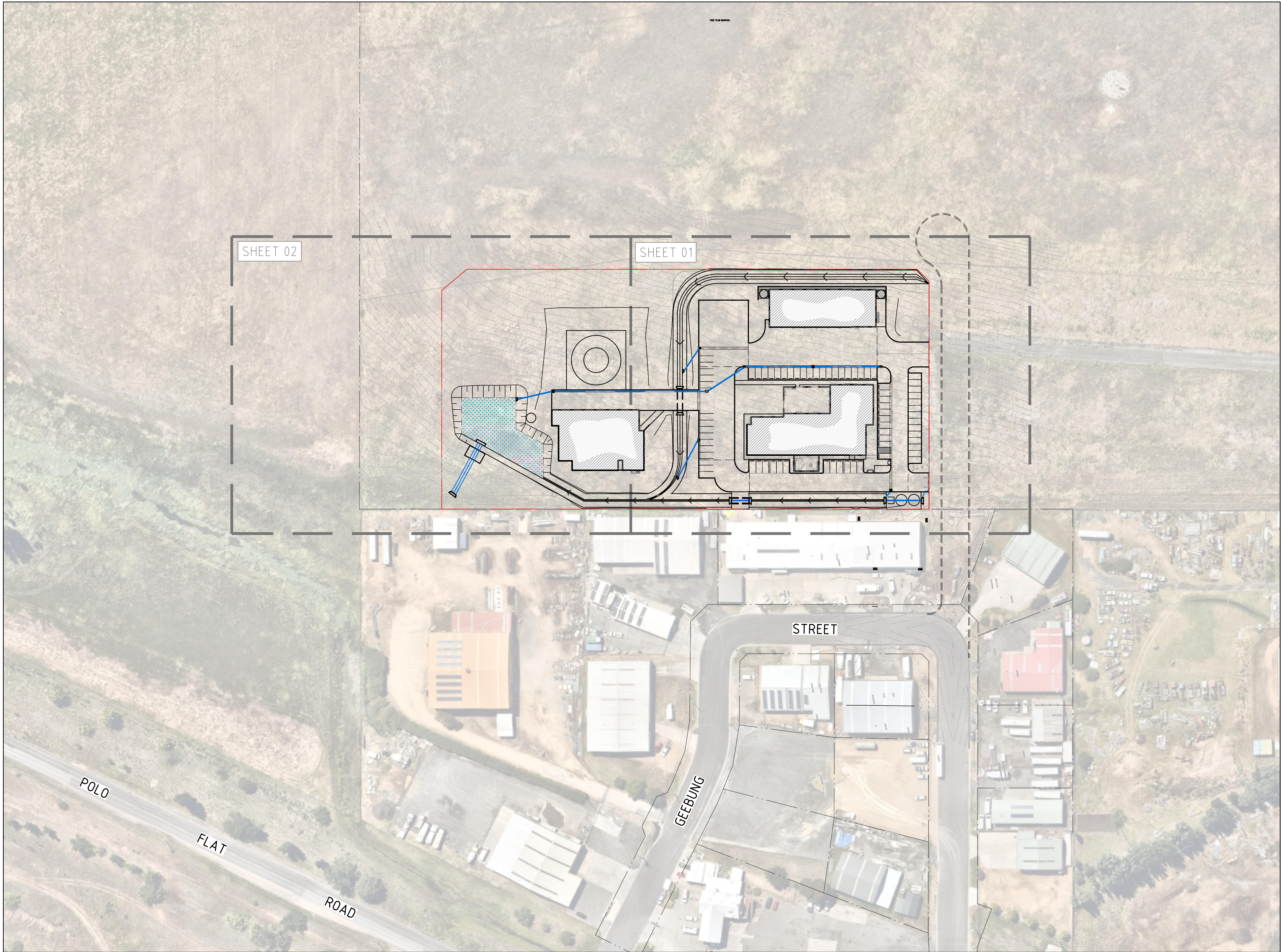
DRAWN: E. EAGER  
DESIGNED: J. DI FONZO  
JOB MANAGER: N. SUTHERLAND  
VERIFIER:

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| REVISION | DESCRIPTION                       | ISSUED | VER'D | APP'D | DATE     | CLIENT  | ARCHITECT   | <div>ALL DIMENSIONS TO BE VERIFIED ON SITE BEFORE COMMENCING WORK.<br/>NORTHRUP ACCEPTS NO RESPONSIBILITY FOR THE USABILITY, COMPLETENESS OR SCALE OF DRAWINGS TRANSFERRED ELECTRONICALLY.<br/>THIS DRAWING MAY HAVE BEEN PREPARED USING COLOUR, AND MAY BE INCOMPLETE IF COPIED TO BLACK &amp; WHITE</div> | <div><div>Sydney<br/>Level 11 345 George Street, Sydney NSW 2000<br/>Ph (02) 9241 4188 Fax (02) 9241 4324<br/>Email sydney@northrop.com.au ABN 81 094 433 100</div></div> | PROJECT  | DRAWING TITLE                  | JOB NUMBER              |          |
|----------|-----------------------------------|--------|-------|-------|----------|---|---|---|--|--|--------------------------------|-------------------------|----------|
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|          |                                   |        |       |       |          |   |   |   |  |  |                                | DRAWING NUMBER          | REVISION |
|          |                                   |        |       |       |          |   |   |   |  |  |                                | C0103                   | 01       |
|          |                                   |        |       |       |          |   |   |   |  |  |                                | DRAWING SHEET SIZE = A1 |          |
|          |                                   |        |       |       |          |   |   |   |  | 11 GEEBUNG STREET, POLO FLAT, NSW 2630             | SPECIFICATION NOTES - SHEET 03 |                         |          |



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JOB MANAGER: N. SUTHERLAND  
VERIFIER:



LEGEND

PROPOSED BOUNDARY LINE

EXISTING BOUNDARY LINE

PROPOSED STORMWATER PIPE

PROPOSED STORMWATER STRUCTURE

SHEET EXTENTS

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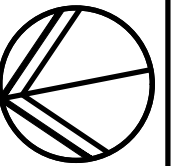


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SCALE 1:800@A1

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10

20

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40m



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Sydney

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Email sydney@northrop.com.au ABN 81 094 433 100

PROJECT

NSW RURAL FIRE SERVICE: MONARO  
FIRE CONTROL CENTRE

11 GEEBUNG STREET,  
POLO FLAT, NSW 2630

DRAWING TITLE

CIVIL ENGINEERING PACKAGE

GENERAL ARRANGEMENT PLAN

JOB NUMBER

222002-07

DRAWING NUMBER

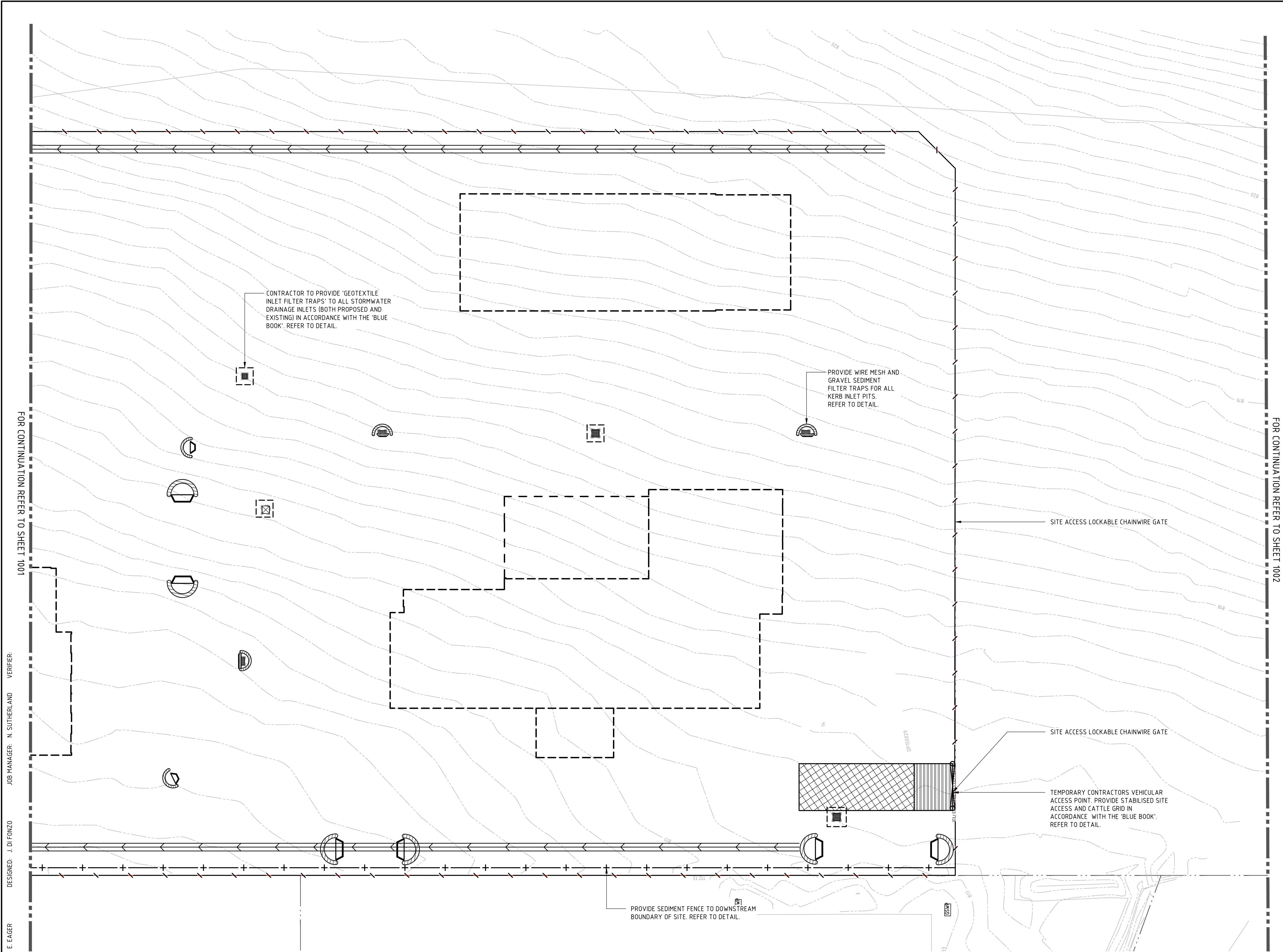
C0201

REVISION

01

DRAWING SHEET SIZE = A1





LEGEND

PROPOSED BOUNDARY LINE

EXISTING BOUNDARY LINE

PROPOSED BUILDING FOOTPRINT

EXISTING CONTOURS

SEDIMENT FENCE

SECURITY FENCE

WIRE MESH AND GRAVEL SEDIMENT FILTER

GEOTEXTILE INLET FILTER TRAP

STABILISED SITE ACCESS

STOCKPILE

SEDIMENT BASIN

- GENERAL NOTES:
1.

REFER SPECIFICATIONS NOTES FOR SEDIMENT AND SOIL EROSION CONTROL GENERAL REQUIREMENTS.
2.

ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH COUNCIL / RELEVANT AUTHORITY SPECIFICATIONS AND DETAILS.
3.

ALL SEDIMENT AND SOIL EROSION CONTROL MEASURES TO BE INSTALLED IN ACCORDANCE WITH THE 'BLUE BOOK'. CONTRACTOR TO ENSURE THESE MEASURES ARE IN PLACE AND MAINTAINED AT ALL TIMES DURING CONSTRUCTION WORKS.
4.

CONTRACTOR TO PROVIDE 'WIRE MESH AND GRAVEL SEDIMENT FILTER' TO ALL PAVED / ROAD AREAS (BOTH PROPOSED AND EXISTING) IN ACCORDANCE WITH THE 'BLUE BOOK'.
5.

CONTRACTOR TO PROVIDE 'GEOTEXTILE INLET FILTER TRAPS' TO ALL STORMWATER DRAINAGE INLETS (BOTH PROPOSED AND EXISTING) IN ACCORDANCE WITH THE 'BLUE BOOK'.
6.

ALL PITS OPEN TO ATMOSPHERE TO BE PROTECTED IN ACCORDANCE WITH THE 'BLUE BOOK'.
7.

SEDIMENT BASIN SIZING BASED ON THE BLUE BOOK

SEDIMENT BASIN CALC SUMMARY

| PARAMETER                                | ADOPTED VALUE |
|--|---------------|
| TOTAL DISTURBED AREA (ha)                | 1.287         |
| SOIL TEXTURE GROUP                       | D             |
| DESIGN RAINFALL DEPTH (DAYS)             | 5             |
| DESIGN RAINFALL DEPTH (PERCENTILE)       | 80%           |
| x-DAY, y-PERCENTILE RAIN FALL EVENT (mm) | 15.8          |
| Cv                                       | 0.10          |
| SEDIMENT STORAGE VOLUME (m³)             | 10.2          |
| SETTLING ZONE VOLUME (m³)                | 20.33         |
| TOTAL BASIN VOLUME REQUIRED (m³)         | 30.5          |
| TOTAL BASIN VOLUME PROVIDED (m³)         | 42.1          |

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2

4

6

8

10

12m

Sydney

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PROJECT

NSW RURAL FIRE SERVICE: MONARO

FIRE CONTROL CENTRE

11 GEEBUNG STREET,

POLO FLAT, NSW 2630

DRAWING TITLE

CIVIL ENGINEERING PACKAGE

SEDIMENT AND SOIL EROSION

CONTROL PLAN - SHEET 01

JOB NUMBER

222002-07

DRAWING NUMBER

C1001

REVISION

01

DRAWING SHEET SIZE = A1

FOR CONTINUATION REFER TO SHEET 1001

FOR CONTINUATION REFER TO SHEET 1002

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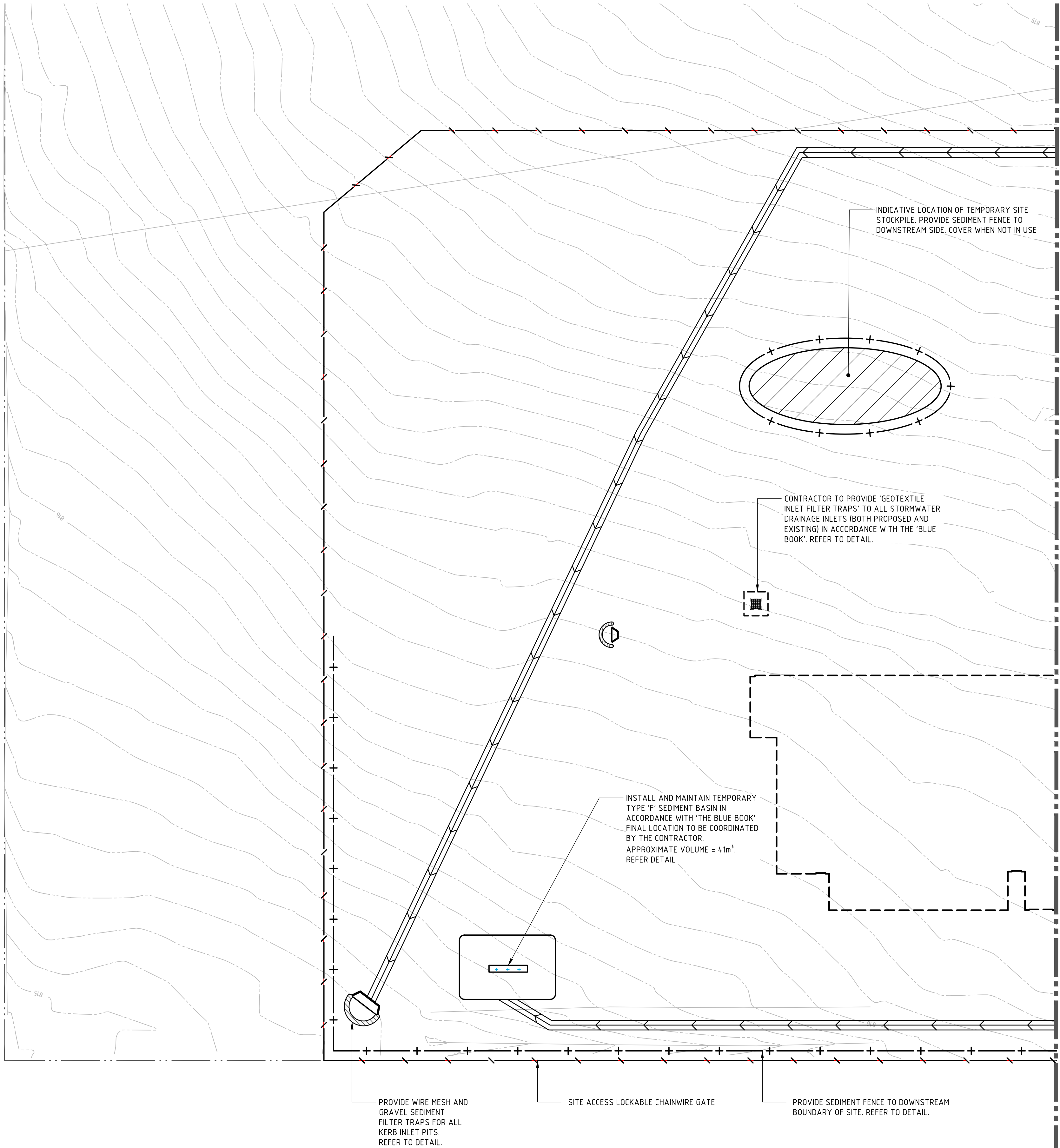
DESIGNED: J. DI FONZO

JOB MANAGER: N. SUTHERLAND

VERIFIER:



DRAWN: E. EAGER  
DESIGNED: J. DI FONZO  
JOB MANAGER: N. SUTHERLAND  
VERIFIER:



FOR CONTINUATION REFER TO SHEET 1001

#### LEGEND

- PROPOSED BOUNDARY LINE
- EXISTING BOUNDARY LINE
- PROPOSED BUILDING FOOTPRINT
- EXISTING CONTOURS
- SEDIMENT FENCE
- SECURITY FENCE
- WIRE MESH AND GRAVEL SEDIMENT FILTER
- GEOTEXTILE INLET FILTER TRAP
- STABILISED SITE ACCESS
- STOCKPILE
- SEDIMENT BASIN

#### GENERAL NOTES:

- REFER SPECIFICATIONS NOTES FOR SEDIMENT AND SOIL EROSION CONTROL GENERAL REQUIREMENTS.
- ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH COUNCIL / RELEVANT AUTHORITY SPECIFICATIONS AND DETAILS.
- ALL SEDIMENT AND SOIL EROSION CONTROL MEASURES TO BE INSTALLED IN ACCORDANCE WITH THE 'BLUE BOOK'. CONTRACTOR TO ENSURE THESE MEASURES ARE IN PLACE AND MAINTAINED AT ALL TIMES DURING CONSTRUCTION WORKS.
- CONTRACTOR TO PROVIDE 'WIRE MESH AND GRAVEL SEDIMENT FILTER' TO ALL PAVED / ROAD AREAS (BOTH PROPOSED AND EXISTING) IN ACCORDANCE WITH THE 'BLUE BOOK'.
- CONTRACTOR TO PROVIDE 'GEOTEXTILE INLET FILTER TRAPS' TO ALL STORMWATER DRAINAGE INLETS (BOTH PROPOSED AND EXISTING) IN ACCORDANCE WITH THE 'BLUE BOOK'.
- ALL PITS OPEN TO ATMOSPHERE TO BE PROTECTED IN ACCORDANCE WITH THE 'BLUE BOOK'.
- SEDIMENT BASIN SIZING BASED ON THE BLUE BOOK

#### SEDIMENT BASIN CALC SUMMARY

| PARAMETER                                | ADOPTED VALUE |
|--|---------------|
| TOTAL DISTURBED AREA (ha)                | 1.287         |
| SOIL TEXTURE GROUP                       | D             |
| DESIGN RAINFALL DEPTH (DAYS)             | 5             |
| DESIGN RAINFALL DEPTH (PERCENTILE)       | 80%           |
| x-DAY, y-PERCENTILE RAIN FALL EVENT (mm) | 15.8          |
| Cv                                       | 0.10          |
| SEDIMENT STORAGE VOLUME (m³)             | 10.2          |
| SETTLING ZONE VOLUME (m³)                | 20.33         |
| TOTAL BASIN VOLUME REQUIRED (m³)         | 30.5          |
| TOTAL BASIN VOLUME PROVIDED (m³)         | 42.1          |

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PROJECT

**NSW RURAL FIRE SERVICE: MONARO FIRE CONTROL CENTRE**

11 GEEBUNG STREET,  
POLO FLAT, NSW 2630

DRAWING TITLE

**CIVIL ENGINEERING PACKAGE**

**SEDIMENT AND SOIL EROSION CONTROL PLAN - SHEET 02**

JOB NUMBER

**222002-07**

DRAWING NUMBER

**C1002**

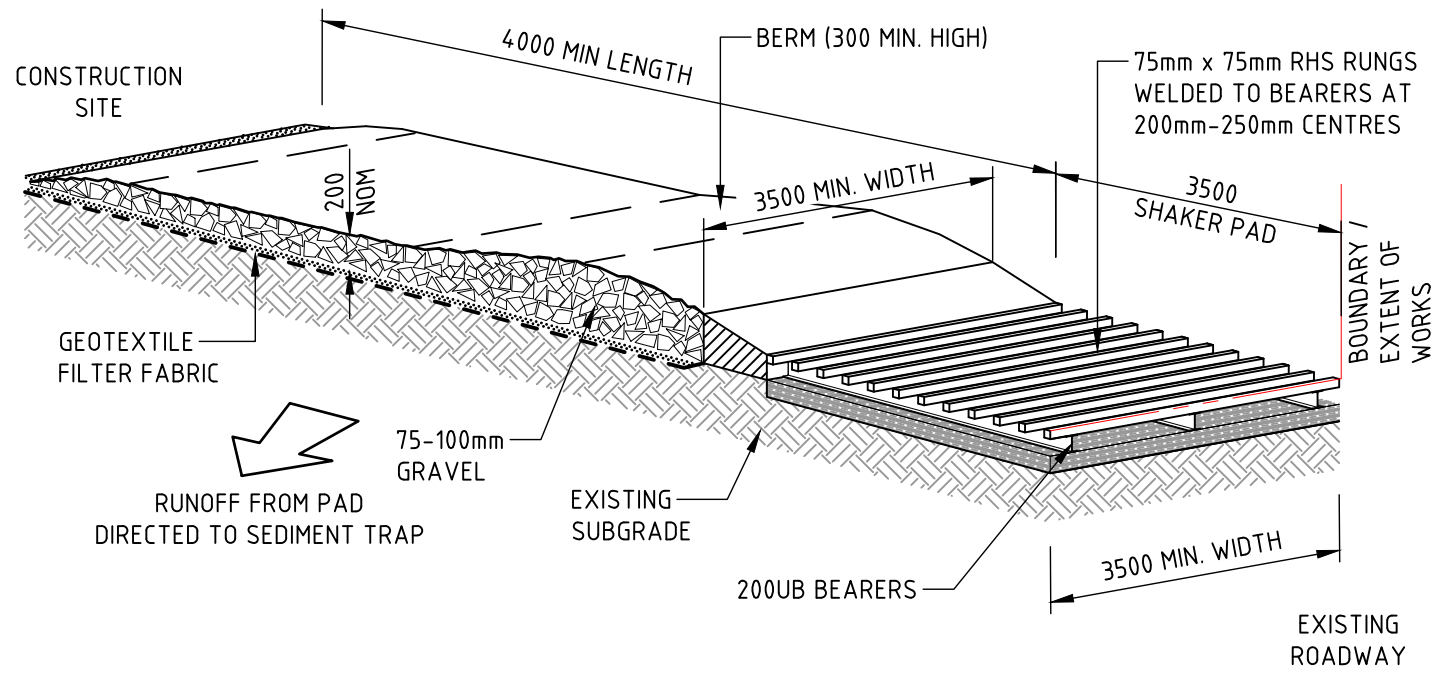
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**01**

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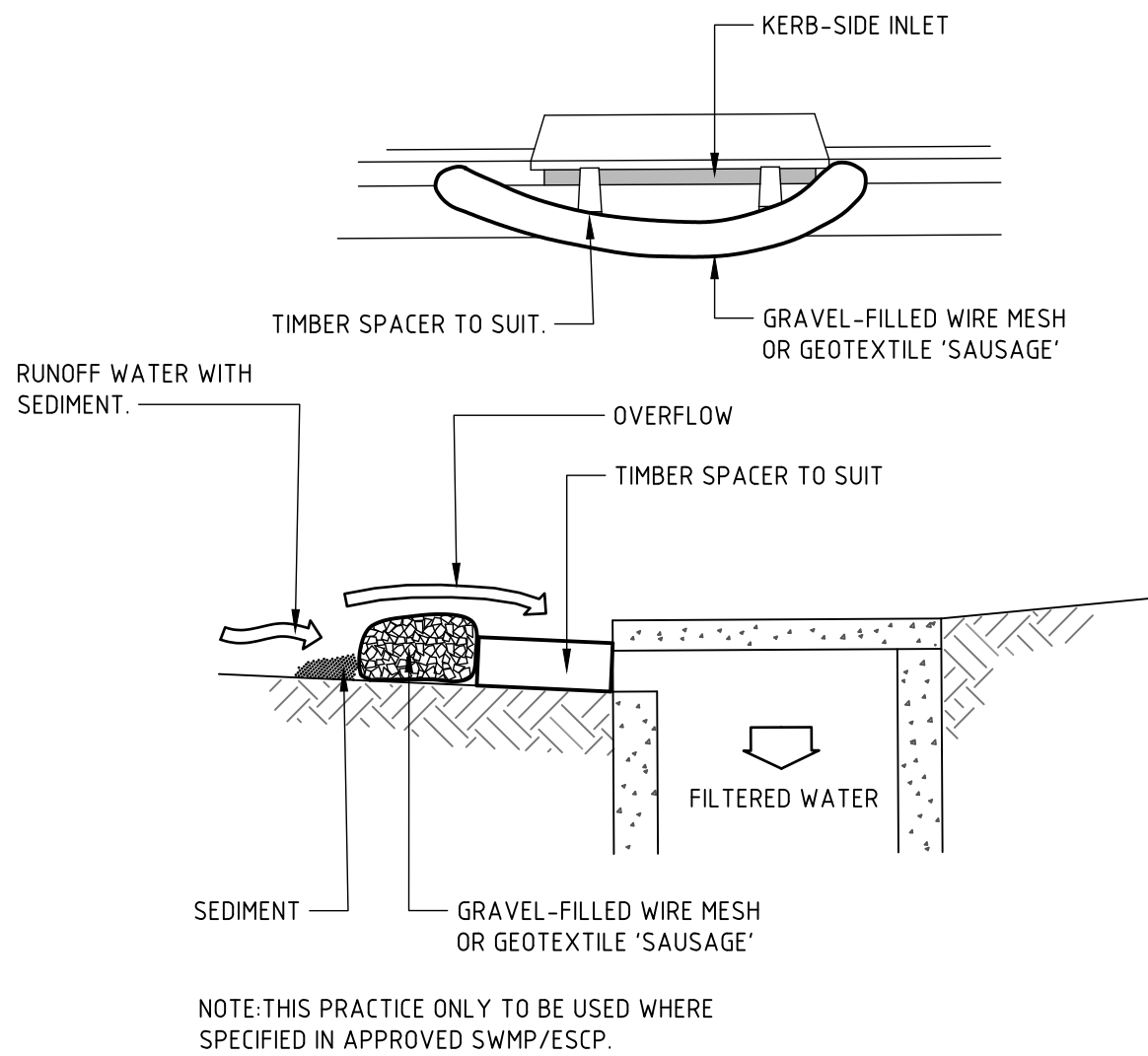
DESIGNED: J. DI FONZO  
DRAWN: E. EAGER  
JOB MANAGER: N. SUTHERLAND  
VERIFIER:



#### CONSTRUCTION NOTES

1. THE TEMPORARY ACCESS SHALL BE MAINTAINED IN A CONDITION THAT PREVENTS TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS OF WAY.
  - THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL GRAVEL AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT.
2. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS OF WAY MUST BE REMOVED IMMEDIATELY.
3. INSTALL BARRIER ON EITHER SIDE OF SHAKER PAD. TO ENSURE VEHICLES ARE GUIDED ON TO THE PAD.
4. INVERT OF SHAKER PAD TO BE DRAINED VIA AGRICULTURAL PIPE WRAPPED IN GEOTEXTILE FABRIC.

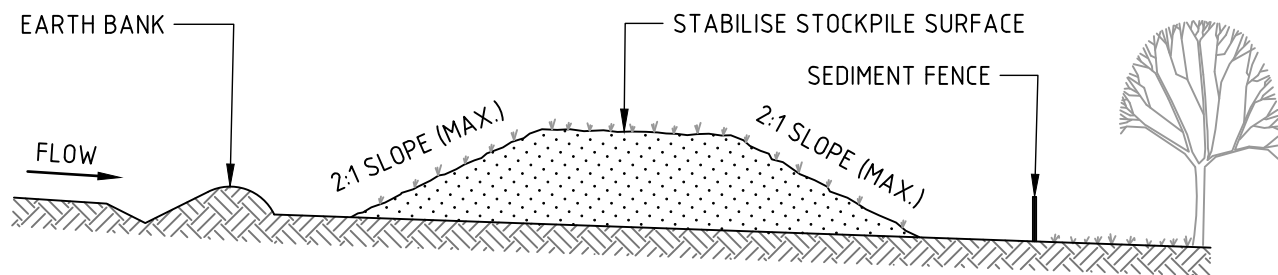
### STABILISED SITE ACCESS



#### CONSTRUCTION NOTES

1. INSTALL FILTERS TO KERB INLETS ONLY AT SAG POINTS.
2. FABRICATE A SLEEVE MADE FROM GEOTEXTILE OR WIRE MESH LONGER THAN THE LENGTH OF THE INLET PIT AND FILL IT WITH 25mm TO 50mm GRAVEL.
3. FORM AN ELLIPTICAL CROSS-SECTION ABOUT 150mm HIGH x 400mm WIDE.
4. PLACE THE FILTER AT THE OPENING LEAVING AT LEAST A 100mm SPACE BETWEEN IT AND THE KERB INLET. MAINTAIN THE OPENING WITH SPACER BLOCKS.
5. FORM A SEAL WITH THE KERB TO PREVENT SEDIMENT BYPASSING THE FILTER.
6. SANDBAGS FILLED WITH GRAVEL CAN SUBSTITUTE FOR THE MESH OR GEOTEXTILE PROVIDING THEY ARE PLACED SO THAT THEY FIRMLY ABUT EACH OTHER AND SEDIMENT-LADEN WATERS CANNOT PASS BETWEEN.

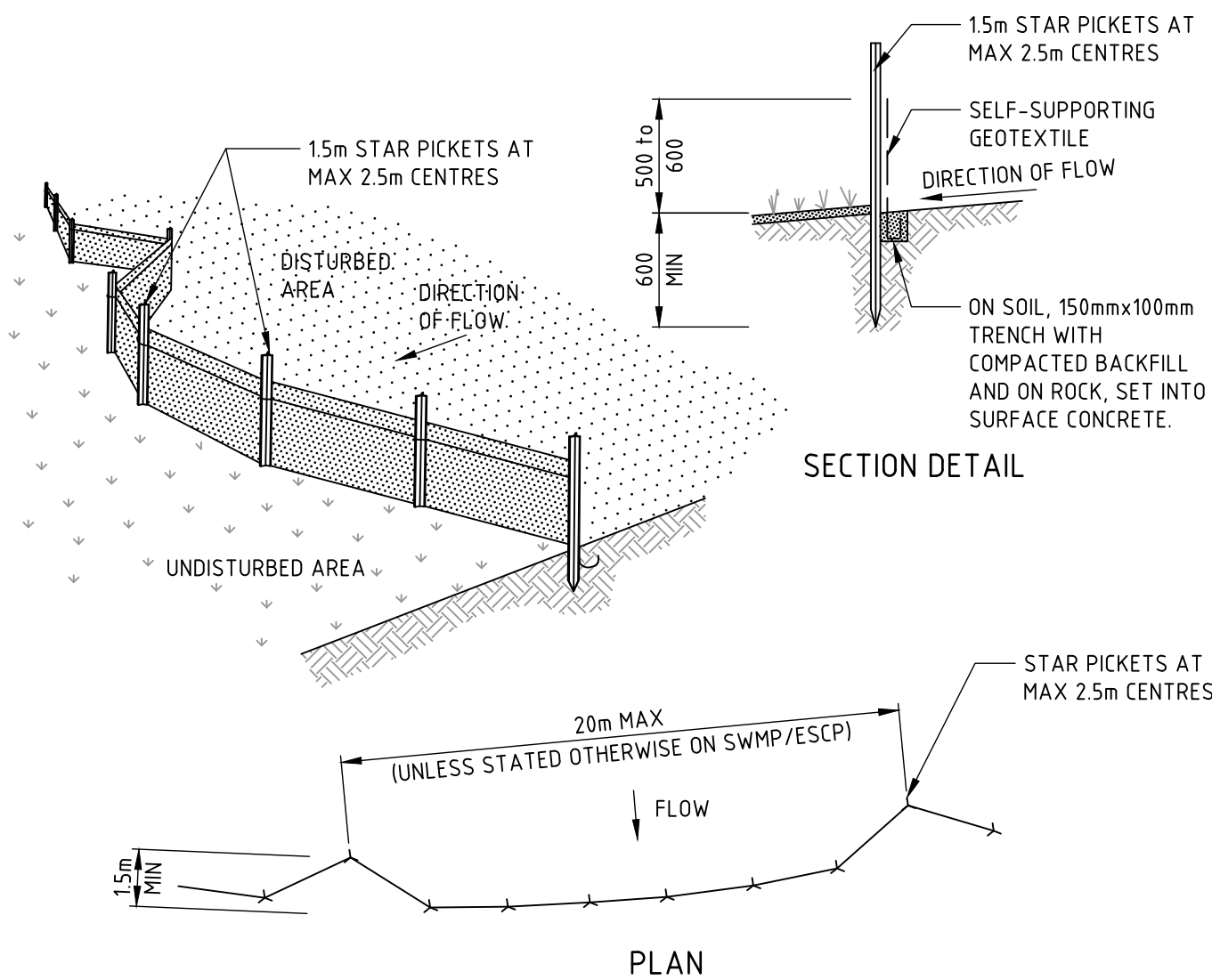
### WIRE MESH AND GRAVEL SEDIMENT FILTER



#### CONSTRUCTION NOTES

1. PLACE STOCKPILES MORE THAN 2m (PREFERABLY 5m) FROM EXISTING VEGETATION, CONCENTRATED WATER FLOW, ROADS AND HAZARD AREAS.
2. CONSTRUCT ON THE CONTOUR AS LOW, FLAT, ELONGATED MOUNDS.
3. WHERE THERE IS SUFFICIENT AREA, TOPSOIL STOCKPILES SHALL BE LESS THAN 2m IN HEIGHT.
4. WHERE THEY ARE TO BE IN PLACE FOR MORE THAN 10 DAYS, STABILISE FOLLOWING THE APPROVED ESCP OR SWMP TO REDUCE THE C-FACTOR TO LESS THAN 0.10.
5. CONSTRUCT EARTH BANKS (STANDARD DRAWING 5-5) ON THE UPSLOPE SIDE TO DIVERT WATER AROUND STOCKPILES AND SEDIMENT FENCES (STANDARD DRAWING 6-8) 1 TO 2m DOWNSLOPE.

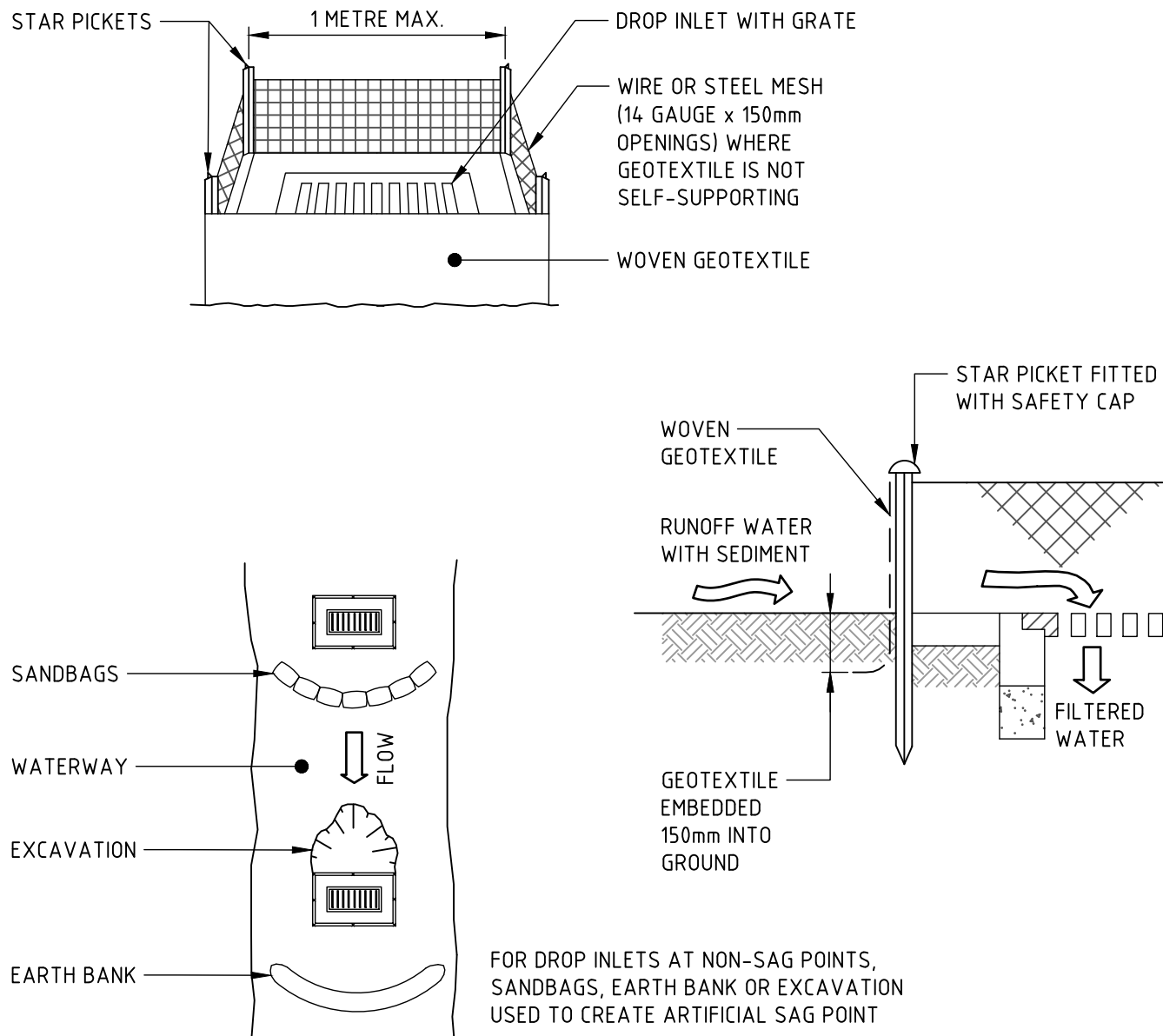
### STOCKPILE



#### CONSTRUCTION NOTES

1. CONSTRUCT SEDIMENT FENCES AS CLOSE AS POSSIBLE TO BEING PARALLEL TO THE CONTOURS OF THE SITE, BUT WITH SMALL RETURNS AS SHOWN IN THE DRAWING TO LIMIT THE CATCHMENT AREA OF ANY ONE SECTION. THE CATCHMENT AREA SHOULD BE SMALL ENOUGH TO LIMIT WATER FLOW IF CONCENTRATED AT ONE POINT TO 50 LITRES PER SECOND IN THE DESIGN STORM EVENT, USUALLY THE 10-YEAR EVENT.
2. CUT A 150mm DEEP TRENCH ALONG THE UPSLOPE LINE OF THE FENCE FOR THE BOTTOM OF THE FABRIC TO BE ENTRENCHED.
3. DRIVE 15 METRE LONG STAR PICKETS INTO GROUND AT 2.5 METRE INTERVALS (MAX) AT THE DOWNSLOPE EDGE OF THE TRENCH. ENSURE ANY STAR PICKETS ARE FITTED WITH SAFETY CAPS.
4. FIX SELF-SUPPORTING GEOTEXTILE TO THE UPSLOPE SIDE OF THE POSTS ENSURING IT GOES TO THE BASE OF THE TRENCH. FIX THE GEOTEXTILE WITH WIRE TIES OR AS RECOMMENDED BY THE MANUFACTURER. ONLY USE GEOTEXTILE SPECIFICALLY PRODUCED FOR SEDIMENT FENCING. THE USE OF SHADE CLOTH FOR THIS PURPOSE IS NOT SATISFACTORY.
5. JOIN SECTIONS OF FABRIC AT A SUPPORT POST WITH A 150mm OVERLAP.
6. BACKFILL THE TRENCH OVER THE BASE OF THE FABRIC AND COMPACT IT THOROUGHLY OVER THE GEOTEXTILE.

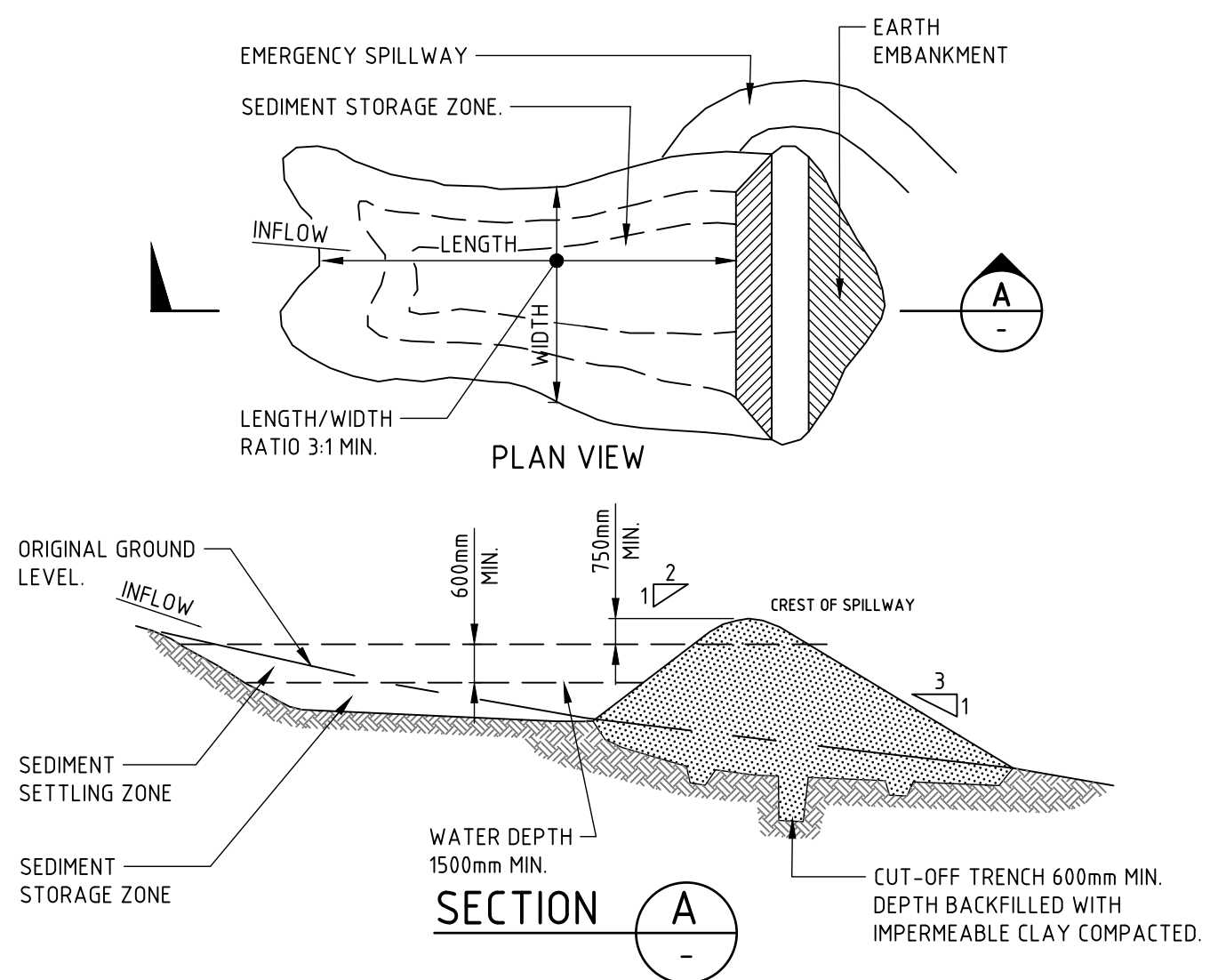
### SEDIMENT FENCE



#### CONSTRUCTION NOTES

1. FABRICATE A SEDIMENT BARRIER MADE FROM GEOTEXTILE OR STRAW BALES.
2. FOLLOW STANDARD DRAWING 6-7 AND STANDARD DRAWING 6-8 FOR INSTALLATION PROCEDURES FOR THE STRAW BALES OR GEOFABRIC. REDUCE THE PICKET SPACING TO 1 METRE CENTRES.
3. IN WATERWAYS, ARTIFICIAL SAG POINTS CAN BE CREATED WITH SANDBAGS OR EARTH BANKS AS SHOWN IN THE DRAWING.
4. DO NOT COVER THE INLET WITH GEOTEXTILE UNLESS THE DESIGN IS ADEQUATE TO ALLOW FOR ALL WATERS TO BYPASS IT.

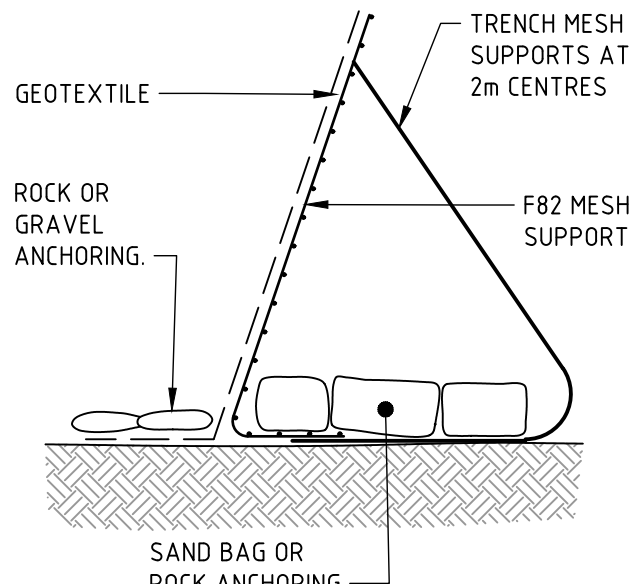
### GEOTEXTILE INLET FILTER TRAPS



#### CONSTRUCTION NOTES

1. REMOVE ALL VEGETATION AND TOPSOIL FROM UNDER THE DAM WALL AND FROM WITHIN THE STORAGE AREA.
2. CONSTRUCT A CUT-OFF TRENCH 500mm DEEP AND 1200mm WIDE ALONG THE CENTRELINE OF THE EMBANKMENT EXTENDING TO A POINT ON THE GULLY WALL LEVEL WITH THE RISER CREST.
3. MAINTAIN THE TRENCH FREE OF WATER AND RECOMPACT THE MATERIALS WITH EQUIPMENT AS SPECIFIED IN THE SWMP TO 95 PER CENT STANDARD PROCTOR DENSITY.
4. SELECT FILL FOLLOWING THE SWMP THAT IS FREE OF ROOTS, WOOD, ROCK, LARGE STONE OR FOREIGN MATERIAL.
5. PREPARE THE SITE UNDER THE EMBANKMENT BY RIPPING TO AT LEAST 100mm TO HELP BOND COMPACTED FILL TO THE EXISTING SUBSTRATE.
6. SPREAD THE FILL IN 100mm TO 150mm LAYERS AND COMPACT IT AT OPTIMUM MOISTURE CONTENT FOLLOWING THE SWMP.
7. CONSTRUCT THE EMERGENCY SPILLWAY.
8. REHABILITATE THE STRUCTURE FOLLOWING THE SWMP.

### (APPLIES TO 'TYPE D' AND 'TYPE F' SOILS ONLY) EARTH SEDIMENT BASIN - WET



#### CONSTRUCTION NOTES

1. INSTALL THIS TYPE OF SEDIMENT FENCE WHEN USE OF SUPPORT POSTS IS NOT DESIRABLE OR NOT POSSIBLE. SUCH CONDITIONS MIGHT APPLY, FOR EXAMPLE, WHERE APPROVAL IS GRANTED FROM THE APPROPRIATE AUTHORITIES TO PLACE THESE FENCES IN HIGHLY SENSITIVE ESTUARINE AREAS.
2. USE BENT TRENCH MESH TO SUPPORT THE F82 WELDED MESH FACING AS SHOWN ON THE DRAWING ABOVE. ATTACH THE GEOTEXTILE TO THE WELDED MESH FACING USING UV RESISTANT CABLE TIES.
3. STABILISE THE WHOLE STRUCTURE WITH SANDBAG OR ROCK ANCHORING OVER THE TRENCH MESH AND THE LEADING EDGE OF THE GEOTEXTILE. THE ANCHORING SHOULD BE SUFFICIENTLY LARGE TO ENSURE STABILITY OF THE STRUCTURE IN THE DESIGN STORM EVENT, USUALLY THE 10-YEAR EVENT.

### SEDIMENT FENCE

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| REVISION | DESCRIPTION                       | ISSUED | VER'D | APP'D | DATE     |
|----------|-----------------------------------|--------|-------|-------|----------|
| 01       | ISSUED FOR 90% DESIGN DEVELOPMENT | EE     |       | JD    | 28.09.23 |
|          |                                   |        |       |       |          |
|          |                                   |        |       |       |          |
|          |                                   |        |       |       |          |
|          |                                   |        |       |       |          |



|   |  |
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| ARCHITECT<br><b>NBRS</b><br>+61 2 9522 2344<br>nbris.com.au | CLIENT<br>NSW RURAL FIRE SERVICE: MONARO<br>FIRE CONTROL CENTRE<br>11 GEEBUNG STREET,<br>POLO FLAT, NSW 2630 |
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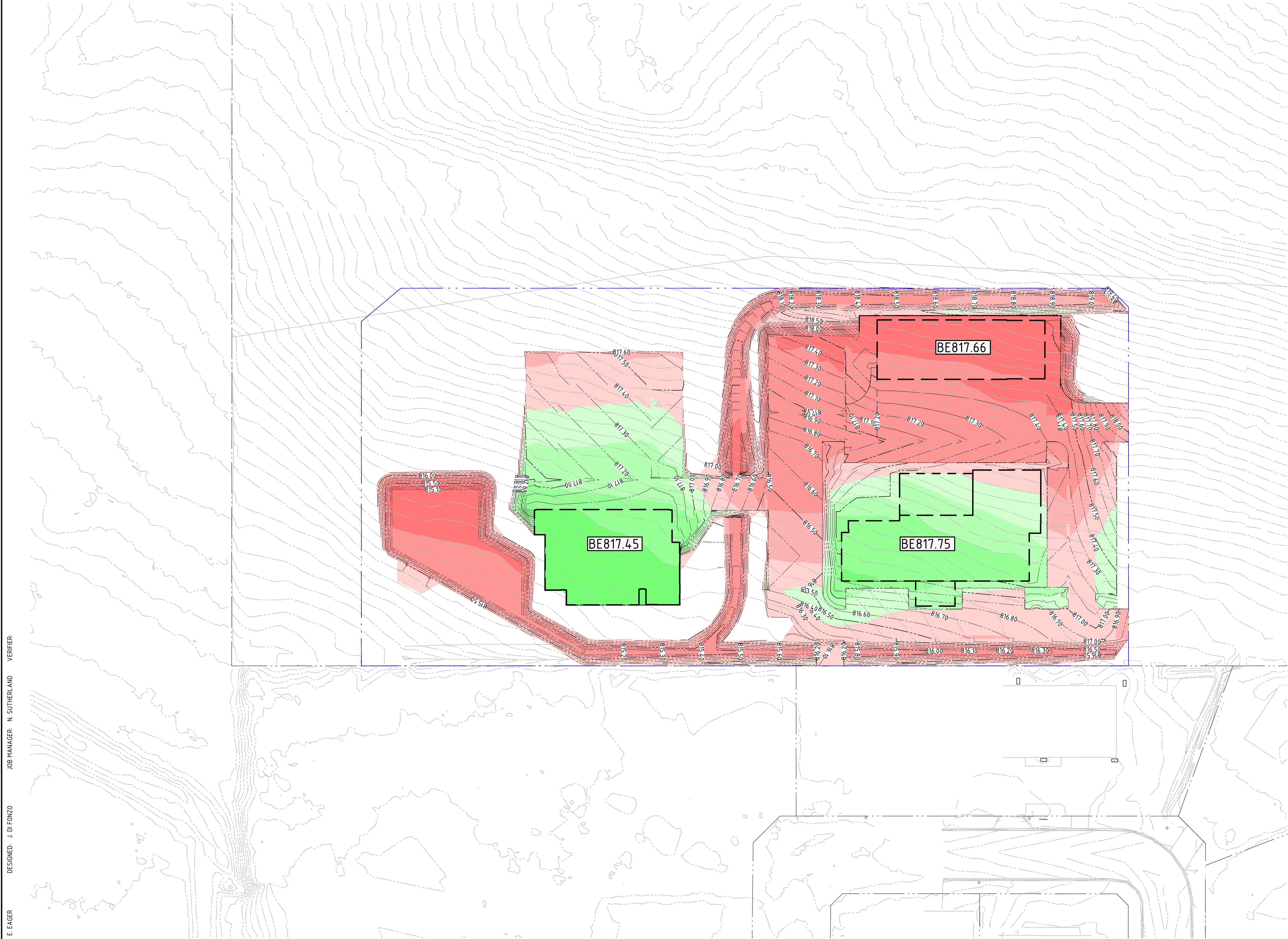
|   |
|---|
| PROJECT<br>NSW RURAL FIRE SERVICE: MONARO<br>FIRE CONTROL CENTRE<br>11 GEEBUNG STREET,<br>POLO FLAT, NSW 2630 |
|---|

|  |
|--|
| DRAWING TITLE<br>CIVIL ENGINEERING PACKAGE<br>SEDIMENT AND SOIL EROSION<br>CONTROL DETAILS |
|--|

|                         |                         |                |
|-------------------------|-------------------------|----------------|
| JOB NUMBER<br>222002-07 | DRAWING NUMBER<br>C1101 | REVISION<br>01 |
| DRAWING SHEET SIZE = A1 |                         |                |



DRAWN: E. EAGER  
DESIGNED: J. DI FONZO  
JOB MANAGER: N. SUTHERLAND  
VERIFIER:



| LEGEND        |                             |
|---------------|-----------------------------|
|               | PROPOSED BOUNDARY LINE      |
|               | EXISTING BOUNDARY LINE      |
|               | PROPOSED BUILDING FOOTPRINT |
|               | BULK EARTHWORKS PAD LEVEL   |
|               | PROPOSED CONTOURS           |
| DEPTH OF CUT  |                             |
|               | - 999m TO - 2.0m            |
|               | - 2.0m TO - 1.5m            |
|               | - 1.5m TO - 1.25m           |
|               | - 1.25m TO - 1.0m           |
|               | - 1.0m TO - 0.75m           |
|               | - 0.75m TO - 0.5m           |
|               | - 0.5m TO - 0.25m           |
|               | - 0.25m TO - 0.0m           |
| DEPTH OF FILL |                             |
|               | 0.0m TO 0.25m               |
|               | 0.25m TO 0.5m               |
|               | 0.5m TO 0.75m               |
|               | 0.75m TO 1.0m               |
|               | 1.0m TO 1.25m               |
|               | 1.25m TO 1.5m               |
|               | 1.5m TO 2.0m                |
|               | 2.0m TO 999m                |

| GENERAL NOTES |  |
|---------------|--|
| 1.            | REFER SPECIFICATIONS NOTES FOR EARTHWORKS GENERAL REQUIREMENTS.  |
| 2.            | ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH COUNCIL / RELEVANT AUTHORITY SPECIFICATIONS AND DETAILS.  |
| 3.            | CAD FILES / DTM FILES TO BE SUPPLIED IN AUTOCAD FORMAT FOR SETOUT PURPOSES (UPON REQUEST).   |
| 4.            | STRIP EXISTING TOPSOIL / CONSULTATION WITH THE GEOTECHNICAL ENGINEER / REPORT. FOR THE PURPOSES OF EARTHWORKS CALCULATIONS A TOPSOIL STRIPPING DEPTH OF 150mm HAS BEEN ASSUMED.  |
| 5.            | NO ALLOWANCE HAS BEEN MADE FOR BULKING FACTORS. NOTE ALL VOLUMES DEPICTED ARE SOLID VOLUMES ONLY AND MAY NOT REFLECT DETAILED EARTHWORKS.  |
| 6.            | NO ALLOWANCE HAS BEEN MADE FOR DETAILED EARTHWORKS, ie SERVICE TRENCHING, DETAILED EXCAVATION, FOOTINGS, RETAINING WALLS AND THE LIKE. CONTRACTOR IS TO ALLOW FOR REMOVAL OF ALL EXCESS MATERIAL GENERATED BY THE WORKS. |
| 7.            | THE CONTRACTOR SHALL USE FINAL SURFACE LEVELS AND TYPICAL PAVEMENT DETAILS FOR ACTUAL EARTHWORKS LEVELS.   |
| 8.            | BULK EARTHWORKS ARE BASED ON THE FOLLOWING DEPTHS FROM FINISHED SURFACE LEVELS;  |
| 8.1.          | ASPHALT PAVEMENT 390mm   |
| 8.2.          | CONCRETE PAVEMENT 320mm  |
| 8.3.          | BUILDING SLAB 100-200mm (REFER STRUCTURAL DWGS)  |
| 8.4.          | FOOTPATH PAVEMENT 175mm  |
| 8.5.          | LANDSCAPE AREA 300mm   |
| 9.            | APPROXIMATE BULK EARTHWORK VALUES AS FOLLOWS;  |
| 9.1.          | CUT 5266 m <sup>3</sup>  |
| 9.2.          | FILL 2115 m <sup>3</sup>   |
| 9.3.          | BALANCE -3151 m <sup>3</sup>   |
| 9.4.          | NOTE: SITE STRIPPING VOLUMES HAVE NOT BEEN INCLUDED IN ABOVE CALCULATIONS.   |

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| REVISION | DESCRIPTION                       | ISSUED | VER'D | APP'D | DATE     |
|----------|-----------------------------------|--------|-------|-------|----------|
| 01       | ISSUED FOR 90% DESIGN DEVELOPMENT | EE     |       | JD    | 28.09.23 |
|          |                                   |        |       |       |          |
|          |                                   |        |       |       |          |
|          |                                   |        |       |       |          |
|          |                                   |        |       |       |          |



NSW  
GOVERNMENT

CLIENT

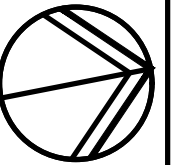
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SCALE 1:500 @ A1

0 5 10 15 20 25m



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PROJECT

**NSW RURAL FIRE SERVICE: MONARO  
FIRE CONTROL CENTRE**

11 GEEBUNG STREET,  
POLO FLAT, NSW 2630

DRAWING TITLE

**CIVIL ENGINEERING PACKAGE**

**BULK CUT AND FILL PLAN**

JOB NUMBER

**222002-07**

DRAWING NUMBER

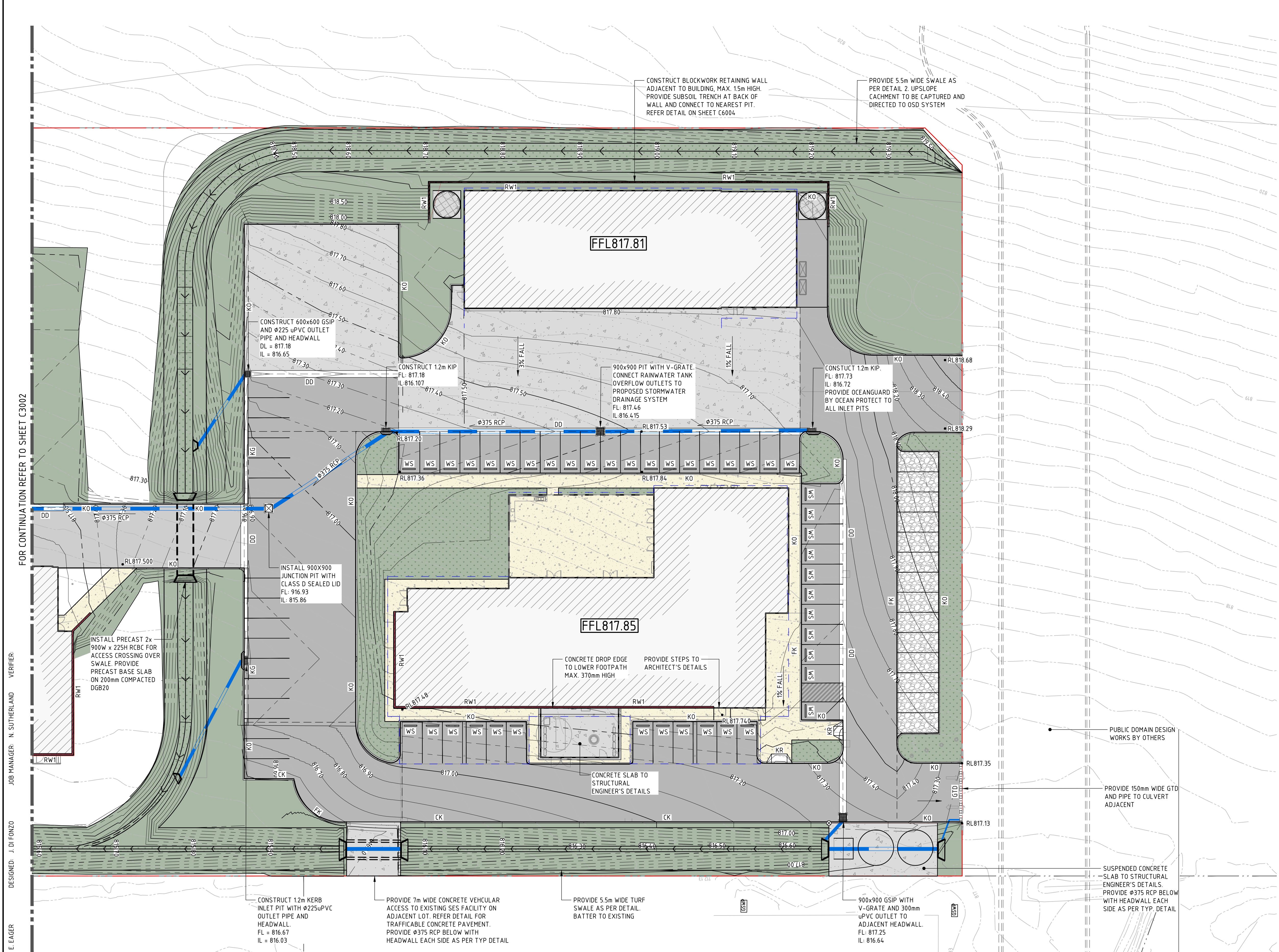
**C2001**

REVISION

**01**

DRAWING SHEET SIZE = A1





**LEGEND**

PROPOSED BOUNDARY LINE

EXISTING BOUNDARY LINE

FUTURE BUILDING OUTLINE

ROOF OUTLINE

PROPOSED KERB

FUTURE KERB (BY OTHERS)

VEHICULAR CROSSING

KERB RAMP

WHEEL STOP

KERB ONLY

KERB AND GUTTER

FLUSH KERB

CASTELLATED KERB

DISH DRAIN

PROPOSED SPOT HEIGHT

PROPOSED FINISHED FLOOR LEVEL

CONTOURS

EXISTING CONTOURS

NEW DRAINAGE STRUCTURE

STORMWATER PIPE

KERB TRANSITION

CONCRETE HEADWALL

DRAINAGE SWALE

RETAINING WALL - STRUCTURAL

LANDSCAPING - REFER TO LANDSCAPE ARCHITECT FOR DETAILS

FOOTPATH

CONCRETE PAVEMENT - TYPE 1

ASPHALT PAVEMENT - TYPE 2

DRIVEWAY

GRAVEL

- GENERAL NOTES:**
1. SURVEY SUPPLIED BY: KLEVEN SPAIN SURVEY CONSULTANTS

1.1. REF. NUMBER: SM489

1.2. DRAWING TITLE: CONTOUR & DETAIL SURVEY GEEBUNG STREET POLO FLAT

1.3. REVISION DATE: 01/12/2022

1.4. REVISION NUMBER: 01

1.5. GEOCENTRIC DATUM OF AUSTRALIA: GDA 2020

1.6. SURVEYOR: J. KLEVEN

1.7. APPROVED: J. KLEVEN

2. REFER SPECIFICATIONS NOTES FOR STORMWATER AND SITEWORKS GENERAL REQUIREMENTS.

3. ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH COUNCIL / RELEVANT AUTHORITY SPECIFICATIONS AND DETAILS.

4. CAD FILES TO BE SUPPLIED IN AUTOCAD FORMAT FOR SETOUT PURPOSES (UPON REQUEST).

5. SUBSOIL DRAINAGE TO RETAINING WALLS, KERBS AND SWALE DRAINS NOT SHOWN FOR CLARITY - REFER RELEVANT DETAILS.

6. REFER 'STORMWATER LONGITUDINAL SECTIONS' FOR PIPE INFORMATION.

7. REFER 'STORMWATER PIT SCHEDULE' OR 'STORMWATER LONGITUDINAL SECTIONS' FOR PIT INFORMATION.

8. REFER HYDRAULIC ENGINEERS / ARCHITECTS DRAWINGS FOR DOWNPIPE LOCATIONS AND SIZING.

9. PROVIDE DRAINAGE CONNECTIONS TO KERB IN ACCORDANCE WITH COUNCIL STANDARD DETAILS AND SPECIFICATION.

10. CONTRACTOR TO ALLOW TO ADJUST AND LIAISE WITH RELEVANT SERVICE AUTHORITIES IN RELATION TO EXISTING SERVICE ADJUSTMENT AND MODIFICATIONS.

11. WHEEL STOPS TO BE INSTALLED TO ALL CAR SPACES AS SHOWN AND INSTALLED IN ACCORDANCE WITH AUSTRALIAN STANDARDS AND MANUFACTURERS SPECIFICATIONS. IF WHEEL STOPS ARE NOT SHOWN, ALLOW FOR WHEEL STOPS WHERE CAR SPACES ARE FRONTING A WALL

12. REFER 'RETAINING WALL ELEVATIONS' FOR RETAINING WALL INFORMATION.

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| REVISION | DESCRIPTION                             | ISSUED | VER'D | APP'D | DATE     | CLIENT |
|----------|---|--------|-------|-------|----------|--------|
| 03       | RE-ISSUED FOR PRE-DA                    | EE     |       | JD    | 01.03.23 |        |
| 04       | RE-ISSUED FOR PRE-DA                    | EE     |       | JD    | 14.03.23 |        |
| 05       | ISSUED FOR DRAFT DA                     | JD     |       | JD    | 16.08.23 |        |
| 06       | ISSUED FOR DRAFT DA                     | EE     |       | NS    | 23.08.23 |        |
| 07       | ISSUED FOR DEVELOPMENT APPLICATION      | EE     |       | NS    | 20.09.23 |        |
| 08       | ISSUED FOR DRAFT 90% DESIGN DEVELOPMENT | EE     |       | JD    | 28.09.23 |        |



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SCALE 1:250@A1

**PROJECT**  
**NSW RURAL FIRE SERVICE: MONARO FIRE CONTROL CENTRE**

**11 GEEBUNG STREET, POLO FLAT, NSW 2630**

**DRAWING TITLE**  
**CIVIL ENGINEERING PACKAGE**

**SITEWORKS AND STORMWATER MANAGEMENT PLAN - SHEET 01**

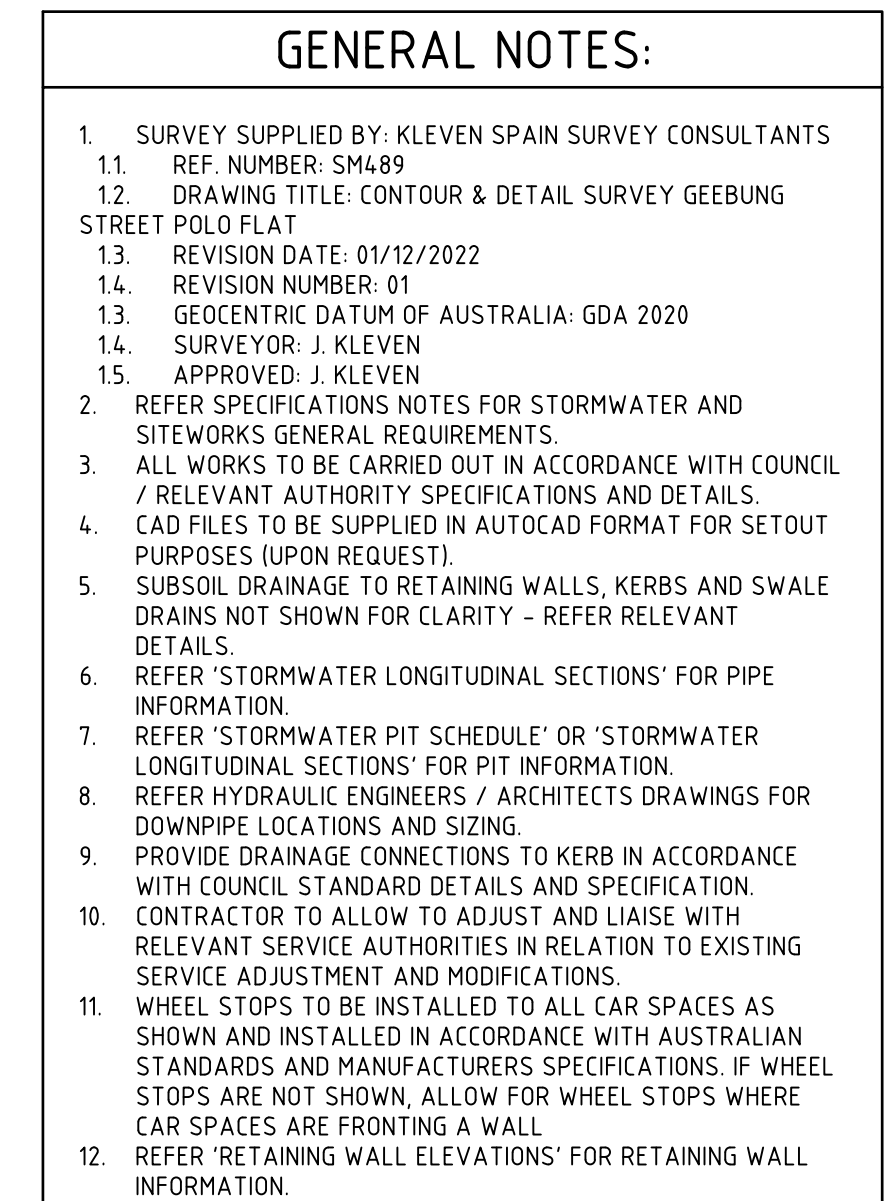
**JOB NUMBER**  
**222002-07**

**DRAWING NUMBER**  
**C3001**

**REVISION**  
**08**

**DRAWING SHEET SIZE = A1**

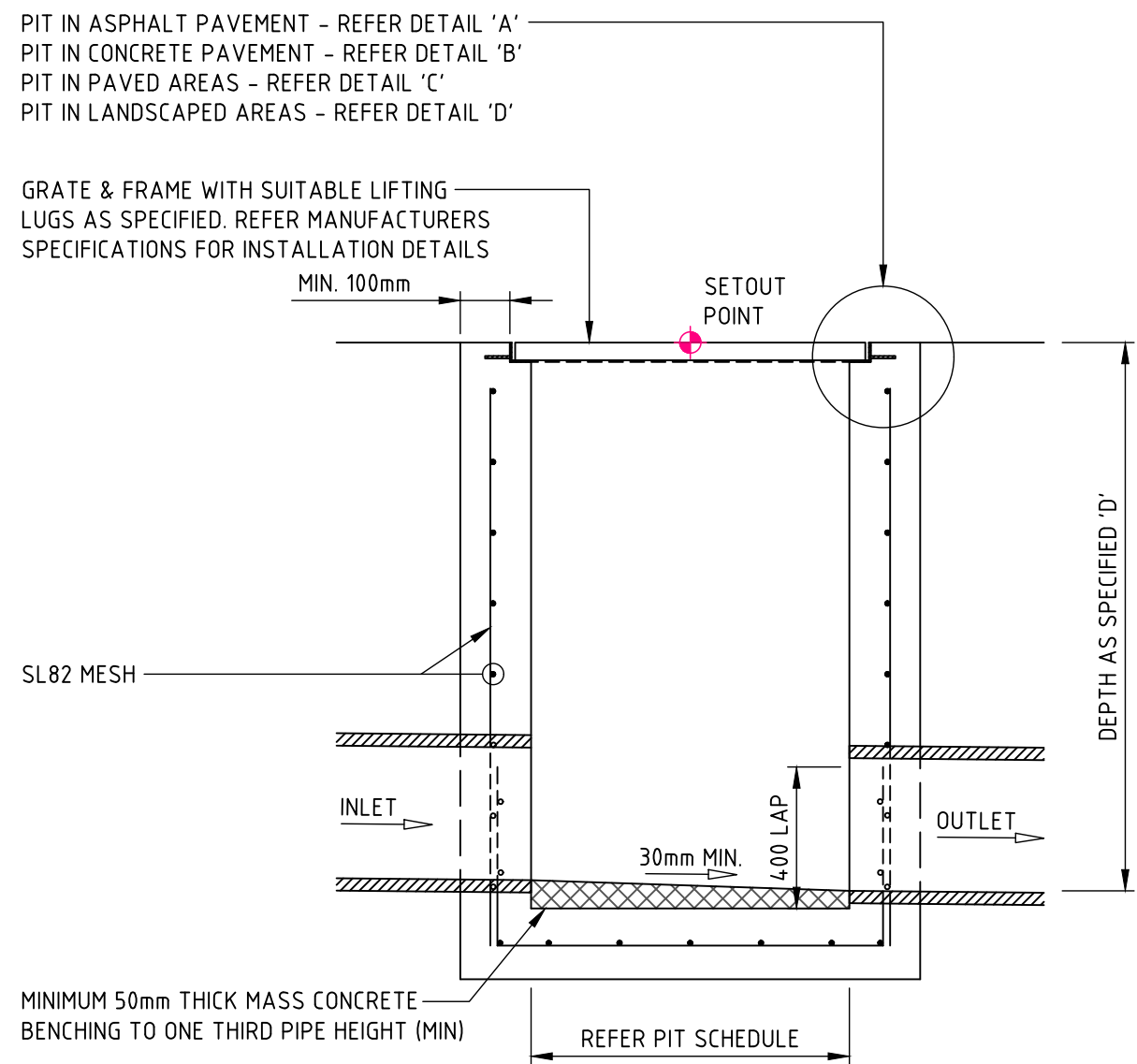




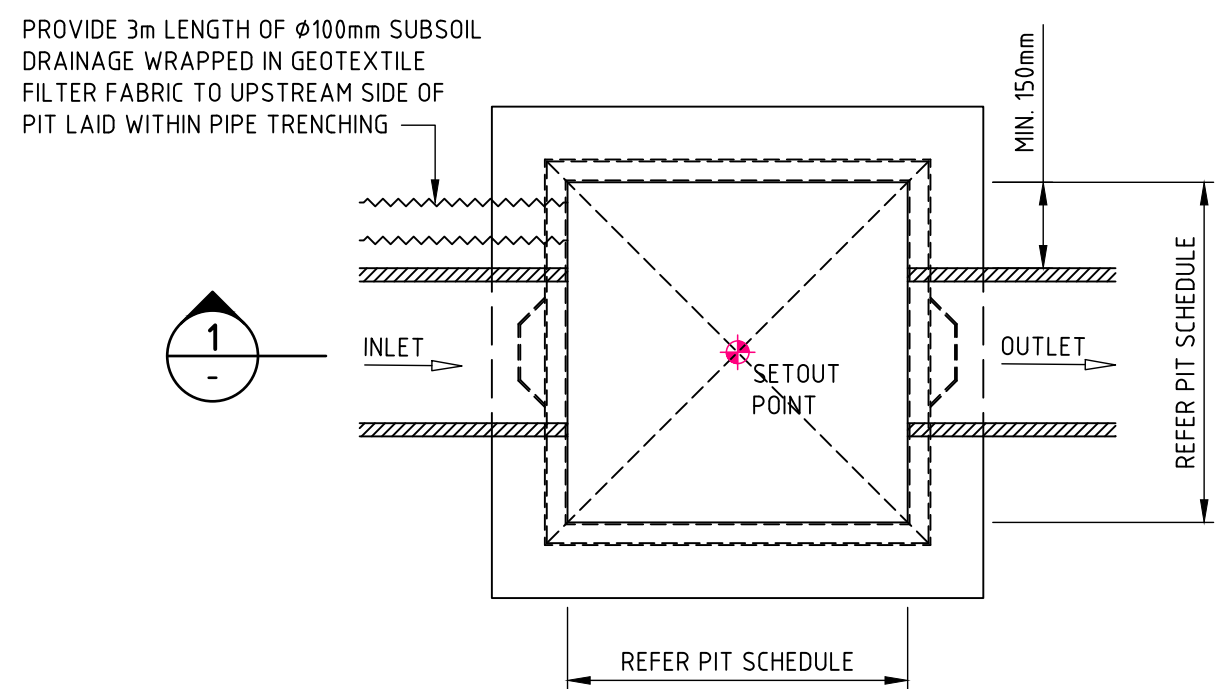
|   |   |   |  |  |  |                |          |              |           |                         |  |
|---|---|---|--|--|--|----------------|----------|--------------|-----------|-------------------------|--|
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|   |   |   | DRAWING NUMBER   | REVISION   |  |                |          |              |           |                         |  |
|   |   |   | <b>C3002</b>   | <b>07</b>  |  |                |          |              |           |                         |  |
| DRAWING SHEET SIZE = A1   |   |   |  |  |  |                |          |              |           |                         |  |



DRAWN: E. EAGER  
DESIGNED: J. DI FONZO  
JOB MANAGER: N. SUTHERLAND  
VERIFIER:

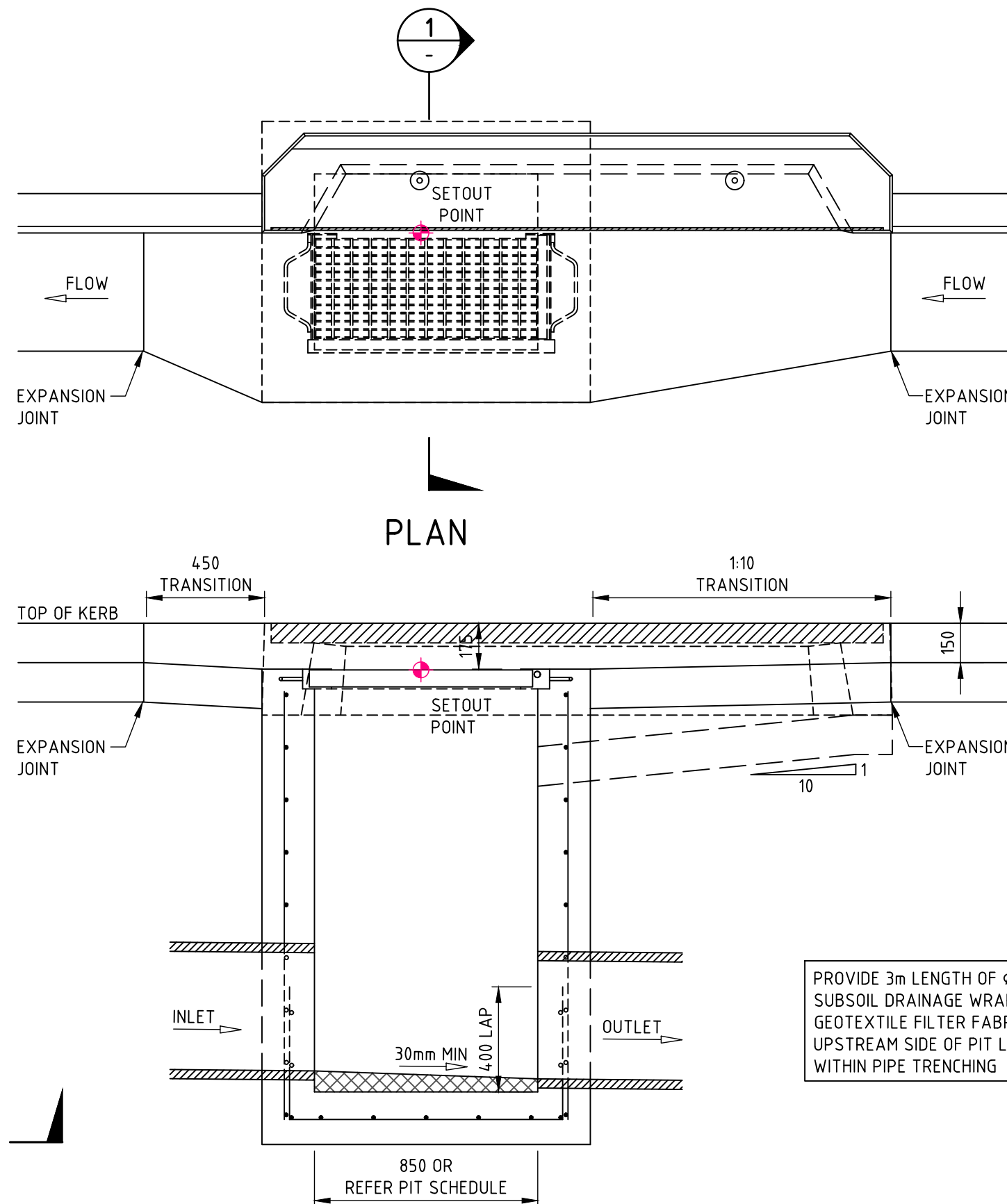


SECTION 1



### SURFACE INLET PIT 'SIP' / JUNCTION PIT 'JP'

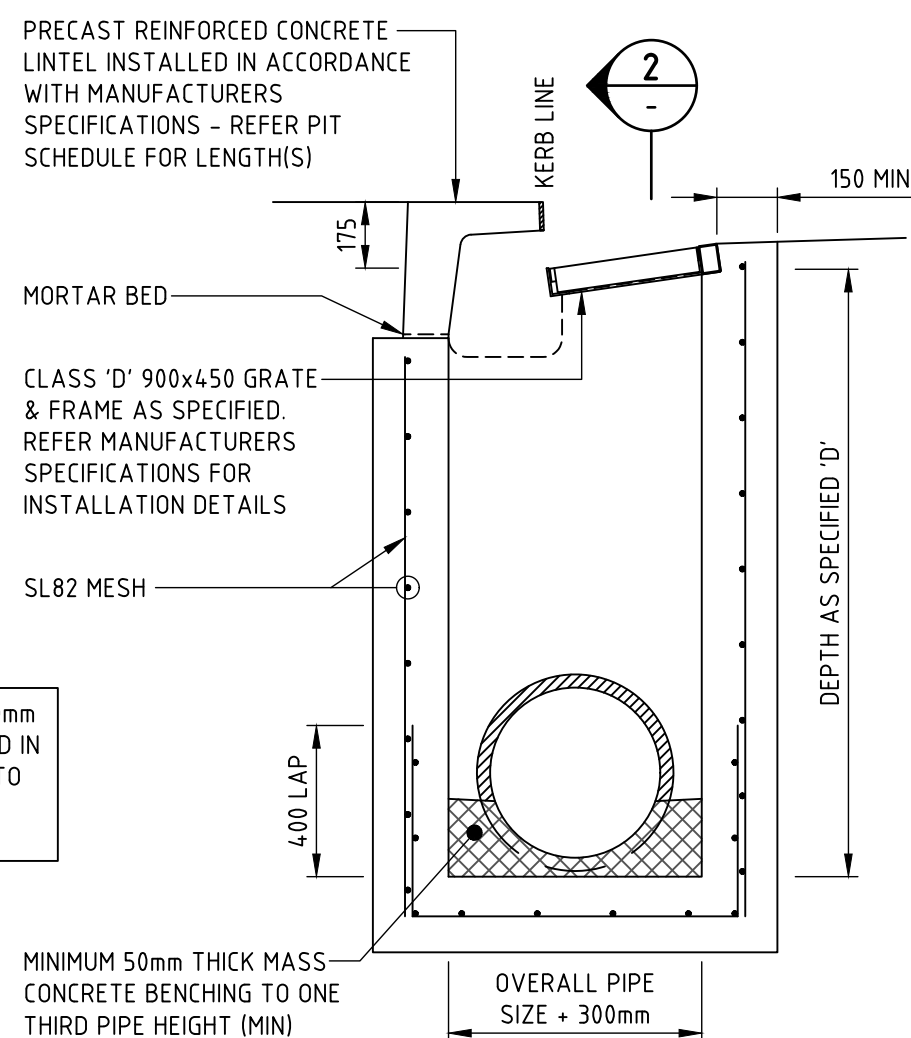
PIT STRUCTURE TO BE 200mm THICK UNLESS SHOWN OTHERWISE. DRILL AND EPOXY PLASTIC PROPRIETARY STEP IRONS IN ACCORDANCE WITH AUSTRALIAN STANDARDS AND MANUFACTURERS SPECIFICATIONS (PITS > 1000mm DEPTH).  
REFER PIT INTERFACE DETAIL 'F' FOR CORNER REINFORCEMENT  
SCALE 1:20



SECTION 2

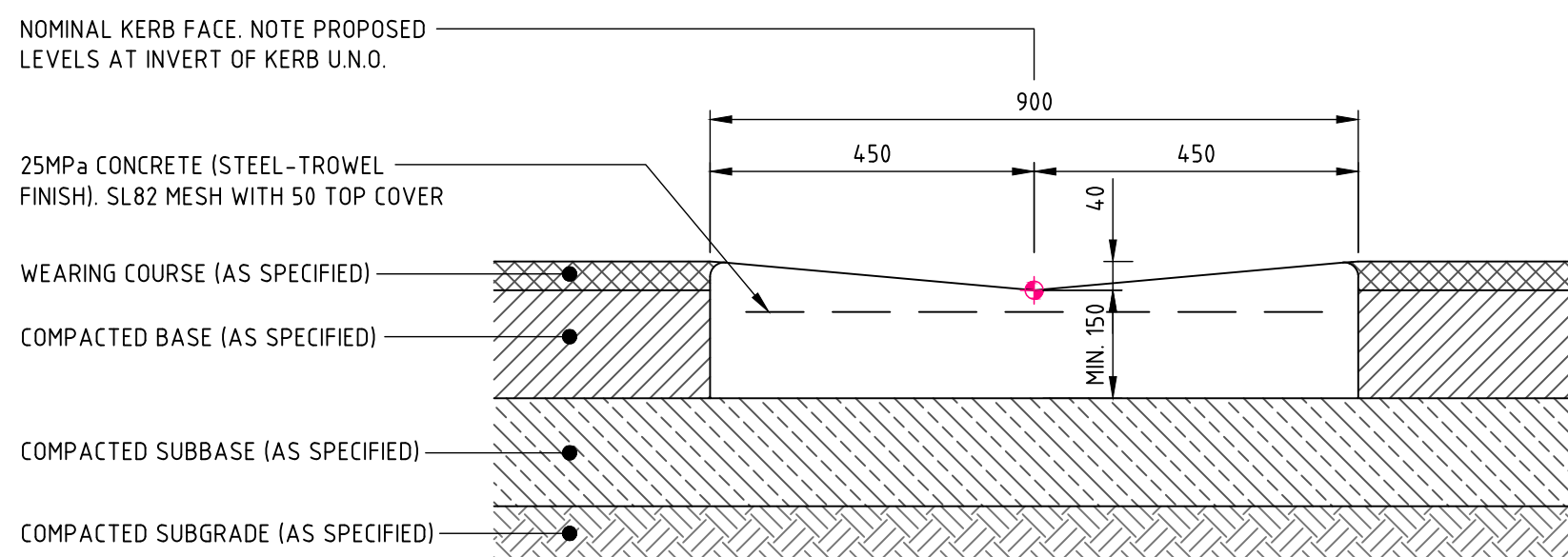
### KERB INLET PIT 'KIP'

PIT STRUCTURE TO BE 200mm THICK UNLESS SHOWN OTHERWISE. DRILL AND EPOXY PLASTIC PROPRIETARY STEP IRONS IN ACCORDANCE WITH AUSTRALIAN STANDARDS AND MANUFACTURERS SPECIFICATIONS (PITS > 1000mm DEPTH).  
REFER PIT INTERFACE DETAIL 'F' FOR CORNER REINFORCEMENT  
SCALE 1:20



SECTION 1

PROVIDE 3m LENGTH OF Ø100mm SUBSOIL DRAINAGE WRAPPED IN GEOTEXTILE FILTER FABRIC TO UPSTREAM SIDE OF PIT LAID WITHIN PIPE TRENCHING



### DISH DRAIN - 900 WIDE 'DD'

EXPANSION JOINTS @ MAX 12m CTRS / TOOL JOINTS @ MAX 3m CTRS  
ALL RADII TO BE 20mm U.N.O.  
SCALE 1:10

'WELDLK-TGF' TRENCH GRATE AND FRAME AS SPECIFIED. REFER MANUFACTURERS SPECIFICATIONS FOR INSTALLATION DETAILS

N12 BARS @ 450 CENTRES

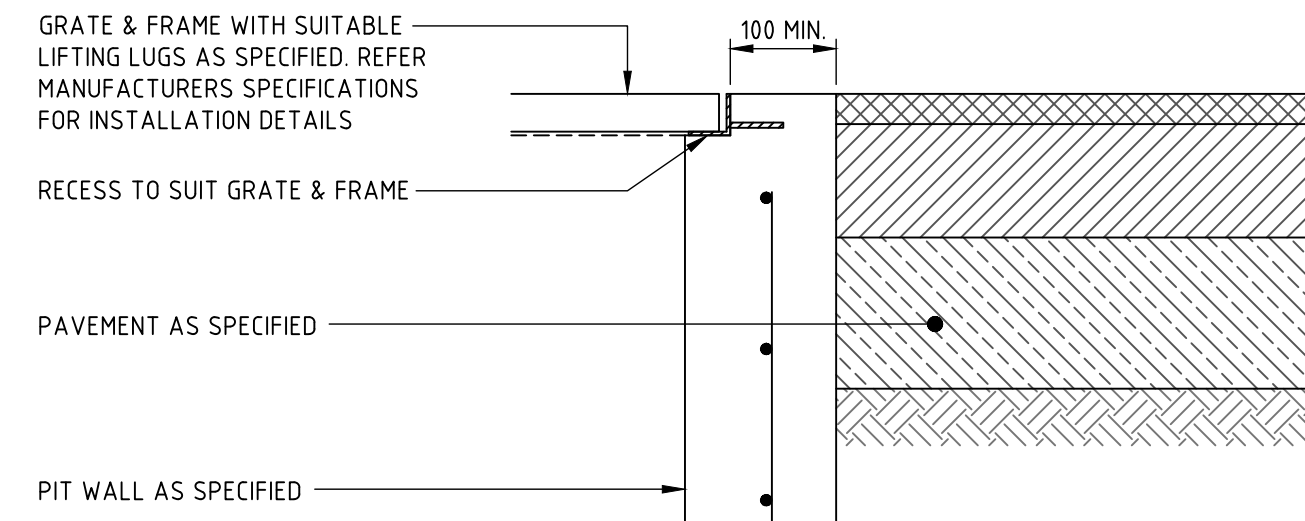
5xN12 LONGITUDINAL BARS

100mm DGB20 BASE MATERIAL COMPACTED TO 98% MMDD

SUBGRADE MATERIAL COMPACTED TO 100% SMDD

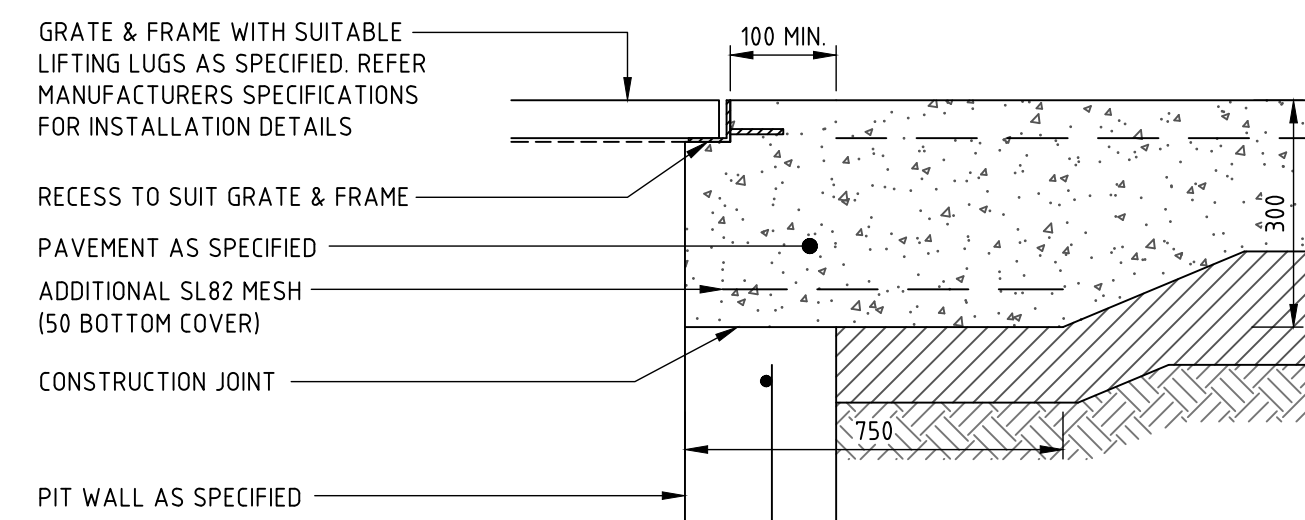
### GRADED TRENCH DRAIN 'GTD'

GRADED TRENCH DRAIN TO HAVE MINIMUM 150mm CLEARANCE AND 1% LONGITUDINAL FALL.  
GRATE CLASS TO BE CLASS 'B' HEELSAFE IN PEDESTRIAN AREAS AND CLASS 'D' IN TRAFFICKED AREAS UNLESS NOTED OTHERWISE ON PLAN  
SCALE 1:10



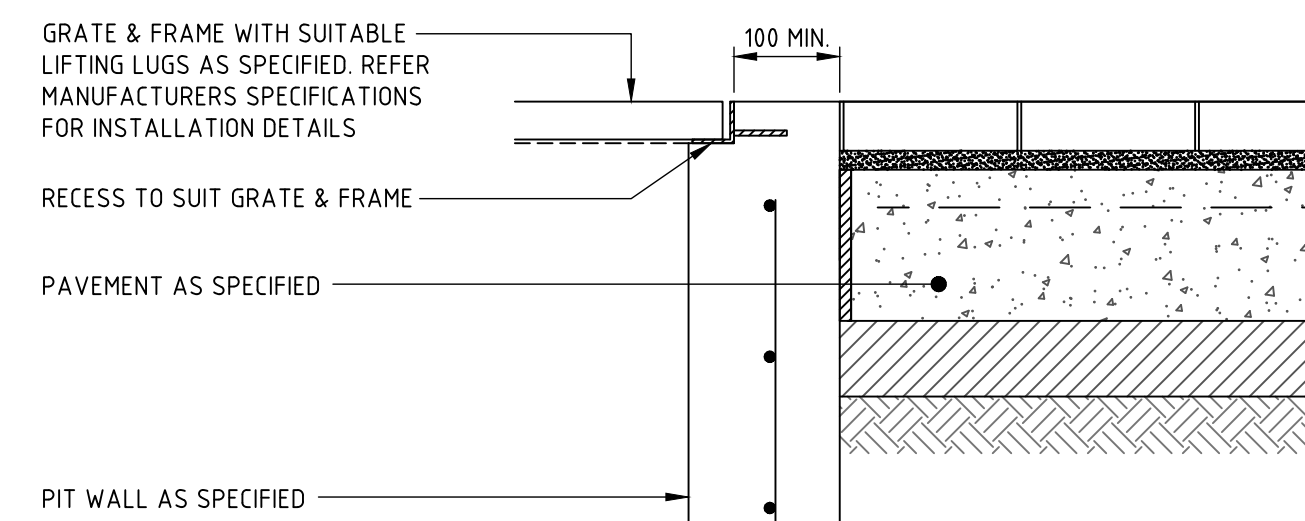
### PIT INTERFACE - DETAIL 'A'

SCALE 1:10



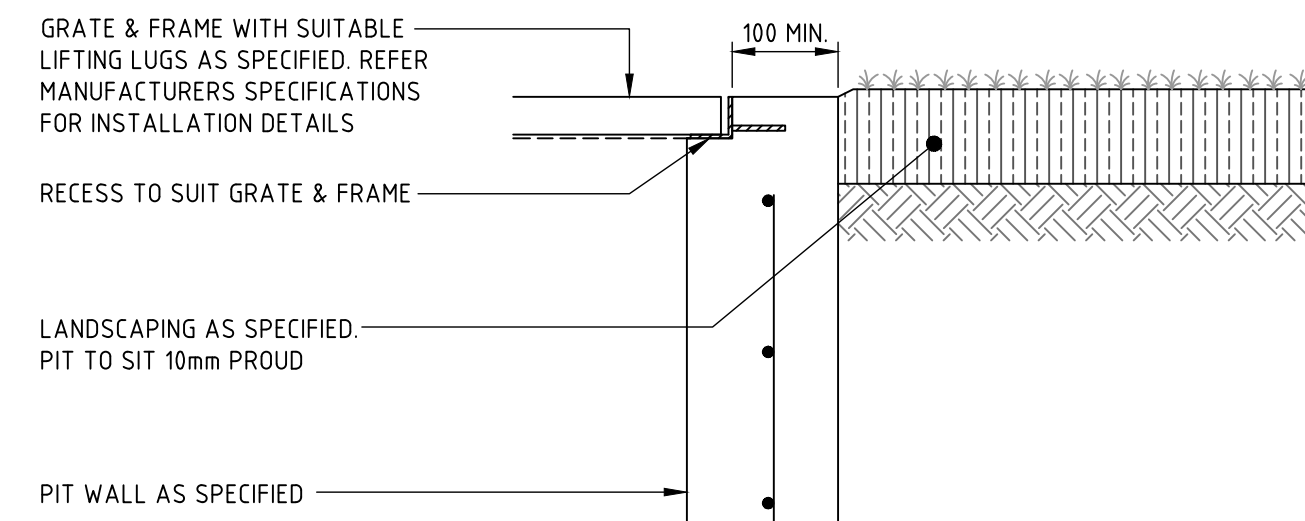
### PIT INTERFACE - DETAIL 'B'

SCALE 1:10



### PIT INTERFACE - DETAIL 'C'

SCALE 1:10



### PIT INTERFACE - DETAIL 'D'

SCALE 1:10

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| REVISION | DESCRIPTION                       | ISSUED | VER'D | APP'D | DATE     |
|----------|-----------------------------------|--------|-------|-------|----------|
| 01       | ISSUED FOR 90% DESIGN DEVELOPMENT | EE     |       | JD    | 28.09.23 |
|          |                                   |        |       |       |          |
|          |                                   |        |       |       |          |
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| SCALE 1:10 @ A1<br>SCALE 1:20 @ A1  |

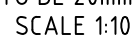
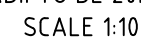


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| PROJECT<br>NSW RURAL FIRE SERVICE: MONARO<br>FIRE CONTROL CENTRE |
| 11 GEEBUNG STREET,<br>POLO FLAT, NSW 2630                        |

|  |
|--|
| DRAWING TITLE<br>CIVIL ENGINEERING PACKAGE |
| DETAILS - SHEET 01                         |

|                         |
|-------------------------|
| JOB NUMBER<br>222002-07 |
| DRAWING NUMBER<br>C6101 |
| REVISION<br>01          |
| DRAWING SHEET SIZE = A1 |





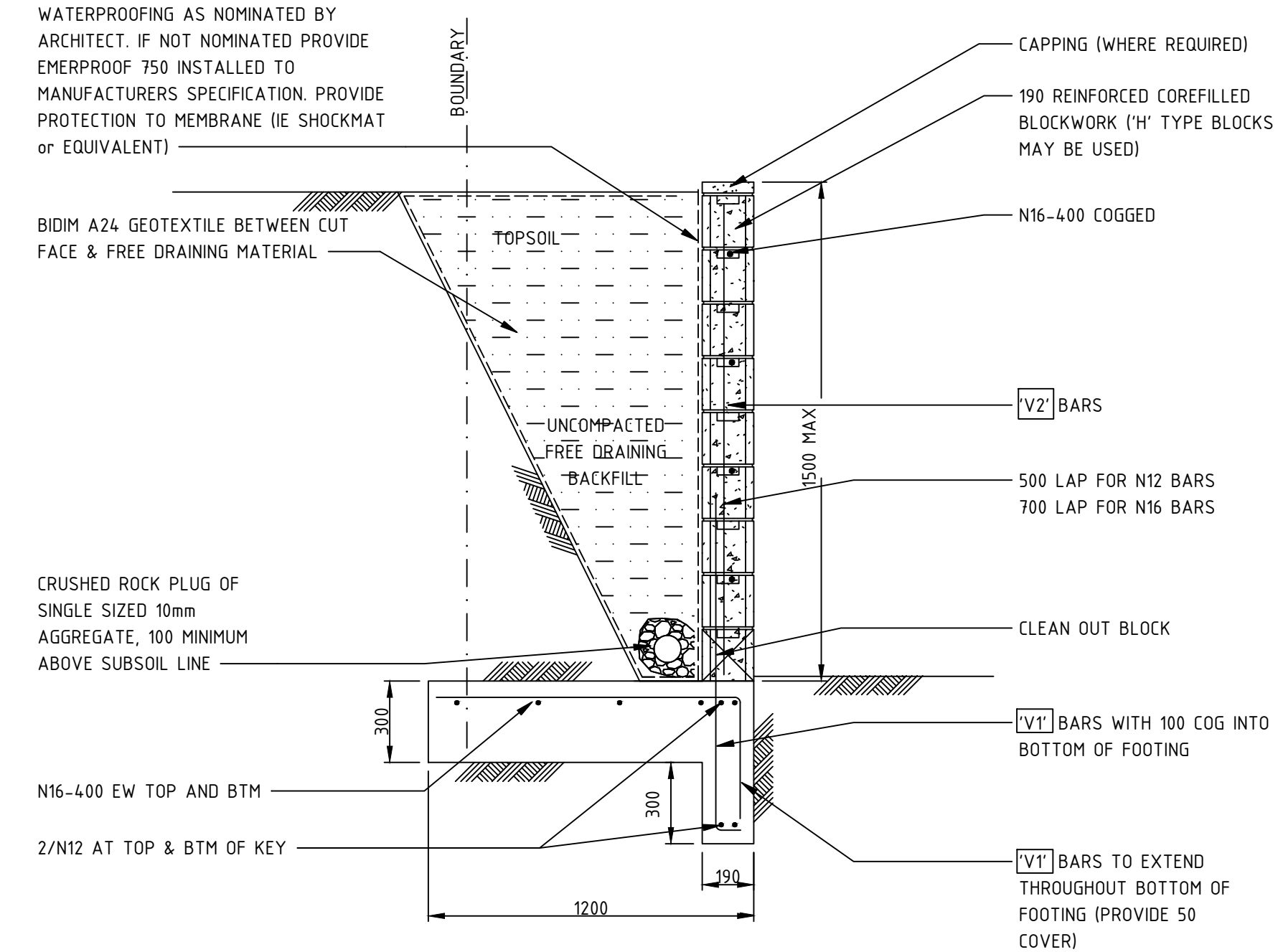
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|-------------------------|-----------|
| JOB NUMBER              |           |
| <b>222002-07</b>        |           |
| DRAWING NUMBER          | REVISION  |
| <b>C6102</b>            | <b>01</b> |
| DRAWING SHEET SIZE - A1 |           |







DRAWN: E. EAGER  
DESIGNED: J. DI FONZO  
JOB MANAGER: N. SUTHERLAND  
VERIFIER:



RETAINING WALL NOTES:

- BUILDER IS TO MAINTAIN STABILITY OF WALL DURING BACKFILLING PROCEDURE.
- PROVIDE CLEANOUT BLOCKS IN BOTTOM COURSE.
- LOADINGS FOR HANDRAILS, BALUSTRADES & FENCES HAVE NOT BEEN INCLUDED IN DESIGN OF WALL. REFER TO ENGINEER IF THESE ARE REQUIRED.
- BUILDER IS TO ENSURE THAT THE STABILITY OF THE TEMPORARY EXCAVATION IS MAINTAINED DURING THE CONSTRUCTION OF THE WALL & THAT NO ADJACENT FOOTINGS / STRUCTURES ARE WITHIN THE ZONE OF INFLUENCE OF THE EXCAVATION, CONTACT NORTHROP ENGINEERS or A SUITABLY QUALIFIED GEOTECHNICAL ENGINEER IF THERE ARE ANY CONCERNS.

| RETAINING WALL RW? SCHEDULE |      |      |           |           |
|-----------------------------|------|------|-----------|-----------|
| HEIGHT 'H'                  | 'B'  | 'K'  | 'V1' BARS | 'V2' BARS |
| 1200                        | 800  | 600  | N12-400   | N12-400   |
| 1400                        | 1000 | 750  | N12-400   | N12-400   |
| 1600                        | 1150 | 900  | N16-400   | N16-400   |
| 1800                        | 1350 | 1050 | N16-400   | N16-400   |

FOR  $\phi^{\circ}$  = 25° & 125kPa BEARING

| RETAINING WALL RW? SCHEDULE |      |     |           |           |
|-----------------------------|------|-----|-----------|-----------|
| HEIGHT 'H'                  | 'B'  | 'K' | 'V1' BARS | 'V2' BARS |
| 1200                        | 700  | 300 | N12-400   | N12-400   |
| 1400                        | 850  | 450 | N12-400   | N12-400   |
| 1600                        | 1050 | 600 | N12-400   | N12-400   |
| 1800                        | 1150 | 600 | N16-400   | N16-400   |
| 2000                        | 1350 | 750 | N16-400   | N16-400   |

FOR  $\phi^{\circ}$  = 30° & 125kPa BEARING

| RETAINING WALL RW? SCHEDULE |      |     |           |           |
|-----------------------------|------|-----|-----------|-----------|
| HEIGHT 'H'                  | 'B'  | 'K' | 'V1' BARS | 'V2' BARS |
| 1200                        | 650  | 150 | N12-400   | N12-400   |
| 1400                        | 800  | 300 | N12-400   | N12-400   |
| 1600                        | 900  | 300 | N12-400   | N12-400   |
| 1800                        | 1050 | 450 | N12-400   | N12-400   |
| 2000                        | 1150 | 450 | N16-400   | N16-400   |
| 2200                        | 1350 | 600 | N16-400   | N16-400   |

FOR  $\phi^{\circ}$  = 35° & 125kPa BEARING

ENGINEERS NOTES:  
 $\psi$  = 18kN/m<sup>2</sup>  
 $P_s$  = 5kPa (SURCHARGE)  
 $\mu$  = 0.45 (FRICTION BETWEEN SOIL & FOOTING) ASSUMED TO BE WALL THAT EXTENDS FOR SIGNIFICANT LENGTH WITHOUT RETURNS  
KEY DEPTH (K) IS BASED WORST CASE CALCULATIONS

ASSUMING  
THE MATERIAL AT THE TOE OF THE WALL IS AS POOR AS THE MATERIAL AT THE TOP OF THE WALL (OFTEN IT GETS STRONGER);  
THE RETAINING WALL THAT COULD INCREASE YOUR RESISTANCE TO SLIDING. REMEMBER THAT THE FOOTING OF THE RETAINING WALL IS EFFECTIVELY A VERY DEEP BEAM ABLE TO TRANSFER HORIZONTAL FORCES A FAIR WAY;

ALL KEY DEPTHS TO BE CALCULATED BY ENGINEER PRIOR TO ISSUING OF RETAINING WALL DETAILS

ASSUMED TO HAVE 15° ANGLE OF FRICTION BETWEEN BACK FACE OF WALL & SOIL.

ASSUMED TO HAVE NO HYDROSTATIC PRESSURE BEHIND WALL.

FOS = 1.5 OVERTURN  
FOS = 1.4 SLIDING  
FOS = 1.5 BEARING  
d = 120mm

R01-2/02

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| REVISION | DESCRIPTION                       | ISSUED | VER'D | APP'D | DATE     |
|----------|-----------------------------------|--------|-------|-------|----------|
| 01       | ISSUED FOR 90% DESIGN DEVELOPMENT | EE     |       | JD    | 28.09.23 |
|          |                                   |        |       |       |          |
|          |                                   |        |       |       |          |
|          |                                   |        |       |       |          |
|          |                                   |        |       |       |          |



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| ARCHITECT  | CLIENT   |
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|-----------------|---|
| SCALE 1:20 @ A1 | 0.0 0.2 0.4 0.6 0.8 1.0m  |

| NORTHROP   |
|--|
| Sydney<br>Level 11 345 George Street, Sydney NSW 2000<br>Ph (02) 9241 4188 Fax (02) 9241 4324<br>Email sydney@northrop.com.au ABN 81 094 433 100 |

| PROJECT  |
|--|
| NSW RURAL FIRE SERVICE: MONARO FIRE CONTROL CENTRE |
| 11 GEEBUNG STREET, POLO FLAT, NSW 2630             |

| DRAWING TITLE             |
|---------------------------|
| CIVIL ENGINEERING PACKAGE |
| DETAILS - SHEET 04        |

|                         |          |
|-------------------------|----------|
| JOB NUMBER              |          |
| 222002-07               |          |
| DRAWING NUMBER          | REVISION |
| C6104                   | 01       |
| DRAWING SHEET SIZE = A1 |          |