DON RIVER STREAM BANK STABILISATION

20 KELLYS ROAD, DIXALEA

FOR BANANA SHIRE COUNCIL

ARO

Banana SHIRE
SHIRE OF OPPORTUNITY

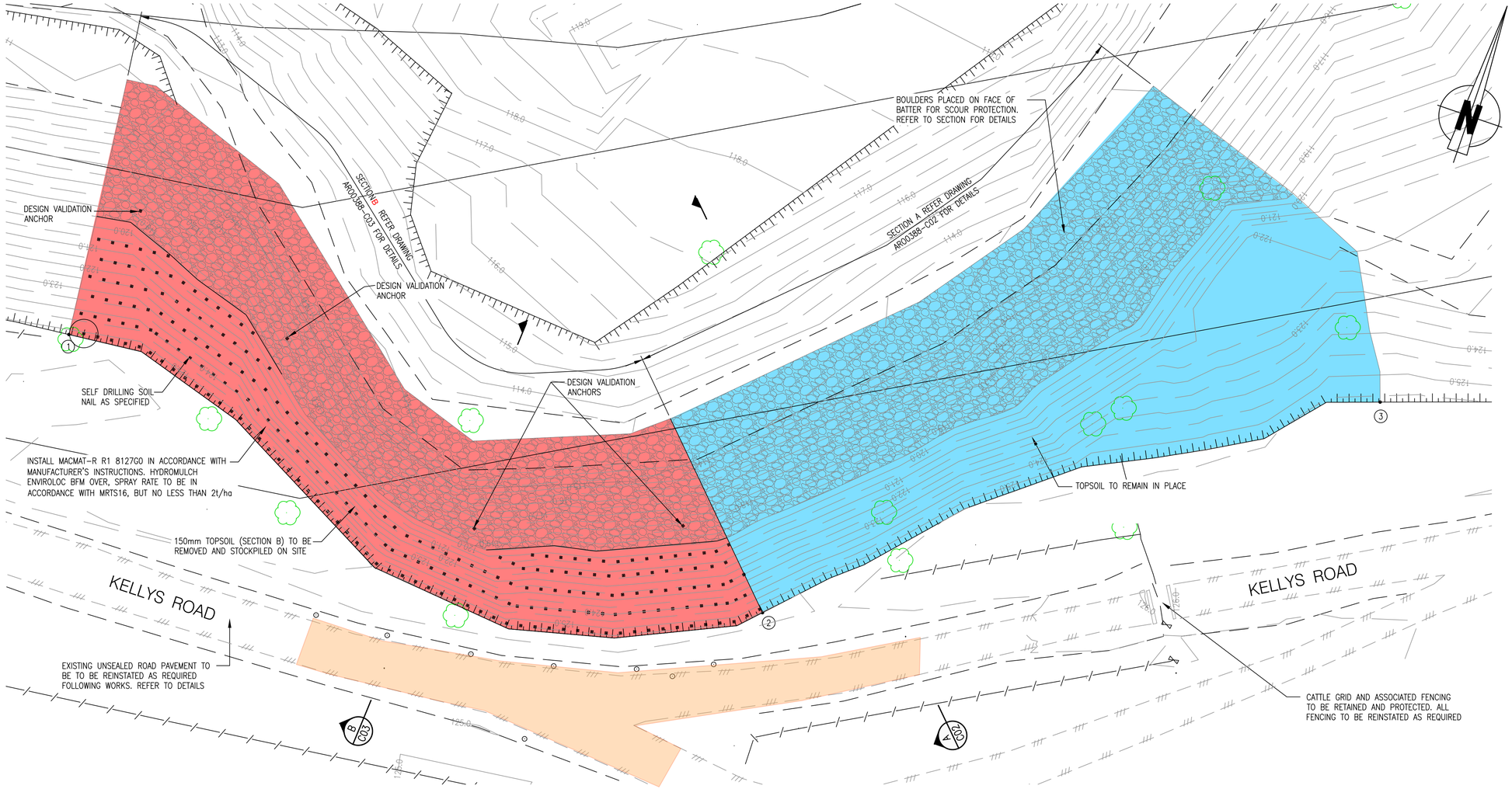
LOCALITY PLAN
NOT TO SCALE

SCHEDULE OF PROJECT DRAWINGS

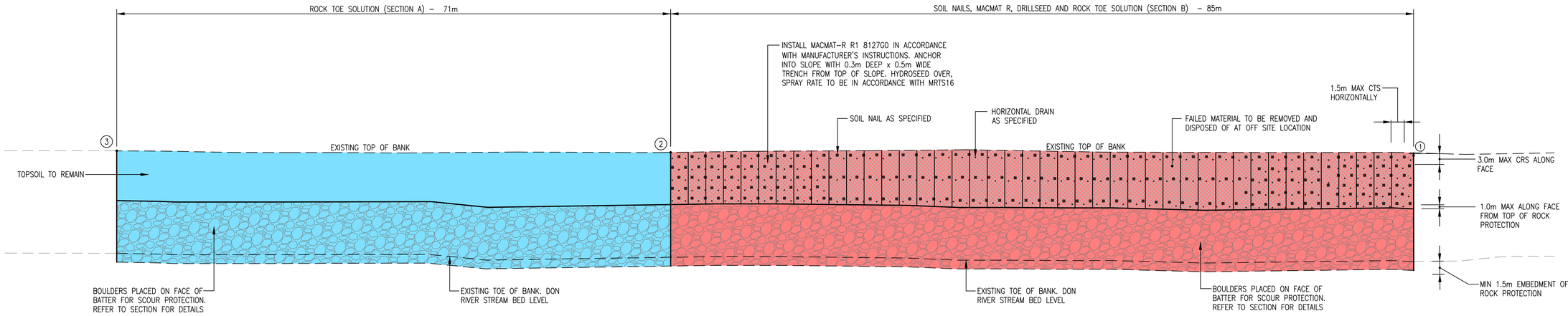
PHOTO OF DAMAGE
NOT TO SCALE

TENDER ISSUE ONLY

DO NOT SCALE



LAYOUT PLAN
SCALE 1:250



ELEVATION
SCALE 1:250

LEGEND

- EXISTING SURFACE CONTOUR (0.25m INTERVAL)
- EXISTING FENCE
- TOP OF EXISTING BATTER
- TOE OF EXISTING BATTER
- EDGE OF EXISTING UNSEALED ROAD
- SW — EXISTING STORMWATER
- T — EXISTING TELECOMMUNICATIONS
- E — EXISTING OVERHEAD ELECTRICITY
- EXISTING SIGNIFICANT TREES

NOTES

1. LOCATION OF ALL EXISTING SERVICES TO BE CONFIRMED PRIOR TO CONSTRUCTION BY CONTRACTOR THROUGH LIAISON WITH RELEVANT AUTHORITIES AND ONSITE SERVICE LOCATION.
2. NEW ROADWORKS TO JOIN SMOOTHLY TO EXISTING WORKS.
3. COREFLUTE PROJECT SIGNS (2 No.) TO BE PROVIDED FOR EACH SITE AND INSTALLED AT A LOCATION AGREED UPON WITH THE SUPERINTENDENT.

SETOUT TABLE

POINT No.	EASTING	NORTHING
1	231478.867	7344989.145
2	231557.057	7344996.140
3	231604.848	7345045.277

TENDER ISSUE ONLY

Revisions

No.	Description	Reviewed	Approved	Date
3	TENDER ISSUE ONLY			19/03/2025
2	ISSUED FOR APPROVAL	-	-	07/08/2024
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Client Logo

Client: BANANA SHIRE COUNCIL
Project: DON RIVER STREAMBANK STABILISATION WORKS
Title: GENERAL ARRANGEMENT AND ELEVATION

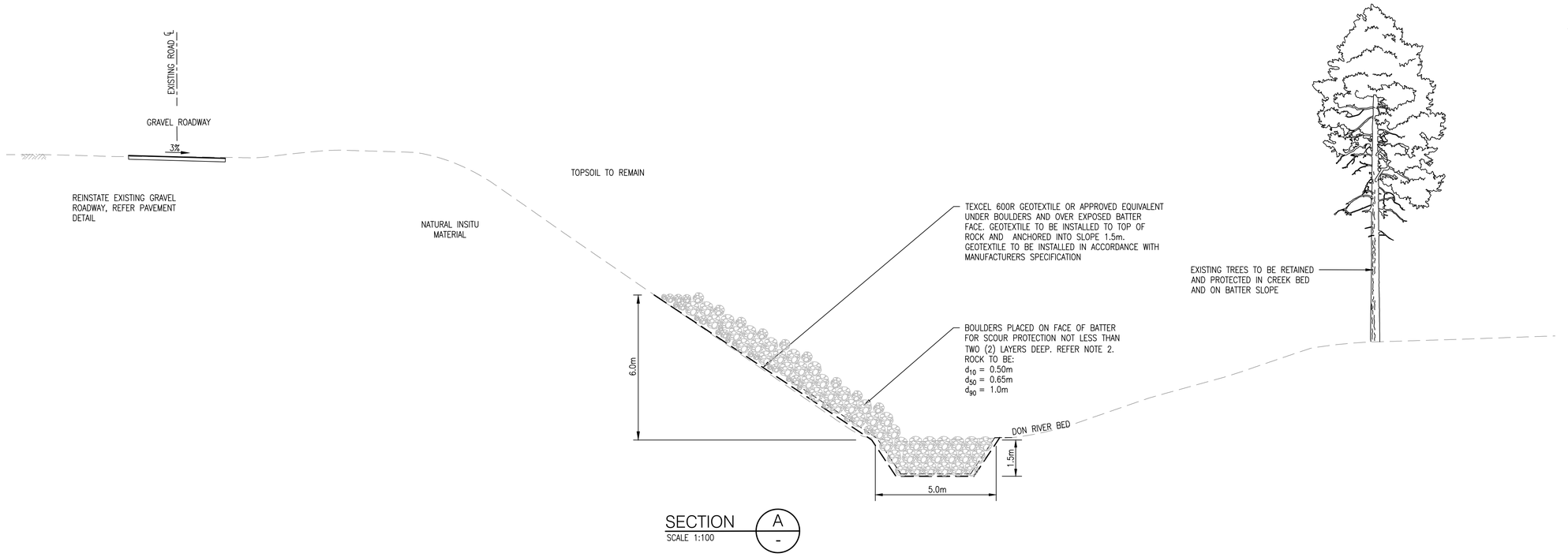
Drawn	Designed	Approved		Scale (A1 size)
JW	KR			1:250
Drawing Check	Design Check	RPEQ	Date	Drawing is not to be used for construction unless approved.

ARO
51 Sheridan Street
Cairns Qld 4870
T (07) 4281 6897
E admin@aroindustries.com.au
W www.aroindustries.com.au
ABN: 49 641 461 298

Drawing No. ARO0388-C01

Revision 3

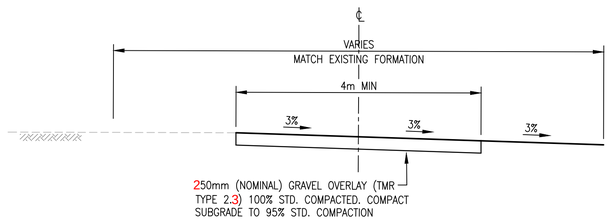
DO NOT SCALE



SECTION A
SCALE 1:100

NOTES

1. CONTRACTOR TO CONFIRM LOCATION AND DEPTH OF ALL EXISTING SERVICES PRIOR TO COMMENCEMENT OF WORKS.
2. ROCKS ARE TO BE STRATEGICALLY PLACED AND STACKED BY AN EXPERIENCED OPERATOR TO ENSURE STABILITY OF THE PLACED ROCK SO THAT VOIDS ARE FILLED WHEREVER POSSIBLE. ROCKS TO BE GRANITE.



TYPICAL ROAD CROSS SECTION

SCALE 1:50

0 1 2 3 4 5m
SCALE 1:100 (A1)

0 0.5 1.0 1.5 2.0 2.5m
SCALE 1:50 (A1)

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Client Logo

Client: BANANA SHIRE COUNCIL

Project: DON RIVER STREAMBANK STABILISATION WORKS

Title: TYPICAL STABILISATION SECTION AND DETAILS

Drawn	Designed	Approved		Scale (A1 size)
JW	KR			AS SHOWN
Drawing Check	**Design Check**	**RPEQ**	**Date**	
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ARO
51 Sheridan Street
Cairns Qld 4870
T (07) 4281 6897
E admin@aroindustries.com.au
W www.aroindustries.com.au
ABN: 49 641 461 298

Drawing No. ARO0388-C02

Revision 3

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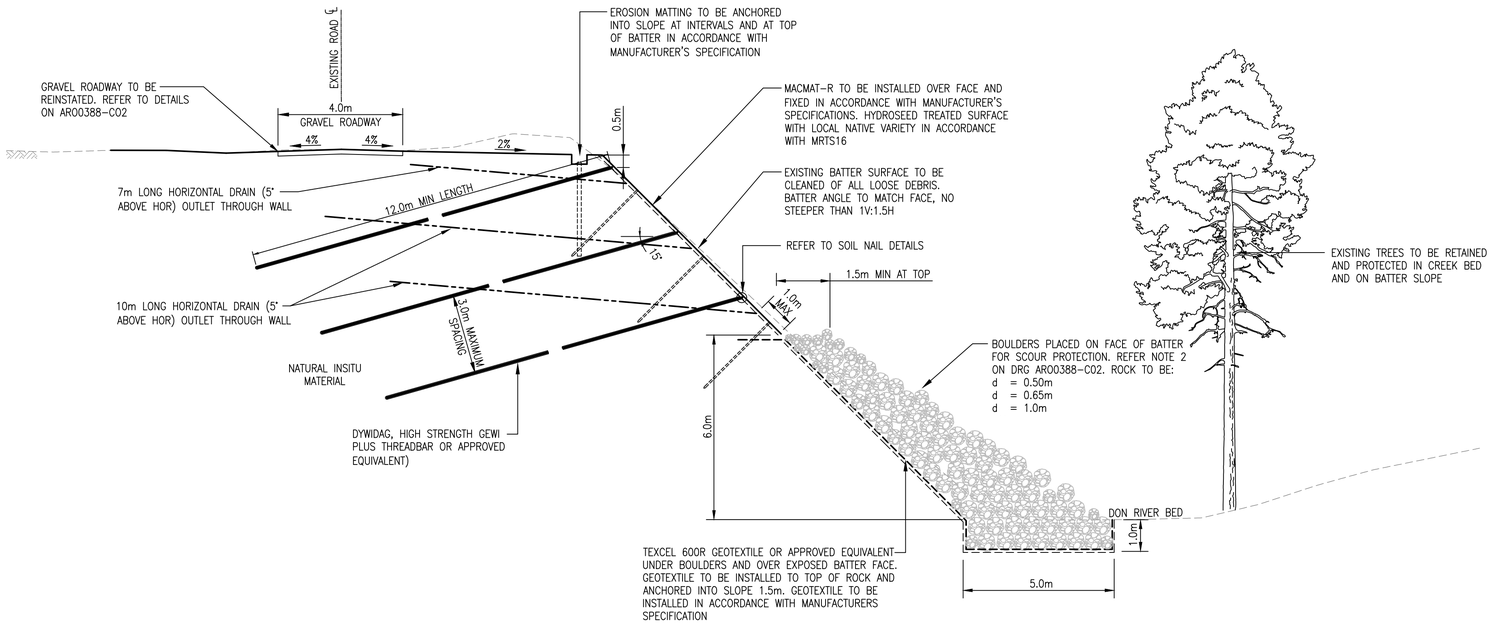


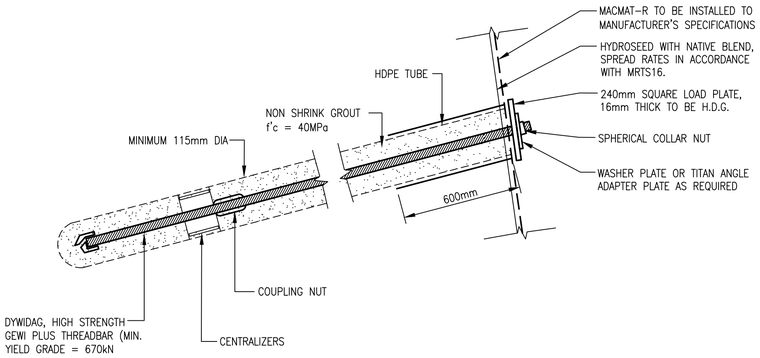
SECTION B
C01
SCALE 1:100

SOIL NAIL SCHEDULE

SOIL NAILS	DESIGN LENGTHS (m)	INSTALLATION ANGLE (DEG, DOWNWARDS)	SPACING		MIN. BAR DIAMETER (mm)	WORKING TENSILE LOAD (kN)
			HORIZONTAL	VERTICAL		
1st ROW	12.0m	15°	1.5m	3.0m	28	160
2nd ROW	12.0m	15°	1.5m	3.0m	28	160
3rd ROW	12.0m	15°	1.5m	3.0m	28	160

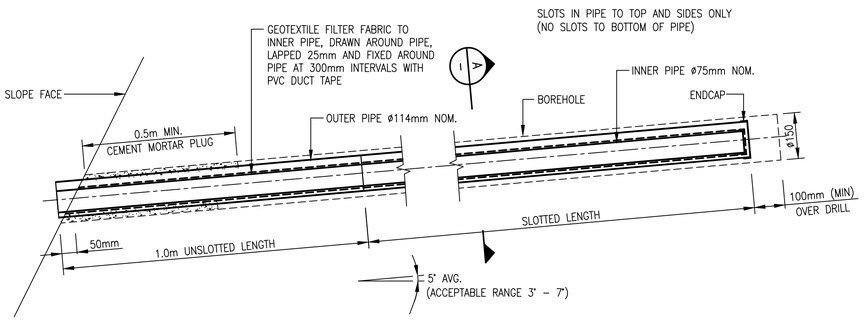
NOTES

1. REFER TO DRAWING ARO0388-C02 FOR TYPICAL ROAD CROSS SECTION.
2. CONTRACTOR TO CONFIRM LOCATION AND DEPTH OF ALL EXISTING SERVICES PRIOR TO COMMENCEMENT OF WORKS.
3. ROCKS ARE TO BE STRATEGICALLY PLACED AND STACKED BY AN EXPERIENCED OPERATOR TO ENSURE STABILITY OF THE PLACED ROCK SO THAT VOIDS ARE FILLED WHEREVER POSSIBLE. ROCKS TO BE GRANITE.
4. MACMAT-R TO HAVE BOTH Zn/Al AND PA6 POLYMER COATING FOR CORROSION PROTECTION.



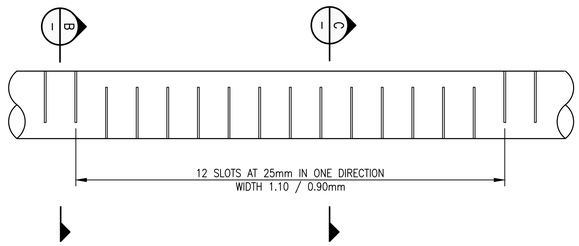
TYPICAL SOIL NAIL DETAIL

NOT TO SCALE



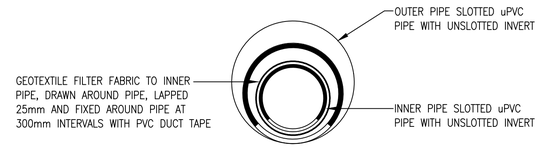
HORIZONTAL DRAIN

NOT TO SCALE

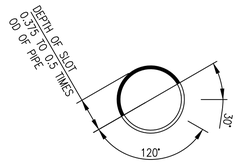


INNER / OUTER PIPE SLOTTING DETAIL (TOP VIEW)

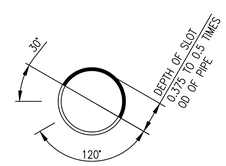
NOT TO SCALE



SECTION A
NTS



SECTION B
NTS



SECTION C
NTS

0 0.5 1.0 1.5 2.0 2.5m
SCALE 1:50 (A1)

0 1 2 3 4 5m
SCALE 1:100 (A1)

CONSTRUCTION ISSUE

Revisions	No.	Description	Reviewed	Approved	Date
	3	CONSTRUCTION ISSUE			
	2	ISSUED FOR APPROVAL	-	-	07/08/2024
	1	PRELIMINARY ISSUE	-	-	09/01/2024

Client Logo: Banana SHIRE SHIRE OF OPPORTUNITY

Client: BANANA SHIRE COUNCIL
Project: DON RIVER STREAMBANK STABILISATION WORKS
Title: TYPICAL SOIL NAIL SECTION AND DETAILS SHEET

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JW	KR			AS SHOWN
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ARO
51 Sheridan Street
Cairns Qld 4870
T (07) 4281 6897
E admin@aroindustries.com.au
W www.aroindustries.com.au
ABN: 49 641 461 298

Drawing No. ARO0388-C03
Revision 3

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1. GENERAL NOTES

1.1 SECTION CONTENT
GROUND WORKS GENERALLY, PROTECTION OF TREES, SITE CLEARING, EXCAVATION, PLACING AND COMPACTING FILL, INSTALLATION OF GEOTEXTILE, GABIONS AND MATTRESSES, SLUICED ROCK FILL, CRIB WALLS, EARTH REINFORCEMENT AND GROUND ANCHORS.

1.2 DEFINITIONS
DESCRIPTION AND CLASSIFICATION OF SOILS: TO AS 1726.
BAD GROUND: GROUND UNSUITABLE FOR THE PURPOSES OF THE WORKS, INCLUDING FILLING LIABLE TO SUBSIDENCE; GROUND FULL OF VEGETATIVE MATTER; GROUND CONTAINING CAVITIES, FAULTS OR FISSURES; GROUND CONTAMINATED BY HARMFUL SUBSTANCES INCLUDING OIL, CEMENT AND CHEMICALS; GROUND CONTAINING ACID SULPHATE SOIL; OR GROUND WHICH IS OR BECOMES SOFT, WET AND UNSTABLE; AND THE LIKE.
NON-RIPPABLE MATERIAL: AS DEFINED IN CLAUSE 7.8.
LINE OF INFLUENCE: A LINE EXTENDING DOWNWARD AND OUTWARD FROM THE BOTTOM EDGE OF A FOOTING, SLAB OR PAVEMENT AND DEFINING THE EXTENT OF FOUNDATION MATERIAL HAVING INFLUENCE ON THE STABILITY OR SUPPORT OF THE FOOTINGS, SLAB OR PAVEMENT.
SUBGRADE: THE PREPARED FORMATION ON WHICH A PAVEMENT OR SLAB IS CONSTRUCTED OR THE TOP PORTION OF EARTHWORKS IMMEDIATELY BELOW THE PAVEMENT OR SLAB. SUBGRADE IS CONSIDERED TO BE THE TOP 150 MM IN CUTTINGS AND THE TOP 300 MM IN EMBANKMENT UNLESS STATED OTHERWISE.
SUBGRADE LEVEL: THE TOP SURFACE OF THE PREPARED SUBGRADE ON WHICH A PAVEMENT OR SLAB IS CONSTRUCTED.
RELATIVE COMPACTION: THE RATIO BETWEEN THE CRITICAL ZONE (TREES): THE AREA DESCRIBED BY THE GREATER OF THE VERTICAL PROJECTION OF THE CANOPY OR A RADIUS OF TEN TIMES THE TREE TRUNK DIAMETER AND EXTENDING TO A DEPTH OF 750 MM BELOW THE GROUND.

1.3 MEASUREMENT
IF PROVISIONAL QUANTITIES ARE SPECIFIED, OR THERE HAVE BEEN VARIATIONS TO THE CONTRACT DIMENSIONS OF EXCAVATIONS, DO NOT COMMENCE BACKFILLING OR PLACE ANY PERMANENT WORK IN EXCAVATIONS UNTIL THE QUANTITIES OF EXCAVATION AND BACKFILLING HAVE BEEN AGREED AND RECORDED.

MEASUREMENT OF NON-RIPPABLE MATERIAL
IF PAYMENT IS TO BE CLAIMED FOR EXCAVATION IN NON-RIPPABLE MATERIAL, DO NOT REMOVE THE MATERIAL UNTIL THE LEVEL AND (IF APPLICABLE) CLASS OF MATERIAL HAVE BEEN DETERMINED.

2. QUALITY NOTES

2.1 INSPECTION
WITNESS POINTS
GIVE SUFFICIENT NOTICE SO THAT INSPECTION MAY BE MADE.

HOLD POINTS
DO NOT PROCEED WITHOUT APPROVAL, GIVE SUFFICIENT NOTICE SO THAT INSPECTION MAY BE MADE.
IF ROCK OR BAD GROUND IS ENCOUNTERED, GIVE NOTICE IMMEDIATELY AND OBTAIN INSTRUCTIONS.

ITEM	DESCRIPTION	INSPECTION	HOLD POINT	DELIVERABLE
1	EXCAVATION TO REMOVE ALL LOOSE MATERIAL FROM FACE	✓	✓	– INSPECTION & TEST PLAN (ITP) – PHOTO'S WITH GPS DATA – INSPECTION AND CONFIRMATION BY GEOTECHNICAL ENGINEER
2	SETOUT AND TESTING OF DESIGN VALIDATION TESTING ANCHORS AND TESTING	✓	✓	– ACCEPTANCE, TESTING COMPLETED IN ACCORDANCE WITH MRTS03 USING WORKING LOADS SPECIFIED ON DESIGN DRAWINGS
3	SETOUT OF SOIL NAILS AND HORIZONTAL DRAINS	✓	✓	– ITP – PHOTO'S WITH GPS DATA
4	DRILL HOLES TO DESIGN DEPTH AND CLEAN. INSPECTED AND APPROVED BY ENGINEER	✓	✓	– ITP – PHOTO'S WITH GPS DATA
5	SOIL NAIL INSTALLATION INCLUDING SPACERS AND GROUTING	✓		– ITP – PHOTO'S WITH GPS DATA
6	HORIZONTAL DRAIN INSTALLATION AND GROUTING	✓		– ITP – PHOTO'S (DIGITAL) WITH GPS – GROUT TESTING, REFER SECTION 2.4 OF NOTES
7	MACMAT R INSTALLATION	✓	✓	– ITP – PHOTO'S
8	ROCK SCOUR PROTECTION	✓	✓	– ITP – PHOTO'S
9	HYDROMULCH	✓	✓	– ITP – PHOTO'S
10	SUBGRADE INSPECTION	✓	✓	– ITP – PHOTO'S & VIDEO (PROOF ROLL) – SIGN OFF BY CONSTRUCTION ENGINEERS
11	BASE / SUB BASE INSPECTIONS	✓	✓	– ITP – PHOTO'S (DIGITAL) WITH GPS – VIDEO OF PROOF ROLL – SIGN OFF BY CONSTRUCTION ENGINEERS
12	ROAD RECONSTRUCTION	✓	✓	– ITP – PHOTO'S WITH GPS DATA
13	CLEAN UP OF SITE	✓		– PHOTO'S WITH GPS DATA
14	PRACTICAL COMPLETION INSPECTION	✓	✓	– COMPILED / COMPLETED ITP'S – COMPILED / COMPLETED QA DOCUMENTATION – PHOTO'S SHOWING DEPTH

2. QUALITY NOTES CONT'D

2.2 SAMPLES
GENERAL
SUBMIT TO THE TESTING AUTHORITY SAMPLES OF THE FOLLOWING:
- EACH TYPE OF IMPORTED FILL.
- EACH TYPE OF EXCAVATED MATERIAL, WHICH IS TO BE RE-USED AS SELECT FILL OR EMBANKMENT FILL IN THE WORKS.

IDENTIFICATION
ATTACH A TAG TO EACH SAMPLE SHOWING RELEVANT INFORMATION INCLUDING DESCRIPTION, SOURCE AND NOMINAL SIZE OF MATERIAL.

2.3 CONTRACTOR'S SUBMISSIONS
MATERIALS
IMPORTED MATERIALS: NOTIFY THE SUPPLIER, SOURCE AND SUPPLIERS DESCRIPTION OF ALL IMPORTED MATERIALS.
RECYCLED PRODUCTS: NOTIFY THE NATURE, SOURCE, PROPORTIONS AND METHOD OF INCORPORATION OF ANY ADDED FILLERS OR BINDERS.
IMPORTED FILL: SUBMIT CERTIFICATION OR TEST RESULTS, WHICH ESTABLISH THE COMPLIANCE OF IMPORTED FILL.

2.4 MATERIAL QUALITY ASSURANCE TEST PROGRAM (SOIL NAILS)

QUALITY ASSURANCE TEST PROGRAM	FREQUENCY	MINIMUM REQUIREMENTS	STANDARD
SLUMP TEST (SLUMP MEASURED AT DISCHARGE TO PUMP)	1 EA 40m^3	80 ±30mm	AS1012.3 – 1983
CONCRETE TEST UCS	2 EA 40m^3	1 DAY = 10 MPa 3 DAY = 20 MPa 7 DAY = 30 MPa 28 DAY = 32 MPa	AS1012.9 & AS1012.14
GROUT UCS TESTS (m^3)	1 EA 25m^3	4 DAY = 20 MPa	ASTM C109 / C109M–11b & MRST03
SOIL NAIL TESTS (VALIDATION / COMP PROOF TESTING CREEP TESTING	AS PER MRTS03	AS PER MRTS03	MRST03

SOIL NAILS – ULTIMATE PULLOUT CAPACITY – REFER SOIL NAIL SCHEDULE(S)
– WORKING LOAD – REFER SOIL NAIL SCHEDULE(S)

3. SITE MANAGEMENT

3.1 EXISTING SERVICES
MARKING
BEFORE COMMENCING GROUND WORKS, LOCATE AND MARK EXISTING UNDERGROUND SERVICES IN THE AREAS THAT WILL BE AFFECTED BY THE EARTHWORKS OPERATIONS.
3.2 DEWATERING
KEEP EARTHWORKS FREE OF SURFACE WATER. PROVIDE AND MAINTAIN SLOPES, CROWNS AND DRAINS ON EXCAVATIONS AND EMBANKMENTS TO ENSURE SATISFACTORY DRAINAGE. PLACE CONSTRUCTION INCLUDING FILLING, PAVING, STRUCTURES AND SERVICES, ON GROUND FROM WHICH SURFACE WATER HAS BEEN REMOVED. PROTECT FRESHLY LAID WORK FROM WATER DAMAGE.
3.3 SITE RESTORATION
REQUIREMENT
WHERE EXISTING GROUND SURFACES ARE NOT REQUIRED TO BE VARIED AS PART OF THE WORKS, RESTORE THEM TO THE CONDITION EXISTING AT THE COMMENCEMENT OF THE WORK UNDER THE CONTRACT.
3.4 MANAGEMENT PLANS
- TRAFFIC MANAGEMENT PLAN
- ENVIRONMENTAL MANAGEMENT PLAN
- QUALITY MANAGEMENT PLAN

4. CLEARING

4.1 SITE CLEARING
TIMING
DO NOT CLEAR ANY AREA UNTIL COMMENCEMENT OF OTHER WORK IN THE AREA IS IMMINENT.
EXTENT
GENERAL: CLEAR ONLY THE SITE AREAS TO BE OCCUPIED OR AFFECTED BY THE WORKS AND ANY OTHER AREAS THAT THE CONTRACT SPECIFICALLY REQUIRES TO BE CLEARED.
CONTRACTOR'S SITE AREAS: IF NOT INCLUDED WITHIN THE AREAS SPECIFIED ABOVE, CLEAR GENERALLY ONLY TO THE EXTENT NECESSARY FOR THE PERFORMANCE OF THE WORKS.
CLEARING OPERATIONS
OLD WORKS:
REMOVE OLD SLABS, FOUNDATIONS, RETAINING WALLS, PAVING, ABANDONED SERVICES AND THE LIKE TO A DEPTH OF 300 MM BELOW EXISTING OR FINISHED SURFACE OR 500 MM BELOW SUBGRADE LEVEL (WHICHEVER IS LOWER).
REFILLING: UNLESS OTHERWISE SPECIFIED, REFILL GRUB HOLES AND THE LIKE WITH MATERIAL SIMILAR TO THE SURROUNDING SOIL.
SPOIL TO BE REMOVED FROM SITE TO A LOCATION NOMINATED BY THE SUPERINTENDENT. (ALLOW 50km RETURN TRIP)

5. TOLERANCES

SURFACE LEVEL
GENERAL: PROVIDE FINISHED SUBGRADE THAT IS EVENLY GRADED BETWEEN LEVEL POINTS, FREE DRAINING AND CONFORM TO THE REQUIRED TOLERANCES.
SMOOTHNESS: AS NORMALLY PRODUCED BY A GRADER BLADE (EXCEPT FOR BATTERS WITHOUT TOPSOIL).
TOLERANCES: THE LIMITS IN THE TABLE 5.1 APPLY TO THE FINISHED SURFACE UNLESS OVERRIDDEN BY THE REQUIREMENTS FOR THE FINISHED LEVEL AND THICKNESS OF THE SURFACING.

TABLE 5.1 – TOLERANCES

ITEM	LEVEL TOLERANCES ABSOLUTE	RELATIVE TO A 3.0m STRAIGHTEDGE *
CUT SUBGRADE LEVEL IN EARTH AND FILL SUBGRADE LEVEL	+0 mm –50mm	15mm
CUT SUBGRADE IN ROCK	+0 mm –75mm	UNSPECIFIED

* LIMITS TO INCORPORATE DUE ALLOWANCE FOR DESIGN SHAPE WHERE RELEVANT

OTHER GROUND SURFACES
ABSOLUTE LEVEL TOLERANCE: ± 50 MM, PROVIDED THE AREA MATCHES ADJACENT CONSTRUCTION.
HORIZONTAL SURFACES
ABSOLUTE TOLERANCE: ± 50 MM, EXCEPT WHERE ALIGNMENT WITH AN EXISTING ROAD STRUCTURE IS NECESSARY. JOIN NEW CONSTRUCTION TO THE EXISTING WORK IN A SMOOTH MANNER.
BATTERS
SLOPE: AVERAGE SLOPE NOT STEEPER THAN SHOWN ON THE DRAWINGS NOR MORE THAN 10% FLATTER, PROVIDED THAT FLATTER SLOPES DO NOT ENCROACH ON ABUTTING PROPERTY.
ABSOLUTE LEVEL TOLERANCE: FOR CUT BATTERS IN EARTH, ± 150 MM AND FOR CUT BATTERS IN ROCK AND FOR FILL BATTERS, ± 300 MM; BOTH MEASURED FROM THE AVERAGE SLOPE PLANE.
TOPSOIL TO BATTERS: ABSOLUTE LEVEL TOLERANCE ± 50 MM, PROVIDED THE AREA MATCHES ADJACENT CONSTRUCTION.

6. COMPACTION

6.1 METHOD OF COMPACTION AND TESTING
REQUIREMENT: SELECT THE METHODS OF COMPACTION AND COMPLIANCE TESTING TO SUIT THE MATERIAL CATEGORY LISTED IN TABLE 6.1.

TABLE 6.1 – COMPACTION METHOD

MATERIAL CATEGORY	COMPACT METHOD	DENSITY COMPLIANCE TESTS
1. COHESIONLESS SAND	COMPACTED LAYER METHOD	RELATIVE DRY DENSITY OR DENSITY INDEX (IF RDD GIVES MEANINGLESS ANSWERS)
2. SOILS OTHER THAN 1 ABOVE WHICH, AFTER COMPACTION, HAVE LESS THAN 20% OF STONE RETAINED ON THE 37.5mm SIEVE	COMPACTED LAYER METHOD	RELATIVE DRY DENSITY
3. COARSE GRANULAR SOILS WITH MORE THAN 70% OF STONE RETAINED ON THE 37.5mm SIEVE	MECHANICAL INTERLOCK METHOD	NIL ON MATERIAL IN GENERAL
4. SOILS OTHER THAN 3 ABOVE WHICH, AFTER COMPACTION, HAVE 20% – 70% OF STONE RETAINED ON THE 37.5mm SIEVE	COMPACTED LAYER METHOD OR MECHANICAL INTERLOCK METHOD	RELATIVE DRY DENSITY RDD WHERE APPROPRIATE ON THE FINER GRAINED MATERIALS WHICH COMPLETELY FILL THE VOIDS BETWEEN ROCKS

6.2 COMPACTED LAYER METHOD OF CONSTRUCTION
STONE SIZE: LIMIT STONE SIZE IN FILL MATERIAL TO LESS THAN TWO-THIRDS OF THE UNCOMPACTED LAYER DEPTH.
EXECUTION: PLACE AND COMPACT FILL MATERIAL UNIFORMLY IN LAYERS.
COMPACTION LAYER THICKNESS: COMPLY WITH TABLE 6.2 FOR THE ALLOWABLE LOOSE LAYER THICKNESS FOR THE LOCATION AND PROPERTIES OF THE MATERIAL BEING COMPACTED. WHERE THE UNCOMPACTED THICKNESS OF A LAYER WOULD OTHERWISE BE LESS THAN THE SPECIFIED MINIMUM THICKNESS, A LESSER THICKNESS OF NEWLY PLACED MATERIAL MAY BE EMPLOYED BY LOOSENING THE UNDERLYING MATERIAL TO GIVE A TOTAL DEPTH EQUAL TO THE MINIMUM THICKNESS.

TABLE 6.2 – LAYER THICKNESS FOR COMPACTION

MATERIAL/LOCATION	LOOSE LAYER THICKNESS MINIMUM	MAXIMUM
GENERAL FILL IN ROAD EMBANKMENT	150	300
CLAY FILL IN WATER RETAINING STRUCTURES	150	200
SUBGRADE	100	200
BACKFILL OTHER THAN SAND	–	100
SAND BACKFILL	150	300

6.3 MECHANICAL INTERLOCK METHOD OF CONSTRUCTION
EXECUTION: PLACE AND COMPACT COARSE GRANULAR FILL MATERIAL UNIFORMLY IN LAYERS. ROLL EACH LAYER UNTIL NO PERMANENT VISIBLE LOWERING OF THE SURFACE OCCURS.

MINIMUM THICKNESS OF UNCOMPACTED LAYERS: GREATER OF 150 MM OR 1.5 TIMES THE MAXIMUM ROCK SIZE IN THE LAYER.
MAXIMUM THICKNESS OF UNCOMPACTED LAYERS: COMPLY WITH TABLE 6.3 FOR THE SPECIFIED MODULE WEIGHTS, WHICH APPLY TO BOTH DRAWN AND SELF-PROPELLED SINGLE DRUM ROLLERS. INTERPOLATE LAYER THICKNESS FOR MODULE WEIGHTS BETWEEN THE LISTED VALUES.

TABLE 6.3 – MAXIMUM THICKNESS OF UNCOMPACTED LAYERS

LOCATION	MINIMUM RELATIVE COMPACTION (STANDARD) (COHESIVE SOILS GENERALLY) (SEE NOTES 1, 2, 3, 4)	MINIMUM DENSITY INDEX (COHESIONLESS SOILS) (SEE NOTES 1, 5)
SINGLE 1 OR 2 STOREY RESIDENTIAL DWELLING SITES		
a) ALLOTMENT FILL	95%	65%
b) BUILDING PAD (SEE NOTE 6)	100%	80%
COMMERCIAL, INDUSTRIAL AND MULTI UNIT RESIDENTIAL DEVELOPMENTS		
a) ALLOTMENT FILL	98%	70%
b) BUILDING PAD (SEE NOTE 6)	100%	80%
ROAD AND STRUCTURAL (OTHER THAN BUILDING) FORMATIONS INCLUDING EMBANKMENTS, FOOTPATHS, PAVED AREAS AND SHOULDERS (SEE NOTE 7)		
a) >0.3m BELOW SUBGRADE LEVEL	95%	65%
b) ≤0.3m BELOW SUBGRADE LEVEL	100%	80%
ALL OTHER AREAS EG. PARKS		
a) >0.3m BELOW DESIGN LEVEL	90%	62%
b) ≤0.3mBELOW DESIGN LEVEL	95%	65%

LOCATION	MINIMUM RELATIVE COMPACTION (STANDARD) (COHESIVE SOILS GENERALLY) (SEE NOTES 1, 2, 3, 4)	MINIMUM DENSITY INDEX (COHESIONLESS SOILS) (SEE NOTES 1, 5)
REPLACEMENT OF UNSUITABLE OR OVER-EXCAVATED SUBGRADE MATERIAL	100%	80%
BACKFILLING OF GRUB HOLES	100%	80%

NOTES:
1. FIELD DRY DENSITY TO AS 1289.5.31, AS 1289.5.3.5 OR AS 1289.5.8.1. IF USING AS 1289.5.8.1, CALIBRATE THE SURFACE MOISTURE-DENSITY GAUGE IN ACCORDANCE WITH AS 1289.5.8.4 BEFORE USE ON SITE.
2. STANDARD MAXIMUM DRY DENSITY TO AS 1289.5.1.1
3. RELATIVE COMPACTION (% OF MAXIMUM DRY DENSITY) TO AS 1289.5.4.1
4. FOR PLASTIC SOILS, COMPACT SOILS DESIGNATED UNDER THE UNIFIED CLASSIFICATIONS SYSTEM AS OH CH MH TO NOT LESS THAT 92% NOR GREATER THAN 96% OF STANDARD MAXIMUM DRY DENSITY AT MOISTURE CONTENTS OF BETWEEN 90% AND 120% OF OPTIMUM MOISTURE CONTENT.
5. DENSITY INDEX TO AS 1289.5.6.1 MAXIMUM AND MINIMUM DRY DENSITIES TO AS 1289.5.5.1
6. AVERAGE IMPOSED BEARING PRESSURE OF FLOOR SLAB NOT TO EXCEED 20 kPa. IMPOSED BEARING PRESSURES OF STRIP AND PAD FOOTINGS NOT TO EXCEED 100 kPa.
7. IN THE CONTEXT OF THIS SPECIFICATION, ROAD FORMATION IS DEEMED TO INCLUDE ALL THE AREA WITHIN THE DESIGNATED ROAD RESERVE. STRUCTURAL FORMATION IS DEEMED TO INCLUDE THE AREA UNDER THE PAVING PLUS A NOMINAL 1.0m FROM THE EDGE OF THE PAVED AREA.

TENDER ISSUE ONLY

Revisions

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Client Logo: Banana SHIRE – SHIRE OF OPPORTUNITY

Client: BANANA SHIRE COUNCIL
Project: DON RIVER STREAMBANK STABILISATION WORKS
Title: GENERAL NOTES SHEET 1 OF 2

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ARO
51 Sheridan Street
Cairns Qld 4870
T (07) 4281 6897
E admin@aroindustries.com.au
W www.aroindustries.com.au
ABN: 49 641 461 298

Drawing No. ARO0388-C04
Revision 3

DO NOT SCALE

7. EXCAVATION

7.1 GENERAL
EXTENT
SITE SURFACE: EXCAVATE OVER THE SITE TO GIVE CORRECT LEVELS AND PROFILES AS THE BASIS FOR CONSTRUCTION, PAVING, FILLING, LANDSCAPING AND THE LIKE. MAKE ALLOWANCE FOR COMPACTION OR SETTLEMENT.
FOOTINGS: EXCAVATE FOR FOOTINGS, PITS, WELLS, SHAFTS AND THE LIKE, TO THE REQUIRED SIZES AND DEPTHS, CONFIRM THAT THE BEARING CAPACITY IS AS SPECIFIED.
PREPARATION
PRIOR TO EXCAVATING, CUT ANY PAVEMENT WEARING SURFACE, CONCRETE FOOTPATH, KERB AND CHANNEL OR THE LIKE BY SAW OR OTHER APPROVED MEANS TO GIVE A CLEAN BREAK LINE ALONG THE EDGE OF EXCAVATION.
EXISTING FOOTINGS, SLABS AND PAVEMENTS
IF EXCAVATION IS REQUIRED BELOW THE LINE OF INFLUENCE OF AN EXISTING FOOTING, SLAB OR PAVEMENT, USE METHODS THAT MAINTAIN THE SUPPORT OF THE FOOTING, SLAB OR PAVEMENT AND ENSURE THAT THE STRUCTURE AND FINISHES SUPPORTED BY THE FOOTING ARE NOT DAMAGED.
7.2 SURFACE DRAINAGE
CATCH DRAINS
CONSTRUCT CATCH DRAINS AT THE TOP OF CUTTINGS. GRADE AND TRIM THE CATCH DRAINS TO ENSURE THE FREE FLOW OF WATER AND CONNECT TO THE DRAINAGE SYSTEM. INSTALL EROSION PROTECTION MEASURES WHERE NECESSARY.
TABLE DRAINS
PROFILE: NEATLY TRIM EARTH TABLE DRAINS TO THE REQUIRED PROFILE, GRADE AND ALIGNMENT. INSTALL EROSION PROTECTION MEASURES WHERE NECESSARY.
GRADING: CONSTRUCT TABLE DRAINS WITH A MINIMUM GRADE OF 0.5% AND WITH A MAXIMUM LENGTH OF 50 M BEFORE DIVERSION TO DRAINAGE SYSTEM.
7.3 PROVISIONAL DEPTHS
CONTRACT DEPTHS
THE FOOTING OR PIER DEPTHS SHOWN ON THE DRAWINGS ARE ONLY A BASIS FOR MEASUREMENT OF QUANTITIES. ACTUAL EXCAVATION LEVELS WILL BE DETERMINED ON THE BASIS OF MATERIAL ENCOUNTERED.
7.4 EXPLOSIVES
DO NOT USE EXPLOSIVES.
7.5 BEARING SURFACES
GENERAL
PROVIDE HORIZONTAL BEARING SURFACES FOR LOAD BEARING ELEMENTS INCLUDING FOOTINGS. STEP TO ACCOMMODATE LEVEL CHANGES. MAKE THE STEPS TO THE APPROPRIATE COURSES IF SUPPORTING MASONRY.
DETERIORATION
IF THE BEARING SURFACE DETERIORATES AFTER APPROVAL, EXCAVATE FURTHER TO A SOUND SURFACE BEFORE PLACING THE LOAD BEARING ELEMENT.
7.6 REINSTATEMENT OF EXCAVATION
GENERAL
WHERE EXCAVATION EXCEEDS THE REQUIRED EXTENT, WHETHER AS A RESULT OF BAD GROUND (AND WHERE FOOTING LEVELS OR THE LIKE ARE NOT VARIED) OR AS A RESULT OF EXCESS EXCAVATION, REINSTATE TO THE CORRECT DEPTH AND REQUIRED BEARING VALUE.
PARTICULAR
WITHIN THE 'LINE OF INFLUENCE' OF FOOTINGS, BEAMS OR OTHER STRUCTURAL ELEMENTS: REFILL OVER-EXCAVATION WITH CONCRETE OF STRENGTH APPROPRIATE TO THE LOADING, MINIMUM 15 MPA. BELOW SLABS OR PAVEMENTS: REFER TO CLAUSE 9.0.
7.7 ADJACENT STRUCTURES
TEMPORARY SUPPORTS
GENERAL: PROVIDE SUPPORTS TO ADJACENT STRUCTURES WHERE NECESSARY, SUFFICIENT TO PREVENT DAMAGE ARISING FROM THE WORKS.
LATERAL SUPPORTS: PROVIDE LATERAL SUPPORT USING SHORING.
VERTICAL SUPPORTS: PROVIDE VERTICAL SUPPORT WHERE NECESSARY USING PILING OR UNDERPINNING OR BOTH.
PERMANENT SUPPORTS
IF PERMANENT SUPPORTS FOR ADJACENT STRUCTURES ARE NECESSARY AND ARE NOT DESCRIBED, GIVE NOTICE AND OBTAIN INSTRUCTIONS.
ENCROACHMENTS
IF ENCROACHMENTS FROM ADJACENT STRUCTURES ARE ENCOUNTERED AND ARE NOT SHOWN ON THE DRAWINGS, GIVE NOTICE AND OBTAIN INSTRUCTIONS.
ROCK BOLTING
PROVIDE PROPRIETARY HIGH STRENGTH STEEL BARS OR TUBES ANCHORED INTO HOLES DRILLED IN THE ROCK AND TENSIONED AGAINST PLATES BEARING ON THE ROCK FACE TO PROVIDE TEMPORARY OR PERMANENT SUPPORT FOR THE ROCK FACE. REFER CLAUSE 18.0.
7.8 NON-RIPPABLE MATERIAL
GENERAL
WHERE THE METHODS OF MEASUREMENT REQUIRE DIFFERENTIATION OF NON-RIPPABLE MATERIAL, THE FOLLOWING CRITERIA APPLY. MACHINE CLASSIFICATION TO AS 2868.
CONFINED EXCAVATION
DEFINITION: EXCAVATION OF TRENCHES AND TO BROADER AREAS LESS THAN 1000 M2 IN EXTENT.
CLASSIFICATION: CLASSIFY MATERIAL AS NON-RIPPABLE IF ANY OF THE NOMINATED CLASSES OF CRAWLER EXCAVATOR FITTED WITH A HEAVY DUTY BUCKET, CANNOT RIP AT A PRODUCTION RATE (IN SITU VOLUME) EXCEEDING THE NOMINATED VALUES. FIT BUCKET TEETH WITH HIGH PENETRATION BOOTS, APPROVED BY THE MACHINE MANUFACTURER FOR USE ON THE PARTICULAR MACHINE IN ROCK.
CLASS 55 CRAWLER EXCAVATOR FITTED WITH A MAXIMUM 450 MM WIDE BUCKET: MAXIMUM PRODUCTION RATE 1.5 M3 PER HOUR.
CLASS 85 CRAWLER EXCAVATOR FITTED WITH A MAXIMUM 600 MM WIDE BUCKET: MAXIMUM PRODUCTION RATE 3 M3 PER HOUR.
CLASS 115 CRAWLER EXCAVATOR FITTED WITH A MAXIMUM 750 MM WIDE BUCKET: MAXIMUM PRODUCTION RATE 4.5 M3 PER HOUR.
CLASS 155 CRAWLER EXCAVATOR FITTED WITH A MAXIMUM 900 MM WIDE BUCKET: MAXIMUM PRODUCTION RATE 7 M3 PER HOUR.
CLASS 200 CRAWLER EXCAVATOR FITTED WITH A MAXIMUM 1050 MM WIDE BUCKET: MAXIMUM PRODUCTION RATE 10 M3 PER HOUR.
OTHER EXCAVATION
CLASSIFICATION: CLASSIFY MATERIAL AS NON-RIPPABLE IF THE NOMINATED CLASSES OF CRAWLER TRACTOR, EQUIPPED WITH A HEAVY DUTY, SINGLE TINE PARALLELOGRAM RIPPER (APPROVED BY THE MACHINE MANUFACTURER FOR USE ON THE PARTICULAR MACHINE IN ROCK), CANNOT RIP AT A PRODUCTION RATE (IN SITU VOLUME) EXCEEDING THE NOMINATED VALUES.
CLASS 150C CRAWLER TRACTOR: MAXIMUM PRODUCTION RATE OF 50 M3 PER HOUR.
CLASS 200C CRAWLER TRACTOR: MAXIMUM PRODUCTION RATE OF 75 M3 PER HOUR.
CLASS 300C CRAWLER TRACTOR: MAXIMUM PRODUCTION RATE OF 90 M3 PER HOUR.
CLASS 400C CRAWLER TRACTOR: MAXIMUM PRODUCTION RATE OF 105 M3 PER HOUR.
CLASS 500C CRAWLER TRACTOR: MAXIMUM PRODUCTION RATE OF 120 M3 PER HOUR.
CLASS 600C CRAWLER TRACTOR: MAXIMUM PRODUCTION RATE OF 135 M3 PER HOUR.

8. FILLING

8.1 FILL MATERIAL
GENERAL
MATERIAL TYPE: INORGANIC, NON-PERISHABLE MATERIAL.
SULPHUR CONTENT: DO NOT USE FILLING WITH SULPHUR CONTENT EXCEEDING 0.5% WITHIN 0.5 M OF CEMENT BOUND ELEMENTS (FOR EXAMPLE CONCRETE STRUCTURES OR MASONRY), UNLESS SUCH ELEMENTS ARE PROTECTED BY IMPERMEABLE MEMBRANES OR BY OTHER SUITABLE MEANS.
SOURCES
WHERE DIRECTED, RE-USE MATERIAL RECOVERED FROM EXCAVATIONS ON THE SITE. DRY OUT RECOVERED MATERIAL AS NECESSARY PRIOR TO USE.
FILL TYPES
GENERAL FILL: WELL GRADED MATERIAL, MAXIMUM PARTICLE SIZE 75 MM, PLASTICITY INDEX ≤ 55%.
SELECT FILL: GRANULAR MATERIAL COMPLYING WITH THE FOLLOWING PROPERTIES.
- PARTICLE SIZE: 75 MM MAXIMUM.
- PROPORTION PASSING 0.075 MM SIEVE: 25% MAXIMUM.
- PLASTICITY INDEX: ≥ 2%, ≤ 15%.
- SOAKED CBR: NOT LESS THAN 15.

ROAD EMBANKMENT FILL: WELL GRADED MATERIAL WITH MAXIMUM PLASTICITY INDEX 35% AND MAXIMUM PARTICLE SIZE DETERMINED BY LOCATION AND LAYER THICKNESS, BUT NOT EXCEEDING TWO-THIRDS OF THE UNCOMPACTED LAYER THICKNESS.
FILL SUBGRADE: USE CLASS 3 MATERIAL OR SELECT FILL.
CLASS 3 MATERIALS ARE DEFINED AS:
- TMR TYPE 2.1, 2.2, 2.3 OR 2.4
- TMR TYPE 3.1, 3.2 OR 3.3 PROVIDED THE SOAKED CBR IS > 15%
- SAND: A FINE GRAINED MATERIAL WITH MORE THAN 90% PASSING THE 0.425mm SIEVE PROVIDED THE MATERIAL IS OF UNIFORM QUALITY AND MEETS ATTERBERG LIMITS OF TMR (2.1, 2.2, 2.3) SOIL AGGREGATE AND HAS A MINIMUM SOAKED CBR OF 15 %

8.2 PREPARATION FOR FILLING
GENERAL
REMOVE LOOSE MATERIAL, DEBRIS AND ORGANIC MATTER.
BENCHING
IF FILLING IS TO BE PLACED AGAINST A GROUND SURFACE THAT SLOPES MORE THAN 1V:4H, BENCH INTO THE NATURAL SURFACE FOR AT LEAST 1 M AT EVERY 1 M CHANGE OF LEVEL TO FORM A KEY FOR THE FILLING.
UNDER GROUND SLABS, PAVEMENTS AND OTHER LOAD BEARING ELEMENTS
UNDER FILLING THAT WILL SUPPORT SLABS, PAVEMENTS AND OTHER LOAD-BEARING ELEMENTS, COMPACT THE STRIPPED SURFACE AS FOR FILLING. IF NECESSARY LOOSEN THE MATERIAL TO A DEPTH OF 200 MM AND ADJUST THE MOISTURE CONTENT.
UNDER EARTH MOUNDS
CULTIVATE THE GROUND BY RIPPING TO A DEPTH OF 200 MM BEFORE MOUND FORMATION.
ROCK
REMOVE ANY OVERHANGING ROCK LEDGES. REMOVE ANY LOOSE OR UNSTABLE BLOCKS OF ROCK.
8.3 PLACING FILL
GENERAL
LAYERS: PLACE AND COMPACT FILL IN ACCORDANCE WITH THE COMPACTED LAYER METHOD OF CONSTRUCTION SPECIFIED IN CLAUSE 6.2 TO ACHIEVE THE DENSITY SPECIFIED IN CLAUSE 6.4.
PLACING AT STRUCTURES
GENERAL: PLACE AND COMPACT FILLING IN LAYERS SIMULTANEOUSLY ON BOTH SIDES OF STRUCTURES, CULVERTS AND PIPELINES TO AVOID DIFFERENTIAL LOADING. COMMENCE COMPACTION OF EACH LAYER AT THE STRUCTURE AND PROCEED AWAY FROM IT.
PLACING AGAINST CONCRETE: DO NOT PLACE FILL AGAINST CONCRETE UNTIL THE CONCRETE STRENGTH IS MORE THAN 80% OF THE SPECIFIED STRENGTH.
SUPPORTS: REMOVE ANY TEMPORARY SUPPORTS TO EXCAVATIONS PROGRESSIVELY AS BACKFILLING PROCEEDS.

9. SUBGRADE PREPARATION

9.1 GENERAL
TRIM THE SUBGRADE TO AN EVEN SURFACE FREE FROM LOOSE MATERIAL.
9.2 COMPACTION
COMPACT, OR RECOMPACT, SUBGRADE MATERIAL TO OBTAIN THE DENSITY SPECIFIED IN CLAUSE 6.4.
SUBGRADE AFFECTED BY MOISTURE
WHERE THE SUBGRADE IS UNABLE TO SUPPORT CONSTRUCTION EQUIPMENT, OR IT IS NOT POSSIBLE TO COMPACT THE OVERLYING PAVEMENT BECAUSE OF HIGH SUBGRADE MOISTURE CONTENT, PERFORM ONE OR MORE OF THE FOLLOWING:
- ALLOW THE SUBGRADE TO DRY UNTIL IT WILL SUPPORT EQUIPMENT AND ALLOW COMPACTION.
- SCARIFY THE SUBGRADE TO A DEPTH OF 150 MM, WORK AS NECESSARY TO ACCELERATE DRYING, AND RECOMPACT WHEN THE MOISTURE CONTENT APPROXIMATES THE OPTIMUM.
- EXCAVATE THE WET MATERIAL AND REPLACE WITH CLASS 3 MATERIAL OR SELECT FILL.
- TREAT THE MATERIAL WITH LIME MIXED IN BY APPROVED SPECIALISED PLANT.

9.3 SIDE DRAIN, MITRE DRAIN AND BLANKET COURSE
GENERAL: CONSTRUCT PAVEMENT DRAINAGE SYSTEM TO COMPLY WITH STANDARD DRAWING BSD-2041. FOR ROADS, CONSTRUCT SIDE DRAINS ON BOTH SIDES UNLESS DIRECTED OTHERWISE.
MATERIAL: CONFORM TO THE FILTER MATERIAL REQUIREMENTS OF S300 QUARRY PRODUCTS CLAUSE 4.4.
CONSTRUCTION: DO NOT ALLOW CONSTRUCTION EQUIPMENT TO TRAVEL OR STAND DIRECTLY ON CONSTRUCTED SUBSOIL DRAINS.
9.4 SPRINGS OR SEEPS
IF SPRINGS OR SEEPS ARE FOUND, PROVIDE DRAINAGE AS DIRECTED.
DRAINING DEPRESSIONS
IF SUBGRADE IS REPLACED, GRADE DEPRESSIONS IN THE NATIVE MATERIAL TO DRAIN TO THE SUBSOIL DRAINAGE SYSTEM OR CONNECT BY MITRE DRAINS.
IN ROCK SUBGRADES, DRAIN DEPRESSIONS WITH SUBGRADE DRAINS AT LEAST 150 MM WIDE, BACKFILLED WITH COARSE FILTER, AND CONNECTED TO THE SUBSOIL DRAINAGE SYSTEM.
9.5 UNSUITABLE MATERIAL
REMOVE ROOTS, BOULDERS, SILT, ORGANIC MATTER AND OTHER UNSUITABLE MATERIALS.
REMOVE OR LIME TREAT SUBGRADE WITH A SOAKED CBR LESS THAN 3 TO AN APPROVED DEPTH WHICH SHALL NOT BE LESS THAN 150 MM. IF REMOVED, REPLACE WITH CLASS 3 MATERIAL OR SELECT FILL.
9.6 BACKFILLING
REINSTATE OVER-EXCAVATION, INCLUDING EXCAVATION FOR GRUB HOLES TO THE CORRECT LEVEL WITH CLASS 3 MATERIAL OR SELECT FILL AND COMPACT TO COMPLY WITH CLAUSE 6.4.
9.7 RECTIFICATION
IF A SECTION OF SUBGRADE MATERIAL FAILS TO MEET THE REQUIRED DENSITY AFTER COMPACTION, REWORK OR RECTIFY AS FOLLOWS:
- FILL SUBGRADES: REMOVE THE NON-COMPLYING MATERIAL, REPLACE WITH CLASS 3 MATERIAL OR SELECT FILL AND RECOMPACT.
- CUT SUBGRADES: REWORK THE MATERIAL, OR REPLACE WITH CLASS 3 MATERIAL OR SELECT FILL AND RECOMPACT.

9.8 PROOF ROLLING
TIMING: FOLLOWING COMPLETION OF SUBGRADE COMPACTION AND TRIMMING, INSPECT THE WHOLE OF THE SUBGRADE AREA BY PROOF ROLLING WITH A FULLY LOADED SINGLE REAR AXLE TRUCK (OR ACCEPTABLE EQUIVALENT).
ACCEPTANCE OF SUBGRADE: NO VISIBLE SIGNS OF DEFORMATION OR INSTABILITY IN THE SUBGRADE DURING PROOF ROLLING

10. SOIL NAILS

1. DYWIDAG, HIGH STRENGTH, GENI PLUS THREADBAR (28mm) INTO 115mm (MIN) DIA HOLES OR GREATER USING CEMENT/ WATER GROUT. REFER SOIL NAIL SCHEDULE RELEVANT TO EACH SITE FOR DETAILS.
2. THE NAILS SHOULD BE KEPT CENTRAL IN THE BOREHOLE PRIOR TO GROUTING BY USING CENTRALISERS AT NOT MORE THAN 3m SPACING ALONG THE NAIL. THE LAST CENTRALISER SHALL BE LOCATED NO FURTHER THAN 500mm FROM THE FACE.
3. INSTALLED AT AN ANGLE OF 15 DEGREES BELOW HORIZONTAL.
4. SPACING:
   - 1.5m CENTRES HORIZONTALLY & 3.0m VERTICALLY, WITH THE TOP ROW NO MORE THAN 1.0m BELOW THE CREST OF THE CUT FACE. THE BOTTOM SHALL BE AT NOT MORE THAN 1.0m ABOVE THE BASE. MINIMUM SPACING TO THE EDGE OF CONCRETE IS TO BE 0.5m.
5. THE TOLERANCES ON DRILLED HOLE DIAMETERS ARE NOT IN EXCESS OF 10mm WITH MINIMUM THICKNESS OF GROUT COVER BEING 30mm AT ALL LOCATIONS.
6. THE DEPTH OF THE DRILLED HOLE SHALL NOT BE IN EXCESS OF 150mm OF THE DESIGNED DEPTH.
7. MAXIMUM OFFSET TO THE MARKED LOCATION NOT EXCEED 100mm VERTICALLY AND 300mm HORIZONTALLY.
8. SOIL NAILS ARE TO BE TERMINATED AT THE FACE USING PROPRIETARY END FIXINGS AS SHOWN IN PROJECT DRAWINGS.
9. SOIL NAILS SHALL BE DOUBLE CORROSION PROTECTED.

GROUTING
- GROUTING TO BE UNDERTAKEN IN A BOTTOM UP MANNER, BY PUMPING GROUT INTO THE BOTTOM OF THE BOREHOLE THROUGH A GROUT TUBE, WHICH IS WITHDRAWN AS THE HOLE IS GROUTED.
- GROUT DENSITY TO BE NO LESS THAN 1900kg/m^3
- WATER USED IN GROUTING SHALL BE CLEAN AND FREE FROM OIL, ACIDS, ALKALI, ORGANIC OR VEGETABLE MATTER AND FROM ANY INGREDIENTS HARMFUL TO STEEL OR CEMENT GROUT.
- CEMENT GROUT SHALL BE PASSED THROUGH A 2.36mm SIEVE APERTURE.
- THE GROUT SHALL BE USED AS SOON AS POSSIBLE AFTER MIXING.
- SOIL NAIL INSTALLATION AND GROUTING SHALL BE CARRIED OUT WITHIN 24 HOURS AFTER THE HOLES ARE DRILLED (OR AS SOON AS PRACTICALLY POSSIBLE).

11. SOIL NAIL ACCEPTANCE TESTING OF SOIL NAILS (MRTS03)

1. TESTING OF THE SOIL NAILS SHALL BE CARRIED OUT AND TEST RESULT INCLUDED IN THE QUALITY RECORDS. ACCEPTANCE OF TEST RESULTS FOR SOIL NAILS SHALL BE SUBJECT TO THE APPROVAL OF THE DESIGNER.
2. THE NUMBER OF NAILS TO BE TESTED IS AS STATED IN THE TABLE BELOW.

No. OF SOIL NAILS	MINIMUM NUMBER OF PULL-OUT TESTS
<50	3
51 – 100	6
> 100	6%

3. THE TEST PROCEDURE SHALL BE –
   - THE GROUT SHALL HAVE A MINIMUM STRENGTH OF 40 MPa AND BE AT LEAST 4 DAYS OF AGE;
   - THE TEST LOAD SHALL BE 1.5 TIMES THE WORKING LOAD WHICH SHALL BE AS SPECIFIED IN THE DRAWINGS;
   - THE TEST LOAD SHALL BE MEASURED WITH AN ACCURACY OF ± 1 KN;
   - THE TEST FRAME USED TO MOUNT THE TESTING JACK SHALL HAVE SUPPORTS SUCH THAT IT DOES NOT LOAD THE RETAINED FACE AT ANY LOCALISED POINT;
   - DIAL GAUGES USED TO RECORD DEFLECTION OF THE SOIL NAIL SHALL BE ACCURATE TO AT LEAST 0.01mm;
   - THE SOIL NAIL SHALL BE LOADED TO 20% OF THE TEST LOAD, WHICH POINT SHALL BE RECORDED AS THE DATUM FOR DEFLECTION MEASUREMENTS;
   - THE REMAINING TEST LOAD SHALL BE APPLIED IN THREE EQUAL INCREMENTS AND DEFLECTION MEASUREMENTS SHALL BE RECORDED AT EACH STAGE. THE FULL TEST LOAD SHALL BE MAINTAINED FOR 1 HOUR;
   - 3 COMPLETE CYCLES OF THE TEST LOAD SHALL BE APPLIED SEQUENTIALLY; AND
   - THE TEST SHALL BE CONSIDERED SUCCESSFUL IF THE DEFLECTION OF THE SOIL NAIL AFTER THREE CYCLES DOES NOT EXCEED 0.1% OF ITS LENGTH.

12. HORIZONTAL DRAINS

HORIZONTAL DRAINS
- PIPES TO BE uPVC WITH STRENGTH GRADE OF CLASS 18.
- HOLES TO BE 100mm IN DIAMETER AT AN INCLINATION OF 5 DEGREES UPWARD FROM THE HORIZONTAL TO ENSURE FREE DRAINING.
- PIPE TO BE WRAPPED IN GEOFABRIC, GREENFLO OR APPROVED EQUIVALENT.
- PIPES TO BE SLOTTED, REFER DETAIL ON DRAWINGS.
- THE LOCATION OF THE HORIZONTAL DRAINS SHALL BE CONFIRMED ONSITE BY THE ADMINISTRATOR OR PRINCIPAL'S GEOTECHNICAL ENGINEER. THIS CONSTITUTES A HOLD POINT.
- MUST MEET THE REQUIREMENTS OF TFNSW QA SPECIFICATION R40.

13. EROSION AND SEDIMENT CONTROL

1. ALL EXPOSED / DISTURBED AREAS SHALL BE HYDROMULCHED WITH ENVIROLOC HYDROMULCHING BFM OR APPROVED ALTERNATIVE.

14. ROCK FILLING

APPLICATION
ROCK FILLING TO PROVIDE LOW SETTLEMENT AT STRUCTURES AND OTHER AREAS AS SPECIFIED.

ROCK
USE CLEAN, HARD, DURABLE, WELL GRADED ROCK SPALLS WITH A NOMINAL SIZE OF 200 MM. WET/DRY STRENGTH VARIATION TESTED IN ACCORDANCE WITH QUEENSLAND DEPARTMENT OF TRANSPORT AND MAIN ROADS TEST METHOD Q205C OR AS 1141.22 MUST NOT EXCEED 35%. TEN PERCENT FINES VALUE TESTED IN ACCORDANCE WITH QUEENSLAND DEPARTMENT OF TRANSPORT AND MAIN ROADS TEST METHOD Q205B OR AS 1141.22 MUST NOT BE LESS THAN 140 KN. ROCKS OF LENGTH GREATER THAN 100mm MUST HAVE BREADTH AND THICKNESS NOT LESS THAN ONE-THIRD OF THE LENGTH.

PLACING
LAYERING: PLACE ROCK IN LAYERS NO DEEPER THAN 750mm. CONSTRUCT LAYERS HORIZONTALLY. AT STRUCTURES, AVOID DIFFERENCES IN SURFACE LEVELS THAT WOULD CAUSE HORIZONTAL LOADING ON THE STRUCTURE.

COMPACTION
GENERAL: DURING THE PLACING OF THE ROCK, CONTINUOUSLY SLUICE WITH WATER PUMPED FROM A 50 MM PUMP THROUGH A 50 MM HOSE AND NOZZLE AND COMPACT WITH A VIBRATING ROLLER OF STATIC WEIGHT 5 TONNES TO ENSURE ROCK TO ROCK CONTACT THROUGHOUT.
CONFINED SPACES: WHERE THE USE OF A 5 TONNE ROLLER IS IMPRACTICABLE, USE A 1 TONNE VIBRATORY ROLLER OR, IF NECESSARY, A MECHANICAL RAMMER.

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Client: BANANA SHIRE COUNCIL
Project: DON RIVER STREAMBANK STABILISATION WORKS
Title: GENERAL NOTES SHEET 2 OF 2

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ARO
51 Sheridan Street
Cairns Qld 4870
T (07) 4281 6897
E admin@aroindustries.com.au
W www.aroindustries.com.au
ABN: 49 641 461 298

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