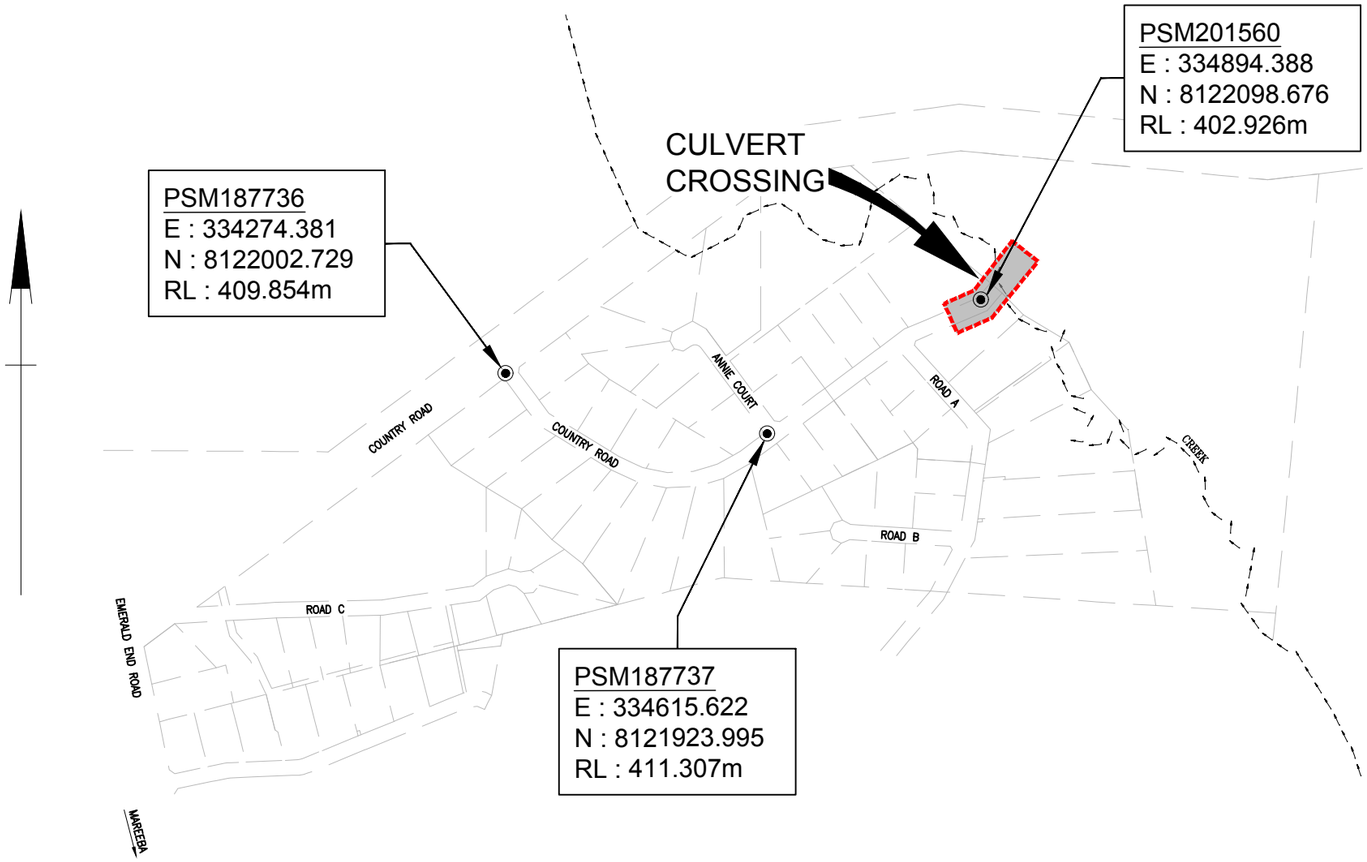
CONMAT PTY. LTD.

COUNTRY ROAD ESTATE

COUNTRY ROAD CULVERT CROSSING



CIVIL DRAWINGS LIST

160-012-C101	COVER SHEET, LOCALITY PLAN AND DRAWINGS LIST
160-012-C102	GENERAL NOTES
160-012-C103	CULVERT PLAN
160-012-C104	COUNTRY ROAD LONGITUDINAL SECTION
160-012-C105	COUNTRY ROAD CROSS SECTIONS (SHEET 1 OF 3)
160-012-C106	COUNTRY ROAD CROSS SECTIONS (SHEET 2 OF 3)
160-012-C107	COUNTRY ROAD CROSS SECTIONS (SHEET 3 OF 3)
160-012-C108	TYPICAL ROAD CROSS SECTION AND DETAILS
160-012-C109	EROSION AND SEDIMENT CONTROL PLAN
160-012-C110	EROSION AND SEDIMENT CONTROL NOTES

STRUCTURAL DRAWINGS LIST

160-012-S101	WORKPLACE HEALTH AND SAFETY NOTES
160-012-S102	STRUCTURAL ENGINEERING NOTES SHEET 1 OF 2
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160-012-S110	CULVERT SITE PLAN
160-012-S111	TYPICAL CULVERT SECTION A
160-012-S112	CULVERT DETAILS SHEET 1 OF 2
160-012-S113	CULVERT DETAILS SHEET 2 OF 2
160-012-S120	CULVERT PRECAST DECK PANELS P1-P6 & P9-P11
160-012-S121	CULVERT PRECAST DECK PANEL P7
160-012-S122	CULVERT PRECAST DECK PANEL P8
160-012-S123	CULVERT PRECAST HEAD WALL W4
160-012-S130	STORMWATER PIT

Client:

CONMAT
CONSTRUCTION MATERIALS

Prepared by:

ERSCON
CONSULTING ENGINEERS

FOR COUNCIL APPROVAL

PRINT IN COLOUR 160-012-C101 REV A

GENERAL NOTES:

1. LEVEL DATUM : AHD
2. ORIGIN OF LEVELS: (GDA2020 ZONE 55):

NUMBER	EASTING	NORTHING	RL	LOCATION
PSM187736	334274.381	8122002.729	409.854m	COUNTRY ROAD, MAREEBA
PSM187737	334615.622	8121923.995	411.307m	COUNTRY ROAD, MAREEBA
PSM201560	334894.388	8122098.676	402.926m	COUNTRY ROAD, MAREEBA

3. EXISTING CONDITIONS HAVE BEEN BASED ON SURVEY DATA COLLECTED BY TWINE SURVEYORS. NO RESPONSIBILITY IS TAKEN FOR THE ACCURACY OF THE INFORMATION SHOWN.
4. THE CONTRACTOR IS TO LIAISE WITH TWINE SURVEYS TO ESTABLISH SITE SURVEY CONTROLS.
5. DETAILS OF SERVICES ARE PROVIDED FOR INFORMATION ONLY, AND NO RESPONSIBILITY IS TAKEN FOR THE ACCURACY AND COMPLETENESS OF THE INFORMATION. POSITIONS OF SERVICE CROSSINGS SHALL BE RECORDED AND CHECKED BY THE CONTRACTOR. NOT ALL CROSSINGS HAVE NECESSARILY BEEN SHOWN ON THE DRAWINGS. THE CONTRACTOR IS TO CHECK SERVICES ON SITE PRIOR TO COMMENCEMENT OF CONSTRUCTION.
6. FOR ALL SPECIFICATIONS REFER TO FNQROC STANDARD SPECIFICATIONS.
7. INSPECTION AND TEST PLANS ARE TO BE UNDERTAKEN BY CONTRACTOR IN ACCORDANCE WITH FNQROC DEVELOPMENT MANUAL.
8. AS CONSTRUCTED DATA TO BE PREPARED AND SUBMITTED BY THE CONTRACTOR IN ACCORDANCE WITH FNQROC DEVELOPMENT MANUAL.

EARTHWORKS NOTES:

1. ALL EARTHWORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH THE CURRENT FNQROC DEVELOPMENT MANUAL SPECIFICATION – S1 'EARTHWORKS'.
2. FNQROC SPECIFICALLY REFERENCES AS 3798 'GUIDELINES ON EARTHWORKS FOR COMMERCIAL AND RESIDENTIAL DEVELOPMENTS' IN RELATION TO ALL EARTHWORK OPERATIONS INCLUDING APPROPRIATE METHODS OF TESTING, FREQUENCY OF TESTING AND REPORTING PROCEDURES. GEOTECHNICAL TESTING SERVICES SHALL BE AS DETERMINED BY LEVEL 1 IN ACCORDANCE WITH AS 3798. ALL CERTIFICATION AND TEST RESULTS ARE TO BE COMPILED AND PROVIDED TO THE SUPERINTENDENT PRIOR TO WORKS ACCEPTANCE.
3. ALL BATTERS SHALL BE 1 IN 3 MAX UNLESS NOTED OTHERWISE ON THE PROJECT DRAWINGS.
4. FINISHED SURFACE LEVELS SHOWN ON PROJECT DRAWINGS ARE AFTER ALL EARTHWORKS ARE COMPLETE INCLUDING TOPSOILING. ALL AREAS ARE TO BE GRADED EVENLY BETWEEN FINISHED SURFACE LEVELS UNLESS NOTED OTHERWISE.
5. DRY DENSITY RATIO AS REFERRED TO IN THESE NOTES IS THE RATIO DETERMINED IN ACCORDANCE WITH AS1289.5.4.1 OF COMPACTED DRY DENSITY IN ACCORDANCE WITH AS1289.5.3.1 OR AS1289.5.8.1 TO THE STANDARD MAXIMUM DRY DENSITY DETERMINED IN ACCORDANCE WITH AS1259.5.1.11 (STANDARD COMPACTION).
6. NO VEGETATION SHALL BE REMOVED WITHOUT PRIOR APPROVAL OF THE SUPERINTENDENT UNLESS NOTED ON THE PROJECT DRAWINGS.
7. ALL VEGETAL MATTER, TOPSOIL AND OTHER UNSUITABLE MATERIAL SHALL BE STRIPPED/REMOVED FROM AREAS TO BE EXCAVATED OR FILLED. ALL VEGETAL MATTER AND UNSUITABLE MATERIAL SHALL BE DISPOSE OF OFF-SITE UNLESS ADVISED OTHERWISE BY THE SUPERINTENDENT. TOPSOIL SHALL BE STOCKPILED ON-SITE FOR REUSE. SURPLUS TOPSOIL SHALL BE DISPOSED OF OFF-SITE.
8. SHOULD ANY SOFT OR UNSUITABLE MATERIAL BE IDENTIFIED, THE CONTRACTOR SHALL INFORM THE SUPERINTENDENT IMMEDIATELY AND SEEK THE ADVICE OF THE SUPERINTENDENT OR GITA.
9. COMPACT FILL TO 95% DRY DENSITY RATIO IN LAYERS OF THICKNESS APPROPRIATE TO THE COMPACTION PLANT EMPLOYED BT NOT EXCEEDING 300mm.
10. ROAD VERGE SHALL BE FULLY TURFED ON COMPLETION OF TOPSOILING. ELSEWHERE, DISTURBED AREAS 1:3 OR FLATTER SHALL BE GRASS SEEDED AND AREAS STEEPER THAN 1:3 SHALL BE HYDROMULCHED (UNLESS NOTED OTHERWISE).

CONCRETE NOTES:

1. ALL CONCRETE WORKS INCLUDING SUPPLY, PLACEMENT, COMPACTION, REINFORCEMENT AND FINISHING SHALL BE CARRIED OUT IN ACCORDANCE WITH THE CURRENT FNQROC DEVELOPMENT MANUAL SPECIFICATION – S7 CONCRETE WORKS.

DRAINAGE NOTES:

1. ALL STORMWATER DRAINAGE WORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH THE CURRENT FNQROC DEVELOPMENT MANUAL SPECIFICATION – S4 'STORMWATER DRAINAGE'.
2. ALL KERB INLET PITS TO BE CONSTRUCTED IN ACCORDANCE WITH FNQROC STD DRG'S S1050 AND S1060.

EROSION AND SEDIMENT CONTROL NOTES:

1. PRIOR TO CONSTRUCTION COMMENCING, THE CONTRACTOR MUST PREPARE AN EROSION & SEDIMENT CONTROL PLAN (ESCP) TO MANAGE THE SITE DURING CONSTRUCTION AND THE DEFECT LIABILITY PERIOD.
2. THE ESCP MUST BE CONSISTENT WITH THE APPROVED EROSION & SEDIMENT CONTROL STRATEGY (ESCS) AND SHALL TAKE INTO CONSIDERATION THE CONTRACTOR'S PROPOSED CONSTRUCTION METHODOLOGY AND PROGRAM.
3. AN ESCP THAT DIFFERS TO THE APPROVED ESCS MUST BE SUBMITTED TO THE SUPERINTENDENT FOR APPROVAL PRIOR TO SUBMITTING TO COUNCIL.
4. NO EARTHWORKS SHALL COMMENCE ON ANY PART OF THE SITE PRIOR TO APPROPRIATE EROSION AND SEDIMENT CONTROL MEASURES BEING INSTALLED DOWNSTREAM OF THE SITE AND IN ACCORDANCE WITH THE APPROVED ESCP.
5. AT ALL TIMES THE CONTRACTOR SHALL MONITOR THE PREVAILING WEATHER CONDITIONS AND TAKE ALL NECESSARY PRECAUTIONS TO CONTROL EROSION AND DOWNSTREAM SEDIMENTATION DURING ALL STAGES OF CONSTRUCTION.
6. THE IMPACT ON THE ENVIRONMENT SHALL BE MINIMISED BY OBSERVING THE FOLLOWING CONSTRUCTION PRACTICES:
   - AREAS DISTURBED BY CONSTRUCTION TRAFFIC AND PROCEDURES SHALL BE MINIMISED.
   - MINIMISE TRAFFIC MOVEMENTS AND SPEEDS ON EXPOSED SURFACES.
   - REVEGETATION OF DISTURBED AREAS SHALL BE CARRIED OUT SOON AFTER THE COMPLETION OF TOPSOIL PLACEMENT.
   - FLOW DIVERSION SHALL BE CARRIED OUT BY EARLY INSTALLATION OF DRAINS ALONG TOPS OF BATTERS WITH APPROPRIATE SILTATION CONTROL DEVICES.
   - SEDIMENT INTERCEPTION BY THE PLACEMENT OF SUITABLE RETENTION SYSTEMS ACROSS DRAINAGE LINES AND AT INTERCEPTION POINTS FOR BOTH THE CONSTRUCTION AND STOCKPILE AREAS.
4. ALL ACCESS TO AND FROM THE SITE SHALL BE VIA A TEMPORARY CONSTRUCTION ENTRY/EXIT. THE CONTRACTOR SHALL NOMINATE A PROPOSED ACCESS LOCATION ON THE ESC PLAN FOR APPROVAL BY THE SUPERINTENDENT.
5. STOCKPILES SHALL ONLY BE LOCATED IN AREAS NOMINATED ON THE PROJECT DRAWINGS OR APPROVED BY THE SUPERINTENDENT. ALL STOCKPILES MUST HAVE APPROPRIATE ESC MEASURES INSTALLED TO PREVENT SEDIMENT TRANSPORT. THE MAXIMUM HEIGHT OF ALL STOCKPILES MUST BE LIMITED TO 2.0m
6. ALL PERMANENT AND TEMPORARY UNLINED SWALES AND DRAINS MUST HAVE APPROPRIATE TEMPORARY EROSION PROTECTION.
7. ALL PARTIALLY CONSTRUCTED DRAINAGE STRUCTURES MUST BE PROTECTED AGAINST SEDIMENT INFILTRATION DURING CONSTRUCTION.
8. ALL COMPLETED DRAINAGE STRUCTURES MUST BE PROTECTED AGAINST SEDIMENT INFILTRATION UNTIL GRASSING IS ESTABLISHED.
9. THE CONTRACTOR IS RESPONSIBLE FOR THE CONTROL OF DUST EMANATING FROM THE SITE AT ALL TIMES FOR THE DURATION OF CONSTRUCTION. WET SUPPRESSION METHODS TO BE USED.
10. ALL EROSION AND SEDIMENT CONTROL MEASURES MUST BE CHECKED FOR DAMAGE, CLEANED OUT AND FULLY REINSTATED AFTER EACH RAINFALL EVENT RESULTING IN RUNOFF.
11. IF EROSION AND SEDIMENT CONTROL DEVICES HAVE BEEN FOUND TO BE DEFICIENT OR FAILED IN SERVICE, DUE TO UNFORESEEN CIRCUMSTANCES, CORRECTIVE ACTION IS TO BE UNDERTAKEN IMMEDIATELY WHICH MAY INCLUDE AMENDMENTS/ADDITIONS TO THE ORIGINAL APPROVED EROSION CONTROL PLANS.
12. THE INSTALLATION, REMOVAL, RELOCATION OR MODIFICATION TO EROSION AND SEDIMENT CONTROL DEVICES MAY BE MADE BY COUNCIL IF DEEMED NECESSARY AND RELEVANT.
13. EROSION AND SEDIMENT CONTROL DEVICES SHALL REMAIN IN PLACE UNTIL THE TREATMENT AREA IS SUITABLY STABILISED/VEGETATED.
14. THE CONTRACTOR SHALL UNDERTAKE A FORMAL COMPLIANCE AUDIT OF THE ESC AT SIX WEEKS INTERVALS DURING THE CONSTRUCTION PERIOD OF THE PROJECT. RECORDS OF THE AUDIT SHALL BE RETAINED ON SITE. WHERE IDENTIFIED AS PART OF THE AUDIT THE ESCP SHALL BE UPDATED AND PROVIDED TO THE SUPERINTENDENT.

COUNTRY ROAD CENTRELINE

CHAINAGE	EASTING	NORTHING	BEARING	LENGTH	RADIUS
260.000	334875.023	8122083.792	61°34'43.10"		
TC 274.074	334887.978	8122089.292	61°34'43.10"		
IP 283.498	334896.816	8122093.044		18.848	-39.997
CT 292.922	334902.989	8122100.400	39°59'54.50"		
300.538	334907.861	8122106.207	39°59'54.50"		

WATER NOTES:

1. ALL WATER RETICULATION WORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH THE CURRENT FNQROC DEVELOPMENT MANUAL SPECIFICATION – S5 'WATER RETICULATION'.
2. ALL PVC AND PE PIPES SHALL BE CLASS PN16. PVC PIPES SHALL BE RUBBER RING JOINTED AND DUCTILE IRON COMPATIBLE.
3. FOR MAIN TRENCHING, BEDDING & ANCHORAGE DETAILS REFER FNQROC STD DRAWINGS S2015 & S2016. ENSURE COVER TO WATER MAINS IS 800mm MINIMUM UNDER ROADWAYS AND 600mm MINIMUM ELSEWHERE.
4. ALL WATER MAINS SHALL BE INSTALLED ON A STANDARD 2.0m OFFSET FROM THE PROPERTY BOUNDARY UNLESS NOTED OTHERWISE ON PLANS.
5. WHERE NON-METALLIC PIPES ARE LAID, A CONTINUOUS STEEL WIRE, 1.6mm MIN DIAMETER, SHALL BE LAID IMMEDIATELY ABOVE THE FILL SAND TO ASSIST IN FUTURE LOCATING. THIS WIRE IS TO BE WRAPPED ONCE AROUND ALL HYDRANTS AND VALVES.
6. COUNCIL MUST BE CONTACTED TO PERFORM ANY DIRECT CONNECTION OR ALTERATION TO LIVE WATER MAINS. THE CONTRACTOR SHALL LODGE WITH COUNCIL THE APPROPRIATE APPLICATION FORMS AND FEES FOR THESE WORKS TO BE COMPLETED. IT MAY BE POSSIBLE FOR SOME WORKS TO BE PERFORMED BY THE CONTRACTOR UNDER SPECIAL CIRCUMSTANCES AND SUBJECT TO APPROPRIATE CONDITIONS AGREED TO WITH COUNCIL.
7. ALL HYDRANTS AND VALVES TO BE LOCATED OPPOSITE PROPERTY BOUNDARY TRUNCATIONS AND CORNERS, UNLESS NOTED OTHERWISE ON PLANS. FOR VALVES & HYDRANT BOXES INSTALLATION DETAILS REFER FNQROC STD DRAWINGS S2000 AND S2005.
8. HYDRANTS OR VALVES CONSTRUCTED IN CONCRETE ARE TO HAVE A COMPRESSIBLE LAYER (ABLEFLEX) INSTALLED ON THE SURROUND. REFER FNQROC STD DRAWING S2000.
9. THE MINIMUM TEST PRESSURE FOR ALL PIPES SHALL BE 1250 KPa. THE CONTRACT SHALL GIVE COUNCILS WATER OFFICER 24 HOURS NOTICE PRIOR TO TESTING. PERIOD.

LANDSCAPING NOTES:

1. ALL LANDSCAPING WORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH THE CURRENT FNQROC DEVELOPMENT MANUAL SPECIFICATION – S8 'LANDSCAPING'.
2. ALL PLANTS MUST BE ORDER SUPPLIED BY A REPUTABLE NURSERY, AND ORDERED WELL IN ADVANCE TO ENSURE AVAILABILITY.
3. TURF TO BE USED SHALL BE ROLLED B GRADE TURF MIX OF SPECIES 80% BUFFALO GRASS (AXONOPUS COMPRESSUS) AND 20% COUCH GRASS VARIETIES.
4. STREET TREES SHALL BE PROVIDED WHERE INDICATED ON PLAN. FINAL LOCATION TO BE DETERMINED ON SITE FOLLOWING INSTALLATION OF DRIVEWAYS AND CONFIRMATION OF SITE SERVICES
5. STREET TREES FINAL LOCATION SHALL BE IN ACCORDANCE WITH THE FOLLOWING:
   a. GREATER THAN 4.0m FROM ELECTRICITY OR TELECOMMUNICATION POLES OR PILLARS.
   b. GREATER THAN 7.5m FROM STREET LIGHTS
   c. GREATER THAN 2.0m FROM STORMWATER DRAINAGE PITS
   d. GREATER THAN 3.0m FROM DRIVEWAYS
   e. A MINIMUM OF 0.8m AND A MAXIMUM OF 1.0m FROM THE BACK OF KERB
6. TEMPORARY IRRIGATION SHALL BE INSTALLED TO ENABLE WATERING DURING THE ESTABLISHMENT PERIOD.

PRINT IN COLOUR

FOR COUNCIL APPROVAL

PLOT DATE:30/10/2025 12:06:20 PM
FILE LOCATION:X:\160 Conmat\012 Country Rd Stage 3-5 Culvert\Drawings\160-012-C102 NOTES.dwg

REVISIONS

NO.	DATE	DESCRIPTION	DESIGN	APPROVED
A	30/10/25	COUNCIL ISSUE	MF	JM
1	14/03/25	INITIAL ISSUE		

ERSCON CONSULTING ENGINEERS

CLIENT: CONMAT CONSTRUCTION MATERIALS

SCALE: NTS

ALL DIMENSIONS IN METRES UNLESS NOTED OTHERWISE

DRAWN	MG	DESIGNED	MG
DRAWN APPROVED	MF	DESIGN APPROVED	MF

CIVIL SIGNOFF APPROVAL

DATE: 02/06/25 RPEQ: 05085

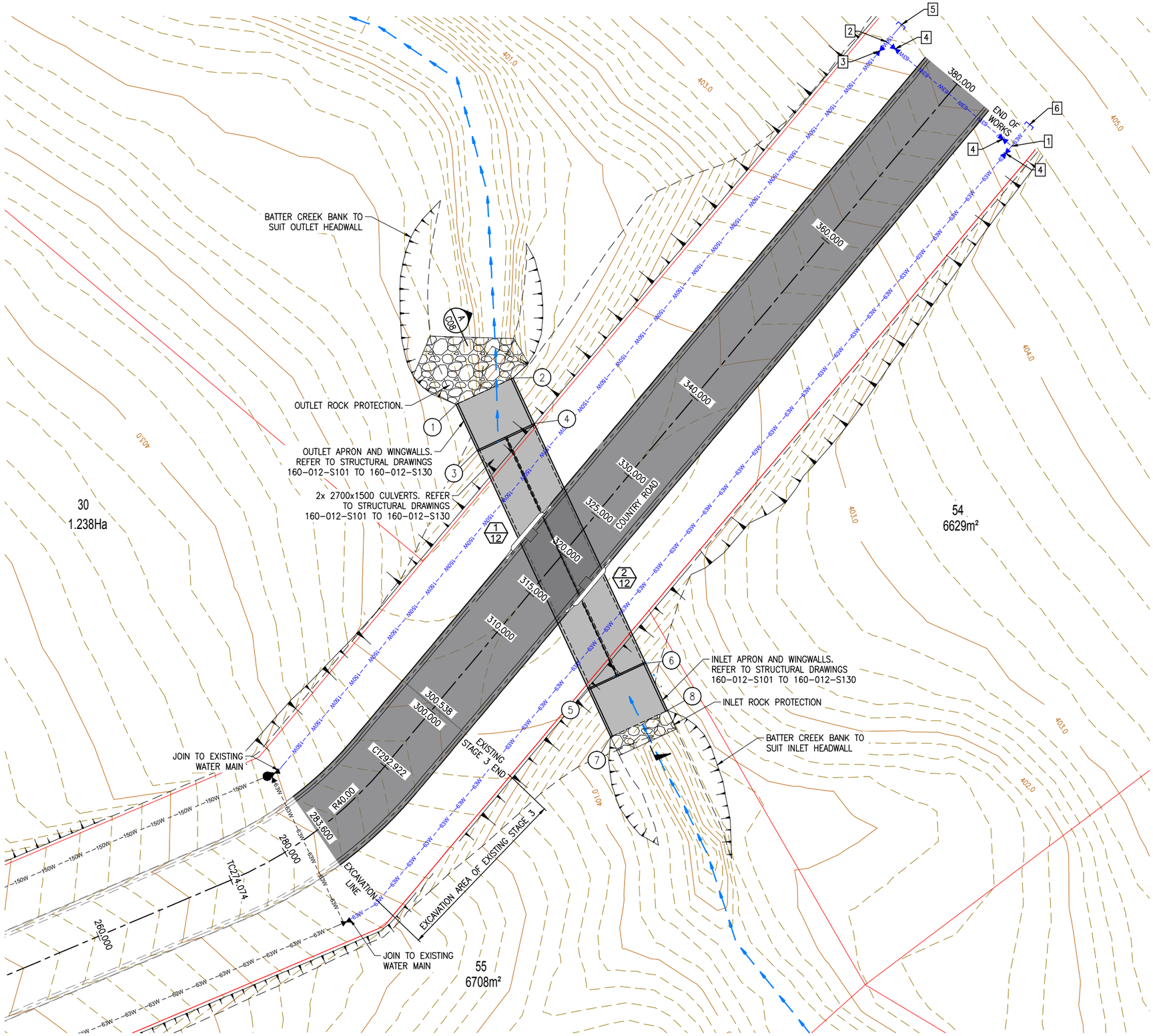
PROJECT REF: COUNTRY ROAD ESTATE
COUNTRY ROAD CULVERT CROSSING

DRAWING REF: GENERAL NOTES

DRAWING NO: 160-012-C102

SIZE: A3

REVISION: A



KERB INLET PIT SETOUT

POINT NO	EASTING	NORTHING
1/12	334917.194	8122123.166
2/12	334922.791	8122118.164

CULVERT SETOUT

POINT NO	EASTING	NORTHING	HEIGHT
1	334909.973	8122135.776	399.320
2	334915.550	8122138.369	399.320
3	334912.046	8122131.318	399.350
4	334917.623	8122133.911	399.350
5	334922.945	8122107.877	399.500
6	334928.523	8122110.471	399.500
7	334925.086	8122103.278	399.530
8	334930.662	8122105.871	399.530

WATER CONNECTIONS

1	⊥	63 x 63 x 63 D.I.C.L TEE WITH CONCRETE THRUST BLOCK.
2	⊥	150 x 150 x 63 D.I.C.L TEE WITH CONCRETE THRUST BLOCK.
3	150SV	150 DIA. SLUICE VALVE CLASS 600 M.E. COMPLETE WITH C.I. COVER BOX MARGIN AND KERB MARKER.
4	63SV	63 DIA. GATE VALVE BRASS COMPLETE WITH C.I.. COVER BOX MARGIN AND KERB MARKER.
5	⊣	150 DIA. D.I.C.L. DEAD END CAP WITH CONCRETE THRUST BLOCK.
6	⊣	63 DIA. D.I.C.L. DEAD END CAP WITH CONCRETE THRUST BLOCK.

LEGEND

- PROPERTY BOUNDARY
- TOE OF BATTER
- TOP OF BATTER
- ROAD CENTERLINE
- MAJOR CONTOURS (1m INTERVAL)
- MINOR CONTOURS (0.2m INTERVAL) 1.0
- EXISTING WATER FLOW
- EXISTING ø63 uPVC WATER MAIN
- EXISTING ø150 uPVC WATER MAIN
- PROPOSED ø63 uPVC WATER MAIN (CLASS 16)
- PROPOSED ø150 uPVC WATER MAIN (CLASS 16)

PRINT IN COLOUR

FOR COUNCIL APPROVAL

REVISIONS				
NO.	DATE	DESCRIPTION	DESIGN	APPROVED
A	29/10/25	ADD SEP, REMOVE SCUPPERS	MF	JM
2	21/03/25	REDUCED CULVERT LENGTH	MG	
1	21/01/25	INITIAL ISSUE		

ERSCON CONSULTING ENGINEERS

CLIENT: CONMAT CONSTRUCTION MATERIALS

SCALE
1:400 0 2 4 6 8 10 12 A3
1:10 0 0.1 0.2 0.3 A3
1:25 0 0.25 0.5 0.75 A3
ALL DIMENSIONS IN METRES UNLESS NOTED OTHERWISE

DRAWN	BW	DESIGNED	MF
DRAWN APPROVED	JM	DESIGN APPROVED	JM

CIVIL SIGNOFF APPROVAL
DATE: 02/06/25 RPEQ: 05085

PROJECT REF: COUNTRY ROAD ESTATE
COUNTRY ROAD CULVERT CROSSING

DRAWING REF: CULVERT PLAN

DRAWING NO: 160-012-C103 | SIZE: A1 | REVISION: A

PLOT DATE:30/10/2025 12:06:45 PM
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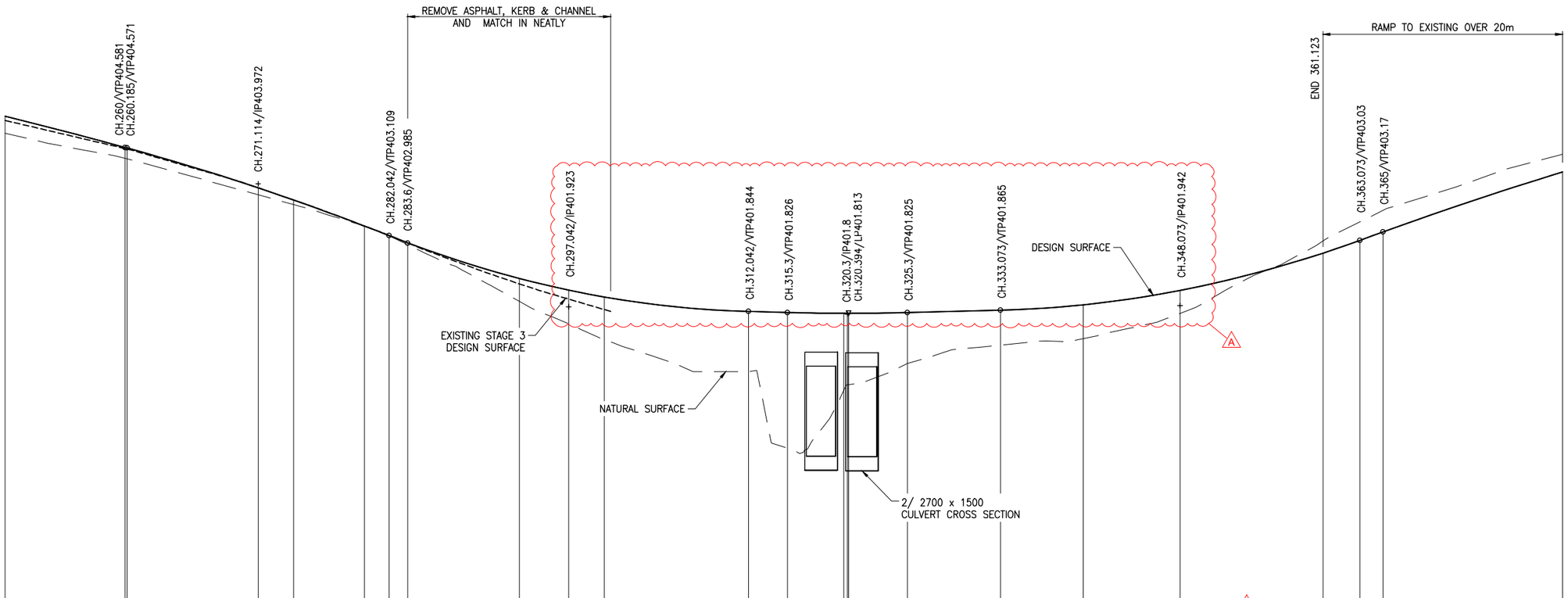

CHAINAGE	CUT/FILL	EXISTING STAGE 3 DESIGN SURFACE	DESIGN SURFACE	NATURAL SURFACE
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260.185	0.179		404.571	404.391
271.114	0.115	403.907	403.906	403.791
274.074	0.075	403.705	403.703	403.628
280	−0.003	403.265	403.268	403.27
282.042	0.004	403.095	403.109	403.104
283.6	0.03	402.983	402.985	402.955
292.922	0.384	402.304	402.394	402.01
297.042	0.562		402.2	401.637
300	0.712	401.958 402.021	402.086	401.373
312.042	1.003		401.844	400.841
315.3	2.265		401.826	399.561
320	1.288		401.813	400.525
320.3	1.195		401.813	400.618
320.394	1.193		401.813	400.62
325.3	0.85		401.825	400.976
333.073	0.583		401.865	401.282
340	0.564		401.954	401.391
348.073	0.384		402.195	401.811
360	−0.205		402.818	403.023
363.073	−0.307		403.03	403.338
365	−0.357		403.17	403.528
380	−0.294		404.171	404.465

LONGITUDINAL SECTION - COUNTRY ROAD

SCALE 1:400H 10V

PRINT IN COLOUR

FOR COUNCIL APPROVAL

PLOT DATE30/10/2025 12:07:12 PM
FILE LOCATIONX:\160 Conmat\012 Country Rd Stage 3-5 Culvert\Drawings\160-012-C104 ROAD LONG SECTION.dwg

REVISIONS

NO.	DATE	DESCRIPTION	DESIGN	APPROVED
A	28/10/25	VC CHANGE	MF	JM
1	13/03/25	INITIAL ISSUE		

ERSCON
CONSULTING ENGINEERS

CLIENT
CONMAT
CONSTRUCTION MATERIALS

SCALE
1:400 0 2 4 6 8 10 12 A3
HORIZONTAL
1:10 0 0.1 0.2 0.3 A3
ALL DIMENSIONS IN METRES UNLESS NOTED OTHERWISE

DRAWN MG
DESIGNED MF
DRAWN APPROVED MF
DESIGN APPROVED JM
CIVIL SIGNOFF APPROVAL
DATE: 02/06/25 RPEQ: 05085

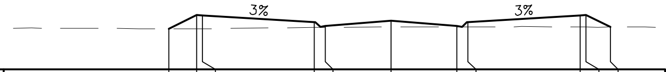
PROJECT REF
COUNTRY ROAD ESTATE
COUNTRY ROAD CULVERT CROSSING

DRAWING REF
COUNTRY ROAD
LONGITUDINAL SECTION

DRAWING NO
160-012-C104

SIZE
A3

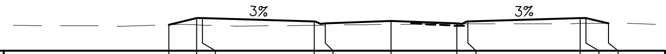
REVISION
A



Datum 403.0

CUT/FULL	404.086	404.452	404.443	404.265	404.155	404.294	404.155	404.265	404.443	404.452	404.127
DESIGN HEIGHT	404.086	404.452	404.443	404.265	404.155	404.294	404.155	404.265	404.443	404.452	404.127
EXISTING SURFACE	404.086	404.085	404.086	404.115	404.117	404.128	404.134	404.135	404.129	404.128	404.127
DESIGN OFFSET	-11.760	-10.299	-9.999	-4.070	-3.485	0.000	3.485	4.070	9.999	10.299	11.597

Ch 265.000



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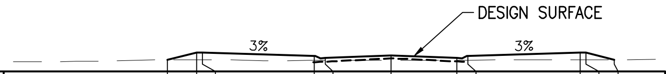
CUT/FULL	404.373	404.738	404.729	404.552	404.442	404.581	404.442	404.552	404.729	404.738	404.440
EXISTING STAGE 3 DESIGN SURFACE							404.328				
DESIGN HEIGHT	404.373	404.738	404.729	404.552	404.442	404.581	404.442	404.552	404.729	404.738	404.440
EXISTING SURFACE	404.373	404.366	404.358	404.349	404.357	404.400	404.421	404.423	404.437	404.438	404.440
DESIGN OFFSET	-11.762	-10.299	-9.999	-4.070	-3.485	0.000	3.485	4.070	9.999	10.299	11.493

Ch 260.000



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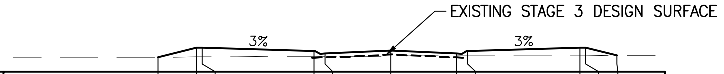
CUT/FULL	404.622	405.006	404.997	404.819	404.709	404.848	404.709	404.819	404.997	405.006	404.628
EXISTING STAGE 3 DESIGN SURFACE				404.503	404.520	404.691	404.537				
DESIGN HEIGHT	404.622	405.006	404.997	404.819	404.709	404.848	404.709	404.819	404.997	405.006	404.628
EXISTING SURFACE	404.622	404.619	404.618	404.586	404.587	404.596	404.605	404.606	404.624	404.624	404.628
DESIGN OFFSET	-11.835	-10.299	-9.999	-4.070	-3.485	0.000	3.485	4.070	9.999	10.299	11.811

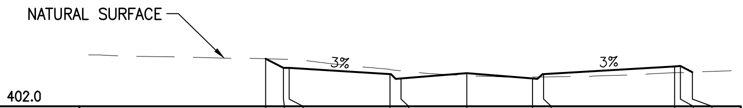
Ch 255.000



Datum 404.0

CUT/FULL	404.754	405.259	405.250	405.072	404.962	405.102	404.962	405.072	405.250	405.259	404.847
EXISTING STAGE 3 DESIGN SURFACE				404.733	404.751	404.900	404.747				
DESIGN HEIGHT	404.754	405.259	405.250	405.072	404.962	405.102	404.962	405.072	405.250	405.259	404.847
EXISTING SURFACE	404.754	404.769	404.771	404.805	404.807	404.818	404.828	404.829	404.841	404.842	404.847
DESIGN OFFSET	-12.320	-10.299	-9.999	-4.070	-3.485	0.000	3.485	4.070	9.999	10.299	11.948

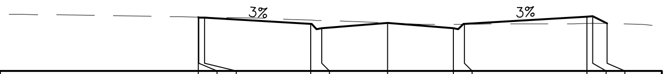
Ch 250.000



Datum 402.0

CUT/FULL	403.262	403.025	403.016	402.856	402.746	402.886	402.746	402.856	403.064	403.073	402.908
DESIGN HEIGHT	403.262	403.025	403.016	402.856	402.746	402.886	402.746	402.856	403.064	403.073	402.908
EXISTING SURFACE	403.262	403.253	403.248	402.977	402.947	402.823	402.775	402.779	402.891	402.896	402.908
DESIGN OFFSET	-10.647	-9.701	-9.401	-4.070	-3.485	0.000	3.485	4.070	10.996	11.296	11.955

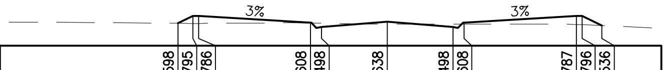
Ch 285.000



Datum 402.0

CUT/FULL	403.425	403.415	403.406	403.238	403.128	403.268	403.128	403.238	403.433	403.442	403.254
DESIGN HEIGHT	403.425	403.415	403.406	403.238	403.128	403.268	403.128	403.238	403.433	403.442	403.254
EXISTING SURFACE	403.425	403.425	403.422	403.344	403.334	403.270	403.231	403.238	403.255	403.259	403.254
DESIGN OFFSET	-10.007	-9.967	-9.667	-4.070	-3.485	0.000	3.485	4.070	10.553	10.853	11.604

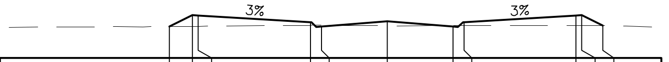
Ch 280.000



Datum 403.0

CUT/FULL	403.598	403.795	403.786	403.608	403.498	403.638	403.498	403.608	403.787	403.796	403.536
DESIGN HEIGHT	403.598	403.795	403.786	403.608	403.498	403.638	403.498	403.608	403.787	403.796	403.536
EXISTING SURFACE	403.598	403.595	403.594	403.602	403.598	403.576	403.574	403.574	403.564	403.557	403.536
DESIGN OFFSET	-11.078	-10.291	-9.991	-4.070	-3.485	0.000	3.485	4.070	10.013	10.313	11.351

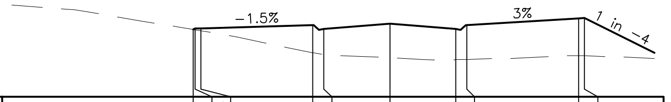
Ch 275.000



Datum 403.0

CUT/FULL	403.832	404.137	404.128	403.950	403.840	403.980	403.840	403.950	404.128	404.137	403.862
DESIGN HEIGHT	403.832	404.137	404.128	403.950	403.840	403.980	403.840	403.950	404.128	404.137	403.862
EXISTING SURFACE	403.832	403.838	403.839	403.866	403.867	403.852	403.855	403.856	403.861	403.861	403.862
DESIGN OFFSET	-11.519	-10.299	-9.999	-4.070	-3.485	0.000	3.485	4.070	9.999	10.299	11.401

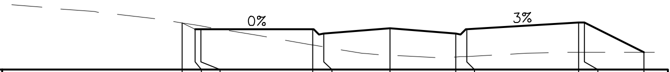
Ch 270.000



Datum 400.0

CUT/FULL	401.790	401.819	401.824	401.913	401.803	401.942	401.803	401.913	402.090	402.099
DESIGN HEIGHT	401.790	401.819	401.824	401.913	401.803	401.942	401.803	401.913	402.090	402.099
EXISTING SURFACE	401.790	401.781	401.755	401.176	401.121	401.037	400.987	400.996	401.094	401.089
DESIGN OFFSET	-10.414	-10.299	-9.999	-4.070	-3.485	0.000	3.485	4.070	9.999	10.299

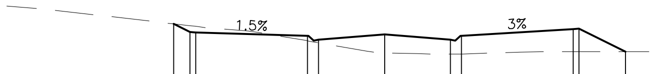
Ch 305.000



Datum 401.0

CUT/FULL	402.226	402.056	402.056	402.056	401.946	402.086	401.946	402.056	402.234	402.243	401.453
DESIGN HEIGHT	402.226	402.056	402.056	402.056	401.946	402.086	401.946	402.056	402.234	402.243	401.453
EXISTING SURFACE	402.226	402.169	402.144	401.644	401.594	401.373	401.328	401.343	401.448	401.449	401.453
DESIGN OFFSET	-10.977	-10.299	-9.999	-4.070	-3.485	0.000	3.485	4.070	9.999	10.299	13.461

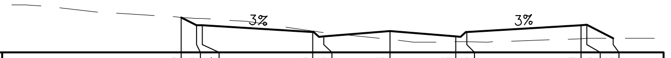
Ch 300.000



Datum 401.0

CUT/FULL	402.570	402.355	402.350	402.261	402.151	402.291	402.151	402.261	402.439	402.448	401.835
DESIGN HEIGHT	402.570	402.355	402.350	402.261	402.151	402.291	402.151	402.261	402.439	402.448	401.835
EXISTING SURFACE	402.570	402.521	402.504	402.123	402.073	401.807	401.775	401.777	401.833	401.832	401.835
DESIGN OFFSET	-11.163	-10.299	-9.999	-4.070	-3.485	0.000	3.485	4.070	9.999	10.299	12.754

Ch 295.000



Datum 402.0

CUT/FULL	402.916	402.713	402.704	402.528	402.418	402.558	402.418	402.528	402.710	402.719	402.368
DESIGN HEIGHT	402.916	402.713	402.704	402.528	402.418	402.558	402.418	402.528	402.710	402.719	402.368
EXISTING SURFACE	402.916	402.890	402.881	402.555	402.518	402.334	402.270	402.269	402.356	402.361	402.368
DESIGN OFFSET	-11.032	-10.219	-9.919	-4.070	-3.485	0.000	3.485	4.070	10.133	10.433	11.836

Ch 290.000

PRINT IN COLOUR

FOR COUNCIL APPROVAL

PLOT DATE30/10/2025 12:07:38 PM
FILE LOCATION X:\160 Conmat\012 Country Rd Stage 3-5 Culvert\Drawings\160-012-C105 ROAD CROSS SECTION (1 OF 3).dwg

REVISIONS

NO.	DATE	DESCRIPTION	DESIGN	APPROVED
A	30/10/25	VC CHANGED	MF	JM
1	13/03/25	INITIAL ISSUE		

ERSCON
CONSULTING ENGINEERS

CLIENT
CONMAT
CONSTRUCTION MATERIALS

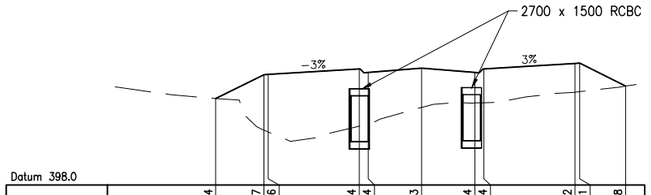
SCALE
1:400 0 2 4 6 8 12 A3
HORIZONTAL
1:40 0 0.2 0.4 0.6 0.8 1 1.2 A3
VERTICAL
ALL DIMENSIONS IN METRES UNLESS NOTED OTHERWISE

DRAWN MG
DESIGNED MF
DRAWN APPROVED MF
DESIGN APPROVED JM
CIVIL SIGNOFF APPROVAL
DATE: 02/06/25 RPEQ: 05085

PROJECT REF
COUNTRY ROAD ESTATE
COUNTRY ROAD CULVERT CROSSING

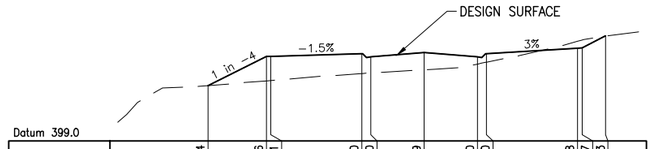
DRAWING REF
COUNTRY ROAD
CROSS SECTIONS (SHEET 1 OF 3)

DRAWING NO 160-012-C105
SIZE A3
REVISION A



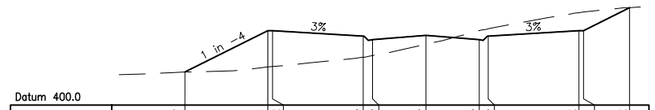
Datum 398.0																		
CUT/FULL		400.814		401.597	401.606		401.784	401.674		401.813		401.674	401.784			401.962	401.971	401.218
DESIGN HEIGHT	400.814	400.814		401.597	401.606		401.784	401.674		401.813		401.674	401.784			401.962	401.971	401.218
EXISTING SURFACE	400.814	400.814		399.783	399.721		399.916	399.987		400.525		400.671	400.680			401.025	401.042	401.218
DESIGN OFFSET	-13.429	-13.429		-10.299	-9.999		-4.070	-3.485		0.000		3.485	4.070			9.999	10.299	13.310

Ch 320.000



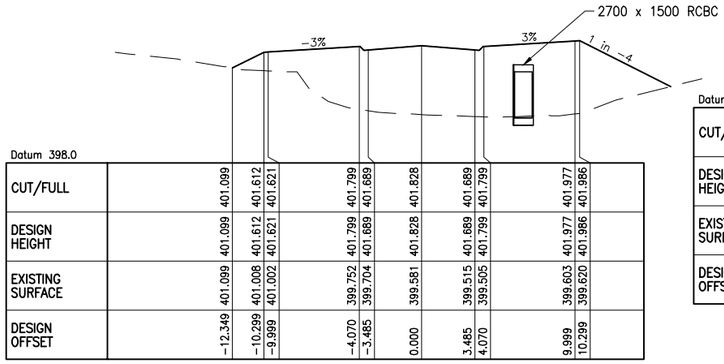
Datum 399.0																		
CUT/FULL		400.804		401.756	401.761		401.850	401.740		401.879		401.740	401.850			402.028	402.037	402.423
DESIGN HEIGHT	400.804	400.804		401.756	401.761		401.850	401.740		401.879		401.740	401.850			402.028	402.037	402.423
EXISTING SURFACE	400.804	400.804		400.960	400.972		401.196	401.216		401.321		401.508	401.566			402.246	402.288	402.423
DESIGN OFFSET	-14.108	-14.108		-10.299	-9.999		-4.070	-3.485		0.000		3.485	4.070			9.999	10.299	11.845

Ch 335.000



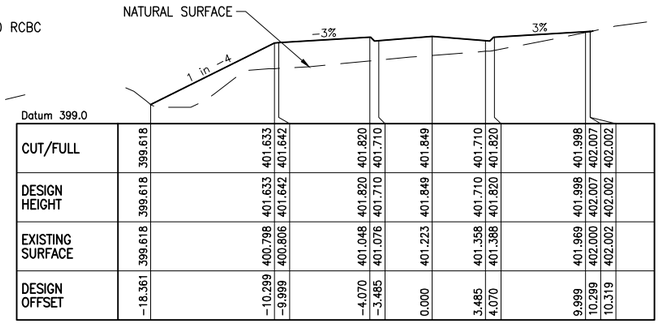
Datum 400.0																		
CUT/FULL		401.077		402.431	402.422		402.244	402.134		402.274		402.134	402.244			402.422	402.431	403.182
DESIGN HEIGHT	401.077	401.077		402.431	402.422		402.244	402.134		402.274		402.134	402.244			402.422	402.431	403.182
EXISTING SURFACE	401.077	401.077		401.240	401.255		401.561	401.611		401.983		402.427	402.488			403.015	403.032	403.182
DESIGN OFFSET	-15.715	401.077		-10.299	-9.999		-4.070	-3.485		0.000		3.485	4.070			9.999	10.299	13.304

Ch 350.000



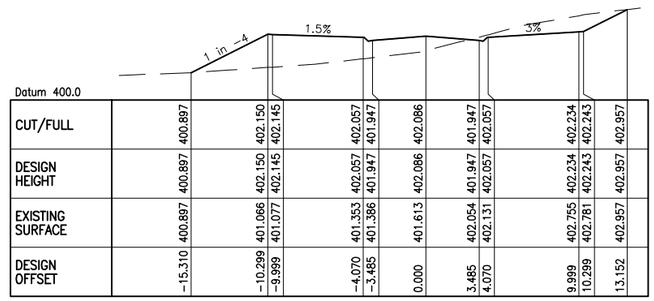
Datum 398.0																		
CUT/FULL		401.099		401.612	401.621		401.799	401.689		401.828		401.689	401.799			401.977	401.986	
DESIGN HEIGHT	401.099	401.099		401.612	401.621		401.799	401.689		401.828		401.689	401.799			401.977	401.986	
EXISTING SURFACE	401.099	401.099		401.008	401.002		399.752	399.704		399.581		399.515	399.505			399.603	399.620	
DESIGN OFFSET	-12.349	-12.349		-10.299	-9.999		-4.070	-3.485		0.000		3.485	4.070			9.999	10.299	

Ch 315.000



Datum 399.0																		
CUT/FULL	399.618		401.633	401.642		401.820	401.710		401.849		401.710	401.820			401.998	402.007	402.002	
DESIGN HEIGHT	399.618	399.618	401.633	401.642		401.820	401.710		401.849		401.710	401.820			401.998	402.007	402.002	
EXISTING SURFACE	399.618	399.618	400.798	400.806		401.048	401.076		401.223		401.358	401.388			401.969	402.000	402.002	
DESIGN OFFSET	-18.361	-18.361	-10.299	-9.999		-4.070	-3.485		0.000		3.485	4.070			9.999	10.299	10.319	

Ch 330.000

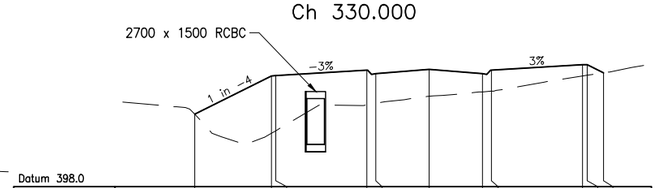


Datum 400.0																		
CUT/FULL		400.897		402.150	402.145		402.057	401.947		402.086		401.947	402.057			402.234	402.243	402.957
DESIGN HEIGHT	400.897	400.897		402.150	402.145		402.057	401.947		402.086		401.947	402.057			402.234	402.243	402.957
EXISTING SURFACE	400.897	400.897		401.066	401.077		401.353	401.386		401.613		402.054	402.131			402.755	402.781	402.957
DESIGN OFFSET	-15.310	400.897		-10.299	-9.999		-4.070	-3.485		0.000		3.485	4.070			9.999	10.299	13.152

Ch 345.000

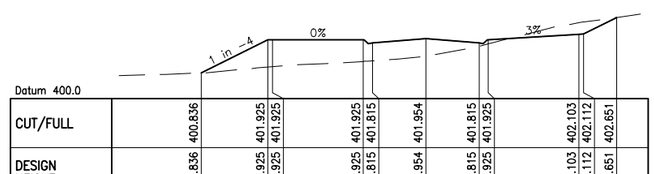
Datum 400.0																		
CUT/FULL		401.489		401.643	401.652		401.830	401.720		401.860		401.720	401.830			402.008	402.017	
DESIGN HEIGHT	401.489	401.489		401.643	401.652		401.830	401.720		401.860		401.720	401.830			402.008	402.017	
EXISTING SURFACE	401.489	401.489		401.436	401.401		400.909	400.851		400.840		400.816	400.800			400.653	400.645	
DESIGN OFFSET	-10.916	-10.916		-10.299	-9.999		-4.070	-3.485		0.000		3.485	4.070			9.999	10.299	

Ch 310.000



Datum 398.0																		
CUT/FULL	400.361		401.608	401.617		401.795	401.685		401.824		401.685	401.795			401.972	401.981	401.711	
DESIGN HEIGHT	400.361	400.361	401.608	401.617		401.795	401.685		401.824		401.685	401.795			401.972	401.981	401.711	
EXISTING SURFACE	400.361	400.361	398.738	399.823		400.671	400.723		400.945		401.095	401.115			401.607	401.629	401.711	
DESIGN OFFSET	-15.287	-15.287	-10.299	-9.999		-4.070	-3.485		0.000		3.485	4.070			9.999	10.299	11.381	

Ch 325.000



Datum 400.0																		
CUT/FULL		400.836		401.925	401.925		401.925	401.815		401.954		401.815	401.925			402.103	402.112	402.651
DESIGN HEIGHT	400.836	400.836		401.925	401.925		401.925	401.815		401.954		401.815	401.925			402.103	402.112	402.651
EXISTING SURFACE	400.836	400.836		401.035	401.048		401.216	401.234		401.391		401.713	401.790			402.475	402.501	402.651
DESIGN OFFSET	-14.657	400.836		-10.299	-9.999		-4.070	-3.485		0.000		3.485	4.070			9.999	10.299	12.454

Ch 340.000

PRINT IN COLOUR

FOR COUNCIL APPROVAL

REVISIONS					
A	30/10/25	VC CHANGE	MF	JM	
2	21/03/25	REDUCED CULVERT LENGTH	MG		
1	13/03/25	INITIAL ISSUE			
NO.	DATE	DESCRIPTION	DESIGN	APPROVED	

ERSCON CONSULTING ENGINEERS

CLIENT: CONMAT CONSTRUCTION MATERIALS

SCALE
1:400 HORIZONTAL 0 2 4 6 8 12 A3
1:40 VERTICAL 0 0.2 0.4 0.6 0.8 1 1.2 A3
ALL DIMENSIONS IN METRES UNLESS NOTED OTHERWISE

DRAWN MG | DESIGNED MF
DRAWN APPROVED MF | DESIGN APPROVED JM
CIVIL SIGNOFF APPROVAL
DATE: 02/06/25 RPEQ: 05085

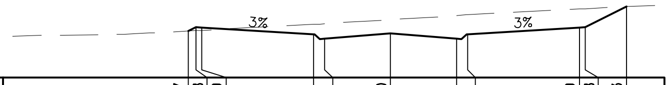
PROJECT REF: COUNTRY ROAD ESTATE
COUNTRY ROAD CULVERT CROSSING
DRAWING REF: COUNTRY ROAD
CROSS SECTIONS (SHEET 2 OF 3)
DRAWING NO: 160-012-C106
SIZE: A3
REVISION: A

PLOT DATE:30/10/2025 12:08:05 PM
FILE LOCATION:X:\160 Conmat\012 Country Rd Stage 3-5 Culvert\Drawings\160-012-C106 ROAD CROSS SECTION (2 OF 3).dwg

Datum 403.0

CUT/FULL	403.652	403.681	403.672	403.494	403.384	403.523	403.384	403.494	403.672	403.681	404.111
DESIGN HEIGHT	403.652	403.681	403.672	403.494	403.384	403.523	403.384	403.494	403.672	403.681	404.111
EXISTING SURFACE	403.652	403.654	403.660	403.774	403.784	403.853	403.944	403.952	404.061	404.068	404.111
DESIGN OFFSET	−10.416	−10.299	−9.999	−4.070	−3.485	0.000	3.485	4.070	9.999	10.299	12.019

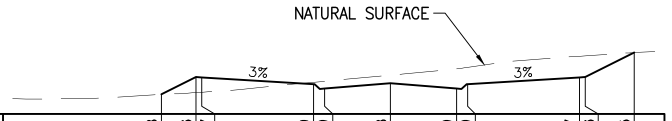
Ch 370.000



Datum 402.0

CUT/FULL	403.227	403.328	403.319	403.141	403.031	403.170	403.031	403.141	403.319	403.328	403.873
DESIGN HEIGHT	403.227	403.328	403.319	403.141	403.031	403.170	403.031	403.141	403.319	403.328	403.873
EXISTING SURFACE	403.227	403.238	403.246	403.404	403.420	403.528	403.639	403.656	403.811	403.819	403.873
DESIGN OFFSET	−10.704	−10.299	−9.999	−4.070	−3.485	0.000	3.485	4.070	9.999	10.299	12.479

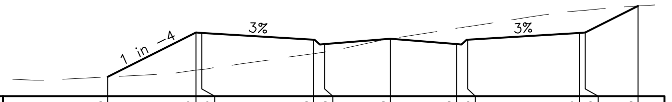
Ch 365.000



Datum 402.0

CUT/FULL	402.518	402.976	402.967	402.789	402.679	402.818	402.679	402.789	402.967	402.976	403.625
DESIGN HEIGHT	402.518	402.976	402.967	402.789	402.679	402.818	402.679	402.789	402.967	402.976	403.625
EXISTING SURFACE	402.518	402.565	402.576	402.842	402.868	403.023	403.196	403.230	403.526	403.536	403.625
DESIGN OFFSET	−12.128	−10.299	−9.999	−4.070	−3.485	0.000	3.485	4.070	9.999	10.299	12.898

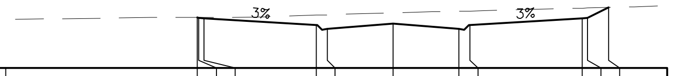
Ch 360.000



Datum 401.0

CUT/FULL	401.508	402.675	402.666	402.488	402.378	402.518	402.378	402.488	402.666	402.675	403.378
DESIGN HEIGHT	401.508	402.675	402.666	402.488	402.378	402.518	402.378	402.488	402.666	402.675	403.378
EXISTING SURFACE	401.508	401.687	401.706	402.124	402.164	402.509	402.791	402.836	403.250	403.265	403.378
DESIGN OFFSET	−14.969	−10.299	−9.999	−4.070	−3.485	0.000	3.485	4.070	9.999	10.299	13.111

Ch 355.000



Datum 403.0

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EXISTING STAGE 3 DESIGN SURFACE											
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EXISTING SURFACE	404.342	404.343	404.343	404.402	404.411	404.465	404.507	404.512	404.587	404.591	404.606
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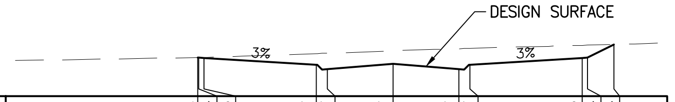
Ch 380.000



Datum 403.0

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DESIGN HEIGHT	404.022	404.014	404.005	403.827	403.717	403.857	403.717	403.827	404.005	404.014	404.364
EXISTING SURFACE	404.022	404.022	404.025	404.125	404.136	404.197	404.253	404.261	404.341	404.345	404.364
DESIGN OFFSET	−10.329	−10.299	−9.999	−4.070	−3.485	0.000	3.485	4.070	9.999	10.299	11.697

Ch 375.000

PRINT IN COLOUR

FOR COUNCIL APPROVAL

PLOT DATE30/10/2025 12:09:00 PM
FILE LOCATION X:\160 Conmat\012 Country Rd Stage 3-5 Culvert\Drawings\160-012-C107 ROAD CROSS SECTION (3 OF 3).dwg

REVISIONS

NO.	DATE	DESCRIPTION	DESIGN	APPROVED
A	30/10/25	VC CHANGE	MF	JM
1	17/03/25	INITIAL ISSUE		

ERSCON
CONSULTING ENGINEERS

CLIENT
CONMAT
CONSTRUCTION MATERIALS

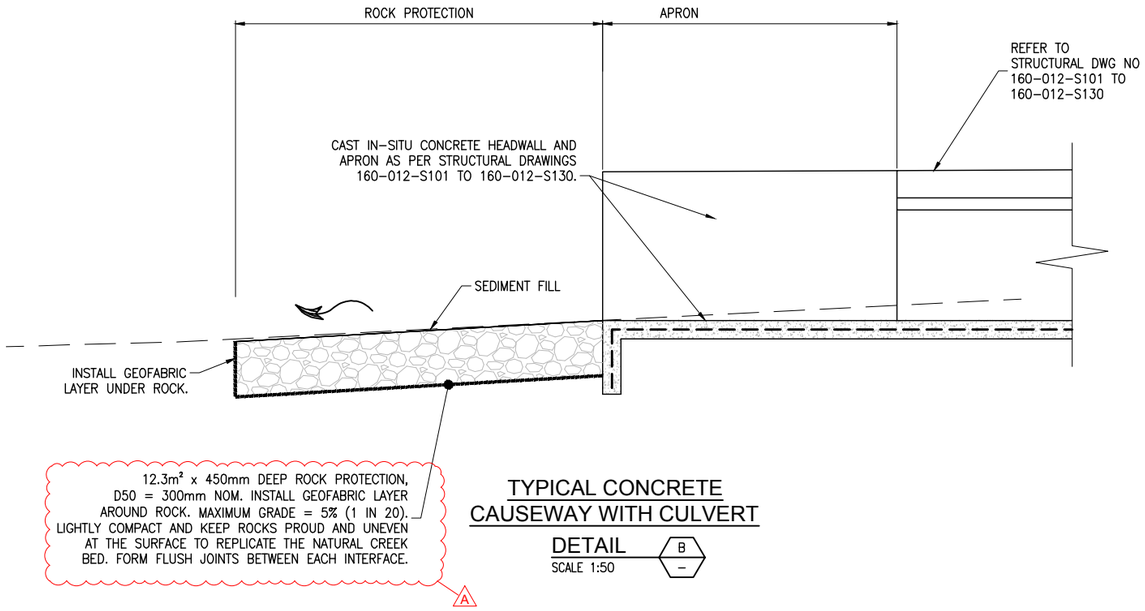
SCALE
1:400 0 2 4 6 8 12 A3
HORIZONTAL
1:40 0 0.2 0.4 0.6 0.8 1 1.2 A3
VERTICAL
ALL DIMENSIONS IN METRES UNLESS NOTED OTHERWISE

DRAWN MG
DESIGNED MF
DRAWN APPROVED MF
DESIGN APPROVED JM
CIVIL SIGNOFF APPROVAL
DATE: 02/06/25 RPEQ: 05085

PROJECT REF
COUNRTY ROAD ESTATE
COUNTRY ROAD CULVERT CROSSING

DRAWING REF
COUNTRY ROAD
CROSS SECTIONS (SHEET 3 OF 3)

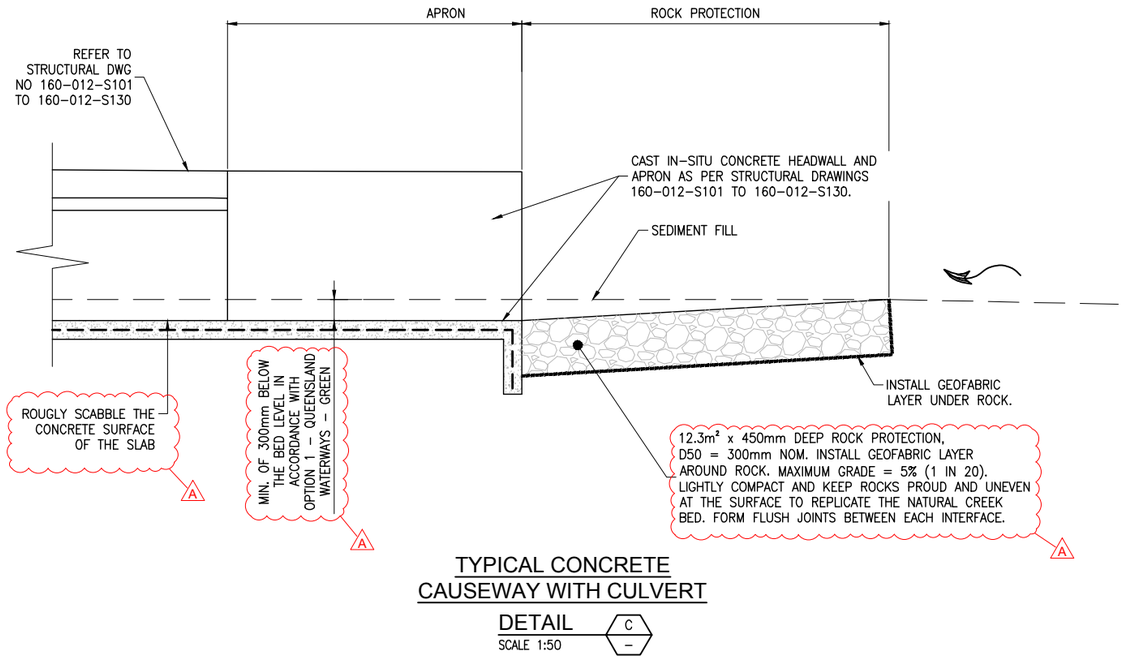
DRAWING NO 160-012-C107
SIZE A3
REVISION A



TYPICAL CONCRETE CAUSEWAY WITH CULVERT DETAIL

B

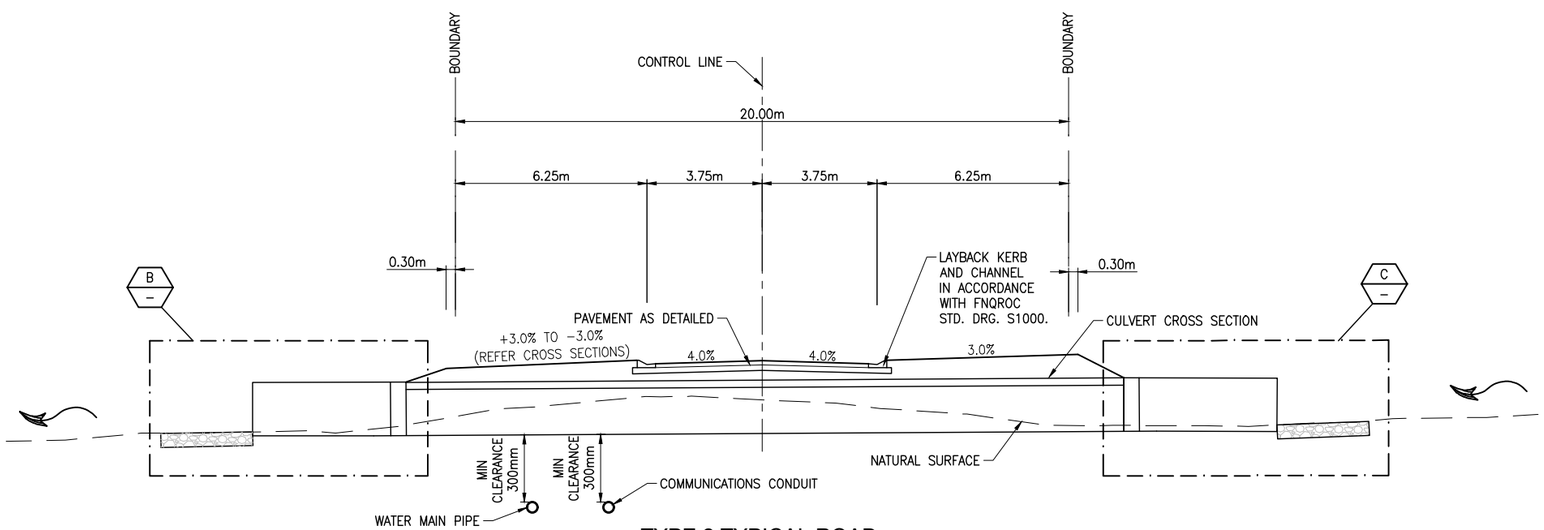
SCALE 1:50



TYPICAL CONCRETE CAUSEWAY WITH CULVERT DETAIL

C

SCALE 1:50



TYPE 2 TYPICAL ROAD CROSS SECTION DETAIL

A

C103

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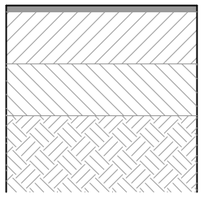


PRIMER, PLUS 2 COAT SPRAYED BITUMEN SEAL (16mm/10mm AGGREGATE)

110mm BASE, TYPE 2.2 MINIMUM CBR 60% COMPACTED TO 100% SRDD.

140mm SUB BASE, TYPE 2.3 MINIMUM CBR 45% COMPACTED TO 100% SRDD.

SUB-GRADE CBR 7% (ASSUMED) COMPACTED TO 98% SRDD. (CBR TO BE CONFIRMED BY TAKING SAMPLES AT 100m INTERVALS, MINIMUM OF 3).

PAVEMENT DETAIL

N.T.S.

GENERAL NOTES:

1. CONCRETE CYLINDER TESTS TO BE PROVIDED FOR ALL LOTS.
2. HOLD POINTS: STEEL INSPECTION AND APPROVAL BY SUPERINTENDENT PRIOR TO ALL CONCRETE POURS.

PAVEMENT NOTES:

1. THE SUB-BASE LAYER SHALL EXTEND A MINIMUM OF 150MM BEHIND THE REAR FACE OF THE KERB AND CHANNEL.
2. THE BASE AND SURFACING SHALL EXTEND TO THE FACE OF ANY KERBING. WHERE THE TOP SURFACE OF THE SUB-BASE LAYER IS BELOW THE LEVEL OF THE UNDERSIDE OF THE KERB AND CHANNEL, THE BASE LAYER SHALL ALSO EXTEND A MINIMUM OF 150MM BEHIND THE REAR FACE OF THE KERB AND CHANNEL.
3. SUBGRADE CBR RESULTS AND FINAL PAVEMENT DESIGN ARE TO BE SUBMITTED TO COUNCIL FOR APPROVAL PRIOR TO PLACEMENT OF GRAVEL.

PRINT IN COLOUR

FOR COUNCIL APPROVAL

PLOT DATE:30/10/2025 2:31:02 PM
FILE LOCATION:X:\160 Conmat\012 Country Rd Stage 3-5 Culvert\Drawings\160-012-C108 TYPICAL CROSS SECTION DETAILS.dwg

REVISIONS

NO.	DATE	DESCRIPTION	DESIGN	APPROVED
A	30/10/25	GREEN WATERWAY NOTES	MF	JM
2	21/03/25	REDUCED CULVERT LENGTH	MG	
1	13/03/25	INITIAL ISSUE		

ERSCON CONSULTING ENGINEERS

CLIENT: CONMAT CONSTRUCTION MATERIALS

SCALE
1:200 0 1 2 3 4 5 6 A3
1:50 0 0.25 0.5 0.75 1.0 1.25 1.50 A3
ALL DIMENSIONS IN METRES UNLESS NOTED OTHERWISE

DRAWN	MG	DESIGNED	MF
DRAWN APPROVED	MF	DESIGN APPROVED	JM

CIVIL SIGNOFF APPROVAL

DATE: 02/06/25 RPEQ: 05085

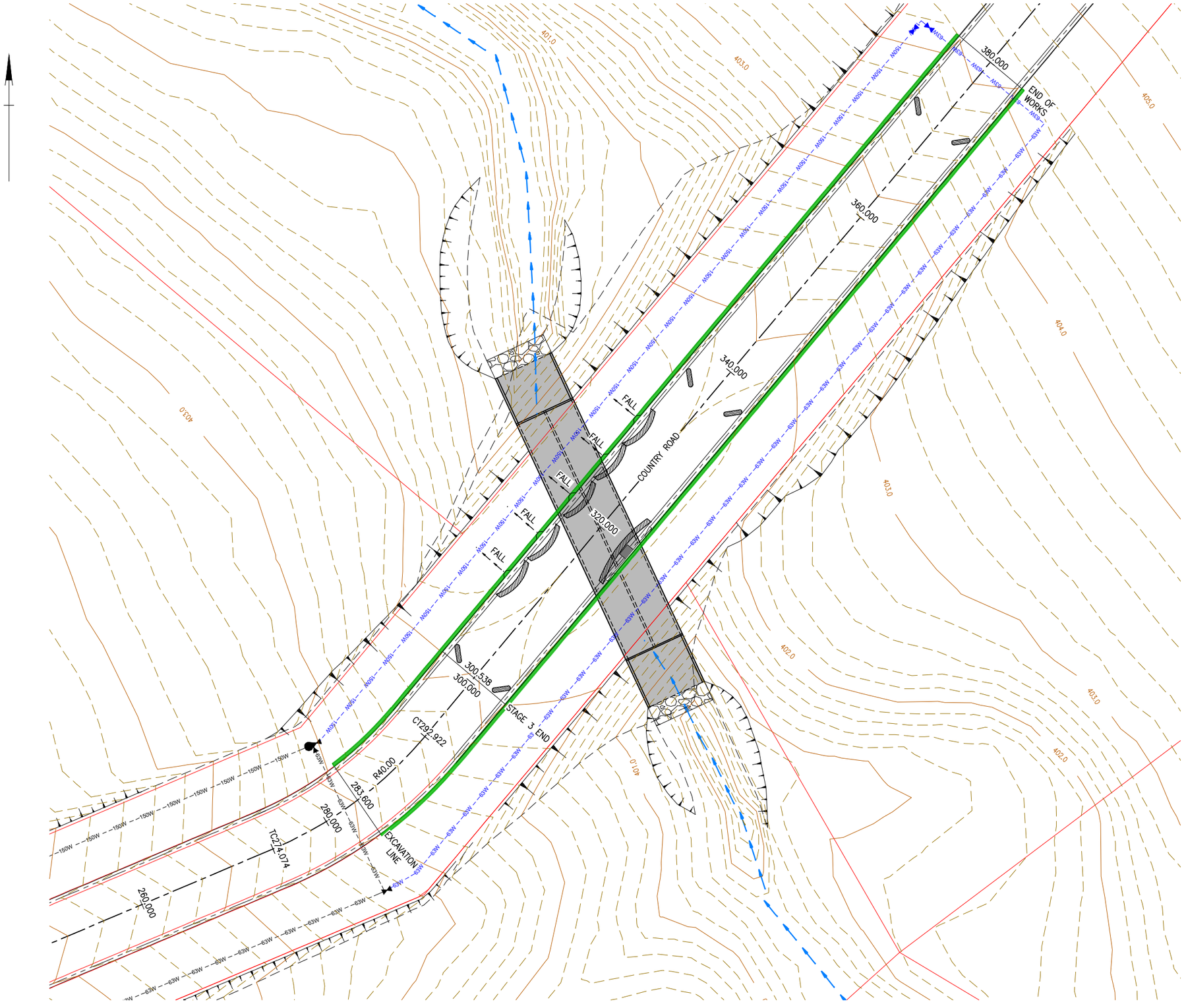
PROJECT REF: COUNTRY ROAD ESTATE
COUNTRY ROAD CULVERT CROSSING

DRAWING REF: TYPICAL ROAD CROSS SECTION AND DETAILS

DRAWING NO: 160-012-C108

SIZE: A3

REVISION: A



LEGEND

- PROPERTY BOUNDARY
- EXISTING WATER FLOW
- TOE OF BATTER
- TOP OF BATTER
- ROAD CENTERLINE
- 1.0 MAJOR CONTOURS (1m INTERVAL)
- MINOR CONTOURS (0.2m INTERVAL)
- 63W EXISTING Ø63 uPVC WATER MAIN
- 150W EXISTING Ø150 uPVC WATER MAIN
- 63W PROPOSED Ø63 uPVC WATER MAIN (CLASS 16)
- 150W PROPOSED Ø150 uPVC WATER MAIN (CLASS 16)
- GRATED KERB INLET PIT WITH SAND BAG SURROUND IN ACCORDANCE WITH FNQROC STD DWG S5000.
- TEMPORARY ROCK/SHAKER GRID
- PROPOSED TURF
- PROPOSED HYDROMULCH
- PROPOSED GRASS/DRILL SEED
- SEDIMENT FENCING
- ROCK FILTER DAM
- SAND BAG CHECK DAM.
- TURF BATTER CHUTE

PRINT IN COLOUR

FOR COUNCIL APPROVAL

PLOT DATE:30/10/2025 12:10:25 PM
FILE LOCATION:X:\160 Conmat\012 Country Rd Stage 3-5 Culvert\Drawings\160-012-C109 ESCP.dwg

REVISIONS				
NO.	DATE	DESCRIPTION	DESIGN	APPROVED
A	30/10/25	COUNCIL ISSUE	MF	JM
1	24/03/25	INITIAL ISSUE		

ERSCON CONSULTING ENGINEERS

CLIENT: CONMAT CONSTRUCTION MATERIALS

SCALE: 1:400 0 2 4 6 8 10 12 A3

ALL DIMENSIONS IN METRES UNLESS NOTED OTHERWISE

DRAWN	MG	DESIGNED	MF
DRAWN APPROVED	MF	DESIGN APPROVED	JM

CIVIL SIGNOFF APPROVAL

DATE: 02/06/25 RPEQ: 05085

PROJECT REF: COUNTRY ROAD ESTATE
COUNTRY ROAD CULVERT CROSSING

DRAWING REF: EROSION AND SEDIMENT CONTROL PLAN

DRAWING NO: 160-012-C109 | SIZE: A1 | REVISION: A

SEDIMENT FENCE

MATERIAL

FABRIC:
POLYPROPYLENE, POLYAMIDE, NYLON, POLYESTER, OR POLYETHYLENE WOVEN OR NON-WOVEN FABRIC, AT LEAST 700mm IN WIDTH AND A MINIMUM UNIT WEIGHT OF 140GSM. ALL FABRICS TO CONTAIN ULTRAVIOLET INHIBITORS AND STABILISERS TO PROVIDE A MINIMUM OF 6 MONTHS OF USEABLE CONSTRUCTION LIFE (ULTRAVIOLET STABILITY EXCEEDING 70%).

FABRIC REINFORCEMENT:
WIRE OR STEEL MESH MINIMUM 14-GAUGE WITH A MAXIMUM MESH SPACING OF 200mm.

SUPPORT POSTS/STAKES:
1500mm² (MIN) HARDWOOD, 2500mm² (MIN) SOFTWOOD, OR 1.5kg/m (MIN) STEEL STAR PICKETS SUITABLE FOR ATTACHING FABRIC.

INSTALLATION

1. REFER TO APPROVED PLANS FOR LOCATION, EXTENT AND REQUIRED TYPE OF FABRIC (IF SPECIFIED). IF THERE ARE QUESTIONS OR PROBLEMS WITH THE LOCATION, EXTENT, FABRIC TYPE, OR METHOD OF INSTALLATION CONTACT THE ENGINEER OR RESPONSIBLE ON-SITE OFFICER FOR ASSISTANCE.
2. TO THE MAXIMUM DEGREE PRACTICAL, AND WHERE THE PLANS ALLOW, ENSURE THE FENCE IS LOCATED:
   i. TOTALLY WITHIN THE PROPERTY BOUNDARIES;
   ii. ALONG A LINE OF CONSTANT ELEVATION WHEREVER PRACTICAL;
   iii. AT LEAST 2m FROM THE TOE OF ANY FILLING OPERATIONS THAT MAY RESULT IN SHIFTING SOIL/FILL DAMAGING THE FENCE.
3. INSTALL RETURNS WITHIN THE FENCE AT MAXIMUM 20m INTERVALS IF THE FENCE IS INSTALLED ALONG THE CONTOUR, OR 5 TO 10m MAXIMUM SPACING (DEPENDING ON SLOPE) IF THE FENCE IS INSTALLED AT AN ANGLE TO THE CONTOUR. THE 'RETURNS' SHALL CONSIST OF EITHER:
   i. V-SHAPED SECTION EXTENDING AT LEAST 1.5m UP THE SLOPE; OR
   ii. SANDBAG OR ROCK/AGGREGATE CHECK DAM A MINIMUM 1/3 AND MAXIMUM 1/2 FENCE HEIGHT, AND EXTENDING AT LEAST 1.5m UP THE SLOPE.
4. ENSURE THE EXTREME ENDS OF THE FENCE ARE TURNED UP THE SLOPE AT LEAST 1.5m, OR AS NECESSARY, TO MINIMISE WATER BYPASSING AROUND THE FENCE.
5. ENSURE THE SEDIMENT FENCE IS INSTALLED IN A MANNER THAT AVOIDS THE CONCENTRATION OF FLOW ALONG THE FENCE, AND THE UNDESIRABLE DISCHARGE OF WATER AROUND THE ENDS OF THE FENCE.
6. IF THE SEDIMENT FENCE IS TO BE INSTALLED ALONG THE EDGE OF EXISTING TREES, ENSURE CARE IS TAKEN TO PROTECT THE TREES AND THEIR ROOT SYSTEMS DURING INSTALLATION OF THE FENCE. DO NOT ATTACH THE FABRIC TO THE TREES.
7. UNLESS DIRECTED BY THE SITE SUPERVISOR OR THE APPROVED PLANS, EXCAVATE A 200mm WIDE BY 200mm DEEP TRENCH ALONG THE PROPOSED FENCE LINE, PLACING THE EXCAVATED MATERIAL ON THE UP-SLOPE SIDE OF THE TRENCH.
8. ALONG THE LOWER SIDE OF THE TRENCH, APPROPRIATELY SECURE THE STAKES INTO THE GROUND SPACED NO GREATER THAN 3m IF SUPPORTED BY A TOP SUPPORT WIRE OR WEIR MESH BACKING, OTHERWISE NO GREATER THAN 2m.
9. IF SPECIFIED, SECURELY ATTACH THE SUPPORT WIRE OR MESH TO THE UP-SLOPE SIDE OF THE STAKES WITH THE MESH EXTENDING AT LEAST 200mm INTO THE EXCAVATED TRENCH, ENSURE THE MESH AND FABRIC IS ATTACHED TO THE UP-SLOPE SIDE OF THE STAKES EVEN WHEN DIRECTING A FENCE AROUND A CORNER OR SHARP CHANGE OF DIRECTION.
10. WHEREVER POSSIBLE, CONSTRUCT THE SEDIMENT FENCE FROM A CONTINUOUS ROLL OF FABRIC. TO JOIN FABRIC EITHER:
    i. ATTACH EACH END TO TWO OVERLAPPING STAKES WITH THE FABRIC FOLDING AROUND THE ASSOCIATED STAKE ONE TURN, AND WITH THE TWO STAKES TIED TOGETHER WITH WIRE; OR
    ii. OVERLAP THE FABRIC TO THE NEXT ADJACENT SUPPORT POST.
11. SECURELY ATTACH THE FABRIC TO THE SUPPORT POSTS USING 25 X 12.5mm STAPLES, OR TIE WIRE AT MAXIMUM 150mm SPACING.
12. SECURELY ATTACH THE FABRIC TO THE SUPPORT WIRE/MESH (IF ANY) AT A MAXIMUM SPACING OF 1m.
13. ENSURE THE COMPLETED SEDIMENT FENCE IS AT 450mm, BUT NOT MORE THAN 700mm HIGH. IF A SPILL-THOUGH WEIR IS INSTALLED, ENSURE THE CREST OF THE WEIR IS AT LEAST 300mm ABOVE GROUND LEVEL.
14. BACKFILL THE TRENCH AND TAMP THE FILL TO FIRMLY ANCHOR THE BOTTOM OF THE FABRIC AND MESH TO PREVENT WATER FROM FLOWING UNDER THE FENCE.

ADDITIONAL REQUIREMENTS FOR THE INSTALLATION OF SPILL-THROUGH WEIR

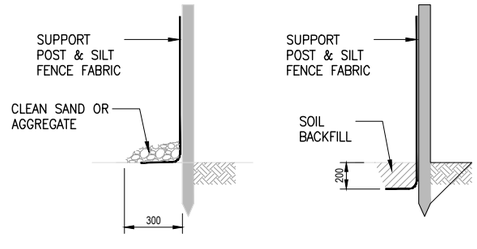
15. LOCATE THE SPILL -THROUGH WEIR SUCH THAT THE WEIR CREST WILL BE LOWER THAN THE GROUND LEVEL AT EACH END OF THE FENCE.
16. ENSURE THE CREST OF THE SPILL-THROUGH WEIR IS AT LEAST 300mm THE GROUND ELEVATION.
17. SECURELY TIE A HORIZONTAL CROSS MEMBER (WEIR) TO THE SUPPORT POSTS/STAKES EACH SIDE OF THE WEIR. CUT THE FABRIC DOWN THE SIDE OF EACH POST AND FOLD THE FABRIC OVER THE CROSS MEMBER AND APPROPRIATELY SECURE THE FABRIC.
18. INSTALL A SUITABLE SPLASH PAD AND/OR CHUTE IMMEDIATELY DOWN-SLOPE OF THE SPILL-THROUGH WEIR TO CONTROL SOIL EROSION AND APPROPRIATELY DISCHARGE THE CONCENTRATED FLOW PASSING OVER THE WEIR.

MAINTENANCE

19. INSPECT THE SEDIMENT FENCE AT LEAST WEEKLY AND AFTER ANY SIGNIFICANT RAIN. MAKE NECESSARY REPAIRS IMMEDIATELY.
20. REPAIR ANY TORN SECTIONS WITH A CONTINUOUS PIECE OF FABRIC FROM POST TO POST.
21. WHEN MAKING REPAIRS, ALWAYS RESTORE THE SYSTEM TO ITS ORIGINAL CONFIGURATION UNLESS AN AMENDED LAYOUT IS REQUIRED OR SPECIFIED.
22. IF THE FENCE IS SAGGING BETWEEN STAKES, INSTALL ADDITIONAL SUPPORT POSTS.
23. REMOVE ACCUMULATED SEDIMENT IF THE SEDIMENT DEPOSIT EXCEEDS A DEPTH OF 1/3 THE HEIGHT OF THE FENCE.
24. DISPOSE OF SEDIMENT IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.
25. REPLACE THE FABRIC IS THE SERVICE LIFE OF THE EXISTING FABRIC EXCEEDS 6 MONTHS.

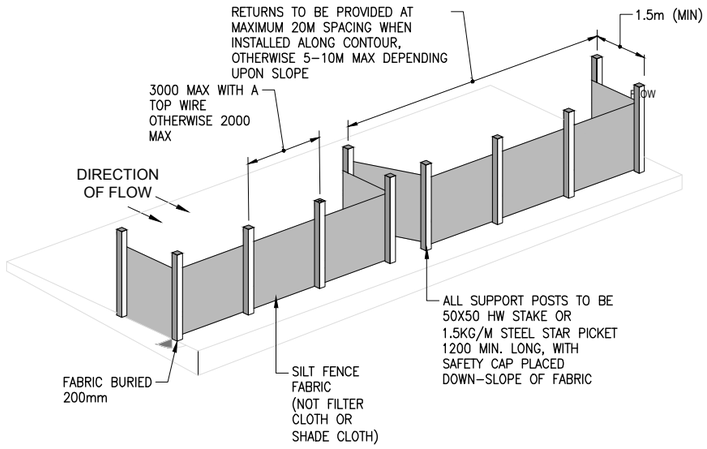
REMOVAL

26. WHEN DISTURBED AREAS UP-SLOPE OF THE SEDIMENT FENCE ARE SUFFICIENTLY STABILISED TO RESTRAIN EROSION, THE FENCE MUST BE REMOVED.
27. REMOVE MATERIALS AND COLLECTED SEDIMENT AND DISPOSE OF IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.
28. REHABILITATE/REVEGETATE THE DISTURBED GROUND AS NECESSARY TO MINIMISE THE EROSION HAZARD.



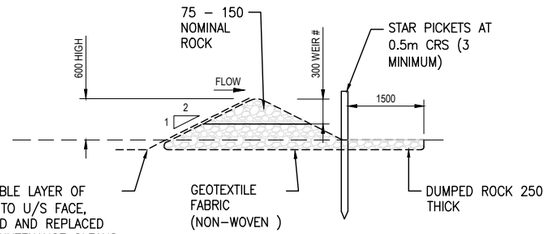
ANCHORING BASE OF FABRIC

NOT TO SCALE



SEDIMENT FENCE

NOT TO SCALE



ROCK FILTER DAM

NOT TO SCALE

MATERIALS

ROCK:
75 TO 150mm NOMINAL DIAMETER, HARD, EROSION RESISTANT ROCK.

GEOTEXTILE FABRIC:
HEAVY-DUTY, NEEDLE-PUNCHES, NON-WOVEN FILTER CLOTH ('BIDIM' A24 OR EQUIVALENT).

INSTALLATION

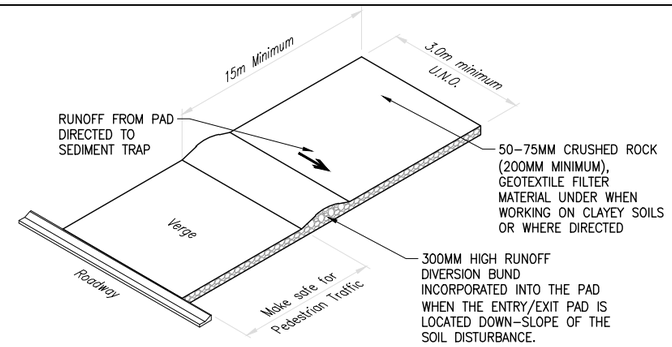
1. REFER TO APPROVED PLANS FOR LOCATION AND INSTALLATION DETAILS. IF THERE ARE QUESTIONS OR PROBLEMS WITH THE LOCATION OR METHOD OF INSTALLATION, CONTACT THE ENGINEER OR RESPONSIBLE ON-SITE OFFICER FOR ASSISTANCE.
2. PRIOR TO PLACEMENT OF THE FILTER DAM, ENSURE THE TYPE AND SIZE OF EACH CHECK DAMS WILL NOT CAUSE A SAFETY HAZARD OR CAUSE WATER TO SPILL OUT OF THE DRAIN.
3. CONSTRUCT THE FILTER DAM TO THE DIMENSIONS AND PROFILE SHOWN WITHIN THE APPROVED PLAN.
4. WHERE SPECIFIED, THE FILTER DAM SHALL BE CONSTRUCTED ON A SHEET OF GEOTEXTILE FABRIC USED AS A DOWNSTREAM SPLASH PAD.

MAINTENANCE

1. INSPECT EACH FILTER DAM AND THE DRAINAGE CHANNEL AT LEAST WEEKLY AND AFTER RUNOFF-PRODUCING RAINFALL.
2. CHECK FOR DISPLACEMENT OF THE FILTER DAM
3. CHECK FOR SOIL SCOUR AROUND THE ENDS OF THE FILTER DAM. IF SUCH EROSION IS OCCURRING, CONSIDER EXTENDING THE WIDTH OF THE FILTER DAM TO AVOID SUCH PROBLEMS.
4. IF SEVERE SOIL EROSION OCCURS EITHER UNDER OR AROUND THE FILTER DAM, THEN SEEK EXPERT ADVICE ON AN ALTERNATIVE TREATMENT MEASURE.
5. REMOVE AND SEDIMENT ACCUMULATED BY THE FILTER DAM, UNLESS IT IS INTENDED THAT THIS SEDIMENT WILL REMAIN WITHIN THE CHANNEL.
6. DISPOSE OF COLLECTED SEDIMENT IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.
7. REPLACE GEOFABRIC LAYER ON UPSTREAM FACE WITH A CLEAN LAYER AS REQUIRED.

REMOVAL

1. WHEN CONSTRUCTION WORK WITHIN THE DRAINAGE AREA ABOVE THE FILTER DAM HAS BEEN COMPLETED, AND THE DISTURBED AREAS AND THE DRAINAGE CHANNEL ARE SUFFICIENTLY STABILISED TO RESTRAIN EROSION, ALL TEMPORARY CHECK DAMS MUST BE REMOVED.
2. REMOVE THE FILTER DAM AND ASSOCIATED SEDIMENT AND DISPOSE OF IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.



TEMPORARY ROCK/SHAKER GRID

NOT TO SCALE

MATERIAL

ROCK:
WELL GRADED, HARD, ANGULAR, EROSION RESISTANT ROCK, NOMINAL DIAMETER OF 50 TO 75mm (SMALL DISTURBANCES) OR 100 TO 150mm (LARGE DISTURBANCES). ALL REASONABLE MEASURES MUST BE TAKEN TO OBTAIN ROCK OF NEAR UNIFORM SIZE.

FOOTPATH STABILISING AGGREGATE:
25 TO 50mm GRAVEL OR AGGREGATE.

GEOTEXTILE FABRIC:
HEAVY-DUTY, NEEDLE-PUNCHES, NON-WOVEN FILTER CLOTH ('BIDIM' A24 OR EQUIVALENT).

INSTALLATION

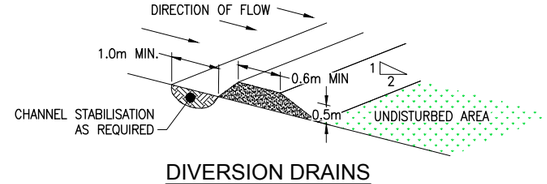
1. REFER TO APPROVED PLANS FOR LOCATION AND DIMENSIONAL DETAILS. IF THERE ARE QUESTIONS OR PROBLEMS WITH THE LOCATION, DIMENSIONS, OR METHOD OF INSTALLATION, CONTACT THE ENGINEER OR RESPONSIBLE ON-SITE OFFICER FOR ASSISTANCE.
2. CLEAR THE LOCATION OF THE ROCK PAD, REMOVING STUMPS, ROOTS AND OTHER VEGETATION TO PROVIDE A FIRM FOUNDATION SO THAT THE ROCK IS NOT PRESSED INTO SOFT GROUND. CLEAR SUFFICIENT WIDTH TO ALLOW PASSAGE OF LARGE VEHICLES, BUT CLEAR ONLY THAT NECESSARY FOR THE EXIT. DO NOT CLEAR ADJACENT AREAS UNTIL THE REQUIRED EROSION AND SEDIMENT CONTROL DEVICES ARE IN PLACE.
3. IF THE EXPOSED SOIL IS SOFT, PLASTIC OR CLAYEY, PLACE A SUB-BASE OF CRUSHED ROCK OR A LAYER OF HEAVY-DUTY FILTER CLOTH TO PROVIDE A FIRM FOUNDATION.
4. PLACE THE ROCK PAD FORMING A MINIMUM 200mm THICK LAYER OF CLEAN, OPEN-VOID ROCK.
5. IF THE ASSOCIATED CONSTRUCTION SITE IS UP-SLOPE OF THE ROCK PAD, THUS CAUSING STORMWATER RUNOFF TO FLOW TOWARDS THE ROCK PAD, THEN FORM A MINIMUM 300mm HIGH FLOW CONTROL BERM ACROSS THE ROCK PAD TO DIVERT SUCH RUNOFF TO A SUITABLE SEDIMENT TRAP.
6. THE LENGTH OF THE ROCK PAD SHOULD BE AT LEAST 15M WHERE PRACTICABLE, AND AS WISE AS THE FULL WIDTH OF THE ENTRY OR EXIT AND AT LEAST 3m. THE ROCK PAD SHOULD COMMENCE AT THE EDGE OF THE OFF-SITE SEALED ROAD OR PAVEMENT.
7. FLARE THE END OF THE ROCK PAD WHERE IT MEETS THE PAVEMENT SO THAT THE WHEELS OF TURNING VEHICLES DO NOT TRAVEL OVER UNPROTECTED SOIL.
8. IF THE FOOTPATH IS OPEN TO PEDESTRIAN MOVEMENT, THE COVER THE COARSE ROCK WITH FINE AGGREGATE OR GRAVEL, OR OTHERWISE TAKE WHATEVER MEASURES ARE NEEDED TO MAKE THE AREA SAFE.

MAINTENANCE

9. INSPECT ALL SITE ENTRY AND EXIT POINTS PRIOR TO FORECAST RAIN, DAILY DURING EXTENDED PERIODS OF RAINFALL, AFTER RUNNOFF-PRODUCING RAINFALL, OR OTHERWISE AT FORTNIGHTLY INTERVALS.
10. IF SAND, SOIL, SEDIMENT OR MUD IS TRACKED OR WASHED ONTO THE ADJACENT SEALED ROADWAY, THEN SUCH MATERIAL MUST BE PHYSICALLY REMOVED, FIRST USING A SQUARE-EDGED SHOVEL, AND THEN A STIFF-BRISTLED BROOM, AND THEN BY A MECHANICAL VACUUM UNIT, IF AVAILABLE.
11. IF NECESSARY FOR SAFETY REASONS, THE ROADWAY SHALL ONLY BE WASHED CLEAN AFTER ALL REASONABLE EFFORTS HAVE BEEN TAKEN TO SHOVEL AND SWEEP THE MATERIAL FROM THE ROADWAY.
12. WHEN THE VOIDS BETWEEN THE ROCK BECOMES FILLED WITH MATERIAL AND THE EFFECTIVENESS OF THE ROCK PAD IS REDUCED TO A POINT WHERE SEDIMENT IS BEING TRACKED OFF THE SITE. A NEW 100MM LAYER OF ROCK MUST BE ADDED AND/OR THE ROCK PAD MUST BE EXTENDED.
13. ENSURE ANY ASSOCIATED DRAINAGE CONTROL MEASURES (e.g. FLOW CONTROL BERM) ARE MAINTAINED IN ACCORDANCE WITH THEIR DESIRED OPERATIONAL CONDITIONS.
14. DISPOSE OF SEDIMENT AND DEBRIS IN A MANNER THAT WILL NOT CREATE AN EROSION OR POLLUTION HAZARD.

REMOVAL

1. THE ROCK PAD SHOULD BE REMOVED ONLY AFTER IT IS NO LONGER NEEDED AS A SEDIMENT TRAP.
2. REMOVE MATERIALS AND COLLECTED SEDIMENT AND DISPOSE OF IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.
3. RE-GRADE AND STABILISE THE DISTURBED GROUND AS NECESSARY TO MINIMISE THE EROSION HAZARD.



DIVERSION DRAINS

NOT TO SCALE

MAINTENANCE

1. SHOULD BE CHECKED WEEKLY
2. EXCESSIVE SEDIMENT SHOULD BE REMOVED TO AVOID PONDING
3. REPAIR ANY SLUMPS OR DAMAGE

SPACING

1. THE SPACING OF CATCH DRAINS DOWN EXPOSED SLOPES SHOULD NOT EXCEED THE DISTANCE DEFINED BY:

MAXIMUM SPACING ≈ 48 [LOG(H)] - 25 METRES
≡ 71 - 48 [LOG(% SLOPE)] METRES
WHERE: H IS THE HORIZONTAL SLOPE COMPONENT AS DEFINED BY H(H):1(V) AND (% SLOPE)= 100/H

FOR COUNCIL APPROVAL

PRINT IN COLOUR

NO.	DATE	DESCRIPTION	DESIGN	APPROVED
A	30/10/25	COUNCIL ISSUE		
1	24/03/25	INITIAL ISSUE		

REVISIONS

ERSCON CONSULTING ENGINEERS

CLIENT: CONMAT CONSTRUCTION MATERIALS

SCALE: NTS

ALL DIMENSIONS IN METRES UNLESS NOTED OTHERWISE

DRAWN	MG	DESIGNED	MF
DRAWN APPROVED	MF	DESIGN APPROVED	JM

CIVIL SIGNOFF APPROVAL

DATE: 02/06/25 RPEQ: 05085

PROJECT REF: COUNTRY ROAD ESTATE
COUNTRY ROAD CULVERT CROSSING

DRAWING REF: EROSION AND SEDIMENT CONTROL NOTES

DRAWING NO: 160-012-C110 | SIZE: A3 | REVISION: A

PLOT DATE:30/10/2025 12:10:47 PM
FILE LOCATION:X:\160 Conmat\012 Country Rd Stage 3-5 Culvert\Drawings\160-012-C110 ESC NOTES.dwg

WORKPLACE HEALTH AND SAFETY DESIGN REPORT

THESE NOTES SHOULD BE READ AND UNDERSTOOD BY ALL INVOLVED IN THIS PROJECT.
THIS INCLUDES (BUT IS NOT LIMITED TO): DESIGNERS, CLIENT, OWNER, OWNER BUILDER, PRINCIPAL CONTRACTOR, SUB-CONTRACTORS, TRADE CONTRACTORS, CONSULTANTS, MAINTENANCE WORKERS, DEMOLISHERS, GENERAL WORKERS AND ANY PERSON CONDUCTING A BUSINESS OR UNDERTAKING (PCBU) ON THIS PROJECT.

GENERAL

1. ANY CHANGES TO THE SPECIFICATIONS OF THE STRUCTURAL DESIGN OR LOADING OF THE STRUCTURE BEFORE, DURING OR AFTER CONSTRUCTION MUST BE APPROVED BY THE STRUCTURAL ENGINEER OR AN APPROPRIATELY QUALIFIED ENGINEER BEFORE PROCEEDING WITH ANY CONSTRUCTION OR ALTERATION WORKS.
2. PROPER PERSONAL PROTECTIVE EQUIPMENT (PPE) SHOULD BE PROVIDED, USED, WORN AND CURRENT AT ALL TIMES.
3. AN ADEQUATE FIRST AID KIT SHOULD BE PRESENT AND MAINTAINED ON SITE AT ALL TIMES.
4. NO UNIQUE/NON-TYPICAL BUILDING TECHNIQUES OR METHODS ARE REQUIRED FOR CONSTRUCTION, MAINTENANCE OR DEMOLITION OF THIS PROJECT. AS SUCH, A SAFETY-IN-DESIGN REVIEW BY THE ENGINEER HAS IDENTIFIED NO RISKS REQUIRING UNIQUE CONSIDERATION OR ACTION BEYOND THE REQUIREMENTS OF THE NATIONAL WORKPLACE HEALTH AND SAFETY ACT, THE WORKPLACE HEALTH AND SAFETY REGULATIONS AND INDUSTRY CODES OF PRACTICE.

SLIPS, TRIPS AND FALLS

1. CONSTRUCTION, CLEANING AND MAINTENANCE OF THIS BUILDING MAY REQUIRE PERSONS TO BE SITUATED WHERE A FALL IN EXCESS OF 1.4m IS POSSIBLE WHERE THIS ACTIVITY CANNOT BE AVOIDED, SCAFFOLDING, LADDERS, FALL BARRIERS AND/OR PPE SHOULD BE USED IN ACCORDANCE WITH THE RELEVANT GUIDELINES, REGULATIONS OR LEGISLATION. CARE SHOULD BE TAKEN TO PREVENT A FALL FROM ANY HEIGHT.
2. THE SITE SHOULD BE KEPT TIDY AND FREE OF TRIP HAZARDS AT ALL TIMES, INCLUDING DURING CONSTRUCTION, MAINTENANCE AND EVERYDAY USE.
3. ADEQUATE LIGHTING SHOULD BE PROVIDED AT ALL TIMES DURING CONSTRUCTION AND MAINTENANCE AND WHEN THE BUILDING IS BEING USED TO ENSURE SAFE WORKING CONDITIONS.
4. ACCESSWAYS AND PATHS SHOULD BE MONITORED AT ALL TIMES TO ENSURE SURFACES ARE KEPT FREE OF ANY OBJECTS THAT MAY CAUSE A SLIP OR TRIP HAZARD.

MANUAL TASKS

1. ANY ITEMS WITH A MASS GREATER THAN 25kg SHOULD BE LIFTED BY TWO OR MORE WORKERS, OR WITH THE AID OF A MECHANICAL LIFTING DEVICE. WHERE POSSIBLE, COMPONENTS SHOULD BE STORED IN A WAY WHICH MINIMISES THE NEED FOR BENDING BEFORE LIFTING.
2. ALL PORTABLE TOOLS USED DURING CONSTRUCTION, MAINTENANCE AND DEMOLITION OF THIS BUILDING SHOULD BE PROPERLY MAINTAINED IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS.

FALLING OBJECTS

1. CONSTRUCTION, MAINTENANCE OR DEMOLITION WORK ON OR AROUND THIS BUILDING IS LIKELY TO INVOLVE PERSONS WORKING ABOVE GROUND LEVEL. WHERE THIS OCCURS, ONE OR MORE OF THE FOLLOWING MEASURES SHOULD BE TAKEN TO PREVENT INJURY FROM FAILING OBJECTS.
   - PREVENT OR RESTRICT ACCESS TO AREAS BELOW WHERE THE WORK IS BEING CARRIED OUT BY THE USE OF APPROPRIATE BARRICADES.
   - PROVIDE TOE-BOARDS TO SCAFFOLDING OR WORK PLATFORMS.
   - PROVIDE MESH BARRICADES TO THE SIDE OF SCAFFOLDING OR WORK PLATFORMS.
   - PROVIDE PROTECTIVE STRUCTURES, HOARDING AND GANTRIES BELOW THE WORK AREA,
   - ENSURE ALL PERSONS BELOW THE WORK AREA HAVE SUITABLE PPE (HARD HATS, SAFETY FOOTWEAR, EYE PROTECTION ETC.) AND THAT IT IS USED CORRECTLY.
2. DURING CONSTRUCTION, RENOVATION OR DEMOLITION OF THIS BUILDING. PARTS OF THE STRUCTURE WILL REMAIN STANDING PRIOR TO OR AFTER SUPPORTING ELEMENTS ARE IN PLACE, CONTRACTORS SHOULD ENSURE THAT TEMPORARY BRACING OR OTHER REQUIRED SUPPORTS ARE IN PLACE AT ALL TIMES TO PREVENT COLLAPSE.
3. DURING CONSTRUCTION, RENOVATION, MAINTENANCE OR DEMOLITION MECHANICAL LIFTING OF MATERIALS MAY BE REQUIRED. WHERE SUCH LIFTING IS NECESSARY, ENSURE THAT APPROPRIATE LIFTING DEVICES ARE USED, THAT LOADS ARE APPROPRIATE AND ARE PROPERLY SECURED AND THAT ACCESS TO AREAS BELOW THE LOAD IS PREVENTED OR RESTRICTED.

PUBLIC ACCESS

1. PUBLIC ACCESS TO CONSTRUCTION AND DEMOLITION SITES AND AREAS UNDER MAINTENANCE CAN CAUSE RISK TO WORKERS AND THE PUBLIC. WARNING SIGNS AND BARRIERS SHOULD BE PROVIDED TO PREVENT UNAUTHORISED ACCESS. ELECTRICAL INSTALLATIONS, EXCAVATIONS, PLANT AND LOOSE MATERIAL SHOULD BE SECURED WHEN NOT FULLY SUPERVISED.

TRAFFIC MANAGEMENT

1. PARKING OF VEHICLES OR LOADING/UNLOADING OF VEHICLES ON THIS SITE/ROADWAY MAY CAUSE A TRAFFIC HAZARD. PARKING FOR WORKERS AND LOADING AREAS SHOULD BE PROVIDED AND SUPERVISED BY TRAINED TRAFFIC MANAGEMENT PERSONNEL.
2. CONSTRUCTION OF THIS BUILDING MAY REQUIRE LOADING AND UNLOADING OF MATERIALS ON THE ROADWAY. DELIVERIES SHOULD BE WELL PLANNED TO AVOID CONGESTION OF LOADING AREAS. LOADING AND UNLOADING SHOULD BE SUPERVISED BY TRAINED TRAFFIC MANAGEMENT PERSONNEL.
3. PLANT OPERATING ON THIS SITE MAY CAUSE A RISK OF COLLISION. A TRAFFIC MANAGEMENT PLAN SHOULD BE ADOPTED AND SUPERVISED BY TRAINED TRAFFIC MANAGEMENT PERSONNEL.
4. ANY TEMPORARY ROAD CLOSURES ARE TO COMPLY WITH ALL LOCAL GOVERNMENT REQUIREMENTS. THE PRINCIPAL CONTRACTOR IS TO COMPLETE ALL NECESSARY DOCUMENTATION FOR TRAFFIC MANAGEMENT, SIGNAGE, BARRICADES, TRAFFIC CONTROLLERS ETC.

SERVICES

1. UNDERGROUND SERVICES MAY BE PRESENT AT THIS SITE. ALL SERVICES SHOULD BE LOCATED (USING DIAL BEFORE YOU DIG AND A SPECIALIST CONTRACTOR) AND CLEARLY MARKED PRIOR TO ANY WORKS COMMENCING.

BEFORE YOU DIG www.1100.com.au

2. WHERE THERE IS A RISK OF WORKERS OF PLANT COMING INTO CONTACT WITH POWER LINES THEY SHOULD BE DISCONNECTED OR RELOCATED. WHERE THIS IS NOT POSSIBLE, POWER LINES SHOULD BE CLEARLY MARKED WITH BRIGHT COLOURED MARKERS AND SIGNAGE SHOULD BE PROVIDED AT GROUND LEVEL.
3. DURING RENOVATION AND MAINTENANCE WORK, ALL EXISTING SERVICES WITHIN THE WORK AREA SHOULD BE LOCATED PRIOR TO WORK COMMENCING. IF DISCONNECTION IS NOT POSSIBLE, SERVICES SHOULD BE CLEARLY MARKED TO AVOID ANY RISK OF CONTACT OR RUPTURE.
4. ANY TEMPORARY SERVICES ARE TO BE CLEARLY MARKED AND HAVE ALL NECESSARY PROTECTIVE COVERINGS FOR THE PROPER PERFORMANCE OF THE WORK IN ACCORDANCE WITH THE REQUIREMENTS OF THE RELEVANT AUTHORITIES.

HAZARDOUS SUBSTANCES

1. MANY MATERIALS USED IN THE CONSTRUCTION OF THIS BUILDING CAN CAUSE HARM IF INHALED OR HANDLED. PERSONS WORKING ON OR IN THE BUILDING DURING CONSTRUCTION, MAINTENANCE OR DEMOLITION SHOULD ENSURE GOOD VENTILATION AND WEAR PERSONAL PROTECTIVE EQUIPMENT INCLUDING PROTECTION AGAINST INHALATION WHILE USING POWDERED MATERIALS OR WHEN SANDING, DRILLING, CUTTING OR OTHERWISE DISTURBING OR CREATING POWDERED MATERIAL.
2. TREATED TIMBER MAY BE USED IN THIS BUILDING. DUST OR FUMES FROM THIS MATERIAL CAN BE HARMFUL. PERSONS WORKING ON OR IN THIS BUILDING DURING CONSTRUCTION, MAINTENANCE OR DEMOLITION SHOULD ENSURE GOOD VENTILATION AND WEAR APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT. DO NOT BURN TREATED TIMBER.
3. MANY TYPES OF GLUE, SOLVENTS, SPRAY PACKS, PAINTS, VARNISHES AND SOME CLEANING MATERIALS AND DISINFECTANTS HAVE DANGEROUS EMISSIONS. AREAS WHERE THESE ARE USED SHOULD BE KEPT WELL VENTILATED. PERSONAL PROTECTIVE EQUIPMENT MAY BE REQUIRED. THE MANUFACTURER'S RECOMMENDATIONS FOR USE MUST BE CAREFULLY CONSIDERED AT ALL TIMES.
4. IF IBREGLASS, ROCKWOOL, CERAMIC AND OTHER MATERIAL USED FOR THERMAL OR SOUND INSULATION MAY CONTAIN SYNTHETIC MINERAL FIBRE WHICH MAY BE HARMFUL IF INHALED OR IF IT COMES INTO CONTACT WITH THE SKIN, EYES OR OTHER SENSITIVE PARTS OF THE BODY. APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT SHOULD BE WORN AT ALL TIMES WHEN INSTALLING, REMOVING OR WORKING WITH SUCH MATERIALS.
5. AREAS WHERE TIMBER FINISHES ARE APPLIED SHOULD BE KEPT WELL VENTILATED DURING SANDING AND APPLICATION AND FOR A PERIOD AFTER INSTALLATION. PERSONAL PROTECTIVE EQUIPMENT MAY BE REQUIRED. THE MANUFACTURER'S RECOMMENDATIONS FOR USE MUST BE CAREFULLY CONSIDERED AT AI L TIMES.
6. WORKS INVOLVING EXPOSURE TO ASBESTOS SHALL ONLY BE CARRIED OUT BY LICENCED SPECIALISTS AND STRICTLY IN ACCORDANCE WITH THE WHS REGULATIONS.

OTHER HIGH-RISK ACTIVITY

1. ALL ELECTRICAL WORK SHOULD BE CARRIED OUT IN ACCORDANCE WITH THE *'CODE OF PRACTICE MANAGING ELECTRICAL RISKS AT THE WORKPLACE, AS/NZ 3012'* AND ALL LICENSING REQUIREMENTS. NEW ELECTRICAL INSTALLATION ON CONSTRUCTION AND DEMOLITION SITES MUST BE IN ACCORDANCE WITH THE WIRING RULES OF AS/NZS 3000 AND APPROPRIATE REQUIREMENTS OF AS/NZA 3012.
2. ALL WORK USING PLANT SHOULD BE CARRIED OUT IN ACCORDANCE WITH THE *'CODE OF PRACTICE MANAGING RISKS OF PLANT AT THE WORKPLACE'.*
3. ALL WORK SHOULD BE CARRIED OUT IN ACCORDANCE WITH THE *'CODE OF PRACTICE MANAGING NOISE AND PREVENTING HEARING LOSS AT WORK'.*
4. DUE TO THE HISTORY OF SERIOUS INCIDENTS, IT IS RECOMMENDED THAT PARTICULAR CARE BE EXERCISED WHEN UNDERTAKING ANY WORK INVOLVING STEEL CONSTRUCTION AND CONCRETE PLACEMENT.

FIRE FIGHTING

1. THE CLIENT/OWNER IS TO ENSURE THAT APPROPRIATE FIRE FIGHTING EQUIPMENT IS PROVIDED ON SITE DURING CONSTRUCTION AND MAINTAINED FOR THE LIFE OF THE BUILDING.
2. ALL FIRE FIGHTING EQUIPMENT IS TO BE PROVIDED AND MAINTAINED IN ACCORDANCE WITH THE RELEVANT AUSTRALIAN STANDARDS.

GENERAL WORKPLACE HEALTH AND SAFETY REQUIREMENTS

1. THE CLIENT/OWNER IS TO ENSURE THAT THE PRINCIPAL CONTRACTOR COMPLIES WITH ALL REQUIREMENTS OF THE NATIONAL WH&S ACT 2011, WORKPLACE HEALTH AND SAFETY REGULATIONS 2011 AND CODES OF PRACTICE DURING THE CONSTRUCTION OF THE BUILDING.
2. THE PRINCIPAL CONTRACTOR MEANS THE BUILDER WHO HAS OBTAINED THE BUILDING PERMIT AND WHOSE LICENCE NUMBER IS BEING USED FOR THE CONTRACT.
3. THE CLIENT/OWNER MUST ENSURE THAT THE PRINCIPAL CONTRACT COMPLETES A CONSTRUCTION WORKPLACE PLAN AS APPLICABLE UNDER THE WH&S LEGISLATION.
4. THE CLIENT/OWNER MUST ENSURE THAT THE PRINCIPAL CONTRACTOR AND ALL TRADE CONTRACTORS COMPLETE WORK METHOD STATEMENTS (WMS) AS APPLICABLE UNDER THE WH&S LEGISLSATION BEFORE ANY WORK COMMENCES.
5. THE CLIENT/OWNER MUST ENSURE THAT WORKERS HAVE A CURRENT GENERAL SAFETY INDUCTION (WHITE OR BLUE) CARD.
6. THE CLIENT/OWNER MUST ENSURE THAT THE PRINCIPAL CONTRACTOR CONDUCTS THE NECESSARY SITE-SPECIFIC INDUCTION AS REQUIRED BY WH&S LEGISLATION.
7. THE CLIENT/OWNER MUST ENSURE THAT THE PRINCIPAL CONTRACTOR HAS THE APPROPRIATE FIRST AID KITS AND THAT THEY ARE MAINTAINED AND KEPT ON SITE FOR THE DURATION OF THE CONSTRUCTION.
8. THE CLIENT/OWNER MUST ENSURE THAT THE PRINCIPAL CONTRACTOR, TRADE CONTRACTORS AND WORKERS MEET ALL OF THEIR WH&S OBLIGATIONS DURING CONSTRUCTION.
9. THE CLIENT/OWNER MUST ENSURE THAT THE PRINCIPAL CONTRACTOR AND TRADE CONTRACTORS ENSURE THAT ONLY EXPERIENCED, QUALIFIED, LICENSED PERSONS ARE EMPLOYED TO CARRY OUT THE WORK.
10. THE CLIENT/OWNER MUST ENSURE THAT THE PRINCIPAL CONTRACTOR HAS PUT IN PLACE THE WORKPLACE HEALTH AND SAFETY CONTROL MEASURES IN ACCORDANCE WITH WHA&S REGULATION FOR ALL HIGH RISK CONSTRUCTION WORK INCLUDING BUT NOT LIMITED TO: CONSTRUCTION SAFETY PLAN, WORK METHOD STATEMENTS, ROOF EDGE PROTECTION, SCAFFOLDS AND WORK PLATFORMS, WORK PLATFORMS ON TRESTLE LADDERS, FALL ARREST PLATFORMS, TRAVEL RESTRAINT SYSTEMS, FALL ARREST HARNESS SYSTEMS, STAIR VOID PROTECTION, BALCONY EDGE PROTECTION, INDUSTRIAL SAFETY NETS AND EXCAVATION FALLS PROTECTION.

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FOR COUNCIL APPROVAL

REVISIONS					
NO.	DATE	DESCRIPTION	DESIGN	APPROVED
3	21/08/25	COUNCIL APPROVAL	RQ	MF
2	30/06/25	DECK PANEL OPENINGS ADDED	RQ	MF
1	31/03/25	FOR COUNCIL APPROVAL	RQ	MF

ERSCON CONSULTING ENGINEERS

CLIENT: CONMAT CONSTRUCTION MATERIALS

SCALE: ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE

DRAWN	APPROVED
CS	RQ
DESIGN	APPROVED
RQ	RQ

STRUCTURAL SIGNOFF APPROVAL

DATE: 20/03/2025 RPEQ: 15306

PROJECT REF: COUNTRY ROAD ESTATE
COUNTRY ROAD CULVERT CROSSING

DRAWING REF: WORKPLACE HEALTH AND SAFTEY NOTES

DRAWING NO: 160-012-S101 | SIZE: A1 | REVISION: 3

3/11/2025 12:03:59 PM
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A. GENERAL NOTES

A1. THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH ALL OTHER PROJECT DRAWINGS, SPECIFICATIONS AND WITH SUCH OTHER WRITTEN INSTRUCTIONS AS MAY BE ISSUED DURING THE COURSE OF THE WORK. ALL DISCREPANCIES SHALL BE REFERRED FOR 'APPROVAL BY THE ENGINEER' BEFORE PROCEEDING WITH THE WORK.

A2. THE TERM 'ENGINEER' REFERRED TO IN THESE NOTES IS TAKEN TO MEAN THE CERTIFYING RPEQ ENGINEER WHOSE NAME APPEARS ON THE STRUCTURAL DESIGN CERTIFICATE ISSUED WITH THESE DRAWINGS.

A3. WHERE THE 'APPROVAL OF THE ENGINEER' IS SPECIFIED OR REQUIRED IN THESE NOTES, APPROVAL IS TO BE PROVIDED IN WRITING. SUBSTITUTIONS OR ADJUSTMENTS ARE NOT PERMITTED WITHOUT THE 'APPROVAL OF THE ENGINEER'.

A4. **WORKMANSHIP AND MATERIALS ARE TO BE IN ACCORDANCE WITH THE REQUIREMENTS OF FNQROC, STANDARDS AUSTRALIA CODES AND THE WORKPLACE HEALTH AND SAFETY ACT.** ALL LOCAL AND STATUTORY AUTHORITY'S REQUIREMENTS AND BYLAWS ARE TO BE ADHERED TO.

A5. **AS CONSTRUCTED DATA TO BE PREPARED BY THE CONTRACTOR AND SUBMITTED TO THE COUNCIL IN ACCORDANCE WITH FNQROC DEVELOPMENT MANUAL.**

A6. THE CONTRACTOR SHALL PROVIDE (TO THE CONTRACTOR'S COSTS AND CERTIFICATION) AND LEAVE IN PLACE UNTIL PERMANENT BRACING ELEMENTS ARE CONSTRUCTED, SUCH TEMPORARY BRACING ELEMENTS AS IS NECESSARY TO STABILIZE THE STRUCTURE AND ANY ADJACENT STRUCTURES DURING CONSTRUCTION, TRANSPORTATION, EXCAVATIONS AND ERECTION, ENSURING NO PART SHALL BE OVERSTRESSED DURING THESE ACTIVITIES.

A7. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE ALL EXISTING SERVICES ON THE SITE, SERVICES WHERE SHOWN ON THESE DRAWINGS ARE INDICATIVE LOCATIONS ONLY. THE CONTRACTOR IS TO RECTIFY IMMEDIATELY ANY OBSTRUCTION OR DAMAGE TO SUCH SERVICES AND PROVIDE TEMPORARY AND ADEQUATE SERVICES WHILST REPAIRS ARE CARRIED OUT.

A8. ANY DRAINAGE WORKS SHOWN ON THE STRUCTURAL DRAWINGS ARE INDICIATIVE ONLY AND DO NOT FORM PART OF ERSCON's STRUCTURAL CERTIFICATION, EXCEPT DRAINAGE BEHIND RETAINING WALLS. DRAINAGE WORKS ARE TO BE BY THE CIVIL ENGINEERING DOCUMENTATION.

A9. **INSPECTIONS** AND CERTIFICATION: THE INSPECTOR MUST BE A REGISTERED PROFESSIONAL ENGINEER OF QLD AND INSPECT AND CERTIFY ALL STRUCTURE RELATED CONSTRUCTION WORKS. CONTRACTOR TO ARRANGE REQUIRED INSPECTIONS FOR THE FOLLOWING **HOLD POINTS:**

1. **AFTER EXCAVATION TO NATURAL GROUND BEFORE CONSTRUCTING ANY SOIL IMPROVEMENT WORKS OR FILL. CONTRACTOR MUST PROVIDE DCP TEST RESULTS TO THE CERTIFYING ENGINEER LATEST AT THIS STAGE OF WORKS.**
2. **AFTER ANY SOIL IMPROVEMENT WORKS OR FILL HAS BEEN CONSTRUCTED AND BASE SLAB SET UP HAS NOT BEEN STARTED YET**
3. **AFTER COMPLETED SET UP OF FORMWORK FOR BASE SLAB AND/OR APRON SLAB AND PLACEMENT OF BASE SLAB REINFORCEMENT AND/OR HEAD WALL /WING WALLS STARTER BARS** (MIN. 24h BEFORE THE CONCRETE POUR)
4. **AFTER COMPLETED SET UP OF FORMWORK FOR THE CULVERT WALLS AND PLACEMENT OF THE WALL REINFORCEMENT. FURTHER WALL SECTION INSPECTIONS CAN BE DONE VIA PHOTOS PROVIDED BY THE BUILDER TO THE ENGINEER FOR APPROVAL 24h BEFORE THE CONCRETE POUR.**
5. **AFTER COMPLETED SET UP OF FORMWORK FOR THE WING WALLS AND PLACEMENT OF THE REINFORCEMENT** (MIN. 24h BEFORE THE CONCRETE POUR).
6. **AFTER COMPLETED SET UP OF FORMWORK FOR THE CULVERT DECK PANELS AND PLACEMENT OF THE REINFORCEMENT AND ALL ANCHILLARY ITEMS** (MIN. 24h BEFORE THE CONCRETE POUR).
7. **AFTER COMPLETED SET UP OF FORMWORK FOR THE HEAD WALL AND PLACEMENT OF THE REINFORCEMENT AND ALL ANCHILLARY ITEMS** (MIN. 24h BEFORE THE CONCRETE POUR).
8. **AFTER PLACEMENT OF THE CULVERT DECK PANELS AND THE HEAD WALL PANEL BUT BEFORE GROUTING OF THE CONNECTION POINTS OF THE DECK PANELS TO THE WALLS.**

A10. PERMISSION IS GIVEN TO COPY THESE PLANS FOR USE ON THIS SPECIFIC PROJECT ONLY. PLANS MAY ONLY BE REPRODUCED AS A COMPLETE SET AND MUST INCLUDE THE STRUCTURAL DESIGN CERTIFICATE.

A11. IF ANY PART OF THIS DOCUMENTATION IS UNCLEAR OR ILLEGIBLE, PLEASE CONTACT THIS OFFICE.

A12. DO NOT OBTAIN DIMENSIONS BY SCALING FROM THESE DRAWINGS.

A13. ABBREVIATIONS:

ABBR.	DESCRIPTION	ABBR	DESCRIPTION
CBR	CALIFORNIA BEARING RATIO	RCBC	REINFORCED CONCRETE BOXED
CL	CENTRE LINE	REIN	REINFORCEMENT
C.J.	CONSTRUCTION JOINT	S.C.	SAW CUT
CM	CONRETE MASONRY (BLOCKWORK)	SRDD	STANDARD RELATIVE DRY DENSITY
CRS	CENTRES	T.B.A	TO BE ADVISED
DCP	DYNAMIC CONE PENETROMETER	T/O	TOP OVER (REINFORCING LAYER)
E/W	EACH WAY (REINFORCING LAYERS)	T/U	TOP UNDER (REINFORCING LAYER)
HORI	HORIZONTAL	TYP	TYPICAL
MAX	MAXIMUM	ULS	ULTIMATE LIMIT STATE
MIN	MINIMUM	U.N.	UNLESS NOTED OTHERWISE
QA	QUALITY ASSURANCE	VERT	VERTICAL
RC	REINFORCED CONCRETE	WH&	WORKPLACE HEALTH & SAFETY

B. ELECTRONICALLY TRANSFERRED DRAWINGS

B1. *ERSCON* ACCEPTS NO RESPONSIBILITY FOR A DRAWING THAT HAS BEEN AMENDED IN ANY WAY BY OTHER PARTIES.

B2. ANY PART OF *ERSCON's* DRAWINGS COPIED FROM ELECTRONICALLY TRANSFERRED DRAWINGS BECOMES THE RESPONSIBILITY OF THE RECIPIENT TO DISTRIBUTE ONLY TO THE PARTICIPATING PARTIES AS COMPLETE SET OF DRAWINGS.

C. HEALTH & SAFETY

C1. THE CONTRACTOR SHALL DEVELOP, IMPLEMENT AND ADMINISTER A WORKPLACE HEALTH AND SAFETY PROGRAM THAT WILL ENSURE THAT ALL CONSTRUCTION ACTIVITIES ARE PERFORMED TO THE RELEVANT WORKPLACE HEALTH AND SAFETY REQUIREMENTS AND ANY OTHER RELEVANT STATUTORY REQUIREMENTS.

C2. THE WORKPLACE HEALTH AND SAFETY PROGRAM MUST BE COORDINATED WITH ADJOINING PROPERTY OWNERS AND ALL RELEVANT PARTIES AS NECESSARY TO ENSURE A SAFE BUILDING ENVIRONMENT AT ALL TIMES.

C3. CONTRACTOR TO ARRANGE THE DESIGN AND CERIFICATION OF ANY LIFTING ARRANGEMENT FOR ON-SITE PRECAST ELEMENTS BY A SUITABLY QUALIFIED ENGINEER.

C4. CONTRACTOR TO BE FULLY LICENSED & REGISTERED FOR THE TYPES OF CONSTRUCTION WORKS. WORKS TO BE UNDERTAKEN ONLY BY SUITABLY QUALIFIED/ TRAINED STAFF IN ACCORDANCE WITH THE MANUFACTURER's WH&S AND QA PROCEDURES.

D. DESIGN PARAMETERS AND SERVICE LOADS

D1. THE REINFORCED CONCRETE CULVERT STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH THE CURRENT ISSUES OF AS 5100.2-2017 BRIDGE DESIGN – DESIGN LOADS, AS 5100.5-2017 BRIDGE DESIGN – CONCRETE, AND STANDARDS MENTIONED WITHIN THOSE CODES AS APPLICABLE AND SUBSEQUENTLY THE DESIGN WILL SATISFY THE MINIMUM REQUIREMENTS SET OUT IN THE FNQROC DEVELOPMENT MANUAL VERSION 9.

D2. DESIGN CRITERIA AND ASSUMPTIONS USED IN THE DESIGN AMONGST OTHERS:

i. PERMANENT, IMPOSED AND OTHER ACTIONS TO AS/NZS 1170.0: 2002 AND AS/NZS 1170.1: 2002
ii. VEHICLE LOADING TO AS 5100.2
iii. EARTHQUAKE LOADS TO AS 1170.4: 2024
iv. EXPOSURE CLASSIFICATION, CONCRETE PROPERTIES & CURING, CONCRETE STRENGTH AND REINFORCEMENT COVER TO AS 5100.5

D3. THE CULVERT HAS BEEN DESIGNED FOR THE STANDARD ROAD TRAFFIC LOADS AS DEFINED IN AS5100.2.

D4. THE CULVERT HAS BEEN DESIGNED FOR AN EXPOSURE CLASSIFICATION B2.

D5. ALL THE ABOVE DO NOT INCLUDE LOADS WHICH MAY BE APPLIED DURING CONSTRUCTION. THE BUILDER IS TO MAINTAIN THE STABILITY OF THE STRUCTURE DURING CONSTRUCTION AT ALL TIMES.

E. SITE PREPARATIONS, EARTHWORKS AND FOUNDATION NOTES

E1. EARTHWORKS SHALL BE IN ACCORDANCE WITH AS3798 "GUIDELINES ON EARTHWORKS FOR COMMERCIAL AND RESIDENTIAL DEVELOPMENTS" AND AS FOLLOWS, AND SATISFY THE MINIMUM REQUIREMENTS SET OUT IN THE FNQROC DEVELOPMENT MANUAL SPECIFICATION 'S1 EARTHWORKS'.

E2. REFER TO THE 'GENERAL NOTES' OF THE CIVIL ENGINEERING DESIGN DOCUMENTION BY *ERSCON* CONSULTING ENGINEERS FOR FURTHER NOTES.

E3. **THE DESIGN OF THE STRUCTURE HAS BEEN BASED ON THE FOUNDATION HAVING A MINIMUM BEARING CAPACITY OF 150 kPa AND THE SOIL BEING OF GRANULAR TYPE.**

E4. BEFORE ANY CONSTRUCTION COMMENCES, THE SAFE BEARING CAPACITY OF THE GROUND AND SOIL PROPERTIES SHALL BE VERIFIED WITH A GEOTECHNICAL INVESTIGATION AND THE REPORT FORWARDED TO THE ENGINEER. IF THE BEARING PRESSURE AND SOIL TYPE IS ASSESSED AS BEING LESS AND DIFFERENT THAN ASSUMED, THE ENGINEER WILL NEED TO BE CONTACTED TO PROVIDE A SUITABLE AMENDED DESIGN.

E5. UNLESS NOTED OTHERWISE IN SPECIFICATIONS, THE BASE SLAB SHALL BE FOUNDED ON COMPACTED NATURAL GROUND INCLUDING THE FOUNDATION PREPARATION WORKS AS SPECIFIED ON THE CULVERT SECTION DRAWING. DO NOT PROVIDE A DAMP PROOF MEMBRANE UNDER THE BASE SLABS. MOISTEN GROUND BEFORE CONCRETE POUR.

E6. IF COMPACTED CONTROLLED FILL IS TO BE USED AS FOUNDING MATERIAL, THIS IS TO BE CONFIRMED WITH THE ENGINEER BEFORE CONSTRUCTION COMMENCES AND THE ENGINEER WILL NEED TO BE ASKED TO PROVIDE A SUITABLE DESIGN.

E7. DURING CONSTRUCTION THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING EXCAVATIONS IN STABLE CONDITIONS. PROTECT SURROUNDING PROPERTY AND SERVICES FROM ADVERSE EFFECTS OF GROUND WORKS. PROVIDE TEMPORARY WORKS AS REQUIRED. PROVIDE SHORING CERTIFIED BY SUITABLY QUALIFIED STRUCTURAL ENGINEER TO ALL DEEP EXCAVATIONS WHERE REQUIRED.

E8. KEEP EXCAVATIONS FREE OF WATER. PROVIDE ADEQUATE DRAINAGE TO ENSURE FOUNDATION IS NOT AFFECTED BY MOISTURE. PREVENT FOUNDATION DRYING OUT DUE TO EXPOSURE. PLACE BLINDING, FOOTINGS AND BACKFILL AS SOON AS PRACTICABLE AFTER EXCAVATION.

E9. STRIP BUILDING PLATFORM OF ALL TOPSOIL AND VEGETATION TO A MINIMUM DEPTH OF 150mm AND STOCKPILE. REMOVE ALL DELETERIOUS MATTER.

E10. ALL TREES AND LARGER VEGETATION SHALL BE KEPT MIN. 5m AWAY FROM THE CULVERT STRUCTURE.

E11. THE CONTRACTOR SHALL CHECK ALL EXCAVATIONS FOR ORGANIC MATERIAL AND RUBBISH. IF ANY OF THIS MATERIAL IS FOUND, IT SHALL BE REMOVED FROM THE WORKS TO A PLACE DESIGNATED BY THE SUPERINTENDENT.

E12. EXPOSURE OF EXCAVATED FOOTINGS SHALL BE MINIMISED TO PREVENT LOCALISED MOISTURE CHANGES DURING THE CONSTRUCTION PERIOD.

E13. TREE REMOVAL: WHERE A TREE IS REMOVED, EXCAVATE 200mm BELOW EXTENT OF ROOT BALL. COMPACT EXPOSED SURFACE TO 98% SRDD TO A DEPTH OF AT LEAST 250mm. PLACE APPROVED COMPACTED FILL AND REQUEST THE SPECIFICATION FROM THE ENGINEER BEFORE COMMENCING CONSTRUCTION.

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REVISIONS					
3	21/08/25	COUNCIL APPROVAL	RQ	MF
2	30/06/25	DECK PANEL OPENINGS ADDED	RQ	MF
1	31/03/25	FOR COUNCIL APPROVAL	RQ	MF
NO.	DATE	DESCRIPTION	DESIGN	APPROVED

ERSCON CONSULTING ENGINEERS

CLIENT: CONMAT CONSTRUCTION MATERIALS

SCALE: ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE

DRAWN: CS | APPROVED: RQ
DESIGN: RQ | APPROVED: RQ
STRUCTURAL SIGNOFF APPROVAL
DATE: 20/03/2025 RPEQ: 15306

PROJECT REF: COUNTRY ROAD ESTATE
COUNTRY ROAD CULVERT CROSSING
DRAWING REF: STRUCTURAL ENGINEERING NOTES
SHEET 1 OF 2
DRAWING NO: 160-012-S102 | SIZE: A1 | REVISION: 3

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E14. WHERE THE SUITABLE FOUNDING MATERIAL IS DEEPER THAN REQUIRED FOR THE FOOTING, THE EXCAVATION IS TO BE BACKFILLED WITH A WEAK MIX CONCRETE (N10) TO THE UNDERSIDE OF THE FOOTING BUT THIS IS TO BE CONFIRMED WITH THE ENGINEER BEFORE COMMENCING ANY BUILDING WORKS.

E15. **BACKFILLING** SHALL NOT TAKE PLACE UNTIL THE BASE SLAB AND THE CULVERT WALLS HAVE REACHED THEIR FULL 28-DAY CONCRETE STRENGTH AND THE DECK PANELS HAVE BEEN PLACED WITH THE GROUT FILLING OF THE CONNECTION POINTS HAVING ATTAINED MIN. 40 MPa STRENGTH.

F. CONCRETE AND REINFORCEMENT NOTES

F1. ALL WORKMANSHIP AND MATERIALS SHALL BE GENERALLY IN ACCORDANCE WITH AS3600 CONCRETE STRUCTURES AND AS5100 BRIDGE DESIGN, AND STANDARDS MENTIONED WITHIN THOSE DOCUMENTS AS APPLICABLE; AND SHALL SATISFY THE MINIMUM REQUIREMENTS SET OUT IN THE FNQROC DEVELOPMENT MANUAL SPECIFICATION 'S7 CONCRETE WORKS'.

F2. ALL FORMWORK SHALL BE IN ACCORDANCE WITH AS 3610 FORMWORK FOR CONCRETE.

F3. MINIMUM COVER TO ALL REINFORCEMENT SHALL BE 50mm EXCEPT WHERE CAST AGAINST GROUND IT SHALL BE 80mm.

F4. SIZES OF CONCRETE ELEMENTS DO NOT INCLUDE THICKNESS OF APPLIED FINISHES. ALL CONCRETE THICKNESSES SHOWN ARE MINIMUM STRUCTURAL REQUIREMENTS; NO REDUCTION IN THICKNESS DUE TO FALLS OR TOPPING IS PERMITTED. REFER CIVIL DRAWINGS FOR CONFIRMATION OF ALL SLAB FALLS AND STEPS.

F5. NO HOLES, CHASES OR EMBEDMENT OF PIPES OTHER THAN THOSE SHOWN ON THE STRUCTURAL DRAWINGS SHALL BE MADE IN CONCRETE MEMBERS WITHOUT PRIOR APPROVAL OF THE ENGINEER.

F6. WET CONCRETE TO BE UNIFORM, HOMOGENEOUS, COHESIVE AND ABLE TO WORK READILY INTO CORNERS AND AROUND REINFORCEMENT COMPLETELY FILLING FORMWORK WITHOUT SEGREGATION, EXCESS FREE WATER ON SURFACE, LOSS OF MATERIAL OR CONTAMINATION. CONCRETE TO HAVE GOOD DIMENSIONAL STABILITY AND ABLE TO RESIST PLASTIC SETTLEMENT CRACKING, THERMAL CRACKING AND SHRINKAGE CRACKING.

F7. USE CEMENTITIOUS MATERIALS LESS THAN SIX MONTHS OLD. USE BAGGED CEMENT IN ORDER OF RECEIPT.

F8. DO NOT ADD WATER TO CONCRETE AFTER TRUCK HAS LEFT BATCHING PLANT.

F9. CONSTRUCTION JOINTS SHALL BE LOCATED AND CONSTRUCTED AS PER THE DETAILS ON THE DRAWINGS.

F10. CONCRETE SHALL HAVE THE FOLLOWING PROPERTIES.

CONCRETE SPECIFICATION, U.N.O. ON DRAWINGS:

ELEMENT	GRADE	SLUMP	MAX AGGREGATE SIZE
CULVERT BASE SLAB, APRON SLAB, WALLS, WINGWALLS, DECK SLAB PANEL AND HEADWALLS	**S50**	80 +/-15	20 mm
	▪ **MIN. CEMENTITIOUS MATERIAL CONTENT 450 kg/m³** ▪ **MAX. THE WATER / CEMENT RATIO 0.4** ▪ **CURE CONCRETE CONTINUOUSLY FOR AT LEAST 14 DAYS** ▪ **MIN. 32 MPa CONCRETE STRENGTH AT TIME OF STRIPPING AND CURING** ▪ **RECOMMENDATION: ADD PENETRON ADMIX-SB OR XYPEX ADMIC C-Series TO THE CONCRETE AT TIME OF BATCHING AS PER THE DRAWINGS SPECIFICATION AND STRICTLY IN ACCORDANCE WITH THE MANUFACTURER's SPECIFICATIONS.**		

METHOD OF PLACEMENT BY PUMP.
PROJECT ASSESSMENT IS NOT REQUIRED.

F11. PROVIDE A 10mm x 10mm CHAMFER TO EXPOSED EDGES ON CONCRETE UNO.

F12. NON-SHRINK GROUT SHALL BE Parchem CONBEXTRA CB CEMENTITIOUS, OR APPROVED

FORMWORK

F13. RESPONSIBILITY FOR DESIGN, CERTIFICATION, CONSTRUCTION AND PERFORMANCE OF FORMWORK AND FALSEWORK LIES WITH THE CONTRACTOR.

F14. FORMWORK TO BE DESIGNED AND CONSTRUCTED TO AS3610.

F15. APPLY RELEASE AGENT COMPATIBLE WITH CONTACT SURFACES TO INTERIOR OF FORMWORK. WHERE NECESSARY CLEAN REINFORCEMENT TO REMOVE TRACES OF RELEASE AGENT. SEAL JOINTS BETWEEN FORMWORK PANELS, AND TO HARDENED CONCRETE WITH A FLEXIBLE RUBBER STRIP.

F16. DO NOT STRIP FORMWORK PRIOR TO 36 HOURS AFTER PLACEMENT.

REINFORCEMENT

F17. STEEL REINFORCEMENT IS TO COMPLY WITH AS/NZS4671. SYMBOLS ON DRAWINGS FOR GRADE AND TYPE OF REINFORCEMENT ARE AS FOLLOWS:
R: STRUCTURAL GRADE 250 PLAIN ROUND BAR TO AS/NZS4671
N: HOT ROLLED GRADE 500 DEFORMED (RIBBED) BAR DUCTILITY CLASS N TO AS/NZS4671
L: HOT ROLLED GRADE 500 DEFORMED BAR DUCTILITY CLASS L TO AS/NZS4671
SL: HARD DRAWN WIRE GRADE 500 SQUARE MESH DUCTILITY CLASS L TO AS/NZS4671
RL: HARD DRAWN WIRE GRADE 500 RECTANGULAR MESH DUCTILITY CLASS L TO AS/NZS4671
TM: HARD DRAWN STEEL GRADE 500 TRENCH MESH DUCTILITY CLASS L TO AS/NZS4671
W: GRADE 500 STEEL REINFORCING WIRE TO AS/NZS4671

F18. FOLLOWING ABBREVIATIONS APPLY TO DESCRIBE THE PLACEMENT OF REINFORCEMENT:
E/W: EACH WAY FF: FAR FACE NF: NEAR FACE
EF: EACH FACE BTM: BOTTOM

F19. PROVIDE ACRS (AUSTRALIAN CERTIFICATION AUTHORITY FOR REINFORCING STEEL LTD) CERTIFICATION OF COMPLIANCE WITH AS/NZS4671 FOR ALL REINFORCEMENT.

F20. PROVIDE DOCUMENTATION TO SHOW THAT REINFORCEMENT SUPPLIER AND MILL COMPLIES WITH AS/NZS4671.

F21. REINFORCEMENT MUST HAVE UNIQUE MARKS TO IDENTIFY SUPPLIER.

F22. DO NOT SPLICE REINFORCEMENT OTHER THAN SHOWN ON THE DRAWINGS.

F23. DO NOT BEND OR STRAIN REINFORCEMENT IN A WAY THAT MAY CAUSE DAMAGE. BEND DIAMETERS TO BE TO AS3600. BARS TO BE BENT COLD UNO. DO NOT COOL HEATED BARS BY QUENCHING.

F24. WELDING OR SITE BENDING OF REINFORCEMENT IS NOT PERMITTED WITHOUT APPROVAL OF THE ENGINEER.

F25. ALL REINFORCEMENT SHALL BE SUPPORTED IN ITS CORRECT POSITION BEFORE CONCRETING (BY APPROVED CHAIRS, SPACERS, LIGATURES OR TIES AT 800 mm MAXIMUM CENTRES EACH WAY UNO.) TO PREVENT DISPLACEMENT OF REINFORCEMENT BY WORKMEN OR EQUIPMENT DURING CONCRETE PLACEMENT.

F26. FOR CONCRETE SURFACES WITH B2 EXPOSURE CLASSIFICATION OR GREATER, ONLY USE PROPRIETARY HIGH STRENGTH FIBRE REINFORCED CEMENT SPACER BLOCKS OR SUPPORTS.

F27. SECURELY TIE REINFORCEMENT WITH WIRE TIES. TURN ENDS OF TIE WIRES INTO CONCRETE, CLEAR OF COVER ZONE.

CONCRETE TESTING

F28. TEST SLUMP OF EACH BATCH OF CONCRETE DELIVERED BEFORE PLACING CONCRETE FROM THAT DELIVERY. SLUMP MEASURED TO BE NO GREATER THAN TARGET SLUMP WITHIN TOLERANCES GIVEN IN AS1379 CLAUSE 5.2.3.

F29. CONCRETE TESTING RESULTS TO BE PROVIDED AT 1 SAMPLE PER 25m³. EACH SAMPLE TO COMPRISE FOUR CYLINDERS: TEST TWO AT 7 DAYS AND TWO AT 28 DAYS.

F30. CONCRETE TESTING TO BE BY AN APPROVED INDEPENDENT NATA REGISTERED LABORATORY.

DELIVERABLES

F31. **AT LEAST ONE WEEK PRIOR TO CONCRETE PLACEMENT SUBMIT DETAILS OF PROPOSED CONCRETE MIX DESIGNS**, SEQUENCE AND TIMES FOR CONCRETE POURS, CONSTRUCTION JOINT LOCATIONS FOR ENGINEER's/INSPECTORS's APPROVAL. NOMINATE FOR EACH MIX DESIGN THE TYPE AND PROPORTIONS OF CONSTITUENTS, AGGREGATE GRADINGS, ADDITIVES AND ADMIXTURES, MAXIMUM WATER CONTENT AND MAXIMUM WATER/CEMENT RATIO, TARGET SLUMP, TARGET CHARACTERISTIC STRENGTH (f'c), AND TARGET DRYING SHRINKAGE.

F32. USE READY MIXED CONCRETE MIXED BY BATCH PRODUCTION PROCESS DELIVERED IN AGITATING TRUCKS. FOR EACH BATCH SUPPLY A DOCKET LISTING INFORMATION REQUIRED BY AS1379 CLAUSE 1.8.3 AND FOLLOWING:
- SERIAL NUMBER OF IDENTIFICATION CERTIFICATES OF EACH BATCH
- NAME OF CONCRETE DELIVERY SUPERVISOR
- ELEMENT FOR WHICH CONCRETE WAS ORDERED AND WHERE IT WAS PLACED
- METHOD OF PLACEMENT AND CLIMATIC CONDITIONS DURING POUR
- PROJECT ASSESSMENT CARRIED OUT
- TOTAL AMOUNT OF WATER REQUIRED BY MIX DESIGN
- TOTAL AMOUNT OF WATER ADDED AT PLANT

F33. PROVIDE RECORD OF SLUMP TESTING TO SUPERINTENDENT.

F34. FORWARD CONCRETE PRODUCTION ASSESSMENT INFORMATION TO SUPERINTENDENT AS PER AS1379 CLAUSE 6.4 WHEN PRODUCTION ASSESSMENT IS UNDERTAKEN.

F35. REPORT DRYING SHRINKAGE TESTING RESULTS TO SUPERINTENDENT.

G. PRECAST CONCRETE ELEMENTS

G1. ALL PRECAST CONCRETE WORK SHALL BE CARRIED OUT IN ACCORDANCE WITH AS3850 PREFABRICATED CONCRETE ELEMENTS, AS 5100 BRIDGE DESIGN AND AS 3610 FORMWORK FOR CONCRETE AS APPLICABLE.

G2. REINFORCEMENT OF PRECAST CONCRETE UNITS HAVE BEEN DESIGNED FOR 'IN-SERVICE' CONDITIONS ONLY. THE BUILDING CONTRACTOR IS RESPONSIBLE TO ENGAGE A QUALIFIED CONTRACTOR E.G. *REID CONSTRUCTION SYSTEMS* TO DESIGN, DOCUMENT AND CERTIFY ANY ADDITIONAL REINFORCEMENT REQUIRED FOR LOADS DURING HANDLING, LIFTING AND TRANSPORTATION, ANY LIFTERS, BRACES ETC.

G3. USE CAST IN FERRULES FOR STRUCTURAL FIXINGS, NOT MECHANICAL OR CHEMICAL ANCHORS

G4. ENSURE THAT PRECAST UNITS REMAIN UNCRACKED AND UNDAMAGED DURING HANDLING, ERECTION AND INSTALLATION OPERATIONS. USE FORMWORK BOND BREAKERS AND STRONG BACKS AS REQUIRED. PROTECT UNITS FROM STAINING, DISCOLOURATION AND OTHER DAMAGE.

G5. USE RIGID FORMWORK AND INTENSE COMPACTION, SUCH AS VIBRATING TABLES OR FORM VIBRATORS, TO AS 5100.

G6. PRECAST UNIT TOLERANCES TO BE TO AS3850 EXCEPT WHERE VARIED BY SPECIFICATION.

G7. CONTRACTOR TO PROVIDE COMPONENTS, MATERIALS, FASTENERS, BRACES, STRONGBACKS, SHIMS, JOINTING STRIPS, SEALANTS, FLASHING, GROUT AND MORTAR, BEARING PADS AND STRIPS, TIES, DOWELS, CLIPS, FIXINGS etc AS REQUIRED.

G8. CAST UNITS WITH OUTER FACE OFF FORM.

G9. REMOVE TEMPORARY ATTACHMENTS AFTER ERECTION, MAKE GOOD AND SEAL.

G10. NON-SHRINK GROUT SHALL BE OF 28 DAY CHARACTERISTIC STRENGTH OF 40 MPa e.g. Parchem CONBEXTRA CB CEMENTITIOUS, OR APPROVED EQUIVALENT INSTALLED IN ACCORDANCE WITH MANUFACTURER 's SPECIFICATIONS. SUBMIT PRODUCT DETAILS FOR APPROVAL.

PRINT IN COLOUR

FOR COUNCIL APPROVAL

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REVISIONS

NO.	DATE	DESCRIPTION	DESIGN	APPROVED
3	21/08/25	COUNCIL APPROVAL	RQ	MF
2	30/06/25	DECK PANEL OPENINGS ADDED	RQ	MF
1	31/03/25	FOR COUNCIL APPROVAL	RQ	MF

ERSCON CONSULTING ENGINEERS

CLIENT: CONMAT CONSTRUCTION MATERIALS

SCALE: ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE

DRAWN: CS | APPROVED: RQ
DESIGN: RQ | APPROVED: RQ
STRUCTURAL SIGNOFF APPROVAL
DATE: 20/03/2025 RPEQ: 15306

PROJECT REF: COUNTRY ROAD ESTATE
COUNTRY ROAD CULVERT CROSSING
DRAWING REF: STRUCTURAL ENGINEERING NOTES
SHEET 2 OF 2
DRAWING NO: 160-012-S103 | SIZE: A1 | REVISION: 3

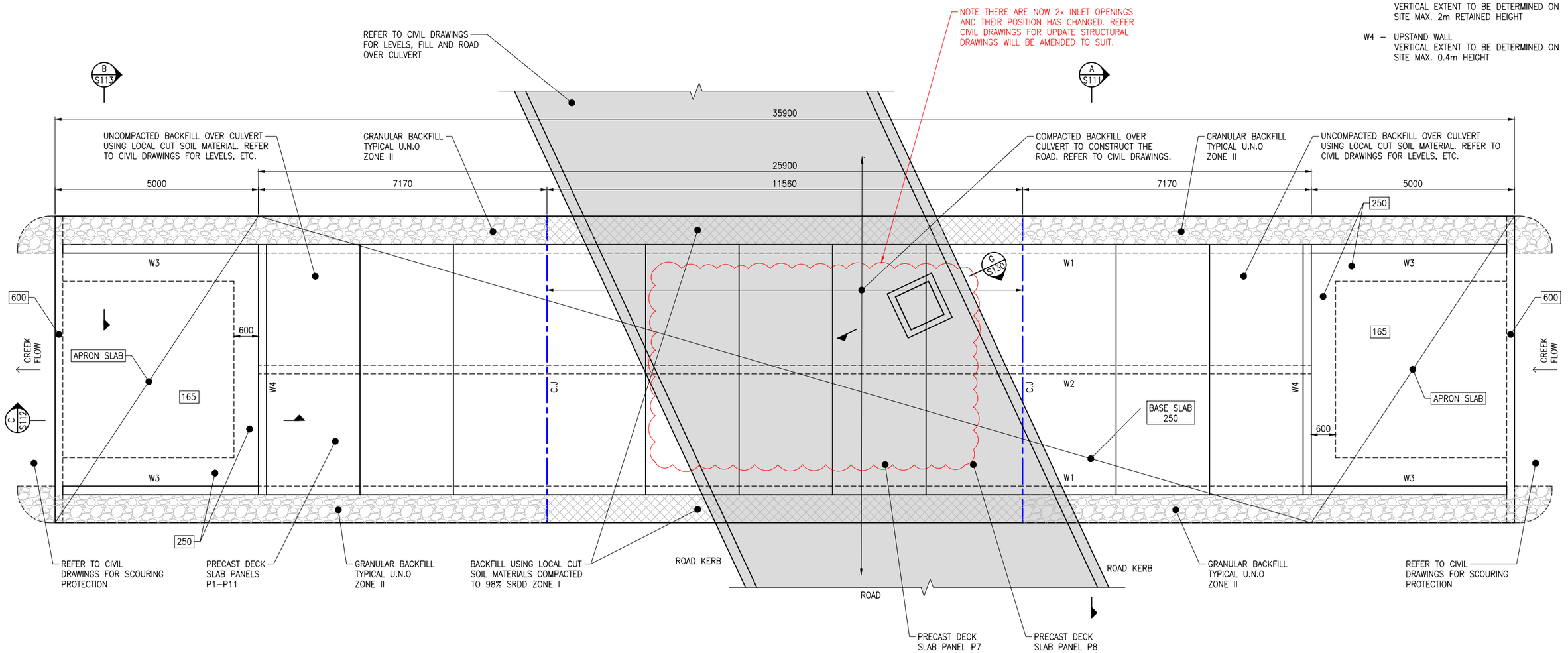
MEMBER SCHEDULE

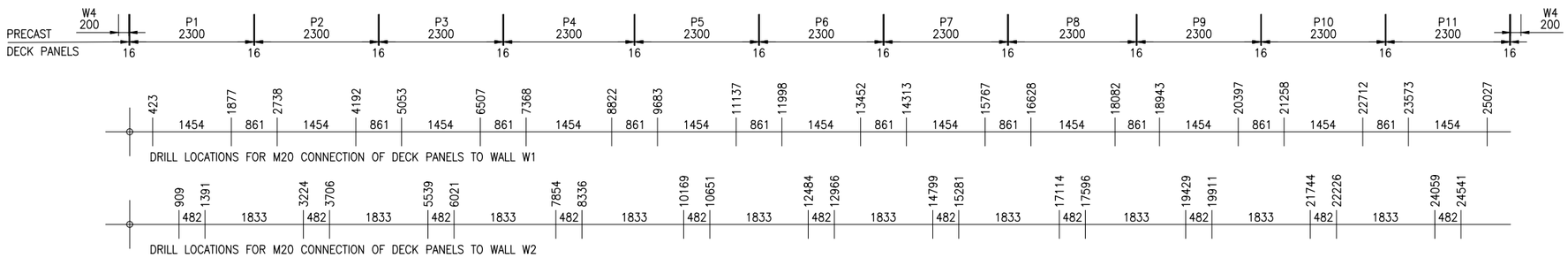
W1 – EXTERNAL WALL, 210 THICK

W2 – INTERMEDIATE WALL, 210 THICK

W3 – WING WALLS 210 THICK
VERTICAL EXTENT TO BE DETERMINED ON SITE MAX. 2m RETAINED HEIGHT

W4 – UPSTAND WALL
VERTICAL EXTENT TO BE DETERMINED ON SITE MAX. 0.4m HEIGHT





CULVERT SITE PLAN

SCALE 1:50

PRINT IN COLOUR

FOR COUNCIL APPROVAL

REVISIONS					
NO.	DATE	DESCRIPTION	DESIGN	APPROVED
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3	21/08/25	COUNCIL APPROVAL	RQ	MF
2	30/06/25	DECK PANEL OPENINGS ADDED	RQ	MF
1	31/03/25	FOR COUNCIL APPROVAL	RQ	MF

ERSCON CONSULTING ENGINEERS

CLIENT: CONMAT CONSTRUCTION MATERIALS

SCALE: 1:100 / 1:50 — 0 1 2 3 — A3 / A1

ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE

DRAWN	CS
APPROVED	RQ
DESIGN	RQ
APPROVED	RQ

STRUCTURAL SIGNOFF APPROVAL

DATE: 20/03/2025 RPEQ: 15306

PROJECT REF	COUNTRY ROAD ESTATE COUNTRY ROAD CULVERT CROSSING
DRAWING REF	CULVERT SITE PLAN
DRAWING NO	160-012-S110
SIZE	A1
REVISION	4

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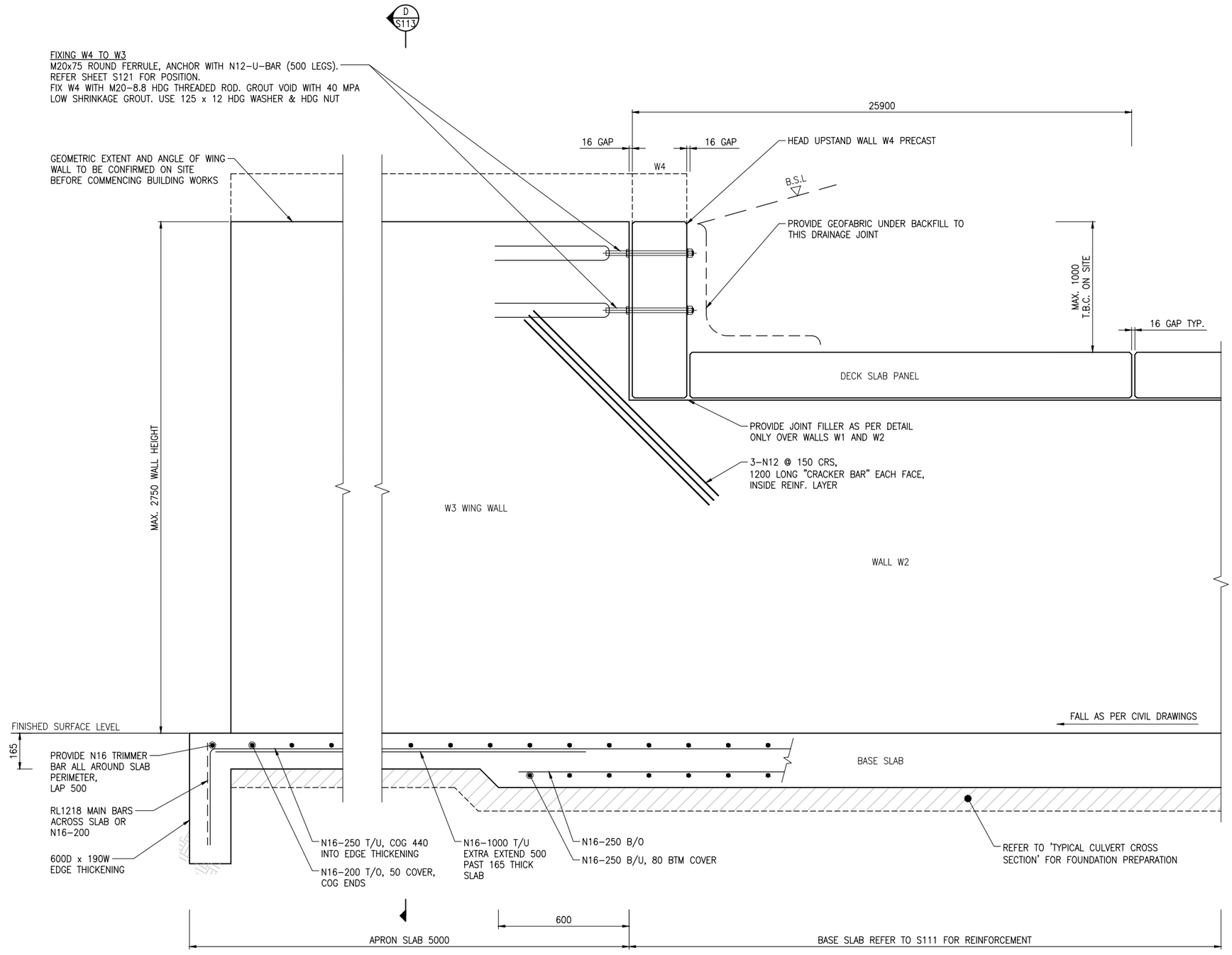

C S110 TYPICAL SECTION THROUGH APRON SLAB

SCALE 1:10

NOTES:

REINFORCEMENT COVER
50mm TOP, BTM & SIDES TYP. U.N.O.
BASE SLAB 80 BTM (CAST AGAINST GROUND)

CONCRETE
S50
MIN. CEMENTITIOUS CONTENTS 450 kg/m³
MAX. WATER/CEMENT RATIO 0.4
CURE FOR MIN. 14 DAYS
MIN. STRENGTH AT TIME OF STRIPPING 32 MPa

WATER PROOFING – RECOMMENDATONS
PROVIDE PENETRON ADMIX SB TO THE CONCRETE MIX STRICTLY IN ACC. WITH THE MANUFACTURERS SPECIFICATIONS WHICH IS AT A DOSE OF 0.8–1% OF TOTAL CEMENTITIOUS CONTENTS PER m³ OF CONCRETE = 3.6–4.5 kg/m³.
ADD ADMIX TO THE CONCRETE MIX AT THE TIME OF BATCHING.
ALTERNATIVE USE 'XYPEX ADMIX C–SERIES' LIKE ADMIX C–2000/2000 NF. BUILDING CONTRACTOR TO CONFIRM PRODUCT CHOICE WITH MANUFACTURER BEFORE COMMENCING WORKS.

MEMBER SCHEDULE:

W3 – WING WALLS 210 THICK
VERTICAL EXTENT TO BE DETERMINED ON SITE
MAX. 2m–RETAINED HEIGHT

W4 – UPSTAND WALL
VERTICAL EXTENT TO BE DETERMINED ON SITE
MAX. 0.4m HEIGHT

APRON SLAB

TO REDUCE RAPID EVAPORATION OF WATER FROM THE SURFACE OF ALL CONCRETE FLATWORK, APPLY 'SUPERCURE HR' IMMEDIATELY AFTER INITIAL SCREENING. ALTERNATIVE 'ECOVAP' OR 'MASTERCURE 111CF' CAN BE USED. THE PRODUCT MUST BE MIXED AND APPLIED STRICTLY TO MANUFACTURER'S SPECIFICATION.

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FOR COUNCIL APPROVAL

REVISIONS					
3	21/08/25	COUNCIL APPROVAL	RQ	MF
2	30/06/25	DECK PANEL OPENINGS ADDED	RQ	MF
1	31/03/25	FOR COUNCIL APPROVAL	RQ	MF
NO.	DATE	DESCRIPTION	DESIGN	APPROVED

ERSCON CONSULTING ENGINEERS

CLIENT: CONMAT CONSTRUCTION MATERIALS

SCALE
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ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE

DRAWN	CS	APPROVED	RQ
DESIGN	RQ	APPROVED	RQ

STRUCTURAL SIGNOFF APPROVAL
DATE: 20/03/2025 RPEQ: 15306

PROJECT REF	COUNTRY ROAD ESTATE COUNTRY ROAD CULVERT CROSSING
DRAWING REF	CULVERT DETAILS SHEET 1 OF 2
DRAWING NO	160-012-S112
SIZE	A1
REVISION	3

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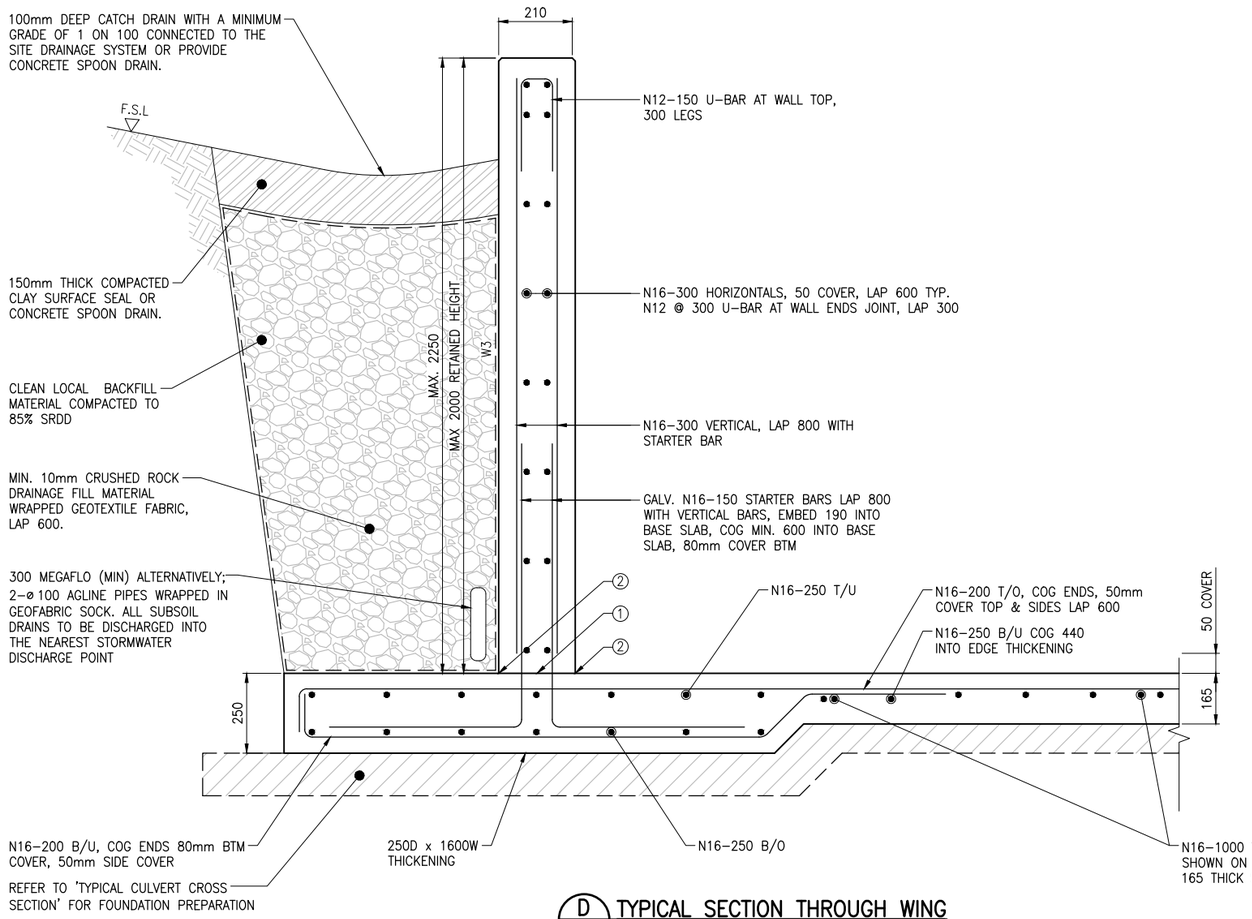


D S112 **TYPICAL SECTION THROUGH WING WALL (W3) AND APRON SLAB**

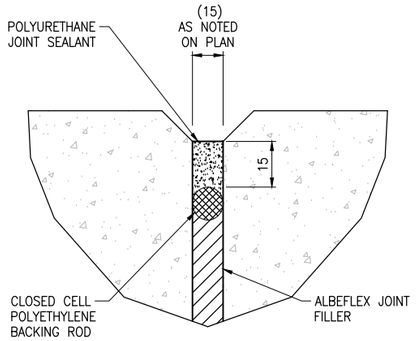
SCALE 1:10

LEGEND

WATER PROOFING RECOMMENDATION

① THOROUGHLY CLEAN JOINT SURFACE & APPLY 2 COATS OF "XUPEX CONCENTRATE" SLURRY TO JOINT SURFACE AT A RATE OF 1.0 kg/sqm.

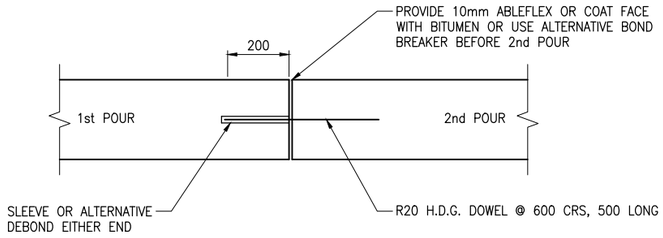
② APPLY ONE SLURRY COAT OF "XUPEX CONCENTRATE" AT A RATE OF 0.8 kg/sqm. THEN FILL SLOT TO SURFACE WITH "XUPEX CONCENTRATE" IN DRY–PAC FORM. PROVIDE 10x10 CHAMFER AT THIS LOCATION.



NOTE:
PROVIDE TEMPORARY SHIN PLATES IN GAP DURING PLACEMENT OF DECK PANELS

TYPICAL DECK PANEL JOINT DETAIL

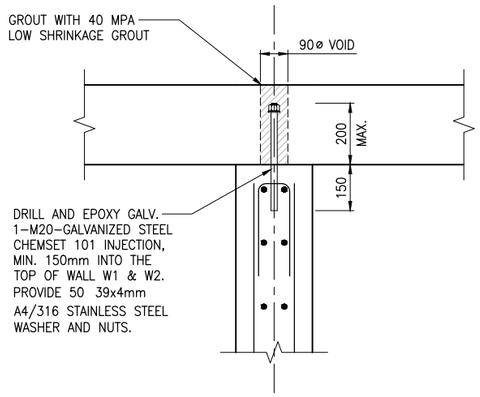
SCALE 1:1



TYPICAL CONSTRUCTION JOINT IN BASE SLAB AND WALLS

SCALE 1:10

NOTE: WALL JOINTS CAN BE CONSTRUCTED WITHOUT DOWELS



TYPICAL CONNECTION DECK PANELS TO TOP OF WALL (W1 & W2)

SCALE 1:10

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FOR COUNCIL APPROVAL

REVISIONS					
3	21/08/25	COUNCIL APPROVAL	RQ	MF
2	30/06/25	DECK PANEL OPENINGS ADDED	RQ	MF
1	31/03/25	FOR COUNCIL APPROVAL	RQ	MF
NO.	DATE	DESCRIPTION	DESIGN	APPROVED

ERSCON CONSULTING ENGINEERS

CLIENT: CONMAT CONSTRUCTION MATERIALS

SCALE
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ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE

DRAWN	CS	APPROVED	RQ
DESIGN	RQ	APPROVED	RQ

STRUCTURAL SIGNOFF APPROVAL
DATE: 20/03/2025 RPEQ: 15306

PROJECT REF	COUNTRY ROAD ESTATE COUNTRY ROAD CULVERT CROSSING
DRAWING REF	CULVERT DETAILS SHEET 2 OF 2
DRAWING NO	160-012-S113
SIZE	A1
REVISION	3

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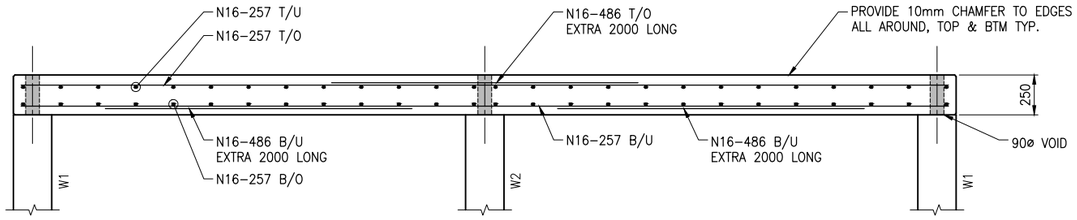
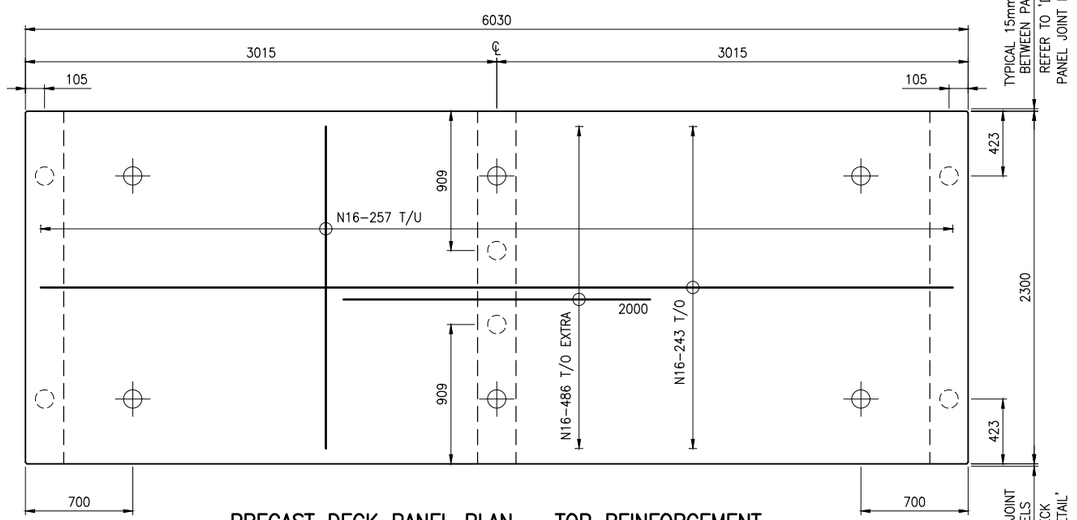


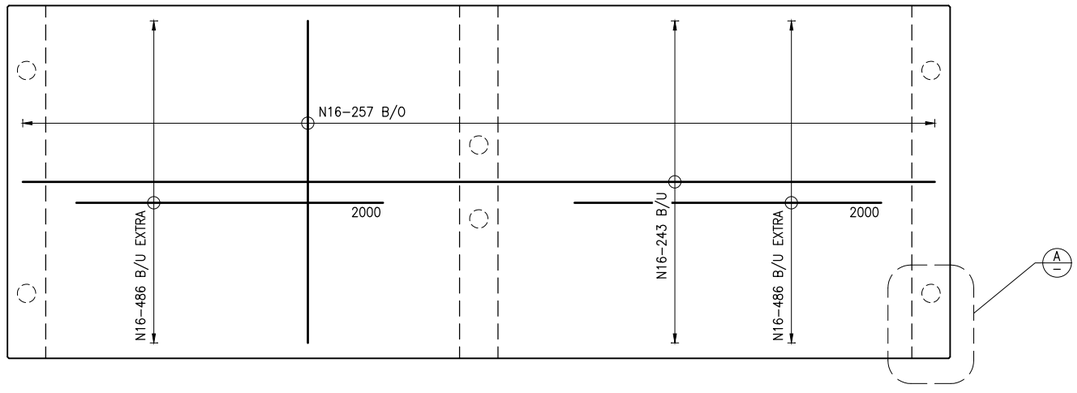
PRECAST DECK PANEL TYPICAL SECTION

SCALE 1:20



PRECAST DECK PANEL PLAN – TOP REINFORCEMENT

SCALE 1:20



PRECAST DECK PANEL PLAN – BOTTOM REINFORCEMENT

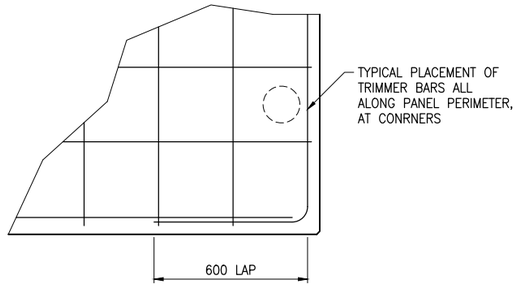
SCALE 1:20

PRECAST PANEL NOTES:

1. ALL DETAILS TO BE IN ACCORDANCE WITH AS3850 AND AS5100.
2. THE PANELS HAVE BEEN DESIGNED FOR FINAL 'IN SERVICE' CONDITIONS ONLY. 'REID CONSTRUCTION SYSTEMS' SHALL PROVIDE THE LIFTER DESIGN & CERTIFICATION AND ANY ADDITIONAL REINFORCEMENT REQUIRED TO RESIST LOADS IMPOSED DURING, TRANSPORT AND LIFTING.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE LIFTING ARRANGEMENT & CRANAGE.
4. INSTALL LIFTERS IN ACCORDANCE WITH MANUF. INSTRUCTIONS.
5. LIFTER LOCATIONS & SPECIFICATION TO BE CONFIRMED BY 'REID CONSTRUCTION SYSTEMS' BEFORE ANY PRECAST WORKS COMMENCE
6. ALL PANEL JOINTS SHALL BE 15mm AND SEALED AS PER DETAIL
7. ALL DIMENSIONS TO BE CHECKED ON SITE AGAINST BUILT DIMENSIONS OF CULVERT WALL BEFORE ANY PRECAST WORKS COMMENCE
8. DO NOT SCALE OFF DRAWING
9. TYPICAL PANEL DETAILS UNO
   CONCRETE GRADE = S50
   MIN. CEMENTITOUS CONTENTS 450 kg/m³
   MAX. WATER/CEMENT RATIO 0.4
   CURE FOR MIN. 14 DAYS
   MIN. STRENGTH AT TIME OF STRIPPING 32 MPa
   THICKNESS: 250mm
   REINFORCEMENT: AS SHOWN
   TRIMMER: 1–N16 EACH FACE (LAP 600) ALL ALONG OUTER PERIMETER
   COVER: 50mm
   FINISHES TO PANELS: SMOOTH OFF–FORM FINISH
   PROVIDE 10x10 CHAMFERS TO ANY EDGES
10. NUMBERS OF PANELS : 9
11. WATER PROOFING – RECOMMENDATION:
    PROVIDE PENETRON ADMIX SB TO THE CONCRETE MIX STRICTLY IN ACC. WITH THE MANUFACTURER'S SPECIFICATIONS WHICH IS AT A DOSE OF 0.8–1% OF TOTAL CEMENTITIOUS CONTENTS PER m³ OF CONCRETE = 3.6–4.5 kg/m³.
    ADD ADMIX TO THE CONCRETE MIX AT THE TIME OF BATCHING.
    ALTERNATIVE USE 'XYPEX ADMIX C–SERIES' LIKE ADMIX C–2000/2000 NF. BUILDING CONTRACTOR TO CONFIRM PRODUCT CHOICE WITH MANUFACTURER BEFORE COMMENCING WORKS.
12. PANEL WEIGHT: 8.7t
13. PANEL VOLUME: 3.47m³
14. TO REDUCE RAPID EVAPORATION OF WATER FROM THE SURFACE OF ALL CONCRETE FLATWORK, APPLY 'SUPERCURE HR' IMMEDIATELY AFTER INITIAL SCREEDING. ALTERNATIVE 'ECOVAP' OR 'MASTERCURE 111CF' THE PRODUCT MUST BE MIXED AND APPLIED STRICTLY TO MANUFACTURER'S SPECIFICATIONS.

LEGEND

- PROVIDE 90 DIA. VOID IN DECK SLAB PANELS. ADJUST REINFORCEMENT AT VOID TO ENSURE MIN. 50mm COVER IS MAINTAINED.
- LIFTING INSERT, INDICATIVE LOCATIONS SHOWN ONLY



DETAIL A

SCALE 1:10

PRINT IN COLOUR

FOR COUNCIL APPROVAL

NO.	DATE	DESCRIPTION	DESIGN	APPROVED
3	21/08/25	COUNCIL APPROVAL	RQ	MF
2	30/06/25	DECK PANEL OPENINGS ADDED	RQ	MF
1	31/03/25	FOR COUNCIL APPROVAL	RQ	MF

REVISIONS

ERSCON CONSULTING ENGINEERS

CLIENT: CONMAT CONSTRUCTION MATERIALS

SCALE
1:20 0 0.1 0.2 0.3 0.4 0.5 0.6 A3
1:10 A1
1:40 0 0.2 0.4 0.6 0.8 1 1.2 A3
1:20 A1
ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE

DRAWN	CS	APPROVED	RQ
DESIGN	RQ	APPROVED	RQ

STRUCTURAL SIGNOFF APPROVAL
DATE: 20/03/2025 RPEQ: 15306

PROJECT REF	COUNTRY ROAD ESTATE COUNTRY ROAD CULVERT CROSSING		
DRAWING REF	CULVERT PRECAST DECK PANELS P1-P6 & P9-P11		
DRAWING NO	160-012-S120	SIZE A1	REVISION 3

3/11/2025 12:04:09 PM
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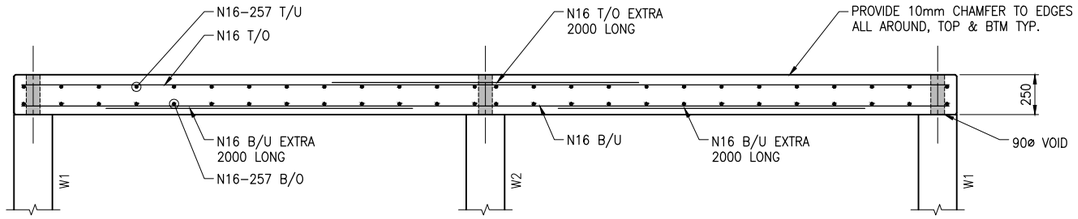
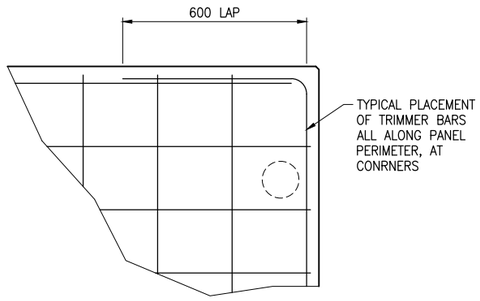




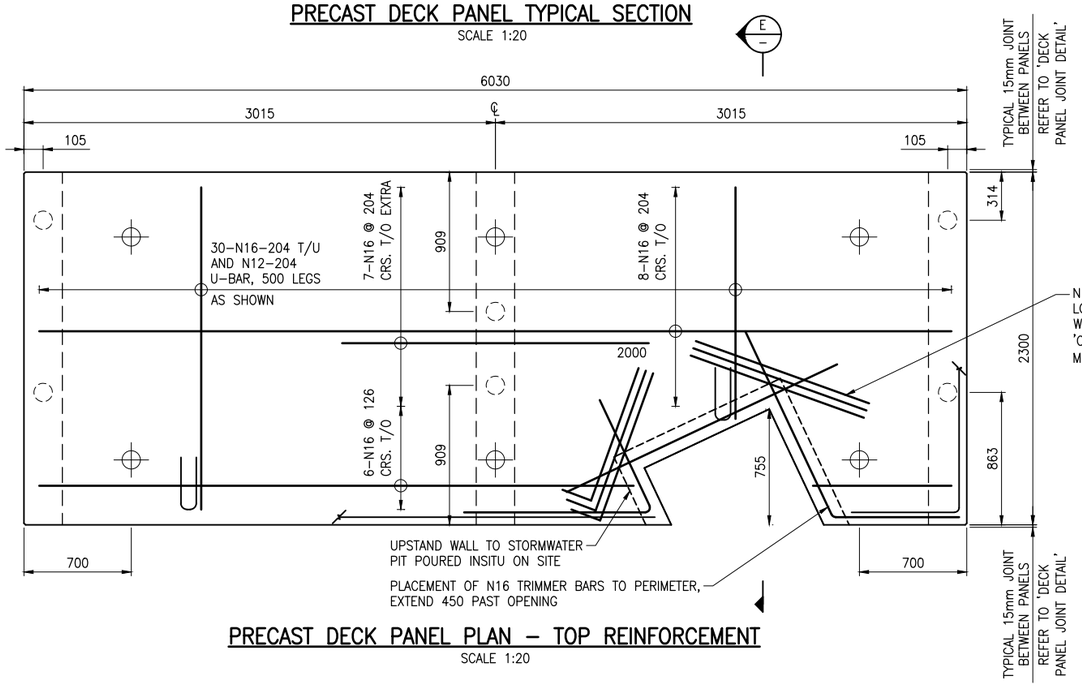
DETAIL B
SCALE 1:10

PRECAST PANEL NOTES:

1. ALL DETAILS TO BE IN ACCORDANCE WITH AS3850 AND AS5100.
2. THE PANELS HAVE BEEN DESIGNED FOR FINAL 'IN SERVICE' CONDITIONS ONLY. 'REID CONSTRUCTION SYSTEMS' SHALL PROVIDE THE LIFTER DESIGN & CERTIFICATION AND ANY ADDITIONAL REINFORCEMENT REQUIRED TO RESIST LOADS IMPOSED DURING, TRANSPORT AND LIFTING.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE LIFTING ARRANGEMENT & CRANAGE.
4. INSTALL LIFTERS IN ACCORDANCE WITH MANUF. INSTRUCTIONS.
5. LIFTER LOCATIONS & SPECIFICATION TO BE CONFIRMED BY 'REID CONSTRUCTION SYSTEMS' BEFORE ANY PRECAST WORKS COMMENCE
6. ALL PANEL JOINTS SHALL BE 15mm AND SEALED AS PER DETAIL
7. ALL DIMENSIONS TO BE CHECKED ON SITE AGAINST BUILT DIMENSIONS OF CULVERT WALL BEFORE ANY PRECAST WORKS COMMENCE
8. DO NOT SCALE OFF DRAWING
9. TYPICAL PANEL DETAILS UNO
   CONCRETE GRADE = S50
   MIN. CEMENTITOUS CONTENTS 450 kg/m³
   MAX. WATER/CEMENT RATIO 0.4
   CURE FOR MIN. 14 DAYS
   MIN. STRENGTH AT TIME OF STRIPPING 32 MPa
   THICKNESS: 250mm
   REINFORCEMENT: AS SHOWN
   TRIMMER: 1–N16 EACH FACE (LAP 600) ALL ALONG OUTER PERIMETER
   COVER: 50mm
   FINISHES TO PANELS: SMOOTH OFF–FORM FINISH
   PROVIDE 10x10 CHAMFERS TO ANY EDGES
10. NUMBERS OF PANELS : 1
11. WATER PROOFING – RECOMMENDATION:
    PROVIDE PENETRON ADMIX SB TO THE CONCRETE MIX STRICTLY IN ACC. WITH THE MANUFACTURER'S SPECIFICATIONS WHICH IS AT A DOSE OF 0.8–1% OF TOTAL CEMENTITIOUS CONTENTS PER m³ OF CONCRETE = 3.6–4.5 kg/m³.
    ADD ADMIX TO THE CONCRETE MIX AT THE TIME OF BATCHING.
    ALTERNATIVE USE 'XYPEX ADMIX C–SERIES' LIKE ADMIX C–2000/2000 NF. BUILDING CONTRACTOR TO CONFIRM PRODUCT CHOICE WITH MANUFACTURER BEFORE COMMENCING WORKS.
12. PANEL WEIGHT: 8.7t
13. PANEL VOLUME: 3.47m³
14. TO REDUCE RAPID EVAPORATION OF WATER FROM THE SURFACE OF ALL CONCRETE FLATWORK, APPLY 'SUPERCURE HR' IMMEDIATELY AFTER INITIAL SCREEDING. ALTERNATIVE 'ECOVAP' OR 'MASTERCURE 111CF' THE PRODUCT MUST BE MIXED AND APPLIED STRICTLY TO MANUFACTURER'S SPECIFICATIONS.

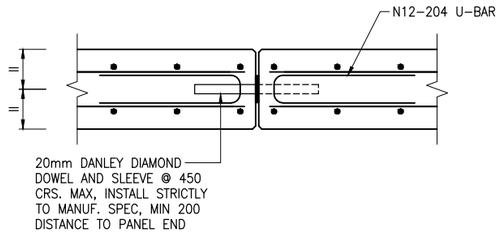
PRECAST DECK PANEL TYPICAL SECTION

SCALE 1:20



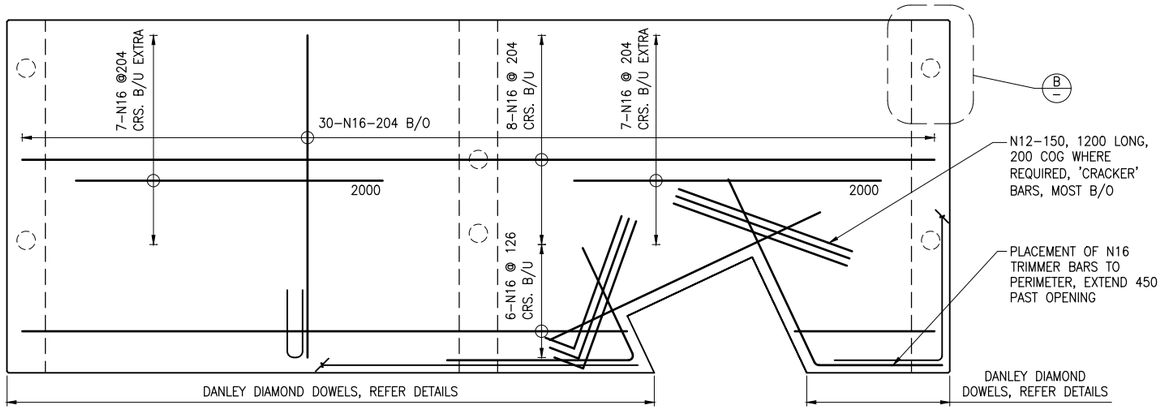
PRECAST DECK PANEL PLAN – TOP REINFORCEMENT

SCALE 1:20



P7 TO P8 CONNECTION DETAIL

SCALE 1:10

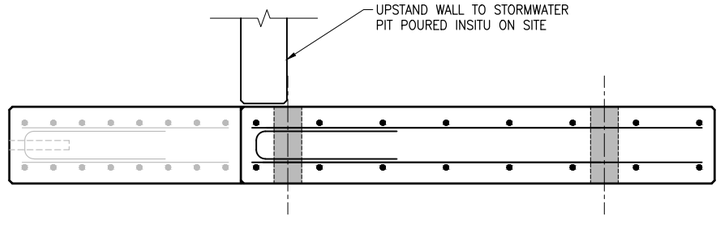


PRECAST DECK PANEL PLAN – BOTTOM REINFORCEMENT

SCALE 1:20

LEGEND

- PROVIDE 90 DIA. VOID IN DECK SLAB PANELS. ADJUST REINFORCEMENT AT VOID TO ENSURE MIN. 50mm COVER IS MAINTAINED.
- LIFTING INSERT, INDICATIVE LOCATIONS SHOWN ONLY



E SECTION
SCALE 1:10

PRINT IN COLOUR

FOR COUNCIL APPROVAL

REVISIONS				
NO.	DATE	DESCRIPTION	DESIGN	APPROVED
2	21/08/25	COUNCIL APPROVAL	RQ	MF
1	30/06/25	DECK PANEL OPENINGS ADDED	RQ	MF

ERSCON CONSULTING ENGINEERS

CLIENT: CONMAT CONSTRUCTION MATERIALS

SCALE
1:20 / 1:10 — 0 0.1 0.2 0.3 0.4 0.5 0.6 — A3 / A1
1:40 / 1:20 — 0 0.2 0.4 0.6 0.8 1 1.2 — A3 / A1
ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE

DRAWN	CS	APPROVED	RQ
DESIGN	RQ	APPROVED	RQ

STRUCTURAL SIGNOFF APPROVAL
DATE: 20/03/2025 RPEQ: 15306

PROJECT REF	COUNTRY ROAD ESTATE COUNTRY ROAD CULVERT CROSSING
DRAWING REF	CULVERT PRECAST DECK PANEL P7
DRAWING NO	160-012-S121
SIZE	A1
REVISION	2

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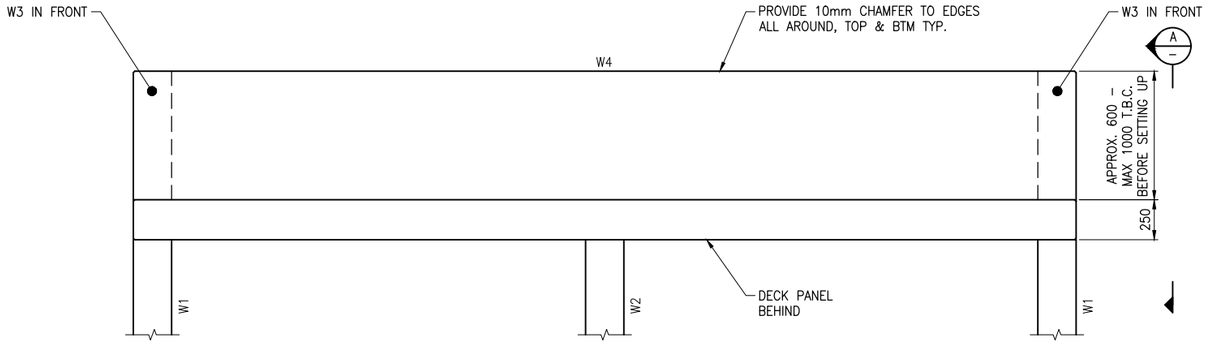
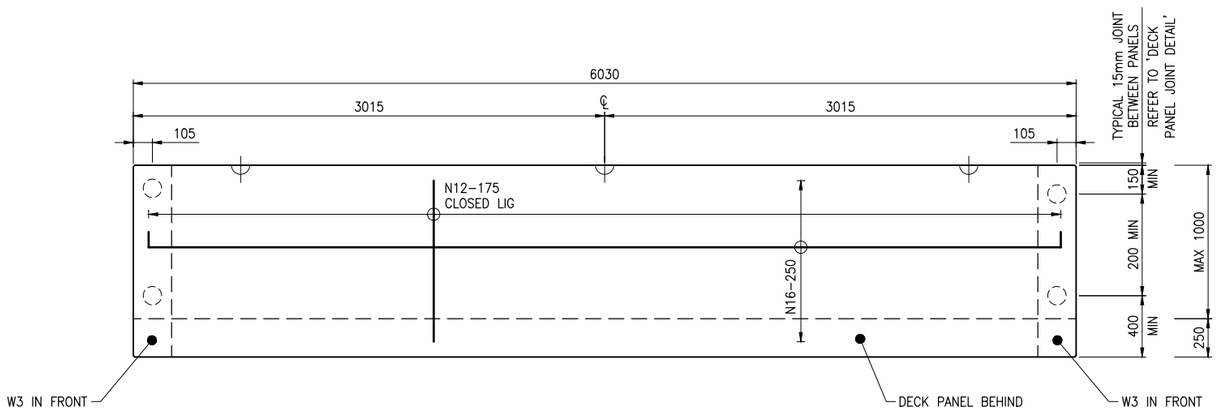


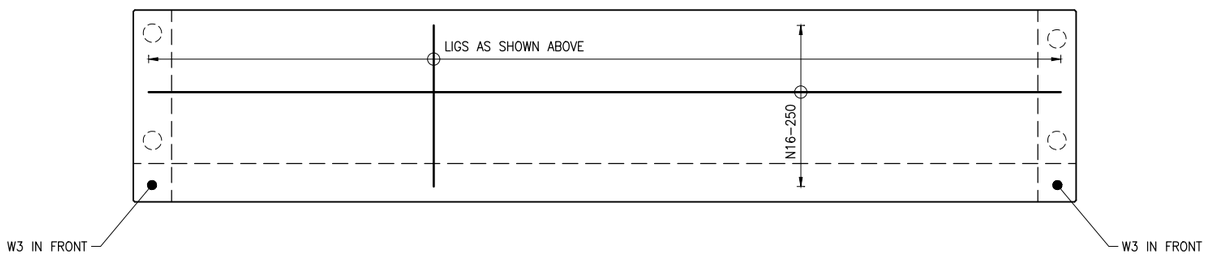
PRECAST HEAD WALL PANEL TYPICAL ELEVATION

SCALE 1:20



PRECAST HEAD WALL PANEL PLAN – TOP REINFORCEMENT

SCALE 1:20



PRECAST HEAD WALL PANEL PLAN – BOTTOM REINFORCEMENT

SCALE 1:20

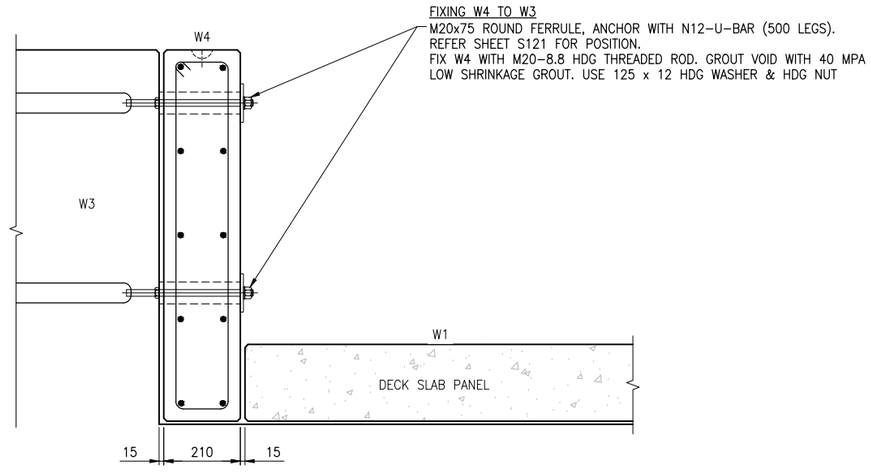
PRECAST PANEL NOTES:

1. ALL DETAILS TO BE IN ACCORDANCE WITH AS3850 AND AS5100.
2. THE PANELS HAVE BEEN DESIGNED FOR FINAL 'IN SERVICE' CONDITIONS ONLY. 'REID CONSTRUCTION SYSTEMS' SHALL PROVIDE THE LIFTER DESIGN & CERTIFICATION AND ANY ADDITIONAL REINFORCEMENT REQUIRED TO RESIST LOADS IMPOSED DURING, TRANSPORT AND LIFTING.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE LIFTING ARRANGEMENT & CRANAGE.
4. INSTALL LIFTERS IN ACCORDANCE WITH MANUF. INSTRUCTIONS.
5. LIFTER LOCATIONS & SPECIFICATION TO BE CONFIRMED BY 'REID CONSTRUCTION SYSTEMS' BEFORE ANY PRECAST WORKS COMMENCE
6. ALL PANEL JOINTS SHALL BE 15mm AND SEALED AS PER DETAIL
7. ALL DIMENSIONS TO BE CHECKED ON SITE AGAINST BUILT DIMENSIONS OF CULVERT WALL BEFORE ANY PRECAST WORKS COMMENCE
8. DO NOT SCALE OFF DRAWING
9. TYPICAL PANEL DETAILS UNO
   CONCRETE GRADE = S50
   MIN. CEMENTITOUS CONTENTS 450 kg/m³
   MAX. WATER/CEMENT RATIO 0.4
   CURE FOR MIN. 14 DAYS
   MIN. STRENGTH AT TIME OF STRIPPING 32 MPa
   THICKNESS: 210mm
   REINFORCEMENT: AS SHOWN
   TRIMMER: 1–N16 EACH FACE (LAP 600) ALL ALONG OUTER PERIMETER
   COVER: 50mm
   FINISHES TO PANELS: SMOOTH OFF–FORM FINISH
   PROVIDE 10x10 CHAMFERS TO ANY EDGES
10. NUMBERS OF PANELS : 2
11. WATER PROOFING – RECOMMENDATION:
    PROVIDE PENETRON ADMIX SB TO THE CONCRETE MIX STRICTLY IN ACC. WITH THE MANUFACTURER'S SPECIFICATIONS WHICH IS AT A DOSE OF 0.8–1% OF TOTAL CEMENTITIOUS CONTENTS PER m³ OF CONCRETE = 3.6–4.5 kg/m³.
    ADD ADMIX TO THE CONCRETE MIX AT THE TIME OF BATCHING.
    ALTERNATIVE USE 'XYPEX ADMIX C–SERIES' LIKE ADMIX C–2000/2000 NF. BUILDING CONTRACTOR TO CONFIRM PRODUCT CHOICE WITH MANUFACTURER BEFORE COMMENCING WORKS.
12. PANEL WEIGHT: MAX 4t
13. PANEL VOLUME: 1.58m³
14. TO REDUCE RAPID EVAPORATION OF WATER FROM THE SURFACE AFTER THE CONCRETE POUR, APPLY 'SUPERCURE HR' IMMEDIATELY AFTER INITIAL SCREEDING. ALTERNATIVE 'ECOVAP' OR 'MASTERCURE 111CF' THE PRODUCT MUST BE MIXED AND APPLIED STRICTLY TO MANUFACTURER'S SPECIFICATIONS.

LEGEND

PROVIDE 90 DIA. VOIDS IN PANELS. ADJUST REINFORCEMENT AT VOID TO ENSURE MIN. 50mm COVER IS MAINTAINED. MATCH ROUND FERRULES IN W3 TO VOID POSITION

LIFTING INSERT, INDICATIVE LOCATIONS SHOWN ONLY



SECTION A–A THROUGH HEAD UPSTAND WALL W4

SCALE 1:10

PRINT IN COLOUR

FOR COUNCIL APPROVAL

REVISIONS					
NO.	DATE	DESCRIPTION	DESIGN	APPROVED
3	21/08/25	COUNCIL APPROVAL	RQ	MF
2	30/06/25	DECK PANEL OPENINGS ADDED	RQ	MF
1	31/03/25	FOR COUNCIL APPROVAL	RQ	MF

ERSCON CONSULTING ENGINEERS

CLIENT: CONMAT CONSTRUCTION MATERIALS

SCALE
1:20 0 0.1 0.2 0.3 0.4 0.5 0.6 A3
1:10 A1
1:40 0 0.2 0.4 0.6 0.8 1 1.2 A3
1:20 A1
ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE

DRAWN CS | APPROVED RQ
DESIGN RQ | APPROVED RQ
STRUCTURAL SIGNOFF APPROVAL
DATE: 30/06/2025 RPEQ: 15306

PROJECT REF: COUNTRY ROAD ESTATE
COUNTRY ROAD CULVERT CROSSING
DRAWING REF: CULVERT PRECAST HEAD WALL W4
DRAWING NO: 160-012-S123 | SIZE: A1 | REVISION: 3

3/11/2025 12:04:01 PM
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P05-F-DD01 Document Transmittal

Project: **Country Road Culvert Crossing**

Attention: Carl Ewin

Company: Mareeba Shire Council

From: ERSCON Consulting Engineers

ERSCON CONSULTING ENGINEERS

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	Date of Issue													
Day	25	10												
Month	08	11												
Year	25	25												

Dwg/Doc Number	Dwg/Doc Title	Revision												
160-012-L001	Operational Works Letter	1												
160-012-R001	Operational Works Report	1												
160-012-R002	Stormwater Management Plan	1												
160-012-C101	Cover Sheet, Locality Plan and Drawings List	1	A											
160-012-C102	General Notes	1	A											
160-012-C103	Culvert Plan	2	A											
160-012-C104	Country Road Longitudinal Section	1	A											
160-012-C105	Country Road Cross Sections (Sheet 1 of 3)	1	A											
160-012-C106	Country Road Cross Sections (Sheet 2 of 3)	2	A											
160-012-C107	Country Road Cross Sections (Sheet 3 of 3)	1	A											
160-012-C108	Typical Road Cross Section and Details	2	A											
160-012-C109	Erosion and Sediment Control Plan	1	A											
160-012-C110	Erosion and Sediment Control Notes	1	A											
160-012-S101	Workplace Health and Safety Notes	3	3											
160-012-S102	Structural Engineering Notes Sheet 1 of 2	3	3											
160-012-S103	Structural Engineering Notes Sheet 2 of 2	3	3											
160-012-S110	Culvert Site Plan	3												
160-012-S111	Typical Culvert Section A	3												
160-012-S112	Culvert Details Sheet 1 of 2	3	3											
160-012-S113	Culvert Details Sheet 2 of 2	3	3											
160-012-S120	Culvert Precast Deck Panels P1-P6 & P9-P11	3	3											
160-012-S121	Culvert Precast Deck Panel P7	2	2											
160-012-S122	Culvert Precast Deck Panel P8	2												
160-012-S123	Culvert Precast Head Wall W4	3	3											
160-012-S130	Stormwater Pit	2												

Company Name	Attention	Number of Copies												
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Mareeba Shire Council	Brian Millard	1	1											
Mareeba Shire Council	Carl Ewin	1	1											
Mareeba Shire Council Planning	Planning	1	1											
ConMat	Steven Lavis	1	1											
ConMat	Roy Lavis	1	1											
Tyrone Corp	Patrick McNamee	1	1											
Tyrone Corp	Peter McNamee	1												

			Reason for Issue												
A - Approval	T - Tender Issue	R - As Requested	A	A											
P - Preliminary	C - Constructon Issue	FI - For Information													

			Format Issued												
A - Original	C - Copy	P - PDF	P	P											
M - Model	D - Acad Drawing	O - Other													

			Method of Delivery												
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H - Hand Delivery	CO - Courier	O - Other													