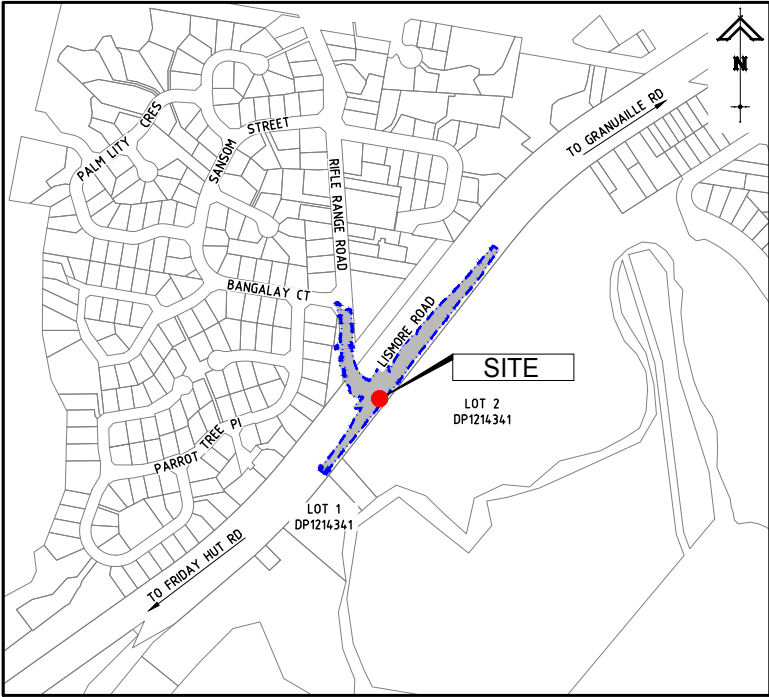
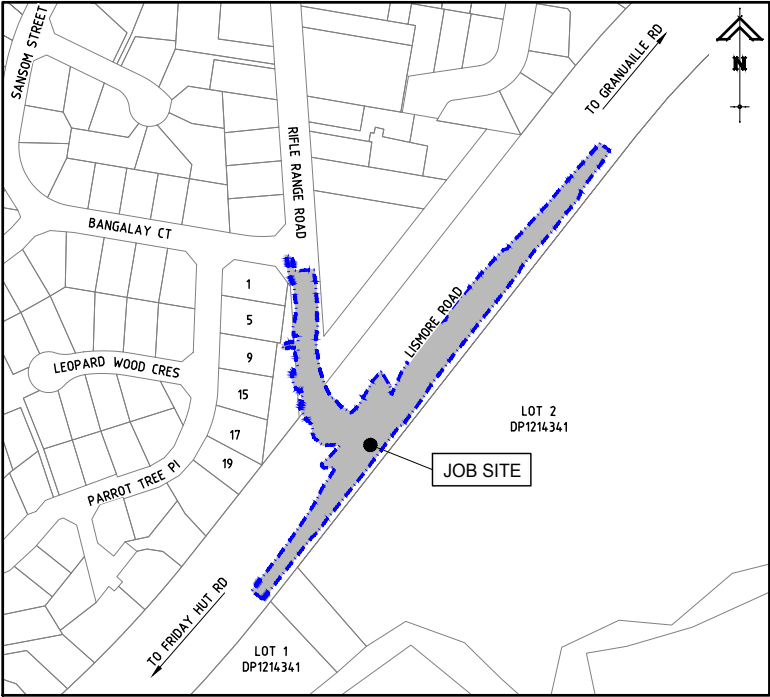


RIFLE RANGE ROAD AND BANGALOW ROAD INTERSECTION UPGRADE WORKS

DETAILED DESIGN CONTRACT BE170269-02



LOCALITY PLAN
N.T.S.



NEIGHBOURHOOD PLAN
N.T.S.

SCHEDULE OF DRAWINGS

DRAWING No.	DRAWING TITLE
C000	COVER SHEET
C100	OVERALL SITE LAYOUT PLAN
C101	ROADWORKS TYPICAL CROSS SECTION AND DETAILS - SHEET 1 OF 2
C102	ROADWORKS TYPICAL CROSS SECTION AND DETAILS - SHEET 2 OF 2
C103	PAVEMENT DETAILS
C104	BUS STOP DETAILS
C105	EXISTING BASE PLAN - SHEET 1 OF 2
C106	EXISTING BASE PLAN - SHEET 2 OF 2
C200	BULK EARTHWORKS LAYOUT PLAN - SHEET 1 OF 2
C201	BULK EARTHWORKS LAYOUT PLAN - SHEET 2 OF 2
C300	ROADWORK ALIGNMENT PLAN
C310	LONGITUDINAL SECTION - SHEET 1 OF 2
C311	LONGITUDINAL SECTION - SHEET 2 OF 2
C320	LISMORE ROAD CROSS SECTION - SHEET 1 OF 4
C321	LISMORE ROAD CROSS SECTION - SHEET 2 OF 4
C322	LISMORE ROAD CROSS SECTION - SHEET 3 OF 4
C323	LISMORE ROAD CROSS SECTION - SHEET 4 OF 4
C324	RIFLE RANGE ROAD CROSS SECTION - SHEET 1 OF 2
C325	RIFLE RANGE ROAD CROSS SECTION - SHEET 2 OF 2
C330	SIGNAGE AND LINEMARKING PLAN
C340	PAVEMENT LAYOUT PLAN
C350	TURNING MOVEMENT FOR BUS
C351	TURNING MOVEMENT FOR SRV
C400	STORMWATER CATCHMENT LAYOUT PLAN
C401	STORMWATER DRAINAGE LAYOUT PLAN
C410	STORMWATER DRAINAGE LONGSECTIONS
C411	STORMWATER DRAINAGE STRUCTURAL DETAILS - SHEET 1 OF 2
C412	STORMWATER DRAINAGE STRUCTURAL DETAILS - SHEET 2 OF 2
C420	STORMWATER DRAINAGE CALCULATIONS TABLE
C450	CULVERT STRUCTURAL NOTES
C451	CULVERT STRUCTURAL DETAILS - SHEET 1 OF 4
C452	CULVERT STRUCTURAL DETAILS - SHEET 2 OF 4
C453	CULVERT STRUCTURAL DETAILS - SHEET 3 OF 4
C454	CULVERT STRUCTURAL DETAILS - SHEET 4 OF 4

RMS ACCEPTANCE

GEOTECHNICAL		RSTM	
	NAME		NAME
ROAD DESIGN		ASSET MANAGER	
	NAME		NAME

PREPARED FOR

BYRON SHIRE COUNCIL

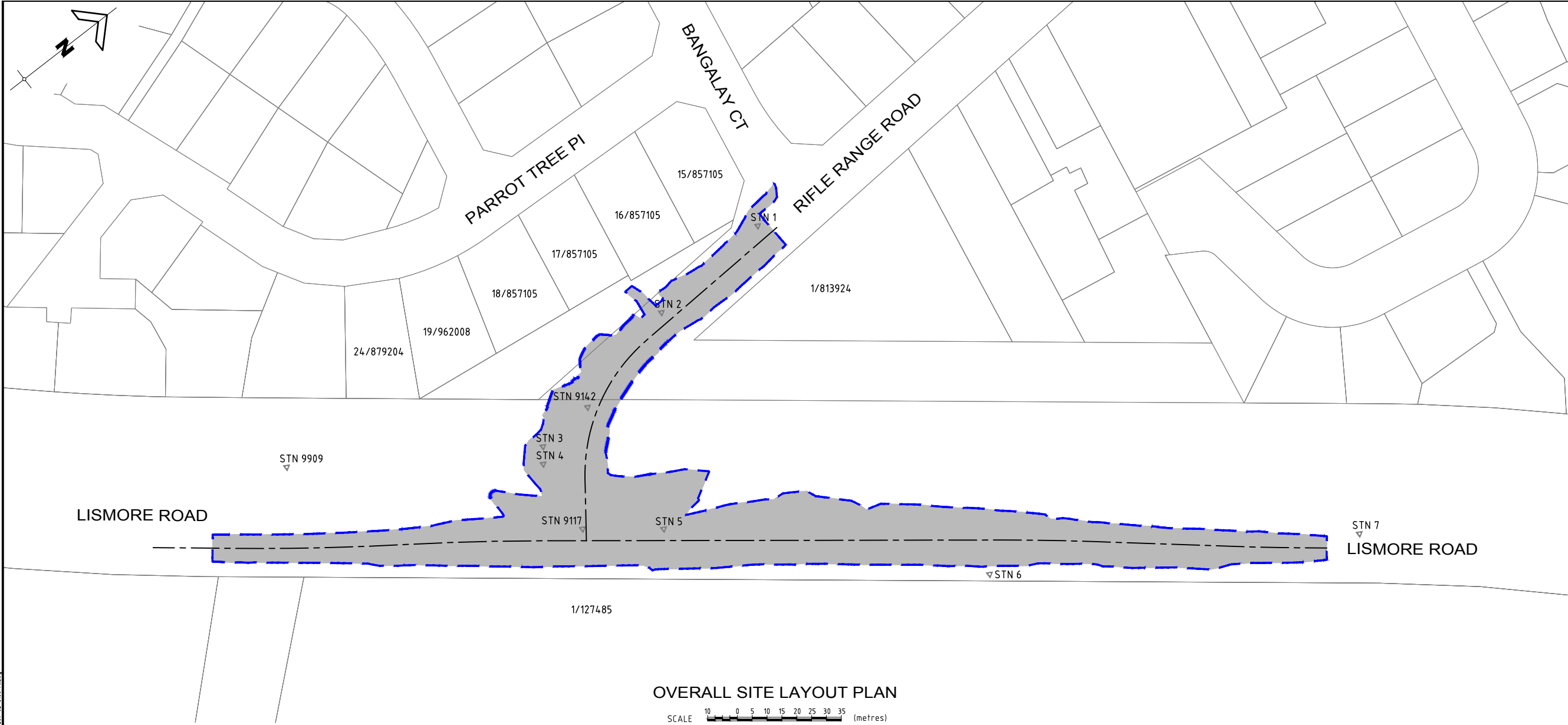
PREPARED BY



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Coote Burchills Engineering Pty Ltd
ABN 76 166 942 365

DATE : 28-11-23

PROJECT No.:	DRAWING No. :	VERSION:
BE170269-02	C000	G



GENERAL NOTES:

1. CONTRACT DOCUMENTATION
ALL DRAWINGS UNDER THIS CONTRACT ARE TO BE READ IN CONJUNCTION WITH THE PROJECT SPECIFICATION.

2. SURVEY INFORMATION
CONTROL SURVEY TO BE ESTABLISH ON SITE BY THE CONTRACTOR. SETOUT INFORMATION SHALL NOT BE OBTAINED BY SEALING FROM THESE DRAWINGS.

3. DATUM
ALL LEVELS SHOWN ON DRAWINGS ARE A.H.D. (DERIVED).

4. EXISTING SURVEY CONTROL STATIONS
THE CONTRACTOR IS TO ENSURE THAT SURVEY CONTROL STATIONS ARE NOT DAMAGED OR DISTURBED IN ANY WAY BY CONSTRUCTION ACTIVITIES.

5. EXISTING SERVICES
EXISTING SERVICES LOCATIONS WHERE SHOWN ON THE DRAWINGS ARE INDICATIVE ONLY. THE CONTRACTOR SHALL CONTACT THE RELEVANT AUTHORITIES TO ASCERTAIN THE EXACT LOCATION OF ALL EXISTING SERVICES PRIOR TO COMMENCEMENT OF WORK AND SHALL TAKE ALL NECESSARY PRECAUTIONS TO AVOID DAMAGE TO EXISTING SERVICES. CONTRACTOR IS TO UNDERTAKE A DIAL-BEFORE-YOU-DIG SEARCH PRIOR TO COMMENCEMENT.

6. PROVISION FOR TRAFFIC
PROVISION FOR TRAFFIC ON EXISTING LOCAL ROADS IS TO BE IN ACCORDANCE WITH THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES AND LOCAL AUTHORITY REQUIREMENTS. THE CONTRACTOR IS TO TAKE PARTICULAR CARE TO ENSURE THAT VEHICULAR AND PEDESTRIAN ACCESS TO EXISTING RESIDENCES IN LOCAL STREETS IS MAINTAINED AT ALL TIMES THROUGHOUT THE COURSE OF THE WORKS.

7. WORK BOUNDARIES
THE CONTRACTOR IS TO RESTRICT ACTIVITIES TO THOSE AREAS DESIGNATED AS WORK AREAS UNDER THIS CONTRACT. AT NO TIME SHALL THE CONTRACTOR ENTER ADJOINING PROPERTIES OR CONTRACT WORK AREAS ON THE SITE WITHOUT WRITTEN AUTHORISATION FROM THE SUPERINTENDENT.

8. SITE CLEARING
CLEARING AND GRUBBING SHALL BE CARRIED OUT TO ALL WORK AREAS AS SPECIFIED AND SHALL INCLUDE THE REMOVAL OF ALL REMAINING TREES (UNLESS NOMINATED TO BE PRESERVED), EXISTING VEGETATION, SURFACE MULCH, TIMBER, FENCES AND ANY OTHER DEBRIS.

9. TOPSOIL STRIPPING
ALL TOPSOIL STRIPPED FROM WORK AREAS SHALL BE TEMPORARILY STOCKPILED FOR LATER RE-SPREADING TO ALL FOOTPATHS, ROAD VERGES, BATTERS, ALLOTMENTS AND PARK AREAS.
10. EARTHWORKS (GENERAL)
ALL FILL MATERIAL PLACED SHALL BE COMPACTED AND TRIMMED TO FINAL EARTHWORKS LEVELS AND PROFILES SHOWN ON THE CONTRACT DRAWINGS AND TESTED IN ACCORDANCE WITH THE PROJECT SPECIFICATION.

ALL EARTHWORKS CONSTRUCTION FOR LISMORE ROAD TO BE IN ACCORDANCE WITH RMS SPECIFICATION R44 AND SUPPORTING MATERIAL SPECIFICATIONS.

11. COMPACTION STANDARDS
ALL FILL MATERIAL PLACED UNDER THIS CONTRACT SHALL BE COMPACTED IN ACCORDANCE WITH RMS SPECIFICATION R44 AND SUPPORTING MATERIAL SPECIFICATIONS.

12. STORMWATER DRAINAGE
LOCATION AND ALIGNMENT OF ALL STORMWATER DRAINLINES IS TO BE VERIFIED ON SITE WITH THE SUPERINTENDENT PRIOR TO EXCAVATION. THE DESIGN SURFACE LEVELS OF MANHOLES AND OTHER STRUCTURES ARE TO BE VERIFIED ON SITE WITH THE SUPERINTENDENT. ALL DRAINAGE CONSTRUCTION SHALL BE IN ACCORDANCE WITH RMS SPECIFICATION R11 AND SUPPORTING MATERIAL SPECIFICATIONS.

13. ELECTRICAL RETICULATION
ALIGNMENTS OF ALL CONDUIT CROSSINGS ARE TO BE VERIFIED ON SITE WITH THE SUPERINTENDENT PRIOR TO EXCAVATION. ALL ELECTRICAL WORKS ARE TO BE CONSTRUCTED IN ACCORDANCE WITH THE RELEVANT CONSULTANT'S DRAWINGS.

14. TOPSOIL REPLACEMENT AND GRASSING
FOLLOWING COMPLETION OF ROADWORKS CONSTRUCTION AND BULK EARTHWORKS OPERATIONS, THE FULL EXTENT OF FOOTPATHS, ROAD VERGES, BATTERS, ALLOTMENTS AND PARK AREAS IS TO BE RE-TOPSOILED TO A MINIMUM DEPTH OF 100mm AND GRASSED AS FURTHER DETAILED IN THE SPECIFICATION.

15. TESTING
ALL TESTING SHALL BE CARRIED OUT BY AN APPROVED N.A.T.A. TESTING AUTHORITY IN ACCORDANCE WITH THE PROJECT SPECIFICATION.

16. "AS CONSTRUCTED" SURVEY
"AS CONSTRUCTED" SURVEY SHALL BE CARRIED OUT BY THE CONTRACTOR.

17. MAINTENANCE OF SITE CONDITION
AT THE COMPLETION OF WORKS THE SITE IS TO BE LEFT IN A CLEAN AND TIDY CONDITION TO THE SATISFACTION OF THE SUPERINTENDENT AND BYRON SHIRE COUNCIL.

LEGEND:

EXTENT OF PROPOSED WORKS

SURVEY CONTROL TABLE				
STATION ID	EASTING (m)	NORTHING (m)	ELEVATION (ADH)	STATION DESCRIPTION
STN 1	350385.268	1824935.842	47.47	SCREW IN KERB
STN 2	350388.455	1824892.366	45.03	SCREW IN KERB
STN 9142	350398.392	1824853.204	43.65	SCREW IN KERB
STN 3	350399.660	1824833.228	46.86	DPY
STN 4	350404.344	1824829.675	46.81	BOLT
STN 9909	350352.229	1824760.865	47.95	
STN 9117	350429.699	1824826.747	44.63	SCREW IN BITUMEN
STN 5	350446.464	1824848.311	44.45	BOLT
STN 6	350525.730	1824925.615	45.55	BOLT
STN 7	350591.270	1825032.253	43.20	

RIFLE RANGE ROAD
AND BANGALOW
ROAD
INTERSECTION
UPGRADE WORKS

FOR

BYRON SHIRE COUNCIL

A1 ORIGINAL SIZE BEFORE REDUCTION

F	REISSUED FOR CONSTRUCTION	28-11-23
E	REISSUED FOR CONSTRUCTION	15-09-23
D	REISSUED FOR CONSTRUCTION	17-07-23
C	ISSUE FOR CONSTRUCTION	07-06-23
B	PLAN AMENDED	23-02-22
A	ORIGINAL ISSUE	28-01-22
VER.	DESCRIPTION	DATE

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Coote Burchills Engineering Pty Ltd
ABN 76 166 942 365

PROJECT:

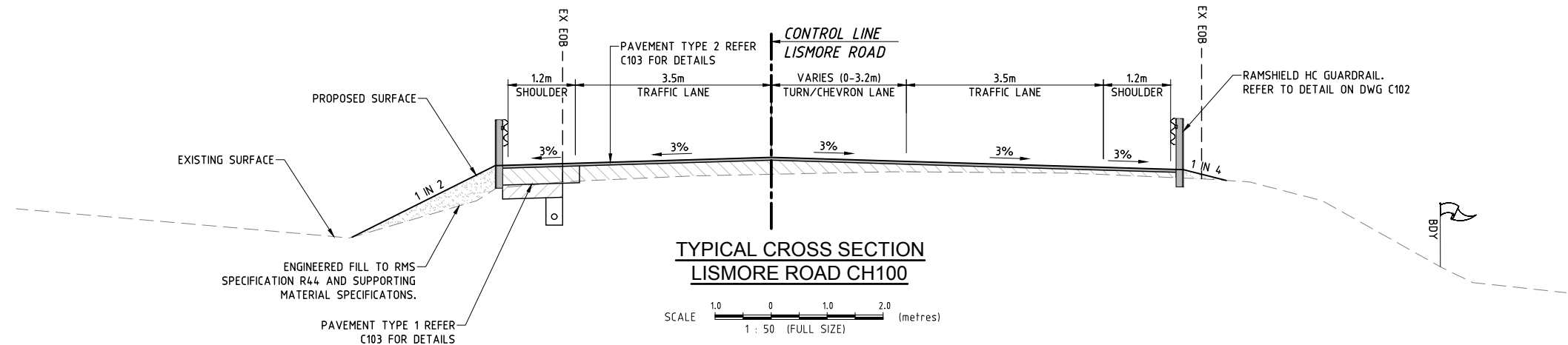
RIFLE RANGE ROAD
AND BANGALOW ROAD
INTERSECTION
UPGRADE WORKS

DRAWING TITLE :

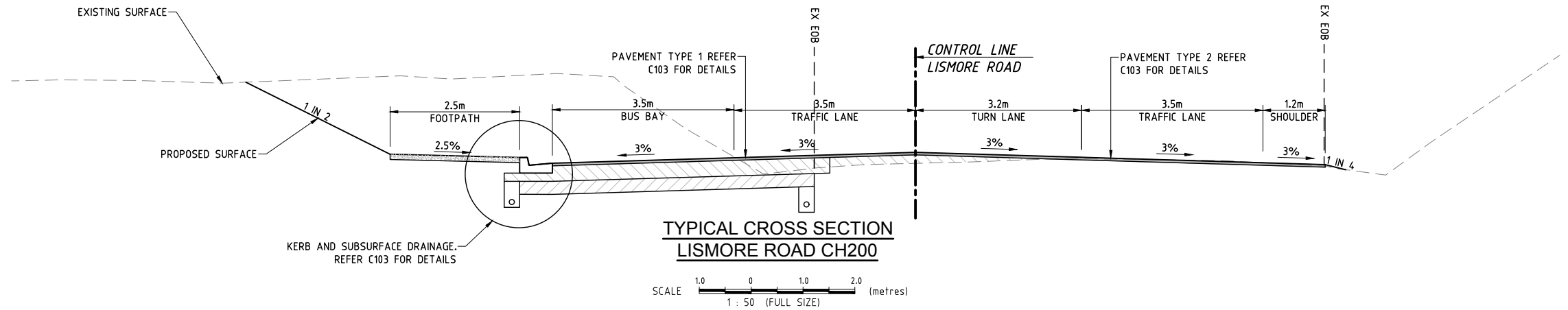
OVERALL SITE LAYOUT
PLAN

TINSW REG. No. :	DS2023/000976	DATE :	28-11-23
PROJECT LEADER :	DEREK WALTON		
DESIGNER :	VAN LE		
DRAFTSPERSON :	VAN LE		
CHECKED :	DEREK WALTON		
APPROVED FOR AND ON BEHALF OF BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365 			
SCALE :	AS NOTED	DATUM :	AHD
PROJECT No.:	BE170269-02	DRAWING No.:	C100
		VERSION:	F

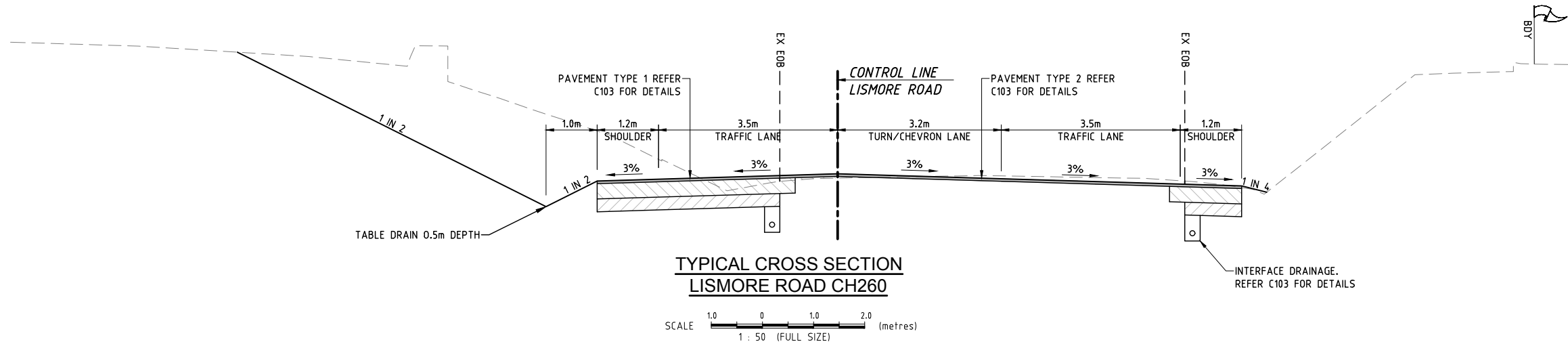
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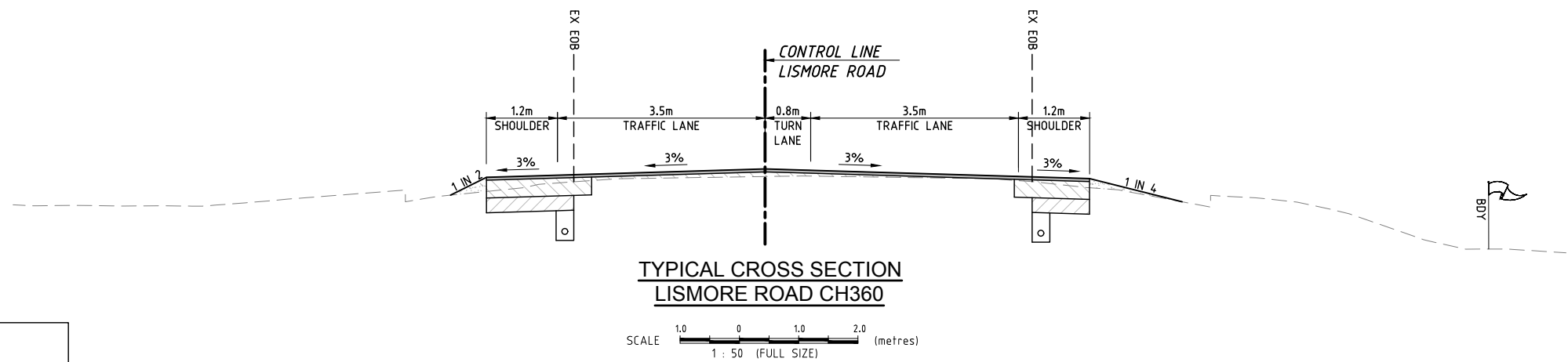
TYPICAL CROSS SECTION
LISMORE ROAD CH100



TYPICAL CROSS SECTION
LISMORE ROAD CH200



TYPICAL CROSS SECTION
LISMORE ROAD CH260



TYPICAL CROSS SECTION
LISMORE ROAD CH360

NOTES:

- REFER TO PAVEMENT REPORT "754-BNEGE302701" PREPARED BY TETRA TECH COFFEY.

RIFLE RANGE ROAD AND BANGALOW ROAD INTERSECTION UPGRADE WORKS

FOR
BYRON SHIRE COUNCIL

A1 ORIGINAL SIZE BEFORE REDUCTION

VER.	DESCRIPTION	DATE
F	REISSUED FOR CONSTRUCTION	28-11-23
E	REISSUED FOR CONSTRUCTION	15-09-23
D	REISSUED FOR CONSTRUCTION	17-07-23
C	ISSUE FOR CONSTRUCTION	07-06-23
B	PLAN AMENDED	23-02-22
A	ORIGINAL ISSUE	28-01-22

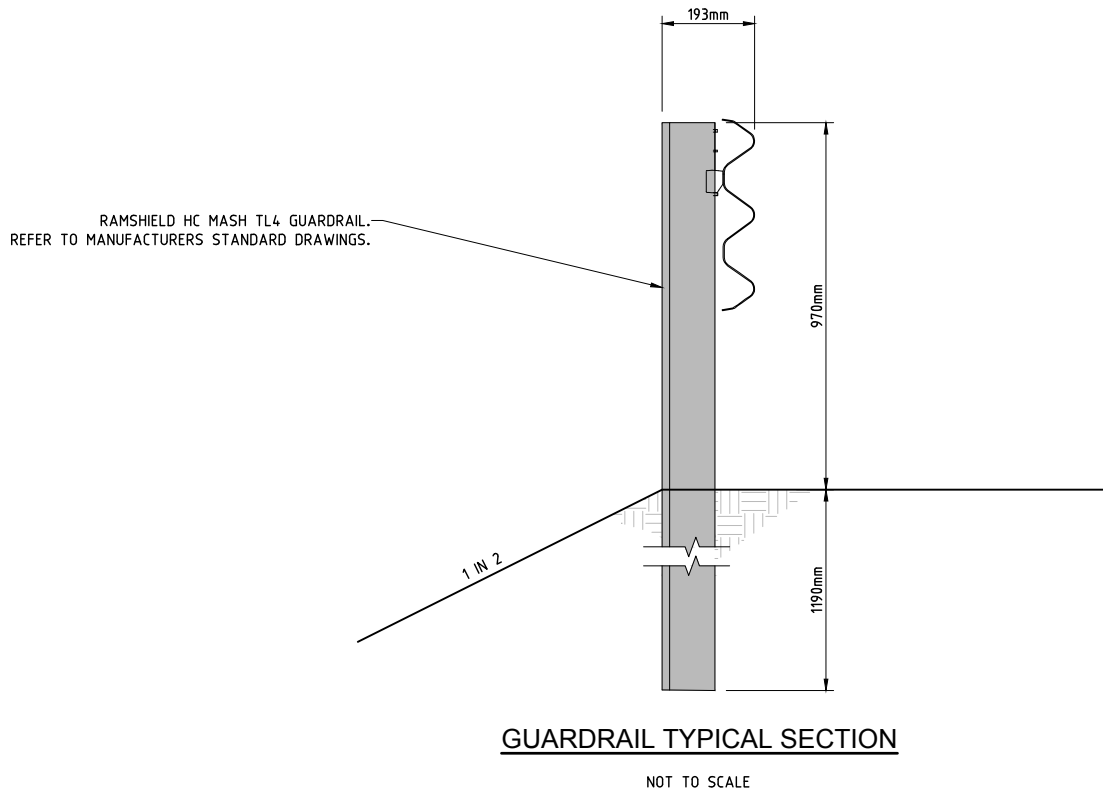
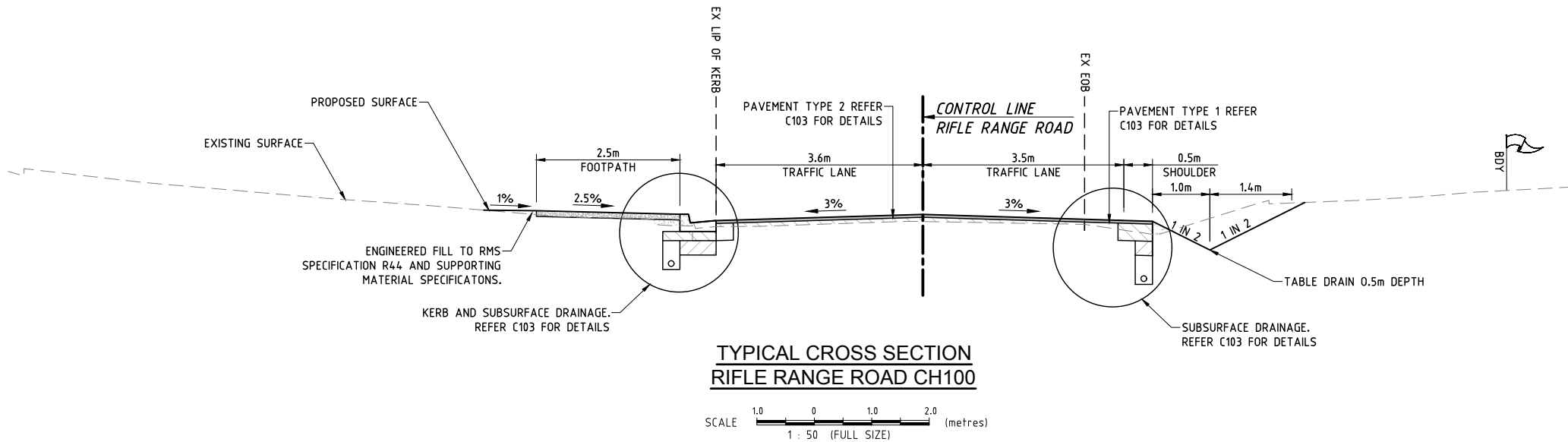
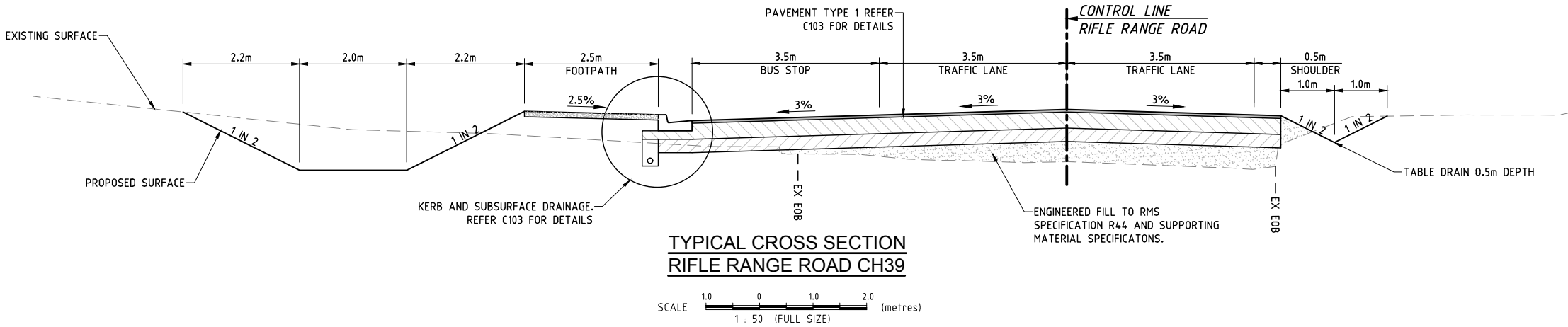
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Coote Burchills Engineering Pty Ltd
ABN 76 166 942 365

PROJECT:
**RIFLE RANGE ROAD
AND BANGALOW ROAD
INTERSECTION
UPGRADE WORKS**

DRAWING TITLE:
**ROADWORKS TYPICAL
CROSS SECTION AND
DETAILS - SHEET 1 OF 2**

TINSW REG. No.:	DS2023/000976	DATE:	28-11-23
PROJECT LEADER:	DEREK WALTON		
DESIGNER:	VAN LE		
DRAFTSPERSON:	VAN LE		
CHECKED:	DEREK WALTON		
APPROVED FOR AND ON BEHALF OF	BURCHILLS ENGINEERING SOLUTIONS	ABN 76 166 942 365	
SCALE:	AS NOTED	DATUM:	AHD
PROJECT No.:	BE170269-02	DRAWING No.:	C101
		VERSION:	F



NOTES:

1. REFER TO PAVEMENT REPORT "754-BNEGE302701" PREPARED BY TETRA TECH COFFEY.

RIFLE RANGE ROAD AND BANGALOW ROAD INTERSECTION UPGRADE WORKS

FOR
BYRON SHIRE COUNCIL

A1 ORIGINAL SIZE BEFORE REDUCTION

VER.	DESCRIPTION	DATE
F	REISSUED FOR CONSTRUCTION	28-11-23
E	REISSUED FOR CONSTRUCTION	15-09-23
D	REISSUED FOR CONSTRUCTION	17-07-23
C	ISSUE FOR CONSTRUCTION	07-06-23
B	PLAN AMENDED	23-02-22
A	ORIGINAL ISSUE	28-01-22

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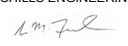


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PROJECT:
RIFLE RANGE ROAD AND BANGALOW ROAD INTERSECTION UPGRADE WORKS

DRAWING TITLE:
ROADWORKS TYPICAL CROSS SECTION AND DETAILS - SHEET 2 OF 2

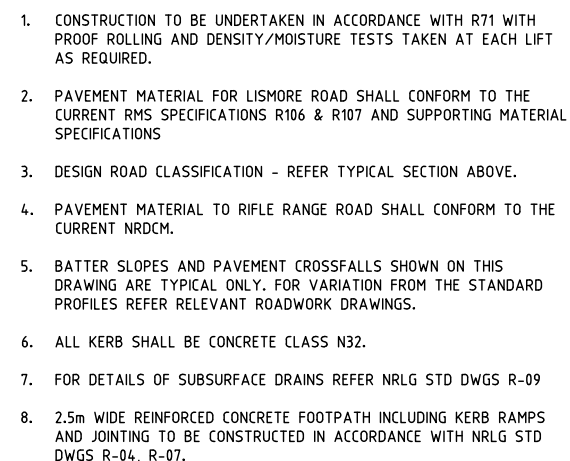
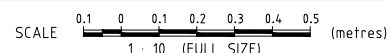
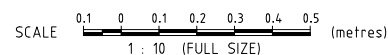
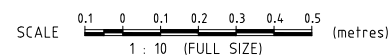
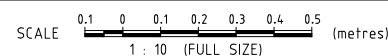
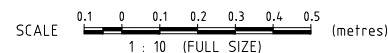
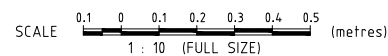
TINSW REG. No. :	DS2023/000976	DATE :	28-11-23
PROJECT LEADER :	DEREK WALTON		
DESIGNER :	VAN LE		
DRAFTSPERSON :	VAN LE		
CHECKED :	DEREK WALTON		
APPROVED FOR AND ON BEHALF OF BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365 			
SCALE :	AS NOTED	DATUM :	AHD
PROJECT No.:	BE170269-02	DRAWING No.:	C102
		VERSION:	F



SCALE  (metres)

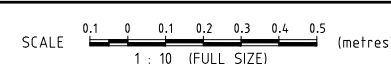


SCALE  (metres)
1 : 10 (FULL SIZE)



1. SUBGRADE TESTS SHALL BE UNDERTAKEN TO CONFIRM EXISTING CBR VALUES AND THE PAVEMENT DESIGN.
2. PAVEMENT MATERIAL FOR LISMORE ROAD SHALL CONFORM TO THE CURRENT RMS SPECIFICATIONS R116 AND SUPPORTING MATERIAL SPECIFICATIONS
3. DESIGN ROAD CLASSIFICATION - REFER TYPICAL SECTION C101 & C102 .
4. PAVEMENT MATERIAL TO RIFLE RANGE ROAD SHALL CONFORM TO THE CURRENT NRDCM.
5. CONSTRUCTION AND COMPACTION OF PAVEMENT SHALL BE UNDERTAKEN IN MAXIMUM LAYERS OF 150mm THICK AS PER TfNSW R71.
6. REFER TO 'MR65 LISMORE ROAD, AT RIFLE RANGE ROAD, BANGALOW - GEOTECHNICAL INVESTIGATION AND PAVEMENT THICKNESS DESIGN', PREPARED BY COFFEY, FOR PAVEMENT CONSTRUCTION METHODOLOGY.
7. REFER TO PAVEMENT REPORT "754-BNEGE302701" PREPARED BY TETRA TECH COFFEY.

1. THE CONTRACTOR SHALL LOCATE AND PROTECT ALL EXISTING SERVICES. ANY DAMAGE TO EXISTING SERVICES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE RECTIFIED AT THEIR EXPENSE.
2. ALL WORKS WITHIN LISMORE ROAD TO BE CONSTRUCTED IN ACCORDANCE WITH RMS SPECIFICATIONS AND STANDARD DRAWINGS. ALL WORKS COMPLETED WITHIN RIFLE RANGE ROAD SHALL BE CONSTRUCTED IN ACCORDANCE WITH B.S.C STANDARD SPECIFICATIONS AND DRAWINGS.
3. THE CONTRACTOR SHALL HAVE AN APPROVED SET OF CONSTRUCTION PLANS. ALL RELEVANT CURRENT B.S.C STANDARD SPECIFICATIONS AND DRAWINGS AND ALL RMS PROJECT SPECIFICATIONS ON SITE AT ALL TIMES DURING THE CONSTRUCTION PHASE.
4. THE CONTRACTOR SHALL MAINTAIN MINIMUM VERTICAL CLEARANCE FROM ALL EXISTING UTILITIES WHERE CROSSINGS OCCUR.
5. THE CONTRACTOR'S CONSTRUCTION TRAFFIC MANAGEMENT PLAN IS TO MAINTAIN VEHICULAR ACCESS TO ALL EXISTING ALLOTMENTS DURING THE COURSE OF THE WORKS, ANY DISRUPTIONS TO NORMAL ACCESS TO BE MINIMISED AS MUCH AS POSSIBLE.



FOR

BYRON SHIRE COUNCIL

A1 ORIGINAL SIZE BEFORE REDUCTION

G	REISSUED FOR CONSTRUCTION	28-11-23
F	REISSUED FOR CONSTRUCTION	15-09-23
E	REISSUED FOR CONSTRUCTION	17-07-23
D	ISSUE FOR CONSTRUCTION	07-06-23
C	PLAN AMENDED	18-03-22
B	PLAN AMENDED	23-02-22
A	ORIGINAL ISSUE	28-01-22
VER.	DESCRIPTION	DATE

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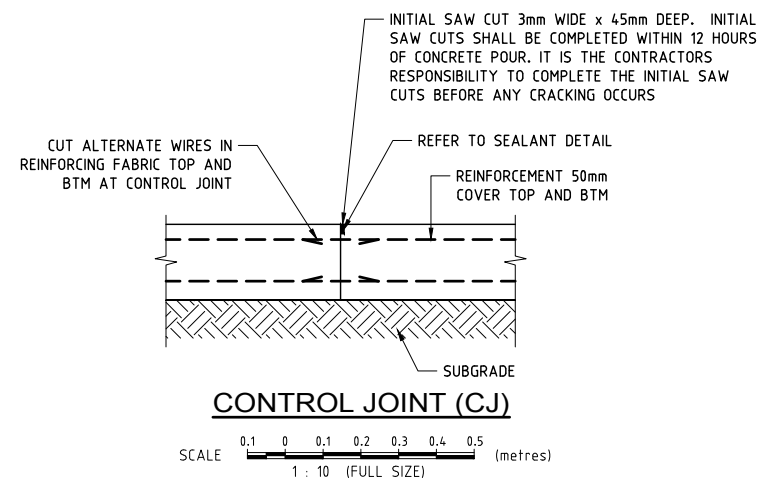
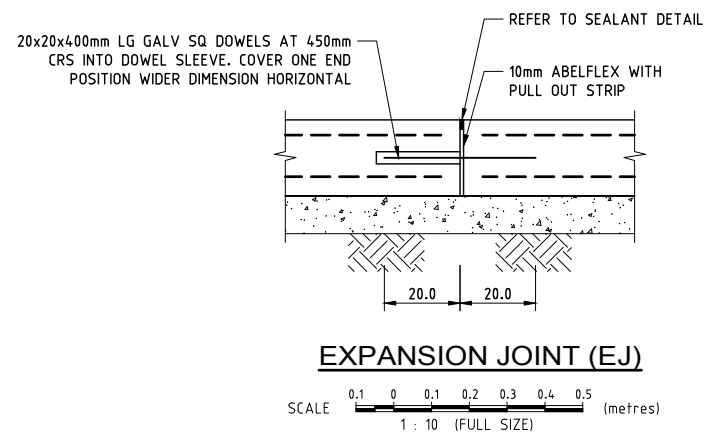
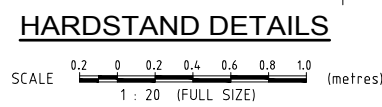
PROJECT:

RIFLE RANGE ROAD
AND BANGALOW ROAD
INTERSECTION
UPGRADE WORKS

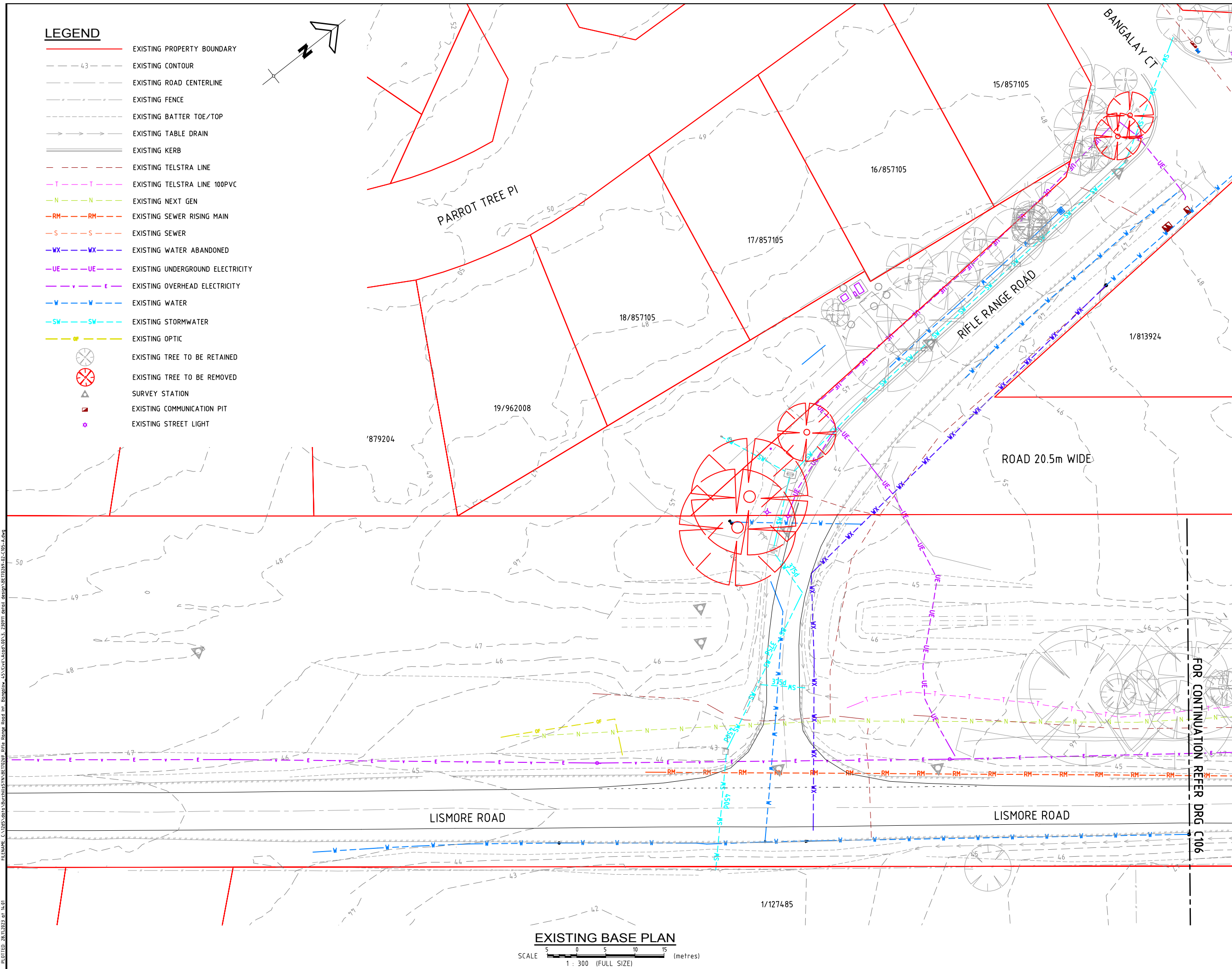
DRAWING TITLE :

PAVEMENT DETAILS

TINSW REG. No. :	DS2023/000976	DATE : 28-11-23
PROJECT LEADER :	DEREK WALTON	
DESIGNER :	VAN LE	
DRAFTSPERSON :	VAN LE	
CHECKED :	DEREK WALTON	
APPROVED FOR AND ON BEHALF OF BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365 		
SCALE : AS NOTED	DATUM : AHD	FULL SIZE : A1
PROJECT No.:	DRAWING No. :	VERSION:
BE170269-02	C103	G



TINSW REG. No. :		DS2023/000976		DATE : 28-11-23	
PROJECT LEADER : DEREK WALTON					
DESIGNER : VAN LE					
DRAFTSPERSON : VAN LE					
CHECKED : DEREK WALTON					
APPROVED FOR AND ON BEHALF OF BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 395 					
SCALE: AS NOTED		DATUM : AHD		FULL SIZE : A1	
PROJECT No.:		DRAWING No. :		VERSION:	
BE170269-02		C104		F	



RIFLE RANGE ROAD
AND BANGALOW
ROAD
INTERSECTION
UPGRADE WORKS

BYRON SHIRE COUNCIL

E	REISSUED FOR CONSTRUCTION	28-11-23
D	REISSUED FOR CONSTRUCTION	15-09-23
C	REISSUED FOR CONSTRUCTION	17-07-23
B	ISSUE FOR CONSTRUCTION	07-06-23
A	ORIGINAL ISSUE	18-03-22
VER.	DESCRIPTION	DATE

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PROJECT:

RIFLE RANGE ROAD
AND BANGALOW ROAD
INTERSECTION
UPGRADE WORKS

EXISTING BASE PLAN -
SHEET 1 OF 2

PROJECT LEADER : DEREK WALTON

DESIGNER : VAN LE

DRAFTSPERSON : VAN LE

CHECKED : DEREK WALTON

APPROVED FOR AND ON BEHALF OF
BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365

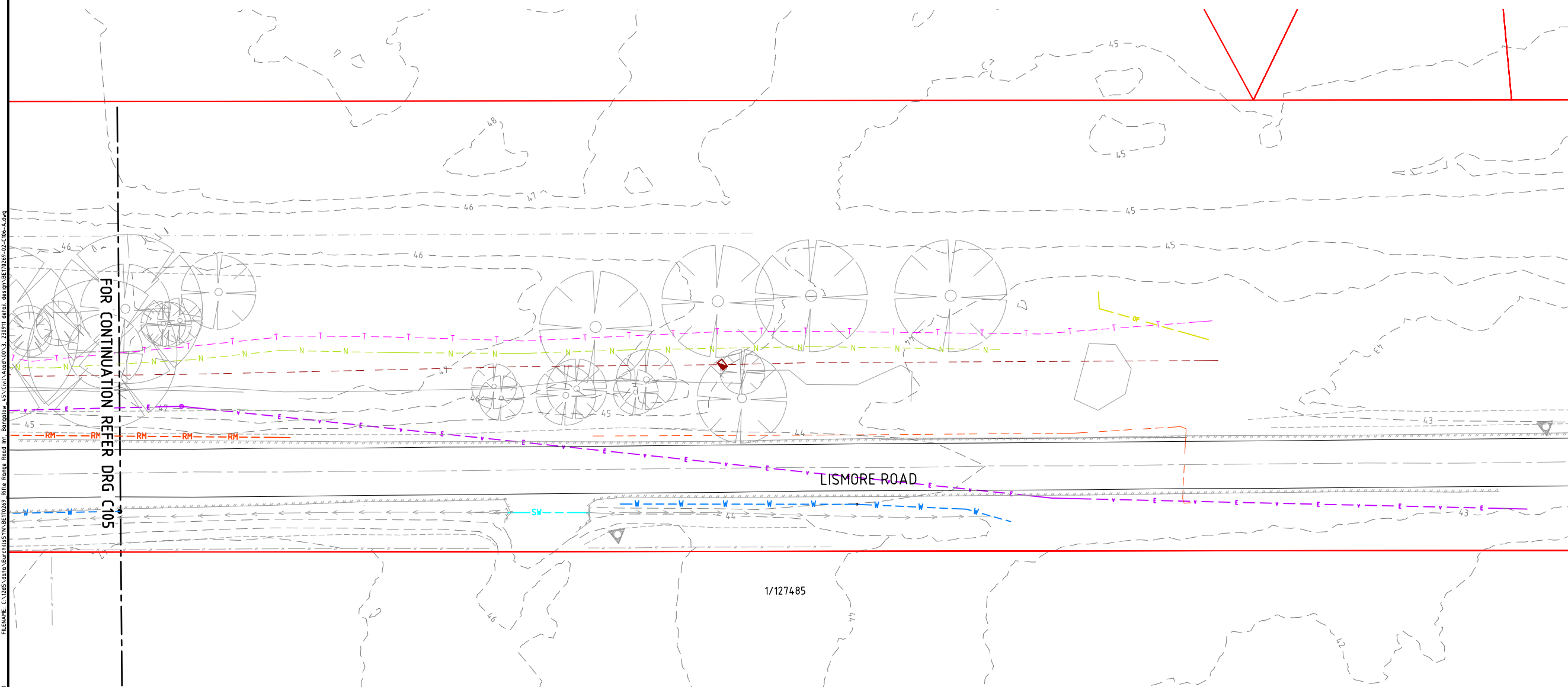
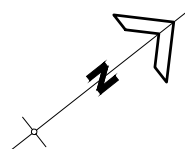
SCALE : AS NOTED	DATUM : AHD	FULL SIZE : A1
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PROJECT No.:	DRAWING No. :	VERSION:
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BF170269-02	C105	F
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	EXISTING PROPERTY BOUNDARY
	EXISTING CONTOUR
	EXISTING ROAD CENTERLINE
	EXISTING FENCE
	EXISTING BATTER TOE/TOP
	EXISTING TABLE DRAIN
	EXISTING KERB
	EXISTING TELSTRA LINE
	EXISTING TELSTRA LINE 100PVC
	EXISTING NEXT GEN
	EXISTING SEWER RISING MAIN
	EXISTING SEWER

	EXISTING WATER ABANDONED
	EXISTING UNDERGROUND ELECTRICITY
	EXISTING OVERHEAD ELECTRICITY
	EXISTING WATER
	EXISTING STORMWATER
	EXISTING OPTIC
	EXISTING TREE TO BE RETAINED
	EXISTING TREE TO BE REMOVED
	SURVEY STATION
	COMMUNICATION COMMUNICATION PIT
	EXISTING STREET LIGHT



SCALE  (metres)
1 : 300 (FULL SIZE)

FOR

BYRON SHIRE COUNCIL

A1 ORIGINAL SIZE BEFORE REDUCTION

E	REISSUED FOR CONSTRUCTION	28-11-23
D	REISSUED FOR CONSTRUCTION	15-09-23
C	REISSUED FOR CONSTRUCTION	17-07-23
B	ISSUE FOR CONSTRUCTION	07-06-23
A	ORIGINAL ISSUE	18-03-22
VER	DESCRIPTION	DATE

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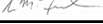
Gold Coast | Brisbane | Toowoomba
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Phone: +61 7 5509 6400
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Email: admin@burchills.com.au
Cooto Burchills Engineering Pty Ltd
ABN 76 166 942 365

PROJECT:

RIFLE RANGE ROAD
AND BANGALOW ROAD
INTERSECTION
UPGRADE WORKS

DRAWING TITLE :

EXISTING BASE PLAN -
SHEET 2 OF 2

TINSW REG. No. : DS2023/000976		DATE : 28-11-23	
PROJECT LEADER : DEREK WALTON			
DESIGNER : VAN LE			
DRAFTSPERSON : VAN LE			
CHECKED : DEREK WALTON			
APPROVED FOR AND ON BEHALF OF BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365 			
SCALE : AS NOTED		DATUM : AHD	
		FULL SIZE : A1	
PROJECT NO : BE170269-02		DRAWING NO. : C106	
		VERSION : E	

FILENAME: C:\2d\data\Burchills\SYN\BE170269_Rifle Range Road Int, Bangalore_45\Civil\Acad\00\3. 230911 detail design\BE170269-02-C106-A.dwg
PLOTTED: 28.11.2023 at 14:01

LEGEND

- 38.35 --- EXISTING CONTOUR
--- 38.35 --- DESIGN CONTOUR
--->--->---> EXISTING TABLE DRAIN
----- EXISTING EDGE OF BITUMEN
===== EXISTING KERB
----- EXISTING BATTER
- - - - - PROPOSED ROAD CENTRELINE
===== PROPOSED KERB
----- PROPOSED FOOTPATH/VERGE
----- PROPOSED SHOULDER
[Grey Box] EARTHWORKS AREA OF FILL
[Dark Grey Box] EARTHWORKS AREA OF CUT
- - - - - PROPOSED BATTER
--->--->---> PROPOSED TABLE DRAIN
- - - - - PROPOSED RAMSHIELD HC GUARDRAIL

GENERAL EARTHWORKS NOTES:

- ALL EARTHWORKS CONSTRUCTION UNDER THIS CONTRACT IS TO BE PERFORMED STRICTLY IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE GEOTECHNICAL ENGINEER'S REPORT PREPARED BY THE PRINCIPAL'S GEOTECHNICAL CONSULTANT.
- ALL COMPACTION TESTING UNDER THIS CONTRACT IS TO BE CARRIED OUT TO AS3798 LEVEL 1 STANDARD BY A NATA-ACCREDITED TESTING AUTHORITY. CERTIFICATION FOR ALL EARTHWORKS CONSTRUCTION AND TESTING IS TO BE PROVIDED BY A REGISTERED PROFESSIONAL ENGINEER QUEENSLAND (RPEQ) ENGAGED BY THE CONTRACTOR.
- ALL DESIGN LEVELS SHOWN ON THE CONTRACT DRAWINGS ARE FINISHED SURFACE LEVELS FOLLOWING TOPSOIL REPLACEMENT.
- ALL STRUCTURAL FILL MATERIAL PLACED SHALL BE COMPACTED TO THE FOLLOWING MINIMUM DENSITY IN ACCORDANCE WITH THE SPECIFICATION AND THE GEOTECHNICAL REPORT.
- AS PER ANNEXURES IN R44 ALL EARTHWORKS BATTERS ARE TO BE HYDROMULCHED WITH APPROVED SEED MIX.
- EXISTING DAMS ARE TO BE DE-WATERED AND CLEANED-OUT. ALL UNSUITABLE OR SATURATED MATERIAL IS TO BE REMOVED AND REPLACED WITH SELECTED ON-SITE STRUCTURAL FILL MATERIAL AND COMPACTED AS SPECIFIED.
- PROVIDE CONDITION SURVEY OF ADJACENT RESIDENTIAL BUILDINGS FOR ALL PROPERTIES IF REQUIRED LOCATED WITHIN NOMINAL 100m OF EARTHWORKS OPERATIONS WHERE VIBRATORY EQUIPMENT IS TO BE USED. CONDITION SURVEY TO BE UNDERTAKEN BY QUALIFIED PERSONNEL WITH BUILDING EXPERIENCE.

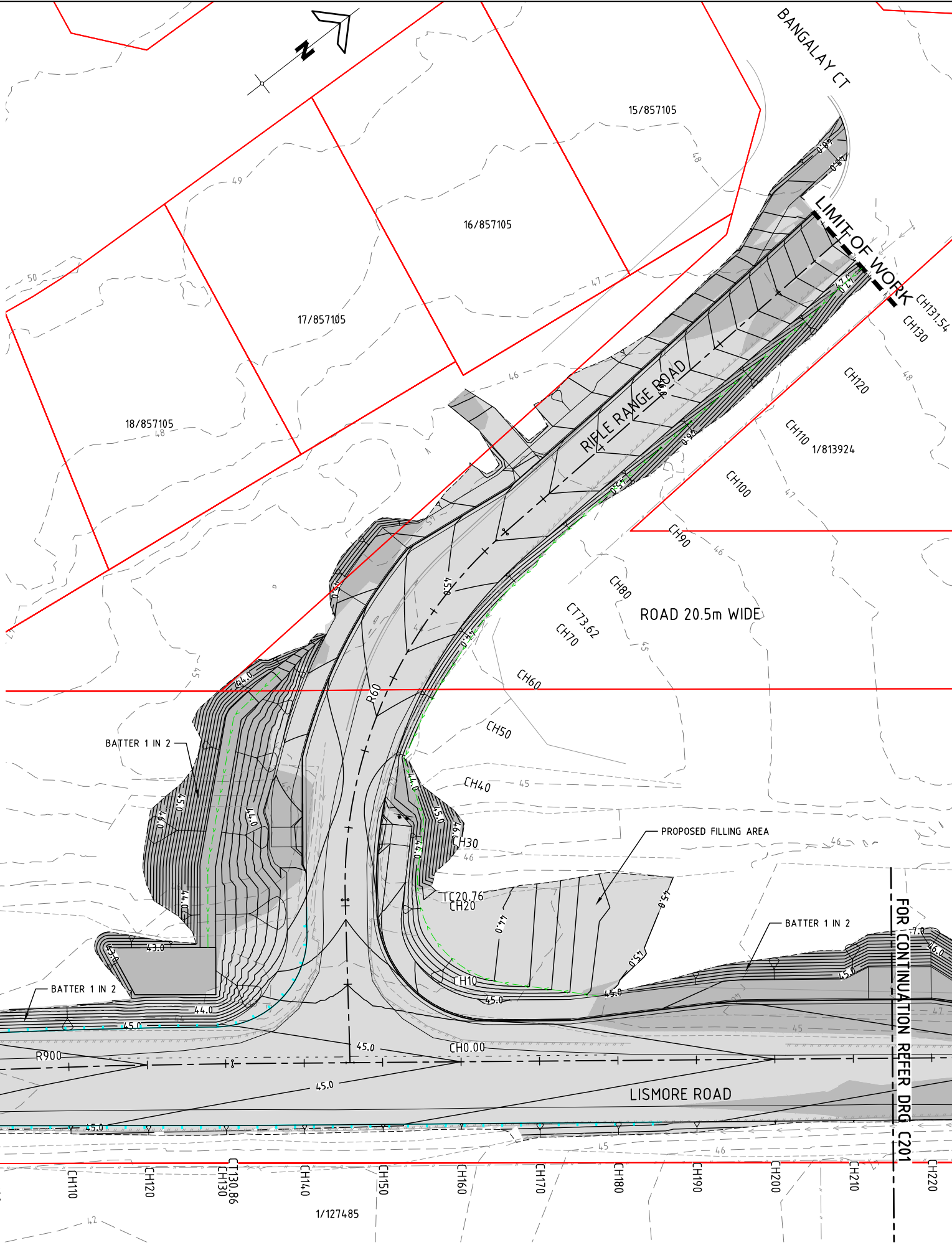
BULK EARTHWORKS SUMMARY		
STRUCTURAL FILLING		
AREA	NETT SOLID FILL	incl. COMPACTION FACTOR (0.85)
OVERALL FILLING		
(ALLOTMENTS, ROADS, BATTERS)	1,729 cu.m.	
TOTAL FILL	1,729 cu.m.	2,034 cu.m.
EXCAVATION		
AREA	NETT CUT	
OVERALL EXCAVATION		
NOT INCLUDING ROAD BOX	2,036 cu.m.	
TOTAL CUT	2,036 cu.m.	
NOTE :		
2,034 cu.m. ON LEADS TO STRUCTURAL FILL i.e. 2,036 - 2,034 cu.m. = 2 cu.m. SPOIL OFF SITE		

WARNING : UNDERGROUND SERVICES

UNDERGROUND SERVICES EXIST IN THIS VICINITY. THE CONTRACTOR IS TO CONTACT THE RELEVANT AUTHORITIES TO CONFIRM EXACT LOCATION OF SERVICES ON SITE PRIOR TO ANY EXCAVATION OR CONSTRUCTION COMMENCING.

NOTE :

ALL DESIGN/SETOUT INFORMATION SHOWN ON THIS DRAWING IS AVAILABLE IN DIGITAL FORMAT FROM THE OFFICE OF THE SUPERINTENDENT UPON REQUEST BY THE CONTRACTOR.



BULK EARTHWORKS LAYOUT PLAN

SCALE 1 : 300 (FULL SIZE)

RIFLE RANGE ROAD AND BANGALOW ROAD INTERSECTION UPGRADE WORKS

FOR
BYRON SHIRE COUNCIL

A1 ORIGINAL SIZE BEFORE REDUCTION

F	REISSUED FOR CONSTRUCTION	28-11-23
E	REISSUED FOR CONSTRUCTION	15-09-23
D	REISSUED FOR CONSTRUCTION	17-07-23
C	ISSUE FOR CONSTRUCTION	07-06-23
B	PLAN AMENDED	23-02-22
A	ORIGINAL ISSUE	28-01-22
VER.	DESCRIPTION	DATE

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Phone: +61 7 5509 6400
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Email: admin@burchills.com.au
Coote Burchills Engineering Pty Ltd
ABN 76 166 942 365

PROJECT:
RIFLE RANGE ROAD AND BANGALOW ROAD INTERSECTION UPGRADE WORKS

DRAWING TITLE:
BULK EARTHWORKS LAYOUT PLAN - SHEET 1 OF 2

TNSW REG. No. :	DS2023/000976	DATE : 28-11-23
PROJECT LEADER :	DEREK WALTON	
DESIGNER :	VAN LE	
DRAFTSPERSON :	VAN LE	
CHECKED :	DEREK WALTON	
APPROVED FOR AND ON BEHALF OF BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365		
SCALE : AS NOTED	DATUM : AHD	FULL SIZE : A1
PROJECT No. :	DRAWING No. :	VERSION :
BE170269-02	C200	F

	EXISTING CONTOUR
	DESIGN CONTOUR
	EXISTING TABLE DRAIN
	EXISTING EDGE OF BITUMEN
	EXISTING KERB
	EXISTING BATTER
	PROPOSED ROAD CENTRELINE
	PROPOSED KERB
	PROPOSED FOOTPATH/VERGE
	PROPOSED SHOULDER
	EARTHWORKS AREA OF FILL
	EARTHWORKS AREA OF CUT
	PROPOSED BATTER
	PROPOSED TABLE DRAIN

FOR

A1 ORIGINAL SIZE BEFORE REDUCTION

G	REISSUED FOR CONSTRUCTION	28-11-23
F	REISSUED FOR CONSTRUCTION	15-09-23
E	REISSUED FOR CONSTRUCTION	17-07-23
D	ISSUE FOR CONSTRUCTION	07-06-23
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VER.	DESCRIPTION	DATE

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BURCHILLS
ENGINEERING SOLUTIONS

PROJECT:

DRAWING TITLE :

TfNSW REG. No. :	DS2023/000976	DATE : 28-11-23
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PROJECT LEADER : DEREK WALTON

DESIGNER : VAN LE

DRAFTSPERSON : VAN LE

CHECKED : DEREK WALTON

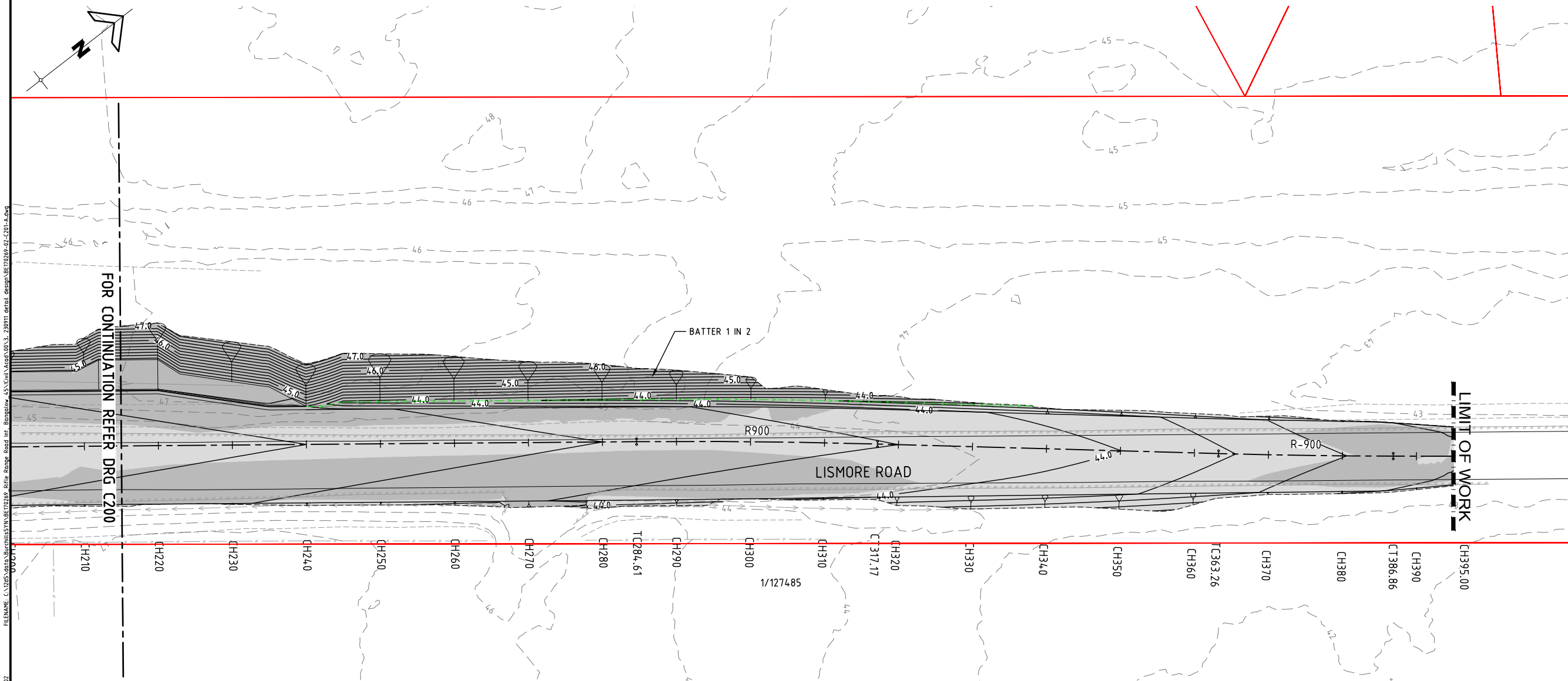
APPROVED FOR AND ON BEHALF OF
BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365

Lm. Fiel

SCALE : AS NOTED	DATUM : AHD	FULL SIZE : A1
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PROJECT No.:	DRAWING No. :	VERSION:
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BE170269-02	C201	G
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SCALE  (metres)
1 : 300 (FULL SIZE)

The diagram illustrates the vertical alignment of the MC10 control. It consists of four horizontal lines representing different road features:

- CONTROL ALIGNMENT LABEL:** A box containing the text "MC10".
- CONTROL ALIGNMENT:** A solid line with short vertical tick marks at each end.
- EXISTING EDGE OF BITUMEN:** A dashed line.
- EXISTING ROAD CENTRELINE:** A long-dashed line.

The labels are positioned to the right of their corresponding lines. The MC10 label is centered vertically between the Control Alignment and the Existing Edge of Bitumen lines.

1. FOR ALIGNMENT TABLE REFER TO SHEET C310 & C311.

FOR

BYRON SHIRE COUNCIL

A1 ORIGINAL SIZE BEFORE REDUCTION

F	REISSUED FOR CONSTRUCTION	28-11-23
E	REISSUED FOR CONSTRUCTION	15-09-23
D	REISSUED FOR CONSTRUCTION	17-07-23
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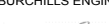


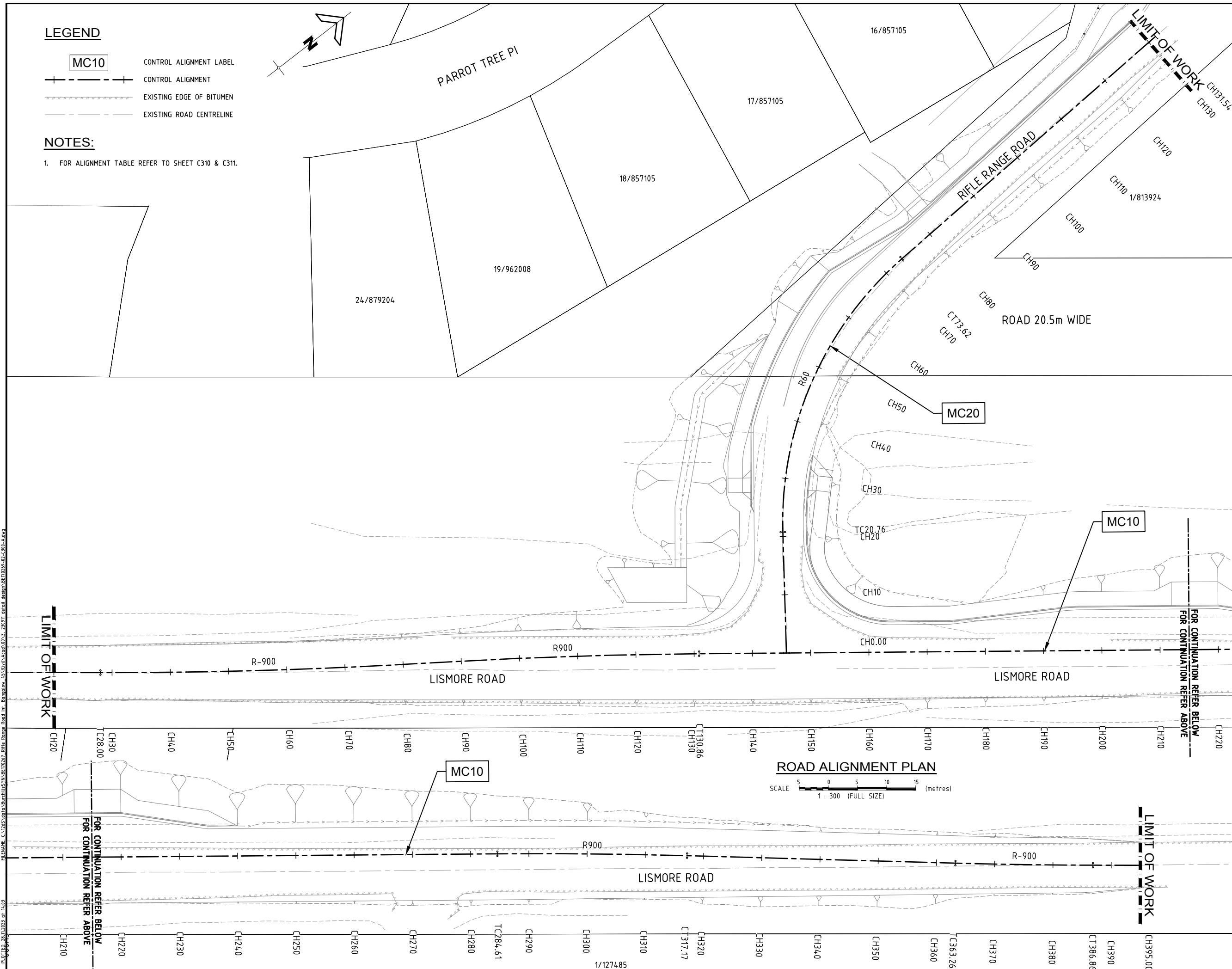
PROJECT:

RIFLE RANGE ROAD
AND BANGALOW ROAD
INTERSECTION
UPGRADE WORKS

DRAWING TITLE :

ROADWORK ALIGNMENT PLAN

TINSW REG. NO. :		DS2023/000976		DATE : 28-11-23	
PROJECT LEADER : DEREK WALTON					
DESIGNER :		VAN LE			
DRAFTSPERSON :		VAN LE			
CHECKED :		DEREK WALTON			
APPROVED FOR AND ON BEHALF OF BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365 					
SCALE : AS NOTED		DATUM : AHD		FULL SIZE : A1	
PROJECT No. :		DRAWING No. :		VERSION:	
BE170269-02		C300		F	



— — — — — EXISTING SURFACE
————— DESIGN SURFACE

FOR

A1 ORIGINAL SIZE BEFORE REDUCTION

F	REISSUED FOR CONSTRUCTION	28-11-23
E	REISSUED FOR CONSTRUCTION	15-09-23
D	REISSUED FOR CONSTRUCTION	17-07-23
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B	PLAN AMENDED	23-02-22
A	ORIGINAL ISSUE	28-01-22
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Email: admin@burchills.com.au
Coote Burchills Engineering Pty Ltd
ABN 76 166 942 365

PROJECT:

RIFLE RANGE ROAD
AND BANGALOW ROAD
INTERSECTION
UPGRADE WORKS

DRAWING TITLE :

LONGITUDINAL
SECTION - SHEET 1 OF
2

TfNSW REG. No. :	DS2023/000976	DATE : 28-11-23
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PROJECT LEADER :	DEREK WALTON
------------------	--------------

DESIGNER : VAN LE

DRAFTSPERSON : VAN LE

CHECKED : DEREK WALTON

APPROVED FOR AND ON BEHALF OF
BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365

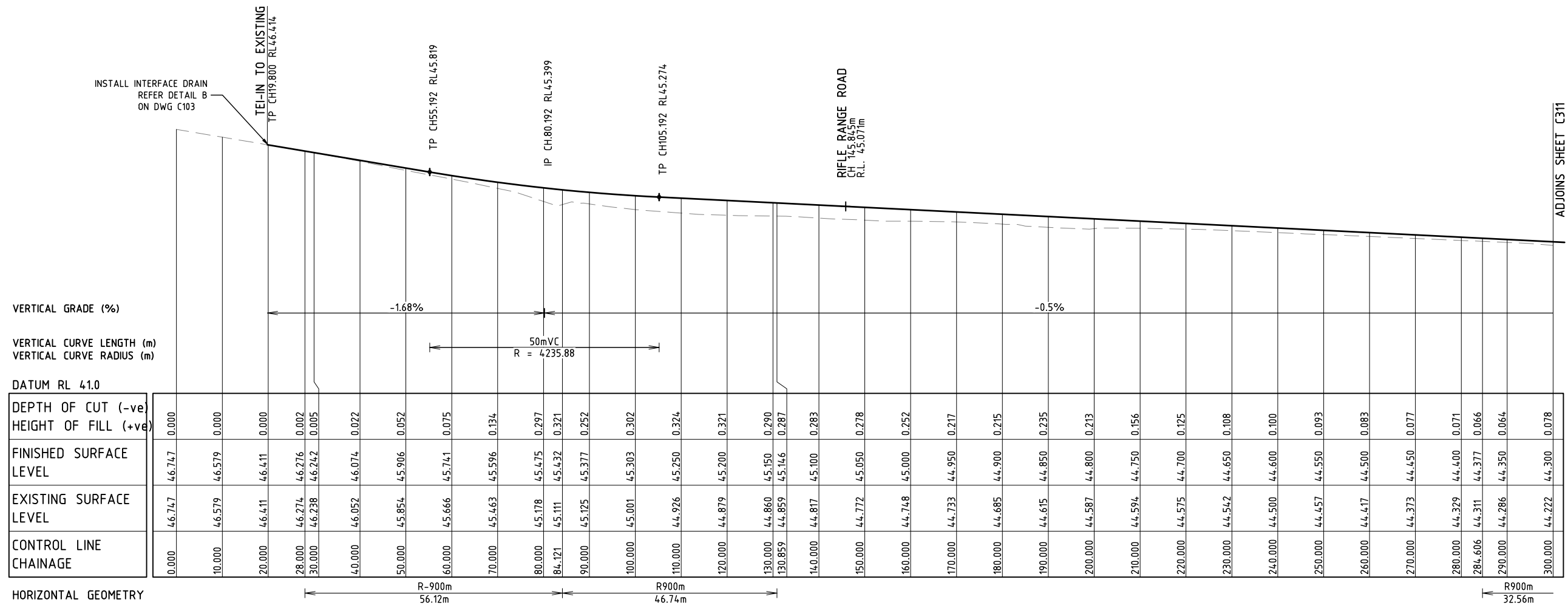
Lm. Fiel

SCALE : AS NOTED	DATUM : AHD	FULL SIZE : A1
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PROJECT No.:

DRAWING No. :

VERSION:



MC10 - LISMORE ROAD
LONGITUDINAL SECTION

Horizontal scale 1:500
Vertical scale 1:50

LISMORE ROAD CONTROL LINE SETOUT TABLE

LISMORE ROAD CONTROL LINE SETOUT TABLE								
PT	CHAINAGE	EASTING	NORTHING	HEIGHT	BEARING	RAD/SPIRAL	A.LENGTH	DEFL.ANGL
IP 1	0.000	350346.060	1824708.710	46.750	38°19'19.67"			
TC	28.000	350363.430	1824730.670	46.280	38°19'19.67"			
IP 2	56.060	350380.830	1824752.690	45.800		R = -900.000	56.120	3°34'21.93"
CC	84.120	350396.830	1824775.760	45.430	34°44'57.74"			
IP 3	107.490	350410.150	1824794.960	45.260		R = 900.000	46.740	2°58'31.70"
CT	130.860	350424.460	1824813.450	45.150	37°43'29.44"			
TC	284.610	350518.530	1824935.060	44.380	37°43'29.44"			
IP 4	300.890	350528.490	1824947.940	44.300		R = 900.000	32.560	2°04'22.44"
CT	317.170	350538.910	1824960.450	44.210	39°47'51.88"			
TC	363.260	350568.420	1824995.860	43.830	39°47'51.88"			
IP 5	375.060	350575.970	1825004.930	43.670		R = -900.000	23.600	1°30'09.51"
CT	386.860	350583.290	1825014.190	43.520	38°17'42.37"			
IP 6	395.000	350588.330	1825020.580	43.420	38°17'42.37"			

SCALE (metres)
1 : 500 (FULL SIZE)

SCALE  (metres)

 EXISTING SURFACE
 DESIGN SURFACE

FOR

A1 ORIGINAL SIZE BEFORE REDUCTION

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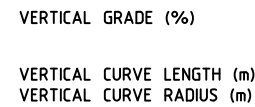
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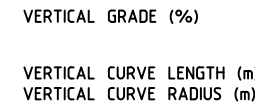
RIFLE RANGE ROAD
AND BANGALOW ROAD
INTERSECTION
UPGRADE WORKS

LONGITUDINAL
SECTION - SHEET 2 OF
2

TNSW REG. No. : DS2023/000976		DATE : 28-11-23	
PROJECT LEADER : DEREK WALTON			
DESIGNER : VAN LE			
DRAFTSPERSON : VAN LE			
CHECKED : DEREK WALTON			
APPROVED FOR AND ON BEHALF OF BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365 			
SCALE : AS NOTED		DATUM : AHD	FULL SIZE : A1
PROJECT No. : BE170269-02		DRAWING No. : C311	VERSION : F

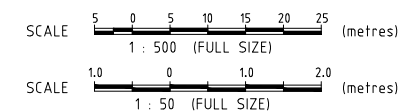


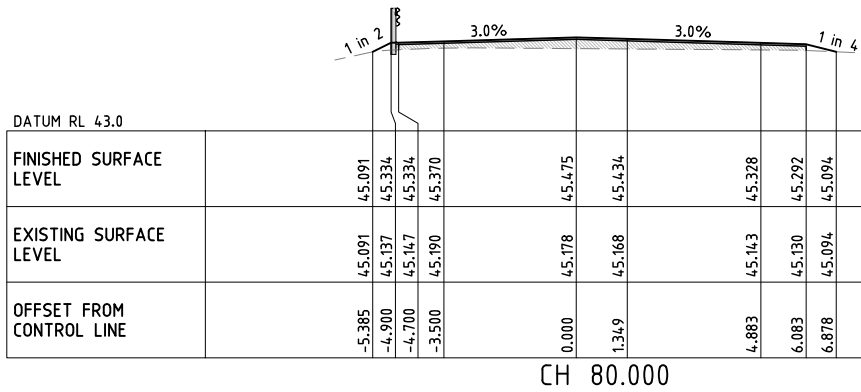
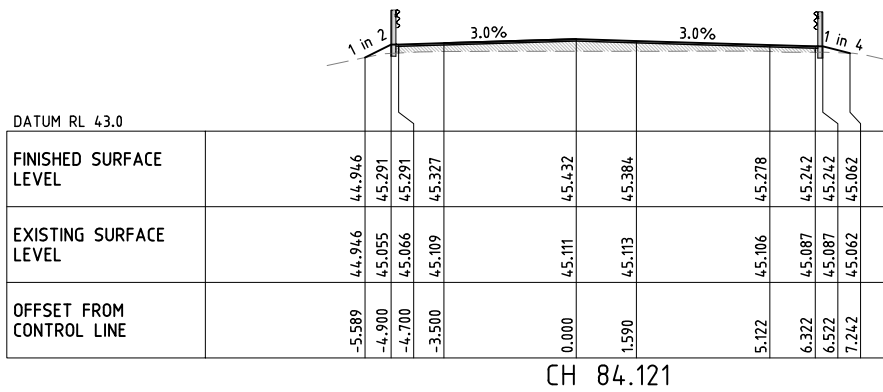
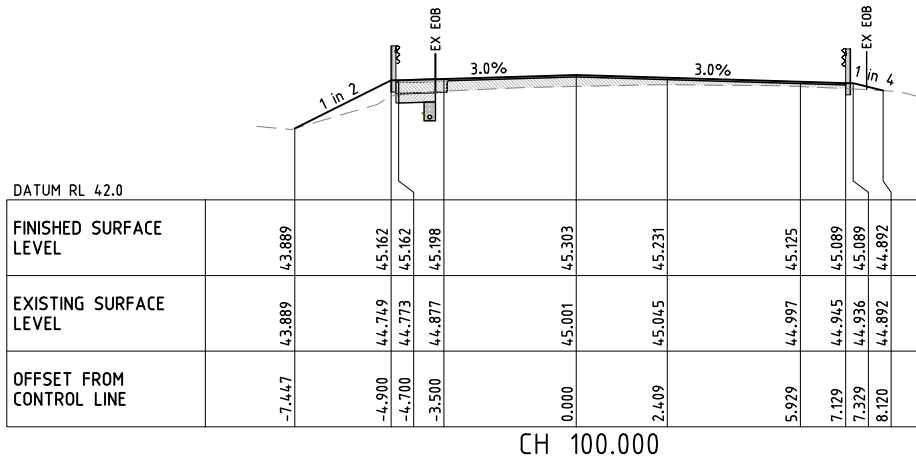
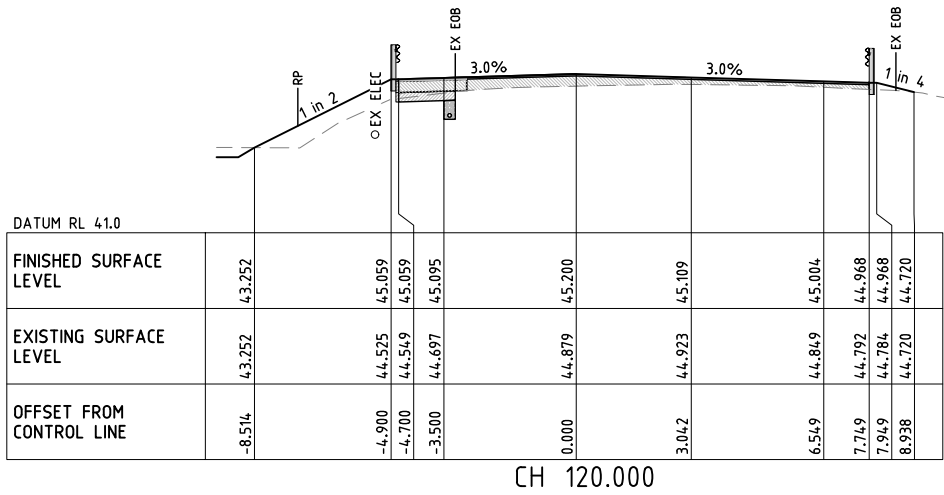
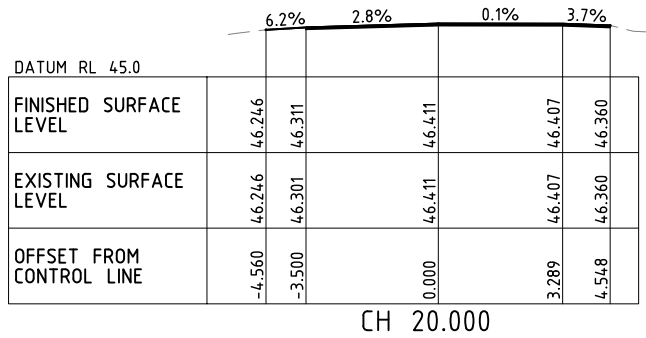
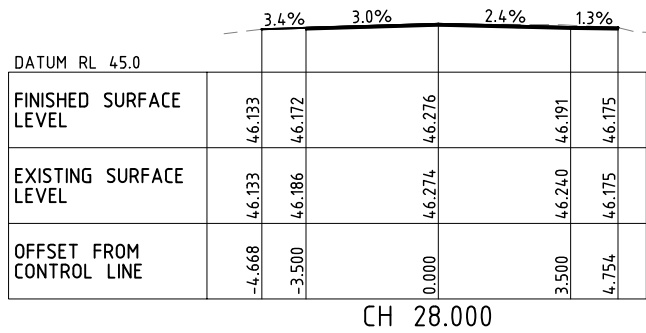
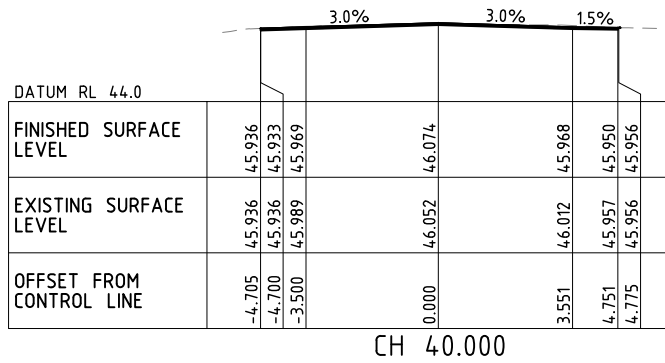
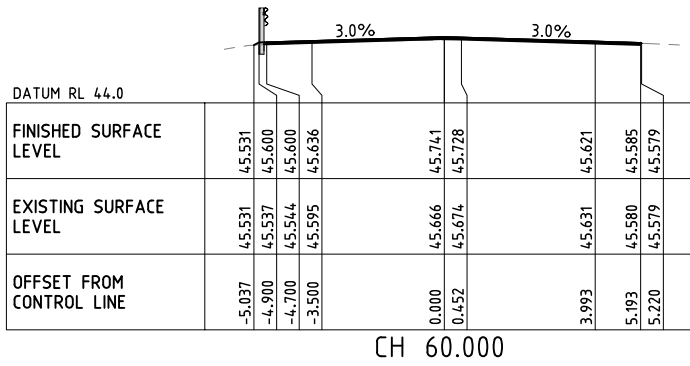
Horizontal scale 1:500
Vertical scale 1:50



Horizontal scale 1:500
Vertical scale 1:50

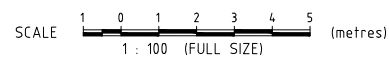
RIFLE RANGE ROAD CONTROL LINE SETOUT TABLE								
PT	CHAINAGE	EASTING	NORTHING	HEIGHT	BEARING	RAD/SPIRAL	A.LENGTH	DEFL.ANGL
IP 1	0.000	350433.630	1824825.300	45.070	306°30'09.33"			
TC	20.760	350416.940	1824837.650	44.560	306°30'09.33"			
IP 2	47.190	350394.200	1824854.480	44.660		R = 60.000	52.860	50°28'25.57"
CT	73.620	350392.710	1824882.720	45.240	356°58'34.90"			
IP 3	131.540	350389.660	1824940.560	47.760	356°58'34.90"			





LEGEND :

	EXISTING SURFACE
	DESIGN SURFACE
	PROPOSED RAMSHIELD HC GUARDRAIL



RIFLE RANGE ROAD AND BANGALOW ROAD INTERSECTION UPGRADE WORKS

FOR
BYRON SHIRE COUNCIL

A1 ORIGINAL SIZE BEFORE REDUCTION

VER.	DESCRIPTION	DATE
G	REISSUED FOR CONSTRUCTION	28-11-23
F	REISSUED FOR CONSTRUCTION	15-09-23
E	REISSUED FOR CONSTRUCTION	17-07-23
D	ISSUE FOR CONSTRUCTION	07-06-23
C	PLAN AMENDED	18-03-22
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Coote Burchills Engineering Pty Ltd
ABN 76 166 942 365

PROJECT:
**RIFLE RANGE ROAD
AND BANGALOW ROAD
INTERSECTION
UPGRADE WORKS**

DRAWING TITLE:
**LISMORE ROAD CROSS
SECTION - SHEET 1 OF
4**

TINSW REG. No. :	DS2023/000976	DATE : 28-11-23
PROJECT LEADER :	DEREK WALTON	
DESIGNER :	VAN LE	
DRAFTSPERSON :	VAN LE	
CHECKED :	DEREK WALTON	
APPROVED FOR AND ON BEHALF OF BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365 		
SCALE : AS NOTED	DATUM : AHD	FULL SIZE : A1
PROJECT No.:	DRAWING No.:	VERSION:
BE170269-02	C320	G

LEGEND :

— — — — — EXISTING SURFACE

_____ DESIGN SURFACE

RIFLE RANGE ROAD
AND BANGALOW
ROAD
INTERSECTION
UPGRADE WORKS

FOR

BYRON SHIRE COUNCIL

A1 ORIGINAL SIZE BEFORE REDUCTION

F	REISSUED FOR CONSTRUCTION	28-11-23
E	REISSUED FOR CONSTRUCTION	15-09-23
D	REISSUED FOR CONSTRUCTION	17-01-23
C	ISSUE FOR CONSTRUCTION	07-06-23
B	PLAN AMENDED	23-02-22
A	ORIGINAL ISSUE	28-01-22
VER.	DESCRIPTION	DATE

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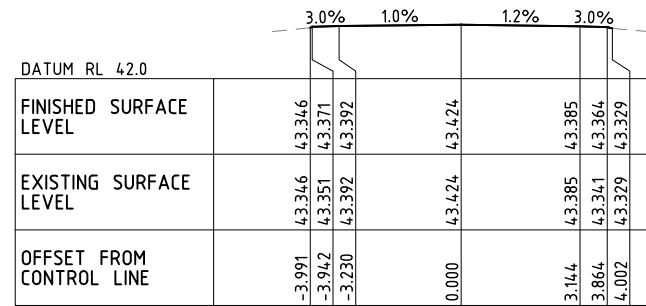
PROJECT:

RIFLE RANGE ROAD
AND BANGALOW ROAD
INTERSECTION
UPGRADE WORKS

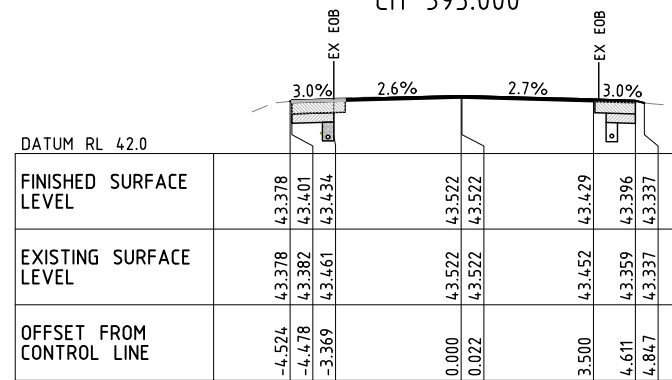
DRAWING TITLE :

LISMORE ROAD CROSS
SECTION - SHEET 4 OF
4

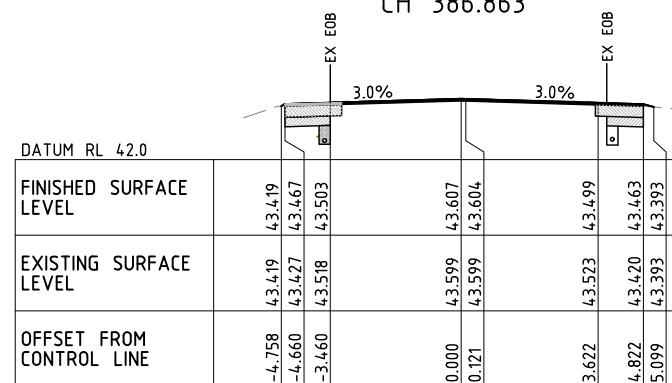
TINSW REG. NO. :		DS2023/000976	DATE : 28-11-23	
PROJECT LEADER :		DEREK WALTON		
DESIGNER :		VAN LE		
DRAFTSPERSON :		VAN LE		
CHECKED :		DEREK WALTON		
APPROVED FOR AND ON BEHALF OF BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365 				
SCALE : AS NOTED		DATUM : AHD		FULL SIZE : A1
PROJECT No. :		DRAWING No. :		VERSION :
BE170269-02		C323		F



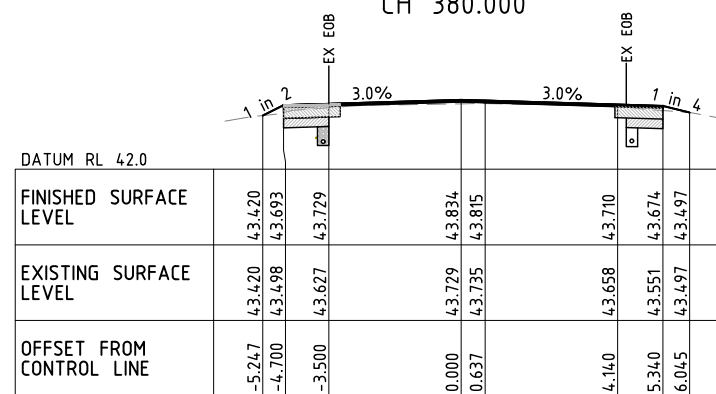
CH	395.000
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CH 386.863



CH	380.000
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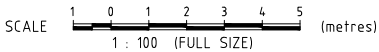
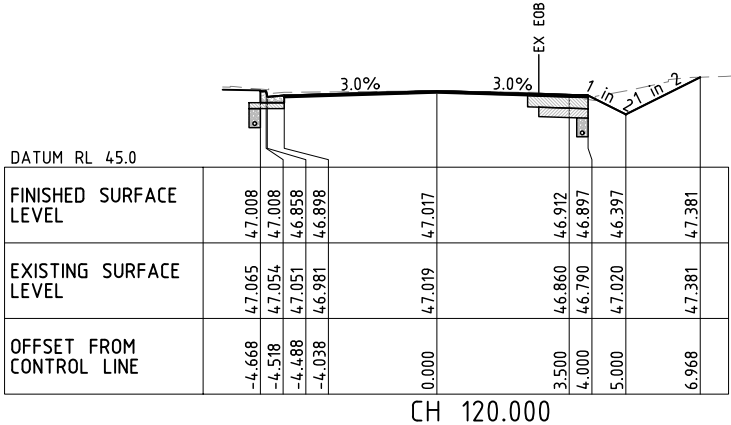
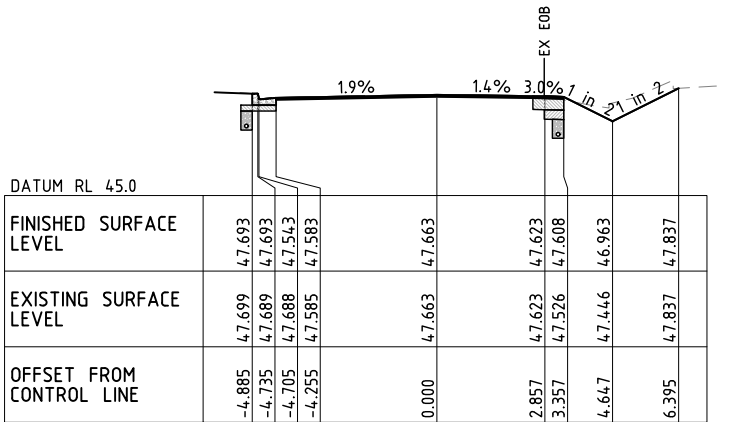


CH 363.260

SCALE  (metres)

LEGEND :

--- EXISING SURFACE
—— DESIGN SURFACE



RIFLE RANGE ROAD
AND BANGALOW
ROAD
INTERSECTION
UPGRADE WORKS

FOR

BYRON SHIRE COUNCIL

A1 ORIGINAL SIZE BEFORE REDUCTION

F	REISSUED FOR CONSTRUCTION	28-11-23
E	REISSUED FOR CONSTRUCTION	15-09-23
D	REISSUED FOR CONSTRUCTION	17-01-23
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VER.	DESCRIPTION	DATE

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Coote Burchills Engineering Pty Ltd
ABN 76 166 942 365

PROJECT:

RIFLE RANGE ROAD
AND BANGALOW ROAD
INTERSECTION
UPGRADE WORKS

DRAWING TITLE :

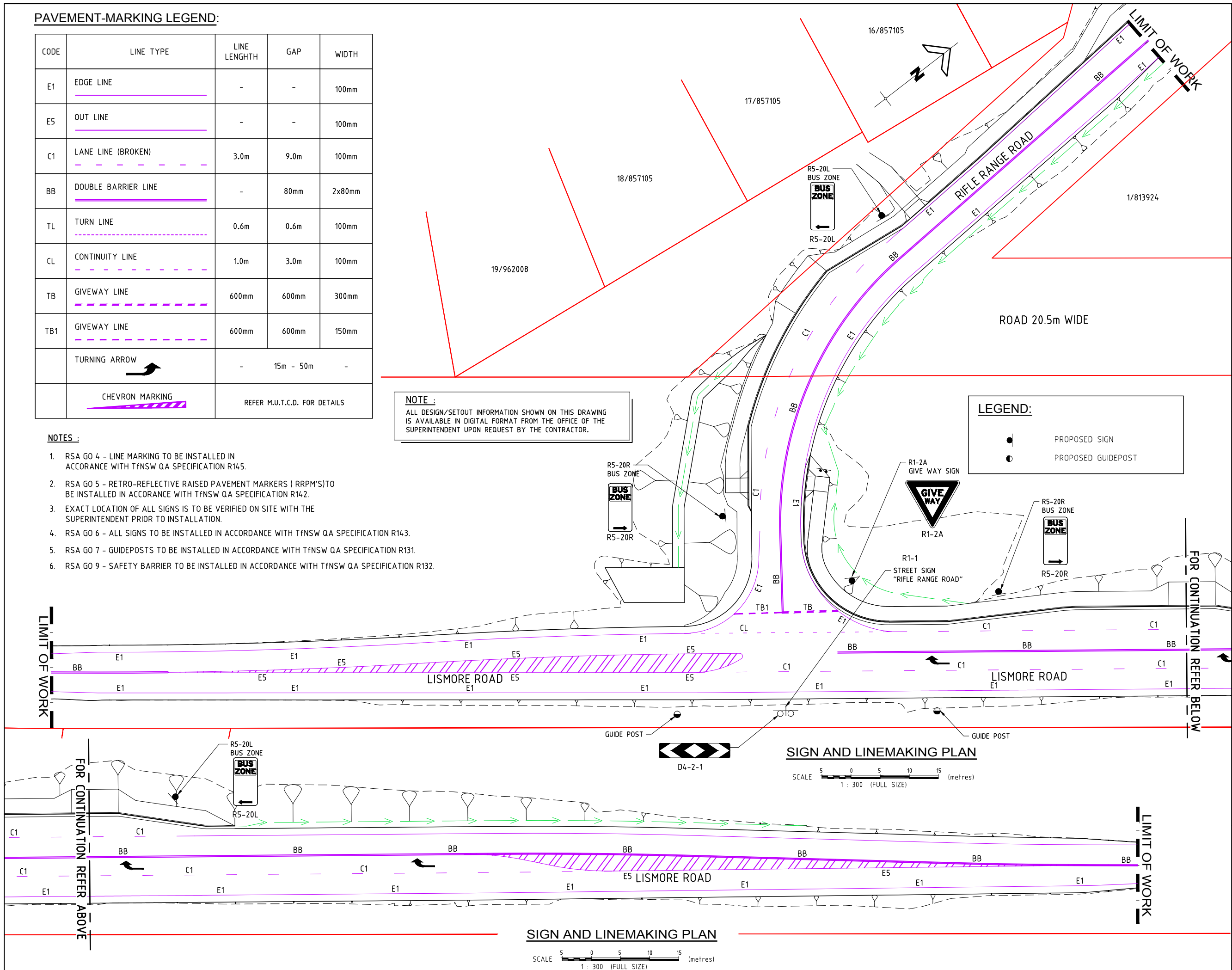
RIFLE RANGE ROAD
CROSS SECTION - SHEET
2 OF 2

TINSW REG. No. :	DS2023/000976	DATE :	28-11-23
PROJECT LEADER :	DEREK WALTON		
DESIGNER :	VAN LE		
DRAFTSPERSON :	VAN LE		
CHECKED :	DEREK WALTON		
APPROVED FOR AND ON BEHALF OF BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365 			
SCALE :	AS NOTED	DATUM :	AHD
PROJECT No.:	BE170269-02	DRAWING No.:	C325
		VERSION:	F

CODE	LINE TYPE	LINE LENGTH	GAP	WIDTH
E1	EDGE LINE 	-	-	100mm
E5	OUT LINE 	-	-	100mm
C1	LANE LINE (BROKEN) 	3.0m	9.0m	100mm
BB	DOUBLE BARRIER LINE 	-	80mm	2x80mm
TL	TURN LINE 	0.6m	0.6m	100mm
CL	CONTINUITY LINE 	1.0m	3.0m	100mm
TB	GIVEWAY LINE 	600mm	600mm	300mm
TB1	GIVEWAY LINE 	600mm	600mm	150mm
	TURNING ARROW 	- 15m - 50m -		
	CHEVRON MARKING 	REFER M.U.T.C.D. FOR DETAILS		

1. RSA GO 4 - LINE MARKING TO BE INSTALLED IN ACCORDANCE WITH TfNSW QA SPECIFICATION R145.
2. RSA GO 5 - RETRO-REFLECTIVE RAISED PAVEMENT MARKERS (RRPM'S)TO BE INSTALLED IN ACCORDANCE WITH TfNSW QA SPECIFICATION R142.
3. EXACT LOCATION OF ALL SIGNS IS TO BE VERIFIED ON SITE WITH THE SUPERINTENDENT PRIOR TO INSTALLATION.
4. RSA GO 6 - ALL SIGNS TO BE INSTALLED IN ACCORDANCE WITH TfNSW QA SPECIFICATION R143.
5. RSA GO 7 - GUIDEPOSTS TO BE INSTALLED IN ACCORDANCE WITH TfNSW QA SPECIFICATION R131.
6. RSA GO 9 - SAFETY BARRIER TO BE INSTALLED IN ACCORDANCE WITH TfNSW QA SPECIFICATION R132.

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FOR

BYRON SHIRE COUNCIL

A1 ORIGINAL SIZE BEFORE REDUCTION

G	REISSUED FOR CONSTRUCTION	28-11-23
F	REISSUED FOR CONSTRUCTION	15-09-23
E	REISSUED FOR CONSTRUCTION	17-07-23
D	ISSUE FOR CONSTRUCTION	07-06-23
C	PLAN AMENDED	18-03-22
B	PLAN AMENDED	23-02-22
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Coote Burchills Engineering Pty Ltd
ABN 76 166 942 365

PROJECT:

RIFLE RANGE ROAD
AND BANGALOW ROAD
INTERSECTION
UPGRADE WORKS

DRAWING TITLE :

**SIGNAGE AND
LINEMARKING PLAN**

TWS REG. No.		DS2023/000976	DATE: 28-11-23	
PROJECT LEADER:		DEREK WALTON		
DESIGNER:		VAN LE		
DRAFTSPERSON:		VAN LE		
CHECKED:		DEREK WALTON		
APPROVED FOR AND ON BEHALF OF BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365				
				
SCALE: AS NOTED		DATE: AHD		FULL SIZE: A
PROJECT No.:		DRAWING No.:		VERSION:
BE170269-02		C330		G

LEGEND

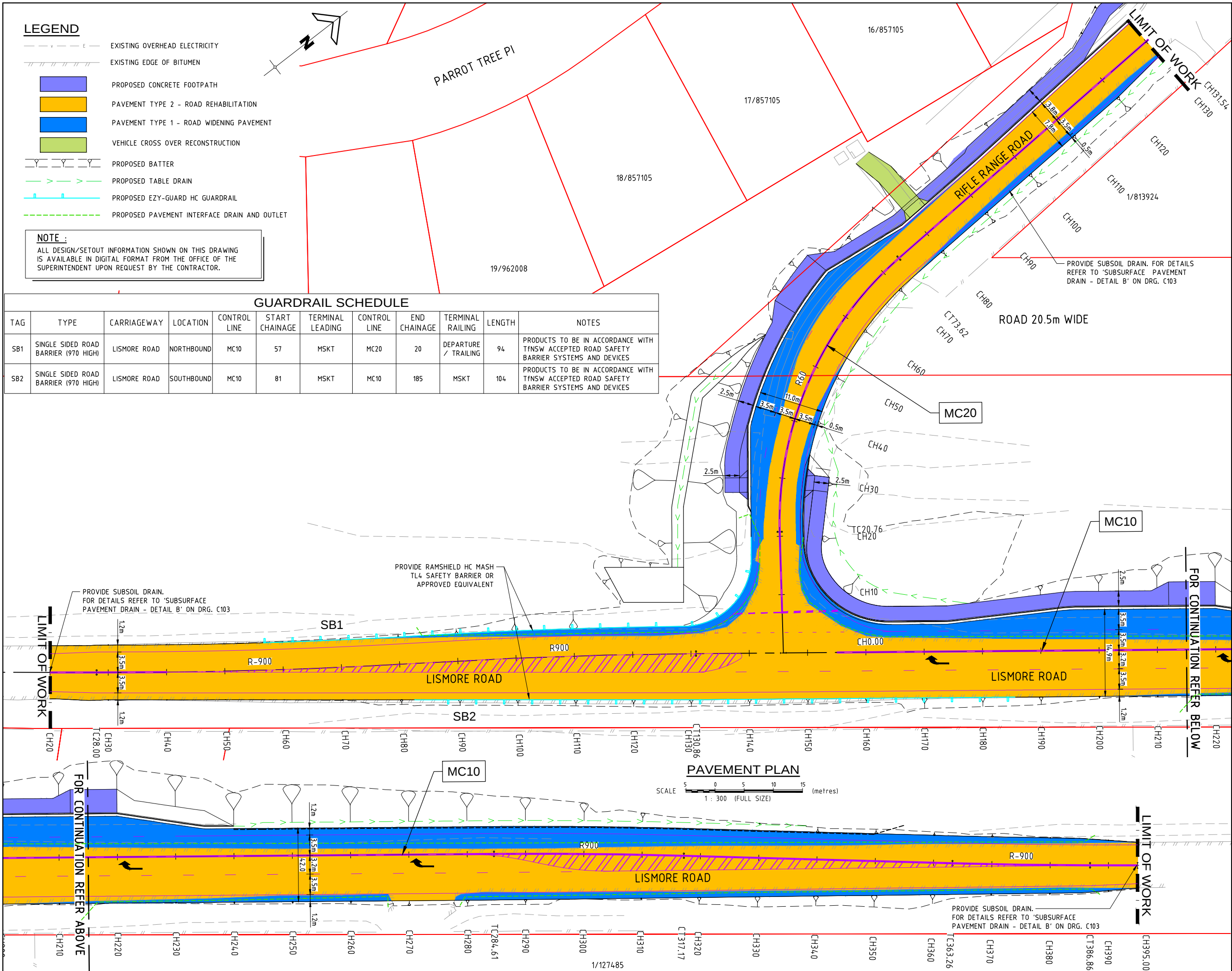
- EXISTING OVERHEAD ELECTRICITY
- EXISTING EDGE OF BITUMEN
- PROPOSED CONCRETE FOOTPATH
- PAVEMENT TYPE 2 - ROAD REHABILITATION
- PAVEMENT TYPE 1 - ROAD WIDENING PAVEMENT
- VEHICLE CROSS OVER RECONSTRUCTION
- PROPOSED BATTER
- PROPOSED TABLE DRAIN
- PROPOSED EZY-GUARD HC GUARDRAIL
- PROPOSED PAVEMENT INTERFACE DRAIN AND OUTLET

NOTE :

ALL DESIGN/SETOUT INFORMATION SHOWN ON THIS DRAWING IS AVAILABLE IN DIGITAL FORMAT FROM THE OFFICE OF THE SUPERINTENDENT UPON REQUEST BY THE CONTRACTOR.

GUARDRAIL SCHEDULE

TAG	TYPE	CARRIAGEWAY	LOCATION	CONTROL LINE	START CHAINAGE	TERMINAL LEADING	CONTROL LINE	END CHAINAGE	TERMINAL RAILING	LENGTH	NOTES
SB1	SINGLE SIDED ROAD BARRIER (970 HIGH)	LISMORE ROAD	NORTHBOUND	MC10	57	MSKT	MC20	20	DEPARTURE / TRAILING	94	PRODUCTS TO BE IN ACCORDANCE WITH TNSW ACCEPTED ROAD SAFETY BARRIER SYSTEMS AND DEVICES
SB2	SINGLE SIDED ROAD BARRIER (970 HIGH)	LISMORE ROAD	SOUTHBOUND	MC10	81	MSKT	MC10	185	MSKT	104	PRODUCTS TO BE IN ACCORDANCE WITH TNSW ACCEPTED ROAD SAFETY BARRIER SYSTEMS AND DEVICES



RIFLE RANGE ROAD AND BANGALOW ROAD INTERSECTION UPGRADE WORKS

FOR

BYRON SHIRE COUNCIL

A1

ORIGINAL SIZE BEFORE REDUCTION

VER.	DESCRIPTION	DATE
G	REISSUED FOR CONSTRUCTION	28-11-23
F	REISSUED FOR CONSTRUCTION	15-09-23
E	REISSUED FOR CONSTRUCTION	17-07-23
D	ISSUE FOR CONSTRUCTION	07-06-23
C	PLAN AMENDED	18-03-22
B	PLAN AMENDED	23-02-22
A	ORIGINAL ISSUE	28-01-22

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ABN 76 166 942 365

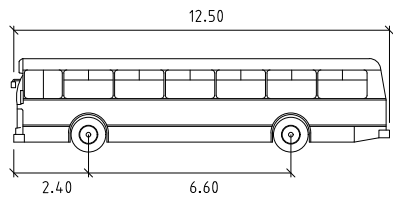
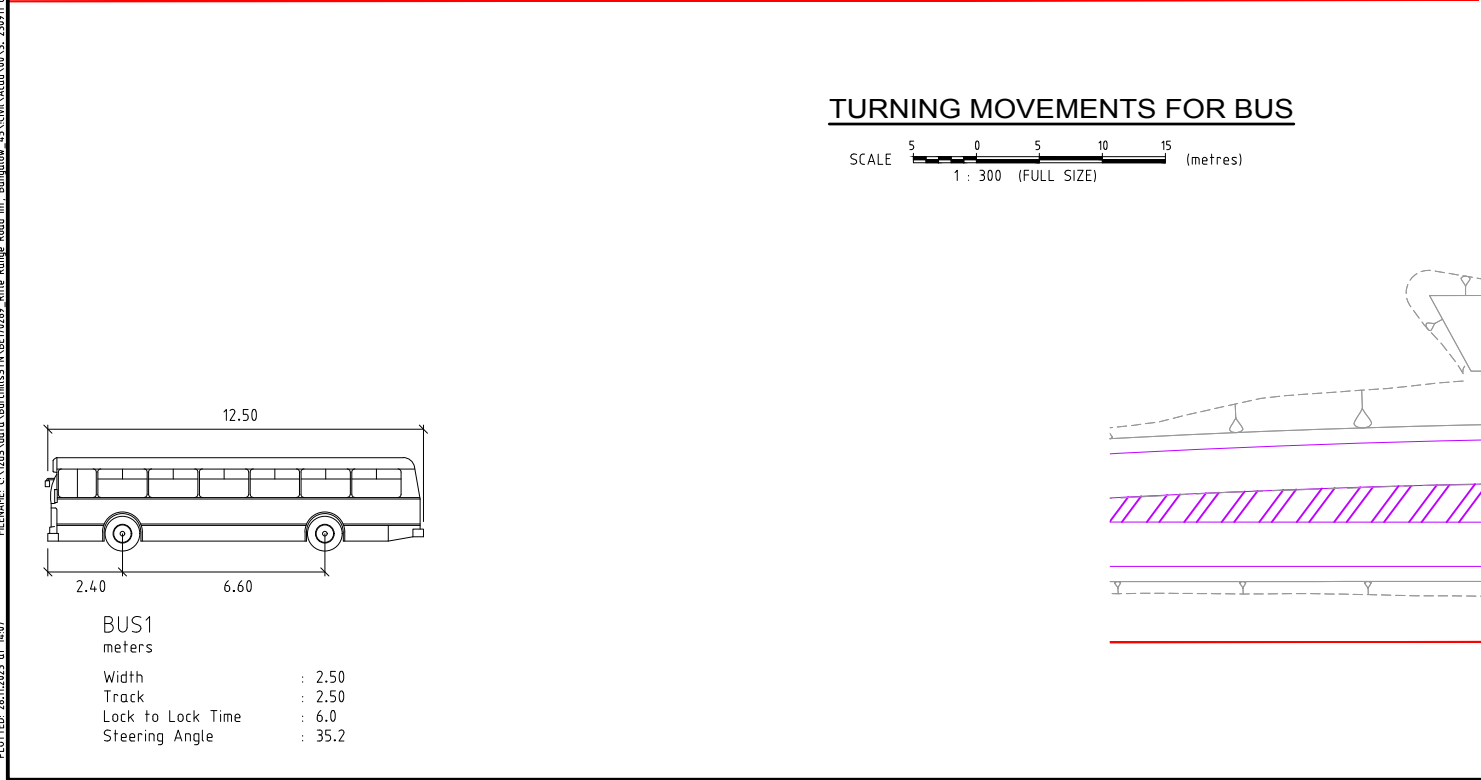
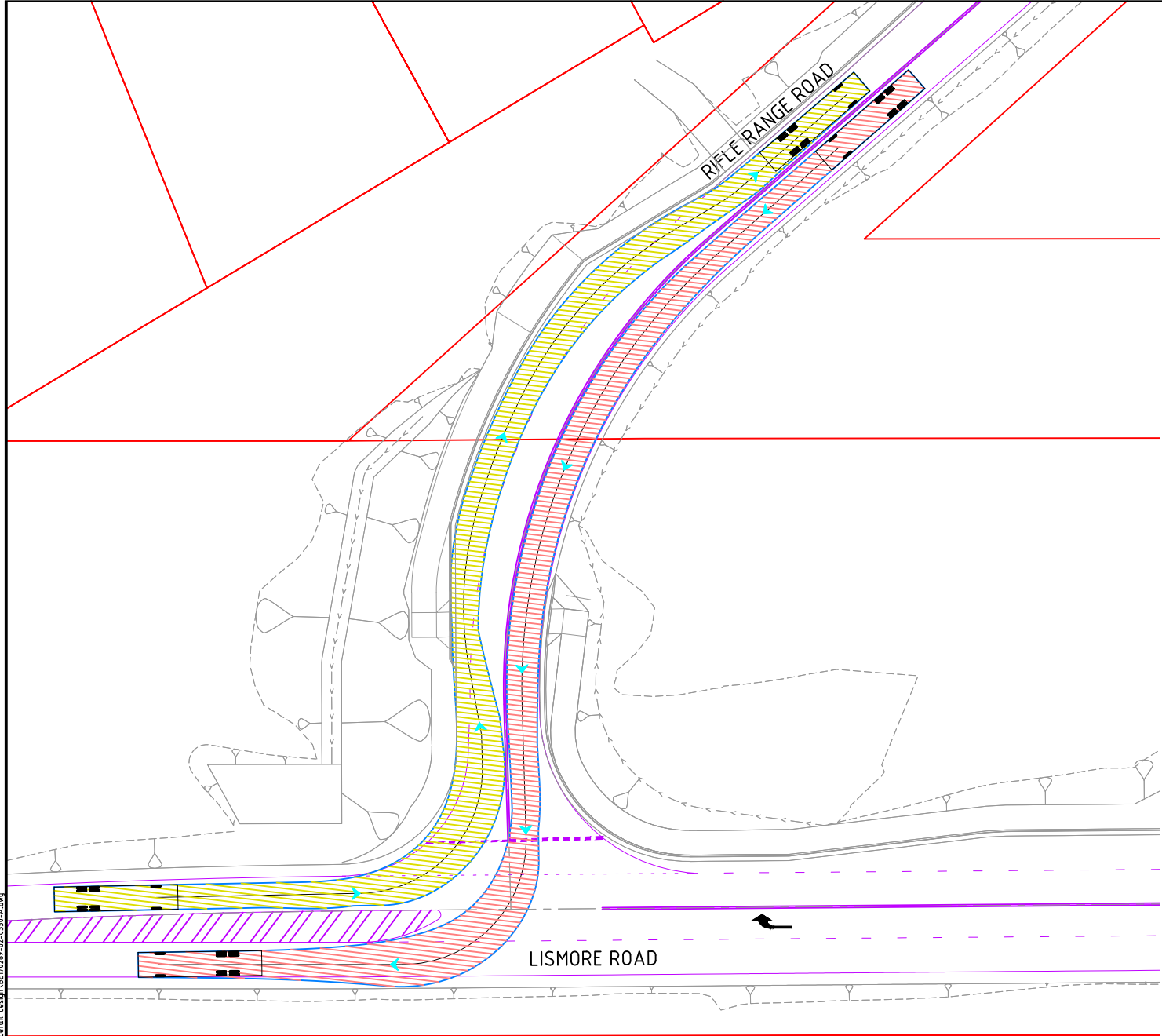
PROJECT:

RIFLE RANGE ROAD AND BANGALOW ROAD INTERSECTION UPGRADE WORKS

DRAWING TITLE:

PAVEMENT LAYOUT PLAN

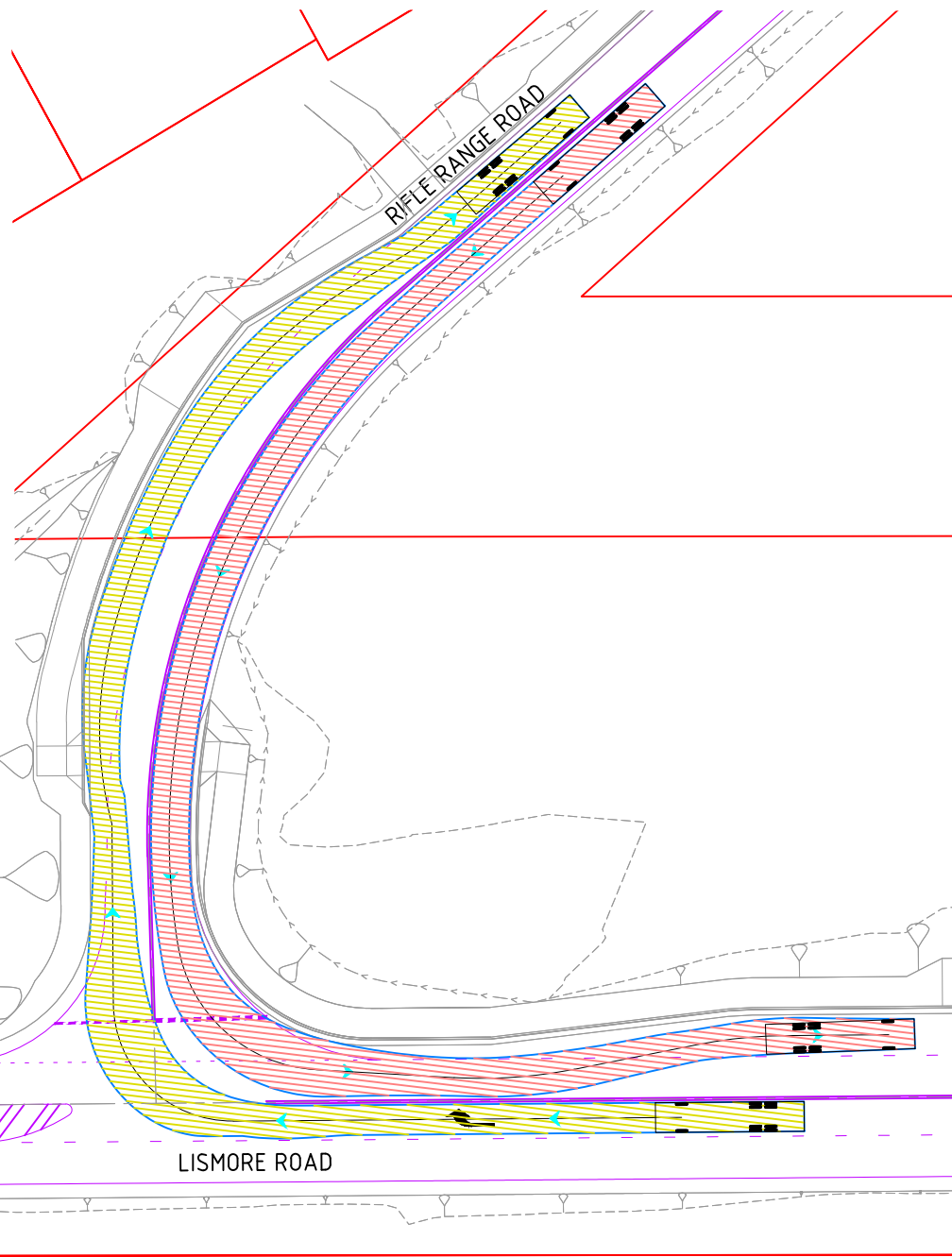
TNSW REG. No. :	DS2023/000976	DATE :	28-11-23
PROJECT LEADER :	DEREK WALTON		
DESIGNER :	VAN LE		
DRAFTSPERSON :	VAN LE		
CHECKED :	DEREK WALTON		
APPROVED FOR AND ON BEHALF OF BURGILLS ENGINEERING SOLUTIONS	ABN 76 166 942 365		
SCALE :	AS NOTED	DATUM :	AHD
PROJECT No.:	BE170269-02	DRAWING No.:	C340
		VERSION:	G



BUS1
meters
Width : 2.50
Track : 2.50
Lock to Lock Time : 6.0
Steering Angle : 35.2

TURNING MOVEMENTS FOR BUS

SCALE 5 0 5 10 15 (metres)
1 : 300 (FULL SIZE)



RIFLE RANGE ROAD AND BANGALOW ROAD INTERSECTION UPGRADE WORKS

FOR

BYRON SHIRE COUNCIL

A1 ORIGINAL SIZE BEFORE REDUCTION

VER.	DESCRIPTION	DATE
E	REISSUED FOR CONSTRUCTION	28-11-23
D	REISSUED FOR CONSTRUCTION	15-09-23
C	REISSUED FOR CONSTRUCTION	17-07-23
B	ISSUE FOR CONSTRUCTION	07-06-23
A	ORIGINAL ISSUE	18-03-22

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ABN 76 166 942 365

PROJECT:

RIFLE RANGE ROAD
AND BANGALOW ROAD
INTERSECTION
UPGRADE WORKS

DRAWING TITLE:

TURNING MOVEMENT
FOR BUS

TINSW REG. No.: DS2023/000976 DATE: 28-11-23

PROJECT LEADER: DEREK WALTON

DESIGNER: VAN LE

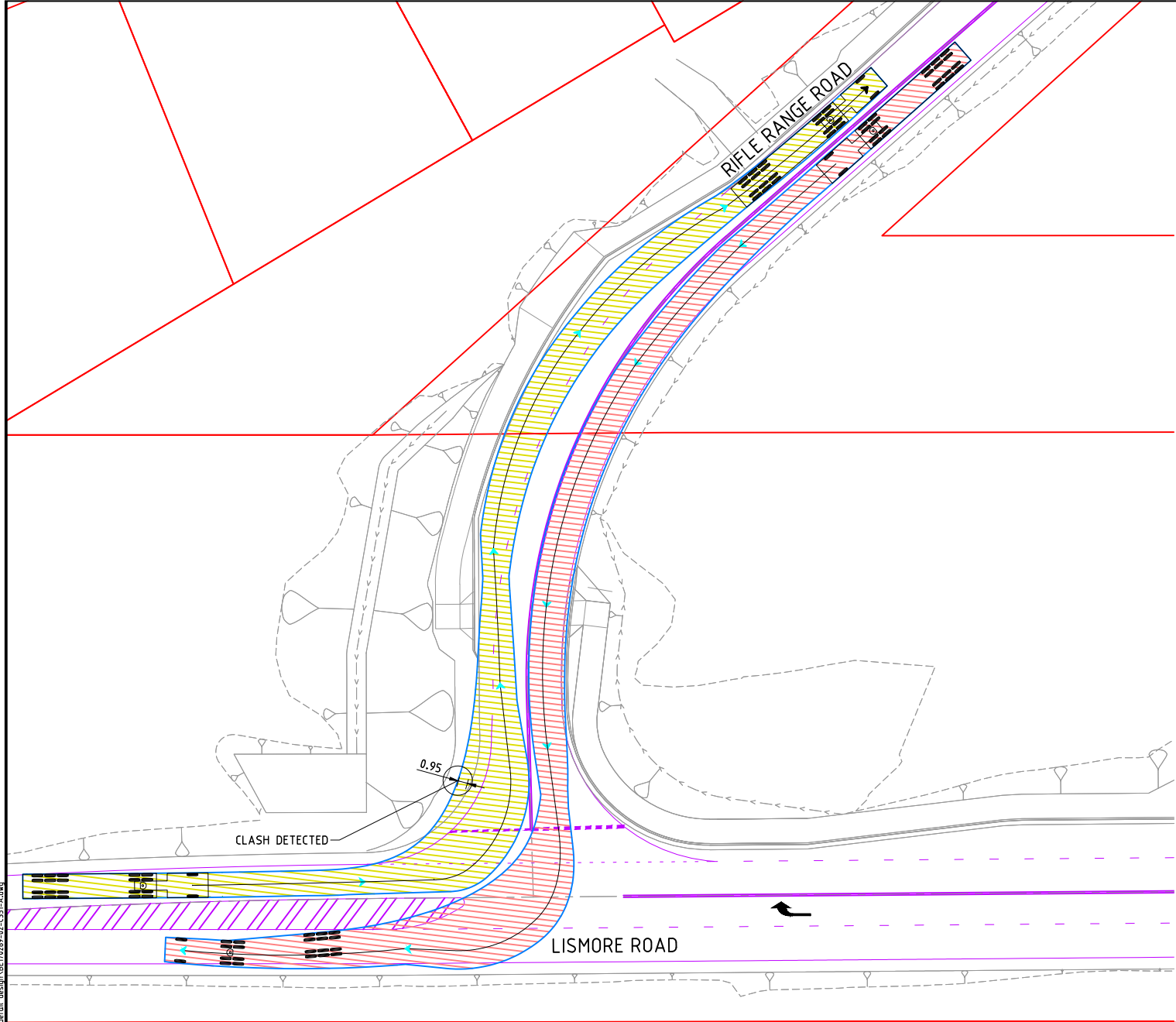
DRAFTSPERSON: VAN LE

CHECKED: DEREK WALTON

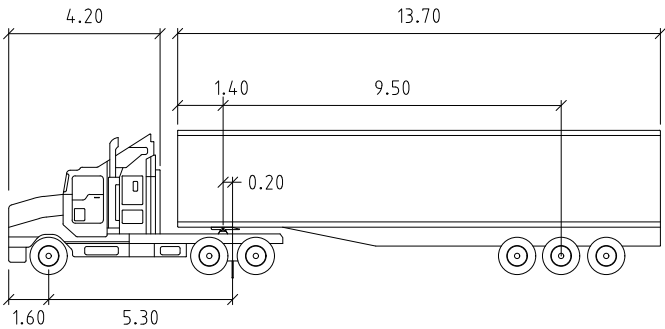
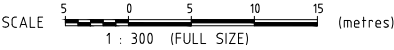
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BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365

SCALE: AS NOTED DATUM: AHD FULL SIZE: A1

PROJECT No.: BE170269-02 DRAWING No.: C350 VERSION: E

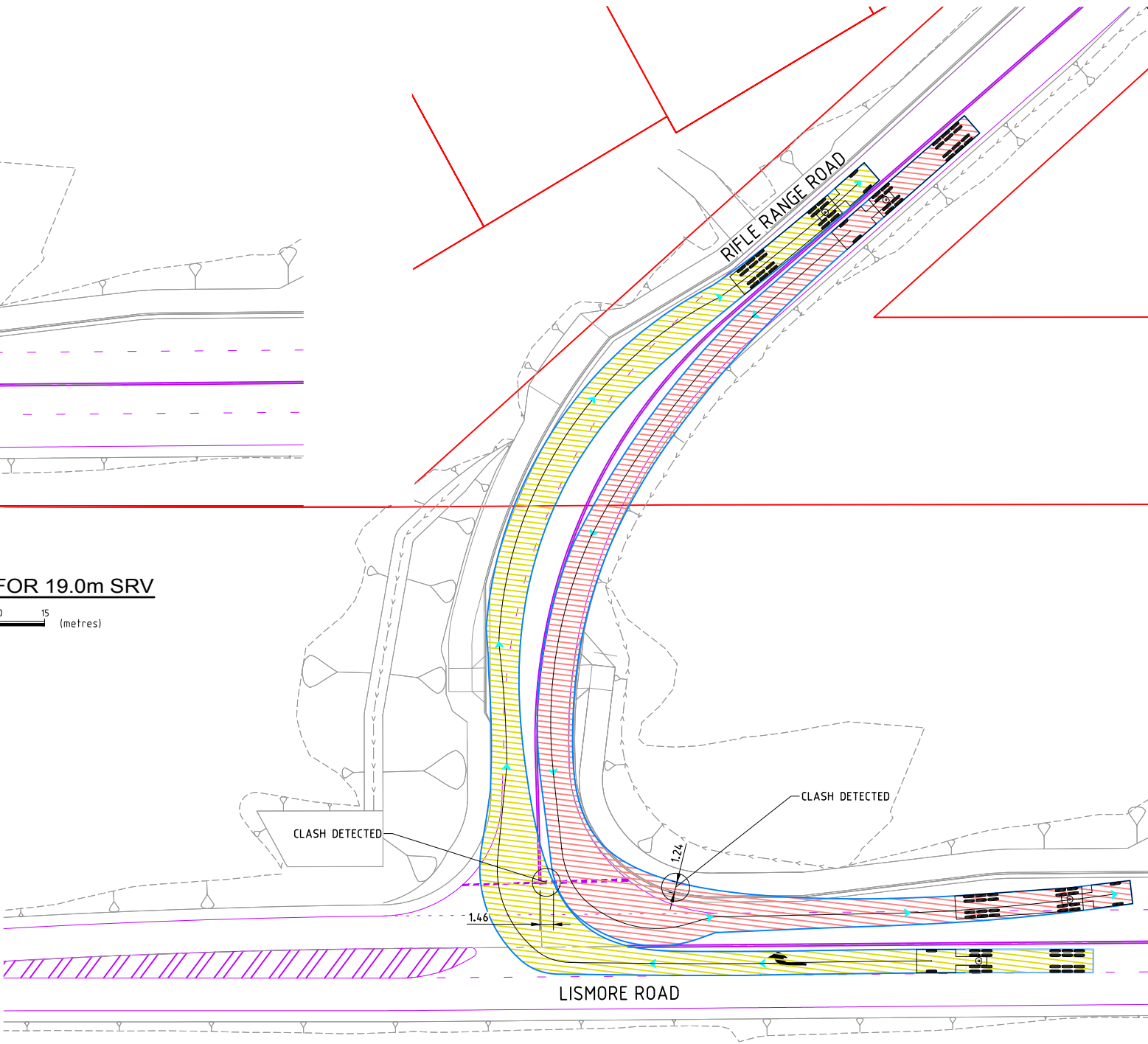


TURNING MOVEMENTS FOR 19.0m SRV



PM S 19M

Tractor Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 27.8
Tractor Track	: 2.50	Articulating Angle	: 70.0
Trailer Track	: 2.50		



RIFLE RANGE ROAD AND BANGALOW ROAD INTERSECTION UPGRADE WORKS

FOR

BYRON SHIRE COUNCIL

A1 ORIGINAL SIZE BEFORE REDUCTION

VER.	DESCRIPTION	DATE
D	REISSUED FOR CONSTRUCTION	28-11-23
C	REISSUED FOR CONSTRUCTION	15-09-23
B	REISSUED FOR CONSTRUCTION	17-07-23
A	ORIGINAL ISSUE	07-06-23

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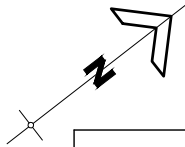


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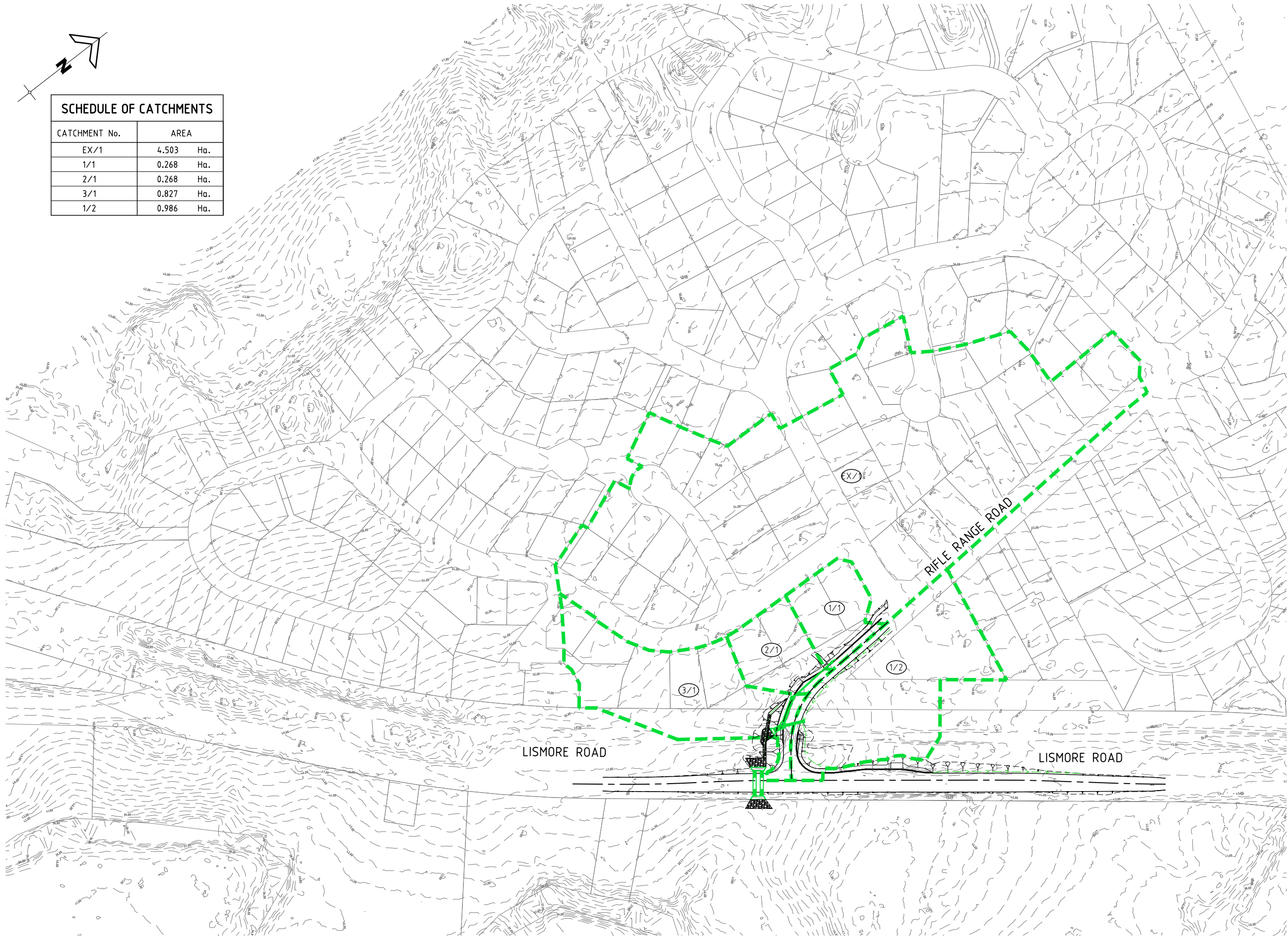
PROJECT:
**RIFLE RANGE ROAD
AND BANGALOW ROAD
INTERSECTION
UPGRADE WORKS**

DRAWING TITLE:
**TURNING MOVEMENT
FOR SRV**

TINSW REG. No. :	DS2023/000976	DATE :	28-11-23
PROJECT LEADER :	DEREK WALTON		
DESIGNER :	VAN LE		
DRAFTSPERSON :	VAN LE		
CHECKED :	DEREK WALTON		
APPROVED FOR AND ON BEHALF OF BURCHILLS ENGINEERING SOLUTIONS	ABN 76 166 942 365		
SCALE :	AS NOTED	DATUM :	AHD
PROJECT No. :	BE170269-02	DRAWING No. :	C351
		VERSION :	D



SCHEDULE OF CATCHMENTS		
CATCHMENT No.	AREA	
EX/1	4.503	Ha.
1/1	0.268	Ha.
2/1	0.268	Ha.
3/1	0.827	Ha.
1/2	0.986	Ha.



CATCHMENT PLAN

SCALE 12.5 0 12.5 25 37.5 50 62.5 (metres)
1 : 1250 (FULL SIZE)

LEGEND

--- CATCHMENT BOUNDARY

RIFLE RANGE ROAD
AND BANGALOW
ROAD
INTERSECTION
UPGRADE WORKS

FOR

BYRON SHIRE COUNCIL

A1 ORIGINAL SIZE BEFORE REDUCTION

F	REISSUED FOR CONSTRUCTION	28-11-23
E	REISSUED FOR CONSTRUCTION	15-09-23
D	REISSUED FOR CONSTRUCTION	17-07-23
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B	PLAN AMENDED	23-02-22
A	ORIGINAL ISSUE	28-01-22
VER.	DESCRIPTION	DATE

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ABN 76 166 942 365

PROJECT:

RIFLE RANGE ROAD
AND BANGALOW ROAD
INTERSECTION
UPGRADE WORKS

DRAWING TITLE:

STORMWATER
CATCHMENT LAYOUT
PLAN

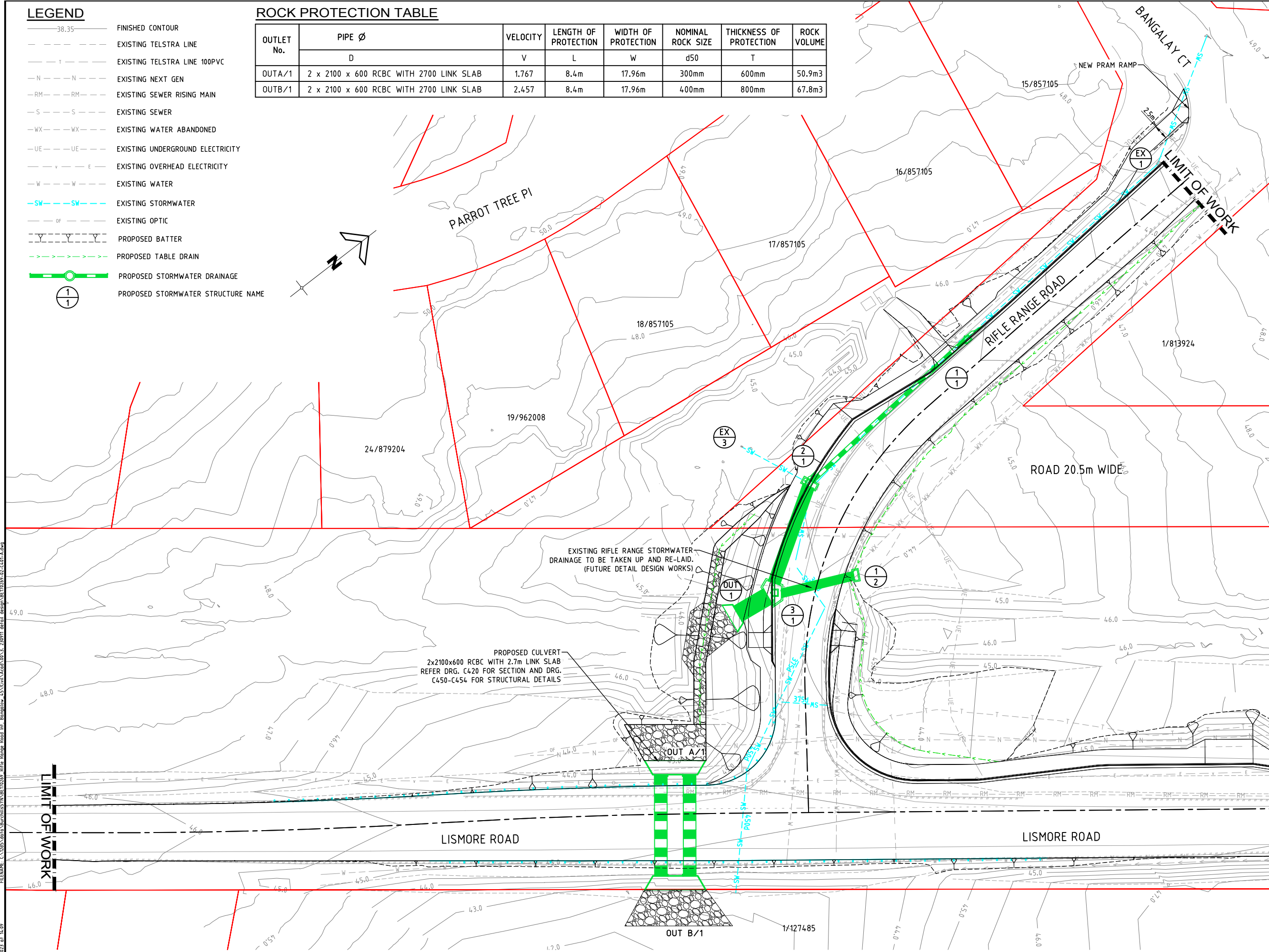
TINSW REG. No. :	DS2023/000976	DATE :	28-11-23
PROJECT LEADER :	DEREK WALTON		
DESIGNER :	VAN LE		
DRAFTSPERSON :	VAN LE		
CHECKED :	DEREK WALTON		
APPROVED FOR AND ON BEHALF OF BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365			
SCALE :	AS NOTED	DATUM :	AHD
PROJECT No.:	BE170269-02	DRAWING No.:	C400
		VERSION:	F

LEGEND

---	38.35	FINISHED CONTOUR
---	---	EXISTING TELSTRA LINE
---	T	EXISTING TELSTRA LINE 100PVC
---	N	EXISTING NEXT GEN
---	RM	EXISTING SEWER RISING MAIN
---	S	EXISTING SEWER
---	WX	EXISTING WATER ABANDONED
---	UE	EXISTING UNDERGROUND ELECTRICITY
---	v	EXISTING OVERHEAD ELECTRICITY
---	W	EXISTING WATER
---	SW	EXISTING STORMWATER
---	OF	EXISTING OPTIC
---	Y	PROPOSED BATTER
---	---	PROPOSED TABLE DRAIN
---	---	PROPOSED STORMWATER DRAINAGE
---	---	PROPOSED STORMWATER STRUCTURE NAME

ROCK PROTECTION TABLE

OUTLET No.	PIPE Ø	VELOCITY V	LENGTH OF PROTECTION L	WIDTH OF PROTECTION W	NOMINAL ROCK SIZE d50	THICKNESS OF PROTECTION T	ROCK VOLUME
	D						
OUTA/1	2 x 2100 x 600 RCBC WITH 2700 LINK SLAB	1.767	8.4m	17.96m	300mm	600mm	50.9m ³
OUTB/1	2 x 2100 x 600 RCBC WITH 2700 LINK SLAB	2.457	8.4m	17.96m	400mm	800mm	67.8m ³



STORMWATER DRAINAGE PLAN

SCALE 1 : 300 (FULL SIZE)

RIFLE RANGE ROAD AND BANGALOW ROAD INTERSECTION UPGRADE WORKS

FOR BYRON SHIRE COUNCIL

A1 ORIGINAL SIZE BEFORE REDUCTION

VER.	DESCRIPTION	DATE
F	REISSUED FOR CONSTRUCTION	28-11-23
E	REISSUED FOR CONSTRUCTION	15-09-23
D	REISSUED FOR CONSTRUCTION	17-07-23
C	ISSUE FOR CONSTRUCTION	07-06-23
B	PLAN AMENDED	23-02-22
A	ORIGINAL ISSUE	28-01-22

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ABN 76 166 942 365

RIFLE RANGE ROAD AND BANGALOW ROAD INTERSECTION UPGRADE WORKS

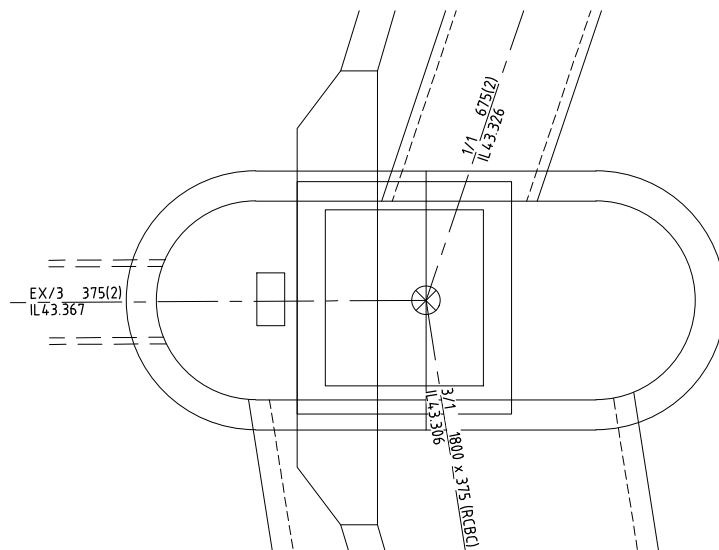
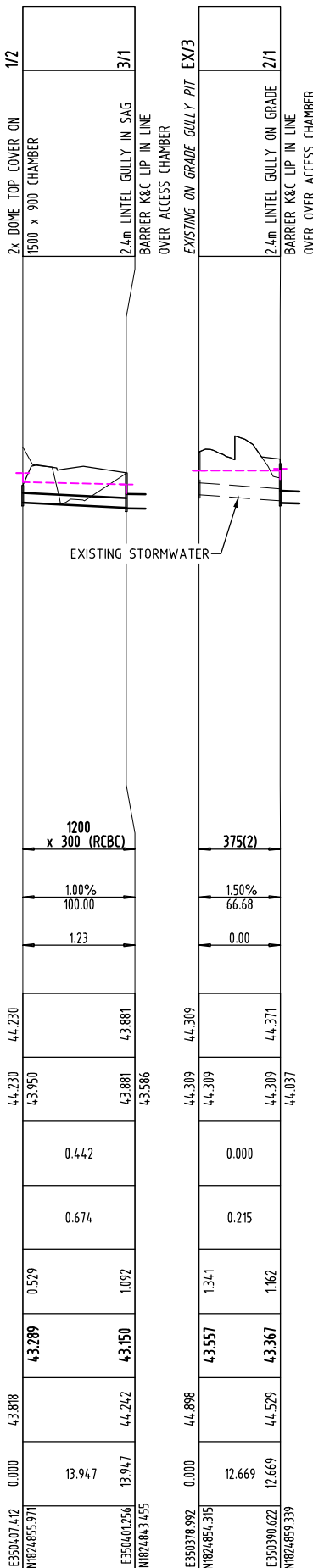
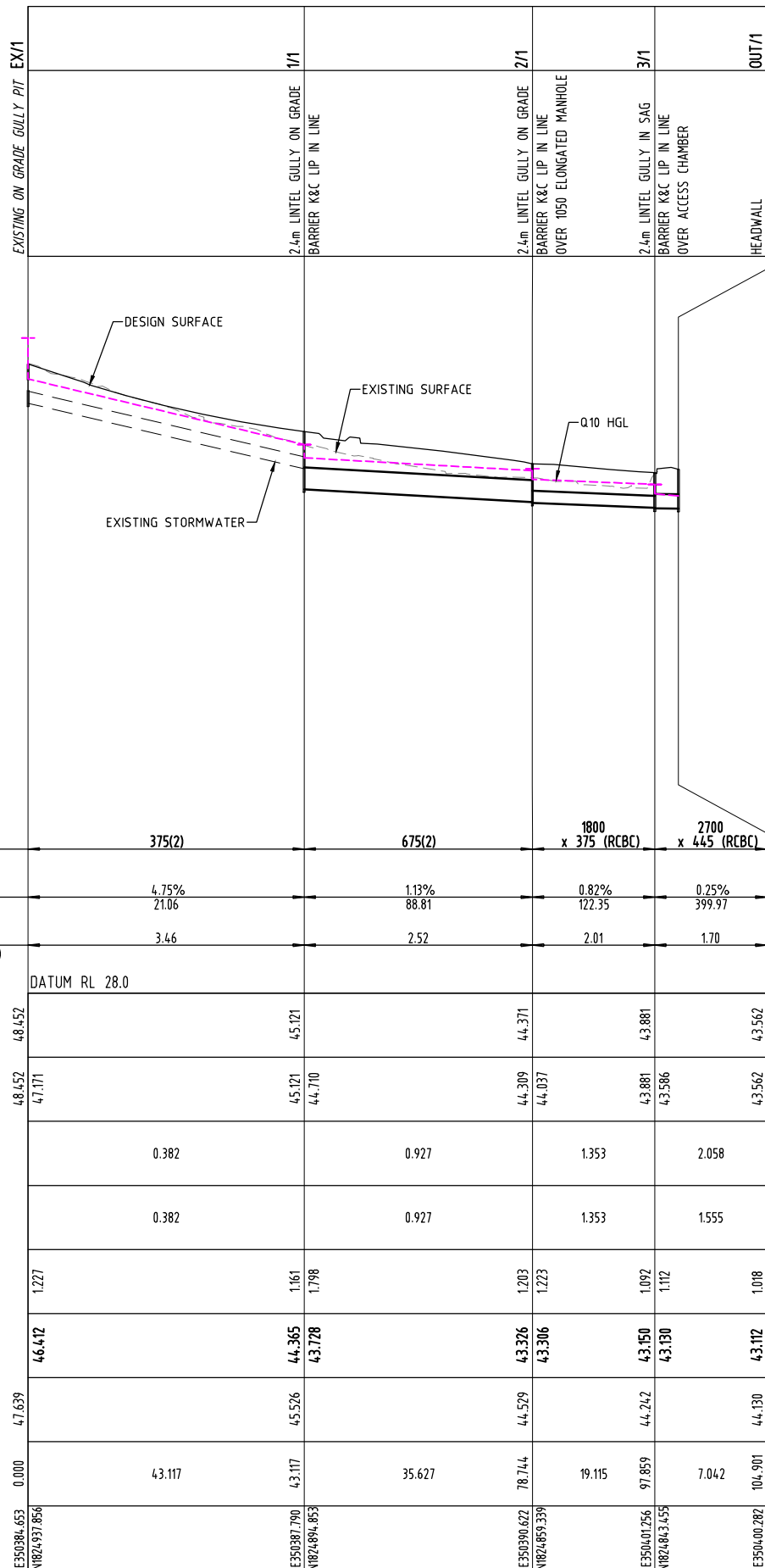
STORMWATER DRAINAGE LAYOUT PLAN

TNSW REG. No. :	DS2023/000976	DATE :	28-11-23
PROJECT LEADER :	DEREK WALTON		
DESIGNER :	VAN LE		
DRAFTSPERSON :	VAN LE		
CHECKED :	DEREK WALTON		
APPROVED FOR AND ON BEHALF OF BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365			
SCALE :	AS NOTED	DATUM :	AHD
PROJECT No.:	BE170269-02	DRAWING No.:	C401
		VERSION:	F

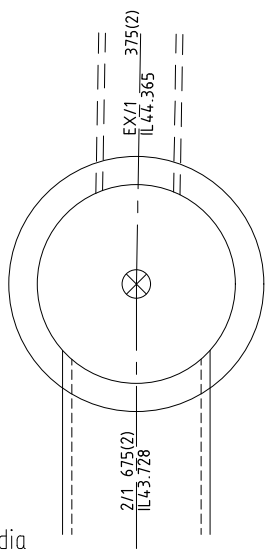
STRUCTURE NAME
STRUCTURE DESCRIPTION

PIPE SIZE	mm (Class)		375(2)		675(2)		x 1800 375 (RBC)		x 2700 445 (RBC)
PIPE GRADE	%		4.75%		1.13%		0.82%		0.25%
PIPE SLOPE	1 in X		21.06		88.81		122.35		399.97
FULL PIPE FLOW VELOCITY	(m/s)		3.46		2.52		2.01		1.70
PART FULL FLOW VELOCITY	(m/s)								
DATUM RL 28.0									
WATER LEVEL IN STRUCTURE		48.452		45.121		44.371		43.881	43.562
HYDRAULIC GRADE LEVEL		48.452		45.121		44.309		43.881	43.562
				44.710		44.037		43.586	
PIPE FLOW (Cumecs)			0.382		0.927		1.353		2.058
PIPE CAPACITY AT GRADE (Cumecs)			0.382		0.927		1.353		1.555
DEPTH TO INVERT		1.227		1.161		1.203		1.092	1.018
				1.798		1.223		1.112	
INVERT LEVEL OF DRAIN		46.412		44.365		43.326		43.150	43.112
				43.728		43.306		43.130	
DESIGN SURFACE LEVEL		47.639		45.526		44.529		44.242	44.130
RUNNING CHAINAGE		0.000	43.117	43.117	35.627	78.714	19.115	97.859	704.901
STRUCTURE LOCATION		E350384.653 N824.937.956	E350387.790 N824.894.853			E350390.622 N824.859.338		E350400.756 N824.843.455	E350400.282 N824.843.455

LINE

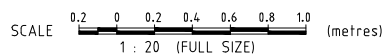


2/1 - 2.4m GULLY PIT OVER 1050 ELONGATED MANHOLE



1/1 - 1050 dia

STRUCTURE DETAILS



RIFLE RANGE ROAD
AND BANGALOW
ROAD
INTERSECTION
UPGRADE WORKS

FOR

BYRON SHIRE COUNCIL

A1 ORIGINAL SIZE BEFORE REDUCTION

F	REISSUED FOR CONSTRUCTION	15-09-23
E	REISSUED FOR CONSTRUCTION	17-07-23
D	ISSUE FOR CONSTRUCTION	07-06-23
C	PLAN AMENDED	18-03-22
B	PLAN AMENDED	23-02-22
A	ORIGINAL ISSUE	28-01-22
VER.	DESCRIPTION	DATE

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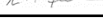


PROJECT:

RIFLE RANGE ROAD
AND BANGALOW ROAD
INTERSECTION
UPGRADE WORKS

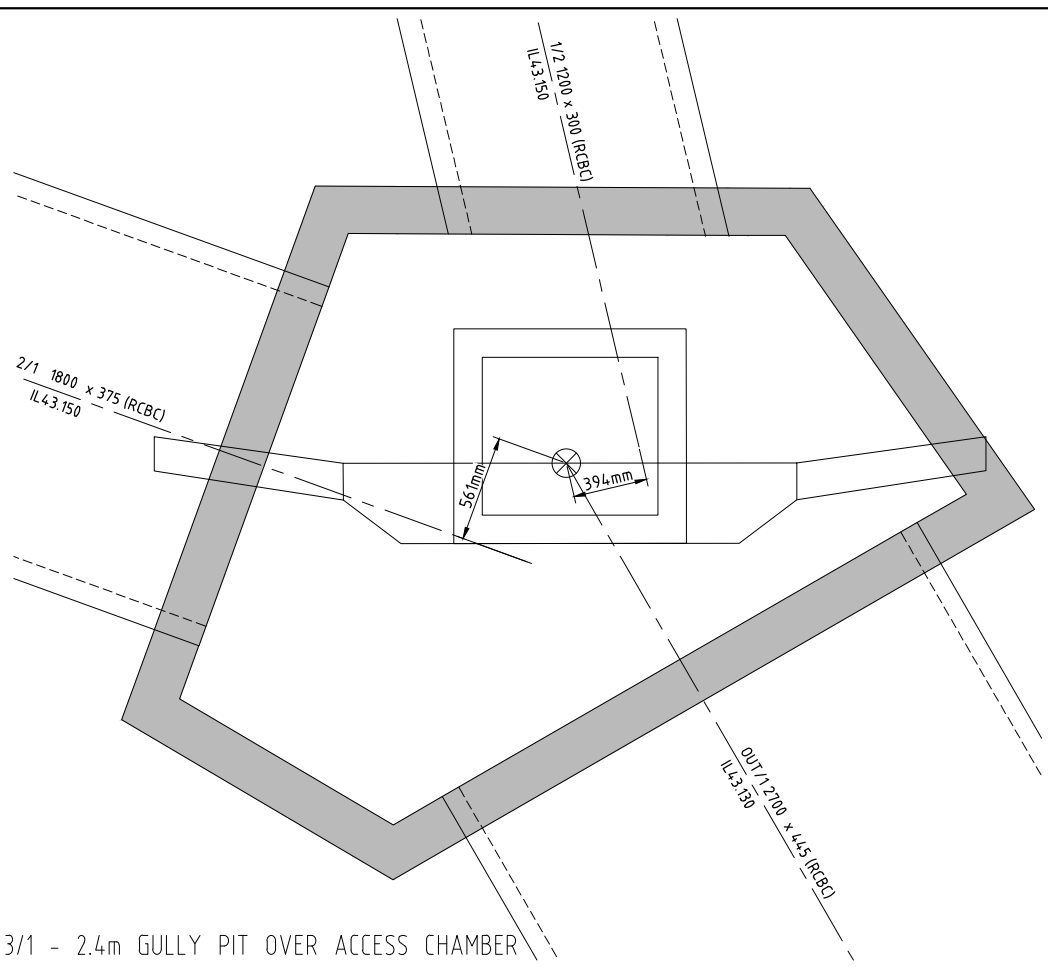
DRAWING TITLE :

STORMWATER
DRAINAGE
LONGSECTIONS

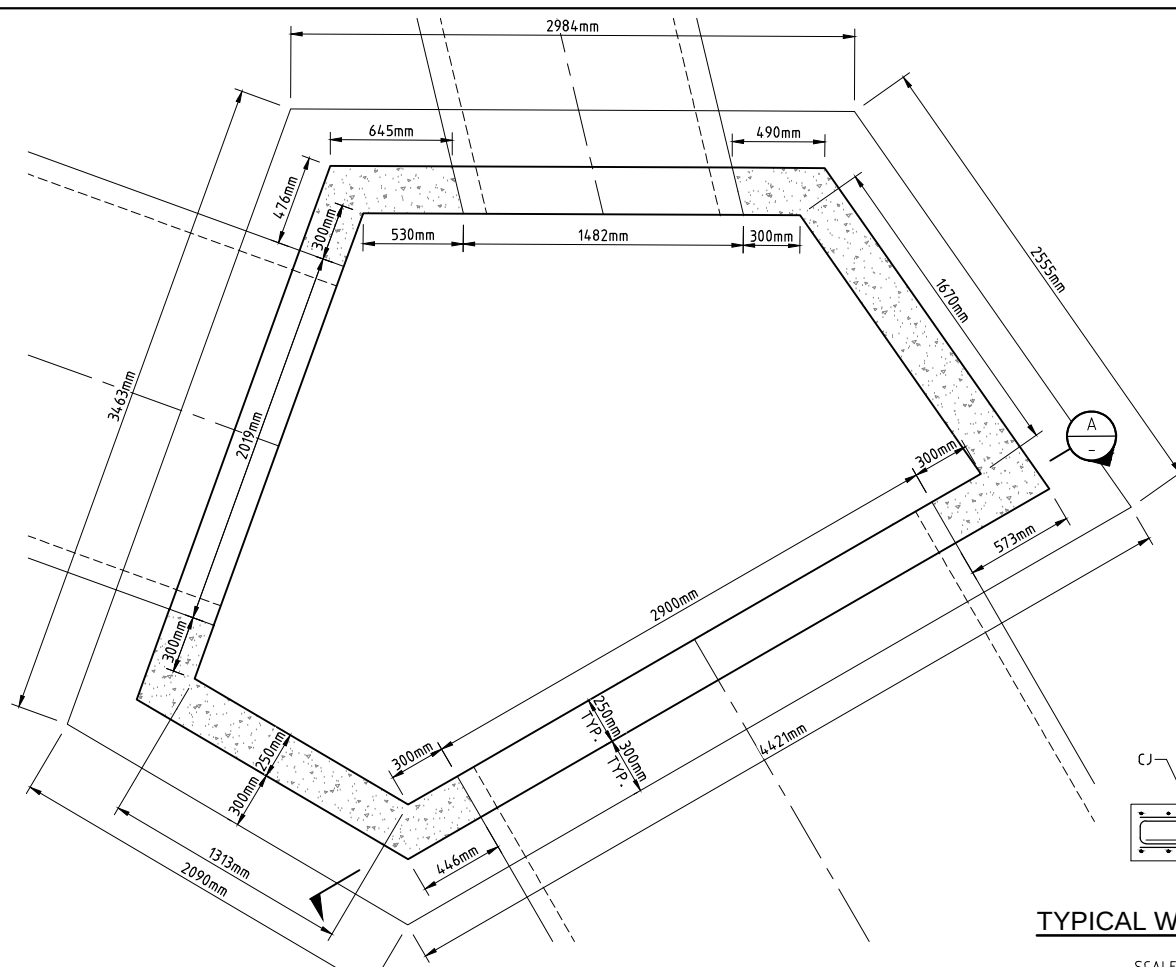
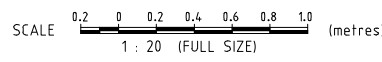
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PROJECT LEADER : DEREK WALTON			
DESIGNER : VAN LE			
DRAFTSPERSON : VAN LE			
CHECKED : DEREK WALTON			
APPROVED FOR AND ON BEHALF OF BURCHILL'S ENGINEERING SOLUTIONS ABN 76 166 942 365 			
SCALE : AS NOTED		DATUM : AHD	
PROJECT No. :		FULL SIZE : A1	
BE170269-02		DRAWING No. :	
		VERSION:	
		F	

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PLOTTED: 29.11.2023 at 09:40

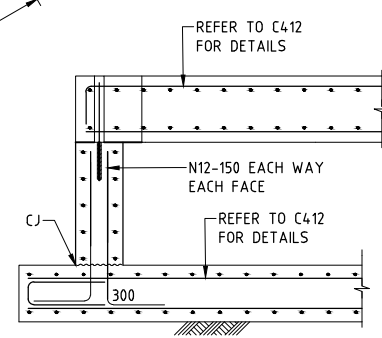
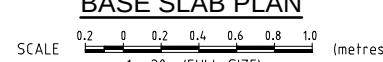
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PLOTED: 29-11-2022 at 09:45
DESIGNER: VAN LE
DRAFTSPERSON: VAN LE
CHECKED: DEREK WALTON
APPROVED FOR AND ON BEHALF OF BURCHILLS ENGINEERING SOLUTIONS
ABN 76 166 942 365



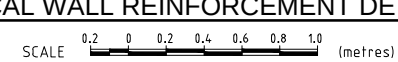
GENERAL ARRANGEMENT PLAN



BASE SLAB PLAN



TYPICAL WALL REINFORCEMENT DETAILS



GENERAL NOTES:

- DIMENSIONS ARE NOT TO BE SCALED. SET OUT DIMENSIONS ARE TO BE VERIFIED WITH THE ENGINEER.
- CONTRACTOR TO CHECK WORK IN DETAIL PRIOR TO CALLING FOR INSPECTION BY THE ENGINEER.
- IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT ALL FOOTINGS ARE INSPECTED BY A REPRESENTATIVE FROM THE GEOTECHNICAL CONSULTANT. IF IT IS DEEMED NECESSARY TO MODIFY THE FOOTING DESIGN TO SUIT THE CONDITIONS FOUNDED ONSITE THE ENGINEER SHALL BE INFORMED IMMEDIATELY.
- THE DESIGN HAS CONSIDERED AN ALLOWANCE BEARING CAPACITY OF 100 kPa. A HOLD POINT SHALL BE IMPLEMENTED TO ALLOW A SUITABLY QUALIFIED GEOTECHNICAL ENGINEER TO CONFIRM THIS DESIGN PARAMETER PRIOR TO UNDERTAKING THE WORKS.
- ALL EARTHWORKS SHOULD BE SUPERVISED BY A SUITABLE QUALIFIED PERSON.
- SITE PREPARATION WORKS AND EARTHWORKS SHOULD BE CARRIED OUT IN ACCORDANCE WITH AS3798 'GUIDELINES ON EARTHWORKS FOR RESIDENTIAL AND COMMERCIAL DEVELOPMENTS' AS A MIN.
- ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH CURRENT STANDARDS AUSTRALIA CODES AS3600, AS1379 AND THE PROJECT SPECIFICATION.
- DESIGN AND CONSTRUCT FORMWORK INCLUDING ERECTION, STRIPPING, BRACING AND BACK PROPPING SHALL BE IN ACCORDANCE WITH AS3610.
- NO PENETRATIONS, RECESSES OR CHASES OTHER THAN THOSE SHOWN ON THE STRUCTURAL DRAWINGS SHALL BE MADE IN CONCRETE MEMBERS WITHOUT APPROVAL OF THE ENGINEER.
- NO PENETRATIONS OF THE SLABS IS TO OCCUR WITHOUT THE APPROVAL OF THE ENGINEER.
- CONCRETE SIZES SHOWN ARE MINIMUM AND NO REDUCTIONS BY DUCTS, PIPES, ETC. SHALL BE MADE WITHOUT THE APPROVAL OF THE ENGINEER. SIZES DO NOT INCLUDE THICKNESS OF APPLIED FINISHES.
- THE CONCRETE SHALL BE COMPACTED USING HIGH FREQUENCY VIBRATORS.
- CHARACTERISTIC CONCRETE STRENGTH (F'C) AND COVERS SHALL BE AS FOLLOWS, UNLESS NOTED OTHERWISE:
- CLEAR COVER TO REINFORCEMENT INCLUDING FITMENTS SHALL BE AS NOTED ON THE DRAWINGS. WHERE NOT SPECIFICALLY DESIGNATED, THE COVER SHALL BE 60mm MINIMUM.
- DISTRIBUTION REINFORCEMENT TO MAIN REINFORCEMENT IN SLABS SHALL BE A MINIMUM OF N12-300.
- WELDING OF REINFORCEMENT IS NOT PERMITTED UNLESS SHOWN ON THE DRAWINGS OR APPROVED BY THE ENGINEER.
- TOP AND BOTTOM REINFORCEMENT IN SLABS SHALL BE SUPPORTED IN BOTH DIRECTIONS AT 1000mm MAXIMUM CENTRES. SLAB FABRIC TO BE SUPPORTED AT 800 MAX CRS.
- HOOKS, LAPS AND BENDS TO BE IN ACCORDANCE WITH AS3600.
- UNLESS SHOWN OTHERWISE IN THE DRAWINGS MINIMUM LAP LENGTHS SHALL BE AS FOLLOWS:

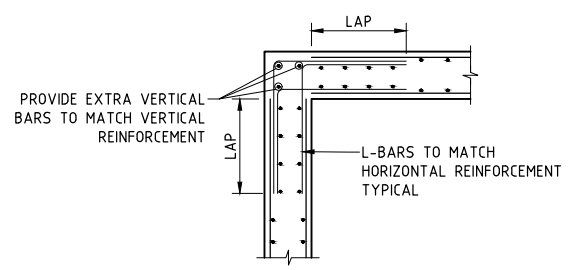
REINFORCEMENT LAP SCHEDULE			
BAR DIAMETER	FOOTING LAP	SLAB LAP	WALL LAP
N12	500	450	500
N16	650	600	650
N20	800	700	800
N24	1000	1000	1000
N28	1350	1350	1150
N32	1750	1750	1300
N36	-	-	1450

WHERE TWO BARS OF DIFFERENT DIAMETERS LAP, THE MINIMUM LAP FOR THE SMALLER BAR DIAMETER SHALL BE USED.

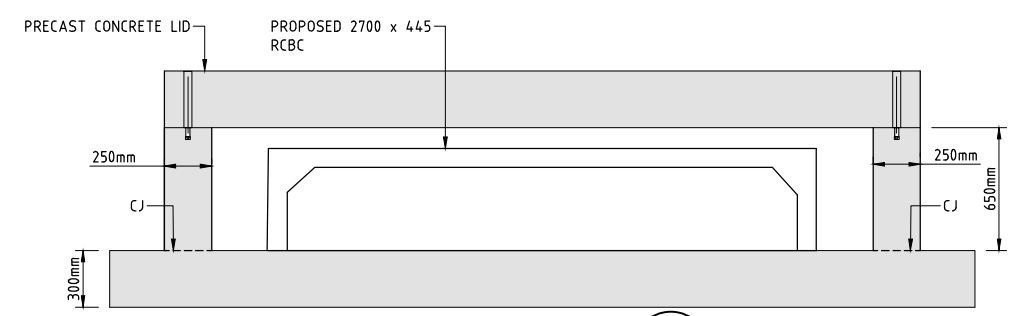
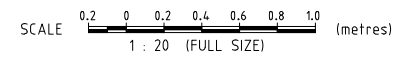
ELEMENT	F'C AT 28 DAYS	MIN COVER (mm)	SLUMP (mm)	EXPOSURE CLASS TO AS5100
SLAB ON GROUND	40	60	100	B2
WALLS	40	60	80	B2
ALL OTHER CONCRETE ELEMENTS	40	60	80	B2

NOTES:

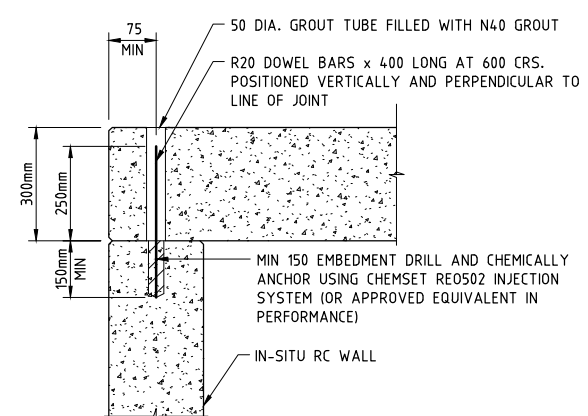
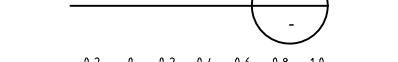
REFER TO NORTHERN RIVERS LOCAL GOVERNMENT STANDARD DRAWINGS FOR DETAILS OF STORMWATER STRUCTURES.



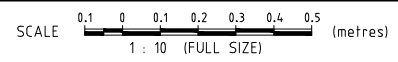
TYPICAL JUNCTION DETAILS



SECTION A



TYPICAL PRECAST LID CONNECTION



RIFLE RANGE ROAD AND BANGALOW ROAD INTERSECTION UPGRADE WORKS

FOR
BYRON SHIRE COUNCIL

A1 ORIGINAL SIZE BEFORE REDUCTION

VER.	DESCRIPTION	DATE
A	REISSUED FOR CONSTRUCTION	28-11-23

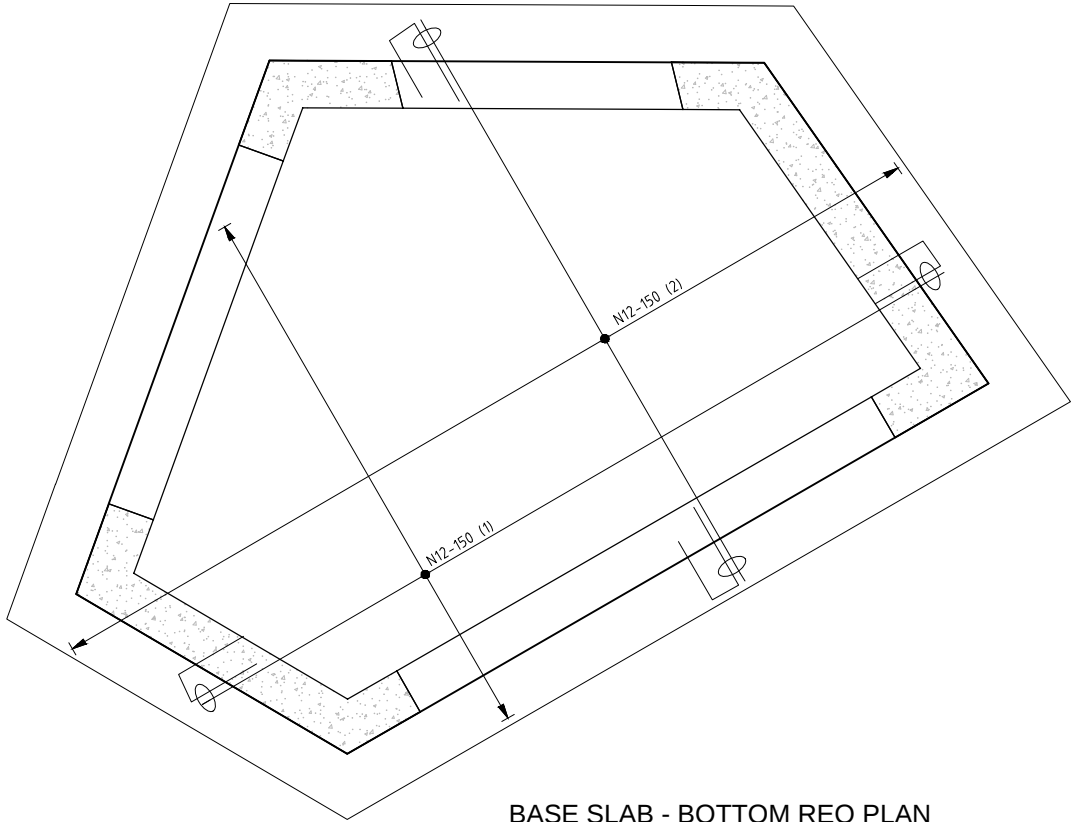
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Coote Burchills Engineering Pty Ltd
ABN 76 166 942 365

PROJECT:
RIFLE RANGE ROAD AND BANGALOW ROAD INTERSECTION UPGRADE WORKS

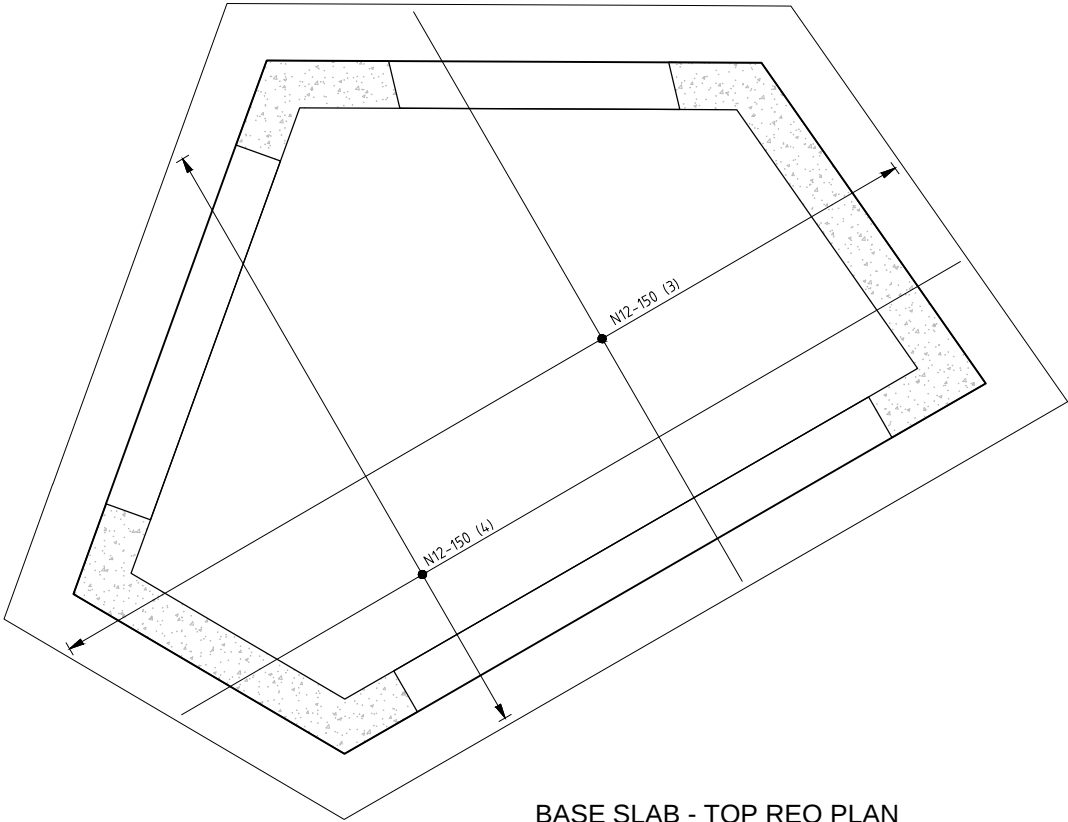
DRAWING TITLE:
STORMWATER DRAINAGE STRUCTURAL DETAILS - SHEET 1 OF 2

TINSW REG. No.:	DS2023/000976	DATE:	28-11-23
PROJECT LEADER:	DEREK WALTON		
DESIGNER:	VAN LE		
DRAFTSPERSON:	VAN LE		
CHECKED:	DEREK WALTON		
APPROVED FOR AND ON BEHALF OF BURCHILLS ENGINEERING SOLUTIONS	ABN 76 166 942 365		
SCALE:	AS NOTED	DATUM:	AHD
PROJECT No.:	BE170269-02	DRAWING No.:	C411
		VERSION:	A



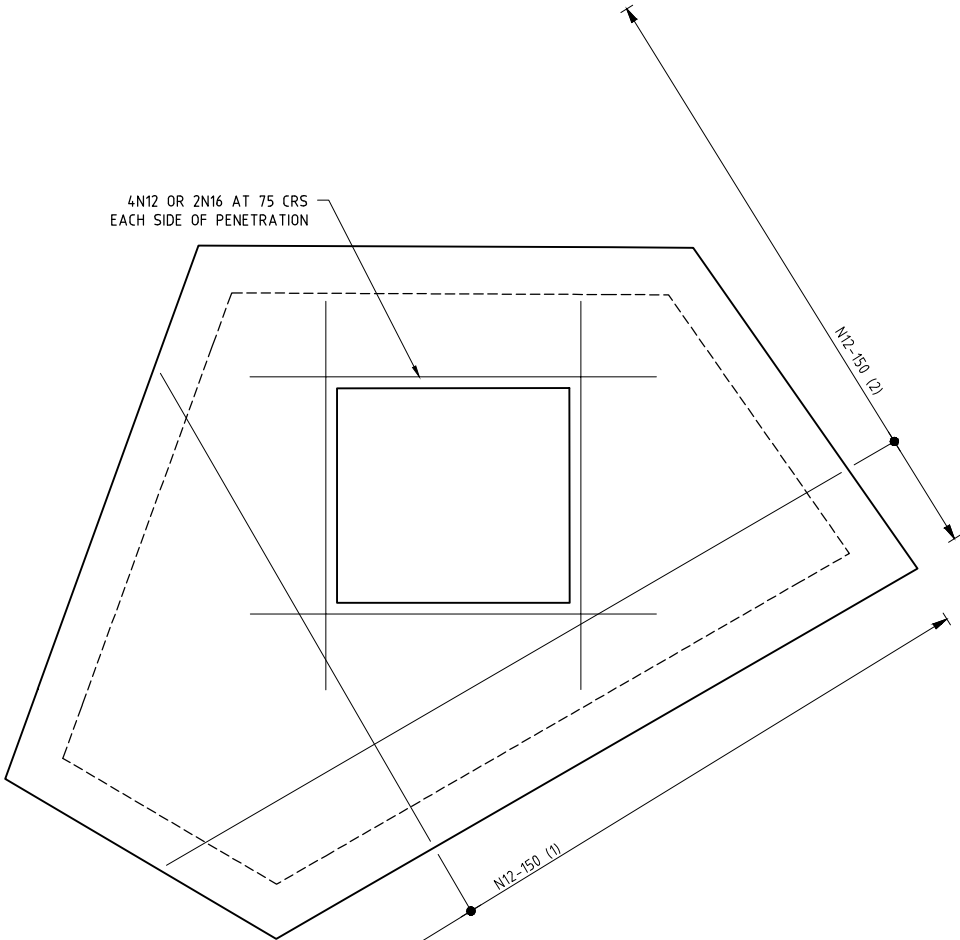
BASE SLAB - BOTTOM REO PLAN

SCALE 0.2 0 0.2 0.4 0.6 0.8 1.0 (metres)
1 : 20 (FULL SIZE)



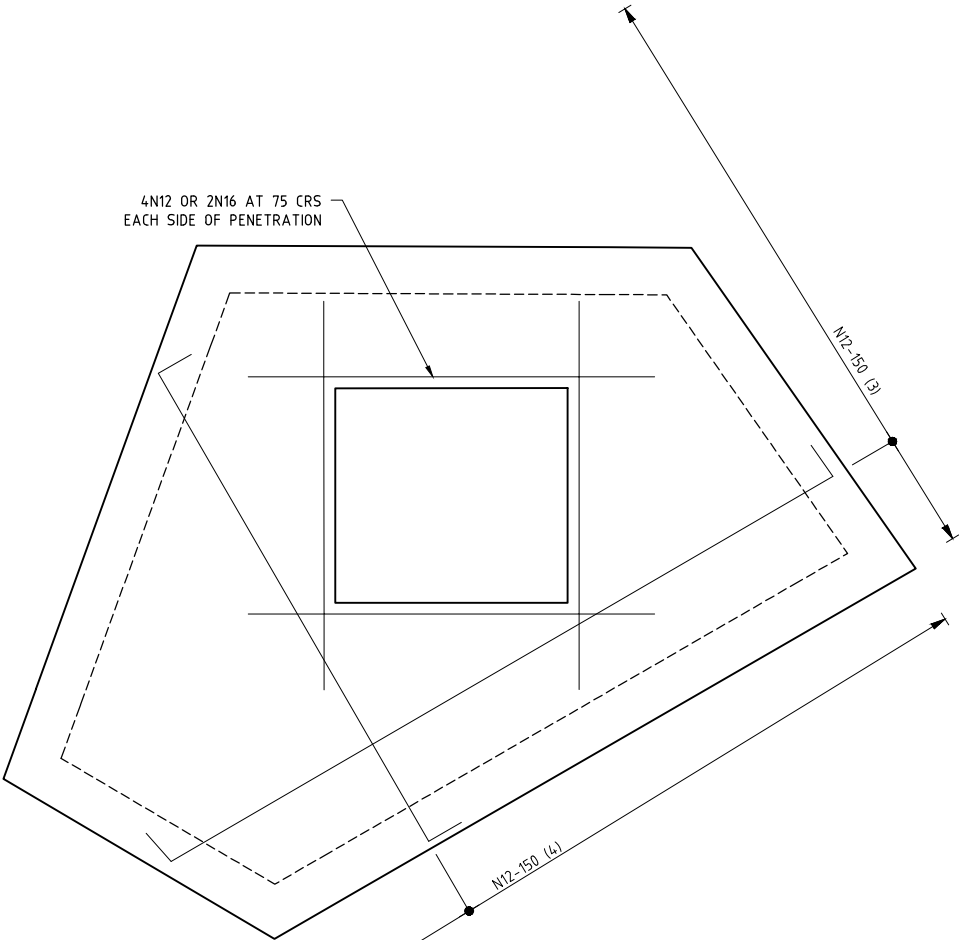
BASE SLAB - TOP REO PLAN

SCALE 0.2 0 0.2 0.4 0.6 0.8 1.0 (metres)
1 : 20 (FULL SIZE)



PIT LID - BOTTOM REO PLAN

SCALE 0.2 0 0.2 0.4 0.6 0.8 1.0 (metres)
1 : 20 (FULL SIZE)



PIT LID - TOP REO PLAN

SCALE 0.2 0 0.2 0.4 0.6 0.8 1.0 (metres)
1 : 20 (FULL SIZE)

NOTES:

REFER TO NORTHERN RIVERS LOCAL GOVERNMENT STANDARD DRAWINGS FOR DETAILS OF STORMWATER STRUCTURES.

RIFLE RANGE ROAD
AND BANGALOW
ROAD
INTERSECTION
UPGRADE WORKS

FOR

BYRON SHIRE COUNCIL

A1 ORIGINAL SIZE BEFORE REDUCTION

A	REISSUED FOR CONSTRUCTION	28-11-23
VER.	DESCRIPTION	DATE

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Coote Burchills Engineering Pty Ltd
ABN 76 166 942 365

PROJECT:

RIFLE RANGE ROAD
AND BANGALOW ROAD
INTERSECTION
UPGRADE WORKS

DRAWING TITLE:

STORMWATER
DRAINAGE
STRUCTURAL DETAILS -
SHEET 2 OF 2

TINSW REG. No.: DS2023/000976 DATE: 28-11-23

PROJECT LEADER: DEREK WALTON

DESIGNER: VAN LE

DRAFTSPERSON: VAN LE

CHECKED: DEREK WALTON

APPROVED FOR AND ON BEHALF OF
BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365

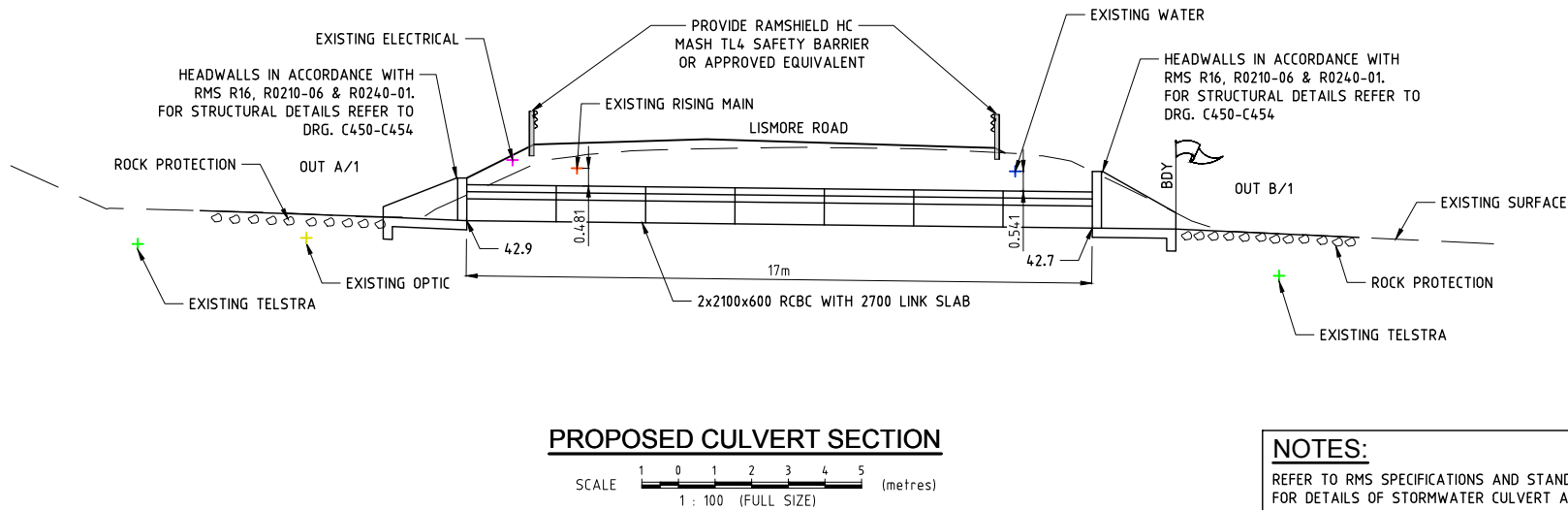
SCALE: AS NOTED DATUM: AHD FULL SIZE: A1

PROJECT No.: BE170269-02 DRAWING No.: C412 VERSION: A

FILENAME: C:\FILES\data\Burchills\STW BE170269 Rifle Range Road Im. Bangalow - L\N\Civil\Access\03-3_23001.dwg Design: BE170269-02-C420-A-004
PLOTED: 28-11-2023 at 14:03

LOCATION				TIME		SUB-CATCHMENT RUNOFF						INLET DESIGN						DRAIN DESIGN										HEADLOSSES										PART FULL		DESIGN LEVELS														
DESIGN ARI	STRUCTURE No.	DRAIN SECTION	SUB-CATCHMENTS CONTRIBUTING	LAND USE	SLOPE OF CATCHMENT	SUB-CATCHMENT TIME OF CONC.	RAINFALL INTENSITY	10yr RUNOFF CO-EFFICIENT	CO-EFFICIENT OF RUNOFF	SUB-CATCHMENT AREA	EQUIVALENT AREA	SUM OF (C x A)	SUB-CATCHMENT DISCHARGE	FLOW IN K&C (INC. BYPASS)	ROAD GRADE AT INLET	MINOR FLOW ROAD CAPACITY	INLET TYPE	FLOW INTO INLET	BYPASS FLOW	BYPASS STRUCTURE No.	CRITICAL TIME OF CONC.	RAINFALL INTENSITY	TOTAL (C x A)	MAJOR TOTAL FLOW	MAJOR SURFACE FLOW CAPACITY	MAJOR SURFACE FLOW	PIPE FLOW	REACH LENGTH	PIPE GRADE	PIPE / BOX DIMENSIONS (CLASS)	FLOW VELOCITY FULL (PIPE GRADE VELOCITY)	TIME OF FLOW IN REACH	STRUCTURE CHART No.	STRUCTURE RATIOS FOR 'K' VALUE CALCULATIONS	VELOCITY HEAD	U/S HEADLOSS COEFFICIENT	U/S PIPE STRUCT. HEADLOSS	LAT. HEADLOSS CO-EFFICIENT	LAT. PIPE STRUCT. HEADLOSS	W.S.E. CO-EFFICIENT	CHANGE IN W.S.E	PIPE FRICTION SLOPE	PIPE FRICTION HEADLOSS (L x S/I)	DEPTH	VELOCITY	OBVERT LEVELS	DRAIN SECTION H.G.L.	UPSTREAM H.G.L	LAT. H.G.L	W.S.E.	SURFACE OR K&C INVERT LEVEL	STRUCTURE No.		
Yr's					%	min	mm/h			ha	ha	l/s	l/s	l/s	%	l/s		l/s	l/s		min	mm/h	ha	l/s	l/s	l/s	l/s	m	%	mm	m/s	min			m		m	m	%	m	m	m/s	m	m	m	m	m	m						
10 100	EX/1	EX/1 to 1/1	EX/1			5.00 5.00	190 286			0.85 1.00	4.583 4.583	3.828 4.583	2020 3577	2020	0.00	382		382	938	1/1	5.00 5.00	190 286	3.828 4.583	3577		382	43.117	4.75	375(2)	3.44 (3.44)	0.21		Qg 0.382 Qo 0.382 Do 375 CHRT 32: Vol/2gDo 1.63 H/Do Kg side flow 2.10 end flow 1.99	0.610	2.10	1.281			2.10	1.281	4.75	2.050		m	m/s	m	m	46.787 44.740	47.171 45.121	48.452		48.452	47.639	EX/1
10 100	1/1	1/1 to 2/1	EX/1/1			5.00 5.00	190 286	0.85 1.00	0.268 0.268	0.228 0.268	0.228 0.268	120 213	1758	2.50		8246	550	1208	2/1		5.21 5.21	189 282	4.056 4.771	3737		927 35.627	113	675(2)	2.52 (2.52)	0.24		Qg 0.547 Qo 0.927 Do 675 Flow EX/1 made eqy grate flow CHRT 32: Vol/2gDo 0.47 H/Do Kg side flow 3.55 end flow 3.17 K vals above for stepped pipes as grate flow grate flow decreased by 0.380 from EX/1	0.324	1.27	0.411		CHART 33 Angle 1 S/Do 2.5 Du/Do 0.56 Qg/Do 0.59 K 1.04 S/Do 2.83 cor 0.23 Ku 1.27 Kw 1.27 K vals steep pipes as pipe flow Ku 1.27 Kw 1.27	1.27	0.411	1.13	0.401		44.419 44.011	44.710 44.309	45.121		45.121	45.526	1/1					
10 100	EX/3	EX/3 to 2/1														M					0.00 0.00	190 286	0.000 0.000	0		0 12.669	150	375(2)	0.00 (1.94)	0.21				0.000	0.20	0.000		0.00	0.000			43.932 43.742	44.309 44.309	44.309		44.309	44.898	EX/3						
10 100	2/1	2/1 to 3/1	EX/1/1/2/1			5.00 5.00	190 286	0.85 1.00	0.268 0.268	0.228 0.268	0.228 0.268	120 213	1328	2.50		8246	443	885	3/1		5.45 5.45	187 277	4.284 5.039	3877		1353 19.115	0.82	1800 x 375 (RCBC)	2.01 (2.01)	0.16		Qg 0.436 Qo 1.353 Do 620 Flow EX/3 made eqy grate flow Angle 29 Chart 36 S/Do 2.5 chart Du/Do 1.09 Ku 1.57 K/0.5 1.89 Qu/Do 0.68 Cp 0.72 K 1.88 S/Do 3.0 K/ 1.36 K/0.5 1.59 K 1.53 S/Do 2.5 K/ 1.57 K/0.5 1.89 K 1.88	0.206	1.32	0.272		Interp val for S/Do 2.84 Kw 1.62 CHART 35 S/Do 3.0 K/ 1.04 K/0.5 1.37 K 1.29 S/Do 2.5 K/ 1.34 K/0.5 1.41 K 1.39 Interp val for S/Do 2.84 Kw 1.32 K vals above for stepped pipes as grate flow	1.62	0.334	0.82	0.156		43.681 43.525	44.037 43.881	44.309		44.371	44.529	2/1					
10 100	1/2	1/2 to 3/1	1/2			5.00 5.00	190 286	0.85 1.00	0.986 0.986	0.838 0.986	0.838 0.986	442 783	442	0.00	500	100	442	0			5.00 5.00	190 286	0.838 0.986	783		442 13.947	1.00	1200 x 300 (RCBC)	1.23 (1.87)	0.22		Qg 0.442 Qo 0.442 Do 480 CHRT 32: Vol/2gDo 0.26 H/Do Kg side flow 3.62 end flow 3.15	0.077	3.62	0.280			3.62	0.280	0.43	0.069			43.612 43.451	43.950 43.881	44.230		44.230	43.850	1/2				
10 100	3/1	3/1 to OUT/1	EX/1/1/1/2/1/2/3/1			5.00 5.00	190 286	0.85 1.00	0.827 0.827	0.703 0.827	0.703 0.827	371 657	1256	0.00	285	8245.144	285	971			5.61 5.61	186 275	5.825 6.852	5234		2058 7.042	0.25	2700 x 445 (RCBC)	1.70 (1.28)	0.04		Qg 0.279 Qo 2.058 Do 770 Routine 21 CHART 48 Du/Do 0.62 Du/Do 0.21 K 1.89 d/Do 2.8 chrt Qg/Do 0.14 Kg 0.08 d/Do 15 chrt Qg/Do 0.14 Kg 0.09 d/Do 1.82 Interp value Kg 0.10 Kw/Ku= 1.99 Combined pipes in line case Join Pipes	0.147	2.90	0.295		1/2 and 3/1 Vel 1.2387 Vel 2.4453 Eq Dia 757 Angle 111 Flow 1.779 CHART 33 Angle 0 S/Do 2.5 Du/Do 0.46 Qg/Do 0.14 K 0.61 S/Do 1.28 cor 0.19 Ku 0.88 Kw 0.88 Interpolated Kw= 2.00 Ku= 2.00	2.90	0.295	0.44	0.016		43.579 43.562	43.586 43.562	43.881		43.881	44.242	3/1					

STORMWATER DRAINAGE CALCULATIONS TABLE



NOTES:
REFER TO RMS SPECIFICATIONS AND STANDARD DRAWINGS FOR DETAILS OF STORMWATER CULVERT AND HEADWALLS.

RIFLE RANGE ROAD
AND BANGALOW
ROAD
INTERSECTION
UPGRADE WORKS

FOR
BYRON SHIRE COUNCIL

A1 ORIGINAL SIZE BEFORE REDUCTION

G	REISSUED FOR CONSTRUCTION	28-11-23
F	REISSUED FOR CONSTRUCTION	15-09-23
E	REISSUED FOR CONSTRUCTION	17-07-23
D	ISSUE FOR CONSTRUCTION	07-06-23
C	PLAN AMENDED	18-03-22
B	PLAN AMENDED	23-02-22
A	ORIGINAL ISSUE	28-01-22
VER.	DESCRIPTION	DATE

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ABN 76 166 942 365

PROJECT:
RIFLE RANGE ROAD
AND BANGALOW ROAD
INTERSECTION
UPGRADE WORKS

DRAWING TITLE:
STORMWATER
DRAINAGE
CALCULATIONS TABLE

TNSW REG. No. :	DS2023/000976	DATE :	28-11-23
PROJECT LEADER :	DEREK WALTON		
DESIGNER :	VAN LE		
DRAFTSPERSON :	VAN LE		
CHECKED :	DEREK WALTON		
APPROVED FOR AND ON BEHALF OF BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365			
SCALE :	AS NOTED	DATUM :	AHD
PROJECT No.:	BE170269-02	DRAWING No.:	C420
		VERSION:	G

3. THE STRUCTURAL DRAWINGS MUST BE READ IN CONJUNCTION WITH ALL OTHER CONSULTANTS' DRAWINGS AND SPECIFICATIONS AND WITH SUCH OTHER WRITTEN INSTRUCTIONS AS MAY BE ISSUED DURING THE COURSE OF THE CONTRACT. ANY DISCREPANCY MUST BE REFERRED TO THE SUPERINTENDENT FOR RESOLUTION PRIOR TO COMMENCEMENT OF THE WORK. DETAIL NOTES ON THESE DRAWINGS AND THE SPECIFICATION CLAUSES TAKE PRECEDENCE OVER THE GENERAL NOTES.
2. ALL MATERIALS AND WORKMANSHIP MUST BE IN ACCORDANCE WITH THE RELEVANT CURRENT STANDARDS AUSTRALIA CODES, THE BUILDING CODE OF AUSTRALIA AND ORDINANCES OF THE RELEVANT BUILDING AUTHORITIES, EXCEPT WHEN VARIED BY THE CONTRACT DOCUMENTS.
3. ALL DIMENSIONS SHOWN ON THE STRUCTURAL DRAWINGS MUST BE VERIFIED BY THE CONTRACTOR ON SITE, PRIOR TO COMMENCEMENT OF ANY FABRICATION OR CONSTRUCTION WORKS. THE STRUCTURAL DRAWINGS MUST NOT BE SCALED FOR DIMENSIONS.
4. ALL LEVELS ARE IN METRES AND ALL DIMENSIONS ARE IN MILLIMETRES, U.N.O.
5. THE METHOD OF CONSTRUCTION AND THE MAINTENANCE OF SAFETY DURING CONSTRUCTION IS THE RESPONSIBILITY OF THE CONTRACTOR. IF ANY STRUCTURAL ELEMENT PRESENTS DIFFICULTY IN RESPECT OF CONSTRUCTABILITY OR SAFETY, THE MATTER MUST BE REFERRED TO THE SUPERINTENDENT FOR RESOLUTION PRIOR TO COMMENCEMENT OF THE WORK.
5. NO HOLES OR CHASES OTHER THAN THOSE ON THE STRUCTURAL DRAWINGS MUST BE MADE IN ANY STRUCTURAL MEMBER, WITHOUT PRIOR WRITTEN APPROVAL OF THE SUPERINTENDENT.
7. THESE NOTES MUST ALSO APPLY TO ALL MATERIALS AND PROPRIETARY PRODUCTS USED IN CONSTRUCTION OF THE WORK.
3. THE CONTRACTOR MUST BE RESPONSIBLE TO ENSURE ALL MATERIALS AND PROPRIETARY PRODUCTS SOURCED COMPLY WITH THE APPROPRIATE QUALITY AND RELEVANT STANDARDS NOTED WITHIN THESE GENERAL NOTES.

- THE DESIGN, CERTIFICATION, CONSTRUCTION, INSPECTION AND PERFORMANCE OF THE FORMWORK AND FALSE WORK MUST BE THE RESPONSIBILITY OF THE CONTRACTOR, EXCEPT TO THE EXTENT THAT FORMWORK DESIGN IS SHOWN ON THE STRUCTURAL DRAWINGS.
- FORMWORK MUST BE DESIGNED TO ACCOMMODATE MOVEMENTS AND/OR LOAD RE-DISTRIBUTION DUE TO ANY POST TENSIONING.
- THE FORMWORK MUST NOT BE DESIGNED TO RELY ON RESTRAINT OR SUPPORT FROM THE PERMANENT STRUCTURE.
- DURING CONSTRUCTION, SUPPORT PROPPING WILL BE REQUIRED WHERE LOADS FROM STACKED MATERIALS, FORMWORK AND OTHER SUPPORTED SLABS INDUCE LOADS IN A SLAB OR BEAM WHICH EXCEED THE DESIGN CAPACITY FOR STRENGTH OR SERVICEABILITY LIMIT STATES AT THAT AGE. ONCE THE NOMINATED 28 DAY STRENGTH HAS BEEN ATTAINED, THESE LOADS MUST NOT EXCEED THE DESIGN SUPERIMPOSED LOADS SET OUT IN THESE GENERAL NOTES.
- DO NOT PLACE PERMANENT LOADS ON THE CONCRETE STRUCTURE UNTIL AFTER FORMWORK AND PROPPING IS REMOVED.
- REFER TO THE SPECIFICATION FOR TEST PANEL REQUIREMENTS. REINFORCEMENT FOR TEST PANELS MUST BE SIMILAR TO THAT IN THE PERMANENT STRUCTURE BEING REPRESENTED BY THE TEST PANEL.
- BEFORE PLACING REINFORCEMENT IN THE FORMWORK, APPLY A RELEASE AGENT TO THE FACE OF THE FORMWORK COMPATIBLE WITH THE REQUIRED SURFACE FINISH.
- DIMENSIONAL TOLERANCES MUST COMPLY WITH AS3610 FOR THE APPROPRIATE FINISH CLASS.
- CHAMFER RE-ENTRANT ANGLES AND FILLET AT CORNERS BY 25MM U.N.O.
- BEFORE PLACING CONCRETE, REMOVE ALL WATER, DUST, AND DEBRIS FROM THE FORMWORK.
- FILL ALL HOLES LEFT BY FORM TIE BOLTS WITH MORTAR MATCHING THE SURFACE COLOUR OF THE FINISHED SURFACE. CAMBER - REFER NOTE C9

1. ALL WORKMANSHIP AND MATERIALS MUST BE IN ACCORDANCE WITH THE CURRENT EDITION OF AS3600 INCLUDING AMENDMENTS, EXCEPT WHERE VARIED BY THE CONTRACT DOCUMENTS.
2. READYMIX CONCRETE SUPPLY MUST COMPLY WITH AS1379.
3. CONCRETE QUALITY:
GENERAL REQUIREMENTS ARE GIVEN IN THE FOLLOWING TABLE. REFER TO THE SPECIFICATION FOR ADDITIONAL REQUIREMENTS FOR SPECIAL CLASS CONCRETE.

ELEMENT	CONC. CLASS	STRENGTH GRADE (MPa)	CEMENT TYPE	MAX. AGG. SIZE (mm)	SLUMP (mm)	MAX. SHRINKAGE STRAIN @ 56 DAYS (u - 10 - 6)
WALL	SPECIAL	40	SL	20	80	500-600 MAX.

SL – SHRINKAGE LIMITED

4. PROJECT CONTROL TESTING MUST BE CARRIED OUT ON ALL SPECIAL CLASS CONCRETE IN ACCORDANCE WITH AS1379, CLAUSE 6.5.
5. ADMIXTURES CONTAINING CHLORIDES MUST NOT BE USED.
6. CLEAR CONCRETE COVER TO ALL REINFORCEMENT FOR DURABILITY AND FIRE RESISTANCE MUST BE AS FOLLOWS U.N.O.

ELEMENT, INT OR EXT SURFACE	EXPOSURE CLASS TO AS3600	CONCRETE GRADE	MIN. COVER (mm)	ADJUST COVER FOR FIRE RATING (mm)
WALLS	A1	32	50	-

AT EXTERNALLY EXPOSED SURFACES METALLIC ITEMS INCLUDING FORM BOLTS, FORM SPACERS, METALLIC BAR CHAIRS AND TIEWIRE MUST NOT BE PLACED IN THE COVER ZONE.

- CONCRETE SIZES SHOWN DO NOT INCLUDE THICKNESSES OF APPLIED FINISHES.
3. REINFORCEMENT MUST BE SUPPORTED ON PURPOSE MADE CONCRETE, STEEL OR PLASTIC SUPPORTS DEPENDING ON THE EXPOSURE CONDITION TO PROVIDE THE SPECIFIED CLEAR AT EXTERNAL SURFACES EITHER ALL PLASTIC OR CONCRETE SUPPORTS MUST BE USED.
9. SUPPORTS MUST BE LOCATED AT NOT MORE THAN 60 BAR DIAMETERS EACH WAY FOR BARS AND NOT MORE THAN 750mm EACH WAY FOR MESH.
10. BARS DENOTED N MUST BE TYPE D500N.
11. REINFORCEMENT NOTATION
- | | |
|-------------------|-------------------|
| N12 -300 | 3/N 28 |
| SPACING (mm) | BAR DIAMETER (mm) |
| BAR DIAMETER (mm) | TYPE OF BAR |
| TYPE OF BAR | NUMBER OF BARS |
12. SITE BENDING OF REINFORCEMENT BARS MUST BE DONE USING A RE-BENDING TOOL WITHOUT HEATING. THE BARS MUST BE RE-BENT AGAINST A FLAT SURFACE OR A PIN WITH A DIAMETER NOT LESS THAN THE MINIMUM PIN SIZE PRESCRIBED IN AS3600.
13. REINFORCEMENT IS REPRESENTED DIAGRAMMATICALLY AND NOT NECESSARILY IN TRUE PROJECTION.
14. WHERE TRANSVERSE TIE BARS ARE NOT SHOWN PROVIDE N12-400 SPLICED WHERE NECESSARY AND LAP 400mm WITH MAIN BARS U.N.O.
15. ALL DOWELS PLACED IN DOWEL JOINTS AND IN EXPANSION JOINTS IN CONCRETE SLABS MUST BE PLACED WITHIN THE FOLLOWING TOLERANCES.
- | |
|--|
| VERTICAL ALIGNMENT ± 2 DEGREES FROM LEVEL. |
| HORIZONTAL ALIGNMENT ± 2 DEGREES FROM LINE PERPENDICULAR TO FACE OF THE JOINT. |
| POSITION ± 5 mm. |
16. GIVE A MINIMUM OF 24 HOURS NOTICE FOR INSPECTION OF REINFORCEMENT BY THE SUPERINTENDENT OR AS REQUIRED BY THE SPECIFICATION.
17. THE FINISHED CONCRETE MUST BE A DENSE HOMOGENEOUS MASS, COMPLETELY FILLING THE FORMWORK THOROUGHLY EMBEDDING THE REINFORCEMENT AND FREE OF STONE POCKETS. ALL CONCRETE MUST BE COMPACTED WITH MECHANICAL VIBRATORS.
18. CURING OF ALL CONCRETE MUST BE ACHIEVED BY KEEPING SURFACES CONTINUOUSLY WET FOR A PERIOD OF 7 DAYS, U.N.O. APPROVED SPRAY-ON CURING COMPOUNDS THAT COMPLY WITH AS3799 MAY BE USED WHERE FLOOR FINISHES WILL NOT BE AFFECTED. POLYTHENE SHEETING OR WET HESSIAN MAY BE USED TO RETAIN CONCRETE MOISTURE WHERE PROTECTED FROM WIND AND TRAFFIC. CURING MUST COMMENCE IMMEDIATELY AFTER CONCRETE PLACEMENT.

3. ALL WORKMANSHIP AND MATERIAL MUST BE IN ACCORDANCE WITH AS4100 AND AS1554 EXCEPT WHERE VARIED BY THE CONTRACT DOCUMENTS.
4. U.N.O., ALL STEEL MUST BE OF THE FOLLOWING GRADE IN ACCORDANCE WITH THE RELEVANT AUSTRALIAN STANDARD.
5. WORKSHOP FABRICATION DRAWINGS MUST BE SUBMITTED TO THE SUPERINTENDENT IN ACCORDANCE WITH THE SPECIFICATION FOR REVIEW AT LEAST 7 DAYS PRIOR TO COMMENCEMENT OF FABRICATION. FABRICATION MUST NOT COMMENCE WITHOUT THE SUPERINTENDENT'S APPROVAL OF THE WORKSHOP DRAWINGS.
6. THE CONTRACTOR MUST ENSURE THAT FIXINGS BETWEEN STEELWORK AND OTHER BUILDING ELEMENTS ARE COORDINATED AND INSTALLED. WHERE POSSIBLE THE FIXINGS MUST BE SHOWN ON THE WORKSHOP FABRICATION DRAWINGS.
7. ALL MEMBERS MUST BE SUPPLIED IN SINGLE LENGTHS. SPLICES MUST ONLY BE PERMITTED IN LOCATIONS SHOWN ON THE STRUCTURAL DRAWINGS.
8. ALL STEELWORK MUST BE SECURELY TEMPORARILY BRACED BY THE CONTRACTOR AS NECESSARY TO STABILISE THE STRUCTURE DURING ERECTION. CONSULT STRUCTURAL ENGINEER FOR ADDITIONAL DESIGN OF TEMPORARY PROPPING OR BRACING IF REQUIRED.
9. PROTECTIVE COATING:
STRUCTURAL STEELWORK NOT ENCASED IN CONCRETE MUST HAVE THE FOLLOWING MINIMUM PROTECTIVE COATING U.N.O. IN THE SPECIFICATION.
ALL MEMBERS - ALL SURFACES
10. SURFACE PREPARATION : POWER TOOL CLEAN TO AS1627.2 OR ABRASIVE BLAST CLEAN TO AS1627.4 CLASS 2.5

- PRIMER : HIGH BUILD INORGANIC ZINC PHOSPHATE
 DRY FILM THICKNESS : MINIMUM 75 MICRONS - MAXIMUM 100 MICRONS
 TOP COAT : TO OWNER'S SPECIFICATIONS
 EXTERNAL MEMBERS : REFER TO SPECIFICATION
8. STEELWORK INTENDED TO BE CONCRETE ENCASED MUST BE UNPAINTED. ENCASED CONCRETE MUST BE GRADE N25 U.N.O. PROVIDING A COVER ADEQUATE TO SUIT FIRE RATING OR EXPOSURE CONDITIONS. CONCRETE ENCASEMENT MUST BE CENTRALLY REINFORCED WITH 5mm WIRE TO AS4617 OR 6mm STRUCTURAL GRADE BARS TO AS4617 AT 150mm PITCH.

FOR

A1 ORIGINAL SIZE BEFORE REDUCTION

E	REISSUED FOR CONSTRUCTION	28-11-23
D	REISSUED FOR CONSTRUCTION	15-09-23
C	REISSUED FOR CONSTRUCTION	17-07-23
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A	ORIGINAL ISSUE	08-05-23
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PROJECT:

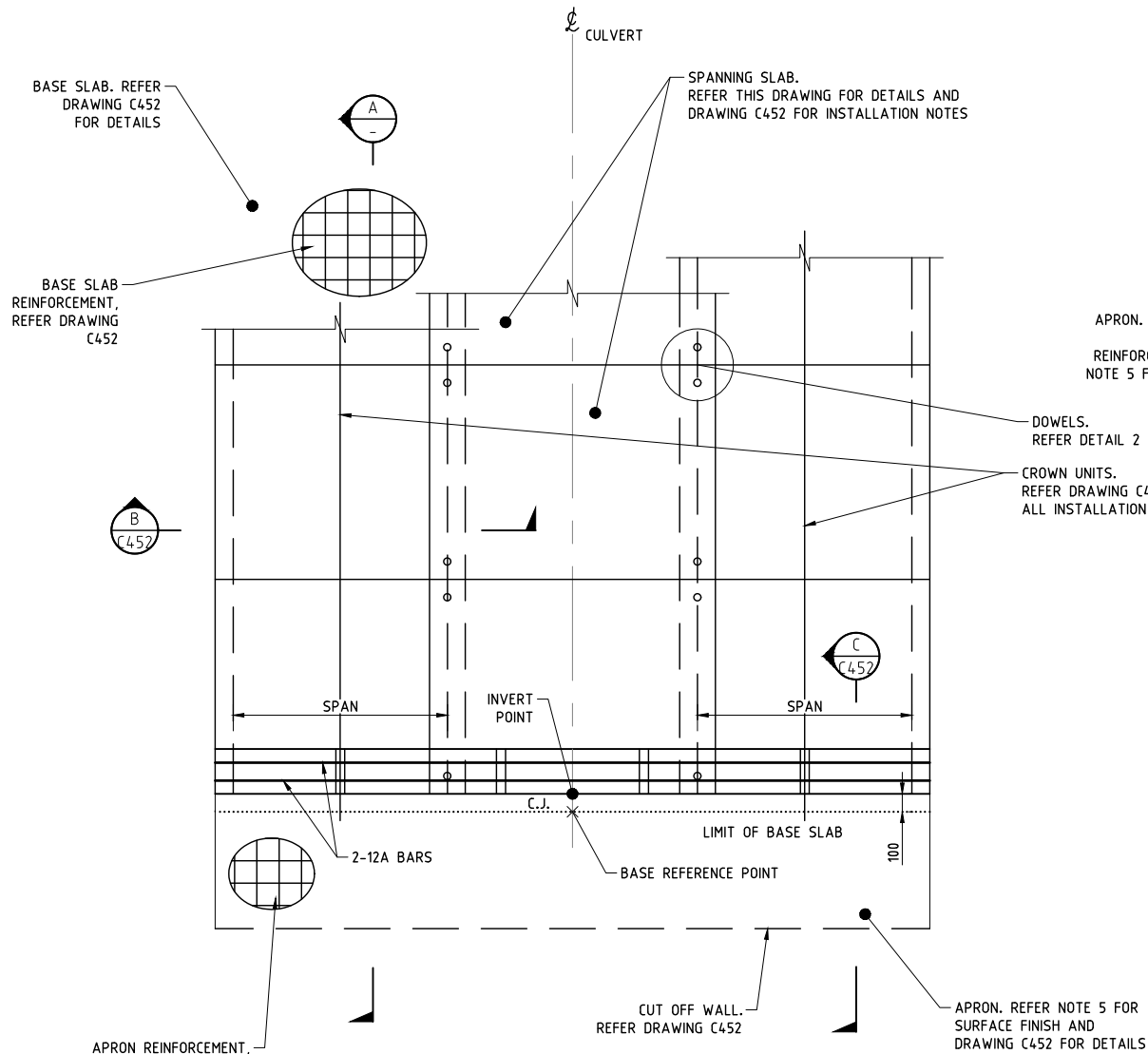
RIFLE RANGE ROAD AND BANGALOW ROAD INTERSECTION UPGRADE WORKS

DRAWING TITLE :

CULVERT STRUCTURAL NOTES

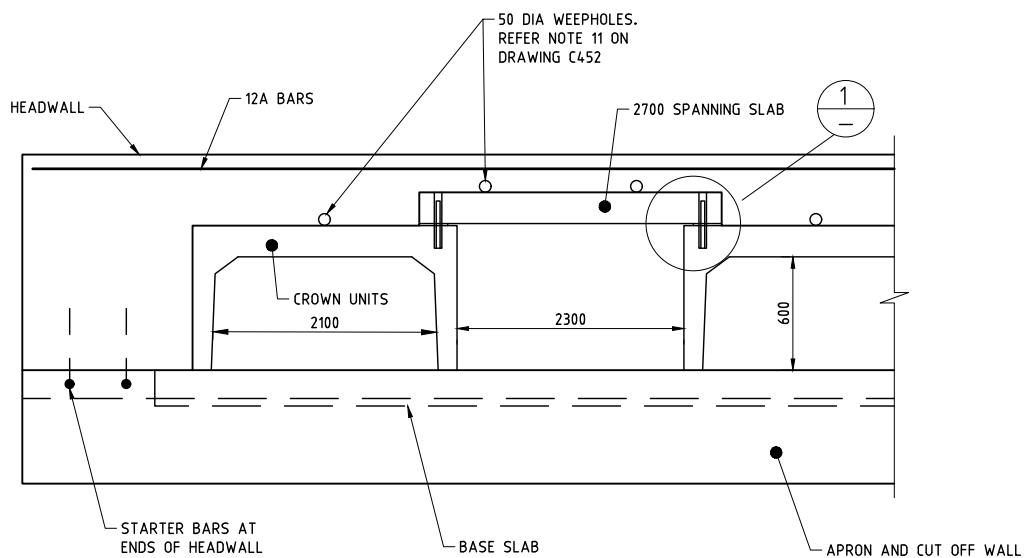
NSW REG. No. :	DS2023/000976	DATE : 28-11-23
PROJECT LEADER : DEREK WALTON		
DESIGNER : VAN LE		
DRAFTSPERSON : VAN LE		
CHECKED : DEREK WALTON		
APPROVED FOR AND ON BEHALF OF BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365 		
SCALE : AS NOTED	DATUM : AHD	FULL SIZE : A1
PROJECT No. : BE170269-02	DRAWING No. : C450	VERSION : E

FILENAME: C:\Users\adam.burchills\Documents\Burchills\BE170269 Rifle Range Road In. Bungalow - CIVIL\Drawings\BE170269-02-C451-A.dwg PLOTED: 28-11-2023 at 14:03



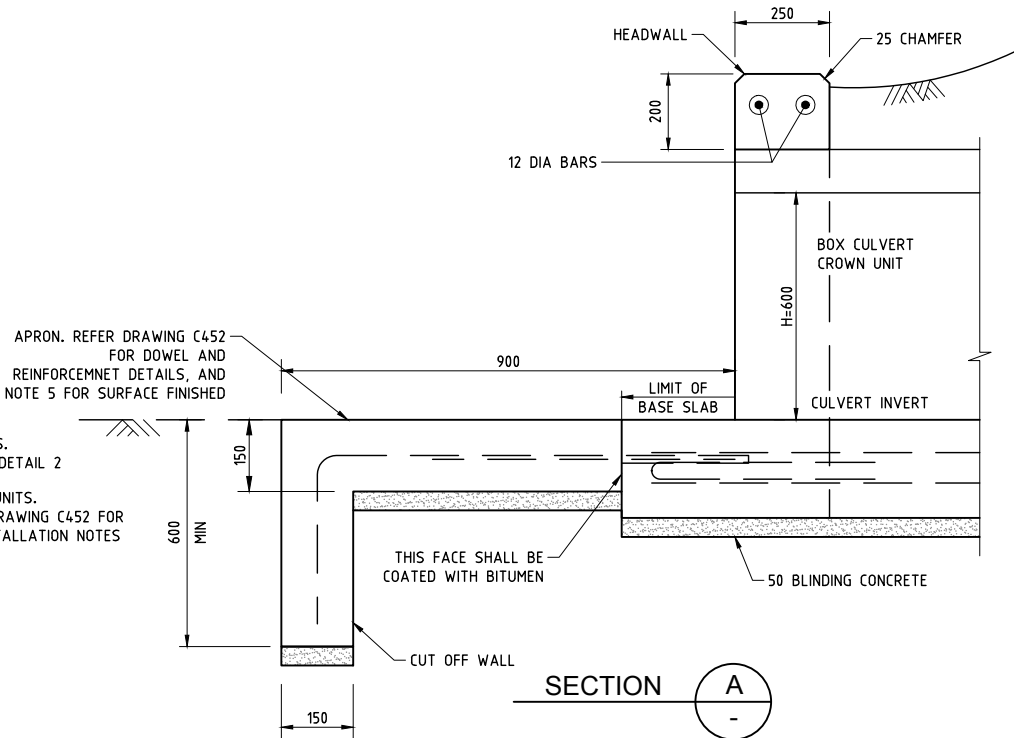
TYPICAL PLAN

SCALE 0.2 0 0.2 0.4 0.6 0.8 1.0 (metres)
1 : 20 (FULL SIZE)



TYPICAL ELEVATION - SPANNING SLAB DETAILS
GENERAL ARRANGEMENT - SLAB LINK BOX CULVERT

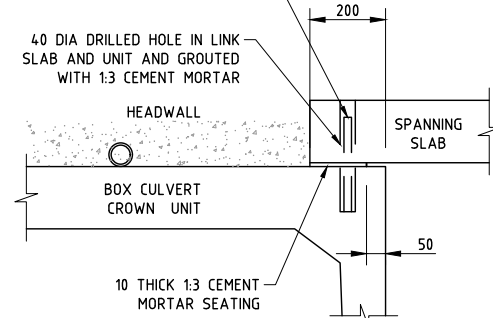
SCALE 0.2 0 0.2 0.4 0.6 0.8 1.0 (metres)
1 : 20 (FULL SIZE)



SECTION A
TYPICAL DETAILS FOR APRON
AND BASE SLAB

SCALE 0.1 0 0.1 0.2 0.3 0.4 0.5 (metres)
1 : 10 (FULL SIZE)

20 DIA X 250 LONG GALVANISED DOWEL. LOCATION OF DRILLED HOLE FOR CONNECTION DOWEL SHALL BE AS PER PRECASTER'S SPECIFICATIONS



DETAIL 1

SPANNING SLAB SUPPORT

SCALE 0.1 0 0.1 0.2 0.3 0.4 0.5 (metres)
1 : 10 (FULL SIZE)

GENERAL NOTES:

- SCOPE: THIS DRAWING IS TO DETAIL CAST INSITU BASE SLAB, APRONS AND HEADWALLS FOR PRECAST R C BOX CULVERTS AND SLAB LINK BOX CULVERTS WHERE H (HEIGHT OF OPENING) = 600.
- DESIGN TRAFFIC LOADING: HLP400, M1600, A160 AND W80 ARE IN ACCORDANCE WITH AS5100.2. MAXIMUM HEIGHT OF FILL OVER THE CULVERT SHALL BE 2000. MAXIMUM DESIGN PRESSURE (Ed) UNDER THE CULVERT SLAB BASES ARE PROVIDED IN THE BASE SLAB DETAILS AND DIMENSIONS TABLE ON DRAWING C452. MAXIMUM DESIGN PRESSURE (Ed) UNDER THE CULVERT APRON IS 75 kPa.
- DOWELLED CONTRACTION JOINTS SHALL BE PROVIDED WHERE (a) THE LENGTH AND/OR (b) THE WIDTH OF THE BASE SLAB EXCEED 20m. WHEN CONTRACTION JOINTS ARE REQUIRED ACROSS THE WIDTH, THEY SHALL BE LOCATED AT 1/4 SPAN POINTS OF CROWN UNITS AND ARE TO BE CONTINUED ACROSS THE APRON. 24 HOURS MINIMUM SHALL BE ALLOWED BETWEEN POURS.
- APRON AND BASE SLAB MINIMUM REINFORCEMENT FOR SHRINKAGE AND TEMPERATURE EFFECTS ARE DESIGNED CONSIDERING THE FULL RESTRAINT CONDITION TO AS 5100. FOR THE SLAB ON GROUND CONDITION, ONLY THE TOP HALF OF THE SLAB THICKNESS IS CONSIDERED FOR CALCULATION OF THIS REINFORCEMENT.
- CONCRETE DESIGN LIFE 100 YEARS. EXPOSURE CLASSIFICATION AND COVER TO REINFORCEMENT SHALL BE IN ACCORDANCE WITH AS 5100. MINIMUM CONCRETE STRENGTH AND COVER TO REINFORCEMENT SHALL BE AS SHOWN IN TABLE BELOW

EXPOSURE CLASSIFICATION	B2
MINIMUM CONCRETE STRENGTH	54% ₂₀
MINIMUM COVER UNO'	60

BLINDING CONCRETE N20/20.
SURFACE ROUGHENING OF THE APRONS SHALL BE BROOM FINISH USING A BROOM NOT LESS THAN 400 WIDE TO ACHIEVE AN AVERAGE TEXTURE DEPTH OF 0.8. THE DIRECTION OF BRUSHING SHALL BE PERPENDICULAR TO THE DIRECTION OF FLOW.

- ANGLE GRADE 300 TO AS/NZS 3679.1. BOLTS AND SCREWS CLASS 4.6 TO AS 1111.1. NUTS CLASS 5 TO AS 1112.1. WASHERS CLASS 5 TO AS 1237.1. AFTER FABRICATION ALL BOLTS AND NUTS SHALL BE HOT DIP GALVANISED TO AS 1214, AND ALL OTHER STEELWORK AS/NZS 4680.
- INFILL BETWEEN LEGS OF MULTIPLE CELL CULVERTS SHALL BE ACHIEVED BY PLACING CONCRETE PLUGS OF 250 MINIMUM LENGTH AT BOTH ENDS OF THE CULVERT, USING SAME GRADE OF CONCRETE AS HEADWALL, AND INFILL THE REMAINING GAP WITH 1:10 LEAN MIX HAVING MAXIMUM AGGREGATE SIZE OF 10mm PACKED DRY.
- REINFORCING STEEL, SHALL BE IN ACCORDANCE WITH AS/NZS 4671, AND ACRS CERTIFIED. DEFORMED BARS GRADE D500N. ROUND BARS GRADE R250N. MESH GRADE D500L. REINFORCEMENT SHALL BE HOT DIP GALVANIZED TO AS/NZS 4680 WHERE SHOWN.
- WEEPHOLES SHALL BE PROVIDED IN THE HEADWALLS HORIZONTALLY AS FOLLOW: MINIMUM OF 1 WEEPHOLE FOR EACH CULVERT CROWN UNIT, PLACED CENTRALLY; LOCATION OF WEEPHOLES SHALL BE DETERMINED SUCH THAT REINFORCEMENT COVER REQUIREMENTS ARE MET; AND, APPROVED DRAINAGE FILTER SHALL BE PROVIDED AT EACH WEEPHOLE.

RIFLE RANGE ROAD AND BANGALOW ROAD INTERSECTION UPGRADE WORKS

FOR

BYRON SHIRE COUNCIL

A1 ORIGINAL SIZE BEFORE REDUCTION

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Coote Burchills Engineering Pty Ltd
ABN 76 166 942 365

PROJECT:

RIFLE RANGE ROAD AND BANGALOW ROAD INTERSECTION UPGRADE WORKS

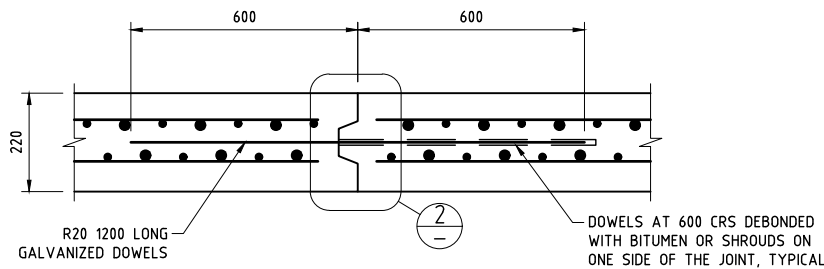
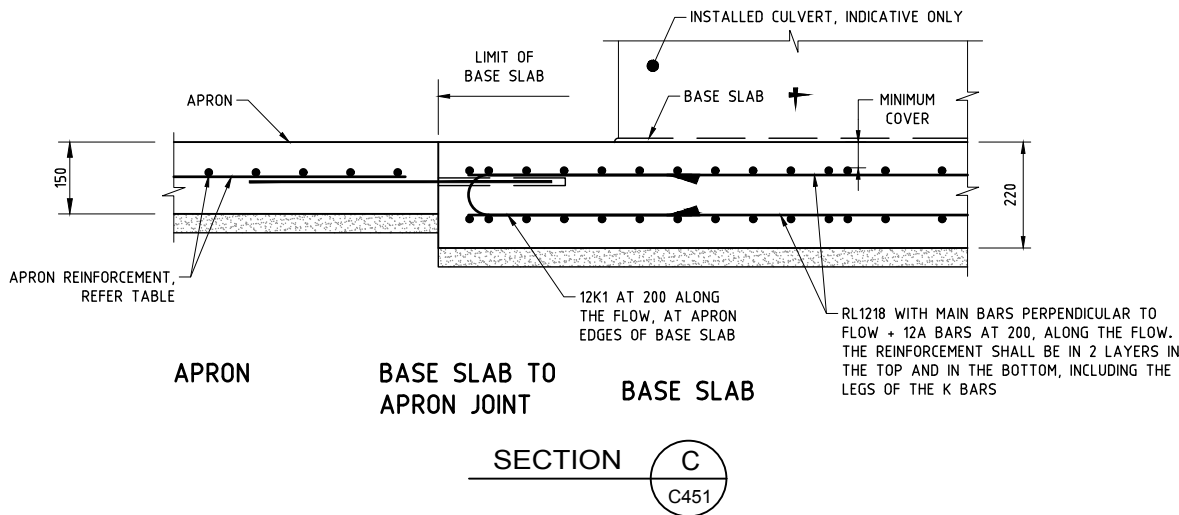
DRAWING TITLE:

CULVERT STRUCTURAL DETAILS - SHEET 1 OF 4

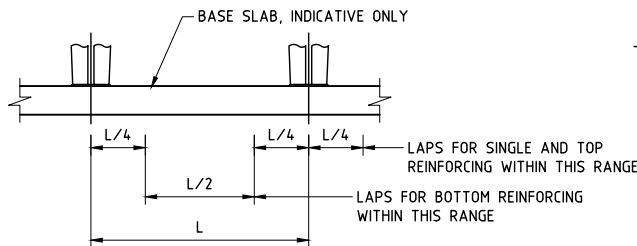
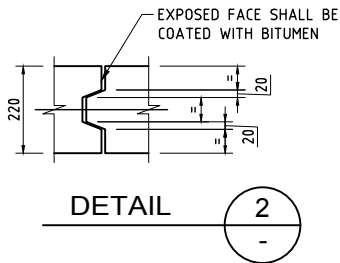
TINSW REG. No. :	DS2023/000976	DATE : 28-11-23
PROJECT LEADER :	DEREK WALTON	
DESIGNER :	VAN LE	
DRAFTSPERSON :	VAN LE	
CHECKED :	DEREK WALTON	
APPROVED FOR AND ON BEHALF OF BURCHILLS ENGINEERING SOLUTIONS	ABN 76 166 942 365	
SCALE : AS NOTED	DATUM : AHD	FULL SIZE : A1
PROJECT No. :	DRAWING No. :	VERSION :
BE170269-02	C451	E

NOTES FOR INSTALLATION OF PRECAST UNITS:

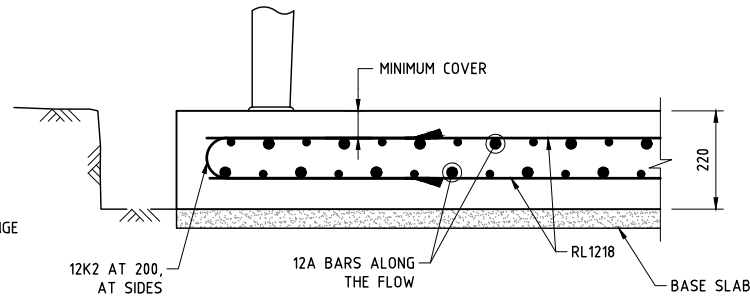
1. DOWELED CONNECTIONS SHALL BE IN ACCORDANCE WITH THIS DRAWING.
2. DO NOT USE FLUID GROUT AS HYDROSTACTIC HEAD WILL DAMAGE CULVERT LEGS.
3. HOLDING DOWN ANCHORS SHALL BE INSTALLED WHERE THE LEG(S) OF THE CROWN UNIT EXTEND MORE THAN 300 BEYOND THE OUTSIDE FACE OF THE HEADWALL. REFER DETAILS ON THIS DRAWING FOR HOLDING DOWN ANCHOR PLACEMENT AND INSTALLATION.
4. LEAN MIX CONCRETE SHALL BE PLACED BETWEEN SPANNING SLABS ON CROWN UNIT CELLS. LEAN MIX CONCRETE INFILL IS NOT REQUIRED ON THE OUTERMOST CROWN UNITS.



BASE SLAB DOWELLED CONTRACTION JOINTS
FOR USE TRAVERSELY AND/OR LONGITUDINALLY. REFER NOTE 3 ON DRAWING C451



REINFORCING BAR LAP
LOCATIONS - ALL BASE SLABS



SECTION B
C451
TYPICAL BASE SLAB AND APRONS
FOR SMALL BOX CULVERTS

APRON AND CUT OFF WALL DIMENSIONS AND
MINIMUM REINFORCEMENT REQUIREMENTS

EXPOSURE CLASSIFICATION	APRON AND CUT OFF WALL #	
	THICKNESS Z ⊕	REINFORCEMENT
B2	150	N12 AT 150 BOTH WAYS

⊕ WHERE Z IS A CONSTANT THICKNESS FOR APRONS AND CUT OFF WALLS

REFER NOTE 4 OF DRAWING C451

BASE SLAB DETAILS

UP TO SPAN	MAXIMUM DESIGN PRESSURE (Ed) kPa	BASE SLAB THICKNESS ↑ d FOR EXPOSURE CLASSIFICATION
600	190	B2
750		180
900		180
1200		180
1500		190
1800		190
2100		220

↑ WHERE d IS A CONSTANT THICKNESS
FOR BASE SLAB

SCALE 0.1 0 0.1 0.2 0.3 0.4 0.5 (metres)
1 : 10 (FULL SIZE)

RIFLE RANGE ROAD
AND BANGALOW
ROAD
INTERSECTION
UPGRADE WORKS

FOR

BYRON SHIRE COUNCIL

A1 ORIGINAL SIZE BEFORE REDUCTION

VER.	DESCRIPTION	DATE
E	REISSUED FOR CONSTRUCTION	28-11-23
D	REISSUED FOR CONSTRUCTION	15-09-23
C	REISSUED FOR CONSTRUCTION	17-07-23
B	ISSUE FOR CONSTRUCTION	07-06-23
A	ORIGINAL ISSUE	08-05-23

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ABN 76 166 942 365

PROJECT:

RIFLE RANGE ROAD
AND BANGALOW ROAD
INTERSECTION
UPGRADE WORKS

DRAWING TITLE:

CULVERT STRUCTURAL
DETAILS - SHEET 2 OF 4

TINSW REG. No.: DS2023/000976 DATE: 28-11-23

PROJECT LEADER: DEREK WALTON

DESIGNER: VAN LE

DRAFTSPERSON: VAN LE

CHECKED: DEREK WALTON

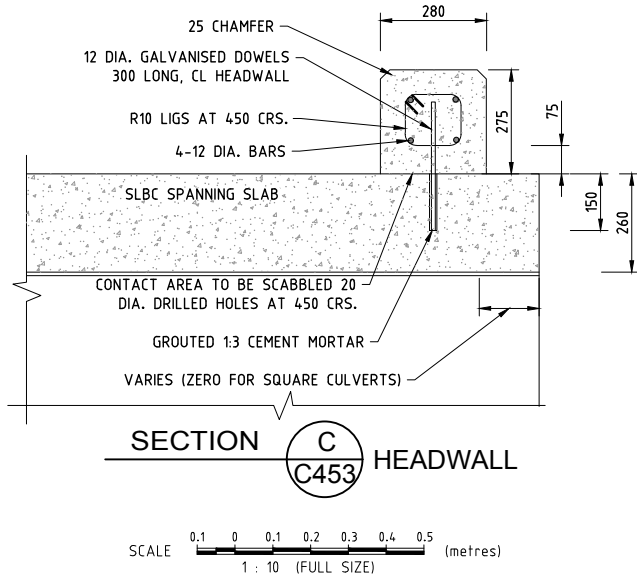
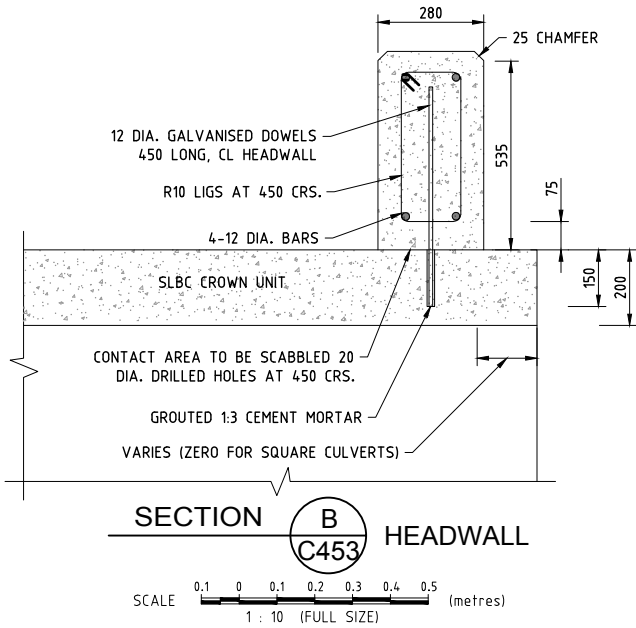
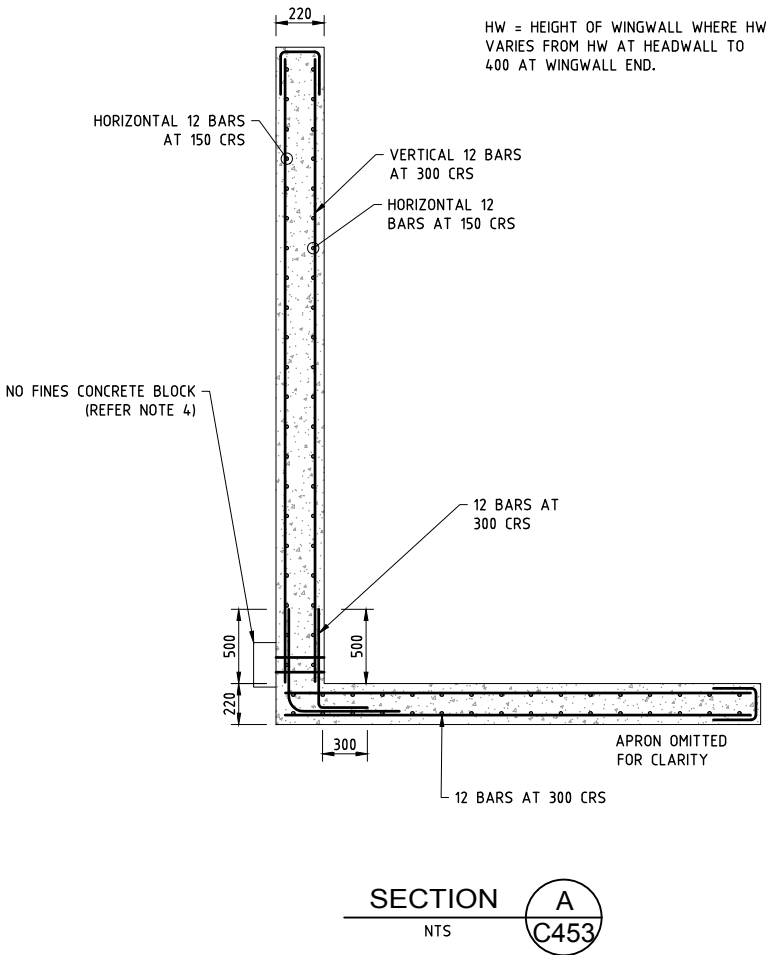
APPROVED FOR AND ON BEHALF OF
BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365

SCALE: AS NOTED DATUM: AHD FULL SIZE: A1

PROJECT No.: BE170269-02 DRAWING No.: C452 VERSION: E

NOTES:

1. CONCRETE:
REINFORCED CONCRETE CLASS S40/20 (S50/20).
CONCRETE COVER TO BE 55 (75) UNLESS SHOWN OTHERWISE.
EXPOSURE CLASSIFICATION B2.
2. STEEL:
REINFORCING STEEL TO BE IN ACCORDANCE WITH AS/NZS 4671.
DEFORMED BARS - GRADE D500N.
ROUND BARS - GRADE R250N.
DEFORMED WIRE - GRADE D500L.
3. WEEPHOLES OF 90 DIA. ARE TO BE PROVIDED AT MAXIMUM 1200 CRS. IN WINGWALLS. A 300 x 300 x 150 NO FINES CONCRETE BLOCK OR APPROVED EQUIVALENT IS TO BE PROVIDED AT EACH WEEPHOLE. LOCATION OF WEEPHOLES IS TO PROVIDE 55 (75) CLEAR COVER TO WINGWALL STEEL.
4. LAPS SHALL BE MADE SO THAT THE TWO OUTERMOST WIRES OF ONE FABRIC OVERLAP THE TWO OUTERMOST WIRES OF THE SHEET BEING LAPPED.
5. EXCESS BAR LENGTH - EXCESS BAR LENGTH PROTRUDING OUTSIDE THE DIMENSIONS OF THE WALL OR FOOTING SHALL BE CUT TO PROVIDE THE MINIMUM COVER.
6. DIMENSIONS ARE MILLIMETRES UNLESS SHOWN OTHERWISE.
- AUSTRALIAN STANDARDS:
AS/NZS 4671 STEEL REINFORCING MATERIALS
AS/NZS 4680 HOT-DIP GALVANIZED (ZINC) COATINGS ON FABRICATED FERROUS ARTICLES



RIFLE RANGE ROAD
AND BANGALOW
ROAD
INTERSECTION
UPGRADE WORKS

FOR

BYRON SHIRE COUNCIL

A1 ORIGINAL SIZE BEFORE REDUCTION

VER.	DESCRIPTION	DATE
E	REISSUED FOR CONSTRUCTION	28-11-23
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PROJECT:

RIFLE RANGE ROAD
AND BANGALOW ROAD
INTERSECTION
UPGRADE WORKS

DRAWING TITLE:

CULVERT STRUCTURAL
DETAILS - SHEET 4 OF 4

TINSW REG. No.: DS2023/000976 DATE: 28-11-23

PROJECT LEADER: DEREK WALTON

DESIGNER: VAN LE

DRAFTSPERSON: VAN LE

CHECKED: DEREK WALTON

APPROVED FOR AND ON BEHALF OF
BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365

SCALE: AS NOTED DATUM: AHD FULL SIZE: A1

PROJECT No.: BE170269-02
DRAWING No.: C454
VERSION: E