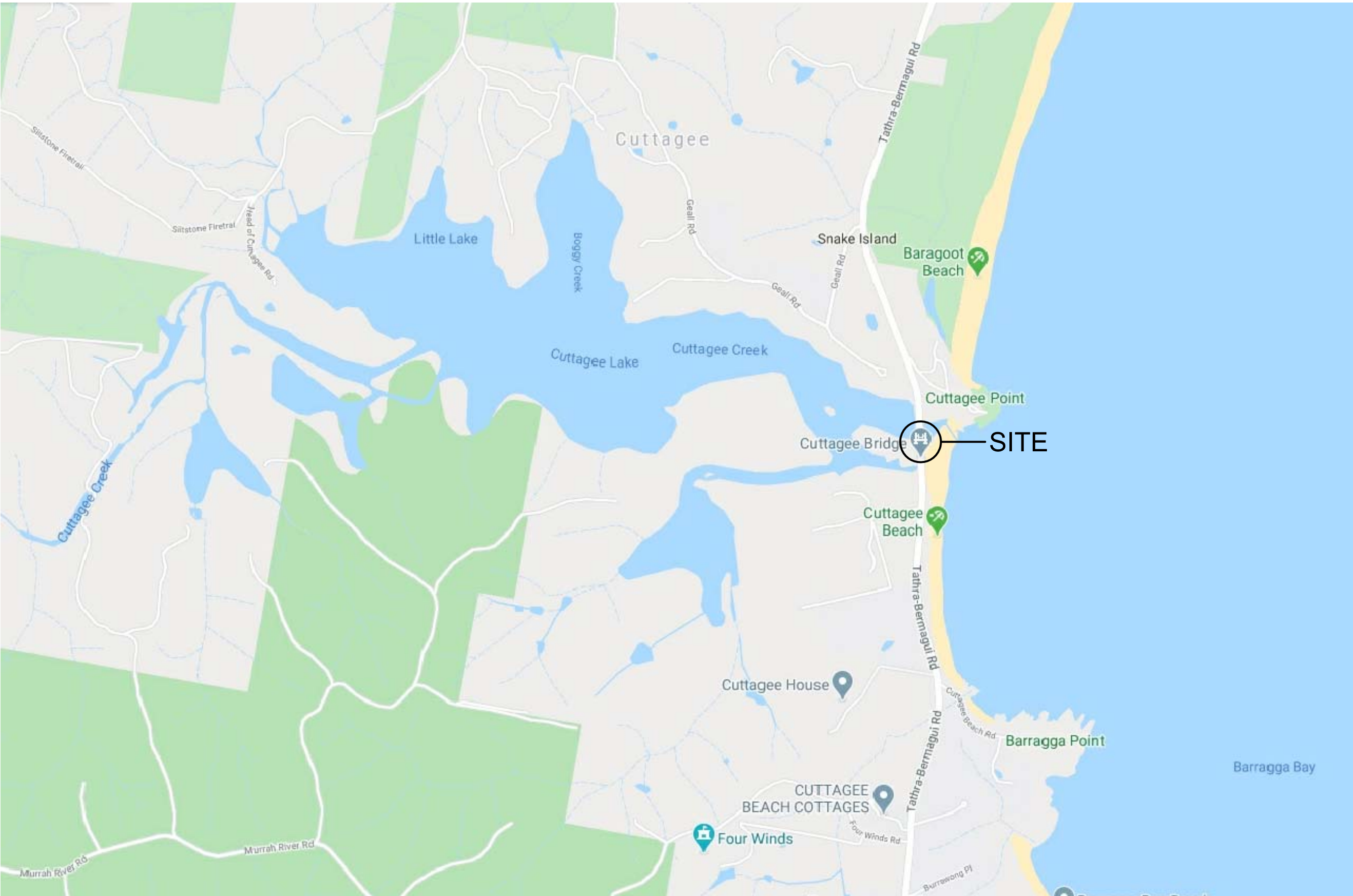


CUTTAGEE LAKE BRIDGE REPLACEMENT

TATHRA - BERMAGUI ROAD, CUTTAGEE, NSW
for BEGA VALLEY SHIRE COUNCIL



LOCALITY PLAN

SAFETY IN DESIGN STATEMENT & ENGINEERING DESIGN CERTIFICATION

THIS DESIGN FOR THE
CUTTAGE LAKE BRIDGE REPLACEMENT

AS PREPARED BY ANDREW MARSHMAN AND ASSOCIATES PTY LTD REPRESENTS THE CONSTRUCTION METHODS AND MATERIALS AS PRESCRIBED BY THE BRIDGE OWNER AND PRINCIPAL ENGINEERING AUTHORITY (BEGA VALLEY SHIRE COUNCIL (BVSC)) AND COMPLY WITH THE REQUIREMENTS OF THE AUSTRALIAN STANDARD (AS) 5100.1.043 RATING. ANY VARIATIONS TO THOSE ELEMENTS SHOWN ON THESE PLANS INCLUDING NATURALLY OCCURRING FOUNDATION TYPES/LEVELS AND EXISTING BRIDGE CONSTRUCTION) DISCOVERED PRIOR TO AND/OR DURING CONSTRUCTION ARE TO BE REFERRED IMMEDIATELY TO THIS OFFICE AND THE PRINCIPAL ENGINEERING AUTHORITY (BVSC) FOR DESIGN COMPLIANCE APPRAISAL AND CONSTRUCTION IMPLICATIONS, TO MAINTAIN THE CURRENT VALIDITY OF THIS STATEMENT AND CERTIFICATION ALL ASPECTS OF THE DESIGN IMPLEMENTATION AND CONSTRUCTION INCLUDING CONSTRUCTION SPECIFICATION, CONSTRUCTION SUPERVISION/CERTIFICATION AND STATUTE AUTHORITY OCCUPATIONAL SAFETY REQUIREMENTS ARE TO BE IN ACCORDANCE WITH FORMAL DETAILED AND SUPERVISED APPROVAL OF THE PRINCIPAL ENGINEERING AUTHORITY (BVSC).

DRAWING SCHEDULE

[illegible]

PRELIMINARY
NOT FOR CONSTRUCTION

Rev.	Description	Eng.	Date	Rev.	Description	Eng.	Date	<div><div>MARSHMAN O'NEILL ENGINEERS</div><div>CONSULTING STRUCTURAL CIVIL</div></div> <div>ANDREW MARSHMAN & ASSOCIATES PTY LTD ABN 86 064 689 694 35a Main Street (P.O Box 768) Merimbula NSW 258 PH: 02 6495 1670 FAX: 02 6495 3456 andrewmarshmanengineers.com.au</div>	PROJECT CUTTAGEE LAKE BRIDGE REPLACEMENT TATHRA – BERMAGUI ROAD, CUTTAGEE, NSW FOR BEGA VALLEY SHIRE COUNCIL		TITLE COVER SHEET							
P1	PRELIMINARY DESIGN ISSUE	A.M.	07.08.20															
P2	PRELIMINARY DESIGN ISSUE	A.M.	12.08.20															
P3	PRELIMINARY DESIGN ISSUE – PEDESTRIAN LANE CONCEPT	A.M.	13.07.21															
								Copyright © Andrew Marshman & Associates Pty Limited (2009). All rights reserved. This document and all works comprised in it are copyright and no part of it may in any form or by any means (including without limitation, electronic, mechanical, microcopying, photocopying, recording, scanning or otherwise) be reproduced, modified, stored in a retrieval system, published, distributed or any part of these works is granted to any person without the express prior written consent of Andrew Marshman & Associates Pty Limited and any implied licence to use any part of these works is expressly excluded.		Design A. MARSHMAN		Drawn D. ELCOAT		Approved ANDREW MARSHMAN <small>BE (HONSD) MIE Aust 13880761 CPENG NER Chartered Engineer</small>				
										Scale N.T.S. (A1)		Date AUGUST 2020		Job. No. AC20022 06		Sheet C1.1		Rev. P.3

- GENERAL

G1.

THESE NOTES SHALL BE READ IN CONJUNCTION WITH ALL ENGINEERING DRAWINGS. THE CONTRACT SPECIFICATION AND OTHER WRITTEN INSTRUCTIONS AS MAY BE ISSUED. IN CASE OF DISCREPANCY, PRECEDENCE IS GIVEN TO DRAWINGS, NOTES, THEN SPECIFICATION

G2.

THE CONTRACT SPECIFICATION IS BVSC/RTA SPECIFICATION

G3.

THESE DRAWINGS SHALL NOT BE USED FOR COMMITTING TO MATERIALS ORDERS OR CONSTRUCTION UNTIL AUTHORISED AND ISSUED AS "FOR CONSTRUCTION"

G4.

DEFINITIONS

UNO = UNLESS NOTED OTHERWISE
ENGINEER = NOMINATED REPRESENTATIVE
SUPERINTENDENT = NOMINATED SUPERINTENDENT IN THE CONTRACT OR BVSC
SLS = SERVICEABILITY LIMIT STATE
ULS = ULTIMATE LIMIT STATE
NS = NATURAL SURFACE LEVEL
HDG = HOT DIP GALVANIZED TO AS1214 & AS4680

G5.

UNLESS NOTED OTHERWISE:
ALL DIMENSIONS ARE GIVEN IN MILLIMETERS
ALL CHAINAGES ARE GIVEN IN METERS
ALL CO-ORDINATES ARE TO MAP GRID AUSTRALIA (MGA)
ALL LEVELS ARE GIVEN TO AUSTRALIAN HEIGHT DATUM (AHD)

G6.

ALL DIMENSIONS RELEVANT TO SETTING OUT AND OFF-SITE WORK SHALL BE VERIFIED BY THE CONTRACTOR & BVSC BEFORE CONSTRUCTION AND FABRICATION COMMENCED

G7.

DO NOT OBTAIN DIMENSIONS BY SCALING FROM DRAWINGS

G8.

REFER ALL DISCREPANCIES TO THE SUPERINTENDENT FOR RESOLUTION BEFORE PROCEEDING WITH WORK

G9.

WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH THE CONTRACT SPECIFICATIONS, AUSTRALIAN STANDARDS (INCLUDING ALL AMENDMENTS), AUSTRALIAN STANDARDS CODES OF PRACTICE AND THE REQUIREMENTS OF ANY OTHER RELEVANT STATUTORY AUTHORITIES. ALL THE ABOVE DOCUMENTS ARE THOSE CURRENT (AS VARIED BY CONTRACT DOCUMENTS) AT THE COMMENCEMENT OF THE CONTRACT/WORKS.

G10.

OBTAIN NECESSARY PERMITS AND APPROVALS FROM RELEVANT AUTHORITIES BEFORE WORK ON SITE IS COMMENCED.

G11.

SUPPLY RELEVANT SECTIONS OF THESE NOTES AND THE SPECIFICATION TO SUBCONTRACTORS

G12.

FULL DETAILS OF ANY VARIATION OF THE SCOPE, METHOD OF WORKS OR MATERIALS USED MUST BE SUBMITTED BY THE CONTRACTOR TO THE SUPERINTENDENT AND ENGINEER BEFORE THE WORK IS COMMENCED.

G13.

THE DRAWINGS DO NOT SHOW ALL DETAILS OF FIXTURES, INSERTS, SLEEVES AND OPENINGS REQUIRED. ALL SUCH DETAILS INCLUDING RECESSES AND CHASES MUST BE APPROVED BY THE ENGINEER BEFORE THE WORK IS COMMENCED.

G14.

KEEP ON SITE A COMPLETE SET OF CONTRACT DOCUMENTS (INCLUDING DRAWINGS AND SPECIFICATIONS) AND SITE INSTRUCTIONS

PROPRIETARY ITEMS

G15.

NOMINATION OF PROPRIETARY ITEMS DOES NOT INDICATE EXCLUSIVE REFERENCE, BUT INDICATES REQUIRED PROPERTIES OF ITEM. SIMILAR ALTERNATIVES HAVING REQUIRED PROPERTIES MAY BE OFFERED TO THE SUPERINTENDENT & ENGINEER FOR APPROVAL

G16.

INSTALL PROPRIETARY ITEMS STRICTLY IN ACCORDANCE WITH MANUFACTURER'S REQUIREMENTS AND RECOMMENDATIONS.

G17.

THE APPROVAL OF A SUBSTITUTION SHALL BE SOUGHT FROM THE ENGINEER AND ANY APPROVAL GIVEN IS NOT AN AUTHORISATION FOR A VARIATION TO THE CONTRACT. ANY VARIATION INVOLVED MUST BE TAKEN UP WITH THE SUPERINTENDENT BEFORE THE WORK IS COMMENCED.

SERVICES

G18.

THE CONTRACTORS ATTENTION IS PARTICULARLY DRAWN TO THE POTENTIAL HAZARD PRESENTED BY THE PRESENCE OF BURIED, CONCEALED, AND/OR OVERHEAD SERVICES IN THE AREA OF CONSTRUCTION ACTIVITY.

G19.

PRIOR TO ANY CONSTRUCTION ACTIVITY ON SITE (INCLUDING EXCAVATION, DRILLING OR PILING) THE CONTRACTOR SHALL CHECK WITH ALL RELEVANCE AUTHORITIES, OBTAIN ALL NECESSARY PERMITS, THE CONTRACTOR SHALL BY SITE EXPLORATION CONFIRM THE LOCATION OF ALL SERVICES WHICH MAY BE AFFECTED BY THE WORKS. THE CONTRACTOR SHALL MARK THE LOCATION OF ALL SERVICES CLEARLY AND ACCURATELY ON SITE AND ON THE AS-BUILT DRAWINGS.

G20.

THE CONTRACTOR SHALL TAKE PRECAUTIONS TO ESTABLISH THE LOCATION OF AND PROTECT ALL AFFECTED SERVICES AT THE SITE. SERVICES SHOWN ON DRAWINGS ARE INDICATIVE LOCATIONS ONLY. NOT ALL SERVICES ARE SHOWN ON THE DRAWINGS

G21.

HAND EXCAVATION ONLY IS PERMITTED WITHIN ONE METER OF IN-GROUND SERVICES.

TEMPORARY WORKS

G22.

THESE DRAWINGS DO NOT DETAIL TEMPORARY WORKS, CONSTRUCTION METHODS AND TEMPORARY WORKS ARE THE RESPONSIBILITY OF THE CONTRACTOR / BVSC

G23.

THE DESIGN CERTIFICATION AND PERFORMANCE OF FORMWORK AND FALSE WORK SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE CARRIED OUT IN ACCORDANCE WITH THE RELEVANT CODES.

G24.

THE CONTRACTOR IS RESPONSIBLE FOR THE CONSTRUCTION PROCEDURE AND ALL LOADS APPLIED DURING CONSTRUCTION MAINTAIN THE STRUCTURE IN A STABLE CONDITION DURING CONSTRUCTION AND PROVIDE TEMPORARY BRACING AND/OR SUPPORT AS REQUIRED. ENSURE NO PART IS OVERSTRESSED. DO NOT PLACE OR STORE BUILDING MATERIALS ON STRUCTURAL MEMBERS WITHOUT SUPERINTENDENT'S APPROVAL. THE CONTRACTOR SHALL PROVIDE CALCULATIONS TO JUSTIFY THE ADEQUACY OF THE STRUCTURE TO SAFELY WITHSTAND THE INTENDED IMPOSED LOADS AND/OR CONSTRUCTION PROCEDURE.

G25.

HAVE TESTING PERFORMED BY AN INDEPENDENT NATA (NATIONAL ASSOCIATION OF TESTING AUTHORITIES) ACCREDITED AUTHORITY AND PROVIDE TEST REPORTS TO SUPERINTENDENT.

DESIGN REQUIREMENTS

D1.

THE STRUCTURAL ELEMENTS SHOWN ON THE DRAWINGS HAVE BEEN DESIGNED TO RESIST THE FOLLOWING LOADINGS

WIND LOADING TO AS1170.2 AND AS5100.2	
REGION	A1
ULTIMATE REGIONAL WIND SPEED V2000	48 m/s
SERVICEABILITY REGIONAL WIND SPEED V20	35 m/s
TERRAIN CATEGORY	II
TOPOGRAPHY MULTIPLIER (M1)	1
SHIELDING MULTIPLIER (Ms)	1

D2.

THE STRUCTURAL ELEMENTS SHOWN ON THESE DRAWINGS HAVE BEEN DESIGNED IN ACCORDANCE WITH AS 5100.2-(2004) BRIDGE DESIGN FOR THE FOLLOWING PERMANENT & IMPOSED LOADINGS

DESIGN CRITERIA	LOADING	
DESIGN LOADS IN ACCORDANCE WITH AS5100.2 (2004) BRIDGE DESIGN PART 2 DESIGN LOADS	TRAFFIC - SM1600, A160 AND W80	
N° OF DESIGN LANES	1	
OPERATING SPEED	80km/h	
DEAD LOADING - CONCRETE DENSITY	27kN/m ³	
SUPERIMPOSED DEAD LOADING	22kN/m ³	
BRIDGE & OFF STRUCTURE BARRIERS REGULAR PERFORMANCE LEVEL OR IAW BVSC REQUIREMENTS	FT (ULS TRANSVERSE OUTWARD LOAD)	250kN
	FL (ULS LONG OR TRANSVERSE LOAD)	80kN
	LL (VEHICLE CONTACT LENGTH)	11m
	FV (ULS VERTICAL LOAD)	80kN
	LV (ULS VERTICAL CONTACT LENGTH)	5.5m
	HR (MINIMUM EFFECTIVE HEIGHT)	800mm
FLOOD HEIGHT	VU (ULS VELOCITY)	15m/s
	EXISTING BRIDGE - ASSUMED AT EXISTING DECK LEVEL	

D3.

THE STRUCTURAL ELEMENTS SHOWN ON THESE DRAWINGS HAVE BEEN DESIGNED IN ACCORDANCE WITH AS 5100.2-(2004) BRIDGE DESIGN FOR A 100 YEAR DESIGN LIFE.

FOUNDATIONS

F1.

ROCK FOUNDATION TO HAVE MINIMUM BEARING CAPACITY OF 1000 kPa.

F2.

FOOTINGS SHALL BE FOUNDED IN THE MATERIALS AND AT THE DEPTHS SHOWN ON THE DRAWINGS TO SUIT THE SITE EXCAVATED CONSTRUCTION AS APPROVED BY THE DESIGN ENGINEER.

F3.

THE FORMATION OF THE FOUNDATIONS SHALL BE APPROVED BY THE ENGINEER BEFORE PLACEMENT OF BLINDING CONCRETE OR REINFORCEMENT COMMENCES. THE CONTRACTOR SHALL INFORM THE ENGINEER IF CONDITIONS OTHER THAN THOSE DESCRIBED IN THE PLANS ARE ENCOUNTERED.

F4.

MINIMUM ALLOWABLE BEARING CAPACITIES AND SKIN FRICTION VALUES ARE TO BE CONFIRMED ON SITE BY THE ENGINEER PRIOR TO THE PLACEMENT OF ANY CONCRETE OR REINFORCEMENT FOR SPREAD (OR BORED PILE) FOUNDATIONS.

F5.

THE ENGINEER SHALL BE ADVISED IMMEDIATELY IF ANY UNEXPECTED GROUND WATER IS ENCOUNTERED ON SITE.

F6.

KEEP EXCAVATIONS FREE OF WATER, PROVIDE ADEQUATE DRAINAGE TO ENSURE FORMATION IS NOT AFFECTED BY MOISTURE. PREVENT FOUNDATION DRYING OUT DUE TO EXPOSURE. CONSTRUCT FOOTINGS AND BACKFILL AS SOON AS PRACTICAL AFTER EXCAVATION WITH A LAYER OF GRADE N15 BUILDING CONCRETE TO AVOID SOFTENING OR DRYING OUT BY EXPOSURE.

F7.

WHERE THE FORMATION OF THE FOUNDATIONS BECOMES SOFTENED OR LOOSENED DUE TO ADVERSE WEATHER GROUND SEAPAGE OR OTHER CAUSES, ALL SOFT OR LOOSE MATERIAL SHALL BE REMOVED DOWN TO ACCEPTABLE BEARING SURFACE AND IMMEDIATELY REPLACED WITH A LAYER OF GRADE N15 BLINDING CONCRETE.

F8.

ENSURE EXCAVATIONS ARE STABLE AND PROTECT SURROUNDING PROPERTY AND SERVICES FROM ADVERSE EFFECTS OF GROUND WORKS. PROVIDE TEMPORARY WORKS AS REQUIRED.

F9.

USE SUITABLE CONSTRUCTION TECHNIQUES AND EQUIPMENT FOR BACKFILLING ADJACENT TO STRUCTURES TO PREVENT OVERSTRESS AND DAMAGE. BACKFILL EVENLY TO AVOID DIFFERENTIAL SOIL PRESSURES ON STRUCTURES. BACKFILL AGAINST RETAINING WALLS ONLY AFTER SPECIFIED CONCRETE STRENGTH IS ACHIEVED AND PERMANENT SUPPORT INSTALLED WHERE APPLICABLE. REFER TO THE SPECIFICATION FOR THE LIMITS OF BACKFILLING.

PILES

F11.

ALL PILES TO BE DESIGNED, INSTALLED AND TESTED (SEE NOTE F13) BY AN APPROVED SPECIALIST SUBCONTRACTOR IN ACCORDANCE WITH DRAWINGS, SPECIFICATION AS 2159 & AS 5100. ALLOWANCE IS TO BE MADE FOR CORROSION RATES APPLICABLE TO SITE SOIL CONDITIONS & 100 YEAR DESIGN LIFE. (REFER NOTE F1) WE RECOMMEND THAT ALL PILES BE HOT DIP GALVANIZED IN ACCORDANCE WITH AS1214 ELSE SOIL pH TEST REQUIRED TO DETERMINE STEEL CORROSION RATE & HENCE ADDITIONAL STEEL PLATE THICKNESS REQUIRED.

F12.

PILE SETTING OUT DIMENSIONS ARE TO CENTRELINE OF PILE AT UNDERSIDE OF PILECAP. U.N.O. TOLERANCE ON POSITION OF PILES ± 50mm. U.N.O. (OR DESIGN) MAXIMUM DEVIATION OF PILE FROM SPECIFIED INCLINATION 1 IN 50.

F13.

SPECIFIED PILE LOADS ARE THE ULTIMATE (OR DESIGN) APPLIED STRUCTURAL LOAD U.N.O. THE FACTORED PILE CAPACITIES IS TO EXCEED THE SPECIFIED ULTIMATE APPLIED STRUCTURAL LOADS.

F14.

PRELIMINARY PILE DESIGN IS SHOWN ON THE DRAWINGS. PILES ARE TO BE DRIVEN TO REFUSAL IN ROCK FOUNDATION (SEE NOTE F1).
SCREW PILES

F15.

PILES SHALL BE SCREW-IN STEEL OR APPROVED EQUIVALENT U.N.O.

F16.

MAKE ALLOWANCE FOR TRIMMING DRIVEN ENDS OF PILES AND EXTENSION OF PILE REINFORCEMENT INTO ABUTMENT/PILECAP AS REQUIRED.

F17.

U.N.O. PILES SHALL PROJECT 500 INTO ABUTMENT CROSSHEADS.

F18.

THE PILING CONTRACTOR SHALL CERTIFY, SUPPLY AND INSTALL PILES TO RESIST THE DESIGN LOADS INDICATED ON THE ENGINEERS DRAWINGS.

F19.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING THE PILES WITHOUT DAMAGE. THE PILES SHALL BE DESIGNED TO RESIST ALL ADDITIONAL RELEVANT TEMPORARY CONSTRUCTION AND PERMANENT LOADS. THESE LOADS INCLUDE FORCES DUE TO ECCENTRICITY OF PILE RELATIVE TO BEARING LOADS AND LATERAL SOIL LOADS ACTING ON THE PILES.

F20.

PRIOR TO ANY CONSTRUCTION ACTIVITY ON SITE THE CONTRACTOR SHALL SUBMIT DRAWINGS AND CALCULATIONS TO DEMONSTRATE THAT THE PROPOSED PILING WILL MEET THE SPECIFIED PERFORMANCE REQUIREMENT.

F21.

THE PILING CONTRACTOR SHALL DEMONSTRATE TO THE ENGINEERS SATISFACTION THAT THE INSTALLED PILES WILL CARRY THE DESIGN LOADS SPECIFIED ON THE ENGINEERS DRAWINGS. REFER TO THE SPECIFICATION FOR PILE TESTING REQUIREMENTS. A MINIMUM OF TWO PILES PER ABUTMENT /PIER SHALL BE LOAD TESTED TO CONFIRM LOAD CARRYING CAPACITY IN ACCORDANCE WITH AS 2159 - 1995 (INCLUDING TABLE 4.2 & SECTION 8) REFER ALSO TO BRIDGE FOUNDATION DRAWINGS.

F22.

PILE INSTALLATION RECORD AND LOAD TEST RESULTS ARE TO BE PROVIDED TO THE SUPERINTENDENT ON COMPLETION OF PILE INSTALLATION.

F23.

THE PILING CONTRACTOR SHALL MAKE THEMSELVES AWARE OF THE GEOTECHNICAL INVESTIGATION REPORT IF AVAILABLE (SEE F1) AND OF FOUNDING CONDITIONS AT THE SITE.

F24.

THE CONTRACTOR SHALL PROVIDE A SURVEYED DRAWING SHOWING THE AS-BUILT CENTRELINE POSITION AND CUT-OFF LEVELS OF ALL PILES WITHIN ONE WEEK OF COMPLETION OF THE PILING FOR THE RELEVANT FOUNDATION.

F25.

TOLERANCES OF PILE POSITIONS SHALL MEET THE VALUES GIVEN IN THE SPECIFICATION.

STEELWORK

S1.

ALL WORKMANSHIP AND MATERIAL SHALL BE IN ACCORDANCE WITH THE CONTRACT SPECIFICATION, AS 5100 AND AS 1554 EXCEPT WHERE VARIED BY THE CONTRACT DOCUMENTS.

S2.

STEEL COMPONENTS SHALL CONFORM TO THE FOLLOWING TABLE U.N.O.

COMPONENTS	AS	GRADE
PLATE (GENERAL) PILE BAND	3678	250
FABRICATED BOX GIRDER, STIFFENERS AND ATTACHMENT PLATES	3678	350 LD
HOT ROLLED SECTIONS	3679	300
CHS > 80mm Dia	1163	C350
CHS < 80mm Dia	1163	C250
RHS AND SHS	1163	C350
WELDED BEAMS AND COLUMNS	3679	300
FLAT BARS AND RODS	3679	250
HOT ROLLED STEEL FLATS	1394	250
HOT ROLLED SECTIONS	3679	300
WELDED SECTIONS	3679	300
ISO METRIC BOLTS AND SCREW	1111	
ISO METRIC NUTS	1112	
HIGH STRENGTH STEEL BOLTS	1252	
COLD FINISHED BARS	1443	

S3.

PROVIDE STEEL MEMBERS MADE FROM WHOLE LENGTHS WHEREVER POSSIBLE, IF NECESSARY, MAKE LENGTHS UP OF SECTIONS JOINED BY COMPLETE PENETRATION FULL STRENGTH BUTT WELDS. GROUND FLUSH. WHERE PROPOSED SHOW JOINTS ON SHOP DRAWINGS, ENSURE MEMBERS ARE CONCENTRIC AT CONNECTIONS (GRAVITY-OR GAUGE-LINES TO INTERSECT) U.N.O. ACCURATELY PRE-FORM PARTS TO AVOID FORCE AND/OR RESTRAINT DURING JOINING.

S4.

SUBMIT DETAILS OF SUITABLE DRAINAGE HOLES IN STEEL SECTIONS TO PREVENT WATER COLLECTION DURING CONSTRUCTION (E.G. CROP INTERNAL CORNERS OF CLEATS AND STIFFENERS ETC. TO FACILITATE DRAINAGE), TO THE ENGINEER FOR APPROVAL.

S5.

PROVIDE 3mm CAP PLATES SEAL WELDED TO HOLLOW SECTIONS U.N.O. PROVIDE DRILLED VENT/RAIN HOLES AT TOP AND BOTTOM EXTREMITIES FOR HOLLOW SECTIONS TO BE HOT DIPPED GALVANIZED. PROVIDE RUBBER SEALS OR PLUG WELD WELD VENT/RAIN HOLES THAT REMAIN EXPOSED. PROVIDE DRILLED SUSPENSION HOLES IN END PLATES, ETC FOR ITEMS TO BE HOT DIPPED GALVANIZED.

S6.

SLIP FACTOR ASSUMED FOR FRICTION TYPE BOLTS = 0.35, DECREASE AND LIGHTLY OIL TF AND TB BOLTS PRIOR TO INSTALLATION. TENSION TF AND TB BOLTS USING PART-TURN METHOD TO AS 4100. PROVIDE WITNESS MARKS ON THE BOLT AND NUT.
- STEELWORK CONT.

S7.

GROUT BASE PLATES, HOLDING-DOWN BOLTS AND REBATED ETC. BEFORE LOADS ARE APPLIED. USE AN APPROVED HIGH-STRENGTH NON-SHRINK PRE-MIXED GROUT.

S8.

PREPARE WORKSHOP DRAWINGS AND SUBMIT THREE COPIES OF EACH FOR SUPERINTENDENT'S REVIEW OF GENERAL COMPLIANCE WITH DESIGN CONCEPT. SHOP DRAWINGS TO SHOW RELEVANT DETAILS OF EACH ASSEMBLY, COMPONENT AND CONNECTION, TOGETHER WITH INFORMATION RELATIVE TO FABRICATION, SURFACE TREATMENT AND ERECTION, INCLUDING IDENTIFICATION, LOCATION, TYPE AND GRADE, DIMENSIONS OF ITEMS, REQUIRED CAMBER (WHERE APPLICABLE), LOCATION, TYPE AND SIZE OF WELDS OR BOLTS, WELD CATEGORIES AND BOLTING CATEGORIES. SURFACE PREPARATION METHODS AND COATING SYSTEM, VENT/RAIN HOLES FOR HOT DIP GALVANISING, PROPOSED JOINTS IN STEEL MEMBERS ETC.

S9.

DO NOT COMMENCE FABRICATION UNTIL SHOP DRAWINGS HAVE BEEN REVIEWED. ALLOW 14 DAYS FOR SUPERINTENDENT'S REVIEW. SUPERINTENDENT'S REVIEW DOES NOT INCLUDE CHECKING OF DIMENSIONS AND DOES NOT RELIEVE CONTRACTOR OF RESPONSIBILITY FOR COMPLIANCE WITH DRAWINGS AND SPECIFICATIONS.

S10.

USE IDENTIFICATION MARKS COMPATIBLE WITH AND VISIBLE THROUGH PAINT SYSTEM.

S11.

STRAIGHTEN MEMBERS DISTORTED DURING FABRICATION AND/OR GALVANISING PROCESS USING AN APPROVED METHOD.

S12.

AFTER ASSEMBLY, AREAS OF STEELWORK WHICH HAVE BEEN LEFT UNPAINTED BECOME DAMAGED OR ABRADED DURING TRANSPORT OR ERECTION SHALL BE WIRE BRUSHED, CLEANED AND THEN BRUSH PAINTED, REFER PAINTING SPECIFICATION FOR REPAIRS TO DAMAGED SURFACES.

S13.

ALL BRAND NAME PRODUCTS SHALL BE ERECTED TO THE MANUFACTURERS SPECIFICATION.

S14.

BEARERS OR PACKERS MUST BE USED UNDER POINTS OF CONSTRAINT (ROPE AND CHAIN FIXINGS) TO PREVENT BENDING OF STEELWORK DURING TRANSPORT.

S15.

COMPLETE STEELWORK SHALL BE TRIAL ASSEMBLED AND ALL DEFECTS RECTIFIED PRIOR TO DELIVERY TO SITE FROM FABRICATION SHOP.

S16.

ALL STEEL GRADES TO BE IDENTIFIED ON MAIN MEMBERS ON NON-CRITICAL AREAS AND APPROVED BY SUPERINTENDENT

S17.

UNLESS NOTED OTHERWISE ON THE ENGINEERS DRAWINGS"
-ALL BOLTS TO BE MINIMUM M20 GRADE 8.8/S GALVANIZED IN 22mm DIA. HOLES.
-ALL HOLDING DOWN BOLTS TO BE MINIMUM M20 GRADE 4.6/S, HDG.
-ALL CLEAT PLATES AND STIFFENERS TO BE MINIMUM 10mm THICK.
-ALL BUTT WELDS SHALL BE COMPLETE PENETRATION BUTT WELDS.

WELDING

S18.

WELDING SYMBOLS ARE TO AS 1101.3.

S19.

WELD TYPES ARE DESIGNATED AS FOLLOWS:

DESIGNATION	DESCRIPTION
CFW	CONTINUOUS FILLET WELD
CPBW	COMPLETE PENETRATION BUTT WELD
PPBW	PARTIAL PENETRATION BUTT WELD
FSBW	FULL STRENGTH BUTT WELD

S20.

FABRICATOR SHALL DEVELOP WELD JOINT DETAILS TO SUIT WELDING METHODS AND PROCEDURES COMPLYING WITH THE REQUIREMENTS OF AS 1554.5 AND AWS D11 AND THE CONTRACT SPECIFICATION AND INCLUDE THESE DETAILS IN THE SHOP DRAWINGS FOR APPROVAL.

S21.

ALL WELDED GROOVE JOINTS TO BE GROUND SMOOTH AND FLUSH WITH BASEMETAL ON ALL SURFACES. GRINDING TO BE DONE IN LONGITUDINAL DIRECTION OF MEMBER ONLY.

BOLTING

S22.

U.N.O. CONNECTIONS BETWEEN TWO STRUCTURAL STEEL MEMBERS ARE TO HAVE MINIMUM 2M20 8.8/S HDG BOLTS IN 22mm DIA HOLES.

S23.

USE BOLT LENGTHS SO THAT PROJECTION BEYOND BUT IS AT LEAST TWO THREADS AND NOT MORE THAN 10mm AFTER THE UNIT HAS BEEN TIGHTENED. A MINIMUM OF ONE WASHER SHALL BE USED UNDER THE NUT IN ALL SITUATIONS. IF TIGHTENING IS CARRIED OUT AT THE HEAD AN ADDITIONAL WASHER SHALL BE USED UNDER THE HEAD.

S24.

USE LOCK NUTS FOR BOLTS SUBJECT TO VIBRATION.

S25.

U.N.O. SLOTTED HOLES TOP BE 2 x x BOLT DIAMETER LONG. U.N.O. BOLTS TO BE SET CENTRAL IN SLOT IN SLOTTED HOLES, USE HARDENED WASHERS UNDER THE NUT AND BOLT HEAD.

S26.

BOLT TYPE AND TIGHTENING PROCEDURE ARE DESIGNATED: NUMBER - SIZE - STRENGTH - GRANDE/TIGHTENING PROCEDURES EG 4-M24 8.8/TB = 4 OFF 24 DIAMETER METRIC HIGH STRENGTH STRUCTURAL BOLTS FULLY TENSIONED IN BEARING MODE.

S27.

THE BOLTING PROCEDURE IS DESIGNATED AS FOLLOWS:

DESIGNATION	DESCRIPTION
4.6/S	COMMERCIAL BOLTS OF STRENGTH GRADE 4.6 TO AS 1111 TIGHTENED USING A STANDARD WRENCH TO A SNUG TIGHT CONDITION.
8.8/S	HIGH STRENGTH BOLTS OF STRENGTH GRADE 8.8 TO AS 1252 TIGHTENED USING A STANDARD WRENCH TO A SNUG TIGHT CONDITION.
8.8/TF	HIGH STRENGTH BOLTS OF STRENGTH GRADE 8.8 TO AS 1252 FULLY TENSIONED TO AS 4100 DESIGN D. S A FRICTION TYPE JOINT.
10.9/TF	HIGH STRENGTH BOLTS OF STRENGTH GRADE 10.9 TO AS 1252 FULLY TENSIONED TO AS 4100 DESIGN D. S A BEARING TYPE JOINT.

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P1	PRELIMINARY DESIGN ISSUE	A.M.	07.08.20				
P2	PRELIMINARY DESIGN ISSUE	A.M.	12.08.20				
P3	PRELIMINARY DESIGN ISSUE - PEDESTRIAN LANE CONCEPT	A.M.	13.07.21				

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PROJECT		TITLE				
CUTTAGEE LAKE BRIDGE REPLACEMENT		NOTES				
TATHRA - BERMAGUI ROAD, CUTTAGEE, NSW for BEGA VALLEY SHIRE COUNCIL		Design A. MARSHMAN	Drawn D. ELCOAT	Approved ANDREW MARSHMAN <small>BE (HONSII) MIE Aust (388076) CPEng NER Chartered Engineer</small>		
Scale N.T.S. (A1)	Date AUGUST 2020	Job. No. AC20022.06	Sheet C1.2	Rev. P3		

BOLTING CONT.

- S28. BOLTS IN THE TF AND TB CONNECTION SHALL BE TIGHTENED USING THE PART TURN METHOD OR LOAD INDICATING WASHERS. CALIBRATED TORQUE WRENCHES SHALL NOT BE USED. A HARDENED WASHER SHALL BE USED UNDER THE BOLT HEAD OR NUT. WHICHEVER IS ROTATED, THE REUSE OF FULLY TENSIONED BOLTS IS HIGHLY PROHIBITED, SLIP FACTOR ASSUMED FOR FRICTION TYPE BOLT = 0.35.
- S29. HOLDING DOWN BOLTS TO BE GRADE 4.6 U.N.O. SUPPLY HOLDING DOWN BOLTS WITH TWO CLASS 5 HEXAGONAL HEAD NUTS AND TWO EXTRA LARGE FLAT WASHERS. HOT DIP GALVANISE HOLDING DOWN BOLTS, NUTS AND WASHERS TO AS 1214. TIE HOLDING DOWN BOLT GROUPS RIGIDLY TOGETHER PRIOR TO INSTALLATION (EG. TACK WELD WITH 10mm DIAMETER REINFORCING BAR TO FORM A RIGID CAGE) TO ENSURE CORRECT BOLT LOCATIONS AND SET OUT USING A 3mm MILD STEEL TEMPLATE SUPPLIED BY STEELWORK FABRICATOR. PROVIDE 4 M12 LIGATURES TO FIX HOLDING DOWN BOLT CAGE SECURELY TO SLAB/FOOTING REINFORCEMENT.
- S30. DRILL HOLES FULL SIZE OR REAM TO FULL SIZE AFTER SUB-DRILLING OR SUB-PUNCHING. SUB-DRILLED OR SUB-PUNCHED HOLES TO BE AT LEAST 3mm UNDERSIZE. FLAME CUTTING OF HOLES IS NOT PERMITTED. BOLT HOLE SIZE TO BE:

CONNECTION	BOLT Dia PLUS
STEEL TO STEEL	2mm
STEEL TO CONCRETE	4mm
HOLDING DOWN BOLTS	6mm

PROTECTION OF STEELWORK AGAINST CORROSION:

- S31. REFER TO CONTRACT SPECIFICATIONS FOR DETAILS OF PROTECTIVE TREATMENT OF STEEL WORK
- S32. AFTER COMPLETION OF FABRICATION, PREPARATION FOR SURFACE TREATMENT TO BE ROUND OFF TOUGH WELDS, SHARP EDGES, BURNS, ARISES, WELD SPLATTER AND SLAG ETC. REMOVE GREASE, OIL AND OTHER CONTAMINANTS TO AS 1627.1. REMOVE RUST, MILLSCALE, OXIDE DEPOSITS, OLD PAINT FILMS ETC. BY ABRASIVE BLAST CLEANING TO AS 1627.4 CLASS 2? TO 35 MICRONS PROFILE HEIGHT OR BY POWER TOOL CLEANING TO AS 1627.2 CLASS 2. REMOVE ALL DUST BY BRUSHING OR VACUUM CLEANING
- S33. APPLY SURFACE TREATMENT AS SOON AS PRACTICABLE AFTER PREPARATION WITHIN FOUR HOURS AND BEFORE A RUST BLOOM APPEARS. APPLICATION OF SURFACE TREATMENT TO COMPLY WITH MANUFACTURERS RECOMMENDATIONS.
- S34. REFER TO CONTRACT SPECIFICATIONS FOR DETAILS OF PROTECTIVE TREATMENT OF STEEL WORK. U.N.O. IN DRAWINGS OR IN SPECIFICATION. ALL STEELWORK TO BE HOT DIP GALVANIZED.
- S35. PROTECTIVE COATINGS ARE TO BE SHOP APPLIED AND CURED IN WORKSHOP IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS. UNLESS APPROVED OTHERWISE IN WRITING BY SUPERINTENDENT. PROTECTIVE COATINGS ARE TO BE SMOOTH, UNIFORM AND WITHOUT RUNS, BEADS, PINHOLES, SURFACE GRAZING OR OTHER IMPERFECTIONS.
- S36. PROTECT COATINGS FROM DAMAGE AND DETERIORATION DURING TRANSPORT, STORAGE AND ERECTION. REPAIR DAMAGE TO PROTECTIVE COATINGS TO REINSTATE INTEGRITY OF NOMINATED COATING IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND THE SPECIFICATION. EDGES OF PATCH REPAIRS TO BE FEATHERED.
- S37. FACING SURFACES OF TF CONNECTIONS SHALL BE LEFT UNPAINTED AND FREE OF SCALE UNLESS OTHERWISE NOTED.
- S38. COATINGS DAMAGED DURING TRANSPORT AND ERECTION OR BY WELDING SHALL BE MADE GOOD AFTER BEING WIRE-BRUSHED CLEAN AND RECOATED AS ABOVE.
- S39. THE ENDS OF ALL TUBULAR MEMBERS NOT REQUIRED TO BE HOT DIP GALVANIZED ARE TO BE SEALED WITH 3mm THICK PLATE AND CONTINUOUS FILLET WELDED UNLESS NOTED OTHERWISE.

GALVANISING

- S40. HOT DIP GALVANISING SHALL BE IN ACCORDANCE WITH RELEVANT AUSTRALIA STANDARDS AS 1214, AS 1559, AS 4680, AS 4791 AND AS 4792. REPAINTING/REPAIR OF DAMAGED GALVANIZED SURFACES (EG. SITE WELDS) TO BE PAINTED WITH TWO COATS OF APPROVED ZINC RICH PAINT.
- S41. HOT DIP GALVANISE BOLTS, SCREW, NUTS AND WASHERS TO AS 1214. ORDERED AS SUCH FROM BOLT MANUFACTURER. TAP GALVANIZED NUTS 0.4mm OVERSIZE TO SUIT GALVANIZED THREADS TO AS 1214 AND OIL FOR PROTECTION. INSTALL WASHERS UNDER BOLT HEAD AND NUT. USE TAPERED WASHERS AS REQUIRED.
- S42. WHERE NOMINATED AS GALVANIZED ON DRAWINGS, STEELWORK TO BE HDG TO AS 4680 AND AS 1214. ANNEAL COLD WORKED ITEMS TO 650°C PRIOR TO GALVANISING, ZINC COATING TO BE CONTINUOUS, ADHERENT FREE FROM LUMPS, SPIKES, DAGS, RUNS, BLISTERS, ROUGHNESS, GRITTY AREAS, UNCOATED SPOTS, ACID AND BLACK SPOTS, DROSS, FLUX AND OTHER IMPERFECTIONS.
- S43. TREAT CONTACT SURFACES OF FRICTION-TYPE BOLTED JOINTS BY WIRE BRUSHING OR LIGHT BLASTING TO EXTENT NECESSARY TO ACHIEVE REQUIRED SLIP FACTOR.
- S44. PASSIVATE GALVANIZED STEEL TO BE IN CONTACT WITH CONCRETE BY DIPPING IN 0.2% SODIUM DICHROMATE SOLUTION.
- S45. REPAIR DAMAGE TO GALVANIZED COATING BY POWER TOOL CLEANING TO AS 1627.2 OR IF INACCESSIBLE BY HAND TOOL CLEANING TO AS 1627.7 FOLLOWED BY SOLVENT CLEANING/DEGREASING TO AS 1627.1 AND APPLY TWO COATS OF AN ORGANIC ZINC-RICH PRIMER EACH 60 MICRONS DRY FILM THICKNESS OVERLAPPING SOUND METALLIC ZINC.
- S46. DO NOT PAINT GALVANIZED STEELWORK UNLESS SPECIFIED ON THE ENGINEERING DRAWINGS. WHERE AS SPECIFIED PREPARE GALVANIZED SURFACES TO BE PAINTED USING AN ETCH PRIMER TO ENSURE ADHESION OR TO MANUFACTURERS RECOMMENDATIONS AND APPLY PAINT IN THE WORKSHOP.

CONCRETE

- C1. ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH AS 5100-2004 AND CONTRACT SPECIFICATION
- C2. WHERE THE MEANING OF ABBREVIATIONS USED IS UNCERTAIN, REFER TO ENGINEER FOR CLARIFICATION PRIOR TO PROCEEDING.
- C3. CONCRETE SHALL BE FROM AN APPROVED SOURCE AND SHALL COMPLY WITH THE REQUIREMENTS OF THE FOLLOWING STANDARDS, UNLESS NOTED OTHERWISE:

STANDARD N°	STANDARD NAME
AS 5100.5	BRIDGE DESIGN PART 5: CONCRETE
AS 4671	STEEL REINFORCING MATERIALS
AS 3972	PORTLAND CEMENT
AS 1379	READY-MIX CONCRETE
AS 2758.1	CONCRETE AGGREGATES

- C4. UNLESS NOTED OTHERWISE ALL CEMENT SHALL COMPLY WITH AS 3972:
- | DESIGNATION | DESCRIPTION |
|-------------|--------------------------------|
| GP | GENERAL PURPOSE |
| GB | GENERAL PURPOSE BLENDED CEMENT |
| SR | SULPHATE RESISTANT CEMENT |

- C5. NO PENETRATIONS, RECESSES OR CHASES OTHER THAN THOSE SHOWN ON THE DRAWINGS SHALL BE MADE IN THE CONCRETE MEMBERS WITHOUT PRIOR APPROVAL OF THE ENGINEER.

- C6. CONCRETE SHALL BE (B80, NSW RMS) STANDARD SPECIFICATION FOR FOR ALL BRIDGEWORKS:

STRUCTURAL ELEMENT	CONCRETE GRADE	EXPOSURE CLASSIFICATION	CEMENT TYPE
PILE CAPS	B80-40 MPa	B1	GB
PAD FOOTINGS	B80-40 MPa	B1	GB
ABUTMENTS	B80-40 MPa	B1	GB
BLINDING CONCRETE	15 MPa	B1	GP

- C7. MANUFACTURE AND DELIVERY OF CONCRETE SHALL COMPLY WITH THE REQUIREMENTS OF THE CONTRACT SPECIFICATION
- C8. PLACEMENT, COMPACTION, CONSTRUCTION JOINTS AND CURING OF CONCRETE SHALL COMPLY WITH THE REQUIREMENTS OF THE CONTRACT SPECIFICATION
- C9. PROVIDE LOCATIONS AND DETAILS OF CONSTRUCTION JOINTS FOR SUPERINTENDENT'S APPROVAL PRIOR TO CONSTRUCTION.
- C10. CONCRETE ELEMENTS SHALL BE CONSTRUCTED WITHIN THE DIMENSIONAL TOLERANCES GIVEN IN THE CONTRACT SPECIFICATION.
- C11. PROVIDE AN UPWARDS PRECAMBER AS SHOWN ON DRAWINGS.
- C12. MINIMUM COVER (mm) TO ALL REINFORCEMENT EXCEPT SL4/MECH UNO SHALL BE AS FOLLOWS:

ELEMENT	EXPOSURE CONDITION			PRECAST
	FORMS	CAST AGAINST BLINDING	GROUND	
PAD FOOTINGS/PILE CAPS	70	40	100	N/A
ABUTMENTS	70	40	100	30

- C13. COVER IS THE CLEAR DISTANCE BETWEEN ANY REINFORCING (INCLUDING FITMENTS) AND THE SURFACE OF THE STRUCTURAL ELEMENT.
- C14. REINFORCING BARS SHALL NOT BE USED TO KEEP FORMS APART. A THROUGH TIE STEEL SYSTEM SHALL BE USED TO MAINTAIN THE POSITION OF THE FORMS. ALL REINFORCEMENT SHALL BE FIRMLY SUPPORTED ON APPROVED BAR CHAIRS AT NOT GREATER THAN 800mm CENTERS BOTH WAYS. MESH SHALL BE SUPPORTED ON APPROVED BAR CHAIRS AT 800mm MAXIMUM CENTERS.
- C15. EXTERNAL ELEMENTS ARE THOSE EXPOSED TO WEATHER, RAIN AND WATER PENETRATION AND ARE CLASSIFIED B1 UNLESS NOTED OTHERWISE.
- C16. THE COVERS SHALL BE MAINTAINED USING APPROVED BAR CHAIRS, IN SLABS BAR CHAIRS BE PROVIDED AT 800x800mm MAXIMUM CENTERS.
- C17. CONSTRUCTION JOINTS SHALL BE LOCATED AND DETAILED AS SHOWN ON THE DRAWINGS OR SHALL BE LOCATED AND FORMED TO THE APPROVAL OF THE ENGINEER. CONCRETE AGAINST WHICH NEW CONCRETE IS TO BE PLACED SHALL BE INTENTIONALLY ROUGHENED IN ACCORDANCE WITH CONTRACT SPECIFICATION TO EXPOSE THE INBOUND COURSE AGGREGATE, TO ENSURE SATISFACTORY BOND BETWEEN ADJACENT CONCRETE SURFACES U.N.O. ALL CONCRETE SURFACES SHALL BE CLEAN AND FREE OF LAITANCE, THOROUGHLY MOISTEN THE ROUGHENED SURFACE IMMEDIATELY PRIOR TO PLACING CONCRETE.
- C18. CONDUITS AND PIPES WHEN CAST IN SLABS AND WALLS ARE TO BE PLACED AT MIDDLE THIRD THICKNESS OF MEMBERS AND BETWEEN TWO REINFORCEMENT LAYERS WHERE THERE IS ONLY ONE LAYER OF REINFORCEMENT, PROVIDE 50mm COVER TO CONDUIT. MAXIMUM ALLOWED FREE DROP OF CONCRETE DURING PLACING CONCRETE TO BE 2m.
- C19. CURING OF CONCRETE SHALL COMMENCE NO LATER THAN ONE HOUR AFTER FINISHING OPERATIONS HAVE BEEN COMPLETED ON THE CONCRETE PLACED. THE CONCRETE SHALL BE CURED IN ACCORDANCE WITH THE CONTRACT SPECIFICATION.

- C20. ALL CONCRETE SURFACE FINISHES ARE TO MEET THE REQUIREMENTS OF THE CONTRACT SPECIFICATION

- C21. THE PERFORMANCE APPLICATION SURFACE PREPARATION AND TESTING FOR THE FOLLOWING CONCRETE COATINGS ARE REQUIRED TO MEET THE REQUIREMENTS OF THE CONTRACT SPECIFICATION:

COATING	APPLICATION
ANTI-CARBONATION	ALL EXPOSED CONCRETE SURFACES
WATERPROOFING	ALL BURIED SURFACES/SURFACES BELOW BALLAST

- C22. THE CONTRACTOR SHALL SUBMIT DETAILS OF ALL PROPOSED CONCRETE COATINGS TO THE SUPERINTENDENT FOR REVIEW IN ACCORDANCE WITH THE CONTRACT SPECIFICATION.

- C23. ALL FORMED EXPOSED EDGES AND RE-ENTRANT CORNERS SHALL BE CHAMFERED OR FILLETED 20 x 20mm U.N.O. ON THE ENGINEERS DRAWINGS. DRIP GROOVES TO BE PROVIDED IN SOFFIT OF ALL BEAMS AND SLABS TO PERIMETER OF STRUCTURES (WITH DUE ALLOWANCE FOR MINIMUM COVER TO REINFORCEMENT).

PRECAST CONCRETE

- P1. PRECAST CONCRETE IS TO COMPLY WITH THE CONCRETE NOTES ON THESE DRAWINGS AND AS 5100.
- P2. THE CONTRACTOR SHALL REFER TO ALL RELEVANT DRAWINGS TO ENSURE THAT ALL OPENINGS, RECESSES, FIXINGS AND FITTINGS SPECIFIED ON THE DRAWINGS ARE INCORPORATED INTO THE PRECAST PANELS.
- P3. ALL FERRULES USED SHALL BE HDG STEEL OR OTHERWISE APPROVED AND FITTED WITH ANCHORAGE BARS MINIMUM 10mm DIAMETER. THE FERRULES SHALL DEVELOP THE FULL CAPACITY OF THE BOLT TO BE USED IN THE CONJUNCTION WITH THE FERRULE. A MINIMUM M20 DIAMETER FERRULE IS TO ADOPTED U.N.O.
- P4. FERRULES THAT WILL BE EXPOSED AFTER COMPLETION OF ERECTION ARE TO RECESSED 30mm BELOW THE CONCRETE SURFACE AND ARE TO BE GROUTED ON COMPLETION WITH NON SHRINK GROUT. BONDING AGENT TO BE APPLIED TO SURFACE PRIOR TO GROUTING.
- P5. ALL HOT DIP GALVANIZED FERRULES AND FIXINGS SHALL BE IN ACCORDANCE WITH AS 4680. MINIMUM COATING THICKNESS IS 85 MICRONS.
- P6. GROUT TO BE USED SHALL BE NON-SHRINK AND SHALL HAVE A 28 DAY CHARACTERISTIC STRENGTH OF 40mpa. DETAILS OF THE PROPOSED GROUT TO BE SUBMITTED TO THE ENGINEER FOR APPROVAL.

FORMWORK AND FALSEWORK

- K1. THE FORMWORK AND FALSEWORK PROPOSALS, DESIGN, MATERIALS, CONSTRUCTION AND REMOVAL SHALL COMPLY WITH THE REQUIREMENTS OF THE CONTRACT SPECIFICATION AND AS 5100 UNLESS OTHERWISE APPROVED BY THE SUPERINTENDENT.
- K2. DURING CONSTRUCTION, SUPPORT PROPPING IS REQUIRED WHERE LOADS FROM STACKED MATERIALS, FORMWORK AND OTHER SUPPORTED SLABS INDUCE LOADS IN A SLAB OR BEAM WHICH EXCEED THE DESIGN LOAD FOR STRENGTH OR SERVICEABILITY AT THAT AGE OR WHERE THE STRUCTURE IS INCOMPLETE. ONCE THE NOMINATED 28 DAY STRENGTH HAS BEEN ATTAINED, THESE LOADS SHALL NOT EXCEED THE DESIGN SUPERIMPOSED LOADS SET OUT UNDER DESIGN REQUIREMENTS NOTE D1.
- K3. THE FORMWORK SHALL NOT BE DESIGNED TO RELY ON RESTRAINT OR SUPPORT FROM THE PERMANENT STRUCTURE WITHOUT PRIOR APPROVAL FROM THE ENGINEER.
- STEEL REINFORCEMENT
- R1. THE STEEL REINFORCEMENT SHALL COMPLY WITH THE REQUIREMENTS OF THE CONTRACT SPECIFICATION AND AS 5100 UNLESS OTHERWISE APPROVED BY THE SUPERINTENDENT.
- R2. REINFORCEMENT SHOWN ON THE DRAWINGS IS REPRESENTED DIAGRAMMATICALLY AND NOT NECESSARILY SHOWN IN TRUE PROJECTION.
- R3. SPLICES IN REINFORCEMENT SHALL BE MADE ONLY IN THE POSITION SHOWN ON THE DRAWINGS OR AS OTHERWISE APPROVED BY THE ENGINEER. BAR LAPS IN MILLIMETERS ARE TO BE AS SHOWN BELOW UNLESS SHOWN OTHERWISE.

BAR Dia	BAR LAPS	
	HORIZONTAL BARS WITH > 300mm CONCRETE CAST BELOW	ALL OTHER BARS
N12	400	300
N16	500	400
N20	750	600
N24	900	700
N28	1200	900
N32	1500	1200
N36	1750	1400

NOTE: BAR LAPS CALCULATED ASSUMING B1 EXPOSURE F'c=32 MPa AND COVER TO REINFORCEMENT = 45mm.

- R4. BUNDLED BARS SHALL BE TIED TOGETHER AT 30 BAR DIAMETER CENTERS WITH THREE WRAPS OF THE WIRE.

- R5. REINFORCEMENT SYMBOLS:

SYMBOL	DESCRIPTION
N	GRADE 500 DEFORMED REINFORCING BARS, DUCTILITY CLASS TO AS 4671
R	GARDE 250 PLAIN REINFORCING BARS TO AS 1302
W	HARD DRAWN STEEL REINFORCING WIRE, GRADE 500 DUCTILITY CLASS L TO AS 4671
TM	HARD DRAWN STEEL TRENCH MESH, GRADE 500 DUCTILITY CLASS L TO AS 4671
RL	RECTANGULAR RIB MESH, GRADE 500 DUCTILITY CLASS L TO AS 4671
SL	SQUARE RIB MESH, GRADE 500 DUCTILITY CLASS L TO AS 4671

- R6. REINFORCEMENT ABBREVIATIONS

ABBREVIATION	DESCRIPTION
EF	EACH FACE
NF	NEAR FACE
FF	FAR FACE
EW	EACH WAY
T	TOP
B or BTM	BOTTOM
C	CENTRAL
CP	CENTRALLY PLACED
LV	LENGTH VARIES

- R7. DESIGNATION OF REINFORCEMENT BARS IS IN ACCORDANCE WITH RMS STANDARD BAR SHAPE DIAGRAM. REFER RMS DRAWING No. B031 (OR EQUIVALENT).

- R8. THE CONTRACTOR SHALL PROVIDE THE SUPERINTENDENT WITH ACRS (AUSTRALIAN CERTIFICATION AUTHORITY FOR REINFORCING STEEL LTD.) CERTIFICATION OF COMPLIANCE WITH AS 4871 FOR ALL REINFORCEMENT. THE CONTRACTOR SHALL PROVIDE THE SUPERINTENDENT WITH CERTIFICATION OF COMPLIANCE WITH AS 1311 FOR ALL PRESTRESSING TENDONS.

- R9. PROVIDE STANDARD COGS AND HOOKS TO AS 5100. TERMINATE ENDS OF COLUMN AND BEAM LIGATURES IN A HOOK OF AT LEAST 135 DEGREES. PROVIDE FIRST LIGATURE WITHIN 50mm OF FACE OF SUPPORT.

- R10. DO NOT WELD OR HEAT REINFORCEMENT UNLESS SHOWN ON DRAWINGS OR OTHERWISE APPROVED BY SUPERINTENDENT. WHERE ALLOWED, WELDING OF REINFORCEMENT (INCLUDING TACK-WELDING FOR FIXING PURPOSES) TO COMPLY WITH AS 5100 AND AS 1554.3 DO NOT WELD REINFORCEMENT WITHIN 75mm OF A SECTION THAT HAS BEEN BENT (100mm FOR N28 AND N32 BARS, 125mm FOR N36 BARS). EXTENT OF WELD INSPECTION/TESTING TO BE:

WELD INSPECTION METHOD	QUANTUM
ANTI-CARBONATION	100% OF WELDS
VISUAL EXAMINATION	50% OF WELDS
RADIOGRAPHIC OR ULTRASONIC	5% OF FILLET WELDS & 100% OF BUTT WELDS

- R11. ALL REINFORCEMENT SHALL BE SECURELY TIED WITH WIRE TIES AND ALL TIE ENDS SHALL BE TURNED INTO THE MEMBER CLEAR OF THE COVER ZONE.

- R12. MINIMUM LAPS IN MESH SHALL BE THE LARGER SPACING OF TRAVERSE WIRES UNLESS SHOWN OTHERWISE.

- R13. MESH SHALL NOT BE LAID ON THE GROUND AND PULLED INTO POSITION THROUGH THE CONCRETE.

- R14. REINFORCEMENT DEVELOPMENT LENGTHS SHALL EQUAL LAP LENGTHS.

- R15. ALL RE-ENTRANT CORNERS OR PENETRATIONS THROUGH WALLS AND SLABS SHALL BE TRIMMED USING MINIMUM 2N16 DIAGONAL CORNER BARS 1500mm LONG.

- R16. REINFORCEMENT SHALL NOT BE CUT OR BENT ON SITE WITHOUT THE PRIOR APPROVAL OF THE ENGINEER.

- R17. AT SLAB EDGES INCLUDING CONSTRUCTION AND OTHER JOINTS AT LEAST ONE REINFORCING BAR OR FABRIC WIRE SHALL BE RELOCATED PARALLEL TO AND WITHIN 75mm OF THE SLAB EDGE.

- R18. AT PENETRATIONS WITH DIMENSIONS LESS THAN 400mm DO NOT CUT REINFORCEMENT. PLACE REINFORCEMENT TO EACH SIDE OF PENETRATION U.N.O. ON THE PLANS. AT PENETRATIONS WITH DIMENSIONS LESS THAN 600mm LAY REINFORCEMENT IN REQUIRED POSITION AND CUT OUT TO SUIT PENETRATION, PROVIDE ADDITIONAL BARS TO MATCH THE SIZE, LENGTH AND NUMBER OF BARS CUT AND PLACE EQUALLY ON EACH SIDE OF THE PENETRATION U.N.O. ON PLANS. PROVIDE 2N12 BARS ACROSS PENETRATION CORNERS.

- R19. THE FINAL INSPECTION OF REINFORCEMENT SHALL BE COMPLETED AND SUPERINTENDENTS APPROVAL GIVEN BEFORE CONCRETE IS DELIVERED FOR THE RELEVANT SECTION.

- R20. SPLICES SHALL BE STAGGERED SO THAT NOT MORE THAN 50% OCCUR AT ANY LOCATION U.N.O.

- R21. THE TOLERANCE ON THE NOMINAL COVERS FOR FIXING THE REINFORCEMENT SHALL BE AS NOTED IN THE CONTRACT SPECIFICATION.

- R22. SPACING OF REINFORCEMENT SHALL BE TAKEN AS EQUAL U.N.O.

- R23. REINFORCING BAR COUPLERS SHALL DEVELOP AT LEAST THE FULL STRENGTH OF THE JOINED BARS AS PER AS 5100.

- R24. ENSURE REINFORCING CAGES ARE ELECTRICALLY CONTINUOUS.

- R25. EMBEDDED FIXTURES (INSERTS, THREADED SOCKETS, FERRULES, BOLTS AND STAINLESS REINFORCING ETC.) WITHIN COVER CONCRETE OR EXPOSED TO AIR MUST NOT BE IN CONTACT WITH REINFORCING STEEL. PROVIDE ISOLATING STRIPS BETWEEN DISSIMILAR STEELS AND TO SEPARATE EXPOSED FIXTURES.

INSPECTIONS

- I1. 48 HOURS NOTICE SHALL BE GIVEN SO THAT INSPECTION CAN BE MADE OF THE FOLLOWING:

ITEM	DESCRIPTION
1.	FOUNDING MATERIAL
2.	PILE INSTALLATION
3.	ABUTMENT REINFORCEMENT
4.	PSC PLANK REINFORCEMENT
5.	DECK REINFORCEMENT
6.	BARRIER REINFORCEMENT
7.	APPROACH SLAB REINFORCEMENT
8.	FINAL INSPECTION

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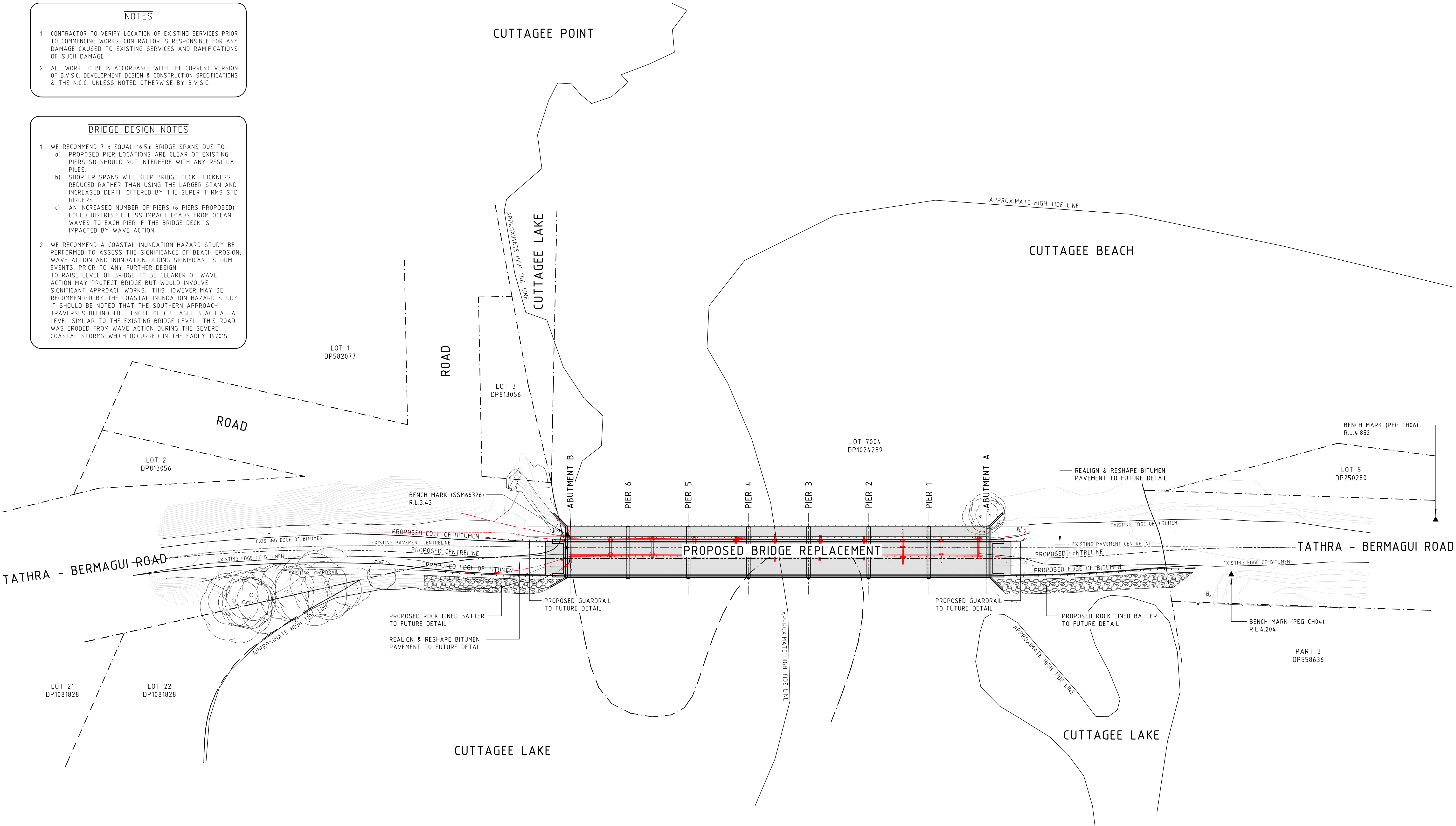
Rev.	Description	Eng.	Date	Rev.	Description	Eng.	Date	<div>MARSHMAN O'NEILL ENGINEERS</div> <div>CONSULTING STRUCTURAL CIVIL</div> <div>ANDREW MARSHMAN & ASSOCIATES PTY LTD ABN 86 064 689 696 35a Main Street (P.O Box 768) Merimbula NSW 258 PH: 02 6495 1670 FAX: 02 6495 3456 andrewmarshmanengineers.com.au</div>	PROJECT CUTTAGEE LAKE BRIDGE REPLACEMENT TATHRA - BERMAGUI ROAD, CUTTAGEE, NSW for BEGA VALLEY SHIRE COUNCIL		TITLE NOTES				
P1	PRELIMINARY DESIGN ISSUE	A.M.	07.08.20						Copyright © Andrew Marshman & Associates Pty Limited (2009). All rights reserved. This document and all works comprised in it are copyright and no part of it may in any form or by any means (including without limitation, electronic, mechanical, microcopying, photocopying, recording, scanning or otherwise) be reproduced, modified, sorted in a retrieval system, published, distributed or any part of these works is granted to any person without the express prior written consent of Andrew Marshman & Associates Pty Limited and any implied licence to use any part of these works is expressly excluded.	Design A. MARSHMAN	Drawn D. ELCOAT	Approved ANDREW MARSHMAN <small>BE (HONSII) MIE Aust (389076) CPEng NER Chartered Engineer</small>			
P2	PRELIMINARY DESIGN ISSUE	A.M.	12.08.20							Scale N.T.S. (A1)	Date AUGUST 2020	Job. No. AC20022.06	Sheet C1.3	Rev. P3	
P3	PRELIMINARY DESIGN ISSUE - PEDESTRIAN LANE CONCEPT	A.M.	13.07.21												

NOTES

1. CONTRACTOR TO VERIFY LOCATION OF EXISTING SERVICES PRIOR TO COMMENCING WORKS. CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE CAUSED TO EXISTING SERVICES AND RAMIFICATIONS OF SUCH DAMAGE
2. ALL WORK TO BE IN ACCORDANCE WITH THE CURRENT VERSION OF B.V.S.C. DEVELOPMENT DESIGN & CONSTRUCTION SPECIFICATIONS & THE N.C.C. UNLESS NOTED OTHERWISE BY B.V.S.C.

BRIDGE DESIGN NOTES

1. WE RECOMMEND 7 x EQUAL 16.5m BRIDGE SPANS DUE TO:
- a) PROPOSED PIER LOCATIONS ARE CLEAR OF EXISTING PIERS SO SHOULD NOT INTERFERE WITH ANY RESIDUAL PILES
 - b) SHORTER SPANS WILL KEEP BRIDGE DECK THICKNESS REDUCED RATHER THAN USING THE LARGER SPAN AND INCREASED DEPTH OFFERED BY THE SUPER-T RMS STD GIRDERS
 - c) AN INCREASED NUMBER OF PIERS (6 PIERS PROPOSED) COULD DISTRIBUTE LESS IMPACT LOADS FROM OCEAN WAVES TO EACH PIER IF THE BRIDGE DECK IS IMPACTED BY WAVE ACTION
2. WE RECOMMEND A COASTAL INUNDATION HAZARD STUDY BE PERFORMED TO ASSESS THE SIGNIFICANCE OF BEACH EROSION, WAVE ACTION AND INUNDATION DURING SIGNIFICANT STORM EVENTS, PRIOR TO ANY FURTHER DESIGN.
- TO RAISE LEVEL OF BRIDGE TO BE CLEARER OF WAVE ACTION MAY PROTECT BRIDGE BUT WOULD INVOLVE SIGNIFICANT APPROACH WORKS. THIS HOWEVER MAY BE RECOMMENDED BY THE COASTAL INUNDATION HAZARD STUDY. IT SHOULD BE NOTED THAT THE SOUTHERN APPROACH TRAVERSES BEHIND THE LENGTH OF CUTTAGEE BEACH AT A LEVEL SIMILAR TO THE EXISTING BRIDGE LEVEL. THIS ROAD WAS ERODED FROM WAVE ACTION DURING THE SEVERE COASTAL STORMS WHICH OCCURRED IN THE EARLY 1970'S.



SITE PLAN

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Rev.	Description	Eng.	Date	Rev.	Description	Eng.	Date
P1	PRELIMINARY DESIGN ISSUE	A.M.	07.08.20				
P2	PRELIMINARY DESIGN ISSUE	A.M.	12.08.20				
P3	PRELIMINARY DESIGN ISSUE - PEDESTRIAN LANE CONCEPT	A.M.	13.07.21				

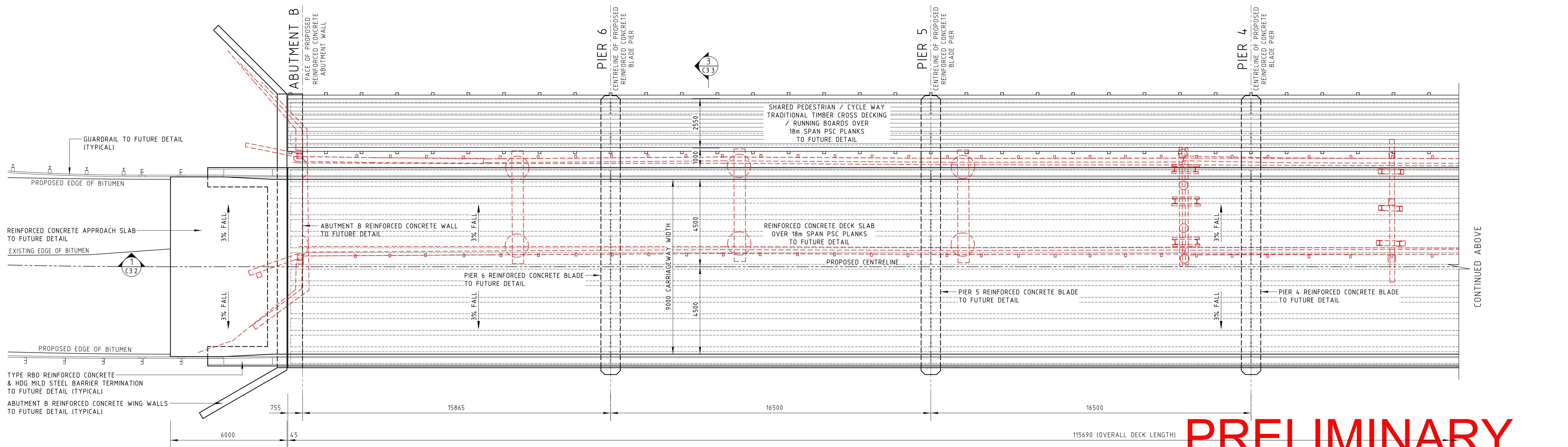
MARSHMAN O'NEILL
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PROJECT	CUTTAGEE LAKE BRIDGE REPLACEMENT
TATHRA - BERMAGUI ROAD, CUTTAGEE, NSW for BEGA VALLEY SHIRE COUNCIL	
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TITLE	SITE PLAN
Design	A. MARSHMAN
Drawn	D. ELCOAT
Approved	ANDREW MARSHMAN
BE (HONSII) MIE Aust (389076) CPEng NER Chartered Engineer	
Scale	1500 (A1) 1:1000 (A3)
Date	AUGUST 2020
Job. No.	AC20022.06
Sheet	C2.1
Rev.	P3



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Rev.	Description	Eng.	Date	Rev.	Description	Eng.	Date	<div>MARSHMAN O'NEILL</div> <div>ENGINEERS</div> <div>CONSULTING STRUCTURAL CIVIL</div> <div>ANDREW MARSHMAN & ASSOCIATES PTY LTD ABN 86 064 689 694 35a Main Street (P.O Box 768) Merimbula NSW 258 PH: 02 6495 1670 FAX: 02 6495 3456 andrewmarshmanengineers.com.au</div>	PROJECT	TITLE			
P1	PRELIMINARY DESIGN ISSUE	A.M	07.08.20						CUTTAGEE LAKE BRIDGE REPLACEMENT	GENERAL ARRANGEMENT			
P2	PRELIMINARY DESIGN ISSUE	A.M	12.08.20						TATHRA - BERMAGUI ROAD, CUTTAGEE, NSW for BEGA VALLEY SHIRE COUNCIL	CENTRELINE LONGITUDINAL SECTION / ELEVATION			
P3	PRELIMINARY DESIGN ISSUE - PEDESTRIAN LANE CONCEPT	A.M	13.07.21										
								Copyright © Andrew Marshman & Associates Pty Limited (2009). All rights reserved. This document and all works comprised in it are copyright and no part of it may in any form or by any means (including without limitation, electronic, mechanical, microcopying, photocopying, recording, scanning or otherwise) be reproduced, modified, sorted in a retrieval system, published, distributed or any part of these works is granted to any person without the express prior written consent of Andrew Marshman & Associates Pty Limited and any implied licence to use any part of these works is expressly excluded.	<div>Design</div> <div>A MARSHMAN</div>	<div>Drawn</div> <div>D ELCOAT</div>	<div>Approved</div> <div>ANDREW MARSHMAN</div> <div>BE (HONS) MIE Aust (388576) (PEng NER Chartered Engineer)</div>		
									<div>Scale</div> <div>1:100 (A1) 1:200 (A3)</div>	<div>Date</div> <div>AUGUST 2020</div>	<div>Job. No.</div> <div>AC20022.06</div>	<div>Sheet</div> <div>C3.2</div>	<div>Rev.</div> <div>P</div>



9000 CARRIAGEWAY WIDTH

1000 SHOULDER

3500 NORTH BOUND LANE

3500 SOUTH BOUND LANE

1000 SHOULDER

1000

2550 SHARED PEDESTRIAN / CYCLE WAY

TYPE R80 REINFORCED CONCRETE & HDG MILD STEEL BARRIER TO FUTURE DETAIL

REINFORCED CONCRETE DECK SLAB TO FUTURE DETAIL

3% FALL

R.L. 4.00

3% FALL

TYPE R80 REINFORCED CONCRETE & HDG MILD STEEL BARRIER TO FUTURE DETAIL

TRADITIONAL TIMBER STYLE PEDESTRIAN / CYCLE WAY SAFETY GUARDRAIL BARRIER TO BVSC REQUIREMENTS

16.5m SPAN PSC PLANKS TO FUTURE DETAIL

PROPOSED CENTRELINE

600

CENTRELINE EXISTING BARRIER POSTS

3150

EXISTING CENTRELINE

EXISTING BRIDGE TO BE DEMOLISHED SHOWN RED DASHED (TYPICAL)

TRADITIONAL TIMBER CROSS DECKING / RUNNING BOARDS

INDICATIVE OUTLINE OF REINFORCED CONCRETE BLADE PIER IN FRONT & BEHIND

EXISTING GROUND LINE (APPROX)

PEDESTRIAN LANE CONCEPT
TYPICAL SECTION THROUGH BRIDGE DECK

SECTION 3
C3.1

PRELIMINARY
NOT FOR CONSTRUCTION

[illegible]