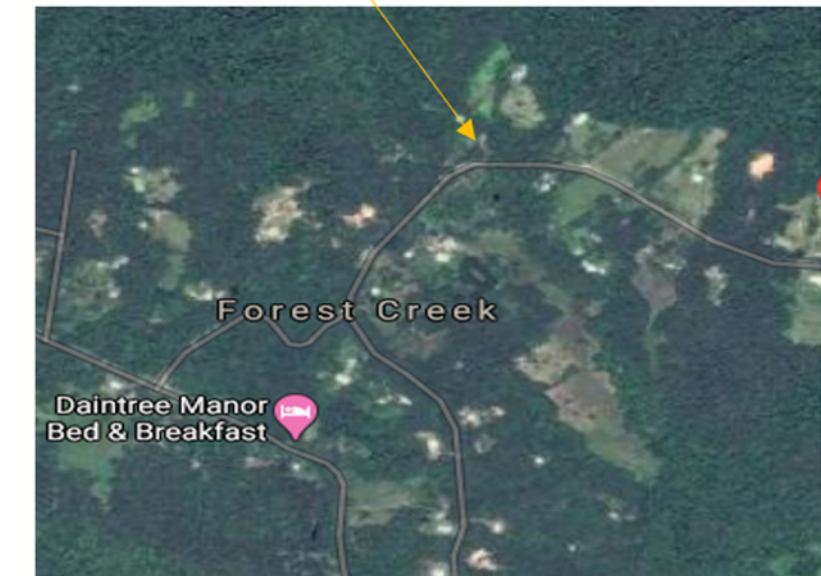


Bridge Site Location



New Vehicle Bridge Location

Drawing List:

Drawing No.	Description
051/01	Bridge Isometric View, Drawing list & location
051/02	Site Location Plan
051/03	Soil Erosion and Sediment Control
051/04	Bridge – General Arrangement
051/05	Bridge – Structural details - Sheet 1
051/06	Bridge – Structural Details - Sheet 2
051/07	Concrete Footing details
051/08	Concrete Deck Slab Details
051/09	Bridge Engineering Notes
051/10	Tree Removal - Riparian works
051/11	Bridge Erection / Installation Notes & Timber Rail Details

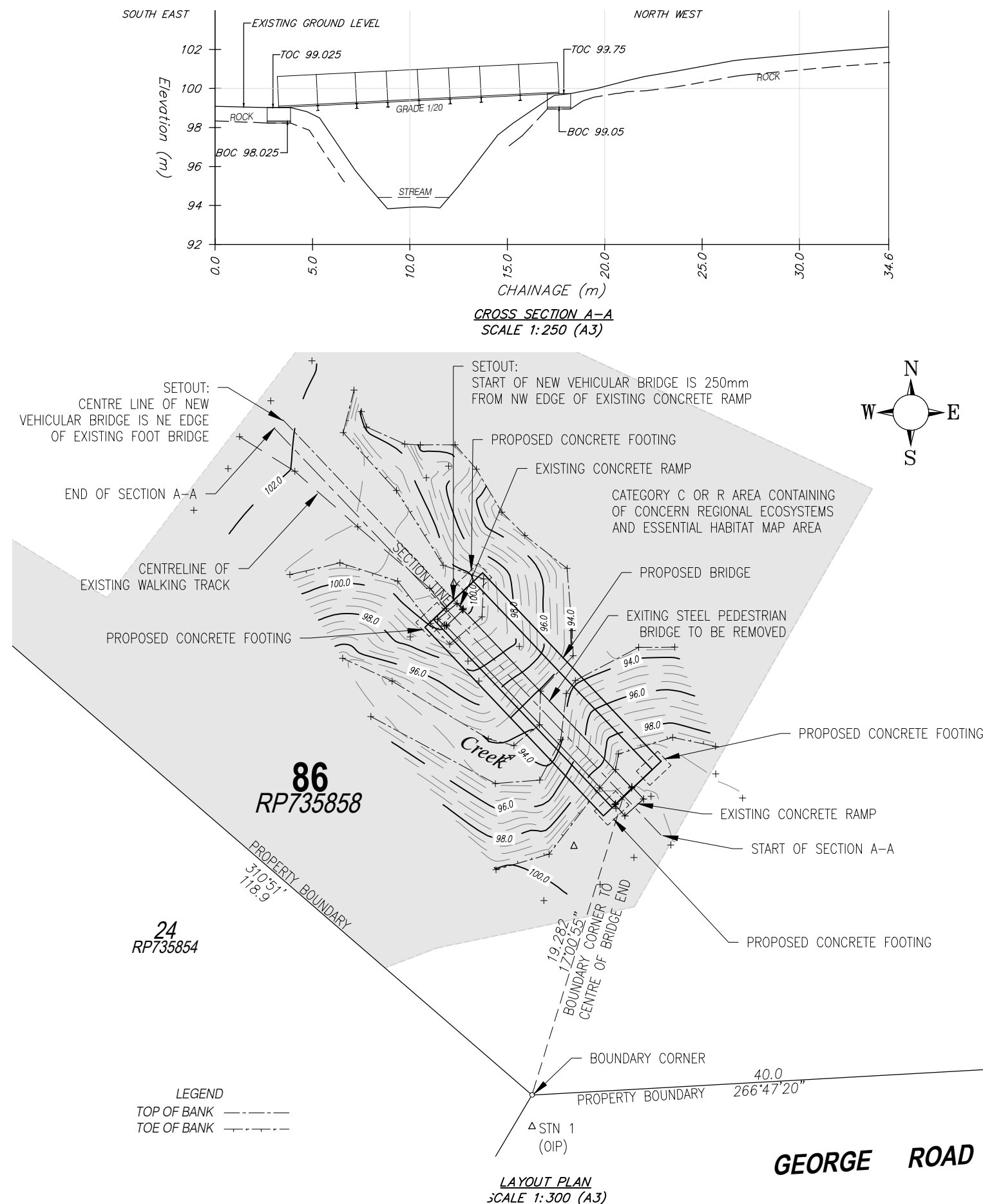
General Notes

1) This Drawing is to be read in conjunction with Drawing No. 051 / 02 to 051 / 11 inclusive.

L Dave O'Toole MIEAust CPEng RPEQ NER Consulting Structural Engineer	I certify that the structural details shown on this drawing are in accordance with all relevant Australian standards Refer to Form 15. Signed: <i>L O'Toole</i>				Project: Vehicle Bridge at 86 George Rd, Forest Creek. Description: Bridge: Location, Isometric & Dwg List Drawing No: 051 / 01 Rev A Date: 12 / 10 / 2020
		A	01/11/2020	Issued for DA Approval.	
		Revision Reference	Date	Description	



SITE LOCALITY
SCALE 1:10,000 (A3)



L Dave O'Toole MIEAust CPEng RPEQ NER
Consulting Structural Engineer

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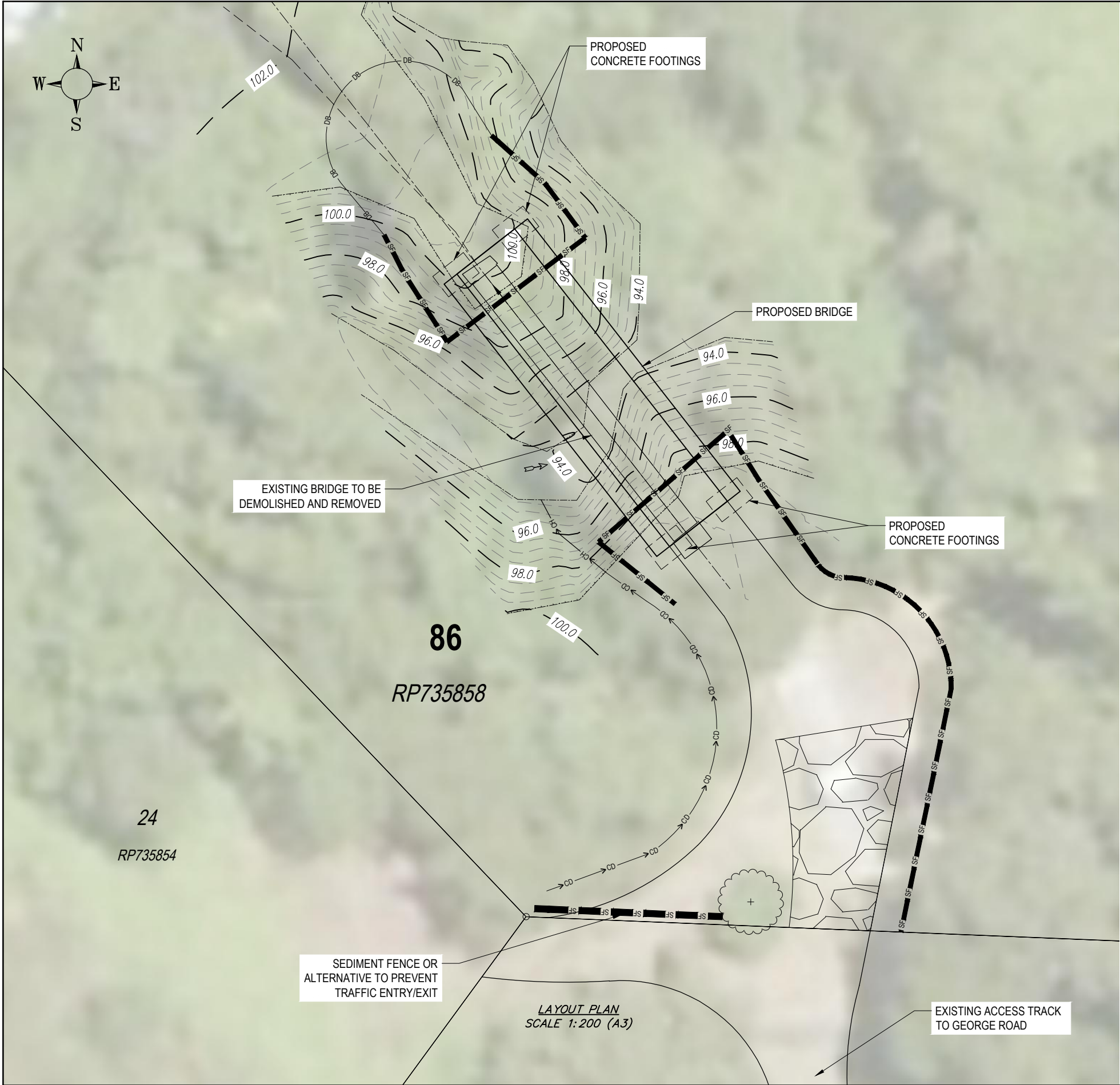
I certify that the details shown on this drawing are in
accordance with all relevant Australian Standards
Refer to Form 15.

Signed:

L. O'Toole

A	03/11/2020	Issued for DA Approval.
Revision Reference	Date	Description

Project: Vehicle Bridge at 86 George Rd, Forest Creek
Description: Layout Plan, Long Section & Site Plan
Drawing No: 051/02 Rev A
Date: 03/11/2020



LEGEND:

- SF SEDIMENT FENCE (REFER TO IECA DRG. SF-01 & SF-02)
- CD CATCH DRAIN (REFER TO IECA DRG. CD-01, CD-02 & CD-03)
- DB DIVERSION BANK OR CONTROL BERM (REFER TO IECA DRG. DB-01 & CB-01)
- CH CHUTE (REFER TO IECA DRG. CH-01, CH-02 & CD-04)
- ROCK PAD CONSTRUCTION EXIST (REFER TO IECA STD. DRG. IECA STD. DRG. EXIT-03)

EROSION AND SEDIMENT CONTROL NOTES:

1. DETAILS SHOWN ON THESE DRAWINGS REPRESENT PROPOSED MINIMUM REQUIREMENTS FOR ONE POSSIBLE METHOD TO ACHIEVE COMPLIANCE WITH LEGISLATION TO PREVENT ENVIRONMENTAL HARM FROM EROSION AND SEDIMENT TRANSFER OFF THE CONSTRUCTION SITE, HOWEVER COMPLIANCE WITH THESE DRAWINGS MAY NOT BE SUFFICIENT TO ACHIEVE COMPLIANCE.
2. IT IS THE CONTRACTOR'S RESPONSIBILITY TO MONITOR SITE AND WEATHER CONDITIONS AND WATER QUALITY LEAVING THE SITE AND IMPLEMENT APPROPRIATE MEASURES TO COMPLY WITH THE STATUTORY REQUIREMENTS INCLUDING THE ENVIRONMENTAL PROTECTION ACT 1994.
3. SHOULD THIS REQUIRE ADDITIONAL MEASURES OR ALTERATIONS TO THE DETAILS SHOWN ON THESE DRAWINGS THE CONTRACTOR IS TO PROVIDE WORK METHOD STATEMENTS AND/OR REVISED DRAWINGS TO THE ENGINEER CLEARLY DETAILING THE PROPOSED CHANGES AND PRIOR TO IMPLEMENTING THEM.
4. FOR STANDARD SEDIMENT CONTROL DEVICE DETAILS REFER TO STANDARD DRAWINGS PROVIDED FOR THIS PROJECT.
5. MAINTAIN EROSION CONTROL MECHANISMS IN WORKING ORDER DURING ENTIRE CONSTRUCTION.
6. SEDIMENT LOSS FROM THE WORK SITE MUST BE MANAGED IN ACCORDANCE WITH CURRENT RELEVANT ENVIRONMENTAL GUIDELINES LEGISLATION. THIS WILL NECESSITATE THE USE OF APPROPRIATE EROSION AND SEDIMENT CONTROLS. THESE MUST BE IMPLEMENTED AT THE SITE ESTABLISHMENT PHASE AND MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD.
7. PRE-DISTURBANCE SOIL PROFILES AND COMPACTION LEVELS MUST BE REINSTATED.
8. ALL STOCKPILES TO BE COVERED AND TO BE ENCLOSED IN SEDIMENT FENCE.
9. ALL VEHICLES EXITING FROM THE SITE ARE TO EXIT VIA CONSTRUCTION EXITS ONLY TO PREVENT MATERIAL BEING TRACKED OR DEPOSITED ON PUBLIC ROADS.
10. ALL DISTURBED AREAS MUST BE LEFT IN A STABLE CONDITION.
11. ALL VEGETATION WITHIN 4m OF GENERAL MACHINE OPERATION MUST BE PROTECTED WITH A STAR PICKET AND ROPE FENCE CONSTRUCTED AT LEAST 1m CLEAR OF THE VEGETATION.
12. EROSION AND SEDIMENT CONTROL IS THE RESPONSIBILITY OF THE CONTRACTOR WHO MUST COMPLY WITH COUNCIL/QUEENSLAND GOVERNMENT REQUIREMENTS.
13. PROGRESSIVELY CLEAN UP ALL LITTER AND OIL LEAKS, AND PREVENT WASH OFF OF CEMENT SLURRY.
14. SUITABLE DUST CONTROL MEASURES TO BE IMPLEMENTED AT ALL TIMES.
15. THE CONTRACTOR MUST ADVISE THE ENGINEER ONCE THE EROSION AND SEDIMENT CONTROL MEASURES HAVE BEEN INSTALLED.
16. EROSION AND SEDIMENT CONTROL MEASURES MUST REMAIN IN PLACE UNTIL REHABILITATION MEASURES HAVE ESTABLISHED.
17. DRAWINGS ARE INDICATIVE. DO NO SCALE DRAWINGS.
18. PLEASE NOTE SURVEY DRG. 1517-01 CONTOURS ARE BASED ON ARBITRARY TBM LEVEL OF 100.00M, SET AS TOP OF EXISTING FOOT BRIDGELEVEL AT END OF NORTH SIDE. THE DIFFERENCE BETWEEN THESE CONTOURS AND LIDAR CONTOURS IS THUS -73.5m.

L Dave O'Toole MIEAust CPEng RPEQ NER
Consulting Structural Engineer

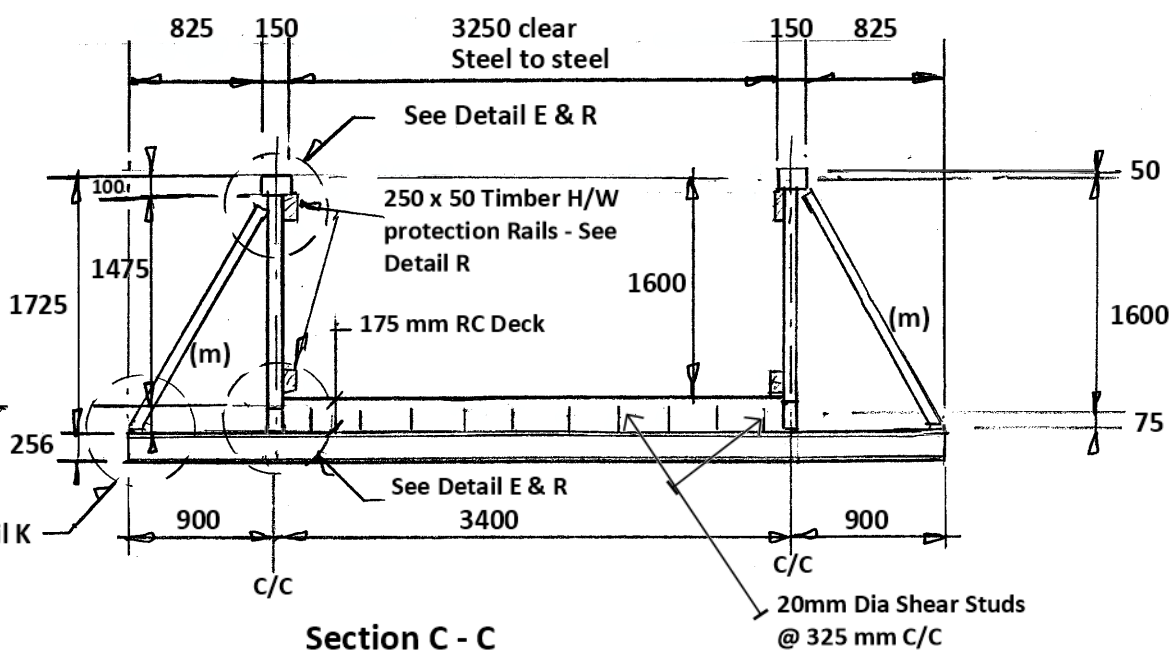
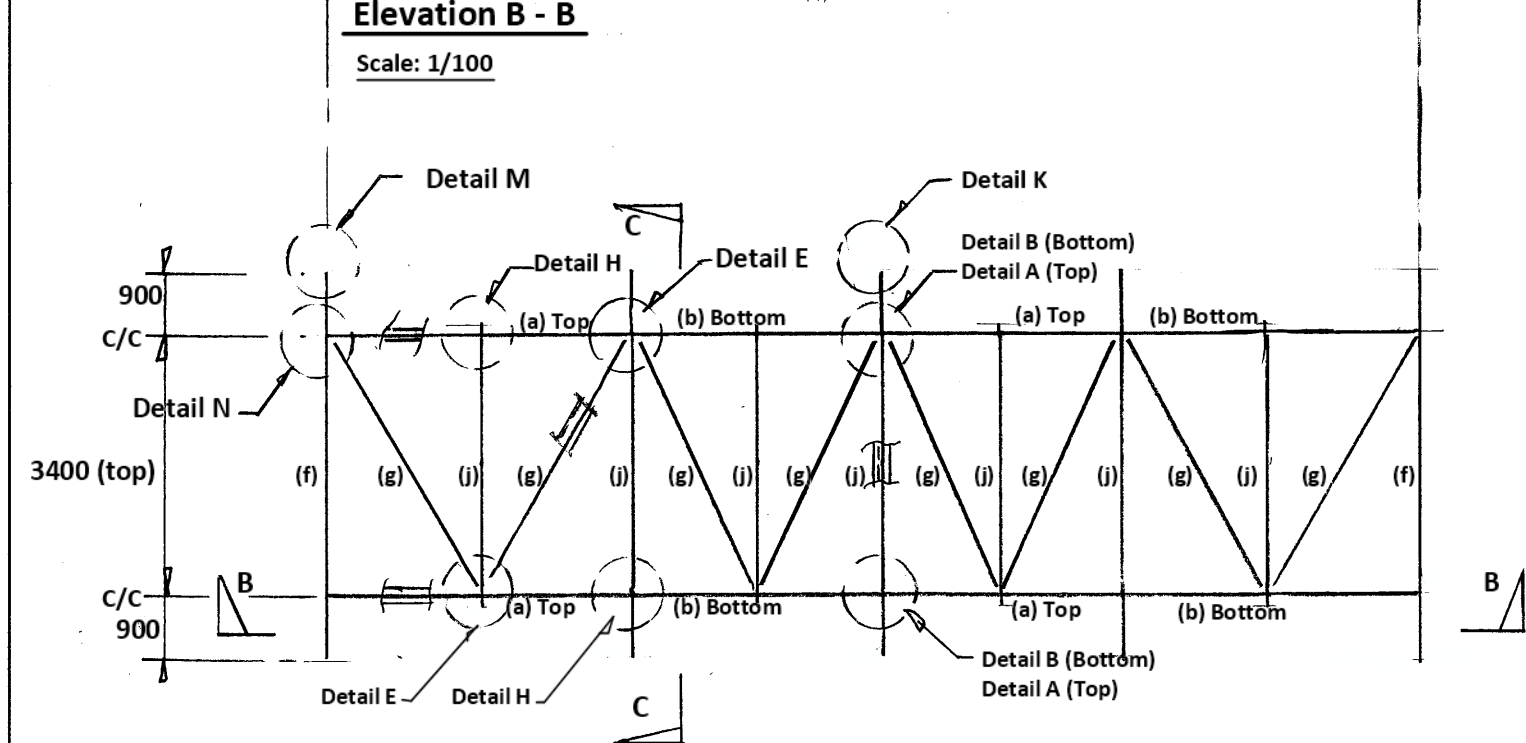
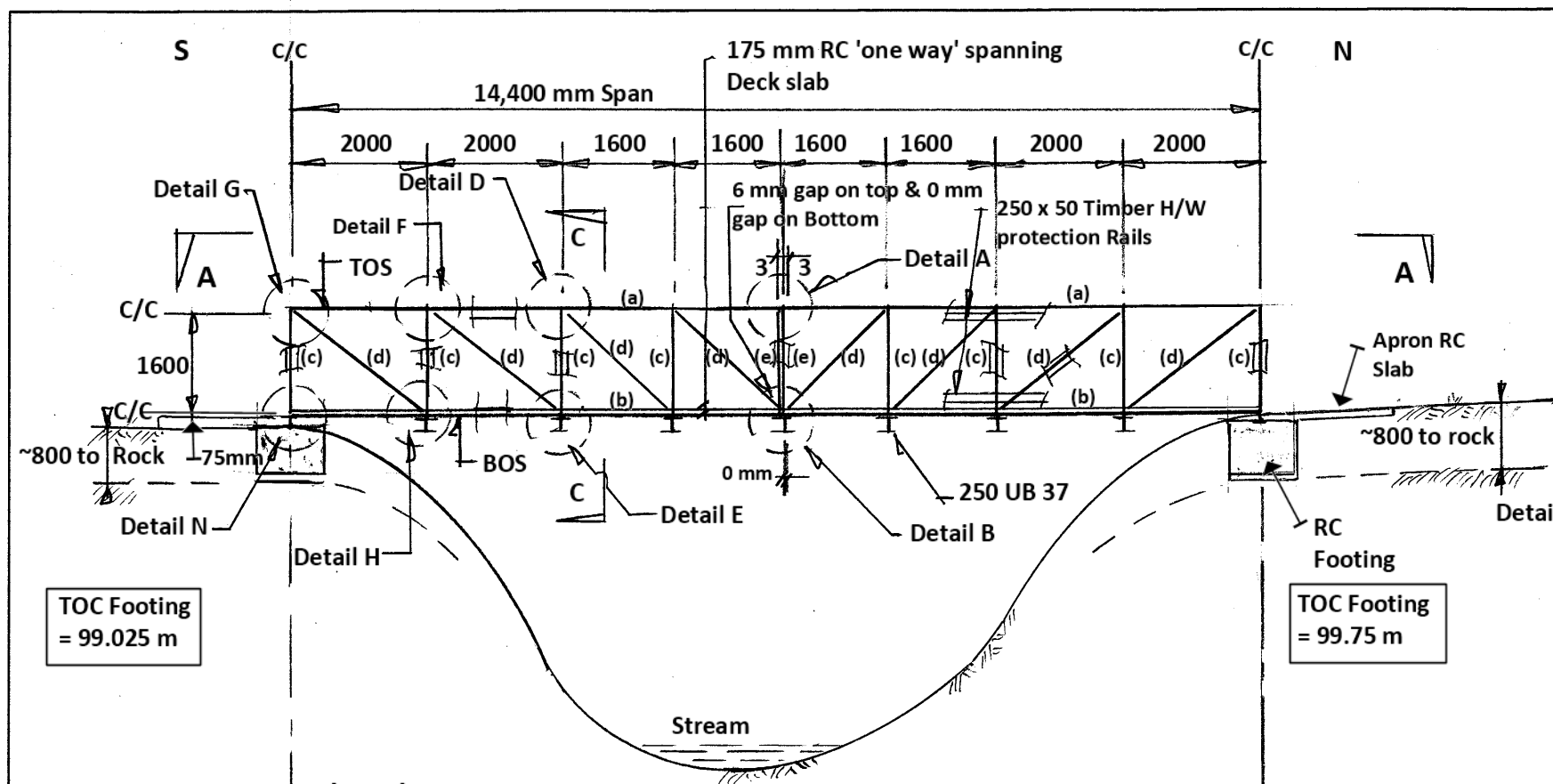
19 Canbanora Place, Mooroolbool, Cairns Qld 4870
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Email: otoole.eng@bigpond.com

I certify that the details shown on this drawing are in
accordance with all relevant Australian Standards
Refer to Form 15.

Signed: . *L Dave O'Toole*

A	03/11/2020	Issued for DA Approval.
Revision Reference	Date	Description

Project: Vehicle Bridge at 86 George Rd, Forest Creek
Description: Bridge: Soil Erosion and Sediment Control
Drawing No: 051/03 Rev A
Date: 03/11/2020



Member Schedule	
(a)	150 x 100 x 9 RHS □
(b)	150 x 100 x 8 RHS □
(c)	100 x 100 x 6 SHS
(d)	89 x 89 x 6 SHS
(e)	100 x 50 x 8.33 Channel
(f)	150 x 150 UC 37
(g)	90 x 90 x 6 EA
(j)	250 UB 37
(m)	100 x 100 x 15 UC

General Notes:

- 1) This drawing is to be read in conjunction with drawing Nos: 051 /01 to 03 & 05 to 11.
- 2) For transport, handling & logistics considerations, the bridge trusses are intended to be fabricated in two sections and TB bolted spliced on site during erection.
- 3) In order to provide a truss upward precamber of approx. 25 mm (estimated dead load deflection) an installation horizontal gap of 6 mm is provided in splice - in top chord only.

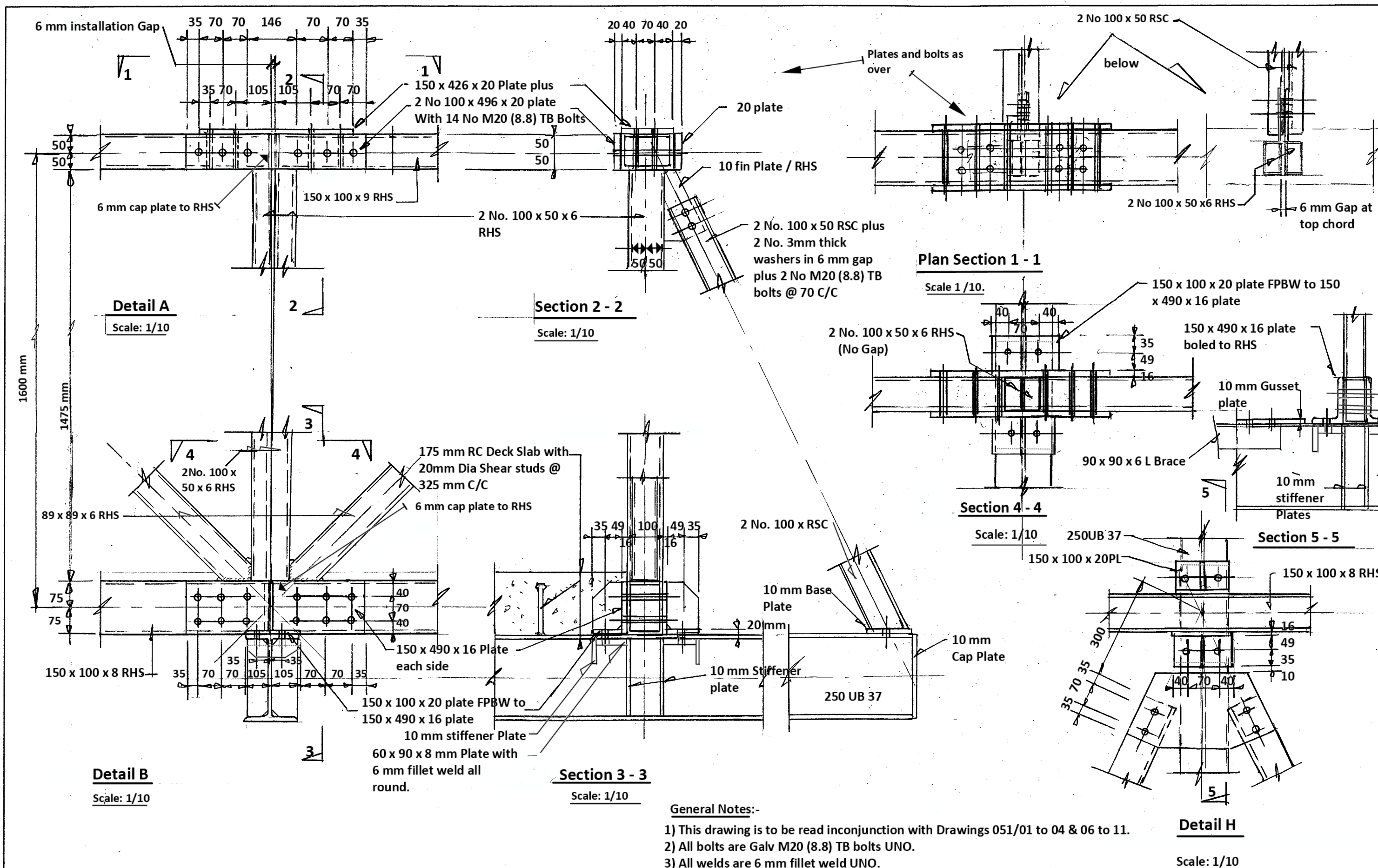
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Signed: *L Dave O'Toole*

A	01/10/2020	Issued for DA Approval.
Revision Reference	Date	Description

Project: Vehicle Bridge at 86 George Rd, Forest Creek.
Description: Bridge: General arrangement
Drawing No: 051 / 04 Rev A
Date: 01 / 10 / 2020



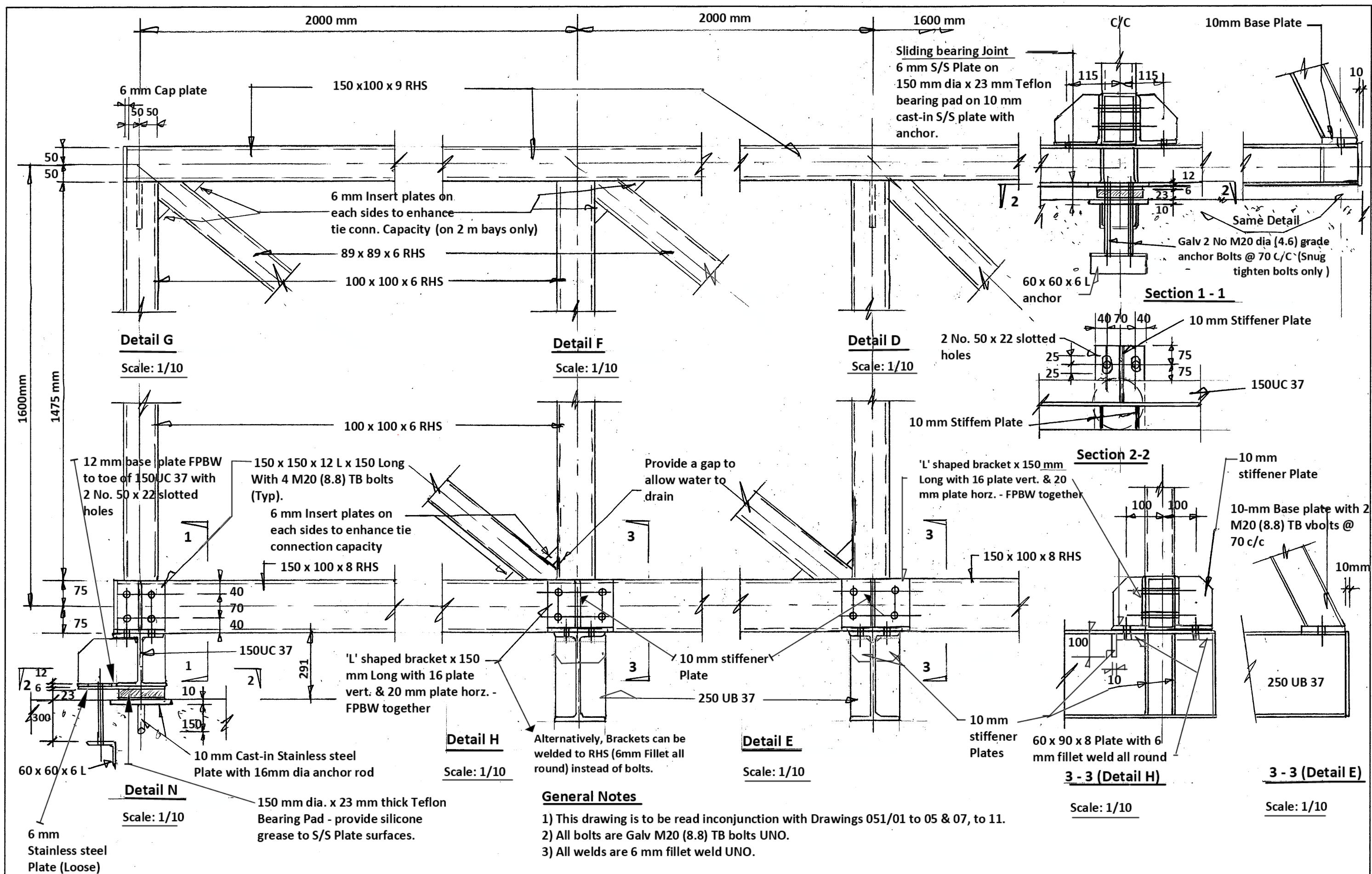
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A	01/10/2020	Issued for DA Approval.
Revision Reference	Date	Description

Project: Vehicle Bridge at 86 George Rd, Forest Creek.
Description: Bridge: Structural Details -Sheet 1
Drawing No: 051/ 05 Rev A
Date: 02/10/2020



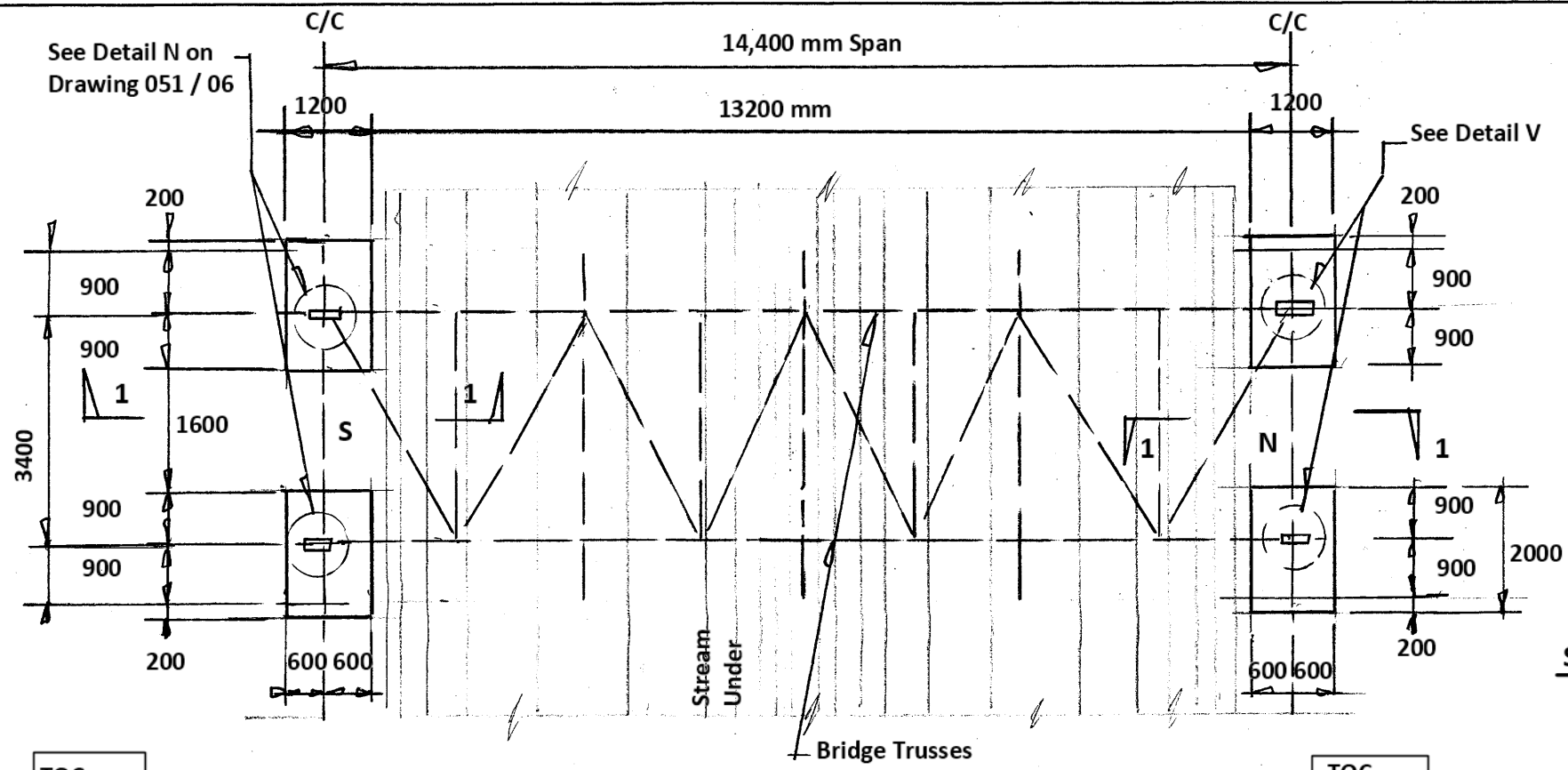
L Dave O'Toole MIEAust CPEng RPEQ NER
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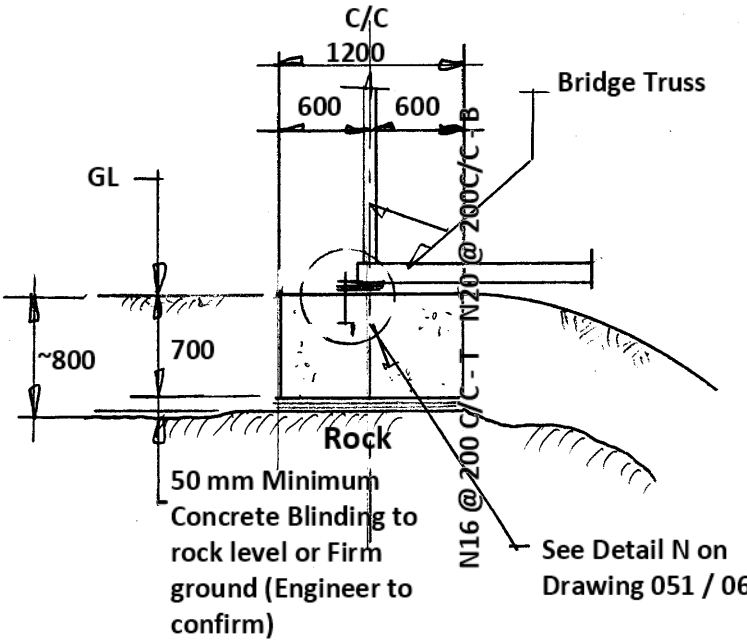
A	01/10/2020	Issued for DA Approval.
Revision Reference	Date	Description

Project: Vehicle Bridge at 86 George Rd, Forest Creek.
Description: Bridge: Structural Details - Sheet 2
Drawing No: 051/06 Rev A
Date: 03/10/2020



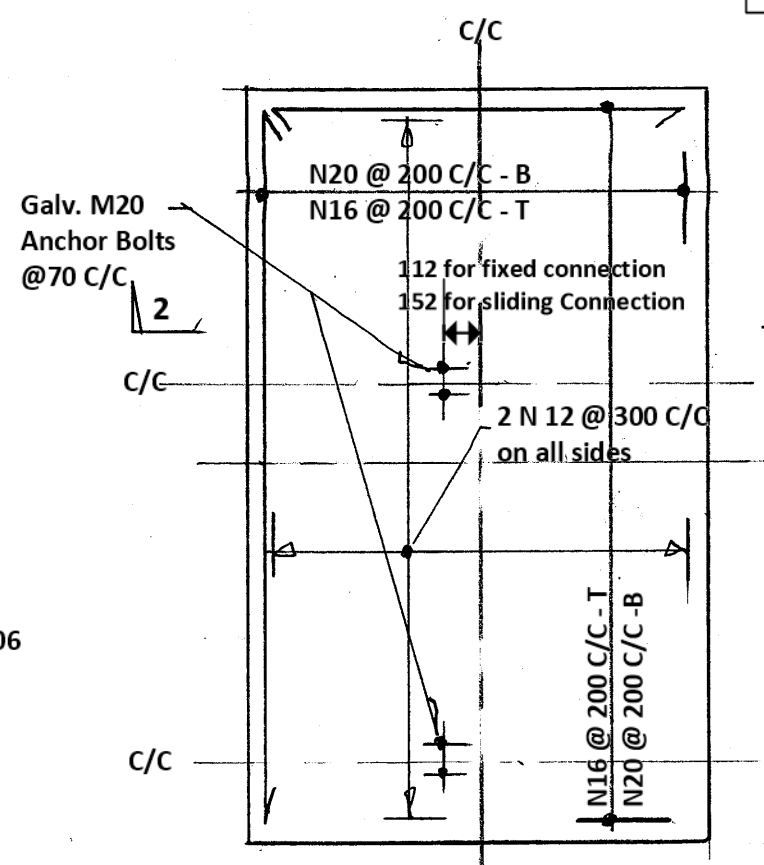
TOC = 99.025 m

Plan
Scale: 1/100



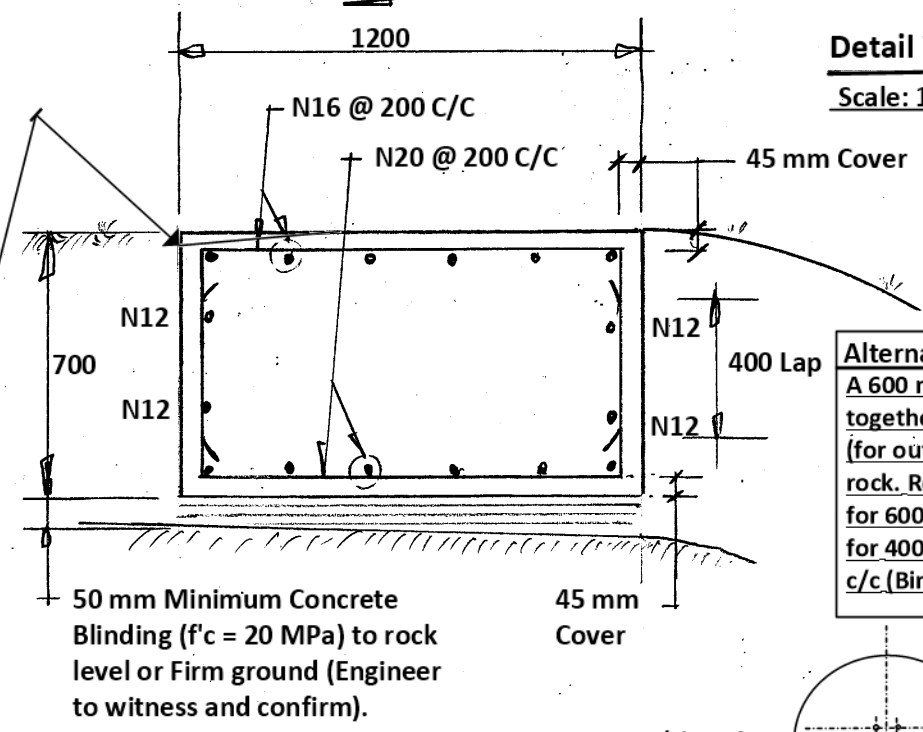
Section 1 - 1
Scale: 1/50

Note: Detail N is a Sliding joint & Detail V is a Fixed Joint



Footing Plan - 2 No. as Drawn & 2 No. to opposite hand
Scale: 1/10

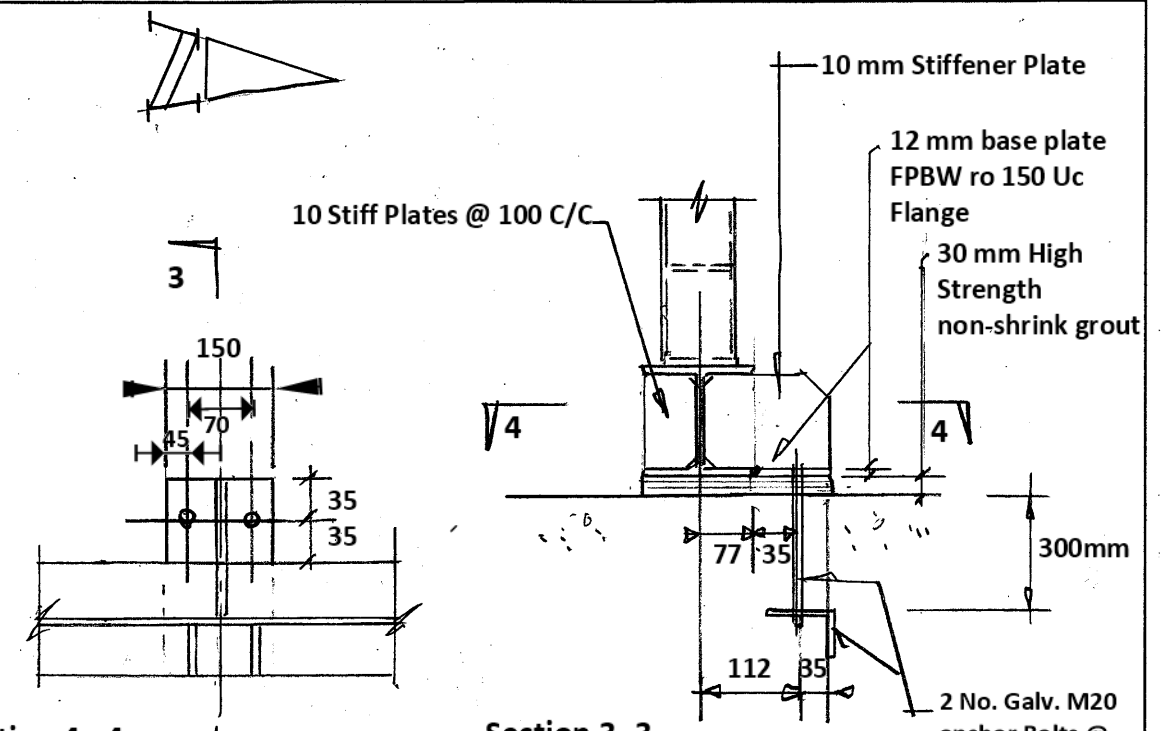
Section 4 - 4



Section 2 - 2
Scale: 1/10

Provide 20mm deep by 350mm long chamfer along top of North Footing only to avoid steel truss clash

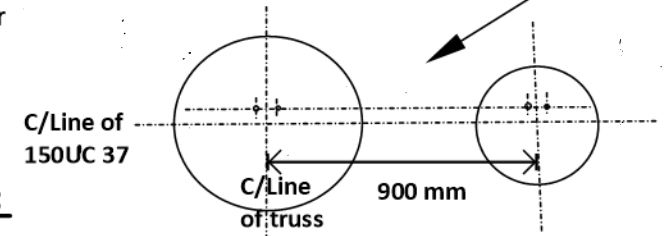
Section 3 - 3



Section 3 - 3

Detail V
Scale: 1/10

Alternative if Rock level is > 1.5m
A 600 mm dia bored Pier (for Truss) together with a 400 mm dia bored pier (for outrigger) can be used - down to rock. Reinforced with 6N20 @ 235 c/c for 600 mm dia pier & 6 N20 @ 200 c/c for 400mm dia. Pier and Hoops at 200 c/c (Binders)



General Notes:

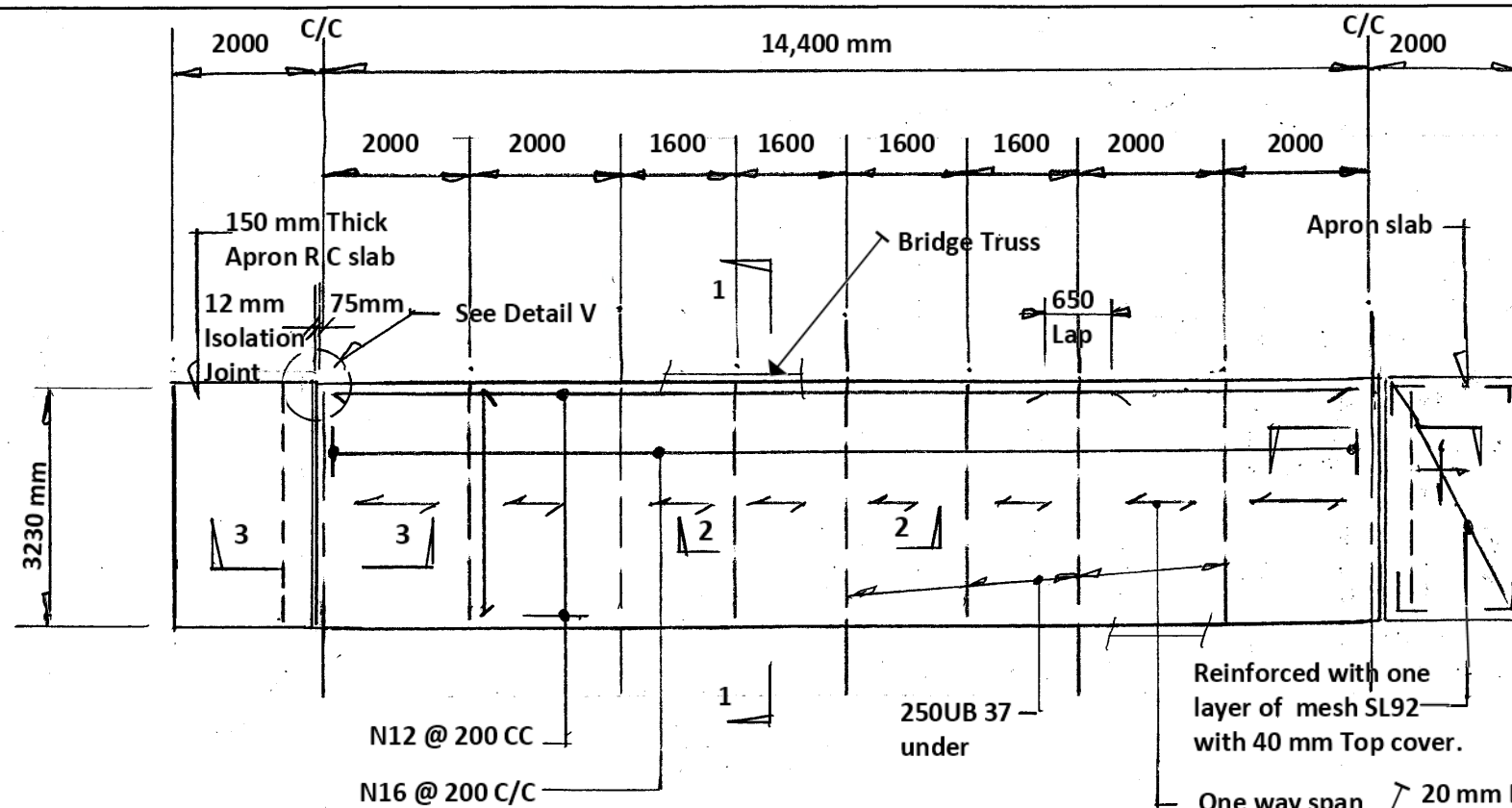
- 1) This drawing is to be read inconjunction with Drawing No. 051/ 01 to 06, & 08 to 11
- 2) The concrete contractor is to confirm the Rock level or firm ground to the Engineer prior to pouring concrete.
- 3) Footing Concrete f'c = 32MPa.

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Refer to Form 15.
Signed: *L O'Toole*

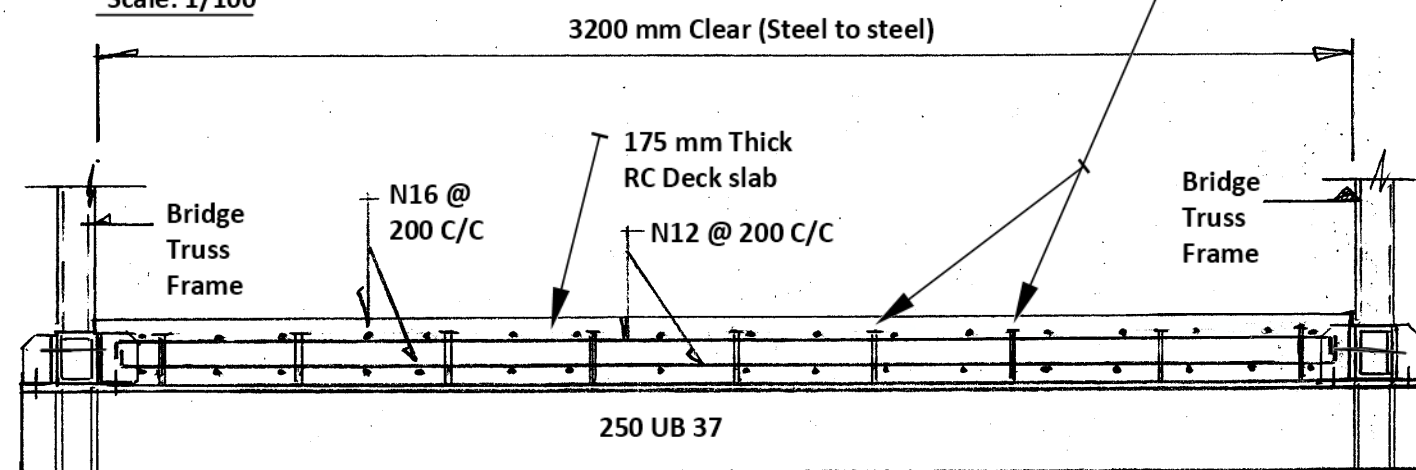
A	01/11/2020	Issued for DA Approval.
Revision Reference	Date	Description

Project: Vehicle Bridge at 86 George Rd, Forest Creek.
Description: Bridge: Footings - GA & RC Details
Drawing No: 051 / 07 Rev A
Date: 07 / 10 / 2020



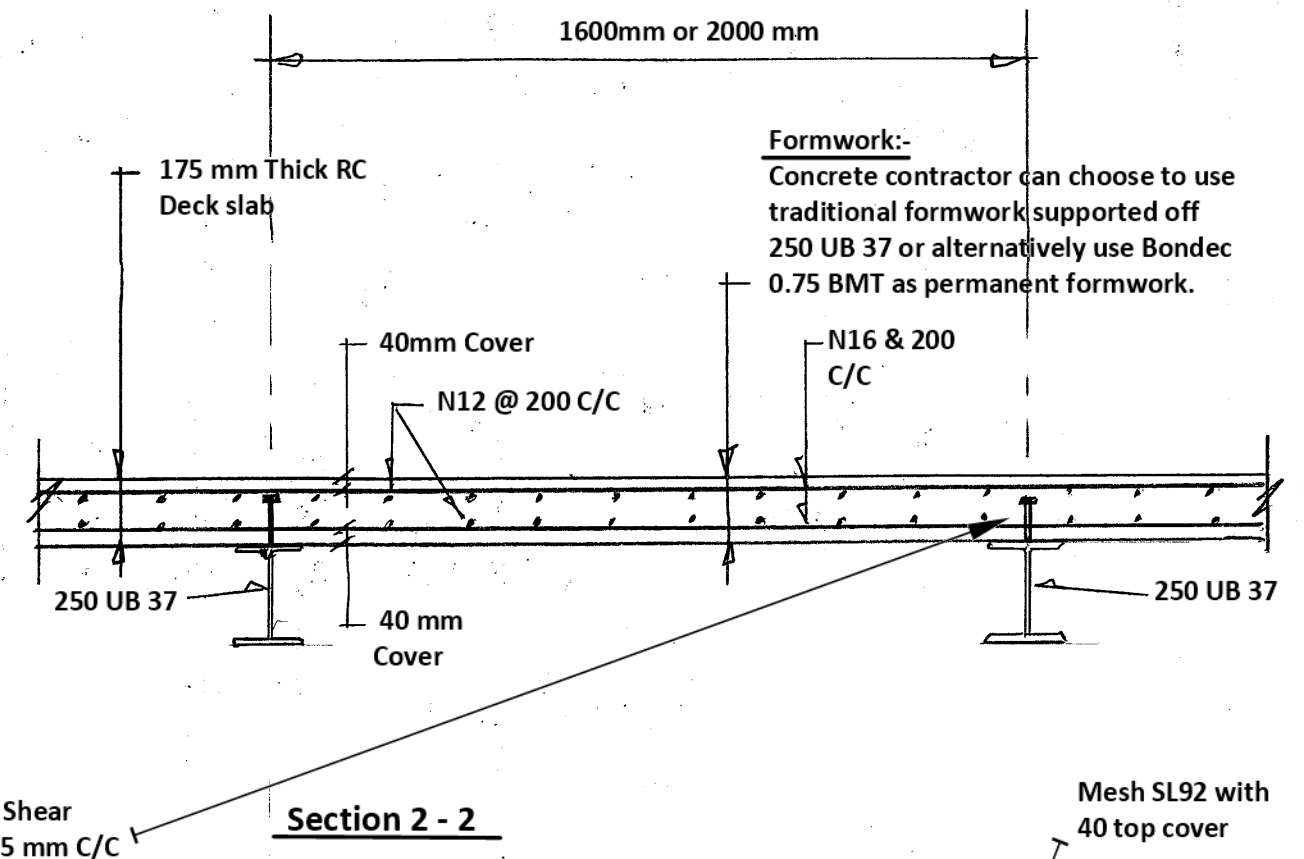
Deck Plan

Scale: 1/100



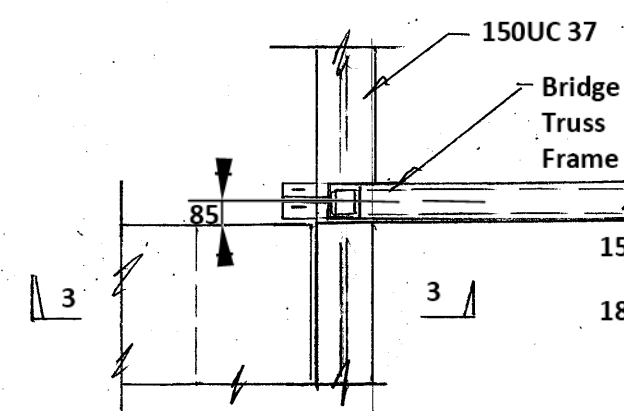
Section 1-1

Scale: 1/20



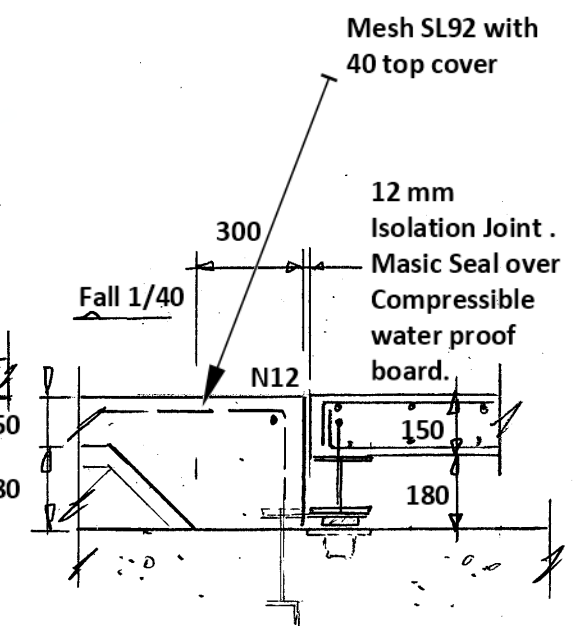
Section 2-2

Scale: 1/20.



Detail V

Scale: 1/20



Section 3-3

Scale: 1/20

General Notes:

- 1) This drawing is to be read in conjunction with drawings Nos 051/04, 05, 06, 07, & 09.
- 2) Deck Concrete $f'c = 40$ MPa

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I certify that the structural details shown on this drawing are in accordance with all relevant Australian standards

Refer to Form 15.

Signed:

L Dave O'Toole

A	01/10/2020	Issued for DA Approval.
Revision Reference	Date	Description

Project: Vehicle Bridge at 86 George Rd, Forest Creek.
Description: Bridge: Deck - RC Details
Drawing No: 051 / 08 Rev A
Date: 05 / 10 / 2020

GENERAL NOTES

- G1 These drawings shall be read in conjunction with all other project drawings, specifications and with such other written instructions as may be issued during the course of the work. All discrepancies shall be referred to the Engineer for decision before proceeding with the work.
- G2 The term 'Engineer' referred to in these notes is taken to mean the certifying Engineer whose name appears on the structural design certificate and the plans/specifications referenced in that certificate.
- G3 Where the 'approval of the Engineer' is specified in these notes that approval is to be provided in writing. The Engineer must approve in writing any adjustments, variations or proposed alternatives to these drawings.
- G4 Workmanship and materials are to be in accordance with the requirements of the current Building Code of Australia (NCC 2019), the Workplace Health and Safety Act (Qld) and S.A.A Codes including all amendments, and local and statutory authorities, except where requirements are varied by the contract documents.
- G5 During construction the contractor shall be responsible for maintaining excavations in a stable condition.
- G6 The contractor shall provide and leave in place until permanent bracing elements are constructed, such temporary bracing as is necessary to stabilise the structure and any adjacent structures during fabrication, transportation and erection, ensuring no part shall be overstressed during construction activities.
- G7 Wind loadings for this structure have been determined in accordance with AS 1170.2. The following criteria have been adopted:
Region C Terrain Category 2 Wind Classification: C2
- G8 Dead and live loads have been determined in accordance with AS 1170.0, 1, 2 & AS 5100.2 as modified – see Form 15 Certification.
- G9 Do not obtain dimensions by scaling, all stated existing dimensions and clearances are to be confirmed on site.
- G10 It is the contractor's responsibility to locate all existing services on the site, services where indicated on these drawings are indicative locations only. The contractor is to rectify immediately any obstruction or damage to such services and provide temporary and adequate services whilst repairs are carried out.
- G11 No Holes, chases or embedment of pipes, other than those on the structural drawings, shall be made in structural members without the approval of the Engineer.
- G12 If any part of this documentation is unclear or illegible please contact the Engineer.
- G13 These engineering notes take precedence over the architectural drawing notes, if in conflict.

SITE PREPARATIONS, EARTHWORKS AND FOUNDATIONS NOTES

- E1 Earthworks shall be in accordance with AS 3798 and as follows.
- E2 The contractor shall check all excavations for organic material and rubbish. If any of this material is found, it shall be removed from the works to a place designated by the superintendent.
- E3 All vegetation and topsoil shall be removed to stockpile.
- E4 Exposure of excavated footings shall be minimised to prevent localised moisture changes during the construction period.

CONCRETE NOTES

- C1 All workmanship and materials shall be in accordance with AS 3600
- C2 Minimum cover to all reinforcement shall be to AS3600, as follows: -
Exposure classification B1.
- | Item | COVER | Note |
|--|-------|----------|
| Ground level footing & edge thickening (Top Reo) | 35mm | |
| Suspended RC Slab | 40mm | |
| Footings | 45 | With DPM |
- C3 All Footing and slab concrete to be grade $f'c = 32$ MPa (20 mm max agg)
All Deck slab concrete to be grade $f'c = 40$ MPa (20 mm max agg)
- C4 Sizes of concrete elements do not include thickness of applied finishes.
- C5 No holes, chases or embedment of pipes other than those shown on the structural drawings shall be made in concrete members without prior approval of the Engineer.
- C6 Construction joints shall have concrete faces fully scabbled prior to placing adjacent concrete and are to be used only where shown or specifically approved.
- C7 Reinforcement is represented diagrammatically and not necessarily shown in true proportion or scale.
- C8 Splicing (laps) of reinforcement is to be UNO:
N12 - 450mm
N16 - 650mm
Mesh - Two cross wires plus 25mm
- C9 All reinforcement shall be supported in its correct position during concreting by approved bar chairs, spacers or support bars at 1000mm maximum centres both ways. Supports over membranes to be placed on metal or plastic plates to prevent puncturing of the membrane.
- C10 Formwork shall be designed and constructed in accordance with AS 3610. All concrete shall be normal density unless noted otherwise.
- C11 Concrete elements greater than 100mm thick shall be compacted using mechanical vibration.
- C12 No Control joints shall be constructed.

STEELWORK NOTES

- S1. STRUCTURAL STEEL SHALL BE TO AS 3678 & AS 3679 GRADE 250 OR BHP-300 PLUS. For RHS & SHS sections – steel to be Grade C450 Plus to AS 1163.
- S2. ALL MATERIALS ARE TO BE NEW.
- S4. FABRICATION AND ERECTION SHALL BE TO AS4100 & AS4600.
- S5. SHOP SPLICES SHALL BE PREPARED BUTT WELDS OF SUFFICIENT STRENGTH TO DEVELOP THE FULL STRENGTH OF THE MEMBER.
- S6. WELDING SYMBOLS ARE TO AS1101 PART 3.
- S7. WELDING:
S7.1 ALL WELDS SHALL BE TO AS 1554 - PART 1 CATEGORY SPECIAL PURPOSE (SP) (E48XX or W50X).
S7.2 ALL ADJOINING PLATES AND SECTIONS SHALL BE WELDED WITH CONTINUOUS FILLET WELDS, EXCEPT WHERE PLATES OR SECTIONS FORM PART OF A BOLTED CONNECTION, UNLESS NOTED OTHERWISE.
S7.3 FILLET WELDS FOR PLATES AND SECTIONS 10MM OR LESS THICK SHALL BE 6MM, IF SIZE IS NOT STATED.
S7.4 FILLET WELDS BETWEEN PLATES AND SECTIONS GREATER THAN 10MM THICK SHALL BE 8MM, IF SIZE IS NOT STATED.

- S7.5 ALL BUTT WELDS SHALL BE QUALIFIED COMPLETE PENETRATION, UNLESS NOTED OTHERWISE.
- S7.6 ALL BACKING STRIPS SHALL BE PROVIDED AND POSITIONED BY THE FABRICATOR AS REQUIRED.
- S8. ALL BOLT HOLES SHALL BE DRILLED.
- S8.1 PUNCHING OR FLAME CUTTING IS NOT PERMITTED.
- S9. TOLERANCES:
S9.1 FABRICATION:
S9.1.1 UP TO 500MM = ± 1.0 MM, UNLESS NOTED OTHERWISE
S9.1.2 OVER 500MM = ± 2.0 MM, UNLESS NOTED OTHERWISE
S9.1.3 ALL HOLE CENTRES = ± 1.0 MM, UNLESS NOTED OTHERWISE
- S10. SURFACE TREATMENT:
S10.1 ALL STEEL ITEMS SHALL BE PAINTED, EXCEPT WHERE THE ITEM IS STAINLESS STEEL OR GALVANISED.
S10.2 NEW STEELWORK:
S10.2.1 ALL SURFACES SHALL BE FREE FROM OIL, GREASE, DIRT OR ANY OTHER CONTAMINANTS.
S10.2.2 DRY ABRASIVE BLAST ALL SURFACES IN ACCORDANCE WITH AS1627.4 CLASS 2.5.
S10.2.3 APPLY ONE COAT OF AN EPOXY ZINC RICH PRIMER TO ACHIEVE 75UM MINIMUM DRY FILM THICKNESS.
S10.2.4 THE PRIMER SHALL BE FOLLOWED BY TWO COATS OF THE HIGH BUILD, HIGH SOLIDS EPOXY PAINT TO ACHIEVE 150UM DRY FILM THICKNESS PER COAT.
- S11. SITE WORK:
S11.1 SITE PAINTED ITEMS SHALL COMPLY WITH THE REQUIREMENTS FOR NEW STEELWORK WHERE PRACTICAL. POWER TOOL CLEANING SHALL BE TO AS 1627 CLASS 2.
S11.2 GALVANISED STEEL: GALVANISE IN ACCORDANCE WITH AS1650 WITH A MINIMUM COATING OF 600G/M2.
S11.3 TOUCH UP SITE WELDS ON DURAGAL OR GALVANISED STEELWORK WITH AN APPROVED ZINC RICH PAINT SYSTEM.
- S12. FINAL COLOURS:
S12.1 GENERALLY FINAL COLOURS SHALL BE AS FOLLOWS: STEELWORK - AS2700 COLOUR CODE N52 GREY, OR AS REQUESTED BY CLIENT.
- S13. EXPOSED PORTIONS OF PINS AND SHAFTS SHALL BE POWER TOOL CLEANED TO AS 1627 CLASS 2 AND THEN PAINTED AS FOR THE STEELWORK.
- S14. BOLTS:
S14.1 ALL BOLTS AND NUTS SHALL BE DURAGAL OR GALVANISED, EXCEPT STAINLESS STEEL ITEMS.
S14.2 ALL BOLTS M12 AND M16 SHALL BE COMMERCIAL GRADE 4.6/5 (UNLESS NOTED OTHERWISE).
S14.3 ALL BOLTS M20 AND M30 SHALL BE HIGH STRENGTH GRADE 8.8 (UNLESS NOTED OTHERWISE).
S14.4 BOLTS NOTED AS 8.8/TB SHALL BE PRE-TENSIONED IN ACCORDANCE WITH AS4100 USING THE 'PART TURN OF NUT' METHOD.
S14.4 ALL BOLTS SHALL HAVE GALVANISED WASHERS.
S14.5 ALL BOLTS SHALL BE SUPPLIED IN STANDARD MANUFACTURED LENGTHS.
S14.6 A FLAT WASHER SHALL BE PLACED UNDER THE ROTATING ELEMENT OF EACH BOLTED JOINT.
S14.7 BOLTS PASSING THROUGH SLOTTED HOLES SHALL BE PROVIDED WITH FLAT WASHERS UNDER THE BOLT HEAD AND NUT.

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Consulting Structural Engineer

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I certify that the structural details shown on this drawing are in accordance with all relevant Australian standards

Refer to Form 15.

Signed:

L Dave O'Toole

A

Revision Reference

01/11/2020

Date

Issued for DA Approval.

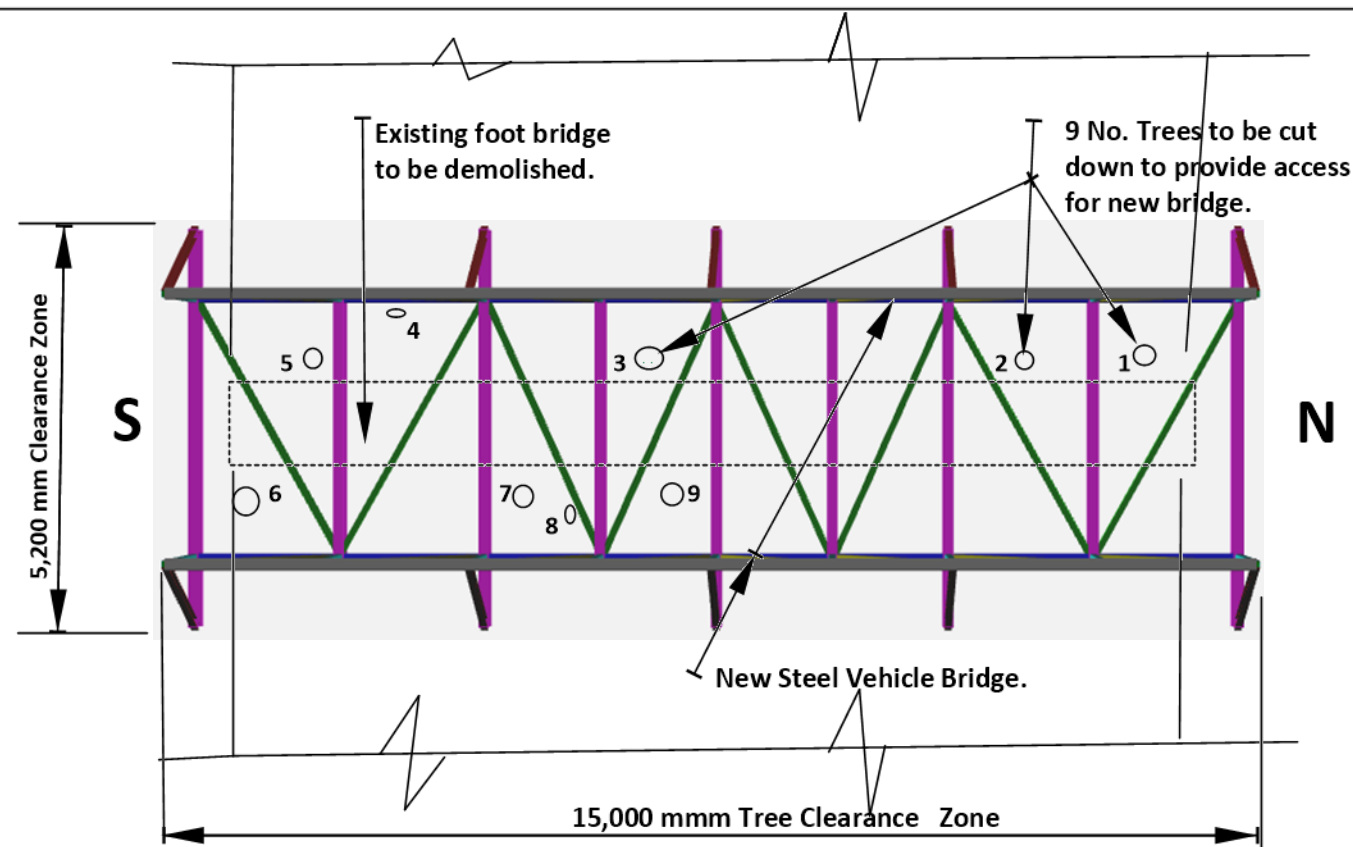
Description

Project: Vehicle Bridge at 86 George Rd, Forest Creek.

Description: Bridge: Engineering Notes

Drawing No: 051 / 09 Rev A

Date: 12 / 10 / 2020



Vehicle Bridge Plan - Showing Trees to be removed to allow new bridge access.

Scale: 1/100

Proposed Tree Clearance

- 1) Cut above noted trees and leave stumps to decay naturally.
- 2) Lift cut trees out of Ravine and stockpile on site for later use.
- 3) Stockpiled trees may be used as follows:-
 - * Mulched (not chipped) for use in Mulch Berm Sediment traps.
 - * Mulched for use as Berms to control the velocity of runoff on steep slopes.
 - * Mulched for use in either 'clean' or 'dirty' water flow diversion banks

General Notes:

- 1) This drawing is to be read inconjunction with Drawings 015/ 01 to 09 & 11.



Existing Foot Bridge



Tree No. 1 - Rainforest tree



Tree No. 2 - Rainforest tree



Tree No. 3 - Palm tree



Tree No. 4 - Rainforest tree



Tree No. 5 - Rainforest tree



Tree No. 6 - Rainforest tree



Trees No. 7, No. 8 & No. 9 - Rainforest trees

<p>L Dave O'Toole MIEAust CPEng RPEQ NER Consulting Structural Engineer</p> <p>19 Canbanora Place, Mooroolbool, Cairns Qld 4870 Mobile Phone: 0400 252 715 Email: otoole.eng@bigpond.com</p>	<p>I certify that the structural details shown on this drawing are in accordance with all relevant Australian standards Refer to Form 15. Signed: <i>L. O'Toole</i></p>	<p>A</p> <p>Revision Reference</p>	<p>01/11/2020</p> <p>Date</p>	<p>Issued for DA Approval.</p> <p>Description</p>	<p>Project: Vehicle Bridge at 86 George Rd, Forest Creek. Description: Bridge: Tree removal - Riparian Works. Drawing No: 051 / 10 Rev A Date: 17 / 10 / 2020</p>
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