EXPERT WITNESS REPORT

SUNBURY SOUTH AND LANCEFIELD ROAD INFRASTRUCTURE CONTRIBUTIONS PLAN
JACKSONS CREEK BRIDGE CROSSING (SS-BR-01 & LR-BR-01) - ALTERNATE SOLUTIONS AND PROBABLE COSTS

8 OCTOBER 2020

PREPARED FOR VILLAWOOD PROPERTIES

This report has been prepared by the office of Spiire, Level 6, 414 La Trobe Street PO Box 16084 **Melbourne** Victoria 8007

Acknowledgements and Recognition

David Cameron - Spiire
Rob Howard - Hatch
Cornelius von Oppen – Winslow Infrastructure

Issue Date	Rev No	Authors	Checked	Approved
5/10/2020	0 Draft	Mark Breuer	David Cameron	Mark Breuer
8/10/2020	1 for issue	Mark Breuer	David Cameron	Mark Breuer

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Authors: Mark Breuer Spiire Australia Pty Ltd. Project Number enter job number

File Name: G:\30\305911\Expert report for Panel\2020 10 08 Final SS and LR ICP bridge option review.docx

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1. WITNESS STATEMENT AND QUALIFICATIONS

1.1 NAME AND ADDRESS

Name: Mark Breuer

Company: Spiire Australia Pty Ltd

Address: Level 6, 414 Latrobe Street
Melbourne Vic 3000

Position: Managing Director

Qualifications: B. Eng 1992 RMIT, GAICD

1.2 PROFILE AND EXPERTISE

I have over 28 years' experience in the civil engineering and urban development industries across Victoria and NSW.

I am the managing director of Spiire Australia and have been an employee for 27 years. Spiire employs over 250 people across 3 states and territories with skills in civil engineering, surveying, town planning, urban design, integrated water and landscape architecture.

Whist I currently oversee the business operations, I am also actively involved in the delivery of major projects and have a strong understanding of the development industry and processes across metropolitan Melbourne and regional Victoria. I am an active member of the UDIA greenfield committee where I play a key role interfacing with infrastructure authorities.

I bring particular expertise to the early phases of masterplanned greenfield developments to ensure the civil infrastructure strategy can enable the projects to proceed in a timely and cost effective way.

Project experience includes:

- Woodlea, Mirvac and VIP
  - Rockbank, 2008–present
  - Project Director – facilitation of major infrastructure and stakeholder negotiations
- Thornhill Park, Welsh Group
  - Rockbank, 2012–present
  - Project Director – facilitation of major infrastructure and stakeholder negotiations
- E-Gate Urban Renewal project, Private Consortium
  - Melbourne, 2014-2016
  - Project Director – EOI preparation, including masterplanning, infrastructure strategy, feasibility and structuring of commercial offer.

2. INSTRUCTIONS

Spiire have been instructed by Norton Rose Fulbright to provide civil engineering assessment and expert witness advice for alternative options for the Sunbury South and Lancefield Road Infrastructure Contribution Plan (ICP) bridges across the Jacksons Creek.

Specifically Spiire have been instructed to:

- review this memorandum (Norton Rose Fulbright letter of instruction dated 2 October 2020) and accompanying documents;
- confer with instructing solicitors and counsel where necessary;
- prepare an expert witness statement concerning civil engineering and functional layout matters relevant to the ICP, in particular in relation to the appropriateness of the design and location of bridges LR-BR-01 and SS-BR-01;
- attend an engineering witness conclave with other engineering expert witnesses if necessary; and
- if necessary, present your expert evidence at the hearing before Planning Panels Victoria

3. SCOPE OR WORK

This assessment and report have been prepared by Mark Breuer, with the assistance of David Cameron (Spiire), Rob Howard (Hatch) and Cornelius von Oppen (Winslow) as well as other specialist staff at each organisation.

Spiires scope of work is to undertake a civil engineering assessment to determine alternative suitable location(s) and alignment options for the Jackson's Creek bridges that are cost effective for a connector road as requested in Norton Rose Fulbright's letter of instruction.

Assessment of the impact of bridge options on ecology and cultural heritage is not part of Spiires scope.

Spiire have partnered with the following team to support preparation of the options:

Hatch – Rob Howard
Hatch are a global engineering consultancy with specialists in bridge structural engineering. Hatch have provided the bridge structure solution for each option.

Winslow Infrastructure – Cornelius von Oppen
Winslow Infrastructure are a major civil construction company with expertise in building bridges and associated civil infrastructure. Winslow Infrastructure have supported the preparation of opinion of probable costs (OPC) and provided advice on constructability.

It should be noted that due to the COVID-19 restrictions in Victoria and metropolitan Melbourne, Spiire, Hatch and Winslow have been unable to undertake a site inspection. The work documented in this report has relied on aerial photographs, VPA background reports and LIDAR digital terrain data.

4. INFORMATION USED & RELIED UPON

In response to my instructions, I have predominantly relied on the following documents:

VPA - Lancefield Road Precinct Structure Plan, June 2018 (Amended November 2019) – and associated background reports

VPA - Sunbury South Precinct Structure Plan, June 2018 (Amended November 2019) – and associated background reports

VPA - Sunbury South and Lancefield Road Infrastructure Contributions Plan, April 2020 – and associated background reports

GDH - Sunbury Sth Lancefield Rd ICP Design and Costs dated November 2019 for the Victorian Planning Authority (GHD report)

The basis of this report has been to adopt as many of the principles and cost basis contained within GHD's report titled Sunbury Sth Lancefield Rd ICP Design and Costs dated November 2019 for the Victorian Planning Authority (GHD report). The GHD report contains the final design solutions and cost which form the basis of the ICP and hence the Jackson Creek Bridges. This will enable any comparison with this report a lot simpler and on a "like for like" basis.

5. KEY ASSUMPTIONS

5.1 DESIGN ASSUMPTIONS

5.1.1 ROAD GEOMETRY AND CONFIGURATION

Both roads crossing the Jacksons Creek are identified in the ICP as connector roads. An extract from the Sunbury South and Lancefield Road PSP show the typical configuration of a connector road and are depicted in figure 1 and 2.

The configuration of the connector road in the location of the bridges is a modification of the 25m connector road to minimise the footprint (disturbance) and bulk earthworks. A typical cross section as used in determining the alignment and cost options in this report is depicted in figure 3.

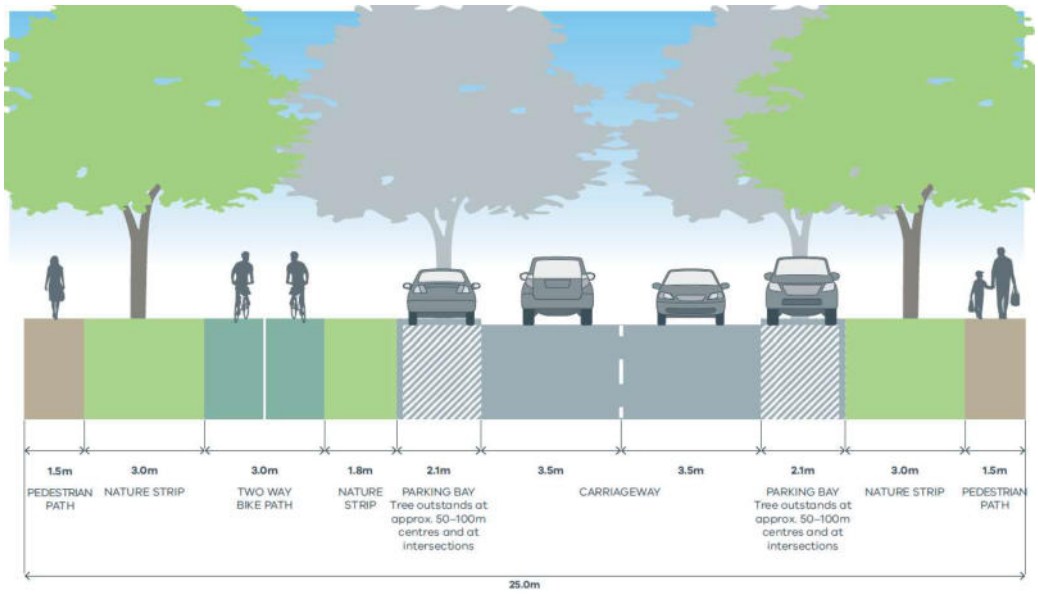


Figure 1: Typical Connector Road 25m road reserve

(Source: VPA gazetted Sunbury South and Lancefield Road PSPs)

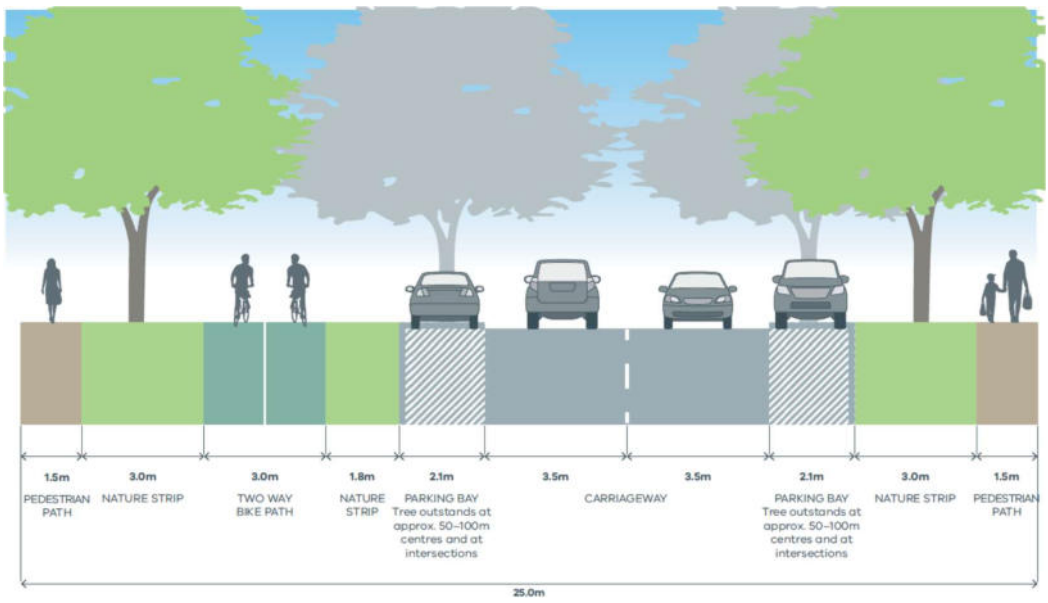


Figure 2: Typical Connector Road 34m road reserve

(Source: VPA gazetted Sunbury South and Lancefield Road PSPs)

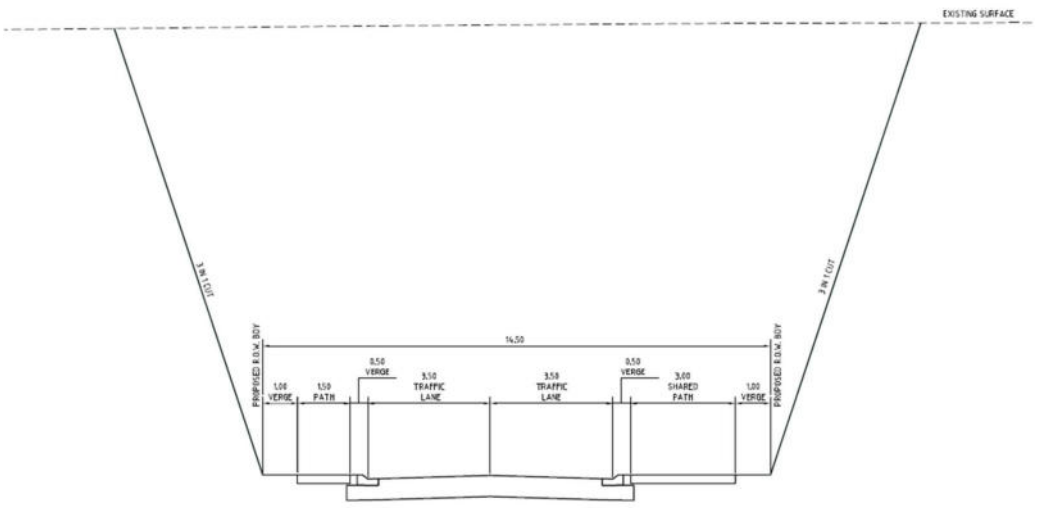


Figure 3: Typical Connector Road cross section in deep cut (source Spiire)

The design principles adopted when determining both vertical and horizontal alignments for the bridge crossing, are in accordance with those adopted in the GHD report.

Table 1: Bridge/road alignment design parameters

Element	Design parameter	Reference
Design Speed	60 km/hr	Growth Area Road Network Planning – Guidance and Policy Principles
Horizontal Geometry	Minimum radius for adverse cross fall 200m (no superelevation)	VicRoads Supplement to Ausroads Guide to Road Design,
Vertical Geometry	Maximum grade 9% Minimum grade 1%	Ausroads Guide to Road Design, Part 3, Table 8.3 & 8.5,
Cut / Fill Batters (v in h)	Cut 1 in 3 Fill 1 in 6	As adopted by GHD report
Anchor treated cut batters	Cut 3 in 1	As adopted by GHD report

5.1.2 BRIDGE DESIGN

Hatch have prepared the design options for the bridge structures in consultation with Winslow Infrastructure in regards to constructability and cost. My report relies on the advice of these experts.

The bridge designs have adopted similar structures to those in the GHD report or a combination thereof.

The bridge structure concepts are preliminary and subject to further onsite investigations such as geotechnical and detailed design.

5.2 OPINION OF PROBABLE COST (OPC) ASSUMPTIONS

The OPC's have been prepared using the same template and structure as those contained in the GHD report Appendix C – Cost Plans. Where ever possible we have adopted the rates used in the estimate unless our opinion varies significantly.

To ensure the costs are comparable solutions, any additional infrastructure required has been costed on an extra over basis (ie if the bridge is shorter then there will be additional off-bridge road costs).

6. DESIGN OPTIONS

Design options have been prepared using the parameters and assumptions in section 5.1 of this report. As far as practicable, the alignment for option A and B has been adopted to minimise any impact on the gazetted PSPs and hence not impacting developments that have already commenced or obtained planning approvals. Other options have not been explored.

The designs explore essentially 2 options for each crossing of Jacksons Creek. Option A being the same horizontal alignment as the interim ICP and GHD report. Different vertical alignments have then been adopted to achieve a more efficient and cost effective solution for the bridge with the key aim to reduce the structure length.

Option B explores alternate horizontal alignments to find a more cost efficient solution, whilst still maintaining the same "connection points" to the PSP. This eliminates any need for amendment of the PSP or impact on approved developments.

6.1 LANCEFIELD ROAD JACKSONS CREEK CROSSING (LR-BR-01)

6.1.1 OPTION A

Option A maintains the same horizontal alignment as the GHD report but with different vertical geometry to push down into the Jacksons Creek valley. This reduces the bridge span, however creates additional off-bridge road length and bulk earthworks. The vertical grade of the bridge is set at the maximum allowable 9% and both Hatch and Winslow infrastructure have advised there is minimal impact to constructability or cost.

The bridge span reduces from 490Lm (ICP adopted) to 245 Lm or a 50% reduction. Additional road and earthworks have been accounted for in the OPC. The new vertical alignment presented in option A significantly reduces the height of the piers from 35.5m to 16m. This reduction allowed Hatch to adopt the cheaper concrete super-T option, utilise a simpler pier shape and change the bored piles to driven piles. The changes to the alignment reduced the length of the structure by 50% but due to the reduction in complexity the cost reduction is greater than 50%.

Refer appendix B for concept drawings.

6.1.2 OPTION B

Option B pursues an alternative horizontal alignment which "chases" the contours down into the Jacksons Creek Valley floor. This concept reduces the span of the bridge from 490Lm to 90 Lm or an 82% reduction. Additional road and earthworks have been accounted for in the OPC. As with the GHD report, rock anchors/soil nails have been applied in areas of deep excavation as the most cost effective solution.

Due to the significantly reduced scale of the bridge, the structure will consist of super T beams with a span of 30 Lm each (3 No spans), again a consistent solution with the type adopted in other locations in the GHD report. Constructability of the bridge is significantly improved as the complexity and material costs are both greatly reduced in this option.

Refer appendix B for concept drawings.

6.2 SUNBURY SOUTH JACKSONS CREEK CROSSING (SS-BR-01)

6.2.1 OPTION A

Option A maintains the same horizontal alignment as the GHD report but with different vertical geometry to push down into the Jacksons Creek environs. This reduces the bridge span, however creates additional off bridge road length and bulk earthworks.

Hatch have proposed a 245m structure consisting of 7 super T spans @ 35Lm each. The bridge span reduces from 315m (ICP adopted) to 245m or a 22% reduction. The structural solution differs from the solution adopted in GHD report which was a steel box girder. The use of super T's are considered a more cost effective and constructible solution and is consistent with other bridge types adopted in the interim ICP.

The key driver for the bridge solution in option A is the height of the piers. The GHD report/ICP design requires lifting of super-T girders onto 43m high piers. Placing a 35m beam into 43m high piers would require a boom height of 85m which is not possible. Option A concept has adopted steel box girders which can be launched into place. This change means additional cost of using steel spans.

Refer appendix C for concept drawings.

6.2.2 OPTION B

Option B is considered a refinement of the horizontal alignment adopted in the GHD report. Option B is a minor departure of the horizontal alignment to locate a more optimal solution reducing the bridge size and bulk earthworks.

Option B reduces the span of the bridge from 315Lm to 240 Lm or a 24% reduction. Additional road and earthworks have been accounted for in the OPC. As with the GHD report, rock anchors/soil nails have been applied in areas of deep excavation as the most cost effective solution.

This option has similar pier height considerations to option A. However, with option B the valley reduces in depth away from the central span. Hatch consider a steel launched span is appropriate for the 26m high central span. The approach spans on either side, 2 on the South and 4 on the North, are the lower cost concrete super-T structure.

Refer appendix C for concept drawings.

7. OPINION OF PROBABLE COSTS (OPC)

Spiire, Hatch and Winslow Infrastructure have prepared opinions of probable costs for each of the alternate options. A summary of the OPC's included in sections 7.1 and 7.2 and appendix D and E contain the detailed schedules using the same format and content as the GHD report. For the bridge structure costs, I have relied on the advice of Hatch and Winslow Infrastructure as this is outside my area of expertise.

Where possible we have adopted the same cost basis for each item as the GHD report, however where this assessment departs items are highlighted in yellow. One major item is excavation. Spiire have recently tendered bulk earthworks in the Sunbury region and consider the rates used in the GHD Report to be too high. We have adopted a rate of $43.20 per cubic meter which includes rock (Winslow Infrastructure have confirmed this rate is appropriate for solid rock excavation in that area).

Habitat Compensation Fees have been excluded from the OPC's for all options as this falls outside my scope and expertise. It should be noted, these costs are considered to be minor when considered in the context of the overall costs as demonstrated in the GHD report.

7.1 LANCEFIELD ROAD JACKSONS CREEK CROSSING (LR-BR-01)

Table 2 below provides a summary of the Lancefield Road Jacksons creek crossing. Both options achieve a significant reduction in cost as well as improving constructability of the bridge structure. Given the road has a connector road status, option B is the preferred solution from a constructability and cost basis.

Table 2: OPC summary LR-BR-01

	GHD Report / Interim ICP solution	Option A	Option B
Total	$103,867,741	$47,914,254	$30,527,193
% difference from ICP	0%	-54%	-71%

Detail schedules are attached in appendix D

7.2 SUNBURY SOUTH JACKSONS CREEK CROSSING (SS-BR-01)

Table 3 below provides a summary of the Sunbury South Jacksons creek crossing. Option A cost is greater than the GHD report as Hatch have adopted a steel girder structure. As highlighted in section 6.2.1, Hatch and Winslow Infrastructure do not believe the GHD report SS-BR-01 solution is constructible and therefore the ICP cost is not appropriate (it would be significantly higher).

Option B is the preferred solution given it is only a minor departure from the ICP horizontal alignment, costs are reduced and constructability improved.

Table 3: OPC summary SS-BR-01

	GHD Report / Interim ICP solution	Option A	Option B
Total	$41,735,843	$43,553,373	$36,391,021
% difference from ICP	0%	+4%	-13%

Detailed schedules are attached in appendix E

8. CONCLUSION

It is my opinion that alternative locations and geometry of the bridge crossings can be achieved to reduce cost and improve constructability.

It is therefore my opinion that:

- The preferred option for the Lancefield Road Jacksons Creek crossing is Option B
- The preferred option for the Sunbury South Jacksons Creek crossing is Option B
- Option B for each location achieves the same outcome and is designed within the same geometric parameters as the GHD report
- Each option will provide a functional connector road at reduced cost
- Both options should be assessed for ecology and cultural heritage impacts (not part of my scope or expertise)

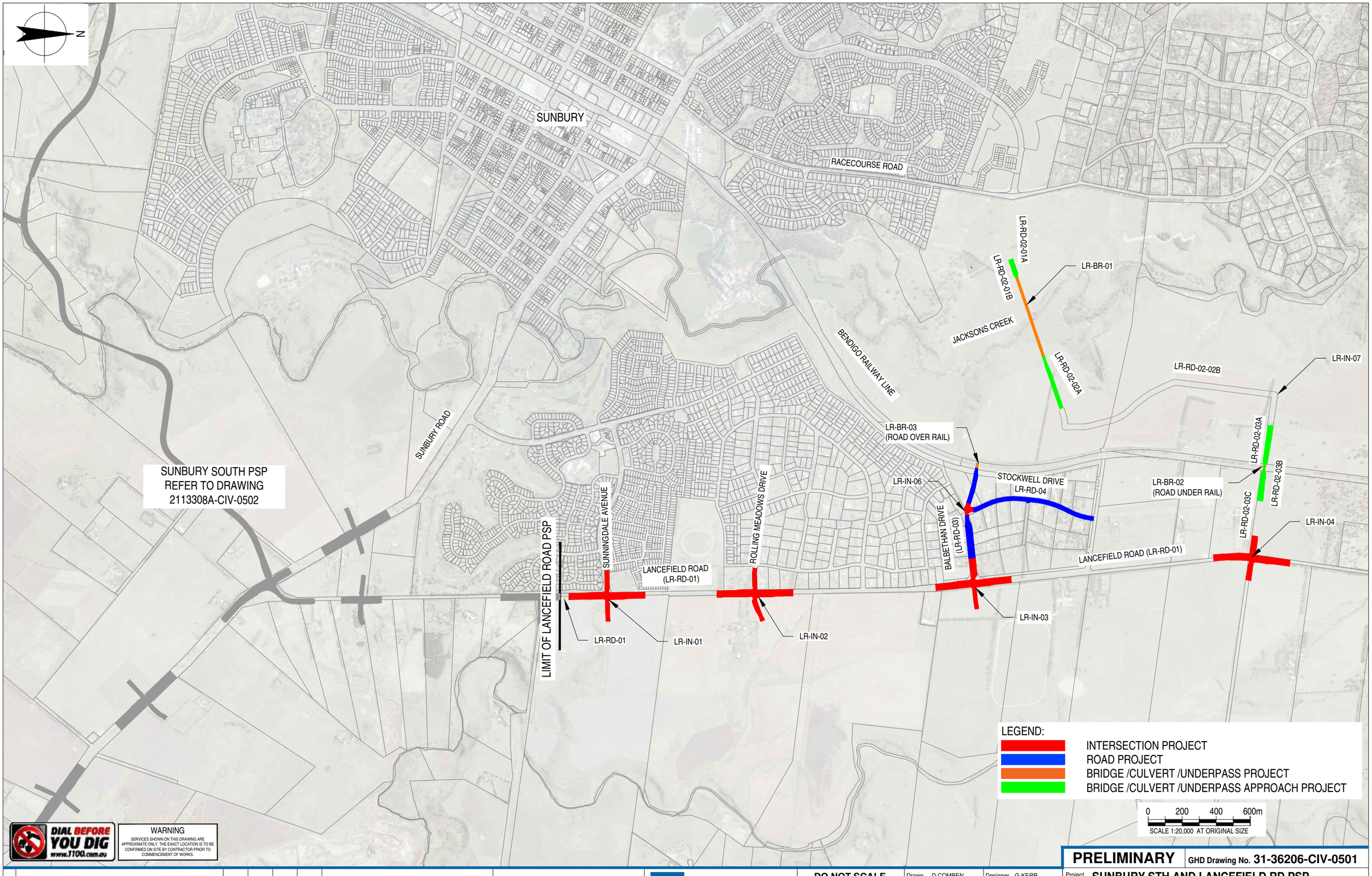
9. DECLARATION

I have made all the inquiries that I believe are desirable and appropriate and no matters of significance which I regard as relevant have to my knowledge been withheld from the Panel.

Mark Breuer
Managing Director
Spiire Australia Pty Ltd.

APPENDIX A

CONTEXT PLANS



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No	Revision	Drawn	Project Manager	Project Director	Date
J	INTERSECTION LR-IN-06 ADDED	SL	LM*	MW*	12.09.19
I	UPDATED PROJECT NAMING CONVENTION - GHD	SL	LM*	MW*	12.08.19
H	AMENDED TO VPA COMMENTS - GHD	SL	LM*	MW*	06.08.19

Note: * indicates signatures on original issue of drawing or last revision of drawing

Victorian Planning Authority

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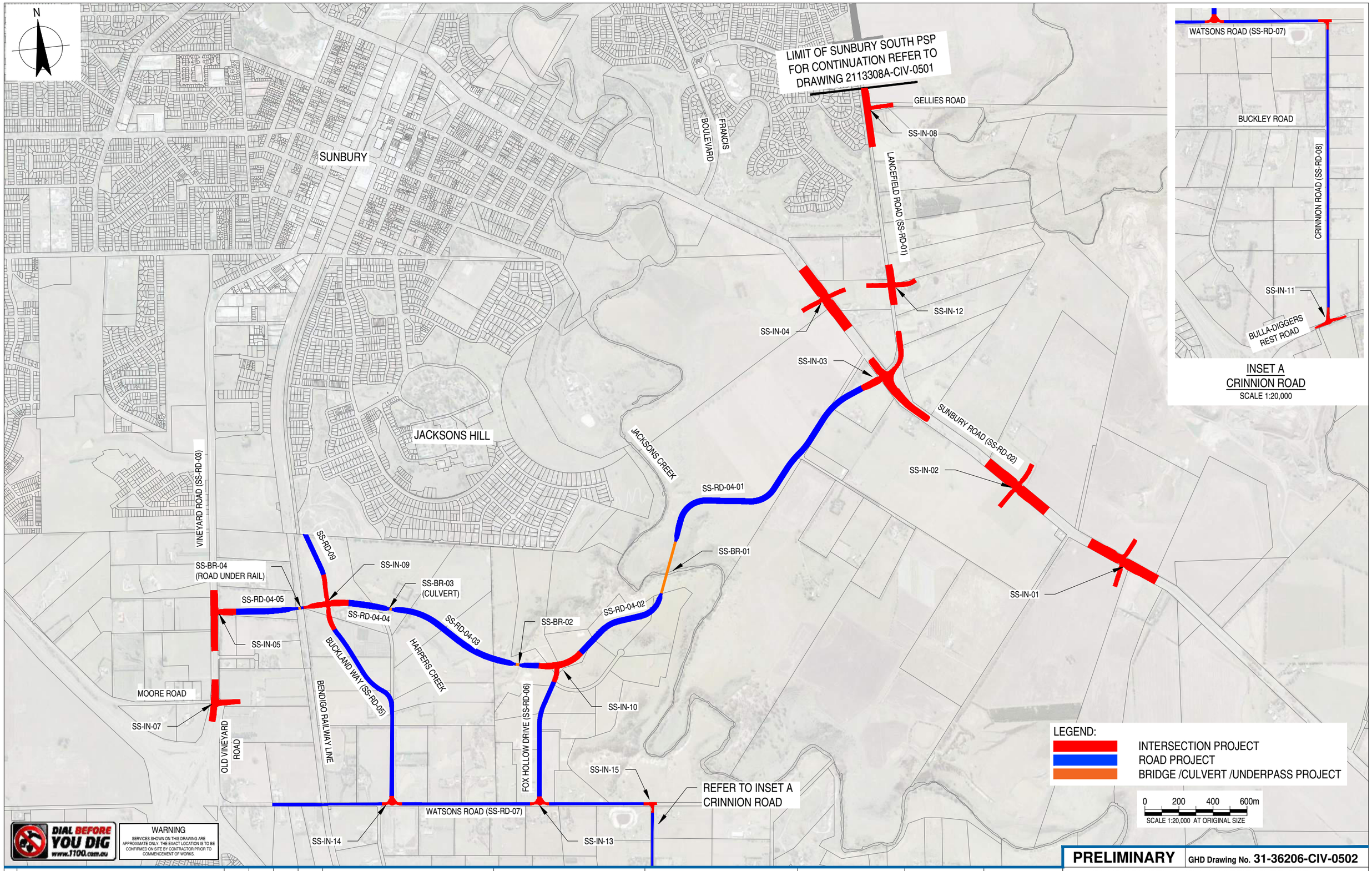
Drawn	D.COMBEN	Designer	G.KERR
Drafting Check		Design Check	
Approved (Project Director)			
Date			
Scale	AS SHOWN	This Drawing must not be used for Construction unless signed as Approved	

PRELIMINARY GHD Drawing No. 31-36206-CIV-0501

Project SUNBURY STH AND LANCEFIELD RD PSP
Title OVERALL LAYOUT PLAN
LANCEFIELD ROAD PSP

Original Size A3 Drawing No: 2113308A-CIV-0501 Rev: J

Plot Date: 18 September 2019 - 2:54 PM Plotted By: Shane Laybourne Cad File No: G:\31\36206\CADD\Drawings\31-36206-CIV-0501-0502.dwg



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No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Project Manager	Project Director	Date
K	ROAD PROJECT SS-RD-09 ADDED		SL	LM*	MW*	12.09.19
J	INTERSECTION SS-IN-15 ADDED		SL	LM*	MW*	21.08.19
I	INTERSECTION SS-IN-14 ADDED		SL	LM*	MW*	12.08.19
H	AMENDED TO VPA COMMENTS - GHD		SL	LM*	MW*	06.08.19

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Drawn	D.COMBEN	Designer	G.KERR
Drafting Check		Design Check	
Approved (Project Director)			
Date			
Scale	AS SHOWN	This Drawing must not be used for Construction unless signed as Approved	

PRELIMINARY GHD Drawing No. 31-36206-CIV-0502

Project **SUNBURY STH AND LANCEFIELD RD PSP**

Title **OVERALL LAYOUT PLAN SUNBURY SOUTH PSP**

Original Size **A3** Drawing No: **2113308A-CIV-0502** Rev: **K**

Plot Date: 18 September 2019 - 1:45 PM Plotted By: Shane Laybourne Cad File No: G:\31\36206\CADD\Drawings\31-36206-CIV-0501-0502.dwg

APPENDIX B

LANCEFIELD ROAD JACKSONS CREEK CROSSING (LR-BR-01) DESIGN OPTION A & B DRAWINGS

N

Jacksons Creek

Lancefield Road - Jacksons Creek Bridge LR-BR-01
Villawood Option A
Layout Overall

Co-ordinate Datum GDA94	Scale A1 1 : 2000	20 0 20 40 60 Lengths are in metres	
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Drawn By	DSC	Checked By	

REV	AMENDMENT	APPROVED	DATE

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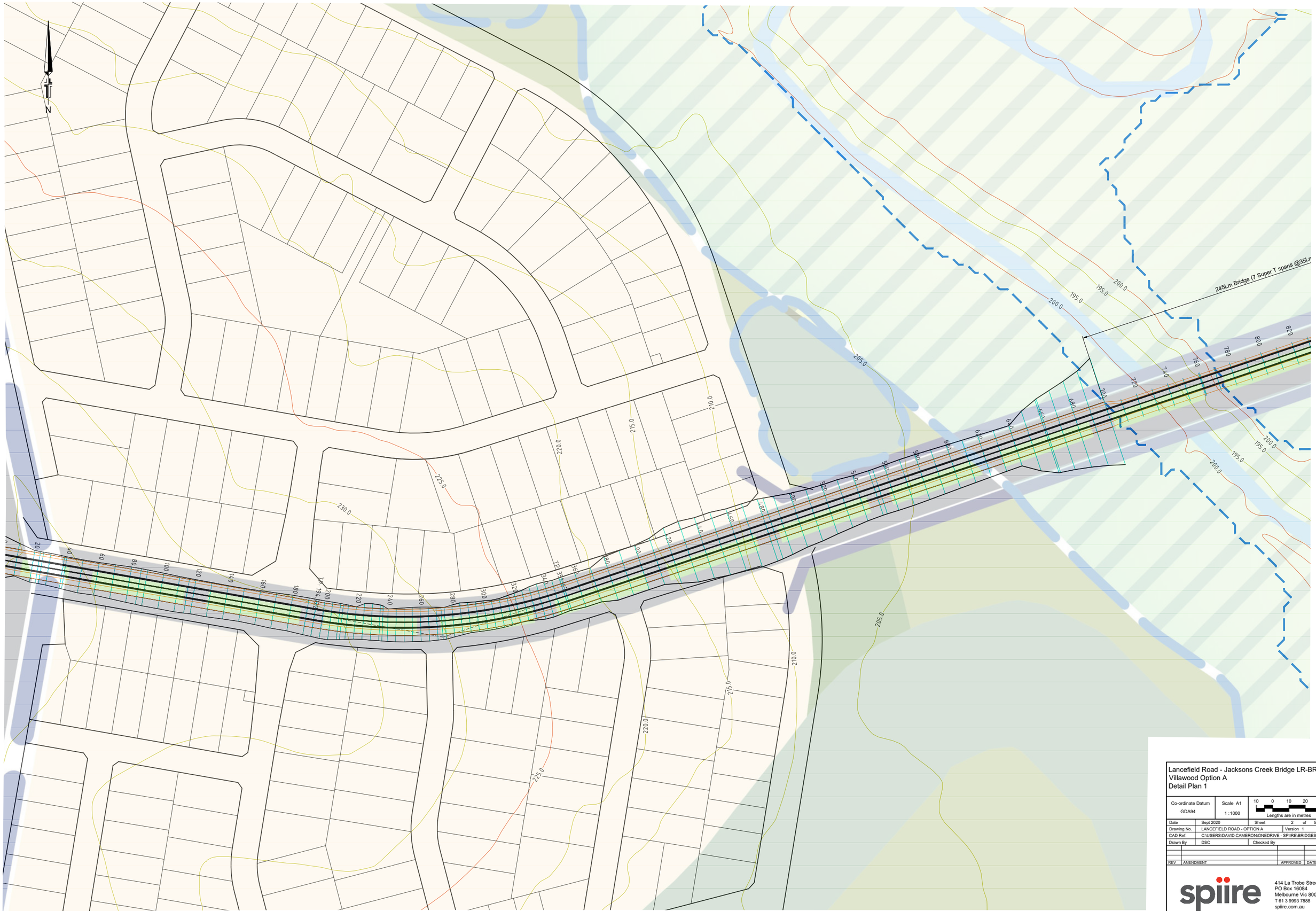

Lancefield Road - Jacksons Creek Bridge LR-BR-01
Villawood Option A
Detail Plan 1

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Drawn By	DSC	Checked By	

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245Lm Bridge (7 Super T spans @35Lm each)

Lancefield Road - Jacksons Creek Bridge LR-BR-01
Villawood Option A
Detail Plan 2

Co-ordinate Datum	GDA94	Scale A1	1 : 1000
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Drawing No.	LANCEFIELD ROAD - OPTION A	Version	1
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Drawn By	DSC	Checked By	

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VERT EXAG 1:5
Datum 185.000

DESIGN LEVELS	EXISTING LEVELS	DEPTH	CHAINAGE
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240.661	241.108	0.447	30.000
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240.172			
239.490	240.209	0.719	50.000
238.808	239.540	0.732	60.000
238.126	239.028	0.902	70.000
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237.032			
236.774	237.855	1.080	90.000
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234.430	235.587	1.156	180.000
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234.030	235.306	1.276	200.000
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215.934	214.253	-1.681	420.000
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214.134	212.225	-1.909	440.000
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211.434	209.411	-2.023	470.000
210.534	208.605	-1.929	480.000
210.214			
209.655	207.975	-1.680	490.000
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205.291	201.141	-4.150	700.000
205.688	200.904	-4.783	710.000
206.174	200.456	-5.719	720.000
206.752	199.985	-6.766	730.000
207.419	198.278	-9.141	740.000
208.177	194.972	-13.205	750.000

GHD ALIGNMENT SHERWOOD GRADING LONG SECTION

Lancefield Road - Jacksons Creek Bridge LR-BR-01
Villawood Option A
Longitudinal Section 1

Co-ordinate Datum	Scale A1	10 0 10 20 30
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Date	Sept 2020	Sheet	4 of 5
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CAD Ref.	C:\USERS\DAVID.CAMERON\ONEDRIVE - SPIIRE\BRIDGES		
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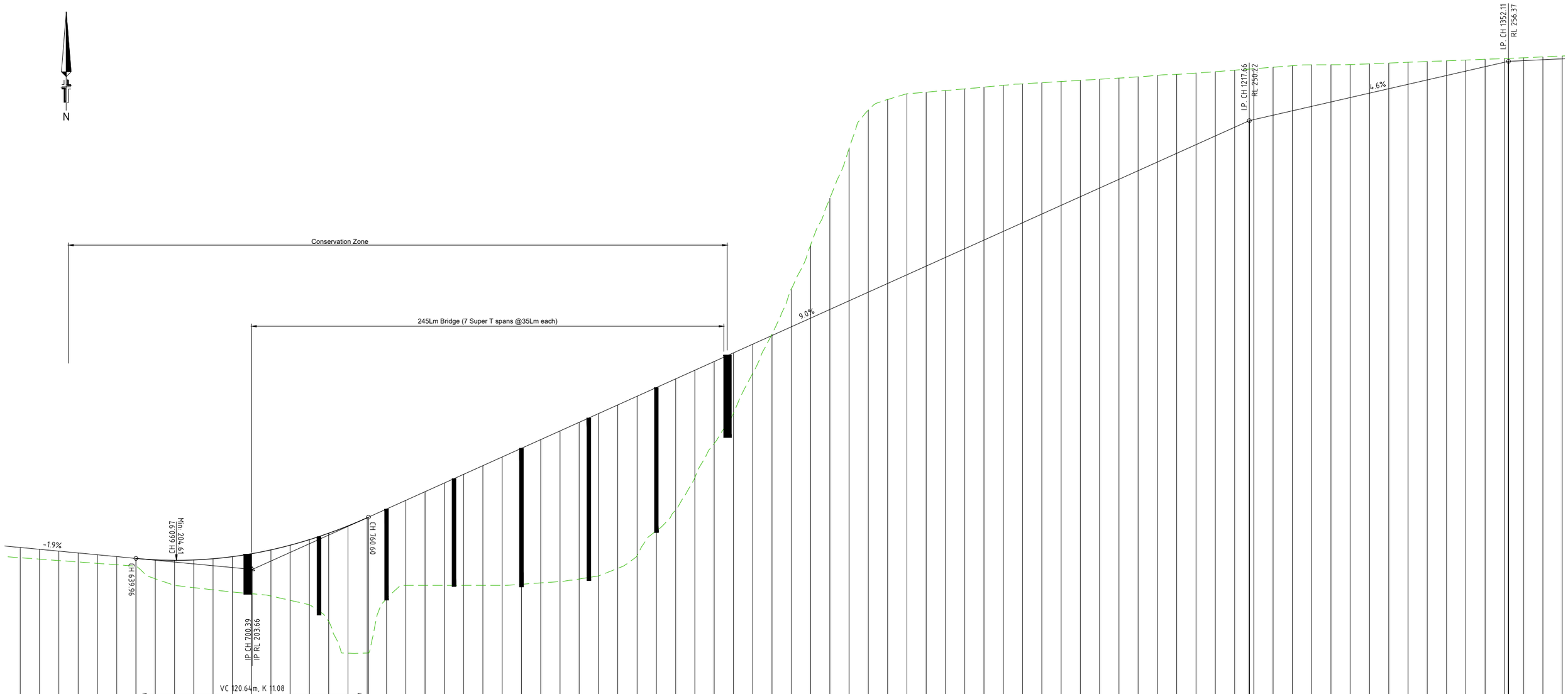

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620.000	-0.889	204.293	205.182
630.000	-0.844	204.149	204.993
640.000	-0.800	204.004	204.805
650.000	-1.964	202.696	204.804 204.660
660.000	-2.585	202.021	204.606
670.000	-2.870	201.773	204.643
680.000	-3.226	201.543	204.769
690.000	-3.665	201.320	204.985
700.000	-4.150	201.141	205.291
710.000	-4.783	200.904	205.688
720.000	-5.719	200.456	206.174
730.000	-6.766	199.985	206.752
740.000	-9.141	198.278	207.419
750.000	-13.205	194.972	208.177
760.000	-14.035	194.992	209.026
770.000	-9.305	200.621	209.080 209.926
780.000	-8.825	202.001	210.826
790.000	-9.723	202.003	211.726
800.000	-10.622	202.004	212.626
810.000	-11.520	202.006	213.526
820.000	-12.421	202.005	214.426
830.000	-13.322	202.005	215.326
840.000	-14.105	202.121	216.226
850.000	-14.864	202.262	217.126
860.000	-15.624	202.403	218.026
870.000	-16.259	202.667	218.926
880.000	-16.833	202.994	219.826
890.000	-16.955	203.772	220.726
900.000	-16.544	205.083	221.626
910.000	-14.860	207.666	222.526
920.000	-13.601	209.825	223.426
930.000	-11.143	213.183	224.326
940.000	-8.499	216.727	225.226
950.000	-6.262	219.864	226.126
960.000	-3.015	224.011	227.026
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1030.000	19.085	252.411	233.326
1040.000	18.777	253.003	234.226
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1070.000	16.585	253.511	236.926
1080.000	15.869	253.695	237.826
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1130.000	12.075	254.401	242.326
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1200.000	6.671	255.297	248.626
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1220.000	5.281	255.604	250.323
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1320.000	1.526	256.427	254.901
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1370.000	0.293	256.832	256.538
1380.000	0.289	256.921	256.631

Lancefield Road - Jacksons Creek Bridge LR-BR-01
Villawood Option A
Longitudinal Section 2

Co-ordinate Datum GDA94	Scale A1 1 : 1000	10 0 10 20 30 Lengths are in metres

Date	Sept 2020	Sheet	5 of 5
Drawing No.	LANCEFIELD ROAD - OPTION A	Version	1
CAD Ref.	C:\USERS\DAVID.CAMERON\ONEDRIVE - SPIIRE\BRIDGES		
Drawn By	DSC	Checked By	

REV	AMENDMENT	APPROVED	DATE

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Lancefield Road - Jacksons Creek Bridge LR-BR-01
Villawood Option B
Layout Overall

Co-ordinate Datum	GDA94	Scale A1	1 : 2000
		Lengths are in metres	20 0 20 40 60
Date	Sept 2020	Sheet	1 of 5
Drawing No.	LANCEFIELD ROAD - OPTION B	Version	1
CAD Ref.	C:\USERS\DAVID.CAMERON\ONEDRIVE - SPIIRE\BRIDGES		
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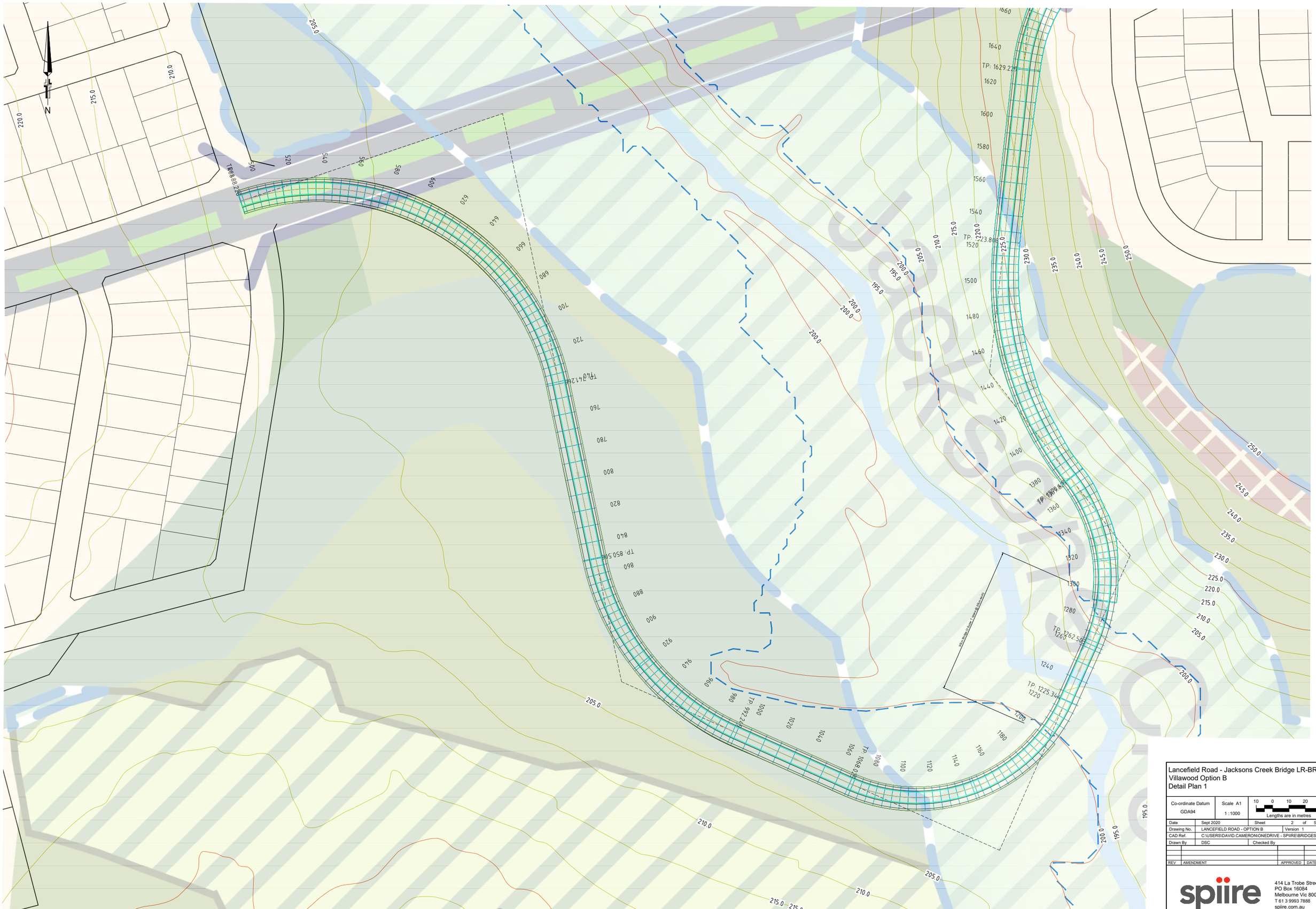

Lancefield Road - Jacksons Creek Bridge LR-BR-01
Villawood Option B
Detail Plan 1

Co-ordinate Datum GDA94	Scale A1 1 : 1000	10 0 10 20 30 Lengths are in metres	
Date	Sept 2020	Sheet	2 of 5
Drawing No.	LANCEFIELD ROAD - OPTION B		Version 1
CAD Ref.	C:\USERS\DAVID.CAMERON\ONEDRIVE - SPIIRE\BRIDGES		
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Lancefield Road - Jacksons Creek Bridge LR-BR-01
Villawood Option B
Detail Plan 2

Co-ordinate Datum GDA94	Scale A1 1 : 1000	10 0 10 20 30 Lengths are in metres	
Date	Sept 2020	Sheet	3 of 5
Drawing No.	LANCEFIELD ROAD - OPTION B		Version 1
CAD Ref.	C:\USERS\DAVID.CAMERON\ONEDRIVE - SPIIRE\BRIDGES		
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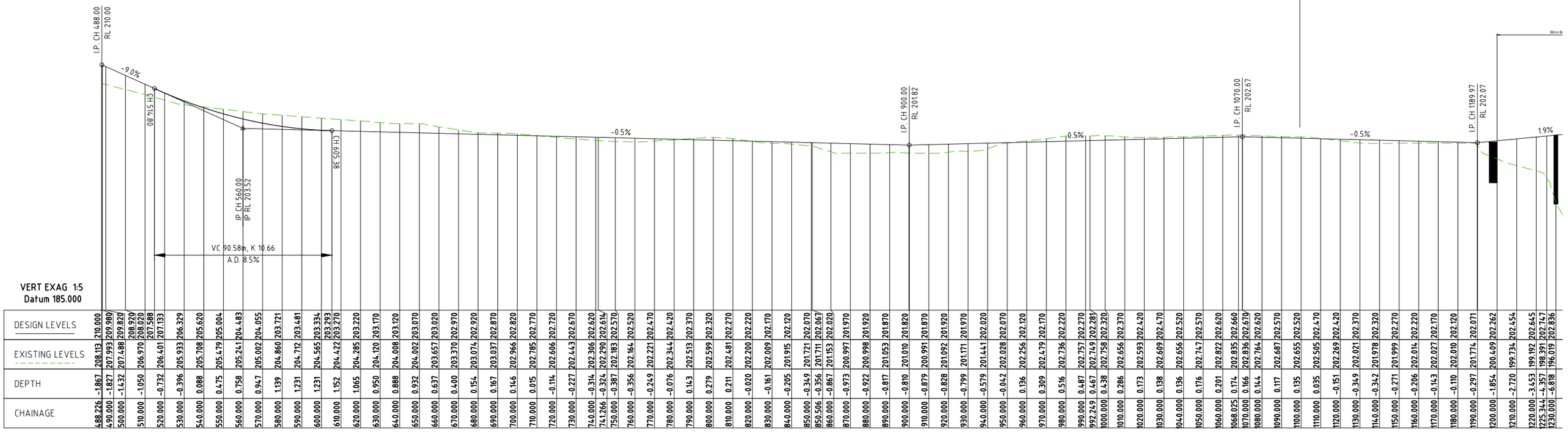

VERT EXAG 1:5
Datum 185.000

CHAINAGE	DEPTH	EXISTING LEVELS	DESIGN LEVELS
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500.000	-1.432	207.488	209.829
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520.000	-0.732	206.401	207.133
530.000	-0.396	205.933	206.329
540.000	0.088	205.708	205.620
550.000	0.475	205.479	205.004
560.000	0.758	205.241	204.483
570.000	0.947	205.002	204.055
580.000	1.139	204.860	203.721
590.000	1.231	204.712	203.481
600.000	1.231	204.565	203.334
610.000	1.152	204.422	203.270
620.000	1.065	204.285	203.220
630.000	0.950	204.120	203.170
640.000	0.888	204.008	203.120
650.000	0.932	204.002	203.070
660.000	0.637	203.657	203.020
670.000	0.400	203.370	202.970
680.000	0.154	203.074	202.920
690.000	0.167	203.037	202.870
700.000	0.146	202.966	202.820
710.000	0.015	202.785	202.770
720.000	-0.114	202.606	202.720
730.000	-0.227	202.443	202.670
740.000	-0.314	202.306	202.620
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750.000	-0.387	202.183	202.570
760.000	-0.356	202.164	202.520
770.000	-0.249	202.221	202.470
780.000	-0.076	202.344	202.420
790.000	0.143	202.513	202.370
800.000	0.279	202.599	202.320
810.000	0.211	202.481	202.270
820.000	-0.020	202.200	202.220
830.000	-0.161	202.009	202.170
840.000	-0.205	201.915	202.120
850.000	-0.349	201.721	202.070
850.506	-0.356	201.711	202.067
860.000	-0.867	201.153	202.020
870.000	-0.973	200.997	201.970
880.000	-0.922	200.998	201.920
890.000	-0.817	201.053	201.870
900.000	-0.810	201.010	201.820
910.000	-0.879	200.991	201.870
920.000	-0.828	201.092	201.920
930.000	-0.799	201.171	201.970
940.000	-0.579	201.441	202.020
950.000	-0.042	202.028	202.070
960.000	0.136	202.256	202.120
970.000	0.309	202.479	202.170
980.000	0.516	202.736	202.220
990.000	0.487	202.757	202.270
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1000.000	0.438	202.758	202.320
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1030.000	0.138	202.609	202.470
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1120.000	-0.151	202.269	202.420
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1220.000	-3.453	199.192	202.645
1225.344	-4.357	198.391	202.747
1230.000	-5.818	196.019	202.836

CL-9 LONG SECTION

Lancefield Road - Jacksons Creek Bridge LR-BR-01
Villawood Option B
Longitudinal Section 1

Co-ordinate Datum GDA94	Scale A1 1 : 1000	10 0 10 20 30 Lengths are in metres
Date	Sept 2020	Sheet 4 of 5
Drawing No.	LANCEFIELD ROAD - OPTION B	Version 1
CAD Ref.	C:\USERS\DAVID.CAMERON\ONEDRIVE - SPIIRE\BRIDGES	
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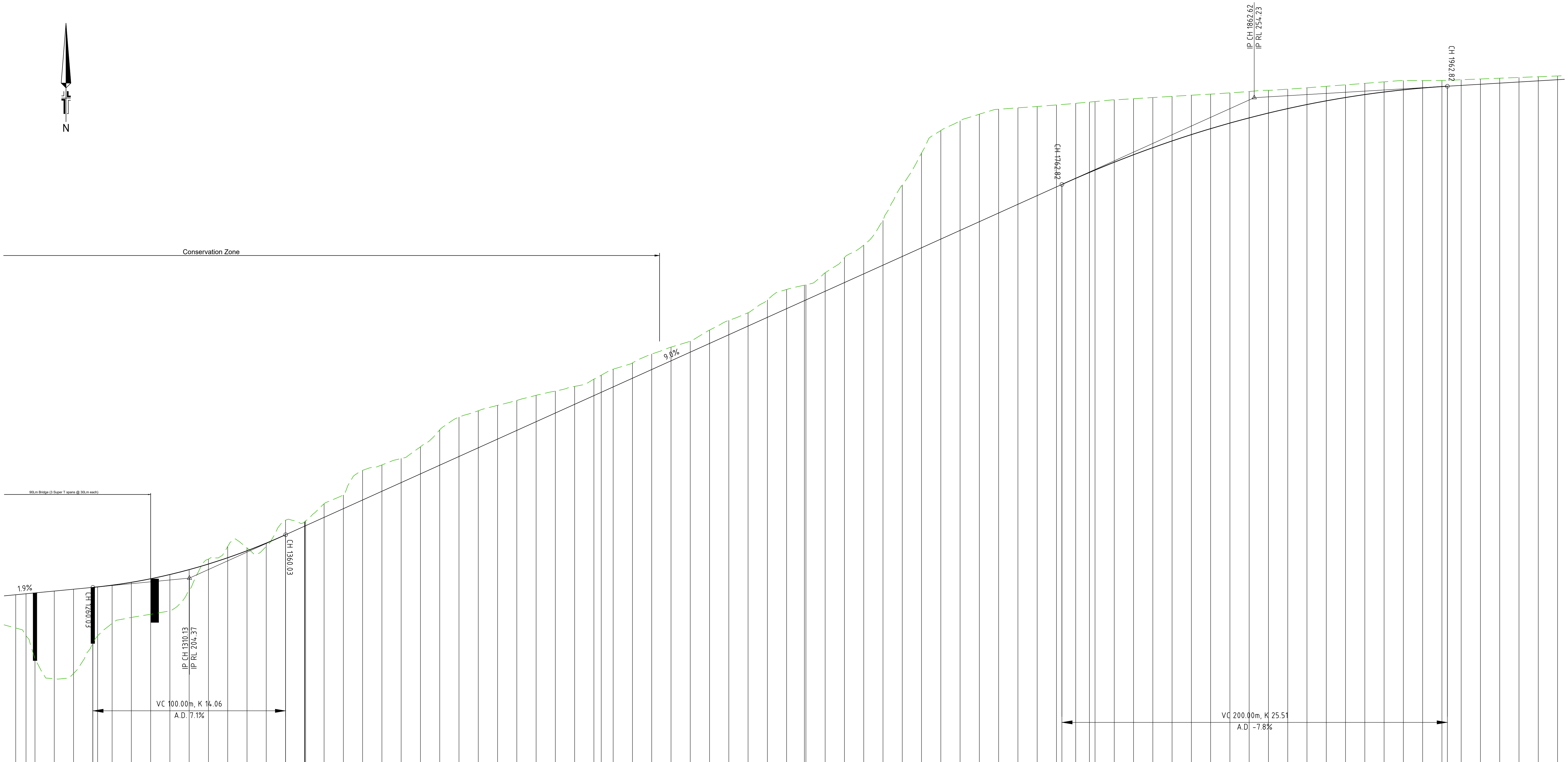

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1250.000	-8.746	194.473	203.219
1260.000	-5.787	197.623	203.411
			203.411
1262.503	-5.088	198.373	203.461
1270.000	-3.975	199.662	203.637
1280.000	-3.646	200.289	203.935
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1300.000	-3.760	200.982	204.742
1310.000	-2.125	203.127	205.252
1320.000	0.513	206.346	205.834
1330.000	1.174	207.660	206.486
1340.000	0.298	207.507	207.209
1350.000	-0.346	207.658	208.004
1360.000	1.510	210.381	208.871
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1369.829	0.448	210.206	209.758
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1380.000	1.406	212.082	210.676
1390.000	1.408	212.986	211.578
1400.000	3.070	215.551	212.481
1410.000	2.732	216.115	213.383
1420.000	2.499	216.785	214.286
1430.000	2.811	217.998	215.188
1440.000	3.666	219.756	216.090
1450.000	4.082	221.075	216.993
1460.000	3.843	221.738	217.895
1470.000	3.504	222.301	218.798
1480.000	3.113	222.814	219.700
1490.000	2.736	223.338	220.603
1500.000	2.272	223.777	221.505
1510.000	1.861	224.268	222.407
1520.000	1.709	225.019	223.310
1523.808	1.774	225.427	223.654
1530.000	1.839	226.052	224.212
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1570.000	1.132	228.954	227.822
1580.000	1.384	230.108	228.725
1590.000	1.486	231.113	229.627
1600.000	1.383	231.913	230.529
1610.000	1.808	233.240	231.432
1620.000	1.991	234.326	232.334
1629.229	1.601	234.769	233.167
1630.000	1.568	234.805	233.237
1640.000	1.925	236.064	234.139
1650.000	2.590	237.632	235.042
1660.000	2.985	238.929	235.944
1670.000	4.636	241.483	236.847
1680.000	7.395	245.144	237.749
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1740.000	10.012	253.175	243.164
1750.000	9.249	253.315	244.066
1760.000	8.507	253.476	244.969
			245.223
1770.000	7.781	253.642	245.861
1777.105	7.301	253.773	246.472
1780.000	7.106	253.821	246.715
1790.000	6.474	254.004	247.530
1800.000	5.815	254.121	248.306
1810.000	5.201	254.243	249.042
1820.000	4.627	254.366	249.739
1830.000	4.087	254.483	250.396
1840.000	3.583	254.597	251.015
1850.000	3.132	254.726	251.594
1860.000	2.733	254.867	252.134
1870.000	2.363	254.997	252.635
1880.000	2.017	255.114	253.096
1890.000	1.734	255.253	253.519
1900.000	1.507	255.409	253.902
1910.000	1.315	255.562	254.247
1920.000	1.163	255.715	254.552
1930.000	1.053	255.871	254.818
1940.000	0.956	256.002	255.045
1950.000	0.775	256.008	255.233
1960.000	0.634	256.017	255.382
			255.417
1970.000	0.587	256.090	255.503
1980.000	0.549	256.170	255.621
1990.000	0.510	256.249	255.740
2000.000	0.469	256.327	255.858
2010.000	0.428	256.405	255.977
2020.000	0.388	256.483	256.095

Lancefield Road - Jacksons Creek Bridge LR-BR-01
Villawood Option B
Longitudinal Section 2

Co-ordinate Datum	Scale A1	10 0 10 20 30
GDA94	1 :1000	Lengths are in metres

Date	Sept 2020	Sheet	5 of 5
Drawing No.	LANCEFIELD ROAD - OPTION B	Version	1
CAD Ref.	C:\USERS\DAVID.CAMERON\ONEDRIVE - SPIIRE\BRIDGES		
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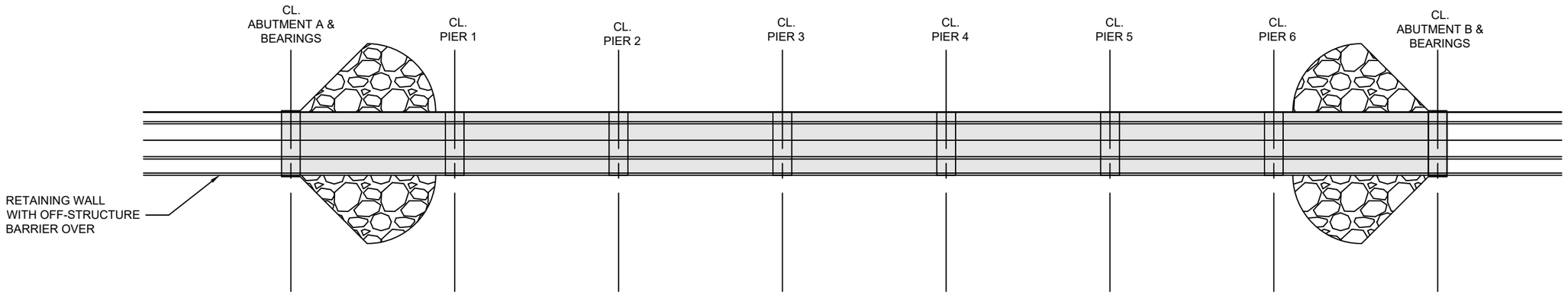

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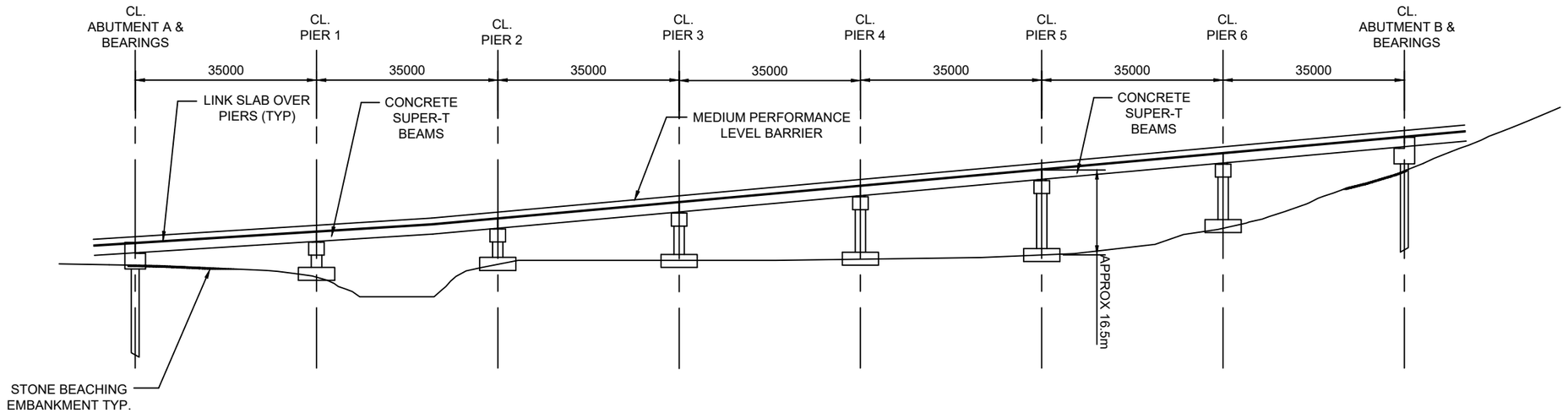

ELEVATION - OPTION A
1:1000

NOT FOR CONSTRUCTION

Revised By	In Serv	Rev.	Date	Description	Designed	Checked	Ind. Review	Approved
Hatch		A	2/10/2020	Concept Design				RH

Consultant

HATCH

Franchisee / Lessee

Communities Designed for Living

STRUCTURAL

LANCEFIELD ROAD

ALTERNATIVE OPTION A
GENERAL ARRANGEMENT
SHEET 1

File Name H-363928-STR-SKT-006

Sheet No.

In Serv.

Scale 1:1000

Sheet Size A3

Drawn By	Designed By
M SIMMONS	
Checked By	Ind. Review
Approved By	Approval Date
R HOWARD	

Drawing Number 006

Revision A

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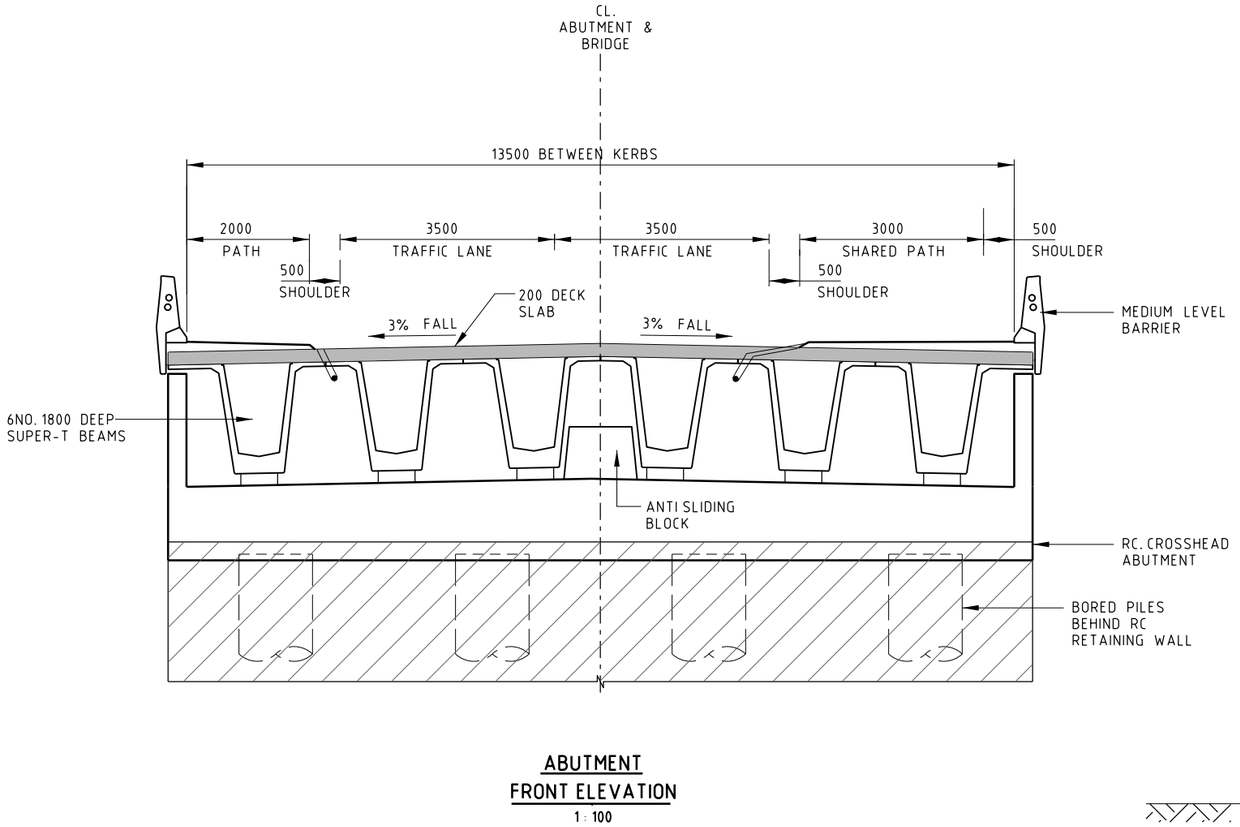
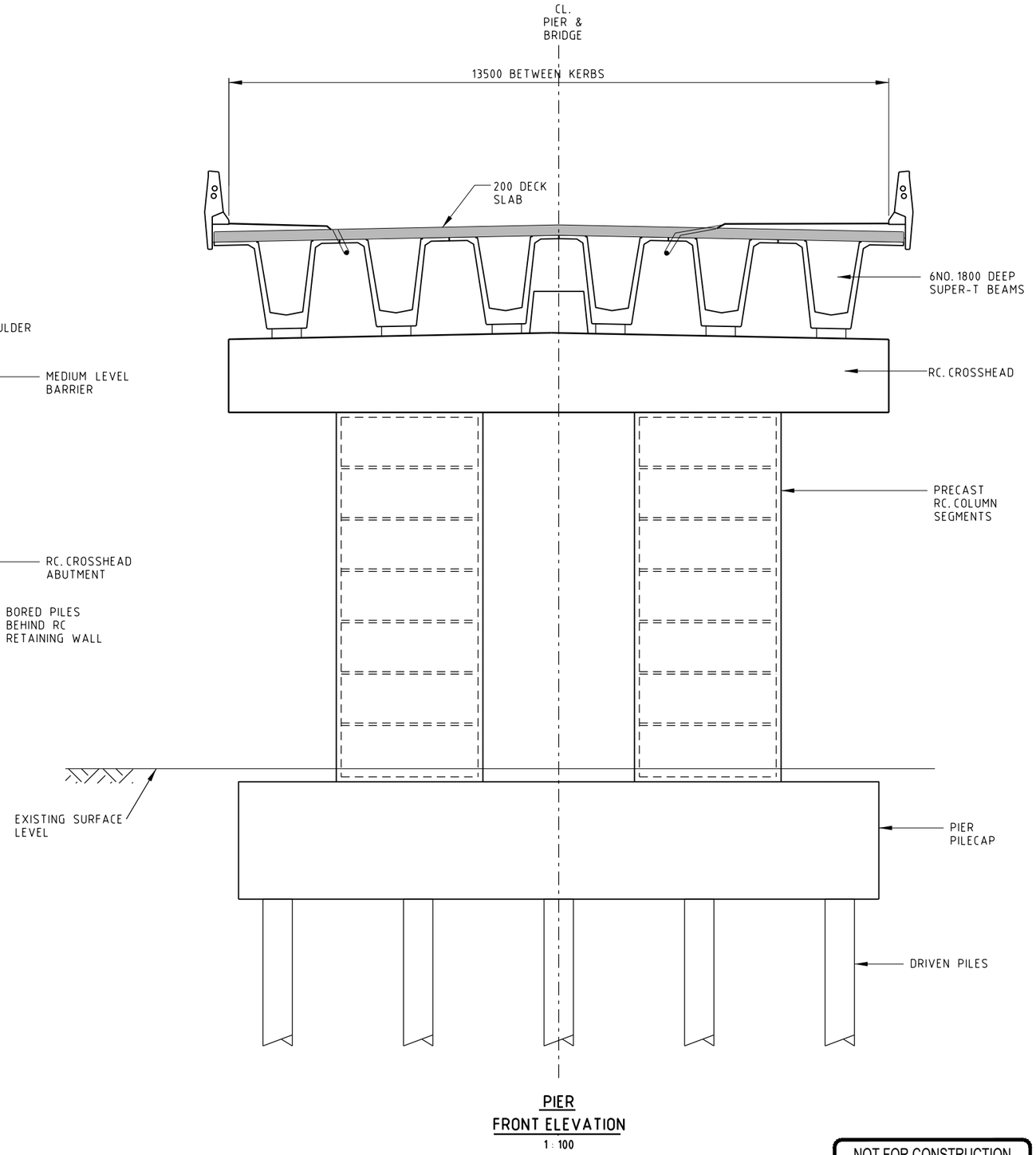


ABUTMENT
FRONT ELEVATION
1 : 100



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FRONT ELEVATION
1 : 100

NOT FOR CONSTRUCTION

Revised By	In Serv	Rev.	Date	Description	Designed	Checked	Ind. Review	Approved
Hatch		A	2/10/2020	Concept Design				RH

Consultant

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Franchisee / Lessee

villawood properties
Communities Designed for Living

STRUCTURAL

LANCEFIELD ROAD

ALTERNATIVE OPTION A
CROSS SECTIONS
SHEET 1

File Name	H-363928-STR-SKT-007
Sheet No.	
In Serv.	
Scale	1:1000
Sheet Size	A3

Drawn By: M SIMMONS	Designed By:
Checked By:	Ind. Review:
Approved By: R HOWARD	Approval Date:
Drawing Number: 007	Revision: A

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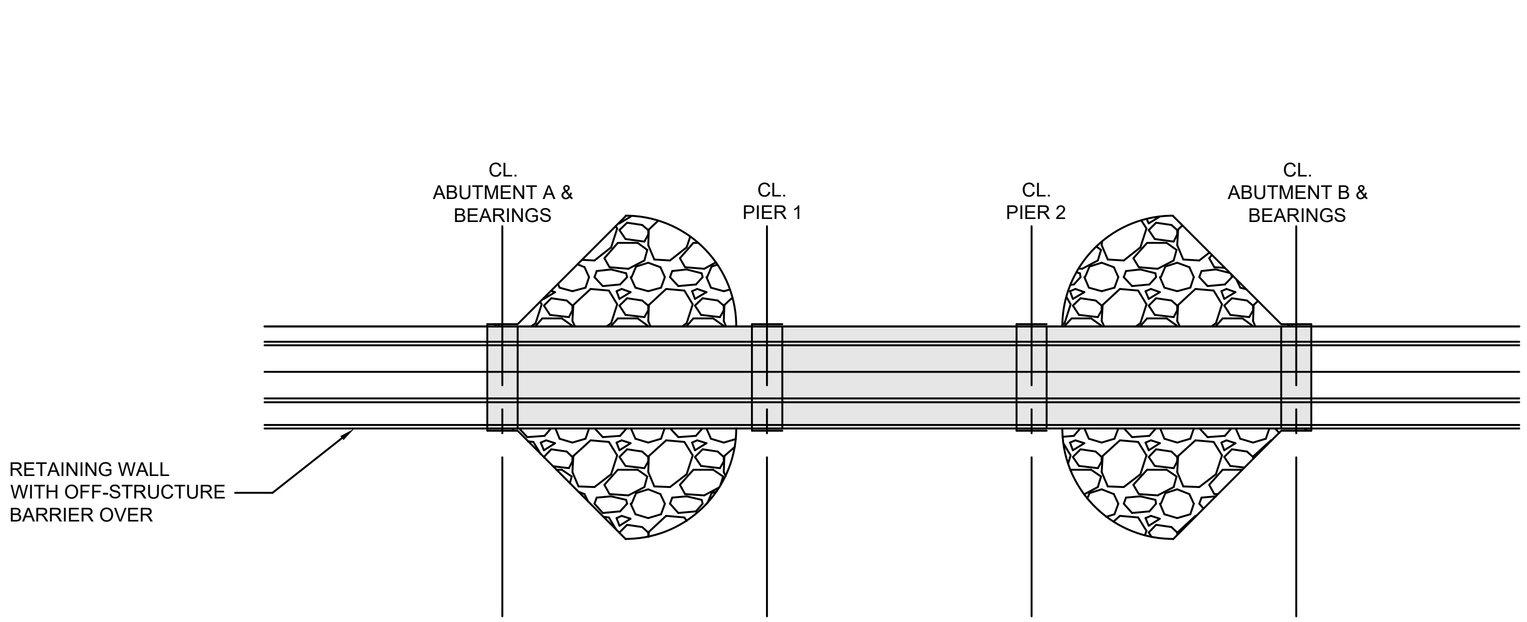

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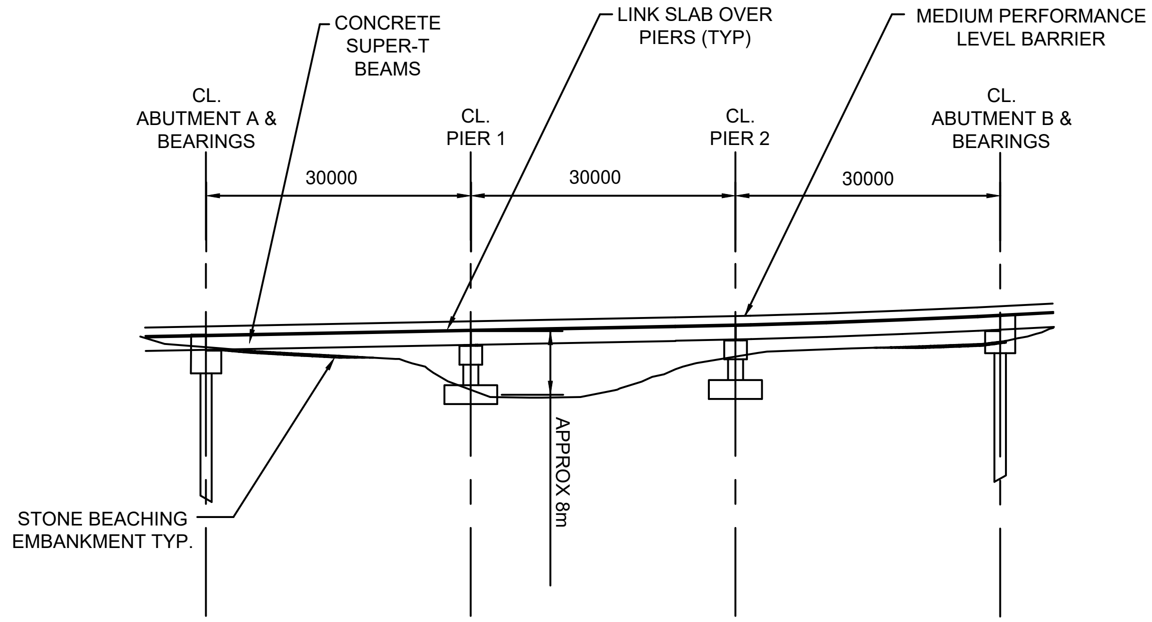

ELEVATION - OPTION B
1:1000

NOT FOR CONSTRUCTION

Revised By	In Serv	Rev.	Date	Description	Designed	Checked	Ind. Review	Approved
Hatch		A	2/10/2020	Concept Design				RH

Consultant
HATCH
Franchisee / Lessee
villawood properties
Communities Designed for Living

STRUCTURAL
LANCEFIELD ROAD
ALTERNATIVE OPTION B
GENERAL ARRANGEMENT
SHEET 1

File Name H-363928-STR-SKT-008
Sheet No.
In Serv.
Scale 1:1000
Sheet Size A3

Drawn By M SIMMONS
Designed By
Checked By
Ind. Review
Approval By R HOWARD
Approval Date
Drawing Number 008
Revision A

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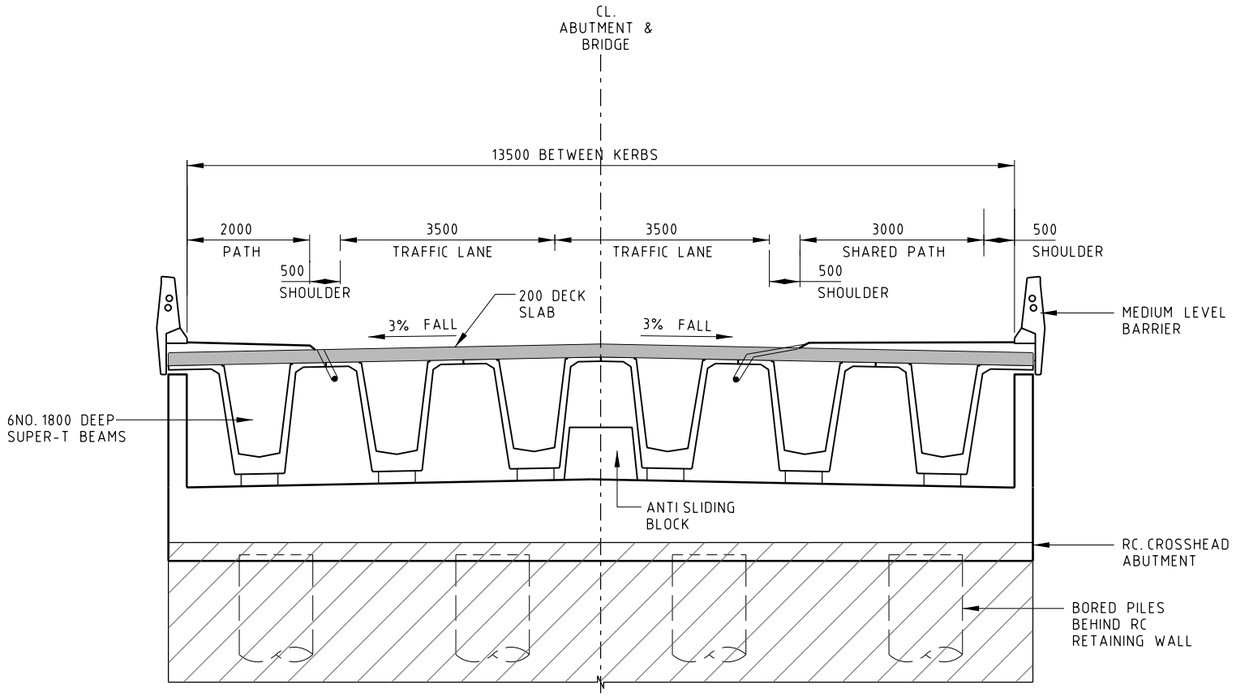
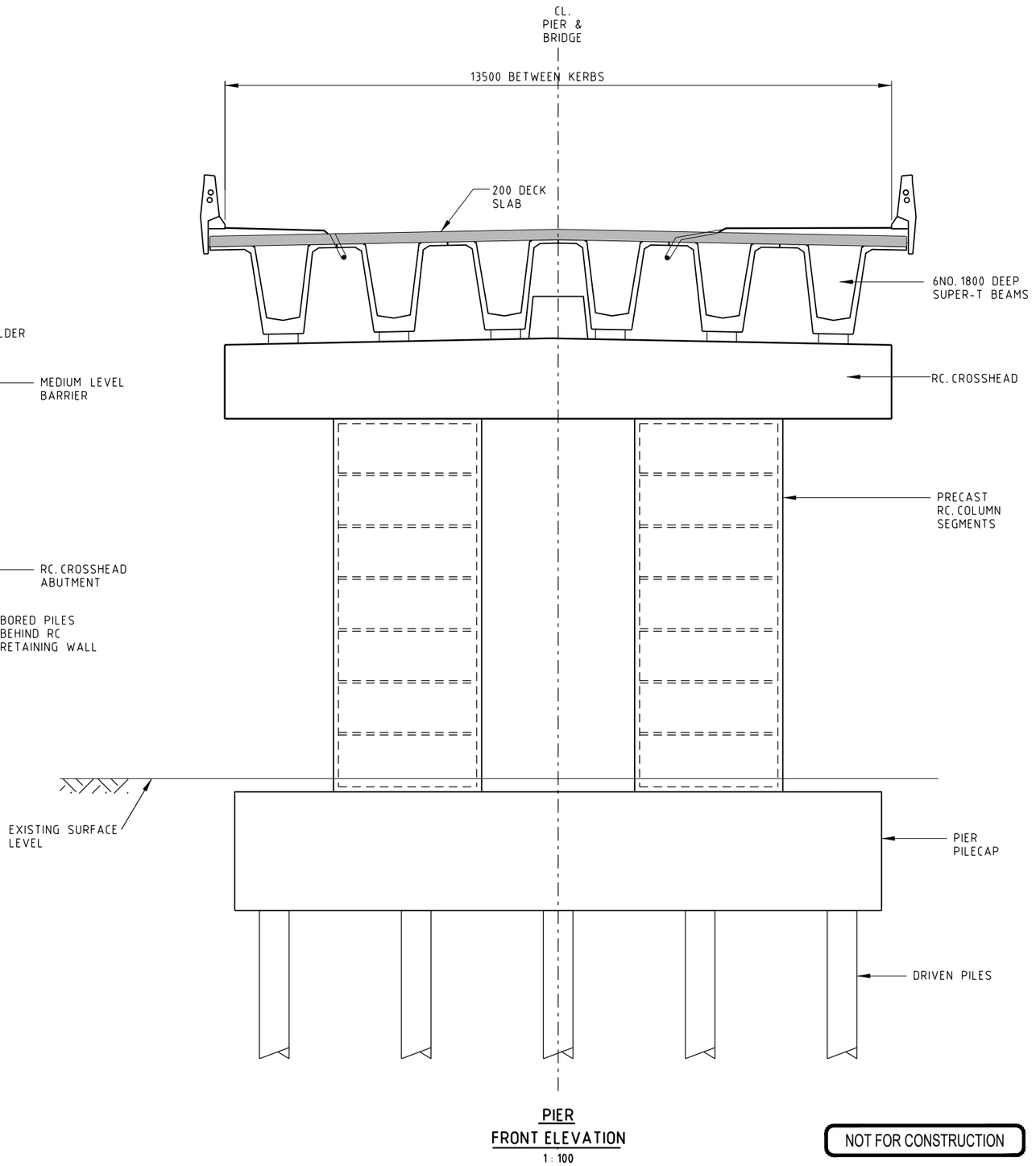


ABUTMENT
FRONT ELEVATION
1 : 100



PIER
FRONT ELEVATION
1 : 100

NOT FOR CONSTRUCTION

Revised By	In Serv	Rev.	Date	Description	Designed	Checked	Ind. Review	Approved
Hatch		A	2/10/2020	Concept Design				RH

Consultant

HATCH

Franchisee / Lessee

villawood properties
Communities Designed for Living

STRUCTURAL

LANCEFIELD ROAD

ALTERNATIVE OPTION B
CROSS SECTIONS
SHEET 1

File Name	H-363928-STR-SKT-009
Sheet No.	
In Serv.	
Scale	1:1000
Sheet Size	A3

Drawn By	M SIMMONS
Designed By	
Checked By	
Ind. Review	
Approval By	R HOWARD
Approval Date	
Drawing Number	009
Revision	A

10/01/2020 1:46:49 PM

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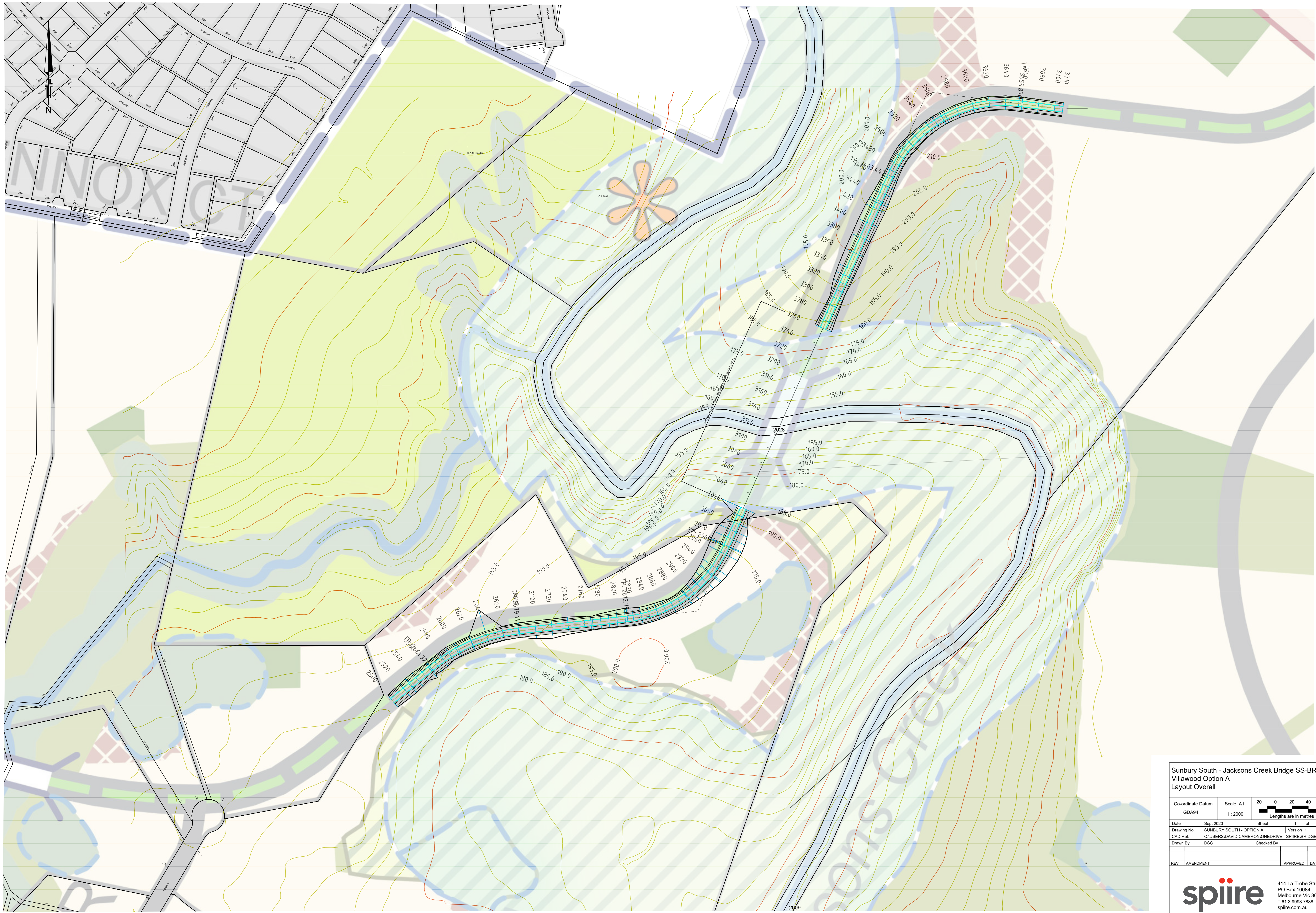
APPENDIX C

SUNBURY SOUTH JACKSONS CREEK CROSSING (SS-BR-01) DESIGN OPTION A & B DRAWINGS



Sunbury South - Jacksons Creek Bridge SS-BR-01
Villawood Option A
Layout Overall

Co-ordinate Datum	Scale A1	
GDA94	1 : 2000	20 0 20 40 60 Lengths are in metres

Date	Sept 2020	Sheet	1 of 5
Drawing No.	SUNBURY SOUTH - OPTION A	Version 1	
CAD Ref.	C:\USERS\DAVID.CAMERON\ONEDRIVE - SPIIRE\BRIDGES		
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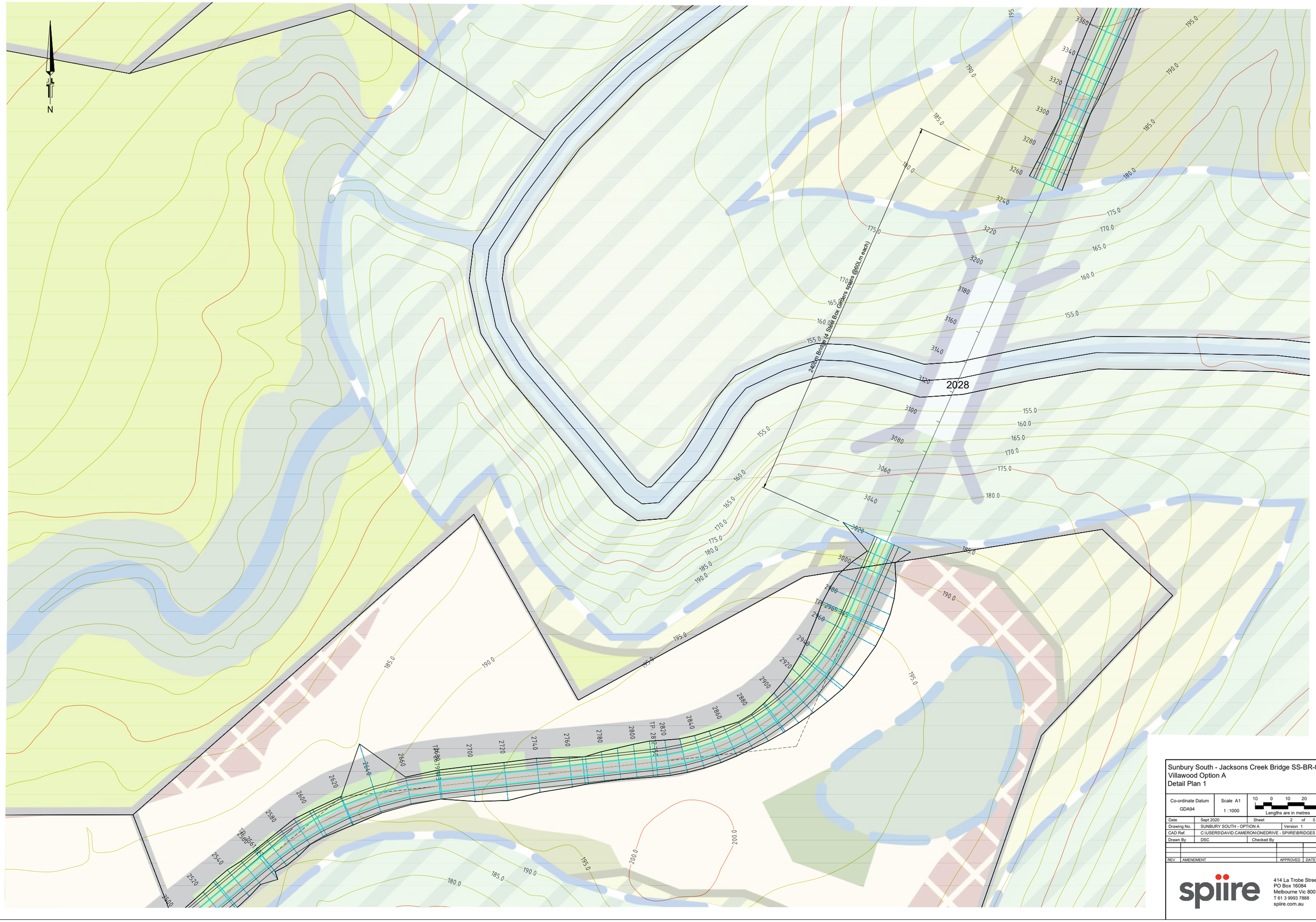

Sunbury South - Jacksons Creek Bridge SS-BR-01
Villawood Option A
Detail Plan 1

Co-ordinate Datum GDA94	Scale A1 1 : 1000	10 0 10 20 30 Lengths are in metres	
Date	Sept 2020	Sheet	2 of 5
Drawing No.	SUNBURY SOUTH - OPTION A		Version 1
CAD Ref.	C:\USERS\DAVID.CAMERON\ONEDRIVE - SPIIRE\BRIDGES		
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C.A.16 Sec.25

C.A.2007

2028

240m Bridge (4 Steel Box Girders spans @60.0m each)

Sunbury South - Jacksons Creek Bridge SS-BR-01
Villawood Option A
Detail Plan 2

Co-ordinate Datum GDA94	Scale A1 1 : 1000	10 0 10 20 30 Lengths are in metres	
Date	Sept 2020	Sheet	3 of 5
Drawing No.	SUNBURY SOUTH - OPTION A		Version 1
CAD Ref.	C:\USERS\DAVID.CAMERON\ONEDRIVE - SPIIRE\BRIDGES		
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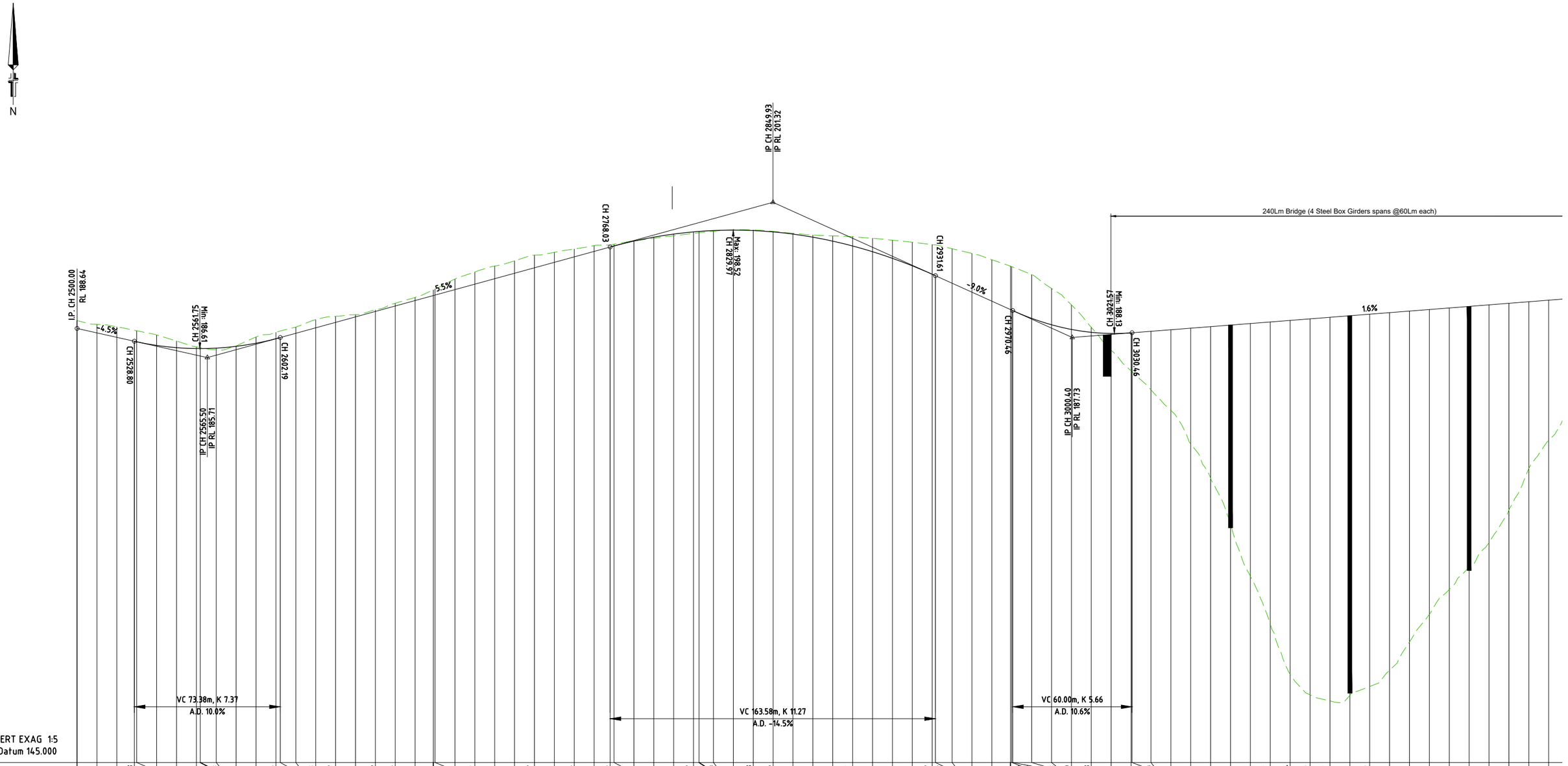

VERT EXAG 1:5
Datum 145.000

DESIGN LEVELS	188.635	188.188	187.741	187.348	187.295	186.932	186.705	186.614	186.612	186.658	186.837	187.153	187.604	187.721
EXISTING LEVELS		189.055	188.796		188.404	187.989	187.369	186.786	186.715	186.494	186.854	187.784	188.242	
DEPTH		0.866	1.055		1.109	1.057	0.663	0.172	0.104	-0.164	0.017	0.631	0.638	
CHAINAGE		2510.000	2520.000		2530.000	2540.000	2550.000	2560.000	2561.927	2570.000	2580.000	2590.000	2600.000	

DESIGN LEVELS	188.150	188.698	189.247	189.796	190.345	190.894	191.443	191.945	191.992	192.541	193.090	193.639	194.188	194.737
EXISTING LEVELS	188.777	189.521	189.853	190.019	190.496	191.172	191.760	192.515	192.590	193.603	194.320	194.911	195.433	196.009
DEPTH	0.627	0.823	0.606	0.223	0.151	0.278	0.317	0.570	0.598	1.062	1.230	1.272	1.246	1.272
CHAINAGE	2610.000	2620.000	2630.000	2640.000	2650.000	2660.000	2670.000	2679.143	2680.000	2690.000	2700.000	2710.000	2720.000	2730.000

DESIGN LEVELS	195.286	195.834	196.383	196.824	196.931	197.418	197.816	198.126	198.347	198.392	198.479	198.523	198.478	198.345
EXISTING LEVELS	196.289	196.625	196.971		197.102	197.447	197.705	197.957	198.188	198.258	198.413	198.546	198.546	198.399
DEPTH	1.003	0.791	0.588		0.172	0.029	-0.111	-0.169	-0.159	-0.134	-0.066	0.023	0.068	0.054
CHAINAGE	2740.000	2750.000	2760.000		2770.000	2780.000	2790.000	2800.000	2810.000	2812.750	2820.000	2830.000	2840.000	2850.000

DESIGN LEVELS	198.124	197.814	197.415	196.927	196.351	195.685	194.931	194.087	193.942	193.185	192.282	191.378	190.533	190.475
EXISTING LEVELS	198.208	198.029	197.943	197.862	197.707	197.513	197.303	197.068		196.655	196.178	195.544	194.897	194.849
DEPTH	0.085	0.216	0.529	0.934	1.356	1.827	2.372	2.981		3.470	3.897	4.165	4.365	4.374
CHAINAGE	2860.000	2870.000	2880.000	2890.000	2900.000	2910.000	2920.000	2930.000		2940.000	2950.000	2960.000	2969.365	2970.000

DESIGN LEVELS	190.433	189.653	189.008	188.540	188.248	188.132	188.193	188.200	188.349	188.505	188.662	188.818	188.975	189.131
EXISTING LEVELS		194.055	192.661	191.012	188.749	186.449	184.381		182.467	180.396	177.017	173.571	168.958	163.705
DEPTH		4.402	3.653	2.472	0.501	-1.683	-3.812		-5.882	-8.109	-11.645	-15.247	-20.017	-25.426
CHAINAGE		2980.000	2990.000	3000.000	3010.000	3020.000	3030.000		3040.000	3050.000	3060.000	3070.000	3080.000	3090.000

DESIGN LEVELS	189.287	189.444	189.600	189.757	189.913	190.070	190.226	190.383	190.539	190.695	190.852	191.008	191.165	191.321	191.478
EXISTING LEVELS	158.947	153.867	151.805	151.193	151.741	152.641	154.272	157.112	159.884	162.388	164.587	167.104	170.383	174.547	177.384
DEPTH	-30.341	-35.576	-37.796	-38.564	-38.172	-37.428	-35.954	-33.270	-30.655	-28.307	-26.265	-23.904	-20.782	-16.774	-14.094
CHAINAGE	3100.000	3110.000	3120.000	3130.000	3140.000	3150.000	3160.000	3170.000	3180.000	3190.000	3200.000	3210.000	3220.000	3230.000	3240.000

CL-5 LONG SECTION

Sunbury South - Jacksons Creek Bridge SS-BR-01
Villawood Option A
Longitudinal Section 1

Co-ordinate Datum GDA94	Scale A1 1 : 1000	10 0 10 20 30 Lengths are in metres	
Date	Sept 2020	Sheet	4 of 5
Drawing No.	SUNBURY SOUTH - OPTION A	Version 1	
CAD Ref.	C:\USERS\DAVID.CAMERON\ONEDRIVE - SPIIRE\BRIDGES		
Drawn By	DSC	Checked By	

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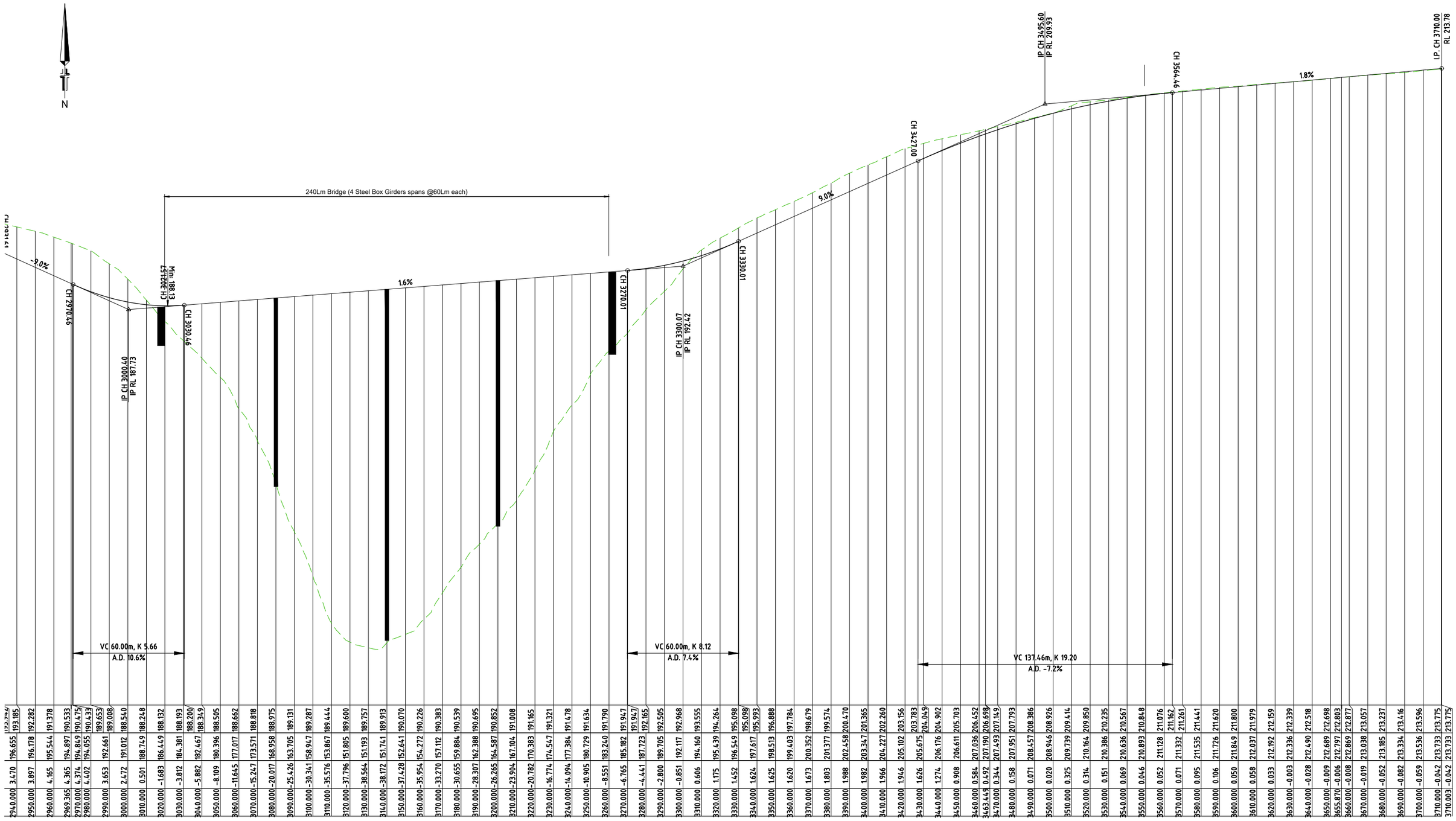

2940.000	3.470	196.655	193.185
2950.000	3.897	196.178	192.282
2960.000	4.165	195.544	191.378
2969.365	4.365	194.897	190.533
2970.000	4.374	194.849	190.475
			190.433
2980.000	4.402	194.055	189.653
2990.000	3.653	192.661	189.008
3000.000	2.472	191.012	188.540
3010.000	0.501	188.749	188.248
3020.000	-1.683	186.449	188.132
3030.000	-3.812	184.381	188.193
			188.200
3040.000	-5.882	182.467	188.349
3050.000	-8.109	180.396	188.505
3060.000	-11.645	177.017	188.662
3070.000	-15.247	173.571	188.818
3080.000	-20.017	168.958	188.975
3090.000	-25.426	163.705	189.131
3100.000	-30.341	158.947	189.287
3110.000	-35.576	153.867	189.444
3120.000	-37.796	151.805	189.600
3130.000	-38.564	151.193	189.757
3140.000	-38.172	151.741	189.913
3150.000	-37.428	152.641	190.070
3160.000	-35.954	154.272	190.226
3170.000	-33.270	157.112	190.383
3180.000	-30.655	159.884	190.539
3190.000	-28.307	162.388	190.695
3200.000	-26.265	164.587	190.852
3210.000	-23.904	167.104	191.008
3220.000	-20.782	170.383	191.165
3230.000	-16.774	174.547	191.321
3240.000	-14.094	177.384	191.478
3250.000	-10.905	180.729	191.634
3260.000	-8.551	183.240	191.790
3270.000	-6.765	185.182	191.947
			191.947
3280.000	-4.441	187.723	192.165
3290.000	-2.800	189.705	192.505
3300.000	-0.851	192.117	192.968
3310.000	0.606	194.160	193.555
3320.000	1.175	195.439	194.264
3330.000	1.452	196.549	195.098
			195.098
3340.000	1.624	197.617	195.993
3350.000	1.625	198.513	196.888
3360.000	1.620	199.403	197.784
3370.000	1.673	200.352	198.679
3380.000	1.803	201.377	199.574
3390.000	1.988	202.458	200.470
3400.000	1.982	203.347	201.365
3410.000	1.966	204.227	202.260
3420.000	1.946	205.102	203.156
			203.783
3430.000	1.626	205.675	204.049
3440.000	1.274	206.176	204.902
3450.000	0.908	206.611	205.703
3460.000	0.584	207.036	206.452
3463.449	0.492	207.190	206.698
3470.000	0.344	207.493	207.149
3480.000	0.158	207.951	207.793
3490.000	0.071	208.457	208.386
3500.000	0.020	208.946	208.926
3510.000	0.325	209.739	209.414
3520.000	0.314	210.164	209.850
3530.000	0.151	210.386	210.235
3540.000	0.069	210.636	210.567
3550.000	0.046	210.893	210.848
3560.000	0.052	211.128	211.076
			211.162
3570.000	0.071	211.332	211.261
3580.000	0.095	211.535	211.441
3590.000	0.106	211.726	211.620
3600.000	0.050	211.849	211.800
3610.000	0.058	212.037	211.979
3620.000	0.033	212.192	212.159
3630.000	-0.003	212.336	212.339
3640.000	-0.028	212.490	212.518
3650.000	-0.009	212.689	212.698
3655.870	-0.006	212.797	212.803
3660.000	-0.008	212.869	212.877
3670.000	-0.019	213.038	213.057
3680.000	-0.052	213.185	213.237
3690.000	-0.082	213.334	213.416
3700.000	-0.059	213.536	213.596
3710.000	-0.042	213.733	213.775
3710.003	-0.042	213.733	213.775

Sunbury South - Jacksons Creek Bridge SS-BR-01
Villawood Option A
Longitudinal Section 2

Co-ordinate Datum GDA94	Scale A1 1 :1000	10 0 10 20 30 Lengths are in metres
Date	Sept 2020	Sheet 5 of 5
Drawing No.	SUNBURY SOUTH - OPTION A	Version 1
CAD Ref.	C:\USERS\DAVID.CAMERON\ONEDRIVE - SPIIRE\BRIDGES	
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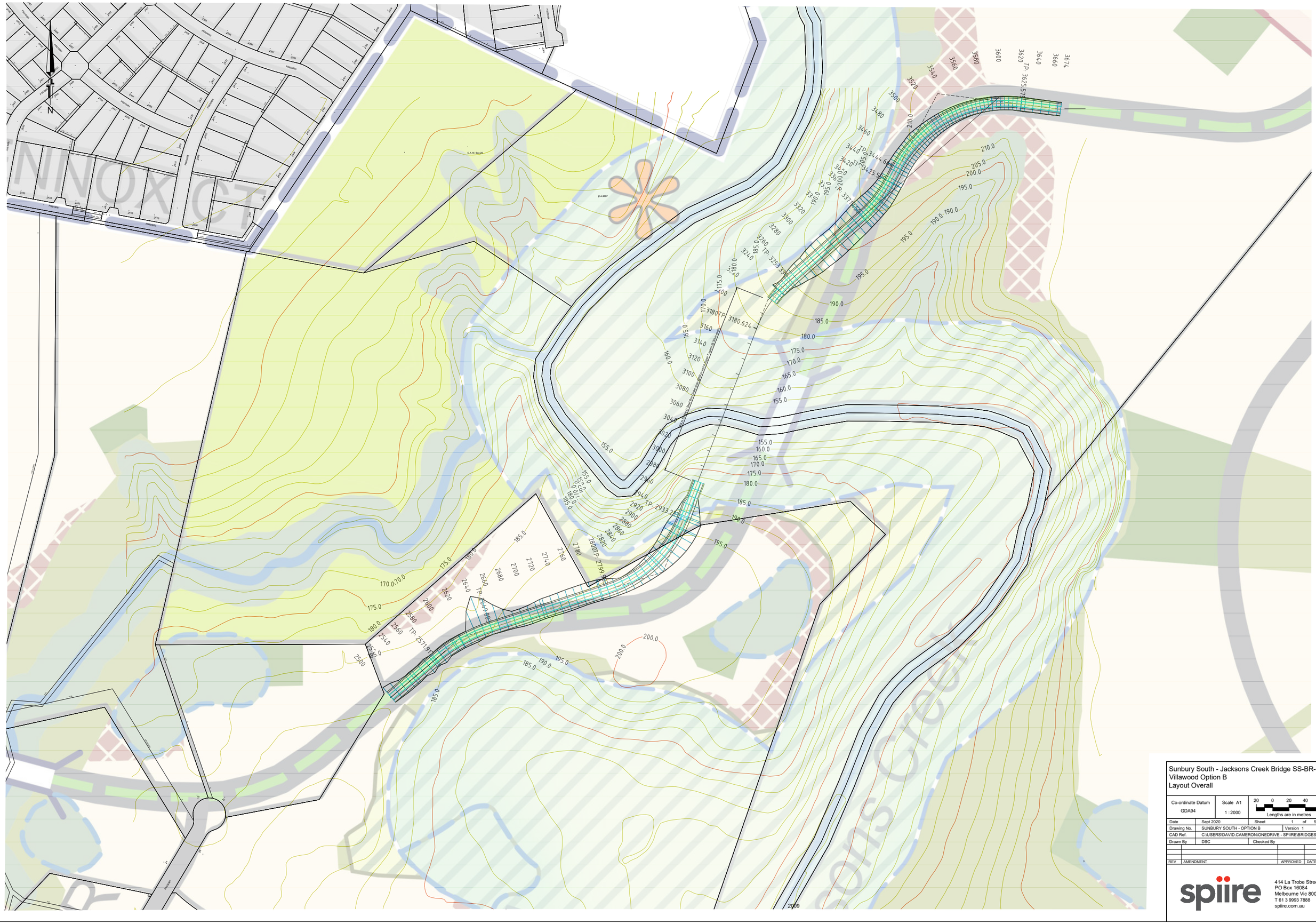

Sunbury South - Jacksons Creek Bridge SS-BR-01
Villawood Option B
Layout Overall

Co-ordinate Datum GDA94	Scale A1 1 : 2000	20 0 20 40 60 Lengths are in metres	
Date	Sept 2020	Sheet	1 of 5
Drawing No.	SUNBURY SOUTH - OPTION B	Version 1	
CAD Ref.	C:\USERS\DAVID.CAMERON\ONEDRIVE - SPIIRE\BRIDGES		
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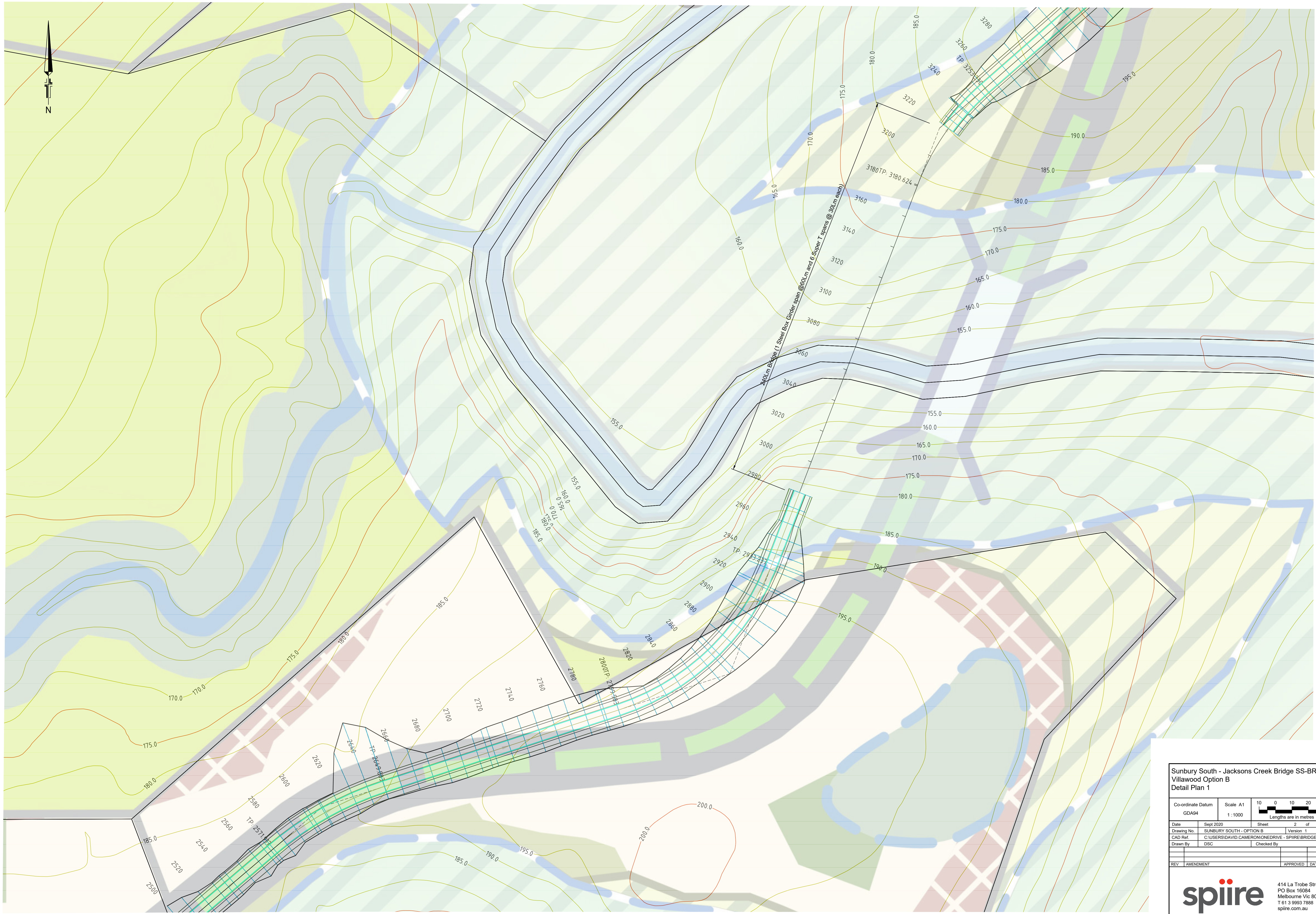

Sunbury South - Jacksons Creek Bridge SS-BR-01
Villawood Option B
Detail Plan 1

Co-ordinate Datum GDA94	Scale A1 1 :1000	10 0 10 20 30 Lengths are in metres
Date	Sept 2020	Sheet 2 of 5
Drawing No.	SUNBURY SOUTH - OPTION B	Version 1
CAD Ref.	C:\USERS\DAVID.CAMERON\ONEDRIVE - SPIIRE\BRIDGES	
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Villawood Option B
Detail Plan 2

Co-ordinate Datum	Scale A1	
GDA94	1 :1000	10 0 10 20 30 Lengths are in metres

Date	Sept 2020	Sheet	3 of 5
Drawing No.	SUNBURY SOUTH - OPTION B	Version 1	
CAD Ref.	C:\USERS\DAVID.CAMERON\ONEDRIVE - SPIIRE\BRIDGES		
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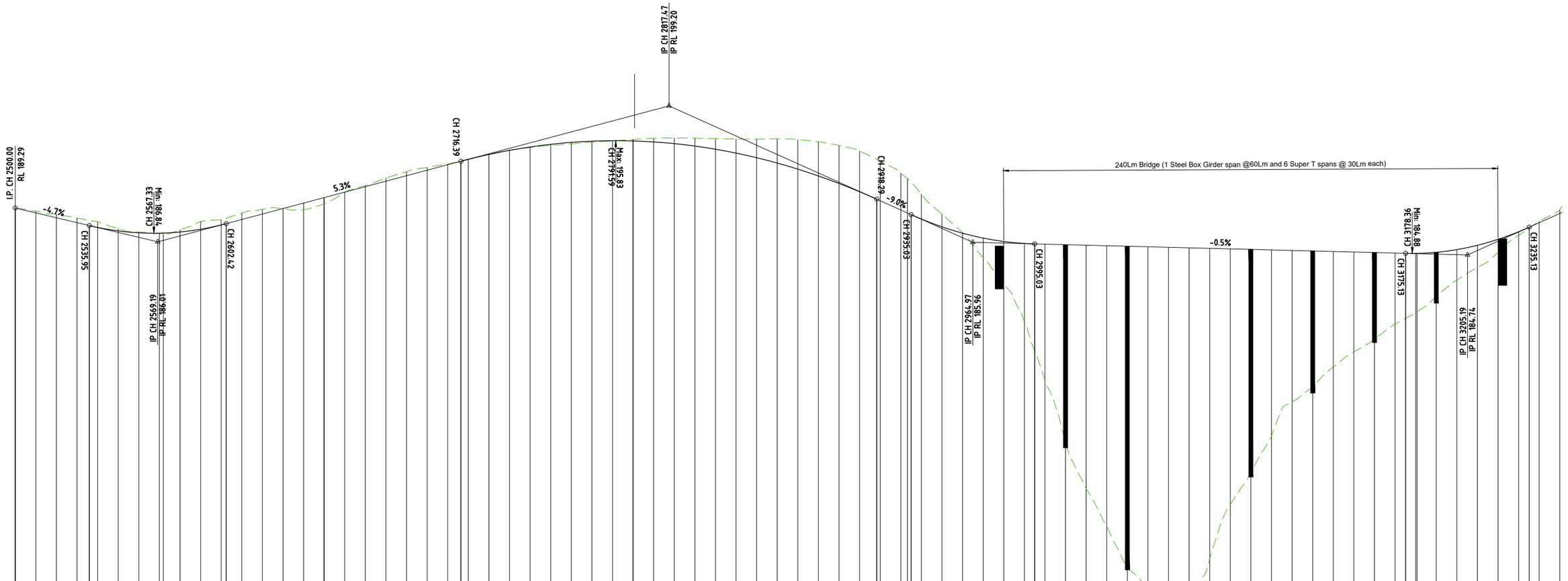

VERT EXAG 1:5
Datum 145.000

CHAINAGE	DESIGN LEVELS	EXISTING LEVELS	DEPTH
189.292			
2510.000	188.817	189.004	0.187
2520.000	188.342	188.688	0.346
2530.000	187.867	188.327	0.459
2540.000	187.584	187.953	0.548
2550.000	187.067	187.281	0.214
2560.000	186.881	186.964	0.083
2570.000	186.845	186.804	-0.041
2571.917	186.856	186.791	-0.065
2580.000	186.961	187.157	0.196
2590.000	187.229	187.988	0.760
2600.000	187.648	188.154	0.506
2610.000	187.772	188.805	0.630
2620.000	188.175	188.706	0.456
2630.000	188.706	189.162	-0.049
2640.000	189.238	189.189	-0.644
2649.883	189.769	189.125	-0.589
2650.000	190.294	189.705	-0.585
2660.000	190.832	189.716	-0.046
2670.000	191.363	190.786	0.106
2680.000	191.895	191.470	0.291
2690.000	192.426	192.186	0.390
2700.000	192.958	192.817	0.279
2710.000	193.489	193.236	0.069
2720.000	193.829	193.558	0.017
2730.000	194.016	194.033	0.033
2740.000	194.487	194.519	0.016
2750.000	194.886	194.903	-0.055
2760.000	195.215	195.160	-0.096
2770.000	195.474	195.377	-0.141
2780.000	195.661	195.520	-0.092
2790.000	195.778	195.686	-0.019
2799.983	195.825	195.806	0.140
2800.000	195.801	195.941	0.141
2810.000	195.706	196.057	0.351
2820.000	195.541	196.095	0.554
2830.000	195.305	196.070	0.765
2840.000	194.998	196.024	1.025
2850.000	194.621	195.986	1.364
2860.000	194.173	195.974	1.801
2870.000	193.654	196.008	2.354
2880.000	193.064	195.934	2.870
2890.000	192.404	195.720	3.317
2900.000	191.672	195.365	3.693
2910.000	190.869	194.819	3.950
2920.000	190.149	193.851	3.856
2930.000	189.995	192.665	3.567
2933.237	189.098	192.139	3.332
2940.000	188.807	190.643	2.426
2950.000	188.646	188.698	1.237
2960.000	188.217	186.899	0.052
2970.000	187.461	186.483	-1.089
2980.000	186.846	181.863	-4.178
2990.000	186.373	178.303	-7.546
3000.000	186.040	172.496	-13.284
3010.000	185.849	166.607	-19.122
3020.000	185.805	162.058	-23.620
3030.000	185.780	158.368	-27.259
3040.000	185.729	154.509	-31.067
3050.000	185.678	152.345	-33.180
3060.000	185.627	151.930	-33.545
3070.000	185.577	151.987	-33.437
3080.000	185.526	155.220	-30.154
3090.000	185.475	160.525	-24.798
3100.000	185.424	163.671	-21.601
3110.000	185.373	167.157	-18.064
3120.000	185.323	170.486	-14.684
3130.000	185.272	171.927	-13.192
3140.000	185.221	173.862	-11.206
3150.000	185.170	175.321	-9.696
3160.000	185.119	176.553	-8.414
3170.000	185.069	178.037	-6.879
3180.000	185.018	179.119	-5.765
3180.624	184.967	179.203	-5.683
3190.000	184.916	180.715	-4.274
3200.000	184.890	182.294	-2.957
3210.000	184.884	183.513	-2.159
3220.000	184.989	184.990	-1.260
3230.000	185.251	186.651	-0.335
3240.000	185.671	187.426	0.148
3250.000	188.762	189.115	0.353

CL-5 LONG SECTION

Sunbury South - Jacksons Creek Bridge SS-BR-01
Villawood Option B
Longitudinal Section 1

Co-ordinate Datum GDA94	Scale A1 1 : 1000	10 0 10 20 30 Lengths are in metres
Date	Sept 2020	Sheet 4 of 5
Drawing No.	SUNBURY SOUTH - OPTION B	Version 1
CAD Ref.	C:\USERS\DAVID.CAMERON\ONEDRIVE - SPIIRE\BRIDGES	
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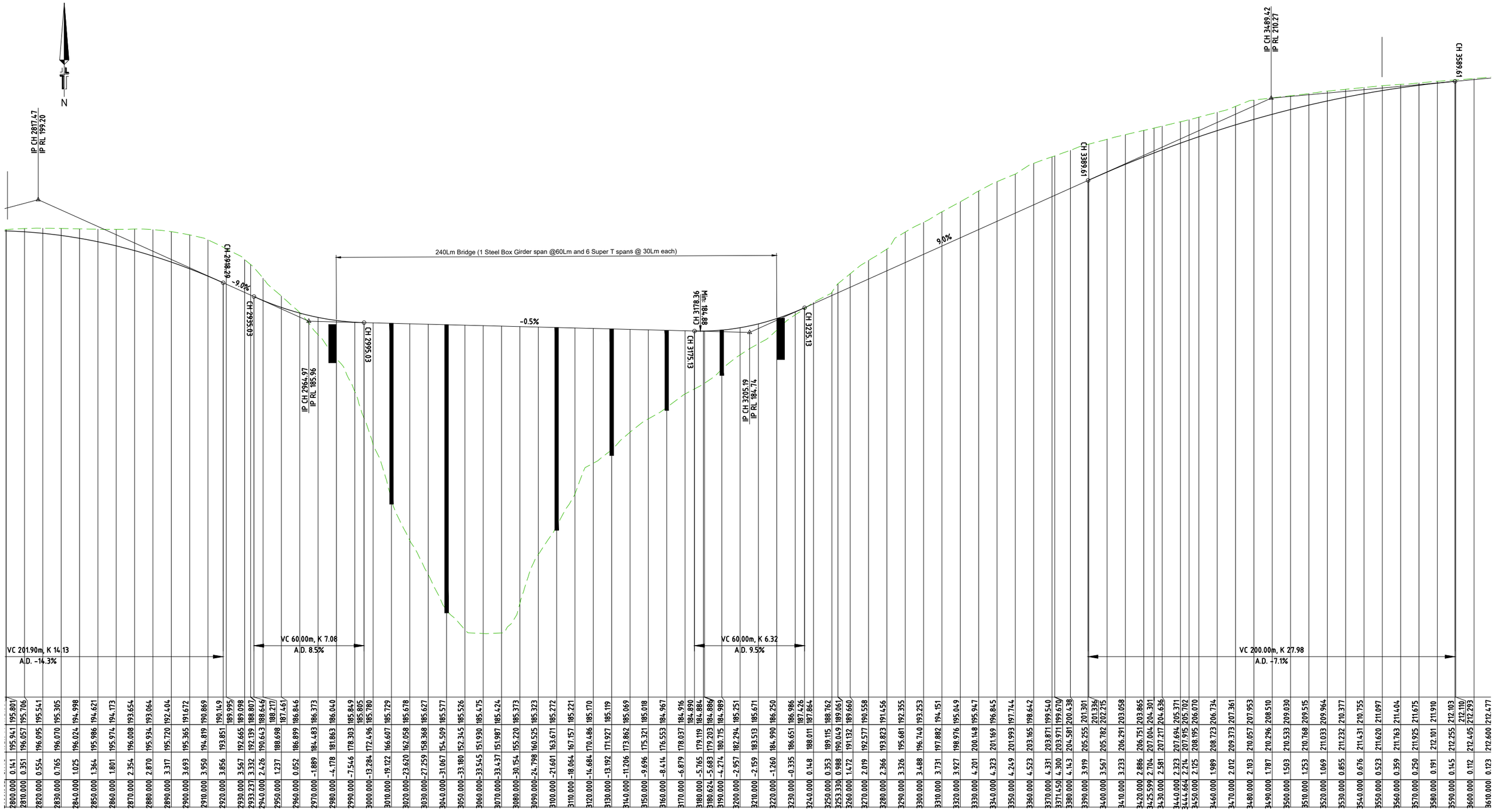

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195.706	196.057	0.351	2810.000
195.541	196.095	0.554	2820.000
195.305	196.070	0.765	2830.000
194.998	196.024	1.025	2840.000
194.621	195.986	1.364	2850.000
194.173	195.974	1.801	2860.000
193.654	196.008	2.354	2870.000
193.064	195.934	2.870	2880.000
192.404	195.720	3.317	2890.000
191.672	195.365	3.693	2900.000
190.869	194.819	3.950	2910.000
190.149			
189.995	193.851	3.856	2920.000
189.098	192.665	3.567	2930.000
188.807	192.139	3.332	2933.237
188.646			
188.217	190.643	2.426	2940.000
187.461	188.698	1.237	2950.000
186.846	186.899	0.052	2960.000
186.373	184.483	-1.889	2970.000
186.040	181.863	-4.178	2980.000
185.849	178.303	-7.546	2990.000
185.805			
185.780	172.496	-13.284	3000.000
185.729	166.607	-19.122	3010.000
185.678	162.058	-23.620	3020.000
185.627	158.368	-27.259	3030.000
185.577	154.509	-31.067	3040.000
185.526	152.345	-33.180	3050.000
185.475	151.930	-33.545	3060.000
185.424	151.987	-33.437	3070.000
185.373	155.220	-30.154	3080.000
185.323	160.525	-24.798	3090.000
185.272	163.671	-21.601	3100.000
185.221	167.157	-18.064	3110.000
185.170	170.486	-14.684	3120.000
185.119	171.927	-13.192	3130.000
185.069	173.862	-11.206	3140.000
185.018	175.321	-9.696	3150.000
184.967	176.553	-8.414	3160.000
184.916	178.037	-6.879	3170.000
184.890			
184.884	179.119	-5.765	3180.000
184.886	179.203	-5.683	3180.624
184.989	180.715	-4.274	3190.000
185.251	182.294	-2.957	3200.000
185.671	183.513	-2.159	3210.000
186.250	184.990	-1.260	3220.000
186.986	186.651	-0.335	3230.000
187.426			
187.864	188.011	0.148	3240.000
188.762	189.115	0.353	3250.000
189.061	190.049	0.988	3253.330
189.660	191.132	1.472	3260.000
190.558	192.577	2.019	3270.000
191.456	193.823	2.366	3280.000
192.355	195.681	3.326	3290.000
193.253	196.740	3.488	3300.000
194.151	197.882	3.731	3310.000
195.049	198.976	3.927	3320.000
195.947	200.148	4.201	3330.000
196.845	201.169	4.323	3340.000
197.744	201.993	4.249	3350.000
198.642	203.165	4.523	3360.000
199.540	203.871	4.331	3370.000
199.670	203.971	4.300	3371.450
200.438	204.581	4.143	3380.000
201.301			
201.336	205.255	3.919	3390.000
202.215	205.782	3.567	3400.000
203.058	206.291	3.233	3410.000
203.865	206.751	2.886	3420.000
204.301	207.004	2.704	3425.599
204.636	207.217	2.581	3430.000
205.371	207.694	2.323	3440.000
205.702	207.915	2.214	3444.664
206.070	208.195	2.125	3450.000
206.734	208.723	1.989	3460.000
207.361	209.373	2.012	3470.000
207.953	210.057	2.103	3480.000
208.510	210.296	1.787	3490.000
209.030	210.533	1.503	3500.000
209.515	210.768	1.253	3510.000
209.964	211.033	1.069	3520.000
210.377	211.232	0.855	3530.000
210.755	211.431	0.676	3540.000
211.097	211.620	0.523	3550.000
211.404	211.763	0.359	3560.000
211.675	211.925	0.250	3570.000
211.910	212.101	0.191	3580.000
212.103			
212.110	212.255	0.145	3590.000
212.293	212.405	0.112	3600.000
212.477	212.600	0.123	3610.000

Sunbury South - Jacksons Creek Bridge SS-BR-01
Villawood Option B
Longitudinal Section 2

Co-ordinate Datum GDA94	Scale A1 1 :1000	10 0 10 20 30 Lengths are in metres

Date	Sept 2020	Sheet	5 of 5
Drawing No.	SUNBURY SOUTH - OPTION B	Version 1	
CAD Ref.	C:\USERS\DAVID.CAMERON\ONEDRIVE - SPIIRE\BRIDGES		
Drawn By	DSC	Checked By	

REV	AMENDMENT	APPROVED	DATE

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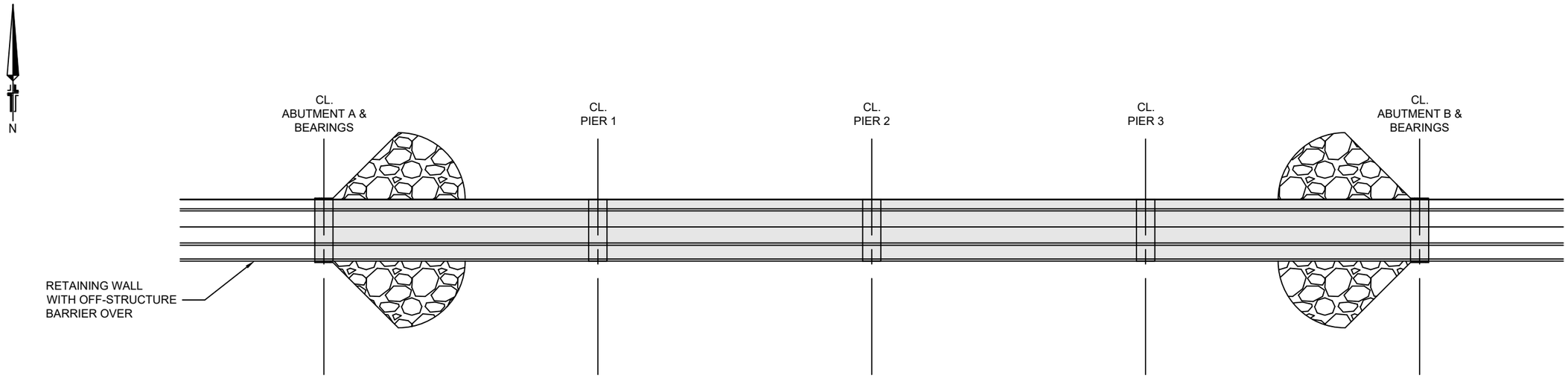

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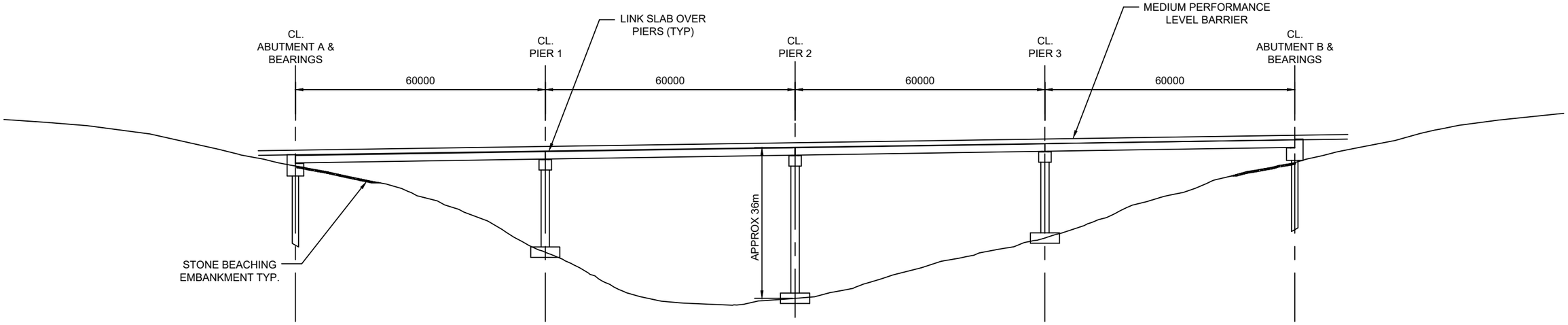

ELEVATION - OPTION A
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villawood properties
Communities Designed for Living

STRUCTURAL

SUNBURY SOUTH

ALTERNATIVE OPTION A
GENERAL ARRANGEMENT
SHEET 1

File Name	H-363928-STR-SKT-001
Sheet No.	
In Serv.	
Scale	1:1000
Sheet Size	A3

Drawn By	M SIMMONS
Designed By	
Checked By	
Ind. Review	
Approval By	R HOWARD
Approval Date	
Drawing Number	001
Revision	A

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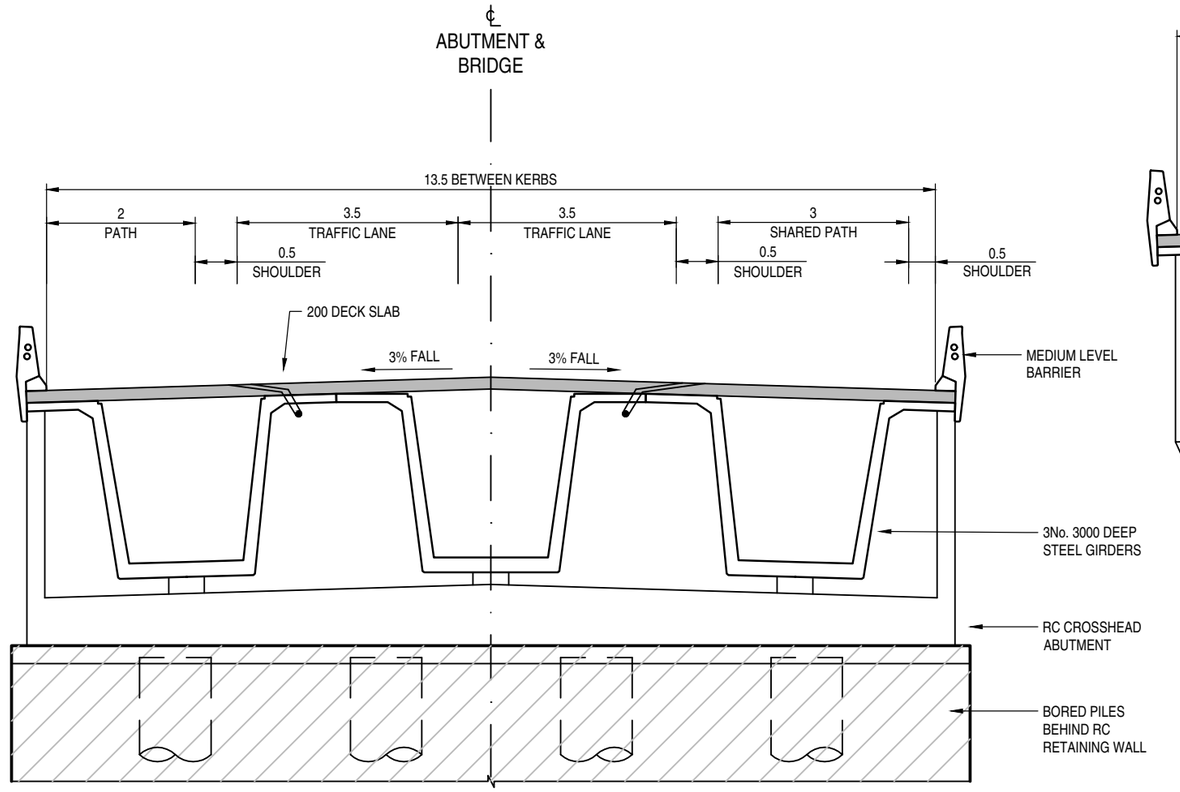
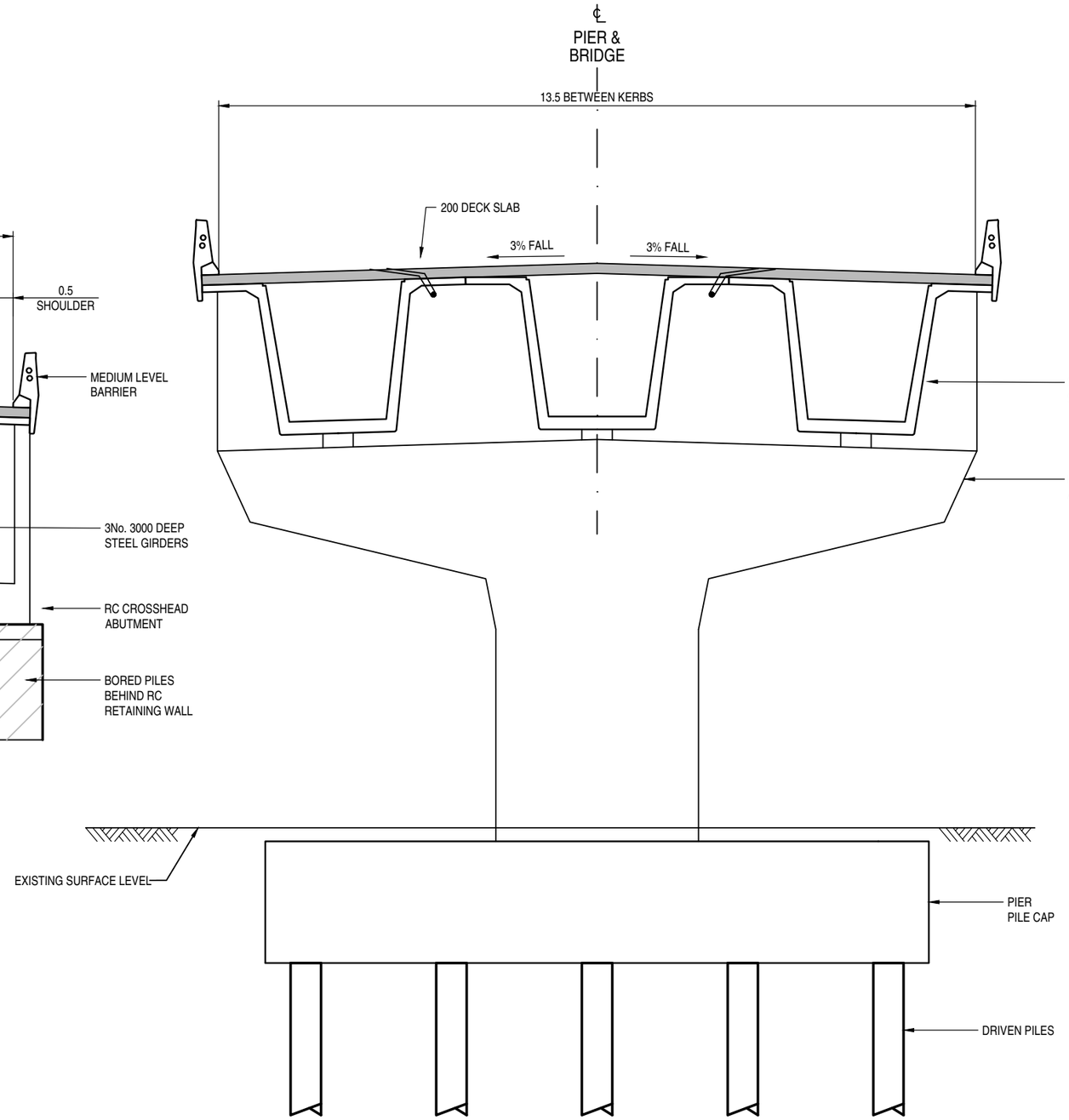


ABUTMENT
FRONT ELEVATION

NOT TO SCALE



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STRUCTURAL

SUNBURY SOUTH

ALTERNATIVE OPTION A
CROSS SECTIONS
SHEET 1

File Name H-363928-STR-SKT-002

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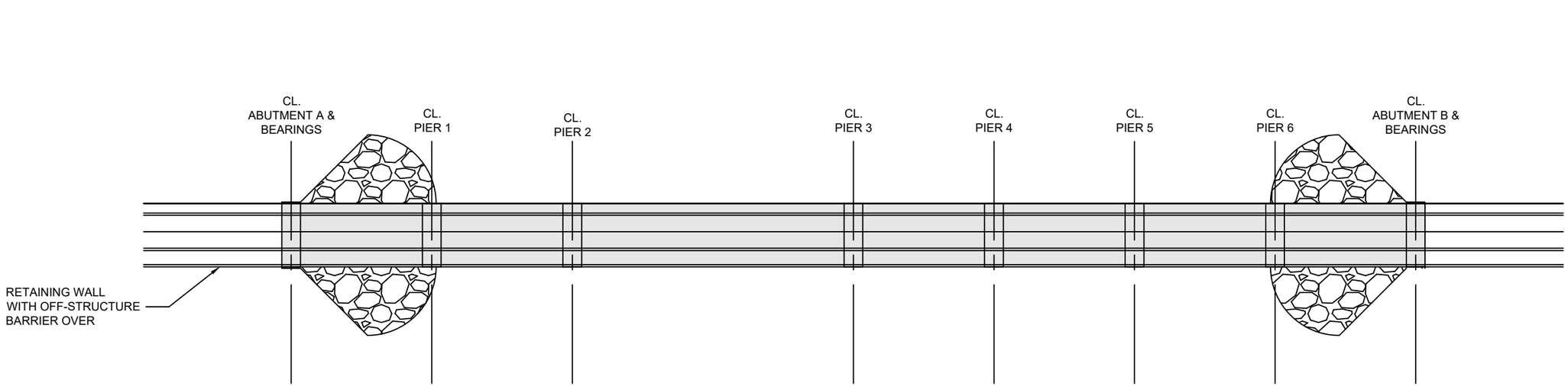

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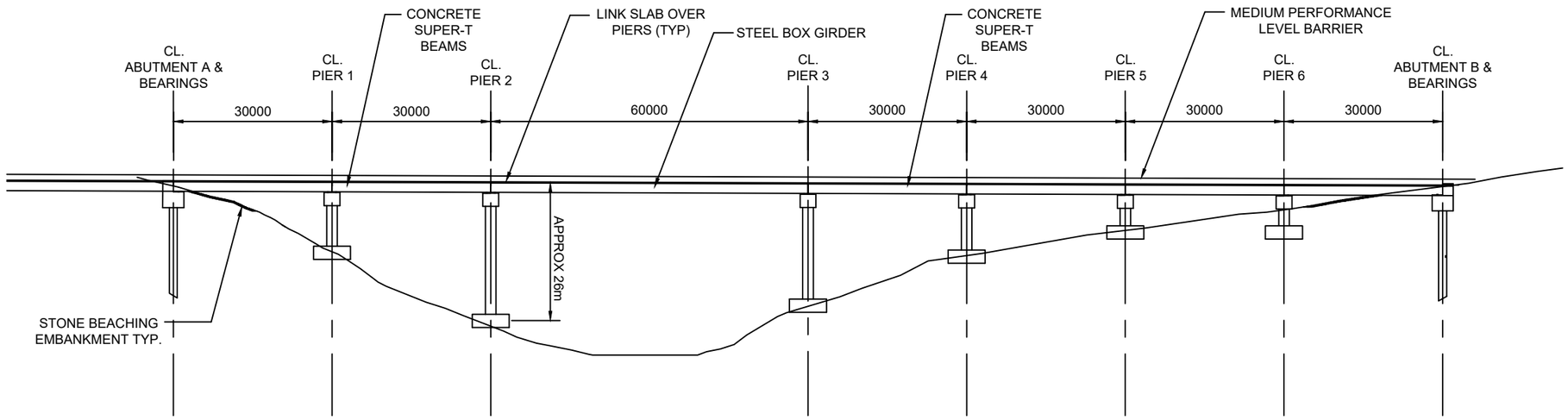

ELEVATION - OPTION B
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SUNBURY SOUTH
ALTERNATIVE OPTION B
GENERAL ARRANGEMENT
SHEET 1

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Sheet No.	
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Sheet Size	A3

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Checked By	
Ind. Review	
Approved By	R HOWARD
Approval Date	
Drawing Number	003
Revision	A

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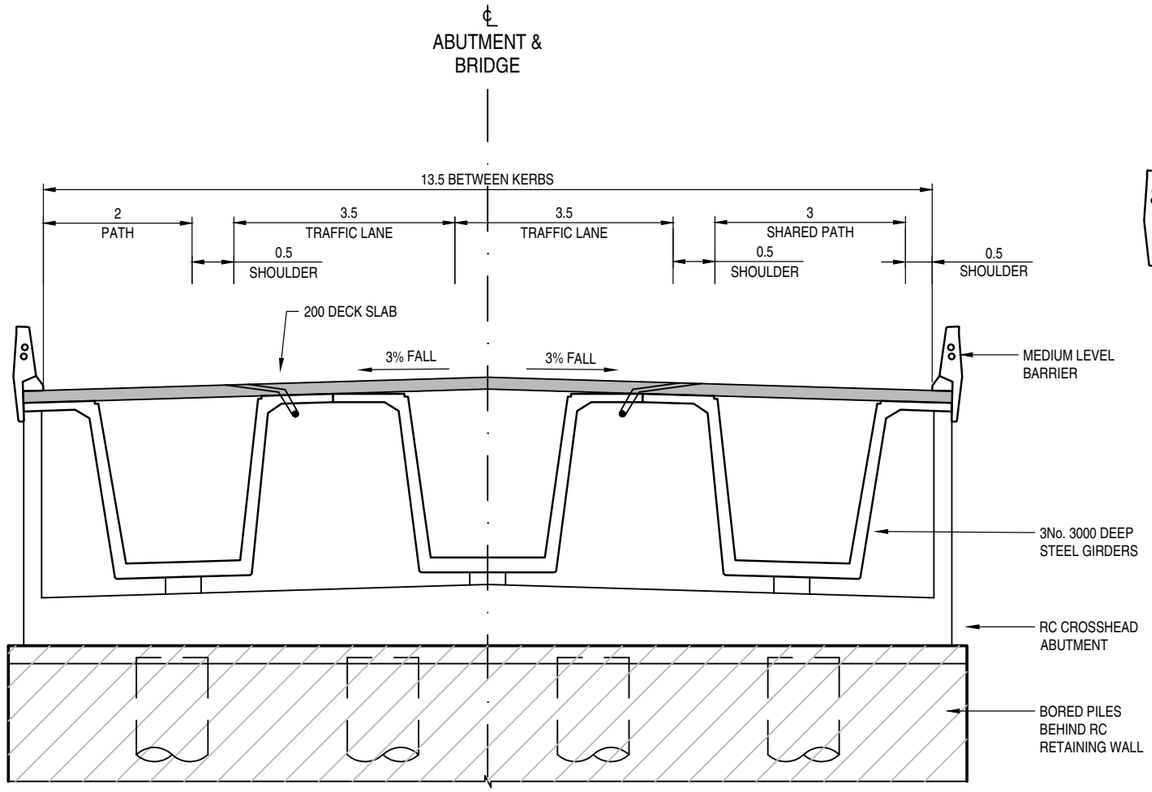

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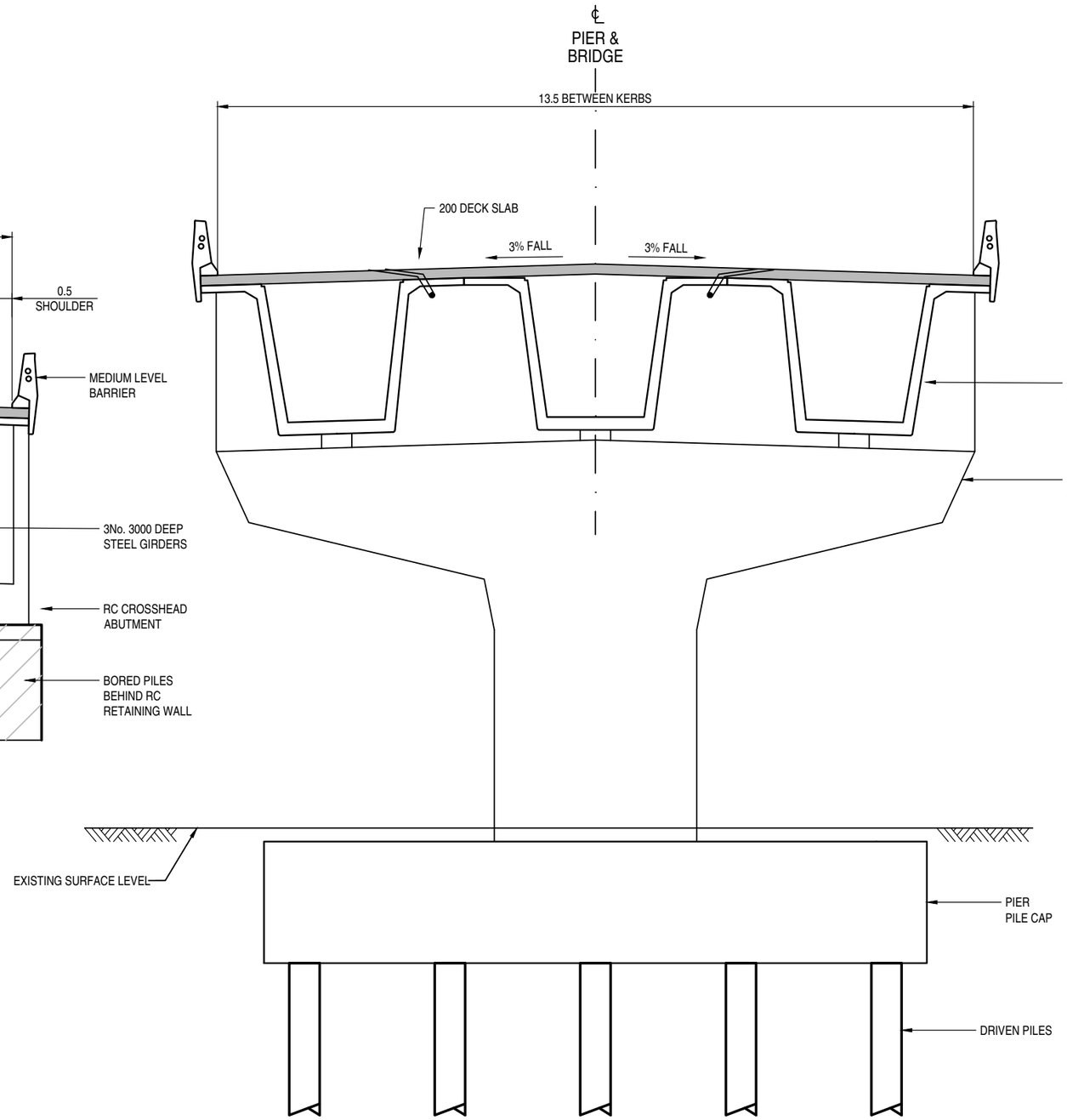

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ALTERNATIVE OPTION B
CROSS SECTIONS
SHEET 1

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In Serv.:
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Designed By:
Checked By:
Ind. Review:
Approval By: R HOWARD
Approval Date:
Drawing Number: 004
Revision: A

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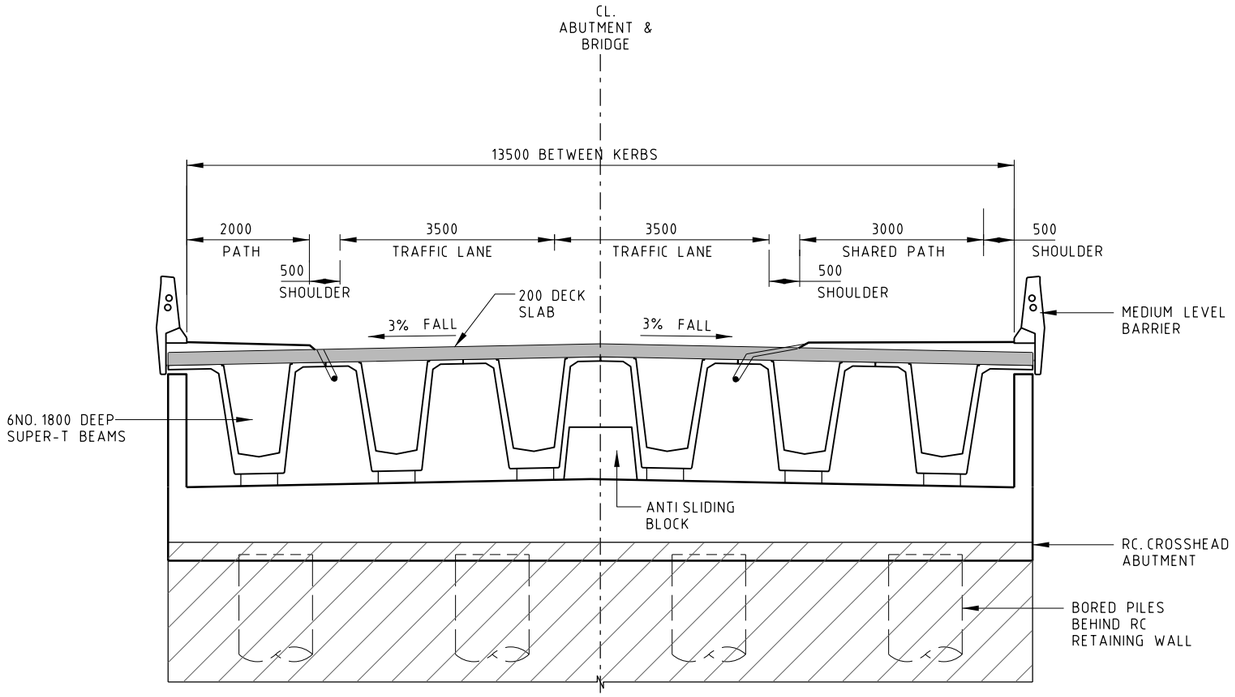

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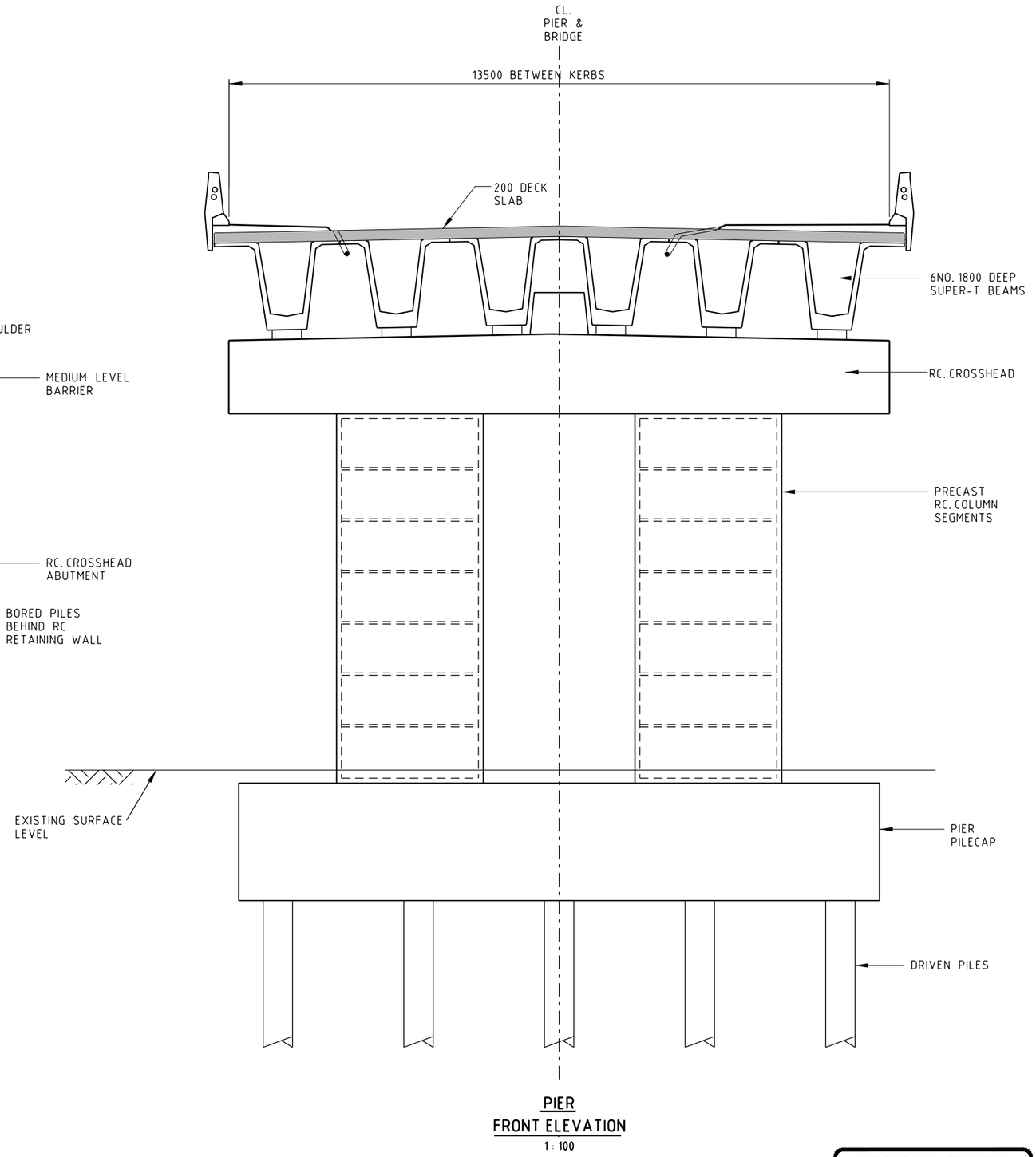

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ALTERNATIVE OPTION B
CROSS SECTIONS
SHEET 2

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APPENDIX D

LANCEFIELD ROAD JACKSONS CREEK CROSSING (LR-BR-01) OPINION OF PROBABLE COST SCHEDULE

Lancefield Road Bridge 01 (LR-BR-01)

Item	Description	LR-BR-01 - Bridge Steel Girder ICP Adopted Approx. length 490m Quantity	Unit	Rate	Amount	Comments	LR-BR-01 Hatch/Spiire Option A Approx length 245m (7 Super T spans @35Lm each) Quantity	Unit	Rate	Amount	Comments
WORKS											
1	SITEWORKS AND EARTHWORKS										
1.1	Pre-construction										
1.1.1	Site preparation	2	Item	5,500.00	$ 11,000		2	Item	5,500.00	$ 11,000	
1.1.2	Strip Site Locally	0	sq.m	2.75				sq.m	2.75	$ -	
1.2	Earthworks									$ -	
1.2.1	Bulk excavation and fill	10,000	cu.m	43.2	$ 432,000		81,100	cu.m	43.2	$ 3,503,520	
1.2.2	EO Allowance for rock excavation works	5,000	cu.m	96.8	$ 484,000	EO allowance of encountering rock to 50% of excvation area		cu.m	96.8	$ -	
1.2.3	Fill only	0	cu.m	37.8			9500	cu.m	55	$ 522,500	
1.3	Set-Out									$ -	
1.3.1	Allow for site setout and marking	1	Item	12,500.00	$ 12,500		1	Item	12,500.00	$ 12,500	
10	ROADWORKS AND ASSOCIATED INFRASTRUCTURE										
(Works additional to GHD Long Bridge Option to support Shorter span bridge ie additional length pavement, retaining walls etc)											
10.1	150mm Shotcrete retaining wall with soil nails										
10.1.1	Shotcrete and mesh						6180	sq.m	300.00	$ 1,854,000	
10.1.2	Soil nails						3461	Item	1,000.00	$ 3,460,800	
10.2	SSP Type Retaining wall						0	sq.m	1,500.00	$ -	
10.3	Guard Rail						0	LM	100.00	$ -	
10.4	Safety Fencing at top of Cutting						500	LM	250.00	$ 125,000	
10.5	Additional Length Roadway (ICP adopted Bridge length minus Proposed structure length)						245	LM	5,000.00	$ 1,225,000	
2	STRUCTURE										
2.1	Slab & Foundations/Piers/Beams										
2.1.1	Bridge Structure	7,383	sq.m	4,450.00	$ 32,854,350	Conc slab (200mm thk) including 3000mm deep steel girdersSteel Girder, 50m spans with reinforced concrete deck	3,308	sq.m	2,450.00	$ 8,103,375	Allow for reinforced single span concrete bridge (Total width 13.5m approx.) 200mm thick deck slab on top of super 1800mm T Beams
2.1.2	Elastomeric Bearings	0	Item	1,650.00			0			$ -	
2.1.3	Cast in-situ concrete base slab with footings	0	sq.m	550			0	Item	1650	$ -	
2.1.4	Bridge Columns	8,970	cu.m	1,100.00	$ 9,867,000	Pier concrete Column 12,000wx2500d 40Mpa	1,327	cu.m	1,800.00	$ 2,387,880	Pier Concrete column 2No. 3000w x 3000d as per GHD SS-BR-01
2.1.5	Pile	2,600	Lm	1,800.00	$ 4,680,000	Foundation Concrete bored Piles 900dx2000l 50 Mpa	70	Item	5400	$ 378,000	Unit price for driven piles as per GHD SS-BR-01. 10 per pier
2.1.6	Pile Cap	624	cu.m	650	$ 405,600	Concrete pier Pile Cap 16,000lx2500wx1200d 40Mpa	384	Item	950.00	$ 364,800	
2.1.7	Retaining Walls - Wing & Keeper Walls	0	sq.m	1,100.00			0	sq.m	1,100.00	$ -	
2.1.8	Retaining Walls - Fender Wall	0	Item	16,500.00			0	Item	16,500.00	$ -	
2.1.9	Retaining Wall	0	sq.m	1,120.00			0	sq.m	1120	$ -	
2.1.10	Bridge deck	0	sq.m	480			0	sq.m	480.00	$ -	
2.1.11	Constructability	1	Item	7,624,177.50	$ 7,624,178	Includes site reinstatement, temporary works, staging etc.	1	Item	4,750,000	$ 4,750,000	
2.2	Abutments									$ -	
2.2.1	RC Abutment / Crosshead Beam	1,208	cu.m	2,500.00	$ 3,020,900	1200w x 1000d 40Mpa	162	cu.m	2,500.00	$ 405,000	
2.2.2	Anti Sliding Blocks	0	Item	2,500.00			8	Item	2,500.00	$ 20,000	
2.2.3	Abutment Walls and Bearings	0	Item	400,000.00			85.725	cu.m	1800	$ 154,305	
2.2.4	Bored piles	0	Item	9,712.80			8	Item	12,000.00	$ 96,000	Bored piles at abutments
2.3	Bridge Containment Barriers									$ -	
2.3.1	Bridge containment barriers	1,000	Lm	2,850.00	$ 2,850,000		490	LM	2850	$ 1,396,500	
2.3.2	Barriers - Medium Containment	0	LM	1,750.00			0	LM	1750	$ -	
2.3.3	Barriers - Armco (off structure)	0	LM	110			0	LM	110	$ -	
2.4	Other									$ -	
3	ON-BRIDGE WORKS									$ -	
3.1	Ashphalt Wearing Course Over Slab									$ -	
3.1.1	Asphalt pavement	4,410	sq.m	110	$ 485,100		1715	sq.m	110.00	$ 188,650	
3.1.2	Road pavement under bridge	0	sq.m	250			0	sq.m	250	$ -	
3.1.3	Cycle track	0	sq.m	1,200.00			0	sq.m	1200	$ -	
3.2	Kerb and Channel									$ -	
3.2.1	Kerb and channel	1,000	Lm	75	$ 75,000		490	LM	75	$ 36,750	
3.3	Footpath									$ -	
3.3.1	Footpath	1,500	sq.m	66	$ 99,000		1225	sq.m	85.00	$ 104,125	2m on one side, 3m on the oth
3.3	Footpath										
3.3.1	Bridge walkway	0	sq.m	1,500.00			0	sq.m	155	$ -	
3.3.2	Pedestrian footpath	0	sq.m	155			0		155	$ -	
3.3.3	Shared path	0	sq.m	155			0				
3.4	Lighting On-Bridge										
3.4.1	Lighting	34	Item	17,500.00	$ 595,000	Includes Poles	9	Item	17,500.00	$ 157,500	
3.4.2	Allowance for Conduits	0	LM	16.5			0	LM	16.5	$ -	
3.5	Other									$ -	
4	OFF-BRIDGE WORKS									$ -	
4.1	Approach Slabs									$ -	
4.1.1	Reinforced concrete slabs (approach slabs)	50	cu.m	500	$ 25,000		50	sq.m	500	$ 25,000	
4.2	Safety Gurad Rail/Barrier									$ -	
4.2.1	Handrails	0	Item	5,000.00			0	Item	5,000.00	$ -	
4.2.2	Guard rails	200	LM	1,500.00	$ 300,000	Vehicle approach barriers	200	LM	1,500.00	$ 300,000	
4.2.3	Safety rails	0	Item	1,700.00			0	Item	20,000.00	$ -	
4.3	Drainage								0	$ -	
4.3.1	Drainage to bridge	0	Item	22,000.00			0	Item	150,000.00	$ -	
4.3.2	Drainage to lowered road under	0	Item	100,000.00			0	Item	100,000.00	$ -	
4.3.3	Rock Beaching	0	cu.m	100			0	cu.m	100	$ -	
4.4	Scour Protection									$ -	
4.5	Other									$ -	
5	MISCELLANEOUS									$ -	
5.1	Architectural screens / cladding to Piers / Deck	1,000	LM	1,200.00	$ 1,200,000		490	LM	2,000.00	$ 980,000	
5.2	Anti Throw screens	979.94	LM	1,650.00	$ 1,616,901		490	LM	1,650.00	$ 808,500	
5.3	Dewatering works	0	Item	250,000.00			0	Item	250,000.00	$ -	
5.4	Melbourne Water Temp Diversion	0	sq.m	1,000.00			0	sq.m	0.00	$ -	
5.5	Linemarking	490	Item	32	$ 15,680		245	LM	32	$ 7,840	
5.6	Signage	0	Item	25,000.00			0	Item	25,000.00	$ -	
5.7	Occupation costs	0	Item	20,000.00			0	Item	20,000.00	$ -	
5.8	Construction occupation	0	Item	1,035,000.00			0	Item	1,035,000.00	$ -	
5.9	Habitat Compensation Fee (Estimate)	1	Item	19,497.12	$ 19,497	Estimate from DELWP	0	Item	19,497.00	$ -	Not Considered
6	RAIL RELATED ITEMS									$ -	
6.1	Occupation costs (minor)	0	Item	20,000.00			0	Item	20,000.00	$ -	
6.2	Construction occupation	0	Item	1,035,000.00			0	Item	1,035,000.00	$ -	
6.3	Signalling Adjustments	0	Item	750,000.00			0	Item	750,000.00	$ -	
6.4	Rail Occupation Costs (Power Off) - N/A Vline Only	0	Note				0	Note	0	$ -	
6.5	Rail Occupation Costs (Major) - Vline	0	Weekend	100,000.00			0	Wkend	100,000.00	$ -	
6.6	Track & Ballast	0	Item	1,650.00			0	Item	1,650.00	$ -	
6.7	OHLE (Assume + 100m each way)	0	TM	550			0	TM	550	$ -	
7	SERVICES									$ -	
7.1	APA Gas	0	Item	4,400,000.00			0	Item	4,400,000.00	$ -	
7.2	Telstra NBN	0	Item	400,000.00			0	Item	400,000.00	$ -	
7.3	Western Water Sewer	0	Item	300,000.00			0	Item	300,000.00	$ -	
7.4	Services relocation	0	Item	150,000.00			0	Item	150,000.00	$ -	
7.5	Increase in Head Contractor Preliminaries (22% to 25%)	3%	%	66,672,705.62	$ 2,000,181		3%	%		$ 941,356.35	
				SUB TOTAL WORKS	**$ 68,672,887**					**$ 32,319,901**	
8	DELIVERY										
8.1	Council Fees	3%	Item		$ 2,231,869		3%	Item		$ 1,050,396.79	
8.2	VicRoads Fees	0%	Item				0%	Item		$ -	
8.3	Traffic Management	5%	Item		$ 3,433,644		5%	Item		$ 1,615,995.07	
8.4	Environmental Management	1%	Item		$ 343,364		1%	Item		$ 161,599.51	
8.5	Survey & Design	5%	Item		$ 3,433,644		5%	Item		$ 1,615,995.07	
8.6	Supervision & Project Management	15%	Item		$ 10,300,933	Increased due to scale of project	12%	Item		$ 3,878,388	
8.7	Site Establishment	3%	Item		$ 1,716,822		3%	Item		$ 807,998	
8.8	Contingency	20%	Item		$ 13,734,577		20%	Item		$ 6,463,980	
		SUB TOTAL - DELIVERY			**$ 35,194,854**					**$ 15,594,352**	
		TOTAL			**$ 103,867,741**					**$ 47,914,254**	

Lancefield Road Bridge 01 (LR-BR-01)

Item	Description	LR-BR-01 - Bridge Steel Girder ICP Adopted Approx. length 490m Quantity	Unit	Rate	Amount	Comments	LR-BR-01 Hatch/Spiire Option B Approx length 90m (3 Super T spans @ 30Lm each) Quantity	Unit	Rate	Amount	Comments
WORKS											
1	SITEWORKS AND EARTHWORKS										
1.1	Pre-construction										
1.1.1	Site preparation	2	Item	5,500.00	$ 11,000		2	Item	5,500.00	$ 11,000	
1.1.2	Strip Site Locally	0	sq.m	2.75				sq.m	2.75	$ -	
1.2	Earthworks									$ -	
1.2.1	Bulk excavation and fill	10,000	cu.m	43.2	$ 432,000		65,000	cu.m	43.2	$ 2,808,000	
1.2.2	EO Allowance for rock excavation works	5,000	cu.m	96.8	$ 484,000	EO allowance of encountering rock to 50% of excvation area		cu.m	96.8	$ -	
1.2.3	Fill only	0	cu.m	37.8			9500	cu.m	55	$ 522,500	
1.3	Set-Out									$ -	
1.3.1	Allow for site setout and marking	1	Item	12,500.00	$ 12,500		1	Item	12,500.00	$ 12,500	
10	ROADWORKS AND ASSOCIATED INFRASTRUCTURE										
(Works additional to GHD Long Bridge Option to support Shorter span bridge ie additional length pavement, retaining walls etc)											
10.1	150mm Shotcrete retaining wall with soil nails										
10.1.1	Shotcrete and mesh						4480	Item	300.00	$ 1,344,000	
10.1.2	Soil nails						2509	sq.m	1,000.00	$ 2,508,800	
10.2	SSP Type Retaining wall						0	sq.m	1,500.00	$ -	
10.3	Guard Rail						330	LM	100.00	$ 33,000	
10.4	Safety Fencing at top of Cutting						660	LM	250.00	$ 165,000	
10.5	Additional Length Roadway (ICP adopted Bridge length minus Proposed structure length)						1100	LM	5,000.00	$ 5,500,000	
2	STRUCTURE										
2.1	Slab & Foundations/Piers/Beams										
2.1.1	Bridge Structure	7,383	sq.m	4,450.00	$ 32,854,350	Conc slab (200mm thk) including 3000mm deep steel girdersSteel Girder, 50m spans with reinforced concrete deck	1,215	sq.m	2,450.00	$ 2,976,750	Allow for reinforced single span concrete bridge (Total width 13.5m approx.) 200mm thick deck slab on top of super 1800mm T Beams
2.1.2	Elastomeric Bearings	0	Item	1,650.00			0			$ -	
2.1.3	Cast in-situ concrete base slab with footings	0	sq.m	550			0	Item	1650	$ -	
2.1.4	Bridge Columns	8,970	cu.m	1,100.00	$ 9,867,000	Pier concrete Column 12,000wx2500d 40Mpa	185	cu.m	1,800.00	$ 333,720	Pier Concrete column 2No. 3000w x 3000d as per GHD SS-BR-01
2.1.5	Pile	2,600	Lm	1,800.00	$ 4,680,000	Foundation Concrete bored Piles 900dx2000l 50 Mpa	20	Item	5400	$ 108,000	Unit price for driven piles as per GHD SS-BR-01. 10 per pier
2.1.6	Pile Cap	624	cu.m	650	$ 405,600	Concrete pier Pile Cap 16,000lx2500wx1200d 40Mpa	96	Item	950.00	$ 91,200	
2.1.7	Retaining Walls - Wing & Keeper Walls	0	sq.m	1,100.00			0	sq.m	1,100.00	$ -	
2.1.8	Retaining Walls - Fender Wall	0	Item	16,500.00			0	Item	16,500.00	$ -	
2.1.9	Retaining Wall	0	sq.m	1,120.00			0	sq.m	1120	$ -	
2.1.10	Bridge deck	0	sq.m	480			0	sq.m	480.00	$ -	
2.1.11	Constructability	1	Item	7,624,177.50	$ 7,624,178	Includes site reinstatement, temporary works, staging etc.	1	Item	1,500,000	$ 1,500,000	
2.2	Abutments									$ -	
2.2.1	RC Abutment / Crosshead Beam	1,208	cu.m	2,500.00	$ 3,020,900	1200w x 1000d 40Mpa	64.8	cu.m	2,500.00	$ 162,000	
2.2.2	Anti Sliding Blocks	0	Item	2,500.00			4	Item	2,500.00	$ 10,000	
2.2.3	Abutment Walls and Bearings	0	Item	400,000.00			37.8	cu.m	1800	$ 68,040	
2.2.4	Bored piles	0	Item	9,712.80			8	Item	12,000.00	$ 96,000	Bored piles at abutments
2.3	Bridge Containment Barriers									$ -	
2.3.1	Bridge containment barriers	1,000	Lm	2,850.00	$ 2,850,000		180	LM	2850	$ 513,000	
2.3.2	Barriers - Medium Containment	0	LM	1,750.00			0	LM	1750	$ -	
2.3.3	Barriers - Armco (off structure)	0	LM	110			0	LM	110	$ -	
2.4	Other									$ -	
3	ON-BRIDGE WORKS									$ -	
3.1	Ashphalt Wearing Course Over Slab									$ -	
3.1.1	Asphalt pavement	4,410	sq.m	110	$ 485,100		630	sq.m	110.00	$ 69,300	
3.1.2	Road pavement under bridge	0	sq.m	250			0	sq.m	250	$ -	
3.1.3	Cycle track	0	sq.m	1,200.00			0	sq.m	1200	$ -	
3.2	Kerb and Channel									$ -	
3.2.1	Kerb and channel	1,000	Lm	75	$ 75,000		180	LM	75	$ 13,500	
3.3	Footpath									$ -	
3.3.1	Footpath	1,500	sq.m	66	$ 99,000		450	sq.m	85.00	$ 38,250	2m on one side, 3m on the oth
3.3	Footpath										
3.3.1	Bridge walkway	0	sq.m	1,500.00			0	sq.m	155	$ -	
3.3.2	Pedestrian footpath	0	sq.m	155			0		155	$ -	
3.3.3	Shared path	0	sq.m	155			0				
3.4	Lighting On-Bridge										
3.4.1	Lighting	34	Item	17,500.00	$ 595,000	Includes Poles	7	Item	17,500.00	$ 122,500	
3.4.2	Allowance for Conduits	0	LM	16.5			0	LM	16.5	$ -	
3.5	Other									$ -	
4	OFF-BRIDGE WORKS									$ -	
4.1	Approach Slabs									$ -	
4.1.1	Reinforced concrete slabs (approach slabs)	50	cu.m	500	$ 25,000		50	sq.m	500	$ 25,000	
4.2	Safety Gurad Rail/Barrier									$ -	
4.2.1	Handrails	0	Item	5,000.00			0	Item	5,000.00	$ -	
4.2.2	Guard rails	200	LM	1,500.00	$ 300,000	Vehicle approach barriers	200	LM	1,500.00	$ 300,000	
4.2.3	Safety rails	0	Item	1,700.00			0	Item	20,000.00	$ -	
4.3	Drainage								0	$ -	
4.3.1	Drainage to bridge	0	Item	22,000.00			0	Item	150,000.00	$ -	
4.3.2	Drainage to lowered road under	0	Item	100,000.00			0	Item	100,000.00	$ -	
4.3.3	Rock Beaching	0	cu.m	100			0	cu.m	100	$ -	
4.4	Scour Protection									$ -	
4.5	Other									$ -	
5	MISCELLANEOUS									$ -	
5.1	Architectural screens / cladding to Piers / Deck	1,000	LM	1,200.00	$ 1,200,000		180	LM	2,000.00	$ 360,000	
5.2	Anti Throw screens	979.94	LM	1,650.00	$ 1,616,901		180	LM	1,650.00	$ 297,000	
5.3	Dewatering works	0	Item	250,000.00			0	Item	250,000.00	$ -	
5.4	Melbourne Water Temp Diversion	0	sq.m	1,000.00			0	sq.m	0.00	$ -	
5.5	Linemarking	490	Item	32	$ 15,680		90	LM	32	$ 2,880	
5.6	Signage	0	Item	25,000.00			0	Item	25,000.00	$ -	
5.7	Occupation costs	0	Item	20,000.00			0	Item	20,000.00	$ -	
5.8	Construction occupation	0	Item	1,035,000.00			0	Item	1,035,000.00	$ -	
5.9	Habitat Compensation Fee (Estimate)	1	Item	19,497.12	$ 19,497	Estimate from DELWP	0	Item	19,497.00	$ -	Not Considered
6	RAIL RELATED ITEMS									$ -	
6.1	Occupation costs (minor)	0	Item	20,000.00			0	Item	20,000.00	$ -	
6.2	Construction occupation	0	Item	1,035,000.00			0	Item	1,035,000.00	$ -	
6.3	Signalling Adjustments	0	Item	750,000.00			0	Item	750,000.00	$ -	
6.4	Rail Occupation Costs (Power Off) - N/A Vline Only	0	Note				0	Note	0	$ -	
6.5	Rail Occupation Costs (Major) - Vline	0	Weekend	100,000.00			0	Wkend	100,000.00	$ -	
6.6	Track & Ballast	0	Item	1,650.00			0	Item	1,650.00	$ -	
6.7	OHLE (Assume + 100m each way)	0	TM	550			0	TM	550	$ -	
7	SERVICES									$ -	
7.1	APA Gas	0	Item	4,400,000.00			0	Item	4,400,000.00	$ -	
7.2	Telstra NBN	0	Item	400,000.00			0	Item	400,000.00	$ -	
7.3	Western Water Sewer	0	Item	300,000.00			0	Item	300,000.00	$ -	
7.4	Services relocation	0	Item	150,000.00			0	Item	150,000.00	$ -	
7.5	Increase in Head Contractor Preliminaries (22% to 25%)	3%	%	66,672,705.62	$ 2,000,181		3%	%		**$ 599,758.20**	
				SUB TOTAL WORKS	**$ 68,672,887**					**$ 20,591,698**	
8	DELIVERY										
8.1	Council Fees	3%	Item		$ 2,231,869		3%	Item		$ 669,230.19	
8.2	VicRoads Fees	0%	Item				0%	Item		$ -	
8.3	Traffic Management	5%	Item		$ 3,433,644		5%	Item		$ 1,029,584.91	
8.4	Environmental Management	1%	Item		$ 343,364		1%	Item		$ 102,958.49	
8.5	Survey & Design	5%	Item		$ 3,433,644		5%	Item		$ 1,029,584.91	
8.6	Supervision & Project Management	15%	Item		$ 10,300,933	Increased due to scale of project	12%	Item		$ 2,471,004	
8.7	Site Establishment	3%	Item		$ 1,716,822		3%	Item		$ 514,792	
8.8	Contingency	20%	Item		$ 13,734,577		20%	Item		$ 4,118,340	
		SUB TOTAL - DELIVERY			**$ 35,194,854**					$ 9,935,494	
		TOTAL			**$ 103,867,741**					**$ 30,527,193**	

APPENDIX E

SUNBURY SOUTH JACKSONS CREEK CROSSING (SS-BR-01) OPINION OF PROBABLE COST SCHEDULE

Sunbury South Bridge 1 (SS-BR-01)

Item	Description	SS-BR-01 (Long Option) - ICP adopted Approx. length 315m Quantity	Unit	Rate	Amount	Comments	SS-BR-01 Hatch/Spiire Option A Approximate length 240m (4 Steel Box Girders spans @60Lm each) Quantity	Unit	Rate	Amount	Comments
	WORKS										
1	SITEWORKS AND EARTHWORKS										
1.1	Pre-construction										
1.1.1	Site preparation	2	Item	$ 5,500.00	$ 11,000		2	Item	$ 5,500.00	$ 11,000	
1.1.2	Strip Site Locally	0	sq.m	$ 2.75				sq.m	$ 2.75	$ -	
1.2	Earthworks										
1.2.1	Bulk excavation and fill	6,922	cu.m	$ 43.20	$ 299,009		20,100	cu.m	$ 43.20	$ 868,320	
1.2.2	EO Allowance for rock excavation works	3,461	cu.m	$ 96.80	$ 335,001	EO allowance of encountering rock to 50% of excavated area		cu.m	$ 96.80	$ -	
1.2.3	Fill only	0	cu.m	$ 37.80			100	cu.m	$ 55.00	$ 5,500	
1.3	Set-Out									$ -	
1.3.1	Allow for site setout and marking	1	Item	$ 12,500.00	$ 12,500		1	Item	$ 12,500.00	$ 12,500	
10	ROADWORKS AND ASSOCIATED INFRASTRUCTURE										
(Works additional to GHD Long Bridge Option to support Shorter span bridge ie additional length pavement, retaining walls etc)											
10.1	150mm Shotcrete retaining wall with soil nails										
10.1.1	Shotcrete and mesh						0	sq.m	300.00	$ -	
10.1.2	Soil nails						0	Item	1,000.00	$ -	
10.2	SSP Type Retaining wall						0	sq.m	1,500.00	$ -	
10.3	Guard Rail						0	LM	100.00	$ -	
10.4	Safety Fencing at top of Cutting						0	LM	250.00	$ -	
10.5	Additional Length Roadway (ICP adopted Bridge length minus Proposed structure length)						75	LM	5,000.00	$ 375,000	
2	STRUCTURE										
2.1	Slab & Foundations/Piers/Beams										
2.1.1	Bridge structure	4,785	sq.m	$ 2,450.00	$ 11,723,250	Allow for reinforced single span concrete bridge (Total width 13.5m approx.) 200mm thick deck slab on top of super 1800mm T Beams	3,240	sq.m	4,450.00	$ 14,418,000	
2.1.2	Elastomeric Bearings	0	Item	$ 1,650.00			0	Item	$ 1,650.00	$ -	
2.1.3	Cast in-situ concrete base slab with footings	0	sq.m	$ 550.00			0	sq.m	$ 550.00	$ -	
2.1.4	Bridge Columns	1,386	sq.m	$ 3,500.00	$ 4,851,000		2,502	cu.m	1,800.00	$ 4,503,600	Pier concrete Column 12,000wx2500d 40Mpa
2.1.5	Piles	80	Item	$ 3,584.70	$ 286,776	Driven piles Approx. 10 per pier	40	Item	$ 6,500.00	$ 260,000	
2.1.6	Pile Cap	8	Item	$ 31,950.00	$ 255,600		3	Item	$ 31,950.00	$ 95,850	
2.1.7	Retaining Walls - Wing & Keeper Walls	0	sq.m	$ 1,100.00			0	sq.m	$ 1,100.00	$ -	
2.1.8	Retaining Walls - Fender Wall	0	Item	$ 16,500.00			0	Item	$ 16,500.00	$ -	
2.1.9	Retaining Wall	0	sq.m	$ 1,120.00			0	sq.m	$ 1,120.00	$ -	
2.1.10	Bridge Deck	0	sq.m	$ 480.00			0	sq.m	$ 480.00	$ -	
2.1.11	Constructability	1	Item	$ 2,691,649.26	$ 2,691,649	Allowance for temporary works due to site conditions	1	Item	$ 2,500,000.00	$ 2,500,000	
2.2	Abutments										
2.2.1	RC Abutment / Crosshead Beam	130	cu.m	$ 2,500.00	$ 325,000		81	cu.m	$ 2,500.00	$ 202,500	
2.2.2	Anti Sliding Blocks	10	Item	$ 2,500.00	$ 25,000		0	Item	$ 2,500.00	$ -	
2.2.3	Abutment Walls and Bearings	1	Item	$ 400,000.00	$ 400,000		1	Item	$ 400,000.00	$ 400,000	
2.2.4	Bored piles	8	Item	$ 9,712.80	$ 77,702	Bored piles behind RC retaining wall	8	Item	$ 12,000.00	$ 96,000	
2.3	Bridge Containment Barriers										
2.3.1	Bridge containment barriers	646	LM	$ 2,850.00	$ 1,841,100		480	LM	$ 2,850.00	$ 1,368,000	
2.3.2	Barriers - Medium Containment	0	LM	$ 1,750.00				LM	$ 1,750.00	$ -	
2.3.3	Barriers - Armco (off structure)	0	LM	$ 110.00				LM	$ 110.00	$ -	
2.4	Other										
3	ON-BRIDGE WORKS										
3.1	Ashphalt Wearing Course Over Slab										
3.1.1	Asphalt pavement	2,205	sq.m	$ 110.00	$ 242,550	Road pavement - Traffic lane. Allow traffic lane (7m) wide	1,680	sq.m	$ 110.00	$ 184,800	
3.1.2	Road pavement under bridge	0	sq.m	$ 250.00			0	sq.m	$ 250.00	$ -	
3.1.3	Cycle track	0	sq.m	$ 1,200.00			0	sq.m	$ 1,200.00	$ -	
3.2	Kerb and Channel										
3.2.1	Kerb and channel	630	LM	$ 75.00	$ 47,250		480	LM	$ 75.00	$ 36,000	
3.3	Footpath										
3.3.1	Bridge walkway	0	sq.m	$ 1,500.00				sq.m	$ 1,500.00	$ -	
3.3.2	Pedestrian footpath	0	sq.m	$ 155.00				sq.m	$ 155.00	$ -	
3.3.3	Shared path	1,575	sq.m	$ 132.00	$ 207,900	Shared path overlay total	1,200	sq.m	$ 132.00	$ 158,400	
3.4	Lighting On-Bridge										
3.4.1	Lighting	11	Item	$ 17,500.00	$ 192,500	Assumed poles 12m high with luminaries	9	Item	$ 17,500.00	$ 157,500	
3.4.2	Allowance for Conduits	0	LM	$ 16.50				LM	$ 16.50	$ -	
3.5	Other										
4	OFF-BRIDGE WORKS										
4.1	Approach Slabs										
4.1.1	Reinforced concrete slabs (approach slabs)	108	sq.m	$ 500.00	$ 54,000	Assumed 200mm thick	108	sq.m	$ 500.00	$ 54,000	
4.2	Safety Gurad Rail/Barrier									$ -	
4.2.1	Handrails	0	Item	$ 5,000.00				Item	$ 5,000.00	$ -	
4.2.2	Guard rails	200	LM	$ 1,500.00	$ 300,000	Vehicle approach barriers	200	LM	$ 1,500.00	$ 300,000	
4.2.3	Safety rails	0	Item	$ 20,000.00				Item	$ 20,000.00	$ -	
4.3	Drainage								$ -	$ -	
4.3.1	Drainage to bridge	2	Item	$ 150,000.00	$ 300,000	Works to approach slabs	2	Item	$ 150,000.00	$ 300,000	
4.3.2	Drainage to lowered road under	0	Item	$ 100,000.00				Item	$ 100,000.00	$ -	
4.3.3	Rock Beaching	560	cu.m	$ 100.00	$ 56,000	300mm thick	560	cu.m	$ 100.00	$ 56,000	
4.4	Scour Protection										
4.5	Other										
5	MISCELLANEOUS										
5.1	Architectural screens / cladding to Piers / Deck	630	LM	$ 2,000.00	$ 1,260,000		480	LM	$ 2,000.00	$ 960,000	
5.2	Anti Throw screnes	630	LM	$ 1,650.00	$ 1,039,500		480	LM	$ 1,650.00	$ 792,000	
5.3	Dewatering works	1	Item	$ 250,000.00	$ 250,000	Allowance for dewaterinh works	1	Item	$ 250,000.00	$ 250,000	
5.4	Melbourne Water Temp Diversion	0	sq.m	$ -				sq.m	$ -	$ -	
5.5	Linemarking	315	LM	$ 32.00	$ 10,080		240	LM	$ 32.00	$ 7,680	
5.6	Signage	0	Item	$ 25,000.00				Item	$ 25,000.00	$ -	
5.7	Occupation costs	0	Item	$ 20,000.00				Item	$ 20,000.00	$ -	
5.8	Construction occupation	0	Item	$ 1,035,000.00				Item	$ 1,035,000.00	$ -	
5.9	Habitat compenstaion fee	1	Item	$ 88,000.88	$ 88,001	Estimate from DELWP	0	Item	$ 88,000.88	$ -	Not Considered
6	RAIL RELATED ITEMS										
6.1	Occupation costs (minor)	0	Item	$ 20,000.00				Item	$ 20,000.00	$ -	
6.2	Construction occupation	0	Item	$ 1,035,000.00				Item	$ 1,035,000.00	$ -	
6.3	Signalling Adjustments	0	Item	$ 750,000.00				Item	$ 750,000.00	$ -	
6.4	Rail Occupation Costs (Power Off) - N/A Vline Only	0	Note					Note	$ -	$ -	
6.5	Rail Occupation Costs (Major) - Vline	0	Wkend	$ 100,000.00				Wkend	$ 100,000.00	$ -	
6.6	Track & Ballast	0	Item	$ 1,650.00				Item	$ 1,650.00	$ -	
6.7	OHLE (Assume +100m each way)	0	TM	$ 550.00				TM	$ 550.00	$ -	
7	SERVICES										
7.1	APA Gas	0	Item	$ 4,400,000.00				Item	$ 4,400,000.00	$ -	
7.2	Telstra NBN	0	Item	$ 400,000.00				Item	$ 400,000.00	$ -	
7.3	Western Water Sewer	0	Item	$ 300,000.00				Item	$ 300,000.00	$ -	
7.4	Services relocation	1	Item	$ 150,000.00	$ 150,000	Allowances for service relocation surrounding approach slabs	1	Item	$ 150,000.00	$ 150,000	
7.5	Increase in Head Contractor Preliminaries (22% to 25%)	3%	%	$ 27,332,367.94	$ 819,971	Allowance for scale of project	3%	%		$ 855,679.50	
				SUB TOTAL - WORKS	**$ 28,152,339**					**$ 29,378,330**	
8	DELIVERY										
8.1	Council Fees	3.25%	Item		$ 914,951		3.25%	Item		$ 954,796	
8.2	VicRoads Fees	0%	Item				0%	Item		$ -	
8.3	Traffic Management	5%	Item		$ 1,407,617		5%	Item		$ 1,468,916	
8.4	Environmental Management	0.5%	Item		$ 140,762		0.5%	Item		$ 146,892	
8.5	Survey & Design	5%	Item		$ 1,407,617		5%	Item		$ 1,468,916	
8.6	Supervision & Project Management	12%	Item		$ 3,378,281	Increase due to scale of project	12%	Item		$ 3,525,400	
8.7	Site Establishment	2.5%	Item		$ 703,808		2.5%	Item		$ 734,458	
8.8	Contingency	20%	Item		$ 5,630,468		20%	Item		$ 5,875,666	
				SUB TOTAL - DELIVERY	$ 13,583,504					$ 14,175,044	
				TOTAL	**$ 41,735,843**					**$ 43,553,373**	

Sunbury South Bridge 1 (SS-BR-01)

Item	Description	SS-BR-01 (Long Option) - ICP adopted Approx. length 315m Quantity	Unit	Rate	Amount	Comments	SS-BR-01 Hatch/Spiire Option B Approx length 240m (1 Steel Box Girder @60Lm and 6 Super T spans @30Lm each) Quantity	Unit	Rate	Amount	Comments
	WORKS										
1	SITEWORKS AND EARTHWORKS										
1.1	Pre-construction										
1.1.1	Site preparation	2	Item	$ 5,500.00	$ 11,000		2	Item	$ 5,500.00	$ 11,000	
1.1.2	Strip Site Locally	0	sq.m	$ 2.75				sq.m	$ 2.75	$ -	
1.2	Earthworks										
1.2.1	Bulk excavation and fill	6,922	cu.m	$ 43.20	$ 299,009		35,600	cu.m	$ 43.20	$ 1,537,920	
1.2.2	EO Allowance for rock excavation works	3,461	cu.m	$ 96.80	$ 335,001	EO allowance of encountering rock to 50% of excavated area		cu.m	$ 96.80	$ -	
1.2.3	Fill only	0	cu.m	$ 37.80			0	cu.m	$ 55.00	$ -	
1.3	Set-Out									$ -	
1.3.1	Allow for site setout and marking	1	Item	$ 12,500.00	$ 12,500		1	Item	$ 12,500.00	$ 12,500	
10	ROADWORKS AND ASSOCIATED INFRASTRUCTURE										
	(Works additional to GHD Long Bridge Option to support Shorter span bridge ie additional length pavement, retaining walls etc)										
10.1	150mm Shotcrete retaining wall with soil nails										
10.1.1	Shotcrete and mesh						0	sq.m	300.00	$ -	
10.1.2	Soil nails						0	Item	1,000.00	$ -	
10.2	SSP Type Retaining wall						0	sq.m	1,500.00	$ -	
10.3	Guard Rail						0	LM	100.00	$ -	
10.4	Safety Fencing at top of Cutting						0	LM	250.00	$ -	
10.5	Additional Length Roadway (ICP adopted Bridge length minus Proposed structure length)						75	LM	5,000.00	$ 375,000	
2	STRUCTURE										
2.1	Slab & Foundations/Piers/Beams										
2.1.1	Bridge structure	4,785	sq.m	$ 2,450.00	$ 11,723,250	Allow for reinforced single span concrete bridge (Total width 13.5m approx.) 200mm thick deck slab on top of super 1800mm T Beams	2,430	sq.m	$ 2,450.00	$ 5,953,500	Concrete Spans
2.1.1	Bridge structure						810	sq.m	4,450.00	$ 3,604,500	Steel Span
2.1.2	Elastomeric Bearings	0	Item	$ 1,650.00			0	Item	$ 1,650.00	$ -	
2.1.3	Cast in-situ concrete base slab with footings	0	sq.m	$ 550.00			0	sq.m	$ 550.00	$ -	
2.1.4	Bridge Columns	1,386	sq.m	$ 3,500.00	$ 4,851,000		1,782	cu.m	1,800.00	$ 3,207,600	Pier Concrete column 2No. 3000w x 3000d as per GHD SS-BR-01
2.1.5	Piles	80	Item	$ 3,584.70	$ 286,776	Driven piles Approx. 10 per pier	60	Item	$ 5,400.00	$ 324,000	
2.1.6	Pile Cap	8	Item	$ 31,950.00	$ 255,600		6	Item	$ 31,950.00	$ 191,700	
2.1.7	Retaining Walls - Wing & Keeper Walls	0	sq.m	$ 1,100.00			0	sq.m	$ 1,100.00	$ -	
2.1.8	Retaining Walls - Fender Wall	0	Item	$ 16,500.00			0	Item	$ 16,500.00	$ -	
2.1.9	Retaining Wall	0	sq.m	$ 1,120.00			0	sq.m	$ 1,120.00	$ -	
2.1.10	Bridge Deck	0	sq.m	$ 480.00			0	sq.m	$ 480.00	$ -	
2.1.11	Constructability	1	Item	$ 2,691,649.26	$ 2,691,649	Allowance for temporary works due to site conditions	1	Item	$ 3,000,000.00	$ 3,000,000	
2.2	Abutments										
2.2.1	RC Abutment / Crosshead Beam	130	cu.m	$ 2,500.00	$ 325,000		129.6	cu.m	$ 2,500.00	$ 324,000	
2.2.2	Anti Sliding Blocks	10	Item	$ 2,500.00	$ 25,000		8	Item	$ 2,500.00	$ 20,000	
2.2.3	Abutment Walls and Bearings	1	Item	$ 400,000.00	$ 400,000		1	Item	$ 400,000.00	$ 400,000	
2.2.4	Bored piles	8	Item	$ 9,712.80	$ 77,702	Bored piles behind RC retaining wall	8	Item	$ 12,000.00	$ 96,000	
2.3	Bridge Containment Barriers										
2.3.1	Bridge containment barriers	646	LM	$ 2,850.00	$ 1,841,100		480	LM	$ 2,850.00	$ 1,368,000	
2.3.2	Barriers - Medium Containment	0	LM	$ 1,750.00				LM	$ 1,750.00	$ -	
2.3.3	Barriers - Armco (off structure)	0	LM	$ 110.00				LM	$ 110.00	$ -	
2.4	Other										
3	ON-BRIDGE WORKS										
3.1	Ashphalt Wearing Course Over Slab										
3.1.1	Asphalt pavement	2,205	sq.m	$ 110.00	$ 242,550	Road pavement - Traffic lane. Allow traffic lane (7m) wide	1,680	sq.m	$ 110.00	$ 184,800	
3.1.2	Road pavement under bridge	0	sq.m	$ 250.00			0	sq.m	$ 250.00	$ -	
3.1.3	Cycle track	0	sq.m	$ 1,200.00			0	sq.m	$ 1,200.00	$ -	
3.2	Kerb and Channel										
3.2.1	Kerb and channel	630	LM	$ 75.00	$ 47,250		480	LM	$ 75.00	$ 36,000	
3.3	Footpath										
3.3.1	Bridge walkway	0	sq.m	$ 1,500.00				sq.m	$ 1,500.00	$ -	
3.3.2	Pedestrian footpath	0	sq.m	$ 155.00				sq.m	$ 155.00	$ -	
3.3.3	Shared path	1,575	sq.m	$ 132.00	$ 207,900	Shared path overlay total	1,200	sq.m	$ 132.00	$ 158,400	
3.4	Lighting On-Bridge										
3.4.1	Lighting	11	Item	$ 17,500.00	$ 192,500	Assumed poles 12m high with luminaries	9	Item	$ 17,500.00	$ 157,500	
3.4.2	Allowance for Conduits	0	LM	$ 16.50				LM	$ 16.50	$ -	
3.5	Other										
4	OFF-BRIDGE WORKS										
4.1	Approach Slabs										
4.1.1	Reinforced concrete slabs (approach slabs)	108	sq.m	$ 500.00	$ 54,000	Assumed 200mm thick	108	sq.m	$ 500.00	$ 54,000	
4.2	Safety Gurad Rail/Barrier									$ -	
4.2.1	Handrails	0	Item	$ 5,000.00				Item	$ 5,000.00	$ -	
4.2.2	Guard rails	200	LM	$ 1,500.00	$ 300,000	Vehicle approach barriers	200	LM	$ 1,500.00	$ 300,000	
4.2.3	Safety rails	0	Item	$ 20,000.00				Item	$ 20,000.00	$ -	
4.3	Drainage								$ -	$ -	
4.3.1	Drainage to bridge	2	Item	$ 150,000.00	$ 300,000	Works to approach slabs	2	Item	$ 150,000.00	$ 300,000	
4.3.2	Drainage to lowered road under	0	Item	$ 100,000.00				Item	$ 100,000.00	$ -	
4.3.3	Rock Beaching	560	cu.m	$ 100.00	$ 56,000	300mm thick	560	cu.m	$ 100.00	$ 56,000	
4.4	Scour Protection										
4.5	Other										
5	MISCELLANEOUS										
5.1	Architectural screens / cladding to Piers / Deck	630	LM	$ 2,000.00	$ 1,260,000		480	LM	$ 2,000.00	$ 960,000	
5.2	Anti Throw screnes	630	LM	$ 1,650.00	$ 1,039,500		480	LM	$ 1,650.00	$ 792,000	
5.3	Dewatering works	1	Item	$ 250,000.00	$ 250,000	Allowance for dewaterinh works	1	Item	$ 250,000.00	$ 250,000	
5.4	Melbourne Water Temp Diversion	0	sq.m	$ -				sq.m	$ -	$ -	
5.5	Linemarking	315	LM	$ 32.00	$ 10,080		240	LM	$ 32.00	$ 7,680	
5.6	Signage	0	Item	$ 25,000.00				Item	$ 25,000.00	$ -	
5.7	Occupation costs	0	Item	$ 20,000.00				Item	$ 20,000.00	$ -	
5.8	Construction occupation	0	Item	$ 1,035,000.00				Item	$ 1,035,000.00	$ -	
5.9	Habitat compenstaion fee	1	Item	$ 88,000.88	$ 88,001	Estimate from DELWP	0	Item	$ 88,000.88	$ -	Not Considered
6	RAIL RELATED ITEMS										
6.1	Occupation costs (minor)	0	Item	$ 20,000.00				Item	$ 20,000.00	$ -	
6.2	Construction occupation	0	Item	$ 1,035,000.00				Item	$ 1,035,000.00	$ -	
6.3	Signalling Adjustments	0	Item	$ 750,000.00				Item	$ 750,000.00	$ -	
6.4	Rail Occupation Costs (Power Off) - N/A Vline Only	0	Note					Note	$ -	$ -	
6.5	Rail Occupation Costs (Major) - Vline	0	Wkend	$ 100,000.00				Wkend	$ 100,000.00	$ -	
6.6	Track & Ballast	0	Item	$ 1,650.00				Item	$ 1,650.00	$ -	
6.7	OHLE (Assume +100m each way)	0	TM	$ 550.00				TM	$ 550.00	$ -	
7	SERVICES										
7.1	APA Gas	0	Item	$ 4,400,000.00				Item	$ 4,400,000.00	$ -	
7.2	Telstra NBN	0	Item	$ 400,000.00				Item	$ 400,000.00	$ -	
7.3	Western Water Sewer	0	Item	$ 300,000.00				Item	$ 300,000.00	$ -	
7.4	Services relocation	1	Item	$ 150,000.00	$ 150,000	Allowances for service relocation surrounding approach slabs	1	Item	$ 150,000.00	$ 150,000	
7.5	Increase in Head Contractor Preliminaries (22% to 25%)	3%	%	$ 27,332,367.94	$ 819,971	Allowance for scale of project	3%	%		$ 714,963.00	
				SUB TOTAL - WORKS	**$ 28,152,339**					**$ 24,547,063**	
8	DELIVERY										
8.1	Council Fees	3.25%	Item		$ 914,951		3.25%	Item		$ 797,780	
8.2	VicRoads Fees	0%	Item				0%	Item		$ -	
8.3	Traffic Management	5%	Item		$ 1,407,617		5%	Item		$ 1,227,353	
8.4	Environmental Management	0.5%	Item		$ 140,762		0.5%	Item		$ 122,735	
8.5	Survey & Design	5%	Item		$ 1,407,617		5%	Item		$ 1,227,353	
8.6	Supervision & Project Management	12%	Item		$ 3,378,281	Increase due to scale of project	12%	Item		$ 2,945,648	
8.7	Site Establishment	2.5%	Item		$ 703,808		2.5%	Item		$ 613,677	
8.8	Contingency	20%	Item		$ 5,630,468		20%	Item		$ 4,909,413	
				SUB TOTAL - DELIVERY	$ 13,583,504					$ 11,843,958	
				TOTAL	**$ 41,735,843**					**$ 36,391,021**	