



Bluestone Bridge Road, Geelong

07 July 2023

To	Oliver Stoltz	Contact No.	+61 3 8687 8680
Copy to	Sasha Sheko	Email	soumil.naik@ghd.com
From	Soumil Naik	Project No.	12605146
Project Name	Bluestone Bridge Geelong Options Assessment		
Subject	Preferred Option Report		

Dear Oliver,

1. Project Background

In March 2023, GHD were engaged by the City of Greater Geelong (CoGG) to undertake an options assessment of the several layout configurations considered for the Bluestone Bridge located along the along Bluestone Bridge Road, in Lovely Banks near Geelong.

It is estimated that the traffic along Bluestone Bridge Road is likely to increase as a result of the Creamery Road Precinct Structure Plan (CRPSP) development as well as wider strategic growth from other developments in the surrounding area. In order to account for the likely increase of traffic along Bluestone Bridge Road and provide a shared user path connection, CoGG had identified five conceptual options in order to safely manage the current and future traffic under the Bluestone Bridge which is of significant historical importance. The conceptual options considered are listed below:

- Option 0: Do Nothing (Existing Conditions)
- Option 1: Close Road and Build a Shared User Path (SUP) under the Bluestone Bridge span
- Option 2: Build Shared User Path (SUP) and Traffic Signals to Control Traffic Flow under the Bluestone Bridge span
- Option 3: Build Road and Shared User Path (SUP) under the Bluestone Bridge span
- Option 4: Build Road under the Bluestone Bridge span with Shared User Path (SUP) outside the bridge spans

As part of Stage 1 of the project, GHD developed five high-level concept design layouts based on the conceptual options (listed above) considered by CoGG and completed a high level assessment for the same which included high-level cost estimates to deliver each option. The assessment along with the cost estimates for each concept design were detailed in an Options Assessment report and submitted to CoGG (dated 12 April 2023).

1.1 Purpose of this report

Following the review of each option detailed in the Options Assessment report, Option 2 was preferred by CoGG. This report forms a part of Stage 2 works of the project which further develops the high-level concept design Option 2 (preferred option) based on the comments and suggestions made by the CoGG. This report also undertakes a revised cost estimate to deliver the preferred option based on the updated concept design layout.

2. Scope and limitations

2.1 Limitations

This report: has been prepared by GHD for City of Greater Geelong and may only be used and relied on by City of Greater Geelong for the purpose agreed between GHD and City of Greater Geelong as set out in section 1.1 of this report.

GHD otherwise disclaims responsibility to any person other than City of Greater Geelong arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report (refer section(s) 2.2 of this report). GHD disclaims liability arising from any of the assumptions being incorrect.

Accessibility of documents

If this report is required to be accessible in any other format, this can be provided by GHD upon request and at an additional cost if necessary.

Cost Estimates

GHD's nominated subconsultants (WT Partnership) has prepared the preliminary cost estimates set out in Section 3.3 of this report ("Cost Estimate") using information reasonably available to WT Partnership who prepared this report; and based on assumptions and judgments made by WT Partnership.

The Cost Estimate has been prepared for the purpose of this high level assessment and must not be used for any other purpose.

The Cost Estimate is a preliminary estimate only. Actual prices, costs and other variables may be different to those used to prepare the Cost Estimate and may change. Unless as otherwise specified in this report, no detailed quotation has been obtained for actions identified in this report. GHD does not represent, warrant or guarantee that the [works/project] can or will be undertaken at a cost which is the same or less than the Cost Estimate.

Where estimates of potential costs are provided with an indicated level of confidence, notwithstanding the conservatism of the level of confidence selected as the planning level, there remains a chance that the cost will be greater than the planning estimate, and any funding would not be adequate. The confidence level considered to be most appropriate for planning purposes will vary depending on the conservatism of the user and the nature of the project. The user should therefore select appropriate confidence levels to suit their particular risk profile.

2.2 Assumptions

Any assumptions that have been made during the course of this assessment have been mentioned within the relevant sections of the report.

3. Preferred Option Details

Figure 1 provides the high-level concept layout plan previously prepared by GHD.

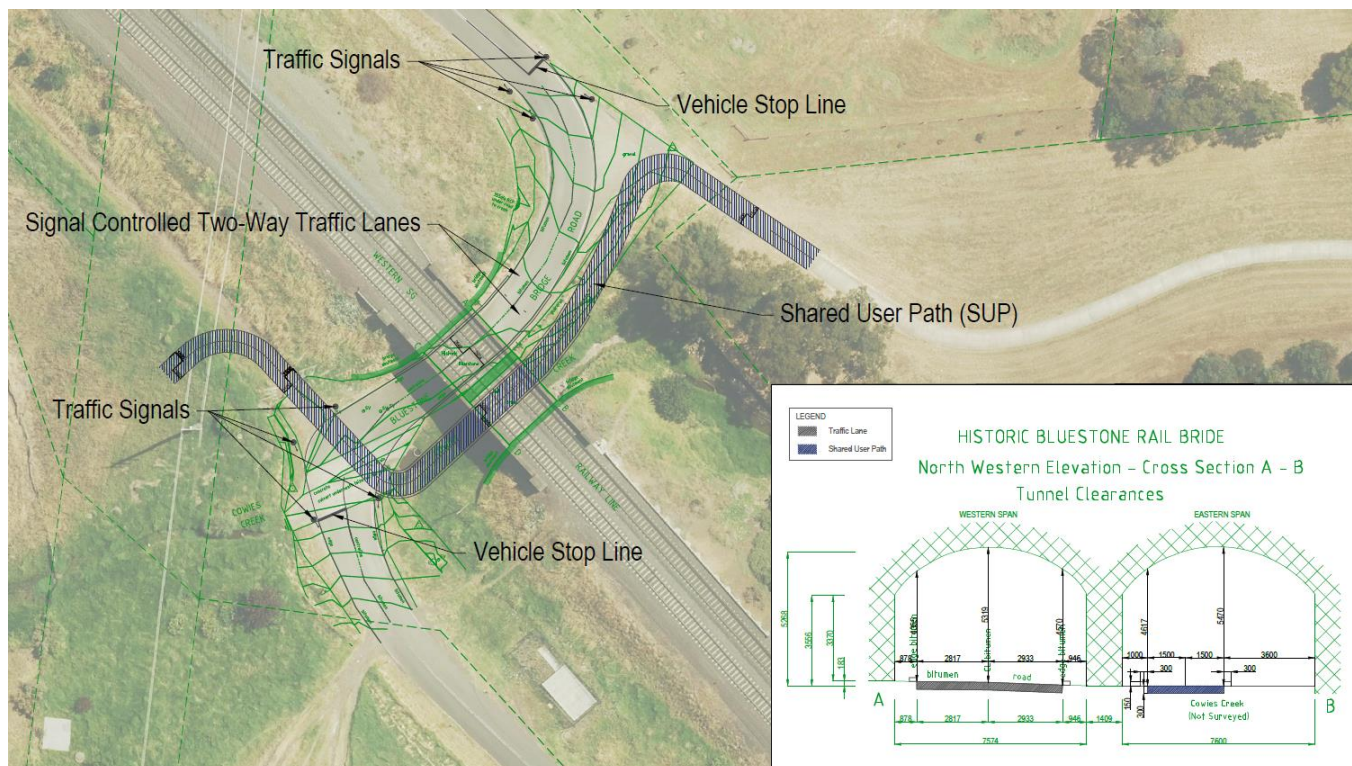


Figure 1 High-Level Concept Design Layout (Preferred Option)

3.1 Preferred Option Design Details

Western Underpass: Two-way Road; One way at a time controlled via signals

The preferred option would use the existing two-way road under the western span of the bridge. However, traffic would be controlled via traffic signals at either end of the Bluestone Bridge, permitting one way traffic at a time. This would require traffic in the other direction to wait (at the stop line) until the oncoming traffic passes. There would be 300mm kerbs on either side of the existing traffic lanes under the span of the bridge.

Eastern Underpass: Shared User Path

The SUP is proposed to be constructed under the eastern span of the bridge and will have a width of 3.0 metres along with 300mm kerbs on either side. Since the underpass below the eastern arch of the bridge is currently a creek, the SUP would be constructed on a culvert or on a boardwalk, if feasible.

Other Considerations

Vehicle 'Stop Lines' are proposed to be provided on either side of the Bluestone Bridge within the oncoming traffic lanes. In addition, four sets of traffic lights along with the associated hardware are also proposed to be installed on either end of the bridge.

3.2 Changes to the High-Level Concept Design

This high-level concept design has further been developed to include the following changes:

- The section of the Shared User Path under the eastern span of the Bluestone Bridge is proposed to be constructed on a culvert or in the form of a suspended boardwalk.
- CoGG's Environmental Planning Unit identified that the Cowies Creek was of significant importance for the Growling Grass Frog habitat on both sides of the Bluestone Bridge Road. In order to establish a connectivity between the upstream and downstream sections of the creek, it was suggested that the existing box culvert and floodway located near the Bluestone Bridge may have to be replaced with a series of box culverts. This has been noted as part of the updated design.
- All the infrastructure associated with the traffic signals has now been relocated to remain outside the area of the existing box culvert. This includes the 'Stop Lines' within the northbound traffic lanes (located on the southern side of the Bluestone Bridge) as well as any signal light infrastructure that was previously shown on the existing culvert at the location.
- The 'Stop Lines' within the southbound traffic lanes have been moved further to the north in comparison to previous design. This modification has been done to stop the southbound traffic at an appropriate location in order to allow the largest vehicle in the northbound direction pass safely.

The updated high-level concept layout plan of the preferred option along with the road cross-section has been presented within Appendix A of this report.

The swept path assessment undertaken using various vehicles for the preferred option has been presented in Appendix B of this report.

3.3 Updated Cost Estimate

An updated high-level cost estimate for the delivery of the preferred option (Option 2) has been prepared by WT (Cost Estimation Consultants) based on the revised concept design layout prepared by GHD.

The updated estimate total project cost for the delivery of this option was projected to be **\$1,999,720** which included a construction cost of **\$1,398,320**.

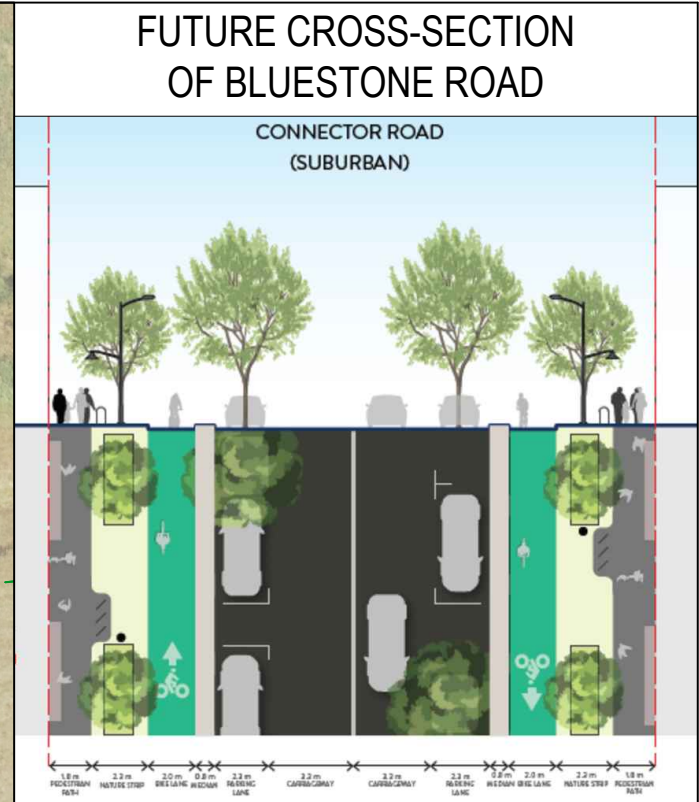
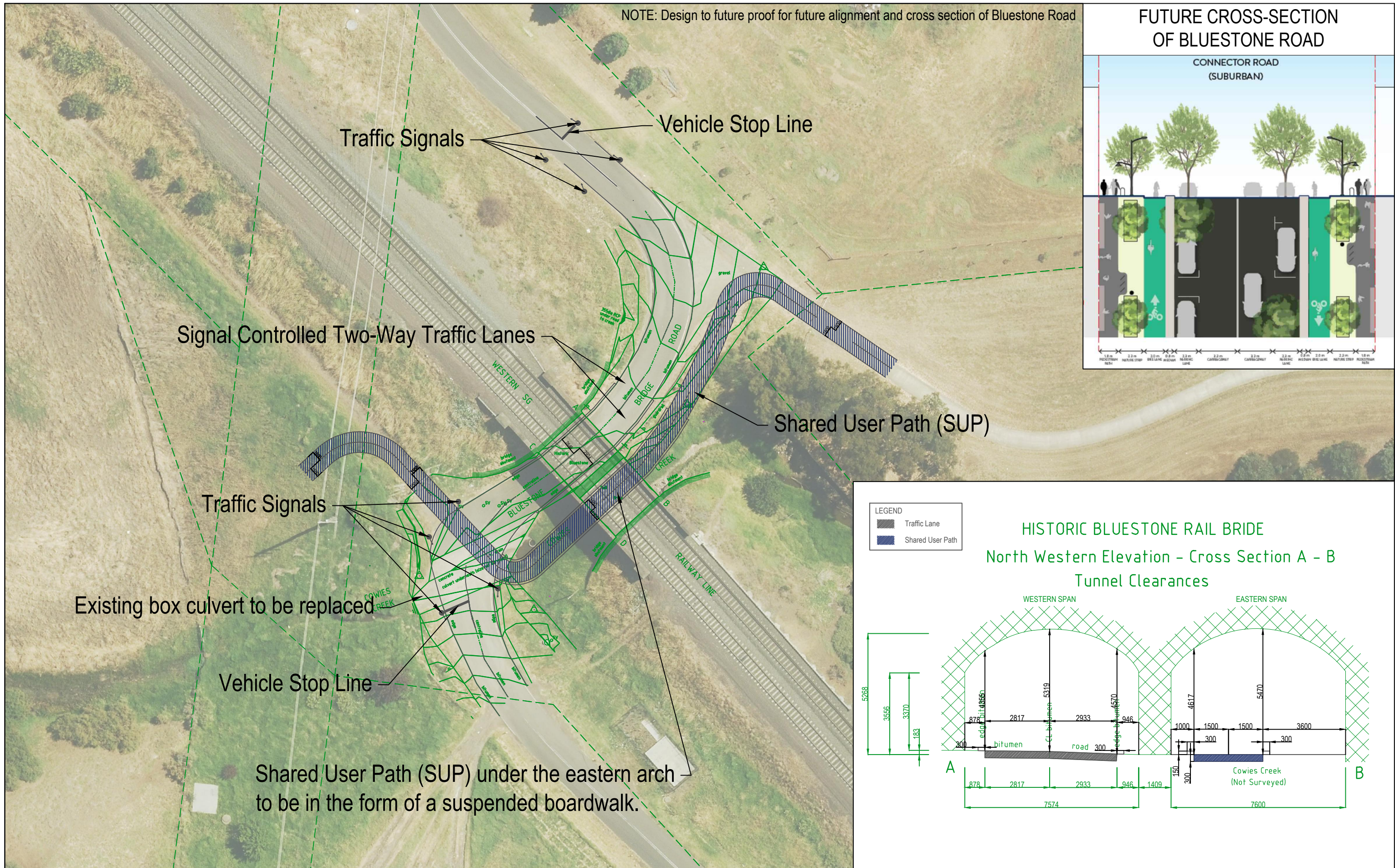
The details of the cost estimation for the preferred option have been attached within Appendix B of this report.

Appendices

Appendix A

Concept Layout Plan (Preferred Option)

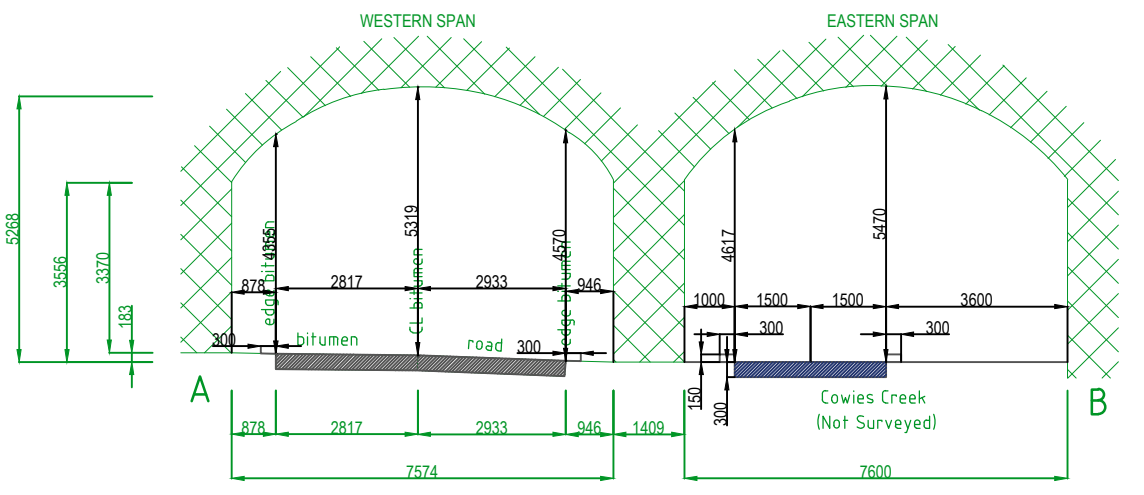
NOTE: Design to future proof for future alignment and cross section of Bluestone Road



HISTORIC BLUESTONE RAIL BRIDGE

North Western Elevation - Cross Section A - B

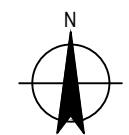
Tunnel Clearances



Rev	Description	App'd	Date
C	Final Issue		05/07/2023
B	Updates Based on Client Comments		16/06/2023
A	Preliminary Concept Designs		15/03/2023

Plot Date: 5 July 2023 - 11:11 AM Plotted by: Soumil Naik

File Name: \\ghdnet\ghd\AU\Geelong\Projects\311\2605146\Tech\Design\SK02 (2023.06.02)\12605146-XC_Bluestone_Bridge_SK02.dwg



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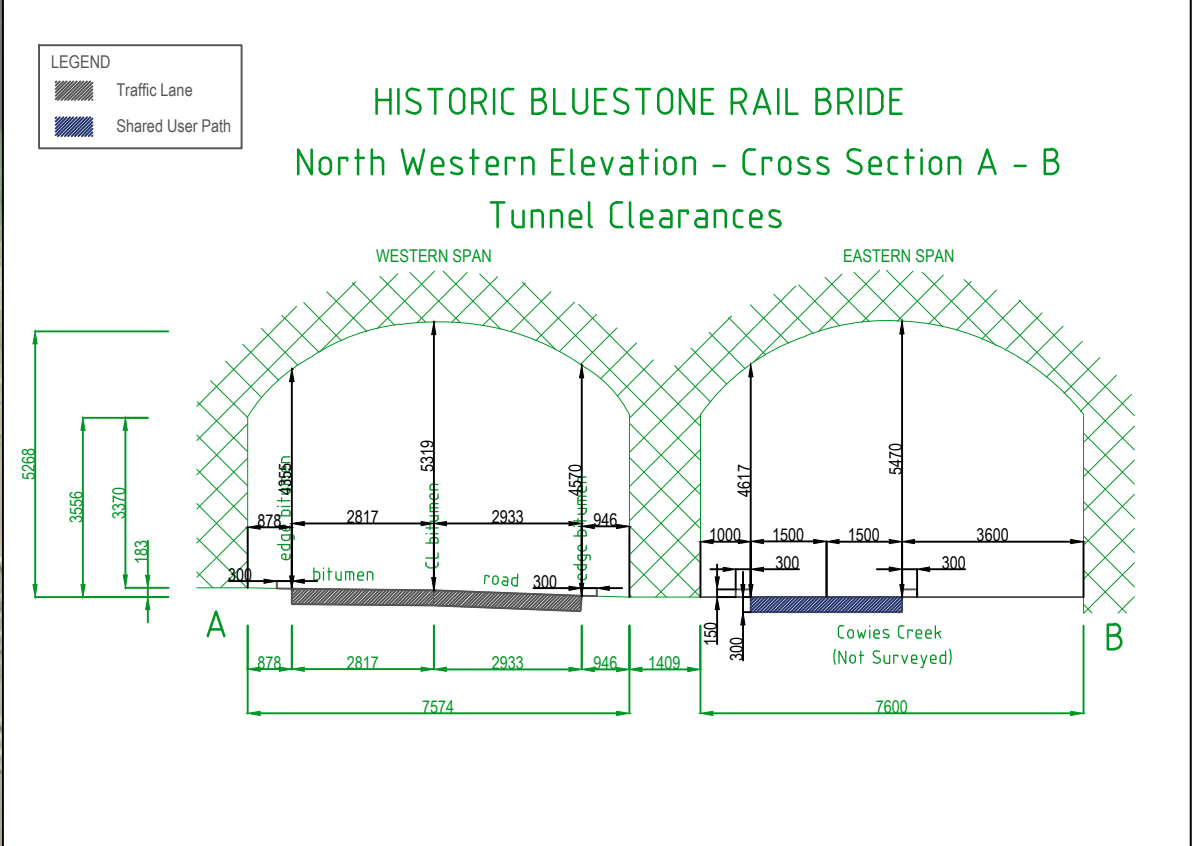
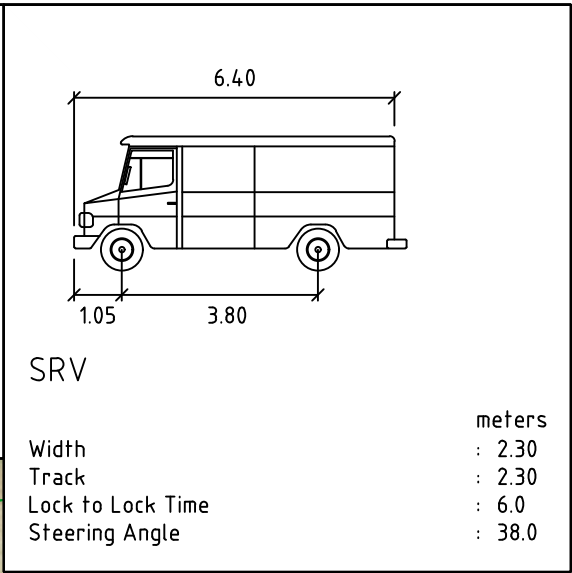
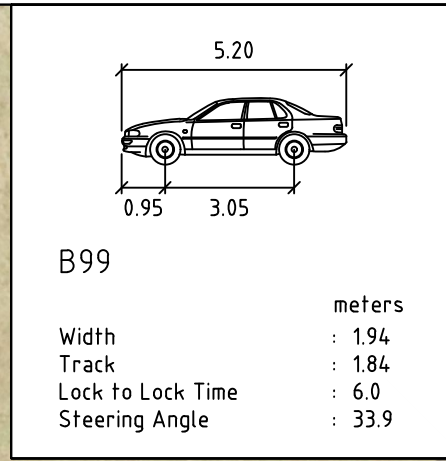
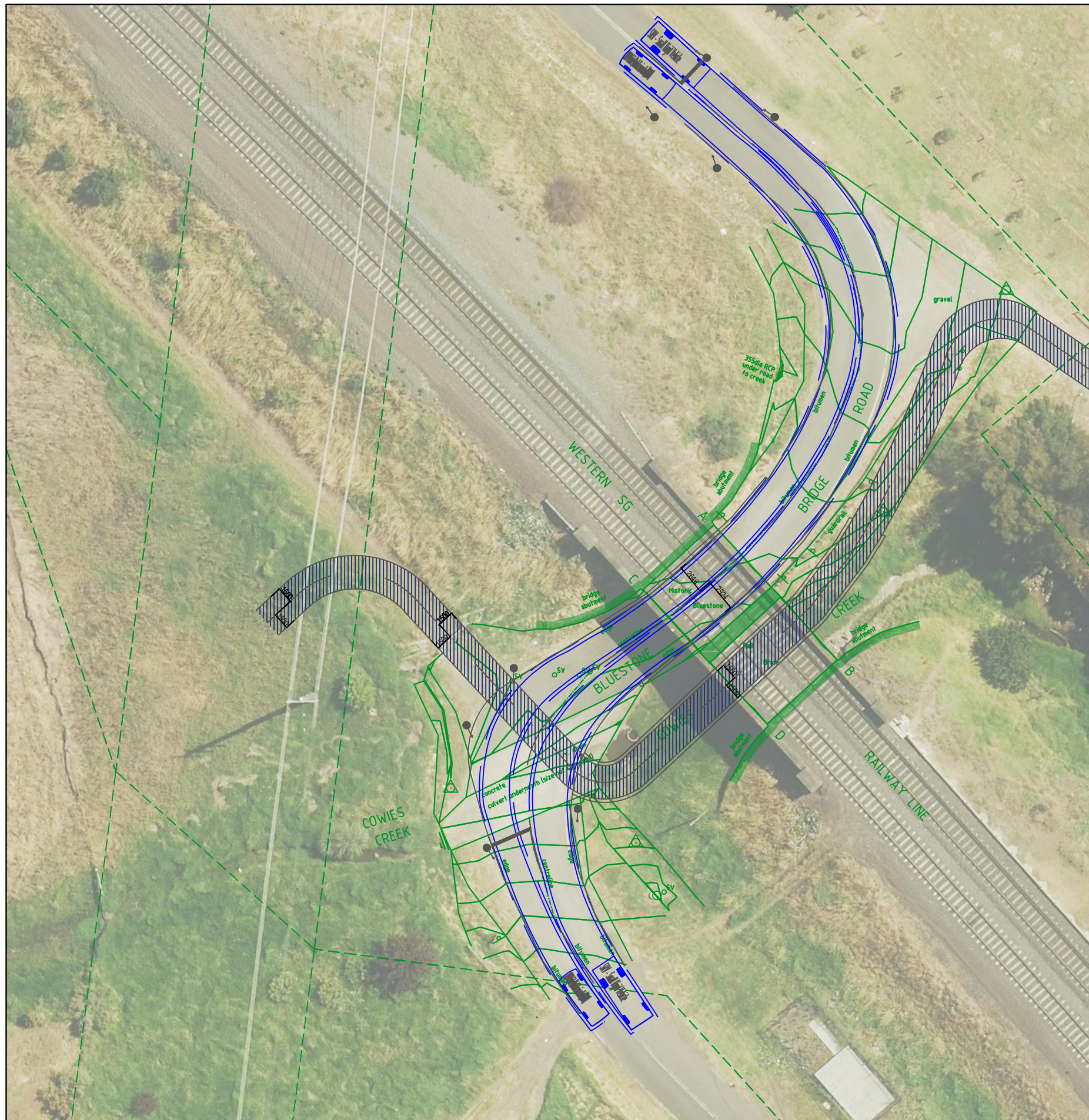
City of Greater Geelong (CoGG)
 Bluestone Bridge
 Bluestone Bridge Option 2
 Western Span: Two-Way Rd (Existing)
 Eastern Span: Shared User Path (SUP)

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 Project No: 12605146
 Sketch no: 12605146-Bluestone_Bridge-SK060
 Rev no: B

Size: A3

Appendix B

Swept Path Assessment (Preferred Option)



Rev	Description	App'd	Date
B	Final Issue		05/07/2023
A	Issued for Client Review		16/06/2023

Plot Date: 5 July 2023 - 11:11 AM Plotted by: Soumil Naik

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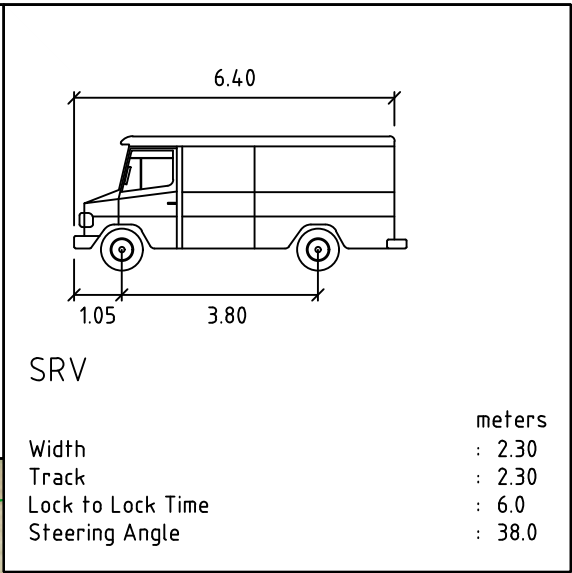
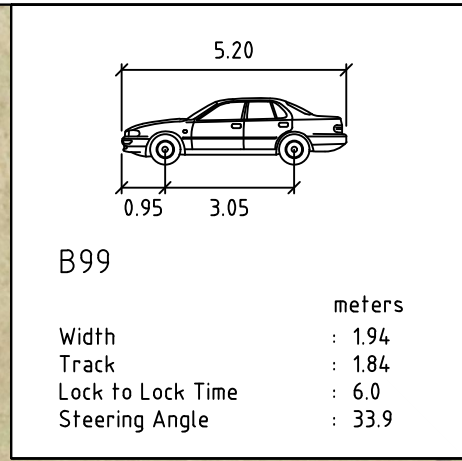
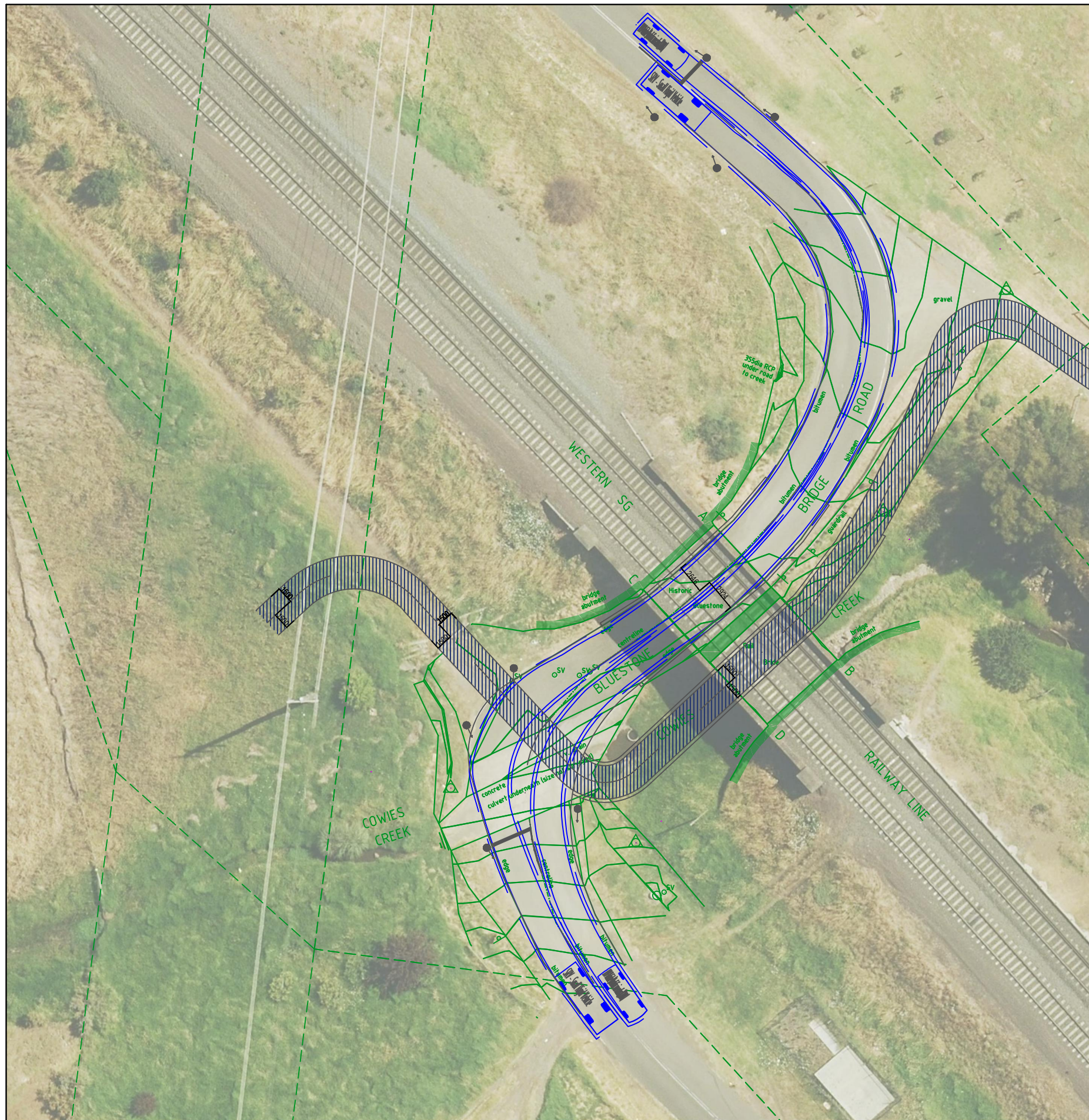
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City of Greater Geelong (CoGG)
 Bluestone Bridge Option 2
SWEPT PATH ASSESSMENT
 Western Span: Two-Way Rd (Existing)
 Eastern Span: Shared User Path (SUP)

Project No. 12605146
 Status code
 Sketch no. 12605146-Bluestone Bridge-SK061
 Rev no. A

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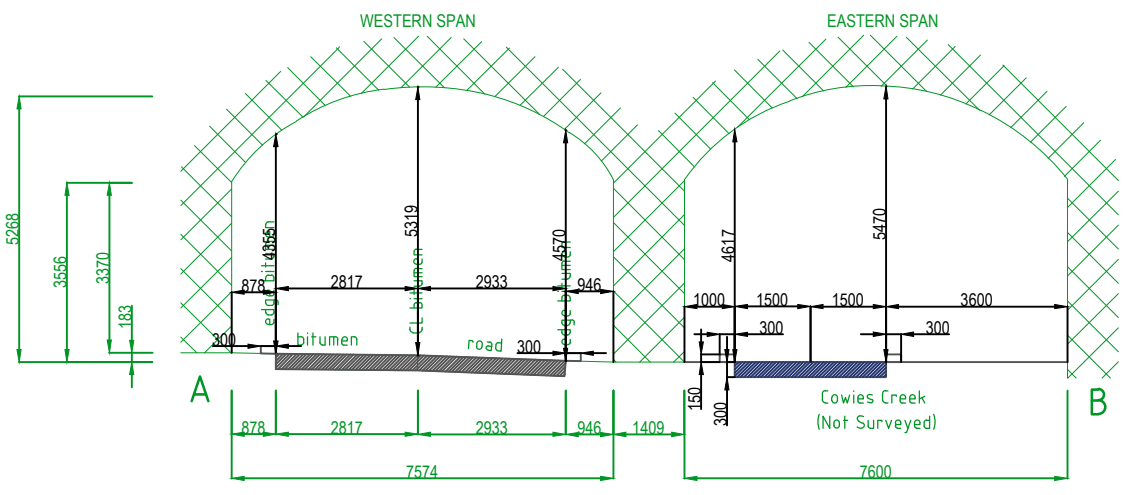
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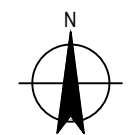
HISTORIC BLUESTONE RAIL BRIDGE

North Western Elevation - Cross Section A - B

Tunnel Clearances



Rev	Description	App'd	Date
B	Final Issue		05/07/2023
A	Issued for Client Review		16/06/2023

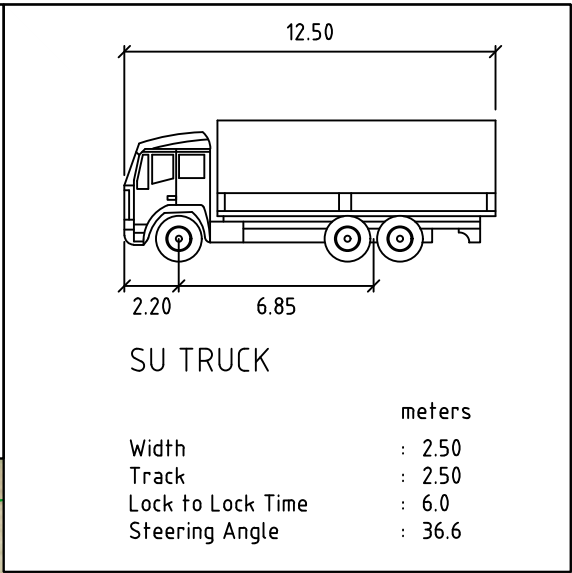
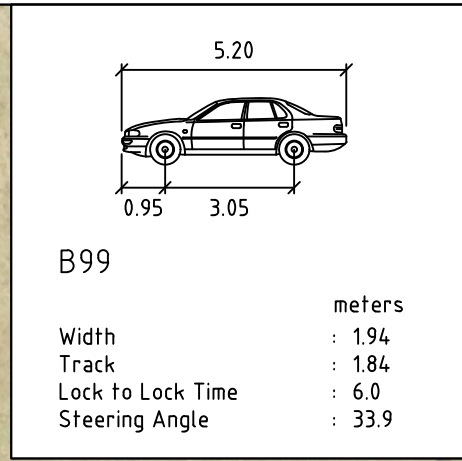
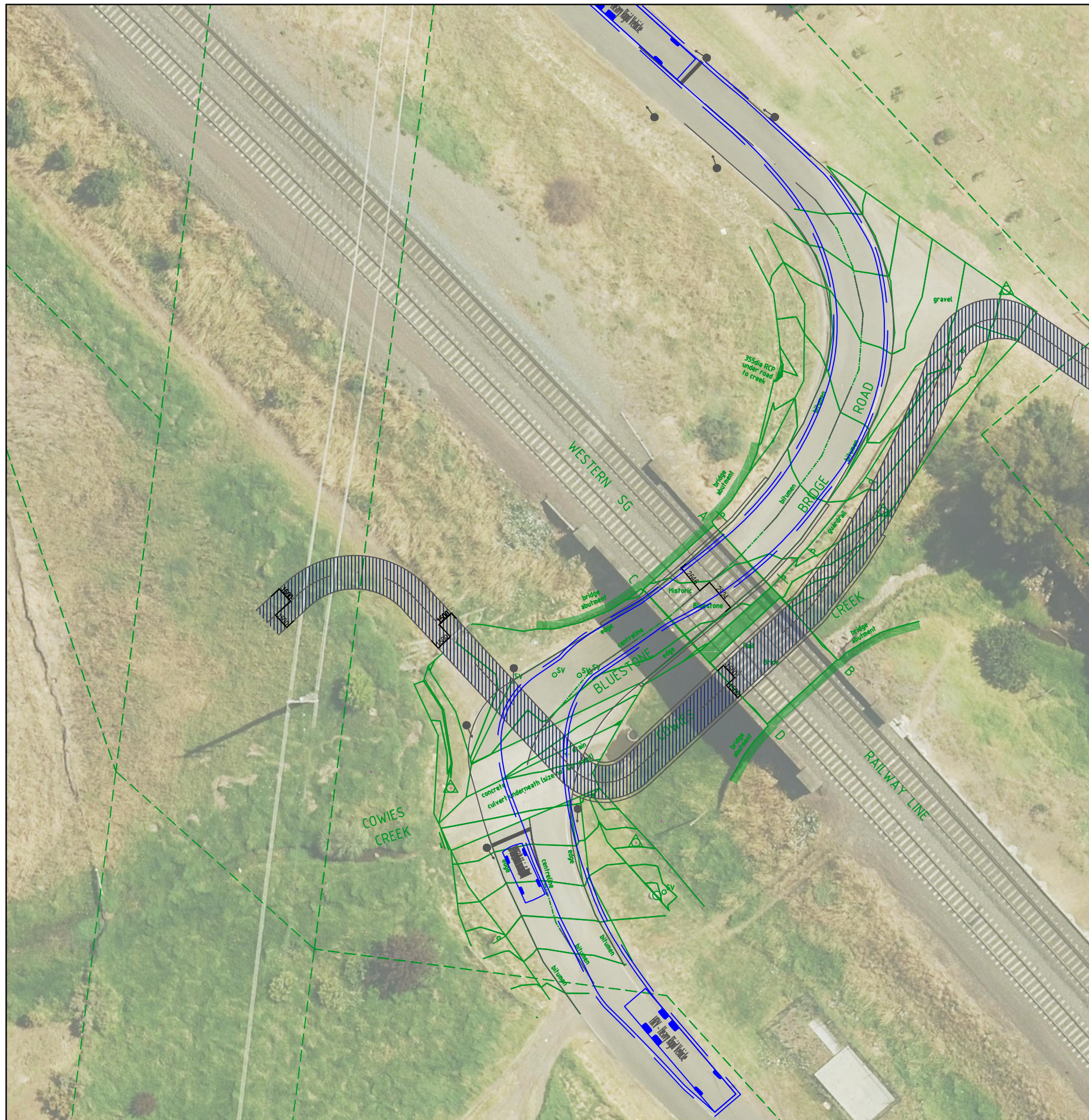


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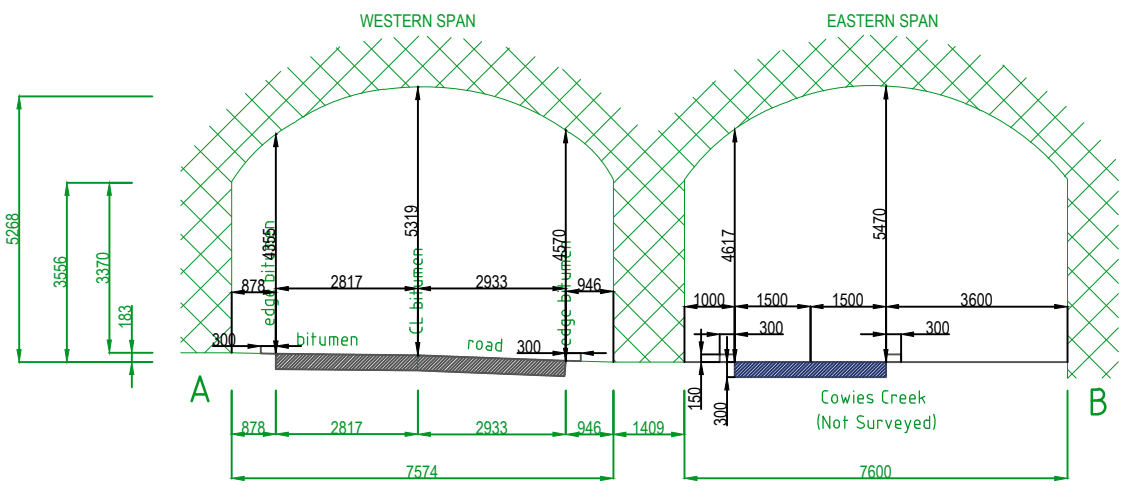


City of Greater Geelong (CoGG)
 Bluestone Bridge Option 2
SWEPT PATH ASSESSMENT
 Western Span: Two-Way Rd (Existing)
 Eastern Span: Shared User Path (SUP)

Size
A3



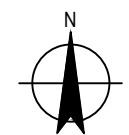
HISTORIC BLUESTONE RAIL BRIDGE
 North Western Elevation - Cross Section A - B
 Tunnel Clearances



Rev	Description	App'd	Date
B	Final Issue		05/07/2023
A	Issued for Client Review		16/06/2023

Plot Date: 5 July 2023 - 11:11 AM Plotted by: Soumil Naik

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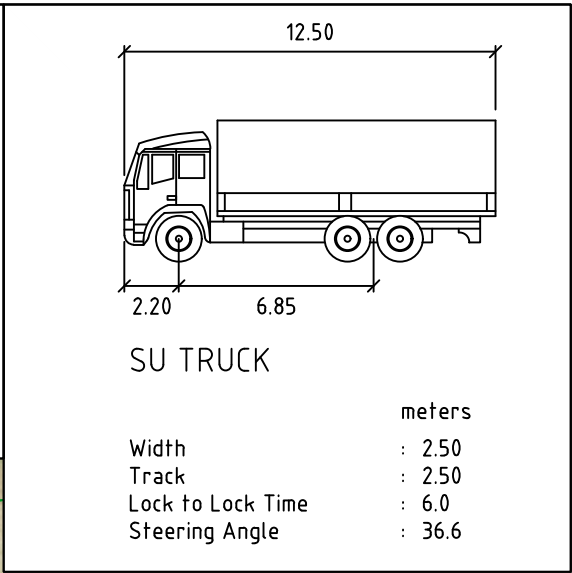
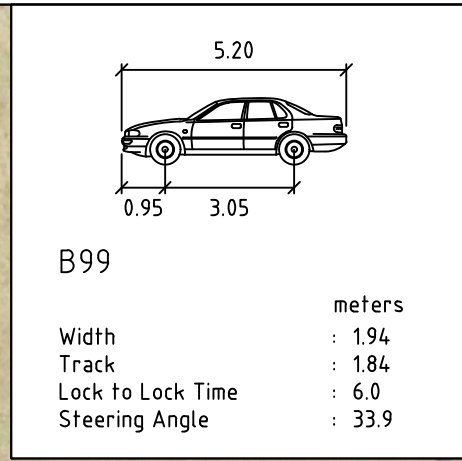
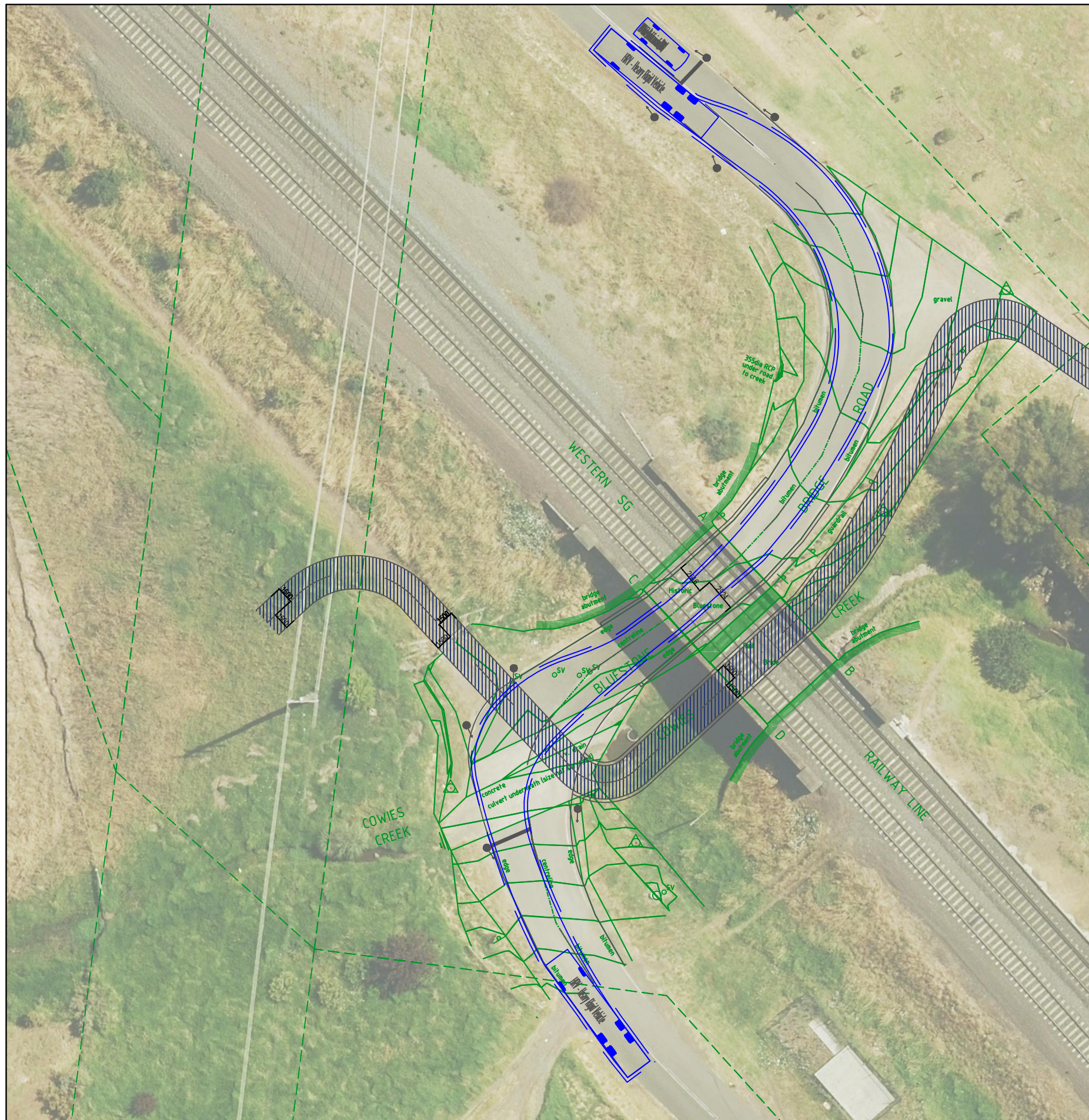
City of Greater Geelong (CoGG)
 Bluestone Bridge Option 2
SWEPT PATH ASSESSMENT
 Western Span: Two-Way Rd (Existing)
 Eastern Span: Shared User Path (SUP)

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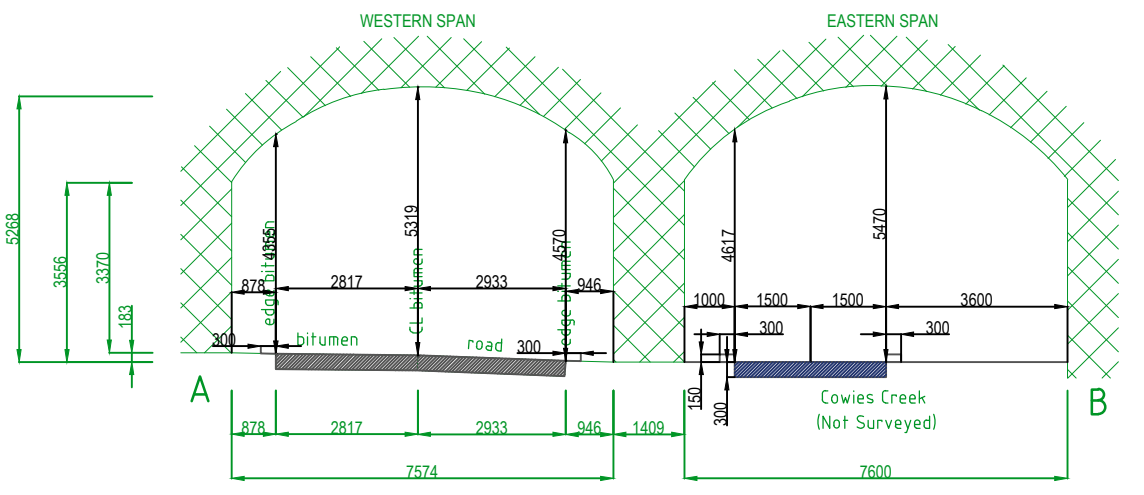
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 Rev no.: A



HISTORIC BLUESTONE RAIL BRIDGE

North Western Elevation - Cross Section A - B

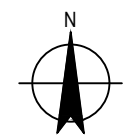
Tunnel Clearances



Rev	Description	App'd	Date
B	Final Issue		05/07/2023
A	Issued for Client Review		16/06/2023

Plot Date: 5 July 2023 - 11:11 AM Plotted by: Soumil Naik

File Name: \ghdnet\ghd\AU\Geelong\Projects\3112605146\Tech\Design\SK02 (2023.06.02)\12605146-XC_Bluestone_Bridge_SK02.dwg



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 Status code: Project No. 12605146

City of Greater Geelong (CoGG)
 Bluestone Bridge Option 2
SWEPT PATH ASSESSMENT
 Western Span: Two-Way Rd (Existing)
 Eastern Span: Shared User Path (SUP)

Size: A3
 Sketch no.: 12605146-Bluestone_Bridge-SK064
 Rev no.: A

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Appendix C

Cost Estimation Details (Preferred Option)

ESTIMATE SUMMARY



PR-018663 Bluestone Bridge
 High Level Cost Estimate
 Concept Design - Option 2 (Preferred) Draft v2.0

Job No: PR-018663
 Cost Base Date:
 GFA (m2): 0.00

Date Printed: 26/06/2023

Section	Unit	Quantity	Rate	Cost (\$)
<u>OPTION 2 (PREFERRED)</u>				
1				
	ESTIMATE CRITERIA			
	<u>DIRECT COSTS</u>			
2				414,720
	Works to Western span of Bluestone Bridge			
3				408,800
	Works to Eastern span of Bluestone Bridge (Existing Creek)			
	<u>Other costs</u>			
4	%	10.0	823,520	82,400
	Miscellaneous costs including maintenance during construction, and Environmental & Cultural Heritage Management			
5	%	10.0	905,920	90,600
	Traffic management during construction			
6	%	5.0	905,920	45,300
	Safe working (railway corridor)			
				<i>Subtotal - Direct costs</i>
				1,041,820
	<u>INDIRECT COSTS</u>			
7	%	14.0	1,041,820	145,900
	Construction Preliminaries			
8	%	8.0	1,041,820	83,400
	Design			
				<i>Subtotal - Indirect Costs</i>
				229,300
9	%	10.0	1,271,120	127,200
	Overhead & Profit (10%)			
				TOTAL ESTIMATED CONSTRUCTION COST
				1,398,320
	<u>Other Costs</u>			
10	%	10.0	1,398,320	139,900
	Owner's Costs			
11				Excl
	Land Acquisition			

ESTIMATE SUMMARY



PR-018663 Bluestone Bridge
High Level Cost Estimate
Concept Design - Option 2 (Peferred) Draft v2.0

Job No: PR-018663
Cost Base Date:
GFA (m2): 0.00

Date Printed: 26/06/2023

Section	Unit	Quantity	Rate	Cost (\$)
				1,538,220
TOTAL ESTIMATED COST - BASE ESTIMATE				
12 Contingency	%	30.0	1,538,220	461,500
				1,999,720
TOTAL PROJECT ESTIMATE				

ESTIMATE DETAIL



PR-018663 Bluestone Bridge
High Level Cost Estimate
Concept Design - Option 2 (Peferred) Draft v2.0

Job No: PR-018663
Cost Base Date:
GFA (m2): 0.00

Date Printed: 26/06/2023

Item	Section	Unit	Qty	Rate	Cost \$
------	---------	------	-----	------	---------

1 ESTIMATE CRITERIA

PROJECT SCOPE

1.1 This high level cost estimate has been prepared for GHD for Option 2 of the Bluestone Bridge Project

Option 2: Signal controlled traffic movements and shared user path

1.2 1- Close 1 lane Bluestone Bridge road using Temporary NJB during construction

1.3 2- Resheet existing road in 2 stage

1.4 3- Place Conduits and new kerbs behind Temporary Barrier

1.5 4- Place Traffic signals

1.6 5- Construct SUP

1.7 6- Remove Temporary Barrier

DOCUMENTATION USED:

1.8 This high level cost estimate is based upon drawings and commentary provided by GHD in their email dated 16 June 2023

1.9 - 12605146-XC_Bluestone_Bridge_SK060 Rev B

ASSUMPTIONS

Pavements

1.10 Western span - milling and 40mm asphalt overlay assumed to existing pavement

1.11 Eastern span - 3.0m wide SUP pavements to be constructed at grade and over suspended boardwalk / footbridge

Drainage

ESTIMATE DETAIL



PR-018663 Bluestone Bridge
High Level Cost Estimate
Concept Design - Option 2 (Peferred) Draft v2.0

Job No: PR-018663
Cost Base Date:
GFA (m2): 0.00

Date Printed: 26/06/2023

Item	Section	Unit	Qty	Rate	Cost \$
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1 ESTIMATE CRITERIA

(Continued)

1.12	Replacement of existing box culvert under road and new full depth pavement - like for like replacement, no extension assumed (subject to confirmation in detailed design) <u>Traffic Signals</u>				
1.13	Local point of supply (POS) and inground conduits assume connection within 150m of site. <u>Other Direct Costs</u>				
1.14	Traffic Management - 10% of direct cost				
1.15	Safeworking Requirements (Rail corridor) - 5% of direct cost				
1.16	Miscellaneous costs allowance - 10% of direct cost (assumes Maintenance during construction, Environmental management and Cultural Heritage management) <u>Indirect Costs</u>				
1.17	Construction Preliminaries - 14% of direct cost				
1.18	Design - 8% of direct cost				
1.19	Contractor's Overheads & Profit - 10% of construction cost				

2 Works to Western span of Bluestone Bridge

2.1	Resheet existing pavement	m2	690	71.83	49,560
2.2	Full depth pavement	m2	108	259.35	28,010
2.3	New Kerb	m	44	75.00	3,300
2.4	Barriers, guardrail	m	30	180	5,400
2.5	Line marking	m2	690	5.00	3,450
2.6	Signage	Item	1	5,000	5,000

ESTIMATE DETAIL

PR-018663 Bluestone Bridge
High Level Cost Estimate
Concept Design - Option 2 (Peferred) Draft v2.0

Job No: PR-018663
Cost Base Date:
GFA (m2): 0.00

Date Printed: 26/06/2023

Item	Section	Unit	Qty	Rate	Cost \$
2	Works to Western span of Bluestone Bridge				<i>(Continued)</i>
2.7	Provision for new traffic signals including new POS	no	1	320,000	320,000

414,720

3 Works to Eastern span of Bluestone Bridge (Existing Creek)

3.1	Under bridge site preparation	days	3	6,250.00	18,750
3.2	Shared User Path, 3.0m wide, on ground	m2	254	174.41	44,300
3.3	Shared User Path, 3.0m wide, suspended boardwalk / footbridge	m2	129	2,500	322,500
3.4	Verge construction	m2	146	79.32	11,580
3.5	New Kerb - SUP	m	72	75.00	5,400
3.6	Line marking	m2	254	5.00	1,270
3.7	Signage	Item	1	5,000	5,000

408,800

Project name		Bluestone Bridge Geelong Options Assessment					
Document title		Bluestone Bridge Road, Geelong Preferred Option Report					
Project number		12605146					
File name		12605146_REP-Bluestone_Bridge_Road-Preferred-Option_Report.docx					
Status Code	Revision	Author	Reviewer		Approved for issue		
			Name	Signature	Name	Signature	Date
S4	A	Soumil Naik	Toby Cooper	ON FILE	Toby Cooper	ON FILE	27/06/23
S4	1	Soumil Naik	Toby Cooper	ON FILE	Toby Cooper	ON FILE	7/07/23
[Status code]							
[Status code]							
[Status code]							

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