



Barham-Koondrook Bridge – Caisson repair work

Addendum review of environmental factors

Transport for NSW

April | 2020

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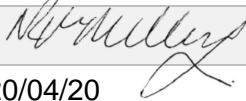
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Executive summary

The proposed modification

Transport for NSW is proposing to modify the Barham-Koondrook Bridge – Truss and Victorian approach span restoration by including repairs to the bridge's watertight metal retaining structures, or caissons, to address significant levels of corrosion (proposed modification). The caissons prevent water entering the bridge piers.

Key features of the proposed modification include:

- preparing the caisson surface where repairs are required by removing rust and paint
- applying epoxy to the prepared surface
- installing a new steel connecting plate, or splice plate, overlaying the original connection.

Background

A review of environmental factors (REF) was prepared for the Barham-Koondrook Bridge – Truss and Victorian approach span restoration on 8 February 2016. The project REF was placed on public display between 29 February 2016 and 18 March 2016 for community and stakeholder comment.

A submissions report, dated 17 May 2016 was prepared to respond to issues raised.

Need for proposed modification

The proposed modification is needed to allow repairs to be carried out on metal caisson splices on Barham-Koondrook Bridge. During final re-painting works on the bridge in August 2018, significant corrosion was found. Analysis of the corrosion raised concerns about the bridge's capacity to carry GML B-Double vehicles. The proposed modification is needed to allow efficient and timely repairs to be carried out.

Proposal objectives

The objectives for the proposed modification include:

- minimising impact on the heritage significance of the bridge
- minimising impact on the environment
- minimising impact on the community
- being cost effective
- maintaining existing freight access and serviceability requirements for the route.

Options considered

The following options were considered:

Option 1 – Do nothing

This option involves not doing any work on the caissons and continue to monitor the structural integrity of the caissons.

Option 2 – Rebuild piers

This option involves removing the heavily corroded sections of the caisson and completely rebuilding the piers.

Option 3 – Caisson repairs - bolted flange cover plate

This option involves installing hollow bolted plates around the corroded caissons with bolted flange joints.

Option 4 – Caisson repairs – butt-welded cover plate

This option would incorporate a connecting vertical butt weld, a technique where two pieces of metal are joined on the same plane along a common edge.

Option 5 – Caisson repairs – bolted and sealed splice plate

This option involves installation of steel splice plates over the corroded caisson rivet splices. The plates would be joined with a bolted and sealed splice plate. New hollow bolts would be installed the length of the plate.

Transport for NSW considers Option 5 to be the best outcome. It would be more visually intrusive than option 4 but less intrusive than option 3. The bolted and sealed splice plate would provide a more constructible and durable design than both options 3 and 4, as it would prevent water ingress, and has less risk of suffering impact damage from flood debris than option 3. Option 5 is considered the preferred option.

Justification and conclusion

The proposed modification would ensure the integrity and functionality of the state heritage listed Barham-Koondrook Bridge would be retained. Without repair, the caisson corrosion would compromise the structural integrity of the bridge, leading to a loss of function, and potentially its demolition.

The adverse impact on the environment is expected to be minor. The benefits of the proposal are considered to outweigh any minor impact on the environment. No safeguards have been added or modified.

The assessment of the proposed modification's impact has concluded:

- the proposed modification is not likely to have a significant impact on the environment
- the proposed modification is not likely to have a significant impact on matters of national environmental significance or the environment of Commonwealth land.

There would be no additional environmental impacts as a result of the proposed modifications. This addendum REF has examined and taken into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the proposed activity.

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1 Introduction

1.1 Proposed modification overview

Transport for NSW is proposing to modify the Barham-Koondrook Bridge – Truss and Victorian approach span restoration by including repairs to the bridge's watertight metal retaining structures, or caissons, to address significant levels of corrosion (proposed modification).

Key features of the proposed modification include:

- preparing the surface of the caissons where repairs are required by removing rust and paint
- applying epoxy to the prepared surface
- installing a new steel connecting plate, or splice plate, overlaying the original connection.

The location of the proposed modification is shown in Figure 1-1 and the proposed modification is shown in Figure 1-2. Chapter 3 describes the proposed modification in more detail.

A review of environmental factors (REF) was prepared for the Barham-Koondrook Bridge – Truss and Victorian approach span restoration on 8 February 2016 (referred to in this addendum REF as the project REF). The project REF was placed on public display between 29 February 2016 and 18 March 2016 for community and stakeholder comment. A submissions report, dated 17 May 2016 was prepared to respond to issues raised.

In addition the following addendum REFs for the Barham-Koondrook Bridge – Truss and Victorian approach span restoration have been prepared:

- Barham-Koondrook Bridge – Pedestrian pathway improvements, May 2017
- Barham-Koondrook Bridge – Additional stockpile site, April 2018
- Barham-Koondrook Bridge – Truss span transport route work, August 2018.



Figure 1-1: Location of the proposed modification

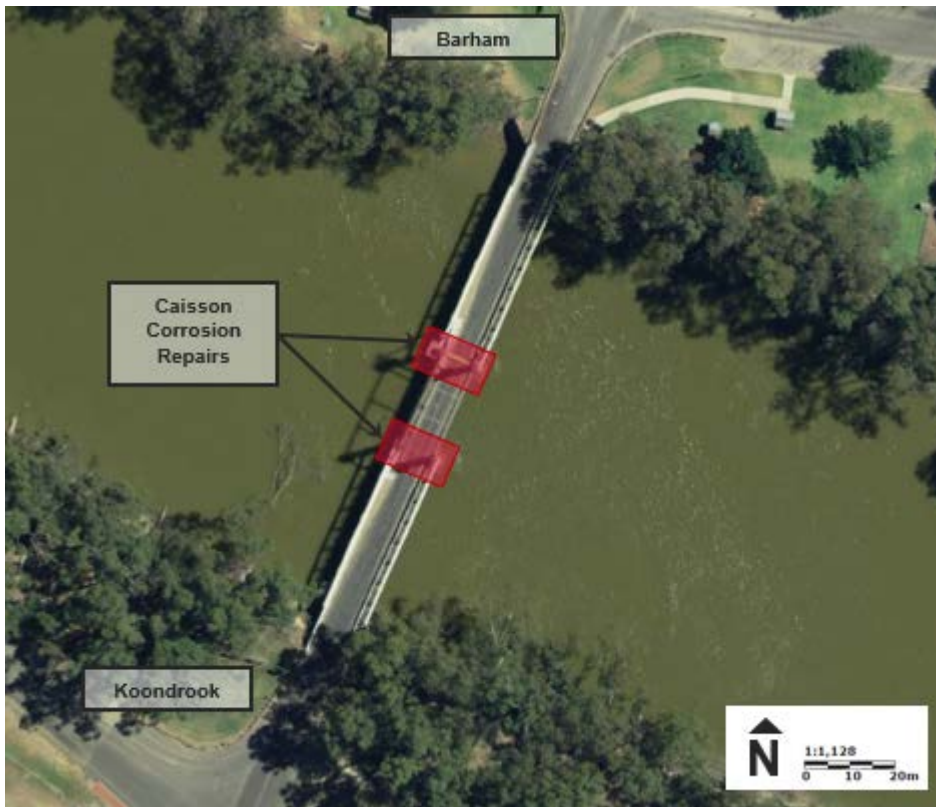


Figure 1-2: The proposed modification

1.2 Purpose of the report

This addendum review of environmental factors (REF) has been prepared by Transport for NSW Safety, Environment and Regulation on behalf of Transport for NSW Regional and Outer Metropolitan. For the purposes of these works, Transport for NSW is the proponent and the determining authority under Division 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

This addendum REF is to be read in conjunction with the project REF, submissions report and previous addendum REFs for the project. The purpose of this addendum REF is to describe the proposed modification, to document and assess the likely impact of the proposed modification on the environment, and to detail mitigation and management measures to be implemented.

The description of the proposed work and assessment of associated environmental impact has been carried out in context of clause 228 of the Environmental Planning and Assessment Regulation 2000, *Is an EIS Required? Best Practice Guidelines for Part 5 of the Environmental Planning and Assessment Act 1979* (Is an EIS Required? guidelines) (DUAP, 1995/1996), Roads and Road Related Facilities EIS Guideline (DUAP, 1996), the *Biodiversity Conservation Act 2016* (BC Act), the *Fisheries Management Act 1994* (FM Act), and the Australian Government's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

In doing so, the addendum REF helps fulfil the requirements of section 5.5 of the EP&A Act including that Transport for NSW examine and take into account to the fullest extent possible, all matters affecting or likely to affect the environment by reason of the activity.

The findings of the addendum REF would be considered when assessing:

- whether the proposed modification is likely to result in a significant impact on the environment and therefore the necessity for an environmental impact statement to be prepared and approval to be sought from the Minister for Planning and Public Spaces under Division 5.2 of the EP&A Act
- the significance of any impact on threatened species as defined by the BC Act and/or FM Act, in section 1.7 of the EP&A Act and therefore the requirement for a Species Impact Statement or a Biodiversity Development Assessment Report
- the significance of any impact on nationally listed biodiversity matters under the EPBC Act, including whether there is a real possibility that the activity may threaten long-term survival of these matters, and whether offsets are required and able to be secured
- the potential for the proposed modification to significantly impact any other matters of national environmental significance or Commonwealth land and therefore the need to make a referral to the Australian Government Department of Agriculture, Water and the Environment for a decision by the Australian Government Minister for the Environment on whether assessment and approval is required under the EPBC Act.

2 Need and options considered

2.1 Strategic need for the proposed modification

Chapter 2 of the Barham-Koondrook Bridge – Truss and Victorian Approach Span Restoration REF addresses the strategic need for the project, the project objectives and the options that were considered. The proposed modification described and assessed in this addendum REF is consistent with the strategic need for the project.

The proposed modification is needed to allow repairs to be carried out on the metal caisson splices at piers 2 and 3. During final re-painting works on the bridge in August 2018, significant corrosion was found. Analysis of the corrosion raised concerns about the bridge's capacity to carry GML B-Double vehicles. The proposed modification is needed to allow efficient and timely repairs to be carried out to address the structural shortfalls.

2.2 Proposal objectives and development criteria

Section 2.3 of the project REF identifies the proposal objectives and development criteria that apply to the proposed modification. The objectives for the proposed modification include:

- minimising impact on the heritage significance of the bridge
- minimising impact on the environment
- minimising impact on the community
- being cost effective
- maintaining existing freight access and serviceability requirements for the route.

2.3 Alternatives and options considered

2.3.1 Identified options

The following options were considered:

Option 1 – Do nothing

This option involves not doing any work on the caissons and continue to monitor the structural integrity of the caissons.

Option 2 – Rebuild piers

This option involves removing the heavily corroded sections of the caisson and completely rebuilding the piers.

Option 3 – Caisson repairs - bolted flange cover plate

This option involves installing hollow bolted plates around the corroded caissons with bolted flange joints.

Option 4 – Caisson repairs – butt-welded cover plate

This option would incorporate a connecting vertical butt weld, a technique where two pieces of metal are joined on the same plane along a common edge.

Option 5 – Caisson repairs – bolted and sealed splice plate

This option involves installation of steel splice plates over the corroded caisson rivet splices. The plates would be joined with a bolted and sealed splice plate. New hollow bolts would be installed the length of the plate.

2.3.2 Analysis of options

Option 1 would not have an impact on the environment or the community. This option would result in significant reduction to freight access in the region given strengthening is required to ensure that the bridge remains open under existing traffic loadings. This option is not the preferred option.

Option 2 has the potential to provide the best outcome for improved strength and reduced maintenance costs. This option is not the preferred option given the initial high cost to carry out the work, the adverse impact to the community and the impact to the original fabric of the bridge.

Options 3, 4 and 5 provide strengthening to the piers and also aim to reduce further corrosion and loss of original fabric by preventing water entering the piers. These options would be cost effective and reduce the impact to the community with most work being carried out from under the bridge.

Option 3 would be the most visually intrusive of the three caisson repair options considered, and its raised profile would make it vulnerable to damage and more likely to collect debris. These issues would affect the durability of the repair as once paint damage occurs the steel is again vulnerable to corrosion, and with varying river levels it is not always possible to see paint damage or repaint the affected area immediately. This option is not the preferred option.

Option 4 would be the least visually intrusive of the three caisson repair options considered. The butt-welding process which would be difficult to carry out given the narrow space. The butt weld would also introduce a considerable amount of heat into the joint and surrounding area which could cause damage to the repair and weaken the surrounding area. This option is not the preferred option.

Option 5 would be more visually intrusive than option 4 but less intrusive than option 3. The bolted and sealed splice plate would provide a more constructible and durable design than both options 3 and 4, as it would prevent water ingress, and has less risk of suffering impact damage from flood debris than option 3. This option is the preferred option.

2.4 Preferred option

The bolted and sealed spliced plate caisson repair option (option 5) is the preferred option as it best meets objectives of the proposed modification, provides a durable design, would not be vulnerable to damage and has ease of constructability.

3 Description of the proposed modification

3.1 The proposed modification

Transport for NSW is proposing to modify the Barham-Koondrook Bridge – Truss and Victorian Approach Span restoration project to carry out strengthening on the caisson piers (pier 2 and pier 3). The proposed modification is shown in Figure 1-2 and in more detail in Figures 3-1 to 3-3.

Key features of the proposed modification include:

- preparing the caisson surface where repairs are required by removal of all rust and paint
- applying epoxy to the prepared surface
- installing a new steel splice plate overlaying the original splice connection.

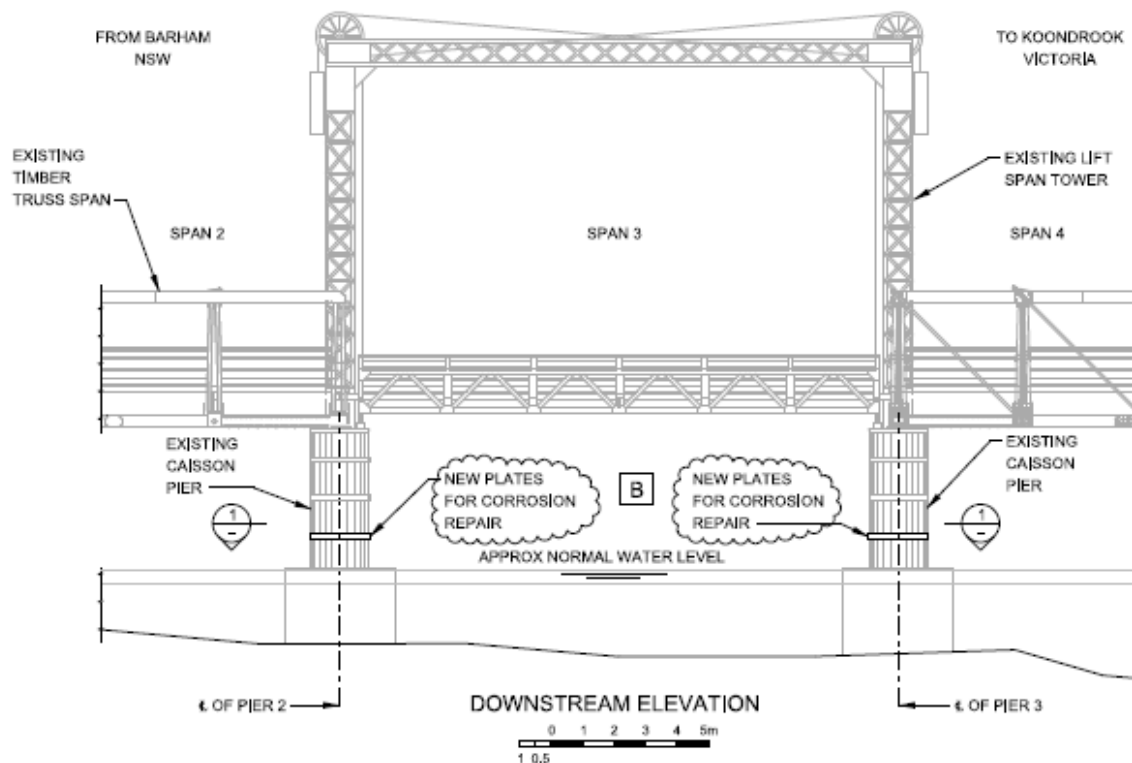


Figure 3-1: Key features of the proposed modification – caisson repair standard details



Figure 3-2: Barham Bridge looking south west showing the location of the caisson repairs

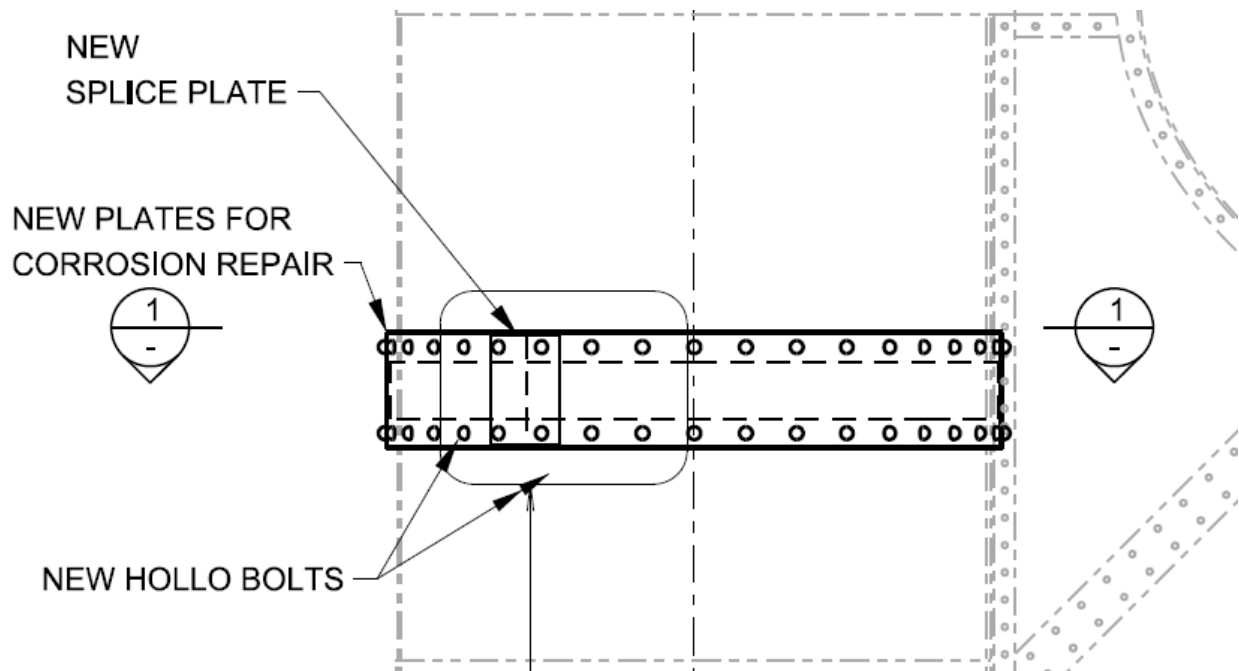


Figure 3-3: Extract from design drawings showing proposed repair methodology

3.2 Construction activities

3.2.1 Work methodology

The proposed work methodology involves:

- establishing site compounds
- installing environmental controls
- installing marine traffic controls
- launching a barge and boat from the public boat ramp
- installing scaffold on the pier cofferdam and caissons to allow access to the work site
- infrequently delaying traffic for up to 20 minutes, however, no bridge closures will be needed.

The proposed caisson repairs involve:

- preparing the surface of the caissons including the removal of all rust and paint around where the proposed cover is to be installed
- temporarily supporting the steel cover plate
- applying epoxy to the cleaned surface to form an even surface
- installing a new steel splice plate over the existing caisson, overlaying the original splice connection
- drilling holes in the existing caisson, removing loose concrete, injecting epoxy into holes followed by hollo bolt installation
- welding cover plate joint onsite
- injecting epoxy between new cover plate and existing caisson
- patching paint repairs as required
- disposing any waste to appropriately licenced waste facility
- rehabilitating compound site
- removing environmental and traffic controls.

3.2.2 Construction hours and duration

The proposal is expected to start construction in mid-2020 and is expected to take three months to complete. The proposal would be carried out during standard working hours in accordance with the Interim Construction Noise guideline (DECC, 2009). Standard working hours include:

- Monday to Friday: 7am to 6pm
- Saturday: 8am to 1pm
- Sunday and public holidays: No work.

To minimise disruptions to daily traffic and businesses, it may be necessary to do some work outside of these hours. This would most likely be done on Saturday afternoons or on Sundays. It is unlikely that work would be carried out during the evening or night-time periods.

3.2.3 Plant and equipment

- Barge and boat
- Hand tools
- Bridge truck

3.2.4 Traffic management and access

It is intended for the work to be carried out from a barge on the water. Minor disruptions to traffic may occur should any work need to be carried out from the bridge deck.

3.3 Ancillary facilities

The following site compound and ancillary sites would be established:

- The compound site located in Parkman Ave (known as the “dairy compound”), established for the project REF, will be used again as the main site compound for the proposed modification
- A number of parking spaces along Murray Street near the intersection with Thule Street will be sectioned off to allow for equipment/galley to be laid within close vicinity of the bridge. This eliminates the need to impact the parkland near the bridge.

3.4 Public utility adjustment

There would be no adjustments to public utilities.

3.5 Property acquisition

No property acquisition would be needed for the proposed modification.

4 Statutory and planning framework

4.1 Environmental Planning and Assessment Act 1979

4.1.1 State Environmental Planning Policies

State Environmental Planning Policy (Infrastructure) 2007

State Environmental Planning Policy (Infrastructure) 2007 (ISEPP) aims to allow the effective delivery of infrastructure across the State.

Clause 94 of ISEPP permits development on any land for the purpose of a road or road infrastructure facilities to be carried out by or on behalf of a public authority without consent.

As the proposed modification is for a road infrastructure facility and is to be carried out by Transport for NSW, it can be assessed under Division 5.1 of the EP&A Act. Development consent from council is not required.

The proposal is not located on land reserved under the *National Parks and Wildlife Act 1974* and does not require development consent or approval under State Environmental Planning Policy (Coastal Management) 2018 (CM SEPP), State Environmental Planning Policy (State and Regional Development) 2011 or State Environmental Planning Policy (State Significant Precincts) 2005.

Part 2 of ISEPP contains provisions for public authorities to consult with local councils and other public authorities prior to the commencement of certain types of development.

Consultation, including consultation as required by ISEPP (where applicable), is discussed in chapter 5 of this addendum REF.

Other SEPPs

4.1.1.1 Murray Regional Environmental Plan No. 2 – riverine land

The main objective of this plan is to ensure that appropriate consideration is given to development with the potential to adversely affect the riverine environment of the River Murray. Murray River is one of 11 local government areas to which the Murray REP applies.

Clause 8(c) states that the planning principles set out in Part 2 (clauses 9 and 10) apply when a public authority proposes to carry out development which does not require development consent but which has the potential to adversely affect the riverine environment of the River Murray.

The general principles of the plan that must be taken into account include:

- *the aims, objectives and planning principles of this plan*
- *any relevant River Management Plan*
- *any likely effect of the proposed plan or development on adjacent and downstream local government areas*
- *the cumulative impact of the proposed development on the River Murray.*

Clause 10 of the plan also states a number of specific principles that should be taken into account with regard to access, bank disturbance, flooding, land degradation, landscape, river related uses, settlement, water quality and wetlands. This clause does not apply to the proposed modification.

Clause 12 requires consultation under specific circumstances. Agency consultation is not needed under the provisions of this clause.

Clause 13 requires consultation with agencies and authorities for particular activities and undertakings. Clause 13 does not apply to the proposed modification.



Figure 4-1 Murray REP Map (Native vegetation labelled as “V”)

4.1.1.2 State Environmental Planning Policy No. 44 Koala Habitat Protection (SEPP 44)

The SEPP 44 encourages the conservation and management of natural vegetation areas that provide habitat for koalas to ensure permanent free living populations would be maintained over their present range.

The SEPP 44 aims to identify areas of potential and core koala habitat. These are described as follows:

- Core koala habitat is defined as an area of land with a resident population of koalas, evidenced by attributes such as breeding females, and recent and historical records of a population
- Potential koala habitat is defined as areas of native vegetation where the trees listed in Schedule 2 of SEPP 44 constitute at least 15 per cent of the total number of trees in the upper or lower strata of the tree component.

While SEPP 44 does not apply to proposals assessed under Part 5 of the EP&A Act, as a

matter of best practice, consideration has been given to the intent of the SEPP.

Koalas have been recorded within 10 kilometres of the proposal site, including within the Koondrook- Perricoota State Forest several kilometres away. The riparian vegetation along the Murray River next to the proposal site provides potential core koala habitat, and is near the Koondrook-Perricoota State Forest. SEPP 44 applies to the Murray River LGA. An assessment of the potential impact to koalas has been included in Section 6.3 of the project REF. No further assessment is considered necessary given the proposed modification does not involve the removal of trees.

4.1.2 Local Environmental Plans

4.1.2.1 Wakool Local Environmental Plan 2013

The proposed modification is located within the Murray River Local Government Area (LGA) and is governed by the *Wakool Local Environmental Plan 2013* (LEP). The provisions of the LEP do not apply to the proposal due to the application of the ISEPP. Nevertheless, consideration is given below to the provisions of the LEP.

The proposed modification is located in NSW on land zoned W1 Natural Waterways under the LEP. The objectives of the W1 zone are to:

- protect the ecological and scenic values of natural waterways
- prevent development that would have an adverse effect on the natural values of waterways in this zone
- provide for sustainable fishing industries and recreational fishing.

It is considered that the proposed modification is consistent with the objectives of this zone.

4.2 Other relevant NSW legislation

4.2.1 Heritage Act 1977

Given Barham-Koondrook Bridge is listed as a state heritage item, the bridge restoration work needed approval under section 60 of the *Heritage Act 1977* to carry out the work.

An application to modify the approval under section 65A of the *Heritage Act 1977*, to include the proposed caisson repair work, was approved with conditions by Heritage NSW on 14 January 2020 (refer to Appendix D).

4.3 Commonwealth legislation

4.3.1 Environment Protection and Biodiversity Conservation Act 1999

Under the EPBC Act a referral is required to the Australian Government for proposed actions that have the potential to significantly impact on matters of national environmental significance or the environment of Commonwealth land. These are considered in Appendix A and chapter 6 of the addendum REF.

A referral is not required for proposed road actions that may affect nationally listed threatened species, endangered ecological communities and migratory species. This is because requirements for considering impacts to these biodiversity matters are the subject of a strategic assessment approval granted under the EPBC Act by the Australian Government in September 2015.

Potential impacts to these biodiversity matters are also considered as part of chapter 6 of the addendum REF and Appendix A.

Findings – matters of national environmental significance (other than biodiversity matters)

The assessment of the proposed modification's impact on matters of national environmental significance and the environment of commonwealth land found that there would be no change to the findings of the determined activity and would be unlikely to cause a significant impact on matters of national environmental significance or the environment of commonwealth land. A referral to the Australian Government Department of Agriculture, Water and the Environment is not required.

4.4 Confirmation of statutory position

The proposed modification is categorised as development for the purpose of road infrastructure facilities and is being carried out by or on behalf of a public authority. Under clause 94 of ISEPP the proposed modification is permissible without consent. The proposed modification is not state-significant infrastructure or state-significant development. The proposed modification can be assessed under Division 5.1 of the EP&A Act. Consent from council is not required.

5 Consultation

5.1 Ongoing or future consultation

Consultation listed in Table 5-1 is to be carried out by Transport for NSW prior to the start of the proposed modification.

Table 5-1 Consultation to be carried out for the proposed modification

Agency	Issue
Murray River Council	General consultation about proposed modification
Gannawarra Shire Council	General consultation about proposed modification
Affected residents	General consultation about proposed modification

Consultation would continue with councils and the community while the work is being carried out. Planned consultation activities are outlined in section 5 of the project REF.

6 Environmental assessment

This chapter of the addendum REF provides a detailed description of the potential environmental impacts associated with the construction and operation of the proposed modification of the Barham-Koondrook Bridge – Truss and Victorian approach span restoration. All aspects of the environment potentially impacted upon by the proposed modification are considered. This includes consideration of the factors specified in the guidelines *Roads and Related Facilities EIS Guideline* (DUAP, 1996) and *Is an EIS*

required? (DUAP, 1999) as required under clause 228(1) of the Environmental Planning and Assessment Regulation 2000. The factors specified in clause 228(2) of the Environmental Planning and Assessment Regulation 2000 are also considered in Appendix A.

Site-specific safeguards and management measures are provided to ameliorate the identified potential impacts.

6.1 Non-Aboriginal Heritage

6.1.1 Existing environment

Barham-Koondrook Bridge is a state-listed heritage item. Refer to the project REF for further details about the existing environment.

Focus Bridge Engineering prepared a Statement of Heritage Impact (SOHI) for the proposed modification in November 2019 (refer to Appendix C). This SOHI accompanied an application to Heritage NSW under section 65A of the *Heritage Act 1977* to modify the approved section 60 application 2017/S60/15. The section 65A application (S65A/2019/061) was approved with conditions on 14 January 2020 (refer to Appendix D)

6.1.2 Potential impacts

The SOHI determined the impact of the proposed repairs on the heritage significance of the bridge to be negligible. The work seeks to maintain the heritage significance of the bridge by retaining the original fabric and strengthening it with new fabric. The proposed work would prevent further deterioration and loss of fabric and allow the bridge to remain in service as an important link in a transport route between NSW and Victoria. The repair would be carried out in a manner that is as unobtrusive as possible.

The proposal follows the *Burra Charter* principle of conservation based on a respect for original fabric and use of the bridge by using a cautious approach of changing as much as necessary but as little as possible so that its cultural significance is retained.

To document the work and provide information for the bridge's ongoing management, the SOHI recommends that archival standard photographs be taken prior to, during and at completion of the work. This is already detailed in safeguards NAH3, NAH4 and NAH6.

6.1.3 Safeguards and management measures

No additional or revised safeguards or management measures are required.

6.2 Other impacts

6.2.1 Existing environment and potential impacts

Environmental factor	Existing environment	Potential impacts
Noise and vibration	See project REF	It is considered the impact of the proposed modification would be minor given the work would be carried out during standard hours and would be short in duration. The affected residents would be notified in accordance with safeguard NOISE3 listed in chapter 7.2
Air quality	See project REF	The proposed modification may generate localised dust and emissions from cleaning the caissons and welding activities. The expected impact is considered to be minor given the small scale of the modification and short duration of the work.
Waste and resource management	See project REF	The proposed modification is likely to result in small amounts of waste. Waste is to be managed in accordance with safeguard WASTE1 in chapter 7.2 and Project Specific Plan Attachment 8.2 – Waste Minimisation and Management Plan. No problems associated with the disposal of waste are expected.
Biodiversity	See project REF	No additional impact. The modification is not likely to significantly impact threatened species, populations or ecological communities or their habitats, within the meaning of the BC Act or FM Act and therefore a Species Impact Statement is not required. The modification is not likely to significantly impact threatened species, populations, ecological communities or migratory species, within the meaning of the EPBC Act.

Traffic and access	See project REF	No additional impact
Landscape character and visual amenity	See project REF	No additional impact
Soil and water	See project REF	No additional impact
Socio-economic	See project REF	No additional impact
Climate change	See project REF	No additional impact.

6.2.2 Safeguards and management measures

No additional or revised safeguards or management measures are required.

6.3 Cumulative impacts

6.3.1 Potential impacts

The proposed activities have the potential to have cumulative environmental effects with other existing or likely future activities, however the effects would be minimal due to the limited scope of work for the activities covered in this addendum assessment and the potential impacts on the environment would be minimised with the implementation of the safeguards listed in chapter 7.2.

6.3.2 Safeguards and management measures

No additional or revised safeguards or management measures are required.

7 Environmental management

7.1 Environmental management plans

A number of safeguards and management measures have been identified to minimise adverse environmental impacts, including social impacts, which could potentially arise as a result of the proposed modification. Should the proposed modification proceed, these management measures would be addressed if required during detailed design and incorporated into the Project Environmental Management Plan (PEMP) and Contractors Environmental Management Plan (CEMP) and applied during the construction and operation of the proposed modification.

7.2 Summary of safeguards and management measures

Environmental safeguards and management measures for the Barham-Koondrook Bridge – Truss and Victorian approach span restoration are summarised in Table 7-1. Additional safeguards and management measures identified in this addendum REF are included in bold and italicised font. The safeguards and management measures will be incorporated into the CEMP and the PEMP and implemented during construction and operation of the proposed modification, should it proceed. These safeguards and management measures will minimise any potential adverse impacts arising from the proposed works on the surrounding environment.

Table 7-1: Summary of safeguards and management measures

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
G1	General	All environmental safeguards must be incorporated within the following: <ul style="list-style-type: none"> • Project Environmental Management Plan • Detailed design stage • Contract specifications for the proposal • Contractor's Environmental Management Plan 	Project manager	Pre-construction	
G2	General	<ul style="list-style-type: none"> • A risk assessment must be carried out on the proposal in accordance with the Transport for NSW Project Pack and PMS risk assessment procedures to determine an audit and inspection program for the work. The recommendations of the risk assessment are to be implemented • A review of the risk assessment must be carried out after the initial audit or inspection to evaluate if the level of risk chosen for the project is appropriate • Any work resulting from the proposal and as covered by the REF may be subject to 	Project manager and regional environmental staff	Pre-construction After first audit	

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		environmental audit(s) and/or inspection(s) at any time during their duration			
G3	General	<ul style="list-style-type: none"> The environmental contract specification G36 must be forwarded to Transport for NSW's Environment Manager South West region for review at least 10 working days before the start of construction A contractual hold point must be maintained until the CEMP is reviewed by Transport for NSW's Environment Manager South West region 	Project manager	Pre-construction	
G4	General	The Transport for NSW project manager must notify Transport for NSW's Environmental Officer, South-West region at least five working days before work starting	Project manager	Pre-construction	
G5	General	All businesses and residences likely to be affected by the proposed work must be notified at least five working days before the start of the proposed activities	Project manager	Pre-construction	
G6	General	Environmental awareness training must be provided, by the contractor, to all field personnel and subcontractors	Contractor	Pre-construction and during construction as required.	
SW1	Soil and Water	<p><u>Soil and Water Management Plan</u></p> <p>A Soil and Water Management Plan will be prepared in accordance with QA Specification G38 and implemented as part of the CEMP. The plan will identify all reasonably foreseeable risks relating to soil erosion and water pollution associated with carrying out the activity, and describe how these risks will be</p>	Project manager	Pre-construction	

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		managed and minimised during construction. That will include arrangements for managing pollution risks associated with spillage or contamination on the site and adjoining areas, and monitoring during construction			
SW2	Soil and water	<p><u>Install erosion, sediment and water quality controls</u></p> <p>Consistent with any specific requirements of the approved Soil and Water Management Plan, control measures will be implemented to minimise risks associated with erosion and sedimentation and entry of materials to drainage lines and waterways. That will include, but not necessarily be limited to:</p> <ul style="list-style-type: none"> - sediment management devices, such as fencing, hay bales or sand bags - measures to divert or capture and filter water prior to discharge, such as drainage channels and first flush and sediment basins - scour protection and energy dissipaters at locations of high erosion risk - installation of measures at work entry and exit points to minimise movement of material onto adjoining roads, such as rumble grids or wheel wash bays - appropriate location and storage of construction materials, fuels and chemicals, including bunding where appropriate 	Project manager, contractor	Pre-construction	
SW3	Soil and water	<p><u>Stockpile management</u></p> <p>Stockpiles will be designed, established, operated and decommissioned in accordance with the RTA <i>Stockpile</i></p>	Project manager, contractor	Pre-construction, during	

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		<i>Site Management Guideline 2015</i>		construction, Post construction	
SW4	Soil and water	<u>Dewatering</u> Any dewatering activities will be carried out in accordance with the RTA Technical Guideline: Environmental management of construction site dewatering in a manner that prevents pollution of waters	Project manager, contractor	During construction	
SW5	Soil and water	<u>Work in waterways</u> A detailed Environmental Work Method Statement (EWMS) will be prepared and implemented for all works carried out within waterways. The EWMS will detail measures to avoid or minimise risks from erosion and sedimentation to water quality and biodiversity. It will be prepared in accordance with relevant guidelines including, but not limited to: <ul style="list-style-type: none"> - RMS Biodiversity Guidelines - Protecting and managing biodiversity on RTA projects - NSW DPI (Fisheries) guidelines Why Do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings 	Project manager, contractor	Pre-construction, During construction	
SW6	Soil and water	<u>Monitor</u> Consistent with any specific requirements of the approved Soil and Water Management Plan a monitoring program will be implemented during construction to ensure effective implementation of all temporary and permanent soil, erosion and water pollution safeguards. The timing and frequency of	Project manager, contractor	During construction	

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		monitoring inspections will be set out in the SWMP. The inspections will assess implementation and success of the controls, actions required to ensure on-going effective operation, and compliance with any statutory approvals. A register of inspections will be established			
SW7	Soil and water	<u>Efficient use of water</u> Work practices will be implemented during construction to support efficient water use and minimise waste. That will include, but not necessarily be limited to, measures to reuse and recycle water where practicable for use in road construction (such as dust suppression and concreting) and irrigation or revegetated areas	Project manager, contractor	During construction	
SW8	Soil and water	<u>Rehabilitation</u> All areas disturbed during construction, including areas for stockpiles compound sites, temporary access roads and temporary work areas, would be stabilised and rehabilitated to prevent future erosion	Project manager	Post construction	
SW9	Soil and water	<u>Hazardous materials storage</u> All fuels, chemicals and other hazardous materials must be stored in a roofed, fire-protected and impervious bunded area at least 20 metres from waterways, drainage lines, basins, flood-affected areas or slopes above 10%. Bunding design must comply with relevant Australian Standards, and should generally be in accordance with guidelines provided in the EPA Authorised Officers Manual.	Project manager, contractor	During construction	

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		Appropriate on-site signage must be provided to identify the materials stored			
SW10	Soil and water	<p><u>Emergency equipment</u></p> <p>Appropriate emergency equipment will be provided on-site and located at strategic, accessible locations. This will include:</p> <ul style="list-style-type: none"> - fire response measures, including fire extinguishers, fire blankets and accessible water - spill kits - first aid kits - external showers 	Project manager, contractor	During construction	
SW11	Soil and water	<p><u>Refuelling</u></p> <p>Refuelling will occur in impervious bunded areas at least 20 metres from drainage lines and waterways. Refuelling on barges will occur within a double-bunded area</p>	Project manager, contractor	During construction	
SW12	Soil and water	<p><u>Cleaning and washing</u></p> <p>Cleaning of equipment and vehicles will only occur in areas where water pollution will not occur. Wash-down or wash-out will only occur in bunded areas</p>	Project manager, contractor	During construction	
SW13	Soil and water	<p><u>Incident reporting and response</u></p> <p>Environmental incidents, such as pollution spills and unauthorised vegetation clearing, will be reported and managed in accordance with Transport for NSW's Environmental Incident Classification and Reporting</p>	Project manager, contractor	During construction	

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		Procedure			
SW14	Soil and water	<u>Garnet</u> Controls would be established during sand blasting of bridge elements to prevent garnet being released to the environment	Project manager, contractor	During construction	
SW15	Soil and water	Fill imported onto the proposal site for the construction of the in-stream working platforms will be clean, inert rock spoil with a minimum grade of 50mm	Contractor	Construction, Operation	
SW16	Flooding	The detailed design and construction of the cofferdam will take into consideration potential flooding impacts during construction. Ongoing management of the cofferdam will be included in the Construction Environmental Management Plan (CEMP)	Project manager	Pre-construction	
TT1	Minimise impacts to existing traffic	<u>Local community notification</u> Consultation will be carried out with potentially affected residences prior to the commencement of and during works in accordance with the RTA's Community Involvement and Communications Resource Manual. Consultation would include but not be limited to door knocks, newsletters or letter box drops providing information on the proposed works, working hours and a contact name and number for more information or to register complaints	Project manager	Pre-construction, during construction	
TT2	Minimise traffic related risks	<u>Traffic Management Plan</u> A Traffic Management Plan (TMP) will be prepared and implemented as part of the CEMP. The TMP will be	Project manager	Pre-construction,	

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
	during construction	<p>prepared in accordance with Roads and Maritime's Traffic Control at Work Sites Manual and the worksite manual Roads and Maritime Specification G10. The TMP will include:</p> <ul style="list-style-type: none"> - confirmation of haulage routes - measures to maintain access to local roads and properties - site specific traffic control measures (including signage) to manage and regulate traffic movement - measures to maintain pedestrian and cyclist access - requirements and methods to consult and inform the local community of impacts on the local road network - access to construction sites including entry and exit locations and measures to prevent construction vehicles queuing on public roads - a response plan for any construction traffic incident - consideration of other developments that may be under construction to minimise traffic conflict and congestion that may occur due to the cumulative increase in construction vehicle traffic - monitoring, review and amendment mechanisms 			
TT3	Access	<p><u>Notifications to landowners</u></p> <p>Disruptions to property access and traffic will be notified to landowners at least five days prior in accordance with the relevant community consultation processes outlined in the TMP.</p>	Project manager	Pre-construction, during construction	

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
TT4	Access	<u>Wide loads</u> Consultation and notification of the transport industry and road freight providers would occur in relation to the reduced width capability of the temporary bridge	Project manager	Pre-construction, during construction	
TT7	Reduce speeds, traffic delays and disruptions during construction	<u>Community information</u> Road users and local communities will be provided with timely, accurate, relevant and accessible information about changed traffic arrangements and delays owing to construction activities	Transport for NSW	Pre-construction, During construction	
TT8	Local road dilapidation	<u>Dilapidation reports</u> Pre-construction and post construction road dilapidation reports for local roads likely to be used for construction will be prepared. Any damage resulting from construction (not normal wear and tear) will be repaired unless alternative arrangements are made with the relevant road authority. Copies of road dilapidation reports will be provided to the local roads authority	Project manager	Pre-construction	
TT9	Water traffic	Four-knot speed limit and no wash within construction zone will be implemented from 600 metres upstream and 900 metres downstream of the bridge	Transport for NSW	During construction	
TT10	Water traffic	Work schedule must give consideration to vessels that would need passage. It is noted that a higher number of vessels require passage during summer and peak holiday periods	Transport for NSW	Pre-construction	

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
TT11	Water traffic	<p>Transport for NSW will consult with boat owners along the river regarding any changes to river traffic arrangements, including but limited to:</p> <ul style="list-style-type: none"> • Murray River Paddle steamers, Echuca • Port of Echuca Paddle Boats • Echuca-Moama River Watch and User Group • Sunraysia User Group 	Transport for NSW	Pre-construction	
TT12	Water traffic	“No Anchorage” signs would be installed near the streamflow gauge located about 50 metres downstream of the bridge on the Victorian bank of the Murray River	Transport for NSW	During construction	
B1	Pre-clearing	Obtain a planning permit from Gannawarra Shire Council to remove or prune native vegetation on the Victorian side of the Murray River	Project manager	Pre-construction, during construction	
B2	Minimise risks to native flora and fauna during construction	<p><u>Flora and Fauna Management Plan</u></p> <p>A Flora and Fauna Management Plan will be prepared and implemented as part of the CEMP. It will address terrestrial and aquatic matters and include, but not necessarily be limited to:</p> <ol style="list-style-type: none"> plans for the construction site and adjoining area showing native vegetation, flora and fauna habitat, threatened species and endangered ecological communities plans showing areas to be cleared and areas to be protected, including exclusion zones and protected habitat features (eg hollow-bearing trees), and 	Project manager	Pre-construction, during construction	

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		<p>areas for rehabilitation or re-establishment of native vegetation</p> <p>c) requirements set out in the RTA Landscape Guideline</p> <p>d) procedures addressing relevant matters specified in the Biodiversity Guidelines - Protecting and managing biodiversity on RTA projects (RTA 2011) including but not limited to:</p> <ul style="list-style-type: none"> - pre-clearing, including the outcomes of final flora and fauna species checks, establishment of exclusion zones and on-ground identification of specific habitat features to be retained (such as hollow-bearing trees) - vegetation clearing and bushrock removal, including staged habitat removal and any specified seasonal limits on clearing activities - fauna handling and unexpected threatened species finds - rehabilitation, revegetation, re-use of soils, woody debris and bushrock, and other habitat management actions - weed and pathogen management <p>e) procedures addressing relevant matters specified in the NSW DPI (Fisheries) Policy and guidelines for fish habitat conservation and management</p>			

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		<p>f) monitoring during construction and post-construction</p> <p>g) adaptive management measures to be applied if monitoring indicates unexpected adverse impact</p>			
B3	Minimise risks to native flora and fauna during construction	<p><u>Pre-construction check</u></p> <p>Pre-clearing surveys will be carried out in accordance with Guide 1: Pre-clearing process of the Biodiversity Guidelines - Protecting and managing biodiversity on RTA projects (RTA 2011)</p>	Project manager, contractor	Pre-construction, during construction	
B4	Minimise risks to native flora and fauna during construction	<p><u>Detailed design</u></p> <p>Measures to further avoid and minimise the construction footprint and native vegetation or habitat removal will be considered during the detailed design stage and implemented where practicable and feasible</p>	Project manager, contractor	Pre-construction, during construction	
B5	Protect native flora and fauna and avoid inadvertent impacts	<p><u>Unexpected threatened species</u></p> <p>Consistent with the Biodiversity Guidelines - Protecting and managing biodiversity on RTA projects, and any specific requirements of the approved Flora and Fauna Management Plan, an unexpected finds procedure will be implemented in the event that a threatened species or ecological community that had not been identified and assessed by the REF is unexpectedly encountered during the construction process</p>	Project manager	Post construction	
B6	Protect native flora and fauna, minimise edge effects and avoid	<p><u>Exclusion zones and protected habitat features</u></p> <p>Consistent with the approved Flora and Fauna Management Plan:</p>	Project manager, contractor	Pre-construction, during construction	

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
	inadvertent impacts	<ul style="list-style-type: none"> - the limits of clearing within the construction site will be delineated using appropriate signage and barriers, identified on site construction drawings and during construction staff induction - vegetation and habitat features to be retained, such as hollow-bearing trees, will be clearly identified and protected by suitable fencing, signage or markings - identified areas containing habitat for microchiropterean bats, arboreal birds and woodland species will not be cleared during the breeding season between September and January, where practicable 			
B7	Protect native flora and fauna and avoid inadvertent impacts	<p><u>Stockpiles, plant and ancillary sites</u></p> <p>Vehicle parking, machinery, construction compounds, material stockpiles and the like, will be located in cleared or disturbed areas, not within the drip-zone of vegetation to be retained or within other protected or exclusion zones identified in the Flora and Fauna Management Plan.</p>	Project manager, contractor		
B8	Protect native flora and fauna	<p><u>Fauna handling</u></p> <p>Fauna handling will be managed in accordance with Guide 9: Fauna handling of the Biodiversity Guidelines</p> <ul style="list-style-type: none"> - Protecting and managing biodiversity on RTA projects, and any specific requirements of the approved Flora and Fauna Management Plan. 	Project manager	Post construction	
B9	Rehabilitation	<p><u>Rehabilitation</u></p>	Project manager, contractor	During construction	

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		All areas disturbed during construction, including areas for stockpiles compound sites, temporary access roads and temporary work areas, would be stabilised and rehabilitated to prevent future erosion			
B10	Minimise weed, pest species and pathogen risks	<p><u>Weed, Pest Species and Pathogen Management</u></p> <p>Weed species will be managed in accordance with Guide 6: Weed Management of the Biodiversity Guidelines - Protecting and managing biodiversity on RTA projects, and any specific requirements of the approved Flora and Fauna Management Plan</p>	Project manager, contractor	Pre-construction, During construction	
B11	Support future rehabilitation or revegetation	<p><u>Topsoil management - future re-use</u></p> <p>Consistent with the Biodiversity Guidelines - Protecting and managing biodiversity on RTA projects, topsoil removed during construction, which has been assessed as low-risk for weeds and with good potential for containing indigenous flora seed material, will be stockpiled in cleared or disturbed areas for re-use in post-construction rehabilitation or revegetation. Until re-use occurs the stockpile will be managed in accordance with the RTA Stockpile Site Management Guideline</p>	Project manager, contractor	Construction	
B12	Restore and rehabilitate habitat	<p><u>Habitat management - species selection</u></p> <p>Consistent with the Biodiversity Guidelines - Protecting and managing biodiversity on RTA projects, and any specific requirements of the approved Flora and Fauna Management Plan, locally indigenous plant species will be used during rehabilitation and revegetation</p>	Project manager, contractor	During construction	

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
B13	Clearing of native vegetation	<ul style="list-style-type: none"> • Clearing of vegetation will be restricted to that assessed in the project REF and includes trees located within 30 metres east of the bridge along the southern riverbank. The limit of clearing would be delineated (eg temporary site fencing, flagging, earth bunding) along the river and at the stockpile and compound site. Clearing limits would be discussed in the site induction to ensure staff and contractors are made aware of limits of clearing • Trees will be removed in such a way as not to cause damage to surrounding vegetation. This will ensure groundcover disturbance is kept to a minimum • Areas already impacted by previous clearing or disturbance will be used to minimise clearing where feasible. Trimming is preferred over removal where feasible 	Project manager, contractor	During construction	
B14	Fauna and habitat impact Microchiroptera n bat species	<p>A bat management plan will be developed for the proposed work and must include the following:</p> <ul style="list-style-type: none"> • Staff should be educated about microchiropteran bats, their ecological role, conservations significance, and the risk of disease with certain species • Carry out final inspection of the bridge components to be removed to locate any bat roost sites prior to the commencement of removing each component 	Project manager, contractor	During construction	

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		<ul style="list-style-type: none"> • If evidence of roost sites are identified, implement exclusion techniques such as the use of spotlights on the bridge at night, installing netting/ plastic sheeting once bats have left, starting an oxy-torch (to cut bolts) • If bats are observed emerging from the bridge components to be removed, work must cease and an experienced ecologist with bat handling experience be consulted • If roost sites in the form of hollow bearing trees have to be removed an experienced ecologist must be on hand to inspect each hollow before the destruction so bats can be excluded and or have time to relocate • Timing of deck removal must avoid bat breeding and lactating periods (September-November) 			
B15	Disturbance to fallen timber and dead wood	<ul style="list-style-type: none"> • Any snags located within the study area would be relocated to nearby areas of habitat, if necessary • DPI Fisheries will be contacted regarding the re-use of CWD as aquatic habitat • Coarse Woody Debris will be placed within the nearby river bank and will be managed in accordance with the requirements the Roads and Maritime Biodiversity Guidelines (RTA, 2011) - Guide 5 (CWD) 	Project manager	Pre-construction, during construction	

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
B16	Temporary bridge construction – barge for crane in river	<ul style="list-style-type: none"> Ensure the height of the river is sufficient to avoid contact with the stream bed Ensure that the barge has a sufficient bund to prevent and spills entering the waterway. Timing of work to occur outside of spawning of native fish species 	Project manager	Pre-construction, during construction	
B17	Temporary bridge construction - rock platform for crane in the river	<ul style="list-style-type: none"> Fish passage will be maintained throughout the site during the length of the work Any snags located within the study area will be relocated to nearby areas of habitat, if necessary DPI Fisheries will be contacted regarding the re-use of CWD as aquatic habitat 	Project manager	Pre-construction, during construction	
B18	Crane pads on the river banks (1 in NSW and 1 in VIC)	DPI Fisheries will be contacted regarding the re-use of CWD as aquatic habitat	Project manager, contractor	Pre-construction, during construction	
B19	Extra cofferdams may need to be built in the river for removal of piles, depending on design of temporary bridge	<ul style="list-style-type: none"> Notify DPI Fisheries prior to any work within water land not included in the scope of this Biodiversity Assessment. Any snags located within the study area will be relocated to nearby areas of habitat, if necessary DPI Fisheries will be contacted regarding the re-use of CWD as aquatic habitat 	Project manager, contractor	Pre-construction, during construction	
B20	Truss span transport tree removal	Trees identified in the Barham-Koondrook Bridge – truss span transport route work addendum review of environmental factors are to remain if possible. Impact	Project manager	During construction	

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		to the trees is to be kept to the minimum amount necessary to transport the truss spans			
B21	Truss span transport revegetation	Where trees identified in the Barham-Koondrook Bridge – truss span transport route work addendum review of environmental factors are lopped or removed, revegetation will be carried out in consultation with Murray River Council	Project manager	During construction	
AH1	Unexpected finds	<u>Unexpected finds</u> The Standard Management Procedure - Unexpected Heritage Items must be followed in the event that a known or potential Aboriginal object(s), including skeletal remains, is found during construction. This applies where Transport for NSW does not have approval to disturb the object(s) or where a specific safeguard for managing the disturbance (apart from the procedure) is not in place. Work may only re-start once the requirements of that procedure have been satisfied	Project manager, contractor	Pre-construction, during construction	
AH2	Accidental discovery of items of Aboriginal cultural significance	<ul style="list-style-type: none"> • All contractors and/or employees of contractors who are supervising work during the activity in relation to earthmoving or ground disturbance will attend an on-site cultural heritage induction • The on-site cultural heritage induction must cover: <ul style="list-style-type: none"> a. the specific requirements of this CHMP; b. the contingency plans contained in this CHMP; and c. cultural awareness training 	Project manager, contractor	Pre-construction, during construction	

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
NAH1	Unexpected finds	<p><u>Unexpected finds</u></p> <p>Should any heritage items, archaeological remains or potential relics of Non-Aboriginal origin be encountered, then construction work that might affect or damage the material must cease and notification provided to the relevant Transport for NSW officer identified in Transport for NSW's Standard Management Procedure - Unexpected Archaeological Finds. Work may only re-start once the requirements of that procedure have been satisfied</p>	Project manager, contractor	Pre-construction, during construction	
NAH2	Enhancing public understanding and awareness	<p><u>Heritage interpretation</u></p> <p>A Non-Aboriginal Heritage Interpretation Strategy will be prepared and implemented to promote community understanding and awareness of the site's heritage values. The strategy will be prepared in accordance with guidelines published by the Office of Environment and Heritage</p>	Project manager	Pre-operation	
NAH3	Legislative requirement	<p>Transport for NSW has obtained a Section 60 approval for the proposal. All conditions of the approval must be followed as listed below</p> <p><u>Nominated heritage consultant</u></p> <ul style="list-style-type: none"> A heritage consultant shall be nominated for the project. Their name is to be submitted to the Heritage Council of NSW and approved prior to the start of work 	Project manager	Pre-construction	

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		<ul style="list-style-type: none"> • The nominated heritage consultant is to provide advice on the detailed design, carry out on-site heritage inductions and inspect the demolition and removal of material to ensure no significant fabric or elements are damaged or removed • All work shall be carried out by suitably qualified tradespeople with practical experience in conservation and restoration of similar heritage items. The nominated heritage consultant shall be consulted before the selection of appropriate tradespeople <p><u>Site protection and work</u></p> <ul style="list-style-type: none"> • Significant building fabric and elements are to be protected during the work from potential damage • Protection systems must ensure historic fabric is not damaged or removed • The installation of new services shall be carried out in such a manner as to minimise damage to or removal of historic fabric and shall not obscure historic features <p><u>Archival recording</u></p> <p>A report must be provided to the Heritage Division at the completion of work that includes:</p> <ul style="list-style-type: none"> • an archival photographic recording of the bridge carried out before and during the work, in accordance with the Heritage Council document, 			

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		Photographic Recording of Heritage Items using Film or Digital Capture <ul style="list-style-type: none"> a summary of the work, up to five pages, including a description of the work carried out, the methodology and any other relevant matters 			
NAH4	Changes to the heritage values of the bridge	An archival recording be prepared for Barham-Koondrook Bridge. This should follow the guidelines for Items of State Heritage Significance as outlined in the NSW Heritage Branch publication How to Prepare Archival Records of Heritage Items	Project manager	Pre-construction	
NAH5	Changes to the heritage values of the bridge	Methodology for painting the lift span will be finalised during detailed design in consultation with the NSW Office of Environment and Heritage - Heritage branch	Project manager	Pre-construction	
NAH6	Design	Conditions of section 60 approval for the proposed modification must be satisfied	Transport for NSW or contractor	Pre-construction, construction	
NOISE1	Minimise noise and vibration risks during construction	<u>Noise and Vibration Management Plan</u> A Noise and Vibration Management Plan will be prepared and implemented as part of the CEMP. The plan should generally follow the approach in Practice Note VI of the RTA Environmental Noise Management Manual and identify: <ul style="list-style-type: none"> - all potential significant noise and vibration generating activities associated with the activity - measures to be implemented during construction to minimise noise and vibration impacts, such as restrictions on working hours, staging, placement and operation of work compounds, parking and storage areas, temporary noise barriers, haul road 	Project manager, contractor	Pre-construction	

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		<p>maintenance, and controlling the location and use of vibration generating equipment</p> <ul style="list-style-type: none"> - feasible and reasonable mitigation measures to be implemented, determined in accordance with OEH's Interim Construction Noise Guideline and taking into account Transport for NSW's Beyond the Pavement urban design policy, process and principles - a monitoring program to assess performance against relevant noise and vibration criteria - arrangements for consultation with affected neighbours and sensitive receivers, including notification and complaint handling procedures - contingency measures to be implemented in the event of non-compliance with noise and vibration criteria 			
NOISE2	Minimise risks to local and sensitive receivers	<p><u>Standard construction hours</u></p> <ul style="list-style-type: none"> • Monday to Friday 7.00 am to 6.00 pm • Saturdays 8.00 am to 1.00 pm • No construction on Sundays or Public Holidays. 	Project manager, contractor	Pre-construction, during construction	
NOISE3	Community notification	<p><u>Local community notification - sensitive receivers</u></p> <p>All sensitive receivers (eg schools, local councils) likely to be affected must be notified at least five days before start of any works associated with the activity that may have an adverse noise or vibration impact. The notification must include details of the project, construction period and construction hours, contact information for project management staff, complaint</p>	Project manager, contractor	Pre-construction, during construction	

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		and incident reporting, and how to obtain further information			
NOISE4	Working hours	If possible, restrict the hours that noisy activities such as the use of rock breakers, jack hammers and piling rigs will occur, taking into account times identified by the community when they are less sensitive to noise (such as mid-morning or mid-afternoon for work near residences) and whether the community is prepared to accept a longer period of construction in exchange for restrictions on construction times	Project manager, contractor	During construction	
NOISE5	Noise during the removal of the temporary bridge	If the temporary piles are broken by rock hammer, attended noise monitoring should occur with a focus on the 'Recommended Area' identified in Figure 9 of the Noise and Vibration Impact Assessment (Project REF Appendix K)	Project manager, contractor	During construction	
NOISE6	Noise monitoring	Attended noise monitoring will be carried out during the pile driving work to confirm the predicted noise levels	Project manager, contractor	During construction	
NOISE7	Staff training	Briefing of the work team in order to create awareness of the locality of sensitive receivers and the importance of minimising noise emissions	Project manager, contractor	Pre-construction, during construction	
NOISE8	Community information	Before piling activities starting, a letterbox drop will be conducted to all occupants of buildings within the 'Recommended Area' highlighted in Figure 8 of the Noise and Vibration Impact Assessment (Project REF Appendix K) to inform them of the proposed works ahead of time. This letter will outline the proposed timing and duration of work as well as provide the community with a contact number or liaison officer	Project manager	Pre-construction, during construction	

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		available to adequately respond to all project related enquiries			
NOISE9	Vibration impacts	<ul style="list-style-type: none"> All construction work should be carried out Monday to Friday, 7am to 6pm, where possible When working close to sensitive receivers, use lower vibration generating items of plant and equipment where possible eg smaller vibratory rollers and hydraulic hammers Minimise consecutive vibration intensive works in the same locality (if applicable) 	Project manager, contractor	Pre-construction, during construction	
UD1	Pre-construction / detailed design	<p><u>Urban Design and Landscape Plan</u></p> <p>An Urban Design and Landscape Plan will be prepared in consultation with Gannawarra Shire Council to support the final detailed project design and implemented as part of the CEMP.</p> <p>The plan will present an integrated urban design for the project, providing practical detail on the application of design principles and objectives identified in the environmental assessment. The plan will include design treatments for:</p> <ul style="list-style-type: none"> location and identification of existing vegetation and proposed landscaped areas, including species to be used (cross-referencing any relevant specified biodiversity safeguards) built elements including retaining walls, bridges and noise walls pedestrian and cyclist elements including footpath 	Project manager	Post construction	

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		location, paving types and pedestrian crossings - fixtures such as seating, lighting, fencing and signs - details of the staging of landscape works taking account of related environmental controls such as erosion and sedimentation controls and drainage - procedures for monitoring and maintaining landscaped or rehabilitated areas			
UD2	Minimise visual and landscape impacts during construction	<u>Work sites</u> Project work sites, including construction areas and supporting facilities (such as storage compounds and offices) will be managed to minimise visual impacts, including appropriate storage of equipment, parking, stockpile screening and arrangements for the storage and removal of rubbish and waste materials	Project manager, contractor	During construction	
UD3	Visual amenity	Mature trees will be used for revegetation as much as possible and practical	Project manager	Post Construction	
AIR1	Community notification	<u>Local community notification - sensitive receivers</u> All sensitive receivers (eg schools, local councils) likely to be affected must be notified at least five days before start of any work associated with the activity that may have an adverse impact on local air quality. The notification must include details of the project, construction period and construction hours, any recommended measures that can be implemented (eg window closure, staying indoors, etc), contact information for project management staff, complaint and incident reporting; and how to obtain further information	Project manager	Pre-construction, during Construction	

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
AIR2	Protect local air quality and avoid inadvertent impacts	<u>Protecting air quality</u> Dust suppression measures will be implemented to protect local air quality	Project manager, contractor	During Construction	
AIR3	General air quality impact	Construction activities are to be managed to minimise dust and fuel emissions	Project manager, contractor	During Construction	
AIR4	Dust	Stockpiles or areas that may generate dust are to be managed to suppress dust emissions in accordance with the Stockpile Site Management Guideline (Roads and Maritime, 2015)	Project manager, contractor	During Construction	
WASTE 1	Avoid, minimise and sustainably manage waste	<u>Waste Management Plan</u> A Waste Management Plan will be prepared and implemented as part of the CEMP. It will provide specific guidance on measures and controls to be implemented to support minimising the amount of waste produced and appropriately handle and dispose of unavoidable waste. It will also address the importation of waste to the site for use in carrying out the project The plan will give effect to any management measures contained in any waste assessment carried out for the project and include, but not necessarily be limited to: <ul style="list-style-type: none"> - measures to avoid and minimise waste associated with the project - classification of wastes generated by the project and management options (re-use, recycle, 	Project manager	Pre-construction	

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		<p>stockpile, disposal)</p> <ul style="list-style-type: none"> - classification of wastes received from off-site for use in the project and management options - identifying any statutory approvals required for managing both on and off-site waste, or application of any relevant resource recovery exemptions - procedures for storage, transport and disposal - monitoring, record keeping and reporting, including any documentation management obligations arising from resource recovery exemptions. <p>The plan will be prepared taking into account the Transport for NSW Environmental Procedure - Management of Wastes on Roads and Maritime Services Land and relevant RMS Waste Fact Sheets</p>			
WASTE 2	Pre-construction / detailed design	<p><u>Pre-construction assessment</u></p> <p>Before land is used for ancillary construction purposes (compounds, storage, parking, etc) a pre-construction land assessment must be carried out to identify the presence of any pre-existing wastes.</p> <p>The assessment is to be prepared in accordance with the Transport for NSW Environmental Procedure - Management of Wastes on Roads and Maritime Services Land. Where the land is privately owned, a copy of the assessment will be provided to the landowner</p>	Project manager	Pre-construction	
WASTE 3	Avoid, minimise and	<p><u>Sampling of waste materials - to be exported off-site</u></p> <p>Waste materials (such as soils and aggregates) obtained from the project and to be exported to a non-</p>	Project manager	Pre-construction, during construction	

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
	sustainably manage waste	road construction site or project must be sampled and managed in accordance with relevant Transport for NSW waste fact sheets			
WASTE 4	Avoid, minimise and sustainably manage waste	<p><u>Vegetated waste</u></p> <p>Any trees to be removed shall be reused as millable timber wherever practicable. Other vegetated material from native species shall be mulched and re-used on-site for landscaping or rehabilitation purposes if consistent with the approved Flora and Fauna Plan for the project. Weed species, or vegetation not considered appropriate for re-use on-site, will be removed and disposed of to an appropriately licenced facility</p>	Project manager, contractor	Pre-construction, during construction	
WASTE 5	Compliance monitoring of waste management	<p><u>Monitor implementation of safeguards - construction phase</u></p> <p>Consistent with any specific requirements of the approved Waste Management Plan a monitoring plan will be implemented during construction for the works durations to assess effective implementation of waste safeguards, identify any unexpected or inadvertent impacts, and identify recommended revisions or improvements</p>	Project manager	Pre-construction, during construction	
WASTE 6	Compliance monitoring of waste management	<p><u>Adaptive management - during construction</u></p> <p>After considering the outcomes and recommendations arising from the monitoring program, and any other relevant information that becomes available during construction, appropriate measures will be implemented to address identified deficiencies or carry out actions needed to address waste related impacts. If</p>	Project manager	Pre-construction, during construction	

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		necessary, the Waste Management Plan will be reviewed and updated to include any additional measures.			
WASTE 7	Final condition of ancillary sites	<p><u>Post-construction assessment</u></p> <p>A post-construction land assessment must be carried out on land that was used for ancillary construction purposes (compounds, storage, parking, etc) to determine the suitability for hand-back to the landowner</p> <p>The assessment is to be prepared in accordance with the Transport for NSW Environmental Procedure - Management of Wastes on Roads and Maritime Services Land. Where the land is privately owned, a copy of the assessment will be provided to the landowner</p>	Project manager	Post construction	
SE1	Pre-construction / detailed design	<p><u>Communication Plan</u></p> <p>A Communication Plan (CP) will be prepared and implemented as part of the CEMP to ensure provision of timely and accurate information to the community during construction. The CP will include (as a minimum):</p> <ul style="list-style-type: none"> - mechanisms to provide details and timing of proposed activities to affected residents, including changed traffic and access conditions - contact name and number for complaints <p>The CP will be prepared in accordance with the Transport for NSW Stakeholder Engagement Toolkit.</p>	Project manager	Pre-construction	

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
SE2	Construction	<p><u>Emergency access</u></p> <p>Access for emergency vehicles will be maintained at all times during construction. Any site-specific requirements will be determined in consultation with the relevant emergency services agency</p>	Project manager, contractor	During construction	
SE3	Impacts to residents	<p><u>Local community notification</u></p> <p>Stakeholder engagement will be carried out with potentially affected residences before the start of and during works in accordance with the Transport for NSW Stakeholder Engagement Toolkit. Communication activities may include door knocks, newsletters or letter box drops, providing information on the proposed works, working hours and a contact name and number for more information or to register complaints</p>	Project manager	Pre-construction, during construction	
SE4	Property impacts	<p><u>Consultation - property owners</u></p> <p>Consultation will be carried out with all affected property owners during detailed design and construction to develop and implement measures to mitigate impacts on land use viability, infrastructure and severance</p>	Project manager	Pre-construction, during construction	
SE5	Impacts on viability of businesses	<p><u>Consultation - businesses</u></p> <p>Consultation will occur with Koondrook and Barham businesses to identify appropriate management strategies to avoid or minimise impacts on access and operations. This will include consideration of measures such as additional signage and alternative access</p>	Project manager	Pre-construction, during construction	

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		arrangements			
SE6	Impacts to community	<u>Complaints</u> A complaints handling procedure and register will be included in the CEMP.	Project manager	Pre-construction, during construction	
SE7	Impacts to residents and general community	<u>Community information</u> Road users and local communities will be provided with timely, accurate, relevant and accessible information about changed traffic arrangements and delays owing to construction activities	Project manager	Pre-construction, during construction	
CC1	Climate change	The construction contractor will consider: <ul style="list-style-type: none"> • the life cycle environmental impact of materials and plant used in the construction process (this will be considered during procurement) • establishing operating procedures for site vehicles to increase the efficiency of vehicle fuel use • reducing vegetation clearing as much as feasible, and re-establishing vegetation in suitable areas when construction is completed • reducing site wastage by re-using and recycling waste materials as a preference before disposing to landfill 	Project manager	Pre-construction.	

7.3 Licensing and approvals

All relevant licenses, permits, notifications and approvals needed for the Barham-Koondrook Bridge – Truss and Victorian approach span restoration and when they need to be obtained are listed in Table 7-2. Additional or changed licenses and approval requirements identified in this addendum REF are indicated by underlined and/or struck out font.

Table 7-2: Summary of licensing and approval required

Instrument	Requirement	Timing
<i>Gannawarra Planning Scheme</i>	Planning permit to remove mature vegetation and to carry out work on land subject to inundation in Victoria	Before start of work
<i>VicRoads (now Regional Roads Victoria)</i>	Approval to carry out work in the road reserve in Victoria	Before start of work

The following approvals may be needed to carry out the work:

- If the list span is to be blasted and repainted off-site, application to the Office of Environment and Heritage to amend the existing Section 60 approval conditions would be needed
- Should water need to be extracted from the Murray River, a Water Works Approval would be required from the NSW Office of Water
- If the work would inhibit, block or obstruct the passage of fish, a permit under Part 7 of *Fisheries Management Act 1994* is required.

8 Conclusion

8.1 Justification

The proposed modification would ensure the integrity and functionality of the state heritage listed Barham-Koondrook Bridge would be retained. Without repair, the caisson corrosion would compromise the structural integrity of the bridge, leading to a loss of function and potentially its demolition.

The adverse impact on the environment is expected to be minor. The benefits of the proposal are considered to outweigh any minor impact on the environment. No safeguards have been added or modified.

8.2 Objects of the EP&A Act

Object	Comment
1.3(a) To promote the social and economic welfare of the community and a better environment by the proper management, development and conservation of the State's natural and other resources	The proposed modification meets this object. An adverse impact on the environment or the social or economic welfare of the community is not likely
1.3(b) To facilitate ecologically sustainable development by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment	The proposed modification meets this object, as discussed in sections 8.2.1 to 8.2.4 below
1.3(c) To promote the orderly and economic use and development of land	Not relevant to the proposed modification
1.3(d) To promote the delivery and maintenance of affordable housing	Not relevant to the proposed modification
1.3(e) To protect the environment, including the conservation of threatened and other species of native animals and plants, ecological communities and their habitats	The proposed modification meets this object. As discussed in section 6, there would be negligible impact on threatened and other species of native animals and plants, ecological communities and their habitats
1.3(f) To promote the sustainable management of built and cultural	Not relevant to the proposed modification

heritage (including Aboriginal cultural heritage).	
1.3(g) To promote good design and amenity of the built environment.	Not relevant to the proposed modification
1.3(h) To promote the proper construction and maintenance of buildings, including the protection of the health and safety of their occupants.	Not relevant to the proposed modification
1.3(i) To promote the sharing of the responsibility for environmental planning and assessment between the different levels of government in the State.	Not relevant to the proposed modification
1.3(j) To provide increased opportunity for community participation in environmental planning and assessment.	<p>Consultation with the community has occurred to date and would continue for the duration of the work</p> <p>Consultation will be carried out with Murray River Council regarding the proposed modification. Given the minor nature of the proposed modification, consultation with the public has not been carried out.</p>

8.3 Ecologically sustainable development

8.3.1 The precautionary principle

Given the small scale of the proposed modification and a minor impact on the environment is expected, serious or irreversible environmental damage is unlikely.

8.3.2 Intergenerational equity

The proposed modification would not impact on natural or cultural features that would compromise the health, diversity or productivity of the environment to a level that would impact on future generations.

The proposed modification would ensure Barham-Koondrook Bridge is structurally sound for over mass transport vehicles, benefiting future generations by ensuring the safety of road users and conserving a state heritage listed item.

8.3.3 Conservation of biological diversity and ecological integrity

The proposed modification would have negligible impact on biological diversity and ecological integrity.

8.3.4 Improved valuation, pricing and incentive mechanisms

This principle gives monetary values to environmental resources. The proposed modification would assist in the restoration of Barham-Koondrook Bridge which is a state heritage-listed item.

The proposed caisson repair work avoids and minimises impacts on the natural, built and social environments. In doing so, the cost of impact associated with the proposal have been minimised as far as reasonably practical. These factors ensure the development would conform to the principles of “ecologically sustainable development”.

8.4 Conclusion

This addendum REF has examined and taken into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the proposed activity.

This has included consideration where relevant of conservation agreements and plans of management under the NPW Act, biodiversity stewardship sites under the BC Act, wilderness areas, areas of outstanding value, impacts on threatened species, populations and ecological communities and their habitats and other protected fauna and native plants. It has also considered potential impacts to matters of national environmental significance listed under the Federal EPBC Act.

Potential environmental impacts from the proposed modification have been avoided or reduced during the design development and options assessment. The proposed modification as described in the addendum REF best meets the project objectives and would have a minor impact on the environment. Safeguards and management measures as detailed in this addendum REF would ameliorate or minimise these expected impacts. The proposed modification would ensure the structural integrity of a state listed heritage item is maintained. On balance, the proposed modification is considered justified and the following conclusions are made.

Significance of impact under NSW legislation

The proposed modification would not result in a change to the findings of the project REF, submissions report, pedestrian pathway improvements addendum REF, additional stockpile site addendum REF or truss span transport route work addendum REF and would be unlikely to cause a significant impact on the environment. Therefore it is not necessary for an environmental impact statement to be prepared and approval to be sought from the Minister for Planning and Public Spaces under Division 5.2 of the EP&A Act. A Biodiversity Development Assessment Report or Species Impact Statement is not required. The proposed modification is subject to assessment under Division 5.1 of the EP&A Act. Consent from council is not required.

Significance of impact under Australian legislation

The proposed modification would not likely cause a significant impact on matters of national environmental significance or the environment of commonwealth land within the meaning of the EPBC Act. A referral to the Australian Government Department of Agriculture, Water and the Environment is not required.

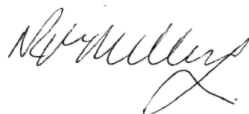
9 Certification

This addendum review of environmental factors provides a true and fair review of the proposed modification in relation to its potential effects on the environment. It addresses to the fullest extent possible all matters affecting or likely to affect the environment as a result of the proposed modification.



Gemma Barber
Environment Officer
Transport for NSW
Date: 29/04/2020

I have examined this addendum review of environmental factors and accept it on behalf of Transport for NSW.



Nicholas McMullen
Bridge Works Manager
Transport for NSW
Date: 20/04/20

10 References

Terms and acronyms used in this addendum REF

Term / Acronym	Description
AusLink	Mechanism to facilitate cooperative transport planning and funding by Commonwealth and state and territory jurisdictions
BC Act	<i>Biodiversity Conservation Act 2016</i> (NSW).
CEMP	Construction / Contractor's environmental management plan
EIA	Environmental impact assessment
EP&A Act	Environmental Planning and Assessment Act 1979 (NSW). Provides the legislative framework for land use planning and development assessment in NSW
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth). Provides for the protection of the environment, especially matters of national environmental significance, and provides a national assessment and approvals process.
ESD	Ecologically sustainable development. Development which uses, conserves and enhances the resources of the community so that ecological processes on which life depends, are maintained and the total quality of life, now and in the future, can be increased
FM Act	<i>Fisheries Management Act 1994</i> (NSW)
Heritage Act	<i>Heritage Act 1977</i> (NSW)
ISEPP	State Environmental Planning Policy (Infrastructure) 2007
LALC	Local Aboriginal Land Council
LEP	Local Environmental Plan. A type of planning instrument made under Part 3 of the EP&A Act.
LoS	Level of Service. A qualitative measure describing operational conditions within a traffic stream and their perception by motorists and/or passengers.
NES	Matters of national environmental significance under the Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i> .
NPW Act	<i>National Parks and Wildlife Act 1974</i> (NSW)
Roads and Maritime	NSW Roads and Maritime was dissolved by the Transport Administration Amendment Bill in August 2019, all function are now managed by Transport for NSW
SEPP	State Environmental Planning Policy. A type of planning instrument made under Part 3 of the EP&A Act.
SEPP 14	State Environmental Planning Policy No.14 – Coastal Wetlands
TSC Act	<i>Threatened Species Conservation Act 1995</i> (NSW)

**QA
Specifications**

Specifications developed by Roads and Maritime Services for use with road work and bridge work contracts let by Transport for NSW.

Appendix A

Consideration of clause 228(2) factors and matters of National Environmental Significance and Commonwealth land

Clause 228(2) Checklist

In addition to the requirements of the Is an EIS required? (1995/1996) guideline and the Roads and Related Facilities EIS Guideline (DUAP, 1996) as detailed in the addendum REF, the following factors, listed in clause 228(2) of the Environmental Planning and Assessment Regulation 2000, have also been considered to assess the likely impacts of the proposed modification on the natural and built environment.

Factor	Impact
<p>Any environmental impact on a community? Any impact on a community would be negligible.</p>	Nil
<p>Any transformation of a locality? The proposed modification would not transform a locality.</p>	Nil
<p>Any environmental impact on the ecosystems of the locality? The proposed modification would not have an impact on the ecosystems of the locality.</p>	Nil
<p>Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality? The proposed modification would not have an impact on the aesthetic, recreational, scientific or other environmental quality or value of a locality.</p>	Nil
<p>Any effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations? The proposed modification would have a negligible impact on the heritage significance of the Barham-Koondrook Bridge.</p>	Nil
<p>Any impact on the habitat of protected fauna (within the meaning of the <i>National Parks and Wildlife Act 1974</i>)? The proposed modification would not have an impact on the habitat of protected fauna.</p>	Nil
<p>Any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air? The proposed modification would not endanger any species of animal, plant or other form of life.</p>	Nil
<p>Any long-term effects on the environment? The proposed modification would not have any long term effects on the environment.</p>	Nil
<p>Any degradation of the quality of the environment? The proposed modification is unlikely to degrade the quality of the environment.</p>	Nil

Factor	Impact
<p>Any risk to the safety of the environment?</p> <p>It is not likely that the proposed modification would pose any risks to the safety of the environment.</p>	<p>Nil</p>
<p>Any reduction in the range of beneficial uses of the environment?</p> <p>The proposed modification would not cause a reduction in the range of beneficial uses of the environment.</p>	<p>Nil</p>
<p>Any pollution of the environment?</p> <p>The proposed modification would result in minor additional short term air, water and noise pollution from plant and machinery. Pollution would be minor considering the nature and duration of the work.</p>	<p>Minor negative Short-term</p>
<p>Any environmental problems associated with the disposal of waste?</p> <p>No problems with the disposal of waste are expected.</p>	<p>Nil</p>
<p>Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply?</p> <p>The proposed modification would not generate increased demands on resources that are or are likely to become in short supply.</p>	<p>Nil</p>
<p>Any cumulative environmental effect with other existing or likely future activities?</p> <p>Given the minor nature of the proposed modification, the work is unlikely to have a cumulative impact on the environment.</p>	<p>Nil</p>
<p>Any impact on coastal processes and coastal hazards, including those under projected climate change conditions?</p> <p>The proposed modification would not have an impact on coastal processes or coastal hazards, including those under projected climate change conditions.</p>	<p>Nil</p>

Matters of National Environmental Significance and Commonwealth land

Under the environmental assessment provisions of the EPBC Act, the following matters of national environmental significance and impacts on Commonwealth land are required to be considered to assist in determining whether the proposed modification should be referred to the Australian Government Department of Water, Agriculture and the Environment.

Under the EPBC Act strategic assessment approval a referral is not required for proposed road actions that may affect nationally listed threatened species, populations, endangered ecological communities and migratory species. Impacts on these matters are assessed in detail as part of this addendum REF in accordance with Australian Government significant impact criteria and taking into account relevant guidelines and policies.

Factor	Impact
<p>Any impact on a World Heritage property? The proposed modification would not have an impact on a World heritage property.</p>	Nil
<p>Any impact on a National Heritage place? The proposed modification would not have an impact on a National Heritage place.</p>	Nil
<p>Any impact on a wetland of international importance? An EPBC Act Protected Matters search identified six wetlands of international importance as existing within the same catchment as the proposal:</p> <ul style="list-style-type: none"> • Banrock Station Wetland Complex • Gunbower Forest • Kerang Wetlands • NSW Central Murray State Forests • Riverland • Coorong and Lakes Alexandrina and Albert Wetland. <p>The proposal is unlikely to impact on these areas given the minimal scope of the work and the distances to the wetlands.</p>	Nil
<p>Any impact on a listed threatened species or communities? The proposed modification would not have an impact on listed threatened species or communities, as discussed in section 6.</p>	Nil
<p>Any impacts on listed migratory species? The proposed modification would not have an impact on listed migratory species</p>	Nil
<p>Any impact on a Commonwealth marine area? The proposed modification would not have an impact on a Commonwealth marine area.</p>	Nil

Factor	Impact
Does the proposed modification involve a nuclear action (including uranium mining)? The proposed modification would not involve a nuclear action.	Nil
Additionally, any impact (direct or indirect) on Commonwealth land? The proposed modification would not have a direct or indirect impact on Commonwealth land.	Nil

Appendix B

Statutory consultation checklists



Infrastructure SEPP

Certain development types

Development type	Description	Yes / No	If 'yes' consult with	ISEPP clause
Car Park	Does the project include a car park intended for the use by commuters using regular bus services?	No		ISEPP cl. 95A
Bus Depots	Does the project propose a bus depot?	No		ISEPP cl. 95A
Permanent road maintenance depot and associated infrastructure	Does the project propose a permanent road maintenance depot or associated infrastructure such as garages, sheds, tool houses, storage yards, training facilities and workers' amenities?	No		ISEPP cl. 95A

Development within the Coastal Zone

Issue	Description	Yes / No / NA	If 'yes' consult with	ISEPP clause
Development with impacts on certain land within the coastal zone	Is the proposal within a coastal vulnerability area and is inconsistent with a certified coastal management program applying to that land?	No		ISEPP cl. 15A

Note: See interactive map here: <https://www.planning.nsw.gov.au/policy-and-legislation/coastal-management>. Note the coastal vulnerability area has not yet been mapped.

Note: a certified coastal zone management plan is taken to be a certified coastal management program

Council related infrastructure or services

Issue	Potential impact	Yes / No	If 'yes' consult with the relevant local council(s).	ISEPP clause
Stormwater	Are the works likely to have a substantial impact on the stormwater management services which are provided by council?	No		ISEPP cl.13(1)(a)
Traffic	Are the works likely to generate traffic to an extent that will strain the capacity of the existing road system in a local government area?	No		ISEPP cl.13(1)(b)
Sewerage system	Will the works involve connection to a council owned sewerage system? If so, will this connection have a substantial impact on the capacity of any part of the system?	No		ISEPP cl.13(1)(c)
Water usage	Will the works involve connection to a council owned water supply system? If so, will this require the use of a substantial volume of water?	No		ISEPP cl.13(1)(d)
Temporary structures	Will the works involve the installation of a temporary structure on, or the enclosing of, a public place which is under local council management or control? If so, will this cause more than a minor or inconsequential disruption to pedestrian or vehicular flow?	No		ISEPP cl.13(1)(e)
Road & footpath excavation	Will the works involve more than minor or inconsequential excavation of a road or adjacent footpath for which council is the roads authority and responsible for maintenance?	No		ISEPP cl.13(1)(f)

Local heritage items

Issue	Potential impact	Yes / No	If 'yes' consult with the relevant local council(s)	ISEPP clause
Local heritage	Is there is a local heritage item (that is not also a State heritage item) or a heritage conservation area in the study area for the works? If yes, does a heritage assessment indicate that the potential impacts to the heritage significance of the item/area are more than minor or inconsequential?	No		ISEPP cl.14

Flood liable land

Issue	Potential impact	Yes / No	If 'yes' consult with	ISEPP clause
Flood liable land	Are the works located on flood liable land? If so, will the works change flood patterns to more than a minor extent?	No		ISEPP cl.15
Flood liable land	Are the works located on flood liable land? (to any extent). If so, do the works comprise more than minor alterations or additions to, or the demolition of, a building, emergency works or routine maintenance	No		ISEPP cl.15AA

Note: Flood liable land means land that is susceptible to flooding by the probable maximum flood event, identified in accordance with the principles set out in the manual entitled Floodplain Development Manual: the management of flood liable land published by the New South Wales Government.

Public authorities other than councils

Issue	Potential impact	Yes / No	If 'yes' consult with	ISEPP clause
National parks and reserves	Are the works adjacent to a national park or nature reserve, or other area reserved under the <i>National Parks and Wildlife Act 1974</i> , or on land acquired under that Act?	No	DPIE	ISEPP cl.16(2)(a)
National parks and reserves	Are the works on land in Zone E1 National Parks and Nature Reserves or in a land use zone equivalent to that zone?	No	DPIE	ISEPP cl. 16(2)(b)
Aquatic reserves and marine parks	Are the works adjacent to an aquatic reserve or a marine park declared under the <i>Marine Estate Management Act 2014</i> ?	No	Department of Industry	ISEPP cl.16(2)(c)
Sydney Harbour foreshore	Are the works in the Sydney Harbour Foreshore Area as defined by the <i>Sydney Harbour Foreshore Authority Act 1998</i> ?	No	Sydney Harbour Foreshore Authority	ISEPP cl.16(2)(d)
Bush fire prone land	Are the works for the purpose of residential development, an educational establishment, a health services facility, a correctional centre or group home in bush fire prone land?	No	Rural Fire Service	ISEPP cl.16(2)(f)
Artificial light	Would the works increase the amount of artificial light in the night sky and that is on land within the dark sky region as identified on the dark sky region map? (Note: the dark sky region is within 200 kilometres of the Siding Spring Observatory)	No	Director of the Siding Spring Observatory	ISEPP cl. 16(2)(g)
Defence communications buffer land	Are the works on buffer land around the defence communications facility near Morundah? (Note: refer to Defence Communications Facility Buffer Map referred to in clause 5.15 of Lockhart LEP 2012, Narrandera LEP 2013 and Urana LEP 2011).	No	Secretary of the Commonwealth Department of Defence	ISEPP cl. 16(2)(h)
Mine subsidence land	Are the works on land in a mine subsidence district within the meaning of the <i>Mine</i>	No	Mine Subsidence Board	ISEPP cl. 16(2)(i)

Issue	Potential impact	Yes / No	If 'yes' consult with	ISEPP clause
	<i>Subsidence Compensation Act 1961?</i>			

Growth Centres SEPP

Issue	Potential impact	Yes / No	If 'yes' consult with	SEPP clause
Clearing native vegetation	Do the works involve clearing native vegetation (as defined in the Local Land Services Act 2013) on land that is not subject land (as defined in cl 17 of schedule 7 of the <i>Threatened Species Conservation Act 1995</i>)?	No	Department of Planning, Industry and Environment	SEPP 18A

Appendix C

Statement of Heritage Impact

11 November 2019

Nick McMullen
Bridge Works Manager
South West NSW Regional NSW and Outer Metropolitan
Roads and Maritime Services
193 Morgan Street
Wagga Wagga NSW 2650

Link Business Hub
271 Bruncker Road
Adamstown, NSW, 2289
Our ref: 220010
Your ref:

Dear Nick,

Assessment of heritage impact on the proposed repairs to the metal caisson splices to Piers 2 and 3 at Barham Bridge, Barham, NSW

1 Introduction

Focus Bridge Engineering (FBE) has been engaged by Roads and Maritime Services (Roads and Maritime) to provide an assessment of the heritage impacts of the proposed repairs to the metal caisson splices on the two river piers at Barham Bridge, Barham, NSW (see Figure 1).



Figure 1 – Barham Bridge location (Source: Roads and Maritime)

Roads and Maritime has a current approval under Section 60 of the NSW *Heritage Act 1977* (application 2017/S60/15 approved 18/04/2017) to undertake repairs on the pier webbing on piers 2 and 3. Water levels in the Murray River have dropped since the S60 permit was issued, revealing significant corrosion in the caisson (pier) splice, at the same level and associated with the same corrosion in the splash zone that required replacement of the pier webbing (see Figures 2 and 3). Analysis of the material section loss raised concerns about the Bridge's capacity to carry GML B-Double vehicles, as it was found that there was approximately 30% section loss in the steel splice bands and that this was reducing the strength of the caissons.

Roads and Maritime is seeking approval to undertake additional work outside the scope of the original approval via a Section 65 modification application. The potential heritage impact of the proposed works on the piers and the bridge itself are considered below and recommendations provided.



Figure 2 - Barham Bridge looking south west, showing deterioration of the pier webbing on both river piers (Source: Roads and Maritime)



Figure 3 - Showing corrosion at caisson splice (Source: Roads and Maritime)

2 Options discussion

The location of the proposed repair is shown as number 2 in Figure 4.



Figure 4 – Barham Bridge: 1. Pier webbing corrosion. 2 Caisson splice repair location (Source: Roads and Maritime)

Roads and Maritime considered three options for the caisson corrosion repairs. These options cover the different ways in which a new cover plate with two wider vertically spaced rows of cup-head bolts (to avoid existing rivets) could be designed, constructed and maintained:

1. Option1 – Bolted flange cover plate.
2. Option 2 – Butt welded cover plate.
3. Option 3 – Bolted and sealed splice plate.

The cover plate solution is preferred as it does not require the disturbance of the existing caisson rivet splice detail which might compromise the structural capacity and safety of the bridge. The cover plate whilst blocking access to the original spliced rivet connection provides strength in the area required while endeavouring to maintain its original function and rivet layout around the cylinder circumference.

The options were assessed as follows.

2.1 Option 1 – bolted flange

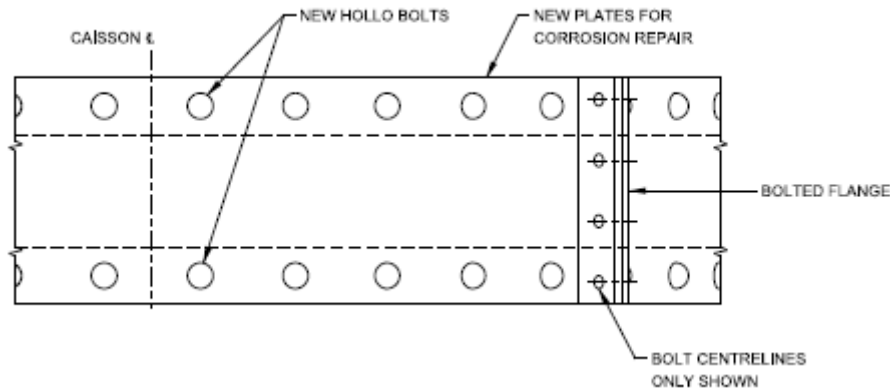


Figure 5 – Option 1 with bolted flange (Source: Roads and Maritime)

Option 1 with the four (4) bolted flange connections would be the most visually obtrusive of the three options considered, and its raised profile would make it vulnerable to damage and more likely to collect debris. These issues would affect the durability of the repair as once paint damage occurs the steel is again vulnerable to corrosion, and with varying river levels it is not always possible to see paint damage or repaint the affected area immediately.

2.2 Option 2 – butt weld

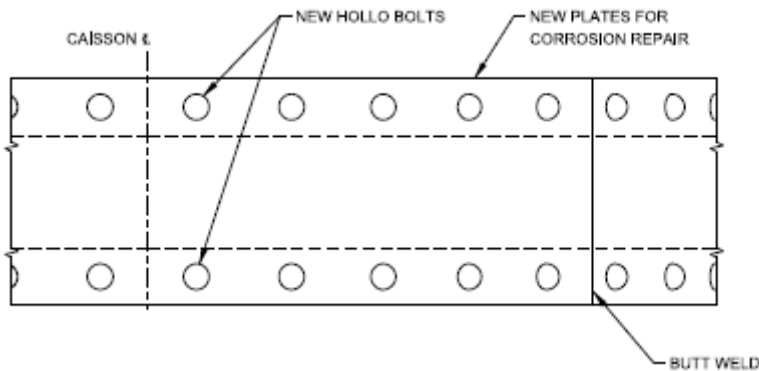


Figure 6 – Option 2 with butt weld (Source: Roads and Maritime)

Butt welding is a technique whereby two pieces of metal are joined on the same plane along a common edge. Option 2 would incorporate a connecting vertical butt weld which would be difficult to construct within very tight dimensional tolerances. To do this, temporary dogs (see Figure 7 below) would need to be welded to hold the two pieces of metal together and then ground off once finished. This requires additional work and may damage the repair if care is not taken. The butt welding process would also introduce a considerable amount of heat into the joint and surrounding area which could cause damage to the repair and weaken the surrounding area. Option 2 is the least visually intrusive of the three options considered.

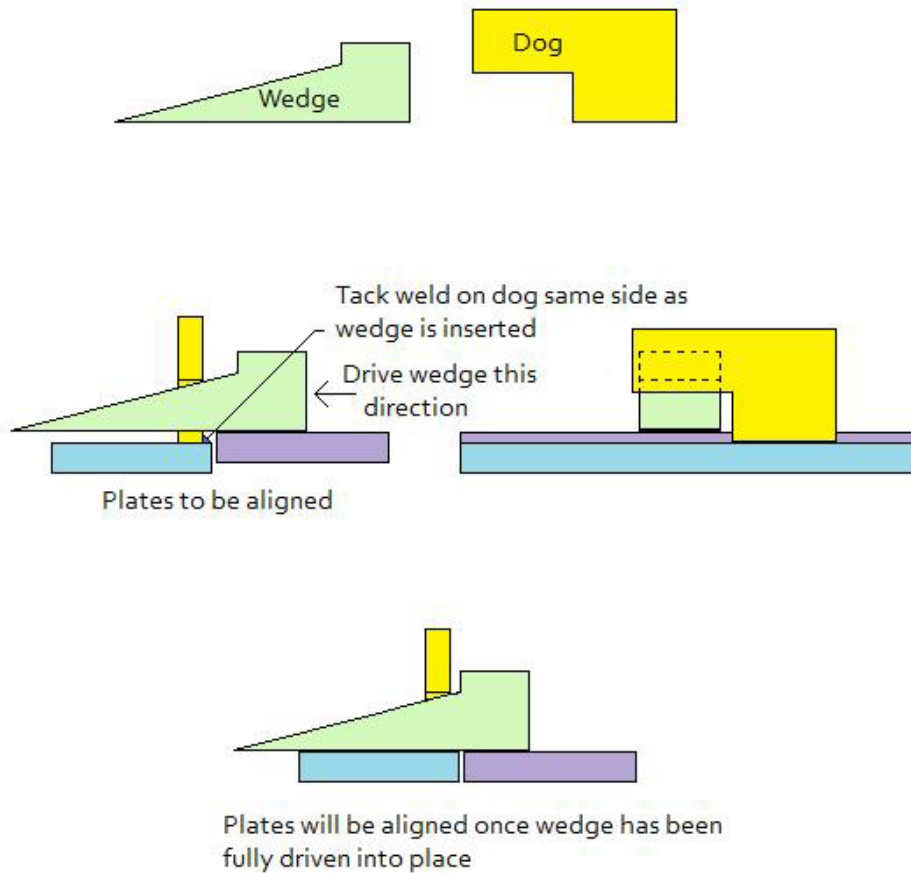


Figure 7 - "Wedge and dog" technique used to align plates prior to welding (Source: American Welding Society).

2.3 Option 3 – splice plate

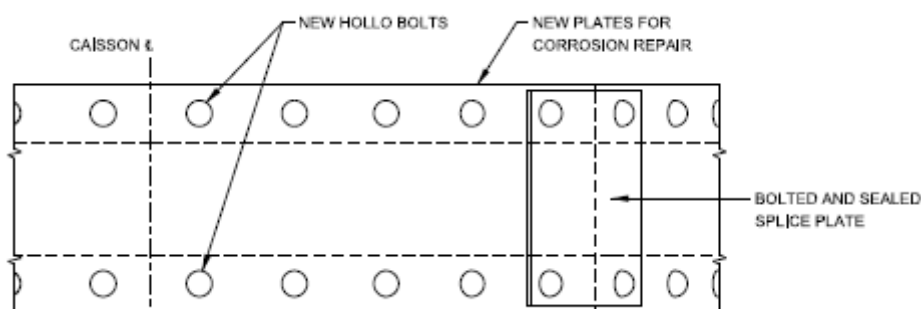


Figure 8 – Option 3 with splice plate (Source: Roads and Maritime)

Option 3 would involve splicing together two plates and then applying a seal weld. A seal weld is designed to prevent a liquid (in this case water) entering into a space where corrosion could occur. The bolted splice plate would be more visually intrusive than Option 2 but less so than Option 1, and provides a more constructible and durable design than both options 1 and 2, as it would prevent water ingress, and has less risk of suffering impact damage from flood debris than Option 1. Roads and Maritime has thus selected Option 3 as the preferred option.



3 Proposed works

In order to prevent further corrosion of the caisson and loss of original fabric, and in order to prevent deterioration of the pier itself, Roads and Maritime proposes to bolt a new steel cover plate over the corroded rivetted steel splice affecting both steel caisson pier 2 and 3. A new steel splice plate would be bolted to the existing caisson, overlaying the original splice connection and fastened with a seal welded cover plate.

The work includes the following basic steps:

1. Prepare the caisson surface including the removal of all rust and paint
2. Temporarily support steel cover plate
3. Drill new holes one at a time for the new cover plate
4. Remove concrete from the newly drilled holes
5. Inject epoxy into new bolt holes and install new hollow bolts
6. Once epoxy has cured fully tension all new hollow bolts and attach steel bolt covers to match existing rivets
7. Weld joints on cover plate
8. Inject epoxy between cover plate and existing caisson
9. Close injection holes
10. Patch paint repairs as required

4 Assessment of heritage impact

The form and fabric of the wrought iron piers have previously been assessed as being of high heritage significance. In the Statement of Heritage Impact (SOHI) prepared for the works being undertaken under the current S60 approval the piers are described thus:

The piers that support the lift span comprise twin wrought iron cylinders, connected by wrought iron plate diaphragms with an elliptical opening. This pier system is uncommon for river crossings of this period of construction. The upper portions of the wrought iron caissons were filled with concrete to provide support for the lift towers, lift span and timber truss spans. The cylinders were supported on a concrete pile cap, excavated in the riverbed, in turn founded on timber piles driven deep into the riverbed.

Steel sheet piling encloses each pier and this extends approximately one metre above normal water level. Sheet piling encasement was installed in the 1970s as a cofferdam to protect the concrete pile caps from undermining due to scour. The bottom edge of the steel plate bracing between cylinders at Pier 3 has some corrosion loss.

The impact of the proposed works upon the heritage significance of the bridge as a whole as well as its individual components has been assessed in the most part using the questions listed in the NSW Heritage Office, Department of Urban Affairs and Planning document "Statements of heritage impact". The intent of preparing a SOHI is to enable the impacts of proposed work upon a heritage item to be understood, and thus to enable an informed decision to be made on whether to allow the works to proceed. The following questions are presented in "Statements of Heritage Impact" as the minimum response required to properly address proposals for works on heritage items which would result in the alteration of an item.



4.1 What aspects of the proposal respect or enhance the heritage significance of Barham Bridge?

One element of the Bridge's heritage significance is its continued operation as a road bridge since its opening in 1904, and its ability to adapt to and meet the challenges of increased traffic and vehicle loads over the past 115 years. The proposed works respect this aspect of the bridge's significance by preventing further deterioration of original bridge fabric, enabling the bridge to continue to function at a safe level while meeting the demands of current and future traffic requirements.

The proposed works have been developed with the intent of retaining original fabric rather than removal and replacement. The proposal seeks to respect the aesthetic significance of the piers and the bridge as a whole by minimising the visual impact of the work. This is important given the rarity of this type of pier on a timber truss bridge which contributes to the bridge's distinctive appearance. As the repairs would form a seal over the corroded components, preventing exposure to air and moisture, the proposed works would halt deterioration of original fabric at this location.

4.2 What aspects of the Proposal could have a detrimental effect on the heritage significance of Barham Bridge?

The work would involve removal of a small amount of original fabric through drilling holes into the caisson splice and pier itself. The works would also introduce new techniques of attaching metal to the piers, with the use of welding and bolting, rather than riveting. However, it's also noted that riveting as an attachment technique is not feasible for the application as the inside of the caisson cannot be accessed. Given the high degree of heritage significance ascribed to the piers comes from them being rare examples of metal piers on a river bridge, this aspect of their significance remains unchanged. To not act to halt the existing corrosion and allow further deterioration and loss of fabric to occur would put the integrity of the piers and the bridge as a whole at risk, which would be a far greater and unacceptable impact on the bridge's heritage significance.

4.3 Have more sympathetic solutions been considered and discounted? Why?

Three options were developed for the repair, and the option selected is the one that achieves the desired result in the most sympathetic manner possible.

4.4 Is the alteration sympathetic to the bridge? In what way?

The proposed works are sympathetic to the bridge in that they have been designed to be as unobtrusive as possible whilst still conserving original fabric and preventing further deterioration of that fabric. All options considered took into account the degree of heritage significance embodied in the piers and the contribution the piers make to the bridge's overall heritage significance. The proposed works are necessary in order to maintain the integrity and prevent further deterioration of original fabric. The heritage impact of the works would be minimised by limiting the loss of original fabric to drilling bolt holes into the existing caisson splices, and adding a small amount of new fabric, rather than completely replacing the splices. While the works would be obvious as new fabric added to the piers, they have been designed with a minimal profile so as not to be visually obtrusive. The head of the bolts proposed for use in the works are of a similar profile and dimensions to those of the existing rivets on the caissons. The



works would only be visible when the water level in the river is low, and, unless viewed close-up from a boat, difficult to see when observed from either river bank.

4.5 Statement of heritage impact

The impact of the proposed repairs on the heritage significance of the bridge would be negligible. The work seeks to maintain the heritage significance of the bridge by retention of original fabric through supplementing it with new fabric, and would be undertaken in a manner that is as unobtrusive as possible whilst still meeting the objective of preventing further deterioration. The work would halt corrosion at this location that if left unchecked would eventually compromise the structural integrity of the bridge, ultimately leading to a loss of function, and potentially its demolition.

In short, the proposal follows the *Burra Charter* principal of conservation based on a respect for original fabric and use of the bridge by using a cautious approach of changing as much as necessary but as little as possible so that its cultural significance is retained.

5 Conclusions and recommendations

Whilst it would be preferable from a heritage conservation perspective to not make any non-reversible changes to original fabric, it is essential that this work be undertaken to halt the corrosion of the caisson splices. The work would both prevent further deterioration and loss of fabric, and allow the bridge to remain in service as an important link in a transport route between NSW and Victoria.

In order to document the work and provide information for the bridge's ongoing management, it is recommended that archival standard photographs be undertaken prior to, during and at completion of the work.

Section 65 of the *Heritage Act* permits modifications to an existing Section 60 approval if, in the opinion of the Heritage Council of NSW "the act, matter or thing authorised by the modified approval is substantially the same as the act, matter or thing authorised by the original approval". The finding of this assessment is that the proposed repairs to the caisson splices on piers 2 and 3 of Barham Bridge, are of a nature and degree of heritage impact that satisfies the condition of Section 65 of the Act, and are in keeping with the principles of the *Burra Charter*.

In light of this it is recommended that Roads and Maritime apply to the Heritage Council of NSW to modify the existing heritage approval. This letter has been reviewed by Claire Everett, Director, New State Environment and Heritage.

Yours faithfully

A handwritten signature in blue ink that reads "Mark Tilley".

Mark Tilley

Principal Bridge Engineer

Focus Bridge Engineering



0438 690 306

Appendix D

Section 65A approval



Our ref: DOC19/988273

Nicholas McMullen
Bridge Works Manager
South West NSW, Regional NSW and Outer Metropolitan
193 Morgan Street, Wagga Wagga NSW 2650
Transport, Roads & Maritime Services

By email: nicholas.r.mcmullen@rms.nsw.gov.au
Cc: Ian Berger, ian.BERGER@rms.nsw.gov.au

Dear Mr McMullen

**APPLICATION TO MODIFY 60 APPROVAL UNDER THE HERITAGE ACT 1977
BARHAM BRIDGE OVER MURRAY RIVER, STATE HERITAGE REGISTER NO. 01456**

Proposal: Corrosion repairs to pier splice
Section 60 application no: 2017/S60/15, approved on 18 April 2017
S65A application no: S65A/2019/061 received 18 November 2019

I refer to your application under Section 65A of the *Heritage Act 1977* (the Act) to modify the approved Section 60 application 2017/S60/15.

As delegate of the Heritage Council of NSW (the Heritage Council), I have considered the modified proposal and found it to be substantially the same as the approved Section 60 application 2017/S60/15.

Your application for modification is approved under Section 65A of the Act. A copy of the conditions of the original application is provided below with amendments resulting from the modification shown by striking through text or new text in ***bold italics***.

APPROVED DEVELOPMENT

1. ***All work shall comply with the information contained within:***
 - a. ***Engineering drawings, prepared by Transport – Roads & Maritime Services as listed below:***

<i>Dwg No</i>	<i>Dwg Title</i>	<i>Date</i>	<i>Rev</i>
<i>Project Name: BRIDGE OVER MURRAY RIVER (KOONDROOK BRIDGE) AT BARHAM - CAISSON CORROSION REPAIR - HERITAGE CONCEPT</i>			
<i>KA999HC</i>	<i>GENERAL ARRANGEMENT – SHEET 1 OF 2</i>	-	-
<i>KA999HC</i>	<i>DETAILS – SHEET 2 OF 2</i>	-	-

- b. ***Statement of Heritage Impacts: Letter report to Nick McMullen, Bridge Works Manager RMS, Assessment of heritage impact on the proposed repairs to the metal caisson splices to Piers 2 and 3 at Barham Bridge, Barham, NSW, from Mark Tilley, Focus Bridge Engineering, 11 November 2019 - DOC no DOC19/988273-2***

EXCEPT AS AMENDED by the conditions of this approval.

NOMINATED HERITAGE CONSULTANT

Level 6, 10 Valentine Ave Parramatta NSW 2150 ■ Locked Bag 5020 Parramatta NSW 2124
P: 02 9873 8500 ■ E: heritagemailbox@environment.nsw.gov.au

2. A suitably qualified and experienced heritage consultant is to be nominated for the project.
3. The nominated heritage consultant is to provide advice on the detailed design, undertake on-site heritage instructions and inspect the works to ensure that no significant fabric or elements are damaged or removed.
4. All work shall be carried out by suitably qualified tradespeople with practical experience in conservation and restoration of similar heritage structures, material and methods. The nominated heritage consultant shall be consulted prior to the selection of appropriate tradespeople.

Reason: A suitably qualified consultant will ensure the heritage values of the place are appropriately acknowledged and interpreted. They will ensure the works are adequately monitored and provide ongoing support as required.

SITE PROTECTION AND WORKS

5. Significant bridge fabric and elements are to be protected during the works from potential damage. Protection systems must ensure heritage fabric is not damaged or removed.
6. Protection systems are to be developed in consultation with the heritage consultant.

Reason: The protection of significant fabric and elements will ensure that heritage fabric is not obscured, damaged or removed.

SWAY BRACES

7. Elimination of the cut outs to the new sway braces.

Reason: Elimination of the cut outs from the new sway braces will ensure that these elements are distinguished from the Victorian design components.

LIGHTING

- ~~8. Drawings that clearly indicate the pedestrian and feature lighting is to be provided to the Heritage Council or its delegate for approval prior to the works commencing.~~

~~*Reason: The final lighting solution is still being developed.*~~

FOOTBRIDGE

9. The addition of an external full length steel bridge pathway is considered an isolated acceptable solution. It is important to note that the addition of footbridges to other DeBurgh timber truss bridges is not considered a standard acceptable solution.

Reason: The four extant De Burgh timber truss bridges, including Barham Bridge, do not incorporate an external footbridge. However, the Cobram Bridge over Murray River includes an internal footbridge.

COMPLIANCE

- ~~10. Officers of the Office of Environment and Heritage, Heritage Division are to be permitted entry to the site at any time as a condition of this approval and may photograph, take samples or request records in relation to any aspects of the approved activity.~~
- ~~11. The Applicant and the nominated Heritage Consultant may be required to participate in random audits of Heritage Council approvals to confirm compliance with conditions of consent at any time.~~
10. **If requested, the applicant and any nominated heritage consultant may be required to participate in audits of Heritage Council of NSW approvals to confirm compliance with conditions of consent.**

Reason: To ensure that the proposed works are completed as approved.

DURATION OF APPROVAL

12. This approval shall be void if the activity to which it refers is not physically commenced within five years after the date of the approval or within the period of consent specified in any relevant development consent granted under the *Environmental Planning and Assessment Act 1979*, whichever occurs first.

PHOTOGRAPHIC ARCHIVAL RECORDING

13. A photographic archival recording of Barham Bridge must be prepared prior to the commencement of works, in accordance with the NSW Heritage publications *How to prepare archival records of heritage items* and *Photographic Recording of Heritage Items using Film or Digital Capture*. The original copy of the archival record must be deposited with the ***Heritage NSW Heritage Division, Office of Environment and Heritage***, and an additional copy provided to the Wakool Shire Council.

Reason: To ensure the sway braces proposed to be removed, are recorded in-situ.

Advice

Section 148 of the *Heritage Act 1977* (the Act), allows people authorised by the Minister to enter and inspect, for the purposes of the Act, with respect to buildings, works, relics, moveable objects, places or items that is or contains an item of environmental heritage. Reasonable notice must be given for the inspection.

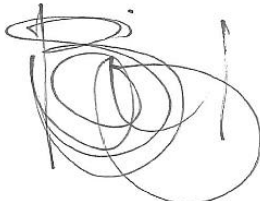
Right of Appeal

If you are dissatisfied with this determination appeal may be made to the Minister under section 70 of the Act.

It should be noted that an approval under the Act is additional to that which may be required from other Local Government and State Government Authorities in order to undertake works.

If you have any queries regarding this Section 65A approval for Barham Bridge, please contact Alexander Timms, Senior Heritage Officer at the Heritage NSW on (02) 8837 6067 or at alexander.timms@environment.nsw.gov.au

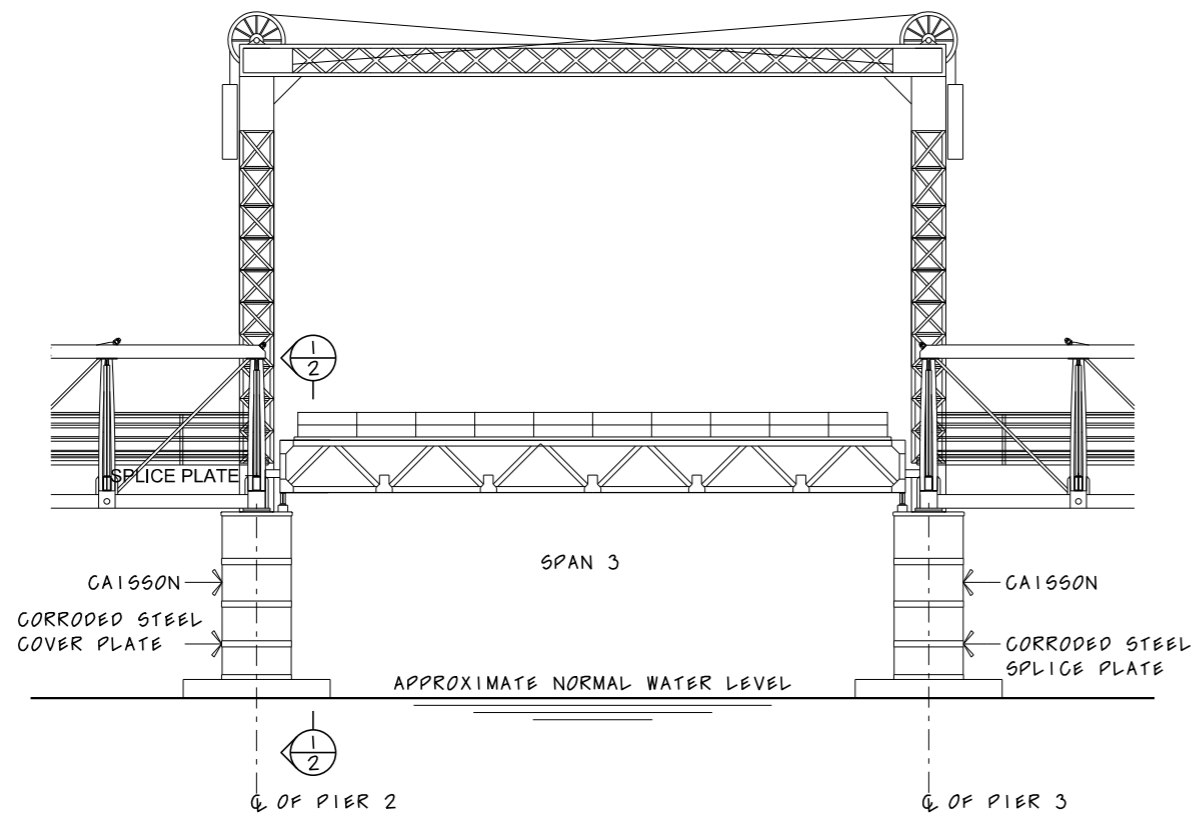
Yours sincerely



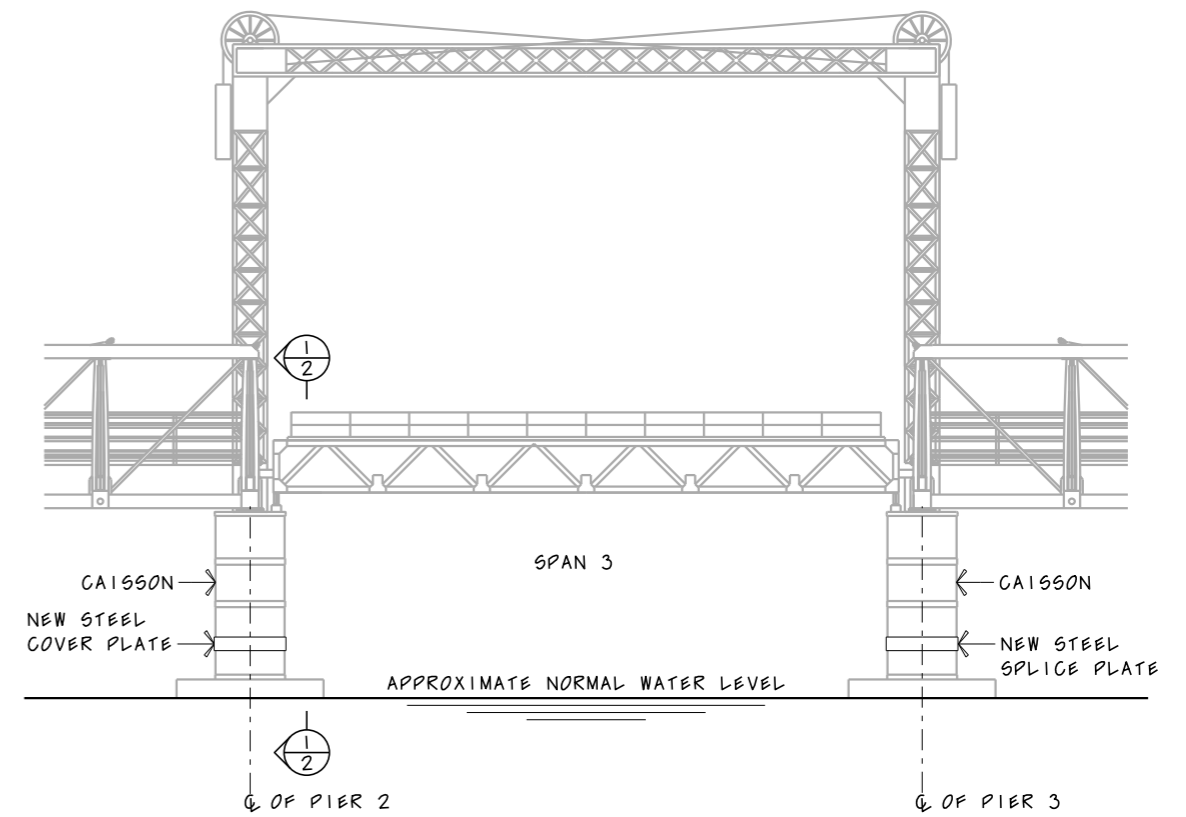
SARAH JANE BRAZIL

Senior Team Leader Major Projects
Heritage NSW
Department of Premier and Cabinet
As Delegate of the Heritage Council of NSW

14 January 2020

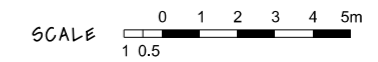


ELEVATION
AS EXISTING



ELEVATION
AS PROPOSED

GENERAL NOTES



DIMENSIONS ARE IN MILLIMETRES.
EXISTING DIMENSIONS HAVE BEEN ADOPTED FROM THE ORIGINAL BRIDGE DRAWINGS (1902), REGISTRATION NUMBER OF PLANS: 0319 469 BC 0112.

HERITAGE ACT 1977
APPLICATION TO MODIFY AN APPROVAL
SECTION 65A


Application No: 2019/S65A/061

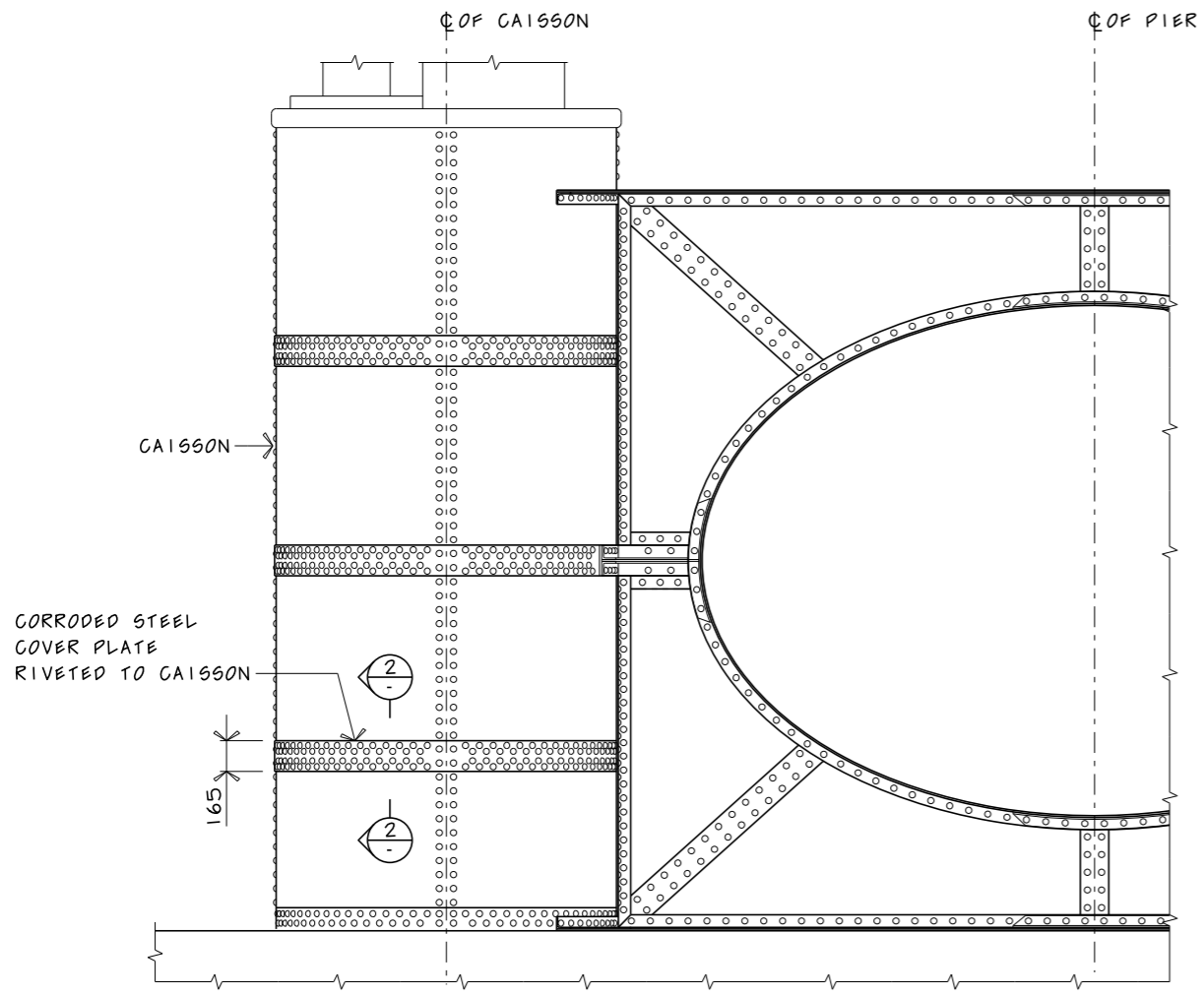
Approved by: the Heritage Council of NSW
Delegated Authority

On: 14/01/2020

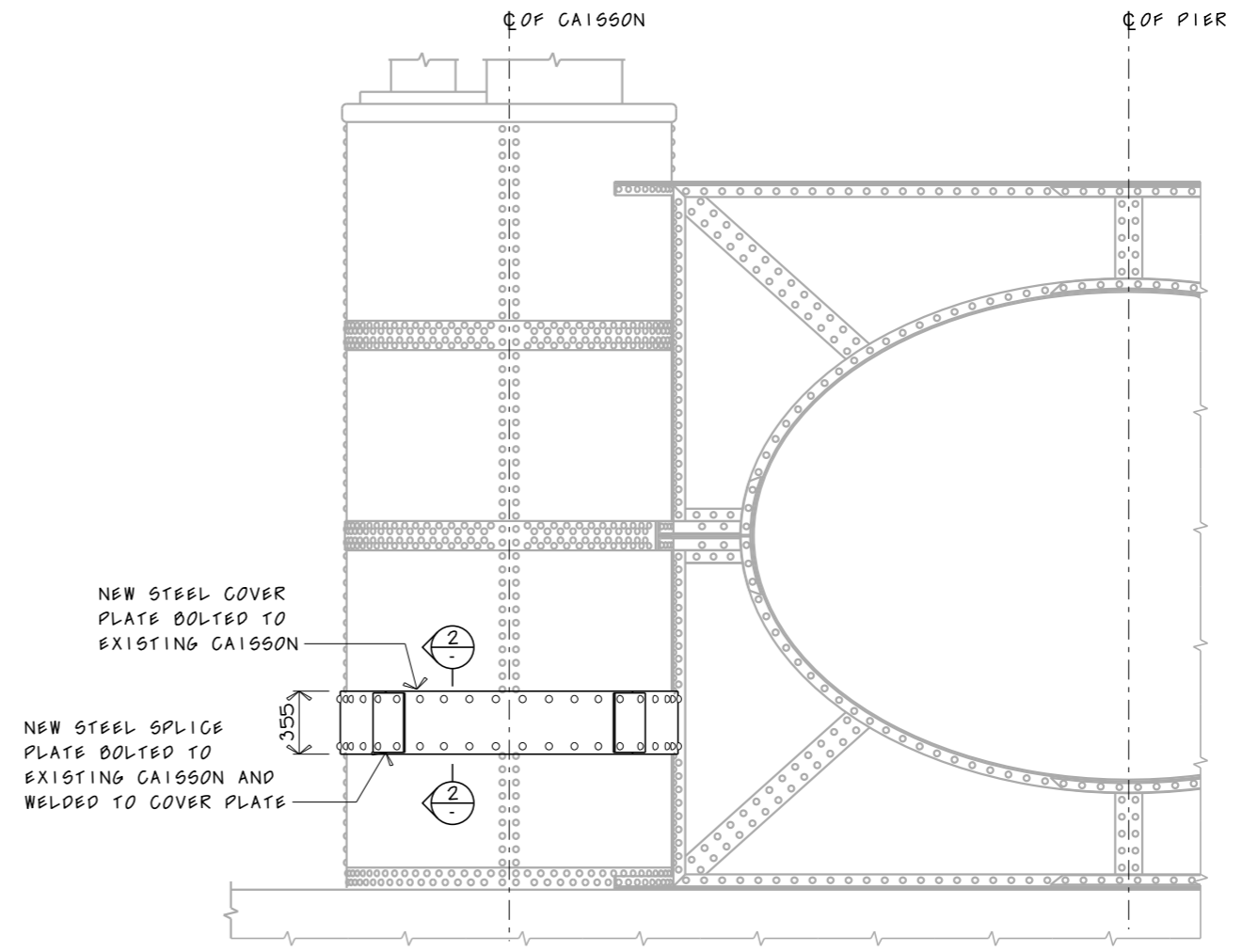
these plans should be read in conjunction with
the decision notice

le
(for) Delegate
Heritage Council

ISSUE	DATE	AMENDMENT DESCRIPTION	PREP	CHECK	AUTH
MAIN ROAD No 319 SHIRE OF WAKOOL					
BRIDGE OVER MURRAY RIVER (KOONDROOK BRIDGE)					
AT BARHAM					
CAISSON CORROSION REPAIR - HERITAGE CONCEPT					
GENERAL ARRANGEMENT					
PREPARED BY BRIDGE ENGINEERING SECTION PHONE (02) 8837-0832			 Transport Roads & Maritime Services www.rms.nsw.gov.au		
DESIGN	PREPARED	CHECKED	SKETCH No KA999HC		
DRAWING			BRIDGE No B3256		
ISSUE STATUS FOR HERITAGE REVIEW					
BRIDGE ENGINEER (REHABILITATION DESIGN)		ISSUE	0	No SHEETS	2
				SHEET No	1



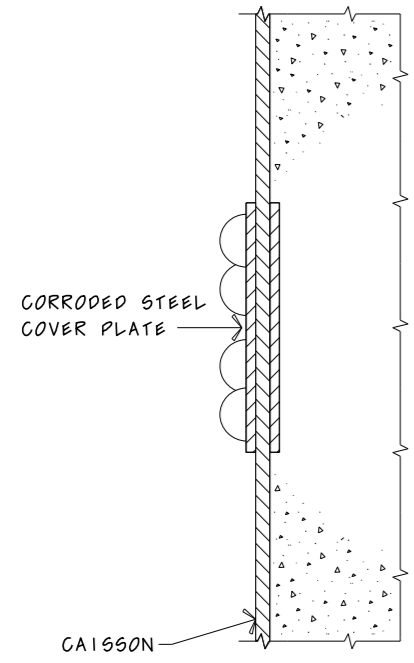
SECTION 1-1
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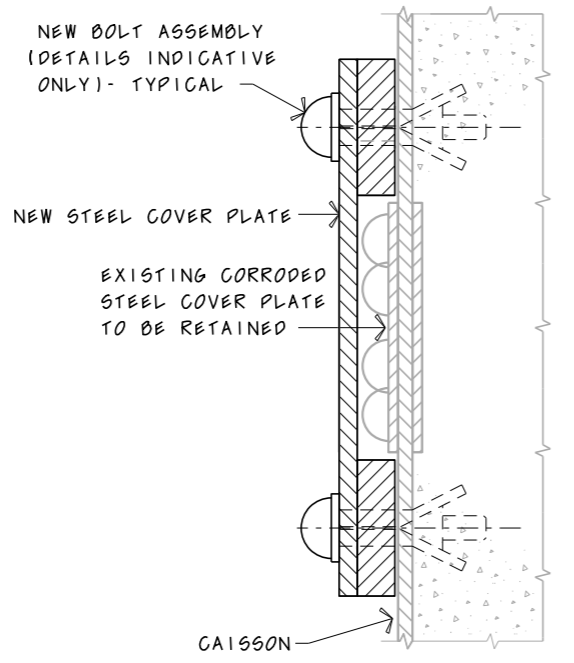
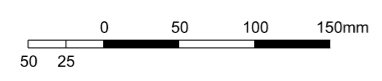
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AS PROPOSED

PIERS 2 AND 3

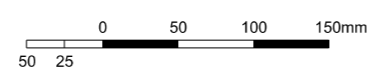
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SECTION 2-2
AS PROPOSED



GENERAL NOTES

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FOR OTHER GENERAL NOTES RELATING TO THIS SHEET, SEE SHEET 1.

HERITAGE ACT 1977
APPLICATION TO MODIFY AN APPROVAL
SECTION 65A

Application No: 2019/S65A/061

Approved by: the Heritage Council of NSW
Delegated Authority

On: 14/01/2020

these plans should be read in conjunction with
the decision notice

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(for) Delegate
Heritage Council

ISSUE	DATE	AMENDMENT DESCRIPTION	PREP	CHECK	AUTH
MAIN ROAD No 319 SHIRE OF WAKOOL BRIDGE OVER MURRAY RIVER (KOONDROOK BRIDGE) AT BARHAM CAISSON CORROSION REPAIR - HERITAGE CONCEPT					
DETAILS					
PREPARED BY BRIDGE ENGINEERING SECTION PHONE (02) 8837-0832			Transport Roads & Maritime Services <small>www.rms.nsw.gov.au</small>		
DESIGN			SKETCH No KA999HC		
DRAWING			BRIDGE No B3256		
ISSUE STATUS FOR HERITAGE REVIEW					
BRIDGE ENGINEER (REHABILITATION DESIGN)			ISSUE 0	No SHEETS 2	SHEET No 2

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THIS DRAWING IS CONFIDENTIAL AND SHALL ONLY BE USED FOR THE PURPOSE OF THE NOMINATED PROJECT