# APPENDIX F

Lachlan River Bridge Modification Project

# Statement of Heritage Impact

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View of the Lachlan River Railway Bridge.

# STATEMENT OF HERITAGE IMPACT

## LACHLAN RIVER RAIL BRIDGE

FORBES, NSW

NOVEMBER 2021

2-0008-230-EAP-05-RP-7007

Report prepared by

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for WSP

on behalf of ARTC

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**Acknowledgement**

OzArk acknowledge Traditional Owners of the area on which this assessment took place and pay respect to their beliefs, cultural heritage and continuing connection with the land. We also acknowledge and pay respect to the post-contact experiences of Aboriginal people with attachment to the area and to the elders, past and present, as the next generation of role models and vessels for memories, traditions, culture and hopes of local Aboriginal people.

## EXECUTIVE SUMMARY

OzArk Environment & Heritage (OzArk) has been engaged by WSP (the client) to complete a Statement of Heritage Impact (SOHI) for the proposed works to Lachlan River Bridge for the purpose of the Stockinbingal to Parkes Inland Rail Project (the proposal). This report assesses historic heritage values that may be impacted by the proposal. The proposal is in the Forbes Local Government Area (LGA).

The Lachlan River Bridge is listed on Schedule 5 of the Forbes Local Environmental Plan (LEP) 2013 as the "Railway Bridge over Lachlan River, Forbes" (I123) as an item of local heritage significance.

The Australian Rail Track Corporation (ARTC) Stockinbingal to Parkes (S2P) project approval pathway is via Part 5.1 of the *Environmental Planning and Assessment Act* 1979 (EP&A Act), with ARTC as the determining authority.

The proposed works require horizontal and vertical clearances at specific sites to accommodate the operation of double stacked container trains. The Lachlan River Bridge is one such site where vertical clearance is required. This report aims to examine which modification option is preferred for the preservation of heritage values. The options presented for the modification of the Lachlan River Railway Bridge to meet vertical clearance include:

- Option 1: Modify existing truss to provide vertical clearance of 7.1 metres
- Option 2: Replace bridge truss span with new concrete or steel spans

The works may also require patch painting areas of the bridge. Ancillary works will include adjusting handrails and utilities on the bridge and establishing construction compounds, laydown areas, a crane pad and environmental controls.

The purpose of this report is to assess the impacts of the proposed modification options to the heritage values of the Lachlan River Bridge. This report has not aimed to reassess the heritage significance of the bridge. OzArk agrees with the previous significance assessment of this item and agrees with the designation of local heritage significance for the bridge. The current report is focused on assessing potential impacts to these previously assessed values.

Two options were presented for examination within this SOHI. It is concluded that modification of the existing truss to achieve the appropriate vertical clearance (Option 1) will have the least impact to the heritage significance of Lachlan River Bridge. This option keeps central the basic conservation principles of the Burra Charter, including articles relating to change. This is considered the most reasonable option for preserving the heritage values of the bridge whilst importantly allowing it to continue its function as a vital rail link across the Lachlan River. While the modification will impact an item of local heritage value, the loss of the values is mitigated by the overall minimal modification to truss components and by the ability to conserve the majority

of the bridge's heritage values through the continued use of the bridge as an item of rail infrastructure which will ensure its' continued maintenance. The potential patch painting is understood to be only a minor modification that will be conducted in a stylistically sympathetic manor to negate the aesthetic impact to the bridge.

The following recommendations have been designed to mitigate the impacts to Lachlan River Bridge in relation to Option 1:

1) Modification of the truss structure and strengthening of the vertical and deficient members should be undertaken in a sympathetic style to reduce the impact to the aesthetic values of the bridge. The 'like for like' principle should be applied where feasible.
2) Patch painting and other ancillary works should similarly be conducted in a stylistically sympathetic way so as to also not affect the aesthetic values of the bridge.
3) As modification to Lachlan River Bridge is unavoidable, there will be a loss to some heritage values through impact to fabric. To mitigate this, archival photographic recording should be carried out prior to the proposed works. This will preserve a record of the bridge's historic, aesthetic and technical heritage values prior to modification, for future generations. A record of this recording should be deposited with Forbes Shire Council and the Forbes Library so that a copy of the record is maintained.
4) An Interpretation Plan should be prepared for Lachlan River Bridge to ensure information regarding the bridge is preserved.
5) As per Clause 14 of the SEPP (Infrastructure), written notification (including a copy of this report and a scope of works) of the ARTC's intent to modify Lachlan River Bridge must be sent to Forbes Shire Council, with 21 days given for review.
6) To avoid the potential for harm to historic objects on unassessed adjacent landforms, all ground surface disturbing activities must be confined to the assessed area.
7) In the event that unexpected historic heritage items are uncovered during work at the Lachlan River Railway Bridge, an *Unanticipated Finds Protocol* (**Appendix 1**) should be followed.

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# 1 INTRODUCTION

## 1.1 BRIEF DESCRIPTION OF THE PROPOSAL

OzArk Environment & Heritage (OzArk) has been engaged by WSP (the client) to complete a Statement of Heritage Impact (SOHI) for the proposed modification or replacement of the Lachlan River Bridge for the purpose of the Stockinbingal to Parkes Inland Rail Project (the proposal). This report assesses historic heritage values that may be impacted by the proposal. The proposal is in the Forbes Local Government Area (LGA) (**Figure 1-1**).

## 1.2 BACKGROUND

The Australian Government has committed to delivering a significant piece of national transport infrastructure that will provide a safe, sustainable solution to the freight challenge that exists on Australia's east coast. The Inland Rail Program is a 1,700-kilometre interstate freight rail corridor that will connect Melbourne and Brisbane, via central-west New South Wales (NSW) and Toowoomba in Queensland QLD). The Stockinbingal to Parkes (S2P) section, is an enhancement project within the Inland Rail Program. It is a 173-kilometre section of existing rail corridor located in regional NSW between the towns of Stockinbingal and Parkes.

A number of enhancement works (which do not constitute a complete upgrade of the track alignment) are required to be undertaken in this section, including alterations to, or construction or removal of various structural and track assets along the alignment. The enhancement works required along the S2P corridor have been split into four Review of Environmental Factors (REF) packages.

## 1.3 THE PROPOSED WORKS

An options assessment report was completed in February 2021 for the Stockinbingal to Forbes project. The report identified two options to address the insufficient vertical clearance of the Lachlan River Bridge and meet the objectives of the proposal. A 'Do-nothing option' was considered but as the proposal is needed to support the development of Inland Rail, this option was not progressed. The design options considered were:

- modifications to the existing bridge
- replacement of the bridge truss span with new concrete or steel spans.

Both options were assessed using Inland Rails' program wide multi-criteria analysis (MCA). The MCA process is a robust methodology recognised as an industry standard. It has been widely used in Australia and internationally, including being consistently applied across multiple Inland Rail projects. The purpose of the MCA is to assess each option against a set of criteria, including, technical viability, safety, constructability and scheduling, environmental impacts, community and property impacts, operational approach, and stakeholder engagement.

The MCA process involves ARTC review and stakeholder engagement including an options assessment workshop. The assessment and identification of the preferred option are presented in an options assessment report for the proposal (WSP, 2021).

The assessment identified that the two options would perform similarly during operation in regard to safety and ease of operation as no changes to the track arrangement are proposed. The preferred option was the modification to the Lachlan River Bridge, as it provided the following superior outcomes:

- Reduced construction duration and complexity of construction activities
- Lower risk to worker safety during construction due to smaller scale of works and no in river works
- Minimised environmental impacts including:
    - Smaller construction footprint reducing impacts to vegetation and the river banks
    - Avoidance of works within Lachlan River which may impact fish passage and aquatic habitat.
    - Avoidance of potential changes to flooding from greater changes to the bridge structure including new piers within the waterway
    - Less natural resources such as concrete and steel required for construction
    - Less waste produced as demolition of bridge is not required
- Conservation of the locally heritage listed Lachlan River Bridge
- Minimised impact to private property during construction due to a smaller construction footprint.
- Reduced noise and visual impacts to receivers during construction.

This SOHI has been prepared for the modification works to the Lachlan River Bridge (the proposal) in Forbes, NSW. This report aims to examine which option is preferred for the conservation of heritage values, and then to offer mitigation measures for the chosen option. The options presented for the modification of the Lachlan River Railway Bridge to meet vertical clearance include:

- Option 1: Modify the existing truss to provide vertical clearance of 7.1 metres (m). This includes removal of members within the end frames and along the top of the truss structure and replacement with alternative members (see **Figure 1-2**), as well as strengthening vertical members with truss bracing frames and strengthening stringers and cross girders. This modification was needed due to the removal of existing bracing (for clearances) which resulted in the bridge requiring alternative strengthening measures to

ensure its' integrity under load. The complete 100% reference design plans for this option are attached in **Appendix 2**: WSP 100% reference design. 1.

- Option 2: Replace bridge truss span with new concrete or steel spans.

The works will also require patch painting areas of the bridge where necessary. Ancillary works will include adjusting handrails and utilities on the bridge and establishing construction compounds, laydown areas, a crane pad and environmental controls.

**Figure 1-1. Aerial showing the location of the proposed S2P study area and immediate impact area in relation to the town of Forbes.**

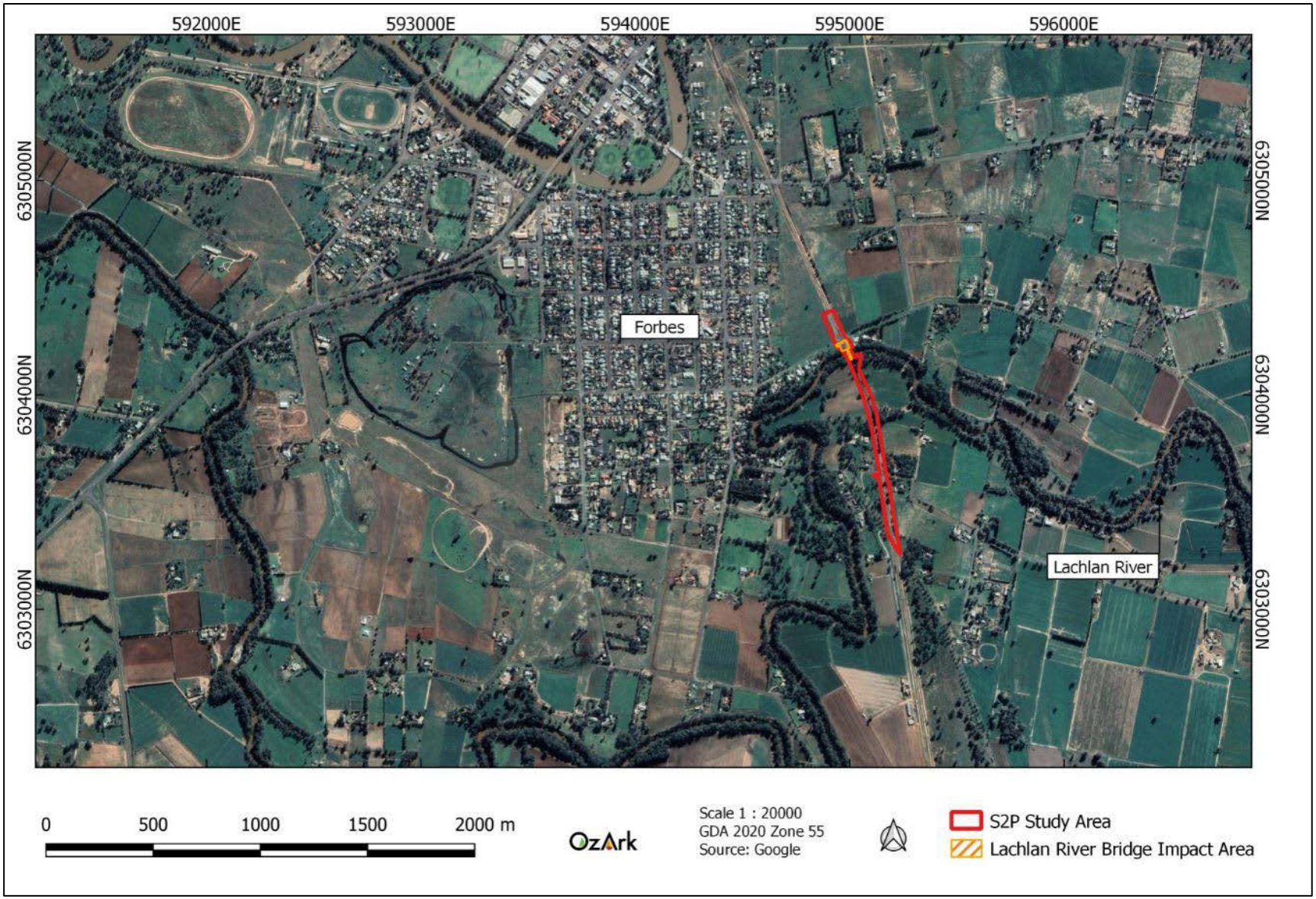
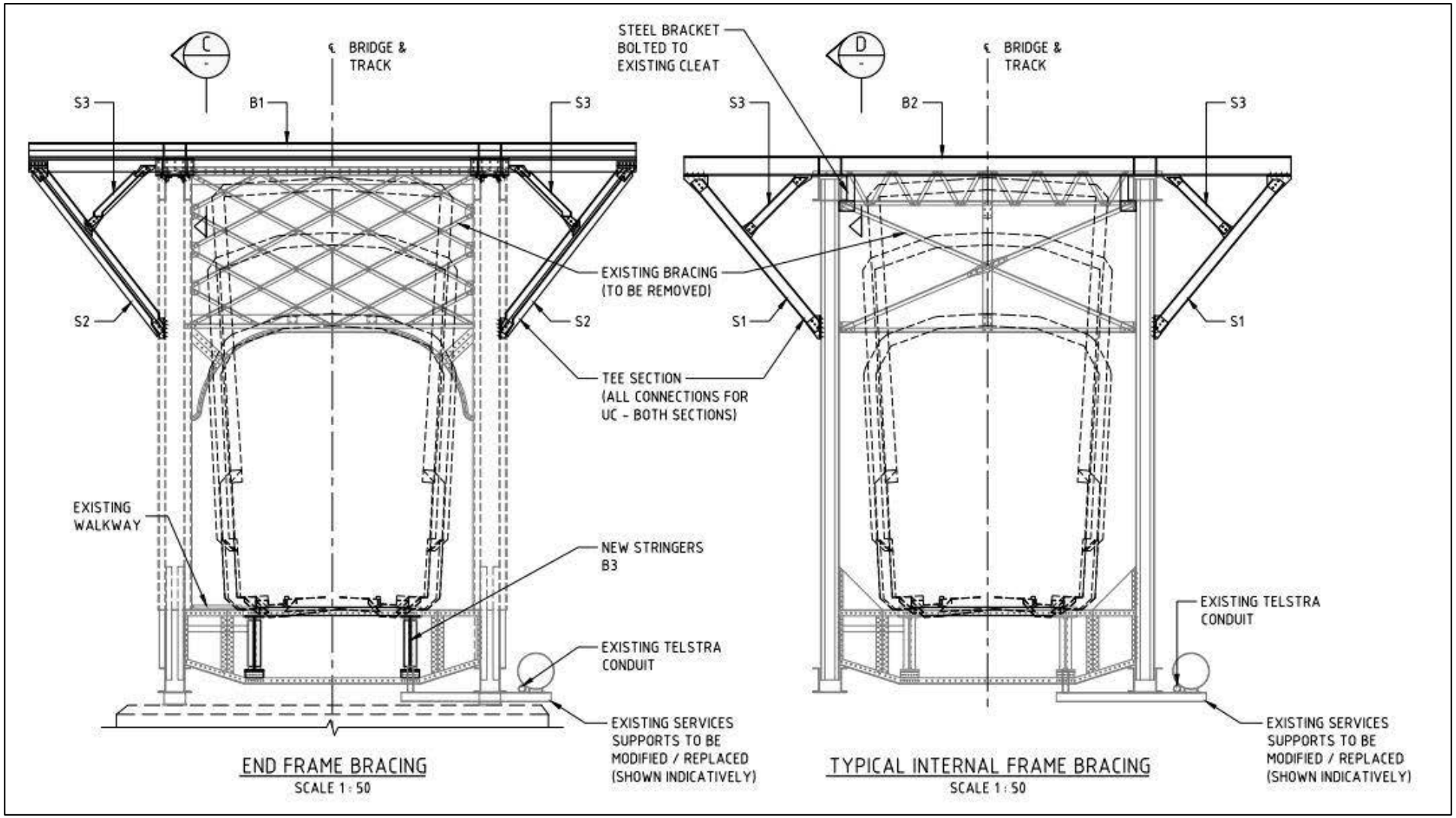


**Figure 1-2: 100% design modification plans provided by WSP 2021 for Option 1.**



## 1.4 HERITAGE STATUS

The existing bridge is a multi-span bridge that comprises a single steel span truss crossing the Lachlan River. The bridge was likely constructed by 1918, with plans from the bridge dating back to 1912, with the approach spans replaced in 1996. The height of the braces in the truss structure do not provide sufficient vertical clearance and sections of handrail encroach on horizontal clearance.

The Lachlan River Railway Bridge is listed on Schedule 5 of the Forbes Local Environmental Plan (LEP) 2013 as the "Railway Bridge over Lachlan River, Forbes" (I123) as an item of local heritage significance. This report aims to identify whether the proposed options for modification or replacement of the Lachlan River Railway Bridge would have an impact on this identified heritage significance.

This report has not aimed to reassess the heritage significance of the bridge. OzArk agrees with the previous significance assessment of this item and with the designation of local heritage significance for the bridge. This report is focussed on assessing potential impacts to these previously assessed values.

Further, it is not within the scope of this report to assess the potential rarity of this item in terms of the population of such structures across NSW. However, it is assumed that bridges of this type and condition are relatively rare.

## 1.5 PROPOSAL LOCATION

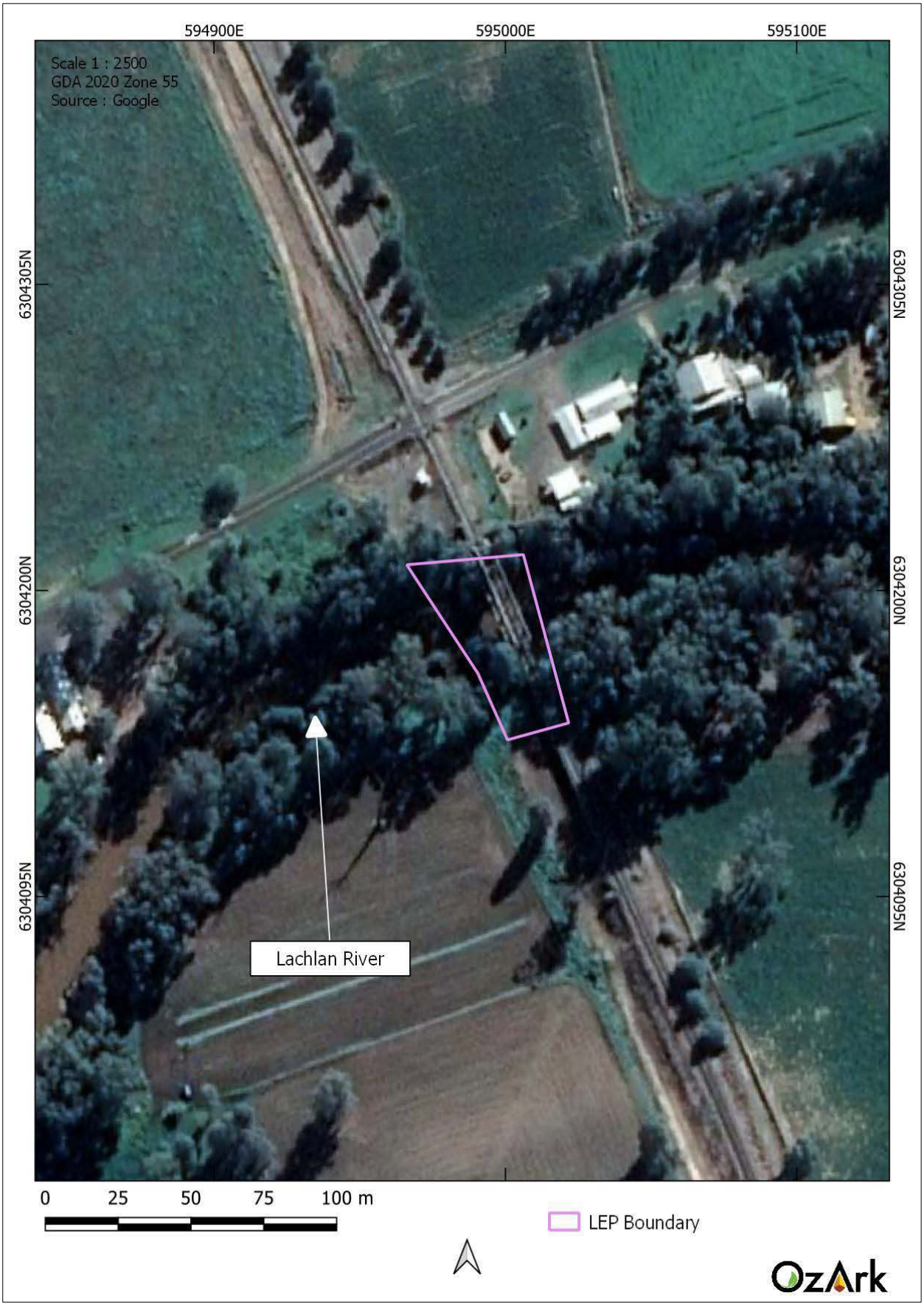
The S2P Lachlan River Bridge study area and immediate impact area can be seen on **Figure 1-1**.The Lachlan River Bridge LEP boundary is shown on **Figure 1-3**. It is located 1.7 km southeast of Forbes Town Hall and 2 km south of Forbes Railway Station on the Stockinbingal to Parkes railway line. It is approximately 40 m south of Lower Bathurst Street, Forbes.

## 1.6 ASSESSMENT APPROACH

This assessment applies the Heritage Council's *Historical Archaeology Code of Practice* (Heritage Council 2006) in the completion of a historical heritage assessment, including field investigations.

The SOHI has been prepared in accordance with the NSW Heritage Manual regarding SOHIs (2002) and '*Assessing Heritage Significance*' (2001) guidelines. The philosophy and process adopted is that guided by the Australia ICOMOS Burra Charter 2013.

**Figure 1-3: Aerial showing the Lachlan River Bridge LEP boundary.**



# 2 HISTORIC HERITAGE IMPACT ASSESSMENT

## 2.1 BACKGROUND

The current assessment will apply the Heritage Council *Historical Archaeology Code of Practice* (Heritage Council 2006) in the completion of a SOHI, including field investigations.

Please see **Section 1.3** for a description of the proposed works and **Section 1.5** for a description of the study area. **Section 3.2** details the observations of the study area taken during the site visit.

## 2.2 BRIEF HISTORY OF THE AREA

The study area is situated on the traditional lands of the Wiradjuri people. The first European explorers of the Central Western Plains region were John Oxley and George Evans. Between May and June 1815, surveyor George Evans led the first British party to the Lachlan River. Evans came onto the river close to Cowra and followed northwest until it was joined by Mandagery Creek, near Eugowra. Evans named it the Lachlan after the then governor, Lachlan Macquarie. He returned to the river in 1817 as the second-in-charge on an expedition led by Surveyor-General John Oxley, who Macquarie had sent to trace the Lachlan as far as possible and to determine if it entered an inland sea. The expedition explored the lower part of the Lachlan valley, travelling through the Forbes area (London 2004). In a letter Oxley did not report favourably on the area of Forbes, discussing the harsh terrain as:

> *"a very barren desolate spot, with little grass for the horses; but further on the country appeared even worse." (Oxley 1820: 19 in London 2004: 27).*

Following Oxley's expedition, the land was gradually occupied by pastoral squatters and by 1836, Surveyor General Mitchell deemed Forbes occupied (FHS 1988). Between 1826 and 1858 settlers came to the Lachlan valley to set up pastoral runs, however, sequential droughts in 1839 to 1844 and 1849 to 1852 resulted in many leaving the Forbes area (London 2004).

A gold rush in the Lachlan valley in 1861 occurred when gold nuggets were discovered at Forbes on James and William Rankin's Station near the Lachlan River (London 2004). This initial gold rush brought an influx of European settlers to the area. By September of 1861 a second gold rush took place, and by the end of 1861, around 40,000 people had formed a 'tent city' on the 'Black Ridge' which was later renamed Forbes, after the first Chief Justice of New South Wales, Francis Forbes. By mid-1863 surface payable gold became limited and the population of Forbes declined to 3,500 people (FHS 1988).

Those who remained in Forbes took advantage of the free selection of land before formal land surveys were commenced in the 1860s and 1870s. By 1889, a flour mill, wool scouring plants, breweries, and other rural industries had developed. Raising cattle was the principal industry for the earliest colonial settlers into the Forbes district, however, sheep and wheat were also farmed.

Although settlement at Forbes boomed due to the gold rush, Forbes continued as a town due to the area being a large rural producer (London 2004).

## 2.3 DEVELOPMENT OF INLAND RAILWAY LINES

The first public railway line in NSW was established in the 1850s linking Sydney with Granville. The railway lines were soon extended to Penrith in Sydney's west and Liverpool in the south-west (London 2004). Railway lines to Goulburn through the Southern Highlands, and over the Blue Mountains, including the Great Lithgow Zig Zag, had been completed by the 1860s. Many rural settlements formed committee's ('railway leagues') to petition the government to ensure their districts had access to the railway as the plans and surveys for new routes were being prepared (London 2004).

As Forbes was established as a regional town by the 1860s, it soon became the headquarters of the Land Board for the 'District for the Lachlan Valley west of Eugowra' under the *Land Act 1884* (Sharp 2017). Throughout the 1880s the policy was structured and by the early 1890s the objective was to connect towns without a railway to Sydney (Sharp 2017).

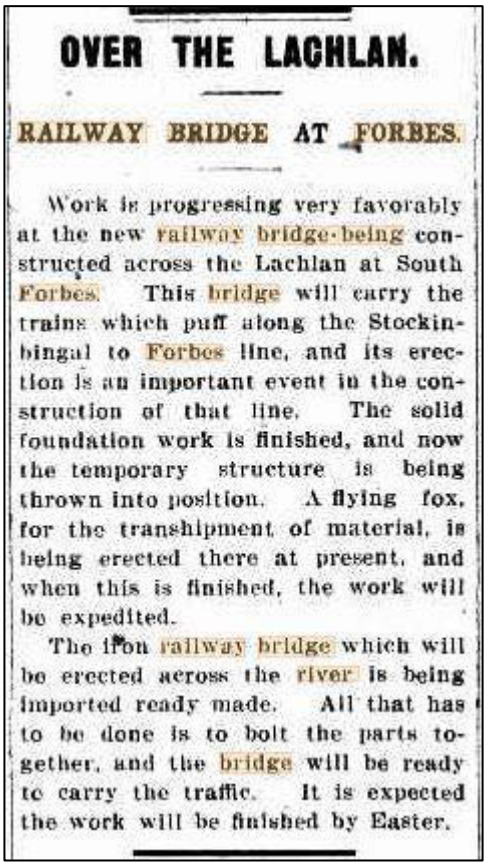
While an extension of the railway line through Forbes was not initially favourable, the eventual discovery of gold near Parkes led to the Legislative Assembly passing the *Molong to Parkes and Forbes Railway Act* by 25 June 1880. In 1881 the government agreed to construct the first section of the line from Orange to Forbes via Molong. Construction did not begin until 1885. The railway reached Forbes via Parkes in 1893. By 1893 Forbes was linked to other regional centres and Sydney. On 18 December 1893, Forbes station opened, as the terminus from Molong. The line was extended south from Forbes to Caragabal in 1918. The main passenger service to and from Forbes was known as the 'Western Mail', later renamed the 'Forbes Mail'.

## 2.4 BRIEF HISTORY OF THE LACHLAN RIVER BRIDGE

The Lachlan River Bridge was likely constructed by 1918 with plans of the bridge dated to 1912. The manufacturers of the bridge were Dorman Long and Co Ltd, a company founded in 1875. Dorman Long and Co Ltd also supplied construction material for the Sydney Harbour Bridge. The designs for the piers and foundations of the Lachlan River Bridge were signed off on 29 February 1912 by the Chief Engineer for Railway and Tramway Construction and by Assistant Engineer J.J.C Bradfield on 22 February 1912.

*The Forbes Advocate* (30 January 1914) records the construction progress on the Lachlan River Rail Bridge This provides a firm construction date for the bridge (**Figure 2-1**).

**Figure 2-1: News article relating to the Lachlan River Railway Bridge.**



OVER THE LACHLAN.

RAILWAY BRIDGE AT FORBES.

Work is progressing very favorably at the new railway bridge being constructed across the Lachlan at South Forbes. This bridge will carry the trains which puff along the Stockinbingal to Forbes line, and its erection is an important event in the construction of that line. The solid foundation work is finished, and now the temporary structure is being thrown into position. A flying fox, for the transhipment of material, is being erected there at present, and when this is finished, the work will be expedited.

The iron railway bridge which will be erected across the river is being imported ready made. All that has to be done is to bolt the parts together, and the bridge will be ready to carry the traffic. It is expected the work will be finished by Easter.

The Lachlan River Bridge was constructed as a single track, metal truss, box-girder bridge (see **Figure 2-2**). The development of through-trusses in bridge construction was an American innovation of the late 1800s (RTA 2006). The term “through-truss” implies strictly to the upper chords which are connected by a system of bracing passing above the road or railway. The style became standard for all major railway and road bridges in NSW following the retirement of Chief Civil Engineer for Railways John Whitton and William Bennett (Public Works Department) (RTA 2006).

Prior to 1970, most historic iron or steel bridges used rivets. The rivets were nearly always used for the connections to hold together built-up structural steel on bridges. As used on the Lachlan River Railway Bridge, two different sized field rivets (button heads) were inserted into the plate while red-hot. The steel trusses were signed off by the Director General of Public Works, L. David, on 7 August 1913 and the Chief Engineer for Railway and Tramway Construction.

Girders were used for the construction of the bridge. They were pre-fabricated and deeper than ‘off the shelf’ rolled steel beams available at the time. As the spans of bridges increased, the metal truss quickly emerged as the ideal structure. A steel girder on the northern side of the bridge on the eastern frame has the Head Wrightson and Co. maker’s mark. The company specialised in the manufacture of large industrial products including railway chairs, naval ships and bridges. The bridge currently contains steel trusses of the original fabric from construction of

the bridge in the 1910s and a second maker's mark has been identified on the steel beams, one of which is Dorman Long and Co Ltd.

**Figure 2-2: Image of the Lachlan River Bridge.**


## 2.5 RELEVANT LEGISLATION

### 2.5.1 Commonwealth legislation

#### *2.5.1.1 Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)*

The EPBC Act, administered by the Commonwealth Department of Water, Agriculture and Environment, provides a framework to protect nationally significant flora, fauna, ecological communities and heritage places. The EPBC Act establishes both a National Heritage List and Commonwealth Heritage List of protected places. The assessment and permitting processes of the EPBC Act are triggered when a proposed activity or development could potentially have an impact on one of the matters of national environment significance listed by the EPBC Act. Ministerial approval is required under the EPBC Act for proposals involving significant impacts to national/commonwealth heritage places.

### 2.5.2 State legislation

#### *2.5.2.1 Environmental Planning and Assessment Act 1979 (EP&A Act)*

The EP&A Act establishes requirements relating to land use and planning and was amended by the Environmental Planning and Assessment Amendment Act 2017. The framework governing

environmental and heritage assessment in NSW is contained within the following parts of the EP&A Act:

- Part 5: Environmental impact assessment on any heritage items which may be impacted by activities undertaken by a state government authority or a local government acting as a self-determining authority
    - Division 5.1: Environmental Impact Assessment (except for State Significant Infrastructure).

#### *2.5.2.2 Heritage Act 1977 (Heritage Act)*

The Heritage Act establishes the Heritage Council of NSW. The Heritage Council's role is to advise the government on the protection of heritage assets, make listing recommendations to the Minister in relation to the State Heritage Register (SHR), and determination of proposals that involve modification to heritage items or places listed on the SHR. Ordinarily, proposals involving the modification of a listed heritage item will require approval under Part 4 of the Heritage Act.

Automatic protection is afforded to 'relics', defined as 'any deposit or material evidence relating to the settlement of the area that comprised New South Wales, not being Aboriginal settlement, and which holds state or local significance' (note: formerly the Heritage Act protected any 'relic' that was more than 50 years old. The age criterion has since been dropped from the Act and relics are protected according to their heritage significance assessment by a qualified archaeologist rather than purely based on their age). Excavation of land on which it is known or where there is reasonable cause to suspect that 'relics' will be exposed, moved, destroyed, discovered or damaged is prohibited unless authorised by an excavation permit issued under Section 140 Heritage Act.

### 2.5.3 Forbes Local Environmental Plan (LEP) 2013

The Forbes LEP 2013 establishes requirements relating to the conservation of heritage items. The provisions listed in Section 5.10 of the LEP specify that development consent is required for the demolition, disturbance or alteration of a heritage site.

The only cases in which consent is not required is in the event that the applicant has notified the consent authority of the proposed development and the consent authority has advised the applicant in writing before any work is carried out that it is satisfied that the proposed development:

a) is of a minor nature or is for the maintenance of the heritage item, Aboriginal object, Aboriginal place of heritage significance or archaeological site or a building, work, relic, tree or place within the heritage conservation area, and
b) would not adversely affect the heritage significance of the heritage item, Aboriginal object, Aboriginal place, archaeological site or heritage conservation area.

The consent authority must, before granting consent under this clause in respect of a heritage item or heritage conservation area, consider the effect of the proposed development on the heritage significance of the item or area concerned. This subclause applies regardless of whether a heritage management document is prepared under subclause (5) or a heritage conservation management plan is submitted under subclause (6)

It is also specified that the consent authority may require, after considering the heritage significance of a heritage item and the extent of change proposed to it, the submission of a heritage conservation management plan before granting consent under this clause.

For the current project, however, State Environmental Planning Policy (Infrastructure) 2007 (detailed below) provides overriding measures, as documented in **Section 2.5.5.**

### 2.5.4 State Environmental Planning Policy (Infrastructure) 2007

State Environmental Planning Policy (SEPP) (Infrastructure) 2007 provides that certain types of development are permissible without development consent. Clause 79 of SEPP (Infrastructure) 2007 provides for development on any land for 'the purpose of a railway or rail infrastructure to be carried out by or on behalf of a public authority without consent'. The project can be assessed under Part 5 of the EP&A Act via the completion and determination of an REF. A development consent from the council is not required.

Clause 14, in Part 2 of the SEPP (Infrastructure) 2007 contains provisions for public authorities to consult with local councils if the development is likely to affect the heritage significance of a local item. There is a requirement for an assessment of impact to be prepared, provided to the local Council with 21 days for review, and consideration given to responses.

### 2.5.5 Applicability to the proposal

The proposal will be assessed under Part 5.1 of the EP&A Act and SEPP (Infrastructure) 2007 applies. This means that Forbes Council is not required to give development consent, although this assessment report shall be provided for their consideration.

Archaeological features and deposits are protected under Section 139 of the Heritage Act. If it is anticipated that a relic will be discovered, exposed, moved, damaged or destroyed during an activity, an application must be made to the Heritage Council for an excavation permit under Section 140 of the Heritage Act.

Any significant heritage objects are afforded protection under the Heritage Act.

It is noted there are no Commonwealth or National heritage listed places within the study area, and as such, the heritage provisions of the EPBC Act do not apply.

## 2.6 LOCAL CONTEXT

### 2.6.1 Desktop database searches conducted

A desktop search of the following databases was completed to identify any previously-recorded heritage within the study area and its environs. The results of this search are summarised in **Table 2-1**. Databases searched included the Heritage Council of NSW administered SHR, State Heritage Inventory (SHI), the Australian Heritage Database and the Forbes LEP.

The search of the Heritage Council of NSW administered heritage databases and the Forbes LEP revealed the Railway Bridge over the Lachlan River to be the only listed site within the study area (**Figure 2-3**Figure 2-3**)**. The next nearest heritage listed item to the project area is the Iron Bridge over the Lachlan River including archaeological site (I82), located 163.5 m west. The Weir Swimming Baths (I105) and Old Town Weir (I104) are located approximately 300 m west of the study area, and the Municipal Power Station (I48) is located just under 500 m to the west. **Figure 2-4** shows state and locally registered heritage sites in the area.

**Table 2-1: Historic heritage: desktop-database search results.**

| Name of Database Searched | Date of Search | Type of Search | Comment |
|---|---|---|---|
| National and Commonwealth Heritage Listings | 9 February 2021 | Forbes LGA | No places listed are located within the study area |
| State Heritage Listings | 9 February 2021 | Forbes LGA | No places listed are located within the study area |
| State Government Agencies – Section 170 Heritage and Conservation Registers | 9 February 2021 | Forbes LGA | Lachlan River Bridge is not listed on the any S170 register |
| Forbes LEP 2013 | 9 February 2021 | Forbes LGA | Lachlan River Bridge is formally listed as *Railway Bridge over Lachlan River*, under number I123. 111 items are listed on the Forbes LEP, item I123 is the only item in the study area |

**Figure 2-3: Forbes LEP Map showing the location of the Lachlan River Bridge (item I123) in relation to other LEP listed heritage items.**

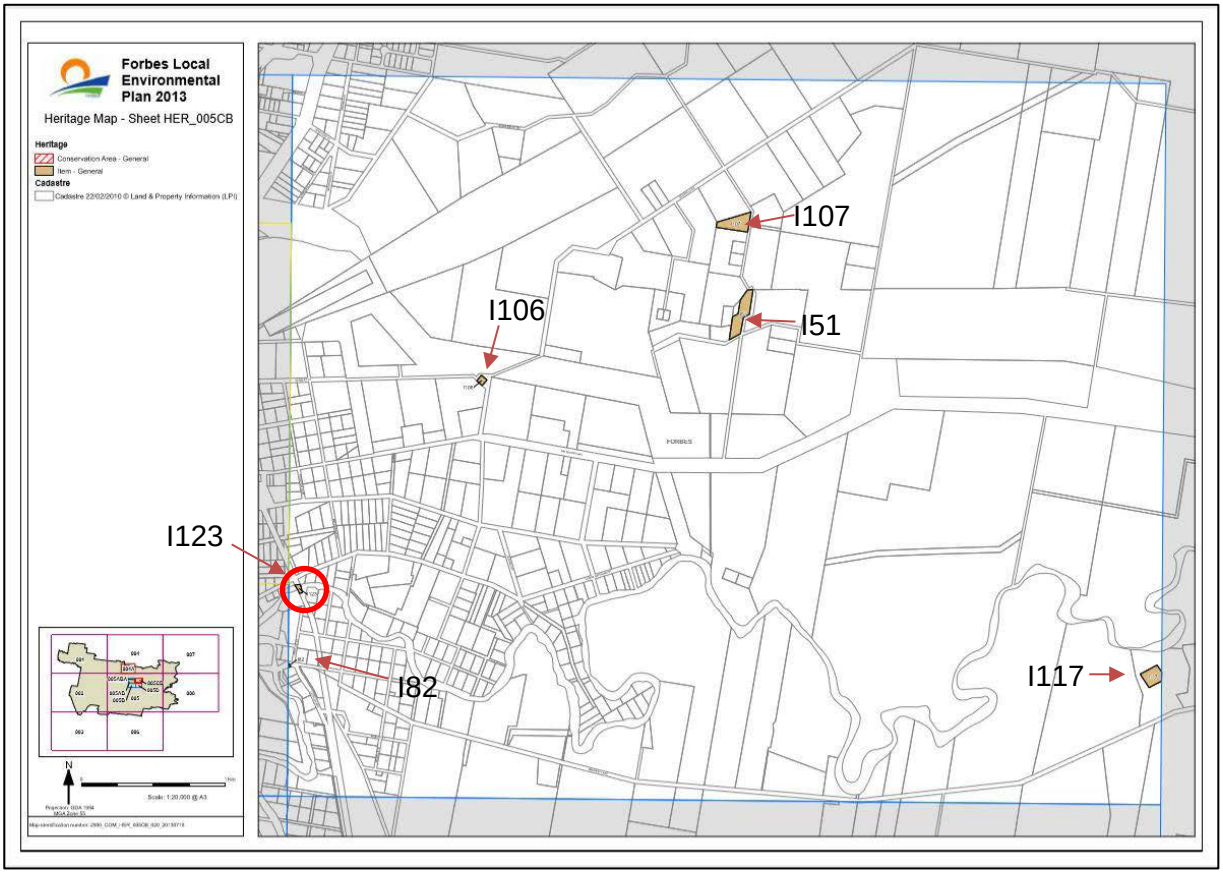
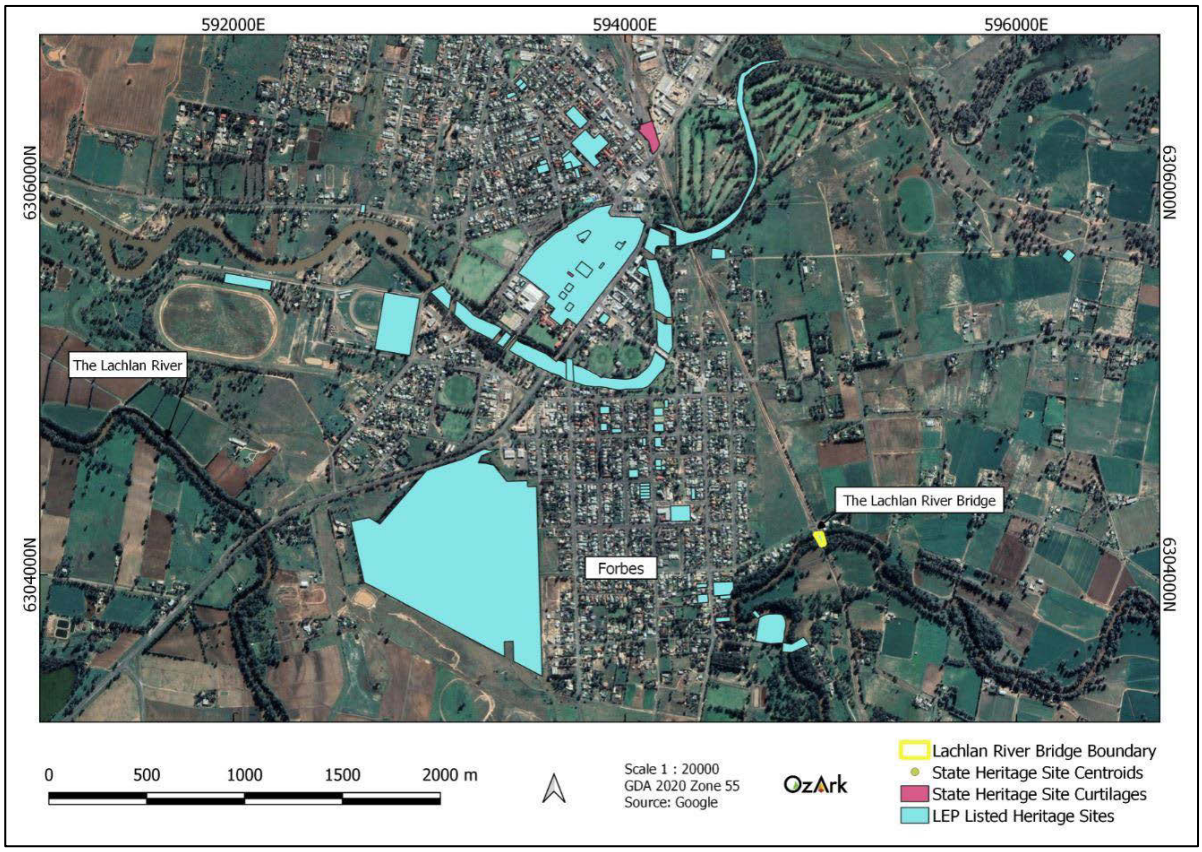



**Figure 2-4: State and locally listed sites at Forbes.**



# 3 RESULTS OF HISTORIC HERITAGE ASSESSMENT

## 3.1 SURVEY METHODOLOGY

Standard archaeological field survey and recording methods were employed in this study to ground truth existing level of disturbance, photograph the current condition of the Lachlan River Bridge, and to assess whether any other items of historic heritage exist or are likely to exist within the study area. The entire study area was inspected by pedestrian survey.

## 3.2 ASSESSMENT RESULTS

### 3.2.1 Description of the bridge

The bridge spans the Lachlan River, which is approximately 20 m wide at this point. It is a single track, metal truss, box-girder bridge. The Lachlan River flows from east to west underneath the bridge, and has steep embankments, up to 5 m above water level on the northern side. The banks are fringed with native tree species and exotic willows on both sides. The Stockinbingal to Parkes railway line to the north and south of the bridge is raised on an embankment consisting largely of rail ballast. Small rural residential and farming properties are located around the northern side of the bridge. Agricultural land extends on either side of the railway on the southern side of the bridge.

The bridge consists of a metal truss box girder frame supported by two concrete piers on either bank of the river. The bridge deck is supported by steel girders with timber sleepers fixed to the steel girder supports. Rail beams are fixed to the timber sleepers and a metal mesh walkway has been installed on the eastern side of the bridge deck for pedestrian access of the bridge. The box girder construction consists of vertical and diagonal steel trusses which support a latticed steel frame over the top of the bridge deck.

### 3.2.2 Current condition of the bridge

During the site inspection, the overall physical condition of the bridge was assessed as sound (this is a visual inspection by a non-engineer). The steel trusses were assessed as being in good physical condition during the visual inspection (from an aesthetic perspective undertaken by a non-engineer). The trusses are original fabric from the construction of the bridge in the 1910s, and two maker's marks were identified on the steel beams. One is located on the top horizontal girder and accredits Dorman and Long (a British steelmaker) (**Figure 3-1**: photo 8). The other is a steel plate affixed to the diagonal end post at the northern end of the bridge on the west side, which accredits Head Wrightson and Company (a British girder manufacturer), (**Figure 3-1**: photo 7). These elements were constructed in England and shipped out to be assembled on site.

The approach spans to the bridge on both sides are manufactured of modern reinforced concrete, which support concrete sleepers. During the visual inspection the approach spans were assessed

as being in good condition. The installation of these concrete approaches has removed the original fabric in these specific areas. The northern approach levels with the surrounding terrain where it meets a rail crossing over Lower Bathurst Street. The southern approach extends for approximately 65 m before it levels with the surrounding terrain as it crosses a lower area of the Lachlan River flood plain.

Utility services (electricity, telecommunications, and water) are located within the rail corridor and are partially fixed to the bridge. A PVC water pipe is connected to the western side of the bridge and runs across the span of the deck (**Figure 3-1**: photo 4).

Timber piers were identified below the Lachlan River Bridge (**Figure 3-1**: photo 5). While they are thought to pre-date the Lachlan River Bridge, it could not be determined by how much or their association to the current bridge. It is likely they represent piers for an earlier pedestrian bridge. The wooden piers are now almost fully submerged.

### 3.2.3 Archaeological potential

The presence of the timber piers in the river at the study area indicate that there was a waterway crossing of some kind here prior to the construction of the Lachlan River Bridge. As the current rail bridge is on almost the same alignment as the piers indicate, it is considered very unlikely that any physical remains of this earlier bridge would remain on the river banks due to the significant construction footprint for the current bridge abutments and piers.

There is no historic evidence to suggest any other specific heritage items / relics are likely to be present in the study area.

### 3.2.4 Assessment conclusion

The visual inspection concluded with the following observations on specific components on the bridge[1]:

- Concrete piers: the piers are in good condition (**Figure 3-1**: photo 1). The structure appears sound, weather-tight and with no significant repairs apparently needed. Components, features and joinery are well maintained. The integrity of the piers is good. Elements that contribute to the heritage value of the bridge are intact and not compromised by significant removals, modifications, additions or other damage.
- Metal truss box girder: the truss box girder is in good condition (**Figure 3-1**: photo 2). The structure is sound and with no significant repairs needed. Components, features, and joinery appear well maintained. The integrity of the truss box girder is excellent. Elements

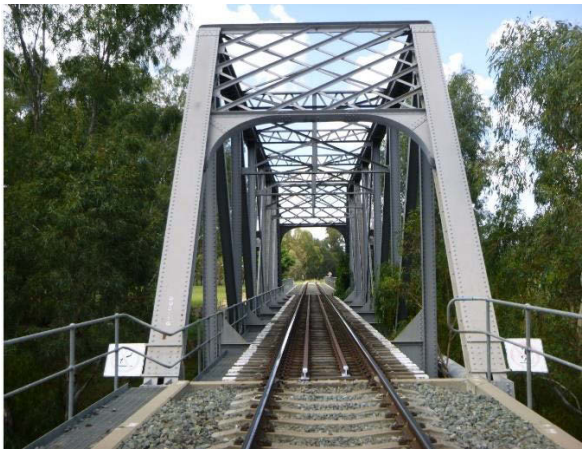
[1] Please note comments re condition are from an arm's length visual inspection only. This is not a structural engineering assessment.

that contribute to the heritage value of the bridge are intact. The truss has not undergone obvious significant removals, modifications, additions or other damage.

- Bridge deck: the bridge deck is in fair condition (**Figure 3-1**: photo 2). The structure is sound, but may require some minor repair due to inadequate maintenance. The integrity of the component is fair. The bridge deck has been modified since its construction and a metal mesh walkway has been installed on the eastern side of the bridge deck for safe pedestrian access. However, the structure still retains sufficient original or historically associated fabric for its values to be understood and interpreted.
- Approach spans: the approach spans are in good condition (**Figure 3-1**: photo 3). The structure is sound, with no significant repair needed. Components, features and joinery are well maintained. The integrity of the approach spans is poor, with heritage values diminished through modifications and additions. These modifications include the use of reinforced concrete sleepers.
- Wooden piers: wooden piers were identified under the existing rail bridge (**Figure 3-1**: photo 6). The piers appear to be part of a wooden bridge predating the Lachlan River Rail Bridge. The piers were mostly submerged, and a full assessment of their condition was unable to be undertaken (**Figure 3-1**: photo 5).

**Figure 3-1: Images of the bridge taken during the visual inspection.**

1. North view of bridge showing trusses and concrete piers.



2. View of the bridge facing south.

3. View of the approach spans facing north.

4. View of the water pipe along the western side of the bridge.

5. View of the submerged wooden piers.

6. North view of the piers in relation to the bridge.


7. Makers mark “Head Wrightson & Co Ltd; Constructors Thornaby on Tees England 1919”

8. Makers mark “Dorman Long & Co Ltd; Middlesbrough”

## 3.3 STATEMENT OF HERITAGE SIGNIFICANCE

The Lachlan River Bridge has been previously assessed as an item of local heritage significance. The majority of the bridge is original fabric, with some modifications having been made (to the approach spans and bridge deck) to continue its operational use as a railway bridge. Based on the previous assessment of heritage significance, as well as the visual inspection undertaken for this report, individual features contributory value to the overall significance of the bridge have been assessed. For the purpose of this report the contributory value has been categorised as being either high, moderate or low. Factors equating to these rankings include but are not limited to:

- High contributory value:
    - most of the original fabric in intact
    - the item is in good condition.
- Moderate contributory value:
    - some of the original fabric is intact
    - the item is in poor-fair condition.
- Low contributory value:
    - the original fabric is not intact
    - the item is in very poor condition

Each item has been assessed as having a contributory value ranging from high to low. The rankings of the individual elements associated with the bridge are:

- Concrete piers: high
- Metal truss box girder: high
- Bridge deck: moderate–high
- Approach spans: low
- Timber piers: low

### 3.3.1 Summary Statement of Significance

As the Lachlan River Bridge has already undergone significance assessment, the following summary has been compiled from the NSW Heritage Register.

The bridge is locally significant due to its role in opening access to the agricultural areas to the south of Forbes thereby contributing to the development of economic opportunities in the district. Completed in the 1910s, the bridge demonstrates the pattern of inland railway expansion in western NSW. The bridge was constructed during the early tenure of chief railway engineer J.J.C. Bradfield who signed off the design plans for the foundation and the piers. As Chief Engineer of Metropolitan Railway Construction from 1912, Bradfield later became famous for the design and

construction of the Sydney Harbour Bridge and had significant influence over the development and design of Sydney's transport and public works.

The item represents a degree of technical representativeness. The design of the bridge is characteristic of a class of steel truss bridge constructed throughout NSW from the 1920s onwards. Despite some modification and maintenance, the bridge largely maintains intact original fabric. The metal truss design was replicated at a number of road and rail river bridges throughout the early twentieth century. The item as a whole conforms with early twentieth century technical achievements and has a high degree of aesthetic significance associated with the engineering technique as the metal truss is still in its original form.

## 3.4 LIKELY IMPACTS TO HISTORIC HERITAGE FROM THE PROPOSAL

The proposed works require horizontal and vertical clearances at specific sites to accommodate the operation of double stacked container trains. The Lachlan River Bridge is one such site where vertical clearance is required. The options presented for the modification of the Lachlan River Railway Bridge to meet vertical clearance included:

- Option 1: Modify existing truss to provide vertical clearance of 7.1 m (see **Figure 3-2**: photos 1 (existing) and 2 (proposed). This will also need to include strengthening and replacement of the existing elements with truss bracing frames, stringers and beams to enable the bridge to cope with increased train weights safely (**Figure 1-2**). Works will require patch painting areas of the bridge where necessary.
- Option 2: Replace bridge truss span with new concrete or steel spans (see **Figure 3-2**: photo 4).

Ancillary works will include adjusting handrails and utilities on the bridge and establishing construction compounds, laydown areas, a crane pad and environmental controls.

Please note the 'do nothing' option, was not canvassed as success of the Inland Rail Program requires modification to this item of infrastructure.

This report aims to examine which option is preferred for the optimal preservation of the bridge's heritage values, and then provide mitigation measures and recommendations in relation to the chosen option.

The Heritage NSW guidelines for preparing a SOHI include a range of questions for consideration when assessing impacts to a heritage item. The proposed design options are assessed in **Section 4**.

**Figure 3-2: Projected scenarios showing the two options**

1. Image of the existing bridge focusing on the truss and end frame.

2. Aerial mage of the existing bridge.

3. Three dimensional image of the proposed modification with new angled frames and the location of handrail adjustments shown in white (Option 1)


4. Proposed replacement of truss spans with steel or concrete spans (Option 2).

# 4 STATEMENT OF HERITAGE IMPACT

The NSW Heritage Office (2002) guidelines for the production of a SOHI were developed to help people who wish to carry out work that could impact on a heritage item. A SOHI is meant to convey what the impact of a proposal would be and an informed decision can be made whether to allow a proposal to proceed.

In this case, the two options outlined in Section 3 are being considered, and the following section assesses each of these options in relation to their potential impact to the heritage significance / values of Lachlan River Bridge.

## 4.1 OPTIONS ASSESSMENT

The following points relate to the threads of the significance of the bridge being examined in relation to each of the options.

- *The item has been assessed as being an item of cultural significance due to the bridge's significance in demonstrating the pattern of inland railway expansion in western NSW and the development agricultural trade in the region via regional railway lines.*
    - Option 1: Modifying the truss of the bridge to enable vertical clearance will maintain the overall heritage values of the bridge as a historical marker of the inland rail expansion and development of regional agriculture. It is acknowledged that the installation of bracing and support structures will enable the continued safe use of the bridge and therefore allow the bridge to remain as an active rail bridge embodying its cultural significance, albeit with a slightly modified truss.
    - Option 2: Replacement of the truss with concrete or steel support spans would preserve some of the cultural significance, as there would be a bridge present that would still form part of the broader railway network. The immediate visual understanding of this water crossing as a historical rail landmark would however be lost.
- *The item has been assessed as being an item of social significance due to the bridges association with the life or works of a person, or group of persons, of importance in NSW's cultural or natural history (or the cultural or natural history of the local area).*
    - Option 1: Although modifying the truss of the bridge for vertical clearance will have an impact on the design of the bridge, as approved by chief railway engineer J.J.C. Bradfield, this impact is considered minor in contrast with Option 2. The majority of the original engineering will be preserved, also allowing for the preservation of the maker's marks, connecting the bridge to specific historic companies and persons.
    - Option 2: Removal of the truss would completely eliminate the social significance of the bridge in respect of its connection to early railway engineering.
- *The item has been assessed as being an item of aesthetic significance due to the bridges' aesthetic characteristics and technical achievement in NSW (or the local area).*

- Option 1: Modifying the trusses of the bridge for vertical clearance and installing a supporting frame at each end will have an impact on the aesthetic of the bridge. It is arguable that the most prominent view of the bridge is its elevation, i.e. from side on, and from this angle, the bridge remains relatively unchanged aesthetically. From the end view, however, i.e. along the rail line, or viewing south from Bathurst Street, the profile of the bridge will be altered, with the supporting braces creating a 'martini glass' profile. While this does substantially alter the end on appearance of the bridge, it nonetheless remains an iron truss railway bridge retaining much of its original visual aesthetics. The supporting beams have been designed to imitate the iron aesthetic of the existing trusses to reduce the overall negative impact of the required additional bracing. From this point of view the modification will generally maintain the aesthetic value of bridge, as the original fabric and main structure will be largely retained and conserved. The modification would be noticeable primarily only from a view along the railway line (south and north – Bathurst Street), whereas the bridge from the other viewpoints (from the river or adjacent homes) would not appear significantly altered.
- Option 2: Removal of the truss and replacement with a concrete beam would not preserve the aesthetic or technical significance of the bridge at all.

- The item has been assessed as being an item of cultural environmental significance due to the bridge demonstrating the engineering techniques of early twentieth century rail infrastructure.
  - Option 1: Modifying the truss of the bridge for vertical clearance, including the addition of the support frame shown in **Figure 1-2** will impact the engineering values of the bridge to some extent. It is noted this bridge truss design was replicated at a number of road and rail river bridges throughout the early twentieth century. Further, through retention and conservation of the majority of the metal truss, the loss of this value is reduced.
  - Option 2: Removal of the truss would not preserve the cultural environmental significance as embodied by its engineering at all.

### 4.1.1 Option conclusion

Both options were assessed using Inland Rails' program wide multi-criteria analysis (MCA). The MCA process is a robust methodology recognised as an industry standard. It has been widely used in Australia and internationally, including being consistently applied across multiple Inland Rail projects. The purpose of the MCA is to assess each option against a set of criteria, including, technical viability, safety, constructability and scheduling, environmental impacts, community and property impacts, operational approach, and stakeholder engagement.

The MCA process involves ARTC review and stakeholder engagement including an options assessment workshop. The assessment and identification of the preferred option are presented in an options assessment report for the proposal (WSP, 2021).

The assessment identified that the two options would perform similarly during operation in regard to safety and ease of operation as no changes to the track arrangement are proposed. The

preferred option was the modification to the Lachlan River Bridge, as it provided the following superior outcomes:

- Reduced construction duration and complexity of construction activities
- Lower risk to worker safety during construction due to smaller scale of works and no in river works
- Minimised environmental impacts including:
  - Smaller construction footprint reducing impacts to vegetation and the river banks
  - Avoidance of works within Lachlan River which may impact fish passage and aquatic habitat.
  - Avoidance of potential changes to flooding from greater changes to the bridge structure including new piers within the waterway
  - Less natural resources such as concrete and steel required for construction
  - Less waste produced as demolition of bridge is not required
- Conservation of the locally heritage listed Lachlan River Bridge
- Minimised impact to private property during construction due to a smaller construction footprint
- Reduced noise and visual impacts to receivers during construction. .

## 4.2 SPECIFIC QUESTIONS RELATED TO THE MINOR PARTIAL DEMOLITION OF A HERITAGE ITEM

The SOHI guidelines ask the following questions in relation to the minor partial demolition of a heritage item. These questions relate to Option 1.

Is the partial demolition essential for the heritage item to function?

- Modification to the truss and strengthening of frames and stringers (**Figure 1-2**) is essential for the continued operation of the bridge, as the trains that will be run on the line require higher vertical clearance than is currently available and will be heavier than the trains that have previously run on this line.
- If the bridge cannot be modified to enable vertical clearance and weight loads, then future trains would not be able to use it, so partial demolition of elements (i.e. the cross bracing) is required for the heritage item to continue to function.

Are important features of the item affected by the demolition / alteration?

- Elements of heritage significance, specifically in this case the truss, will be modified. End frames and portal bracing at each end of the truss will require removal and replacement with alternative members, as well as the strengthening and replacement of vertical members with truss bracing frames and replacing stringers (**Figure 1-2**). Despite this, the majority of the original heritage fabric will be able to be retained intact.

- Despite this, the overall aesthetic of the truss will be largely retained, such that the bridge, as part of the broader rail line and within its local landscape setting, will not be significantly diminished.

Is the resolution to partially demolish sympathetic to the heritage significance of the item?

- The modification of the truss is sympathetic to the heritage significance of the item because, although the truss will be impacted, the majority of the original materials and the essence of the bridge design will remain intact.
- Of the options considered that enable the aims of the project to be met, this option is definitely the preferred and the most sympathetic to the heritage values of the bridge.

## 4.3 CONCLUSIONS

Two options were presented for examination within this SOHI. It is concluded that modification of the existing truss to achieve the appropriate vertical clearance (Option 1) will have the least impact to the heritage significance of Lachlan River Bridge. This option keeps central the basic conservation principles of the Burra Charter, including articles relating to change. This is considered the most reasonable option for conserving the heritage values of the bridge whilst importantly allowing it to continue its function as a vital rail link across the Lachlan River. While the modification will impact an item of local heritage value, the loss of the values is mitigated by the overall minimal modification to truss components and by the ability to conserve the majority of the bridge's heritage values through the continued use of the bridge as an item of rail infrastructure which will ensure its' continued maintenance. The potential patch painting is understood to be only a minor modification that will be conducted in a stylistically sympathetic manor to negate the aesthetic impact to the bridge.

# 5 MANAGEMENT RECOMMENDATIONS

This assessment has concluded that Option 1 would be the most sympathetic to the heritage values of the bridge and is therefore the preferred option.

The following recommendations have been designed to mitigate the impacts to Lachlan River Bridge in relation to Option 1:

1) Modification of the truss structure and strengthening of the vertical and deficient members should be undertaken in a sympathetic style to reduce the impact to the aesthetic values of the bridge. The 'like for like' principle should be applied where feasible.
2) Patch painting and other ancillary works should similarly be conducted in a stylistically sympathetic way so as to also not affect the aesthetic values of the bridge.
3) As modification to Lachlan River Bridge is unavoidable, there will be a loss to some heritage values through impact to fabric. To mitigate this, archival photographic recording should be carried out prior to the proposed works. This will provide a record of the bridge's historic, aesthetic and technical heritage values prior to modification, for future generations. A record of this recording should be deposited with Forbes Shire Council and the Forbes Library so that a copy of the record is maintained.
4) An Interpretation Plan should be prepared for Lachlan River Bridge to ensure information regarding the bridge is preserved.
5) As per Clause 14 of the SEPP (Infrastructure), written notification (including a copy of this report and a scope of works) of the ARTC's intent to modify Lachlan River Bridge must be sent to Forbes Shire Council, with 21 days given for review.
6) To avoid the potential for harm to historic objects on unassessed adjacent landforms, all ground surface disturbing activities must be confined to the assessed area.
7) In the event that unexpected historic heritage items are uncovered during work at the Lachlan River Railway Bridge, an *Unanticipated Finds Protocol* (**Appendix 1**) should be followed.

## REFERENCES


| | |
|---|---|
| Australia ICOMOS 2004 | Australia ICOMOS (2004). The Illustrated Burra Charter: Good Practice for Heritage Places, Deakin University, Burwood, Victoria. |
| Burra Charter 2013 | International Council on Monuments and Sites 2013. *The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance*. |
| DLT 2015 | Dorman Long Technology (2015) Dorman Long Historical Information. Available online at http://dormanlongtechnology.com/en/Dorman%20Long%20historical%20information.htm |
| DUAP 1996 | Department of Urban Affairs and Planning (1996) NSW Heritage Manual |
| FHS 1988 | Forbes Heritage Society (1988) Heritage Library. |
| Grace's Guide 2016 | Grace's Guide (2016) Head, Wrightson and Co. Available online at https://www.gracesguide.co.uk/Head,_Wrightson_and_Co |
| HBDP 2009 | Heritage Branch of the Department of Planning (2009). Standard Exemptions for Works Requiring Heritage Council Approval. |
| Heritage Office 2001 | Heritage Office of the Department of Planning (now Department of Premier and Cabinet). *Assessing Heritage Significance.* |
| Heritage Office 2002 | Heritage Office of the Department of Planning (now Department of Premier and Cabinet). *Statements of Heritage Impact*. |
| Heritage Council 2006 | Heritage Council of the Department of Planning (now Department of Premier and Cabinet). *Historical Archaeology Code of Practice.* |
| HODUAP 2002 | Heritage Office and Department of Urban Affairs & Planning (2002). Statements of Heritage Impact. Available online at http://www.environment.nsw.gov.au/heritage/publications/#S-U |
| London 2004 | London, A (2004) Forbes Shire Community Based Heritage Study. |
| RTA 2006 | RTA (2006) Bridge Types in NSW: Historical Overviews. RTA Environment Branch. |
| WSP 2016 | WSP Parsons Brinckerhoff (2016) Australian Rail Track Corporation Inland Rail Victoria/New South Wales Enhancement Works, Phase 1 – Concept Track and Civil Design Report - Stockinbingal to Parkes, June 2016, unpublished report to ARTC. |

# APPENDIX F

Lachlan River Bridge Modification Project

# Statement of Heritage Impact

## **Appendix 1** Historic heritage: Unanticipated finds protocol

**STOCKINBINGAL TO PARKES** REVIEW OF ENVIRONMENTAL FACTORS

## APPENDIX 1: HISTORIC HERITAGE: UNANTICIPATED FINDS PROTOCOL

A historic artefact is anything which is the result of past activity not related to the Aboriginal occupation of the area. This includes pottery, wood, glass and metal objects as well as the built remains of structures, sometimes heavily ruined.

Heritage significance of historic items is assessed by suitably qualified specialists who place the item or site in context and determine its role in aiding the community's understanding of the local area, or their wider role in being an exemplar of state or even national historic themes.

The following protocol should be followed if previously unrecorded or unanticipated historic objects are encountered:

1. All ground surface disturbance in the area of the finds should cease immediately, then:
    a) The discoverer of the find(s) will notify machinery operators in the immediate vicinity of the find(s) so that work can be halted
    b) The site supervisor will be informed of the find(s).
2. If finds are suspected to be human skeletal remains, then NSW Police must be contacted as a matter of priority.
3. If there is substantial doubt regarding the historic significance for the finds, then gain a qualified opinion from an archaeologist as soon as possible. This can circumvent proceeding further along the protocol for items which turn out not to be significant. If a quick opinion cannot be gained, or the identification is that the item is likely to be significant, then proceed to the next step.
4. Notify the Heritage NSW as soon as practical on 131 555 providing any details of the historic find and its location.
5. If in the view of the heritage specialist or the Heritage NSW that the finds appear not to be significant, work may recommence without further investigation. Keep a copy of all correspondence for future reference.
6. If in the view of the heritage specialist or the Heritage NSW that the finds appear to be significant, facilitate the recording and assessment of the finds by a suitably qualified heritage specialist. Such a study should include the development of appropriate management strategies.
7. If the find(s) are determined to be significant historic items (i.e. of local or state significance), any re-commencement of ground surface disturbance may only resume following compliance with any legal requirements and gaining written approval from the Heritage NSW.

# APPENDIX F

Lachlan River Bridge Modification Project

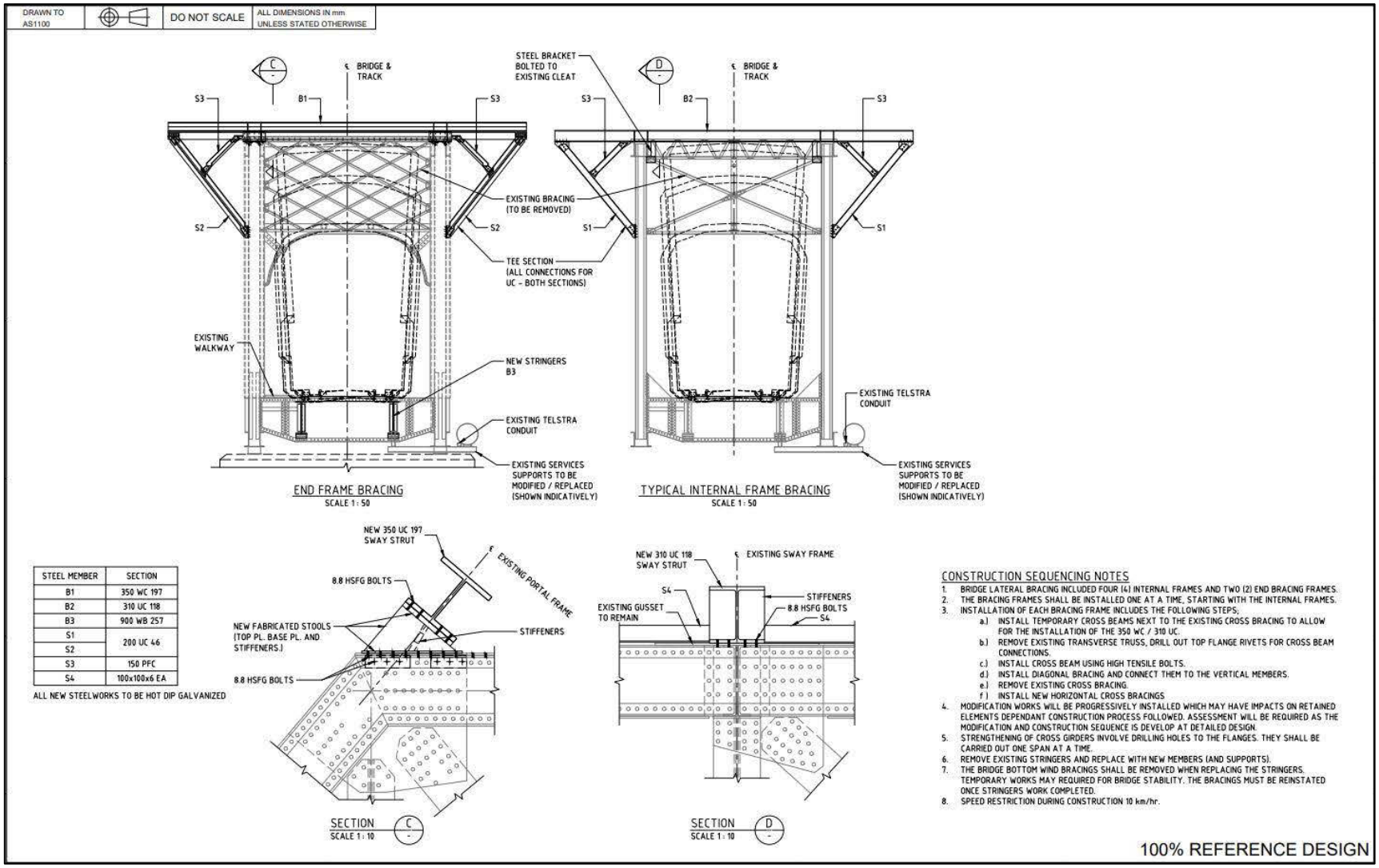
# Statement of Heritage Impact

## **Appendix 2** WSP 100% reference design

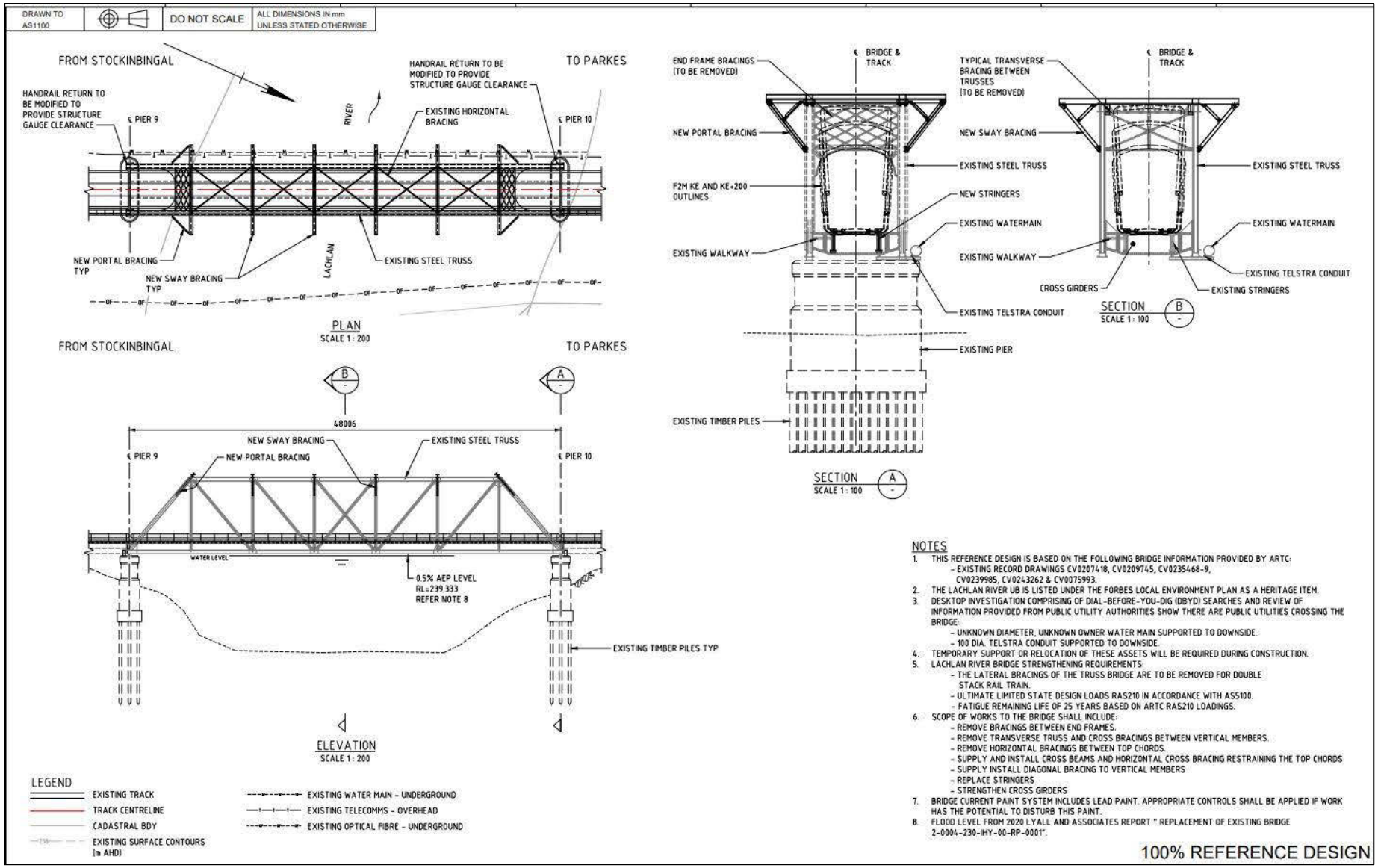
**STOCKINBINGAL TO PARKES** REVIEW OF ENVIRONMENTAL FACTORS

# APPENDIX 2

**Appendix 2: WSP 100% reference design. 1. Design Page 1 of 3**



**Appendix 2: WSP 100% reference design. 2: Design Page 2 of 3.**



**Appendix 2: WSP 100% reference design. 3 Design page 3 of 3.**