Great Western Highway Upgrade

Forty Bends Upgrade
Review of Environmental Factors

Technical Paper 4
Statement of Heritage Impact

Culvert 5 on Forty Bends Road

October 2012

Alliance Report No NH-0729-C
EXECUTIVE SUMMARY

HERITAGE ITEMS AND SITES
The Roads and Maritime Services (RMS) is proposing to upgrade the Great Western Highway at Forty Bends, approximately 5.5 kilometres south of Lithgow. The proposal would include the realignment of about 2.8 kilometres of the Great Western Highway from a point about 470 metres east of the eastern end of Forty Bends Road to a point about 250 metres west of McKanes Falls Road.

The following heritage items and sites are potentially impacted by the proposal:

Partially within the boundary of the proposal are (Table 2.1):
- Bridge/Road Party site.
- Forty Bends Road, Mitchell’s line of road and culverts.
- Old lines of road and potential remains of culverts associated with the current highway.
- Daintree (1960119/B048), 31 Daintree Lane, off Forty Bends Road.
- Emoh, 3431 Great Western Highway.
- Road culvert and retaining wall, (Emoh culvert).

Immediately adjacent to the boundary of the proposal are (Table 2.1):
- Cottage (1960120/B049), 3357 Great Western Highway.
- Cottage (1960116/B045), 24 Old Bathurst Road.

IMPACTS ON SIGNIFICANCE
Following detailed assessment of impacts it was identified that there were:

- No known impacts on four items:
  - Emoh, 3431 Great Western Highway.
  - Road culvert and retaining wall, (Emoh culvert).
  - Cottage (1960120/B049), 3357 Great Western Highway.
  - Cottage (1960116/B045), 24 Old Bathurst Road.

- Minor impacts on three items or sites:
  - Bridge/Road Party site.
  - Forty Bends Road, Mitchell’s line of road and culverts.
  - Old lines of road and potential remains of culverts associated with the current highway.

- Moderate impacts on one site:
  - Daintree (1960119/B048), 31 Daintree Lane, off Forty Bends Road.

There was also some limited potential for relics from drainage basin construction on historic properties associated with:
- Emoh, 3431 Great Western Highway.
- Cottage (1960116/B045), 24 Old Bathurst Road.

The report outlines key mitigation and management measures to be implemented prior to and during construction. A Non-Aboriginal heritage management plan would be prepared prior to construction and would form part of the Construction Environmental Plan (CEMP) for the proposal.
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1.0 Introduction

1.1 Background
The Great Western Highway upgrade between Mount Victoria to Lithgow is part of the NSW and Australian Governments’ commitment to improve road safety and accessibility to communities in the Blue Mountains and Central West region of NSW. Investigations for the upgrade started in May 2008 to determine the preferred route corridor for the project. The preferred route corridor was determined in May 2010. Forty Bends upgrade was identified as the first section to be progressed to detailed design and construction. Roads and Maritime Services (RMS) is preparing a Review of Environmental Factors (REF) as part of the Forty Bends upgrade. The REF comprises the environmental assessment under Part 5 of the New South Wales (NSW) Environmental Planning and Assessment Act 1979 (EP&A Act) and addresses the environmental impacts of the proposal. This report specifically assesses the potential non-Aboriginal heritage impacts of the proposed Forty Bends upgrade.

A series of heritage reports were produced to identify the heritage items within the general locality and the proposal site specifically. The corridor options report (2009) mapped heritage items, reviewed all inventory sheets, including items which were not identified in heritage studies in relation to the proposed corridors. Some preliminary survey work was undertaken at this time. Once the corridor was chosen, the preferred route corridor study (2012) involved a more detailed look at heritage items within the corridor and provided guidance for the concept design. Most items were inspected if there was likely to be an impact on the heritage item. Opportunities and constraints were identified at this time. This Forty Bends report has adopted the recommendations arising from the preferred route corridor study and assessed heritage issues within the proposal site. All stages of this work have involved an iterative relationship with the heritage consultants and the design team to avoid or reduce impacts on heritage values where possible.

The preferred route corridor study (Casey & Lowe June 2012b) identified issues of relevance to the Forty Bends area, part of Section 5 of the preferred route corridor study, Great Western Highway upgrade (Table 2.1). The proposal was amended early in 2012 to avoid many of the potentially affected heritage items identified in the preferred route corridor study.

1.2 Project Description
Roads and Maritime Services propose to upgrade and widen about 2.8 kilometres of the Great Western Highway at Forty Bends to three lanes with a central median along the majority of its length. The proposed upgrade extends from a point about 470 metres east of the eastern end of Forty Bends Road to a point about 250 metres west of McKanes Falls Road (the proposal).

The proposal forms part of a series of ongoing upgrades of the Great Western Highway. The Great Western Highway is the main road link between Sydney and Lithgow and beyond to the Central West of New South Wales. The Great Western Highway serves as:

- A key freight route between Sydney and the central west of NSW, including the timber industry in the Oberon area.
- A tourist route with destinations including the Blue Mountains, historic Hartley, Jenolan Caves, Mudgee and Bathurst.
- A connection between the many towns and villages along its length.
The proposal is needed to improve the road safety and traffic capacity along this section of road and would be consistent with other road improvement activities along the Great Western Highway. The existing alignment has a limited number of opportunities for passing.

The key features of the proposal are:

- The proposal has been developed based on the concept design that has been prepared using the available information and current design standards and criteria for the Great Western Highway upgrade program. Some elements of the design may be further refined during detailed design. The key elements of the Construction of a new road alignment consisting of generally three lanes with two lanes eastbound to the east of Whites Creek and two lanes westbound to the west of Whites Creek. Lane widths would be 3.5 metres with shoulder widths typically varying between 1.0 metres and 2.5 metres. The upgrade alignment would diverge up to 40 metres south of the existing Great Western Highway in the vicinity of Whites Creek.
- The design speed for the alignment would be 100 kilometres per hour east of McKanes Falls Road and 80 kilometres per hour west of McKanes Falls Road. The posted speed limit for the whole of the new highway alignment would be 80 kilometres per hour.
- Widening of the existing alignment predominantly to the south of the Great Western Highway. The total proposal footprint of the widening works would vary from about 40 metres to 90 metres.
- A central median along the length of the proposal of varying widths, ranging up to 9.5 metres. Carriageways would be separated by a combination of vegetated, depressed and paved medians.
- Construction of new twin, five-span bridges, about 150 metres in length across Whites Creek. The new bridges would comprise four lanes, each 3.5 metres in width, with two lanes carrying traffic in each direction. The total width of the two bridges would be about 30 metres. Shoulders on the bridges would be between 2.5 and 3.25 metres (off-side) and 1.0 metres on the near side.
- Rehabilitation works along the existing alignment of Whites Creek following the removal of the redundant section of the existing Highway. This would include creating a rehabilitated, natural creek bed in this location linking the existing alignment of Whites Creek prior to passing under the new Whites Creek bridge.
- Upgrades to four existing local road intersections, including two intersections with Forty Bends Road, Daintree Close and McKanes Falls Road, to provide connection to the upgraded highway and property access points. Upgrades would include minor widening and u-turn facilities located along the western end of Forty Bends Road and about 150 metres south of the intersection of the Great Western Highway and McKanes Falls Road.
- New or improved access from the existing highway to nine properties along the length of the proposal. The proposal includes provision of new or reconstructed driveways to retain existing property access.
- Closure and relocation of two intersections of Forty Bends Road with the Great Western Highway. These include:
  - Closure of the existing intersection at the eastern end of Forty Bends Road to general traffic (except for emergency vehicles) and a new cul-de-sac constructed on Forty Bends Road.
  - Relocation of the existing intersection at the western end of Forty Bends Road to a point about 200 metres west of the existing intersection.
- Five major cuts 14 metres to 19 metres in height located on the northern side of the proposed alignment.
- Five major fill embankments 10 metres to 15 metres in height located predominantly on the southern side of the proposed alignment.
• Three retaining walls would be required at the following locations
  o Retaining wall 1 – between approximate chainages 32080 and 32190 (about 110 metres long and up to 7.0 metres high).
  o Retaining wall 2 – between approximate chainage 32560 and 32725 (about 165 metres long and up to 5.6 metres high).
  o Retaining wall 3 – between approximate chainage 33040 and 33240 (about 200 metres long and up to 7.0 metres high).
• Removal of about 300 metres of redundant Great Western Highway pavement from about 100 metres east of Whites Creek to about 200 metres west of Whites Creek, and associated culvert. This would include rehabilitation works to link this area to the existing alignment of Whites Creek.
• Construction of three temporary and five permanent construction basins in addition to temporary access tracks along the length of the proposal.
• Construction of nine new culverts along the length of the proposal to manage cross-drainage flows and six new culverts across access roads and service roads as part of the proposal. One existing culvert would be retained at the western end of the proposal. A total of 23 existing drainage culverts under the Great Western Highway would be either decommissioned or removed.
• Measures to mitigate the formation of black ice, including the relocation of the road alignment to the south away from the Hassans Walls escarpment in key locations and an active maintenance program.
• A main compound site located east of the western end of Forty Bends Road, in addition to smaller stockpile areas along the length of the proposal during construction.
• A combination of wildlife crossing structures, which would include three fauna underpasses (box culverts), canopy rope bridges at Whites Creek and the western underpass and glider poles located at Whites Creek and near the western fauna underpass.
• Relocation and/or temporary diversion of existing underground utilities including water, powerlines and telephone cables.

1.3 Study Area
The study area for the proposed upgrade extends approximately 2.8 kilometres along a section of the Great Western Highway, at Forty Bends, South Bowenfels, from just west of Fernhill to just west of McKanes Falls Road near Emoh (Figure 1.1). The whole of the study area is within Lithgow City Council (LCC). The study area is the proposal site for the REF and this is illustrated on Figure 1.2. Where considered relevant we have included information outside the study area.
Figure 1-1 Showing the Mount Victoria to Lithgow corridor, concept design and the location of Forty Bends indicated by white box.

Legend:
- Existing highway
- Concept design alignment
- Concept design alignment - tunnel
- Preferred route corridor
- Local roads
- Waterways
- Railway

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Figure 1-2 Forty Bends proposal

Mt Victoria to Lithgow: Great Western Highway Forty Bends upgrade

LEGEND

<table>
<thead>
<tr>
<th>Chainage</th>
<th>Proposal</th>
<th>Proposal site</th>
<th>Existing highway</th>
<th>Waterways</th>
<th>Property boundary</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Permanent drainage basins</td>
<td>Temporary drainage basins</td>
<td>Compound site and stockpile locations</td>
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<td></td>
<td></td>
<td></td>
<td>Potential compound</td>
<td>Potential stockpile</td>
<td>Potential stockpile and compound</td>
</tr>
</tbody>
</table>

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1.4 Purpose of this Report
This report addresses heritage items or sites partially within the proposal and heritage items adjacent to the proposal. Chapter 3 provides information about each item or site, and where relevant it then addresses the visual/curtilage issues and the significance of the remains. Chapter 4 investigates the impacts from the proposal on each item or site and their significance. Mitigation strategies to reduce impact on significance are outlined in Chapter 5. As considerable historical information has been presented in previous reports, additional historical research undertaken for this report is included in Appendix 1. The archaeological testing for the Bridge/Road Party site is included in Appendix 4.

This Statement of Heritage Impact (SoHI) is part of the REF for the Forty Bends upgrade. The following elements form part of this study:

- The purpose of the SOHI is to identify all heritage impacts associated with the proposal, identify the statutory requirements as well as appropriate mitigation measures.
- Survey old lines of road where they are within the proposal site.
- Archaeological Assessment and archaeological testing of the potential convict-period Bridge/Road Party site.
- Heritage Act S139 (4) exception for testing Bridge/Road Party site.
- Assessment and reporting of impacts including visual and curtilage aspects.
- Consideration of project specific mitigation for construction impacts on heritage.

1.5 Report Methodology
The heritage items addressed within this report were identified in the Non-Aboriginal Heritage Preferred Route Corridor Study for the Great Western Highway Upgrade (July 2012). The impacts from the proposal on heritage items, buildings and archaeological sites within Forty Bends are limited. Consequently, the majority of items listed in Table 2.1 are not addressed in detail within this report as they are outside the proposal boundary. The heritage items discussed in detail are those located within or adjacent to the proposal site and are potentially impacted by the design. The location of heritage items and sites in relation to the proposal is discussed in Chapter 2. It is noted that the proposal discussed in relation to Forty Bends (Section 5) in the preferred route corridor report (Casey & Lowe 2012a, b) has been altered to avoid or minimise impacts to heritage items and relics adjacent to the Great Western Highway. Therefore there is some change in the assessment of potential impacts between the two reports. This report was prepared in accordance with the NSW Heritage Manual (1996), Assessing Heritage Significance (2001), Levels of Heritage Significance (2008) and Assessing Significance for Historical Archaeological Sites and Relics (2009) and other relevant Heritage Council and Heritage Branch Guidelines.

In summary, the potential heritage items and known heritage items were identified by employing a variety of methods:

- Review of previous reports undertaken for this Mount Victoria to Lithgow upgrade.
- Review of heritage items listed under Lithgow Local Environment Planning instruments and maps.
- Review of State Heritage Inventory for State Heritage Register (SHR) items and other heritage items.
- Review of relevant S170 registers.
- Site visits and visual inspection.

This methodology is discussed further below.
1.5.1 Previous Investigations and Non-Aboriginal Heritage Reports

The following background studies have been consulted and utilised as basis for the preparation of this report:

1.5.1.1 Corridor Options report

As part of the corridor options report (September 2009), Casey & Lowe and Mayne-Wilson & Associates undertook extensive investigations addressing four different corridor options. The Orange Corridor was ultimately chosen as the preferred route corridor. The 2009 report provided extensive historical research and some preliminary fieldwork, as well as preliminary analysis of curtilages and historic vistas. Aspects of the 2009 report are utilised in this report but only the most relevant issues are addressed while other aspects of the 2009 report will be referred to rather than extracted. The 2009 report is available on-line at:

documents/reports.html

1.5.1.2 Non-Aboriginal Heritage Preferred Route Corridor Study for the Great Western Highway Upgrade (June 2012).

To address the preferred route corridor Casey & Lowe subsequently prepared Non-Aboriginal Heritage,Preferred Route Corridor Study, Great Western Highway Upgrade (July 2012b). This report built on the previous 2009 report. The 2012b report identified the heritage items within the preferred route corridor and addressed the issues arising from the proposal as many of the heritage items and archaeological sites could be avoided by the proposal.

Desktop

All heritage databases were reviewed for the corridor options report, including Lithgow City Council LEP and the information from the corridor options report was used.

- State Heritage Inventory.
- Lithgow City Council LEP.
- Lithgow City Council Land Use Study.
- National Heritage List.
- Register of the National Estate

Surveys

Field survey was undertaken of critical parts of the study area all along the preferred route corridor, to inspect areas where there were potential impacts. Typically the surveys were to examine known heritage items, or inspect potential heritage items or archaeological sites. These were undertaken throughout the project at various times: 19 April 2011; 27 April 2011, and 10 May 2011.

1.5.2 Further investigations for this report

1.5.2.1 Desktop

The Lithgow City Council LEP and list of proposed heritage items to be listed from the Draft Land Use Strategy were reviewed on 6 June 2012 to include any new heritage items or those that were previously going to be listed and in the end are not proposed to be listed. A copy of the LCC LEP list for South Bowenfels is included in Appendix 2. A new LCC LEP will be produced from the list in the land use study following public consultation by Council.

Additional historical research was undertaken by Dr Ian Jack to further expand knowledge of the Bridge/Road Party site and to assist with the testing program, as well as the assessment of archaeological significance and for Portion 22. These are included in Appendices 1 and 4.

1.5.2.2 Survey
Casey & Lowe used previous reports, mapping undertaken of heritage items and sites for the preferred route corridor, as well as new mapping of heritage items and archaeological sites overlaid onto the proposal to determine which areas need to be investigated. Where previously the team had undertaken sufficient fieldwork these items or sites were not revisited, i.e. Emoh and the nearby culvert. The main focus of fieldwork was to further inspect the existing Great Western Highway and surrounds for surviving remnants of Mitchell’s 1830s road and assess the significance of the tracks along the northern side of the road identified during the preferred route corridor. In addition a detailed review of Forty Bends Road was undertaken as well as a review of issues in association with Daintree Cottage and the proposal.

1.5.2.3 Archaeological Testing
Casey & Lowe have also completed a Preliminary Archaeological Assessment & Research Design for Testing, Section 140 Excavation Permit Application, Bridge Party and Road Party Site, Great Western Highway, South Bowenfels (March 2012a). The Heritage Branch, Office of Environment and Heritage (OEH) issued a permit (2012/S140/09) to undertake this testing. Archaeological testing was undertaken on 12 and 13 June, 2012. An Archaeological Assessment and testing report were written for this site including a statement of significance (July 2012c) (Appendix 4). Summary results of this assessment and testing are included in this report in Chapter 3. The testing work included a metal detector survey of part of the potential site of the Road/Bridge Party site on the northern side of the road and the northeastern and northwestern sections of the private property.

1.5.3 Overview of heritage curtilages
A search of the relevant heritage inventory sheets was made to ascertain whether there was any landscape or archaeological items within the grounds of the heritage places that may be adversely affected by the proposal.

The consultants took note of the formal, State Heritage Inventory (SHI) curtilages which were marked on plans (Figures 2.1, 2.2, 2.3). Curtilages proposed by Mayne-Wilson & Associates (MWA) in the corridor options report (2009) were used as a general guide only, and were treated as open to revision based on further information becoming available.

There were no curtilages identified in the LCC LEP. The only curtilages were those provided for SHR items by the Heritage Council listing. Therefore we have used curtilages identified in 2009 as the basis for assessing potential impacts on significance rather than property boundaries. As there are no SHR items within the study area all curtilage for heritage items were those proposed by Mayne-Wilson in consultation with Mary Casey in accordance with Heritage Office manual. It is considered these curtilages capture the key heritage elements of the item and the core of any potential archaeological remains.
Curtilages proposed *before* the publication of the Heritage Office manual *Heritage Curtilages* in 1996 were usually based on *existing property boundaries*, and not often on the basis of the important heritage (and archaeological) elements they were actually known to contain. Moreover, in page 6 of that Manual, there is provision for the determination of *reduced* curtilages. It is noted that the Heritage Council has approved Development Applications which have proposed reduced curtilages for heritage-listed places in the past, e.g. for the subdivision of rural estates on the fringes of metropolitan Sydney. Based on this, if any existing curtilages was based on property boundaries, a suggested curtilage was identified and outlined in this report based on heritage significance.

Where curtilages were amended for this report, ie at Gonna-do, Cottage 1960116 and Daintree, it was as a result of clarification of property ownership, specific location of heritage items, and inaccurate mapping data obtained heretofore.

### 1.5.4 Overview of the visual analysis of heritage items

For the previous reports, such as the *Non-Aboriginal Heritage Preferred Route Corridor Study, Great Western Highway Upgrade* (Casey & Lowe 2012b), the approach taken was to photograph the visual catchments out from and toward each of the heritage items and places along the corridor route, and then analyse them. This included the extent to which the views outward from and to those places were important, or whether they were necessarily limited, foreground views.

In the case of heritage items at Forty Bends assessed in this report, all of the buildings are located immediately south of the existing Great Western Highway, and facing Hassans Walls only a short distance away. There was therefore no need to enter the properties or take photographs of the views outward from each dwelling, as they were foreshortened or closed off by Hassans Walls. As they were very simple rural structures, taking advantage of the limited views available did not appear to have been a consideration when they were being built. In the case of Emoh, a general store for over a century, it was built close to the original highway in 1841 to serve the passing trade and the local community of South Bowenfels.

### 1.6 Legislative Requirements

#### 1.6.1 Environment Protection and Biodiversity Conservation Act 1999

The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) enhances the management and protection of Australia’s heritage places. Any action that is likely to have a significant impact on the matters protected under the EPBC Act must be referred to the Commonwealth Environment Minister for further consideration.

The Australian Heritage Database (AHD) includes the National Heritage List, which includes the natural, historic and indigenous places that are of outstanding national heritage value to the Australian nation. The AHD also contains the Commonwealth Heritage List that comprises those places on Commonwealth lands and waters or under Australian Government control. Items on both of these lists are protected under the EPBC Act. There are no items in the proposal area that are listed on the National or Commonwealth Heritage Lists.

Although it has no specific statutory obligations, the Minister must have regard to information in the Register of the National Estate (RNE) kept under the *Australian Heritage Council Act 2003* in making any decision under this Act to which the information is relevant. No items in the study area are listed under the RNE.
1.6.2 NSW Heritage Act 1977
In NSW, the legal protection for items of local or State heritage significance is afforded by the *Heritage Act 1977*. Many items of State significance are listed on the State Heritage Register and their inclusion on the register identifies them as possessing values that are important to the NSW community. No items within the study area are currently listed on the State Heritage Register however there are items of State significance adjacent.

1.6.2.1 Relics Provisions *NSW Heritage Act, 1977*
The main legislative requirement on archaeological remains or relics are the relic provisions of the *Heritage Act 1977* (refer Division 9: Section 139.140-146 – Relics Provisions – Excavation Permit).

According to Section 139:

1. A person must not disturb or excavate any land knowing or having reasonable cause to suspect that the disturbance or excavation will or is likely to result in a relic being discovered, exposed, moved, damaged or destroyed unless the disturbance or excavation is carried out in accordance with an excavation permit.
2. A person must not disturb or excavate any land on which the person has discovered or exposed a relic except in accordance with an excavation permit.
4. The Heritage Council may by order published in the Gazette create exceptions to this section, either unconditionally or subject to conditions, in respect of any of the following:
   a. any relic of a specified kind or description,
   b. any disturbance or excavation of a specified kind or description,
   c. any disturbance or excavation of land in a specified location or having specified features or attributes,
   d. any disturbance or excavation of land in respect of which an archaeological assessment approved by the Heritage Council indicates that there is little likelihood of there being any relics in the land.

A 'relic' is an item of 'environmental heritage' defined by the *Heritage Act 1977* (amended) as:

those places, buildings, works, relics, moveable objects, and precincts of State or local heritage significance.

It was more recently further defined as:

Relevant case law and the general principles of statutory interpretation strongly indicate that a ‘relic’ is properly regarded as an object or chattel. A relic can, in some circumstances, become part of the land and be regarded as a fixture (a chattel that becomes permanently affixed to land).\(^2\) A relic as further defined by the Act is:

\[\text{.any deposit, object or material evidence-} \]
\[\text{(a) which relates to the settlement of the area that comprises New South Wales,} \]
\[\text{not being Aboriginal settlement; and} \]
\[\text{(b) is of State or local heritage significance.} \]

Any item identified as an historical archaeological site or relic cannot be impacted upon without an **excavation permit**. An excavation permit forms an approval from the Heritage Council for permission to ‘disturb’ a relic. An application for an excavation permit (Section 140) must be made to the Heritage Council of NSW (or its delegate) and it will take approximately six to eight weeks to be processed. The application for a permit must nominate a qualified archaeologist to manage the disturbance of the relics.

Exceptions
An application for a S139(4) Exception approval may be made where the impact is considered to be in accordance with the following categories:

(1A) An archaeological assessment, zoning plan or management plan has been prepared in accordance with Guidelines published by the Heritage Council of NSW which indicates that any relics in the land are unlikely to have State or local heritage significance.

(1B) The excavation or disturbance of land will have a minor impact on archaeological relics including the testing of land to verify the existence of relics without destroying or removing them.

(1C) A statement describing the proposed excavation demonstrates that evidence relating to the history or nature of the site, such as its level of disturbance, indicates that the site has little or no archaeological research potential.

1.6.2.2 Section 170 Registers
Under the NSW Heritage Act 1977 all government statutory authorities are required to maintain a S170 register which contains a list of heritage sites. According to Section 170:

(3) A government instrumentality shall establish and keep a register entitled the ‘Heritage and Conservation Register’.

(4) A government instrumentality shall enter in the register details of each item of the environmental heritage which is subject to an interim heritage order or listing on the State Heritage Register; or is listed in an environmental planning instrument under the Environmental Planning and Assessment Act 1979 as an item of environmental heritage, or could, in accordance with guidelines issued from time to time by the Heritage Council, be subject to an interim heritage order or listing on the State Heritage Register; and which in the case of a statutory body, is owned or occupied by the statutory body; or in the case of a Department head, is vested in or owned or occupied by, or subject to the control of, the appropriate minister or the Department.

The study area contains a known item on RMS’s Section 170 (S170) register. A state government agency has approval over any impacts on these items but they are required to inform the Heritage Branch of any changes to significant items, and provide 14 days notice.
1.6.3 State Environmental Planning Policy (Infrastructure) 2007 – REG 14

State Government instrumentalities are required to consult the respective local council for any work proposed to a heritage item of local significance. Clause 14 of the State Environmental Planning Policy (Infrastructure) 2007 (ISEPP) sets the requirements for such activity. The subject clause has been provided below:

Consultation with councils-development with impacts on local heritage
14 Consultation with councils-development with impacts on local heritage
(1) This clause applies to development carried out by or on behalf of a public authority if the development:
(a) is likely to have an impact that is not minor or inconsequential on a local heritage item (other than a local heritage item that is also a State heritage item) or a heritage conservation area, and
(b) is development that this Policy provides may be carried out without consent.
(2) A public authority, or a person acting on behalf of a public authority, must not carry out development to which this clause applies unless the authority or the person has:
(a) had an assessment of the impact prepared, and
(b) given written notice of the intention to carry out the development, with a copy of the assessment, to the council for the area in which the heritage item or heritage conservation area (or the relevant part of such an area) is located, and
(c) taken into consideration any response to the notice that is received from the council within 21 days after the notice is given.

Based on the concept design there would be no impacts to the fabric of any locally listed heritage items, however, there would be impacts to the curtilage of one draft heritage item that are not considered as minor or inconsequential (refer to section 4.3.4 for details). It is therefore recommended that the council be consulted and provided written notice of the intention to carry out the development and that the RMS take into consideration any notice from council within 21 days from when the notice is provided.

1.6.4 Lithgow City Council Local Environmental Plan (1994)

The Environmental Planning and Assessment Act 1979 (EP&A Act) controls land use planning in NSW. The planning system established by the EP&A Act includes Local Environment Plans (LEPs) and other provisions relating to development control.

Two heritage items or areas listed on the Lithgow Local Environmental Plan 1994 are located within or directly adjacent to the proposal site.

The Lithgow City Council (LCC) is in the process of reviewing and updating the 1994 LEP which has only 91 heritage items. It has produced its Draft Land Use Strategy which has been endorsed by LCC and has been sent to the Department of Planning and Infrastructure for approval. Appendix 3 of this report includes the amended list of heritage items which are to be included in the new LEP. This amended list is included in Appendix 2 of this report. Table 2.1 has been updated to reflect this new list. Therefore, a total of five heritage items and/or draft heritage items are located within the study area.

Lithgow City Council has kindly provided this project with access to the inventory sheets and the GIS data for mapping. Liaison with Council commenced in 2009 and informs the corridor options report and the preferred route corridor study. Further stages of work on this project will need to review the new LEP once it becomes available.
Any potential impacts as a result of the proposal are addressed in Chapter 4.

1.7 Authorship
This Statement of Heritage Impact was prepared by Dr Mary Casey, Director, Casey & Lowe Pty Ltd and Jenny Winnett. Warwick Mayne-Wilson, Mayne-Wilson & Associates, was responsible for the analysis and writing of visual and curtilage sections. Dr Ian Jack undertook additional historical research (Appendix 1). The report was reviewed by Tony Lowe, Director, Casey & Lowe Pty Ltd.

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Gretta Logue, RMS
Assiah Issa, RMS
Katrina Stankowski, Heritage Branch, Office of Environment and Heritage

1.9 Limitations
There were no particular constraints to producing this report. There was sufficient time and funding to complete this report to a quality standard.

1.10 Glossary
Historical Archaeology (Non-Indigenous/European)
Historical Archaeology (in NSW) is the study of the physical remains of the past, in association with historical documents, since the British occupation of NSW in 1788. As well as identifying these remains the study of this material can help elucidate the processes, historical and otherwise, which have created our present surroundings. Historical archaeology includes an examination of how the late 18th and 19th-century arrivals lived and coped with a new and alien environment, what they ate, where and how they lived, the consumer items they used and their trade relations, and how gender and cultural groups interacted. The material remains studied include:

Archaeological Sites:
- below ground: these contains relics which include building foundations, occupation deposits, rubbish pits, cesspits, wells, other features, and artefacts.
- above ground: buildings, works, industrial structures and relics that are intact or ruined.
- cultural landscapes: major foreshore reclamation
- structures associated with maritime activities.

Archaeological Potential
Archaeological potential is here used and defined as a site's potential to contain archaeological relics which fall under the provisions of the Heritage Act 1977 (amended). This potential is identified through historical research and by judging whether current building or other activities have removed all evidence of known previous land use.

Archaeological Site
A place that contains evidence of past human activity. Below ground sites include building foundations, occupation deposits, features and artefacts. Above ground archaeological sites include buildings, works, industrial structures and relics that are intact or ruined.
Archaeological Investigation or Excavation
The manual excavation of an archaeological site. This type of excavation on historic sites usually involves the stratigraphic excavation of open areas.

Archaeological Monitoring
Archaeological monitoring is recommended for those areas where the impact of the works is not considered to mean the destruction of significant archaeological fabric. Nevertheless the disturbance of features both suspected and unsuspected is possible. In order to provide for the proper assessment and recording of these features an archaeologist should inspect the works site at intervals they consider to be adequate and to be ‘at call’ in case the contractor uncovers remains that should be assessed by the archaeologist.

Monitoring is a regular archaeological practice used on many building and development sites.

Research Design
A set of questions which can be investigated using archaeological evidence and a methodology for addressing them. A research design is intended to ensure that archaeological investigations focus on genuine research needs. It is an important tool that ensures that when archaeological resources are destroyed by excavation, their information content can be preserved and can contribute to current and relevant knowledge.

Research Potential
The ability of archaeological evidence, through analysis and interpretation, to provide information about a site that could not be derived from any other source and which contributes to the archaeological significance of that site and its ‘relics’.3

Relic
Means any deposit, artefact, object or material evidence that:
(a) relates to the settlement of the area that comprises New South Wales, not being Aboriginal settlement, and
(b) is of State or local heritage significance.
(NSW Heritage Act 1977, Definitions, Part 1.4)

It was more recently further defined as:
Relevant case law and the general principles of statutory interpretation strongly indicate that a ‘relic’ is properly regarded as an object or chattel. A relic can, in some circumstances, become part of the land and be regarded as a fixture (a chattel that becomes permanently affixed to land).4

3 Taken from the Assessing Significance for Historical Archaeological Sites and ‘Relics’, 2009:11.
1.11 Abbreviations
C&L     Casey & Lowe Pty Ltd
EIS     Environmental Impact Statement
LCC     Lithgow City Council
LEP     Local Environmental Plan
LPMA    Land and Property Management Authority
MWA     Mayne-Wilson Associates
ML, SLNSW  Mitchell Library, State Library of New South Wales
NLA     National Library of Australia
NSW     New South Wales
OEH     Office of Environment and Heritage
REF     Review of Environmental Factors
RMS     Road and Maritime Services
RNE     Register of the National Estate
SKM     Sinclair Knight Merz
SHI     State Heritage Inventory
SHR     State Heritage Register
SIX     Spatial Information Exchange
SOHI    Statement of Heritage Impact
SRNSW   State Records, New South Wales

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2.0 Heritage Items, Sites and the Proposal

2.1 Heritage items, Forty Bends
A list of all heritage items and potential archaeological sites within or close to the proposal site is located in Table 2.1 and illustrated in Figures 2.1, 2.2 and 2.3. Six items or types of sites are partially within the proposal site and two are adjacent to the proposal site. These eight items are discussed in detail in Chapter 3 of this report.

- Bridge/Road Party site.
- Forty Bends Road, Mitchell’s line of road and culverts.
- Old lines of road or tracks and potential remains of culverts associated with the current highway.
- Daintree (1960119/B048), 31 Daintree Lane, off Forty Bends Road.
- Emoh, 3431 Great Western Highway.
- Road culvert and retaining wall, (Emoh culvert).
- Cottage (1960120/B049), 3357 Great Western Highway.
- Cottage (1960116/B045), 24 Old Bathurst Road.

Lithgow City Council has undertaken a Draft Land Use Strategy which produced a final list of the heritage items it proposes to add to its LEP (Appendix 2). ⁵ Table 2.1 incorporates this more recent information.

Mt Victoria to Lithgow: Great Western Highway upgrade
Forty Bends: Non-Aboriginal Heritage Sites

* Please note the Bridge/Road Party site has been removed for confidentiality
Table 2.1: List of heritage items within and adjacent to the proposal site.

<table>
<thead>
<tr>
<th>Mapping/SHI No LCC LEP No</th>
<th>ITEM NAME</th>
<th>NO</th>
<th>STREET ADDRESS</th>
<th>LOCALITY</th>
<th>Significance</th>
<th>Date</th>
<th>LEP</th>
<th>SHR</th>
<th>S170</th>
<th>NT</th>
<th>RNE</th>
<th>Relationship to the proposal site</th>
<th>Distance from proposal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960119 B048</td>
<td>Daintree Cottage</td>
<td>31</td>
<td>Daintree Lane, off Old Forty Bends Road</td>
<td>South Bowenfels</td>
<td>Local</td>
<td>1900</td>
<td>draft</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Partially within the proposal site</td>
<td>10m</td>
</tr>
<tr>
<td>1960162 B051</td>
<td>Emoh (Emu Store/ Corderoy's Store)</td>
<td>3431</td>
<td>Great Western Highway</td>
<td>South Bowenfels</td>
<td>State</td>
<td>1834</td>
<td>1994</td>
<td>-</td>
<td>-</td>
<td>yes</td>
<td>-</td>
<td>Partially within the proposal site</td>
<td>10m</td>
</tr>
<tr>
<td>1960795 A027</td>
<td>Road culvert &amp; retaining Wall (Emoh culvert)</td>
<td>-</td>
<td>Great Western Highway</td>
<td>South Bowenfels</td>
<td>State</td>
<td>1860</td>
<td>1994</td>
<td>-</td>
<td>RMS</td>
<td>-</td>
<td>-</td>
<td>Partially within the proposal site</td>
<td>10m</td>
</tr>
<tr>
<td>1960116 B045</td>
<td>Cottage</td>
<td>24</td>
<td>Old Bathurst Road</td>
<td>South Bowenfels</td>
<td>Local</td>
<td>1840</td>
<td>draft</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Adjacent to the proposal site</td>
<td>10m</td>
</tr>
<tr>
<td>1960120 B049</td>
<td>Cottage</td>
<td>3357</td>
<td>Great Western Highway</td>
<td>South Bowenfels</td>
<td>Local</td>
<td>1890s</td>
<td>draft</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Adjacent to the proposal site</td>
<td>10m-20m</td>
</tr>
</tbody>
</table>

LEP = Local Environmental Plan, SHR = State Heritage Register, NT = National Trust, RNE = Register of the National Estate, Reg = Registered, Ind = Indicative.
3.0 Heritage Assessment

The heritage items in the vicinity of the proposed design for Forty Bends proposal are listed above (Table 2.1). These items were discussed in detail within the *Non-Aboriginal Heritage, Preferred Route Corridor Study for the Great Western Highway Upgrade* report for the Mount Victoria to Lithgow Alliance (Casey & Lowe 2012b). A brief description and assessment of significance of each of the identified listed and potential heritage items is provided below.

‘Heritage significance’ is a term used to describe the inherent cultural and historical value of an item. Significance may be contained within the fabric of a building or other place, in its setting and its relationship with other nearby items. The main aim in assessing significance is to produce a succinct statement of significance, which summarises an item’s heritage values. The statement is the basis for policies and management structures that will affect the item’s future (NSW Heritage Branch 2001).

The NSW State Heritage Branch recommends assessment of heritage items in a number of situations, which include:

- Making decisions about whether to retain an item.
- Considering changes to an item.
- Preparing a heritage study.
- Preparing a conservation management plan.
- Considering an item for listing on the State Heritage Register or on the schedule of heritage items in a local environmental plan, or
- Preparing a statement of environmental effects or a heritage impact statement as part of the development and building approval process.

The nature of various heritage values and the degree of these values will be appraised according to the following criteria:6

**Criterion (a): Historic Significance - (evolution)**

*an item is important in the course, or pattern, of NSW’s cultural or natural history (or the cultural or natural history of the local area);*

**Criterion (b): Associative Significance – (association)**

*an item has strong or special association with the life or works of a person, or group of persons, or importance in NSW’s cultural or natural history (or the cultural or natural history of the local area);*

**Criterion (c): Aesthetic Significance - (scenic qualities / creative accomplishments)**

*an item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW (or the cultural or natural history of the local area);*

**Criterion (d): Social Significance - (contemporary community esteem)**

*an item has a strong or special association with a particular community or cultural group in NSW for social, cultural or spiritual reasons (or the cultural or natural history of the local area);*

---

Criterion (e): Technical/Research Significance - (archaeological, educational, research potential and scientific values)

an item has potential to yield information that will contribute to an understanding of NSW’s cultural or natural history (or the cultural or natural history of the local area);

Criterion (f): Rarity

an item possesses uncommon, rare or endangered aspects of NSW’s cultural or natural history (or the cultural or natural history of the local area);

Criterion (g): Representativeness

an item is important in demonstrating the principal characteristics of a class of NSW’s cultural or natural places of cultural or natural environments (or the cultural or natural history of the local area).

To be assessed as having heritage significance an item must:

▪ meet at least one of the seven significance criteria
▪ retain the integrity of its key attributes

Items may also be ranked according to their heritage significance as having:

▪ Local Significance
▪ State Significance

3.1 Bridge/road party site

3.1.1 Background

The existing highway from the western end of Forty Bends Road and to the western extent of the proposed Forty Bends upgrade generally follows the old line of Mitchell’s 1830s road but was substantially modified during the 20th century. This potential convict-period site, which provided accommodation for a work party, was identified from historical research for the preferred route corridor report, with additional research undertaken for this report. The potential archaeological site is assessed in detail in Casey & Lowe 2012c Archaeological Assessment and Testing, Bridge/Road Party Site, Great Western Highway, South Bowenfels (Appendix 4). A preliminary assessment and research design identified the possibility that relics associated with this site may survive within the existing road reserve on the southern side of the highway, and on the northern side of the highway above the modern cutting (Figure 3.1).7

7 Casey & Lowe 2012a.
Archaeological testing carried out on the 12 and 13 June, 2012 identified that 20th-century impacts appeared to have removed potential archaeological remains in the road reserve. A metal detector survey of an area of approximately 1335 square metres on the northern side of the highway, found evidence of 20th-century metals, mostly wire fencing and early telephone/electricity cabling. Therefore the extent of this potential archaeological site has been adjusted to the land within DP806538, the footprint of the original road reserve surveyed in 1832/33 and then confirmed again in 1834 and 1836 (Figure 3.2).8 The northern side of the road shows evidence of a substantial 20th-century cutting, reducing the original ground level by about 10 metres. Therefore the area of the existing road reserve on the southern side and to the north of the highway is considered to have no or little archaeological potential to contain substantial 19th-century archaeological deposits and therefore has no potential archaeological significance.9 The 20th-century road cutting and roadworks are considered to have removed all substantial archaeological remains in these areas.

It is noted that archaeological testing was undertaken in the road reserve but not on the adjacent private property which still retains the potential to contain remains from the occupation by the 1832-34 bridge/road party.

As no testing was undertaken within the adjacent property, it is still considered to have a high level of archaeological potential to contain relics of potential State significance. Due to security issues it was not possible to test within the boundary of the private property when the permit was being lodged.

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8 Casey & Lowe 2012a:15.
9 Casey & Lowe 2012c, (Appendix 4).
Figure 3.2: Plan showing the amended location of the potential bridge/road party site and the proposal.

This photo has been removed for confidentiality purposes
The northeastern and northwestern sections of this property are within the proposal site (Figure 3.2). A metal detector survey of the land within the proposal indicates that there were extensive metal signatures in both areas. To the east it may be a 20th-century rubbish dump with numerous tin cans. One tin can was lying on the surface and this was used to calibrate the metal signature consistently showing up on the discriminating metal detector in this area.\(^\text{10}\) It is also possible that the 20th-century rubbish dump covers earlier 1830s remains. The metal signature on the western side of this property also showed a potential to contain metals associated with the 19th and 20th-century occupation of this site. The eastern side of the property is extensively overgrown with blackberry bushes which made it difficult to access this area.

\[\text{This photo has been removed for confidentiality purposes}\]

Figure 3.3: View of the weatherboard cottage (right) and garage on the former bridge/road party site with overgrowth to the east. View to south. C&L 2012.

\[\text{This photo has been removed for confidentiality purposes}\]

Figure 3.4: Overgrown area to the east of the garage which was the subject of a brief metal detector survey. C&L 2011.

\(^{10}\) The metal detector survey was undertaken by Dr Martin Gibbs, Senior Lecturer, Department of Archaeology, University of Sydney.
This photo has been removed for confidentiality purposes

Figure 3.5: View to east over western side of property which is quite steep with a creek line running through it (arrowed). This suggests the bridge/road party site would have been located on the flat ground in the area of the house, garage and overgrown area. C&L 2011.

This photo has been removed for confidentiality purposes

Figure 3.6: View to west showing the house on the bridge/road party site, the road reserve in front and the extensive cutting of the 20th-century road to the north (right). C&L 2012.

3.1.2 Archaeological Assessment and Heritage Significance

This assessment addresses the extent of the archaeological site, its archaeological potential and its predicted heritage significance. A detailed historical research and archaeological assessment for this site is included in Appendix 4.

A convict bridge/road party operated in the area of Hassans Walls between 1832-34, presumably to make this section of Mitchell’s road and build culverts associated with Forty Bends and the numerous creeks running down off Hassans Walls and cutting through the footslopes. This site provided accommodation for between 83 to 66 or less men at various times. The huts at Hassans Walls were therefore occupied by the Bridge Party from March 1832 until late 1833. The Road Party No. 11 then lived in the huts from late 1833 until September 1834. It seems unlikely that the station was occupied by convict gangs after September 1834.
Statement of Significance
The archaeological remains of the Hassans Walls bridge/road party convict site is part of a system of accommodation and work areas for convicts in iron and non-ironed gangs along the length of the Western Road, from the beginning of the Blue Mountains to Bathurst. This site was previously inaccurately identified. The archaeological sites of a number of convict stockades sites have been subject to looting while this site has not, nor has there been any substantial development of the site. Therefore there is the possibility that this site may contain a series of intact archaeological deposits and features that will be representative of this rare type of site. The archaeology excavation, recording and interpretation of this site has the ability to address a range of research questions, including the level of accommodation available at these sites, access to and nature of food and rations, evidence for convict ownership of personal goods, nature of incarceration and the convict work-system and further questions to be developed. These remains are potentially of State significance.

It is noted that the extent of this site has been redefined to the private property adjacent to the proposal but the proposal extends into this property.

3.2 Mitchell’s line of road and culverts, Forty Bends Road and Daintree Close
Prior to the current research for the Mount Victoria to Lithgow upgrade the section of bypassed road at Forty Bends was thought to be part of Lockyer’s c1829 road. Historical research by Dr Ian Jack and field survey and analysis of historic maps and plans by Dr Mary Casey has been able to confirm that this is a relatively intact section of Surveyor Thomas Mitchell’s 1830s road. This work is included in Casey & Lowe reports for this project: the corridor options report (2009), the preferred route corridor (2012b) and further research located in Appendix 4 of this report.

3.2.1 Background
Once Surveyor-General Thomas Mitchell determined in 1829-30 his preference for a new road to go across Victoria Pass, it became Mitchell’s road. During the 1830s Cox’s pass down Mount York was replaced by the work undertaken by convict gangs at Mount Victoria. Among these works was the huge operation of building Victoria Pass on his alternate road to Bathurst. Victoria Pass is a major convict-built stone pass above the convict stockade site which is down at the foot of Mount Victoria in the Little Hartley Valley. The road works and building of culverts or bridges at Forty Bends and Hassans Walls probably were undertaken between 1832 and 1834 and possibly after that date as the Hassans Walls stockade was occupied between 1835-1837.

A series of stockades were established with smaller road and bridge parties also located at strategic sections along the route. These included:

- No 1 Stockade, Mount Victoria (1830-1833). Materials were reused at Coxs River stockade but No. 1 Stockade needed to be used again when there was a collapse of stonework associated with Victoria Pass.
- River Lett bridge party (c1830).13
- No 2 Stockade, Coxs River (1832-1840).
- Hassans Walls bridge/road party (1832-1834).
- Bowens Hollow Stockade, (1836-1838).
- Hassans Walls Stockade (1835-1837).

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11 This section is a summary of research by Dr Ian Jack included in Casey & Lowe 2012a, 2012b.
12 William C. Foster, Sir Thomas Livingston Mitchell and his World, 1792-1855 Institution of Surveyors NSW, Sydney 1985, 118-120, 140-144, 162-163.
The modern route between Little Hartley to the east of Hartley is close to Mitchell’s original alignment. At Hartley the 1830s alignment passed through the township and across the River Lett approximately 500 metres to the west of the modern bridge. It then joined the existing highway alignment up River Lett Hill passing around what became in the 1850s the inns at Fernhill. The road alignment was pushed to the edge of the footslopes below the impenetrable Hassans Walls, making sure to keep above the deep valleys carved by the creeks running off Hassans Walls. In the area of Forty Bends, Mitchell’s Road and Lockyer’s road had to deal with the same difficulties of skirting Hassans Walls but they chose slightly different routes (Figure 1.2, Figure 1.3).

In summary this was very difficult terrain for road building and it was not until the mid-20th century, between 1930 and 1946, that this windy section of road at Forty Bends, with its road terraced into the hillside and series of cuttings and five culverts over creek lines, was able to be bypassed (Figure 3.7, Figure 3.8, Figure 3.9, Figure 3.10). This bypassed older line of road linked into the surviving section of road near Daintree Lane. It was during the late 19th century and again in the mid to late 20th century that the road between McKanes Falls Road and the western end of the current study area was substantially upgraded. Part of the evidence for this is the later 19th-century culvert and retaining wall near Emoh and the existing roadworks which probably removed a series of culverts between Whites Creek and McKanes Falls Road and replaced them with modern concrete culverts (Figure 3.56).

3.2.2 Analysis of Historic Plans

Research and analysis of historic and parish plans has greatly assisted understanding of the evolution of road building within the study area. There are a number of Crown plans of historic portions at Forty Bends which illustrate how the road making developed. One of the key plans makes it clear that Lockyer’s road and Mitchell’s road at Forty Bends were on two different alignments and that the road at Forty Bends was Mitchell’s line (Figure 2.1, Figure 2.2, Figure 3.7, Figure 3.11).

![Figure 3.7: Red arrows indicate the location of Lockyer’s 'old road', the double dashed line. Mitchell's 1830s road is indicated by the purple arrows. The approximate location of the 1835-1837 Hassans Walls stockade is also indicated. Note the historic portions within the study area, from east to west, portion 31, 19, 20, 22 (purple circles). Map of the parish of Lett, 3rd ed., 1892, LPMA, PMap OE06 11278401.](image-url)
Figure 3.8: This is the earliest parish plan to show the realignment of the road prior to 1946. Review of parish plans from 1905, 1914, 1918, 1924, and 1930 show the earlier road alignment. This plan shows the establishment of the modern alignment between the eastern end of Forty Bends Road and the area near Daintree Lane. It also shows how the various bends were absorbed into the modern road and why they no longer survive. SIX Viewer, Pixel portal. http://images.maps.nsw.gov.au/pixel.html. Lands Department, 1946 (c).

Figure 3.9: While similar to Figure 3.8 it does show some slight differences in the surviving bends within the new road alignment. Both this plan and Figure 3.10 indicate that the bend to the north of Daintree is an original early bend and that the section of road immediately to the east has been remade. Regional charting map, Pixel, parish of Lett. Pixel, Lands Department, nd (c).
Figure 3.10: This plan suggests that the bend in the road adjacent to Daintree cottage (red circle) is one of the original Forty Bends and supports that the road immediately to the east was rebuilt during the 20th century. Status Branch Charting Map, Pixel. Lands Department, nd (c).

Figure 3.11: Lockyer’s road to the south and Mitchell’s road to the north, showing the two junctions of the roads, either side of portion 31. The westerly junction is shown in this plan by Richards in 1837 as within portion 19. The ‘Huts’ marked to the east is thought to be the site of Hassans Walls stockade. LPMA, Crown Plan, B303.691.
3.2.3 Field Survey of Forty Bends Road

Forty Bends Road is a bypassed section of Mitchell’s 1830s road which contains the remains of five culverts and cuttings where the road was terraced into the foothills of Hassans Walls (Table 3.1; Figure 3.13). It is noted that the description of the culverts has changed since 2008 and 2011, as we were able to gain access to these areas in the November 2011 and February 2012 surveys due to council road works which cleared vegetation away and made elements visible, although some culverts and their retaining walls were difficult to photograph (Figure 3.26, Figure 3.8). The road at the eastern end appears to be a modern section or road made as part of the mid 20th-century bypass (Figure 3.12).

![Figure 3.12: Survey plan of Forty Bends Road, Culverts 1 to 5, and the proposal.](image)

**Table 3.1: Culverts on Forty Bends Road and their condition.**

<table>
<thead>
<tr>
<th>Culvert</th>
<th>Upslope</th>
<th>Downslope</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>modern concrete</td>
<td>modern concrete</td>
</tr>
<tr>
<td>2</td>
<td>possibly original sandstone</td>
<td>modern concrete</td>
</tr>
<tr>
<td>3</td>
<td>original sandstone</td>
<td>modern concrete</td>
</tr>
<tr>
<td>4</td>
<td>original sandstone</td>
<td>modern concrete</td>
</tr>
<tr>
<td>5</td>
<td>original sandstone</td>
<td>modern concrete</td>
</tr>
</tbody>
</table>

The eastern end of Forty Bends Road, in the vicinity of Culvert 1, was rebuilt when it was bypassed prior to 1946. The original bend in this area was removed and would have been within the existing highway (Figure 3.7, Figure 3.8, Figure 3.9). What appears to be a new section of road contains Culvert 1 as well as another completely modern concrete culvert. Culvert 1 is near where the old line of road recommences and is the easternmost culvert on the original section of Forty Bends Road. It is constructed of concrete on both sides but is rebuilt within the old line of road (Figure 3.14, Figure 3.15, Figure 3.16).

In the 300 metres between Culverts 1 and 2 is a windy road with cuttings into the rocky footslopes of Hassans Walls (Figure 3.17, Figure 3.18, Figure 3.19, Figure 3.20, Figure 3.21). On the downslope side Culvert 2 is constructed in modern concrete while the upslope side is a small sandstone culvert which is possibly original 1830s in date (Figure 3.22, Figure 3.23, Figure 3.24). There is a stone cutting in between the two culverts (Figure 3.25). There are two streams cutting across the road in this area (Figure 1.3). As with all other culverts along this section of road the downslope side of Culvert 3 has been rebuilt while the upslope side appears to be an original 1830s retaining wall and culvert (Figure 3.26, Figure 3.27).
Culvert 4 is just to the west of the entrance to Monte Vista where there is a substantial earthen cutting (Figure 3.28, Figure 3.29, Figure 3.30, Figure 3.31). The downslope sides of these culverts are within the Monte Vista property. Moving westwards are more embankments and the substantial remains of Culvert 5 (Figure 3.32, Figure 3.33, Figure 3.34, Figure 3.35). Just past Culvert 5 the road starts to climb uphill and there are no further culverts before the western intersection with the existing highway. As with the eastern section this part of the road is windy with further stone cuttings until it terminates at the intersection with the highway (Figure 3.36, Figure 3.37, Figure 3.38, Figure 3.39). The upper part of this intersection is modern and there is little evidence for the earlier line of road at this intersection.

The road to the west of the junction of the highway with Forty Bends Road is currently called Daintree Close part of which would be proposed to be renamed Forty Bends Road as part of the proposal (Figure 3.40, Figure 3.41). The eastern section of Daintree Close (proposed Forty Bends Road) was rebuilt, probably as part of the existing bypass realignment and therefore it is unlikely that the old road survives within the eastern section of Daintree Close. The section of road near Daintree Cottage appears to be back to the original alignment where it would have once connected into the highway (Figure 3.13, Figure 3.42, Figure 3.43, Figure 3.44). The dip in the road corridor near Daintree cottage is one of the original bends (Figure 3.9). This was the western end of the bypassed section of Mitchell’s road and appears to be in reasonable but disused condition. It is noted that there are no substantial cuttings or culverts along Daintree Close. Daintree Close turns to the south immediately west of Daintree cottage. This is a later local road providing access after the original portion 20 was subdivided (Figure 3.45).
Fig 3-13 - Michells Road and Forty Bends Road and culverts

Mt Victoria to Lithgow: Great Western Highway upgrade

Forty Bends: Non-Aboriginal Heritage Sites

LEGEND

- Chainage
- Proposal
- Proposal site
- Mitchell's Road
- Original section of Mitchell's Road
- Rebuilt section of Mitchell's Road
- Potential heritage areas
- Permanent drainage basins
- Temporary drainage basins
- Compound site and stockpile locations
- Potential compound
- Potential stockpile
- Potential stockpile and compound

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Aerial Photograph: AUSIMAGE SKM, 2011
Figure 3.14: Culvert 1, concrete construction, from the eastern side. C&L 2011.

Figure 3.15: Culvert 1 from the western (left) side, concrete construction. C&L 2011.

Figure 3.16: Modern section of road at intersection at eastern end of Forty Bends Road and existing highway. View to northeast. C&L June 2012.

Figure 3.17: View from eastern end of Forty Bends Road showing narrow roadway. On the right is a wider section where it is proposed to locate a cul-de-sac as part of the upgrade. C&L June 2012.

Figure 3.18: View from western side of first bend with shallow cutting into earthen embankment. C&L June 2012.

Figure 3.19: View to north from first bend towards the second bend. This is a straight section of road typifying the country views of this road. C&L June 2012.
Figure 3.20: View from second bend with cutting from first bend towards the second bend. This is a straight section of road typifying the country views of this road. C&L June 2012.

Figure 3.21: View to west from second bend with cutting on east. C&L June 2012.

Figure 3.22: Culvert 2 is a shallow sandstone culvert on eastern side of the road at Bend 2. C&L February 2012.

Figure 3.23: Detail of Culvert 2. Visible is a shallow channel made with sandstone blocks and a capping stone. C&L February 2012.

Figure 3.24: The western side of Culvert 2 is made of modern concrete. C&L 2011.

Figure 3.25: View to west from Bend 2 with another cutting in the middle ground. C&L 2012.
Figure 3.26: Eastern side of Culvert 3 is sandstone blocks. Visibility is poor. C&L 2011.

Figure 3.27: Modern concrete culvert on the western side of Culvert 3. C&L 2012.

Figure 3.28: Northern face of Culvert 4 with a sandstone block retaining wall. C&L 2011.

Figure 3.29: Modern concrete culvert on the downslope side of Culvert 4. C&L 2012.

Figure 3.30: Section of road and rock cutting opposite the entrance to Monte Vista, looking east. C&L 2011.

Figure 3.31: Detail of cutting near Monte Vista, looking west. C&L 2011.
Figure 3.32: View westwards from Bend 4 to Bend 5 with another rock cutting on the northeast. C&L 2012.

Figure 3.33: Western side of cutting in Figure 3.32, looking southeast. C&L 2012.

Figure 3.34 Sandstone block retaining wall of Culvert 5, northern or upslope face. C&L 2009.

Figure 3.35: Southern side of Culvert 5 is a modern concrete culvert. C&L 2011.

Figure 3.36: West of Culvert 5 the road ascends around more bends, looking south with another cutting into the foote slope. C&L 2012.

Figure 3.37: The western section of the road before it rejoins the existing highway has shallower cuttings. C&L 2012.
Figure 3.38: Next section of road looking south with cutting into the footslope. C&L 2012.

Figure 3.39: Last section of Forty Bends road before it rejoins the existing highway, looking south. The upper part of this is 20th century as it has left the original alignment. C&L 2012.

Figure 3.40: View to west along Daintree Close. This is a rebuilt section of 20th-century road with modern stone retaining wall to the south. There are two modern culverts running off the southern side. C&L 2012.

Figure 3.41: Rebuilt section of Daintree Close in relation to the existing highway, looking west. C&L 2012.

Figure 3.42: Looking west section of Mitchell’s line of road near Daintree Cottage, Daintree Close. C&L 2012.

Figure 3.43: Looking west along section of Mitchell’s line of road adjacent to Daintree Cottage, Daintree Close. C&L 2012.
3.2.4 Discussion of Heritage Significance

The bypassed section of Mitchell’s old line of road at Forty Bends includes most of Forty Bends Road, except for the eastern end, and the eastern section of Daintree Close (Figure 3.13). The eastern section of Daintree Close was built during the 20th century. The intact section of Forty Bends Road is approximately 1.6 kilometres in length and four of the five culverts are partially intact, with sandstone retaining walls or construction, on the upslope side of the road. All culverts on the downslope have been modernised. Culvert 4 is now some distance from the road alignment indicating that this section was realigned at some point. The surviving line of road includes embankment cuttings into the upslope side.

As part of the investigations for the Mount Victoria to Lithgow Great Western Highway upgrade numerous sections of old lines of road have been examined. Some sections of Coxs Road which were bypassed by Mitchell’s Road remain quite intact. These include sections at Mount York and Soldiers Pinch. Mitchell’s alignment has been upgraded over the last 100 years and much of it within the study area is modern and substantially rebuilt. The key sections which allow us to understand the nature and materials of the early road are the State-significant structure of Victoria Pass, a major feat of engineering, and the section of Old Bathurst Road through Hartley. The road through Hartley has bypassed sections of road as well as a culvert and is within a State-significant cultural and social landscape among an important group of buildings. While the road at Little Hartley has been extensively upgraded, the inns along the road help us to interpret how the road was used and evolved in the 1840s and 1850s. The original sections of road at Forty Bends are the most intact within the Mount Victoria to Lithgow study area. The roadworks illustrate how the difficult landscape of Hassans Walls was challenged and a road established along the footslopes. The bypassing of the road in the mid-20th century has essentially left the road intact except for council upgrading of culverts.
There are other sections of Mitchell’s road which are known to survive, such as Old Bathurst Road at South Bowenfels (immediately to the west of the proposal site) as well as at the No. 2 Stockade at Coxs River. Therefore Forty Bends Road is not the only section of intact road alignment that helps us understand the labour-intensive work required to complete the road, the length of time involved to complete this work, with the location of the bridge/road gang nearby dating between 1832 and 1834. All of this background helps us interpret the value and meaning of this road. In terms of its level of significance, there are no major engineering works in this section it is considered that on our current understanding that the intact sections of Forty Bends Road and Daintree Close (which are part of Mitchell’s original alignment and road works) are of local heritage significance.

3.2.5 Assessment of Significance

It is noted that Casey & Lowe have not undertaken an exhaustive survey of the 1830s remains of Mitchell’s road beyond the preferred route corridor reporting and survey. We have read a number of reports, theses and local publications and are aware of sections of intact road and/or remnant culverts within or adjacent to the proposal site. We recommend that RMS should undertake a detailed heritage assessment of Mitchell’s road (outside the proposal site) to supplement these reports. This would allow for a more nuanced and developed understanding of the significance of the surviving sections of Mitchell’s road, outside the proposal site, rather than a piecemeal approach. In addition it would allow for developed stakeholder consultation about the road and its significance.

Criterion (a): Historic Significance - (evolution)

The road at Forty Bends is part of the original sections of Mitchell’s road, the western descent, built in the 1830s by convict iron gangs from Mount Victoria to Bathurst. Mitchell chose a new alignment to take the road over Victoria Pass and then down the slopes of Mount Victoria to avoid the difficult descent over Mount York. The causeway at Victoria Pass is one of the earliest substantial engineering works in Australia and is still in operation. The road was built by convict work gangs, mostly ironed gangs which were accommodated at stockades or camps in strategic or not so strategic locations along the road. The road through Forty Bends had at least five culverts with associated retaining walls in the surviving section, and there were another four or five to the west and a bridge to the east near Fernhill. The culverts were necessary for the construction of a stable road which would survive the water deluges off Hassan’s Walls after heavy rain. The section of road at Forty Bends was bypassed in the 20th century and therefore has retained many elements of its original construction.

Criterion (b): Associative Significance – (association)

The construction of the 1830s road is associated with Surveyor-General Thomas Mitchell and forms part of his achievements during the 1830s. Mitchell is a significant figure in the history of public works in NSW and it was through the successful implementation of a new road system that he made a substantial contribution to the progress of NSW and the opening up of the area to the west of the Blue Mountains. This section of road is strongly associated with the convict road and bridge gangs who built the road and lived in the nearby convict accommodation sites, one which is near to the proposal site and another to the east near Fernhill. The number of creek crossing testifies to the extensive labour required within this area to be able to cross the footslopes of Hassan’s Walls.

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14 We have drawn on the Statement of Significance for Victoria Pass, Government Architect’s Office, 2008
Criterion (c): Aesthetic Significance - (scenic qualities / creative accomplishments)
The surviving remains of Mitchell’s road at Forty Bends shows a range of techniques and approaches to 1830s road construction, such as the use of locally quarried stone for building culverts and retaining walls, as well as bridges. There was also extensive modification of Hassans Walls footslopes where the road was terraced into the hillside. It is noted that the footslopes of Hassans Walls was and is difficult terrain to cross and the walls themselves were a substantial barrier. The placement of the alignment here was probably the best line within very difficult terrain and the constraints of 1830s road building technology which did not involve extensive cuttings. While not on the scale of Victoria Pass or the substantial retaining walls near No 2 Stockade Cox’s River, this section of the road was still a significant achievement.15

Criterion (d): Social Significance - (contemporary community esteem)
Surveyor-General Thomas Mitchell is a significant individual in the history of the local area, as are the remnant roads. There is considerable community interest in the convict association with the road building. While there has been no specific consultation about the significance of this section of Forty Bends road, a number of the local residents are certainly interested in the old lines of road. The Value Management workshop for the corridor options identified that the history and heritage of the area was one of the key concerns of the local community.

Criterion (e): Technical/Research Significance - (archaeological, educational, research potential and scientific values)
Further detailed survey and analysis of this road and other remnants of road have the ability to help further our understanding of the construction techniques used within the road system, and questions such as how far away were quarrying sites from construction sites and accommodation site. How did the convict road building system and the accommodation system operate within the landscape?

Criterion (f): Rarity
Short sections of the 1830s road built to Mitchell’s alignment are known to survive within the Mount Victoria to Lithgow preferred route corridor but the section at Forty Bends is the most intact. State significant remains of this road include the Victoria Pass causeway and sections of road and retaining walls near Cox’s No 2 stockade, Lake Lyell. Other sections of Mitchells Road including Old Bathurst Road at Bowenfels with the Bowen Creek bridge abutments and causeway which are considered to be of State significance.16 Sections of the road also survive within Hartley village where this section or road once crossed the river. While the alignment survives in many areas there is little remnant fabric as most of it has been upgraded, such as the areas between Forty Bends Road and McKanes Falls Road or between Little Hartley and just east of Hartley.

Criterion (g): Representativeness
The section of road within the proposal site is part of a section of road with no major built engineering works, though it has remnants of retaining walls and culverts. It has the appearance of a narrow tree-lined country road with cuttings and terracing into the hill side. The construction of culverts and retaining wall represent the type of small-sale stonework which would have been undertaken along the length of the original road and while typical of roadbuilding in this kind of terrain, the extent to which it survives outside the study area is unclear. Remains of a similar bridge is found at Hartley within private property where a section of road was bypassed at an early stage.

15 Rosen *:22, 114, 121, 122, 123. Other photos of other sections of 1830s road are shown on pages 78-81,
16 LCC, Inventory Sheet, 1960792
Integrity
None of the surviving sections of culverts are intact and have been partially upgraded with modern concrete culverts on the downslope side. One culvert has been completely removed. Remains of Culvert 5 are now outside the road easement as there was some minor adjustment to the road. The western end of the original road at Forty Bends, near Daintree Cottage, has lost its connection to the main section as part of the road was either buried or removed and rebuilt (Figure 3.13). This suggests that elements of the road are original and represent key aspects of this original section of the road and its alignment but the integrity has been reduced through upgrading and possibly by ongoing maintenance.

Ability to demonstrate
This section of road demonstrates the nature of the difficult terrain for which the surveyors had to design a road and the types of techniques used to manage this terrain. It represents the early tree-lined country style of road which would have been typical of Mitchell’s Road for much of its course, unlike the more exceptional engineering works and retaining wall. The bendy nature of the road is also unusual for Mitchell as he frequently preferred a more direct line, but this relates to the limited opportunities in which the road could be aligned in this area. The section of road north of Daintree Cottage was disconnected from the main section of road during an earlier realignment and its ability to illustrate the connection has been diminished.

Level of Significance
The identification of a level of State or local significance for this section of 1830s Mitchell’s road is difficult to do without the context of an overall heritage study and assessment of significance for the road. The existing piecemeal approach is to have separate elements of the road assessed, such as Victoria Pass, Bowen’s Hollow bridge and abutments. This results in value being placed on the major engineering works rather than more sedate and typical elements of the road, such as at Forty Bends. Does this mean that where there are lines of road with cuttings not previously been identified as being significant that they are not significant? As noted previously a more detailed assessment of the significance of the surviving road needs to be undertaken. There needs to be an understanding of how Mitchells’ road to Bathurst rates in relation to the Great North Road which is listed on the SHR, the National Heritage List and included on the World Heritage List for convict sites. As part of this preliminary assessment it is considered that the Forty Bends section of Mitchell’s road is of local significance, based on its integrity and representativeness. Further research and analysis may show that it is of State significance as part of a group of road and stockade sites which opened up western NSW.
Statement of Significance
The road at Forty Bends is part of the original sections of Mitchell’s road which was built in the 1830s from Mount Victoria to Bathurst. It is associated with Surveyor-General Thomas Mitchell, his choice of a new road alignment over Victoria Pass to Bathurst in the 1830s and the opening up of New South Wales to the west of the Blue Mountains. These works were undertaken by convict work gangs, mostly ironed gangs, and was part of a hard labour system of punishment. The convicts and soldiers lived at the nearby Hassans Walls stockade or Bridge/Road Party site. The choice of this alignment faced the difficulty of crossing the footslopes of Hassans Walls which required a series of bridge and culvert crossings, remains of which survive at Forty Bends. This road illustrates elements of a narrow country lane, road cuttings and culverts with stone retaining walls. These remains are part of sections of Mitchell’s road which survive within the Lithgow City Council area and elsewhere along the route, some of which have more substantial engineering works. It is representative of the more typical elements of the road. The alignment has had some minor adjustments and only the upslope side of three of the culverts and walls remain. This section of road is expected to have significance to the local community. The identification of a level of significance for Forty Bends Road is difficult without broader research. It has at a minimum a local level and depending upon overviews of it within the context of other elements of Mitchell’s Road, it may reach the State significance threshold.

3.3 Other lines of road and potential culverts associated with the existing highway

3.3.1 Field survey
During the field survey for the preferred route corridor sections of older roads or tracks were identified on the southern and northern sides of the highway (Figure 3.54). These old lines of road were mapped as part of the current report and additional fieldwork undertaken in February 2012 (Figure 2.2, Figure 2.3). As part of an assessment of where earlier sections of Mitchell’s road may have survived the extensive 20th-century roadworks, a series of historical and parish maps were analysed (Section 3.2.2). This led to the survey of a few areas where there were potential sections of roadway in addition to areas where tracks were found to survive. Reviewing the results of the fieldwork and research it was determined that all surviving sections of tracks on the northern side of the road were probably associated with the service road for the old telephone/electricity lines, evidence of which was found lying on the ground (Figure 3.46, Figure 3.47, Figure 3.48, Figure 3.49). There are a number of by-passed sections of the earlier line of road along the southern side of the existing highway which are elements of the earlier road which was bypassed in 1946.

3.3.2 Northern Side of the Road
Site inspections within the proposal site to the north of the intersection of the current highway with Forty Bends Road found evidence of old service tracks (Figure 3.52). These tracks are terraced into the hillside and follow the undulating topography of the landscape (Figure 3.46, Figure 3.47, Figure 3.48, Figure 3.49). The service tracks appear to have been preserved as property access routes and bush tracks. These types of tracks are common throughout the Blue Mountains, i.e. one at Browntown which is still in use (Figure 3.49).
3.3.2.1 Heritage Significance
As these service tracks are found throughout the Blue Mountains to provide access to electrical and Telstra easements they are not considered to be of significance. While they illustrate the presence of an earlier use in this area they are not more important than the original services themselves, which have often relocated. These tracks involve little indication of engineering expertise or remnant fabric and are no more than dirt tracks such as fire trails which litter the Blue Mountains. These tracks are not considered to reach the local significance threshold, on any of the heritage significance criteria.

3.3.3 Southern Side of Road from western end
3.3.3.1 Section of road near Emoh and nearby culvert and retaining wall
The historic inn and store, Emoh, is much lower than the existing highway and access to these buildings is provided by Mudgee Street which is an earlier line of road (Figure 3.49, Figure 3.50). The level of the existing Great Western Highway is above the level of the house and when the existing highway was constructed an extensive retaining wall and culvert was also built (Figure 3.51). The presence of this substantial culvert and retaining wall indicates that this section of the highway possibly dates to the late 19th century. This section of the old road, Mudgee Street, continues to the west and north and has a number of important heritage items. Mudgee Street is also part of the line of Mitchell’s 1830s road.
3.3.4 Bypassed bends on southern side

Along the southern side of the existing highway are two bypassed sections for road (Figure 3.54):
- Bend 1.
- Bend 2.

A site inspection on 6 February 2012 supported the interpretation that these were bends from Mitchell’s 1830s road but they were all covered with 20th-century bitumen and road surfacing and had been substantially modified. One of the bends is adjacent to a house which is part of the reason this connection to the early road has survived.

3.3.4.1 Bend 1

This bypassed bend (Chainage 32,900) is directly opposite a service track which sits at the top of the cutting. The bend consists of a bitumen road (Figure 3.54).
Figure 3.52: Bypassed Bend 1, beginning from the west, view to east. C&L 6 February 2012

Figure 3.53: Extensive modern cutting removing the footslope, the original reason for construction of the bend. The 20th-century road building removed other evidence of bends along this line except for two bends. C&L 6 February 2012
3.3.4.2  Bend 2

This bypassed section of the old highway was subject to archaeological testing in June 2012 (Appendix 4). Any evidence of early roadmaking had not survived the impacts from 20th-century engineering of the modern road. This bypassed section of road has no surviving fabric but it does represent the former alignment of Mitchell’s 1830s road.

Imaged removed for privacy

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Figure 3.54: Survey plan of Bends 1 and 2.

Figure 3.55: Section of bypassed section of road. C&L February 2012.

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17 Casey & Lowe 2012c, (Appendix 4).
3.3.4.3 Heritage Significance of bypassed bends, Bend 1 and Bend 2

These two bends are remnant evidence of the earlier line of Mitchell’s 1830s road. The survival of these bends helps us understand the historical development of the road and makes the landscape more legible. The archaeological testing of the bridge party site illustrated that the modern road works have removed all evidence of earlier roadworks (Appendix 4). Therefore these bypassed sections of roads are considered to be highly impacted by 20th-century roadworks and are considered unlikely to have any integrity of remnant fabric. Therefore they are considered to have no heritage significance as not considered to reach local significance threshold on any of the heritage significance criteria.

3.3.5 Buried Culverts

There are five creek lines between Emoh and Forty Bends Road, all crossing the original line of Mitchell’s road, the existing highway (Figure 2.3). Only the culvert near Emoh has a visible and substantial extant culvert (Figure 3.3 and Figure 3.51). This is not one of the 1830s culverts and is thought to date from the 1860s. It is possible that an earlier culvert may survive beneath the existing road in this locality.

The other four creek lines were inspected but were found to have modern concrete culverts (Figure 3.56). If evidence of 1830s culverts survives they would be buried beneath the existing highway. It is likely that the 20th-century roadworks will have substantially impacted on these culverts. The presence of modern cuttings near to some of the potential culverts locations, suggests that the culverts were probably demolished during the 20th century when the road was reduced.

3.3.5.1 Heritage Significance of Buried Culverts

Evidence of buried culverts within the existing highway is likely to be quite disturbed and lacking in integrity. As there are partially intact, extant and visible culverts at nearby Forty Bends Road, thought to date to the 1830s, it is likely that any evidence of potential buried culverts could reach the local significance threshold but this would need to be determined on a case by case basis. At this stage as they could be part of Mitchell’s line of road and provide evidence of early road making practices, they would need to be considered to be of potential local significance and a relic under the Heritage Act, 1977. This may include buried evidence of the culvert near Emoh. The extensive later 20th-century roadwork may have removed all evidence or it may have not.

Figure 3.56: 20th-century concrete culvert on the existing highway at Forty Bends. C&L 2012

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18 RMS S170 register, SHI 4301026
3.4 **Daintree (1960119/B048), 31 Daintree Lane, off Forty Bends Road.**
Daintree cottage is four-roomed weatherboard cottage with hipped roof built c1900 as the residence for Pierce’s orchard (Figure 3.58). It has a formal driveway with recent plantings and is located on a prominent ridge but looks northwards towards Hassans Walls rather than down the valley to the south (Figure 3.59). The style of the house is Victorian-Georgian in timber form.\(^{19}\) The identified local heritage significance is:

- **Historic:** One of the older orchards in an area once famous for its apples, opened by a prominent family, the Pierces. **Aesthetic:** The buildings and cleared orchard land nestle into the lower slopes of Hassans Walls, creating an attractive and significant modified environment.
- **Social:** As the local dance-hall sixty or so years ago, the apple-shed had considerable social significance to the whole Bowenfels area.\(^{20}\)

It is noted that this statement of significance was written for the property prior to the current subdivision and only a few of the fruit trees are within the home yard.

3.4.1 **Proposed Curtilage**
The curtilage proposed by Warwick Mayne-Wilson for Daintree Cottage is based on the following factors:

Home yard, which includes the following principal elements (Figure 3.57):
- The Cottage itself with apple shed (although now modern) (Figure 3.58, Figure 3.61).
- The long entry driveway down from Daintree Close to the cottage (Figure 3.59).
- The landmark Cedar planting at the front gate, supported by mature Pine trees, some of them also close to the northern boundary, and some set back from it (Figure 3.60, Figure 3.61).

The LCC heritage study inventory sheet (Appendix 3) stated that several subdivisions of this property were being advertised in 2004, so it is not known whether the land to the east of the north-south fence is currently in the same ownership as that of the cottage itself. Whatever the case, it is not considered that the land/paddock to the east is of sufficient importance to warrant being included within the cottage’s curtilage. In accordance with the Heritage Office’s Manual *Heritage Curtilages* (1996), the proposed curtilage may, depending on the actual ownership, be a either a lot boundary or a reduced curtilage. In this case the reduced curtilage has been chosen.

The landmark Cedar tree (*Cedrus deodara* or commonly Indian Cedar), possibly planted at the entrance gate in the 1950s or 1960s, at the entry gate was intended as a landmark planting to draw attention to the front entry of the property. The choice of a Cedar was to distinguish it from all the other Pine trees commonly planted throughout the whole Mount Victoria to Lithgow area as windbreaks. It is a contributory item, i.e. it contributes to the aesthetic appreciation of the Daintree property, because it helps the latter, as an attractive and significant modified cultural landscape, to nestle into the lower slopes of Hassans Walls. It is an uncommon tree in this area and it is an excellent, representative example of its species. It should be retained where possible, as should the mature pine trees beside and behind it, as well as along the western boundary down Daintree Close. These give the property a valuable sense of enclosure and privacy from traffic moving down Daintree Lane or Close. These elements are shown in Figure 3.58, Figure 3.59, Figure 3.60, Figure 3.61).

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\(^{19}\) Lithgow Heritage Study Heritage Inventory, SHI1960119, Study no. B048 (Appendix 3).
\(^{20}\) Lithgow Heritage Study Heritage Inventory, SHI1960119, Study no. B048 (Appendix 3).
Figure 3.57: The aerial shows the proposed roadworks in yellow, with the proposed curtilage in red for this heritage-listed property.
3.5 Emoh (1960162/8051)

Emoh, a former store and inn dating to the 1830s and 1840s is listed as being of State significance on the LEP. It is located on the southern side of the existing highway approximately 200 metres west of McKanes Falls Road. Because of the height of the road in relation to Emoh, there is no surviving view from the house to the north. Emoh is currently on the LCC LEP 1994 and will be retained in the LCC draft Land Use Study (Appendix 2).

The heritage inventory sheet (Appendix 3) described the buildings as:

1. 1830s building at south east: slabs covered with weatherboard, iron pitched roof, simple verandah to north, stone-flagged interior floor, ceiling made of bark (known to have been replaced as required by Corderoys).
2. 1840s homestead originally simple rectangular stone building, probably with the present two chimneys, extended to east in c. 1862 when roof-line altered to present form. Shingles under the corrugated iron roof. Front verandah with wooden posts and iron-work brackets and valances. The rear rooms are on two levels because of the fall in the site.
3. The store on the west end was also built in sections. The oldest part, probably built by Coleman in 1840s, is two-storied stone on stone-nog foundation: the cellar ceiling has large early iron hooks depending to hang foodstuffs; the cellar floor is earth. To the north is Corderoy’s 1862 store on rubble-stone foundations. This had a brick facade in the nineteenth century; the front verandah was encased in fibro in the 1960s. Conversion to accommodation in the 1940s entailed internal changes.
The heritage significance of Emoh resides in:

**Historic:** Emoh shares with the Harp of Erin at Little Hartley (828) the distinction of being a very early store on Mitchell’s Great Western Highway. It remained a general store for a century after 1841. From 1854 onwards it descended through five generations of the Corderoys, originally storekeepers at Emu Plains and later also owning the store at Hampton. The fabric of the residence and store is a highly significant commentary on this continuity of ownership and use.

**Social:** As the principal focal store in South Bowenfels in the 19th century, Emoh had local social significance. **Scientific:** Details of construction are highly significant for further elucidation of the complex and for vernacular building more widely: the 1830s house with slab waifs, stone floor and bark-ceiling, the 1840s store with stone-nog foundation walling and the changes in the rest of the store and the 1840s homestead are all extremely important features of the complex.21

Emoh has been assessed as being of State heritage significance in the inventory sheet (Appendix 3) but is only listed on the LCC LEP.

![Figure 3.62: Emoh, a former inn, at left, is located on the southern side and below the level of the existing highway. MWA 2009.](image)

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21 LLC Heritage Inventory Sheet, Appendix 3
Figure 3.63: The changes to the existing highway by the proposal are quite minor in relation to Emoh and the nearby culvert and retaining wall. The proposal is no closer to Emoh nor is there a change in the level of the road. A water quality basin is located to the east of the Emoh curtilage.
3.5.1 Archaeological Potential

There are no known potential archaeological remains outside the proposed curtilage but there is some limited likelihood that a 19th and/or 20th-century rubbish dump may be encountered during earthmoving. It is also possible that there may be remains of timber structures. These remains may reach the local significance threshold but would need to be assessed.

Figure 3.64: View to southwest over the general area of the proposed water quality basin to the east of Emoh, chainage 33,250. This is currently used as pasture and is on high ground near the road. C&L June 2012.

3.6 Road culvert and retaining wall (Emoh culvert)

This substantial stone culvert and retaining wall is 22 metres in length at the top and its walling is six courses above the circular culvert with keystone (Figure 3.65). Part of this wall appears to have been reconstructed. The significance of this item is:

The retaining wall and culvert relate physically to the earlier alignment of the Western Road approaching historic village of Bowenfels. The masonry retaining wall and culvert is a well-preserved and largely intact example of nineteenth century main road infrastructure. The wall displays fine details of workmanship and design including the projecting stringcourse and unusual parapet will with pyramid-topped stones posts. The wall and culvert has been assessed as being of low state significance. 22

The RMS S170 listing has identified this culvert and wall as being of State significance. If it were assessed under current criteria it is unlikely to meet the State significance listing.

22 RMS S170 register SHI no. 4301026
3.7 Cottage (1960120/B049), 3357 Great Western Highway
This c1890 cottage is a four-roomed timber cottage with sandstone foundations and a hipped roof with rear skillion and enclosed skillion verandah at the front. It has a hipped roof over the central section of the house. There is a modern garage to the east and a tank stand down the hillside. It is described a Victorian Georgian (Appendix 3). This house is immediately adjacent to the existing highway (Figure 3.67, Figure 3.68, Figure 3.69). While currently not listed on the LCC LEP 1994 it is proposed to be listed on a new LEP as part of the LCC Draft Land Use Study (Appendix 2). The heritage study inventory sheet for this property identifies it as having local heritage significance:
Historic: The cottage has local significance as the replacement homestead on one of the early grants along Mitchell’s highway in the 1830s and as the centre of activity of a well-known bush carpenter’s business in the period between the world wars.23

Appendix 1 includes additional research on the historical background of this property, which is within historic lot 22, and its residents. As is evident in Figure 3.67 and Figure 3.68, the house is already virtually on the edge of the existing highway, which has been rebuilt at a higher level in more recent times. The house is located immediately adjacent to the existing road reserve. The curtilage of the property follows existing cadastral boundaries (Figure 3.69). In the case of the proposed northern curtilage it is immediately adjacent to the house and the modern existing access road is outside the curtilage.

Figure 3.67: Lithgow Heritage Study item no. 1960120, viewed from the east, already below road level. MWA 2009.

Figure 3.68: The cottage viewed from the west, with the existing highway edge at the left. MWA 2009.

23 Lithgow Heritage Study Heritage Inventory, SHI1960112/B049 (Appendix 3).
Figure 3.69: Plan showing that Cottage 1960120 is outside the proposal boundary.
3.8  Cottage (1960116/8045)

This ruined stone and timber cottage is of local significance and is proposed to be listed on a new Lithgow LEP (Appendix 2). It is at the eastern end of the study area and possibly dates to the 1840s and is one of the older buildings along this section (Appendix 3). It is significant for:

   Historic: the road created a small community as it wound its way through forty bends: this cottage is a highly significant early part of that community and later in the 19th century it was the house of a local doctor. Aesthetic: with a spectacular back-drop of Hassans Walls and mature trees on the property, the cottage, even in disrepair, makes a striking visual contribution to the cultural landscape. Scientific: because of disrepair, the details of the slab construction, which are unusual, are uncommonly legible (See GL8/1).24

Figure 3.70: Lithgow LEP heritage item no. 1960116, to the northeast of Old Forty Bends Road, by south of the final route of the Great Western Highway. MWA 2009

3.8.1  Curtilage and Visual Analysis

The former cadastral boundaries associated with this cottage are quite extensive and cross over to the northern side of the existing highway. The proposed curtilage for this property identifies a core area. As with many houses at Forty Bends, the views are to the south over the valley rather than towards Hassans Walls and the highway.25

3.8.2  Archaeological Issues

As the water quality basin would be located within the historic boundaries of Cottage 1960116 there is some limited possibility of a 19th and/or 20th rubbish dump being discovered by this work. The land in the northeast corner is unused and there are a number of existing older structures or outbuildings dotting to property. The northeast corner is some considerable distance from the proposed curtilage. It is also possible that other archaeological remains, possibly relics, may be exposed in this work. Any archaeological remains would need to be accurately assessed if found and they would likely be of local heritage significance.

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24 LCC Heritage Inventory 1960116/8045 (Appendix 3).
25 Casey & Lowe 2009
Figure 3.71: Plan showing the proposal site in relation to the proposed curtilage. Note the old road alignment projecting into this property (green line) from Forty Bends Road. The water quality basin is outside the proposed curtilage.
4.0 Impacts from the Proposal

4.1 Potential impacts from the proposal
The following heritage items and sites are discussed in Chapter 3 and are potentially impacted by the proposal:

- Bridge/Road Party site.
- Forty Bends Road, Mitchell’s line of road and culverts.
- Old lines of road and potential remains of culverts associated with the current highway.
- Daintree Cottage (1960119/B048), 31 Daintree Lane, off Forty Bends Road.
- Buried culverts on Great Western Highway between Forty Bends Road and McKanes Falls Road.

These four heritage items are within the proposal site but with no identified impact:

- Cottage (1960120/B049), 3357 Great Western Highway.
- Cottage, (1960116/B045), 24 Old Bathurst Road (Forty Bends Road).
- Emoh, 3431 Great Western Highway.
- Road culvert and retaining wall (Emoh culvert).

The proposal in the vicinity of the Emoh residence and the nearby culvert would not encroach on the curtilage and would be at the same level as the existing highway. Therefore there would be no impact from the proposal on these two items. It is noted that there would be a water quality basin located approximately 60 metres to the east of Emoh’s curtilage. It is considered that this detention basin would not affect the State heritage significance of Emoh. Although there are pleasant views to the south of Emoh, these are not addressed by the buildings, and would not be affected in any way by the proposal.

4.1.1 Items within the proposal boundary with some impact from the design
There are four heritage items or sites affected by the proposal where there would be potential impacts:

- Bridge/Road Party site.
- Forty Bends Road, Mitchell’s line of road and culverts.
- Potential remains of buried culverts associated with the current highway, between western end of Forty Bends Road and Emoh.
- Daintree (1960119/B048), 31 Daintree Lane, off Forty Bends Road.

4.1.1.1 Bridge/Road Party site
The northeastern triangle of this property projects into the proposal site, approximately 100 square metres to the east of the house. Also an adjacent area of land which is road reserve may also contain remains associated with this site. Testing in the adjacent road reserve immediately north of the house and a metal detector survey on the northern side of the highway above the cutting found no remains associated with this site (Appendix 4).26 It is considered likely that some potential archaeological remains associated with this site of potential State significance are within the areas of impact within the private property and the fenced area of the road reserve but not within the road reserve to the north of the house or on the northern side of the road where testing occurred. An amended plan of the potential archaeological site maps the extent of the site (Figure 3.2).

26 Casey & Lowe 2012c, Appendix 4
4.1.1.2 Mitchell’s line of road and culverts
There would be some impact on the bypassed section of early road, Forty Bends Road. In the eastern area there would be a cul-de-sac which is to be located within the original line of Mitchell’s road. The cul-de-sac would terminate the through access along the old line of road. The design of the cul-de-sac requires some minimal construction of kerb and guttering. Therefore this cul-de-sac is unlikely to impact on heritage significance. Culvert 1, a modern culvert is within the footprint of the cul-de-sac. There is no impact of the identified remnant early culverts by the proposal.

The western section of Daintree Close, near Daintree Cottage, is part of Mitchell’s 1830s road (Figure 4.1). It is disconnected from the main bypassed section of Mitchell’s road, Forty Bends Road. The proposal would incorporate a new turning bay in this location and raise the road level. Therefore the proposal would impact on this disconnected section of Mitchell’s 1830s road by burying it beneath fill at this location.

4.1.1.3 Old lines of road and potential culverts associated with the current highway
Originally four culverts were built along the section of the highway west of Forty Bends Road and McKanes Falls Road. While none of these original culverts are visible there is a possibility that remnants of these culverts may have survived 20th-century road building and therefore the potential exists for culvert remnants to be affected during construction of the proposal. The remains of the two bends, chainage 32,900 and 32,500, which survive between Forty Bends Road and McKanes Falls Road are likely to be removed by the proposal. The tracks along the northern side of the road are likely to be removed by widening the road to the north (Figure 1.2). These 20th-century service roads however have no heritage significance.

4.1.1.4 Daintree (1960119/B048), 31 Daintree Lane, off Forty Bends Road
The construction works associated with the turning bay immediately north of Daintree Cottage will impact the curtilage of this property (Figure 3.57, Figure 4.1). This proposal involves an earthworks embankment to the north of the property at approximately a 2:1 slope. There would be a level difference of approximately 5.5m (maximum) between the existing lane and the proposed earthworks. The proposal would affect approximately 955m2 of the curtilage. Approximately 4300m2 of the curtilage would be unaffected. There would be moderate impacts on the significance of this item due to the loss of plantings and association with the early line of road. It is recommended that opportunities are explored during the detailed design to reduce the impacts on the curtilage where possible.
Figure 4.1: Plan showing the impacts on the western section of Daintree Lane, part of Mitchell’s 1830s road, and Daintree Cottage. Blue line indicates the section of 1830s road bypassed in the mid-20th century. The red line indicates the modern section of road in this area. North is at the top.

4.1.2 Heritage items adjacent to the proposal

The following items are identified as adjacent to the proposal (Table 2.1):

4.1.2.1 Emoh (1960162/B051), Great Western Highway

The Emoh residence and home yard would not be impacted by the proposal and the existing road level would be maintained at this point. Therefore there are no issues arising from the proposal with the Emoh residence and associated structures within the proposed curtilage. The land containing the water quality basin, approximately 40 metres to the east, is located within the same historic property as Emoh and therefore has some limited archaeological potential which may be impacted by the proposal. There is a low likelihood of significant artefacts occurring in this location as the proposed water quality basin is located outside the home yard, captured by the proposed curtilage, and away from creeklines. Typically key archaeological deposits such as well, cesspits, cisterns and other structures and deposits are located close to the inn or house. Dumping of large collections of rubbish some distance from an inn or house is also common. These dumps are frequently some distance from the dwelling and in an area not typically used by the residents for other purposes. Therefore this location on high ground adjacent to the road is unlikely to be a site for a rubbish dump. There is considered to be no impact on the State significance of this heritage item.

4.1.2.2 Masonry Culvert and Retaining Wall (Emoh culvert) (SHI 4301026)

The retaining wall of the culvert adjacent to Emoh is outside the proposal site. It is possible that remains of this culvert survive, but are buried, on the northern side of the existing highway, however major roadworks would not occur in this area as part of the proposal. Proposed upgrading of stormwater on the northern side of the road would have no impact on the southern side of the highway in this area. There would be no impact on the visible fabric or the possibly buried culvert from the proposal.
4.1.2.3  **Cottage (1960120/B049), 3357 Great Western Highway**

This cottage is outside the proposal site and the road would be located at the existing level and in the same location in relation to the cottage (Figure 3.69). At this location the proposal involves widening to the north and a cutting into the northern slope which moves impact away from this heritage item. Therefore as the existing alignment and grade is being maintained, there would be no impacts from the proposal on the heritage significance of this property.

4.1.2.4  **Cottage (1960116/B045), 24 Old Bathurst Road (Forty Bends Road)**

As the proposal proceeds westward, it passes at a distance of about 80 metres to the north of cottage 1960116 which would therefore not be directly impacted proposal. The proposed water quality basin to its east is sufficiently distant to have no adverse impact on the curtilage of the cottage but there is some limited likelihood of potential relics within the area of the water quality basin.

4.1.3  **Impacts from construction**

The compound sites are not located within any known heritage sites as they are all outside identified curtilages (Figure 1.2). It is noted that they are close to culverts 4 and 5 on Forty Bends Road. It is also possible that these areas may have unidentified features exposed by the proposed limited clearance. These may include remnants of stone quarrying, very little of which has been identified within the proposal. It is noted that access to the compounds for site establishment and trucks for spoil shipment may involve Forty Bends Road if it is suitable. It is possible that there may be inadvertent impacts on the remnants of the 1830s road from this increased transport should it utilise Forty Bends Road. Management strategies need to be put in place to avoid such impacts on the road generally and the culverts specifically.

4.2  **Impacts on Heritage Significance**

This section discusses impacts on heritage significance. The level of identified impacts is outlined in (Table 4.1).

4.2.1  **Bridge/Road Party site**

There is potential for some limited impacts on the most northerly sections of this potential state archaeological site (Table 4.1, Figure 3.2). As most of the site is considered to be outside the proposal these impacts are considered to be relatively minor and would not affect the overall significance of the heritage item. It is presumed that most of the structures and activities would be within the core part of the site rather than in a northeastern part of the site or on the steeply sloping ground to the west. Further archaeological testing is recommended in this area prior to construction.
4.2.2 Forty Bends Road, Mitchell’s line of road and culverts
There are some impacts on the western end of Mitchell’s Road north of Daintree Cottage. A turning bay would be constructed in this area of flat ground and the area would be filled to raise levels to the north and west of Daintree Cottage. This fill could potentially impact on the Daintree Cottage curtilage (see below). The proposed impacts from the turning bay will bury part of the remaining section of Mitchell’s line of road at Forty Bends. It will no longer be visible or legible in the landscape. Although it is currently not especially visible nor is it legible as it is at a deadend and no longer connects to highway nor does it have culverts or cuttings. This section of Mitchell’s road was previously disconnected from the main bypassed section and therefore is somewhat isolated. The key elements of the bypassed section of Mitchell’s road survives to the east, with remnant culverts, bends and cuttings. While it would be preferable to retain all elements of Mitchell’s road the burying of this section has little impact on the local significance of the main section of road at Forty Bends. It is noted that this turning bay was located in this area to avoid impacts on the western end of Forty Bends Road which would have had an impact on its heritage significance.

4.2.3 Old line of road and potential culverts associated with existing highway
The old lines of road have been determined to be 20th-century service tracks and therefore have no heritage significance. The former bends are considered to have no heritage integrity and therefore have no heritage significance. The significance of buried remnant culverts would depend upon the degree to which they survive. This would need to be assessed at the time of discovery. General observations during field survey suggest that the drainage works for the modern roadworks are quite extensive and there is limited potential for such remains to survive.

4.2.4 Daintree Cottage, 1960119/B048
The northern line of trees within the curtilage may need to be removed, including a fine Cedar tree (Cedrus deodara) (Figure 3.59, Figure 3.60). This has the potential to impact on the significance of this item by removing plantings along the northern fenceline and at the entrance road to the house and shifting the curtilage of the item a few metres to the south of its present alignment. The statement of significance for this heritage item in Chapter 3.5 referred to the significance of the house’s relationship to the earlier apple orchard and to the setting as a ‘significant modified environment’, the plantings would be included as part of the ‘modified environment’. The extent to which the proposal impacts on this item, its plantings and curtilage in the northern part of the property is of concern and needs to be mitigated. It is noted that the statement of significance for this site does not list these plantings specifically as part of its significance, other than surviving fruit trees, which are mostly outside the curtilage and not affected by the proposal but they are part of the nestling of the cottage within the rural landscape and a part of its aesthetic qualities. It is recommended that these planting are retained where possible. Appropriate landscaping needs to be implemented to mitigate these impacts if they cannot be retained.

4.2.5 Potential rubbish dumps associated with Emoh and Cottage 1960116
All key heritage items and significant relics are likely to be within the home paddock included within the curtilage of these properties. As the curtilages are a small part of the original historic property there is some possibility of finding potential relics outside the curtilage. A preliminary inspection of these areas did not identify any obvious relics. There is still some limited possibility for finding relics in the area of the water quality basins associated with these two historic properties but outside the two identified heritage curtilages. These works need to be covered by a S140 approval and appropriate methodologies identified in the Research Design for their management.
Table 4.1: List of heritage items and sites and impacts on their heritage significance.

<table>
<thead>
<tr>
<th>SHI No/ LCC LEP No</th>
<th>ITEM NAME</th>
<th>No.</th>
<th>STREET ADDRESS</th>
<th>LOCALITY</th>
<th>Significance</th>
<th>Potential Impact on Significance by Proposal</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>Bridge/Road Party site</td>
<td>-</td>
<td></td>
<td>South Bowenfels</td>
<td>Potentially State</td>
<td>Minor</td>
</tr>
<tr>
<td>-</td>
<td>Forty Bends Road, Mitchell’s line of road and culverts</td>
<td>-</td>
<td>Forty Bends Road</td>
<td>South Bowenfels</td>
<td>Local</td>
<td>Minor</td>
</tr>
<tr>
<td>-</td>
<td>Old line of road and potential culverts associated with existing highway.</td>
<td>-</td>
<td>North of Great Western Highway</td>
<td>North of Forty Bends Road</td>
<td>None to Local</td>
<td>Minor</td>
</tr>
<tr>
<td>1960119 BO48</td>
<td>Daintree Cottage</td>
<td>31</td>
<td>Daintree Lane, off Old Forty Bends Road</td>
<td>South Bowenfels</td>
<td>Local</td>
<td>Moderate</td>
</tr>
<tr>
<td>1960162 BO51</td>
<td>Emoh (Emu Store/ Corderoy’s Store)</td>
<td>3431</td>
<td>Great Western Highway</td>
<td>South Bowenfels</td>
<td>State</td>
<td>None</td>
</tr>
<tr>
<td>1960795 A027</td>
<td>Road culvert &amp; retaining Wall (Emoh culvert)</td>
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<td>Great Western Highway</td>
<td>South Bowenfels</td>
<td>State</td>
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<td>South Bowenfels</td>
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<td>1960116 BO45</td>
<td>Cottage</td>
<td>24</td>
<td>Old Bathurst Road</td>
<td>South Bowenfels</td>
<td>Local</td>
<td>None</td>
</tr>
</tbody>
</table>
5.0 Mitigation of potential impacts

5.1 Mitigation
As outlined in Table 4.1 there are minor impacts on the heritage significance of three heritage items or sites and there may be a moderate impact on one item. There is some limited potential for relics associated with two detention basins near Cottage 1960116 and Emoh. Proposed mitigation measures are described in Table 5.1 below. Mitigation measures are identified as either prior to construction or during construction. A Non-Aboriginal heritage management sub-plan would be developed and included in the overall Construction Environmental Management Plan for the Forty Bends proposal.

There is some limited possibility for finding unknown or buried remains of culverts between Forty Bends Road and Emoh. To guide the possibility of finding culverts, a procedure needs to be put in place and included in the CEMP sub-plan. As a precaution a S140 approval would be obtained from the Heritage branch, Office of Environment & Heritage (OEH) for this eventuality so as to reduce potential delays and manage risk. Further consultation with OEH Heritage branch would be undertaken prior to seeking this approval.

There is also some limited possibility for finding relics associated with water quality basins associated with two historic properties but outside the two identified heritage curtilages. These works need to be covered by a S140 approval and appropriate methodologies identified in the Research Design for their management.

In addition to the measures outlined below in Table 5.1, the Non-Aboriginal heritage sub-plan should include any mitigation measures outlined in the Noise and Vibration Technical Paper and Traffic and Transport Technical Paper that are relevant to items of Non-Aboriginal heritage and that would be affected by the proposal.
Table 5.1: Mitigation strategies for the proposal and preliminary recommendations for construction.

<table>
<thead>
<tr>
<th>SHI No/ LCC LEP No</th>
<th>ITEM NAME</th>
<th>Significance</th>
<th>Impact on Significance by Proposal</th>
<th>Statutory Requirements</th>
<th>Mitigation (prior to construction)</th>
<th>Mitigation (during construction)</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>Bridge/Road Party site</td>
<td>Potentially State</td>
<td>Minor</td>
<td>S140 approval</td>
<td>Testing in northern area of the site. Detailed archaeological recording if any remains are found. Interpretation of site.</td>
<td>Map area and fence to protect and include the plan in the Non-Aboriginal heritage sub-plan of the CEMP. Undertake works in accordance with S140 approval.</td>
</tr>
<tr>
<td>-</td>
<td>Forty Bends Road, Mitchell’s line of road and culverts</td>
<td>Local</td>
<td>Minor</td>
<td></td>
<td>Undertake a condition assessment survey of the pavement and culverts. Avoid key areas of this road especially along the original or early sections of Forty Bends Road.</td>
<td>Map the area and include the plan in the Non-aboriginal heritage sub-plan of the CEMP. Provide induction about significance to construction workers. Determine appropriate strategies to minimise impacts from construction works and truck movements and include in the CEMP Non-aboriginal heritage sub-plan. Manage to minimise impacts from construction compounds and increased traffic movements.</td>
</tr>
<tr>
<td>-</td>
<td>Old line of road and potential culverts associated with existing highway.</td>
<td>None to Local</td>
<td>Minor</td>
<td>S140 approval</td>
<td></td>
<td>Induction training about heritage and archaeology remains. Assess significance and record remains if found. Consider possibility of reburying remains of earlier culverts with appropriate protection. Map potential sites. Include RMS Unexpected Finds procedure (July 2012) in Non Aboriginal Heritage sub-plan of the CEMP.</td>
</tr>
<tr>
<td>1960116 B045</td>
<td>Cottage, some limited likelihood of relics in area of water quality basin</td>
<td>Local</td>
<td>None known</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Casey & Lowe

Statement of Heritage Impact, Non-Indigenous Heritage

Great Western Highway Upgrade, Forty Bends
<table>
<thead>
<tr>
<th>SHI No/ LCC LEP No</th>
<th>ITEM NAME</th>
<th>Significance</th>
<th>Impact on Significance by Proposal</th>
<th>Statutory Requirements</th>
<th>Mitigation (prior to construction)</th>
<th>Mitigation (during construction)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960119 BO48</td>
<td>Daintree Cottage</td>
<td>Local</td>
<td>Moderate</td>
<td>Draft LEP item</td>
<td>Undertake consultation with LCC, maintain as many cultural plantings as possible and the access road. If cedar trees cannot be retained through further refinement of the design appropriate landscape to mitigate the impacts on this item is required.</td>
<td>Implement appropriate strategies following detailed design. Appropriate landscape mitigation of the detailed design at Daintree.</td>
</tr>
<tr>
<td>1960162 BO51</td>
<td>Emoh (Emu Store/ Corderoy’s Store), some limited likelihood of relics in area of water quality basin</td>
<td>State</td>
<td>None known</td>
<td>-</td>
<td>Undertake building condition survey.</td>
<td>Include induction training about heritage and archaeology remains. Include RMS Unexpected Finds procedure (July 2012) in Non Aboriginal Heritage sub-plan of the CEMP. Monitoring of vibration.</td>
</tr>
<tr>
<td>1960795 A027</td>
<td>Road culvert &amp; retaining Wall (Emoh culvert)</td>
<td>State</td>
<td>None</td>
<td>-</td>
<td>-</td>
<td>Map location and include the plan in the Non-Aboriginal heritage sub-plan of the CEMP. Induct construction work teams on the location of this item. Identify protective strategies and include in the Non-aboriginal heritage sub-plan as required.</td>
</tr>
<tr>
<td>1960120 BO49</td>
<td>Cottage</td>
<td>Local</td>
<td>None</td>
<td>-</td>
<td>Undertake building condition survey.</td>
<td>Map location and include the plan in the Non-aboriginal heritage sub-plan of the CEMP. Induct work teams on the significance of this item. Monitoring of vibration. May need to fence this area off.</td>
</tr>
<tr>
<td></td>
<td>Unknown relics in compound areas</td>
<td></td>
<td>Possibly S139(4) or S140 approval</td>
<td>Survey compound areas, identify if any constraints or areas to be avoided.</td>
<td>Identify appropriate management strategies.</td>
<td></td>
</tr>
<tr>
<td>SHI No/ LCC LEP No</td>
<td>ITEM NAME</td>
<td>Significance</td>
<td>Impact on Significance by Proposal</td>
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<tr>
<td>_</td>
<td>Unknown relics in water quality basins near Emoh and Cottage 1960116</td>
<td>_</td>
<td>_</td>
<td>S140 approval for water quality basins</td>
<td>_</td>
<td>Induction training for dealing with archaeological relics. Monitor construction works, undertake archaeological works as required. If remains found assess significance and undertake archaeological recording as recommended.</td>
</tr>
</tbody>
</table>
6.0 Bibliography

6.1 Bibliography

Casey & Lowe, September 2009, Phase 2 Corridor Options, Historic Heritage, Mt Victoria to Lithgow. Report for SKM on behalf of the NSW RTA.
Casey & Lowe, March 2011, Phase 2 Corridor Options Historic Heritage, Mt Victoria to Lithgow, Draft Report for Sinclair Knight Merz on behalf of the Roads & Traffic Authority.
Casey & Lowe, 2012a, Preliminary Archaeological Assessment & Research Design for Testing, Section 140 Excavation Permit Application, Bridge Party and Road Party Site, Great Western Highway, South Bowenfels, for Mount Victoria to Lithgow Alliance, March 2012.
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Casey & Lowe, 2012c, Archaeological Assessment and Testing, Bridge/Road Party Site, Great Western Highway, South Bowenfels, for Mount Victoria to Lithgow Alliance, July 2012.
Rosen, S. 2006a, Penal ideology and Nation Building on the Great Western Road, unpublished Heritage Assessment, Sydney.
Rosen, S. 2006b, “That Den of Infamy, the No. 2 Stockade Cox’s River”, An historical investigation into the construction, in the 1830s, of the Western Road from Mt Victoria to Bathurst by a convict workforce, unpublished PhD thesis for the University of Western Sydney.
APPENDICES LIST

Appendix 1: Additional historical research undertaken for portion 22.
Appendix 2: Extract of heritage items at South Bowenfels from Lithgow City Council Draft Land Use Study.
Appendix 3: Lithgow City Council Heritage Study inventory sheets relevant to the proposal.
Appendix 4: Archaeological Assessment and Testing, Bridge/Road Party Site, Great Western Highway, South Bowenfels.