Appendix E

Landscape character and visual amenity assessment
Roads and Maritime Services

Widening Bridge over the Bemboka River

Landscape character and visual impact assessment report
August 2013

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Executive summary

Introduction

Roads and Maritime Services (RMS) proposes to widen the bridge over the Bemboka River at Moran’s Crossing on the Snowy Mountains Highway 8.6 km east of Bemboka. The existing concrete bridge is listed in the RMS Section 170 Heritage and conservation register and assessed as having State significance. The proposed work includes

- A new bridge adjacent and parallel to the downstream edge of the existing bridge to widen the bridge by 6.0 to 6.5 m.
- Widening of road approaches involving additional cutting into the embankments in some places.
- A new sedimentation basin and at least two accidental spill basins.
- Relocation of a track that provides access for trucks to a water pumping point.

The landscape character and visual impact assessment is part of the project review of environmental factors and was undertaken in accordance with RMS (2013).

Landscape character and visual impacts

Landscape character impacts were considered for the highway near the bridge (low impact significance) and for the bridge curtilage where the proposed bridge will change the architectural character of a key landscape character element (high-moderate impact significance).

Key viewing opportunities were from the Snowy Mountains Highway, private farming land and the access track to the water pumping point. In addition, some views with glimpses of the existing bridge exist from parts of Polacks Flat Road approximately one kilometre from the bridge. Viewpoints were selected to represent the viewing experiences within the visible area.

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<th>Viewpoint</th>
<th>Key visual impacts</th>
<th>Significance</th>
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| V1 Snowy Mountains Highway – western approach | • Top of road and bridge double in width  
• Eastern spill basin may be highly contrasting depending on materials used (assumed that design will be adapted to avoid this situation) | Low (assumes recommendation 1 implemented)                                |
| V2 Snowy Mountains Highway – eastern approach  | • Top of road and bridge double in width  
• All spill and sediment basins may be visible and highly contrasting depending on materials used (assumed that design will be adapted to avoid this situation) | Low (assumes recommendation 1 implemented)                                |
| V3 Bemboka River private recreation space | • Minimal visual effect                                                                  | Negligible                                                                |
| V4 Driveway, Pyke residence           | • New bridge will obscure existing bridge and change character                           | Moderate                                                                  |
| V5 Triggel residence                 | • Minimal visual effect                                                                  | Negligible                                                                |
### Mitigation

Opportunities exist to further improve the proposal design in order to reduce the visual impacts. Recommendations relating to these are summarised below.

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<th>Recommendation</th>
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<td>1. That proposed sediment and spill basins be fully vegetated with native grasses on all surfaces.</td>
<td>Other finishes, particularly geotextile and concrete will contrast starkly with the surrounding landscape.</td>
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<tr>
<td>2. That native screen planting be established between the road and proposed sediment and spill basins where feasible.</td>
<td>The basins are likely to be visible as part of a sequential view, particularly when travelling west along the Snowy Mountains Highway. The basins will be seen together with the existing materials stockpile area.</td>
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<td>3. That the landowners to the south-east of the bridge be consulted about their preference for establishing new vegetation to screen views to the proposed bridge and embankment.</td>
<td>The existing bridge is a focal point in the view from the driveway and the proposal will alter the character of the view. New earthworks along the road embankment will be clearly visible.</td>
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<tr>
<td>4. That options be explored to create a publicly accessible viewing location on the northern side of the bridge.</td>
<td>The existing bridge has heritage significance. The southern elevation of the existing bridge will be obscured by the proposal. The northern elevation of the existing bridge will be less affected by the proposal. Creating a new viewing location on the northern side would offset the loss of visual amenity on the southern side.</td>
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<td>5. That the RMS Urban Design section review and collaborate with the RMS Bridge Design section to make the new bridge design as compatible as practical to the visual and landscape character of the existing bridge.</td>
<td>The current bridge design has adverse effects on the landscape character and views of the heritage bridge and its curtilage, particularly for the downstream elevation of the bridge.</td>
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### Conclusion

The proposal as described in the visual impact assessment results in some moderate-high impacts on the visual landscape, in particular for the landscape character in the bridge curtilage and moderate visual impacts for the property to the south-east of the bridge. Implementation of the recommendations for mitigation measures as detailed in this report would ameliorate or minimise these expected impacts to a low significance level. On balance the proposal is considered justified since low significance visual impact can be achieved.
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## Appendices

| Appendix 1       | Maps |
I Introduction

1.1 Purpose of the report

Roads and Maritime Services (RMS) proposes to widen the bridge over the Bemboka River at Moran’s Crossing on the Snowy Mountains Highway 8.6 km east of Bemboka (refer to Appendix 1 Map 1).

This landscape character and visual impact assessment (LCVIA) has been prepared by landscape architects Fresh Landscape Design on behalf of Roads and Maritime Services, Roads, Southern Region as part of the project review of environmental factors. For the purposes of these works, Roads and Maritime Services is the proponent and the determining authority under Part 5 of the Environmental Planning and Assessment Act 1979 (EP&A Act).

The purpose of the landscape character and visual impact assessment is to describe the landscape character and views in the vicinity of the proposal, to document the likely visual impacts of the proposal and to detail protective measures to be implemented.

Figure 1.1: Existing bridge at Bemboka River
I.2 Description of the proposed work

- A new bridge would be constructed adjacent and parallel to the downstream edge of the existing bridge at Moran’s crossing to widen the bridge by 6.0 to 6.5 m (refer to Appendix 1 Map 2).

- The new reinforced concrete bridge would be constructed using 1500 mm deep Super T Planks aligned to match the deck levels of the existing bridge. Refer to Figure 1.2 for images of bridges using similar materials. The bottom edge of the new beams would be flat and the Super T planks would cover nearly all of the view of the super structure of the existing bridge from the downstream side (refer to Figure 1.3).

- The piers of the new bridge would be circular in cross-section. They would be placed to align with some of the piers in the existing bridge. Fewer piers would be required in the new bridge.

- The approaches to the bridge would be widened to accommodate lane widths of 3.5 m and shoulders of 2.0 m for 420 m east and 590 m west of the existing bridge. Widening the road approaches would require additional cutting into the embankment in some places.

- A sedimentation basin and at least two accidental spill basins would be constructed in the locations shown on Map 2b (Appendix 1). The final surface finishes for these structures have not been determined but could involve geotextile fabric, concrete, rip-rap, placed rock and graded soil. Refer to Figure 1.4 for an example of a spill basin constructed with geotextile, concrete and rip-rap on the Federal Highway.

- The existing unnamed access track to the water pumping facility would be relocated as shown on Map 2b (Appendix 1).

- Tree and understorey vegetation clearing would occur on the southern side of the road to make space for the road widening, additional bridge structure and basins.

Figure 1.2: Examples of other bridges built with Super T Planks

(source: Roads and Maritime Services)
1.3 Methodology

The landscape character and visual impact assessment has been undertaken in accordance with EIA-N04 Environmental Impact Assessment Practice Note: Guideline for Landscape Character and Visual Impact Assessment (RMS 2013). The study area has not been divided into landscape character areas because the project is relatively small in extent with the scope limited to close proximity (within 1 km) of the bridge. The process followed was:

- Describe the proposed work (above).
- Describe the existing landscape character.
• Assess the landscape character impacts of the proposed work based on sensitivity and magnitude.
• Map the areas from where the proposal would be visible based on topography (visual envelope map).
• Identify key viewpoints.
• Assess visual impacts for the viewpoints based on assessments of sensitivity and magnitude.
• Identify opportunities for mitigation of adverse impacts.

Assessment of landscape character and visual impact and their significance is a subjective judgement. The RMS methodology involves assessment of impact based on a rating of sensitivity and magnitude, which are then combined using a matrix to give a significance rating (RMS 2013 p.7).

Sensitivity

For landscape character, sensitivity is a judgement related to the susceptibility of the key elements that form the character of that landscape to the type of changes proposed and the value attached to the landscape. It has been assumed that wild or tranquil landscapes are likely to be highly valued and sensitive to change. Other indications of high value landscapes are areas recognised at a national, state or local level, mentioned in tourism literature or identified through community consultation.

In the case of visual impact, sensitivity relates to the capacity of the view to absorb change, the type of viewers, number of viewers, direction of view, quality of view and composition. It has been assumed that the most sensitive views are likely to be ones seen by people engaged in outdoor recreation, visitors to heritage assets and travellers along scenic routes where views are an important part of the experience, occupiers of residences with views affected by the proposal, and communities and workers where views are an important contributor to the landscape setting. Less sensitive views are likely to be ones seen by people engaged in activities that do not involve appreciation of views of the landscape, travellers and workers who are not likely to notice views.

Sensitivity has been rated as high, moderate, low or negligible.

Magnitude

Assessment of magnitude for landscape character impact has been based on the scale, form and character of the proposed work when compared with the existing condition. It has been assumed that large-scale changes that introduce new, discordant or intrusive elements to the landscape will have a higher magnitude than small changes or changes involving replication of features already present.

The assessment of magnitude for visual impact considers the scale of the change in the view including the proportion of the view occupied by the proposal, the degree of visual contrast or integration with the existing landscape elements, the angle of the view in relation to the main activity of the viewer and the distance of the viewpoint from the proposed work.

The magnitude of the effect has been rated as high, moderate, low or negligible.
Visual envelope map

A visual envelope map for the proposal was modelled using ArcGIS 10 (3d Analyst) using a combination of field data, ground truthed NSW Land and Property Information (LPI) data and data provided by the client (refer to Appendix 1 Map 3). A 25 m resolution digital terrain model (DTM) was obtained from NSW Land and Property Information (LPI) for visual envelope analysis within 10 km. The distance limit is considered adequate given the local topography and nature of the proposal. The visual envelope analysis was based on the estimated bridge height at the time the modelling was carried out (November 2012) using 10 m contours and available design specifications. The visual envelope analysis used default earth curvature and light refraction settings. The resolution of the DTM (25 m) and contour interval (10 m) means that the visual envelope map should be used with some uncertainty and supplemented with other methods of analysis such as ground truthing and photomontages. Furthermore, the visual envelope map ignores the screening effects of vegetation.

Fieldwork

Fieldwork was undertaken on 17 December 2012. Based on the visual envelope map findings and preliminary ground truthing, the survey area was limited to roads and residences within one kilometre of the existing bridge. Observations were recorded at 12 locations in the survey area (refer to Appendix 1 Map 4 for observation points). Photographs were taken using a 35mm SLR digital camera with the lens set at 55mm, which closely represents the central vision of the human eye. Weather conditions were lightly overcast. Locations were recorded using a handheld GPS unit. Supplementary fieldwork for viewpoint 8 was undertaken on 14 August 2013.

Photomontages

Photomontages were prepared for viewpoints where the visual impacts were likely to be highest. Photomontages are digital simulations of how a view might appear with the proposed development in place. Representations of the proposed structures are superimposed onto a photograph of the view. The photomontages are an artist's representation of what the proposed development might look like based on the proposed infrastructure at the time of preparation. Infrastructure types and locations shown in the photomontages may vary from that actually built. Montages were prepared to show what the proposed bridge upgrade might look like after several years when batters are stabilised.
2 Landscape character impact assessment

2.1 Existing landscape character

2.1.1 Bemboka valley

Bemboka Bridge is located on the Snowy Mountains Highway approximately 7 km from the small town of Bemboka. The bridge crosses the Bemboka River, a permanent river flowing through the rural landscape of the Bemboka valley. Moran’s Crossing is set low in the landscape and surrounded by tall trees.

The landscape of the Bemboka valley in the vicinity of the Bemboka Bridge is rolling grazing land, cleared to pasture with scattered farm houses, rural buildings, wire fences and clumps of trees. The Bemboka valley is encircled and enclosed by forested ranges. While visible, the built structures are not intrusive and the topography and vegetation provide the dominant landscape character elements.

Figure 2.1 Typical rural landscape character in the Bemboka valley

2.1.2 Snowy Mountains Highway near Bemboka Bridge

The Snowy Mountains Highway has a sealed surface with two lanes. Near the bridge it curves and undulates through the rural setting of the valley and passes through a number of small road cuttings.

The landscape character of the river near the bridge is rural in appearance with tall stands of indigenous trees along the banks. A row of poplars to the north of the bridge provides a strong vertical element in the view. Vegetation on the southern side of the bridge appears damaged and patchy in places.

The bridge is located at a relatively low elevation in the landscape (approximately level with the top of the river banks) with the landform and vegetation rising up around it to create an enclosed spatial quality. Areas of open water and large rounded boulders sit within the flat river corridor interspersed by patches of low shrubs.

The key elements contributing to the landscape character of the highway in the vicinity of the bridge (refer to Figures 2.2, 2.3 and 2.4) are:
• size and materials of the road surface
• occasional road cuttings of modest proportions
• rolling landform, well covered with grass and scattered clumps of large trees
• brief glimpses along the river from the bridge
• low and unpretentious barrier treatment on the sides of the bridge.

Figure 2.2 Snowy Mountains Highway near Bemboka Bridge

Figure 2.3 Snowy Mountains Highway at Bemboka Bridge
2.1.3 Bemboka Bridge curtilage

No mention of the bridge environs for tourist or community recreational purposes has been found in contemporary tourism information. While the character of the bridge is relatively unremarkable when driving along the highway, the side elevations provide a distinctive and attractive cultural element that is pivotal to the landscape character of the small area along the river from where the bridge is visible.

The existing concrete bridge was built in 1937 and is listed in the RMS Section 170 Heritage and conservation register and assessed as having State significance. It has an elegant appearance with curved soffits along the bottom of the beams, tapered octagonal piers, box type abutments and a low concrete kerb with steel crash barriers along the sides. A full architectural description of the existing bridge is available in Statement of Heritage Impact: Widening Bridge Over Bemboka River (nghheritage, May 2013).

The residence closest to the bridge is approximately 280 m east of the bridge and another is situated approximately 900 m north of the bridge. Neither house is visible from the bridge curtilage.

The key elements contributing to the landscape character of the area around the bridge (refer to Figure 2.5) are:
- elegant proportions and lines of heritage bridge
- attractive colour contrast between bridge materials and surrounding landscape
- expanses of water and rounded boulders, softened by vegetation
- tall stands of trees along banks
- sense of enclosure and serenity.
2.2 Landscape character impacts

The landscape character impacts have been considered for two areas in the immediate vicinity of the bridge due to limits in scope of this report. These areas were selected on the basis of their proximity to the proposed work.

2.2.1 Snowy Mountains Highway near bridge

The landscape character of the highway near and on the bridge has a low sensitivity to changes that introduce road and bridge elements similar to those already existing both in the vicinity and wider afield. In addition the rural character established by the topography, road, vegetation and river has the capacity to absorb some low contrast changes due to its variable qualities.

The proposed bridge widening will enlarge existing road cuttings, widen the road pavement areas near the bridge, change the bridge surface from concrete to asphalt, increase the size of the side barriers, add sediment/spill basins and remove some vegetation. These changes are consistent with the scale, materials and character commonly seen in the area.

An exception would be if the sediment/spill basins were finished with shotcrete (unresolved at the time of writing). This design choice would introduce materials and form contrasting with the existing landscape character. It is recommended and expected that the final design will avoid this outcome.

The changes proposed for the landform and vegetation are relatively small in scale and consistent with the existing character of the highway. The overall level of impact to landscape character experienced on the highway near the bridge will be low.

Sensitivity: Low
Magnitude: Low
Overall level of impact: Low (assumes no shotcrete)
2.2.2  Bemboka Bridge curtilage

The landscape character in the river area beside the bridge is highly sensitive to changes in the style and appearance of the bridge. The bridge is a defining and historic element.

The vegetation element is less sensitive to change since it already a disturbed environment involving rural clearing and introduction of exotic plants. Recent clearing of willows in the creekbed has already changed the vegetation in recent times. Some of the remaining trees immediately downstream from the bridge appear in poor condition and the groundcover vegetation is disturbed by vehicle movements.

Other elements contributing to the landscape character in this area will remain relatively undisturbed by the proposed work.

The design of the proposed bridge extension has already been adapted to reduce the magnitude of the landscape character changes. For example, the deck level of the new bridge matches the existing, the piers are aligned with the existing piers, the colour of the materials is similar and the bridge has been located where vegetation is in poor condition. The magnitude of the proposed change is moderate due to the proposed bridge design being sympathetic in scale and elevation to the existing bridge but contrasting in line and architectural detail.

Given the high sensitivity of the landscape character to changes in the bridge architecture, the landscape character impact of the proposed bridge widening for this area is high-moderate.

Sensitivity: High
Magnitude: Moderate
Overall level of impact: High-Moderate

It is recommended that the RMS Urban Design section review and collaborate with the RMS Bridge Design section to make the new bridge design as compatible as practical to the landscape character of the existing bridge.