APPENDIX D  BEMBOKA BRIDGE URBAN DESIGN REPORT
BEMBOKA BRIDGE UPGRADE
URBAN DESIGN REVIEW
April 2014

DRAFT
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1. Introduction

NSW Roads and Maritime Services (RMS) intends to widen the bridge at Moran’s Crossing south west of Bemboka (refer Figure 1). The existing bridge deck will carry traffic in one direction, and a new bridge will be constructed to sit adjacent and run parallel with the existing bridge to allow higher mass limit vehicles to use the bridge in both directions.

The existing bridge is listed on the RMS’ Section 170: heritage and conservation register and is considered of historic significance on a state level (RMS 17 April 2009).

This report addresses the aesthetics of the preferred bridge design and its compatibility with the existing structure in accordance with RMS’ Bridge aesthetics guideline (July 2012, refer Figure 2). The preferred bridge design and alternative design options prepared by RMS’ Bridge Engineering and RMS’ Centre for Urban Design are included in appendices A and B.

A more detailed description of the proposal is provided in the Preliminary environmental investigations Bemboka Bridge duplication November 2012. The broader visual impacts of the proposal are considered in the draft Visual impact assessment report 2013.

2. Objectives

The objectives for the bridge design are:
- Respect the aesthetic values of the existing bridge and views to and from it.
- Produce a good combined outcome aesthetically in accordance with RMS’ Bridge aesthetics guideline (July 2012).
- Protect the ecological value of the area.
- Provide a safe, cost effective and fit for purpose outcome.

3. Existing bridge

Bemboka River Bridge was built in 1937 and is listed on the RMS’ Heritage and conservation register. RMS’ statement of significance states that the bridge is visually distinctive as a 1930s concrete beam bridge and its good condition and pleasing appearance represents the high technical achievement embodied in bridges of its class.

The existing bridge comprises four (4) sets of concrete piers supporting a concrete arched structure above, which supports the roadway. The piers are octagonal in shape and taper in towards the caps. The bridge is 7.0m wide and spans a total distance of 92.2m (Refer Figures 3-6).
4. Proposed new westbound bridge

The proposed new concrete bridge structure will sit adjacent to the existing bridge on the southern side (downstream). It will feature two precast concrete piers supporting four (4) Super T Girders (refer Figures 7, 8, 9 and 10).

A wire rope safety barrier will divide the two directions of traffic on the new widened roadway. Eastbound traffic will use the existing bridge and westbound traffic will use the new bridge (refer to Figure 7).

A number of options were considered in arriving at the preferred concept and discussions were held between RMS and the Office of Environment and Heritage. The preferred option has been developed with a view to minimising the impact on the existing bridge and the existing environment.

Key elements of the proposed bridge design:

- Simple round column piers provide a straight forward, unadorned structure, which is in contrast to the distinctive tapered octagonal shaped braced twin piers of the existing structure (refer Figure 8).
- The piers are founded directly into rock and avoid the need for exposed pile caps, simplifying the number of elements and allowing the structure of the existing bridge to remain visible.
- The depth of the girders is less than the depth of the existing arch structure and will retain some visibility of the arch structure when viewed from downstream (southern elevation). (Refer Figures 8 and 10).
- The number of spans is reduced compared to the existing bridge. This increases the visibility of the existing piers, abutments and bridge structure.

Refer Appendix A for further details of the preferred bridge design and Appendix B for details of the alternative pier designs considered during the design development phase.

Figures 12, 14, 16 and 18 illustrate the proposal in context with the existing bridge.

Refer Appendix A for further details of the preferred bridge design and Appendix B for details of the alternative pier designs considered during the design development phase.

Figures 12, 14, 16 and 18 illustrate the proposal in context with the existing bridge.
The illustration shows the new bridge with the depth of the deck approximately the same as the existing structure. Wider spacing of piers enables views of the existing structure. Simple round column piers do not compete with the more complex octagonal geometry and shaped capitals and cross ties. The new piers are founded on rock, avoiding the need for exposed pile caps and keeping the number of new elements to a minimum.
Photomontage 1 - downstream looking north east

When viewed from downstream, the existing bridge structure will be partly obscured by the new bridge. However, wider spans will enable views of the existing piers upstream of the new bridge. The shape of the new piers does not try to compete with the slim tapered octagon shaped existing piers. The curved soffit and abutment of the existing bridge are still visible behind the new bridge.

Figure 13 – View of existing bridge from downstream looking north east

Figure 14 – Photomontage 1 - Proposed bridge from downstream looking north east
Photomontage 2 - downstream looking south east

The new bridge is mostly obscured behind the existing structure when viewed from upstream.
Photomontage 3 - view from eastern approach looking west

Photo montage 3 is an edited version of the photo montage included in the draft Visual impact assessment 2013. The edited version shown here indicates an asphalt finish to the road surface of the existing bridge rather than a concrete finish shown in the draft Visual impact assessment.
5. References


NSW Land and Property Information. Aerial photo.

RMS Centre for urban design (2012) Bridge aesthetics design guideline (July 2012).

RMS (2009). Section 170: heritage and conservation register (17 April 2009)