9.3 OLD GOULBURN RIVER BRIDGE - FUTURE WORKS

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File No: CM18/353

Attachments:
1. Detailed Design for Pedestrian Structure
2. Structural Timber Rehabilitation Plan
3. Old vs. New Bridge Refurbishment Methodologies
4. Cable Stabilisation Works
5. Rehabilitation and Refurbishment Preliminary Cost Estimate
6. Statement of Heritage Significance

SUMMARY

To update Council on the progress of impending works to complete stabilisation works of the Old Goulburn River Timber Bridge structure.

This report also outlines the previous design work prepared for the future rehabilitation and re-use of the timber heritage structure and seeks approval from Council to re-engage with the community for the review and advancement of these designs.
RECOMMENDATION

THAT Council:

1. Progress work on the Old Goulburn River Bridge as per the project stages below;
   
a) Complete Stage 1 works to stabilise the timber structure.

b) Engage with the local community for the review of the bridge rehabilitation plan (as per Attachment 2) and the original refurbishment plan (as per Attachment 1) and revised refurbishment plan (as per Attachment 3).

c) In partnership with the community, review, update and finalise detailed design plans and costings for the rehabilitation and refurbishment of the bridge utilising the funding committed in the 2018-2019 Capital Works program.

d) Obtain a new permit from Heritage Victoria for the proposed works.

e) Continue to seek external grant funding for the rehabilitation and refurbishment works.

f) Stage 2 works – Rehabilitation of damaged and deteriorated timber elements (timing TBC subject to funding)

g) Stage 3 works – Refurbishment i.e. installation of new pedestrian structure and ancillary works (timing TBC subject to funding)

BACKGROUND

Engineers Structural Assessment and Detailed Design

In 2007 an Engineers Report was prepared which assessed the structural condition of the timber structure and contemplated a plan to stabilise, secure and rehabilitate the Old Goulburn River Bridge with a view to potentially use the bridge as a pedestrian-only bridge at a future time.

The report identified the following stages of works to achieve this long-term goal;
• Remove damaged and decaying elements of the bridge including the existing bitumen road surface, timber decking, cross beams and guard rails
• Restoration and refurbishment of timber bridge components including piers, cross bracing and cross-head beams;
• Installation of a pedestrian-only bridge structure utilising two (2) of the seven (7) existing steel I-beam girders as well as salvaged decking timber deemed suitable for re-use.

In 2010 an Engineers specification and detailed design was prepared which detailed the above works. Following this, a Heritage Permit was issued in October 2010 which would allow Council to undertake these works.

An extract from this design package is shown in Attachment 1 depicting the general arrangement for the installation of a pedestrian bridge structure utilising the existing timber sub-structure (pier sets) and some reclaimed superstructure elements including steel girders and timber decking.

The extent to which public consultation was conducted for these designs is not known to officers.

2014 Stabilisation Works

In June 2014 Council engaged a contractor to carry out works on the historic structure to stabilise and secure the bridge from further deterioration. These works involved the removal of the bridge superstructure including bridge decking and kerbing, guard railing, cross beams and the main steel I-beam girders.

As these works progressed, it became apparent that the bridge structure had deteriorated beyond the extents that were originally understood and that works could not progress due to safety concerns with the stability of the remaining structure.

Heritage Victoria also raised concerns with the methodology being used by the contractor to perform these works as it was inherently different to the methodology recommended in the 2007 Engineers Report. As a result, these works were suspended immediately.

Heritage Victoria subsequently requested that an updated Engineering inspection of the bridge be undertaken by GMR Engineering Services to establish the current condition of the bridge and whether the current refurbishment techniques and methodology were compatible with the state of deterioration of the structure and the current heritage permit.

2015 Engineers Structural Assessment

In January 2015 GMR Engineering Services was engaged to undertake a structural assessment of the heritage bridge. The scope of these works was to:

• Determine the structural capacity of the remaining structure including piles and piers, through non-destructive condition assessments;
• Design review of the original refurbishment proposal as documented by GMR in 2007;
• Provide advice on the appropriateness of proceeding with this original refurbishment design with regard to the current condition and level of deterioration of the bridge and the existing heritage permit; and

• To give consideration to deploying an alternative refurbishment methodology with consideration for the current condition and level of deterioration of the bridge.

The Engineers report found that the bridge structure had deteriorated considerably since the last structural assessment in 2007. It found the deterioration is partly due to the continued natural decay of the various bridge elements, but also from the mechanical damage that resulted from a number of uncontrolled collapses of steel I-beam girders as part of the 2014 stabilisation works.

Despite the obvious visual degradation of some structural elements, the report also suggests that the majority of the pile x-sections are likely to remain intact and are structurally sound below water level and below ground level.

The report concludes that while many elements of the bridge remain sound, some elements of the previous refurbishment methodology may no longer be appropriate or applicable for this now weakened structure and an alternative methodology should be pursued.

Attachment 2 details the timber elements in need of replacement or rehabilitation in order for the timber structure to be deemed fit for re-use as a pedestrian bridge.

Design review of previous works methodology

The previous refurbishment design involved the re-use of the some of the existing steel beams, the cross beams and some of the timber decking. This refurbishment methodology would rely on the support provided by the remaining steel I-beam girders (2 girders to remain in place) to provide lateral support and restraint to the pier sets. Unfortunately, the progressive deterioration of the structure since the previous Engineers assessment has made that an unlikely proposition. The review concluded that very little (if any) of the superstructure (ie. beams, cross beams and timber decking) is now recoverable.

Further, the Engineers report found that the retention of these steel girders could be detrimental to the health of the bridge due to the sheer weight of the girders. The report concluded that if the existing refurbishment methodology were to be retained, the substructure (ie. the piles and piers) will require significant strengthening and upgrading works which may warrant the replacement or rehabilitation of much of the timber structure. A likely consequence being that very little of the original structure will be retained.

Refurbishment Methodology Review

A key departure from the original refurbishment methodology is the exclusion of the use of the existing rolled steel girders in the final refurbishment, both a) as a means of reducing risk liability associated with these heavy structural elements remaining in place while refurbishment is carried out and b) by reducing the dead load on the remaining timber structure into the future.
Whilst it is accepted that these steel beams represent an important element in the timeline of this heritage bridge, the alternative methodology (which retains all other timber elements of the bridge) is considered to be a complementary alternative that will allow future works (if funded) to enhance the remaining timber structure.

The revised bridge refurbishment would involve the installation of lightweight trussed bridge beams in lieu of the existing main steel girders and the installation of lighter weight bridge decking in lieu of reclaimed timber decking.

A comparison of the existing and proposed refurbishment methodologies is shown in Attachment 3.

With the removal of the existing steel I-beams from the future rehabilitation plans, which would have provided interim lateral support to the structure until the ultimate refurbishment of the structure could take place, an alternative system to provide lateral support to the bridge structure is required.

Stabilisation Works

With the findings of the 2015 Engineers report and in consultation with Heritage Victoria, a proposal to secure the stability of the bridge using a system of cables spanning the length of the bridge and anchored to either side of the river has been designed and documented.

With a bracing system in place, works to secure the bridge from further deterioration can re-commence. These works are identified as Stage 1 works and will include;

- The implementation of the bridge bracing system as documented in Attachment 4;
- Removal of all remaining steel girders, timber cross beams, decking and guardrail;
- Application of a waterproofing membrane to all exposed upper faces of structural cross head beams.
- Abutment areas adjacent to the structure will also be cleared of remaining debris to ensure public access to these areas and the reinstatement of river front paths.

A tender was recently released for the completion of these stabilisation works and submissions are currently under evaluation. It is expected that a report will be prepared for the June Council meeting for the award of these works.

FUTURE ACTION

If Council resolves the recommendation officers will undertake the actions for the future stabilisation, rehabilitation and refurbishment of the timber heritage bridge;

FINANCIAL, RESOURCE AND ASSET MANAGEMENT IMPLICATIONS

Stage 1 Works

The following table summarises the project funding allocated to the Old Goulburn River Bridge – Stabilise and Secure project
The following table is a summary of the current financial position for the Old Goulburn River Bridge Project.

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<th>Item</th>
<th>Amount</th>
</tr>
</thead>
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<tr>
<td>Income</td>
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<tr>
<td>Expenditure (Life to Date)</td>
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<tr>
<td>Total Remaining Budget</td>
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</tr>
</tbody>
</table>

**Stage 2 and 3 Works**

As part of the 2015 GMR report, a schedule of costs for the bridge rehabilitation and refurbishment was prepared. These total costs for the complete refurbishment of the bridge structure are estimated at $925,000. It is noted that this estimate encompasses a project contingency of just 5% which is well below the recommended contingency amount for a project of this type and complexity. A contingency of 20% is considered more appropriate for a project of this type and complexity given the current phase of the project.

The draft preliminary cost schedule, shown in Attachment 5, assumes the works would be completed as a single continuous project.

Due to the significant investment required to deliver the Stage 2 and 3 works in a single package of works, coupled with the practical limitations of combining these two phases of works, it is recommended that a staged approach is adopted for the rehabilitation and ultimate refurbishment of the historic bridge.

**Asset Management Implications**

Prior to making a future commitment towards the rehabilitation and refurbishment of this timber heritage structure (Stage 2 and 3 works), it is the officer’s recommendation that a detailed Whole of Life cost analysis be undertaken and that a Business Case be prepared to assess the merits of a full refurbishment of the bridge including its role in the wider off-road trail network.
POLICY AND LEGISLATIVE IMPLICATIONS

The *Heritage Act* 2017 places obligations on all owners of a State-significant property place (including local councils) to maintain it to the extent that its conservation is not threatened, and to ensure that is does not fall into a state of disrepair. Recent legislation changes now mean the State Government has stronger powers to enforce repairs if it is deemed that future preservation is under threat.

Council also has obligations under the *Planning and Environment Act* 1987 which include a role in the identification, protection and management of heritage places. Council should be setting an example for heritage sites under its management / ownership as a benchmark for heritage properties places in private ownership.

The Statement of Significance for the Old Goulburn River Bridge is shown in Attachment 6 of this report.

PROJECT RISKS

A project of this type and complexity contains numerous risks, both physical, financial and reputational.

- Stabilisation works may reveal additional deterioration of the bridge structure beyond that which is currently understood resulting in additional costs to rehabilitate the bridge.

- Timber is natural building material and is subject to natural defects which may be obscured for visual inspection. Further, the timber elements of the existing structure are over 100 years old and have been exposed to cycles of wetting and drying for their entire life. Therefore, it is impossible to definitively determine the condition of some timber elements which may result in risk of failure of some timber elements.

- A large flood could destroy the bridge.

- The investment in the bridge structure may be considered by some community members as a misallocation of public funds.

- Members of the public may consider that there are higher priorities for off-road path infrastructure in and around Seymour.

- In the absence of a clear and definitive plan for an off-road trail network on the North side of the Goulburn River, the merits of the bridge refurbishment may be questioned by some members of the community.

- Members of the public may be frustrated by the apparent lack of progress on this project.
SUSTAINABILITY IMPLICATIONS (SOCIAL AND ENVIRONMENTAL)
No sustainability implications associated with the contents of this report.

CHARTER OF HUMAN RIGHTS IMPLICATIONS
The rights protected in the Charter of Human Rights and Responsibilities Act 2006 were considered in preparing this report and it’s determined that the subject matter does not raise any human rights issues.

CHILDREN AND YOUNG PEOPLE IMPLICATIONS
Not applicable.

OFFICER DECLARATION OF CONFLICT OF INTEREST
No officers involved in the preparation of this report have any direct or indirect interest in this matter.

CONCLUSION
In 2010 an Engineers specification and detailed design was prepared which detailed a rehabilitation and re-use plan for the Old Goulburn River Bridge.

With the passage of time and the documented decline in the condition of the bridge, a review of this rehabilitation and refurbishment plan is appropriate.

Officers propose to conduct a review of this work in partnership with the community ahead of ongoing grant seeking efforts to secure funds to complete rehabilitation and refurbishment work.
MITCHELL SHIRE COUNCIL

Council Meeting Attachment

DEVELOPMENT AND INFRASTRUCTURE

20 MAY 2019

9.3
OLD GOULBURN RIVER BRIDGE - FUTURE WORKS

Attachment No: 1
Detailed Design for Pedestrian Structure
Mitchell Shire Council
Refurbishment of Heritage Timber Bridge over the Goulburn River
at Seymour, Victoria