7 REPORTS DIRECT TO COUNCIL

7.4 INFRASTRUCTURE SERVICES

7.4.5 PROPOSAL TO RETAIN EXISTING PICKERING BRIDGE, MOY POCKET

File No: Statutory Meeting

Author: Project Coordinator
Infrastructure Services Department

Attachments:

PURPOSE

A late request has been received from community members to retain the existing old timber bridge, known as the Pickering Bridge, over the Mary River at Moy Pocket which spans the border between Sunshine Coast Regional Council and Gympie Regional Council. The purpose of this report is to present for Council's consideration the benefits, risks and costs of retention, and recommends that council remove the old bridge as proposed in the construction program which involves the replacement of the old low level timber bridge with a higher level, two lane concrete bridge.

EXECUTIVE SUMMARY

At council's Ordinary Meeting 14 September 2011 (OM11/218) council resolved to accept Department of Transport and Main Roads special funding offer of $3,000.000 to replace the existing low level, single lane timber bridge with a higher level, two lane concrete bridge with the balance of costs to be funded by Sunshine Coast and Gympie Regional Councils, based on a shared cost for the bridge structure, and each council paying for the road works components on either side of the bridge. The special funding offer from Department of Transport and Main Roads was made as this bridge is part of a vital haulage route this bridge that serves the nearby Boral quarry and will be used extensively to provide rock to the ongoing Bruce Highway upgrades.

During the design phase for the new bridge, council consulted with members of the local community in 2011 and 2012 regarding requests to both avoid a large area of native vegetation, and if possible to retain the existing timber bridge for use as a pedestrian bridge. Council was able to design the bridge approaches to avoid the native vegetation, at considerable extra cost to the Sunshine Coast Regional Council by changing the location of the new bridge to be downstream of the old bridge, however was not supportive of the retention of the existing bridge based on the design engineer's recommendation. The new bridge was thus designed with sufficient width to cater for both heavy vehicle and pedestrian movements.

Council has received renewed requests to retain the existing timber bridge for use as a pedestrian bridge and to seek to preserve the heritage values of the old timber bridge, which requires council consideration given this option is not supported by the engineering consultants nor is it budgeted for. Further, the new bridge is due to be completed by the end of 2013, and retention of the old bridge will now require some further design and modeling work as well as increased amount of site works, for which there is no current budget.

It will also then require an ongoing commitment by council to fund the annual maintenance of the old bridge.

Should the bridge be retained, council will also need to plan for future demolition of the structure, as it is estimated that even with the maintenance the remaining life is only 20 years being a timber structure.

OFFICER RECOMMENDATION

That Council:

(a) receive and note the report titled "Proposal to Retain Existing Pickering Bridge, Moy Pocket"

(b) authorise the Chief Executive Officer to continue with the removal of the existing Pickering Bridge as part of the current Pickering Bridge replacement project, as originally planned in the project scope and

(c) give consideration to recognising the heritage value of the existing bridge through reusing timbers in a form that serves local community benefit, request the Chief Executive Officer to progress some concepts for future budget considerations.

FINANCE AND RESOURCING

The $4,000,000 project is currently funded through $3,000,000 received from Department of Transport and Main Roads, $900,000 from Sunshine Coast Regional Council and $100,000 from Gympie Regional Council. Essentially the cost of the bridge structure is funded by the $3,000,000 from the Department of Transport and Main Roads, the additional costs apportioned to Sunshine Coast Regional Council is broadly due to:

- Approach works - $400,000
- Additional approach works to avoid vegetation - $350,000
- Wider shoulder lanes over bridge - $75,000
- Appropriate standards of construction - $60,000
- Provision of river access - $15,000
- TOTAL - $900,000

Gympie Regional Council is understood to be recommending that no financial costs or liabilities be accepted by their council in terms of this proposal, and at the stage of writing this report, are intending to consider a report at their forthcoming ordinary council meeting to ratify their position.

Council has been in contact with Boral Quarries who have made an informal verbal offer of $3,000 per year over twenty years for the ongoing bridge maintenance, which will need to be formalised.

Should this council opt to retain the existing bridge the overall costs would be a total of $285,000 over twenty years.

The cost is made up of:

- 2013/2014 - extra capital cost - $150,000
- Annual maintenance cost per year for twenty years - $5,000 p.a. totalling $100,000
- Future demolition cost - - $35,000

  TOTAL - $285,000

The project would need an increased capital allocation for completion in this current financial year of $150,000, for which no funding source has been identified at this point in time. If council were to approve retention of the old bridge, then an increased funding allocation will be required through the next budget review process. Further an increased annual allocation for maintenance will be requested through the 2014/15 budget development process.

Should council wish to retain the bridge it would be proposed that the cost apportionment over twenty years be on the basis that:

- Funds be provided from Boral - $60,000 (to be confirmed)
- Gympie Regional Council (expected to decline as a funding partner) - $0
- Sunshine Coast Regional Council - $225,000

Should Gympie Regional Council agree to be a partner, as the current joint owner of the bridge, then council's contribution will decrease to $112,500.

CORPORATE PLAN

Corporate Plan Theme: ***Robust Economy***
Emerging Priority: 1.3 - Infrastructure for economic growth
Strategy: 1.3.1 - Facilitate the delivery of key infrastructure projects for our preferred economic growth

Corporate Plan Theme: ***Accessibility and connectedness***
Emerging Priority: 6.1 - A transport system that allows ease of movement
Strategy: 6.1.2 - In partnership with all levels of government, build and maintain a high quality transport network

Corporate Plan Theme: ***Managing growth***
Emerging Priority: 7.5 - Council's services and assets meet the needs of our growing community
Strategy: 7.5.3 - Maintain and renew council assets to agreed standards

CONSULTATION

Internal Consultation

Internal consultation was undertaken with:

- Division 10 Councillor
- Executive Director Infrastructure Services
- Transport and Engineering Services Manager

External Consultation

External consultation was undertaken with:

- Gympie Regional Council
- Boral Quarries

Community Engagement

During the preliminary design stage, Council's Project Coordinator consulted with local community members to discuss the project including alignment options and the option to keep the existing timber bridge as a pedestrian access. The outcome of the consultation included aligning the new bridge to ensure the approach is not constructed through a highly vegetated park area. The cost to align the bridge to avoid the vegetation as requested by the community came at an additional cost of to the Sunshine Coast Regional Council of approximately $250,000, in reality it has ultimately cost significantly more due to unsuitable material found in excavation. The option to keep the existing bridge was also considered however was rejected at the time given concerns over risks due to lack of balustrades, ongoing maintenance costs and potential damage to the new bridge should the existing bridge fail in floods. This original decision to remove the old bridge was made in writing to the community member who had lead much of the engagement in August 2012, nine months ahead of the commencement of construction.

In July 2013 Sunshine Coast Regional Council received a renewed request from a local Gympie community member suggesting that there was strong resolve in the community seeking to retain the existing timber bridge (Attachment 1). In summarising the basis for the request, in their opinion:

- the old bridge would be safer for pedestrians to use to cross the river rather than share the new bridge with large number of heavy vehicles
- the popular sand bank on the Gympie side is best accessed by parking on the Sunshine Coast side and walking along the old bridge
- keeping the bridge would retain heritage character and
- the old bridge is likely to withstand floods without incident due to the sturdy construction.

Council has also received communication from a local Kenilworth resident (Attachment 2) and the Kenilworth District and Chamber of Commerce reiterating the comments above (Attachment 3).

Gympie Regional Council officers were consulted who have advised of receiving a similar request to retain the existing timber bridge. Gympie Regional Council's initial response at the time was that they would not support the retention of the existing bridge as they have a policy of not retaining old timber bridges following replacement on the grounds of high maintenance costs.

It is understood that a petition has been presented to Gympie Regional Council for their consideration and the matter is being presented to their current round of council meetings.

Subsequent to Gympie Regional Council's initial response, the community furthered their efforts with Sunshine Coast Regional Council's Division 10 Councillor who sought discussions with council officers on the process of retaining and funding the retention of the existing bridge.

Council staff's view has been consistently put forward stating that the design proposal for the new bridge and the budget associated within it, does not include retention of the old bridge due to the costs and the ongoing maintenance liabilities and risks.

Council's Division 10 Councillor also joined in communications with the community member seeking funding from Boral Quarries on the basis that the nearby quarry is a major user of the local road network.

Additional community consultation occurred during the construction phase regarding the specific requirements for river users and in particular a local kayak business operator to allow his business to maintain access to the river.

PROPOSAL

Engineering review of option to retain existing bridge
In response to the local community request, council sought the expert engineering opinion from Tod Consulting Engineers to carry out a safety and risk assessment and a cost versus benefit analysis of keeping the existing bridge, as attached to this report (Attachment 4).

The key points from the engineering consultant's report are summarised below:

a) Many parts of the existing bridge are in poor condition and require immediate repair.

b) The existing bridge does not meet standards for pedestrian safety and would require either handrails, or signage and/or temporary barriers for events.

c) The scour protection for the new bridge requires the existing bridge to be removed or partially removed and reconstructed to allow placement of the scour protection.

d) Should the existing bridge fail in event of a flood event there is risk that the new bridge could be damaged. To reduce this risk the engineer has nominated rock anchors be installed to tie down the existing bridge.

e) The estimated costs to repair, modify and maintain the existing bridge is $285,000 over twenty years.

f) The life of the bridge with repairs and ongoing maintenance is likely to be twenty years.

Ultimately the engineer's recommendation is to remove the existing bridge and maintain safety of public using the new bridge during community events.

Yet to be considered through flood modelling is the potential for upstream flooding should the existing bridge remain. The new bridge has been designed for zero upstream flooding, however the retention of the old bridge is likely to restrict water flow increasing upstream flooding and increasing water velocities around both bridges causing greater risk of scour (Attachment 5).

The current plan for demolition of the bridge would allow the decking timbers to be reclaimed and reused for other bridge structures, as they are only around 7 years old. Should the old bridge fail in a flood, these may be lost.

Features of new bridge
The features of the new concrete bridge includes two 3.3 metre traffic lanes, a 1.6 metre shoulder lane on the upstream side where pedestrians are more likely to cross, a 1.2 metre should on downstream side. The deck level is approximately 4 metres above the level of the existing bridge and the posted speed over the bridge is 60km/hr.

The realignment of the new approach allows the existing approach road on Sunshine Coast Regional Council side to act as a safe access to the park area and will also allow for all wheel drive vehicles and pedestrians to gain close access to the river bank. Adjacent the new bridge abutment concrete paths will allow access to the water's edge on the southern bank. The alignment of the paths has been chosen through consultation with the community member and a local kayak business operator.

Gympie Regional Council's position
Gympie Regional Council is understood to have received a petition from the local community to retain the existing bridge which is to be reported to their current round of council meetings. It is understood that the officer recommendation to Gympie Regional Council is that '*Gympie Regional Council advise Sunshine Coast Regional Council that it would not accept any financial costs, legal liabilities or other risks associate with the old Pickering Bridge on Moy Pocket should it be retained after completion of the new bridge'*. Officers will provide a verbal update to Council on Gympie's position at the Council Ordinary meeting.

Funding
The current $4,000,000 project is funded through $3,000,000 from Department of Transport and Main Roads, $900,000 from Sunshine Coast Regional Council and $100,000 from Gympie Regional Council. The higher costs apportioned to Sunshine Coast Regional Council is largely as a result of the longer approach road following this council's option to avoid the vegetation as per the strong representation by the community. The lower costs to Gympie Regional Council are largely out of a lesser extent of works on their side plus opting for a lesser standard design for some elements to their approach due to budgeting issues.

Gympie Regional Council is expected to reject any financial liability to retain the existing bridge. Should this council opt to retain the existing bridge the overall costs would be $285,000 over twenty years part funded by Boral Quarries who made an informal verbal offer of $3,000 per year over twenty years.

The informal offer from Boral Quarries is as a result of requests from the local community member and Division 10 Councillor. The verbal financial offer was made in a conference call between Council officers, Division 10 Councillor and representatives from Boral Quarries and is yet to be substantiated in writing.

Recognition of existing heritage value of existing bridge
Whilst not the preferred option by community advocates, there may be opportunity to recognise the heritage value of the existing Pickering Bridge through a number of means such as signage in the local park and / or reuse of some of the old timbers in a manner that is supported by the community and respectful to the site and the structure.

Legal

Legal matters associated with retaining the existing bridge are considered to be in relation to a duty of care to ensure the bridge is maintained and safe for the use allowed in particular given the Gympie Regional Council's position to remove itself from all liabilities and risks. Council will need to ensure that the old bridge is maintained in a safe state to allow ongoing access by members of the community.

Policy

There are no policy implications with this proposal however it may set precedence for the bridge replacement program

Risk

Council has a responsibility to maintain its bridges in good order. The option to retain the existing bridge binds Council to continuing to maintain the bridge to mitigate this risk noting this risk extends to include the portion of the bridge on Gympie's side.

A range of key risks have been considered in the Tod Consulting report and are summarised as follows:

- Many parts of the existing bridge are in poor condition and require immediate repair
- The existing bridge does not meet standards for pedestrian safety and would require either handrails, or signage and/or temporary barriers for events
- The scour protection for the new bridge requires the existing bridge to be removed or partially removed and reconstructed to allow placement of the scour protection
- Should the existing bridge fail in event of a flood event there is risk that the new bridge could be damaged. To reduce this risk the engineer has nominated rock anchors be installed to tie down the existing bridge
- The estimated costs to repair, modify and maintain the existing bridge is $285,000 over twenty years
- The life of the bridge with repairs and ongoing maintenance is likely to be twenty years

Retention of the old bridge will cause a delay in the current construction program, potentially pushing the completion date into the new year, and coinciding with the wet season, with an increased risk of costs and wet weather impacts.

Previous Council Resolution

(OM11/218) Ordinary Meeting 14 September 2011

That Council:

(a) receive and note the report titled "Mary River Bridge, Moy Pocket – Department of Transport and Main Roads Funding Proposal";
(b) request the Chief Executive Officer to write to the Department of Transport and Main Roads advising that the contribution with conditions in accepted; and
(c) request the Chief Executive Officer to write to Gympie Regional Council to advise that Council will manage the project on behalf of both Councils subject to written agreement that any cost overruns above $3million will be funded 50/50.

Related Documentation

Tod Consulting engineers report dated 3 September 2013.
Photos of existing bridge.

Critical Dates

The project is in its final stages of construction. The decision to remove the bridge is required to ensure the project remains on time.

The decision to retain the existing bridge will increase the overall project duration with potential for other delay costs.

Implementation

The option to remove the existing bridge would be implemented through the current project team established for the construction of the new bridge. Should Council opt to retain the old bridge it would cause delay to the current program while flood modelling is checked, designs amended and additional resources and activities to make initial repairs and modifications.

The Chief Executive Officer
Sunshine Coast Council
Locked bag 72
Sunshine Coast Mail Centre Q4560

July 22 2013

RE: Request to retain the old Pickering Bridge for safer river access at Moy Pocket.

Dear Sir

I write further to my letter of September 25, 2011, a subsequent on-site meeting with Council staff and consultants, and a subsequent letter from Adam Britton in relation to the Pickering Bridge at Moy Pocket.

Council would be aware of the substantial volume of heavy truck traffic that uses Pickering Bridge to access the Boral quarry at Moy Pocket. While this is somewhat limited at present, both in volume and speed, my concern was that the new (two-lane as opposed to single-lane) bridge would see considerably more trucks travelling at much greater speed.

My initial request had been that the new bridge, currently under construction, include a pedestrian walkway to alleviate these safety concerns, but an on-site meeting raised the possibility of retaining the old bridge solely for pedestrian access.

Council staff and consultants undertook to investigate this possibility, one which was warmly supported by those at the meeting.

In his letter of August 31, 2012, Project Coordinator Adam Britton advised that Council had decided against a separate pedestrian lane and further that:

"The option of leaving in place the original timer bridge and adapting it has also been considered. However this has been discounted for a number of reasons, including the cost to make it compliant with the regulations for use of pedestrians and especially in accordance with the Disabled Discrimination Act; the ongoing maintenance issues associated with upkeep of the bridge; and the potential for increased debris accumulation from having two bridges in close proximity."

Since that letter I have discussed those reasons with many in the community and find there is a strong resolve to have Council retain the old bridge.

Safety.

On the issue of safety, it seems almost laughable that pedestrians may currently use the single bridge, mixing it with trucks and general traffic, but as soon as the vehicles are removed from the equation, it becomes unsafe for walkers. It would not be a purpose –built pedestrian access but rather a retained bridge which would present pedestrians with an option.

That option is important. While the width of each lane on the new bridge will be 3.5 metres, it will not be uncommon for two trucks to pass, at speed, on the bridge, travelling in opposite directions. This is not a good situation for pedestrian to be in. To be able to amble, untroubled, across the old bridge would present a much safer alternative.

Pedestrian access **across** the river.

The need for a pedestrian access across the river arises from two factors. There is very little room for vehicle parking on the northern bank, most parking is to the south. Many then walk across the bridge to get to the 'sandy beach".

The other factor is that the Mary is becoming increasingly popular for kayakers with the sections from Kenilworth to Pickering Bridge and from Pickering Bridge to Walker Road being two of the most popular sections. As a

passing motorist I often encounter people sitting on the bridge waiting for kayakers to arrive by river or for fellow kayakers to arrive ready to paddle downstream.

At the annual Brownwater Classic the bridge is used by up to 100 excited pedestrians, of all ages, to carry their boats to the starting line and then as a vantage point to watch the race.

Improved river access.

Improved access to the river was one emerging theme in the Mary Valley Renewal Plan and council has the unique opportunity to assist in this by retaining the old bridge.

Ongoing upkeep.

Pickering Bridge is a wooden bridge sturdy enough to have withstood the relentless onslaught of heavily-laden quarry trucks for over a quarter of a century. It has had substantial deck replacements on two occasions during that time. It is not a clapped-out old country bridge. With the load reduced to foot traffic, there is no reason why it shouldn't be able to stay in service for many more years.

Potential for increased debris accumulation.

Pickering Bridge is one of the few major river bridges in the area that has not been swept away by flooding in the past thirty years. This is generally attributed to partly its sturdy construction but equally to its being a low-level bridge. Although this means that it floods readily, it also means that most of the debris borne along in the floodwaters passes well over it, without incident. The new bridge by virtue of its extra height will be far more likely to accumulate debris in its own right.

Retention of heritage character.

We are gradually replacing all our old wooden bridges which really are quite marvels of construction, a tribute to their builders and an important reminder of out river heritage. This could help to address that loss.

River stability.

Council has received advice that removal of the pylons from the old bridge has a good chance of increasing river instability at the site, though bed lowering. Recent erosion both upstream and downstream, along with lowering of the upstream flood channel earlier this year show that the river has become far from stable in this reach.

Council is presented with a choice and an opportunity in this matter.

It can choose to force the inevitable pedestrians to use the new high-level bridge, in the full knowledge that the frequency, speed and heavy nature of the vehicles using it place them at considerable risk.

Alternatively it can help to provide a river experience that is free of such risk, that connects with our heritage, that provides the chance to spot a platypus, dangle a fishing line or simply throw blackbean pods off the bridge and watch them pass under it.

There is a growing feeling of community support to come out to save the old Pickering Bridge.

In recent media article council referred to having undergone community consultation in planning the new bridge. We ask that it listen to the community voice in also retaining the old one.

Yours

Mackay

Ian Mackay

cc Cr Greg Rogerson Sunshine Coast Council, Cr Wayne Sachs Gympie Regional Council, Cr Julie Walker Gympie Regional Council, Mary River Catchment Coordinating Committee, Kenilworth Chamber of Commerce.

Roads/Projects/Bridges
D: 21410 R: 10 X Emk
Inbox Infrastructure General

Elli Schlunke

13 October 2013

The C.E.O.
Sunshine Coast Regional Council

SCC CORRESPONDENCE
X0059136

RECEIVED
17 OCT 2013
SCRC Caloundra

Dear Sir

Re: The E. Pickering Bridge.

I would like to voice my support for the proposal to keep the old timber bridge at Moy Pocket, as it is such a valuable asset to the local community.

I live on Moy Pocket Gap Connection Road and I am amongst many who utilise this old bridge and regard it with affection and respect. It has lasted so long, even with heavy quarry vehicles pounding over it many times a day.

With no pedestrian access on the new bridge, there will be no safe way for pedestrians to cross the river. Perhaps more importantly, there will be extremely limited access to the river itself, which we have always had until now, and which is being encouraged as a high priority in the Mary Valley Renewal Plan.

Surely, once the vehicular traffic no longer uses it, its maintenance for pedestrian use would be greatly minimised. As for safety, it would definitely be a lot safer for pedestrians, families, people fishing or enjoying annual community events, than it is at present.

I consider that, along with the nearby small park with its magnificent black bean trees, the old bridge would continue to be a well-used and appreciated recreational asset. And it already exists. It would be a terrible waste to demolish it, when it could go on being a tremendous asset for the local community as well as the many visitors to this area.

The old low timber bridges are becoming rare, and I think this would be a really good one to save, not only for its future usefulness, but also as a preserved piece of the history of this area.

I would encourage the Council to find a way to keep the bridge for a better future.

Thank you for your time.
Yours sincerely,

Eschlunke

(1)

KENILWORTH AND DISTRICT CHAMBER OF COMMERCE AND CITIZENS INC.

kenilworth
HEART OF THE MARY VALLEY

The CEO
Sunshine Coast Council
Locked bag 72
Sunshine Coast Mail Centre Q4560

Re :- Pickering Bridge, Moy Pocket Road . Gheerulla
KENILWORTH

Dear Sir/Madam
It has been brought to our attention that the old Pickering Bridge across the Mary River will be removed once the new bridge is completed.

We request that the bridge be retained for the following reasons.

- The crossing at Pickering Bridge is popular with picnickers, fishermen and swimmers. The river there is quite accessible unlike other parts of the river
- The section from Pickering Bridge down to the next road crossing at Walker Road is regarded by kayakers as one of the best sections to kayak.
- Kenilworth's economy is increasingly reliant on tourist visitation. The Mary River and its unique creatures is a drawcard which is only beginning to be appreciated.
- A similar retained wooden bridge on the north Maroochy River near Yandina (George Best Park) provides a good working model of what is possible for Pickering Bridge and has good visitation.
- As this bridge is on the boundary of Sunshine Coast Council and Gympie Regional Council, it could be utilized by residents and visitors to both shires.

Could you please pass this on to relevant councillors and authorities for their consideration

Yours sincerely
18/10/2013

Kathy Mullins
Secretary

1513
X 21410 10

TOD consulting engineers

EXISTING TIMBER BRIDGE, MOY POCKET RD, MOY POCKET STRUCTURAL ENGINEER REPORT – PROPOSED USE AS PEDESTRIAN BRIDGE

DOCUMENT NO: 12660_RP1

REV	DATE	DETAILS	AUTHOR	CHECKED	
A	25-8-2013	Preliminary issue for discussion	CD	CD	
B	3-9-2013	Issue for general use	CD	SP, AB	

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Executive Summary

In 2010, Tod Consulting was engaged by the Sunshine Coast Council (SCC) to report on the existing timber bridge crossing the Mary River, on Moy Pocket Rd at Moy Pocket. Our assessment advised that the existing bridge is unable to safely carry road traffic, which includes 44-50 tonne quarry trucks from the local Boral-owned quarry. Construction of a replacement road bridge has commenced, and this will be completed before the close of 2013.

Once road traffic is transferred onto the new bridge, the existing timber bridge will not be required for its current function. The local community has expressed an interest in retaining the existing bridge for recreational events.

Background

- Imposed loads would reduce to approximately 20% of current road traffic loads, if the bridge use was changed to pedestrian traffic.
- The bridge is located on the boundary between Sunshine Coast Council (SCC) and Gympie Regional Council (GRC).

Taking the Safety & Risk Assessment (Section 2), and Cost versus Benefits Assessment (refer Section 3) into account, Tod Consulting strongly recommends the following actions so that:

a) Public safety is maintained
b) Community events can be held without putting adults and children at risk
c) The local community's predominate link road is maintained
d) Supply of road construction gravels (from the quarry) are unhindered, so that Councils and State Government can maintain and extend vital road networks, throughout the Sunshine Coast and Gympie Regions
e) Costs to the two Councils (SCC and GRC) are kept at a reasonable level, proportionate with the benefits of the bridge(s) to their collective communities

ACTIONS TO TAKE

1. **REMOVE THE EXISTING BRIDGE**

2. **MAINTAIN SAFETY DURING COMMUNITY EVENTS**

1.0 Introduction and Background

In 2010, Tod Consulting was engaged by the Sunshine Coast Council (SCC) to report on the existing timber bridge crossing the Mary River, on Moy Pocket Rd at Moy Pocket. A locality plan can be seen in Appendix A. Our assessment advised that the existing bridge is unable to safely carry road traffic, which includes 44-50 tonne quarry trucks from the local Boral-owned quarry.

Construction of a replacement road bridge has commenced, and this will be completed before the close of 2013. Once road traffic is transferred onto the new bridge, the existing timber bridge will not be required for its current function.

The local community has expressed an interest in retaining the existing bridge for recreational and events. The object of this report is to investigate this possibility from safety and engineering points of view.

Background

The existing bridge is of timber girder construction (refer Appendix C for elevation and section):

- 3.6m nominal width between kerbs with a single traffic lane
- 6 spans long, each span 9.1m nominal
- 4 x hardwood girders to each span, varying size, some round, others octagonal, 450-500mm nominal diameter
- 2 x headstocks to each pier and abutment, 290mm deep x 170mm wide hardwood
- 3 x hardwood support piles to each pier and abutment, varying size, 350-400mm diameter
- Timber piles are braced with diagonal timber bracing down to water level. There is no bracing below water level
- SCC carried out a reconstruction of the bridge in 2003 and installed new decking, girders, corbels and headstocks on the Spans 1,2 and 3. The girders for Span 4 were also replaced. The best sections of the removed old decking from these spans were used to replace the worst of the decking on spans 5 and 6. Tod Consulting understands that diagonal pile braces and support piles were not replaced; nor were the span 5 & 6 girders, corbels and headstocks.

- Deck level is RL 9.97 according to survey provided by SCC. River bed is nominally 4.1-4.9 m below the bridge deck level. Water level on day of inspection was 3.2 m below bridge deck level
- Anecdotal advice from the adjacent Boral (formerly Sunshine Coast) quarry suggested that the bridge is overtopped by flooding of the Mary River one to four times a year. This correlates with separate anecdotal advice from SCC's bridge maintenance crew, who advise that they need to clear flood debris off the bridge an average of three times a year

- Imposed loads would reduce to approximately 20% of current road traffic loads, if the bridge use was changed to pedestrian traffic.

- The bridge is located on the boundary between Sunshine Coast Council (SCC) and Gympie Regional Council (GRC).
- The south eastern half of the bridge (Spans 1, 2 and 3) is the responsibility of SCC. The north-western half of the bridge (Spans 4, 5 and 6) is the responsibility of GRC.

- Weekday traffic volumes in 2010 were approximately 300 vehicles in each direction (600 total) per day. Approximately 40% of the traffic was truck traffic, presumably from the quarry. To put this into perspective, during the peak hour on Monday, there were an average of 3.1 vehicles every 5 minutes.
- On weekends, traffic volumes dropped to 167 vehicles in each direction (334 total) per day on Saturday and 112 in each direction (224 total) per day on Sunday.

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2.0 Safety and Risk Assessment

Risks

All actions involve risk, and there would be risks associated with keeping the existing bridge for community events. We've used the risk assessment matrix shown in Appendix D for our assessment.

Where shown in this report, costs are preliminary estimates for comparison purposes only. For detailed costs, it would be necessary to document detailed Engineering solutions and arrange for estimates or tenders from an Estimator or Contractor. GST is NOT included. Costs do not allow for inflation; nor has an allowance been made for loan interest on capital expenditure.

2.1 Risks to Community safety (if the existing bridge is kept)

2.1.1 Existing bridge condition

A number of timber members are in poor condition, on Spans 5 and 6. Even with the reduced loading, there is a possibility of partial collapse, because these members will continue to dilapidate. The bridge is most likely to have issues when it is heavily loaded, such as during a community event.

Likelihood:
- Possible – might occur at some time

Consequences:
- Major – serious injuries likely to numerous people

Risk Level:
- Extreme – immediate action required to reduce risk

Options to reduce risk:

1. Substitute: Replace or strengthen members in poor condition (see Appendix C for list). Capital estimate: $15,000 OR

2. Isolate: Demolish spans 5 and 6 to reduce the risk, effectively converting the bridge to a jetty. It is noted that the community wants a complete bridge. Capital estimate: $15,000

3. Eliminate: Demolish the bridge to eliminate the risk. Temporarily close the new bridge to road traffic for community events. Capital estimate: $35,000

2.1.2 Lack of handrails and potential falls

The bridge is 4.9m above the river bed at the deepest part of the river. Water levels vary depending on time of year, but it can be less than 1 metre deep at times. There are a number of Standards that could be applied to this bridge to assess handrail requirements. In our opinion, AS2156 Australian Standard for Walking Tracks is the most appropriate, as it includes allowance for footbridges, lookouts and other structures in various settings.

Track classification: Class 3 (Users need no bushwalking experience and a minimum level of specialized skills. Users may encounter natural hazards such as steep slopes, unstable surfaces and minor water crossings. They are responsible for their own safety.)

Warrant for permanent handrails (Table 2, AS2156.2): Provide Type C Barrier (900mm height, 2 x rails only, no infill required)

Risks if permanent handrails weren't provided

While duly noting the above AS2156.2 recommendation, we have carried out a risk assessment to evaluate the risks if handrails weren't provided. Note that the fall height is sufficient for serious injury of someone who unaware of the risks.

Likelihood of someone falling:

- Rare but might occur, at times when only one or two people are on the bridge
- Possible to almost certain, during a community event with numerous people on the bridge, including children

Consequences:

- Moderate to Major – serious injury possible, particularly to young children

Risk Level:

- Moderate to High at normal times when only one or two people are on the bridge;
- Extreme during events when numerous people are on the bridge

Options to reduce risk

1. Engineer: Install permanent handrails on existing bridge.

   Option A: provide Frangible/fall-over type barriers, such as Brifen wire rope barrier or steel barrier with hinge mechanism. These would require some form of reinstatement after each flood event, by replacing bent posts if wire rope barrier was used, or by replacing broken shear pins on every post if hinged steel barriers were used. Capital cost $40,000+ with ongoing repair costs of several thousand dollars per year); OR

   Option B: provide heavy barriers with RHS cross member in decking – capital cost $95,000+. These would increase the bridge's "sail" area during a flood, and increase the risk of bridge overstress and collapse. We do NOT recommend option B.

2. Administrate:

   Normal users – Install Council-provided warning signage and line markings to guide normal users to stay away from edges of bridge. Capital estimate: $5000

   Large community events (>20 people, or such number as agreed between Council and the event organisers) – require all community event organisers to install temporary water-filled barriers or other approved type across the bridge,

   Smaller community events (<20 people, or such number as agreed between Council and the event organisers): require organisers to induct each attendee in safe procedures (working at heights, manage children at all times, stay away from edge, follow line markings) and require them to sign a waiver, such as the type used at motoring events
   ; OR

3. PPE: install safely wire along centre of bridge, and require community event organisers to provide lanyard type harnesses for each attendee to wear. Not practical due to imposed cost to community event organisers; OR

4. Eliminate: Demolish the bridge to eliminate the risk. Temporarily close the new bridge to road traffic during community events to allow safe pedestrian access across new bridge. Capital cost: $35,000

Of these options, options 2 and 4 are the most feasible in our opinion. Option 2 would need to be carefully reviewed by Council's legal representatives to ensure wording of signage and waivers are suitable.

2.1.3 Risk of people being on bridge in rising flood event

The existing bridge is overtopped by flood waters 2-3 times a year. If the bridge was kept, some people may stand on it to watch rising floodwaters. This section looks at the risks:

Likelihood of someone falling:

- Possible, given that people would probably stand near the edge to look at the flowing water

Consequences:

- Major to Catastrophic – as a person would fall into rapidly flowing flood waters, serious injury or death could occur

Risk Level:

- High to Extreme – preventative action must be taken

Options to reduce risk:

1. Administrate: Provide warning signs at access points to bridge, and/or further away along Moy Pocket Rd. Unfortunately, this is unlikely to deter some people. This option would need to be carefully reviewed by Council's legal representatives to ensure wording of signage is suitable

2. Isolate: Provide locked gates at the approaches to the bridge, which are only unlocked for community events. These gates would need to be heavy construction, to resist flood loads including debris and logs. Capital estimate: $10,000

3. Engineer: Provide frangible/fall-over type handrail barriers per previous section. Capital cost $40,000+ with ongoing repair costs of several thousand dollars per year

4. Eliminate: Demolish the bridge to eliminate the risk. Capital estimate: $35,000

2.2 Risks to Council assets (if the existing bridge is kept)

2.2.1 Impact on scour protection of new bridge

To reduce the risk of flood damage to the new bridge, the design requires:

- 1 in 4 slopes (batters) extending out to each side at each Abutment (end) to minimise accelerations in water flow velocities over the approach roads to the new bridge, and
- Heavy rock laid over the ground as armour to protect against scour (washing away of soil). Excessive scour must be managed and prevented, as it could cause serious overloading of the support piles for the new bridge

The end spans of the existing timber bridge get in the way of the above requirements. It is not acceptable to reduce these requirements. The risks to the new bridge approaches and abutments would be high to extreme if the above requirements were not constructed.

Options to minimise risk to new bridge

1. Substitute: Update flood study model to check flood levels (affluxes) and velocities are not changed significantly by the combined blockage of the existing bridge and new bridge. Modify the existing timber bridge to accommodate the 1 in 4 batters and heavy rock armour. Remove and reconstruct span 1 and 6 of the existing bridge to suit, installing new

timber piles and headstocks. Shorten existing timber girders and reinstall. Capital estimate: $65,000

2. Eliminate: Demolish the bridge to eliminate the risk. Temporarily close the new bridge to road traffic for community events. Capital estimate: $35,000

2.2.2 Flood loads and possible overturning

The existing bridge piles are in a variety of conditions, from poor to fair condition. Embedment depth into the river bed is unknown. The existing bridge superstructure members are in a variety of conditions, from very poor to good. There is a possibility that a significant portion of the existing bridge could break apart during a flood event, and strike the new bridge, which could cause overloading and damage to concrete surfaces, the barriers, and the kerb.

Likelihood:
- Possible, might occur at some time

Consequences:
- Major, repair costs for new bridge of $100,000+, repair costs for old bridge of $300,000+

Risk Level:
- Extreme

Options to reduce risk:

1. Engineer: Tie the existing bridge down. Install tiedown rock anchors to upstream piles of existing bridge. Tod Consulting recently recommended this for a bridge in the Gympie Region, and it has been implemented recently. Capital estimate: $10,000 per bridge pier to be tied down x 5 piers = $50,000

2. Eliminate: Demolish the bridge to eliminate the risk. Capital estimate: $35,000

2.2.3 Maintenance of existing bridge

If the existing bridge was kept in place, the structure would need to be maintained, for public safety reasons. This would involve:
a) Replacing dilapidated members from time to time, and
b) Maintaining termite baits at each end of the bridge.

We estimate an average annual cost as follows:

- Structure maintenance estimate: $5000 per year

Due to the sporadic nature of timber dilapidation, this cost may not be incurred every year, but larger costs will be incurred every few years. It is intended to be an average cost.

2.3 Benefits to keeping the existing bridge

There would be a several benefits in keeping the existing bridge, but the principal one is a means of cross-river access that is free of traffic for pedestrians and community event attendees, who may wish to cross the river for various reasons:

- Recreational walking
- Vantage point for community events
- Fishing

We compare the traffic risk to pedestrians in Table 1.

Table 1: Traffic risks to pedestrians

	Existing bridge kept in place	Existing bridge removed, new bridge open to road traffic
Likelihood of pedestrians being hit by traffic	Rare – may occur in rare circumstances	Possible – might occur at some time
Consequences if pedestrians hit in vicinity of bridge(s):	Major injury or death	Major injury or death
Risk Level:	Low to Moderate	High to Extreme, particularly during events with numerous people (if new bridge open to traffic at same time). Recommend closing the new bridge to traffic during community events.

Accordingly, there is a reduction in traffic risk levels to pedestrians, if the existing bridge were kept in place. But if the existing bridge was removed, the risk to pedestrians during community events could be managed by closing the new bridge to traffic.

3.0 Cost versus Benefits Assessment

As detailed in Section 2, there would be a number of costs, risks and benefits associated with keeping the old bridge.

The costs would need to be shared between the two Councils (SCC and GRC) who are responsible for the bridge. The risks would need to be shared by the two Councils and the community. The benefits would be shared by the community.

All of the risks identified in Section 2 must be managed, so that:

a) Public safety is maintained
b) Community events can be held without putting adults and children at risk
c) The local community's predominate link road is maintained
d) Supply of road construction gravels (from the quarry) are unhindered, so that the Councils and State Government can maintain and extend vital road networks, throughout the Sunshine Coast and Gympie Regions
e) Costs to the two Councils (SCC and GRC) are kept at a reasonable level, proportionate with the benefits of the bridge(s) to their collective communities

Taking all of the risk management options from Section 2 into account, we compare the lowest cost alternative of keeping the bridge versus removing it, in Table 2.

Table 2: Comparing lowest cost alternative of keeping the existing bridge, versus removing it

Keep the existing bridge	Remove the bridge
Bridge condition: Use Substitution - replace members in bad condition (refer Appendix C). Capital estimate: $15,000	Bridge condition: Use elimination - remove the bridge. Capital estimate = $35,000
Fall risks: Use Administration - use signage and line marking. Capital estimate: $ 5,000	Fall risks: Use elimination - remove the bridge
Keep people off bridge during flood event: Use Administration. Use same signage as for fall risks	Keep people off bridge during flood event: Use elimination - remove the bridge
Protect new bridge with batters (slopes) and rock protection as designed: Use substitution - modify existing bridge ends to suit with new piles. Capital estimate: $65,000	Protect new bridge with batters (slopes) and rock protection as designed: Use elimination – remove the bridge
Prevent old bridge from overturning and hitting new bridge: Use engineering – install tiedown anchors at each pier. Capital estimate: $50,000	Prevent old bridge from overturning and hitting new bridge: Use elimination – remove the bridge
Maintain existing bridge during proposed service life – assume 20 years. Maintenance estimate: $5000 per year x 20 years = $100,000	Maintenance of existing bridge not required
Protect pedestrians from traffic: Use isolation - keep the existing bridge in place as a pedestrian route. Build safe access paths across rock armour to bridge. Capital estimate = $15,000	Protect pedestrians from traffic: Use administration and isolation - arrange for community events to be scheduled for weekends outside quarry hours to minimise traffic/pedestrian risks. Require event holders to induct all attendees in safety procedures, manage children at all times, to wear high visibility vests and cross new bridge using wider shoulder on upstream side. For larger events with more people (say 20 or more), arrange for temporary closure of the new bridge for safe pedestrian access for duration of event.
Demolition of bridge at end of service life to protect new bridge from damage: $35,000	
TOTAL ESTIMATED WHOLE OF LIFE COST: $ 150,000 now + $5000 maintenance per year x no. of years required to be in service (say 20 years) + demolition of bridge at end of service life $35,000 = **$285,000**	**TOTAL ESTIMATED WHOLE OF LIFE COST**: $ 35,000 now + ongoing administrative cost of closing road bridge during large community events (say $4000 per year x 20 years) = **$115,000**

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4.0 Conclusions

Taking the Safety & Risk Assessment of Section 2, and Cost versus Benefits Assessment of Section 3 into account, Tod Consulting strongly recommends the following actions so that:

a) Public safety is maintained
b) Community events can be held without putting adults and children at risk
c) The local community's predominate link road is maintained
d) Supply of road construction gravels (from the quarry) are unhindered, so that Councils and State Government can maintain and extend vital road networks, throughout the Sunshine Coast and Gympie Regions
e) Costs to the two Councils (SCC and GRC) are kept at a reasonable level, proportionate with the benefits of the bridge(s) to their collective communities

ACTIONS TO TAKE

1. **REMOVE THE EXISTING BRIDGE**

   The existing bridge has a number of inherent risks with significant costs to manage. In our opinion, public safety and amenity during community events would be better maintained by action 2 below, than by keeping the existing bridge. In addition, the risks to the new bridge will be lower if the existing bridge is removed.

2. **MAINTAIN SAFETY DURING COMMUNITY EVENTS**

   We suggest the following:

   Set up a simple phone call procedure for community event organisers to arrange for one/both Councils to advertise and close road and/or use Traffic controllers to control traffic for events held during weekend hours (outside of quarry operating hours). This is to ensure that attendees, particularly children, can cross the road and new bridge without risk of being hit by traffic.

   Closures could be largely subsidised by the Councils, with a small charge to each community organisation to ensure event commitment. The risk to pedestrians attending each event would be managed, and the cost (estimated at $4000/year x 20 years = $80,000) is much lower than other alternatives:

   a) the additional construction costs for new bridge, if a dedicated walkway had been designed (estimated at $210,000 for extra bridge width + protective barrier), or
   b) the whole of life cost required to maintain the existing bridge (estimated at $285,000)

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Appendix A – Locality plan

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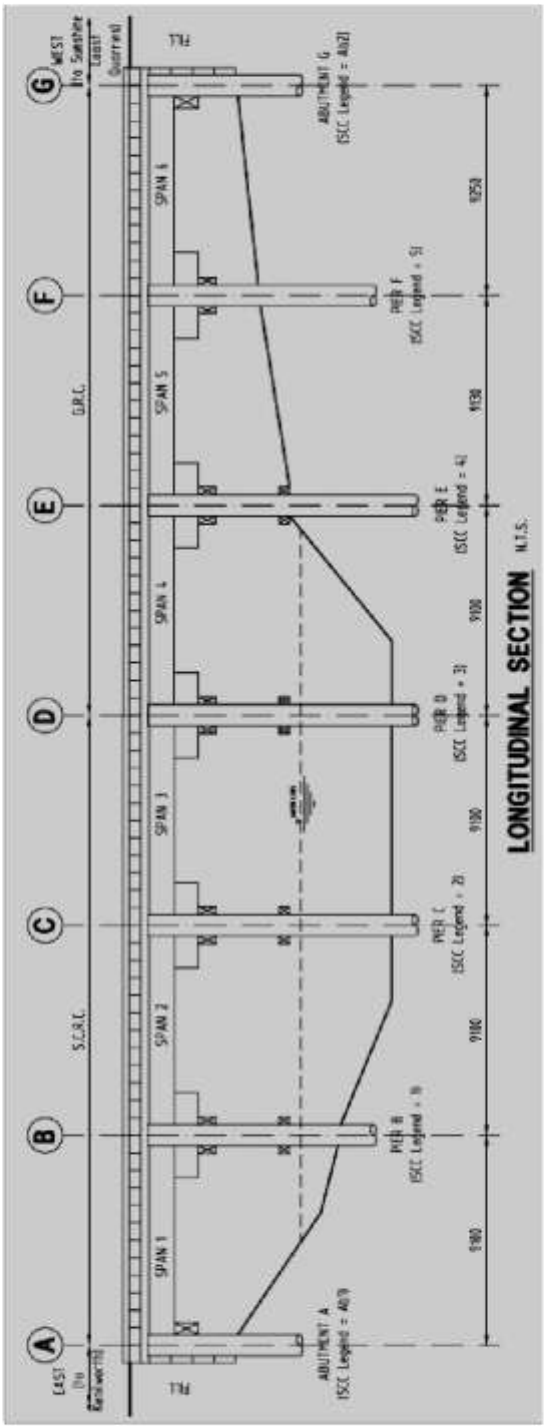
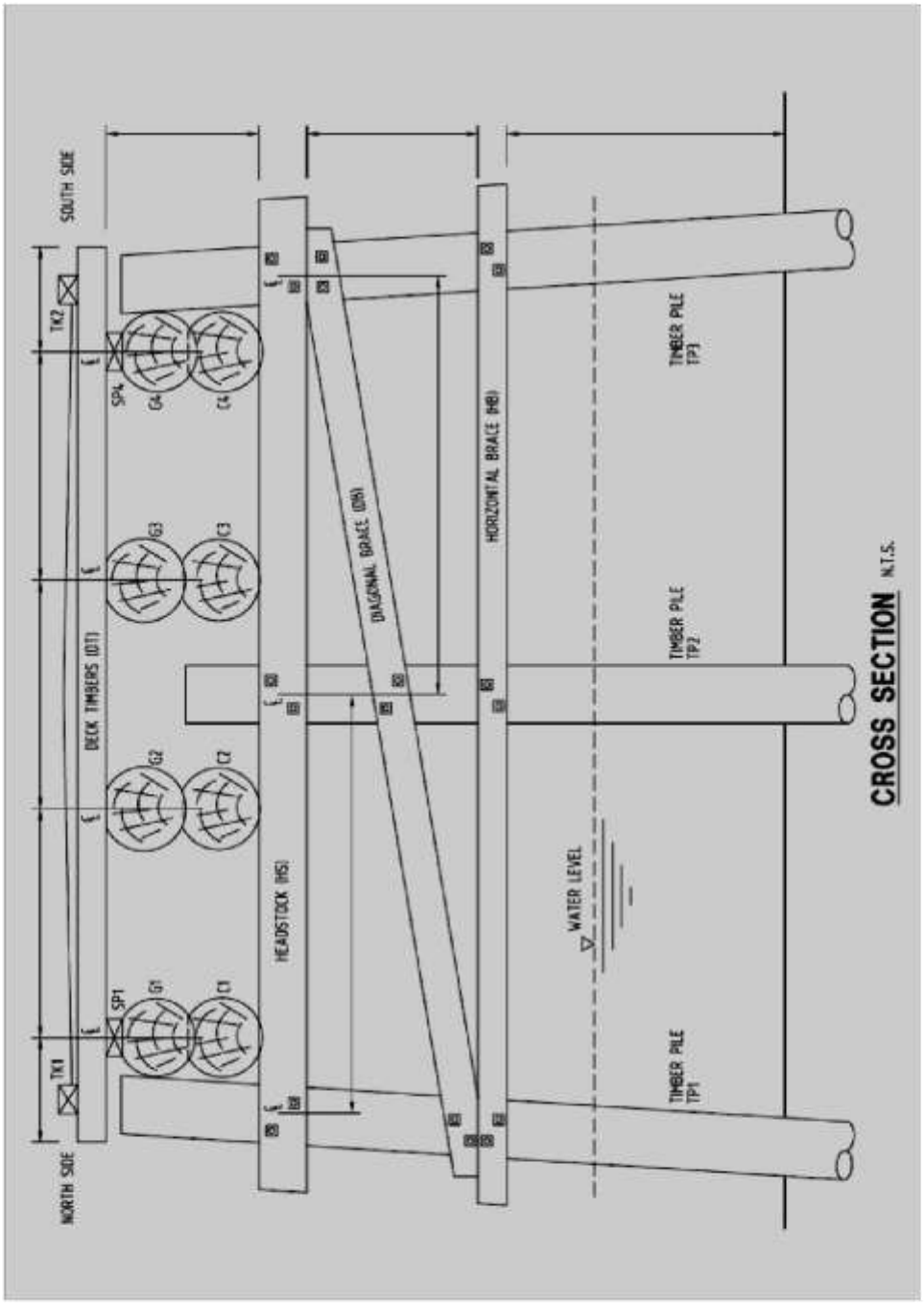
Appendix B – Representative elevations of bridge




SOUTH SIDE
NORTH SIDE
TK2
TK1
SP4
SP1
G4
G3
G2
G1
C4
C3
C2
C1
DECK TIMBERS (DT)
HEADSTOCK (HS)
DIAGONAL BRACE (DB)
HORIZONTAL BRACE (HB)
TIMBER PILE TP3
TIMBER PILE TP2
TIMBER PILE TP1
WATER LEVEL
CROSS SECTION N.T.S.

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Appendix C – Members that would need to be replaced or strengthened

Location	Member	Action
Span 6	Girder 1 (downstream side of bridge). Bad horizontal crack	Replace member
Span 6, Pier F	Headstocks. Ends badly split, and associated bolts corroded	Install king posts underneath headstock ends (upstream and downstream sides of bridge) bolted to piles with 3-M24 galv.
Span 5, Pier E	Outside pile, north (downstream) side	Splice in new section of pile at top
Span 5, Pier E	Eastern headstock	Install king posts underneath headstock ends (upstream and downstream sides of bridge) bolted to piles with 3-M24 galv.
Span 2, Pier B	Diagonal and horizontal bracing. Bolts are seriously corroded. Some bracing timbers are cracked and split.	Replace corroded bolts with HDG equivalent
Span 5, Pier E	Diagonal and horizontal bracing - Bolts are seriously corroded	Replace corroded bolts with HDG equivalent

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Appendix D – Risk Assessment methodology

Likelihood	Assess the likelihood and consequences from the hazards or risks Consequences				
	Insignificant *No Injury, 0 - low $ loss*	**Minor** *First Aid Injury, low - medium $ loss*	**Moderate** *Medical Treatment, medium - high $ loss*	**Major** *Serious Injuries, major $ loss*	**Catastrophic** *Death, huge $ loss*
Almost Certain *is expected to occur at most times*	M	H	E	E	E
Likely *will probably occur at most times*	M	H	H	E	E
Possible *might occur at some time*	L	M	H	E	E
Unlikely *could occur at some time*	L	L	M	H	E
Rare *may occur in rare circumstances*	L	L	M	H	H

RISK ASSESSMENT CALCULATOR

Identify the hazards or risks of the work.
Assess the likelihood and consequences from the hazards or risks.
Decide on the measures to control the risks.
Implement the chosen Control Options.
Monitor and Evaluate Control Options to ensure adequate control.

Legend		Control Options	
E	Extreme risk, immediate action required	ELIMINATE	- Eliminate the process, material or substance completely.
H	High risk, prioritised action required	SUBSTITUTE	- Replace the process, material or substance with a safer one.
M	Moderate risk, planned action required	ISOLATE	- Isolate the person(s) from the process, material or substance.
L	Low risk, actioned by routine procedures	ENGINEER	- Design or re-design the process, material or substance.
MBRC SAFETYfirst1 It's in your hands		ADMINISTRATE	- Limit exposure to the risk by job rotation, work procedure and training.
		PPE	- Use protective equipment.

The Risk Matrix (excerpt from MBRC Risk Assessment Form, Document No. 2.3.5, dated Sept 2009)

Above photo: View of existing Pickering Bridge looking north.

Above photo: View of both bridges looking south.

Above photo: View looking upstream.

Above photo: View looking downstream .