ASSISTANT GENERAL MANAGER ENGINEERING SERVICES REPORT

ITEM 11.3 SF2459 270918 LANES BRIDGE BOWRAVILLE - PROGRESS REPORT NO1

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SUMMARY:

This report provides Council with the first progress report following the presentation of the workshop on the concept report and endorsement to construct the replacement bridge with Council day labour.

The piling contractor will commence on site on 8 October 2018 to take advantage of the low stream flow within the river to avoid any possible issues from a flood event. As a prelude to the contactor arriving on site, Council day labour will dismantle two small sections of the old bridge footpath in preparation for the new piles and also place additional support bracing on the old structure.

Council staff has already commenced preliminary works and will continue with tree clearing and site preparation for piling in the lead up to 8 October.

RECOMMENDATION:

That Council receive and note the progress report on the replacement of Lanes Bridge.

OPTIONS:

Receive the report.

DISCUSSION:

The existing Lanes Bridge is over 90 years old and is one of the Shire's oldest timber bridge structures. The bridge was brought forward within Council's bridge replacement program by three (3) years and included in the Capital Works Program to demonstrate Council's intention to provide funding to match the State and Federal funding grants.

The existing timber bridge structure:

- 54m Long (five spans)
- 9.75m wide - 2 lanes and timber/recycled plastic footpath
- Deck Centreline height varies from RL 6.15m to RL 6.20m AHD.

The new bridge geometry encompasses:

- Replace existing bridge with a concrete bridge,
- Horizontal alignment of the bridge moved approximately 7.5m upstream of the existing bridge alignment (ie. new bridge is partially over the existing deck),
- Bridge deck raised by 1.75m to RL 7.9m AHD, to achieve approximately 1 in 1 year flood immunity

The new bridge is to be built using a mixture of precast and pour-in-situ concrete elements, namely:

- Bored concrete internal piles with steel encasement, with formed concrete columns over
- Driven steel piles at abutments, topped with a pour in-situ cylindrical pile cap
- Precast concrete beams, abutment headstocks and internal headstocks
- Pour-in-situ decking slab
- Thrie beam guardrail, and fabricated collapsible pedestrian fence

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Progress report

Communication protocol:

Progress of the construction will be via monthly media releases and photos on Council's web page. A mobile media hub is to be established through Councils IT section and this will allow the opportunity to advise residents of updates and road closures via a mobile phone text alert. Residents will be encouraged to register their mobile phone/email contact and a computer generated email will advise of pending road closures and progress updates.

All road closures alerts will be publicised on MyRoadinfo and the existing road closure notice to emergency and transport services.

A fold down style sign will be erected at key entry location points at Macksville, Nambucca Heads and Valla to forewarn of pending road closures and redirect traffic via Wilson Road. The key sign will have *"Lanes Bride Bowraville - one lane 20t load limit"* notice and the fold down section will have *"road closed detour via Wilson Road"*.

WHS Plan
A detailed WHS plan has been developed for the construction process.

Risk Management Plan
A detailed risk management plan has been developed for the project and provided to Councils insurer.

Quality Assurance Plan
A detailed QA plan is being finalised with the various hold points required to ensure compliance with the design and standards, an external third party engineer has been engaged to witness and verify the structural elements of Council's day labour works and completion of a works as executed drawing. The contractors for the piling, cranes and supply of bridge components will provide their own documentation to Council as part of the overall QA, WHS and risk management.

Traffic Management Plan
A detailed traffic management plan is being finalised to encompass the periods of closure, single lane access for the ingress and egress from Bowraville and general traffic movements on the construction site.

Level two inspection of the existing structure
As part of the risk management regime, an independent level two inspection of the existing structure was undertaken; this identified some emergency works to replace some girders and also identified some additional bracing which council day labour will complete.

Tenders:

- *Piles:* Tenders for supply of piles has been awarded to Civil Sydney and an onsite meeting occurred with the contractor on Friday 14 September. The contractor will commence on site on 8 October 2018 to take advantage of the low stream flow within river to avoid any possible issues from a flood event. As a prelude to the contactor arriving on site, Council day labour will dismantle the sections of the old bridge in preparation for the new piles and also place additional support bracing on the old structure.
- *Concrete precast bridge components*: Tenders for the supply of major concrete precast components closed on 18 September and a report presented to Council in this business paper.
- *Crane hire:* Tenders for the supply of crane hire closed on 18 September and a report presented to Council in this business paper.

Hydrology report and effect of flooding on nearby dwellings:

The options report presented to Council identified that two dwellings adjacent to the bridge site may potentially be affected by flooding emanating from the new level of the bridge. A third property owner came forward and contacted Council to ascertain whether their dwelling at 32 High Street would be impacted.

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Council resolved that:

> *"staff undertake negotiations with the owners of 8 and 14 High Street which were identified as potentially being affected by the raising of the bridge, with a view to Council funding the raising of their dwellings or otherwise reaching agreement whereby they will enter into a Deed of Release for the increased flood afflux. In relation to the negotiation with the residents that Council's position be to immediately proceed with the replacement of the bridge and that the outcome of the negotiations be reported back to Council as soon as possible."*

The first hydrological and hydraulic modelling report by GHD did not cover the extent of the area required for assessment required by Council in its Flood Risk Management Study, and also lacked detail in some key areas.

GHD completed the additional hydrological and hydraulic modelling, and are currently compiling the final report for Council. The secondary modelling undertaken by GHD has determined the predicted flood afflux at nearby dwellings caused by the raising of the bridge.

The hydrological and hydraulic modelling determined that only one residence (No. 8 High St, Bowraville) would be effected by the raising of the bridge to RL 7.90m (1.75m above the existing bridge level), which may now potentially have water levels above the floor level for a 1 in 100 year rainfall event.

The initial flood modelling for the two other dwellings identified No 14 and No 32 High St as potentially being vulnerable to flooding. The hydrological and hydraulic modelling determined that the flood afflux at these two residences was in the order of 140mm, the existing freeboard at these dwellings was in the order of 300mm for the 1 in 100 year flood event.

This effectively means that even with the raised flood levels attributed to the new bridge, these dwellings still have around 150mm of freeboard, and therefore would not be disadvantaged by the raising of the bridge, for rainfalls of up to the 1 in 100 year event.

Staff has met on site with residents of No 32 High St and contacted the previous owner of No 14 High St. Discussions with the owners of both these dwellings has confirmed the results of GHD's modelling. The residents indicated the historical height of previous flood waters and for this reason, it was concluded that these dwellings did not require lifting. A formal letter has be sent to the property owners advising that there is no further action being taken by Council.

The owner of No 8 High St Bowraville has been contacted, and will be meeting with Council Staff on site in early October as they are presently away from the Shire. A further report will be provided to Council.

Environmental considerations:

Micro Bats

The ecological report by Ecosure concluded that there were no bats present at the Lanes Bridge site. However discussions with locals and the structures crew seemed to indicate that there was a high likelihood of bats in the area. In order to avoid any unexpected disruptions to the construction process, Council staff immediately engaged a bat survey from Future Ecology, who determined that there was indeed some bat activity in the area. Recorded bat calls were analysed and determined that there was the presence of two threatened species, namely, the southern myotis and little bentwing-bats.

The recommendation from the ecologist was that bat boxes be installed on the new bridge and in the surrounding area to rehouse displaced bats once the existing bridge is demolished. However the existing bridge must remain in place until early next year, when the bat breeding season is completed which starts in late October. It is anticipated that this will not be a problem, as the existing bridge is set to remain until the end of the construction process, when traffic will be allowed on the new bridge, and only two small portions of the bridge will be removed at the location for the new piles.
Provided that there are no maternal roosts in the locations where the new piles must go, the presence of micro bats in the bridge should not hinder the construction of the new bridge.

However if it is found that maternal roosts are present in the sections of the bridge which must be demolished immediately, work will need to be halted until Council can perform the processes required by the new Bio-diversity Conservation Act.

Part 5 tests have been ordered for the southern myotis and little bentwing-bats, and should be completed shortly.

Trees:

Council are currently finalising negotiations with the McKay Association to address the removal of 4 of the 5 red cedar trees which are currently in the way of the new southern bridge approach. There are 4 red cedar trees in an avenue on the southern side of the bridge, and 1 significant red cedar tree out of the avenue.

Initially the McKay Association offered to fund the relocation of the existing red cedar trees. However, after Council approval was given for them to conduct the works, the McKay Association decided to withdraw their offer. The 4 red cedar trees in the avenue will now need to be removed by Council, and will be milled to get any usable timber available (these trees are relatively young and small and may not yield much usable timber).

The significant tree which is marked by a plaque on a rock is located far enough away from the new road and can be protected during the construction of the new bridge and remain at that location after the bridge is completed. A root barrier will need to be constructed on the road side of the tree to protect the new pavement from the roots of the tree.

One further tree has been identified on the project footprint for removal which is a habitat tree and will have bird boxes placed into surrounding trees adjacent to the site.

CONSULTATION:

General Manager
Engineer Designer
Surveyor
Manager Infrastructure Services
Structure's Coordinator
Roads Coordinator

SUSTAINABILITY ASSESSMENT:

Environment

There are significant environmental implications associated with the construction of the new bridge. These have been investigated and mitigation measures included within the project plan.

Social

There are significant social implications associated with the construction of a new bridge, should the road be closed, and residents and industry be required to be diverted for a period of up to 7 months through construction.

Tallowood Steiner School have advised of the implications to their staff and students as follows:

> *Tallowood Steiner School*
> *Staff members total: 10*
> *Students total: 40*

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1 *6 staff members (both permanent and casuals) affected by this:*
Extra 32 minutes travel (without any traffic) one way = Extra 1h and 4 minutes per day
Extra 29.1 kilometres one way = Extra 58.2 kilometres per day

2 *26 students out of 40 affected:*
a *Students that travel to school mostly by private car: 7 students between the ages of 5 and 7 will have between 40 minutes to 1h 4 minutes extra travel per day.*
b *Bus from North Arm Road: 12 students between the ages of 5 and 12 extra 1h 4 minutes travel per day.*
c *Busses from Missabotti: currently students travel from Missabotti to Bowraville, then take bus to Tallowood Steiner School. At the end of day, they take the bus to Bowraville, then change bus to Missabotti busses: 7 students between the age of 6 and 12 will have an extra 2h 8 minutes extra travel per day.*

Economic

There are significant economic implications associated with construction of the new bridge should the road be closed and residents and industry be required to diverted for a period of up to 7 months through construction. The proposed option mitigates full closure and traffic diversion.

The closing of the whole road pavement has already been met with significant community angst following the story that was prematurely aired on NBN News without seeking any formal advice from the Council and the Engineering Department

Post construction, the bridge will increase economic outlook with less closures and increased productivity.

Risk

There are significant risk implications associated with construction of the new bridge. These have been investigated and mitigation measures included within the project plan. During the course of construction there is the potential of significant flooding of the area during large storm events. The option being recommended reduces the risk in that there is no side track, the bridge deck will be higher than the existing deck level and a single lane of traffic under traffic lights is maintained.

The raising of the bridge deck by 1.75m, results in a flood afflux of approximately 140mm at nearby residences, meaning that one dwelling will be now be affected by the 1 in 100 year event at No 8 High St. Therefore, the dwelling will require to be lifted (a relatively cheap project) and the bridge can still achieve greater than approximately 1 year flood immunity, and not inundate residences with flood afflux caused by the additional embankments for the bridge approaches.

Initial investigations into the price of raising the residence indicated that the construction cost would be approximately $20,000 to $30,000. Additional legal costs would accompany the construction cost of the raise, meaning that a conservative estimate of cost for a single house raise is in the order of $40,000.

FINANCIAL IMPLICATIONS:

Direct and indirect impact on current and future budgets

The cost of the bridge is generally covered from grants. Council will take a $1m loan fund through T-Corp to match the federal grant.

Source of fund and any variance to working funds

Council has signed a funding agreement for $1M of Federal funding (matched by Council through loan funds) and most recently signed the funding agreement for $500,000 provided from the State Government under the 'Bridge Timber Replacement' program.

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A further grant was submitted with the Office of Environment and Heritage – NSW State Government Flood Plain Program on 28 March 2018 for $400,000. The grant at 2:1 ratio on the difference in price between replacing the existing bridge same as existing, and replacing the bridge with a higher flood immunity.

The road is classified as a Regional Road and funding can be provided from within the Block Grant.

Service level changes and resourcing/staff implications

There is a proposed improved service level associated with the raising of the bridge deck by 1.75m, which increases the flood immunity for the community. At present all work has been undertaken in house and tenders let for works outside the scope of Council's bridge team.

ATTACHMENTS:
There are no attachments for this report.