Committee of the Whole Report
For the Meeting of February 18, 2016

To: Committee of the Whole
Date: February 12, 2016

From: Jonathan Huggett, P. Eng.

Subject: Johnson Street Bridge Replacement Project Quarterly Update

RECOMMENDATION:
That City Council receive this report for information.

EXECUTIVE SUMMARY
Quarterly reports are prepared on the Johnson Street Bridge Replacement Project throughout the year to keep Council and the community updated on this important project. This is the first quarterly report for 2016, with the next one scheduled for May 2016. Should any emergent issues arise, staff will provide an immediate update to Council.

Since the update on November 19, 2015 Council directed that PCL revise the project schedule to achieve completion of the Project in the fall of 2017 (last identified as early 2018). After careful re-evaluation of the structural steel fabrication in China the schedule has been updated to reflect the new bridge opening to traffic in July 2017 (last identified as late summer 2017). The project is expected to complete by November 2017 (last identified as early 2018). The critical elements for achieving schedule are the ring structures being fabricated in China. These are due to arrive in Victoria by the end of 2016. While steel fabrication is continuing and fabrication of the trusses are nearing completion, correction of various non-conformances detected during fabrication represent the major risk to schedule. Non-conformances are always present in any steel fabrication, but resolving these issues between the fabrication in Shanghai and the steel designers’ office in New York has always presented logistical challenges.

On November 19, 2015 Council directed staff to request Hardesty and Hanover to appear before Council to provide assurances regarding the quality of the steel fabrication. It was moved that:

    City Council direct staff to arrange for the Hardesty & Hanover Engineer of Record (Keith Griesing) to appear before Council in public session to present his opinions on the quality of the structural steel being fabricated in China.

Council declined to approve a staff recommendation for additional funding until H&H had attended a meeting of Council. It was moved that:

    City Council direct staff to advise PCL that the City will not accept the schedule proposing a January 2018 project completion date and that the City will not authorize any further progress payments until an acceptable schedule is received.

The City is engaged in a complex mediation process and various claims have been made by the City against the other parties. As a result reports and presentations of this type require vetting by insurers for the other parties and their legal counsel. The intent is to prepare a public report for Council to
review prior to attendance by H&H so that Council may have time to consider questions they may wish to address to H&H. H&H are working on this report and staff continue to actively press for it to be finalised.

The City’s current approved budget for the Johnson Street Bridge Project is $96.854 million.

Please find in the table below a summary of the allocation of the approved project completion contingency (see Appendix C for a more detailed account of the contingency):

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Original Project Completion Contingency</td>
<td>$2,515,000</td>
</tr>
<tr>
<td>Add: Value Engineering Savings</td>
<td>$300,000</td>
</tr>
<tr>
<td>Approved Funding March 2015</td>
<td>$1,500,000</td>
</tr>
<tr>
<td>Approved Funding July 2015</td>
<td>$2,554,000</td>
</tr>
<tr>
<td>Project Completion Contingency December 2015</td>
<td>$6,869,000</td>
</tr>
<tr>
<td>Less Committed Contingency</td>
<td>(4,749,474)</td>
</tr>
<tr>
<td>Unallocated Contingency at December 2015</td>
<td>$2,119,526</td>
</tr>
</tbody>
</table>

There remain a number of unresolved issues that will require further additional funding including costs of fendering, claim for additional professional consulting services, public realm, insurance adjustment, City support costs, legal costs, archaeological monitoring, and increased quantities of materials required. At this point, the total cost is yet to be determined for many of these items, but the total is significant and will require additional funding consideration by Council. Council will be provided with updates as further information becomes available.

The mediation is ongoing and involves legal counsel and representatives of the City, PCL, MMM, and Hardesty and Hanover, as well as the insurers for all parties. The mediator, a senior construction lawyer, has set timelines for the exchange of information between the parties regarding all known claims that have been notified up to the end of February 2016, including the City’s claims, leading up to a mediation session scheduled for March 7 and 8, 2016. The purpose of this session is to negotiate a resolution of all known claims among the parties. However, subsequent mediation sessions may be required to deal with future claims. For example, the full consequences of the delay in the fabrication of the steel cannot be determined until the steel has been delivered. Any resolution of mediation would require Council consideration related to settlement.

Following the October workshop on the public realm areas around the Johnson Street Bridge staff have worked with the landscape architect to create plan view and three dimensional renderings of the three proposed public realm spaces. The designs were presented to Council in January where Council directed staff to meet with the stakeholders from the workshop before going to the public with the new renderings to collect feedback. City staff met with the stakeholder group in early February to collect their feedback in order to refine the concepts and are now working towards holding an open house event in late February to engage the community and find out which elements of the proposed concepts the public prefers. Results of broader public input will be shared with Council along with cost estimate for the preferred public realm designs or elements and pedestrian bridge design identified by the community. Staff will also recommend funding and phasing options for Council to consider. As mentioned in the August 2015 Governance and Priorities Committee report on the public realm, there is currently not enough budget in the cash allowance to complete the original landscape and public realm plans.
PURPOSE
As directed by Council, staff provides quarterly reports on the Johnson Street Bridge Replacement Project throughout the year. This is the first report for 2016, with the next update scheduled for May 2016.

SCHEDULE UPDATE
Since the update on November 19, 2015, Council directed that PCL revise the project schedule to achieve completion of the Project in the fall of 2017 (last identified as early 2018). After careful re-evaluation of the structural steel fabrication in China the schedule has been updated to reflect the new bridge opening to traffic in July 2017 (last identified as late summer 2017). The project is expected to complete by November 2017 (last identified as early 2018). The critical elements for achieving schedule are the ring structures being fabricated in China. These are due to arrive in Victoria by the end of 2016. While steel fabrication is continuing and fabrication of the trusses are nearing completion, correction of various non-conformances detected during fabrication represent the major risk to schedule. Non-conformances are always present in any steel fabrication, but resolving these issues between the fabrication in Shanghai and the steel designers’ office in New York has always presented logistical challenges.

Ring fabrication is continuing with a short break for Chinese New Year. Major welding is in progress and involves undertaking continuous welding along a very large circumference of each ring structure.

In Victoria, the concrete roadway bridge decks have been completed, and the main tasks on site will shortly switch to installing the bridge opening machinery and structural steelwork in the bascule pit. It is also expected that fendering, once agreed and approved, will be completed by late summer 2016.

See Appendix A for a summary schedule of project milestones.

Financial Implications
The approved budget for the Johnson Street Bridge replacement Project is $96.854 million – see Appendix B.

As of December 31, 2015, actual costs of $65.001 million have been incurred, including the following:

<table>
<thead>
<tr>
<th>Vendor</th>
<th>Services</th>
<th>Budgeted</th>
<th>Invoiced</th>
<th>% Invoiced</th>
</tr>
</thead>
<tbody>
<tr>
<td>MMM</td>
<td>Professional Services: Project Management, design, procurement, administration, geotechnical engineering, permits</td>
<td>$ 9,352,377</td>
<td>$ 9,281,380</td>
<td>99.13%</td>
</tr>
<tr>
<td>MMM</td>
<td>Contingency: Owner’s Quality Control for steel fabrication, steel detailing workshop, supplementary services, unforeseen geotechnical engineering, utility mapping, seismic design review, additional designing, redesigning navigational lighting, joint footing review, review of non-conformance reports, multicolour lighting review, fendering design, redesign for LED fixtures, redesigning control room frames, custom traffic pole base, walkable service review, H&amp;H settlements 1 and 2</td>
<td>$ 1,957,564</td>
<td>$ 1,688,947</td>
<td>86.29%</td>
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<tr>
<td>PCL</td>
<td>Main Bridge Contract: Coferdam, creosote, bedrock, concrete vault, asbestos pipe, sharps, hazardous waste, and soil disposal, relocation of generator load bank, fender anode installation, subgrade excavation for retaining wall no. 2, installation of a street light pole, additional CCTV cameras, installation of rip rap, multi-use trail pedestrian overpass changes, anti-graffiti coating, wall embeds for fenders, fendering solar pipe, traffic signal arm changes, conduit and wiring at Harbour Road, revised roadway luminaires, an increase to the environmental cash allowance, fill for retaining wall no. 4, utility conflicts, Delta path tie in, rail trestle beam removal, west side power distributor kiosk, Harbour Road bike box, generator fencing, and bascule pier lighting</td>
<td>$ 63,236,000</td>
<td>$ 39,582,442</td>
<td>62.60%</td>
</tr>
<tr>
<td>PCL</td>
<td>Contingency: Cofferdam, creosote, bedrock, concrete vault, asbestos pipe, sharps, hazardous waste, and soil disposal, relocation of generator load bank, fender anode installation, subgrade excavation for retaining wall no. 2, installation of a street light pole, additional CCTV cameras, installation of rip rap, multi-use trail pedestrian overpass changes, anti-graffiti coating, wall embeds for fenders, fendering solar pipe, traffic signal arm changes, conduit and wiring at Harbour Road, revised roadway luminaires, an increase to the environmental cash allowance, fill for retaining wall no. 4, utility conflicts, Delta path tie in, rail trestle beam removal, west side power distributor kiosk, Harbour Road bike box, generator fencing, and bascule pier lighting</td>
<td>$ 1,345,482</td>
<td>$ 1,051,635</td>
<td>78.16%</td>
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There remain a number of unresolved issues that will require further additional funding including unforeseen geotechnical conditions, purchase of seabed land, claim for additional professional consulting services, insurance adjustment, City support costs, legal costs, archaeological monitoring, public realm, costs of fendering, and increased quantities of materials required. At this point, the total cost is yet to be determined for many of these items, but the total is significant and will require additional funding. Council will be provided with updates as further information becomes available.

For a detailed account of the current JSB budget, and contingency items, please see appendices B and C.

It should also be noted that those additional funds do not include an amount for either the Contractor’s, the Consultant’s, or the City’s claims which are subject to mediation.

There are limited options for the City other than to complete the project and seek resolution of additional costs, where applicable, through the mediation or litigation process.

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CONSTRUCTION PROGRESS

Construction Progress

Completed areas
Areas west of Harbour Road, including Harbour Road and Esquimalt Road, have now been substantially completed. On the east side of the bridge Michael Williams Green is now also substantially complete and being enjoyed by the public. The City is now working with the contractor to formally take over the areas.

*Looking north up Harbour Road towards Esquimalt Road*
West Approach
With the completion of work on Harbour and Esquimalt Roads there will be minimal work in roadways until the new bridge is operational. Work behind the construction fencing will continue to focus on underground infrastructure and the construction of the multi-use path.

Water Crossing Site
Over the past few months crews have been focused on preparing the roadway decks and other areas of the harbour. In early February the bridge vehicular deck was nearly complete, with all the deck slabs poured and the road surface drivers and cyclists will travel on is now in place on both the east and west sides. With the completion of these decks the contractor will use this area to install the heavy mechanical equipment, including motors and support structure for the moveable sections of the bridge.
Pedestrian Overpass
Abutment work is mostly complete for the new pedestrian overpass. This can be seen from Esquimalt Road as travellers move eastbound on Esquimalt Road near Harbour Road. Landscaping is part of the public realm discussions and is to be completed later in the project. The pedestrian bridge structure itself is currently on hold pending final design features which have been part of the public realm discussions.
Looking north at the north side ped bridge from the south abutment.

**East Approach**

Lanes along roads approaching the bridge on the downtown side have been modified to allow for continued construction in the area, as well as make improvements for public safety and efficiency. This includes added bike lanes for west, south, and north bound traffic, and increased signage for drivers and cyclists to find their way. Physical road locations have also shifted to adjust the construction site as needed.

Looking west from Michael Williams green at the new road alignment with dedicated bike lane
Northeast Plaza
The northeast plaza near the Janion building continues to take shape in anticipation of the opening of the Janion building in late spring 2016. When complete, this plaza will provide a publicly usable space as well as reduce the active construction areas around the bridge site.

Area from the blue fence to building face underway to becoming Janion Plaza

STEEL PROGRESS/ FABRICATION/QUALITY ASSURANCE
The following summarizes the steel fabrication progress:

- North Truss – Final Weld(s) and inspection(s) ongoing.
- North Ring – Work is proceeding on the large middle web welds (around the circumference of the ring).
- South Ring – Work is proceeding on the large middle web welds (around the circumference of the ring).
- Lower Counterweight – In final stages of welding and assembly, the (2) major components will be welded together at a later date.
- Roadway Deck (OSD) – The (20) panels that make up the deck continue to be welded together to form larger full-width deck elements.
The following diagrams provide visual clarity of steel components being fabricated for the new bridge:

PCL project and quality management personnel visited the facility in China during the weeks of November 28, 2015 and January 17, 2016. Progress was reviewed, and quality records and processes were completed.

The South Truss has been moved out of the shop #2 and stored temporarily outside. Additional inspection of the middle flange welds is in progress.

Ring fabrication was in progress for the north and south ring middle web elements, welding the webs to the inner and outer flanges around the circumferences of the rings. North ring outer web splice welding is complete.

The lower counterweight “tail” is in the final stages of completion.

Orthotropic steel deck panel splicing is ongoing, and inspection of the end floor beams continues. Weld repair locations have been investigated.
Plate cutting is in progress for multi-use and pedestrian walkways.

*Photo 1 – North Truss Final Weld Inspections*
Photo 2 – South Ring Welding
Photo 3 – OSD Splicing of Panels
Bridge Machinery Fabrication
Hardesty and Hanover inspected the bridge machinery during a visit to Steward Machine in Birmingham, Alabama on December 10, 2015 and December 11, 2015.

Span Support Machinery
- Wheel assembly is in progress. The shafts have been installed on the wheels.
- The spacer rings were being installed on the wheel shafts at the time of this inspection.
- The wheel bearing housings are complete and awaiting final assembly.
- The wheel bearing housings are on site and in inside storage (awaiting final wheel assembly).
- The welding has been completed on the intermediate equalizer frames. They are ready for stress relief and final machining.
- The equalizer trucks welding and stress relief operations are completed and the equalizer trucks are being final machined.
- The primary equalizer frames are in various stages of fit up and welding.
- The primary equalizer pins are complete.
- The span support base assemblies are in various stages of fit up and welding.
- Various pin end plates are being machined.
Span Drive Machinery

- The four Main Pinion Shafts are machined and complete. There is a small area of damage to one on the gear teeth on one of the pinion shafts. The area of damage will fall outside of the rack tooth contact at final assembly.
- The four Main Hydraulic Motors are at Steward Machine’s facility, boxed and in inside storage (awaiting assembly to the Main Pinion Shafts).

Span Lock Shop Drawings

- Hardesty and Hanover’s latest review comments to the Span Lock Machinery submittal were discussed with Steward Machine personnel. A revision addressing these comments will be submitted as soon as possible.
Photos – Pinion Shafts at Steward Machinery
Other Items

- Third party weld inspection was being performed on the ongoing span support components.
MEDIATION UPDATE
The mediation is ongoing and involves legal counsel and representatives of the City, PCL, MMM, and Hardesty and Hanover, as well as the insurer for MMM and Hardesty and Hanover. The mediator, a senior construction lawyer, has set timelines for the exchange of information between the parties regarding all known claims that have been notified up to the end of February 2016, including the City’s claims, leading up to a mediation session scheduled for March 7 and 8, 2016.

The purpose of this session is to negotiate a resolution of all known claims among the parties. However, subsequent mediation sessions may be required to deal with future claims. For example, the full consequences of the delay in the fabrication of the steel cannot be determined until the steel has been delivered. Any resolution of mediation would require Council consideration related to settlement.

The mediation proceedings are confidential and so the City is not able to disclose the content of the proceedings. The City has retained independent expert witnesses dealing with fendering, steel fabrication, and schedule delays. A report regarding the results of the March mediation will be brought to Council after that mediation session has concluded.

PUBLIC REALM UPDATE
Following the October workshop on the public realm areas around the Johnson Street Bridge staff have worked with the landscape architect to create plan view and three dimensional renderings of the three proposed public realm spaces. The designs were presented to Council in January where Council directed staff to meet with the stakeholders from the workshop before going out to the public with the new renderings to collect public feedback. City staff met with a group of stakeholders in early February to collect their feedback in order to refine the concepts and are now working towards holding an open house event in late February to engage the community and find out which elements of the proposed concepts the public prefers. Results of broader public input will be shared with Council along with cost estimate for the preferred public realm designs or elements and pedestrian bridge design identified by the community. Staff will also recommend funding and phasing options for Council to consider. As mentioned in the August 2015 Governance and Priorities Committee report on the public realm, there is currently not enough budget in the cash allowance to complete the original landscape and public realm plans.

FENDERING UPDATE
Research and investigation continues into the design requirements and options for the north side fendering in order to protect the bridge from ship collision. The City has retained independent experts to advise on these fendering issues to ensure that design is adequate and cost effective. This is ongoing priority work, and a further update will be provided to Council when this report is presented.

SAFETY AND ENVIRONMENT
Environmental monitoring is being conducted by Hemmera field representatives on a regular basis. An archaeological monitor from Stantec and a First Nations representative are on-site during the excavation works at the west and east side of the project.

The City has requested MMM to have a safety audit of the bridge design undertaken and a report is expected by the end of February 2016.
**UPDATE ON RISK MANAGEMENT**

Effective risk management requires continuous monitoring and updating. The following (Table 2) are the current significant project risks and their mitigation strategy:

Table 2. Risk Management Matrix

<table>
<thead>
<tr>
<th>Risk</th>
<th>Detail</th>
<th>Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delivery of Steelwork being fabricated in China</td>
<td>The quality and timing of the steel is perhaps the most critical issue facing the Project</td>
<td>Continued ongoing close monitoring and field inspections. H&amp;H are preparing an overall assessment of steel quality for Council review.</td>
</tr>
<tr>
<td>Financial consequences of mediation</td>
<td>The financial consequences of the mediation are not yet known, and may not be known for some time.</td>
<td>City staff are working with legal counsel to ensure a full and accurate exchange of information with the other parties occurs. Any agreement on financial issues requires the approval of Council.</td>
</tr>
<tr>
<td>Fendering</td>
<td>There are financial challenges related to the north side fendering.</td>
<td>Re-evaluation of the north side fendering requirements together with an ongoing stakeholder consultation and input from two independent specialists in marine fender design and operation.</td>
</tr>
<tr>
<td>Public Realm design</td>
<td>Need to ensure both public acceptance and financial viability of the public realm</td>
<td>Staff and consultants preparing options, costings and further consultation.</td>
</tr>
<tr>
<td>Management of Contingency Funding</td>
<td>March 2015 Council approved $1.5 million additional funding and directed that Council wanted detailed updates on major contingency funding items. July 2015 Council approved additional $2.554 million. Requests for further funding on hold pending steel quality presentation to Council by H&amp;H</td>
<td>Project Director is preparing detailed contingency funding reports, and is looking for cost savings opportunities. A more detailed assessment of the probable project costs is being constantly undertaken.</td>
</tr>
<tr>
<td>Machinery Issues</td>
<td>A critical part of the bridge is the machinery operation. Work is underway on production of the machinery.</td>
<td>Regular off site inspections of the machinery fabrication are being carried out. Hardesty and Hanover have engaged a specialist machinery expert familiar with this kind of work.</td>
</tr>
</tbody>
</table>

**Next Steps**
The following are the priority tasks over the next three months:

1. Continue to monitor steel fabrication in China as this is critical to achieving the current schedule.
2. Arrange for the presentation to Council by H&H regarding the steel fabrication quality and resolve the previous additional funding requests that Council has placed on hold.
3. Resolve the north side fendering design issues and bring a report to Council regarding next steps.
4. Attend the March 7 and 8, 2016 mediation sessions and report to Council regarding the results of the mediation.
5. Public realm consultation.

RECOMMENDATION:
That City Council receive this report for information.

Respectfully submitted,

Jonathan Huggett, P. Eng.
Project Director

Susanne Thompson
Director of Finance

Report accepted and recommended by the City Manager: ________________

Date: ________________

List of Attachments
- Appendix A – Summary Schedule
- Appendix B – Budget Update
- Appendix C – Project Completion Contingency