
REVIEW OF JOHNSON STREET BRIDGE PROJECT

Prepared for: City of Victoria

Prepared by: Jonathan R Huggett P.Eng

Table of Contents

1	Summary of Findings	i
1.1	Background	i
1.2	Discussion	ii
1.3	Review Process	iii
1.3.1	Interviews	iii
1.3.2	Documents Reviewed	iv
1.4	Issues Resulting from Review	iv
1.4.1	Project Leadership	iv
1.4.2	Resolution of Issues that Arise	v
1.4.3	The Role of MMM	vi
1.4.4	Assessment of Risks	viii
1.4.5	Quality Assurance	ix
1.4.6	Project Schedule	ix
1.4.7	Project Costs	x
1.5	Governance	xi
1.6	Other Remarks	xii
1.7	Recommendations	xii

1 Summary of Findings

1.1 Background

The Johnson Street Bridge is an iconic bridge in the City of Victoria, which is in need of replacement. The City has a limited budget of \$92.8 Million for the entire Project, of which \$48.5 Million was raised pursuant to a borrowing authorized by referendum. The City embarked on a sophisticated competitive procurement process (the "Procurement Process"), the objective of which was to procure construction of the replacement bridge for a fixed price. Throughout the Procurement Process, the City was advised from an engineering point of view by MMM Group Limited ("MMM"). The City obtained legal advice from Fraser Milner Casgrain LLP (now, Dentons LLP).

Eventually, the Procurement Process culminated in the selection of PCL as contractor pursuant to an agreement made effective the 31st day of December 2012 (the "Construction Contract").

Pursuant to the Construction Contract, the City agreed to pay PCL \$63,235,000, "as may be adjusted in accordance with the Contract Documents" (the "Contract Price"), plus GST /HST, for the performance of the Work. In the Construction Contract, the term "Work" is defined to mean and include "anything and everything required to be done for the fulfilment and completion of the [Construction] Contract".

It is our understanding that during the course of the Procurement Process, but after selection of PCL as preferred proponent, it was determined that Hardesty & Hanover ("H&H"), the engineering consultants who had assisted PCL with its winning proposal, should cease to advise PCL and would instead become subconsultants of MMM. All of the engineering work undertaken by H&H was to be made available to MMM.

A number of provisions in the Construction Contract make it very clear that the City (through MMM) will provide all design required for the performance of the Work (other than certain limited design-build elements of the Project which we understand are not in issue). Article 1.2 of the Construction Contract states that MMM has been engaged by the City to perform the City's design obligations. The mechanics for Design Optimizations and completion of design are set out in Article 3.1 of the Construction Contract, which in turn reference Appendices E [Specifications], F [Drawings], G [Scope of Work of Design Optimizations] and H [Design Development and Review Procedure].

It is apparent that when the Construction Contract was signed, a great deal of the design for the Project remained to be finalized and that a great deal of collaborative

work was required before "Issued for Construction" drawings would be developed to permit PCL to undertake construction of the New Bridge.

1.2 Discussion

We have reviewed the current status of the Project and have prepared this report with regards to the delivery of the Project. We have held numerous meetings with staff from the City, PCL, MMM and H&H. We have also reviewed large quantities of written documentation. The review has been undertaken as a Professional Engineer, experienced in the project management and administration of complex projects undertaken by a BC municipality. The report documents issues, proposes corrective action and updates Council on action already initiated by the City Manager to deal with the problems identified. Throughout the review process we have regularly briefed the City Manager on interim findings and it is understood that he has taken appropriate action to rectify many of the issues identified.

As a general issue, construction contracts of this type are complex arrangements and this project is particularly complex in both the work to be undertaken and the roles and responsibilities assigned to the contracting parties. The City has existing contracts with both PCL and MMM, which were designed by the City to dovetail to ensure that the major risks and responsibilities were assigned to either PCL or MMM. For the City the key issue has always been to establish a series of fixed price contracts to undertake all of the work with the major risks for the execution being assigned to one of the other two parties.

Our long experience in the administration of public sector projects has shown us that it is virtually impossible to develop contracts at the outset of a project that can 100% guarantee that all eventualities can be covered in the contract. A basic principle is that lawyers draft contracts under the direction of management and executive driven by business needs, and engineers and architects administer them in practice. That often means "give and take" and as a project proceeds issues develop that either could not have been foreseen and, for whatever reason, things do not turn out as anticipated.

This means that on any construction project there are important principles that always apply such as:

1. Roles and responsibilities of everyone involved in the project must be clearly defined at the outset.
2. The Owner (in this case the City) must establish a single point of responsibility, one individual who is given the mandate and authority to administer the contracts on behalf of the City
3. Communication and cooperation between the various participants in the project must be excellent and constantly reviewed
4. Issues that are identified must be dealt with immediately and resolution determined without delay

5. Key risks must be identified, continually monitored, and dealt with appropriately

When a project goes astray there are two types of issues that must be considered, these being: root causes, and symptoms. Addressing symptoms doesn't deal with the basic cause of the problems.

1.3 Review Process

The following steps were undertaken in the review Process:

1.3.1 Interviews

I either met with and/or interviewed the following people either in person or by phone. Several people were interviewed on more than one occasion:

Name	Company	Project Role
Sean Brock	PCL	PCL District Manager, Vancouver
Ankur Talwar	PCL	PCL District Manager, Seattle
Dan Leachman	PCL	Site Superintendent
Tim Stanley	MMM Group Limited	Executive Vice President, Partner
Didier Samouilhand	MMM Group Limited	Resident Engineer
Joost Meyboom	MMM Group Limited	Project Principal
Keith Griesing	Hardesty and Hanover	Director of Engineering/Principal
Dwayne Kalynchuk	City of Victoria	Director of Engineering and Public Works
Ken Jarvela	City of Victoria	Senior Project Manager
Tom Zworski	City of Victoria	City Solicitor
Katie Hamilton	City of Victoria	Director of Communications and Civic Engagement
John Haythorne	Dentons	External Legal Counsel

In addition to the above I have discussed the project on numerous occasions with the City Manager, Jason Johnson.

I also chaired a meeting between the Principals of MMM and PCL at which the City Manager and the City's Director of Engineering and Public Works were present. Subsequent to these meetings, the City Manager has retained my services as Interim Project Director, under the supervision of the City's Director of Engineering and Public Works to begin resolving many of the issues and as a result I have chaired a number of weekly progress meetings at which all of the issues are being addressed.

1.3.2 Documents Reviewed

As part of the review process we have received and read the following key documents:

1. Amending Agreement to the Engineering Agreement signed on 4 January 2013 between the City of Victoria and the MMM Group
2. Engineering Agreement signed purported to be dated November 2012 (the signed copy we received was undated) between the City of Victoria and the MMM Group
3. PCL letter requesting a change order for additional costs dated 17 March 2014
4. Draft MMM response to the 17 March 2014 PCL letter sent to the City for review and copied to PCL
5. Project Charter – Amended 21 March 2013
6. Construction Agreement with PCL Constructors West Coast – Dated January 2013
7. Agreement between MMM and H&H dated February 2013

I have also scanned a large number of other documents that are on the City's project website.

1.4 Issues Resulting from Review

1.4.1 Project Leadership

During my review I asked everyone involved a simple question: "who is in charge of the project". Nobody could provide me with an answer. That is an unacceptable situation. In my opinion the City must assign, and that means also delegate appropriate authority, to an individual who is accountable for the day-to-day administration of the project. That individual is not Council, it's not the City Manager, the Director of Engineering and Public Works or the City Solicitor, though of course all of those maybe important resources. In the end that individual is accountable to City Council through the City Manager. It must be clear that in my opinion this was not a responsibility of City Council to appoint that individual and it is a problem that has existed since at least January 2013.

That individual needs the following qualifications:

1. Ideally a Professional Engineer with good leadership and communication skills – a team player who can motivate others through their leadership skills
2. A long history of the successful management and administration of complex engineering projects

It is important that the individual commands the respect of the other project participants. Experience in steel bridge construction is not an essential requirement as the City has retained specialist consultants to provide that skill set. Good communication skills and the ability to establish a spirit of cooperation and good working relationships is paramount.

Realigning leadership on a major project takes time, not only in determining the individual who should provide that leadership but also in changing the project culture to a truly cooperative one. The City Manager should be tasked to make interim arrangements to provide leadership to the project teams. The City should also determine whether any of the current project participants are suited to such a role.

Recommendation One -

That the City appoints and delegates authority to one individual (the Project Director) to manage the project, who shall report through the City Manager to Council. In addition the City Manager should determine whether any of its current project participants are suited to this role.

Action Taken:

The City Manager has retained the Consultant (Jonathan R Huggett P.Eng) on an interim basis (until September 2014), and reporting to the City's Director of Engineering and Public Works to provide leadership on behalf of the City in resolving the issues identified in this report. The City Manager has indicated he will be reviewing longer-term issues around leadership once the Project has stabilized.

1.4.2 Resolution of Issues that Arise

During the review, various issues have been identified which are still unresolved. The failure to resolve these issues means that other issues then arise. In my experience resolving issues on construction contracts is not adequately dealt with by simply saying no and threatening litigation. Every construction contract I have ever been involved with has issues that require resolution. Resolution requires give and take and cooperatively working together. Of course legal contracts are important, but no contract ever fully deals with every issue that arises. An experienced Project Director will call all the parties together on a weekly basis and nobody leaves the room until a timely path to resolution has been identified. It is naïve in the extreme to believe that all that has to be done is to look up an appropriate page in a contract and enforce the requirement. Even when issues cannot be easily resolved a process of mediation is to be preferred to litigation, since ultimately litigation rarely benefits anyone. An experienced project referee can be very helpful in that regard. Note that the current agreements do not make provision

for the appointment of a project referee. I have provided further information regarding the roles and responsibilities of project referee in Appendix A at the end of this report. This provision would require mutual consent of the three contracting entities.

One very important issue we have identified is that many of the issues are not being resolved in a timely manner for the following reasons:

1. Both MMM and H&H have largely expended much of their budget and are reluctant to incur additional costs that they cannot cover. This raises issues of whether the original scope and budget of their services was sufficient in the first place or whether additional services have become necessary as the project has unfolded.
2. There are disputes between the contractor and MMM and its sub-consultants as what constitutes adequate design detail
3. The City has required additional services. For example, it requires MMM and H&H to do a thorough review of the PCL bridge erection procedures to ensure that the permanent structure is not damaged during lifting and that risks related to activity in the navigation channel have been fully analyzed

Recommendation Two –

That issues arising on the project are dealt with in a timely manner through constructive dialogue and teamwork. The City should also consider, in consultation with the other contracting entities, appointing an independent Project Referee to deal with the most difficult issues.

Action Taken:

The Interim Project Director has asked both MMM and PCL prepare a detailed scope of work for MMM and its subconsultants from now until the end of the Project and then MMM will be invited to submit a proposal as to how these services can be provided.

This issue is an example of how work that is not being undertaken in a timely manner is delaying the Project. To simply deny that these services are required or that they have already been paid for means that important engineering services are not being undertaken.

1.4.3 The Role of MMM

MMM has advised the City since 2010. MMM developed the indicative design for the Project and actively participated in the RFP process, which led to the optimizations for the final design. MMM have provided costs estimates for construction and for the required engineering services.

There is a recurring theme, as discussed above, that the costs for MMM performing construction services are a challenge, yet the budget was set by MMM in its

agreement with the City. A lack of budget for undertaking services can never be justification for failing to provide adequate professional services. At the end of this Project there is a justifiable expectation on the part of the City that MMM will provide written certification that the Project has been designed and constructed in accordance with all applicable regulations, accepted best practice, and is of an acceptable quality. MMM must provide all of the services required to make that declaration.

It should be clear that we have not had the time to perform an exhaustive review of all correspondence between the City and MMM, but we remain concerned regarding engineering services provided to the City. At this point it is not our intent to apportion blame. The City is relying on MMM as an experienced advisor, and we note the following ongoing unresolved issues:

- After one year there is still no agreed detailed schedule
- Disputes between PCL and MMM are common involving such issues as design reviews and the like
- The development of the detailed design of the bridge has taken considerably longer than projected

It may be that part of the problem lies in the lack of overall project leadership. We have had discussions with the Principals of MMM and H&H and steps have already been taken to correct the situation and further steps are planned as noted below.

Finally, because the contracts with MMM and PCL are designed to dovetail the latest claim for additional costs by PCL, if found to be valid, might imply fault with MMM. For this reason MMM are in a conflict of interest in assessing the PCL request for additional costs. The City should appoint independent advisors to assess the PCL claim for additional costs.

Recommendation Three -

- 1. The roles and responsibilities of MMM and their performance to date needs to be reviewed with MMM. This should take a thorough review of their contract and discussing whether all of the services required are being adequately provided.***
- 2. MMM are in a conflict of interest regarding the assessment of the PCL claim and the City should recognize that.***

Action Taken:

The following action has already been taken:

1. MMM have assigned an additional office engineer to review contractor submittals
 2. MMM have been asked to review all of the engineering services required to complete the Project and to submit a proposal regarding that as soon as possible.
- We expect that proposal by the end of July.

1.4.4 Assessment of Risks

On any project of this complexity there are project risks. With the advent of many alternative delivery projects, it has become standard practice to develop, maintain and constantly update a project risk registry. This starts at the feasibility stage and is maintained until final delivery of the project. The downside of these processes is that during our experience in being involved in the development of many risk registries we see a pronounced tendency by those involved to simply copy the last risk registry from another project without seriously understanding the specific challenges on the actual project. I am not necessarily implying this has been done on this project. On the Johnson Street Bridge project there are in our preliminary assessment the following real important risks that must be properly managed:

1. The Project budget is extremely tight and there is a very real prospect that it will not be achieved.
2. A fundamental concept of the project legal agreements is a cooperative undertaking of the project. What are the risks and consequences if that spirit of cooperation cannot be established.
3. A large portion of the bridge is being made in China and quality assurance is a key concern.
4. Communication is poor which may lead to misunderstandings and failure to deliver a satisfactory project
5. Bascule bridges are known to have start up problems related to getting the lift mechanisms and closure systems to work properly once fabricated and installed.
6. Effective management of the project ensuring timely resolution of issues that may arise.

While the City is publishing a risk assessment in its reports, that risk registry does not adequately reflect or focus on the real and important risks related to the project. In our judgment focusing on too many risks, many of which are not significant would be a mistake. The City needs to focus on a smaller number of very real risks that would be very serious if they materialized. The input of PCL and MMM is very important in that regard.

Recommendation Four -

Revise the risk monitoring process to identify and focus on a smaller number of risks that are specific to the project (not generic risks) and develop proper mitigation strategies to deal with them.

Action Taken:

Through regular weekly meetings the Project Team are now coming to grips with all of the key project risks and these are being tracked on a weekly basis. We will reflect these better in the upcoming reports to Council so they may be properly managed.

1.4.5 Quality Assurance

In the discussion of risk, we identified a major issue regarding quality assurance of the steel fabrication being undertaken in China. There is an increasing tendency around the world to have major steel fabrication undertaken in China and also other predominantly Asian countries. The reasons for this are largely price, but also capacity. The large number of such fabrications means that China in particular has developed the facilities to undertake such fabrications and the number of North American suppliers has significantly decreased. The barriers related to this include language, distance, adherence to North American standards and principles, recourse to North American courts in the event of a dispute and the like. It is clearly PCL's responsibility (PCL acknowledges this) to ensure the work is properly undertaken. The City does have a two-year warranty from PCL. Whilst PCL did make a verbal commitment beyond that if there are any problems related to the fabrication, that maybe of little value after the warranty period has expired if problems do become evident. In addition PCL have their own quality control company, Atema (<http://www.atema.com>) working in China. They review quality control testing undertaken by the steel fabrication subcontractor ZTSS Bridge.

Steel fabrication has now commenced in China. The H&H project engineer has paid one visit to the Chinese fabricator to assure himself that the fabrication plant has the skills and expertise to manufacture the steel portions of the bridge. We understand 6 additional visits are planned at currently unspecified times. Nevertheless we identified that the City does not have its own quality assurance plan in place. Clearly if the steel does show up in Victoria and there are problems with it, it will be little comfort to the City that PCL are responsible to fix those problems.

Recommendation Five –

That the City in consultation with MMM and PCL devise an appropriate Owner's quality assurance plan that provides further comfort that the portions of the bridge manufactured in China are of appropriate quality and meet all North American standards of workmanship and material quality.

Action Taken:

The City has now issued a fully detailed quality assurance change order to MMM and principally it's sub consultant H&H to ensure third party checks on the steel fabrication in China are being undertaken. I am satisfied that this issue has now been dealt with, but ongoing monitoring will be required.

1.4.6 Project Schedule

A fundamental component of any construction project is a project schedule. That presents the assumptions that a contract price is based on regarding the timelines of the project. It provides such detail as when design information becomes available, the lead times regarding ordering of equipment and most importantly identifies the "critical path" – the items that are driving the schedule.

It is used, for example, as the basis to assess claims for delay. Without a baseline schedule these assessments become extremely difficult, not to mention that the parties to the contract are unclear on the expectations regarding their performance.

Pursuant to GC 4.12 of the Construction Contract, PCL agreed to provide by mid-January of 2013, or such later date as the Consultant may agree, a revised and expanded work schedule based on Appendix D. This expanded work schedule is to contain sufficient detail to permit the Consultant to be able to understand and monitor the progress of the Work. A detailed work schedule was prepared by PCL and sent to the City and MMM on April 6, 2013. That work schedule includes dates by which design information would be given to PCL. We are still trying to resolve any comments that were prepared or sent to PCL by the City/MMM but it is clear that this schedule has not been formalized by issue of a change order, which would be the usual practice.

The following issues to be resolved:

1. The Project Schedule needs to be adopted by issue of a change order.

While it is very late to be agreeing a project schedule, when the City already has a claim for delay, and fabrication work has begun in both China and Victoria, it is better late than never to adopt a project schedule.

Recommendation Six –

That the City should make it a priority to formalize a project schedule for the Project in an agreement involving PCL, MMM and the City and include it in both contracts.

Action Taken

City staff and MMM are reviewing all responses made by City /MMM staff to PCL regarding the April 6, 2013 schedule and are endeavouring to ensure formal adoption of the project schedule by the end of July 2014.

1.4.7 Project Costs

The City entered into Contracts with both PCL and MMM to establish a collaborative approach to undertaking this project within a fixed price. One of the purposes of this review is to press the restart button on the Project and get it back on track. However well the City is able to restart the process and set up a new management framework, we feel obliged to address the difficult issue of cost. Even if the City were to follow all of our previous recommendations we still can't ignore the challenges to be faced regarding costs.

The term "fixed price contract" is often used on construction projects but in reality there is no such thing as a fixed price contract. It is possible to establish a fixed price contract related to a fixed scope of work, an agreed project schedule and a detailed allocation of risk, but any variation in any one of those three categories is inevitably going to lead to a variation in price. That is the purpose of a contingency.

We recommend a pragmatic approach to deal with costs on this project. I am certainly not suggesting that the City tear up contracts, but complex issues are involved. The Project has turned out to be far more complex than originally anticipated and this has resulted in changes to schedule, scope and risk.

Recommendation Seven – The City should do a thorough and realistic assessment of potential costs on this project and work with its partners to develop strategies to contain costs.

Action Taken:

The City is in the process of reviewing PCL's request for a change order for schedule delays. The City has also asked MMM (and its sub-consultant H&H) to review the scope of work required to complete the engineering services for the project.

The City is also taking various actions as detailed in the previous recommendations to improve communication in the Project team, to resolve outstanding issues speedily, and to foster a more collaborative approach to the delivery of the Project. This will take time to establish a more definitive Project budget, but at the same time it would be very unwise to cause additional delays.

1.5 Governance

It is clear to me that the intended collaborative nature of this project has not materialized. Problems are not being dealt with on an expeditious basis, communications are poor, risks are not being identified and proactively dealt with and there needs to be a fundamental change in the attitude of the Project team. Team members' roles and responsibilities are not being clearly understood and the City should review the suitability of the key individuals to fulfill the roles they have been given.

The most fundamental project accountability is accountability for the success of the project. A project without a clear understanding of who assumes accountability for its success has no clear leadership. With no clear accountability for project success, there is no one person driving the solution of the difficult issues that beset all projects at some point in their life. The concept of a single point of accountability is the first principle of effective project governance. We are not clear as to who is ultimately accountable to the City for the success of this project.

We recommend that the City appoint a Project Director with good communication skills, experienced in providing leadership to complex engineering projects, through a collaborative approach. The Project Director should be advised by a Steering Committee composed of the Principals of MMM, PCL, the City and others as appropriate. The Project Director should:

1. Report to City Council through the City Manager

2. Have access to other City staff for additional guidance, as he or she may deem necessary
3. Be given clear accountability and authority guidelines
4. Facilitate resolution of all disputes in a timely manner through good communication.
5. Recognize that in the first instance face to face conversations work best and generally intransigent written communications do not foster harmonious working relationships
6. Be able to access legal advice as required

Recommendation Eight – The City should put in place the recommended Project Governance strategy outlined in this review. That process needs to recognize not only the roles and responsibilities but also the ability of key individuals to fulfill those roles.

Action Taken:

The City Manager has appointed the consultant Jonathan Huggett P.Eng as an Interim Project Director with instructions to implement the recommendations in this report as quickly as possible. The Interim Project Director will report to the City's Director of Engineering and Public Works and both will report to the City Manager on a regular basis.

1.6 Other Remarks

In our review of this project, we have focused on trying to determine the current state of the project and provide suggestions and recommendations to rectify the many problems. We have avoided going back through the history of the project, except to the extent we needed to in order to determine the current status. It has not been our objective, nor were we retained to apportion blame or comment on what could have been done differently in the past. The project is where it is and while it would be beneficial to the City to conduct a "lessons learned" process at some point in the future, the priority for the City should be to get the project back on track as fast as possible and minimize any negative outcomes to the maximum extent possible.

The City Manager has already instructed various changes noted in this report to be put in place, and has also initiated various work items to deal expeditiously with outstanding challenges.

1.7 Recommendations

1. ***Recommendation One - That the City appoints and delegates authority to one individual (the Project Director) to manage the project, who shall report through the City Manager to Council. In addition the City Manager should determine whether any of its current project participants are suited to this role, and also the roles they currently fulfill.***
2. ***Recommendation Two – That issues arising on the project are dealt with in a timely manner through constructive dialogue and teamwork. The City should also consider, in consultation with the other contracting entities, appointing an independent Project Referee to deal with the most difficult issues.***
3. ***Recommendation Three –***
 - a. ***The roles and responsibilities of MMM and their performance to date needs to be reviewed with MMM. This should take a thorough review of their contract and discussing whether all of the services required are being adequately provided.***
 - b. ***MMM are in a conflict of interest regarding the assessment of the PCL claim and the City should recognize that.***
4. ***Recommendation Four - Revise the risk monitoring process to identify and focus on a smaller number of risks that are specific to the project (not generic risks) and develop proper mitigation strategies to deal with them.***
5. ***Recommendation Five – That the City in consultation with MMM devise an appropriate quality assurance plan that provides further comfort that the portions of the bridge manufactured in China are of appropriate quality and meet all North American standards of workmanship and material quality.***
6. ***Recommendation Six – That the City should make it a priority to formalize a project schedule for the Project in an agreement involving PCL, MMM and the City and include it in both contracts.***
7. ***Recommendation Seven – The City should do a thorough and realistic assessment of potential costs on this project and work with its partners to develop strategies to contain costs.***
8. ***Recommendation Eight – The City should put in place the recommended Project Governance strategy outlined in this review. That process needs to recognize not only the roles and responsibilities but also the ability of key individuals to fulfill those roles.***

