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Attention: Ross Crockford, Director  
Yule Heibel, Director  
Mat Wright, Director

Dear Messrs Crockford & Wright and Ms Hiebel:

**Re: The Future of the Johnson Street Bridge**

Thank you for your letter dated October 6, 2009 to Mayor and Council of the City of Victoria regarding the imminent Johnson Street Bridge Replacement Project. Your letter has been forwarded to the MMM Group as the City's Owner's Representative for this Project to respond to your inquiries outlined in your letter. We will respond to your comments in the order outlined in your letter:

**1. "The City should identify the specific repair work that needs to be done immediately to the existing bridge".**

We believe this has been done and was considered by the City in developing the repair/replacement strategy. The Delcan Condition Assessment Report completed in February 2009 gave significant consideration to the structural, mechanical and electrical components of the existing bridge. Expertise was also provided by Stafford Bandlow, a firm who specializes in electro-mechanical systems of moveable bridges. The reference that the work may cost less is misleading given that the cost is associated with the scope of work and the scope associated with the Delcan costs is significantly more than the cost of the motors as noted in the letter.

We also believe that the statement that it is impossible to know whether such an earthquake will occur tomorrow or in the next 100 years from now is irresponsible. It is the professional engineer's responsibility to hold paramount the safety, health and welfare of the public. It is also related to an understanding of the BC Building Code. Seismically upgrading the bridge, as part of its rehabilitation, is highly recommended and consistent with practices within the Province.

**2. “The City should decide what level of seismic vulnerability is “acceptable” for the existing bridge.”**

In the letter, the authors state that seismic strengthening is not required. As professional engineers and the Owner’s Representative, we would strongly recommend that as part of any significant rehabilitation of a public amenity, seismic upgrading should be included to the level required of the jurisdiction.

It may or may not be a low priority in Portland, but this is not the case in most other parts of the world and in particular the Province of BC. It should be noted that a jurisdiction’s seismic retrofit policy is typically based on the standards and economic considerations for the area, in addition to life-safety concerns.

In BC, the Ministry of Transportation & Infrastructure has targeted and completed seismic retrofits on many of the bridges that are considered to be vital to the Province’s economy. This retrofit program has been in effect for about a decade and is ongoing in accordance with their 2005 Seismic Retrofit Design Criteria. It is based on a policy that following an earthquake, extensive economic downtime and the corresponding loss of revenue can be avoided and should not be added to the expected cost of re-building other parts of society’s infrastructure. Johnson Street Bridge is a vital link in Victoria’s and the CRD’s [Capital Regional District] Primary Inter-municipal Road [as outlined in the CRD’s TravelChoices Long-Term Transportation Strategy] and economic network, and as such a seismic retrofit is consistent with the emergency preparedness planning of most jurisdictions. This also would provide an excellent level of redundancy in the transportation network, which is prudent to provide and an important factor in emergency preparedness.

Once the bridge is replaced as a lifeline structure, it will be recommended for inclusion as part of the CRD’s Emergency Preparedness Routing as an alternative to the Pt. Ellice [Bay Street] Bridge, which was seismically upgraded several years ago. This is supported by the Engineering and Fire Departments as it will provide necessary redundancy in the transportation network in a vulnerable area of the City / Region for use by emergency personnel.

The 2006 Building Code also supports the approach in seismically upgrading a building or structure. For example, any time a building undergoes significant rehabilitation or change of use, the building must comply with the current Building Code, which includes seismic upgrading. One of the major considerations immediately after a major seismic event is providing critical infrastructure to support rebuilding of the City, and rebuilding of its economic and social structure.

In our professional opinion, soil liquefaction is not an issue as it is relatively easier to rebuild a roadway to the bridge than to rebuild the bridge itself, which could take at least 24 months in such a

scenario. Also, it would likely be extremely difficult to engage a contractor and costs would be extraordinary in such an event.

**3. “The City should examine the wide range of seismic upgrade options listed in Delcan’s report”.**

The City has considered seismic upgrade options as determined by qualified professional engineers licensed to practice in BC and as presented in Delcan’s report. From a cost perspective, all the retrofit options are “comparable” when the required underpinning of the existing counterweight tower is included. Similarly, we believe that all retrofit options could be implemented. However, a seismic retrofit would significantly impact the defining characteristics of the bridge. The consultants recommended a combination of seismic mitigation options for the existing bridge that included plating of the lattice beams, the installation of cross-bracing for additional stability and underpinning of the timber pile cap of the counterweight towers. The consultants also recognized that plating of the lattice beams would add weight to the bridge, which must be considered for the counterweight, mechanical and braking systems, the foundation, as well as the loss of heritage characteristics of the bridge.

**4. “The City should seek advice from an experienced heritage bridge engineer.”**

The MMM Group and indeed most Canadian bridge engineering firms are capable and experienced with projects requiring heritage restorations. There are 4 key definitions that need to be understood as part of any historic review. These include:

- Conservation: all actions or processes that are aimed at safeguarding the character-defining elements of a cultural resource so as to retain its heritage value and extend its physical life. This may involve “Preservation,” “Rehabilitation,” “Restoration,” or a combination of these actions or processes. “Reconstruction” or reconstitution of a disappeared cultural resource is not considered conservation and is therefore not addressed in this document.
- Preservation: the action or process of protecting, maintaining, and/or stabilizing the existing materials, form, and integrity of a historic place or of an individual component, while protecting its heritage value.
- Rehabilitation: the action or process of making possible a continuing or compatible contemporary use of a historic place or an individual component, through repair, alterations, and/or additions, while protecting its heritage value.
- Restoration: the action or process of accurately revealing, recovering or representing the state of a historic place or of an individual component, as it appeared at a particular period in its history, while protecting its heritage value.

Given that the bridge is in need of repairs and seismic strengthening, a rehabilitation project would be required while conserving the character-defining elements of the bridge as far as practical. We believe that the strategy recommended in the Delcan report is the most appropriate for the Johnson Street Bridge and constitutes a reasonable approach to addressing the needs of the bridge. However, the rehabilitation and seismic upgrading does not address the current or future needs of the bridge as outlined in the City's Official Community Plan, the CRD's Regional Growth Strategy, the CRD's TravelChoices Long-term Transportation Strategy, the City's Bicycle Master Plan, and the City's Pedestrian Master Plan.

The reason the City is replacing the Johnson Street Bridge is in balance of all of the considerations which include, but are not limited to:

- Embodied Energy;
- Heritage Assessment;
- Life Cycle Assessment;
- Regional Growth Strategies Objectives;
- Accessibility – pedestrians, cyclists;
- Safety;
- Improved Pedestrian Facilities;
- Cycling Facilities for Commuter and Recreational Users;
- Marine Traffic; and
- Traffic and Business Disruption,

The Replacement Option provides a 100-year solution towards meeting the City's Triple-Bottom Line objectives from a social, environmental and economic perspective.

**5. “The City should examine and learn from the many successful examples of heritage bridge rehabilitation in other Cities.”**

The consultants involved in the Condition Assessment Report have excellent knowledge and capability in managing rehabilitation of older structures and we feel the information provided to the City considered all of the issues, complexities and unknowns associated with rehabilitating older structures. The information provided to the City in the Delcan report is consistent with the projects referenced in your letter and as such the City's engineering and financial deliberations have been carried out in the context of those projects and in balance of all the considerations, resulted in the determination [approval-in-principle] to replace the bridge.

We have reviewed the projects referenced in your letter and prepared a table outlining costs in current dollars and length of closures to complete the projects.

Bridge	Bridge Type	Project Scope	Cost	Cost in \$2009*	Required Closure	Seismic Zone
Fourth Street Bridge, San Francisco.	Strauss Bascule	Seismic Retrofit, Provision of LRT crossing	\$55M (2006)	\$65M	+12 months	Similar to Victoria
Third Street Bridge, San Francisco.	Strauss Trunnion Bascule	Rehabilitation and Seismic Retrofit	\$10M (2000)	\$26M	8 months	Similar to Victoria
Cherry Street Bridge, Toronto	Strauss Trunnion Bascule	Rehabilitation	\$2.6M (2007)	\$3M	5 months	minor
Hawthorne Bridge, Portland	Vertical Lift Bridge	Rehabilitation	\$21.3M (1999)	\$54M	13 months	Similar to Victoria

\*Based on 3% cost escalation from 1999 to 2003, 6% cost escalation from 2003 to 2009

As the Owner’s Representative, we are not suggesting that one could not restore the bridge. The question is really what are the costs, impacts and benefits associated with rehabilitation versus replacement. It is very clear from the table provided that the costs for rehabilitation are very comparable to what is estimated for the Johnson Street Bridge in the Delcan report and in fact may be much higher once you start the project.

One of the main issues determining why replacement was preferred was the expected length of closure and the corresponding economic impact to the Downtown area and surrounding community. The road closures required with each of the projects noted above are significant and will impact the City in the range of 5 – 12 months. An approximate estimate of the economic impact could run into the tens of millions if not hundreds of millions of dollars. This was also noted in a U.S. Federal

Highway Administration's [FHWA] report that states the economic impact of bridge closures far exceeds the capital cost of the project. This would be unacceptable to the City and the Downtown businesses.

Also, it is important to note that the projects outlined in the letter do not include all of the additional amenities that the City is proposing with the replacement bridge, which includes on-road commuter bike lanes, enhanced rail corridor, enhanced multi-use trail, improved road approaches, new trail connections, landscaping, and safety improvements.

It is also unreasonable to compare projects like the Johnson Street Bridge with others, as one needs to fully understand the issues, surrounding conditions, community values, regulations, policies, design standards, networks with each project.

Respecting the 4th Street Bridge example in San Francisco, the consultant did not use that as a direct comparison, but was specifically asked to bring back information regarding the restoration work of that bridge which experienced a project cost increase from an estimated \$17 million to \$55 million for the rehabilitation work.

**6. "The City should identify exactly how long the existing bridge would need to be closed for repairs".**

Based on the projects referenced in your letter, it is clear that comparable rehabilitation-type projects have required significant closures with durations that have varied from 5 months (without seismic retrofit work) to more than a year (with seismic retrofit work), neither of which are recommended for this project. In some of the cases cited, the moveable span was removed from the site for re-coating in order to maintain marine traffic. A similar approach would make sense for the Johnson Street Bridge. The idea that the existing railway bridge could be used for vehicular traffic while the roadway bridge is unusable is not practical or safe given the narrowness of the bridge and need for shared use by pedestrians, cyclists and cars.

The Replacement Option will not require full closure of the bridge as with the Rehabilitation Option. Some of these details will also be addressed as part of the procurement of the contractor performing the work as they may have other options or suggestions.

A full closure of the existing bridge under the Rehabilitation Option for a 5-12+ month period would not be acceptable to the Downtown businesses and the City's road network does not have redundancy to accommodate a very significant increase in traffic on its remaining bridge [Pt Ellice]. Comparatively, Portland has several [8?] bridges that serve its downtown area. Staging of the repainting work on the existing bridge would be extremely challenging, if not impractical from a technical perspective given the nature of the bridge and federal regulations to accommodate marine traffic.

**7. “The City should explore options for improved bicycle and pedestrian access to the existing bridge”.**

As the Owner’s Representative, we have reviewed a number of options for improved bicycle and pedestrian access to the existing bridge. The City had considered adding a cantilevered multi-use path to the side of the existing bridge some years ago and based on a professional engineer’s review this was not deemed viable. A separate bascule bridge structure was recommended, the cost of which is estimated at \$12 million. The upgrading of the bridge deck was also considered and it was determined that it would cost approximately \$10 million. This would add significant weight to the bridge and would affect the electrical / mechanical systems, balancing, foundation and counterweight.

Unfortunately, an upgraded deck on the existing bridge will not be a significant cycling improvement since this will not consist of separate / dedicated bike lanes as proposed in the Replacement Option and will not meet current engineering standards for a shared traffic lane.

The slipperiness of the existing grating can be reduced but likely at the expense of weight. Increasing the weight of the bridge will have “knock-on” effects that have not been explored but as noted previously likely would require strengthening of structural steel, re-balancing and upgrades to the electrical/mechanical system.

The total cost for a rehabilitated bridge including the separate bascule structure for pedestrians / cyclists and upgrading of the bridge deck for cycling traffic would be \$57 million [an updated estimate of \$35 M for repairing the existing bridge + \$12 M for separate pedestrian / bike bascule bridge + \$10 M for upgraded bridge deck], but without improvements to the road approaches, landscaping, etc. In comparison, the cost of the new bridge as a unified structure is \$63 million.

**8. “The City should fully disclose and discuss with the taxpayers the financial impacts of replacing the bridge versus repairing it.”**

The City has provided information regarding the financial aspects of the bridge project. Over the long-term, it is clear that replacing the bridge is more cost-effective and provides the best value to the citizens of Victoria over the next 100 years, with the addition of amenities and support for the sustainability of the community.

The City is not recommending or suggesting the application of tolls to road or marine users as part of the bridge replacement. Furthermore, we do not believe that the City has legislative authority to enact a toll on road users as this would require provincial legislation and certainly not on marine users as they are federally regulated. If it were practical to build a fixed bridge at this location then

this would be a non-issue. However, we believe that aspect has been adequately addressed in other discussions and presentations.

Cities are always challenged with establishing priorities and the need to address infrastructure was one of Council's 7 top priorities due to aging infrastructure and deficits. Other projects, such as sewer treatment, will be funded on a user-pay system as is the City's water and solid waste system.

**9. "If the City intends to continue with replacement, it should seek a clear mandate to proceed in a referendum".**

The option to use the Alternative Approval Process [AAP or counter-petition] versus a referendum is clearly the City's choice under the Community Charter. It is our understanding that AAPs are typically used for required projects, whereas a referendum is used for non-essential projects.

During the Public Engagement Process for this Project, the City received overwhelming support to replace the bridge. This was clearly demonstrated in the results of the Public Engagement:

Public Engagement Summary

- Should the AAP Total surveys completed = 5,195
- 13, 021 visits to [www.johnsonstreetbridge.com](http://www.johnsonstreetbridge.com)
- 3,491 on-line surveys collected
- 184 e-mail responses
- 1,574 paper surveys collected from outreach events and displays
- Contact with an estimated 2,200 citizens in-person at roughly 35 events and presentations

Should the AAP not be successful, then the City would be required to hold a referendum.

It is inappropriate to compare the Project as a \$23 million rehabilitation versus a \$63 million replacement. This is not an "apples to apples" comparison. If you were to add the additional amenities such as a proper multi-use trail and cycle-friendly deck to the existing bridge, the cost would be approximately \$57 million as compared to the \$63 million Replacement project, but without on-road bike lanes, a fully accessible bridge, the elimination of the S-curve on the west side, improved road approaches [including improved sidewalks and bike lanes], enhanced marine channel, other safety improvements and disruption to business. When the value of the federal contribution of \$21 million is considered, this makes a significant difference.

The other major consideration is the higher operating and maintenance costs for the Rehabilitation Option [including seismic upgrading] and the issue that this would only have a 40-year life versus a 100-year life for the Replacement Option.

In conclusion, and in balance of all the considerations, we believe the replacement of the bridge is the best solution. The new Rolling Bascule Bridge is respectful of our past and complementary to the surrounding Downtown area, and will create a legacy for the future.

Thank you once again for your comments, perspective on the Project, and for sharing this information for the City's consideration.

Yours truly,

A handwritten signature in black ink that reads "J. Meyboom". The signature is written in a cursive style with a large, stylized initial "J".

Joost Meyboom, Dr.sc.tech, P.Eng.  
Owner's Engineer  
Johnson Street Bridge Replacement Project  
MMM Group Ltd.

cc. Victoria City Mayor & Council  
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Mike McCliggott, Assistant City Manager  
Peter Sparanese, Director of Engineering  
Katie Josephson, Director of Communications  
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