



CITY OF VANCOUVER

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ADMINISTRATIVE REPORT

Report Date: March 25, 2008
Author: Dane Doleman
Phone No.: 604.871.6930
RTS No.: 07159
VanRIMS No.: 03-1200-30
Meeting Date: April 15, 2008

TO: Standing Committee on Transportation and Traffic

FROM: General Manager of Engineering Services

SUBJECT: Granville Bridge - Strengthening Design

RECOMMENDATION

- A. THAT Council approve funds for consulting services and related expenses for the Granville Street Bridge strengthening design at an estimated cost of \$330,000; source of funding to be:
- 2003-05 Streets Basic Capital - Aging Uncurbed Arterials Program (CBEA4B) - \$220,000
 - 2006-07 Streets Basic Capital - Major Maintenance of City Bridges Program (CCEA1C) - \$110,000
- B. THAT, subject to the conditions set out in Recommendations C, D and E, Council's normal policy of conducting an open competitive procurement process be waived and the General Manager of Engineering Services be authorized to enter into a sole-sourced contract with Buckland and Taylor Ltd. for engineering consulting services at an estimated total cost not to exceed \$227,885 plus applicable taxes with the source of funding as indicated in Recommendation A above.
- C. THAT the Director of Legal Services be authorized to execute and deliver on behalf of the City all legal documents required to implement Recommendation B.
- D. THAT all such legal documents be on terms and conditions satisfactory to the General Manager of Engineering Services and the Director of Legal Services.

- E. THAT no legal rights or obligations will be created or arise by Council's adoption of Recommendation B, C and D until such legal documents are executed and delivered by the Director of Legal Services.

GENERAL MANAGER'S COMMENTS

The General Manager of Engineering Services recommends the approval of Recommendations A through E.

COUNCIL POLICY

Council approves consulting contracts that exceed \$30,000.

Issuance of a formal Invitation to Tender or Request for Proposals is required for contracts in excess of \$100,000.

Contracts are to be awarded on the basis of best overall value to the City.

Funding of Capital projects must be approved by Council.

PURPOSE

The purpose of this report is to seek Council approval to award a sole-sourced consulting contract to Buckland and Taylor Ltd to complete the Granville Street Bridge strengthening design and to approve the re-allocation of Capital funds in support of the aforementioned consulting contract.

BACKGROUND

The Granville Bridge is safe and inspected regularly and was designed to comply with the prevailing design code of the day. The bridge is not a designated truck route, therefore as per the Street and Traffic By-law No.2849, any vehicle with a Gross Vehicle Weight (GVW) exceeding 10,000kgs (10 tonnes) is restricted from using the bridge (Coast Mountain buses are exempt from this bylaw with Council approval). Due to the Canada Line construction and impaired access to the Cambie Street Bridge there has been an increase in demand for other truck crossings of False Creek. The BC Trucking Association made a request to the City to allow private coaches (tour buses) on the Granville Street Bridge. This request triggered an evaluation of the load-carrying capacity of the bridge and the current posted Gross Vehicle Weight (GVW) load limit of 27 tonnes.

In April 2007, Buckland and Taylor Ltd. was awarded a contract to complete the preliminary load rating analysis based on the Canadian Highway Bridge Design Code (CHBDC) CAN/CSA S6-06. The analysis reviewed the loading imposed for highway single unit trucks and buses (GVW 31 tonnes), private motorcoaches (GVW 24 tonnes), and the 3 axle articulated transit bus (GVW 31 tonnes). The results of the analysis are as follows:

- The deck system (slab and girders) on the steel truss spans was found to be adequate;
- The concrete girder approach spans have deficiencies for loadings imposed by larger vehicles (GVW 24 and 31 tonnes); and
- Some of the concrete approach spans are considered deficient for the loadings imposed by the existing 2 axle transit buses (GVW19 tonnes).

The noted deficiencies relate to how the bridge compares to the current code and does not mean the bridge is incapable of supporting the existing traffic. The bridge has performed well under current traffic conditions and has the capacity to carry greater loads. However, the identified deficiencies should be addressed if new loading conditions or new traffic (heavier vehicles) are to be introduced to the bridge. In the interim, a heightened inspection regime has been implemented and staff are working on developing and implementing appropriate upgrades to the structure.

DISCUSSION

Completion of the bridge strengthening project will address the existing deficiencies and allow the City to add another truck and bus crossing across False Creek.

Furthermore, completion of the upgrades in a timely manner will provide greater flexibility in transportation planning related to the Olympics.

As part of the preliminary design, a number of strengthening techniques were investigated:

- Externally applied steel stirrups (U shaped brackets attached to the girders)
- Application of Fibre Reinforced Polymer (FRP)
- Concrete encapsulation

After review, both staff and the consultant recommend the most conventional strengthening option (the externally applied steel stirrups - see Appendix A) as the preferred technique, due to the low cost, ease of installation and maintenance, and preferred construction timeline.

The estimated timeline to complete the bridge strengthening project (design and construction) is approximately 16 months (3 months- design, 13 months- tender and construct) at an estimated cost of \$5.0M.

Implementation of the strengthening upgrades (extent of upgrades - see Appendix B) is contingent on Capital funding. Funding applications have been submitted to Translink through the Major Road Network (MRN) program and it is expected that this project will receive funding (a total of \$2.25M over 2 years) however no funding has been approved yet. The remaining \$2.75M is being requested through the 09-11 Capital Plan.

Staff are requesting that Council approve the reallocation of funds in support of the design of the upgrades to ensure that we do not preclude the completion of the bridge strengthening before the Olympics. Staff will report back to Council with detailed estimates and confirmation of external funding prior to proceeding to the implimentaion (construction) phase.

Buckland and Taylor Ltd. having completed the initial load rating and preliminary strengthening design for the Granville Street Bridge are well positioned to complete the detailed design and contract documents in a timely manner. The work that they have performed in the past is directly related to this project, was of very high quality and their continued efforts on this project will offer good value to the City.

As this would be a sole-sourced contract, a Notice of Intent- PS08051 was posted on the City of Vancouver and BC BID websites for 10 days (March 14th to March 24th inclusive). No challenges were expressed from the consulting community regarding the sole-sourced contract.

If the strengthening upgrades are not implemented private trucks and buses will continue to be restricted from using the bridge. There will be no effect on the Translink (Coast Mountain Bus) buses as Translink buses have been using this bridge for an extended period of time and there are no signs of distress in the bridge by their use.

FINANCIAL IMPLICATIONS

A total of \$330,000 is required to fund the activities in support of the engineering consulting services for the Granville Bridge strengthening design. This includes the consultant contract (up to and including construction tendering services) of \$227,885 plus applicable taxes, a provision of \$70,000 for equipment rentals, City crew time and an allowance for localised material testing. Funding will be provided from existing Streets Basic Capital programs:

- \$220,000 from 2003-05 Aging Uncurbed Arterials Program (CBEA4B)
- \$110,000 from 2006-07 Major Maintenance of City Bridges Program (CCEA1C)

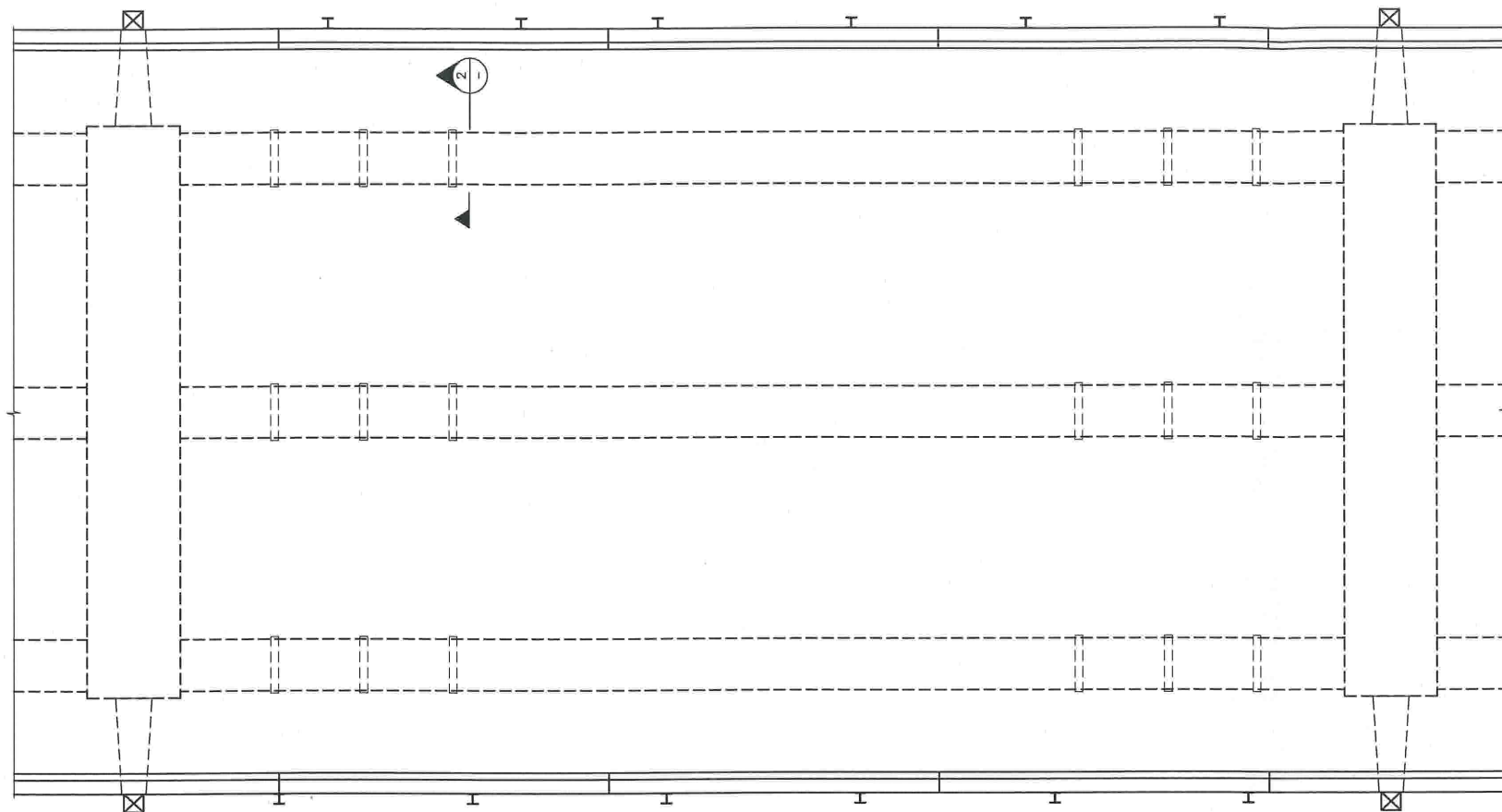
The Aging Uncurbed Arterials Program has ended and there is no further work planned. Staff recommend that funding of \$220,000 be re-allocated from the 2003-05 Aging Uncurbed Arterials Program to the Granville Bridge strengthening design.

A funding application of \$2.25M has been submitted to Translink through the MRN program and it is expected that this project will receive funding however no funding has been approved yet. The remaining \$2.75M is being requested through the 09-11 Capital Plan.

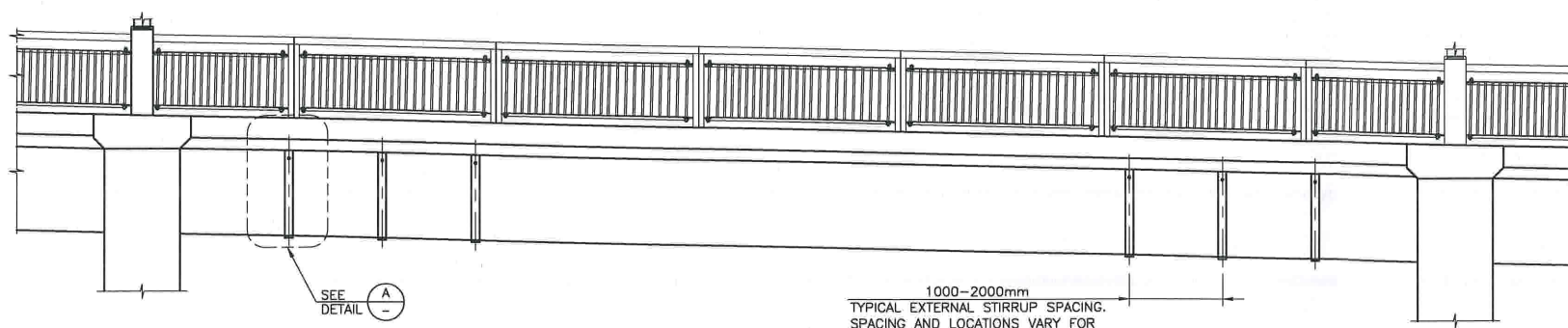
CONCLUSION

Staff recommend that a sole-sourced contract for engineering consulting services be awarded to Buckland and Taylor Ltd for the Granville Bridge strengthening design, and that \$330,000 be allocated to fund activities in support of the engineering consulting services.

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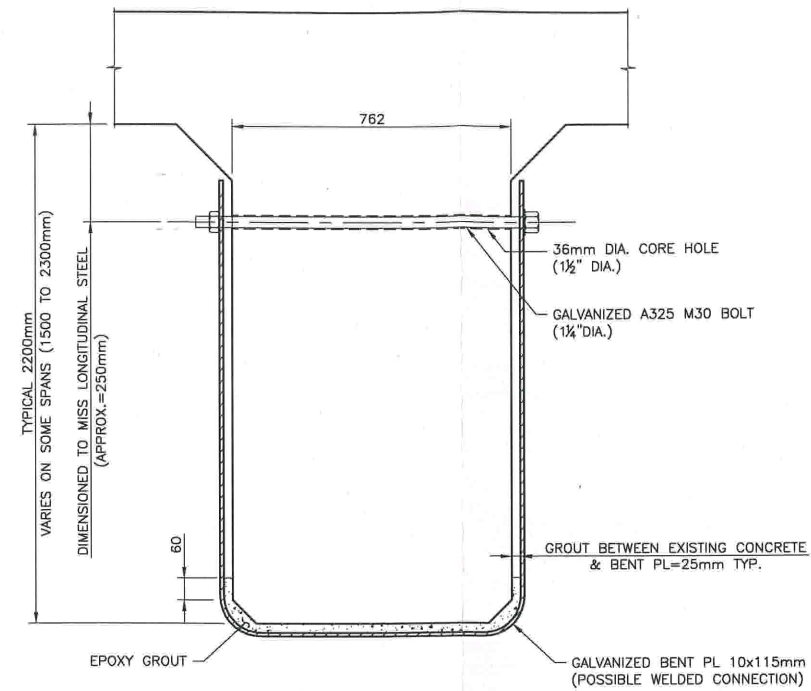
TYPICAL PLAN VIEW OF 3 GIRDER SPAN
 SCALE: 1:50
 (2, 5 & 7 GIRDER SPANS ALSO REQUIRE STRENGTHENING)



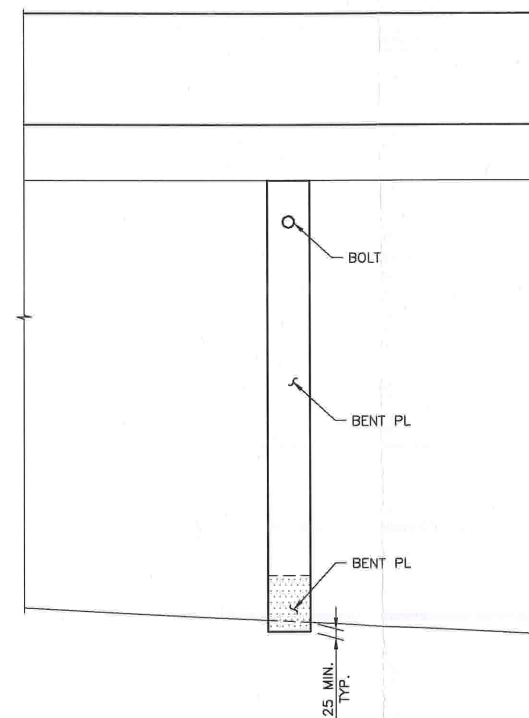
SEE
 DETAIL **A**

1000-2000mm
 TYPICAL EXTERNAL STIRRUP SPACING.
 SPACING AND LOCATIONS VARY FOR
 EACH GIRDER SPAN.

VIEW 1 TYPICAL
 1:50



SECTION 2 TYPICAL
 1:10



DETAIL A TYPICAL
 1:10

INSTALLATION PROCEDURE

1. TRIAL FIT STIRRUP TO GIRDER TO LOCATE BOLT HOLE POSITION.
2. CORE BOLT HOLE THROUGH GIRDER.
3. INSTALL EXTERNAL STIRRUP AND TIGHTEN BOLT.
4. GROUT BOTTOM PORTION OF STIRRUP.

CLIENT	CITY OF VANCOUVER		
PROJECT	GRANVILLE STREET BRIDGE		
TITLE	GIRDER SHEAR STRENGTHENING EXTERNAL STIRRUP CONCEPT		
DESIGNED EER	LCC	CHECKED	
DRAWN	LCC	APPROVED	
SCALE	AS NOTED	DATE	NOV. 15, 2007
DRAWING No.	1803-01		REV.



BUCKLAND & TAYLOR LTD.
 Bridge Engineering



LTR	REVISION	DR.	APP.	DATE



LEGEND

-  GRANVILLE BRIDGE
-  AREA TO BE STRENGTHENED



CITY OF VANCOUVER – ENGINEERING SERVICES

DIV./BR. TRANSPORTATION
 DATE: 11/28/07 DESIGN: DD/vbp
 DWG: VBP CHK: DD/DK
 REFS:

**GRANVILLE BRIDGE
 STRENGTHENING**

SCALE: NTS
 DIRECTORY:
 DWG. NO. YF1507
 SHEET.....OF..... REVISION:.....