



RECEIVED

CITY OF TRAIL MEMORANDUM

City of Trail

DATE: OCTOBER 22, 2010 **FILE NO.** 5400-02
TO: DAVID PEREHUDOFF, CHIEF ADMINISTRATIVE OFFICER
FROM: WARREN PROULX, ENGINEERING TECHNICIAN
SUBJECT: OLD TRAIL BRIDGE CLOSURE

The City of Trail received a letter from our bridge engineers, Buckland and Taylor, on their recent annual structural assessment of the Old Trail Bridge. A copy of the letter is attached.

Over the last several years, the engineers have closely monitored the condition of the bridge piers. The extent of the corrosion for the steelwork on all three piers did not show any signs of distress, therefore, their condition was only monitored. In their 2009 inspection, it was noted that the steelwork encasing the piers had started to corrode and some of the plates were separating from the rest of the steelwork. As a result of these observations in 2009, this year's inspection included special access to the pier shafts and a detailed inspection was completed.

The inspection of the piers revealed significant deterioration of the steel shells surrounding the piers and significant deterioration of the pier concrete inside the steel shells. Because of these levels of deterioration, in Buckland and Taylor's opinion, the current capacity of the bridge piers to resist unusual loads is insufficient to meet current standards. It was their recommendation that the bridge be closed to all public use. Our engineers have confirmed the bridge be closed to both vehicle and pedestrian use. Public safety is their main concern and they strongly recommend that there be no further public use of this bridge. They also have concern over the individuals who maintain the utilities on the bridge and their safety.

Our bridge engineers considered the possibility for strengthening the piers to permit resumption of bridge use. The cost of the strengthening is estimated to be in the millions of dollars. While Buckland and Taylor would be pleased to provide engineering services to undertake this investigation and design, they do not recommend the expenditure because of the low probability of a successful outcome. Buckland and Taylor have long been in business of maintaining bridges and this is the first time they have recommended to close a

bridge. They have maintained over 2000 bridges and they have not taken closing our bridge lightly.

In the year 1999, the bridge was closed to both vehicles and pedestrians as a result of an engineering study that determined a significant loss in the corroded bottom chord of the steel trusses. The City of Trail, with the assistance of the Ministry of Transportation, requested a RFP (Request for Proposal) for engineering services. Numerous engineering firms submitted proposals and Buckland and Taylor was selected the consultant that best suited the needs for the City of Trail. In the year 2000, Buckland and Taylor conducted a thorough structural assessment of the bridge and recommended several options for repairs to the bridge. The option selected by the City of Trail was the rehabilitation of the existing bridge for two lane traffic for three ton vehicles. This option would have a design life of 20 to 25 years estimating the level of corrosion losses to be steady. Unfortunately, the level of corrosion has exceeded estimated corrosion rates and the deterioration of the bridge steel structure has resulted in major expenditures. Not only the steel chord, but floor beams, web plates and other steel components are showing signs of excessive corrosion. For your information, we have no record of this bridge ever being painted since 1911, therefore, little protection for steel corrosion.

In the year 2001, major repair work to the steel bottom chord and the reduction of the width and reconstruction of the sidewalk allowed the bridge to reopen. Cost for these repairs was approximately \$500,000.

Buckland and Taylor recommended in 2000 to the City that an annual structural assessment be completed on this bridge and a major assessment be conducted every five years. The City has hired Buckland and Taylor every year since 2000 to carry out this engineering work. As a result of these inspections, we have completed additional repairs to the bridge since the reopening in 2001. In 2006, we completed additional repairs to the chord at a cost of \$100,000. In 2008, we replaced two abutment floor beams and the bolt assembly holding up the Terasen Gas and RDKB interceptor sewer utility pipes. Cost for these repairs was approximately \$210,000. This year, we had a contract signed to proceed with additional repairs to the chord and painting the sidewall guardrails at a cost of \$125,000. We have asked the contractor not to proceed with this work until a decision of the bridge closure has been finalized.

For your information, the Old Trail Bridge was constructed in 1911 and handed over to the City of Trail by the BC Department of Highways in 1962. This was as a result of the construction of the new Victoria Street Bridge in 1961. Since we took over the bridge, we have gone through numerous bridge closures and major repairs to the bridge over the last 50

years. Some repairs have been in excess of \$200,000 while other in the range of \$25,000 to \$100,000. We have a long list of repairs completed on file in the engineering department. A chart is attached listing the major expenditures on the Old Bridge since the Ministry of Transportation transferred responsibility of the bridge to the City of Trail.

Due to the closure of the Old Trail Bridge, it will be necessary to inform Terasen Gas and the RDKB that the bridge is substandard and a decision not to rehabilitate the bridge and eventual demolition would require they relocate their utility. Terasen Gas has an 8" gas main suspended on the bridge and the RDKB has an interceptor sewer also suspended on the bridge. This interceptor sewer was installed on the Old Bridge in 1971 because to install the interceptor sewer on the new bridge or install it underwater would have been more expensive than installing it on the old bridge. This interceptor sewer is a major service line from Rossland, Warfield, Rivervale, Oasis, Teck Metals and West Trail pumping sewer over the bridge.

For your information, we have obtained the following cost estimates for discussion:

1. The cost of a feasibility study to locate a new bridge in the Waneta area without conducting detailed investigations would be \$50,000.
2. Cost estimate to construct a new two vehicle lane bridge with a pedestrian sidewalk one block downstream from the current bridge at the Main Street intersection would be in the order of twenty million dollars based on rough engineering costs. The City has purchased the homes on the Riverside Avenue side of the Columbia River in anticipation of one day building a bridge at this location. The estimated time to construct a new bridge from design to completion is between 18 months and 2 years.
 - 2.1 Cost estimate to develop concept plans and detailed cost estimates for a new bridge at this location would be \$50,000. We could obtain this information in a 8 to 10 week period.
3. Cost estimate to demolish the old bridge, depending on the availability of local equipment and expertise, would be in the order of three to five million dollars based on rough engineering costs. To our knowledge, there are no regulations that require a municipality to demolish a bridge that has been closed. The bridge would have to be secured to strictly prohibit access (ie. remove decking etc. at each end of the bridge). Further investigation of this issue would be required as government agencies in charge of bridges were not available at the time this report was written.

RECOMMENDATION

1. That Council authorize the permanent closure of the "Old Trail Bridge" to vehicular and pedestrian traffic.
2. That notwithstanding recommendation #1, that staff be directed to investigate the possibility of the bridge remaining open for pedestrian traffic only, subject to consultation with the Municipal Insurance Association.
3. That the City proceed with developing a concept plan and detailed cost estimate for a new 2 lane bridge with a pedestrian sidewalk at the Main Street location one block downstream from the Old Trail Bridge. Cost estimate for this work is estimated at \$50,000.
4. That the City put Terasen Gas and the Regional District of Kootenay Boundary on notice that it may become necessary for them to remove their utilities off the Old Trail Bridge due to the unsafe condition.
5. That staff be directed to investigate the costs and procedures to be followed to demolish the existing structure, with consideration to approach the Province for funding assistance to facilitate this once the information is obtained.

Please advise if you require any additional information.



Warren Proulx
Engineering Technician

Attachment

cc Larry Abenante, Public Works Manager

Agreed.


Oct. 22 2010

Our Reference: 1551-wp-009-l-na

Our File: 1551

By E-mail – Original by Mail

2010 October 19

The City of Trail
1394 Pine Avenue
Trail, BC V1R 4E6

Attention: Mr. Warren Proulx
Engineering Technician

Dear Sirs,

Re: Old Trail Bridge

Buckland & Taylor Ltd. recently completed an annual inspection of the Old Trail Bridge for The City of Trail. During our annual inspections conducted over the past few years, visibly increasing deterioration of the river piers has been observed. As a result of these observations, this year's inspection included provision of special access to the pier shafts whereby detailed, close-up inspection could be undertaken over most areas of all three piers.

This close-up inspection of the piers revealed significant deterioration of the steel shells surrounding the piers, and significant deterioration of the pier concrete inside the steel shells. Because of the observed level of deterioration, it is Buckland & Taylor's opinion that the current capacity of the bridge piers to resist unusual loads is insufficient to meet current standards. It is therefore our recommendation that the bridge be closed to all public use.

We have briefly considered possibilities for strengthening of the piers to permit resumption of bridge use. Our initial impression is that the cost of any such strengthening would be in the order of several million dollars. Additional study would be required to more accurately assess these costs. While we would be pleased to undertake this investigation, we do not recommend the associated expenditure because of the low probability of a successful outcome. This is a disappointing conclusion, but we are pleased to have been able to extend the life of the bridge for 10 years after it was first considered unusable.

Please contact the undersigned if you have any questions or wish to further discuss this letter.

Yours truly,

BUCKLAND & TAYLOR LTD.



Nedim Alca, P.Eng.

HISTORY OF OLD TRAIL BRIDGE MAJOR EXPENDITURES

YEAR	ISSUE	COST
1962	Bridge transferred to City of Trail by Ministry of Transportation	Nil
1969	Repairs to piers due to undermining/erosion	\$ 40,000
1972	New rocker bearings and redecking of bridge	\$135,000
1980	Replace deck mesh	\$ 25,000
1985	Deck and structural timber replaced and replace deck mesh	\$ 56,000
1989	Major rehabilitation of timber structure, grating and sidewalk repairs	\$190,000
1995	Complete replacement of stringers, wood structure, new hardwood deck and modifications of the sidewalk	\$600,000
2001	Major rehabilitation to steel chords, removal of wooden sidewalk and replace with new steel sidewalk	\$500,000
2006	Additional repairs to bottom steel chord	\$100,000
2008	Replacement of two abutment steel floor beams and bolt assembly for utility hangers	\$210,000
2010	Additional repairs to bottom steel chord and painting sidewalk guardrails (PROJECT DELAYED)	\$125,000
	TOTAL (not including 2010):	\$1,856,000