City of Trail

CITY OF TRAIL
MEMORANDUM

ENTERED

DATE: DECEMBER 9, 2010 **FILE NO. 5400-02**

TO: DAVID PEREHUDOFF, CHIEF ADMINISTRATIVE OFFICER

FROM: WARREN PROULX, ENGINEERING TECHNICIAN

SUBJECT: OLD TRAIL BRIDGE – NEW BRIDGE PROPOSALS

As instructed by City Council as a result of the permanent closure of the "Old Trail Bridge" to both vehicular and pedestrian traffic, several concept plans and cost estimates for new bridge proposals have been prepared by our bridge engineers. The following options are based on the location of the new bridge one block downstream from the Old Trail Bridge at the intersection of Columbia Avenue and Main Street. The estimated costs include engineering, design, construction services, and the supply fabrication, installation and construction costs for the bridge.

OPTION #1: A two lane roadway bridge with shoulders and a sidewalk ..... $20 million

This bridge would also carry utilities, including the RDKB interceptor sewer, Terasen Gas pipeline and a waterline. The bridge would be designed to the latest Canadian Highway Bridge Design Code requirements and to the same live loading as modern highway bridges. The foundations for this bridge would consist of two abutments and two river piers. The two piers would be constructed on piles driven into the riverbed and would have reinforced concrete shields to provide protection against river debris (i.e. logs). The superstructure would consist of three steel girders and a concrete deck. The sidewalk would have a steel / aluminum fence on one side and would be separated from the roadway by concrete barriers. A concept drawing of this option is attached. As you will see on the drawing, the difference in elevation between Columbia Avenue and Riverside Avenue is 35 feet; therefore, the bridge deck is sloped at 4.9% for a total distance of 700 feet from Columbia Avenue to Riverside Avenue. The existing Old Trail Bridge is level from one side to the other.

OPTION #2: A one lane bridge, pedestrian bridge, capable of carrying an emergency vehicle: ..... $15 million

Our bridge engineers were asked to include this option in their concept proposals so we can understand the difference in cost in comparison to Option #1 and the possibility of a cost reduction measure. When a pedestrian only bridge is required to carry an emergency vehicle, a cable supported suspension bridge system no longer tends to be

economical for this bridge length. The deck system is required to be more substantial and the most suitable solution is a bridge similar to Option #1 with a more narrow deck. As in Option #1, in this option, the bridge deck is also sloped at 4.9% from Columbia Avenue to Riverside Avenue. There are some cost savings with this option as less steel girders and fewer materials would be required. The cost of major items such as river piers, abutments and construction costs would be similar for both Options #1 and #2. A cost savings due to fewer materials would be in the order of $5 million.

OPTION #3: Pedestrian suspension bridge: ..... $6.5 million

This bridge would only require a tower on each side at the edge of the river and no mid piers required. Concrete abutments are also necessary at each end of the bridge. The bridge would require wind cables to minimize wind movement of the deck and the structure. The deck would be reinforced concrete panels. The concrete deck would provide for low maintenance surface suitable for both pedestrians and cyclist use. The concrete deck panels would be removable to allow access to the pipelines for inspection and maintenance. The side fences would be an aluminum picket style fence. This bridge would be capable of supporting the three utility lines (water, sanitary and Terasen Gas). Removal of snow will have to be completed by snow blower or a small 4x4 ATV. The deck of the bridge will be 2 metres (6.5 feet) wide. The slope of the bridge would be approximately 5% from Columbia Avenue to Riverside Avenue. A concept drawing of this option is attached.

City Council also has concerns about the impact the closure of the Old Bridge will have on traffic patterns downtown. This issue has been discussed with engineering, public works, and the Trail Traffic Committee with several suggestions brought forward but no recommendations. Suggestions discussed are:

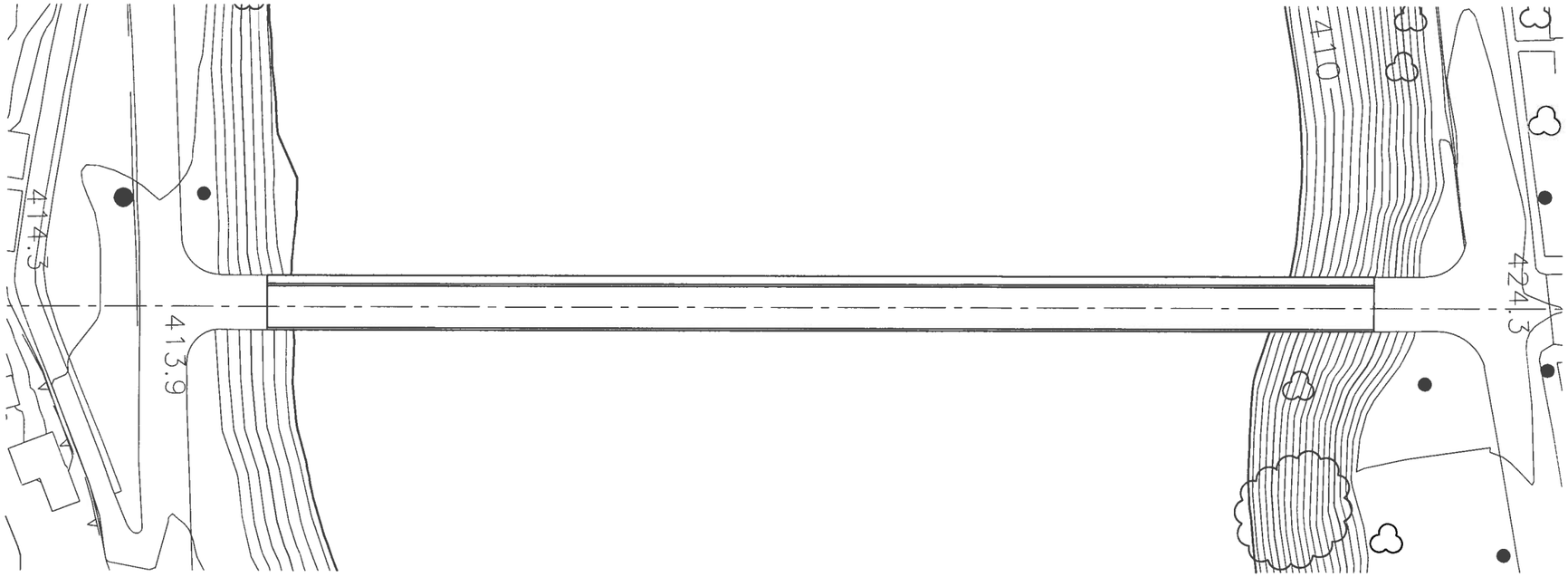
i. Have downtown traffic lights flashing at rush hours to make Bay and Cedar Avenues through traffic.
ii. Install traffic lights on the New Bridge to allow 3-lane traffic in one direction at certain times of day. (This would also assist in traffic flow in case of a vehicle accident on the bridge.)
iii. Eliminate the left hand turn lane into the Trail Memorial Centre at the New Bridge on Victoria Street to increase the length of the left hand turn lane off of Victoria Street to exit onto Bay Avenue.

We would suggest that a committee be established to solve the problem of getting vehicles off of Victoria Street into downtown and vice versa.

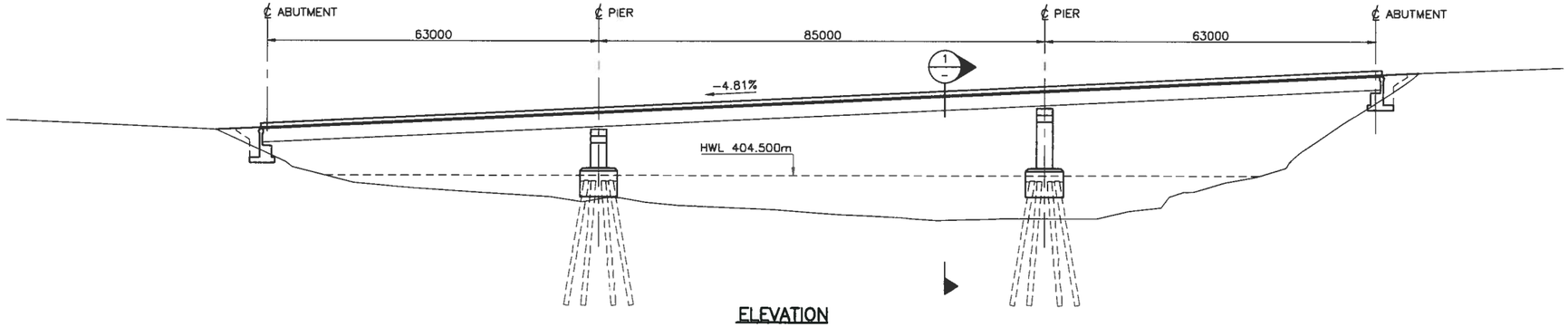
Please advise if you require any additional information.

Warren Proulx
Engineering Technician

cc: Larry Abenante, Public Works Manager
Michelle McIsaac, Corporate Administrator



PLAN
1:500



ELEVATION
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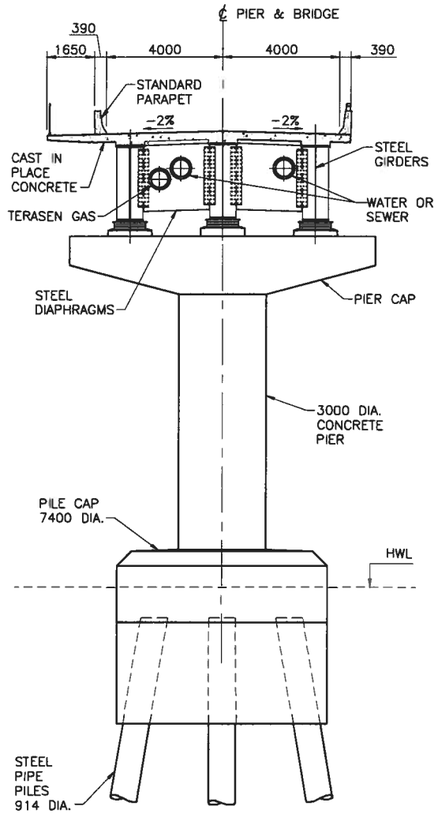


SECTION 1 – 1
1:100

Option 1/2

Two lane option
One lane option

PRELIMINARY 2010 NOV 17

CLIENT	CITY OF TRAIL
PROJECT	NEW TRAIL BRIDGE
TITLE	GENERAL ARRANGEMENT CONCEPT

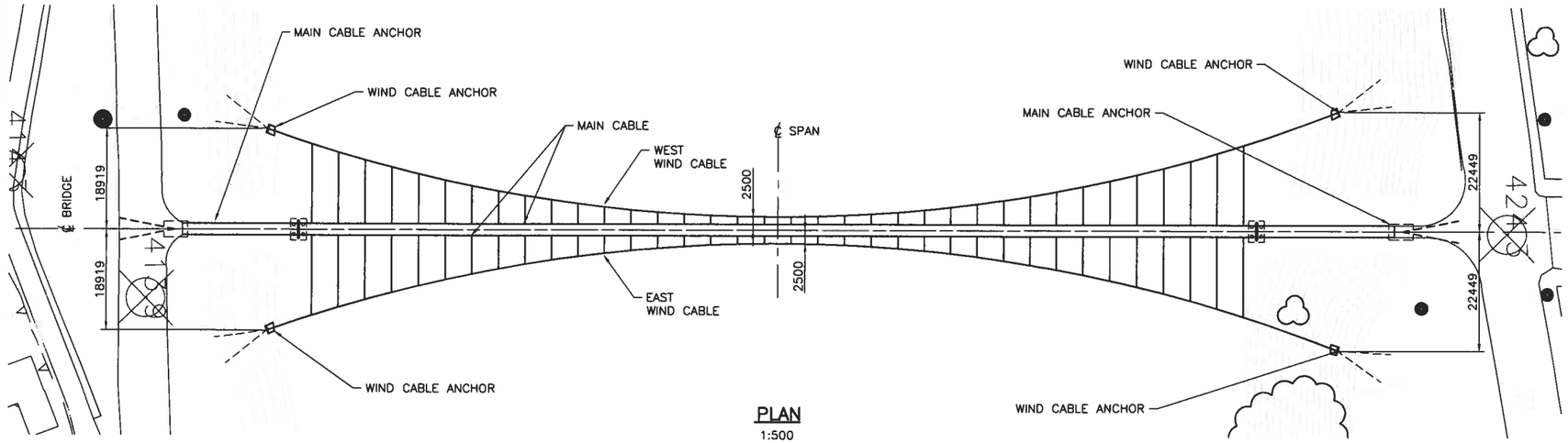
BUCKLAND & TAYLOR LTD.
Bridge Engineering

DESIGNED NIA		CHECKED ???	
DRAWN KAM		APPROVED ???	
SCALE ???		DATE ???	
DRAWING No. 1551–SK1			REV.

0 50
ORIGINAL SCALE IN mm FOR REDUCED PLANS

LTR	REVISION	DR.	APP.	DATE

File: Concept.dwg Date/Time: November 17, 2010 4:01 p.m. Scale: 1–1 kmarat Xrefs:



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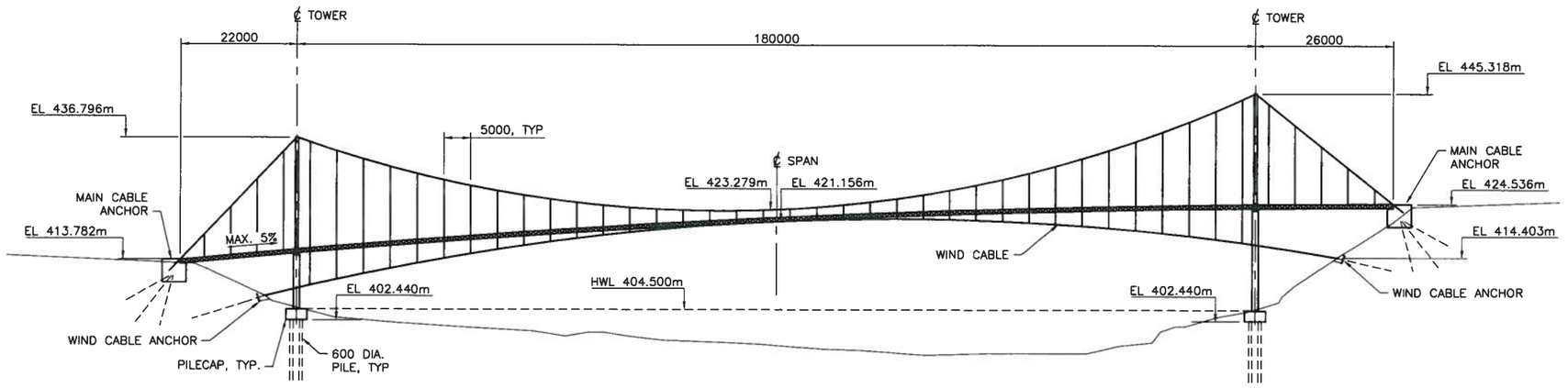

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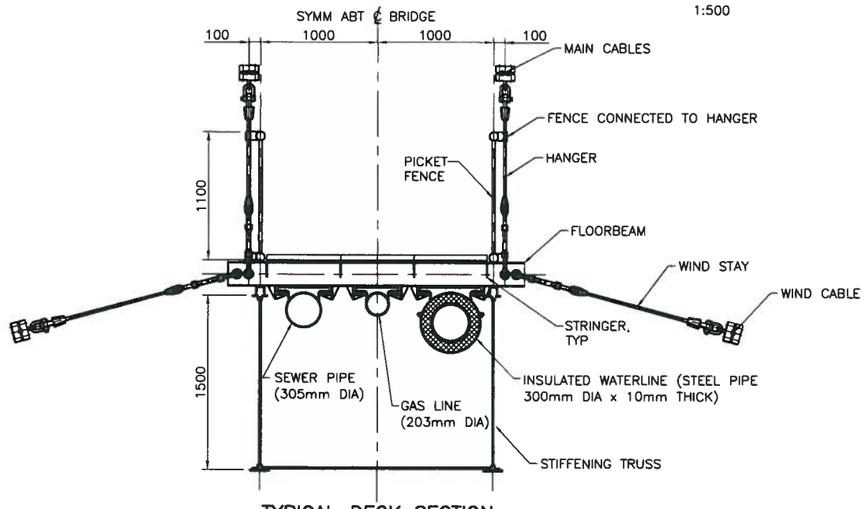

TYPICAL DECK SECTION
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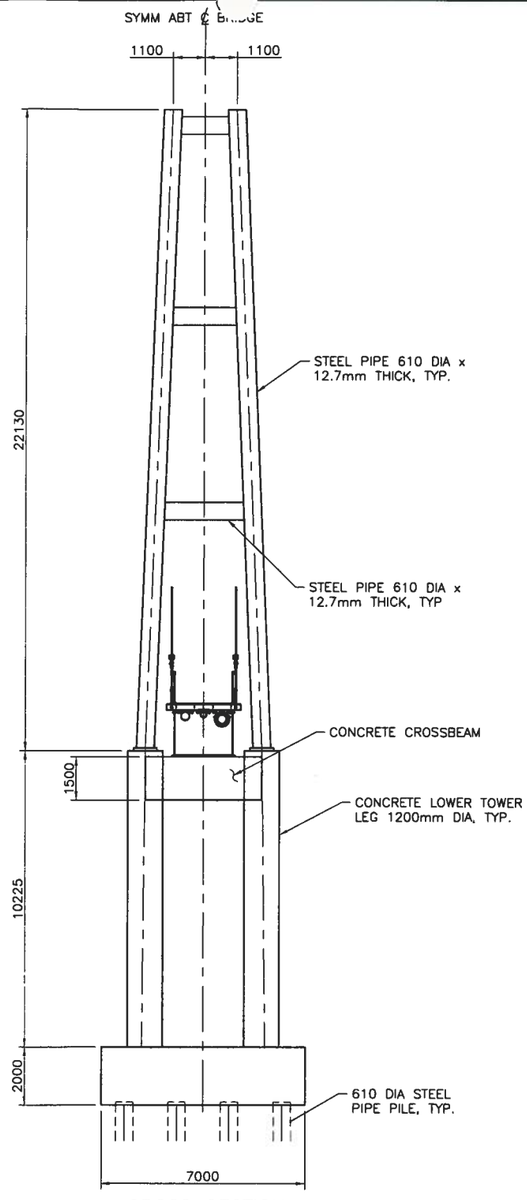

CROSS SECTION AT TOWER
1:100

PRELIMINARY 2010 DEC 08

CLIENT: CITY OF TRAIL

PROJECT: NEW TRAIL BRIDGE

TITLE: GENERAL ARRANGEMENT CONCEPT

BUCKLAND & TAYLOR LTD. Bridge Engineering

DESIGNED AMB	CHECKED NA
DRAWN KEM	APPROVED BDM
SCALE AS SHOWN	DATE 2010 DEC 08
DRAWING No. 1551–SK2	REV. PA

ORIGINAL SCALE IN mm FOR REDUCED PLANS (0 – 50)

LTR	REVISION	DR.	APP.	DATE

Option 3

File: 1551-SK2.dwg Date/Time: December 02, 2010 3:25 p.m. Scale: 1=1 KEME Xrefs: