

Golden Ears Bridge Project

April 17, 2008 Bill Kendrick







- A new high-level bridge across the Fraser River.
- B An interchange at 113B Avenue.
- G A new roadway heading north, crossing both the Lougheed Highway and the CPR tracks.
- The Abernethy Connector will head north and east from the new interchange at Lougheed Highway to 128th Avenue in Maple Ridge.
- An off-ramp to 199A Street and onramp from 201st Street connecting to 200th Street and Highway #1.
- () A connection to 192nd Street, providing Port Kells access.
- G A new east/west road connecting to Highway #15, after crossing under Highway #1.
- A new intersection at Highway #15, south of 96th Avenue.
- Widening of 200th Street from 201st Street to 86th Avenue.

Project Scope



- 13.3 km (8.25 miles) of 2, 4 & 6 lane mainline
- 11.5 km (7.1 miles) of local street reconstruction
- 17 bridges
- Total 4.656 km (2.9 miles) of bridges
- Total 112,000 sq m (1.2 million sq ft) of bridge deck



Stakeholders

Many stakeholders other than TransLink

- Four municipalities
- Katzie First Nation with 3 separate reserves
- Five different Utility Owners plus the Municipalities
- Two national railways
- Ministry of Transportation



GEB Project



- DBFO project; \$800 M DB Price
- Owner: GVTA ("TransLink")
- GVTA has rights of taxation
- Revenue stream from direct tolls (not at risk)



TransLink Revenue Stream



Projected Annual Toll Revenues, based on car toll of \$2.50 (\$2003)





• Financing cost driven

The Deal

- "license fee"; constrained capital payments
- 32 year operating period
- Operating payments constrained to a small range
- Capital costs don't get paid down until year 9

Selection Process



- Technical Submittal Pass/Fail
- Aesthetics Submissions Pass/Fail
- Financial Submission Lowest NPV







the story of golden ears





Our Team: The Golden Crossing Group





Bid Phase Schedule

- RFQ
- Shortlist of 3 teams
- RFP issued
- Technical Submission
- Notification of Technical Compliance
- Financial Submission
- Preferred Proponent Announcement

Nov, 2004 Dec 8, 2004 Jan 14, 2005 Sept 13, 2005 Oct 21, 2005 Nov 4, 2005 Dec 7, 2005

Delivery Phase Schedule

- Commercial Close
- Financial Close
- Traffic Availability



Feb 24, 2006 Mar 3, 2006 Jun, 2009



Bid Phase



- 25,000 labour hours of design
- Bridge strategy
 - focus on foundations
 - maximize modularization
 - precast deck planks key
- Road Strategy
 - few alignment alternatives
 - focus on embankment heights/fill material

Site Conditions



Geotechnical Issues



- Soft silt and clays
- Settlements drive decisions
 - Embankment heights limited
 - Use of lightweight fills (pumice, EPS)
- Seismic design requirements are key



Approach Structures



- 8m "Economic height" of approach fills
- 2.4m NU, 45m span modules
- Prestressed deck planks
- Two level seismic (post-disaster)
 - 475 Yr event limited inelasticity
 - 1000 Yr event prevent collapse

Main River Bridge



- 968 m (3175 ft) shore pier to shore pier
- 6 lanes plus 2 sidewalks
- Four river piers
- 240 m spans
- Composite steel extradosed superstructure
- Foundation: 2.4 m diameter, 92 m deep, partly cased bored piles (drilled shafts)





GOLDEN EARS BRIDGE ELEVATION

Comparison of Golden Ears Bridge to the Alex Fraser Bridge

Design Considerations



- Three level seismic (lifeline structures)
 - 475 Yr elastic response
 - 1000 Yr limited inelasticity
 - 2475 Yr prevent collapse
- Vessel collisions
- Settlement tolerance

Piling









Pile Load Test using Osterberg Cell

For High capacity piles
No need for external loading
Can test selected portions of pile



Back Calculation



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STAGE 3:

- INSTALL STAYS TO STAGE 1A FORCE. THE EAST AND WEST STAY CABLES SHALL BE STRESSED CONCURRENTLY.

STAGE 4:

- PROP TO NETVILING PRECAST PANELS CONFIRM BY SURVEY THAT THE PLAN ALIGNMENT OF THE STELL SEGMENT IS ACCEPTABLE. IF NOT ADJUST USING THE WIRE ROPE SQUERKE RECORD.
 - CHCCK: THAT PRECAST PANEL SUPPORTS ARE IN PLACES ON FLOORBEAM, STRUT BEAM AND GIRDER TOP FLANGES RESPECTIVELY.
 - ERECT DECK AND SUBJECUAR FRECAST PANELS.

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Questions



