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Document Type:	**TECHNICAL APPRAISAL FORM Tunnels**
Submission Name:	T6 – Todd-Cabana Tunnel
Document Number:	285380-03-127-0020

Design Consultant:		**HMM**
Date	**Revision**	**Description**
Sept. 28, 2012	0	IFC Submission

Issued by: Stephen F. Yang
Name

Fucheng Yang
Signature

Sept. 28, 2012
Date

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1 Project Description

This submission contains design drawings and geotechnical recommendations associated with Tunnel 6 – Todd-Cabana Tunnel. This submission is intended for IFC.

1.1 Name and location of tunnel

Tunnel 6 is named Todd-Cabana Tunnel and located along the below-grade section of Highway 401 with the Station 10+140 at the centreline of the tunnel. In addition to accommodating the eastbound and westbound traffic of Hwy 401, the Tunnel 6 is also designed parallel with the Hwy 3 at the location of the tunnel. Todd Lane crosses over the tunnel and connects to Hwy 3 at grade on the north side of the tunnel and continues to Canaba Rd West further north.

1.2 Permitted traffic speed

HWY401

Highway Classification:	UFD – HWY 401
Design Speed:	110 km/h for HWY401 under the structure
Posted Speed:	90 km/h for HWY401 under the structure 60km/h for Todd Lane over the structure
Lanes:	7 lanes under the structure for HWY401 with East one lane for the entrance ramp from Todd Ln Street 5 lanes on Todd Ln over the tunnel
Design Clearance:	Provided 5.209 m vertical clearance, 5.0m is required
Bridge Design Vehicle:	CL-625-ONT

2 Tunnel Details

2.1 Basic layout

The Todd-Cabana Tunnel is 120.3 m long and has a constant width of 56.1m. The tunnel has three 3.75m wide westbound lanes, three 3.75 m wide eastbound lanes, and one 3.5m wide eastbound speed change lane (SCL) for the entrance ramp from Todd Ln street. Minimum 2.5m wide shoulders are accommodated along each side of the travelling bounds. There are dedicated median to divide the westbound and eastbound lanes at the centerline of HWY 401.

Basic Layout Summary

Length	120.3m
Clear Roadway Width	39.720m
Alignment	HWY401 centerline

Lanes	3 – 3.75m wide westbound lanes under 3 – 3.75m wide eastbound lanes under 1 – 3.50m wide eastbound SCL lane under 5 – variable width lanes on Todd Ln St. over
Shoulder	Minimum 2.5m wide each side of a traffic bound
Median Barrier	Tall wall to protect pier
Road side Barrier	Along outer sides of all shoulders along HWY 401

2.2 Restrictions to traffic

Not applicable.

3 Brief Description of Tunnel, Traffic and Tunnel Geometry

3.1 Structural form of Tunnel

Todd-Cabana Tunnel is a cut-and-cover structure; its main bearing structure is composed of 41 lines of NU1900 modified girders, each with two spans. The cross-sectional shape of these girders is derived from that of the standard NU girders with 35mm concrete added to each side of the web and 50mm added to the bottom of the bottom flange of the girders to enhance their resistance to RWS tunnel fires as per Project Agreement. These girders are precast prestressed concrete girders, transported and erected on-site, then connected together to make them continuous to bear SDL and live loads. Semi-integral abutments over driven deep HP steel piles are used; the central piers consist of pier caps supported by 1.2m diameter of circular columns over concrete footings, which are in turn also supported by driven deep HP steel piles.

The 235mm thick concrete slab, consisting of 90mm thick precast panels with cast-in-place concrete topping and 30mm thick constant haunches sitting on top of the NU1900 modified girders, is divided into segments of lengths no more than 48m wide. The divided slab segments are separated by 50mm wide gap expansion joints, due to thermal expansion and contraction resulted from temperature changes ranging from -32°C to +20°C, if the construction temperature is set to be 15°C. With a maximum 47.55m wide deck segment, the movement of decks at the expansion joints due to temperature changes would be -15.2mm to +9.5mm, which is allowable for 47mm thick elastomeric bearings and could be accommodated by the 50mm wide gaps at the expansion joints. The 20mm long term uneven settlements of the tunnel foundations also need expansion joints in the superstructure to release stress.

The tunnel superstructure is expected to expand and/or contract immediately after construction and during its service life due to creep, shrinkage and thermal movement. Dividing the tunnel superstructure into segments using expansion joints significantly reduces the demand on the bearings caused by these movements, and reduces bending demand on piles perpendicular to the girder center lines, thus resulting in a more efficient design. Most of the strip seals are to be installed 0.85m below backfill. They

are also covered by a metal plate or board for further protection from vertical live load/impact. The expansion joints are not expected to require frequent maintenance. Inspection (e.g. for signs of leakage) can be undertaken from beneath the deck using a lifting platform or similar. The replacement procedure for expansion joints is expected to be similar to that of replacing buried utilities on top of tunnels. For joints exposed to traffic, appropriate standard joints have been specified with input from suppliers.

In addition, a utility corridor with electrical and gas pipes is located at the west end of the tunnel over the deck, close to the west end parapet wall. The utility plunges down below the deck and penetrates the abutment diaphragm at the north side to pass HWY 3 through underground. There are 2 plunges, one plunge for electrical cable ducts (12 of 90mm diameter PVC ducts for Bell Canada, 2 of 100mm diameter PVC ducts for COGECO and 4 of 100mm diameter PVC ducts for MNSi) and another plunge for one gas pipe of 100mm diameter for Union Gas Main.

See summary below for general arrangement.

Structure Summary

Structural Type:	Prestressed concrete modified NU1900 girders, semi-integral abutments and frame piers.
Span Arrangement:	Two span structure with modified NU girders spaced at 3.01m, except at expansion joints which is 2.4 m and at utility corridor which has varying spacing 2.85m, 2.86m. Span length is 25.80 for the north and 30.30m for the south spans.
Foundation Type:	Concrete footings on driven deep HP steel piles
North Abutment	Semi-integral abutment with 1.7m wide and 1.5m deep abutment cap supported on deep HP 310x110 steel piles spaced at 2.3m.
South Abutment	Semi-integral abutment with 1.7m wide and 1.5m deep abutment cap supported on deep HP 310x110 steel piles spaced at 2.0m.
Central Pier	1.5mx1.5m cap beam supported on 1.2m diameter of columns over 3.2m wide and 1.25m deep concrete footings, which are again supported on driven deep HP 310x110 steel piles spaced at 1.82m
Span Articulation:	Semi-integral support at abutments, fixed at the central pier. Girders are supported by laminated plate bearings, and the longitudinal translation of girders is supposed to be fixed at the central pier. 3 expansion joints parallel to girders are provided on the deck along the full length of the tunnel.
Deck:	235mm thick concrete deck comprising 90mm thick precast panels and cast-in-place concrete topping and 30mm thick constant haunches; 1.8mx0.45m parapet wall at each side

	of the tunnel. 0.85m maximum deep engineered soil fill is over the concrete deck where no roadway is present and 1m soil fill over the deck in the West utility corridor; and these soil fills could be replaced with 0.5m asphalt and concrete pavement for normal traffic use. The depth of the soil fill could be reduced to 0.5m to facilitate landscaping. 0.5m in total of concrete pavement and asphalt is over the concrete deck where roadways are required.

3.2 Structural form of portal structures

N/A.

3.3 Traffic and geometry

3.3.1 Horizontal and vertical alignment of tunnel and tunnel approaches

Tunnel: 3 lanes in each traffic bound (East- and west-), plus 1 SCL (Speed Change Lane) in the East side inside the tunnel.

Horizontal alignment: the tunnel is at a curve of an arc with a radium R=1100m; the centerline of the tunnel is at STA. 10+140.000.

Vertical alignment: In the longitudinal direction, 0. 5% down slope from East to West at the ground level of HWY 401, 0.45% down slope from East to West at the tunnel top slab level. In the transversal direction, 4.4% down slope from South to North in both East- and Westbound road surface of HWY 401; at tunnel deck level, 1.0% down slope from South to North in the South span, 1.8% down slope from South to North in the North span.

Above tunnel: five lanes on Todd Lane Street over the tunnel to access Hwy 3 and Cabana St. West; one sidewalk and one trail are also provided for pedestrian over the tunnel for South-North crossing.

3.3.2 Cross-section

5.209 m vertical clearance is provided while 5.0m is required.

3.3.3 Standards used

Design Criteria in accordance with Part 2 of Project Agreement – Schedule 15-2:

Article 1 – Highway Geometrics Design Criteria

Article 3 – Structural Design Criteria

Article 4 – Tunnel Design Criteria

Article 5 – Geotechnical and Foundation Design Criteria

Referenced Documents as specified in these Articles following the order of precedence as instructed.

No deviation from the standards used including design traffic flows and speeds.

3.3.4 Accommodation of mechanical and electrical services in Tunnel

Accommodation of light fixtures is designed with two options for contractors to choose. Electrical cables and conduits to host them are carefully designed. The electrical cables come from behind the South abutment and penetrate through the diaphragm and are distributed into the tunnel though electrical board on the diaphragm and carried by luminaire supporting structures underneath the tunnel and between the girders.

3.3.5 Minimum headroom, horizontal clearances

Minimum headroom (vertical clearance) is 5.209 m. Horizontal clearances between road side barriers and the driving lanes vary from 10.130 to 10.135m on the north side(10m is required) and 8.153m(7m is required, near the entrance ramp) to 10.153m(10m is required) on the south side under the tunnel, dependent on the longitudinal location.

3.4 Proposed arrangements for inspection and maintenance

All exposed structure elements will be accessible for inspection and maintenance. Some elements may require use of an inspection platform.

3.5 Provision to be made in the Tunnel layout for emergency communication and escape facilities, fire, etc.

No escape facilities are needed for this tunnel due to the short length of only 120.3m. Emergency communication details are shown on ATMS New Construction drawings which is not included in this submission.

3.6 Landscaping above Tunnel and protection of Tunnel roof

Landscaping above tunnel is shown on Landscape Construction drawings which is not included in this submission. Tunnel has been designed with 0.85 m soil layer on top deck to accommodate the requirement for drainage and landscaping.

3.7 Finishes

Concrete finishes on exterior of the parapet wall will have grassland pattern. All remaining finishing is specified in the General Notes, Doc No. 285380-03-060-SEG1-2602. RSS retaining walls should meet relevant MTO standard for high performance RSS retaining walls.

4 Design Assessment Criteria

4.1 Live Loading

4.1.1 Loading relating to normal traffic under applicable code loading and regulation

One truck of CL-625-ONT or one emergency truck defined in the project Agreement applied anywhere over the tunnel is used as vehicle load and 4kPa of uniform pressure load is used as pedestrian loads, which are as per the Canadian Highway and Bridge Design Code (CHBDC) S6-06 for the parts of the structure where no traffic lanes are present. This conforms to the requirement defined in Clause 3.3 of the Project Agreement – Schedule 15.2. The DLA with reduced load effect is considered as per Clause 3.8.5.4.2 of CHBDC S6-06 for structures with 0.85m soil fill; load intensity on deck is reduced with wheel load spreading effects defined in CHBDC Clause 6.9.6 if the truck travels over the part of the tunnel where the earth fill on top of the structure is more than 0.6m thick.

Normal live loads and pedestrian loads are considered as per CHBDC S6-06 for the parts of the structure where traffic lanes are present.

The pedestrian load used in the design of T-6 is as per Clause 3.8.9 of the CHBDC S6-06. The equivalent load pressure from the pedestrian load is 4kPa.

Lateral pressure induced by the traffic loads or pedestrian loads is also considered when designing the parapet walls.

4.1.2 Design vehicle

One CHBDC CL-625-ONT truck applied anywhere on the tunnel was used for the parts of the tunnel where there is no designated traffic lanes on the tunnel but with 0.85m or 1m soil fill.

Normal CL-625-ONT traffic live loads, including multilane loads of CHBDC CL-625-ONT trucks and CL-625-ONT lane loads, are used in designing the parts of the structure where normal traffic lanes are present. The 0.85m maximum soil fill over the tunnel could be replaced with 0.5m concrete and asphalt pavement and multilane traffic could be placed on top of this pavement.

4.1.3 Provision for exceptional abnormal loads

N/A

4.1.4 Any special loading not covered above

N/A

4.1.5 Heavy or high load route requirements and arrangements being made to preserve the route and any provisions for future heavier loads or future widening

N/A

4.1.6 Authorities consulted or any special conditions required

N/A

4.2 Other restrictions

4.2.1 Parapet walls

1.8m x 0.45m parapet walls + 2.3m fence over the parapet wall at the overhangs of exterior girders at the entrance of the tunnel are considered; the fence has an assumed equivalent weight of 1kN/m for this submission.

5 Structural Analysis

5.1 Methods of analysis proposed

T6 has been analysed in accordance with CHBDC S6-06 and S6S1-10 (Supplement No. 1 to CAN/CSA-S6-06). Following software design aids are used:

- Canadian Bridge Analysis System (CANBAS) version 2.0.1,
- STAAD Pro 2007 version 20.07.02.15
- Microsoft Office Excel 2003
- Response 2000 1.0.5
- pcaColumn 2.6

5.2 Assumptions of structural elements

5.2.1 Cast-In-Place Concrete

Minimum compressive strength at 28 days: 30MPa (substructure)

Minimum compressive strength at 28 days: 40MPa (deck and diaphragms)

5.2.2 Precast Prestressed Concrete

Minimum compressive strength at transfer: 42MPa (girders)

Minimum compressive strength at 28 days: 60MPa (girders)

Minimum compressive strength at transfer: 24MPa (deck panels)

Minimum compressive strength at 28 days: 40MPa (deck panels)

5.2.3 Reinforcing Steel

Plain reinforcing steel bars: CAN/CSA G30.18-M92; Grade 400W

Coated reinforcing steel bars: CAN/CSA G30.18-M92; Grade 400W unless otherwise noted

Stainless steel reinforcing bars: Type 316LN or Duplex 2205 or Type XM-28; Grade 500

5.2.4 Prestressing Steel

Strands shall be low-relaxation, size designation 15, Grade 1860 in accordance with CSA Standard G279.

5.2.5 Structural Stiffness

Structural stiffness is calculated according to CAN/CSA S6-06 Clause 5.9.1 grillage model and finite element method.

5.3 Proposed earth pressure coefficient (K_a, K_o, or K_p)

Refer to Geotechnical Report prepared by AMEC Earth and Environmental, Doc. No. 285380-04-119-0084.

5.4 Proposed fire design including protection of structure and cable

For proposed fire design refer to the following fire protection documents:
- Tunnel Structural Fire Assessment, Doc. No. 285380-03-126-0045;
- Tunnel Structural Fire Assessment – Deck Slab, Doc. No. 285380-03-126-0049;
- Tunnel Fire Design Criteria, Doc. No. 285380-03-109-0004.

Only non-combustible materials are used in tunnel for electrical and ATMS works.

6 Ground Conditions

6.1 Ground Conditions

Refer to "Geotechnical Investigation and Design Report Tunnel T-6", Doc No. 285380-04-119-0084, dated Sept. 20, 2012.

6.2 Geotechnical Design Parameters

Refer to "Geotechnical Investigation and Design Report Tunnel T-6", Doc No. 285380-04-119-0084, dated Sept. 20, 2012.

6.3 Differential Settlement

Refer to "Geotechnical Investigation and Design Report Tunnel T-6", Doc No. 285380-04-119-0084, dated Sept. 20, 2012.

6.4 Anticipated Ground Movements or Settlement

Refer to "Geotechnical Investigation and Design Report Tunnel T-6", Doc No. 285380-04-119-0084, dated Sept. 20, 2012.

6.5 Groundwater Conditions and Mitigative Measures

Refer to "Geotechnical Investigation and Design Report Tunnel T-6", Doc No. 285380-04-119-0084, dated Sept. 20, 2012.

6.6 Variance from Geotechnical Memo Recommendations

N/A

7 Drainage and Waterproofing

7.1 Details of proposed/existing drainage

7.1.1 Ground water seepage and run off

Refer to Highway and Roadway Drainage Design Report, Doc No. 285380-70-119-0001 for Phase 1 and Phase 2.

7.1.2 Accidental spillage, water carried in by vehicles

Drainage structures have been placed along the tunnel to collect runoff from vehicles and any accidental spills. These liquids would then be conveyed to the spill containment units located upstream of each pumping station. See Highway New Construction Drawings for more details.

7.1.3 A fire main burst

The runoff from a fire main burst would be less than the 100yr storm flow, which the storm system is designed for. The flow would be collected within two or three inlets. Watermains crossing HWY 401 and HWY 3 will be installed in steel casings per MTO requirements. Casing material will be stronger than the watermain material to be used. Additionally, the casing void (area between outside of watermain pipe and casing pipe) will be fill with cement based grout. Grouting the void area will provide added strength to the pipe system crossing the Highways, and minimize the potential for watermain breaks underneath a travel lane. Should a break occur under the travelled portion of the Highway, the casing will direct water flow to the shoulder areas where the subdrains and catchbasins will direct the water into the storm system. Water valves are placed along the watermain along HWY 401. This will permit the watermain to be isolated in the area of a break. Once the valves are closed, the water flow will be shut off.

7.1.4 Tunnel washing

The runoff from a watermain burst would be less than the 100yr storm flow, which the storm system is designed for. The flow would be collected within two or three inlets. Watermains crossing HWY 401 and HWY 3 will be installed in steel casings per MTO requirements. Casing material will be stronger than the watermain material to be used. Additionally, the casing void (area between outside of watermain pipe and casing pipe) will be fill with cement based grout. Grouting the void area will provide added strength to the pipe system crossing the Highways, and minimize.

7.2 Details of proposed waterproofing

The entire area of the T6 deck will be sealed with a waterproofing system as per Project Agreement requirement. Details are provided in the Tunnel Watertightness memo Rev E Doc No. 285380-03-126-0039.

7.3 List special requirements of local drainage authority

None

8 Tunnel Support System and Method of Construction

8.1 Basis of the design of the Tunnel support system for temporary and permanent conditions and any proposals for ground treatment

Structural form as described on Section 3.1 is one of the effective support system commonly used to carry roadway above for highway underpass. This support system is also cable of satisfying the design requirements for permanent conditions of the WEP tunnels.

Refer to "Geotechnical Investigation and Design Report Tunnel T-6", Doc No. 285380-04-119-0084, dated Sept. 20, 2012, for the basic of permanent ground treatment design.

Design for temporary conditions is not addressed in this submission.

8.2 Show how the proposed method of construction, i.e. excavation and applicable ground support, will ensure the continued safe use of the Parkway and prevent structural failure

Permanent design is based on the Construction Sequence provided on the Foundation Plan, Abutment Layout and Ground Improvements Plan. Instrumentation and monitoring of the temporary works during construction should be implemented by the Contractor in addition to the limited instrumentation already installed during the geotechnical investigation.

(Construction methodology, staging and temporary works design is not appressed in this submission.

8.3 Give details of predicted settlements on adjacent structures

Refer to "Geotechnical Investigation and Design Report Tunnel T-6", Doc No. 285380-04-119-0084, dated Sept. 20, 2012, for anticipated deformation of the ground around the structure.

8.4 State methods to be adopted to monitor and control the effects of tunnel construction to ensure compliance with any criteria imposed to limit surface movements or vibration (if applicable)

A program of site instrumentation and monitoring will be developed and implemented during construction, but is not part of this submission.

9 Checking

9.1 Independent Check

Independent check is required as per Project Agreement – Schedule 15-2, Part 2, Article 3 3.2 (c) (i).

Independent Checking Team: INTERNATIONAL BRIDGE TECHNOLOGIES.

9.2 Responsible Design Personnel

Originator: Stephen Fuheng Yang, P.Eng.

Checker: Matthias Yu, P.Eng.

Reviewer: Biljana Rajlic, P.Eng.

10 Drawings and Documents

10.1 List of Drawings (included in this submission):

Drawing No.	Revision	Drawing Name
285380-03-060-SEG1-2600	0	COVER SHEET, SITE PLAN AND KEY PLAN
285380-03-060-SEG1-2601	0	GENERAL ARRANGEMENT
285380-03-060-SEG1-2602	0	GENERAL NOTES
285380-04-090-SEG1-2603	0	BOREHOLE LOCATION AND SOIL STRATA
285380-04-090-SEG1-2604	0	SOIL STRATIGRAPHY
285380-03-061-SEG1-2605	0	FOUNDATION LAYOUT
285380-03-061-SEG1-2606	0	FOUNDATION DETAILS
285380-03-060-SEG1-2607	0	GROUND IMPROVEMENTS - PLAN
285380-03-061-SEG1-2608	0	ABUTMENT LAYOUT I
285380-03-061-SEG1-2609	0	ABUTMENT LAYOUT II
285380-03-061-SEG1-2610	0	ABUTMENT REINFORCEMENT
285380-03-061-SEG1-2612	0	WINGWALL DETAILS
285380-03-061-SEG1-2613	0	RSS WALLS LAYOUT
285380-03-061-SEG1-2614	0	RSS WALLS DETAILS
285380-03-061-SEG1-2615	0	PIER LAYOUT
285380-03-061-SEG1-2616	0	PIER REINFORCEMENT
285380-03-062-SEG1-2617	0	GIRDER AND BEARING LAYOUT
285380-03-062-SEG1-2618	0	BEARING DETAILS
285380-03-063-SEG1-2620	0	PRESTRESSED GIRDER ELEVATIONS
285380-03-063-SEG1-2621	0	PRESTRESSED GIRDER DETAILS
285380-03-064-SEG1-2622	0	INTERIOR PRECAST DECK PANELS

285380-03-064-SEG1-2623	0	PRECAST PANELS AT EXPANSION JOINTS
285380-03-064-SEG1-2624	0	DECK LAYOUT AND REINFORCEMENT
285380-03-064-SEG1-2625	0	ABUTMENT DIAPHRAGM LAYOUT AND REINFORCEMENT
285380-03-064-SEG1-2626	0	PIER DIAPHRAGM LAYOUT AND REINFORCEMENT
285380-03-064-SEG1-2627	0	DECK DETAILS
285380-03-065-SEG1-2628	0	PARAPET WALL FINISH
285380-03-065-SEG1-2629	0	6000 mm APPROACH SLAB
285380-03-065-SEG1-2630	0	FENCE DETAILS
285380-03-065-SEG1-2631	0	DETAILS OF CONCRETE SLOPE PAVING
285380-03-066-SEG1-2632	0	STANDARD DETAILS
285380-07-444-SEG1-2633	0	EMBEDDED ELECTRICAL WORK I
285380-07-444-SEG1-2634	0	EMBEDDED ELECTRICAL WORK II
285380-07-444-SEG1-2635	0	EMBEDDED ELECTRICAL WORK III
285380-07-444-SEG1-2636	0	EMBEDDED ELECTRICAL WORK IV
285380-03-060-SEG1-2640	0	GROUND IMPROVEMENTS - SECTION I
285380-03-060-SEG1-2641	0	GROUND IMPROVEMENTS - SECTION II
285380-03-060-SEG1-2642	0	GROUND IMPROVEMENTS - SECTION III
285380-04-094-SEG1-2643	0	CONSTRUCTION NOTES - BACKFILL AT STRUCUTRES
285380-04-094-SEG1-2644	0	CONSTRUCTION NOTES - LIGHTWEIGHT FILL
285380-04-094-SEG1-2645	0	CONSTRUCTION NOTES – EXPANDED POLYSTYRENE
285380-03-061-SEG1-2646	0	LIGHT/SIGNAL/COMMUNICATION FOUNDATIONS
285380-03-080-SEG1-2647	0	FIRE SUPPRESSION PLAN
285380-03-080-SEG1-2648	0	FIRE SUPPRESSION PROFILE
285380-03-0680-SEG1-2649	0	FIRE SUPPRESSION DETAILS
285380-07-067-SEG1-2650	0	LUMINAIRE STRUCTURAL SUPPORT OPTION 1
285380-07-067-SEG1-2651	0	LUMINAIRE STRUCTURAL SUPPORT OPTION 2
285380-07-067-SEG1-2652	0	WIREWAY STRUCTURAL SUPPORT
285380-03-064-SEG1-2653	0	REINFORCEMENT FOR UTILITY PENETRATION

10.2 List of Documents (included in this submission):

Document No.	Revision	Document Name
285380-03-127-0020	0	Technical Appraisal Form
285380-04-119-0084	0	Geotechnical Investigation and Design Report Tunnel T-6
285380-03-126-0039	E	Tunnel Watertightness

10.3 List of Reference Drawings and Documents (not included in this submission)

See Appendix A.

The above design and construction proposals are submitted for review

Signed: Biljana Rajlic

Design Manager

Name: Biljana Rajlic

Engineering Qualifications: P. Eng.

Date: Sept. 28th, 2012

Professional Registration Number: 10041385

Affix Professional Seal

LICENSED PROFESSIONAL ENGINEER
B. RAJLIC
SEP 28, 2012
PROVINCE OF ONTARIO

Signed: .....

Project Co Representative

Name: .....

Date: Oct 23, 2012

Professional Registration Number: .....

Affix Professional Seal

Appendix A – Referenced Drawings and Documents

Referenced Drawing(s)

Drawing No.	Revision	Drawing Name

Certificate(s)

Certificate No.	Revision	Certificate Name

Special Provision(s)

Document No.	Revision	Document Name
285380-70-119-0001	C	Highway and Roadway Drainage Design Report
285380-03-126-0045	D	Tunnel Structural Fire Assessment
285380-03-126-0049	B	Tunnel Structural Fire Assessment – Deck Slab
285380-03-109-0004	3	Tunnel Fire Design Criteria
285380-83-119-0013	B	Tunnel Top Soil – Proposed Soil Profiles and Corresponding Unit Weight