

SCHEDULE 6

Description of Highway 407 East Partial

1. CURRENT STATUS OF HIGHWAY 407 EAST PARTIAL

1.1 Environmental Assessment Status

On June 24th, 1998, the Environmental Assessment (the "EA") for Highway 407 East Partial from Markham Road to Highway 7 just east of Brock Road received approval to proceed subject to Conditions of Approval attached to Order in Council 1704/98 referenced in Schedule 17 to the Concession Agreement (the "EA Approval"). These conditions include compliance with all provisions of the Environmental Assessment as submitted and with the objectives/future commitments identified in Section 6.4 of the Environmental Assessment and revised by the Ministry of Transportation letter to the Ministry of Environment dated August 26, 1997 included in Appendix Five, "MTO response to Government/Public Comments", of the December, 1997 Ministry of Environment (MOE) "Review Under the *Environmental Assessment Act* prepared by Ministries and Agencies of the Province of Ontario".

1.2 Status of Design Work

Figure 2 depicts Highway 407 East Partial.

The Environmental Assessment for the Highway 407 East Partial received approval for a conceptual plan of Highway 407 and adjacent transitway. The plan was based on the standard design criteria for an ultimate 10 lane freeway with a basic minimum right-of-way of 100 metres.

Planning of the adjacent transitway protected for passenger heavy rail technology having 60 metre minimum Right-of-Way (ROW). The design of interchanges was based on the conceptual footprint of a Standard Parclo A4 with allowances made for skew. The conceptual plan and profile was based on 1:10,000 Ontario Base Mapping. Geometric design was to have occurred at the preliminary design phase using 1:2,000 base mapping. As a result, alignments, profiles and ROW requirements in the Environmental Assessment are conceptual estimates only and do not include adjustments associated with drainage and hydrology studies, stormwater management planning or structural design.

To date, the Ministry of Transportation has initiated and/or completed a significant amount of pre-engineering work for Highway 407 East Partial. This includes the "Design Criteria & Concept Development Highway 407/Transitway (Nov 1998)" study, the Conceptual Preliminary Design Report, geotechnical investigations and Soils Report, Pavement Design Report, foundations investigations for all major structures, culverts and high cut/fill locations, as listed in Schedule 17.

While the conceptual preliminary design has been prepared consistent with the terms and conditions contained in the EA Report, limited preliminary municipal / agency consultation has been undertaken during this work. No public consultation has been undertaken during this work.

As such, it is the responsibility of the Concessionaire to complete all design and obtain approvals in accordance with the EA and the Concession Agreement.

2. WORKS TO BE COMPLETED

When used in this Schedule, "Work" refers to the design and construction of Highway 407 East Partial and includes all development, design, materials and construction for Highway 407 East Partial and appurtenances required to open a completed electronic toll highway to vehicular traffic. The Work also includes all supporting highway infrastructure/components, including but not limited to, grading, granular base, paving, structures, drainage system(s) including watercourse realignments, guiderail, illumination, traffic signals, pavement markings, signing, sign gantries, traffic management, landscaping, noise and other environmental measures.

Highway 407 East Partial has been planned as an ultimate 10 lane freeway with an urban concrete tall wall median barrier. Regardless of what may be depicted in the Reference Documents, a basic 4 lane freeway with a rural cross section is to be designed and built with provision for widening in future.

Highway 407 East Partial shall be designed and built in accordance with Ministry Safety Standards and other regulatory agency standards, specifications, guidelines, policies and practices. Highway 407 East Partial shall be designed to 120 km/hr, freeway design standards. Where appropriate, acceleration, deceleration and auxiliary lanes shall be included. Fully paved shoulders and rumble strips shall be provided on both sides of the roadway.

Parclo A4 interchanges are to be provided at Markham Road and Durham Regional Road 30. There are two additional interchanges located within the Seaton Lands (conceptually identified in the EA as North Road and Sideline 24), and a future interchange at the Markham By-Pass. A partial interchange (north oriented moves) is to be provided at 9th line.

In addition to these interchanges, the works to be constructed also include a grade separation at 10th line, a rail crossing at the CPR line, and major water crossings at the Rouge River, Little Rouge, West Duffins Creek, West Duffins Tributary, Urfe Creek and Brougham Creek. Further information regarding each of these structures and interchanges is provided in Sections 2.6 and 2.8.

The Concessionaire shall ensure that its design and construction of Highway 407 does not impede the future construction of a transitway, and that no property required for the future transitway be used for highway purposes.

2.1 Project Limits

The Work to be constructed includes all Work required to effectively tie in Highway 407 East Partial with connecting highways and intersecting roads. The limits consist not only of the physical roadway connection but incorporate all other highway infrastructure needs such as right-of-way grading, paving, drainage, traffic signals, illumination, fencing and signing. Signing needs

include advance signing and route markers some distance away from the interchange itself. The construction limits of north/south arterial roads and intersecting highways will be the end of ramp tapers or matching grade points, whichever is greater. Work also includes any work necessary to comply with environmental approvals.

In order to provide an interchange at Durham Regional Road 30, the Concessionaire shall realign Highway 7 from just east of Locust Hill to Green River. As such, the limits of construction shall include Highway 7 and extend approximately 500 m east of Regional Road 30 and 500 m west of the CPR structure in order to enable the construction of the realignment.

2.2 Alignment

The alignment for Highway 407 East Partial shall be designed and constructed in accordance with Ministry Safety Standards for Comparable Controlled Access Highways with a design speed of 120 km/h. A conceptual design for the highway alignment is contained in the "Highway 407 East Partial Conceptual Preliminary Design Report", identified in Schedule 17 to the Concession Agreement. Interchange ramps shall be designed in accordance with the design parameters specified in the Conceptual Preliminary Design Report.

All side road alignments shall be designed in accordance with Ministry Safety Standards for the design speed indicated in the Conceptual Preliminary Design Report.

Design parameters contained in the Design Criteria shall be used in finalizing the alignment.

For all detours or temporary roadworks, all detour design speeds shall be in accordance with the above for new works.

As part of the preliminary engineering work for Highway 407 East Partial, the Ministry of Transportation undertook consultation with various agencies and municipalities for various watercrossings. At the West Duffins Creek crossing, various review agencies expressed concerns with the location of the structure crossing, and two alternatives were developed. For the final design of this crossing the selection of the final alignment will be subject to further negotiations by the Concessionaire with affected agencies and the public in accordance with the terms of the Concession Agreement.

2.3 Cross Section

The cross section for the initial extension, Highway 407 East Partial shall be a 4 lane, divided freeway with fully paved 3 m shoulders on the outside and 2.5m shoulders on the median side. Ultimately, Highway 407 East Partial will be expanded to a 10 lane cross section, with a 7.5 m urban median, and 3 m fully paved outside shoulders. At structure locations, an ultimate median width of 8.5 m shall be provided. This cross section is similar to the design provided for Highway 407 west of Markham Road and is detailed in the Ministry of Transportation's Conceptual Preliminary Design Report.

Highway 407 East Partial will terminate at an at-grade intersection at Highway 7. As such, it will be necessary to transition Highway 407 from the rural median divided freeway to a 4 lane divided semi-urban freeway/high speed arterial. The cross section for the section between Brock Road and Highway 7 shall be designed to a 120 km/h design speed where possible, and shall include a 4 lane cross section divided by a 2 m raised median. However this section of Highway 407 shall be posted at 80 km/h. Details for this transition are included in the Ministry of Transportation's Conceptual Preliminary Design Report.

The conceptual preliminary design completed by the Ministry of Transportation has assumed that there will initially be an at grade intersection at Brock Road and not an interchange as originally provided for in the EA. This revision will require that a transition from a high speed freeway to a high speed arterial occur west of Urfe Creek. This change to the EA has been included in the Ministry of Transportation's Conceptual Preliminary Design Report, however it does not have the concurrence of any regulatory agency, and differs from original discussions that took place between the Ministry of Transportation and various agencies during the preparation of the Design Criteria and Concept Development Report identified in Schedule 17 to the Concession Agreement. The Concessionaire will be responsible for preparing a revised design and environmental mitigation/compensation plan for regulatory review and approval.

As noted in Section 2.6, Highway 7 shall be realigned between Locust Hill and Green River. The initial cross section for this highway shall be two lanes with standard shoulders and other cross section elements for a rural King's Highway with a design speed of 100 km/h. At the intersection of the new Highway 7 and Durham Road 30, the Concessionaire shall provide the necessary auxiliary lanes as indicated in the Conceptual Preliminary Design Report.

Details regarding the required cross section for other sideroads and interchanges are provided in the Conceptual Preliminary Design Report.

2.4 Pavement Structure

The Ministry of Transportation has provided soils information, as well as pavement and geotechnical designs in the Reference Documents. The Concessionaire is not obliged to use these pavement designs in the Work.

Steel slag shall not be used in the pavement structure anywhere within the Highway 407 Lands.

2.5 Drainage

The Work includes the drainage and hydrology design to accommodate the construction of Highway 407 East Partial. The Work is to be undertaken in accordance with the Highway 407 Drainage and Hydrology Guideline.

The Ministry of Transportation has completed a Preliminary Design Criteria and Concept Development for Highway 407 East Partial, from Markham Road to Highway 7 east of Brock Road (November 1998). The report and supporting appendices provide a comprehensive strategy

for the proposed stormwater quality, quantity and erosion treatment, as well as a preliminary strategy (type of structure and size) for the major watercourse crossings. The stormwater/drainage facilities to be built by the Concessionaire shall be in accordance with the strategy provided by the Grantor which is based on a basic 10 lane ultimate configuration, including the future transitway extension. If the Grantor does not build the transitway in accordance with the stormwater/drainage strategy provided to the Concessionaire, adjustments to existing stormwater/drainage facilities shall be the responsibility of the Grantor.

External stakeholder agencies (including regulating agencies) participated in the design criteria and concept development assignment. The external stakeholder groups concur/approve with a majority of the stormwater treatment and crossing strategies. The Concessionaire is responsible for securing all required regulatory agency approvals for its final stormwater management and watercourse crossing strategy including the detail design of the drainage infrastructure.

The Concessionaire shall undertake appropriate level of hydrologic/hydraulic modelling and drainage calculations for the detail design of the drainage elements.

2.6 Interchanges and Intersections

As provided in the Environmental Assessment Report and Conceptual Preliminary Design Report, the Concessionaire shall be responsible for the design and construction of interchanges at the following crossing roads:

- Markham Road
- Ninth Line (Partial)
- Durham Regional Road 30

At Ninth Line, the Concessionaire shall provide an interchange that will only permit moves to and from the north. However, the design and construction of Highway 407 East Partial shall ensure that all moves at the interchange can be provided at a future date.

The Conceptual Preliminary Design Report includes a design for the future Markham By-Pass interchange. The Concessionaire will design and construct an interchange at the Markham By-Pass not later than five years from the Effective Date, and immediately following the construction of the Markham By-Pass by the municipality. As part of the initial construction of Highway 407 East Partial, the Concessionaire shall ensure that the design and construction of the Work will permit the future construction of this interchange as provided in the Ministry of Transportation's Conceptual Preliminary Design Report.

The Environmental Assessment Report provides for an interchange at Brock Road. However, the Concessionaire shall provide an at-grade intersection at Brock Road. Details for this intersection design are included in the Conceptual Preliminary Design Report. Changes to the preliminary design to reflect this decision do not have the approval of the public or regulatory agencies. The Concessionaire must meet the requirements of the conditions of approval and the Environmental Assessment and obtain the approval of all interested parties and stakeholders.

The EA Report also identifies conceptual interchanges at North Road and Sideline 24. As part of the initial construction of Highway 407 East Partial, the Concessionaire shall design and construct North Road and Sideline 24 as underpasses (i.e. both roads go over Highway 407). The Concessionaire shall design and construct one interchange within five years of the Effective Date, and the second interchange between five and ten years from the Effective Date. The final location of these interchanges will be subject to negotiations and agreement between the Concessionaire, the local municipalities and affected stakeholders. The alignment for North Road and Sideline 24 shall be as indicated in the Conceptual Preliminary Design Report. The structures shall be designed in accordance with the requirements identified in the Conceptual Preliminary Design Report.

An interim termination of Highway 407 shall be provided at Highway 7 as identified in the Conceptual Preliminary Design Report and Environmental Assessment Report. The design and construction of the intersection shall be such that future expansion of the intersection to provide for westbound double left-turn lanes on Highway 7 westbound to Highway 407 westbound can be accommodated. Such provisions will include construction of the Highway 407 eastbound to Highway 7 eastbound channelized right turn lane, provisions for signals and illumination in the ultimate location. The Concessionaire shall undertake any stakeholder consultation necessary to obtain environmental approvals for any change from previously discussed options and the final design/mitigation measures/compensation.

The above noted termination will also require Highway 7 to be realigned to the south and the profile to be raised. Properties which currently gain access to Highway 7 within the limits of this realignment shall have access maintained onto the existing highway, with the existing highway being modified to connect to the realigned Highway 7. Beyond the limits necessary to maintain private access, the existing highway shall be barricaded, with appropriate signing provided.

At Brock Road, the Concessionaire shall provide an at-grade intersection, which provides for all moves including a northbound to westbound double-left turn lane. Details of the intersection design are included in the Conceptual Preliminary Design Report.

The Highway 7 realignment from Green River to Locust Hill will include the construction of a new intersection at Regional Road 30. Local residents in Green River are concerned with the construction of this intersection in close proximity to the community, and have requested that the intersection be relocated south and west of the community. As part of the Ministry of Transportation's conceptual preliminary design, alternatives for the relocation of the intersection were examined. However, no consultation has taken place with the public to determine a preferred alternative. The Concessionaire shall consider local concerns and the potential for relocation of the intersection, and realignment of sideroads.

South of Highway 407 at Regional Road 30, a similar realignment of Markham Concession Road 11 will be required.

Other intersections and ramp terminals, including traffic signal requirements, shall be designed and constructed in accordance with Ministry Safety Standards.

2.7 Roadside Safety

The Concessionaire shall ensure that the design and construction of Highway 407 East Partial and sideroads meet Ministry Safety Standards. At all locations where guide rail is warranted along the Highway 407 East Partial or associated interchanges, steel beam guide rail shall be the considered the minimum acceptable treatment.

Since Highway 407 East Partial will terminate at an at-grade intersection, it will be necessary to transition between a 4 lane divided freeway condition to a 4 lane divided high-speed arterial. With Brock Road being constructed as an at-grade intersection, the conceptual preliminary design completed by the Ministry of Transportation has provided this transition west of Brock Road. In addition to the safety initiatives included in the conceptual preliminary design, the Concessionaire shall employ innovative traffic measures and "human-factor" initiatives in the design and construction of this transition to alert drivers of this changing driving environment. The use of similar traffic safety measures will also be necessary to the termination of Highway 407 at Highway 7.

2.8 Structures

Within the limits of Highway 407 East Partial, the Concessionaire shall design and construct the following bridge structures:

- Markham Road Underpass
- Rouge River Crossing
- 9 th Line Underpass
- 10 th Line Overpass
- CPR Overhead
- Little Rouge Crossing
- Regional Road #30 Underpass
- West Duffin Creek Crossing
- West Duffin Creek Tributary Crossing
- North Road Underpass
- Sideline 24 Underpass
- Urfe Creek Crossing
- Brougham Creek Crossing
- Brock Road Underpass*

- * For the Brock Road underpass, the initial design shall be done in accordance with the Conceptual Preliminary Design Report which does not provide a structure, but an at grade intersection. However, the Concessionaire shall ensure that the design and construction of this intersection shall minimize the future costs of upgrading this intersection to either a full interchange or future underpass structure.

In this section, Overpass structure shall mean a bridge structure providing grade separation where the freeway is over the crossing road. Underpass structure shall mean a bridge structure

providing a grade separation where the freeway is under the crossing road. Overhead structure means a bridge structure providing a grade separation between a crossing road or freeway with a railway where the crossing road or freeway is over the railway. Subway structure means a bridge structure providing a grade separation where the freeway is under the crossing road. Overhead structure means a bridge structure providing a grade separation between a crossing road or freeway with a railway where the crossing road or freeway is under the railway.

The Preliminary General Arrangement drawings are included in the Highway 407 East Partial Conceptual Preliminary Design. The Concessionaire is not obliged to utilize the bridge designs provided by the Ministry of Transportation.

The Concessionaire shall also develop, design and build the concrete culvert structures as identified in the Reference Documents across the Highway 407 ultimate platform.

The Concessionaire shall design and build the structure(s) associated with embankment stabilization and protection for the steep cliff located at north side of Highway 407 to the east of the Rouge River Crossing and other structures associated with high fill or deep cut at various locations along Highway 407.

The Concessionaire shall design and construct all overhead sign structures required for traffic signing. This will include, but may not be limited to an overhead sign structure at the termination of Highway 407 at Highway 7, and in advance of the transition from the divided to undivided section of Highway 407 west of Brock Road. Overhead sign structures shall be designed such that they can be accommodated in the ultimate highway requirements.

For all underpass structures, the Concessionaire shall carry out discussion with the local municipalities for the inclusion of raised pedestrian sidewalk(s) on the bridge deck within the foreseeable future and provide raised sidewalk(s) as necessary or reserve the space for the future sidewalk(s). Any costs associated with installing sidewalks on the structures shall be negotiated between the Concessionaire and municipality.

The Concessionaire shall ensure that in addition to the requirements stated above, each structure barrier wall incorporates one 50mm and one 70mm spare duct and appropriate access points must also be provided to these ducts.

All overpass structures shall be designed to accommodate the ultimate lane requirements of the crossing roads according to the classification of crossing roads. All underpass structures shall be designed to the ultimate cross-section of Highway 407 East Partial. Railway overhead structures shall accommodate the clearance requirements of the railway authority. River crossings, have to satisfy the requirements from hydrology investigation and navigable requirements. The Concessionaire shall be responsible for the application and securing the approval of the permit(s) under *Navigable Waters Protection Act* and any other Environmental Laws.

2.9 Arterial Crossing Roads

Except as contemplated by the Concession Agreement, the Concessionaire will be responsible to

secure all municipal approvals and approvals from adjacent land owners required to carry out all construction on the arterial road crossings.

The arterial road crossings shall be designed and constructed in accordance with the existing design speed of the road. A summary of the design speeds for arterial roads is included in the Conceptual Preliminary Design Report.

As noted in the EA Report, an interim connection of Highway 407 East Partial is to be provided at Highway 7 immediately east of Brock Road. As such, the underpass structure identified in the EA report for Sideline 16 cannot be provided at this time. The Concessionaire shall provide a connection to Highway 407 as part of the design to allow for all moves at Sideline 16. The Concessionaire shall ensure that the tolling infrastructure that is installed will not result in tolling charges for any continuous travel on Sideline 16.

2.10 Illumination and Traffic Signals

All temporary and permanent illumination shall be provided in accordance with Ministry Safety Standards. The Highway 407 East Partial termination at Highway 7, Sideline 16 intersection, Brock Road, and all ramp intersections where signals are warranted shall be illuminated in accordance with Ministry Safety Standards.

The Concessionaire is responsible for designing, supplying and installing traffic signals at all intersections that meet traffic signal warrants, in accordance with Ministry Safety Standards. The control equipment shall be to the requirements of the road authority that will be assuming the future maintenance and operation of the traffic signal system.

The Concessionaire shall prepare and submit traffic signal layout drawings in accordance with the following:

- i. The Concessionaire prepares PHM-125 drawings and submits it to Ministry of Transportation Central Region Traffic Office for technical and legal approval. Once approved, the Central Region Traffic Office will submit the drawings to the road authority that will be assuming the future maintenance and operation of the traffic signal system for technical comments.
- ii. The road authority that will be assuming the future maintenance and operation of the traffic signal system is to test equipment, inspect installation, commission and take over maintenance upon activation.
- iii. The road authority that will be assuming the future maintenance and operation of the traffic signal system undertakes the timing for signals.
- iv. The road authority that will be assuming the future maintenance and operation of the traffic signal system maintains controller cabinet.
- v. Until activation of the traffic signal system, the Concessionaire is responsible for

the maintenance of the installation.

- vi. The Concessionaire supplies controller cabinets and co-ordinates the purchase of the controller cabinets in accordance to the requirements of the road authority that will be assuming the future maintenance and operation of the traffic signal system.

The obligations with respect to operation, maintenance and power consumption charges for traffic signal and illumination installations are outlined as follows:

1. **Temporary Installations (traffic signal and illumination)**

Where required, the Concessionaire will supply, install, maintain and remove (until permanent installation is activated) the temporary installation. Where the temporary installation replaces an existing installation, the costs of maintenance and power charges will remain with the authority having jurisdiction over the existing installation. Where the temporary installation is a new installation, not relocated "in kind", the costs of maintenance and power charges shall be paid by the Concessionaire.

2. **Permanent Installations (traffic signal and illumination)**

The Concessionaire will supply and install the permanent installation ready for activation. The installation will be energized for use as warranted with the permission and approval of the respective agency. Following activation of the installation, the respective agency will assume all responsibilities for the cost of operation, maintenance and power consumption of the installation.

2.11 Electrical

The replacement of power supply equipment and the lighting system shall be done to Ministry Safety Standards.

The electrical work consists primarily of illumination, traffic signals and permanent vehicle presence detectors. Temporary signals and detour illumination may be required as part of the electrical design Work depending upon the construction staging of the electrical work, design features and other parameters specified for the electrical work.

All electrical equipment shall be selected so that their installation/locations provide adequate safety for aircraft using the Buttonville airport. All electrical equipment shall not extend into the designated landing thresholds as determined by Transport Canada or their assigns.

All electrical work shall be performed in accordance with the Ministry Safety Standards.

Negotiations with different hydro authorities, municipalities and roadway authorities as appropriate shall be carried out with the view of:

- a) selecting suitable power supply equipment and their locations at the appropriate interchanges
- b) formulating a legal agreement with each hydro authority for the supply of electrical energy and for establishing the cost and billing arrangements for power consumed, and applicable engineering standards.
- c) determining the requirements for traffic signal interconnection, equipment, standards, material costs, etc.

Embedded electrical Work in the form of conduits, junction boxes and miscellaneous electrical fittings is required on both sides of each new structure and for installation of future underpass illumination equipment. Where required, pole bases shall be provided on applicable structures for future installation of lighting poles.

The Concessionaire shall conduct negotiations with the appropriate road authority charged with the responsibility for maintaining each traffic signal system in order to determine type of equipment, system operation, requirements for interconnection and traffic signal legal approval procedures, and build same.

The Concessionaire shall be responsible for the design, supply and installation and the electrical underground power distribution system for the Toll System. This electrical work shall include, but is not limited to the following: power supply systems, power supply cabinets, conduits, manholes, electrical junction boxes and power cables.

In addition to doing the electrical work, the Concessionaire shall be responsible for the design, supply and installation of the civil Work necessary

2.12 Signing and Pavement Markings

The Concessionaire will be responsible for sign layouts, designing, manufacturing and installing all signs, including but not limited to: regulatory, warning, hazard, information, temporary, advance, toll highway signs, trail blazer, name of crossing roads, 500 metre, and snow plow markers, and supporting frames in accordance with Ministry Safety Standards.

The Concessionaire will be responsible for the supply, placement, inspection and maintenance of all signage (including crossing roads).

For the purpose of this Schedule, the term signs and markers includes the necessary supporting frame structures or supporting poles. All walkways on overhead sign frames shall cover the ultimate width of the roadway.

For any signage on intersecting highways and municipal facilities, the Concessionaire will be responsible for obtaining Approval for sign layout and location from the applicable authority, such as Ministry of Transportation and municipalities.

The Concessionaire shall supply all necessary Temporary Advance Information Signs (TC-64's). These signs shall be installed a minimum of seven calendar days and a maximum of fourteen

calendar days prior to any lane reductions or closures. All 'TC-64' shall conform to the guidelines specified in the MUTCD and "Central Region Freeway Detour Signing" booklet (January 1994). Guidelines for the standard of reflectorization, size and fonts can be obtained from these manuals.

An overhead sign structure will be required at the transition from the freeway design to a high speed arterial road west of Brock Road and at the termination of Highway 407 at Highway 7. Additional overhead signing that may be required as a result of visibility and safety issues shall also be provided.

Signing Considerations

In addition to Ministry Safety Standards for highway signing identified in Schedule 20, the following highway signing guidelines are to be provided:

- 1) In cases of unusual lane or ramp configurations, priority must be placed on conveying the message on the guide sign to ensure an optimal safe operation of Highway 407 East Partial. Attention shall be given to areas of anticipated weaving within a decision making zone (i.e. drivers wishing to exit within an entrance ramp with considerable volume).
- 2) The location of the overhead guide signs takes precedence over the location of the tolling gantries. In instances where communication restrictions dictate placement of the gantry system within the immediate vicinity of an overhead guide sign, enhanced guide signing is required.
- 3) In cases where visibility of a guide sign is reduced by a bridge structure, consideration must be given to enhanced signing (i.e. diagrammatic signs). Every effort should be made to ensure maximum sight distance of the guide sign especially in instances of unusual lane arrangement, geometric conditions, or heavy weaving volumes.
- 4) The current G.f-4/G.f-104 standard within the Kings Highway Guide Signing Policy Manual (KHGSPM) is no longer used by Ministry of Transportation - Central Region. Layout details for these signs can be obtained from the Ministry of Transportation Central Region Traffic Management Office.
- 5) Careful consideration must be given to the use of chevron (Wa-9) and "diamond reflector" delineation signing. Wa-9 should be installed on highway exit ramps where the combination of multiple changes in horizontal alignment, vertical alignment, and super-elevation causes a loss in driver perception of the horizon. Chevrons shall be used at all inner loop ramps.
- 6) Concessionaire shall install all M lane designation signs (Rb-41 through Rb-47) on all ramps to assist the driver in choosing the correct lane to minimize weaving at the terminus of the ramp.
- 7) Wa-132 must be used on freeway to freeway ramp lane drops instead of Wa-32.
- 8) All crash cushion attenuator devices and end treatments require hazard markers.

- 9) Combining overhead guide signs with ground mounted guide signs for a given sequence of turn off signs, is an unacceptable practice. The sign designer must select either all guide signs within a single turn off sequence to be mounted overhead or on the ground depending on the criteria of the KHGSPM.
- 10) Wb-102 signal ahead signs are required on all signalized freeway exit ramps.
- 11) G.r-12 advance turn off signs must include an advance turn arrow instead of a straight arrow as shown in the KHGSPM.
- 12) Placement of all new signs on crossing highways must consider maintaining visibility of existing signs. Placement of any new signs must consider any existing object such as a light pole, signal pole, trees, and bridge parapet wall.
- 13) All new 407 signs on crossing facilities must be fully covered with a completely opaque tarp until Highway 407 East Partial is opened. Blocking parts of the sign with partial tarps or tabs is unacceptable.
- 14) All low speed freeway to freeway ramps will require enhanced advisory signing (i.e. for low speed inner loop ramps).
- 15) Advisory speed limits should be determined utilizing "Ball-Bank" testing.
- 16) Destinations have been used on several freeways when the geographic directions conflict with official route designations. Official destination(s) should be selected by the Ministry of Transportation Traffic Office and guide signs should either include the destination or at least include provisions for a future destination.

3. TRAFFIC MANAGEMENT

The Concessionaire shall be responsible for traffic safety and management during field work and construction of the Work and during the installation and testing of toll equipment. The Work includes the management of traffic during construction with minimal impacts on the traveling public. In addition to the requirements set out in this section, the following minimum requirements are to be implemented during the Work:

- a. Traffic may not be staged on a granular surface at any time during construction. Where construction operations necessitate the working area be less than 4m from the traffic, the Concessionaire shall erect barriers or delineators along the edge of the traveled lane. In no case shall the distance between traffic and working areas be less than 1.5m unless protected by temporary concrete barriers and delineators.
- b. The Concessionaire shall schedule the Work so that there will be no open excavation adjacent to a lane carrying traffic overnight and on non-working days, except where

protected by temporary concrete barriers. Excavations within 4m of lanes carrying traffic shall be backfilled with the final granular and/or asphalt material up to profile grade and compacted prior to closing down operations.

- c. Materials and equipment shall not be stored within 4m of the travelled portion of any roadway. The Concessionaire shall seek approval from the respective municipal authorities for traffic management plans associated with Work on municipal roads, from Ministry of Transportation for associated Work on Ministry of Transportation roads.
- d. . Where the Concessionaire must work adjacent to traveled lanes on a freeway, the Concessionaire must maintain a minimum lane width of 3.4m with a 1.0m paved shoulder where no parallel run of barrier exists, or a 0.5m shoulder where a parallel run of barrier is used. All operations, with the exception of final paving, must take place behind temporary concrete barrier.

The Concessionaire shall seek approval from the respective municipal authorities for traffic management plans associated with Work on municipal roads, and from the Ministry of Transportation for associated Work on Ministry of Transportation roads.

Traffic management shall be in accordance with Ministry Safety Standards.

Regarding the approval of speed reductions, the Ministry of Transportation is responsible for approving legal speed reductions on King's Highways. The appropriate municipality, through changes to its by-laws, is responsible for approving legal speed reductions on municipal roads. The Concessionaire is responsible for applying for, and obtaining all approvals.

Permitted Time for Lane Closures (Highway 7)

Traffic lanes may be closed for construction only during the following times:

of existing lanes 1 per direction Direction: eastbound and westbound

Lane Closure	Monday or a Day Following a Holiday	Tuesday to Thursday Except on Days Following and Preceding Holidays	Friday or a Day Preceding a Holiday	Saturday	Sunday
One Lane Closure	00:00-06:00 09:00-15:00 19:00-23:59	00:00-06:00 09:00-15:00 19:00-23:59	00:00-06:00 09:00-15:00 19:00-23:59	00:00-23:59	00:00-15:00 18:00-23:59

Two Lane Closure	Not Permitted	Not Permitted	Not Permitted	Not Permitted	Not Permitted
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4. PROPERTY

As part of the design Work, the Concessionaire will be responsible for ensuring that designs minimize land locking and the severing of Crown land or private property.

The Concessionaire is responsible to provide and install full chain link fencing on both sides of the Highway 407 East Partial. All fences within and bordering the Highway 407 Lands are the responsibility of the Concessionaire.

At the Core Agency Review meeting of April 15th, 1998, 2 alternatives were developed for the West Duffins Creek crossing. As agreed between the Ministry of Transportation and review agencies, both of these alternatives (EAR-2 and Alternative R-4) would be carried forward to the next phase in design. It is the responsibility of the Concessionaire to negotiate the final alternative for this structure with the agencies and public, and reach a mutually acceptable alternative. If Alternative R-4 eventually becomes the preferred alternative, the Grantor will have to terminate its leases with several of the property owners. This termination will require approximately 12 months to complete. As such, the Concessionaire must include adequate time in its schedule to accommodate these lease terminations.

In addition to the area noted above, if during the course of the Concessionaire's design and construction, it is determine that additional property is required on leased lands owned by ORC, it is expected that termination of the lease will require 12 months.

Any failure by the Grantor to provide vacant possession of any portion of the Highway 407 Lands within the time provided in the Highway 407 Lands Availability Schedule which has a material effect on the timing of the performance of the Work shall, notwithstanding anything contained in the Concession Agreement, be deemed to constitute a Delay Event

5. ENVIRONMENTAL REQUIREMENTS

The Concessionaire shall be responsible to meet any outstanding obligation as the "proponent" as defined under the *Environmental Assessment Act* (the "EA Act") and for complying with all of the conditions under any EA Approval, and, to the extent required, under any other applicable provincial and federal environmental legislation.

In undertaking the Work, the Concessionaire shall, to the extent required, address any environmental requirements including: environmental inventory, assessment of impacts, public consultation, design of mitigation, preparing and submitting design and construction reports and other environmental documentation, obtaining of environmental approvals, provision of formal environmental clearance/approvals, provision of mitigation, full compliance with the conditions of

the EA Approval, monitoring and other environmental services. Complying with the conditions of the EA Approval does not preclude more restrictive or additional conditions or requirements being imposed under other statutes.

The Concessionaire will be responsible for completing any additional submissions, addenda or other work, regardless of who completed previous work and submissions. Consultation and preliminary design has been undertaken with respect to specific environmental issues with stakeholders. The commitments made by the Ministry of Transportation shall be complied by the Concessionaire when undertaking this project unless these commitments are modified through approvals, amendments to approvals or additional consultation with stakeholders. These commitments are contained in the EA Approval, the EA report and preliminary design work. The Ministry of Transportation has not obtained environmental approvals under any statute other than the *EA Act*. The consultations and design work stated in the draft preliminary design work have not been completed or approved. The Concessionaire shall consult as required by any conditions of the EA Approval, or otherwise, in undertaking the Work. Any uncompleted negotiations and discussions to date do not preclude any additional requirements that may be necessary to obtain any required further approvals.

When the Concessionaire is required to undertake the assessment and evaluation of environmental impacts, the Concessionaire shall, in such assessment and evaluation, consider, among others, the following factors:

- sensitivities identified;
- significance of expected condition changes/effects, level of effects, duration and certainty of effects;
- degree to which condition changes/effects can be mitigated (based on previous and concurrent experience); and
- degree of mitigation incorporated in the generation of alternatives.

The Concessionaire shall consider utilizing a wide range of environmental protection measures to address potential environmental impacts identified as described above. Although site specifics have the greatest influence on the selection of environmental measures, the approaches to environmental protection can be generally categorized in order of decreasing preference, as follows:

- avoidance/prevention;
- control/mitigation (reducing the severity of environmental impacts);
- compensation (provision of "equivalent" or countervailing environmental features);
- enhancement (improvement over previous environmental conditions); and
- combinations of the above.

The Concessionaire shall address environmental protection with respect to the following aspects, among others, of planning, design and construction:

- generation and assessment of alternatives;
- evaluation and selection of preferred alternatives; and

- development of the plan/design/approach.

For environmental protection with respect to planning, design and construction the Concessionaire shall undertake, among others, the following activities:

- identification of environmental constraints;
- identification of environmental deficiencies;
- identification of environmental protection strategies;
- identification of environmental design elements;
- identification of environmental mitigation; and
- identification of environmental construction/maintenance constraints.

Figure 2 - Highway 407 East Partial

