7.0 DESCRIPTION OF THE RECOMMENDED PLAN

Following confirmation of the Overall Preferred Alternative, preliminary design commenced to finalize the Recommended Plan. Preliminary Design included more detailed investigation and the development of preliminary design plans, profiles, cross-sections and design criteria.

This section documents the refinements to the Recommended Plan as a result of consultation with stakeholders (**Section 7.1**) and the description of the Recommended Plan (**Section 7.2**), which describes the activites undertaken as part of the preliminary design. The Preliminary Design Plan is presented in **Exhibit 7-1**.

7.1 REFINEMENTS TO THE RECOMMENDED PLAN

7.1.1 Review during Third Round of Consultation

The Overall Preferred Alternative refinements, the preliminary design and potential mitigation measures were presented at the third Community Workshop (WS 3) on February 25, 2012 and at the third Public Information Centre (PIC 3) on March 29, 2012. The feedback from this round of consultation indicated that there was general agreement that the Recommended Plan was appropriate; however some refinements to the final plan were suggested. These included concerns regarding the proximity between the new QEW eastbound on-ramp and Kedleston Way and the proximity between the relocated QEW north noise wall and Premium Way. Requests were made for more landscape plantings along Kedleston Way and Premium Way to provide a visual and noise barrier.

Following the PIC, refinements in these areas were reviewed in further detail:

- A geometric review of the proposed alignment of the QEW eastbound on-ramp from Mississauga Road confirmed that it is not feasible to increase the distance between the on-ramp and Kedleston Way; however, the visual and aesthetic impacts associated with partial removal of the cultural woodlot due to the ramp improvements will be mitigated through implementation of the measures described in **Section 8.2.2**.
- Opportunities for landscaping planting along Premium Way to the east of Dickson Road were reviewed and are described in **Section 8.2.2**.

The majority of the other comments received during the third round of consultation were related to pedestrian / cycling connections, noise / environment issues (including requests for more details on the noise and air analysis and requests for noise walls to be placed on the bridge in the short term), and construction (i.e., when will construction begin? What are the expected construction noise and traffic impacts?).

Additional information on WS 3 and PIC 3 and how comments were addressed are presented in **Section 3.1.3.6**.

7.2 DESCRIPTION OF THE RECOMMENDED PLAN

The Recommended Plan is shown on **Exhibit 7-1** and is described in the following sections. The Recommended Plan essentially involves building a new North Twin Credit River Bridge (Steel or Concrete options) and rehabilitation of the existing Credit River Bridge. In addition, the Recommended Plan would include the following features:

- Improvements to the current six basic lanes of the QEW mainline highway cross-section to current geometric design standards.
- Improvements to and reconfiguration of the existing Mississauga Road Interchange and ramps, including extension of the Mississauga Road eastbound on-ramp as an auxiliary lane to the Hurontario Street eastbound off-ramp.
- Replacement of the Mississauga Road Overpass to accommodate the proposed Credit River Bridge and QEW Mainline improvements.
- QEW drainage and stormwater management improvements including two new ponds at Mississauga Road and on the east side of the Credit River, north of the QEW.
- Minor realignment of short sections of Mississauga Road and Premium Way to accommodate proposed QEW improvements.
- Property requirements from 4 properties along the corridor
- Highway illumination, extension of high mast lighting to the west of the Mississauga Road Interchange and the reinstatement of the ER light poles on the QEW Credit River Bridges (i.e., new North Twin and rehabilitated existing).
- Relocation of affected utilities.

7.2.1 Highway Geometrics

7.2.1.1 Horizontal Alignment

The horizontal alignment of the existing highway within the study limits is curvilinear in nature, consisting of several horizontal curves connected by tangent sections.

The geometry of the existing horizontal alignment is essentially maintained but with a northerly shift of the QEW median alignment between west of Mississauga Road and west of Hurontario Street in order to accommodate the realigned QEW mainline centre-line across the Credit River Bridges. The existing horizontal radii of 1700 m and 1050 m of the existing back-to-back curves through the Mississauga Road Interchange is maintained, and the existing horizontal radii of 1200 m to the west of Hurontario Street is maintained where the new QEW mainline centre-line tie back into the existing QEW mainline centre-line. All horizontal alignment elements for the QEW meet or exceed the requirements set out in the Geometric Design Standards for Ontario Highways (GDSOH) for the applicable design speed of 120 km/h.

Although, the existing 1050 m radius horizontal curve meets minimum standards, as part of the alternatives considered for the Mississauga Road Overpass Bridge, an alternative of increasing the radius to 1400 m was considered as the minimum superelvation[3] required would be less than that of a 1050 m radius curve and may potentially minimize impacts to Mississauga Road. In comparing both curves, the 1400 m radius was not recommended as it would have required more significant grade changes along Mississauga Road under the QEW. The proposed improvements to the Mississauga Road Overpass and the alternatives considered are described further in Section 7.2.2.2 and 7.2.3.

The horizontal alignment of the QEW, Mississauga Road and the local road realignments are presented on **Exhibit 7.1**.

7.2.1.2 Vertical Alignment

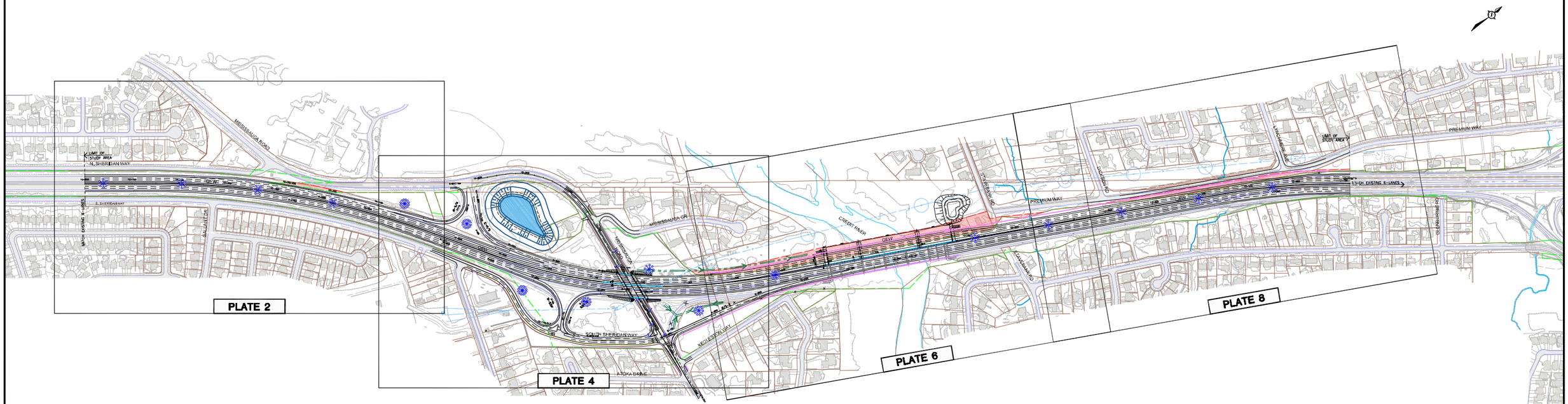
The profile of the existing QEW within the study limits is relatively flat and the profile of the improved QEW generally follows the existing profile.

With the exception of the existing Credit River Bridge, all vertical alignment elements for the QEW meet or exceed the requirements set out in the Geometric Design Standards for Ontario Highways (GDSOH) for the applicable design speed of 120 km/h. Along the QEW, the minimum grade is 0.5% and the maximum is 1.5%, which meets the minimum requirements of the GDSOH with an urban drainage system and is less than the maximum grade of 3.0% for freeways. A number of crest and sag curves are located along the length of the highway. All vertical curves meet or exceed the minimum curve requirements set forth in the GDSOH for the applicable design speed.

Across the existing Credit River Bridge, the existing profile of 0.2%, which does not meet the minimum 0.5% slope for urban drainage, remains unchanged. Preliminary cursory review has indicated that it is not structurally feasible to change the profile of the existing bridge. However, it is recommended that the feasibility of improving the existing bridge profile be examined in Detail Design. The new North Twin Credit River Bridge is designed with a profile of 0.5% to meet the minimum slope for urban drainage.

The vertical alignment of the QEW and Mississauga Road is presented on **Exhibit 7.1**.

[3] Superelevation is the banking of the roadway along a horizontal curve so motorists can safely and comfortably maneuver the curve at reasonable speeds. As speeds increase and horizontal curves becomes tighter a steeper superelevation rate is required.



Ontario

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GWP 08-20008
QUEEN ELIZABETH WAY
from Mississauga Road to Hurontario Street
Preliminary Design and Class Environmental Assessment

LEGEND

- EXISTING ROADWAY
- EXISTING MTO RIGHT-OF-WAY
- EXISTING NOISE WALL
- PROPERTY LINE
- PROPOSED ROADWAY
- PROPOSED MTO RIGHT-OF-WAY
- PROPOSED NOISE WALL
- SIDEWALKS /MULTI-USE PATH
- HIGH MAST LIGHTING

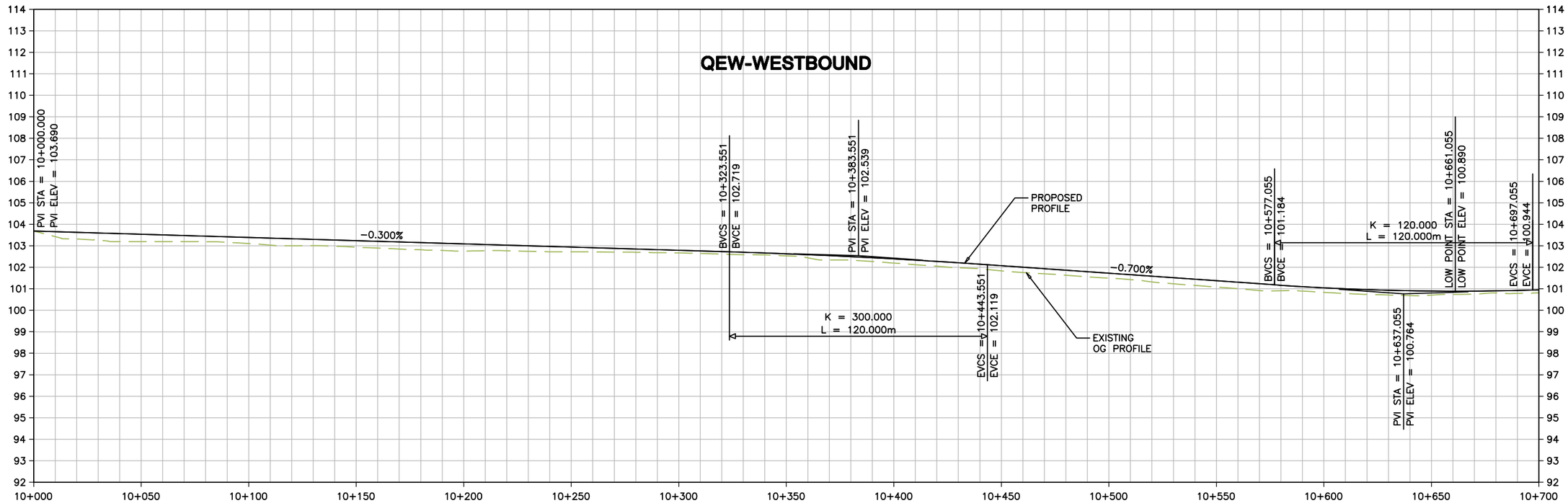
Scale :

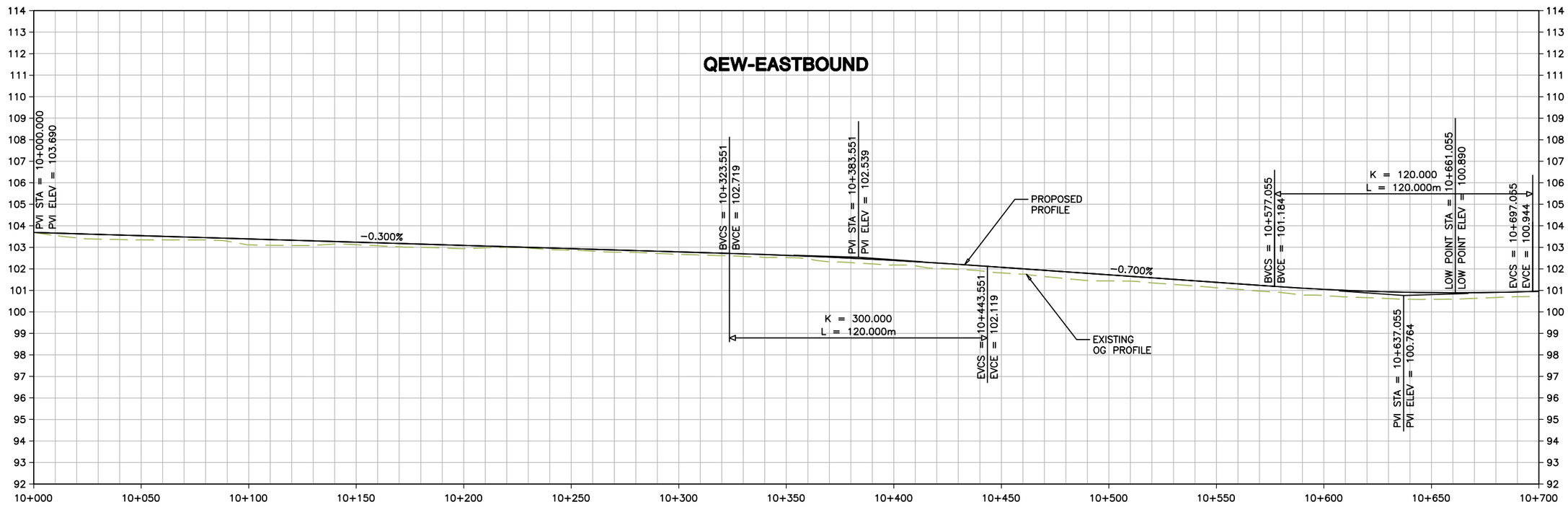
40m 0 80m
Horizontal
1 : 8000

KEY PLAN

EXHIBIT

7-1





EXHIBIT

7-1

RECOMMENDED 6-LANES PROFILE
STA. 10+000 TO STA. 10+700
PLATE 1

Scale :

Horizontal 1 : 2000 (10m 0 20m)

Vertical 1 : 200 (1m 0 2m)

GWP 08-20008
QUEEN ELIZABETH WAY
from Mississauga Road to Hurontario Street
Preliminary Design and Class Environmental Assessment

Ontario

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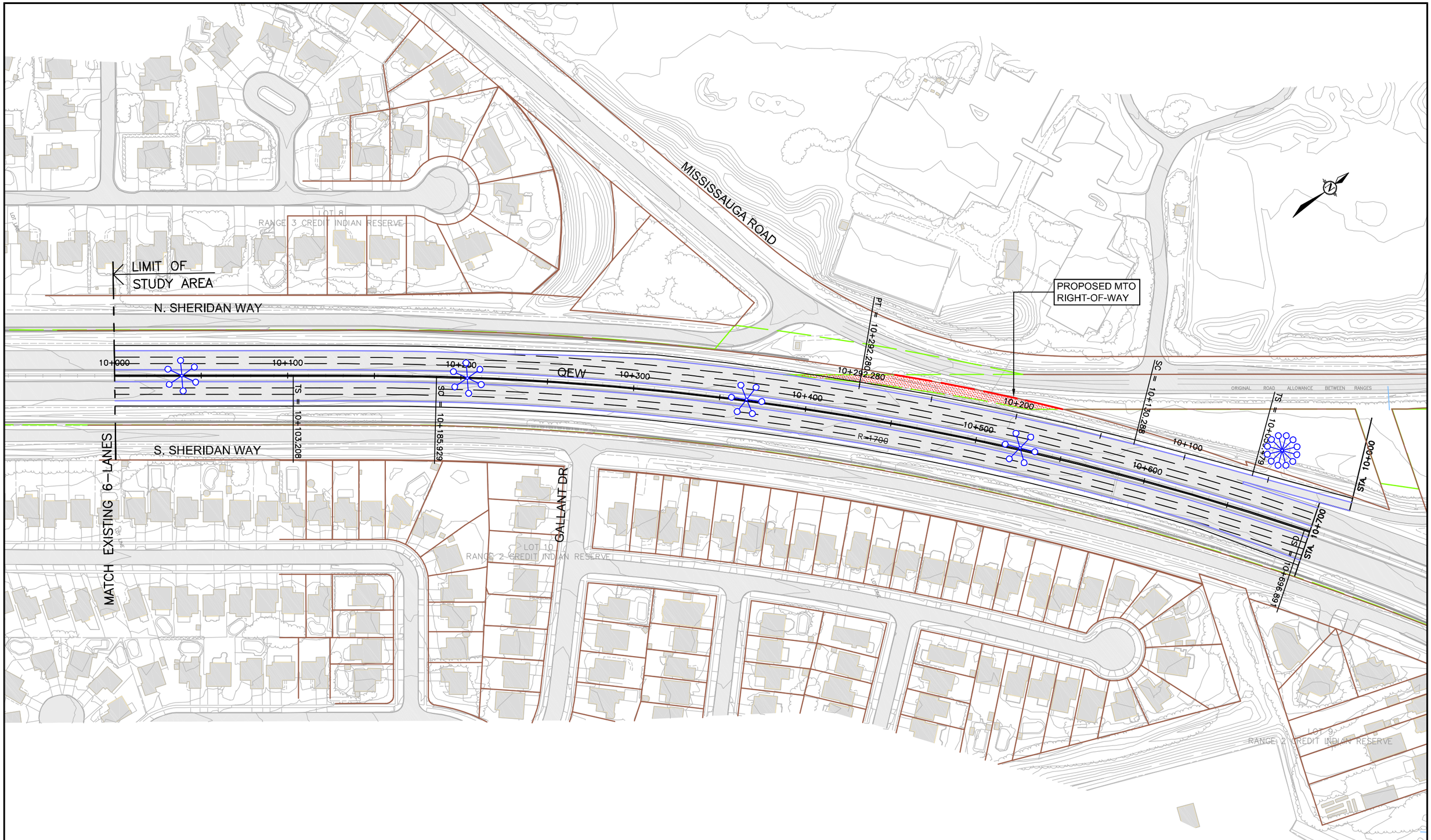

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GWP 08-20008
QUEEN ELIZABETH WAY
from Mississauga Road to Hurontario Street
Preliminary Design and Class Environmental Assessment

LEGEND

- EXISTING ROADWAY
- EXISTING MTO RIGHT-OF-WAY
- EXISTING NOISE WALL
- PROPERTY LINE
- PROPOSED ROADWAY
- PROPOSED MTO RIGHT-OF-WAY
- PROPOSED NOISE WALL
- SIDEWALKS /MULTI-USE PATH
- HIGH MAST LIGHTING

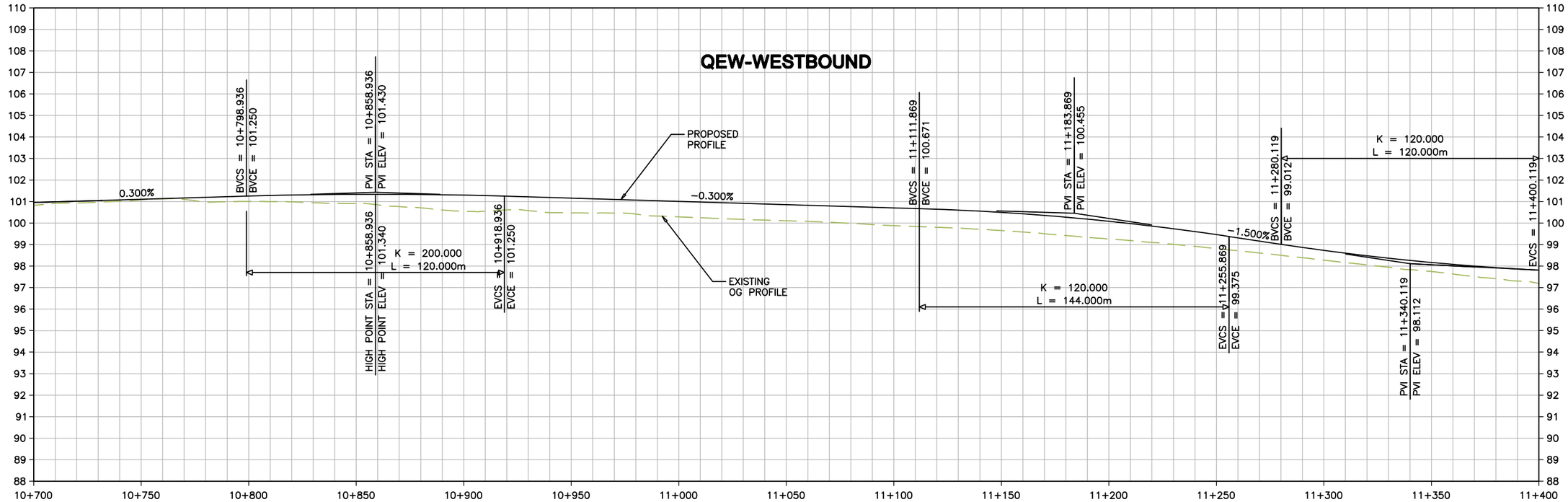
Scale :

10m 0 20m
Horizontal
1 : 2000

RECOMMENDED 6-LANES PLAN
STA. 10+000 TO STA. 10+700
PLATE 2

EXHIBIT

7-1



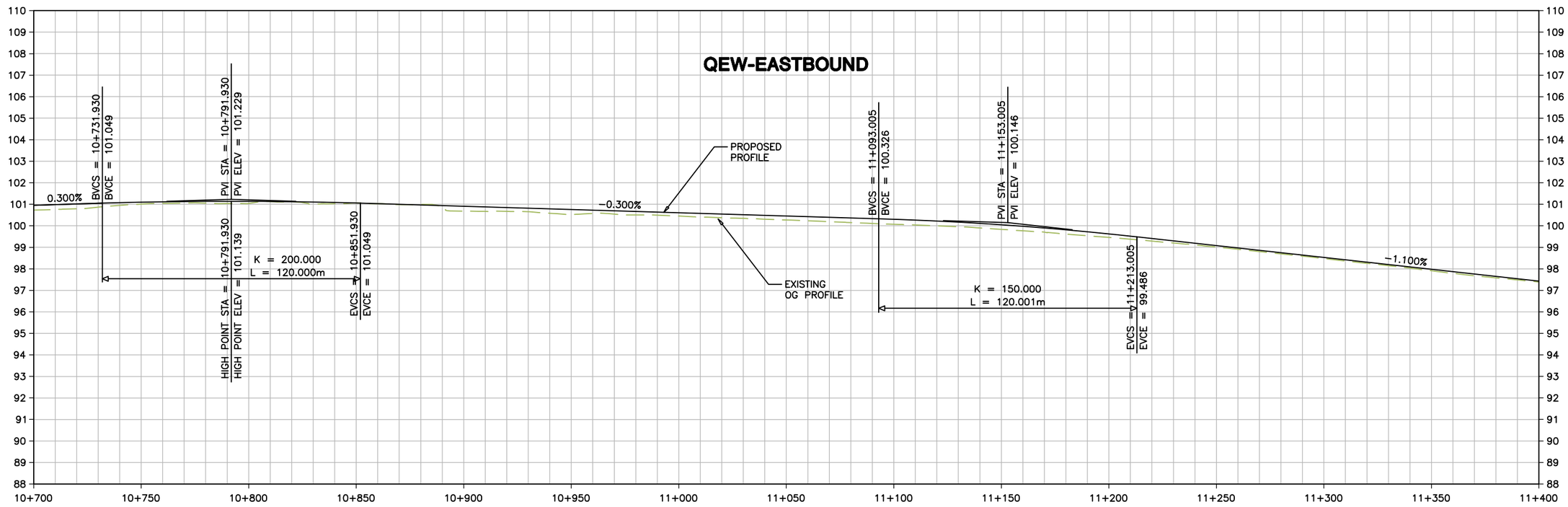


EXHIBIT				
7-1	**RECOMMENDED 6-LANES PROFILE** **STA. 10+700 TO STA. 11+400** **PLATE 3**	Scale : 10m 0 20m — Horizontal 1 : 2000 1m 0 2m — Vertical 1 : 200		**GWP 08-20008** **QUEEN ELIZABETH WAY** **from Mississauga Road to Hurontario Street** **Preliminary Design and Class Environmental Assessment**

Ontario

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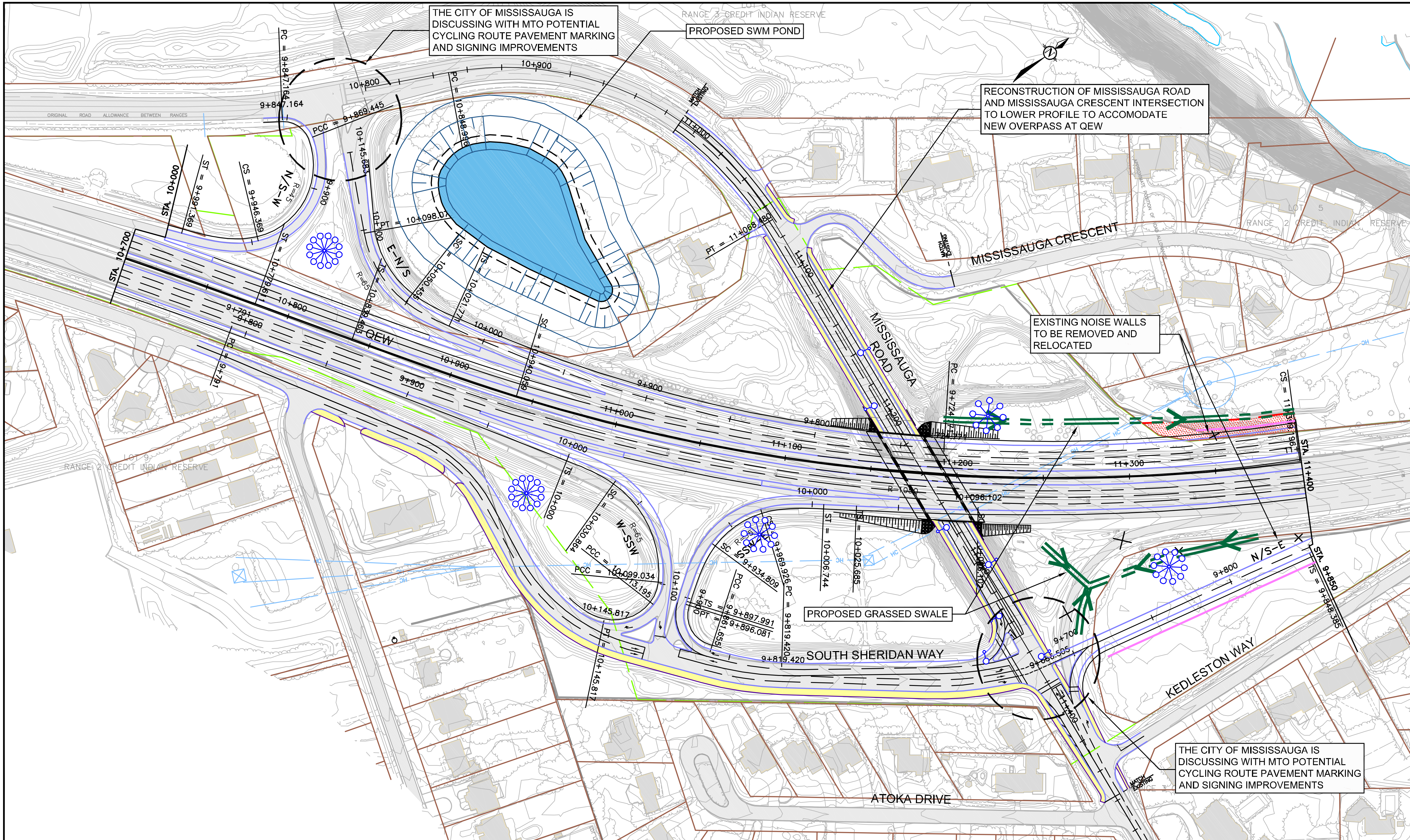


Ontario / MRC McCORMICK RANKIN	**GWP 08-20008** **QUEEN ELIZABETH WAY** **from Mississauga Road to Hurontario Street** **Preliminary Design and Class Environmental Assessment**	

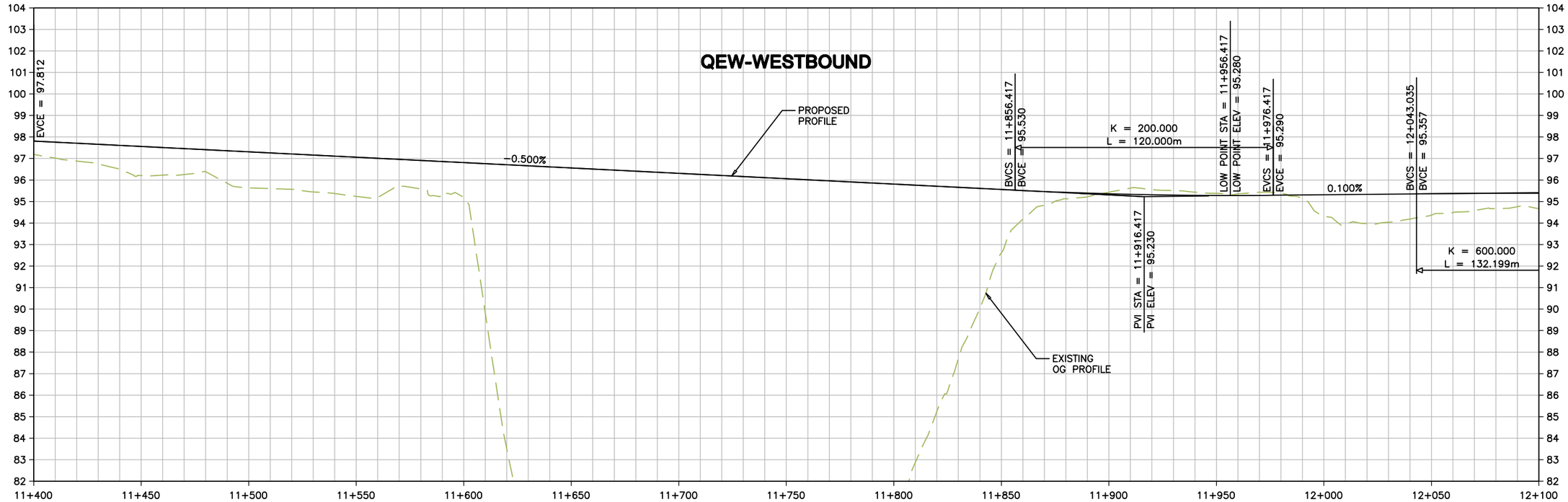
LEGEND

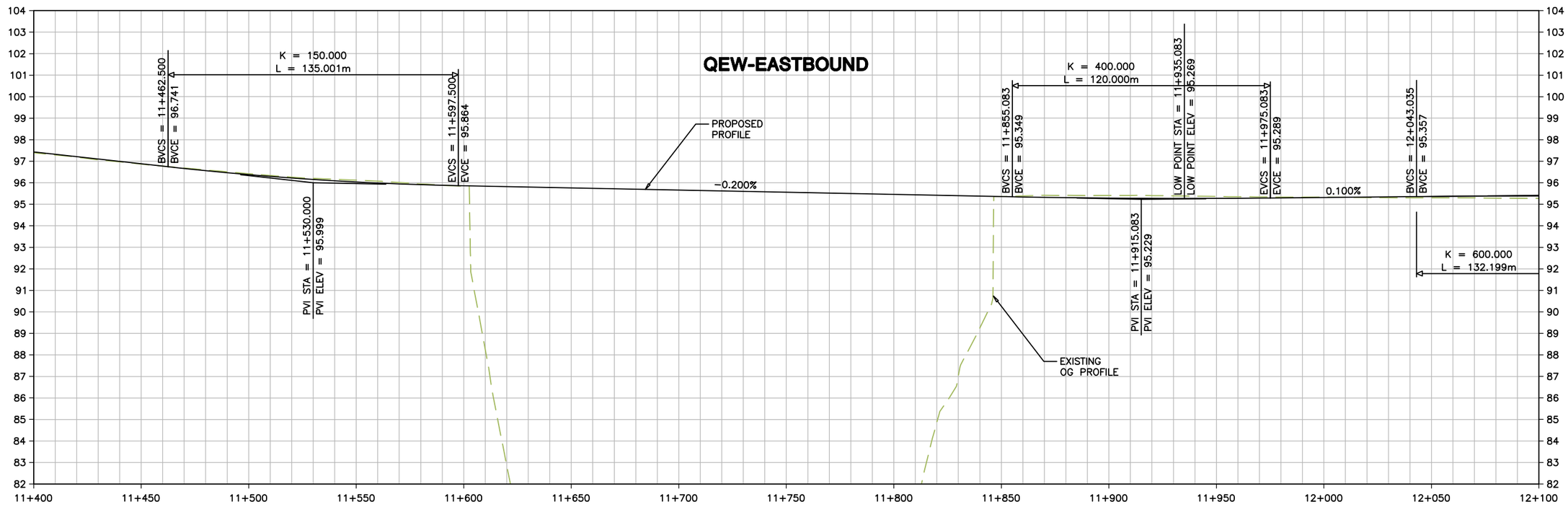
- EXISTING ROADWAY
- EXISTING MTO RIGHT-OF-WAY
- EXISTING NOISE WALL
- PROPERTY LINE
- PROPOSED ROADWAY
- PROPOSED MTO RIGHT-OF-WAY
- PROPOSED NOISE WALL
- SIDEWALKS /MULTI-USE PATH
- HIGH MAST LIGHTING

Scale :
10m 0 20m
Horizontal
1 : 2000

RECOMMENDED 6-LANES PLAN
STA. 10+700 TO STA. 11+400
PLATE 4

EXHIBIT
7-1





EXHIBIT

7-1

RECOMMENDED 6-LANES PROFILE
STA. 11+400 TO STA. 12+100
PLATE 5

Scale :

10m 0 20m — Horizontal 1 : 2000

1m 0 2m — Vertical 1 : 200

GWP 08-20008
QUEEN ELIZABETH WAY
from Mississauga Road to Hurontario Street
Preliminary Design and Class Environmental Assessment

Ontario

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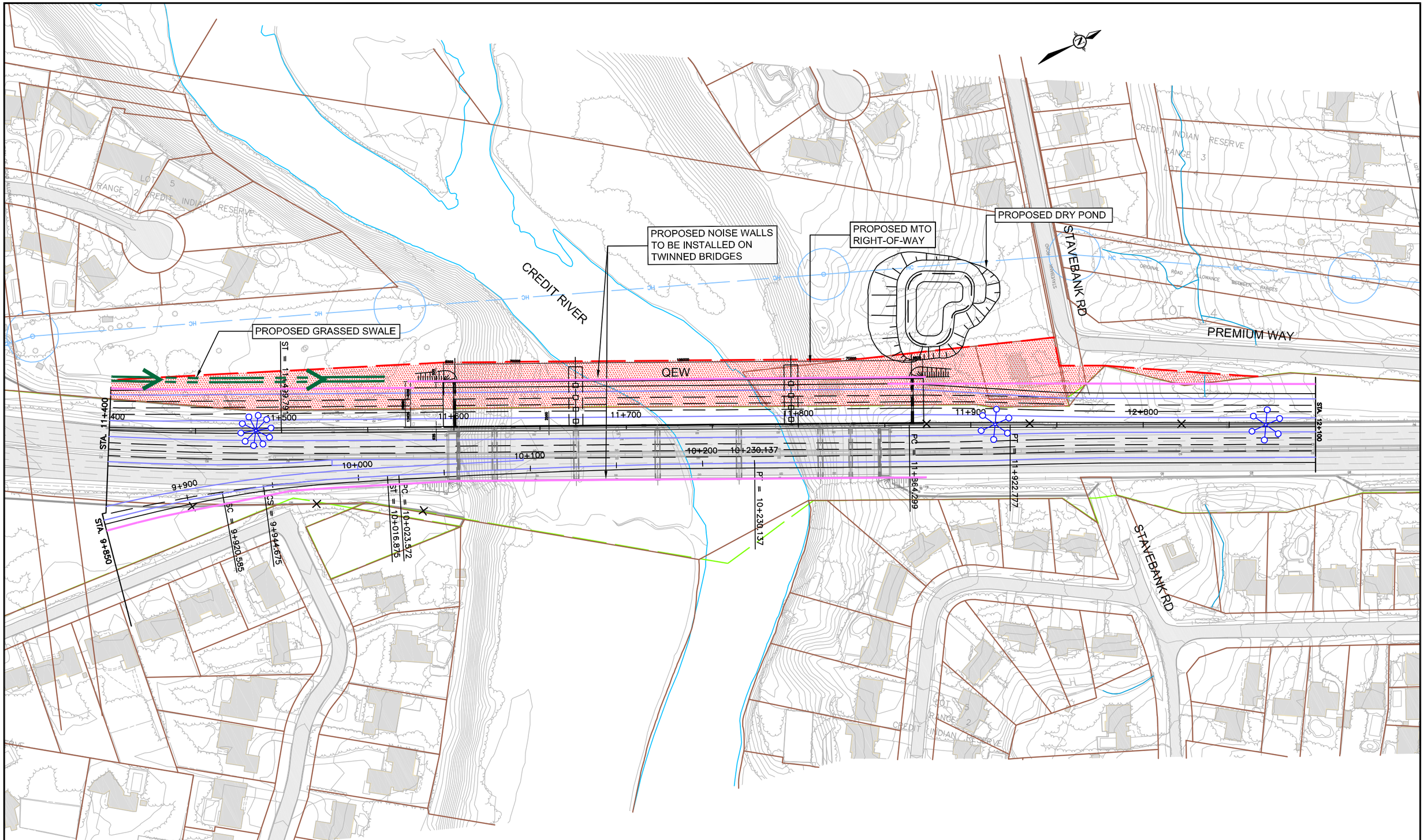

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GWP 08-20008
QUEEN ELIZABETH WAY
from Mississauga Road to Hurontario Street
Preliminary Design and Class Environmental Assessment

LEGEND

- EXISTING ROADWAY
- EXISTING MTO RIGHT-OF-WAY
- EXISTING NOISE WALL
- PROPERTY LINE
- PROPOSED ROADWAY
- PROPOSED MTO RIGHT-OF-WAY
- PROPOSED NOISE WALL
- SIDEWALKS /MULTI-USE PATH
- HIGH MAST LIGHTING

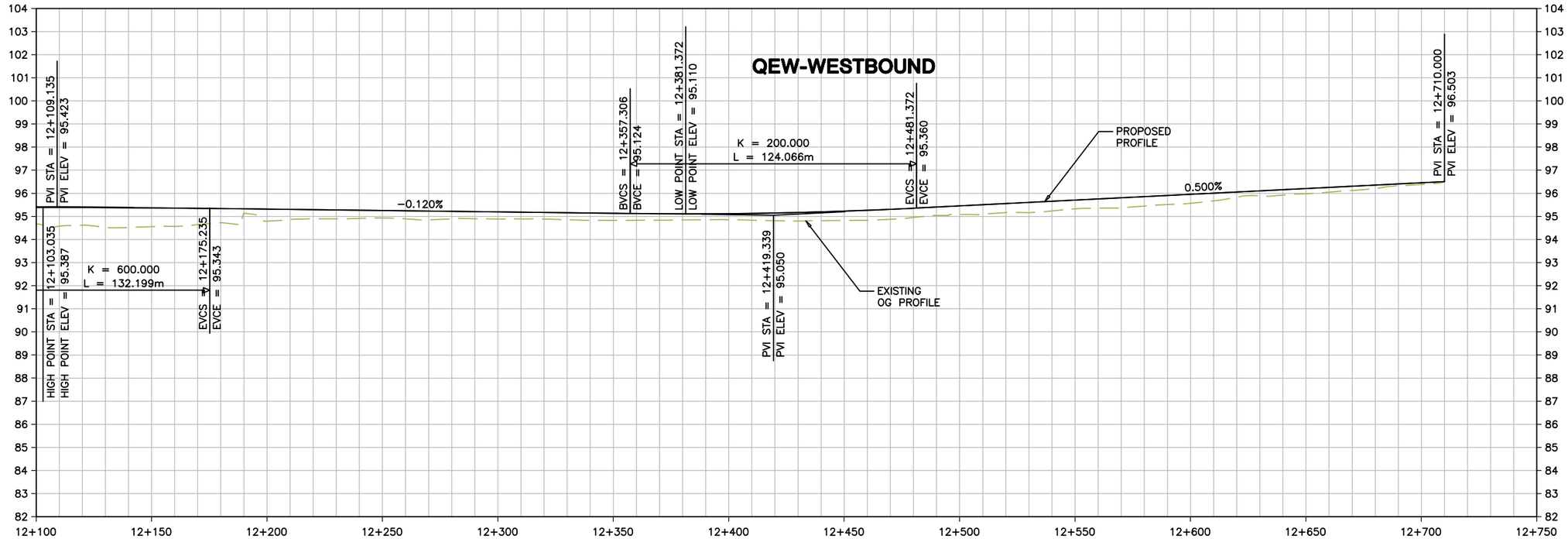
Scale :

10m 0 20m
Horizontal
1 : 2000

RECOMMENDED 6-LANES PLAN
STA. 11+400 TO STA. 12+100
PLATE 6

EXHIBIT

7-1



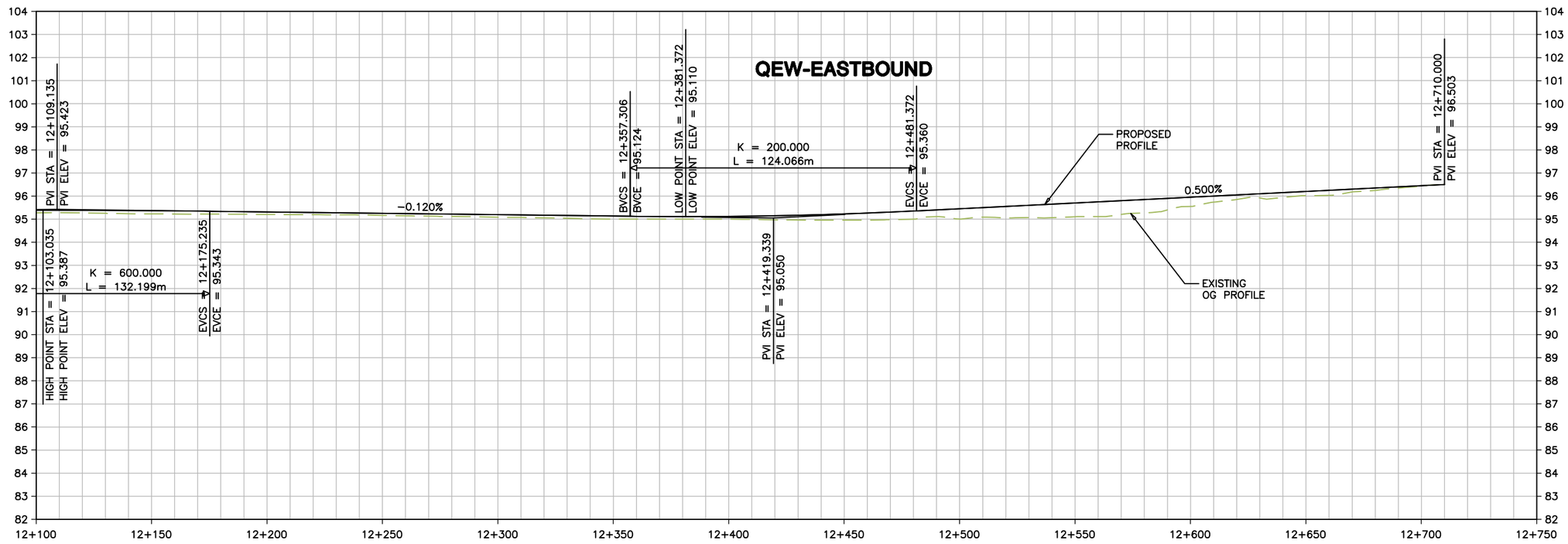
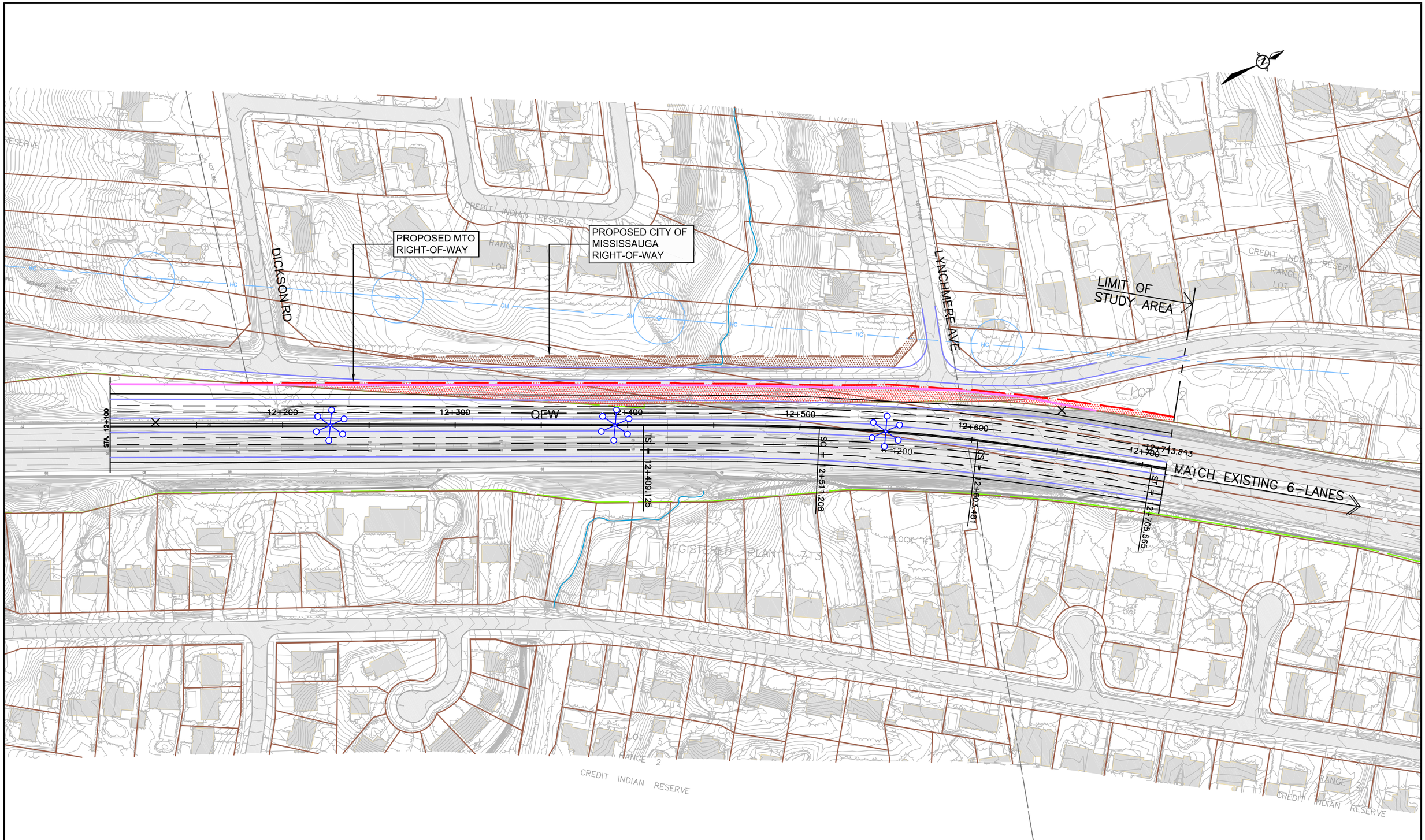


EXHIBIT 7-1	RECOMMENDED 6-LANES PROFILE STA. 12+100 TO STA. 12+100 PLATE 7	Scale : Horizontal 1 : 2000 (10m 0 20m) Vertical 1 : 200 (1m 0 2m)		GWP 08-20008 QUEEN ELIZABETH WAY from Mississauga Road to Hurontario Street Preliminary Design and Class Environmental Assessment	Ontario MRC McCORMICK RANKIN



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GWP 08-20008
QUEEN ELIZABETH WAY
from Mississauga Road to Hurontario Street
Preliminary Design and Class Environmental Assessment

LEGEND

- EXISTING ROADWAY
- EXISTING MTO RIGHT-OF-WAY
- EXISTING NOISE WALL
- PROPERTY LINE
- PROPOSED ROADWAY
- PROPOSED MTO RIGHT-OF-WAY
- PROPOSED NOISE WALL
- SIDEWALKS /MULTI-USE PATH
- HIGH MAST LIGHTING

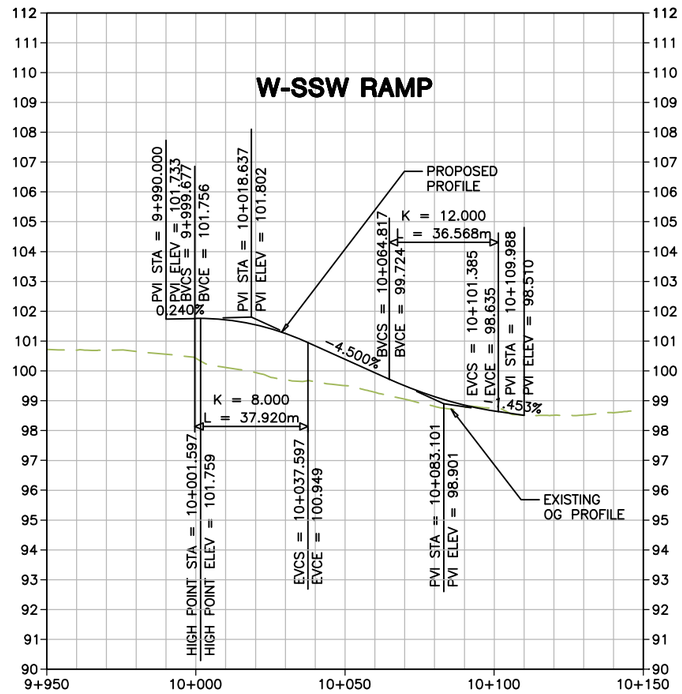
Scale :

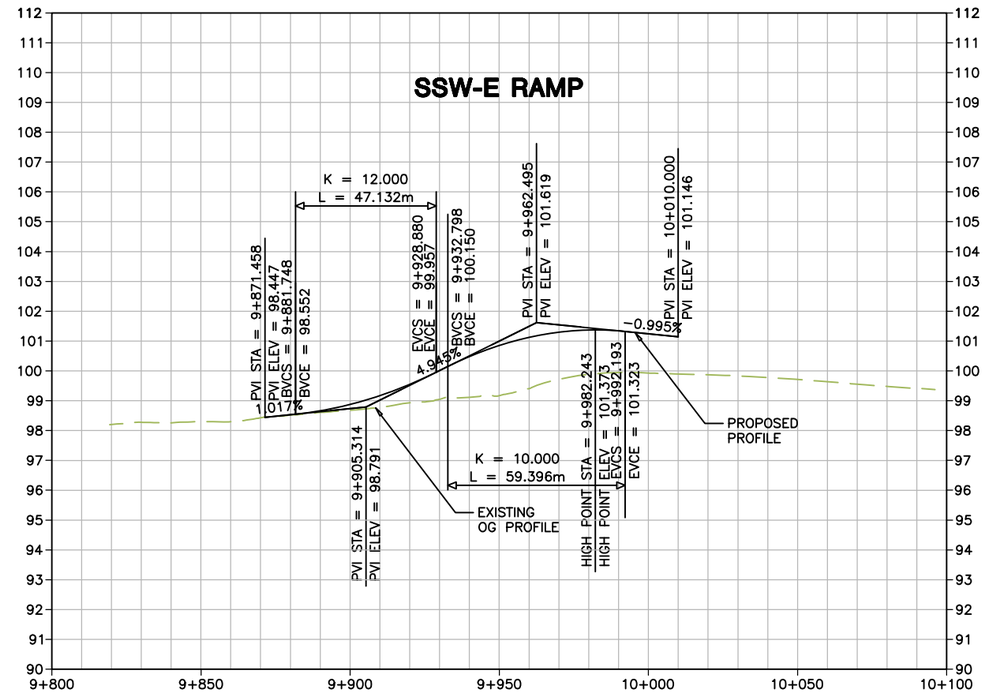
10m 0 20m
Horizontal
1 : 2000

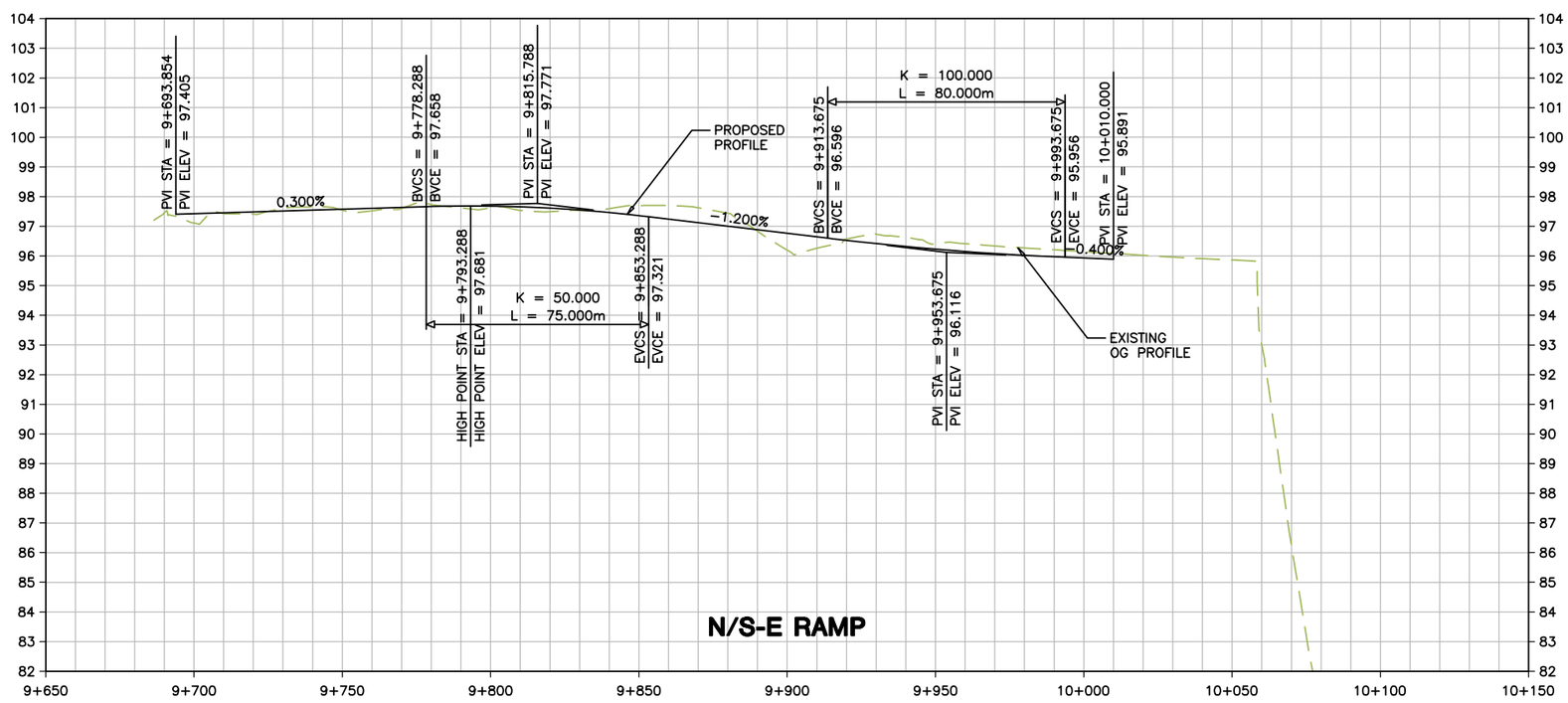
RECOMMENDED 6-LANES PLAN
STA. 12+100 TO STA. 12+713.863
PLATE 8

EXHIBIT

7-1







EXHIBIT

7-1

RECOMMENDED 6-LANES PROFILES
MISSISSAUGA ROAD INTERCHANGE
PLATE 9

Scale :

Horizontal 1 : 2000 (10m 0 20m)

Vertical 1 : 200 (1m 0 2m)

GWP 08-20008
QUEEN ELIZABETH WAY
from Mississauga Road to Hurontario Street
Preliminary Design and Class Environmental Assessment

Ontario

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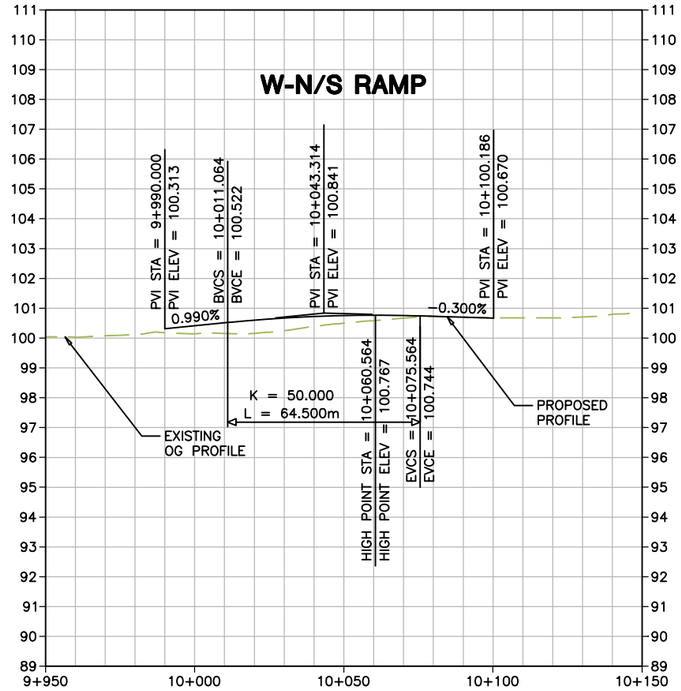

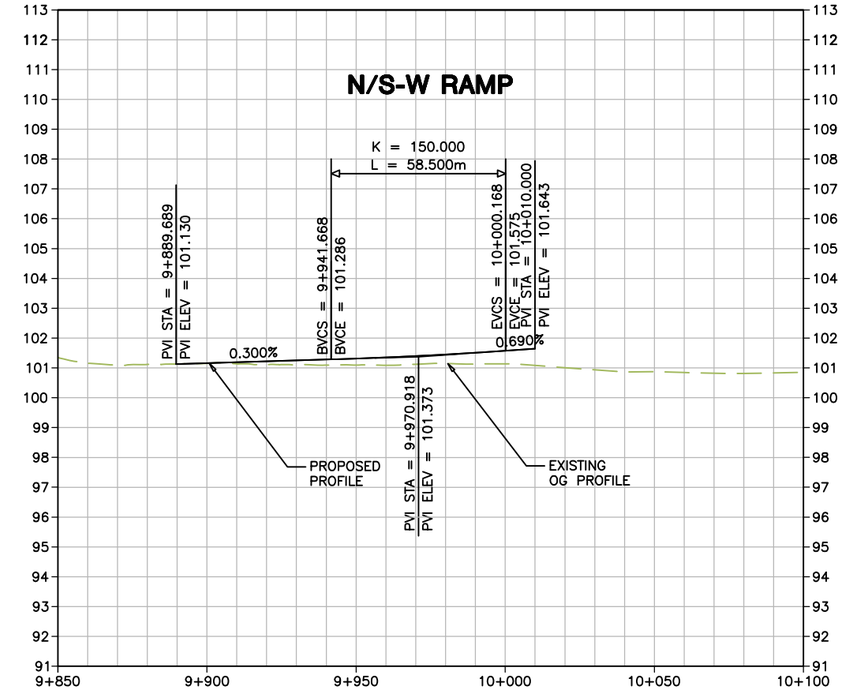

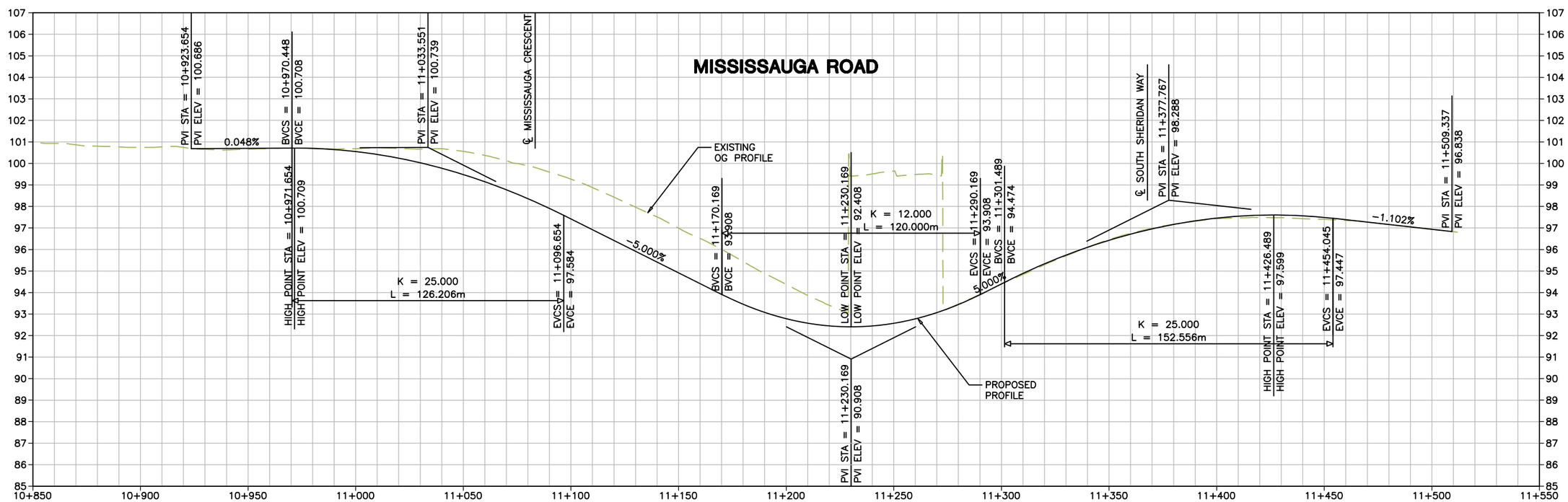

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GWP 08-20008
QUEEN ELIZABETH WAY
from Mississauga Road to Hurontario Street
Preliminary Design and Class Environmental Assessment

Scale :

10m 0 20m — Horizontal 1 : 2000

1m 0 2m — Vertical 1 : 200

RECOMMENDED 6-LANES PROFILES
MISSISSAUGA ROAD INTERCHANGE
PLATE 10

EXHIBIT

7-1

7.2.1.3 Cross-Sections

As part of the improvements proposed at the Credit River Bridge and the Mississauga Road Interchange, the existing six lane cross-section is being improved to current standards. All proposed cross-section elements will meet the requirements in the GDSOH. The existing and proposed typical cross-sections are presented in **Exhibit 7.2**.

Lane Widths

The existing QEW has three 3.66 m wide lanes in each direction. Consistent with MTO design standards, the improved QEW cross-section proposes three 3.75 m wide basic lanes in each direction.

Shoulder and Median Widths

The existing QEW median and shoulders widths within the study limits are below current MTO design standards. The improved QEW cross-section proposes median and outside shoulders widths of 3.0 m. All shoulders will be fully paved. The existing steel-beam guiderail and concrete median barrier will be completely replaced by concrete median barrier within the study limits to accommodate the proposed shift in alignment across the QEW Credit River Bridges.

Cross-fall and Superelevation

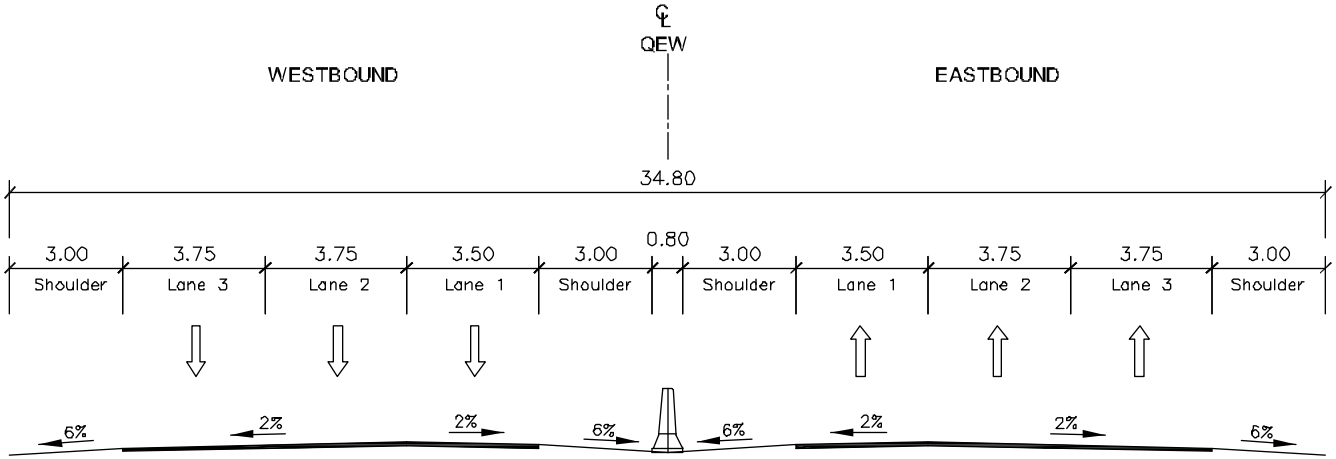
The existing cross-fall will be maintained at 2% for lanes and 6% for shoulders.

The two existing horizontal curves through the Mississauga Road Interchange of 1050 m and 1700 m radius have existing superelevation of 2%, which is below current MTO design standards. The QEW mainline improvements include improving the superelevation to the minimum standard of 5% and 3.9%, respectively. These improvements are described in further detail in Section 7.2.3.

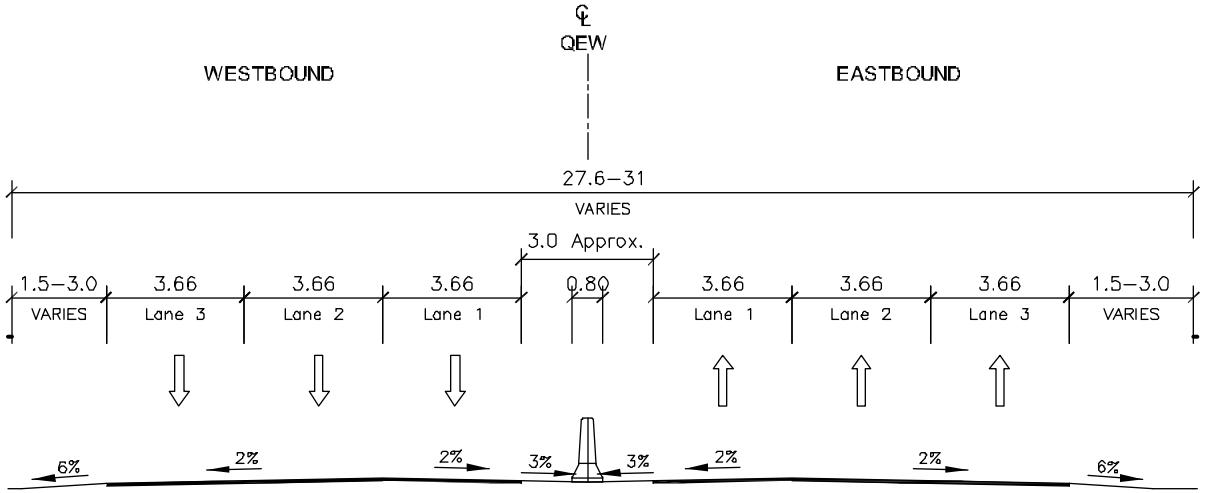
Crown

The existing QEW crowns are located between Lanes 1 and 2 in each direction for tangent sections of the QEW. To accommodate the proposed shift in alignment across the QEW Credit River Bridges a crown shift will be required. The relocated crowns will still be located between Lanes 1 and 2 for the improved QEW mainline.

A crown is the "peak" or high point of a road when viewed longitudinally. The crown is provided so that water will drain off both sides of the roadway. On divided roadways, there is typically a crown in each direction of travel so that some water can drain to the median and some to the outside.



PROPOSED 6-LANE CROSS-SECTION



EXISTING TYPICAL QEW CROSS-SECTION

Ontario MRC McCORMICK RANKIN A member of MMM GROUP	**GWP 08-20008** **QUEEN ELIZABETH WAY** **from Mississauga Road to Hurontario Street** **Preliminary Design and Class Environmental Assessment**	Scale : 1 : 200 2m 0 4m	**EXISTING AND PROPOSED TYPICAL CROSS-SECTIONS**	Exhibit **7-2**

7.2.2 Bridges

A total of three bridges are included in the Recommended Plan including rehabilitation of the existing Credit River Bridge; the new North Twin Credit River Bridge; and replacement of the Mississauga Road Overpass. A brief summary of the bridges is provided below.

7.2.2.1 QEW Credit River Bridges

New North Twin Credit River Bridge

In order to maintain all existing six lanes of the QEW while completing the rehabilitation of the existing Credit River Bridge, a new Twin Bridge will be constructed to the north.

The Recommended Plan, North Twinning, is a new 267 m three-span structure over the Credit River with one pier on each side of the river channel. Both a concrete segmental and steel girders structure type options have been developed and are carried forward to subsequent phases of design. The span arrangement and span lengths of both options are the same.

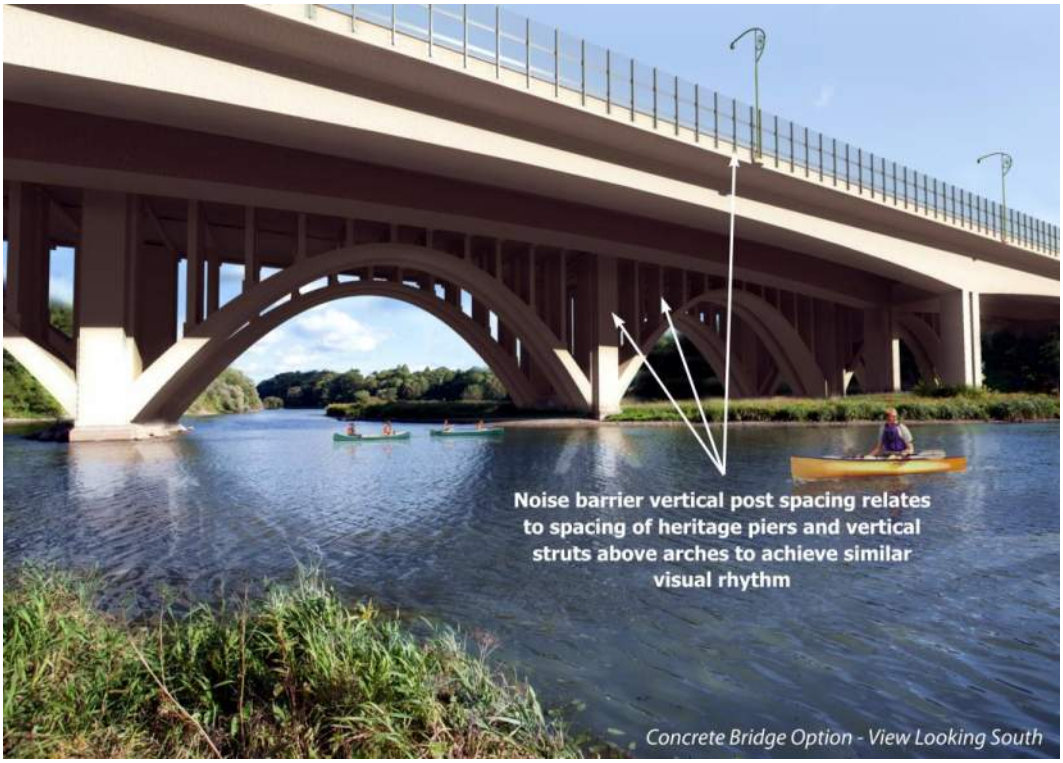
The recommended structure configuration is summarized as follows:

- Three-span bridge structure.
- Spans: 68 m + 118 m + 68 m.
- Deck Type: Concrete Segmental Box Girder or Steel Girder.
- Abutments: conventional abutments and wing-walls.
- Intermediate Piers: concrete pier columns designed visually sympathetic to the existing heritage bridge (2 pier columns for concrete option and 4 pier columns for steel option)
- Abutments and Pier Foundations: caisson or spread footings

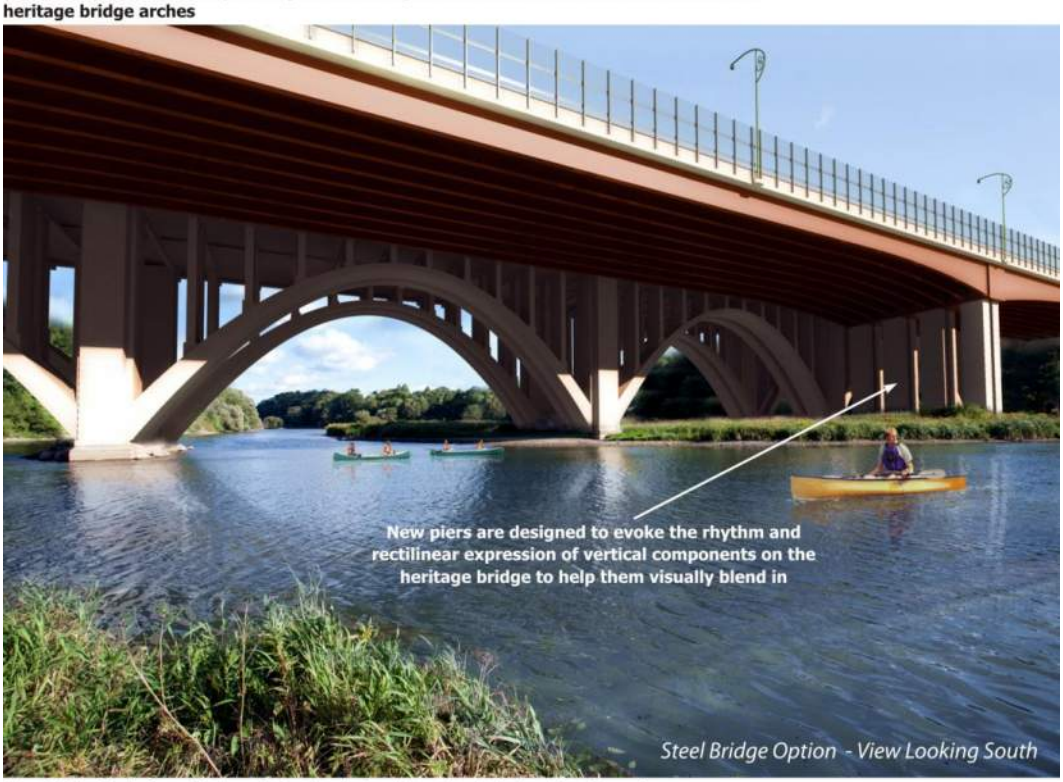
It is noted that foundations investigation information was not available for the east river bank to the north of the existing Credit River Bridge and therefore the exact depth of the shale bedrock for the east pier of the North Twin Bridge is estimated for this preliminary design. The preliminary foundation recommendation is caisson footings; however, should the depth of bedrock be shallower than estimated a spread footing may be preferred. Further borehole investigation and analysis will be required during the Detail Design to confirm the foundation recommendations.

The Recommended North Twin Credit River Bridge options: Concrete Segmental Box Girder and Steel Girder are illustrated, with key design elements noted, in the following **Exhibit 7-3A** and the preliminary General Arrangement drawings are included in **Exhibit 7-4**, illustrate the recommended structure configuration for each of the bridge options.

EXHIBIT 7-3A: NORTH TWIN CREDIT RIVER BRIDGE OPTIONS



New superstructure and span lengths are configured to maximize north side views to the heritage bridge arches



New bridge is designed to be minimal and visually understated so the viewer's eye is drawn to the bold curves and articulation of the heritage bridge

Existing QEW Credit River Bridge

The existing Credit River Bridge, originally constructed as a four-lane bridge in 1934, and widened to six lanes in 1960, is almost 80 years old and in need of repair.

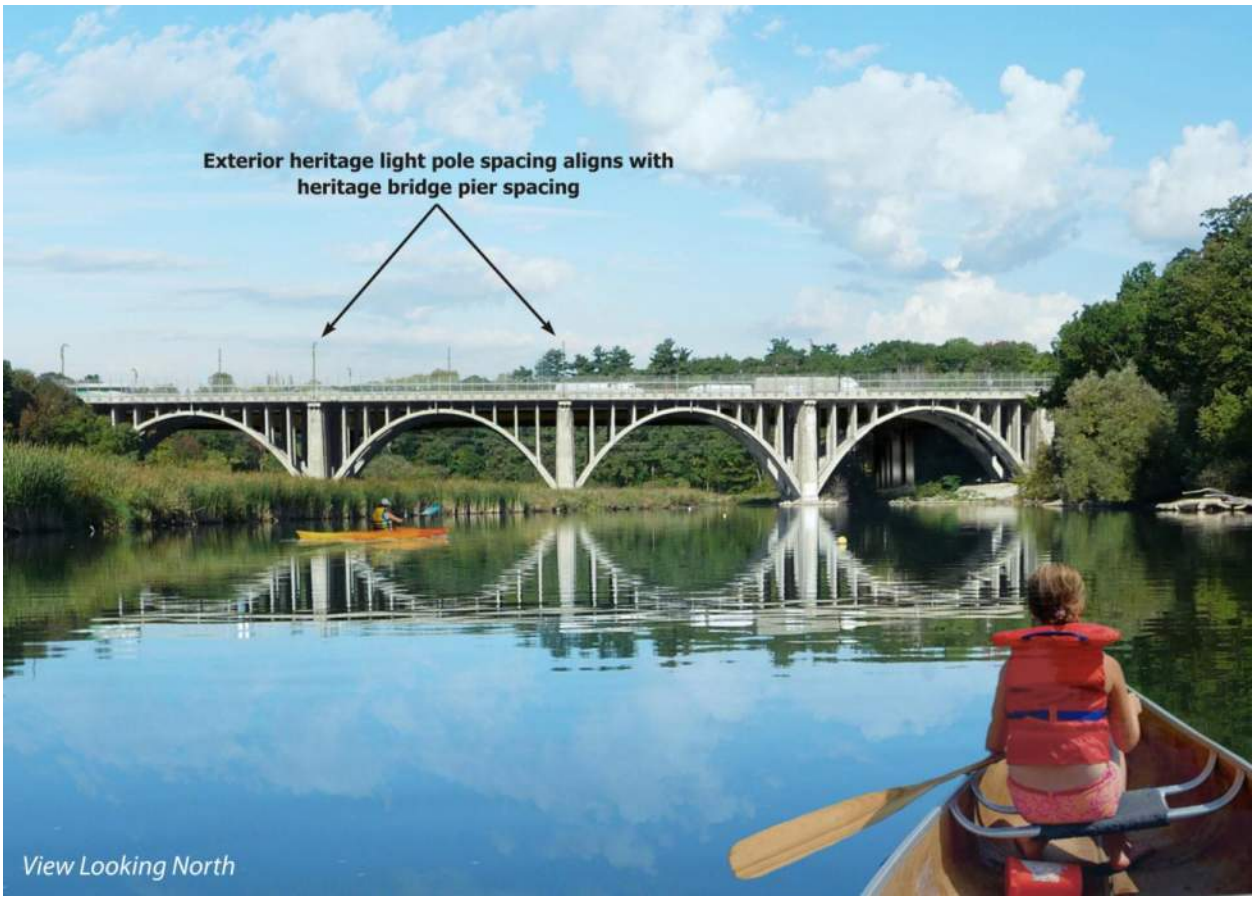
The bridge is a 7-span concrete arch bridge with spandrel walls and a reinforced concrete deck. As discussed in **Section 1.4.1**, to "hold" the bridge for the short-term, a Holding Strategy is currently under construction, with the works expected to be complete by 2013.

The long-term rehabilitation of the existing Credit River Bridge includes:

- Complete replacement of the existing concrete bridge deck and floor beams;
- Local repairs to the existing concrete arches and spandrels;
- Remove the existing double expansion joints (5 in total) and install new single expansion joints; and
- Remove existing barriers and construct new concrete barrier wall.

The Existing Credit River Bridge with the new Twin Bridge is illustrated, with key design elements noted, in the following **Exhibit 7-3B**, and the preliminary General Arrangement drawings is included in **Exhibit 7-4**, illustrate the recommended structure configuration for each of the bridge options.

EXHIBIT 7-3B: EXISTING CREDIT RIVER BRIDGE



7.2.2.2 Mississauga Road Overpass

The existing Mississauga Road Overpass will be impacted by the Overall Preferred Alternative. The existing Mississauga Road Overpass is too narrow to accommodate the cross-section of the Recommended Plan. In addition, the new QEW centerline is approximately 9 m north of the existing QEW centreline at the Mississauga Road Overpass.

A number of design alternatives were developed for the new 6-lane cross-section of the QEW. These alternatives included combinations of widening and/or replacement of the existing Mississauga Road Overpass, as well as replacement with twin bridge rather than a single; flattening the existing horizontal curve from the radius of 1050 m to 1400 m to reduce the minimum standard rate of superelevation required; raising the vertical profile of the QEW to minimize impacts to Mississauga Road; and considering a range of superelevation rates from the existing of 2% up to the standard superelevation rate of 5% for a 1050 m horizontal curve. The twin bridge and curve flattening options resulted in more significant impacts to Mississauga Road and were considered viable solutions to minimizing impacts to Mississauga Road. By raising the profile of the QEW and lowering the grade of Mississauga Road the minimum standard 5% superelevation rate for the existing 1050 m raidus curve could be achieved.

Therefore, the Recommended Plan calls for a complete replacement of the existing bridge. The existing horizontal curve of 1050 m radius through the Mississauga Road Interchange and across the bridge will be maintained and the existing 2% will be improved to the minimum standard of 5%. In order to accommodate the wider 6-lane cross-section, the northerly shift in the highway centre-line and the improvement in the superelevation rate, Mississauga Road will be lowered by 1.5 m and the QEW will be raised by 1.6 m. Further detail on the road work is described in **Section 7.2.3** .

The recommended structure configuration is summarized as follows:

- One-span bridge structure.
- Span: 35.2 m (accommodating a wider cross-section of Mississauga Road underneath)
- Deck Type: Concrete Precast Box Beams.
- Abutment Foundations: spread footings.

DISTRICT
CONT. No.
WP No.

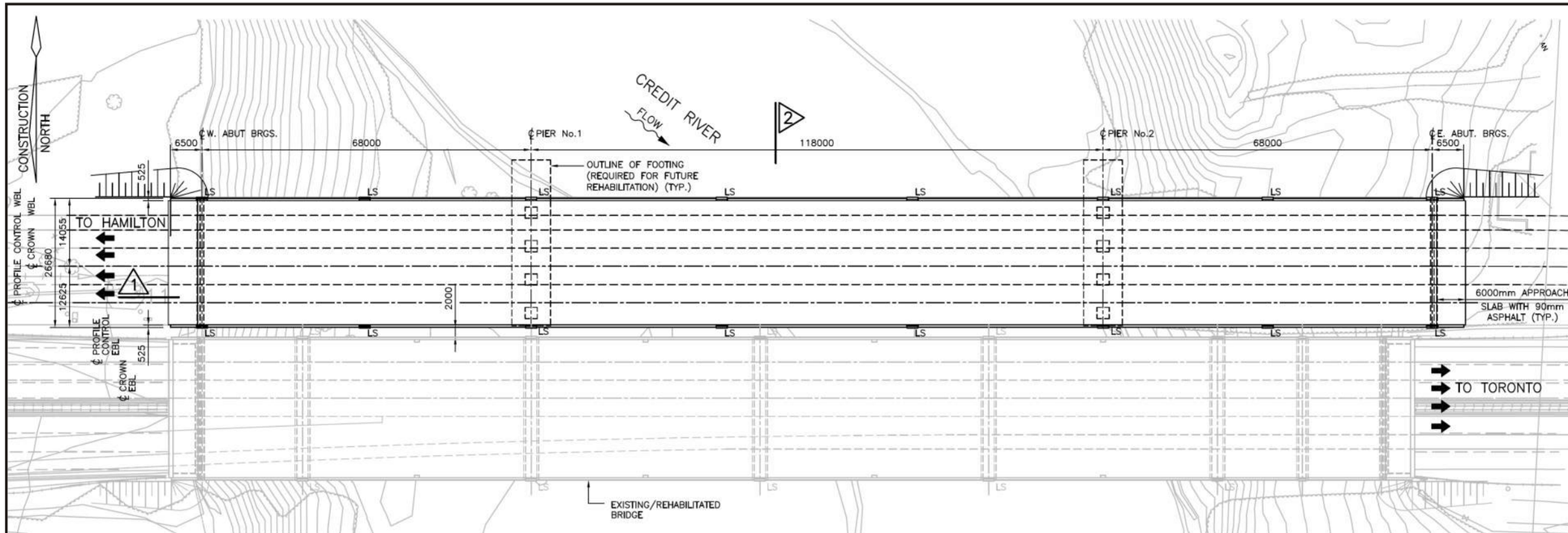
QUEEN ELIZABETH WAY WB
OVER CREDIT RIVER
NORTH TWINNING (OPTION 1)

PRELIMINARY
GENERAL ARRANGEMENT

McCORMICK RANKIN CORPORATION
A member of MMM GROUP

SHEET

METRIC



PLAN
1 : 500

GENERAL NOTES

CLASS OF CONCRETE

ALL CONCRETE UNLESS NOTED OTHERWISE 30MPa

CLEAR COVER TO REINFORCING STEEL

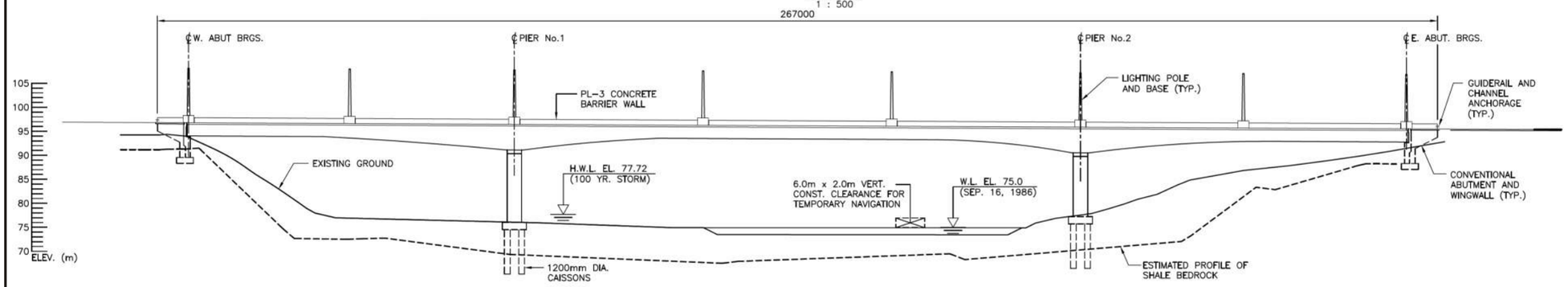
FOOTINGS	100±25
DECK	
TOP	70±20
BOTTOM	40±10
REMAINDER UNLESS OTHERWISE NOTED	70±20

LIST OF DRAWINGS

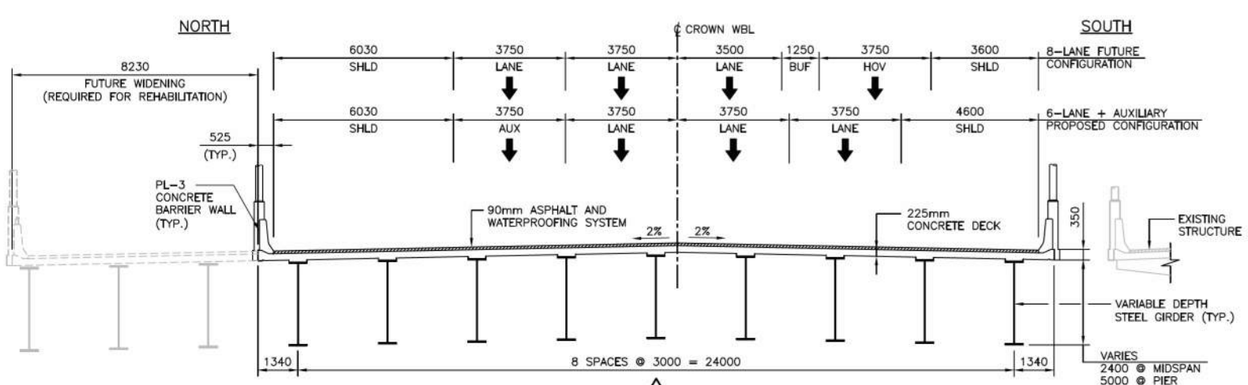
1. PRELIMINARY GENERAL ARRANGEMENT

LIST OF ABBREVIATIONS

AUX – DENOTES AUXILIARY LANE
LS – DENOTES LIGHT STAND



1 ELEVATION
1:500



2
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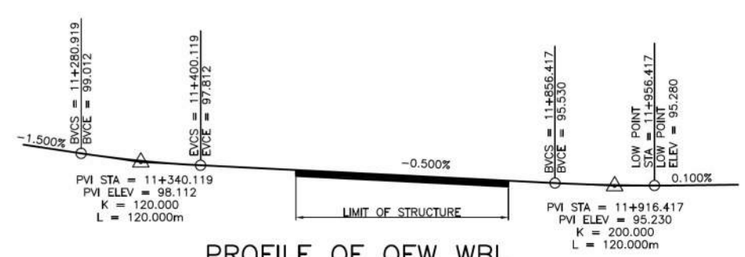


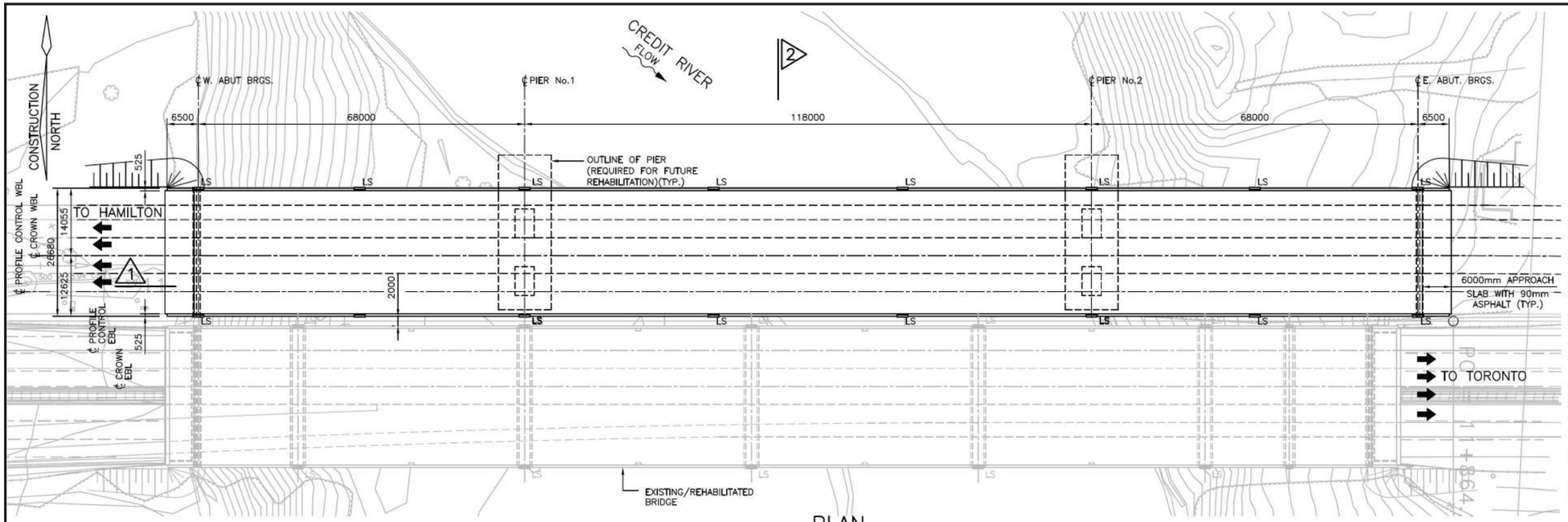
PROFILE OF QEW WBL
N.T.S.

OPTION 1 : STEEL GIRDER BRIDGE

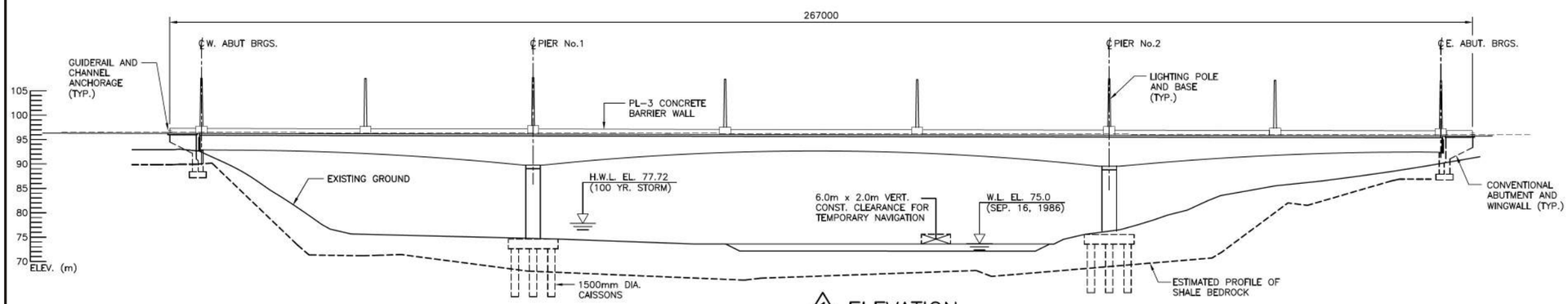
DRAWING NOT TO BE SCALED
100mm ON ORIGINAL DRAWING

CREDIT RIVER NORTH TWINNING (OPTION 1)

Exhibit
7-4



PLAN
1:500



1 ELEVATION
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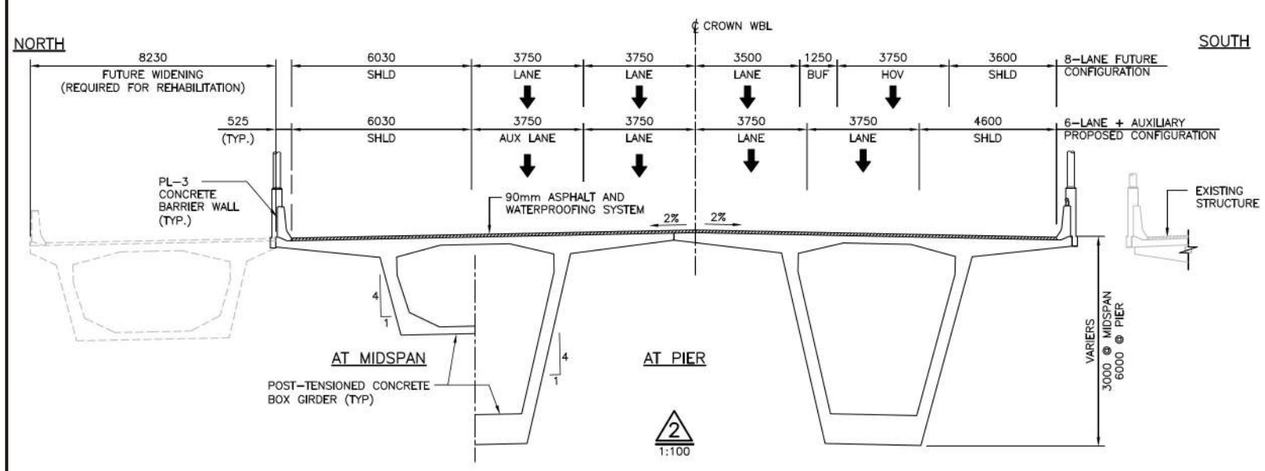

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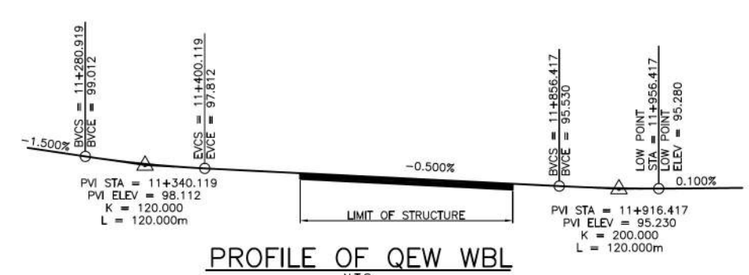


PROFILE OF QEW WBL
N.T.S.

DRAWING NOT TO BE SCALED
100mm ON ORIGINAL DRAWING

DISTRICT CONT. No. WP No.	
QUEEN ELIZABETH WAY WB OVER CREDIT RIVER NORTH TWINNING (OPTION 2)	SHEET
PRELIMINARY GENERAL ARRANGEMENT	
McCORMICK RANKIN CORPORATION A member of MMM GROUP	METRIC

GENERAL NOTES

CLASS OF CONCRETE

FOOTINGS AND SLOPE PAVING	30MPa
MASS CONCRETE	30MPa
REMAINDER UNLESS NOTED OTHERWISE	35MPa

CLEAR COVER TO REINFORCING STEEL

FOOTINGS	100±25
DECK	
TOP	70±20
BOTTOM	40±10
REMAINDER UNLESS OTHERWISE NOTED	70±20

LIST OF DRAWINGS

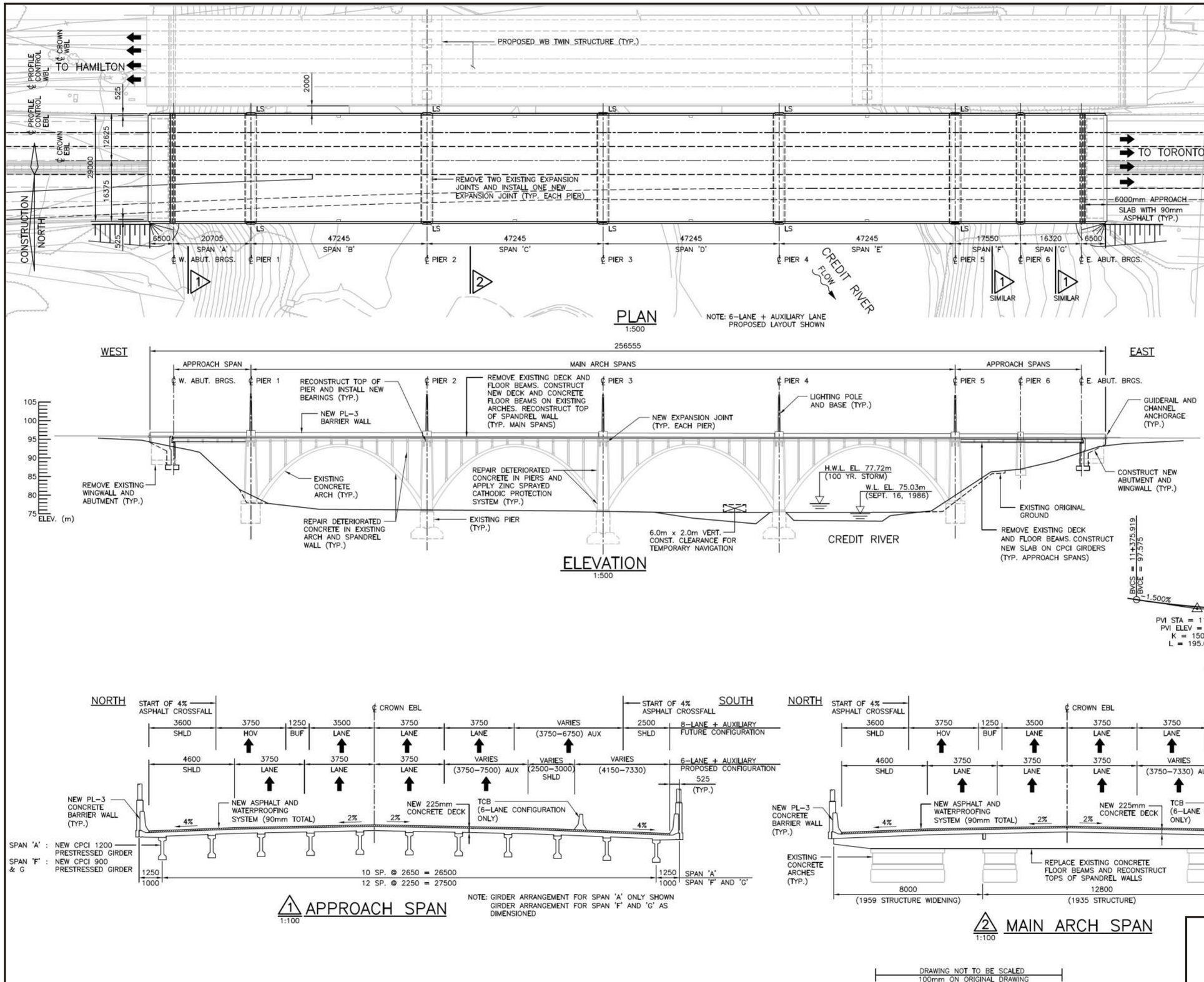
1. PRELIMINARY GENERAL ARRANGEMENT

LIST OF ABBREVIATIONS

AUX – DENOTES AUXILIARY LANE
LS – DENOTES LIGHT STAND

OPTION 2 : CONCRETE SEGMENTAL BOX GIRDER BRIDGE

CREDIT RIVER NORTH TWINNING (OPTION 2)	Exhibit 7-4



DISTRICT
CONT. No.
WP No.

QUEEN ELIZABETH WAY EB OVER CREDIT RIVER BRIDGE REHABILITATION

PRELIMINARY GENERAL ARRANGEMENT

McCORMICK RANKIN CORPORATION
A member of MMM GROUP

SHEET

METRIC

GENERAL NOTES

CLASS OF CONCRETE

PRESTRESSED CPCI GIRDERS	50MPa
REMAINDER UNLESS NOTED OTHERWISE	30MPa

CLEAR COVER TO REINFORCING STEEL

DECK	
TOP	70±20
BOTTOM	50±10
REMAINDER UNLESS OTHERWISE NOTED	70±20

LIST OF DRAWINGS

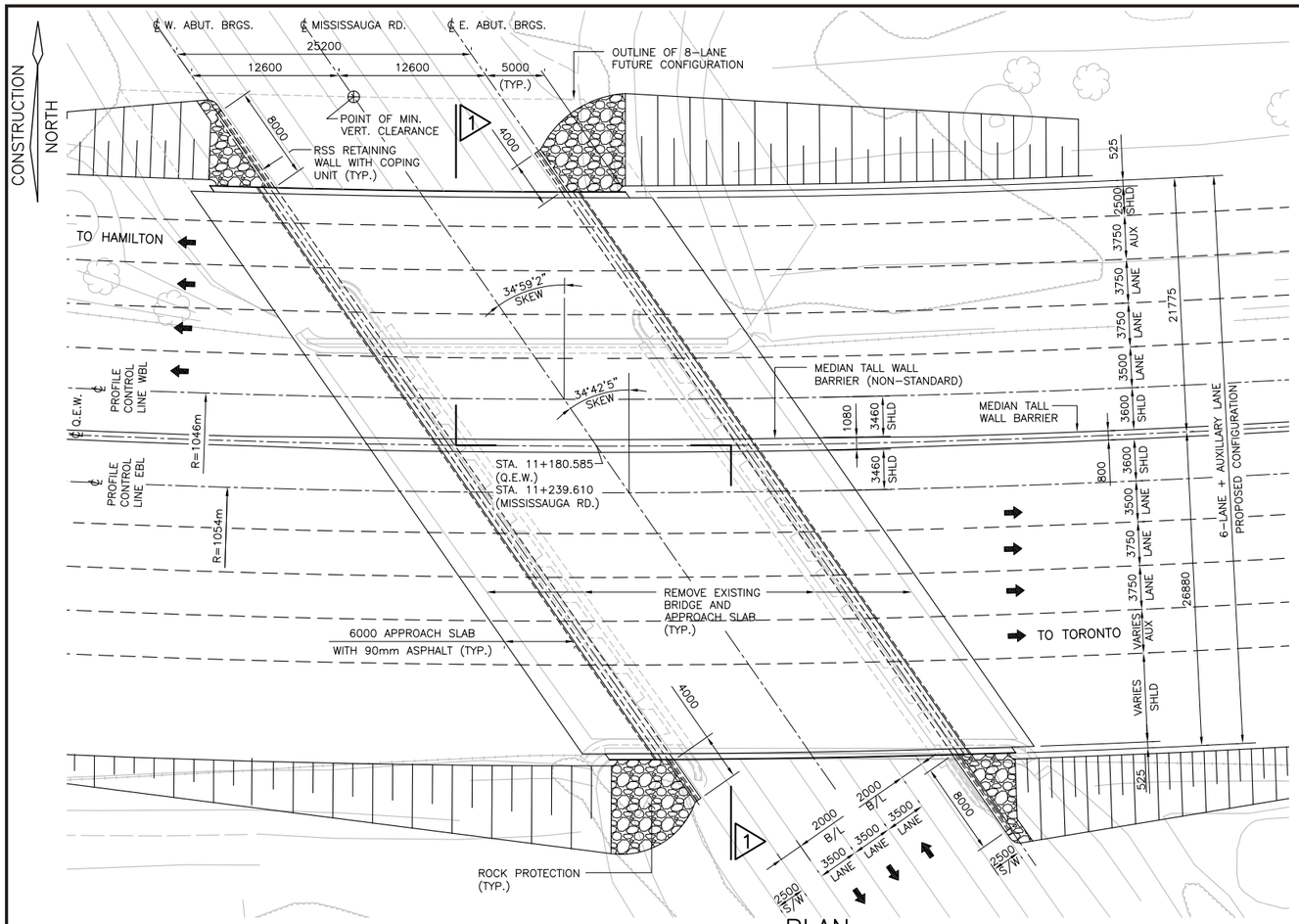
1. PRELIMINARY GENERAL ARRANGEMENT

LIST OF ABBREVIATIONS

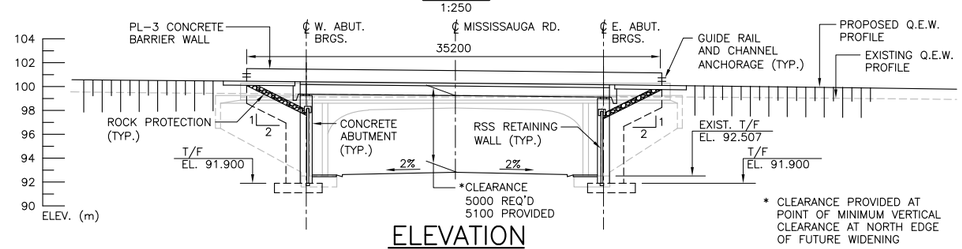
AUX – DENOTES AUXILIARY LANE
LS – DENOTES LIGHT STAND

CREDIT RIVER BRIDGE REHABILITATION

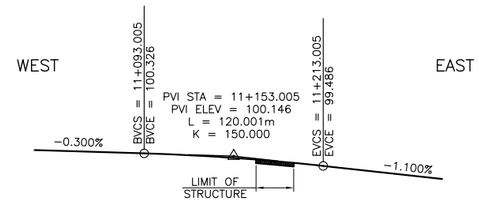
Exhibit **7-4**



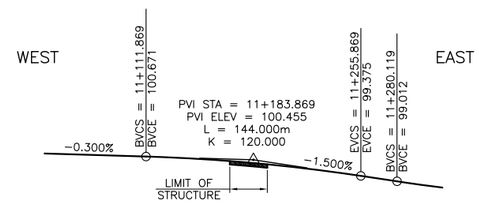
PLAN
1:250



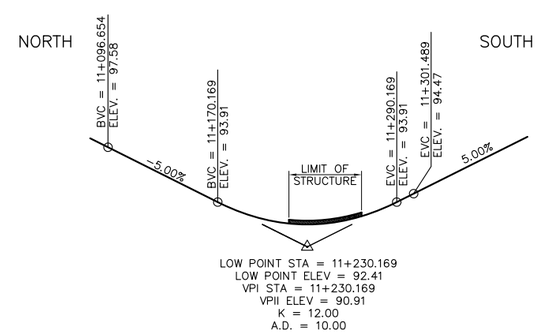
ELEVATION
1:250



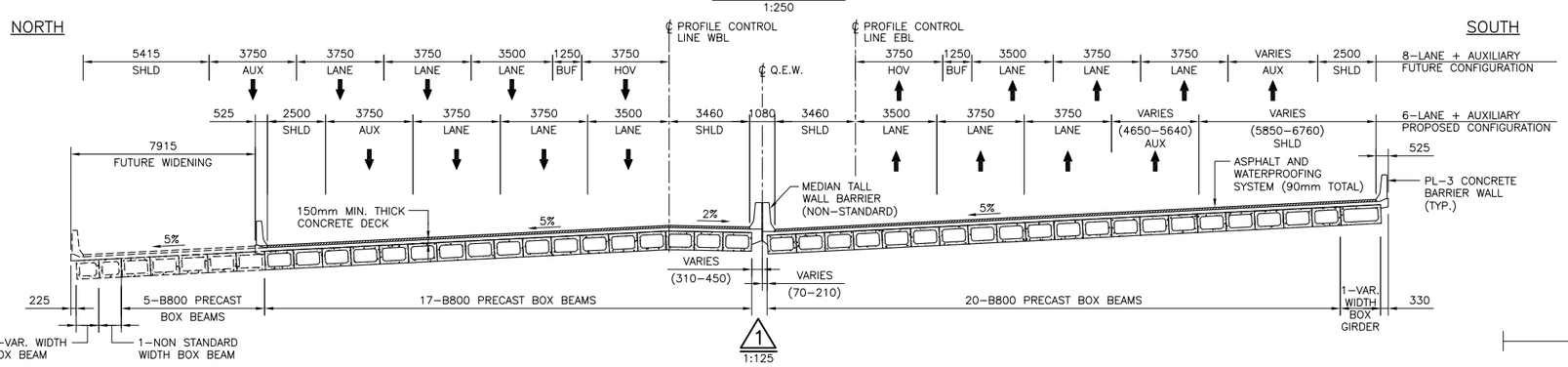
PROFILE OF EBL Q.E.W.
N.T.S.



PROFILE OF WBL Q.E.W.
N.T.S.



PROFILE MISSISSAUGA ROAD
N.T.S.



1:125

DRAWING NOT TO BE SCALED
100mm ON ORIGINAL DRAWING

DISTRICT
CONT. No.
WP No.

QUEEN ELIZABETH WAY
MISSISSAUGA ROAD OVERPASS
BRIDGE REPLACEMENT

PRELIMINARY
GENERAL ARRANGEMENT

McCORMICK RANKIN CORPORATION
A member of MMM GROUP

SHEET

METRIC

GENERAL NOTES

CLASS OF CONCRETE AT 28 DAYS

PRESTRESSED BOX GIREDERS	50MPa
REMAINDER UNLESS OTHERWISE NOTED	30MPa

CLEAR COVER TO REINFORCING STEEL

FOOTINGS	70±20
DECK	
TOP	70±20
BOTTOM	50±10
REMAINDER UNLESS OTHERWISE NOTED	70±20

LIST OF DRAWINGS

1. GENERAL ARRANGEMENT

LIST OF ABBREVIATIONS

AUX – DENOTES AUXILIARY LANE
BUF – DENOTES BUFFER ZONE
B/L – DENOTES BIKE LANE
S/W – DENOTES SIDEWALK
T/F – DENOTES TOP OF FOOTING

MISSISSAUGA ROAD OVERPASS BRIDGE REPLACEMENT

Exhibit
7-4

7.2.3 Mississauga Road Interchange

The Mississauga Road Interchange is the only interchange within the study limits and is immediately to the west of the existing QEW Credit River Bridge. Building a new North twin Credit River Bridge provided an opportunity to examine improvements to the existing Mississauga Road Interchange. Many of the existing interchange ramp elements that do not meet current standards, identified in **Section 4.4.1**, will be improved to current standards. Also, all ramp tie-ins will be adjusted to match the proposed improved QEW cross-section.

Interchange alternatives on the south side were assessed and evaluated to identify the preferred interchange alternative, as discussed previously in **Section 6.4.5**. Alternative 1E Modified was selected as the preferred alternative, and is shown in **Exhibit 7-1**. The Recommended Plan includes the following interchange improvements:

- Longer speed change lanes for the two successive eastbound on-ramps at Mississauga Road Interchange: increasing the South Sheridan Way (SSW)-East ramp from 200 m to 400 m; and increasing the N/S-E ramp from 290 m to greater than 500 m. The minimum standard for an on-ramp speed change lane is 500 m; due to space constraints 400 m is the maximum length that could be provided for the SSW-E ramp. The N/S-E ramp could not be shifted further east due to the proximity of the Credit River Bridge
- The second eastbound on-ramp (N/S-E ramp) from Mississauga Road extends into a new eastbound auxiliary lane to the eastbound off-ramp at the Hurontario Street Interchange.
- Implementation of traffic signals at the QEW eastbound on/off-ramp intersection at South Sheridan Way.
- At the QEW eastbound on/off-ramp intersection at South Sheridan Way, left-turns are now prohibited from SSW to eastbound QEW. Instead SSW eastbound traffic will now continue straight and use the second eastbound on-ramp from Mississauga Road. This second eastbound on-ramp with two lanes (tapered to one lane before the merge with QEW) will operate with staggered ramp meter signal control in the morning peak period.

<u>Mississauga Road</u>

The existing Mississauga Road through the QEW Interchange area will be reconstructed in order to accommodate the new Mississauga Road Overpass. Mississauga Road is proposed to be lowered to allow for the shift in the QEW mainline alignment and a new wider Mississauga Road Overpass.

Mississauga Road is lowered by 1.5 m to accommodate the proposed improvements, requiring reconstruction of 300 m of Mississauga Road including the intersection with Mississauga Crescent, 100 m of Mississauga Crescent, and two nearby driveways on Mississauga Road. It is anticipated that this reconstruction including the grading can be accommodated primarily within the existing road right-of-way.

The QEW mainline profile is raised by 1.6 m to accommodate the recommended geometric improvements, requiring reconstruction of approximately 650 m of the QEW. The construction staging of the QEW reconstruction and grade raise will be coordinated with the bridge replacement construction. This grade change will result in a minor shift in how the existing interchange ramps connect into the mainline.

The existing cross-section of Mississauga Road under the QEW includes three 3.5 m lanes (1 northbound, 1 southbound through and 1 southbound turning lanes), bike-lanes and sidewalks in each direction.

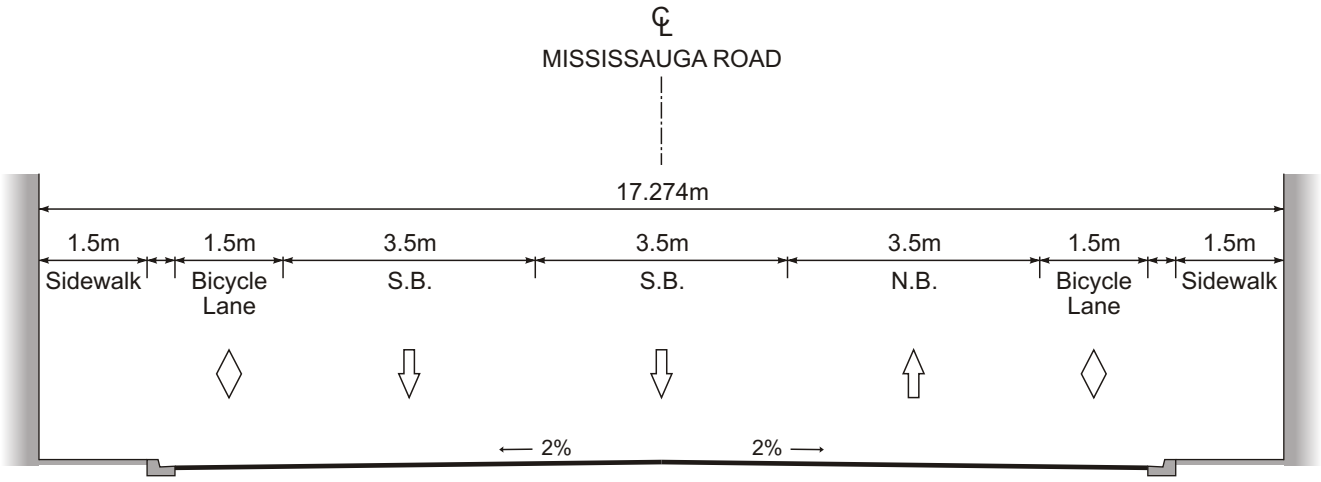
The proposed cross-section of Mississauga Road under the new bridge includes maintaining the three 3.5 m lanes, and providing 2.0 m bike lanes and 2.5 m sidewalks in each direction. The wider Mississauga Road cross-section will facilitate the reconstruction of Mississauga Road and the new bridge construction.

The recommended cross-section treatment was also confirmed in consultation with City of Mississauga municipal staff and taking into consideration input received from the public.

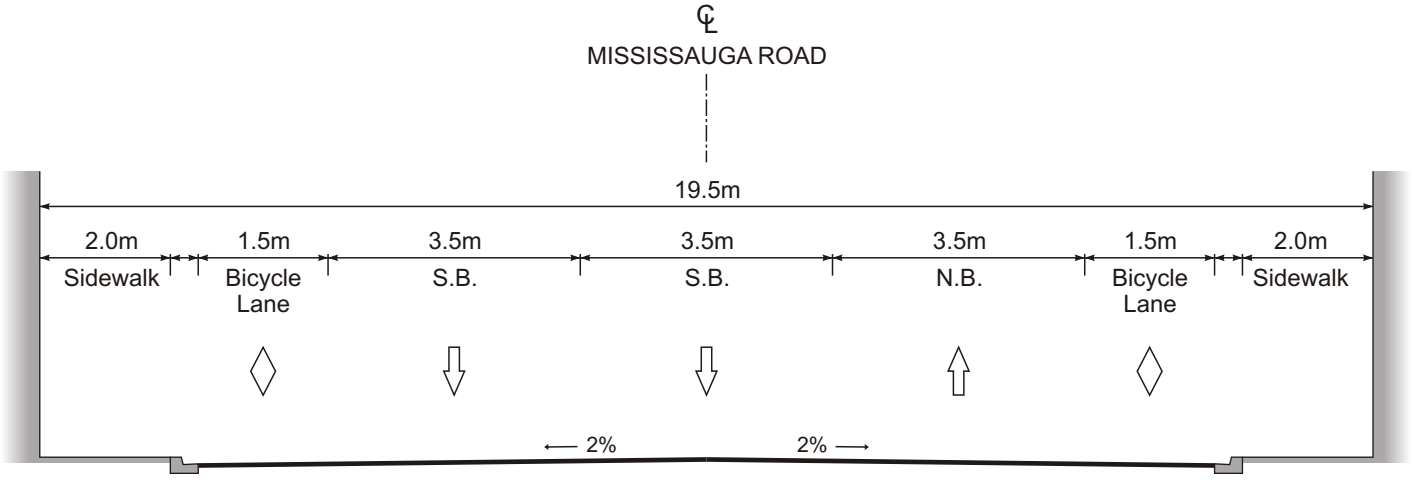
The existing and proposed Mississauga Road typical cross-sections are shown in **Exhibit 7-5**.

<u>Mississauga Crescent</u>

As part of the reconstruction of Mississauga Road, the intersection with Mississauga Crescent and approximately 100 m of Mississauga Crescent at the intersection with Mississauga Road will be reconstructed to match the lowered Mississauga Road.



EXISTING CROSS SECTION
MISSISSAUGA ROAD AT QEW OVERPASS



PROPOSED CROSS SECTION
MISSISSAUGA ROAD AT QEW OVERPASS

Ontario MRC McCORMICK RANKIN A member of MMM GROUP	**GWP 08-20008** **QUEEN ELIZABETH WAY** **from Mississauga Road to Hurontario Street** **Preliminary Design and Class Environmental Assessment**	**EXISTING AND PROPOSED MISSISSAUGA ROAD CROSS SECTIONS**	Exhibit **7-5**

7.2.4 Parallel Roads

The QEW in the study area passes through an urban residential area with local roads in very close proximity. These parallel roads are described in **Section 4.4.1**.

To the west of the Credit River, North and South Sheridan Way are located immediately adjacent to the QEW and begin/terminate at Mississauga Road in the vicinity of the interchange and extend to the west. The Recommended Plan does not impact the existing north and south service roads.

To the east of the Credit River, Premium Way is a local road to the north of the QEW, and Pinetree Way is a local residential street to the south of the QEW.

The only local road realignment required to accommodate the Recommended Plan is along the north side of the QEW from east of the Credit River to the east study limit: a short section of Premium Way between Dickson Road and Lynchmere Avenue (approximately 400 m). This section of Premium Way will be shifted northerly approximately 15 m and will tie back to the existing Premium Way just to the east of Dickson Road.

7.2.5 Noise Walls

Within the study limits, the QEW has noise walls on both the north and south sides, except at the Credit River Bridge. A detailed noise analysis was conducted, following the MTO Environmental Guide for Noise (October 2006).

The future conditions analysis included relocating the existing noise walls within the study area that are impacted by the proposed works, these walls are located to the east of Mississauga Road both north and south of the QEW, and the existing wall east of the Credit River along the north side of the QEW. The location of the existing and relocated walls is illustrated in **Exhibit 7-1**. The height of the new noise walls will be 5 m high, which is the maximum height considered for MTO highways.

Based on the results of the noise analysis, the Recommended Plan includes 5 m transparent noise barriers to be installed on the south side of the existing Credit River Bridge and the north side of the new Credit River Bridge i.e., on the north and south sides of the QEW crossing of the Credit River. For the purposes of this EA, noise mitigation is recommended to be implemented as part of the long-term strategy. **Section 8.2.3** provides further information on the noise analysis, the recommendations and the design concept of the noise walls.

The noise assessment also confirmed that noise mitigation, under the existing condition, is warranted, therefore this location will remain on the Ministry's Noise Barrier Retrofit Program list. An independent structural feasibility study was undertaken to consider the implications of implementing the noise walls on the existing bridge, in advance of the long-term strategy. The feasibility study determined that the existing bridge parapet walls cannot support the addition of noise walls at this time; significant work (and cost) would be required to strengthen the parapets in order to allow for noise barrier installation in the short-term.

As such, the structural review recommended that noise walls are only economically feasible on the Credit River Twin Bridges (i.e., south side of existing bridge and north side of new bridge) in the future.

Any further consideration of implementing the noise walls in advance of the long-term strategy would be dependent on budget and priority of this project relative to other highway improvements required throughout the province.

7.2.6 Drainage and Stormwater Management

7.2.6.1 Highway Drainage

For the existing conditions and the Recommended Plan, an analysis of the drainage patterns was conducted in order to determine the drainage and stormwater management requirements for the Recommended Plan. The existing drainage conditions are discussed in **Section 4.1.7**.

The proposed highway improvements included in the Recommended Plan as presented in **Exhibit 7-1**, will result in an increase in pavement area and therefore increases in roadway runoff flows.

Hydraulic analysis was undertaken to assess the capacity of the watercourse and culvert crossings of the QEW. The analysis of the roadway drainage system under the proposed improvements noted that peak flow increases at Culverts C1 (Tecumseh Creek), C6 (Stavebank Creek), and C7 (Kenolli Creek) are less than 10%. However, the peak flow increases at Culverts C2, C3, C4 and C5 are substantial and therefore require peak flow control, as well as quality control. To mitigate the potential impacts due to the proposed improvements, the stormwater management strategy recommends providing two new SWM ponds within the study area: a wet pond within the Mississauga Road Interchange (located between the westbound off-ramp and Mississauga Road); and a dry pond north of the QEW on the east bank of the Credit River. The details of the SWM strategy are illustrated in **Exhibit 7-6** Proposed Conditions Plans.

The hydraulic analysis of the proposed North Twin Credit River Bridge shows that there is no resulting hydraulic impact on the Credit River, as the proposed bridge has a wide span with the abutments of the bridge on top of the valley bank (and outside the floodplain). The two supporting piers are in the floodplain but outside the main channel.

A capacity assessment of the existing QEW storm sewers was also completed. The existing median storm sewer systems along the QEW were built in the 1960's. As part of the proposed improvements, the new North Twin Credit River Bridge results in a new QEW alignment through the Mississauga Road Interchange and across the Credit River Bridge; therefore, requiring replacement of the existing median storm sewers. It was assumed that the existing storm sewers were designed to convey the 5-year storm as the majority of the existing median and outside storm sewers are undersized. The current standard is a 10-year storm. It is recommended that the existing median and outside storm sewers are to be replaced to accommodate the QEW improvements. The existing storm sewers and those

that are recommended to be replaced are illustrated in **Exhibit 7-6** Proposed Conditions Plans.

Drainage analysis of the existing and new North Twin Credit River Bridges was completed. There are eighteen deck drains on the existing QEW Credit River Bridge deck: 10 in total are located in the outside shoulders and 8 are located in the median shoulders. As part of the bridge rehabilitation (i.e., bridge deck replacement), the 8 median deck drains and the 4 outside drains directly over the Credit River will be removed.

The New North Twin Bridge has been designed with a 0.5% longitudinal slope so that deck drains will not be required. All flow on the New Twin Bridge will be conveyed to the proposed dry pond on the east bank of the Credit River.

7.2.6.2 Stormwater Management (SWM)

Existing stormwater management (SWM) measures currently do not address quantity and water quality control, with the exception of the grassed swales along sections of the QEW, west of the Credit River, which provide some degree of quality treatment of storm runoff from the highway and ramps.

A drainage and stormwater management strategy was developed to minimize potential impacts the Credit River, Stavebank Creek and Kenolli Creek as a result of the proposed improvements. The SWM strategy will provide water quality treatment and peak flow control for the runoff from the improved highway.

The SWM strategy is illustrated in **Exhibit 8-1** and includes the following components:

1. <u>Stormwater Management Wet Pond</u>

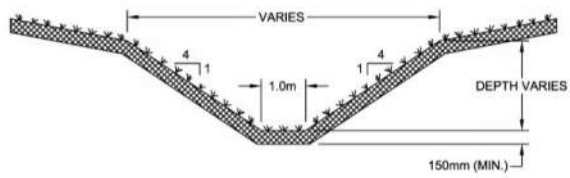
   A SWM wet pond is proposed within the QEW Mississauga Road Interchange, located on the north side between the westbound off-ramp and Mississauga Road. The pond will treat approximately 9.88 ha of the highway and external areas. The proposed SWM pond has been designed to control the peak flows up to the 100-year storm event.

   The SWM pond will have a surface area of approximately 5140 m^2 and will provide an enhanced level of treatment in accordance with the MOE Stormwater Management Planning and Design Manual (2003). The pond will have 4:1 side slopes, a pond bottom elevation of 95.10 metres, a permanent pool of 1.10 m in depth and volume of approximately 3480 m^3, and an active storage volume of approximately 6000 m^3. The controlled outflow will discharge to an existing ditch inlet located at the northwest corner of the QEW Mississauga Road Interchange via a sewer, and will not impact the capacity of the portion of the existing storm sewers to be retained. The outlet control structure will control the maximum peak outflow from the pond to approximately the existing ditch inlet sewer design 5-year flow (0.26 m^3/s). For safety purposes, a fence will be provided along the MTO property line with guardrails along the shoulder of the ramp.

2. Grassed Swales and Grassed-lined Highway Embankments

Existing flat bottom grassed swales on the south side of the QEW from Sta. 10+900 to Sta. 11+200 will be maintained, to continue to provide a level of water quality treatment for the runoff from the highway and ramps.

Flat bottom grassed swales are proposed on the north side of the QEW from Sta. 11+200 to Sta. 11+600 to provide a level of water quality treatment for the runoff from the highway (Catchment areas 130 and 132) before discharging to Culverts C4 and C5. This portion of the highway will be in super-elevation where the runoff from the highway will sheet flow through the grassed lined embankments before reaching the flat bottom grassed swales. The grassed lined embankments have been tested and shown to be very effective in trapping sediments and suspended solids, thus improving water quality. Treatment is achieved by the grassed lined embankments and flat bottom grassed swales. Flat bottom grassed swales are also proposed along the QEW Mississauga Road Interchange eastbound on-ramp from Mississauga Road. The runoff will discharge to the existing QEW storm sewer system via a new ditch inlet.



WATER QUALITY GRASS SWALE
N.T.S.

3. Stormwater Management Dry Pond

A stormwater management dry pond is proposed on the north side of the QEW and on the west side of Stavebank Road. The proposed dry pond will have dimensions of approximately 30 m by 20 m with 3:1 side slopes. The pond will have a bottom elevation of 91.0 m and an active storage volume of approximately 2000 m^3. The pond will provide peak flow controls for the runoff from a portion of the highway (Catchment areas 148, 150, 155 and 190) and for the runoff from the existing and new bridge deck areas (Catchment areas 135, 140, 142, and 145). The pond outflows will be controlled to the existing condition peak flow rates before discharging to Stavebank Creek at Culvert C6. The peak flow control ensures that there are no impacts upstream and downstream of Culvert C6. The dry pond will also provide a basic level of water quality treatment (60% TSS removal) in accordance with the MOE Stormwater Management Planning and Design Manual (2003).

A dry pond has been selected as the total contributing drainage area is less than 5 ha. It should be noted that there are a number of constraints, underground watermain, overhead hydro lines, and oil pipe lines in the vicinity of the proposed dry pond. Through extensive ongoing consultation, Enersource Hydro Mississauga and Trans Northern Pipelines Inc. have confirmed that the proposed relocation plans at the

Credit River Valley crossing can be designed to accommodate the proposed dry Pond. Hydro One has noted that the dry pond will not impact the existing tower, but is reviewing as part of their feasibility study for their future expansion alternatives and has committed to work with MTO moving forward to assess the impacts of the proposed dry pond.

4. Erosion Control

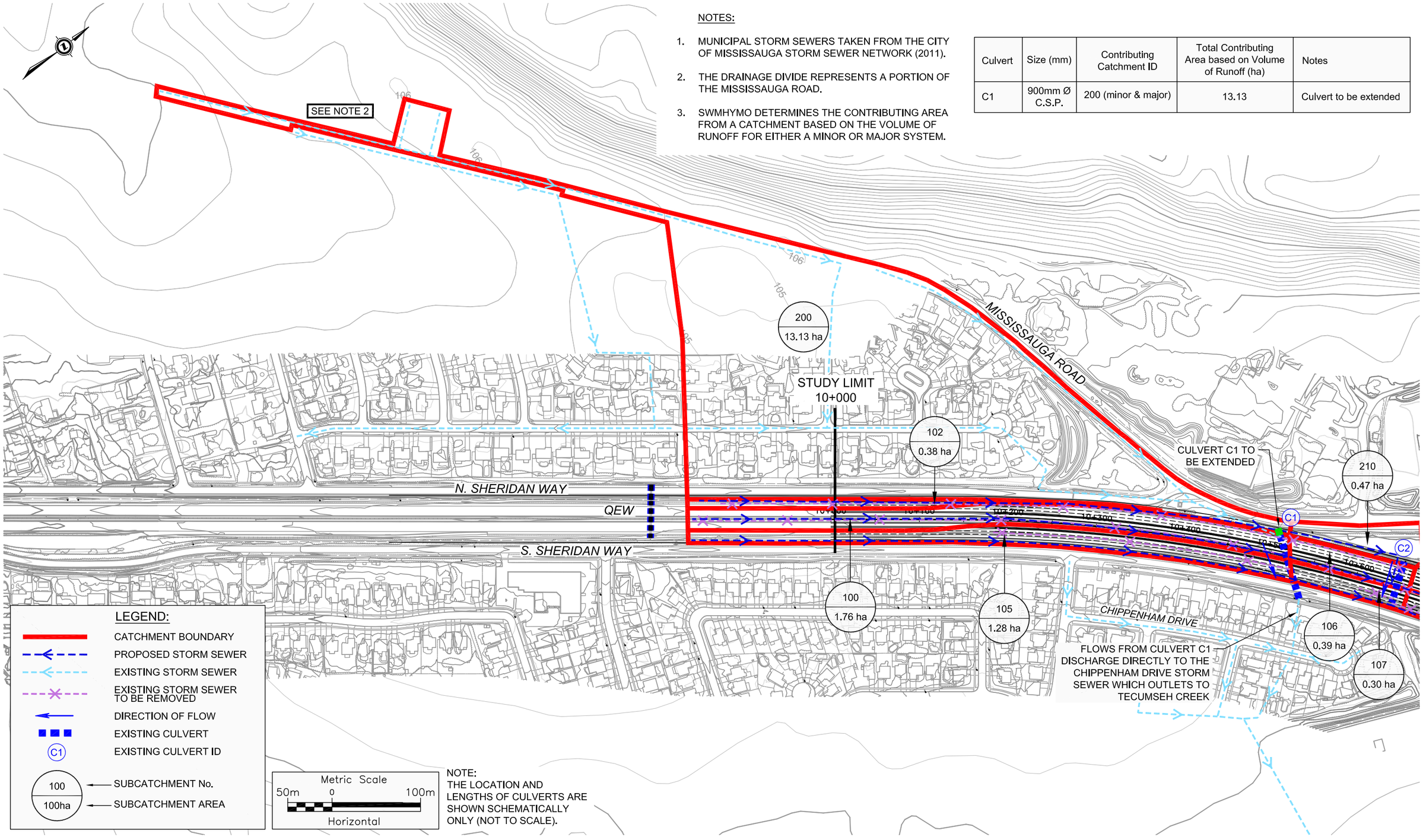
Existing bridge deck drains directly over the Credit River will be removed, and splash pads equipped with sub angular river stones will be provided below the proposed bridge deck drains for mitigating any erosion that may occur when water drains from the new deck drains over the Credit River valley flood plain areas. The size of these splash pads will be approximately 1000 x 1000 mm in area and approximately 300 mm in depth.

During the Detail Design, the provision of more frequent deck drains over the flood plain areas (and not directly over the Credit River) shall be investigated to reduce the spread along the shoulder and to reduce the amount of flow draining from each deck drain to the Credit River below. Options to disperse the flow from the deck drains should be considered as an erosion control measure.

NOTES:

1. MUNICIPAL STORM SEWERS TAKEN FROM THE CITY OF MISSISSAUGA STORM SEWER NETWORK (2011).
2. THE DRAINAGE DIVIDE REPRESENTS A PORTION OF THE MISSISSAUGA ROAD.
3. SWMHYMO DETERMINES THE CONTRIBUTING AREA FROM A CATCHMENT BASED ON THE VOLUME OF RUNOFF FOR EITHER A MINOR OR MAJOR SYSTEM.

Culvert	Size (mm)	Contributing Catchment ID	Total Contributing Area based on Volume of Runoff (ha)	Notes
C1	900mm Ø C.S.P.	200 (minor & major)	13.13	Culvert to be extended



NOTE:
THE LOCATION AND LENGTHS OF CULVERTS ARE SHOWN SCHEMATICALLY ONLY (NOT TO SCALE).

Ontario

MRC McCORMICK RANKIN A member of MMM GROUP

GWP 08-20008
QUEEN ELIZABETH WAY
from Mississauga Road to Hurontario Street
Preliminary Design and Class Environmental Assessment

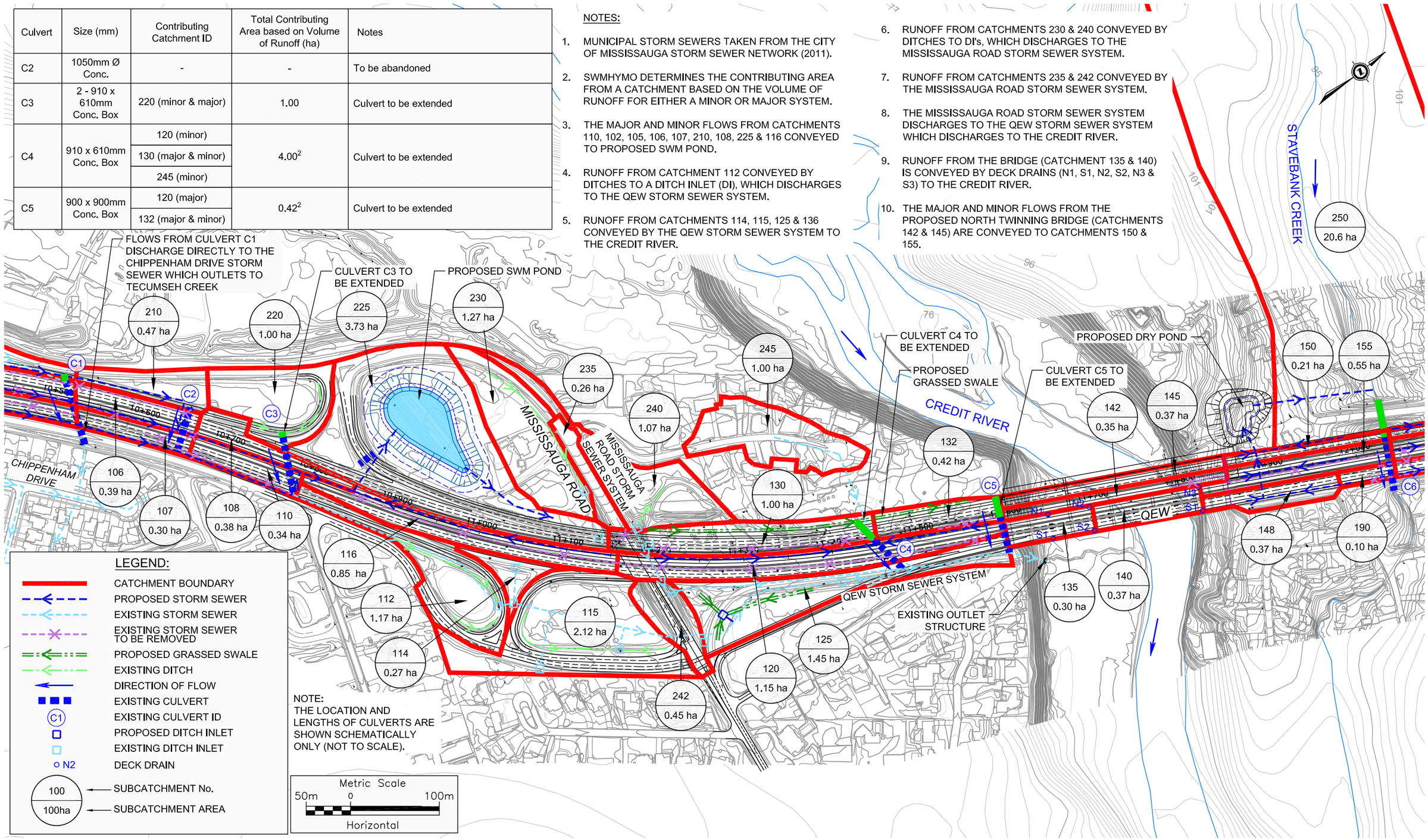
PROPOSED CONDITIONS
DRAINAGE MOSAIC (WITH CONTROL) - SHEET 1

Exhibit
7-6

Culvert	Size (mm)	Contributing Catchment ID	Total Contributing Area based on Volume of Runoff (ha)	Notes
C2	1050mm Ø Conc.	-	-	To be abandoned
C3	2 - 910 x 610mm Conc. Box	220 (minor & major)	1.00	Culvert to be extended
C4	910 x 610mm Conc. Box	120 (minor)	4.00^2	Culvert to be extended
		130 (major & minor)		
		245 (minor)		
C5	900 x 900mm Conc. Box	120 (major)	0.42^2	Culvert to be extended
		132 (major & minor)		

NOTES:

1. MUNICIPAL STORM SEWERS TAKEN FROM THE CITY OF MISSISSAUGA STORM SEWER NETWORK (2011).
2. SWMHYMO DETERMINES THE CONTRIBUTING AREA FROM A CATCHMENT BASED ON THE VOLUME OF RUNOFF FOR EITHER A MINOR OR MAJOR SYSTEM.
3. THE MAJOR AND MINOR FLOWS FROM CATCHMENTS 110, 102, 105, 106, 107, 210, 108, 225 & 116 CONVEYED TO PROPOSED SWM POND.
4. RUNOFF FROM CATCHMENT 112 CONVEYED BY DITCHES TO A DITCH INLET (DI), WHICH DISCHARGES TO THE QEW STORM SEWER SYSTEM.
5. RUNOFF FROM CATCHMENTS 114, 115, 125 & 136 CONVEYED BY THE QEW STORM SEWER SYSTEM TO THE CREDIT RIVER.
6. RUNOFF FROM CATCHMENTS 230 & 240 CONVEYED BY DITCHES TO DI's, WHICH DISCHARGES TO THE MISSISSAUGA ROAD STORM SEWER SYSTEM.
7. RUNOFF FROM CATCHMENTS 235 & 242 CONVEYED BY THE MISSISSAUGA ROAD STORM SEWER SYSTEM.
8. THE MISSISSAUGA ROAD STORM SEWER SYSTEM DISCHARGES TO THE QEW STORM SEWER SYSTEM WHICH DISCHARGES TO THE CREDIT RIVER.
9. RUNOFF FROM THE BRIDGE (CATCHMENT 135 & 140) IS CONVEYED BY DECK DRAINS (N1, S1, N2, S2, N3 & S3) TO THE CREDIT RIVER.
10. THE MAJOR AND MINOR FLOWS FROM THE PROPOSED NORTH TWINNING BRIDGE (CATCHMENTS 142 & 145) ARE CONVEYED TO CATCHMENTS 150 & 155.



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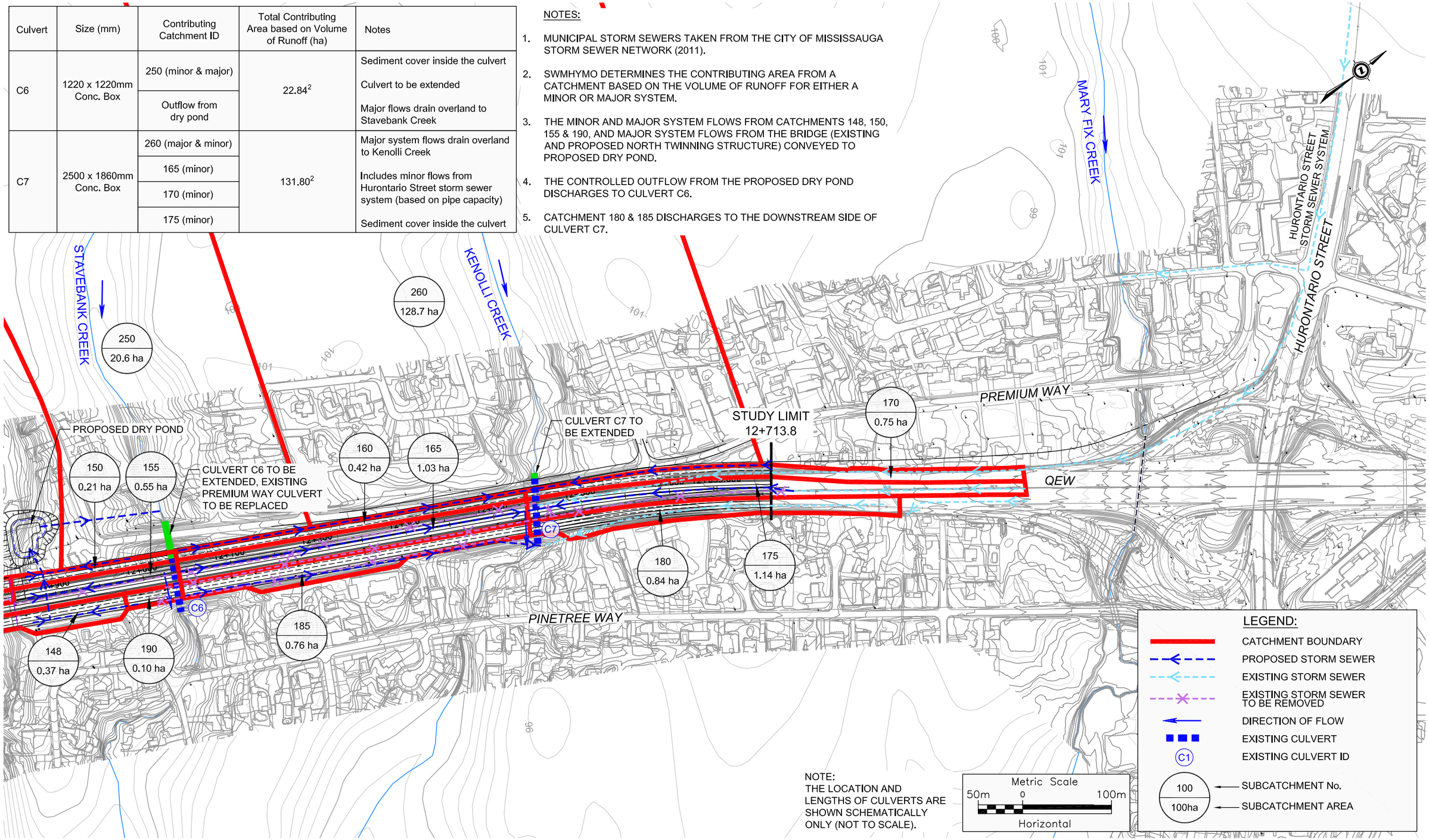
PROPOSED CONDITIONS
DRAINAGE MOSAIC (WITH CONTROL) - SHEET 2

Exhibit
7-6

Culvert	Size (mm)	Contributing Catchment ID	Total Contributing Area based on Volume of Runoff (ha)	Notes
C6	1220 x 1220mm Conc. Box	250 (minor & major)	22.84[2]	Sediment cover inside the culvert Culvert to be extended
		Outflow from dry pond		Major flows drain overland to Stavebank Creek
C7	2500 x 1860mm Conc. Box	260 (major & minor)	131.80[2]	Major system flows drain overland to Kenolli Creek
		165 (minor)		Includes minor flows from Hurontario Street storm sewer system (based on pipe capacity)
		170 (minor)		
		175 (minor)		Sediment cover inside the culvert

NOTES:

1. MUNICIPAL STORM SEWERS TAKEN FROM THE CITY OF MISSISSAUGA STORM SEWER NETWORK (2011).
2. SWMHYMO DETERMINES THE CONTRIBUTING AREA FROM A CATCHMENT BASED ON THE VOLUME OF RUNOFF FOR EITHER A MINOR OR MAJOR SYSTEM.
3. THE MINOR AND MAJOR SYSTEM FLOWS FROM CATCHMENTS 148, 150, 155 & 190, AND MAJOR SYSTEM FLOWS FROM THE BRIDGE (EXISTING AND PROPOSED NORTH TWINNING STRUCTURE) CONVEYED TO PROPOSED DRY POND.
4. THE CONTROLLED OUTFLOW FROM THE PROPOSED DRY POND DISCHARGES TO CULVERT C6.
5. CATCHMENT 180 & 185 DISCHARGES TO THE DOWNSTREAM SIDE OF CULVERT C7.



NOTE:
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GWP 08-20008
QUEEN ELIZABETH WAY
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PROPOSED CONDITIONS
DRAINAGE MOSAIC (WITH CONTROL) - SHEET 3

Exhibit
7-6

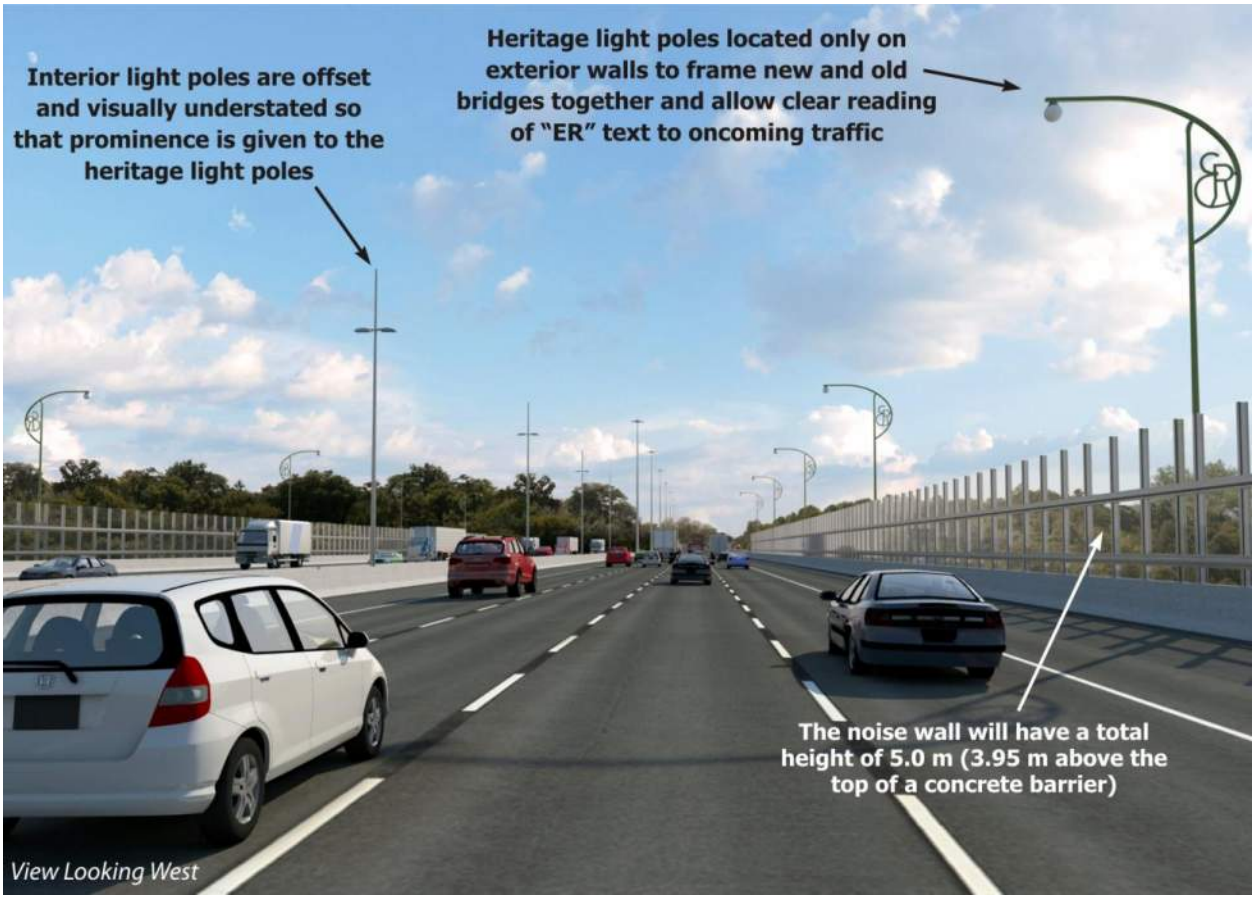
7.2.7 Illumination

Mainline QEW illumination is currently provided between the Mississauga Road Interchange and the east study limit with a mix of high mast light poles, conventional light poles and heritage ER light poles. Currently there is no illumination from west of the Mississauga Road Interchange to the Erin Mills Parkway Interchange.

High mast lighting is provided at the Mississauga Road Interchange in the median and outside of the interchange ramp shoulders. Most of this high mast lighting will be maintained as part of the Recommended Plan. Additional median high mast poles are recommended between the Interchange and the west study limit, and relocation of one high mast pole northwest of the Mississauga Road Overpass is required.

Across the QEW Credit River Bridge, the heritage ER light poles were recently reinstated as part of the Holding Strategy Construction Contract. The heritage ER light poles will be maintained on the south side of the rehabilitated Credit River Bridge and will be installed on the north side of the new North Twin Credit River Bridge. The illumination for the Recommended Plan is illustrated below in **Exhibit 7-7**.

EXHIBIT 7-7: QEW CREDIT RIVER BRIDGE PROPOSED ILLUMINTATION



Conventional illumination is provided from east of the Credit River Bridge to the east study limit. This mainline illumination will be improved to median high mast lighting as part of the Recommended Plan, and consistent with the illumination provided to the east through the Hurontario Street Interchange.

The recommended illumination plan is illustrated in **Exhibit 7-1**.

7.2.8 Advanced Traffic Management System

Within the QEW Study Area, MTO's ATMS infrastructure consists of the COMPASS freeway traffic management system, including pole-mounted cameras, under-pavement vehicle detection loops, ramp metering stations and variable message signs to monitor and respond to traffic congestion and incidents.

The main COMPASS communications system (Fibre Optic) runs primarily along the south side of the roadway with branch cables crossing the QEW mainline to service equipment on the opposite side of the road; and under all ramps within the Mississauga Road Interchange.

Two cameras are located along the QEW; one is located adjacent to the S-E Ramp at Mississauga Road & QEW and the other is located on the south side of the QEW, approximately 925m east of Mississauga Road.

No changeable message signs are located in the Study Area.

Most of the COMPASS infrastructure (e.g., underground conduit) within the Study Area will be impacted by the proposed improvements. The detailed relocation plan can be accommodated within the MTO highway right-of-way and will be confirmed during Detail Design.

7.2.9 Foundation Investigation and Design

Borehole investigations were completed for the proposed North Twin Credit River Bridge and the new Mississauga Road Overpass. These investigations and recommendations were incorporated into the preliminary design of the structures as noted in **Section 7.2.2** and summarized below:

<u>North Twin Credit River Bridge</u>

The foundations investigation field work was carried out between May 9 and June 9, 2011; boreholes were drilled and sampled at the west abutment and west pier. Boreholes were not drilled on the east bank due to access constraints and permission to enter restrictions. Instead, recommendations for this location were based on available past foundations information and therefore the exact depth of the shale bedrock for the east pier and east abutment of the North Twin Bridge is estimated for this preliminary design.

The preliminary foundation type recommendation is caisson footings; however, should the depth of bedrock be shallower than estimated a spread footing may be preferred. Further

borehole investigation and analysis will be required during the Detail Design to confirm the foundation recommendations.

Mississauga Road Overpass Replacement

The foundations investigation fieldwork was carried out on September 17, 2011; two boreholes were drilled and sampled to the north of the existing bridge, on the east and west sides of Mississauga Road.

The recommended abutment foundation type is spread footing on shale bedrock, which is consistent with the existing bridge. Further borehole investigation and analysis will be required during the Detail Design to confirm the foundation recommendations.

7.2.10 Utilities

The following major utilities are located within the study area:

- Trans-Northern Pipelines Inc.
- Hydro One
- Enersource Hydro Mississauga
- Rogers Cable
- Bell Canada
- Enbridge Consumers Gas

In addition, there are existing municipal utilities, watermains and sanitary sewers along local roads. Plans of the existing utilities are included in **Section 4.5**.

There are several major utilities with the QEW Study Area that will require protection or relocation as a result of the Recommended Plan. The exact details of utility relocation will be confirmed during the next phase of design. The following summarizes the existing utilities located within the study area and the key relocations that are anticipated as a result of discussions with the utility companies.

Recognizing the potential for conflict with the major utilities located adjacent to the QEW corridor at the Credit River, extensive ongoing consultation has been undertaken with utilities throughout this study and is summarized in **Section 3.2.4**. A review of preliminary utility relocations was undertaken as part of this study to confirm the feasibility of proposed relocation, as well as to identify potential approvals and permit requirements early in the project process. Further consultation and exact details of the relocation design will be developed during the next phase of design. Details of the anticipated approvals and permits for the utility relocations are described in **Section 8.4.1**.

Trans-Northern Pipelines Inc.

- Existing 273.1 mm and 508 mm diameter pipelines run east-west along the north side of the QEW, generally following the hydro corridor, and then on the west side of the Credit River both pipelines cross to the south side of the QEW and continue westerly on the south side.

- A total of 940 m of pipeline relocation within the Hydro One corridor is required from Premium Way to west of the Credit River in order to accommodate the Recommended Plan. This relocation occurs in 2 different segments: 1) approximately 580 m of relocation across the Credit River, and including the vault to the west of Stavebank Road; and 2) approximately 360 m of relocation along Premium Way between Dickson Road and Lynchmere Avenue.

Hydro One

- Existing Hydro One 230 kV overhead transmission line on steel poles run east-west along the north side of the QEW and crosses to the south side of the QEW at the Mississauga Road Interchange.
- None of the existing Hydro One facilities are directly impacted by the Recommended Plan; however, the Trans-Northern Pipelines and Enersource facilities currently located in the Hydro One corridor will be relocated within the corridor. Hydro One has indicated that they are protecting for potential future expansion of the existing 230 kV line and want to ensure that they are not precluded from ultimately accommodating two 230kV double-circuit lines (one existing and one future) within the existing corridor. MTO's Recommended Plan and the associated Trans-Northern Pipelines and Enersource relocation may conflict with Hydro One's potential future expansion. Hydro One has committed to work with MTO moving forward and is undertaking a feasibility study to examine a range of options and associated costs for their potential future expansion, to ensure that it remains viable.

Enersource Hydro Mississauga

- Enersource Hydro Mississauga overhead lines on wooden poles run east-west along the north side of the QEW within the Hydro One corridor and then to the west of the Credit River half of the lines continue along the north side and then turn north along Mississauga Road and half of the lines cross to the south side of the QEW.
- Enersource underground lines are located through the interchange area, along Mississauga Road, Kedleston Way and South Sheridan Way. Underground lines also cross under the QEW just to the east of Stavebank Road.
- Approximately 1300 m of Enersource overhead line relocation is required along the north side of the QEW within the Hydro One corridor from east of Lynchmere Avenue to the west side of the Credit River.
- Approximately 300 m of Enersource underground line relocation is required along Mississauga Road from South Sheridan Way to Mississauga Crescent; and approximately 650 m of relocation is required along Premium Way from Stavebank Road to Lynchmere Avenue.

Enbridge Gas

- There are local gas lines throughout the study area generally along the local residential roads which provide gas connections to local properties.
- Approximately 300 m of Enbridge local gas line relocation is required along Mississauga Road from South Sheridan Way to Mississauga Crescent; and approximately 400 m of relocation is required along Premium Way from Dickson Road to east of Lynchmere Avenue.

Telephone/Television/Internet

- Throughout the study area Bell Canada and Rogers Cable are located underground and aerially, generally along the local residential roads and provide connections to local properties.

Sanitary Sewers and Storm Sewers

- There are Peel Region sanitary sewers throughout the study area generally along the local residential roads to provide connections to local properties; however there are three crossings of the QEW. There is a 300 mm diameter crossing west of the Mississauga Road Interchange at Indian Grove; a 250 mm diameter crossing just west of the Credit River Bridge from the cul-de-sac of Mississauga Crescent to the corner of Kedleston Way and Knareswood Driver; and a 375 mm diameter crossing located between Lynchmere Avenue and Dickson Road.
- City of Mississauga storm sewers are located throughout the study area, generally along the local residential roads; however, there is one QEW crossing just west of the Credit River Bridge.
- It is anticipated there will be no impact to these crossings (sanitary and storm sewers) of the QEW during construction; however, adequate protection measures may be required.

Watermains

- There are Peel Region watermains throughout the study area generally along the local residential roads to provide connections to local properties; however there are two crossings of the QEW. There is a 200 mm diameter crossing just west of the Mississauga Road Interchange at Indian Grove; and a 300 mm diameter crossing located at Stavebank Road.
- It is anticipated there will be no impact to these crossings of the QEW during construction; however, adequate protection measures may be required.

7.2.11 Property Requirements

The property requirements are illustrated on the Recommended Plan in **Exhibit 7-1**. Acquisition of a total of four properties is required within the Study Area to accommodate the Recommended Plan: two private properties; one provincially owned; and a City of Mississauga property.

Provincially owned property (Hydro One corridor) is required on the north side of the existing QEW to accommodate the right-of-way needed for the new North Twin Credit River Bridge and the QEW improvements to the west of the Credit River. These right-of-way requirements are illustrated on the Recommended Plan in **Exhibit 7-1**. Extensive consultation has been undertaken with Hydro One and Infrastructure Ontario (IO) regarding the required property as described in **Sections 3.2.4 and 3.2.5**. IO has confirmed that the property MTO requires for the highway right-of-way will be considered a provincial transfer.

Property is required from the City of Mississauga on north side of the existing QEW corridor along Premium Way from approximately Stavebank Road to Lynchmere Avenue. In addition, realignment of a portion of Premium Way and associated utility relocations through this segment will require property from the Hydro One corridor (provincially-owned lands) along the north side. Extensive consultation has been undertaken with City of Mississauga staff as described in **Section 3.2.1**. Further consultation will be required during subsequent design phases to finalize exact property requirements and agreements.

All efforts have been made to minimize the property required and maximize opportunities for use of the remaining lands. Negotiations with the owners will be carried out by the MTO Property Section to establish the fair market value of the land and negotiate the acquisition of the property prior to tendering the project for construction. Any specific requirements negotiated as part of the property purchase agreement will be incorporated during the Detail Design phase. The need for temporary construction easements and/or permission to enter will be determine during the Detail Design phase.

7.2.12 Constructability Workshop

A Constructability Review Workshop was held in early December 2011.

A Constructability Review is a multi-disciplinary independent review of the Overall Preferred Alternative focused on confirming that construction requirements are achievable and in keeping with common construction methods and standards. An independent team of specialists experienced in construction focused on the new North Twin Credit River Bridge, the rehabilitation of the existing Credit River Bridge, the replacement of the Mississauga Road Overpass, and reconstruction of Mississauga Road to lower the profile.

The goal of the workshop was to:

- Review operational constraints and environmental protection considerations
- Reduce potential construction overruns and schedule delays

- Develop preliminary construction sequencing and staging layout
- Review access and egress details
- Develop a preliminary construction schedule
- Identify major construction item quantities
- Develop preliminary construction cost estimates

Key outcomes from the workshop included:

1. Confirming the Constructability of the Overall Preferred Alternative
2. Highlighting many Preliminary Design and subsequent Detail Design items
3. Refining the Construction Staging and Schedule

7.2.13 Construction Staging

All existing six lanes of the QEW will be maintained during construction, with the exception of non-peak periods when short-term lane closures may be required. The preliminary construction staging plan has been developed to coordinate the works at the Credit River Bridge with the replacement of the Mississauga Road Overpass and the interchange ramps improvements.

Improvements to the Mississauga Road Interchange will be carried out with minimum interference to the existing traffic moves. Closures of the interchange ramps will be kept to a minimum in order to minimize delays. Detailed construction staging works will be developed during the Detail Design phase for this project.