HIGHWAY 401 EXPANSION PROJECT CREDIT RIVER TO REGIONAL ROAD 25

Design and Construction Report No. 2

Detail Design and Class Environmental Assessment Study (Group 'B')

January 2020

West Corridor Constructors

HIGHWAY 401 EXPANSION PROJECT
DESIGN AND CONSTRUCTION REPORT

DETAIL DESIGN AND CLASS ENVIRONMENTAL ASSESSMENT STUDY
(GROUP 'B')

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THE PUBLIC RECORD

This Design and Construction Report (DCR) has been prepared under the Ministry of Transportation (MTO) *Class Environmental Assessment for Provincial Transportation Facilities (2000).* The preliminary design for this project was approved following the filing of the *"Highway 401 Improvements from East of the Credit River to Trafalgar Road W.O. 07-20021, Preliminary Design and Class Environmental Assessment Study (May, 2013)"* and the *"Highway 401 Improvements from Trafalgar Road to Regional Road 25 Preliminary Design and Class Environmental Assessment Study, W.O. 07-20024 (March, 2013)".*

This DCR is available for a 30-day agency and public review period commencing January 9, 2020 and ending February 7, 2020 during regular business hours at the following locations:

Highway 401 Expansion Project Office 2000 Argentia Road, Plaza 5, Suite 500 Mississauga, ON L5N 2R7	Ministry of Transportation Central Region, Major Projects Office 159 Sir William Hearst Avenue, 7th Floor, Toronto, ON M3M 0B7	Region of Peel, Clerk's Division 10 Peel Centre Drive, Suite A and B Brampton, ON L6T 4B9
City of Mississauga, Office of the City Clerk 300 City Centre Drive Mississauga, ON L5B 3C1	Halton Region, Clerk's Office 1151 Bronte Road Oakville, ON L6M 3L1	Town of Milton, Clerk's Office 150 Mary Street Milton, ON L9T 6Z5
Town of Halton Hills, Clerk's Department 1 Halton Hills Drive Halton Hills, ON L7G 5G2	The DCR is also available for review online at the project website: www.401expansion-missisauga-milton.ca	

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List of Acronyms and Abbreviations

AA	Archaeological Assessment
ACM	Asbestos Containing Materials
ANSI	Area of Natural and Scientific Interest
ATMS	Advanced Traffic Management System
BMP	Best Management Practices
CCTV	Closed-circuit Television
CEAA	Canadian Environmental Assessment Act
CN Rail	Canadian National Railway
CNWA	Canadian Navigable Waters Act
CP Rail	Canadian Pacific Railway
CHL	Cultural Heritage Landscape
CSP	Coagulated Steel Pipe
CUW	Cultural Woodlands (ELC Code)
CUW1	Mineral Cultural Woodland (ELC Code)
CUM1	Mineral Cultural Meadow (ELC Code)
CUT1	Mineral Cultural Thicket (ELC Code)
CVC	Credit Valley Conservation
DCR	Design and Construction Report
DFO	Department of Fisheries and Oceans
DSS	Designated Substances Survey
EA	Environmental Assessment
EAA	Environmental Assessment Act
EASR	Environmental Activity and Sector Registry
ELC	Ecological Land Classification
EPZ	Environmental Protection Zone
ESA	Endangered Species Act

Phase I/II ESA	Phase I/II Environmental Site Assessment
ESC	Erosion and Sediment Control
ETR	Express Toll Route
FAA	Fisheries Act Authorization
FOD	Deciduous Forest (ELC Code)
GAEM	Governmental Authority Environmental Meeting
GPS	Global Positioning System
GTA	Greater Toronto Area
HOV	High Occupancy Vehicle
HWM	High Water Mark
IO	Infrastructure Ontario
ITS	Intelligent Transportation System
LED	Light-emitting Diode
LOA	Letter of Advice
MAS2	Mineral Shallow Marsh (ELC Code)
MAM2	Mineral meadow Marsh (ELC Code)
MBCA	Migratory Birds Convention Act
MECP	Ministry of Environment, Conservation and Parks
MHSTCI	Ministry of Heritage, Sport, Tourism and Culture Industries
MNRF	Ministry of Natural Resources and Forestry
MP	Member of Parliament
MPP	Member of Provincial Parliament
MTO	Ministry of Transportation Ontario
NPC	Noise and Pollution Control
NSA	Noise Sensitive Area
OAO	Open Aquatic (ELC Code)
OPP	Ontario Provincial Police

OPSD	Ontario Provincial Standard Drawing
OPSS	Ontario Provincial Standards and Specifications
P3	Public Private Partnership
PHP	Provincial Heritage Property
PHPPS	Provincial Heritage Property of Provincial Significance
PIC	Public Information Centre
PSW	Provincially Significant Wetlands
PTE	Permission to Enter
PTTW	Permit to Take Water
ROW	Right of Way
SAR	Species at Risk
SARA	Species at Risk Act
SWH	Significant Wildlife Habitat
SWM	Stormwater Management
SWMP	Stormwater Management Pond
TAC	Transportation Association of Canada
TCPL	TransCanada Pipeline
TESR	Transportation Environmental Study Report
TPO	Toronto Premium Outlets
TSS	Total Suspended Solids
UNESCO	United Nations Education, Scientific and Cultural Organization
VMS	Variable Message Sign
WC	Watercourse
WCC	West Corridor Constructors

Executive Summary

West Corridor Constructors (WCC) has been selected by the Ministry of Transportation (MTO) and Infrastructure Ontario (IO) to design, build and finance the Highway 401 Expansion Project (the Project), which includes the expansion of approximately 18 kilometres (km) of Highway 401 within the western Greater Toronto Area (GTA), from east of the Credit River in Mississauga to west of Regional Road 25 in Milton. WCC is a fully integrated team led by Aecon Infrastructure Management Inc. (Aecon), Parsons Inc. (Parsons), and Amico Infrastructures Inc. (Amico).

The Project includes widening the existing six lane configuration to the following:

- 12-lane Core-Collector system from the Credit River to Winston Churchill Boulevard;
- 10-lanes from Winston Churchill Boulevard to the Highway 407ETR/Highway 401 Interchange;
- 12-lane Core-Collector system from the Highway 407ETR/Highway 401 Interchange to James Snow Parkway; and
- 10-lanes from the James Snow Parkway to Regional Road 25.

The Project also includes:

- Median High Occupancy Vehicle (HOV) lanes;
- 9 new, replaced or widened bridges;
- 6 bridge rehabilitations, retaining wall construction/rehabilitation;
- 6 structural culvert replacements, extensions or rehabilitations;
- Other miscellaneous structures; and,
- Supporting facilities and features such as drainage, lighting, signage and carpool lots.

This Project is being completed as a Group ‘B’ project under the MTO Class Environmental Assessment for Provincial Transportation Facilities (2000). Consultation is currently ongoing as part of the detail design phase. A Notice of Study Commencement and Design and Construction Report No. 1 Submission was issued and distributed in August 2019. Meetings with key stakeholders / agencies were held to present the Project and discuss their interests and concerns. A website (www.401expansion-mississauga-milton.ca), an email address (info@401expansion-mississauga-milton.ca) and a 24-hour toll free line (1-888-619-1665) were set up for the Project.

This DCR is available for 30-day public review period and documents the Project, Civil Works, drainage and stormwater, and select structural works. This DCR includes information on the environmental assessment process, design details, consultation undertaken, anticipated impacts and associated mitigation measures.

1 Introduction

1.1 Highway 401 Expansion Project

The Highway 401 Expansion project (the Project) includes the expansion of approximately 18 kilometres (km) of Highway 401 within the western Greater Toronto Area (GTA), from east of the Credit River in Mississauga to west of Regional Road 25 in Milton.

West Corridor Constructors (WCC) has been selected by the Ministry of Transportation (MTO) and Infrastructure Ontario (IO) to design, build and finance the Project. WCC is a fully integrated team led by Aecon Infrastructure Management Inc. (Aecon), Parsons Inc. (Parsons), and Amico Infrastructures Inc. (Amico).

The Project (as shown in Figure 1) includes widening the existing six lane configuration to the following:

- 12-lane Core-Collector system from the Credit River to Winston Churchill Boulevard;
- 10-lanes from Winston Churchill Boulevard to the Highway 407ETR/Highway 401 Interchange;
- 12-lane Core-Collector system from the Highway 407ETR/Highway 401 Interchange to James Snow Parkway; and
- 10-lanes from the James Snow Parkway to Regional Road 25.

The scope of work for the Project includes, but is not limited to:

- Median High Occupancy Vehicle (HOV) lanes;
- 9 new, replaced or widened bridges;
- 6 bridge rehabilitations, retaining wall construction/rehabilitation;
- 6 structural culvert replacements, extensions or rehabilitations;
- Other miscellaneous structures;
- Erosion and sediment control, and environmental protection;
- Earthwork, excavation, and grading;
- Drainage, storm water management, and natural channel realignments;
- Carpool lots;
- Utility relocations;
- High Mast Lighting, municipal street lighting, traffic signals, and electrical systems;
- Intelligent Transportation System (ITS)/ Advanced Traffic Management System (ATMS) infrastructure;
- Overhead signage;
- Asphalt and concrete paving;
- Roadside protection; and,

- Landscaping and vegetation restoration/mitigation/compensation and Overall Benefit for Species at Risk.

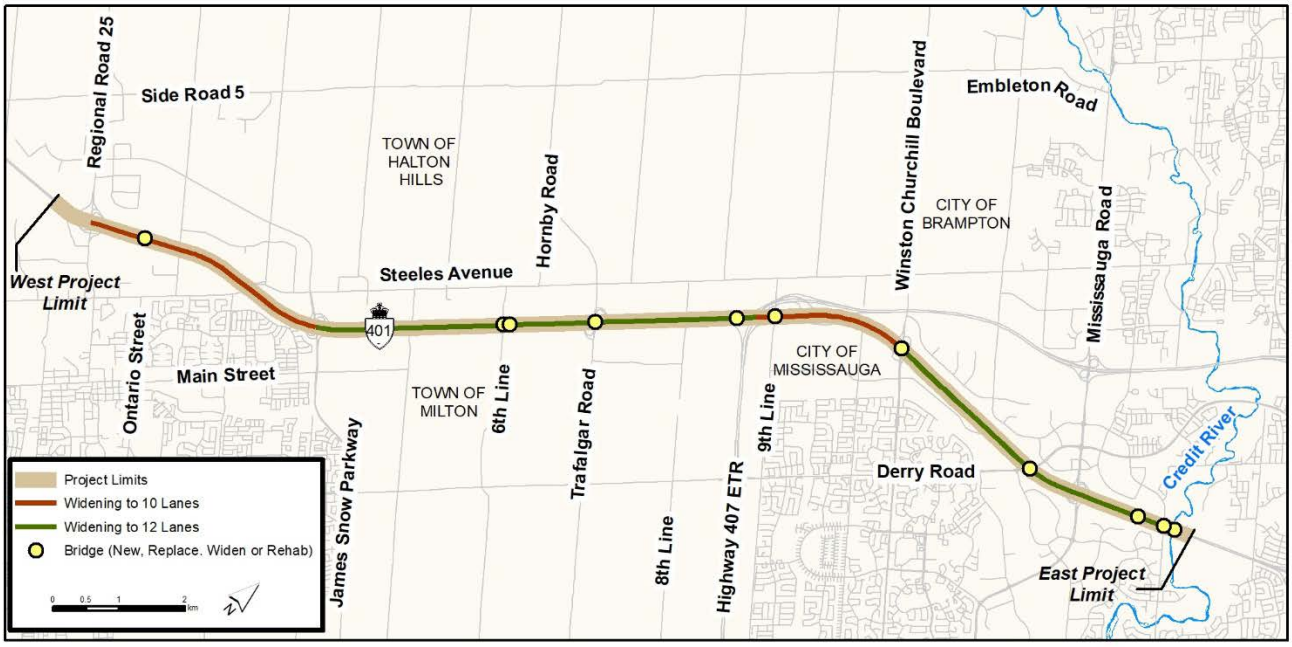


Figure 1: Project Overview Map

The preliminary design for this Project was completed as a Group 'B' project under the - *MTO Class Environmental Assessment for Provincial Transportation Facilities (2000)* in 2013. The projects were approved following the filing of the two Transportation Environmental Study Reports (TESRs) for the "*Highway 401 Improvements from East of the Credit River to Trafalgar Road W.O. 07-20021, Preliminary Design and Class Environmental Assessment Study (May, 2013)*" (URS) and the "*Highway 401 Improvements from Trafalgar Road to Regional Road 25 Preliminary Design and Class Environmental Assessment Study, W.O. 07-20024 (March, 2013)*" (URS).

In 2015, the Detail Design and Class EA was advanced for three of the structures from the *Highway 401 Improvements from Trafalgar Road to Regional Road 25 (March 2013)* TESR. This was documented in the Design and Construction Report (DCR) for the "*Replacement and Widening of Highway 401 Regional Road 25 Underpass, 5th Line Overpass and Oakville Creek West Branch Structures, DB-2014-2009 (August 2015)*" (Morrison Hershfield Ltd). Construction of these structures has been completed.

Field investigations and reporting was completed in 2017/2018 to document environmental conditions should they have changed since the TESRs were completed. In 2019, WCC also completed field investigations to confirm the findings from previous investigations. WCC is carrying forward the recommendations from preliminary design

and will complete the detail design for the Highway 401 Expansion Project, as well as carry out the construction.

1.2 Environmental Assessment Process

1.2.1 Ontario Environmental Assessment Act (EAA)

The Ontario Environmental Assessment Act (EAA) forms the basis and foundation for environmental assessments (EA) undertaken within the province. The purpose of the EAA is to help protect the environment by requiring projects subject to the EAA to follow a planning process that considers its environmental impacts and mitigation measures to help avoid or reduce adverse impacts to the environment.

The EAA identifies two planning and approval processes: Individual EAs and Class EAs. Class EAs, once approved by the Ministry of Environment, Conservation and Parks (MECP), provide for specific classes of undertakings to follow an alternative planning and decision-making process that is more streamlined than an individual EA (which is laid out in Part II of the EAA). Given that the approved process is followed, undertakings conducted under Class EAs do not require formal review and approval under the EAA and can proceed with implementation, if all other approvals have been obtained.

The MTO Class Environmental Assessment for Provincial Transportation Facilities (2000) outlines the EA process for specific groups of provincial transportation projects. This Project is following the Class EA process for a Group ‘B’ project, which generally includes major improvements to existing provincial transportation facilities.

A provision in the MTO Class EA document states that if a project has not proceeded to construction within five years of the Notice of Submission for the TESR, and a DCR has not been submitted within that five-year period, a review of the not-constructed portions of the Project must be carried out (MTO, 2000). Following the preliminary design and Notice of Submission of the TESRs for this Project in 2013, AECOM was retained by MTO in 2017 and 2018 to carry out additional field and desktop investigations for all project factors (e.g., terrestrial and aquatic ecosystems, groundwater, air quality, noise and vibration, etc.) to update and supplement the findings from 2013. The existing conditions have not changed significantly since the TESRs were approved in 2013, and environmental conditions that have changed are documented in the 2017 and 2018 investigations and/or in investigations that WCC undertook in 2019. The information from the TESRs in 2013, the additional studies in 2017 and 2018, and any updates from the detail design stage have also been documented in subsequent sections to inform the detail design work described in this DCR.

As part of the Class EA process, EA documentation is required to record the planning and decision-making process that was undertaken. This Project includes the submission and filing of a Design and Construction Report (DCR) for a 30-day public and agency review period. Multiple DCRs will be prepared and made available for public and agency review for this Project (for more details see Section 1.3). Any concerns and comments should be submitted to WCC. WCC will consider all comments received during the public and agency review process. Following the 30-day DCR review period, and subject to obtaining required permits, approvals, and authorizations, Environmental Clearance will be issued to allow for construction of the works covered in the DCR to commence.

1.3 Public Private Partnership

The Public Private Partnership (P3) model is a cooperative arrangement between the public sector (MTO/IO) and the private sector (WCC), which allows for more effective delivery of larger and more complex infrastructure projects. MTO/IO and WCC, a consortium comprised of three private firms (Aecon, Parsons, and Amico) integrated in a Joint Venture, are working together under a P3 approach. WCC will design, build, and finance the Project.

The Design-Build approach is a way to deliver construction projects where the designer and contractor work together as one entity, known as the design-builder (WCC), to provide both design and construction services to the owner of the infrastructure (MTO). The design-builder is involved at the onset of a project, allowing for greater effectiveness, collaboration, and innovation.

Using the Design-Build model gives the flexibility that design does not have to be fully complete before construction can begin. Portions of the Project will be constructed as the design is completed for the proposed works, resulting in a phased implementation of the Project. Before construction can start, environmental clearance is needed through the filing of the DCR and obtaining the required permits, approvals, and authorizations. Three DCRs are anticipated for this Project to document the proposed works and to obtain environmental clearance (EA process and phased implementation shown in Figure 2). Only the portions of construction included in each DCR can proceed to construction. The Project works covered in each DCR is summarized in Table 1.

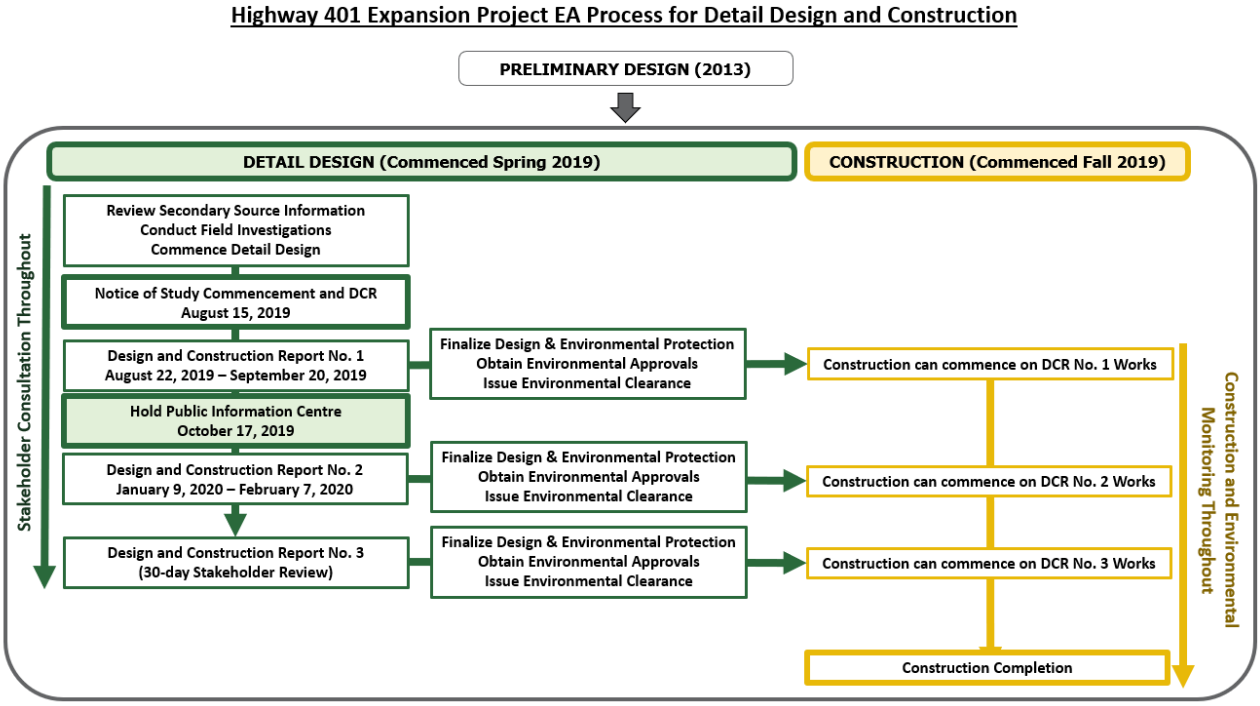


Figure 2: EA Process and Phased Implementation

Table 1: Works Covered in Project DCRs

DCR	Project works covered in each DCR
DCR No. 1 (August 2019)	• Clearing and Grubbing of vegetation within the Project Limits • CN Rail Overhead Bridge Replacement • Trafalgar Road Underpass Bridge Replacement • CP Rail Overhead Bridge Replacement • Traffic and Construction Staging

DCR No. 2 (January 2020)	• Civil Works including:
	  • Roadway design
	  • Drainage and stormwater management
	  • Watercourse realignments (Hornby Creek and realignments related to structure works in DCR No. 2)
	• Supplementary Works (carpool lots, active transportation, illumination, ITS/ATMS, signage, truck inspection stations)
	• Structural Works including:
	  • New Structure:

DCR	Project works covered in each DCR
	○ Ramp Hwy 407E-Hwy401W over Hwy 401WB Collector Structure (Basketweave) • Bridge Replacements: ○ Sixth Line Underpass Bridge ○ Oakville Creek East Bridge ○ Creditview Road Underpass Bridge ○ Credit River Bridge • Bridge Rehabilitations and/or Widening: ○ Winston Churchill Boulevard Underpass Bridge ○ Ninth Line Underpass Structure and Toe Walls ○ Derry Road Overpass • Culvert replacements: ○ Sixteen Mile Creek east of Regional Road 25 Culvert • Retaining Walls and Toe Walls • Traffic and Construction Staging
DCR No. 3 (Anticipated Spring 2020)	• Civil Works including: • Drainage design associated with DCR No. 3 structures • Watercourse realignments (Mullet Creek and realignments related to culvert works in DCR No. 3) • Corridor-wide landscaping and restoration • Vegetation mitigation/compensation and Overall Benefit for Species at Risk • Wildlife passage and fencing, at designated locations • Sixteen Mile Creek Culvert west of Fifth Line Culvert Extension and Rehabilitation • East Oakville Creek Culvert Replacement • Tenth Line west of Trafalgar Culvert Extension and Replacement • Winston Churchill West Culvert Replacement • Mullet Creek Culvert Extension and Rehabilitation • Traffic and Construction Staging

2 General Description of Works Included in DCR No. 2

The works included in DCR No. 2 are the roadway design for the widening of Highway 401 to either the 10- or 12-lane configuration, and structural works on several interchanges, bridges, and culverts throughout the Project. DCR No. 2 also includes improvements to drainage and stormwater management, electrical/ITS/ATMS, carpool lots, signage, and watercourse realignments.

The existing six lanes on Highway 401 will be widened to either 10 lanes or 12 lanes, with appropriate medians and shoulders as required by provincial design standards. Other considerations include changes to existing local crossing roads and interchanges to accommodate the widened highway. Revisions to roadway design also include consideration of pavement structure, roadside safety, illumination, ITS/ATMS, and signage.

The structural scope of works covered in DCR No. 2, as previously noted in Table 1, includes a new bridge, bridge replacements, bridge widening and rehabilitations, culvert work and work on new and existing retaining walls and toe walls. Where required, existing structures will be demolished to accommodate the new works. DCR No. 2 also includes the realignment of Hornby Creek.

The widening of the highway corridor results in a greater pavement surface resulting in greater runoff, and consequently a need for improved drainage infrastructure. Drainage and stormwater management improvements include new and retrofitted stormwater management ponds, upgraded water quality and quantity control and new catch basins, ditches, and sewers to direct runoffs.

Supplementary works that are a part of DCR No. 2 include the construction and expansion of commuter carpool lots to provide enhanced carpooling options for commuters, active transportation considerations, improved electrical/ITS/ATMS infrastructure, signage, and decommissioning of the two existing Truck Inspection Stations located between Fifth Line and Sixth Line.

The detailed description of DCR No. 2 works can be found in Section 4.

3 Consultation

Consultation is an integral component of the EA process. Section 3.1 summarizes the consultation undertaken during preliminary design, Section 3.2 summarizes consultation efforts for the detail design phase, and Section 3.3 discusses the consultation undertaken specifically for the works covered under DCR No. 2.

3.1 Consultation during Preliminary Design

Both of the preliminary design projects were completed in 2013 as Group ‘B’ projects under the MTO Class EA and their TESRs document the consultation that was undertaken during the Project.

Consultation carried out during preliminary design included developing a Project contact list, publishing of the Notices of Study Commencement, Notices of Public Information

Centre (PIC) and Notices of TESR Submission in local newspapers, hosting PICs, and meeting and consulting with key federal and provincial agencies, local municipalities and conservation authorities, elected officials, emergency service providers, interest groups, Indigenous communities, utility companies, and the public. Two PICs were held per study, for a total of four PICs.

Following the completion of the preliminary design and prior to the commencement of detail design, MTO continued consultation with external stakeholders, including municipalities and regulatory agencies, regarding the upcoming detail design project, potential impacts, and permits and authorizations.

WCC has built on the consultation undertaken by MTO during the preliminary design and subsequent pre-detail design phase. Details of the consultation activities are listed in Section 3.2 and 3.3.

3.2 Consultation during Detail Design – Overall Approach

WCC is undertaking consultation throughout the detail design and construction phases of the Project. The following sections describe the general consultation methods being used throughout the detail design phase of the Project.

3.2.1 Project Contact List

A Project contact list of potentially affected and interested stakeholders was developed based on the preliminary design and pre-detail design contact lists and is continually being updated.

The contact list is comprised of Members of Parliament (MPs) and Members of Provincial Parliament (MPPs), relevant federal and provincial agencies, including regulatory agencies, municipalities and Conservation Authorities, emergency services, interest groups, utility companies (see Section 4.7), Indigenous communities (see Section 3.2.7), other transportation providers (e.g. school boards, 407ETR, transit providers, rail companies, trucking organizations). Specific external contacts include:

Federal and Provincial Agencies:

- Department of Fisheries and Oceans
- Transport Canada, Navigation Protection Program
- Metrolinx / GO Transit
- Ministry of Environment, Conservation and Parks
- Ministry of Natural Resources and Forestry
- Ministry of Heritage, Sport, Tourism and Culture Industries
- Ministry of Municipal Affairs and Housing
- Ministry of Agriculture, Food and Rural Affairs
- Ministry of Indigenous Affairs

- Ministry of Energy, Northern Development and Mines

Local Municipalities/Conservation Authorities:

- Halton Region
- Peel Region
- Town of Halton Hills
- Town of Milton
- City of Mississauga
- Conservation Halton
- Credit Valley Conservation

Elected Officials:

- MPPs – Mississauga-Malton, Mississauga-Streetsville, Milton, Wellington-Halton Hills
- MPs – Mississauga-Malton, Mississauga-Streetsville, Milton, Wellington-Halton Hills
- Mayors and Local / Regional Councillors

Emergency Services:

- Ontario Provincial Police
- Peel Regional Police
- Halton Regional Police
- Regional Emergency Management – Region of Peel
- Halton Emergency Management
- City of Mississauga, Fire and Emergency Services
- Halton Region Paramedic Services
- Halton Hills Fire Department
- Milton Fire Department
- Halton Region EMS
- Peel Region EMS

Other transportation providers, local interest groups and stakeholders:

- CN Rail
- CP Rail
- 407ETR
- Greater Toronto Airports Authority
- Toronto Premium Outlets
- Thermo Fisher Scientific
- Student Transportation of Peel Region
- Halton Student Transportation Services
- Peel District School Board
- Halton Catholic District School Board
- Halton Region District School Board
- Dufferin Peel Catholic District School Board
- Peel District School Board
- Transportation Management Associations
- Ontario Trucking Association
- Credit River Anglers Association
- Halton North Peel Naturalist Club
- Halton Environmental Network
- Churchill Meadows Residents Association
- Izaak Walton Fly Fishing Club
- Meadowvale Village Community Association

- Milton Green
- The Bruce Trail Conservancy
- South Peel Naturalists Club
- Friends of the Greenbelt Foundation
- Heritage Mississauga
- The Heritage Foundation of Halton Hills
- Oakville Cycling Club
- Milton Bicycle Club
- Mississauga Board of Trade
- Halton Hills Chamber of Commerce
- Milton Chamber of Commerce

Members of the public that requested to be added are also on the contact list. Public stakeholders, including their personal information, are not included on this list in accordance with the *Freedom of Information and Protection of Privacy Act*.

3.2.2 Notice of Study Commencement and Design and Construction Report No. 1 Submission

A Notice of Study Commencement and Design and Construction Report No. 1 Submission was sent out August 15, 2019 to inform stakeholders about the commencement of the detail design phase of the Project and the availability of Design and Construction Report (DCR) No. 1. The Notice of Study Commencement and DCR No. 1 Submission outlined the Project works and background, the Class EA process being followed, works included in DCR No. 1, the viewing locations for the DCR, and key WCC contacts. The Notice of Study Commencement and DCR No. 1 Submission directed interested parties to resources for additional project information, including a link to the project website and phone line.

The Notice of Study Commencement and DCR No. 1 Submission was distributed to residents and businesses adjacent to the Project limits via Neighbourhood Mail, sent via email/regular mail to the Project contact list, and published in the following local newspapers:

- Brampton Guardian
- Mississauga News
- Milton Champion
- Georgetown Independent
- Le Metropolitain – Mississauga (French language)
- Le Metropolitain – Brampton (French language)

The Notice of Study Commencement and DCR No. 1 Submission materials are provided in **Appendix A.**

WCC considered all comments and concerns brought up during the DCR No. 1 review period (August 22, 2019 to September 20, 2019). Permits and approvals have been or are in the process of being obtained for works covered in DCR No. 1. WCC

commenced construction for the works covered in DCR No. 1 in October 2019 where approvals allowed.

3.2.3 Project Website, Toll-Free Line and Email Address

A website (http://www.401expansion-mississauga-milton.ca) was developed to provide information on the Project; the Class EA process being followed; EA notices and environmental documents; and project updates, including construction progress and traffic impacts. Interested members of the public can also sign up for project updates and submit comments through the website.

The website will be available throughout the duration of the Project and is an effective way to reach a wide range of stakeholders. In addition to the website, a 24-hour toll-free line (1-888-619-1665) and a project email address (info@401expansion-mississauga-milton.ca) are available for stakeholders to contact WCC.

3.2.4 Public Information Centre (PIC)

An Online PIC, hosted on the Project website, was held on Thursday, October 17, 2019. The purpose of this Online PIC was to provide information on the Highway 401 Expansion Project, describe the Environmental Assessment Process, summarize how traffic and environmental impacts are being mitigated, identify next steps, and outline how the public can stay informed and involved in the Project.

The Notice of Online PIC was published in local newspapers (listed in Section 3.2.2), posted on the Project website, and distributed to those on the Project contact list on Thursday, October 3, 2019. The Notice included details on the purpose and format of the PIC, when and where the PIC was being hosted, and how to participate.

Three one-hour live Question & Answer (Q&A) sessions were hosted on the day of the PIC (at 10:00AM, 1:00PM, and 7:00PM) through an online webcast and teleconference line. These live Q&A sessions commenced with a video presentation providing information regarding the Project, followed by an open Q&A period, where attendees could submit questions (by phone or through an online chat function) and WCC staff could provide answers verbally. PIC materials were made available on the Project website and included:

- PIC Video Presentation (viewable on the website)
- PIC Video Presentation Transcript (PDF)
- PIC Presentation Slides (PDF)
- Map of the Project (Roll Plan PDF)
- Landscape Concepts (PDF)
- PIC Comment Form (fillable PDF)

- Question and Answer Session Summary (available following the PIC)

There were approximately 56 attendees across the three online Q&A sessions, with 21 questions received. Additional comments were invited to be submitted during the PIC comment period which ended on October 31, 2019. Five comments were received during this period; they are included with their responses in Table 3.

The Notice of PIC and PIC Materials are included in the PIC Summary Report in **Appendix A**.

3.2.5 Consultation with External Agencies and Key Stakeholders

Consultation with external agencies and key stakeholders is ongoing throughout the Project. This consultation includes meetings, teleconferences, providing project information, including the relevant design packages at key milestones, and correspondence. A list of the external agencies and key stakeholders consulted during the Project is included in **Appendix A**. Refer to Section 3.3 for a detailed description of the consultation with external agencies and key stakeholders to date.

3.2.6 Governmental Authority Environmental Meeting (GAEM)

The purpose of GAEMs are to allow for direct communication with key governmental agencies on environmental details that are relevant and of interest to their agency. GAEMs are held at key project milestones and on an as-needed basis throughout the Project. Individual, face-to-face meetings with agencies will be held if required.

Members of the GAEM include representatives from the Department of Fisheries and Oceans (DFO), Ministry of Natural Resources and Forestry (MNRF), MECP, Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI), Transport Canada, Conservation Halton and Credit Valley Conservation.

GAEM No. 1 is documented in DCR No. 1 and GAEMs held during the DCR No. 2 period are documented in Section 3.3.

3.2.7 Indigenous Consultation

MTO maintains the Indigenous community engagement/consultation responsibility for the Project and is supported by WCC. The following Indigenous communities are being consulted at key milestones in the Project, including the Notice of Study Commencement, Notice of PIC, and Notices of DCR Submissions. MTO sent letters to each Indigenous community encouraging them to provide comments and/or concerns and offering to meet one on one with their community, if required. Indigenous Communities consulted include:

- Mississaugas of the Credit First Nation;

- Six Nations of the Grand River; and,
- Haudenosaunee Confederacy Chiefs Council.

3.3 Consultation Undertaken for DCR No. 2 Works

Consultation concerning the design, construction activities, impacts and mitigation of DCR No. 2 works has been occurring since the commencement of the Project. The PIC (Section 3.2.4) presented the Project works, including the scope of work covered in DCR No. 2, to stakeholders.

3.3.1 GAEM No. 2

The second GAEM was held on October 9, 2019. The purpose of this GAEM was to provide details on the Online PIC, to provide an update on the status of DCR No. 1, discuss upcoming DCRs No. 2 and 3, to summarize consultation taken to date, and to discuss permitting and authorizations for these works. The GAEM was attended by representatives from MECP, MHSTCI, Conservation Halton and Credit Valley Conservation.

3.3.2 GAEM No. 3

The third GAEM was held on December 10, 2019. The purpose of this GAEM was to provide details on the DCR No. 2 content and discuss permitting and authorizations for these works. The GAEM was attended by representatives from Transport Canada, MNRF, and Conservation Halton.

3.3.3 Notice of Design and Construction Report No. 2 Submission

A Notice of Design and Construction Report No. 2 Submission was distributed on January 9, 2020 to inform stakeholders about the availability of DCR No. 2. The Notice of DCR No. 2 Submission outlined the Project works and background, the Class EA process being followed, works included in DCR No. 2, the viewing locations for the DCR, and key WCC contacts. The Notice of DCR No. 2 Submission directed interested parties to resources for additional project information, including a link to the project website and phone line.

The Notice of DCR No. 2 Submission was sent via email/regular mail to the Project contact list, included on the Project website, and published in the following local newspapers:

- Brampton Guardian
- Mississauga News
- Milton Champion
- Georgetown Independent

- Le Metropolitain – Mississauga (French language)
- Le Metropolitain – Brampton (French language)

The Notice of DCR No. 2 Submission materials are provided in **Appendix A.**

3.3.4 Consultation with External Agencies and Key Stakeholders

WCC have held targeted meetings and exchanged correspondence with external agencies, municipalities, and other key stakeholders that may be affected by or interested in the Project. Table 2 documents the comments and WCC's responses.

3.3.5 Consultation with Public

WCC has received comments and questions from the general public related to the Project. Table 3 documents the comments and WCC's responses.

Table 2: Summary of Consultation with External Agencies/Stakeholders to date

Agency/ Stakeholder	Date	Summary of Consultation	WCC Response
CP Rail	April 30, 2019	Meeting to discuss the proposed bridge design at the CP Rail Structure. CP Rail interested in reviewing bridge drawings. CP Rail Agreement is required for the works.	WCC provided drawings to CP Rail for their review and comments received August 7, 2019. The CP Rail Agreement is in the process of being obtained.
	July 26, 2019 August 7, 2019	WCC provided drawings of CP Rail structure for review. CP Rail provided comments and mark-ups on the drawings. Identified a whistle post requiring protection during construction. Placement of deck drains outside the rail ROW to prevent undercutting at embankments.	WCC revised drawings as per CP Rail comments. No major design changes. Whistle post will be protected.
	November 1 / December 10,2019	WCC sent final design and construction documents for review.	WCC following up with CP Rail for comment. Comments will be addressed and incorporated once received, where applicable.
CN Rail	May 27, 2019	Meeting to discuss the proposed bridge design at the CN Rail Structure. CN Rail is interested in reviewing bridge drawings and interested in drainage and demolition. CN Rail Agreement is required for the works.	WCC provided drawings to CN Rail for their review. The CN Rail Agreement is in the process of being obtained.
	September 24, 2019	Meeting to discuss CN Rail requirements for bridge design, agreements, permits, flagging, review process, approvals.	WCC continued to work with CN Rail to obtain Agreement/permits and will be coordinating with CN Rail during construction.
	September 25 / November 4, 2019	WCC sent final design and CN Rail did not have comments on the design. WCC also sent construction documents for review.	WCC following up with CN Rail for comment on the construction submissions. Comments will be addressed and incorporated once received, where applicable.
Halton Region	March 26, 2019	Meeting to introduce the project and discuss permitting and water and wastewater relocations.	WCC provided design and permitting information.
	May 31, 2019	Meeting to review the proposed design for the Trafalgar Road Underpass Structure, including the design for the bicycle lanes. Halton Region indicated requirement for ATMS/ITS conduit in the new Trafalgar Road bridge. Discussed coordination of works.	WCC revised the design to include the ATMS/ITS conduit. WCC continued to progress design and engage Halton Region.
	August 2, 2019	Meeting to review progress of water and wastewater relocations. Halton Region confirmed they do not have further comments on the Trafalgar Bridge Design Package. The ITS conduit was added and is under review by MTO and IO. Discussed progress of adjacent design and construction contracts.	WCC continued to work with and update Halton Region on design progress.
	September 27, 2019	Meeting with the Region's consultant for the detail design of the Tremaine Road Interchange and Advanced Works Contract. Main areas for design coordination are speed change lanes, signage, and ditch tie-ins.	WCC provided comments on the Tremaine Road Advanced Works and Main Interchange design package. WCC continued to coordinate with the Region and their consultant.

Agency/ Stakeholder	Date	Summary of Consultation	WCC Response
	November 15, 2019	Meeting to discuss impacts of WCC on Halton Region's access to existing utilities and review Pre-Final review comments.	Solutions for access were discussed and agreed to which will minimize environmental and grading impacts and also be appropriate for the expected frequency of access. Halton Region has no major comments on WCC Pre-Final design.
	November 19, 2019	Correspondence indicating that the Region did not have comments on the Drainage and Stormwater Management Report as there will be no negative impacts to Regional infrastructure.	N/A
Peel Region	April 5, 2019	Meeting to introduce the project and discuss permitting and water and wastewater relocations.	WCC provided design and permitting information.
	July 12, 2019	Meeting to review the proposed design for several regional roads, including Derry Road and Winston Churchill Boulevard, and water and wastewater relocations. Interested in coordination between regional projects and the Highway 401 Expansion Project, and local traffic impacts resulting from construction.	WCC shared drawings and concept designs for structure improvements and traffic staging. WCC continued discussions about water and wastewater.
	July 26, 2019	Meeting to review the progress of the water and wastewater relocations.	WCC continued to work with and update Peel Region on design progress.
	September 6, 2019	Meeting to review the progress of the water and wastewater relocations.	WCC continued to work with and update Peel Region on design progress.
	October 2, 2019	Meeting to discuss Winston Churchill Boulevard, fencing plans, and water and wastewater relocations. Peel Region's EA design for Winston Churchill Boulevard will tie into WCC's design.	WCC provided design drawings for Winston Churchill Boulevard and fencing plan.
	November 2019	Comments received on civil design related to utilities and on the Derry Road Overpass design regarding storm conveyance system over/under and crossing Derry Road at Highway 401.	WCC has incorporated comments where applicable. Peel Region will review revised package in next submission.
	December 15, 2019	Meeting to review the progress of the water and wastewater relocations.	WCC continued to work with and update Peel Region on design progress.
City of Mississauga	June 26, 2019	Meeting to review the design elements of City interest, permitting and approval requirements, and details regarding Mullet Creek works and Creditview Road Underpass Structure.	WCC provided requested designs and documents prior to follow-up meeting.
	August 13, 2019	Meeting to discuss access to City-owned lands, related permitting, and Mullet Creek realignment. Discussed CVC's involvement in design review and/or approval.	WCC furthered the creek realignment design and determined tree removals.
	September 25, 2019	Meeting to discuss impacts to Mullet Creek resulting from realignment and general permitting.	WCC furthered the creek realignment design and determined tree removals.
	October 16, 2019	Meeting to discuss permits and access during construction. Mullet creek agreement	WCC continued to coordinate with the City to obtain all required permits.

Agency/ Stakeholder	Date	Summary of Consultation	WCC Response
	November 13, 2019	Comments from MiWay on impacts of this Project to MiWay transit service and bus stops on five routes on Derry Road, Winston Churchill Boulevard and on Highway 401. They noted that it is not anticipated that bus stops will be impacted but transit service will be.	WCC is confirming impacts to bus stops, though no impacts are anticipated at this time. WCC will contact / follow up with MiWay as required.
	November 13, 2019	Correspondence from the City regarding the traffic signal infrastructure requirements for powering temporary traffic signals.	WCC noted the requirements and will address through design and construction.
	November 13, 2019	Correspondence from City of Mississauga Forestry department providing comments on the Restoration Plan for Mullet Creek. Questions and comments relate to quantities of replantings, seed mixes, and riparian planting.	WCC addressed the items through the restoration plan for Mullet Creek and discussed responses at the November 19 meeting with the City.
	November 19, 2019	Meeting to discuss restoration of the Mullet Creek realignment and culvert replacement. City needs to review the Mullet Creek area to determine the restoration and replantings needed.	WCC completed a site visit with the City and provided details of tree impacts (see below).
	November 26, 2019	Site visit with WCC and the City's arborists to review the existing site conditions and vegetation and to identify which trees/vegetation will be removed for the Mullet Creek realignment.	WCC provided information that outlines trees to be impacted and those to be preserved, outlines if any of the trees are dead, and provides information on species and size.
	November 29, 2019	Correspondence indicating that WCC does not need any further sign off from the City to the PHMs.	N/A
	December 20, 2019	Meeting to discuss Creditview Road coordination and Mullet Creek requirements.	WCC to continue to coordinate with the City.
Town of Milton	July 4, 2019	Meeting to review design elements relevant to Town of Milton, permitting and approval requirements, and details regarding the Tremaine Road interchange and High Point Pond (HPP). The Town requested a presentation to council in advance of the PIC.	WCC furthered designs and provided to the Town. Confirmed that designs for a proposed offline culvert do not impact the HPP weir. WCC presented to Council.
	September 16, 2019	Presentation to the Town of Milton Council about the Project. Questions received about 10 lanes versus 12 lanes, traffic impacts, project schedule and noise mitigation.	N/A
	November 2019	Comments received on the civil design package related to ownership of the new stormwater management pond (SWMP).	WCC confirmed that the SWMP will be owned by MTO.
Town of Halton Hills	July 11, 2019	Meeting with Town's Traffic Department to discuss using Town roads for haul routes. Town does not object to WCC's proposed access locations and routes and provide permission for WCC to use the proposed routes. However, damage to the road as a result of the heavy trucks are to be repaired by WCC.	WCC sent the Haul Route Plan to the Town.
	July 26, 2019	Meeting to review design elements of Town interest, traffic impacts and communications, and has requested a presentation to council in advance of the PIC.	WCC to provide traffic detour plans, when available. WCC will coordinate with the Town

Agency/ Stakeholder	Date	Summary of Consultation	WCC Response
			regarding communication of traffic impacts during construction to the public.
	September 30, 2019	Presentation to the Town of Halton Hills Council about the Project. Project was generally well received.	N/A
	October 2019	Comments received on civil design concerning works at Sixth Line and Eighth Line.	Comments reviewed and responded to by technical disciplines and required updates will be incorporated into the design package and provided to Halton Hills for review.
	November 12, 2019	Teleconference to discuss Town of Halton Hills comments on WCC Pre-Final design and Town requirements for Municipal Consent.	WCC confirmed all comments will be addressed in their Final Design. Municipal Consent will follow Town of Halton Hills review of this design.
Ontario Provincial Police	June 11, 2019	Meeting to discuss proposed design of the highway and median enforcement areas.	WCC continued to engage OPP in relation to enforcement areas and traffic impacts.
	November 12, 2019	Meeting to discuss proposed design of the highway and median enforcement areas. WCC presented design updates, showing revised design to address previous OPP comments. OPP confirmed that they had no objections to the latest WCC design. However, they requested some slight adjustments to one of the median enforcement areas.	WCC to address the median enforcement area in the Final design.
OPP Modernization (OPPM2) Contract (Argentia Road)	May 3, 2019	Meeting to introduce WCC and discuss the OPP Modernization Phase 2 Project for an OPP Station near Argentia Road. OPPM interested in fencing impacts and timing of ramp from OPP site to Highway 401.	WCC provided relevant materials to OPPM.
	September 20, 2019	Meeting to coordinate between the Highway 401 Expansion Project and the OPPM2 project.	WCC provided relevant materials to OPPM and continued to communicate where work requires coordination with the OPPM site.
	October 18, 2019	Meeting to coordinate between the Highway 401 Expansion Project and the OPPM2 project.	WCC provided relevant materials to OPPM and continued to communicate where work requires coordination with the OPPM site.
	December 4, 2019	Meeting to coordinate between the Highway 401 Expansion Project and the OPPM2 project.	WCC provided relevant materials to OPPM and continued to communicate where work requires coordination with the OPPM site.
407ETR	May 28, 2019	Meeting to discuss project schedule, limits of paving and design, toll gantry locations, traffic and staging, and encroachment permits.	Following the meeting, WCC provided drawings for 407ETR's review on the works covered in DCR No. 1.

Agency/ Stakeholder	Date	Summary of Consultation	WCC Response
	June 19, 2019	Email correspondence about obtaining encroachment permit to work on 407ETR lands. 407ETR indicated they had no comments on the clearing and grubbing works but would like to review the traffic staging and signage plan.	WCC provided traffic staging and signage plan to 407ETR.
	August 1, 2019	Technical Workshop to review the progress of the design at the Highway 407ETR interchange and related ramps.	WCC have forwarded exhibits from the meeting to 407ETR.
	October 30, 2019	Highway 407ETR provided comments on the Highway 407ETR interchange design package.	WCC reviewed and addressed the comments.
Greater Toronto Airports Authority (GTAA)	September 18, 2019	Email from the GTAA indicating they have no concerns from a Land Use perspective.	Noted by WCC Project team.
Metrolinx	August 20, 2019 September 3, 2019	Email from Metrolinx indicating their interest in impacts to GO Bus service. Teleconference to discuss the Project and impacts to the existing GO bus lane on the highway.	WCC continued to send Project updates and traffic notices to Metrolinx.
TCPL	August 29, 2019	Letter from TCPL indicating they have 2 high pressure natural gas pipelines crossing Highway 401 between Winston Churchill Boulevard and Highway 407ETR. TCPL provided a list of requirements, including that written consent must be obtained from TCPL prior to undertaking certain construction activities.	WCC obtained a TCPL crossing permit for works in their ROW and is determining if other permits are required.
	November 7, 2019	Email inquiring when construction is scheduled to commence for the section of Highway 401 between Highway 407ETR and Winston Churchill Boulevard.	Construction will commence on Highway 401 between Highway 407ETR and Winston Churchill Blvd in early 2020.
Toronto Premium Outlets (TPO)	July 24, 2019	Meeting to discuss the project, particularly work at Trafalgar Road Underpass and traffic impacts related to TPO.	WCC will keep TPO informed of construction and staging schedule and also posting traffic and closure updates on our Project website.
	October 3, 2019	Email inquiry about when work will begin that impacts the Trafalgar Road exit on Highway 401. TPO thought work would start in October 2019.	Work is anticipated on the Trafalgar Bridge on November 8, 2019. Traffic notices will be sent to TPO.
Thermo Fisher Scientific	October 17, 2019	Correspondence with Thermo Fisher Scientific outlining WCC's scope that is applicable to Thermo Fisher Scientific.	WCC to reach out with timing for specific works in 2020.
	October 18, 2019	Email noting that prior to actual construction, they should be notified a few days in advance. Provided information on existing fencing and indicated a need for a sound absorption wall.	WCC to reach out prior to construction activities in the vicinity of the facility. WCC noted that Noise Assessments were completed by MTO that determined the facility is in a commercial / industrial area and does not qualify as a Noise

Agency/ Stakeholder	Date	Summary of Consultation	WCC Response
			Sensitive Area (NSA), and thus does not require noise mitigation measures.
Ministry of Environment, Conservation and Parks	August 6, 2019	Meeting to discuss Species at Risk (SAR) permits and approvals for works included under subsequent DCRs.	WCC provided design and environmental impacts as required for permitting. Ongoing discussions and correspondence have continued with MECP.
	November – December 2019	Correspondence with MECP on the status and conditions of approvals including bat SAR Letter of Advice, Credit River American Eel Letter of Advice, and 17 2 (c) permit for Redside Dace. MECP had comments relating to the design of cofferdams during construction and footings removal, which WCC addressed. MECP confirmed that an authorization in relation to American Eel under the ESA will not be required provided the design and mitigation measures described in the memorandum are followed.	WCC continued to provide MECP with details of the proposed works to support MECP's review of the permits and approvals. WCC will continue to work with MECP to obtain the outstanding permits.
Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI)	September 27, 2019	Email from MHSTCI indicating their interest in archaeological, built and cultural heritage resources. MHSTCI reviewed DCR No. 1 and had no comments.	WCC continued to send subsequent Project notices to MHSTCI for their review.
Ministry of Natural Resources and Forestry (MNRF)	October 25, 2019	Email from MNRF indicating their interest in the detail design of works at the Credit River and other watercourse crossings.	WCC advised the detail design for construction activities at Credit River and other watercourses will be included in future DCRs that will be available in early 2020.
Transportation Canada (Navigations Protection Program)	October 21, 2019	Email indicating the new *Canadian Navigable Waters Act (CNWA)* applies to all navigable waterways and provided an overview of the categories of work covered under the CNWA and the general approval and review process.	WCC reviewed the information provided and, through consultation with Transport Canada, determined approval is required under the CNWA.
	November 28, 2019	Email indicating that under the previous Navigation Protection Act, Transport Canada aimed to issue approvals within 50 business days of receiving a completed application. The CNWA also requires a 30-day advertising and comment period that is in addition to the 50 days.	Noted by WCC Project Team.
	December 2, 2019	Teleconference with Transport Canada to clarify the approval and review process, public notification requirements and timelines. Discussed the works at Credit River Bridge and confirmed that the works would be considered Major Works and would require Transport Canada approval. Transport Canada provided a list of the key documents required for the application.	WCC prepared and submitted an application for works at Credit River through the Transport Canada application review process.
	December 10, 2019	During the GAEM No. 3 presentation, Transport Canada indicated that other waterways in the Project may be considered navigable and may require further action under the CNWA (approval or public notification).	WCC advised Transport Canada the only other watercourse bridge crossing in the Project Limits is Oakville Creek East Bridge.
	December 11, 2019	Transport Canada reviewed information for Oakville Creek East Bridge and indicated this waterway is non-navigable and thus no application is required.	Noted by WCC Project Team.

Agency/ Stakeholder	Date	Summary of Consultation	WCC Response
	December 13, 2019	Teleconference to clarify the questions and information required in the CNWA application for Credit River Bridge.	N/A
	December 23, 2019	Correspondence with Transport Canada regarding navigability and CNWA requirements for other watercourses in the Project limits.	Determination of navigability on the other watercourses is ongoing.
All Utilities	Ongoing	Meetings ongoing with the following utilities to discuss relocation requirements: Halton Region, Peel Region, Alectra Utilities, Rogers, Bell, Enbridge Gas, Union Gas, Cogeco, Halton Hills Hydro, and TransCanada.	WCC continued to discuss and engage with the Regions and utility companies regarding relocations.
Governmental Authority Communications Meeting No. 1	July 17, 2019	Meeting attended by communication staff from local municipalities to discuss how WCC will be disseminating key project information.	WCC updated the Traffic Disruption Notices Contact list. WCC notified key communications stakeholders about the launch of the Project website.
Governmental Authority Communications Meeting No. 2	November 26, 2019	Meeting to provide an update on comments received, Project progress, commencement of construction activity at Trafalgar Road and the Creditview Road lane closure.	WCC continued to hold Governmental Authority Communication Meetings.
Six Nations of the Grand River First Nation	July 10, 2019	MTO met with Six Nations and provided a summary of the Project; their key concerns relate to archaeology, forested areas, watercourses and SAR.	MTO continued to meet with Six Nations and has offered to provide reports and information if requested.
	September 18, 2019	Six Nations is interested in the ecological restoration works.	
Haudenosaunee Development Institute (HDI)	September 26, 2019	Met with HDI and provided a brief description of the Highway 401 Expansion Project.	MTO continued to meet with HDI.
Mississaugas of the Credit First Nation (MCFN)	October 23, 2019	MTO met with MCFN and provided a summary of the Project; their key interests relate to archaeology, monitoring, environmental permits and plant salvage.	MTO and WCC to coordinate MCFN field staff being on site.
All Indigenous Communities	August 15, 2019	A Notice of Study Commencement and DCR No. 1 Submission and accompanying letter were sent to the three Indigenous communities listed in Section 3.2.7.	N/A
	October 9, 2019	A Notice of Online Public Information Centre and accompanying letter were sent to the three Indigenous communities listed in Section 3.2.7.	N/A
	January 2, 2020	A Notice of DCR No. 2 Submission and accompanying letter were sent to the three Indigenous communities listed in Section 3.2.7.	N/A

Table 3: Summary of Comments Received from the Public up to DCR No. 2

Category	Comments Received	WCC's Response
Design	Why is Highway 401 going from 10 to 12 lanes and then back up to 12? This will create traffic bottlenecks.	Determination of the lane requirements was completed during preliminary design in 2013 using a travel demand forecast exercise. Based on the existing traffic conditions and projected traffic volume growth for this section of the Highway 401 corridor, it was determined which sections were recommended for 10 lanes and 12 lanes in order to meet the projected 2031 travel demand. Other constraints that limit the number of lanes include property and geographic constraints of existing structures and buildings that prevent widening to 12 lanes throughout the entire 18km.
Schedule	When is the expansion of Highway 401 anticipated to commence?	Construction works commenced in October 2019 for the works described in DCR No. 1.
Schedule	When is the expansion of Highway 401 anticipated to be completed?	Travelers can expect to have full use of the expanded facility by late 2022.
Construction	How will the highway be constructed? Will it be in sections or all at once?	Work on mainline Highway 401 will be done in two construction stages. The first stage of construction includes constructing new lanes on the outside of the highway (i.e. north and south). Once the new lanes are complete, stage 2 will commence, which includes diverting traffic to the new constructed lanes on the outside and commencing construction on the existing, inside lanes.
Design	How many lanes of Highway 401 will be carried over the Credit River?	12 lanes of Highway 401 will be carried over Credit River to tie into the existing highway expansion to the east of the Project limits.
Construction Impacts / Environmental	Concerned with sediment and erosion control and bridge design at Credit River as it relates to impacts on fish habitat and fish holding areas.	WCC conducts daily inspections of the work area and no issues have been observed with sediment migrating from the current work zone. Erosion and sediment control is an important part of the Project, and comprehensive plans for sediment management are part of the Project, in particular around sensitive watercourses such as the Credit River. The proposed Credit River Bridge design has the new piers located outside the existing piers and the normal wetted channel of the river, so impacts to habitat and fish holding areas will be minimized. Further information about the design, mitigation measures and restoration for the Credit River bridge works will be included in Design and Construction Reports that will be available for review on the Project website and at various review locations.
Construction Impacts	What are the impacts to Creditview Road Bridge?	The Highway 401 Expansion necessitates the replacement of the Creditview Road Bridge. The Proposed Design for this section of Creditview Road includes work that will be completed by the City of Mississauga and work to be completed by WCC. The following key elements will be completed by WCC: • Reconstructing Creditview Road from Argentia Road to Old Creditview Road; • Widen the Creditview Bridge to four traffic lanes; and, • Implement a 3.5 m multi-use trail (west side) and 1.5 m sidewalk (east side) of the roadway. To accommodate construction and minimize traffic impacts, the replacement of the Creditview Road bridge requires that Creditview Road be restricted to one lane of southbound traffic only. Northbound traffic will be detoured via Mississauga Road utilizing Argentia Road and Derry Road. The detour is approximately 4.4 km long. For the southbound traffic utilizing Creditview Road, the lanes will be realigned to the east side of the Creditview Road structure. Various construction staging options were closely examined to identify the preferred approach to accommodate the replacement of the Creditview Road Bridge and the above approach was determined to have the least impact to traffic and the local community. Next steps include

Category	Comments Received	WCC's Response
		finalizing the design and providing notification to stakeholders and the community regarding the timing of construction activities and the implementation of the partial closure of the bridge.
Construction Impacts	Is the northbound lane closure on Creditview Road permanent? When will the northbound lanes re-open? Closure reduces options for cyclists across Highway 401.	The northbound lane closure on Creditview Road is temporary and will be closed for the duration of construction at the bridge including after hours. The replacement of the Creditview Road Bridge will begin in December 2019. The new Creditview Road Bridge will be four lanes and is anticipated to re-open in 2021, at which point northbound traffic over Highway 401 will be restored.
Design	Can you increase the queuing length of the northbound left turn lane at the Trafalgar Road Carpool lot?	The queue length is constrained by the Trafalgar bridge, thus, opportunities to increase the length is limited.
Design	Will the new Trafalgar Road Bridge be able to accommodate the future six lane scenario of Trafalgar Road?	Yes, the new Trafalgar Road bridge is designed to be wide enough to ultimately support six lanes of traffic, speed change lanes to the highway ramps, and two future bike lanes. However, WCC will only be constructing the approaches and Trafalgar Road bridge itself to two lanes in each direction to match existing conditions. The timing for when Trafalgar Road will go from four to six lanes will be dependent on Halton Region, but no additional structural work is anticipated to accommodate six lanes on the bridge.
Noise Impacts	Will there by noise barriers installed along the highway? Or particularly at James Snow Parkway to Regional Road 25?	There are no sound barriers or noise mitigation structures required for this Project. A Noise Assessment was completed during the Preliminary Design stage of the Project (2013) and was updated in 2018 to identify potential noise effects of the improvements based on traffic volumes anticipated in 2041. The assessment was completed in accordance with the MTO Environmental Guide for Noise (October 2006) to identify areas where noise levels from the highway would exceed MTO's criteria, i.e. a change in noise levels greater than 5 dBA or levels greater than 65dBA overall. The assessment determined that the operational noise levels due to the to the proposed improvements will have a minor to negligible perceived noise increase in most noise sensitive areas within the Project limits and that no permanent noise mitigation was required. DCRs include additional information related to construction noise mitigation for the Project early works. WCC will also be using asphalt to pave the highway, which is quieter than paving with concrete.
Property Impacts	General and specific inquiries about impacts to properties.	All property for this Project has been acquired by MTO following the Preliminary Design that was undertaken in 2013. Clarification provided to stakeholders regarding specific property inquiries.
Design	Roadway lighting should be selected and installed to reduce light pollution.	The highway lighting system includes high mast poles at a height of 35m to curtail spill lighting, LED lighting which is directional in nature and prevents light pollution in the sky, and in specific areas that are more sensitive to light, WCC will be using shielding to control light spill and wattage of luminaires have been reduced by 25%.
Design	Suggestion to remove the Sixth Line bridge and have cul-de-sacs on both ends of Sixth Line.	The preliminary design for all local crossing roads was completed and approved in 2013 and will not be significantly changed as per the suggestion.
Design	Suggestion to construct a full interchange between Fifth Line and Sixth Line.	The preliminary design for all interchanges was completed and approved in 2013 and will not be significantly changed as per the suggestion.
General	Can the Project limits be extended to include the future Tremaine Road interchange?	The Project limits was determined in the Preliminary Design conducted in 2013 and will not be extended or revised for this Project.

Category	Comments Received	WCC's Response
Other Projects	What is the timing of the interchange at Highway 401 and Tremaine Road?	The Highway 401 and Tremaine Road interchange is not included within our Project limits. The timing of the interchange will be related to widening of Tremaine Road which is being managed by Halton Region.
Other Projects	Why is the Second Line Bridge Project not progressing?	The Second Line Bridge is not within our Project limits. More information on that project can be found at http://www.401mavis.ca/.
Other Projects	Inquiring about Blue Sky Crescent and Guildwood Way.	Stakeholder was advised to contact the City of Mississauga about local roadway works.

4 Detailed Description of DCR No. 2 Design and Construction

The works in DCR No. 2 includes Civil Works, including roadway design, drainage and stormwater management, supplemental civil works, structures, and traffic and construction staging. The Recommended Plan and relevant drawings can be found in **Appendix B** and **Appendix C**.

4.1 Roadway Design

4.1.1 Highway Widening

The existing Highway 401 within the Project limits carries six lanes of traffic (three per direction) through Mississauga, Milton and Halton Hills.

The proposed Highway 401 will widen the existing six lanes to either 10 or 12 lanes total, with one High Occupancy Vehicle (HOV) lane in each direction. The 10 lane sections will include five lanes in each direction. The 12 lane sections will utilize the Core-Collector system, with three lanes in the Core and three lanes in the Collector, for a total of six lanes in each direction. Figures 3 and 4 show typical cross sections for the 10-lane and 12-lane sections. While lane widths will be consistent throughout, median and shoulder widths will vary throughout the corridor. Throughout the entire Project limits the median separation will be by means of concrete barrier.

The horizontal alignment of Highway 401 will generally remain as per existing with a few minor adjustments for improved safety. Minor horizontal lane shifts will be required throughout the corridor to accommodate infrastructure that is to remain in place such as bridges and culverts. The Highway 401 vertical alignment will also generally match existing conditions but will require some adjustments to accommodate drainage requirements, meet clearances at existing bridges and simplify construction staging operations.

At the east and west Project limits, the roadway design will properly tie-in to match the existing highway alignment and cross section for a seamless transition.

WCC's design is flexible (asphalt) pavement which will be utilized throughout the corridor, with the exception of the ramps in the Highway 401 and Highway 407ETR area, where rigid (concrete) pavement will be utilized for consistency with existing conditions on Highway 407ETR.

Figure 3: Typical 10 Lane Cross Section

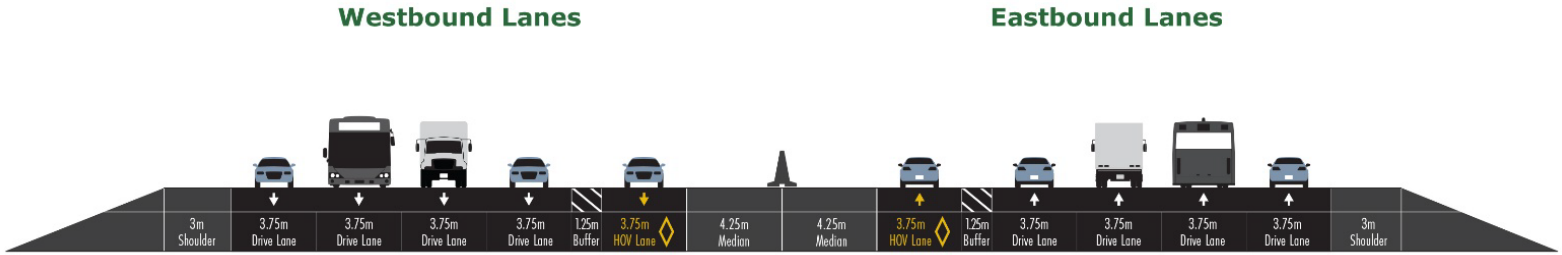
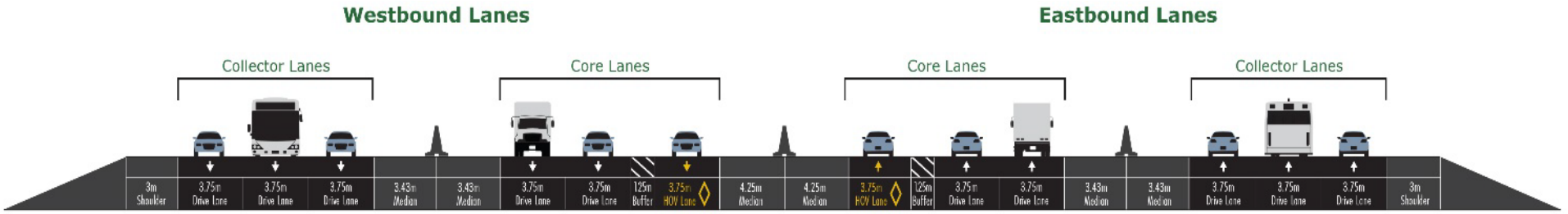


Figure 4: Typical 12 Lane Cross Section



4.1.2 Roadside Safety

All aspects of the roadway design attempt to maximize traffic safety, the safety of the public and the safety of the construction workforce throughout the construction period. The design endeavors to provide a barrier-free corridor as far as practically possible (i.e. minimize the use of guiderail and concrete barrier) and to follow 'clear zone' principles for protection of roadside hazards as per MTO standards. Side slopes have been flattened where possible, rather than implementation of non-traversable, steep slopes. Where permanent embankments cannot be flattened due to the surrounding terrain, roadside protection (guiderail or concrete barrier) has been provided.

4.1.3 Interchanges, Local Road Realignments, and Cul-de-Sacs

There are 5 'parclo A-4' (partial cloverleaf) interchanges along Highway 401 that will require reconfiguration due to highway widening: Regional Road 25, James Snow Parkway, Trafalgar Road, Winston Churchill Boulevard and Mississauga Road. Refer to **Figure 5** for a typical interchange layout. There is also one freeway-to-freeway interchange at Highway 401 and Highway 407ETR that will be modified to accommodate the widening of the highway.

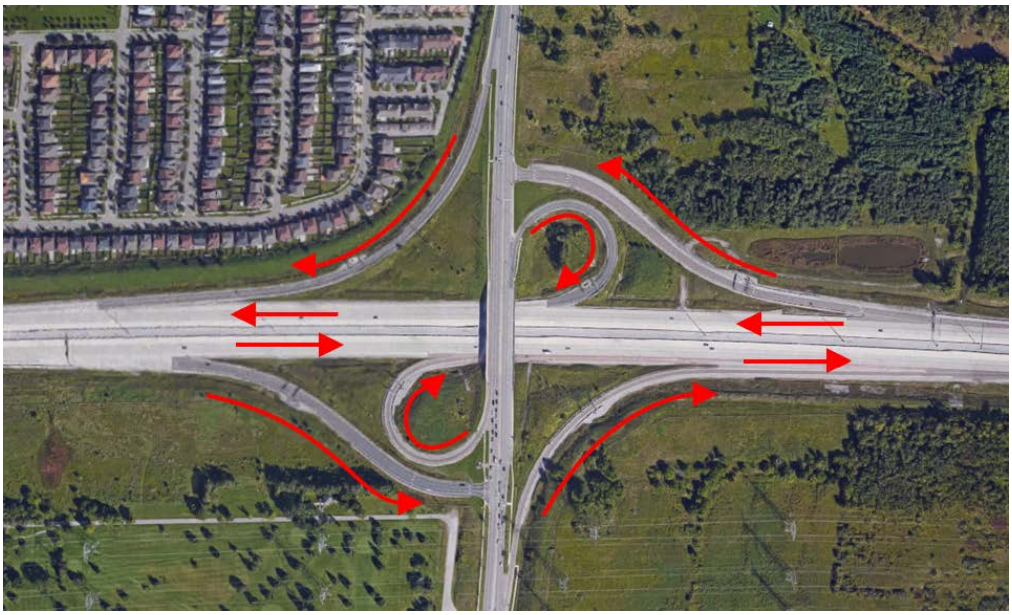


Figure 5: Typical 'Parclo A-4' Interchange

Minor crossing road realignments will also be required north and south of Highway 401 at Sixth Line and Creditview Road. These realignments are required so that the local

roadway and approaches can tie into the new offline replacement structures at each of these locations.

Cul-de-Sacs will also be modified at Eighth Line, north and south of Highway 401.

4.2 Structures

DCR No. 2 works includes several bridges, structural culverts and retaining walls within the corridor. The designs for the proposed structures covered by this DCR conform to MTO design standards, including appropriate geometries, widths, and clearances. General Arrangement Drawings for these structures can be found in **Appendix C.**

4.2.1 New Structures

4.2.1.1 Ramp Hwy 407E-Hwy401W over Hwy 401WB Collector Structure (Basketweave)

The proposed new 'Basketweave' Ramp structure (Site 10X-0726/B0) will be located at the Highway 401 and Highway 407ETR interchange. The proposed structure will carry traffic from Highway 407ETR East to Highway 401 West over the future-realigned Highway 401 westbound Collector of the widened Highway 401.

The proposed new structure is a single-span rigid frame with a clear span of approximately 14m. The total length of the structure is approximately 69m and will carry two traffic lanes.

The design of the proposed structure has been provided, for review, to 407ETR. Consultation and coordination with 407ETR will continue throughout the Project.

4.2.2 Bridge Replacements

4.2.2.1 Sixth Line Underpass Bridge

The existing Sixth Line Underpass Bridge (Site 10X-077/B0) is a four-span concrete T-beam bridge constructed in 1958, with a total length of 62.2m. The total width of the structure is 10.5m and carries two lanes of Sixth Line traffic over Highway 401. The structure was rehabilitated in 2009.

The work at the Sixth Line Underpass includes replacing the existing structure with a three-span continuous bridge to the west, to accommodate two lanes of traffic, paved shoulders, and parapet walls with railings. The proposed structure has a total length of approximately 94m and a total deck width of approximately 12m. The existing structure will be demolished with the existing foundations being removed just below the existing ground elevation.

4.2.2.2 Oakville Creek East Bridge

The Oakville Creek East Bridge (Site 10X-0078/B1 & B2) is located approximately 90m east of Sixth Line, crossing the Oakville Creek East Branch watercourse. The existing structure is a single-span rigid frame structure originally constructed around 1958. The span of the bridge is 15.3m. The total width of the structure is 37.90m and carries six traffic lanes of Highway 401 over the branch of Oakville Creek East.

The work at the Oakville Creek East Bridge includes replacing the existing structure with two single-span integral abutment bridges that will accommodate twelve traffic lanes in a Core-Collector system on Highway 401. The proposed structures have an overall approximate span of 28m and an overall approximate width of 39m each. Each new structure will carry six traffic lanes of Highway 401 in each direction. The existing structures will be demolished just below the existing ground elevation.

The Oakville Creek East Bridge is within a major valley and riparian corridor at the Sixteen Mile Creek Middle East Branch watercourse. The proposed bridge design is substantially larger than existing and accommodates wildlife passage, generally 4m wide and 2.5m high, on each side of the watercourse, and will attempt to achieve an openness ratio of 1. The wildlife passage is intended to provide connectivity for a range of wildlife, but particularly for White-tailed Deer, thus natural substrates (avoid rip-rap or sharp rock protection) more conducive to animal movement and ungulates will be used. Gentle slopes will be incorporated, where possible, to guide wildlife to the passage. Steep slopes will be incorporated, where applicable, between the structure and the highway to discourage wildlife from climbing to the highway. Further wildlife passage enhancements for this structure are noted in Section 5.1.2 and in the future DCR No. 3.

4.2.2.3 Creditview Road Underpass Bridge

The existing Creditview Road Underpass Bridge (Site 24X-0127/B0) is a four-span concrete girder bridge, built in 1958, with a total length of 62.0m. The existing bridge deck has a total width of 10.4m and carries two lanes of Creditview Road traffic over Highway 401. The original bridge was rehabilitated in 2003.

The bridge has been subject to repeated vehicle impact damage due to the low clearance along the west side of the structure. Previous damage has included damaged sections of concrete and damage to embedded reinforcing steel. Previous repairs have included adding additional reinforcement and splicing of damaged steel reinforcement.

The minimum vertical clearance provided for Highway 401 traffic under the existing bridge is currently posted at 4.3m under the westbound lanes, which is significantly below the required 5.0m minimum vertical clearance. The existing bridge cannot accommodate the proposed realignment and widening of the Highway 401.

The existing bridge will be replaced with a three-span continuous bridge constructed offline to the east of the existing structure, which will accommodate four lanes of traffic lanes, paved shoulders, and parapet walls with railings on each side with a 2m sidewalk on the east side and a 3.5m multi-use trail on the west side. The proposed structure has a total length of approximately 106m and a total deck width of approximately 22m. The proposed bridge will also provide the required vertical clearance. Creditview Road will be realigned to accommodate the new structure (as noted in Section 4.1.3). The existing structure will be demolished with the existing foundations being removed just below the existing ground elevation.

4.2.2.4 Credit River Bridge

The Credit River Bridge (Site No. 24X-0128/B1, B2, B3 & B4) is located approximately 200m east of Creditview Road, crossing over the Credit River. The existing bridges are twin three-span continuous concrete T-beam bridges built in 1957 with a total length of 67.98m. The total width of the existing structures is 33.0m and carries six traffic lanes of Highway 401 over the Credit River. The original bridges were rehabilitated in 1977 and again in 1990.

The work at the Credit River Bridge includes replacing the existing twin bridges with four new bridges that will accommodate traffic on the westbound Collector, westbound Core, eastbound Core and eastbound Collector. Each structure is a three-span continuous integral abutment bridge with a total length of approximately 83m each and a total deck width of approximately 19m – 23m. Each structure will carry three traffic lanes, paved shoulders and barrier walls with railings.

The existing structures will be demolished just below the existing ground elevation. The existing farm access located under the Credit River Bridge will be realigned under the new east end span.

The Credit River is direct fish habitat, including American Eel (Species at Risk) and Atlantic Salmon. Refer to Section 5.1.3 and 5.1.4.1 for further discussion.

The Credit River Bridge is within a major valley and riparian corridor. The proposed bridge design is substantially larger than existing and accommodates wildlife passage, which also addresses an EA commitment carried over from Preliminary Design. Dry passage for wildlife, approximately 4m wide and 4m high, on each side of the watercourse, and will provide an openness ratio of 4.4. The wildlife passage is intended to provide connectivity for a range of wildlife, but particularly for White-tailed Deer, thus natural substrates (avoid rip-rap or sharp rock protection) more conducive to animal movement and ungulate footing will be used. Gentle slopes will be incorporated to guide wildlife to the passage, where possible. Steep slopes will be incorporated, where

applicable, between the structure and the highway to discourage wildlife from climbing to the highway. Further wildlife passage enhancements for this structure are noted in Section 5.1.2 and in the future DCR No. 3.

4.2.3 Bridge Rehabilitations and/or Widening

4.2.3.1 Ninth Line Underpass Bridge

The existing Ninth Line Underpass Bridge (Site 10X-0542/B0) is a two-span continuous pre-stressed concrete CPCI 1900 girder bridge built in 1997 with a total length of 81.9m. The total width of the structure is 12m and carries two lanes of Ninth Line traffic over Highway 401.

The work at the Ninth Line Underpass Bridge includes rehabilitating the existing structure and constructing new toe walls to accommodate the widening of the Highway 401. Rehabilitation work includes deck repairs, new asphalt and waterproofing, new approach slabs and new barrier walls on RSS walls.

4.2.3.2 Winston Churchill Boulevard Underpass Bridge

The existing Winston Churchill Boulevard Underpass Bridge (Site 10X-0098/B1 & B2) consists of twin two-span continuous post-tensioned concrete circular voided slab bridge structures built in 1987 with a total length of 89.0m each. The total width of the twin structure is approximately 30.0m and carries six traffic lanes of Winston Churchill Boulevard over the Highway 401.

The work at the Winston Churchill Boulevard Underpass Bridge includes rehabilitating the original structure and constructing new toe walls to accommodate the widening of the Highway 401. Rehabilitation work includes deck repairs, new asphalt and waterproofing, new approach slabs and installation of new expansion joints.

4.2.3.3 Derry Road Overpass Bridge

The existing Derry Road Overpass Bridge (Site 24X-0124/B1, B2, B3 & B4) are twin two span reinforced concrete rigid frames constructed in 1996, with a total length varying from 40.2m to 40.5m. The structure carries five traffic lanes of Highway 401 EBL and six traffic lanes of Highway 401 WBL over Derry Road. Six traffic lanes of Derry Road are accommodated under the bridges.

The work at the Derry Road Derry Road Overpass Bridge includes rehabilitating the original structure and widening the existing structures to accommodate the widening of the Highway 401. The proposed new structures consist of two new two span continuous reinforced concrete rigid frames with similar spans to the existing rigid frame structures. The widened bridge will accommodate twelve lanes on Highway 401, with six traffic

lanes in both the eastbound and westbound directions. The minimum vertical clearance provided by the new structures is approximately 4.80m.

4.2.4 Structural Culvert Replacements

4.2.4.1 Sixteen Mile Creek east of Regional Road 25 Structural Culvert

Sixteen Mile Creek east of Regional Road 25 Culvert (Site No. 10X-0368/C0) is located approximately 320m east of the Highway 401 and Regional Road 25 interchange. The existing structure is a cast-in-place concrete rigid frame box culvert (construction year unknown). The structure is in a south-to-north orientation. The length of the existing structure is approximately 82.5m long, with a span of 3.7m and height of 1.8m.

The existing culvert conveys a fishery supporting tributary of the west branch of Sixteen Mile Creek that is also designated as Redside Dace (Species at Risk) Occupied Habitat. More details on the environmental sensitivities of this watercourse can be found in Section 5.1.3 and 5.1.4.

The proposed culvert is an open footing rigid frame, with clear span 6.0m and height of 2.0m. The existing Town of Milton pond and weir north of the culvert will not be impacted.

4.2.5 Retaining Walls and Toe Walls

Several locations through the corridor requires construction of retaining walls or toe walls (a low wall) to support new infrastructure, slopes and soil (see **Appendix B** for locations).

4.2.5.1 Regional Road 25 Off-Ramp Retaining Walls

The Regional Road 25 Off-Ramp retaining walls will be cast-in place with a total length of approximately 70m. The height of the cast-in-place retaining walls varies along the length, with the greatest exposed height being approximately 3m above grade.

4.2.5.2 Highway 407 Retaining Wall

A retaining wall, with a total length of approximately 200m, will be constructed to retain the grade between the Highway 407 ramp and Highway 401. The height of the retaining wall varies along the length, with the greatest exposed height being approximately 3m above grade.

4.2.5.3 East of Derry Road Retaining Wall

A retaining wall to the east of Derry Road and on the southside of Highway 401 has a total length of approximately 160m and will be constructed to retain the Highway 401.

The height of the retaining wall varies along the length, with the greatest exposed height being approximately 7m above grade.

4.2.5.4 West of Mississauga Road Retaining Wall

A retaining wall to the west of Mississauga Road on the northside of Highway 401 has a total length of approximately 190m and will be constructed to retain the Highway 401. The height of the retaining wall varies along the length, with the greatest exposed height being approximately 2m above grade.

4.2.5.5 Highway 401 EB Off-Ramp to Mississauga Road Retaining Wall

The existing Highway 401 Eastbound Off-Ramp to Mississauga Road Retaining Wall (Site 24X-0793/W0) is located approximately 200m west of Mississauga. The height of the cast-in-place retaining wall varies along the length, with the greatest exposed height being approximately 2.5m above grade. The Off-Ramp to Mississauga Road requires rehabilitation of the existing retaining wall such as concrete repairs.

4.2.5.6 Toe Walls

The following locations require construction of toe walls to support existing slopes:

- James Snow Parkway Structures (Site 10X-0312/W0)
- Highway 401 Underpass at Highway 407ETR WBL (Site 10X-0539/W0)
- Highway 401 Underpass at Highway 407ETR EBL (Site 10X-0540/W0)

4.2.6 Bridge Aesthetics

Embossments on the wingwalls will be included on the Trafalgar Road Underpass Bridge (discussed in DCR No. 1), Sixth Line Underpass Bridge, and Creditview Road Underpass Bridge. Embossments will be placed on the wing walls and the following alternative design concepts were developed in consideration of the environmental and historical significance of the area:

- Monarch Butterfly, Black Walnut tree, and Salmon - which are common in the surrounding natural environment.
- Crop or Farming Equipment - recognition of the historical farming operations in the area.

There will also be architectural detailing in a brick-like pattern on the parapet walls at the three bridges listed above. The design of the embossments will be developed for inclusion in DCR No. 3.

4.3 Drainage and Stormwater Management

Drainage and Stormwater Management (SWM) strategies have been developed with the aim of minimizing the potential impacts, in terms of both water quantity and quality, of the proposed highway expansion on the natural environment and existing drainage infrastructure, while ensuring an adequate roadway drainage system is incorporated as part of the overall improvements.

Existing Conditions

The existing drainage system within the Project limits consists of catch basins, storm sewers, roadside ditches, culverts and SWM facilities. Generally, runoff from the existing highway right-of-way (ROW) is conveyed through catch basins, median and lateral storm sewers and roadside ditches. Runoff from the interchange areas and crossroads are mainly managed by curb and gutter, roadside ditches and interchange culverts.

At the Highway 407ETR/Highway 401 interchange area, there are six existing stormwater management ponds (SWMP), though only three of those SWMPs are within the Project Limits. These stormwater facilities have been designed and constructed to provide water quality, water quantity and erosion control for the runoff from Highway 407ETR and two of the ponds, Ponds 1 and 3, currently accept flow from Highway 401.

Drainage and SWM Approach

The proposed design of the widened highway includes upgraded drainage facilities to accommodate an increase in flows resulting from increased surface area of the widened highway and to maintain existing drainage patterns and discharge points.

Runoff quantity control will be achieved through a combination of roadway drainage and SWM Ponds. Runoff quality control will be achieved using a ‘treatment train’ approach, which utilizes multiple best management practices in sequence to meet stormwater management objectives. Quality control will meet the MECP Stormwater Management Planning and Design Manual (2003) criteria for Enhanced Protection, which provides equivalent to 80% Total Suspended Solids (TSS) removal.

Proposed Drainage and SWM Design

The proposed drainage and SWM system will consist of new storm sewer systems, new interchange culverts, ditches, catch basins and stormwater facilities. This includes:

- Existing storm sewer system on the Highway 401 mainline will be replaced;

- The remaining storm sewer system along municipal crossing roads or ramps within the Project limits will be retrofitted or replaced where the existing systems cannot meet the current standards;
- Roadside ditches will be regraded to the required bottom width to provide positive drainage toward existing discharge points. A series of flat bottom ditches with flow control structures (also called detention ditches) along the foot of the highway embankments are proposed to control runoff flow quantities;
- Ditches that will be impacted by the proposed roadway improvements will be relocated with matching geometry/capacity of the existing ditches;
- Runoff leaving the roadway will be directed to enhanced swales and flat-bottom grassed ditches which provide water quality treatment, detain stormwater runoff, and can aid in spill containment;
- Culverts will be fully or partially replaced, extended, receive inlet improvements and/or removed, where required, to accommodate the highway widening. This includes:
  - Box and circular non-structural culverts made from either concrete, high-density polyethylene (HDPE), or corrugated steel pipe (CSP). Non-structural culverts are sized according to flows and drainage and to minimize flooding.
  - Larger structural culverts described in Section 4.2.4 and DCR No. 3.
  - Where required, the drainage design of culverts also meets fisheries and aquatic SAR requirements and incorporates fluvial geomorphological considerations. (refer to Section 5.1.3 and 5.1.4.1).
- Two new wet SWMPs: one south of Highway 401 to the west of Fifth Line (approximate top of pond surface area of 5510 m^2 and depth of 5 m), and one south of Highway 401 to the west of Sixth Line (approximate top of pond surface area of 8535 m^2 and depth of 5 m). These ponds will provide stormwater quantity and quality control on the west end of the Project limits;
- Modifications (retrofitting) will also be undertaken at two existing wet ponds near the Highway 401 and Highway 407ETR interchange (approximately 0.8ha at 407ETR Pond 1 (online pond) and approximately 0.1ha at 407ETR Pond 5 (offline pond)) to address requirements resulting from losing storage capacity. Pond cleanout will occur at 407ETR Pond 3 (online pond); and,
- Erosion and sediment control considerations for structure and pond designs will be integrated, where required, and includes, scour protection and pond inlet/outlet stabilization. Erosion and sediment control mitigation during construction is described in Section 5.

Key drainage design features are shown in **Appendix B** and **Appendix C**. Drainage design elements (i.e. culverts, online ponds) that have fisheries considerations are discussed in Section 5.1.3.

4.4 Construction Staging

Construction staging for the proposed works aims, as far as practically possible, to maintain traffic flow and minimize traffic impacts throughout the Project during construction. Construction staging takes into consideration the peak and off-peak traffic hours within the Project limits. Off-peak hours on mainline Highway 401 are generally from 10:00PM – 5:00AM eastbound and 11:00PM – 6:00AM westbound. The mainline Highway 401 refers to the existing six lanes on Highway 401, excluding the on and off ramps and the crossing roads (local roads that cross over or under the highway).

Construction for DCR No. 2 works on mainline Highway 401 will generally be undertaken in two construction stages. Stage 1 of construction, anticipated to begin in Winter/Spring of 2020, includes constructing new lanes on the outside of the highway (i.e. to the north and south of the existing Highway 401). Once the new lanes are completed, Stage 2 will be implemented, which includes diverting traffic to the new constructed lanes on the outside and commencing reconstruction of the existing, inside lanes. During peak traffic hours, six lanes will be maintained on mainline Highway 401 at all times, as per existing conditions. There will be short term closures, including full overnight closures, of some interchange ramps for the delivery of equipment and materials. Some off-ramps will be reduced to a single lane throughout construction.

Construction of bridges and other structures is also anticipated to begin in Winter/Spring 2020; anticipated staging and potential traffic disruptions areas outlined below:

- Sixth Line Underpass Bridge – New structure will be built to the west of the existing structure. The existing structure will be maintained during construction.
- Oakville Creek East Bridges – Bridge replacement will be completed in two stages with the outside of the bridge being completed in stage 1 and the inside of the structure in stage 2.
- Ninth Line Underpass Bridge – Bridge rehabilitation will be completed in two stages. Traffic will be reduced from 2 lanes to 1 lane for the duration of work to a single lane. Signage will be provided, as required.
- Winston Churchill Boulevard Underpass Bridge – Bridge rehabilitation will be completed in four stages. Lane reductions will be necessary to complete the works. Four through lanes (two in each direction) will be maintained during peak hours throughout construction.
- Derry Road Overpass Bridges – Structures will be widened as part of the mainline Highway 401 staging. Lane reductions will be necessary to complete the works. Four through lanes (two in each direction) will be maintained during peak hours.
- Creditview Road Underpass Bridge – New structure will be built to the east of the existing structure. Creditview Road was reduced to a single lane (southbound traffic only) in December 2019. Detour signage is provided.

- Credit River Bridges – Bridge replacement will be completed in two stages with the outside of the bridge being completed in stage 1 and the inside of the structure in stage 2.
- For the bridge demolitions at Sixth Line Bridge, Creditview Road Bridge, and Trafalgar Road Bridge (covered in DCR No. 1), temporary, full closure of Highway 401 will be required. A formal signed detour with appropriate signage will be provided. The demolitions will be undertaken overnight to minimize impacts to highway traffic and are anticipated to take one night each. Notification of the closure will be provided to the public, key stakeholders, and to those on the Project Contact List.
- Construction activities may result in temporary closures of sidewalks during construction. Where sidewalks are impacted, pedestrian traffic will be maintained where possible, and signage will be placed to direct pedestrians to a safe route.

Traffic closures will be communicated using standard construction signage and/or Portable Variable Message Signs (i.e. electronic signing). WCC will communicate upcoming traffic disruptions, detours and road closures on the Traffic page of the Project website (http://401expansion-mississauga-milton.ca/) and through email blasts sent to those who subscribe to Project updates.

4.5 Supplementary Works

4.5.1 Commuter Carpool Lots

DCR No. 2 works includes the following provisions for commuter carpool lots:

- New Trafalgar Road Commuter Carpool Lot (Northwest Quadrant) with a minimum of 330 new parking stalls
- New Winston Churchill Boulevard Commuter Carpool Lot (Northwest Quadrant) with a minimum of 146 new parking stalls
- Expansion of the existing Mississauga Road Commuter Carpool Lot (Northwest Quadrant) which currently has 73 parking spaces and will be expanded to a minimum of 128 parking spaces

Accessible parking stalls are included in all commuter carpool lots. The proposed commuter carpool lot layouts are shown in **Appendix B**.

4.5.2 Active Transportation

The following active transportation provisions are included in the Project:

- Multi-use path along the west side of Creditview Road at Highway 401.

- Provision for future bike lanes on Regional Road 25 and the Trafalgar Road Underpass Structure, though the bike lane itself will not be constructed as part of this Project.

4.5.3 Illumination

Existing lighting within the corridor consists of conventional off ramp partial illumination at the five crossing road interchanges within the Project limits, and a section of high-mast illumination through the Highway 401-Highway 407ETR interchange.

Corridor-wide continuous high-mast lighting will be provided along mainline Highway 401 and at the following interchange locations:

- Regional Road 25
- James Snow Parkway
- Trafalgar Road
- Winston Churchill Boulevard
- Mississauga Road

Modifications to the high-mast lighting within the MTO ROW at the Highway 407ETR interchange will also be implemented. The high-mast lighting for this Project will be designed to tie into the lighting adjacent to the project limits. High-mast lighting locations are shown in **Appendix B**.

The following design considerations were incorporated to reduce light spill along the corridor:

- High mast poles at a maximum height of 35m along 401 mainline.
- LED lighting.
- In specific areas that are more sensitive to light, WCC will be using shielding to control light spill, and also wattage of luminaires has been reduced.

Lighting will also be provided/replaced at overpass and underpass structures at:

- Regional Road 25
- Steeles Avenue
- James Snow Parkway
- Trafalgar Road
- Winston Churchill Boulevard
- Mississauga Road
- Creditview Road
- Derry Road

The existing Highway 401 underpass lighting will be replaced with LED luminaires. Full LED lighting will also be provided at the Trafalgar Road, Winston Churchill Boulevard and Mississauga Road commuter carpool lots.

4.5.4 Intelligent Transportation System/Advanced Traffic Management System

The proposed ITS will provide full coverage with CCTV cameras located at each interchange and local road crossing plus a few locations in between. Four full size Variable Message Signs (VMS) will be located in the eastbound direction and one in the westbound direction before transfer lanes or the initiation of the express/collector roadways. Two small eastbound pole mount VMS will provide travel times. Non-intrusive traffic detectors will be deployed throughout the project to determine traffic volumes, speeds and density. Bluetooth detectors will be used to determine, and report, travel times between interchanges.

4.5.5 Signage

New traffic signs will be installed throughout the corridor. All interchanges will be upgraded to have overhead signs to make navigation easier and safer. Additional ground mounted signs will also be installed as required.

4.5.6 Truck Inspection Stations

The existing eastbound and westbound Truck Inspection Stations located on Highway 401, which have previously been decommissioned, will be demolished at the end of this Project. The Truck Inspection Stations will be used during construction as a staging/storage area.

4.6 Hornby Creek Realignment

Hornby Creek, east of Sixth Line, requires creek realignment to the north of Highway 401 to accommodate the widened highway. A fluvial geomorphological assessment was undertaken to determine an appropriate design for the new creek alignment. Realignment of Hornby Creek is anticipated to occur “in the dry” and connections/tie-ins to existing watercourses will occur as per in-water timing windows. The realigned channel will be longer than the existing and includes riffles and pools varying residual depths to provide habitat and flow diversity and energy dissipation. The radius of most meander bends is intended to minimize bank erosion. Tighter bends are intended to promote undercut banks. An overall reduction in sediment loading is anticipated to the drainage system. The channel realignment design minimizes impacts to trees and shrubs by being placed within the existing cultural meadow community and avoiding the deciduous forest (including Bat SAR habitat) and cultural thicket communities wherever

possible. The realignment incorporates a more natural planform and will result in a more stable channel and potential reduction in sedimentation. Following construction activities, the surrounding area will be restored (to be described in DCR No. 3). Refer to **Appendix C** for the proposed design. Further fisheries discussion is included in Section 5.1.3.

4.7 Utilities

Coordination with utility service providers will be ongoing throughout the Project.

For the works in DCR No. 2, key considerations included any potential protection measures for works occurring near existing utilities and potential utility conflicts along the Highway 401 corridor. Where utility impacts cannot be avoided, relocation of utilities will take place prior to the highway construction. Utility stakeholders potentially affected by the works in DCR No. 2 include:

- Alectra
- Aptum Technologies (previously known as Cogeco Peer 1)
- Bell Canada
- Bell 360
- CN Rail
- CP Rail
- Enbridge Gas
- Freedom Mobile
- Halton Region (water and wastewater infrastructure)
- Halton Hills Hydro
- Hydro One Networks Inc.
- Hydro One Telecom
- Milton Hydro
- Mississauga Hydro
- Peel Region (water and wastewater infrastructure)
- Rogers
- Zayo
- TransCanada Hydro
- TransCanada Pipeline
- Union Gas

Correspondence was received from TransCanada Pipeline (TCPL) regarding TransCanada and National Energy Board requirements for activities in proximity to pipelines. WCC has obtained a TCPL Crossing Permit for works in TCPL's ROW and will be meeting all TCPL requirements.

4.8 Design Refinements

As part of the detail design process, refinements were made to the Preliminary Design to account for changes in site conditions, updates to standards and guidelines, further

development of design, optimization of the construction approach to minimize impacts, and to avoid property impacts. Key design refinements related to works in DCR No. 2 are:

- Roadway design refined to meet current Transportation Association of Canada (TAC) safety standards with MTO Supplementary Standards.
- Realigning the Trafalgar Road interchange and local road to optimize staging of the structure replacement and reduce impacts to the public.
- The Sixth Line Underpass Bridge was changed from a two-span to three-span structure and will be built to the west of the existing structure, which will be maintained during construction. These refinements reduce staging conflicts, traffic impacts, and provide improved safety during construction.
- The Credit River Bridge overall bridge length was reduced but remains a three-span bridge. The optimized design maintains the piers out of the water, meets all hydrological requirements, and provides fish passage, wildlife passage and farm access.
- Elements of the interchange, roadway grading, drainage and structural culvert design near Regional Road 25 have been optimized to minimize impacts to Redside Dace SAR Habitat. Refer to Section 5.1.4.1 for further discussion.

5 Environmental Impacts, Mitigation and Commitments

5.1 Natural Environment

5.1.1 Terrestrial Ecosystems – Vegetation

Existing Conditions

During the Preliminary Design, desktop and field investigations were undertaken to complete an inventory of existing natural environment conditions (URS 2013a, URS 2013b, AMEC 2011, AMEC 2012). Ecological investigations included Ecological Land Classification (ELC) System (Lee et al. 1998) vegetation communities' identification, breeding bird surveys, plant and wildlife inventories, and visual searches for Significant Wildlife Habitat (SWH). Additional field investigations were undertaken in 2017 and 2018 to confirm previous findings and determine the presence of bat SAR (AECOM, 2018d, AECOM 2018e). These investigations included ELC identification, wildlife observations and monitoring, tree inventories, SWH and SAR habitat assessment, and bat acoustic surveys. During 2019, WCC completed field investigations to confirm key existing conditions, inventory for removals, reconfirm location of rare plants and invasive species, and identify suitable vegetation salvage opportunities. Seed harvesting for Black Walnut trees was also completed for future landscaping and plantings.

The Project limits are largely represented by commercial, agricultural, industrial and residential properties. Natural areas throughout the Project limits are mostly fragmented and isolated from other natural areas by the existing highway, roads, agricultural lands or developed areas. Natural areas were the focus of ELC investigations completed in 2018 and include Deciduous Forest (FOD), Mineral Cultural Woodland (CUW1), Mineral Cultural Meadow (CUM1), Mineral Cultural Thicket (CUT1), Mineral Shallow Marsh (MAS2), and Mineral Meadow Marsh (MAM2) vegetation types. Specifically, 21 different ELC vegetation communities were represented across the Project limits.

211 vascular plants were also recorded within the vegetation communities. No provincially or federally designated SAR or provincially rare plants were identified.

Given the highly urbanized nature of the lands adjacent to the highway, a high proportion of vegetation in the Project limits are non-native and invasive plant species. In particular, Common Reed (*Phragmites*) is present throughout the Project limits. Sensitive environmental areas within the Project limits (described in DCR No. 1) include Redside Dace Regulated Habitat, SAR American Eel Watercourse (Credit River), Non-SAR fisheries watercourses, SAR Bat Habitat, Significant Wildlife Habitat, Edge Management Areas, Valley Corridors, Hornby Creek and Mullet Creek Watercourse Realignment Areas, and the Mitigation Lands. Portions of some of these features have been designated as Environmental Protection Zones and will not be disturbed during construction. Discussion about these sensitive environmental areas, as it pertains to DCR No. 2 works is described in subsequent sections. As per the mitigation measure in DCR No. 1, the realignment of Hornby Creek was designed to minimize the number of trees impacted. The new alignment was placed within the existing cultural meadow community and avoids the deciduous forest (including Bat SAR habitat) and cultural thicket communities wherever possible.

Impacts

Vegetation clearing and grubbing, which was covered in DCR No. 1 and commenced in October 2019, will be completed in advance of the specific works in DCR No. 2, as required. Thus, there are minimal vegetation impacts anticipated in relation to works in DCR No. 2. The additional ELC impact as part of DCR No. 2 works is related to the “Open Aquatic (OAO)” ELC classification given to the two existing 407ETR Ponds that will be retrofitted.

During construction activities there could be potential impacts to vegetation adjacent to the construction zone that may be impacted by construction machinery. Potential impacts include damage to adjacent trees and roots, soil compaction, increased erosion and sediment risks, and spread of invasive species.

Mitigation Measures

Measures to minimize the impacts to vegetation are:

- Apply standard erosion and sediment control (ESC) measures consistent with Ontario Provincial Standards and Specifications (OPSS). These control measures will be implemented prior to work and be maintained during construction until disturbed areas have been effectively stabilized with permanent vegetation cover. (Refer to Section 5.2).
- Provide clear delineation of vegetation clearing zones and vegetation retention zones (e.g. EPZs, Mitigation Lands, treed natural areas) within the Project limits in both the design documents and in the field to minimize the risk of vegetation impacts outside of the Project limits and avoid incidental impacts as a result of temporary stockpiling, debris disposal and access. Equipment, materials and other construction activities will not be permitted in these zones.
- Prior to heavy machinery working adjacent to EPZs, Mitigation Lands, treed natural areas or edge management areas, tree protection fence will be installed outside the drip-line to protect any vegetation that is to be retained and is in the vicinity of exposure to damage by machinery or other sources.
- Installation of tree protection fencing will be in accordance with Ontario Provincial Standard Specification (OPSS) (OPSS 801.07.02) – Construction Specification for the Protection of Trees and Ontario Provincial Standard Drawing (OPSD) 220.010 (formerly OPSS 805).
- Prune roots or adjacent trees that are to be retained but extend into the work limits and that may be damaged from construction.
- Equipment and heavy machinery will be stored away from naturalized areas to minimize damage to natural areas outside of the work limits.
- Where possible, earth movement will be restricted immediately adjacent to woodlands during periods of high dust generation.
- Avoid the compaction of soils and root zones around trees within natural features.
- Vegetation communities occurring outside but adjacent to the Lands (identified as Edge Management Areas) will be protected with tree protection fence.
- In the event that adjacent vegetation communities or planted trees are accidently damaged during construction activities, WCC will implement contingency measures such as pruning tree limbs or roots that are accidently damaged using proper arboricultural techniques during grading and excavation.
- Equipment working in invasive species locations will be thoroughly cleaned prior to moving from the site as per the Clean Equipment Protocol for Industry (Halloran et.al, 2013).

5.1.2 Terrestrial Ecosystems – Wildlife and Wildlife Habitat

In addition to the background review undertaken during Preliminary Design, additional field studies were conducted in 2017 and 2018 to identify potential wildlife and wildlife habitat within the Project limits (URS, 2013a, URS, 2013b, AECOM, 2018d, AECOM 2018e). Field investigations included amphibian breeding surveys, various bird surveys, Significant Wildlife Habitat (SWH) assessment, bat surveys and monitoring, and wildlife passage monitoring.

The broader landscape of the Highway 401 corridor in the Project limits provides habitat for tolerant urban-adapted species (e.g., generalist bird and mammal species). The isolated wetland and woodland fragments found throughout the corridor provide habitat for birds and some mammals and function as wildlife linkages. Most mammals that would be expected within the Project limits are habitat generalists that would be common in urban and rural areas throughout southern Ontario including Eastern Grey Squirrel, Groundhog, Raccoon, Eastern Cottontail, White-tailed Deer, and Striped Skunk.

Within the vicinity of the Project limits, the Ontario Breeding Birds Atlas has records of 145 bird species, of which 49 were observed during field investigations. Of the 45, Barn Swallow, was the only SAR observed. The Ontario Reptile and Amphibian Atlas has records of 28 reptiles and amphibians, and 3 of the 28 were observed incidentally during field investigations, none of which are SAR. The Ontario Butterfly Atlas has records of 89 butterflies and moths. Two of the 89 species were observed during field investigations, including the Monarch butterfly, which is a species of Special Concern.

The SWH identified within the Project limits is shown in Table 4.

Table 4: Summary of SWH Present in the Project limits

Significant Wildlife Habitat	Description
Seasonal Concentration Area of Animals	Bat Maternities Colony SWH is present in Forested Communities throughout the Project lands.
Rare Vegetation Communities	Fresh – Moist Black Walnut Lowland Deciduous Forest (FOD7-4) is listed as a provincially rare vegetation type.
Habitats of Species of Conservation Concern	Terrestrial Crayfish Habitat is present in the Potential Laydown Area southwest of Highway 401 / Winston Churchill Boulevard.

Significant Wildlife Habitat	Description
	Monarch habitat (presence of common milkweed in suitable habitat types) is present throughout the Project lands.
Animal Movement Corridors	No SWH of this type as identified in the SWH Criteria Schedule for Ecoregion 7E (MNRF, 2015) was present.

Habitat connectivity was also assessed along riparian corridors of the Credit River and Sixteen Mile Creek, where there is the greatest potential for maintaining wildlife linkages. Maintaining habitat connectivity across the landscape is important to the preservation of local wildlife during the construction and long-term operation of the highway.

The existing Sixteen Mile Creek Middle East Branch crossing east of Sixth Line (Oakville Creek East Bridges), Sixteen Mile Creek East Branch crossing east of Trafalgar Road (Oakville Creek East Culvert – to be covered in DCR No. 3) and the crossing at the Credit River are recognized as an important regional linkage for wildlife crossing north-south across the highway , in addition to providing connection between various ecological functions. Field investigations noted that there was evidence of Cliff Swallow, White-tailed Deer, Striped Skunk, Raccoon, and Coyote at the bridges and culverts of watercourse crossings throughout the Project limits. The Credit River facilitates wildlife crossing for larger mammals, particularly White-tailed Deer, beneath the existing Credit River bridge. In 2019, WCC completed field investigations to confirm conditions at these wildlife linkages to determine appropriate fencing and wildlife passage designs. Details of wildlife passage features are discussed as part of the structure design in Section 4.2 and in subsequent DCR No. 3.

Impacts

The expansion of the highway itself will result in reduction of wildlife habitat. However, through detail design, removal of more critical components of wildlife habitat (e.g., wildlife corridors, bat SAR habitat, rare vegetation communities) were minimized through adjustments to grading limits, where possible.

Expansion of the highway will further reduce wildlife connectivity and movement between already fragmented natural areas. Highway 401 is a significant barrier to wildlife movement between natural areas north and south of the highway and expansion of the roadway will further exaggerate the barrier effect of the highway to wildlife mobility.

Under DCR No. 2 works, the existing structures at Sixteen Mile Creek Middle East Branch, east of Sixth Line (Oakville Creek East Bridges), and the Credit River will be replaced. While construction is occurring in these locations, there will be temporary impacts to wildlife either through an increased likelihood of incidental contact with wildlife and/or construction work may deter wildlife from that area. However, as described in Section 4.2, the new structures will be larger than existing, and will accommodate wildlife passage.

DCR No. 2 works at, or near bridge structures can have impacts to breeding birds. These impacts and associated mitigation measures are discussed further in Section 5.1.2.1.

Mitigation Measures

- WCC will provide training to all on-site personnel to outline wildlife that may be present on-site as well as responsibilities to report wildlife and potential SAR to the WCC SAR Specialist. The training manual will include fact sheets for known wildlife and SAR in the area which will also note procedures for reporting / handling any encounters with injured or deceased wildlife/SAR.
- Under no circumstances will any animal (i.e., bird, turtle, snake, mammal, butterfly, etc.) be knowingly harmed, harassed or otherwise disturbed. If an animal is encountered, it will be permitted to move away on its own.
- If wildlife is observed or encountered in the work area and remains within the work area, construction activities will cease, if required, so as not to harm the animal. Appropriate personnel, such as the WCC Wildlife Biologist, will be notified. The WCC Biologist will determine the significance of the species, handle the wildlife accordingly, and if required notify the appropriate regulatory agency. Wildlife encounters should be handled according to the Environmental Awareness Training Manual and the Safe Handling Protocol.
- Should an injured or orphaned animal be encountered, the WCC Wildlife Biologist will transport the animal to a wildlife rehabilitation centre (approved Wildlife Custodian by the MNRF or a member of the College of Veterinarians of Ontario).
- Wildlife crossing features will be incorporated at the Oakville Creek East Bridges and the Credit River Bridges and will include dry passage, use of natural substrates conducive to wildlife use, retaining and replanting of native vegetation, and other ecological improvements as part of the valley restoration plans. The design for wildlife passages features, fencing and escape ramps will be covered in DCR No. 3 (refer to Section 5.1.6).
- Wildlife fence will be installed. Details of the wildlife fence and wildlife passage will be in DCR No. 3

5.1.2.1 Migratory Birds

The *Migratory Birds Convention Act, 1994 (MBCA)* provides federal protection to most migratory bird species. Destruction of migratory bird species during construction and other related activities is illegal unless a permit has been obtained. Construction work can have impacts to ground nesting birds (e.g. killdeer). In addition, some birds, particularly species like Barn Swallow (a SAR), commonly build their nests on the inner walls of culverts and on the undersides of bridges. Construction and demolition works associated with the structures described in Section 4.2 may occur during the breeding bird timing window.

In 2019, WCC completed inspections of culverts and structures that are proposed for removal or alteration to determine the presence of bird nests which may be protected under the *MBCA (1994)* or the *ESA (2007)* (i.e., Barn Swallow). Nests of migratory birds were documented throughout the corridor, and in two locations (WC-26 culvert at 407ETR Pond 3 and WC-11 culvert west of Steeles Avenue) Barn Swallow nesting was observed (Refer to Section 5.1.4.2).

To protect nesting migratory birds, the following mitigation measures will be undertaken:

- Active nests will not be knowingly removed or disturbed in accordance with the *MBCA (1994).*
- If the active nests of migratory birds are found, contact WCC's Biologist for further direction. The location of the nest will be noted using handheld GPS.
- To avoid potential nest abandonment and/or predation, nests will be physically flagged if they are located close to an active construction zone and are a risk of accidental damage.
- WCC will install bird nesting preventative measures on structures within the Project limits prior to the active season (before April 1). The measures will be maintained until August 31 of the same calendar year, or until removal is required to facilitate demolition at the structure.
- WCC will conduct daily visual inspections on structures during construction for presence of nesting birds, if required.

5.1.3 Aquatic Ecosystems – Watercourses, Fish and Fish Habitat

During preliminary design, the existing conditions of the Project limits was inventoried and described (URS, 2013a, URS, 2013b). The Project limits are located in two watersheds, the Sixteen Mile Creek watershed to the west and the Credit River watershed to the east. Most of the Project lands are located within the Sixteen Mile Creek watershed that drains in a north-south direction towards Lake Ontario with its headwaters in the Niagara Escarpment. The Credit River watershed, draining the east end of the Project lands, also drains towards Lake Ontario.

The predominant watercourses within the Project lands include the tributaries of the West, Lower Middle, Middle, Middle East and East branches of the Sixteen Mile Creek, and the Credit River and associated tributaries. Given the urban, industrial/commercial and agricultural land uses in the Project limits, many watercourses have been straightened as a result of agricultural operations and urbanization.

There are 27 watercourse crossings and 3 existing storm water management ponds within the proposed highway widening project area that support fish and fish habitat.

Due to the expansion of the highway, structures, such as bridges and culverts that convey watercourses will need to be replaced, rehabilitated, and/or widened. In some cases, minor realignments and channel modifications will be required as a result of encroachment from grading and bridge or culvert works. The two major watercourse realignments are of Mullet Creek (to be covered in DCR No. 3) and Hornby Creek (covered in DCR No. 2), for which preliminary fluvial geomorphic assessments were completed (AECOM 2018b; AECOM 2018c).

Updated fish community records and field investigations were undertaken in 2017/18 to determine the fish species in the watercourses throughout the Project limits (AECOM, 2018k). Through field investigations and correspondence with MNRF, it was determined that two aquatic SAR, Redside Dace (*Clinostomus elongatus*) and American Eel (*Anguilla rostrata*), are present. For more information on aquatic SAR, see Section 5.1.4.1.

In 2019, WCC undertook additional fisheries and fluvial geomorphology investigations, as required, to confirm existing conditions, impacts of the project, design requirements and mitigation measures.

Impacts

The works in DCR No. 2 include in-water work activities below the high-water mark (HWM) at a number of the fisheries watercourses (including some SAR watercourses) within the Project limits. Proposed activities were assessed in accordance with the MTO/DFO/MNRF Fisheries Protocol, Version 3 (2016). Should there be changes in this Protocol based on legislative changes, WCC will consult with the appropriate regulatory agencies and MTO to determine the proper assessment process to be followed.

DCR No. 2 works will require vegetation grubbing, excavation, grading, use of equipment near water, cofferdam installations, dewatering and pumping, new structure placement, rock and scour protection installation, channel works, culvert abandonment and demolition, bridge and pier removals, bridge demolition, and construction staging and access areas. These activities can result in temporary and permanent loss of fish

habitat, impacts to fish passage, potential need for fish salvage, disturbance of bank stability, and increased risk of erosion, sedimentation and scour.

Other impacts to watercourses, may include the entry of deleterious substances into the watercourse, leading to direct disturbance to fish species, fish habitat and water quality. The disturbance and release of sediments may have direct negative effects such as respiratory stress, reduced feeding efficiency and loss of nursery/rearing habitat in downstream areas. Sediment impacts which are not properly contained may affect local fish populations as well as downstream habitat.

Phragmites is also present in and around the watercourses within the Project limits.

A summary of the fisheries watercourses, the proposed activities, and anticipated approvals required for DCR No. 2 works is provided in Table 5. Mapping of the DCR No. 2 watercourses can be found in **Appendix D**. Details of some of the site-specific impacts and opportunities are described below.

Offline and Online Culvert Replacements (Non-SAR) (WC-01, WC-03, WC-11, WC-14, WC-24)

Most of the culvert replacements in DCR No. 2 will be replaced “offline” meaning that the new culvert will be built beside the existing culvert. This method was chosen to reduce risk of fisheries impacts during construction by isolating the construction work area away from the watercourse. This minimizes the need for need for stream diversions, bypass pumping and fish relocations, other than to complete the tie-in transitions from the existing location to the new culvert and reduces the amount of in-water work required. The new channel segments (tie-ins required to realign the existing watercourse to the new adjacent culvert location) will be stabilized with streambed material and vegetation prior to connecting to the existing watercourse. The culvert construction areas will be isolated from the adjacent existing watercourse to prevent the transfer of sediment or otherwise deleterious substances. The existing culverts will be infilled and abandoned. New habitat creation and/or restoration will be undertaken, as required, in accordance with permits and approvals received.

The culvert replacement and extension at WC-11 will be replaced ‘online’ meaning that the new culvert will be built in the same location as the existing. Due to the existing configuration of the watercourse channel upstream and downstream of the culvert, the online option was preferred for the replacement works at this location as it allowed for a more natural channel tie-in to the new culvert inlet and outlet. A low flow channel will be constructed within the culvert, including the placement of stream bed material incorporating a gradation of substrate size/types to mimic natural conditions. The culvert replacement works will be isolated from the existing watercourse to prevent the transfer

of sediment or otherwise deleterious substances. New habitat creation and/or restoration will be undertaken, as required, in accordance with permits and approvals received.

Redside Dace Watercourses (WC-02, WC-04, WC-05, WC-06)

The culvert replacements at the Redside Dace watercourses will also be completed offline, the benefits of which were described above. These culvert replacements are designed as open-bottom culverts that are wider than existing, and include habitat creation, natural channel design, and fish passage features. Riparian habitat will be lost due to highway embankment fill, grading, and retaining wall construction. Note that at WC-04, there are no structural works, only grading of the embankment around Regional Road 25.

These watercourses are subject to a 17 2 (c) permit from MECP, and as part of the permit, Overall Benefit activities will be implemented (refer to Section 5.1.4.1).

WC-14 Culvert Replacement

WC-14 and the associated highway ditch on the south side of Highway 401 was confirmed to be direct fish habitat in 2019, although the quality of the habitat is low and there are no critical or exceptional habitat features present. The existing WC-14 culvert, which conveys drainage south under Highway 401 to the highway ditch will be replaced and extended offline (as described above). There will also be associated channel work to relocate the highway ditch to the south of the existing to accommodate the highway widening. An earthen berm will be installed in the ditch downstream of the culvert outlet to divert flows into an adjacent SWMP.

Due to installation of the berm and riprap barrier downstream of the new culvert, fish will no longer be able to access the section of highway ditch upstream of the berm/pond or the culvert. The proposed works will result in an overall net decrease of fish habitat at this location.

This work is subject to DFO Request for Review. Fish and fish habitat compensation and restoration will be undertaken to address impacts in accordance with future approvals received, as required.

Hornby Creek Watercourse Realignment (WC-19), Oakville Creek East Bridge (WC-18) and WC-18A Culvert Extension

The Hornby Creek channel that flows parallel to Highway 401 will be realigned to the north and the WC-18A Tributary that flows parallel to Highway 401 downstream of Sixth Line will be realigned to the north. The channel upstream of Sixth Line will be realigned to create a new tie-in point with the culvert extension associate with the realignment of Sixth Line.

Channel realignments will follow the principles of natural channel design and include pools and riffles and incorporate fish habitat features. Banks at the new channel tie-in locations will be graded appropriately and match existing bank slopes to ensure stability. The realignment of Hornby Creek will result in a channel providing more stable banks and potential reduction in sedimentation, and hence net improvement at the site.

The temporary and permanent impacts of these works will be compensated through permanent channel creation utilizing natural design principles, fish passage features and habitat restoration and enhancement. Habitat diversity has been incorporated into the proposed realignment and includes bank log structures, boulders, boulder cluster, and large woody debris. The final design will incorporate diverse plantings, including those providing overhanging habitat and shade, and substrate placement. Details on the restoration and enhancement will be documented in DCR No. 3.

For the Oakville Creek East Bridge, the proposed structure is a single span bridge that is substantially larger than the existing bridge and will accommodate wildlife passage. Permanent impacts include placement of new streambed material and scour protection to protect new abutments. Removal of the existing bridge will also be required and will be staged to minimize impacts. Temporary impacts are expected during removal of the existing bridge structure. However, removal works will be isolated from the watercourse to prevent the transfer of sediment or otherwise deleterious substances. New habitat creation and/or restoration will be undertaken, as required, in accordance with permits and approvals received.

South of the highway a temporary bridge over WC-18 will also be required to facilitate construction access and will follow the MTO Temporary Watercourse Crossing Best Management Practices (BMP).

Highway 401/407ETR Area (WC 25, WC-25North, WC-25A, WC-26, WC-27, WC-27A)

At the Highway 401 and 407ETR interchange area, there are both new and replacement culverts as well as works to existing 407ETR SWM ponds.

The existing WC-25 culvert will be replaced and extended at its existing location due to its connection with the 407ETR Pond 1 (WC-25A). A new crossing on this watercourse is required further north to accommodate the relocation of the 407ETR on-ramp. The new crossing (WC-25 North) culvert installation construction area will be isolated from the existing watercourse to prevent the transfer of sediment or otherwise deleterious substances. Impacts at these locations will result from an increase in culvert footprint area within the watercourse. New habitat creation and/or restoration will be undertaken, as required, in accordance with permits and approvals received.

The portion of WC-26 under Highway 401 will be replaced, and the portion of WC-27 under Highway 401 will be replaced and extended. The culvert dimensions will be

confirmed based on final hydrodynamic modelling results, as well as fish passage considerations. The Like-for-Like Culvert Replacement BMP may apply for WC-26, and it is anticipated that potential impacts for WC-27 can be mitigated through the implementation of standard measures to protect fish and fish habitat.

WC-25A (407ETR Pond 1) requires retrofitting and expansion, as described in Section 4.3). WC-27A (407ETR Pond 3) requires cleanout works. Potential impacts to the watercourses these SWM ponds discharge to can be fully mitigated through the implementation of standard measures to protect fish and fish habitat.

Credit River Bridge (WC-36)

For the Credit River Bridge works, the permanent impacts will be as a result of the construction of new piers and installation of rock protection. Temporary impacts are associated with the installation and removal of cofferdams required to facilitate the removal of existing piers in-the-dry and construction staging and access. These temporary impacts can be mitigated through standard controls, best management practices and restoration after construction.

The proposed bridge design has moved the new piers outside of the existing piers (which will be removed) and normal wetted channel of the river, therefore impacts to habitat and fish holding areas will be minimized. Fish habitat creation will be carried out through removal of existing bridge piers and subsequent restoration of the pier footprint areas. In addition, rock protection will be installed around the new piers, consisting of large clean rounded boulders which will provide additional habitat opportunities for American Eel (SAR) as well as refuge and cover for bait/forage fish and juvenile fish.

The Credit River watercourse is subject to a Letter of Advice from MECP due to the presence of American Eel (refer to Section 5.1.4.1).

Table 5: Summary of Proposed Activities at Fisheries Watercourses for DCR No. 2

ID	Type of Fish Habitat, in-water timing window	Proposed Design and Works	Anticipated Approvals
WC-01	Ephemeral, Indirect, Warmwater, July 1 to March 31	Offline Culvert Replacement/Extension (Concrete Box Culvert) Channel tie-in works Infilling/abandonment of existing culvert	Request for Review – DFO
WC-02	Intermittent, Direct, Coolwater July 1 to September 15 Important and Exceptional Habitat: Redside Dace (SAR) Contributing	Offline Culvert Replacement/ Extension (Open Bottom Concrete Culvert) Channel tie-in works Infilling/abandonment of existing culvert	Request for Review – DFO ESA, 2007 17 2 (c) permit – MECP
WC-03	Ephemeral, Indirect, Warmwater July 1 to March 31	Offline Culvert Replacement/Extension (CSP Culvert) Channel tie-in works Infilling/abandonment of existing culvert	Request for Review – DFO
WC-04	Permanent, Direct, Coolwater July 1 to September 15 Important and Exceptional Habitat: Redside Dace (SAR) Occupied	Roadside grading and drainage ditch tie-ins	Fisheries Act Authorization SARA Permit – DFO ESA, 2007 17 2 (c) permit – MECP
WC-05	Permanent, Direct, Coolwater July 1 to September 15 Important and Exceptional Habitat: Redside Dace (SAR) Occupied	Offline Structural Culvert Replacement/Extension (Open Bottom Concrete Culvert) Retaining Wall, Concrete Debris Removal Channel realignment and tie-ins Natural channel design and features to improve fish passage Infilling/abandonment of existing culvert	Fisheries Act Authorization – DFO SARA Permit – DFO ESA, 2007 17 2 (c) permit – MECP
WC-06	Permanent, Direct, Coolwater July 1 to September 15 Important and Exceptional Habitat: Redside Dace (SAR) Contributing	Offline Structural Culvert Replacement /Extension (Open Bottom Concrete Culvert) Channel tie-in works Infilling/abandonment of existing culvert	Request for Review – DFO ESA, 2007 17 2 (c) permit – MECP
WC-11	Permanent, Direct, Warmwater July 1 to March 31	Online Culvert Replacement/Extension (Concrete Box Culvert) Channel tie-in works	Request for Review – DFO
WC-14	Intermittent, Direct, Warmwater July 1 to March 31	Offline Culvert Replacement/Extension (Concrete Box Culvert) Ditch Relocation	Request for Review – DFO

ID	Type of Fish Habitat, in-water timing window	Proposed Design and Works	Anticipated Approvals
WC-18	Permanent, Direct, Coolwater June 15 to September 30	Bridge Replacement (Single Span) Removal of Existing Structure	Request for Review – DFO
WC-18A	Permanent, Direct, Coolwater June 15 to September 30	Culvert Extension (Concrete Box Culvert) Channel Realignment and tie-ins Natural Channel Design	Fisheries Act Authorization – DFO
WC-19	Permanent, Direct, Coolwater June 15 to September 30, Important and Exceptional	Hornby Creek Realignment	Fisheries Act Authorization – DFO
WC-24	Ephemeral, Indirect, Warmwater July 1 to March 31	Offline Culvert Replacement/Extension (Concrete Box Culvert) Channel tie-in works	MTO Notification Form
WC-25	Intermittent, Direct, Warmwater July 1 to March 31	Online Culvert Replacement/Extension (Concrete Box Culvert)	Request for Review – DFO
WC-25North	Intermittent, Direct, Warmwater July 1 to March 31	New Culvert (Concrete Box Culvert)	Request for Review – DFO
WC-25A	Intermittent, Direct, Warmwater July 1 to March 31	407ETR Stormwater Management Pond 1 Retrofitting	MTO Notification Form
WC-26	Permanent, Direct, Warmwater July 1 to March 31	Online Partial Culvert Replacement (Concrete Box Culvert)	MTO Notification Form
WC-27	Intermittent, Direct, Warmwater July 1 to March 31	Online Partial Culvert Replacement and Extension (Concrete Box Culvert)	Request for Review – DFO
WC-27A	Intermittent, Direct, Warmwater July 1 to March 31	407ETR Stormwater Management Pond 3 Cleanout	MTO Notification Form
WC-36	Permanent, Direct, Coolwater July 1 to August 15 Important and Exceptional Habitat: Atlantic Salmon and American Eel (SAR)	Bridge Replacement (3 Span Bridge) Removal of existing structure	Request for Review – DFO ESA, 2007 Letter of Advice (LOA) – MECP

Mitigation Measures

- Obtain required approval(s) prior to work commencing.
- Work will be undertaken in accordance with the conditions in the approvals and in consultation with DFO. This may include completing compensation and monitoring during and post-construction.
- In-water works or work on the banks is permitted in accordance with the appropriate timing windows.
- Where possible, schedule work to avoid wet and rainy periods that may increase erosion and sedimentation.
- Works shall be undertaken in accordance with OPSS 182: *General Specification for Environmental Protection for Construction in Waterbodies and on Waterbody Banks*.
- Site isolation/containment measures (i.e. cofferdams) will be implemented to isolate areas where in-water work is required. Capture and relocate any fish from within the work area, as required.
- Aim to minimize duration of in-water work and conduct instream work during periods of low flow to further reduce the risk to fish and their habitat and to allow work in water to be contained.
- Perform regular inspection of the work area(s).
- Vegetation to be retained will be delineated and protected.
- Clearing of riparian vegetation has been minimized.
- The control of water from dewatering operations is to be conducted in accordance with OPSS 517: Construction Specification for Dewatering.
- Screens will be used for water intakes or outlet pipes to prevent entrainment or impingement of fish.
- Dewatering operations shall be directed to a sediment control device or natural attenuation area prior to discharge to watercourses.
- ESC measures consistent with OPSS 804 - Construction Specification for Seed and Cover and OPSS 805 - Construction Specification for Temporary Erosion and Sediment Control Measures, will be implemented prior to work and be maintained during construction until disturbed areas have been effectively stabilized with permanent vegetation cover. (Refer to Section 5.2)
- Erosion and sediment controls will be designed to contain/isolate the construction zone, manage site drainage/runoff and prevent erosion of exposed soils and migration of sediment into watercourses.
- WCC will monitor erosion and sediment control (ESC) systems for effectiveness, repairing deficient controls in a timely manner using an adaptive management approach when deemed appropriate.
- All disturbed areas of the work site will be stabilized and revegetated promptly, and/or treated with appropriate erosion protection materials.

- Enhancing shading of the watercourse by planting native species in areas of overhanging / riparian vegetation loss will be provided.
- Machinery will arrive on-site in a clean condition and will be maintained to be free of fluid leaks, invasive species and noxious weeds.
- Heavy machinery access will be limited to pre-defined areas within the Project limits.
- Stockpiled materials will be stored and stabilized at least 30m from watercourses.
- Materials and equipment used will be operated and stored in such a manner that prevents any deleterious substance from entering the water.
- Machinery will be refuelled, washed and serviced a minimum of 30m away from the top of bank to prevent discharge of deleterious substances into occupied and contributing watercourses.
- Consider construction staging such that spills and leaks into the watercourse will be avoided or minimized.
- Prepare a Spill Prevention and Management Plan prior to commencement of construction operations. Have spill kits onsite and drip pans under all non-mobile machinery.

5.1.4 Species at Risk

During preliminary design, Species at Risk (SAR) screening was conducted to determine which SAR had the potential to occur within the Project limits (URS 2013a, URS 2013b). Additional reviews and correspondence with MNRF were carried out in 2017. Field investigations were also conducted to determine the presence of bat SAR. Based on these SAR reviews and investigations, four SAR were determined to be in the Project limits: Redside Dace, American Eel, Little Brown Myotis, and Eastern Small-footed Myotis. Table 6 provides a summary of the four SAR. The *Endangered Species Act (ESA)* provides provincial protection and the *Species at Risk Act (SARA)* provides federal protection.

Table 6: SAR Determined to be Present in the Project Limits

SAR Name	Legal Protection		Permits / Timing Constraints
	Provincial (ESA)	Federal (SARA)	
Redside Dace (Clinostomus elongates)	Listed as Endangered Species and Regulated Habitat protection under the *ESA*	Listed as Endangered Species protection under the *SARA*	17 2 (c) ESA Permit for Redside Dace to be obtained SARA Permit to be obtained

SAR Name	Legal Protection		Permits / Timing Constraints
	Provincial (ESA)	Federal (SARA)	
			In-water work timing window for Redside Dace Regulated Habitat is permitted only from July 1 to September 15.
American Eel (Anguilla rostrate)	Listed as Endangered Species and general habitat protection under the *ESA.* Protection is limited to the watercourse and does not include any riparian areas.	No status or schedule under the *SARA*	Letter of Advice from MECP obtained In-water work timing window for Credit River is permitted only from July 1 to August 15, but this is limited to the watercourse and not riparian areas.
Little Brown Myotis *(Myotis lucifugus)*	Listed as Endangered Species and general habitat protection under the *ESA*	Listed as Endangered Species only receives protection under the *SARA* if on federal land	Letter of Advice (LOA) from MNRF obtained (MNRF File No. AU-LOA-11-19) Clearing window for bats permits vegetation clearing from October 1 to March 31
Eastern Small-footed Myotis *(Myotis leibii)*	Listed as Endangered Species and general habitat protection under the *ESA*	No status or schedule under the *SARA*	LOA from MNRF obtained (MNRF File No. AU-LOA-11-19) Clearing window for bats permits vegetation clearing from October 1 to March 31

5.1.4.1 Aquatic SAR

The two aquatic SAR found within the study area are Redside Dace and American Eel.

The presence of Redside Dace habitat is confirmed at four watercourse crossings (unnamed tributaries of the West Branch of Sixteen Mile Creek) near the west end of the Project limits by Regional Road 25. Two of the watercourse crossings are confirmed Redside Dace Occupied Habitat (WC-04 and WC-05) and two of the watercourse crossings are considered Redside Dace Contributing Habitat (WC-02 and WC-06).

Grading, culvert, and channel works will be occurring at each of these watercourses within the Regulated Habitat as part of DCR No. 2 works.

Refinements to the design were carried out to minimize impacts to Redside Dace and associated habitat. Design refinements, mitigation and Overall Benefit include:

- Inclusion of retaining walls at the southwest quadrant of Highway 401 and Regional Road 25.
- Adjustments to the on and off-ramps at the northeast and northwest quadrants of Highway 401 and Regional Road 25.
- The existing structures at WC-02, WC-05, and WC-06 will be replaced with larger open-bottom culverts that span the bankfull width to facilitate the design of a more natural channel that will, as required, include riffle and pool habitat.
- Implementation of Environmental Protection Zones at the southwest quadrant of Highway 401 and Regional Road 25.
- Use of enhanced vegetated ditch swales.
- Planting of trees and shrubs within Redside Dace Regulated Habitat.

American Eel has been confirmed to be present in the main branch of the Credit River on the east end of the Project limits, which is being replaced as part of DCR No. 2 works. Species protection is limited to the watercourse and does not include any riparian areas. The Credit River Bridge replacement will include in-water works and impacts as described in Section 5.1.3. Impacts to American Eel will be minimized through the implementation of best management practices during construction, as well as fish habitat creation. Restoration of the removed pier footprint areas will occur and the use of large clean rounded boulders for the rock protection will provide habitat opportunities by creating crevices and openings for American Eel.

Mitigation Measures

Measures to minimize the impacts to aquatic SAR are:

- For wildlife encounters with SAR refer to Section 5.1.2 Mitigation Measures.
- Aquatic Ecosystem Mitigation Measures from Section 5.1.3 apply.

- Works within Redside Dace Regulated Habitat and the Credit River will not take place until required permits and approvals are received. Works will be undertaken in accordance with the conditions of permits or approvals. This may include completing compensation and monitoring during and post-construction.
- ESC BMPs for Redside Dace Regulated Habitat will be consistent with Guidance for Development Activities in Redside Dace Protected Habitat (MNRF, 2016).
- While completing project activities within Redside Dace Regulated Habitat, daily monitoring will occur. Additional monitoring details are included in Section 7.2.
- Environmental training will be conducted so all staff are aware of the importance of maintaining proper ESCs for the purpose of protecting aquatic SAR.
- All construction equipment and machinery will be operated within the construction zone and will not create any additional disturbance to the existing bed and banks of the watercourses within the Redside Dace Regulated Habitat.
- Site restoration of Redside Dace habitat and the Credit River will be undertaken following the completion of the proposed works in accordance with permits and approvals and will be described in subsequent DCRs.
- During construction at the Credit River, debris platforms will be provided, and necessary containment measures taken during removal and construction to collect any falling concrete and construction debris, such that no debris or materials resulting from the removal and construction operations will fall into the Credit River.
- Temporary water barriers (i.e., cofferdams) will be used and designed to accommodate any expected high flows of the watercourse during construction at the Credit River.
- Appropriate sediment controls will be implemented at the Credit River prior to commencement of construction works. This includes sediment control devices installed both up and downstream of the construction site. Accumulated sediments will be pumped out prior to removal of the trap.

5.1.4.2 Terrestrial SAR

Bat SAR habitat for Little Brown Myotis and Eastern Small-footed Myotis has been confirmed within some of the deciduous forests (FOD) and cultural woodlands (CUW) within the Project limits, as described in DCR No. 1. This includes the FOD community in the area of Hornby Creek realignment, and as described in Sections 4.6 and 5,1,1, the realignment avoids FOD communities wherever possible. The removal of Bat SAR habitat was covered in DCR No. 1, which identified that removals (i.e., vegetation clearing) are within the impacts permitted in the Bat SAR Letter of Advice. Some Bat SAR habitat is located within EPZs (refer to Section 5.1.1) and will be protected throughout DCR No. 2 works. In 2019, WCC completed field visits to determine suitability for bat SAR habitat and locations for bat boxes.

As described in Section 5.1.2.1, nests of Barn Swallow, a SAR bird protected by both the ESA and the MBCA, was observed in a culvert in the Highway 407ETR area and in a culvert west of Steeles Avenue. Barn Swallow typically nest on the inner walls of culverts and undersides of bridges. Methods to minimize impacts to Barn Swallow are covered under mitigation measures that apply to other migratory birds in Section 5.1.2.1 which relate to preventative measures to keep Barn Swallow out of the structures so they cannot nest there prior to construction activities taking place.

Mitigation Measures

Measures to minimize the impacts to terrestrial SAR are:

- For wildlife encounters with SAR refer to Section 5.1.2 Mitigation Measures.
- Tree protection measures as described in Section 5.1.1 also apply to bat habitat.
- Project works will be done in accordance with the conditions of the Bat SAR Letter of Advice obtained from MNRF (MNRF File No. AU-LOA-11-19), which includes installation of bat boxes (artificial roosting structures), woodland restoration and monitoring.
- Reduce light spill near bat habitat as per measures in Section 4.5.3.
- Construction activities within 30m of known cavity trees will be restricted to daylight hours when possible.
- Registration with MECP for Barn Swallow using the Notice of Activity Form will be completed.

5.1.5 Designated Natural Areas

During preliminary design, the Project limits were reviewed for provincially or federally significant natural heritage features, including Provincially Significant Wetlands (PSW), Areas of Natural or Scientific Interest (ANSI), Environmentally Significant Areas, significant valleylands, significant woodlands, provincial parks, or conservation areas. The Niagara Escarpment Biosphere Reserve, designated by the United Nations Education, Scientific and Cultural Organization (UNESCO), is located in the broader region, approximately 2km west of the Project limits. One environmentally sensitive area, the Meadowvale Station Woods Area of Natural and Scientific Interest (ANSI) is present immediately east of the construction limits along the west side of 2 Line West and is linked with the Credit River floodplain south of Highway 401.

As there are no Designated Natural Areas within the Project limits, there are no impacts and mitigation measures for these features.

5.1.6 Landscaping and Ecological Restoration

Permanent landscaping and ecological restoration works are not covered under DCR No. 2 but will be included in DCR No. 3 to address enhancement, restoration and/or compensation related to the impacts described in Sections 5.1.1 to 5.1.4.

In 2019, WCC commenced initial plant cuttings and seed harvesting for future landscaping and plantings.

Mitigation Measures

- Landscaping and Ecological Restoration will be developed as part of this Project and will identify areas which will receive landscape treatments, enhancement and/or restoration. The Plan will include details of Valley Restoration, Edge Management Areas, SAR habitat restoration, compensation and overall benefit measures, Enhancement and Restoration of SWH, where feasible, Fish Habitat Enhancement and Riparian Habitat Restoration, and Stormwater Management Pond Naturalization.

5.1.7 Groundwater

During preliminary design, groundwater studies were completed (URS 2013a, URS 2013b) that determined the Project limits are located within three physiographic regions: the Iroquois Plain, the Peel Plain, and the South Slope. The Project limits consist predominantly of deposits of glacial, glaciofluvial, and glaciolacustrine origin, namely the Halton Till which is composed of silt to silty clay matrix with a minor amount of sand.

The shallow groundwater within the study area is influenced by surface topography, likely flowing into the Sixteen Mile Creek watershed system and the Credit River to the east.

A Door-to-Door Water Well Survey (Water Well Survey) was carried out in 2017 to determine details of existing water supply wells near the proposed highway right of way on either side of Highway 401 (AECOM, 2018g). This provides an inventory of existing wells, which will be important during groundwater monitoring to assess if groundwater and wells are being impacted as part of the Project.

During construction projects, particularly for activities requiring excavation or digging into the ground, there is the potential that groundwater is encountered and needs to be dewatered from the construction site. Hydrogeological investigations were undertaken by WCC in 2019 to determine the extent and impacts of groundwater dewatering.

Impacts

Large volumes of groundwater taking can have significant impacts to groundwater quantity, thus an Environmental Activity and Sector Registry (EASR) or Permit to Take

Water (PTTW) are required before dewatering can occur. A PTTW will be obtained from the MECP if the amount of water taken exceeds 400,000 L/day, or the water taking will be registered on the EASR as a “prescribed activity” if the amount of water taken exceeds 50,000 L/day and is below 400, 000 L/day.

Based on the combined dewatering rates for the structures in DCR No. 2 (and the future DCR No. 3), one overall PTTW will be obtained for the Project to allow flexibility for multiple structures to be built simultaneously, if necessary.

Proper construction best management practices will be employed to minimize the potential for contaminants to leach into the groundwater.

Mitigation Measures

- WCC will limit the depth of excavation and minimize the need for dewatering during construction, particularly in areas designated as having a high potential for groundwater impact (i.e. creeks and tributaries).
- All materials and equipment used will be operated and stored to prevent deleterious substances from entering the water.
- WCC will obtain Permit to take Water (PTTW) for works within DCR No. 2.
- Dewatering activities will be conducted in accordance with all applicable procedures provided in the Ontario’s Water Taking Regulation (O. Reg. 387/04 made under the Ontario Water Resource Act, as amended by O. Reg. 64/16, March 29, 2016), OPSS 518 Control of Water from Dewatering Operations, and the specific requirements outlined under the PTTW.
- Water wells or groundwater monitoring wells, if no longer in use, will be properly decommissioned as per the Ontario Wells Regulation (R.R.O. 1990, Reg. 903).
- WCC will minimize groundwater recharge impacts by directing the surface runoff to roadside ditches and improve ditch conditions during construction with inclusion of ESC measures.
- Silt laden discharge water from dewatering activities will be directed away from the watercourse in such a way as to minimize sedimentation.
- Application of appropriate energy dissipation and settling/filtration measures during temporary dewatering of the near or instream construction zones.
- A Groundwater Monitoring Program will be implemented during construction. If impacts are noted, more frequent monitoring of the wells and possible further assessment of the impacts will be required. See Section 7.2 for additional details.
- Investigate and promptly address any complaints of interference related to construction activities.
- Follow best management practices for road de-icing applications, as applicable for WCC’s construction work zone.

5.1.8 Surface Water

Within the Project Limits, there are many drainage features, including fish bearing and non-fish bearing watercourses. For details about existing watercourses as they relate to fish and fish habitat, see Section 5.1.3. Other watercourses only convey drainage across the Project limits.

Within the Project Limits there are three existing stormwater management ponds (SWMPs) that collect surface runoff from Highway 401 and 407ETR. Two of the SWM Ponds are online (located on a stream) and one is offline (separated from any other waterbody, no inlets or outlets). More details about drainage and stormwater management can be found in Section 4.3.

A Surface Water Monitoring Program was conducted by MTO in 2017 and 2018 to collect baseline data on flow and water quality at four watercourses as a base for surface water monitoring during construction by WCC.

Impacts

Construction impacts can result in adverse impacts to watercourses due to increased siltation, changes in stream channel structure and water clarity, increase in water temperatures, potential increase input of roadside pollutants.

Stormwater management (SWM) strategies can minimize adverse impacts to surface water by managing surface water runoff to meet water quality and quantity control criteria set by DFO, MTO, MECP, MNRF, Conservation Halton, and Credit Valley Conservation. The long-term water quality and quantity requirements will be achieved through retrofitting the existing ponds and construction of the proposed new wet ponds, detention ditch system, infiltration galleries, vegetated embankments, and underground storage (if required) across the Project. The existing and proposed SWM facilities are described in Section 4.3.

No surface water taking is required for the Project. The works in DCR No. 2 will require surface water diversions, which do not require permit or approval.

Mitigation Measures

- General Aquatic Ecosystem Mitigation Measures from Section 5.1.3 apply.
- Erosion and sediment control measures will be employed during construction to manage surface water runoff and construction drainage. See Section 5.2 for additional ESC details.
- WCC will undertake a Surface Water Monitoring Program during construction to identify whether there are any changes in surface water quality due to construction works. See Section 7.2 for additional details.

- Adaptive management measures are to be implemented if necessary, during construction.

5.2 Erosion and Sediment Control (ESC)

Construction can increase the risk of erosion and sedimentation in an area, from such activities as removal of vegetation, soil management, working in and around watercourses, and the installation of temporary access roads. As such, erosion and sediment controls (ESC), which act to reduce or prevent the movement of sediment from a site during construction through the implementation of structures and/or land management techniques, are vital to construction projects to manage erosion and sediment risks. WCC will therefore address sediment control at its source rather than to reactively deal with sedimentation into areas that are more difficult to resolve and/or restore.

Impacts

Construction works along the mainline will have sediment and erosion risks associated with the movement and storage of large amounts of loose earth throughout the Project limits. An Erosion and Sediment Overview Risk Assessment was completed by WCC to identify areas of higher risk of erosion and sedimentation, which were predominantly areas adjacent to watercourses and areas with steep slopes. DCR No. 2 includes many structures at fisheries and SAR watercourses. The proposed structural works also have sediment and erosion risks due to works on the embankments and temporary stockpiling of soil material brought onto the site.

Mitigation Measures

- Aquatic Ecosystem Mitigation Measures from Section 5.1.3 and SAR Measures from Section 5.1.4 apply.
- WCC will retain natural vegetation cover and minimize root grubbing, where possible, to provide natural erosion control cover.
- WCC will prepare and implement site specific erosion and sediment control plans (site-specific ESCPs) and drainage and sediment management plans (DSMPs) in advance of construction to describe detailed measures at each work site throughout the phases of construction.
- WCC will implement the ESC measures prior to the start of construction activities or disturbance of soil and they will be maintained during construction until the disturbed areas have been effectively stabilized.
- WCC will promptly stabilize and re-vegetate all disturbed areas of the work site, and/or treat the site with appropriate erosion protection materials.
- ESC measures will be installed per design, maintained and monitored frequently to confirm they are working effectively and according to OPSS 805 (Construction

Specification for Temporary Erosion and Sediment Control Measures). The ESC measures will be inspected and maintained, as described in Section 7.2, on a regular basis.
- ESC measures will be placed as necessary at appropriate intervals in the ditches down gradient from areas of soil disturbance to trap suspended sediments and reduce the erosive force of runoff.
- Stockpiled materials will be stored away from water and sensitive natural features. Sediment control measures such as silt fence will be around the base of the stockpile to prevent mobilization of the stockpile.
- In the event of a sediment spill, WCC will take reasonable action to stop the spread of spilled materials by blocking catch basins, digging trenches, creating dykes, and spreading an absorbent. Spills will be reported according to the Spill Prevention and Management Plan.

5.3 Excess Earth

Excavation activities for construction projects often result in excess earth on site that needs to be properly managed and controlled. Suitable soils will be reused within the Project limits as much as possible. Excavated earth that is not utilized immediately will be temporarily stockpiled.

Impacts

It is anticipated that Stage 1 will produce a net “borrow” site (fill being imported from external sources) while Stage 2 will be a net “excess” site. The majority of earth excavated for the Project will be suitable for construction and re-used within the Project limits. Strategies to minimize excess earth generation included minimizing excavation and fill requirements, optimizing balance of cut and fills, and utilizing slope flattening or berm creation as part of design. While the amount of excess soil is not anticipated to be high, some temporary stockpiling will be required on site and some excess earth management off-site may be required.

Mitigation Measures

- Suitable excavated soils will be reused within the Project limits as much as possible.
- Stockpiles of contaminated or potentially contaminated soil will be properly contained.
- Earth imported from external sources will be in accordance with applicable standards and guidelines.
- Offsite management and disposal of waste and excess materials generated during construction will be conducted in accordance with O. Reg. 347 and OPSS 180 - General Specification for The Management of Excess Materials.

- Earth will not be located within the boundaries of a sensitive environmental area as defined in O. Reg. 153/04 (as amended).
- Earth will not be placed in locations where there is direct drainage to that location.
- Stockpiles will not be placed on property or within areas of known or suspected contamination.
- Measures to prevent the mobilization of stockpiles will be employed using silt fences and other erosion control methods as appropriate.
- Necessary steps will be taken to minimize dust emissions, and limit infiltration of precipitation and discharge of soil particles through drainage and runoff.
- Stockpiles will be monitored to confirm that the stockpiles remain intact and that there are no environmental adverse effects, erosion issues or sedimentation concerns.
- Where environmental or other concerns are identified, necessary corrective action will be taken in a timely manner.

5.4 Socio-Economic

5.4.1 Noise and Vibration

Previous Studies

Noise impacts associated with transportation projects are assessed based on the MTO Environmental Guide for Noise (October 2006). In general, the areas adjacent to Highway 401 consist mainly of commercial, industrial, and rural areas with scattered residences. However, there are concentrations of residential development to the southwest of the James Snow Parkway interchange, and east of the Credit River. Noise investigations were undertaken during preliminary design to compare potential noise impacts and possible noise mitigation for the “Future No Build” (2031) (i.e., the highway is not built) and “Future Build” (i.e., the highway is built) (2031) scenarios (URS, 2011b, URS, 2013a, URS, 2013b, URS, 2013c). An additional noise assessment was completed in 2018 to update the preliminary design noise assessment (AECOM, 2018f). It was determined that the operational noise levels due to the Project will have a minor to negligible perceived noise increase at most noise receptors (noise sensitive locations where human activity may be adversely impacted by the project). Some receptors in Noise Sensitive Areas (NSAs) exceeded the MTO’s criteria for requiring noise mitigation investigation (i.e. change in noise levels greater than 5 dBA or levels greater than 65dBA overall), however noise mitigation is not economically (i.e. high cost per benefit), administratively (i.e. not able to be located on public right of way) and technically (i.e. poor constructability due to design, safety, topography etc.) feasible to address traffic noise impacts from the Project. Therefore, no operational noise mitigation measures were recommended as a result of these previous studies. However, potential impacts

due to noise during construction were identified to require mitigation and will be addressed by WCC.

A baseline vibration assessment was also undertaken at the Thermo Fisher Scientific facility at the northwest quadrant of Highway 401 / Mississauga Road interchange (AECOM, 2018h, AECOM 2018i) to review potential vibration impacts on the vibration sensitive equipment inside the facility.

Potential Impacts – Noise

Construction will be a temporary source of noise. Although for some periods and types of work, construction noise may be noticeable, with adequate controls impacts can be minimized. The nearest noise receptors in the vicinity of pile driving activities related to DCR No. 2 are located the southwest quadrant of Sixth Line and Highway 401, southeast quadrant of Trafalgar Road and Highway 401, north of the new Ramp Hwy 407E-Hwy401W over Hwy 401WB Collector Structure (Basketweave), southeast and southwest of Highway 401 and Derry Road, and the southwest quadrant of Creditview Road and Highway 401.

Most of the noise is likely to occur during the operation of equipment, which will vary temporally and spatially as construction progresses. Construction noise levels at a given receptor location will vary over time as different activities take place and it is not anticipated that receptors would be exposed to constant construction noise and vibration for the duration of the DCR No. 2 works. Furthermore, many of the construction activities will not be clearly distinguishable from the regular levels of noise generated by road traffic on Highway 401 and nearby major municipal roadways. Potential construction noise impacts for DCR No. 2 works include:

- Minor noise impacts due to equipment used for earthworks, general bridge construction, and for placement of fencing and temporary concrete barriers for protection of work areas.
- Pile driving activities for DCR No. 2 structures will be the greatest source of noise, however, the piling will be localized to bridge piers, and abutment locations and will be temporary.
- Demolition of the Truck Inspection Stations and bridge/culvert structures.
- For the works outlined in DCR No. 2 there may be some construction activities occurring at night and on weekends in order to minimize impacts to traffic. The majority of this work is anticipated to take place in the provincial ROW, but some work may occur within municipal ROWs.

Works on provincial highways are not subject to the municipal Noise By-law provisions for construction activities within provincial highway rights-of-way. However, works

occurring in areas of municipal jurisdiction may require municipal noise by-law exemptions.

Potential Impacts – Vibration

Construction activities are a source of vibration and depending on the activity, equipment in use, and distance between a vibration source and receptor, differing amounts of vibration can be experienced. For this Project, pile driving at the structures is the most significant operation that will produce the highest ground-borne vibration levels. Building damage is not anticipated since damage is only likely in close proximity to the piles being driven and there are no buildings located close to piling operations. Other equipment such as dozers, pavement breakers, rollers, compactors, etc. tend to generate lower levels of vibration.

Works under DCR No. 2 will be occurring near Thermo Fisher Scientific, a vibration sensitive receptor near Highway 401 and Mississauga Road.

Mitigation Measures

Measures to minimize the impacts of construction noise and vibration are:

- General best management practices to limit construction noise will be employed.
- To the extent possible, limit noisy construction activities to daytime hours.
- In noise sensitive areas, pile driving will be restricted to daytime hours.
- Obtain noise by-law exemption from local municipalities where work is taking place within municipal rights-of-way and abide by any noise by-law conditions.
- Equipment will be maintained in good operating condition and comply with MECP noise emission standards (Noise Pollution Control (NPC) – 115 and NPC-118 and Ontario Model Municipal Noise Control By-Law).
- WCC will keep idling of construction equipment to a minimum.
- WCC will maximize the distance between the construction staging areas and nearby receptors.
- Maintain construction haul roads to avoid the loud noise caused by construction vehicles travelling over uneven road surfaces.
- If complaints regarding construction noise arise from construction, they will be investigated according to the provisions of *MTO Environmental Guide for Noise (October 2006).*
- In the presence of persistent noise complaints, construction equipment should be checked for compliance with MECP NPC-115 guidelines. Heavily loaded trucks will be routed away from residential streets, where possible.
- The use of equipment that generate high levels of vibration will be minimized, where feasible.

- Equipment used within 80m of Thermo Fisher Scientific receptor (at Mississauga Road) cannot exceed a vibration velocity 400 micro-m/sec (PPV). If required, equipment will be tested before commencing construction activity in the vicinity of Thermo Fisher Scientific. WCC will also conduct vibration monitoring (see Section 7.2) during construction works within 80m of the property to verify that the vibration velocity is not exceeded.

5.4.2 Air Quality

Previous Studies

Air Quality investigations were undertaken during preliminary design to compare the "Future No Build" (2031) and "Future Build" (2031) Scenarios (Novus Environmental, 2012, URS, 2013a, URS, 2013b, RWDI, 2011). Further air dispersion modelling was undertaken in 2018 for the "Future No-Build" (2041) and "Future Build" (2041) Scenarios (AECOM, 2018j). The assessments examined criteria air contaminants (nitrogen dioxide, carbon monoxide and particulate matter) and key volatile organic compounds (benzene, 1, 3-Butadiene, formaldehyde, acetaldehyde and acrolein) at sensitive receptors.

The results of the 2013 analysis indicated that, for most contaminants, the predicted maximum emissions at sensitive receptors near Highway 401 are within applicable MECP Ambient Air Quality Criteria and Canadian Ambient Air Quality Standards thresholds. Where there were exceedances, they were not significant or persistent. As well, the results of the 2018 analysis specifically identified that cumulative concentrations of pollutants are very similar when comparing the "Future No-Build" and "Future Build" scenarios, and the only pollutant to exceed standards, was due to the background concentration and not due to the Project. Therefore, regional air quality impacts related to the Project are not significant, and no mitigation measures for the Project were recommended to address operational air quality impacts. It was recommended that opportunities for tree planting be examined in detail design to reduce roadway particulate matter at nearby receptors.

Both the 2013 and 2018 Assessments identified the potential for construction air quality impacts.

Potential Impacts

The main concerns for air quality as a result of construction activities typically include fugitive dust and diesel exhaust emissions.

The most significant source of dust emissions from construction activities is typically from vehicle traffic on unpaved or paved roads or open construction areas. Wind erosion may also pick up dust from unpaved roads or storage piles. The loading,

unloading and transferring of materials is also a significant source of fugitive dust, particularly during strong wind conditions. Demolition activities can result in fugitive dust emissions resulting from blasting or removal of structures.

WCC will minimize potential impacts to adjacent properties during construction (e.g. dust control measures). Therefore, the construction impacts to air quality are not considered significant.

Mitigation Measures

Measures to minimize potential air quality impacts during construction include the following Best Management Practices (BMPs):

- Keep construction machinery and equipment in good operating condition.
- No unnecessary idling of vehicles and limit the speed of vehicular travel.
- Where feasible, increase separation distances between sensitive receptors, such as schools, residences, and parks and all exhaust points.
- Dust suppressant measures, as identified in Ontario Provincial Standard Specification (OPSS.MUNI 506), will be used during construction, where appropriate. This may include non-chloride dust suppressants or periodic watering. Chemical dust suppressants will not be used in natural areas where there are plants, watercourses, or other sensitive environmental features.
- Disturbed lands will be vegetated (e.g., seeded) as appropriate and where possible, to reduce the potential for dust to develop from exposed soil.
- Regular cleaning of construction sites and access roads to remove construction-caused debris and dust.
- Cover loads when hauling fine-grained materials.
- Prompt cleaning of paved streets / roads where tracking of soil, mud or dust has occurred.
- Tire washes and other methods to prevent trucks and other vehicles from tracking soil, mud or dust onto paved streets or roads.
- Cover stockpiles of soil, sand and aggregate, as necessary and where possible.
- Compliance with posted speed limits and, as appropriate, further reductions in speeds when travelling at sites with unpaved surfaces.
- Opportunities for tree planting to reduce roadway particulate matter at nearby receptors (e.g. James Snow Parkway), will be examined and discussed in DCR No. 3.
- Minimize the amount of material being transferred on-site at any one time.
- Avoid prolonged storage of debris onsite.

5.4.3 Waste and Contamination

Given the industrial and commercial nature of the properties adjacent to the highway, a Contamination Overview Study was completed that determined there is potential for environmental site contamination for properties along the highway corridor (URS 2013a, URS 2013b). Phase II Environmental Site Assessments (ESAs) were completed for three properties adjacent to the highway and Phase I ESAs were completed for the two Truck Inspection Stations on Highway 401 in 2017 (AECOM, March 2018a, AECOM, March 2018b, AECOM, March 2018c, AECOM, March 2018e, AECOM, March 2018f). One location was identified as contaminated with cyanide, which was described in DCR No. 1. Four additional Phase II ESAs were completed in 2019 by WCC, which included Phase II ESAs for the Truck Inspection Stations, and no additional contamination was identified.

A Designated Substances Survey (DSS) was completed for 17 bridges and eight structural culverts within the Project limits (AECOM February 2018a, AECOM February 2018b, AECOM March 2018d). These structures were tested for substances such as asbestos, lead, mercury, silica, polychlorinated biphenyls (PCBs), and others. Designated Substances and Hazardous Building Materials Assessments for the Trafalgar Road Truck Inspection Stations (north and south of Highway 401) was also completed.

Impacts

Demolitions of bridges, culverts and buildings will be completed as described in Section 4. The results of the DSS confirmed that road level asphalt and waterproofing membrane of the DCR No. 2. structures did not contain asbestos, but that asbestos containing materials (ACM) may be present in the joint sealant and insulation materials of the bridges that will be demolished as part of DCR No. 2 works and must be assumed to contain asbestos for the purposes of demolition works. The culverts did not contain any materials suspected of containing ACMs. Additional DSS identified included:

- Lead containing materials found in paint on the Creditview Road Bridge
- Mercury within streetlight fixtures on Winston Churchill Boulevard Bridge
- Assumed silica presence in poured concrete decking, retaining walls, beams, foundations, abutments, footings guiderails and culvert materials

No other designated substances were found or suspected for the bridge and culvert structures in DCR No. 2.

The Designated Substances and Hazardous Building Materials Assessments for the Trafalgar Road Truck Inspection Stations (north and south of Highway 401) identified

the following designated substances and potentially hazardous materials within the buildings: paint containing lead, fluorescent lightbulbs containing mercury, potential ozone depleting substances in refrigerator and air conditioning equipment, and assumed silica in building foundation and concrete pavement materials.

General spills of deleterious materials may also occur on the construction site due to the presence of chemicals, fuels and lubricants for construction equipment. General best management practices should be employed to reduce the risk of spills from entering the environment.

Mitigation Measures

- Should any contaminated materials be encountered during the undertaking, caution will be exercised while handling and disposing of contaminated materials. Excess materials will be managed in accordance with standard MTO practices (as governed by OPSS 180).
- During construction, if visual evidence of contamination is noted, further investigation will be required.
- Excess soil/fill material that is not suitable for onsite use will be disposed properly off-site.
- The management, abatement or removal, and recycling or disposal of designated substances will adhere to various regulatory requirements or guidelines to ensure worker health and safety, including O. Reg. 347/90 (General – Waste Management), O. Reg. 278/05 (asbestos), the *Environmental Protection Act* (mercury), O. Reg. 490/09 and O. Reg. 213/91 (lead and silica dust), the Ontario Ministry of Labour Guidelines for Lead and Silica on Construction Projects, and O. Reg. 463/10 (ozone depleting substances). Any potential ACMs should be treated as ACMs unless confirmatory sampling is completed.
- WCC will update the designated substances listings, as required.
- WCC will provide subcontractors with the listings of identified designated substances.
- An Asbestos Abatement Plan(s) will be prepared and implemented as required to address suspected ACMs in accordance with O. Reg. 278/05.
- All other construction wastes and materials resulting from demolition or refurbishment will be identified and classified under O.Reg. 347.
- Waste and recyclable materials including metal and plastic will be removed and properly managed off-site for re-use recycling or disposal. Asphalt and concrete will be re-used on the Project.
- Any required approvals for waste management will be obtained by WCC.

5.4.4 Land Use and Property

The existing lands within the Project limits is a mix of urban built-up areas, agricultural fields, and some greenlands. The east end of the project, in the City of Mississauga, has more urban development in the form of commercial and employment lands, whereas the west end of the project is dominated by agricultural fields and industrial areas. There is one residential suburban neighbourhood south of Highway 401 and west of James Snow Parkway.

All property required for this Project has been acquired by the province at this time; no additional property is required. Construction works will be limited to the Project Lands and fencing will be installed at the property boundary of the Project Lands to delineate the extent of where work can occur. The fencing design accommodates watercourses and wildlife passages. Where access is required to any municipal, rail, or 407ETR right of way, appropriate agreements and permits will be obtained. With regards to DCR No. 2 works, access for the farm operation that operates on each side of Highway 401 east of the Credit River will be maintained during construction. The existing farm access will also be realigned under the east end span. There are some properties and businesses adjacent to the corridor that will receive new or reconfigured driveways/entrances to address impacts of the Project.

For the works in DCR No. 2, the following agreements have been/will be obtained:

- MTO Encroachment Permit
- Permissions to Enter (PTEs) from municipalities and/or property owners, where needed
- 407ETR Encroachment Permit

5.4.5 Canadian Navigable Waters Act

The *Canadian Navigable Waters Act* (CNWA) (previously the *Navigation Protection Act*) applies to all navigable waterways in Canada and came into effect in August 2019. Although no watercourses within the Project limits are on the Schedule of Navigable Waters, the Credit River is considered a navigable waterway and is subject to the provisions of the CNWA.

As per the CNWA and through discussions with Transport Canada, the works on the Credit River are considered Major Works and require approval under Transport Canada's Navigation Protection Program. WCC will obtain authorization for the works at Credit River and will comply with conditions of the approval. WCC is consulting with Transport Canada regarding navigability and CNWA requirements for other watercourses in the Project limits which will be documented in DCR No. 3, as required.

5.5 Cultural Heritage

5.5.1 Archaeology

Previous Investigations and Potential Impacts

Stage 1 Archaeological Assessments (AA) were completed during Preliminary Design (URS, 2010a, URS, 2010b, P088-018-2010, P088-031-2010). It recommended a combination of Stage 2 test pit survey and pedestrian survey for areas deemed to have archaeological potential, and which had not been previously assessed. A Stage 2 Archaeological Assessment was completed in 2017 and 2018 (AECOM 2018l, P123-0358-2017) in accordance with the Standards and Guidelines for Consultant Archaeologists (MHSTCI, 2011). A total of 221 property parcels were identified as being impacted by the proposed improvements. 145 parcels were identified as disturbed and containing no archaeological potential and 50 parcels were fully assessed and cleared of further archaeological concern.

One site was identified as having archaeological potential and a Stage 3 AA was recommended; however, the site and its protection and monitoring buffers are within a portion of the Project limits that will not be impacted by any ground disturbance or grading.

In 2019, WCC completed a Stage 2 AA for the remaining properties requiring clearance. Two properties were determined to have further archaeological potential:

- A historical Euro-Canadian archaeological site was encountered on one property within the Project limits. A Stage 3 AA was completed for the one property and did not recommend further archaeological investigations.
- An Archaic time period artifact was encountered on one property within the Project limits. A Stage 3 AA will be required; however, this site is not impacted by works in DCR No. 2.

The completed Stage 2 and 3 AA reports were submitted to MHSTCI. The Project limits that will be impacted by DCR No. 2 works have been cleared of archaeological potential.

Mitigation Measures

- Should previously undocumented archaeological resources be discovered, the person discovering the archaeological resources will cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out archaeological fieldwork, in compliance with sec. 48 (1) of the *Ontario Heritage Act.*
- The *Cemeteries Act,* R.S.O. 1990 c. C.4 and the *Funeral, Burial and Cremation Services Act*, 2002, S.O. 2002, c.33 (when proclaimed in force) require that any

person discovering human remains must notify the police or coroner and the Registrar of Cemeteries at the Ministry of Government and Consumer Services.

5.5.2 Built Heritage

Previous Investigations

A review of built heritage features was undertaken during preliminary design (URS 2013a, URS2013b). In 2017, a Heritage Review was completed on the existing bridges and culverts within the Project limits (AECOM, 2017d). Based on the preliminary design and 2017 Heritage Review findings, further Cultural Heritage Evaluation Reports (CHERs) were undertaken (AECOM 2017a, AECOM 2017b, AECOM 2017c, AECOM 2018a). A summary of the overall findings is outlined below:

- John Dolmage House, 7548 Trafalgar Road, Milton: Has cultural heritage value or interest according to criteria for a Provincial Heritage Property (PHP) outlined in O. Reg 9/06 and is listed on the Milton Heritage Inventory. It has since been determined that the Project will not impact this property.
- Joseph Cunningham House, 7622 Fifth Line Road, Milton: Has cultural heritage value or interest according to criteria for a PHP outlined in O. Reg 9/06, but did not meet the criteria for a Provincial Heritage Property of Provincial Significance (PHPPS) outlined in O. Reg 10/06. The Project does not physically impact the Cunningham House, but there will be works occurring on the MTO ROW adjacent to the property that may affect the Cunningham House's heritage attributes which required additional assessment. (refer to DCR No. 1 for further discussion).
- Sylvan Oaks, 7564 Tenth Line West, Mississauga: Has cultural heritage value or interest according to O. Reg. 9/06 and that the house and the Cultural Heritage Landscape (CHL) also meet the criteria for a PHPPS outlined in O. Reg. 10/06. However, the Project does not encroach on the property line of Sylvan Oaks and no impact is anticipated on the CHL and no further assessment or impact mitigation was required.
- Cowin House, 14920 Steeles Avenue, Halton Hills: The Cowin House and bank barn at 14920 Steeles Avenue, Halton Hills, do not have cultural heritage value according to O. Reg. 9/06 and O. Reg 10/06 and no further assessment or impact mitigation was required.
- Sixth Line Underpass, Sixth Line at Highway 401, bordering Halton Hills and Milton: Has cultural heritage value or interest according to criteria for a PHP outlined in O. Reg. 9/06, but did not meet the criteria for a PHPPS outlined in O. Reg 10/06. Although the Sixth Line underpass meets the criteria for O. Reg. 9/06, it does not score sufficiently to meet the threshold for the Ontario Heritage Bridge List. The Project will be replacing the Sixth Line structure and demolishing the existing structure. No further heritage assessment is needed, but documentation of the existing structure in a Heritage Documentation Report was required.

Potential Impacts

With regards to the works in DCR No. 2, the only impact to heritage features is the replacement of the Sixth Line Underpass structure. The new structure is being built to the west of the existing structure. The existing structure will be demolished once the new bridge is operational. A Heritage Documentation Report for the Sixth Line Structure has been completed by WCC in 2019.

Mitigation Measures

- Documentation of the Sixth Line Underpass has already been completed, therefore no further mitigation required for the works in DCR No. 2. The Heritage Documentation Report has been placed at MTO Central Region Office, a public institution.

5.6 Adjacent Studies/Projects

Several other projects are expected to take place within or overlap with the Project limits, as listed in Table 7 below. Where required, WCC will coordinate with the relevant stakeholders of these projects to resolve interfaces, questions or concerns regarding WCC's proposed design or construction. Timelines noted below are based on current estimates from the stakeholders and may be subject to change.

Table 7: Other Studies and Projects Adjacent to the Project Limits

Name of Other Studies / Projects	Proponent	Timing
Peel Region/Mississauga		
Highway 401 Expansion – Credit River to 403/410 Interchange	MTO	2016 – 2020
Creditview Road Widening	City of Mississauga	2019 – 2020/21
Widening and Reconstruction of the Derry Road and Argentia Road Intersection	Peel Region	TBD
Widening of Winston Churchill Boulevard	Peel Region	EA completion 2020, Construction planned for 2025
West Trunk Twinning Project	Peel Region	2020 – 2021
Halton Region		

Name of Other Studies / Projects	Proponent	Timing
Greater Toronto Area West Transportation Corridor Route Planning and Environmental Assessment Study (partially in Mississauga)	MTO	EA completion 2022
Tremaine Road Interchange and Advanced Works Contract	Halton Region	2020 - 2022
Sewer Crossing at 8th Line	Halton Region	2019 – 2020
EA – Regional Road 25 Widening from 4 to 6 lanes from Steeles to 5th Side Road	Halton Region	EA Completion Mid-2019, Construction planned for 2022
Watermain Crossing near Trafalgar Road Interchange	Halton Region	Underway, estimated completion 2020
Watermain replacement on Harrop Drive from Steeles Avenue to Hwy 401 (300 mm) PR-2907	Halton Region	In design, completion by 2020
Watermain relocation (300 mm) just south of the 401 from Chisholm Drive to Peru Road PR-3105	Halton Region	In design, completion by 2020
Road widening – Trafalgar Road from Steeles Ave to 10th Side Road	Halton Region	2019 – 2022

5.7 Summary of Environmental Concerns and Commitments

The TESRs from preliminary design included a Table of Environmental Concerns and Commitments. These tables have been included as **Appendix E** with an additional column that details how the concerns and commitments have been addressed or carried through into detail design.

A Table of Environmental Concerns and Commitments has been developed for the works covered under DCR No. 2 and is shown in Table 8:

Table 8: Environmental Concerns and Commitments from DCR No. 2 Detail Design

Legend	
DFO: Fisheries and Oceans Canada	MUN: Municipalities
MNRF: Ministry of Natural Resources Forestry	RES / BUS: Area residents and/or businesses
MTO: Ministry of Transportation	UTIL: Utilities
CA: Conservation Authority	MHSTCI: Ministry of Heritage, Sport, Tourism, and Culture Industries
MECP: Ministry of Environment, Conservation and Parks	CN Rail: Canadian National Railway
CP Rail: Canadian Pacific Railway	

Ref No.	Environmental Concern and Potential Impact	Concerned Agencies	ID No.	Mitigation / Commitment
1	**Terrestrial Ecosystems – Vegetation**	DFO MNRF MECP MTO MUN CA	1.1	Apply standard erosion and sediment control (ESC) measures consistent with Ontario Provincial Standards and Specifications (OPSS). These control measures will be implemented prior to work and be maintained during construction until disturbed areas have been effectively stabilized with permanent vegetation cover. (Refer to Section 5.2).
			1.2	Provide clear delineation of vegetation clearing zones and vegetation retention zones (e.g. EPZs, Mitigation Lands, treed natural areas) within the Project limits in both the design documents and in the field to minimize the risk of vegetation impacts outside of the Project limits and avoid incidental impacts as a result of temporary stockpiling, debris disposal and access. Equipment, materials and other construction activities will not be permitted in these zones.
			1.3	Prior to heavy machinery working adjacent to EPZs, Mitigation Lands, treed natural areas or edge management areas, tree protection fence will be installed outside the drip-line to protect any vegetation that is to be retained and is in the vicinity of exposure to damage by machinery or other sources.
			1.4	Installation of tree protection fencing will be in accordance with Ontario Provincial Standard Specification (OPSS) (OPSS 801.07.02) – Construction Specification for the Protection of Trees and Ontario Provincial Standard Drawing (OPSD) 220.010 (formerly OPSS 805).
			1.5	Prune roots or adjacent trees that are to be retained but extend into the work limits and that may be damaged from construction.
			1.6	Equipment and heavy machinery will be stored away from naturalized areas to minimize damage to natural areas outside of the work limits.
			1.7	Where possible, earth movement will be restricted immediately adjacent to woodlands during periods of high dust generation.
			1.8	Avoid the compaction of soils and root zones around trees within natural features.
			1.9	Vegetation communities occurring outside but adjacent to the Lands (identified as Edge Management Areas) will be protected with tree protection fence.

Ref No.	Environmental Concern and Potential Impact	Concerned Agencies	ID No.	Mitigation / Commitment
			1.10	In the event that adjacent vegetation communities or planted trees are accidently damaged during construction activities, WCC will implement contingency measures such as pruning tree limbs or roots that are accidently damaged using proper arboricultural techniques during grading and excavation.
			1.11	Equipment working in invasive species locations will be thoroughly cleaned prior to moving from the site as per the Clean Equipment Protocol for Industry (Halloran et.al, 2013).
			1.12	**Invasive Species Management:** Equipment working in invasive species locations will be thoroughly cleaned prior to moving from the site as per the Clean Equipment Protocol for Industry (Halloran et.al, 2013).
2	**Terrestrial Ecosystems – Wildlife and Wildlife Habitat**	DFO MNRF MECP MTO MUN CA	2.1	WCC will provide training to all on-site personnel to outline wildlife that may be present on-site as well as responsibilities to report wildlife and potential SAR to the WCC SAR Specialist. The training manual will include fact sheets for known wildlife and SAR in the area which will also note procedures for reporting / handling any encounters with injured or deceased wildlife/SAR.
			2.2	Under no circumstances will any animal (i.e., bird, turtle, snake, mammal, butterfly, etc.) be knowingly harmed, harassed or otherwise disturbed. If an animal is encountered, it will be permitted to move away on its own.
			2.3	If wildlife is observed or encountered in the work area and remains within the work area, construction activities will cease, if required, so as not to harm the animal. Appropriate personnel, such as the WCC Wildlife Biologist, will be notified. The WCC Biologist will determine the significance of the species, handle the wildlife accordingly, and if required notify the appropriate regulatory agency. Wildlife encounters should be handled according to the Environmental Awareness Training Manual and the Safe Handling Protocol.
			2.4	Should an injured or orphaned animal be encountered, the WCC Wildlife Biologist will transport the animal to a wildlife rehabilitation centre (approved Wildlife Custodian by the MNRF or a member of the College of Veterinarians of Ontario).
			2.5	Wildlife crossing features will be incorporated at the Oakville Creek East Bridges and the Credit River Bridges and will include dry passage, use of natural substrates conducive to wildlife use, retaining and replanting of native vegetation, and other ecological improvements as part of the valley restoration plans. The design for wildlife passages features, fencing and escape ramps will be covered in DCR No. 3 (refer to Section 5.1.6).
			2.6	Wildlife fence will be installed. Details of the wildlife fence and wildlife passage will be in DCR No. 3
			2.7	**Migratory Birds:** Active nests will not be knowingly removed or disturbed in accordance with the MBCA (1994).
			2.8	If the active nests of migratory birds are found, contact WCC's Biologist for further direction. The location of the nest will be noted using handheld GPS.
			2.9	To avoid potential nest abandonment and/or predation, nests will be physically flagged if they are located close to an active construction zone and are a risk of accidental damage.
			2.10	WCC will install bird nesting preventative measures on structures within the Project limits prior to the active season (before April 1). The measures will be maintained until August 31 of the same calendar year, or until removal is required to facilitate demolition at the structure.
			2.11	WCC will conduct daily visual inspections on structures during construction for presence of nesting birds, if required.

Ref No.	Environmental Concern and Potential Impact	Concerned Agencies	ID No.	Mitigation / Commitment
3	**Aquatic Ecosystems – Watercourses, Fish and Fish Habitat**	DFO MOE MNR MTO CA	3.1	Obtain required approval(s) prior to work commencing.
			3.2	Work will be undertaken in accordance with the conditions in the approvals and in consultation with DFO. This may include completing compensation and monitoring during and post-construction.
			3.3	In-water works or work on the banks is permitted in accordance with the appropriate timing windows.
			3.4	Where possible, schedule work to avoid wet and rainy periods that may increase erosion and sedimentation.
			3.5	Works shall be undertaken in accordance with OPSS 182: *General Specification for Environmental Protection for Construction in Waterbodies and on Waterbody Banks*.
			3.6	Site isolation/containment measures (i.e. cofferdams) will be implemented to isolate areas where in-water work is required. Capture and relocate any fish from within the work area, as required.
			3.7	Aim to minimize duration of in-water work and conduct instream work during periods of low flow to further reduce the risk to fish and their habitat and to allow work in water to be contained.
			3.8	Perform regular inspection of the work area(s).
			3.9	Vegetation to be retained will be delineated and protected.
			3.10	Clearing of riparian vegetation has been minimized.
			3.11	The control of water from dewatering operations is to be conducted in accordance with OPSS 517: Construction Specification for Dewatering.
			3.12	Screens will be used for water intakes or outlet pipes to prevent entrainment or impingement of fish.
			3.13	Dewatering operations shall be directed to a sediment control device or natural attenuation area prior to discharge to watercourses.
			3.14	ESC measures consistent with OPSS 804 - Construction Specification for Seed and Cover and OPSS 805 - Construction Specification for Temporary Erosion and Sediment Control Measures, will be implemented prior to work and be maintained during construction until disturbed areas have been effectively stabilized with permanent vegetation cover. (Refer to Section 5.2)
			3.15	Erosion and sediment controls will be designed to contain/isolate the construction zone, manage site drainage/runoff and prevent erosion of exposed soils and migration of sediment into watercourses.
			3.16	WCC will monitor erosion and sediment control (ESC) systems for effectiveness, repairing deficient controls in a timely manner using an adaptive management approach when deemed appropriate.
			3.17	All disturbed areas of the work site will be stabilized and revegetated promptly, and/or treated with appropriate erosion protection materials.
			3.18	Enhancing shading of the watercourse by planting native species in areas of overhanging / riparian vegetation loss will be provided.
			3.19	Machinery will arrive on-site in a clean condition and will be maintained to be free of fluid leaks, invasive species and noxious weeds.
			3.20	Heavy machinery access will be limited to pre-defined areas within the Project limits.
			3.21	Stockpiled materials will be stored and stabilized at least 30m from watercourses.
			3.22	Materials and equipment used will be operated and stored in such a manner that prevents any deleterious substance from entering the water.

Ref No.	Environmental Concern and Potential Impact	Concerned Agencies	ID No.	Mitigation / Commitment
			3.23	Machinery will be refuelled, washed and serviced a minimum of 30m away from the top of bank to prevent discharge of deleterious substances into occupied and contributing watercourses.
			3.24	Consider construction staging such that spills and leaks into the watercourse will be avoided or minimized.
			3.25	Prepare a Spill Prevention and Management Plan prior to commencement of construction operations. Have spill kits onsite and drip pans under all non-mobile machinery.
4	**Species at Risk**	MECP MTO CA	4.1	**Aquatic Species at Risk:** For wildlife encounters with SAR refer to Section 5.1.2 Mitigation Measures.
			4.2	Aquatic Ecosystem Mitigation Measures from Section 5.1.3 apply.
			4.3	Works within Redside Dace Regulated Habitat and the Credit River will not take place until required permits and approvals are received. Works will be undertaken in accordance with the conditions of permits or approvals. This may include completing compensation and monitoring during and post-construction.
			4.4	ESC BMPs for Redside Dace Regulated Habitat will be consistent with Guidance for Development Activities in Redside Dace Protected Habitat (MNRF, 2016).
			4.5	While completing project activities within Redside Dace Regulated Habitat, daily monitoring will occur. Additional monitoring details are included in Section 7.2.
			4.6	Environmental training will be conducted so all staff are aware of the importance of maintaining proper ESCs for the purpose of protecting aquatic SAR.
			4.7	All construction equipment and machinery will be operated within the construction zone and will not create any additional disturbance to the existing bed and banks of the watercourses within the Redside Dace Regulated Habitat.
			4.8	Site restoration of Redside Dace habitat and the Credit River will be undertaken following the completion of the proposed works in accordance with permits and approvals and will be described in subsequent DCRs.
			4.9	During construction at the Credit River, debris platforms will be provided, and necessary containment measures taken during removal and construction to collect any falling concrete and construction debris, such that no debris or materials resulting from the removal and construction operations will fall into the Credit River.
			4.10	Temporary water barriers (i.e., cofferdams) will be used and designed to accommodate any expected high flows of the watercourse during construction at the Credit River.
			4.11	Appropriate sediment controls will be implemented at the Credit River prior to commencement of construction works. This includes sediment control devices installed both up and downstream of the construction site. Accumulated sediments will be pumped out prior to removal of the trap.
			4.12	**Terrestrial Species at Risk:** For wildlife encounters with SAR refer to Section 5.1.2 Mitigation Measures.
			4.13	Tree protection measures as described in Section 5.1.1 also apply to bat habitat.

Ref No.	Environmental Concern and Potential Impact	Concerned Agencies	ID No.	Mitigation / Commitment
			4.14	Project works will be done in accordance with the conditions of the Bat SAR Letter of Advice obtained from MNRF (MNRF File No. AU-LOA-11-19), which includes installation of bat boxes (artificial roosting structures), woodland restoration and monitoring.
			4.15	Reduce light spill near bat habitat as per measures in Section 4.5.3.
			4.16	Construction activities within 30m of known cavity trees will be restricted to daylight hours when possible.
			4.17	Registration with MECP for Barn Swallow using the Notice of Activity Form will be completed.
5	**Landscaping and Ecological Restoration**	MNRF MECP MTO CA	5.1	Landscaping and Ecological Restoration will be developed as part of this Project and will identify areas which will receive landscape treatments, enhancement and/or restoration. The Plan will include details of Valley Restoration, Edge Management Areas, SAR habitat restoration, compensation and overall benefit, Enhancement and Restoration of SWH, where feasible, Fish Habitat Enhancement and Riparian Habitat Restoration, and Stormwater Management Pond Naturalization.
6	**Groundwater**	MECP CA	6.1	WCC will limit the depth of excavation and minimize the need for dewatering during construction, particularly in areas designated as having a high potential for groundwater impact (i.e. creeks and tributaries).
			6.2	All materials and equipment used will be operated and stored to prevent deleterious substances from entering the water.
			6.3	WCC will obtain Permit to take Water (PTTW) for works within DCR No. 2.
			6.4	Dewatering activities will be conducted in accordance with all applicable procedures provided in the Ontario's Water Taking Regulation (O. Reg. 387/04 made under the Ontario Water Resource Act, as amended by O. Reg. 64/16, March 29, 2016), OPSS 518 Control of Water from Dewatering Operations, and the specific requirements outlined under the PTTW.
			6.5	Water wells or groundwater monitoring wells, if no longer in use, will be properly decommissioned as per the Ontario Wells Regulation (R.R.O. 1990, Reg. 903).
			6.6	WCC will minimize groundwater recharge impacts by directing the surface runoff to roadside ditches and improve ditch conditions during construction with inclusion of ESC measures.
			6.7	Silt laden discharge water from dewatering activities will be directed away from the watercourse in such a way as to minimize sedimentation.
			6.8	Application of appropriate energy dissipation and settling/filtration measures during temporary dewatering of the near or instream construction zones.
			6.9	A Groundwater Monitoring Program will be implemented during construction. If impacts are noted more frequent monitoring of the wells and possible further assessment of the impacts will be required. See Section 7.2 for additional details.
			6.10	Investigate and promptly address any complaints of interference related to construction activities.
			6.11	Follow best management practices for road de-icing applications, as applicable for WCC's construction work zone.
7	**Surface Water**	MECP MNRF MTO	7.1	General Aquatic Ecosystem Mitigation Measures from Section 5.1.3 apply.
			7.2	Erosion and sediment control measures will be employed during construction to manage surface water runoff and construction drainage. See Section 5.2 for additional ESC details.

Ref No.	Environmental Concern and Potential Impact	Concerned Agencies	ID No.	Mitigation / Commitment
		CA	7.3	WCC will undertake a Surface Water Monitoring Program during construction to identify whether there are any changes in surface water quality due to construction works. See Section 7.2 for additional details.
			7.4	Adaptive management measures are to be implemented if necessary during construction.
8	**Erosion and Sediment Control**	MECP MNRF MTO CA	8.1	Aquatic Ecosystem Mitigation Measures from Section 5.1.3 and SAR Measures from Section 5.1.4 apply.
			8.2	WCC will retain natural vegetation cover and minimize root grubbing, where possible, to provide natural erosion control cover.
			8.3	WCC will prepare and implement site specific erosion and sediment control plans (site-specific ESCPs) and drainage and sediment management plans (DSMPs) in advance of construction to describe detailed measures at each work site throughout the phases of construction.
			8.4	WCC will implement the ESC measures prior to the start of construction activities or disturbance of soil and they will be maintained during construction until the disturbed areas have been effectively stabilized.
			8.5	WCC will promptly stabilize and re-vegetate all disturbed areas of the work site, and/or treat the site with appropriate erosion protection materials.
			8.6	ESC measures will be installed per design, maintained and monitored frequently to confirm they are working effectively and according to OPSS 805 (Construction Specification for Temporary Erosion and Sediment Control Measures). The ESC measures will be inspected and maintained, as described in Section 7.2, on a regular basis.
			8.7	ESC measures will be placed as necessary at appropriate intervals in the ditches down gradient from areas of soil disturbance to trap suspended sediments and reduce the erosive force of runoff.
			8.8	Stockpiled materials will be stored away from water and sensitive natural features. Sediment control measures such as silt fence will be around the base of the stockpile to prevent mobilization of the stockpile.
			8.9	In the event of a sediment spill, WCC will take reasonable action to stop the spread of spilled materials by blocking catch basins, digging trenches, creating dykes, and spreading an absorbent. Spills will be reported according to the Spill Prevention and Management Plan.
9	**Excess Earth**	MTO MECP	9.1	Suitable excavated soils will be reused within the Project limits as much as possible.
			9.2	Stockpiles of contaminated or potentially contaminated soil will be properly contained.
			9.3	Earth imported from external sources will be in accordance with applicable standards and guidelines.
			9.4	Offsite management and disposal of waste and excess materials generated during construction will be conducted in accordance with O. Reg. 347 and OPSS 180 - General Specification for The Management of Excess Materials.
			9.5	Earth will not be located within the boundaries of a sensitive environmental area as defined in O. Reg. 153/04 (as amended).
			9.6	Earth will not be placed in locations where there is direct drainage to that location.
			9.7	Stockpiles will not be placed on property or within areas of known or suspected contamination.
			9.8	Measures to prevent the mobilization of stockpiles will be employed using silt fences and other erosion control methods as appropriate.
			9.9	Necessary steps will be taken to minimize dust emissions, and limit infiltration of precipitation and discharge of soil particles through drainage and runoff.

Ref No.	Environmental Concern and Potential Impact	Concerned Agencies	ID No.	Mitigation / Commitment
			9.10	Stockpiles will be monitored to confirm that the stockpiles remain intact and that there are no environmental adverse effects, erosion issues or sedimentation concerns.
			9.11	Where environmental or other concerns are identified, necessary corrective action will be taken in a timely manner.
10	**Noise and Vibration**	MTO MECP MUN RES / BUS	10.1	**Noise:** General best management practices to limit construction noise will be employed.
			10.2	To the extent possible, limit noisy construction activities to daytime hours.
			10.3	In noise sensitive areas, pile driving will be restricted to daytime hours.
			10.4	Obtain noise by-law exemption from local municipalities where work is taking place within municipal rights-of-way and abide by any noise by-law conditions.
			10.5	Equipment will be maintained in good operating condition and comply with MECP noise emission standards (Noise Pollution Control (NPC) – 115 and NPC-118 and Ontario Model Municipal Noise Control By-Law).
			10.6	WCC will keep idling of construction equipment to a minimum.
			10.7	WCC will maximize the distance between the construction staging areas and nearby receptors.
			10.8	Maintain construction haul roads to avoid the loud noise caused by construction vehicles travelling over uneven road surfaces.
			10.9	If complaints regarding construction noise arise from construction, they will be investigated according to the provisions of MTO Environmental Guide for Noise (October 2006).
			10.10	In the presence of persistent noise complaints, construction equipment should be checked for compliance with MECP NPC-115 guidelines. Heavily loaded trucks will be routed away from residential streets, where possible.
			10.11	**Vibration:** The use of equipment that generate high levels of vibration will be minimized.
			10.12	Equipment used within 80m of Thermo Fisher Scientific receptor cannot exceed a vibration velocity 400 micro-m/sec (PPV). If required, equipment will be tested before commencing construction activity in the vicinity of Thermo Fisher Scientific. WCC will also conduct vibration monitoring (see Section 7.2) during construction works within 80m of the property to verify that the vibration velocity is not exceeded.
11	**Air Quality**	MTO MECP	11.1	Keep construction machinery and equipment in good operating condition.
			11.2	No unnecessary idling of vehicles and limit the speed of vehicular travel.
			11.3	Where feasible, increase separation distances between sensitive receptors, such as schools, residences, and parks and all exhaust points.
			11.4	Dust suppressant measures, as identified in Ontario Provincial Standard Specification (OPSS.MUNI 506), will be used during construction, where appropriate. This may include non-chloride dust suppressants or periodic watering. Chemical dust suppressants will not be used in natural areas where there are plants, watercourses, or other sensitive environmental features.
			11.5	Disturbed lands will be vegetated (e.g., seeded) as appropriate and where possible, to reduce the potential for dust to develop from exposed soil.

Ref No.	Environmental Concern and Potential Impact	Concerned Agencies	ID No.	Mitigation / Commitment
			11.6	Regular cleaning of construction sites and access roads to remove construction-caused debris and dust.
			11.7	Cover loads when hauling fine-grained materials.
			11.8	Prompt cleaning of paved streets / roads where tracking of soil, mud or dust has occurred.
			11.9	Tire washes and other methods to prevent trucks and other vehicles from tracking soil, mud or dust onto paved streets or roads.
			11.10	Cover stockpiles of soil, sand and aggregate, as necessary and where possible.
			11.11	Compliance with posted speed limits and, as appropriate, further reductions in speeds when travelling at sites with unpaved surfaces.
			11.12	Opportunities for tree planting to reduce roadway particulate matter at nearby receptors (e.g. James Snow Parkway), will be examined and discussed in DCR No. 3.
			11.13	Minimize the amount of material being transferred on-site at any one time.
			11.14	Avoid prolonged storage of debris onsite.
12	**Waste and Contamination**	MTO UTIL	12.1	Should any contaminated materials be encountered during the undertaking, caution will be exercised while handling and disposing of contaminated materials. Excess materials will be managed in accordance with standard MTO practices (as governed by OPSS 180).
			12.2	During construction, if visual evidence of contamination is noted, further investigation will be required.
			12.3	Excess soil/fill material that is not suitable for onsite use will be disposed properly off-site.
			12.4	The management, abatement or removal, and recycling or disposal of designated substances will adhere to various regulatory requirements or guidelines to ensure worker health and safety, including O. Reg. 347/90 (General – Waste Management), O. Reg. 278/05 (asbestos), the *Environmental Protection Act* (mercury), O. Reg. 490/09 and O. Reg. 213/91 (lead and silica dust), the Ontario Ministry of Labour Guidelines for Lead and Silica on Construction Projects, and O. Reg. 463/10 (ozone depleting substances),. Any potential ACMs should be treated as ACMs unless confirmatory sampling is completed.
			12.5	WCC will update the designated substances listings, as required.
			12.6	WCC will provide subcontractors with the listings of identified designated substances.
			12.7	An Asbestos Abatement Plan(s) will be prepared and implemented as required to address suspected ACMs in accordance with O. Reg. 278/05.
			12.8	All other construction wastes and materials resulting from demolition or refurbishment will be identified and classified under O.Reg. 347.
			12.9	Waste and recyclable materials including metal and plastic will be removed and properly managed off-site for re-use recycling or disposal. Asphalt and concrete will be re-used on the Project.
			12.10	Any required approvals for waste management will be obtained by WCC.
13	**Archaeology**	MTO MHSTCI	13.1	Should previously undocumented archaeological resources be discovered, the person discovering the archaeological resources will cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out archaeological fieldwork, in compliance with sec. 48 (1) of the Ontario Heritage Act.
			13.2	The Cemeteries Act, R.S.O. 1990 c. C.4 and the Funeral, Burial and Cremation Services Act, 2002, S.O. 2002, c.33 (when proclaimed in force) require that any person discovering human remains must notify the police or coroner and the Registrar of Cemeteries at the Ministry of Government and Consumer Services.

6 Environmental Approvals and Permits for DCR No. 2 Works

The permits, licenses, agreements and approvals required for works covered under DCR No. 2 are summarized in Table 9.

Table 9: Permits, Licenses, Agreements and Approvals for DCR No. 2 Works

Permit / Approval	Issued By	Related Works
MTO Encroachment Permit	MTO	For work on MTO-owned lands
Road Occupancy Permit	Region of Peel Region of Halton City of Mississauga Town of Milton Town of Halton Hills	For works in municipal Right of Ways
LoA for bat SAR (MNRF File No. AU-LOA-11-19)	MNRF* and MECP	Vegetation removal, restoration and compensation for bat SAR habitat (Obtained February 2019)
Registration using the Notice of Activity Form for Barn Swallow	MECP	Construction activities and bridges and culverts noted to be habitat for Barn Swallow
17 2 (c) ESA Permit for Redside Dace	MECP	Construction activities in Occupied and Contributing Regulated Redside Dace Habitat
SARA Permit for Redside Dace	DFO	Construction activities in Occupied Redside Dace watercourses
Fisheries Act – Request for Review Letter of Advice	DFO	Works as described in Section 5.1.3
Fisheries Act Authorization(s)	DFO	Works at WC-04, WC-05, WC-18A, WC-19
MTO Notification Form	MTO/ DFO/MNRF	Works as described in Section 5.1.3

Permit / Approval	Issued By	Related Works
LoA for American Eel	MECP	Works at Credit River (Obtained December 2019)
Canadian Navigable Waters Act Approval	Transport Canada	Construction works at Credit River
PTTW	MECP	Groundwater taking for construction activities
Archaeological Clearance	MHSTCI	Stage 2 and 3 Archaeological Assessment completed and submitted to MHSTCI
407ETR Encroachment Permit	407ETR	For construction activities on 407ETR lands
Municipal Noise By-law Exemption	City of Mississauga Town of Milton Town of Halton Hills	Works occurring on municipal-owned lands and outside of the permitted hours as defined by each municipality's Noise By-Law

**LoA for Bat SAR was obtained when ESA, 2007 and SAR permitting was administered through MNRF. MECP is now the regulatory agency responsible for ESA, 2007 and SAR permitting.*

7 Monitoring

7.1 Prior to Construction

During the completion of the detail design, the design drawings and specifications will be further developed and finalized. It is expected that design modifications or refinements will be required during this process, which could result in environmental benefits or impacts that may not have been anticipated or identified in this document. Should this occur, the modifications are not anticipated to alter the basic intent of the undertaking. WCC will be monitoring these design changes to determine the impacts and revise the mitigation measures, as appropriate, and pertinent changes will be discussed with appropriate external agencies and members of the public prior to construction, as deemed necessary.

7.2 Construction Monitoring

Monitoring programs will be implemented to:

- Assess compliance with the design details, environmental commitments and conditions of permits and approvals; and,
- Monitor the effectiveness of mitigation measures and identify the need for additional measures or adaptive management, where necessary.

All personnel who are working or accessing the construction site will be required to complete Health and Safety Training and Environmental Awareness Training. The Environmental Awareness Training covers sensitive vegetation areas and watercourses, wildlife protocols, including SAR, ESC and fencing, and best management practices for work on the construction site to address environmental factors such as spills, air quality, and noise.

Construction and Environmental Site Inspection

Daily site inspections will occur for the Project by construction and environmental staff. Monitoring will be undertaken in compliance with MTO's Construction Administration and Inspection Task Manual (CAIT Manual) and the conditions or commitments of the EA and permits, licenses, approvals or agreements obtained. A key component to environmental site inspections will be monitoring the performance of ESC measures.

Surface Water Monitoring Program

During construction, WCC will implement a Surface Water Monitoring and Mitigation Program at four watercourses where baseline monitoring was conducted by MTO in 2017 and 2018. The monitoring program will include water level data and collection of bi-weekly samples upstream and downstream of the four identified watercourses from April to November until Substantial Completion of the Project. The program will commence in 2020.

The monitoring program will identify whether there are any changes in surface water quality due to construction works. Adaptive management measures will be implemented if necessary, during construction to control levels to match the baseline data results collected or to improve upon the baseline results, but not to exceed them during construction.

Groundwater Monitoring Program

WCC will be responsible for undertaking monitoring of private water supply wells for groundwater quality and quantity. If impacts to the quality and quantity of the water wells are observed or reported, more frequent monitoring of the wells may be required until the monitoring result consistently indicates that no impacts are present.

Additional monitoring will also be implemented in accordance with PTTW conditions, if required.

Vibration Monitoring at Thermo Fisher Scientific

WCC will conduct site specific vibration monitoring at the Thermo Fisher Scientific Property, 2100 Syntax Court in Mississauga. The monitoring will be conducted at three outdoor locations approximately one metre from the building façade. WCC will be responsible for continuously monitor vibration levels during any and all construction activities in the vicinity (within 80 m) of the Thermo Fisher Scientific Property to verify that the construction activities do not exceed the vibration limit.

Monitoring for Fisheries Act, SARA and/or ESA

Specific monitoring requirements will be determined when permits, approvals and authorizations are received. A primary focus of the monitoring will be related to ESC measures, which will also be monitored through the daily Construction and Environmental Site Inspections. Post-construction effectiveness monitoring will also be implemented in accordance with future permit conditions.

Vegetation and Wildlife Monitoring

Will include monitoring of overall site conditions and specific monitoring associated with the Bat SAR Letter of Advice (MNRF File No. AU-LOA-11-19).

7.3 EA Compliance Monitoring

Monitoring compliance with the commitments and conditions of the EAs (Preliminary Design TESRs and Detail Design DCRs) along with conditions and commitments of environmental approvals will be on-going throughout the Project. In addition to the documentation in the DCRs, an Annual Compliance Report will be prepared to document progress and compliance with EA commitments and conditions.

8 References

AECOM, 2017a: Cultural Heritage Evaluation Report, 7622 Fifth Line, Cunningham House, Highway 401 Expansion, Regional Road 25 to the Credit River (W.O. # 17, Agreement #2016-E-0004) for MTO. November, 2017.

AECOM, 2017b: Cultural Heritage Evaluation Report, 14920 Steeles Avenue, Cowin House, Highway 401 Expansion, Regional Road 25 to the Credit River (W.O. # 17, Agreement #2016-E-0004) for MTO. October, 2017).

AECOM, 2017c: Cultural Heritage Evaluation Report, Sylvan Oaks, the Hustler Farm, Highway 401 Expansion Regional Road 25 to the Credit River (W.O. # 17, Agreement #2016-E-0004) for MTO. October, 2017.

AECOM, 2017d: Highway 401 Expansion from Regional Road 25 to the Credit River, Bridge & Culvert Heritage Review Technical Memorandum for MTO. November 2017.

AECOM, 2018a: Cultural Heritage Evaluation Report, Sixth Line Underpass, Highway 401 Expansion, Regional Road 25 to the Credit River (W.O. # 17, Agreement #2016-E-0004) for MTO. January, 2018.

AECOM, 2018b: Hornby Creek Fluvial Geomorphic Assessment and Channel Design.

AECOM, 2018c: Mullet Creek Fluvial Geomorphic Assessment and Channel Design.

AECOM, 2018d: Highway 401 Expansion Terrestrial Ecosystems Existing Conditions and Impact Assessment Memorandum. March 2018.

AECOM, 2018e: Species at Risk Bat Habitat Assessment and Acoustic Monitoring Analysis for the Highway 401 Expansion, Owner's Engineer Services Project Technical Memorandum. July 2018.

AECOM, 2018f: Highway 401 Expansion from Regional Road 25 to the Credit River – Traffic Noise Impact Assessment

AECOM, 2018g: Highway 401 Expansion from Regional Road 25 to the Credit River – Door-to-Door Water Well Survey, February 2018.

AECOM, 2018h: Highway 401 Expansion, Thermo Fisher Scientific - Baseline Vibration Measurement Study

AECOM, 2018i: Highway 401 Expansion, Thermo Fisher Scientific - Construction Vibration Assessment and Vibration Monitoring Program

AECOM, 2018j: Highway 401 Expansion from Regional Road 25 to the Credit River - Technical Memo: Air Quality Modelling of 2041 Scenarios. March 2018.

AECOM, 2018k: Provisional Fisheries Assessment and Pathways of Effect (PoE) Analysis. August 2018.

AECOM, 2018l: Highway 401 Expansion from Regional Road 25 to the Credit River: Stage 2 Archaeological Assessment

AECOM, February 2018a: Designated Substances and Hazardous Building Materials Assessment, Trafalgar North Inspection Station, Highway 401 Expansion, Credit River to Regional Road 25.

AECOM, February 2018b: Designated Substances and Hazardous Building Materials Assessment, Trafalgar South Inspection Station, Highway 401 Expansion, Credit River to Regional Road 25.

AECOM, March 2018a: Phase II Environmental Site Assessment, 2100 Syntex Court, Mississauga, Ontario.

AECOM, March 2018b: Phase II Environmental Site Assessment, 10862 Steeles Avenue East, Milton, Ontario.

AECOM, March 2018c: Phase II Environmental Site Assessment, 6780 Creditview Road, Mississauga, Ontario

AECOM, March 2018d: Designated Substances Survey for Highway 401 Expansion – Regional Road 25 to the Credit River Foundation Remediation for Bridge/Culvert Structures

AECOM, March 2018e: Phase One Environmental Site Assessment, Trafalgar North Inspection Station, Highway 401 Expansion, Credit River to Regional Road 25.

AECOM, March 2018f: Phase One Environmental Site Assessment, Trafalgar South Inspection Station, Highway 401 Expansion, Credit River to Regional Road 25.

AMEC Earth & Environmental, 2011: Terrestrial Existing Conditions Report. Preliminary Design and Detail Design – 2008-E-0027. MTO Highway 401 from Trafalgar Road to Regional Road 25, Halton Region. Prepared for MTO.

AMEC Environment & Infrastructure, 2012: Preliminary Design and Class Environmental Assessment Terrestrial Impact Assessment Report Highway 401 Improvements from East of the Credit River to Trafalgar Road. Prepared for MTO. August 2012.

Halloran, J., H. Anderson and D. Tassie, 2013: Clean Equipment Protocol for Industry. Peterborough Stewardship Council and Ontario Invasive Plant Council. Peterborough, ON. Available at: https://www.invasivespeciescentre.ca/Portals/0/Documents/WhatWeDo/Landowners/Clean_Equipment_Protocol_for_Industry.pdf

Lee, H., W. Bakowsky, J. Riley, J. Bowles, M. Puddister, P. Uhlig and S. McMurray, 1998: MNRF Ecological Land Classification for Southern Ontario. First Approximation and Its Application Field Guide.

MECP, 2003: Stormwater Management Planning and Design Manual. March 2003.
MNRF, 2015: Significant Wildlife Habitat Ecoregion 7E Criterion Schedule. January 2015. 40 pp.

MNRF, 2016: Guidance Document for Development Activities in Redside Dace Protected Habitat.

MHSTCI, 2011: Standards and Guidelines for Consultant Archaeologists. 2011.

Morrison Hershfield Ltd., 2015: Design-Build Major, Replacement and Widening of Highway 401 Regional Road 25 Underpass, 5th Line Overpass and Oakville Creek

West Branch Structures. August 2015.MTO, 2000: Class Environmental Assessment for Provincial Transportation Facilities. July 2000.

MTO, 2006. Environmental Guide for Noise. October 2006.

MTO, 2018: MTO – Bridge Embossment Criteria, Highway 401 Expansion. February 2018.

MTO/DFO/MNRF, 2016: Protocol for Protecting Fish and Fish Habitat on Provincial Undertakings – Version 3.

Novus Environmental, 2012: Highway 401 Improvements from East of Credit River to Trafalgar Road, Novus Reference No. 10-0012. Air Quality Assessment Report, October 2012.

RWDI, 2011: Highway 401 Widening from Trafalgar Road to Regional Road 25, RWDI # 0940355. Air Quality Assessment Report, June 2011.

URS Canada Ltd., 2010a: Stage 1 Archaeological Assessment, Highway 401 Widening from East of the Credit River to Trafalgar Road, Class Environmental Assessment, Region of Peel and Region of Halton, Ontario, P088-031-2010, on file with MHSTCI

URS Canada Ltd., 2010b: Stage 1 Archaeological Assessment, Highway 401 Improvements, Regional Road 25 to Trafalgar Road, Class Environmental Assessment (Group B), Town of Milton, Town of Halton Hills, Regional Municipality of Halton, Ontario, P088-018-2010, on file with MHSTCI

URS Canada Ltd., 2011b: Noise Study report, Preliminary Design Services, Highway 401 Improvements – Trafalgar Road to Regional Road 25.

URS Canada Ltd., 2013a: Highway 401 Improvements from Credit River to Trafalgar Road Preliminary Design and Class EA Study (W.O. 07-20021). Transportation Environmental Study Report. May 2013.

URS Canada Ltd., 2013b: Highway 401 Improvements from Trafalgar Road to Regional Road 25 Preliminary Design and Class Environmental Assessment (EA) Study (W.O. 07-20024). Transportation Environmental Study Report. March 2013.

URS Canada Ltd., 2013c: Noise Study report, Preliminary Design Services, Highway 401 Improvements – East of the Credit River to Trafalgar Road

URS Canada Ltd., 2015: Highway 401 Bridge Rehabilitation/Replacement from Trafalgar Road westerly to Regional Road 25 Preliminary Design and Class EA Study G.W.P. 2188-10-00 and G.W.P. 2152-11-00. Preliminary Design Report.

Appendix A

Consultation Materials

NOTICE OF STUDY COMMENCEMENT AND DESIGN AND CONSTRUCTION REPORT NO. 1 SUBMISSION

HIGHWAY 401 EXPANSION PROJECT CREDIT RIVER TO REGIONAL ROAD 25

West Corridor Constructors (WCC) has been selected by the Ministry of Transportation (MTO) and Infrastructure Ontario to design, build and finance the Highway 401 Expansion Project (the Project). The Project is approximately 18 km long and is located within the western Greater Toronto Area (GTA), from east of the Credit River in Mississauga to west of Regional Road 25 in Milton. The Project includes widening the existing six-lane configuration to the following:

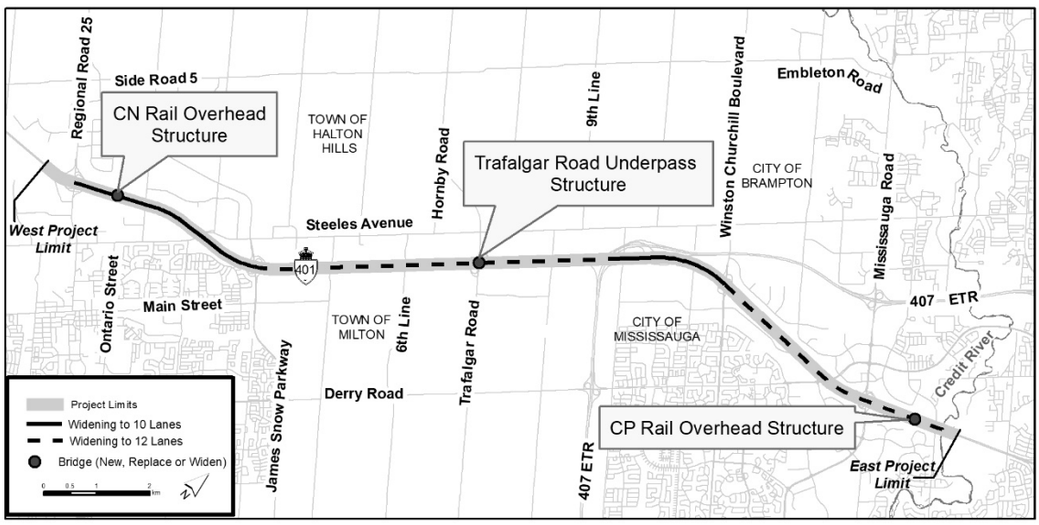
- 12-lane Core-Collector system from the Credit River to Winston Churchill Boulevard;
- 10-lanes from Winston Churchill Boulevard to the Highway 407 ETR/Highway 401 Interchange;
- 12-lane Core-Collector system from the Highway 407 ETR/Highway 401 Interchange to James Snow Parkway; and
- 10-lanes from the James Snow Parkway to Regional Road 25.

The Project includes median High Occupancy Vehicle (HOV) lanes and modifications to existing infrastructure to accommodate the proposed widening, including 9 new, replaced or widened bridges, 5 bridge rehabilitations, retaining wall construction / rehabilitation and 7 culvert replacements, extensions or rehabilitations. This Project will also include supporting facilities and features such as drainage, lighting, signage, Advanced Traffic Management System and carpool lots.

The Preliminary Design was previously completed and is documented in two Transportation Environmental Study Reports (TESRs) for the "*Highway 401 Improvements from East of the Credit River to Trafalgar Road W.O. 07-20021, Preliminary Design and Class Environmental Assessment Study (May, 2013)*" and the "*Highway 401 Improvements from Trafalgar Road to Regional Road 25 Preliminary Design and Class Environmental Assessment Study, W.O. 07-20024 (March, 2013)*". The recommendations from the TESRs will be built upon as part of the Detail Design.

THE PROCESS

This Detail Design project is following the approved planning process for a Group 'B' project under the *MTO Class EA for Provincial Transportation Facilities (2000)*, with the opportunity for public input throughout the Project. A Public Information Centre (PIC) will be held to allow the public an opportunity to review and comment on project details. Design and Construction Reports (DCRs) will be prepared to document the study process, design details, environmental impacts and mitigation measures, and a summary of consultation undertaken. The DCRs will each be available for a 30-day review period. Notices for the PIC and DCRs will be published in local newspapers, on the Project website (www.401expansion-mississauga-milton.ca) and distributed to the Project contact list.



DCR NO. 1 WORKS

DCR No. 1 has been prepared to document the design and construction process undertaken for the following works: Clearing and Grubbing along the entire Project corridor and replacement of the CN Rail Overhead Structure, the CP Rail Overhead Structure, and the Trafalgar Road Underpass Structure. DCR No. 1 documents the study process, design details, the environmental impacts and mitigation measures of these works, and the consultation conducted.

COMMENTS

We are interested in hearing your comments regarding this Project and on DCR No. 1, which will be available for 30-day review period from August 22, 2019 to September 20, 2019. The report will be available on the Project website (www.401expansion-mississauga-milton.ca) and at the following locations during their regular hours of operation:

Highway 401 Expansion Project Office
2000 Argentia Road, Plaza 5, Suite 500, Mississauga, ON L5N 2R7

Ministry of Transportation, Central Region, Major Projects Office
159 Sir William Hearst Avenue, 7th Floor, Toronto, ON M3M 0B7

Peel Region, Clerk's Division
10 Peel Centre Drive, Suite A and B, Brampton, ON L6T 4B9

Halton Region, Clerk's Office
1151 Bronte Road, Oakville, ON L6M 3L1

Town of Milton, Town Hall
150 Mary Street, Milton, ON L9T 6Z5

Town of Halton Hills, Clerk's Department
1 Halton Hills Drive, Halton Hills, ON L7G 5G2

City of Mississauga, Office of the City Clerk
300 City Centre Drive, Mississauga, ON L5B 3C1

If you wish to submit comments on the DCR, obtain additional information, ask questions or sign up for the Project contact list please contact those listed below by email at info@401expansion-mississauga-milton.ca, by phone at 1-888-619-1665 (24-hour), or via the Project website at www.401expansion-mississauga-milton.ca. Information collected will be used in accordance with the *Freedom of Information and Protection of Privacy Act*. With the exception of personal information, all comments will become part of the public record.

If you have any accessibility requirements in order to participate in this Project, please contact one of the Project Team members listed below via email, phone or the Project website as listed above.

David Ellis, P.Eng., GSC
WCC Project Director
Aecon Group Inc.
2000 Argentia Road, Plaza 5, Suite 500, Mississauga, ON L5N 2R7

Sarah Merriam, M.Sc.
WCC Environmental Manager
Parsons Inc.
2000 Argentia Road, Plaza 5, Suite 500, Mississauga, ON L5N 2R7

Ryan Bissonnette
WCC Communications Director
Aecon Group Inc.
2000 Argentia Road, Plaza 5, Suite 500, Mississauga, ON L5N 2R7

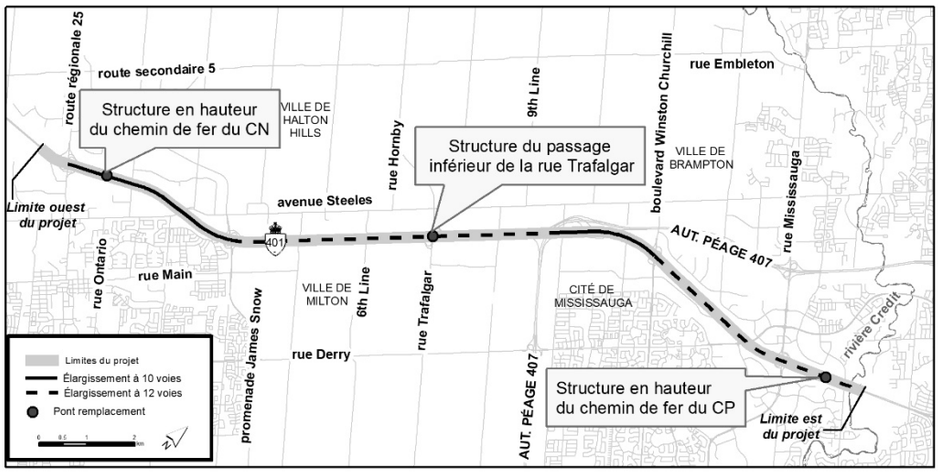
Des renseignements sont disponibles en français en composant 1-888-619-1665.

Avis de début d'étude et soumission du rapport de conception et de construction nº 1

Projet d'expansion de l'autoroute 401 de la rivière Credit à la route régionale 25

Le **ministère des Transports (MTO)** et **Infrastructure Ontario** ont retenu les services de **West Corridor Constructors (WCC)** pour concevoir, construire et financer le projet d'expansion de l'autoroute 401 (le projet). Le projet est long d'environ 18 km et est situé dans l'ouest de la région du Grand Toronto, de l'est de la rivière Credit à Mississauga jusqu'à l'ouest de la route régionale 25 à Milton. Le projet comprend l'élargissement des six voies existantes pour obtenir ce qui suit :

- 12 voies centrales et collectrices de la rivière Credit jusqu'au boulevard Winston Churchill;
- 10 voies du boulevard Winston Churchill jusqu'à l'échangeur de l'autoroute express à péage 407 et de l'autoroute 401;
- 12 voies centrales et collectrices de l'échangeur de l'autoroute express à péage 407 et de l'autoroute 401 jusqu'à la promenade James Snow;
- 10 voies de la promenade James Snow jusqu'à la route régionale 25.



Le projet comprend des voies médianes réservées aux véhicules multioccupants (VMO) et des modifications aux infrastructures existantes pour faciliter l'élargissement proposé, notamment neuf nouveaux ponts, remplacés ou élargis, la remise en état de sept ponts, la construction ou la remise en état d'un mur de soutènement et le remplacement, le prolongement ou la remise en état de sept ponceaux. Ce projet tiendra également compte des installations et fonctions connexes, comme le drainage, l'éclairage, la signalisation, le système avancé de gestion de la circulation et des parcs de stationnement incitatif.

La conception préliminaire a déjà été effectuée et est documentée dans deux rapports d'étude environnementale sur les transports pour les projets suivants : *Améliorations à l'autoroute 401 de l'est de la rivière Credit jusqu'à la rue Trafalgar W.O. 07-20021, Étude de conception détaillée et d'évaluation environnementale de portée générale (mai 2013)* et *Améliorations à l'autoroute 401 de la rue Trafalgar jusqu'à la route régionale 25, Étude de conception détaillée et d'évaluation environnementale de portée générale, W.O. 07-20024 (mars 2013)*. Les recommandations des rapports serviront à la conception détaillée.

LE PROCESSUS

Ce projet de conception détaillée respecte le processus de planification approuvé pour les projets de groupe B conformément à l'*Évaluation environnementale de portée générale pour les routes provinciales (2000)* du MTO et le public aura l'occasion de fournir des commentaires tout au long de l'étude. Un centre d'information aura lieu afin de permettre aux membres du public de consulter et de commenter les détails du projet. Des rapports de conception et de construction seront préparés pour documenter le processus de l'étude, les détails de la conception, les impacts environnementaux et les mesures d'atténuation, puis un sommaire de consultation sera réalisé. Ces rapports seront tous accessibles pour une période de 30 jours à des fins d'examen. Les avis concernant le centre d'information et les rapports de conception et de construction seront publiés dans les journaux locaux et sur le site Web du projet (**www.401expansion-mississauga-milton.ca**), et distribués aux personnes figurant sur la liste de distribution.

RAPPORT DE CONCEPTION ET DE CONSTRUCTION No 1 SUR LES TRAVAUX

Le rapport de conception et de construction no 1 a été préparé afin de documenter le processus de conception et de construction des travaux suivants : Déblaiement et défrichement le long du corridor du projet, ainsi que remplacement de la structure en hauteur du chemin de fer du CN, de la structure en hauteur du chemin de fer du CP et de la structure du passage inférieur de la rue Trafalgar. Le rapport nº 1 documente le processus de l'étude, les détails de la conception, les impacts environnementaux et les mesures d'atténuation de ces travaux, ainsi que la consultation réalisée.

COMMENTAIRES

Nous voulons entendre vos commentaires concernant ce projet et le rapport de conception et de construction nº 1, qui pourra être consulté pendant une période d'examen de 30 jours du 22 août au 20 septembre 2019. Le rapport sera accessible sur le site Web du projet (**www.401expansion-mississauga-milton.ca**) ainsi qu'aux emplacements suivants durant les heures d'ouverture normales :

Bureau du projet d'expansion de l'autoroute 401
2000, rue Argentia, plaza 5, bureau 500, Mississauga (Ontario) L5N 2R7

Ministère des Transports, région du Centre, Bureau des grands projets
159, avenue Sir William Hearst, 7e étage, Toronto (Ontario) M3M 0B7

Région de Peel, division de Clerk
10, rue Peel Centre, bureaux A et B, Brampton (Ontario) L6T 4B9

Région de Halton, bureau du greffier
1151, rue Bronte, Oakville (Ontario) L6M 3L1

Ville de Milton, Hôtel de ville
150, rue Mary, Milton (Ontario) L9T 6Z5

Ville de Halton Hills, Service du greffier
1, rue Halton Hills, Halton Hills (Ontario) L7G 5G2

Cité de Mississauga, bureau du greffier
300, rue City Centre, Mississauga (Ontario) L5B 3C1

Si vous voulez formuler des commentaires sur le rapport de conception et de construction, obtenir des renseignements supplémentaires, poser des questions ou être inscrit sur la liste de distribution du projet, veuillez prendre contact avec l'une des personnes ci-dessous par courriel au **info@401expansion-mississauga-milton.ca**, par téléphone au 1 888 619-1665 (24 heures), ou via le site Web du projet au **www.401expansion-mississauga-milton.ca.** L'information recueillie sera utilisée conformément à la *Loi sur l'accès à l'information et la protection de la vie privée*. Tous les commentaires, à l'exception des renseignements personnels, feront partie du dossier public.

Si vous avez des exigences en matière d'accessibilité pour participer à ce projet, veuillez prendre contact avec l'un des membres de l'équipe du projet nommés ci-dessus par courriel, téléphone ou via le site Web du projet mentionné ci-dessus.

David Ellis, ing., GSC
Directeur de projets à WCC
Aecon Group Inc.
2000, rue Argentia, Plaza 5,
bureau 500, Mississauga (Ontario)
L5N 2R7

Sarah Merriam, M.Sc.
Gestionnaire environnementale à WCC
Parsons Inc.
2000, rue Argentia, Plaza 5,
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L5N 2R7

Ryan Bissonnette
Directeur des communications à WCC
Aecon Group Inc.
2000, rue Argentia, Plaza 5,
bureau 500, Mississauga (Ontario)
L5N 2R7

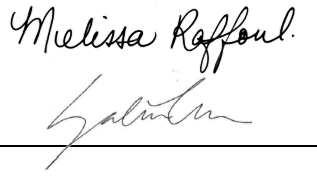
Des renseignements sont disponibles en français en composant le 1 888 619-1665.

West Corridor Constructors	Highway 401 Expansion Project Credit River to Regional Road 25	
	DOCUMENT NO.	WCC-ENV-RPT-00028
	REVISION NO.	0

Public Information Centre Summary Report

REVISION HISTORY			
Revision	Revision Date (YYYY-MM-DD)	Pages Revised	Description of Revision
0	2019-11-15	-	Rev0

The signatures below certify that this Quality document has been reviewed and accepted, and demonstrates that the signatories are aware of all the requirements contained herein and are committed to ensuring their provision.

	Name	Signature	YYYY-MM-DD
Prepared by:	**Melissa Raffoul** Environmental Planner **Salina Chan** Environmental Planner		2019-11-15
Reviewed by:	**Sarah Merriam** Environmental Manager		2019-11-15
Approved by:	**Paul Draycott** Environmental Director		2019-11-15

PROPRIETARY INFORMATION

If printed, this document is an uncontrolled copy of a controlled document held by the Quality Management System. Prior to use, ensure this document is the most recent revision by checking on Aconex. To request changes, submit a Document Change Request to the Quality Department.

Table of Contents

Appendices

1 Introduction

1.1 Project Overview and Scope

West Corridor Constructors (WCC) is an all-Canadian, fully integrated team led by Aecon Infrastructure Management Inc. (Aecon), Parsons Inc. (Parsons), and Amico Infrastructures Inc. (Amico) in a Joint Venture to deliver the Highway 401 Expansion Project – Credit River to Regional Road 25 (the Project) in partnership with Infrastructure Ontario and Lands Corporation (IO) and the Ministry of Transportation of Ontario (MTO), collectively referred to herein as the Contracting Authority (CA). The Project is approximately 18 kilometers long and is located within the western Greater Toronto Area, from east of the Credit River in Mississauga to west of Regional Road 25 in Milton. The Project includes widening the existing six lane configuration to the following:

- 12-lane Core-Distributor system from the Credit River to Winston Churchill Boulevard;
- 10-lanes from Winston Churchill Boulevard to the Highway 407 ETR/Highway 401 Interchange;
- 12-lane Core-Distributor system from the Highway 407 ETR/Highway 401 Interchange to James Snow Parkway; and
- 10-lanes from the James Snow Parkway to Regional Road 25.

The expansion will involve modifications to existing infrastructure to accommodate the proposed widening, including 9 bridge structure replacements and/or widenings. The scope of work for the Project includes, but is not limited to:

- Erosion and sediment control, and environmental protection;
- Earthwork, excavation, and grading;
- Drainage, storm water management, and natural channel realignments;
- Structural and non-structural culvert replacements;
- Bridge replacement and rehabilitation;
- Retaining walls;
- Utility relocation;
- Lighting, signals, and electrical systems;
- ITS/ATMS infrastructure;
- Overhead signage;
- Asphalt and concrete paving;
- Roadside protection; and
- Landscaping and restoration.

1.2 Purpose of this Report

The purpose of this report is to provide a summary of the Public Information Centre (PIC) held for the Project in accordance with Schedule 17 Table 3.5 Item 22.

2 Public Information Centre Overview

An Online Public Information Centre (PIC) for the Highway 401 Expansion Project was held on October 17, 2019 and hosted on the project website. The PIC was held online, and the website contained PIC materials, including the PIC video presentation, presentation slides, and a Project map. There were also

three live one-hour Question & Answer (Q&A) sessions held throughout the day at 10:00AM, 1:00PM, and 7:00PM, which were hosted on a live webcast presentation and a teleconference line. A link to the website used can be found below:

- http://401expansion-mississauga-milton.ca/ea-process/public-information-centre/
- http://401expansion-mississauga-milton.ca/fr/ea-processus/centre-dinformation-publique/

The PIC was held online to help reach a broader audience, since many users of Highway 401 are commuters from surrounding communities and do not live in the Project limits. The PIC is an appropriate format for information exchange since the PIC materials will be available for review from any location at any time on the project website. WCC recognized that there may be some stakeholders who may not have access to a computer, therefore a teleconference option was also provided. Those on the teleconference were able to listen to the presentation and ask the Project Team questions. WCC representatives who staffed the PIC were:

Q&A Speakers
- David Ellis, Design Build Director
- Harrie Van Dyk, Construction Manager
- Ryan Bissonnette, Communications Director
- Sarah Merriam, Environmental Manager
- Derek Surgeoner, Deputy Design Manager
- Kosta Catsiapis, East Segment Highway Design Manager

Additional Support
- Paul Draycott
- Saad Syed
- Catherine Banville (French Language Services)
- Nikolaos Papasotiriou
- Melissa Raffoul
- Salina Chan
- Bella Santos

2.1 Purpose of the PIC

The purpose of the Online PIC was to provide information on the Highway 401 Expansion Project, describe the Environmental Assessment Process, summarize how traffic and environmental impacts are being mitigated, identify next steps, and outline how the public can stay informed and involved in the Project.

2.2 Notification

Prior to the PIC, the following activities were carried out in order to make the details of the PIC known to the public and other interested stakeholders:

- A Notice of Online PIC was published in the following newspapers on Thursday October 3, 2019: Brampton Guardian, Mississauga News, Milton Champion, Georgetown Independent, Le Metropolitain (Mississauga and Brampton - French language).
- The Notice of Online PIC was sent through email and hard copy mail to the Project contact list, which includes MPPs, federal and provincial agencies, municipalities, Conservation Authorities, emergency services, interest groups, utility companies, Indigenous communities, other transportation providers (e.g. school boards, 407ETR, transit providers, rail companies, trucking organizations), and members of the public. The Notice of PIC was not distributed to MPs due to the election writ period.
- The Notice of Online PIC was posted to the Project website.

The Notice of Online PIC included details on the purpose and format of the PIC, when and where the PIC was being hosted, and how to participate. Please refer to **Appendix A** for a copy of the Notice of PIC.

2.3 PIC Materials

Materials prepared for the PIC, which were available on the website were:

- PIC Video Presentation (Video embedded on the website)

- PIC Video Presentation Transcript (PDF)
- PIC Presentation Slides (PDF)
- Landscape Concepts (PDF)
- Map of the Project (PDF)
- PIC Comment Form (PDF)

Except for the PIC Video Presentation and the technical Map of the Project, all materials were translated and available in French on the Project website. A copy of the PDF PIC materials is in **Appendix B.** The PIC Video Presentation and PDF Presentation Slides provided information on the following:

1. Purpose of the Public Information Centre
2. Project Limits
3. Benefits of the Project
4. Project Background and Environmental Assessment
5. EA and Design Build Process
6. Highway 401 Widening
7. Interchanges and Road Realignment
8. Structures
9. Bridge Aesthetics
10. Drainage and Stormwater Management
11. Supplementary Works
12. Traffic Impacts
13. Landscaping and Restoration
14. Environmental Mitigation
15. Next Steps and How to Stay Informed

3 Attendance and Participation

PIC attendees could either join the PIC online or by phone and the number of attendees could be tracked throughout each Q&A session. Questions during the Q&A session could be asked by typing the question/comment into the 'chat' function of the webcast or by relaying a question to the teleconference operator who would then type the question in through the chat function. Responses were verbally provided by the Project Team for all PIC attendees to hear.

A total of 56 people attended the Online PIC across the three live Q&A sessions, with 21 questions received during the three Q&A sessions. **Table 1** provides a breakdown of number of attendees and questions for each session.

Table 1: PIC Attendance and Questions/Comments

Q&A Session	No. of Online Attendees	No. of Teleconference Attendees	No. of Comments Received (Online)	No. of Questions Received (Online)	No. of Questions / Comments Received (Teleconference)
Q&A #1 10AM – 11AM	23	2	2	5	0
Q&A #2 1PM – 2PM	25	1	1	11	0
Q&A #3 7PM – 8PM	8	0	0	5	0
Total	56	3	3	21	0

The PIC video presentation is embedded on the Project website and is hosted on a video viewing platform known as Vimeo. The video presentation had been viewed 22 times on Vimeo (i.e. via the website) by 8:00 PM on the PIC day and 36 times by the end of the PIC comment period (October 31, 2019).

4 Feedback Received

4.1 Questions and Comments during the PIC

Below is a summary of the questions and comments receive during the live Q&A sessions. All questions were responded to verbally through the online webcast. A Q&A Summary was prepared and uploaded to the Project website in French and English following the PIC. Please refer to **Appendix C** for the Q&A Summary.

General:

- What is WCC?
- What is the cost of the project?
- What does mainline mean?

Design and Construction:

- How will the decision making around the final lane configurations be determined?
- Why are some parts 10 lanes and some parts 12 lanes?
- Is the detail design available for the Credit River bridge?
- What is the sequence of construction / staging of works?
- How long will construction be going on for?
- Will HOV Lanes be built?
- How many lanes are being affected during construction?
- When do you forecast completion of all construction?
- Are there any carpool lots being built?
- Where can I see the design of the expansion?

Traffic, Access, Property:

- Is all widening occurring within lands owned by MTO? Or will appropriation be required? Has this process been completed?
- How will you ensure that my daily commute is not impacted?
- Can you define off-peak and on-peak hours?
- What are the off-peak hours?

Environmental:

- What are the environmental impacts?
- Are there any species that will face extinction because of this project?

Other:

- Thank you - this was a very informative presentation.
- Request to add to the public contact list
- Preliminary feedback on the online PIC format was positive

4.2 Comments Following the PIC

The comment period for the PIC was open until October 31, 2019. A PIC Comment Form was available on the website, but stakeholders could also email or call to provide comments. A total of 3 PIC Comment Forms were received and 2 stakeholders emailed in questions and comments related to the PIC and its content. One of the PIC Comment forms indicated that a response from the Project Team was not required. Otherwise the stakeholders were responded to. During the PIC comment period there were also

6 new direct subscribers to the Project contact list. A summary of the PIC Comment Forms and emails are in **Table 2**.

Table 2: Summary of PIC Comments

Comment No.	Comment	Response
1	Participated in the 1:00PM session and confirmed that the presentation was functioning properly and questions were answered appropriately.	WCC confirmed receipt of the comment form.
2	Request to be added to the Project contact list for traffic updates.	WCC added stakeholder to Project contact list.
3	What is the queuing length of the northbound left turn lane? Is it possible to increase the queuing length to accommodate future traffic that will enter the South Hornby Business Park? How many lanes of traffic will the Trafalgar Road Bridge ultimately support? It would be ideal if it could support three lanes per direction plus a centre turning lane. Preferred the online PIC format, though additional dates and times for the Q&A sessions would be appreciated. Six lanes per direction should be carried throughout the entire corridor rather than going from five lanes to six lanes and back in each direction. Explore a movable centre median if six lanes cannot be supported.	The queuing length of the northbound left turn lane at the Trafalgar Road commuter carpool lot is 85m. The queue length is constrained by the Trafalgar bridge, thus, opportunities to increase the length is limited. The new Trafalgar Road bridge is designed to be wide enough to ultimately support six lanes of traffic (three per direction), speed change lanes to the highway ramps, and two future bike lanes. However, WCC will only be constructing the approaches and Trafalgar Road bridge itself to two lanes in each direction to match existing conditions. The timing for when Trafalgar Road will go from four to six lanes will be dependent on Halton Region, but no additional structural work is anticipated to accommodate six lanes on the bridge. Determination of the number of lanes was completed during preliminary design in 2013 using a travel demand forecast exercise. Based on the projected traffic volume growth through this part of the Highway 401 corridor, sections were identified for 10 lanes or 12 lanes in order to meet the projected future travel demand. There are also other constraints that limit the number of lanes include property and geographic constraints of existing structures and buildings that prevent widening to 12 lanes throughout the entire 18km.

4	Suggestion to: • Remove the Sixth Line Overpass and end Sixth Line as cul-de-sacs on both sides of Highway 401 • Construct a new full interchange between Fifth Line and Sixth Line • Extend the Project limits to just west of a new full interchange with the planned realigned Tremaine Road	*[Project form indicated a written response not required so no response was sent]* The preliminary design for all local crossing roads, interchanges, and Project limits was completed and approved in 2013 and will not be significantly changed as per the suggestion.
5	MNRF is interested in works at the Credit River and would like to be kept circulated on the development of the detail design of Credit River and other watercourse crossings.	WCC noted MNRF's interest and added the MNRF contact to the Project contact list and the Governmental Authority Environmental Meeting contact list. MNRF will receive future notices of DCRs that will have design information about watercourse crossings.

Appendix A
Notice of Online PIC

NOTICE OF ONLINE PUBLIC INFORMATION CENTRE
HIGHWAY 401 EXPANSION PROJECT CREDIT RIVER TO REGIONAL ROAD 25

A Public Information Centre (PIC) is being held online through the Highway 401 Expansion Project website to enable you to review and comment on key Project works, the EA process, and the associated impacts and mitigation measures. The PIC is being hosted online to reach a wide audience that reflects the varied users of the Highway 401.

The PIC materials will be available online starting October 17, 2019 and West Corridor Constructors (WCC) will host one-hour live question and answer (Q&A) sessions during the day, according to the following details:

Where: http://401expansion-mississauga-milton.ca/ea-process/public-information-centre/

Date: Thursday, October 17th, 2019 from 9:00 AM – 8:00 PM

Q&A Times: 10:00 AM – 11:00 AM / 1:00 PM – 2:00 PM / 7:00 PM – 8:00 PM

More information on how to participate in the Q&A sessions will be available on the website. If you are unable to participate in the online PIC because of accessibility issues, a teleconference will be available for you at 1-855-327-6834 to listen to the presentation and ask questions.

COMMENTS

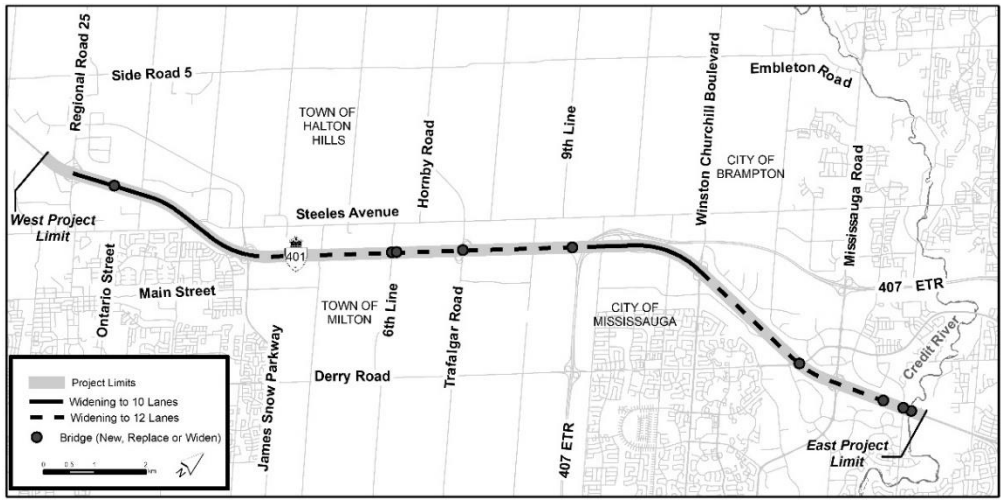
If you are unable to join one of the Q&A sessions above, you can still view the PIC materials online and submit your comments to the Project Team through:

Email: info@401expansion-mississauga-milton.ca

Phone: 1-888-619-1665 (24-hour)

Project Website: www.401expansion-mississauga-milton.ca

The Highway 401 Expansion Project is approximately 18 km long and includes widening the existing six-lane configuration to a 10-lane or 12-lane Core-Collector system, including High Occupancy Vehicle (HOV) lanes.



WCC has been selected by the Ministry of Transportation (MTO) and Infrastructure Ontario to design, build and finance the Highway 401 Expansion Project.

Information collected will be used in accordance with the *Freedom of Information and Protection of Privacy Act*. Except for personal information, all comments will become part of the public record. If you have any accessibility requirements, please contact us. Des renseignements sont disponibles en français en composant 1-888-619-1665.

AVIS D'UN CENTRE D'INFORMATION PUBLIC EN LIGNE
PROJET D'EXPANSIONS DE L'AUTOROUTE 401
RIVIÈRE CREDIT À ROUTE RÉGIONALE 25

Un centre d'information public se tient en ligne sur le site Web du projet d'expansion de l'autoroute 401 pour vous permettre d'examiner et de commenter sur les travaux principaux du projet, le processus d'évaluation environnementale ainsi que les impacts et les mesures d'atténuation associés. Le centre d'information public est hébergé en ligne afin de toucher un large public qui reflète les divers utilisateurs de l'autoroute 401.

Les documents du centre d'information public seront disponibles en ligne à partir du 17 octobre 2019 et West Corridor Constructors (WCC) organisera des séances d'une heure de questions et réponses en direct pendant la journée, selon les détails suivants :

Où: http://401expansion-mississauga-milton.ca/fr/ea-processus/centre-dinformation-publique/

Date: Jeudi 17 octobre 2019, de 9h00 à 20h00

Questions-réponses: de 10h00 à 11h00 / de 13h00 à 14h00 / de 19h00 à 20h00

Plus d'information sur la participation dans les sessions des questions-réponses sera disponible sur le site web. Si vous ne pouvez pas participer au centre d'information public en ligne en raison de problèmes d'accessibilité, une téléconférence sera disponible à 1-855-327-6834 afin que vous puissiez écouter la présentation et poser vos questions.

COMMENTAIRES

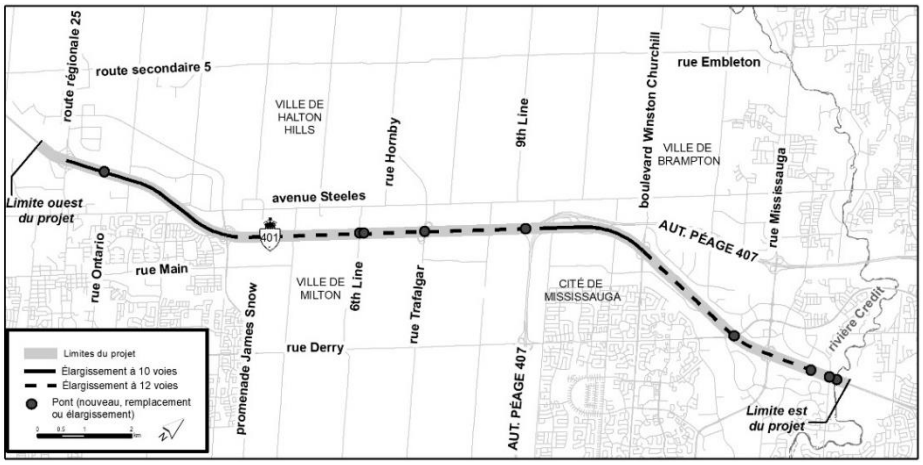
Si vous ne pouvez pas participer à l'une des sessions de questions-réponses ci-dessus, vous pouvez toujours consulter les documents du centre d'information public en ligne et envoyer vos commentaires à l'équipe de projet via :

Courriel : info@401expansion-mississauga-milton.ca

Téléphone : 1-888-619-1665 (24 Heures)

Site Web du projet : http://401expansion-mississauga-milton.ca/fr/

Le projet d'expansion de l'autoroute 401 est long d'environ 18 km et il comprend l'élargissement des six voies existantes à dix voies ou douze voies centrales et collectrices, y compris des voies réservées aux véhicules à occupation multiple (VOM).



Le ministère des Transports (MTO) et Infrastructure Ontario ont retenu les services de WCC pour concevoir, construire et financer le projet d'expansion de l'autoroute 401.

On utilisera les informations collectées selon la Loi sur l'accès à l'information et la protection de la vie privée. Sauf des informations personnelles, tous les commentaires feront parties du dossier public. Si vous avez des exigences en matière d'accessibilité, veuillez nous contacter. Des renseignements sont disponibles en français en composant 1-888-619-1665.

Appendix B
PIC Materials

HIGHWAY 401 EXPANSION PROJECT

PUBLIC INFORMATION CENTRE

October 17, 2019

Purpose of this Public Information Centre (PIC)

- Provide information on the Highway 401 Expansion Project
- Describe the Environmental Assessment process
- Summarize how traffic and environmental impacts are being mitigated
- Identify Next Steps
- Outline how you can stay informed and involved

PIC Content available on the Project website includes:

1. Video presentation
2. PDF / Downloadable copy of the presentation slides
3. PDF Map of the entire Highway 401 Expansion corridor
4. Summary of the Question and Answer Sessions
5. PIC Comment form

Project Limits

Benefits of the Project

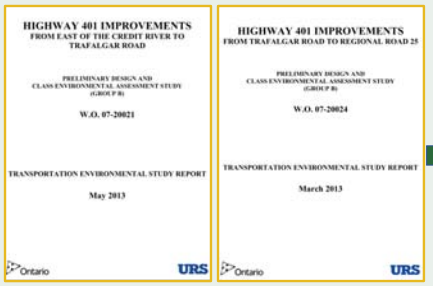
The Highway 401 Expansion Project will have both local and regional benefits:

Improved Travel	• Reduced traffic congestion • Reduced travel times
Provides Carpooling Options	• New and expanded Commuter Carpool Lots • High Occupancy Vehicle (HOV) Lanes
Economic Benefits	• More efficient movement of people and goods, within the Highway 401 corridor • Generation of employment opportunities

Project Background and Environmental Assessment

This Project is following the approved planning process for a Group 'B' project under the *MTO Class Environmental Assessment (EA) for Provincial Transportation Facilities (2000)*

Preliminary Design (2013)



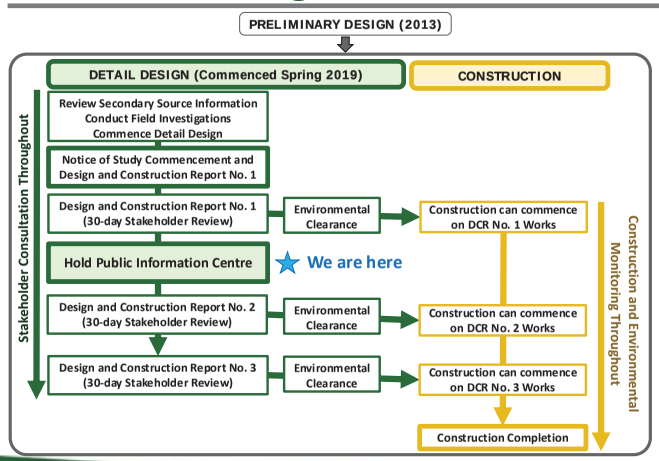
Detail Design and Construction of three bridges (2015 – 2018)

WCC selected to design and build the Highway 401 Expansion (Spring 2019)

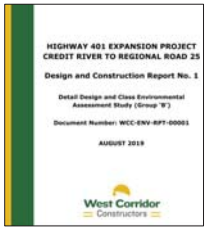
West Corridor Constructors

AECON PARSONS AMICO

EA and Design Build Process



DCR No. 1



- Clearing and Grubbing
- Structure Replacements:
  - CN Rail Bridge
  - Trafalgar Road Bridge
  - CP Rail Bridge
- **Environmental Clearance issued and construction of DCR No. 1 works has commenced**

Highway 401 Widening

Typical 10 Lane Cross Section

Median widths will vary throughout the corridor

Typical 12 Lane Cross Section

Median widths will vary throughout the corridor

Interchanges and Road Realignment

- Interchange reconfiguration:
  - Regional Road 25
  - James Snow Parkway
  - Trafalgar Road
  - Winston Churchill Boulevard
  - Mississauga Road
  - Highway 401 and Highway 407 ETR
- Local road realignments:
  - Sixth Line north and south of Highway 401
  - Trafalgar Road north and south of Highway 401
  - Creditview Road north and south of Highway 401

Mississauga Road, southwest quadrant

Structures

Structure	Description of work
New and Replacement Bridges	
Highway 401 and Highway 407 ETR Interchange Ramp	• Existing Highway 407 ETR westbound to Highway 401 westbound ramp relocated
Sixth Line Bridge	• Bridge Replacement • Number of lanes on Sixth Line will remain the same • Existing structure will be maintained during construction
Creditview Road Bridge	• Bridge Replacement • Final bridge will provide two lanes in each direction
Watercourse Bridge Replacements	
Oakville Creek East Bridges	• Bridge Replacement and Widening • Will accommodate wildlife passage under the structure
Credit River Bridges	• Bridge Replacement and Widening • Will accommodate wildlife passage under the structure

Hwy 401 / Hwy 407ETR Interchange

Credit River Bridge

Structures

Structure	Details
Bridge Rehabilitations and Widening	
Ninth Line Bridge	• Bridge Rehabilitation • Lane closures during construction, as necessary
Winston Churchill Boulevard Bridges	• Bridge Rehabilitation • Lane closures during construction, as necessary
Derry Road Bridges	• Bridge Rehabilitation & Widening of Highway 401 bridge over Derry Road to six lanes in each direction • Lane closures during construction, as necessary

Other Structures:
- **Culverts**
- **Retaining Walls and Toe Walls**

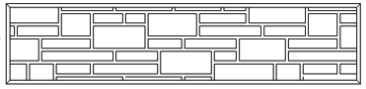
Winston Churchill Blvd, looking south

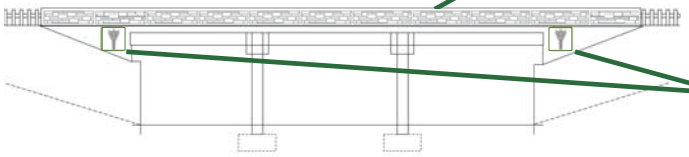
Derry Road, looking south

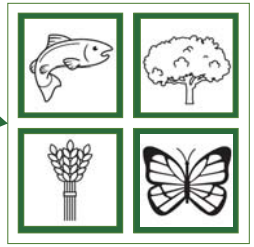
Bridge Aesthetics

- Architectural detail on the parapet wall and embossments on the wingwalls will be included on the following bridges:
  - Trafalgar Road Bridge
  - Sixth Line Bridge
  - Creditview Road Bridge

Architectural detail for parapets







Embossment Concepts

Drainage and Stormwater Management

- Stormwater quantity and quality control
- Sewers, culverts, roadside and flat-bottom grassed ditches, and existing and new stormwater management ponds.
- Proposed Stormwater Management Ponds:
  - Two (2) new wet ponds south of Highway 401 (one west of Fifth Line and one west of Sixth Line).
  - Modifications to two (2) existing wet ponds near the Highway 407 ETR and Highway 401 Interchange

Pond 2 – West of Fifth Line

Pond 1 – West of 6th Line

407ETR Pond 1 and Pond 5

Supplementary Works

- **Commuter Carpool Lots:**
  - New Trafalgar Road Commuter Carpool Lot (Northwest Quadrant)
  - New Winston Churchill Boulevard Commuter Carpool Lot (Northwest Quadrant)
  - Expansion of existing Mississauga Road Commuter Carpool Lot (Northwest Quadrant)

Mississauga Road Commuter Carpool Lot

- **Active Transportation:**
  - Accommodate future bike lanes on Regional Road 25
  - Accommodate future bike lanes on Trafalgar Road Underpass Structure
  - Multi-use path along the west side of Creditview Road
- **Illumination:** Continuous high mast lighting corridor wide

Traffic Impacts

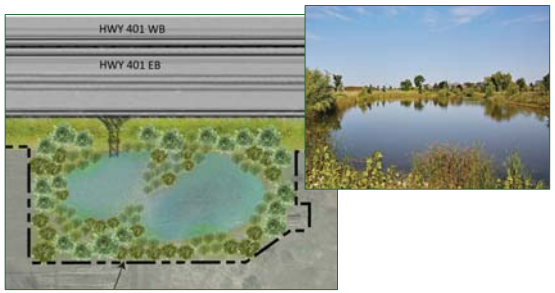
- During **peak traffic hours** six lanes will be maintained on mainline Highway 401, as per existing conditions
- During off peak traffic hours there will be **short term** closures and lane reductions
- **Lane closures** anticipated:
  - Some off-ramps will be reduced to a single lane throughout construction
  - Ninth Line will be reduced from 2 Lanes to 1 Lane
  - Derry Road will be reduced from 6 Lanes to 4 Lanes
  - Winston Churchill Boulevard will be reduced from 6 Lanes to 4 Lanes
  - Creditview Road Bridge lane closures to be confirmed

Information about traffic disruptions will be posted on the website and traffic updates will be sent to those subscribed by email to the Project contact list

Landscaping and Restoration

- Landscaping and restoration will occur corridor wide, including around the stormwater ponds, within interchanges, and in valley corridors
- Ecological Restoration will include habitat enhancement for species at risk and wildlife passage features

Typical Interchange Landscaping



Stormwater Management Pond Naturalization

Environmental Mitigation

Factor	Existing Conditions and / or Impacts	Mitigation Measures
Terrestrial	• Isolated Natural areas • Existing highway is a barrier to wildlife movement	• Minimize vegetation removals and install tree protection barriers • Invasive species management • Landscaping and restoration • Wildlife fence and wildlife passage features
Aquatic	• Fish bearing watercourses – Direct and Indirect • Watercourse realignments • Risk of erosion and sedimentation	• Permits and approvals • In-water work timing windows • Install and maintain ESC measures until the site is stabilized
Species at Risk	• Four Species at Risk (SAR) • Consultation with regulatory agencies is ongoing	• Permits and approvals • Adhere to timing windows
Water / Erosion and Sediment	• Groundwater dewatering • Construction impacts to surface water • Risk of erosion and sedimentation	• Environmental Activity and Sector Registry (EASR) / Permit To Take Water (PTTW) • Properly installed and monitored ESC measures • Spills Prevention and Management Plan, Groundwater Monitoring Program, Surface Water Monitoring Program
Land Use	• Mix of urban, agricultural and some natural areas • Property has already been acquired by the province; no additional property is needed	• Construction works will be limited to the Project Lands • Permission to Enter will be obtained if required

Environmental Mitigation

Factor	Existing Conditions and / or Impacts	Mitigation Measures
Noise and Vibration	• No permanent noise mitigation • Construction noise mitigation • Potential for vibration impacts	• Noise bylaw exemption for work within municipal right-of-way • Limit noisy construction activities to daytime, equipment in good operating condition, noise complaints will be investigated • Vibration monitoring at select locations
Air Quality	• No significant impacts to regional air quality • Limited construction air quality impacts	• Keep construction machinery and equipment in good condition • Dust suppressant measures
Excess Earth, Waste and Contamination	• Excess earth generation • Contaminated areas requiring remediation • Demolition of structures/buildings with designated substances	• Excess materials management • Remediation of soil • Designated substances management
Archaeology	• The areas to be impacted have been cleared of archaeological value	• If undocumented archaeological resources are discovered, construction will stop and findings investigated
Built Heritage	• Two Provincial Heritage Properties	• Documentation produced • Mitigation measures including landscaping

Next Steps and How to Stay Informed

- Ongoing construction
- Review and response to comments
- DCR No. 2 review period anticipated for January 2020
- DCR No. 3 review period anticipated for Winter/Spring 2020
- Travelers can expect to have full use of the expanded facility by late 2022

There is a **PIC Comment Form** available on the website. Please provide comments on the PIC **by October 31, 2019**.

For more information on the Project or to contact the WCC Project Team:

Email : info@401expansion-mississauga-milton.ca

Phone: 1-888-619-1668 (24 hour)

Project Website: www.401expansion-mississauga-milton.ca

Public Information Centre Presentation Transcript

Slide 1 – Title Slide

Hello and thank you for joining us for the Highway 401 Expansion Public Information Centre. I'll be presenting on behalf of West Corridor Constructors, or WCC, for short. WCC was the consortium selected by the Ministry of Transportation and Infrastructure Ontario to design and construct the Highway 401 Expansion Project.

Slide 2 – Purpose of this Public Information Centre (PIC)

The purpose of this Public Information Centre (or PIC) is to provide an overview of the Project, describe the Environmental Assessment process, summarize the traffic and environmental impacts and mitigation, identify next steps, and outline how you can stay informed and involved.

This video presentation will briefly take you through some of the key features and details of the Highway 401 Expansion.

In addition to this video, we have additional PIC resources available for download on the Project website, as noted on this slide, so that you can review the information in more detail. A comment form is on the website to provide comments and summary from the Question and Answer sessions held on October 17th will also be available.

Slide 3 – Project Limits

The Highway 401 Expansion Project is approximately 18 km long and located in the western GTA, from east of the Credit River in Mississauga to west of Regional Road 25 in Milton. As shown on the map, the Project includes widening the existing six lane configuration of the highway to:

- 12-lanes from the Credit River to Winston Churchill Boulevard
- 10-lanes from Winston Churchill Boulevard to the Highway 407 ETR/Highway 401 Interchange
- 12-lanes from the Highway 407 ETR/Highway 401 Interchange to James Snow Parkway
- 10-lanes from James Snow Parkway to Regional Road 25

The highway will also include High Occupancy Vehicle lanes (HOV lanes) and include improvements to the drainage system, lighting, signage, Advanced Traffic Management System, commuter carpool lots, and landscaping.

Slide 4 - Benefits of the Project

Benefits of the project include improved travel through the corridor by reducing congestion and travel times, and more carpooling options through new and expanded Commuter Carpool Lots and the inclusion of HOV lanes. Economic benefits include better movement of people and goods through the corridor and providing employment opportunities.

Slide 5 – Project Background and Environmental Assessment

This Project is following the MTO Class Environmental Assessment for Provincial Transportation Facilities, which is a planning and decision-making process that requires projects to consider, avoid, minimize and mitigate environmental impacts.

The Preliminary Design for this section of Highway 401 was completed in 2013.

In 2015, the Detail Design was completed for three of the structures in the corridor—the Regional Road 25, Fifth line and Oakville Creek West structures—and was documented in a Design and Construction Report. Construction of these three structures has already been completed.

All these works bring us to Spring 2019, when WCC was selected to design and build the Highway 401 Expansion Project. WCC is an all-Canadian, fully integrated team comprised of Aecon Infrastructure Management Inc., Parsons Inc., and Amico Design Build Incorporated.

Slide 6 – EA and Design Build Process

This graphic describes the Design-Build approach for this Project, which allows the designer and constructor to work together collaboratively.

As the detail design progresses, Design and Construction Reports, or DCRs, will be prepared to document the design, consultation and work to be constructed and these will be made available for 30-day public review periods.

In August, WCC published DCR No. 1 which documented early works for the Project, including vegetation clearing and grubbing and replacement of the CN Rail, Trafalgar Road, and CP Rail bridges. Environmental clearance has been issued for some of the works in DCR No. 1 and construction for those works has started.

While works in DCR No. 1 are being constructed, the design for the rest of the works will progress and be documented in DCR No. 2 and DCR No. 3. And once the works in DCR No. 2 and No. 3 receive environmental clearance they will also move into construction.

Slide 7 – Highway 401 Widening

The Highway is being widened from six lanes to either a 10-lane or 12-lane configuration. These graphics show a typical cross section of a 10 and 12 lane highway and both configurations will have one HOV lane in each direction. As you can see, the 12-lane configuration utilizes the “Express” and Collector system that is already in place on sections of Highway 401 in the GTA.

Slide 8 – Interchanges and Road Realignment

To accommodate the widening, some interchanges, including the on and off ramps, will need to be reconfigured. As well, Sixth Line, Trafalgar Road and Creditview Road also require slight realignment north and south of Highway 401 to accommodate expansion.

Slide 9 - Structures

A key part of the expansion includes bridge replacements to accommodate the widened highway. In addition to the bridge replacements in DCR No. 1, this Project also includes relocation of an existing Highway 407 ETR ramp, replacement of the Sixth line and Creditview Road bridges, and replacement of the Credit River and Oakville Creek East Watercourse crossings.

Slide 10 - Structures

Several bridges require rehabilitation and/or widening to accommodate additional lanes on Highway 401, including Ninth Line, Winston Churchill Boulevard and Derry Road Bridges. Other structural work includes replacement and extension of culverts and construction of retaining walls.

Slide 11 – Bridge Aesthetics

Trafalgar Road bridge, Sixth Line bridge and Creditview Road bridge will have architectural detailing on the parapet walls in this brick-like pattern you see here. Embossment options on the wingwalls of each bridge are also being considered. Options include:

- Monarch Butterfly, Black Walnut tree, and Salmon which are common in the surrounding natural environment
- Agricultural embossments as a nod to the historical farming operations in the area

Slide 12 – Drainage and Stormwater Management

In addition to roadway works, WCC will be using a combination of sewers, culverts, ditches and stormwater management ponds to address drainage and stormwater quantity and quality control.

New stormwater management ponds will be built west of Fifth Line and west Sixth Line and two of the Highway 407ETR stormwater management ponds will be modified.

Slide 13 – Supplementary Works

The Project will also include the creation of two new Commuter Carpool Lots by Trafalgar Road and Winston Churchill Boulevard and the expansion of one existing Commuter Carpool Lot along Mississauga Road.

WCC's design also considers opportunities for active transportation on local roads by accommodating future bike lanes planned on Regional Road 25 and Trafalgar Road. As well a multi-use path will be constructed along the west side of Creditview Road.

We will also be installing high mast lighting throughout the corridor.

Slide 14 – Traffic Impacts

Construction work for this project will result in some traffic impacts. We look to minimize these disruptions wherever we can, and we do appreciate your cooperation and support while intense construction activities occur.

Some of the key details we want to highlight are that 6 Lanes on mainline Highway 401 will be maintained during peak traffic hours, as per the existing conditions. During off peak hours, there may be short term closures and lane reductions.

There will also be lane reductions to accommodate construction, including some of the off-ramps, Ninth Line, Derry Road and Winston Churchill Boulevard. Lane closures along Creditview Road are still being confirmed.

For all disruptions, detours will be communicated in advance, as required, and signage will be in place.

Communication of traffic disruptions to the public is a very important part of this Project. We will be posting updates and information on the Project website and also sending email blasts with traffic updates to those subscribed by email to the Project contact list.

Slide 15 – Landscaping and Restoration

Landscaping and restoration will occur corridor wide and includes habitat enhancement for species at risk and wildlife passage features. These activities will take place near the end of the Project, when construction is closer to completion.

The corridor will be planted with a mix of native deciduous and coniferous trees and shrubs.

Images shown here depict typical landscaping design for interchange areas, and stormwater management ponds. These two landscape concepts, along with additional images for the roadside and valley areas are posted on the website in a sperate file so you can better see the details and review.

Slide 16 – Environmental Mitigation

WCC recognizes that there will be impacts to the environmental as a result of the highway widening.

We will look to avoid or minimize impacts and provide mitigation measures, such minimizing vegetation removals, providing wildlife passage, installing and maintaining erosion and sediment control measures.

Slide 17 – Environmental Mitigation

WCC will be producing overarching environmental guidance materials for construction works and obtaining relevant permits and approvals for works to proceed.

Please review the environmental impacts and mitigation measures on these slides, which are on the website for download, and if you have any questions feel free to contact the project team.

Slide 18 – Next Steps and How to Stay Informed

So with that, onto next steps:

- WCC will be continuing with construction and you will start to see more activity along the corridor.
- Consultation, including review and response to comments, will also be ongoing
- We will be developing DCR 2 and 3, which are anticipated to be available for public review in early 2020.
- It is anticipated that travelers will have full use of the expanded highway corridor by late 2022.

We encourage you to review all the PIC materials available on our website. If you would like to submit comments or questions, please fill out a PIC Comment Form and send it back to us by October 31, 2019.

You can also submit comments at any time through the Contact Us page of the website, by email or phone as listed on this slide. If you would like to receive notifications about the project, including traffic updates and when the DCRs are available for review, please subscribe on the website.

On behalf of the entire West Corridor Constructor Team thank you for your interest in the Highway 401 Expansion Project and for participating in this PIC.

Landscape Concepts

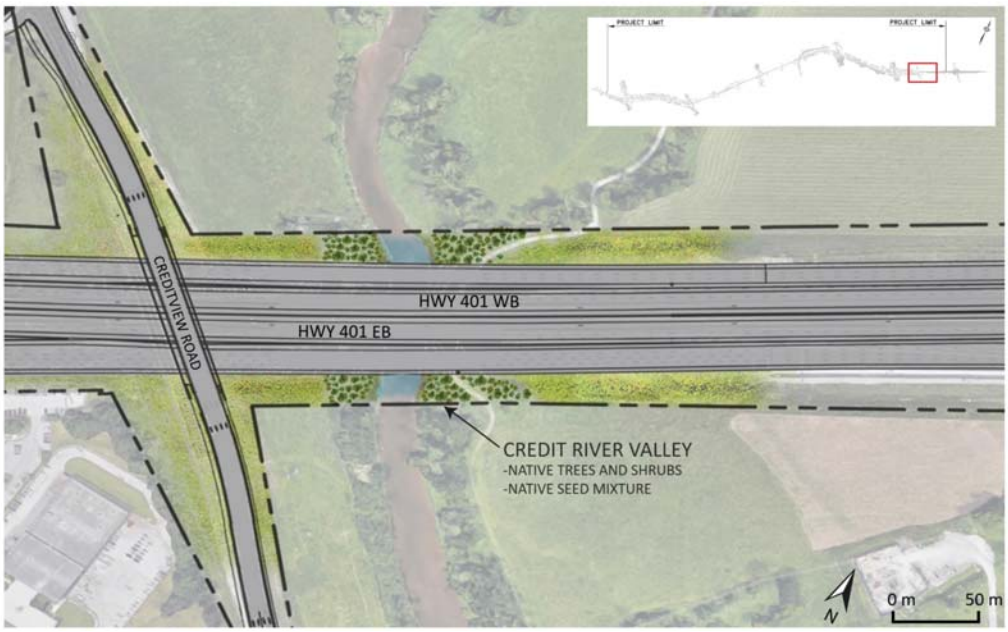
Public Information Centre

October 17, 2019

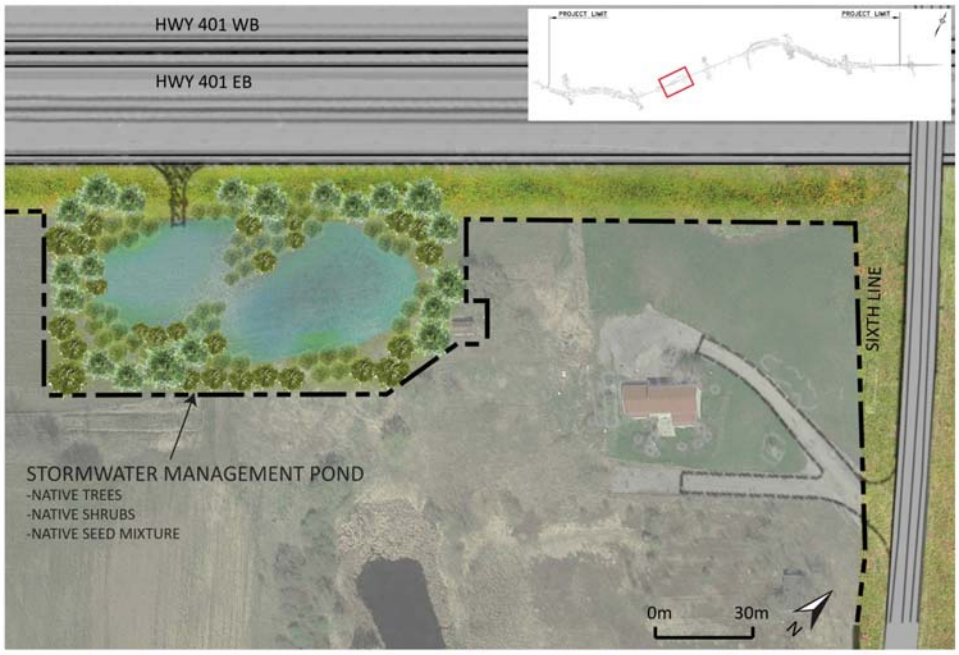
Typical Highway Interchange

Typical Roadside

Typical Valley Area



Stormwater Management Pond Naturalization

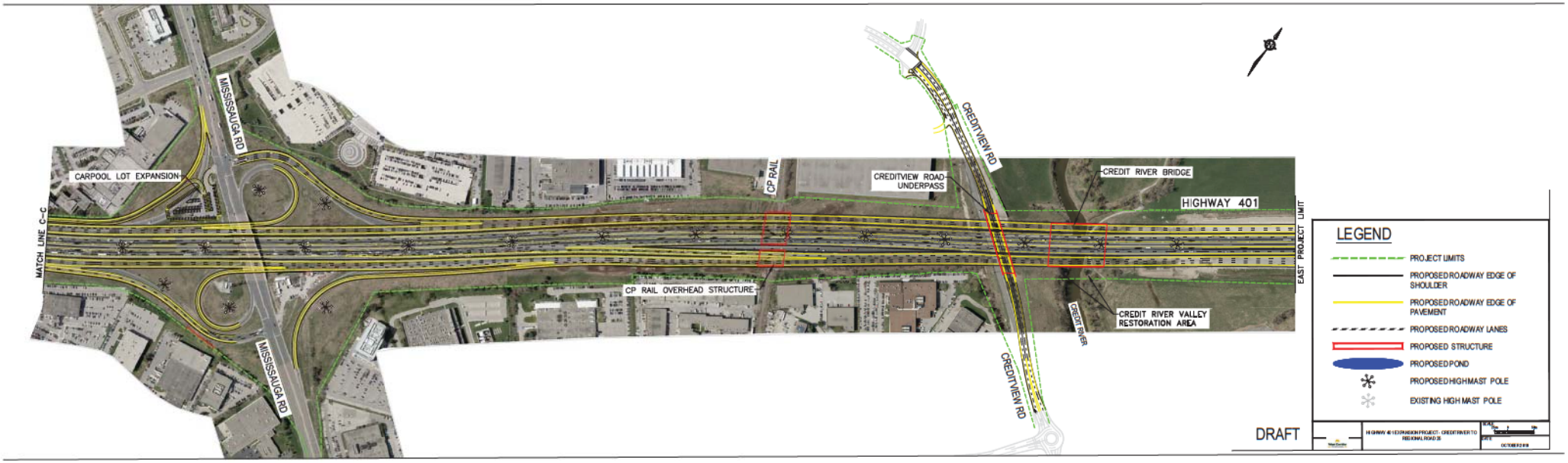



LEGEND
PROJECT LIMITS
PROPOSED ROADWAY EDGE OF SHOULDER
PROPOSED ROADWAY EDGE OF PAVEMENT
PROPOSED ROADWAY LANES
PROPOSED STRUCTURE
PROPOSED POND
PROPOSED HIGHMAST POLE
EXISTING HIGH MAST POLE
CHISHOLM DR
REGIONAL ROAD 25
SIXTEEN MILE CREEK WEST BRANCH
CN RAIL
CN HURON MISSION
HIGHWAY 401
BOSTON CHURCH RD
CN RAIL OVERHEAD STRUCTURE
SIXTEEN MILE CREEK CULVERT
FAIRHOF DR
STEELES AVE E
MATCH LINE A-4
DRAFT


JAMES SNOW PARKWAY N
MATCH LINE A-3
SIXTEEN MILE CREEK LOWER MAIN BRANCH
HIGHWAY 401
POND
SIXTH LINE
SIXTEEN MILE CREEK MIDDLE EAST BRANCH
SIXTH LINE UNDERPASS
HORNBY CREEK
OAKVILLE CREEK EAST BRIDGE
MATCH LINE A2-A3
LEGEND
PROJECT LIMITS
PROPOSED ROADWAY EDGE OF SHOULDER
PROPOSED ROADWAY EDGE OF PAVEMENT
PROPOSED ROADWAY LANES
PROPOSED STRUCTURE
PROPOSED POND
PROPOSED HIGHMAST POLE
EXISTING HIGH MAST POLE
DRAFT


MATCH LINE A3+A2
SIXTEEN MILE CREEK MIDDLE EAST BRANCH EAST OF SIXTH LINE VALLEY RESTORATION AREA
CARPOOL LOT
TRAFALGAR RD
SIXTEEN MILE CREEK EAST BRANCH VALLEY AT TRAFALGAR ROAD VALLEY RESTORATION AREA
HIGHWAY 401
EAST OAKVILLE CREEK CULVERT
TRAFALGAR ROAD UNDERPASS
EIGHTH LINE
HIGHWAY 401 UNDERPASS AT HIGHWAY 407 ETR WBL
HIGHWAY 401 UNDERPASS AT HIGHWAY 407 ETR EBL
NINTH LINE
NINTH LINE UNDERPASS
HIGHWAY 407ETR
LEGEND
PROJECT LIMITS
PROPOSED ROADWAY EDGE OF SHOULDER
PROPOSED ROADWAY EDGE OF PAVEMENT
PROPOSED ROADWAY LANES
PROPOSED STRUCTURE
PROPOSED POND
PROPOSED HIGH MAST POLE
EXISTING HIGH MAST POLE
DRAFT


CARPOOL LOT
WINSTON CHURCHILL BOULEVARD WEST CULVERT
WINSTON CHURCHILL BOULEVARD UNDERPASS
HIGHWAY 401 UNDERPASS AT 401 W TO HIGHWAY 407 E RAMP
HIGHWAY 401
TRAFALGAR ROAD
DERRY ROAD OVERPASS WIDENING
MUDDY CREEK CULVERT
LEGEND
PROJECT LIMITS
PROPOSED ROADWAY EDGE OF SHOULDER
PROPOSED ROADWAY EDGE OF PAVEMENT
PROPOSED ROADWAY LANES
PROPOSED STRUCTURE
PROPOSED POND
PROPOSED HIGH MAST POLE
EXISTING HIGH MAST POLE
DRAFT


MISSISSAUGA RD
CARPOOL LOT EXPANSION
MATCH LINE C-C
CP RAIL
CREDITVIEW ROAD UNDERPASS
CREDITVIEW RD
CREDIT RIVER BRIDGE
HIGHWAY 401
EAST PROJECT LIMIT
CP RAIL OVERHEAD STRUCTURE
CREDIT RIVER
CREDIT RIVER VALLEY RESTORATION AREA
MISSISSAUGA RD
CREDITVIEW RD
LEGEND
PROJECT LIMITS
PROPOSED ROADWAY EDGE OF SHOULDER
PROPOSED ROADWAY EDGE OF PAVEMENT
PROPOSED ROADWAY LANES
PROPOSED STRUCTURE
PROPOSED POND
PROPOSED HIGH MAST POLE
EXISTING HIGH MAST POLE
DRAFT

West Corridor Constructors

Highway 401 Expansion Project
Credit River to Regional Road 25

Public Information Centre – Comment Form

PUBLIC INFORMATION CENTRE - OCTOBER 17, 2019

WCC is undertaking the design and construction of approximately 18 kilometers of Highway 401 located in the western Greater Toronto Area, from east of the Credit River in Mississauga to west of Regional Road 25 in Milton. The Project includes widening of the existing six lane configuration to either a 10-lane configuration or a 12-lane Core-Collector system.

Please take a few minutes to complete this comment sheet and return it by October 31, 2019 using one of these methods below:

- Email to info@401expansion-mississauga-milton.ca
- Mail to 2000 Argentia Road, Plaza 5, Suite 500, Mississauga, ON, L5N 2R7

NAME: _____

ADDRESS: _____

EMAIL: _____

Do you require a written response to your comments? ☐ Yes ☐ No

1. Do you have any questions about the Environmental Assessment, design, or construction process for this Project?

West Corridor Constructors

Highway 401 Expansion Project
Credit River to Regional Road 25

Public Information Centre – Comment Form

2. Do you have any questions or concerns about the proposed Project works?	
3. Did you enjoy the format of this online Public Information Centre (PIC)? Do you prefer an online PIC or traditional in-person PIC?	
4. Do you have any additional feedback or comments?	

PROJET D'EXPANSION DE L'AUTOROUTE 401

CENTRE D'INFORMATION PUBLIC

17 Octobre 2019

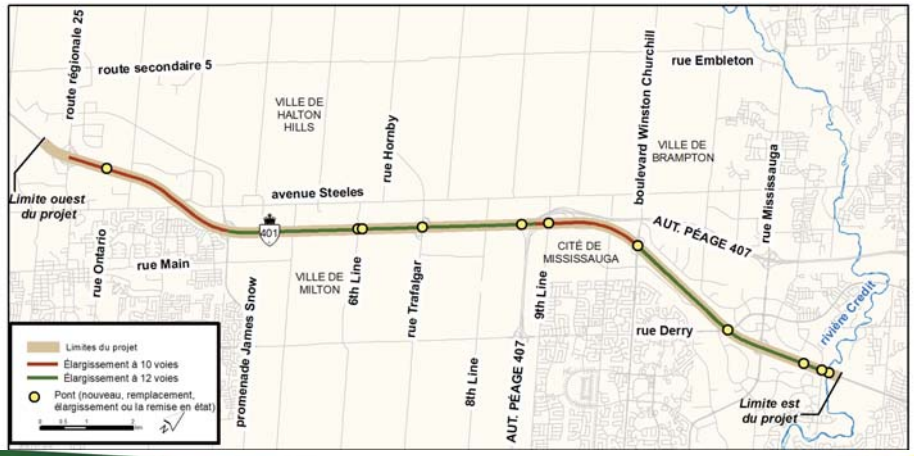
But de ce centre d'information public

- Fournir des informations sur le projet d'expansion de l'autoroute 401
- Décrire le processus d'évaluation environnementale
- Résumer comment le trafic et les impacts environnementaux sont atténués
- Identifier les prochaines étapes
- Décrire comment on peut rester informé et impliqué

Le contenu du centre d'information public disponible sur le site Web inclut:

1. Présentation vidéo
2. Copie PDF téléchargeable des diapositives de la présentation
3. Carte PDF du corridor d'expansion de l'autoroute 401 entier
4. Résumé des sessions de questions-réponses
5. Formulaire de commentaire du centre d'information public

Limites du Projet



Avantages du projet

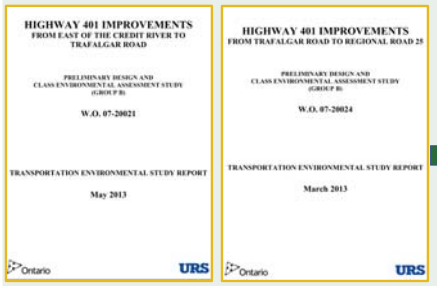
Le projet d'expansion de l'autoroute 401 aura des avantages locaux et régionaux:

Voyage amélioré	• Réduction des embouteillages • Réduction du temps de deplacement
Des options de covoiturage	• Nouveaux stationnements de covoiturage aggrandis pour les navetteurs • Voies réservées aux véhicules à occupation multiple (VOM)
Avantages économiques	• Circulation plus efficace des personnes et des marchandises, tant à l'échelle locale que régionale, dans le couloir de l'autoroute 401 • Création d'emplois

Contexte du projet et évaluation environnementale

Ce projet suit le processus de planification approuvé pour un projet du groupe « B » dans le cadre de l'évaluation environnementale de portée générale (EE) du MTO pour les installations provinciales de transport (2000).

Conception Préliminaire (2013)


HIGHWAY 401 IMPROVEMENTS
FROM EAST OF THE CREDIT RIVER TO TRAFALGAR ROAD
PRELIMINARY DESIGN AND CLASS ENVIRONMENTAL ASSESSMENT STUDY (GROUP B)
W.O. 07-20021
TRANSPORTATION ENVIRONMENTAL STUDY REPORT
May 2013
Ontario URS

HIGHWAY 401 IMPROVEMENTS
FROM TRAFALGAR ROAD TO REGIONAL ROAD 25
PRELIMINARY DESIGN AND CLASS ENVIRONMENTAL ASSESSMENT STUDY (GROUP B)
W.O. 07-20024
TRANSPORTATION ENVIRONMENTAL STUDY REPORT
March 2013
Ontario URS

Conception détaillée et construction de trois ponts (2015 – 2018)

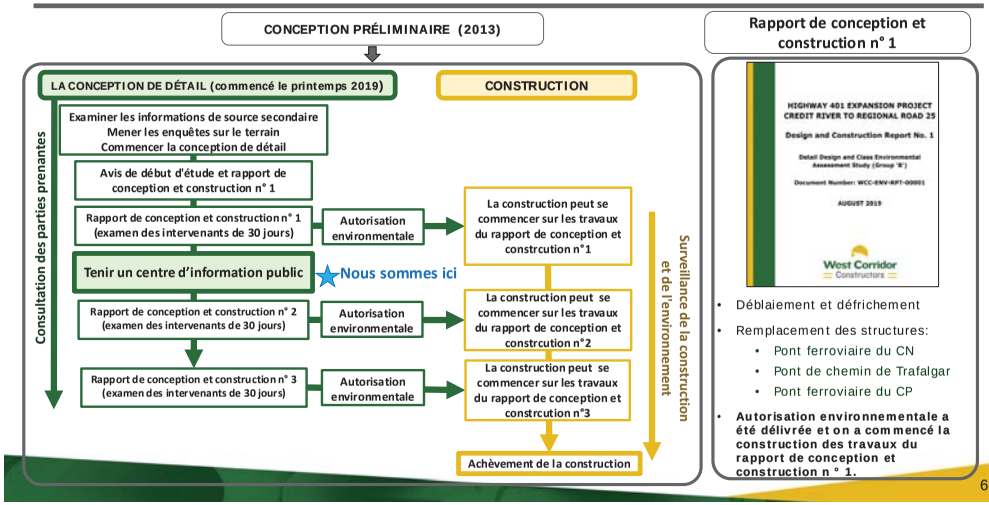

Ontario
DESIGN-BUILD MAJOR
REPLACEMENT AND WIDENING OF HIGHWAY 401 REGIONAL ROAD 25 UNDERPASS, 3RD LINE OVERPASS AND OAKVILLE CREEK WEST BRANCH STRUCTURES
DESIGN AND CONSTRUCTION REPORT
MH

WCC choisi pour concevoir et construire l'expansion de l'autoroute 401 (printemps 2019)

West Corridor Constructors

AECON PARSONS AMICO

EE et processus de conception-construction



Rapport de conception et construction n° 1

HIGHWAY 401 EXPANSION PROJECT
CREDIT RIVER TO REGIONAL ROAD 25
Design and Construction Report No. 1
Detail Design and Class Environmental Assessment Study (Group 'B')
Document Number: WCC-ENV-RPT-00001
AUGUST 2019
West Corridor Constructors

- Déblaiement et défrichement
- Remplacement des structures:
  - Pont ferroviaire du CN
  - Pont de chemin de Trafalgar
  - Pont ferroviaire du CP
- **Autorisation environnementale a été délivrée et on a commencé la construction des travaux du rapport de conception et construction n ° 1.**

Élargissement de l'autoroute 401

Section transversale typique à 10 voies

Voies en direction ouest — Voies en direction est

Les largeurs médianes varieront tout au long du corridor

Section transversale typique à 12 voies

Voies en direction ouest — Voies en direction est

Les largeurs médianes varieront tout au long du corridor

Échanges et réalignement des routes

- Reconfiguration de l'échange:
  - Route régionale 25
  - Promenade James Snow
  - Rue Trafalgar
  - Boulevard Winston Churchill
  - Rue Mississauga
  - Autoroute 401 et autoroute express à péage 407
- Réalignements des routes locales:
  - Sixième ligne au nord et au sud de l'autoroute 401
  - Rue Trafalgar au nord et au sud de l'autoroute 401
  - Rue Creditview au nord et au sud de l'autoroute 401

Rue Mississauga, quadrant sud-ouest

Structures

Structure	Description du travail
Ponts neufs et remplacés	
Rampe d'échangeur de l'autoroute 401 et de l'autoroute express à péage 407	• On a déplacé la rampe existante en direction ouest de l'autoroute express à péage 407 à l'autoroute 401.
Pont de la sixième ligne	• Remplacement du pont • Le nombre de voies sur la sixième ligne restera le même. • La structure existante sera maintenue pendant la construction.
Pont de la rue Creditview	• Remplacement du pont • Le pont final fournira deux voies dans chaque direction.
Remplacement des ponts de cours d'eau	
Ponts du ruisseau Oakville de l'est	• Remplacement et élargissement du pont • Permettra d'accommoder le passage de la faune sous la structure
Ponts de la rivière Credit	• Remplacement et élargissement du pont • Permettra d'accommoder le passage de la faune sous la structure

L'échangeur de l'autoroute 401 et de l'autoroute express à péage 407

Pont de la Riviére Credit

Structures

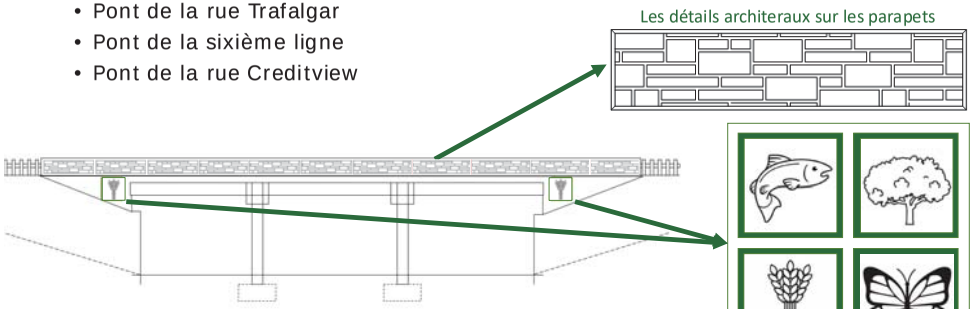
Structure	Détails
Réhabilitations et élargissement des ponts	
Pont de la neuvième ligne	• Réhabilitation du pont • Fermeture de voies pendant la construction, en tant que de besoin
Ponts du boulevard Winston Churchill	• Réhabilitation du pont • Fermeture de voies pendant la construction, en tant que de besoin
Ponts de la rue Derry	• Réhabilitation du pont et élargissement du pont de l'autoroute 401 sur la rue Derry jusqu'aux six voies dans chaque direction • Fermeture de voies pendant la construction, en tant que de besoin
Autres Structures: • **Ponceaux** • **Murs de soutènement et murs d'orteil**	

Boulevard Winston Churchill, en direction du sud

Rue Derry, en direction du sud

Esthétique des ponts

- Les détails architecturaux sur les murs de parapet et les reliefs sur les murs en aile seront inclus sur les ponts suivants:
  - Pont de la rue Trafalgar
  - Pont de la sixième ligne
  - Pont de la rue Creditview



Concept de gaufrage

Drainage et gestion des eaux pluviales

- Contrôle de la quantité et de la qualité des eaux pluviales
- Égouts, ponceaux, fossés gazonnés en bordure de route et à fond plat, et nouveaux bassins de gestion des eaux pluviales existants et nouveaux
- Bassins de gestion des eaux pluviales proposés:
  - Deux (2) nouveaux bassins humides au sud de l'autoroute 401 (un à l'ouest de cinquième ligne et un à l'ouest de sixième ligne)
  - Modification de deux (2) bassins humides existants près de l'échangeur de l'autoroute express à péage 407 et de l'autoroute 401

Bassin 2 – ouest de la cinquième ligne

Bassin 1 – ouest de la sixième ligne

Bassins 1 et 5 de l'autoroute express à péage 407

Travaux supplémentaires

- **Stationnements de covoiturage:**
  - Nouveau stationnement de covoiturage de la rue Trafalgar pour les navetteurs (quart nord-ouest)
  - Nouveau stationnement de covoiturage du boulevard Winston Churchill pour les navetterus (quart nord-ouest)
  - Agrandissement du parc de covoiturage existant de la rue Mississauga(quart nord-ouest)

Stationnement de covoiturage de la rue Missisauga

- **Transport actif:**
  - Accommoder des futures bandes cyclables sur la route régionale 25
  - Accommoder des futures bandes cyclables sur le passage inférieur de la rue Trafalgar
  - Chemin multi-usage le long du côté ouest de la rue Creditview
- **Illumination:** haut mât continu éclairant le couloir largement

Impacts du traffic

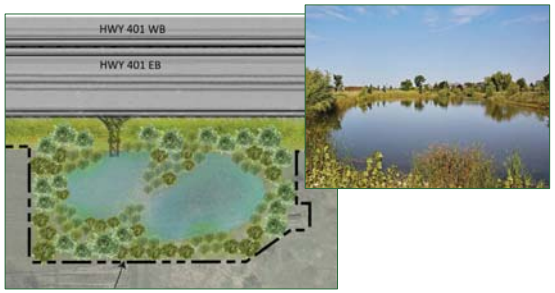
- Pendant **les heures de pointe**, six voies seront maintenues sur l'autoroute 401, conformément aux conditions existantes.
- Pendant les heures creuses, il y aura des fermetures à **court terme** et des réductions de voies.
- **Fermetures de voies** prévues:
  - Certaines rampes de sortie seront réduites à une seule voie pendant la construction.
  - La neuvième ligne sera réduite de deux voies à une voie.
  - La rue Derry sera réduite des six voies à quatre voies.
  - Le boulevard Winston Churchill sera réduit de six voies à quatre voies.
  - Les fermeture des voies du pont de la rue Creditview sont à confirmer.

Des informations sur les perturbations de la circulation seront publiées sur le site Web et des mises à jour sur la circulation seront envoyées aux personnes abonnées par courrier à la liste de contacts du projet.

Aménagement paysager et restauration

- L'aménagement paysager et la restauration auront lieu dans tout le corridor, y compris autour des bassins de gestion des eaux pluviales, dans les échangeurs et dans les couloirs des vallées.
- La restauration écologique comprendra l'amélioration de l'habitat pour les espèces en péril et les caractéristiques du passage de la faune

Aménagement paysager typique pour l'échange



Naturalisation d'un bassin de gestion des eaux pluviales

Atténuation Environmentale

Facteur	Conditions existantes et /ou impacts	Mesures d'atténuation
Terrestre	• Zones naturelles isolées • L'autoroute existante est un obstacle au mouvement de la faune.	• Minimiser les enlèvements de végétation et installer des barrières de protection des arbres • Gestion des espèces envahissantes • Aménagement paysager et restauration • Clôture de la faune et caractéristiques du passage de la faune
Aquatique	• Cours d'eau piscicoles - directs et indirects • Réalignements de cours d'eau • Risque d'érosion et de sédimentation	• Permis et approbations • Périodes de chronométrage des travaux dans l'eau • Installer et maintenir les mesures de contrôle de l'érosion et des sédiments jusqu'à la stabilisation du site
Espèces en péril	• Quatre espèces en péril • Les consultations avec les organismes de réglementation sont en cours.	• Permis et approbations • Adhérer aux périodes de chronométrage
Eau/érosion et sédiments	• Assèchement des eaux souterraines • Impacts de la construction sur les eaux de surface • Risque d'érosion et de sédimentation	• Registre des activités et des secteurs de l'environnement /Permis de prélèvement d'eau • Mesures de contrôle de l'érosion et des sédiments correctement installées et surveillées • Plan de prévention et de gestion des déversements, programme de surveillance des eaux souterraines et celui de surveillance des eaux de surface
Utilisation des terres	• Combinaison de zones urbaines, d'agricoles et de certaines zones naturelles • La propriété a déjà été acquise par la province; aucune propriété supplémentaire n'est nécessaire.	• Les travaux de construction seront limités aux terrains du projet. • La permission d'entrer sera obtenue si nécessaire.

Atténuation environnementale

Facteur	Conditions existantes et / ou impacts	Mesures d'atténuation
Bruit et vibration	• Aucune atténuation du bruit permanente • Atténuation du bruit de la construction • Potentiel d'impacts de vibration	• Exemption des règlements sur le bruit pour les travaux dans les emprises municipales • Limiter les activités de construction bruyantes à la journée, l'equipement en bon état de fonctionnement, les plaintes relatives au bruit feront l'objet d'une enquête • Surveillance des vibrations à certains endroits
Qualité de l'air	• Aucun impact significatif sur la qualité de l'air régional • Impacts limités sur la qualité de l'air de construction	• Maintenir les machines et le matériel de construction en bon état • Mesures antipoussière
Excès de terre, déchets et contamination	• Excès de terre • Zones contaminées nécessitant des mesures d'assainissement • Démolition de structures/bâtiments en utilisant des substances désignées	• Gestion des excès de matériaux • Assainissement du sol • Gestion des substances désignées
Archéologie	• Les zones touchées ont été débarrassées de leur valeur archéologique.	• Si on découvrira des ressources archéologiques non, la construction sera interrompue et les résultats seront examinés.
Patrimoine bâti	• Deux biens patrimoniaux provinciaux	• Documentation produite • Mesures d'atténuation, y compris l'aménagement paysager

Prochaines étapes et comment rester informé

- Construction en cours
- Examiner les commentaires et y répondre
- Période d'examen du rapport de conception et construction n °2 est prévue pour l'hiver/printemps 2020.
- Période d'examenn du rapport de conception et construction n °3 est prévue pour l'hiver/printemps 2020.
- Les voyageurs peuvent s'attendre à utiliser pleinement les installations élargies d'ici à la fin de 2022.

Un **formulaire de commentaire du centre d'information public** est disponible sur le site Web. Veuillez commenter le centre avant le 31 octobre 2019. **Pour plus d'informations sur le projet ou pour contacter l'équipe du projet WCC:**

Courriel: info@401expansion-mississauga-milton.ca

Téléphone: 1-888-619-1668 (24 heures)

Site Web: www.401expansion-mississauga-milton.ca/fr

Centre d'information public - présentation transcription

Diapositive 1 – Titre

Bonjour et merci de nous avoir rejoints pour le centre d'information public de l'expansion de l'autoroute 401. Je présenterai au nom de West Corridor Constructors, ou WCC, en abrégé. WCC est un consortium choisi par le ministère des Transports et de l'Infrastructure de l'Ontario pour concevoir et construire le projet d'agrandissement de l'autoroute 401.

Diapositive 2 – But du centre d'information public

Let but du centre d'information public est fournir un aperçu du projet, décrire le processus d'évaluation environnementale, résumer des impacts environnementaux et ceux du traffic ansi que leur attenuation, identifier les prochaines étapes et décrire comment on peut rester informé et impliqué.

Cette présentation vidéo vous expliquera brièvement certaines des caractéristiques et des détails clés du projet d'expansion de l'autoroute 401.

En plus de cette vidéo, nous avons d'autres ressources du centre d'information public à télécharger sur le site Web du projet afin que vous puissiez examiner les informations plus en détail. Un formulaire de commentaires est disponible pour fournir des commentaires. Le résume des séances de questions et réponses du 17 octobre sera également disponible.

Diapositive 3 – Limites du Projet

Le projet d'expansion de l'autoroute 401 est environ de 18 km et il est situé dans l'ouest de la région du Grand Toronto (RGT), de l'est de la rivière Credit à Mississauga à l'ouest de la route régionale 25 à Milton. Comme indiqué sur la carte, le projet comprend l'élargissement des six voies existantes jusqu'à celles qui suivent:

- 12 voies de la rivière Credit jusqu'au boulevard Winston Churchill
- 10 voies du boulevard Winston Churchill jusqu'à l'échange de l'autoroute express à péage 407 et celui de l'autoroute 401
- 12 voies de l'autoroute express à péage 407 et de l'autoroute 401 jusqu'à l'est de la promenade James Snow
- 10 voies de la promenade James Snow jusqu'à l'ouest de la route régionale 25

L'autoroute comprendra également des voies réservées aux véhicules à occupation multiple (VOM) et des améliorations au système de drainage, à l'éclairage, à la signalisation, au système de gestion avancée de la circulation, aux stationnements de covoiturage et à l'aménagement paysager.

Diapositive 4 - Avantages du projet

Les avantages de ce projet comprennent une amélioration des déplacements dans le corridor en réduisant les embouteillages et les temps de déplacement, plus des options de covoiturage grâce à la création de nouveaux stationnements de covoiturage et à leur élargissement ainsi qu'à l'inclusion de voies VMO. Les avantages économiques comprennent une meilleure circulation des personnes et des biens dans le corridor et la création d'emplois

Diapositive 5 – Contexte du projet et évaluation environnementale

Ce projet suit l'évaluation environnementale de portée générale du MTO pour les installations de transport provinciales, ce qui est un processus de planification et de prise de décision nécessitant que les projets prennent en compte, évitent, minimisent et atténuent les impacts environnementaux.

La conception préliminaire de cette section de l'autoroute 401 a été achevée en 2013.

En 2015, la conception détaillée a été achevée pour trois des structures du corridor — la route régionale 25, la cinquième ligne et les structures d'ouest du ruisseau Oakville — et elle a été documentée dans un rapport de conception et de construction. La construction de ces trois structures est déjà réalisée.

Tous ces travaux nous amènent au printemps 2019, lorsque WCC a été choisi pour concevoir et construire le projet d'expansion de l'autoroute 401. WCC est une équipe entièrement canadienne et entièrement intégrée comprenant Aecon Infrastructure Management Inc., Parsons Inc. et Amico Design Build Incorporated.

Diapositive 6 – EE et processus de conception-construction

Ce schéma décrit l'approche de la conception-construction pour ce projet, ce qui permet au concepteur et au constructeur de travailler ensemble.

Au fur et à mesure de l'avancement de la conception, des rapports de conception et de construction seront préparés pour documenter la conception, les consultations et les travaux à réaliser. Ces rapports seront mis à disposition pour des périodes d'examen public de 30 jours.

En août, WCC a publié le rapport de conception et construction n ° 1 qui a documenté les travaux préliminaires du projet, notamment le déblaiement et défrichement de la végétation, ainsi que le remplacement des ponts ferroviaires du CN et CP et du pont de la rue Trafalgar. On a délivré une autorisation environnementale pour certains des travaux du rapport de conception et construction n ° 1 et la construction de ces travaux a commencé.

Alors que les travaux du rapport de conception et construction ° 1 seront en cours, la conception des travaux qui seront documentés dans les rapports de conception et construction n° 2 et 3 continuera à progresser. Lorsque les travaux dans les rapports de conception et construction n ° 2 et n ° 3 recevront l'autorisation environnementale, ils entreront également dans la construction.

Diapositive 7 – Élargissement de l'autoroute 401

L'autoroute est élargie de six voies à 10 ou 12 voies. Ces schémas montrent une coupe transversale typique d'une route à 10 et 12 voies et les deux configurations auront une voie VMO dans chaque direction. Comme on peut le constater, on utilise pour la configuration à 12 voies le système « Express » et collecteur qui est déjà en place sur des tronçons de l'autoroute 401 dans la région du Grand Toronto.

Diapositive 8 – Échanges et réalignement des routes

Pour accommoder l'élargissement, on devra reconfigurer certains échanges, notamment les rampes d'accès et de sortie. De plus, la sixième ligne, la rue Trafalgar et la rue Creditview doivent être légèrement alignés au nord et au sud de l'autoroute 401 pour permettre l'élargissement.

Diapositive 9 - Structures

Un élément clé de l'agrandissement comprend le remplacement des ponts pour permettre l'accès à l'autoroute élargie. En plus du remplacement des ponts dans le rapport de conception et

construction n ° 1, ce projet comprend également le déplacement d'une rampe d'accès existante de l'autoroute express à péage 407, le remplacement des ponts de la sixième ligne et de la rue Creditview, ainsi que le remplacement des traverses de l'est de la rivière Credit et du ruisseau Oakville.

Diapositive 10 - Structures

Plusieurs ponts ont besoin de la réhabilitation et/ou de l'élargissement pour permettre l'ajout de voies sur l'utoroute 401, notamment des ponts de la neuvième ligne, le boulevard Winston Churchill, et la rue Derry. Les autres travaux structurels comprennent le remplacement et l'extension des ponceaux et la construction des murs de soutènement.

Diapositive 11 – Esthétique des ponts

Les ponts de la rue Trafalgar, de la sixième ligne et de la rue Creditview auront les détails architecturaux sur les murs de parapet avec ce motif en forme de brique qu'on peut voir ici. Des options de gaufrage sur les murs en aile de chaque pont sont également à l'étude. Les options comprennent:

- Papillon monarque, noyer noir et saumon qui sont communs dans l'environnement naturel environnant
- Embossages des images agricoles pour commémorer opérations agricoles historiques de la région

Diapositive 12 – Drainage et gestion des eaux pluviales

En plus des travaux routiers, WCC utilisera une combinaison d'égouts, de ponceaux, de fossés et de bassins de gestion des eaux pluviales pour gérer le drainage et le contrôle de quantité et de qualité des eaux pluviales.

On construira de nouveaux bassins de gestion des eaux pluviales à l'ouest des cinquième et sixième lignes et on réajustera deux des bassins de gestion des eaux pluviales de l'autoroute express à péage 407.

Diapositive 13 – Travaux supplémentaires

Le projet comprendra également la création de deux nouveaux stationnements de covoiturage prés de la rue Trafalgar et prés du boulevard Winston Churchill, ainsi que l'agrandissement d'un stationnement de covoiturage existant le long de la rue Mississauga.

La conception du WCC tient également compte des possibilités de transport actif sur les routes locales en aménageant les futures bandes cyclables prévues sur la route régionales 25 et sur la rue Trafalgar. De plus, un chemin multi-usage sera construit le long du côté ouest de la rue Creditview.

Nous installerons également un éclairage de haut mât dans tout le couloir.

Diapositive 14 – Impacts du traffic

Les travaux de construction liés à ce projet résulteront en répercussions sur la circulation. Nous cherchons à minimiser ces perturbations chaque fois que nous le pouvons et nous apprécions votre coopération et votre soutien pendant les travaux de construction intenses.

Parmi les détails clés que nous voulons souligner, citons le fait que six voies de l'autoroute principale 401 seront maintenues pendant les heures de pointe, conformément aux conditions

existantes. Pendant les heures creuses, il peut y avoir des fermetures à court terme et des réductions de voies.

Il y aura également des réductions de voies pour permettre la construction, y compris certaines des rampes de sortie, la neuvième ligne, la rue Derry et le boulevard Winston Churchill. Les fermetures de voies le long du chemin Creditview sont encore en train d'être confirmées.

Pour toutes les perturbations, on communiquera des déviations à l'avance au besoin et une signalisation sera en place.

La communication des perturbations de la circulation au public est une partie très importante de ce projet. Nous publierons des mises à jour et des informations sur le site Web du projet et enverrons également des courriers contenant des mises à jour sur le traffic aux abonnés à la liste de contacts du projet.

Diapositive 15 – Aménagement paysager et restauration

L'aménagement paysager et la restauration auront lieu dans tout le couloir et comprendront l'amélioration de l'habitat pour les espèces en péril et les passages pour la faune. Ces activités auront lieu vers la fin du projet, lorsque les travaux de construction seront bientôt achevés.

On plantera le couloir avec un mélange d'arbres et d'arbustes à feuilles caduques et résineuses indigènes.

Les images présentées ici illustrent la conception paysagère typique des zones d'échange et des basins de gestion des eaux pluviales. Ces deux concepts de paysage, ainsi que des images supplémentaires pour les secteurs de bord de route et de vallée, sont publiés sur le site Web dans un fichier séparé pour que vous puissiez mieux voir les détails et les revoir.

Diapositive 16 – Atténuation Environmentale

WCC est conscient que l'élargissement de la route aura des conséquences sur l'environnement.

Nous chercherons à éviter ou à minimiser les impacts et à proposer des mesures d'atténuation, telles que minimiser les absorptions de végétation, fournir un passage pour la faune, installer et maintenir des mesures de contrôle de l'érosion et des sédiments.

Diapositive 17 – Atténuation Environmentale

WCC produira des documents d'orientation environnementale pour les travaux de construction et obtiendra les permis et autorisations nécessaires à la poursuite des travaux.

Veuillez examiner les impacts environnementaux et les mesures d'atténuation sur ces diapositives, téléchargeables sur le site Web, et si vous avez des questions, n'hésitez pas à contacter l'équipe du projet.

Diapositive 18 – Prochaines étapes et comment rester informé

Les prochaines étapes sont comme le suit:

- WCC continuera ses travaux de construction et vous constaterez une activité accrue le long du corridor.
- La consultation, y compris l'examen et la réponse aux commentaires, sera également en cours.
- Nous développerons les rapports de conception et construction n ° 2 et 3, qui devraient être disponibles pour examen au début de 2020.

- On prévoit que les voyageurs utiliseront pleinement le corridor routier élargi d'ici la fin de 2022.

Nous vous encourageons à consulter tous les documents du centre d’information public disponibles sur notre site Web. Si vous souhaitez soumettre des commentaires ou des questions, veuillez remplir un formulaire de commentaire du centre et nous le renvoyer avant le 31 octobre 2019.

Vous pouvez également envoyer des commentaires à tout moment en utilisant la page Contactez-nous du site Web, par courrier ou par téléphone, comme indiqué sur cette diapositive. Si vous souhaitez recevoir des notifications sur le projet, y compris des mises à jour sur le traffic et le moment où quand les rapports de conception et construction seront disponibles pour vérification, veuillez vous inscrire sur le site Web.

Au nom de toute l’équipe de West Corridor Constructors, je vous remercie de votre intérêt pour le projet d’expansion de l’autoroute 401 et de votre participation à ce centre d’information public.

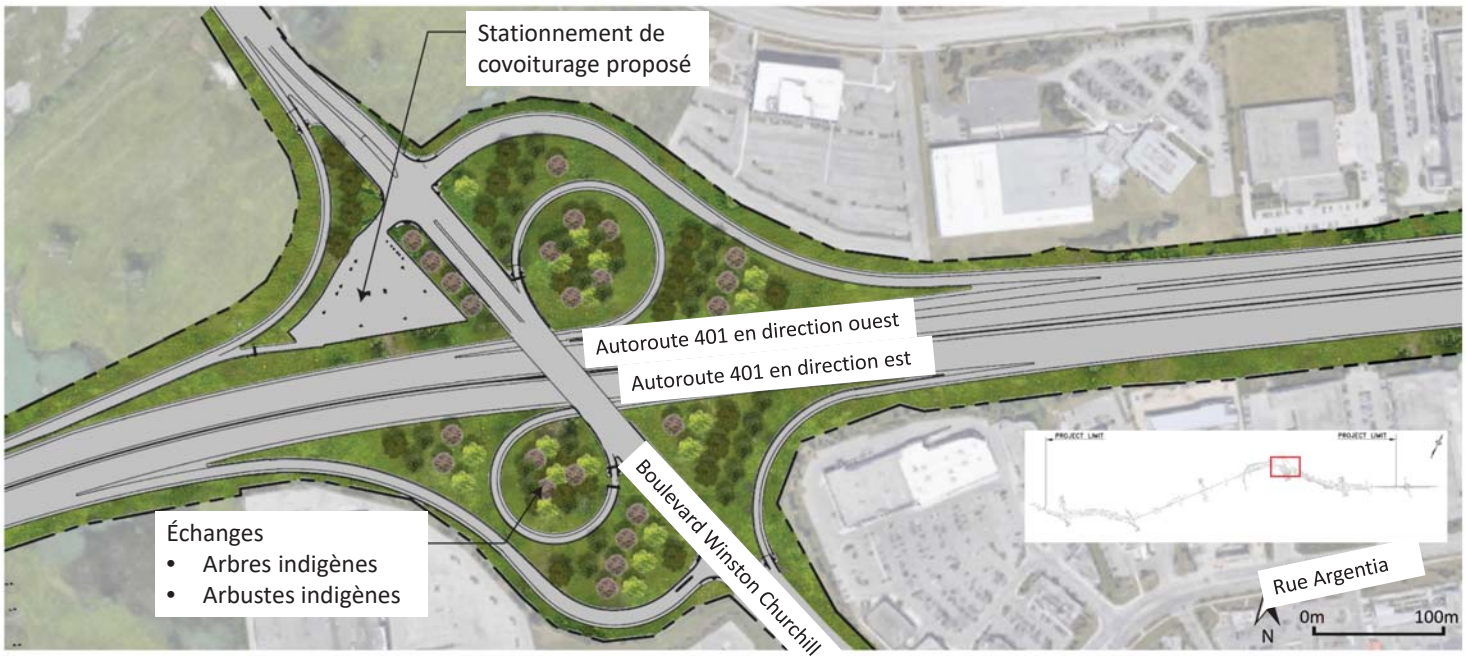
Projet d’expansion de l’autoroute 401

Concepts de paysager

Centre d’information public

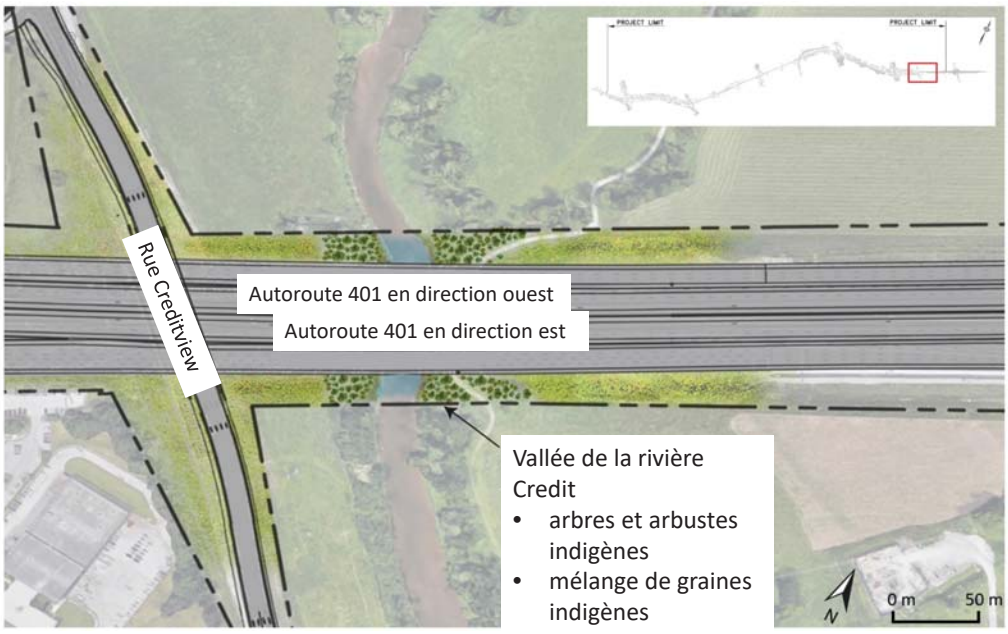
17 octobre 2019

Échangeur autoroutier typique

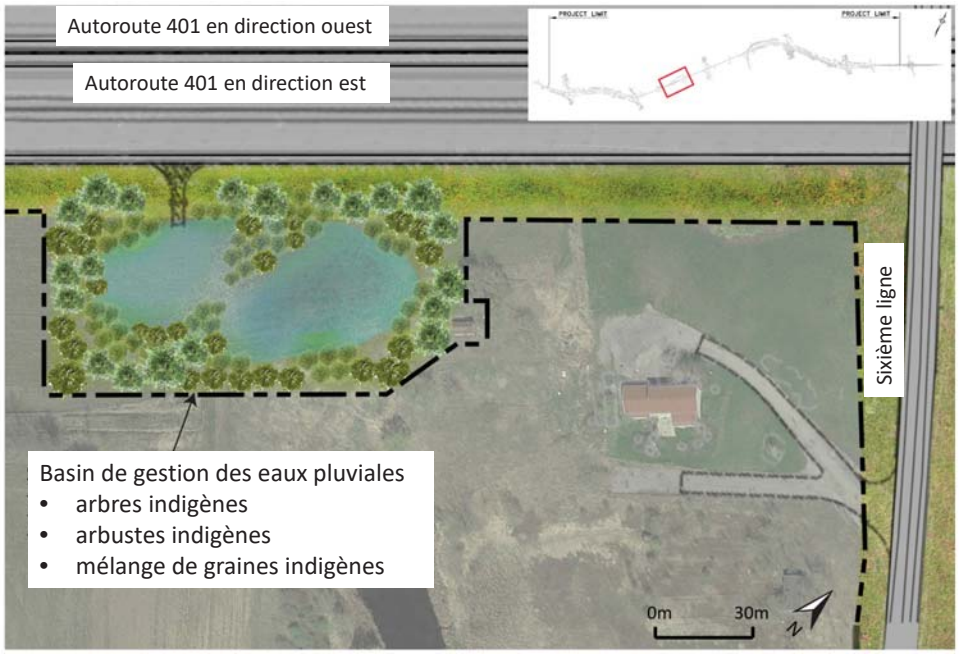


Bord de la route typique

Région typique de la vallée



Naturalisation d'un bassin de gestion des eaux pluviales



Projet d'expansion de l'autoroute 401
Rivière Credit à la route régionale 25

Centre d'information public – formulaire de commentaire

CENTRE D'INFORMATION PUBLIC – 17 OCTOBRE 2019

WCC entreprend la conception et la construction d'environ 18 kilomètres de l'autoroute 401 située dans la région ouest de la région du Grand Toronto, de l'est de la rivière Credit à Mississauga jusqu'à l'ouest de la route régionale 25 à Milton. Le projet comprend l'élargissement de six voies existantes à dix ou douze voies centrales et collectrices.

Veuillez prendre quelques minutes pour compléter ce formulaire de commentaires et le renvoyer avant le 31 octobre 2019 en utilisant l'une des méthodes suivantes:

- Envoyer par courrier électronique à info@401expansion-mississauga-milton.ca
- Envoyer par courrier à 2000 Argentia Road, Plaza 5, Suite 500, Mississauga, ON, L5N 2R7

NOM: _____

ADDRESSE: _____

COURRIER ÉLECTRONIQUE: _____

Avez-vous besoin d'une réponse écrite à vos commentaires? ☐ Oui ☐ Non

1. Avez-vous des questions sur l'évaluation environnementale, la conception ou le processus de construction de ce projet?

West Corridor Constructors

Projet d'expansion de l'autoroute 401
Rivière Credit à la route régionale 25

Centre d'information public – formulaire de commentaire

2. Avez-vous des questions ou des préoccupations concernant les travaux du projet proposé?	
3. Avez-vous apprécié le format de ce centre d'information publique en ligne? Préférez-vous un centre d'information public en ligne ou un centre traditionnel en personne?	
4. Avez-vous un retour d'information ou des commentaires supplémentaires?	

Appendix C
PIC Q&A Summary

Highway 401 Expansion Project
Credit River to Regional Road 25

Online Public Information Centre (PIC)
Question & Answer Summary

Introduction

An Online Public Information Centre (PIC) for the Highway 401 Expansion Project was held on October 17, 2019 and hosted on the project website. There were three live one-hour Q&A sessions held throughout the day at 10:00AM, 1:00PM, and 7:00PM, which were hosted on a live webcast presentation and a teleconference line. The questions and answers provided at the Q&A sessions are summarized below.

Summary of Questions and Answers

General

Q: What is WCC?

West Corridor Constructors (WCC) is a consortium comprised of Aecon Infrastructure Management Inc. (Aecon), Parsons Inc. (Parsons), and Amico Design Build Inc. (Amico) integrated in a Joint Venture. WCC was selected by The Ministry of Transportation Ontario (MTO) and Infrastructure Ontario (IO) to design, build and finance the Highway 401 Expansion Project.

Q: What is the cost of the project?

WCC signed a $639.8 million fixed-price contract to design, build, and finance the Highway 401 Expansion Project.

Q: What does mainline mean?

The mainline refers to the existing six lanes on Highway 401, excluding the on and off ramps and the crossing roads (local roads that cross over or under the highway).

Design and Construction

Q: How will the decision making around the final lane configurations be determined? / Why are some parts 10 lanes and some parts 12 lanes?

Determination of the lane requirements was completed during preliminary design in 2013 using a travel demand forecast exercise. Based on the existing traffic conditions and projected traffic volume growth for this section of the Highway 401 corridor, it was determined which sections were recommended for 10 lanes and 12 lanes in order to meet the projected 2031 travel demand. Other constraints that limit the number of lanes include property and geographic constraints of existing structures and buildings that prevent widening to 12 lanes throughout the entire 18km.

Q: Is the detail design available at Credit River bridge?

The Credit River bridge will be included in Design and Construction Report No. 2, which is anticipated to be available for public review in Winter 2020. The Design and Construction Report will provide details of the new Credit River bridge, including design drawings.

Q: What is the sequence of construction / staging of works? / When will construction begin?

For this project, we have divided some work into what we are calling “Early Works”. Design and Construction Report No. 1 details these early works, which include clearing and grubbing of the entire Project corridor, and work on CN Rail bridge, Trafalgar Road bridge, and CP Rail bridge. In terms of this Project’s construction schedule, these are the construction activities that are starting first – some of which are already in progress. Clearing and grubbing activities are to start in key areas, which include the three bridges covered in DCR No. 1 and areas were silt fencing or new fencing for property is to be installed.

In terms of the construction sequence, or staging, for work on mainline Highway 401, there will be two construction stages. The first stage of construction includes constructing new lanes on the outside of the highway (i.e. north and south). Once the new lanes are complete, stage 2 will commence, which

includes diverting traffic to the new constructed lanes on the outside and commencing construction on the existing, inside lanes.

The most current information about traffic disruptions will be available on the Project website and WCC will also distribute email traffic updates as required to communicate key disruptions and updates to the public.

Q: How long will construction be going on for? / When do you forecast completion of all construction?

Travelers can expect to have full use of the expanded facility by late 2022.

Q: Will HOV Lanes be built?

Yes, High Occupancy Vehicle (HOV) lanes will be constructed through the corridor, with one HOV lane in each direction.

Q: Are there any carpool lots being built?

Yes, the following construction activities are related to carpool lots:

- New Trafalgar Road Commuter Carpool Lot (Northwest Quadrant) – minimum 330 new parking stalls
- New Winston Churchill Boulevard Commuter Carpool Lot (Northwest Quadrant) – minimum 146 new parking stalls
- Expansion of existing Mississauga Road Commuter Carpool Lot (Northwest Quadrant) – Currently has 73 parking spaces and will be expanded to a minimum of 128 parking spaces

Q: Where can I see the design of the expansion?

The corridor map available online with the PIC materials provides a draft of the roadway design. Future Design and Construction Reports will provide additional details of the roadway and structure design.

Traffic, Access, Property

Q: Is all widening occurring within lands owned by MTO? Or will appropriation be required? Has this process been completed?

All property for this project has been acquired by MTO following the preliminary design that was undertaken in 2013. Thus, no additional property is required for the works that WCC is constructing.

Q: How will you ensure that my daily commute is not impacted?

Unfortunately, construction has impacts, especially for those living or commuting in the immediate area. WCC will consider how our activities affect local traffic and communities, provide advance notice of all temporary closures and lane reductions, and always strive to be mindful of reducing the impacts of construction. Updates about all temporary and permanent road closures and lane reductions will be posted on the website.

WCC does appreciate your cooperation and support while intense construction activities occur.

Q: How many lanes are being affected during construction?

During peak traffic hours, six lanes will be maintained on mainline Highway 401, as per existing conditions. During off-peak hours, there will be some short-term closures and lane reductions which include some interchange ramps. The PIC displays available online have further information on the anticipated lane closures on local roads impacted by the highway widening. The most current information about traffic disruptions will be available on the Project website and WCC will also distribute email traffic updates as required to communicate key disruptions and updates to the public.

Q: Can you define off-peak and on-peak hours? / What are the off-peak hours?

Off-peak hours on mainline Highway 401 is generally from 10:00 PM – 5:00AM / 6:00 AM, depending on the direction of traffic.

Environmental

Q: What are the environmental impacts?

As the Project requires widening of the highway and interchanges, there will be some environmental impacts. Environmental impacts include the natural, socio-economic, and cultural environments. We will look to avoid or minimize environmental impacts and provide mitigation measures, such as minimizing vegetation removals, providing wildlife passage, installing and maintaining erosion and sediment control measures. WCC will be producing overarching environmental guidance materials for construction works and obtaining relevant permits and approvals for works to proceed. The DCRs will also document environmental impacts and mitigation measures.

Q: Are there any species that will face extinction because of this project?

No species face extinction because of this Project. However, there are four Species at Risk (shortened to SAR) within our Project limits. There are Redside Dace located in several watercourses at Highway 401 and Regional Road 25, American Eel in the Credit River, and two bat SAR throughout the corridor. There are potential for impacts to these SAR, however the relevant permits and approvals are being obtained from regulatory agencies. Construction staging and timing has also been developed to avoid critical timing windows for each SAR (such as no vegetation removal during bat roosting window, completing in-water works during the permitted timing window) so that impacts are minimized.

Projet d'expansion de l'autoroute 401
Rivière Credit à la route régionale 25

Centre d'information public en ligne
Résumé des questions et réponses

Introduction

Un centre d'information public pour l'expansion de l'autoroute 401 a eu lieu le 17 octobre 2019 sur le site web du projet. On a organisé trois séances de questions-réponses en direct tout au long de la journée à 10h00, 13h00 et 19h00 et on les a animées par une présentation en direct sur le Web et sur une ligne de téléconférence. Les questions et réponses fournies lors des sessions de questions-réponses sont résumées ci-dessous.

Résumé des questions et des réponses

Général

Q: Qu'est ce que WCC?

West Corridor Constructors (WCC) est un consortium composé d'Aecon Infrastructure Management Inc. (Aecon), Parsons Inc. (Parsons) et Amico Design Build Inc. (Amico), intégrée dans une coentreprise. Le ministère des Transports de l'Ontario (MTO) et de l'Infrastructure Ontario (IO) ont choisi WCC pour concevoir, construire et financer le projet d'expansion de l'autoroute 401.

Q: Combien coûte-il ce projet?

WCC a signé un contrat à prix fixe de 639,8 millions de dollars pour concevoir, construire et financer le projet d'expansion de l'autoroute 401.

Q: Qu'est-ce que veut dire la ligne principale?

La ligne principale fait référence aux six voies existantes sur l'autoroute 401, à l'exclusion des rampes d'accès et des routes locales qui se croisent sur l'autoroute ou sous lui.

Conception et construction

Q: Comment déterminera-t-on les décisions concernant les configurations de la voie finale? / Pourquoi y a-t-il des parties à 10 voies et des parties à 12 voies?

On a déterminé des besoins en voies lors de la conception préliminaire en 2013 à l'aide d'un exercice de prévision de la demande de déplacements. Fondé sur les conditions de circulation existantes et de la croissance projetée du volume de circulation pour cette section du corridor de l'autoroute 401, on a détermine quelles sections étaient recommandées pour 10 voies et 12 voies afin de répondre à la demande de déplacements prévue pour 2031. Parmi les autres contraintes qui limitent le nombre de voies, on peut citer les contraintes liées à la propriété et à la géographie des structures existantes qui empêchent l'élargissement à 12 voies sur 18 km.

Q: La conception détaillée est-elle disponible au pont de la rivière Credit?

On inclura le pont de la rivière Credit dans le rapport de conception et de construction n° 2 qui devrait être disponible pour examen public à l'hiver 2020. Le rapport de conception et de construction fournira des détails sur le nouveau pont de la rivière Credit, y compris des dessins de conception.

Centre d'information public en ligne
Résumé des questions et réponses

Q: Quelle est la séquence de construction / de mise en scène des travaux? / Quand commencera la construction?

Pour ce projet, nous avons divisé certains travaux en ce que nous appelons « Travaux Préliminaires ». Le rapport de conception et de construction n° 1 fournit des détails sur ces travaux préliminaires, qui comprennent déblaiement et défrichement le long du corridor du projet, ainsi que les travaux sur le chemin de fer du CN, le pont de la rue Trafalgar et le chemin de fer du CP. Pour ce qui est du calendrier de construction de ce projet, ce sont les activités de construction qui démarrent en premier et certaines d'elles sont déjà en cours. Les activités de déblaiement et de défrichement commenceront dans les zones clés, y compris les trois ponts couverts par le rapport de conception et de construction n° 1 et les zones où se des clôtures anti-limon ou de nouvelles clôtures pour la propriété doit être installée.

En ce qui concerne la séquence de construction, ou l'étape, pour des travaux sur la route principale 401, il y aura deux étapes de construction. La première étape de la construction comprend la construction de nouvelles voies à l'extérieur de la route (du nord et du sud). Une fois que les nouvelles voies seront terminées, la seconde phase commencera et comprendra le détournement de la circulation vers les nouvelles voies construites à l'extérieur et le début de la construction sur les voies intérieures existantes.

Les informations les plus récentes sur les perturbations de la circulation seront disponibles sur le site Web du projet. WCC diffusera également des mises à jour du trafic par courrier électronique afin de communiquer les principales perturbations et mises à jour au public.

Q: Combien de temps durera la construction? / Quand prévoyez-vous l'achèvement de toute la construction?

Les voyageurs peuvent s'attendre à utiliser pleinement les installations agrandies d'ici la fin de 2022.

Q: Construira-t-on les voies réservées aux véhicules à occupation multiple (VOM)?

Oui, on construira les voies réservées aux véhicules à occupation multiple (VOM) dans le couloir, avec une voie réservée aux véhicules à occupation multiple dans chaque direction.

Q: Y a-t-il des stationnements de covoiturage en construction?

Oui, les activités de construction suivantes sont liées aux stationnements de covoiturage:

- Nouveau stationnement de covoiturage de la rue Trafalgar pour les navetteurs (quart nord-ouest) – minimum de 330 nouvelles places de stationnement
- Nouveau stationnement de covoiturage du boulevard Winston Churchill pour les navetteurs (quart nord-ouest) – minimum de 146 nouvelles places de stationnement
- Élargissement du stationnement de covoiturage existant de la rue Mississauga (quart nord-ouest) – compte actuellement 73 places de stationnement et sera étendu à un minimum de 128 places de stationnement

Q: Où puis-je voir la conception de l'expansion?

La carte du corridor est disponible en ligne avec les documents du centre d'information public et elle fournit une esquisse du projet de conception de la route. Les futurs rapports de conception et de construction fourniront des détails supplémentaires sur la conception de la route et celle de la structure.

Centre d'information public en ligne
Résumé des questions et réponses

Circulation, accès, propriété

Q: Est-ce que tout élargissement qui se produit sur des terres appartenant au MTO? Ou une appropriation sera-t-elle nécessaire? Ce processus est-il terminé?

Toutes les propriétés de ce projet ont été acquises par le MTO à la suite de la conception préliminaire entreprise en 2013. Ainsi, aucune propriété supplémentaire n'est requise pour les travaux que WCC est en train de construire.

Q: Comment assurerez-vous que mes déplacements quotidiens ne seront pas impliqués?

Malheureusement, la construction a des conséquences, en particulier pour ceux qui vivent ou se rendent dans les environs immédiats. WCC examinera l'impact de ses activités sur la circulation et les communautés locales, donnera un préavis de toutes les fermetures temporaires et des réductions de voies, et s'efforcera toujours de réduire les impacts de la construction. On affichera des mises à jour sur toutes les fermetures temporaires et permanentes de routes et les réductions de voies sur le site Web.

WCC apprécie votre coopération et votre soutien pendant les travaux de construction intenses.

Q: Combien de voies sont impliquées pendant la construction?

Pendant les heures de pointe, six voies seront maintenues sur l'autoroute 401, conformément aux conditions existantes. Pendant les heures creuses, il y aura des fermetures à court terme et des réductions de voies, y compris des rampes d'échange. Les écrans du centre d'information public disponibles en ligne comprendront des informations supplémentaires sur les fermetures de voies prévues sur les routes locales impliquées par l'élargissement de l'autoroute. Les informations les plus récentes sur les perturbations de la circulation seront disponibles sur le site Web du projet. WCC diffusera également des mises à jour du trafic par courrier électronique afin de communiquer les principales perturbations et mises à jour au public.

Q: Pouvez-vous définir les heures de pointe et les heures creuses? / Quelles sont les heures creuses?
Les heures creuses sur la route principale 401 sont généralement de 22h00 à 5h00 / 6h00, selon le sens de la circulation.

Environnement

Q: Quels sont les impacts environnementaux?

Comme le projet nécessite l'élargissement de la route et des échangeurs, il y aura des impacts environnementaux. Les impacts environnementaux comprennent les environnements naturels, socio-économiques et culturels. Nous essayerons d'éviter ou de minimiser les impacts environnementaux et de proposer des mesures d'atténuation, telles que la réduction des retraits de végétation, la fourniture de passage pour la faune, l'installation et le maintien de mesures de contrôle de l'érosion et des sédiments. WCC produira des documents d'orientation environnementale complets pour les travaux de construction et obtiendra les permis et autorisations nécessaires à la poursuite des travaux. Les rapports de conception et de construction documenteront également les impacts environnementaux et les mesures d'atténuation.

Q: Y a-t-il des espèces qui risquent l'extinction à cause de ce projet?

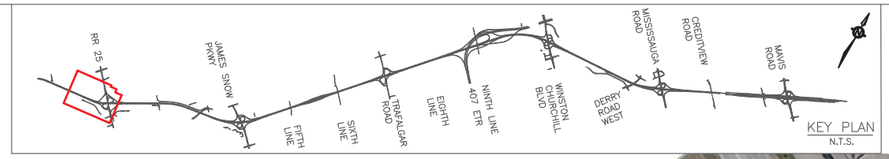
Aucune espèce n'est menacée d'extinction à cause de ce projet. Cependant, il y a quatre espèces en péril dans les limites de notre projet. Le méné long se trouve dans plusieurs cours d'eau sur l'autoroute 401 et sur la route régionale 25. L'anguille d'Amérique se trouve dans la rivière Credit et deux types de chauves souris en péril se trouvent dans tout le couloir. Des impacts potentiels sur ces espèces en péril sont toutefois possibles, mais les autorisations nécessaires sont en train d'être obtenues auprès d'agences de réglementation. On a également mis les étapes de la construction et du calendrier au point pour éviter les créneaux horaires critiques pour chaque espèce en péril (par exemple, aucun enlèvement de végétation pendant nidification de chauve-souris, achèvement des travaux dans l'eau pendant l'horaire autorisé) afin de minimiser les impacts.

Appendix B

Recommended Plan

LEGEND

- CONSTRUCTION LIMITS
- PROPOSED ROADWAY
- LANES
- PROPOSED STRUCTURE IMPROVEMENTS
- PROPOSED STORMWATER MANAGEMENT POND "SWMP"
- PROPOSED HIGH MAST POLE
- PROPOSED DRAINAGE
- MUNICIPAL BOUNDARY



KEY PLAN
N.T.S.

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West Corridor Constructors

CONT
WP

RECOMMENDED PLAN
STA TO STA
Survey Revised

SHEET
1

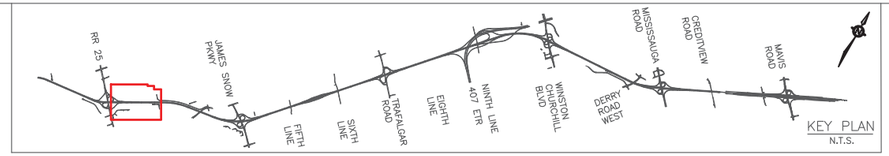
WEST PROJECT LIMITS

SIXTEEN MILE CREEK WEST BRANCH
REGIONAL ROAD 25
STA 12+710
WC–03
WC–02
WC–01
CHISHOLM DR

DOCUMENT CODE:

LEGEND

- CONSTRUCTION LIMITS
- PROPOSED ROADWAY LANES
- PROPOSED STRUCTURE IMPROVEMENTS
- PROPOSED STORMWATER MANAGEMENT POND "SWMP"
- PROPOSED HIGH MAST POLE
- PROPOSED DRAINAGE
- MUNICIPAL BOUNDARY



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West Corridor Constructors

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WP

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SHEET 2

DOCUMENT CODE:

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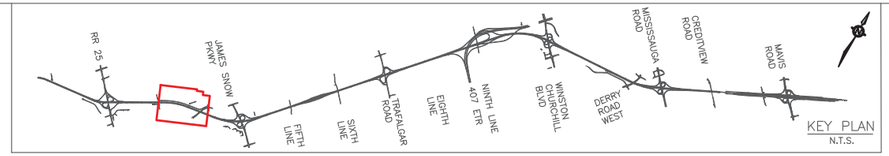
- PROPOSED DRAINAGE
- MUNICIPAL BOUNDARY



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West Corridor Constructors

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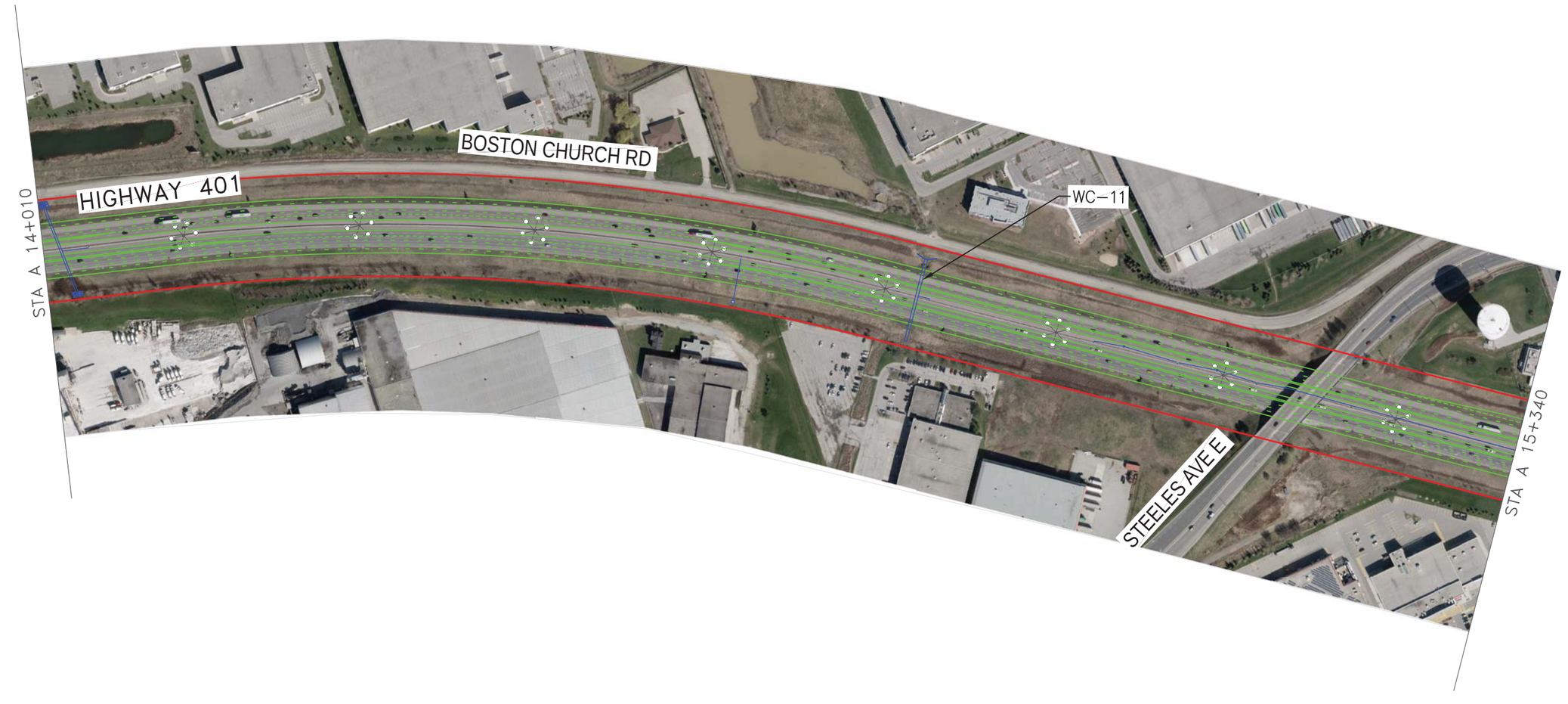
WP

RECOMMENDED PLAN
STA TO STA
Survey Revised

SHEET 3



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- PROPOSED DRAINAGE
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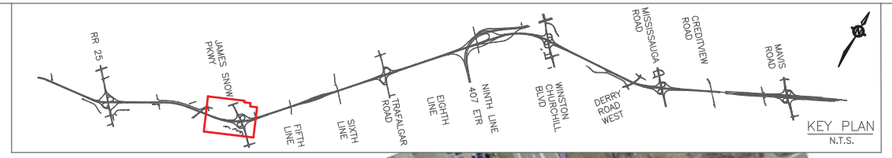

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West Corridor Constructors

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WP

RECOMMENDED PLAN
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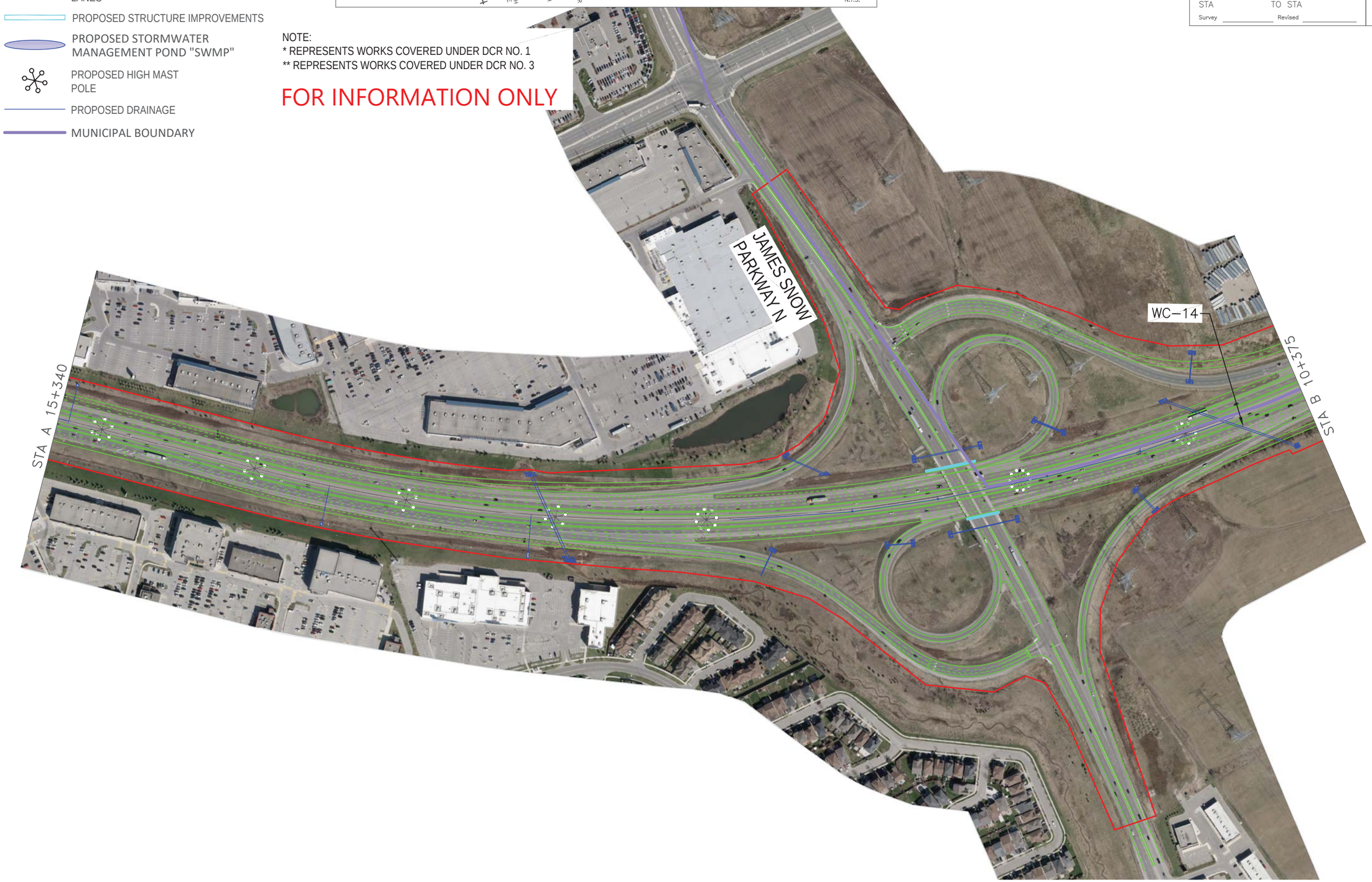
SHEET 4



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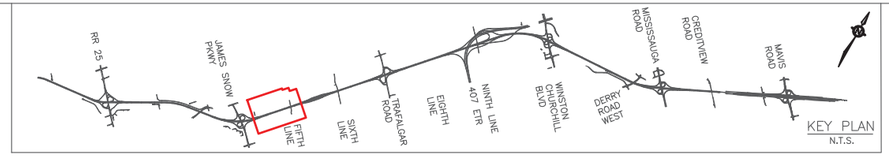

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WP

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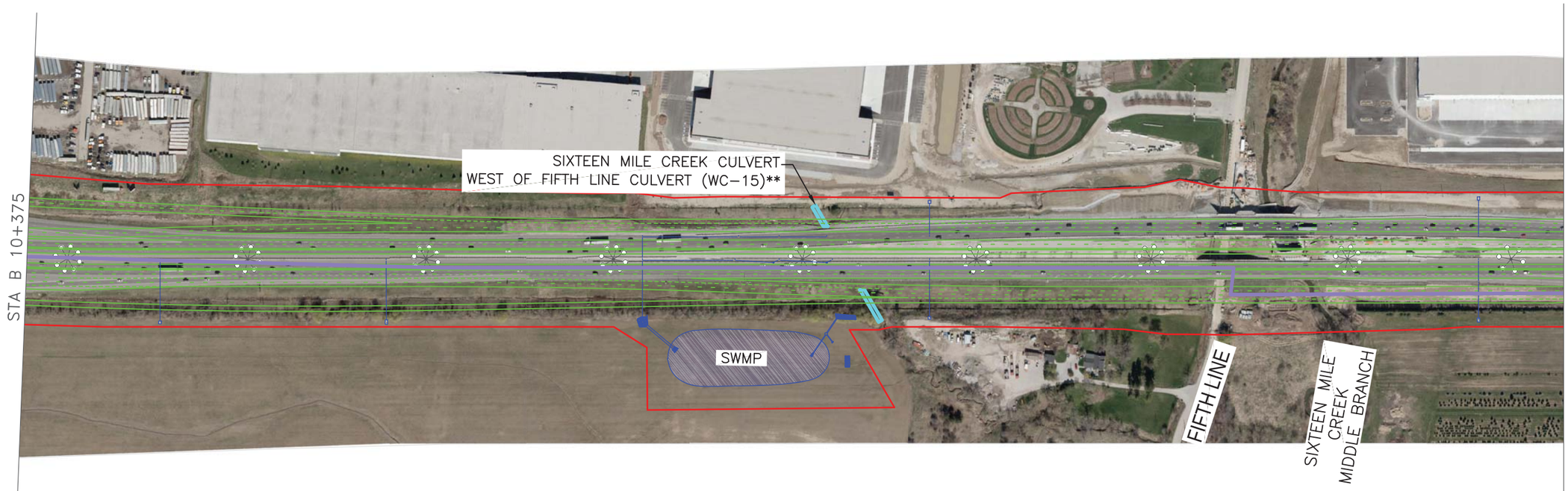
SHEET
5



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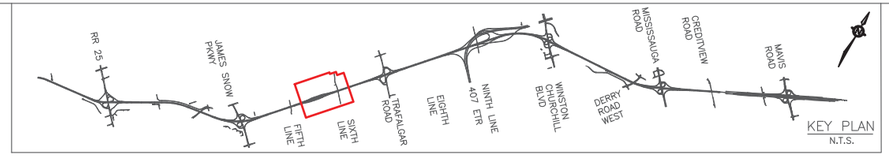

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- LANES
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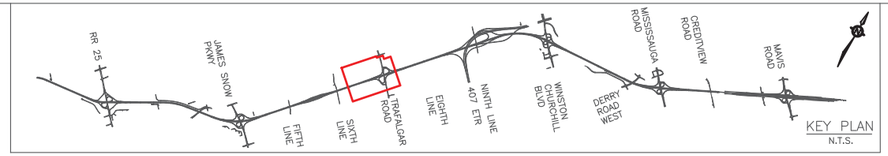

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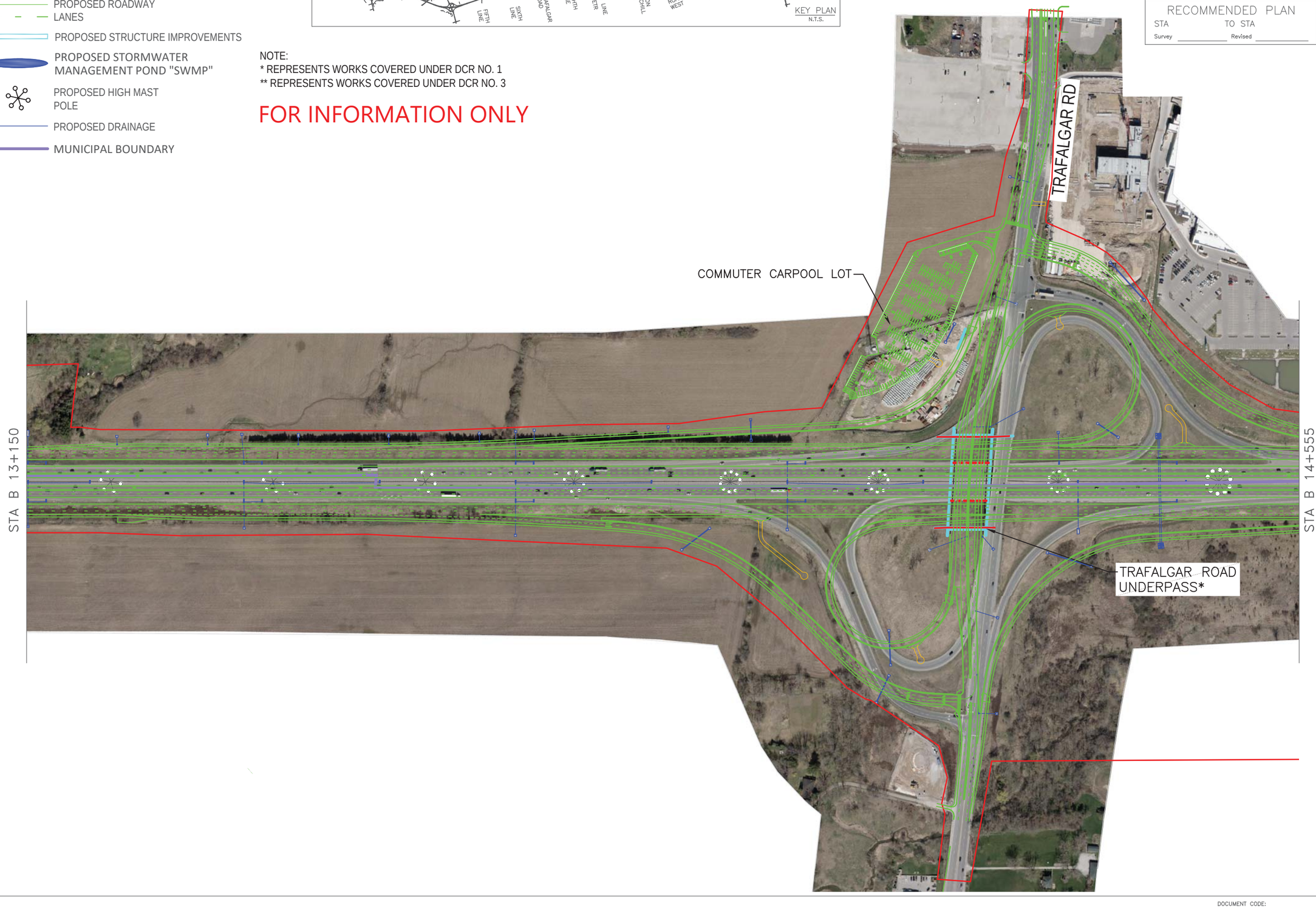

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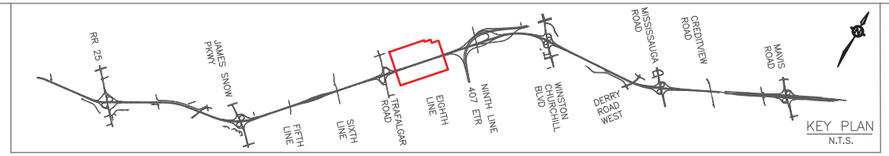

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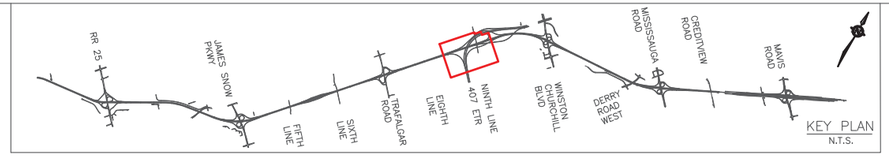

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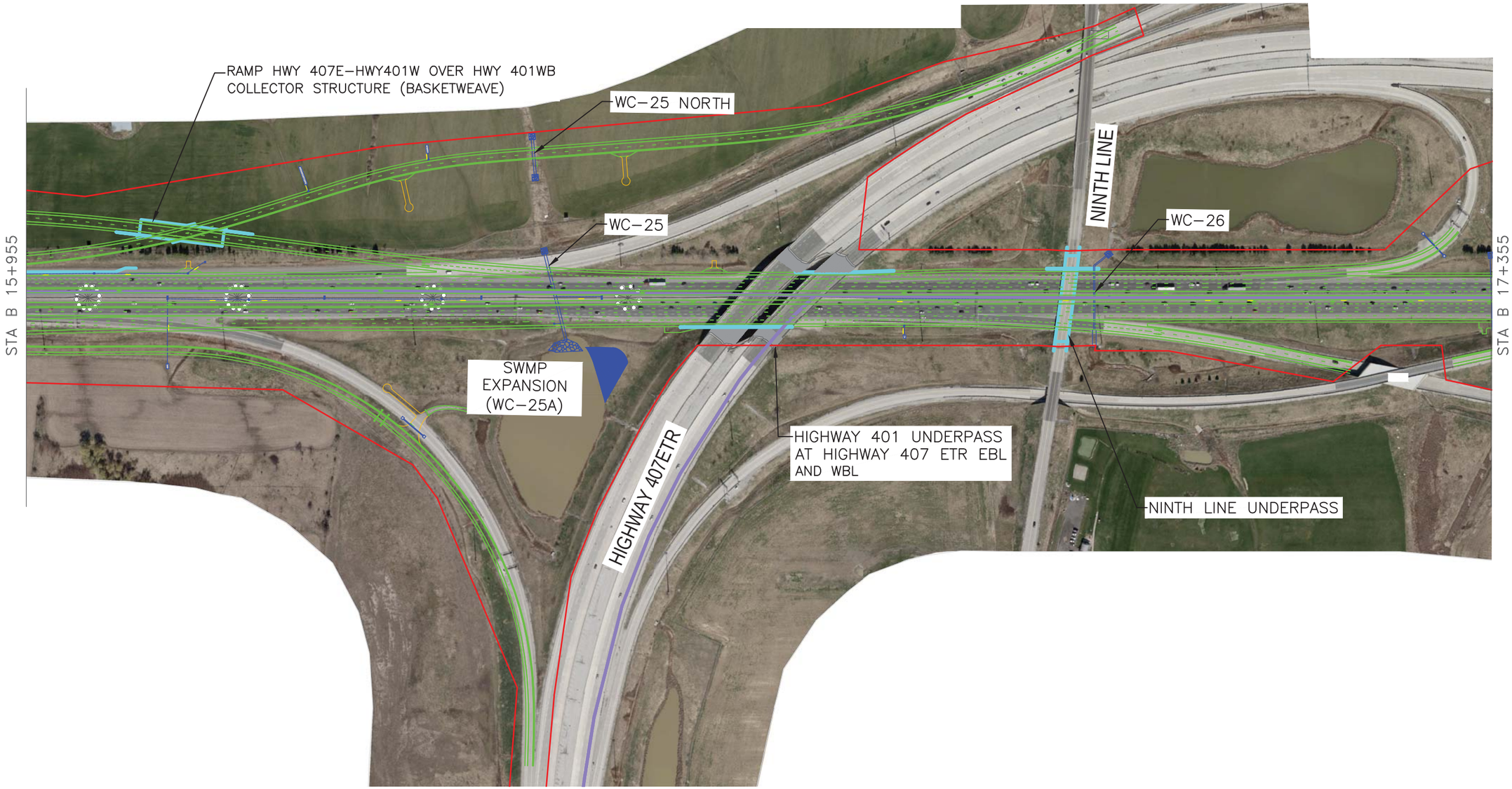

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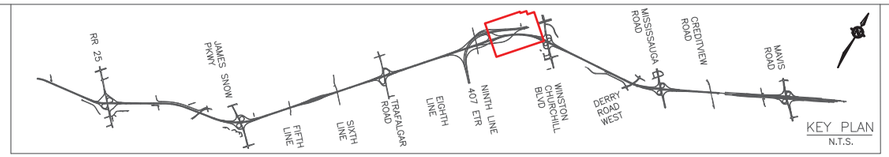

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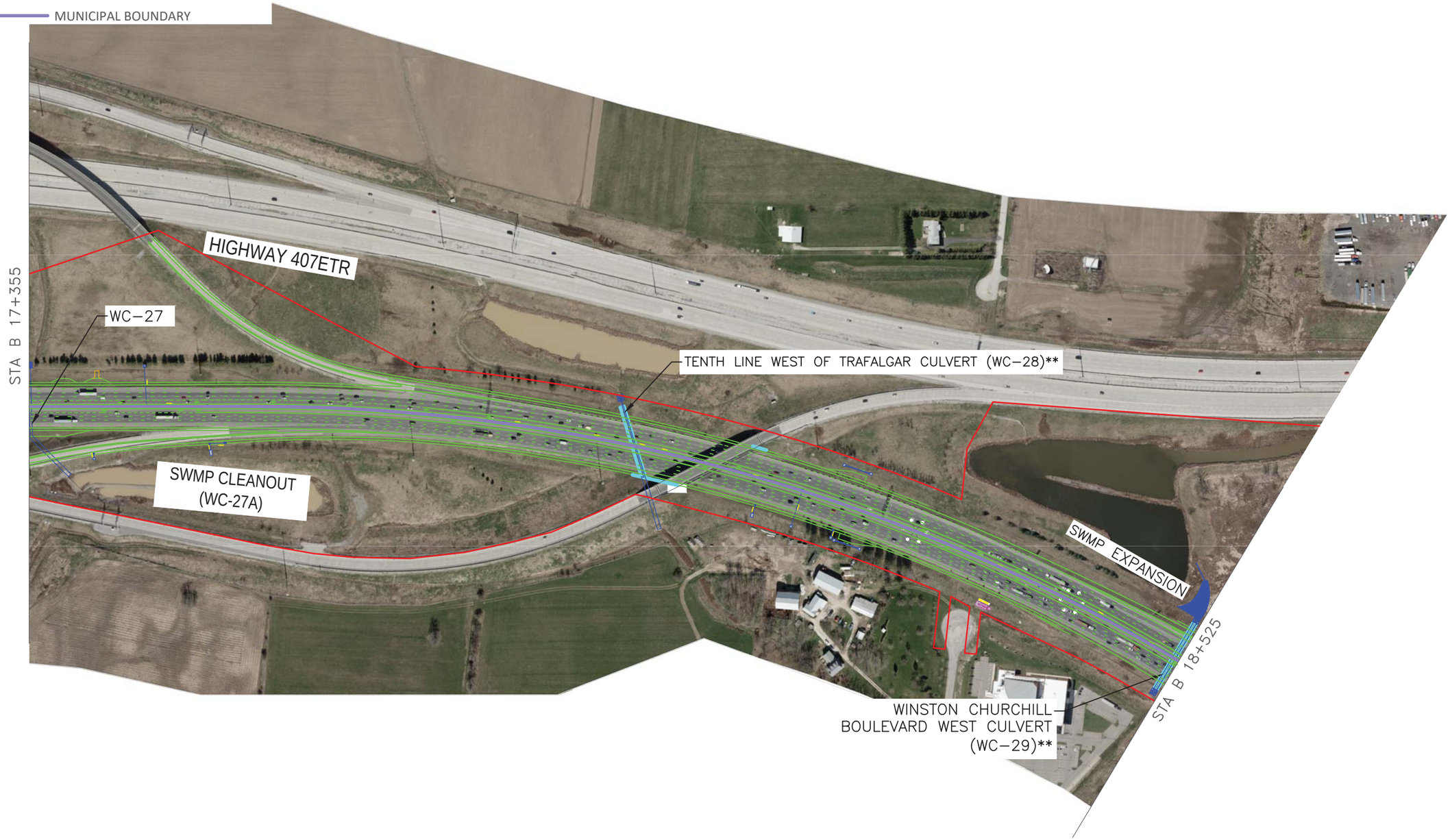

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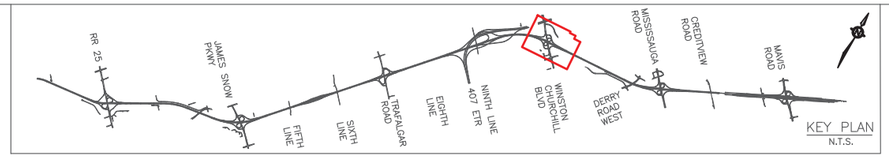

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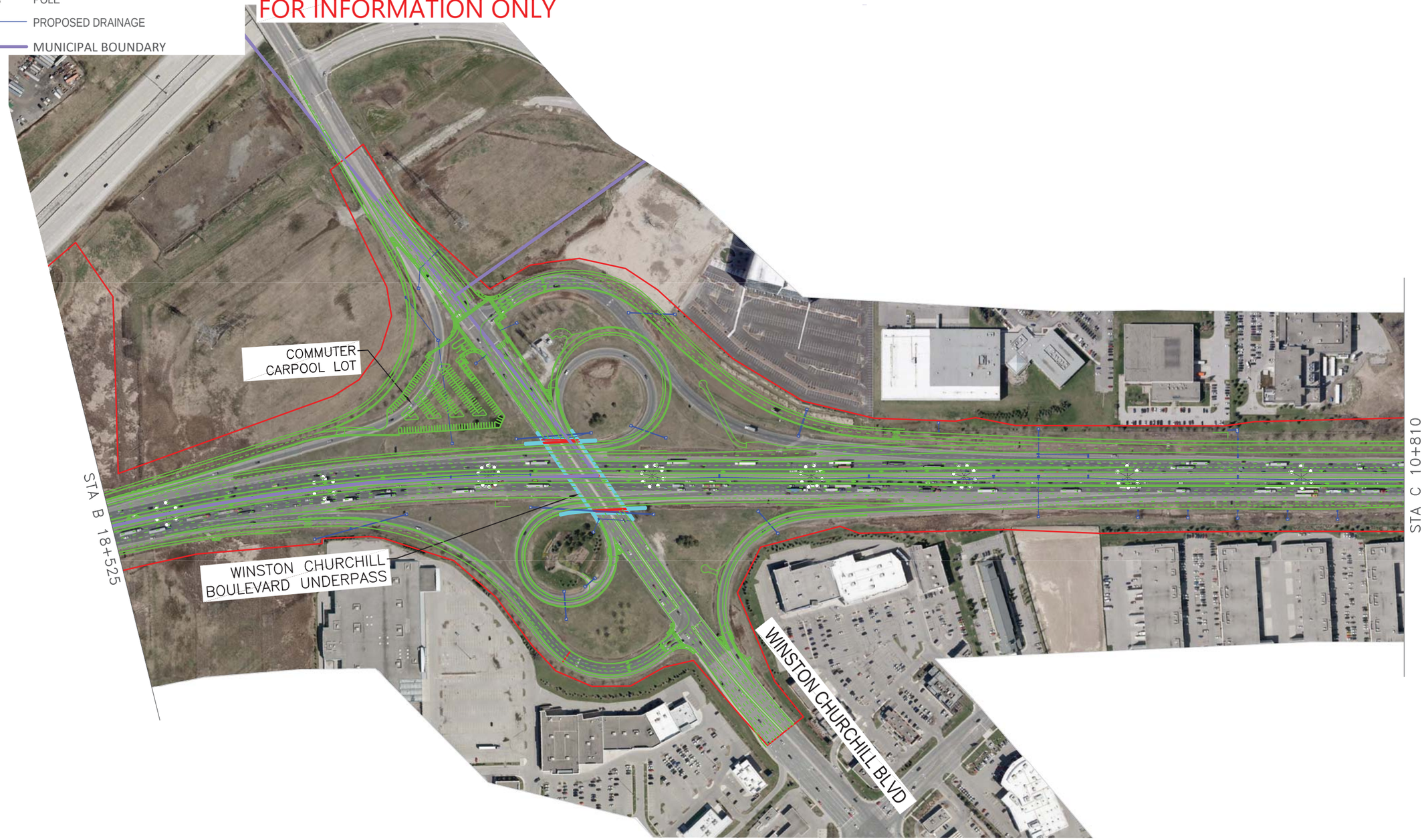
SHEET
11



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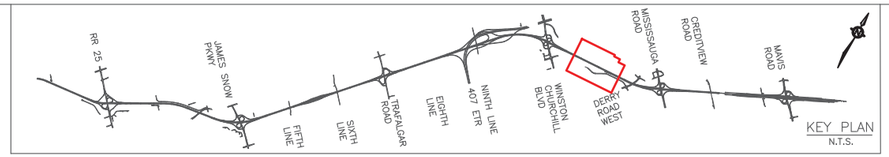

KEY PLAN
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CONT
WP

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STA TO STA
Survey Revised

SHEET
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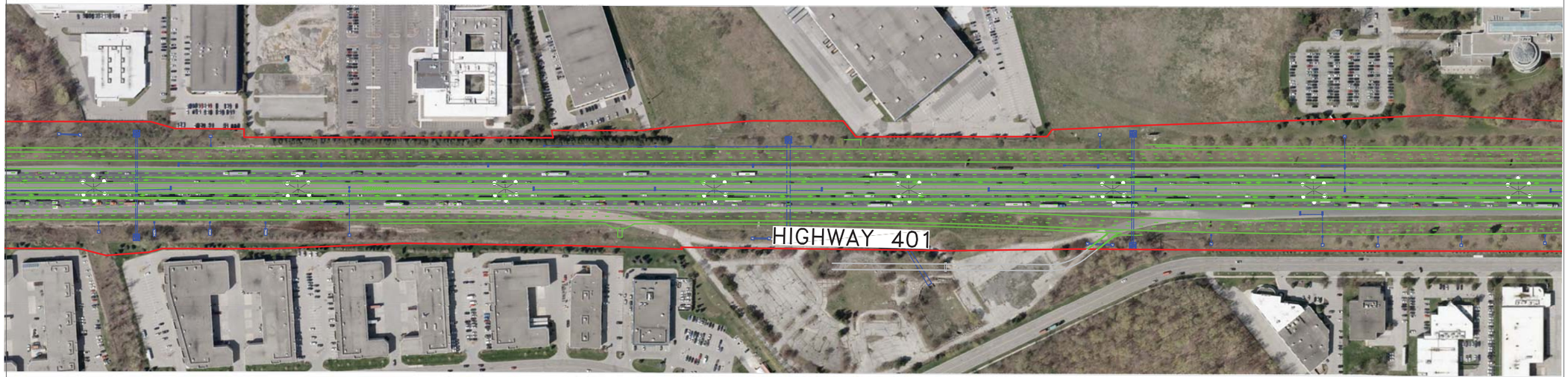

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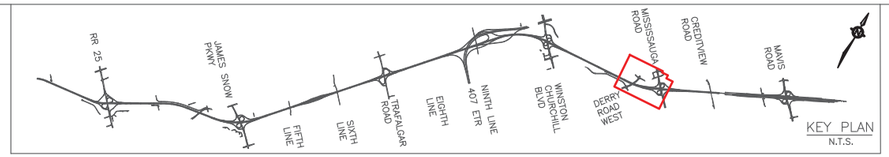

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WP

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SHEET
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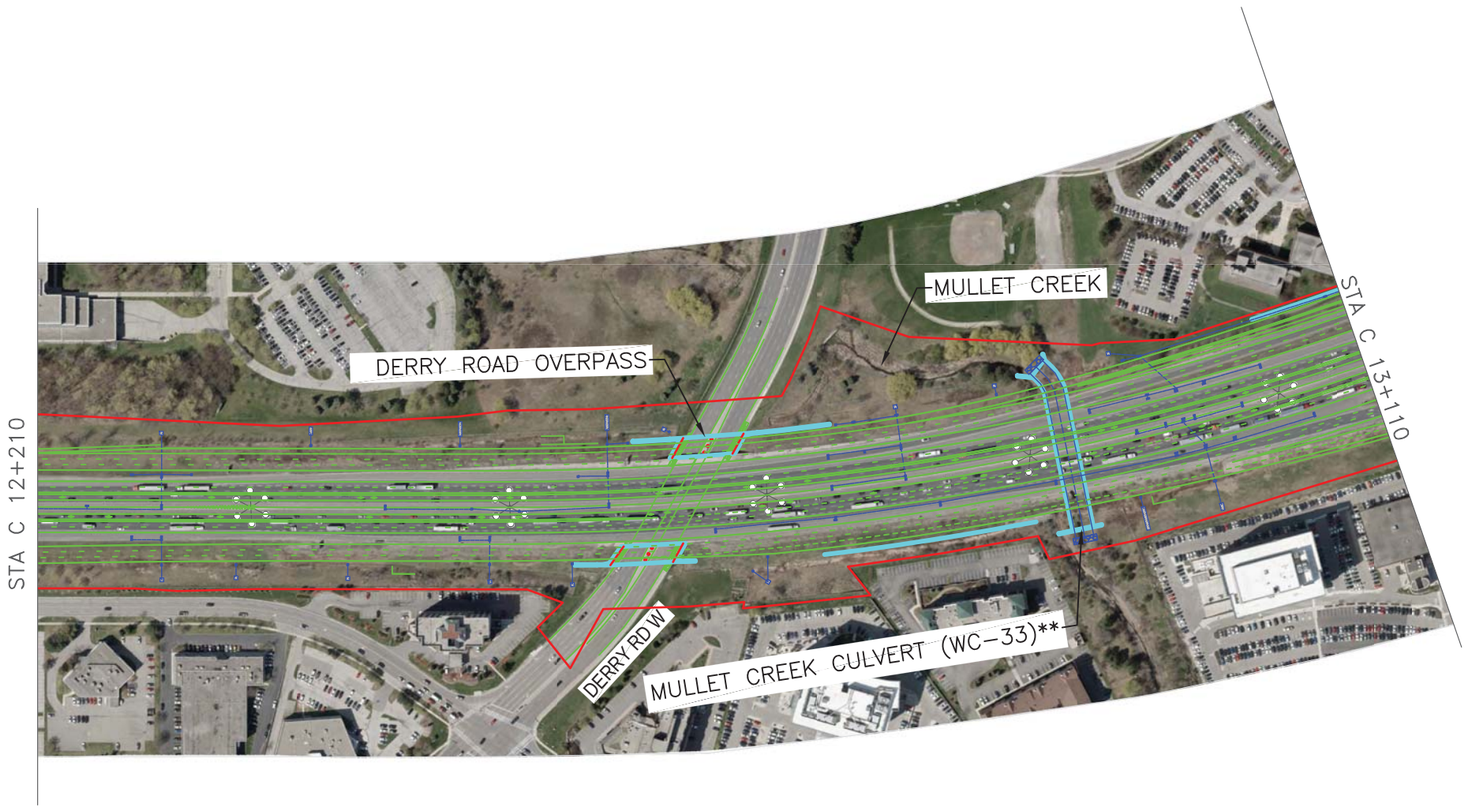

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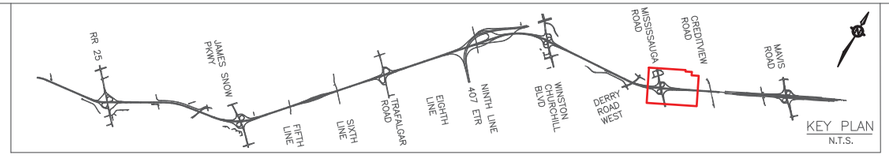

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West Corridor Constructors

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WP

RECOMMENDED PLAN
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SHEET 14

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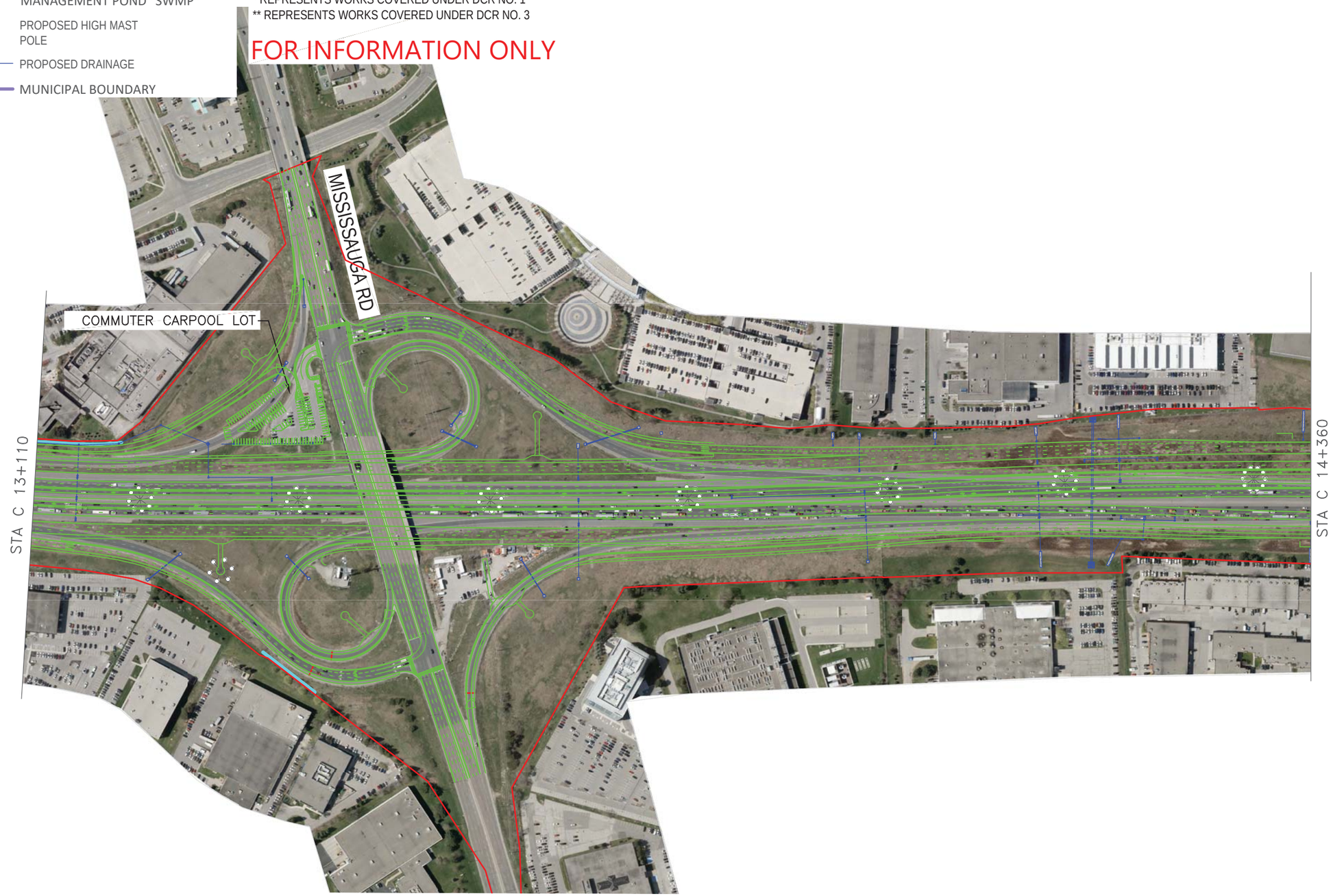

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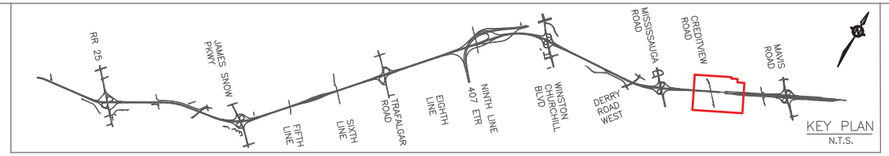

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West Corridor Constructors

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WP

RECOMMENDED PLAN
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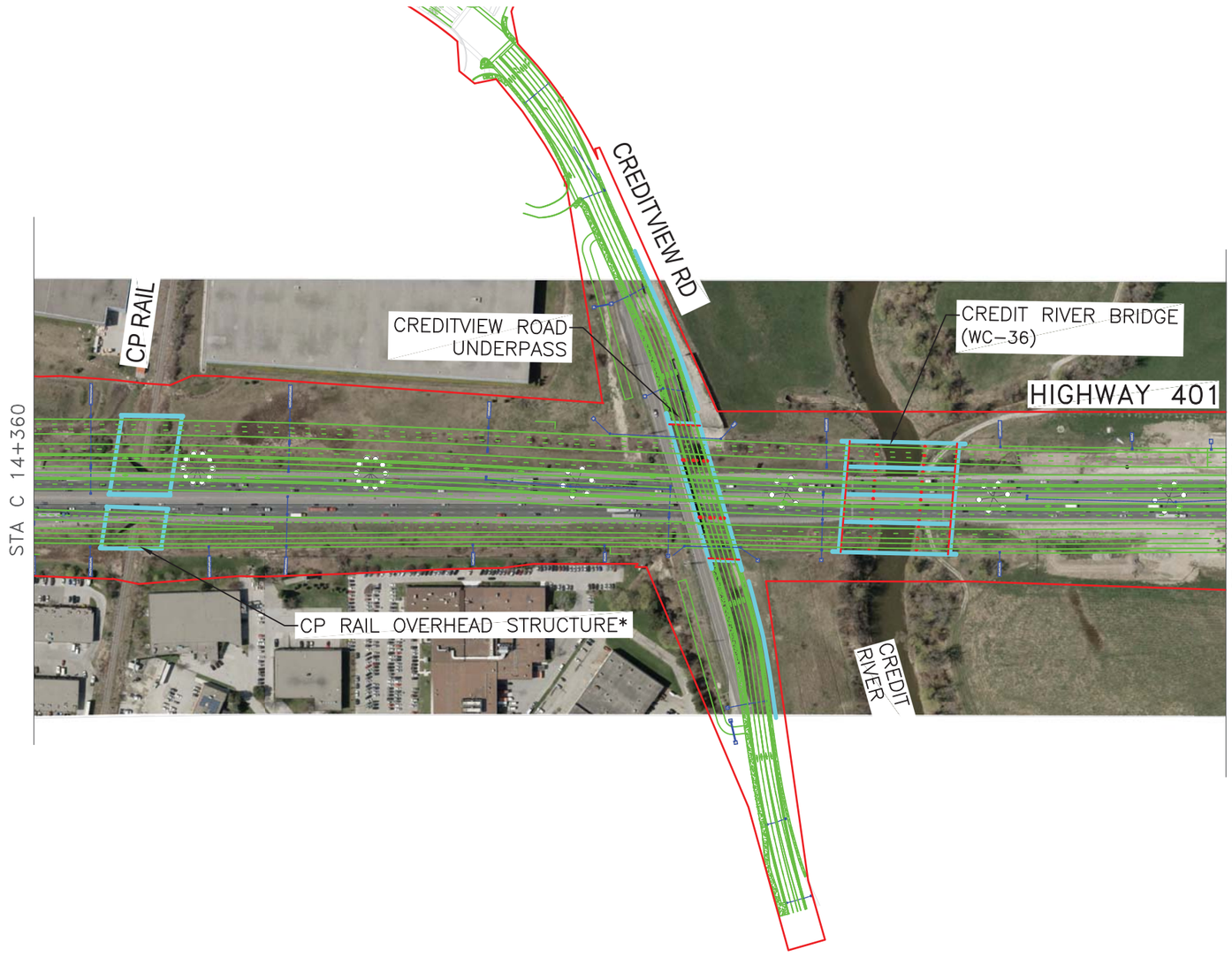
SHEET
15



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Appendix C

Design Drawings:
Structural General Arrangements
Stormwater Pond Details
Hornby Creek Realignment

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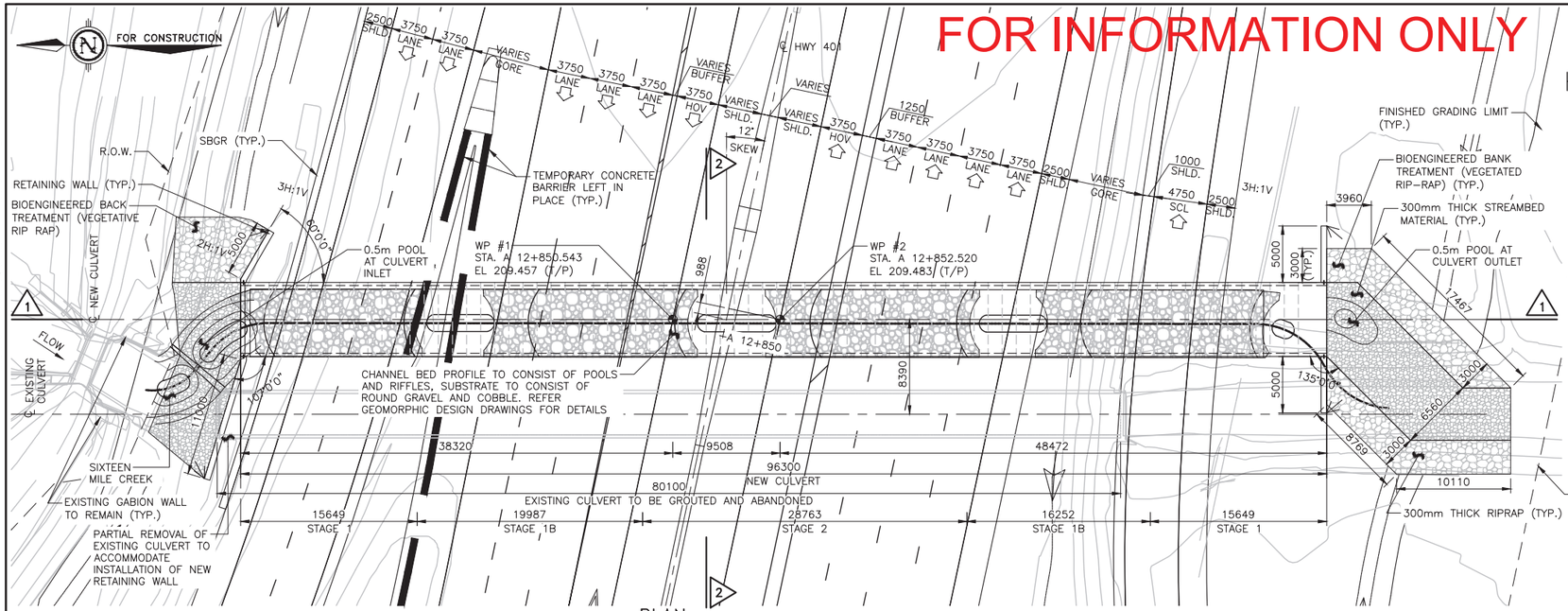
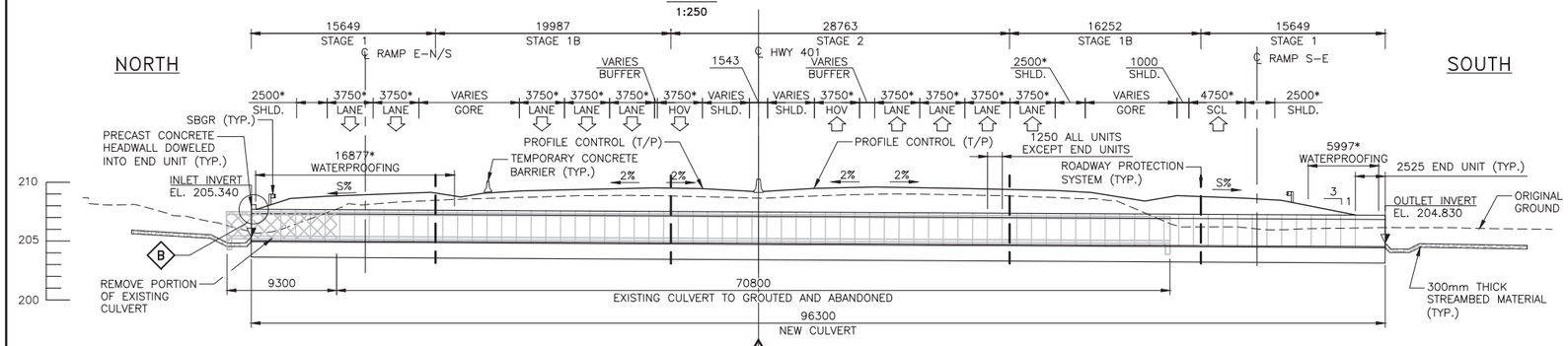


PLAN
1:250



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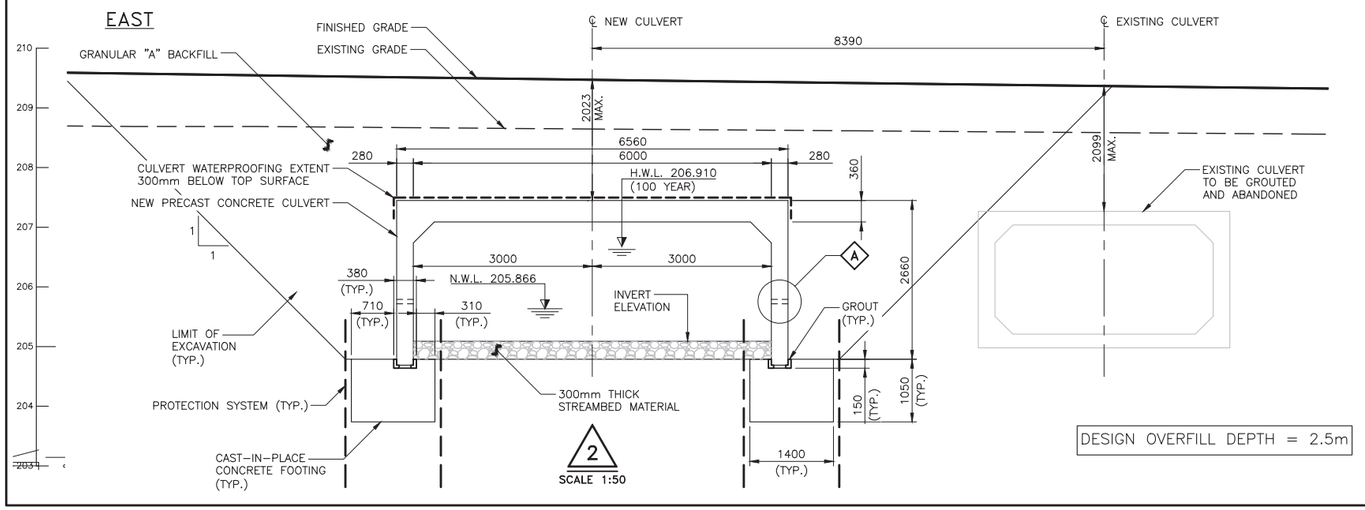
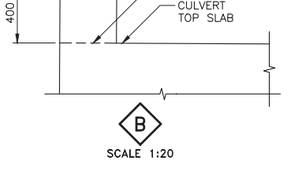
(*DIMENSIONS ARE MEASURED PERPENDICULAR TO THE ROADWAY)



SCALE 1:50

DESIGN OVERFILL DEPTH = 2.5m



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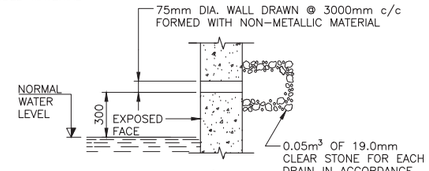

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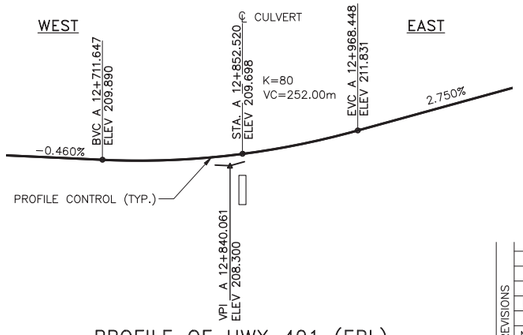

PROFILE OF HWY 401 (EBL)
N.T.S.

METRIC
DIMENSIONS ARE IN METRES AND/OR MILLIMETRES UNLESS OTHERWISE SHOWN

DRAWING NOT TO BE SCALED

100mm ON ORIGINAL DRAWING

LIST OF ABBREVIATIONS

HOV	HIGH OCCUPANCY VEHICLE
PVI	POINT OF VERTICAL INTERSECTION
SCL	SPEED CHANGE LANE
SHLD	SHOULDER
T/P	TOP OF PAVEMENT
WP	WORKING POINT

LIST OF DRAWINGS

HATCH — West Corridor Constructors

CONT No –

WP –

HIGHWAY 401 EXPANSION
SIXTEEN MILE CREEK EAST OF RR 25 CULVERT
GENERAL ARRANGEMENT

SHEET

GENERAL NOTES

1. ALL CIP CONCRETE 30 MPa.
   ALL PRECAST CONCRETE: 35 MPa.
2. CLEAR COVER TO REINFORCING STEEL:
   BOTTOM OF TOP SLAB: 40±10
   FOOTINGS: 100±25
   REMAINDER: 60±20 UNLESS OTHERWISE NOTED
3. REINFORCING STEEL SHALL BE GRADE 400W UNLESS OTHERWISE SPECIFIED.
4. BAR HOOKS SHALL HAVE STANDARD HOOK DIMENSIONS USING MINIMUM BEND DIAMETERS, WHILE STIRRUPS AND TIES SHALL HAVE MINIMUM HOOK DIMENSIONS. ALL HOOKS SHALL BE IN ACCORDANCE WITH THE STRUCTURAL STANDARD DRAWING SS12-1, UNLESS INDICATED OTHERWISE.
5. UNLESS SHOWN OTHERWISE TENSION LAP SPLICES SHALL BE CLASS B.
6. WATERPROOFING SHALL BE APPLIED TO THE LIMIT AS SHOWN IN SECTION 2 IN THIS DRAWING WHEN THE FILL HEIGHT IS LESS THAN OR EQUAL TO 1 METRE AND SHALL EXTEND 1 METRE LONGITUDINALLY BEYOND THE EXTENT OF THE GRANULAR FILL.

CONSTRUCTION NOTES

1. THE WATER LEVEL SHOWN ON DRAWINGS IS SUBJECT TO VARIATIONS.
2. SURFACE WATER CONTROL MEASURES MAY BE REQUIRED. A SUITABLE DEWATERING SCHEME SHALL BE USED. SUBGRADE PREPARATION AND COMPACTION OF THE BEDDING MATERIAL MUST BE COMPLETED IN THE DRY.
3. BACKFILL SHALL BE PLACED SIMULTANEOUSLY BEHIND BOTH SIDES OF THE CULVERT KEEPING THE HEIGHT OF THE BACKFILL APPROXIMATELY THE SAME. AT NO TIME SHALL THE DIFFERENCE IN ELEVATION BE GREATER THAN 500mm.
4. BOTTOMS AND SIDES OF FOOTING TO BE CAST AGAINST SHORING.
5. PROTECTION SYSTEM SHALL MEET REQUIREMENTS FOR PERFORMANCE LEVEL 2. EXACT LOCATIONS AND LIMITS OF PROTECTION SYSTEM SHALL BE DETERMINED PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION WORKS.
6. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED PRIOR TO THE COMMENCEMENT OF THE CONSTRUCTION.
7. NO IN-WATER ACTIVITY SHALL OCCUR DURING THE TIME PERIOD OF SEPTEMBER 16 TO JUNE 30.
8. STORAGE OF MATERIALS AND WASTE PRODUCTS SHALL BE PROHIBITED WITHIN 30m FROM THE TOP OF BANK.
9. ALL CONDITIONS AND REQUIREMENTS OF THE AUTHORIZATIONS AND PERMITS SHALL BE ADHERED TO.

APPLICABLE STANDARD DRAWINGS

OPSD 3329.100	DECK, REINFORCEMENT, SUPPORTS FOR REINFORCING STEEL FOR SLAB DEPTHS 300mm OR LESS
OPSD 3329.101	DECK, REINFORCEMENT, SUPPORTS FOR REINFORCING STEEL FOR SLAB DEPTH GREATER THAN 300mm
OPSD 3370.100	DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE WITH PROTECTION BOARD
OPSD 3370.101	DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE AT ACTIVE CRACKS GREATER THAN 2mm WIDE AND CONSTRUCTION JOINTS
MTOD 3941.210	FIGURES IN CONCRETE, SITE NUMBER AND DATE LAYOUT
OPSD 3950.100	JOINTS, CONCRETE EXPANSION AND CONSTRUCTION ON STRUCTURE

REVISIONS

NO	DATE	BY	DESCRIPTION
B	2020-01-08	PC	FINAL DESIGN DEVELOPMENT SUBMITTAL
A	2019-08-21	PC	PRE-FINAL DESIGN DEVELOPMENT SUBMITTAL

DESIGN	PC	CHK	SC	CODE CAN/CSA S6-14	LOAD CL-625-ONT	DATE 2019-12-18	
DRAWN	CP	CHK	LG	SITE 10X-0368/C0		DWG	1

DOCUMENT CODE: WCC-BR02-STR-00001

MINISTRY OF TRANSPORTATION, ONTARIO ANSI-D 2017-08

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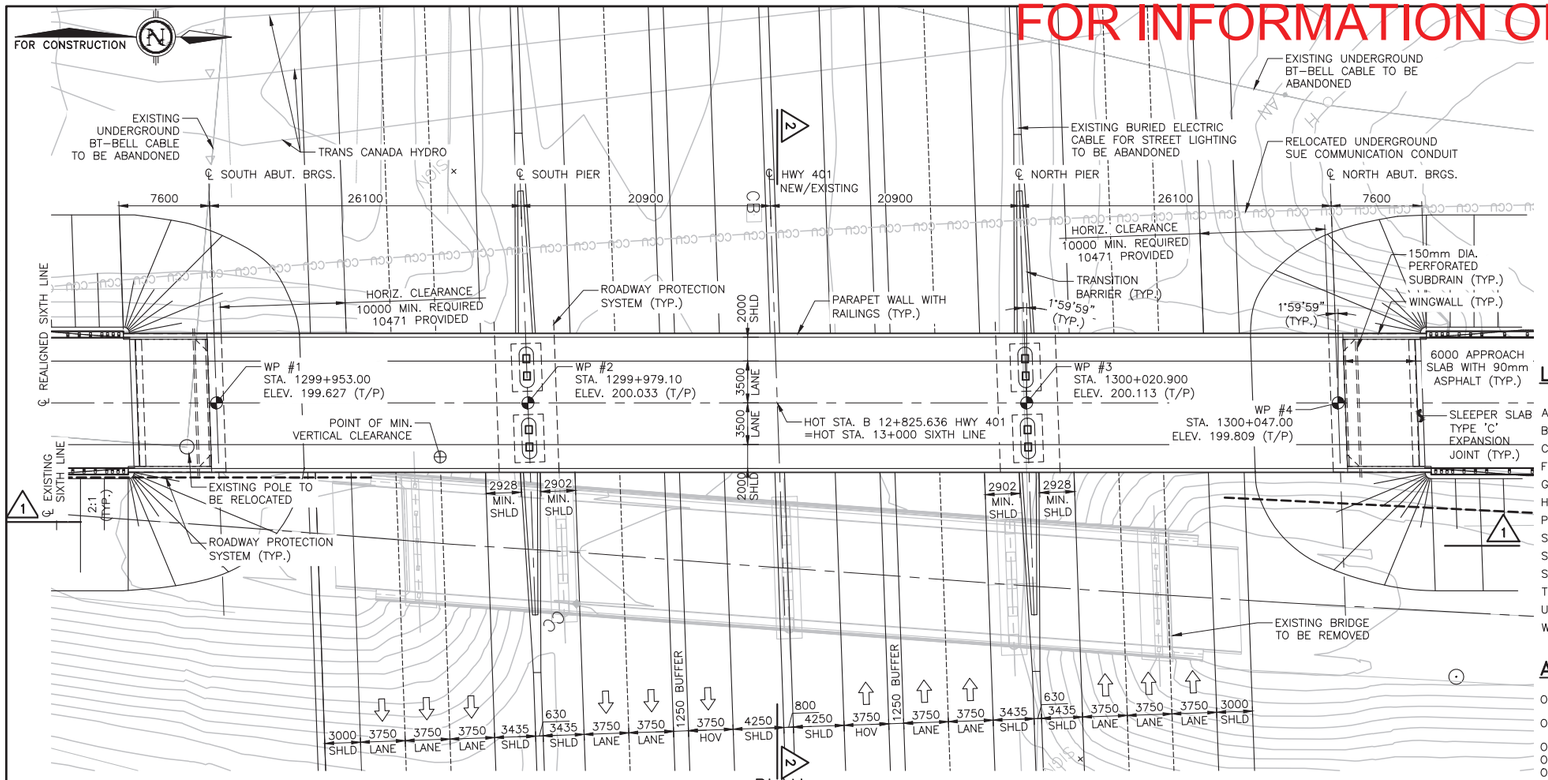
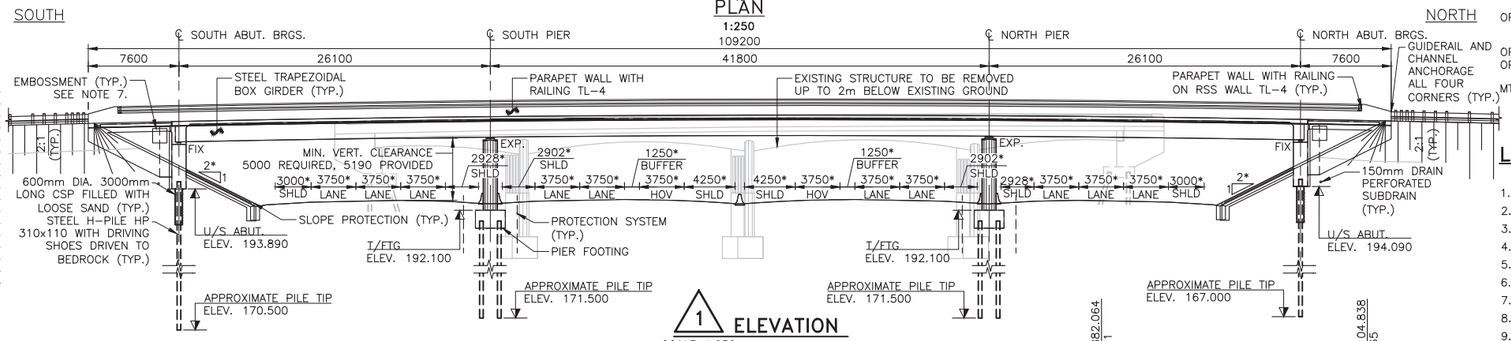
MODIFIED: 2019-12-19 16:28

FOR CONSTRUCTION

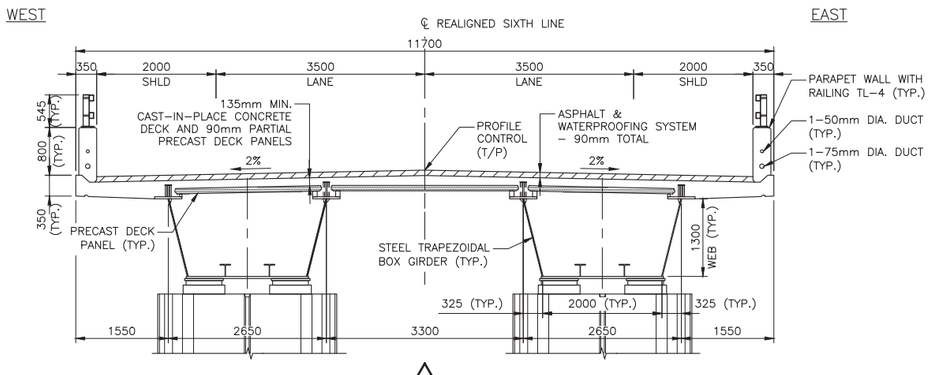


PLAN
1:250



1 ELEVATION
SCALE 1:250

* DIMENSIONS ARE MEASURED PERPENDICULAR TO THE CENTERLINE OF HWY 401



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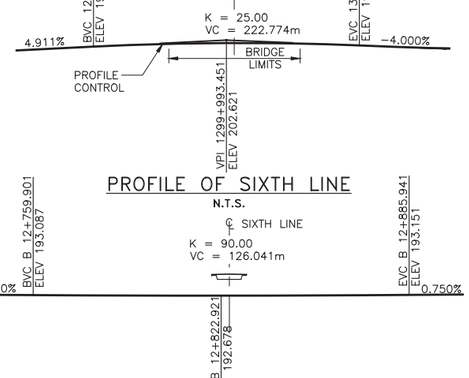
SCALE 1:50



PROFILE OF SIXTH LINE
N.T.S.

PROFILE OF HWY 401
N.T.S.

METRIC
DIMENSIONS ARE IN METRES AND/OR MILLIMETRES UNLESS OTHERWISE SHOWN
DRAWING NOT TO BE SCALED
100mm ON ORIGINAL DRAWING

WP	NORTHING	EASTING
#1	4 824 622.654	277 338.371
#2	4 824 639.871	277 318.754
#3	4 824 667.444	277 287.338
#4	4 824 684.660	277 267.722

LIST OF ABBREVIATIONS

ABUT.	ABUTMENT
BRGS.	BEARINGS
CIP	CAST–IN–PLACE
FIX	FIXED
GFRP	GLASS FIBER REINFORCED POLYMER
HOV	HIGH OCCUPANCY VEHICLE
PVI	POINT OF VERTICAL INTERSECTION
SCL	SPEED CHANGE LANE
SHLD	SHOULDER
SLS	SERVICEABILITY LIMIT STATE
TL	TEST LEVEL
ULS	ULTIMATE LIMIT STATE
WP	WORKING POINT

APPLICABLE STANDARD DRAWINGS

OPSD 0912.430	GUIDE RAIL SYSTEM, STEEL BEAM STRUCTURAL CONNECTION.
OPSD 3101.150	WALL – ABUTMENT BACKFILL MINIMUM GRANULAR REQUIREMENTS.
OPSD 3102.100	WALLS ABUTMENT BACKFILL DRAIN.
OPSD 3311.900	DECK GIRDERS, STEEL BOX ACCESS HATCH
OPSD 3370.100	DECK, WATERPROOFING, HOT APPLIED ASPHALT MEMBRANE WITH PROTECTION BOARD.
OPSD 3370.101	DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE AT ACTIVE CRACKS GREATER THAN 2mm WIDE AND CONSTRUCTION JOINTS.
OPSD 3390.100	DECK DRIP CHANNEL.
OPSD 3419.100	BARRIERS AND RAILINGS – STEEL GUIDE RAIL AND CHANNEL ANCHORAGE.
MTOD 3941.210	FIGURES IN CONCRETE SITE NUMBERS AND DATE LAYOUT.

LIST OF DRAWINGS

1. GENERAL ARRANGEMENT
2. BOREHOLE LOCATIONS AND SOIL STRATA I
3. BOREHOLE LOCATIONS AND SOIL STRATA II
4. CONSTRUCTION STAGING
5. FOUNDATION LAYOUT
6. FOOTING REINFORCEMENT
7. ABUTMENT LAYOUT
8. ABUTMENT REINFORCEMENT
9. WINGWALL DETAILS
10. PIER LAYOUT
11. PIER REINFORCEMENT
12. BEARING LAYOUT AND DETAILS
13. STRUCTURAL STEEL I
14. STRUCTURAL STEEL II
15. STRUCTURAL STEEL III
16. STRUCTURAL STEEL IV
17. STRUCTURAL STEEL V
18. DECK DETAILS I
19. DECK DETAILS II
20. DECK REINFORCEMENT
21. PRECAST DECK PANEL FOR STEEL GIRDERS – DETAILS I
22. PRECAST DECK PANEL FOR STEEL GIRDERS – DETAILS II
23. PARAPET WALL WITH RAILING
24. PARAPET WALL – ARCHITECTURAL FINISH
25. RAILING FOR PARAPET WALL
26. 6000mm APPROACH SLAB
27. STRIP SEAL EXPANSION JOINT "TYPE C"
28. EXPANSION JOINT (TYPE C) AND SLEEPER SLAB
29. DETAILS OF CONCRETE SLOPE PAVING
30. STANDARD DETAILS
31. ELECTRICAL EMBEDDED WORK

GENERAL NOTES

1. CLASS OF CONCRETE:
   DECK.....30 MPa
   PRECAST DECK PANELS.....40 MPa
   MASS CONCRETE.....20 MPa
   REMAINDER.....30 MPa
   UNLESS OTHERWISE NOTED.
2. CLEAR COVER TO REINFORCING STEEL:
   FOOTINGS.....100 ± 25mm
   DECK: TOP.....70 ± 20mm
   BOTTOM.....40 ± 10mm
   REMAINDER.....70 ± 20mm
   UNLESS OTHERWISE STATED.
3. REINFORCING STEEL:
   REINFORCING STEEL SHALL BE GRADE 400W UNLESS OTHERWISE SPECIFIED.

   STAINLESS STEEL REINFORCING SHALL BE TYPE 316LN OR DUPLEX 2205 AND HAVE A MINIMUM YIELD OF 500 MPa. UNLESS OTHERWISE SPECIFIED.

   UNLESS SHOWN OTHERWISE, TENSION LAP SPLICES SHALL BE CLASS 'B'.

   BAR HOOKS SHALL HAVE STANDARD HOOK DIMENSIONS USING MINIMUM BEND DIAMETERS, WHILE STIRRUPS AND TIES SHALL HAVE MINIMUM HOOK DIMENSIONS. ALL HOOKS SHALL BE IN ACCORDANCE WITH THE STRUCTURAL STANDARD DRAWINGS SS12–1 UNLESS INDICATED OTHERWISE.
4. GFRP REINFORCING:
   BAR MARKS WITH THE PREFIX GIII DENOTE GRADE III GFRP BARS.
   CLASS FIBRE REINFORCED POLYMER (GFRP) REINFORCING BARS SHALL BE GRADE III AS SPECIFIED IN CONTRACT DOCUMENTS.
   THE NOMINAL DIAMETER, TENSILE MODULUS OF ELASTICITY AND GUARANTEED MINIMUM TENSILE STRENGTH SHALL BE AS SPECIFIED IN THE CONTRACT DOCUMENTS.

CONSTRUCTION NOTES

1. BACKFILL SHALL NOT BE PLACED BEHIND THE ABUTMENTS UNTIL DECK SLAB IS IN PLACE AND HAS REACHED 75% OF ITS SPECIFIED 28–DAY STRENGTH.
2. BACKFILL SHALL BE PLACED SIMULTANEOUSLY BEHIND BOTH ABUTMENTS KEEPING THE HEIGHT OF BACKFILL APPROXIMATELY THE SAME. AT NO TIME SHALL THE DIFFERENCE IN ELEVATION BE GREATER THAN 500mm.
3. CONSTRUCT ABUTMENTS AND WINGWALL TO THE BEARING SEAT ELEVATIONS. TEMPORARY LATERAL BRACING SHALL BE PROVIDED FOR THE ABUTMENTS. FORMWORK AND LATERAL BRACING SHALL NOT BE REMOVED UNTIL THE CONCRETE IN DECK HAS REACHED 75% OF ITS SPECIFIED 28–DAY STRENGTH.
4. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED PRIOR TO THE COMMENCEMENT OF THE CONSTRUCTION. REFER TO STAGING DRAWINGS FOR DETAILS.
5. TREE PROTECTION FENCING SHALL BE INSTALLED TO KEEP WORKERS OUT OF THE BAT HABITAT ON THE EAST SIDE OF THE BRIDGE. REFER TO STAGING AND ROADWAY DRAWINGS FOR DETAILS.
6. WORK WITHIN 30m OF BAT HABITAT SHALL BE RESTRICTED TO DAYTIME HOURS.
7. EMBOSSMENT DETAIL TO BE DETERMINED BASED ON FURTHER CONSULTATION WITH THE CONTRACTING AUTHORITY.

HATCH | West Corridor Constructors

CONT No –
WP –

HIGHWAY 401 EXPANSION
SIXTH LINE UNDERPASS

GENERAL ARRANGEMENT

SHEET –

REVISIONS				
B	2019–11–20	YO	FINAL DESIGN DEVELOPMENT SUBMITTAL	
A	2019–07–31	YO	PRE–FINAL DESIGN DEVELOPMENT SUBMITTAL	
NO	DATE	BY	DESCRIPTION	

DESIGN	YO	CHK	LG	CODE	CAN/CSA S6–14	LOAD	CL–625–ONT
DRAWN	CR	CHK	YO	SITE	10X–0077/BO	DWG	1

DATE 2019–11–07

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MINISTRY OF TRANSPORTATION, ONTARIO ANSI–D 2017–08

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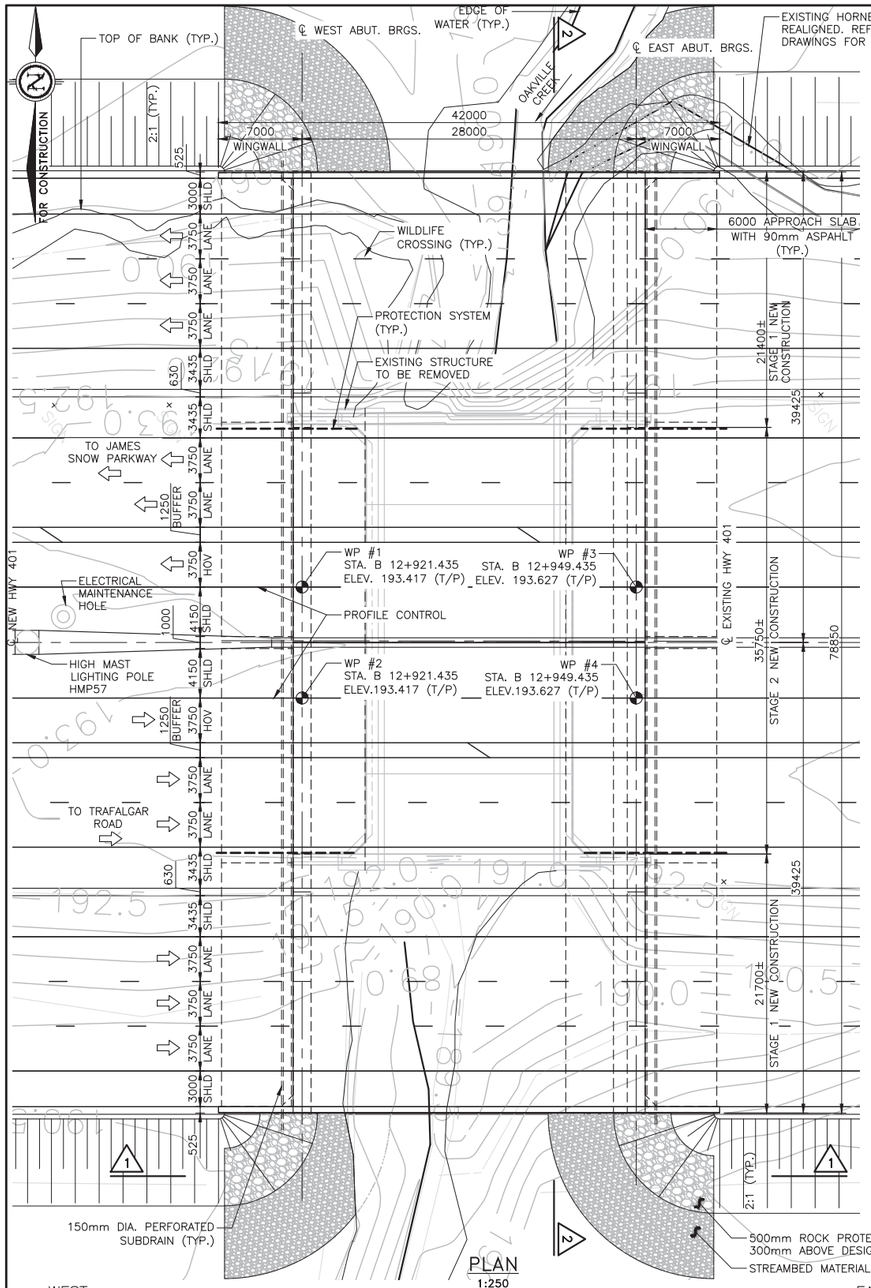


GENERAL NOTES

1. CLASS OF CONCRETE:
   PRECAST PANELS.....40 MPa
   REMAINDER.....30 MPa
   UNLESS NOTED OTHERWISE.

2. CLEAR COVER TO REINFORCING STEEL:
   DECK – TOP.....70±20
   BOTTOM.....40±10
   REMAINDER.....70±20
   UNLESS NOTED OTHERWISE.

3. REINFORCING STEEL:

   REINFORCING STEEL SHALL BE GRADE 400W UNLESS OTHERWISE SPECIFIED.

   BAR MARKS WITH PREFIX 'S' DENOTE STAINLESS STEEL BARS.

   STAINLESS REINFORCING STEEL SHALL BE TYPE 316LN OR DUPLEX 2205 AND HAVE MINIMUM YIELD STRENGTH OF 500 MPa.

   UNLESS SHOWN OTHERWISE TENSION LAP SPLICES SHALL BE CLASS B.

   BAR HOOKS SHALL HAVE STANDARD HOOK DIMENSIONS USING MINIMUM BEND DIAMETERS, WHILE STIRRUPS AND TIES SHALL HAVE MINIMUM HOOK DIMENSIONS. ALL HOOKS SHALL BE IN ACCORDANCE WITH THE STRUCTURAL STANDARD DRAWING SS12–1 UNLESS INDICATED OTHERWISE.

4. GFRP REINFORCING:

   BAR MARKS WITH THE PREFIX GIII DENOTE GRADE III GFRP BARS.

   GLASS FIBRE REINFORCED POLYMER (GFRP) REINFORCING BARS SHALL BE GRADE III AS SPECIFIED IN CONTRACT DOCUMENTS.

   THE NOMINAL DIAMETER, TENSILE MODULUS OF ELASTICITY AND GUARANTEED MINIMUM TENSILE STRENGTH SHALL BE AS SPECIFIED IN THE CONTRACT DOCUMENTS.

CONSTRUCTION NOTES

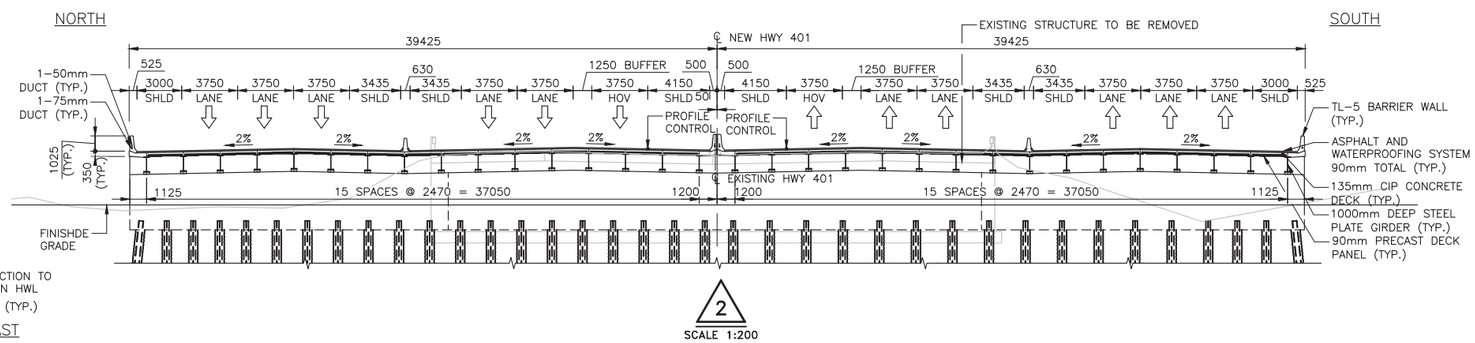
1. ESTABLISH THE BEARING SEAT ELEVATIONS BY DEDUCTING THE ACTUAL BEARING THICKNESS FROM THE TOP OF BEARING ELEVATIONS. IF THE ACTUAL BEARING THICKNESS ARE DIFFERENT FROM THOSE GIVEN WITH THE BEARING DESIGN DATA, ADJUST THE REINFORCING STEEL TO SUIT.
2. BACKFILL TO ABUTMENTS SHALL BE PLACED SIMULTANEOUSLY, KEEPING THE HEIGHT OF THE BACKFILL APPROXIMATELY THE SAME. AT NO TIME SHALL THE DIFFERENCE IN HEIGHTS OF THE BACKFILL BE GREATER THAN 500mm.
3. BACKFILL TO ABUTMENT SHALL NOT BE PLACED UNTIL THE CONCRETE IN THE DECK HAS REACHED 75% OF ITS SPECIFIED 28–DAY STRENGTH.
4. CONSTRUCT ABUTMENTS TO THE BEARING SEAT ELEVATIONS. SUPPLY TEMPORARY LATERAL BRACING FOR THE ABUTMENTS. FORMWORK AND LATERAL BRACING SHALL NOT BE REMOVED UNTIL CONCRETE HAS REACHED A STRENGTH OF 25 MPa.
5. PROTECTION SYSTEM SHALL BE PERFORMANCE LEVEL 2. EXACT LOCATIONS AND LIMITS OF PROTECTION SYSTEM SHALL BE DETERMINED PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION WORKS.
6. BIRD NESTING PROTECTION SHALL BE PROVIDED UNDER THE BRIDGE DECK AS REQUIRED.
7. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED PRIOR TO THE COMMENCEMENT OF THE CONSTRUCTION. REFER TO STAGING DRAWINGS FOR DETAILS.
8. NO IN–WATER ACTIVITY SHALL OCCUR DURING THE TIME PERIOD OF OCTOBER 1 TO JUNE 14.
9. THE SUBSTRATE SHALL BE NATIVE SOIL MATERIAL, MEDIUM TO LARGE SIZE STONE, INTERSTITIAL SPACE FILLED WITH SMALL MATERIAL. NO RIP RAP SHALL BE USED.
10. HORIZONTAL WIDTH OF WILDLIFE CROSSING IS 4m IN MOST LOCATIONS, EXCEPT AT THE SOUTHWEST CORNER WHERE IT IS 3m.
11. OPENNESS RATIO (OR):

    REQUIRED OR = 1.0

    PROVIDED OR = 1.0

LIST OF ABBREVIATIONS

APPROX.	APPROXIMATE
BRGS.	BEARINGS
CIP	CAST–IN–PLACE
E.J.	EXPANSION JOINT
FIX	FIXED
HOV	HIGH OCCUPANCY VEHICLE
PVI	POINT OF VERTICAL INTERSECTION
SCL	SPEED CHANGE LANE
SHLD	SHOULDER
SLS	SERVICEABILITY LIMIT STATE
TL	TEST LEVEL
ULS	ULTIMATE LIMIT STATE
U/S	UNDERSIDE
WP	WORKING POINT



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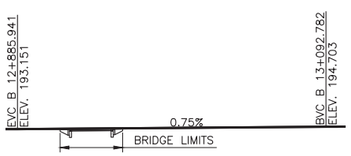

PROFILE OF HWY 401
N.T.S.

WP	NORTHING	EASTING
#1	4 824 730.762	277 360.089
#2	4 824 724.875	277 367.288
#3	4 824 752.438	277 377.813
#4	4 824 746.551	277 385.012

METRIC
DIMENSIONS ARE IN METRES AND/OR MILLIMETRES UNLESS OTHERWISE SHOWN
DRAWING NOT TO BE SCALED
100mm ON ORIGINAL DRAWING

LIST OF DRAWINGS

APPLICABLE STANDARD DRAWINGS

OPSD 912.430	GUIDE RAIL SYSTEM, STEEL BEAM STRUCTURAL CONNECTION
OPSD 3101.150	WALLS, ABUTMENT, BACKFILL MINIMUM GRANULAR REQUIREMENT
OPSD 3102.100	WALLS, ABUTMENT, BACKFILL DRAIN
OPSD 3190.100	WALLS, RETAINING AND ABUTMENT, WALL DRAIN
OPSD 3370.100	DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE WITH PROTECTION BOARD
OPSD 3370.101	DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE AT ACTIVE CRACKS GREATER THAN 2mm WIDE AND CONSTRUCTION JOINTS
OPSD 3390.100	DECK DRIP CHANNEL
OPSD 3419.100	GUIDERAIL AND CHANNEL ANCHORAGE
MTOD 3941.210	FIGURES IN CONCRETE SITE NUMBERS AND DATE LAYOUT

HWL & CLEARANCE			
DESIGN FLOW RETURN PERIOD	HWL (m)	CLEARANCE REQUIRED (m)	CLEARANCE PROVIDED (m)
100 YEAR	191.40	0.3	0.4

HATCH West Corridor Constructors

CONT No –
WP –

HIGHWAY 401 EXPANSION
OAKVILLE CREEK EAST BRIDGE

GENERAL ARRANGEMENT

SHEET –

REVISIONS				
B	2019–12–24	YO	FINAL DESIGN DEVELOPEMENT SUBMITTAL	
A	2019–08–15	YO	PRE–FINAL DESIGN DEVELOPMENT SUBMITTAL	
NO	DATE	BY	DESCRIPTION	

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FOR CONSTRUCTION

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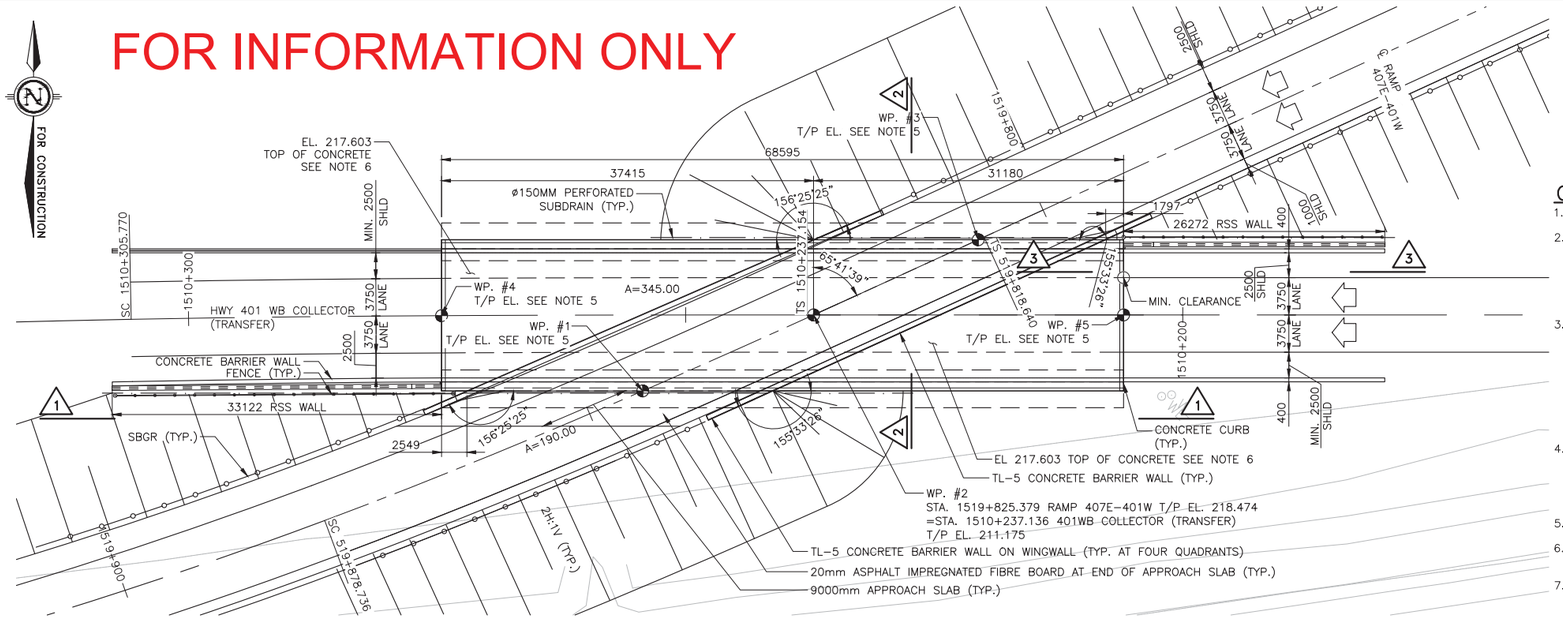


PLAN
1:300

METRIC
DIMENSIONS ARE IN METRES AND/OR MILLIMETRES UNLESS OTHERWISE SHOWN
DRAWING NOT TO BE SCALED
100mm ON ORIGINAL DRAWING

HATCH West Corridor Constructors

CONT No –
WP –

HIGHWAY 401 EXPANSION
RAMP HWY407E – HWY401W OVER
HWY401 WB COLLECTOR STRUCTURE
GENERAL ARRANGEMENT

SHEET –

GENERAL NOTES

1. CAST–IN–PLACE CONCRETE.....30 MPa
   UNLESS NOTED OTHERWISE
2. CLEAR COVER TO REINFORCING STEEL:
   ABUTMENT WALLS.....70± 20
   DECK.....70± 20
   PRECAST CONCRETE.....55± 10
   FOOTINGS.....100± 25
   REMAINDER.....70± 20
   UNLESS NOTED OTHERWISE.
3. REINFORCING STEEL:
   REINFORCING STEEL SHALL BE GRADE 400W UNLESS OTHERWISE SPECIFIED.
   BAR MARKS WITH PREFIX 'S' DENOTE STAINLESS STEEL BARS.
   STAINLESS REINFORCING STEEL SHALL BE TYPE 316LN OR DUPLEX 2205 AND HAVE MINIMUM YIELD STRENGTH OF 500 MPa.
   UNLESS SHOWN OTHERWISE TENSION LAP SPLICES SHALL BE CLASS B.
   BAR HOOKS SHALL HAVE STANDARD HOOK DIMENSIONS USING MINIMUM BEND DIAMETERS, WHILE STIRRUPS AND TIES SHALL HAVE MINIMUM HOOK DIMENSIONS. ALL HOOKS SHALL BE IN ACCORDANCE WITH THE STRUCTURAL STANDARD DRAWING
   SS12–1 UNLESS INDICATED OTHERWISE.
4. GFRP REINFORCING:
   BAR MARKS WITH THE PREFIX GIII DENOTE GRADE III GFRP BARS.
   GLASS FIBRE REINFORCED POLYMER (GFRP) REINFORCING BARS SHALL BE GRADE III AS SPECIFIED IN CONTRACT DOCUMENTS.
   THE NOMINAL DIAMETER, TENSILE MODULUS OF ELASTICITY AND GUARANTEED MINIMUM TENSILE STRENGTH SHALL BE AS SPECIFIED IN THE CONTRACT DOCUMENTS.
5. CONTRACTOR IS RESPONSIBLE TO COORDINATE TOP OF PAVEMENT ELEVATIONS AS PER ROAD ALIGNMENTS GIVEN ON HIGHWAY DRAWINGS. ANY DISCREPANCY FOUND TO BE COMMUNICATED TO DESIGNER.
6. OVERLAY MATERIAL TO BE OPSS GRANULAR B TYPE II COMPACTED TO 95% SPMDD AND NOT TO BE PLACED ON MORE THAN 300MM LIFTS. FINAL LIFT TO BE COMPACTED TO 100%. SPMDD WHEN OVERLAY THICKNESS IS LESS THAN 300mm CONCRETE OVERLAY TO BE USED.
7. APPROXIMATE LOCATION OF WATER TABLE RANGES OF WITHIN 200–209.00 ELEVATION AS PER GEOTECHNICAL DESIGN REPORT WCC–GEO–RPT–0009 REV B (SEPTEMBER 25, 2019) REFER TO TABLE 1.6 "SUMMARY OF OBSERVED GROUND WATER TABLES" FOR ADDITIONAL INFORMATION.

WP#	NORTH	EAST	T/PAVEMENT EL	OVERLAY REQUIREMENTS
1	4827219.177	279329.166	218.385	SEE NOTE 6
2	4827236.533	279336.395	218.474	SEE NOTE 6
3	4827253.406	279343.230	218.512	SEE NOTE 6
4	4827210.769	279309.264	211.014	N/A
5	4827257.960	279359.047	211.309	N/A

CONSTRUCTION NOTES

1. BACKFILL TO ABUTMENTS SHALL BE PLACED SIMULTANEOUSLY, KEEPING THE HEIGHT OF THE BACKFILL APPROXIMATELY THE SAME. AT NO TIME SHALL THE DIFFERENCE IN HEIGHTS OF THE BACKFILL BE GREATER THAN 500mm.
2. BACKFILL TO ABUTMENT SHALL NOT BE PLACED UNTIL THE CONCRETE IN THE DECK HAS REACHED 75% OF ITS SPECIFIED 28–DAY STRENGTH.
3. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED PRIOR TO THE COMMENCEMENT OF THE CONSTRUCTION.

LIST OF ABBREVIATIONS

APPROX.	APPROXIMATE
S	SLOPE (VARIES)
SHLD.	SHOULDER
T/P	TOP OF PAVEMENT
WP	WORKING POINT

LIST OF DRAWINGS:

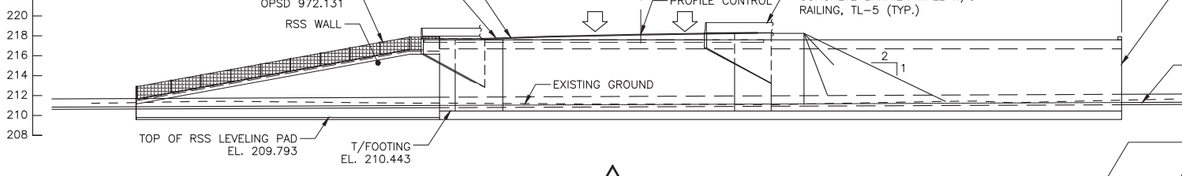
1. GENERAL ARRANGEMENT
2. BOREHOLE LOCATIONS AND SOIL STRATA I
3. BOREHOLE LOCATIONS AND SOIL STRATA II
4. FOUNDATION LAYOUT & FOOTING REINFORCEMENT
5. ABUTMENT
6. ABUTMENT REINFORCEMENT
7. WINGWALL I
8. WINGWALL II
9. RETAINED SOIL SYSTEM WALLS
10. DECK LAYOUT
11. DECK REINFORCEMENT
12. BARRIER WALL WITHOUT RAILING, TL–5 (CFRP REBAR WITH ANCHOR HEAD)
13. 9000mm APPROACH SLAB
14. STANDARD DETAILS
15. ELECTRICAL EMBEDDED WORK

APPLICABLE STANDARD DRAWINGS

OPSD 911.132	GUIDE RAIL SYSTEM, CONCRETE BARRIER CAST–IN–PLACE, TALL WALL INSTALLATION
OPSD 912.430	GUIDE RAIL SYSTEM, STEEL BEAM, STRUCTURE CONNECTION
OPSD 972.132	FENCE, CHAIN–LINK, DETAILS AND TABLE
OPSD 3101.150	WALLS, ABUTMENT, BACKFILL, MINIMUM GRANULAR REQUIREMENT
OPSD 3102.100	WALLS, ABUTMENT, BACKFILL DRAIN
OPSD 3370.100	DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE WITH PROTECTION BOARD
OPSD 3370.101	BRIDGE DECK WATERPROOFING DETAIL JOINTS
OPSD 3941.200	FIGURES IN CONCRETE, SITE NUMBER AND DATE, LAYOUT
OPSD 3950.100	JOINTS, CONCRETE EXPANSION AND CONSTRUCTION ON STRUCTURE
OPSD 4010.00	GUIDERAIL AND CHANNEL ANCHORAGE

CONCRETE WORKING SLAB–MASS CONCRETE NOTE:

1. THE MASS CONCRETE SHALL BE PLACED WITHIN 4 HOURS AFTER EXCAVATION TO THE MENTIONED MINIMUM DEPTHS OR WHEN HARD SILTY CLAY/SHALE IS ENCOUNTERED, WHICHEVER IS DEEPER. A QUALIFIED GEOTECHNICAL ENGINEER SHOULD BE PRESENT AT THE SITE AT THE TIME OF MASS CONCRETE PLACEMENT TO CERTIFY THAT MATERIAL ENCOUNTERED AFTER EXCAVATION IS IN FACT HARD SILTY CLAY OR SHALE.
2. MINIMUM THICKNESS TO BE 100mm THICK.



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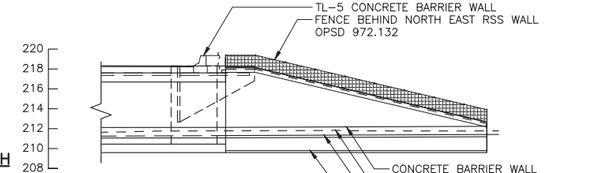
(* DIMENSIONS ARE MEASURED PERPENDICULAR TO CENTERLINE OF ROADWAY)



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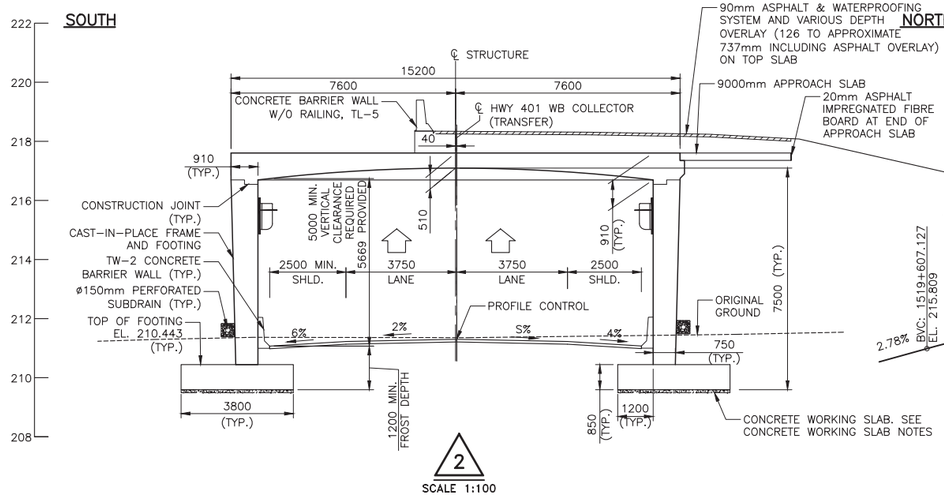

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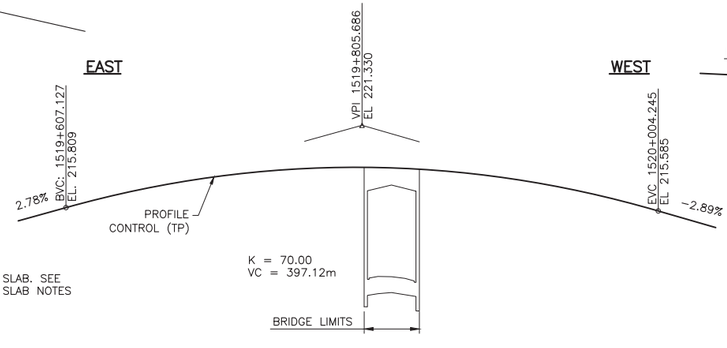
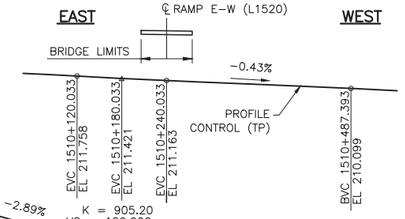


PROFILE OF RAMP 407E–401W
N.T.S.



PROFILE OF HWY401 WB COLLECTOR (TRANSFER)
N.T.S.

REVISIONS				
B	2019–12–18	YO	FINAL DESIGN DEVELOPMENT SUBMITTAL	
A	2019–08–15	YO	PRE–FINAL DESIGN DEVELOPMENT SUBMITTAL	
NO	DATE	BY	DESCRIPTION	

DESIGN	MR	CHK	YO	CODE CAN/CSA S6–14	LOAD CL–625–ONT	DATE 2019–12–10	
DRAWN	KZ	CHK	LG	SITE 10X–0726/BO		DWG	1

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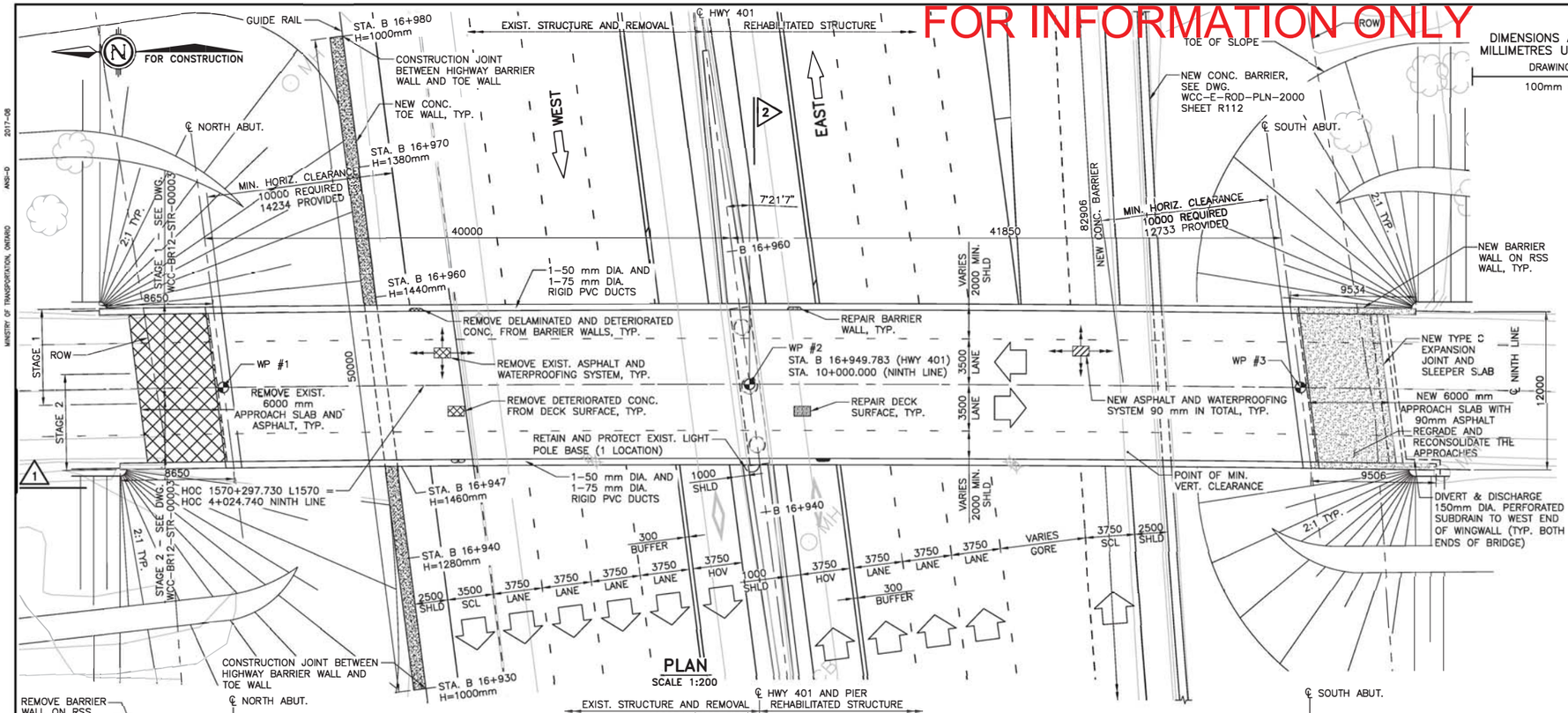
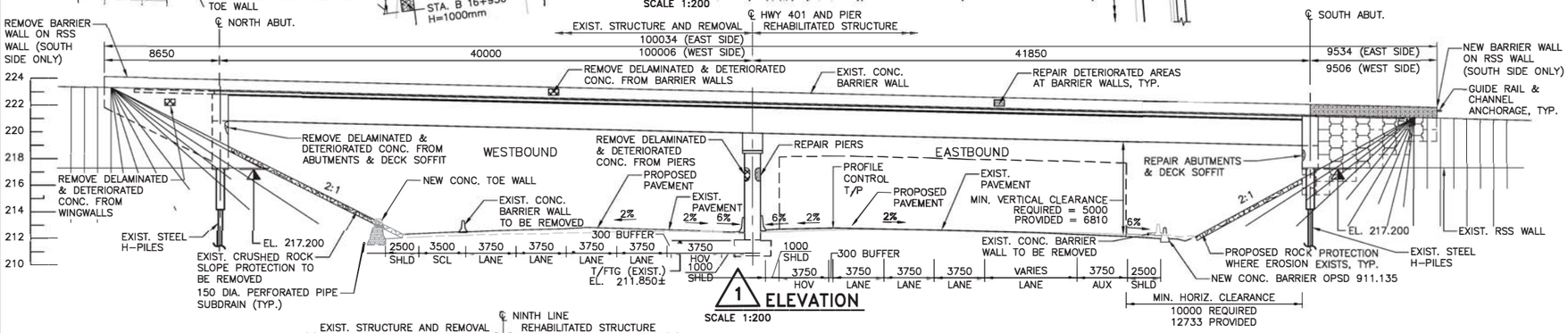
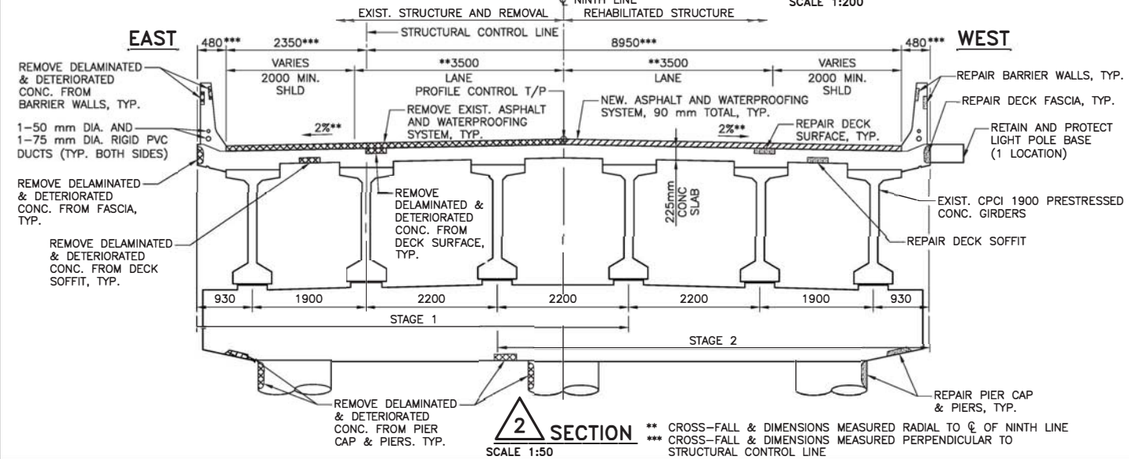
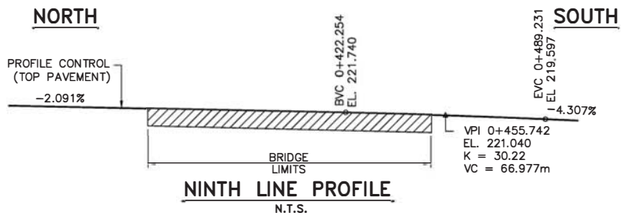
DOCUMENT CODE: WCC–BR09–STR–00001



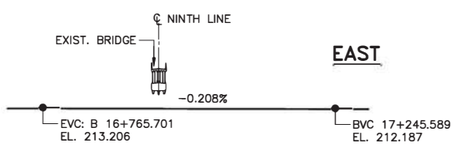




** CROSS–FALL & DIMENSIONS MEASURED RADIAL TO ℄ OF NINTH LINE
*** CROSS–FALL & DIMENSIONS MEASURED PERPENDICULAR TO STRUCTURAL CONTROL LINE



NINTH LINE PROFILE
N.T.S.



HIGHWAY 401 PROFILE
N.T.S.

METRIC

DIMENSIONS ARE IN METRES AND/OR MILLIMETRES UNLESS OTHERWISE SHOWN

DRAWING NOT TO BE SCALED

100mm ON ORIGINAL DRAWING

LEGEND:

- CONCRETE TO REMAIN
- REMOVAL
- NEW CONCRETE
- NEW ASPHALT

SCOPE OF WORK:

THE GENERAL SCOPE OF REPAIR WORK OUTLINED BELOW AND DESIGNATED ON THIS DRAWING SHALL BE CONSIDERED SYMMETRICAL ABOUT THE CENTRELINE OF THE STRUCTURE UNLESS OTHERWISE NOTED.

REMOVALS:

1. REMOVE EXISTING ASPHALT PAVING AND WATERPROOFING SYSTEM ON DECK AND APPROACH SLABS.
2. REMOVE DELAMINATED AND DETERIORATED CONCRETE IN DECK TOP SURFACE, DECK SOFFIT, BARRIER WALLS, PIER CAP AND COLUMNS, ABUTMENTS AND WINGWALLS.
3. REMOVE APPROACH SLABS.
4. REMOVE EXISTING BARRIER AT TOP OF RSS WALL AT SOUTH SIDE.
5. REMOVE PARTIALLY EXISTING ROCK SLOPE PROTECTION.

NEW CONSTRUCTION:

1. PATCH REPAIR DECK TOP SURFACE, DECK SOFFIT, BARRIER WALLS, PIER CAP AND COLUMNS, ABUTMENTS AND WINGWALLS.
2. CONSTRUCT NEW APPROACH SLABS, SLEEPER SLABS AND EXPANSION JOINTS.
3. WATERPROOF AND PAVE BOTH DECK AND APPROACH SLABS.
4. APPLY CONCRETE SEALER TO NEW STRUCTURAL COMPONENTS, PORTION OF BARRIER WALL AND CONCRETE END DAM WHICH ARE NEWLY BUILT TO ACCOMMODATE THE NEW EXPANSION JOINTS.
5. CONSTRUCT NEW TOE WALL, BARRIER WALL AT TOP OF RSS WALL AT SOUTH SIDE AND NEW SLOPE PROTECTION.

LIST OF DRAWINGS:

LIST OF ABBREVIATIONS:

ABUT.	ABUTMENT
BRG'S	BEARINGS
℄	CENTER LINE
CJ	CONSTRUCTION JOINT
EL.	ELEVATION
EXIST.	EXISTING
FTG.	FOOTING
HOV	HIGH OCCUPANCY VEHICLE LANE
MIN.	MINIMUM
N	NORTH
NTS	NOT TO SCALE
ROW	RIGHT OF WAY
S	SOUTH
SHLD	SHOULDER
STA.	STATION
T/P	TOP OF PAVEMENT
TCB	TEMPORARY CONCRETE BARRIER
TYP.	TYPICAL
VERT.	VERTICAL
WP	WORKING POINT

GENERAL NOTES:

1. CLASS OF CONCRETE:
   DECK 30 MPa
   REMAINDER 30 MPa
   UNLESS NOTED OTHERWISE.
2. CLEAR COVER TO REINFORCING STEEL:
   FOOTINGS 100 ±25
   DECK – TOP 70 ±20
   DECK – BOT 40 ±10
   REMAINDER 70 ±20
   UNLESS NOTED OTHERWISE.
3. REINFORCING STEEL:

   REINFORCING STEEL SHALL BE GRADE 400W UNLESS SPECIFIED OTHERWISE.

   BAR MARKS WITH PREFIX 'S' DENOTE STAINLESS STEEL BARS.

   STAINLESS REINFORCING STEEL SHALL BE TYPE 316LN OR DUPLEX 2205 AND HAVE MINIMUM YIELD STRENGTH OF 500 MPa.

   UNLESS SHOWN OTHERWISE TENSION LAP SPLICES SHALL BE CLASS B.

   BAR HOOKS SHALL HAVE STANDARD HOOK DIMENSIONS USING MINIMUM BEND DIAMETERS, WHILE STIRRUPS AND TIES SHALL HAVE MINIMUM HOOK DIMENSIONS. ALL HOOKS SHALL BE IN ACCORDANCE WITH THE STRUCTURAL STANDARD DRAWING SS12–1 UNLESS INDICATED OTHERWISE.

CONSTRUCTION NOTES:

1. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED PRIOR TO THE COMMENCEMENT OF THE CONSTRUCTION.
2. THE EXISTING BRIDGE LOCATION, DIMENSIONS, PROPOSED WORK AND DETAILS SHALL BE VERIFIED FOR ANY DISCREPANCIES PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION WORKS.
3. TYPICAL AREAS OF REPAIRS ARE INDICATED ON THE DRAWINGS. WHERE REPAIR LIMITS ARE NOT SHOWN, LIMITS SHALL BE IDENTIFIED BY THE ENGINEER OF RECORD PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION WORKS.
4. SAWCUT IN CONCRETE, WHERE DESIGNATED, SHALL BE 25mm DEEP OR TO THE FIRST LAYER OF REINFORCING STEEL, WHICHEVER IS LESS.
5. ALL CROSSFALLS ON EXPANSION JOINTS SHALL BE ESTABLISHED TO MATCH EXISTING UNLESS NOTED OTHERWISE.
6. LOCATIONS OF THE EXISTING UTILITY DUCTS SHOWN ON THE DRAWINGS ARE APPROXIMATE AND SHALL BE VERIFIED IN THE FIELD PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION WORKS.
7. ADEQUATE PROTECTION SHALL BE PROVIDED TO ALL UTILITIES, SERVICES, ROADWAYS, ETC., DURING CONSTRUCTION OPERATIONS.
8. PROVIDE DEBRIS PLATFORMS AND NECESSARY CONTAINMENT MEASURES TO COLLECT FALLING CONCRETE AND CONSTRUCTION DEBRIS AS REQUIRED.

APPLICABLE STANDARD DRAWINGS:

OPSD 3120.100	WALLS, RETAINING, CONCRETE TOE WALL
OPSD 911.135	GUIDE RAIL SYSTEM, CONCRETE ROADSIDE BARRIER CAST–IN–PLACE OR SLIPFORMED INSTALLATION

LICENSED PROFESSIONAL ENGINEER
N. PAPASOTIROU
100194982
PROVINCE OF ONTARIO

WORKING POINT TABLE

POINT	STATION	NORTHING	EASTING	ELEVATION
WP #1	9+960.000	4827875.219	279886.067	223.117
WP #2	10+000.000	4827846.329	279913.689	222.270
WP #3	10+041.850	4827815.720	279942.275	221.246

REVISIONS				
NO	DATE	BY	DESCRIPTION	
0	2019–12–06	YG	CONSTRUCTION DOCUMENT SUBMITTAL	

DESIGN	RH	CHK	YG	CODE CAN/CSA S6–14	LOAD CL–625–ONT	DATE	2019–06–18
DRAWN	SL	CHK	RH	SITE 10X–0542/B0		DWG	R1–1

West Corridor Constructors — PARSONS

CONT No –
WP –

HWY 401 EXPANSION
NINTH LINE UNDERPASS
STRUCTURES
GENERAL ARRANGEMENT

SHEET –

DOCUMENT CODE: WCC–BR12–STR–00001

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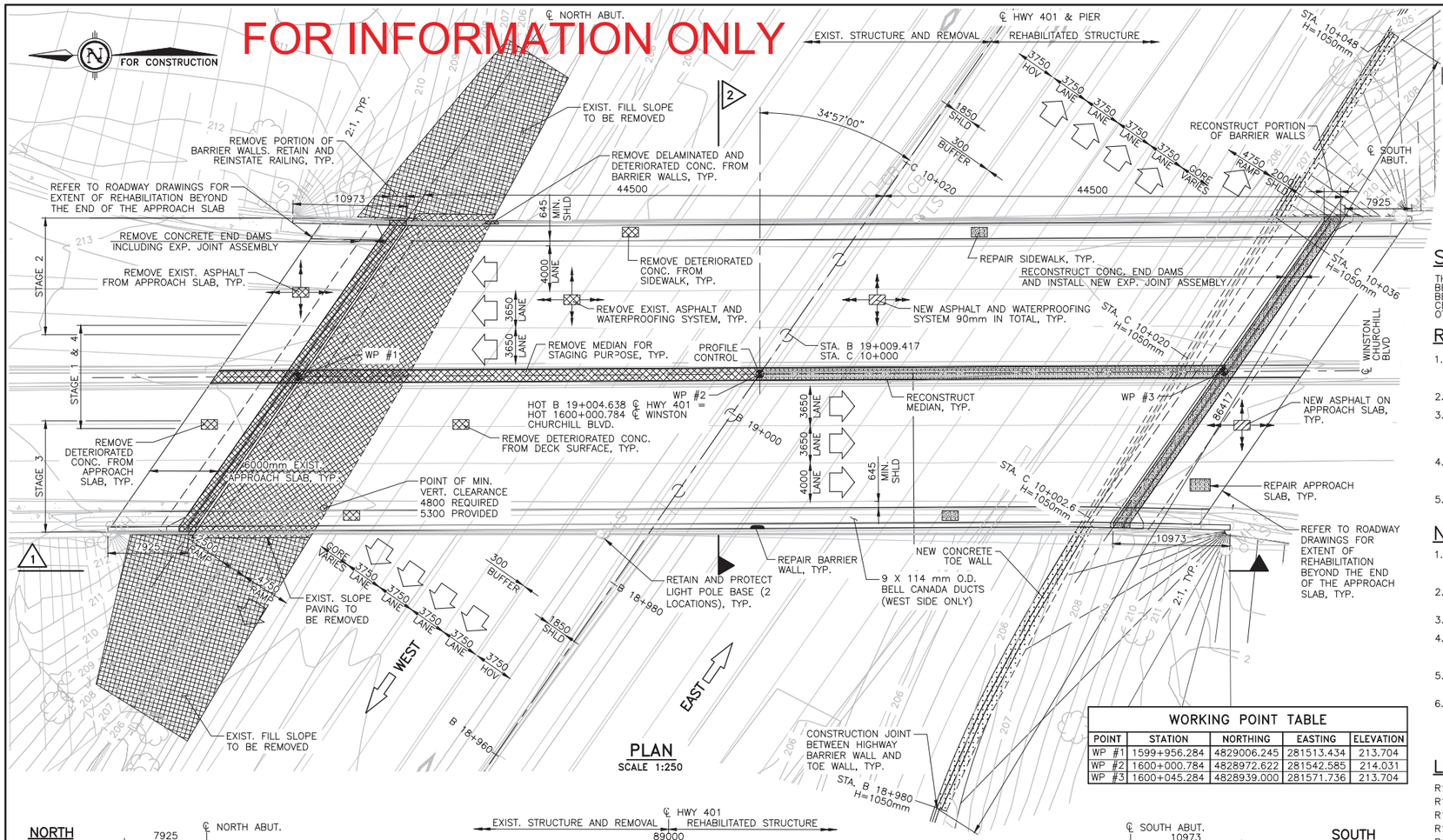
MINISTRY OF TRANSPORTATION, ONTARIO 2017–08 ANSI–D

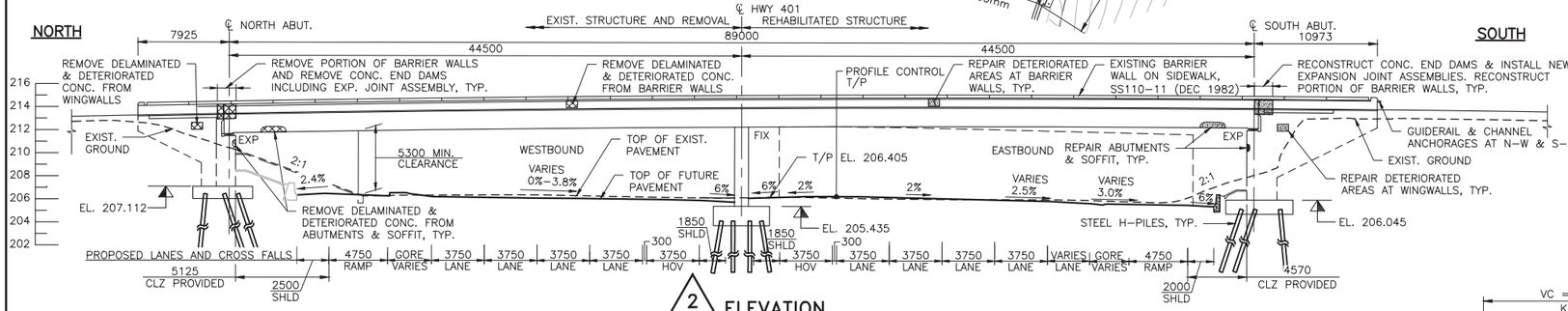
FOR INFORMATION ONLY

FOR CONSTRUCTION

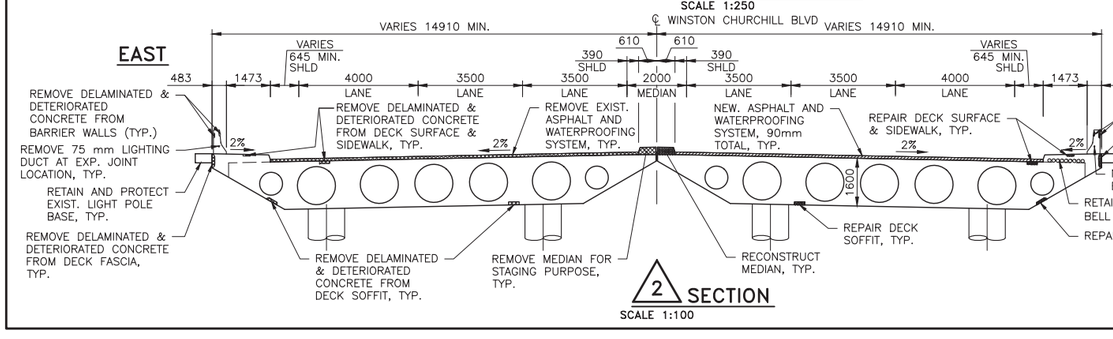


PLAN
SCALE 1:250

WORKING POINT TABLE				
POINT	STATION	NORTHING	EASTING	ELEVATION
WP #1	1599+956.284	4829006.245	281513.434	213.704
WP #2	1600+000.784	4828972.622	281542.585	214.031
WP #3	1600+045.284	4828939.000	281571.736	213.704



2 ELEVATION
SCALE 1:250



2 SECTION
SCALE 1:100

NORTH
SOUTH
VC = 171.93m
K = 30
2.750%
-2.981%
BVC 1599+921.304
EL 212.903
VPI 1600+007.268
EL 215.267
EVC 1600+093.232
EL 212.705

WINSTON CHURCHILL BLVD PROFILE
N.T.S.

WEST
EAST
℄ WINSTON CHURCHILL BLVD
EXISTING BRIDGE
VC = 126.10m
K = 170
-1.132%
-0.390%
BVC B 18+813.155
EL 207.344
VPI B 18+876.206
EL 206.631
EVC B 18+939.257
EL 206.385

HIGHWAY 401 PROFILE
N.T.S.

METRIC

DIMENSIONS ARE IN METRES AND/OR MILLIMETRES UNLESS OTHERWISE SHOWN

DRAWING NOT TO BE SCALED

100mm ON ORIGINAL DRAWING

LEGEND:

- CONCRETE TO REMAIN
- REMOVAL
- NEW CONCRETE
- NEW ASPHALT

SCOPE OF WORK:

THE GENERAL SCOPE OF REPAIR WORK OUTLINED BELOW AND DESIGNATED ON THIS DRAWING SHALL BE CONSIDERED SYMMETRICAL ABOUT THE CENTRELINE OF THE STRUCTURE UNLESS OTHERWISE NOTED.

REMOVALS:

1. REMOVE EXISTING ASPHALT PAVING AND WATERPROOFING SYSTEM ON DECK AND ASPHALT PAVEMENT ON APPROACH SLABS.
2. REMOVE EXISTING CONCRETE MEDIAN.
3. REMOVE DELAMINATED AND DETERIORATED CONCRETE IN DECK SURFACE, SIDE WALKS, BARRIER WALLS, DECK SOFFIT, FASCIA, ABUTMENTS AND WINGWALLS.
4. REMOVE EXPANSION JOINTS AND RELEVANT PORTIONS OF BARRIER WALLS AND CONCRETE END DAMS.
5. REMOVE PARTIALLY EXISTING SLOPE PROTECTION.

NEW CONSTRUCTION:

1. PATCH REPAIR DECK SURFACE, DECK SOFFIT, FASCIA, SIDE WALK, BARRIER WALLS, ABUTMENTS AND WINGWALLS.
2. WATERPROOF DECK, PAVE DECK AND APPROACH SLABS.
3. CONSTRUCT NEW CONCRETE MEDIAN.
4. INSTALL NEW EXPANSION JOINTS AND CONSTRUCT RELEVANT PORTIONS OF NEW BARRIER WALLS.
5. CONSTRUCT NEW TOE WALL AND NEW SLOPE PROTECTION.
6. APPLY CONCRETE SEALER TO NEW CONCRETE COMPONENTS OF SURFACE OF MEDIAN, PORTION OF BARRIER WALL AND CONCRETE END DAM WHICH ARE NEWLY BUILT TO ACCOMMODATE THE NEW EXPANSION JOINTS.

LIST OF DRAWINGS:

GENERAL NOTES:

1. CLASS OF CONCRETE:
   EXISTING DECK & MEDIAN 35 MPa
   DECK & MEDIAN REPAIR 30 MPa
   REMAINDER 30 MPa
   UNLESS NOTED OTHERWISE.
2. CLEAR COVER TO REINFORCING STEEL:
   FOOTINGS 100±25
   DECK – TOP 70 ±20
   DECK – BOT 50 ±10
   REMAINDER 70 ±20
   UNLESS NOTED OTHERWISE.
3. REINFORCING STEEL:

   REINFORCING STEEL SHALL BE GRADE 400W UNLESS SPECIFIED OTHERWISE.

   BAR MARKS WITH PREFIX 'S' DENOTE STAINLESS STEEL BARS.

   STAINLESS REINFORCING STEEL SHALL BE TYPE 316LN OR DUPLEX 2205 AND HAVE MINIMUM YIELD STRENGTH OF 500 MPa.

   UNLESS SHOWN OTHERWISE TENSION LAP SPLICES SHALL BE CLASS B.

   BAR HOOKS SHALL HAVE STANDARD HOOK DIMENSIONS USING MINIMUM BEND DIAMETERS, WHILE STIRRUPS AND TIES SHALL HAVE MINIMUM HOOK DIMENSIONS. ALL HOOKS SHALL BE IN ACCORDANCE WITH THE STRUCTURAL STANDARD DRAWING SS12-1 UNLESS INDICATED OTHERWISE.

CONSTRUCTION NOTES:

1. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED PRIOR TO THE COMMENCEMENT OF THE CONSTRUCTION.
2. THE EXISTING BRIDGE LOCATION, DIMENSIONS, PROPOSED WORK AND DETAILS SHALL BE VERIFIED FOR ANY DISCREPANCIES PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION WORKS.
3. TYPICAL AREAS OF REPAIRS ARE INDICATED ON THE DRAWINGS. WHERE REPAIR LIMITS ARE NOT SHOWN, LIMITS SHALL BE IDENTIFIED PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION WORKS.
4. SAWCUT IN CONCRETE, WHERE DESIGNATED, SHALL BE 25mm DEEP OR TO THE FIRST LAYER OF REINFORCING STEEL, WHICHEVER IS LESS.
5. ALL CROSSFALLS ON EXPANSION JOINTS SHALL BE ESTABLISHED TO MATCH EXISTING UNLESS NOTED OTHERWISE.
6. LOCATIONS OF THE EXISTING UTILITY DUCTS SHOWN ON THE DRAWINGS ARE APPROXIMATE AND SHALL BE VERIFIED IN THE FIELD PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION WORKS.
7. ADEQUATE PROTECTION SHALL BE PROVIDED TO ALL UTILITIES, SERVICES, ROADWAYS, ETC., DURING CONSTRUCTION OPERATIONS.
8. PROVIDE DEBRIS PLATFORMS AND NECESSARY CONTAINMENT MEASURES TO COLLECT FALLING CONCRETE AND CONSTRUCTION DEBRIS AS REQUIRED.

LIST OF ABBREVIATIONS:

ABUT.	ABUTMENT
B.O.	BOTTOM OF
BRG'S	BEARINGS
℄	CENTER LINE
C.J.	CONSTRUCTION JOINT
EL.	ELEVATION
EXIST.	EXISTING
FTG.	FOOTING
HOV	HIGH OCCUPANCY VEHICLE LANE
MIN.	MINIMUM
N.	NORTH
NTS	NOT TO SCALE
S.	SOUTH
SHLD	SHOULDER
STA.	STATION
T.O.	TOP OF
T/P	TOP OF PAVEMENT
TCB	TEMPORARY CONCRETE BARRIER
TYP.	TYPICAL
VERT.	VERTICAL
WP	WORKING POINT

APPLICABLE STANDARD DRAWINGS:

OPSD 3120.100 WALLS, RETAINING, CONCRETE TOE WALL
OPSD 3190.100 WALLS, RETAINING AND ABUTMENT WALL DRAIN

West Corridor Constructors — PARSONS

CONT No –
WP –

HWY 401 EXPANSION
WINSTON CHURCHILL BOULEVARD
UNDERPASS STRUCTURES
GENERAL ARRANGEMENT

SHEET –

REVISIONS				
NO	DATE	BY	DESCRIPTION	
0	2019-12-06	YG	CONSTRUCTION DOCUMENT SUBMITTAL	
DESIGN	RH	CHK	YG	CODE CAN/CSA S6-14 LOAD CL-625-ONT DATE 2019-06-11
DRAWN	SL	CHK	RH	SITE10X-0098/B1&B2 DWG R1-1

DOCUMENT CODE: WCC-BR16-STR-00001

MINISTRY OF TRANSPORTATION, ONTARIO — ANSI-D — 2017-08

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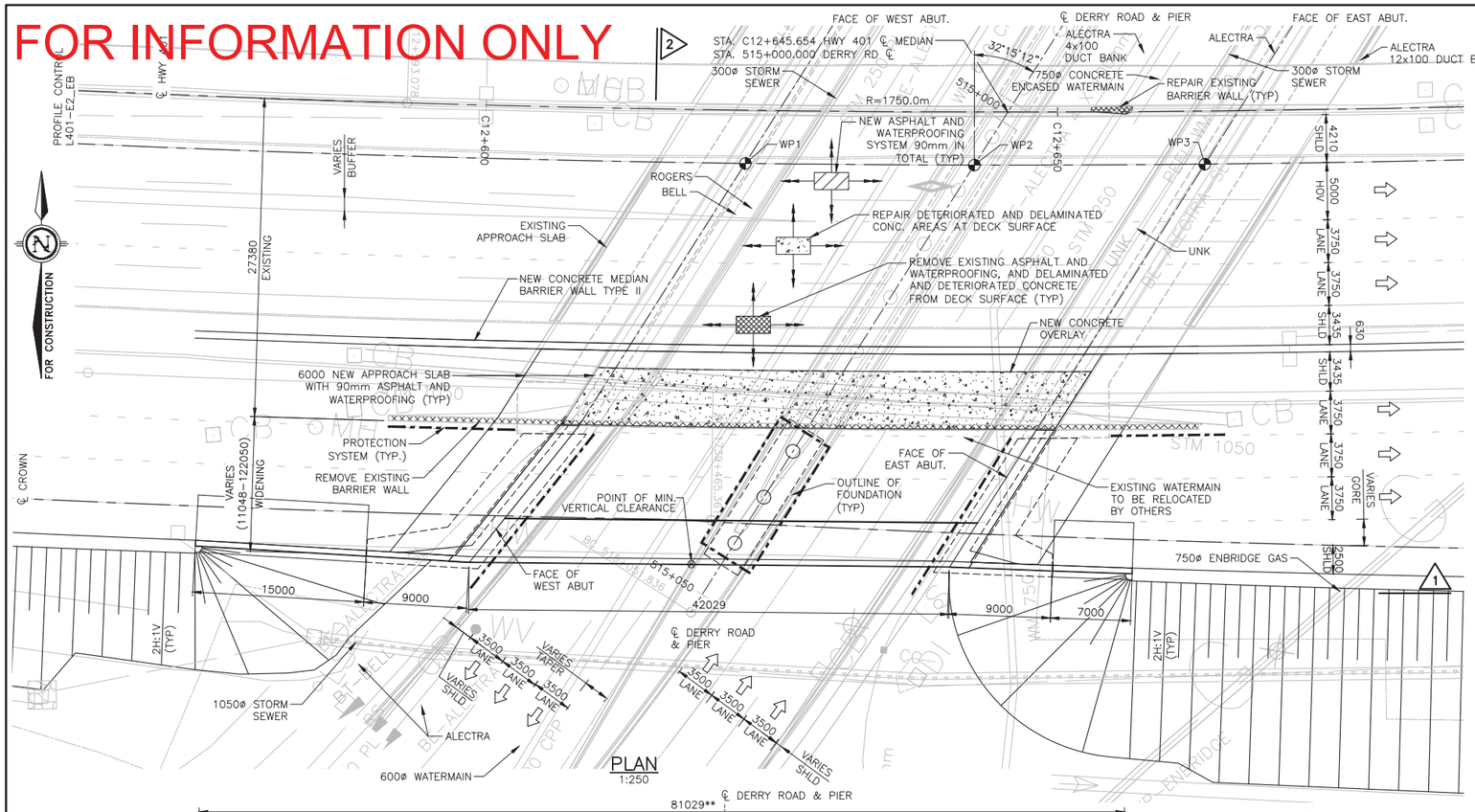
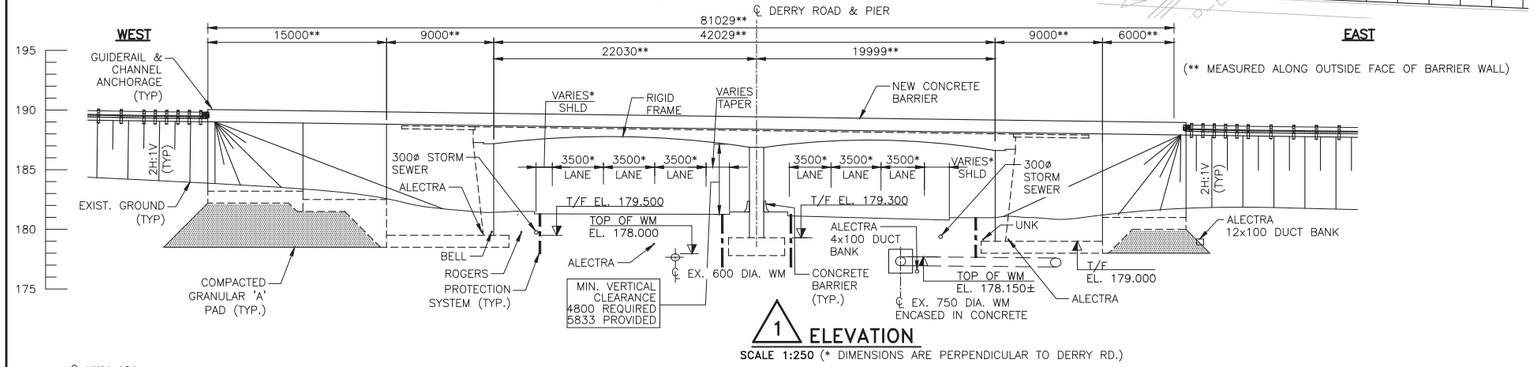
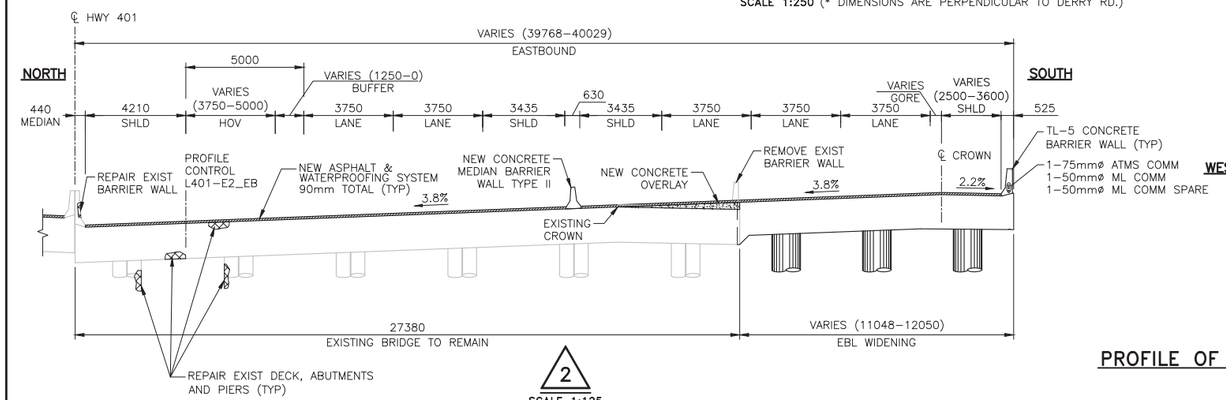
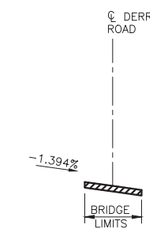
FOR INFORMATION ONLY

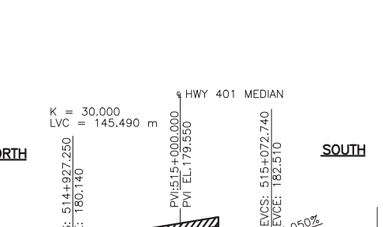








PROFILE OF HWY 401 EB (L401-E2_EB) COLLECTOR
N.T.S.



PROFILE OF DERRY ROAD
N.T.S.

LIST OF DRAWINGS

1. GENERAL ARRANGEMENT I
2. GENERAL ARRANGEMENT II
3. BOREHOLE LOCATIONS AND SOIL STRATA I
4. BOREHOLE LOCATIONS AND SOIL STRATA II
5. CONSTRUCTION STAGING I
6. CONSTRUCTION STAGING II
7. EXISTING STRUCTURE REMOVALS I
8. EXISTING STRUCTURE REMOVALS II
9. EXISTING STRUCTURE REMOVALS III
10. EXISTING STRUCTURE REMOVALS IV
11. EXISTING STRUCTURE REMOVALS V
12. FOUNDATION I
13. FOUNDATION II
14. ABUTMENTS I
15. ABUTMENTS II
16. WINGWALLS I
17. WINGWALLS II
18. RETAINING WALLS
19. PIER DETAILS
20. PRECAST BEAM LAYOUT
21. PRECAST BEAM DETAILS
22. DECK DETAILS I
23. DECK REINFORCEMENT I
24. DECK DETAILS II
25. DECK REINFORCEMENT II
26. BARRIER WALL WITHOUT RAILING, TL-5
27. REINFORCED CONCRETE MEDIAN BARRIER WALL
28. REINFORCED CONCRETE ASYMETRICAL MEDIAN BARRIER WALL
29. 6000mm APPROACH SLAB I
30. 6000mm APPROACH SLAB II
31. REPAIR DETAILS
32. STANDARD DETAILS
33. ELECTRICAL EMBEDDED WORKS

LIST OF ABBREVIATIONS:

W.P.	-DENOTES WORKING POINT
ABUT.	-DENOTES ABUTMENT
T/P	-DENOTES TOP OF PAVEMENT
EXIST.	-DENOTES EXISTING
SHLD	-DENOTES SHOULDER
HOV	-DENOTES HIGH OCCUPANCY VEHICLE
EBL	-DENOTES EAST BOUND LANE
RW	-DENOTES RETAINING WALL
SCL	-DENOTES SPEED CHANGE LANE
CONC.	-DENOTES CONCRETE

LEGEND:

- CONCRETE TO REMAIN
- REMOVAL
- NEW CONCRETE
- NEW PAVEMENT

METRIC
DIMENSIONS ARE IN METRES AND/OR MILLIMETRES UNLESS OTHERWISE SHOWN
DRAWING NOT TO BE SCALED
100mm ON ORIGINAL DRAWING

West Corridor Constructors — PARSONS

CONT No –
WP –

HWY 401 EXPANSION
DERRY ROAD OVERPASS STRUCTURES
GENERAL ARRANGEMENT I

SHEET –

GENERAL NOTES:

1. CLASS OF CONCRETE:
   PRECAST BEAMS..... 30 MPa
   REMAINDER..... 30 MPa
   UNLESS NOTED OTHERWISE
2. CLEAR COVER TO REINFORCING STEEL(mm):
   FOOTINGS..... 100± 25
   DECK – TOP..... 70± 20
   DECK – BOT..... 50± 10
   REMAINDER..... 70± 20
   UNLESS NOTED OTHERWISE.
3. REINFORCING STEEL:
   REINFORCING STEEL SHALL BE GRADE 400W UNLESS OTHERWISE SPECIFIED.
   BAR MARKS WITH PREFIX 'S' DENOTE STAINLESS STEEL BARS.
   STAINLESS REINFORCING STEEL SHALL BE TYPE 316LN OR DUPLEX 2205 AND HAVE MINIMUM YIELD STRENGTH OF 500 MPa.
   UNLESS SHOWN OTHERWISE TENSION LAP SPLICES SHALL BE CLASS B.
   BAR HOOKS SHALL HAVE STANDARD HOOK DIMENSIONS USING MINIMUM BEND DIAMETERS, WHILE STIRRUPS AND TIES SHALL HAVE MINIMUM HOOK DIMENSIONS. ALL HOOKS SHALL BE IN ACCORDANCE WITH THE STRUCTURAL STANDARD DRAWING SS12-1 UNLESS INDICATED OTHERWISE.

CONSTRUCTION NOTES:

1. THE EXISTING BRIDGE LOCATION, DIMENSIONS, PROPOSED WORK AND DETAILS SHALL BE VERIFIED FOR ANY DISCREPANCIES PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION WORKS.
2. BACKFILL TO ABUTMENTS SHALL BE PLACED SIMULTANEOUSLY, KEEPING THE HEIGHT OF THE BACKFILL APPROXIMATELY THE SAME. AT NO TIME SHALL THE DIFFERENCE IN HEIGHTS OF THE BACKFILL BE GREATER THAN 500mm.
3. BACKFILL IN THE ABUTMENTS SHALL NOT BE PLACED UNTIL THE CONCRETE IN THE DECK HAS REACHED A STRENGTH OF 25MPa.
4. CONSTRUCT ABUTMENTS AND WINGWALLS TO THE BEARING SEAT ELEVATIONS. TEMPORARY LATERAL BRACING SHALL BE PROVIDED FOR THE ABUTMENTS. FORMWORK AND LATERAL BRACING SHALL NOT BE REMOVED UNTIL CONCRETE HAS REACHED A STRENGTH OF 25MPa.
5. PROTECTION SYSTEM SHALL BE PERFORMANCE LEVEL 2. EXACT LOCATIONS AND LIMITS OF PROTECTION SYSTEM SHALL BE DETERMINED PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION WORKS

REHABILITATION NOTES:

REMOVE AND REPAIR DETERIORATED CONCRETE OF EXIST NORTH BARRIER WALL.

PATCH REPAIR EXIST DECK TOP AND PLACE ASPHALT AND WATERPROOFING SYSTEM 90 mm TOTAL.

REMOVE AND REPAIR DETERIORATED CONCRETE OF EXIST SOFFIT, ABUTMENT AND PIER COLUMNS.

APPLICABLE STANDARD DRAWINGS

1.
OPSD 3190.100 WALL, RETAINING AND ABUTMENT, WALL DRAIN
OPSD 3370.100 DECK, WATERPROOFING, HOT APPLIED ASPHALT MEMBRANE WITH PROTECTION BOARD
OPSD 3370.101 DECK, WATERPROOFING, HOT APPLIED ASPHALT MEMBRANE AT ACTIVE CRACKS GREATER THAN 2mm WIDE AND CONSTRUCTION JOINTS
OPSD 3941.200 FIGURES IN CONCRETE, SITE NUMBER AND DATE, LAYOUT
OPSD 3950.100 JOINTS, CONCRETE EXPANSION AND CONSTRUCTION, ON STRUCTURE

WP#	STATION	COORDINATE		T/P EL
		NORTH	EAST	
1	C12+622.741	4829235.979	284157.071	187.225
2	C12+642.718	4829239.123	284176.853	186.947
3	C12+662.840	4829242.519	284196.740	186.666

REVISIONS				
NO	DATE	BY	DESCRIPTION	

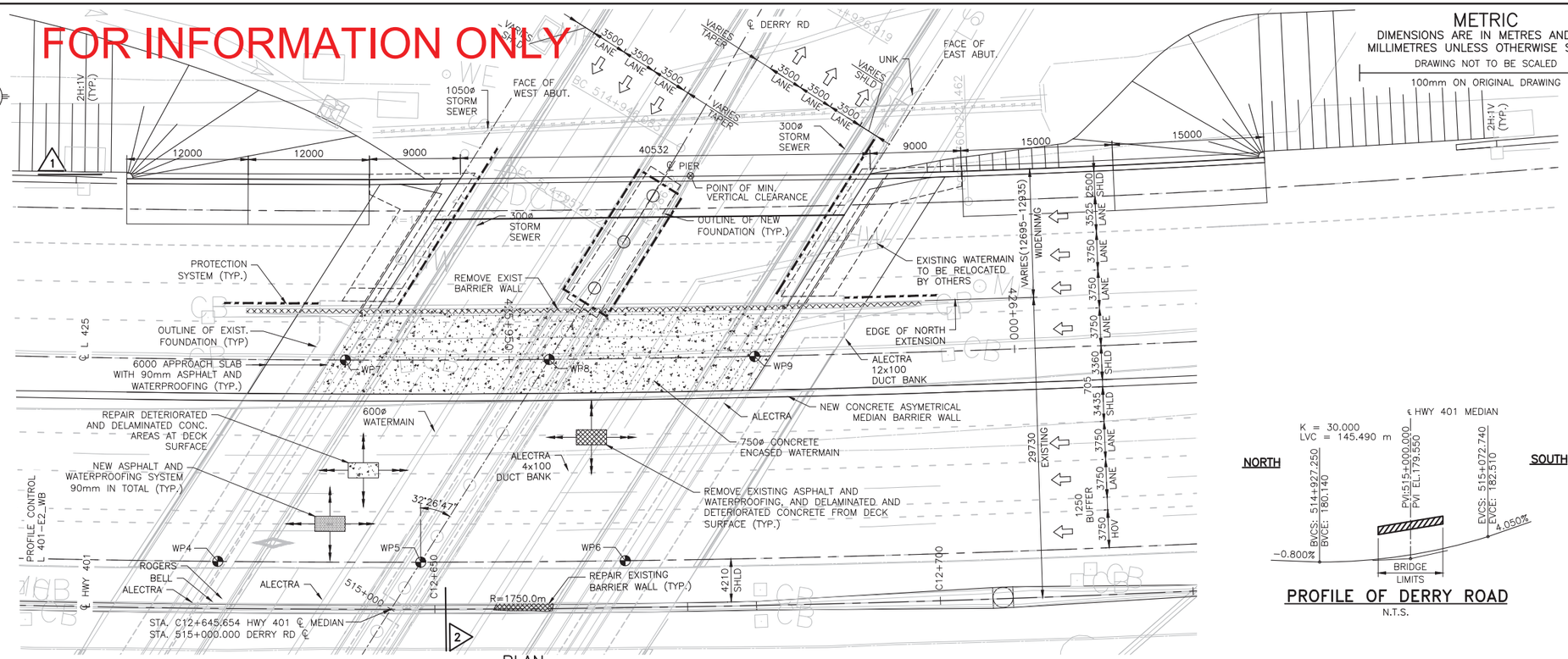
DESIGN	BA	CHK	FA	CODE CAN/CSA S6-14	LOAD CL-625-ONT	DATE	2019-08-21
DRAWN	AS	CHK	BA	SITE 24X-0124/B1&B2		DWG	1

DOCUMENT CODE: WCC-BR17-STR-00001

MINISTRY OF TRANSPORTATION, ONTARIO 2017-08 ANSI-D
FILE NAME: c:\pw_working\ontario\parsons_p002695e\dms19194\WCC-BR17-STR-00001.dwg
MODIFIED: 2019-12-31 14:22

FOR INFORMATION ONLY

FOR CONSTRUCTION



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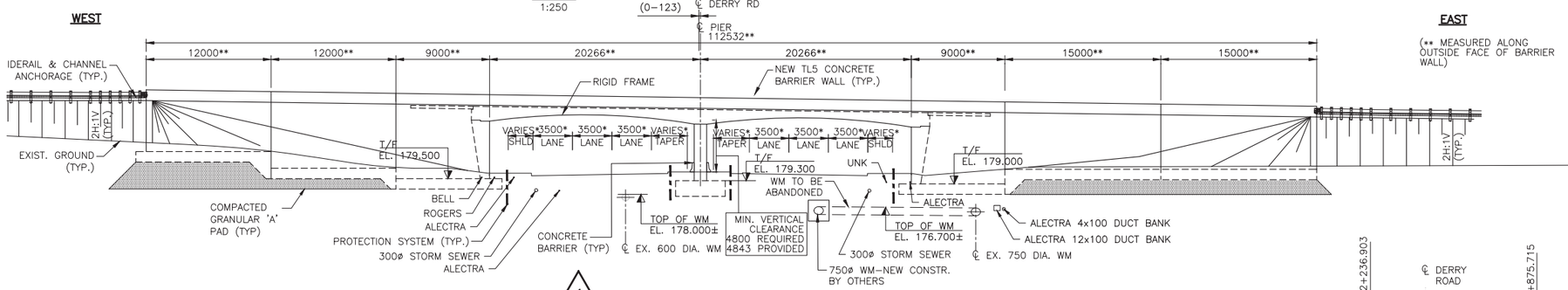

1 SECTION (* DIMENSIONS ARE MEASURED PERPENDICULAR TO DERRY RD.)
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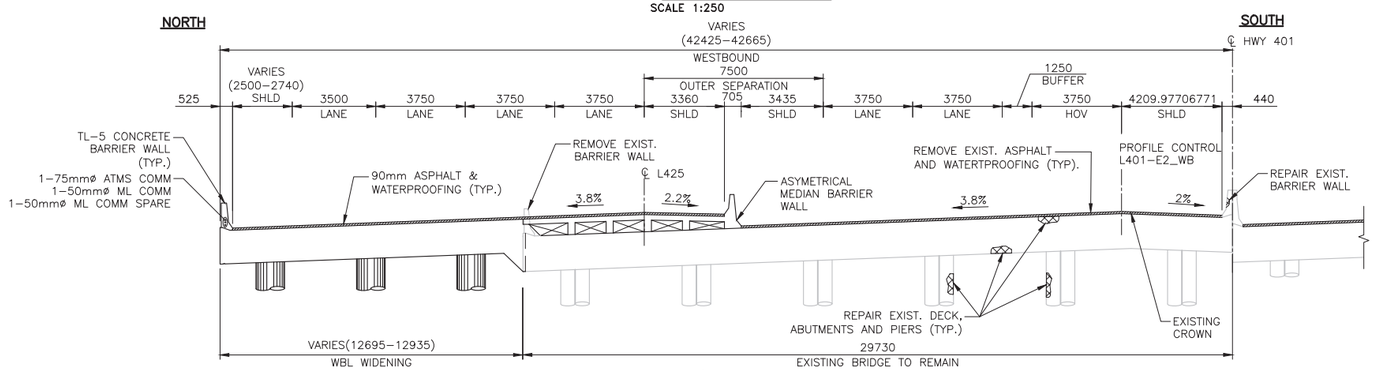

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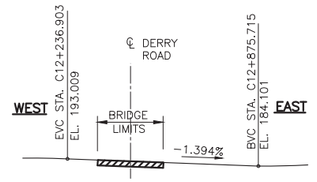
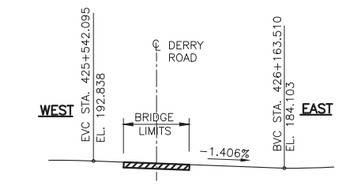
PROFILE OF DERRY ROAD
N.T.S.



PROFILE OF HWY 401 WB (L401-E2_WB) COLLECTOR
N.T.S.



PROFILE OF HWY 401 WB (L425)
N.T.S.

METRIC
DIMENSIONS ARE IN METRES AND/OR MILLIMETRES UNLESS OTHERWISE SHOWN
DRAWING NOT TO BE SCALED
100mm ON ORIGINAL DRAWING

West Corridor Constructors — PARSONS

CONT No –
WP –

HWY 401 EXPANSION
DERRY ROAD OVERPASS STRUCTURES
GENERAL ARRANGEMENT II

SHEET –

NOTES:

1. REFER TO 'GENERAL ARRANGEMENT I' FOR GENERAL, CONSTRUCTION & REHABILITATION NOTES.

APPLICABLE STANDARD DRAWINGS

OPSD 3190.100	WALL, RETAINING AND ABUTMENT, WALL DRAIN
OPSD 3370.100	DECK, WATERPROOFING, HOT APPLIED ASPHALT MEMBRANE WITH PROTECTION BOARD
OPSD 3370.101	DECK, WATERPROOFING, HOT APPLIED ASPHALT MEMBRANE AT ACTIVE CRACKS GREATER THAN 2mm WIDE AND CONSTRUCTION JOINTS
OPSD 3941.200	FIGURES IN CONCRETE, SITE NUMBER AND DATE, LAYOUT
OPSD 3950.100	JOINTS, CONCRETE EXPANSION AND CONSTRUCTION, ON STRUCTURE

LIST OF ABBREVIATIONS:

W.P.	–DENOTES WORKING POINT
ABUT.	–DENOTES ABUTMENT
T/P	–DENOTES TOP OF PAVEMENT
EXIST.	–DENOTES EXISTING
SHLD	–DENOTES SHOULDER
HOV	–DENOTES HIGH OCCUPANCY VEHICLE
EBL	–DENOTES EAST BOUND LANE
RW	–DENOTES RETAINING WALL
SCL	–DENOTES SPEED CHANGE LANE

LEGEND:

- CONCRETE TO REMAIN
- REMOVAL
- NEW CONCRETE
- NEW PAVEMENT

WP#	STATION	COORDINATE		T/P EL
		NORTH	EAST	
4	C12+628.484	4829246.048	284161.323	187.549
5	C12+648.609	4829249.265	284181.135	187.268
6	C12+668.882	4829252.735	284201.055	186.985
7	425+933.218	4829267.677	284169.914	187.331
8	425+953.974	4829271.149	284190.377	187.047
9	425+975.012	4829274.919	284211.075	186.762

REVISIONS

NO	DATE	BY	DESCRIPTION

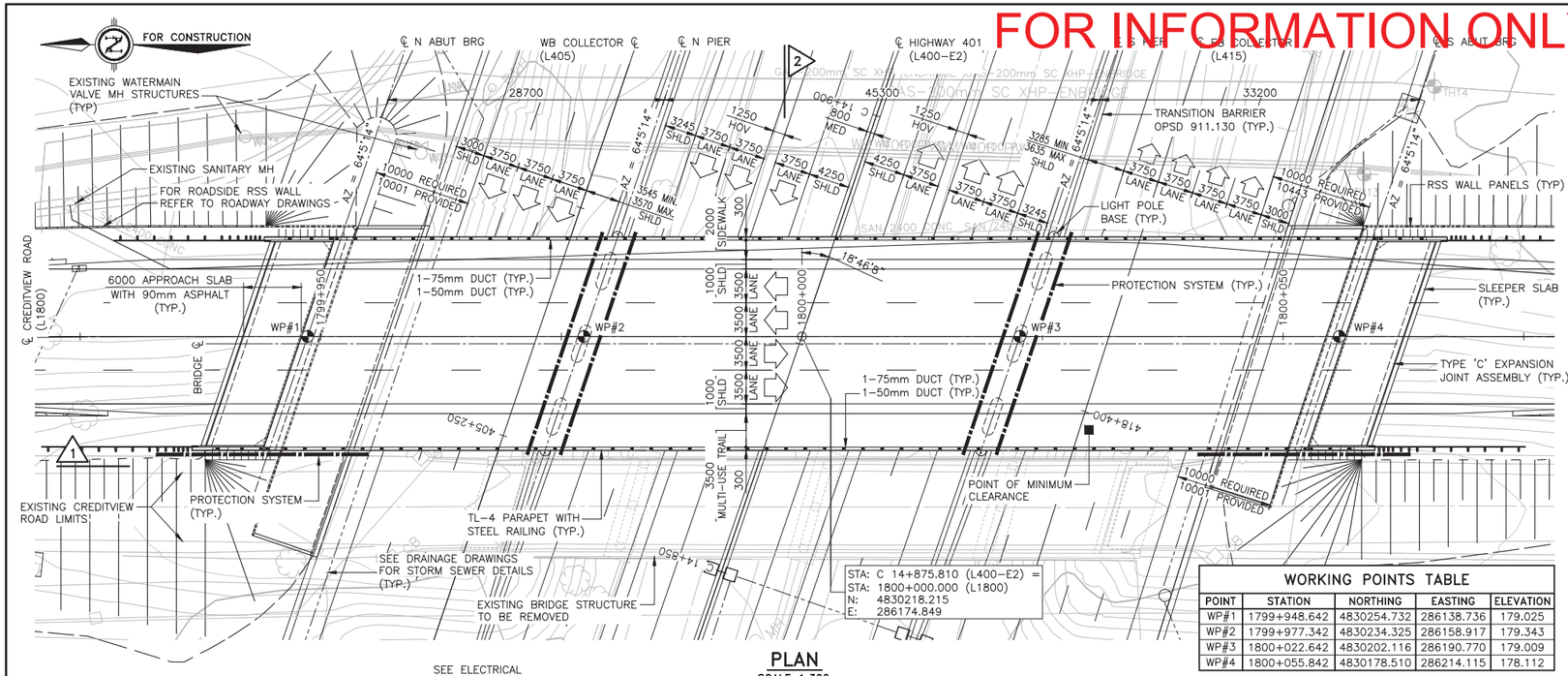
DESIGN	BA	CHK	FA	CODE CAN/CSA S6-14	LOAD CL-625-ONT	DATE 2019-08-21	
DRAWN	AS	CHK	BA	SITE 24X-0124/B1&B2		DWG	2

DOCUMENT CODE: WCC-BR17-STR-00002

MINISTRY OF TRANSPORTATION, ONTARIO ANSI-D 2017-08

FILE NAME: c:\pw_working\ontario\parsons_p002695e\dms19194\WCC-BR17-STR-00002.dwg
MODIFIED: 2019-12-31 14:49

FOR INFORMATION ONLY



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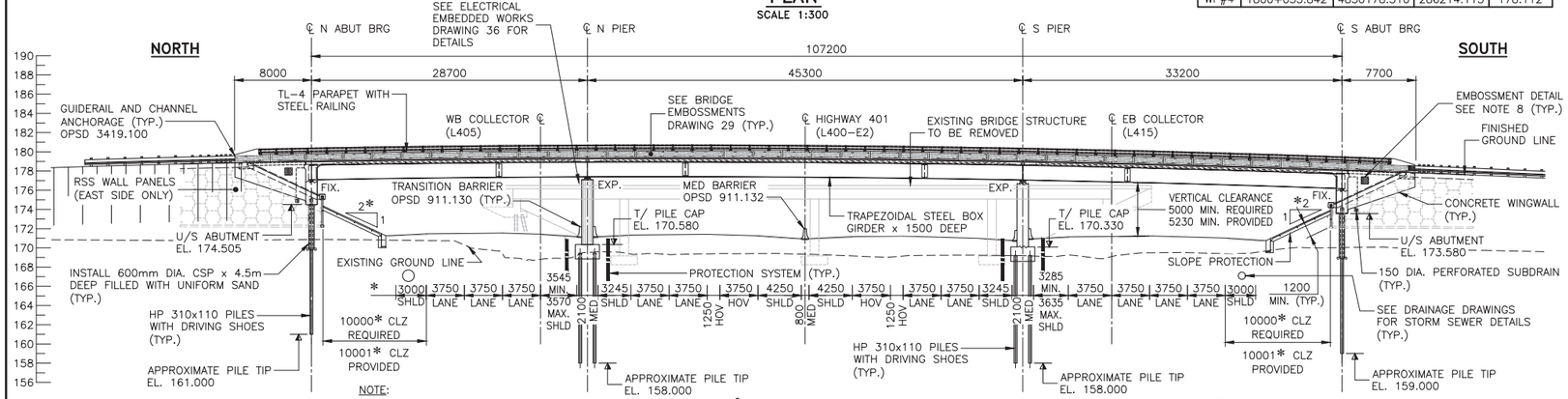

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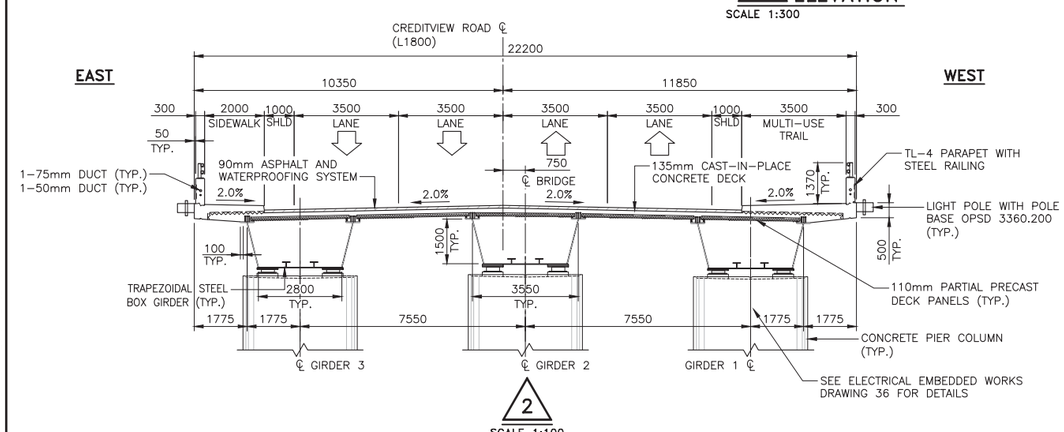

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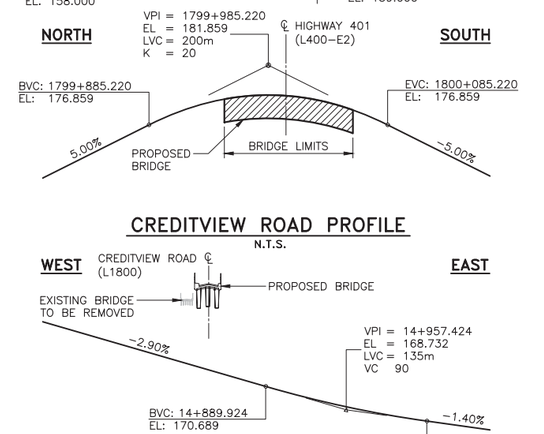

CREDITVIEW ROAD PROFILE
N.T.S.

HIGHWAY 401 PROFILE
N.T.S.

WORKING POINTS TABLE

POINT	STATION	NORTHING	EASTING	ELEVATION
WP#1	1799+948.642	4830254.732	286138.736	179.025
WP#2	1799+977.342	4830234.325	286158.917	179.343
WP#3	1800+022.642	4830202.116	286190.770	179.009
WP#4	1800+055.842	4830178.510	286214.115	178.112

METRIC
DIMENSIONS ARE IN METRES AND/OR MILLIMETRES UNLESS OTHERWISE SHOWN
DRAWING NOT TO BE SCALED
100mm ON ORIGINAL DRAWING

LIST OF DRAWINGS:

1. GENERAL ARRANGEMENT
2. BOREHOLE LOCATIONS & SOIL STRATA I
3. BOREHOLE LOCATIONS & SOIL STRATA II
4. CONSTRUCTION STAGING
5. FOUNDATION LAYOUT AND DETAILS
6. FOOTING REINFORCEMENT
7. NORTH ABUTMENT
8. SOUTH ABUTMENT
9. ABUTMENT REINFORCEMENT
10. WINGWALL DETAILS
11. NORTH ABUTMENT RSS WALL
12. SOUTH ABUTMENT RSS WALL
13. PIER DETAILS
14. PIER REINFORCEMENT
15. BEARING LAYOUT
16. STRUCTURAL STEEL I
17. STRUCTURAL STEEL II
18. STRUCTURAL STEEL III
19. STRUCTURAL STEEL IV
20. STRUCTURAL STEEL V
21. STRUCTURAL STEEL VI
22. STRUCTURAL STEEL VII
23. DECK LAYOUT AND SCREED ELEVATIONS
24. DECK REINFORCEMENT I
25. DECK REINFORCEMENT II
26. PRECAST DECK PANELS I
27. PRECAST DECK PANELS II
28. PARAPET WALL I
29. PARAPET WALL II
30. PARAPET WALL III
31. 6000mm APPROACH SLAB
32. EXPANSION JOINT I
33. EXPANSION JOINT II
34. CONCRETE SLOPE PAVING
35. STANDARD DETAILS
36. ELECTRICAL EMBEDDED WORKS

LIST OF ABBREVIATIONS

BRG	BEARING
HOV	HIGH OCCUPANCY VEHICLE
HWY	HIGHWAY
N	NORTH
S	SOUTH
SHLD	SHOULDER
MED	MEDIAN
WP	WORKING POINT
CLZ	CLEAR ZONE

APPLICABLE STANDARD DWGS:

OPSD 0912.430	GUIDE RAIL, STEEL BEAM STRUCTURE CONNECTION.
OPSD 2215.02	ANCHORAGE ASSEMBLY FOR LIGHTING AND SIGNAL POLES
OPSD 3101.150	WALLS, ABUTMENT, BACKFILL MINIMUM GRANULAR REQUIREMENTS
OPSD 3102.100	WALLS, ABUTMENT, BACKFILL, DRAIN
OPSD 3311.900	DECK GIRDERS, STEEL BOX ACCESS HATCH
OPSD 3360.100	DECK LIGHT POLE BASES STRUCTURES WITH BARRIER WALLS
OPSD 3360.200	DECK LIGHT POLE BASES STRUCTURES WITH PARAPET WALLS
OPSD 3370.100	DECK, WATERPROOFING, HOT APPLIED ASPHALT MEMBRANE WITH PROTECTION BOARD
OPSD 3370.101	DECK, WATERPROOFING, HOT APPLIED ASPHALT MEMBRANE AT ACTIVE CRACKS GREATER THAN 2mm WIDE AND CONSTRUCTION JOINTS
OPSD 3390.100	DECK, DRIP CHANNEL
OPSD 3419.100	BARRIERS AND RAILINGS – STEEL GUIDE RAIL AND CHANNEL ANCHORAGE
OPSD 3941.200	FIGURES IN CONCRETE, SITE NUMBER AND DATE, LAYOUT

GENERAL NOTES:

1. CLASS OF CONCRETE:

   DECK.....30 MPa
   PRECAST DECK PANELS.....40 MPa
   REMAINDER.....30 MPa
   UNLESS NOTED OTHERWISE

2. CLEAR COVER TO REINFORCING STEEL:

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

3. REINFORCING STEEL:

   REINFORCING STEEL SHALL BE GRADE 400W UNLESS OTHERWISE SPECIFIED.

   GLASS FIBRE REINFORCEMENT POLYMER REINFORCING BARS SHALL BE GRADE I, GRADE II OR GRADE III AS SPECIFIED IN THE CONTRACT DRAWINGS. THE NOMINAL DIAMETER, TENSILE MODULUS OF ELASTICITY AND GUARANTEED MINIMUM TENSILE STRENGTH SHALL BE AS SPECIFIED IN THE CONTRACT DOCUMENTS.

   BAR MARKS WITH PREFIX 'S' DENOTE STAINLESS STEEL BARS.

   STAINLESS REINFORCING STEEL SHALL BE TYPE 316LN OR DUPLEX 2205 AND HAVE MINIMUM YIELD STRENGTH OF 500 MPa, UNLESS NOTED OTHERWISE.

   UNLESS SHOWN OTHERWISE TENSION LAP SPLICES SHALL BE CLASS B.

   BAR HOOKS SHALL HAVE STANDARD HOOK DIMENSIONS USING MINIMUM BEND DIAMETERS, WHILE STIRRUPS AND TIES SHALL HAVE MINIMUM HOOK DIMENSIONS. ALL HOOKS SHALL BE IN ACCORDANCE WITH THE STRUCTURAL STANDARD DRAWING SS12–1 UNLESS INDICATED OTHERWISE.

4. RETAINED SOIL SYSTEM:

   RETAINED SOIL SYSTEM SHALL HAVE THE FOLLOWING ATTRIBUTES:

APPLICATION:	FALSE ABUTMENT
PERFORMANCE:	HIGH
APPEARANCE:	HIGH

5. ROADWAY CLASSIFICATION (HWY 401) : RFD 120
   ROADWAY CLASSIFICATION (CREDITVIEW ROAD) : UAD 80

6. REFER TO ROADWAY DRAWINGS FOR DETAILS OF HORIZONTAL AND VERTICAL ALIGNMENT AND GRADIENTS OF HWY 401 AND CROSSING ROADS.

7. EROSION AND SEDIMENT CONTROL MEASURES WILL BE INSTALLED IN ADVANCE OF THE WORKS.

8. EMBOSSMENT DETAIL TO BE DETERMINED BASED ON FURTHER CONSULTATION WITH THE CONTRACTING AUTHORITY.

CONSTRUCTION NOTES:

1. BACKFILL TO ABUTMENTS SHALL BE PLACED SIMULTANEOUSLY, KEEPING THE HEIGHT OF THE BACKFILL APPROXIMATELY THE SAME. AT NO TIME SHALL THE DIFFERENCE IN HEIGHTS OF THE BACKFILL BE GREATER THAN 500mm.

2. BACKFILL IN THE ABUTMENTS SHALL NOT BE PLACED UNTIL THE CONCRETE IN THE DECK HAS REACHED 70% OF ITS DESIGN STRENGTH.

3. CONSTRUCT ABUTMENTS TO THE BEARING SEAT ELEVATIONS. THE CONTRACTOR SHALL SUPPLY TEMPORARY LATERAL BRACING FOR THE ABUTMENTS. FORMWORK AND LATERAL BRACING SHALL NOT BE REMOVED UNTIL CONCRETE HAS REACHED A STRENGTH OF 25 MPa.

4. THE CONTRACTOR SHALL ESTABLISH THE BEARING SEAT ELEVATIONS BY DEDUCTING THE ACTUAL BEARING THICKNESSES FROM THE TOP OF BEARING ELEVATIONS. IF THE ACTUAL BEARING THICKNESSES ARE DIFFERENT FROM THOSE GIVEN WITH THE BEARING DESIGN DATA, THE CONTRACTOR SHALL ADJUST THE REINFORCING STEEL TO SUIT.

5. PROTECTION SYSTEM SHALL BE PERFORMANCE LEVEL 2. EXACT LOCATIONS AND LIMITS OF PROTECTION SYSTEM SHALL BE DETERMINED PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION WORKS.

LICENSED PROFESSIONAL ENGINEER Y.GAO 100171533 04 Dec 2019 PROVINCE OF ONTARIO

LICENSED PROFESSIONAL ENGINEER N.PAPASOTIRIOU 100194982 04 Dec 2019 PROVINCE OF ONTARIO

REVISIONS				
0	2019–12–02	YG	CONSTRUCTION DOCUMENT SUBMITTAL	
NO	DATE	BY	DESCRIPTION	

DESIGN	CH	CHK	YG	CODE CHBDC–S6–14	LOAD CL–625–ONT	DATE 2019–06–02	
DRAWN	SF	CHK	CH	SITE 24X–0127/BO		DWG	01

West Corridor Constructors — PARSONS

CONT No –
WP –

HIGHWAY 401 EXPANSION
CREDITVIEW UNDERPASS

GENERAL ARRANGEMENT

SHEET –

MINISTRY OF TRANSPORTATION, ONTARIO ANSI–D 2017–08

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FOR CONSTRUCTION

MINISTRY OF TRANSPORTATION, ONTARIO ANSI–D 2017–08

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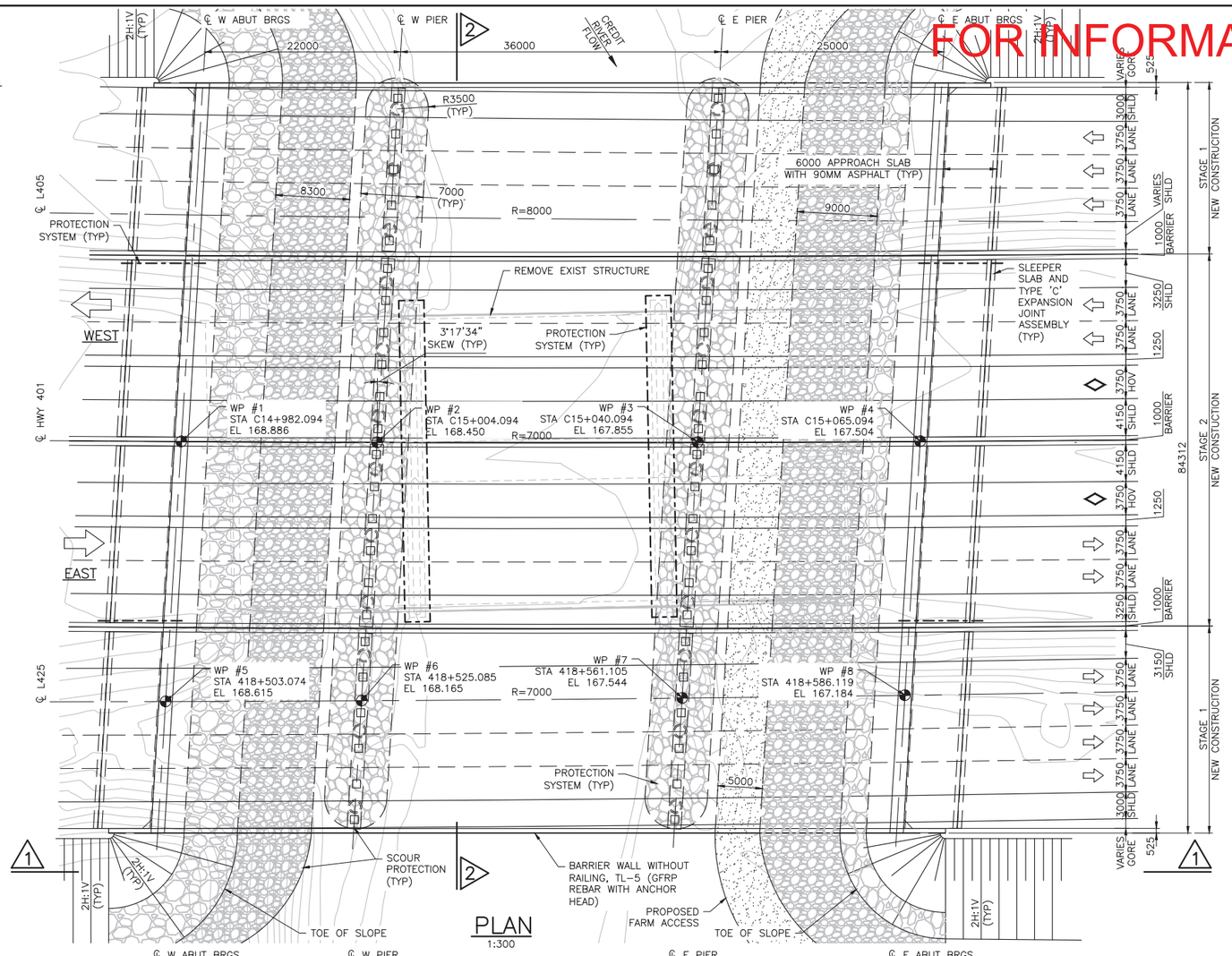

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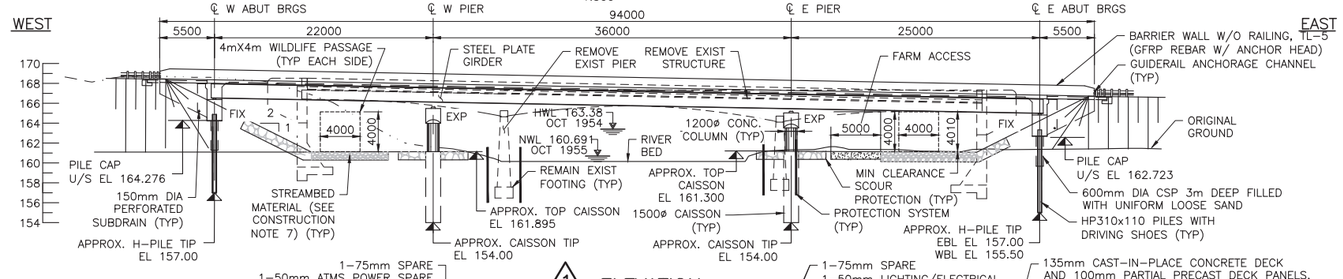

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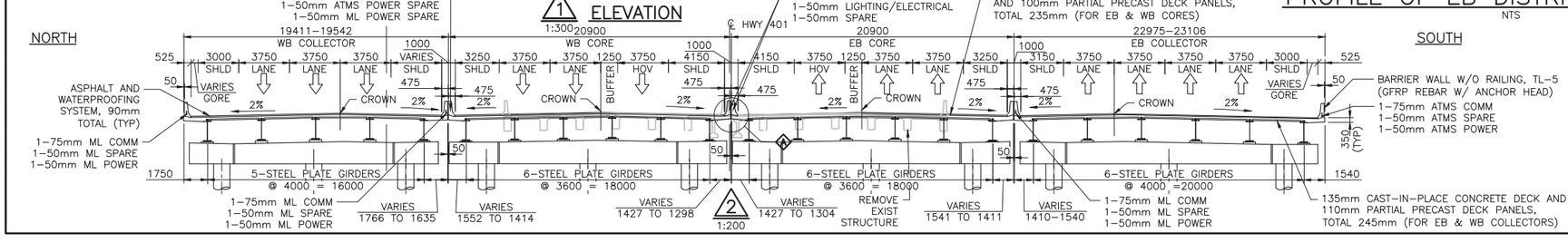


2
1:200

METRIC
DIMENSIONS ARE IN METRES AND/OR MILLIMETRES UNLESS OTHERWISE SHOWN

DRAWING NOT TO BE SCALED

100mm ON ORIGINAL DRAWING

LIST OF DRAWINGS:

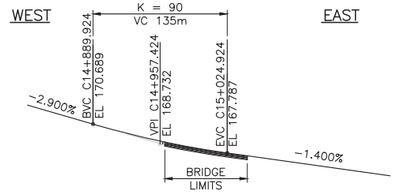
APPLICABLE STANDARD DRAWINGS:

OPSD 0912.430	GUIDE RAIL SYSTEM, STEEL BEAM STRUCTURAL CONNECTION.
OPSD 3101.150	WALL – ABUTMENT BACKFILL MINIMUM GRANULAR REQUIREMENTS.
OPDS 3311.900	DECK GIRDERS, STEEL BOX ACCESS HATCH.
OPSD 3370.100	DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE WITH PROTECTION BOARD.
OPSD 3370.101	DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE AT ACTIVE CRACKS GREATER THAN 2mm WIDE AND CONSTRUCTION JOINTS.
OPSD 3390.100	DECK DRIP CHANNEL.
OPSD 3419.100	BARRIERS AND RAILINGS – STEEL GUIDE RAIL AND CHANNEL ANCHORAGE.
OPSD 3941.210	FIGURES IN CONCRETE SITE NUMBERS AND DATE LAYOUT.
OPSD 3950.100	JOINTS CONCRETE EXPANSION AND CONSTRUCTION ON STRUCTURE

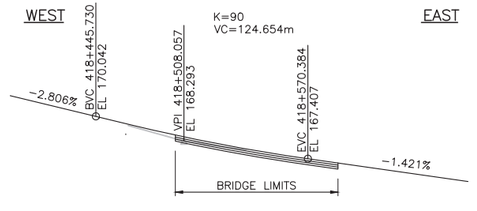
LIST OF ABBREVIATIONS:

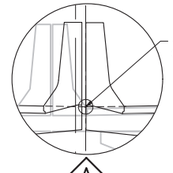
BRGS	BEARINGS	SCL	SPEED CHANGE LANE
EL	ELEVATION	SHLD	SHOULDER
FIX	FIXED	TL	TEST LEVEL
HOV	HIGH OCCUPANCY VEHICLE	WP	WORKING POINT

PROFILE OF HWY 401
NTS



PROFILE OF EB DISTRIBUTOR (L425)
NTS





GENERAL NOTES:

1. CLASS OF CONCRETE:
   DECK ..... 30 MPa
   PRECAST DECK PANELS ..... 40 MPa
   MASS CONCRETE ..... 20 MPa
   REMAINDER ..... 30 MPa
   UNLESS NOTED OTHERWISE
2. CLEAR COVER TO REINFORCING STEEL:
   FOOTINGS ..... 100±25
   DECK – TOP ..... 70±20
   DECK – BOTTOM ..... 40±10
   REMAINDER ..... 70±20
   UNLESS NOTED OTHERWISE.
3. REINFORCING STEEL:
   REINFORCING STEEL SHALL BE GRADE 400W UNLESS OTHERWISE SPECIFIED.
   BAR MARKS WITH PREFIX 'S' DENOTE STAINLESS STEEL BARS.
   STAINLESS REINFORCING STEEL IN PIER AND BARRIER WALLS SHALL BE TYPE 316LN OR DUPLEX 2205 AND HAVE MINIMUM YIELD STRENGTH OF 500 MPa UNLESS OTHERWISE SPECIFIED
   UNLESS SHOWN OTHERWISE TENSION LAP SPLICES SHALL BE CLASS B.
   BAR HOOKS SHALL HAVE STANDARD HOOK DIMENSIONS USING MINIMUM BEND DIAMETERS, WHILE STIRRUPS AND TIES SHALL HAVE MINIMUM HOOK DIMENSIONS. ALL HOOKS SHALL BE IN ACCORDANCE WITH THE STRUCTURAL STANDARD DRAWING SS12–1 UNLESS INDICATED OTHERWISE.
4. GFRP REINFORCING:
   BAR MARKS WITH THE PREFIX GIII DENOTE GRADE III GFRP BARS.
   GLASS FIBRE REINFORCED POLYMER (GFRP) REINFORCING BARS SHALL BE GRADE III AS SPECIFIED IN CONTRACT DOCUMENTS.
   THE NOMINAL DIAMETER, TENSILE MODULUS OF ELASTICITY AND GUARANTEED MINIMUM TENSILE STRENGTH SHALL BE AS SPECIFIED IN THE CONTRACT DOCUMENTS.
5. STRUCTURAL STEEL
   ALL STRUCTURAL STEEL SHALL CONFORM TO CSA/CSA–G40.20–04/G40.21–04. STRUCTURAL STEEL FOR SUPERSTRUCTURE MEMBERS SHALL BE GRADE 350AT CATEGORY 3 FOR PLATES AND 350A CATEGORY 2 FOR ROLLED SECTIONS. ROLLED SECTIONS SHALL CONFORM TO CSA STANDARD G40.20/G40.21 OR ASTM SPECIFICATION A588.
   ALL STRUCTURAL STEEL EXTERIOR SURFACE SHALL BE COATED FOR A DISTANCE OF 1000mm FROM THE FACE OF ABUTMENTS TOWARDS THE ENDS OF THE GIRDERS, AND FROM CENTRELINE PIER FOR A DISTANCE OF 1000mm BEYOND EACH FACE FOR EACH PIER CAP. THE COLOUR OF THE TOP COAT SHALL BE 10045 BROWN.
6. BOLTS ON ATMOSPHERIC CORROSION RESISTANT STEEL SHALL BE ASTM A325 TYPE 3, M22. BOLTS ON COATED STEEL SHALL BE GALVANIZED ASTM A325M TYPE 1, M22. BOLT THREADS SHALL BE EXCLUDED FROM THE SHEAR PLANES.
7. STUD SHEAR CONNECTORS SHALL BE 22mm DIA. AND SHALL CONFORM TO ASTM A108 AND SCA W59.
8. ROADWAY CLASSIFICATION (HWY 401) : RFD 120
9. REFER TO ROADWAY DRAWINGS FOR DETAILS OF HORIZONTAL AND VERTICAL ALIGNMENT AND GRADIENTS OF HWY 401 AND CROSSING ROADS.
10. ESC MEASURES WILL BE INSTALLED PRIOR TO WORKS PROCEEDING.

CONSTRUCTION NOTES:

1. BACKFILL TO ABUTMENTS SHALL BE PLACED SIMULTANEOUSLY, KEEPING THE HEIGHT OF THE BACKFILL APPROXIMATELY THE SAME. AT NO TIME SHALL THE DIFFERENCE IN HEIGHTS OF THE BACKFILL BE GREATER THAN 500mm.
2. BACKFILL IN THE ABUTMENTS SHALL NOT BE PLACED UNTIL THE CONCRETE IN THE DECK SLAB HAS REACHED 70% OF IT DESIGN STRENGTH.
3. CONSTRUCT ABUTMENTS TO THE BEARING SEAT ELEVATIONS. SUPPLY TEMPORARY LATERAL BRACING FOR THE ABUTMENTS. FORMWORK AND LATERAL BRACING SHALL NOT BE REMOVED UNTIL CONCRETE HAS REACHED 70% OF ITS SPECIFIED 25 DAY STRENGTH.
4. PROTECTION SYSTEM SHALL BE PERFORMANCE LEVEL 2. EXACT LOCATIONS AND LIMITS OF PROTECTION SYSTEM SHALL BE DETERMINED PRIOR TO COMMENCEMENT OF ANY CONSTRUCTION WORK.
5. BIRD NESTING PROTECTION SHALL BE PROVIDED TO THE GIRDER BOTTOM FLANGE FOR THE FULL LENGTH OF THE GIRDER AND ALL ACCESSIBLE BEARING SEATS.
6. EROSION AND SEDIMENT CONTROL MEASURE SHALL BE INSTALLED PRIOR TO THE COMMENCEMENT OF THE CONSTRUCTION. REFER TO STAGING DRAWINGS FOR DETAILS.
7. THE SUBSTRATE SHALL BE NATIVE SOIL MATERIAL, MEDIUM TO LARGE SIZE STONE, INTERSTITIAL SPACE FILLED WITH SMALL MATERIAL. NO RIP RAP SHALL BE USED.

HATCH | West Corridor Constructors | PARSONS

CONT No –
WP –

HWY 401 EXPANSION
CREDIT RIVER BRIDGE

GENERAL ARRANGEMENT

SHEET –

REVISIONS				
B	2019–02–07	AL	FINAL DEVELOPMENT SUBMITAL	
A	2019–10–31	AL	PRE–FINAL DEVELOPMENT SUBMITAL	
NO	DATE	BY	DESCRIPTION	

DESIGN	AL	CHK	AF	CODE CAN/CSA S6–14	LOAD CL–625–ONT	DATE	OCT 2019
DRAWN	FP	CHK	AL	SITE 24X–0128/B1,2,3&4		DWG	01

DOCUMENT CODE: WCC–BR22–STR–00001

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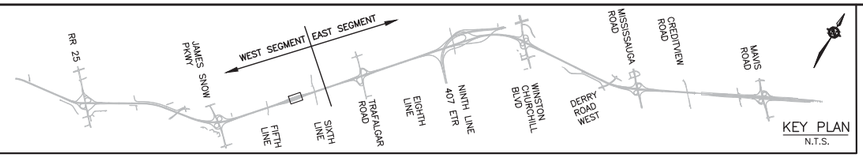


METRIC
DIMENSIONS ARE IN METRES AND/OR MILLIMETRES UNLESS OTHERWISE SHOWN

20m 0 20 40 60
1:1000

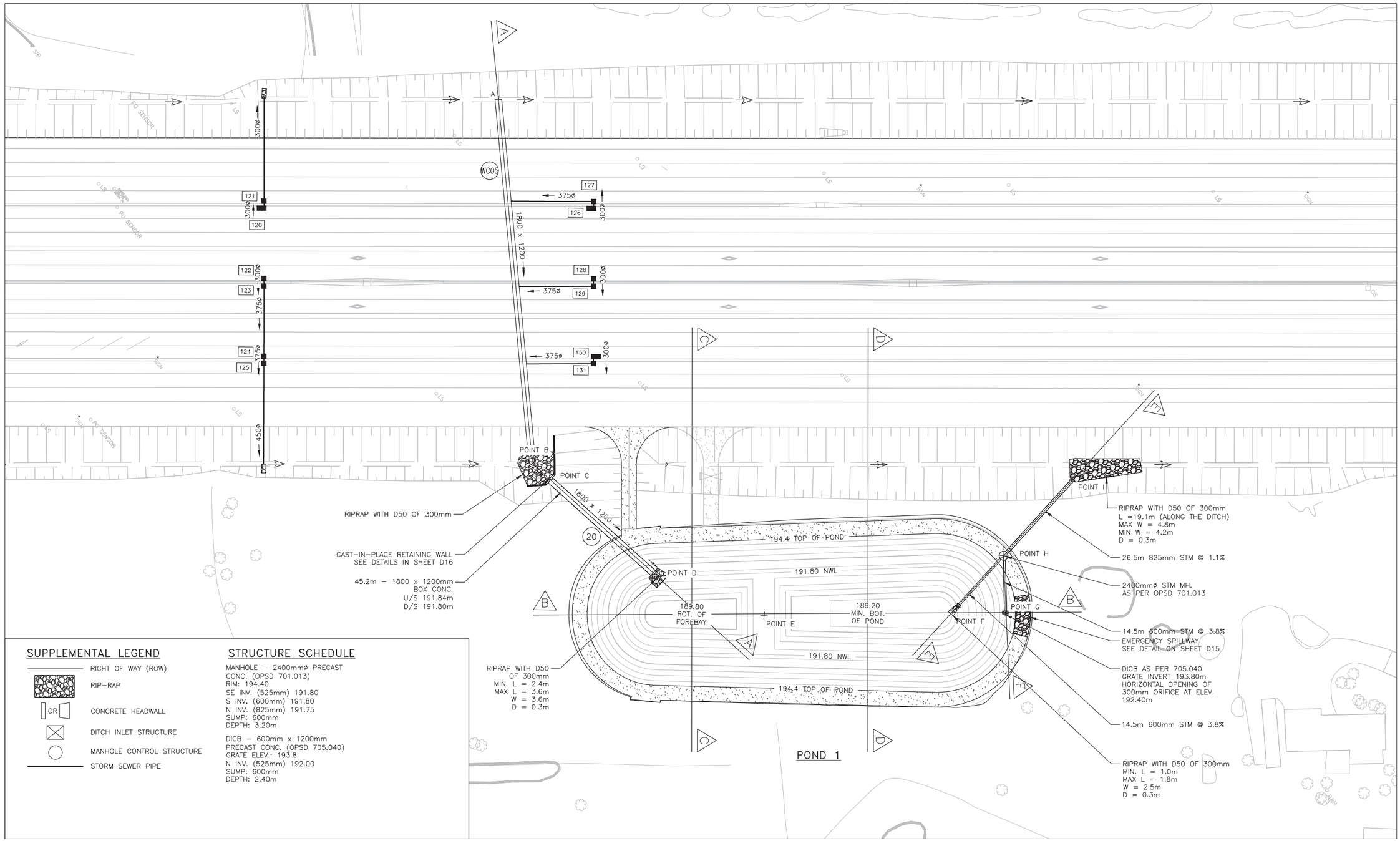
HARCH DILLON CONSULTING | West Corridor Constructors | PARSONS

CONT
WP

HWY 401
WEST POND 1 – PLAN
STA TO STA
Survey _____ Revised _____

SHEET
D12

FOR INFORMATION ONLY



SUPPLEMENTAL LEGEND

- RIGHT OF WAY (ROW)
- RIP–RAP
- OR CONCRETE HEADWALL
- DITCH INLET STRUCTURE
- MANHOLE CONTROL STRUCTURE
- STORM SEWER PIPE

STRUCTURE SCHEDULE

MANHOLE – 2400mmø PRECAST
CONC. (OPSD 701.013)
RIM: 194.40
SE INV. (525mm) 191.80
S INV. (600mm) 191.80
N INV. (825mm) 191.75
SUMP: 600mm
DEPTH: 3.20m

DICB – 600mm x 1200mm
PRECAST CONC. (OPSD 705.040)
GRATE ELEV.: 193.8
N INV. (525mm) 192.00
SUMP: 600mm
DEPTH: 2.40m

MINISTRY OF TRANSPORTATION, ONTARIO — HWY-401-2016

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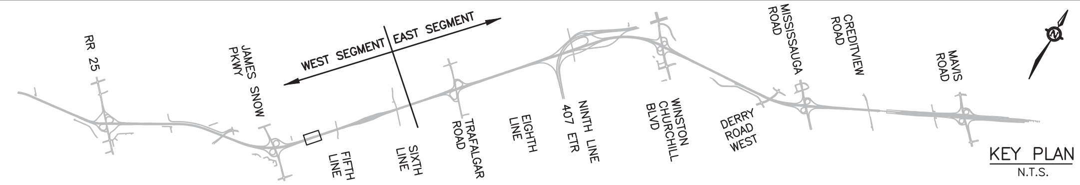

METRIC
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HATCH DILLON CONSULTING West Corridor Constructors PARSONS

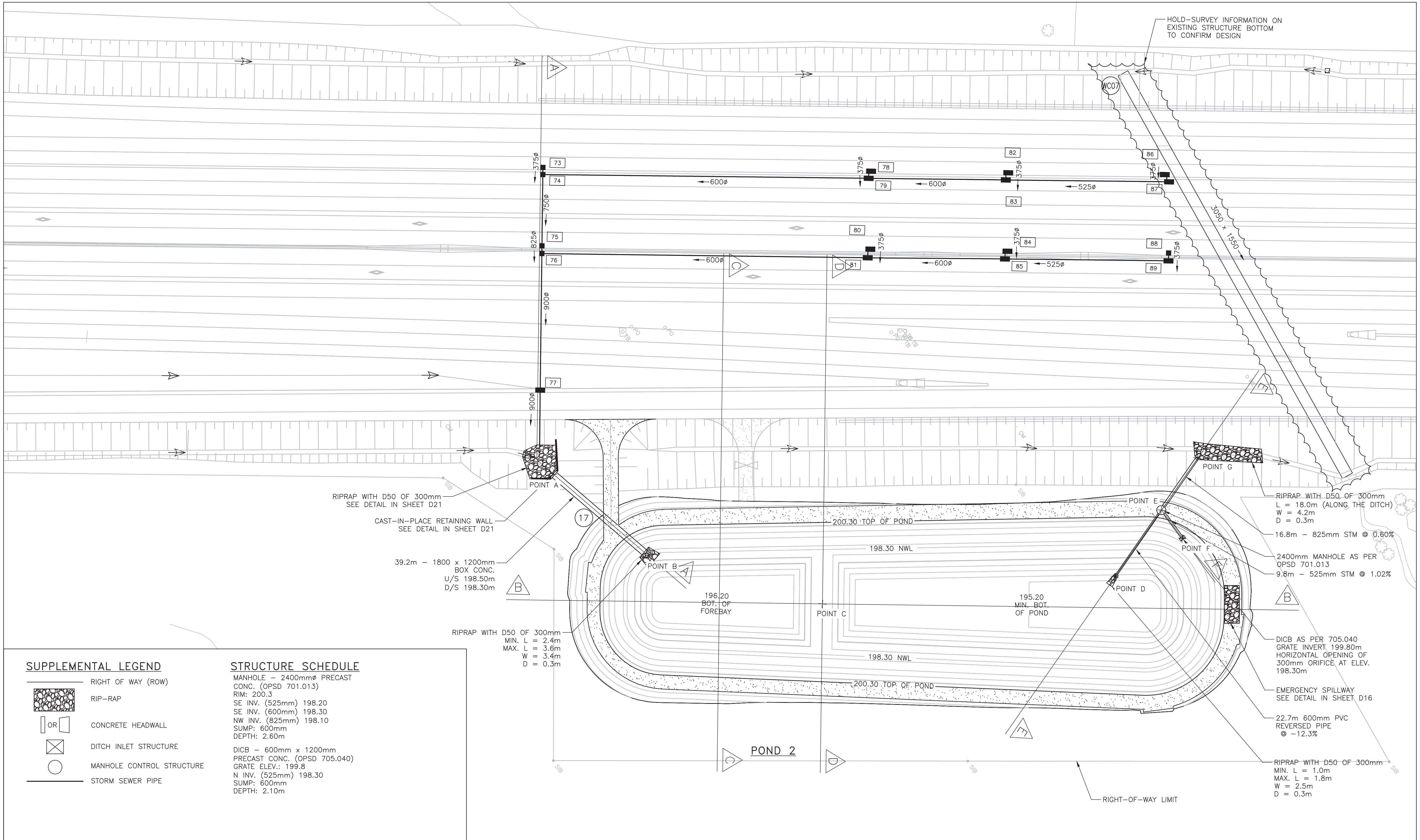
CONT
WP

HWY 401
WEST POND 2 – PLAN
STA TO STA
Survey Revised

SHEET
D17

2016-10
ANSI-D
MINISTRY OF TRANSPORTATION, ONTARIO

FOR INFORMATION ONLY



SUPPLEMENTAL LEGEND

- RIGHT OF WAY (ROW)
- RIP-RAP
- OR CONCRETE HEADWALL
- DITCH INLET STRUCTURE
- MANHOLE CONTROL STRUCTURE
- STORM SEWER PIPE

STRUCTURE SCHEDULE

MANHOLE – 2400mmø PRECAST CONC. (OPSD 701.013)
RIM: 200.3
SE INV. (525mm) 198.20
SE INV. (600mm) 198.30
NW INV. (825mm) 198.10
SUMP: 600mm
DEPTH: 2.60m

DICB – 600mm x 1200mm PRECAST CONC. (OPSD 705.040)
GRATE ELEV.: 199.8
N INV. (525mm) 198.30
SUMP: 600mm
DEPTH: 2.10m

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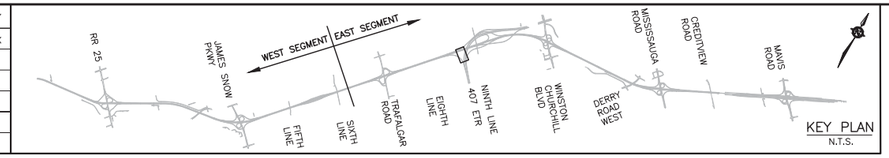

METRIC
DIMENSIONS ARE IN METRES AND/OR MILLIMETRES UNLESS OTHERWISE SHOWN

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HATCH | West Corridor Constructors | PARSONS

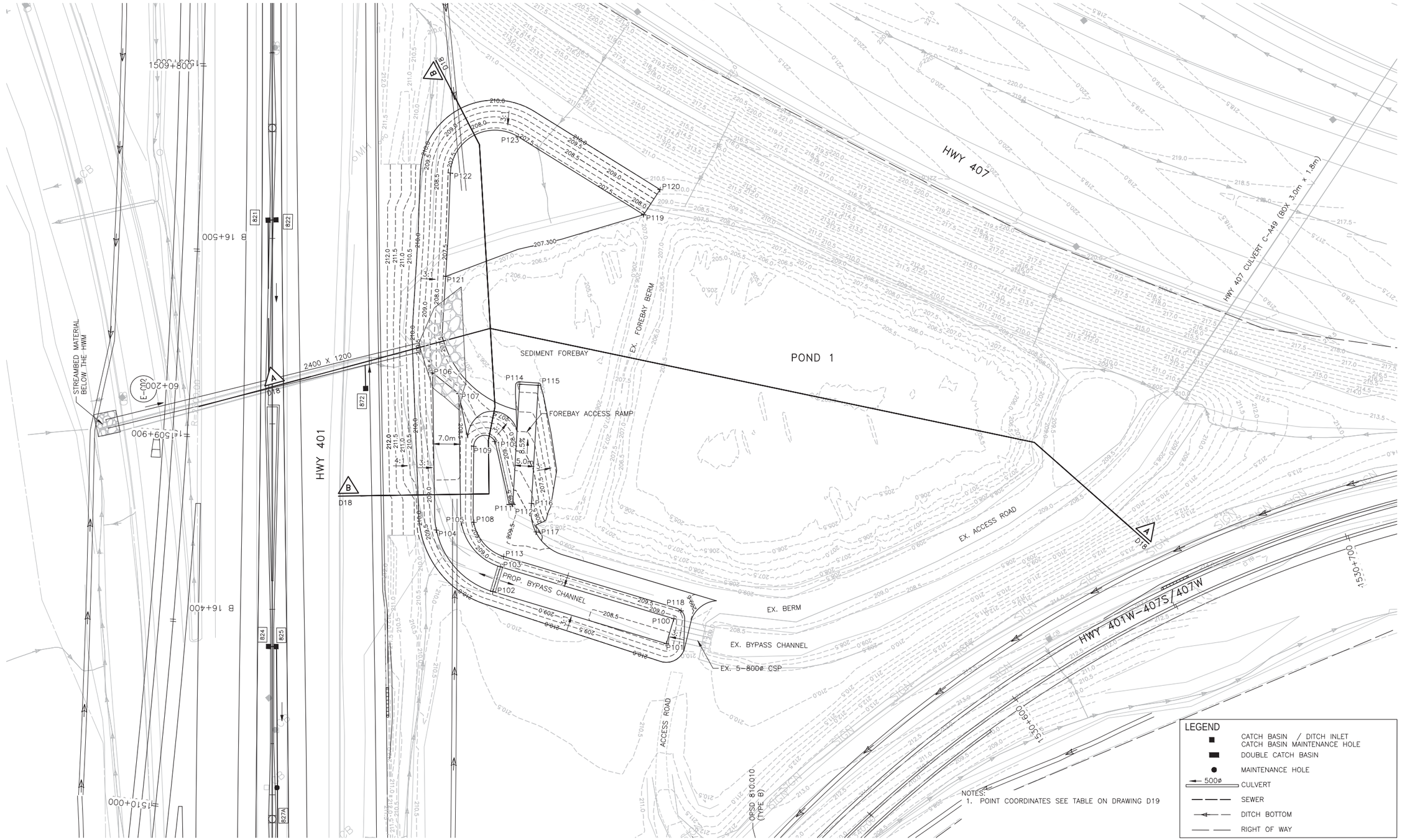
CONT
WP

DRAINAGE PLAN
407ETR POND 1

Survey _____ Revised _____

SHEET
D17

FOR INFORMATION ONLY



MINISTRY OF TRANSPORTATION, ONTARIO 2016-10

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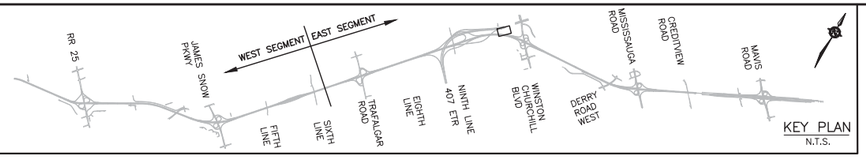

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HATCH | West Corridor Constructors | PARSONS

CONT
WP

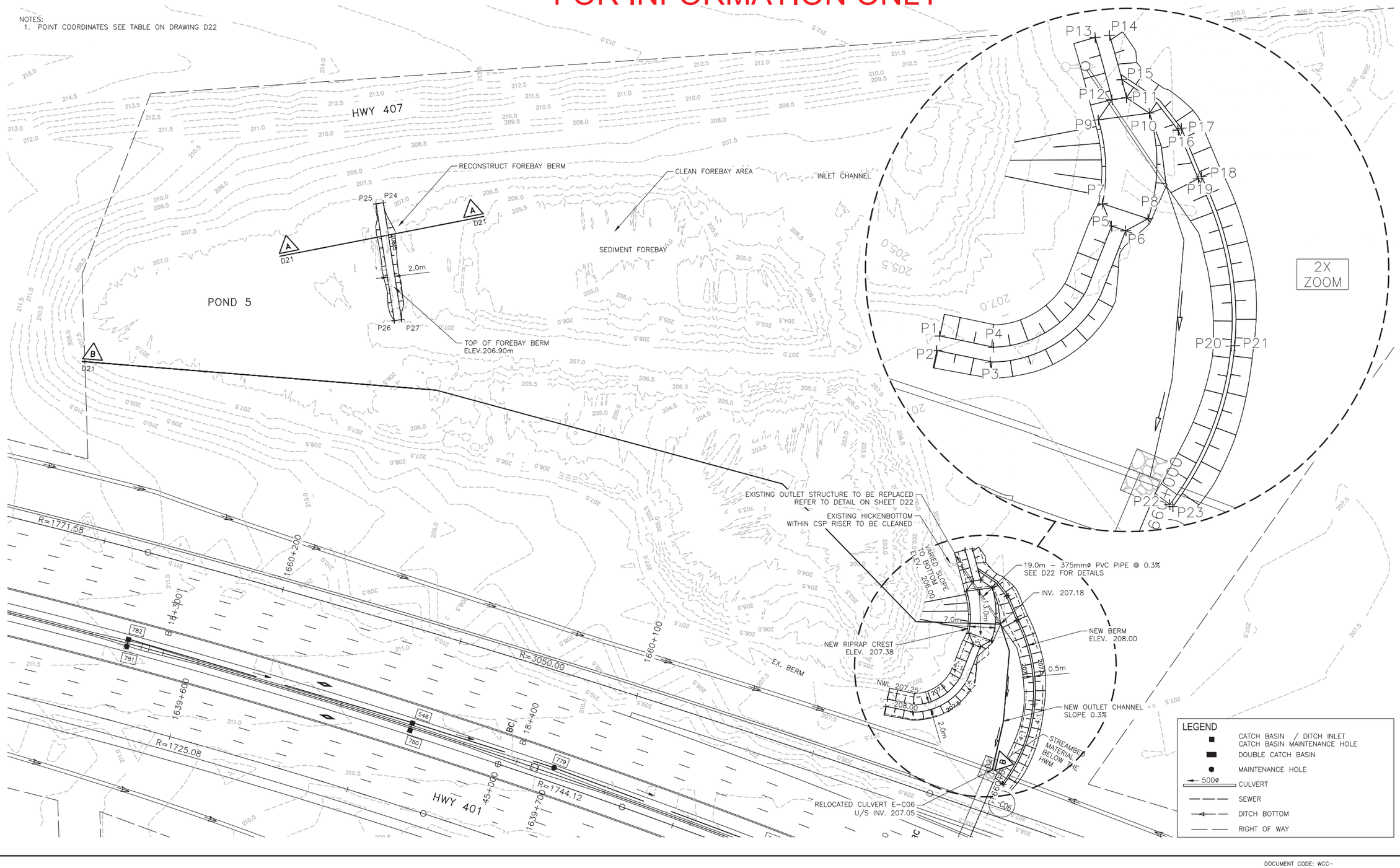
DRAINAGE PLAN
407ETR POND 5

Survey _____ Revised _____

SHEET
D20

FOR INFORMATION ONLY

NOTES:
1. POINT COORDINATES SEE TABLE ON DRAWING D22



LEGEND
- CATCH BASIN / DITCH INLET
- CATCH BASIN MAINTENANCE HOLE
- DOUBLE CATCH BASIN
- MAINTENANCE HOLE
- 500ø CULVERT
- SEWER
- DITCH BOTTOM
- RIGHT OF WAY

MINISTRY OF TRANSPORTATION, ONTARIO ANSI-D 2015-10

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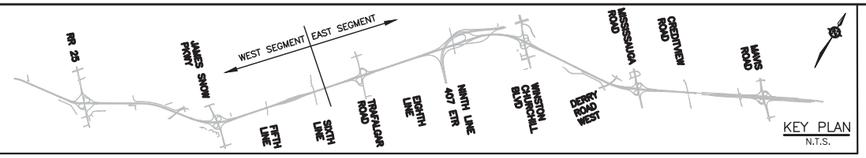

METRIC

DIMENSIONS ARE IN METRES AND/OR MILLIMETRES UNLESS OTHERWISE SHOWN

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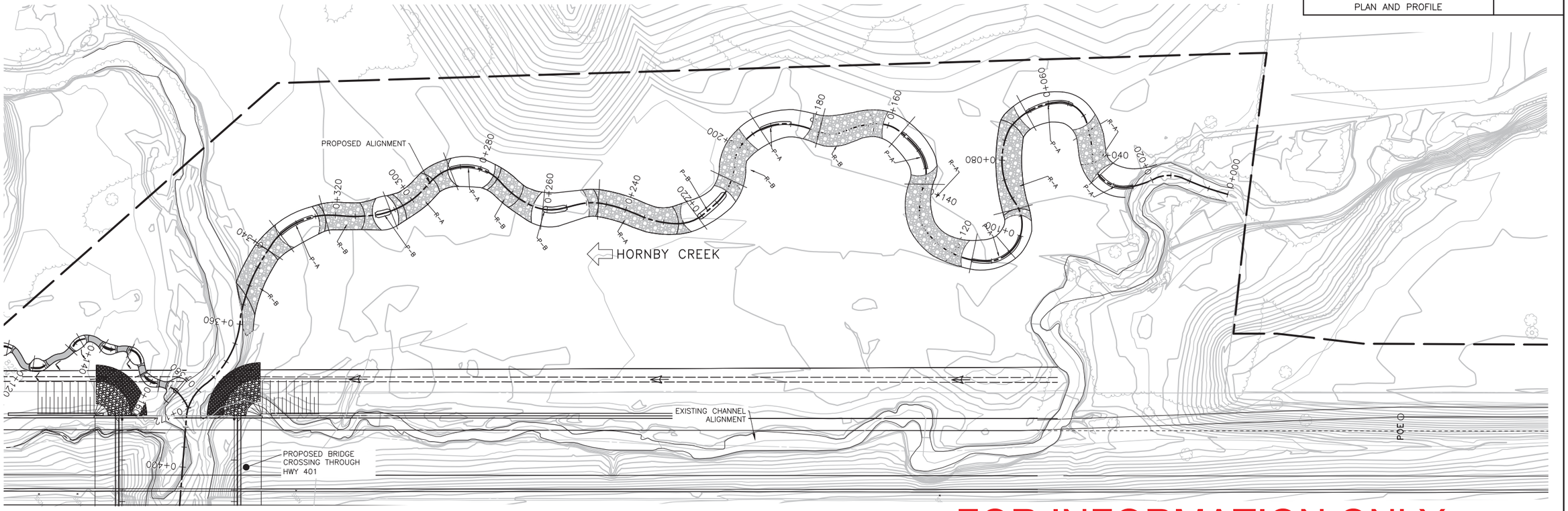
HATCH | West Corridor Constructors | PARSONS

CONT
WP

HWY 401 EXPANSION

HORNBY CREEK
W-C11A (WC-19)
PLAN AND PROFILE

SHEET
G31



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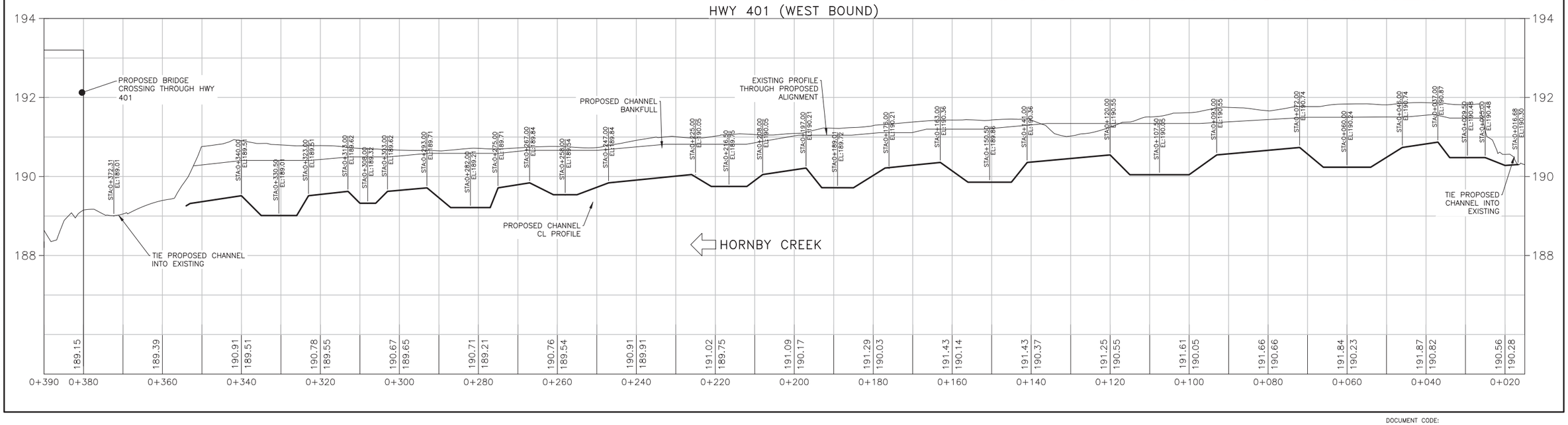

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MINISTRY OF TRANSPORTATION, ONTARIO ANSI–D 2016–10

DOCUMENT CODE:

Appendix D

Fish and Fish Habitat Mapping

REGIONAL ROAD 25

HIGHWAY 401

MARTIN STREET

WC-01

WC-02

WC-03

WC-04

WC-05

WC-06

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Legend

- Highway 401 Expansion Project Limits
- Flow Direction

Flow Regime, Thermal Regime, Classification

- Ephemeral , Warm , Indirect Fish Habitat
- Intermittent , Cool , Direct Fish Habitat
- Permanent , Cool , Direct Fish Habitat

Highway 401 Expansion

Fisheries Watercourses WC01, WC02, WC03, WC04, WC05, WC06

0 25 50 100 150 200 250 Metres

Date: 12/18/2019	1:5,000 * when printed 11"x17"	Datum: NAD 1983 MTM 10 Source: MNRF, MTO

West Corridor Constructors

Appendix D

N

WC-11

HIGHWAY 401

WC-12

STEELES AVENUE EAST

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Legend

Highway 401 Expansion Project Limits

Flow Direction

Flow Regime, Thermal Regime, Classification

Permanent , Warm , Direct Fish Habitat

Highway 401 Expansion

Fisheries Watercourses WC11

0 10 20 40 60 80 100 Metres

Date: 12/17/2019	1:2,000 * when printed 11"x17"	Datum: NAD 1983 MTM 10 Source: MNRF, MTO

West Corridor Constructors

Appendix D

N

Legend

- Highway 401 Expansion Project Limits
- Flow Direction

Flow Regime, Thermal Regime, Classification

- Intermittent , Warm , Direct Fish Habitat

Highway 401 Expansion

Fisheries Watercourses WC14

0 15 30 60 90 120 150 Metres

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12/18/2019	1:3,000 * when printed 11"x17"	Source: MNRF, MTO

West Corridor Constructors

Appendix D

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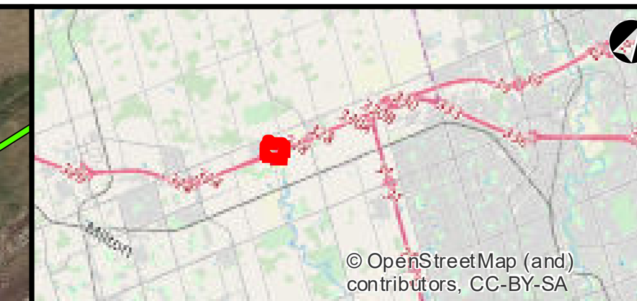

Legend

- Highway 401 Expansion Project Limits
- Watercourse
- Flow Direction

Flow Regime, Thermal Regime, Classification

- Permanent , Cool , Direct Fish Habitat

Highway 401 Expansion

Fisheries Watercourses WC18, WC18A, WC19

0 10 20 40 60 80 100 Metres

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West Corridor Constructors

Appendix D

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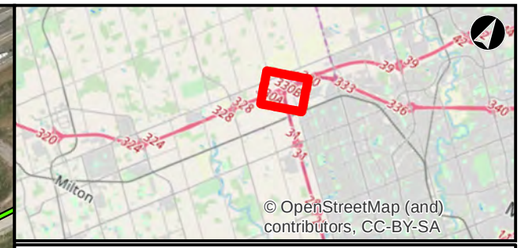

Legend

- Highway 401 Expansion Project Limits
- Flow Direction

Flow Regime, Thermal Regime, Classification

- Ephemeral , Warm , Indirect Fish Habitat
- Intermittent , Warm , Direct Fish Habitat
- Permanent , Warm , Direct Fish Habitat

Highway 401 Expansion

Fisheries Watercourses WC24, WC25, WC25 North, WC25A, WC26, WC27, WC27A

0 25 50 100 150 200 250 Metres

Date: 12/11/2019	1:5,500 * when printed 11"x17"	Datum: NAD 1983 MTM 10 Source: MNRF, MTO

West Corridor Constructors

Appendix D

N

Legend

- Highway 401 Expansion Project Limits
- Watercourse
- Flow Direction

Flow Regime, Thermal Regime, Classification

- Permanent , Cool , Direct Fish Habitat

Highway 401 Expansion

Fisheries Watercourses WC36

0 10 20 40 60 80 100 Metres

Date: 12/16/2019	1:2,000 * when printed 11"x17"	Datum: NAD 1983 MTM 10 Source: MNRF, MTO

West Corridor Constructors

Appendix D

N

Appendix E

Tables of Environmental Concerns and Commitments from Preliminary Design

Highway 401 Improvements from East of the Credit River to Trafalgar, Preliminary Design and Class Environmental Assessment Study, W.O. 07-20021 (May 2013)

Table 9-8: Summary of Environmental Concerns, Mitigating Measures and Commitments to Future Work

Legend	
DFO: Fisheries and Oceans Canada	**MUN: Municipalities**
MNR: Ministry of Natural Resources *(now known as Ministry of Natural Resources and Forestry (MNRF))*	**RES / BUS: Area residents and/or businesses**
MTO: Ministry of Transportation	**UTIL: Utilities**
CA: Conservation Authority	**MTCS: Ministry of Tourism, Culture and Sport** *(now known as Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI))*
MOE: Ministry of the Environment *(now known as Ministry of Environment, Conservation, and Parks (MECP))*	**CPR: Canadian Pacific Railway**

Note: The below is presented exactly as written in the TESR, except for column 'Commitment Addressed in DCR #2 Detail Design'

Ref No.	Environmental Concern and Potential impact	Concerned Agencies	ID No.	Mitigation / Commitment to Future Work	Commitment Considered and Addressed in DCR No. 2 Detail Design?
1	**Fisheries and Aquatic Habitat** (Bridge replacement / widening and culvert extensions, Mullet Creek realignment)	DFO MNR MTO CA	1.1	Operate and store all materials and equipment in such a manner that prevents any deleterious substance from entering the water	Yes, and carried forward to Detail Design Mitigation and Commitments.
			1.2	Incorporate appropriate timing constraints to ensure work avoids critical life stages: • All culvert crossings within the study area will require all in-water construction (i.e. removal of the existing bridge piers) to be completed during the warmwater window of July 1 to warmwater window of July 1 to March 31; and • The Credit River bridge crossing will require all in-water construction to be completed during the warmwater / coldwater window of July 1 to September 15 accommodate the coldwater migratory species present.	Yes, updated existing conditions and timing windows provided for the watercourses in DCR No. 2 (Section 5.1.3). Adherence to in-water timing windows included in Detail Design Mitigation and Commitments.
			1.3	Consider construction staging such that spills and leaks into the watercourse will be avoided or minimized	Yes, and carried forward to Detail Design Mitigation and Commitments
			1.4	Apply standard Erosion and Sediment Control (ESC) measures (e.g. silt fence, silt curtain, sedimentation basins, etc.) consistent with MTO Best Management Practices and Ontario Provincial Standards and Specifications (OPSS) to ensure no effects to the surface waters. The control measures shall be implemented prior to work and shall be maintained during construction and until disturbed areas have been effectively stabilized with permanent vegetation cover	Yes, and carried forward to Detail Design Mitigation and Commitments.
			1.5	Minimize the disturbance or removal of riparian vegetation	Yes, removal of vegetation has been minimized and covered in DCR No. 1.
			1.6	Promptly stabilize and re-vegetated all disturbed areas of the work site, and/or treat the area with appropriate erosion protection materials. In riparian and aquatic habitats, all temporarily disturbed areas will be reinstated to original condition, or better, upon completion of works	Yes, and carried forward to Detail Design Mitigation and Commitments.
			1.7	Store and stabilize any stockpiled materials away from the water	Yes, and carried forward to Detail Design Mitigation and Commitments.
			1.8	Design crossings to minimize loss of functional channel bed and maintain groundwater discharge	Yes, this has been considered in the design.
			1.9	Integrate deeper water habitat into any inlet or outlet treatments	Yes, this has been integrated in the design of all watercourse crossings, where applicable.

Table 9-8: Summary of Environmental Concerns, Mitigating Measures and Commitments to Future Work

Ref No.	Environmental Concern and Potential impact	Concerned Agencies	ID No.	Mitigation / Commitment to Future Work	Commitment Considered and Addressed in DCR No. 2 Detail Design?
			1.10	Isolate work area to facilitate work in “the dry”	Yes, and carried forward to Detail Design Mitigation and Commitments.
			1.11	Capture any fish trapped within the isolated construction area and release them downstream of the site	Yes, and carried forward to Detail Design Mitigation and Commitments.
			1.12	Any stockpiled materials shall be stored and stabilized at least 30 m away from the watercourse. A single row of silt fencing (double row in the event that SAR are present) will be installed along the down slope perimeter to prevent the mobilization of the stockpile.	Yes, and carried forward to Detail Design Mitigation and Commitments
			1.13	Any equipment entering the water shall be free of fluid leaks and externally cleaned or degreased to prevent contamination of the water.	Yes, and carried forward to Detail Design Mitigation and Commitments
			1.14	Mitigation Measures for Dewatering Activities: Dewatering activities where fish are present will include fish removal	Yes, and carried forward to Detail Design Mitigation and Commitments
			1.15	Pumps shall be fitted with screens or barriers to effectively prevent fish entrainment during dewatering	Yes, and carried forward to Detail Design Mitigation and Commitments
			1.16	All stranded fish are to be captured and relocated to adjacent channels sections outside the work area	Yes, and carried forward to Detail Design Mitigation and Commitments
			1.17	Silt laden discharge water from dewatering activities will be directed away from the watercourse in such a way as to minimize sedimentation. The discharge outlets will be located a minimum of 30 m from a watercourse and within a vegetated area. The discharge drainage must not flow through the construction site. Filter rings and filter bags may be utilized for the outflow.	Yes, and carried forward to Detail Design Mitigation and Commitments.
			1.18	The discharge from the dewatering will be monitored to ensure changes to the flow path or scour does not develop and result in sediment entering any watercourse.	Yes, Monitoring discussed in Section 7.2.
			1.19	Works at Mullet Creek (north side between Highway 401 and Derry Road) • Armoring the side slopes / banks to avoid impacts to the creek and floodplain are proposed to mitigate the need for channel realignment; and • In the event that creek realignment is required, a fluvial assessment as well as an assessment of impacts to fish and fish habitat shall be undertaken during detail design.	Not Applicable for DCR No. 2 but will be addressed in DCR No. 3
2	**Erosion and Sediment** (Potential impacts to watercourses include short-term water quality deterioration)	MOE MNR MTO MUN	2.1	Install temporary ESC measures (i.e. silt fences) prior to construction and maintain throughout construction, as required	Yes, and additional Detail Design Mitigation and Commitments carried forward
			2.2	Install flow checks and ground stabilization as necessary	Yes, and additional Detail Design Mitigation and Commitments carried forward
			2.3	Routinely inspect ESC structures, including after storms, and repair as required	Yes, and additional Detail Design Mitigation and Commitments carried forward
			2.4	All ESC measures shall be monitored by a qualified environmental inspector. Inspections are to be conducted during in water construction activities until the site is stabilized and until the silt fencing is removed	Yes, and additional Detail Design Mitigation and Commitments carried forward
			2.5	All exposed soils shall be treated with appropriate erosion protection to prevent sediment laden water from entering any water body.	Yes, and additional Detail Design Mitigation and Commitments carried forward

Table 9-8: Summary of Environmental Concerns, Mitigating Measures and Commitments to Future Work

Ref No.	Environmental Concern and Potential impact	Concerned Agencies	ID No.	Mitigation / Commitment to Future Work	Commitment Considered and Addressed in DCR No. 2 Detail Design?
3	**Groundwater**	MOE MNR MTO MUN	3.1	The following mitigation measures are proposed to manage the potential impacts: A pre-construction water well survey shall be conducted to document the baseline conditions of water wells within the study area	Yes, baseline well monitoring completed. Groundwater Monitoring Program carried forward to Detail Design Mitigation and Commitments and detailed in Section 7.2.
			3.2	Any wells to be removed during the highway improvement activities will have to be decommissioned properly as per the Ontario Wells Regulation (R.R.O. 1990, Reg. 903)	Yes, and carried forward to Detail Design Mitigation and Commitments.
			3.3	Limit the depth of excavation and minimize the need for dewatering during construction, particularly in areas designated as having a high potential for groundwater impact (i.e. where creeks and their tributaries cross Highway 401)	Yes, and carried forward to Detail Design Mitigation and Commitments.
			3.4	If dewatering is required, dewatering activities shall be conducted in accordance with approved control procedures; a Permit to Take Water must be obtained from MOE if the amount of water taken exceeds 50 m^3/day;	Yes, and carried forward to Detail Design Mitigation and Commitments. The thresholds for requiring a PTTW have changed since the TESR and are updated in the DCR. A Permit to Take Water will be obtained.
			3.5	Minimize disturbance to existing vegetation and grassed slopes where re-grading is required (disturbed areas shall be re-vegetated as quickly as possible after completion of construction activities)	Yes, removal of vegetation has been minimized and covered in DCR No. 1.
			3.6	Implement stormwater management measures to protect water quality that may infiltrate groundwater resources	Yes, considered in the design. Stormwater management discussed in Section 4.3.
			3.7	Prepare and implement a spill prevention and control management plan	Yes, and carried forward to Detail Design Mitigation and Commitments.
			3.8	Follow best management practices for road de-icing applications	Yes, and carried forward to Detail Design Mitigation and Commitments as applicable for WCC's construction work zone.
4	**Drainage and Hydrology**	MNR MTO CA MUN	4.1	Use of enhanced grass swales (flat bottom ditches and V-shaped ditches);	Yes, grassed-lined flat bottom ditches have been designed to convey the drainage and improve the runoff quality; V-shaped ditches included in few locations where ROW is a constraint.
			4.2	Use of existing SWMPs at the Highway 401 / 407ETR interchange where practical	Yes. Two existing ponds at the Highway 401 / 407ETR interchange will be retrofitted and one existing pond cleaned out to accommodate the drainage from the Project. Refer to Section 4.3.

Table 9-8: Summary of Environmental Concerns, Mitigating Measures and Commitments to Future Work

Ref No.	Environmental Concern and Potential impact	Concerned Agencies	ID No.	Mitigation / Commitment to Future Work	Commitment Considered and Addressed in DCR No. 2 Detail Design?
			4.3	Implement on-site SWM controls for the expanded/ improved and proposed carpool lots.	The SWM strategy developed for the Project covers proposed carpool lots. Detention ditches will address runoff quantity control at carpool lots
5	**Terrestrial Ecosystems** (Removal of edge vegetation within forest communities and ornamental vegetation / hedgerows)	MNR MTO MUN CA	5.1	Forests and woodlots will be delineated-and marked in the field, and disturbance to these areas will be minimized or avoided during construction	Yes, and additional Detail Design Mitigation and Commitments carried forward
			5.2	Where tree or vegetation protection is required, exclusion zones will be delineated with appropriate fencing prior to construction works. Tree exclusion zones will consider sensitive species and set dripline boundaries appropriately as required	Yes, and additional Detail Design Mitigation and Commitments carried forward
			5.3	Temporarily disturbed areas (i.e. those to be graded) will be restored and restoration seeding / planting will include appropriate native species	Not Applicable for DCR No. 2 but will be addressed in DCR No. 3. Detail Design Mitigation and Commitment for Landscape and Restoration Plan included in Section 5.1.6.
			5.4	Vegetation clearing will be kept to a minimum necessary to access and complete the approved design. Tree removal and vegetation clearing adjacent to the drainage features will consist of cutting of woody vegetation and leaving roots left in place (no grubbing) where possible	Not applicable for DCR No. 2. Vegetation clearing and grubbing covered in DCR No. 1.
			5.5	All disturbed areas of the work site shall be stabilized and re-vegetated promptly, and/or treated with appropriate erosion protection materials. In riparian and aquatic habitats, all temporarily disturbed areas will be reinstated to original condition, or better, upon completion of works	Yes, and carried forward to Detail Design Mitigation and Commitments.
			5.6	Native seed mix will be used to stabilize exposed soils. Seed restoration that is to occur late in the growing season may include a nurse crop.	Not Applicable for DCR No. 2 but will be addressed in DCR No. 3. Detail Design Mitigation and Commitment for Landscape and Restoration Plan included in Section 5.1.6.
			5.7	Conduct vegetation removal and protection measures in accordance with OPSS 201 (tree clearing) and OPSS 565 (tree protection)	Not applicable for DCR No. 2. Vegetation clearing and grubbing covered in DCR No. 1.
			5.8	In the event that wildlife encountered during construction does not move from the construction zone, the Contract Administrator will be notified	Yes, updated and carried forward to Detail Design Mitigation and Commitments.
			5.9	Implement environmental inspection during construction to make sure that protection measures are implemented, maintained and repaired and to make sure remedial measures are implemented where warranted	Yes, Monitoring described in Section 7.2
			5.10	Landscaping will be considered to protect / enhance roadside vegetated areas. A landscaping plan will be developed during detail design, which will include consideration of snow hedge requirements	Not Applicable for DCR No. 2 but will be addressed in DCR No. 3.

Table 9-8: Summary of Environmental Concerns, Mitigating Measures and Commitments to Future Work

Ref No.	Environmental Concern and Potential impact	Concerned Agencies	ID No.	Mitigation / Commitment to Future Work	Commitment Considered and Addressed in DCR No. 2 Detail Design?
					Detail Design Mitigation and Commitment for Landscape and Restoration Plan included in Section 5.1.6.
			5.11	All migratory bird species and their nests are protected under the *Migratory Bird Convention Act* (MBCA 1994) and therefore, vegetation clearing efforts must be avoided during their breeding season (April 15 to *July 15*). The songbird breeding season extends from mid-May until late July.	Yes, and breeding bird timing windows updated in the Detail Design Commitments and Mitigation Measures.
			5.12	Vegetation removal (including trees, shrubs and grasslands) will be undertaken through the late summer, fall and winter months (where possible) to avoid disrupting any species during their nesting season (MBCA 1994; Fish and Wildlife Coordination Act 1997). If removal of vegetation must occur during the breeding season, an extensive nest search of the area to be affected must be done to ensure that no birds or their nests are destroyed during construction	Not applicable for DCR No. 2. Vegetation clearing and grubbing covered in DCR No. 1.
6	**Wildlife**	MNR MTO CA	6.1	Suitable substrate (ground cover) will be provided under the Credit River bridge to accommodate deer passage.	Partially Addressed. DCR No. 2 describes how wildlife passage will be accommodated at the Credit River and features to be incorporated, such as natural substrate (see Section 4.2.2.4). To be discussed further in DCR No. 3.
7	**Species at Risk**	MTO MNR CA	7.1	In order to avoid adverse effects to the Barn Swallow and its habitat, mitigation measures for the Barn Swallow will be applied, including adhering to breeding bird season restrictions. Additional consultation with MNR will be undertaken during detail design to discuss potential permitting requirements under the ESA;	Yes, and breeding bird timing windows updated, and mitigation related to nesting on structures included in the Detail Design Commitments and Mitigation Measures. Surveys undertaken did not observe Barn Swallow nesting within the structures in the Project limits (Section 5.1.2.1).
			7.2	Snapping Turtle currently does not have habitat protection under Ontario's ESA. Efforts will be made to avoid any inadvertent injury to this species.	Yes, Species of Special Concern addressed in wildlife encounter mitigation in Section 5.1.2.
			7.3	Monarch Butterflies prefer open grasslands with abundant milkweed. It is considered a specially protected invertebrate under the FWCA 1997 and efforts will be made to avoid any inadvertent injury to this species	Addressed in DCR No. 1 through vegetation removal minimization.
			7.4	Additional SAR screening will be required by the Contractor prior to commencement of works to confirm that there are no SAR in the work area as wildlife SAR can move into an area at any given time. Consultation with MNR will be undertaken during detail design to ensure that any newly regulated SAR potentially interacting with construction activities are considered and the need for approvals under the Endangered Species Act will be confirmed at that time	Yes. Existing conditions, impacts and anticipated approvals updated (Section 5.1.4.2). Bat SAR are present in the lands and Detail Design Mitigation and Commitments are included in DCR No. 2. Consultation with MECP ongoing. SAR wildlife encounters addressed in Section 5.1.2.
8	**Property Impacts**	MTO Impacted Property Owners MUN	8.1	Efforts have been made, where appropriate at key locations, to minimize the extent of additional property that is required to accommodate the proposed highway improvements by including retaining walls, curb and gutter and other measures in the Recommended Plan.	n/a – property required for the proposed works have already been obtained by MTO prior to Detail Design.
			8.2	The construction works will temporarily affect access for the farm operation that owns and farms the lands on each side of Highway 401 east of Credit River. Further consultation with this land owner / farm	Access will be maintained / accommodated during construction. The permanent farm access will be

Table 9-8: Summary of Environmental Concerns, Mitigating Measures and Commitments to Future Work

Ref No.	Environmental Concern and Potential impact	Concerned Agencies	ID No.	Mitigation / Commitment to Future Work	Commitment Considered and Addressed in DCR No. 2 Detail Design?
				operator will be undertaken during detail design regarding the specific design treatments for the crossing and construction details.	realigned to accommodate the Credit River Bridge. Consultation with the land owner / farm operator ongoing.
			8.3	MTO will negotiate the transfer of all necessary properties prior to construction. Affected owners will be consulted when the property plans are being finalized. Potentially impacted property owners were contacted as part of this study. Compensation will be based on fair market value of properties required.	Completed by MTO prior to Detail Design. Discussed in DCR 1 Section 5.5.4.
9	**Waste Management and Contamination**	MTO MOE	9.1	A Preliminary Site Screening (PSS) will be undertaken for properties required to accommodate the proposed improvements to this section of the Highway 401 corridor	Completed prior to Detail Design.
			9.2	Phase I Environmental Site Assessments will be required on the selected industrial / commercial properties required for the proposed highway improvements	Yes, additional waste and contamination investigations completed. Discussed in Section 5.4.3. As required, additional Detail Design Mitigation and Commitments carried forward.
			9.3	If highway improvement work (i.e. excavation) is conducted in the vicinity of the spill locations, special attention shall be paid to the soil and groundwater in the area for any visual evidence of contamination (i.e. discoloration, odour or free product); if visual evidence of contamination is noted, further investigation work of the soil and/or groundwater quality in the area will be required.	Yes, updated and carried forward to Detail Design Mitigation and Commitments.
			9.4	In addition, should any contaminated materials be encountered during the undertaking, caution will be exercised while handling and disposing of contaminated materials. Excess materials will be managed in accordance with standard MTO practices (as governed by OPSS 180).	Yes, and carried forward to Detail Design Mitigation and Commitments.
10	**Air Quality**	MTO MOE RES / BUS	10.1	Construction related dust and other emissions will be addressed through diligent implementation Best Management Practices (standard operating procedures) such as application of dust suppressants, reduced travel speeds for heavy vehicles, efficient staging of activities and minimization of haul distances, covering stockpiles, etc.	Yes, and carried forward to Detail Design Mitigation and Commitments.
11	**Noise During Construction**	MTO MOE RES / BUS	11.1	During construction, the Contractor will be required to: Abide by any municipal noise control by-laws	Yes. WCC will obtain municipal Noise By-law exemptions and abide by municipal noise control By-laws for work outside of the highway right of way. Refer to Section 5.4.1.
			11.2	Keep idling of construction equipment to a minimum	Yes, and carried forward to Detail Design Mitigation and Commitments.
			11.3	Maintain equipment in good working order to reduce noise from construction activities	Yes, and carried forward to Detail Design Mitigation and Commitments.
			11.4	Be available to address any concerns that may arise with respect to noise during construction	Yes, and carried forward to Detail Design Mitigation and Commitments.
			11.5	Complaints will be investigated according to the provisions of the MTO Environmental Guide for Noise (October 2006). Any initial complaint from the public requires verification by MTO that the general noise control measures agreed to are in effect. If not, MTO will advise the Contractor of any problems and enforce its contract.	Yes, and carried forward to Detail Design Mitigation and Commitments.

Table 9-8: Summary of Environmental Concerns, Mitigating Measures and Commitments to Future Work

Ref No.	Environmental Concern and Potential impact	Concerned Agencies	ID No.	Mitigation / Commitment to Future Work	Commitment Considered and Addressed in DCR No. 2 Detail Design?
12	**Sidewalks and Bicycle Lanes on Structures**	MTO MUN	12.1	MTO will explore municipal requests for construction of sidewalks and bicycle lanes on selected structures (subject to municipal funding) during detail design.	Yes, sidewalks have been incorporated onto structures as required. The design also includes space to accommodate future bike lanes on Trafalgar Road and includes construction of a multi-use path on Creditview Road Underpass Bridge (refer to Section 4.5.2)
13	**Utilities**	MTO UTIL	13.1	All potentially affected utility companies will be contacted to develop a utility relocation plan prior to construction during detail design. Furthermore, all utility relocations will be completed before construction of this project is initiated. If it is necessary to complete utility relocations during construction, the Contractor will be required to coordinate the timing of each operation to ensure that they are carried out independently. Special provisions will be included in the contract during detail design to address this, and to ensure that care and precautions are taken to safeguard existing utilities from damage.	Yes, discussed in Section 4.7.
14	**Archaeological**	MTO MTCS	14.1	Should the proposed improvements to Highway 401 result in the encroachment upon previously undisturbed lands determined to have archaeological site potential, a Stage 2 Archaeological Assessment should be conducted in accordance with MTCS' Standards and Guidelines for Consultant Archaeologists (2011) prior to any land disturbing activities. The purpose of this work would be to identify and assess any archaeological remains that may be present	No further lands required.
			14.2	No additional archaeological assessment is required within the remainder of the study area, and those areas that do not exhibit archaeological site potential may be considered clear of further archaeological concern. No grading or other activities that may result in the destruction or disturbance of an archaeological site are permitted until notice of MTCS approval has been received	Yes, has been considered.
			14.3	Should deeply buried archaeological remains be found during construction activities, the Heritage Operations Unit, MTCS will be notified immediately. In the event that human remains are encountered during construction, the Contractor / MTO will immediately contact both MTCS and the Registrar or Deputy Registrar of the Cemeteries Regulation Unit, Ontario Ministry of Government Services.	Yes, updated and carried forward to Detail Design Mitigation and Commitments
15	**Heritage Resources**	MTO MTCS MUN	15.1	The proposed ROW encroaches the Cowin Farm and as such, a Cultural Heritage Evaluation Report (CHER) will be prepared during detail design to determine the specific values of the farm residence and other buildings within the Cowin Farm's landscape setting.	Yes. Additional assessment undertaken by MTO before detail design (Refer to Section 5.5.2). No further assessment or impact mitigation was required.
16	**Aboriginal Community Consultation**	MTO Aboriginal Communities	16.1	Continued consultation and interaction with identified Aboriginal Communities / organizations during detail design.	Yes, and will continue throughout the Project. Refer to Section 3.2.7 and Table 2.
17	**Traffic Disruption and Construction Staging**	MUN MTO	17.1	A preliminary construction staging plan has been developed as part of this study and will be refined during a future detail design study.	Yes, for DCR No. 2 works, described in Section 4.
18	**CP Rail (bridge replacement)**	MTO CP Rail	18.1	Agreements regarding the proposed bridge design will be sought with CP Rail during detail design.	Covered as part of DCR No. 1.

Table 9-8: Summary of Environmental Concerns, Mitigating Measures and Commitments to Future Work

Ref No.	Environmental Concern and Potential impact	Concerned Agencies	ID No.	Mitigation / Commitment to Future Work	Commitment Considered and Addressed in DCR No. 2 Detail Design?
19	**Navigable Waters Protection Act**	MTO Transport Canada	19.1	The provisions of the NWPA apply to the Credit River for the bridge replacement / widening. An application under the NWPA will be prepared and approval will be sought during detail design.	NWPA was replaced by the Canadian Navigable Waters Act in August 2019. Approval for works at Credit River is being obtained. Discussed in Section 5.4.5.

Highway 401 Improvements from Trafalgar Road to Regional Road 25 Preliminary Design and Class Environmental Assessment Study, W.O. 07-20024" (March, 2013)

Table 9-5: Summary of Environmental Concerns, Mitigating Measures and Commitments to Future Work

Legend	
DFO: Fisheries and Oceans Canada	**MUN: Municipalities**
MNR: Ministry of Natural Resources *(now known as Ministry of Natural Resources and Forestry (MNRF))*	**RES / BUS: Area residents and/or businesses**
MTO: Ministry of Transportation	**UTIL: Utilities**
CA: Conservation Authority	**MTCS: Ministry of Tourism, Culture and Sport** *(now known as Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI))*
MOE: Ministry of the Environment *(now known as Ministry of Environment, Conservation, and Parks (MECP))*	**CNR: Canadian National Railway**

Note: The below is presented exactly as written in the TESR, except for column 'Commitment Addressed in DCR #2 Detail Design'

Ref No.	Environmental Concern and Potential impact	Concerned Agencies	ID No.	Mitigation / Commitment to Future Work	Commitment Considered and Addressed in DCR No. 2 Detail Design?
1	**Fisheries and Aquatic Habitat** (Bridge replacement / widening and culvert extensions for Lower Middle, Middle, Middle East and East Branches of Sixteen Mile Creek and associated tributaries, Hornby Creek realignment)	DFO MNR MTO CA	1.1	All materials and equipment used shall be operated and stored in such a manner that prevents any deleterious substance from entering the water	Yes, and carried forward to Detail Design Mitigation and Commitments.
			1.2	Consider construction staging such that spills and leaks into the watercourse will be avoided or minimized	Yes, and carried forward to Detail Design Mitigation and Commitments.
			1.3	Apply standard Erosion and Sediment Control (ESC) measures (e.g., silt fence, silt curtain, sedimentation basins, etc.) consistent with Ontario Provincial Standards and Specifications (OPSS) to ensure no effects to the surface waters. The control measures shall be implemented prior to work and be maintained during construction and until disturbed areas have been effectively stabilized with permanent vegetation cover	Yes, and carried forward to Detail Design Mitigation and Commitments.
			1.4	All disturbed areas of the work site shall be stabilized and re-vegetated promptly, and/or treated with appropriate erosion protection materials. In riparian and aquatic habitats, all temporarily disturbed areas will be reinstated to original condition, or better, upon completion of works	Yes, and carried forward to Detail Design Mitigation and Commitments.
			1.5	Minimize the disturbance or removal of riparian vegetation (MNR, 2010)	Yes, and carried forward to Detail Design Mitigation and Commitments.
			1.6	Any stockpiled materials shall be stored and stabilized away from the water	Yes, and carried forward to Detail Design Mitigation and Commitments.
			1.7	Opportunities for enhancing shading of the watercourse by planting native species in areas of overhanging / riparian vegetation loss will be examined during detail design	Carried forward to Detail Design Mitigation and Commitments, to be addressed in DCR No. 3.
			1.8	Construction timing considerations will be required for each of the crossings which entail inwater works or working within 30 m of the meander belt. The majority of the crossings are listed as warmwater Low sensitivity fish habitat, with the exception of drainage systems C-1D, C-11A, and crossings B-03 and B-02, which are listed as High sensitivity, and Crossings C-17, C-16, B-01 and B-02 which are listed as Moderate sensitivities.	Yes, updated existing conditions and timing windows provided for the watercourses in DCR No. 2 (Section 5.1.3). Adherence to in-water timing windows included in Detail Design Mitigation and Commitments.

Table 9-5: Summary of Environmental Concerns, Mitigating Measures and Commitments to Future Work

Ref No.	Environmental Concern and Potential impact	Concerned Agencies	ID No.	Mitigation / Commitment to Future Work	Commitment Considered and Addressed in DCR No. 2 Detail Design?
				- The warmwater systems require that all inwater construction will be completed from July 1 to March 31. To take advantage of typical dryer weather and lower water levels, opportunities to complete these works by October 31 will be examined. - The coldwater systems containing Brook Trout (High sensitivity) require a construction period from June 1 to September 30.	
			1.9	Hornby Creek Channel Realignment • The watercourse at C-11A is classified as warmwater, however, the presence of young of the year rainbow trout suggest the watercourse should be managed for migratory salmonids and hence have a construction period of June 16 to March 14	Yes, updated existing condition and timing window provided for the watercourses in DCR No. 2 (Section 5.1.3).
			1.10	The project works entail realignment of approximately 230 m of channel. The realignment works will follow the principles of natural channel design to be used during the detail design phase of the project	Yes, updated description of realignment provided in Section 4.6 and 5.1.3.
			1.11	The channel realignment will be conducted in "the dry" and utilize standard ESC measures. In-water works will follow the more restrictive warm and coldwater timing windows in order to minimize impacts to the fisheries. The realignment will result in a channel providing more stable banks and potential reduction in sedimentation, and hence net improvement at the site.	Yes, and carried forward to Detail Design Mitigation and Commitments (See Section 4.6).
			1.12	Incorporate habitat diversity into the final design (i.e., bank diversity of plantings and substrate placement associated with any scour protection requirements)	Yes, and restoration will be further described in DCR No. 3
			1.13	Crossings are designed to minimize loss of functional channel bed and maintain groundwater discharge (open footed culvert, spanning structure)	No crossing along Hornby Creek but has been considered at the Highway 401 crossing over Sixteen Mile Creek (open footing, natural substrate).
			1.14	Consider integrating deeper water habitat into any inlet or outlet treatments, and incorporate overhead cover into channel designs	Yes, a diversity of residual pool depths has been integrated in the design, where applicable.
			1.15	Using appropriate techniques, capture any fish trapped within the construction area and release them downstream of the site	Yes, and carried forward to Detail Design Mitigation and Commitments
			1.16	Maintenance measures are not to interfere with fish passage;	Yes, was considered in the design.
			1.17	Consider installing water treatment catchment basins at sources with potentially higher contaminants	Yes, *w*as considered during design and was determined that no water treatment catchment basins were to be installed.
			1.18	Review the option to direct highway drainage to the channel (following SWM treatment) to assist in periodic flow augmentation to downstream areas	Yes, option was reviewed and it was determined that flows will be directed to Sixteen Mile Creek rather than Hornby Creek due to it being realigned to the north.
			1.19	The proposed realignment of Hornby Creek may require a DFO authorization. No HADD / HADD forms will be submitted to DFO during the detail design stage of this project	Yes, the anticipated DFO approval have been updated and described in Section 5.1.3.

Table 9-5: Summary of Environmental Concerns, Mitigating Measures and Commitments to Future Work

Ref No.	Environmental Concern and Potential impact	Concerned Agencies	ID No.	Mitigation / Commitment to Future Work	Commitment Considered and Addressed in DCR No. 2 Detail Design?
2	**Erosion and Sediment** (Potential impacts to watercourses include short-term water quality deterioration)	MOE MNR MTO MUN	2.1	Install temporary Erosion and Sediment Control (ESC) measures (i.e. silt fences) prior to construction and maintain throughout construction, as required	Yes, and additional Detail Design Mitigation and Commitments carried forward.
			2.2	Install flow checks and ground stabilization as necessary	Yes, and additional Detail Design Mitigation and Commitments carried forward
			2.3	Routinely inspect ESC structures, including after storms, and repair as required	Yes, and additional Detail Design Mitigation and Commitments carried forward
3	**Groundwater**	MOE MNR MTO MUN	3.1	Minimize the need for dewatering during construction, particularly in areas designated as having a high potential for groundwater impact	Yes, reviewed and considered in design and groundwater assessment.
			3.2	Conduct dewatering activities in accordance with approved control procedures	Yes, and carried forward to Detail Design Mitigation and Commitments.
			3.3	Minimize disturbance to existing vegetation and grassed slopes where re-grading is required (disturbed areas should be re-vegetated as quickly as possible after completion of construction activities);	Yes, removal of vegetation has been minimized and covered in DCR No. 1.
			3.4	Prepare and implement a SWM plan and include spill prevention and control measures in the contract documents (to be determined in detail design)	Yes, spill prevention addressed and carried forward to Detail Design Mitigation and Commitments. Stormwater management discussed in Section 4.3.
			3.5	Undertake an existing well monitoring program, including the monitoring of potentially affected wells by highway construction or blasting, prior to, during and after the construction / blasting activities (to be determined in detail design)	Yes, baseline well monitoring completed. Groundwater Monitoring Program carried forward to Detail Design Mitigation and Commitments (see Section 7.2).
4	**Drainage and Hydrology**	MNR MTO CA MUN	4.1	Install smooth transitions at the upstream entrance and downstream of culverts	Yes, integrated into the design, where applicable.
			4.2	During the detail design stage of this project, opportunities for minimizing the lengthening of culverts (i.e. C-09, C-10, C-13 and C-18) by stabilizing the existing slopes and installing retaining and head walls and stabilized steeper slopes will be explored where applicable	Yes, this was explored and integrated into the design, where feasible.
			4.3	A fluvial geomorphological assessment will be completed at the detail design stage of this project for realignment of Hornby Creek, if it is deemed necessary in detail design	Yes, discussed in Sections 4.6 and 5.1.3.
			4.4	During subsequent design phases, SWM facilities will be designed to provide quality and quantity treatment to the extent possible	Yes, discussed in Section 4.3.
			4.5	A hydrologic and hydrogeological assessment will be undertaken at the detail design stage of this project to evaluate any potential impact of SWM Pond 02 (south of Highway 401, west of Fifth Line) on the adjacent wetland feature located to the south	Yes, a hydrologic assessment was completed, and a hydrogeological assessment is in progress. These assessments consider groundwater elevation and

Table 9-5: Summary of Environmental Concerns, Mitigating Measures and Commitments to Future Work

Ref No.	Environmental Concern and Potential impact	Concerned Agencies	ID No.	Mitigation / Commitment to Future Work	Commitment Considered and Addressed in DCR No. 2 Detail Design?
					potential impact on adjacent lands. Impacts have been minimized where possible.
5	**Terrestrial Ecosystems** (Removal of edge vegetation within forest communities and ornamental vegetation / hedgerows)	MNR MTO MUN CA	5.1	Re-stabilize and re-vegetate exposed surfaces as soon as possible, using vegetation seed mixes, where feasible, and plantings, where possible	Yes, and additional Detail Design Mitigation and Commitments carried forward
			5.2	Clearly delineate Right-of-Way (ROW) vegetation clearing zones and vegetation retention zones on construction drawings and confirm in the field with the Contractor prior to clearing and grading. Equipment, materials and other construction activities will not be permitted in these zones	Yes, and additional Detail Design Mitigation and Commitments carried forward
			5.3	Conduct vegetation removal and protection measures in accordance with OPSS 201 (tree clearing) and OPSS 565 (tree protection). Vegetation that does not require removal for purposes of the construction will be protected through the installation and maintenance of temporary vegetation protection measures (e.g. temporary fencing)	Not applicable for DCR No. 2. Vegetation clearing and grubbing covered in DCR No. 1.
			5.4	Cut and grubbed material may be disposed of through chipping. Wherever possible, wood chip material will be considered as part of any edge plantings to help retain soil moisture and prevent weed spread	Not applicable for DCR No. 2. Vegetation clearing and grubbing covered in DCR No. 1.
			5.5	Although there is little likelihood of wildlife encounters, in the event that wildlife encountered during construction does not move from the construction zone, the Contract Administrator will be notified	Yes, updated and carried forward to Detail Design Mitigation and Commitments.
			5.6	Implement environmental inspection during construction to make sure that protection measures are implemented, maintained and repaired and to make sure remedial measures are implemented where warranted	Yes, Monitoring described in Section 7.2
			5.7	Landscaping will be considered to protect / enhance roadside vegetated areas. A landscaping plan will be developed during detail design, which will include consideration of snow hedge requirements	Not Applicable for DCR No. 2 but will be addressed in DCR No. 3. Detail Design Mitigation and Commitment included in Section 5.1.6.
			5.8	All migratory bird species and their nests are protected under the Migratory Bird Convention Act (MBCA 1994) and therefore, vegetation clearing efforts must be avoided during their breeding season (April 15 to July 15). The songbird breeding season extends from mid-May until late July (Cadman et al., 2007)	Yes, and breeding bird timing windows updated in the Detail Design Commitments and Mitigation Measures
			5.9	Opportunities to undertake vegetation removal (including trees, shrubs and grasslands) in the late summer, fall and winter months will be considered in the late summer, fall and winter months to avoid disrupting any species during their nesting season (MBCA 1994; Fish and Wildlife Coordination Act 1997). If removal of vegetation must occur during the breeding season, a nest search of the area to be affected will be done to ensure that no birds or their nests are destroyed during construction.	Not applicable for DCR No. 2. Vegetation clearing and grubbing covered in DCR No. 1.

Table 9-5: Summary of Environmental Concerns, Mitigating Measures and Commitments to Future Work

Ref No.	Environmental Concern and Potential impact	Concerned Agencies	ID No.	Mitigation / Commitment to Future Work	Commitment Considered and Addressed in DCR No. 2 Detail Design?
			5.10	The Sixteen Mile Creek corridor is recognized as an important regional linkage for wildlife in the area in addition to providing connection between various ecological functions. Efforts will be made to identify and avoid / protect critical components of wildlife habitat (e.g., vernal pools, migration staging areas, etc.). Where this is not possible the loss of vegetation will be minimized, particularly in edge habitat, and will be re-vegetated with native species after construction where appropriate	Yes, discussed in Section 5.1.2. The Oakville Creek East Bridge structure is larger than existing which will support wildlife passage and connection. Restoration design to be covered in DCR No. 3.
			5.11	The Fresh-Moist Black Walnut Lowland Deciduous Forest area located immediately east of Sixth Line, is a provincially rare vegetation community. Potential project works involve impact on approximately 5,685 m2 of this zone. Efforts will be made to relocate impacted Black Walnut trees where possible. A tree protection and restoration plan will be developed during detail design. Relocation / realignment of the watercourse will be undertaken in a manner which minimizes the number of trees impacted in this area.	Partially. Impacts to the rare vegetation community have been minimized through the relocation of the Sixth Line structure to the west and through the Hornby Creek realignment design. Relocation of black walnut not practicable due to the timing of construction activities and appropriate planting windows. Where feasible, Black Walnut seeds will be salvaged, and the species will be included in the restoration design to be addressed in DCR No. 3.
			5.12	Appropriate ESC methods will be implemented prior to the removal of vegetation near any watercourse. The disturbance or removal of riparian vegetation will be minimized in order to maintain shading on the watercourse and restoration plantings will include appropriate native species.	Yes, and carried forward to Detail Design Mitigation and Commitments. Restoration to be addressed in DCR No. 3.
6	**Species at Risk**	MTO MNR CA	6.1	Chimney Swifts use chimneys in houses and other infrastructure for nesting. There are no plans to demolish buildings as part of Project activities; there are currently no anticipated effects to this Species at Risk (SAR)	n/a
			6.2	Bobolinks prefer grassland habitat and nest on the ground. Vegetation clearing will be kept outside of the breeding bird season (April 15 to July 15) to address these potential effects. All areas will be surveyed for nests prior to any vegetation clearing (including trees, shrubs and grasslands)	Not applicable for DCR No. 2. Vegetation clearing and grubbing covered in DCR No. 1.
			6.3	Monarch Butterflies prefer open grasslands with abundant milkweed. It currently does not have habitat protection under Ontario's ESA; however it is considered a specially protected invertebrate under the FWCA 1997 and efforts will be made to avoid any inadvertent injury to this species	Not applicable for DCR No. 2. Addressed in DCR No. 1 through vegetation removal minimization.
			6.4	The presence of Redside Dace and impacts to their habitat will be confirmed in consultation with MNR during detail design. The mitigation strategy to address impacts to Redside Dace will be consistent with the Guidance for Development Activities in Redside Dace Protected Habitat (February 2011) or other guidance as provided by MNR. During detail design, additional consultation will be undertaken with MNR to develop the mitigation and watercourse enhancement strategy and to identify the need for ESA approvals .	Consultation with MECP ongoing, including permitting discussions. Existing conditions, impacts and anticipated approvals updated (Section 5.1.4.1). Detail Design Mitigation and Commitments included in DCR No. 2 for works near Redside Dace watercourses.
7	**Property Impacts**	MTO Impacted Property Owners MUN	7.1	Efforts have been made to minimize property requirements. MTO will negotiate the transfer of all necessary properties prior to or during detail design. Affected owners will be consulted when the plans are being finalized. Compensation will be based on fair market value of properties required.	n/a – property required for the proposed works have already been obtained by MTO prior to Detail Design.

Table 9-5: Summary of Environmental Concerns, Mitigating Measures and Commitments to Future Work

Ref No.	Environmental Concern and Potential impact	Concerned Agencies	ID No.	Mitigation / Commitment to Future Work	Commitment Considered and Addressed in DCR No. 2 Detail Design?
8	**Waste Management and Contamination**	MTO MOE	8.1	Following MTO's contaminated property process, a broad review of individual properties including a site visit and interview, and completion of Preliminary Site Screening Forms (PSSFs) is recommended (to be conducted in detail design)	Completed prior to Detail Design.
			8.2	Based on the industrial land use, it is expected that Phase I Environmental Site Assessments will be required for selected industrial and/or commercial properties (to be determined during detail design). The need to conduct Phase II ESAs will be identified at that time	Yes, additional waste and contamination investigations completed. Discussed in Section 5.4.3. As required, additional Detail Design Mitigation and Commitments carried forward.
			8.3	In addition, should any contaminated materials be encountered during the undertaking, caution will be exercised while handling and disposing of contaminated materials. Excess materials will be managed in accordance with standard MTO practices (as governed by OPSS 180).	Yes, and carried forward to Detail Design Mitigation and Commitments.
9	**Air Quality**	MTO MOE RES / BUS	9.1	Opportunities for tree planting will be examined to reduce roadway particulate matter at nearby receptors during the detail design stage of this project.	Yes, and carried forward to Detail Design Mitigation and Commitments. To be addressed in DCR No. 3.
			9.2	Construction related emissions will be addressed is through diligent implementation of best management practices for operating procedures such as application of dust suppressants, reduced travel speeds for heavy vehicles, efficient staging of activities and minimization of haul distances, covering stockpiles, etc.	Yes, and carried forward to Detail Design Mitigation and Commitments.
10	**Noise During Construction**	MTO MOE RES / BUS	10.1	During construction, the Contractor will be required to: Abide by any municipal noise control by-laws;	Yes. WCC will obtain municipal Noise By-law exemptions and abide by municipal noise control By-laws for work outside of the highway right of way. Refer to Section 5.4.1.
			10.2	Keep idling of construction equipment to a minimum	Yes, and carried forward to Detail Design Mitigation and Commitments.
			10.3	Maintain equipment in good working order to reduce noise from construction activities	Yes, and carried forward to Detail Design Mitigation and Commitments.
			10.4	Be available to address any concerns that may arise with respect to noise during construction	Yes, and carried forward to Detail Design Mitigation and Commitments.
			10.5	Furthermore, complaints will be investigated according to the provisions of the MTO Environmental Guide for Noise (October 2006). Any initial complaint from the public requires verification by MTO that the general noise control measures agreed to are in effect. If not, MTO will advise the Contractor of any problems, and enforce its contract.	Yes, and carried forward to Detail Design Mitigation and Commitments.
11	**Sidewalks and Bicycle Lanes on Structures**	MTO MUN	11.1	MTO will explore municipal requests for construction of sidewalks and bicycle lanes on selected structures (subject to municipal funding) during detail design.	Yes, sidewalks have been incorporated onto structures as required and the design also includes space to accommodate future bike lanes on Regional Road 25 (refer to Section 4.5.2)
12	**Utilities**	MTO UTIL	12.1	All potentially affected utility companies will be contacted to develop a utility relocation plan prior to construction during detail design. Furthermore, all utility relocations will be completed before construction of	Yes, discussed in Section 4.7.

Table 9-5: Summary of Environmental Concerns, Mitigating Measures and Commitments to Future Work

Ref No.	Environmental Concern and Potential impact	Concerned Agencies	ID No.	Mitigation / Commitment to Future Work	Commitment Considered and Addressed in DCR No. 2 Detail Design?
				this project is initiated. If it is necessary to complete utility relocations during construction, the Contractor will be required to coordinate the timing of each operation to ensure that they are carried out independently. Special provisions will be included in the contract to address this, and to ensure that care and precautions are taken to safeguard existing utilities from damage.	
13	**Archaeological**	MTO MTCS	13.1	Should the proposed improvements to Highway 401 result in the encroachment upon previously undisturbed lands determined to have archaeological site potential, a Stage 2 Archaeological Assessment will be conducted in accordance with MTCS' Standards and Guidelines for Consultant Archaeologists (2011), prior to any land disturbing activities	No further lands required.
			13.2	No grading or other activities that may result in the destruction or disturbance of an archaeological site are permitted until notice of MTCS approval has been received	Yes, has been considered.
			13.3	Should deeply buried archaeological remains be found during construction activities, the Heritage Operations Unit, MTCS will be notified immediately	Yes, updated and carried forward to Detail Design Mitigation and Commitments
			13.4	In the event that human remains are encountered during construction, the proponent will immediately contact both MTCS and the Registrar or Deputy Registrar of the Cemeteries Regulation Unit, Ministry of Government Services, (416) 326-8392. The appropriate Police Services will also be advised of any discoveries.	Yes. updated and carried forward to Detail Design Mitigation and Commitments.
14	**Heritage Resources**	MTO MTCS MUN	14.1	During detail design a Heritage Impact Assessment (HIA) will be undertaken for two heritage properties impacted by the proposed highway improvements (John Dolmage House, 7548 Trafalgar Road and Joseph Cunningham House, 7622 Fifth Line Road) to assess the specific details of the impacts to these heritage resources and develop appropriate mitigation (i.e. replacement of vegetated hedgerows).	Yes. Additional assessments undertaken. Existing conditions and impacts described in Section 5.5.2. No impacts at these locations from DCR No. 2. Works.
15	**Aboriginal Community Consultation**	MTO Aboriginal Communities	15.1	Continued consultation and interaction with identified Aboriginal Communities during detail design	Yes, and will continue throughout the Project. Refer to Section 3.2.7 and Table 2.
16	**Traffic Disruption and Construction Staging**	MUN MTO	16.1	A construction staging plan will be developed during detail design	Yes, for DCR No. 2 works, described in Section 4.4.
			16.2	The opportunity to maintain one of Fifth Line or Sixth Line open during construction of these bridge works will be investigated during detail design in consultation with municipalities	Fifth Line Bridge works has already been completed as part of a previous contract and will not be impacted by the works in DCR No. 2. The Sixth Line Bridge will remain open during construction. A design refinement was incorporated to build the replacement structure offline to the west of the existing structure.
17	**CN Rail (bridge replacement)**	MTO CN Rail	17.1	Agreements regarding the proposed bridge design will be sought with CNR during detail design	Covered as part of DCR No. 1.