

Design and Construction Report

July 2016

Veterans Memorial Parkway Extension and Highway 401 Interchange Improvements

DB 2015-3002



**DESIGN AND CONSTRUCTION REPORT
VETERANS MEMORIAL PARKWAY EXTENSION
AND HIGHWAY 401 INTERCHANGE IMPROVEMENTS
CITY OF LONDON**

DB-2015-3002

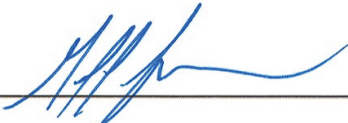


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July 2016

Ministry of Transportation

Veterans Memorial Parkway Extension and Highway 401 Interchange Improvements
DB-2015-3002

DESIGN AND CONSTRUCTION REPORT

This Design and Construction Report has been prepared under the Ministry of Transportation's *Class Environmental Assessment (EA) for Provincial Transportation Facilities, 2000*; a process that has been accepted and approved under Ontario's *Environmental Assessment Act*. This project was approved following the preparation and filing of a Transportation Environmental Study Report (TESR) in May 2013.

A CD copy of this document has been submitted to the following office of the Ontario Ministry of the Environment and Climate Change to fulfill the requirements of the Ontario Ministry of Transportation *Class Environmental Assessment for Provincial Transportation Facilities (2000)*.

Ministry of the Environment and Climate Change
Southwest Region
733 Exeter Road
London ON N6E 1L3

This Design and Construction Report is available for a 30-day review period from August 4, 2016 to September 2, 2016, during regular business hours only, at the following review locations:

City of London City Hall Clerk's Office, 3 rd Floor 300 Dufferin Avenue, London ON	Ontario Ministry of Transportation West Region, Front Lobby 659 Exeter Road, London ON	London Public Library Pond Mills Branch 1166 Commissioners Road East London ON
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COMMENTS

Comments during the review period may be submitted via the Project website or by contacting one of the following individuals:

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Visit the Project Website: hwy401vmp.ca

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Executive Summary

The Ontario Ministry of Transportation (MTO or the Ministry) and the City of London (City) are proposing improvements to the interchange at Highway 401 and Veterans Memorial Parkway (VMP) between Highbury Avenue and Westchester Bourne (Highway 74), in the City of London. This project includes the Detail Design and construction of a reconfigured interchange at Highway 401 and VMP, and extension of VMP to the south. The City is the proponent of the VMP extension from Highway 401 south to Wilton Grove Road. MTO is the proponent for the Highway 401 Interchange improvements. The project will improve access into the City and help prepare for future development opportunities in southeast London.

The project limits are from approximately 0.2 km west of the Old Victoria Road underpass to approximately 0.77 km east of the VMP underpass along Highway 401. The VMP Extension limit is from 0.75 km north of Highway 401, southerly to Wilton Grove Road, and the Wilton Grove Road limit is from 335 m west of the VMP intersection, to 230 m east of the VMP intersection.

The Preliminary Design (G.W.P. 3033-11-00) Transportation Environmental Study Report (TESR) review period ended on July 5, 2013 and MTO issued "Environmental Clearance for Right-of-Way Designation and Property Expropriation" in August 2013. The Preliminary Design activities formed the basis for proceeding to the Design-Build stage of the project. Design-Build (DB) merges two phases (detailed design and construction) into one contract. Dufferin Construction Ltd. has been retained as the Design Builder.

Following the completion of MTO's Class Environmental Assessment (Class EA) and Preliminary Design Study, it came to the Ministry's attention that regional changes were occurring that would cause the need for a second left-turn lane on the W-N/S ramp and two lanes on the northbound VMP. Under the direction of the Ministry, a Preliminary Design was completed to modify the design to consider alternatives and implications of making the proposed changes. A technical memorandum was prepared by HDR in September 2015 to summarize the alternatives that were considered, including proposed changes to the geometry, footprint, schedule and costs. The updated Preliminary Design did not result in any significant additional impacts to existing environmental features and/or conditions.

The project includes the following components:

- Extension of the VMP southerly by approximately 800 m from Highway 401 to form a new intersection with Wilton Grove Road
- Widening of Wilton Grove Road to accommodate the new intersection
- Reconfiguration of the existing partial Highway 401/VMP interchange to a full interchange

- Widening of Highway 401 to accommodate the reconfiguration of the interchange ramps
- Modification of the existing speed change lanes to accommodate the ramp realignments associated with the interchange reconfiguration
- Minor realignment of the existing VMP north of the interchange
- Replacement of the VMP bridge over Highway 401 slightly west of its current alignment
- Drainage improvements, illumination, overhead signs, traffic signals, and retaining walls
- Realignment of the Crinklaw Municipal Drain and installation of a new structural culvert
- Opportunities for wildlife crossing under the new VMP south of Highway 401 and enhancement of the Crinklaw Drain

Construction is expected to start in fall 2016, subject to funding and approvals, and will carry over for two years. It is anticipated that the interchange and VMP extension will be fully functional by the spring/summer of 2018.

Agency and public consultation was initiated with the Notice of Detail Design and Public Information Centre (PIC) which was placed in the *Dorchester Signpost* and the *London/Sarnia L'Action* on Wednesday, May 11, 2016; and, in the *London Free Press* and the *Londoner* on Thursday, May 12, 2016. Direct mailings to the project contact list and approximately 1800 members of the general public/property owners adjacent to Commissioners Road, Bradley Avenue, and Westchester Bourne, were also undertaken by the City of London.

A project website (hwy401vmp.ca) was developed and made operational to function as an interactive tool for the project team to provide study updates, and to provide an opportunity for stakeholders to submit comments during the Detail Design period. Additional links, for Daily Traffic Restrictions/Detour Routes, and Construction Progress Updates will be available during the construction phase.

The Recommended Design will provide improved access at Highway 401 and VMP, and a southern link to Wilton Grove Road via the VMP extension. It is considered to be the most technically, environmentally, and economically suitable alternative for addressing the project objectives. The project consists of an interim plan to address the current need for an improved interchange and extension of the VMP, and an ultimate stage to accommodate the widening of Highway 401, based on future traffic volumes.

The primary construction elements of the Recommended Design include, but are not limited to:

- Earthworks, excavation, and grading
- Environmental protection (vegetation, wildlife, fish)

- Bridges and culverts
- Paving and granular base
- Traffic staging
- Signage
- Fencing of the Highway 401 right-of-way along the new property limits of the ramps
- Drainage and stormwater management
- Landscaping, erosion, and sediment control
- Utility modifications/relocations
- Lighting
- Guide rail installation

Field investigations were undertaken during this Design-Build stage to confirm existing environmental features as described in the 2013 TESR, and the findings were used in the assessment of impacts based on the Recommended Design. There are no significant designated natural features (i.e., Provincially Significant Wetlands, Areas of Natural or Scientific Interest, or Provincial Parks) within the study area. The project is not anticipated to result in significant impacts to the natural environment, and any impacts shall be mitigated to acceptable levels.

Environmental protection/mitigation and environmental monitoring are integral components of the Recommended Design for this project. The Design-Builder's responsibilities and obligations for environmental management associated with this project include:

- Design and construction quality management
- Mitigating construction impacts to surrounding community
- Integrating design and construction staff through constructability review during Detail Design and implementation of the Environmental Management Plan during construction
- Identifying and mitigating major areas of risk
- Addressing staging and traffic control, including minimizing impacts to the traveling public
- Meeting all obligations for environmental protection during construction

A summary of the key environmental concerns and environmental protection/mitigation requirements for this project is provided in Section 4.0 and Table 4.

The following environmental exemptions and permits are required for the work:

- Request for Review form is to be completed and submitted to Department of Fisheries and Oceans Canada (DFO)
- City of London exemption from Noise Control By-Law PW-12, Part 2, 2.4 (d), pertaining to prohibited hours for Construction – Excavation (Temporary Noise Permit)

- Dewatering requirements are expected to be above 50,000 L/day but below 400,000 L/day requiring an Environmental Activity and Sector Registry (EASR) registration to proceed
- An Information Gathering Form (IGF) should be prepared and submitted to solicit comment from MNRF to address potential interactions with suitable maternity habitat for bat species that are protected by the Endangered Species Act (ESA) and determine authorization requirements under the ESA, if any

To maintain traffic safety and allow for efficient construction, road and ramp closures will be required during construction. The Construction Staging and Traffic Management Plan as presented at the PIC can be referenced in Appendix B. Following the PIC, the Plan was further refined to facilitate a coordinated construction approach in the N-E quadrant of the interchange. This will require a closure of the E-N ramp for three to four weeks and a lane reduction on westbound Highway 401 during that time. The overall staging of this project as summarized in Section 3.8, Table 3, includes five major stages of construction from fall 2016 to summer 2018.

The traffic management for this project will focus on advance notification of the users of the study area roadways and area residents of changes to the available ramps and lanes at various stages of construction. Drivers will be able to select alternate routes when their preferred route through the Highway 401/VMP interchange is not available, or is constrained during construction.

The preferred detour route during full closures of Highway 401 has been developed in consultation with the City of London, County of Middlesex, and Municipality of Thames Centre. The detour route will be implemented as needed (i.e., on several occasions) as overnight closures for the removal of the existing VMP bridge over Highway 401, girder placement for the new bridge, and overhead sign installation. The preferred detour route follows:

- Highbury Avenue (4.5 km west of VMP) northbound/southbound
- Bradley Avenue eastbound/westbound
- Westchester Bourne (1.8 km east of VMP) northbound/southbound

Existing intersections may require the use of police presence to facilitate traffic diversion during construction. Road users will have advance warning of these occasions and may make decisions for alternative travel routes and/or mode of travel and/or time of travel, if possible.

This Design and Construction Report (DCR) has been prepared near the completion of Detail Design and in accordance with the Ministry of Transportation's Class EA requirements. This document deals with design-specific details and issues. For environmental issues of broader concern, reference should be made to the Preliminary Design documentation.

1.0 Overview of the Undertaking

1.1 PROJECT LOCATION AND BACKGROUND

The Ontario Ministry of Transportation (MTO or the Ministry) and the City of London (City) are proposing improvements to the interchange at Highway 401 and Veterans Memorial Parkway (VMP) between Highbury Avenue and Westchester Bourne (Highway 74), in the City of London. This project includes the Detail Design and construction of a reconfigured interchange at Highway 401 and VMP, and extension of VMP to the south. The current configuration of the interchange is shown on Exhibit 1.

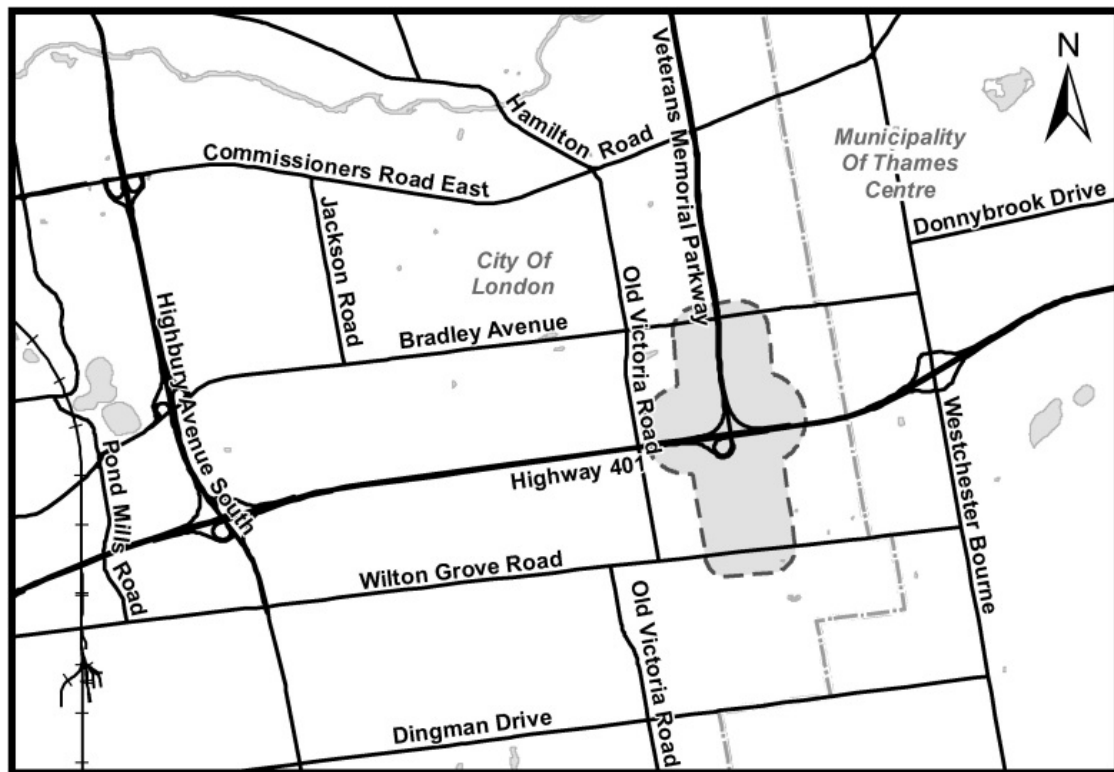


Exhibit 1: Location Plan

The project limits extend from approximately 0.2 km west of the Old Victoria Road underpass to approximately 0.77 km east of the VMP underpass along Highway 401. The VMP Extension limit is from 0.75 km north of Highway 401, southerly to Wilton Grove Road, and the Wilton Grove Road limit is from approximately 335 m west of the VMP intersection, to 230 m east of the VMP intersection.

The City is the proponent of the VMP extension from Highway 401 south to Wilton Grove Road. MTO is the proponent for the Highway 401 Interchange improvements.

Following the completion of the Class Environmental Assessment and Preliminary Design Study, it came to the Ministry’s attention that regional changes were occurring that would cause the need for a second left-turn lane on the W-N/S ramp and two lanes on northbound VMP. Under the direction of the Ministry, a Preliminary Design was completed to modify the design to consider alternatives and implications of making the proposed changes. A technical memorandum was prepared in September 2015 to summarize the alternatives that were considered, including proposed changes to the geometry, footprint, schedule and costs. The updated Preliminary Design did not result in any significant additional impacts to existing environmental features and/or conditions.

The Preliminary Design activities formed the basis for proceeding to the Design-Build stage of the project. Design-Build (DB) merges two phases (detailed design and construction) into one contract. Dufferin Construction Ltd. has been retained as the Design-Builder. The project timeline is illustrated in Exhibit 2.



Exhibit 2: Project Timeline

1.2 PURPOSE AND NEED

VMP is a key corridor providing one of five accesses from the provincial highway network to the City of London and providing the main access between Highway 401 and London International Airport. The existing VMP is a divided urban expressway which connects Highway 401 via a trumpet interchange, connecting with VMP to the north only. There is no VMP to the south of Highway 401. The project is designed to accommodate a future eight-lane cross section of Highway 401.

This project was approved to proceed by a City of London council resolution dated April 5, 2011 in order to prepare for future development opportunities in the area. The project supports the City of London’s economic growth objectives, including future growth in southeast London, as identified in the City’s *Industrial Lands Development Strategy Update* (2011). The project also

implements recommendations of the *Smart Moves Transportation Master Plan* by providing additional capacity and improving traffic operations.

1.3 PROPOSED IMPROVEMENTS

During this Design-Build phase, which was commenced in April 2016, the Approved Plan from Preliminary Design was developed to the implementation level of detail, and construction documents and drawings have been prepared for the Recommended Design, as illustrated on Exhibit 3.

The Approved Plan was carried forward with minor refinements. The Preliminary Design recommendations required updating to accommodate a dual left-turn lane along the W-N/S ramp at the Highway 401/VMP interchange to accommodate future traffic growth. Further details are provided in Section 3.0 of this report.

The project includes the following components:

- Extension of the VMP southerly by approximately 800 m from Highway 401 to form a new intersection with Wilton Grove Road
- Widening of Wilton Grove Road to accommodate the new intersection
- Reconfiguration of the existing partial Highway 401/VMP interchange to a full interchange
- Widening of Highway 401 to accommodate the reconfiguration of the interchange ramps
- Modification of the existing speed change lanes to accommodate the ramp realignments associated with the interchange reconfiguration
- Minor realignment of the existing VMP north of the interchange
- Replacement of the VMP bridge over Highway 401 slightly west of its current alignment
- Drainage improvements, illumination, overhead signs, traffic signals, and retaining walls
- Realignment of the Crinklaw Municipal Drain and installation of a new structural culvert
- Opportunities for wildlife crossing under the new VMP south of Highway 401 and enhancement of the Crinklaw Drain

Construction is expected to start in fall 2016, subject to funding and approvals, and will carry over for two years. It is anticipated that the interchange and VMP extension will be fully functional by the spring/summer of 2018.



Exhibit 3: Project Overview

1.4 RELATED STUDIES

The following list outlines other related studies within the Highway 401 corridor in the vicinity of VMP:

- G.W.P. 476-89-00. Highway 401 Improvements Planning and Preliminary Design Study, from 1.0km west of Highway 4 (Colonel Talbot Road) easterly to 1.0km east of Highbury Avenue (2004)
- G.W.P. 3031-11-00. New Interchange at Highway 401 and Wonderland Road South, City of London (2012)
- G.W.P. 3032-11-00. Highway 401 Highbury Avenue Interchange Reconstruction Class Environmental Assessment Addendum (2012)
- Contract 76-36 & 91-08. Veterans Memorial Parkway Interchange Class Environmental Assessment Study

1.5 OVERVIEW OF THE ENVIRONMENTAL ASSESSMENT PROCESS

1.5.1 Ontario Environmental Assessment Act

The Ontario *Environmental Assessment Act* (EAA) governs the conduct of planning studies in the province of Ontario. The purpose of this Act is the betterment of the people of the whole or any part of Ontario by providing for the protection, conservation and wise management in Ontario of the environment. R.S.O. 1990, c. E.18, s. 2.

The Act mandates clear terms of reference and ongoing consultation with all relevant parties and establishes a 'Class Environmental Assessment' process to streamline the planning for certain types of projects.

1.5.2 Ministry of Transportation Class Environmental Assessment for Provincial Transportation Facilities, 2000

The MTO *Class Environmental Assessment for Provincial Transportation Facilities* (2000) (Class EA) was approved under the Ontario *Environmental Assessment Act* (EAA) in 1997 and amended in 2000. The planning document defines groups of projects and activities, and the Environmental Assessment (EA) processes that the MTO has committed to follow for these projects. Provided that this process is followed, projects and activities included under the Class EA do not require formal review and approval under the EAA.

The projects and activities in the Class EA are classified into four groups; this project has followed the approved planning process for Group 'B' projects, which include: improvements to existing highways and freeways, new interchanges, or modifications to traffic access, improvements to

provincial transitways and ferryboat docks/terminal, and the establishment/improvement of provincial transportation facilities.

As required under the Class EA, two formal documents have been developed for this project. They include:

- A Transportation Environmental Study Report (TESR), prepared in May 2013 to document Preliminary Design
- This Design and Construction Report (DCR), prepared to document Detail Design

1.5.3 Municipal Class Environmental Assessment Process

This study has also followed the approved planning process for Schedule 'C' projects under the Municipal Engineers Association's *Municipal Class Environmental Assessment* (2000, and amended in 2007 and 2011). The Preliminary Design was completed by MTO and the City of London and documented in a TESR (May 2013). Environmental Clearance under the Municipal Class EA was received in June 2013.

1.5.4 The Canadian Environmental Assessment Act

The *Canadian Environmental Assessment Act*, 2012 (CEAA 2012) and its regulations establish the legislative basis for the federal EA process. Under CEAA 2012, an EA is only required for particular projects included in the list of "designated projects." These types of projects are likely to have significant adverse environmental effects and therefore may be subject to a federal EA.

The proposed improvements to this section of the Highway 401 corridor are not listed as a "designated project" under the CEAA 2012 and therefore CEAA approvals are not required for this undertaking.

1.6 PURPOSE OF THE DESIGN AND CONSTRUCTION REPORT

This DCR documents the implications on environmental features associated with the design and construction of the Highway 401 and VMP improvements. This DCR includes:

- A description of the project and its purpose
- An overview of the public consultation undertaken
- Major features of the proposed work, including any design refinements
- Anticipated environmental effects and proposed mitigation measures
- Commitments to monitoring associated with the implementation of the project

The DCR has been prepared; on the basis of the recommended Detail Design to:

- Address any minor design modifications that result in environmental impacts or benefits that may not have been anticipated or detailed in the 2013 TESR and the 2015 Update to the Design-Build Ready Design
- Further assess environmental impacts and refine mitigation requirements
- Address any commitments to future work identified in the 2013 TESR

This document deals with design-specific details and issues. For environmental issues of broader concern, reference should be made to the Preliminary Design documentation as noted above. If it is necessary to make significant changes to the commitments outlined in the DCR, or changes to any concept of any portion of the project, an Addendum to the DCR may be required. Any changes that may arise will be discussed with the parties most affected. If all parties can be identified and those parties agree that an Addendum is not required, then none will be prepared. If an Addendum is required, appropriate documentation will be prepared and filed in the Public Record for at least 30 calendar days.

During the course of this Detail Design study, all reasonable steps were taken to meet environmental technical requirements, formal environmental approvals, environmental reporting obligations, and environmental standards applicable to the project.

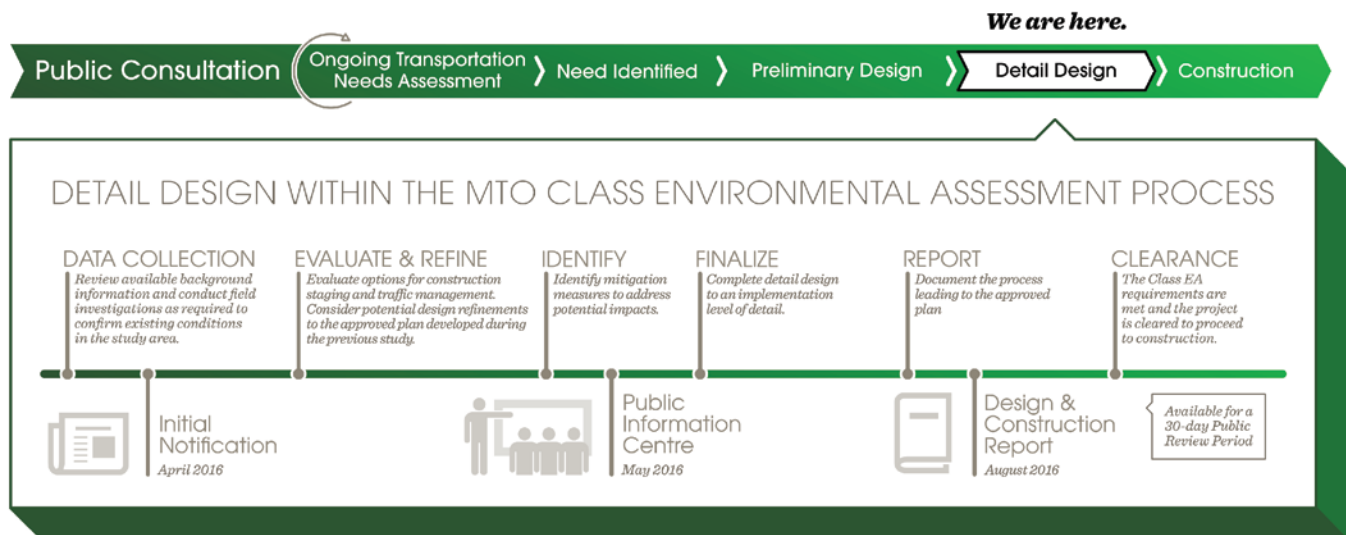


Exhibit 4: MTO Class EA Process

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2.0 Consultation Process

The Preliminary Design phase of the project involved a broad range of participants with diverse interests, including the City of London, external agencies, property owners, and members of the general public. The consultation process for this Design-build project was designed to provide a smooth transition from Preliminary Design to the current phase.

2.1 CONSULTATION PLAN OVERVIEW

A Consultation Plan was developed at the start of the project and was designed to include:

- Notice of Study Commencement
- Communication with external agencies in order to obtain pertinent technical information and confirm the requirement for legislative or regulatory approvals related to the undertaking
- Communication with adjacent property owners where work proposed is likely to have an impact on their property
- Communication with residents and businesses in the area that may be affected by construction staging and traffic management
- A Public Information Centre on Thursday, May 26, 2016
- Notice of Study Completion
- A project specific website: hwy401vmp.ca

The Master Contact List from the Preliminary Design and Class EA study was updated in March 2016 and used for initial study notification. Key stakeholders include local municipalities, institutions, service providers, local business owners, industries and associations, and the general public with an interest in the project, including adjacent property owners and local residents. The list was added to and updated as necessary throughout the study.

Stakeholder input was incorporated into the project findings and recommendations, as appropriate, and responses were provided to all input received. All project correspondence to/from the public was collected in accordance with the *Freedom of Information and Protection of Privacy Act*. Accordingly, with the exception of personal information, all public comments are part of the public record.

This project is within a designated area under the *French Languages Services Act* and therefore specific documents required French language translation. Each mandatory public notice was published one day each in the Dorchester Signpost, London Free Press, The Londoner and London/Sarnia L'Action.

A description of the consultation plan undertaken and the results of the process to address government agency/municipal interests and public concerns are provided in the following sections. Relevant consultation materials are included in Appendix A of this report.

2.2 PROJECT WEBSITE

A project website (hwy401vmp.ca) was developed and made operational to function as an interactive tool for the project team to provide study updates, and an opportunity for stakeholders to submit comments during the Detail Design period. The content includes a Home page and related links for Project Schedule, EA Process, Project Overview, Notices, Consultation, Reports, FAQs, Contact Us, Additional links, for Daily Traffic Restrictions/Detour Routes, and Construction Progress Updates will be available during the construction phase.

Visitors will find useful information in a clear and memorable context, and have the opportunity to contact the project team directly through the dedicated project email address [comments@hwy401vmp.ca].

The website conforms to current *Accessibility for Ontarians with Disabilities Act (AODA)* requirements, WCAG 2.0 Level A, allowing all visitors to benefit from the available information. The project website experienced a notable increase in activity following the PIC, although no direct comments were submitted.

2.3 NOTICE OF COMMENCEMENT AND PUBLIC INFORMATION CENTRE

The Notice of Commencement of Detail Design and the Public Information Centre (PIC) was published in the following newspapers:

- Dorchester Signpost (in English) on Wednesday, May 11, 2016
- London/Sarnia L' Action (in French) on Wednesday, May 11, 2016
- London Free Press (in English) on Thursday, May 12, 2016
- The Londoner (in English) on Thursday, May 12, 2016

The Ontario Government Notice (OGN) described the project, including the Approved Plan and the Class EA process, and provided details of the PIC, including the date, venue, location, and purpose. The Notice also requested public involvement, and provided names and contact information for representatives from the MTO, City of London, and Stantec.

Study Commencement and PIC notification letters with a copy of the OGN including the date and time for the PIC were sent to approximately 68 external agencies/stakeholders on the project mailing list on Friday, May 6, 2016. A comment form was also included as a part of the mailed materials. Additionally, the City of London mailed the aforementioned OGN to approximately 1800 property owners adjacent to Commissioners Road, Bradley Avenue, and Westchester Bourne during the week of May 11, 2016.

Jeff Yurek, MPP (Elgin-Middlesex-London) and Teresa Armstrong, MPP (London-Fanshawe) were notified on April 27, 2016, in advance of the newspaper publication.

A copy of the notification materials is contained in Appendix A.

2.4 CONSULTATION AND ENGAGEMENT WITH FIRST NATION AND MÉTIS COMMUNITIES

Contact with federal and provincial agencies involved in aboriginal affairs to confirm the appropriate groups to consult was completed during Preliminary Design. The First Nations and First Nation agencies that were contacted by MTO during this Detail Design study included:

- Chippewas of the Thames First Nation
- Oneida Nation of the Thames First Nation
- Caldwell First Nation
- Mississaugas of the New Credit First Nation
- Kettle and Stony Point First Nation
- Six Nations of the Grand River Territory
- Aamjiwnaang First Nation (Chippewas of Sarnia First Nation)
- Munsee-Delaware Nation
- Association of Iroquois and Allied Indians
- London District Chiefs Council
- Walpole Island (Bkejwanong First Nation)
- Union of Ontario Indians
- Haudenosaunee Confederacy Council
- Métis Nation of Ontario

Correspondence from the Ministry, dated May 6, 2016, provided Notice of Study Commencement and the PIC, including a copy of the OGN. The purpose was to inform the communities of the project and the PIC, as well as provide an opportunity for input.

2.5 CONSULTATION WITH EXTERNAL AGENCIES

The government agencies, ministries, and stakeholders that were contacted during this study are outlined in Table 1.

Table 1: Study Contact List

Provincial Government

- | | |
|--|--|
| • Ministry of Natural Resources and Forestry, Aylmer District Office | • Ministry of Agriculture, Food, and Rural Affairs |
| • Ministry of Tourism, Culture, and Sport | • Ministry of Municipal Affairs and Housing |
| • Ministry of the Environment and Climate Change | • Ontario Provincial Police, Middlesex Detachment |

- MPP, Jeff Yurek (Elgin-Middlesex-London)
- MPP, Teresa Armstrong (London-Fanshawe)

Municipal Government

- City of London
- Middlesex County
- Municipality of Thames Centre
- London Police / Fire Services
- Middlesex-London EMS
- Elgin-St. Thomas EMS
- City of London Transportation Advisory Committee
- City of London Agricultural Advisory Committee
- Thames Valley District School Board
- London District Catholic School Board
- Middlesex-London Health Unit

Stakeholders / Utilities

- Upper Thames River Conservation Authority
- London Transit Commission
- Southwestern Ontario Student Transportation Services
- Urban League of London
- Nature London
- Crinklaw Farms
- London Dairy Farms Ltd.
- Atchison Machine Service Inc.
- Bruynland Farm Inc.
- 27 Cardigan Inc.
- Patton Cormier Ferreira
- Realty Executives
- London Hydro
- Union Gas
- Rogers Cable Communication Inc.
- Allstream
- Hydro One Networks Inc.
- Bell Canada

2.5.1 Municipal Meetings

K. Grabowski from the City of London has actively participated in the study with representation at all project meetings.

A meeting was held with municipal representatives from the City of London, County of Middlesex, Middlesex-London EMS, London Fire Services, and the Ontario Provincial Police

(Middlesex Detachment) on Wednesday, May 11, 2016 to discuss various aspects of the project and the construction staging and traffic management plan.

The Preliminary Design plans defined Commissioners Road to be the detour route and two other options were discussed – Bradley Avenue and Wilton Grove Road. Commissioners Road was initially defined to be the detour route because of the road condition and existing signals along the route. Bradley Avenue had some concerns for road condition which have been primarily addressed within the City portion of detour. The Wilton Grove route still has road condition concerns.

The City of London and Middlesex County advised that they would be supportive of a Bradley Avenue detour, but would look for some assurances that the traffic volumes will not create problems for traffic on Highbury or Bradley. Use of a Police officer at key locations (i.e., uncontrolled intersections) would be beneficial to assist turning movements.

There was some discussion regarding travel by long combination vehicles (LCVs) through the detour route. It was determined that these are short durations, and that LCVs would have to either park and wait or time their drive to avoid the detours. Meetings continue to occur as the design progresses to finalization of a contract package and construction.

2.5.2 Summary of External Agency Feedback

There was limited formal correspondence received from external agencies as a result of the study commencement and PIC notification. Comments provided by the Ministry of Tourism, Culture and Sport, Heritage Planner (June 22, 2016) noted that MTCS had received the Archaeological Assessment for their review, and that it had been entered into the Ontario Public Register of Archaeological Reports.

It was noted that the Cultural Heritage Assessment Report (CHAR) does not identify any outstanding concerns with direct impacts, and the TESR documents that the CHAR recommendations are being followed. MTCS should be advised if any technical heritage studies will be completed for the EA, and to provide them to MTCS before issuing a Notice of Study Completion.

2.6 PUBLIC INFORMATION CENTRE

A Public Information Centre (PIC) was held on Thursday, May 26, 2016, at the Ramada Inn, in the City of London, from 4:00 PM to 7:00 PM. The objectives of the PIC were to present and receive input on the design details of the Approved Plan, including information about the construction staging, traffic management plan, and associated road improvements in advance of the construction activities anticipated to begin in the fall of 2016.

A separate external agency session was held from 3:00 PM to 4:00 PM at the same venue, in advance of the general public session. An invitation to attend the meeting was sent to external

agencies on the project mailing list on May 6, 2016, requesting them to attend the PIC anytime between 3:00 PM and 7:00 PM.

The PIC was a drop-in format. The text panels and displays were available for review. Project team representatives from MTO, the City of London, Dufferin, and Stantec were present to answer questions and discuss the study on a one-to-one basis. The Class EA document and the *Environmental Reference for Highway Design (2013)* were made available for reference purposes.

The following information was displayed at the PIC:

- Welcome
- Project History and Process
- Project Description
- The Approved Plan
- VMP Bridge Over Highway 401
- Crinklaw Drain Culvert and Crinklaw Drain Realignment Design Concept
- Construction Staging and Traffic Management Plan
- Overnight Highway 401 Detour Route
- Existing Conditions, Mitigation and Commitments
- Next Steps
- Thank You for Attending

A copy of the information presented on the PIC display boards is provided in Appendix B.

2.6.1 PIC Attendance

Twelve people signed the visitor register at the PIC. Attendees included representatives from Bell Canada, Nature London, and adjacent farm businesses, as well as property owners on Old Victoria Road, Dingman Drive, and Meadowgate Boulevard, and other members of the public who were interested in the project. All names and addresses from the visitor register and submitted comment forms were added to the project mailing list.

2.6.2 Summary of PIC Participant Feedback

Participants were encouraged to fill in and submit a comment form to provide feedback on the project. Comment forms could be returned in the comment box at the meeting or by mail, fax, or email.

Verbal comments received at the PIC were related to local access, detour routes, construction staging, how construction would affect local drainage, and when Wilton Grove Road would receive improvements outside of the project's construction limits.

An overview of comments received from the public/agencies and responses provided are included in Table 2.

Table 2: Summary of PIC Input Received and Responses Provided

Comment	MTO Response
Will farm equipment be accommodated on the VMP between Wilton Grove Road and Bradley Avenue?	VMP is classified as an "urban expressway" and is a controlled access highway. It has been designed to carry large traffic volumes at high speeds with uninterrupted traffic flow characteristics. Farm equipment cannot be accommodated due to safety concerns. However, farm equipment moving from Wilton Grove Road to Bradley Avenue can be accommodated on the adjacent roads with bridges over Highway 401 at Old Victoria Road to the west, and Westchester Road to the east.
Concerned with drainage in farm fields and how it will be affected during construction.	Modifications and additions to the existing culvert network that will serve the future VMP extension and interchange. Linear treatment swales are provided within the roadside ditches along the east and west sides of the southerly extension of the VMP for stormwater quality control.
Interested in Crinklaw Drain improvements and staging.	The Crinklaw Drain will be realigned to allow for modifications of the southwest quadrant of the interchange and the VMP extension and a new culvert will be installed under the southerly VMP extension.
How will traffic impact Old Victoria Road during the detour periods?	The preferred detour route to be implemented during overnight closures for the removal of the existing VMP bridge over Highway 401 and girder replacement for the new bridge follows Highbury Avenue - northbound/southbound; Bradley Avenue - eastbound/westbound; and Westchester Bourne - northbound/southbound. The existing intersection at Old Victoria Road may require the use of police presence to facilitate traffic diversion during the closures.

2.6.3 Study Completion

The Ontario Government Notice of Study Completion was published in the following newspapers on the dates specified:

- Dorchester Signpost (in English) – Wednesday, August 3, 2016
- London Free Press (in English)– Wednesday, August 3, 2016
- The Londoner (in English) – Thursday, August 4, 2016
- London/Sarnia L' Action (in French) – Wednesday, August 3, 2016

The notice announced the commencement of the 30-day public and regulatory agency review period for the DCR, the locations where the DCR can be viewed, and the closing date for comments to be submitted. Notification letters and a copy of the Notice were provided to the names on the project contact/ mailing list. Comments during the review period may be also be submitted via the project website (hwy401vmp.ca).

Reasonable efforts will be made to resolve issues or concerns raised during the review period.
Formal responses will be provided to all comments received.

3.0 Major Features of the Proposed Work

The project has been developed to the implementation level of detail. The Approved Plan was carried forward from Preliminary Design and refined during the Design-Build phase. The Recommended Design will provide direct access from Wilton Grove Road to VMP and Highway 401. It is considered to be the most technically, environmentally, and economically suitable for addressing the project objectives. It consists of an interim plan to address the current need for an extension of VMP and subsequent interchange improvements, and an ultimate stage to accommodate the widening of Highway 401, based on future traffic volumes.

The Recommended Design is outlined in Section 1.3 and the details are provided in the subsections below. The PIC displays in Appendix B provide an overview of the information detailed in the sections below.

Design drawings with details of the proposed improvements to be constructed are shown on the Detail Design Plan in Appendix C.

3.1 STRUCTURE REPLACEMENTS

3.1.1 VMP Underpass

The new VMP Underpass will carry five lanes of VMP traffic over Highway 401. The structure will be a two-span (37.5 m – 37.5 m) integral abutment bridge with a continuous slab-on-girder superstructure. This configuration requires a pier situated in the median of Highway 401. The structure will have an overall width of 27.9 m, a barrier wall length of 88.2 m, and a superstructure depth of approximately 2.7 m (includes 2% crossfall).

The span configuration will accommodate future Highway 401 widening to eight lanes and can also accommodate further widening to ten lanes with modifications to the abutments.

The cross-section of the structure consists of a slab-on-girder system. The bridge deck will be protected with waterproofing (10 mm) and asphalt (80 mm). The superstructure will consist of nine 2000 mm deep NU girders for each span supporting a 3.1 m wide deck.

The integral abutments will be cast-in-place concrete with cast-in-place concrete wingwalls attached. The abutments will be founded on steel H-piles. Black reinforcing steel will be used in the abutments, which are outside of the splash zone for the future Highway 401 eight-lane configuration, and wingwalls.

The majority of the existing substructure will be removed; however, portions located 600 mm or more below final grade will remain.

Aesthetic Features

In accordance with the MTO *Aesthetic Guidelines for Bridges*, the aesthetic classification for this structure is Level 2 – Medium. The Ministry and the City of London have noted that consideration should be given to providing some aesthetic features at this site. Bridge aesthetics will include:

- Barrier wall pillars at the abutments
- “Falling Maple Leaf Motif” on the barrier walls and wingwalls
- Pigmented concrete sealer

These features are shown on the Preliminary General Arrangement Drawing, included in Appendix C.

3.1.2 Crinklaw Drain

The Crinklaw Drain is a Municipal Drain serving lands immediately to the east of the VMP interchange. The drain flows from east to west and will be re-aligned to the south of its existing alignment to accommodate the reconfiguration of the VMP interchange.

The culvert will be a 3.96 m × 3.35 m × 39.34 m precast concrete rigid frame culvert. The culvert opening was modified during Detail Design to accommodate standard precast culvert sizing. The Openness Ratio (OR) for the culvert is approximately 0.27, which exceeds the Preliminary Design requirement of 0.25. The invert elevations for the culvert are based on the Crinklaw Drain 2014 Report (by Spriet Associates).

A precast concrete culvert is preferred to a cast-in-place concrete culvert at this site, mainly due to the better durability and quality control of precast construction. Precast construction also minimizes the on-site duration of construction impacts to the environment and traffic. Retained Soil System (RSS) retaining walls, including culvert header walls, are utilized to reduce the culvert length, and to retain the VMP embankments. The fill cover over the culvert will be approximately 3.3 m. The culvert top slab and the top 500 mm of the outside face of the walls will be waterproofed.

The construction of the culvert will be carried out approximately 220 m south of the existing Crinklaw Drain. Flow will be maintained in the existing channel during the culvert construction. The drain will be realigned to flow through the new Crinklaw Drain Culvert.

Foundation investigations carried out by Stantec identified a silt deposit, with trace sand and clay, at about elevation 271 to 269 m in the vicinity of the culvert inlet. More extensive dewatering of the excavation may be required during construction of the culvert, including the inlet cut-off wall.

3.1.3 Interchange Reconfiguration

With reference to Exhibit 5, north of Highway 401, the Parclo A3 configuration will include:

- A realigned direct E-N exit ramp in the northeast quadrant
- A new E-S ramp in the northeast quadrant, the ramp terminal will be signalized at VMP
- A new direct S-W inner loop ramp in the northeast quadrant
- A realigned direct N-W ramp in the northwest quadrant

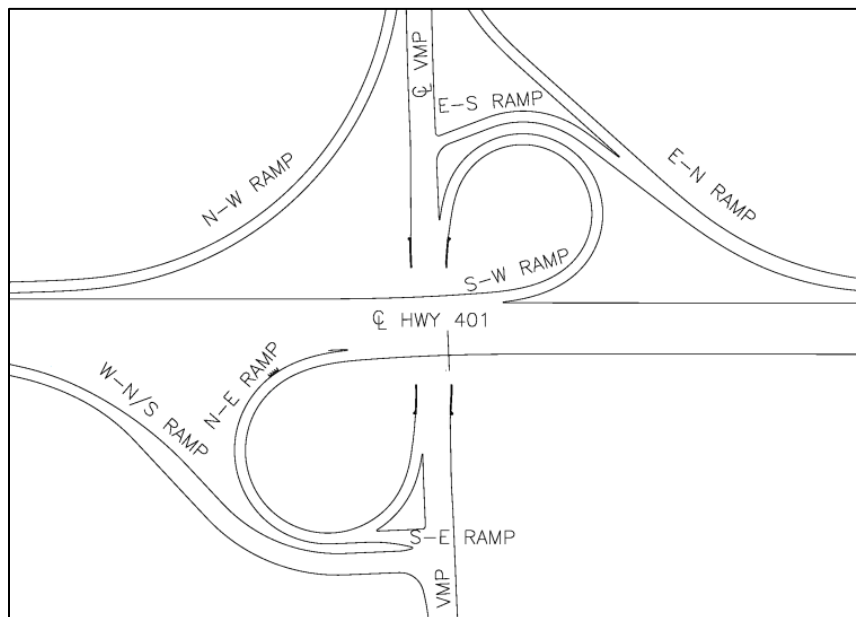


Exhibit 5: Interchange Configuration

South of Highway 401, the Parclo A3 configuration will include:

- A realigned W-N/S exit ramp in the southwest quadrant, which includes a dual left-turn lane, and separate right-turn lane - the ramp terminal will be signalized at the VMP Extension
- A realigned N-E inner loop ramp in the southwest quadrant
- A new S-E connecting ramp in the southwest quadrant
- A new retaining wall in the southeast quadrant
- Realignment of Crinklaw Drain to the south

3.1.4 Extension of Veterans Memorial Parkway

VMP will be extended as a 2-lane expressway within a 60 m right-of-way and a rural cross-section. Wilton Grove Road will be widened to accommodate turning lanes.

3.1.5 Design Refinements

The Design-Build team implemented several enhancements to the Approved Plan from the Preliminary Design, including:

- W-N/S ramp is realigned with dual left-turn lanes, and separate right-turn lane
- N-E ramp is realigned based on R=65 m radius
- VMP alignment shifted 3.75 m to the west
- A second northbound lane is provided on VMP, starting from south of the W-N/S ramp terminal intersection to the existing 4-lane section of VMP north of Highway 401
- An additional bridge deck width of 4.55 m to accommodate the second VMP northbound lane, and to provide a minimum of 2.5 m shoulders on the bridge (the majority of the additional widening of the bridge over Highway 401 is on the west side)
- Speed change lane added for E-N ramp entry onto northbound VMP
- Profile adjustment to N-W ramp in the vicinity of the VMP exit bullnose, resulting in a need for a retaining wall to contain grading footprint within the existing MTO right-of-way
- The left-turn lane and run-out at the W/S ramp terminal is adjusted to better align the southbound VMP lane across the ramp terminal intersection. The adjustment to the left-turn lane run-out north of the ramp terminal shifts the east edge of the VMP pavement further east by 1.25 m

3.1.6 Intersections

There are 3 new intersections (W-N/S and E-S ramps at VMP, and VMP at Wilton Grove Road) within the study limits. They are all T-intersections. A northbound left turn lane is provided on VMP to access the S-E ramp to Highway 401. A realigned W-N/S exit ramp in the southwest quadrant includes a dual left-turn lane and a right-turn lane onto VMP. Southbound VMP has both a right and left turn lane at its new intersection with Wilton Grove Road. Eastbound Wilton Grove Road has a new left turn lane to VMP as well as a new right turn lane for westbound traffic on to VMP.

The new Wilton Grove Road and VMP intersection has been developed based on widening both sides of Wilton Grove Road along the existing centreline. The intersection has been designed to accommodate LCV turns. The proposed lane widths on Wilton Grove Road at the intersection are 3.75 m to accommodate increased heavy truck traffic.

3.1.7 Overhead Signs

The key plan below shows the location of the four new Overhead Signs Support Structures and the existing Sign Support Structure on Highway 401 that will be removed.

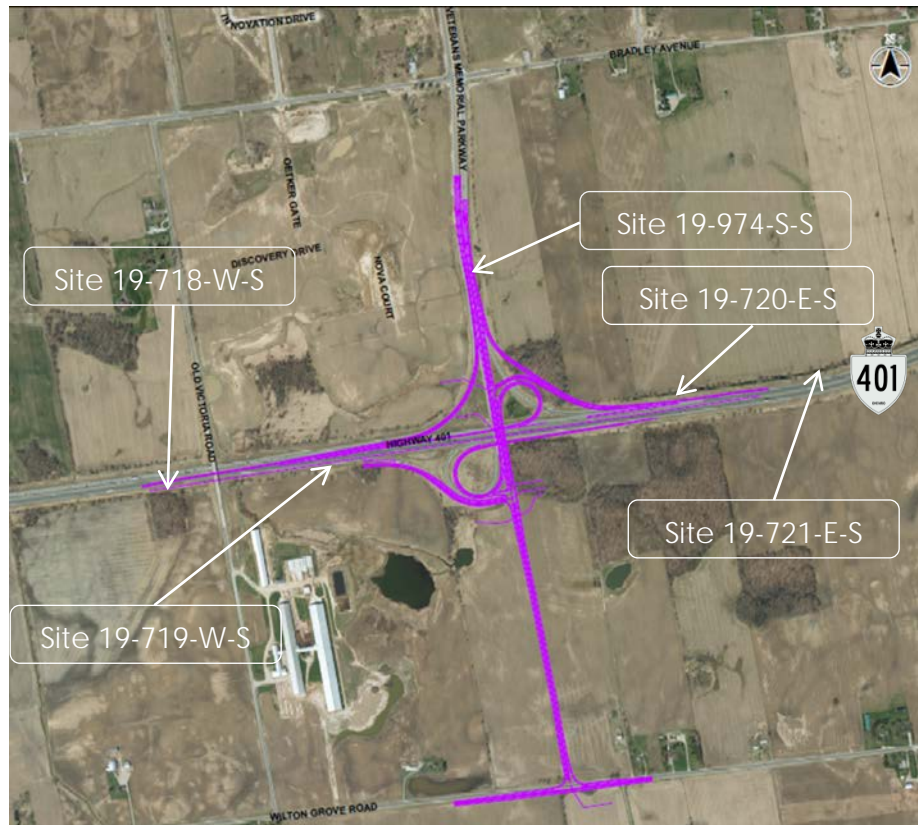


Exhibit 6: Location of Overhead Signs

The proposed work includes the removal of the existing sign support structure, Site 19-974-S-S, and the installation of new Overhead Sign Support Structures, including:

- Construct a Ground Mounted footing for each of the four new sign support structures
- Install two Tri-chord Cantilever type signs, Sites 19-718-W-S and 19-19-721-E-S
- Install two Single Cantilever type signs, Sites 19-719-W-S and 19-720-E-S

3.1.8 Utilities

Various hydro and electrical utilities exist in the vicinity of the proposed works. Consultation with utilities is ongoing to confirm the location of all plant, potential conflicts and specific relocation strategies.

Bell Canada has existing conduit (containing fibre optic), buried cable and pedestals within the Wilton Grove Road right-of-way and will require localized relocation or mitigation due to the proposed improvements to Wilton Grove Road at the VMP intersection. Bell Canada also has existing conduit (containing fibre optic) along the north side of Highway 401 that crosses VMP just north of the Highway 401.

Hydro One has a 27.6 kV aerial distribution line present along the north side of Wilton Grove Road and the line crosses to the south side of Wilton Grove Road at the proposed location of the VMP intersection. The Hydro One crossing of Wilton Grove Road will require relocation as part of the new intersection. London Hydro also has a 4.8 kV aerial distribution line along the west side of VMP that terminates at a transformer box located adjacent to the existing southbound to westbound on-ramp. The London Hydro line and Transformer will require relocation as part of the new intersection.

Hydro One has two 230 kV hydro transmission lines in a corridor located just north of Highway 401.

Rogers Communications and MTS Allstream (formerly AT&T) have no facilities within the study area.

A 420 kPa Union Gas main along the south side of Wilton Grove Road (along the edge of the existing right-of-way) was in conflict with the proposed widening of Wilton Grove Road at the VMP intersection. The gas main terminated near the VMP intersection, and was identified as being redundant by Union Gas. It was removed to the west limit of the widening of Wilton Grove Road.

Natural Resources Gas (NRG) has a gas main crossing near the east limits of the widening of Wilton Grove Road. Based on discussions with NRG and a daylighting program, it was determined that this gas main is in conflict with the proposed grading. It will be relocated outside the limits of the Wilton Grove Road widening.

A Closed-Circuit Television Camera (CCTV), and communication equipment to facilitate connection to the COMPASS Traffic Operations Centre in London, will be installed at VMP as part of this project.

Traffic counting stations will be installed on Highway 401 mainline and all interchange ramps.

“Environmental Clearance for Utility Relocation” was issued on July 4, 2016.

3.2 ILLUMINATION

Partial illumination for decision areas and critical points for the E-N/S, W-N/S, N-E, N-W and S-W ramps will be provided as warranted in accordance with Ministry Directive PLNG-B-05. In addition, intersection partial illumination will be provided as warranted at the W-N/S and S-E ramp terminal. All illumination will be LED (or Ministry approved equivalent).

Full illumination is not warranted along Highway 401 or along VMP within the project limits at this time.

3.3 TRAFFIC SIGNALS

Traffic signals are recommended and will be constructed at both ramp terminal intersections as part of this project.

Based on the analysis of future traffic volumes, the need for traffic signals at VMP/Wilton Grove Road intersection is expected between 2022 and 2032. Therefore, stop control on VMP will be implemented as part of this project and traffic signals will be implemented as future traffic volumes increase and warrant the need for signals. With stop control on VMP, the VMP/Wilton Grove intersection is expected to operate with an acceptable level of service.

3.4 ENTRANCES

VMP is a fully controlled expressway and therefore no private entrances are permitted on VMP within the study limits. Two farm accesses exist from Wilton Grove Road, just west of the proposed intersection with VMP; one access to the north field and one access to the south field. These accesses will be permitted to remain in their current location and for their current use since a raised median on Wilton Grove Road is not proposed.

3.5 FENCING/FEATURE SIGN

New highway fencing will be required at the new right-of-way of the proposed interchange. The City of London has a gateway feature sign in the northeast quadrant of the interchange. The armour stone will be salvaged and put into storage. The City of London may request additional works at a later date. Opportunities for lighting will be reviewed.

3.6 DRAINAGE

Upgrades to drainage infrastructure within the interchange and a dry stormwater management (SWM) facility are proposed. The extension of VMP south to Wilton Grove Road will require the realignment of the Crinklaw Drain and a new culvert to convey flows westerly towards the Moore Drain located west of the site.

New culverts and ditching will provide proper drainage within the interchange. Due to the condition of the existing culverts, it is proposed that all CSP culverts within the interchange are replaced and upgraded to meet MTO design criteria as a part of the improvements. The concrete box culverts under Highway 401 are proposed to be retained and extended as a result of roadway improvements. Ramp culverts around the proposed interchange are not located on a watercourse and have been designed using a 10-year design storm.

Portions of the median storm sewer may be disturbed during construction of the VMP underpass. These sewers are proposed to be replaced with similar size pipes. New catch basins and storm sewer are also proposed along VMP to provide adequate drainage. These sewers generally

consist of a single catch basin with a single outlet pipe and a minimum storm sewer size that is sufficient to drain the required flow.

The existing Henning Stuart Drain piped system includes catch basins immediately south and north of the existing Wilton Grove Road. The proposed road improvements will not impact the piped system. Following discussions with the Drainage Superintendent the piped system was cleaned out and maintained as is.

3.7 STORMWATER MANAGEMENT

The Stormwater Management (SWM) strategy was designed to minimize/mitigate environmental impacts due to the proposed highway improvements.

The proposed improvements to the VMP interchange at Highway 401 include additional impervious area resulting from ramps and the extension of VMP south to Wilton Grove Road. The increase in impervious area requires water quantity and water quality control to the 'Normal' level. Water quality control is typically achieved using a wet pond or wetland SWM facility; however, wet ponds and wetlands are typically recommended for much larger drainage areas. Thus, a treatment train approach using vegetated filter strips, grass swales and a dry SWM facility are recommended to provide the necessary controls. The Preliminary Design recommended a dry SWM pond in the northeast quadrant of the VMP interchange with linear controls for the remainder of the site due to space limitations. End-of-pipe facilities are effective at providing water quality and water quantity controls while linear facilities are generally more effective at providing water quality control.

The proposed dry facility in the northeast quadrant provides water quality and quantity controls for approximately 14 ha of upstream land. Water quality control for the remainder of the highway will be provided through the use of grass swales. The MTO Standards require that roadside ditches have a minimum base width of 1.0 m and a minimum length of 40 m. Highway embankments can also be used to improve water quality. The highway embankment should be a minimum 3.0 m in length measured from the edge of the shoulder to the invert of the roadside ditch to maximize sediment removal. This is most important for road areas that do not drain to a roadside ditch but drain directly to a watercourse.

Highway embankments and roadside ditches should be planted with dense vegetation to prevent erosion and trap sediments. Rock check dams can be used along steep grades to reduce velocities and erosion.

3.8 CONSTRUCTION STAGING AND TRAFFIC MANAGEMENT

To maintain traffic safety and allow for efficient construction, road and ramp closures will be required during construction. The Construction Staging and Traffic Management Plan as presented at the PIC can be referenced in Appendix B.

Following the PIC, the Plan was further refined to facilitate a coordinated construction approach in the N-E quadrant of the interchange. This will require a closure of the E-N ramp for three to four weeks and a lane reduction on westbound Highway 401 during that time. The overall staging of this project as summarized in Table 3 includes five major stages of construction from fall 2016 to summer 2018.

Table 3: Construction Staging and Traffic Management

Stage	Work to be Undertaken	Traffic Management
Stage 1	<ul style="list-style-type: none"> Install erosion control measures and wildlife exclusionary fence Construct new Crinklaw Drain culvert and channel Initiate construction of new E-N Ramp Construct VMP extension from Crinklaw Drain to Wilton Grove Road Reconstruct and widen Wilton Grove Road for turn lanes 	<ul style="list-style-type: none"> Highway 401: all lanes open VMP and ramps open Wilton Grove Road: daytime flagging
Stage 2A	<ul style="list-style-type: none"> Preparation for VMP Bridge demolition 	<ul style="list-style-type: none"> VMP closed over Highway 401 N-E and W-S ramps closed
Stage 2B	<ul style="list-style-type: none"> Remove the existing VMP bridge over Highway 401 	<ul style="list-style-type: none"> Highway 401 and all ramps: full closure overnight with detours provided
Stage 3A	<ul style="list-style-type: none"> Construct VMP north of Crinklaw Drain Begin construction of new VMP bridge Begin construction of Highway 401 overhead signs Construct Highway 401 eastbound off-ramp and on-ramp (W-N/S and N/S-E ramps) 	<ul style="list-style-type: none"> Highway 401: two lanes open in westbound direction during stage 3A (approximately 2 months) Highway 401: eastbound off-ramp to VMP (W-N ramp) and on-ramp from VMP (N-E ramp) remain closed, traffic to use alternate interchanges for access Wilton Grove Road: one lane in each direction
Stage 3B	<ul style="list-style-type: none"> Construct E-N ramp 	<ul style="list-style-type: none"> Highway 401: Two lanes open westbound; 3 lanes open in eastbound (approximately 3 weeks) E-N ramp closed Same closures as 2A
Stage 3C	<ul style="list-style-type: none"> Construct S-W, E-S ramps and SWM pond Construct VMP north of bridge to north ramp terminal Continue construction of VMP bridge 	<ul style="list-style-type: none"> Same closures as Stage 2A Highway 401: 3 lanes open both directions Highway 401: full closure overnight for girder and overhead sign placement (2 occasions in each direction)
Stage 4	<ul style="list-style-type: none"> Construct City of London storm and sanitary crossings 	<ul style="list-style-type: none"> Highway 401 westbound: two lanes open

Stage	Work to be Undertaken	Traffic Management
	<ul style="list-style-type: none"> • Complete construction of Highway 401 westbound off-ramp and on-ramps (N-W) • Construct stormwater management pond • Complete new VMP bridge over Highway 401 	<ul style="list-style-type: none"> • Highway 401 eastbound: three lanes open • VMP closed from Bradley Avenue to Wilton Grove Road • Highway 401: eastbound off-ramp to VMP (W-N ramp) and on-ramp from VMP (N-E ramp) remain closed. Traffic to use alternate interchanges for access • Highway 401: westbound off-ramp to VMP (E-N/S ramp) and on-ramps from VMP (N-W ramp and S-W ramp) closed. Traffic to use alternate interchanges for access
Stage 5	<ul style="list-style-type: none"> • Final paving 	<ul style="list-style-type: none"> • Flagging as required

3.8.1 Traffic Management

The traffic management for this project will focus on advance notification of the users of the study area roadways and area residents of changes to the available ramps and lanes at various stages of construction. Drivers will be able to select alternate routes when their preferred route through the Highway 401/VMP interchange is not available, or is constrained during construction.

The preferred detour route during full closures of Highway 401 has been developed in consultation with the City of London, County of Middlesex, and Municipality of Thames Centre. The detour route will be implemented as needed (i.e., on several occasions) as overnight closures for the removal of the existing VMP bridge over Highway 401, girder placement for the new bridge, and overhead sign installation. The preferred detour route follows:

- Highbury Avenue (4.5 km west of VMP) northbound/southbound
- Bradley Avenue eastbound/westbound
- Westchester Bourne (1.8 km east of VMP) northbound/southbound

Existing intersections may require the use of police presence to facilitate traffic diversion during construction. Road users will have advance warning of these occasions and may make decisions for alternative travel routes and/or mode of travel and/or time of travel, if possible.

4.0 Environmental Issues and Commitments

This section focuses on the direct and indirect environmental effects associated with the construction of the VMP extension and Highway 401/VMP interchange improvements. In general, impacts to the natural, social, and cultural environment were minimized during planning and design by following these three principles:

- Avoidance
- Identification of roadway design elements at key locations that can minimize environmental impacts
- Development of generic environmental protection plan guidelines for consideration during and following construction

The design, construction, and operation/maintenance phases of this project involve typical activities for which potential environmental impacts are predictable, and known environmental protection measures are applied. All commitments made during the Preliminary Design have been reviewed and addressed. Details on how environmental impacts will be mitigated, either through the use of environmental design or through environmental constraints contained in the contract package and the EMP, are included in the following sections.

Design changes made during Detail Design do not compromise or contradict the intent of the Preliminary Design mitigation or the EA commitments in the TESR.

4.1 NATURAL ENVIRONMENT

The existing environmental features as described in the TESR (2013) were taken into consideration during this study and updated based on supplementary field investigations and background studies undertaken in spring 2016.

4.1.1 Erosion and Sediment Control

Due to the nature of the proposed improvements, the potential for erosion and sedimentation exists. An Erosion and Sediment Control Plan (ESCP) will be developed to effectively manage potential impacts to Crinklaw Drain, drainage ditches, the dry SWM facility, and to the adjacent woodlot area during excavation and grading activities associated with construction.

4.1.1.1 Proposed Mitigation Measures

Erosion protection will be provided during and after construction in accordance with applicable Best Management Practices (BMPs) outlined in MTO's *Environmental Guide for Erosion and Sediment Control During Construction of Highway Projects* (2015) as summarized in the ESCP. Erosion Control BMPs are intended for application to exposed soil where there is high potential

for erosion and are intended to prevent erosion at the source to reduce the amount of sediment that needs to be managed by downstream sediment control measures. Cover is the most effective erosion control practice to protect soil from erosion by wind, rain splash, and overland flow. Sediment Control BMPs are intended for application to flowing water where there is a need to retain mobilized sediment and prevent water with excessive sediment from leaving the construction site. These measures should be installed close to the sediment source to reduce the quantity of water that must be managed and reduce the consequences of a failure. Sediment control can be accomplished by filtering or settling sediment-laden run-off water.

Various mitigation techniques will be employed during construction to reduce the risk of impacts to natural environment features. Mitigation measures will be implemented to prevent sediment and dust from entering sensitive natural features (e.g. watercourses and wetlands).

The primary principles associated with sedimentation and erosion protection measures are to: (1) minimize the duration of soil exposure; (2) retain existing vegetation, where feasible; (3) encourage re-vegetation; (4) divert runoff away from exposed soils; (5) keep runoff velocities low; and to (6) trap sediment as close to the source as possible. To address these principles, the following mitigation measures are proposed:

- Silt fencing will be used adjacent to Crinklaw Drain when exposed soil slopes are at risk of eroding
- No equipment will be permitted to enter any natural areas beyond tree protection fencing
- All materials requiring stockpiling (fill, topsoil, etc.) will be stabilized and kept at a safe distance (> 15 m) from Crinklaw Drain, other drainage features, and the top of steep slopes
- If there is insufficient time remaining in the growing season, sites shall be stabilized with temporary erosion control measures such as erosion control blankets and seeded the following spring. Erosion and sediment control measures shall be maintained until vegetation has been established in disturbed areas
- Refueling of equipment will be carried out away from Crinklaw Drain with the largest buffer possible (minimum 30 m) to avoid potential impacts, in the event that an accidental spill occurs
- In addition to any specified requirements, additional silt fence should be available on-site, prior to grading operations, to provide a contingency supply in the event of an emergency
- All sediment and erosion controls should be monitored regularly and properly maintained, as required. Controls are to be removed only after the soils of the construction area have been stabilized and adequately protected until cover is re-established
- The limits of construction adjacent to all natural features to be retained will be delineated prior to construction, and monitored during construction (along with sediment and erosion

control measures) to ensure the limits are maintained with respect to vehicular traffic and soil or equipment stockpiling

- The Contractor is required to restore any disturbed natural areas to pre-construction conditions
- Banks of the newly aligned channel will be stabilized as per the landscape plan for the project

An MTO RAQS registered Fisheries Contracts Specialist will be responsible for reporting on the suitability of the erosion and sediment control measures; i.e., that they are functioning effectively and being maintained, and that the other general mitigation measures are being implemented as intended. The Fisheries Contracts Specialist will notify the contractor in the event that modifications and/or repairs are required.

In addition to the specified requirements, additional erosion and sediment control measures should be maintained on-site throughout operations to provide a contingency supply in case of an emergency.

4.1.2 Management of Excess Materials

Excess material will be generated during construction and may include old pavement, concrete, vegetation, soils and structure components during the removal of the existing VMP bridge.

Designated substances such as asbestos or lead paint may be encountered during general construction activities. For example, the existing superstructure lighting conduit on VMP bridge, contains asbestos and is planned for removal.

As part of the geotechnical and environmental requirements, a soil sampling program and an Excess Materials Management Plan (EMMP) were completed. The purpose of the EMMP is to determine suitable management protocols for excess materials that may be generated at the site during construction of the road improvements.

4.1.2.1 Proposed Mitigation

Based on the results of the soil sampling program, soil excavated at the site may be reused within the site boundaries, if deemed to be geotechnically suitable, following the soil management guidance presented below.

The MOECC's document, *Management of Excess Soil – A Guide for Best Management Practices*, (MOECC, 2014), provides guidance on soil management options when soil cannot be managed on-site. This document should be consulted to determine the possibility of alternatives to landfill disposal for excess fill that does not meet the Table 1 Site Condition Standards (SCS). In addition, consultation with the local MOECC District Office may be advisable on a case by case basis. In

In addition, the MTO's document, *Contaminated Property and Excess Material Management*, (MTO, 2006) should also be consulted to determine the preferred method of handling excess fill.

During the course of excavation, should suspect soils (e.g., stained or odorous soil, or soil containing debris or slag, etc.) be encountered, the construction administrator and/or MTO shall be consulted to determine appropriate actions, in accordance with Ontario Provincial Standard Specification (OPSS) 180. It is expected that additional sampling and/or off-site removal of any suspect soils to an appropriately licensed facility would be required.

It is anticipated that salt-related parameters Electrical Conductivity (EC), chloride and Sodium Absorption Ratio (SAR) related to de-icing activities along the highway would likely exceed the Table 1 and/or Table 2 SCS in all sections of the site. These exceedances would not be considered to represent an environmental concern within the road alignment. This is supported by Section 48 (3) of Ontario Regulation 153/04, which states that: If a qualified person determines that an applicable site condition standard is exceeded at the property solely because a substance has been used on a highway for the purpose of keeping the highway safe for traffic under conditions of snow or ice or both, as provided for under section 2 of Regulation 339 of the Revised Regulations of Ontario, 1990 (Classes of Contaminants – Exemptions), the applicable site condition standard is deemed not to be exceeded for the purpose of Part XV.1 of the Act.

If soil impacted by salt-related parameters is to be excavated and removed from the site, however, it should be managed in accordance with MTO's Non-Standard Special Provision (NSSP) for the management of salt-impacted fill, and in consideration of the MOECC 2014 document referenced above.

Alternatives for managing excess material both on-and off-site will be evaluated as the quantities are finalized.

Designated Substance Management

Should any other suspected designated substances, such as asbestos, silica, or lead-based paint be encountered during the construction of the project, the Design-Builder or an appropriately qualified contractor or consultant should assess and manage the designated substances prior to any disturbances, in accordance with SSP 101 F21 – Occupational Health and Safety Act - List of Designated Substances and with Ontario Regulation 490/09 and 278/05 (Ministry of Labour, 2010) under the *Occupational Health and Safety Act*.

Effluent and Cleaning Materials Management

Any effluent or cleaning materials generated during the work program will be considered waste and will need to be managed as such. Any effluent or cleaning materials should be contained in appropriate storage containers and sampled prior to off-site disposal to determine the quality and the appropriate location for disposal. Effluent and cleaning materials cannot be discharged overland or to surface water bodies, unless testing determines that they meet the MOECC Provincial Water Quality Objectives (MOEE, 1994).

4.1.3 Groundwater Resources

Hydrogeological site conditions were documented in the 2013 TESR, prepared by McCormick Rankin Corporation (MRC), based on regional reports and data sources. Additional site investigations were completed by Thurber Engineering Ltd (Thurber) from December 2013 to January 2014, including borehole drilling, monitoring well installation and water level monitoring (Thurber, 2014), and from April to May 2016, by Stantec (2016) including borehole drilling, monitoring well installation, water level monitoring and hydraulic testing. Stantec has reviewed the new borehole, water level and hydraulic test data and found it generally consistent with the interpretation of site conditions presented in the TESR. Stantec's 2016 work has also confirmed the nature of groundwater conditions in and around Crinklaw Drain that were previously unknown.

Water levels were collected by Stantec geotechnical staff during spring 2016 during a period of typically high seasonal groundwater levels. The groundwater table within the upper sand aquifer is interpreted to be approximately 262.6 m above mean sea level (AMSL) to 262.9 m AMSL (11 to 13 m Below Ground Surface (BGS) based on water levels measured at three monitoring wells.

Ecoplans' pre-construction well monitoring was completed to confirm the presence of private wells in the vicinity of the design plan and to determine pre-construction well water quality and water level conditions. The identified water supply wells within 500 m of the design plan exhibit the following characteristics:

- Wells are either located along Wilton Grove Road, where below ground excavation is not expected to intercept the water table, or along Bradley road, which is beyond the limit of construction
- Wells are completed in the deep overburden or bedrock at depths below 20 m BGS, and confined by the silty to clayey till deposits at surface

Based on these characteristics, water quantity and/or quality impacts are not anticipated given the proposed construction activities. Thus, a private well monitoring program is not required for the project. The pre-construction monitoring results from Ecoplans (2013) should be referred to in the event of an interference complaint during and/or post-construction.

4.1.3.1 Potential Impacts

The project is located within the Upper Thames River Source Protection Area, where significant drinking water threat policy areas are outlined in the *Approved Source Protection Plan for Thames-Sydenham and Region* (Thames-Sydenham and Region Source Protection Committee, 2015).

The improvements do not intersect any areas where significant drinking water threat policies apply. The nearest significant drinking water threat policy area is located 6.5 km to the west of the wellhead protection area for the Dorchester well field.

Crinklaw Drain is the main drainage feature in the vicinity of the project. Field staff reported several low-lying areas where ponded water temporarily caused saturated ground conditions after heavy rain or snow melt. Evidence of groundwater discharge (e.g., groundwater seeps, vegetation common in areas of discharge such as watercress, and/or a cold-water stream thermal regime) was not found at the site. The lack of groundwater discharge indicators combined with the interpreted hydrogeological setting, does not suggest Crinklaw Drain is located in an area of groundwater discharge.

Groundwater Takings

The majority of the project components for the proposed interchange will require below ground construction to a maximum of approximately 2 m BGS, which is above the groundwater table (11 m BGS to 13 m BGS). Perched conditions may be present in some areas resulting in short-term dewatering. In low-lying areas, saturated ground conditions may temporarily exist after heavy rain or snow melt. Construction dewatering may be required if excavation in these areas occurs before soils fully drain. Deeper excavation is anticipated for the following project components:

- Bridge foundation works at the VMP Underpass
- Installation of the dry SWM pond
- Culvert replacement at Crinklaw Drain
- Storm and sanitary sewer crossings of VMP

Stormwater Takings

Stormwater may need to be managed during construction, especially after heavy rain or snow melt. Under Ontario Regulation 64/16, pumping of surface water at ground surface is generally exempt from PTTW and Environmental Activity and Sector Registry (EASR) requirements and it is expected that the Contractor would manage surface water as necessary to maintain a dry construction site. However, pumping of any surface water runoff or precipitation that enters an excavation would need to be recorded under the PTTW or EASR process.

The excavation for culvert replacement is expected to be 30 m long by 5.6 m wide with 1:1 sloped sides. Historical weather data for the London International Airport, which is located 10 km north of the site, indicate a maximum extreme daily rainfall of 89 mm for the 1981 to 2010 period (Environment Canada, 2016). The anticipated dewatering requirements from direct precipitation into the culvert excavation after 89 mm of rainfall in 24 hours are estimated at 15,210 L/day. Additional stormwater inputs from the catchment area for Crinklaw Drain may bring the pooled water depth in the excavation to 0.5 m deep. The total stormwater dewatering requirements for culvert replacement are therefore estimated at 91,500 L/day for an extreme rainfall event and its associated runoff.

Similarly, for the storm and sanitary sewer replacements, the total stormwater dewatering requirements for a 30 m long by 3 m wide excavation with 0.5 m of pooled water are estimated at 45,000 L/day.

Stormwater dewatering requirements for other project components, under a similarly extreme rainfall event, may be of similar or lesser volume, based on the construction methods or weather conditions at the time of work.

4.1.3.2 Proposed Mitigation

The western portion of the study area, near Highway 401 and Old Victoria Road, intersects an area of course textured glaciolacustrine deposits that are classified as a Significant Groundwater Recharge Area (SGRA) with a vulnerability score of 6. During construction, the primary concern in this area would be the potential for a contaminant spill from the handling and storage of fuel. The following mitigation measures shall be implemented during construction to address these risks:

- Refueling of equipment is to be completed away from SGRAs, whenever possible, to minimize potential impacts to groundwater quality in the event that an accidental spill occurs
- To minimize the impact of potential contaminant spills, the Contractor shall implement best management protocols such as secondary containment of temporary fuel storage, and the use of a spill response plan

It is expected that standard construction sump/trash pump(s), or their equivalent, will be used for dewatering. It is the Contractor's responsibility however, to design and implement a dewatering strategy. The Contractor may therefore choose to use a well point system, sump or trash pumps, passive drainage, or the equivalent, as conditions require.

During dewatering it is the Contractor's responsibility to document pumping rates. Water taking records will be required as a condition of any water taking permits that are obtained for this work. The dewatering volumes could be estimated by the Contractor using a flow meter; through manual measurement in the field; based on the pump type, size and duration of pumping; and/or an equivalent calculation as determined by the Contractor.

A PTTW or EASR is required for water takings in excess of 50,000 L/day. The anticipated groundwater and stormwater dewatering requirements for this project are approximately 200,000 L/day. Dewatering requirements are therefore expected to be above 50,000 L/day but below 400,000 L/day, requiring an EASR to proceed. A PTTW would be required if dewatering requirements were expected to exceed 400,000 L/day.

To register an EASR, a water taking report and a dewatering plan must be completed and signed by a qualified professional. The water taking report would include dewatering requirements; the anticipated impacts to private wells; and the potential soil settlement impacts

from the anticipated dewatering. The discharge plan and soil settlement impact assessment will be documented in the Environmental Management Plan.

The Design-Builder will register an EASR to conduct groundwater and stormwater dewatering at rates less than 400,000 L/day during construction. The maximum discharge rate during construction is estimated at 181,500 L/day as provided in the Groundwater Assessment Report (Stantec, 2016).

The groundwater and stormwater dewatering can be completed to the proposed discharge locations without causing any long-term impact to groundwater conditions or surface water features. Any short-term impacts can be effectively mitigated with the proposed mitigation and contingency measures. Prior to discharge, the Design-Builder must obtain all necessary land authorization and sewer use permits as required.

4.1.4 Fish and Fish Habitat Resources

The project is located within the jurisdiction of the Aylmer District of the Ministry of Natural Resources and Forestry (MNRF) and the Upper Thames River Conservation Authority (UTRCA). There is one watercourse that provides fish habitat in the study area. The Crinklaw Drain consists of a closed portion and an open portion. The closed portion extends from its head on the north side of Highway 401, southerly across the highway and southwest to an outlet in the open portion, approximately 150 m south of Highway 401. The open portion continues westerly through a wooded area (woodlot) approximately 335 m to an outlet in a natural low area in the northwest.

Field investigations were undertaken by Stantec on May 3, 2016 to confirm the existing conditions that were documented in the Fish and Fish Habitat Existing Conditions and Impact Assessment Report (Ecoplans, 2013) completed during the Preliminary Design. In the vicinity of the proposed VMP and Highway 401 interchange, the Crinklaw Drain is an intermittent watercourse that supports a seasonal warmwater baitfish community. Stantec's habitat assessment confirmed the findings of the Preliminary Design survey, which provided a thorough description of Crinklaw Drain within the study area.

Upstream of the proposed channel realignment segment and within the woodlot east of the existing interchange, aquatic habitat within the trapezoidal channel consists of a slow moving 'flat' over a mixture of soft substrates and detritus. The channel within the woodlot is devoid of in-water vegetation, but adjacent riparian vegetation provides 100% overhead cover to the watercourse.

Within the proposed channel realignment segment, the watercourse is characterized by braided flow through grassy in-water vegetation. At some locations the flow path forms a narrow 'flat' or 'run' through the grassy vegetation. Minimal to moderate riparian cover is provided by the adjacent and overhanging shrubs and grasses. A pool approximately 25 cm to 30 cm deep is situated immediately upstream of a large area of *Phragmites* and diffuse flow continues downstream through the *Phragmites*, with no distinct channel.

Downstream of the proposed realignment, the diffuse flow (from the area of *Phragmites*) concentrates to form a narrow and shallow 'flat' through a grassy floodplain. The channel widens and the wetted depth increases at the inlet to a large agricultural pond. Submergent vegetation and algae were also observed in the channel, immediately upstream of the pond. The pond has submergent and emergent vegetation along the perimeter and water was turbid at the time of the field survey.

No fish were observed upstream of or within the proposed channel realignment segment. A small cyprinid species (likely Brook Stickleback [*Culaea inconstans*]) was observed in the channel immediately upstream the agricultural pond located approximately 90 m south of the Highway 401 off ramp. At the time of the May 2016 survey, the following in situ water parameters were recorded:

- | | | | |
|----------------------------------|---------------|------------------------------|--------------------------------|
| • Dissolved Oxygen:
14.7 mg/L | • pH:
7.91 | • Conductivity:
802 µS/cm | • Water Temperature:
10.0°C |
|----------------------------------|---------------|------------------------------|--------------------------------|

4.1.4.1 Potential Impacts

The geometric configuration of the proposed interchange improvement and VMP extension results in the need for the realignment of a portion of Crinklaw Drain on the west and east sides of the VMP extension. A length of approximately 223 m of open channel must be realigned and a culvert must be installed on the newly aligned channel.

The work will result in changes to habitat that is used during periods of higher water by warmwater baitfish species. The destruction of habitat in Crinklaw Drain will be offset by the new channel, which will be accessible by the warmwater baitfish community of Crinklaw Drain. Although habitat within the new culvert will be altered, it will provide fish habitat and allow fish passage; therefore the culvert is Low Risk to fish and fish habitat. The duration of the change in access to the 100 m of habitat upstream of the realigned segment (temporary alteration) is not known. The difference in the stream bed elevation from the realigned channel to the upstream segment of the drain can be corrected by a future drain cleanout.

Stantec agrees with the Ecoplans assessment that the sensitivity of fish habitat in Crinklaw Drain is Low; however, in light of the extent of the channel realignment and the temporary change in access to upstream habitat, Stantec recommends a project review by Department of Fisheries and Oceans (DFO). A Request for Review form will be completed and submitted to DFO to confirm Stantec's assessment that serious harm is not likely and that a *Fisheries Act* authorization is not required for the realignment of Crinklaw Drain.

The final design and construction-related mitigation measures will be incorporated into the Contract Documents for implementation during construction.

4.1.4.2 Mitigation Measures

Design

The following design-related mitigation measures were applied to Crinklaw Drain, as it provides fish habitat on a seasonal basis within the reach to be realigned.

The Crinklaw Drain realignment was designed to avoid a long, oblique culvert crossing under the VMP extension and interchange ramp terminals. The realignment was designed to continue to convey downstream flows and to provide upstream passage for fish that utilize the drain. The design includes a low flow channel (approximate 2-year flow) and a vegetated floodplain / riparian zone that will convey the regulatory (250-year) flows. The proposed channel and culvert were designed to maintain the capacity of the existing hydraulic system. The channel will be diverted south to the newly built channel once the precast culvert is constructed.

The box culvert was designed with a low flow channel to maintain fish passage and existing flow conditions to downstream habitat. The low flow channel will be created by adding quarry stone (50 mm to 200 mm diameter) and Granular A to the culvert bottom. Rip-rap rock protection will reduce scour and erosion for approximately 4 m of creek bed upstream of the culvert inlet and 4 m of creek bed downstream of the outlet.

The Design Concept Drawings for Crinklaw Drain are provided in Appendix B.

Construction

Timing Windows

Works adjacent to aquatic resources that provide fish habitat are restricted to certain periods to avoid construction-related impacts to fish species during their most sensitive/vulnerable life cycles (i.e., during reproduction and early development stages of offspring). Therefore, construction activities are often not permitted close to, or within fish habitat during these periods.

Construction of the new channel and culvert will occur prior to 'abandoning' the existing channel. Crinklaw Drain is an intermittent stream that supports warmwater baitfish. In-water (instream) construction activities (specifically, diverting flow to the new channel) must be completed within the warmwater timing window from July 2 through March 14 of the following year, as indicated in the Fish and Fish Habitat Existing Conditions and Impact Assessment Report (Ecoplans 2013).

Flow Diversion/Dewatering

If water is present in Crinklaw Drain when the existing channel is connected to the new channel (i.e. diversion of flow), the following mitigation measures will be applied to isolate the channel from construction activities:

- Design and implement isolation plan to isolate temporary in-water work zones to maintain clean flow to downstream/around the work zone at all times.
- Fish rescue plan - Transfer fish in the work area away from the construction area using capture, handling, and release techniques to minimize harm and stress. Ensure the intakes of pumping hoses are equipped with an appropriate device to avoid entraining and impinging fish (see DFO's Freshwater Intake End-of-Pipe Fish Screen Guideline (1995)).
- Manage all water from dewatering operations to prevent erosion and/or release of sediment laden or contaminated water to the waterbody (e.g., settling basin, filter bag, energy dispersion measures).

Based on the nature of the watercourse, it is recommended that the channel connection occur during dry weather periods. As a contingency, materials should be on site at all times in the event that water levels increase during construction.

Erosion and Sediment Control

Various mitigation techniques for erosion and sediment control as outlined in Section 4.1.1 will be employed during construction to reduce the risk of impacts to natural environment features.

An MTO RAQS registered Fisheries Contracts Specialist will be responsible for reporting on the suitability of the erosion and sediment control measures; (i.e., that they are functioning effectively and being maintained, and that the other general mitigation measures are being implemented as intended). The Fisheries Contracts Specialist will notify the contractor in the event that modifications and/or repairs are required.

Applicable OPSSs

The following Ontario Provincial Standard Specifications (OPSSs) are applicable to fish habitat and the construction at Crinklaw Drain:

- OPSS 182 General Specification for Environmental Protection for Construction in Waterbodies and on Waterbody banks
- OPSS 185 General Specification for Temporary Flow Control for Construction in Waterbodies
- OPSS 805 Construction Specification for Temporary Erosion and Sediment Control Measures

4.1.4.3 Monitoring

Environmental mitigation measures shall be inspected during critical periods of in-water construction to make sure that measures have been installed and are functioning properly for the protection of fish and fish habitat. A Stantec MTO RAQS registered Fisheries Contracts Specialist will conduct the inspections.

4.1.5 Surface Water Protection

The study area is located in the Dingman Creek subwatershed. There are two watercourses in the study area, including the Crinklaw Drain and the Henning-Stuart Drain. Crinklaw Drain conveys flows from northeast of Highway 401 and east of VMP to the west and ultimately, the Moore Drain. Runoff from the area southeast of the interchange is directed south towards the Henning-Stuart Drain and crosses Wilton Grove Road through an existing CSP culvert.

The drainage design for VMP was undertaken in a manner that minimized any impacts on the hydrologic characteristics of the adjacent wetlands and woodlots. To this end, the drainage design does:

- Southeast Quadrant Woodlot: ensure no runoff from VMP discharges to the woodlot, and ensures that the water table within the woodlot is not impacted by either construction or the permanent road works
- Southwest Quadrant Wetland Complex: ensure that the realignment of Crinklaw Drain continues to convey runoff to and through the wetland complex without affecting the water table or flow velocities at the point of discharge to the wetland.

Relevant standard construction mitigation measures will ensure that surface water quality is protected during construction. These measures are outlined in section 4.1.1. Additional mitigation measures include:

- All mobile equipment refueling will take place no closer than 30 m from watercourses in order to prevent water contamination due to accidental fuel spills. For non-mobile equipment, refueling should be carried out in a controlled manner so as to prevent fuel spillage, and drip pans should be located under the equipment at all times
- All equipment operating near fish-bearing watercourses and wetted roadside channels will be properly maintained in order to avoid contaminant leakage and should be free of excess oil/grease. In the event that a spill occurs, proper containment, clean up, and reporting, in accordance with provincial requirements, will be completed
- A spills plan and spill containment equipment will be available on-site to address any spills which may occur during the work
- All necessary precautions will be taken to prevent the accumulation of litter and construction debris within watercourses, wetlands, and wetted roadside channels

- Baseline pre-construction water samples to be collected from the existing Crinklaw Drain within the project limits
- Crinklaw Drain water samples should be analyzed for general chemistry, total metals, volatile organic compounds, and microbiology (total coliforms and *Escherichia coli*)

4.1.6 Terrestrial Resources

Field investigations were undertaken by Stantec on May 4, 2016 to confirm existing conditions as documented in the Terrestrial Ecosystems Report (Ecoplans, 2013) for the Preliminary Design study. Given the ecological resources within the Study Area, low impacts to terrestrial ecosystems are anticipated from the project, and any impacts of the undertaking can be minimized to acceptable levels through the application of mitigation measures.

All vegetation communities observed are considered provincially common, and are widespread in southern Ontario.

Vegetation

Field investigations updated the vegetation community classification completed during the Class EA and Preliminary Design (Ecoplans, 2013). Key revisions and updates are summarized as follows:

- The approximate limit of vegetation clearing that is already complete was mapped in the northeast quadrant
- The limit of the invasive colony of invasive *Phragmites* (*Phragmites australis* subsp. *australis*) in the southeast quadrant was expanded; a second dense colony was identified in the NE quadrant (between the existing Highway 401 off ramp and the VMP)
- Forest communities were identified to Vegetation Type in the southwest quadrant, including communities that were not classified by Ecoplans (2013)
- Agricultural fields were identified by type throughout the study area, including corn fields, tilled agriculture, hay, and fallow fields
- Hedgerows, cultural plantations and constructed stormwater management ponds were mapped throughout the study area
- Industrial use was mapped south of Bradley Avenue, west of the existing VMP

All vegetation communities observed are considered provincially common (S5), and are widespread in southern Ontario. Ecoplans (2013) noted one community that ranked was uncommon (S3S4) (SWT2-9 in the NE quadrant); however, it was a very small unit (5-8m by 10m) interspersed with a marsh (MA) community, and was removed by vegetation pre-clearing.

Fifty-eight (58) species of vascular plants were recorded during field investigations, including 49 native species and nine exotic species. None of the species had a CC value of 9 or 10. One species had a CC value of 8, Broad-leaved Water-lead (*Hydrophyllum canadense*). It was found in the retained portion of the woodland in the northeast quadrant.

Wildlife and Wildlife Habitat

Nest Surveys

Nest surveys conducted during field investigations located the following nests:

- Four Cliff Swallow nests on the Old Victoria Road (OVR) bridge
- Seven nests on the VMP bridge
- One raptor stick nest in the retained portion of the woodland in the northeast quadrant; no raptors were seen near this nest and it is considered inactive
- One raptor stick nest in the woodland in the southeast quadrant; a Red-tailed Hawk (*Buteo jamaicensis*) was observed flying near this nest, and the nest is considered active

Cliff Swallow nests were indicated by location on separate field data cards for the OVR Bridge and the VMP Bridge. Field investigations did not correspond with the breeding season for Cliff Swallow; however, they are expected to return to both bridge sites to nest.

Cliff Swallow and raptor nests are protected by the *Migratory Bird Convention Act* (MBCA) and *Fish and Wildlife Conservation Act* (FWCA), respectively. Barn Swallow nests were not observed during field investigations and they are considered absent from the VMP Bridge and the Old Victoria Road Bridge.

Significant Wildlife Habitat

Field observations noted the presence of a chimney (burrow) of Meadow Crayfish (*Cambarus diogenes*) or Terrestrial Crayfish (*Fallicambarus fodiens*) in the southeast quadrant. Meadow Crayfish is ranked provincially rare (S3) and Terrestrial Crayfish is provincially uncommon (S4). According to the MNRF (2015), the presence of one or more chimneys qualifies all adjacent wetland and moist forest communities as Significant Wildlife Habitat.

4.1.6.2 Potential Impacts

Significant natural heritage features were evaluated according to the *Environmental Reference for Highway Design* (MTO 2013) and supporting documents, including the *Significant Wildlife Habitat Technical Guide* (MNR 2000) and the *Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E* (MNRF 2015). The background review and site investigation identified the following significant natural heritage features that were not identified during the Class EA and Preliminary Design, and require consideration during the current assessment:

- Suitable bat maternity colonies for Endangered Species Act (ESA) protected bat species – all forest (FO) and swamp (SW) units
- Terrestrial Crayfish habitat – contiguous forest (FO), swamp (SW) and marsh (MA) habitat in the southeast quadrant
- Raptor nest – southeast quadrat

The project will require some minimal removal of forest (FO) habitat along the eastern limit of the proposed VMP in the southeast quadrat. The forest at this location abuts the steep embankment of the existing roadway and is generally composed of regenerating trees. Although there is some possibility that suitable bat maternity trees will require removal, the most suitable trees are expected to occur in the interior portion of the feature, and in the large mature forest (FOD5-2/SWD3-3) to the immediate southeast; therefore, the proposed removals are not expected to limit available maternity habitat for bats. Site specific mitigation measures are recommended to address potential effects to bat maternity habitat (below), and consultation with MRNF is recommended to confirm the expectation of no effect.

Significant Wildlife Habitat for Terrestrial Crayfish is also associated with the forest feature in the SE quadrant; however, the only chimney that was found is located well outside the project area. Suitable habitat for Terrestrial Crayfish is locally abundant outside the project area in the southeast quadrant and the project is not expected to displace the Terrestrial Crayfish population from the area. No specific mitigation measures are required.

Stantec field investigations also confirmed the following protected nests that were documented by Ecoplans (2013) for the Study Area:

- Four Cliff Swallow nests on the Old Victoria Road bridge
- Seven Cliff Swallow nests on the VMP Bridge
- One raptor stick nest in the retained portion of the woodland in the northeast quadrant

Cliff Swallow nests are protected by the MBCA and must be avoided during the active season. Mitigation measures are recommended to avoid contravention of the MBCA.

The raptor nest observed in the SE quadrat is relocated well outside the project area and will be retained. No specific mitigation measures are required.

Stantec and Ecoplans (2013) documented invasive *Phragmites* (*Phragmites australis* subsp. *australis*) in the study area, including large colonies in the northeast and southwest quadrants that may be disturbed by construction. MTO has confirmed that *Phragmites* control may not be practical or feasible for implementation on this project.

Wildlife Passage

The geometric configuration of the proposed interchange improvement and VMP extension results in the need for the realignment of a portion of Crinklaw Drain on the west and east sides of the VMP extension. A length of approximately 223 m of open channel must be realigned and a culvert will be installed on the newly aligned channel. The culvert under the VMP extension will be a 3.96 m wide × 3.35 m high × 39.34 m long precast concrete rigid frame culvert. The culvert opening accommodates a low flow channel and provides wildlife “benches” on each side of the channel. The Openness Ratio (OR) for the culvert is approximately 0.27 to accommodate wildlife travel through the culvert. The retaining walls at the ends of the culvert, in conjunction with wildlife fencing, will help to funnel wildlife into the culvert. Wildlife funnel fencing, with amphibian escape ramps will extend from the culvert along both sides of VMP and the interchange ramps.

These measures will facilitate the wildlife corridor movement opportunities currently present along the drain system between the southwest pond and the woodlands to the east, south of Highway 401.

4.1.6.3 Proposed Mitigation

The following strategies are intended to address potential effects identified above, including strategies to mitigate loss of suitable bat maternity habitat and avoid damage to Cliff Swallow nests on the VMP bridge and the Old Victoria Road bridge.

Suitable Bat Maternity Habitat

Suitable bat maternity habitat is well represented in the SE quadrant and adjacent lands, including deciduous forest and swamp units. Negligible long-term implications to the habitat are anticipated as a result of the proposed removals. In order to minimize or eliminate the risk of accidental harm to bats, tree removal from within the forested portions (FO) of the southeast quadrant should occur outside the period when bats use trees for maternity roosts. *Myotis* species typically give birth in late May to early June, and females fly with newborn young until they become excessively heavy. Young begin to fly in mid- to late-June, at age three to four weeks. Rearing is completed by August when the bats move to hibernacula (Broders *et al.* 2006, Cagle and Cockrum 1943, Gerson 1984).

Cliff Swallow Nests

In order to minimize the risk of harm to Cliff Swallow and their nests, work on the VMP Bridge and the Old Victoria Road Bridge should avoid the West Region specific nesting period identified as April 1 to August 30. If work is required to take place within the Cliff Swallow nesting period, measures must be taken to exclude nesting activity. If construction activities have the potential to damage or destroy existing nests, the nest should be removed prior to commencement of the activity and prior to April 1.

Available exclusion methods include:

- Solid barriers – installation of plywood between the bridge girders, and corner slope exclusion used to cover right-angle attachment sites; and
- Flexible barriers – wire mesh, tarps, geotextile fabric, barrier curtains and netting used to cover attachment sites.

All Cliff Swallow nests were observed with both the top and at least one side of the nest attached to the underside of the Bridge structures. Based on this observation, exclusion that covers right-angle attachment sites may be effective. All potential attachment sites must be covered to improve likelihood of success. In the event nesting is initiated on the structure during construction, activity must stop until the nest is no longer active to avoid contravention of the MBCA.

Required mitigation: Avoid work on the VMP and OVR Bridges between April 1 and August 31, or exclude Cliff Swallow nesting.

Wildlife Passage

The realignment of Crinklaw Drain and associated naturalized riparian corridor as designed will have the benefit of reducing the overall culvert crossing length and provide for continued wildlife movement opportunities along the drain.

Vegetation Removals

The final landscape design will be integrated with the Crinklaw Drain floodplain naturalization plan and provide edge management and other mitigation/protection measures for the significant woodland in the southeast quadrant, as well as the wetland in the southwest quadrant.

4.1.6.4 Monitoring

Implement environmental inspection during construction, using a qualified Biologist/Ecologist at sensitive times/locations during the works (e.g. Crinklaw Drain realignment, wildlife structure installation, etc.). This is to ensure that protection measures are implemented, maintained, and repaired, and that remedial measures are initiated where warranted.

4.1.6.5 Authorization under the Endangered Species Act, 2007

Consultation with the MNRF is recommended to address potential interactions with suitable maternity habitat for bat species that are protected by the *Endangered Species Act* (ESA). An Information Gathering Form (IGF) should be prepared and submitted to solicit comment from MNRF and determine authorization requirements under the ESA, if any.

4.2 SOCIO-ECONOMIC ENVIRONMENT

4.2.1 Adjacent Land Use / Property

Lands along the east and west sides of VMP, north of Highway 401 are designated Light Industrial. Innovation Industrial Park Phase III is located west of VMP, south of Bradley Avenue, east of Old Victoria Road, and north of Highway 401, and will provide the City with approximately 50 ha of fully serviced industrial land.

Lands east of VMP are designated for future industrial use, but are currently under agricultural production. Lands south of Highway 401 are designated agricultural. Rural residences are scattered along Wilton Grove Road.

A landscape planting plan will be prepared for the area south of the interchange to mitigate the adverse impacts of the Highway 401/VMP interchange reconstruction and road extension. The plan includes Retained Soil System vegetated slope, restoration plantings, wildlife structures and reptile/amphibian funnel fencing in addition to riparian enhancement at Crinklaw Drain.

A landscape /tree planting plan for the area of the interchange and north of the interchange as well as the roadside safety enhancement plantings and roadside landscape buffers will be designed and implemented by others under a separate post-construction contract.

Residents, local farmers, and local businesses and property owners may experience temporary disruption during construction due to temporary short-term detours. However, access to private properties within the study area will be maintained at all times during construction.

4.2.2 Noise

Noise sensitive receivers within the Study Area consist of three rural residences located on the north side of Wilton Grove Road, south of Highway 401 and the existing VMP. The noise assessment undertaken during the Preliminary Design study concluded that there are no anticipated increases in noise levels at the three receiver locations as a result of the VMP extension, since the extension is expected to alleviate some of the traffic demand off of Wilton Grove Road, which is the main noise source at all receiver locations (McCormick Rankin, 2013). The noise assessment concluded that the consideration of noise mitigation is not warranted based on MTO/MOECC Noise Protocol.

The City of London Noise Control By-Law PW-12 prohibits any unreasonable or unnecessary noise resulting from excavation or construction operations between 6:00 PM and 7:00 AM without written permission from the City.

4.2.2.1 Potential Impacts

The VMP interchange and reconstruction activities will involve demolition/reconstruction of the VMP bridge, including pile driving for the abutments. The impacts of noise from pile driving will depend on the methods used. During construction, the Design-Builder will be required to abide

by the Contract Operational Constraints and the City of London Noise Control By-law. Night-time construction is proposed for select operations in order to provide the maximum opportunity to minimize construction duration and associated traffic impacts.

The nature of night work will primarily include setup and take down of traffic control measures for the median cross-over on Highway 401. This includes setup of temporary concrete barriers, temporary signs, and pavement markings. Overnight full closures of Highway 401 shall also occur in order to accommodate the demolition of the existing VMP bridge, and the girder installation for the new VMP bridge. Highway 401 traffic will be directed to the preferred detour route that was developed in consultation with the City of London, County of Middlesex, and Municipality of Thames Centre.

4.2.2.2 Proposed Mitigation

Noise from construction activities, such as concrete saws, abrasive sand blasting, dump trucks, cranes, pile driving, jack hammering, and, grading operations is temporary in nature. Idling of construction equipment must be kept to a minimum and equipment should be in good working order to reduce noise from construction activities.

It is impractical to restrict nighttime operations based on the need to optimize Highway 401 and VMP traffic operations during daytime hours. In order to accommodate the required night work, a formal request has been made to the City to approve an exemption from Noise Control By-Law PW-12, Part 2, 2.4 (d), pertaining to prohibited hours for Construction – Excavation. During night-time construction, the primary sources of noise will include generators to provide night-time lighting and operation of dump trucks and diesel powered equipment for loading/unloading, demolishing, etc.

All residential properties within 120 m will be notified in writing (i.e., in advance of night-time construction) and provided with contact information should a noise concern be raised.

4.2.3 Air Quality

The interchange reconstruction and road extension will involve importation, storage, on-site movement and grading of a significant amount of earth material. Air quality concerns are related primarily to total suspended particulate (TSP) and dustfall impacts caused by these activities. Other dust emissions may result from bridge demolition activities, the movements of construction vehicles other than grading equipment, and wind erosion of stockpiles and exposed areas.

4.2.3.1 Proposed Mitigation

Every measure should be taken to minimize emissions and prohibit visible emissions from escaping beyond the contract limits of the construction site. A dust control plan for the construction phase will be developed in accordance with standard MTO procedure.

Dust and air quality impacts to properties adjacent to the study area during construction will be minimized by General Conditions in the contract. These include: minimizing operation and idling of gas powered equipment vehicles, minimizing vehicular traffic on exposed soils and stabilizing high traffic areas with suitable cover material, restoring disturbed areas as soon as possible to minimize the duration of soil exposure, and controlling dust emissions by the application of suitable MOECC approved dust suppressant materials.

4.3 CULTURAL ENVIRONMENT

4.3.1 Archaeological Resources

An archaeological assessment was undertaken for impacted properties associated with the Approved Plan during the Preliminary Design study. Cultural material was recovered in the southern portion of the VMP extension corridor during the Stage 2 assessment. Due to the isolated nature of each Findspot, it was recommended to the Ministry of Tourism, Culture, and Sport (MTCS) and the MTO that the study corridor is free from archaeological concern, and that no further assessment is required.

During construction or future maintenance activities, there is always the chance of encountering deeply buried archaeological material. If this occurs, the MTCS should be informed and the work in the vicinity of the discovery must be suspended immediately. In addition if unmarked human remains are encountered the provisions of the *Ontario Cemeteries Act* apply. Notification must be made to the Ontario Provincial Police, or local police, who will conduct a site investigation and contact the District Coroner. Notification to the Regional Archaeologist, MTCS and the Registrar of Cemeteries, Ministry of Consumer and Commercial Relations shall also be undertaken.

Should other cultural heritage values (archaeological or historical materials or features) be identified during construction operations, all activity in the vicinity of the discovery will be suspended and the MTCS archaeologist shall be contacted.

MTO is pursuing additional property (i.e., approximately 5.0 m offset on NW and NE ramps) to provide additional clearance for drainage. The newly acquired property will be subject to an additional archeological assessment and requires archeological clearance.

4.3.2 Built Heritage Resources and Cultural Landscapes

As outlined in the Preliminary Design Cultural Heritage Assessment Report (Unterman McPhail Associates, 2013), the VMP study area contains two (2) built heritage resources, including a house and agricultural building on Wilton Grove Road, and two (2) cultural heritage landscapes, including agricultural land and Wilton Grove Road as a roadscape.

These features will not be directly impacted by the Recommended Design. However, the proposed extension will result in the disruption of the existing setting and character of the

identified heritage features. The nature of the impacts on the built heritage resources and cultural heritage landscapes are visual in nature, and are not expected to be significant.

4.4 CONSTRUCTION STAGING AND TRAFFIC MANAGEMENT

Construction staging and traffic management will be required for the construction of the proposed improvements as described in Section 3.8 of this report.

Motorists and commercial haulers traveling through the study area may experience temporary delay or disruption during construction. Advanced signing of construction and detour routes will alert drivers of the potential for a slowdown. During construction, traffic conditions will be monitored to make sure that unreasonable delays and back-ups are not occurring. Corrective action will be taken as required to remedy any potentially unsafe situations. These measures are expected to keep traffic delays to the traveling public and commercial truck traffic to a minimum while maintaining safety through the study area.

Overnight full closures of Highway 401 will require the use of a signed detour route along municipal roads. The preferred detour route during full closures of Highway 401 has been developed in consultation with the City of London, County of Middlesex, and Municipality of Thames Centre. The detour route will be implemented on several occasions as overnight closures for the removal of the existing VMP bridge over Highway 401, and girder placement for the new bridge. The preferred detour route follows:

- Highbury Avenue (4.5 km west of VMP) northbound/southbound
- Bradley Avenue eastbound/westbound
- Westchester Bourne (1.8 km east of VMP) northbound/southbound

Existing intersections may require the use of police presence to facilitate traffic diversion during construction.

The City of London, local student transportation services; local agricultural/industrial/commercial operations and emergency response agencies (EMS) will be provided advance notice of the construction schedule. Effective communication will be undertaken with all emergency service providers, including police, fire and ambulance service and safe unimpeded passage will be provided during construction.

During construction, access across Highway 401 on VMP will not be available once the existing bridge is removed. Access across Highway 401 will be available at Old Victoria Road, or adjacent interchanges.

Advanced notice to the emergency services, transportation companies and public, giving the location and dates that a detour/construction zone will be in effect can help ease traffic

congestion through the detour/construction zone. A motorist who is warned in advance will be more tolerant of delays and inconveniences.

The project website hwy401vmp.ca will provide a link to the Ontario 511 - Traveller Information Services website which gives easy 24/7/365 access to Ministry of Transportation (MTO) road information on provincially maintained highways.

4.5 ENVIRONMENTAL EXEMPTIONS AND PERMITS

The following environmental exemptions and permits are required for the work:

- Request for Review form should be completed and submitted to Department of Fisheries and Oceans Canada (DFO)
- City of London exemption from Noise Control By-Law PW-12, Part 2, 2.4 (d), pertaining to prohibited hours for Construction – Excavation (Temporary Noise Permit)
- Dewatering requirements are expected to be above 50,000 L/day but below 400,000 L/day requiring an EASR to proceed
- An Information Gathering Form (IGF) should be prepared and submitted to solicit comment from MNRF to address potential interactions with suitable maternity habitat for bat species that are protected by the Endangered Species Act (ESA) and determine authorization requirements under the ESA, if any.

4.6 SUMMARY OF ENVIRONMENTAL PROTECTION/MITIGATION REQUIREMENTS DURING CONSTRUCTION

The project can be completed without significant adverse impacts to the existing natural, social and cultural environment. The commitments made herein will be documented in the contract package as part of the drawings, tender or referenced attachments. Standard ministry special provision and applicable non-standard special provisions will be included as warranted.

Environmental protection/mitigation and environmental monitoring are integral components of the Recommended Design for this project. The Design-Builder's responsibilities and obligations for environmental management associated with this project will be outlined in the Environmental Management Plan and the Environmental Management System as described in Section 5.0. A summary of environmental effects, proposed mitigation and commitments, as identified at the end of this study is provided in Table 4.

Legend

DFO: Department of Fisheries and Oceans

MTO: Ministry of Transportation

MNRF: Ministry of Natural Resources and Forestry

MOECC: Ministry of the Environment and Climate Change

MTCSS: Ministry of Tourism, Culture and Sport

UTRCA: Upper Thames River Conservation Authority

OPP: Ontario Provincial Police

EMS: Emergency Services

RES/BUS: Local residents and/or businesses

CITY: City of London

CTY: County of Middlesex

MUN: Municipality of Thames Centre

UTIL: Utilities

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Table 4: Environmental Mitigation and Compliance Summary Table

ID	Issues/Concerns/ Potential Effects	Concerned Agencies	Mitigation/Protection	Compliance/Monitoring Requirements/ Verification
1.0 Erosion and Sediment Control				
	<p>Potential for sediment-laden runoff during construction.</p> <p>Minimize the potential for erosion of newly exposed cut/filled slopes.</p> <p>Minimize impacts to aquatic habitat in Crinklaw Drain during construction.</p>	<p>MTO DFO MNRF UTRCA</p>	<ul style="list-style-type: none"> • An Erosion and Sediment Control Plan (ESCP) has been developed for this project • Erosion and sediment protection measures included on contract drawings • Silt fencing will be used adjacent to the Crinklaw Drain when exposed soil slopes are at risk of eroding, as per the contract drawings • No equipment will be permitted to enter any natural areas beyond tree protection fencing • All materials requiring stockpiling (fill, topsoil, etc.) will be stabilized and kept a safe distance (>15 m) from Crinklaw Drain, other drainage features, and the top of steep slopes • If there is insufficient time remaining in the growing season, sites shall be stabilized with temporary erosion control measures such as erosion control blankets and seeded the following spring • Erosion and sediment control measures shall be maintained until vegetation has been established in disturbed areas • Refueling of equipment will be carried out away from Crinklaw Drain with the largest buffer possible (minimum 30 m) to avoid potential impacts, in the event that an accidental spill occurs • In addition to any specified requirements, additional silt fence should be available on-site, prior to grading operations, to provide a contingency supply in the event of an emergency • All sediment and erosion controls should be monitored regularly and properly maintained, as required. Controls are to be removed only after the soils of the construction area have been stabilized and adequately protected until cover is re-established • The limits of construction adjacent to all natural features to be retained will be delineated prior to construction, and monitored during construction (along with sediment and erosion control measures) to ensure the limits are maintained with respect to vehicular traffic and soil or equipment stockpiling • The Contractor is required to restore any disturbed natural areas to pre-construction conditions • Banks of the newly aligned channel will be stabilized as per the landscape plan for the project • An MTO RAQS registered Fisheries Contracts Specialist will be responsible for reporting on the suitability of the erosion and sediment control measures; i.e., that they are functioning effectively and being maintained, and that the other general mitigation measures are being implemented as intended. The Fisheries Contracts Specialist will notify the contractor in the event that modifications and/or repairs are required • All water discharged during dewatering activities must be discharged using erosion control and energy dissipation measures, such as sediment control bags, flow checks, and filter cloth, or equivalent, to reduce suspended solids • The number and size of the sediment control bags will be dependent on the extent of dewatering required • Minimize clearing and grubbing 	<ul style="list-style-type: none"> • Compliance with Environmental Management Plan (EMP) and Environmental Management System (EMS) • Compliance with EMP and EMS • Erosion and sediment control structures will be designed, installed, maintained, and removed in compliance with Erosion and Sediment Control Plan (ESCP) designed for this project • OPSS 577 provides construction specifications for these measures • An MTO RAQS registered Fisheries Contracts Specialist will be responsible for reporting on the suitability of the erosion and sediment control measures
2.0 Management of Excess Materials				
	<p>Excess materials may be encountered during construction and require proper management and/or disposal.</p>	<p>MOECC MNRF UTRCA</p>	<ul style="list-style-type: none"> • Opportunities to minimize excess material generation through salvage and reuse (such as earth material for slope flattening) have been identified • Contract documentation to include OPSS 180 – General Specification for the Management of Excess Material (i.e., disposal, re-use, and stockpiling) 	<ul style="list-style-type: none"> • Compliance with EMP and EMS • Adhere to ESCP

ID	Issues/Concerns/ Potential Effects	Concerned Agencies	Mitigation/Protection	Compliance/Monitoring Requirements/ Verification
			<ul style="list-style-type: none"> • Include special provision for management of excess earth with salt impacts in Contract. For the purpose of this Contract, excess earth with salt impacts is not considered to be "contaminated" within the meaning of Table 1 and/or Table 2 Site Condition Standards in OPSS 180 • Excess fill that cannot be managed on-site and may not meet the Table 1 SCS should be done in consultation with MOECC's Management of Excess Soil – A Guide for Best Management Practices (2014), and MTO's Contaminated Property and Excess Materials Management (2006) documents • Alternatives for managing excess material both on and off-site will be evaluated as the quantities are finalized • Material must be disposed of in accordance with standard MTO specifications and employ good housekeeping practices, including storing construction material, excess material, construction debris and empty containers away from water flow • Existing superstructure lighting conduit on VMP bridge, contains asbestos and is planned for removal. For this and other suspected designated substances encountered during construction, the Design-Builder or a qualified contractor should assess and manage the designated substances prior to disturbances, in accordance with SSP 101 F21 – Occupational Health and Safety Act – List of Designated Substances and with Ontario Regulation 490/09 and 278/05 under the <i>Occupational Health and Safety Act</i> • Any effluent or cleaning materials generated during the work program should be contained in appropriate storage containers and sampled prior to off-site disposal • Effluent and cleaning materials cannot be discharged overland or to surface water bodies, unless testing determines that they meet the MOECC Provincial Water Quality Objectives 	
3.0	Groundwater			
	<p>Potential for contamination during construction.</p> <p>The project is located within the Upper Thames River Source Protection Area.</p>	<p>MOECC MNRF UTRCA</p>	<ul style="list-style-type: none"> • The Design-Builder shall design and implement a dewatering strategy, and may choose to use a well point system, sump or trash pumps, passive drainage, or the equivalent, as conditions require • Prior to discharge, the Design-Builder must obtain all necessary land authorization and sewer use permits as required • During dewatering it is the Design-Builder's responsibility to document pumping rates, as water taking records will be required as a condition of any water taking permits that are obtained for this work • Dewatering requirements are expected to be above 50,000 L/day but below 400,000 L/day, requiring an EASR to proceed • A water taking report including dewatering requirements; the anticipated impacts to private wells; and the potential soil settlement impacts from the anticipated dewatering, must be completed and signed by a qualified professional • A Discharge Plan must be completed and signed by a qualified professional • A PTTW would be required if dewatering requirements were expected to exceed 400,000 L/day. • The Discharge Plan and soil settlement impact assessment will be documented in the Environmental Management Plan • Should discharge be directed on land, and in areas that are greater than 30 m from a watercourse, the proposed monitoring will consist of daily visual and olfactory inspections of the discharge location and the water being discharged should not contain any oil or any other substances in amounts sufficient to create a visible film, sheen, foam or discoloration in the discharge water; if discharge water has an observed sheen and/or odour, or is within 30 m of a watercourse, the dewatering activities must be shut down 	<ul style="list-style-type: none"> • Compliance with EMP and EMS • Registration on MOECC Environmental Activity and Sector Registry (EASR) • A discharge monitoring program will be implemented based on the selected discharge location during construction • Should discharge be directed to sanitary/stormwater sewer system then water quality monitoring will be completed prior to discharge to confirm applicable City of London sewer use by-law criteria are met. Additional periodic discharge water quality monitoring may be required based on the municipal discharge permit requirements. Daily visual and olfactory inspections of the discharge location and discharge water should be undertaken • Should discharge be directed on land, and in areas that are greater than 30 m from a watercourse, the monitoring will consist of daily visual and olfactory inspections of the discharge location and the water being discharged

ID	Issues/Concerns/ Potential Effects	Concerned Agencies	Mitigation/Protection	Compliance/Monitoring Requirements/ Verification
			<ul style="list-style-type: none"> • In the event that regulatory/landowner authorization does not occur and/or applicable discharge water quality criteria are exceeded (e.g., 1:100 year return period storm event), discharge water will be contained within holding tanks and removed off-site to a licensed facility with an MOECC environmental compliance approval and permitted to receive this wastewater • In the event that a water quality issue is noted during dewatering activities, a water treatment specialist will need to be consulted immediately to determine the appropriate mitigation measure to implement • Mitigation measures may include, but are not limited to the following: <ul style="list-style-type: none"> • increased filtration/settling measures, such as additional filter bags / sediment basins, use of a settling tank, or other equivalent measures • adjusted discharge location so that there are no exceedances of applicable criteria • amended construction methodology to reduce the extent of dewatering or sediment produced • Should the pre-treatment water sample exceed the applicable criteria, and it is not practical to complete on-site treatment, impacted water will be hauled off-site to be disposed of at a licensed facility that is in compliance with the MOECC regulations • Refueling of equipment should be completed away from SGRAs, whenever possible, to minimize potential impacts to groundwater water quality in the event that an accidental spill occurs • To minimize the impact of potential contaminant spills, the Contractor should implement best management protocols, such as secondary containment of any temporary fuel storage and the use of a spill response plan 	
4.0	Fish and Fish Habitat			
	<p>The realignment of Crinklaw Drain, and installation of the Crinklaw Drain Culvert crossing VMP, will result in a temporary change in access to habitat (100 m of open channel) located upstream of the realigned channel.</p>	<p>MNRF DFO UTRCA</p>	<ul style="list-style-type: none"> • The realignment was designed to avoid a long, oblique culvert crossing under the VMP extension and interchange ramp terminals. It was designed to continue to convey downstream flows and to provide upstream passage for fish that utilize the drain. The proposed channel and culvert were designed to maintain the capacity of the existing hydraulic system • The box culvert was designed with a low flow channel (by adding quarry stone and Granular A to the culvert bottom) to maintain fish passage and existing flow conditions to downstream habitat • Rip-rap rock protection will reduce scour and erosion for approximately 4 m of creek bed upstream and downstream of the culvert inlet and outlet, respectively • 'In-water' works will be completed during the construction timing window of July 2 through March 14 of the following year • If water is present in the Crinklaw Drain when the existing channel is connected to the new channel, the following mitigation measures shall be applied: <ul style="list-style-type: none"> – Design and implement isolation plan to isolate temporary in-water work zones to maintain clean flow to downstream/around the work zone at all times – Fish rescue plan – Transfer fish in the work area away from the construction area using capture, handling, and release techniques to minimize harm and stress. Ensure the intakes of pumping hoses are equipped with an appropriate device to avoid entraining and impinging fish (per DFO's <i>Freshwater Intake End-of-Pipe Fish Screen Guideline</i> (1995)) – Manage all water from dewatering operations to prevent erosion and/or release of sediment laden or contaminated water to the waterbody (e.g. settling basin, filter bag, energy dispersion measures) 	<ul style="list-style-type: none"> • Compliance with EMP and EMS • Submit Request for Review form to DFO • Obtain 'License to Collect Fish for Scientific Purposes' from MNRF to complete the fish rescue and relocation • Adhere to Erosion and Sediment Control Plan (ESCP) • 'In-water' work at Crinklaw Drain will be completed during the fisheries timing window directed by MNRF

ID	Issues/Concerns/ Potential Effects	Concerned Agencies	Mitigation/Protection	Compliance/Monitoring Requirements/ Verification
			<ul style="list-style-type: none"> Based on the nature of the watercourse, the channel connection should occur during dry weather periods Flow diversion/dewatering materials should be on-site at all times in the event that water levels increase The following OPSS are applicable to fish habitat and the construction at Crinklaw Drain: <ul style="list-style-type: none"> OPSS 182 'General Specification for Environmental Protection for Construction in Waterbodies and on Waterbody Banks' OPSS 185 'General Specification for Temporary Flow Control for Construction in Waterbodies' OPSS 805 'Construction Specification for Temporary Erosion and Sediment Control Measures' 	
5.0	Surface Water Protection			
	Surface water quality in local receiving waters retains its ecological values.	DFO MNRF UTRCA	<ul style="list-style-type: none"> The drainage design for the VMP was undertaken in a manner that minimized any impacts on hydrologic characteristics of the adjacent wetlands and woodlots In order to prevent surface water contamination during construction, measures will be incorporated into the Contract Package to state that care should be taken to avoid accidental spillage or discharge of chemical contaminants (e.g. gasoline, oils, and lubricants) The ESCP includes measures to protect surface water during construction All mobile equipment refueling will take place no closer than 30 m from the study area watercourses in order to prevent water contamination due to accidental fuel spills For non-mobile equipment, refueling should be carried out in a controlled manner so as to prevent fuel spillage, and drip pans should be located under the equipment at all times All equipment operating near fish bearing watercourses and wetland roadside channels will be properly maintained in order to avoid contaminant leakage and should be free of excess oil/grease All necessary precautions must be taken to prevent the accumulation of litter and construction debris within watercourses, wetlands, and wetted roadside channels Baseline pre-construction water sample to be collected from the existing Crinklaw Drain within the project limits and will be analyzed for general chemistry, total metals, volatile organic compounds, and microbiology (total coliforms and Escherichia coli) In the event of a significant rainfall event, construction activity will stop or be delayed until site conditions have returned to normal 	<ul style="list-style-type: none"> Compliance with EMP and EMS Ensure that appropriate surface water protection measures are included in final design Adhere to ESCP Review grading and removal plans to confirm vegetation removal according to requirements Report spills in accordance with Spill Management Plan
6.0	Terrestrial Ecosystems			
	Vegetation protection and restoration.	MNRF UTRCA CITY	<ul style="list-style-type: none"> Consultation with the MNRF is recommended to address potential interactions with suitable maternity habitat for bat species that are protected by the ESA. An IGF should be prepared and submitted to solicit comment from MNRF and determine authorization requirements under the ESA, if any Final landscape design will be integrated with the Crinklaw Drain floodplain naturalization plan and provide edge management and other mitigation/protection measures for the significant woodland in the southeast quadrant and the portion of the woodland to be retained in the NE quadrant, as well as the wetland in the southwest quadrant Implement environmental inspection during construction, using a qualified Biologist/Ecologist at sensitive times/locations during the works (e.g. Crinklaw Drain realignment, wildlife structure installation, etc.). This is to ensure that protection measures are implemented, maintained, and repaired, and that remedial measures are initiated where warranted 	<ul style="list-style-type: none"> Compliance with EMP and EMS A landscape protection and restoration plan will be developed for implementation by others under a separate post-construction contract Adhere to ESCP Implement environmental inspection during construction, using a qualified Biologist/Ecologist at sensitive times/locations during the works

ID	Issues/Concerns/ Potential Effects	Concerned Agencies	Mitigation/Protection	Compliance/Monitoring Requirements/ Verification
			<ul style="list-style-type: none"> • Tree clearing work will be completed during the construction timing window of September 1 through March 31 • Bridge work should be completed during the construction timing window of September 1 through March 31 of the following year to minimize risk of harm to Cliff Swallow and their nests • If work is required to take place within the Cliff Swallow nesting period, measures must be taken to exclude nesting activity, including solid and flexible barriers that exclude right-angle attachment sites • If construction activities have the potential to damage or destroy existing nests, the nest should be removed prior to commencement of the activity and prior to April 1 • In the event that nesting is initiated on the structure during construction, activity must stop until the nest is no longer active to avoid contravening the MBCA 	
7.0 Land Use/Property				
	<p>Impacts to farm access locations and driveways on Wilton Grove Road.</p> <p>Additional property is being acquired in northeast quadrant.</p>		<ul style="list-style-type: none"> • Residents, local farmers, and local businesses and property owners may experience temporary disruption during construction due to temporary short-term detours • Access to private properties within the study area will be maintained at all times during construction • MTO will negotiate with individual property owners to provide fair market value for new property required • Temporary Limited Interests acquired in vicinity of Crinklaw Drain 	<ul style="list-style-type: none"> • Compliance with EMP and EMS
8.0 Air Quality/Noise During Construction				
	<p>Dust emissions from construction operations.</p> <p>Construction noise impacts are temporary in nature and may be noticeable at times at residential Noise Sensitive Areas (NSAs).</p>	<p>MTO MOECC CITY RES/BUS</p>	<ul style="list-style-type: none"> • General Conditions in the contract, include: minimizing operation and idling of gas powered equipment vehicles, minimizing vehicular traffic on exposed soils and stabilizing high traffic areas with suitable cover material, restoring disturbed areas as soon as possible to minimize the duration of soil exposure, and controlling dust emissions by the application of MOECC approved dust suppressant materials • Maintain equipment, particularly mufflers in good working order • Enforce construction codes of practice and local municipal by-law for noise to provide means of limiting excessively noisy operations and equipment • All residential properties within 120 m will be notified in writing (i.e., in advance of night-time construction) and will be provided with contract information should complaints arise • A Temporary Noise Permit for Construction Noise was applied for from the City of London to accommodate night time work 	<ul style="list-style-type: none"> • Compliance with EMP and EMS • Maintain dust monitoring during construction operations • Confirm dust suppression methods • Compliance with EMP and EMS
9.0 Archaeological Resources				
	<p>Limited potential for previously unknown/deeply buried artifacts/remains to be uncovered during construction.</p>	<p>MTCS CITY</p>	<ul style="list-style-type: none"> • MTCS archaeological clearance provided for the Approved Plan • Any new property requirements to be assessed for archaeological potential • Should other archaeological material be found during construction activities, all activity in the vicinity will be suspended and the MTCS archaeologist shall be contacted • In the event that any human remains are encountered during construction, the proponent must immediately suspend work in the vicinity and contact the Ontario Provincial Police, or local police, the Regional Archaeologist for MTCS and the Registrar of Cemeteries for the Ministry of Consumer and Commercial Relations (MCCR) 	<ul style="list-style-type: none"> • Compliance with EMP and EMS • Design-Builder to advise MTO and MTCS if archaeological resources are identified during construction • Archaeological clearance for new property requirements

ID	Issues/Concerns/ Potential Effects	Concerned Agencies	Mitigation/Protection	Compliance/Monitoring Requirements/ Verification
10.0	Built Heritage Resources and Cultural Landscapes			
	Indirect impacts to built heritage resources and cultural heritage landscapes.	MTC CITY	<ul style="list-style-type: none"> No mitigation measures are required 	<ul style="list-style-type: none"> Compliance with EMP and EMS
11.0	Notifications			
	<p>Potential for temporary or permanent change to emergency access.</p> <p>Potential delays and disruptions during construction.</p> <p>Notification requirements for Temporary Noise Permit for Construction Noise.</p>	MTO OPP EMS PROP/BUS	<ul style="list-style-type: none"> Notify OPP and emergency services of construction staging, start of construction, etc. to minimize delay in emergency response times during and after construction Advance signing of construction will be provided During the temporary full closures of Highway 401, traffic will utilize a signed detour route on Highbury Avenue, Bradley Avenue, and Westchester Bourne Access to residential/business entrances within the construction area will be maintained at all times Affected property owners along the proposed detour route will be notified prior to implementing any detour All residential properties within 120 m of the interchange will be notified in writing of the Temporary Noise Permit for Construction Noise and provided with contact information should a noise concern be raised - the EMP will include a plan to address noise issues should complaints be received The project website hwy401vmp.ca will provide a link to the Ontario 511 - Traveller Information Services website which gives easy 24/7/365 access to Ministry of Transportation (MTO) road information on provincially maintained highways 	<ul style="list-style-type: none"> Compliance with EMP and EMS Design-Builder is responsible for notifying the Contract Administrator (at least one week in advance, unless otherwise specified) of any operations that require public notification based on their impact to the travelling public or local residents The Contract Administrator will determine the appropriate course of action and will advise the Design-Builder of any required action Design-Builder to monitor traffic conditions to make sure unreasonable delays and back-ups are not occurring
12.0	Landscape			
	Vegetation restoration and protection of woodlots (edge management)	MTO CITY	<ul style="list-style-type: none"> A landscape planting plan will be prepared for the area south of the interchange to mitigate the adverse impacts of the Highway 401/VMP interchange reconstruction and road extension The plan includes Retained Soil System vegetated slope, restoration plantings, wildlife structures and reptile/amphibian funnel fencing in addition to riparian enhancement at Crinklaw Drain A landscape/tree planting plan for the area of the interchange and north of the interchange as well as the roadside safety enhancement plantings and roadside landscape buffers will be designed and implemented by others under a separate post-construction contract City of London gateway feature sign will be salvaged and put into storage 	<ul style="list-style-type: none"> Compliance with Landscape Plan and contract drawings Compliance with EMP and EMS Post construction contract to be initiated by MTO and City of London

5.0 Monitoring

5.1 ENVIRONMENTAL MANAGEMENT SYSTEM

An Environmental Management System (EMS) has been developed for the Recommended Design and construction. The EMS is part of a Design-Builder's management system used to develop and implement its environmental policy, manage its environmental impacts, and to ensure compliance with all environmental legal requirements. It is a set of interrelated elements (organizational structure, planning activities, responsibilities, practices, procedures, and resources) used to establish and achieve environmental objectives.

The Design-Builder will create and maintain records to provide evidence of compliance with Environmental Laws, Contract environmental requirements, and the EMS.

5.2 ENVIRONMENTAL MANAGEMENT PLAN

An Environmental Management Plan (EMP) has been developed to ensure that the Contract Administrator and the Design-Builder are made aware of, and are prepared to deal with, all environmental issues that may arise during construction. Specific environmental controls based on these detailed mitigation measures will be included in the contract documents and drawings to address specific environmental concerns during the construction phase.

The environmental monitoring/inspection plan for this Design-Build project has the following components:

- On-site construction administrator to oversee the work
- Environmental monitoring plans
- Pre-construction notifications
- Pre-construction environmental monitoring/inspection
- Environmental monitoring during construction
- Post-construction environmental monitoring/inspection

5.3 ENVIRONMENTAL MONITORING/INSPECTION

5.3.1 Project Specific Technical Monitoring

During construction environmental protection activities outlined in the EMP will be implemented and seamlessly integrated with the rest of the construction process. Monitoring will be conducted by an on-site construction supervisory staff to make sure that environmental protection measures, as outlined in this report and in the contract package, are being

implemented and are effective. This includes making sure that the implementation of mitigating measures and key design features is consistent with commitments made to external agencies prior to construction.

In the event that protective measures do not address concerns identified or if major problems develop, the appropriate agency will be contacted to provide additional input.

Periodic site visits by environmental staff will occur during construction. The timing and frequency of such site visits are determined by the schedule of construction operations, the sensitivity of environmental concerns and the development of any unforeseen environmental problems during construction.

In the event that the impacts of construction are different than anticipated, or that the method of construction is such that there are greater than anticipated impacts, the Design-Builder's method of operation will be modified to reduce those impacts.

5.3.2 Post Construction

Following the completion of the project, it is anticipated that monitoring will be conducted by maintenance staff to ensure erosion control measures and stabilization measures for new or modified earthworks are effective. The health and effectiveness of the landscaping components will also be monitored. In the event that problems are identified, remedial action will be initiated as appropriate.

The post-construction monitoring and environmental inspection program will ensure, to the extent possible, that lands disturbed as a result of construction activities will be restored to their original use and condition as soon as possible after construction.

6.0 List of Reference Documents

- Draft Drainage and Stormwater Management Report, May 2016 – Stantec
- Excess Materials Management Plan, June 2016 – Stantec
- Fish and Fish Habitat Existing Conditions and Impact Assessment Report, June 2016 – Stantec
- Foundation Investigation and Design Report, May 2016 – Stantec
- Groundwater Assessment Report, June 2016 – Stantec
- Terrestrial Ecosystems Assessment Report, June 2016 – Stantec
- Culvert Structural Design Report, Crinklaw Drain Culvert, Site 4 CU-29, May 2016 – Stantec
- Structural Design Report, Veterans Memorial Parkway Underpass, Site 19-515, May 2016 – Stantec
- Pavement Design Report, May 2016 - Stantec
- Cultural Heritage Assessment Report - Built Heritage Resources and Cultural Heritage Landscapes, February 2013; - Unterman McPhail Associates
- Contamination Overview Study and Preliminary Water Well Survey, March 2013 – Ecoplans
- Draft Memo – Noise Assessment, February 27, 2013 – McCormick Rankin Corporation
- Stage 1- 2 Archaeological Assessment of VMP, Part of Lots 5 and 6, Concession 2, Geographic Township of Westminster, Middlesex County, City of London, March 6, 2012 – New Directions Archaeology Ltd.
- Terrestrial Ecosystems Report, June 2013 – Ecoplans
- Fish and Fish Habitat Existing Conditions and Impact Assessment Report, July 2013 – Ecoplans
- Fluvial Geomorphology Technical Appendix
- GEOCREs No. 40I14-107 – Foundation Investigation Report for London East Industrial Access Road and Highway 401 Interchange Bridge, Township of Westminster, District 2, London, W.P. 32-73-02, Site 19-515 – December 1974
- GEOCREs No. 40I14-153 – Foundation Investigation Report – Veterans Memorial Parkway Interchange Improvements, GWP 3033-11-00 – Thurber Engineering Ltd – March 31, 2014
- RE: Highway 401/Veterans Memorial Parkway Interchange
- Changes to Structural Design Report (October 2015)
- Final Drainage and Stormwater Management Report, May 2013 – McCormick Rankin Corporation
- Crinklaw Municipal Drain Report - Spriet Associates, October 2014; Revised 2015
- Design-Build Ready Report – January 2014
- Sample Wildlife Fencing Drawings and Specification
- Preliminary Site Screening - October 2013

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Appendix A: Notification Materials



Stantec Consulting Ltd.
200-835 Paramount Drive
Stoney Creek ON L8J 0B4
Tel: (905) 385-3234
Fax: (905) 385-3534

April 27, 2016
File: 165001002

Attention: Teresa Armstrong, MPP, London-Fanshawe

Constituency Office
155 Clarke Road
London ON N5W 5C9

Dear Ms. Armstrong:

**Reference: Veterans Memorial Parkway Extension and Highway 401 Interchange Improvements
Notice of Detailed Design Commencement and Public Information Centre**

The Ontario Ministry of Transportation (MTO) and the City of London have selected Dufferin Construction Company to design and construct improvements to the interchange at Highway 401 and Veterans Memorial Parkway (VMP) and road extension of VMP to the south, in the City of London.

The purpose of this letter is to advise you that the attached Ontario Government Notice (OGN) will be published in the *Dorchester Signpost* (in English) and in the *London/Sarnia L'Action* (in French) on Wednesday, May 11, 2016 and in the *London Free Press and The Londoner* (in English) on Thursday, May 12, 2016.

A Public Information Centre (PIC) is planned to present information on the project, including the construction staging and traffic management plan, and obtain comments in advance of construction activities scheduled to start the fall of 2016. The PIC will be held on:

**Thursday, May 26, 2016
4:00 p.m. to 7:00 p.m.
Ramada Inn (Churchill Ballroom), 817 Exeter Road, London, Ontario**

Municipal and agency representatives are also invited to attend the PIC from 3:00 p.m. to 4:00 p.m. in advance of the general public session noted above. Notices are also being mailed directly to property owners within the study area.

A project website (www.hwy401vmp.ca) has been developed and will provide up-to-date information and an opportunity to submit comments during the detailed design period. The website will be maintained on an ongoing basis for the duration of design and construction.



April 27, 2016

**Reference: Veterans Memorial Parkway Extension and Highway 401 Interchange Improvements
Notice of Detailed Design Commencement and Public Information Centre**

Should you require further information, please contact the MTO Project Engineer, Frank Hochstenbach at 519-873-4575 or frank.hochstenbach@ontario.ca.

Sincerely,

STANTEC CONSULTING LTD.

Donna Madden, CPT
Senior Environmental Planner
Tel: (905) 381-3217
Fax: (905) 385-3534
Donna.madden@stantec.com

Attachment: Ontario Government Notice of Detailed Design and Public Information Centre

- c. F. Hochstenbach, Sr. Project Engineer, MTO West Region
- K. Ho, Environmental Planner, MTO West Region
- K. Grabowski, Transportation Design Engineer, City of London
- D. Emery, Design Manager, Stantec Consulting Ltd.
- G. Jackson, Project Manager, Dufferin Construction Company



Stantec Consulting Ltd.
200-835 Paramount Drive
Stoney Creek ON L8J 0B4
Tel: (905) 385-3234
Fax: (905) 385-3534

April 27, 2016
File: 165001002

Attention: Jeff Yurek, MPP, Elgin-Middlesex-London

Constituency Office
750 Talbot Street
Suite 201, West Wing
St. Thomas ON N5P 1E2

Dear Mr. Yurek:

**Reference: Veterans Memorial Parkway Extension and Highway 401 Interchange Improvements
Notice of Detailed Design Commencement and Public Information Centre**

The Ontario Ministry of Transportation (MTO) and the City of London have selected Dufferin Construction Company to design and construct improvements to the interchange at Highway 401 and Veterans Memorial Parkway (VMP) and road extension of VMP to the south, in the City of London.

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April 27, 2016

**Reference: Veterans Memorial Parkway Extension and Highway 401 Interchange Improvements
Notice of Detailed Design Commencement and Public Information Centre**

Should you require further information, please contact the MTO Project Engineer, Frank Hochstenbach at 519-873-4575 or frank.hochstenbach@ontario.ca.

Sincerely,

STANTEC CONSULTING LTD.

D. M. Madden

Donna Madden, CPT
Senior Environmental Planner
Tel: (905) 381-3217
Fax: (905) 385-3534
Donna.madden@stantec.com

Attachment: Ontario Government Notice of Detailed Design and Public Information Centre

- c. F. Hochstenbach, Sr. Project Engineer, MTO West Region
- K. Ho, Environmental Planner, MTO West Region
- K. Grabowski, Transportation Design Engineer, City of London
- D. Emery, Design Manager, Stantec Consulting Ltd.
- G. Jackson, Project Manager, Dufferin Construction Company

<p>Mark Snowsell, Land Use Regulations Officer Upper Thames River Conservation Authority 1424 Clarke Road London ON N5V 5B9</p>	<p>Christine Creighton, Land Use Planner Upper Thames River Conservation Authority 1424 Clarke Road London ON N5V 5B9</p>	<p>Attn: District Planner Ministry of Natural Resources and Forestry Aylmer District Office 615 John Street North Aylmer ON N5H 2S8</p>
<p>Drew Crinklaw, Rural Planner Ministry of Agriculture, Food and Rural Affairs 667 Exeter Road London ON N6E 1L3</p>	<p>Shari Prowse, Archaeology Review Officer - London - Archaeology Program Unit Ministry of Tourism, Culture and Sport 900 Highbury Avenue North London ON N5Y 1A4</p>	<p>Karla Barboza, Heritage Advisor - Cultural Services Unit Ministry of Tourism, Culture and Sport 401 Bay Street, Suite 1700 Toronto ON M7A 0A7</p>
<p>Laura Hatcher, Team Lead - Heritage Land Use Planning (Acting) - Cultural Services Unit Ministry of Tourism, Culture and Sport 401 Bay Street, Suite 1700 Toronto ON M7A 0A7</p>	<p>Emilee O'Leary, Environmental Resource Planner & EA Coordinator - Air, Pesticides and Environmental Planning Ministry of the Environment and Climate Change 5775 Yonge Street, 9th Floor Toronto ON M2M 4J1</p>	<p>Scott Oliver, Manager (Acting), Community Planning and Development Ministry of Municipal Affairs and Housing 659 Exeter Road, 2nd Floor London ON N6E 1L3</p>
<p>Attn: Planner, Community Planning and Development Ministry of Municipal Affairs and Housing 659 Exeter Road, 2nd Floor London ON N6E 1L3</p>	<p>John Ford, Director of Transportation & Planning London Transit Commission 450 Highbury Avenue North London ON N5W 5L2</p>	<p>Attn: Chair Transportation Advisory Committee c/o City of London 300 Dufferin Avenue London ON N6A 4L9</p>
<p>Betty Mercier, Committee Secretary Transportation Advisory Committee c/o City of London 300 Dufferin Avenue, PO Box 5035 London ON N6A 4L9</p>	<p>Betty Mercier, Committee Secretary Agricultural Advisory Committee c/o City of London 300 Dufferin Avenue, PO Box 5035 London ON N6A 4L9</p>	<p>Manager of Transportation Thames Valley District School Board 1250 Dundas Street PO Box 5888 London ON N6A 5L1</p>
<p>Attn: Transportation Specialist Southwestern Ontario Student Transportation Services 201-557 Southdale Road London ON N6E 1A2</p>	<p>Jacque Davison, Superintendent of Business London District Catholic School Board 5200 Wellington Road South London ON N6E 3X8</p>	<p>Urban League of London 1017 Western Road London ON N6G 1G5</p>
<p>Sandy Levin, Chair, Conservation Committee Nature London PO Box 24008 London ON N6H 5C4</p>	<p>Steve and Donna Crinklaw Crinklaw Farms 2591 Bradley Avenue London ON N6M 1E1</p>	<p>Tommy Faulkner London Dairy Farms Ltd. 3700 Old Victoria Road London ON N6N 1R2</p>
<p>Atchison Machine Service Inc. 132 Clarke Road South London ON N5W 5E1</p>	<p>John, Rick, and Agnes Bruyn Bruynland Farm Inc. 2556 Wilton Grove Road London ON N6N 1M6</p>	<p>27 Cardigan Inc. PO Box 3117 London ON N6A 4J4</p>
<p>Pam Hall, Assistant Patton Cormier Ferreira 140 Fullarton Street, Suite 1512 London ON N6A 5P2</p>	<p>Ranjit Goela, Sales Representative Realty Executives 466 Eagletrace Drive London ON N6G 0E7</p>	<p>John Camara Ayerswood Development Corporation 1299 Oxford Street East London ON N5Y 4W5</p>
<p>Wally Adams, Director, Environmental Health and Infectious Diseases Middlesex-London Health Unit 50 King Street London ON N6A 5L7</p>	<p>Chris Traini, P.Eng. County Engineer Middlesex County 399 Ridout Street N. London ON N6A 2P1</p>	<p>Matt Jenner, Manager of Roads Municipality of Thames Centre 4305 Hamilton Road Dorchester ON N0L 1G3</p>

<p>Jamie MacPherson, Engineering Technologist London Hydro 111 Horton Street, PO Box 2700 London ON N6A 4H6</p>	<p>Hassan El-Mahoun, Distribution Engineer London Hydro 111 Horton Street, PO Box 2700 London ON N6A 4H6</p>	<p>Rob Elliott, Construction Project Manager Union Gas 109 Commissioners Road West London ON N6A 4P1</p>
<p>Gavin Meaker, System Planner Rogers Cable Communications Inc. 800 York Street London ON N5W 2S9</p>	<p>Christine Barnes PUCC Permits Coordinator Allstream 50 Worcester Road Etobicoke ON M9W 5X2</p>	<p>Ed Grills, Transmission Technician Provincial Lines Hydro One Networks Inc. ed.grills@hydroone.com</p>
<p>Adam Ostrowski, Real Estate Services Supervisor Hydro One Networks Inc. adam.ostrowski@hydroone.com</p>	<p>Dan White, Land Use Agent Hydro One Networks Inc. dan.white@hydroone.com</p>	<p>Patrick Hunt, Coordinator Bell Canada 100 Dundas Street, 4th Floor London ON N6A 4L6</p>
<p>Bobbie Levair, Manager Bell Canada 100 Dundas Street, 4th Floor London ON N6A 4L6</p>	<p>Al Hunt, Deputy Chief Operations Middlesex - London EMS 340 Waterloo Street London ON N6B 2N6</p>	<p>Amanda Pfeffer, Sergeant, Traffic Management London Police Service 601 Dundas Street London ON N6B 1X1</p>
<p>David Lazenby, Deputy Fire Chief London Fire Services 400 Horton Street East London ON N6B 1L7</p>	<p>Brian McLaughlin, Deputy Fire Chief London Fire Services 400 Horton Street East London ON N6B 1L7</p>	<p>Jim Malik, Operations Manager Thames EMS 340 Waterloo Street London ON N6B 2N6</p>

MPP

<p>Mr. Jeff Yurek, MPP Elgin-Middlesex-London 750 Talbot Street, Suite 201 St. Thomas ON N5P 1E2</p>	<p>Ms. Teresa Armstrong, MPP London-Fanshawe 155 Clarke Road London ON N5W 5C9</p>	
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Stantec Consulting Ltd.
200-835 Paramount Drive, Stoney Creek ON L8J 0B4

May 6, 2016
File: 165001002

Attention: <First Name> <Last Name>, <Position>
Organization
Region
Address

External Agency Letter

Dear <Title> <Last Name>,

**Reference: Veterans Memorial Parkway Extension and Highway 401 Interchange Improvements
Notice of Detailed Design Commencement and Public Information Centre**

The Ontario Ministry of Transportation (MTO) and the City of London have selected Dufferin Construction Company to design and construct improvements to the interchange at Highway 401 and Veterans Memorial Parkway (VMP) and road extension of VMP to the south, in the City of London.

In follow-up to the Preliminary Design study, this letter is to introduce the Design-Build project and to invite you to the Public Information Centre (PIC). The purpose of the PIC is to present information on the project, including the construction staging and traffic management plan, and obtain comments in advance of construction activities scheduled to start in the fall of 2016.

Additional information including a description of the Approved Plan is provided in the attached Ontario Government Notice (OGN) along with the details of the PIC scheduled on Thursday, May 26, 2016. **Municipal and agency representatives are invited to attend from 3:00 p.m. to 4:00 p.m. in advance of the general public session from 4:00 p.m. to 7:00 p.m.**

If you cannot attend the PIC anytime between 3:00 p.m. and 7:00 p.m. on May 26, 2016 but would like to provide input, please use the enclosed comment sheet. Comments may also be submitted during the detailed design period via the project website at hwy401vmp.ca. The website will provide up-to-date information for the duration of design and construction. For further information, please visit the project website or contact either the undersigned or one of the team members named on the attached notice.

Regards,

STANTEC CONSULTING LTD.

Donna Madden, CPT
Senior Environmental Planner
Tel: (905) 381-3217
Fax: (905) 385-3534
Donna.madden@stantec.com

Attachment: Ontario Government Notice of Detailed Design and Public Information Centre
Comment Sheet

- c. F. Hochstenbach, Sr. Project Engineer, MTO West Region
- K. Ho, Environmental Planner, MTO West Region
- K. Grabowski, Transportation Design Engineer, City of London
- D. Emery, Design Manager, Stantec Consulting Ltd.
- G. Jackson, Project Manager, Dufferin Construction Company

Veterans Memorial Parkway Extension and Highway 401 Interchange Improvements
Design Build Project – Contract 2015-3002

COMMENT FORM

Please provide comments on the project. Use the other side of this form if required.

- Request to be removed from project mailing list.
- Interests or concerns have not changed since Preliminary Design.
- Comments.

<p>Contact Information on Study Mailing List «Title» «First_Name» «Last_Name», «Position» «Organization» «Region» «Address» «Address_2» «City» «Prov» «Postal_Code» Tel: «Work_Phone»</p>	<p><i>If this information is incorrect please provide updated information below.</i></p>
--	--

Please return the completed form by June 23, 2016 to:

Donna Madden, CPT, Senior Environmental Planner, Stantec Consulting Ltd.
200-835 Paramount Drive, Stoney Creek, ON L8J 0B4
Tel. (905) 381-3217, Fax (905) 385-3534, Email: donna.madden@stantec.com

New Contact:

Job Title:

Name of Agency:

Mailing Address

Tel:

Fax:

Email:

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.



Ministry of Transportation

Engineering Office
Environmental Section
West Region

659 Exeter Road
London, Ontario N6E 1L3
Telephone: (519) 873-4560
Facsimile: (519) 873-4600
Email: Cathy.Giesbrecht@ontario.ca

Ministère des Transports

Bureau du génie
Section de l'environnement
Région de l'Ouest

659, rue Exeter
London (Ontario) N6E 1L3
Téléphone: (519) 873-4560
Télécopieur: (519) 873-4600



May 6, 2016

Chippewas of the Thames First Nation
320 Chippewa Road
Muncey ON N0L 1Y0

Attention: Chief Leslee White-eye

**Reference: Veterans Memorial Parkway Extension and Highway 401 Interchange Improvements
Notice of Detailed Design Commencement and Public Information Centre**

The Ontario Ministry of Transportation (MTO) and the City of London have selected Dufferin Construction Company to design and construct improvements to the interchange at Highway 401 and Veterans Memorial Parkway (VMP) and road extension of VMP to the south, in the City of London. The new interchange will improve access into the City and support long-term economic growth and development in the area. Additional information including a description of the Approved Plan and a Key Plan are provided in the attached Notice.

A project website (www.hwy401vmp.ca) has been developed that will provide an opportunity to submit comments during the detailed design period. The website will be maintained on an ongoing basis for the duration of design and construction to provide up-to-date information.

In follow-up to correspondence sent during the Preliminary Design study, this letter is to introduce the Design-Build project and to invite you to the Public Information Centre (PIC). The purpose of the PIC is to present information on the project, including the construction staging and traffic management plan, and obtain comments in advance of construction activities scheduled to start in the fall of 2016. The PIC will be held on:

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If you cannot attend the PIC anytime between 3:00 p.m. and 7:00 p.m. on May 26, but would like to provide comments, or if you have any questions, please contact me at (519) 873-4560, or by email at cathy.giesbrecht@ontario.ca. If you would prefer a meeting with ministry staff, that could also be arranged. Please contact me at your earliest convenience if you are interested in such a meeting.

Yours Truly,



Cathy Giesbrecht
Head, Environmental Section

Information will be collected 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.

- c. F. Hochstenbach, Sr. Project Engineer, MTO West Region
- K. Ho, Environmental Planner, MTO West Region
- K. Grabowski, Transportation Design Engineer, City of London
- D. Emery, Design Manager, Stantec Consulting Ltd.
- G. Jackson, Project Manager, Dufferin Construction Company
- R. Wallis, Aboriginal Liaison, MTO West Region
- R. Elijah, Lands and Environment Director, Chippewas of the Thames First Nation
- F. Burch, Consultation Officer Trainee, Chippewas of the Thames First Nation

Ministry of Transportation

Engineering Office
Environmental Section
West Region

659 Exeter Road
London, Ontario N6E 1L3
Telephone: (519) 873-4560
Facsimile: (519) 873-4600
Email: Cathy.Giesbrecht@ontario.ca

Ministère des Transports

Bureau du génie
Section de l'environnement
Région de l'Ouest

659, rue Exeter
London (Ontario) N6E 1L3
Téléphone: (519) 873-4560
Télécopieur: (519) 873-4600



May 6, 2016

Munsee-Delaware Nation
RR#1 (289 Jubilee Road)
Muncey ON N0L 1Y0

Attention: Chief Roger Thomas

**Reference: Veterans Memorial Parkway Extension and Highway 401 Interchange Improvements
Notice of Detailed Design Commencement and Public Information Centre**

The Ontario Ministry of Transportation (MTO) and the City of London have selected Dufferin Construction Company to design and construct improvements to the interchange at Highway 401 and Veterans Memorial Parkway (VMP) and road extension of VMP to the south, in the City of London. The new interchange will improve access into the City and support long-term economic growth and development in the area. Additional information including a description of the Approved Plan and a Key Plan are provided in the attached Notice.

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Yours Truly,



Cathy Giesbrecht
Head, Environmental Section

Information will be collected 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.

- c. F. Hochstenbach, Sr. Project Engineer, MTO West Region
- K. Ho, Environmental Planner, MTO West Region
- K. Grabowski, Transportation Design Engineer, City of London
- D. Emery, Design Manager, Stantec Consulting Ltd.
- G. Jackson, Project Manager, Dufferin Construction Company
- R. Wallis, Aboriginal Liaison, MTO West Region

Ministry of Transportation

Engineering Office
Environmental Section
West Region

659 Exeter Road
London, Ontario N6E 1L3
Telephone: (519) 873-4560
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Ministère des Transports

Bureau du génie
Section de l'environnement
Région de l'Ouest

659, rue Exeter
London (Ontario) N6E 1L3
Téléphone: (519) 873-4560
Télécopieur: (519) 873-4600



May 6, 2016

Oneida Nation of the Thames First Nation
2212 Elm Avenue
Southwold ON N0L 2G0

Attention: Chief Sheri Doxtator

**Reference: Veterans Memorial Parkway Extension and Highway 401 Interchange Improvements
Notice of Detailed Design Commencement and Public Information Centre**

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4:00 p.m. to 7:00 p.m.
Ramada Inn, 817 Exeter Road, London, Ontario**

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Yours Truly,



Cathy Giesbrecht
Head, Environmental Section

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- c. F. Hochstenbach, Sr. Project Engineer, MTO West Region
- K. Ho, Environmental Planner, MTO West Region
- K. Grabowski, Transportation Design Engineer, City of London
- D. Emery, Design Manager, Stantec Consulting Ltd.
- G. Jackson, Project Manager, Dufferin Construction Company
- R. Wallis, Aboriginal Liaison, MTO West Region

Ministry of Transportation

Engineering Office
Environmental Section
West Region

659 Exeter Road
London, Ontario N6E 1L3
Telephone: (519) 873-4560
Facsimile: (519) 873-4600
Email: Cathy.Giesbrecht@ontario.ca

Ministère des Transports

Bureau du génie
Section de l'environnement
Région de l'Ouest

659, rue Exeter
London (Ontario) N6E 1L3
Téléphone: (519) 873-4560
Télécopieur: (519) 873-4600



May 6, 2016

Caldwell First Nation
PO Box 388
Leamington ON N8H 3W3

Attention: Chief Louise Hillier

**Reference: Veterans Memorial Parkway Extension and Highway 401 Interchange Improvements
Notice of Detailed Design Commencement and Public Information Centre**

The Ontario Ministry of Transportation (MTO) and the City of London have selected Dufferin Construction Company to design and construct improvements to the interchange at Highway 401 and Veterans Memorial Parkway (VMP) and road extension of VMP to the south, in the City of London. The new interchange will improve access into the City and support long-term economic growth and development in the area. Additional information including a description of the Approved Plan and a Key Plan are provided in the attached Notice.

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Yours Truly,

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Head, Environmental Section

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Télécopieur: (519) 873-4600



May 6, 2016

Aamjiwnaang First Nation (Sarnia)
978 Tashmoo Ave
Sarnia ON N7T 7H5

Attention: Chief Chris Plain

**Reference: Veterans Memorial Parkway Extension and Highway 401 Interchange Improvements
Notice of Detailed Design Commencement and Public Information Centre**

The Ontario Ministry of Transportation (MTO) and the City of London have selected Dufferin Construction Company to design and construct improvements to the interchange at Highway 401 and Veterans Memorial Parkway (VMP) and road extension of VMP to the south, in the City of London. The new interchange will improve access into the City and support long-term economic growth and development in the area. Additional information including a description of the Approved Plan and a Key Plan are provided in the attached Notice.

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- G. Jackson, Project Manager, Dufferin Construction Company
- R. Wallis, Aboriginal Liaison, MTO West Region
- S. Johnston, Environmental Officer, Aamjiwnaang First Nation

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Télécopieur: (519) 873-4600



May 6, 2016

Chippewas of Kettle and Stony Point First Nation
6247 Indian Lane
Kettle and Stony Point FN ON N0N 1J0

Attention: Chief Thomas Bressette

**Reference: Veterans Memorial Parkway Extension and Highway 401 Interchange Improvements
Notice of Detailed Design Commencement and Public Information Centre**

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May 6, 2016

Walpole Island First Nation
117 Tahgahoning Road, RR 3
Wallaceburg ON N8A 4K9

Attention: Chief Daniel Miskokomon

**Reference: Veterans Memorial Parkway Extension and Highway 401 Interchange Improvements
Notice of Detailed Design Commencement and Public Information Centre**

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Télécopieur: (519) 873-4600



May 6, 2016

Six Nations of the Grand River Territory
2498 Chiefswood Road, PO Box 5000
Ohsweken ON N0A 1M0

Attention: Chief Ava Hill

**Reference: Veterans Memorial Parkway Extension and Highway 401 Interchange Improvements
Notice of Detailed Design Commencement and Public Information Centre**

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- K. Grabowski, Transportation Design Engineer, City of London
- D. Emery, Design Manager, Stantec Consulting Ltd.
- G. Jackson, Project Manager, Dufferin Construction Company
- R. Wallis, Aboriginal Liaison, MTO West Region
- J. Thomas, Consultation Supervisor, Six Nations of the Grand River
- P. General, Manager, Six Nations of the Grand River

Ministry of Transportation

Engineering Office
Environmental Section
West Region

659 Exeter Road
London, Ontario N6E 1L3
Telephone: (519) 873-4560
Facsimile: (519) 873-4600
Email: Cathy.Giesbrecht@ontario.ca

Ministère des Transports

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Région de l'Ouest

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London (Ontario) N6E 1L3
Téléphone: (519) 873-4560
Télécopieur: (519) 873-4600



May 6, 2016

Sent by mail and by fax to 519-445-2389

Haudenosaunee Six Nations Confederacy Council
2634 6th Line Road, RR 2
Ohsweken ON N0A 1M0

Attention: Hohahe Leroy Hill

**Reference: Veterans Memorial Parkway Extension and Highway 401 Interchange Improvements
Notice of Detailed Design Commencement and Public Information Centre**

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- G. Jackson, Project Manager, Dufferin Construction Company
- R. Wallis, Aboriginal Liaison, MTO West Region
- H. Hill, Haudenosaunee Development Institute

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Télécopieur: (519) 873-4600



May 6, 2016

Mississaugas of the New Credit First Nation
Department of Consultation and Accommodation
6 First Line Road, RR 6
Hagersville ON N0A 1H0

Attention: Fawn Sault

**Reference: Veterans Memorial Parkway Extension and Highway 401 Interchange Improvements
Notice of Detailed Design Commencement and Public Information Centre**

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- G. Jackson, Project Manager, Dufferin Construction Company
- R. Wallis, Aboriginal Liaison, MTO West Region



Stantec Consulting Ltd.
200-835 Paramount Drive
Stoney Creek ON L8J 0B4
Tel: (905) 385-3234
Fax: (905) 385-3534
□

May 6, 2016
File: 1650001002

Attention: <First Name> <Last Name>
Address

Public/Property Owner Letter

Dear <Title> <Last Name>,

**Reference: Veterans Memorial Parkway Extension and Highway 401 Interchange Improvements
Notice of Detailed Design Commencement and Public Information Centre**

The Ontario Ministry of Transportation (MTO) and the City of London have selected Dufferin Construction Company to design and construct improvements to the interchange at Highway 401 and Veterans Memorial Parkway (VMP) and road extension of VMP to the south, in the City of London.

In follow-up to the Preliminary Design study, this letter is to introduce the Design-Build project and to invite you to the Public Information Centre (PIC). The purpose of the PIC is to present information on the project, including the construction staging and traffic management plan, and obtain comments in advance of construction activities scheduled to start in the fall of 2016.

Additional information including a description of the Approved Plan is provided in the attached Ontario Government Notice (OGN) along with the details of the PIC which is scheduled for **Thursday, May 26, 2016** from 4:00 p.m. to 7:00 p.m.

If you cannot attend the PIC anytime between 4:00 p.m. and 7:00 p.m. on May 26, 2016 but would like to provide input, please use the enclosed comment sheet. Comments may also be submitted during the detailed design period via the project website at **www.hwy401vmp.ca**. The website will provide up-to-date information for the duration of design and construction. For further information, please visit the project website or contact either the undersigned or one of the team members named on the attached notice.

Regards,

STANTEC CONSULTING LTD.

Donna Madden, CPT
Senior Environmental Planner
Tel: (905) 381-3217
Fax: (905) 385-3534
Donna.madden@stantec.com

Attachment: Ontario Government Notice of Detailed Design and Public Information Centre

- c. F. Hochstenbach, Sr. Project Engineer, MTO West Region
- K. Ho, Environmental Planner, MTO West Region
- K. Grabowski, Transportation Design Engineer, City of London
- D. Emery, Design Manager, Stantec Consulting Ltd.
- G. Jackson, Project Manager, Dufferin Construction Company

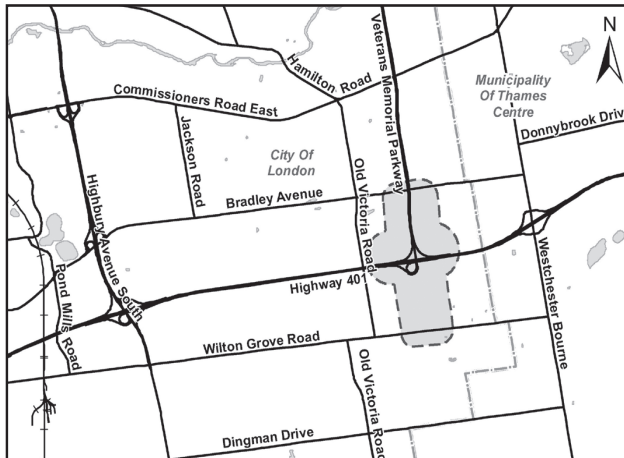
NOTICE OF DETAILED DESIGN AND PUBLIC INFORMATION CENTRE

Veterans Memorial Parkway Extension and Highway 401 Interchange Improvements

The Ontario **Ministry of Transportation (MTO)** and, the **City of London** have selected **Dufferin Construction Company** to design and construct improvements to the interchange at Highway 401 and Veterans Memorial Parkway (VMP) in the City of London, as shown on the key plan.

The project will improve access into the City and support long-term economic growth and development in the area. The Approved Plan includes the following:

- Extension of VMP as a two-lane expressway for approximately 800 m southerly to Wilton Grove Road and construction of a new intersection;
- Interchange improvements that include new ramps and modifications to existing ramps; and
- Replacement of the existing VMP bridge over Highway 401 on its current alignment.



The new bridge and interchange improvements will be designed to accommodate a future eight-lane cross section of Highway 401. Construction of the new bridge will require the temporary closure of the bridge and eastbound ramps for several months during construction. Closures will be communicated and detour routes will be signed.

PROJECT HISTORY/PROCESS

This study has followed the approved planning process for Group 'B' projects under the MTO *Class Environmental Assessment (Class EA) for Provincial Transportation Facilities (2000)* and the *Municipal Class EA (2000, and amended in 2007 and 2011)*. The Preliminary Design was completed by MTO and the City of London and documented in a Transportation Environmental Study Report (TESR). The TESR was made available for a 30-day public review period and received clearance in August 2013.

The completion of detailed design will be undertaken in accordance with MTO's Class EA as a Group 'B' undertaking. A Design and Construction Report (DCR) will be made available for a 30-day public review period with public notice advising of the start of the review period.

PUBLIC INFORMATION CENTRE (PIC)

A PIC is planned to present information on the project, including the construction staging and traffic management plan and obtain comments in advance of construction activities anticipated to start in the fall of 2016. The PIC will be held as a drop-in style, open house format. Representatives of the Design-Build Team will be available to answer questions and receive your input. **The PIC is scheduled as follows:**

Date: Thursday, May 26, 2016
Location: Ramada Inn (Churchill Ballroom), 817 Exeter Road, London, Ontario
Time: 4:00 p.m. to 7:00 p.m.

COMMENTS

For up-to-date information and to submit comments to the project team during the detailed design period, please visit the project website: hwy401vmp.ca or contact one of the following individuals:

Mr. Frank Hochstenbach, P.Eng.
Senior Project Engineer
Ministry of Transportation
Planning and Design
659 Exeter Road, 3rd Floor, London, ON N6E 1L3
toll free: 1-800-265-6072, ext. 519-873-4575
fax: 519-873-4600
e-mail: frank.hochstenbach@ontario.ca

Mr. Karl Grabowski, P.Eng.
Transportation Design Engineer
Planning, Environmental and Engineering Services
City of London
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tel: 519-661-2500, ext. 5071
e-mail: kgrabows@london.ca

Mr. Dave Emery, P.Eng.
Design Manager
Stantec Consulting Ltd.
200-835 Paramount Drive, Stoney Creek, ON L8J 0B4
tel: 905-381-3221 (+0 collect) / fax: 905-385-3534
e-mail: dave.emery@stantec.com

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 the project, please contact one of the Project Team members listed above.

AVIS DE CONSULTATION AU SUJET DE LA CONCEPTION DÉTAILLÉE ET DU CENTRE D'INFORMATION

Prolongement du Veterans Memorial Parkway et améliorations de l'échangeur de l'autoroute 401

Le **ministère des Transports de l'Ontario (MTO)** et la **Ville de London** ont choisi la **Dufferin Construction Company** afin de concevoir et de mettre en place les améliorations à apporter à l'échangeur de l'autoroute 401 à l'intersection de Veterans Memorial Parkway (VMP) dans la Ville de London, comme illustré dans le plan repère.

Le projet améliorera l'accès vers la ville et soutiendra la croissance et le développement économique de la région. Le programme approuvé comporte les éléments suivants :

- Prolongement du VMP en tant que route rapide à deux voies sur une longueur d'environ 800 m en direction du sud de la Wilton Grove Road et construction d'une nouvelle intersection;
- Améliorations de l'échangeur comprenant notamment de nouvelles rampes et des modifications des rampes existantes;
- Remplacement de l'actuel pont du VMP situé au-dessus de l'autoroute 401 à l'emplacement du tracé actuel.

Le nouveau pont et les améliorations de l'échangeur seront conçus afin qu'ils s'adaptent à la future coupe transversale de huit voies de l'autoroute 401. La construction du nouveau pont nécessitera la fermeture temporaire du pont et des bretelles d'accès en direction est pour plusieurs mois au cours des travaux de construction. Les heures de fermeture seront fournies et l'itinéraire des déviations sera signalisé.

HISTORIQUE DU PROJET/PROCESSUS

Cette étude a suivi le processus approuvé de planification pour les projets du groupe « B » aux fins de l'*Évaluation environnementale (EE) de portée générale pour les installations provinciales de transport du MTO (2000) et de catégorie municipale (2000, modifiée en 2007 et 2011)*. La conception préliminaire a été achevée par le MTO et la Ville de London ainsi que consignée dans un rapport d'étude environnementale pour les transports (RÉET). Le RÉET a été mis à disposition du public pour examen pendant une période de 30 jours et a obtenu l'autorisation en août 2013.

L'achèvement de la conception détaillée sera effectué en conformité avec l'évaluation environnementale (EE) du MTO entreprise pour les projets du groupe B. Un rapport de conception et de construction (RCC) sera mis à disposition du public pour examen pendant une période de 30 jours à l'aide d'un avis public indiquant la date du début de la période d'examen.

CENTRE D'INFORMATION (CI)

Un CI est prévu afin de donner des renseignements sur ce projet, notamment en ce qui concerne le plan de préparation des travaux et de gestion de la circulation, ainsi que pour recueillir des commentaires avant les travaux de construction qui devraient commencer à l'automne 2016. Le CI se déroulera sous la forme d'une séance libre et ouverte à tous. Des représentants de l'équipe de conception et de construction du projet seront surplace afin de répondre aux questions et de recevoir vos commentaires et suggestions. **Le déroulement du CI est prévu comme suit :**

Date: Jeudi 26 mai 2016
Lieu : Ramada Inn (salon Churchill), 817, chemin Exeter, London (Ontario)
Heure : de 16 h à 19 h

COMMENTAIRES

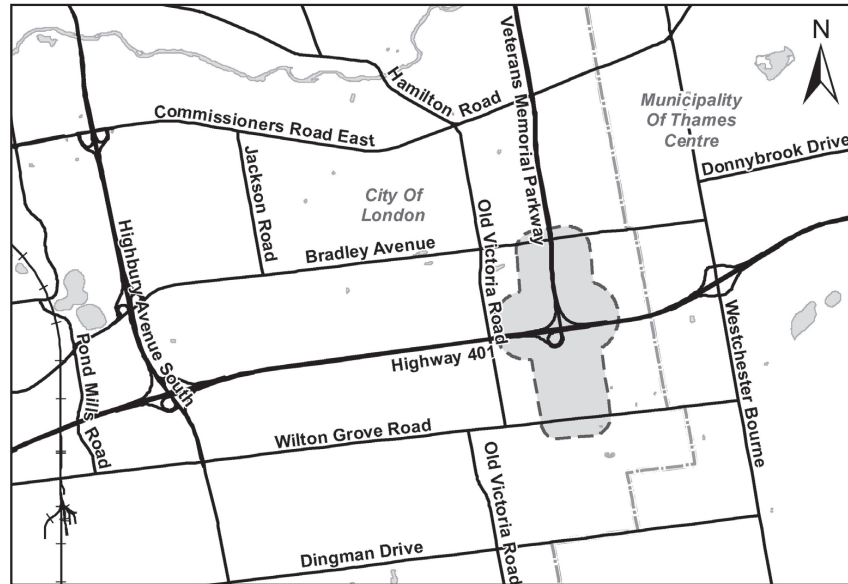
Pour obtenir des renseignements actualisés et soumettre des commentaires aux membres de l'équipe du projet pendant la séance consacrée à la conception détaillée, veuillez visiter le site Web du projet : hwy401vmp.ca ou contacter l'une des personnes-ressources suivantes :

M. Frank Hochstenbach, ing.
Ingénieur principal du projet
Ministère des Transports
Planification et conception
659, chemin Exeter, 3^e étage
London (Ontario) N6E 1L3
sans frais : 1 800 265-6072, poste 519 873-4575
télé. : 519 873-4600
courriel : frank.hochstenbach@ontario.ca

M. Karl Grabowski, ing.
Ingénieur de conception, transports
Services en génie, en gestion de
l'environnement et en planification
Ville de London
C. P. 5035
London (Ontario) N6E 1L3
tél. : 519 661-2500, poste 5071
courriel : kgrabows@london.ca

M. Dave Emery, ing.
Gestionnaire de la conception
Stantec Consulting Ltd.
200-835, promenade Paramount
Stoney Creek (Ontario) L8J 0B4
tél. : 905 381-3221 (+0 recueillir)
télé. : 905 385-3534
courriel : dave.emery@stantec.com

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 au projet, veuillez prendre contact avec l'un des membres de l'équipe du projet nommés ci-dessus.



Appendix B: PIC Materials



Welcome

to the Public Information Centre for the

Highway 401 and Veterans Memorial Parkway

MTO Reference #: DB 2015-3002

Public Information Centre Objectives

- Present design details for the Approved Plan
- Present information on associated road improvements and construction staging
- Provide other project related information
- Gather input on the project
- Answer questions about the design and construction of the project

Please sign-in and take time to review the information.

Representatives from the Ontario Ministry of Transportation (MTO), the City of London, Dufferin Construction and Stantec Consulting Ltd, are available to discuss the project with you.

We also encourage you to complete a comment sheet before leaving.

Comments may also be submitted via the project website (hwy401vmp.ca) where the Public Information Centre display boards are available for review.





Project History and Process

The existing Veterans Memorial Parkway (VMP) is a four-lane divided expressway that connects to Highway 401 via a partial interchange that provides access north of Highway 401 into the City of London. Currently VMP does not extend south of Highway 401.

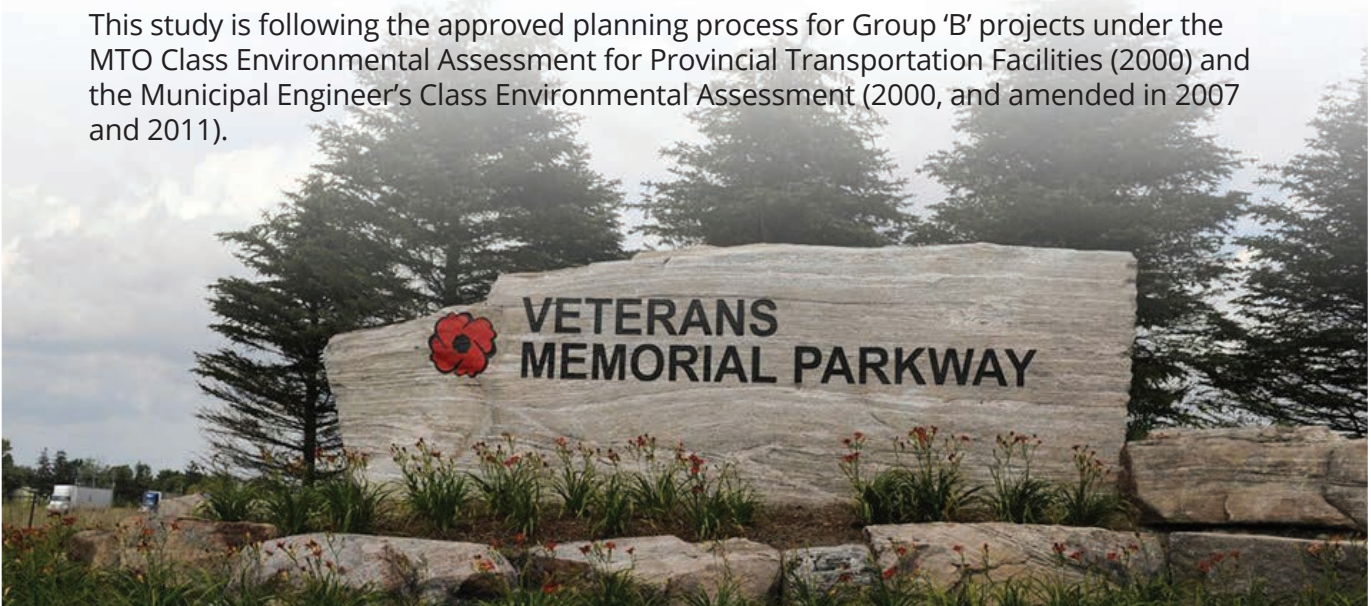
This Design-Build Project is being funded by the MTO and the City of London to:

- Support the City of London’s economic growth objectives, including future growth in southeast London, as identified in the City’s Industrial Lands Development Strategy Update
- Implement recommendations of the Smart Moves Transportation Master Plan by providing additional capacity and improving traffic operations
- Accommodate a future eight-lane cross section of Highway 401

The Project Timeline



This study is following the approved planning process for Group 'B' projects under the MTO Class Environmental Assessment for Provincial Transportation Facilities (2000) and the Municipal Engineer’s Class Environmental Assessment (2000, and amended in 2007 and 2011).



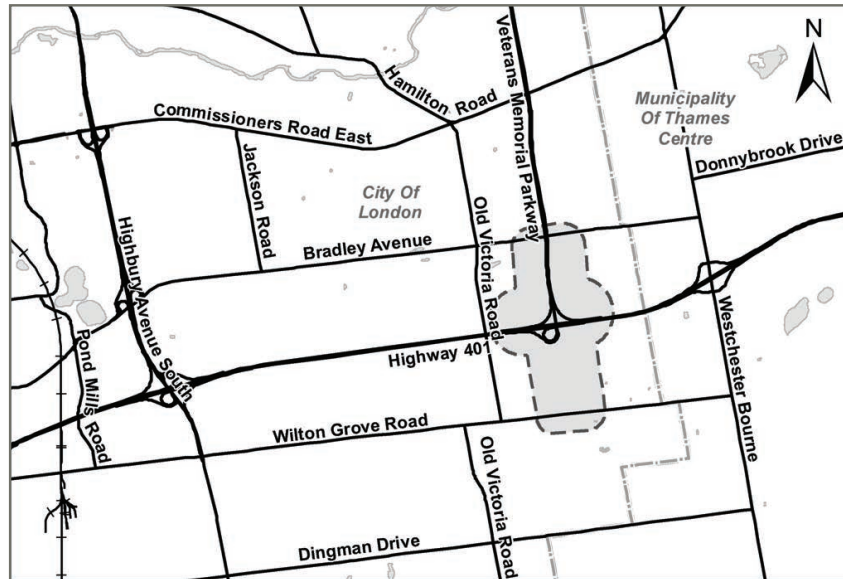
Visit the Project Website: hwy401vmp.ca





Project Description

The Approved Plan from the previous study includes construction of a reconfigured interchange at Highway 401/VMP and extension of VMP to the south. This design stage will refine the Approved Plan and finalize the construction staging and traffic management plan based on public and agency input and constructability.

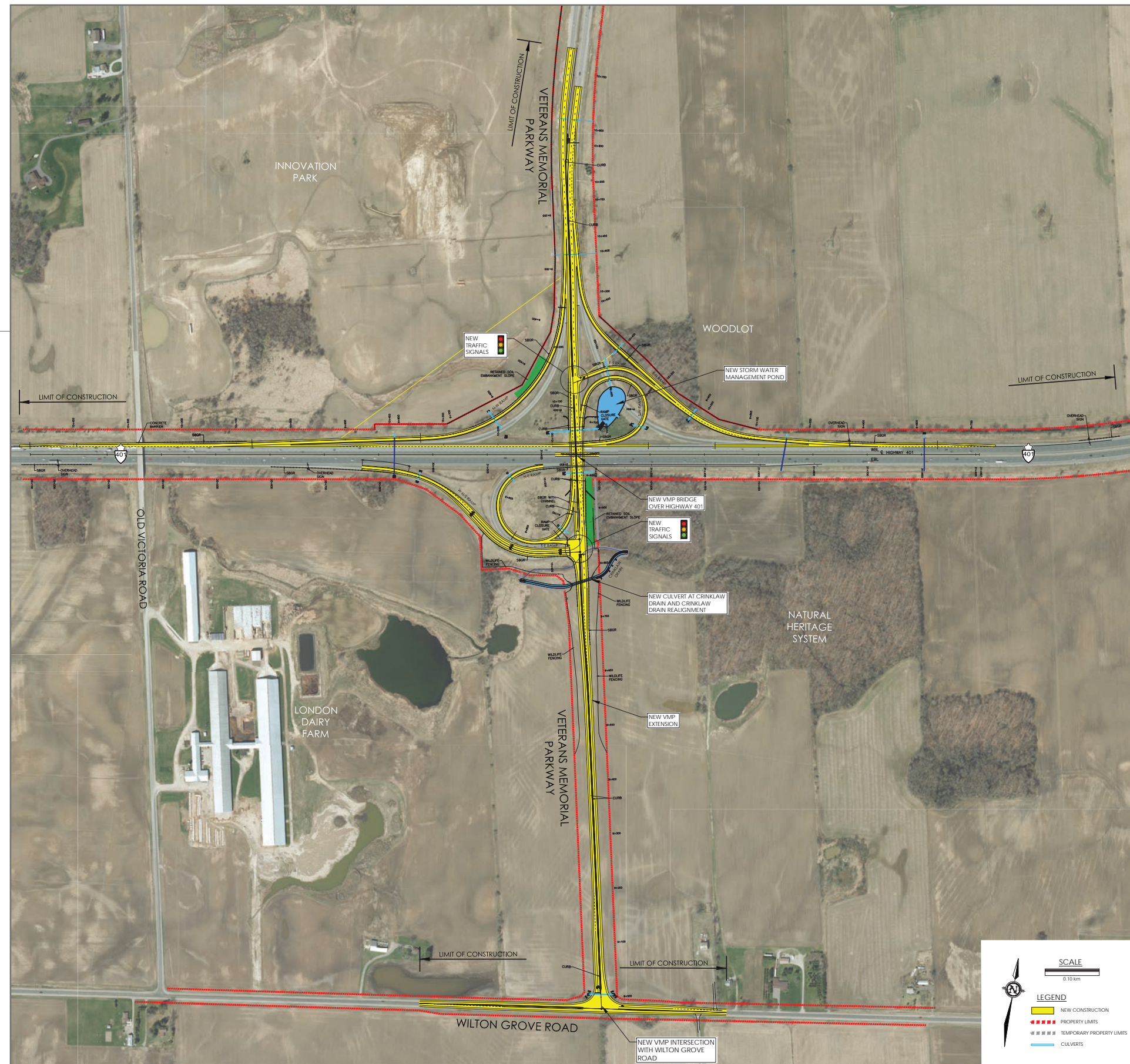


Major project features include:

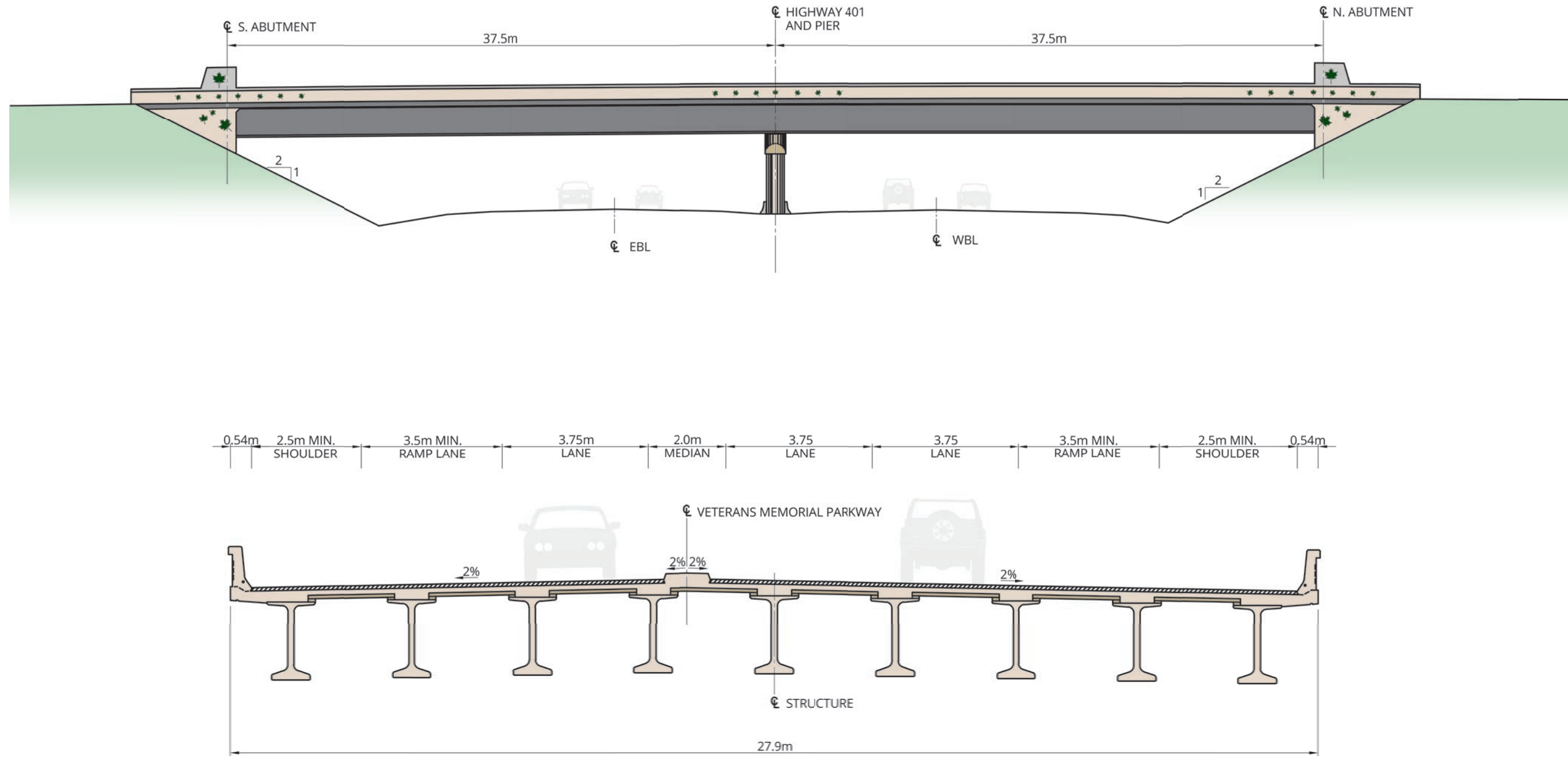
- Extension of the VMP southerly by approximately 800 m from Highway 401 to form a new intersection with Wilton Grove Road
- Widening of Wilton Grove Road to accommodate the new intersection
- Reconfiguration of the existing partial Highway 401/VMP interchange to a full interchange
- Widening of Highway 401 to accommodate the reconfiguration of the interchange ramps
- Modification of the existing speed change lanes to accommodate the ramp realignments associated with the interchange reconfiguration
- Minor realignment of the existing VMP north of the interchange
- Replacement of the VMP bridge over Highway 401 on its current alignment
- Drainage improvements, illumination, overhead signs, traffic signals and retaining walls
- Realignment of the Crinklaw Municipal Drain and installation of a new structural culvert
- Opportunities for wildlife crossing under the new VMP south of Highway 401 and enhancement of the Crinklaw Drain



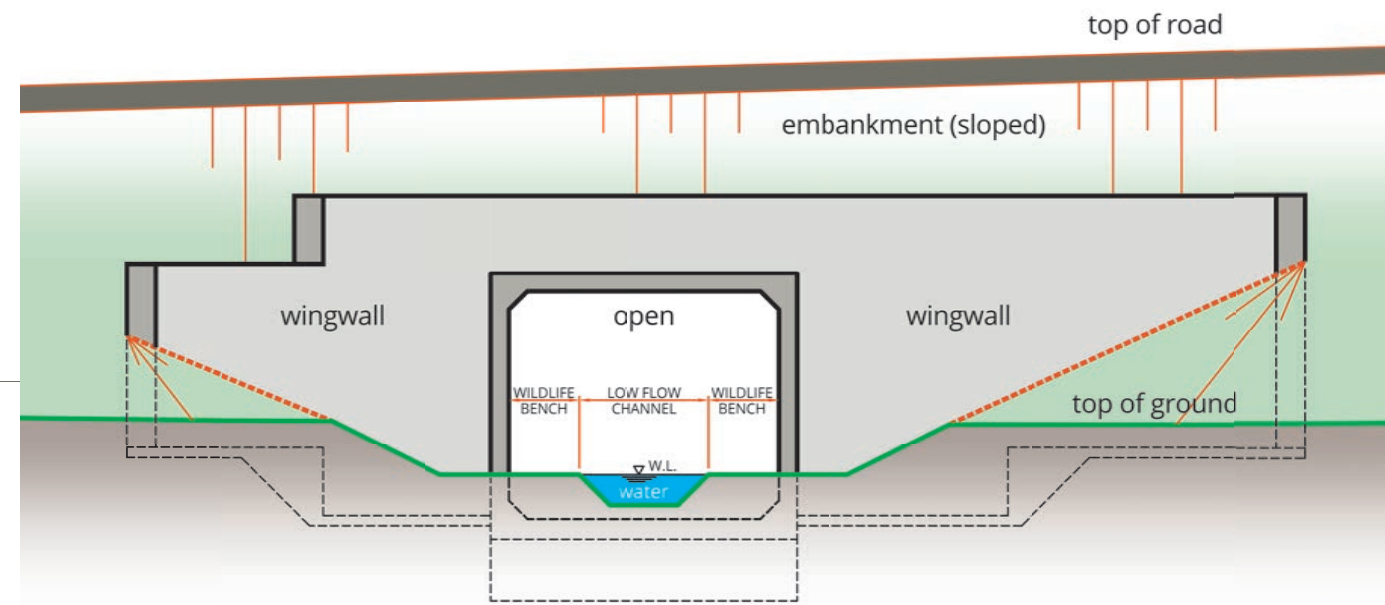
The Approved Plan



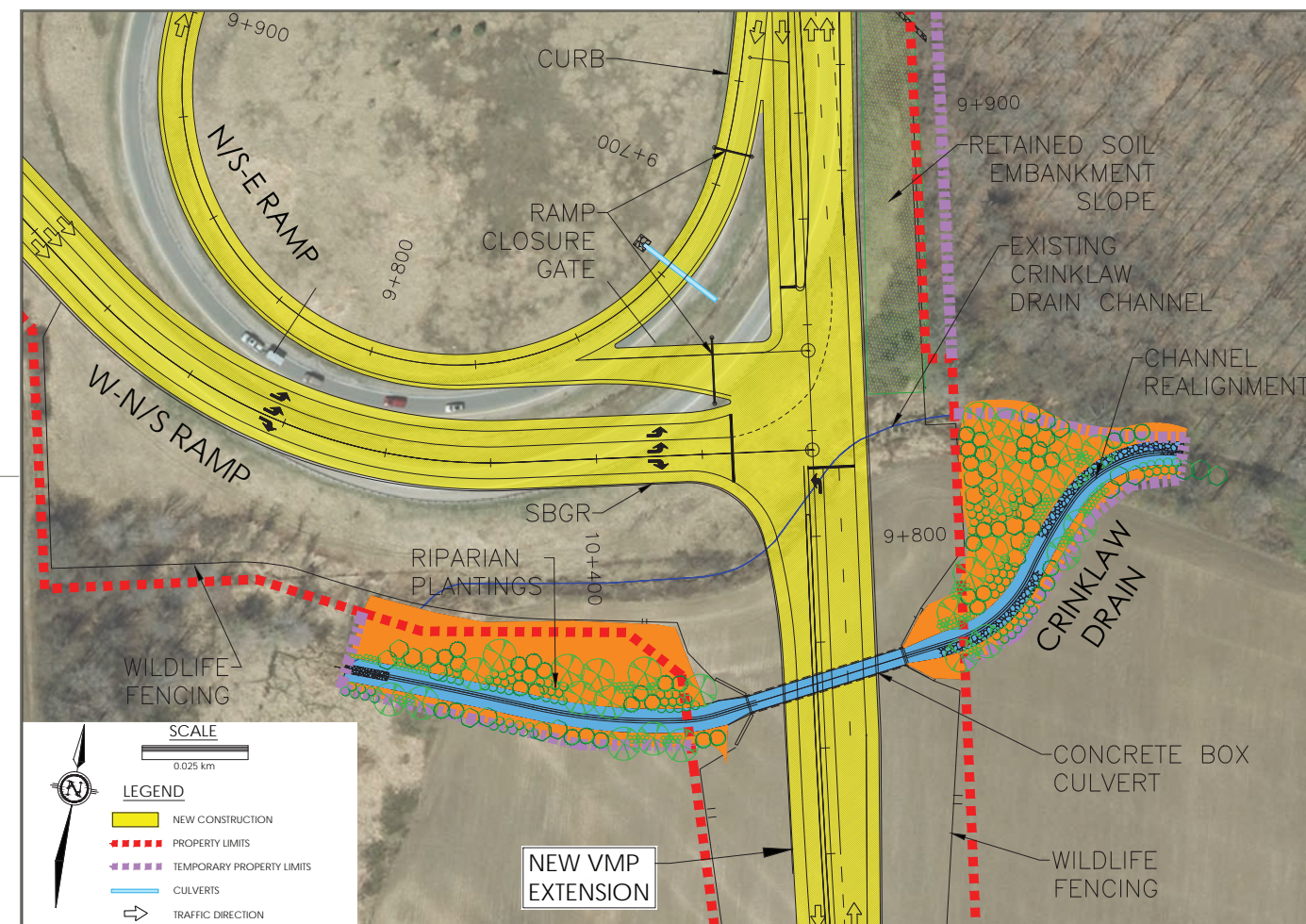
VMP Bridge Over Highway 401



Crinklawn Drain Culvert



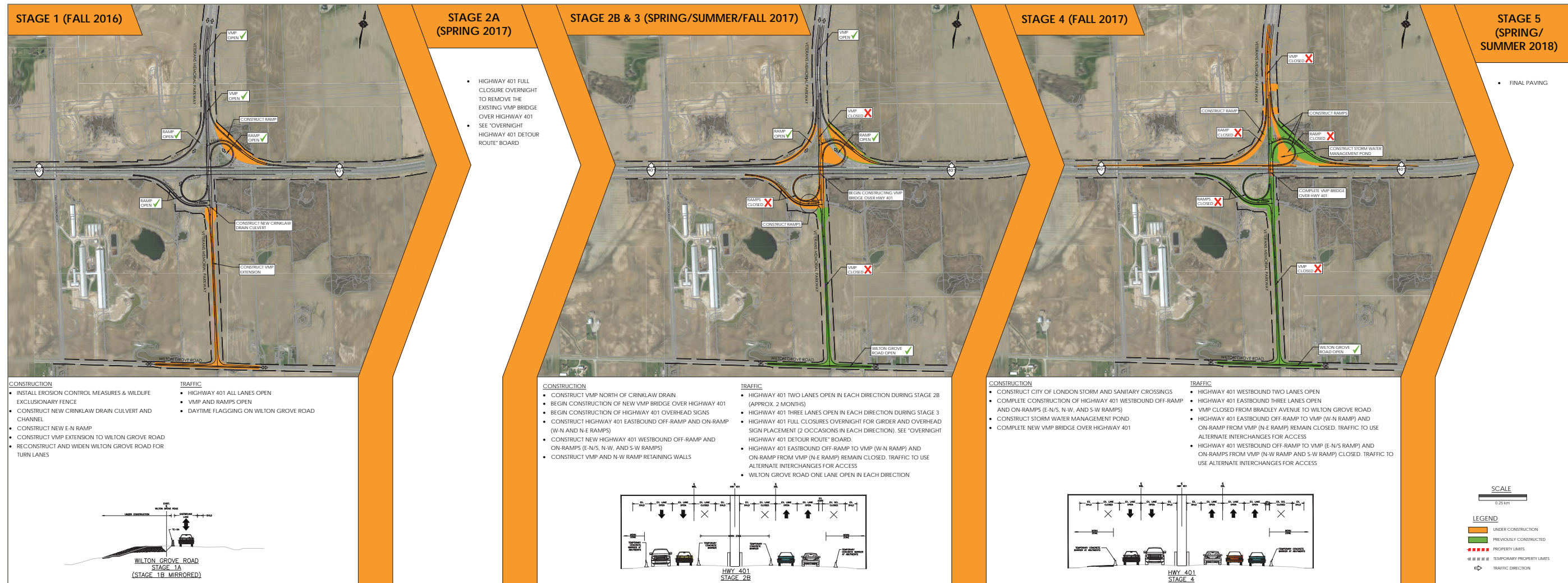
Crinklawn Drain Realignment Design Concept



Construction Staging and Traffic Management Plan

The proposed construction staging strategy includes:

- Long-term closure of the Highway 401 eastbound off-ramp and on-ramp at VMP from spring to fall 2017. Traffic to use alternate interchanges for access to Highway 401.
- Long-term closure of the Highway 401 westbound off-ramp and on-ramp at VMP from late summer to fall 2017.
- Overnight full closures of Highway 401 for bridge demolition and girder installation. Highway 401 traffic to use signed detour route.

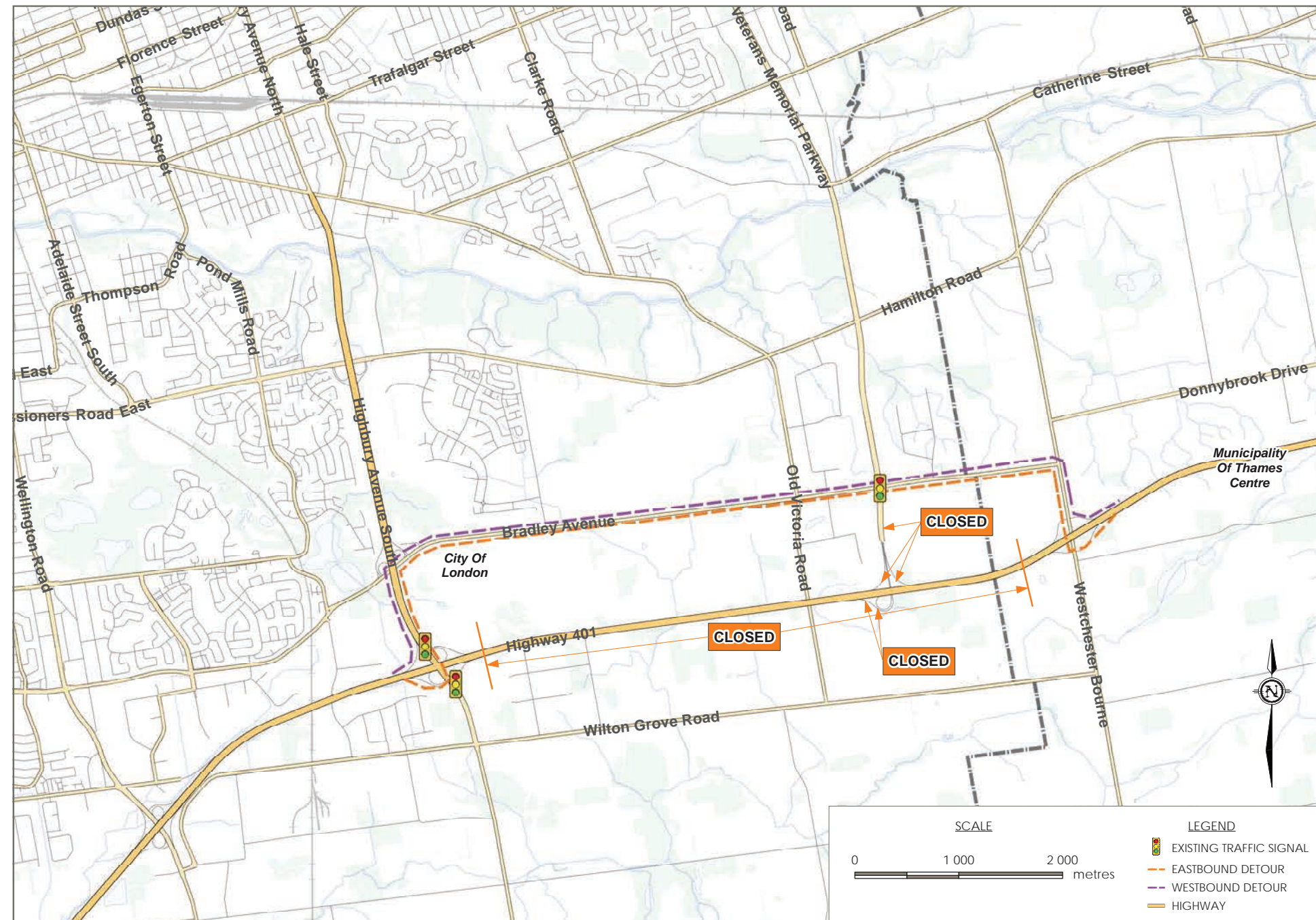


Overnight Highway 401 Detour Route

The preferred detour route during full closures of Highway 401 has been developed in consultation with the City of London, County of Middlesex, and Municipality of Thames Centre. The detour route will be implemented on five occasions as overnight closures for the removal of the existing VMP bridge over Highway 401, and girder placement for the new bridge. The preferred detour route follows:

- Highbury Avenue (4.5km west of VMP) northbound/southbound
- Bradley Avenue eastbound/westbound
- Westchester Bourne (1.8km east of VMP) northbound/southbound.

Existing intersections may require the use of police presence to facilitate traffic diversion during construction.



Existing Conditions, Mitigation, and Commitments

Environmental factors were assessed during the Preliminary Design Study to determine existing conditions and to identify mitigation measures to minimize and/or address potential impacts associated with the proposed works. Additional field work has been undertaken to update information and identify changes to statutory requirements, based on the Approved Plan.

Contract documentation will include general environmental management and specific components to address environmental mitigation related to the following components:

Noise	Air Quality	Archaeology
Fisheries and Aquatic Habitat	Vegetation	Wildlife Habitat
Groundwater Resources	Surface Water	Erosion and Sediment Control
Management of Excess Material	Property Contamination	Utility Relocation / Mitigation

The Environmental Management Plan is an integral component of the Design-Build Project and includes:

- Environmental protection/mitigation
- Environmental monitoring for compliance with identified commitments and approvals during construction
- Addressing the potential for traffic disruption during construction
- Measures to mitigate emergency service issues associated with temporary loss or restriction of access
- Ongoing communication during construction, by way of the project website, to inform the public of the potential for delays
- Advanced signage and notification prior to the start of construction activities
- A Protocol to address environmental issues that arise during construction



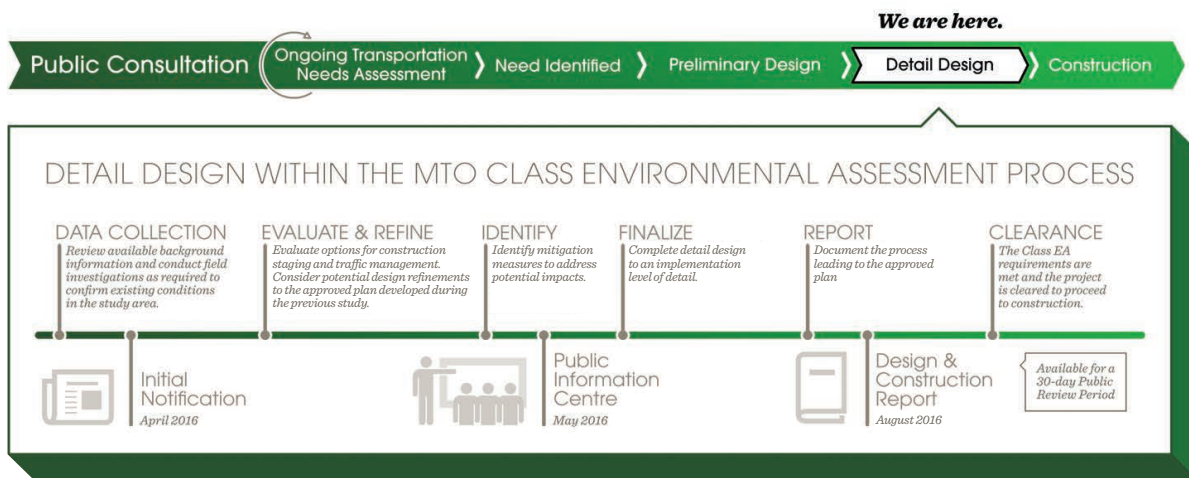
Example of erosion control measures





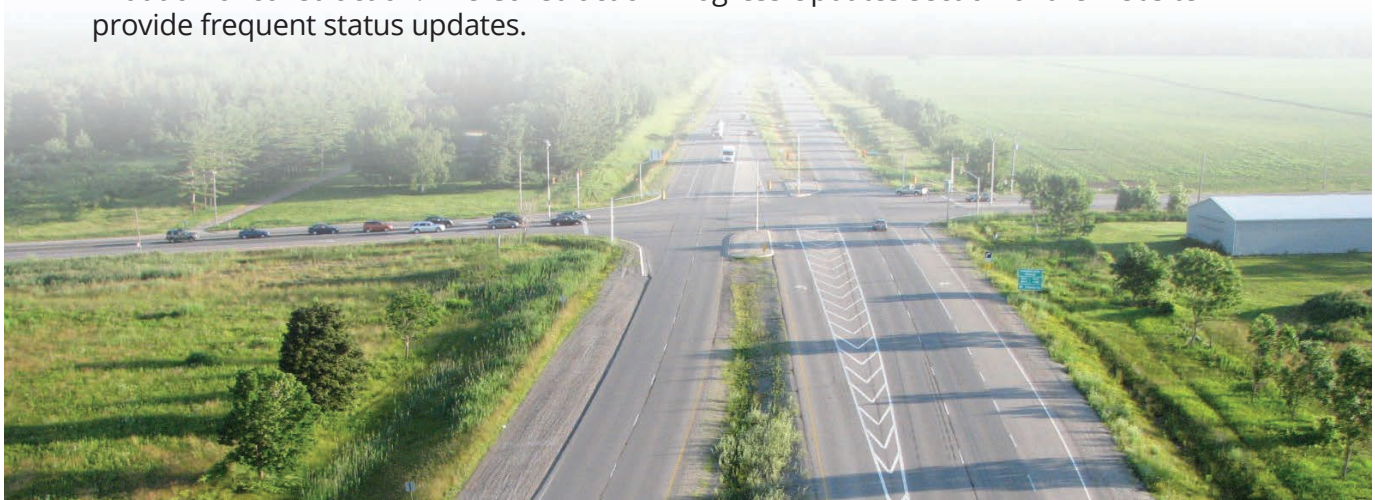
Next Steps

- Input received will be reviewed and considered as the Detailed Design is finalized
- Reasonable efforts will be made to resolve issues or concerns raised and formal responses will be provided to all comments
- The Design and Construction Report will be placed on the public record for a review period of 30 calendar days
- Following the 30-day review, construction may commence, subject to receipt of any other required approvals, permits or authorizations.



Construction is anticipated to begin in fall 2016 and be completed in summer 2018.

The Project website will be maintained for the duration of construction and will provide a link to "Ontario 511" for updates on traffic restrictions and detour routes, following initiation of construction. The Construction Progress Updates section of the website will provide frequent status updates.



Visit the Project Website: hwy401vmp.ca





Thank you for attending

To provide your comments, please fill out a comment form and place in the comment box at today's meeting, or send your comments to:

Mr. Frank Hochstenbach, P.Eng.
Sr. Project Engineer

Ministry of Transportation
659 Exeter Road, 3rd Floor
London ON N6E 1L3
Tel.: 519-873-4575
Toll Free: 1-800-265-6072 ext.
519-873-4575
Fax: 519-873-4600
E-mail: frank.hochstenbach@ontario.ca

Mr. Karl Grabowski, P.Eng.
Transportation Design Engineer

Planning, Environmental and
Engineering Services
City of London
PO Box 5035
London ON N6A 4L9
Tel.: 519-661-2500 ext. 5071
E-mail: kgrabows@london.ca

Mr. Dave Emery, P.Eng.
Design Manager

Stantec Consulting Ltd.
200-835 Paramount Drive
Stoney Creek ON L8J 0B4
Tel.: 905-381-3221
(+0 collect)
Fax: 905-385-3534
E-mail: dave.emery@stantec.com

We would appreciate receiving your comments by **June 23, 2016** so they can be considered early in the design refinement process. All individuals who have submitted comments and an email or mailing address will be added to the project mailing list.

Comments and information regarding this study are being collected to satisfy the requirements of the Environmental Assessment Act, and 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.

Please let us know if you have any accessibility requirements in order to participate in this study.

Appelez Tim Belliveau pour des informations en français. Tel: 905-381-3224 (à frais virés)

Comments may also be emailed:

comments@hwy401vmp.ca

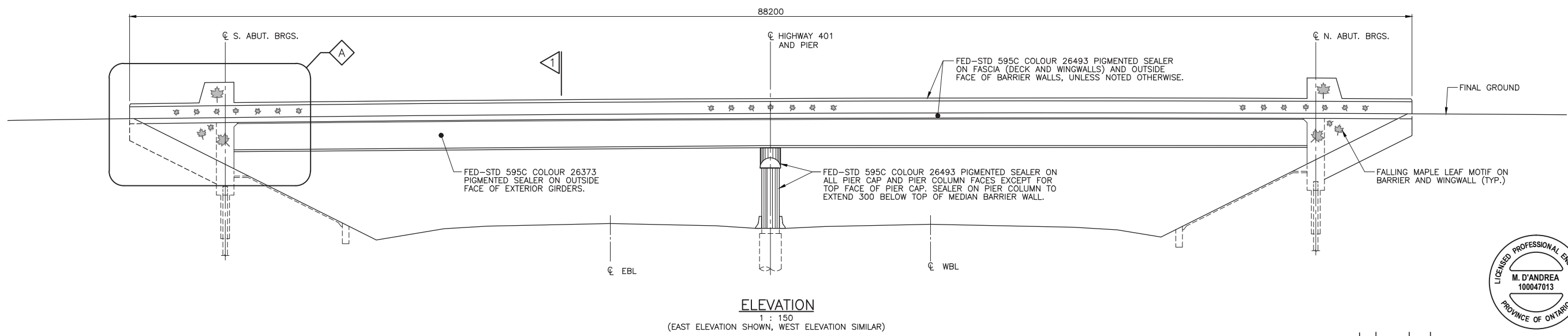
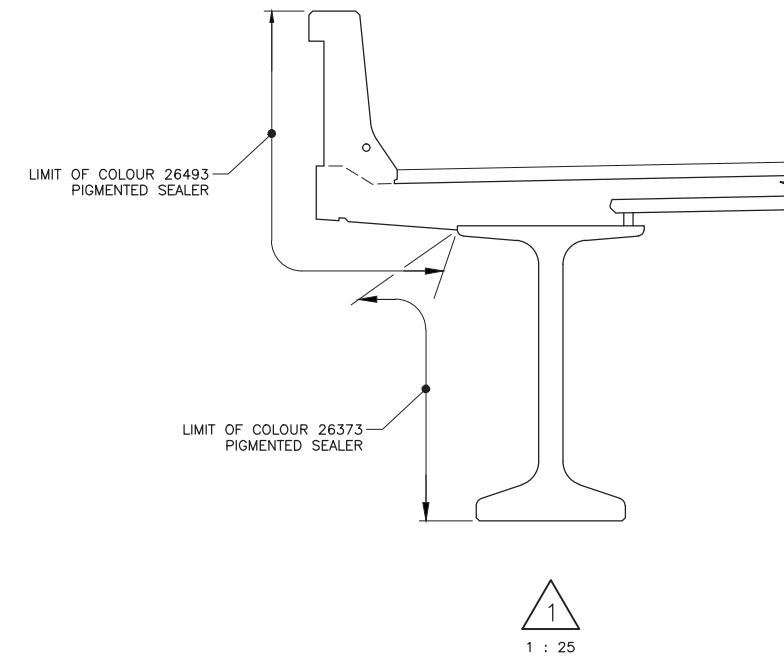
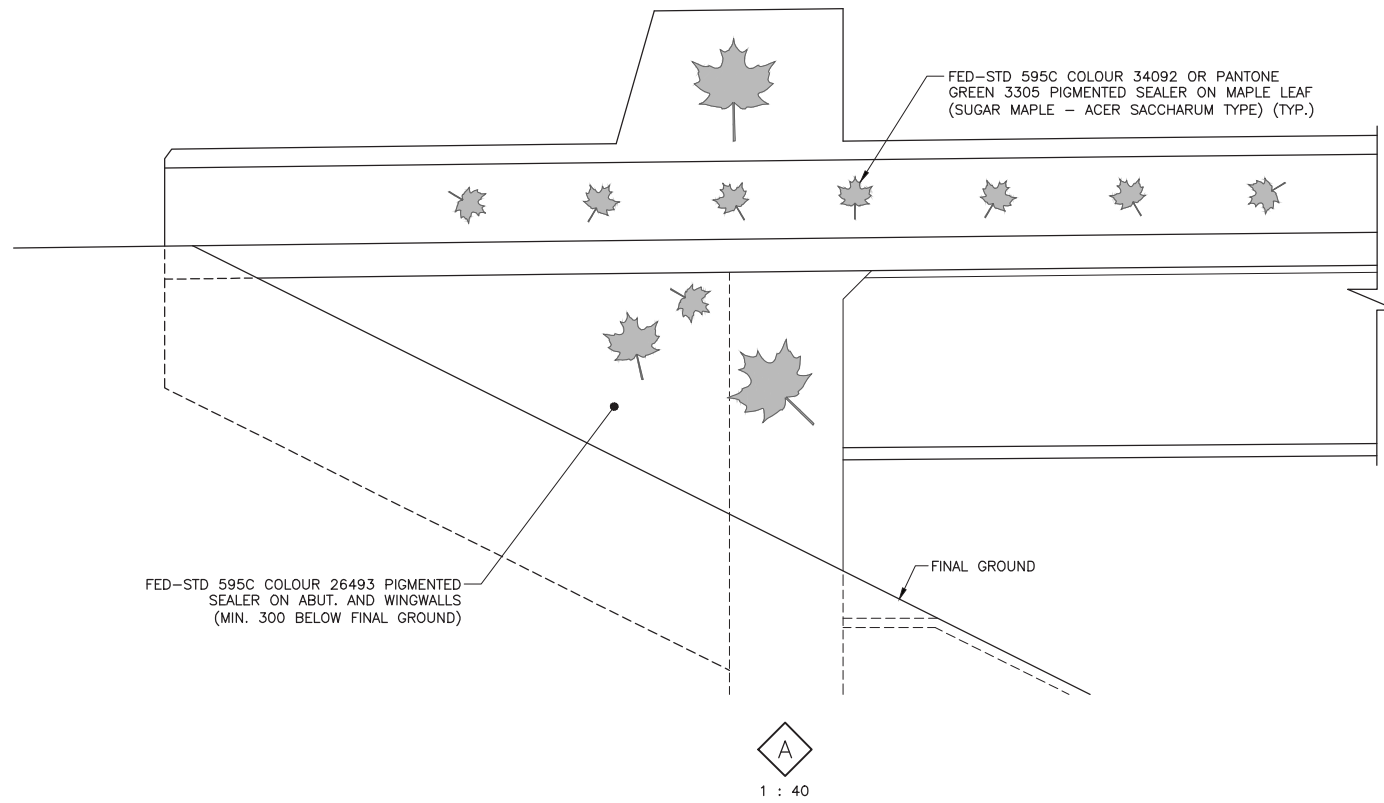
Appendix C: Detail Design Plan

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

CONT 2015-3002
WP 3033-11-02

VETERANS MEMORIAL PARKWAY
UNDERPASS
AESTHETIC DETAILS

SHEET
S21



165001002-VMP_UP-21.DWG Jul 20 2016

DRAWING NOT TO BE SCALED
100 mm ON ORIGINAL DRAWING

REVISIONS	DATE	BY	DESCRIPTION

DESIGN	M.D.	CHK	M.T.	CODE	CHBDC-2006	LOAD	CL-625-ONT	DATE	JUL 2016
DRAWN	A.P.	CHK	M.D.	SITE	19-515	STRUCT	SCHEME	DWG	21

Design and Construction Report - July 2016

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

VETERANS MEMORIAL PARKWAY
CONT 2015-3002
WP 3033-11-07



CRINKLAW DRAIN CULVERT
GENERAL ARRANGEMENT

SHEET
S25



LIST OF DRAWINGS

1. GENERAL ARRANGEMENT
2. BOREHOLE LOCATIONS & SOIL STRATA
3. CULVERT DETAILS
4. RETAINING WALLS
5. EXCAVATION AND BACKFILL

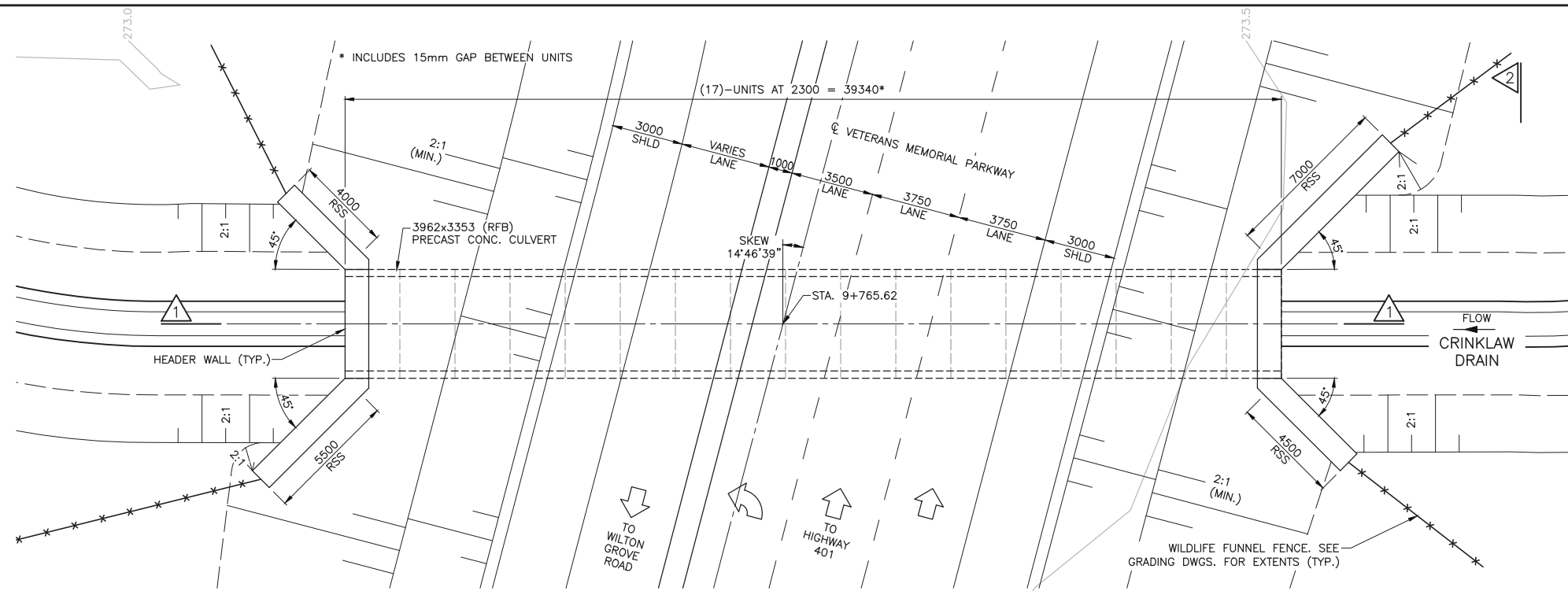
GENERAL NOTES:

1. CLASS OF CONCRETE: 35 MPa UNLESS OTHERWISE SPECIFIED
2. CLEAR COVER TO REIN. STEEL FOR PRECAST CONCRETE:
CULVERT TOP SURFACE 50±10
CULVERT INSIDE WALLS 50±10
REMAINDER 45±10
UNLESS OTHERWISE NOTED
3. CULVERT DESIGN
PRECAST CULVERT DESIGN IS THE RESPONSIBILITY OF THE PRECASTER, AND SHALL BE IN ACCORDANCE WITH CHBDC 2006, LIVE LOAD SHALL BE CL-625-ONT. MINIMUM WALL AND SLAB THICKNESS SHALL BE 250.
4. REINFORCING STEEL
REINFORCING STEEL SHALL BE GRADE 400W UNLESS OTHERWISE SPECIFIED.
TENSION LAP LENGTHS NOT INDICATED ON THE CONTRACT DRAWINGS 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.
NO TACK WELDING SHALL BE PERMITTED TO FABRICATE OR ASSEMBLE REINFORCING STEEL CAGES, UNLESS APPROVED BY THE DESIGN ENGINEER.
5. RETAINED SOIL SYSTEM
RETAINED SOIL SYSTEM WALLS SHALL HAVE THE FOLLOWING ATTRIBUTES:
APPLICATION: WALL/SLOPE
GEOMETRY: VERTICAL
PERFORMANCE: LOW
APPEARANCE: LOW
6. CULVERT SUBSTRATE
CHANNEL SUBSTRATE (D₅₀ = 100 DIA.) WITHIN THE CULVERT SHALL MEET THE FOLLOWING SIZING REQUIREMENTS:

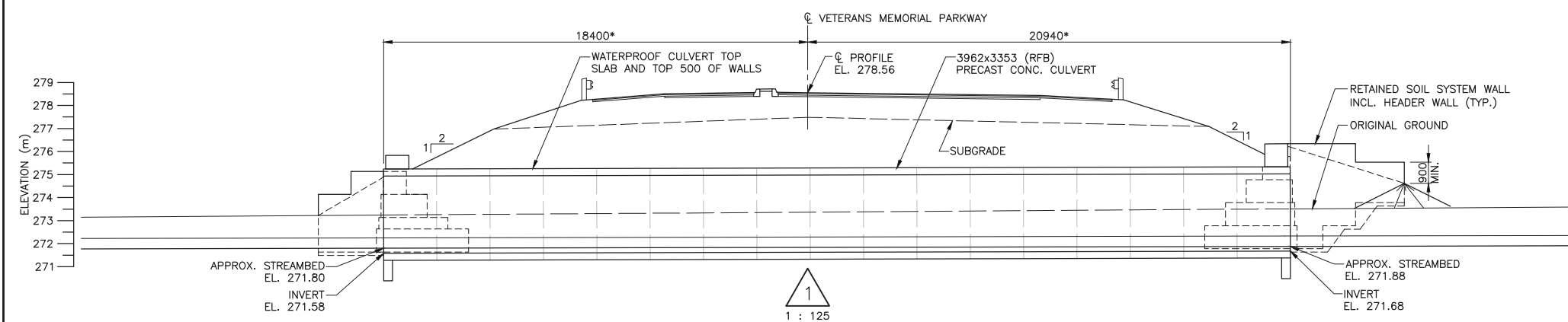
GRADATION	
SIEVE SIZE (mm)	PERCENT PASSING
200	100%
100	50%
75	35-50%
50	20-35%
GRANULAR 'A' (TO COMPLETELY FILL VOIDS)	20%

CONSTRUCTION NOTES:

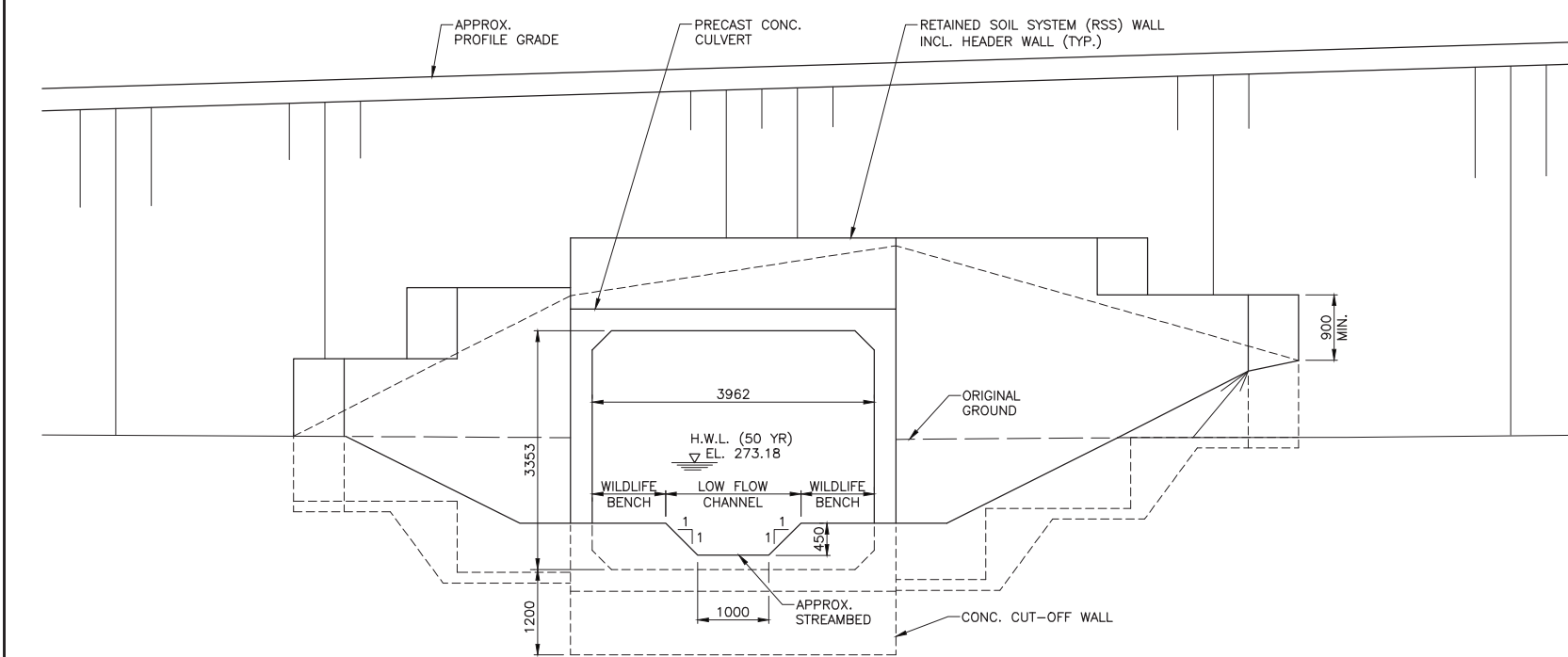
1. BACKFILL SHALL BE PLACED SIMULTANEOUSLY BEHIND BOTH CONCRETE WALLS KEEPING THE HEIGHT OF THE BACKFILL APPROXIMATELY THE SAME. AT NO TIME SHALL THE DIFFERENCE IN ELEVATION BE GREATER THAN 500mm.



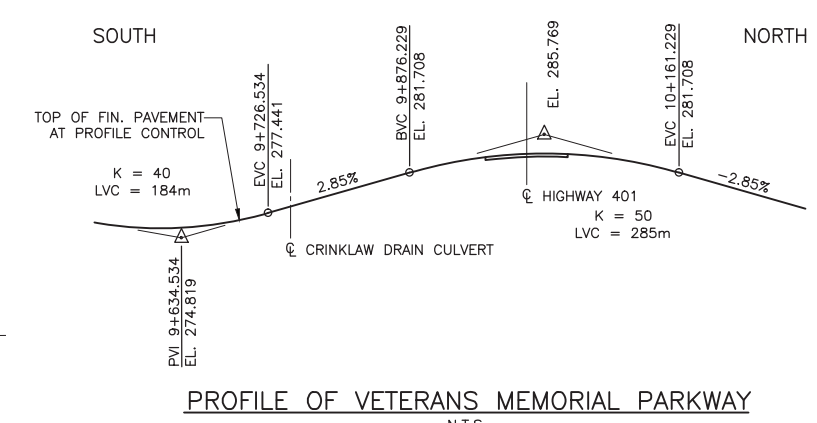
PLAN
1 : 125



1
1 : 125



2
1 : 50



PROFILE OF VETERANS MEMORIAL PARKWAY
N.T.S.

165001002-CRINKLAW_DR_CULV-01.DWG Jul 20 2016

DRAWING NOT TO BE SCALED
100 mm ON ORIGINAL DRAWING

REVISIONS	DATE	BY	DESCRIPTION

DESIGN	M.D. CHK M.T.	CODE CHBDC-2006	LOAD CL-625-ONT	DATE	JUL 2016
DRAWN	B.H. CHK M.D.	SITE 4-CU-29	STRUCT	SCHEME	DWG. 1



Design and Construction Report - July 2016

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

CONT 2015-3002
WP 3033-11-07

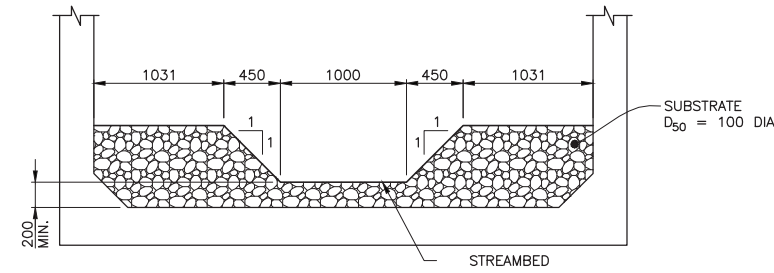
CRINKLAW DRAIN CULVERT
EXCAVATION AND BACKFILL

SHEET
S29



LEGEND

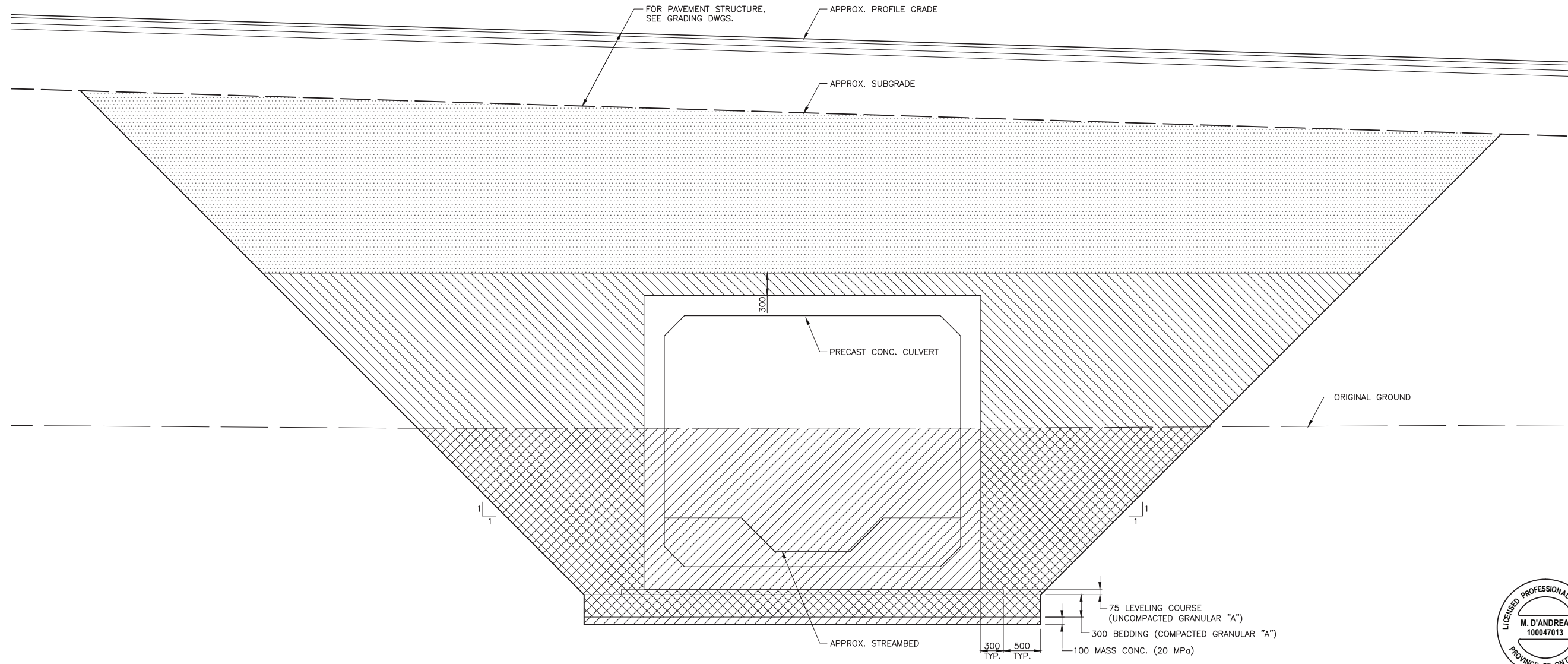
	STRUCTURAL EXCAVATION
	NATIVE BACKFILL
	STRUCTURAL BACKFILL (GRANULAR "A")
	CHANNEL SUBSTRATE



CHANNEL SUBSTRATE WITHIN CULVERT
1 : 30

GENERAL NOTES:

1. THE CONTRACTOR SHALL REPLACE ANY ORGANIC MATERIALS OR SOFT/LOOSE SOILS BELOW THE EXCAVATION BASE WITH STRUCTURAL BACKFILL (GRANULAR "A").
2. THE CONTRACTOR SHALL PLACE THE MASS CONCRETE PAD IMMEDIATELY OVER THE APPROVED EXCAVATION BASE.
3. NATIVE MATERIAL USED AS BACKFILL WHERE INDICATED SHALL BE IN ACCORDANCE WITH RESTRICTIONS ELSEWHERE IN THE CONTRACT.
4. EXCAVATION AND BACKFILLING TO BE CARRIED OUT IN ACCORDANCE WITH RESTRICTIONS ELSEWHERE IN THE CONTRACT.
5. BEDDING SHALL BE PLACED AND COMPACTED IN ACCORDANCE WITH THE SAME REQUIREMENTS AS BACKFILL.
6. ADDITIONAL CHANNEL SUBSTRATE INFORMATION SHOWN ON DWG. 1.



EXCAVATION AND BACKFILL
1 : 30



REVISIONS	DATE	BY	DESCRIPTION









DESIGN	M.D.	CHK	M.T.	CODE	CHBDC-2006	LOAD	CL-625-ONT	DATE	JUL 2016
DRAWN	E.M.	CHK	M.D.	SITE	4-CU-29	STRUCT	SCHEME	DWG.	5

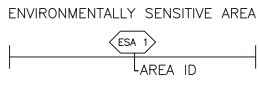
DRAWING NOT TO BE SCALED
100 mm ON ORIGINAL DRAWING

165001002-CRINKLAW_DR_CULV-05.DWG Jul 20 2016

Design and Construction Report - July 2016

SUPPLEMENTARY LEGEND

-  FIBRE TUBE FLOW CHECK OPSD 219.191
-  TEMPORARY ROCK FLOW CHECK DAM OPSD 219.210, OPSD 219.211
-  RIP RAP (SEE DETAIL)
-  GORE AREA (SEE DETAIL)
-  HOT MIX ASPHALT MISCELLANEOUS
-  BARRIER FOR TREE PROTECTION OPSD 220.010
-  WIRE BACK SILT FENCE OPSD 219.131
-  CB TO BE ADJUSTED




GENERAL NOTES:

1. DRAWINGS TO BE READ IN CONJUNCTION WITH:
-OPSD 100 & 200 SERIES
-OPSD 555.010, 553.010, 552.010
-TYPICALS AND DETAILS
2. ALL DISTURBED AREAS TO BE REINSTATED WITH TOPSOIL, SEED AND MATRIX
3. ALL SUBDRAINS AND SUBDRAIN OUTLETS ARE TO BE INSTALLED AS PER SUBDRAIN DETAILS
4. SILT FENCE TO BE INSTALLED AT RIP RAP (SEWER/CULVERT OUTLET) AND WATERCOURSES AS PER DETAILS
5. FOR CURB AND GUTTER, GUIDERAIL, AND PAVEMENT DETAILS AT STRUCTURES SEE STRUCTURE APPROACH DETAIL
6. RUMBLE STRIPS TO BE INSTALLED FROM STA. 16+200 TO STA. 17+595.753 TILBURY NORTH WBL AND FROM STA. 10+000 TO STA. 20+976.195 TILBURY EAST WBL AS INDICATED ELSEWHERE IN CONTRACT DOCUMENTS
7. REINSTATEMENT RELATED TO CONSTRUCTION AND TRAFFIC STAGING IS SHOWN ON STAGING DRAWINGS

ABBREVIATIONS:

- SBEAT = STEEL BEAM ENERGY ATTENUATING TERMINAL
- WBSF = WIRE BACK SILT FENCE
- SBGR = STEEL BEAM GUIDE RAIL
- SCL = SPEED CHANGE LANE
- PS = FULLY PAVED SHOULDER
- WBL = WESTBOUND LANES
- EBL = EASTBOUND LANES
- VMP = VETERAN'S MEMORIAL PARKWAY

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

PLATE No		
CONT	2015-3002	
WP		3033-11-00
NEW CONSTRUCTION		
STA	TO STA	
Survey 2012	Revised 2015	

SHEET
76



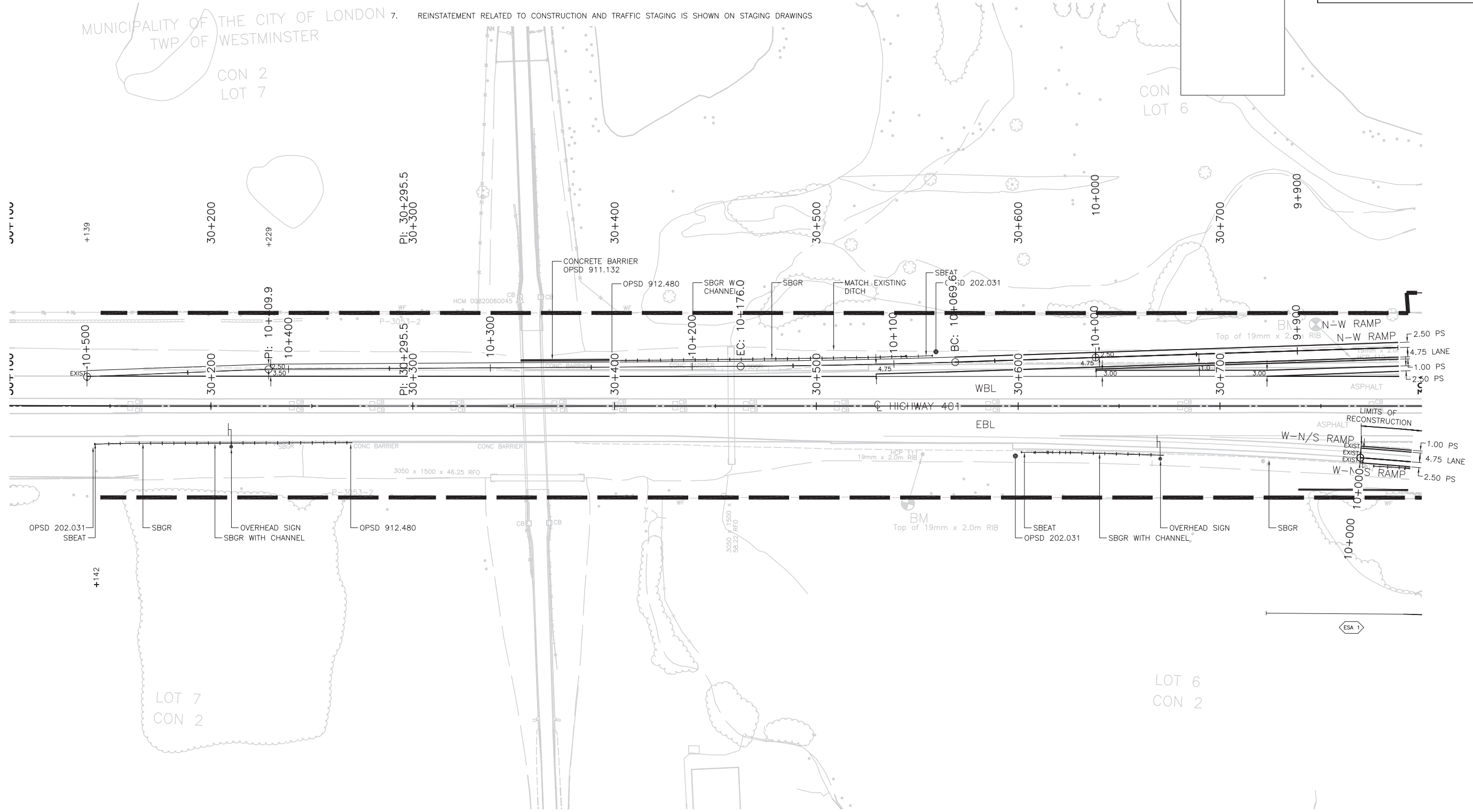
PR-D-707 88-05

MINISTRY OF TRANSPORTATION, ONTARIO

MUNICIPALITY OF THE CITY OF LONDON
TWP OF WESTMINSTER

CON 2
LOT 7

CON
LOT 6



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Design and Construction Report - July 2016

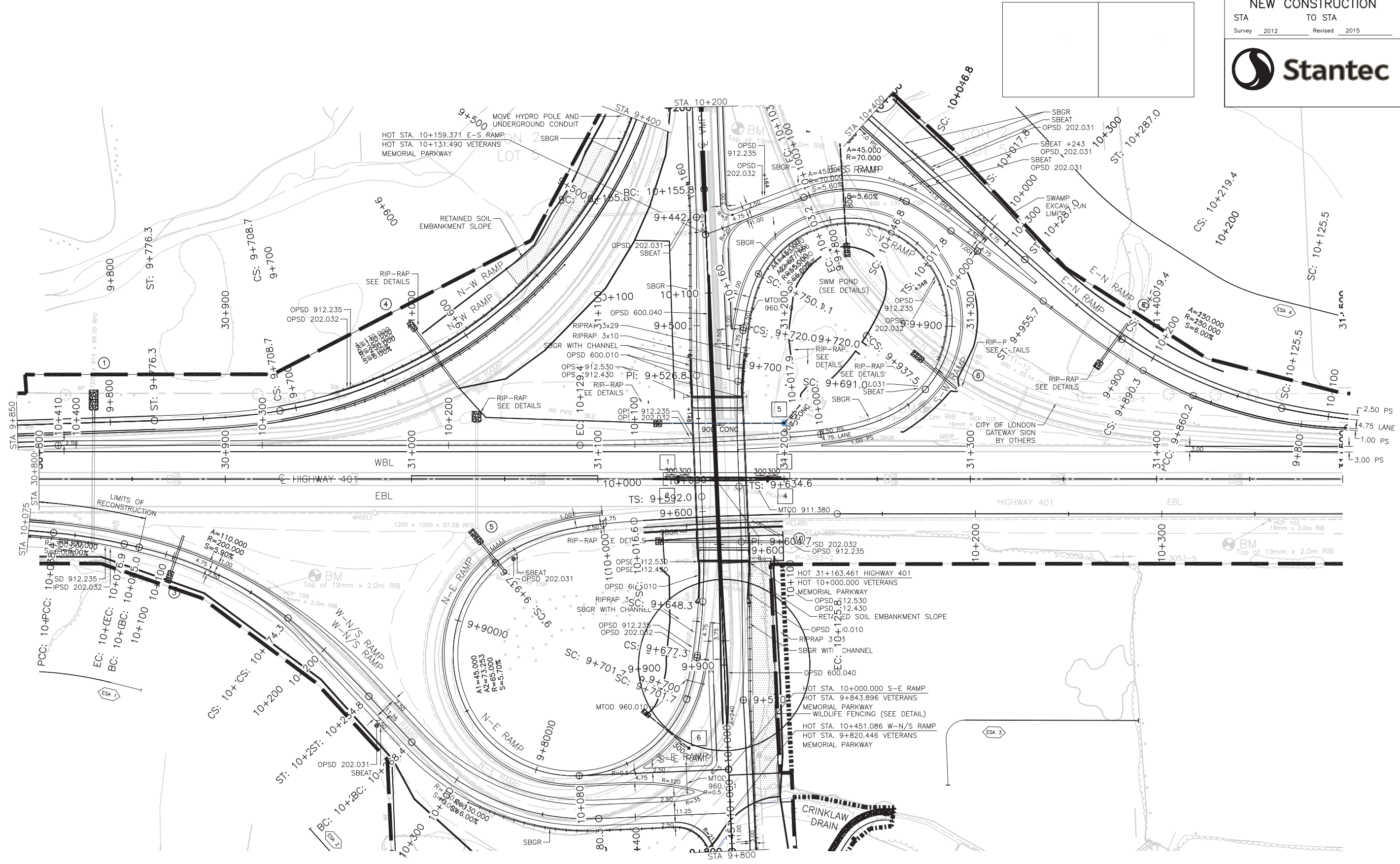
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AND/OR MILLIMETRES
UNLESS OTHERWISE SHOWN

PLATE No
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WP 3033-11-00



NEW CONSTRUCTION
STA TO STA
Survey 2012 Revised 2015

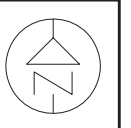
SHEET
77



SCALE
5 10
Horizontal

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PLATE No
CONT 2015-3002
WP 3033-11-00

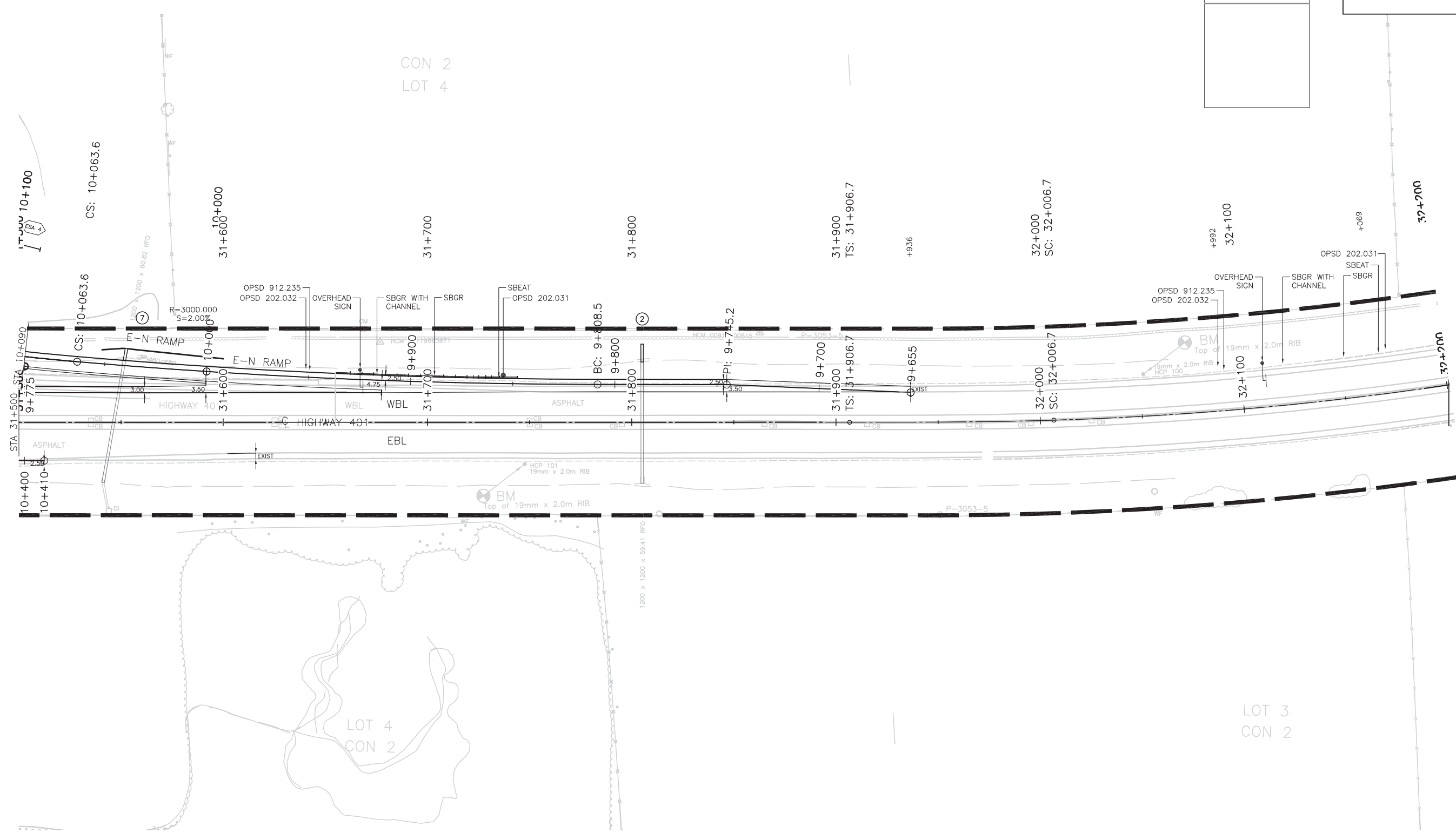


NEW CONSTRUCTION
STA TO STA
Survey 2012 Revised 2015

SHEET
78



Dufferin
Construction
A division of CH2M Canada Group Inc.



SCALE
5 10
Horizontal

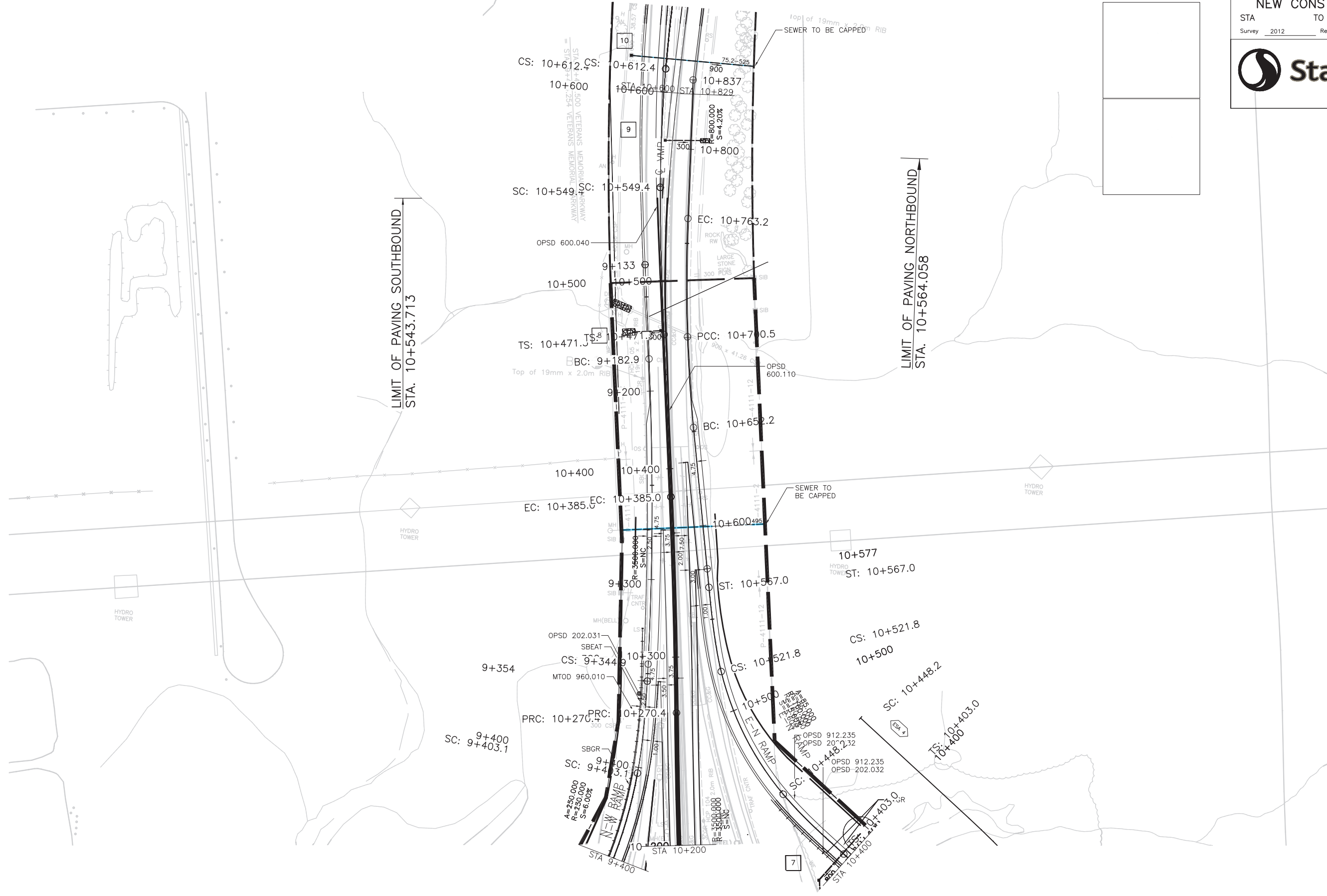
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WP 3033-11-00



NEW CONSTRUCTION
STA TO STA
Survey 2012 Revised 2015

SHEET
80



SCALE
5 10
Horizontal

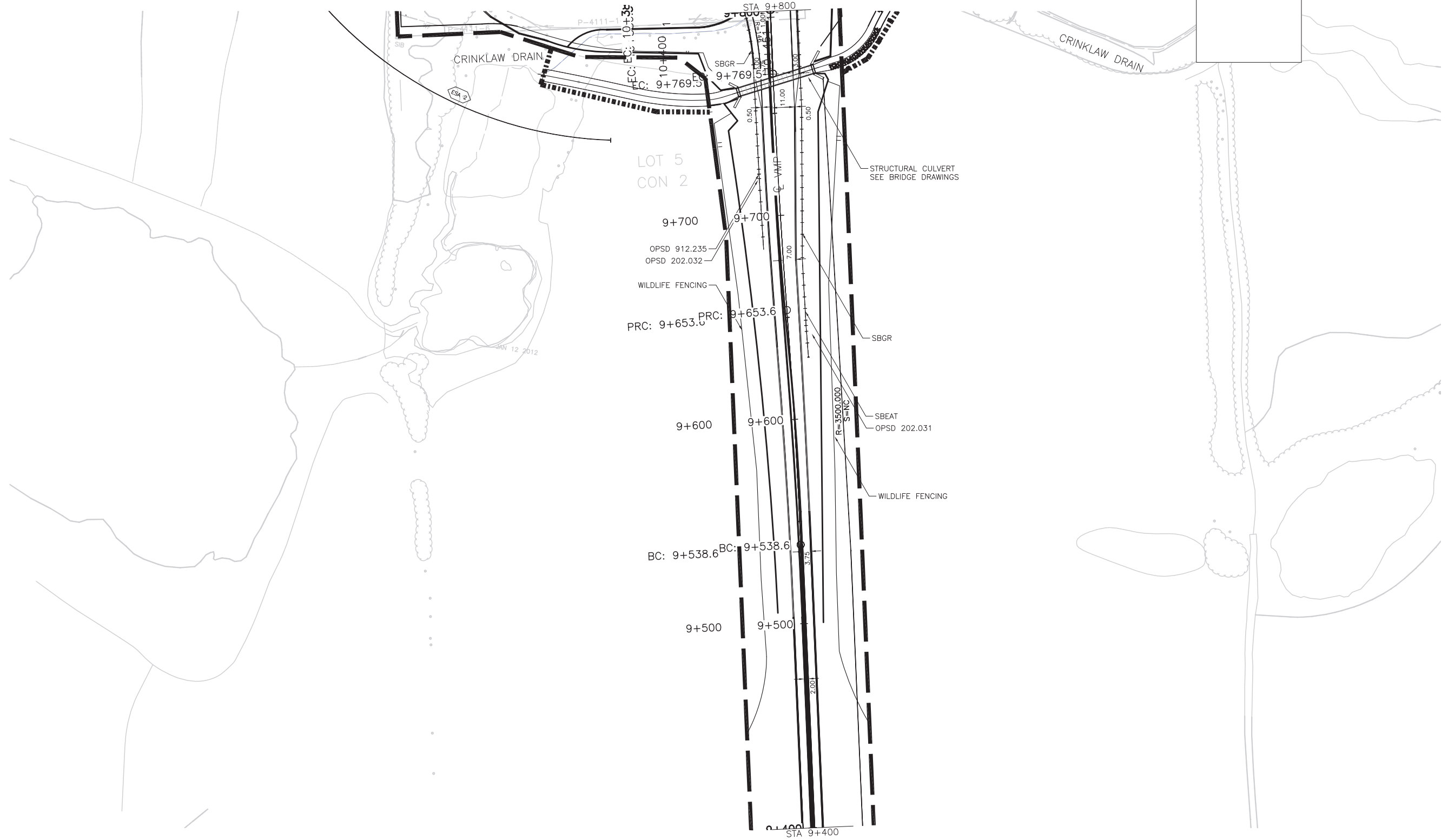
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WP 3033-11-00



NEW CONSTRUCTION
STA TO STA
Survey 2012 Revised 2015

SHEET
81



SCALE
5 10
Horizontal

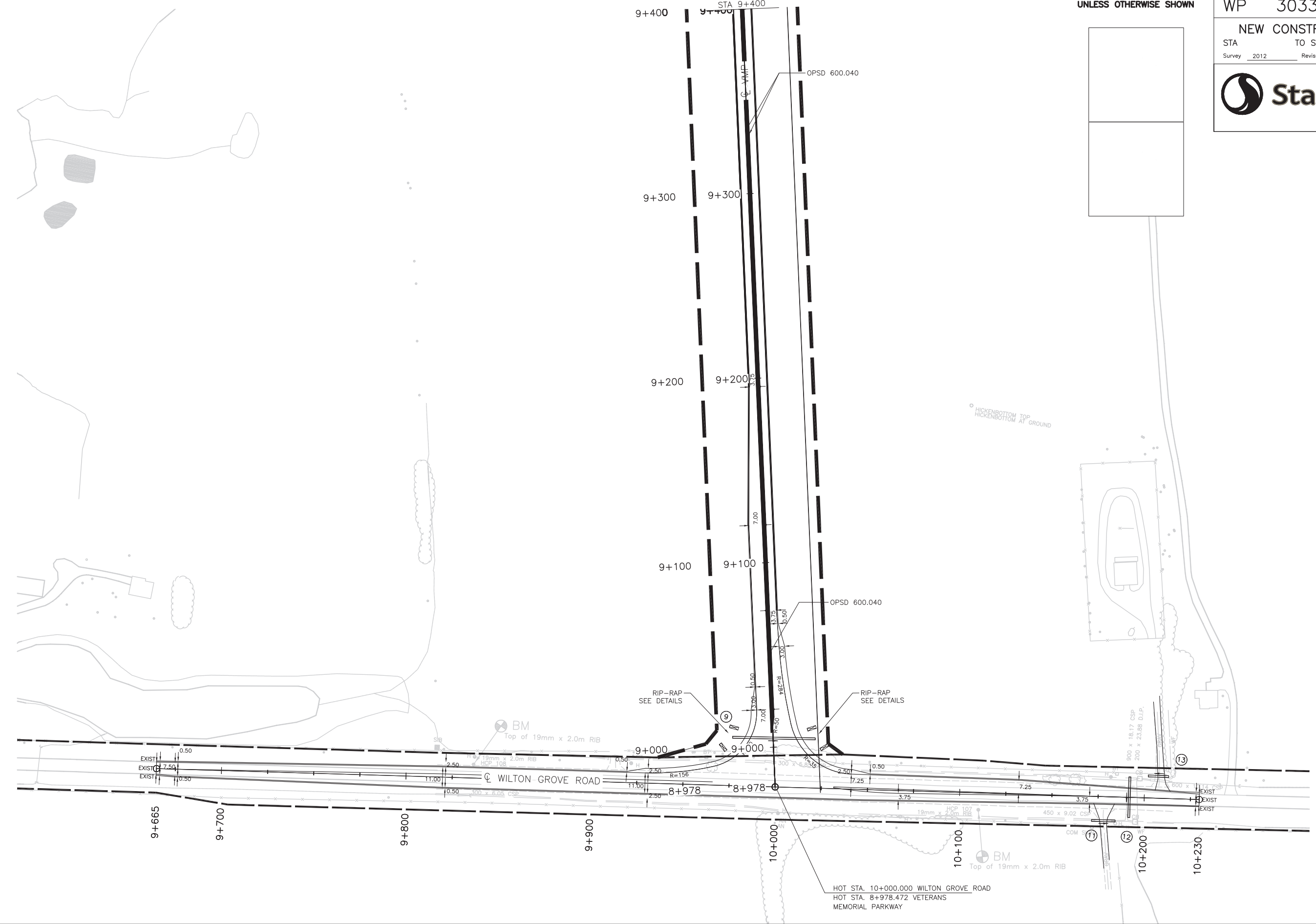
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PLATE No
CONT 2015-3002
WP 3033-11-00



NEW CONSTRUCTION
STA TO STA
Survey 2012 Revised 2015

SHEET
82



SCALE
5
10
Horizontal