Highway 427 Expansion Project

Design and Construction Report

Project Number 16M-01172-11

Document Number	**H427-0-ENV-REP-032**

April 10, 2018

THE PUBLIC RECORD

This Design and Construction Report (DCR) is being carried out in accordance with the approved environmental planning process for projects under the Ontario Ministry of Transportation (MTO) *Class Environmental Assessment (Class EA) for Provincial Transportation Facilities* (2000).

A copy of this document has been submitted to the following office of the Ontario Ministry of the Environment and Climate Change (MOECC) to fulfill the requirements of the MTO Class EA.

Ministry of the Environment and Climate Change
Central Region Office
5775 Yonge Street, 8th Floor
North York, Ontario M2M 4J1

This report is available online for review at www.427expansion.ca, as well as the following review locations between **April 10, 2018** to **May 11, 2018** during regular business hours:

MOECC EA File #: TC-CE-02

Ministry of Environment & Climate Change Environmental Assessment and Permissions Branch 135 St. Clair Avenue West, 1st Floor, Toronto, ON M4V 1P5 Tel: (416) 314-8001	**Ministry of Transportation** Central Region Major Projects Office 159 Sir William Hearst Avenue, 7th Floor, Toronto, ON M3M 0B7 Tel: (416) 235-4299
City of Vaughan Clerk's Office 2141 Major Mackenzie Drive, Vaughan, ON L6A 1T1 Tel: (905) 832-2281	**Regional Municipality of York Clerk's Office** 17250 Yonge St., Newmarket, ON L3Y 6Z1 Tel: (905) 895-1231
Kleinburg Library 10341 Islington Avenue N., Vaughan, ON L0C 1C0 Tel: (905) 653-7323	**Toronto Public Library – Humberwood Library** 850 Humberwood Boulevard, Etobicoke, ON M9W 7A6 Tel: (416) 394-5210
Etobicoke Civic Centre 399 The West Mall, Toronto, ON M9C 2Y2 Tel: (416) 338-4386	**LINK427 Project Office** 1 Royal Gate Boulevard, Woodbridge, ON L4L 8Z7
Regional Municipality of Peel Clerk's Office 10 Peel Centre Drive, Brampton ON L6T 4B9 Tel: (905-791-7800)	**LINK427 Project Website** www.427expansion.ca

Ce document hautement spécialisé n'est disponible qu'en anglais en vertu du règlement 411/97, qui en exempte l'application de la Loi sur les services en français. Pour de l'aide en français, Appelez le Bureau des services en français au: 1-888-595-3152.

HOW TO COMMENT

Interested persons are encouraged to review this DCR and provide comments by **May 11, 2018**.

Comments and information are being collected to assist LINK427 in meeting the requirements of the Ontario Environmental Assessment Act. 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. Comments on this DCR can be provided by mail, e-mail, or online to:

Mr. Christopher Tschirhart
Environmental Director
LINK427
1 Royal Gate Blvd., Suite G
Woodbridge, ON L4L 8Z7
Phone: 1-888-352-8085
E-mail: ask@427Expansion.ca

Mr. Aitor Arbesu Iglesias
Project Director
LINK427
1 Royal Gate Blvd., Suite G
Woodbridge, ON L4L 8Z7
Phone: 1-888-352-8085
E-mail: ask@427Expansion.ca

If you have any accessibility requirements to participate in this project, please contact one of the Project Team members listed above.

Des renseignements sont disponibles en français en composant 1-888-595-3152.

TABLE OF CONTENTS

TABLES

FIGURES

APPENDICES

Appendix A: Study Notification Materials
Appendix B: Public Information Centre Display Materials
Appendix C: Design Drawings
Appendix D: Agency Correspondence
Appendix E: Ontario Provincial Standard Drawings (OPSD)

ACRONYMS

AFP	Alternative Financing & Procurement
ANSI	Area of Natural and Scientific Interest
AODA	Accessibility for Ontarians with Disabilities Act
ATMS	Advanced Traffic Management System
CEAA	Canadian Environmental Assessment Act
CMP	Compliance Monitoring Program
COS	Contamination Overview Study
CVC	Credit Valley Conservation
dBA	A-weighted decibels
DCR	Design and Construction Report
DSS	Designated Substance Survey
DSMP	Drainage and Sediment Management Plan
EA	Environmental Assessment
EAA	Environmental Assessment Act
EASR	Environmental Activity and Sector Registry
ECA	Environmental Compliance Approval
ECCC	Environment and Climate Change Canada
ELC	Ecological Land Classification
EMP	Earth Management Plan
EMS	Environmental Management System
EQMP	Environmental Quality Management Plan
ESA	Environmentally Significant Areas
ESC	Erosion and Sediment Control
ESCP	Erosion and Sediment Control Plan
GHG	Green House Gas
GPL	General Purpose Lanes
HOT	High Occupancy Toll
HVA	Highly Vulnerable Aquifers
IEA	Individual Environmental Assessment
IO	Infrastructure Ontario
ITS	Intelligent Transport Systems
LPD	Litres Per Day

MAG	Municipal Advisory Group
MBR	Migratory Bird Regulations
MBCA	Migratory Birds Convention Act
MMD	Major Mackenzie Drive
MNRF	Ministry of Natural Resources and Forestry
MOECC	Ministry of Environment and Climate Change
MTO	Ministry of Transportation
NOX	Oxides of Nitrogen
OEAA	Ontario Environmental Assessment Act
OPSS	Ontario Provincial Standard Specification
OSHA	Occupational Health and Safety Act
PIC	Public Information Centre
PSW	Provincially Significant Wetlands
PTTW	Permit to Take Water
PVMS	Portable Variable Message Signs
RCD	Reference Concept Design
ROW	Right-Of-Way
SAR	Species at Risk
SCS	Site Condition Standard
TESR	Transportation Environmental Study Report
TRCA	Toronto and Region Conservation Authority
TSP	Total Suspended Particulates
TMP	Traffic Management Plan
TSS	Total Suspended Solids
WCMP	Waste and Contamination Management Plan

Executive Summary

The Ministry of Transportation (MTO) and Infrastructure Ontario (IO) has selected LINK427 to undertake the design, build, finance and maintenance of the Highway 427 Expansion project in the City of Vaughan and the City of Toronto. The scope of work includes the design and construction of the following:

- A new 6.6 km extension of Highway 427 from Highway 7 to Major Mackenzie Drive, including:
  - eight lanes from Highway 7 to Rutherford Road;
  - six lanes from Rutherford Road to Major Mackenzie Drive;
  - three new interchanges (Langstaff Road, Rutherford Road and Major Mackenzie Drive); and
  - new median managed lanes.
- The widening of the existing Highway 427 corridor from Finch Avenue to Highway 7 for a total length of 4.0 km, including:
  - from six to eight lanes between Finch Avenue to south of Steeles Avenue;
  - from four to eight lanes, from south of Steeles Avenue to Highway 7; and
  - new median managed lanes.

This project is being carried out in accordance with the approved environmental planning process for Group 'A' projects under the Ministry of Transportation (MTO) *Class Environmental Assessment for Provincial Transportation Facilities* (2000) (MTO Class EA) and builds upon the approved Environmental Assessment Report (EA) (January 2010) for the Highway 427 Extension. A separate TESR was completed in 2013 for the widening of existing Highway 427 between Albion Road to Highway 7. Subsequently a Transportation Environmental Study Report (TESR) was completed in 2016 to add additional lanes to the proposed Highway 427 extension.

This Design and Construction Report (referred to as DCR #2, because it is the second in a series of DCRs to this assignment) includes an overview of public consultation, an assessment of the potential effects of the proposed project and identification of measures required to mitigate any anticipated adverse effects. Consultation has been undertaken with Government Agencies, pertinent municipalities and the Toronto and Region Conservation Authority (TRCA), which is documented in this DCR. This DCR has been posted for a 30-day review period from **April 10, 2018** to **May 11, 2018**. A notice has been issued to advise the public, project stakeholders and agencies of the start of the review period and locations where the DCR will be available for review. Subsequent DCRs for this project will be made available for public review for a period of 30 days when published.

This DCR #2 documents the design and associated works of the widening of Highway 427 between Finch Avenue and Highway 7, as well as the extension of the existing Highway 427 from Highway 7 to Major Mackenzie Drive. The construction activities in the widening will involve lane diversions to allow for the highway and structures to be widened from Finch Avenue to Highway 7 including erosion and sediment controls, stormwater ponds, grubbing, grading, granulars, hotmix asphalt, culverts, storm sewers, high mast lighting, temporary traffic signals at Finch Avenue, Vaughan Valley Boulevard and Highway 7, electrical, Intelligent Transport Systems, Advanced Traffic Management Systems, guiderails/barrier walls, granular sealing, and retaining walls. Short term diversions and off-peak hour lane closures will be implemented along both the highway and the crossing roads/highways such as Finch Avenue, Albion Road, Steeles Avenue, Highway 407ETR, Highway 7, and Vaughan Valley Boulevard. The construction of the Extension from Highway 7 to Major Mackenzie Drive will be completed in the existing green spaces between the existing sideroads, Highway 7 to Zenway Boulevard, Zenway Boulevard to Langstaff Road, Langstaff Road to Rutherford Road, Rutherford Road to Major Mackenzie, and North of Major Mackenzie Drive. A basic list of the works to be constructed include components of three new Highway interchanges and cross roads (in the open spaces along the Langstaff Road, Rutherford Road, and Major Mackenzie Drive), erosion and sediment controls, grubbing, grading, granulars, hotmix asphalt, retaining walls, construction drainage, stormwater sewers, culverts, three structural culverts, active transportation facilities, and a watermain along the north side of Langstaff Road . Short term off-peak hour lane closures will be implemented along the crossing roads such as Zenway Boulevard, Langstaff Road, Rutherford Road, Major Mackenzie Drive, Barons Street,

Huntington Road, New Enterprise Way, and McGillivray Road. In addition, temporary detours will be constructed south of Zenway Boulevard to allow for construction of the new Zenway Boulevard including the installation of a new watermain, sanitary sewer, street lighting, storm sewers, active transportation facilities and a new underpass structure. Utility relocations, including but not limited to Rogers, Bell, Enbridge, Alectra, Hydro One, Toronto Hydro, and others will be undertaken throughout the limits of the Project including the crossing roads. This DCR #2 also includes for the environmentally conscious reuse of materials as the concrete debris from this and many other projects will be recycled by first constructing a stockpile on the south side of Langstaff Road and secondly by processing, using a crushing plant, this concrete into granulars to be reused on the Project. This concrete will be free of contaminants, it will be contained by jersey barriers and reinforced silt fence on three sides, and it will be processed only between the hours of 7:00am and 7:00pm with care and control given to noise and dust pollution.

Public and stakeholder consultation has been carried out in accordance with the approved environmental planning process for Group 'A' projects under the MTO Class EA. This involved issuing a Notice of Commencement for detail design and construction, which included newspaper notifications, a project website and letters to project contacts/stakeholders carried forward from the preliminary design phase of the project. Consultation was also carried out with Indigenous Communities, the Ministry of Natural Resources and Forestry, the Ministry of Environment and Climate Change, Toronto and Region Conservation Authority, municipalities, utility companies and property owners within a 2.0 km radius of the project. A Public Information Centre (PIC) was also held to provide the public and stakeholders an opportunity to review and comment on the proposed works, including mitigation measures.

The Project Lands are composed largely of agricultural, residential, industrial, commercial and recreational land uses. There are no Provincially Significant Wetlands (PSWs), provincially or regionally Significant Areas of Natural or Scientific Interest (ANSIs) or Environmentally Significant Areas (ESAs) within the Lands. Rainbow Creek and West Robinson Creek are the two main vegetated valley crossings.

Appropriate mitigation measures will be implemented to minimize potential impacts to wildlife and wildlife habitat. The contractor will avoid works within the migratory bird nesting period and will follow best management practices related to encounters with wildlife during construction. Within the Lands, studies identified the presence of species protected under the Provincial Endangered Species Act, 2007 (ESA), as well as the presence of Species at Risk (SAR) habitat on the Lands adjacent to the Rainbow Creek valley. Mitigation measures have been incorporated into this DCR to minimize potential impacts to SAR bats, in accordance with the ESA 2007, and the forthcoming Overall Benefit Permit for SAR bats from the Ministry of Natural Resources and Forestry. Components of the project specifically related to SAR mitigation include: timing window restrictions for structural removal and tree clearing to avoid sensitive periods, habitat compensation, revegetation and planting plans to mitigate impacts to habitat.

Rainbow Creek and West Robinson Creek and their associated valley systems are main tributaries of the Humber River. Only grubbing activities are proposed in these areas as part of DCR #2. Structural work in these valleys will be subject to future DCRs. Mitigation measures will be implemented to minimize impacts to these watercourses during construction which include sediment and erosion control measures to prevent sediment laden runoff from entering the watercourses.

Potential adverse impacts to groundwater due to the construction is not anticipated.

There are no impacts to the existing or future land uses within the Lands as a result of the proposed Highway 427 Expansion as these works are contained with the existing MTO ROW outlined in the previous EAs. No additional property is required for the construction works proposed in DCR #2.

A Noise By-law exemption will be sought from City of Toronto and City of Vaughan for the construction activities associated with DCR #2. Some night work construction is anticipated in the City of Vaughan and the City of Toronto as the project construction schedule dictates. All works within the City of Vaughan and City of Toronto that are included in this DCR will be completed adhering to the applicable Noise Control By-laws.

The construction activities for DCR #2 will not involve the production of any excess soils that require offsite management. However, should there be any excess soils, they will be managed in accordance with the projects Waste and

Contamination Management Plan, the projects Earth Management Plan and with OPSS 180 (Management of Excess Materials).

A Traffic Control Plan will be prepared and implemented for the proposed works along Finch Avenue, Albion Road, Steeles Avenue, 407ETR, Highway 7, Zenway Boulevard, Langstaff Road, Rutherford Road, Major Mackenzie Drive, Vaughan Valley Boulevard, New Enterprise Way, Huntington Road, McGillivray Road, and Barons Street.

Mitigation measures to minimize impacts to air quality are focused on managing equipment and vehicles. Standard dust suppression methods will be applied during construction of the highway and the concrete processing.

The results of previous archaeological assessments in the Lands indicated that the Lands are clear of archaeological potential and no further archaeological assessments are required. The construction activities covered in DCR #2 do not impact any built or cultural heritage landscapes within the Lands.

1. Project Overview

1.1 Project Team and Background

The Ministry of Transportation (MTO) and Infrastructure Ontario (IO) has selected LINK427 to undertake the design, build, finance and maintenance of the Highway 427 Expansion project in the City of Vaughan and the City of Toronto.

The project has been procured as an Alternative Financing & Procurement (AFP) project, which is an innovative way of financing and procuring large, complex infrastructure projects. Under AFP, provincial ministries and/or project owners establish the scope and purpose of a project while design and construction work is financed and carried out by the private sector. In the case of the Highway 427 Expansion, LINK427 will be responsible for the maintenance, construction, lifecycle repair and renewal of the highway for the next 30 years.

The organizational structure of LINK427 is shown in **Figure 1** and is composed of the following private sector companies:

- Developer: ACS Infrastructure Canada Inc. and Brennan Infrastructures Inc. (a member of the Miller Group of Companies)
- Construction: Dragados Canada Inc., Brennan Infrastructures Inc. and BOT Infrastructure Ltd.
- Design: WSP Canada Group Ltd. and Thurber Engineering Ltd.
- Maintenance: ACS Infrastructure Canada Inc. and Brennan Infrastructures Inc.

Figure 1: Organization Structure

1.2 Previous Studies - Preliminary Design

1.2.1 Highway 427 Extension Transportation Corridor Environmental Assessment Report

In July 2006, the Province of Ontario released the *Growth Plan for the Greater Golden Horseshoe* which outlines objectives and policies for the management of growth and development and planning decisions within the Greater Golden Horseshoe over the next 30 years.

The *Growth Plan* supports improving access to inter-modal facilities to enhance the movement of people and goods and to provide access to major employment areas. As per this direction, the MTO initiated an Individual Environmental Assessment (EA) under the Ontario *Environmental Assessment Act* (OEAA) in 2010 for the extension of Highway 427 to address transportation problems at the existing Highway 427 terminus. The Individual EA was conducted in accordance with the planning process documented in the *Highway 427 Transportation Corridor Environmental Assessment Terms of Reference* that was approved by the Minister of the Environment and Climate Change in November 2005.

The purpose of Individual EA was to develop the Recommended Plan for the extension of Highway 427 to meet the following objectives:

- Addressing the existing and short-term transportation problems related to the current Highway 427 terminus, truck traffic accessibility to and from the Canadian Pacific (CP) Vaughan Intermodal Facility, and the impact on inter-regional traffic in the Peel-York boundary area;
- Identifying and protecting required property for any proposed transportation corridor and allowing planned development to occur outside of the transportation corridor;
- Ensuring that the alternatives / preferred solution would not preclude or predetermine planning for the other future transportation corridors or a future extension of the transportation corridor northerly, if ever required.

In November 2010, the Ontario Minister of Environment and Climate Change (MOECC) with the approval of Cabinet made a decision to allow the Highway 427 Extension Transportation Corridor Environmental Assessment Report (EA) (January 2010) to proceed, subject to conditions. The approved Recommended Plan was for a 6.6km transportation corridor from Highway 7 to Major Mackenzie Drive, including a highway, dedicated transitway, located in the City of Vaughan, York Region.

The key elements of the Recommended Plan included the construction of 6 lanes traffic lanes from Highway 7 to Rutherford Road, 4 lanes of traffic lanes from Rutherford Road to Major Mackenzie Drive, a 60m wide transitway right-of-way (ROW) from Highway 7 to north of Major Mackenzie Drive in each direction, and commuter parking lot facilities. The highway expansion also included construction of new interchanges at Langstaff Road, Rutherford Road, and Major Mackenzie Drive.

1.2.2 Highway 427 from Albion Road to Highway 7, Preliminary Design and Class EA Study, Transportation Environmental Study Report

In 2013, the MTO undertook a Class EA to develop a long-term strategy to address needs along the existing Highway 427 transportation corridor between Albion Road and Highway 7. The study followed the approved environmental planning process for Group 'B' undertakings under the MTO *Class Environmental Assessment for Provincial Transportation Facilities* (2000) and was documented in a Transportation Environmental Study Report (TESR, 2013).

The purpose of the Class EA was to develop the Recommended Plan for the existing Highway 427 between Albion Road and Highway 7, to meet the following objectives:

- Identifying interim and ultimate transportation needs of Highway 427 between Albion Road and Highway 7;
- Completing a preliminary design of the technically preferred plan; and
- Completing a Feasibility Study for the widening of the four Highway 427 Overpasses at Highway 407 and the 427N-407E ramp, and identifying ultimate bridge cross section requirements to allow for the ultimate widening of Highway 427 through the 407 Interchange.

The key elements of the Recommended Plan included widening the existing Highway 427 from 4 to 8 lanes from 1.5 km south of Albion Road to Highway 7 for a total length of 4 km. The Recommended Plan also included median managed lanes; widening and rehabilitation of existing bridges where required to accommodate the widening of Highway 427; modifications to the Highway 407 / Highway 427 interchange; and drainage and illumination improvements.

1.2.3 Highway 427 Extension Widening from Highway 7 to Major Mackenzie Drive

Subsequent to the completion of the 2010 Individual EA for the Highway 427 extension and in response to future projected traffic demands, MTO reviewed the original approved EA and determined a potential need for one additional lane in each direction. For that reason, MTO undertook a Class EA in 2016 to amend the Recommended Plan for the proposed Highway 427 extension to allow for an additional lane in each direction. The study followed the approved environmental planning process for Group 'B' undertakings under the MTO *Class Environmental Assessment for Provincial Transportation Facilities* (2000) and was documented in a Transportation Environmental Study Report (TESR, 2016).

The purpose of the Class EA was to develop the Recommended Plan for the widening of the Highway 427 Extension within the median (one northbound lane and one southbound lane).

The key elements of the Recommended Plan include the widening Highway 427 Extension by one additional lane in each direction (to a total of 8 lanes from Highway 7 to Rutherford Road, and 6 lanes from Rutherford Road to Major Mackenzie Drive), median managed lanes, and drainage and illumination improvements.

1.3 Detail Design Project Description

The purpose of the current detail design study is to advance the Recommended Preliminary Design Plan for the Highway 427 Expansion that was approved Individual EA (January 2010) and subsequent TESRs (2013 & 2016). As the project

is being undertaken using an AFP approach, it is LINK427's responsibility to carry forward the preliminary design commitments and incorporate them into the detail design so that they can be implemented during construction.

The overall detail design scope of work includes the design and construction of the following:

- The widening of the existing Highway 427 corridor from Finch Avenue to Highway 7 for a total length of 4.0 km, including:
  - from six to eight lanes between Finch Avenue to south of Steeles Avenue;
  - from four to eight lanes, from south of Steeles Avenue to Highway 7; and
  - new median managed lanes.
- A new 6.6 km extension of Highway 427 from Highway 7 to Major Mackenzie Drive, including:
  - eight lanes from Highway 7 to Rutherford Road;
  - six lanes from Rutherford Road to Major Mackenzie Drive;
  - three new interchanges (Langstaff Road, Rutherford Road and Major Mackenzie Drive); and
  - new median managed lanes.

The location of the proposed works are shown in **Figure 2**.

This project is being carried out in accordance with the approved environmental planning process for Group 'A' projects under the MTO *Class Environmental Assessment for Provincial Transportation Facilities* (2000).

A total of six Design and Construction Reports (DCRs) will be prepared to document the various components of the detail design for the Highway 427 Extension Project. The public consultation which commenced with DCR #1 will continue throughout the project and will be documented as appropriate in each subsequent DCR. DCR #1 was completed and made available for a 30 day public review period from **December 5, 2017** to **January 8, 2018**.

Table 1 provides a summary of how the project components (construction works) have been divided amongst the DCRs. This second DCR documents the construction works in stage 2 of the project component, and will be referred to as DCR #2 in this report.

Table 1: DCR Phasing

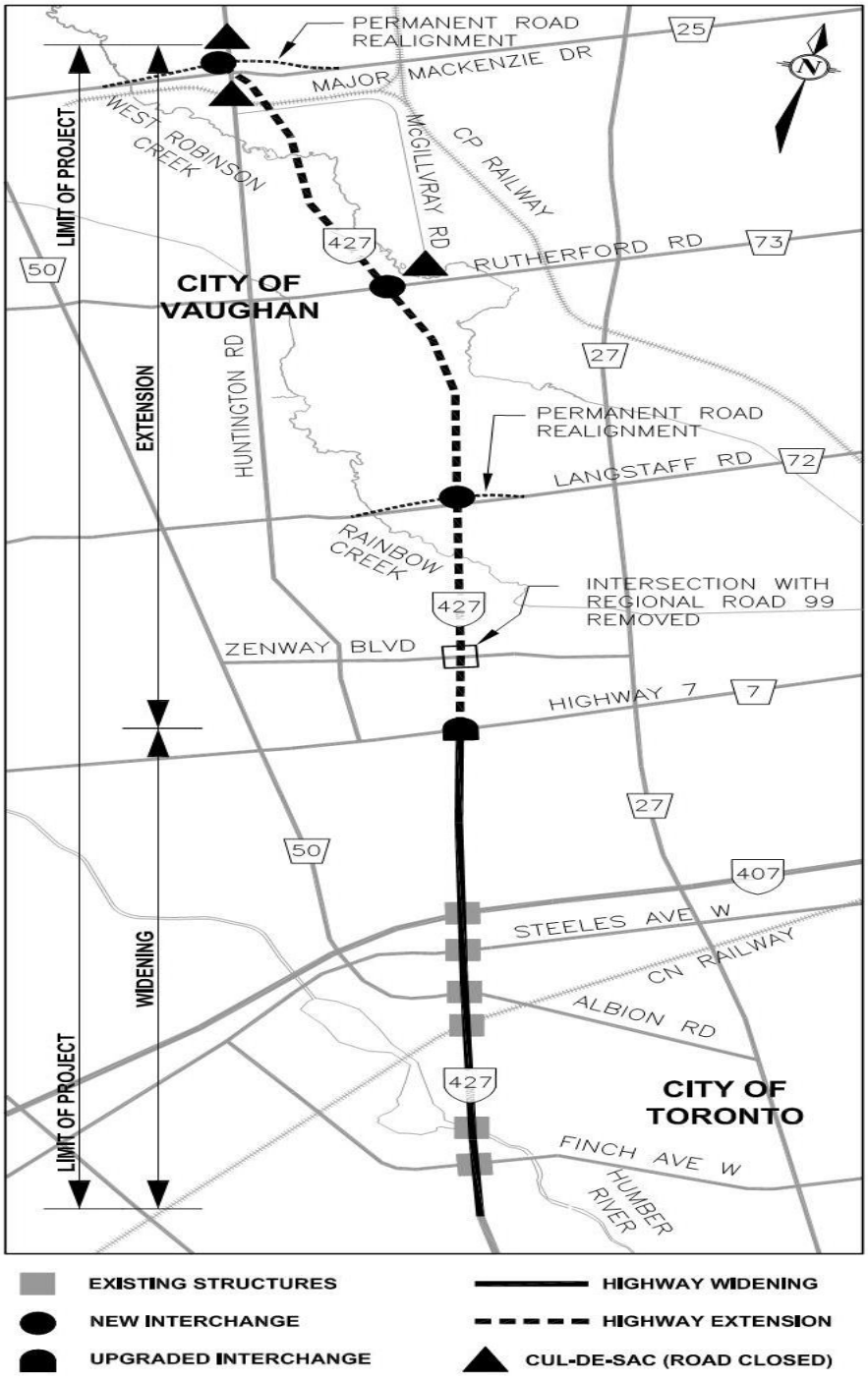
DCR #	Project Area	Construction Work to be Addressed
1	• Finch Avenue to Major Mackenzie Dr.	■ Vegetation / brush clearing ■ Preloads (including grubbing) at the Major Mackenzie Drive and Rutherford Road Interchanges and CP Rail / McGillivray Road overpass. ■ Concrete stockpiling south of Langstaff Road within the lands ■ Advanced utility works
2	• South of Finch Avenue to Major Mackenzie Drive	■ Construction Staging including detours on Highway 427, Finch Avenue, Albion Road, Steeles Avenue, Highway 7, Zenway Boulevard, Huntington Road, and McGillivray Road. ■ Rehabilitation and/or Widening of Highway 427 from South of Finch Avenue to Highway 7, including works on Finch Avenue, the Finch Avenue Interchange, Albion Road, Steeles Avenue, the Highway 7 Interchange and Highway 7. ■ Electrical works along Highway 427 from South of Finch Avenue to Highway 7 including works on Finch Avenue, the Finch Avenue Interchange, Albion Road, Steeles Avenue, Highway 7, the Highway 7 Interchange, and Zenway Boulevard [temporary and permanent street lighting, highmast lighting (along the highway and at the Finch Avenue and Highway 7 Interchanges only), traffic lights (temporary and permanent at the Finch Avenue Interchange, the Highway 7 Interchange, and Vaughan Valley Boulevard only), Intelligent Traffic Systems from Highway 427 from South of Finch Avenue to Highway 7 (along the highway and at the Finch Avenue and Highway 7 Interchanges only) including but not limited to counting stations, cameras, traffic monitoring and advanced works for the future Managed Lanes system. ■ Fencing (security fencing throughout the limits) ■ Foundations – bridge/retaining wall footings and / or deep foundations (piles/caissons) at the CNR Overpass, Albion Road Overpass, 407ETR off-ramp over Albion Road, Steeles Avenue Overpass, Highway 7 retaining walls, and Zenway Boulevard Underpass. Caissons will be installed for the highmast lighting from Finch Avenue to Highway 7, including the areas around Finch Ave, 407ETR, and Hwy 7. Various footings for small signs, breakaway signs, light poles, and traffic poles will be installed along Finch Avenue, throughout the Finch Avenue Interchange, Highway 427 from Finch Avenue to Highway 7, along Highway 7, throughout the Highway 7 Interchange, along Albion Road, and along Steeles Avenue. ■ Grubbing, stripping of top soil, ditching, highway construction and final grading from south of the Finch Avenue to Highway 7 inclusive of the Finch Avenue Interchange, Albion Road, Steeles Avenue, the 407ETR Interchange, Highway 7, and the Highway 7 Interchange. North of Highway 7 the grubbing, stripping of top soil, ditching, highway construction and final grading will be restricted to the open spaces between and adjacent to the crossing roads (up to and including the curb-lines of each road), throughout the existing Highway 7 Interchange, Highway 7 to Zenway Boulevard, Zenway Boulevard to Langstaff Road,

DCR #	Project Area	Construction Work to be Addressed
		along Langstaff Road, Langstaff Road to Rutherford Road, along Rutherford Road, Rutherford Road to Major Mackenzie Drive, and along Major Mackenzie Drive from just east of Highway 50 to just east of Barons Street, and North of Major Mackenzie Drive. Components of the new interchanges at Langstaff Road, Rutherford Road, and Major Mackenzie Drive will be constructed as well. New ramps will be constructed at Highway 7 in addition to the rehabilitation and reconstruction of the existing ramps. Zenway Boulevard will be detoured to the south to allow for the reconstruction of Zenway Boulevard over the proposed 427. ■ Highway Drainage and Water Resources (ditching, subdrains, sewers and culverts) throughout the Highway 427 corridor from south of Finch Avenue to north of Major Mackenzie Drive, the existing interchanges at Finch Avenue, 407ETR, and Hwy 407 in addition to the new interchanges at Langstaff Road, Rutherford Road, and Major Mackenzie Drive, and along the crossing roads: Finch Avenue, Albion Road, Steeles Avenue, 407ETR, Highway 7, Zenway Boulevard, Zenway Detours, Langstaff Road, Rutherford Road, Major Mackenzie Drive, Barons Street, Huntington Road, McGillivray Road, and both CNR/CPR crossings. ■ Removals of select portions of existing roads, existing drainage structures etc. along the existing Highway 427 from south of Finch Avenue to north of Major Mackenzie Drive, including the existing interchanges at Finch Avenue, 407ETR, and Highway 7, Albion Road, Steeles Avenue, Vaughan Valley Boulevard, Zenway Boulevard, Zenway Detours, Langstaff Road, Rutherford Road, Major Mackenzie Drive, Barons Street, Huntington Road, and McGillivray Road. ■ Pavement (granulars, concrete paving, and asphalt) throughout the Highway 427 corridor from south of Finch Avenue to north of Major Mackenzie Drive, the existing interchanges at Finch Avenue, 407ETR, and Highway 7, and along the crossing roads: Finch Avenue, Albion Road, Steeles Avenue, 407ETR, Highway 7, Zenway Boulevard, Zenway Detours, components of the new Langstaff Road ramps and alignment, components of the new Rutherford Road ramps and alignment, components of the new Major Mackenzie Drive ramps and alignment, Barons Street, Huntington Road, McGillivray Road. ■ Structures (overpass and underpass) including the widening/rehabilitations on the Finch Avenue Underpass, three Humber River water crossings, CNR Overpass, Albion Road Overpass, 407ETR off-ramp over Albion Road Overpass, Steeles Avenue Overpass, 407ETR Overpass, Highway 7 Underpass, and construction of the new Zenway Boulevard Underpass. ■ Traffic (lane closures) consisting of short term off-peak hours traffic management on Highway 427 from south of Finch Avenue to Zenway Boulevard (including ramps at Finch Avenue, 407ETR, and Highway 7), Finch Avenue, Albion Road, Steeles Avenue, 407ETR, Highway 7, Zenway Boulevard, Rainbow Valley Boulevard, Vaughan Valley Boulevard, New Enterprise Way, Langstaff Road, Rutherford Road,

DCR #	Project Area	Construction Work to be Addressed
		McGillivray Road, Major Mackenzie Drive, Huntington Road, and Barons Street. ■ Utility relocation, including but not limited to Rogers, Bell, Enbridge, Alectra, Hydro One, Toronto Hydro and others throughout the limits of the Project. ■ Seeding and sodding throughout the limits of the Project. ■ Demolition of Farm Structures (once ESA permits for SAR Bat and Barn Swallow is received) ■ Closure of Huntington Road north of Major Mackenzie Drive and south of CP Rail line ■ Closure of Huntington Road north of Major Mackenzie Drive and south of the CP Rail line. ■ Closure of McGillivray Road at Rutherford Road. ■ Lane detours, diversions and traffic Management for Highway 427 (from south of Finch Avenue to Zenway Boulevard, ramps included), Finch Avenue, Albion Road, Steeles Avenue, Highway 7, and Zenway Boulevard. Including both temporary and permanent modifications to the signalized intersections at both the Finch Avenue and Highway 7 Interchanges, as well as at the Highway 7/Vaughan Valley Intersection. Modifications to unsignalized intersections throughout.
3	• Highway 7 to Major Mackenzie Drive	■ The works necessary to undertake the following: ■ Construction of new Highway 427 overpasses (one for eastbound lanes and one for westbound lanes) at West Robinson Creek. ■ Replacement of the existing Major Mackenzie Drive culvert with an Overpass at West Robinson Creek. ■ Construction of the new Underpass at Langstaff Road and the new Overpass at Major Mackenzie Drive. ■ Finish grading and construction of the New Ramp from the northbound 427 to the westbound Major Mackenzie Drive, using the already built components in DCR #2. ■ Detours and Staging at Langstaff Road and Major Mackenzie Drive utilizing the previously constructed components built in DCR #2, including the new alignments.
4	• Highway 7 to Major Mackenzie Drive	■ The works necessary to undertake the following: ■ Construction of new Highway 427 overpasses (one for eastbound lanes and one for westbound lanes) at Rainbow Creek ■ Replacement of the existing Langstaff Road culvert with an Overpass at Rainbow Creek
5	• Highway 7 to Major Mackenzie Drive	■ The works necessary to undertake the following: ■ Construction of new Overpasses at Rutherford Road, and Street A (Future John Lawrie Street) ■ Electrical (street lighting, traffic lights etc.) for the remainder of the Project ■ Guiderail and barriers for the remainder of the Project

DCR #	Project Area	Construction Work to be Addressed
		■ Intelligent Transport Systems (ITS) for the remainder of the Project ■ Pavement Markings for the remainder of the Project ■ Traffic Signage for the remainder of the Project ■ Water Resources / Stormwater Ponds for the remainder of the Project
6	• South of Finch Avenue to Major Mackenzie Drive	■ The works necessary to undertake the following: ■ Landscaping (planting of trees and shrubs) from south of Finch Avenue to north of Major Mackenzie Drive, including the existing and new interchanges at Finch Avenue, Highway 407, Highway 7, Langstaff Road, Rutherford Road, and Major Mackenzie Drive, and all crossing roads. ■ Vegetation Restoration from south of Finch Avenue to north of Major Mackenzie Drive, including the existing and new interchanges at Finch Avenue, Highway 407, Highway 7, Langstaff Road, Rutherford Road, and Major Mackenzie Drive, and all crossing roads. ■ Fisheries and ESA mitigation

Figure 2: Project Limits Key Map



1.4 Purpose of the Design and Construction Report

This DCR #2 presents the detail design for the following works, and has been prepared in accordance with the requirements of the MTO Class EA process for Group 'A' projects. The purpose of DCR #2 is to document the Class EA process; provide a summary of consultation activities; describe the existing conditions of Lands; present the detail design (Recommended Plan) for the highway; describe the rationale for any changes to the design as approved in preliminary design; explain how commitments during preliminary design have been incorporated into the detail design; and document the potential environmental impacts, proposed mitigation measures and commitments to future work.

As required under the Class EA, this DCR is being made available to the public, stakeholders, agencies and Indigenous Communities for a 30-day review period between **April 10, 2018** to **May 11, 2018** online at www.427expansion.ca, as well as the following review locations:

- Ministry of Environment and Climate Change, Environmental Assessment and Permission Branch
- Ministry of Transportation, Major Projects Office, Central Region
- City of Vaughan (Clerk's Office)
- Regional Municipality of York (Clerk's Office)
- Kleinberg Library, Vaughan
- Toronto Public Library – Humberwood Library
- Regional Municipality of Peel (Clerk's Office)
- Etobicoke Civic Centre
- LINK427 Project Office

Any concerns during this review period should be discussed with LINK427 and all comments will be considered by LINK427. Significant concerns will be resolved through ongoing consultation with concerned/ affected stakeholder and additional studies will be undertaken to address concerns if required. If significant concerns are not identified during the review period, further documentation will not be prepared and LINK427 may commence construction of the elements as described in DCR #2 without further notice, subject to receiving required permits and approvals and the commitments in this DCR.

2. Environmental Assessment Process

2.1 Ontario Environmental Assessment Act

The Ministry of Transportation's *Class Environmental Assessment for Provincial Transportation Facilities* was approved under the *Ontario Environmental Assessment Act (OEAA)* in fall 1999, and was amended in 2000. This planning document defines groups of projects and activities and the environmental assessment process that MTO has committed to follow for these undertakings. Provided that this process is followed, projects and activities included under the MTO Class EA do not require formal review or approval under the OEAA. There is an opportunity at any time during the MTO Class EA process for interested persons to provide comments and review outstanding issues.

The MTO Class EA process is principle-based. Where appropriate, this DCR references the principles applied and how they were achieved during the environmental assessment process.

The following principles underlie the MTO Class EA process:

Transportation engineering principles

- The transportation engineering principles ensure that the project provides an effective and safe transportation system.

Environmental protection principles

- The environmental protection principles ensure that the project provides effective environmental protection. Existing environmental conditions, sensitivities and environmental protection requirements were assessed and are documented in this DCR. Mitigation measures have been developed to avoid, prevent, and/or reduce any residual adverse effects.

External consultation principles

- The consultation principles ensure that there is effective consultation with stakeholders early and throughout the study process. Throughout this study, local elected representatives, Indigenous communities, provincial and federal agencies, local municipalities, interest groups, and members of the general public were encouraged to participate through a proactive consultation plan that included letters, newspaper notices, brochures and a Public Information Centre.

Evaluation principles

- The evaluation principles ensure that an effective evaluation process is in place to provide a balance between transportation engineering and environmental protection principles and to fulfill the project goals. The evaluation process used to assess planning and design alternatives was traceable, replicable and understandable by those who may be affected by the decisions.

Documentation principles

- The documentation principles ensure that there is effective environmental documentation and that the opportunity to challenge the project is provided. The environmental documentation required for this project is this Design and Construction Report (DCR), which will be filed for a 30-day public review period.

Environmental clearance principles to proceed

- As part of the preliminary design, an Individual EA for the Highway 427 Extension was approved, with conditions, by the Ministry of Environment and Climate Change (MOECC) in November 2010, as described in **Section 1.1.1**. Subsequently Transportation Environmental Study Reports (TESRs) were completed in 2013 for the widening of existing Highway 427 between Albion Road to Highway 7 and again in 2016 to add additional lanes to the proposed Highway 427 extension.

Following the 30-day public review of this DCR, the project will have met the requirements of the MTO Class EA. Any comments and concerns received through the 30-day public and agency review process, will be incorporated into the final design. LINK427 will obtain permits and approvals to implement the works in accordance with the EA.

2.2 Canadian Environmental Assessment Act

On July 6, 2012 *Canadian Environmental Assessment Act* (CEAA) (2012) came into effect which focuses on assessment of "designated projects". Projects can be designated projects under CEAA (2012) if they meet the criteria for physical activities under the schedule, **Sections 2** to **4**.

The expansion of Highway 427 is not considered a "designated project". Therefore, an assessment under CEAA is not required.

3. Consultation Process

3.1 Previous Consultation Undertaken during Preliminary Design

Consultation during preliminary design was consistent with the requirements for the Individual EA under the OEAA, and Group "A" projects under the MTO Class EA. Consultation activities included on-going consultation with federal, provincial, and municipal agencies, Indigenous Communities, local elected representatives, interest groups and members of the public.

The following is a summary of preliminary design consultation activities:

External Agency Consultation

The Project Team consulted and held meetings with federal and provincial agencies, local elected officials, municipalities, utilities, interest groups and Municipal Advisory Groups (MAG). The MAG included the Region of Peel, City of Brampton, Town of Caledon, York Region and City of Vaughan.

Meetings with GO Transit / Metrolinx, the Toronto Transit Commission (TTC), and the 407 ETR were held as part of the 2013 EA study.

Meetings were held with the Ministry of Environment and Climate Change (MOECC), the Ministry of Natural Resources and Forestry (MNRF). as well as the Toronto and Region Conservation Authority (TRCA), regarding various elements of the Highway 427 Extension and proposed widening as outlined in the TESR (January 2016).

Public Information Centre

Three rounds of Public Information Centres (PIC) were held during the Individual EA and one PIC was held for each of the subsequent EAs (2013 and 2016). The PICs were organized as "drop-in" style sessions with representatives from MTO and the Project Team available to answer questions and discuss the project. An advanced session was offered for any interested local elected representatives, Indigenous Community representatives and external agency representatives.

3.2 Consultation during Detail Design

Consistent with the requirements for Group "A" projects under the MTO Class EA, consultation with federal, provincial, and municipal agencies, Indigenous Communities, local elected representatives, interest groups and members of the public was on-going over the course of the Detail Design study.

The consultation program was carried out based on the following principles:

- All reasonable efforts are made to ensure that potentially affected or interested parties are given the opportunity to participate in the consultation process;
- Stakeholders may provide input at any time during the study; however, structured opportunities for input occur at key study stages;
- LINK427 shall constructively address input received during the consultation process;
- LINK427 shall make reasonable efforts to resolve concerns; and
- Consultation plans and processes are sufficiently flexible to permit responses to new issues that arise as the study proceeds.

Stakeholders and the public were kept informed of the study and were asked for input through the use of conventional, effective consultation methods including:

- Notices published in local newspapers;
- Direct letter mailings to external agencies, local elected officials, and Indigenous communities;
- A PIC to provide stakeholders with an opportunity to review and comment on the overall study process, the Class EA process, the proposed design, and the proposed mitigation measures; and
- Notice announcing submission of the DCR for public review and comment.

3.2.1 Project Website

A project website (www.427expansion.ca) was created and provides project information, updates, and documents to interested stakeholders. The website includes information on the project background, LINK427, frequently asked questions, public involvement, and provides a comment submission tool.

3.2.2 Study Contact List

A contact list of local elected officials, Indigenous communities, local, provincial and federal agencies, local municipal government, utilities, school boards and interest groups was developed, building on contact lists developed during preliminary design. Over the course of the study, any individuals or organizations expressing interest in the project were added to the contact list.

The contact list includes the following individuals and organizations:

Local Elected Officials	■ MPP – Dufferin-Caledon ■ MPP – Etobicoke North ■ MPP – Vaughan ■ MPP – Bramalea-Gore-Malton ■ MPP – Brampton West ■ MPP – Brampton-Springdale ■ MPP – Mississauga-Brampton South ■ MPP – York West ■ MPP – Mississauga-Erindale	■ MPP – York-Simcoe ■ MPP – Etobicoke Centre ■ MP – Dufferin-Caledon ■ MP – Etobicoke North ■ MP – Vaughan-King ■ MP – Mississauga-Malton ■ MP – Brampton South ■ MP – Brampton East ■ MP – Etobicoke Centre
Provincial and Federal Government Agencies	■ Environment Canada ■ Transport Canada ■ Fisheries and Oceans Canada ■ Ministry of Natural Resources and Forestry ■ Ministry of Health & Long-Term Care ■ Ministry of Tourism, Culture and Sport ■ Ministry of Agriculture, Food & Rural Affairs ■ Ministry of the Environment and Climate Change	■ Ministry of Indigenous Relations and Reconciliation ■ Ministries of Citizenship, Immigration& International Trade ■ Ministry of Community Safety and Correctional Services ■ Ministry of Municipal Affairs and Housing ■ Ministry of Energy ■ Metrolinx ■ Infrastructure Ontario ■ Toronto and Region Conservation Authority (TRCA)
Municipalities	■ City of Brampton ■ City of Vaughan ■ Regional Municipality of Peel ■ Town of Caledon ■ City of Toronto ■ Regional Municipality of York ■ Township of King	
Indigenous Communities	■ Mississaugas of Scugog Island ■ Chippewas of Rama First Nation ■ Hiawatha First Nation	■ Chippewas of Georgina Island First Nation ■ Beausoleil First Nation

	■ Alderville First Nation ■ Huron-Wendat Nation ■ Six Nations of the Grand River Territory ■ Wahta Mohawks First Nation ■ Oneida Nation of the Thames ■ Association of Iroquois and Allied Indians	■ Curve Lake First Nation ■ Mississaugas of the New Credit First Nation ■ Huron-Wendat Nation ■ Kawartha Nishnawbe First Nation ■ Mohawks of the Bay of Quinte ■ Union of Ontario Indians
Utilities	■ TransCanada Pipeline ■ Hydro One Networks ■ CPR ■ CNR ■ Rogers ■ Enbridge ■ Bell ■ Alectra ■ Toronto Hydro	
School Boards	■ York Catholic District School Board ■ Conseil scolaire de district catholique Centre-Sud ■ Credo Christian School ■ Toronto District School Board ■ Conseil scolaire Viamonde	
Emergency Services	■ York Region Emergency Medical Services ■ York Region Paramedic Services ■ York Regional Police ■ Brampton Fire and Emergency Services ■ Peel Ambulance Dispatch ■ City of Toronto EMS ■ City of Toronto Fire Services ■ City of Toronto Fire Services North Command ■ City of Toronto Fire Services West Command	■ Toronto Police Service No. 33 Division ■ Toronto Emergency Medical Services ■ Toronto Paramedic Services ■ Toronto Police Service ■ Ontario Provincial Police ■ Ontario Provincial Police - Highway Safety Division ■ Ontario Provincial Police Facilities Section ■ Vaughan Fire & Rescue Service notification system ■ Vaughan Fire Chief and Deputy Fire Chief
Interest Groups	■ 407ETR ■ Canadian Pacific Railway ■ CN Rail ■ Toronto Transit Commission (TTC) ■ Greater Toronto Airports Authority	■ York Federation of Agriculture ■ Toronto Environmental Alliance ■ Toronto Coalition for Active Transportation

3.2.3 Notice of Commencement of Detail Design and Construction

3.2.3.1 Public Notification

English and French Notices were published in the following local newspapers and posted on the project website to inform the general public of the detail design study commencement and to solicit questions, concerns, and pertinent information:

- Toronto Star: August 23, 2017
- Etobicoke Guardian: August 23, 2017
- Vaughan Citizen: August 24, 2017
- Brampton Guardian: August 24, 2017
- L' Express: August 29, 2017

The notices were also distributed to the following municipal offices to be displayed on their websites and posted on community bulletin boards:

- Region of York
- City of Vaughan
- Region of Peel
- City of Brampton
- City of Toronto

In conjunction with the publication of the newspaper notice, a brochure was distributed via Canada Post Neighbourhood Mail to all residents and businesses within a 2 km radius of the project. The brochure provided details about the project, as well as provided an opportunity to submit information, comments, or questions. The brochure was distributed on August 23, 2017.

A copy of the newspaper notices and brochure are available in **Appendix A**.

3.2.3.2 Stakeholder Notification

Individuals and organizations on the study contact list were sent a Notice of Commencement of Detail Design letter on August 23, 2017.

The purpose of the letter was to inform stakeholders of the project, as well as provide an opportunity to submit information, comments, or questions.

A copy of the notification letters are available in **Appendix A**.

A summary of comments received and responses are presented in **Table 2** below. All comments requiring a response were responded to within a 48 hour period from a representative of LINK427.

Table 2: Summary of Comments Received and Responses of DCR #1 to date

Comment	Response
Member of the public unhappy that the Notice of Detail Design and Construction was not available in French.	Member of the public was contacted and assured that a French translation of the notice is available on the project website and was published in the weekly French language newspaper, L'Express.
Policy inquiry about how a highway expansion fits within the climate change objectives of reducing emissions by 80-95% by 2050.	There is provision in the existing 427 Corridor and the Expansion of 427 to protect for a transit corridor and commuter parking lots. This transit corridor, when completed, will contribute to the reduction of greenhouse gases.
Member of the public expressed preference for Highway 427 to extend North of Major Mackenzie.	Member of the public was contacted and advised that the EA only received approval for an extension to Major Mackenzie Drive.
Multiple requests to be added to project mailing list for updates on the project.	Requests were added to the project mailing list.
Requested information on construction timeline (i.e. start and finish).	Email response advising of current project status and expectation of preliminary work commencing in winter 2018.

3.2.4 Stakeholder Interaction

Stakeholder interactions outlined in the Study Contact List above have been received and documented. For ease of documentation and review by the reader, these interactions are documented in **Appendix D,** entitled Agency Table.

Correspondence regarding DCR #2 was received from the following:

- Curve Lake First Nations
- Chippewas of Rama First Nation
- Alectra
- Bell
- Cole
- Hydro One
- Rogers
- Transcanada Pipeline
- Regional Municipality of York
- Regional Municipality of Peel
- City of Toronto
- City of Vaughan
- TACC
- Ministry of Natural Resources & Forestry
- Toronto and Region Conservation Authority
- Vaughan Bicycle User Group (BUG)
- York Region Cycling Coalition
- SmartCentres
- Zzen Coroporation
- Canadian National Railway
- Canadian Pacific Railway
- 407ETR

3.2.5 Indigenous Communities Consultation

In response to the Notice of Commencement of Detail Design letter, two comments were received from Huron-Wendat Nation requesting copies of the Archaeological Assessments related to the Highway 427 Expansion. The Archaeological Assessment Reports were provided.

In response to the PIC #1 Notice, a comment was received from the Chippewas of Rama First Nation advising that the letter was reviewed and shared with Council and the information was forwarded to Karry Sandy McKenzie, Williams Treaties First Nation Process Co-ordinator/Negotiator. In addition, a comment was received from Curve Lake First Nation

requesting Environmental and Archaeological assessments, as well as design and construction reports. The reports were provided.

No requests for meetings with Indigenous Communities have been received at this time.

3.2.6 Public Information Centre

A PIC was held for DCR #2 on **January 25, 2018** at the Element Vaughan Hotel in Vaughan, Ontario from 4pm to 8pm. There was a one-hour preview session from 3pm to 4pm for invited stakeholders, including municipal representatives. MPs/MPPs and representatives from Indigenous communities. The PIC was organized as an informal 'drop-in' style session with representatives from LINK427 available to answer questions and discuss the project. Attendees were asked to sign a register and were encouraged to complete a comment sheet.

The purpose of the PIC was to provide an opportunity for stakeholders to review and comment on the overall study process, the Environmental Assessment process, and the proposed detail design.. Display panels included:

- A description of the project;
- An overview of the environmental assessment process;
- A summary of existing environmental conditions;
- A description of the study process;
- A description of the detail design;;
- A summary of anticipated environmental impacts and associated mitigation measures; and
- Next steps.

A copy of the Notice of Public Information Centre as well as general comments received during the PIC are available in **Appendix A**.

Forty-four attendees signed in at the PIC register and eleven comment sheets were submitted at the PIC. Nine comments were received by email or phone call in response to the PIC notification and seven additional comments were submitted by email or phone call following the PIC. Responses were provided to each individual that submitted a comment. Comments and responses to comments received at PIC #1 are summarized in **Table 3.** Responses to comments received at the PIC were drafted and sent to members of the public who provided contact information.

A copy of the PIC display materials are included in **Appendix B**.

Table 3: Summary of Comments Received at the PIC

Highway 427 Expansion Project Comments received from Public Information Centre held January 25, 2018	Highway 427 Expansion Project Responses sent by LINK427 on March 12, 2018
Public Comment Form 1 I am concerned about traffic being forced north on Baron's in order to access Huntington Road. This seems as if it may increase through traffic through a residential area.	**Response** An extensive Traffic Management Plan (TMP) has been developed to consider the local mobility of people, goods, and long-haul transportation that will be affected by the proposed construction works. Appropriate mitigation measures will be put in place to address immediate traffic impacts to the work zones. There will be no impact to traffic on Barons Street.
Public Comment Form 2	**Response**

Highway 427 Expansion Project Comments received from Public Information Centre held January 25, 2018	Highway 427 Expansion Project Responses sent by LINK427 on March 12, 2018
My concerns are with respect to ex. Regional water/wastewater infrastructure within the project limits: ■ Huntington: ex 750 wm and sanitary sewer ■ Rutherford: 1800 York-Peel feeder water main ■ Steeles: twin 900 san. FMS How will they be protected during construction and following construction to ensure asset lifecycle will not be detrimentally impacted?	Regarding water/wastewater infrastructure within the project limits, measures have been put in place to maintain watermain integrity during construction and a protection liner has already been added to the watermain.
Public Comment Form 3 I would like to get an idea of the traffic volumes and noise levels at the Major Mackenzie exit. I would also like to know if the transitway is in the scope of this project.	**Response** An extensive Traffic Management Plan (TMP) has been developed to consider the local mobility of people, goods, and long-haul transportation that will be affected by the proposed construction works. Appropriate mitigation measures will be put in place to address immediate traffic impacts to the work zones. Noise parameters are anticipated to be within standard limits for the Highway 400 series. Construction of the transit-way is part of a future project as it is funded by the Province and the needs for the transit-way are assessed.
Public Comment Form 4 Traffic data/volume for 2021 on Langstaff when 427 is open.	**Response** An extensive Traffic Management Plan (TMP) has been developed to consider the local mobility of people, goods, and long-haul transportation that will be affected by the proposed construction works. Appropriate mitigation measures will be put in place to address immediate traffic impacts to the work zones. We have no traffic numbers at this time, as this section of highway has not been built yet.
Public Comment Form 5 ■ Very informative information meeting ■ Provided very detailed display boards – easy to follow ■ Answered questions regarding the species being protected and vegetation protection as well as replanting vegetation in the future	**Response** No response, as contact information was not provided.

Highway 427 Expansion Project Comments received from Public Information Centre held January 25, 2018	Highway 427 Expansion Project Responses sent by LINK427 on March 12, 2018
■ Looking forward to the future 427 expansion scheduled to open in 2021.	
Public Comment Form 6 Good design, just want it to be done on or before 2021.	**Response** We appreciate your positive comments regarding the Highway 427 Expansion project and anticipate that the delivery of this project will be on schedule.
Public Comment Form 7 ■ I would like to get electronic copies of the PIC boards. ■ It will be nice if Highway 427 extension connects with Highway 9 rather than end on municipal road. ■ Truck only lane could be considered in design. There is significant truck traffic due to airport and intermodal yard (CN & CP).	**Response** The boards displayed at the Public Information Centre are available on the project website at www.427expansion.ca for your convenience. With regards to a dedicated truck lane, the design of the highway was not required to consider this feature. One of the benefits of the LINK427 extension will be to better convey truck traffic to and from the inter-modal facility.
Public Comment Form 8 ■ 427 needs to go further north than Major Mac ■ More roads – infrastructure to keep trucks/car move on the roads. Too much time and productivity is lost on the roads. ■ More roundabouts to keep car moving and few stop/go traffic	**Response** The Highway 427 Expansion project will address transportation capacity deficiencies, offer relief from congestion on local roads by providing an alternative route for through traffic, and meet infrastructure needs to address population and employment growth. This will also allow better and more efficient transportation and flow of goods from the CPR Vaughan Intermodal Facility. Once complete, the Highway 427 Expansion project will provide economic benefits to the province by offering an enhanced freeway route into York Region, the City of Toronto, the Vaughan business area and the CPR Vaughan Intermodal Facility.
Public Comment Form 9 ■ Please get done on time! Ensure good connection with future Major Mackenzie road widening ■ Ensure Baron's Street is able to connect to Huntington Road somehow south of Major Mackenzie ■ A little worried with how high the highway will be when it crosses over the CP train tracks. I	**Response** The Highway 427 Expansion project will address transportation capacity deficiencies, offer relief from congestion on local roads by providing an alternative route for through traffic, and meet infrastructure needs to address population and employment growth. We anticipate that the delivery of this project will be on schedule. Once complete, the Highway 427 Expansion project will provide economic benefits to the province by

Highway 427 Expansion Project Comments received from Public Information Centre held January 25, 2018	Highway 427 Expansion Project Responses sent by LINK427 on March 12, 2018
live in Kleinburg impressions and am worried of the views it might impact.	offering an enhanced freeway route into York Region, the City of Toronto, the Vaughan business area and the CPR Vaughan Intermodal Facility.
Public Comment Form 10 Well designed and thought out plan, looking forward to see it progress in the Spring.	**Response** We appreciate your positive comments regarding the Highway 427 Expansion project and encourage you to continue to participate by visiting our project website at www.427expansion.ca or by contacting the staff identified below.
Public Comment Form 11 I am working at the Township of King and would appreciate receiving the updates on the project.	**Response** Updates on the Highway 427 Expansion project will be available on the project website www.427expansion.ca. These updates will include future Design and Construction Reports and Bulletins on the progress of construction.

4. Detailed Description of the Undertaking

This section of the report further details the scope of work included in this DCR#2. These works are based on the Preliminary Design as presented in the EA (January 2010), TESR (2013) and TESR (2016), which was then revised by LINK427 through the Detail Design process. As mentioned in **Section 1.2**, the proposed Highway 427 Expansion project is located within the City of Vaughan and the City of Toronto and includes the design and construction of the following:

- Widening of the existing Highway 427 from Finch Avenue to Highway 7:
  - from six to eight lanes between Finch Avenue to south of Steeles Avenue;
  - from four to eight lanes, from south of Steeles Avenue to Highway 7;
  - new median managed lanes.
- New Extension of Highway 427 from Highway 7 to Major Mackenzie Drive with:
  - eight lanes from Highway 7 to Rutherford Road;
  - six lanes from Rutherford Road to Major Mackenzie Drive;
  - three new interchanges (Langstaff Road, Rutherford Road and Major Mackenzie Drive); and
  - new median managed lanes.

Due to the distinct differences in scope between these two sections of the project, the remainder of this section is divided into two parts: Highway 427 Widening; and Highway 427 Extension.

4.1 Highway 427 Widening from Finch Avenue to Highway 7

As mentioned above, this subsection provides a detailed description on the scope of work and construction methods that will be used within the widening section of Highway 427 (from Finch Avenue to Highway 7). Information pertaining to the New Extension of Highway 427 (from Highway 7 to Major Mackenzie Drive) can be found in **Section 4.2**, and information on environmental impacts and mitigation measures are discussed in **Section 5.0**.

For the purpose of DCR #2, the project design established in the EA (January 2010) and subsequent TESRS (2013 and 2016) will be referred to as the Reference Concept Design. Refinements to the Reference Concept Design are described in **Section 4.1.1**.

4.1.1 Refinements to the Reference Concept Design

During the detail design, the following refinements were made to the Reference Concept Design (RCD) from preliminary design. **Appendix C** provides drawings, which have incorporated these refinements and were used during consultation with various agencies.

1. Final adjustments to the profile were made using detailed survey information of the roadway. These adjustments did not result in any significant changes in the highway profile from the original concept (i.e. RCD).
2. The mainline shoulders of Highway 427 will experience localized reductions in width to accommodate the existing piers for the 407ETR flyover ramps. As the locations of these piers are pre-existing conflicts, structures cannot be modified or relocated; reducing shoulder widths are the only available option.
3. The detailed survey of Albion Road determined that the widening to the west of the 407ETR southbound off-ramp would result in a minimum vertical clearance of less than 4.9m (at the north curb line). In order to meet the minimum required vertical clearance, the design refinements involved locally reducing the width of Albion Road by 1m on the north side. This is achieved by reducing the painted median by 1m and shifting the westbound lanes to the south by 1m.
4. The method of construction for the 407ETR southbound on-ramp has been modified from conventional (construct and demolish) to rapid bridge construction. Instead of building an extension of the superstructure to the west and then removing the east portion of the existing structure (with associated lane reductions and staging), the entire superstructure will be shifted during only one extended closure. Under this extended closure the deck structure will be disengaged from the existing substructure, lifted and driven 5.5m westward to its new final

location and then finally lowered in-place atop new bearings. The bridge will then be reconnected to the roadway and reopened to traffic. This rapid bridge construction technique will allow for works to be completed within one extended closure over a weekend as opposed to several months of several lane closures on both Albion Road and the 407ETR southbound off-ramp.

5. During detailed design and surveying, the minimum vertical clearance at the east end of the CNR northbound structure was determined to be 6.79m, not the 6.878m identified in previous studies. The detail design maintains this minimum clearance.
6. The Highmast lighting fixtures along Highway 427 has been revised from High Pressure Sodium (HPS) to Light Emitting Diode (LED). These fixtures achieve higher energy efficiency and therefore reduce overall power consumption costs for taxpayers. Stakeholders including the 407ETR were consulted.
7. A large retaining wall that was located along the west side of the highway adjacent to the Stormwater Pond 3-W (south of Albion Road) in the RCD was determined no longer necessary and deleted.
8. Existing retaining walls between the northbound and southbound structures at Steeles Avenue will be converted into an Abutment, as opposed to being removed and replaced in the RCD. This allows for decreased time of construction and reduces staging requirements (and potential impacts to pedestrians and cyclists) along Steeles Avenue.

   Rehabilitation of the Highway 7 underpass requires the conversion of the deck from conventional to semi-integral. This requires the ends of the deck to be removed and extended. As a result, full access to the entire structure is required. The original staging plan (as per the RCD) provided for three (3) lanes of traffic flow in each direction, at all times. It has been concluded this configuration would not feasibly allow for the entire bridge to be rehabilitated and could result in many additional years of staging along Highway 7. As a result, the proposed configuration maintain two (2) lanes in each direction; this is the only approach that allows for minimum lane widths and pedestrian/cycle access to be maintained through all stages of construction. Traffic analysis was also performed during detailed design that supports this decision.

4.1.2 Mainline Widening

The existing Highway 427 between Finch Avenue and Highway 7 is proposed to be widened to four lanes in each direction, including three General Purpose Lanes (GPL) and one Managed Lane. All lanes will be 3.75 m wide, with a 1.25 m painted buffer separating the Managed lanes from the GPLs. The widened highway cross-section typically includes a 4.25 m wide median shoulder and a 3.0 m wide outside shoulder, with localized reductions to shoulder widths across some structures. Typical profiles of the completed Highway 427 Widening section are provided below, and are included in **Appendix C**.

Figure 3: Typical Profile - Final Highway 427 Profile (Finch Avenue to Steeles Avenue)

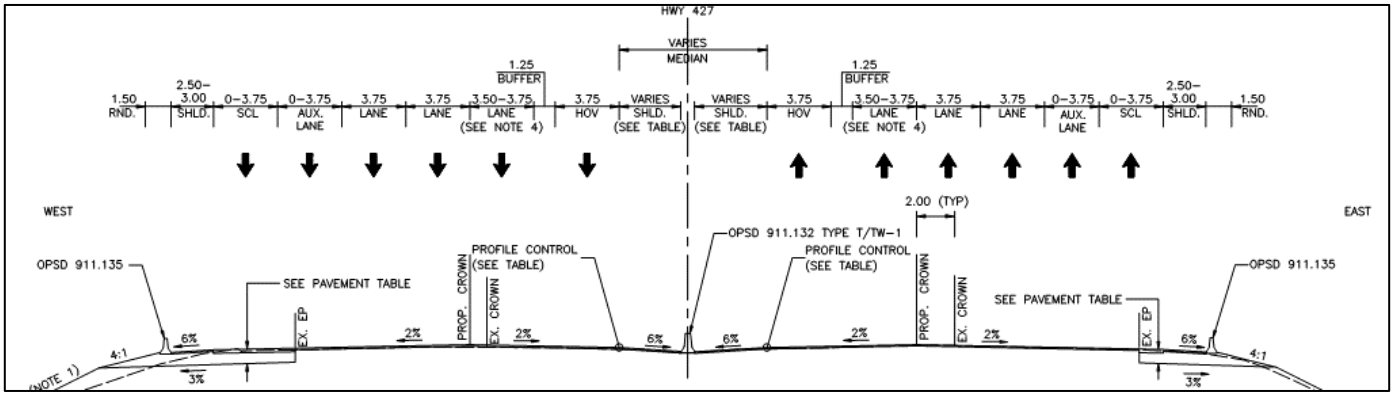
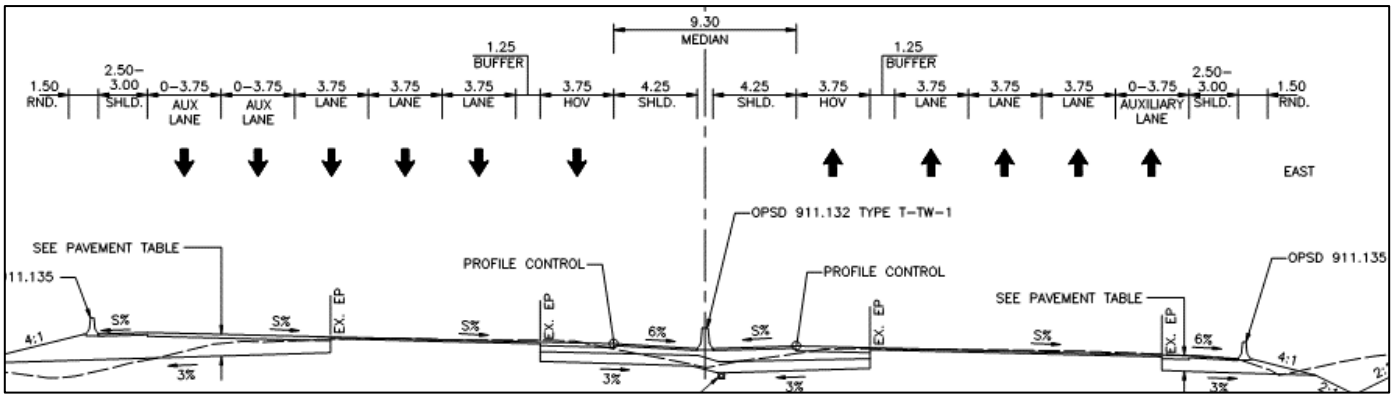


Figure 4: Typical Profile - Final Highway 427 Profile (Steeles Avenue to Highway 7)



Construction Methods

Construction of the extension of Highway 427 Widening will be in stages as there is a need to maintain the current traffic capacity in both the northbound and southbound directions. Details on this staging of provided in section **4.1.10**

In any of these stages for widening of Highway 427, works will initially commence with the implementation of the stage itself, including placement of Traffic Control Barriers (TCB) to provide a safe working zone and painting of temporary line markings to delineate alterations to existing traffic configurations (such as lane shifts or lane width reductions). With staging implemented, the widening works will commence with grubbing of root materials, tree stumps and vegetation (chopping, clearing, and cutting of these materials will be completed prior to these works and were included in DCR 1) by grinding the remaining roots in place or removing them entirely. Excavators, bulldozers, and trucks will then remove the outside shoulders and topsoil for relocation to pre-determined locations for stockpiling, for later usage. The stockpiles will be placed in non-sensitive areas, protected with silt fence and sprayed with cover crop to mitigate any erosion and/or dust problems. Once complete, construction equipment (also including excavators and bull-dozers as well as rollers) will begin constructing all slopes, ditches and roadway earth sub-surfaces. Once these works are completed, the slopes will be covered with the stockpiled topsoil and sprayed with hydro seed/straw blankets as an erosion control measure. The excavated earth will be redistributed around the site to be used for raising the profile of the highway along both the widening and extension sections.

With the new roadway subsurface complete, granular materials will be placed on the earth sub-surface of the highway as a base for the asphalt pavement. All granular materials will enter the site from the predetermined access locations and trucks will operate on the existing construction platforms within the ROW. Once the granular pavement is in place, asphalt will be laid with spreaders and rollers. Concurrent with excavation, granular placement and paving, various electrical and drainage infrastructure will be installed including infrastructure for Advanced Traffic Management Systems (ATMS), highway lighting, and stormwater drainage. This includes conduits, pre-cast concrete and plastic pipes as well as catch basin and manhole structures. Most of this infrastructure will be placed by-hand or trenched, and subsurface installations such as directional drilling or jack-and-boring will be used in complex situations such as deep elevations or placement underneath live-lanes.

The works will complete with the installation of all new highway signage, safety features such as barriers and guide-rail, high-mast installation and painting of line markings and symbols.

4.1.3 Widening and Rehabilitation of Existing Structures

Contained in the scope of this report for the Widening of the existing Highway 427, there are structures that require rehabilitation, conversion and / or widening to accommodate a wider highway cross-section. Similar to Mainline Widening, this work will be performed in stages. A list of these structure locations are as follows:

- Highway 427 at Finch Avenue Underpass (site no. 37-1084)
- Highway 427 Humber River Crossings (sites no. 37-633/1, 37-633/2, and 37-1087)
- Highway 427 CNR Overhead Structures (sites no. 37-1109/1 and 37-1109/2)

- Highway 407E/W-427S Overpass at Albion Road (site no. 37-1115)
- Highway 427 at Albion Road Overpass (site no. 37-1110)
- Highway 427 at Steeles Avenue Overpass (site no. 37-1111)
- Highway 427 at Highway 407 Overpasses (site no. 37-1167/8)
- Highway 427 at Highway 7 Underpass (site no. 37-330)

General Arrangement drawings for these structures are included in **Appendix C**.

Table 4 summarizes the scope of work for each of the bridges within the Highway 427 widening limits.

Table 4: Bridge Rehabilitation and Widening Requirements

Structure & Site No.	Summary of Scope of Work	Existing Cross-Section	New Cross-Section
Highway 427 over Finch Avenue (37-1084)	■ Conversion to Semi-Integral Structure ■ Rehabilitation of deck, abutment and other structural components	Eastbound Structure: ■ 0.762m raised concrete median shoulder ■ 0.3m shoulder ■ 2 x 3.650m GPL ■ 1 variable ramp lane + Gore ■ 0.3m shoulder ■ 2.565m sidewalk + barrier wall Westbound Structure: ■ 0.762 raised concrete median shoulder ■ 0.3m shoulder ■ 2 x 3.650m GPL ■ 1 variable ramp lane + Gore ■ 0.3m shoulder ■ 2.565m sidewalk + barrier wall	■ Cross-Sections Unchanged ■ Existing Min. Vertical Clearance Unchanged
Highway 427 crossings over Humber River (37-633/1, 37-633/2)	■ Conversion to Semi-Integral Structure ■ Rehabilitation of deck, abutment and other structural components	Northbound Structure**: ■ 0.5m inside shoulder ■ 3 x 3.50m GPL ■ Variable gore area ■ 4.75m ramp lane ■ 0.915m outside shoulder ■ 0.525m Barrier Wall Southbound Structure**: ■ 0.5m inside shoulder ■ 3 x 3.50m GPL ■ 1.504m outside shoulder ■ 0.525m Barrier Wall **Currently in temporary staged configuration with Traffic Control Barriers and Barrels	Northbound Structure: ■ 0.485m median barrier wall ■ 2.725m inside shoulder ■ 3.75m Managed Lane ■ 1.25m buffer zone ■ 4 x 3.75m GPL ■ Variable Gore area ■ 4.75m SCL ■ 1.042 m outside shoulder ■ 0.525m barrier wall Southbound Structure: ■ 0.485m median barrier wall ■ 2.725m inside shoulder ■ 5.0m Managed Lane entry/exit ■ 3.50m GPL ■ 2.434m outside shoulder ■ 0.525m barrier wall
Highway 427 Finch N-EW Offramp over Humber River	■ Conversion to semi-integral abutments; ■ Rehabilitation of deck, abutment and other structural components	■ 0.450m barrier wall ■ 0.61m inside shoulder ■ 2 x 3.658m lanes ■ 1.828m outside shoulder ■ 0.450m barrier wall	■ 0.525m barrier wall ■ 1.150m inside shoulder ■ 2 x 3.66m lanes ■ 1.150m outside shoulder ■ 0.525m barrier wall

Structure & Site No.	Summary of Scope of Work	Existing Cross-Section	New Cross-Section
Structure (37-1087)			
Highway 427 over CNR Structures (37-1109/1 and 37-1109/2)	■ Rehabilitation of bridge structure ■ Outside widening of Northbound & Southbound structures to accommodate new Hwy427 cross-section	Northbound Structure**: ■ 1.0m inside shoulder ■ 2 x 3.75m GPL ■ Variable gore area ■ 3 x 3.75m ramp lanes ■ 2.0m outside shoulder Southbound Structure**: ■ 1.0m inside shoulder ■ 2 x 3.75m GPL ■ 2 x 3.75m ramp lanes ■ 1.0m outside shoulder **Currently in temporary staged configuration with Traffic Control Barriers and Barrels	Northbound Structure: ■ 0.485m barrier wall ■ 4.165m inside shoulder ■ 3.75m Managed Lane ■ 1.25m buffer zone ■ 2 x 3.75m GPL ■ 1 shared GPL/ Ramp lane (variable width) ■ 2 x 3.75m ramp lanes ■ 2.50 m outside shoulder ■ 0.525m barrier wall Existing Min. Vertical Clearance Unchanged at 6.79m Southbound Structure: ■ 0.485m barrier wall ■ 3.515m inside shoulder ■ 3.75m Managed Lane ■ 1.25m buffer zone ■ 3 x 3.75m GPL ■ 3.75m Auxiliary (Aux) Lane ■ 3.75m Speed Change Lane (SCL) ■ 2.50m outside shoulder ■ 0.525m barrier wall Existing Min. Vertical Clearance Unchanged at 6.79m
Highway 407E/W-427S over Albion Road (37-1115)	■ Structural realignment including construction of widened abutments and ramp approaches to accommodate new Hwy427 cross-section	■ 0.480 barrier wall ■ Variableinside shoulder ■ 2 x 3.75m ramp lanes ■ 3.50m Ramp Lane ■ Variableoutside shoulder ■ 0.480 barrier wall	■ Cross-Section Unchanged ■ Min. Vertical Clearance Required: 4.90m ■ New Clearance Provided: 4.91m
Highway 427 over Albion Road Structures (37-1110)	■ Rehabilitation of bridge structure ■ Outside widening to Northbound & Southbound Structure to accommodate new Hwy427 cross-section	Northbound Structure**: ■ 0.50m inside shoulder ■ 2 x 3.50m GPL ■ 1.0m outside shoulder Southbound Structure**: ■ 0.50m inside shoulder ■ 2 x 3.50m GPL ■ 1.0m outside shoulder **Currently in temporary staged configuration	Northbound Structure: ■ 0.80m median barrier wall (shared between NB and SB) ■ 4.25m inside shoulder ■ 3.75m Managed Lane ■ 1.25m buffer zone ■ 3 x 3.75m GPL ■ 3.0 m outside shoulder ■ 0.525 barrier wall Min. Vertical Clearance Required: 5.00m New Clearance Provided: 5.66m Southbound Structure: ■ 0.80m median barrier wall (shared between NB and SB)

Structure & Site No.	Summary of Scope of Work	Existing Cross-Section	New Cross-Section
			■ ■ 4.25m inside shoulder ■ 3.75m Managed Lane ■ 1.25m buffer zone ■ 3 x 3.75m GPL ■ 3.0 m outside shoulder ■ 0.525m barrier wall Min. Vertical Clearance Required: 5.00m New Clearance Provided: 5.66m
Highway 427 over Steeles Avenue Structures (37-1111)	■ Rehabilitation of bridge structure ■ Outside and Inside widening of Northbound & Southbound Structures to accommodate new Hwy427 cross-section	Northbound Structure: ■ 0.50m barrier wall ■ 1.0m inside shoulder ■ 2 x 3.75m GPL ■ 2.50m outside shoulder ■ 0.50m barrier wall Southbound Structure: ■ 0.50m barrier wall ■ 1.0m inside shoulder ■ 3 x 3.75m GPL ■ 2.50m outside shoulder ■ 0.50m barrier wall	Northbound Structure: ■ 0.475m median barrier wall ■ 4.165m inside shoulder ■ 4.375m Managed Lane ■ 4.375m GPL ■ 2 x 3.75m GPL ■ 3.0m outside shoulder ■ 0.525m barrier wall Min. Vertical Clearance Required: 5.00m New Clearance Provided: 5.25m Southbound Structure: ■ 0.475m median barrier wall ■ 4.165m inside shoulder ■ 4.375m Managed Lane ■ 4.375m GPL ■ 2 x 3.75m GPL ■ 3.0m outside shoulder ■ 0.525m barrier wall Min. Vertical Clearance Required: 5.00m New Clearance Provided: 5.25m
Highway 427 at Highway 407 Overpasses (37-1167/8)	■ Partial conversion to semi-integral abutments; replacement of approach slabs; milling and paving of surface course.	Northbound Structure***: ■ 0.50m barrier wall ■ 1.0m inside shoulder ■ 2 x 3.75m GPL ■ Variable Ramp Lane ■ 1.0m outside shoulder Southbound Structure***: ■ 0.50m barrier wall ■ 1.0m inside shoulder ■ 2 x 3.75m GPL ■ ■ 1.0m outside shoulder ■ ***To be provided to LINK427 in temporary staged configuration	Northbound Structure: ■ 0.525m median barrier wall ■ 3.60m inside shoulder ■ 3.75m Managed Lane ■ 1.25m buffer zone ■ 3 x 3.75m GPL ■ Variable gore area ■ Variable SCL ■ 1.50m outside shoulder ■ 0.525m barrier wall Southbound Structure: ■ 0.525m median barrier wall ■ 3.60m inside shoulder ■ 3.75m Managed Lane ■ 1.25m buffer zone ■ 3 x 3.75m GPL ■ 3.50m SCL ■ 1.50m outside shoulder

Structure & Site No.	Summary of Scope of Work	Existing Cross-Section	New Cross-Section
			■ 0.525m barrier wall Existing Min. Vertical Clearance Unchanged at 4.803m
Highway 427 at Highway 7 Underpass (37-330)	■ Conversion to semi-integral abutments; patch repairs to concrete deck soffit, fascia, abutments, wingwalls and pier columns; replacement of barrier walls, bearings, and approach slabs.	Eastbound Structure: ■ 1.0m raised median ■ 2 x 3.50m GPL ■ 1 x 3.75m GPL ■ 1.25m outside shoulder ■ 1.50 sidewalk ■ 0.455m barrier wall with railing Westbound Structure: ■ 1.0m raised median ■ 2 x 3.50m GPL ■ 1 x 3.75m GPL ■ 1.50m outside shoulder ■ 0.455m barrier wall with railing	Eastbound Structure: ■ 1.0m raised median ■ 2 x 3.50m GPL ■ 1 x 3.75m GPL ■ 1.25m outside shoulder ■ 1.605 sidewalk ■ 0.35m parapet wall with railing Existing Min. Vertical Clearance Unchanged at 4.672m Westbound Structure: ■ 1.0m raised median ■ 2 x 3.50m GPL ■ 1 x 3.75m GPL ■ 1.855m outside shoulder ■ 0.35m parapet wall with combination traffic/bicycle rail Existing Min. Vertical Clearance Unchanged at 4.672 m

Construction Methods

Rehabilitation of structures and its components begins by first removing all of the predetermined components of the structure so as to expose all of the concrete surfaces for rehabilitation. This is done by means of first scraping the existing asphalt /waterproofing away from the deck, and second saw cutting and chipping the extraneous concrete for disposal offsite. The exposed surfaces will then be inspected for signs of deterioration and then repaired using differing methods. These methods will range from simple patch repairs to the more extensive remove and replace in its entirety.

Conversion of conventional structures to the semi-integral type involves a modification to the ends of each structure, namely the abutment and approach slabs situated immediately behind. Once all of the extraneous concrete is removed and the reinforcing steel exposed the new ballast walls, deck ends, wing walls, sleeper slabs (if necessary), approach slabs, barrier walls, curbs, expansion joints, and medians will be formed and cast with reinforced concrete in a sequential manner to complete the conversion. This will occur at the Finch Avenue Underpass, Humber River Crossings, CNR Overpass, Albion Road Overpass, Steeles Avenue Overpass, the 407ETR Overpass and the Hwy 7 Underpass.

Some of the Structures require widening, and the works to complete the widenings are very similar to the methods used to construct new structures. This starts with the placement of roadway protection systems on the sides of the existing structure to retain all of the existing roadbed immediately adjacent to the excavation. Next, excavations, immediately adjacent to the existing abutments and footings will be completed so as to allow for the widening of the substructure. At the CNR, Albion Road, and Steeles Avenue the excavation below the ground level will be required to construct spread footings. The CNR however, will require a deeper foundation with the use of H-Piles. Based on geotechnical data, there exists the potential for infiltration or seepage of water into the structural excavation sites. In the event this occurs, infiltrated water will be pumped out from the excavation, contained / treated in filter bags, and dispersed over a vegetated area prior to infiltration to the ground or re-entry to an existing waterway. No large-scale or long-term pumping requirements are anticipated. Once the foundations at CNR, Albion Road, and Steeles Avenue are constructed, the abutment will then be constructed above complete with bearing seats for placement of new girders. Following erection of the girders, the deck is then formed and cast with reinforced concrete, along with backfill of the abutments and

construction of approach slabs, sleeper slabs, barrier walls, curbs, and retaining walls. This will occur at the CNR Overpass, Albion Road Overpass, and the Steeles Avenue Overpass.

For the widening of the Humber River Crossings there will be no excavations beyond what is needed behind the abutments within the existing roadway and no intrusion into the valley. In addition to the removal and replacement of the barrier walls on all three structures, there will be an overall widening of 500 mm on the East side of the mainline crossing only. These works will require the installation of a debris/access platform to facilitate these works. These platforms will be installed from the bridge deck and connected to the existing structure with no valley access required. These platforms will remain in place until all of the works are completed. All removals will be contained and removed from the bridge decks via the abutments for recycling. The widening and the replacement barrier walls will then be constructed with reinforced concrete. Once complete, the waterproofing and asphalt will be reinstated.

Specifically for the 407ETR off-ramp to Highway 427 Southbound, the structure at Albion Road will be realigned using a rapid-bridge construction technique. This involves prior construction of the realigned ramp approaches and new substructure westward, adjacent to existing structure limits. With this infrastructure completed, the deck superstructure (girders, deck atop girder, pavement structure, barrier walls) will be lifted and placed in its new, final location over an extended closure with the use of several Self-Propelled Modular Transporters (SPMTs). Finishing works, including connecting the deck structure to the abutment, will be constructed over subsequent nightly lane closures, with use of jump-slabs for the ability to carry daytime traffic during this interim condition.

4.1.4 Crossing Roads (Including grade separations) and Interchanges

The existing interchange ramps at Finch Avenue, Highway 407ETR, and Highway 7 will be realigned to maintain safe merge points to and from Highway 427 and to accommodate the widening of Highway 427 from Finch Avenue to Highway 7. For most ramps, the realignment scope is very minor and contained within the merge areas adjacent to Highway 427 travel lanes on the highway.

At Highway 7 the realignments will be more substantive in nature, as the Highway 7 eastbound on-ramp to Highway 427 southbound (W-S Ramp) will need to be realigned in its entirety to make room for the highway widening. The Highway 427 northbound off-ramp to Highway 7 (S-EW Ramp) will require an additional left turning lane (both temporarily during construction and in the permanent configuration) and the 407ETR off-ramp to southbound Highway 427 (EW-S Ramp) W-S ramp will experience a shift in alignment to the west. New interchange ramps will also be provided to facilitate entrance and exits to/from the newly construction extension section of Highway 427, with further details on this scope provided in **Section 4.2.3** along with discussions on expected impacts and mitigations in **Section 5.2.5**.

The intersection at Highway 7 and Vaughan Valley Boulevard will also require a temporary modification to allow for a double left turn from Highway 7 eastbound to Vaughan Valley northbound. This temporary condition will be in place for the duration of the project. The intersection will be returned to its existing conditions at the end of the project.

Construction Methods

All structural work related to the interchange ramp realignments was completed prior to LINK 427's involvement (with the exception of the 407ETR structure at Albion Road mentioned above). Thus, the interchange ramp scope is primarily construction of road widening and generally consistent with the methods used for the widening of the Highway 427 mainline. Works will initially commence with the implementation of the staging, including placement of Traffic Control Barriers to provide a safe working zone and painting of temporary line markings to delineate any alterations to existing traffic configurations (such as lane shifts or lane width reductions). With staging implemented, the widening works will commence with grubbing of root materials, tree stumps and vegetation (by grinding the remaining roots in place or removing them entirely). Excavators, bulldozers, and trucks will then remove the outside shoulders and topsoil for relocation to pre-determined locations for stockpiling, for later usage. The stockpiles will be placed in non-sensitive areas, protected with silt fence and sprayed with cover crop to mitigate any erosion and/or dust problems. Once complete, construction equipment (also including excavators and bull-dozers as well as rollers) will begin constructing all slopes, ditches and roadway earth sub-surfaces. Once these works are completed, the slopes will be covered with the stockpiled topsoil and sprayed with hydro seed/straw blankets as an erosion control measure. The excavated earth will be

redistributed around the site to be used for raising the profile of the highway along both the widening and extension sections.

With the new roadway subsurface complete, granular materials will be placed on the earth sub-surface of the highway as a base for the pavement. All granular materials will enter the site from the predetermined access locations and trucks will operate on the existing construction platforms within the ROW. Once the granular pavement is in place, asphalt will be laid with spreaders and rollers. Concurrent with excavation, granular placement and paving, various electrical and drainage infrastructure will be installed including infrastructure for Advanced Traffic Management Systems (ATMS), highway lighting, and stormwater drainage. This includes conduits, pre-cast concrete and plastic pipes as well as catch basin and manhole structures. Most of this infrastructure will be placed by-hand or trenched, and subsurface installations such as directional drilling or jack-and-boring will be used in complex situations such as deep elevations or placement underneath live-lanes.

Specifically at 407ETR ramps, methods will be slightly different as a rigid, concrete pavement will be constructed as opposed to flexible asphalt pavement. Grubbing, excavation will all be performed in a similar fashion, however the granular material will be changed to a more permeable mix to allow for drainage through the granular layer (referred to an Open Graded Drainage Layer). With this layer in place, the concrete road structure will be cast-in place. The surface of the concrete pavement will then be grooved (tined) to allow for friction with traveling vehicles. Construction vehicles will include excavators, bull-dozers, dump trucks, XXX

The works will complete with installation of all new highway signage, safety features such as barriers and guide-rail, high-mast installation and painting of line markings and symbols.

4.1.5 Stormwater Management and Drainage during Construction

The drainage within the widening section of Highway 427 from Finch Avenue to Highway 7 is provided by two watercourses, including the West Humber River and the Albion Creek Watershed, both within the TRCA jurisdiction. Based on discussions with MTO, MOECC, MNRF and TRCA, the following design criteria were adopted.

Hydraulic Criteria

Cross culverts less than 6m in span were designed based on the 50-year design flow in order to convey all of the flow within the ROW to receiving stormwater management facilities for effective treatment. For areas with a drainage area greater than 125ha, structures were sized to convey the Regional Storm (Hurricane Hazel) with no significant increases in flood levels from that of the existing condition.

Stormwater Management Criteria

The following stormwater management requirements are provided in order to achieve the criteria set by the TRCA, MTO, MOECC, MNRF and DFO,

- Quality Treatment – Enhanced Protection Level (Level 1) quality treatment with special attention given to mitigation of thermal impacts on coldwater streams;
- Extended Detention – Extended detention of 40 m3/ha of the contributing upstream drainage area for all wet ponds. The erosion storm values will follow the methodology provided in the report “Low Impact Development Stormwater Management Manual”, dated November 2008. Erosion control will provide controls for the 25mm storm to be released over a minimum of 48 hours; and
- Quantity Treatment – Quantity control will be provided where runoff from the proposed 427 Transportation Corridor is shown to have a negative impact on the downstream peak flows within the receiving watercourse and meet post- to predevelopment condition. All outlets from SWM ponds to receiving watercourses will comply with the TRCA’s Storm Outfall and Outfall Channel Design Criteria.

Conditions covered under this DCR

The Drainage and stormwater management requirements throughout the widening limits include:

- Cross culvert installations and extensions to convey flows;
- Flat-bottom swales to treat run-off;

- Three Stormwater Ponds; and
- A median stormwater system.

Drainage Features

There are two culvert extensions, one ditch realignment, and three bridge rehabilitations required for the works proposed in this DCR #2. The culvert extensions will convey Albion Creek / Tributary A (C18) at Highway 407ETR and Creek-1 (Highway 50 Tributary) (C28) at the Highway 427 and Highway 7 interchange. As well, several minor culverts (non-structural) will be installed / extended to distribute flow from the inside ditches to the left/right ditches, and convey the flow to stormwater management facilities. The existing stormwater facilities draining the median to the ditches will be extended as necessary. North of Highway 407ETR, the existing median ditch will be closed in and a median stormwater system installed.

Table 5: Summary of Watercourse Crossing Treatment

Watercourse	Station	Type
Creek 1	10+300 Hwy 7 NB off ramp	Existing culvert to be extended C-28
Albion Creek	12+700	Existing culvert to be extended – C-18
Albion Creek – Tributary A	12+700 to13+700 Left	Existing Ditch to be realigned
West Humber River	11+130	Bridges (37-633/1, 37-633/2 & 37-1087)

Stormwater Management Strategy

The proposed stormwater management strategy consists of utilizing flat-bottomed grassed swales in all locations and implementation of three stormwater management ponds to provide quality and quantity control to runoff.

Specifically, existing drainage patterns are to be maintained as much as possible within the layout of the highway profile. Runoff from areas external to the Right-Of-Way (ROW) will be intercepted and conveyed to the storm water management facilities. Selection of proposed stormwater management practices was determined based on the drainage area contributing flows to local watercourses. The drainage area considered for stormwater management consisted of the complete ROW.

The construction of the Highway 427 widening will include upgrades to the existing stormwater and drainage system to manage existing overland flow, rain and/or snow melt as well as maintain the quality of the water by removing debris and sediment prior to the stormwater entering a watercourse downstream. Within this widening section of Highway 427, three (3) new stormwater management ponds will be constructed (One on the southwest corner of Albion Road, and the Highway 427, one on the Southbound Highway 427 to Eastbound 407ETR ramp, and one on the Westbound 407ETR to the Northbound Highway 427 ramp), along with roadside ditching and a median urban stormwater system (collection structures and buried piping down the center of the highway). The ditches and retention ponds will be lined with vegetation to aid in the filtering of the sediment conveyed with stormwater and snow melt. Overflow structures will be utilized to aid in the management of water quality.

Location of Sedimentation Detention Basins, Swales, and Check Dams

The location of drainage management facilities such as sediment detention basins, swales, and check dams, has been determined prior to commencing the works within each drainage catchment area. A detailed assessment was completed within each drainage catchment area along the Highway 427 Expansion to assess the adequacy of the land in terms of available area, soil characteristics, receiving water characteristics, etc.

Fish Habitat Enhancement and Restoration

Within the widening section, there are a four locations where works will occur either instream or near stream. The instream works include the existing culvert extensions associated with Creek-1 (Highway 50 Tributary) and Albion Creek, as well as the realignment of the Highway 427 west ditch line conveying the watercourse associated Albion Creek / Tributary A. Near stream works are limited to the works associated with the crossing structures over the West Humber River.

Table 6: Summary of Watercourse Crossing – Fish Habitat Enhancement and Restoration

Watercourse	Fishery	Station	Facility	Watercourse /Fish Habitat modifications
Creek 1	Yes	10+300 Highway 7 NB off-ramp	Existing culvert extended C-28	Minor Realignment with culvert extension
Albion Creek	Yes	12+700	Culvert C-18 extended	Minor Realignment with extension of culvert
Albion Creek – Tributary A	Yes	12+700 to 13+700	Ditchline	Minor Realignment

At the locations identified above the natural channel design principles were used for all realignment and/or reinstatements:

- Vegetation feature removals were minimized;
- Morphological diversifications such as plunge pools were implemented;
- Substrates were sized such that “anchor” stones will remain during large storm events, and mixed with smaller gravel, cobble, and sand;
- Smooth transitions designed between the upstream and downstream reaches; and
- Low flow channels designed to maintain fish passage during low flow conditions.

Future DCR’s will detail further enhancements such as:

- The replacement and/or enhancement of riparian and instream vegetation, which might include planting clusters of native trees, shrubs, and herbaceous species along the banks within the lands;
- The stabilization of banks that have eroded and slumped using up-to-date bioengineering techniques, which might include live staking, fascines, live crib walls and native material revetments; and
- The installation of fish habitat structures, which might include cross logs, cabled log jams and boulder placement;

Detailed plans for the extension of the box culvert and the minor realignment/restoration have been developed and will include the best management practices.

Erosion and Sediment Control

A detailed Erosion and Sediment Control Plan (ESCP) has been developed for the Project in accordance with the Environmental Guide for Erosion and Sediment Control During Construction of Highway Projects (‘Environmental Guide’: MTO 2015a). The ESCP documents the environmental protection measures for controlling erosion and sedimentation in order that performance can be readily measured, and the need for corrective actions can be determined. The ESCP provides the knowledge, awareness and methods necessary to complete the required work tasks in a manner that avoids or minimizes erosion and the potential impacts to the environment from sediment.

This ESCP addresses, among other topics:

- identification of areas prone to sedimentation;
- general and site specific measures that will be applied to:
    - mitigate soil erosion and shallow slope movement,
    - control sediment-laden flows, and
    - prevent sediment-laden water from entering watercourses.

This ESCP also includes a description of the inspection/monitoring program that will be implemented to check that the above described measures are working effectively.

As with all environmental management plans, the ESCP will be a 'Living Document' that will be updated as the project progresses through the various stages of design and construction to ensure information is relevant to current site activities and operations.

In addition to the general ESC measures, specific ESC measures for each water crossing will be developed, and presented in a specific Drainage and Sediment Management Plan (DSMP) developed for each watercourse crossing. These site-specific DSMPs will be provided in a series of drawings with a narrative.

Based on the requirements of the ESCP and DSMPs, an Environmental Inspector will conduct regular inspections of the temporary erosion and sedimentation control measures in accordance with Task ENV 7 of the Construction Administration and Inspection Task Manual (MTO 2010) and with the Environmental Guide for Erosion and Sediment Control during Construction of Highway Projects (MTO, 2015a).

Construction Methods

Prior to disturbing the ground and any of the existing drainage all of the existing watercourses (wet and dry) will be protected with the required erosion and sediment control measures outlined in the detailed drawings and the above mentioned ESCP and DSMP's, including but not limited to protections along all watercourses within the Project Limits and all outlets to downstream watercourses. As each catchment area is protected the construction of the ditching, stormwater ponds, temporary sedimentation basins, and check dams will begin using excavators, bulldozers, and trucks to relocate the fill to other parts of the site. Temporary rock check dams will be installed in the ditch lines at the same time. A top soiling operation will begin as soon as the final surfaces of the ditches, temporary swales, and sedimentation basins are constructed. Topsoil will be placed and further protected, with either hydro seeding or hydro seeding with erosion control blankets. The drainage will be constructed from the outlets so as to always maintain positive drainage throughout the limits of the project. Construction of this infrastructure will be concurrent with mainline construction and, as such, will be constructed in the correlated highway staging.

Storm sewer infrastructure such as pre-cast concrete drainage pipes, catch-basins, and manhole structures will be installed along the median of existing highway. These will be installed by first excavating a trench using an excavator and trench-boxes. Trenched operations will include the use of excavators to create the trench, dump trucks to haul excavated materials for treatment and reuse on-site, trench boxes to protect workers and compacting equipment to ensure optimal ground conditions. Trenchless technology operations such as jack and boring and directional drilling will require construction of pits and receiving areas and will utilize specialized trenchless equipment to perform the relocation. Both these subsurface relocation operations will also require laydown areas to store conduits, pipes and any other materials required for the operation.

The pipes and catchment structures will then be installed and backfilled with the appropriate materials. Once complete these trenches will be covered with granular materials, placed using either bulldozers, or graders. Furthermore, construction of stormwater retention ponds will be given priority to allow for drainage of rainwater prior during roadway construction operations. As these are wet-ponds, they are intended to retain water to allow for sedimentation of debris prior to outflow. Thus, the base and walls of these ponds are typically clay-lined to prevent seepage, subject to geotechnical investigation.

Further to these pipes and structure, seven (7) existing drainage culverts will be retained out of which three will experience widening to accommodate the new Highway 427 cross-section. Nineteen new drainage culverts will also be installed along the entire Widening section from Finch Avenue to Highway 7. These will be a combination of pre-cast concrete box structures as well as round plastic concrete and/or corrugated steel pipe (CSP) structures. Most of this infrastructure will be placed by-hand or trenched if placed parallel to the highway, and subsurface installations such as jack-and-boring will be used in crossings underneath live-lanes. The West ditch line along Highway 427 from north of the 407ETR to south of Highway 7 will be realigned using Best Management Principles.

Pond construction will begin with the installation of the outlets. The outlets will be installed with the use of excavators and trucks. Once complete the remainder of the pond will be excavated and the material redistributed to other locations within the Project Limits. The pool of the pond will then be lined and the banks temporarily restored with cover crop until the permanent restoration can be completed. The permanent restoration and landscaping will be addressed in under a future DCR.

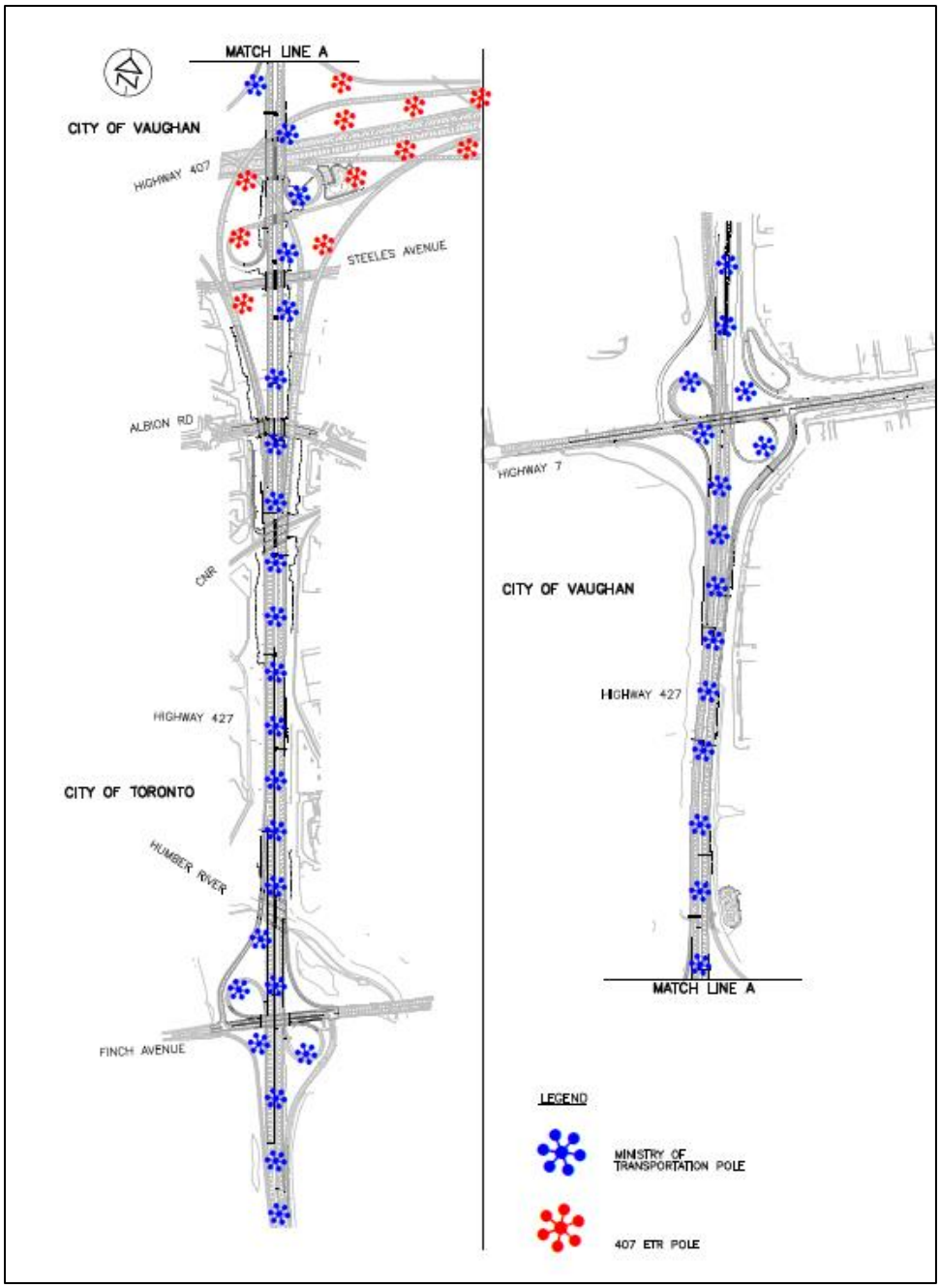
Temporary swales and sedimentation basins will be constructed as shown on the drawings (provided in **Appendix C**) and will removed prior to the completion of the project.

4.1.6 Illumination, Signalized Intersections, Advanced Traffic Management System (ATMS)

Highway 427 will be fully illuminated with new lighting within the widening section from Finch Avenue to Highway 7, including the interchanges at Finch Avenue, Highway 407ETR, and Highway 7. This will include the installation of numerous high mast poles with Light Emitting Diode (LED) lamps along the entire length of the highway, as shown in **Figure 5** below. Temporary lighting will be used to allow for the removal and replacement of the existing high-mast poles between Humber River and the 407ETR to upgrade this infrastructure as per the project requirements.

Crossing roads affected by mainline and structural widening (such as Finch Avenue, Albion Road, Steeles Avenue, and Highway 7) will be provided with additional street lighting and upgrades to existing structural lighting wall-packs (Albion Road and Steeles Avenue only). The crossing roads will use a combination of High Pressure Sodium (HPS) and LED lighting as required by municipal standards. Several new signalized intersections (ramp terminals) will be constructed along the highway to manage the traffic exiting the highway.

Figure 5: Highmast Lighting for the Widening



Existing interchange exit ramps at Finch Avenue will experience temporary modifications to the intersection signals to facilitate structural rehabilitation work in stages. Furthermore, the intersection of the Highway 7 northbound off-ramp as well as the Highway 7 eastbound at Vaughan Valley Boulevard will be reconfigured with an additional left-turning lane for additional capacity. The modifications to the left turns at the Highway 7 northbound off-ramp location will be permanent whereas the Vaughan Valley Boulevard intersection will be returned to its existing configuration at the end of the project. Finally, a new signalized intersection (ramp terminal) will be constructed at Highway 7 to manage southbound traffic exiting the highway. All these intersections will be constructed and / or modified based on standard government specifications and procedures including the *Accessibility for Ontarians with Disabilities Act* (AODA). Highway exit ramps will be supplemented with induction loops (as needed) for sensing queues, and timing of traffic light cycles will be optimized for peak travel directions. ATMS will be installed along all sections of the highway including components such as traffic Counting Stations, and CCTVs.

Construction Methods

Civil provisions for mainline highway lighting and ATMS infrastructure will occur concurrently with widening works in each associated highway stage. Infrastructure (i.e. conduits, sensors, pads, etc.) will be placed by-hand depending on depth of placement, and subsurface installations such as directional drilling or jack-and-boring will be used in complex situations such as deeper elevation placement or placement underneath live-lanes. For highmast lighting poles, foundations will be installed using augers mounted on cranes to excavate the caissons to their desired depth. The excavated material will be hauled away using trucks for reuse elsewhere on the site. The Caissons will then be constructed using reinforced concrete. The associated poles will then be erected into place using cranes. Temporary lighting will be established by installing temporary wood poles with the use of auger trucks and placing equipment. The poles will be complete with arms and lights.

Temporary traffic signals will consist of traffic signal heads positioned on span wires or temporary poles. These will be installed prior to removal of existing traffic signals. Permanent traffic lighting will be constructed on sectional steel poles protected by curbs and/or guide rails. Both temporary and permanent traffic lighting will be installed in accordance with Ontario Traffic Manual Book 12. New traffic lights will be bagged until the roadway or ramp is ready for use, and will be commissioned by certified personnel prior to use.

4.1.7 Utility Relocations

As part of this DCR #2, the scope of utility relocations are as follows, organized by location. These relocations build on the scope previously identified in DCR #1:

Finch Avenue

- Temporary relocation, protection, and reinstatement of buried telecommunications (Bell) wires

Albion Road

- Temporary Protection of subsurface Enbridge gas-line (if needed)
- Temporary Protection of an existing City of Toronto watermain (if needed)
- Temporary Protection of City of Toronto sanitary sewer (if needed)

Steeles Avenue

- Temporary Protection of Rogers conduit (if needed)
- Temporary Protection of two Region of York watermains (if needed)
- Temporary Protection of Toronto Hydro Street Lighting (if needed)
- Temporary Protection of MTO & 407 Electrical Cabinets (if needed)

Highway 7

- Protection of underground telecommunications (Bell) infrastructure
- Temporary Protection of Enbridge gas infrastructure (if needed)
- Temporary Protection of TransCanada gas infrastructure (if needed)

Construction Methods

Subsurface utility relocation will be performed with a combination of trenched and trenchless operations. Trenched operations will include the use of excavators to create the trench, dump trucks to haul excavated materials for treatment and reuse on-site, trench boxes to protect workers and compacting equipment to ensure optimal ground conditions. Trenchless technology operations such as jack and boring and directional drilling will require construction of pits and receiving areas and will utilize specialized trenchless equipment to perform the relocation. Both these subsurface relocation operations will also require laydown areas to store conduits, pipes and any other materials required for the operation.

Above ground utility relocations will consist of hydro pole relocations adjacent to crossing roads. Similar to subsurface operations, laydown areas might be required for storage of poles. In addition, this work will likely require daily lane-closures along crossing roads during the permitted closure periods.

All applicable permits, licenses and approvals from municipalities, regions, or other third party agencies will be obtained prior to starting these works or as required. LINK427 has reviewed permit requirements, and has summarized the list of tentative permits as follows. LINK427 will continue to monitor these requirements and make any required adjustments as design is developed and construction commences.

Table 7: Utility Relocation Permitting Requirements – Highway 427 Widening Section

Location	Utility	Permitting Type/Agency						
		MTO Encroachment	Municipal Consent & Road Occupancy	TRCA	TCPL	HONI Corridor	407ETR	Noise Bylaw Exemption
Finch Ave.	Bell (Protection Only)							
Albion Rd.	Enbridge (Protection Only)**							
Albion Rd.	City of Toronto (Protection Only)**							
Albion Rd.	THES	✓						
Steeles Ave.	407ETR & MTO (Protection Only)**							
Steeles Ave.	York Region (Protection Only)**							
Steeles Ave.	Rogers (Protection Only)**							
Steeles Ave.	THES	✓						
Steeles Ave.	Hydro One	✓						
Highway 7	Enbridge (Protection Only)**							✓**
Highway 7	Bell (Protection Only)							✓**
Highway 7	Alectra	✓	✓		✓			✓**
Highway 7	Rogers	✓	✓		✓			✓**
Highway 7	TCPL (Protection Only)**				✓			✓**
Highway 7	Hydro One	✓	✓		✓			✓**
**Provisional Scope								

Temporary protection measures will include exposing the existing utility by means of hydro-vac or hand-excavation in the area of potential conflict. With the location of the utility known, temporary protection structures (e.g., temporary shoring, sheet piling) will be installed adjacent to the utility so as to not sacrifice structural stability of the utility and surrounding materials during excavation for structural widening works. This will also assist in reducing overall vibrations experienced on the utility due to construction operations. For temporary protection of buried gas mains, protection measures such as utilizing crane mats as a cover layer over the gas mains will be employed to prevent damage.

No significant or long-term outages or disruptions to utility users are expected at any stage, however utility relocations or protections may require short-term duration traffic closures (i.e., implemented on a daily basis during prescribed hours) or temporary access roads and pads to provide a safe working area. Traffic impacts and mitigations associated with short-term duration traffic closures are discussed in section **5.2.5**.

4.1.8 Retaining Walls

The Widening section of Highway 427 contains the following retaining walls that will be built concurrent with mainline and interchange-ramp construction to minimize property impacts. Details of these retaining walls are summarized in the following table.

Table 8: Retaining Walls Summary

Retaining Wall No.	Alignment	Location	Start STA	Finish STA	Length	Max. Height	Wall Type
RW1	SB Hwy 427	West ROW	12+861	12+986	125m	1.0m	Gravity
RW2	SB Hwy 427	West ROW	13+026	13+189	163m	2.2m	RSS
RW3	SB Hwy 427	W-S Ramp Interface	13+830	13+970	140m	3.5m	RSS
RW4	NB Hwy 427 /Hwy 7 S-EW Ramp	East ROW	13+545	13+691	146m	3.0m	RSS

Both Gravity and RSS type retaining walls will be built in accordance with Ontario Provincial Standards, and RSS walls will also be designed in accordance with the MTO Qualification Procedures for Retained Soil Systems, RSS General Criteria, and other applicable specifications.

Whereas gravity walls will be cast-in-place concrete in nature, RSS walls will be precast concrete and both will include a smooth finish to ensure integration with the surrounding landscape. RSS wall manufacturers will also be selected based on the MTO Designated Sources for Materials list.

Construction Methods

Construction of gravity retaining walls (e.g. toe walls) will commence prior to fill material being placed for roadway (or interchange ramp) construction. If required, existing earth material will be excavated and the base will be compacted to ensure stability, and a spread footing will be constructed if required. Next, reinforcing steel bars will be installed (if required) and the wall will then be formed and poured in-place. Sufficient time will be given for the concrete to achieve strength, after which point earth fill and granulars will be laid to build up the roadway sub-base and base. The equipment to be used include bulldozers, excavators, and telescoping forklifts.

Construction of RSS walls be concurrent with construction of the associated interchange ramps and crossing roads. First, the spread footing for this retaining wall will be cast-in-place and the first row of panels will be installed. As earth fill and granulars are placed to build-up the roadway (or ramp), straps are placed perpendicular to the panels and into the fill material which will provide support for the retaining wall panels. As more material is placed to construct the roadway, more panels are placed until the retaining wall and roadway profiles are completed simultaneously. The equipment to be used include bulldozers, excavators, and telescoping forklifts.

4.1.9 Fencing (Security Fence)

Security fencing will be installed along the limits of the MTO ROW in some areas to deter pedestrians from accessing the highway during construction. A continuous security fence will be installed prior to the opening of the highway for public use.

Construction Methods

Construction of security fencing will be in accordance with MTO standards and manufacturer recommendations. The majority of these works will be placed by-hand and post-driving equipment will be used as required.

4.1.10 Construction Staging for the Highway 427 Widening

To accommodate construction of the Highway 427 widening, temporary road impacts will be required. However, these works will occur in stages on both the existing Highway 427 from south of Finch Avenue to Highway 7 as well as associated crossing roads between these limits: Finch Avenue, Albion Road, Steeles Avenue, and Highway 7.

The staging for widening of the existing Highway 427 from Finch Avenue to Highway 7 can be summarized in the following stages occurring between 2018 and 2020:

- Pre-stage [2018]
  - Prior to staging, the expansion joints at the Humber River and CNR structures will need to be installed.
  - Several access points will need to be constructed and shoulder strengthening in some areas will be required within the limits of the project.
  - Pond construction at the three sites (Highway 427 southbound between Albion Road and CNR, southeast corner of 407ETR and Highway 427, and northeast corner of 407ETR and Highway 427) will be constructed using short term off peak hour lane and shoulder closures.
- Stage 1A [2018]:
  - The southbound traffic will be shifted to the newly constructed median from south of Finch Avenue to Steeles Avenue where the traffic will be placed on the outside of the highway up to Highway 7. The northbound traffic will remain unchanged from south of Finch Avenue to Steeles Avenue but will be shifted to the outside of the highway from Steeles Avenue to Highway 7.
  - No changes to Highway 407ETR Mainline, minor alignment changes to the ramp tie-ins on Highway 427 southbound and northbound.
  - Work zones will be established for the rehabilitation and/or widening of Humber River, CNR, Albion Road, and Steeles Avenue.
  - North of Steeles Avenue to Highway 7, works will begin to construct the new median portion of Highway 427
  - Contunuation of pond construction at the three sites (427 southbound between Albion Road and CNR, SE corner of 407ETR and Highway 427, and NE corner of 407ETR and Highway 427) using short term off peak hour lane and shoulder closures.
- Stage 1B, 1C [2018]:
  - The southbound traffic will be shifted around to allow for localized construction and once the inside widening at Steeles Avenue is complete the traffic from Highway 7 to south of Finch Avenue will be completely within the median of the highway. The northbound traffic will remain unchanged from south of Finch Avenue to Steeles Avenue but will be switched into the median from Steeles Avenue to Highway 7.
  - No changes to Hwy 407ETR Mainline, minor alignment changes to the ramp tie-ins on Highway 427 southbound and northbound. The 407ETR southbound onramp will be staged so as to construct the widening. This will include an extended closure on a Saturday night to shift the superstructure over Albion Road into its new position.
  - The “works” (i.e., Mainline rehabilitation and widening, structural rehabilitation, and widening, all electrical and ATMS plant, Stormwater management, retaining walls and fencing) south of Steeles Avenue to Finch Avenue will be completed on the west side of the highway.

- The works north of Steeles Avenue to Highway 7 will be completed in the median and on the east and west side of Highway 427.
- Continuation of pond construction at the three sites (427 southbound between Albion Road and CNR, SE corner of 407ETR and Highway 427, and NE corner of 407ETR and Highway 427) using short term off peak hour lane and shoulder closures.

- Winter-over [2019]:
  - Once the works are complete the southbound traffic will be moved back to the existing section of the highway, out of the median. The northbound traffic will remain unchanged from south of Finch Avenue to Steeles Avenue and realigned back onto the existing section from Steeles Avenue to Highway 7.
  - No changes to Hwy 407ETR Mainline, minor alignment changes to the ramp tie-ins on Highway 427 southbound and northbound.
- Stage 2A, 2B [2019]:
  - The northbound traffic will be realigned onto the median of the highway from south of Finch Avenue to Highway 7. Intermediate ramp configurations will be implemented throughout the stages.
  - The southbound traffic will remain unchanged from the winter-over configuration.
  - No changes to Highway 407ETR Mainline, minor alignment changes to the ramp tie-ins on Highway 427 southbound and northbound.

    Outstanding tie-in works for ponds (SE corner of 407ETR and Highway 427, and NE corner of 407ETR and Highway 427) will be constructed using short term off peak hour lane and shoulder closures.
- Stage 2C/Winter-over [2019-2020]:
  - Both the southbound and the northbound traffic will be redirected onto the newly widened section and the remaining work in the center of the highway will be completed between Finch Avenue and Steeles Avenue. This stage will include the installation of a center barrier complete with high mast illumination and overhead signs.
  - North of Steeles Avenue both the southbound and the northbound traffic will be placed on the widened section of the highway between Steeles Avenue and Highway 7.
  - No changes to Highway 407ETR Mainline, minor alignment changes to the ramp tie-ins on Highway 427 southbound and northbound
  - Outstanding tie-in works for ponds (SE corner of 407ETR and Highway 427, and NE corner of 407ETR and Highway 427) will be constructed using short term off peak hour lane and shoulder closures

For the highway widening, construction activities will be enclosed and separated from the existing traffic with temporary concrete barriers (TCBs). Reductions in lane widths and temporary shifting of lanes will eliminate the need for lane closures for the majority of the work.

As mentioned previously, this project will also encompass staging on crossing roads to facilitate the construction of the highway widening works. This information is provided in detail below, grouped by crossing street. Furthermore, temporary localized lane closures will be required while implementing the various staging configurations as well as material deliveries which cannot be accommodated within the protected work areas. All changes to traffic conditions will be based on a safety-first approach and in accordance with the Project's Traffic Management Plan, as summarized below.

Finch Avenue

Staging	Timing	Work Span	Lane Reductions	Impacts to Pedestrians / Cyclists
Finch – 1	2018	■ Overnight lane closures to facilitate temporary works at the ramps	■ 1 Lane in each direction; OFF-PEAK ONLY	■ None
Finch – 2	2018	■ Finch Ave. lanes widths temporary reduced and shifted to facilitate median removal and median rehabilitation	■ 1 Lane in each direction; OFF-PEAK ONLY	■ None
Finch – 3	2018	■ Finch Ave. lanes diverted to the South to facilitate rehabilitation work on North structure	■ None	■ Temporary Sidewalk Provided on South side of Finch and across the Structure as the North sidewalk will be closed for repairs
Finch – 4	2018	■ Finch Ave. lanes diverted to the North to facilitate rehabilitation work on South structure	■ None	■ Temporary Sidewalk Provided on North side of Finch and across the Structure as the south sidewalk will be closed for repairs
Finch – 5	2019	■ Finch Ave. lanes diverted to the North and South sides to facilitate median reinstatement	■ None	■ Sidewalks reinstated
	2019	■ Final Configuration		

Albion Road

Staging	Timing	Work Span	Lane Reductions	Impacts to Pedestrians / Cyclists
Albion-1	2018-2019	■ Albion Road lane widths temporarily reduced and shifted to the south to facilitate structure construction on north side	■ None	■ North Sidewalk closed, Pedestrian traffic diverted to South side at intersections East and West of work zone
Albion-2	2018-2019	■ Albion Road lane widths temporarily reduced and shifted to the north to facilitate structure construction on south side	■ None	■ South Sidewalk closed, Pedestrian traffic diverted to North side at intersections East and West of work zone
	2019-2020	■ Albion Road lanes restored to new configuration		

Steeles Avenue

Staging	Timing	Work Span	Lane Reductions	Impacts to Pedestrians / Cyclists
Steeles-1	2018-2019	■ Steeles Avenue lane widths temporarily reduced and shifted to the middle to facilitate structure construction on both sides	■ None	■ Pedestrian access will be maintained through work zones
	2019-2020	■ Steeles Avenue restored to existing (pre-construction) configuration		

Highway 7 Interchange

Staging	Timing	Work Span	Lane Reductions	Impacts to Pedestrians / Cyclists
Hwy 7 – 1	2018	■ Hwy 7 ramp S-E/W lane widths temporary reduced and shifted to facilitate Hwy 427 widening and overnight lane closures of Hwy 7 lanes to facilitate temporary works at the S-E/W ramp	■ OFF-PEAK ONLY	■ None
Hwy 7 – 2	2018	■ Hwy 7 lanes widths temporary reduced and shifted to facilitate median removal and median rehabilitations	■ 1 Lane in each direction; OFF-PEAK ONLY	■ N/A
Hwy 7 – 3	2018	■ Hwy 7 lanes reduced and diverted to the South to facilitate rehabilitation work on North structure and construction of Northern ramps	■ 1 Lane EB and WB	■ North shoulder closed, Pedestrian traffic diverted to South side at intersections East and West of work zone
Hwy 7 – 4	2019	■ Hwy 7 lanes diverted to the North to facilitate rehabilitation work on South structure and construction of Southern ramps	■ 1 Lane EB and WB	■ South Sidewalk closed, Pedestrian traffic diverted to North side at intersections East and West of work zone
Hwy 7 – 5	2019	■ Hwy 7 lanes diverted to the North and South sides to facilitate median reinstatement	■ 1 Lane EB and WB	■ Existing sidewalks reinstated
	2019-2020	■ Final Configuration		

A graphical global representation of the staging and lane reductions with respect to the timeline of the Project is shown below in **Figure 6**.

Figure 6: Lane Reduction Timeline

Crossroad Staging Summary (Widening Section from Finch to Highway 7)											
Additional capacity											
No lane reduction											
One lane reduction per direction											
Road closure											
	2018				2019				2020		
Road	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall
Hwy 427 and Hwy 407ETR	Prestage/Stage 1A	Stage 1B	Stage 1C		Stage 2A	Stage 2B	Stage 2C	Stage 2C			Final Configuration
Finch Ave and Ramps	Stage 1	Stage 2	Stage 3		Stage 4			Final Configuration			
Albion Rd	Stage 1		Stage 2		Stage 2			Final Configuration			
Steeles Ave	Stage 1				Stage 1			Final Configuration			
Hwy 407 ETR ramps	prestage/Stage 1A	stage 1B	Stage 1C		Stage 2A	Stage 2B	Stage 2C	Stage 2C			Final Configuration
Highway 7	Stage 1	Stage 2	Stage 3		Stage 4			Final Configuration			
Hwy 7 S-E/W ramp improvements & WB											Final Configuration

4.1.11 Active Transportation

All existing facilities will being maintained during construction, including the Humber River Trail. All facilities that will be affected by construction will be reinstated prior to completion (affected areas are listed in the crossroad tables above). Furthermore, works at Highway 7 will result in a permanent addition of a Traffic/Bicycle railing on the north side of the Highway 7 Underpass.

During Construction

During construction, clear signage will be provided on how to safely traverse the site due to temporary closures or detours to the existing pedestrian and cycle routes along cross roads. The Humber Trail will experience no construction impacts.

4.2 Detailed Description of the Highway 427 Extension from Highway 7 to Major Mackenzie Drive

This subsection provides in-depth information on the scope of work and construction methods that will be used within the new extension section of Highway 427 (from Highway 7 to Major Mackenzie Drive). All similar information pertaining to the widening of Highway 427 (from Finch Avenue to Highway 7) is discussed above, and information on environmental impacts and mitigation measures are discussed in **Section 5.0**.

For the purpose of DCR #2, the project design established in the EA (January 2010) and subsequent TESRs (2013 and 2016) will be referred to as the Reference Concept Design. Refinements to the Reference Concept Design are described in **Section 4.2.1**.

4.2.1 Refinements to the Reference Concept Design

During the detailed design, the following refinements were made from the Reference Concept Design:

1. During the detail design, the profile of the highway was dropped by 1m at the Zenway Boulevard location reducing the overall vertical realignment of Zenway Boulevard by 1m. This was completed to assist in the construction of the grade separation between Highway 427 and Zenway Boulevard.
2. The eastbound to southbound (E-S) highway on-ramp at Rutherford Road was adjusted to accommodate the existing York Region Watermain vent chamber, the existing Alectra station entrance, the existing Alectra power plant and the adjacent ramp terminal.
3. The outlet from Pond 2 at Langstaff Road was changed from entering Rainbow Creek to a buried sewer with an outlet into the roadside ditch upstream of Rainbow Creek. This revised layout provides the required energy dissipation before entering Rainbow Creek. The original concept (RCD) consisted of an outlet into a steep bank of Rainbow Creek which would have required concrete headwalls with energy dissipation blocks as well as mitigation to the opposite creek bank and bed, the current design allows for the energy to be dissipated in a

plunge pool in the ROW, well away from Rainbow Creek. The flow will then pass through the vegetation and gently enter the watercourse.

4. The original design for Rob-7 at Major Mackenzie Drive at Station 10+375 was a culvert placed on a skew through the intersection with the northbound Highway 427 off-ramp. This was changed to a shorter box culvert placed perpendicular to the roadway with a minor realignment of the watercourse so as to allow for easier construction, access, and future maintenance. The realignment was designed within the MTO's protocol. The revised plans have been shown to the external stakeholders (the City of Vaughan and York Region).
5. The original design showed two bridges over Major Mackenzie Drive. The revised design shows one structure carrying both directions of traffic. The revised design does not reduce the number of lanes and is believed to be a more efficient space utilization, providing a simpler and less costly solution for the future ultimate expansion of Highway 427 north of Major Mackenzie Drive.
6. The staging at Zenway Boulevard and Regional Road 99 (Highway 427) in the original concept (RCD) was to provide two lanes in each direction during all stages of construction. The revised design shows a reduction in the number of lanes to match the traffic and construction requirements during stages 2 and 3. In stage 2, the northbound traffic will have two left turn lanes and one right turn lane. The two left turn lanes will match into two westbound lanes. The one right turn lane at Regional Road 99 (Highway 427) will match into one eastbound lane on Zenway Boulevard and develop a second lane prior to reaching the Rainbow Creek Drive intersection. This allows for increased construction of the vertical grade raise at both ends of the detour terminals. When Regional Road 99 (Highway 427) is closed permanently and the Zenway Boulevard traffic is transferred onto the newly vertically aligned Zenway Boulevard (discussed in section **4.2.4**), construction of the transition between the existing profile and the new profile of Zenway Boulevard must be constructed within the allowable times for short term- off peak closures. Thus, the modified design improves construction ease by allowing for the preparation of the transition for one lane each way over the structure prior to closure of Regional Road 99 (Highway 427). With traffic placed on the north side of the Zenway Boulevard structure after the closure, the remaining portions of the connections to the existing profile for the south side can be completed (similar to the RCD). This modification of the Zenway Boulevard staging is also supported by the understanding that volumes of traffic will be reduced once the access from/to Highway 427 Zenway Boulevard is terminated.
7. The profile of both Langstaff Road and the Highway 427 southbound has been revised to accommodate the minimum clearances required from the Hydro One wires, crossing the ROW. This required the profile of the Highway 427 southbound lanes to be lowered by approximately 2m, which consequential modifications to retaining walls and drainage facilities. To provide the clearance on Langstaff Road, the vertical curve of Langstaff Road was shifted to the west and the overall height of the Langstaff Road underpass deck reduced. The shifting of the curve resulted in a decrease of fill height over the existing Langstaff Road at the intersection of the highway and westward.
8. The horizontal alignment of Langstaff Road was changed from the original concept (RCD) of in-line grade-separation to off-line construction of the new Langstaff Road and shifted the profile north of the existing alignment. This revision allows for the new Langstaff underpass structure and a majority of the associated roadway to be constructed with no impacts on the travelling public.

4.2.2 New Highway Construction

The new proposed extension of Highway 427 consists of eight lanes from Highway 7 to Rutherford Road and six lanes from Rutherford Road to Major Mackenzie Drive. All general purpose lanes are designed to be 3.75 m in width, with fully paved median shoulders (generally 4.25 m with one narrower 2.5 m wide section). The outside shoulders will also be fully paved and 3.0 m wide. Speed change lanes will be 3.5 m wide. Typical profiles of the completed Highway 427 Extension section are provided below.

Figure 7: Typical Profile - New 8-Lane Highway 427 Extension Profile (Highway 7 to Rutherford Road)

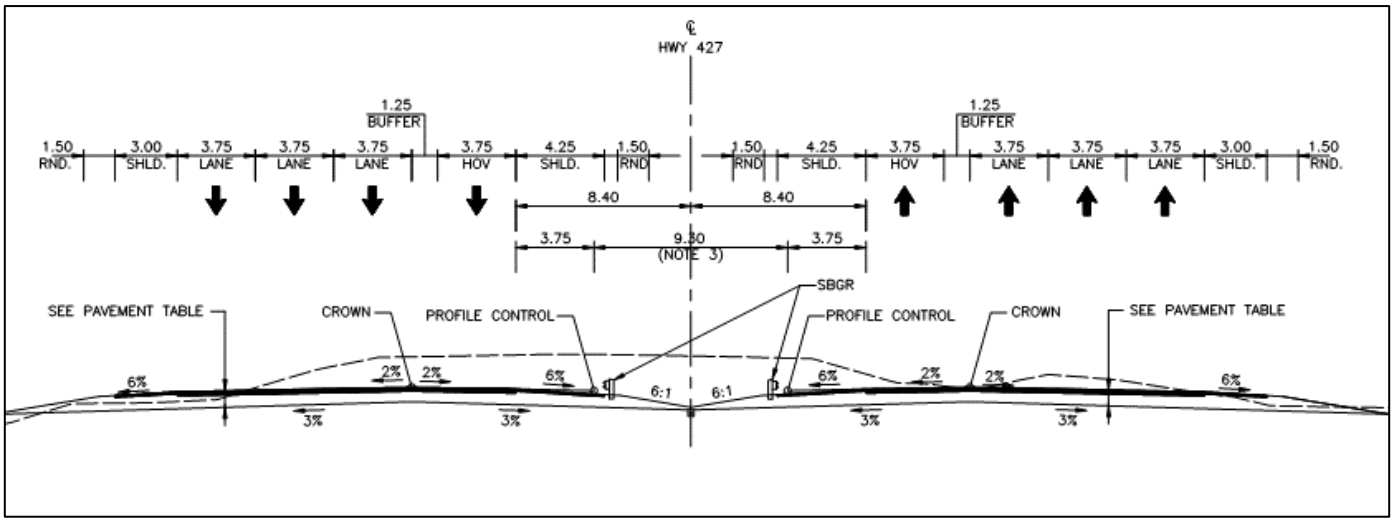
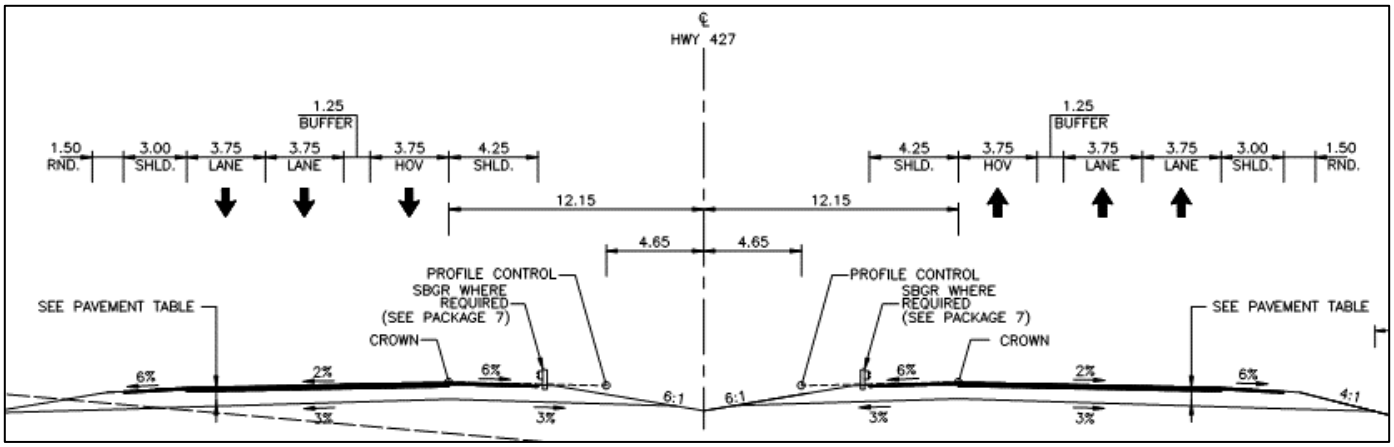


Figure 8: Typical Profile - New 6-Lane Highway 427 Extension Profile (Rutherford Road to Major Mackenzie Drive)



Construction Methods

Construction of the Highway 427 Extension will commence with vegetation grubbing and grading. In the spring of 2018, root materials, tree stumps and vegetation will be grubbed by excavators through grinding the remaining roots in place or removing them completely. Excavators, bulldozers, and trucks will then remove the topsoil for relocation to pre-determined locations for stockpiling, for later usage. The stockpiles will be placed in non-sensitive areas, protected with silt fence and sprayed with cover crop to mitigate any erosion and/or dust problems.

Once vegetation grubbing is complete, construction equipment including excavators, bull-dozers and rollers will begin constructing all ditch and roadway earth sub-surfaces. Excavated earth from areas across the project limits requiring a profile lowering will be redistributed around the site to be placed in other areas requiring a raising of the profile. Once these works are completed and a roadway sub-base is developed, the slopes will be covered with the stockpiled topsoil and sprayed with hydro seed/straw blankets as an erosion control measure.

Granular materials will be placed on the earth sub-surface of the highway as a base for the pavement. Once a granular pavement is in place, asphalt will be laid with spreaders and rollers. All granular materials will enter the site from the specified access locations and trucks will operate on the existing construction platforms within the ROW. Concrete crushing operations will only take place during daytime hours. Concurrent with excavation, granular placement and paving, stormwater drainage facilities will be installed. This includes pre-cast concrete and plastic pipes, pre cast box culverts, catch basins, and manhole structures.

To allow for storage of materials and equipment, laydown areas will be constructed at Langstaff Road and Major Mackenzie Drive. Furthermore, construction access will be via existing municipal roads, and haul routes will be via major roadways. Temporary detours will be constructed at Zenway Boulevard. The works at Langstaff Road, Rutherford Road, Barons Street, New Enterprise Way, Vaughan Valley Boulevard, Rainbow Valley Boulevard, and Major Mackenzie Drive will be completed using short term off-peak hour closures until the staging is implemented (to be included in later DCRs), to maintain traffic during construction. The Zenway Boulevard traffic will be shifted over to newly widened sections of the roadway and the existing paved surface will be removed. During the entire period of construction, traffic will be maintained either on the existing sections, realigned sections, or moved onto the new roads.

4.2.3 New Structures

As mentioned earlier, the existing Zenway Boulevard intersection to / from Highway 427 will be removed and Zenway Boulevard will be vertically realigned to cross over the new Highway 427 extension.

Zenway Boulevard Underpass

- The new underpass at Zenway Boulevard is designed as a two span bridge totaling 73.9 m in length, consisting of NU 2000 concrete girders, precast deck panels, a concrete topping, supported by H-Piles, false abutments, and a concrete centre pier on H-Piles.
- Zenway Boulevard at Highway 427 consists of four lanes, with a 1.5m sidewalk on both sides, with a minimum vertical clearance of 5.05m (5.0m required)

Design drawings for this structure are included in **Appendix C**.

In addition, this DCR #2 covers three structural culverts as described below:

Highway 427 at Station 11+130 (Rainbow Creek)

The new structural culvert under Highway 427 at Station 11+130 near Rainbow Creek is a single precast box culvert with a width of 4500mm, height of 1800mm, length of 98.38m, and depth of 2.65m. The culvert has a 0.53% slope, 178.970m upstream invert, and 178.450m downstream invert. The Openness Ratio is 0.074 for this culvert.

Highway 427 at Station 13+556 (West Robinson Creek)

The new structural culvert under Highway 427 at Station 13+556 near West Robinson Creek is a single precast box culvert with a width of 3000mm, height of 2400mm, length of 125.4m, and depth of 2.91m. The culvert has a 1.58% slope, 188.159m upstream invert, and 184.882m downstream invert. The Openness Ratio is 0.052 for this culvert.

Major Mackenzie Drive at Station 10+524

The new structural culvert under Major Mackenzie Drive at Station 10+524 is a single precast box culvert with a width of 3000mm, height of 1800mm, length of 64.65m, and depth of 1.21m. The culvert has a 0.70% slope, 200.828m upstream invert, and 200.500m downstream invert. The Openness Ratio 0.075 for this culvert.

Construction Methods

Construction of the bridge at Zenway Boulevard will begin by excavating for the bridge pier using excavators and trucks to haul the material for reuse on the site. Based on geotechnical data, there exists the potential for infiltration or seepage of water into the structural excavation site. In the event this occurs, infiltrated water will be pumped out from the excavation, contained / treated in filter bags, and dispersed over a vegetated area prior to infiltration to the ground or re-entry to an existing waterway. No large-scale or long-term pumping requirements are anticipated. Once the appropriate elevation has been reached the pier footing will be formed and poured with reinforced concrete, followed by the pier columns and the pier cap (beam). The abutment construction will begin by placing large fills for the embankments so that the underlying soils can compress under the weight and ensure no further settlement will occur after construction. Once the settlements are complete the deep foundations, H-Piles, installed using cranes with either hydraulic or pneumatic hammers, will be installed to support the weight of the structure. After the piling is complete the base of the abutments will be constructed using reinforced granular walls with precast panels. These walls will provide the support for the abutments to be formed and poured with reinforced concrete. Once the abutments are complete the precast girders and deck panels will be installed using cranes and transport trailers. The deck will then be cast tying the girders,

deck panes, and abutments together into one continuous element. Barrier walls, approach slabs, and sleeper slabs will follow soon after.

The structural culverts to be installed will be precast and brought to site on trailers. The culvert locations will be excavated using excavators and trucks hauling the excess materials to other parts of the site. Next, a clear stone bedding is placed to serve as a foundation along the length of the proposed structural culvert. Cranes will be employed to lift the culverts pieces into place and assembled into a continuous unit. Once complete, the culvert will be backfilled using excavators and bulldozers.

4.2.4 Crossing Roads (including grade separations) and New Interchanges

The scope in DCR #2 for the extension section of this project includes the construction of three (3) new interchanges, one at Langstaff Road, one at Rutherford Road, and one at Major Mackenzie Drive. The existing Interchange at Highway 7 will be modified from its existing configuration to include additional ramps to facilitate entrance and exit to / from the newly constructed extension section of Highway 427.

A “Parclo A-4” configuration will be utilized for the new interchanges at Langstaff Road and Rutherford Road, as well as for the modifications/additions to the Highway 7 interchange (see **Figure 9**). This includes implementing both traffic signals for exit ramps from the highway to municipal roads, and free-flowing loop/ straight-shaped entrance-ramps in both directions of the crossing street.

The Major Mackenzie Drive interchange (the northern termination of Highway 427) will be designed as a “Trumpet” configuration (see **Figure 10**) to provide a continuous transition for northbound highway travelers merging onto westbound Major Mackenzie Drive, as well as for all travelers entering the highway from Major Mackenzie Drive from both directions. Northbound highway traffic merging with eastbound Major Mackenzie Drive traffic will be transitioned through a signalized intersection.

Figure 9: Parclo A-4 Configuration

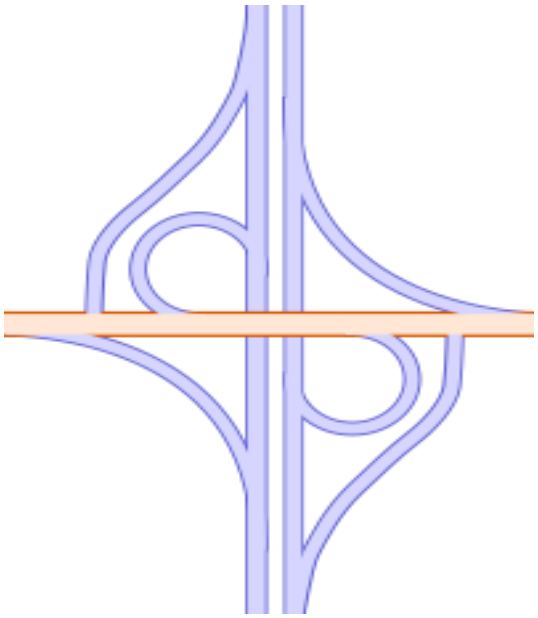
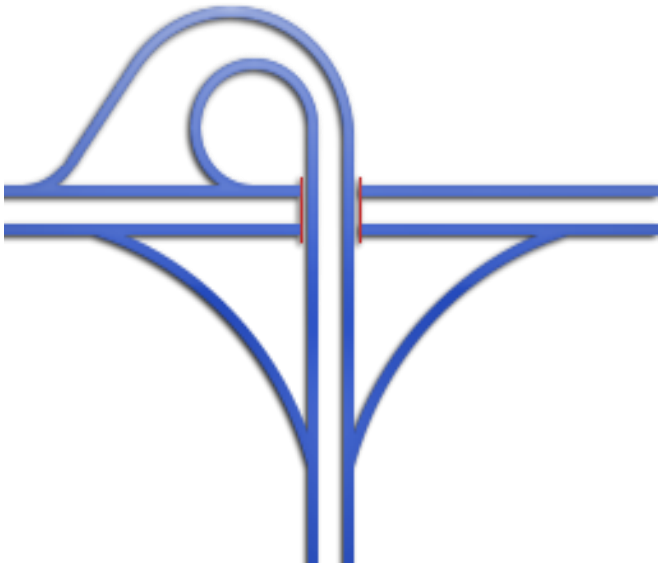


Figure 10: Trumpet Configuration



Furthermore, as part of DCR #2, certain local roads will be subject to permanent modifications to current driving conditions (including grade separations from the new Highway 427 extension), summarized in the following subsections. Details on staging that will be experienced on each of these crossing roads to facilitate the construction of the new Extension section of Highway 427 are provided in **Section 4.2.11** along with further discussions on expected impacts and mitigations in **Section 5.2.5**.

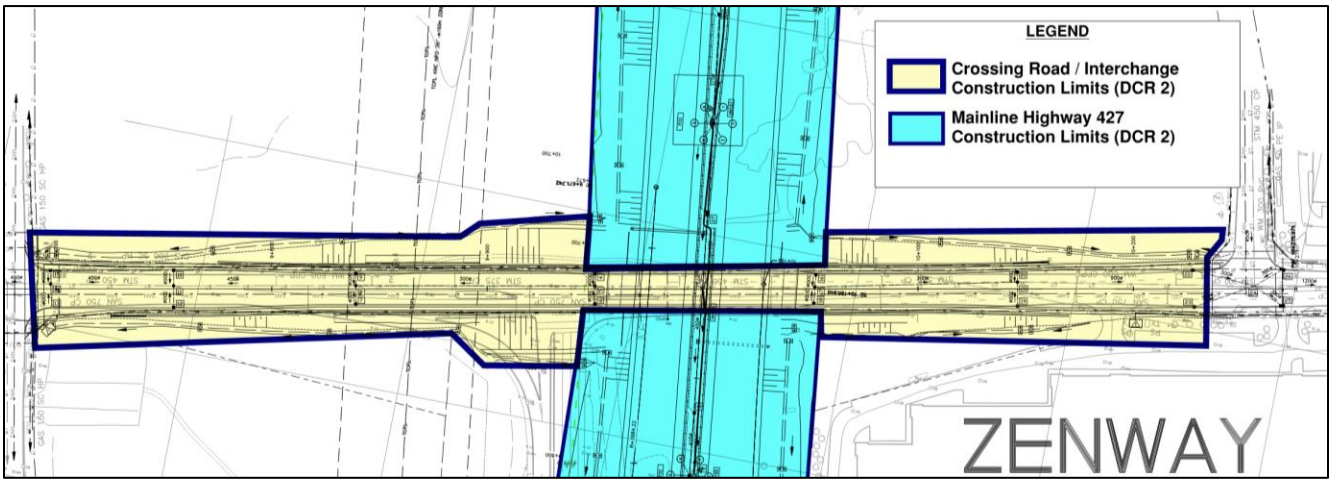
Regional Road 99 (also known as Highway 427) between Zenway Boulevard and Highway 7

Regional Road 99 (connection of Highway 427 between Zenway Boulevard and Highway 7) will be permanently closed and decommissioned to allow for the expansion of Highway 427 northerly to Major Mackenzie Drive. This will be performed over a two-month full closure of this portion of roadway near the end of the project, after which point users will be able to enter the new portion of Highway 427 from Langstaff Road or Highway 7

Zenway Boulevard

Subsequent to the Regional Road 99 (Highway 427) removal, the Zenway Boulevard intersection to / from Highway 427 will removed permanently, and Zenway Blvd will cross over the new Highway 427 atop its current location. This will be possible by implementation of a full 4-lane detour south of the existing alignment during the construction period (refer to **Section 4.2.11** for further staging details). Following the two month closure mentioned above, motorists will then be able to enter and exit Highway 427 (in either direction) from Highway 7 and Langstaff Road. The final alignment of Zenway Boulevard and the construction limits for work in this area included in DCR #2 are shown in **Figure 11** below.

Figure 11: Zenway Boulevard Construction Limits & Final Alignment



Langstaff Road

Langstaff Road will be permanently realigned to the north of its existing location. Traffic will be maintained on the existing alignment until the new alignment is constructed (staging and realignment of traffic to be detailed in future DCRs). Short term off peak hour closures will be utilized in the meantime following prescribed hours and Ontario Traffic Manual Book 7 requirements.

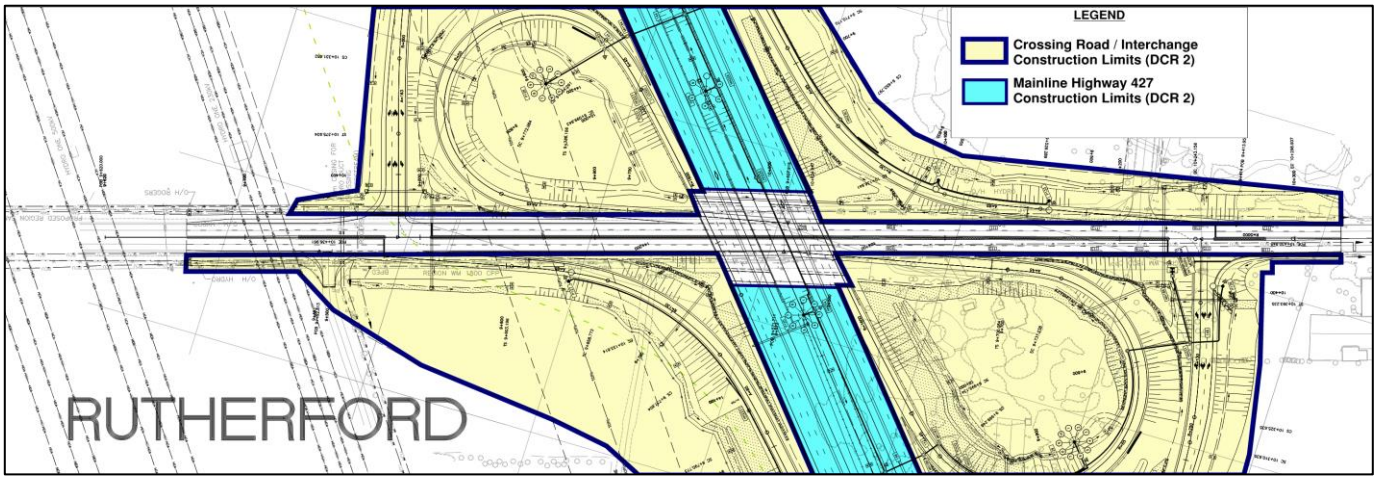
To clarify, the scope of this DCR #2 at Langstaff Road only includes roadway base construction work for the new alignment and new interchange ramps that can be accomplished without long-term staging implementation on the existing Langstaff Road. The scope of DCR #2 has no long-term impacts to existing travel conditions and does not include scope for construction of the new structures at Langstaff Road over proposed Highway 427 and Langstaff over Rainbow Creek. The final alignment of Langstaff Road and the construction limits for work in this area included in DCR #2 is shown in **Figure 12** below.

Figure 12: Langstaff Road Construction Limits & Final Alignment

Rutherford Road

Rutherford Road will not experience any permanent impacts, as the new extension of Highway 427 will be construction over existing Rutherford Road. To clarify, Scope of this DCR2 at Rutherford Road only includes roadway base construction work for the new interchange ramps that can be accomplished without long-term staging. The final alignment of Rutherford Road and the construction limits for work in this area included in DCR 2 is shown in the figure below.

Figure 13: Rutherford Road Construction Limits & Final Alignment



Huntington Road

Huntington Road access to Major Mackenzie Drive will be permanently closed north (2018) and south (2019) of the new Major Mackenzie Drive alignment with cul-de-sacs to avoid a conflict with the new Highway 427 construction. Access to Huntington Road south or north of Major Mackenzie Drive will still be possible from Highway 27 and Highway 50.

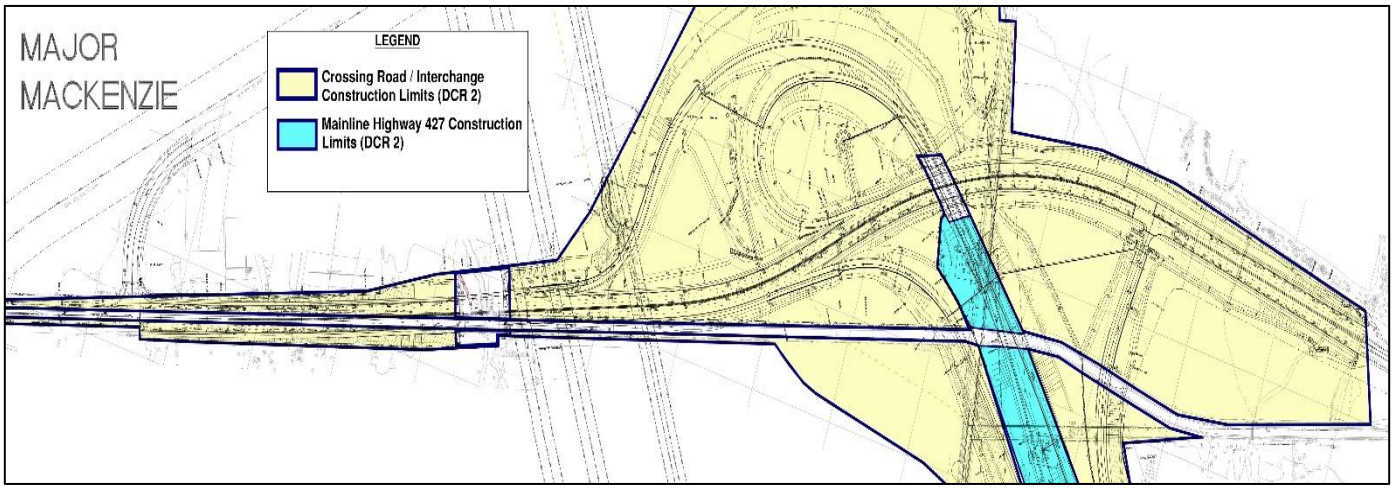
Major Mackenzie Drive

Major Mackenzie Drive (MMD) will be realigned northerly for a 1.5km section to allow for development of the new interchange and termination of Highway 427. Traffic will be maintained on the existing alignment until the new alignment is constructed (staging and realignment of traffic to be detailed in future DCRs). Short term off peak hour closures will be utilized in the meantime.

To clarify, the scope of this DCR #2 at Major Mackenzie Drive **only** includes roadway base construction work for the new alignment and new interchange ramps that can be accomplished without long-term staging implementation on the existing MMD. The scope of DCR #2 has no long-term impacts to existing travel conditions and does not include scope

for construction of the new structures at Highway 427 over the new MMD alignment and MMD over West Robinson Creek. The final alignment of MMD and the construction limits for work in this area included in DCR #2 is shown in the **Figure 13** below.

Figure 14: Major Mackenzie Drive Construction Limits & Final Alignment



McGillivray Road

McGillivray Road access from Rutherford Road will be removed in 2019 to achieve proper spacing for the Highway 427 interchange at Rutherford Road. McGillivray Road will still be accessible from Huntington Road (south of MMD).

Construction Methods

Due to the similarity in scope, interchange ramp and cross-road construction methods are generally consistent with the methods used for the extension of the Highway 427 mainline.

Construction of the Highway 427 Extension Interchange ramps will commence with vegetation grubbing and grading; root materials, tree stumps and vegetation will be grubbed by excavators through grinding the remaining roots in place or removing them completely. Excavators, bulldozers, and trucks will then remove the topsoil for relocation to pre-determined locations for stockpiling, for later usage. The stockpiles will be placed in non-sensitive areas, protected with silt fence and sprayed with cover crop to mitigate any erosion and/or dust problems. Once vegetation grubbing is complete, construction trucks (also including excavators and bull-dozers as well as rollers) will begin constructing all ditch and roadway earth sub-surfaces. Excavated earth from areas across the project limits requiring a profile lowering will be redistributed around the site to be placed in other areas requiring a raising of the profile. Once these works are completed and a roadway sub-base is developed, the slopes will be covered with the stockpiled topsoil and sprayed with hydro seed/straw blankets as an erosion control measure.

Granular materials will be placed on the earth sub-surface of the highway as a base for the pavement. Once a granular pavement is in place, asphalt will be laid with spreaders and rollers. All granular materials will enter the site from the specified access locations and trucks will operate on the existing construction platforms within the ROW. Concrete recycling operations will only take place during daytime hours. Concurrent with excavation, granular placement and paving, stormwater drainage facilities will be installed. This includes pre-cast concrete and plastic pipes, pre cast box culverts, catch basins, and manhole structures.

4.2.5 Stormwater Management and Drainage

The drainage within the extension is provided by two watercourses located within the Humber Watershed, including the Rainbow Creek Watershed and the Robinson Creek Watershed, both within the TRCA jurisdiction. Based on discussions with MOECC, MNRF and TRCA, the following design criteria were adopted.

Hydraulic Criteria

Cross culverts less than 6m in span were designed based on the 50-year design flow in order to convey all of the flow within the ROW to receiving stormwater management facilities for effective treatment. For areas with a drainage area greater than 125ha, structures were sized to convey the Regional Storm (Hurricane Hazel) with no significant increases in flood levels from that of the existing condition.

Stormwater Management Criteria

The following stormwater management requirements are provided in order to achieve the criteria set by the TRCA, MOECC, MNRF and DFO:

- Quality Control – Enhanced Protection Level (Level 1) quality treatment with special attention given to mitigation of thermal impacts on coldwater streams;
- Extended Detention – Extended detention of 40 m3/ha of the contributing upstream drainage area for all wetponds. The erosion storm values will follow the methodology provided in the report "Low Impact Development Stormwater Management Manual", dated November 2008. Erosion control will provide controls for the 25mm storm to be released over a minimum of 48 hours;
- Quantity Control – Quantity control will be provided where runoff from the proposed 427 Transportation Corridor is shown to have a negative impact on the downstream peak flows within the receiving watercourse and meet post- to predevelopment condition. All outlets from SWM ponds to receiving watercourses will comply with the TRCA's Storm Outfall and Outfall Channel Design Criteria.

Conditions covered under this DCR

The Drainage and stormwater management requirements throughout the extension limits include:

- Cross culverts to convey flows;
- flat-bottom swales to treat run-off;
- Temporary Sedimentation Basins;
- Temporary Swales; and
- Urban Stormwater systems

Drainage Features

There are three cross culverts, three sewer installations, and one culvert extension required for the works proposed in this DCR, the remaining cross culverts and major bridge crossings will be covered in later DCR's. These are shown in **Appendix C**. These culvert crossings, and sewer installations, will convey some of the tributaries of the Rainbow and Robinson Creeks. The culvert extension will handle a tributary of the Highway 50 Creek at Highway 7. As well, several minor culverts (non-structural) will be installed to distribute flow from the median ditch to the left/right ditches, and convey the flow to temporary stormwater management facilities. Components of an urban storm sewer system will be installed along the cross roads at Zenway Boulevard, Langstaff Road, and Major Mackenzie Drive. The urban systems at Langstaff Road and Major Mackenzie Drive will convey the stormwater runoff from the paved surfaces to the ditch lines and then into the temporary stormwater management facilities. The system at Zenway Boulevard will replace the existing City of Vaughan system and convey the stormwater from the paved surfaces to the City of Vaughan's Stormwater facilities.

There is an existing offline man-made waterbody (WB05) within the limits, just north of Zenway Boulevard that will require filling. This water body has no connection to the existing drainage in the area.

A Fluvial Geomorphology Assessment Report was also completed to evaluate all watercourse crossings and delineate watercourse reaches. This analysis provided recommendations related to sizing and placement of watercourse crossing structures and these recommendations have been incorporated into the sizing crossing treatments listed below in **Table 9**.

Table 9: Summary of Watercourse Crossing Treatment

Crossing Name	Watercourse	Station	Type
Rain 1	Rainbow Creek	11+130	4500 x 1800mm Box Culvert
Rain 4*	Rainbow Creek	-	1500mm Storm sewer outleting to Rainbow Creek
Rob 1	Robinson Creek	-	825mm Storm Sewer outleting to a future pond locaiton
Rob 2	Robinson Creek	13+556	3000 x 2400mm Box Culvert
Rob 3	Robinson Creek	-	1500mm Storm Sewer outleting to a future pond location
Rob 4	Robinson Creek	10+613 Rutherford Road	Existing Bridge to Stay
Rob 7	Robinson Creek	10+375 Major Mackenzie Drive	2400 x 1500mm Box Culvert

*Area diverted to Rain 3

Stormwater Management Strategy

The proposed stormwater management strategy consists of utilizing flat-bottomed grassed swales in all locations and implementation of temporary sedimentation basins/swales to provide quality and quantity control to runoff.

Specifically, existing drainage patterns are to be maintained as much as possible within the layout of the highway profile. Runoff from areas external to the ROW will be intercepted and conveyed to the temporary sedimentation basins and swales prior to entering the watercourses. Selection of proposed stormwater management practices was determined based on the drainage area contributing flows to local watercourses. The drainage area considered for stormwater management consisted of the complete ROW.

Further details and locations of the permanent stormwater management and their outlets to the downstream watercourses will be addressed in a future DCR.

Location of Sedimentation Detention Basins, Swales, and Check Dams

The location of drainage management facilities such as sediment detention basins, swales, and check dams, has been determined prior to commencing the works within each drainage catchment area. A detailed assessment was completed within each drainage catchment area along the Highway 427 Expansion to assess the adequacy of the land in terms of available area, soil characteristics, receiving water characteristics, etc.

Fish Habitat Enhancement and Restoration

Any instream or near stream works will be conducted during the appropriate in-warmwater construction timing (from July 1 to March 31) to protect the resident warmwater fish communities present at watercourse crossings. A warmwater construction timing window (from July 1 to March 31) shall also be applied for installation of the culverts and associated works at the minor watercourses supporting seasonal fish use or draining to a downstream fishery.

There are no existing culvert removals, within existing Fishery Habitat proposed under this DCR but there will be some minor realignments and reinstatements throughout the Project at the following locations:

Table 10: Summary of Watercourse Crossing – Fish Habitat Enhancement and Restoration

Crossing Name	Watercourse	Fishery	Station	Facility	Watercourse /Fish Habitat modifications
Rain 1	Rainbow Creek	Yes	11+130	4500 x 1800 mm Box Culvert	Minor Realignment
Rob 2	Robinson Creek	Yes	13+556	3000 * 2400 mm Box Culvert	Minor Realignment
Rob 7	Robinson Creek	Yes	10+375 Major Mackenzie Drive	2400 x 1500 mm Box Culvert	Minor Realignment

At the locations identified above the natural channel design principles were used for all realignment and/or reinstatements:

- Vegetation feature removals were minimized; and
- Morphological diversifications such as plunge pools were implemented
- Substrates were sized such that "anchor" stones will remain during large storm events, and mixed with smaller gravel, cobble, and sand.
- Smooth transitions between the upstream and downstream reaches
- Low flow channels to maintain fish passage during low flow conditions

Future DCR's will detail further enhancements such as:

- The replacement and/or enhancement of riparian and instream vegetation, which might include planting clusters of native trees, shrubs, and herbaceous species along the banks within the lands;
- The stabilization of banks that have eroded and slumped using up-to-date bioengineering techniques, which might include live staking, fascines, live crib walls and native material revetments;
- The installation of fish habitat structures, which might include cross logs, cabled log jams and boulder placement; etc.

Detailed plans for the installation of the box culverts and the minor realignment/restorations have been developed and will include the best management practices.

Erosion and Sediment Control

A detailed Erosion and Sediment Control Plan (ESCP) has been developed for the Project in accordance with the Environmental Guide for Erosion and Sediment Control During Construction of Highway Projects ('Environmental Guide': MTO 2015a). The ESCP documents the environmental protection measures for controlling erosion and sedimentation in order that performance can be readily measured, and the need for corrective actions can be determined. The ESCP provides the knowledge, awareness and methods necessary to complete the required work tasks in a manner that avoids or minimizes erosion and the potential impacts to the environment from sediment.

This ESCP addresses, among other topics:

- identification of areas prone to sedimentation;
- general and site specific measures that will be applied to:
    - mitigate soil erosion and shallow slope movement,
    - control sediment-laden flows, and
    - prevent sediment-laden water from entering watercourses.

This ESCP also includes a description of the inspection/monitoring program that will be implemented to check that the above described measures are working effectively.

As with all environmental management plans, the ESCP will be a 'Living Document' that will be updated as the project progresses through the various stages of design and construction to ensure information is relevant to current site activities and operations.

In addition to the general ESC measures, specific ESC measures for each water crossing will be developed, and presented in a specific Drainage and Sediment Management Plan (DSMP) developed for each watercourse crossing. These site-specific DSMPs will be provided in a series of drawings with a narrative.

Based on the requirements of the ESCP and DSMPs, an Environmental Inspector will conduct regular inspections of the temporary erosion and sedimentation control measures in accordance with Task ENV 7 of the Construction Administration and Inspection Task Manual (MTO 2010) and with the Environmental Guide for Erosion and Sediment Control during Construction of Highway Projects (MTO, 2015a).

Construction Period Drainage and Sediment control Plans

Construction Period Drainage and Sediment Management Plans (DSMPs) have been developed for the Project. The purpose of DSMPs is to provide water quality treatment of the runoff generated within all drainage catchment areas within the Lands before water is discharged to any watercourse. In addition to the water quality treatment, DSMPs also address attenuation of frequent runoff events, and sediment control. Each DSMP is site-specific and based on managing stormwater within each drainage catchment area located within the Project limits throughout each and every phase of construction.

Construction Methods

Prior to disturbing the ground and any of the existing drainage all of the existing watercourses (wet and dry) will be protected with the required erosion and sediment control measures outlined in the detailed drawings and the above mentioned ESCP and DSMP's, including but not limited to protections along all watercourses within the Project Limits and all outlets to downstream watercourses. As each catchment area is protected, the construction of the ditching, temporary swales, temporary sedimentation basins, and check dams will begin using excavators, bulldozers, and trucks to relocate the fill to other parts of the site. Temporary rock check dams will be installed in the ditch lines at the same time. A topsoiling operation will begin as soon as the final surfaces of the ditches, temporary swales, and sedimentation basins are constructed. A minimum of 50 mm of topsoil will be placed and further protected with either hydro seeding or hydro seeding with erosion control blankets. The drainage will be constructed from the outlets so as to always maintain positive drainage throughout the limits of the Project.

As the profile and cross section of the highway is exposed several minor culverts and/or sewer lines will be installed to distribute flow from the median ditch to the left/right ditches, as well as convey flow to the temporary sedimentation basins and swales.

Along the crossing roads urban storm sewer infrastructure such as pre-cast concrete drainage pipes, catch-basins, and manhole structures will be installed. These will be installed by first excavating a trench using an excavator to place these components in shallow installations. Deep trench operations (and operations under existing roadways) will include the use of excavators to create the trench, dump trucks to haul excavated materials for treatment and reuse on-site, trench boxes to protect workers and compacting equipment to ensure optimal ground conditions. The pipes and catchments structures will then be installed and backfilled with the appropriate materials. Once complete, these trenches will be covered with granular materials, placed using either excavators, bulldozers, or graders.

For the minor realignments and restorations at the fishery locations identified above, within the specified fisheries timing window of July 1 to March 31, the Best Management Practices will be used to develop and implement specific plans to:

- install the necessary erosion and sediment control measures;
- install the flow by pass systems (including but not limited to diversion pipes, screened pumps, coffer dams, etc.);
- conduct de-fishing operations;
- excavate the existing stream bed;
- installation of the culvert, substrate, plunge pools, and backfill;

- restoration of the channel; and,
- removal of the flow bypass and any temporary devices in the water course.

With these plans in place, non-structural culverts will installed and will be a combination of pre-cast concrete box structures as well as round plastic, concrete and/or corrugated steel pipe (CSP) structures. Most of this infrastructure will be placed by-hand or trenched if placed parallel to the highway, and subsurface installations such as jack-and-boring will be used in crossings underneath live-lanes. Larger structures will follow the methodology similar to structural culvert installation (described in section **4.2.3**). This includes excavation by excavators and trucks hauling the excess materials to other parts of the site. Next, a clear stone bedding is placed to serve as a foundation along the length of the proposed structural culvert. Cranes will be employed to lift the culverts pieces into place and assembled into a continuous unit. Once complete, the culvert will be backfilled using excavators and bulldozers.

The temporary swales and sedimentation basins will be constructed as shown on the drawings and will removed prior to the completion of the project.

4.2.6 Illumination

For Illumination in the Extension Section of Highway 427, the lighting currently applicable in DCR #2 is limited to Zenway Boulevard and Regional Road 99 (also known as Highway 427) between Highway 7 and Zenway Boulevard. Thus, on Zenway Boulevard, lighting will be maintained during construction by first installing temporary wood poles along the detours. The new alignment crossing over the Highway 427 will include new light poles with High Pressure Sodium Lights. The existing lighting on Regional Rd 99 (Highway 427) will also be maintained throughout construction until the road is permanently closed and the new Highway 427 is opened.

For clarity, details on the new signalized intersections for Highway 427 off-ramps (northbound and southbound) at Langstaff Road, Rutherford Road, and MMD as well as information on ATMS, will be provided in future DCRs.

Construction Methods

Civil provisions for this stated infrastructure will occur concurrently with the construction of the new roadway. The civil provisions will be installed in the new boulevards and through the new Underpass structure. The poles will be installed using bucket trucks and other lifting equipment.

Temporary traffic lighting will consist of traffic signal heads positioned on span wires or temporary poles. This work will be installed in accordance with Ontario Traffic Manual Book 12.

4.2.7 Utility Relocations

As part of this DCR #2, the scope of utility relocations are as follows, organized by location. These relocations build on the scope previously identified in DCR #1:

Zenway Boulevard

- Bell subsurface telecommunication relocation
- Alectra (hydro) transformer relocation
- Associated removals/abandonment of existing infrastructure
- Relocation of Street lighting
- Temporary Protection of TransCanada gas main

Langstaff Road

- Bell subsurface & aerial telecommunication relocation
- Alectra hydro wires relocation atop poles to match permanent realignment
- Subsurface relocation of hydro and telecommunication wires within vicinity of Hydro One Networks Incorporated (HONI) transmission towers to maintain clearances
- Associated removals/abandonment of existing infrastructure
- Temporary Protection of TransCanada gas main

Rutherford Road

- Subsurface relocation of hydro (Alectra) and telecommunications (Bell / Rogers) to facilitate interchange and overpass structure construction
- Associated removals/abandonment of existing infrastructure
- Temporary Protection of TransCanada gas main
- Construction of buried Bell infrastructure within the Hydro One corridor

Major Mackenzie Drive & Huntington Road

- Subsurface and Arial relocation of existing Alectra hydro infrastructure to match the new Major Mackenzie Drive alignment. Telecommunication will be also be relocated underground, parallel to the new alignment
- Installation and upgrades to storm-sewers and drainage infrastructure
- Temporary protection of TransCanada Pipeline and Enbridge Gas infrastructure (as needed) for access to Kellam House, as the existing pipelines are shallow
- Associated removals/abandonment of existing infrastructure
- Construction of buried Bell infrastructure within the Hydro One corridor

Construction Methods

Subsurface utility relocation will be performed with a combination of trenched and trenchless operations. Trenched operations will include the use of excavators to create the trench, dump trucks to haul excavated materials for treatment and reuse on-site, trench boxes to protect workers and compacting equipment to ensure optimal ground conditions. Trenchless technology operations such as jack and boring and directional drilling will require construction of pits and receiving areas and will utilize specialized trenchless equipment to perform the relocation. Both these subsurface relocation operations will also require laydown areas to store conduits, pipes and any other materials required for the operation.

Above ground utility relocations will consist of hydro pole relocations adjacent to crossing roads. Similar to subsurface operations, laydown areas might be required for storage of poles. In addition, this work will likely require daily lane-closures along crossing roads during the permitted closure periods. All applicable permits, licenses and approvals from municipalities, regions, or other third party agencies will be obtained prior to starting these works or as required. LINK has reviewed these permitting required, and has summarized the list of tentative permits as follows.

Table 11: Utility Relocation Permitting Requirements – 427 Extension Section

Location	Utility	Permitting Type/ Agency					
		MTO Encroachment	Municipal Consent & Road Occupancy	TRCA	TCPL	HONI Corridor	Noise Bylaw Exemption
Zenway Blvd.	Enbridge	✓					✓**
Zenway Blvd.	Bell	✓	✓		✓		✓**
Zenway Blvd.	Alectra	✓					✓**
Zenway Blvd.	City of Vaughan	✓			✓		✓**
Zenway Blvd.	TCPL (Protection Only)**				✓		✓**
Langstaff Rd.	Bell	✓	✓	✓	✓	✓	✓**
Langstaff Rd.	Alectra	✓		✓	✓	✓	✓**
Langstaff Rd.	City of Vaughan	✓			✓		✓**
Langstaff Rd.	TCPL (Protection Only)**				✓		✓**

Rutherford Dr.	Bell	✓	✓		✓	✓	✓**
Rutherford Dr.	Alectra	✓			✓		✓**
Rutherford Dr.	Rogers	✓			✓		✓**
Rutherford Dr.	TCPL (Protection Only)**				✓		✓**
MMD	Bell	✓	✓	✓	✓	✓	✓**
MMD	Alectra	✓	✓	✓	✓	✓	✓**
MMD	TCPL (Protection Only)**				✓		✓**
MMD	Enbridge (Protection Only)**						✓**
**Provisional Scope							

No significant or long-term outages or disruptions to utility users are expected at any stage, however utility relocations or protections may require short-term duration traffic closures (i.e., implemented on a daily basis during prescribed hours) or temporary access roads and pads to provide a safe working area. Traffic impacts and mitigations associated with short-term duration traffic closures are discussed in **Section 5.2.5**.

4.2.8 Watermains and Sanitary Sewer Relocations

As part of this DCR #2, the scope of watermain and sanitary sewer relocations are as follows, organized by location:

Zenway Boulevard

- City of Vaughan Sanitary and Watermain construction (subsurface relocations)

Langstaff Road

- Subsurface relocation of City of Vaughan watermain

Construction Methods

The relocation of the watermains and the sanitary sewer will be completed using an open cut method where the trench will be fully excavated. Trenched operations will include the use of excavators to create the trench (upto and including 10m deep), dump trucks to haul excavated materials for treatment and reuse on-site, trench boxes to protect workers and compacting equipment to ensure optimal ground conditions. The new watermain and sanitary sewer on Zenway Boulevard will be installed in a joint use trench located on the north side of Zenway Boulevard. The associated chambers and fire hydrants will be installed at the same time. Once the new plant is installed and tested the existing flows will be transferred into the new pipes and the old pipes abandoned in place. Existing chambers and hydrants conflicting with the new highway will be abandoned and/or removed as necessary.

The existing watermain on Langstaff Road will be relocated to the north of the existing roadway. Installed in a single use trench the watermain and associated chambers/fire hydrants will be installed at the same time. At the west end of the watermain relocation is Rainbow Creek. The watermain will be open cut across the creek as the depth will be very shallow to tie into the existing watermain on the west side of Rainbow Creek. A permit will be obtained from the DFO and the work will be performed in the dry with the appropriate coffer dams installed, flow bypass achieved, work zone de-fished, and subsequently temporarily restored. This work will be done within the allowable fisheries timing windows indicated in **Section 4.2.5** Stormwater Management and Drainage. The channel is scheduled for permanent restoration and realignment with the works to be included under a subsequent DCR. Once the testing is complete the flow will be transferred from existing watermain and the old system abandoned. Existing chambers and hydrants conflicting with the new highway will be abandoned and/or removed as necessary.

No significant or long-term outages or disruptions to the users are expected at any stage, however the relocations may require short-term duration traffic closures (i.e., implemented on a daily basis during prescribed hours). Traffic impacts and mitigations associated with short-term duration traffic closures are discussed in **Section 5.2.5.**

4.2.9 Retaining Walls

This project will contain multiple retaining walls across the project lands to minimize property impacts, as summarized by the following table.

Retaining Wall No.	Alignment	Location	Start STA	Finish STA	Length	Max. Height	Wall Type
RW5	Zenway East Approach	South	9+829	9+900	71m	6.8m	RSS
RW6	Zenway West Approach	North	9+844	9+897	53m	3.7m	RSS
RW7	Zenway East Approach	South	10+038	10+096	58m	5.8m	RSS
RW8	Langstaff-Ramp E-N	Right	9+720	9+760	40m	2.25m	RSS
RW9	SB Hwy 427	Left	12+529	12+570	41m	2.25m	RSS
RW10	MMD S-E RAMP	At East ROW Limit	10+170	10+205	35m	1.5m	Gravity

Both Gravity and RSS type retaining walls will be built in accordance with Ontario Provincial Standards, and RSS walls will also be designed in accordance with the MTO Qualification Procedures for Retained Soil Systems, RSS General Criteria, and other applicable specifications.

Whereas gravity walls will be cast-in-place concrete in nature, RSS walls will be precast concrete and both will include a smooth finish to ensure integration with the surrounding landscape. RSS wall manufacturers will also be selected based on the MTO Designated Sources for Materials list.

Construction Methods

Construction of gravity retaining walls (e.g. toe walls) will commence prior to fill material being placed for roadway (or interchange ramp) construction. If required, existing earth material will be excavated and the base will be compacted to ensure stability, and a spread footing will be constructed if required. Next, reinforcing steel bars will be installed (if required) and the wall will then be formed and poured in-place. Sufficient time will be given for the concrete to achieve strength, after which point earth fill and granulars will be laid to build up the roadway sub-base and base. The equipment to be used include bulldozers, excavators, and telescoping forklifts.

Construction of RSS walls be concurrent with construction of the associated interchange ramps and crossing roads. First, the spread footing for this retaining wall will be cast-in-place and the first row of panels will be installed. As earth fill and granulars are placed to build-up the roadway (or ramp), straps are placed perpendicular to the panels and into the fill material which will provide support for the retaining wall panels. As more material is placed to construct the roadway, more panels are placed until the retaining wall and roadway profiles are completed simultaneously. The equipment to be used include bulldozers, excavators, and telescoping forklifts

4.2.10 Fencing (Security Fencing)

Security fencing will be installed along the limits of the MTO ROW in some areas to deter pedestrians from accessing the highway during construction. A continuous security fence will be installed prior to the opening of the highway for public use. For this requirement, chain-link security fencing will be used in accordance with MTO standards.

Construction Methods

Construction of security fencing will be in accordance with MTO standards and manufacturer recommendations. The majority of these works will be placed by-hand and post-driving equipment will be used as required.

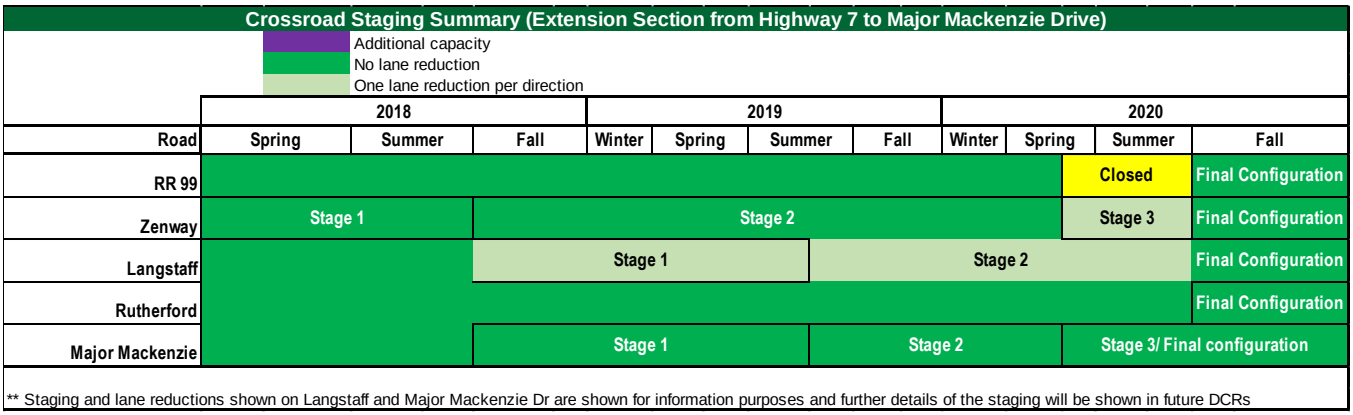
4.2.11 Construction Staging

In order to facilitate the new Highway 427 extension and associated crossing-road grade separations and new interchanges and signalized intersections, certain local roads experience staging. This information is provided in detail below. Furthermore, temporary localized lane closures will be required while implementing the various staging configurations as well as material deliveries which cannot be accommodated within the protected work areas. All changes to traffic conditions will be based on a safety-first approach and in accordance with the project Traffic Management Plan.

Zenway Boulevard Staging				
Staging	**Timing**	**Work Span**	**Lane Reductions**	**Impacts to Pedestrians/Cyclists**
Zenway – 1,2	2018-2020	■ Zenway Boulevard temporarily diverted in full to a long term detour south of existing roadway to facilitate structure and approach construction	None	■ Pedestrians will be diverted to the South side at the closest signalized intersections. The existing sidewalk on the North side will remain open during Stage 1 but will be closed in stage 2
Zenway – 3	2020	■ Zenway Boulevard lanes shifted atop new structure and approaches to facilitate retaining wall construction; ■ Regional Road 99 interchange permanently removed in 40-day closure	When Zenway is vertically realigned there will be only two lanes crossing over Hwy 427	■ Pedestrians will be diverted to the North side at the closest signalized intersections. The existing temporary sidewalk on the South Side of Zenway will be closed.
		■ Final Configuration	None	■ Pedestrians will have access to sidewalks on both the North and South sides of Zenway.

A graphical global representation of the staging and lane reductions with respect to the timeline of the Project is shown below in **Figure 14**.

Figure 15: Lane Reduction Timeline



To clarify, long-term staging on other crossing roads (i.e., Langstaff Road, Rutherford Road, and Major Mackenzie Drive) will be included in future DCRs. As previously mentioned, work at these locations for this DCR #2 will be limited to roadway base construction work for the new alignments and new interchange ramps that can be accomplished without implementation of long-term staging. The scope of DCR #2 has no long-term impacts to existing travel conditions at these other crossing roads.

4.2.12 Demolition

The scope of work for this DCR 2 includes demolition of the two farmsteads. This will include the farm stead at 9571 Huntington Road which contains a Concrete Block Barn, and the farm stead at 9711 Huntington Road which includes a farm house, barn silo, and two driving shed structures. The property at 10200 Hunting Road, the Kellam House, and Barn out structures will be preserved and mothballed until September 2018 under DCR #2. These structures will be demolished after September 2018, after which time Barn Swallows normally vacate their nests. Should Barn Swallows or BATs be present, they will be removed after obtaining the proper ESA permit, and addressed in a future DCR.

Construction Methods

The demolition of these structures will be undertaken according to the approved Demolition Plan. This approved plan will outline the requirements to mitigate dust noise and demolition waste. The following guidelines will be followed during demolition of the prescribed structures:

- Temporary fencing will be erected as required.
- Following clearance or approvals (as needed) from utility companies, all utility lines (including electrical, water, and sewer) will be disconnected at property line and all Utility meters and rentals are returned to the appropriate Utility Company prior to the start of demolition/ removal work.
- Prior to demolition all light bulbs, fluorescent tubes, ballasts and suspected mercury containing equipment will be removed.
- Dust will be controlled by standard dust control measures such as wet demolition methods as required
- Structural demolition will be performed systematically from top of building to bottom using excavators with bucket, grapple, hammer, and shear attachments.
- All hand work will be conducted from the ground such as separation of wood debris from metal and / or concrete.
- All well(s) will be decommissioned by a licensed contractor follow all applicable guidelines.
- All construction debris will be hauled offsite using roll offs and /or demo trailers.
- Construction debris will be taken to an appropriate landfill.
- All metals, concrete, and brick will be taken to a recycler.
- All mercury containing equipment will be disposed in accordance with O. Reg. 347.
- Any backfilling requirements will be done using existing clean fill from the Lands and graded to promote positive drainage.

4.2.13 Active Transportation

The existing facilities will be maintained during construction. New facilities are being added as part of the Project to the extension. In the final configuration the following new facilities will be constructed:

- Zenway Boulevard will have raised sidewalks on either side of the roadway from New Enterprise way to Rainbow Creek Drive.
- Rutherford Drive structure will allow for future expansion with a multi-use path and sidewalk on the boulevard.
- Langstaff Road will continue to have 1.5m bikelanes on either side and raised 5.0m boulevards. Jughandles (ramp designs) are provided at the ramp crossings.
- Major Mackenzie Drive will be constructed with a 3.0m Multi Use Path on the South Side and a raised sidewalk on the North side.
- The installation of AODA measures will be covered in a future DCR.

During Construction

During construction, clear signage will be provided on how to safely traverse the site due to temporary closures or detours to the existing pedestrian and cycle routes along cross roads. The Humber Trail will experience no construction impacts.

5. Environmental Impacts, Mitigation Measures and Commitments

This section identifies the impacts to the natural, socio-economic and cultural environments associated with construction of the components of the Highway 427 Expansion included in this DCR #2, and the proposed measures to mitigate potential effects during construction. Mitigation includes planning decisions, design features, construction requirements, construction constraints and the potential for follow-up monitoring requirements. The assessment of impacts is based on the scope of work described in detail in Section 4, which has been refined by LINK427 through the Detail Design process.

This section also describes and documents how the commitments outlined in the Highway 427 Extension Transportation Corridor Environmental Assessment Report (Individual EA) (January 2010), TESR (November 2013), TESR (January 2016) and the associated MOECC Notice of Approval (November, 2010) have been addressed with respect to the works proposed within DCR #2.

Construction works associated with this DCR #2 will not commence until the applicable permits, approvals and authorizations for those works are in place.

A number of commitments for additional work or environmental impact mitigation measures related to this project have been identified and are summarized below.

The key to ensuring effective environmental quality control and risk management during the project is the development and proactive implementation of an approach that:

- Identifies the environmental sensitivities;
- Presents the environmental protection measures in a way that can be translated into requirements and for which compliance can be verified; and,
- Includes a monitoring program that verifies that the environmental protection measures are being implemented and are effective.

LINK427 is committed to ensuring that this approach is applied proactively and consistently throughout the project. LINK427 has developed an Environmental Management System (EMS) and an Environmental Quality Management Plan (EQMP) to oversee implementation of this commitment throughout design and construction of the project.

5.1 Natural Environment

5.1.1 Terrestrial Ecosystems

5.1.1.1 Existing Conditions

Terrestrial field investigations were undertaken during the Individual EA (January 2010), TESR (2013), TESR (2016) in accordance with the MTO Environmental Reference for Highway Design (2013). Vegetation communities were classified based on the *Ecological Land Classification (ELC) System for Ontario*, and breeding bird surveys were completed according to the *Ontario Breeding Bird Atlas Field Program*. LINK427 conducted surveys in 2017 to review locations of rare plant species, invasive plant species and generally confirm site conditions within the lands.

Vegetation within the Lands is concentrated within the main valley crossings, as well as a few isolated farm woodlots and hedgerows. Vegetation communities documented within the Lands include the following ELC classifications shown on **Figures 16A** - **16D**:

- Dry-Fresh Oak – Hardwood Deciduous Forest (FOD2-4)
- Dry-Fresh Sugar Maple – White Ash Deciduous Forest (FOD5-8)
- Fresh-Moist Willow Lowland Deciduous Forest (FOD7-3)
- Fresh-Moist Bur Oak Deciduous Forest (FOD9-3)
- Dry-Moist Old Field Meadow (CUM1-1)
- Mineral Cultural Thicket (CUT1)

- Mineral Cultural Savanna (CUS1)
- Silver Maple Mineral Deciduous Swamp (SWD3-2)
- Cattail Mineral Shallow Marsh (MAS2-1)
- Reed Canary Grass Mineral Meadow Marsh (MAM2-2)
- Forb Mineral Meadow Marsh (MAM2-10)

All of the aforementioned vegetation communities are common vegetation communities in Ontario. Plant species documented within these communities are also generally common, tolerant species and are represented by a high proportion of non-native species, which is likely due to the high level of disturbance in the surrounding area.

Correspondence with the MNRF during previous study phases (i.e., during the Preliminary Design and Class EA study for the Highway 427 Extension widening) indicated the potential for Butternut (Juglans cinerea) to occur within the Lands. Butternut is a Species at Risk (SAR) listed as Endangered under the Endangered Species Act (ESA); however no Butternut trees were observed during field investigations conducted as part of the Individual EA (January 2010), TESR (2013), TESR (2016) or by LINK427 in 2017. No other SAR plant species have been documented or observed within the Project Lands. If Butternut are observed within 25m of the proposed work area during subsequent field investigations, MNRF will be contacted to determine appropriate next steps.

The EA (2010) notes a number of L-ranked (local ranking system developed by the TRCA) and regionally rare plant species have been documented within the Lands. LINK427 conducted targeted searches for L-ranked and regionally rare plants in September 2017 and documented two L-ranked species that will be impacted within the Lands: Running Strawberry-bush (Euonymus obovatus, L3) and Shagbark Hickory (Carya ovata var. ovata, L3) at two locations. A Rare Plant Salvage and Relocation Plan has been prepared by LINK427 and the plant salvage was conducted in advance of vegetation clearing, as documented in DCR#1 and the VRP. Those L-ranked species that were not salvaged are within retained vegetation areas that are protected by EPZ and / or tree protection fencing.

The EA (2010) also recommended reviewing the locations of mature Bur Oak trees at West Robinson Creek in order to determine if they could be retained. LINK427 surveyed these locations and has made an effort to revise the grading limits to retain three (3) of the four (4) trees identified. Tree protection fencing is in place to protect these retained trees during construction.

The clearing works described in DCR#1 will result in the removal of existing woody vegetation (except within the valleys, identified areas of SAR bat habitat, and in areas identified for the protection of vegetation). Works associated with DCR#2 include grubbing and grading in previously cleared areas. Future DCRs will include any remaining clearing and grubbing as required within the valleys for the new watercrossings.

Between Finch Avenue and Highway 7, the affected vegetation is limited to roadside cultural meadow with scattered trees and shrubs, most of which are non-native and/or planted species. There are also large areas of the invasive Common Reed (Phragmites australis) in the ditch lines. This roadside vegetation is already heavily disturbed by ongoing highway operation and maintenance activities. The trees and shrubs will have been removed as part of DCR#1.

Vegetation that will be affected between Highway 7 and Major Mackenzie Drive is also dominated by cultural meadow and agricultural fields, with more natural vegetation limited to the main valley crossings and three small, isolated farm woodlots (identified in the EA (2010) as FO-15, FO-17b and FO-19). One of the farm woodlots (FO17b) will be removed completely, while the others will be partially retained and protected with fencing / edge management (see mitigation measures below). As mentioned above, trees and shrubs largely have been removed as part of DCR#1 (with the exceptions previously noted).

Figure 16A: Vegetation Communities within the Lands

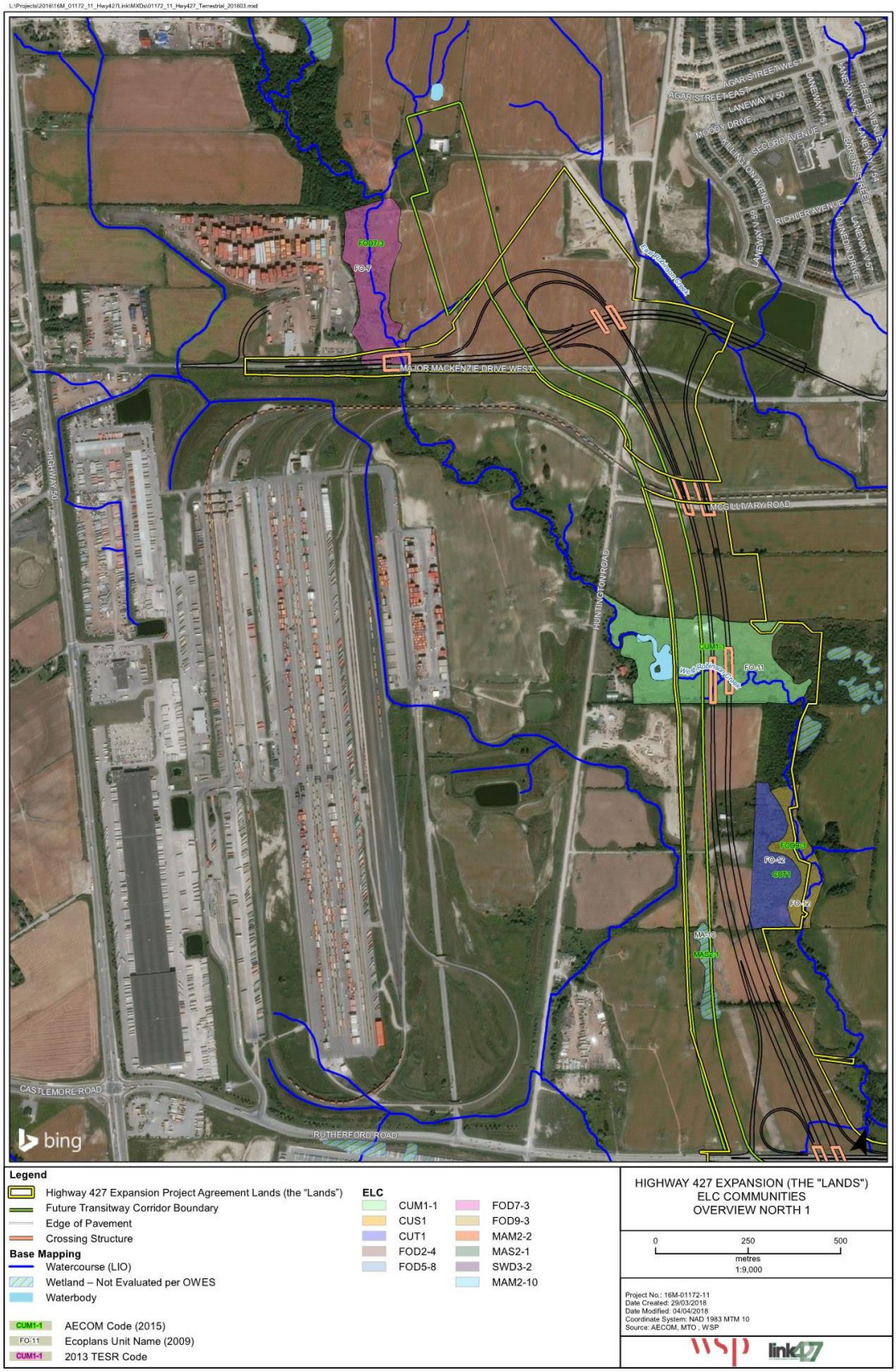


Figure 16B: Vegetation Communities within the Lands

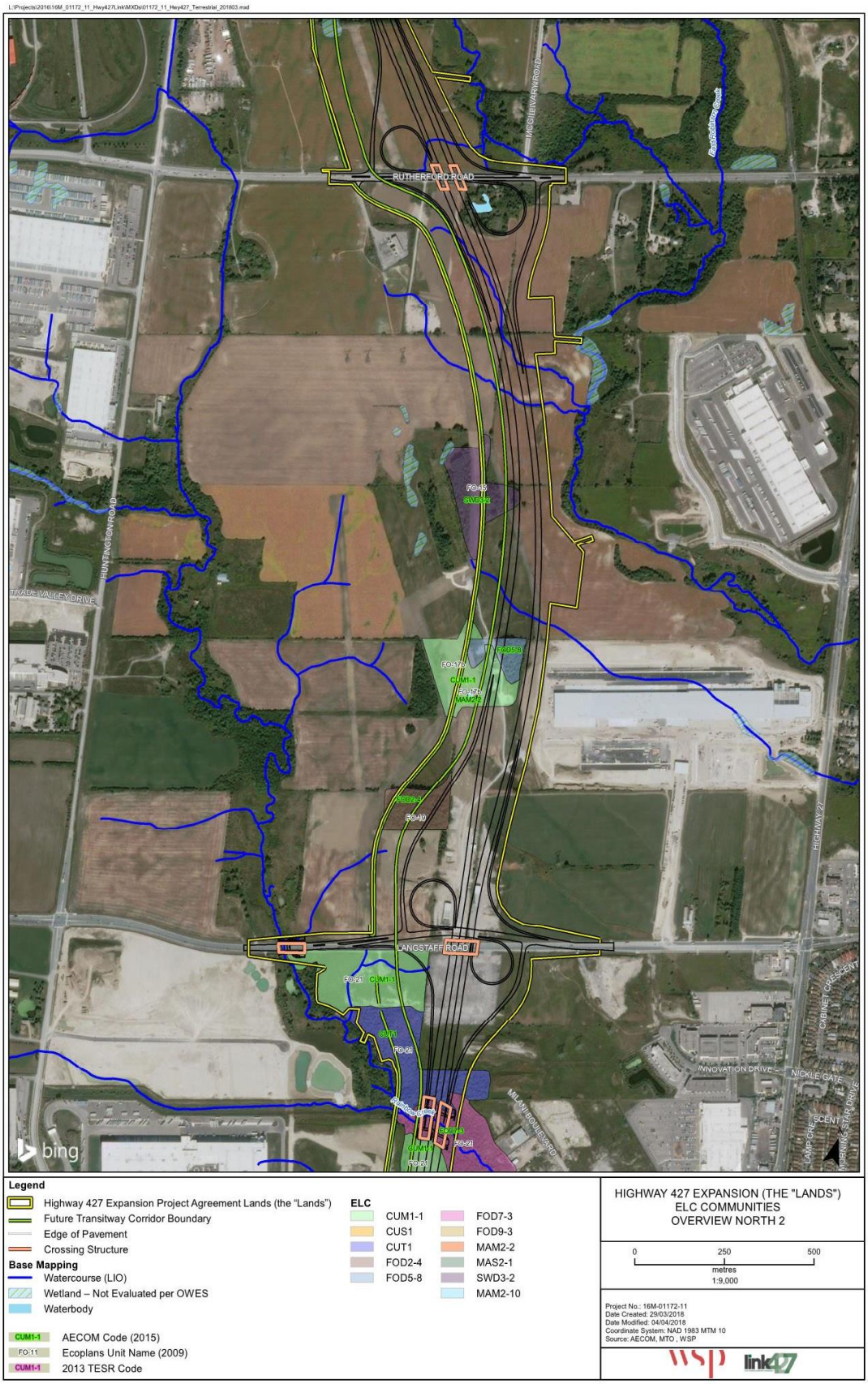


Figure 16C: Vegetation Communities within the Lands

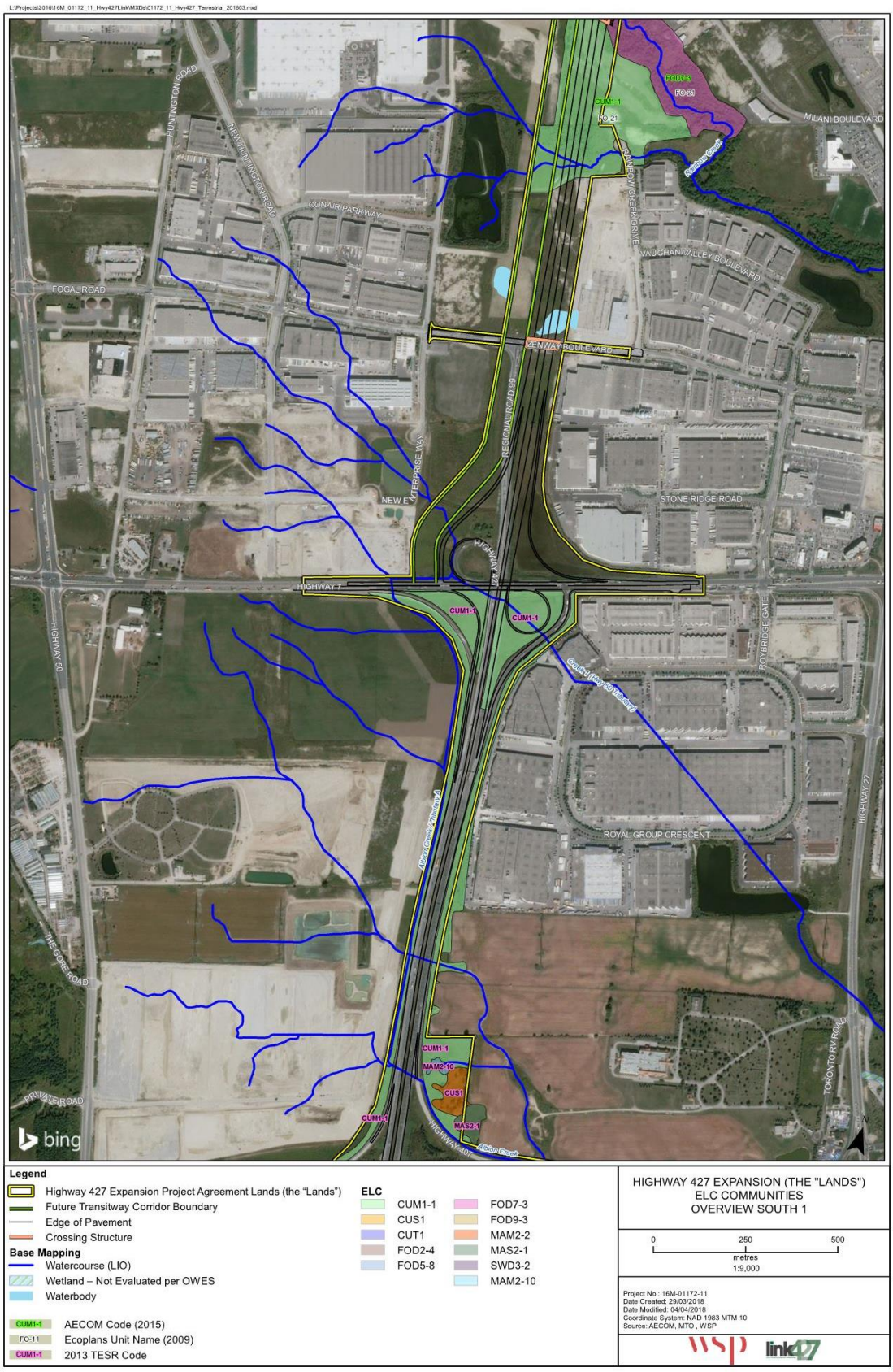


Figure 16D: Vegetation Communities within the Lands

5.1.1.2 Potential Impacts

As noted in Section 4, construction works associated with the DCR #2 include grubbing and grading in previously cleared areas. No additional clearing of vegetation is anticipated as part of DCR#2. Impacts to vegetation within the four main valley crossings will be addressed in a future DCR.

Given that the construction works south of Highway 7 are largely restricted to widening of the existing highway in an already heavily disturbed area, the potential for impacts to terrestrial ecosystems is greater north of Highway 7, where Highway 427 is being extended.

As described in Section 4, construction north of Highway 7 will commence with vegetation grubbing, topsoil stripping and grading. Root materials, tree stumps and vegetation will be grubbed by excavators through grinding the remaining roots in place or removing them completely. Excavators and trucks will then remove topsoil and relocate the materials to stockpile locations for later usage.

These grubbing and grading activities have the potential to result in the following effects to adjacent protected vegetation (as previously documented in the EA [2010] and TESRs [2013 and 2016]) and updated herein. Direct impacts (i.e. vegetation removals) have been addressed in DCR #1.

- Release of construction-generated sediment to adjacent vegetation areas.
- Vegetation clearing / damage beyond the working area.
- Spills of contaminants, fuels and other materials that may reach natural areas.
- Damage from excessive or improper application of herbicides and pesticides for ROW maintenance requirements.
- Damage to adjacent natural vegetation from roadway maintenance activities such as salting and sanding, structure/culvert repairs and ditch cleanout.
- Specifically, salt runoff and salt spray into vegetated areas may cause loss of vegetation vigour and in extreme cases, vegetation dieback, and spread of salt tolerant flora (halophytes).
- Changes in drainage patterns (groundwater and/or surface runoff flow) that can affect dependent vegetation / wetland areas located either upgradient or downgradient of the ROW. Blocking of existing surface / subsurface drainage patterns can result in vegetation dieback / condition changes through impoundment within or diversion of water away from a wetland. An increase in or focused concentration of runoff can also result in erosion and associated sedimentation impacts on receiving vegetation.
- Spread of invasive plant species through improper disposal of grubbed materials and/or stockpiled topsoil containing invasive plant seed and root materials.

5.1.1.3 Mitigation Measures

In order to prevent unintended impacts to adjacent vegetation, all vegetation not requiring removal will be protected with fencing prior to the initiation of the clearing works identified in DCR #1, and will remained fenced throughout construction, including the works identified in this DCR #2. Fencing and other mitigation measures designed to protect and limit the impacts to vegetation are outlined below.

Mitigation measures from the EA (2010) and TESRs (2013 and 2016) have been integrated herein as applicable to DCR #2. The following measures will be implemented during construction and specifically during works associated with DCR #2:

General Vegetation Protection Mitigation Measures

- Grubbing, grading and follow-up construction activities will be carefully planned prior to the start of construction in order to foresee and mitigate any environmental issues before they occur.
- The boundaries of the Lands will be clearly delineated on construction drawings and will be fenced prior to the start of works associated with DCR #1 and will be retained in place throughout the duration of works associated with DCR #2.

- Vegetation removal completed as part of the works associated with DCR #1 and grubbing completed as part of DCR #2 will be restricted to within the Lands, as identified in the design drawings.
- LINK427 has carefully reviewed construction impacts and made extensive efforts to minimize vegetation removals, including altering construction approaches to avoid entering valleys where possible, and to minimize impact where equipment is required to enter sensitive areas.
- Grading limits have also been refined to retain as much vegetation as possible, including a number of mature trees at West Robinson Creek.
- LINK 427 will protect and retain existing vegetation and trees, within identified protected vegetation areas.
- Protected vegetation will be clearly delineated in both the design drawings and will be fenced prior to the start of works associated with DCR #1 and will be retained in place throughout the duration of works associated with DCR #2.
- Prior to heavy machinery working adjacent to identified natural areas and vegetation communities, tree protection barrier fencing shall be installed outside the drip-line of the significant features to protect any vegetation that is to be retained and is in the vicinity of exposure to damage by machinery or other sources. This includes, but is not limited to, where vegetation removals will occur within forested communities. LINK427 shall ensure that all protection fencing conforms to the Ontario Provincial Standard Specification (OPSS) for the Protection of Trees (OPSS 801.07.02).
- Erosion and sediment control (ESC) measures will be installed according to the ESC Plan and as located on the design drawings and will be maintained throughout construction.
- Tree grubbing will be restricted to the required activity zone. Where grubbing is not required, tree stumps will be cut flush to the ground and grubbing will be avoided to minimize soil disturbance, particularly in erosion prone areas.
- In the event that adjacent vegetation communities or planted trees are accidently damaged during construction activities, LINK427 will implement appropriate contingency measures such as pruning tree limbs or roots that are accidently damaged using proper arboricultural techniques.
- Tree/shrub debris will be stored outside identified protected vegetation.
- Any trees/shrubs that are felled will be removed or mulched as soon as possible. During the breeding bird season (April 15th to August 15th) if trees or shrubs need to be removed, a clearance by a qualified biologist will be undertaken prior to any removals.
- Vegetation removals (including non-woody vegetation) shall take place outside of the appropriate timing windows for breeding birds and bats (see Section 5.1.3 for further details).
- Exposed surfaces shall be stabilized and seeded with a temporary seed mix in areas where woody vegetation planting is not to occur within 45 days from completion of the works. Other exposed surfaces will be seeded as per the Landscape Plan.
- Temporary stockpiles will be seeded with a temporary seed mix consisting of Oats (Avena sativa) in spring/summer and winter wheat (Triticum aestivum) in fall as recommended by MNRF to quickly stabilize these areas.
- Areas within the Lands with a high proportion of invasive species that will be removed as part of the advance clearing within DCR #1 (i.e., Buckthorn and Common Reed) will be delineated by LINK427 Plant Ecologist/Botanist(s) prior to the start of clearing activities. These species will be removed and disposed of separately in accordance with the Invasive Species Management Program (ISMP) to avoid the spread of these species with the Lands.
- LINK427 will restrict earth movement immediately adjacent to woodlands during periods of high dust generation. Dust suppressants will be applied during dry periods to those areas which generate large amounts of dust.
- Construction vehicle access will be limited to existing roadways and construction paths, away from the protected vegetation.
- Vehicle re-fueling stations will be located within a centralized location on-site away from the protected vegetation.
- For areas immediately adjacent to the protected vegetation, periodic supervision of the construction will occur.
- LINK427 shall undertake environmental inspection during construction to ensure that protection measures are implemented, maintained and repaired and remedial measures are initiated where warranted.

- There shall be no storage of materials within adjacent natural areas.
- LINK427 will ensure appropriate clearing and disposal of all construction-related debris following construction.
- A Vegetation Restoration Plan (VRP) has been developed in consultation with the Ministry of Natural Resources and Forestry (MNRF) and the Toronto Region Conservation Authority (TRCA). Once completed, the VRP will be used as the guiding document for future vegetation restoration activities. The VRP will be integrated with the erosion control plan, the invasive species management plan and requirements of the ESA permit for SAR Bats. The VRP and Landscape Plan, which is to be implemented as part of DCR #2 and future DCRs, include the following elements:
  - Planting at stormwater ponds will be designed to stabilize inlet and outflow areas and provide shading and bank stabilization. Additional planting around each pond will contribute to vegetative cover.
  - Native species will be utilized where possible, particularly adjacent to sensitive areas and valleys.
  - Vegetation enhancement will be performed in areas where it is likely to be successful and will contribute ecological benefit.
  - Areas of meadow marsh habitat will be created and integrated with the stormwater management system.
  - Site-specific mitigation will be performed at key locations such as woodlands and valleys, to enhance existing vegetation and habitat.
  - Other locations along the highway such as interchanges and embankments will be vegetated with a combination of aesthetic and naturalized plantings.

Per the MOECC Notice of Approval for the 2010 EA, the proponent shall make reasonable efforts during the detail design phase of the undertaking to minimize the removal of existing vegetation features, such as woodlands, and shall consider using any lands surplus to the highway and transitway construction for vegetative restoration. The following measures address this commitment:

- LINK427 has carefully reviewed construction impacts and made extensive efforts to minimize vegetation removals, including altering construction approaches to avoid entering valleys where possible, and to minimize impact where equipment is required to enter sensitive areas.
- Vegetation within valleys and in sensitive areas will be fenced outside the construction impact zones. Existing trees that can be retained will be protected during construction.
- Exposed surfaces will be stabilized and revegetated as quickly as possible (maximum 45 days from completion of the works).
- Clearing will be minimized and grubbing will be restricted to areas where it cannot be avoided. Trees will be felled away from natural areas.
- Significant trees have been identified for protection as described in the EA.
- Forest restoration and edge management will be implemented adjacent to wooded areas.
- Hedgerows will be protected where possible.
- Temporary seed mixes such as oats and winter wheat will be used to stabilize those areas that have been graded and must remain open over the late fall/winter months. Once final grading is completed seeding and planting will be installed in accordance with the appropriate section of the VRP.
- Site-specific mitigation will be performed at key locations such as woodlands and valleys, to enhance existing vegetation and habitat. These measures are documented in a future DCR.

5.1.2 Wildlife, Wildlife Habitat and Species at Risk

5.1.2.1 General Wildlife and Wildlife Habitat

5.1.2.1.1 Existing Conditions

As per the EA (January 2010), no significant wildlife habitat1 was identified by MNRF within the Lands. In general, the wildlife recorded within the Lands during the EA were common, generalist species tolerant of urban or semi-urban conditions. The 2016 TESR confirmed this finding through the statement that: "it has been confirmed that no significant wildlife habitat exists within the Lands and the removal of non-specialized and non-significant marginal habitat can be mitigated as to avoid adverse effect on the non-specialized wildlife observed within the Lands" (p.33). The observed species assemblage was consistent with the cultural habitat mosaic, proximity to development and moderate to high levels of disturbance within the Lands. As noted in the 2010 EA, the two valley systems within the Lands (i.e. Rainbow Creek and West Robinson Creek) provide "some opportunities for wildlife usage and movement however, these systems are limited in terms of width, natural vegetation cover, habitat diversity and wildlife habitat elements. They would not generally fall into the category of significant 'animal movement corridor', but would function more on a local linkage scale" (p.5-19).

5.1.2.1.2 Potential Impacts

As noted above, the wildlife and wildlife habitat community types are common on the landscape and impacts are considered minor and can be mitigated. Much of the loss of habitat has been addressed in DCR #1 through the loss of vegetation communities that will be cleared. Nevertheless, there remains potential for the following impacts to wildlife and wildlife habitat resulting from the works associated with DCR #2, including operation of the future highway.

- Localized impacts due to removal of and edge encroachment into common vegetation / habitat.
- Localized potential impact to migratory birds and their nests.
- Potential incidental encounters with wildlife during construction.
- Wildlife mortality from vehicle strikes during operation of the highway.
- Localized changes to wildlife movement opportunities resulting from the introduction of a new barrier to east-west movement.

5.1.2.1.3 Mitigation Measures

The mitigation measures provided above to minimize effects to vegetation and protect adjacent vegetation areas will in turn protect the associated wildlife habitat features and functions, and therefore also function as mitigation measures for wildlife and wildlife habitat. However, it is also necessary to ensure the protection of breeding birds, as well as wildlife generally that may nest or otherwise use areas where construction is proposed with wildlife-specific mitigation measures, as outlined below.

Migratory Birds

Nesting migratory birds are protected under the *Migratory Birds Convention Act* (MBCA 1994). No work is permitted to proceed that would result in the destruction of active nests (nests with eggs or young birds), the wounding or killing of birds, of species protected under the MBCA 1994 and / or Regulations under that Act.

Mitigation measures to address potential impacts to Migratory Birds include:

- Vegetation clearing, grubbing and other construction activities which may be disruptive to migratory birds will comply with the *Migratory Birds Convention Act* (MBCA 1994) and Migratory Bird Regulations (MBR 2012). Timing restrictions will be complied with, during construction activities, particularly vegetation clearing. Specifically, clearing of vegetation will occur outside of the breeding bird season (April 15th to August 15th).

[1]Significant Wildlife Habitat (SWH) is identified by the MNRF in the Significant Wildlife Habitat Technical Guide (MNR, 2000) as the following broad categories: 1) seasonal concentration areas (e.g., conifer forests for deer wintering); 2) rare vegetation communities or specialized habitats for wildlife; 3) habitats of species ~~of conservation concern, excluding the habitats of endangered and threatened species; or 4) animal movement corridors~~.

- Where vegetation grubbing cannot be conducted outside of the breeding bird season, a qualified Avian Biologist will be retained and shall conduct a nest survey, according to MBCA guidance.
- Clearing shall only be undertaken if no active nests or active breeding pairs are identified within the clearing area by the qualified Avian Biologist.
- Bird nesting preventative measures (e.g., netting) will be installed prior to April 15th on structures that will be rehabilitated / widened in each respective calendar year and will be maintained until August 31st of the calendar year in which they were installed.

General Wildlife Protection

The landscape mosaic within the Lands provide habitat for tolerant, urban-adapted and open-country species (e.g. open-country / generalist birds and mammals, amphibians and reptiles).

Mitigation measures to address potential impacts to general wildlife include:

- All construction workers will be trained in advance of starting work regarding potential to encounter wildlife while undertaking their activities, and the appropriate response if an encounter occurs.
- Any wildlife incidentally encountered during construction will not be knowingly harmed.
- Under no circumstances will any animal (e.g., bird, reptiles, mammals etc.) be knowingly harmed, harassed or otherwise disturbed. If an animal is encountered, it will be allowed to move away on its own.
- If small wildlife (e.g. turtles, amphibians) are stranded within the construction zone MTO will be contacted and the animals will be captured and released by a qualified individual (e.g., LINK427 SAR Biologist).
- In the event that small wildlife encountered does not move away from the construction zone, and construction activities are such that continuing construction in the area would result in harm to the animal, all activities will stop and MTO will be notified immediately.
- A Wildlife Fence Plan is being developed for the project with the sole purpose of keeping wildlife off of the highway ROW and funneling wildlife to the main valley crossings structures. Wildlife fencing and wildlife habitat enhancements are being developed and incorporated into the VRP and will be documented in a future DCR.
- Minimum Openness Ratio (OR) and minimum height commitments for the passage of small wildlife have been incorporated into the design of the structural culverts and watercourse crossings (i.e., Rain-1, Rob-2 and Rob-7). See **Section 4.2.3**.

5.1.2.2 Species at Risk

Since the completion of the 2010 EA, field investigations completed in 2015 and 2016, confirmed five (5) Species at Risk (SAR) within the Lands. The 2015 field investigations identified Barn Swallow and the spring 2016 field investigations confirmed the presence of four (4) SAR bat species (Little Brown Myotis, Northern Myotis, Eastern Small-footed Myotis and Tricoloured Bat).

Barn Swallow

Barn Swallow was observed foraging over the Lands and nesting in two barn structures, as noted in the TESR (2016). Registration under the ESA (2007) was completed by MTO for the removal of breeding habitat for Barn Swallow (i.e., the two barns). The barn structures will be removed to accommodate the Highway 427 Expansion. The requirement is to "moth-ball" the Kellam Barn by boarding it up to help preserve it until later in the project. However, it is also possible that the barn's heritage features will be salvaged and the remnants removed. Whether the barn is boarded up or removed, this work will be done outside of the Barn Swallow active season (i.e., May 1st to August 31st of any given year) and LINK427 will provide alternative housing structures (i.e., nesting kiosks prior to the next Active Barn Swallow Season (i.e., May 1st). Locations of the kiosks generally correspond to the four locations specified in the Barn Swallow Mitigation

Plan. Locations have been adjusted slightly based on field conditions and recommendations by LINK427's wildlife and SAR specialists regarding the most suitable locations.

Mitigation measures to address potential impacts to Barn Swallow include:

- Moth-balling or removal of the two barn structures with confirmed Barn Swallow nesting habitat will occur outside of the Barn Swallow active season (i.e., May 1 to August 31).
- LINK427 will provide alternative housing structures (i.e., nesting kiosks) prior to the next Active Barn Swallow Season (i.e., May 1st). LINK427 will be installing alternative nesting structures prior to May 1, 2018.

LINK427 will implement all mitigation measures outlined in the Barn Swallow Mitigation and Restoration Record prepared in support of the Barn Swallow registration under the ESA, 2007, including 3 years of monitoring identified therein.

SAR Bats

An Overall Benefit permit under the ESA (2007) is currently being obtained for SAR bat habitat removal. Vegetation clearing activities that are proceeding under this DCR will remove identified SAR bat habitat (FO-19, FO-17b, FO-21 and Barn Structure #1 and #2). Vegetation clearing associated with DCR #2 cannot be undertaken within these woodlands and the barns cannot be removed until the ESA Overall Benefit permit has been received. Temporary fencing to delineate SAR bat habitat at Rainbow Creek will be installed prior to advance clearing (i.e. works contained within DCR #1) to ensure that habitat is not impacted prior to obtaining the permit. Fencing locations are provided in **Appendix C**. Fencing will be maintained in place until the permit is obtained and vegetation can be cleared in accordance with the conditions of the permit.

As discussed earlier, the Kellam Barn will be moth-balled (boarded up) or removed to accommodate the Highway 427 Expansion. This work will be done outside of the bat maternity roosting season (i.e., April 30th to September 1st of any given year) and LINK427 will provide alternative housing structures (i.e., bat boxes) prior to the next bat maternity roosting season (i.e., April 30th). LINK427 will be installing bat boxes prior to April 30, 2018, however the barns and confirmed woodland habitat will not be removed until the ESA Overall Benefit permit is obtained.

Mitigation measures to address potential impacts to SAR Bats include:

- All conditions outlined in the forthcoming Overall Benefit Permit for SAR bats will be implemented, and will be done so in accordance with timing requirements outlined therein. It is anticipated that measures outlined in the forthcoming permit will include:
  - Wherever possible, the removal of cavity trees will be scheduled outside of the maternity roosting season for bats, which occurs from April 30 to September 1 of any calendar year.
  - A strict 'no vegetation' removal period between June 1st and July 31st for woodland bat habitat will be applied.
  - Should cavity trees require removal between April 30th or August 1 to September 1st, a night exit survey will be conducted 24 hours prior to tree removal to determine the presence of SAR bats. If no bats are recorded during the survey the removal of the tree must take place immediately the following day. If any bats are observed utilizing the cavity tree, a 30 m buffer will be put in place and the tree will be retained until the bats have vacated the area.
  - Regular monitoring during vegetation removal within the confirmed habitat features slated for removal and the two anthropogenic structures will take place by an environmental monitor.
  - Any construction activities within 30m of known cavity trees shall be restricted to daylight hours when possible, to minimize negative impacts on resident bats.
  - LINK427 will implement overall benefit measures for SAR bats including habitat enhancement habitat restoration, and monitoring, to be confirmed in the forthcoming ESA Overall Benefit Permit.

SAR Encounters

There is some limited potential for SAR encounters during construction. A Species at Risk Awareness Training Manual has been prepared and is provided as an Appendix to the VRP and a protocol to follow in the event of an encounter is provided in that manual. Specifically, the following measures will be followed in the event of an encounter with a SAR:

- A SAR sighting is defined as an observation of a SAR where no action is required.
- A SAR occurrence is defined as an observation of a SAR where action of Capture and Relocation is required.
- In the event that SAR wildlife is encountered in the immediate work area, the protocol outlined below shall be followed:
  - Work in the immediate vicinity of the observation must come to a stop.
  - Should an Ecologist/Biologist not be on-site, one will be contacted immediately.
  - Ecologist/Biologist will notify the District MNRF Biologist within 48 hours of any observation of Endangered and Threatened species and/or immediately for any species going to a wildlife custodian.
  - It is not necessary to notify the District MNRF Biologist with observations of Special Concern species or general wildlife sightings (deer, raccoon etc.).
  - A 30m setback from the area of the species location will be applied to allow the species to vacate the area naturally within a 24 hour period and then exclusionary fence is to be installed if appropriate.
  - Should a SAR be encountered during construction activities completed during the winter months (e.g. dislodged from hibernation), the species will immediately be placed in appropriate containers and stored in a dark, warm, quiet place and be transported to an appropriate wildlife sanctuary/rehabilitation facility as soon as possible. Onsite Ecologists/Biologist will advise of the transportation arrangements and consult with MNRF to notify them of the transportation.
  - Work is to not commence again in the immediate area of the observation until further instructed by onsite Ecologist/Biologist.

5.1.3 Fish and Fish Habitat

5.1.3.1 Existing Conditions

Background information provided through the EA studies and documented in the EA Report (January 2010) along with TESR's (2013 and 2016) subsequent investigations were used to described the existing conditions and undertake the impact assessment of the proposed works with no new field investigations undertaken as part of LINK427's assessment. The EA Report (January 2010) and TESRs (2013 and 2016) identified the predominant natural environmental features within the Lands as those areas associated with the West Robinson Creek, East Robinson Creek and Rainbow Creek watercourses and their respective tributaries and valley systems. Surface water features within the Lands originate as first order headwater drainages, which contribute ephemeral flow, sediments and nutrients to downstream habitat. Second order drainages, including Rainbow Creek and Robinson Creek, contain intermittent or permanent flow and potentially provide spawning, rearing, feeding and migratory habitat for fish and generally support a wider variety of ecological features and functions. Highway 50 Tributary (Creek-1) and Albion Creek / Tributary A and associated tributaries within the Lands do not support direct fish habitat while the West Humber River is also within the Lands and functions to support direct fish habitat. There are no aquatic SAR within the Lands.

The West Robinson Creek (ROB-5) and Rainbow Creek (RAIN-3) mainline crossings as well as the structure crossings at West Robinson Creek at Major Mackenzie Drive (ROB-6) and Rainbow Creek at Langstaff Road (RAIN-5), are not part of this DCR #2 and will be addressed in future DCRs.

Included in DCR #2 are the following smaller surface water features: Highway 50 Tributary (Creek 1), RAIN-1, RAIN-4, ROB-1, ROB-2, and ROB-3 (refer to **Figure 17A**) as well as Albion Creek / Tributary A ditch line. These small surface water features are intermittent or ephemeral drainage features that lack well-defined banks and were altered for drainage purposes when the area was historically cleared for agriculture. These drainage features are typically represented by field swales, agricultural furrows, wet pockets, drainage ditches or topographic lows. They are included in DCR #2

because these features do eventually drain to fish-bearing watercourses and thus standard mitigation measures should apply to protect the habitat in the receiving watercourses. In DCR #2, ROB-4 and ROB-7 are associated with the higher order watercourses West Robinson Creek and East Robinson respectively along with Rainbow Creek being crossed by the proposed relocation of a watermain along Langstaff Road. The West Humber River is the only large watercourse included in DCR #2.

Highway 50 Tributary

This watercourse (identified as Creek-1 in **Figure 17B**) flows within the highway ditch system around the existing Highway 7 and Highway 427 interchange. Downstream of the interchange, it flows through a culvert approximately 700 m long before discharging into a SWMP which outlets to Rainbow Creek. Flow is ephemeral through the cattail-filled or grass ditches. There is no direct fish habitat use within the Lands which are likely isolated due to the long downstream culvert. Any contributions to downstream fish habitat are limited to sediment, nutrients, organic material and/or flow conveyance.

Albion Creek Ditch Line / Tributary A Ditch Line

Albion Creek / Tributary A (**Figure 17B**) is an intermittent watercourse that runs within the highway ditch on the west side of Highway 427 south of Highway 7. The highway drainage channel is cattail-lined and flows parallel to Highway 427 and eventually flows under Highway 427 as Albion Creek at existing Culvert C18. The ditch channel also receives highway drainage via eight median culverts. The ditched portion of Albion Creek is lined on both sides by layers of gabion baskets. Downstream of Highway 427, the channel continues as ditch and through the Highway 407 interchange and then east along Highway 407 on the northbound side until it crosses under the highway through a very long culvert. The long lengths of culverts, piped channels, combined with intermittent flow conditions and the lack of refuge habitat is expected to preclude direct fish use of the study reaches of Albion Creek / Tributary A. Any contributions to downstream fish habitat are limited to sediment, nutrients, organic material and/or flow conveyance.

Rainbow Creek and Tributaries

Rainbow Creek (**Figure 17C**) is a naturally meandering watercourse that does not show significant signs of human influences. It generally flows in a north to south direction on the west side of the proposed highway extension until south of Langstaff Road where it crosses the highway to the east. It flows in a defined channel through a wide variety of habitats including meadows and mixed deciduous forests. It has a variety of instream morphological and cover features to support direct fish use during multiple life-cycles. Seasonal barriers to fish movement are present consisting of debris jams, but no permanent barriers were noted.

Tributary F (identified as RAIN-1 in **Figure 17C**) flows eastward through the Lands and has been degraded as a result of human activity. It flows in two branches, one from an existing SWMP located upstream of the Lands, and the other through a poorly defined drainage swale. The two branches converge within the Lands and continue to flow east through a poorly defined channel until it reaches a drop inlet structure at Rainbow Creek Road outside of the Lands. Both reaches are intermittent. There is no direct fish habitat use with the ROW and the downstream reach. Outside of the Lands (i.e., downstream of Rainbow Creek Road drop structure barrier) the habitat, may potentially provide marginal, direct fish habitat. Any contributions from the upstream reach and within the Lands to downstream fish habitat are limited to sediment, nutrients, organic material and/or flow conveyance. The proposed works will not impact the existing SWMP as it is located outside of the Lands.

Tributary C (identified as RAIN-4 in **Figure 17C**) originates as two small dug channels that flow ephemerally from a wetland feature that holds water as a result of the placement of fill that has inadvertently blocked drainage. The two channels converge to form a wide vegetated swale that drains to Rainbow Creek south of the Langstaff Road crossing. The swale has a very steep gully profile and there is a vertical drop at the outlet to Rainbow Creek which likely is a barrier for fish to move upstream into RAIN-4. As such, there is no direct fish habitat use and RAIN-4 may potentially provide indirect fish habitat to downstream fish habitat through sediment, nutrients, organic material and/or flow conveyance.

Robinson Creek Tributaries

A drainage feature (identified as ROB-1 in **Figure 17D**) flows eastward through the Lands in the form of an agricultural swale. It is ephemeral and is marginally defined through an agricultural field. Overland flow likely contains a high nutrient and sediment concentration, which discharges into Robinson Creek. There is a steep gradient barrier to likely prevent fish movement from Robinson Creek upstream into ROB-1. Thus this swale does not support direct fish use. Any contributions to downstream fish habitat are limited to sediment, nutrients, organic material and/or flow conveyance.

Tributary A (identified as ROB-2 **Figure 17D**) flows eastward through the Lands in the form of an agricultural swale. It is ephemeral and is marginally defined. Overland flow likely contains a high nutrient and sediment concentration, which discharges into Robinson Creek. There is an evident barrier to fish movement downstream. Thus this swale does not support direct fish use. Any contributions to downstream fish habitat are limited to sediment, nutrients, organic material and/or flow conveyance.

West Robinson Creek and Tributaries

Tributary H (identified as ROB-3 in **Figure 17D**) flows north to south through the Lands in a shallow depression through active agricultural lands to the Rutherford Road ditch that drains easterly to West Robinson Creek, located outside the Lands. It has ephemeral flow and is poorly defined beyond the ditch. Overland flow likely contains a high nutrient and sediment concentration, which discharges into West Robinson Creek. There is an evident barrier to fish movement upstream in from West Robinson Creek into Rob-3. Thus this swale does not support direct fish use. Any contributions to downstream fish habitat are limited to sediment, nutrients, organic material and/or flow conveyance.

West Robinson Creek (identified as ROB-4 in **Figure 17D**) flows southeasterly north of Rutherford Road just outside of the Lands. If flows permanently in a defined meandering channel through a mix of agricultural fields and meadows with sporadic riparian trees present. Water quality in the watercourse has been impacted through agricultural and roadway run-off. This reach supports direct fish habitat.

East Robinson Creek

East Robinson Creek (identified as ROB-7 in **Figure 17E**) flows southeasterly through a meadow in a poorly defined channel within the Lands. It is an intermittent feature on the landscape and has been impacted as a result of human activity. The agriculture use in the upstream reach contributes nutrient-rich runoff, while the new residential community to the northeast is likely still a presumed source of non-point source pollution. Channelization has also altered the natural morphology of East Robinson Creek further downstream. The outlet channel from the large SWMP associated with the residential development located in the northeast quadrant of Huntington Road and Major Mackenzie Drive discharges directly into to ROB-7 immediately upstream of the culvert inlet conveying East Robinson Creek under Major Mackenzie Drive. The reach investigated provides marginal, indirect fish habitat. Any contributions to downstream fish habitat are limited to sediment, nutrients, organic material and/or flow conveyance.

West Humber River

The West Humber River (**Figure 17A**) is a permanent watercourse with a meandering channel that has reaches that are natural, as well as reaches that have been subjected to man-made influences. An example of which is the presence of the Claireville Reservoir located upstream of the existing Highway 427 crossing. Downstream of the highway crossing, the river meanderings through a vegetated valley corridor for approximately 9 km before discharging into the Main Humber River. The river supports direct fish use and has highest relative sensitivity of the watercourses within the Lands.

Waterbodies

Within the Lands there are three existing ponds, WB-01 (**Figure 17D**), WB-03 (**Figure 17E**) and WB-05 (**Figure 17C**). Given their presence, they are included in DCR #2 as well. Two small ponds, WB-01 and WB-05 are isolated features with no connectivity to fish-bearing watercourses and appear to be localized depressions on the landscape and are not associated with a commercial, recreational or Aboriginal (CRA) fishery. It is unlikely that WB-01 contains fish while direct fish use was confirmed in WB-05. WB-03 is only partially within the Lands and is the only online pond and is associated with West Robinson Creek, located just west of the future mainline West Robinson Creek crossing. This online pond provides direct fish use. Two additional existing ponds are located completely outside of the Lands (WB-04 (**Figure 17E**)

and WB-06 (**Figure 17C**) and will not be impacted by the proposed works and as such, are not included in DRC #2. It is unlikely that WB-04 provide direct fish use while WB-06 likely does provide direct fish use.

Figure 17A: DCR #2 Highway 427 Expansion Tributary Map

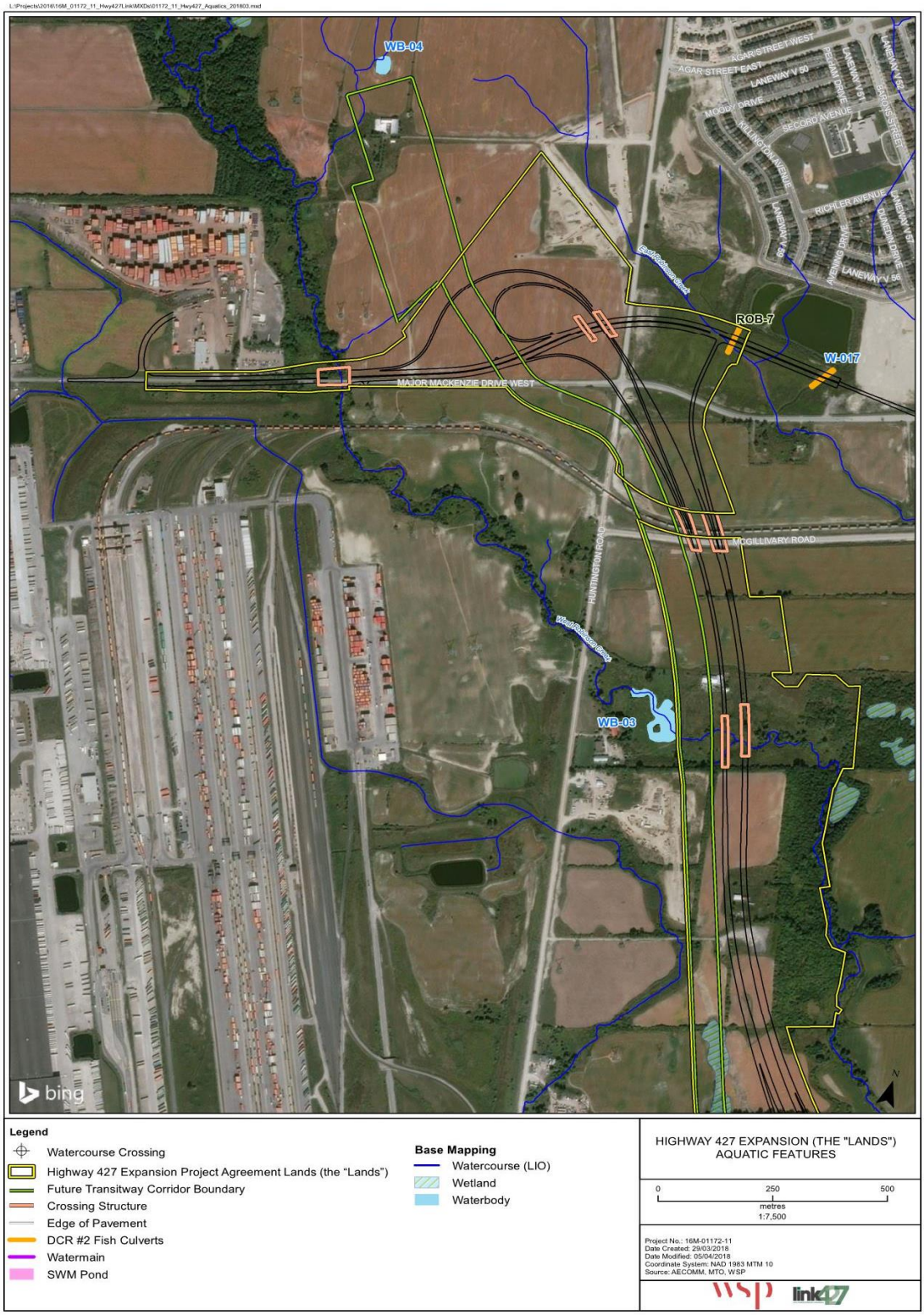


Figure 17B: DCR #2 Highway 427 Expansion Tributary Map

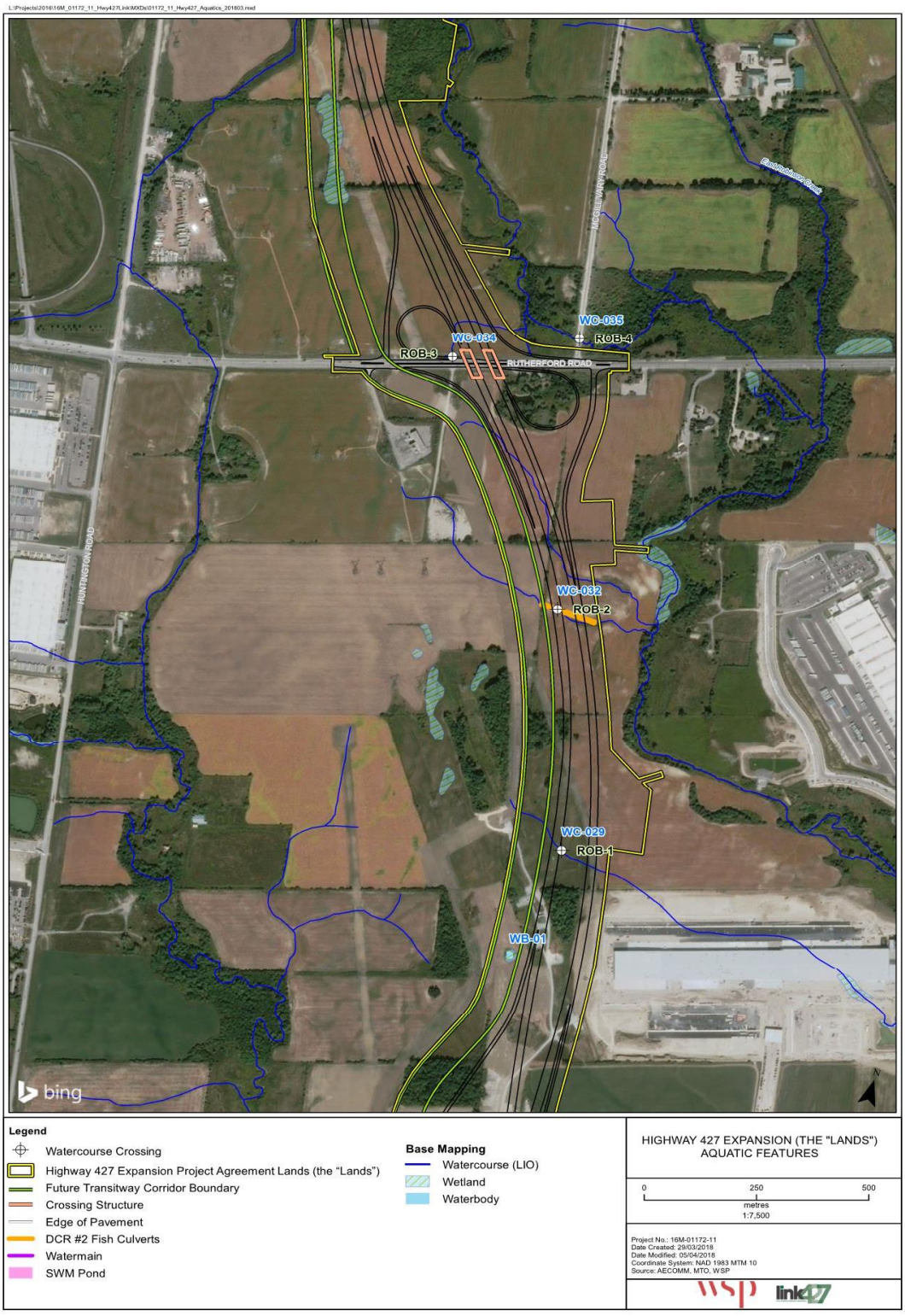


Figure 17C: DCR #2 Highway 427 Expansion Tributary Map

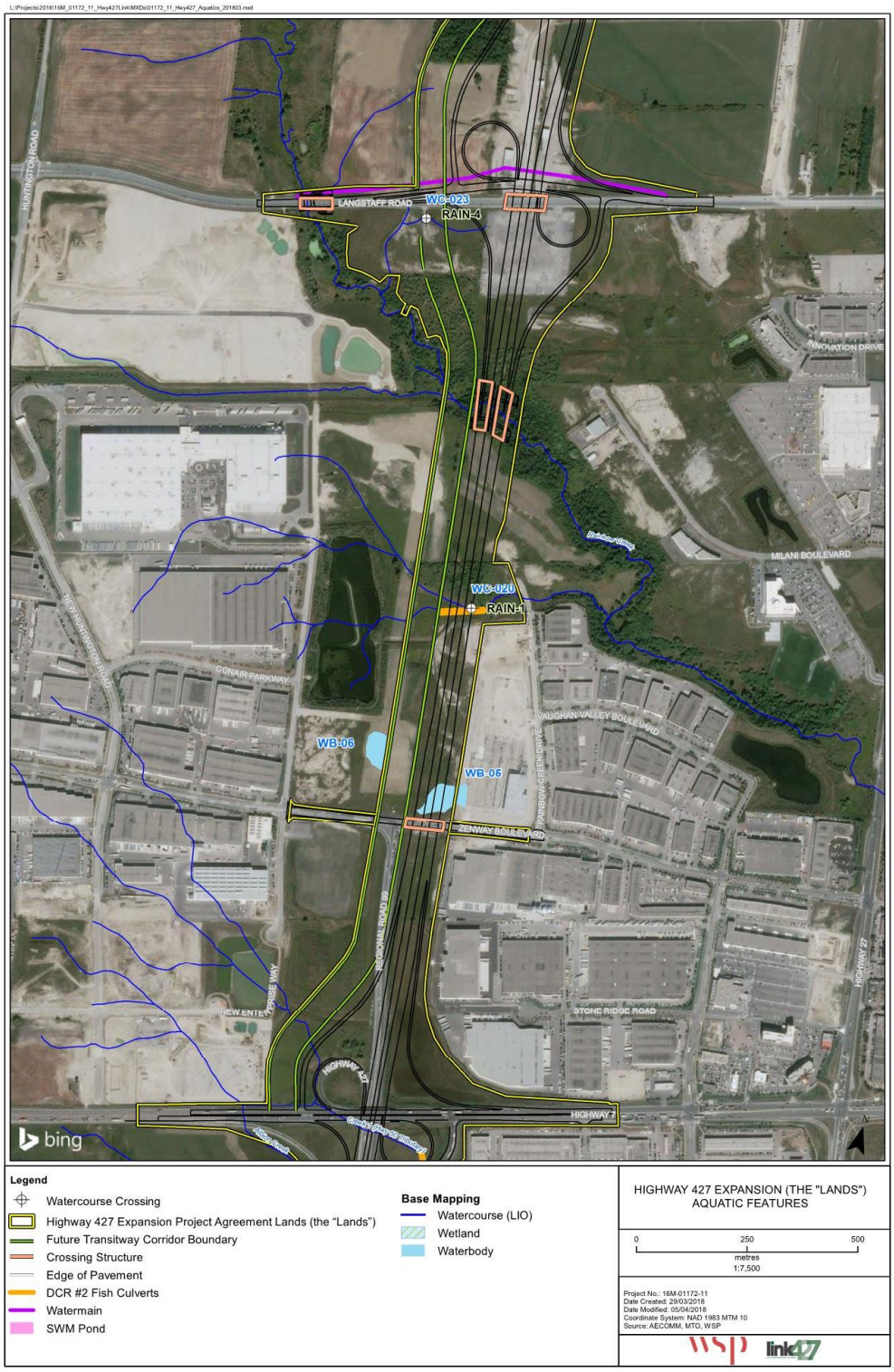


Figure 17D: DCR #2 Highway 427 Expansion Tributary Map

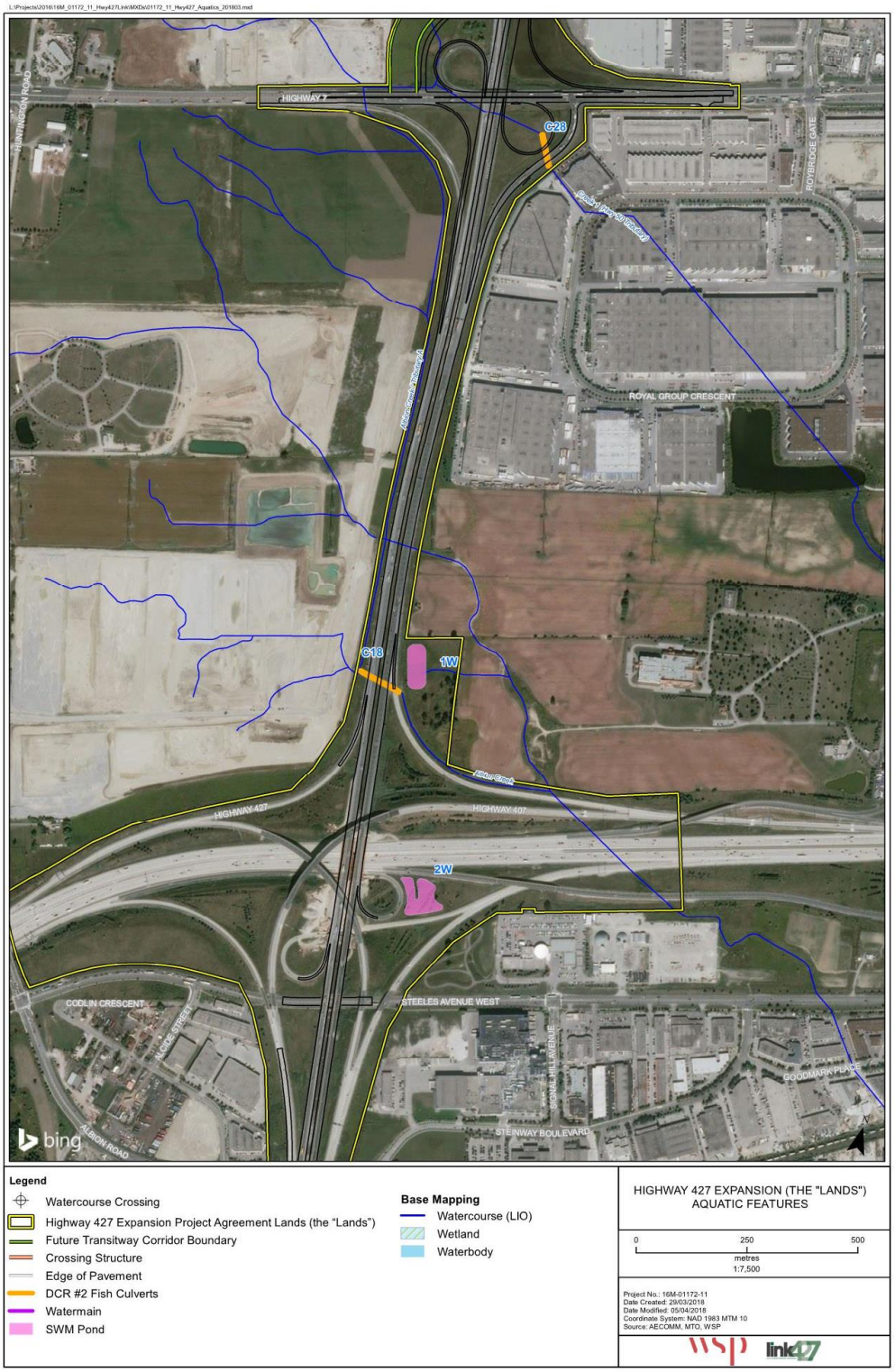
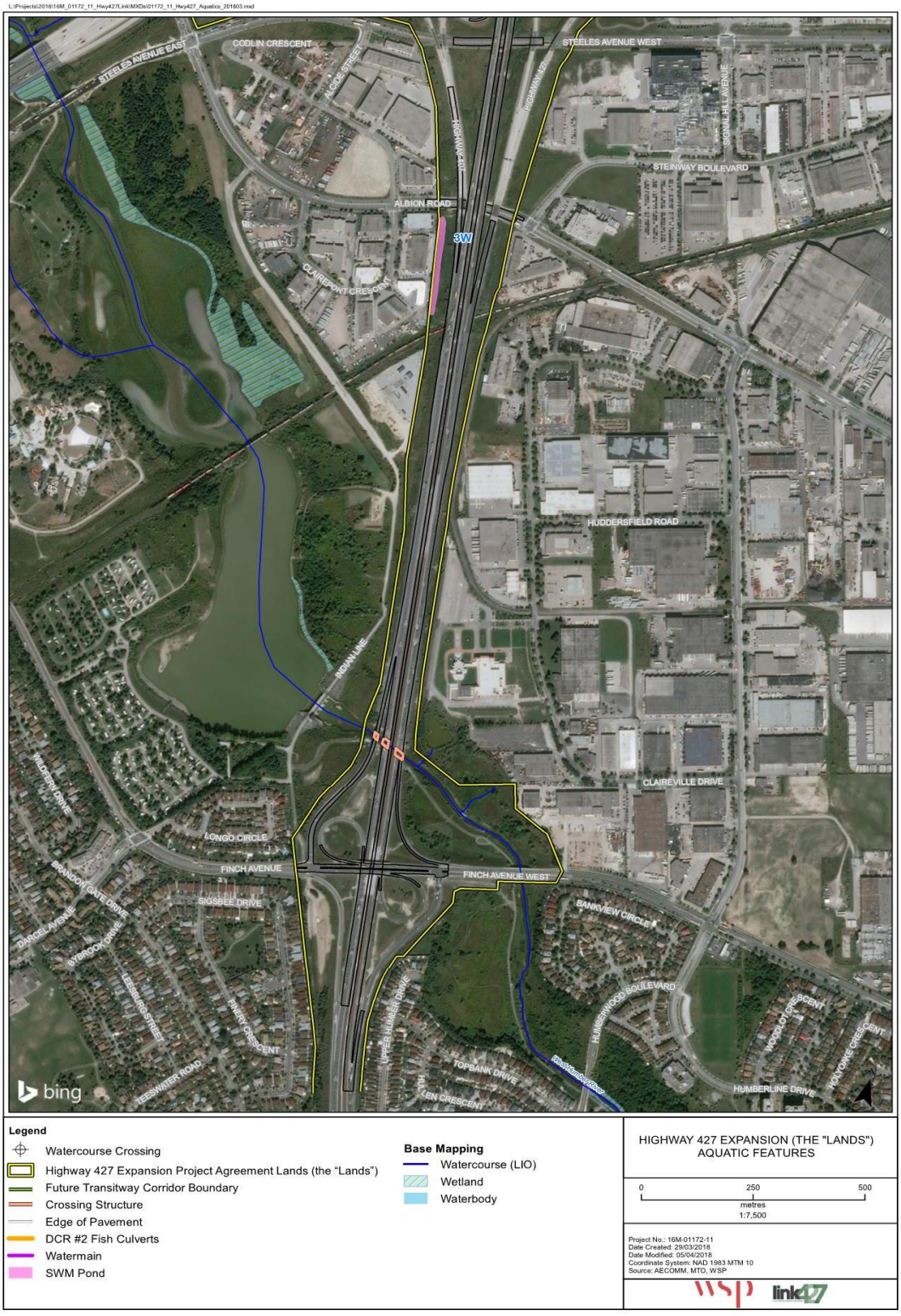


Figure 17E: DCR #2 Highway 427 Expansion Tributary Map



5.1.3.2 Proposed Works and Potential Impacts

Widening Section

In the widening section (Finch Avenue West north to Highway 7) there are there are three watercourses that have the potential to be impacted by the proposed works. They are, the West Humber River, Albion Creek/Tributary A and Creek-1 (Highway 50 Tributary). The proposed works at each watercourse are noted below.

Works to the bridge deck and abutment are proposed which will not require instream works. Although, there are no proposed instream works at the Humber River, works will occur within 30m of the watercourse, as such, all potential impacts are anticipated to be addressed through standard construction mitigation measures (i.e., timing windows and erosion and sediment control measures).

The smaller surface water features, Albion Creek/Tributary A and Creek-1 (Highway 50 Tributary), function as indirect fish habitat and have the potential to contribute ephemeral / intermittent flow, sediments and nutrients to downstream habitats.

The proposed works at Albion Creek/Tributary A will require the extension of the existing culvert C18 (**Figure 17B**) under Highway 427 to accommodate the proposed widening. Additionally, where Tributary A flows within the existing Highway 427 west side ditch (Highway 7 south to C18), it will be shifted and included within the new appropriately sized ditch to accommodate the widening. A new stormwater management pond (SWMP)1W (**Figure 17B**) is proposed north of the C18 outlet on the east side of Highway 427 which will outlet into the ditch conveying Albion Creek.

The proposed works at Creek-1 (Highway 50 Tributary) will require an extension of the existing culvert under the Highway 7 northbound off-ramp to accommodate the proposed new Highway 7 eastbound to Highway 427 northbound on-ramp.

The following are potential impacts associated with the localized direct impacts of the culvert extensions, minor realignments and ditch line relocation:

- The enclosure of habitat within the footprint of the road resulting in localized reduction in riparian function. Affected habitats at the crossings are all poorly defined channels / swales / existing highway ditches.
- Temporary disturbance of the channel bed / banks and alteration of the channel bed / banks along the affected sections of the watercourses. Due to the fact that most of the channels have already been highly disturbed (i.e., minimal riparian vegetation, eroding banks / lack of banks and lack of morphology), direct impacts will be minimal with the implementation of standard construction mitigation measures as discussed in Section 5.1.3.3.
- General potential indirect construction-related impacts (e.g., erosion and sediment influx or disturbance and downstream transfer, other water quality impacts, temporary flow passage) can be managed using appropriate mitigation and restoration measures.
- Localized relocation of the existing Albion Creek ditch line along the west side of Highway 427 is required; however this habitat is already impacted by the existing highway and provides no direct fish use as indicated in the EA documents.

Extension Section

In the extension section (Highway 7 north to Major Mackenzie Drive) there are nine watercourses and waterbodies that have the potential to be impacted by the proposed works. They are Rainbow Creek, RAIN-1, RAIN-4, ROB-1, ROB-2, ROB-3, ROB-4, ROB-7 and WB-05. The smaller surface water features have potential to contribute ephemeral flow, sediments and nutrients to downstream habitat. The proposed works at each watercourse are noted below.

A relocation of an existing watermain to the north side of Langstaff Road will require it to cross Rainbow Creek. The installation of the watermain is proposed to be undertaken in dry conditions by open cutting the channel. The section of the creek at the crossing location will be isolated (e.g., coffer dams) with flow being pumped around the work area to maintain flow to downstream habitats. During installation, fish passage will be temporarily blocked. After installation, the channel bed and banks will be temporarily restored using appropriately sized riverstone with the riparian areas seeded and stabilized (e.g., coir matts). Permanent restoration measures will be undertaken after the completion of the replacement of the Rainbow Creek crossing under Langstaff Road the following year.

A proposed new culvert crossing at RAIN-1 will be installed under the mainline to convey the intermittent flow and associated nutrient inputs to the downstream reach. The culvert will be a concrete box and meet all the design criteria determined during the EA process. As the proposed works will not extend outside of the Lands, there will be no anticipated impacts the existing SWMP located upstream of the crossing, beyond the Lands.

The ephemeral flow associated with RAIN-4 within the Lands will be captured by a storm sewer and conveyed south along the highway corridor to valley lands associated with the Rainbow Creek mainline crossing. In the valley, the storm sewer will outlet, with flow being conveyed to Rainbow Creek as in the existing condition, only downstream of its existing outfall. Flows associated with RAIN-4 downstream of the Lands, will follow the existing flow path to Rainbow Creek.

The ephemeral flow associated with ROB-1 upstream of the Lands will be captured by a by-pass sewer that will convey flow under the highway and outlet into the outlet channel associated with a future SWMP. The outlet channel will then convey flow to Robinson Creek as in the existing condition, only upstream of its existing outfall. Flows associated with ROB-1 downstream of the Lands, will follow the existing flow path to Robinson Creek.

A proposed new culvert crossing at ROB-2 will be installed under the mainline to convey the ephemeral flow and associated nutrient inputs to the downstream reach. The culvert will be a concrete box and meet all the design criteria determined during the EA process.

The ephemeral flow associated with ROB-3 within the Lands will be intercepted by the highway ditch system conveyed to a future SWMP. Outflow from the SWMP will be conveyed to West Robinson Creek as in the existing condition, only upstream of its existing outfall. Flows associated with ROB-3 downstream of the Lands, will follow the existing flow path to West Robinson Creek.

At West Robinson Creek, associated with ROB-4, no instream works are proposed. However, construction grading works will occur in 30 m of the watercourse. As such impacts are anticipated to be mitigated through the application of standard construction mitigation measures.

For the proposed Major Mackenzie Drive crossing of East Robinson Creek, referred to as ROB-7, LINK427 has revised the proposed EA design based on the requirement for the culvert to be located within the Lands, which the EA design was not. The design will change from the proposed twin 3.05m by 1.22m box culverts approximately 120m long to a single 2.4m by 1.5m box culvert that is approximately 64m long. The revised culvert design will result in a much shorter culvert crossing to greatly improve wildlife passage and potentially fish passage, but will require channel realignment works. Due to space constraints, the watercourse will be realigned into the highway ditch system at the upstream side for 105m and on the downstream side for 65 m to connect the culvert inlet and outlet to the existing channel. Although, it is not preferred to align a watercourse through the ditch line, Major Mackenzie Drive is an urban road with curbs and storm sewers to capture and treat road run-off. As such, the impacts to water quality as a result of mixing the watercourse flow with road run-off has been greatly reduced. Additionally, given that East Robinson Creek does not functions as direct fish habitat, the form and function of flow and nutrient conveyance to downstream habitat is being maintained with the proposed design change. The proposed LINK427 design complies with EA Report design criteria.

It should be noted that with the realignment of Major Mackenzie Drive, the outlet channel from the large SWMP associated with the adjacent land development will required a new culvert crossing. Although this outfall channel is not considered to be fish habitat, given its direct, barrier-free outlet connection into East Robinson Creek, it has been included within DCR #2. The proposed crossing is referred to as culvert W-017 (**Figure 17E**) and consists of a structural concrete box culvert 3m by 1.8m and is 65m long.

For the five waterbodies noted, the existing ponds that are either outside of the Lands (WB-04 and WB-06) or where no works are proposed (WB-01 and WB-03), they will be will be addressed through standard mitigation measures including erosion and sediment control measures. WB-05 is proposed to be infilled. However, as WB-05 is not part of a CRA fishery, standard construction mitigation measures will be applied to address the infilling works (i.e., timing windows, fish removal, etc.).

The following are potential impacts associated with the localized direct impacts of the works described above:

- The enclosure of habitat within the footprint of the road resulting in localized reduction in riparian function. Affected habitats at the crossings are all poorly defined channels / swales / existing highway ditches.
- Temporary disturbance of the channel bed / banks and alteration of the channel bed / banks along the affected sections of the watercourses. Due to the fact that most of the channels have already been highly disturbed (i.e. minimal riparian vegetation, eroding banks / lack of banks and lack of morphology), direct impacts will be minimal with the implementation of standard construction methods and mitigation measures.
- Temporary disruption of fish passage in Rainbow Creek during the watermain works.
- General potential indirect construction-related impacts (e.g., erosion and sediment influx or disturbance and downstream transfer, other water quality impacts, temporary flow passage) can be managed using appropriate mitigation and restoration measures.
- Localized realignment of the existing channels at RAIN-1 and ROB-4 is required for the culvert inlet and outlet connections. At ROB-7, the portion the watercourse both upstream and downstream of the crossing will be realigned into the ditch line and result in the loss of the natural channel form.

WB-05 is the only pond with direct impacts as it will be cleared of vegetation and infilled. The other waterbodies, WB-01 and WB-03 will remain on the landscape and will not be directly impacted. However, there may be potential for indirect construction-related impacts (e.g., erosion and sediment influx or disturbance) which can be managed using appropriate mitigation and restoration measures.

5.1.3.3 Mitigation Measures

The potential adverse effects are limited to nominal direct impacts associated with channel enclosures, infilling realignments and infrastructure installation, and potential indirect impacts which can be addressed through standard, proven construction mitigation measures. The recommended mitigation measures include:

- All instream or near stream works will be conducted during the appropriate in-water timing window. A warmwater construction timing (from July 1 to March 31) would be applied to protect the resident warmwater fish communities present in watercourses further downstream (OPSS 182, SSP101F23).
- Sediment and erosion control measures will be implemented during all phases of construction, clean-up and restoration to prevent sediment laden runoff from entering any of the watercourses directly from the construction zone (OPSS 805, SSP805F01, Operational Constraint – Erosion and Sediment Control). The ESC Plan includes the following which are also provided on the design drawings included in **Appendix C**:
  - Perimeter silt fence will be installed between the work areas and all reaches of those watercourses where works are required, including ditch and drainage works that drain to watercourses that support fish habitat.
  - The fencing will be properly installed and regularly inspected and maintained. It will be left in place and maintained until all surfaces contributing drainage to these watercourses are stabilized.
  - All exposed and newly constructed surfaces will be stabilized using appropriate means in accordance with the characteristics of the soil material and slope conditions.
  - These surfaces will be fully stabilized and re-vegetated as quickly as possible (and at a maximum within 45 days) following completion of the works.
- All near-water construction zones will be isolated using standard perimeter silt fencing of the general construction zone up and downstream. The silt fencing will be heavy duty/reinforced fencing for all disturbed areas of the embankments that drain to the streams. Silt fencing will be regularly inspected and maintained as required (OPSS 805, SSP805F01, Operational Constraint – Erosion and Sediment Control).
- Only clean materials free of fine particulate matter will be placed in the water for temporary construction measures (e.g. temporary flow management dams will be constructed of 'pea gravel' bags, geotextile fabric or other clean material), or permanent works (e.g., culvert and channel substrates, cobble / boulder material).
- If any temporary dewatering of the near or instream construction zones is required in order to construct the new culverts or extension of culverts , appropriate energy dissipation and settling / filtration measures will be used for

discharge to ensure no erosion or sediment release occurs in the watercourses / drainage features. No dewatering discharge will be released directly to the watercourses. If temporary dewatering of the near stream construction zone is required, dewatering will be discharged through a filter bag / splash pad located at least 30 m from the watercourses (OPSS 185, OPSS 518).

- All culvert installations and channel restoration works to be completed 'in the dry' using an appropriate temporary flow by-pass system to maintain clean flow around the construction zone. To minimize potential for impacts, culvert works on the minor crossings will be conducted during low flow periods when these features support no or very small flows (Albion Creek, Creek-1, ROB-7) (OPSS 185, OPSS 518).
- Where there is no flow on watercourses / drainage features requiring instream works, contingency temporary flow by-pass measures will be in place to manage any flow in the event of a storm and associated runoff (RAIN-1, RAIN-4, ROB-1, ROB-2, ROB-3, W-017) (OPSS 185, OPSS 518).
- All dredged, salvaged or stockpiled materials will be located a safe distance from the watercourses edges and stabilized to prevent migration of any sediment or other material to the watercourse (OPSS 180).
- All work areas or other disturbed surfaces draining to the watercourses and/or in the floodplain will be stabilized and re-vegetated with appropriate native, non-invasive species as soon as feasible following construction.
- The erosion and sediment control measures will be left in place, monitored and maintained in proper working order until all disturbed areas draining to the watercourses are fully stabilized, including establishment of vegetative cover (Operational Constraint – Erosion and Sediment Control).
- No equipment shall cross or otherwise enter the other watercourses to construct the specified works.
- All activity will be controlled so as to prevent entry of any petroleum products, debris or other potential contaminants / deleterious substances, including sediment, to the watercourses. Storage, maintenance or refueling or maintenance of equipment will be conducted at least 30 m away from the watercourses. The Contractor will have an appropriate spills management/response plan in place throughout construction, including spill control and absorbent materials, instructions regarding their use and notification procedures (OPSS 182, OPSS 100).
- Every effort will be made to retain as much of the natural vegetation as reasonably possible to help ensure bank stability and control erosion, and to expedite the recolonization of native plant species.
- All riparian vegetation removed to construct the highway works will be replaced with a mix of appropriate native species. Additional riparian plantings may be incorporated to enhance existing conditions along the right-of-way (ROW), and along the realigned sections (i.e., the tie-ins both up and downstream of the new culverts) as outlined in the site specific mitigation measures section above. Only native shrub and tree species, compatible with the site conditions will be used.
- A qualified environmental inspector will be on-site as required throughout construction, responsible for ensuring the sediment and erosion control measures are functioning and all of the mitigation measures are being implemented (SSP101F23 – Table B).

Site-specific mitigation measures include the following:

- All culverts will be inset by 10% to prevent erosion and scour of the inlets / outlets (OPSS 182).
- A Scientific Collectors Permit will be obtained in order to conduct a fish salvage prior to any works being conducted for the culvert installation at ROB-7 and W-017 using appropriate techniques to capture and transfer unharmed any stranded fish as specified in the permit. A Scientific Collectors Permit will be required at WB-05 and fish will be removed following direction by the local MNRF (OPSS 182).
- The new ditch line for Albion Creek will be reconstructed with similar or slightly larger profile than the existing ditch line section and it will be fully stabilized prior to re-connection / transfer of flow. The re-stabilization may include re-vegetation with cattail similar to existing ditch.
- The upstream and downstream ends of all the new culverts and extended culverts, as well as the realigned portion of Albion Creek ditch line, Creek-1, RAIN-1, ROB-2 and ROB-7 will transition smoothly with the existing flow paths to avoid development of erosion.

- The extension of culvert Albion Creek culvert C18 and Creek-1 culvert C28 will be designed and installed to transition smoothly with the upstream and downstream Albion Creek and Highway 50 Tributary channel sections respectively to avoid erosion.
- The stormwater management (SWM) pond outfall locations, specifically the outfall of SWMP 3W into Alboin Creek, will be designed and constructed to be stable and minimize erosion potential to the receiving watercourses.
- Follow MTO's Best Management Practice (BMP) for Culvert Extension / Replacement (C18 and C28), Ditch Maintenance within 30 m of a Waterbody, and Maintenance of Riparian Vegetation in Existing Right-of-Way.
- The realignments have be properly designed to maintain form and function of the existing fish habitats.

5.1.3.4 Net Effects

As indicated above, the form and function of these crossings will be maintained. Based on the construction activities anticipated in DCR #2, there are no long term residual effects to fish and fish habitat associated with the installation of the new culverts and infrastructure (watermain), extension of existing culverts and localized channel / ditch realignments as these culverts and realignments will be properly designed and constructed with adherence to the MTO BMP's (Version 2.2, 2016). With the exception of WB-05, all watercourses where instream works are proposed, do not provide direct fish use. A summary of net effects is provided below:

- Structure design will maintain form and function of the existing fish habitat.
- Nominal channel realignments will be designed to be stable to prevent downstream transport of sediment.
- Permanent loss of vegetation anticipated within the majority of the structural footprint (i.e., culverts) although vegetation is common and widespread.
- Associated localized loss in allochthonous inputs from vegetation is negligible.
- No long term residual effects with a properly designed and constructed structures with the application of standard and site specific mitigation measures.

The proposed works have been assessed under the *MTO/DFO/OMNR Fisheries Protocol for Protecting Fish and Fish Habitat on Provincial Highway Undertakings - Version 3* (Pilot, 2016). The West Humber River and ROB-4 works will occur within 30 m of a watercourse and no works below to high-water mark; works have been addressed through the standard construction mitigation measures proposed. The culvert extension works for C18 and C28 will follow the BMP for Culvert Replacement / Extension. The works associated with Albion Creek / Tributary A ditch line relocation, new culvert installations at RAIN-1, ROB-2, ROB-7 and W-017, the by-pass piping / flow conveyance to through SWMP at RAIN-4, ROB-1 and ROB-3 and the open cut installation of the watermain at Rainbow Creek have been addressed through the Pathways of Effects and proposed mitigation measures. The infilling of WB-05 is not a CRA fishery and requires no assessment under the protocol. Based on the assessments, none of the proposed works have been assessed to result in serious harm to fish. As such, this project can proceed without a review by DFO or Authorization under the Fisheries Act. These assessments are documented on MTO Project Notification Forms. However, the use of the BMP for Culvert Replacement / Extension requires a submission to Fisheries and Oceans Canada for their files, not review.

5.1.4 Groundwater and Hydrogeology

5.1.4.1 Existing Conditions

A number of previous studies have been carried out in order to fulfill groundwater and hydrogeological assessment requirements. These studies include:

- A Hydrogeological Assessment completed for the Individual EA (January 2010);
- A Groundwater Assessment Study Report for the TESR (2013); and,
- A summary of Existing Conditions, Potential Impacts, and Mitigation measures for the TESR (2016).

Review of the previous studies, published documents and review of the soil characteristics identified during recently completed geotechnical investigations indicates that the Lands are principally located within the South Slope physiographic region in Southern Ontario. A small part of the Lands at the northwest between Rutherford Road and

Major Mackenzie Drive are classified as lying within the Peel Plain physiographic region. The South Slope physiographic region is mapped from the Oak Ridges Moraine (ORM) to the north and slopes downwards towards Lake Ontario and is typified by smooth, faintly drumlinized clay till plains. The Peel Plain physiographic region is associated with a former glacial lake (Lake Peel) and is characterized by thin glacio-lacustrine deposits principally comprised of clays and silts, overlying till deposits. The Peel Plain is mapped within the South Slope region (which is found to the north and south of the Peel Plain) and is characterized with a gradual and fairly uniform slope towards Lake Ontario.

The topography within the Highway 427 Expansion Lands is generally flat, gently sloping southward from the northwest to the southeast. According to topographic mapping (Brampton, 30M/12, 1994), ground surface elevations range from approximately 200m above sea level (masl) at the northern end of the Lands to approximately 180masl at the southern end of the Lands.

Based on the MOECC water well records and previous hydrogeological studies, the quaternary deposits in the vicinity of the Lands have been logged to depths ranging between about 15mbgs (metres below ground surface) to greater than 47mbgs (encountered at elevations between 164 and 185 masl). Lenses or discontinuous layers of silt, sand and gravel were logged in the well records within these clayey silt/silty clay deposits.

The Lands are located within the Humber River Watershed with two major tributaries to the Humber River crossing the proposed highway alignment (west Robinson Creek and Rainbow Creek). The regional groundwater flow direction within the Lands are to the southwest, south and southeast. On a local scale, the shallow groundwater flow will mimic the surface topography. The shallow groundwater levels are furthermore influenced by seasonal variation, and can be affected by the presence of underground utilities.

A groundwater monitoring program (collection of water levels from existing monitoring wells, water samples from select locations for discharge quality and update of private water well survey) has been completed, in accordance with the EA (January 2010) commitments, to establish baseline conditions and to identify potential adverse impacts to groundwater, environmentally sensitive features or water sources (such as private water wells) related to DCR #2 construction activities. LINK427 staff completed a knock-on-the-door program and made reasonable efforts to contact the residents for the well survey on three events (once during normal work day time, once during the evening time and the third time on a weekend) however so far none of the residents responded to the request with their contact information.

A summary of the completed assessment is provided in **Table 12**. The Dewatering assessment completed by LINK427 includes 13 DCR #2 construction sites (overpass and underpass, bridge and 3 SWMPs, a summary provided in the following table with detail in the appendix) for the widening portion included in this DCR indicates that except for the location of Pond-1W, pumping for groundwater is not anticipated for the works. The pumping discharge is required to be discharged as per O. Reg. 63/16 and 64/16.

5.1.4.2 Potential Impacts

An update of the 2010 hydrogeological assessment was completed in September 2016 by AECOM, and the key findings related to potential impacts are summarized below. The updates were reviewed by LINK427 for dewatering assessment and updated based on recent hydrogeological information derived from recently completed the geotechnical site investigation by LINK427 (2017) and groundwater monitoring works by LINK427 (2017).

Groundwater Susceptibility and Potential Groundwater Impacts

The TESR (2016) indicated groundwater susceptibility to contamination is identified as follows:

- There are coarse textured sand/silt layers present in the glacial till deposits, which serve as the primary aquifers for the private water well supply;
- The hydraulic connectivity between the overburden quaternary aquifer and the deeper bedrock aquifer systems is low due to the fine textured overburden soil. Therefore, the aquifer vulnerability within the Lands are considered low to moderate to the overburden aquifers and deeper bedrock aquifer;

- The shallow overburden aquifer is considered to have higher vulnerability, especially in the areas where coarse textured soils are found at the ground surface, where the groundwater table is shallow, and/or the aquifer is in close vicinity of the surface water bodies and road infrastructure; and,

According to the Highly Vulnerable Aquifers (HVAs) mapping from the Assessment Report for the Toronto and the Region Source Protection Area (TRSPA, July 2015), limited areas of HVAs are present along Rainbow Creek, Robinson Creek and their tributaries north of DCR #2 areas. The remaining DCR #2 areas are Lands that are generally rated as having low or moderate potential for groundwater susceptibility.

Table 12: Dewatering Assessment Summary

Updated: April 4, 2018				
Reference Area	Site ID and Reference Drawing (DWG) Number	Station (STA) IDs	Anticipated Dewatering Volumes (LPD-litres per day)	Construction Section and Tentative Schedule **(Based on Construction Joint Venture (CJV) schedule of March 08, 2018)**
S of Finch to Highway 7				
1	Finch Avenue Underpass (Site 37-1084)(DWG-120)	STA. 10+000	Less than 50,000 LPD	G1 Finch Avenue to Albion Road Earthwork - Early June 2018
2	Humber River Crossings (Site 633 1/2) (DWG-121, 122)	STA. 10+300	Less than 50,000 LPD	G1 Finch Avenue to Albion Road Earthwork -Early June 2018
3	Highway 427South-Finch Avenue, Ramp (Site 37-1087)(DWG-123)	STA.10+500	Less than 50,000 LPD	G1 Finch Avenue to Albion Road Earthwork -Early June 2018
4	CNR Overhead Structures (Site no. 37-1109)(DWG-124, 125)	STA.11+300	Less than 50,000 LPD	G1 Finch Avenue to Albion Road Earthwork -Early June 2018
5	Albion Road Overpass Structures (Site no. 37-1110)(DWG-126)	STA.11+575	Less than 50,000 LPD	G1 Finch Avenue to Albion Road Earthwork -Early June 2018
6	Highway 407East/West-427South Overpass at Albion Road (Site no. 37-1115)(DWG-B05, Book 2)	STA. 11+600	Less than 50,000 LPD	G2 Albion Road to Highway 407 Earthwork - End of April, 2018
7	Steeles Avenue Overpass (Site no. 37-1111)(DWG-128)	STA.11+990	Less than 50,000 LPD	G2 Albion Road to Highway 407 Earthwork - End of April, 2018
8	Highway 407 Overpass (Site no. 37-1167/8)(DWG-129)	STA.12+300	Less than 50,000 LPD	G2 Albion Road to Highway 407 Earthwork - End of April, 2018
9	Highway 7 Underpass (Site no. 37-330)(DWG-130)	STA.14+040	Less than 50,000 LPD	G3 Highway 407 to Highway 7 Earthwork - Early May 2018
10	Highway 427 Storm Water Managemnet Pond (SWMP) Pond-1W (DWG-2212)	STA. 12+800	Less than 50,000 LPD	G3 Highway 407 to Highway 7 Earthwork - Early May 2018
11	Highway 427 SWMP Pond-2W (DWG-2212)	STA. 12+300	Less than 50,000 LPD	G3 Highway 407 to Highway 7 Earthwork - Early May 2018
12	Highway 427 Dry Pond-3W (DWG-2212)	STA. 11+400	Less than 50,000 LPD	G3 Highway 407 to Highway 7 Earthwork - Early May 2018
Highway 7 to Major Mackenzie Drive		Chainage starts at 10+000 from Highway 7 for Northern portion of Highway 427		
13	Zenway Boulevard Underpass (DWG-131, 132)	STA.10+650	Less than 50,000 LPD	G4 Highway 7 to Zenway Boulevard Earthwork - Early July 2019

The potential impacts from the Highway 427 Expansion to the local groundwater system as identified in the TESR (2016) was reviewed. The impacts identified were re-evaluated and updated based on LINK427's review and assessment of dewatering requirements. The results of the assessment are summarized below:

- Changes to recharge/ discharge regimes resulting from the disturbance of the ground surface, ground clearing, compaction, road cuttings, placement of fill, and the presence of the completed impervious layers of road surface;
- Potential dewatering impacts including a reduction in groundwater levels and reduction in flows to nearby private wells and groundwater-dependent water bodies are not anticipated since the assessment indicates that dewatering pumping to remove groundwater will be less than 50,000 LPD;
- Application of commercial fertilizers during seeding activities to re-establish vegetative cover;
- Potential spills of hydrocarbons and other chemicals used during construction activities, which could impact the groundwater aquifer and groundwater-dependent water bodies specially in the areas of high aquifer vulnerabilities; and,
- The future use of salt for road de-icing in winter seasons has the potential to impact the groundwater and surface water resources in the immediate vicinity of the proposed road alignment. Careful thought should be given to use of salt alternative for deicing of the highway.

Due to the presence of low permeability overburden soil of considerable thickness, the potential impacts to the deeper aquifers within the Lands are generally considered to be low to moderate. Higher potential for groundwater impacts are present in the following areas:

- Along the creeks and their tributaries;
- Area of Highly Vulnerable Aquifers (HVAs);
- Areas where groundwater dewatering is required and private water wells are located within the zone of influence.

However since dewatering pumping above 50,000 LPD at each of the 13 DCR #2 project element listed in **Table 12** is not anticipated an EASR will not be required for this phase of construction.

Potential Water Supply Well Impacts

For the widening of Highway 427 south of Zenway Boulevard, dewatering is not expected for construction work of the bridge crossings over the Humber River because this structure will be rehabilitated and widened using the existing piers and therefore no excavations are proposed for the widening of the bridge. Based on the dewatering analyses, the overpass and underpass structures that will be widened will utilize the existing foundations so therefore the requirement of dewatering has been reduced significantly. There may be likely some form of dewatering to address water accumulated from gravity drainage from the sidewalls of the excavated trenches or surface waters accumulated from storm events. Sump pumping should be adequate to address groundwater from these sites. This form of limited low volume dewatering is not anticipated to impact water wells in the vicinity. A private water well monitoring program will be outlined and recommended in the hydrogeological report for the total length of the of the proposed construction works, however a residential well monitoring plan is not required for the Highway 427 widening area as the areas adjacent to widening portion is serviced by municipal services. Any wells to be removed during the highway improvement activities will have to be decommissioned properly as per the Ontario Wells Regulation (R.R.O. 1990, Reg. 903);

The TESR (2016) identified thirteen (13) private water supply wells in the MOECC water well database for the widening portion from south of Albion Road to Zenway Boulevard. The adjacent areas highly urbanized with majority of the area being used as industrial or commercial lands and as such the area is fully serviced by municipal services. It is likely that there are no private wells used by residents for their water supply in this area. None of the MOECC water supply well records in this area are directly impacted by the Highway 427 Expansion alignment and therefore would not need to be mitigated or decommissioned.

For the extension of Highway 427 north of Highway 7 one underpass (Zenway Boulevard) structure will be constructed in this DCR #2 phase. Dewatering is not anticipated at this location because of site conditions (foundation within till, construction on piles with pile cap above ground surface or above groundwater table) and design (construction above ground and groundwater levels) that resulted in conditions where dewatering will not be required during construction.

A total of 13 records of water wells (which includes domestic, public supply and livestock water wells) were identified from the MOECC water well database search. This same number of wells were also identified by AECOM during their water well survey in February 2016. The results of AECOM water well survey as summarized in Table 1 of their report was used as a background document for LINK427 door-to-door water well survey to update the records. Resident notification letters were mailed out and was left in the mailboxes during the door-to-door visit where contact information or addresses were available. As reported by AECOM, out of 13 MOECC recorded water wells five (5) locations had addresses and were contacted and eight (8) well locations did not had any physical addresses so contact could not be made. However since there will be no dewatering anticipated for the widened portion of the existing Highway 427 from south of Albion Road to Zenway Boulevard, any of these wells will not be impacted. **Figures 18A and 18B** shows the locations of existing monitoring wells and MOECC recorded wells as identified from the database search.

Figure 18A: Existing Water Supply Well

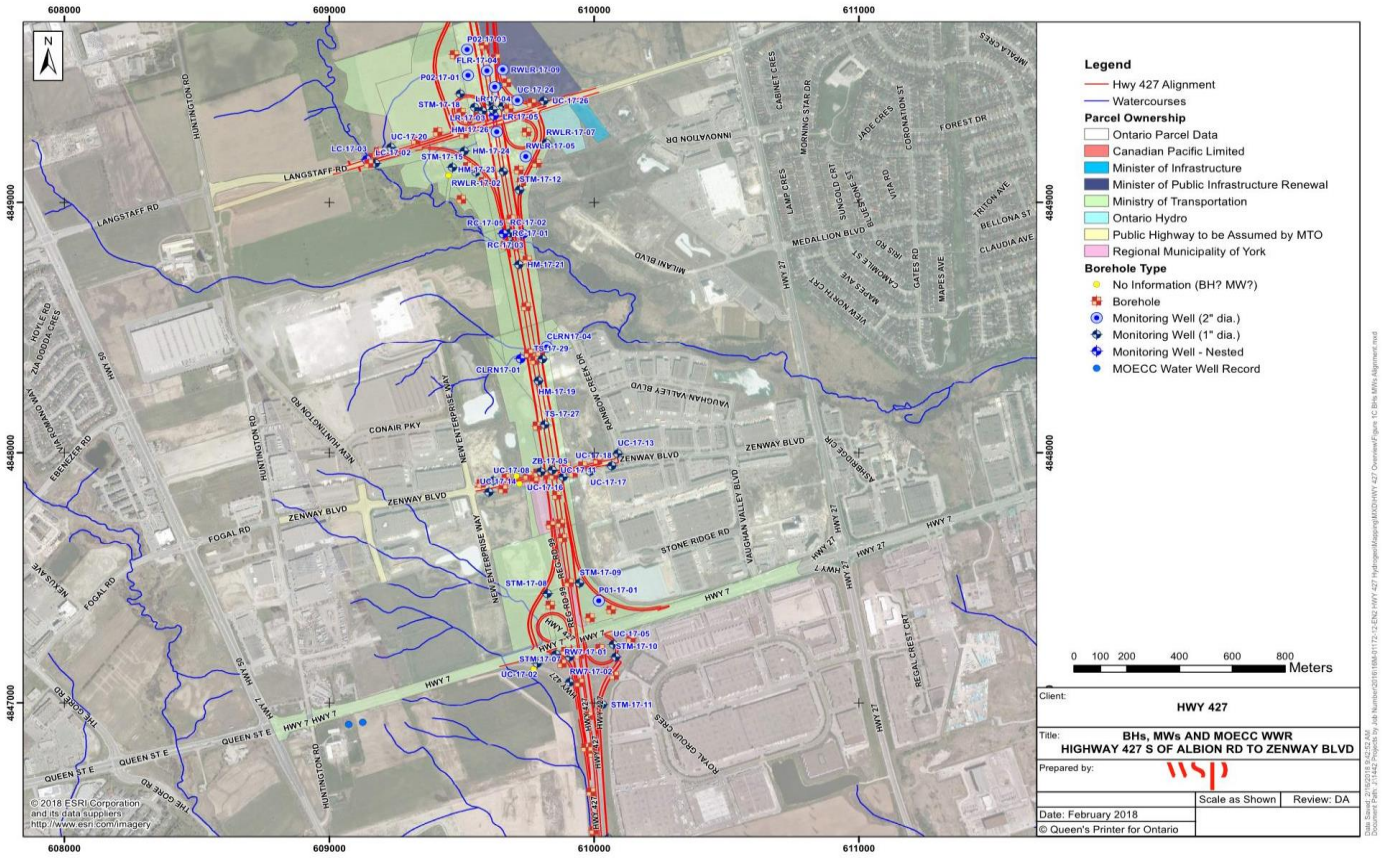
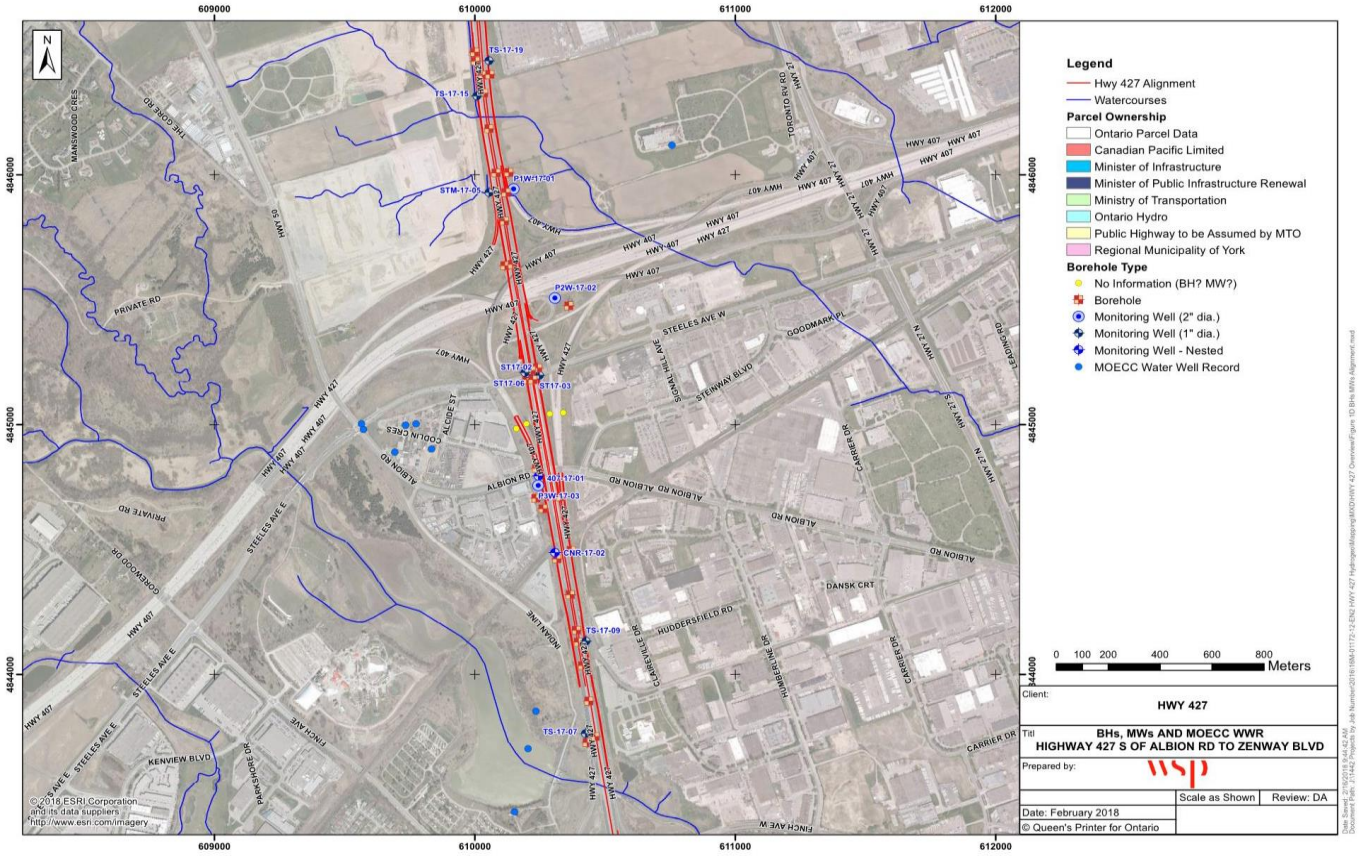


Figure 18B: Existing Water Supply Well



The LINK427 groundwater monitoring program and hydrogeological assessment has been completed as per the EA (2016) commitments. Potential adverse impacts are not likely since the dewatering is not anticipated for widening work of the existing Highway 427 from south of Albion Road to Zenway Boulevard included in DCR #2 phase construction elements.

5.1.4.3 Mitigation Measures

Mitigation measures likely would not be required as groundwater dewatering pumping is not anticipated for the widening portion of the Highway 427 works to Zenway Boulevard. However if pumping is required to remove minor groundwater and surface water accumulated from storm events from the excavated areas then best management practices for mitigation are to be followed.:

- Dewatering activities shall be conducted in accordance with control procedures as specified in OPSS 518 Control of Water from Dewatering Operations. Appropriate dewatering measures shall be implemented to manage any groundwater encountered during grading activities, and dewatering discharge water will be filtered as necessary to prevent transport of sediment to natural surface water receptors;
- A Spill Prevention and Control Management Plan shall be prepared;
- Surface runoff will be directed to roadside ditches and ditch conditions shall be improved to minimize groundwater recharge impacts;
- Installation of groundwater monitoring wells (screened in the shallow overburden), if not already present, near the temporary or permanent groundwater dewatering locations to closely monitor groundwater quantity and quality during the dewatering activities;
- Environmental quality of pumped water discharged to the natural environment must meet the requirements provided in O. Reg. 387/04 and O. Reg. 63/16; and,

- Minimize salt usage and runoff during road de-icing applications by following best practices consistent with those used across North America and employ the latest winter maintenance technologies (alternative to and environmentally friendlier than using road salt).

The following commitments made under the Project Agreement Schedule 17 shall be implemented by LINK427:

- Monitoring of private wells prior to construction to establish background conditions are completed subject to obtaining permission to access the property and the well(s) by the land owner however monitoring of private wells for the Highway 427 widening areas are not required since dewatering is not anticipated for the works in this section. Also the area is serviced by municipal services and it is likely that wells are not used for private water supply.
- The quality of pumping discharge from the excavated areas are to meet the applicable quality objectives as per O. Reg. 387/04, O., Reg. 64/16 and O.Reg. 63/16 conditions and also shall conform to OPSS 518;
- All groundwater monitoring/observation wells and water wells encountered during construction located within the construction alignment (**Figures 18A and 18B**) shall be decommissioned as per the requirements made under O. Reg. 903 as amended. There are no private water supply wells within the construction alignment area of the Highway 427 widening area. Any water wells identified by LINK427 within the construction lands will be decommissioned in accordance with the requirements made under O. Reg. 903 as amended; and
- LINK427 will prepare and submit annual monitoring reports by August 31 of each year until Substantial Completion and for one year after Substantial Completion.

5.1.5 Drainage and Stormwater Management

5.1.5.1 Existing Conditions

The existing Highway 427 between Finch Avenue to south of Steeles Avenue is comprised of six lanes, and is then four lanes between south of Steeles Avenue to Highway 7. Highway 427 does not currently exist between Highway 7 and Major Mackenzie Drive. The extension of the highway will be through a corridor of mainly agricultural lands and some natural valley features, surrounded by employment and industrial areas.

In the proposed extension area, runoff is primarily through the agricultural lands, and in the cases of the industrial areas in this sector, runoff will be collected through storm sewers.

5.1.5.2 EA Commitments

The following EA commitments have been met:

- Flat-bottomed grass-lined swales are proposed throughout the entire study area to provide adequate conveyance capacity of peak flows, while also providing some degree of quality control.
- Quality Treatment –Enhanced Protection Level (Level 1) quality treatment is provided.
- Quantity Treatment – The quantity treatment is provided to control post to predevelopment flows.
- The outlet structure for the extended detention/25 mm erosion storm for all stormwater management wet ponds will utilize a “bottom draw” system, which allows the water discharged from the pond to be taken from the lower (cooler) levels of the pond.
- Areas where stormwater management ponds are not feasible, Low-Impact Development features will be considered, such as dry swales. Low Impact Development features will be designed using the CVC and TRCA document Low Impact Development Stormwater Management Planning and Design Guide, dated 2010.
- Stormwater management facilities will not be located within sensitive environmental features or regulated floodline areas.
- All cross culverts greater than 6m in span are to be designed based on a 100-year design flow without impacting the current flood elevations.
- Cross culverts less than 6m in span will also be designed based on the 50-year design flow in order to convey all of the flow within the ROW to receiving stormwater management facilities for effective treatment.

- For areas with a drainage area greater than 125ha, structures will be sized to convey the Regional Storm (Hurricane Hazel) with no significant increases in flood levels from that of the existing condition.
- Extended Detention – Extended detention of 40m³/ha of the upstream drainage area and erosion control storage for the 25 mm storm to be released over a minimum of 48 hours for all wet ponds.

5.1.5.3 Stormwater Management Strategy Covered in DCR #2

Stormwater management (SWM) measures will be required for quality and quantity control to avoid negative impacts on local water systems as a result of the project. For this project, quality control measures are required to meet 80% total suspended solids (TSS) removal (MOECC Enhanced level treatment), and quantity control measures are required to ensure post-development runoff flow rates do not exceed pre-development runoff flow rates for the 2 to 100 year storm events.

In total there are two (2) wet ponds and one (1) dry pond proposed within the area covered by DRC#2 that provide quality and quantity controls to stormwater runoff from the project site, as specified in the EA documents. The ponds have been designed as follows:

- 2 wet ponds (Pond-1W and 2W) on the northeast and southeast corners of highway 427 and highway 407.
- 1 dry pond/linear pond (Pond-3W) on the southwest corner of Albion Road, and the Hwy 427 (Pond-3W)
- Wet ponds will provide extended detention of the 40m³/ha of the upstream drainage area and erosion control storage for the 25 mm storm to be released over a minimum of 48 hours.
- Enhanced level treatment is being provided to the maximum area practicable with grading constraints.

All stormwater management facilities are located outside of environmentally sensitive areas, consistent with the EA commitments. The locations of the temporary sedimentation ponds during construction will be in the same locations as the permanent pond locations. All remaining stormwater management facilities will be addressed in future DCRs.

In addition to ensuring that all quantity and quality criteria are met for the project, the EA Notice of Approval included commitments to ensure that a surface water monitoring program be put in place so that all mitigation measures are functioning as intended. LINK427 will implement the surface water monitoring program as it is approved by the MOECC.

Finally, all outlets from stormwater management facilities will be designed with adequate erosion protection measures, as specified in the EA documents.

5.1.5.4 Potential Impacts

The works related to this project can potentially have adverse impacts on the natural environment and in particular, watercourses, due to sediment in stormwater originating from the erosion of exposed soils. Ineffective and insufficient stormwater management and sediment control measures can increase fine sediment inputs, impact water quality and increase overland runoff inputs into watercourses. These changes lead to increased flood events, reduced base flows due to sedimentation, decrease habitat diversity and increased channel erosion. Sedimentation from construction activities is a major contributor to these problems.

5.1.5.5 Mitigation Measures

Stormwater management is a component in good erosion and sediment control. Reducing runoff velocities and ensuring that settlement time is incorporated into small storm events will reduce erosion potential and reduce sediment loads into receiving water courses. LINK427 will develop individual Construction Period Drainage and Sediment Management Plan(s) (DSMP) that incorporate each watercourse crossing prior to construction. The purpose of the DSMPs is to provide water quality control of the runoff generated within all drainage catchment areas within the Project Agreement Lands before water is discharged to any watercourse. In addition to the water quality control, DSMPs shall also address attenuation of frequent runoff events, and sediment control. Each DSMP shall be site-specific and based on managing stormwater within each drainage catchment area located within the Project Agreement Lands throughout each phase of construction. Location of drainage management facilities such as temporary sedimentation ponds, sediment detention basins, swales, and check dams, shall be determined prior to commencing the works within each drainage catchment area. Each DSMP shall be prepared in accordance with the “Environmental Guide for Erosion and Sediment Control

during Construction of Highway Projects" (MTO 2007). At a minimum, the DSMP shall include the following components as prescribed in the "Environmental Guide for Erosion and Sediment Control during Construction of Highway Projects":

- Statement of objectives;
- Project description;
- Pre-development site conditions;
- Critical areas of concern;
- Responsibilities and accountability;
- Best Management Practice (BMP) selection and design
- Monitoring and maintenance;
- Contingency plan; and
- Detailed site drawings.

All stormwater management facilities are located outside of environmentally sensitive areas. The locations of the temporary sedimentation ponds during construction will be in the same locations as the ponds proposed in the original EA document (January 2010).

In addition to ensuring that all quantity and quality criteria are met for the project, the EA Notice of Approval included commitments to ensure that a surface water monitoring program be put in place so that all mitigation measures are functioning as intended. LINK427 will implement the surface water monitoring program as approved by MOECC.

Finally, all outlets from stormwater management facilities will be designed with adequate erosion protection measures, as specified in the EA documents.

5.1.5.6 Hydraulics

The proposed development includes 99 culverts in total, 9 of which are retained existing culverts, some are extensions to existing culverts, and 90 are new culverts. Sizing and elevations of each culvert were iteratively evaluated to ensure all design criteria were met.

Runoff from the proposed highway widening and extension is collected in storm sewers or flows overland over the highway embankments to a series of grassed swales. These swales convey flows to stormwater ponds, adjacent roadway swale systems, and local watercourses.

5.1.6 Erosion and Sediment Control

5.1.6.1 Existing Conditions

LINK427 has developed an Erosion and Sediment Control Plan (ESCP) for the project in order to document the environmental protection measures for preventing and controlling erosion and sedimentation during construction works.

The ESCP provides the knowledge, awareness and methods necessary to complete the required work tasks in a manner that avoids or minimizes erosion and the potential impacts to the environment from sediment. The ESCP lays out the framework for ensuring that the design and construction activities are carried out in compliance with the terms and conditions of any project level permits, licenses, authorizations or agreements. As with all environmental management plans, the ESCP is a 'Living Document' that will be reviewed and updated as the project progresses through the various stages of design and construction. In the formulation of the ESCP, the appropriate agencies are being consulted for their input. This keeps the information in the plan relevant to current site activities and operations.

The topography within the project area is generally flat, with a slightly downward slope from the northwest to the southeast. The dominant hydrologic features within the Lands include the Rainbow Creek and Robinson Creek that are part of the Humber River Watershed. The valley land of local water courses, i.e. Rainbow Creek, Robinson Creek and Humber River, has cut through the glaciolacustrine deposits (silt and clay) into the underlying Halton Till. Areas within the watercourse valleys have alluvial coarse textured deposits, whereas the remaining surficial deposits consist primarily of glaciolacustrine silt and clay. The erodibility of the predominant surficial soils can generally be described as low to moderately erodible, with higher erodibility in the stream valleys.

For this work, the ESC measures will be industry standard / proven techniques to prevent erosion of exposed soils and the transport of sediment from construction areas to watercourses, wetlands and protected retained natural areas.

The project has two approaches to erosion and sediment control based on qualitative risk:

1. General ESC for areas with moderate to low risk (the flat areas underlain by clay to silt till and glaciolacustrine deposits), and
2. Site specific ESC for areas of concern (i.e., near watercourses and watercourse valleys) that will be included in the DSMPs.

ESC measures will be monitored and maintained throughout the construction of the project.

5.1.6.2 Potential Impacts and Mitigation Measures

Sedimentation from construction activities has been known to be a major contributor to increased fine sediment inputs, impact water quality and increase overland runoff inputs into watercourses. These changes lead to increased flood events, reduced base flows due to sedimentation, decrease habitat diversity and increased channel erosion that can negatively impact aquatic resources and other natural features. The potential for erosion and downstream sediment transport will be minimized with the application of ESC measures, with the following priority. Stormwater runoff will be managed to prevent overland flow from entering the construction area.

Erosion control measures will be applied to reduce the generation of sediment, and include the following:

- Existing vegetation that is not identified to be removed is to be retained and protected.
- Exposed surfaces will be protected, as practical to reduce erosion, including:
    - Removing only the vegetation above the ground during clearing
    - Minimize the amount of area exposed at one time, including staging grubbing.
- Excavated materials requiring stockpiling will be separated at least 30 meters from all identified watercourses, wetlands, and retained natural areas. The stockpiles will be placed in non-sensitive areas, protected with silt fence and sprayed with cover crop to mitigate any erosion and/or dust problems.
- Erosion measures will be in place prior to the start of construction and remain in place until restoration is complete and disturbed areas are stabilized against erosion.
- Standard erosion control measures will installed and maintained following Ontario Standard Specifications (OPSS) 805 or manufacturer's instructions.
- For most areas where work will not take place for a period of 45 days or more, exposed soils will be protected from erosions using the appropriate means such as hydro-seeding or erosion control blankets. For locations near receiving watercourses, stabilization will take place where work will not take place for a period of 15 days or more.

  A qualified environmental inspector will be on-site daily throughout construction to check that ESC measures are installed, functioning, being maintained as per the standards and industry practice.

- Sediment control approach will include:
    - Rock flow check dams (OPSD 219.210 and 219.211 - see **Appendix E**), silt fence flow check dams (OPSD 219.190 - see **Appendix E**) and/or other suitable measures will be provided in temporary construction ditches and swales, as required, to control flow rates and/or promote settling of sediments within swales prior to discharge.
    - Onsite stormwater conveyance channels for temporary flow control purposes will have adequate capacity and protection to prevent erosion during storm and runoff events.
    - Stormwater outlets shall be stabilized prior to any upstream land disturbing activities.
    - Minimize water velocity with the use of constructed ditches, berms, and check dams.
    - Site entrances will be protected by gravel or other means so that sediment is not tracked off site.

- Storm sewer inlets which are made operable during construction or which drain stormwater runoff from a construction site are to be protected from sediment deposition by the use of filters.
- Where sediment-laden standing water must be removed it will be disposed of by the appropriate means to contain sediment (e.g., sediment bags and sediment trap) (OPSD 219.240) and no direct discharge to watercourses will be allowed.
- Standard sediment control measures will installed and maintained following Ontario Standard Specifications or manufacturer's instructions.
- Dewatering via pumping and isolating the construction zone from outside flows to keep the work in the dry;
- Screening of water prior to dewatering pump intake;
- Heavy duty silt fence at or above the regulatory flood line;
- Temporary sedimentation pond for dewatering prior to discharge to watercourses;
- Temporary diversion swale necessary to convey runoff;
- Dewatering effluent discharge to be directed to sedimentation basins
- Energy diffusers to be employed for dewatering effluent lines
- Use of check dams, sediment barriers, and/or filters prior to discharge to the creek; and,
- In-Stream Control Practices:
    - Auguring and Directional Drilling;
    - Sediment/Turbidity Curtains;
    - Temporary Stream Crossings Via Culvert(s);
    - Dry Flume/By-Pass Pumping;
    - Cofferdam; and,
    - Site Dewatering.
- All sediment control measures will be installed prior to construction.

5.2 Socio-Economic Environment

5.2.1 Air Quality

5.2.1.1 Existing Conditions

An assessment of potential air quality impacts from the project was documented in detail in the Individual EA Report (January 2010), which was updated through an air quality assessment in 2015. The TESR (2013) noted that a regional air quality assessment was undertaken to consider effects of the proposed works on regional air quality. The TESR (2016) outlined and updated the main findings to reflect the proposed widening of two additional lanes. The purpose of the air quality assessment was to determine the potential air quality impacts of the Recommended Plan, utilizing the *Ministry of Transportation Environmental Guide for Assessing and Mitigating the Air Quality Impacts and Greenhouse Gas Emissions of Provincial Transportation Projects (MTO Guide)*. The air quality assessment determined that significant regional air quality impacts are not anticipated as a result of the works. The study also provided recommendations for mitigation measures that can be implemented to reduce the potential for air quality effects from construction.

5.2.1.2 Potential Impacts

The air quality assessment examined local air quality impacts, regional air quality impacts, and climate change implications. The local air quality assessment was conducted using CAL3QHCR dispersion modelling software which was developed with all the necessary information for this project.

As part of the EA (January 2010), regional impacts were determined by assessing the overall change in vehicle use. The analysis focused on pollutants such as oxides of nitrogen (NOX) and particulate matter (total suspended particulates (TSP)), which are important contributions to smog. The increase in Carbon Monoxide, and Course Particulate Matter and Carbon Dioxide is directly attributable to an increase in traffic. In addition, greenhouse gases (GHG) impacts were

analyzed to assess the impact the project will have on climate change. Overall, project related emissions evaluated are significantly less than the Ontario GHG emissions target.

Some temporary effects could be expected from the construction activities associated with the project, these include operation of heavy equipment, topsoil removal and excavation or grading which could generate dust and result in short term decreases in air quality. The potential for these impacts will be controlled through best management practices and LINK427 will be sure to prevent unnecessary release of emissions and air contaminants.

5.2.1.3 Mitigation Measures

Based on the modelling results, specific local mitigation is not warranted. However, to minimize potential impacts to air quality during construction, the following best management practices for dust and other emissions shall be employed:

- Regular cleaning of construction sites to remove construction debris that may emit dust.
- Include provision of transportation modes with low emission rates.
- Dust suppression measures, as identified in Ontario Provincial Standard Specification (OPSS), will be used on unpaved haul roads within the Lands and other traffic areas susceptible to emitting dust (the appropriate dust suppression techniques are subject to the area being free of sensitive plants, nearby watercourses or other ecosystems that may be affected).
- Standard dust suppression methods will be applied during construction of the highway and the concrete processing.
- Trucks will cover their loads when hauling fine-grained materials.
- Various methods to prevent trucks and other vehicles from tracking soil, mud or dust onto paved streets or roads.
- Where necessary, cleaning of paved streets/roads where tracking of soil mud or dust has occurred.
- Compliance with posted speed limits and, as appropriate, further reductions in speeds when travelling at sites with unpaved surfaces.
- Appropriate methods to prevent trucks and other vehicles from tracking soil, mud or dust onto paved streets or roads.
- Use of enclosures, wet sandblasting and / or other techniques to minimize dust during any sandblasting operations.
- Regular maintenance of all motorized equipment/vehicles, including emission control devices where installed by the manufacturer, to ensure emissions from internal combustion engines is minimized.
- No excessive idling of equipment and no idling of equipment that is not in immediate use.

5.2.2 Land Use

5.2.2.1 Existing Conditions

Existing land uses within, and surrounding the project Lands are a mix of agriculture, residential, industrial/commercial and recreational. The Greenbelt exists to the north of the Lands and a major arterial network (including Highway 427) exists to the south leading into the City of Toronto.

CP Rail track crosses the eastern portion of the Lands in a northwest-southeast orientation. Commercial / light industrial land uses are observed within the Lands on the south side of Rutherford Road and east side of the CP Rail track. The subject area lies within York Region, and is subject to the York Region Official Plan (OP).

Future land uses within the Lands are governed by the Regional Municipality of York and the City of Vaughan Official Plans, which were both updated in 2010 after approval of the *Highway 427 Transportation Corridor EA Report (January 2010).* The updates to Official Plans were completed in response to population and employment forecasts for the area, and the City anticipates being able to meet those forecasts given the provincial policies of the Growth Plan for the Greater Golden Horseshoe.

The project Lands are bisected by Highway 427, natural heritage features, including tributaries to the Humber River, and a major hydro transmission corridor.

5.2.2.2 Potential Impacts

There are no impacts to the existing or future land uses within the Lands as a result of the proposed Highway 427 Expansion as these works are contained with the ROW outlined in the previous EAs. No additional property is required for the construction works proposed in DCR #2, therefore no mitigation measures are required.

5.2.2.3 Mitigation Measures

The majority of the construction works are accommodated within the ROW outlined in the previous EAs. Therefore, no new private property is required. No mitigation measures are required.

5.2.3 Noise and Vibration

The DCR #2 construction works will be a temporary source of localized noise. The nature of the construction activities is such that the noise levels will vary temporally and spatially as different activities take place and as the location of the activities moves around the Lands. A Noise By-law exemption will be sought from City of Toronto and City of Vaughan for the construction activities associated with DCR #2. Some night work construction is anticipated in the City of Vaughan and the City of Toronto as the project construction schedule dictates. All works within the City of Vaughan and City of Toronto that are included in this DCR will be completed adhering to the applicable Noise Control By-laws.

5.2.3.1 Mitigation Measures

Implementation of the following measures is recommended to help mitigate any potential noise and vibration impacts:

- LINK427 will be required to keep idling of construction equipment to a minimum and to maintain equipment in good working order to reduce noise from construction activities.
- Noise emissions from construction equipment will also be subjected to the limits set out in the MOECC Publication NPC-115 and the *Noise Control Guideline for Class Environmental Assessment of Undertakings.*
- The MTO Environmental Guide for Noise (October 2006) will be followed.
- Heavily loaded trucks will be routed away from residential streets, where possible, in order to limit vibration impacts.
- Ensure that separation distance between the construction staging areas and nearby receptors be maximized to the greatest extent possible to reduce noise and vibration impacts.
- Response to Noise and Vibration complaints will be done in accordance with the project's Complaint Protocol.
- In the presence of persistent noise and vibration complaints, all construction equipment shall be verified to comply with MOECC NPC-115, NPC-118 and Ontario Model Municipal Noise Control By-Law guidelines.
- As some construction activities are expected to be undertaken during nighttime and/or weekends, exemptions from any applicable municipalities (i.e. City of Vaughan) Noise Bylaws will be sought.

While no significant adverse noise and vibration effects are anticipated due to the limited nature of the activities, a Construction Noise and Vibration Plan has been developed and will be implemented as per the EA Conditions of Approval throughout the construction period.

5.2.4 Waste Management/ Contaminated Property/ Excess Materials Management

5.2.4.1 Existing Conditions

5.2.4.1.1 Soil and Groundwater Quality

A Contamination Overview Study (COS) of the larger Lands was completed as part of the Individual EA to determine the presence and significance of any actual or potential sources of contamination within the Lands. The COS identified areas of potential environmental concern and Phase I and Phase II Environmental Site Assessments were completed by MTO in 2016 for properties identified as having a high potential for environmental impacts (high potential to encounter contaminated material).

Based on the findings of the Phase I and II ESAs and subsequent environmental investigations and delineated programs completed by LINK427 in 2017 and 2018, the following was confirmed:

- Groundwater quality within the Lands meet the generic *Soil, Ground Water and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act, Ministry of the Environment, April 15, 2011 (MOECC SCS).*
- Areas were identified within the Lands where soil quality does not meet the applicable MOECC SSC and remedial activities will be completed prior to construction activities outlined in DCR #2. The Sites with confirmed soil contamination include:
    - 6400 Langstaff Road (PIN #: 033180168);
    - 6350 Langstaff Road (PIN #:033180157);
    - 10220 Huntington Road (PIN # 033210209).

9571 and 9667 Huntington Road (portions of PIN 033200244, PIN 033200246 and PIN 033200258)

5.2.4.1.1.1 Potential Impacts

Where possible, areas of known contamination identified above will be remediated prior to construction activities within those areas, therefore, the potential for adverse impacts associated with construction activities in DCR #2 is low.

All remedial work will be completed in accordance with the Waste and Contamination Management Plan (WCMP), applicable regulations and best management practices and will fulfil the requirements of the EA, TESR and MTO Best Management Practices.

In the event that unknown contamination is discovered during the course of construction activities, procedures and steps outlined in the WCMP will be implemented and procedures for working in contaminated areas will apply.

5.2.4.1.1.2 Mitigation Measures

Remedial excavations will be completed prior to the construction works outlined in DCR #2, in those areas with confirmed soil contamination, therefore, mitigation measures will not be required during construction activities outlined in DCR #2.

The construction activities for DCR #2 will not involve the production of any excess soils that requires offsite management. Should there be any excess soils generated as part of construction activities associated with DCR #2, they will be managed in accordance with the projects Waste and Contamination Management Plan (WCMP), the projects Earth Management Plan (EMP) and with OPSS 180 (Management of Excess Materials).

5.2.4.1.2 Management of Designated Substances and Excess Materials

A designated substance survey (DSS) was previously completed for the three properties that have building structures that are planned for demolition. The DSS identified designated substances (lead, mercury and silica) within structures that will be demolished as part of this project. No other potential designated substances were identified (acrylonitrile, arsenic, benzene, coke oven emissions, ethylene oxide, isocyanates, and vinyl chloride) within the Lands.

The Sites with confirmed designated substances include:

- 10220 Huntington Road (Site 81/Kellam House) (PIN # 033210209);
- 9711 Huntington Road (Site 70/71) (PIN # 033200235/033200241); and
- 9571 Huntington Road (Site 69) (PIN # 033200244).

As part of DCR #2 activities, the farm stead at 9571 Huntington Road which contains a Concrete Block Barn, and the farm stead at 9711 Huntington Road which includes a farm house, barn silo, and two driving shed structures will be demolished. The Kellam Property will be demolished after September 2018 and addressed in DCR #3.

Identified designated substances within the building structures will be removed and disposed of in accordance with the WCMP, MOECC regulations and OSHA requirements. Additional DSSs and/or sampling programs will be completed (as required) if suspected designated substances or hazardous materials are suspected to be present.

Excess materials generated during construction activities will be managed in an environmentally acceptable manner, recycled and/or processed and disposed according to current legislation and practices in accordance with Ontario Provincial Standard Specification (OPSS) 180 and the LINK427 Earth Management Plan.

- Deposited waste and recyclable materials (such as metal, plastic etc.) will be removed and property managed off-site for re-use, recycling or disposal.
- Waste and recyclable materials will be segregated and separated where practicable, removed and/or managed offsite for reuse, recycling or disposal.
- Concrete materials from offsite sources will be assessed (as required) to determine suitability prior to crushing and/or processing activities.
- Permits and approvals associated with the management and processing of excess materials will be obtained as required.

5.2.4.1.2.1 Potential Impacts

Designated substances and excess materials generated during construction works will be managed in accordance with the WCMP, MOECC regulations and OSHA requirements. Permits and approvals will be obtained (as required).

5.2.4.1.2.2 Mitigation Measures

The following containment and mitigation measures will be implemented:

- Designated substances will be managed by persons qualified and trained for the specific substances in accordance with applicable regulations. All materials resulting from demolition will be identified and classified under Ontario Regulation 347 and managed in an environmentally responsible manner.
- In the event that suspect designated substances are identified during design and/or construction activities, additional testing and DSS reports will be completed (as required).

5.2.5 Traffic

5.2.5.1 Existing Conditions

The majority of the existing roadways associated with the project, at the time of the report, are not under any temporary traffic conditions, with the exception of portions of Highway 427. Temporary lane shifts are in place along existing Highway 427 as per the following adjacent contracts:

- MTO contract 2014-2016: east and west lane shifts between Finch Avenue and Steeles Avenue;
- 407ETR contract C3-2016: east and west lane shifts on Highway 427 at the Highway 407ETR structure

Furthermore, the current traffic provisions on all applicable roadways are as follows:

Crossing Road	No. Lanes Per Direction	Median Divider / Barrier? (Y / N)	Bike Lane? (Y / N)	Sidewalk? (Y / N)	Paved Road Surface? (Y / N)
Hwy 427 – Finch Ave to Hwy 407ETR	3	Y	N	N	Y
Hwy 427 – Hwy 407ETR to Hwy 7	2	Y	N	N	Y
Major Mackenzie Drive	1	N	N	N	Y
Huntington Rd	1	N	N	N	N
McGillivray Rd	1	N	N	N	N
Rutherford Rd	2	N	N	N	Y
Langstaff Rd	2	N	Y	N	Y
Zenway Blvd	2	Y	N	Y	Y
Regional Rd #99	2	Y	N	N	Y

Hwy 7	3	Y	N	Y	Y
Steeles Ave	2	N	N	Y	Y
Albion Rd	2	N	N	Y	Y
Finch Ave	2	Y	N	Y	Y

5.2.5.2 Potential Impacts

This section describes the potential traffic impacts expected as part of DCR #2 within both the Widening and Extension section of Highway 427. For simplicity, the impacts have been organized by the following groups.

Pedestrians & Cyclists

Pedestrians and cyclists will not be impacted permanently by the scope works of works described in this DCR #2. However, crossing roads affected by construction will experience minimal impacts throughout the construction period, primarily to facilitate works at the Highway 427 structures (i.e. grade separations). Within the scope of the DCR #2, the portions of work that impact pedestrians and cyclists are listed in the staging tables provided in **Section 4.1.9** and **4.2.9**. As can be seen, all are temporary in nature and access is maintained on at-least one side of the crossing street in almost all conditions.

Transit

Currently, transit systems that operate within the limits will not be impacted permanently by the scheduled works within the scope of the DCR #2. Any stops or stations that fall within the construction limits of this DCR #2 will be maintained under temporary conditions to ensure no impact to transit users.

Short duration Temporary Traffic Impacts (Highway 427, Highway 407ETR, All Crossing Roads)

During the various construction activities, short duration temporary traffic impacts will be required during the implementation of the long duration detours and lane shifts, as well as other activities, including utility relocations / installations, and large material deliveries (concrete, structural steel, rebar, etc.) which may not fit into work zones adjacent to the detours / lane shifts. Short duration temporary traffic impacts include lane closures, lane shifts, road closures, and detour routes, which are implemented for a single shift, and then removed, thereby restoring traffic to the regular conditions. All temporary short duration traffic impacts will be in accordance with the Ontario Traffic Manual, Book 7.

Long duration temporary traffic impacts (Finch Avenue, Albion Road, Steeles Road, Highway 7, and Zenway Boulevard)

The long duration temporary traffic impacts included in the scope of DCR #2 are described in detail within **Section 4.1.9** for the Widening section and **4.2.9** for the Extension section.

Permanent Traffic Impacts (Zenway Boulevard, McGillivray Road and Huntington Road)

As part of the overall design, there are several existing traffic patterns that will be modified and / or eliminated once construction is complete. Details of each of these impacts as well as description of works in this DCR on other crossing roads are described in **Sections 4.1.3** and **4.2.3** above. The following are a summary of the impacts that are covered within the scope of DCR #2:

- Zenway Boulevard will be converted to an overpass structure and will cease to have a direct connection to Highway 427;
- McGillivray Road at Rutherford Road will be closed and redesigned to terminate in a cul-de-sac just north of Rutherford Road;
- Huntington Road at Major Mackenzie Road (north of Major Mackenzie Road) will be closed and redesigned to terminate in a cul-de-sac just north of the realigned Major Mackenzie Drive;
- Huntington Road at McGillivray Road (south of Major Mackenzie Drive) will be closed and redesigned to terminate in a cul-de-sac between McGillivray Road and the CN Rail Crossing;

Of the aforementioned permanent traffic impacts, the largest impact to local traffic will be Zenway Boulevard no longer having direct access to/from Highway 427. As mentioned in **Section 4.2.3**, this restriction will not be completed until near the end of the project, to minimize the impact to the local users who use this point to access to and from Highway 427. The restriction will begin with a 2-month full closure of Highway 427 (the section of roadway between Highway 7 and Zenway Boulevard) to complete the tie-in activities between the existing Highway 427 on the south side of Highway 7 to the new portion of Highway 427 constructed on the north side of Zenway Boulevard. During this two month period, all users must utilize the Highway 7 Interchange, and once complete, users will be given access to the newly constructed Highway 427 between Highway 7 to Langstaff Road Interchanges.

5.2.5.3 Mitigation Measures

As noted above, mitigations to pedestrians, cyclists, and transit users are negligible in nature as all impacts will be accommodated through design and implementation of the long-duration detours (construction staging) described further in **Sections 4.1.10** and **4.2.11.**

With respect to mitigation of short and long duration traffic impacts, an extensive Traffic Management Plan (TMP) has been developed to consider the local mobility of people, goods, and long-haul transportation that will be affected by the construction of the proposed works. This plan outlines the various procedures to be implemented to mitigate traffic impacts. The primary goal for LINK427 and all members associated with this project is to minimize the impacts to the various road users and ensure public safety as they travel through the work zones. This will be accomplished through a variety of methods, as described below.

Limit Traffic Restrictions to Non-Peak Hours

The most significant method of mitigating traffic impacts will be scheduling traffic restrictions to non-peak hours. These would be reflective of the prescribed hours of work outlined in the Project Agreement and those substantiated through traffic and queue analysis. This will ensure that peak traffic will be able to safely flow through the work zones unimpeded and eliminate any delays or traffic queuing.

PVMS Boards

One of the tools for notifying the road users of planned traffic pattern changes, such as the Zenway/Highway 427 interchange closure, and assisting with incident management notifications will be implementation of numerous Portable Variable Message Signs (PVMS) boards across the Project limits. PVMS boards will be placed on high volume roadways and highways approaching the construction limits to address the impacts of the immediate work zone or the length of the corridor in general. For minor road structures, (i.e. residential roads and low-volume roadways, static advisory message signs will be erected to advise the general public of traffic pattern changes and / or anticipated delays).

Communication Procedures

Another tool for notifying various road users of planned traffic pattern changes will be utilizing the established regular communications procedures with stakeholders such as the project website and email notifications to subscribers. These would be published a minimum of 48-hours prior to the implementation of any scheduled traffic impacts and traffic pattern changes, both permanent and temporary. This would be especially important during major traffic events, as they will provide alternate routes and advise of extensive traffic delays. Use of these procedures will ensure motorists will be able to understand expected delays well in advance of entering the work zones and explore alternative solutions if needed to minimize delays.

5.3 Cultural Environment

5.3.1 Archaeological Resources

5.3.1.1 Existing Conditions

An overview of the archaeological features found within the Lands were documented in the previous 427 EA Report (January 2010) and a Stage 1 Archaeological Assessment conducted. The Stage 1 assessment encompassed the entire Highway 427 Transportation Corridor. Additional Stage 2 archaeological assessment work was conducted in 2015 and concluded that the project Lands are clear of archaeological potential. A Stage 3 Mechanical Top Soil Removal was

completed at the Coleraine Cemetery in July 2016. A Stage 2 archaeological assessment will be undertaken for any works required outside of the Lands, which were not anticipated but will be undertaken should an unforeseen situation arise.

5.3.1.2 Potential Impacts

Stage 2 archaeological assessments have been undertaken for all properties impacted by the proposed works and these lands are considered clear of archaeological potential.

5.3.1.3 Mitigation Measures

During construction there remains the low probability of encountering deeply buried archaeological resources. In the event that the following situations are encountered during construction, work must stop immediately and the actions undertaken as listed below:

- Should previously undocumented archaeological resources be discovered, they may be a new archaeological site and therefore subject to Section 48 (1) of the *Ontario Heritage Act*. The proponent or person discovering the archaeological resources will cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out fieldwork, in compliance with Section 48 (1) of the *Ontario Heritage Act*.
- In the event that human remains are encountered during construction, the proponent or person discovering human remains will immediately notify the police or coroner and the Registrar of Cemeteries, Ministry of Government Services at (416) 326-8393.
- The *Cemeteries Act*, R.S.O. 1990, c.C.4 and the *Funeral, Burial and Cremation Services Act*, 2002, S.O. 2002, c.33 (when proclaimed in force) require that any person discovering human remains must notify the police or coroner and the Registrar of Cemeteries at the Ministry of Consumer Services.
- During construction, the Coleraine Burying Grounds (Coleraine Cemetery) and the Coleraine Schoolhouse Site located on the south side of Major Mackenzie Drive will be protected to ensure protection from construction activities.

Should the boundaries of the project Lands change and extend outside of the proposed ROW, additional Stage 2 Archaeological Assessment work may be required.

5.3.2 Built Heritage and Cultural Landscapes

Cultural Heritage Evaluation and Documentation Reports were completed for the Highway 427 Expansion project during the Individual EA (2010) and subsequent phases. The construction activities covered in DCR #2 do not impact any built or cultural heritage landscapes within the Lands.

The scope of work for this DCR includes demolition of the two farmsteads.

All measures regarding the protection of SAR bat species and, Migratory Birds (Barn Swallows) will be adhered to as outlined above.

The property at 10200 Hunting Road Kellam House, Barn and out structures will be preserved and mothballed until September 2018 under DCR #2. These structures will be demolished after September 2018.

The demolition of these structures will be undertaken according to the approved Demolition Plan. This approved plan will outline the requirements to mitigate dust noise and demolition waste.

Heritage Materials from the Kellam House and Barn are being removed by the TRCA for repurposing in the Black Creek Pioneer Village. The CA has yet to provide LINK427 a list of materials salvaged from these structures and the dates when materials have been salvaged.

5.3.2.1 Mitigation Measures

No additional mitigation measures are required as the proposed construction activities result in no additional impacts to cultural or built heritage as identified in the Individual EA (2010).

6. Summary of Environmental Concerns, Mitigation Measures and Commitments

Table 12 below summarizes the environmental impacts associated with the Detail Design and outlines commitments for mitigation measures and future work. The table below also references the commitments and mitigation measures identified as part of the Individual EA (January 2010), the TESR (2013) and TESR (2016). This table will be expanded during future works to ensure the appropriate mitigation measures and design features are consistent with the commitments outlined in the EA Report (January 2010), the 2013 and 2016 TESRs, as well as this DCR.

6.1 Pending Approvals

Pending approvals associated with the work under this DCR include:

- Overall Benefit permit for SAR bats under the *Endangered Species Act* legislation.
- Noise By-law Exemptions.
- Refer to Table 7 for a list of Utility Relocation permits
- Environmental Activity and Sector Registry / Permit to take Water
- Fish Collection Permit

All permitting and approval requirements will be confirmed and obtained as required. Works which are subject to a given permit will be commenced only after the permit is obtained.

Table 13: Summary of Environmental Concerns, Mitigation Measures and Commitments

Environmental Issues / Concern	Agencies	Proposed Mitigation / Commitments to Future Work
Natural Environment		
Terrestrial Ecosystems	**MTO** **MNRF** **TRCA** **MOECC**	■ Grubbing, grading and follow-up construction activities will be carefully planned prior to the start of construction in order to foresee and mitigate any environmental issues before they occur. ■ The boundaries of the Lands will be clearly delineated on construction drawings and will be fenced prior to the start of works associated with DCR #1 and will be retained in place throughout the duration of works associated with DCR #2. ■ Vegetation removal completed as part of the works associated with DCR #1 and grubbing completed as part of DCR #2 will be restricted to within the Lands, as identified in the design drawings. ■ LINK427 has carefully reviewed construction impacts and made extensive efforts to minimize vegetation removals, including altering construction approaches to avoid entering valleys where possible, and to minimize impact where equipment is required to enter sensitive areas. ■ Grading limits have also been refined to retain as much vegetation as possible, including a number of mature trees at West Robinson Creek. ■ LINK 427 will protect and retain existing vegetation and trees, within identified protected vegetation areas. ■ Protected vegetation will be clearly delineated in both the design drawings and will be fenced prior to the start of works associated with DCR #1 and will be retained in place throughout the duration of works associated with DCR #2. ■ Prior to heavy machinery working adjacent to identified natural areas and vegetation communities, tree protection barrier fencing shall be installed outside the drip-line of the significant features to protect any vegetation that is to be retained and is in the vicinity of exposure to damage by machinery or other sources. This includes, but is not limited to, where vegetation removals will occur within forested communities. LINK427 shall ensure that all protection fencing conforms to the Ontario Provincial Standard Specification (OPSS) for the Protection of Trees (OPSS 801.07.02). ■ Erosion and sediment control (ESC) measures will be installed according to the ESC Plan and as located on the design drawings and will be maintained throughout construction. ■ Tree grubbing will be restricted to the required activity zone. Where grubbing is not required, tree stumps will be cut flush to the ground and grubbing will be avoided to minimize soil disturbance, particularly in erosion prone areas.

Environmental Issues / Concern	Agencies	Proposed Mitigation / Commitments to Future Work
		■ In the event that adjacent vegetation communities or planted trees are accidently damaged during construction activities, LINK427 will implement appropriate contingency measures such as pruning tree limbs or roots that are accidently damaged using proper arboricultural techniques. ■ Tree/shrub debris will be stored outside identified protected vegetation. ■ Any trees/shrubs that are felled will be removed or mulched as soon as possible. During the breeding bird season (April 15th to August 15th) if trees or shrubs need to be removed, a clearance by a qualified biologist will be undertaken prior to any removals. ■ Vegetation removals (including non-woody vegetation) shall take place outside of the appropriate timing windows for breeding birds and bats (see **Section 5.1.3** for further details). ■ Exposed surfaces shall be stabilized and seeded with a temporary seed mix in areas where woody vegetation planting is not to occur within 45 days from completion of the works. Other exposed surfaces will be seeded as per the Landscape Plan. ■ Temporary stockpiles will be seeded with a temporary seed mix consisting of Oats (Avena sativa) in spring/summer and winter wheat (Triticum aestivum) in fall as recommended by MNRF to quickly stabilize these areas. ■ Areas within the Lands with a high proportion of invasive species that will be removed as part of the advance clearing within DCR #1 (i.e., Buckthorn and Common Reed) will be delineated by LINK427 Plant Ecologist/Botanist(s) prior to the start of clearing activities. These species will be removed and disposed of separately in accordance with the Invasive Species Management Program (ISMP) to avoid the spread of these species with the Lands. ■ LINK427 will restrict earth movement immediately adjacent to woodlands during periods of high dust generation. Dust suppressants will be applied during dry periods to those areas which generate large amounts of dust. ■ Construction vehicle access will be limited to existing roadways and construction paths, away from the protected vegetation. ■ Vehicle re-fueling stations will be located within a centralized location on-site away from the protected vegetation. ■ For areas immediately adjacent to the protected vegetation, periodic supervision of the construction will occur. ■ LINK427 shall undertake environmental inspection during construction to ensure that protection measures are implemented, maintained and repaired and remedial measures are initiated where warranted.

Environmental Issues / Concern	Agencies	Proposed Mitigation / Commitments to Future Work
		■ There shall be no storage of materials within adjacent natural areas. ■ LINK427 will ensure appropriate clearing and disposal of all construction-related debris following construction. ■ A Vegetation Restoration Plan (VRP) has been developed in consultation with the Ministry of Natural Resources and Forestry (MNRF) and the Toronto Region Conservation Authority (TRCA). Once completed, the VRP will be used as the guiding document for future vegetation restoration activities. The VRP will be integrated with the erosion control plan, the invasive species management plan and requirements of the ESA permit for SAR Bats. The VRP and Landscape Plan, which is to be implemented as part of DCR #2 and future DCRs include the following elements: ■ Planting at stormwater ponds will be designed to stabilize inlet and outflow areas and provide shading and bank stabilization. Additional planting around each pond will contribute to vegetative cover. ■ Native species will be utilized where possible, particularly adjacent to sensitive areas and valleys. ■ Vegetation enhancement will be performed in areas where it is likely to be successful and will contribute ecological benefit. ■ Areas of meadow marsh habitat will be created and integrated with the stormwater management system. ■ Site-specific mitigation will be performed at key locations such as woodlands and valleys, to enhance existing vegetation and habitat. ■ Other locations along the highway such as interchanges and embankments will be vegetated with a combination of aesthetic and naturalized plantings. Per the MOECC Notice of Approval for the 2010 EA, the proponent shall make reasonable efforts during the detail design phase of the undertaking to minimize the removal of existing vegetation features, such as woodlands, and shall consider using any lands surplus to the highway and transitway construction for vegetative restoration. The following measures address this commitment: ■ LINK427 has carefully reviewed construction impacts and made extensive efforts to minimize vegetation removals, including altering construction approaches to avoid entering valleys where possible, and to minimize impact where equipment is required to enter sensitive areas. ■ Vegetation within valleys and in sensitive areas will be fenced outside the construction impact zones. Existing trees that can be retained will be protected during construction. ■ Exposed surfaces will be stabilized and revegetated as quickly as possible (maximum 45 days from completion of the works).

Environmental Issues / Concern	Agencies	Proposed Mitigation / Commitments to Future Work
		■ Clearing will be minimized and grubbing will be restricted to areas where it cannot be avoided. Trees will be felled away from natural areas. ■ Significant trees have been identified for protection as described in the EA. ■ Forest restoration and edge management will be implemented adjacent to wooded areas. ■ Hedgerows will be protected where possible. Temporary seed mixes such as oats and winter wheat will be used to stabilize those areas that have been graded and must remain open over the late fall/winter months. Once final grading is completed seeding and planting will be installed in accordance with the appropriate section of the VRP. Site-specific mitigation will be performed at key locations such as woodlands and valleys, to enhance existing vegetation and habitat. These measures are documented in a future DCR.
Wildlife, Wildlife Habitat and Species at Risk (SAR)	**MTO** **MNRF** **TRCA** **MOECC**	Mitigation measures to address potential impacts to Migratory Birds include: ■ Vegetation clearing, grubbing and other construction activities which may be disruptive to migratory birds will comply with the *Migratory Birds Convention Act* (MBCA 1994) and Migratory Bird Regulations (MBR 2012). Timing restrictions will be complied with, during construction activities, particularly vegetation clearing. Specifically, clearing of vegetation will occur outside of the breeding bird season (April 15th to August 15th). ■ Where vegetation grubbing cannot be conducted outside of the breeding bird season, a qualified Avian Biologist will be retained and shall conduct a nest survey, according to MBCA guidance. ■ Clearing shall only be undertaken if no active nests or active breeding pairs are identified within the clearing area by the qualified Avian Biologist. ■ Bird nesting preventative measures (e.g., netting) will be installed prior to April 15th on structures that will be rehabilitated / widened in each respective calendar year and will be maintained until August 31st of the calendar year in which they were installed. Mitigation measures to address potential impacts to general wildlife include: ■ All construction workers will be trained in advance of starting work regarding potential to encounter wildlife while undertaking their activities, and the appropriate response if an encounter occurs. ■ Any wildlife incidentally encountered during construction will not be knowingly harmed. ■ Under no circumstances will any animal (e.g., bird, reptiles, mammals etc.) be knowingly harmed, harassed or otherwise disturbed. If an animal is encountered, it will be allowed to move away on its own.

Environmental Issues / Concern	Agencies	Proposed Mitigation / Commitments to Future Work

		■ If small wildlife (e.g. turtles, amphibians) are stranded within the construction zone MTO will be contacted and the animals will be captured and released by a qualified individual (e.g., LINK427 SAR Biologist).
		■ In the event that small wildlife encountered does not move away from the construction zone, and construction activities are such that continuing construction in the area would result in harm to the animal, all activities will stop and MTO will be notified immediately.
		■ A Wildlife Fence Plan is being developed for the project with the sole purpose of keeping wildlife off of the highway ROW and funneling wildlife to the main valley crossings structures. Wildlife fencing and wildlife habitat enhancements are being developed and incorporated into the VRP and will be documented in a future DCR.
		■ Minimum Openness Ratio (OR) and minimum height commitments for the passage of small wildlife have been incorporated into the design of the structural culverts and watercourse crossings (i.e., Rain-1, Rob-2 and Rob-7). See **Section 4.2.3**.
		Mitigation measures to address potential impacts to Barn Swallow include:
		■ Moth-balling or removal of the two barn structures with confirmed Barn Swallow nesting habitat will occur outside of the Barn Swallow active season (i.e., May 1 to August 31).
		■ LINK427 will provide alternative housing structures (i.e., nesting kiosks) prior to the next Active Barn Swallow Season (i.e., May 1st). LINK427 will be installing alternative nesting structures prior to May 1, 2018.
		LINK427 will implement all mitigation measures outlined in the Barn Swallow Mitigation and Restoration Record prepared in support of the Barn Swallow registration under the ESA, 2007, including 3 years of monitoring identified therein.
		Mitigation measures to address potential impacts to SAR Bats include:
		■ All conditions outlined in the forthcoming Overall Benefit Permit for SAR bats will be implemented, and will be done so in accordance with timing requirements outlined therein. It is anticipated that measures outlined in the forthcoming permit will include:
		  ■ Wherever possible, the removal of cavity trees will be scheduled outside of the maternity roosting season for bats, which occurs from April 30 to September 1 of any calendar year.
		  ■ A strict 'no vegetation' removal period between June 1st and July 31st for woodland bat habitat will be applied.
		  ■ Should cavity trees require removal between April 30th or August 1 to September 1st, a night exit survey will be conducted 24 hours prior to tree removal to determine the presence of SAR bats.

Environmental Issues / Concern	Agencies	Proposed Mitigation / Commitments to Future Work
		If no bats are recorded during the survey the removal of the tree must take place immediately the following day. If any bats are observed utilizing the cavity tree, a 30 m buffer will be put in place and the tree will be retained until the bats have vacated the area. ■ Regular monitoring during vegetation removal within the confirmed habitat features slated for removal and the two anthropogenic structures will take place by an environmental monitor. ■ Any construction activities within 30m of known cavity trees shall be restricted to daylight hours when possible, to minimize negative impacts on resident bats. LINK427 will implement overall benefit measures for SAR bats including habitat enhancement habitat restoration, and monitoring, to be confirmed in the forthcoming ESA Overall Benefit Permit. Mitigation measures to address potential SAR Encounters include: ■ A SAR sighting is defined as an observation of a SAR where no action is required. ■ A SAR occurrence is defined as an observation of a SAR where action of Capture and Relocation is required. ■ In the event that SAR wildlife is encountered in the immediate work area, the protocol outlined below shall be followed: ■ Work in the immediate vicinity of the observation must come to a stop. ■ Should an Ecologist/Biologist not be on-site, one will be contacted immediately. ■ Ecologist/Biologist will notify the District MNRF Biologist within 48 hours of any observation of Endangered and Threatened species and/or immediately for any species going to a wildlife custodian. ■ It is not necessary to notify the District MNRF Biologist with observations of Special Concern species or general wildlife sightings (deer, raccoon etc.). ■ A 30m setback from the area of the species location will be applied to allow the species to vacate the area naturally within a 24 hour period and then exclusionary fence is to be installed if appropriate. ■ Should a SAR be encountered during construction activities completed during the winter months (e.g. dislodged from hibernation), the species will immediately be placed in appropriate containers and stored in a dark, warm, quiet place and be transported to an appropriate wildlife sanctuary/rehabilitation facility as soon as possible. Onsite Ecologists/Biologist will advise of the transportation arrangements and consult with MNRF to notify them of the transportation.

Environmental Issues / Concern	Agencies	Proposed Mitigation / Commitments to Future Work
		■ Work is to not commence again in the immediate area of the observation until further instructed by onsite Ecologist/Biologist.
Fish and Fish Habitat	**MTO** **MNRF** **TRCA** **DFO**	The recommended mitigation measures include: ■ All instream or near stream works will be conducted during the appropriate in-water timing window. A warmwater construction timing (from July 1 to March 31) would be applied to protect the resident warmwater fish communities present in watercourses further downstream (OPSS 182, SSP101F23). ■ Sediment and erosion control measures will be implemented during all phases of construction, clean-up and restoration to prevent sediment laden runoff from entering any of the watercourses directly from the construction zone (OPSS 805, SSP805F01, Operational Constraint – Erosion and Sediment Control). The ESC Plan includes the following which in notes which are also provided on the design drawings included in **Appendix C**: ■ Perimeter silt fence will be installed between the work areas and all reaches of those watercourses where works are required, including ditch and drainage works that drain to watercourses that support fish habitat. ■ The fencing will be properly installed and regularly inspected and maintained. It will be left in place and maintained until all surfaces contributing drainage to these watercourses are stabilized. ■ All exposed and newly constructed surfaces will be stabilized using appropriate means in accordance with the characteristics of the soil material and slope conditions. ■ These surfaces will be fully stabilized and re-vegetated as quickly as possible (and at a maximum within 45 days) following completion of the works. ■ All near-water construction zones will be isolated using standard perimeter silt fencing of the general construction zone up and downstream. The silt fencing will be heavy duty/reinforced fencing for all disturbed areas of the embankments that drain to the streams. Silt fencing will be regularly inspected and maintained as required (OPSS 805, SSP805F01, Operational Constraint – Erosion and Sediment Control). ■ Only clean materials free of fine particulate matter will be placed in the water for temporary construction measures (e.g. temporary flow management dams will be constructed of 'pea gravel' bags, geotextile fabric or other clean material), or permanent works (e.g., culvert and channel substrates, cobble / boulder material). ■ If any temporary dewatering of the near or instream construction zones is required in order to construct the new culverts or extension of culverts , appropriate energy dissipation and settling / filtration measures will be used for discharge to ensure no erosion or sediment release occurs in the

Environmental Issues / Concern	Agencies	Proposed Mitigation / Commitments to Future Work
		watercourses / drainage features. No dewatering discharge will be released directly to the watercourses. If temporary dewatering of the near stream construction zone is required, dewatering will be discharged through a filter bag / splash pad located at least 30 m from the watercourses (OPSS 185, OPSS 518). ■ All culvert installations and channel restoration works to be completed 'in the dry' using an appropriate temporary flow by-pass system to maintain clean flow around the construction zone. To minimize potential for impacts, culvert works on the minor crossings will be conducted during low flow periods when these features support no or very small flows (Albion Creek, Creek-1, ROB-7) (OPSS 185, OPSS 518). ■ Where there is no flow on watercourses / drainage features requiring instream works, contingency temporary flow by-pass measures will be in place to manage any flow in the event of a storm and associated runoff (RAIN-1, RAIN-4, ROB-1, ROB-2, ROB-3, W-017) (OPSS 185, OPSS 518). ■ All dredged, salvaged or stockpiled materials will be located a safe distance from the watercourses edges and stabilized to prevent migration of any sediment or other material to the watercourse (OPSS 180). ■ All work areas or other disturbed surfaces draining to the watercourses and/or in the floodplain will be stabilized and re-vegetated with appropriate native, non-invasive species as soon as feasible following construction. ■ The erosion and sediment control measures will be left in place, monitored and maintained in proper working order until all disturbed areas draining to the watercourses are fully stabilized, including establishment of vegetative cover (Operational Constraint – Erosion and Sediment Control). ■ No equipment shall cross or otherwise enter the other watercourses to construct the specified works. ■ All activity will be controlled so as to prevent entry of any petroleum products, debris or other potential contaminants / deleterious substances, including sediment, to the watercourses. Storage, maintenance or refueling or maintenance of equipment will be conducted at least 30 m away from the watercourses. The Contractor will have an appropriate spills management/response plan in place throughout construction, including spill control and absorbent materials, instructions regarding their use and notification procedures (OPSS 182, OPSS 100). ■ Every effort will be made to retain as much of the natural vegetation as reasonably possible to help ensure bank stability and control erosion, and to expedite the recolonization of native plant species. ■ All riparian vegetation removed to construct the highway works will be replaced with a mix of appropriate native species. Additional riparian plantings may be incorporated to enhance existing conditions along the right-of-way (ROW), and along the realigned sections (i.e., the tie-ins both up and downstream of

Environmental Issues / Concern	Agencies	Proposed Mitigation / Commitments to Future Work
		the new culverts) as outlined in the site specific mitigation measures section above. Only native shrub and tree species, compatible with the site conditions will be used. ■ A qualified environmental inspector will be on-site as required throughout construction, responsible for ensuring the sediment and erosion control measures are functioning and all of the mitigation measures are being implemented (SSP101F23 – Table B). Site-specific mitigation measures include the following: ■ All culverts will be inset by 10% to prevent erosion and scour of the inlets / outlets (OPSS 182). ■ A Scientific Collectors Permit will be obtained in order to conduct a fish salvage prior to any works being conducted for the culvert installation at ROB-7 and W-017 using appropriate techniques to capture and transfer unharmed any stranded fish as specified in the permit. A Scientific Collectors Permit will be required at WB-05 and fish will be removed following direction by the local MNRF (OPSS 182). ■ The new ditch line for Albion Creek will be reconstructed with similar or slightly larger profile than the existing ditch line section and it will be fully stabilized prior to re-connection / transfer of flow. The re-stabilization may include re-vegetation with cattail similar to existing ditch. ■ The upstream and downstream ends of all the new culverts and extended culverts, as well as the realigned portion of Albion Creek ditch line, Creek-1, RAIN-1, ROB-2 and ROB-7 will transition smoothly with the existing flow paths to avoid development of erosion. ■ The extension of culvert Albion Creek culvert C18 and Creek-1 culvert C28 will be designed and installed to transition smoothly with the upstream and downstream Albion Creek and Highway 50 Tributary channel sections respectively to avoid erosion. ■ The stormwater management (SWM) pond outfall locations, specifically the outfall of SWMP 3W into Alboin Creek, will be designed and constructed to be stable and minimize erosion potential to the receiving watercourses. ■ Follow MTO's Best Management Practice (BMP) for Culvert Extension / Replacement (C18 and C28), Ditch Maintenance within 30 m of a Waterbody, and Maintenance of Riparian Vegetation in Existing Right-of-Way. The realignments have be properly designed to maintain form and function of the existing fish habitats.
Groundwater & Hydrogeology	**MTO MOECC TRCA**	The following best management practices for mitigation are to be followed: ■ Dewatering activities shall be conducted in accordance with control procedures as specified in OPSS 518 Control of Water from Dewatering Operations. Appropriate dewatering measures shall be implemented to manage any groundwater encountered during grading activities, and dewatering

Environmental Issues / Concern	Agencies	Proposed Mitigation / Commitments to Future Work
	Property Owner	discharge water will be filtered as necessary to prevent transport of sediment to natural surface water receptors; ■ A Spill Prevention and Control Management Plan shall be prepared; ■ Surface runoff will be directed to roadside ditches and ditch conditions shall be improved to minimize groundwater recharge impacts; ■ Installation of groundwater monitoring wells (screened in the shallow overburden), if not already present, near the temporary or permanent groundwater dewatering locations to closely monitor groundwater quantity and quality during the dewatering activities; ■ Environmental quality of pumped water discharged to the natural environment must meet the requirements provided in O. Reg. 387/04 and O. Reg. 63/16; and, ■ Minimize salt usage and runoff during road de-icing applications by following best practices consistent with those used across North America and employ the latest winter maintenance technologies (alternative to and environmentally friendlier than using road salt). The following commitments made under the Project Agreement Schedule 17 shall be implemented by LINK427: ■ Monitoring of private wells prior to construction to establish background conditions are completed subject to obtaining permission to access the property and the well(s) by the land owner however monitoring of private wells for the Highway 427 widening areas are not required since dewatering is not anticipated for the works in this section. Also the area is serviced by municipal services and it is likely that wells are not used for private water supply. ■ The quality of pumping discharge from the excavated areas are to meet the applicable quality objectives as per O. Reg. 387/04, O., Reg. 64/16 and O.Reg. 63/16 conditions and also shall conform to OPSS 518; ■ All groundwater monitoring/observation wells and water wells encountered during construction located within the construction alignment (**Figures 17A and 17B**) shall be decommissioned as per the requirements made under O. Reg. 903 as amended. There are no private water supply wells within the construction alignment area of the Highway 427 widening area. Any water wells identified by LINK427 within the construction lands will be decommissioned in accordance with the requirements made under O. Reg. 903 as amended; and ■ LINK427 will prepare and submit annual monitoring reports by August 31 of each year until Substantial Completion and for one year after Substantial Completion.

Environmental Issues / Concern	Agencies	Proposed Mitigation / Commitments to Future Work
Drainage & Stormwater Management	**MTO** **MOECC** **MNRF** **TRCA** **DFO**	Stormwater management is a component in good erosion and sediment control. Reducing runoff velocities and ensuring that settlement time is incorporated into small storm events will reduce erosion potential and reduce sediment loads into receiving water courses. LINK427 will develop individual Construction Period Drainage and Sediment Management Plan(s) (DSMP) that incorporate each watercourse crossing prior to construction. The purpose of the DSMPs is to provide water quality control of the runoff generated within all drainage catchment areas within the Project Agreement Lands before water is discharged to any watercourse. In addition to the water quality control, DSMPs shall also address attenuation of frequent runoff events, and sediment control. Each DSMP shall be site-specific and based on managing stormwater within each drainage catchment area located within the Project Agreement Lands throughout each phase of construction. Location of drainage management facilities such as temporary sedimentation ponds, sediment detention basins, swales, and check dams, shall be determined prior to commencing the works within each drainage catchment area. Each DSMP shall be prepared in accordance with the "Environmental Guide for Erosion and Sediment Control during Construction of Highway Projects" (MTO 2007). At a minimum, the DSMP shall include the following components as prescribed in the "Environmental Guide for Erosion and Sediment Control during Construction of Highway Projects": ■ Statement of objectives; ■ Project description; ■ Pre-development site conditions; ■ Critical areas of concern; ■ Responsibilities and accountability; ■ Best Management Practice (BMP) selection and design ■ Monitoring and maintenance; ■ Contingency plan; and ■ Detailed site drawings. All stormwater management facilities are located outside of environmentally sensitive areas. The locations of the temporary sedimentation ponds during construction will be in the same locations as the ponds proposed in the original EA document (January 2010). In addition to ensuring that all quantity and quality criteria are met for the project, the EA Notice of Approval included commitments to ensure that a surface water monitoring program be put in place so that all mitigation measures are functioning as intended. LINK427 will implement the surface water monitoring program as approved by MOECC.

Environmental Issues / Concern	Agencies	Proposed Mitigation / Commitments to Future Work
		Finally, all outlets from stormwater management facilities will be designed with adequate erosion protection measures, as specified in the EA documents.
Erosion and Sediment Control	**MTO** **MNRF** **TRCA** **MOECC**	Erosion control measures will be applied to reduce the generation of sediment, and include the following: ■ Existing vegetation that is not identified to be removed is to be retained and protected. ■ Exposed surfaces will be protected, as practical to reduce erosion, including: ▪ Removing only the vegetation above the ground during clearing ▪ Minimize the amount of area exposed at one time, including staging grubbing. ■ Excavated materials requiring stockpiling will be separated at least 30 meters from all identified watercourses, wetlands, and retained natural areas. The stockpiles will be placed in non-sensitive areas, protected with silt fence and sprayed with cover crop to mitigate any erosion and/or dust problems. ■ Erosion measures will be in place prior to the start of construction and remain in place until restoration is complete and disturbed areas are stabilized against erosion. ■ Standard erosion control measures will installed and maintained following Ontario Standard Specifications (OPSS) 805 or manufacturer's instructions. ■ For most areas where work will not take place for a period of 45 days or more, exposed soils will be protected from erosions using the appropriate means such as hydro-seeding or erosion control blankets. For locations near receiving watercourses, stabilization will take place where work will not take place for a period of 15 days or more. ■ A qualified environmental inspector will be on-site daily throughout construction to check that ESC measures are installed, functioning, being maintained as per the standards and industry practice. ■ Sediment control approach will include: ■ Rock flow check dams (OPSD 219.210 and 219.211 - see **Appendix E**), silt fence flow check dams (OPSD 219.190 - see **Appendix E**) and/or other suitable measures will be provided in temporary construction ditches and swales, as required, to control flow rates and/or promote settling of sediments within swales prior to discharge. ■ Onsite stormwater conveyance channels for temporary flow control purposes will have adequate capacity and protection to prevent erosion during storm and runoff events. ■ Stormwater outlets shall be stabilized prior to any upstream land disturbing activities.

Environmental Issues / Concern	Agencies	Proposed Mitigation / Commitments to Future Work
		■ Minimize water velocity with the use of constructed ditches, berms, and check dams. ■ Site entrances will be protected by gravel or other means so that sediment is not tracked off site. ■ Storm sewer inlets which are made operable during construction or which drain stormwater runoff from a construction site are to be protected from sediment deposition by the use of filters. ■ Where sediment-laden standing water must be removed it will be disposed of by the appropriate means to contain sediment (e.g., sediment bags and sediment trap) (OPSD 219.240) and no direct discharge to watercourses will be allowed. ■ Standard sediment control measures will installed and maintained following Ontario Standard Specifications or manufacturer's instructions. ■ Dewatering via pumping and isolating the construction zone from outside flows to keep the work in the dry; ■ Screening of water prior to dewatering pump intake; ■ Heavy duty silt fence at or above the regulatory flood line; ■ Temporary sedimentation pond for dewatering prior to discharge to watercourses; ■ Temporary diversion swale necessary to convey runoff; ■ Dewatering effluent discharge to be directed to sedimentation basins ■ Energy diffusers to be employed for dewatering effluent lines ■ Use of check dams, sediment barriers, and/or filters prior to discharge to the creek; and, ■ In-Stream Control Practices: ▪ Auguring and Directional Drilling; ▪ Sediment/Turbidity Curtains; ▪ Temporary Stream Crossings Via Culvert(s); ▪ Dry Flume/By-Pass Pumping; ▪ Cofferdam; and, ▪ Site Dewatering. All sediment control measures will be installed prior to construction.
Socio-Economic Environment		
Air Quality	**MTO MOECC MNRF**	To minimize potential impacts to air quality during construction, the following best management practices for dust and other emissions shall be employed: ■ Regular cleaning of construction sites to remove construction debris that may emit dust.

Environmental Issues / Concern	Agencies	Proposed Mitigation / Commitments to Future Work
		■ Include provision of transportation modes with low emission rates. ■ Dust suppression measures, as identified in Ontario Provincial Standard Specification (OPSS), will be used on unpaved haul roads within the Lands and other traffic areas susceptible to emitting dust (the appropriate dust suppression techniques are subject to the area being free of sensitive plants, nearby watercourses or other ecosystems that may be affected). ■ Standard dust suppression methods will be applied during construction of the highway and the concrete processing. ■ Trucks will cover their loads when hauling fine-grained materials. ■ Various methods to prevent trucks and other vehicles from tracking soil, mud or dust onto paved streets or roads. ■ Where necessary, cleaning of paved streets/roads where tracking of soil mud or dust has occurred. ■ Compliance with posted speed limits and, as appropriate, further reductions in speeds when travelling at sites with unpaved surfaces. ■ Appropriate methods to prevent trucks and other vehicles from tracking soil, mud or dust onto paved streets or roads. ■ Use of enclosures, wet sandblasting and / or other techniques to minimize dust during any sandblasting operations. ■ Regular maintenance of all motorized equipment/vehicles, including emission control devices where installed by the manufacturer, to ensure emissions from internal combustion engines is minimized. ■ No excessive idling of equipment and no idling of equipment that is not in immediate use.
Land Use	**MTO**	The majority of the construction works are accommodated within the ROW outlined in the previous EAs. Therefore, no new private property is required. No mitigation measures are required.
Noise and Vibration	**MTO** **MOECC**	Implementation of the following measures is recommended to help mitigate any potential noise and vibration impacts: ■ LINK427 will be required to keep idling of construction equipment to a minimum and to maintain equipment in good working order to reduce noise from construction activities. ■ Noise emissions from construction equipment will also be subjected to the limits set out in the MOECC Publication NPC-115 and the *Noise Control Guideline for Class Environmental Assessment of Undertakings.* ■ The MTO Environmental Guide for Noise (October 2006) will be followed.

Environmental Issues / Concern	Agencies	Proposed Mitigation / Commitments to Future Work
		■ Heavily loaded trucks will be routed away from residential streets, where possible, in order to limit vibration impacts. ■ Ensure that separation distance between the construction staging areas and nearby receptors be maximized to the greatest extent possible to reduce noise and vibration impacts. ■ Response to Noise and Vibration complaints will be done in accordance with the project's Complaint Protocol. ■ In the presence of persistent noise and vibration complaints, all construction equipment shall be verified to comply with MOECC NPC-115, NPC-118 and Ontario Model Municipal Noise Control By-Law guidelines. ■ As some construction activities are expected to be undertaken during nighttime and/or weekends, exemptions from any applicable municipalities (i.e. City of Vaughan) Noise Bylaws will be sought. While no significant adverse noise and vibration effects are anticipated due to the limited nature of the activities, a Construction Noise and Vibration Plan has been developed and will be implemented as per the EA Conditions of Approval throughout the construction period.
Waste Management / Contaminated Property / Excess Materials Management	**MTO MNRF TRCA DFO**	Remedial excavations will be completed prior to the construction works outlined in DCR #2, in those areas with confirmed soil contamination, therefore, mitigation measures will not be required during construction activities outlined in DCR #2. The construction activities for DCR #2 will not involve the production of any excess soils that requires offsite management. Should there be any excess soils generated as part of construction activities associated with DCR #2, they will be managed in accordance with the projects Waste and Contamination Management Plan (WCMP), the projects Earth Management Plan (EMP) and with OPSS 180 (Management of Excess Materials). The following containment and mitigation measures will be implemented: ■ Designated substances will be managed by persons qualified and trained for the specific substances in accordance with applicable regulations. All materials resulting from demolition will be identified and classified under Ontario Regulation 347 and managed in an environmentally responsible manner. In the event that suspect designated substances are identified during design and/or construction activities, additional testing and DSS reports will be completed (as required).
Cultural Environment		

Environmental Issues / Concern	Agencies	Proposed Mitigation / Commitments to Future Work
Archaeological Resources	**MTO MTCS**	In the event that the following situations are encountered during construction, work must stop immediately and the actions undertaken as listed below: ■ Should previously undocumented archaeological resources be discovered, they may be a new archaeological site and therefore subject to Section 48 (1) of the *Ontario Heritage Act*. The proponent or person discovering the archaeological resources will cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out fieldwork, in compliance with Section 48 (1) of the *Ontario Heritage Act*. ■ In the event that human remains are encountered during construction, the proponent or person discovering human remains will immediately notify the police or coroner and the Registrar of Cemeteries, Ministry of Government Services at (416) 326-8393. ■ The *Cemeteries Act*, R.S.O. 1990, c.C.4 and the *Funeral, Burial and Cremation Services Act*, 2002, S.O. 2002, c.33 (when proclaimed in force) require that any person discovering human remains must notify the police or coroner and the Registrar of Cemeteries at the Ministry of Consumer Services. ■ During construction, the Coleraine Burying Grounds (Coleraine Cemetery) and the Coleraine Schoolhouse Site located on the south side of Major Mackenzie Drive will be protected to ensure protection from construction activities.
Built Heritage and Cultural Landscapes	**MTO**	No additional mitigation measures are required as the proposed construction activities result in no additional impacts to cultural or built heritage as identified in the Individual EA (2010).

7. Project Monitoring

During construction, MTO or its agents (e.g., LINK427) will ensure that mitigation measures and key design features are implemented and remain consistent with the previous EA commitments, including external notifications and consultation. In addition, MTO or its agents (e.g., LINK427) will assess the effectiveness of the environmental mitigation measures to ensure the following:

- Mitigation measures are providing the intended control and/or protection;
- The control and/or protection provided by mitigation measures is adequate;
- Additional mitigation measures are provided, as required, for any unanticipated environmental problems that may develop during construction;
- Information is available regarding required mitigation measures; and
- Environmental monitoring, after a project is completed, may involve follow-up monitoring of significant measures and/or significant concerns.

Condition 8 of the MOECC Notice of Approval (November 2010) outlines the requirements for a Complaint Protocol. The Complaint Protocol, established for the Highway 427 Expansion project addresses how LINK427 will respond to complaints made during the construction and operation of the project. During construction and operation of the Highway 427 Expansion project, this Protocol will act as a tool to ensure that all complaints are addressed, recorded, tracked and handled in an expeditious and efficient manner.

Per Condition 4 and 5 of the MOECC Notice of Approval (November 2010), a Compliance Monitoring Program (CMP) was developed and an Annual Compliance Report was submitted to MOECC on October 30, 2015. The purpose of the CMP is to enable the monitoring of the fulfillment of the provisions of the EA. The CMP identifies the parties responsible for project compliance monitoring and provides the program scope and actions required during the project's detail design, construction, operation and maintenance stages. The Annual Compliance Report describes its compliance with the conditions of approval set out and describes the results of the CMP. Per Condition 5 of the MOECC Notice of Approval and IEA (2010), Annual Compliance reporting which describes compliance with the conditions in the Notice of Approval is being submitted to MOECC annually on or before September 30th of each year.

LINK427 has also developed an Environmental Management System (EMS) that intends to administer environmental management processes within the Highway 427 Expansion Project that complies with the ISO 14001:2004 Standard, and will be applied throughout the Project Term. The EMS will manage significant environmental aspects so as to limit the impacts on the environment and demonstrates the processes to be used to comply with all LINK427's environmental obligations.

Construction is subject to daily general on-site inspection to ensure the execution of the environmental component of the work and to deal with environmental problems that develop during construction. This is the primary method for compliance monitoring.

7.1 Groundwater Monitoring

A groundwater monitoring program is being implemented to confirm that there are no adverse impacts to groundwater resources with regards to the construction activities of the Highway 427 Expansion and to identify construction related impacts early in order to carry mitigation measures, if necessary. The program includes:

- Pre-construction monitoring: weekly, 1 month before start of construction;
- Construction monitoring: dependent upon the length of construction; with a minimum frequency of once a month; and
- Post-construction monitoring: weekly, for 2 weeks after the end of construction.

7.2 Surface Water Monitoring

In accordance with Condition 6 of the EA Conditions of Approval a Surface Water Monitoring program has been developed and will be implemented throughout the construction period to monitor and identify mitigation measures, where required. LINK427 will regularly monitor water quality throughout construction to determine the impact of site runoff on TSS and turbidity. The data will provide a means to detect and assess the impacts on the receiving watercourses. The program relies on standard monitoring parameters reported in a number of other studies, allowing both for comparison with the post-construction monitoring results and similar monitoring efforts.

Appendices

Appendix A: Study Notification Materials

August 23, 2017

RE: NOTICE OF COMMENCEMENT
HIGHWAY 427 EXPANSION, DETAIL DESIGN AND CONSTRUCTION

LINK427 has been selected by the Ministry of Transportation (MTO) and Infrastructure Ontario (IO) to undertake the design, build, finance and maintenance of the Highway 427 Expansion project within the City of Vaughan and the City of Toronto.

Please see the attached Notice of Commencement for additional information and a key plan.

The purpose of this letter is to notify you of this project and provide you with an opportunity to identify any interests you may have.

This project is being carried out in accordance with the approved environmental planning process for projects under the MTO *Class Environmental Assessment (Class EA) for Provincial Transportation Facilities* (2000) and has now progressed to Detail Design. Design and Construction Reports (DCRs) will be prepared to document the Detail Design process, including environmental investigations, potential environmental effects, proposed mitigation measures, commitments to future work and monitoring. The DCRs will each be made available for a 30-day public and agency review period. Notices will be published in local newspapers, on the Project website (www.427expansion.ca) and distributed by mail to those on the project contact list to clearly identify the start and end dates of the review period, list locations where the DCR may be reviewed, and describe the process for submitting comments, including Project Team contact information.

Public Information Centres (PICs) will be held during the detail design process to allow the public an opportunity to review and comment on the project.

We encourage you to actively participate in the study by visiting our project website (www.427expansion.ca), or by contacting the staff identified on the attached "Notice of Commencement" with your comments or information requests.

Under the *Freedom of Information and Protection of Privacy Act* (FOIPPA) and the *Access to Information Act*, comments and information regarding this project, with the exception of personal information, will become part of the public record. If you have accessibility requirements in order to participate in this project, please contact the undersigned.

Yours truly,

Aitor Arbesu Iglesias
Project Director

Encl. Notice of Commencement

cc: Chris Tschirhart, Environmental Director – LINK427

23 Août 2017

RE: AVIS DE LANCEMENT
PROLONGEMENT DE L'AUTOROUTE 427, DÉTAILS CONCERNANT LA CONCEPTION ET LA CONSTRUCTION

Le Ministère des transports (MTO) et Infrastructure Ontario ont choisi **LINK427** pour entreprendre la conception, la construction, le financement et l'entretien du projet de prolongement de l'autoroute 427 dans la Ville de Vaughan et de Toronto.

Veuillez trouver ci-joint l'Avis de lancement pour des renseignements complémentaires et le plan d'ensemble.

L'objectif de cette lettre est de vous faire part de ce projet et de vous donner la chance d'identifier des intérêts que vous pourriez avoir à ce sujet.

Ce projet est effectué conformément au processus de planification environnementale autorisé pour les projets en vertu des normes d'évaluation environnementale du Ministère des transports (MTO) pour les routes provinciales (2000), devenu maintenant une conception détaillée. Les Rapports de conception et de construction (RCC) seront préparés pour élaborer le processus de conception détaillée, comprenant des enquêtes environnementales, la prise en compte d'effets environnementaux potentiels, les mesures d'atténuation proposées, les engagements envers les futurs travaux et la surveillance. Tous les RCC seront mis à la disposition du grand public et aux agences lors d'une période d'examen de 30 jours. Des avis seront publiés dans les journaux locaux, sur le site Web du projet (www.427expansion.ca) et distribués par courrier à celles et ceux qui sont sur la liste de distribution du projet, pour leur signaler du début de la période d'examen et des emplacements où chaque RCC sera mis à disposition, ainsi qu'une description du processus pour soumettre des commentaires, y compris les coordonnées de l'équipe de projet.

Des Centres d'information publique (CIP) se tiendront pendant toute la durée du processus de conception détaillée pour permettre au grand public d'évaluer et de commenter sur les détails du projet.

Nous vous encourageons à participer activement à l'étude en visitant le site web du projet (www.427expansion.ca) ou en contactant le personnel indiqué dans « l'Avis de lancement » avec vos commentaires et vos demandes d'information.

En vertu de la Loi sur l'accès à l'information et la protection de la vie privée, les commentaires et les informations associés à ce projet, avec l'exception des renseignements personnels, seront divulgués au public. Avec l'exception des renseignements personnels, tous les commentaires seront divulgués au public. Si vous avez des exigences en termes d'accessibilité pour participer à ce projet, veuillez contacter la personne ci-dessous.

Cordialement,

Aitor Arbesu Iglesias
Directeur de projet

P.J. Avis de lancement
cc: Chris Tschirhart, Directeur en charge de l'environnement – LINK427

NOTICE OF COMMENCEMENT FOR DETAIL DESIGN AND CONSTRUCTION

Highway 427 Expansion

THE PROJECT

LINK427 has been selected by the Ministry of Transportation (MTO) and Infrastructure Ontario (IO) to undertake the design, build, finance and maintenance of the Highway 427 Expansion project within the City of Vaughan and the City of Toronto. The *Highway 427 Transportation Corridor Environmental Assessment (EA)* received approval from the Ministry of Environment and Climate Change (MOECC) in November 2010. The project was updated through completion of a Transportation Environmental Study Report (TESR) in 2016 to add additional lanes to the proposed Highway 427 extension. A separate TESR was completed in 2013 for the widening of existing Highway 427 between Albion Road to Highway 7.

The Highway 427 Expansion project includes the design and construction of the following:

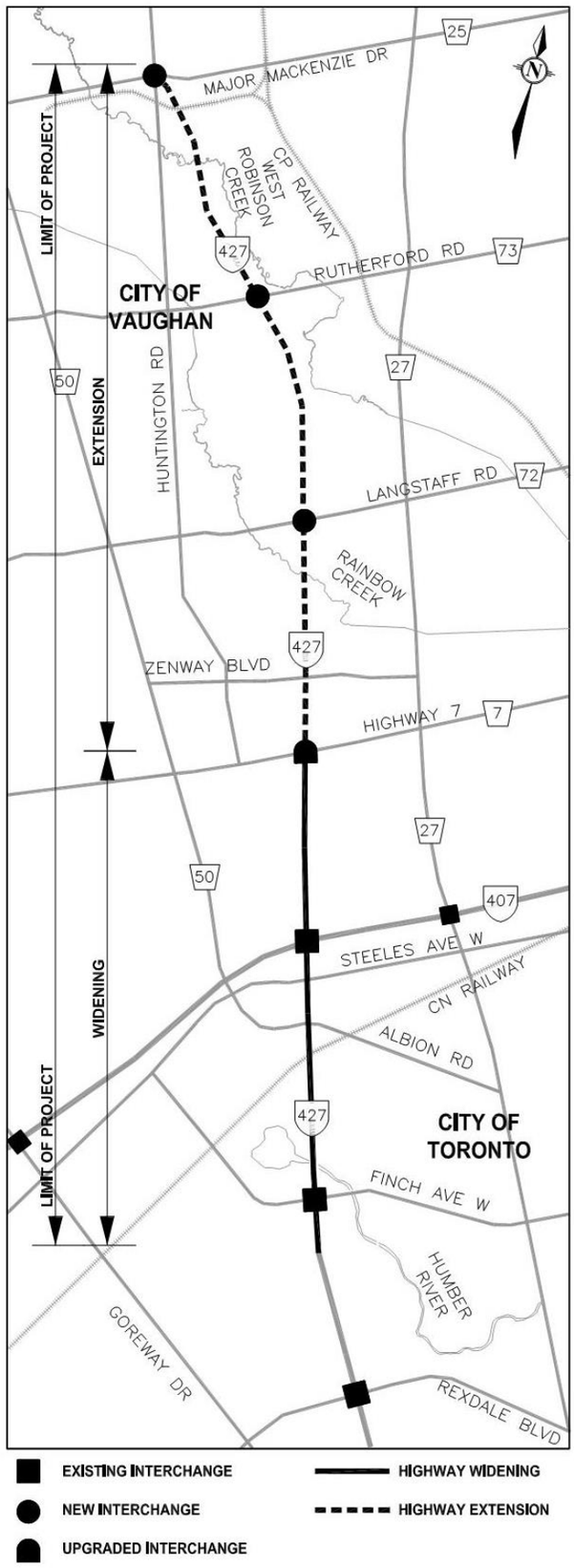
- A new 6.6 km extension from Highway 7 to Major Mackenzie Drive with:
  - eight lanes from Highway 7 to Rutherford Road;
  - six lanes from Rutherford Road to Major Mackenzie Drive;
  - three new interchanges (Langstaff Road, Rutherford Road and Major Mackenzie Drive);
  - new median High Occupancy Toll (HOT) lanes.
- A 4.0 km road widening from Finch Avenue to Highway 7:
  - from six to eight lanes between Finch Avenue to south of Steeles Avenue;
  - from four to eight lanes, from south of Steeles Avenue to Highway 7;
  - new median High Occupancy Toll (HOT) lanes.

THE PROCESS

This project is being carried out in accordance with the approved environmental planning process for projects under the MTO *Class Environmental Assessment (Class EA) for Provincial Transportation Facilities* (2000) and has now progressed to Detail Design.

Public Information Centres (PICs) will be held throughout the detailed design process to allow the public an opportunity to review and comment on project details.

Design and Construction Reports (DCRs) will be prepared to document the Detail Design process, including environmental investigations, potential environmental effects, proposed mitigation measures, commitments to future work and monitoring. The DCRs will each be made available for a 30-day public and agency review period and notices will be published in local newspapers, on the Project website www.427expansion.ca and



distributed by mail to those on the project contact list advising of the start of each review period and locations where each DCR will be available for review.

COMMENTS

We are interested in hearing any comments that you may have regarding this project. If you wish to obtain additional information, provide comments or sign up for the project mailing list please contact those listed below, or visit the project website at www.427expansion.ca.

If you have any accessibility requirements in order to participate in this project please contact one of the Project Team members listed below.

Mr. Chris Tschirhart
LINK427
Environmental Director
1 Royal Gate Blvd.
Woodbridge, ON. L4L 8Z7
Ph: 1-888-352-8085
Email: ask@427Expansion.ca

Mr. Aitor Arbesu Iglesias
LINK427
Project Director
1 Royal Gate Blvd.
Woodbridge, ON. L4L 8Z7
Ph: 1-888-352-8085
Email: ask@427Expansion.ca

Information will be collected in accordance with the *Freedom of Information and Protection of Privacy Act* and the *Access to Information Act*. With the exception of personal information, all comments will be part of the public record.

Des renseignements sont disponibles en français en composant 1-888-595-3152.

AVIS DE LANCEMENT DES DÉTAILS DE CONCEPTION ET DE CONSTRUCTION

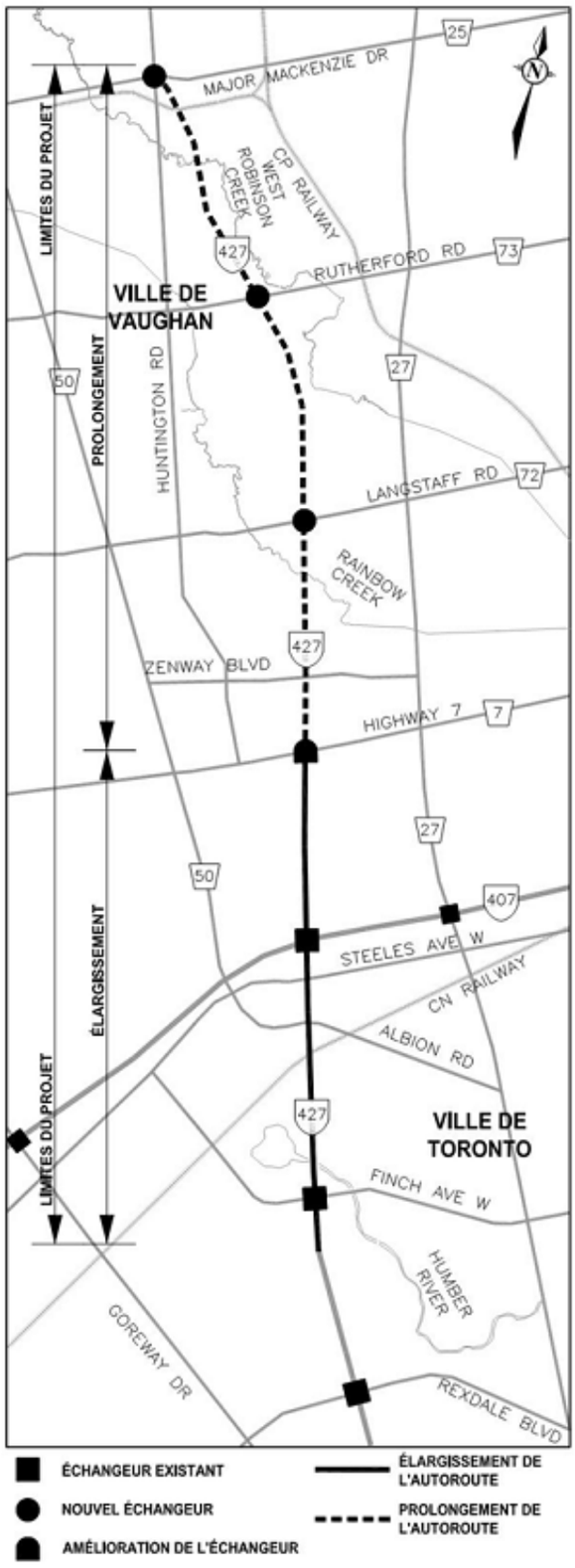
Prolongement de l'autoroute 427

LE PROJET

Le Ministère des transports (MTO) et Infrastructure Ontario ont choisi **LINK427** pour entreprendre la conception, la construction, le financement et l'entretien du projet de prolongement de l'autoroute 427 dans la Ville de Vaughan et de Toronto. *L'évaluation environnementale du corridor de transport de l'autoroute 427* a été approuvée par le Ministère de l'environnement et du changement climatique en novembre 2010. Le projet a été mis à jour par l'achèvement du Rapport d'étude environnementale sur les transports (REET) en 2016 dans le but d'ajouter de nouvelles voies au prolongement suggéré de l'autoroute 427. Un autre REET avait été achevé en 2013 pour l'élargissement de l'autoroute 427, entre Albion Road et la route 7.

Le projet de prolongement de l'autoroute 427 comprend la conception et la construction de ce qui suit :

- Un nouveau tronçon de 6,6 kilomètres de la route 7 à Major Mackenzie Drive comportant
  - huit voies de la route 7 à Rutherford Road;
  - six voies de Rutherford Road à Major Mackenzie Drive;
  - trois échangeurs à Langstaff Road, Rutherford Road et Major Mackenzie Drive;
  - nouvelles voies médianes réservées aux véhicules multioccupants à accès spécial tarifé (VMOT)".
- Une route de 4 kilomètres qui s'élargit au de l'avenue Finch à la route 7
  - passant de six à huit voies, de l'avenue Finch au sud de l'avenue Steeles;
  - passant de quatre à huit voies, de l'avenue Steeles à la route 7;
  - nouvelles voies médianes réservées aux véhicules multioccupants à accès spécial tarifé (VMOT)".



LE PROCESSUS

Ce projet est effectué conformément au processus de planification environnementale autorisé pour les projets en vertu des normes d'évaluation environnementale du Ministère des transports (MTO) pour les routes provinciales (2000), devenu maintenant une conception détaillée.

Des Centres d'information publique (CIP) se tiendront pendant toute la durée du processus de conception détaillée pour permettre au grand public d'évaluer et de commenter sur les détails du projet.

Les Rapports de conception et de construction (RCC) seront préparés pour élaborer le processus de conception détaillée, comprenant des enquêtes environnementales, la prise en compte d'effets environnementaux potentiels, les mesures d'atténuation proposées, les engagements envers les futurs travaux et la surveillance. Tous les RCC seront mis à disposition au grand public et aux agences lors d'une période d'examen de 30 jours. Des avis seront publiés dans les journaux locaux, sur le site Web du projet (www.427expansion.ca) et distribués par courrier à celles et ceux qui sont sur la liste de distribution du projet, pour leur signaler du début de la période d'examen et des emplacements où chaque RCC sera mis à disposition.

COMMENTAIRES

Nous aimerions recevoir vos commentaires à l'égard de ce projet. Si vous désirez obtenir des renseignements supplémentaires, fournir des commentaires ou faire partie de la liste de distribution du projet, veuillez contacter les

personnes ci-dessous ou visiter le site Web du projet à www.427expansion.ca.

Si vous avez des exigences en termes d'accessibilité pour participer à ce projet, veuillez contacter un des membres de l'équipe de projet ci-dessous.

M. Chris Tschirhart
LINK427
Directeur en charge de l'environnement
1 Royal Gate Blvd.
Woodbridge, ON. L4L 8Z7
Tel : 1-888-352-8085
Courriel : ask@427Expansion.ca

M. Aitor Arbesu Iglesias
LINK427
Directeur de projet
1 Royal Gate Blvd.
Woodbridge, ON. L4L 8Z7
Tel : 1-888-352-8085
Courriel : ask@427Expansion.ca

Les informations seront recueillies conformément à la *Loi sur l'accès à l'information et la protection de la vie privée*. Avec l'exception des renseignements personnels, tous les commentaires seront divulgués au public.

Des renseignements sont disponibles en français en composant 1-888-595-3152.

Ministry of Transportation
Major Projects Office
Central Region

159 Sir William Hearst Avenue
Building D, 7th Floor
Toronto, ON M3M 0B7
Tel.: 416-235-3749
Fax: 416-235-3576

Ministère des Transports
Bureau grands projets
Région du Centre

7e étage, édifice D
159, avenue Sir William Hearst
Toronto, ON M3M 0B7
Tél.: 416-235-3749
Téléc. 416-235-3576

Ontario

August 23, 2017

«Name»
«Organization»
«Address»

Dear «Greeting»:

Re: Notice of Commencement, Highway 427 Expansion Project
Detail Design and Construction
Ministry of Transportation

LINK427 has been selected by the Ministry of Transportation (MTO) and Infrastructure Ontario (IO) to undertake the design, build, finance and maintenance of the Highway 427 Expansion project within the City of Vaughan and the City of Toronto.

The purpose of this letter is to notify you of project start-up and inquire if your community has an interest in this study. We also welcome the opportunity to meet with you to discuss this project.

This project is being carried out in accordance with the approved environmental planning process for projects under the MTO *Class Environmental Assessment (Class EA) for Provincial Transportation Facilities* (2000) and has now progressed to Detail Design. Design and Construction Reports (DCRs) will be prepared to document the Detail Design process, including environmental investigations, potential environmental effects, proposed mitigation measures, commitments to future work and monitoring. The DCRs will each be made available for a 30-day public and agency review period. Notices will be published in local newspapers, on the Project website (www.427expansion.ca) and distributed by mail to those on the project contact list to clearly identify the start and end dates of the review period, list locations where the DCR may be reviewed, and describe the process for submitting comments. Public Information Centres (PICs) will be held during the detail design process to allow an opportunity to review and comment on the project.

As part of the Environmental Assessments for the Highway 427 Expansion, a complete Archaeological Assessment was undertaken. LINK427 will follow all protocols as outlined in the Environmental Assessments regarding informing and contacting Indigenous communities regarding any archaeological artefacts that may be found as a result of construction activities.

Under the *Freedom of Information and Protection of Privacy Act* and the *Access to Information Act*, comments and information regarding this project, with the exception of personal information, will become part of the public record. If you have accessibility requirements in order to participate in this project, please contact the undersigned.

If you would like to provide comments, or if you require further information regarding this project, please feel free to contact me by phone at 416-235-4188 or by e-mail at Pauline.VanRoon@ontario.ca. In addition, if you are interested in meeting as a result of receiving this letter, please contact me to arrange a meeting at your earliest convenience.

Sincerely,
Ministry of Transportation

Pauline Van Roon
Head, Planning & Engineering

cc: C. Copeland - MTO Environmental Planner
A. Arbesu - LINK427

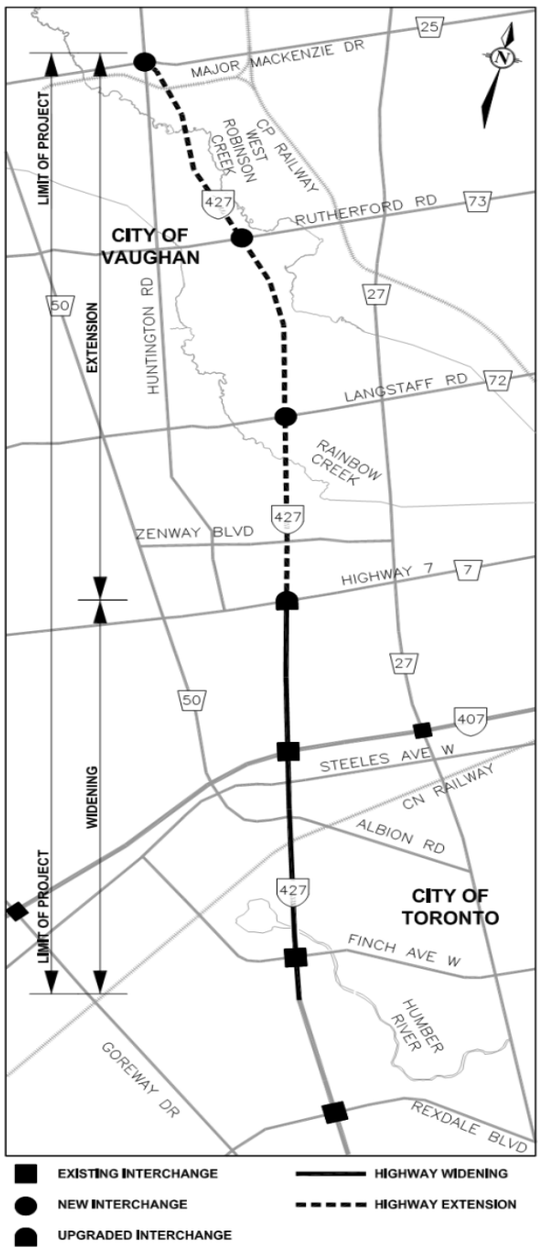
Encl.: Notice of Commencement

NOTICE OF PUBLIC INFORMATION CENTRE
HIGHWAY 427 EXPANSION PROJECT
DETAIL DESIGN AND CONSTRUCTION REPORTS

THE PROJECT

LINK427 has been selected by the Ministry of Transportation (MTO) and Infrastructure Ontario (IO) to undertake the design, build, finance and maintenance of the Highway 427 Expansion project from Finch Avenue to Major Mackenzie Drive within the City of Vaughan and the City of Toronto.

The Highway 427 Transportation Corridor Environmental Assessment (EA) received approval from the Ministry of Environment and Climate Change (MOECC) in November 2010. The project was updated through completion of a Transportation Environmental Study Report (TESR) in 2016 to add additional lanes to the proposed Highway 427 extension. A separate TESR was completed in 2013 for the widening of the existing Highway 427 between Albion Road to Highway 7. This meeting is to introduce the construction works contained in the Design and Construction Reports (DCR #2 and DCR #3), and to provide agencies, interested groups, business representatives and members of the general public with an opportunity to review and comment on the design details, results of the consultation process, construction staging and environmental impacts and mitigation measures.



PUBLIC CONSULTATION

This first Public Information Centres (PIC) has been arranged for members of the project team to be available to discuss the project and answer any questions.

The first PIC is scheduled as follows:

Date:	**January 25, 2018**
Location:	**Element Hotel - Vaughan Southwest** **6170 Hwy 7, Vaughan** **Vaughan, Ontario**
Time:	**4:00 pm to 8:00 pm**

THE PROCESS

This project is being carried out in accordance with the approved environmental planning process for Group 'A' projects under the *MTO Class Environmental Assessment (Class EA) for Provincial Transportation Facilities* (2000). In accordance with MTO's Class EA, DCR #2 and #3 have been prepared and made available for public review.

COMMENTS

We are interested in hearing any comments that you may have regarding this study. If you wish to obtain additional information or provide comments, please consult the project website at: **www.427expansion.ca**. With the exception of personal information, all comments will become part of the public record. Comments on these DCR's can be provided by mail, e-mail, or online to:

Mr. Christopher Tschirhart
Environmental Director
LINK427
1 Royal Gate Blvd., Suite G
Woodbridge, ON L4L 8Z7
Phone: 1-888-352-8085

E-mail: ask@427Expansion.ca

Mr. Aitor Arbesu Iglesias
Project Director
LINK427
1 Royal Gate Blvd., Suite G
Woodbridge, ON L4L 8Z7
Phone: 1-888-352-8085

E-mail: ask@427Expansion.ca

If you have any accessibility requirements in order to participate in this project please contact one of the Project Team members listed above.

Information will be collected in accordance with the *Freedom of Information and Protection of Privacy Act* and the *Access to Information Act*. With the exception of personal information, all comments will be part of the public record.

Des renseignements sont disponibles en français en composant 1-888-595-3152.

General Comments Received at the PIC

- Activities included in DCR #2
- % design completed now
- Term for construction finish
- Long conversation, very interested in everything
- Want to know if Highway will be open in stages (explained Zenway traffic)
- How will access to 427 be when Zenway will be closed?
- Asked about managed lanes
- Asked about total budget
- Asked about lighting pollution around MMD
- Asked about traffic volumes on MMD
- Alectra construction on MMD
- Asked about construction from Baron's St to McGillivray Rd (not LINK427)
- Asked about transitway (not LINK427)
- Asked if there will be 2 lanes in 407 ramps (not 1 as now)
- Detour turns during construction
- Where wall starts
- Signals in the intersection during construction
- Peter to provide info on truck specs.
- Entrance used by trucks
- Why not Huntington Rd bridges to keep continuity?
- Why are you stopping at MMD?
- Sign at Huntington to notify people of closing Rutherford and Langstaff (he will include this on design package comments)
- Active transportation on Highway 7 (bike lane)
- Trails in both main valleys
- Grading for subdivision matching at MMD
- Staging
- North subdivisions (will follow up by phone)
- Asked if we were protecting vegetation/species. Explained protection measures (VRP, bats, barn swallow). Happy that we are protecting environment and wants to see project move ahead
- "Supportive of the highway"
- Asked about wildlife crossings (valley crossings and fencing)
- Discussion on barn swallow kiosk use
- Closure of Huntington Rd – concerned with timing and amount of concern from residents
- Check fill on manholes at old MMD
- Highway 7: no room for cycle lane and sidewalk
- McGillivray Rd: need gate at Huntington and McGillivray
- MMD east and west tie-ins (timing, limits etc.)
- Whether Zenway Blvd will remain open at all times
- Highway 7 W-S ramp: why realigned?
- Why NB separation (Hydro)
- MMD grading in relation to future planned Vaughan roads
- 3D plot off MMD?
- Extension of existing project north of MMD
- When will it happen?
- When will Dufferin contract south of Steeles be completed?

link427

Highway 427 Expansion Project
Public Information Centre (PIC)
Thursday, January 25, 2018

Name (optional): _____
Email (optional): _____
Phone number (optional): _____

Do you have any concerns or comments regarding the Highway 427 Expansion Detail Design and Class Environmental Assessment Study? Please respond in the box below.

I am concerned about traffic being forced north on Baron's in order to access Huntington Rd. This seems as if it may increase through traffic through a residential area.

Information will be collected in accordance with the Freedom of Information and Protection of Privacy Act and the Access to Information Act. With the exception of personal information, all comments will be part of the public record. If you have any accessibility requirements in order to provide comments, please notify one of the Project Team members at this event or email ask@427expansion.ca or call 1-888-352-8085.

link427

Highway 427 Expansion Project
Public Information Centre (PIC)
Thursday, January 25, 2018

Comment Sheet

Name (optional):__ _____
Email (optional):__ _____
Phone number (optional):_____

Do you have any concerns or comments regarding the Highway 427 Expansion Detail Design and Class Environmental Assessment Study? Please respond in the box below.

MY CONCERNS ARE WITH RESPECT TO EX. REGIONAL WATER/WASTEWATER INFRACTRUCTURE WITHIN THE PROJECT LIMITS:

- HUNTINGTON: EX 750 Ø WM & SANITARY SEWER.
- RUTHERGLEN: 1800 Ø YORK-PEEL FEEDER WATER MAIN
- STEELES: TWIN 900 Ø SAN. FMS.

→ HOW WILL THESE BE PROTECTED DURING CONSTRUCTION AND FOLLOWING CONSTRUCTION TO ENSURE ASSET LIFECYCLES WILL NOT BE DETRIMENTALLY IMPACTED

Information will be collected in accordance with the Freedom of Information and Protection of Privacy Act and the Access to Information Act. With the exception of personal information, all comments will be part of the public record. If you have any accessibility requirements in order to provide comments, please notify one of the Project Team members at this event or email ask@427expansion.ca or call 1-888-352-8085.

link427

Highway 427 Expansion Project
Public Information Centre (PIC)
Thursday, January 25, 2018

Name (optional):___ _____
Email (optional):___ _____
Phone number (optional):_____

Do you have any concerns or comments regarding the Highway 427 Expansion Detail Design and Class Environmental Assessment Study? Please respond in the box below.

I would like to get an idea of the traffic volumes and noise levels at the Major Mackenzie exit.

I would also like to know if the transitway is in the scope of this project

Information will be collected in accordance with the Freedom of Information and Protection of Privacy Act and the Access to Information Act. With the exception of personal information, all comments will be part of the public record. If you have any accessibility requirements in order to provide comments, please notify one of the Project Team members at this event or email ask@427expansion.ca or call 1-888-352-8085.

link427

Highway 427 Expansion Project
Public Information Centre (PIC)
Thursday, January 25, 2018

Comment Sheet

Name (optional):_____
Email (optional):_____
Phone number (optiona

Do you have any concerns or comments regarding the Highway 427 Expansion Detail Design and Class Environmental Assessment Study? Please respond in the box below.

TRAFFIC DATA / VOLUME FOR 2021

IN LATER STAGE DESIGN 427 IS OPEN.

Information will be collected in accordance with the Freedom of Information and Protection of Privacy Act and the Access to Information Act. With the exception of personal information, all comments will be part of the public record. If you have any accessibility requirements in order to provide comments, please notify one of the Project Team members at this event or email ask@427expansion.ca or call 1-888-352-8085.

link427

Highway 427 Expansion Project
Public Information Centre (PIC)
Thursday, January 25, 2018

Comment Sheet

Name (optional):_____
Email (optional):_____
Phone number (optional):_____

Do you have any concerns or comments regarding the Highway 427 Expansion Detail Design and Class Environmental Assessment Study? Please respond in the box below.

- Very informative information meeting provided very detailed display boards - easy to follow
- answered questions regarding the species being protected and vegetation protection as well as replanting vegetation in the future
- looking forward to the future 427 expansion scheduled to open in 2021

Information will be collected in accordance with the Freedom of Information and Protection of Privacy Act and the Access to Information Act. With the exception of personal information, all comments will be part of the public record. If you have any accessibility requirements in order to provide comments, please notify one of the Project Team members at this event or email ask@427expansion.ca or call 1-888-352-8085.

link427

Highway 427 Expansion Project
Public Information Centre (PIC)
Thursday, January 25, 2018

Comment Sheet

Name (optional):___
Email (optional):_____
Phone number (optional):_____

Do you have any concerns or comments regarding the Highway 427 Expansion Detail Design and Class Environmental Assessment Study? Please respond in the box below.

Good design, just want it to be done on or before 2021.

Information will be collected in accordance with the Freedom of Information and Protection of Privacy Act and the Access to Information Act. With the exception of personal information, all comments will be part of the public record. If you have any accessibility requirements in order to provide comments, please notify one of the Project Team members at this event or email ask@427expansion.ca or call 1-888-352-8085.

Highway 427 Expansion Project
Public Information Centre (PIC)
Thursday, January 25, 2018

Name (optional):_____
Email (optional):_____
Phone number (option _____

Do you have any concerns or comments regarding the Highway 427 Expansion Detail Design and Class Environmental Assessment Study? Please respond in the box below.

- I would like to get electronic copies of the PIC Boards.

- It will be nice if Highway 427 extension connect with Highway 9 rather than end on municipal road

- Truck only lane could be considered in design. There is significant truck traffic due to airport & intermodal yard (CN & CP).

Information will be collected in accordance with the Freedom of Information and Protection of Privacy Act and the Access to Information Act. With the exception of personal information, all comments will be part of the public record. If you have any accessibility requirements in order to provide comments, please notify one of the Project Team members at this event or email ask@427expansion.ca or call 1-888-352-8085.

Highway 427 Expansion Project
Public Information Centre (PIC)
Thursday, January 25, 2018

Comment Sheet

Name (optional):_____
Email (optional):_____
Phone number (optional):

Do you have any concerns or comments regarding the Highway 427 Expansion Detail Design and Class Environmental Assessment Study? Please respond in the box below.

- 427 needs to go further north than Major Mac.
- more roads – infrastructure to keep trucks/cars move on the roads. too much time/productivity is lost on the Roads.
- more round about to keep cars moving and few stops / go traffic.

Highway 427 Expansion Project
Public Information Centre (PIC)
Thursday, January 25, 2018

Name (optional):
Email (optional):
Phone number (op

Do you have any concerns or comments regarding the Highway 427 Expansion Detail Design and Class Environmental Assessment Study? Please respond in the box below.

- Please get done on time!
- Ensure good connection with future major mackenzie road widening
- ensure baron street is able to connect to huntington road somehow south of major mackenzie
- A little worried with how high the highway will be when it crosses over the CP train tracks. I live in Kleinburg impressions and am worried of the views it might impact.

Information will be collected in accordance with the Freedom of Information and Protection of Privacy Act and the Access to Information Act. With the exception of personal information, all comments will be part of the public record. If you have any accessibility requirements in order to provide comments, please notify one of the Project Team members at this event or email ask@427expansion.ca or call 1-888-352-8085.

link427

Highway 427 Expansion Project
Public Information Centre (PIC)
Thursday, January 25, 2018

Name (optional):___ _____
Email (optional):___ _____
Phone number (opti _____

Do you have any concerns or comments regarding the Highway 427 Expansion Detail Design and Class Environmental Assessment Study? Please respond in the box below.

well designed and thought out plan, looking forward to see it progress in the Spring.

Information will be collected in accordance with the Freedom of Information and Protection of Privacy Act and the Access to Information Act. With the exception of personal information, all comments will be part of the public record. If you have any accessibility requirements in order to provide comments, please notify one of the Project Team members at this event or email ask@427expansion.ca or call 1-888-352-8085.

Highway 427 Expansion Project
Public Information Centre (PIC)
Thursday, January 25, 2018

Name (optional): _____
Email (optional): _____
Phone number (c _____

Do you have any concerns or comments regarding the Highway 427 Expansion Detail Design and Class Environmental Assessment Study? Please respond in the box below.

I am working at the Township of King and would appreciate receiving the updates on the project.

Information will be collected in accordance with the Freedom of Information and Protection of Privacy Act and the Access to Information Act. With the exception of personal information, all comments will be part of the public record. If you have any accessibility requirements in order to provide comments, please notify one of the Project Team members at this event or email ask@427expansion.ca or call 1-888-352-8085.

March 2018

RE: COMMENTS RECEIVED AT PUBLIC INFORMATION CENTRE

Dear

Thank you for your interest in the Highway 427 Expansion project. The purpose of this letter is to acknowledge receipt of your comment(s) provided at Public Information Centre #1 on January 25, 2018.

Updates on the Highway 427 Expansion project will be available on the project website www.427expansion.ca. These updates will include future Design and Construction Reports and Bulletins on the progress of construction.

We trust this information satisfies your concerns and we encourage you to continue to participate by visiting our project website at www.427expansion.ca or by contacting the staff identified below.

Under the *Freedom of Information and Protection of Privacy Act* (FOIPPA) and the *Access to Information Act*, comments and information regarding this project, with the exception of personal information, will become part of the public record. If you have accessibility requirements in order to participate in this project, please contact the undersigned.

Yours truly,

Aitor Arbesu Iglesias
Project Director

cc: Chris Tschirhart, Environmental Director – LINK427

1 Royal Gate Blvd.
Woodbridge, ON L4L 8Z7
1-888-352-8085 | 427expansion.ca

March 2018

RE: COMMENTS RECEIVED AT PUBLIC INFORMATION CENTRE

Dear

Thank you for your interest in the Highway 427 Expansion project. The purpose of this letter is to acknowledge receipt of your comment(s) provided at Public Information Centre #1 on January 25, 2018.

An extensive Traffic Management Plan (TMP) has been developed to consider the local mobility of people, goods, and long-haul transportation that will be affected by the proposed construction works. Appropriate mitigation measures will be put in place to address immediate traffic impacts to the work zones.

Noise parameters are anticipated to be within standard limits for the Highway 400 series. Construction of the transit-way is part of a future project as it is funded by the Province and the needs for the transit-way are assessed.

We trust this information satisfies your concerns. We encourage you to continue to participate by visiting our project website at www.427expansion.ca or by contacting the staff identified below.

Under the *Freedom of Information and Protection of Privacy Act* (FOIPPA) and the *Access to Information Act*, comments and information regarding this project, with the exception of personal information, will become part of the public record. If you have accessibility requirements in order to participate in this project, please contact the undersigned.

Yours truly,

Aitor Arbesu Iglesias
Project Director

cc: Chris Tschirhart, Environmental Director – LINK427

1 Royal Gate Blvd.
Woodbridge, ON L4L 8Z7
1-888-352-8085 | 427expansion.ca

March 2018

RE: COMMENTS RECEIVED AT PUBLIC INFORMATION CENTRE

Dear

Thank you for your interest in the Highway 427 Expansion project. The purpose of this letter is to acknowledge receipt of your comment(s) provided at Public Information Centre #1 on January 25, 2018.

To address your comment regarding water/wastewater infrastructure within the project limits, measures have been put in place to maintain watermain integrity during construction and a protection liner has already been added to the watermain.

We trust this information satisfies your concerns. We encourage you to continue to participate by visiting our project website at www.427expansion.ca or by contacting the staff identified below.

Under the *Freedom of Information and Protection of Privacy Act* (FOIPPA) and the *Access to Information Act*, comments and information regarding this project, with the exception of personal information, will become part of the public record. If you have accessibility requirements in order to participate in this project, please contact the undersigned.

Yours truly,

Aitor Arbesu Iglesias
Project Director

cc: Chris Tschirhart, Environmental Director – LINK427

1 Royal Gate Blvd.
Woodbridge, ON L4L 8Z7
1-888-352-8085 | 427expansion.ca

March 2018

RE: COMMENTS RECEIVED AT PUBLIC INFORMATION CENTRE

Dear

Thank you for your interest in the Highway 427 Expansion project. The purpose of this letter is to acknowledge receipt of your comment(s) provided at Public Information Centre #1 on January 25, 2018.

The Highway 427 Expansion project will address transportation capacity deficiencies, offer relief from congestion on local roads by providing an alternative route for through traffic, and meet infrastructure needs to address population and employment growth. This will also allow better and more efficient transportation and flow of goods from the CPR Vaughan Intermodal Facility.

Once complete, the Highway 427 Expansion project will provide economic benefits to the province by offering an enhanced freeway route into York Region, the City of Toronto, the Vaughan business area and the CPR Vaughan Intermodal Facility.

We trust this information satisfies your concerns. We encourage you to continue to participate by visiting our project website at www.427expansion.ca or by contacting the staff identified below.

Under the *Freedom of Information and Protection of Privacy Act* (FOIPPA) and the *Access to Information Act*, comments and information regarding this project, with the exception of personal information, will become part of the public record. If you have accessibility requirements in order to participate in this project, please contact the undersigned.

Yours truly,

Aitor Arbesu Iglesias
Project Director

cc: Chris Tschirhart, Environmental Director – LINK427

1 Royal Gate Blvd.
Woodbridge, ON L4L 8Z7
1-888-352-8085 | 427expansion.ca

March 2018

RE: COMMENTS RECEIVED AT PUBLIC INFORMATION CENTRE

Dear

Thank you for your interest in the Highway 427 Expansion project. The purpose of this letter is to acknowledge receipt of your comment(s) provided at Public Information Centre #1 on January 25, 2018.

An extensive Traffic Management Plan (TMP) has been developed to consider the local mobility of people, goods, and long-haul transportation that will be affected by the proposed construction works. Appropriate mitigation measures will be put in place to address immediate traffic impacts to the work zones.

We have no traffic numbers at this time, as this section of highway has not been built yet.

We trust this information satisfies your concerns. We encourage you to continue to participate by visiting our project website at www.427expansion.ca or by contacting the staff identified below.

Under the *Freedom of Information and Protection of Privacy Act* (FOIPPA) and the *Access to Information Act*, comments and information regarding this project, with the exception of personal information, will become part of the public record. If you have accessibility requirements in order to participate in this project, please contact the undersigned.

Yours truly,

Aitor Arbesu Iglesias
Project Director

cc: Chris Tschirhart, Environmental Director – LINK427

1 Royal Gate Blvd.
Woodbridge, ON L4L 8Z7
1-888-352-8085 | 427expansion.ca

March 2018

RE: COMMENTS RECEIVED AT PUBLIC INFORMATION CENTRE

Dear

Thank you for your interest in the Highway 427 Expansion project. The purpose of this letter is to acknowledge receipt of your comment(s) provided at Public Information Centre #1 on January 25, 2018.

An extensive Traffic Management Plan (TMP) has been developed to consider the local mobility of people, goods, and long-haul transportation that will be affected by the proposed construction works. Appropriate mitigation measures will be put in place to address immediate traffic impacts to the work zones.

There will be no impact to traffic on Barons Street.

We trust this information satisfies your concerns and we encourage you to continue to participate by visiting our project website at www.427expansion.ca or by contacting the staff identified below.

Under the *Freedom of Information and Protection of Privacy Act* (FOIPPA) and the *Access to Information Act*, comments and information regarding this project, with the exception of personal information, will become part of the public record. If you have accessibility requirements in order to participate in this project, please contact the undersigned.

Yours truly,

Aitor Arbesu Iglesias
Project Director

cc: Chris Tschirhart, Environmental Director – LINK427

1 Royal Gate Blvd.
Woodbridge, ON L4L 8Z7
1-888-352-8085 | 427expansion.ca

March 2018

RE: COMMENTS RECEIVED AT PUBLIC INFORMATION CENTRE

Dear

Thank you for your interest in the Highway 427 Expansion project. The purpose of this letter is to acknowledge receipt of your comment(s) provided at Public Information Centre #1 on January 25, 2018.

We appreciate your positive comments regarding the Highway 427 Expansion project and encourage you to continue to participate by visiting our project website at www.427expansion.ca or by contacting the staff identified below.

Under the *Freedom of Information and Protection of Privacy Act* (FOIPPA) and the *Access to Information Act*, comments and information regarding this project, with the exception of personal information, will become part of the public record. If you have accessibility requirements in order to participate in this project, please contact the undersigned.

Yours truly,

Aitor Arbesu Iglesias
Project Director

cc: Chris Tschirhart, Environmental Director – LINK427

1 Royal Gate Blvd.
Woodbridge, ON L4L 8Z7
1-888-352-8085 | 427expansion.ca

March 2018

RE: COMMENTS RECEIVED AT PUBLIC INFORMATION CENTRE

Dear

Thank you for your interest in the Highway 427 Expansion project. The purpose of this letter is to acknowledge receipt of your comment(s) provided at Public Information Centre #1 on January 25, 2018.

The boards displayed at the Public Information Centre are available on the project website at www.427expansion.ca for your convenience. With regards to a dedicated truck lane, the design of the highway was not required to consider this feature. One of the benefits of the LINK427 extension will be to better convey truck traffic to and from the inter-modal facility.

We trust this information satisfies your concerns. We encourage you to continue to participate by visiting our project website at www.427expansion.ca or by contacting the staff identified below.

Under the *Freedom of Information and Protection of Privacy Act* (FOIPPA) and the *Access to Information Act*, comments and information regarding this project, with the exception of personal information, will become part of the public record. If you have accessibility requirements in order to participate in this project, please contact the undersigned.

Yours truly,

Aitor Arbesu Iglesias
Project Director

cc: Chris Tschirhart, Environmental Director – LINK427

1 Royal Gate Blvd.
Woodbridge, ON L4L 8Z7
1-888-352-8085 | 427expansion.ca

March 2018

RE: COMMENTS RECEIVED AT PUBLIC INFORMATION CENTRE

Dear

Thank you for your interest in the Highway 427 Expansion project. The purpose of this letter is to acknowledge receipt of your comment(s) provided at Public Information Centre #1 on January 25, 2018.

We appreciate your positive comments regarding the Highway 427 Expansion project and anticipate that the delivery of this project will be on schedule.

We encourage you to continue to participate by visiting our project website at www.427expansion.ca or by contacting the staff identified below.

Under the *Freedom of Information and Protection of Privacy Act* (FOIPPA) and the *Access to Information Act*, comments and information regarding this project, with the exception of personal information, will become part of the public record. If you have accessibility requirements in order to participate in this project, please contact the undersigned.

Yours truly,

Aitor Arbesu Iglesias
Project Director

cc: Chris Tschirhart, Environmental Director – LINK427

1 Royal Gate Blvd.
Woodbridge, ON L4L 8Z7
1-888-352-8085 | 427expansion.ca

March 2018

RE: COMMENTS RECEIVED AT PUBLIC INFORMATION CENTRE

Dear

Thank you for your interest in the Highway 427 Expansion project. The purpose of this letter is to acknowledge receipt of your comment(s) provided at Public Information Centre #1 on January 25, 2018.

The Highway 427 Expansion project will address transportation capacity deficiencies, offer relief from congestion on local roads by providing an alternative route for through traffic, and meet infrastructure needs to address population and employment growth. We anticipate that the delivery of this project will be on schedule.

Once complete, the Highway 427 Expansion project will provide economic benefits to the province by offering an enhanced freeway route into York Region, the City of Toronto, the Vaughan business area and the CPR Vaughan Intermodal Facility.

We trust this information satisfies your concerns. We encourage you to continue to participate by visiting our project website at www.427expansion.ca or by contacting the staff identified below.

Under the *Freedom of Information and Protection of Privacy Act* (FOIPPA) and the *Access to Information Act*, comments and information regarding this project, with the exception of personal information, will become part of the public record. If you have accessibility requirements in order to participate in this project, please contact the undersigned.

Yours truly,

Aitor Arbesu Iglesias
Project Director

cc: Chris Tschirhart, Environmental Director – LINK427

1 Royal Gate Blvd.
Woodbridge, ON L4L 8Z7
1-888-352-8085 | 427expansion.ca

Appendix B: Public Information Centre Display Materials

WELCOME TO PUBLIC INFORMATION CENTRE #1

Detail Design and Class Environmental Assessment Study for the Highway 427 Expansion Project

The purpose of this PIC is to introduce the construction works and to provide an opportunity to review and comment on the anticipated environmental effects and the proposed mitigation measures.

At this PIC, you will have a chance to review:

- An overview of the Project
- The steps in the Environmental Assessment (EA) process
- The Detail Design and Construction Activities
- The Existing Conditions in the Project Lands
- Potential Environmental Impacts and Proposed Mitigation

Please ask questions and share your opinions with us.

HIGHWAY 427 EXPANSION

Project Description

The Highway 427 Expansion Project includes the following:

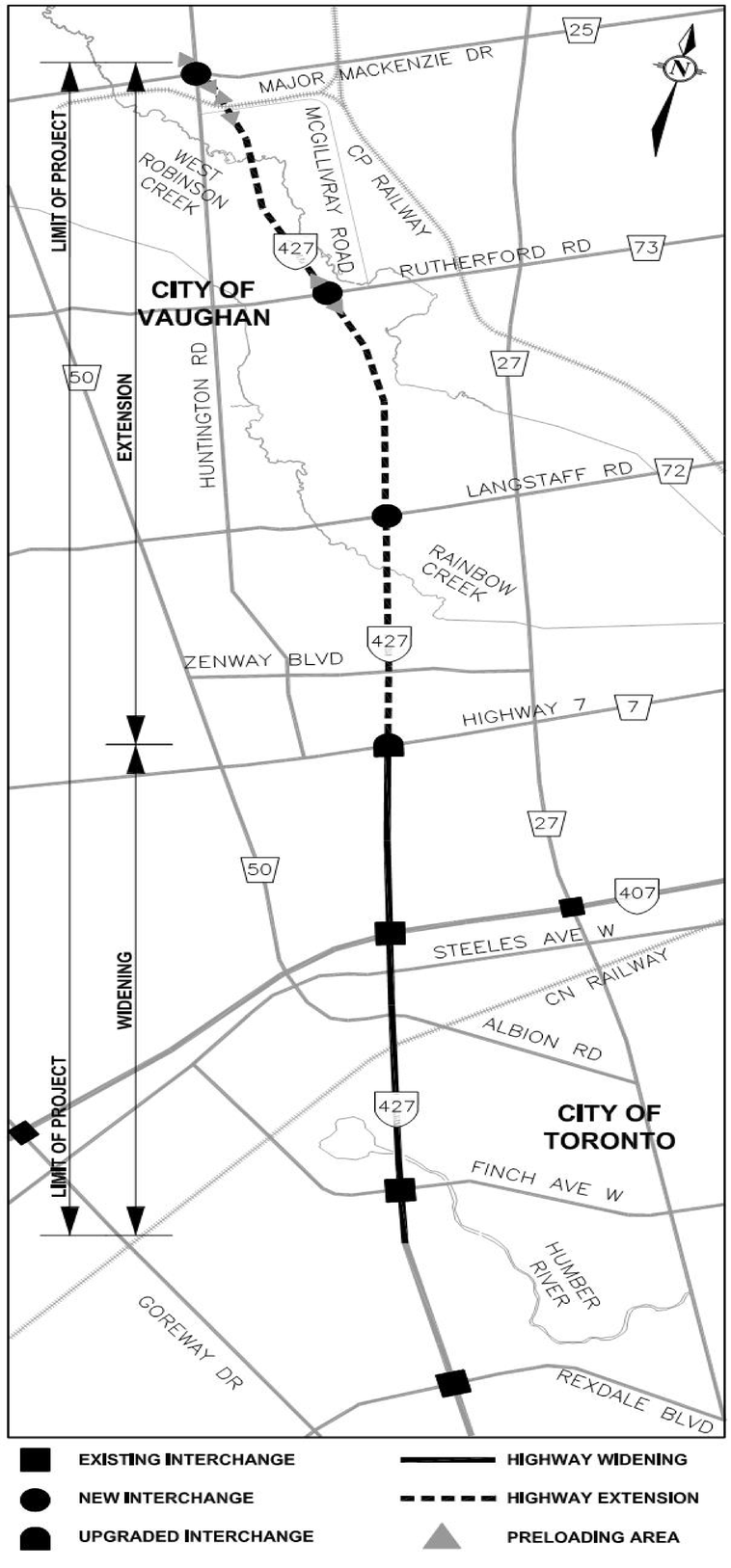
New 6.6 km Highway Extension from Highway 7 to Major Mackenzie Drive with:

- eight lanes from Highway 7 to Rutherford Road
- six lanes from Rutherford Road to Major Mackenzie Drive
- three new interchanges (Langstaff Road, Rutherford Road and Major Mackenzie Drive)
- new median managed lanes

4.0 km Highway Widening from Finch Avenue to Highway 7:

- from six to eight lanes between Finch Avenue to south of Steeles Avenue
- from four to eight lanes, from south of Steeles Avenue to Highway 7
- new median managed lanes

Project Limits



HIGHWAY 427 EXPANSION

Environmental Assessment Process – Preliminary Design

This project is based on the following previous Preliminary Design and Environmental Assessment (EA) studies that together document the key elements of the Project:

- 427 Transportation Corridor Environmental Assessment Report (January 2010), Group 'A' Class EA for the extension of Highway 427 from its existing terminus at Highway 7 to Major Mackenzie Drive.

- Highway 427 from Albion Road to Highway 7 Preliminary Design and Class EA Study Transportation Environmental Study Report (November 2013), Group 'B' Class EA for the widening of the existing Highway 427 from 1.5 km south of Albion Road to Highway 7.

- Transportation Environmental Assessment Report, Highway 427 Extension Widening From Highway 7 to Major Mackenzie Drive (January 2016), Group 'B' Class EA to widen the planned extension of Highway 427 from Highway 7 to Major Mackenzie Drive.

Individual EA
Highway 427 Extension (Highway 7 to Major Mackenzie Drive)
January 2010

→

TESR
Widening of Existing Highway 427 (Albion Road to Highway 7)
November 2013

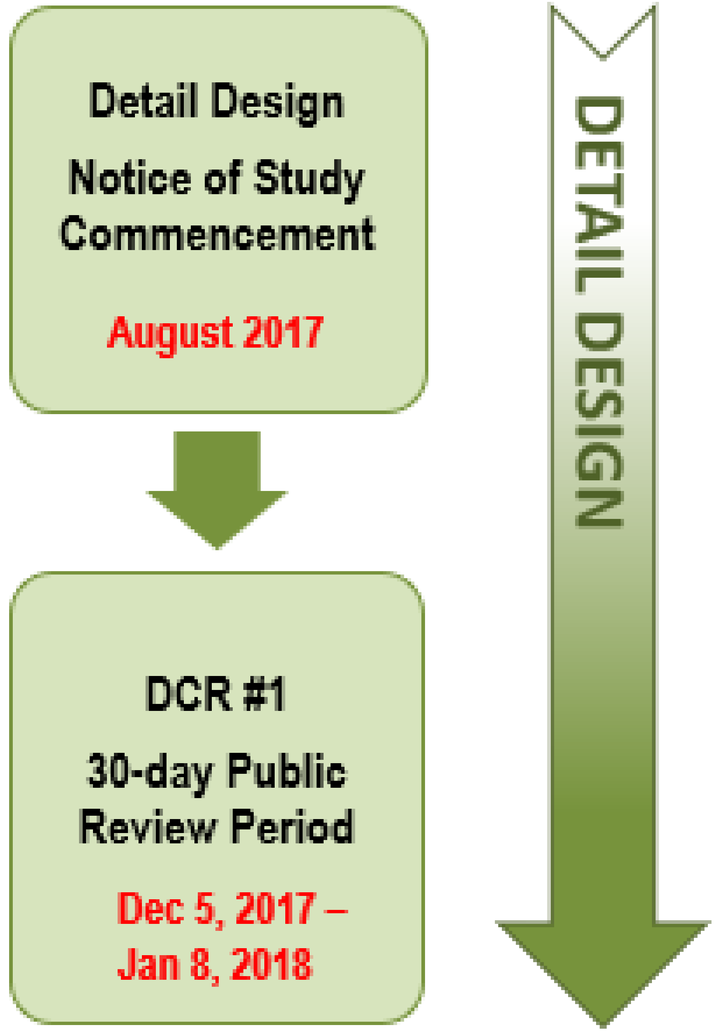
→

TESR
Widening of Highway 427 Extension (Hwy 7 to Major Mackenzie Drive)
January 2016

PRELIMINARY DESIGN

Environmental Assessment Process – Detail Design

- This project is being carried out in accordance with the approved environmental planning process for Group 'A' projects under the *MTO Class Environmental Assessment for Provincial Transportation Facilities* (Class EA).
- Based on the Design-Build / AFP Approach to this project, Detail Design will progress in a staged manner making it necessary to document the process in more than one Design and Construction Report (DCR).
- A series of DCRs are being prepared to document the Detail Design process for the various project components.
- This PIC addresses DCR #2, but DCR #1 was previously prepared to document the following activities:
  - Clearing trees and brush within the entire limits of the project lands from Finch Avenue to the future Major Mackenzie Drive interchange.
  - Preloading (including grubbing) for approach ramps at: Rutherford Road Overpass; CP Rail / McGillivray Road Overpass; and Major Mackenzie Overpass.
  - Advanced utility works
- DCR #1 was filed for public review from December 5, 2017 to January 8, 2018.

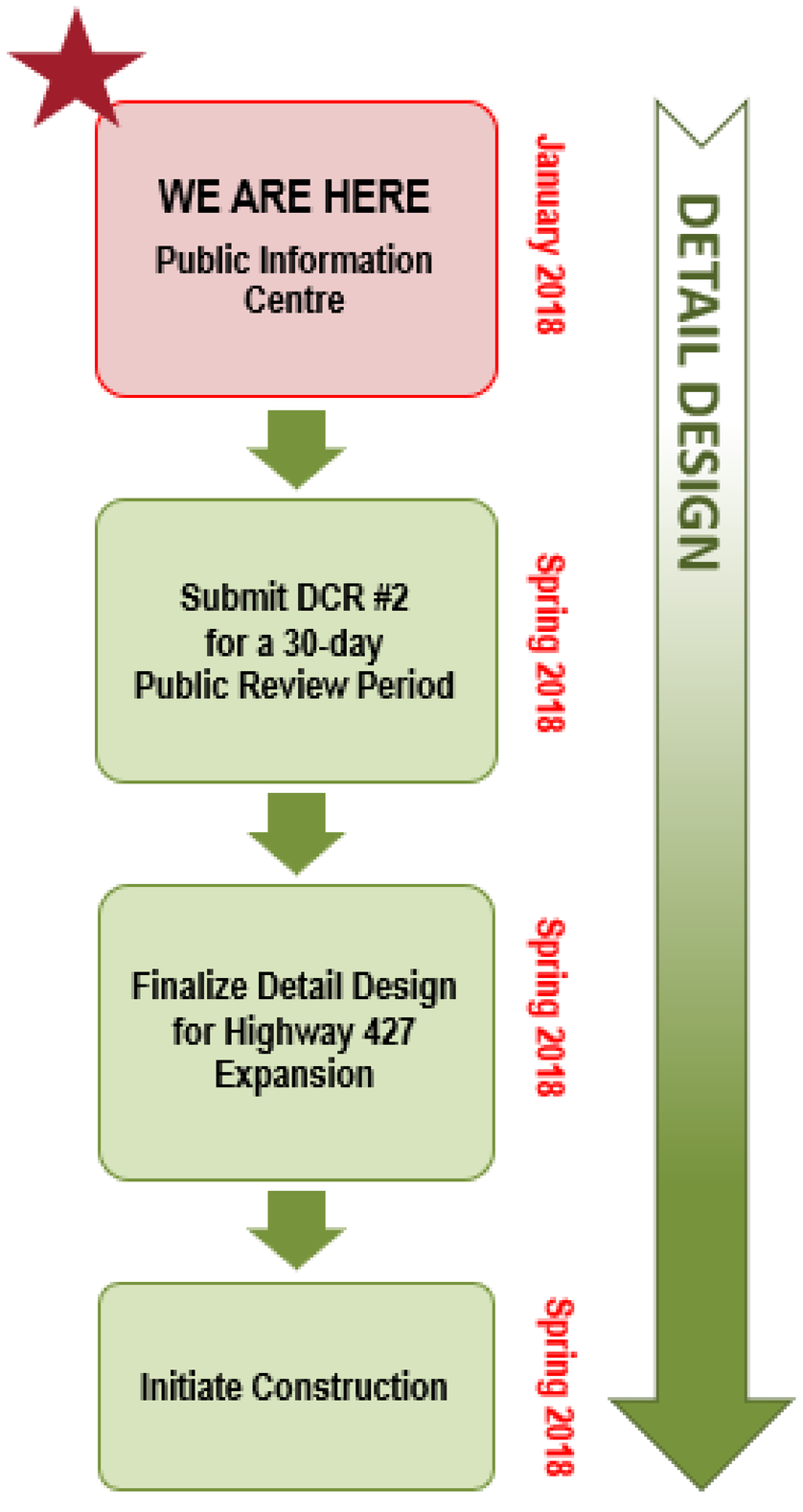


Environmental Assessment Process – Detail Design

This PIC presents the Detail Design process that will be documented in Design and Construction Report #2 (DCR #2), which will include the following:

- An overview of the project and the EA process;
- A summary of consultation activities undertaken;
- A detailed description of the undertakings;
- A description of potential effects on the environment, as well as proposed mitigation measures; and
- Commitments to future work and monitoring.

- In accordance with the MTO Class EA, DCR #2 will be submitted for a 30-day public review period in Spring 2018.
- The detail designs for the construction works addressed by DCR #2 will be finalized taking into consideration comments received.
- Construction will commence on the works contained in DCR #2 in Spring 2018.



Overview of the Proposed Construction Works

The following is an overview of the proposed construction works in DCR #2:

- Construction of the widening of Highway 427 between Finch Avenue to Highway 7;
- Extension of the existing Highway 427 from Highway 7 to Major Mackenzie Drive;
- Construction of three new Highway 427 interchanges at Langstaff Road, Rutherford Road, and Major Mackenzie Drive
- Associated works include:
  - Grubbing, stripping of top soil, ditching, highway construction and final grading
  - Construction staging including detours
  - Traffic (lane closures)
  - Utility relocation
  - Rehabilitation and widening of existing structures
  - Electrical works (street lighting, traffic lights etc.)
  - Fencing (wildlife, security etc.)
  - Implementation of highway drainage (storm sewers and culverts)
  - Removals of existing roads, existing drainage structures, etc.
  - Paving (asphalt)
  - Structures (overpass and underpass)
  - Water resources (culverts)
  - Vegetation restoration
  - Seeding and sodding

Widening of Existing Highway 427 between Finch Avenue and Highway 7

The following is a summary of the proposed construction works for the Widening:

- The existing Highway 427 between Finch Avenue and Highway 7 is proposed to be widened to four lanes in each direction, including three General Purpose Lanes (GPL) and one managed lane.

- There will be temporary reductions in lane widths and temporary shifting of lanes to eliminate the need for lane closures for the majority of the work.

- Modifications, rehabilitation and widening to existing structures accommodating a wider cross-section, including:
  - Highway 427 at Finch Avenue Underpass
  - Highway 427 Humber River Crossings
  - Highway 427 CNR Overhead Structures
  - Highway 407 E/W - 427S Overpass at Albion Road
  - Highway 427 at Albion Road Overpass
  - Highway 427 at Steeles Avenue Overpass
  - Highway 427 at Highway 407 Overpasses
  - Highway 427 at Highway 7 Underpass

- Minor shift in Albion Creek (re-alignment of ditch containing this creek) along the west side of the highway to accommodate widening, as well as extension of Albion Creek culvert only at the inlet at Highway 427.

- Installation of additional high mast lighting along Highway 427.

- Minor alignment changes to the proposed Highway 427 extension north of Highway 7 to tie into the new six lane section of Highway 427.

HIGHWAY 427 EXPANSION

Extension of Highway 427 between Highway 7 and Major Mackenzie Drive

The following is a summary of the proposed construction works for the Extension:

- The new proposed extension of Highway 427 consists of eight lanes from Highway 7 to Rutherford Road and six lanes from Rutherford Road to Major Mackenzie Drive.
- Construction of new local road crossings:
  - Zenway Boulevard Underpass
  - Langstaff Road Underpass
  - Future John Lawrie Street Overpass
  - Rutherford Road Overpass (NBL and SBL)
  - McGillivray Road / CPR Overhead (NBL and SBL)
  - Major Mackenzie Drive Overpass
- Local road closures / realignments at:
  - Major Mackenzie Drive – realignment northerly for a 1.5 km section to allow for development of a new interchange and eliminate the existing intersection with Huntington Road.
  - Huntington Road – removal from McGillivray Road northerly to just north of the realigned Major Mackenzie Drive.
  - McGillivray Road – access to Rutherford Road will be removed.
  - Langstaff Road – permanent realignment to the north of its existing location.
  - Zenway Boulevard intersection to / from Highway 7 – permanent removal. Users will be able to enter and exit the highway (in either direction) from Highway 7 and Langstaff Road.
  - Regional Road 99 (connection of existing Highway 427 between Zenway Boulevard and Highway 7) – permanent closure.
- New interchanges at Langstaff Road, Rutherford Road, and Major Mackenzie Drive.
- Construction of new structural culverts.
- Concrete stockpile located south of Langstaff Road within the MTO right-of-way (ROW).

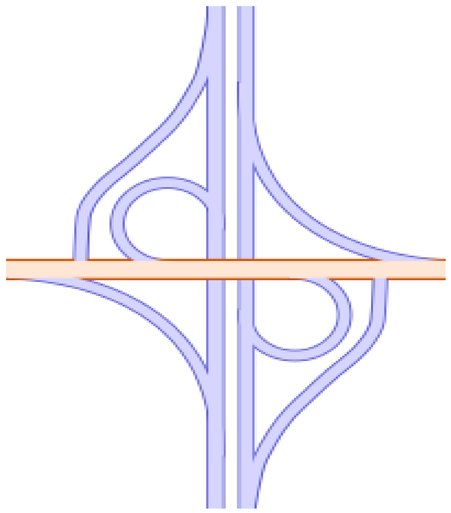
Extension of Highway 427 between Highway 7 and Major Mackenzie Drive

New Interchanges

The extension of Highway 427 will involve the construction of new interchanges at Langstaff Road, Rutherford Road, and Major Mackenzie Drive.

Langstaff Road, Rutherford Road and Highway 7

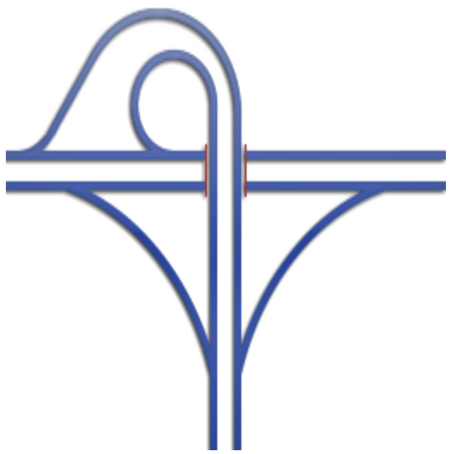
- The new interchanges at Langstaff Road and Rutherford Road, and ramp upgrades implemented at Highway 7, will be designed in a “Parclo A-4” configuration.
- This includes implementing traffic signals for exit ramps from the highway to municipal roads, as well as free-flowing loop-shaped entrance-ramps in both directions of the crossing street.



Parclo A-4” Configuration

Major Mackenzie Drive

- The Major Mackenzie Drive interchange (the northern termination of Highway 427) will be designed as a “Trumpet” configuration to provide a continuous transition for northbound highway travelers merging onto westbound Major Mackenzie Drive, as well as for all travelers entering the highway from Major Mackenzie Drive from both directions.
- Northbound highway traffic merging with eastbound Major Mackenzie Drive traffic will be transitioned through a signalized intersection.

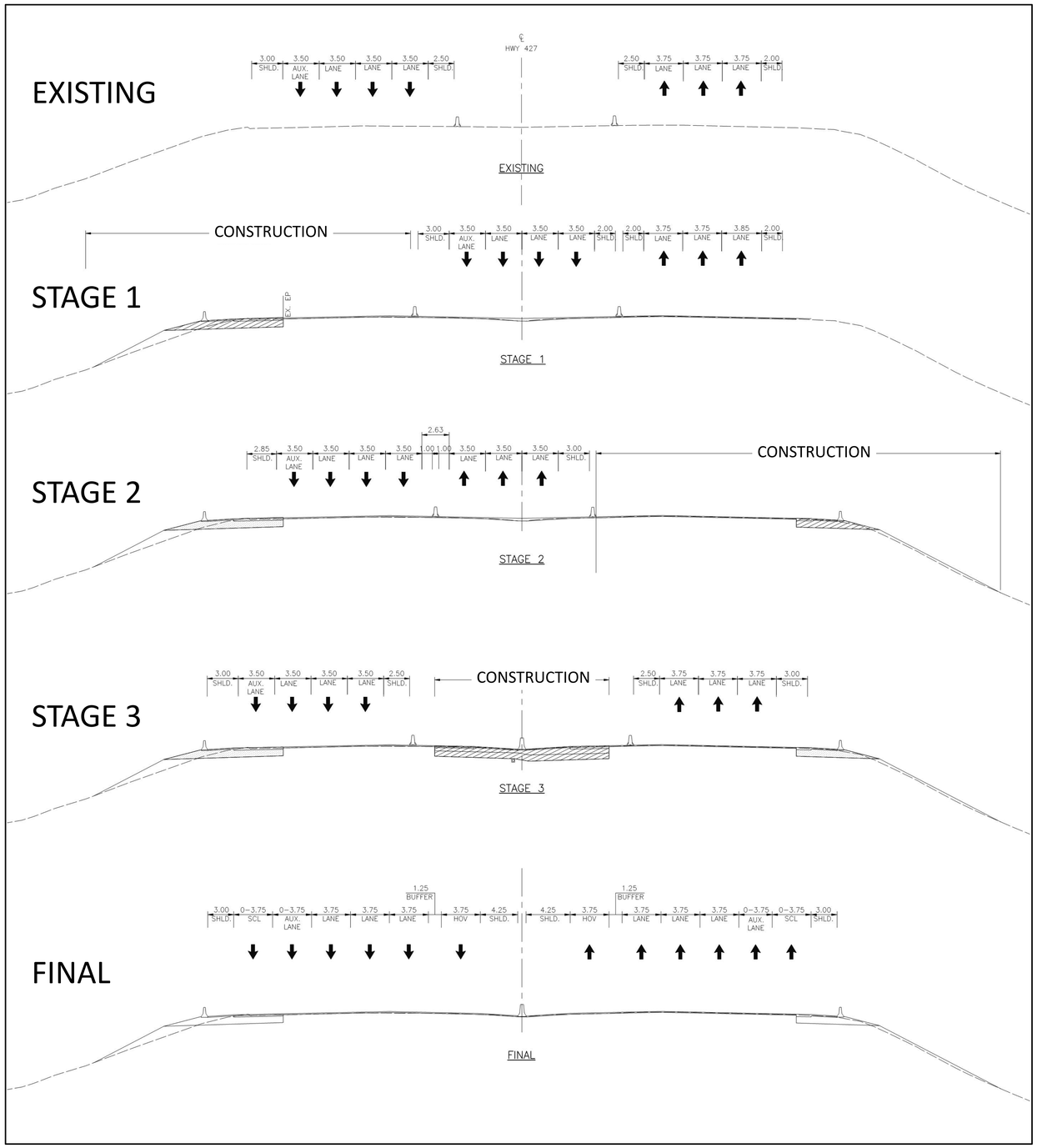


Trumpet Configuration

Construction Staging and Traffic Impacts

Existing Highway 427 Widening

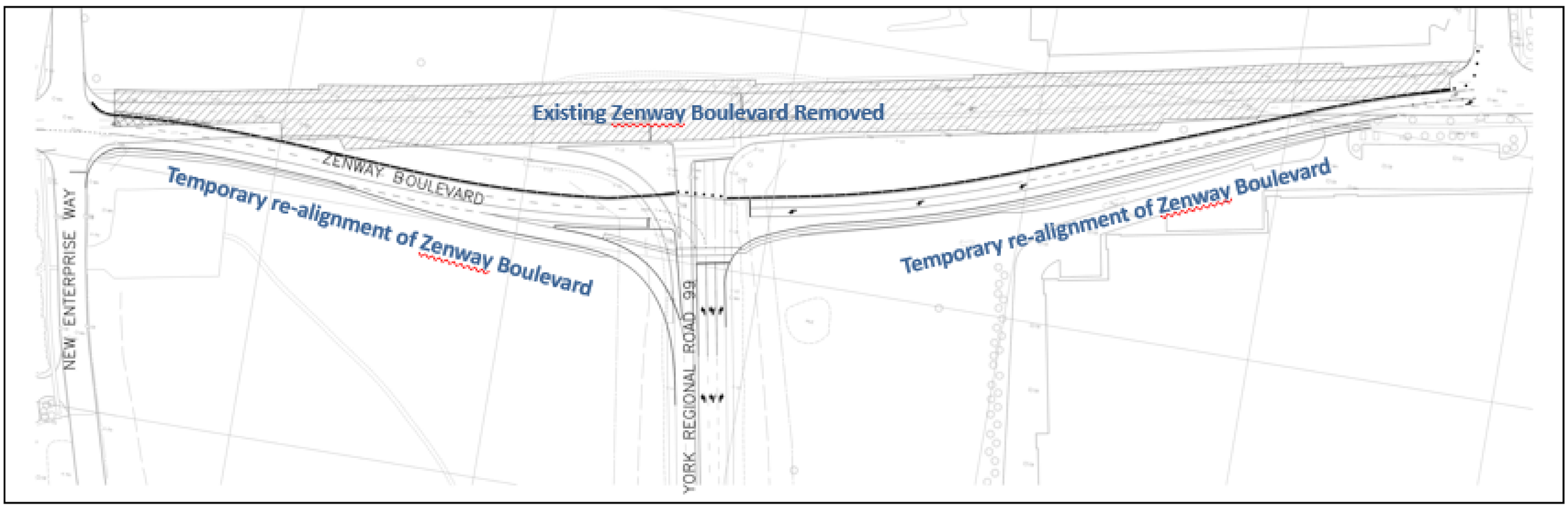
- Construction will require a staged approach to activities with traffic lane shifts, but traffic impacts will be minimal as the same number of lanes will be provided at all times.
- Lane reductions will only be implemented as required during night shift works.
- Staging will be undertaken as follows:
  - Stage 1 (2018): The southbound traffic will be shifted onto the existing widened median and the work on the outside of these lanes will be completed. Over the winter the lanes will be shifted back to the existing.
  - Stage 2 (2019): The northbound traffic will be moved onto the already constructed median and the remainder of the northbound lanes will be constructed. Once complete, traffic will be shifted back to the existing location and the median barrier wall and high mast lighting will be constructed. Over the winter the lanes will remain on the outsides of the highway.
  - Stage 3 (2020): First step is completion of the works in the median of the highway. Once the median works and the entire highway are complete, including the removal of Regional Road 99, the traffic will be placed into its final configuration.



Construction Staging and Traffic Impacts

Zenway Boulevard

- Only minor impacts are expected for the majority of works because traffic will be shifted to a temporary alignment. Access to Highway 427 will be maintained at all times.
- Staging as follows is expected to commence in the Autumn of 2018:
  - Two left turn lanes will be maintained for the northbound to westbound traffic.
  - Two westbound lanes will be maintained west of Regional Road 99.
  - One right turn and eastbound lane will be maintained for the northbound to eastbound traffic.
  - Traffic shifted to the south during construction of the overpass.
  - Traffic shifted to the new bridge structure (anticipated to occur in 2020).
- The new Zenway Bridge is expected to be completed in the Summer of 2020. Note, access to Highway 427 from Zenway Boulevard will no longer be available after final re-alignment.

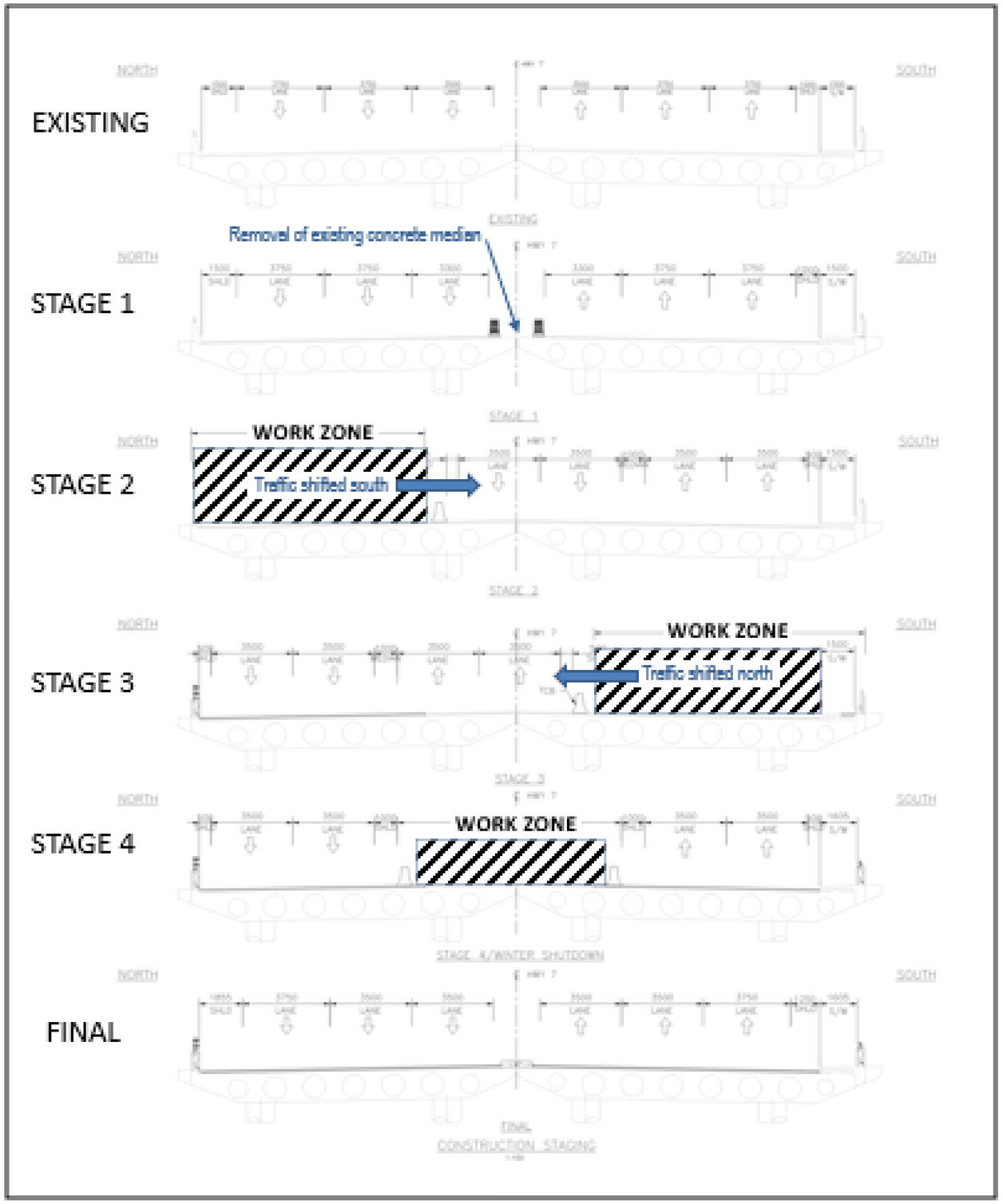


HIGHWAY 427 EXPANSION

Construction Staging and Traffic Impacts

Highway 7

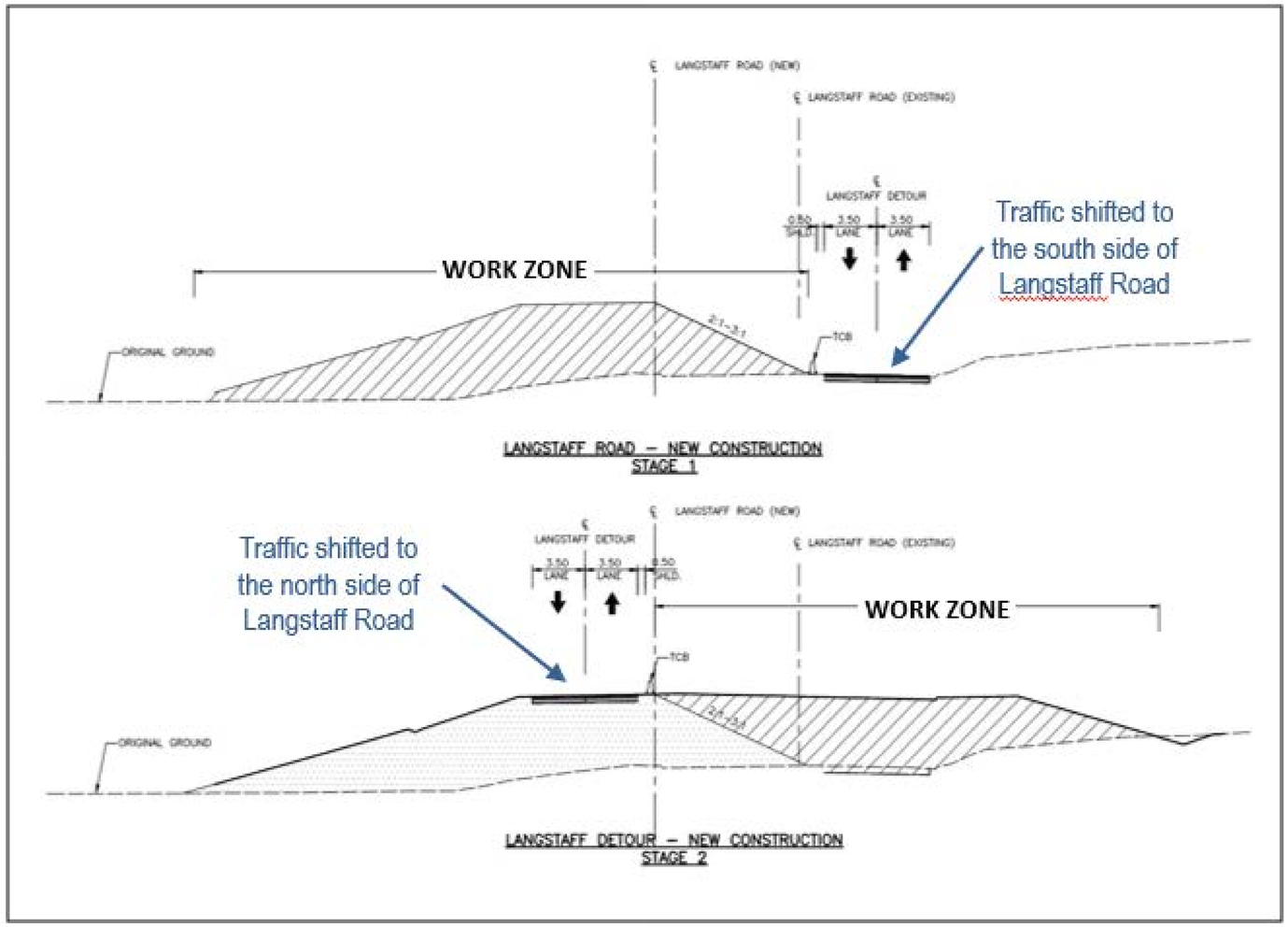
- Construction staging will involve lane reductions from the three existing lanes to two lanes each direction.
- Staging will be undertaken as follows:
  - Stage 1: East and West Bound Median Lanes closed – Removal of existing concrete median.
  - Stage 2: Traffic shifted to the south – Work on two north lanes of the bridge structure.
  - Stage 3: Traffic shifted to the north – Work on the two south lanes of the bridge structure.
  - Stage 4: East and West Bound Median Lanes closed – Work on the middle two lanes of the bridge structure.
  - Final Stage: Reinstated to three lanes each direction on the bridge.



Construction Staging and Traffic Impacts

Langstaff Road

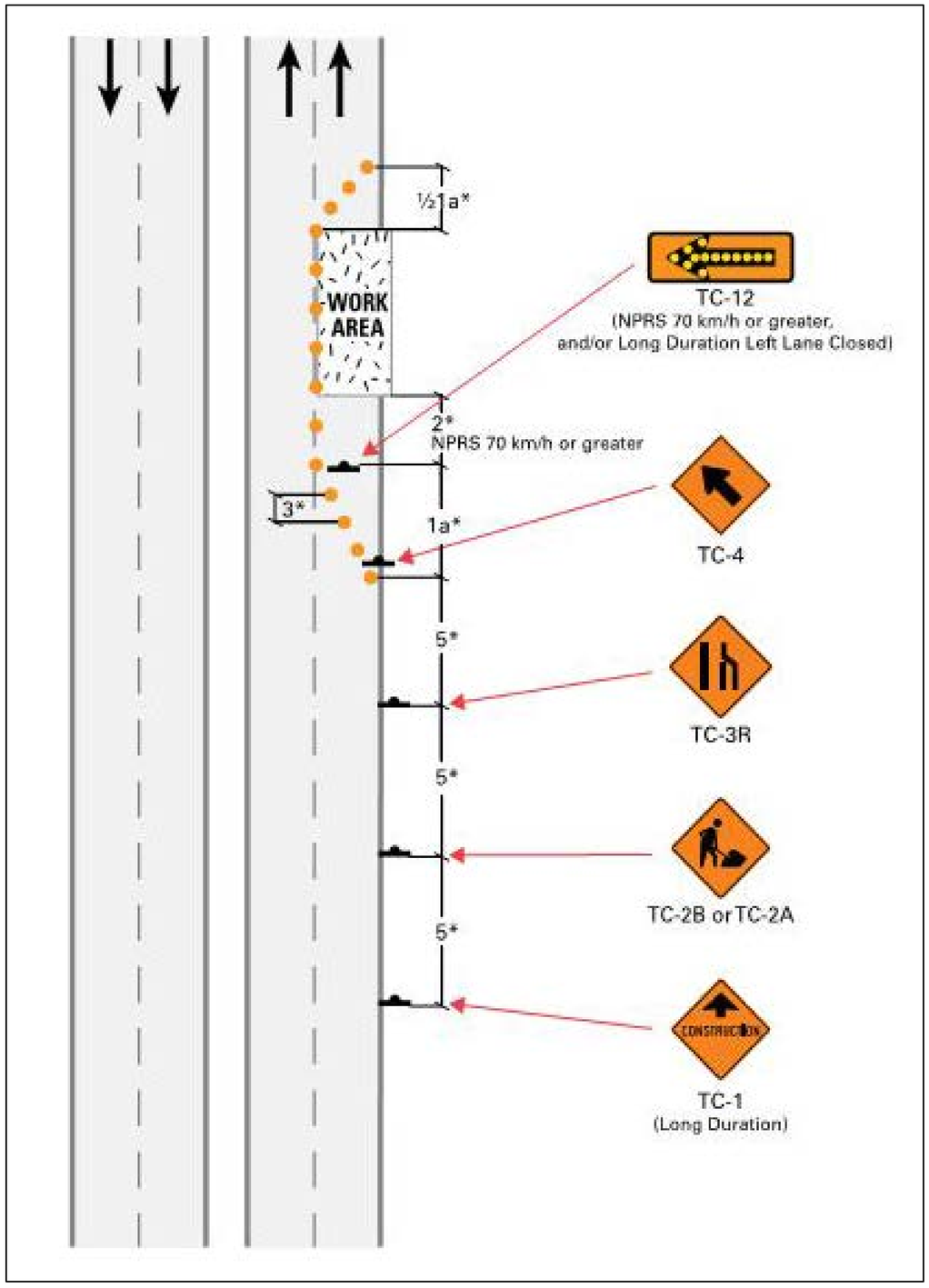
- The majority of the Langstaff crossing will be built offline to avoid impacts to the existing travel lanes. Therefore, minimal traffic impacts are anticipated.
- A section of Langstaff Road from west of the proposed interchange will require a grade separation. As a result, the traffic will be shifted to the south and reduced to one lane in each direction. This will occur late in the summer/fall of 2018 and extend through to the end of 2019. During this time, the north half of the roadway will be constructed approximately 2.5 m above the existing.
- Once the northern half of the roadway is complete, the traffic will be switched onto the northern half with one lane in each direction. This is anticipated to occur in the spring of 2019. During this time, the southern half will then be constructed.
- Once the southern half of the roadway is complete, both halves will be opened up and two lanes of traffic in each direction will be reinstated. This is anticipated to occur in the Summer/Autumn of 2019.



Construction Staging and Traffic Impacts

Rutherford Road

- Traffic impacts for the majority of these construction activities are anticipated to be minimal.
- The abutments of the new interchange structures will be built several metres back from the existing shoulders allowing traffic to continue on the existing roadway.
- Temporary road closures will be required for bridge structure works, such as installation of girders and construction of the deck, but there will be no long-term lane reductions during construction.
- The four lanes of existing traffic will be maintained during the peak hours of the day.
- Work is anticipated to be undertaken in the Autumn / Winter of 2018.
- The figure is taken from Ontario Traffic Manual (OTM) Book 7 – Temporary Conditions, which provides uniform guidelines for traffic control in temporary work zones. While this figure is being used to illustrate the measures to be implemented at Rutherford Road during the construction, it is not intended to be relied upon solely and will instead be reviewed as part of OTM Book 7 as a whole and in conjunction with other OTM books as necessary.



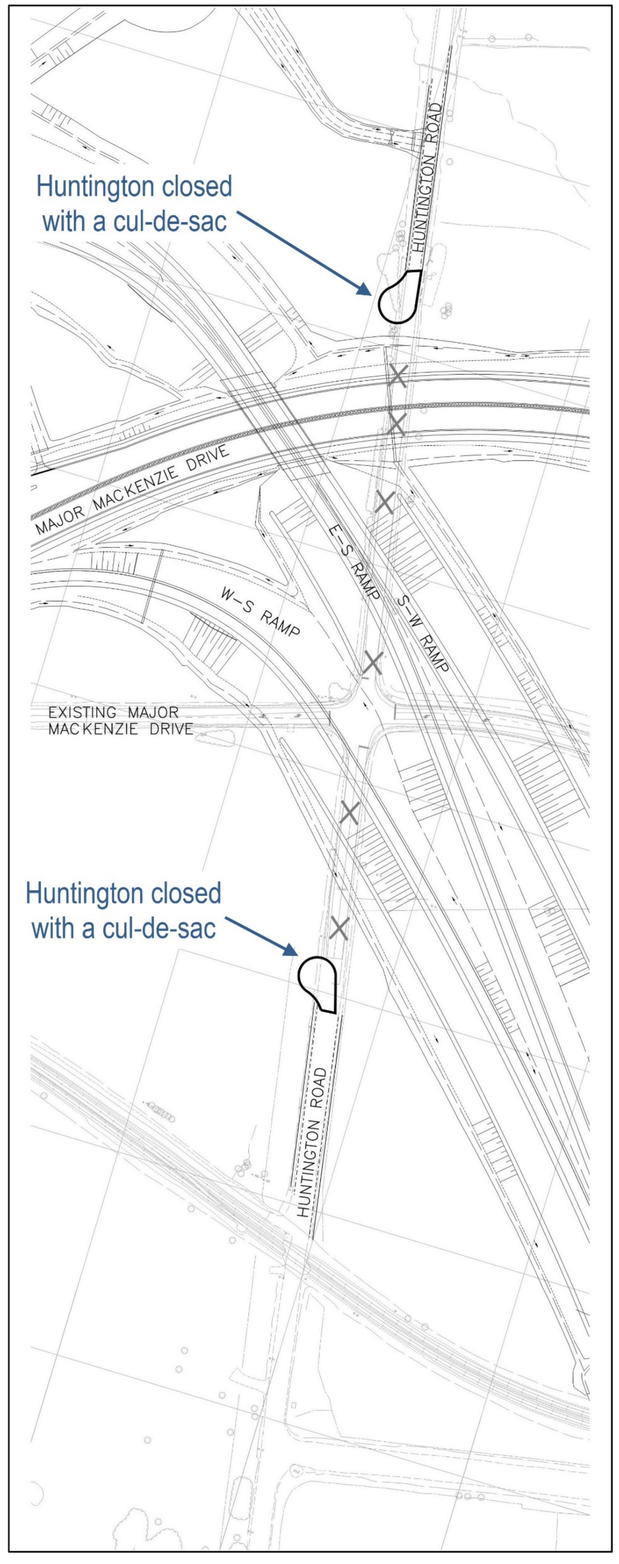
Construction Staging and Traffic Impacts

Huntington Road North of Major Mackenzie Drive

- Preloading on both sides of Major Mackenzie Drive for the interchange is anticipated to be done in the Spring of 2018.
- Major Mackenzie Drive traffic is anticipated to be moved north in the Summer of 2018.
- Once Major Mackenzie Drive is moved north, Huntington Road will be closed with a cul-de-sac (anticipated to be in the Summer of 2018).

Huntington Road South of Major Mackenzie Drive

- Huntington Road will be closed south of the railway tracks at McGillivray Road with a cul-de-sac (anticipated to be in the Summer of 2019).
- McGillivray Road will be closed at Rutherford Road with a cul-de-sac (anticipated to be late in the Summer of 2019.

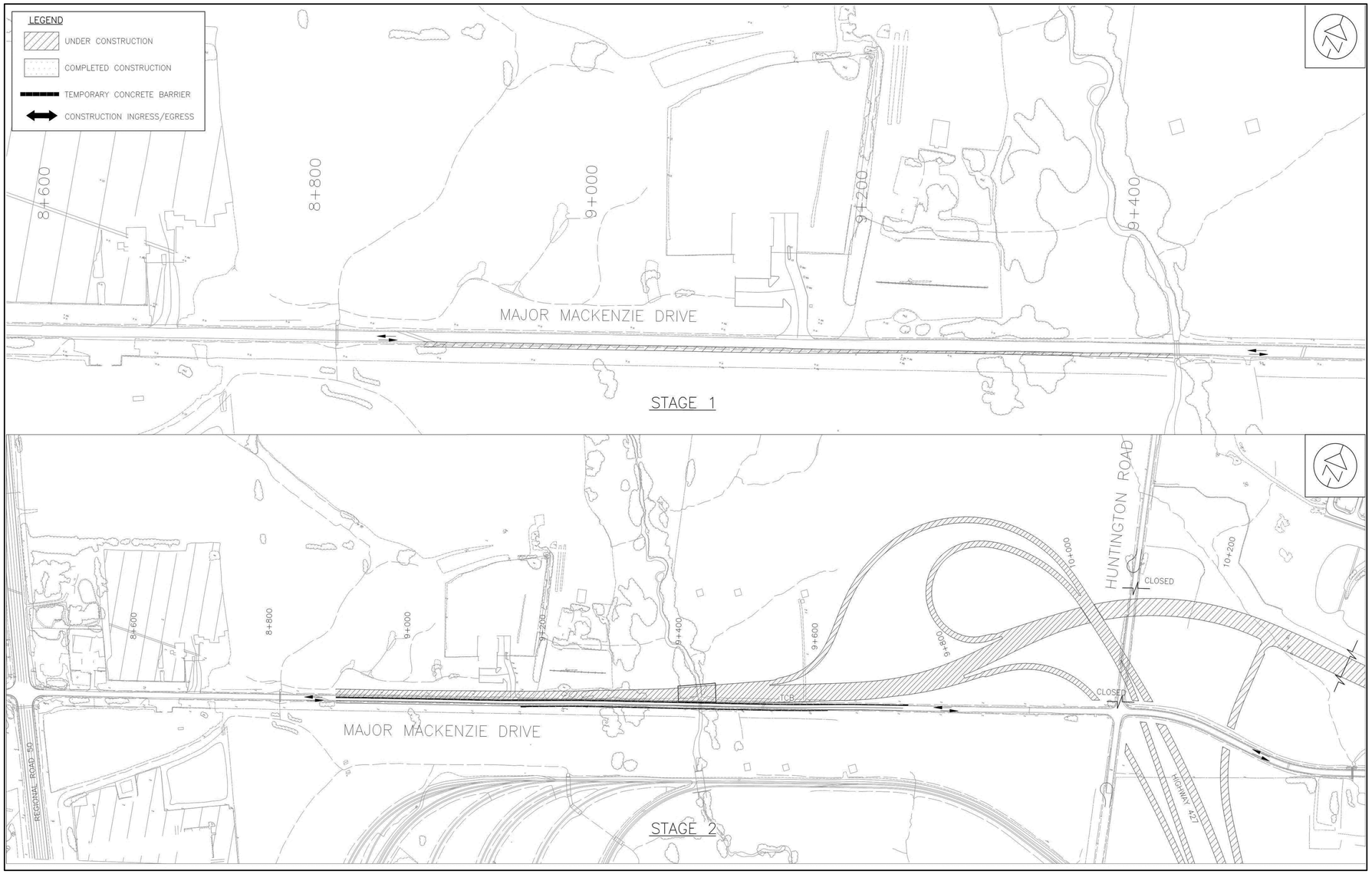


HIGHWAY 427 EXPANSION

Construction Staging and Traffic Impacts

Major Mackenzie Drive

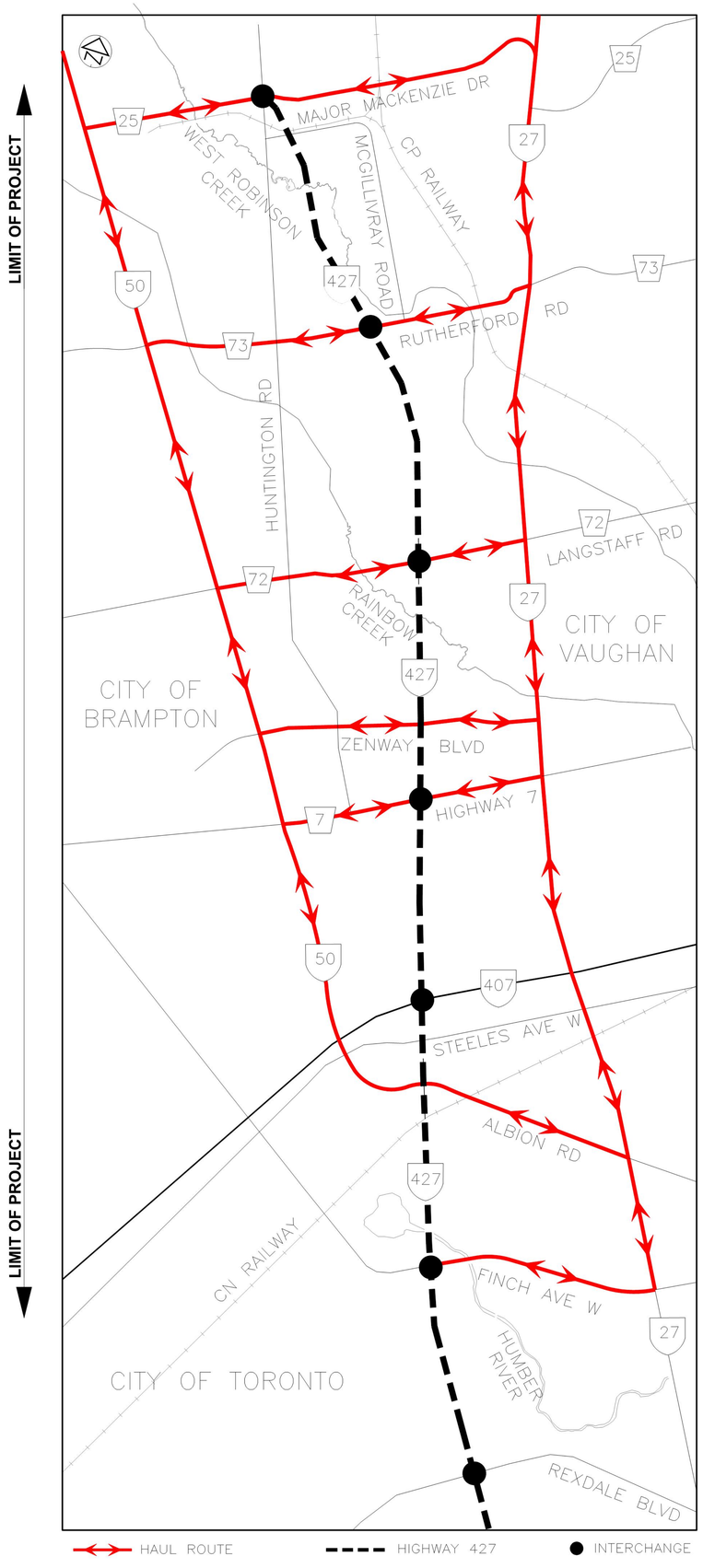
- Only minimal impacts are expected because the majority of the works at the existing Major Mackenzie Drive will occur outside of the existing travel lanes. No long-term lane reductions required during construction.
- Staging will be undertaken as follows:
  - Build the interchange separately on the north side of the existing Major Mackenzie Drive maintaining the existing travel lanes.
  - On the west side of the interchange the existing roadway will be widened on the south side. Once complete, the traffic will be moved onto the newly widened section and the existing section reconstructed.
  - On the east side, the connection to the existing roadway will be completed using single lane closures during off-peak hours.
  - Once both sides of the roadway are constructed and traffic is flowing along the new alignment to the north, the traffic will be placed into its final configuration (anticipated to occur in the Summer of 2019).



HIGHWAY 427 EXPANSION

Haul Routes

- Only suitable arterial roads (load and capacity) will be used for the haul routes. Both Highway 50 and Highway 27 will be used to access the major Regional Roadways.



Existing Environmental Conditions

VEGETATION

- Vegetation is concentrated within the main valley crossings, as well as three small, isolated farm woodlots. There is a high proportion of non-native plant species, which is likely due to the high level of disturbance in the surrounding area.
- Between Finch Avenue and Highway 7, the affected vegetation is limited to roadside cultural meadow with scattered trees and shrubs, most of which are non-native and/or planted species.
- Vegetation that will be affected between Highway 7 and Major Mackenzie Drive is dominated by cultural meadow, hedgerows and agricultural fields, with more natural vegetation limited to the main valley crossings and three isolated farm woodlots.

WILDLIFE AND SPECIES AT RISK

- No significant wildlife habitat was identified by MNRF within the Project Lands.
- No SAR amphibians (i.e., Western Chorus Frog) were recorded. Wildlife recorded within the Project Lands were generally common, generalist species tolerant of urban or semi-urban conditions.
- Spring 2016 field investigations confirmed the presence of Barn Swallow (Threatened) nesting in two barns within the Lands.
- Spring 2016 field investigations confirmed four Endangered bat species (i.e., Little Brown Myotis, Northern Myotis, Eastern Small-footed Myotis and Tricoloured Bat) in two barns and woodland habitat within the Project Lands.

FISH AND FISH HABITAT

- The two main watercourses within the Project Lands are Rainbow Creek and West Robinson Creek which are tributaries of the Humber River. There are also several smaller tributaries of Rainbow and West Robinson Creek.
- No aquatic SAR have been observed within the watercourses or identified by the MNRF or DFO.

Existing Environmental Conditions

GROUNDWATER AND HYDROGEOLOGY

- The Project Lands are located within the Humber River Watershed
- The regional groundwater flow direction in the Lands is to the southwest, south and southeast.
- Potable water supply in the area is comprised of municipal water supply and private well water supplies. A municipal water supply well (the Kleinberg Well) is located north of the Project Lands. The limits of the Wellhead Protection Zone for this well are located approximately 800 m north of the intersection of Major Mackenzie Drive and Huntington Road to the north of the Project Lands.

LAND USE

- Existing land uses within, and surrounding the Project Lands are a mix of agriculture, residential, industrial/commercial and recreational. Commercial/light industrial land uses are within the Project Lands on the south side of Rutherford Road and east side of the CP Rail track.

ARCHAEOLOGICAL RESOURCES

- A Stage 1 Archaeological Assessment of the entire Highway 427 Transportation Corridor was completed as part of the Individual EA (2010).
- Stage 2 Archaeological Assessments were completed in 2015 in areas determined to have archaeological potential. The results of the Stage 2 indicated that the Lands are clear of archaeological potential and no further archaeological assessments are required.
- A Stage 3 Mechanical Top Soil Removal was completed at the Coleraine Cemetery in July 2016. No further assessment is recommended for the site.

CULTURAL LANDSCAPES

- Cultural Heritage Evaluation and Documentation Reports were completed for the Highway 427 Expansion project during the Individual EA (2010) and subsequent phases. The construction activities covered in DCR #2 do not impact any built or cultural heritage landscapes within the Project Lands.

Potential Environmental Impacts and Proposed Mitigation

VEGETATION

Vegetation clearing and grubbing is required during construction. Proposed mitigation includes:

- Vegetation clearing, grubbing and construction activities will be carefully planned to anticipate and mitigate environmental issues before they occur.
- Tree clearing and grubbing will be restricted to the required construction activity zone. The limits of the construction zone will be delineated and fenced to protect the vegetation that is not identified for removal.

- In the event that adjacent vegetation communities or planted trees are accidently damaged during construction activities, LINK427 will implement appropriate contingency measures such as pruning tree limbs or roots that are accidently damaged using proper arboricultural techniques.
- Tree/shrub debris will be stored outside identified protected vegetation.

- Clearing and grubbing activities will be conducted outside of the migratory bird nesting window (April 15 to August 15), and where breeding bat habitat exists, outside of the bat maternity roosting season (April 30 to September 1).
- Vegetation debris will be removed or mulched as soon as possible, especially during the breeding bird season (April 15 to August 15) in order to prevent birds from nesting in debris piles.

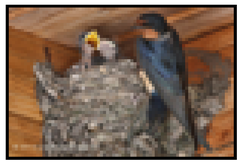
- A Vegetation Restoration Plan and Landscape Plan will be prepared to revegetate disturbed areas following construction and to provide compensation for loss of vegetation within the new alignment.

Potential Environmental Impacts and Proposed Mitigation

WILDLIFE AND SPECIES AT RISK (SAR)

Wildlife and SAR (i.e., bats and Barn Swallow) may be impacted during construction as a result of vegetation clearing and structure removals. Proposed mitigation measures include:

- Any wildlife encountered will not be knowingly harmed.
- If work is scheduled during the breeding bird season (April 15 to August 15), clearing and grubbing will be preceded by a survey by a qualified avian biologist to identify active nests. Active nests will not be disturbed.
- A strict 'no vegetation' removal period between June 1st and July 31st will be adhered to for woodlands identified as SAR bat habitat.
- Should cavity trees require removal between April 30th to September 1st, a night exit survey will be conducted 24 hours prior to tree removal to determine the presence of SAR bats. If bats are present, a 30m buffer will be provided and the tree will be retained until the bats have vacated the area.
- Regular monitoring will take place during vegetation removal within the confirmed habitat features and the two barns with confirmed SAR habitat.
- LINK427 will implement habitat restoration for Barn Swallow, including the installation of alternate nesting structures and creation of foraging habitat.
- LINK427 will implement overall benefit measures for SAR bats including habitat enhancement and habitat restoration.



Potential Environmental Impacts and Proposed Mitigation

FISH AND FISH HABITAT

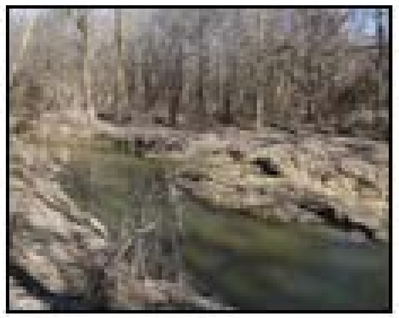
The proposed works have the potential to impact to fish and fish habitat if the appropriate mitigation measures are not implemented. Proposed mitigation measures include:

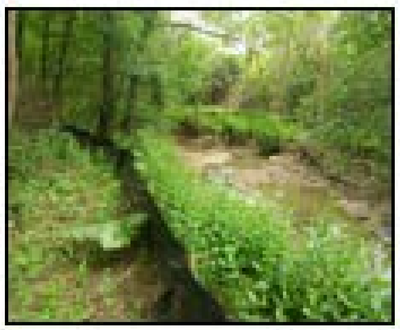
- All instream or near stream works will be conducted during the appropriate in-water timing window. A warmwater construction timing window (from July 1 to March 31) will be applied to protect the resident warmwater fish communities present in watercourses.

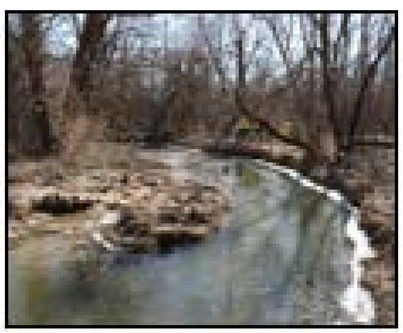
- Sediment and erosion control measures will be implemented during all phases of construction, clean-up and restoration to prevent sediment laden runoff from entering any of the watercourses directly from the construction zone.

- All structure installations and channel restoration works will be completed 'in the dry'. For the Langstaff Road and Major Mackenzie structures, an appropriate temporary flow bypass system may be required to maintain clean flow around the construction zone. To minimize the potential for impacts, works near watercourses will be conducted during low flow periods.

- All near-water construction zones will be isolated using standard perimeter silt fencing of the general construction zone up and downstream. The silt fencing will be heavy duty/reinforced fencing for all disturbed areas of the embankments that drain to the watercourses. Silt fencing will be regularly inspected and maintained as required.







Potential Environmental Impacts and Proposed Mitigation

NOISE

Construction works will be a temporary source of localized noise that may be elevated above existing background levels. The nature of the construction activities is such that the noise levels will vary temporally and spatially as different activities take place and as the location of the activities moves around the Lands. Additionally, night work may be required at various locations during certain stages of construction.

- LINK427 will keep idling of construction equipment to a minimum and will maintain equipment in good working order to reduce the noise emitted from construction activities.
- As some construction activities are expected to be undertaken during nighttime and/or weekends, exemptions from local Noise Bylaws will be sought.
- While no significant adverse noise and vibration effects are anticipated, a Construction Noise and Vibration Plan has been developed by LINK427 and will be implemented as per the EA Conditions of Approval throughout the construction period.

ARCHAEOLOGY & CULTURAL HERITAGE

- The Highway 427 Extension Lands have been assessed for archaeological potential. It is unlikely that archaeological resources are present within the study area.
- In the event that deeply buried archaeological deposits are discovered, the Ministry of Tourism, Culture and Sport will be notified immediately. In the event that human remains are encountered, LINK427 will immediately notify the police or coroner and the Registrar of Cemeteries, Ministry of Government Services.
- The Coleraine Burying Grounds (Coleraine Cemetery) and the Coleraine Schoolhouse Site located on the south side of Major Mackenzie Drive will be protected during construction activities.

Potential Environmental Impacts and Proposed Mitigation

DRAINAGE AND STORMWATER MANAGEMENT

The works can potentially have adverse impacts on the natural environment due to sediment in stormwater originating from the erosion of exposed soils. Effective stormwater management and sediment control measures is a component in good erosion and sediment control.

- LINK427 will develop Construction Period Drainage and Sediment Management Plan(s) (DSMP) that incorporate each watercourse crossing. The purpose of the DSMPs is to provide water quality treatment of the runoff generated within all drainage catchment areas within the Project Lands before water is discharged to any watercourse.

- LINK427 has developed an Erosion and Sediment Control Plan (ESCP) for the project in order to document the environmental protection measures for preventing and controlling erosion and sedimentation during construction works. The ESCP provides the knowledge, awareness and methods necessary to complete construction in a manner that avoids or minimizes erosion and controls sediment.

- The ESC measures required for the works are industry standard proven techniques that will be used to prevent erosion of exposed soils and the transport of sediment from construction areas to retained natural areas, in particular, watercourses.

- In addition, there is a Surface Water Monitoring Program so that all mitigation measures are functioning as intended.

WASTE MANAGEMENT AND CONTAMINATION

Waste, excess materials and emissions have the potential to contaminate the surrounding environment if not managed properly.

- While the construction activities for DCR #2 are not anticipated to result in the production of any excess soils that requires offsite management, should there be excess materials generated during construction, they will be managed in accordance with the project's Earth Management Plan, the Waste and Contamination Management Plan (WCMP), and OPSS 180 (Management of Excess Materials).

- Construction activities will include removals of existing roads and existing drainage structures. A designated substance survey (DSS) and sampling program will be completed prior to construction to determine the appropriate waste management options of excess materials. All materials will be sampled and managed in accordance with the WCMP and in accordance with applicable MOECC regulation and guidelines.

- In the event that unknown contaminated soil and/or groundwater is encountered during construction activities within the Lands, the project will comply with the WCMP, Ontario Environmental Protection Act and the MOECC spills response and contaminated procedures. A project specific Response Plan will be developed and implemented as necessary.

Potential Environmental Impacts and Proposed Mitigation

GROUNDWATER AND HYDROGEOLOGY

A groundwater monitoring program is being implemented, in accordance with the EA commitments, to establish baseline conditions and to identify potential adverse impacts to groundwater, environmentally sensitive features or water sources (such as private water wells) related to DCR #2 construction activities.

- Private water supply wells have been identified within the project Lands. South of Highway 7, none of these wells will be directly impacted by the project and would not need to be decommissioned. North of Highway 7, six wells are located within the Highway 427 extension alignment and will be decommissioned.

- If dewatering activities are required during construction and there is the potential for impacting private water supply wells, or where a well is within the zone of influence of dewatering, a door-to-door well water survey will be conducted to confirm the presence or absence of these wells, and establish baseline conditions prior to the start of construction. Some of this groundwater monitoring work is currently being undertaken.

- LINK427 will install groundwater monitoring wells, if not already present, near the temporary or permanent groundwater dewatering locations to closely monitor groundwater quantity and quality during the dewatering activities.

- Dewatering activities will be conducted in accordance with Ontario Government control procedures (OPSS 518 Control of Water from Dewatering Operations). Appropriate dewatering measures will be implemented to manage any groundwater encountered during grading activities, and dewatering discharge water will be filtered as necessary to prevent transport of sediment to natural surface water receptors.

- The selection of construction machinery, choice of construction methods and phasing of construction will be used in order to reduce water taking requirements.

Overview of Communications Approaches and Tools

Highway 427 Expansion Project Website

- The Highway 427 Expansion project website (www.427expansion.ca) will be the central portal for communication, providing updates and information on traffic disruptions, construction activities and progress.

One-Window Communication

- LINK427 has established a one-window communication system for public enquiries, complaints and comments. Members of the public may contact LINK by telephone: 1-888-352-8085 (French Language line: 1-888-595-3152) or by email at ask@427expansion.ca.

Variable Message Panels

- Portable variable messaging signs (PVMS) will be used at key locations and updated as needed to communicate, in real time, key information related to traffic management.

Notices & Bulletins

- Notices of upcoming consultations or other project activities will be delivered via the Project Mailing List, E-mail List, Project website, and local newspapers. Notices will also be mailed to residents and businesses that reside in a 2km radius of the project boundary.

- Project Bulletins will be prepared monthly, or more frequently if required and may include information on PICs, construction activities, traffic detours and other relevant information. These bulletins will be sent via email and available on the Project website.

Next Steps

Following this Public Information Centre (PIC), we will:

- Review and respond to comments received.
- Refine the Detail Design and mitigation measures based on comments received.
- Finalize the Detail Design and prepare DCR #2 for public review.

Thank you for attending this Public information Centre. We welcome your comments. Please fill out the Comment Sheet you were provided when you entered and submit it before you leave, or e-mail / mail it to the address below within two weeks following the PIC.

If you have questions about the Project or wish to be added to the mailing list, please contact:

Mr. Christopher Tschirhart
Environmental Director
LINK427
1 Royal Gate Blvd., Suite G
Woodbridge, ON L4L 8Z7
Phone: 1-888-352-8085
E-mail: ask@427Expansion.ca

Mr. Aitor Arbesu
Project Director
LINK427
1 Royal Gate Blvd., Suite G
Woodbridge, ON L4L 8Z7
Phone: 1-888-352-8085
E-mail: ask@427Expansion.ca

Comments and information regarding the project are being collected to assist the Ministry of Transportation in meeting the requirements of the Environmental Assessment Act*. This material will be maintained on file for use during the study and may be included in study documentation. Information 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.*

www.427expansion.ca

Appendix C: Design Drawings

Appendix D: Agency Table

Highway 427 Expansion Project Agency Comments received as a result of consultation requests and resulting meetings between the Organizations and LINK427 Staff	Highway 427 Expansion Project LINK427 Responses between May 15th to March 29th 2018
Indigenous Communities	
Curve Lake First Nations	
I have received the notice for the Public Information Centre in regard to the Highway 247 Expansion Detailed Design and Construction on January 18, 2018. As you may be aware Curve Lake First Nation dose not attend public information sessions due to our capacity restraints. If you could please send me the Environmental and Archaeological assessments for this project and any other materials that will outline the detailed design and construction of this project that would be much appreciated. We did try the link provided but we could not find what we are looking for. Once the material is reviewed we will be in contact with you or another representative. Let me know if you have any questions or concerns. Miigwech	MTO Special Project Office furnished the following response: Dear Kaitlin, Thank you for your email on Feb. 20th, 2018 regarding the Highway 427 Expansion. To download the previous Environmental Assessment Reports and Archaeological Assessments, please click on the following link (link included). This link includes: • *427 Transportation Corridor Environmental Assessment (2010)* • *Transportation Environmental Study Report, Highway 427 Extension Widening From Highway 7 to Major Mackenzie Drive (January 2016)* • *Transportation Environmental Study Report, Highway 427 From Albion Road to Highway 7 (November 2013)* • *Preliminary Design and Class Environmental Assessment Study* • Stage 1 and Stage 2 AA from the *427 Transportation Corridor Environmental Assessment (2010)* • Stage 1 AA (2011) for the *Highway 427 From Albion Road to Highway 7 TESR* • Stage 2 AA and Supplemental Documentation (2016) • Stage 2 AA and Supplemental Documentation (2017) • Stage 3 AA Coleraine Cemetery (2017) • Stage 3 AA McKinnon Site and Supplemental Documentation (2017) • Stage 3 AA Jeffery Site (2016) (*Note that the Highway 427 Expansion project limits no longer cross over with this site*) The Detail Design and construction is being undertaken by LINK427 and commenced in 2017 and work is on-going. A courier will be sent to

Highway 427 Expansion Project Agency Comments received as a result of consultation requests and resulting meetings between the Organizations and LINK427 Staff	Highway 427 Expansion Project LINK427 Responses between May 15th to March 29th 2018
	you that includes hard copies of the below Detail Design documents. Website links to download each of the documents are also provided below : • *Highway 427 Expansion Design and Construction Report (DCR) 1 (November 30, 2017):* http://427expansion.ca/wp/wp-content/uploads/2017/10/Hwy-427-DCR-1-FINALJan18.pdf • *Public Information Centre Displays (January 2018):* http://427expansion.ca/wp/wp-content/uploads/2018/01/PIC1Boards-FinalJan26-AODA.pdf Should you require further information on this project, please feel free to contact me.
Chippewas of Rama First Nation	
Dear Christopher & Aitor; Thank you for your letter re: Notice of Public Information Centre – Highway 427 Expansion, Detail Design and Construction. Please be advised that we reviewed your letter. I have shared it with Council and we've forwarded the information to Karry Sandy McKenzie, Williams Treaties First Nation Process Co-ordinator/Negotiator. Ms. McKenzie will review your letter and take the necessary action if required. In the interim, should you wish to contact Ms. McKenzie directly, please do so at k.a.sandy-mckenzie@rogers.com Thank you, Chief Rodney Noganosh	Forwarded to MTO, no response required.
Utilities	
Alectra	

Highway 427 Expansion Project Agency Comments received as a result of consultation requests and resulting meetings between the Organizations and LINK427 Staff	Highway 427 Expansion Project LINK427 Responses between May 15th to March 29th 2018
■ Location of transformer along Zenway is in the way of the temporary detour. Power needs to be maintained at all times. ■ Relocations at Langstaff cannot occur until fills are completed by LINK427. Need confirmation of poles and joint use duct banks in the Hydro corridor. ■ Major relocation required at Rutherford. This work is right outside of critical transfer station infrastructure. Potential requirement for lane closures. ■ At Major Mackenzie and Huntington, permanent relocation cannot commence until fills are completed.	■ Simple relocation will require the relocation of a transformer and the removal of non-essential infrastructure. No outages to occur. ■ Existing material will be raised temporarily to allow fills to be placed. Bell / Alectra will be jointly using poles. ■ There will be a combination of aerial and joint use duct banks, and lane closures will be required. ■ Temporary work on Huntington to allow fills to cross, temporary relocation work on west limit will occur.
Bell	
■ LINK427 would like to enter into agreement with Bell for design and relocation of Bell plant for the Highway 427 expansion project ■ LINK427 enquired which party is responsible for permitting.	■ Bell's standard agreement is 9032 form ■ Bell confirmed they will acquire all required permits
Cole	
■ Cole questioned if drainage from Hydro Corridor conveyed across Hwy 427 is a part of the stormwater management design. ■ Cole looking to incorporate a steel casing on a sanitary pipe at the future John Lawrie and Hwy 427 crossing. LINK427 to provide drainage info.	■ LINK427 confirmed this drainage is part of the Highway 427 stormwater management design. ■ LINK427 provided grading information.
Hydro One	
■ LINK427 requesting induced currents in poles.	■ Hydro One to forward grounding consultants who are versed in this subject.

Highway 427 Expansion Project Agency Comments received as a result of consultation requests and resulting meetings between the Organizations and LINK427 Staff	Highway 427 Expansion Project LINK427 Responses between May 15th to March 29th 2018
■ Hydro One outlined a number of restrictions for working within the Hydro Corridor.	■ LINK427 to implement the proper Hydro One restrictions.
Rogers	
■ Rogers outlines the need for coordination with Bell / Alectra for a joint use trench to minimize buried utilities.	■ LINK427 is leading coordination efforts. Joint use Pole locations to be coordinated by Link427. LINK427 is submitting Trans Canada Pipeline applications on behalf of Rogers.
TransCanada Pipeline	
■ Kickoff meeting to discuss permitting process, regulations to follow during construction. ■ TCPL general comments on design packages. LINK 427 to identify TCPL pipeline on drawings and apply for permits as requested/required. ■ TCPL confirming electrical utilities will be performing their own crossing applications.	■ LINK427 to comply with TCPL regulations & application process. ■ LINK427 identified TCPL pipeline and safe zone on drawings and has applied for permits. This includes inventory of permanent fixtures being installed by LINK427. ■ LINK427 confirmed utilities will be performing their own permit applications.
Municipalities	
Regional Municipality of York	
■ City of Vaughan and York Region asked about communications with the public. ■ Submission of Temporary Road Sign Permit Application for PVMS board. ■ Submission of Road Occupancy Permit and related documents for traffic requirements within the Region of York.	■ LINK427 verified the website to be used will be www.427expansion.ca. ■ Response from LINK427 requesting the submission of an alternate application and additional details. ■ Applied for and provided Blanket Permit.

Highway 427 Expansion Project Agency Comments received as a result of consultation requests and resulting meetings between the Organizations and LINK427 Staff	Highway 427 Expansion Project LINK427 Responses between May 15th to March 29th 2018
■ York Region advised LINK427 of scheduled traffic control measures within the Region of York as required by the Blanket Road Use Permit. ■ Please note that the Region must be advised in advance of any work to be undertaken in the vicinity of existing regional water and wastewater infrastructure. In this regard, please contact Frank Badinski, Construction Administrator (c: 905-955-0959) at least 48 hours in advance of any work. In the attached response you have noted that a "protection liner has already been added to the watermain". Is this pertaining to the 1800mm transmission main on Rutherford? Can you please provide clarification on what the work entails and what has actually been undertaken in the field? Were there any engineering drawings in this regard? Have steps also been taken to protect the 750mm Huntington watermain @ Major Mackenzie and the twin 900mm sanitary forcemains at Steeles, previously commented on?	■ No Reponses Required ■ Clarification being sent to the Municipality of York.
Regional Municipality of York Review of 50% Design Drawings (Package 1,9,2,3,9a)	
■ Finch to Zenway (Package 9 Limits) – Region's "twin 900mm sanitary forcemains" immediately north of Steeles Avenue need to be more clearly labelled in plan and profile views of engineering drawings. Also, as they have been constructed to a relatively shallow depth within the proposed construction limits, their locations must be verified both horizontally and vertically through subsurface utility engineering (SUE) protocols. Also, the forcemains have not been shown in profile on the base drawings. It must be verified that the additional overburden being placed	■ LINK has worked with Wayne Bell (MTO) who gathered this information from York. As well, an extensive SUE investigation was completed at the start of the project. Forcemains will be made clearer on the plan and profile (based on currently available information). The importance of these forcemains to the network is understood. Protection measures will be implemented where required.

Highway 427 Expansion Project Agency Comments received as a result of consultation requests and resulting meetings between the Organizations and LINK427 Staff	Highway 427 Expansion Project LINK427 Responses between May 15th to March 29th 2018
above the forcemains will not have a detrimental effect on the operation or longevity of the twin forcemains.	
■ What was the design speed used for Langstaff Road?	■ The design speed used is 80km/h per the PA requirements which had already been agreed and approved to by YR with MTO prior to detailed design.
■ Sheet 050 and 056 – What is purpose of the 2m centre median on Langstaff? There isn't one currently and there's no description on how it will be terminated to the east or west.	■ Median is as per the PA requirements. It tapers to 0 width at our limits which had already been agreed and approved to by YR with MTO prior to detailed design.
■ Sheet 056 – a 2.0m shoulder will need to be maintained to ensure continuity of the bike lanes on the north and south side of Langstaff Road.	■ Bike lanes are 1.5m width as per the PA requirements which had already been agreed and approved to by YR with MTO prior to detailed design.
■ Consider making the aluminum railings for the bridges Standard Bronze anodized aluminum. Spec. AA M12 C22 A44.	■ This is not part of our current agreement.
■ Given that 4 lanes will be maintained during construction along Zenway Boulevard, YRT/Viva plans to continue operating along the roadway during construction. In this event, we will require that all stops be accessible during and post construction of the underpass. Existing bus stops are located at New Huntington Road, New Enterprise Way, Rainbow Creek Drive, and Vaughan Valley Boulevard.	■ Staging plans will be provided to the Region, and best effort will be made to maintain transit operation when feasible and safe.
■ On Page 121 under Highway 7 Staging Stage4/Winter Shutdown, dual eastbound left turns are proposed at the Highway 7/Vaughan Valley Blvd intersection. York Region does not support adding a second left turn lane at this location. It should be noted that in August, TSO had expressed the Region's concerns and position to WSP as to the proposed	■ Dual eastbound left turns provided as per the PA which had already been agreed and approved to by YR with MTO prior to detailed design. Truck turning templates have been run.

Highway 427 Expansion Project Agency Comments received as a result of consultation requests and resulting meetings between the Organizations and LINK427 Staff	Highway 427 Expansion Project LINK427 Responses between May 15th to March 29th 2018
modifications to the subject intersection. However, there is no response being provided by WSP thus far.	
■ York Region provided information, mapping, and a list of applications that Development Engineering is aware of within the vicinity of the planned Hwy 427 extension.	■ Information was relayed to MTO.
■ The proposed infrastructure associated with the Hwy 427 extension including the highway, ramps, piers, embankments etc. will be constructed above the Regional 1800mm York-Peel feeder main at Rutherford Road. It cannot be emphasized enough as to how critical this transmission main is in meeting the Region's water demand. As such the drawings need to clearly indicate and label the location of the transmission main both horizontally and vertically (including structures) and identify proposed changes to the current situation including clearances from all new infrastructure. A report needs to be produced that determines the impacts if any of additional/reduced overburden on the transmission main, highway live loading and the effect on the transmission main's longevity if any. We will also require a detail drawing(s) including a plan and profile of Rutherford Road that includes details specific to the transmission main and clearly identifies clearances, proposed infrastructure within its zone of influence and how it will be protected to maintain its structural integrity where required.	■ LINK has worked with MTO utilities who gathered this information from York Region. The importance of the 1800mm watermain to the network is understood. The watermain has been added to the Rutherford Rd plan and profile (based on currently available information). Protection measures will be implemented where required. Highway 427 goes over Rutherford Rd, as such the watermain will not be subject to highway traffic loading.
■ The proposed infrastructure associated with the Hwy 427 extension including the highway, ramps, piers, embankments etc. will be constructed above the Regional 750mm watermain on Huntington Road. The drawings need to clearly indicate and label the location of the transmission main both horizontally and	■ LINK has worked with MTO utilities who gathered this information from York Region. Watermain will be added to the Huntington Rd plan (based on currently available information). As LINK is not reconstructing Huntington Rd (only closing), there is no profile

Highway 427 Expansion Project Agency Comments received as a result of consultation requests and resulting meetings between the Organizations and LINK427 Staff	Highway 427 Expansion Project LINK427 Responses between May 15th to March 29th 2018
vertically (including structures) and identify proposed changes to the current situation including clearances from all new infrastructure. A report needs to be produced that determines the impacts if any of additional/reduced overburden on the watermain, highway live loading and the effect on the watermain's longevity if any. We will also require a detail drawing(s) including a plan and profile of Huntington Road that includes details specific to the watermain and clearly identifies clearances, proposed infrastructure within its zone of influence and how it will be protected to maintain its structural integrity where required.	generated for it. Protection measures will be implemented where required.
Consider making the aluminum railings for the bridges Standard Bronze anodized aluminum. Spec. AA M12 C22 A44	■ We have reviewed this request but are able to use MTO bridge standards only.
■ The Hwy 427 extension will create a more challenging condition for pedestrians and cyclists who are currently travelling east-west between Brampton and Woodbridge, as they will need to cross the future highway. Continuous walking and cycling facilities across the interchanges should be provided according to the best design practices including guidance from MTO's Bikeway Design Manual and York Region's Planning & Design Guidelines for Pedestrian and Cycling Facilities (2017), at the Province's cost. These details including pavement markings and signage are not yet included in the design package for the highway crossings: ■ a. Major Mackenzie Drive ■ b. Rutherford Road	■ The condition is noted and understood. Cycling and pedestrian facilities have been included as per the Project Agreement requirements at Major Mackenzie, Langstaff, with future provisions provided at Rutherford. These facilities were the result of lengthy consultation held between MTO, Vaughan, and York Region throughout both the EA and PDR stages.

Highway 427 Expansion Project Agency Comments received as a result of consultation requests and resulting meetings between the Organizations and LINK427 Staff	Highway 427 Expansion Project LINK427 Responses between May 15th to March 29th 2018
■ c. Langstaff Road ■ d. Zenway Blvd ■ e. Highway 7	
■ As part of environmental compensation, was the opportunity considered to include an off- road trail as part of project? It could connect to the West Humber Trail north of Hwy 427 and Finch in the City of Toronto to the Nashville Conservation Reserve in the City of Vaughan? There is strong support from the local community for this. An example of MTO's leadership in this area is the Hon. Herb Gray Parkway project, which included a parkway trail running approximately 20 kilometres set within 120 hectares (300 acres) of green space situated alongside the two highway extensions and across the 11 tunnel tops. It would serve to build even more community support for the project as well as promote healthier lifestyles and the safety of vulnerable road users.	■ No, this is not part of our agreement as per lengthy consultation held between MTO, Vaughan, and York Region throughout both the EA and PDR stages.
■ All new catch basins and catch basin manholes on Regional Roads to have OPS 400.110 frames and covers	■ This will be evaluated and if permitted under the PA, shown on the 90%.
■ Storm sewer from MH 83 on Major Mackenzie Drive Eastbound to be connected to the U093 Box Culvert in order not to conflict with future maintenance of the Box Culvert	■ This will be evaluated and if permitted under the PA, shown on the 90%.
■ Who will be responsible for maintenance of the Multi Use Paths?	■ LINK427 is responsible for maintenance within the Project Lands, on roads only.

Highway 427 Expansion Project Agency Comments received as a result of consultation requests and resulting meetings between the Organizations and LINK427 Staff	Highway 427 Expansion Project LINK427 Responses between May 15th to March 29th 2018
■ On Page 109 (H427-D-F-9A-HWY-000-combined-A.pdf) under Detector Layout, setback loop detectors should be provided to operate left turns on Highway 7 as protected /permissive phases at the Highway7/Vaughan Valley Blvd intersection.	■ Detector Loops have been setback in accordance with York Region Standard Drawing E3.27 for all left turn lanes. Please refer to the revised 90% Drawings.
■ Appendix B- Issue and Suggestions –Package 9A on Page 129 (H427-D-F-9A-HWY-000- combined-A.pdf), York Region has similar concerns about the dual eastbound left turns being proposed at the Highway 7/Vaughan Valley Blvd intersection for interim condition. It should be noted that the Regional staff has expressed the position to WSP back in August that a second eastbound left turn lane is not supported at this location.	■ Dual eastbound left turns provided as per the PA. Truck turning templates have been run. Detailed traffic analysis has been carried out - which is a projecy requirement for detour staging. The traffic analysis will be available with the 90% submission.
■ Typical cross-section of MMD will be as follows: [Curb | Thru | Thru | Centre | Thru | Thru | Curb] [3.5m | 3.3m | 3.3m | 2.0m | 3.3m | 3.3m | 3.5m] This section should be consistent over Highway 427.	■ Lane and median widths provided as per the PA Requirements within the Lands (4 x 3.5, 2 x 3.75) and tapered to existing conditions at the limits of our work. This condition was already agreed to by York Region in consultation with the MTO.
■ West Project Limits (Page032) termination of WB lanes at Gusgo Access Road should be a smoother transition - If 427 is to be built first, the WB lane drop needs to be smoother. Design is showing 3 lanes converging into 1, this will cause significant congestion for WB traffic.	■ Transition provided as per the PA requirements. Pavement markings (included in Package 8) will delineate the transition from 3-lanes to 1-lane. This condition was already agreed to by York Region in consultation with the MTO.
■ Storm sewer (page 032) needs to be installed at a consistent offset to minimize throwaway costs.	■ Limits of ROW do not allow this.
■ Stationing for Gusgo Access Road should be renumbered to avoid confusion with MMD STA (there will be two 10+000 references).	■ Standard MTO stationing used.

Highway 427 Expansion Project Agency Comments received as a result of consultation requests and resulting meetings between the Organizations and LINK427 Staff	Highway 427 Expansion Project LINK427 Responses between May 15th to March 29th 2018
■ East project limits (Page 0035) should show widening to 6-lane cross section (See point 11) and match at Station 10+800.	■ Transition details were provided by MTO as part of background data and have been adopted for the design. This condition was already agreed to by York Region in consultation with the MTO.
Regional Municipality of York Review of 90% Design Drawings (Package 1,9,2,3,9a)	
■ The proposed infrastructure associated with the Hwy 427 extension including the highway, ramps, piers, embankments etc. will be constructed above the Regional 1800mm York-Peel feeder main at Rutherford Road. It cannot be emphasized enough as to how critical this transmission main is in meeting the Region's water demand. As such the drawings need to clearly indicate and label the location of the transmission main both horizontally and vertically (including structures) and identify proposed changes to the current situation including clearances from all new infrastructure. A report needs to be produced that determines the impacts if any of additional/reduced overburden on the transmission main, highway live loading and the effect on the transmission main's longevity if any. We will also require a detail drawing(s) including a plan and profile of Rutherford Road that includes details specific to the transmission main and clearly identifies clearances, proposed infrastructure within its zone of influence and how it will be protected to maintain its structural integrity where required.	■ At this location Highway 427 will pass over Rutherford Road on a new bridge. The alignment and profile of Rutherford Road will remain, generally, as it is. Due to the allowance for the proposed widening in the future, the bridge abutments are located some 10m from the watermain, its location will however be shown on roadway profile.
■ For the Hwy427 NB off ramp, it is suggested to realign McGillivray Rd out of the ramp area. For better provision of the future signal at Rutherford and the new McGillivray, the realignment should be 250+m further east, plus the enough SB sight distance from the new intersection.	■ The realignment of this ramp is not possible due to property constraints.

Highway 427 Expansion Project Agency Comments received as a result of consultation requests and resulting meetings between the Organizations and LINK427 Staff	Highway 427 Expansion Project LINK427 Responses between May 15th to March 29th 2018
■ For the SB off ramp, the Power Stream service access is very close to the off ramp, Power Stream/ Alectra need to be advised that they might have to be right in and right out.	■ Alectra have been consulted.
■ Coordination regarding truck routes and staging will be required.	■ Noted. The LINK427 communication and construction teams will coordinate with Vaughan and York Region.
■ Our preference for the Median islands (including Rutherford Rd) is slab on grade concrete versus curb and gutter and asphalt infill as shown on the drawings. Slab on grade median islands should be constructed to York Regional standards and include proper cut-outs for 4x4 signage posts.	■ As this falls within the CAH the design is constrained by MTO standards.
■ CB's (including Rutherford Rd) – We would prefer the side inlet CB's to be installed (OPSD 400.082) for any new CB installations; otherwise, we have been using the OPSD 400.11 version.	■ Rutherford is rural section - no CBs except for a small portion matching existing
■ 2.5m paved shoulder is being proposed along Rutherford Road. Paved shoulders are recommended for the rural cross-section however the transition to the buffered on-street bike lanes shall be made for the urban cross-section (curb and gutter). As per York Region's Planning & Design Guidelines for Pedestrian and Cycling Facilities (2017) it is recommended to provide 1.5m paved shoulder +1.0m buffer in the form of hatched painted area to provide additional protection for the cyclists.	■ This is not part of our agreement with MTO. We would recommend implementation by the Region when the rest of Rutherford is converted.
■ It is recommended to provide a jug handle crossing at the ramps (except S-E/W ramp) as per OTM Book 18 and York Region's Planning & Design Guidelines for Pedestrian and Cycling Facilities (2017).	■ This is not part of our agreement with MTO.

Highway 427 Expansion Project Agency Comments received as a result of consultation requests and resulting meetings between the Organizations and LINK427 Staff	Highway 427 Expansion Project LINK427 Responses between May 15th to March 29th 2018
■ At the S-E/W ramp crossing Rutherford Road additional pavement markings for the cyclists such as sharrows are recommended as per York Region's Planning & Design Guidelines for Pedestrian and Cycling Facilities (2017).	■ This is not part of our agreement with MTO.
■ There is a Regional 750mm HDPE watermain on Huntington Rd. through the limits of "Package 3 rev A2". The watermain is either not shown or properly labelled on the "New Construction" and "Profile" drawings. The existing watermain is approximately 3m deep through this section and actual vertical/horizontal locations need to be verified through Subsurface Utility Engineering methods.	■ LINK427 are in possession of the original contract drawings for this WM, and it will be shown on the drawings. ■ The as constructed drawings indicate that the watermain is within a steel liner and that this arrangement was due to the future Highway 427.
■ Additional details need to be submitted to York Region for comment to confirm if there will be additional/reduced cover over the watermain as a result of the proposed design and an assessment detailing how potential impact will be mitigated.	■ The as constructed drawings indicate that the watermain is within a steel liner and that this arrangement was due to the future Highway 427. ■ The cover to the main will not be reduced.
■ Additional details need to be submitted to York Region for comment to confirm if the ability to access the watermain for maintenance purposes will be reduced or inhibited in some way.	■ LINK427 asked for clarification on this comment.
■ Additional details need to be submitted to YR for comment to confirm if there are any proposed structures or embankments within the zone of influence of the watermain that could impact its structural integrity and if so how structural integrity will be protected.	■ The as constructed drawings indicate that the watermain is within a steel liner and that this arrangement was due to the future Highway 427.
■ Typical cross-section of MMD will be as follows: [Curb | Thru | Thru | Centre | Thru | Thru | Curb]	■ The proposed design includes two cross sections along MMD. The cross section within the MTO CAH is compliant with MTO standards,

Highway 427 Expansion Project Agency Comments received as a result of consultation requests and resulting meetings between the Organizations and LINK427 Staff	Highway 427 Expansion Project LINK427 Responses between May 15th to March 29th 2018
[3.5m | 3.3m | 3.3m | 2.0m | 3.3m | 3.3m | 3.5m] This section should be consistent over Highway 427.	beyond this section the cross section transitions to match the Regions requirements.
■ West Project Limits (Page032) termination of WB lanes at Gusgo Access Road should be a smoother transition. If 427 is to be built first, the WB lane drop needs to be smoother. Design is showing 3 lanes converging into 1, this will cause significant congestion for WB traffic.	■ The proposals for the temporary interface between the existing MMD cross section and that to be constructed by LINK427 is shown in package 5. This will be a safe transition.
■ Storm sewer (page 032) needs to be installed at a consistent offset to minimize throwaway costs.	■ Will be done where feasible.
■ Stationing for Gusgo Access Road should be renumbered to avoid confusion with MMD STA (there will be two 10+000 references).	■ The reviewer's comments are noted and the existing approach will be brought to the constructor's attention.
■ East project limits (Page 0035) should show widening to 6-lane cross section (See point 11 @50% Design) and match at Station 10+800 - Vaughan can provide the latest design drawings for this area. Depending on which project is built first, either Link427 will need an "interim" design or our MMD Project will need an interim design.	■ A temporary transition may be necessary should the Regions widening contract to the east follow the work by MMD. If this is the case a safe transition will be designed and implemented.
■ A traffic signal for the proposed Hwy 427 off ramp S-EW is necessary, and there will be visibility issues, especially for EB traffic due to the overpass and road bending.	■ The ramp in question does not permit traffic to turn westbound (there is a S-W ramp for this maneuver). The intersection is signalized and the sight distance to its approach meet the standards appropriate for the Design Speed.
■ Our preference for the Median islands (including Major MacKenzie) is slab on grade concrete versus curb and gutter and asphalt infill as shown on the drawings. Slab on grade median	■ The design within the CAH is constrained by the MTO standards.

Highway 427 Expansion Project Agency Comments received as a result of consultation requests and resulting meetings between the Organizations and LINK427 Staff	Highway 427 Expansion Project LINK427 Responses between May 15th to March 29th 2018
islands should be constructed to York Regional standards and include proper cut-outs for 4x4 signage posts.	
■ Catch basins (including Major MacKenzie) – the design indicates OPSD 400.020 Frame and grates which we do not currently implement. We have been using the OPSD 400.11 version; however, we would prefer the side inlet catch basins to be installed (OPSD 400.082) for maintenance purposes.	■ The catch basins suggested by the municipality are not specified in the project agreement with the province.
■ The Regional Municipality of York strongly supports City of Vaughn's comments pertaining proposed trail connections identified in the Vaughan's Trail Master Plan.	■ A review by the City of Vaughan has been undertaken and comments provided discussed with them. Provision for crossings with in the project limits have been described, with the exception of the Robinson Creek and Rainbow Creek Valleys which are the subject of a future DCR.
■ The Hwy 427 extension will create a more challenging condition for pedestrians and cyclists who are currently travelling east-west between Brampton and Woodbridge, as they will need to cross the future highway. Continuous walking and cycling facilities across the interchanges should be provided according to the best design practices including guidance from MTO's Bikeway Design Manual and York Region's Planning & Design Guidelines for Pedestrian and Cycling Facilities (2017), at the Province's cost. These details including pavement markings and signage are not yet included in the design package for the highway crossings: ■ a. Major Mackenzie Drive ■ b. Rutherford Road ■ c. Langstaff Road	■ With regard to Active Transportation, it is noted that these are either scheduled for construction by LINK427 or provision for future implementation has been made. The exception is Highway 7 where the limits of the works are the rehabilitation of the existing structure and consequently AT provisions across the structure are not feasible without the reduction in the existing provisions. The alternative, to widen the structure is not been considered at this time.

Highway 427 Expansion Project Agency Comments received as a result of consultation requests and resulting meetings between the Organizations and LINK427 Staff	Highway 427 Expansion Project LINK427 Responses between May 15th to March 29th 2018
▪ d. Zenway Blvd ▪ e. Highway 7	
▪ York Region strongly supports City of Vaughan comments and recommends to comply with the City of Vaughan Trail Master Plan.	▪ Noted as per previous comments regarding trail crossings outside of the Rainbow Creek and Robinson Creek Valleys.
▪ All proposed culverts on Major Mackenzie Drive shall have sufficient width to accommodate 3.0m cycling facility on the south side of the roadway as well as 1.5m sidewalk on the north side.	▪ These provisions are being provided along MMD.
▪ For the proposed 3.0m MUP on the south side of Major Mackenzie Drive crossing on and off ramps a separated or combined cross-rides are required as per OTM Book 18 and York Region's Planning & Design Guidelines for Pedestrian and Cycling Facilities (2017).	▪ The crossing of the S-E ramp is signalized. The crossing of the W-S ramp is set back from the bull nose to shorten the crossing and improve visibility.
▪ TRAFFIC ANALYSIS MEMO-044: Traffic analysis and some data is referred to the March 31, 2016 AECOM memo which was not available for the Region to review. Please provide the memo for the Region's review so that data such as percentage of heavy truck and TMC can be verified and validated.	▪ The memo has been provided.
▪ TRAFFIC ANALYSIS MEMO-044: The submitted traffic analyses are ONLY based on the auto vehicular volumes and information. A Multi-Modal Level of Service approach shall be taken to also determine LOS for pedestrians, bicycles and transit users using Major Mackenzie Drive. A more detailed analysis are required to determine the impact of the proposed ramps on safety of these vulnerable road users.	▪ Pedestrians and cyclists are provided with segregated facilities.

Highway 427 Expansion Project Agency Comments received as a result of consultation requests and resulting meetings between the Organizations and LINK427 Staff	Highway 427 Expansion Project LINK427 Responses between May 15th to March 29th 2018
Regional Municipality of Peel	
■ LINK427 requested permitting requirements for signage outside of the limits of construction. ■ Peel staff member inquired regarding the timing for construction of the existing Hwy 427 extension project from its current northern terminus at Zenway, northerly to Major Mackenzie Drive. Can you please advise: ■ a) when construction of this Hwy 427 extension is scheduled to start and ■ b) when the Hwy 427 is scheduled to be opened northerly to Major Mackenzie.	■ Peel Region provided contact information for signage permits. ■ Thank you for your interest in the Highway 427 Expansion Project. Construction is expected to start later this year. Please follow the Project website for updates, including display material from our upcoming Public Information Centre. Opening dates will be communicated on the website and through notices when they are available.
City of Toronto	
■ LINK427 requested permitting requirements for signage outside of the limits of construction. ■ City of Toronto noted that only a small part of the project is actually within the City of Toronto; namely, from the Finch Avenue interchange, inclusively, to Steeles Avenue, and the design drawings supplied were only at the fifty per cent stage. Also, we were asked to only look at the ones which you highlighted. ■ ECS-BSE have no objection to the proposed vertical clearance of 4.91m at the curb on WB Albion underneath the existing Hwy 407 Ramp over Albion as noted.	■ City of Toronto provided contact information for signage permits. ■ LINK427 where responsible incorporated these comments into the 90% Design Package.

Highway 427 Expansion Project Agency Comments received as a result of consultation requests and resulting meetings between the Organizations and LINK427 Staff	Highway 427 Expansion Project LINK427 Responses between May 15th to March 29th 2018
Thanks for the opportunity to participate in this review. ■ "ELE": ■ (street lighting) Toronto Hydro now maintains this facility on our behalf. Only this week was this assigned this to an individual for review. ■ (traffic signals) The only ones impacted are at the interchange, and apparently are under the purview of Peel Region or the City of Brampton. ■ "HWY": ■ Finch Ave - General comment Tactile Walk Surface Indicators (TWSI) shall be installed at all depressed curb crossings Ensure large MTO directional signs aren't placed in the sidewalk. Placement behind the sidewalk is required. ■ Finch Ave – no sidewalks on north side overpass Existing sub-standard asphalt sidewalk on north side (N-E\W Ramp) begins in Mississauga, approx. 30m from east curbline of Longo Circle and continues for approx. 322m to Finch Av interchange. City of Toronto portion is limited to only 10 m ±. Upgrade sub-standard asphalt path in the City of Toronto portion to concrete sidewalk spec., 2.1m wide Coordinate with City of Mississauga for concrete sidewalk continuity	

Highway 427 Expansion Project Agency Comments received as a result of consultation requests and resulting meetings between the Organizations and LINK427 Staff	Highway 427 Expansion Project LINK427 Responses between May 15th to March 29th 2018
Proposed asphalt sidewalk between southbound 427 off-ramp and overpass structure Construct to concrete sidewalk spec., 2.1m wide Proposed asphalt sidewalk between overpass structure and WB Finch to NB 427 on-ramp Construct to concrete sidewalk spec., 2.1m wide Request: A 2.1 m Concrete sidewalk should be constructed on the northeast side of the Finch Av E-N Ramp, connecting to the exiting sidewalk at the bridge east of the E-N Ramp (100 m ±). This area is within the MTO Control Access Highway Limits (CAH Limits). ■ Finch Ave – Pedestrian Crossings The two Finch Avenue north-south pedestrian crosswalks at the signalized ramp locations (N-E\W Ramp and S-E\W Ramp) are not AODA compliant. The bullnoses for the centre medians on Finch Ave should be pulled back to straighten the alignment of the crosswalks. This would result in reconstructing the traffic signals. In the current design drawings there are no traffic signals modifications on Finch Avenue. ■ Albion Rd – existing sidewalk both sides of underpass No action required ■ Steeles Ave W – existing sidewalk on south side (City of Toronto) of underpass. No sidewalk on north side (City of Vaughan) No action required	

Highway 427 Expansion Project Agency Comments received as a result of consultation requests and resulting meetings between the Organizations and LINK427 Staff	Highway 427 Expansion Project LINK427 Responses between May 15th to March 29th 2018
Out of scope area general comment: ■ Pedestrian Projects has a sidewalk project on Rexdale Blvd, scheduled for 2018." ■ Also, planning has asked that opportunities for more pedestrian friendly amenities be placed such as those that have been proposed for other Ministry initiatives at Highway 401/Dufferin Street and Highway 404/Sheppard Avenue. ■ "ITS": Camera: An additional camera @ Steeles should be added. There are 5 network cameras proposed and designed (1st @ Finch, 2nd @ between Finch and Albion, 3rd @ Albion, 4th @ north of HWY407, 5th @ HWY7) Detector: The design shows still loops will be used as detectors. Why don't they use O/H detections? Communication: The design shows fibre optic will be used for cameras, future HMSs and tolling stations. This is a good option, no concerns." ■ "STR": The two bridges crossing the railway and river do not involve City infrastructure and were deleted out of the discussion. While appreciating that the Ministry will conduct its own detailed review, the City is looking at this from the perspective of any potential deleterious effect upon its own infrastructure. In reality, more advanced drawings are required for a more thorough response.	

Highway 427 Expansion Project Agency Comments received as a result of consultation requests and resulting meetings between the Organizations and LINK427 Staff	Highway 427 Expansion Project LINK427 Responses between May 15th to March 29th 2018
In any case, there are no new structures, other than the widening of existing ones for the spans at Albion Road. More specific comments, in a table, are attached. "Cycling": "We have a MUT (West Humber Trail) in this area under the Finch Interchange that doesn't seem to be mentioned in most of the staging or show up in most drawings. It was built in 2015-2016, so depending on when the survey was done, may be new (but was built with MTO) **Comments on individual Drawings** ■ HWY DWG0131 shows removals and clearing/grubbing that include a portion of the trail. ■ HWY DWG0150 shows new construction in the same area, but I can't see how the trail will be reinstated. ■ HWY DWG0168 shows profile in the area, with the Humber River shown, but does not show the trail. ■ LAN DWG2001 does not seem to reflect the actual contours in the area or include the trail. (it appears to show the contours before the trail was built) (Link Included) ■ STR DWG600 show the trail in plan and elevation"	■ LINK427 confirms that no construction on the Humber River Underpass will have any effect on the West Humber Trail.
City of Vaughan	
■ City of Vaughan asked about LINK427 coordination with Cole Engineering for Block 59 works.	■ LINK427 coordinated with COLE Engineer.

Highway 427 Expansion Project Agency Comments received as a result of consultation requests and resulting meetings between the Organizations and LINK427 Staff	Highway 427 Expansion Project LINK427 Responses between May 15th to March 29th 2018
■ City of Vaughan and York Region inquired about communications with the public.	■ LINK427 verified the website to be used will be www.427expansion.ca.
■ City of Vaughan questioned the lack of hydrants along the 427 ROW.	
■ City of Vaughan questioned the implementation of planned Multi Use Trails.	■ MTO and LINK427 confirmed multi use trails were not a part of the Project's original EA, but the design does not preclude their implementation once EA approval is granted. Vaughan's proposed trails do not include the sections of the project which are the subject of DCR #2.
■ LINK427 provided copies of the TCP's developed for the construction signage required for site access locations and inquiring about blanket permit for construction signage.	■ LINK427 responded that neither levels are below the wildlife crossings. ■ No Reponses Provided to Date
■ LINK427 inquired of the status for a permit for construction signage within their jurisdiction.	■ City of Vaughan requested a meeting for further details and specifics.
■ LINK427 requested a permit for lane closures on Zenway Blvd for the construction of the site access driveways	■ City of Vaughan to issue the ROP.
Gina Ciampa from the office of Councillor Marilyn Iafrete	
■ Called to speak to the LINK427 Environmental Director. Impact will affect residents in Kleinburg N of Major Mackenzie. How will residents of Maple/Kleinburg be informed? Mobile signs? They will put in e-newsletter. Other suggestion: have the PIC closer to Nashville/Huntington so residents could come out.	■ Environmental Director responded by email stating that the Notice of PIC went out by mail, e-blast, and on Project website. Attached presentation from Municipal meeting on Jan. 15. Stated that at PIC there will be boards outlining the Project impacts.

Highway 427 Expansion Project Agency Comments received as a result of consultation requests and resulting meetings between the Organizations and LINK427 Staff	Highway 427 Expansion Project LINK427 Responses between May 15th to March 29th 2018
Hon. Deborah Schulte, MP for Vaughan-King	
■ MP Schulte called to say she was planning to attend the PIC Preview on Thursday.	■ LINK team members will greet MP Schulte at the PIC and direct her to appropriate representatives.
City of Vaughan Review of 50% Design Drawings (Package 1,9,2,3,9a)	
■ The proposed infrastructure associated with the Hwy 427 extension including the highway, ramps, piers, embankments etc. will be constructed above the Regional 1800mm York-Peel feeder main at Rutherford Road. It cannot be emphasized enough as to how critical this transmission main is in meeting the Region's water demand. As such the drawings need to clearly indicate and label the location of the transmission main both horizontally and vertically (including structures) and identify proposed changes to the current situation including clearances from all new infrastructure. A report needs to be produced that determines the impacts if any of additional/reduced overburden on the transmission main, highway live loading and the effect on the transmission main's longevity if any. We will also require a detail drawing(s) including a plan and profile of Rutherford Road that includes details specific to the transmission main and clearly identifies clearances, proposed infrastructure within its zone of influence and how it will be protected to maintain its structural integrity where required.	■ LINK427 has worked with MTO utilities office who has gathered this information from York Region. The importance of the 1800mm watermain to the network is understood. The watermain has been added to the Rutherford Rd plan and profile (based on currently available information). Protection measures will be implemented where required. Highway 427 goes over Rutherford Rd, as such the watermain will not be subject to highway traffic loading.
■ The proposed infrastructure associated with the Hwy 427 extension including the highway, ramps, piers, embankments etc. will be constructed above the Regional 750mm watermain on Huntington Road. The drawings need to clearly indicate and label the location of the transmission main both horizontally and	■ LINK427 has worked with the MTO utilities office who has gathered this information from York Region. Watermain will be added to the Huntington Rd plan (based on currently available information). As LINK is not reconstructing Huntington Rd (only closing), there is no

Highway 427 Expansion Project Agency Comments received as a result of consultation requests and resulting meetings between the Organizations and LINK427 Staff	Highway 427 Expansion Project LINK427 Responses between May 15th to March 29th 2018
vertically (including structures) and identify proposed changes to the current situation including clearances from all new infrastructure. A report needs to be produced that determines the impacts if any of additional/reduced overburden on the watermain, highway live loading and the effect on the watermain's longevity if any. We will also require a detail drawing(s) including a plan and profile of Huntington Road that includes details specific to the watermain and clearly identifies clearances, proposed infrastructure within its zone of influence and how it will be protected to maintain its structural integrity where required.	profile generated for it. Protection measures will be implemented where required.
■ Storm sewer from MH 83 on Major Mackenzie Drive Eastbound to be connected to the U093 Box Culvert in order not to conflict with future maintenance of the Box Culvert.	■ This will be evaluated and if permitted under the PA, shown on the 90%.
■ Typical cross-section of MMD will be as follows: [Curb | Thru | Thru | Centre | Thru | Thru | Curb] [3.5m | 3.3m | 3.3m | 2.0m | 3.3m | 3.3m | 3.5m] This section should be consistent over Highway 427.	■ Lane and median widths provided as per the PA Requirements within the Lands (4 x 3.5, 2 x 3.75) and tapered to existing conditions at the limits of our work. This condition was already agreed to by York Region in consultation with the MTO.
■ West Project Limits (Page032) termination of WB lanes at Gusgo Access Road should be a smoother transition. If 427 is to be built first, the WB lane drop needs to be smoother. Design is showing 3 lanes converging into 1, this will cause significant congestion for WB traffic.	■ Transition provided as per the PA requirements. Pavement markings (included in Package 8) will delineate the transition from 3-lanes to 1-lane. This condition was already agreed to by York Region in consultation with the MTO.
■ Storm sewer (page 032) needs to be installed at a consistent offset to minimize throwaway costs.	■ Limits of ROW do not allow this.

Highway 427 Expansion Project Agency Comments received as a result of consultation requests and resulting meetings between the Organizations and LINK427 Staff	Highway 427 Expansion Project LINK427 Responses between May 15th to March 29th 2018
■ Stationing for Gusgo Access Road should be renumbered to avoid confusion with MMD STA (there will be two 10+000 references).	■ Standard MTO stationing used.
■ East project limits (Page 0035) should show widening to 6-lane cross section (See point 11) and match at Station 10+800	■ Transition details were provided by MTO as part of background data and have been adopted for the design. This condition was already agreed to by York Region in consultation with the MTO.
■ City of Vaughan had several inquiries on how the project is to be administrated.	■ LINK427 will coordinate with Vaughan Utilities on an on-going bases. ■ For communications the principle contact for LINK427 will be Sean McMillan, Technical Manager. York and Vaughan to provide the points of contact for disciplines. ■ LINK427 provided a schedule with specific information about Major Mackenzie Dr. Vaughan/York and indicated that construction for the adjacent projects could start by July of 2017 and possibly extend into 2021 or further. ■ There was a discussion about utility coordination and the adjacent contracts. ■ LINK427 confirmed that they would work on the transition at the west end of Major Mackenzie Drive. ■ LINK427 will provide traffic information as available. ■ LINK427 explained there will be no PIC for the first DCR for clearing and grubbing but there is a municipal meeting scheduled for Sept 18th. In addition a meeting with all five municipalities was scheduled for Oct 11th, York, Vaughan, Peel, Brampton, and Toronto to discuss communications.

Highway 427 Expansion Project Agency Comments received as a result of consultation requests and resulting meetings between the Organizations and LINK427 Staff	Highway 427 Expansion Project LINK427 Responses between May 15th to March 29th 2018
Water Comments: Project H427-D Stage F Design Package 4 Dwg 0200 and 0201 Revision A	
■ Minimum coverage under the stream bed is noted as 18m, however it should be a minimum of 2.1m	■ Minimum coverage will be increased to more than 2.1m.
■ It appears that a portion of the watermain under the stream and proposed concrete culvert is encased in concrete. Please ensure that the concrete encasement is labeled on the drawing and it should span the entire length of the concrete culvert and slightly beyond.	■ Regarding incasing culvert in concrete LINK427 is evaluating the feasibility of this request.
■ Please note location, depth and connection to the storm sewer for the drain valve chamber	■ Will add depth and connection to drawings.
■ Need to incorporate air relief valve and chamber	■ Will evaluate air relief valve and chamber.
■ The length of the liner should extend beyond the edge of pavement to allow for access and to ensure no impact or service disruption to the travelling portion of the 427	■ LINK427 will evaluate feasibility of extending liner beyond edge of pavement.
■ Utility easement will be required and should be noted on the drawing along with the access to municipal infrastructure	■ Utilities will be provided.
■ Please provide the design analysis associated with the depth of the watermain, such as bearing capacity (as per OPSS)	■ Depth design analysis will be provided when undertaken.
■ Removing 3 hydrants, please note where the next closes hydrant is to the N-E/W Ramp	■ Will provide hydrant information.
City of Vaughan Review of 90% Design Drawings (Package 1,9,2,3,9a)	
■ City of Vaughan 2018 inquiries	■ There are existing watermains and sanitary throughout the project limits, including a 600 mm WM on Zenway, a 750-900 mm on Huntington (X-ing MMD), a 600 mm watermain on Langstaff and a 750 mm sanitary on Zenway.

Highway 427 Expansion Project Agency Comments received as a result of consultation requests and resulting meetings between the Organizations and LINK427 Staff	Highway 427 Expansion Project LINK427 Responses between May 15th to March 29th 2018
	■ LINK427 provided the drawings for Zenway and MMD at both the 50% and 90% levels. ■ LINK427 undertook an extensive daylighting program early in 2017, to determine if the Sanitary ends had been exposed on Zenway to confirm and provide the elevations. ■ There was a discussion about the lack of a hydrant in the 427 ROW. LINK427 responded regarding the lack of hydrants in the 427 ROW, that there are no buildings to service as well as that the hydrants would be located at the highway level and unable to service the elevated portion of Zenway (+ 9 m). No action required. ■ LINK427 is reviewing Vaughan's request for a liner for the sanitary on Zenway. ■ Vaughan provided a document illustrating the crossings A,B,C,D,E and F at various locations throughout the project limits. Vaughan indicated crossings A,B, and D are essential. Crossings C is still being investigated (McGillvary) and E will be at MMD. LINK427 advised that this inquiry will be the subject of a future DCR. LINK427 and CA indicated the trails were not part of the original EA but the designs did not preclude the installation of the trails, in fact there are wildlife passages at each of the these crossings that could be used. Vaughan agreed that an EA for these trails has not yet been done. The CA indicated that all that can be done is that Vaughan be given a level of comfort about whether or not the crossings can be installed. ■ In response to Vaughan's inquiry about advance signage for the closures of Huntington and McGillvary, LINK427 responded that

Highway 427 Expansion Project Agency Comments received as a result of consultation requests and resulting meetings between the Organizations and LINK427 Staff	Highway 427 Expansion Project LINK427 Responses between May 15th to March 29th 2018
	their communications people are in contact with Vaughan discussing the signage and timelines. ■ LINK427 will confirm requirements with OMB regarding the closure signage. ■ Vaughan is researching if LED or HPS for street lighting is required and indicated that the "Roadstar" LED is the only approved LED Light Fixture for the City of Vaughan at this time. ■ LINK427 has provided the most recent construction and traffic staging plans for Zenway Boulevard, Langstaff, Rutherford, and Major Mackenzie Drive.
■ The Vaughan Pedestrian and Bicycle Master Plan trail network (refer to the 2012 master plan update) identifies community multiuse recreation pathway (trails) crossing the proposed Highway 427. Therefore, we request that structures be designed and constructed to allow for future trail crossing at locations noted below and identified in the relevant drawings below. ■ Crossings shall allow for trails composed of a 3 meter width surface and a minimum of 1.5 meter side clearance on both sides. Minimum clear height shall be 3 meters. Attached is a marked up general plan to show crossing locations.	■ Crossing points are at MMD, Rutherford, Street A, Langstaff, Highway 7. At MMD, there will be sidewalks on the north side and multi-use paths on the south side. At Rutherford, there will be provision for future boulevards on both sides, sidewalk on the north and multi-use path on the south. At Street A, there are provisions for sidewalks and multi-use paths on one side. At Langstaff, there will be bike lanes on both sides with jug handle crossings at the ramps, with future provisions for boulevards and sidewalks on both sides. At Highway 7, existing sidewalks will be repaired where required. ■ Our design does not preclude future crossing points in the future as the City may need to construct in the future, pending future agreement between MTO and the City.
■ Provide provisions to allow for an underpass crossing at Sta.11+550 north of Rainbow Creek.	■ Crossing points are at MMD, Rutherford, Street A, Langstaff, Highway 7. At MMD, there will be sidewalks on the north side and multi-use paths on the south side. At Rutherford, there will be

Highway 427 Expansion Project Agency Comments received as a result of consultation requests and resulting meetings between the Organizations and LINK427 Staff	Highway 427 Expansion Project LINK427 Responses between May 15th to March 29th 2018
	provision for future boulevards on both sides, sidewalk on the north and multi-use path on the south. At Street A, there are provisions for sidewalks and multi-use paths on one side. At Langstaff, there will be bike lanes on both sides with jug handle crossings at the ramps, with future provisions for boulevards and sidewalks on both sides. At Highway 7, existing sidewalks will be repaired where required. ■ Our design does not preclude future crossing points in the future as the City may need to construct in the future, pending future agreement between MTO and the City.
■ a- A multiuse recreational trail is proposed to connect to southern side of Langstaff Road at approximately Sta. 9+400. Ensure that works at Langstaff include a trail connection. ■ b- Allow for a for a trail connection beneath the proposed Langstaff ramps at Sta. 9+520. ■ Attached is a concept drawing illustrating the proposed trail for additional information. ■ A multiuse recreational trail is proposed within the hydro corridor at Sta. 10+400. Ensure that works at Langstaff include provisions for a trail connection. ■ A multiuse recreational trail is proposed within the hydro corridor. A trail crossing is desired across highway 427 in the area between Sta.12+600 and 13+300. ■ A multiuse recreational trail is proposed abutting the south side McGillvary Road. Ensure that the proposed overpass width at Sta. 16+050 allows for a trail crossing underneath.	■ Crossing points are at MMD, Rutherford, Street A, Langstaff, Highway 7. At MMD, there will be sidewalks on the north side and multi-use paths on the south side. At Rutherford, there will be provision for future boulevards on both sides, sidewalk on the north and multi-use path on the south. At Street A, there are provisions for sidewalks and multi-use paths on one side. At Langstaff, there will be bike lanes on both sides with jug handle crossings at the ramps, with future provisions for boulevards and sidewalks on both sides. At Highway 7, existing sidewalks will be repaired where required. ■ Our design does not preclude future crossing points in the future as the City may need to construct in the future, pending future agreement between MTO and the City.

Highway 427 Expansion Project Agency Comments received as a result of consultation requests and resulting meetings between the Organizations and LINK427 Staff	Highway 427 Expansion Project LINK427 Responses between May 15th to March 29th 2018
Consultation Meetings with York Region and City of Vaughan Engineering and Planning Departments	
Meeting January 15, 2018	
Purpose of the Meeting	
■ To present the construction activities included in Design and Construction Report (DCR) #2 and obtain any comments the municipalities have in regard to the construction activities, potential effects and recommended mitigation measures. ■ DCR #2 includes construction activities that extend over the entire project area from Finch Avenue to Major Mackenzie Drive. ■ Overall, activities in DCR #2 include, but may not be limited to: ■ Grubbing of the project area; ■ Construction Staging (including detours); ■ Rehabilitation and Widening; ■ Partial Vegetation Restoration; ■ Electrical (street lighting, traffic lights etc.); ■ Fencing (wildlife, security etc.); ■ Highway Drainage (storm sewers and culverts); ■ Removals of existing roads, existing drainage structures; ■ Pavement (asphalt); ■ Structures (overpass and underpass) ; ■ Traffic (lane closures, traffic staging); ■ Haul Route; ■ Foundations (bridge footings); ■ Grubbing, stripping of top soil, ditching, and final grading;	

<table>
<tr><th>Highway 427 Expansion Project
Agency Comments received as a result of consultation requests and resulting meetings between the Organizations and LINK427 Staff</th><th>Highway 427 Expansion Project
LINK427 Responses between May 15th to March 29th 2018</th></tr>
<tr><td colspan="2">

Utility Relocation; and
Seeding and Sodding.

Discussion on the upcoming PIC.
Follow-up on obtaining a one-time Noise By-law Exemption to facilitate overall construction of the project for the entire duration.

</td></tr>
<tr><td colspan="2">Questions Raised/Responses</td></tr>
<tr><td>Municipal Water and Sewer Pipes
York Region and Vaughan asked if all the municipal pipes are identified in the drawings? Will these show up on DCR 2 to make sure everything is captured?
Particular concern that York-Peel feeder main is not represented. 10-diameter York-Peel feeder main on Rutherford and the mains on Steeles were not shown on 50% drawings. 90% didn't show these either.
MTO asked for confirmation as to what level of plans will be shown at PIC. Plans at PIC will be 90%. After Jan. 25th there is still another opportunity to make revisions before going to construction.
Haul Route
York Region and Vaughan inquired if consideration was made to alternatives like Hwy 50 or 27 and 50 to share the haul route load? Hwy 27 has many residential communities. Hwy 50 more catered to commercial. Maybe Huntington Rd. is an alternative? Huntington Rd. doesn't have a half load seasonal restriction.</td><td>LINK427 is aware of this and other mains. LINK427 confirmed that comments from Municipalities will be incorporated. Including all comments received about the pipes which will be addressed.
LINK427 confirmed that responses to comments on the 50% and 90% drawings have been sent.
There will be a roll-plan as well as boards. Each intersection and staging will have a board. These will be 90% drawings. If items are still deemed to be missing at the PIC then comments will be incorporated following the PIC.
LINK427 looked at alternative haul routes, considering time of day and will be adjusted as time goes by.
LINK427 explained that construction schedule dictates when it will be closed. OPI (fiber-optic switch box) relocation at intersection of</td></tr>
</table>

Highway 427 Expansion Project Agency Comments received as a result of consultation requests and resulting meetings between the Organizations and LINK427 Staff	Highway 427 Expansion Project LINK427 Responses between May 15th to March 29th 2018
■ Regarding the traffic signal at Rutherford and Huntington; will it be installed this year or next year? A lot of residents taking Huntington Rd. south have issues with that intersection. Noise By-law Exemption ■ In response to LINK427s inquiry regarding noise by-law exemption application Vaughan staff advised, Vaughan council rises in June, and advised that the application may be processed by the by-law office. Huntington Road ■ City of Vaughan inquired as to the timing of the closure of Huntington Road	Huntington is affecting this. Plan to preload on both sides until it closes. CP is aware of this. ■ Subsequently LINK427 made application to the Municipality of Vaughan to process the noise by-law exemption. ■ Huntington Road at Major Mackenzie Road will change from its existing configuration as part of the construction of the Hwy 427 Expansion project. This reconfiguration will be completed in two phases as follows: ■ (1) North of Major Mackenzie Road – This portion of the roadway will be closed this Spring, approximately June of this year. This is required for the construction of the new Major Mackenzie Road to the north of its existing alignment. As the new Major Mackenzie alignment will be at a higher grade than existing Huntington, it will not be possible for traffic to traverse through the area safely. ■ (2) South of Major Mackenzie Road – This portion of the roadway will be closed in 2019. This will not happen until the new Major Mackenzie alignment is opened to traffic and the existing Major Mackenzie is closed for the construction of the Hwy 427 interchange. ■ LINK427 is undertaking a Traffic Management Plan. Closing Huntington Rd. Temporary signage will be installed until people are adjusted to the new traffic pattern. These supplementary signs

Highway 427 Expansion Project Agency Comments received as a result of consultation requests and resulting meetings between the Organizations and LINK427 Staff	Highway 427 Expansion Project LINK427 Responses between May 15th to March 29th 2018
	would typically include advanced warning signs, detour signs, and / or directional signage.
Developers	
TACC	
■ Coordination of TACC work north of Major Mackenzie. ■ TACC requests re-configuration of the Major Mackenzie Ramp to accommodate an additional entrance to their subdivision development.	■ LINK427 to perform TACC works on TACC's behalf. TACC will apply for encroachment permit. ■ MTO to address this issue as it is outside of the original design scope (Corridor Management Office and Special Projects Office).
Agencies	
Ministry of Natural Resources & Forestry – Aurora District	
■ Ministry of Natural Resources & Forestry administrates the Species At Risk Act. Species at risk habitat exists within the confines of the project. Portions of this habitat exists within DCR #2. ■ Ministry of Natural Resources and Forestry is one of the review agencies for the administration of the Vegetative Restoration Framework and Vegetation Restoration Plan, An alternative process to formulate the Vegetation Restoration Plan has been agreed upon by LINK427, MTO and MNRF.	■ BAT SAR Habitat within the confines of DCR #2 have been earmarked in the field and are protected. No removal of this Habitat area will occur until such time as the Species At Risk Permit is Approved by the Minister of Natural Resource and Forestry ■ The alternative review process has been entered into with monthly review meetings and a three stage review process. The first draft of the VRP has been submitted for review by the Ministry, March 2018. The finalized VRP will be submitted in March of 2018.
Toronto and Region Conservation Authority	
■ Toronto and Region Conservation Authority is one of the review agencies for the administration of the Vegetative Restoration Framework and Vegetation Restoration Plan, An alternative process to formulate the Vegetation Restoration Plan has been agreed upon by LINK427, MTO and TRCA.	■ The alternative review process has been entered into with quarterly review meetings and a three stage review process. The first draft of the VRP has been submitted for review by the TRCA, March 2018. The finalized VRP will be submitted in March of 2018.

Highway 427 Expansion Project Agency Comments received as a result of consultation requests and resulting meetings between the Organizations and LINK427 Staff	Highway 427 Expansion Project LINK427 Responses between May 15th to March 29th 2018
■ Some relocation of utilities require permits from the TRCA. ■ In response to TRCA Polices regarding Stormwater TRCA was consulted broadly regarding both the hydraulics of the crossings (meeting October 10th 2017) at which point they stated within the meeting that they had no issues with the hydraulics and floodplain related impacts at all of the proposed crossings. ■ TRCA was additionally consulted on the proposed SWM and drainage approach in pre-consultation meeting on December 6 2017. The overall approach for SWM was discussed. ■ In February and March 2018, we were in contact with TRCA to discuss the review of the drainage and SWM report. The purpose of these discussions was to outline the CA request that we have explicit stakeholder agreement with the approach and what would be required from their review to satisfy that request.	■ LINK427 and the appropriate utility companies will be obtaining these permits as required. ■ TRCA stated that in general there are no concerns from their part for the approach modifications discussed (treatment train as opposed to wet ponds). It was agreed LINK427 would supply them with a report for review. That was submitted in March. It was agreed that the approach to Stormwater Management by LINK427 is consistent with the Original Environmental Assessment.
Potentially Interested Stakeholders	
Vaughan Bicycle User Group (BUG), Peter DeSouza, Sponsorship & Operations	
The proposed 427 Expansion will be crossing several existing vital links within the industrial and commercial areas of West Vaughan. Several nature trails also exist in the area and will be affected by the proposed path of the 427. These links and trails are well used by cyclists at the present time and measures need to be taken to facilitate the continued safety of the users or to enhance it. The BUG would like to request that space for dedicated bicycle lanes be included for each of the crossings over or under the proposed 427 path. Provisions must be implemented now, even where no cycling facilities currently exist to avoid creating bottlenecks or obstacles for	■ A response is currently being drafted by LINK427.

Highway 427 Expansion Project Agency Comments received as a result of consultation requests and resulting meetings between the Organizations and LINK427 Staff	Highway 427 Expansion Project LINK427 Responses between May 15th to March 29th 2018
cyclists in the future. We know the Vaughan Active Transportation Plan updated in 2012 includes cycling infrastructure at these crossings. We heard they will be completed before 2031. Cyclists prefer separate cycling facilities such as cycle tracks. We need a minimum of 3.5m boulevard space to accommodate a 1.5m sidewalk and 1.5m cycle track plus buffer on each side of the boulevard. Sidewalks should be a minimum 2m on the structure if we have road bike lanes. Again, we need the crossing platform to include these spaces now to prevent future restrictions. The Vaughan Active Transportation Plan shows several trails crossing the proposed path of the Highway 427 Expansion. Therefore, we request the 427 crossing structures are built to include future trail crossings at locations noted below. Typically, these crossings trails are 3m wide plus a minimum of 1.5m side clearance on both sides. Minimum clear height is 3m. Specifically we need the following: • Please allow for an underpass crossing north of Rainbow Creek; • A trail is proposed to connect to the south side of Langstaff Road at approximately Sta. 9+400. Ensure that works at Langstaff include a trail connection. Please allow for a trail connection beneath the proposed Langstaff ramps at Sta. 9+520. • A trail is proposed in the hydro corridor which will require the following modifications: o Sta. 10+400. Please ensure that works at Langstaff include provisions for a trail connection;	

Highway 427 Expansion Project Agency Comments received as a result of consultation requests and resulting meetings between the Organizations and LINK427 Staff	Highway 427 Expansion Project LINK427 Responses between May 15th to March 29th 2018
o Between Sta.12+600 and 13+300 A trail crossing is desired across highway 427; o West of Sta. 9+760 A crossing will be required at Rutherford Road; • A trail is proposed adjacent to the south side McGillvary Road. Please ensure that the proposed overpass width at Sta. 16+050 allows for a trail crossing underneath. Vaughan BUG would appreciate being kept informed of this EA progress directly and would welcome any further correspondence on this project. Since 2014, the Vaughan BUG's main mission is to promote cycling as an effective and a sustainable transportation option, encourage safe cycling, increase driver's awareness and seek improved cycling facilities and infrastructure in Vaughan. Thank you for your time and consideration. Sincerely, Peter DeSouza Sponsorship & Operations	
York Region Cycling Coalition, Michael Iacovelli	
We have a brief, but important comment based on the information presented. We did not see any reference to the implementation of safe cycling infrastructure at the new 427 interchanges. The 400 series highways are huge barriers to connectivity in the City of Vaughan and York Region. The crossing points over the 407, 400 and 404 are dangerous and do not adequately consider safe, active transportation facilities. The Province has an opportunity not to make the same	Dear Michael Iacovelli, Thank you for bringing to our attention the concerns of the York Region Cycling Coalition. LINK 427 has made specific design accommodations for cyclists at the major arterial crossings of Highway 427 in York Region. These accommodations are designed to ensure that the level of protection for cycling infrastructure remains consistent before, during, and

Highway 427 Expansion Project Agency Comments received as a result of consultation requests and resulting meetings between the Organizations and LINK427 Staff	Highway 427 Expansion Project LINK427 Responses between May 15th to March 29th 2018
mistakes with the new 427 interchanges. We do not want another impediment, blocking cyclists from traversing to Peel Region. Can you please confirm that these initial designs will ultimately consider and incorporate safe cycling infrastructure? The York Region Cycling Coalition is a significant coalition of cycling clubs with a collective membership of over 2,500 members. The YRCC has a simple purpose of promoting safety amongst cyclists and motorists and improving cycling in York Region.	after construction of the new interchanges. The design accommodations are as follows: Langstaff – There are bike lanes on both sides. Bicycle crossing locations are also designed at this intersection. Major Mackenzie Drive – There will be a sidewalk on the north side and a multi-use path on the south side. Rutherford – Structure allows for future expansion to a 6-lane road with a multi-use path and sidewalk on the boulevard. Zenway – Will have a sidewalk on both sides but not a dedicated bike lane. Highway 7 Bridge structure – Is being widened with approximately 300 mm wider shoulders. There are no dedicated bike lanes, however the structure has incorporated a new parapet wall with bicycle rail on top. In addition, LINK427 would like to inform you of our plan for managing cyclists and maintaining existing infrastructure during construction staging. The methods that we will use will depend on the type of closure and location. For short duration traffic impacts (temporary lane restrictions) on Regional Roads, if there are existing bike lanes or sidewalks, we would ensure that cyclists and pedestrians have either a clear, delineated path through the work zone or lane restriction, or are escorted through the work area by traffic control personnel. For long duration traffic impacts (detours) on Regional Roads, we are required to ensure that if the road has existing bike lanes or sidewalks, the detour will be designed with the same provisions. We trust that this is good news for you and your coalition and addresses your concerns.

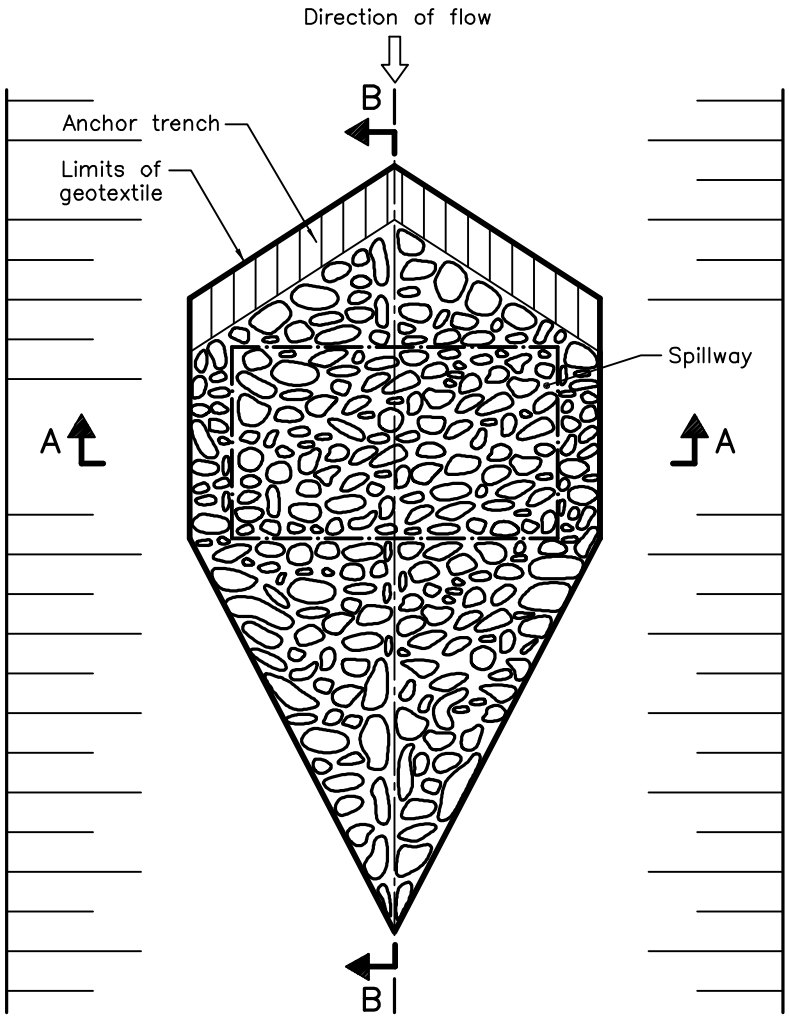
Highway 427 Expansion Project Agency Comments received as a result of consultation requests and resulting meetings between the Organizations and LINK427 Staff	Highway 427 Expansion Project LINK427 Responses between May 15th to March 29th 2018
	Thank you again for your constructive input. Sincerely, Aitor Arbesu, Project Director
SmartCentres, Frank Cicinelli	
■ What studies have been undertaken to address the suitability of Major MacKenzie Drive both east and west from the proposed interchange to handle the volume of traffic anticipated once complete? It would appear to me that we will be increasing the Hwy 427 capacity from 6 to 8 lanes and 6 lanes to the proposed termination; how can a highway with 6 lanes of traffic come to a complete 'dead end' without any impact on traffic flow of the existing roadways? In Bolton, where I live, the current termination point is non-affectionately known as "McGuinty's bottleneck" as 'thanks' for the former Premier canceling this extension when originally planned and subsequently jamming Caledon with logistics companies who expanded based on the original planned extension. Needless to say, resulting in a large amount of truck traffic and numerous deaths on the stretch of Hwy 50 from Mayfield Rd. south to Hwy 7. Is not this 'new' plan the same exercise? Running a highway extension to a dead end? Would it not be a reasonable consideration to taper the number of lanes to interchanges further north such as Mayfield Road the termination point for most of the logistics companies?	■ Thank you for taking the time to email us your comments and concerns regarding the Highway 427 Expansion Project. In regards to studies completed, MTO and IO have conducted numerous studies and planning reports in developing the design model for the project. These studies would have included the projected traffic volumes, which the design would need to account for to ensure that the new infrastructure isn't obsolete before it reaches the stipulated design lifespan. When considering the model of the project, external circumstances are also considered, including upcoming regional road infrastructure projects and other MTO and IO projects. Once the construction requirements and the design parameters/model are determined, these items are clearly identified and outlined on the contract with the builder. Based on regional road infrastructure improvements currently underway, as well as upcoming scheduled transportation improvements for the area, it was determined by MTO and IO that the best termination point would be Major Mackenzie Drive.

Highway 427 Expansion Project Agency Comments received as a result of consultation requests and resulting meetings between the Organizations and LINK427 Staff	Highway 427 Expansion Project LINK427 Responses between May 15th to March 29th 2018
Zzen Corporation	
■ Zzen Corporation has concerns with the LINK427 project in the Zenway Boulevard area.	■ Discussions are ongoing regarding these concerns.
Emergency Services	
■ All Emergency Services wish to be notified of any major and minor traffic impacts (closures, detours etc.)	■ Emergency services and the OPP will be advised of construction timing and major/minor traffic impacts, through Traffic Disruption Notifications (TDN).
Canadian National Railway	
■ After review of the proposed plans for shoring the following was concluded by CN: ■ North side shoring wall should not be a problem, provided the review of the design is completed ■ CN has fiber optics that run parallel to the tracks at this location ■ South side shoring wall is in the future track envelope. ■ Confirmation is required to ensure that the shoring will be removed after installation is completed and the clearance envelope is met. ■ CN may have fiber optics running along this section as well. All designs need to be provided so CN can review and provide final sign off.	■ LINK427 will go through the standard process and apply for the approval permit. ■ LINK427 will undertake measures to locate and protect the fiber optic line during construction. ■ LINK427 will insure removal of shoring after installation and meet the clearance envelope. ■ LINK427 will provide design drawings so CN can review and provide sign off.
Canadian Pacific Railway	

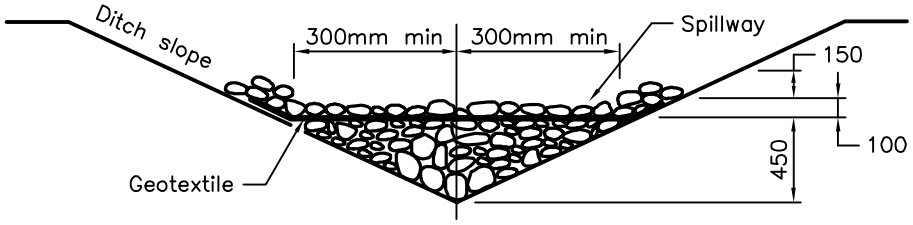
Highway 427 Expansion Project Agency Comments received as a result of consultation requests and resulting meetings between the Organizations and LINK427 Staff	Highway 427 Expansion Project LINK427 Responses between May 15th to March 29th 2018
■ Canadian Pacific Railway has requested LINK427 to apply for the standard permit.	■ LINK427 will go through the standard process and apply for the approval permit, and will supply the requested materials as per the permit.
407ETR	
■ After review of project scope, 407 ETR requested detailed project schedule. ■ LINK427 questioned feasibility of closing southbound off ramp over Albion for longer duration to move the 407 over Albion bridge. ■ 407 ETR questioned process of relocating structure over Albion. ■ 407ETR would like to separate lighting power supplies which are currently jointly used by MTO and 407. ■ 407ETR to have independent audit completed of LINK427's design to make sure compliant with 407 ETR. ■ 407ETR to have independent audit completed of LINK427's design to make sure compliant with 407 ETR standards. ■ 407ETR indicated that power supplies between MTO (427) and 407ETR have to be isolated. ■ LINK427 proposed vertical clearance of 407 ETR E/W -S ramp over Albion of 4.91 m. ■ 407ETR questioned how liability will work between MTO and 407ETR in regards to entrances to stormwater ponds off the interchange ramps	■ LINK427 provided detailed schedule July 13 2017. ■ 407ETR indicated Saturday nightshift would be the best option. ■ LINK427 confirmed the Albion structure will be disengaged from the existing abutment and transferred 5.5 m to a new extended abutment. Work will be done on nights. ■ MTO and 407ETR to discuss separate lighting power (ongoing). ■ Reviews by independent auditor complete/ongoing. ■ Reviews by independent auditor complete/ongoing. ■ MTO and 407ETR are resolving this issue. Site tour occurred after Meeting. ■ 407ETR satisfied with clearance as long as it meetings 4.9 meters as per TAC, and City of Toronto approved. ■ MTO and 407ETR to discuss offline. ■ LINK427 to remove loop indication on drawings

Highway 427 Expansion Project Agency Comments received as a result of consultation requests and resulting meetings between the Organizations and LINK427 Staff	Highway 427 Expansion Project LINK427 Responses between May 15th to March 29th 2018
■ 407ETR does not want traffic counting loops installed on their ramps ■ 407ETR wants sleeper slab removed from E/W-S ramp	■ LINK427 complied

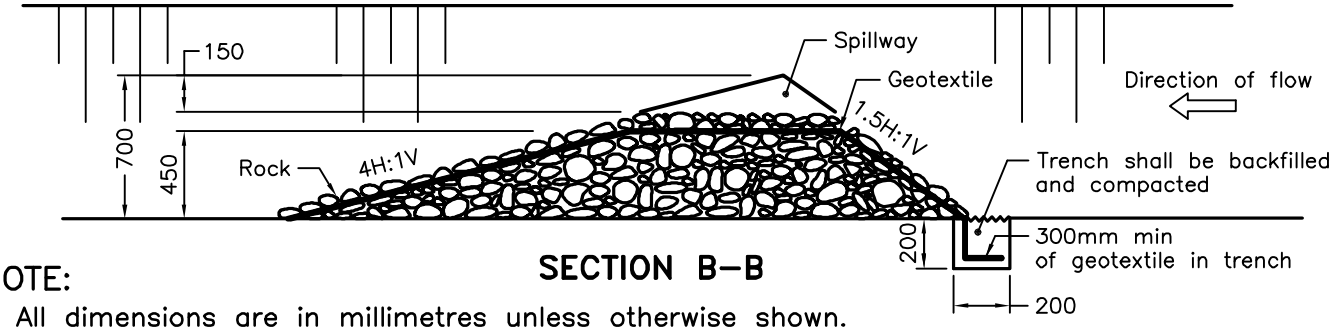
Appendix E: Ontario Provincial Standard Drawings (OPSD)



PLAN
SPILLWAY



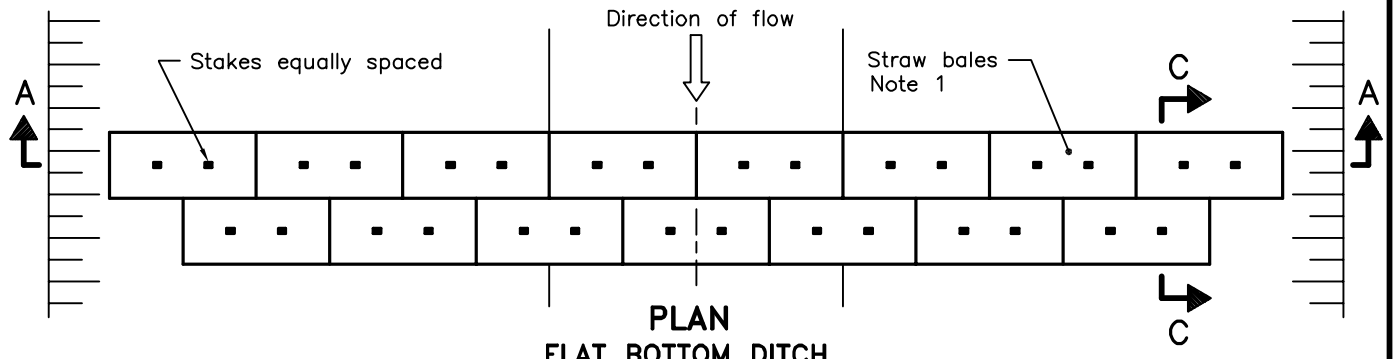
SECTION A–A



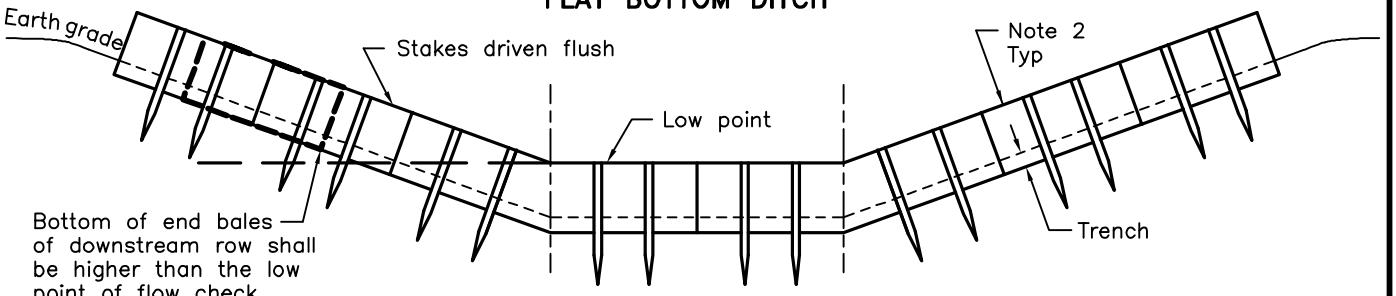
SECTION B–B

NOTE:
A All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2015	Rev	2
TEMPORARY ROCK FLOW CHECK DAM V–DITCH			
			OPSD 219.210

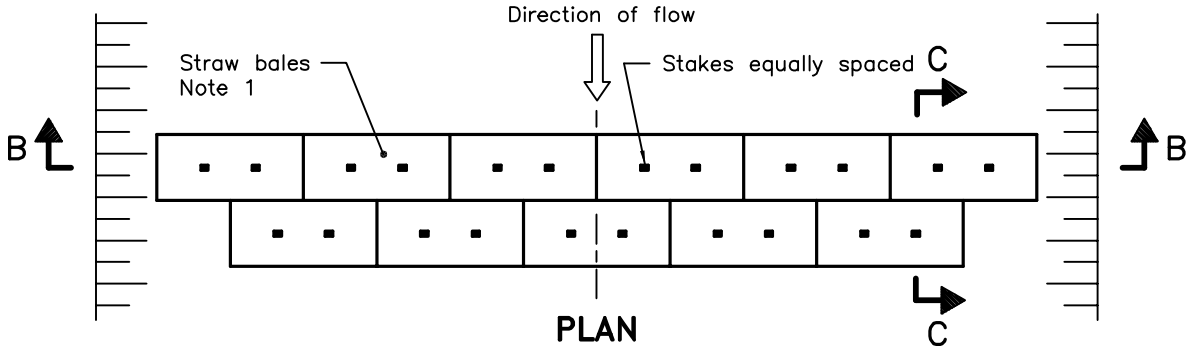


PLAN
FLAT BOTTOM DITCH

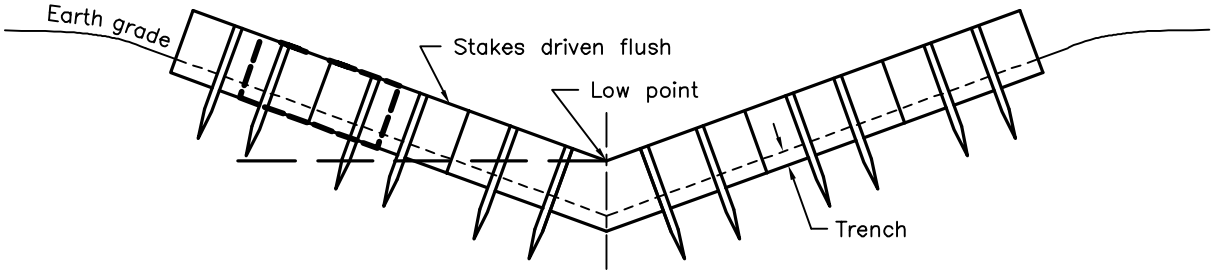


Bottom of end bales of downstream row shall be higher than the low point of flow check. Downstream bale position outlined. Typ

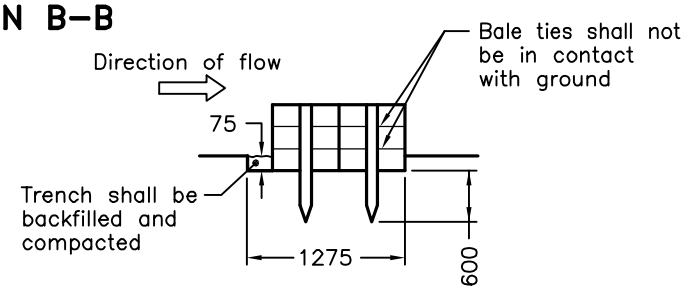
SECTION A–A



PLAN
V–DITCH



SECTION B–B



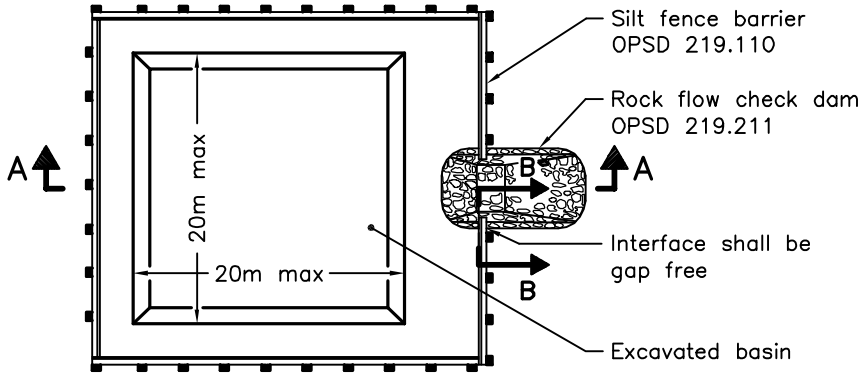
SECTION C–C

NOTES:

1 Number of bales varies and shall suit ditch.
2 Straw bales shall be butted tightly against adjoining bales and shaped to conform to the sides of the ditch to prevent water flow through barrier.

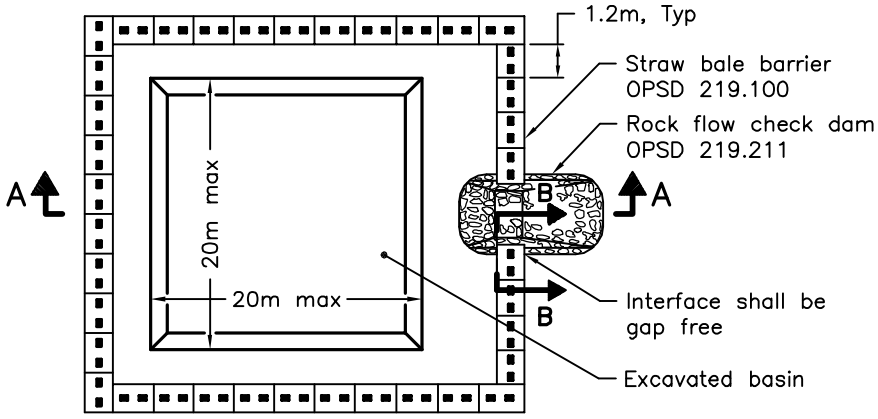
A All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2015	Rev	2
STRAW BALE FLOW CHECK DAM			
	OPSD 219.180		



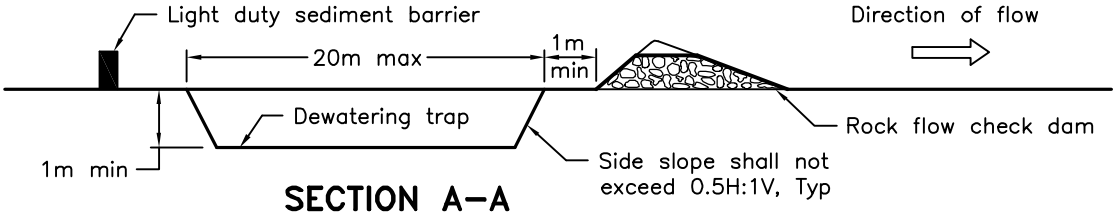
PLAN

DEWATERING TRAP WITH SILT FENCE

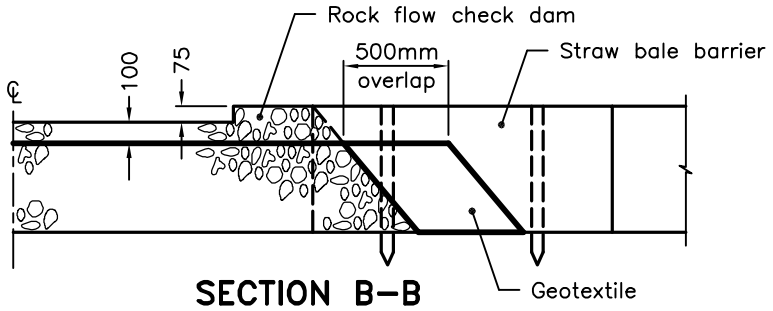


PLAN

DEWATERING TRAP WITH STRAW BALES



SECTION A–A



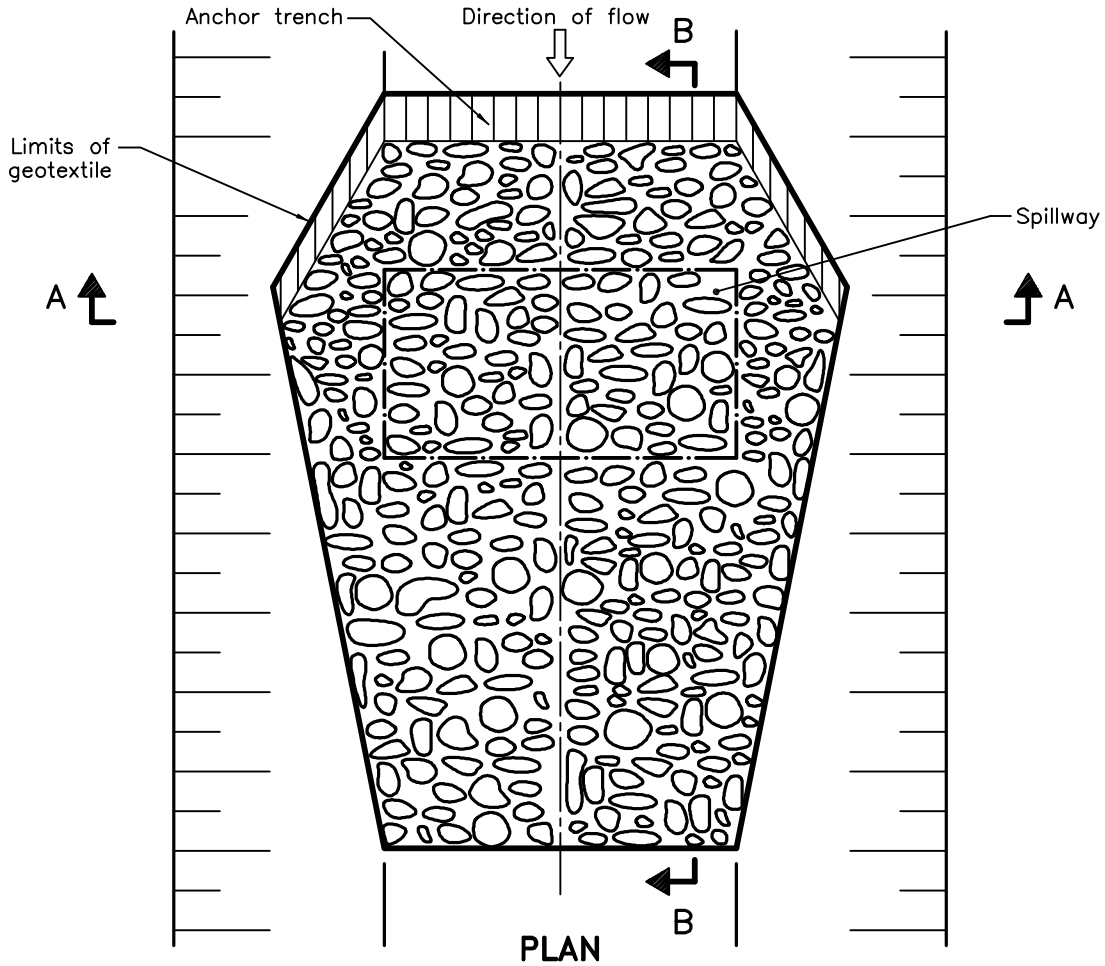
SECTION B–B

STRAW BALE BARRIER SHOWN

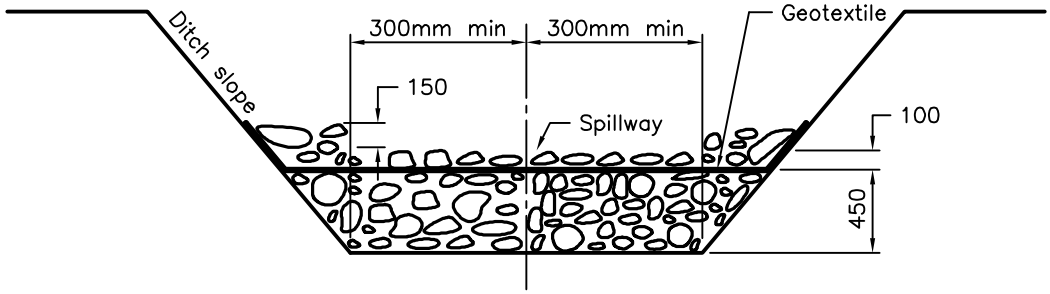
NOTE:

A All dimensions are in millimetres unless otherwise shown.

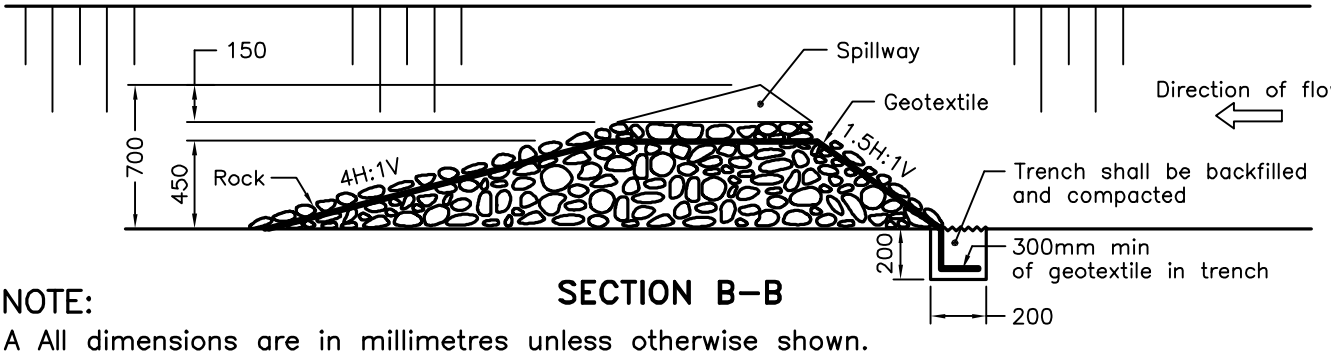
ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2015	Rev	2
SEDIMENT TRAP FOR DEWATERING			
	OPSD 219.240		



PLAN
SPILLWAY



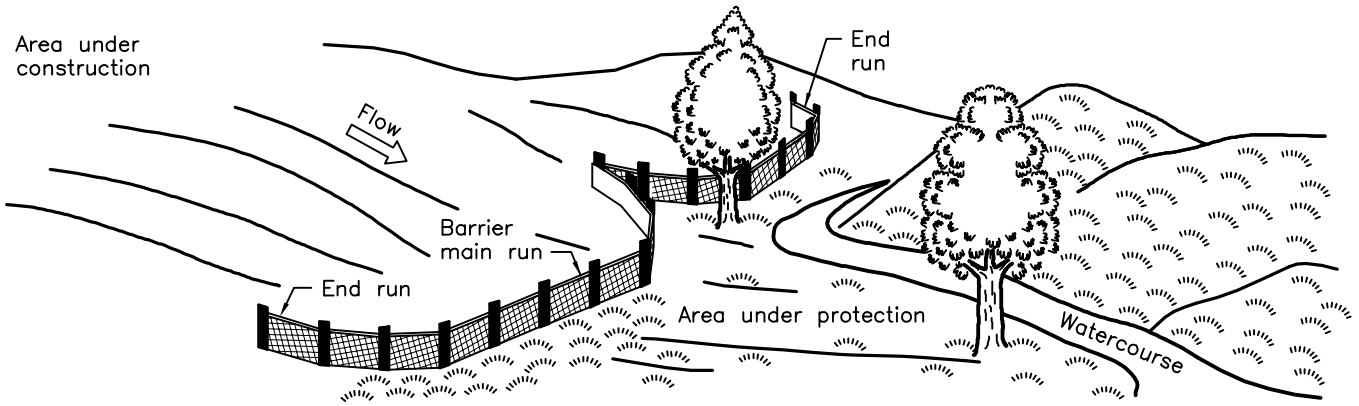
SECTION A–A



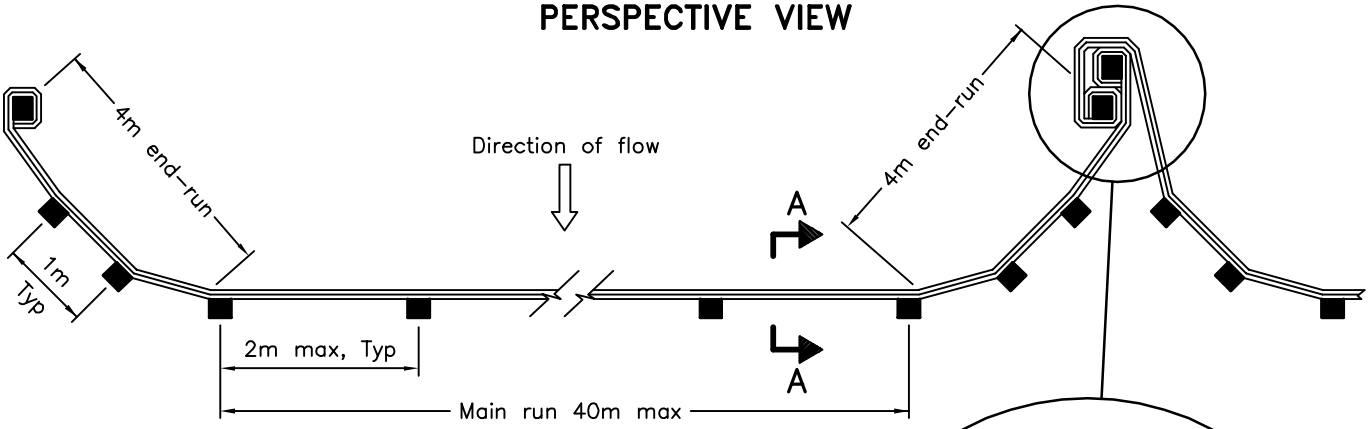
SECTION B–B

NOTE:
A All dimensions are in millimetres unless otherwise shown.

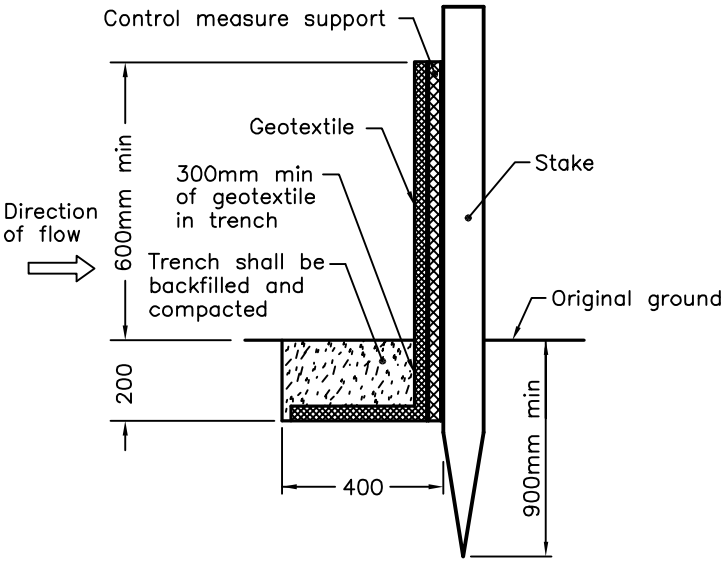
ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2015	Rev	2
TEMPORARY ROCK FLOW CHECK DAM FLAT BOTTOM DITCH			
			OPSD 219.211



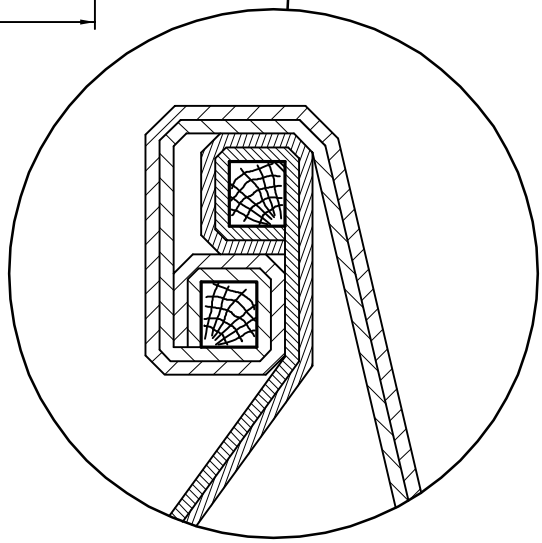
PERSPECTIVE VIEW



PLAN



SECTION A–A



JOINT DETAIL

NOTE:

A All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2015	Rev	2
HEAVY–DUTY SILT FENCE BARRIER			
	OPSD 219.130		