Region of Peel

Mayfield Road Improvements

from Chinguacousy Road to Heart Lake Road
Municipal Class Environmental Assessment

VOLUME 1 - MAIN REPORT

Project No. 101-17262-00

J u l y 2 0 1 4

Environmental Study Report

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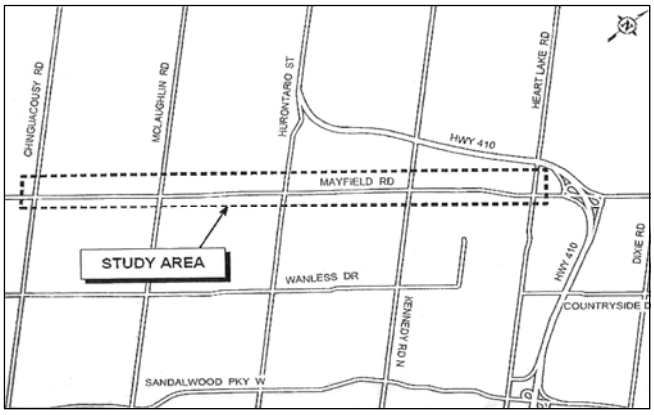
Executive Summary

A. BACKGROUND

The Region of Peel (the Region), through their consultant WSP (formerly GENIVAR), has completed a Municipal Class Environmental Assessment (Class EA) Study to address road improvement requirements for Mayfield Road from Chinguacousy Road to Heart Lake Road. Mayfield Road is an east-west arterial road and forms the boundary line between the City of Brampton and the Town of Caledon. Mayfield Road is currently a two-lane road west of Hurontario Street and a four-lane road east of Hurontario Street.



The Region has various mandates, one of which is to minimize impacts to the environment and maintain and operate a safe and functional regional road network that serves a variety of users. The proposed improvements include the addition of lanes and two new collector roads and will support planned future growth in the Brampton and Caledon Development Areas.

B. MUNICIPAL CLASS EA PLANNING SCHEDULE

In Ontario, municipal road projects are subject to the Municipal Class EA process and must follow a series of mandatory steps outlined in the Ontario Municipal Class EA document. The approved Municipal Class EA document was updated and prepared by the Municipal Engineers Association (MEA) in October of 2000, and was amended in 2007 & 2011. As the project described in this report involves the reconstruction or widening (i.e. additional lanes) of Mayfield Road, with a construction cost of over $2.4 million, a Schedule C Municipal Class EA (Phase 1 to 4) was completed for this study.

C. CONSULTATION PROGRAM

Recognizing that public and regulatory agency consultation is a significant and integral part of the Municipal Class EA process, a consultation program was initiated from the outset of the study and continued throughout.

A wide range of stakeholders were identified and contacted at the outset of the study to 'scope' potential issues and areas of interest or concern. Interest in the project was considered to be any feedback received from a stakeholder indicating that they could be directly affected during the planning, construction and/or operation of the proposed undertaking. A number of methods were undertaken to achieve the above stated objectives, including:

- Placement of Notices of Study Commencement, Public Information Centres 1 and 2 as well as Study Completion within the Brampton Guardian and Caledon Enterprise newspapers;
- Scheduling of two Public Information Centres during Phase 2 and 3 of the study;
- Placement of notices on Region's website;
- Distribution of information mailings (i.e. notices) to regulatory agencies, First Nations and the public during various stages of the study;
- Receiving and responding to written submissions;

- Participation in meetings and telephone discussions with regulatory agencies, utilities, stakeholders including development communities, and the public;
- Scheduling of two Technical Advisory Committee (TAC) meetings during Phase 2 and 3 of the study; and
- Placement of this ESR on the Public Record and provision of a Notice of Study Completion to regulatory agencies and the public during Phase 4 of the study.

D. PROBLEM/OPPORTUNITY STATEMENT

The Region of Peel Long Range Transportation Master Plan (LRTP) and City of Brampton Transportation and Transit Master Plan provide the need and justification for road improvements along Mayfield Road from Chinguacousy Road to Heart Lake Road. The opportunities for improvement have been defined by the following issues:

- The LRTP Update identified the need to widen and improve Mayfield Road between Chinguacousy Road to Heart Lake Road:
  - Year 2018 - from a two lane cross section to a four lane cross section west of Hurontario Street;
  - Year 2021 - from a four lane cross section to six lane cross section east of Hurontario Street;
  - Year 2029 - from a four lane cross section to six lane cross section west of Hurontario Street and additional turn lanes at certain intersections will be built.
- The Brampton Transportation and Transit Master Plan also identified that improvements to transit service and transit infrastructure components will be required by 2016 and 2021; and
- The Town of Caledon Transportation Needs Study has identified the Mayfield West area as an area of growth, which will need supporting transportation infrastructure.
- Considering the above, the problem/opportunity statement for this Municipal Class EA Study is defined as follows:
- As presently configured, Mayfield Road will not have sufficient capacity to accommodate the anticipated traffic volumes by 2021 and 2031; and
- The opportunity exists to update roadway geometrics, integrate cycling facilities, improve transit facilities, improve pedestrian safety, promote alternative methods of transportation and incorporate streetscaping to reflect current Region of Peel policies.

E. ALTERNATIVE SOLUTIONS TO THE PROBLEM

The following five alternative solutions were considered:

- Do Nothing;
- Improve Transportation Systems Management;
- Improve Travel Demand Management;
- Increase Capacity to Parallel Roadways; and
- Increase Capacity to Mayfield Road.

The evaluation process took into consideration various discipline's experience, knowledge and input on the alternative solutions concluded that the preferred solution to solve the current congestion, capacity and operational deficiencies should be improvements along Mayfield Road by widening Mayfield Road to the ultimate six lane urban cross section, but also includes optimizing existing infrastructure (e.g. turning lanes, signal timing), TDM, transit service improvements as part of the overall solution.

F. ALTERNATIVE DESIGN CONCEPTS

The Study Area was broken up into seven distinct areas:

- Chinguacousy Road to McLaughlin Road
- McLaughlin Road to Orangeville Rail
- Orangeville Rail to Hurontario Street
- Hurontario Street to Snelgrove Bridge
- Snelgrove Bridge to Kennedy Road
- Kennedy Road to Stonegate Drive
- Stonegate Drive to Heart Lake Road

The following alternative design concepts were developed and evaluated for road widening at each of the seven areas:

- Do Nothing (screened out due to traffic volumes);
- Widen to the North Side only
- Widen to the South Side only
- Widening to both the North and South sides

Based on the evaluation of the above noted design concepts, the following concepts were identified as the preferred design:

- Widen to both the North and South sides between Chinguacousy Road and Kennedy Road;
- Provide New Collector Road 1 at approximately 450 m east of Chinguacousy Road;
- Provide New Collector Road 2 at approximately 450 m west of McLaughlin Road;
- Maintain Snelgrove Bridge as it is already designed for six lane cross section;
- Widen only to the North side between Kennedy Road and Stonegate Drive, maintain within existing right-of-way;
- Reduced lane width between Kennedy Road and Stonegate Drive to keep pavement within existing right-of-way and to maintain the roadbed within the caisson system that was constructed during the previous widening contract;
- Widen to both the North and South sides between Stonegate Drive and Heart Lake Road, maintain with the existing right-of-way; and
- Provide traffic signals and turning lanes at specific intersections.

G. CAPITAL CONSTRUCTION SCHEDULE

Under the Region's 2013 Capital Roads Construction Program, Mayfield Road between Chinguacousy Road and Heart Lake Road is identified for roadway improvements under the following current schedule:

- Year 2018 - from a two lane cross section to a four lane cross section west of Hurontario Street;
- Year 2021 - from a four lane cross section to six lane cross section east of Hurontario Street;

- Year 2029 - from a four lane cross section to six lane cross section west of Hurontario Street and additional turn lanes at certain intersections will be built.

The Region's Capital Construction Program is reviewed on an annual basis with respect to project schedules (accelerated or deferred), new projects and overall capital cost estimates and budget. Since the Capital Program is approved by Regional Council annually, the noted schedule for Mayfield Road improvements under the 2013 Program are therefore potentially open to change.

H. MITIGATION MEASURES

The overall conclusion drawn from this ESR is that construction of the proposed improvements can be achieved with minimal disruption to and impact upon the natural, physical, socio-economic and cultural environment. The principal negative impacts will include:

- Impacts to residents and business owners in addition to the travelling public during construction;
- Impacts to vegetation property frontages along the corridor;
- Permanent and temporary easements required from several property owners along both sides of the corridor; and
- Potential impacts to fisheries and aquatic habitat.

The significance to these effects can be mitigated through the measures prescribed in this report, along with the use of standard design measures and best construction management practices. It is noted that construction of the proposed roadway improvements are not expected to have any discernible adverse impact on the environment.

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1 Introduction

1.1 Project Background

The Regional Municipality of Peel (Region of Peel), through their consultant WSP (formerly GENIVAR), has completed a Municipal Class Environmental Assessment (Class EA) Study to address the short term (2018 & 2021) and long term (2029) improvements requirements for Mayfield Road. Mayfield Road is an east-west arterial road and forms the boundary line between the City of Brampton and the Town of Caledon. Mayfield Road is currently a two-lane road west of Hurontario Street and a four-lane road east of Hurontario Street. Mayfield Road study area limits (see **Figure 1-1**) extend from Chinguacousy Road to Heart Lake Road.

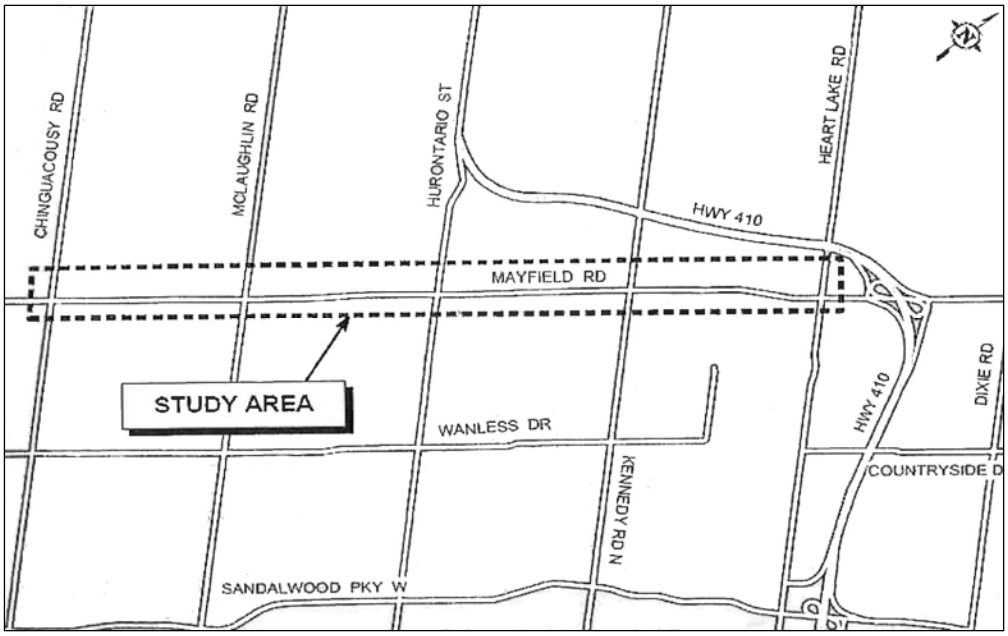

Figure 1-1 - Project Study Area

1.1.1 Provincial Policies

A number of Provincial policies and plans highlight the need for major Regional road improvements such as those proposed for Mayfield Road.

The GTA West Corridor Environmental Assessment Study (currently being undertaken by the MTO) supports the need for improvements to parallel roadways. The Study identifies the need to widen Mayfield Road to support the proposed improvements.

1.1.2 Peel Region Official Plan

Region of Peel's Official Plan is a long-term plan used to assist the Region in managing growth and development. The main purpose of the Plan is to provide Regional Council with a long-term regional strategic policy framework for guiding growth and development in Peel while having regard for protecting the environment, managing the renewable and non-renewable resources, and outlining a regional structure that manages this growth within Peel in the most efficient manner; and to interpret and apply the intent of Provincial legislation and polices within a Regional context using the authority delegated or assigned to the Region from the Government of Ontario.

Part of Region of Peel's Official Plan is to ensure that development only proceed with adequate existing or committed improvements to regional transportation capacity and, if necessary, development be phased until that capacity is or will be available.

Region of Peel has experienced the second highest rate of growth (56% from 2001 to 2031) in the Greater Toronto Area. This pattern is expected to continue as the areas become more developed.

Region of Peel's Official Plan has noted that Mayfield Road is a vital east-west link through the Region.

1.1.3 Peel Region Long Range Transportation Plan (LRTP)

Region of Peel's LRTP was initiated to identify and address transportation challenges anticipated by the Region over the next 20-30 years, and develop appropriate policies, strategies and road improvement plans to address these challenges. The LRTP also provides an overall vision and framework to allow coordination of actions by all levels of government as well as the private sector in addressing transportation challenges in Peel.

The LRTP includes five major studies:

- Transportation Demand Management
- Goods Movement Study in Peel
- Caledon Transportation Needs Study
- Transportation for Persons with Disabilities
- Long Range Transportation Plan Report

Each of the above projects included research, analysis, study of best practices and consultation with stakeholders. The findings of the first four studies above, as well as several previous Regional and area municipal transportation planning studies, were used in developing the LRTP. Major components include:

- Regional road network plan, i.e. Regional road improvements required by 2011, 2021 and 2031;
- Transportation Vision, Goals, Objectives and Policies, which provide a framework for developing and coordinating future actions and programs to improve transportation in Peel; and
- List of provincial highway and GO Transit improvements to meet future Regional needs.

The LRTP has identified the need to widen Mayfield Road from its current configuration to four (4) lanes by 2021 and six (6) lanes by 2031.

1.1.4 Peel Region Strategic Plan – Term of Council Priorities

The Region of Peel's Strategic Plan charts the long-term vision for the communities in Peel, and the Region's role in achieving that vision. The Strategic Plan is the keystone of the strategic planning process.

The Term of Council Priorities (2011 – 2014) was introduced as a second step to help the Region confidently chart its course. Seven (7) key themes, which encompass the programs and services delivered to the Peel community, were developed by Council to advance the Strategic Plan.

- **Environment** - Protect, enhance and restore the environment;
- **Social Development** - Build a community that is stable, responsive and adaptable;
- **Community Health** - Maintain and improve the health of Peel's community;
- **Transportation** - Support and influence sustainable transportation systems;
- **Cultural Development** - Build a cohesive Peel community;
- **Public Safety** - Ensure a safe Peel community; and
- **Service Excellence** - Strive for continued excellence as a municipal government.

1.1.5 Peel Good Movements Task Force

The Peel Goods Movement Task Force is a partnership of key goods movement stakeholders in Region of Peel. The objectives of the Task Force include efficiency, competitiveness and sustainability of the goods movement system.

Mayfield Road has been identified as an essential corridor for goods movement.

1.1.6 Brampton Transportation and Transit Master Plan

Brampton's Transportation and Transit Master Plan (TTMP) was undertaken to be a practical guide for incorporation of transportation investments, policies and actions into the urban transportation environment. To that extent, the City of Brampton's TTMP also shows that Mayfield Road is approaching capacity.

1.1.7 Town of Caledon Transportation Needs Study

Town of Caledon's Transportation Needs Study identified the Mayfield West Area as an area of growth and the need for supporting transportation infrastructure.

1.2 Study Objectives

The purpose of this Municipal Class EA study is to provide a comprehensive and environmentally sound planning process which is open to public participation to meet the following objectives:

- Improve traffic operations by addressing congestion and deteriorating road conditions;
- Investigate traffic and access management measures with potential to improve safety and traffic operations;
- Support area development and approved growth for lands along the corridor; and
- Improve safety for all roadway users (e.g. motorists, cyclists and pedestrians).

This Environmental Study Report describes the planning process followed, the existing conditions within the Study Area, the problem and opportunity, the Alternative Solutions considered to address the problem and opportunity, the evaluation of Alternative Solutions and Alternative Design Concepts, the recommended Preferred Solution and the Recommended Preliminary Design, public and agency consultation, and the description, implementation, mitigation and monitoring of the Preferred Design Concept.

1.3 Study Team

The Study Team includes:

WSP: Lead Consultant, responsible for Project Management, Class EA process, Facilitation, Roadway Engineering, Traffic Modelling and Analysis, Traffic Safety, Structural Engineering, Drainage and Stormwater Management, Geotechnical Investigation and Assessment, Landscape Architecture, and factor specific assessments including Natural Sciences (Fisheries, Terrestrial, Wildlife), Hydrogeology, Noise, and Contaminated Soil.

Archaeological Services Inc.: Responsible for Archaeology and Built Heritage Resource Assessment

Novus Environmental Inc.: Responsible for Air Quality Assessment

Jock Valley Engineering: Responsible for Rail Engineering

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2 Overview of the Municipal Class EA Planning Process

The Municipal Class EA planning process approved under the *Environmental Assessment Act* (EA Act) was followed for this project. The Municipal Class EA allows Region of Peel to meet the requirements of the EA Act for municipal infrastructure projects without having to either undertake an Individual EA or request a specific exemption for the project. Municipal projects addressed by the Municipal Class EA may be implemented without further approval under the EA Act, provided the approved Municipal Class EA planning process was carried out.

2.1 Municipal Class EA Schedules

Since projects undertaken by municipalities vary in their potential environmental effects, the Municipal Class EA classifies the projects into four schedules according to their potential environmental significance:

- **Schedule 'A'** projects are limited in scale, have minimal adverse effects and include a number of municipal maintenance and operational activities. These projects are approved and may proceed directly to Phase 5 for implementation without following the other phases.
- **Schedule 'A+'** projects are similar to Schedule 'A' projects, however, have the requirement for the public to be advised prior to project implementation. These projects are approved and may proceed directly to Phase 5 for implementation without following the other phases.
- **Schedule 'B'** projects have the potential for some adverse environmental effects, whereby the proponent is required to undertake a screening process (Phases 1 and 2), which includes mandatory contact with directly affected public and relevant review agencies to ensure that they are aware of the project and that their concerns are addressed. Schedule 'B' projects require that a Project File be prepared and submitted for review by the public and review agencies. If there are no outstanding concerns, then the municipality may proceed to Phase 5 for implementation.
- **Schedule 'C'** projects have the potential for significant environmental effects and must proceed under the full planning and documentation procedures specified in the Class EA Document (Phases 1 to 4). Schedule 'C' projects require that an Environmental Study Report be prepared and submitted for review by the public and review agencies. If there are no outstanding concerns, then the municipality may proceed to Phase 5 for implementation.

2.1.1 Schedule 'C' Classification

This project is classified as a Schedule 'C' undertaking according to the Municipal Class EA (October 2000 and amended in 2007 & 2011). A Schedule 'C' undertaking must fulfill the first four phases of the MEA Class EA process before moving on to the fifth phase, implementation. The Class EA planning phases undertaken for this study are listed below.

Phase 1: Identify the Problem / Opportunity

This phase involves not only identifying the problem/opportunity, but also describing it in sufficient detail to formulate a clear problem/opportunity statement. To assist in describing the problem/opportunity, input from review agencies and the public may be solicited.

Phase 2: Identify and Evaluate Alternative Solutions to the Problem/Opportunity

This phase involves undertaking the following six steps:

- Identify reasonable alternative solutions to the problem/opportunity;
- Prepare a general inventory of the existing natural, social and economic environments in which the project is to occur;

- Identify the net positive and negative effects of each alternative solution including mitigating measures, where possible;
- Evaluate the alternative solutions and identify a recommended solution;
- Consult with review agencies and the public to solicit comment and input; and
- Select/confirm the preferred solution.

Phase 3: Identification/Evaluation of the Design Alternatives for Implementing the Preferred Solution

This phase involves undertaking the following six steps:

- Identify alternative design concepts for implementing the preferred solution;
- Prepare a detailed inventory of the existing natural, social and economic environments;
- Identify the net positive and negative effects of each alternative solution including mitigating measures, where possible;
- Evaluate the alternative design concepts and identify a recommended design;
- Consult with review agencies and the public to solicit comment and input; and
- Select/confirm the preferred design concept.

Phase 4: Prepare and Submit an Environmental Study Report for Review by the Public and Review Agencies

Following completion of Phase 3, an Environmental Study Report (ESR) will be prepared and placed on public record for a mandatory review period of at least 30 calendar days to allow for review by agencies, stakeholders and the public.

During this review period, concerned individuals have the right to request a Part II Order under the EA Act before the project may proceed to implementation. A Part II Order would elevate a Schedule C project and require that an Individual EA be carried out, documented, and submitted to the Minister of the Environment for review and approval. The decision on whether the project should be subject to a Part II Order rests with the Minister of the Environment. In addition, the Minister of the Environment may deny the Part II Order, but attach a condition to the denial.

Once the public review period has expired and if there are no outstanding Part II Order requests, the Region may proceed to the final phase of the planning and design process, Phase 5, Implementation.

Phase 5: Complete Contract Drawings and Documents and Proceed to Construct, Operate, and Monitor the Project

This phase involves completing contract drawings and tender documents, incorporating the recommended solution and mitigating measures identified during the previous phases of the process. Once contracts are awarded, construction can take place and the project is implemented. Any monitoring programs identified during the Class EA shall be undertaken to ensure that the environmental provisions and commitments made during the process are fulfilled and effective.

2.1.1.1 Mandatory Principals

The planning process followed not only adheres to the guidelines outlined by the Municipal Class EA document but reflects the following five mandatory principals of Class EA planning under the EAA:

- Consultation with affected parties early on and throughout the process, such that the planning process is a co-operative venture;

- Consideration of a reasonable range of alternatives, both the functionally different alternatives to the project (known as alternative solutions) and the alternative methods of implementing the preferred solution;
- Identification and consideration of the effects of each alternative on all aspects of the environment;
- Systematic evaluation of alternatives in terms of their advantages and disadvantages, to determine their net environmental effects; and
- Provision of clear and complete documentation of the planning process followed, to allow 'traceability' of decision-making with respect to the project.

Following these five principals ensures that the Class EA process is devoted to the prevention of problems and environmental damage through planning and decision-making, recognizing that research and evaluation of possible impacts have been taken into account prior to implementation of the project.

Figure 2-1 on the following page provides an overview of the Municipal Class EA process, including the Mayfield Road Improvements Class EA study. .

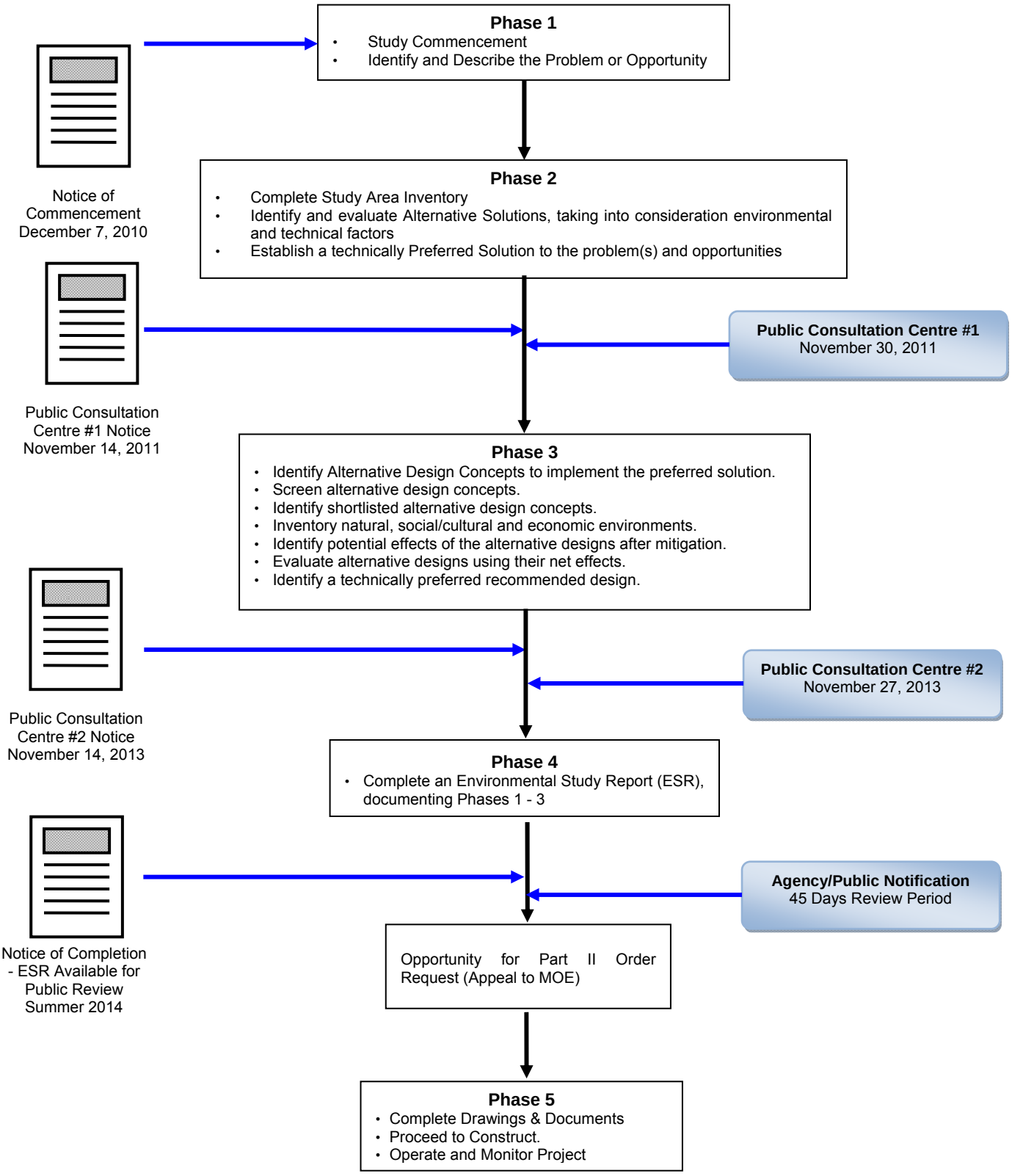

Figure 2-1 - Class EA Overview

2.1.2 Public Review of this Report and Next Steps

The documentation for this Schedule C project consists of an Environmental Study Report (ESR), which is presented as this document. Placement of the ESR for public review completes the planning and preliminary design stages of the project.

This ESR is available for public review and comment for a period of 45 calendar days. A public notice (Notice of Study Completion) was published to announce commencement of the review period. To facilitate public review of this document, copies are available at selected locations during regular business hours.

If, after reviewing this report, you have questions or concerns, please follow this procedure:

- Contact Region of Peel project manager to discuss your questions or concerns;
- Arrange a meeting with the above if you have significant concerns that may require more detailed explanations;
- If you raise major concerns, the Region of Peel will attempt to resolve this issue(s). A mutually acceptable time period for this meeting will be set. If the issues remain unresolved, you may request the Minister of the Environment (see contact information below), by order, to require the Region of Peel to comply with Part II of the *EAA* before proceeding with the project; this is called a Part II Order request. The Minster may make one of the following decisions:
  - Deny the request with or without conditions;
  - Refer the matter to mediation; or
  - Require the Region of Peel to comply with part II of the *EAA* by undertaking one of the following:
    - Set out directions with respect to preparing the Terms of Reference and an Individual EA for the undertaking; or
    - Declare that the Region (proponent) has satisfied the requirements for the preparation of a Term of Reference; however, the proponent must still prepare an individual EA.

Minister's Office
Ministry of Environment
77 Wellesley Street West, 11th Floor, Ferguson Block
Toronto, ON M7A 2T5

A copy of the request must also be forwarded to the attention of the project manager at the Region of Peel.

If no Part II Order requests are received, the Region may proceed with detail design and construction of the recommended works as presented in this report.

Information will be collected in accordance with the *Municipal Freedom of Information and Protection of Privacy Act*. All comments, with the exception of personal information, will become part of the public record.

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3 Phase One: Identification and Description of Problem

3.1 Location and Description of the Roadway

Mayfield Road is located on the boundary between the City of Brampton and the Town of Caledon within the Region of Peel. Mayfield Road is an east-west arterial road, and is currently a two-lane road west of Hurontario Street and a four-lane road east of Hurontario Street. The posted speed limit in the Study Area varies from 60 km/hr to 80 km/hr. Generally, Mayfield Road is a relatively straight and flat roadway, with the exception in the vicinity of the Heart Lake Conservation Area, where the road drops into the valley and there are back to back reverse curves, and at the Orangeville Railway crossing, where there are back to back reverse curves. The length of Mayfield Road within the project limits is approximately 5.8 km.

The approximate limits of the project Study Area are illustrated in **Figure 1-1**. The study will examine the need and feasibility for widening, intersection improvements, changes to road and intersection geometrics and pavement rehabilitation on Mayfield Road to address short and long-term issues related to planned future growth; operational and servicing deficiencies; and road link capacity limitations. The study will also review opportunities to facilitate public transit, pedestrian, and cyclist movement.

The intersections and current controls within the Mayfield Road Study Area are summarized in **Table 3-1** and the lane configuration is shown in **Figure 3-1** and **Figure 3-2**:

Table 3-1 - Current Intersection Controls

Intersection	Control	Dedicated Left-Turn Lane	Dedicated Right -Turn Lane
Chinguacousy Road	Signalized	N/A	N/A
McLaughlin Road	Signalized	1 (WB movements) 1 (EB movements)	1 (NB movements)
Van Kirk Drive	Stop (for NB movements)	1 (WB movements) 1 (NB movements)	1 (EB movements) 1 (NB movements)
Cresthaven Road / Robertson Davies Drive	Signalized	1 (WB movements) 1 (EB movements) 1 (NB movements) 1 (SB movements)	1 (WB movements) 1 (EB movements)
Hurontario Street	Signalized	2 (WB movements) 1 (EB movements) 2 (SB movements) 1 (NB movements)	1 (WB movements) 1 (EB movements) 1 (NB movements) 1 (SB movements)
Colonel Bertram Road	Signalized	1 (WB movements) 1 (EB movements) 1 (NB movements)	1 (WB movements) 1 (EB movements)
Summer Valley Drive	Signalized	1 (EB movements) 1 (SB movements)	1 (SB movements)
Valley View Road	Stop (for NB movements)	N/A	N/A
Inder Heights Drive / Snellview Boulevard	Stop (for SB & NB movements)	1 (WB movements) 1 (EB movements)	1 (NB movements)
Kennedy Road	Signalized	1 (WB movements) 1 (EB movements) 1 (NB movements) 1 (SB movements)	1 (WB movements) 1 (NB movements)
Stonegate Drive	Stop (for NB movements)	1 (WB movements)	N/A
Heart Lake Road	Signalized	1 (WB movements) 1 (EB movements) 1 (NB movements) 1 (SB movements)	1 (WB movements) 1 (EB movements) 1 (NB movements) 1 (SB movements)

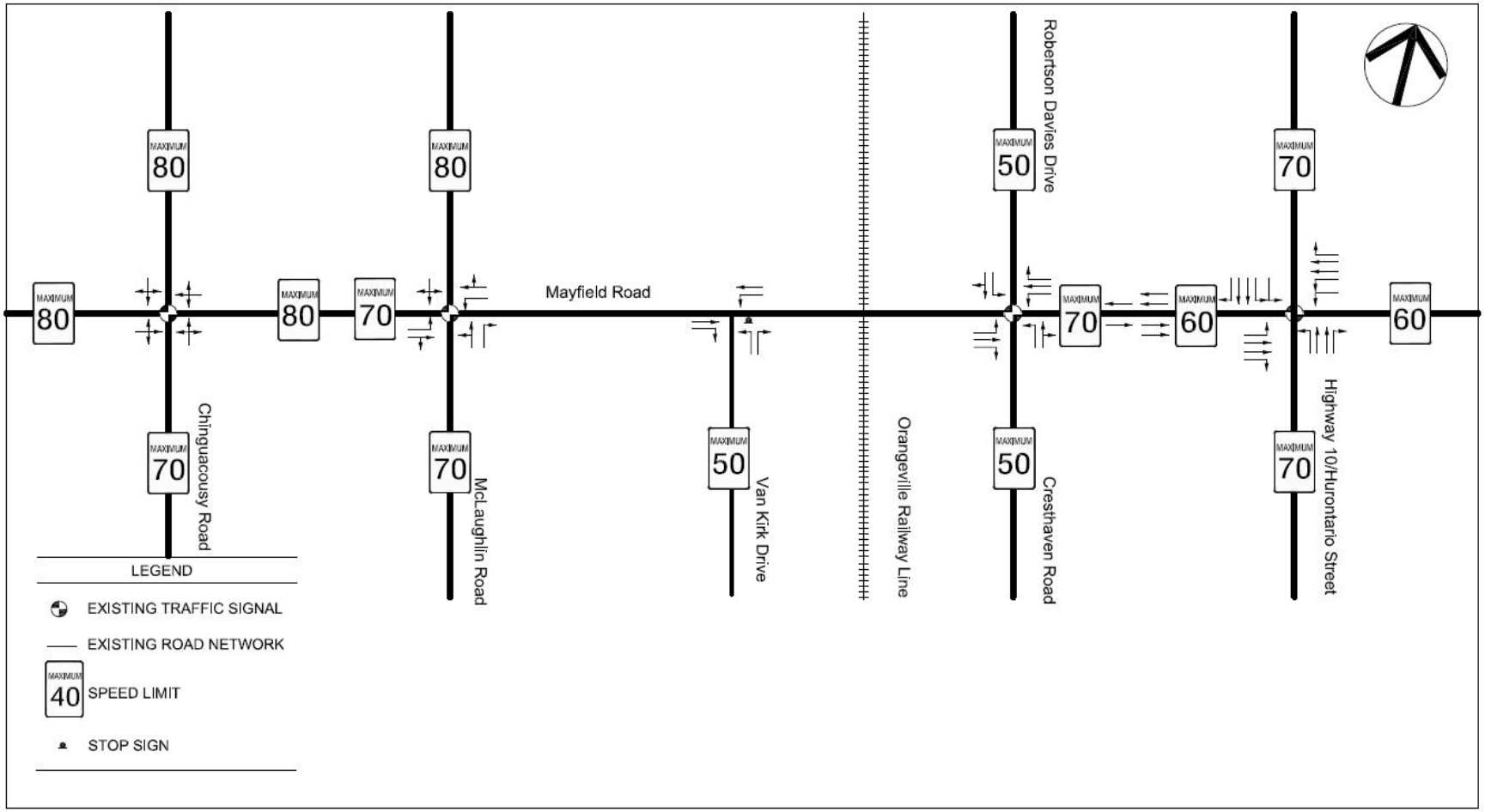

Figure 3-1 - Existing Roadway Lane Configurations west of Hurontario Street

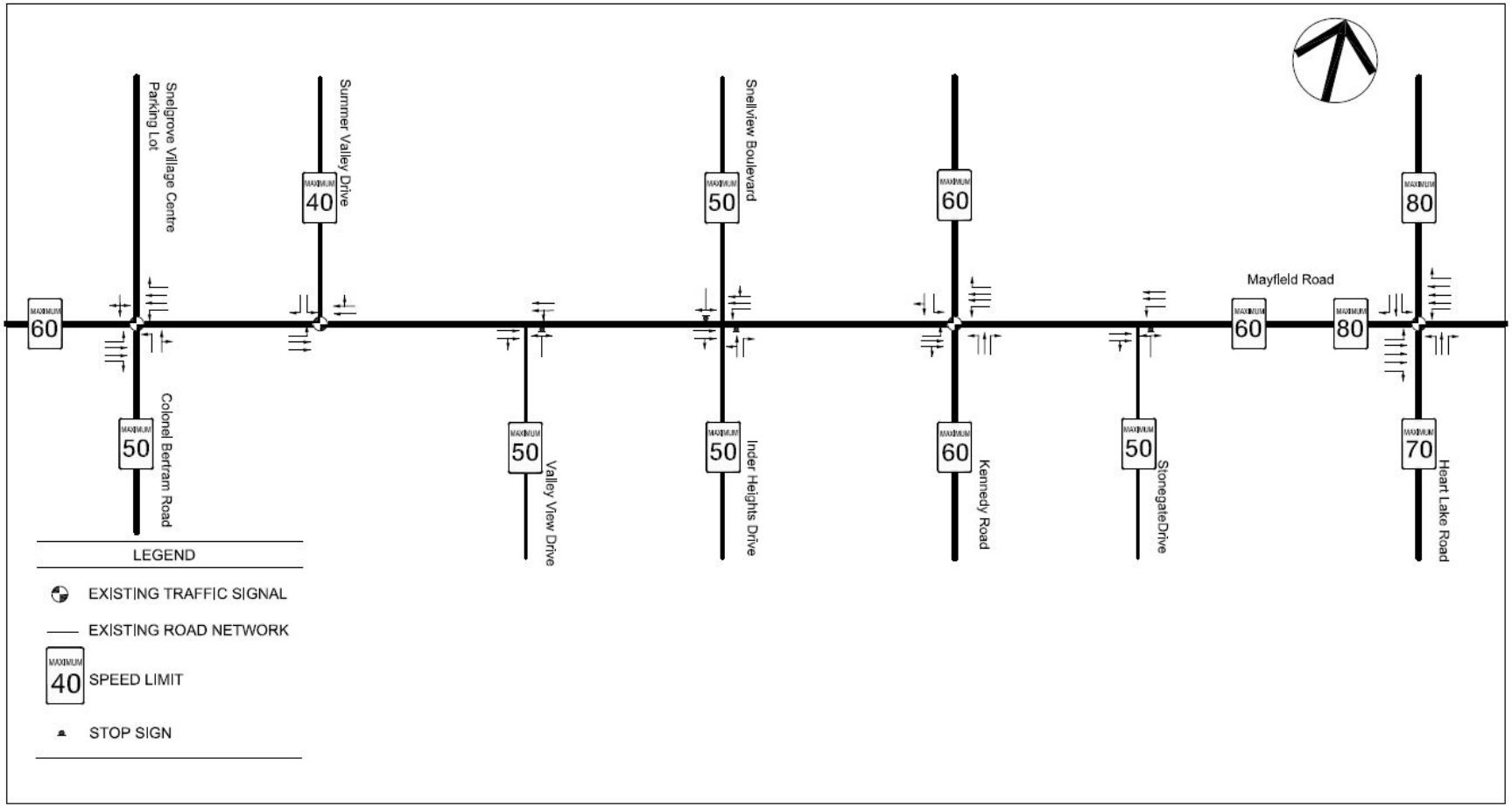

Figure 3-2 - Existing Roadway Lane Configurations east of Hurontario Street

3.1.1 Traffic Information

An analysis of the operation of the intersections was undertaken to determine the quality of operation (i.e. Level of Service, LOS). Intersection capacity analyses for the study intersections for existing traffic conditions for the AM and PM peak hours was analyzed using Highway Capacity Manual (HCM) methodology and Synchro 7.0 software. The analysis is based on the design hour traffic demand volumes and assumes existing lane configurations. The queuing analysis for signalized intersections is based on the intersection storage calculation spreadsheet that is typically used for queuing analysis for Region of Peel intersections. The queuing analysis for unsignalized intersections is based on the HCM methodology. The results of the capacity review for the critical morning and afternoon peak hours at the intersections for the 2021 planning horizon are illustrated in **Table 3-2**.

Table 3-2 - Overall Future Intersection Level of Service (2021) –No Road Improvements

Intersection	Volume-to-Capacity Ratio		Delay (s) and Level of Service			
	Critical Ratio		Overall LOS[1]		Delay (secs)	
	AM	PM	AM	PM	AM	PM
Chinguacousy Road	**0.79**	**1.11**	**LOS C**	**LOS F**	**20**	**91**
Eastbound Left/Through/Right	0.46	0.58	LOS A	LOS A	8	10
Westbound Left/Through/Right	0.89	1.35	LOS C	LOS F	23	181
Northbound Left	0.10	0.40	LOS C	LOS C	25	27
Northbound Through	0.25	0.18	LOS C	LOS C	27	24
Northbound Right	0.17	0.12	LOS C	LOS C	26	23
Southbound Left/Through/Right	0.47	0.20	LOS C	LOS C	29	24
New Collector 1						
Eastbound Left/Through/Right	0.01	0.03	LOS A	LOS A	0	1
Westbound Left/Through/Right	0.03	0.08	LOS A	LOS A	1	2
Northbound Left	0.64	0.79	LOS F	LOS F	111	230
Northbound Through/Right	0.25	0.22	LOS C	LOS D	20	27
Southbound Left	0.70	0.64	LOS F	LOS F	151	204
Southbound Through/Right	0.10	0.20	LOS C	LOS E	20	45
New Collector 2						
Eastbound Through/Right	0.48	0.42			0	0
Westbound Left/Through	0.03	0.09	LOS A	LOS A	1	3
Northbound Left	0.75	1.31	LOS F	LOS F	122	451
Northbound Right	0.23	0.09	LOS C	LOS B	18	14
McLaughlin Road	**0.90**	**0.77**	**LOS C**	**LOS C**	**27**	**25**
Eastbound Left	0.18	0.21	LOS A	LOS A	9	9
Eastbound Through/Right	0.88	0.72	LOS C	LOS B	25	15
Westbound Left	1.06	0.95	LOS F	LOS E	107	57
Westbound Through/Right	0.67	0.90	LOS B	LOS C	14	26
Northbound Left	0.15	0.27	LOS C	LOS C	21	22
Northbound Through	0.37	0.38	LOS C	LOS C	23	23
Northbound Right	0.39	0.08	LOS C	LOS C	23	21
Southbound Left/Through/Right	0.59	0.24	LOS C	LOS C	26	22
Van Kirk Drive						
Eastbound Through	0.60	0.45			0	0
Eastbound Right	0.00	0.01			0	0
Westbound Left	0.09	0.23	LOS B	LOS B	13	11
Westbound Through	0.47	0.65			0	0
Northbound Left	0.45	0.12	LOS F	LOS F	239	243
Northbound Right	0.80	0.22	LOS F	LOS C	59	16

Table 3-2 - Overall Future Intersection Level of Service (2021) –No Road Improvements

Intersection	Volume-to-Capacity Ratio		Delay (s) and Level of Service			
	Critical Ratio		Overall LOS[1]		Delay (secs)	
	AM	PM	AM	PM	AM	PM
Cresthaven Road / Robertson Davies Drive	**1.01**	**0.93**	**LOS D**	**LOS C**	**54**	**35**
Eastbound Left	0.17	0.99	LOS A	LOS F	7	93
Eastbound Through	1.16	0.61	LOS F	LOS A	96	9
Eastbound Right	0.00	0.03	LOS A	LOS A	5	4
Westbound Left	0.25	0.23	LOS B	LOS A	11	6
Westbound Through	0.68	1.06	LOS B	LOS D	12	53
Westbound Right	0.02	0.10	LOS A	LOS A	5	4
Northbound Left	0.18	0.10	LOS B	LOS C	19	23
Northbound Through/Right	0.34	0.17	LOS C	LOS C	20	23
Southbound Left	0.57	0.38	LOS C	LOS C	25	26
Southbound Through/Right	0.14	0.08	LOS B	LOS C	19	22
Hurontario Street	**1.01**	**0.96**	**LOS D**	**LOS D**	**52**	**46**
Eastbound Left	1.42	1.16	LOS F	LOS F	249	168
Eastbound Through	0.89	0.63	LOS D	LOS D	49	41
Eastbound Right	0.57	0.09	LOS D	LOS C	37	34
Westbound Left	0.69	1.08	LOS E	LOS F	57	132
Westbound Through	0.31	0.62	LOS B	LOS C	20	30
Westbound Right	0.12	0.16	LOS B	LOS C	18	23
Northbound Left	0.77	0.84	LOS E	LOS E	61	58
Northbound Through	0.30	0.86	LOS C	LOS D	32	45
Northbound Right	0.22	0.11	LOS C	LOS C	32	27
Southbound Left	0.38	0.39	LOS D	LOS D	47	53
Southbound Through	0.59	0.28	LOS C	LOS B	25	18
Southbound Right	0.13	0.45	LOS B	LOS C	19	21
Colonel Bertram Road	**0.46**	**0.48**	**LOS A**	**LOS A**	**7**	**9**
Summer Valley Drive	**0.49**	**0.52**	**LOS A**	**LOS A**	**7**	**7**
Valley View Road						
Eastbound Through	0.53	0.33			0	0
Eastbound Through/Right	0.27	0.17			0	0
Westbound Left/Through	0.00	0.00	LOS A	LOS A	0	0
Westbound Left	0.30	0.57			0	0
Northbound Left/Right	0.01	0.01	LOS B	LOS B	15	13
Snellview Boulevard / Inder Heights Drive						
Eastbound Left	0.00	0.03	LOS A	LOS B	10	14
Eastbound Through	0.53	0.32			0	0
Eastbound Through/Right	0.27	0.17			0	0
Westbound Left	0.01	0.03	LOS B	LOS A	13	10
Westbound Through	0.22	0.42			0	0
Westbound Right	0.01	0.05			0	0
Northbound Left	0.21	0.07	LOS F	LOS F	98	71
Northbound Through/Right	0.04	0.01	LOS C	LOS B	15	12
Southbound Left/Through/Right	0.91	1.35	LOS F	LOS F	157	419
Kennedy Road	**0.66**	**1.36**	**LOS E**	**LOS F**	**71**	**83**
Eastbound Left	0.42	0.87	LOS A	LOS D	8	47
Eastbound Through/Right	0.47	0.29	LOS A	LOS A	6	7
Westbound Left	0.38	0.47	LOS A	LOS B	9	12
Westbound Through/Right	0.22	0.52	LOS A	LOS A	5	10
Northbound Left	1.23	3.11	LOS F	LOS F	268	1042
Northbound Through/Right	0.94	0.85	LOS F	LOS E	89	57
Southbound Left	1.74	1.47	LOS F	LOS F	468	323
Southbound Through/Right	1.30	0.86	LOS F	LOS E	213	60

Table 3-2 - Overall Future Intersection Level of Service (2021) –No Road Improvements

Intersection	Volume-to-Capacity Ratio		Delay (s) and Level of Service			
	Critical Ratio		Overall LOS[1]		Delay (secs)	
	AM	PM	AM	PM	AM	PM
Stonegate Drive						
Eastbound Through/Right	0.51	0.31			0	0
Westbound Left	0.28	0.16			0	0
Westbound Through	0.05	0.14	LOS B	LOS B	13	10
Northbound Left/Right	0.19	0.41			0	0
	0.39	0.11	LOS C	LOS C	24	18
Heart Lake Road	**1.17**	**1.33**	**LOS E**	**LOS F**	**85**	**133**
Eastbound Left	0.06	0.20	LOS B	LOS B	14	12
Eastbound Through	0.60	0.28	LOS B	LOS B	19	11
Eastbound Right	0.08	0.03	LOS B	LOS A	14	10
Westbound Left	0.18	0.09	LOS B	LOS B	16	10
Westbound Through	0.29	0.48	LOS B	LOS B	15	13
Westbound Right	0.11	0.63	LOS B	LOS B	14	17
Northbound Left	0.09	1.02	LOS B	LOS F	16	107
Northbound Through	0.45	1.12	LOS B	LOS F	20	111
Northbound Right	0.01	0.01	LOS B	LOS C	15	24
Southbound Left	1.80	3.30	LOS F	LOS F	395	1110
Southbound Through	0.33	1.693	LOS B	LOS F	18	334
Southbound Right	0.03	0.02	LOS B	LOS C	16	31

1. Level of Service or LOS is based on average control delay (in seconds) - For **signalized** intersections, "LOS" represents the overall intersection LOS. For **unsignalized** intersections, it represents the movement with the worst LOS.

The results indicate that many of the movements are either with an overall v/c ratio of more than 0.85 or with LOS “E” or “F”. If no improvements are made along Mayfield Road between Chinguacousy Road and Hurontario Street, there will not be sufficient capacity to accommodate traffic demand and vehicles will experience long delays.

If no improvements are made, the overall level of service of Mayfield Road will further worsen for 2031 conditions and longer delay will be expected.

A more detailed discussion of the traffic assessment is provided in **Section 4.3.2.**

3.2 Problem/Opportunity Statement

Region of Peel has a mandate to provide road service in a safe, efficient and cost effective manner to meet the demands of the customers it serves. As part of that mandate, Region of Peel identifies problems associated with its road service and seeks to address them through roadway improvements. Phase One of the Municipal Class EA process involves documenting the factors which lead to the conclusion that an improvement or change is needed. This in turn leads to the development of a clear statement of the problem being addressed by the project. The problem statement becomes the basis for the identification and evaluation of the alternative solutions, and underpins decision-making throughout the study.

Based on the traffic needs described above, improvements to Mayfield Road are required by 2021. As a result, the following Problem Statement has been developed for this project:

As presently configured, Mayfield Road will not have sufficient capacity to accommodate the anticipated traffic volumes by 2021 and 2031.

Projects do not only address the problems or deficiencies, but also look for opportunities to make improvements or enhancements. Where these opportunities exist, they should also be documented and articulated in a clear statement to ensure that they are incorporated into the project. As a result, the following Opportunity Statement has been developed for this project:

The opportunity exists to update roadway geometrics, integrate cycling facilities, improve transit facilities, improve pedestrian safety, promote alternative methods of transportation and incorporate streetscaping to reflect current Region of Peel policies.

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4 Phase Two: Identification and Evaluation of Alternative Solutions

4.1 Identification and Description of the Alternative Solutions

In response to the Problem/Opportunity Statement, five alternative solutions were identified for comparative evaluation:

- **Alternative #1**: Do Nothing (base case)
- **Alternative #2:** Improve Transportation Systems Management
- **Alternative #3:** Improve Travel Demand Management
- **Alternative #4:** Increase Capacity to Parallel Roadways
- **Alternative #5:** Increase Capacity to Mayfield Road

The alternative solutions are briefly described in the following subsections. Section 4 describes the existing conditions present in the Study Area in order to provide context and baseline information for the evaluation of the Alternative Solutions (Section 5).

4.1.1 Alternative Solution # 1 – Do Nothing

No changes or improvements to Mayfield Road between Chinguacousy Road and Heart Lake Road would be undertaken to address the problem/opportunity. This represents a "status quo" alternative and provides a benchmark or base case for comparing the other alternative solutions.

4.1.2 Alternative Solution # 2 – Improve Transportation Systems Management

Transportation System Management (TSM) strategies are an effective way to optimize road network capacity through minimal construction efforts. TSM strategies optimize transportation infrastructure and manage congestion by means of additional operational improvements such as transit signal priority, HOV lanes, bus bays, turning lanes, segregation of slow moving traffic, providing roundabouts instead of traffic signals, etc.

In order to reduce overall congestion within the Study Area, improvements may be made by improving traffic signal operations, adding dedicated turning lanes at intersections, and providing transit signal priority.

4.1.3 Alternative Solution # 3 – Improve Travel Demand Management

Travel Demand Management (TDM) strategies are aimed at improving the efficiency of the transportation system by influencing travel demands and trip patterns. TDM measures work by altering travel mode choice, frequency of travel and time of travel to reduce peak travel demand resulting in enhanced road network capacity.

This alternative would reduce overall traffic volumes within the Study Area by promoting carpooling, working from home programs, and/or other similar initiatives.

4.1.4 Alternative Solution # 4 – Increase Capacity to Parallel Roadways

This alternative proposes to reduce existing and future traffic volumes on Mayfield Road by adding through lanes and improving traffic operations to other parallel roadways in the area.

4.1.5 Alternative Solution # 5 – Increase Capacity on Mayfield Road

This alternative would physically improve Mayfield Road between Chinguacousy Road and Heart Lake Road by adding through lanes and dedicated turning lanes at intersections within the Study Area.

4.2 Selection of the Appropriate Class EA Schedule

Since the solution to the problem/opportunity is expected to result in a project that will fall under Schedule 'B' or Schedule 'C', it was appropriate to continue through Phase Two of the Municipal Class EA Planning and Design Process. This was a preliminary assessment of the Schedule, which was confirmed at the end of Phase Two once the Preferred Solution had been identified.

4.3 Inventory and Description of the Study Area

With the problem defined, a description of the Study Area was established through a review of available secondary source information sources and field visits.

A description of the Study Area was established through a review of available secondary source information sources and field visits. The following sections provide an overview of the existing Technical/Engineering, Natural and Social/Cultural environments within the Study Area.

4.3.1 Roadway Features

Mayfield Road is an east-west arterial road and forms the boundary line between the City of Brampton and the Town of Caledon. Mayfield Road is currently a two-lane road west of Hurontario Street and a four-lane road east of Hurontario Street. Mayfield Road has a posted speed of 80 km/h between Chinguacousy Road to 100 m west of McLaughlin Road, 70 km/h from 100 m west of McLaughlin Road to 305 m west of Hurontario Street, 60 km/h from 305 m west of Hurontario Street to 100 m west of Heart Lake Road and 80 km/h from 100 m west of Heart Lake Road to Heart Lake Road.

Mayfield Road is classified as a Major Road by the Region of Peel's Official Plan (November 2005). It is to be designed to carry high volumes of traffic between significant activity nodes. The classification of a Major Road by the Region of Peel is similar to the classification of a Major Arterial by the Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads (1999)

4.3.1.1 Horizontal Alignment

The minimum radius for a design speed of 70 km/h is 190 m, for 80 km/h is 250 m and for 90 km/h is 340 m, as shown in Table 2.1.2.6 of the TAC Manual. The desirable curve length, on rural roads and intermediate class urban roads, should be at least 150 m for curve angles greater than 5°, increasing by 30m for every 1° decrease. A minimum length of horizontal curve should be three (3) times the design speed (in m/s). Table 4-1, on the following page summarizes the horizontal curves of Mayfield Road within the Study Area.

There are two sets of broken back curves within the Study Area located between STAs 8+878 – 9+598 and STAs 12+078 – 12+658. While it is generally not desirable to use broken back curves they can be accommodated if a spiral curve is used to connect them. However, for ease of construction tangent lengths can be used, if they provide a driver with enough sight distance to see the change in curvature. In the cases of the broken back curves within the Study Area the curves at STA 8+878 – 9+598 are separated by 50m. At STA 12+078 – 12+658 the curves are separated by 100m. Due to the large radii at each set of curves, sufficient sight distance is available.

Since all existing radii are relatively flat (with the exception of the curves at STA 12+200 and STA 12+535), the length of curve does not cause a reduction in safety when considering the stopping or decision sight distance. Therefore, at stations where the length of the horizontal curve is substandard, the exceptionally large radius creates an almost flat and unnoticeable change in the alignment.

Table 4-1 - Summary of Horizontal Curves on Mayfield Road

PI Station	Existing Radius	Actual Length of Curve	Delta Angle	Design Speed	Desirable Length of Curve	Minimum Length of Curve	Meet or Exceeds Minimum Standard
	(m)	(m)	D°M'S"	(m/s)/(km/h)	(m)	(m)	(yes/no)
7+796.591	R-5000	153.554	1°45'35"	25 / 90	250	75	Yes
8+062.429	R-5000	133.813	1°32'00"	25 / 90	260	75	Yes
9+076.848	R-5000	383.983	4°24'00"	22 / 80	170	66	Yes
9+462.357	R-5000	284.781	4°04'45"	22 / 80	180	66	Yes
10+571.176	R-5000	89.699	3°25'35"	19 / 70	200	57	Yes
10+843.157	R-5000	77.196	2°56'55"	19 / 70	220	57	Yes
11+359.233	R-5000	169.264	1°56'23"	19 / 70	250	57	Yes
11+577.150	R-5000	**28.485**	1°21'36"	19 / 70	260	57	No
12+200.002	R-1200	245.229	11°42'32"	19 / 70	150	57	Yes
12+535.304	R-1200	240.614	11°29'19"	19 / 70	150	57	Yes

Note: Bolded values do not meet the minimum desirable standards

4.3.1.2 Vertical Alignment

A maximum road grade of 5% is acceptable for design speeds of 100 km/h and higher (TAC Page 2.1.3.3). For the design speed of 70km/h a maximum road grade of 6% is acceptable. Road grades should not fall below 0.5% to ensure positive drainage of the roadway. However, in retrofit areas, the minimum grade can be lowered if adequate drainage is provided.

For the design speed of 90 km/h, K-values range from 32-53 m for crest curves (for stopping sight distance), and 30-40 m for sag curves (for headlight control).

There are eight (8) vertical curves within the Study Area. Four (4) are crest curves and four (4) are sag curves. As long as the K-Values are met, or exceeded, the length of the curve can be less than the stopping sight distance. All curves within the Study Area exceed the required design K-values.

Table 4-2 summarizes the vertical alignment within the Study Area.

While maximum grades are not exceeded, minimum grades have not been achieved in the existing rural sections. However, Mayfield Road has not shown any signs of distress as a result of poor drainage.

Table 4-2 - Summary of Vertical Curves on Mayfield Road within Study Area

Station VPI	Vertical Curve Type	Approximate Length of Vertical Curve	K-Value	Design Speed	Meets or Exceeds Minimum Standard
	(crest/sag)	(m)		(km/h)	(yes/no)
Entrance Grade: -0.03%					
7+588.115	Sag	11	± 45	90	Yes
Exit Grade: 0.25%					
Entrance Grade: 0.25%					
8+238.158	Crest	23	± 70	90	Yes
Exit Grade: -0.24%					
Entrance Grade: -0.24%					
10+436.856	Crest	105	± 35	70	Yes
Exit Grade: -3.23%					
Entrance Grade: -3.23%					
10+725.788	Sag	306	± 40	70	Yes
Exit Grade: 4.40%					
Entrance Grade: 4.40%					
11+080.906	Crest	282	± 60	70	Yes
Exit Grade: -0.29%					
Entrance Grade: -0.29%					
11+665.340	Sag	205	± 40	70	Yes
Exit Grade: 4.84%					
Entrance Grade: 4.84%					
12+010.848	Crest	485	± 60	70	Yes
Exit Grade: -3.24%					
Entrance Grade: -3.24%					
12+370.897	Sag	183	± 55	70	Yes
Exit Grade: 0.07%					

Note: Bolded values do not meet the minimum desirable standards

4.3.1.3 Cross Sections

Mayfield Road between Chinguacousy Road and 160 m west of Hurontario Street is generally a 2-lane rural section with turning lanes at selected intersections. From 160 m west of Hurontario Street to 330 m west of Heart Lake Road, Mayfield Road is an urbanized 4-lane section with turning lanes at selected intersections. The last 330 m of Mayfield Road, up to Heart Lake Road intersection, is a 6-lane urban section with turning lanes.

The through lane widths vary from 3.2 m to 4.1 m and generally do meet TAC standards for minimum lane width of 3.75 m of a major arterial (TAC Table 2.2.2.3).

Currently, there are exclusive left turn lanes at ten (10) intersections:

- McLaughlin Road;
- Van Kirk Drive;
- Cresthaven Road/Robertson Davies Drive;
- Hurontario Street;
- Colonel Bertram Road;
- Summer Valley Drive;
- Inder Heights Drive;
- Kennedy Road;
- Stonegate Drive; and
- Heart Lake Road.

In addition, there are exclusive right turn lanes at six (6) intersections:

- Van Kirk Drive
- Cresthaven Road/Robertson Davies Drive;
- Hurontario Street;
- Colonel Bertram Road;
- Kennedy Road; and
- Heart Lake Road.

All of the left turn lanes along Mayfield Road within the project limits meet the minimum width of 3.3 m or more when not adjacent to a raised median and at least 3.0 m when adjacent to a raised median.

The southbound right turn lane at Van Kirk Drive intersection is currently 3.1 m and the northbound right turn lane at Hurontario Street intersection is only 3.0 m. Both right turn lanes are not in conformance with the standard lane width as indicated in TAC Geometric Design Guide for a turn lanes. Right-turn lanes are to be no more than 0.2m less than through lanes but not less than 3.3m. However, left-turn lanes if adjacent to raised medians can be as narrow as 3.0m, unless they are dual or triple left-turn lanes,

For the rural sections along Mayfield Road, shoulders widths measured between 2.5-4.0m. This range of shoulder widths is acceptable, as existing shoulders erode over time and a minimum or 3.0 is usually designed for high volume roadways as per section 2.2.4.2.

4.3.1.3.1 Superelevation and Cross-Fall

Superelevation is generally used to aid drivers through a circular or spiral curve. When a vehicle enters a circular curve it experiences a radial acceleration towards the centre of the curve. This in turn causes a centripetal force on the vehicle pushing it towards the outside of the curve. Using the weight of the car to counteract this, a superelevated section is introduced. However, if the horizontal curve is of sufficient size (large radius) then superelevation may not be required. Since the majority of the curves along Mayfield Road are greater than 4000m, no superelevation is required (TAC Table 2.1.2.6)

At STA 12+200 and STA 12+535 the radii are 1200m. For the design speed of 70km/h the superelevation rate should be 2.3%. The superelevation rate was measured between 2-2.5%.

Normal cross-fall along tangent sections of roadway is 2%. Along Mayfield Road, with the exception of intersections and superelevated sections, all tangent sections meet this requirement.

4.3.1.4 Intersections

At intersections, consideration of storage length, parallel lane length and taper lengths must be considered when exclusive turn lanes are introduced. The storage length is a calculated value based on forecast traffic volumes. Parallel and taper lengths are calculated based on the design speed of the roadway. Parallel and taper lengths must be of sufficient length to accommodate the stopping sight distance. This value is exclusive of the storage length requirements.

There are a total of eight (8) signalized and four (4) unsignalized intersections within the Study Area.

4.3.1.4.1 Signalized Intersections

The existing signalized intersections within the Study Area are at the following locations:

- Chinguacousy Road;
- McLaughlin Road;
- Cresthaven Road/Robertson Davies Drive;
- Hurontario Street;
- Colonel Bertram Road;
- Summer Valley Drive;
- Kennedy Road; and
- Heart Lake Road.

While taper lengths are of sufficient length, deceleration lengths at all signalized intersections are insufficient in length with the exception of the west and north approach at Hurontario Street, the west and north approach at Summer Valley Drive, the east approach at Kennedy Road, and all approaches at Heart Lake Road.

Only right-turning sight distances were reviewed at signalized intersections. Since vehicles are permitted to turn on a red light, this review will determine if sufficient sight distance is available for vehicles to safely complete the turning manoeuvre.

Only the north approach at Summer Valley Drive lacked sufficient sight distance. A tree is located within the required sight triangle. However, a proper sight triangle at this intersection has not been obtained and the tree is on private property. Obtaining additional property for a sight triangle should be undertaken. However, the sight line can also be improved without additional property requirements if the stop bar is moved closer to the intersection. Detailed findings of the current signalized intersection configuration can be found in **Appendix D**.

4.3.1.4.2 Un-signalized Intersections

The existing un-signalized intersections within the Study Area are at the following locations:

- Van Kirk Drive;
- Valley View Drive;
- Inder Heights Drive; and
- Stonegate Drive.

While taper lengths are of sufficient length, deceleration lengths at all unsignalized intersections are of insufficient in length with the exception of Valley View Intersection.

Both left and right-turning sight distances were reviewed for approaches which were stop controlled. Uncontrolled approaches were not reviewed. All of the intersections met or exceeded the required turning sight distance.

4.3.2 Traffic

4.3.2.1 Roadway Network

Mayfield Road is an east-west arterial road under the jurisdiction of the Region of Peel and forms the boundary line between the Town of Caledon and the City of Brampton. From Chinguacousy Road to Hurontario Street (2.8 km), Mayfield Road has two lanes. From Hurontario Street (2.8 km) to Heart Lake Road, Mayfield Road has four through lanes.

Mayfield Road has a posted speed of 80 km/h between Chinguacousy Road to 100 m west of McLaughlin Road, 70 km/h from 100 m west of McLaughlin Road to 305 m west of Hurontario Street, 60 km/h from 305 m west of Hurontario Street to 100 m west of Heart Lake Road and 80 km/h from 100 m west of Heart Lake Road to Heart Lake Road.

Chinguacousy Road south of Mayfield Road is classified as a minor collector road and is under the jurisdiction of the City of Brampton, has two lanes and a speed limit of 70km/h. North of Mayfield Road, Chinguacousy Road is classified as a collector road and is under the jurisdiction of the Town of Caledon, has two lanes and a speed limit of 80km/h.

McLaughlin Road south of Mayfield Road is classified as a minor collector road and is under the jurisdiction of the City of Brampton, has two lanes and a speed limit of 70km/h. North of Mayfield Road, McLaughlin Road is classified as collector road and is under the jurisdiction of the Town of Caledon, has two lanes and a speed limit of 80km/h.

Hurontario Street from south of Collingwood Avenue to south of Mayfield Road is classified as a major arterial road and is under the jurisdiction of the City of Brampton, has four lanes and a speed limit of 70km/h.

Kennedy Road south of Mayfield Road is classified as a minor collector road and is under the jurisdiction of the City of Brampton, has four lanes and a speed limit of 60km/h. North of Mayfield Road, Kennedy Road is classified as a collector road and is under the jurisdiction of the Town of Caledon, has two lanes and a speed limit of 60km/h.

Heart Lake Road south of Mayfield Road is classified as a minor collector road and is under the jurisdiction of the City of Brampton, has two lanes and a speed limit of 70km/h. North of Mayfield Road, Heart Lake Road is classified as a collector road and is under the jurisdiction of the Town of Caledon, has two lanes and a speed limit of 80km/h.

Van Kirk Drive is a City of Brampton local road that forms an unsignalized T-intersection with Mayfield Road. It has two lanes and is stop controlled at Mayfield Road and has a 50km/h speed limit.

Cresthaven Road / Robertson Drive: Cresthaven Road is a City of Brampton local road with two lanes and a 50km/h speed limit. Robertson Drive is a Town of Caledon local road with two lanes and a 50km/h speed limit. Cresthaven Road / Robertson Drive form a signalized intersection with Mayfield Road.

Colonel Bertram Road is a City of Brampton local road that has two lanes, a 50km/h speed limit and is signalized at Mayfield Road. The north leg of the Colonel Bertram Road at Mayfield Road intersection is a shopping plaza driveway.

Summer Valley Drive is a City of Brampton local road that has two lanes, a 40km/h speed limit and is signalized at Mayfield Road. Summer Valley Drive forms a T-intersection with Mayfield Road.

Valley View Road is a City of Brampton local road that has two lanes, a 50km/h speed limit and is unsignalized at Mayfield Road. Valley View Road forms a T-intersection with Mayfield Road.

Inder Heights Drive \ Snellview Boulevard: Inder Heights Drive is a City of Brampton local road that has two lanes, a 50km/h speed limit. Snellview Boulevard is a Town of Caledon local road with two lanes and a 50 km/h speed limit. Inder Heights Drive / Snellview Boulevard form an unsignalized intersection with Mayfield Road.

Stonegate Drive is a City of Brampton local road that has two lanes, a 50km/h speed limit and is unsignalized at Mayfield Road. Stonegate Drive forms a T-intersection with Mayfield Road.

The existing lane configurations at each intersection are provided in **Figure 4-1** and **Figure 4-2** on the following pages.

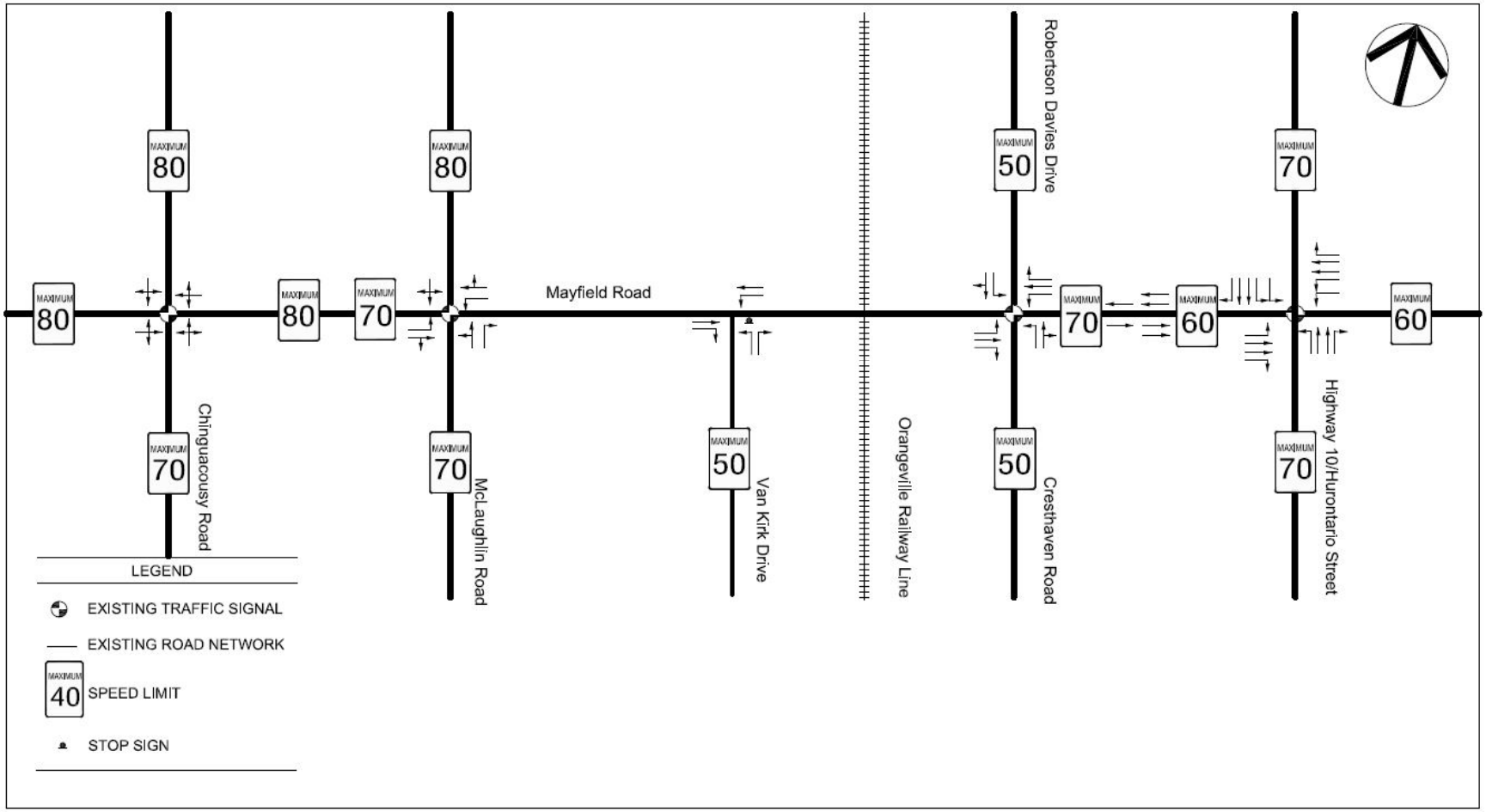

Figure 4-1 - Existing Roadway Lane Configurations west of Hurontario Street

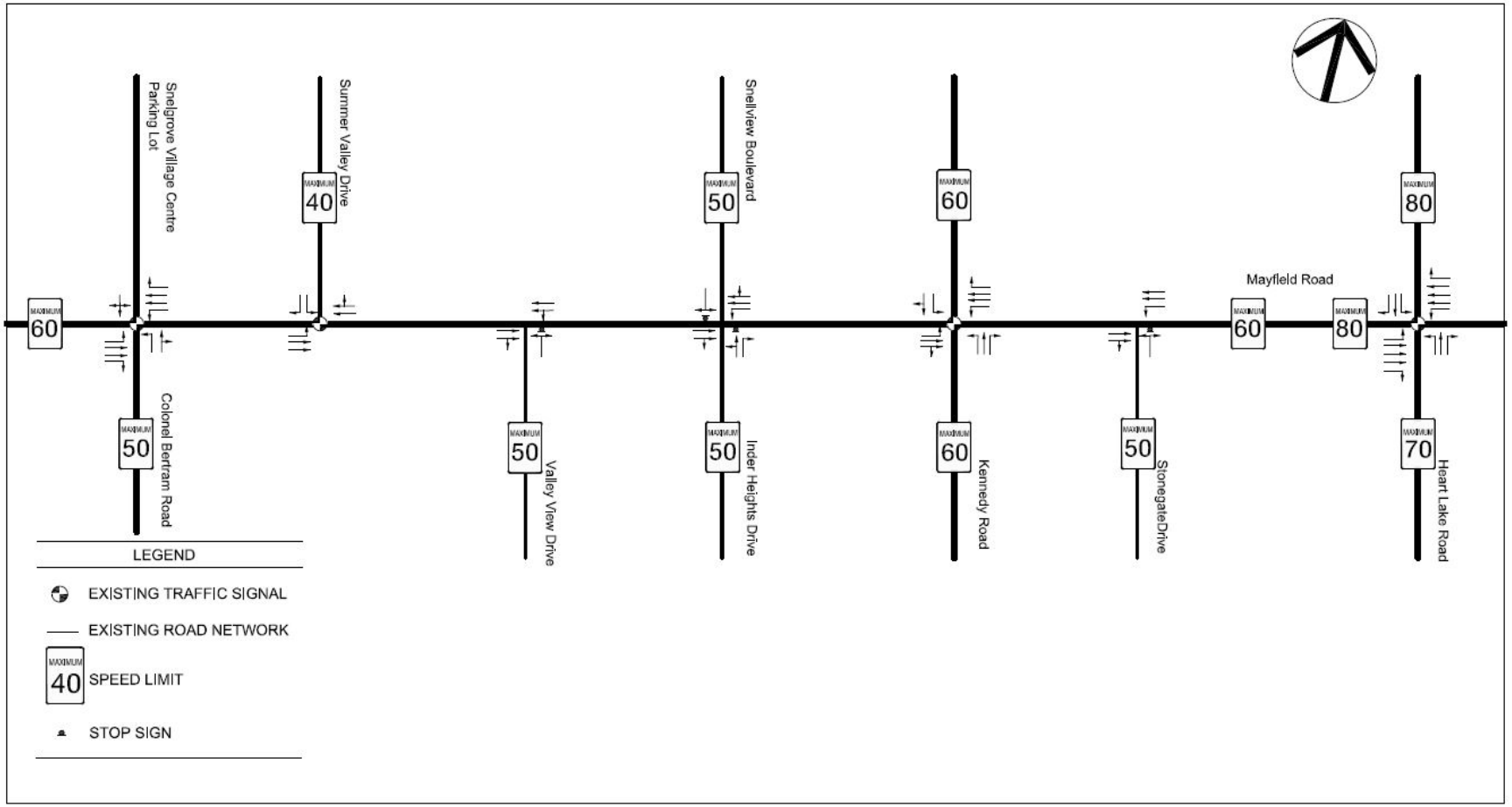

Figure 4-2 - Existing Roadway Lane Configurations east of Hurontario Street

4.3.2.2 Existing Traffic Volumes

2010 AM, midday and PM peak hour turning movement counts for the Mayfield Road corridor were provided to WSP by the Region of Peel. The approximate range of two-way traffic volumes along Mayfield Road within the Study Area are:

- 900 vehicles per hour west of Chinguacousy Road to 1,800 vehicles per hour east of Heart Lake Road in the AM peak hour
- 200 vehicles per hour east of Chinguacousy Road to 650 vehicles per hour west of Summer Valley Drive in the midday peak hour
- 800 vehicles per hour east of Chinguacousy Road to 1,800 vehicles per hour east of Heart Lake Road in the PM peak hour

The midday peak hour volumes are significantly lower than the AM and PM peak hour volumes along the corridor. The only exception is at the Orangeville Railway crossing west of Cresthaven Road where the midday peak hour was given special consideration due to the longer duration of operation of the crossing warning system during the midday peak hour in comparison to the AM and PM peak hours.

The AM and PM peak hour traffic volumes for several movements at the intersection of Heart Lake Road at Mayfield Road from the turning movement counts were significantly lower when compared to the information in the existing Synchro network that was provided to WSP by the Region of Peel. Consequently, the AM and PM peak hour turning movements for the southbound through, southbound left and westbound right movements from the Synchro model were adopted for this study. Traffic volumes were balanced between intersections where appropriate.

The existing AM and PM peak hour traffic volumes are shown in **Figure 4-3** and **Figure 4-4** on the following page.

4.3.2.3 Existing Traffic Capacity Analysis

Intersection capacity analyses for the study intersections for existing traffic conditions for the AM and PM peak hours was analyzed using Highway Capacity Manual (HCM) methodology and Synchro 7.0 software. The new Regional Guidelines for Using Synchro Version 7.73, Revision 8, December 2010 were adopted in the capacity analysis. The queuing analysis for signalized intersections is based on the intersection storage calculation spreadsheet that is typically used for queuing analysis for Region of Peel intersections. The queuing analysis for unsignalized intersections is based on the HCM methodology.

A summary of the capacity analysis showing the overall Level of Service (LOS) and overall volume-to-capacity (v/c) ratios for signalized intersections and the LOS and v/c ratio for the critical lane group for unsignalized intersections is provided in **Table 4-3**. A more detailed summary of the intersection capacity analysis and queuing analysis results can be found in **Appendix D**.

The analysis of existing conditions identifies that the signalized intersections have an overall v/c ratio ranging from 0.24 to 0.62 in the AM peak hour and from 0.26 to 0.58 in the PM peak hour with no critical lane group movements, which indicates that the intersections are operating with reserve capacity during both AM and PM peak hours. The overall LOS for signalized intersections ranges from LOS A to LOS C in the AM and PM peak hours. These are good operational characteristics for the signalized intersections.

At unsignalized intersections all individual lane group v/c ratios are significantly below 0.85 in both the AM and PM peak hours, which indicates that the intersections are operating with reserve capacity. The northbound vehicles exiting the side streets experience the longest delays in both the AM and PM peak hours. These delays range from 11 seconds (LOS B) to 26 seconds (LOS D) in the AM peak hour and from 12 seconds (LOS B) to 40 seconds (LOS E) in the PM peak hour. These are good operational characteristics for the unsignalized intersections.

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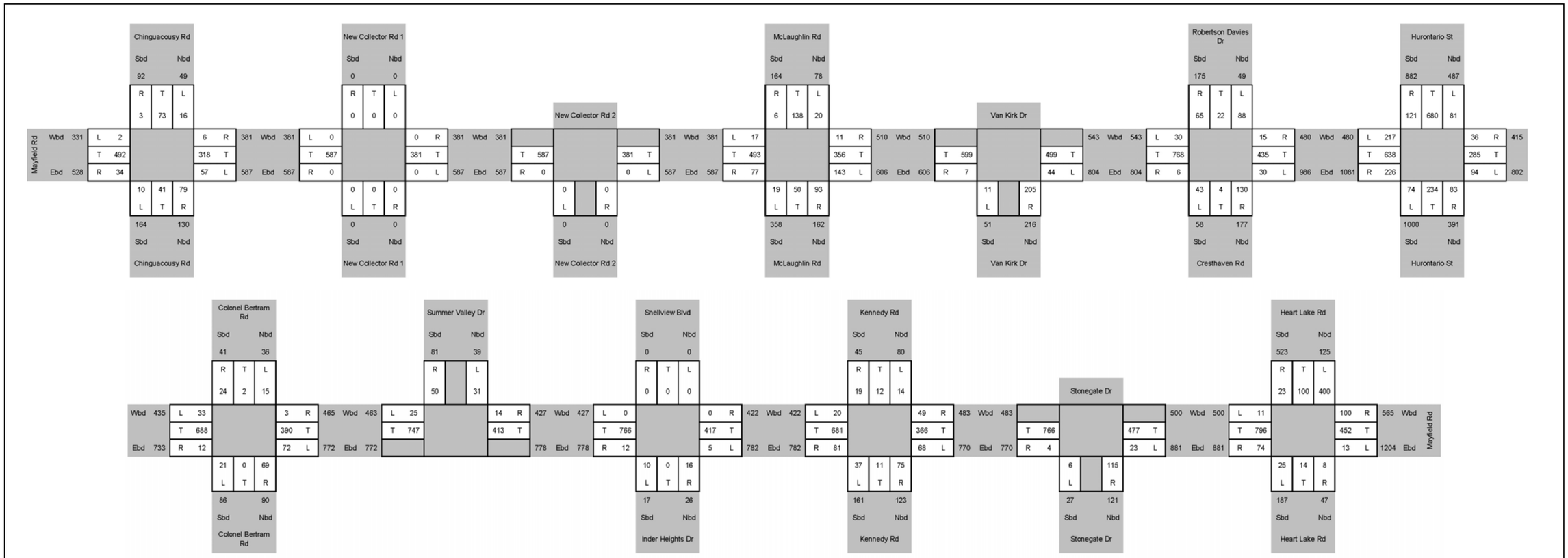

Figure 4-3 - Existing AM Peak Hour Traffic Volumes

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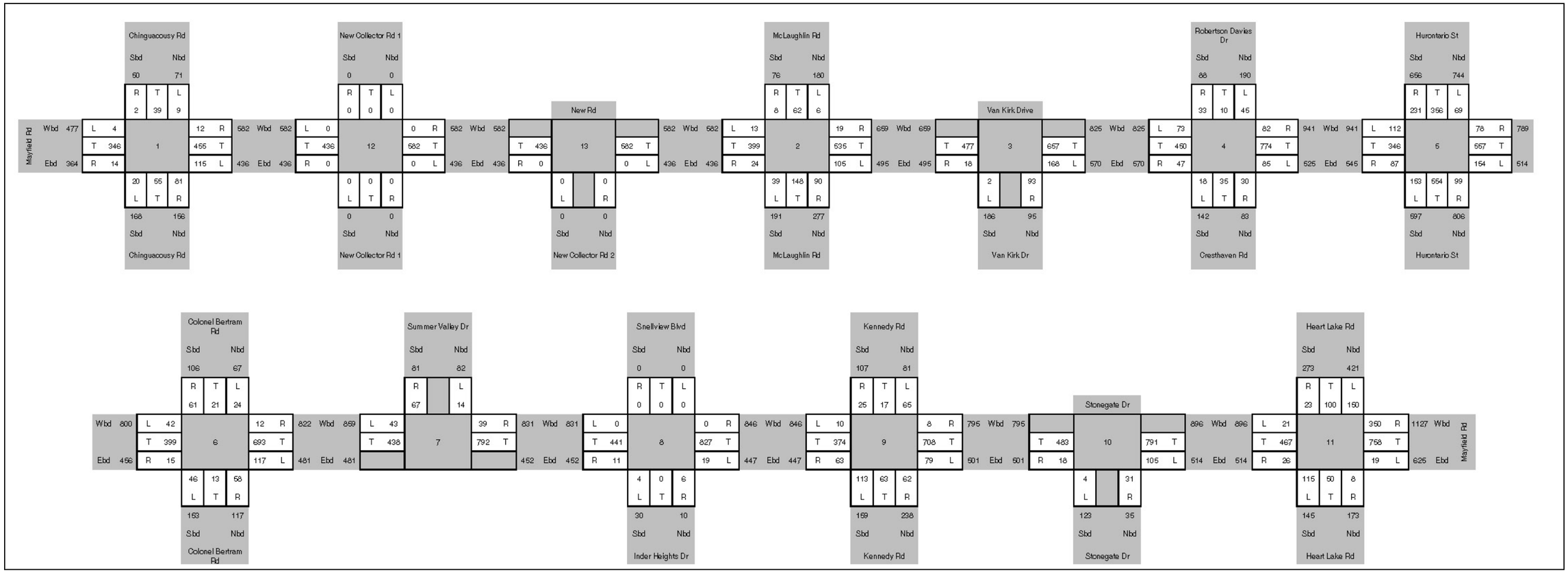

Figure 4-4 - Existing PM Peak Hour Traffic Volumes

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Table 4-3 - Intersection Level of Service, Existing Traffic Volumes

Intersection	AM Peak Hour			PM Peak Hour		
Movement	V/C	Delay (sec.)	LOS	V/C	Delay (sec.)	LOS
Mayfield Road and Chinguacousy Road	0.47	10	B	0.58	11	B
Mayfield Road and McLaughlin Road	0.52	12	B	0.53	14	B
Mayfield Road and Van Kirk Drive Northbound Left	0.06	26	D	0.02	40	E
Mayfield Road and Cresthaven Road/Robertson Davies Drive	0.62	12	B	0.56	8	A
Mayfield Road and Highway 10	0.62	26	C	0.55	26	C
Mayfield Road and Colonel Bertram Road	0.24	8	A	0.27	10	B
Mayfield Road and Summer Valley Drive	0.27	6	A	0.27	6	A
Mayfield Road and Valley View Drive Northbound Left	0.01	11	B	0.00	10	B
Mayfield Road and Inder Heights Drive Northbound Left	0.04	22	C	0.01	18	C
Mayfield Road and Kennedy Road	0.44	10	A	0.32	14	B
Mayfield Road and Stonegate Drive Northbound Left	0.30	18	C	0.07	13	B
Mayfield Road and Heart Lake Road	0.56	17	B	0.39	13	B

The capacity analysis shows that under existing conditions all signalized and unsignalized intersections have good operational characteristics with low delays, reserve capacity and no critical movements.

4.3.2.4 Transit

4.3.2.4.1 Brampton Transit

Brampton Transit operates two (2) regular routes along Mayfield Road: Route 7-Kennedy and Route 24-Van Kirk Industrial.

Route 7-Kennedy runs north-south from Mayfield Road in Brampton to Courtney Park Drive East in Mississauga. Route 24-Van Kirk Industrial runs north-south from north of Mayfield Road to the Downtown Brampton Terminal. **Table 4-4** shows the existing time required for each bus to travel from one end of the route to the other.

Table 4-4 - Existing time required for buses to travel from one end of the route to the other

Route	AM Peak	Midday	PM Peak	Evening	Saturday	Sunday
7 Kennedy	20 min	20 min	20 min	30 min	30 min	30 min
24 Van Kirk Industrial	30 min	30 min	30 min	60 min	60 min	60 min

Brampton Transit also provides special routes before and after school to various secondary schools. Four of these routes, Routes 202, 203, 204, and 213, serve various areas within the Study Area. Routes 202, 203, and 204 connect the neighbourhoods south of Mayfield Road near Hurontario Street and Kennedy Road to the Mayfield Secondary School at Mayfield Road and Bramalea Road. Route 213 connects the neighbourhoods to the southwest of the Mayfield Road / Hurontario Street intersection with St. Edmund Campion Secondary School on Sandalwood Parkway.

The existing bus routes are served by several stops within the Study Area. These bus stops are listed in **Table 4-5**

Table 4-5 - Existing Bus Stops Within Study Area

On Street	At Street	Direction	Route(s) Served
Cresthaven Road	South of Mayfield Road	Northbound, Southbound	213
Robertson Davies Drive	South of Sundridge Street	Northbound	24
Mayfield Road	East of Hurontario Street	Eastbound	7, 202
Hurontario Street	South of Mayfield Road	Northbound, Southbound	NB: 7, 202 SB: 24, 204
Hurontario Street	North of Mayfield Road	Southbound	24
Mayfield Road	Opposite of Summer Valley Drive	Eastbound	7, 202
Mayfield Road	Inder Heights Drive	Eastbound	7, 202
Kennedy Road	South of Mayfield Road	Southbound	7, 202, 203

4.3.2.4.2 GO Transit

GO Transit operates one bus route (37–Orangeville) within the Study Area. The 37-Orangeville runs along Hurontario Street, from Orangeville south through Caledon and Brampton to the Downtown Brampton Terminal. The bus stops on Hurontario Street at Mayfield Road. Six (6) trips operate each way Monday through Friday; most southbound trips operate in the morning and most northbound trips operate in the afternoon. No service is provided on weekends.

Orangeville Brampton Railway

The Orangeville Brampton Railway crosses over Mayfield Road approximately 220m west of Cresthaven Road. The rail traffic over the Mayfield Road crossing is four (4) trains per week (two (2) on Tuesday and two (2) on Thursday). Excursion trains generally operate on Saturday and Sunday and add one (1) train in each direction on these days. Orangeville Brampton Railway (OBRI) does not expect any significant increase in rail traffic in the short term (five (5) years) and are not able to predict for a longer term period.

The train speed at the crossing is 40.2km/h (25mph) and requires crossing circuits approximately 1,100ft (335m) for a warning system with gates. Based on a 20-car train proceeding at a constant 25mph, the time from when the lights start to flash until the gates are fully raised is 90 seconds.

At Mayfield Road, the railway grade crossing has flashing red lights and crossbuck signs installed on both sides of the road. There is no crossing gate arms and relied upon road users to follow the associated warning signals to stop.

The railway siding (Snelgrove) located just north of the crossing is used to allow the locomotive to "run around" the cars to facilitate switching at industries in the area and results in the crossing being blocked for longer periods, and also activation of the warning system when the train will not enter the crossing. When switching occurs the time from when the lights start to flash until the gates are fully raised is approximately five minutes but does not occur in the AM or PM peak hours. Switching usually occurs between 9:00AM through 11:00AM depending on customer needs. The Credit Valley Explorer excursion train has spring, summer and fall schedules requiring the locomotive runaround at Mayfield somewhere between 1:00PM and 2:00PM during winter. Specialty trains require locomotives runaround later in the day between 6:00PM and 8:00PM.

4.3.3 Traffic Safety

Reported collisions between January 2005 and December 2009, were used to determine if Mayfield Road was operating safely. This five-year period was used to represents collision trends within the Study Area

and was compared to a predicted collision frequency. The predicted collision frequency was calculated using the Highway Safety Manual (HSM).

4.3.3.1 Collisions

Figure 4-5, on the following page shows reported collisions within the Study Area for the five-year period. The location, type of impact and severity of each impact is shown graphically. Additional details of these collisions can be found in Appendix C of the Traffic Report (see **Appendix D**).

Collisions are classified into one of three categories, Property Damage Only (PDO), Non-Fatal Injury, or Fatal Collision. Collisions that are classified as PDO can involve more than one vehicle. However, they usually consist of only one vehicle striking an object. In PDO collisions, there are no reported injuries to drivers, passengers, or pedestrians. Injuries to drivers, passengers or pedestrians, which are non-fatal, are classified as non-fatal injuries. Finally, collisions resulting in the death of the driver, passenger or pedestrian, are classified as Fatal Collisions.

A total of 185 collisions were reported between January 2005 and December 2009. The severity of each collision is summarized in **Table 4-6**

Table 4-6 - Summary of Collision Severity

Collision Severity	2005	2006	2007	2008	2009	Total	Proportion
Fatal	0	0	0	1	0	1	1%
Non-fatal injury	9	7	7	6	6	35	19%
Property Damage Only	32	24	20	36	37	149	80%
Total	**41**	**31**	**27**	**43**	**43**	**185**	**100%**

4.3.3.1.1 Intersections

Most collisions occurred at the Hurontario Street, Kennedy Road and Heart Lake Road intersections, with the majority of the collisions being rear-end type at Kennedy Road and Heart Lake Road. Mayfield Road at Hurontario Street is the largest intersection in the Study Area. Both Hurontario Street and Mayfield Road contain four through lanes. Divisional islands were installed in 2007 and a second left-turn lane has been added on the southbound and westbound approaches. Gas stations are located in the southwest and northeast quadrants of the intersection and a commercial shopping plaza is located in the southeast. The presence of the corresponding commercial driveways increases the risk of collisions due to conflicting movements.

4.3.3.1.2 Mid-Block

During 2008 and 2009, construction to widen Mayfield Road was undertaken by the Region. Reduced lane widths produced more frequent stop-and-go traffic. While stop-and-go traffic is a contributing factor to collisions, the exact number of collisions resulting from the combination of construction and stop-and-go traffic cannot be determined. It should be noted that recent modifications to Mayfield Road at Inder Heights Drive and future interchanges at Highway 410 will change collision risks and traffic patterns in this area.

The segment between Kennedy Road and Stonegate Drive contains the highest number of reported collisions. These reported collisions also noted that stop-and-go traffic and/or construction activities were contributing factors.

4.3.3.1.3 Fatal Collisions

Only one fatal collision was reported within the Study Area during the five-year period. It was on Mayfield Road approximately 1.0km west of McLaughlin Road. According to the report, the collision occurred in the early morning in November 2008, the road surface was dry and conditions were clear. A vehicle was travelling at high speed and contacted the gravel shoulder on the right side, lost control, over-corrected.

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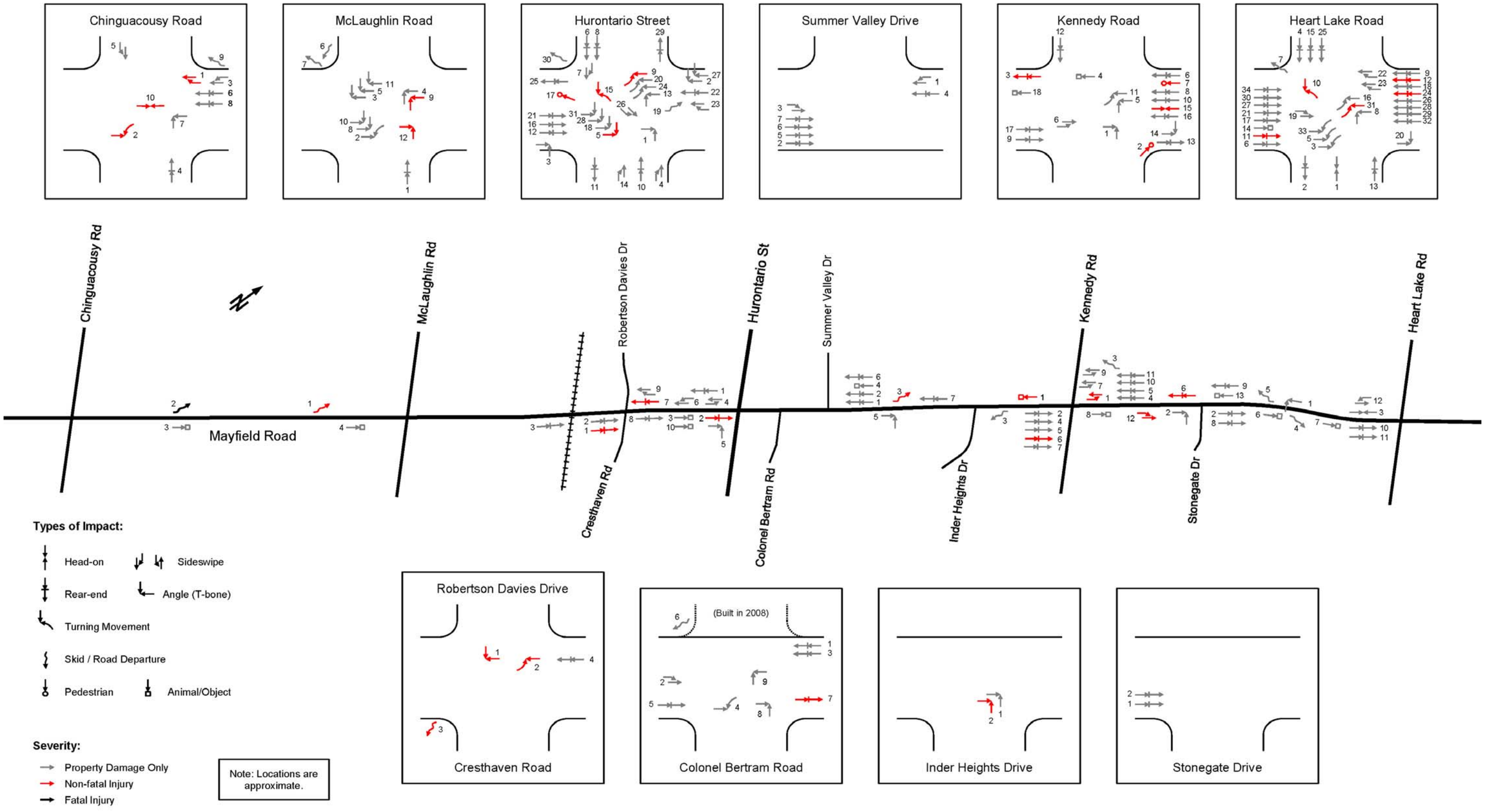

Figure 4-5 - Collision Summary

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4.3.3.1.4 Impact Type

The type of impact can directly affect whether the collision will be resulted in an injury. The number of collisions by type of impact is shown in Table 4-7. Rear-end impacts are the most frequent with 79 collisions. There have been 156 collisions involving two or more vehicles. Among the single motor vehicle (SMV) collisions, 15 were with a pedestrian or an obstacle on the road and the remaining 14 were due to skidding.

Table 4-7 - Summary of Collision Severity by Impact

	Multiple Motor Vehicles						Single Motor Vehicle					
Collision Severity	**Head-on**	**Rear-end**	**Angle (T-bone)**	**Turning Movement**	**Sideswipe**	**With Animal**	**With Pedestrian**	**With Animal**	**With Object**	**Skid to the left**	**Skid to the right**	**Total**
Fatal	0	0	0	0	0	0	0	0	0	1	0	**1**
Non-fatal injury	2	12	5	6	3	0	3	1	0	2	1	**35**
P.D.O.	3	67	28	9	20	1	0	8	3	2	8	**149**
Total	**5**	**79**	**33**	**15**	**23**	**1**	**3**	**9**	**3**	**5**	**9**	**185**

As expected, collisions with pedestrians resulted in an injury 100% of the time. This is followed by skid to the left collisions, which resulted in injury 60% of the time (including 1 fatality). Head-on collisions and turning movement collisions resulted in injuries 40% of the time. Rear-end and angle collisions resulted in injuries 20% of the time. Sideswipes, SMV impacts with animals and skids to the right, all resulted in injuries 10% of the time. Multiple Motor Vehicle impacts with animals and SMV impacts with objects did not result in any injuries.

4.3.3.1.5 Other Traffic Safety Influences

Road surface conditions, lighting conditions, and environmental conditions can all have a direct effect on the severity of collisions. **Table 4-8, Table 4-9,** and **Table 4-10** summarize the effect of road surface, lighting and environmental conditions respectively, during the five-year period.

Table 4-8 - Collisions by Road Surface Condition

	Dry	Wet	Mud	Sand or Gravel	Slush	Loose Snow	Packed Snow	Ice	Total
Fatal injury	1	0	0	0	0	0	0	0	**1**
Non-fatal injury	29	4	0	0	0	1	1	0	**35**
P.D.O.	107	24	1	1	3	6	1	6	**149**
Total	**137**	**28**	**1**	**1**	**3**	**7**	**2**	**6**	**185**

Table 4-9 - Collisions by Light Conditions

	Dark	Dawn	Daylight	Dusk	Total
Fatal injury	1	0	0	0	**1**
Non-fatal injury	6	1	27	1	**35**
P.D.O.	36	4	103	6	**149**

Table 4-9 - Collisions by Light Conditions

	Dark	Dawn	Daylight	Dusk	Total
Total	**43**	**5**	**130**	**7**	**185**

Table 4-10 - Collisions by Environmental Condition

	Clear	Rain	Snow	Drifting Snow	Fog, Mist, Smoke, Dust	Strong wind	Total
Fatal injury	1	0	0	0	0	0	**1**
Non-fatal injury	30	3	1	0	1	0	**35**
P.D.O.	120	17	7	1	3	1	**149**
Total	**151**	**20**	**8**	**1**	**4**	**1**	**185**

The majority of the collisions occurred in dry conditions, during daylight hours, or when conditions were clear, during the five-year period, suggesting that driver error is likely the cause of the collisions. This would indicate that the roadway safety is not being affected by environmental conditions.

4.3.3.2 Detailed Analysis

Using the collision data, a detailed safety analysis was performed for each intersection and road segment within the Study Area. In accordance with HSM Standards, the collisions at each intersection and road segment were standardized to an Equivalent PDO Frequency. Each collision is assigned a modification factor: 542 for a fatal injury, 11 for a non-fatal injury, and 1 for a PDO collision. Therefore, a collision resulting in a fatality would be similar to 542 PDO collisions occurring at the same location. The Equivalent PDO Frequency is used to determine how safely an intersection or road segment is operating when compared to a similar intersection or roadway segment.

A level of service of safety (LOSS) is assigned to each intersection and road segment based on the comparison between the observed and predicted collision frequencies in combination with the predicted frequency's standard deviation. How to determine LOSS is explained in **Table 4-11.**

Table 4-11 - Interpretation of the LOSS

LOSS	Description
I	Measured frequency is less than predicted frequency minus 1.5 x standard deviation.
II	Measured frequency is less than predicted frequency.
III	Measured frequency is less than predicted frequency plus 1.5 x standard deviation.
IV	Measured frequency is greater than predicted frequency plus 1.5 x standard deviation.

Source: Highway Safety Manual, 1st Edition

4.3.3.2.1 Intersections

There are ten (10) intersections being analysed in the Study Area (Valley View Drive is a short dead-end roadway its intersection is treated as a driveway between Summer Valley Drive and Inder Height Drive). **Table 4-12** shows the number of collisions for each of them with regard to severity and year.

Table 4-12 - Collisions per Intersection

Intersecting Road(s)	Fatal injury	Non-fatal injury	P.D.O.	2005	2006	2007	2008	2009	Total
Chinguacousy Road	0	3	7	2	2	2	0	4	**10**
McLaughlin Road	0	2	10	5	1	2	2	2	**12**
Robertson Davies Drive / Cresthaven Road	0	3	1	1	0	0	2	1	**4**
Hurontario Street	0	4	27	4	10	4	8	5	**31**
Colonel Bertram Road	0	1	8	2	3	0	2	2	**9**
Summer Valley Drive	0	0	7	2	1	1	2	1	**7**
Inder Heights Road	0	1	1	1	0	0	1	0	**2**
Kennedy Road	0	5	13	3	1	4	3	7	**18**
Stonegate Drive	0	0	2	0	0	0	2	0	**2**
Heart Lake Road	0	5	29	8	4	4	10	8	**34**
Total	**0**	**24**	**105**	**28**	**22**	**17**	**32**	**30**	**129**

The Collision Rate is calculated by dividing the collision frequency by an index of exposure which depends on the intensity of traffic (AADT Value) and the length of the road segment. For intersections, the length is equal to 1. The Critical Collision Rate is calculated from the overall collision rate average (for intersections and road segments in this study) and the index of exposure – any individual collision rate above this value normally requires further attention (confidence level of 95 percent). **Table 4-13** presents the collision rate and equivalent PDO frequency.

Table 4-13 - Collision Frequency and Rate per Intersection

Intersecting Road(s)	Average $AADT_{max}$	Average $AADT_{min}$	Number of Collisions	Frequency (/year)	Collision Rate	Critical Collision Rate	Equivalent PDO Frequency (/Year)
Chinguacousy Road	9234	2925	10	2.0	0.45	0.69	8.0
McLaughlin Road	10846	4570	12	2.4	0.43	0.65	6.4
Robertson Davies Drive / Cresthaven Road	13629	2322	4	0.8	0.14	0.65	6.8
Hurontario Street	13629	18517	31	6.2	0.43	0.57	14.2
Colonel Bertram Road	20551	3571	9	1.8	0.20	0.21	3.8
Summer Valley Drive	20551	2343	7	1.4	0.16	0.21	1.4
Inder Heights Road	21032	707	2	0.4	0.05	0.21	2.4
Kennedy Road	21389	5885	18	3.6	0.35	0.59	13.6
Stonegate Drive	22159	2598	2	0.4	0.04	0.20	0.4
Heart Lake Road	24206	3167	34	6.8	0.68	0.60	16.8
Total			**129**	**25.8**			**73.8**

The Heart Lake intersection is the only one that exceeds the critical collision rate. In terms of severity, the intersections of Hurontario Street, Kennedy Road and Heart Lake Road have the highest equivalent PDO frequencies.

The predicted collision frequency and LOSS for each intersection is shown in **Table 4-14**.

Table 4-14 - Predicted Collision Frequency and Level of Safety Service of Intersections

Intersecting Road(s)	Setting	Type	Frequency (/year)	Predicted Frequency (/year)	Standard Deviation	LOSS
Chinguacousy Road	Rural	Signalized 4-Leg	2.0	7.0	2.3	I
McLaughlin Road	Rural	Signalized 4-Leg	2.4	8.4	2.8	I
Robertson Davies Drive / Cresthaven Road	Urban	Signalized 4-Leg	0.8	2.9	1.8	II
Hurontario Street	Urban	Signalized 4-Leg	6.2	7.3	4.5	II
Colonel Bertram Road	Urban	Unsignalized 3-Leg	1.8	3.1	2.8	II
Summer Valley Drive	Urban	Unsignalized 3-Leg	1.4	2.8	2.5	II
Inder Heights Road	Urban	Unsignalized 3-Leg	0.4	2.0	1.8	II
Kennedy Road	Urban	Signalized 4-Leg	3.6	6.0	3.7	II
Stonegate Drive	Urban	Unsignalized 3-Leg	0.4	3.3	3.0	II
Heart Lake Road	Urban	Signalized 4-Leg	6.8	5.7	3.6	III
Total			**25.8**	**48.5**		

The Heart Lake Road intersection is the only intersection with an observed collision frequency higher than the predicted value and a moderate to high potential for collision reduction (LOSS III). However, the configuration of this intersection has recently changed and collision data was not available at the time of analysis. The recent changes will likely improve the LOSS of the intersection. All of the other intersections are performing adequately from a safety perspective.

4.3.4 Road Segments

There are seven (7) intersections being analysed in the Study Area (because Hurontario Street, Colonel Bertram Road and Summer Valley Drive are so close to each other, collisions occurring between them are considered “intersection” collisions).

Table 4-15 illustrates the number of collisions for each roadway segment in the Study Area with regard to severity and year. A relatively high number of collisions is found between Kennedy Road and Stonegate Drive (12 collisions) and between Stonegate Drive and Heart Lake Road (13 collisions).

Table 4-15 - Collisions per Road Segment

Intersecting Road(s)	Fatal injury	Non-fatal injury	P.D.O.	2005	2006	2007	2008	2009	Total
Chinguacousy Road – McLaughlin Road	1	1	2	1	0	0	1	2	**4**
McLaughlin Road – Robertson Davies Drive / Cresthaven Road	0	1	2	0	0	0	0	1	**1**
Robertson Davies Drive / Cresthaven Road – Hurontario Street	0	2	8	1	3	1	1	1	**7**
Summer Valley Drive – Inder Heights Drive	0	1	6	2	2	2	0	1	**7**
Inder Heights Drive – Kennedy Road	0	2	5	3	0	0	1	2	**6**
Kennedy Road – Stonegate Drive	0	3	9	1	2	1	3	3	**10**
Stonegate Drive – Heart Lake Road	0	1	12	3	1	3	2	3	**12**
Total	**1**	**11**	**44**	**11**	**8**	**7**	**8**	**13**	**56**

Table 4-16 presents the collision rate and equivalent PDO frequency for the road segments within the Study Area.

Table 4-16 - Collision Frequency and Rate per Road Segment

Road Segment	Average $AADT_{max}$	Average $AADT_{min}$	Number of Collisions	Frequency (/year)	Collision Rate	Critical Collision Rate	Equivalent PDO Frequency (/Year)
Chinguacousy Road – McLaughlin Road	9234	1.4	4	0.8	0.17	0.62	111.0
McLaughlin Road – Robertson Davies Drive / Cresthaven Road	11305	0.9	3	0.6	0.16	0.65	2.6
Robertson Davies Drive / Cresthaven Road – Hurontario Street	13629	0.4	10	2.0	1.01	0.76	6.0
Summer Valley Drive – Inder Heights Drive	21032	0.6	7	1.4	0.30	0.62	3.4
Inder Heights Drive – Kennedy Road	21366	0.4	7	1.4	0.45	0.68	5.4
Kennedy Road – Stonegate Drive	22107	0.5	12	2.4	0.59	0.64	8.4
Stonegate Drive – Heart Lake Road	24206	0.8	13	2.6	0.37	0.57	4.6
Total			**56**	**11.2**			**141.4**

The road segment between Chinguacousy Road and McLaughlin Road displays a high equivalent PDO frequency because of the fatal injury that occurred at that location and the heavy weight associated with such collisions. The second highest equivalent PDO frequency is found between Kennedy Road and Stonegate Drive.

Table 4-17 presents the predicted collision frequency and level of service of safety for each road segment.

Table 4-17 - Predicted Frequency and Level of Service per Road Segment

Intersecting Road(s)	Setting	Type	Frequency (/year)	Predicted Frequency (/year)	Standard Deviation	LOSS
Chinguacousy Road – McLaughlin Road	Rural	Two-Lane Undivided	0.8	2.1	1.1	II
McLaughlin Rd – Robertson Drives Drive / Cresthaven Road	Rural	Two-Lane Undivided	0.6	1.6	1.1	II
Robertson Drives Drive / Cresthaven Road – Hurontario Street	Urban	Two-Lane Undivided	2.0	0.9	0.8	III
Summer Valley Drive – Inder Heights Drive	Urban	Two-Lane Undivided	1.4	2.1	1.9	II
Inder Heights Drive – Kennedy Road	Urban	Two-Lane Undivided	1.4	1.5	1.3	II
Kennedy Road – Stonegate Drive	Urban	Two-Lane Undivided	2.4	1.9	1.7	III
Stonegate Drive – Heart Lake Road	Urban	Two-Lane Undivided	2.6	3.5	3.2	II
Total			**11.2**	**14.2**		

The segment between Robertson Davies Drive / Cresthaven Road and Hurontario Street has a collision rate that exceeds the critical frequency and therefore has moderate to high potential for collision reduction. In this particular case, the lower predicted collision frequency is the result of the short length of the roadway segment and the low traffic volumes in this segment

There does not seem to be a common factor to each of the ten (10) collisions that occurred on this road segment except perhaps the proximity to the neighbouring intersections. Three collisions involved lane weaving to/from a turning lane, four involved rear-ending, and two involved an encounter with a deer. It is projected that the widening of this road segment coupled with the increase in traffic volumes will bring the collision frequency below the predicted frequency.

Table 4-17 indicates that the section between Kennedy Road and Stonegate Drive also has a moderate to high potential for collision reduction (LOSS III). However, roadway modifications have been undertaken on that segment and the historical analysis is no longer applicable.

4.3.5 Safety Analysis Conclusions

The present analysis, which covers a five-year period between January 2005 and December 2009, indicates that Mayfield Road from Chinguacousy Road to Heart Lake is performing relatively well from a safety perspective (i.e. low to moderate potential for collision reduction). However, road constructions occurred during the study period which may have had an impact on the collision history.

In terms of intersections, the analysis indicates that the Heart Lake Road intersection is the only one with an observed collision frequency higher than the predicted value (it has a moderate to high potential for collision reduction). However, the configuration of this intersection has recently changed and the analysis, which is based on the previous configuration, is no longer applicable.

In terms of roadway segments, the two segments with a collision frequency higher than the predicted value is between Robertson Davies Drive / Cresthaven Road and Hurontario Street and between Kennedy Road and Stonegate Drive. In the latter case, modifications have been undertaken and the analysis is no longer applicable. In the former case, there does not seem to be a common factor to the ten (10) collisions that occurred on this road segment except perhaps the proximity to the neighbouring intersections. It is projected that the widening of this road segment coupled with the increase in traffic volumes will bring the collision frequency below the predicted frequency.

4.3.6 Geotechnology

4.3.6.1 Geotechnical Data

Mayfield Road within the Study Area is currently situated at the edge of development within the City of Brampton. Most of the area south of Mayfield Road is developed, except between McLaughlin Road and Chinguacousy Road, where agricultural land dominates. To the north is mostly agricultural, with the exception of Snelgrove, located in the vicinity of Hurontario Street. A significant portion of the land between Kennedy Road and Heart Lake Road is covered by wetlands.

The subsurface stratigraphy encountered at the borehole locations generally consists of a pavement structure consisting of asphalt, upper granular base and lower granular subbase underlain mostly by native silty clay to clayey sandy silt.

The Geotechnical Investigation and Pavement Assessment Reports are included in **Appendix E** and **Appendix F** for reference.

Historic Geotechnical Data

Various geotechnical investigations have been conducted along Mayfield Road between 2003 and 2008. Historic geotechnical reports provided by the Region of Peel provide an overview of the subsurface conditions encountered within Mayfield Road between McLaughlin Road and Heart Lake Road.

The following is a summary of the subsurface conditions based on the previous geotechnical investigations.

Mayfield Road from McLaughlin Road to Hurontario Street

In summary, the depth of topsoil at the borehole locations adjacent to the roadway was observed to be approximately 100 mm to 200 mm; and the asphalt thickness of the road ranged from 100 mm to 200 mm. For the boreholes drilled on the road, a granular base material consisting of sandy gravel was encountered below the asphalt and ranged in thickness between 300 mm and 700 mm. A fill layer of silty clay was encountered in a number of boreholes below the topsoil or pavement structure to depths ranging from 0.8 m to 1.8 m. The native subsoil encountered below the fill layer at the borehole locations was generally confirmed to consist of stiff to very stiff silty clay to clayey silt till which extended to bedrock. Weathered Queenston shale bedrock was encountered in a few boreholes located between McLaughlin Road and the CP rail track at depths ranging between 2.5 m and 6.0 m below the surface of the road.

Groundwater conditions observed in the open boreholes during drilling and records from installed piezometers indicate that the groundwater level is between 4.0 m and 5.0 m below the ground surface.

Mayfield Road from Hurontario Street to Kennedy Road

The native soil within this section is generally clayey silt till and is encountered below the embankment fill. Weathered Queenston shale bedrock was encountered in some of the deep boreholes, indicating that the shale bedrock is about 30 m below the ground surface.

Boreholes were drilled in the vicinity of Snelgrove Bridge showed a fill layer at 1.4 m to 2.9 m depth, underlain by recent stream alluvium strata between 1.5 m and 2.0 m in thickness. This alluvium soil overlies the native clayey silt which extended to about 30 m depth below the ground surface where shale/limestone bedrock was encountered.

Groundwater conditions observed in the open boreholes during drilling and records from installed piezometers within this section indicate that the groundwater level is between 2.0 m to 6.0 m below the ground surface, generally at 4.0 m depth.

Mayfield Road from Kennedy Road to Heart Lake Road

The native subsoil encountered at the borehole locations generally consisted of clayey silt to silt some clay.

Groundwater conditions observed in the open boreholes during drilling and records from installed piezometers within this section indicate that the groundwater level is between 2.0 m to 6.0 m below the ground surface, but generally at 4.0 m depth.

It should be noted that a high fill road embankment, about 400 m west of Heart Lake Road will need further borehole investigation both on the north and south side of Mayfield Road to assess the geotechnical capabilities and settlement characterization of the soil beneath the proposed high embankment.

Wetlands

Three major wetland areas are encountered below and along Mayfield Road between Kennedy Road and Heart Lake Road as follows:

- Wetland 1 – North side of Mayfield Road east of Kennedy Road

Within the intersection of Mayfield Road and Kennedy Road, pavement structures and fill of up to 4.5 m in thickness overlie approximately 2.2 m of peat extended across the width of the Mayfield Road embankment, beyond which the peat thickness tapers in the north and south directions. Below the peat, a layer of firm clayey silt to firm or loose silt some clay was encountered with thickness ranged between 2.0 m and 3.0 m, at which depth it was underlain by stiff to very stiff clayey silt. The groundwater is assumed to essentially coincide with the ground surface in the wetland.

The peat deposit, loose and compressible soils were encountered to significant depth in this area and therefore, the Mayfield Road crossing this wetland area was constructed by replacing the peat deposit and the underneath loose and compressible soils with 0.4 MPa concrete filler caissons with total length ranged between 2.5 m and 12.5 m. The north side of the road embankment was shored using sheet piles, steel piles and anchor tieback.

- Wetland 2 – near culvert crossing under Mayfield Road located approximately 400 m west of Heart Lake Road

In general, the subsurface conditions at this location consist of surficial compact/firm sandy/clayey silt fill overlying a layer of peat and organic silt which ranged in thickness between 0.2 m and 1.4 m which is in turn underlain by native loose to compact sandy silt to sand. The groundwater is assumed to essentially coincide with the ground surface in the wetland.

- Wetland 3 – south side of Mayfield just west of Heart Lake Road

The pavement structure of the existing roadway is underlain by fill to about 4.0 m depth, which is in turn underlain by a fine fibrous to amorphous peat layer with a thickness of between 2.0 m and 2.5 m, extending to about 6 m to 8 m below the existing grade. The thickness of the peat decreases beyond the existing road shoulders. The fill generally consists of dense to compact sand overlying stiff silty clay. The peat typically has a soft to firm consistency. A 1.0 m thick layer of very soft organic silt was found underlying the peat in some of the boreholes. Clayey silt to silty clay till of typically stiff to very stiff consistency underlies the entire site area. The groundwater is assumed to essentially coincide with the ground surface in the wetland.

4.3.6.2 Pavement

A pavement condition survey was undertaken by WSP staff using the Ministry of Transportation (MTO) guidelines and included a visual inspection of the pavement section to identify and classify existing distress features, driving the road at the posted speed to assess the Ride Condition Rating, and assessment of the Pavement Condition Rating.

The severity of distress ranged from very slight to moderate while the density of distress ranged from few to intermittent to frequent. The following photos provide examples of the pavement conditions

Figure 4-6 - Good Pavement Structure with mild rutting

Figure 4-7 - Moderate transverse cracking

Figure 4-8 - Severe longitudinal cracking

Figure 4-9 - Recently repaved area showing ramping

Figure 4-10 - Severe longitudinal cracking

Figure 4-11 - Asphalt in good condition leading up to railway crossing

The Pavement condition survey and report can be found in **Appendix F**.

According to the Geotechnical Investigation and Pavement Assessment Report found in **Appendix E**, the existing pavement structure at the borehole locations can be summarized in **Table 4-18** below:

Table 4-18 - Existing Pavement Structure

Pavement Component	No. Of Observations	Thickness (mm), Range	Thickness (mm), Mean
Hot Mix Asphalt	10	115-255	170
Granular Base Material	10	100-240	155
Granular Subbase Material	10	100-430	265

4.3.7 Drainage

WSP staff conducted field investigation for the crossing culverts within the Study Area on December 17th, 2010 and August 5th, 2011. The main objectives of the field work were to:

- Examine existing road characteristics and land use within the Study Area;
- Verify size and condition of existing crossing culverts; and
- Complete a photo inventory of existing crossing culverts.

The full drainage report can be found in **Appendix G**.

4.3.7.1 Existing Mayfield Road Drainage Characteristics

The west portion of Mayfield Road within the Study Area has mainly a rural cross section, while the east portion of Mayfield Road within the Study Area has an urban cross section. The following summarizes the Mayfield Road drainage characteristics:

- From Chinguacousy Road to just west of Hurontario Street, Mayfield Road consists of one travelling lane and a shoulder in each direction. The road has a mainly rural cross section with ditches located on both sides of the road.
- From just west of Hurontario Street to east of the Etobicoke Creek Bridge, Mayfield Road consists of two travelling lanes in each direction. Right and left turning lanes also exists at most side road intersections. The road has an urban cross section with catchbasins, curb and gutter and storm sewer systems conveying the storm flow.

- From east of the Etobicoke Creek Bridge to Kennedy Road, Mayfield Road consists of two travelling lanes at some locations and one travelling lane at other locations in each direction. Right and left turning lanes also exists at most side road intersections. The road mainly has an urban cross section with catchbasins, curb and gutter and storm sewer systems conveying the storm flow.
- From Kennedy Road to Heart Lake Road, Mayfield Road consists of two travelling lanes in each direction. Right and left turning lanes also exists at most side road intersections. The road has an urban cross section with catchbasins, curb and gutter and storm sewer systems conveying the storm flow.

During the field investigation, WSP Staff also undertook a condition assessment of the existing drainage features. A total of sixteen (16) structures were found to convey the flow of the Etobicoke Creek, Fletcher's Creek and all of the unnamed tributaries within the Study Area. The Etobicoke Creek Bridge is included as one of the sixteen structures. The summary of the existing conditions of all of the structures is listed below in **Table 4-19**.

Table 4-19 - Existing Culvert Summary

Crossing Culvert No.	Approximate Station	Size w x h (mm) / Material	Approximate Depth of Fill (m)	Observations
1	7+348	750 PVC	1.2	New culvert in place – good condition.
2	7+778	600 PVC	1.1	New culvert in place – good condition.
3	7+863	900 PVC	1.3	New culvert in place – good condition.
4	8+248	600 PVC	0.6	New culvert in place – good condition. Culvert is on approximately 45° skew.
5	8.428	750 PVC	0.8	New culvert in place – good condition.
6	8+568	800 CSP	1.3	North end: good condition. South end: rusted and submerged.
7	8+908	North End: 500 CSP South End 600 Conc.	0.8	North end: Poor condition, culvert rusted and bottom separated. South end: Good condition, newly installed 600mm concrete pipe with concrete headwall and stone wing walls. Two ditch inlets were observed that are connected to the culvert south side. The ditch inlets are in good condition.
8	8+948	North End: 1300 x 900 CSPA South End: 3.05 x 1.50 Conc. Box with Open Bottom	1.2	North end: Material is in good condition; however culvert is deformed and settled at mid length South end: Good condition, newly installed concrete box section with concrete headwall and stone wing walls
9	9+138	500 CSP	0.8	Culvert is in poor condition at both ends, heavy rusted and bottom broken
10	9+258	600 CSP	0.8	North end: Poor condition with bottom broken. South end: Buried and not assessed. It was noted that a storm MH exists at the south end location
11	9+328	500 CSP	0.4	Culvert is in poor condition at both ends, heavy rusted and bottom broken
12	9+368	500 CSP	0.6	North end: Poor condition with top broken and heavy rusted inside. South end: 90% silted and not assessed, however the culvert top is rusted.
13	9+678	800 CSP	1.4	Culvert is in poor condition at both ends, heavy rusted and bottom broken. Ditch inlet was located just south of the culvert south end

14 (Snelgrove Bridge)	10+653			Bridge is in good condition
15	11+418	700 CSP	1.1	New culvert in place – good condition
16	12+348	1100 Steel Pipe	1.2	Culvert is in fair condition at both ends with minor rust inside

CSP – Corrugated Steel Pipe
CSPA – Corrugated Steel Pipe Arch
PVC – Polyvinyl Chloride

4.3.7.2 Other Drainage Elements within the Study Area

As the Mayfield Road section from just west of Hurontario Street to Heart Lake Road has an urban cross section, catchbasins were observed on both sides for this section of the Mayfield Road. Scattered ditch inlets were located at different locations on both sides of the Mayfield Road.

It is noted that two Stormceptors are connected at the storm sewer system outlets located on both sides of Etobicoke Creek Crossing on the south side of Mayfield Road. Stormwater management (SWM) ponds are also located north of Mayfield Road just west of Etobicoke Creek, on the northeast quadrant of Mayfield Road and Kennedy Road as well as northwest and southwest quadrants of Mayfield Road and Heart Lake Road. The stormwater pond in the southwest quadrant is located on TRCA property within the Heart Lake Conservation Area.

4.3.8 Utilities

The following utilities were identified within the Study Area:

- Hydro;
- Telecommunications;
- Cable;
- Gas;
- Light poles;
- Watermains;
- Storm sewers; and
- Sanitary sewers

Major hydro poles are located along the north side of Mayfield Road between Chinguacousy Road and just west of Orangeville Rail.

Another line of major hydro poles is lined up from southwest of McLaughlin Road/Mayfield Road intersection, going easterly, crossing over to the north side of Mayfield Road before reaching the water reservoir. The most easterly hydro pole for this line is at the northwest corner of Mayfield Road/Summer Valley Drive intersection.

The third set of hydro poles starts at the southeast corner of Mayfield Road/Valley View Drive intersection and extends along the south side to beyond Heart Lake Road.

The major gas line is located along the north side of Mayfield Road between McLaughlin Road and just east of Hurontario Street. Then the gas line runs along the south side of Mayfield Road until 180m east of Stonegate Drive when it elbows back up to the north and continues along Mayfield Road up to the easterly study limit at Heart Lake Road.

Bell Canada underground plant is located along Mayfield Road on the north side between Chinguacousy Road and Heart Lake Road and on the south side between Hurontario Street and just west of Heart Lake Road.

Installation of two watermain has started at end of 2013 within the study area.

The first watermain runs along the south side of Mayfield Road between Chinguacousy Road and 460m west of Hurontario Street, which then elbowed 45° and lined up with the north side of Mayfield Road up to just west of Hurontario Street intersection.

The second watermain are installed on the north side of Mayfield Road starting at 95m east of Valley View Drive and extended to just east of Kennedy Road to where the culvert retaining wall is.

4.4 Existing Natural Environment

An existing natural environment assessment was undertaken to determine the presence and extent of natural heritage features and associated constraints on the proposed road widening development for Mayfield Road (Regional Road 14). The identification and description of natural features on and adjacent to the Study Area is necessary in order to assess the potential environmental impact of the development and to provide suggestions for the minimization and/or mitigation of these impacts. These sections also include descriptions of natural features on and adjacent to the Study Area, as determined through consultation with relevant authorities, reviews of secondary source information and direct observation during site visits.

Site visits were conducted on August 4, August 5, September 4 and September 22, 2011 to confirm the presence of Natural Heritage Features, map vegetation and to determine general characteristics of the Study Area. Emphasis during the site visits was on documentation of dominant vascular plants and natural features within 10 m of the Mayfield Road right-of-way. At the time of the site visit road resurfacing activities were ongoing between Kennedy Road and Heart Lake Road.

Prior to the site visit a review of background information, satellite images and topographic maps was conducted to identify potential Natural Heritage Features and species of conservation concern. During the site visit photographs of the site were taken and observations of any wildlife, vegetation or natural features were recorded.

The existing conditions within the Study Area, with a focus on the terrestrial and aquatic environment, are described in the following sections

Full details of the natural environment assessment can be found in **Appendix H**.

4.4.1 Terrestrial Environment

4.4.1.1 Chinguacousy Road to McLaughlin Road

The western portion of the Study Area between Chinguacousy Road and McLaughlin Road is predominantly farmland which at the time of the site visit was supporting corn and soybean monocultures. Roadside vegetation consisted predominantly of grasses, common weeds and the occasional shrub. Landscape trees on the residential properties included Silver Maple, Northern Catalpa, Norway Maple , White Spruce, Blue Spruce, Willow, Trembling Aspen, Manitoba Maple and Black Walnut. Several trees in this area may be impacted by the proposed road widening.

A survey of the significant woodland on the south side of Mayfield Road indicated that species composition varied from north to south within the woodland. At the north of the woodland, dominant species were Basswood, Red Oak and White Ash, with pockets of Ironwood and the occasional Bitternut Hickory. Moving south through the woodland, Sugar Maple became a larger component of the composition while the presence of Red Oak decreased. At the south end of the woodland, Sugar Maple was dominant with small contributions of American Beech and Eastern Hemlock, and to a lesser extent White Ash and Blue Beech. Occasional White Pines were observed along the western edge of the woodland.

4.4.1.2 McLaughlin Road to Hurontario Street

The section of Mayfield Road between McLaughlin Road and Hurontario Street is predominantly residential, with pockets of agricultural fields to the northwest and small areas of manicured parkland east of the railway line. The main agricultural crop in this area of the Study Area was soybean. However, a small hay field existed just west of the railway line. Along the south side of Mayfield Road between Van Kirk Drive and McLaughlin Road a small stream lies between the housing development and the roadway. Although the stream appears to have been channelized, the area has been re-naturalized with native riparian vegetation, shrubs and trees.

Manicured lawns and landscape trees lined both sides of Mayfield Road approaching Hurontario Street. Common landscape tree species included Ashes, Scots Pine, Maples, Blue Spruce, European White Poplar, Staghorn Sumac and a thornless cultivar of Honey Locust.

4.4.1.3 Hurontario Street to Kennedy Road North

The most notable feature of the section of Mayfield Road between Hurontario Street and Kennedy Road is the Etobicoke Creek and associated valleylands. Although the general area is predominantly residential or agricultural land, the Etobicoke Creek valleylands support native lowland forest and marsh wetland communities. Black Locust, White Elm, Silver Maple, and Black Walnut were common tree species in the low-lying areas south of Mayfield Road. To the north, a stormwater pond west of Etobicoke Creek provides additional wetland habitat. The pond was fringed with common marsh vegetation such as Cattails, grasses, sedges, Willows and other herbaceous plants. The occasional Eastern White Cedar, Ash, White Spruce, Willow and Staghorn Sumac exist along the edge of the stormwater pond and northern reaches of Etobicoke Creek.

Similar landscape tree species were observed in this section, with the addition of the occasional Red Pine, Basswood, Horsechestnut, and Amur Maple. A new housing development exists on the north side of Mayfield Road at Kennedy Road. Undeveloped land in this area has been colonized by weeds and typical roadside vegetation. A corn field exists along the south side of Mayfield Road west of Kennedy Road.

4.4.1.4 Kennedy Road North to Heart Lake Road

The Heart Lake Provincially Significant Wetland Complex is located on the north and south sides of Mayfield Road in this section of the Study Area. Lands to the north are open meadows with the occasional tree or shrub, and larger concentrations of vegetation along the margins of the wetland areas. Dominant vegetation along the wetland margins consists of Cattails, grasses, Ashes, Silver Maple, Alder, Willows and the occasional White Elm and Staghorn Sumac.

The residential area along the south side of Mayfield Road is separated from the right-of-way by a strip of manicured lawns and landscape trees consistent with those observed in other areas of the Study Area. A conifer plantation consisting of Scots Pine, White Spruce and Norway Spruce exist along the northwest boundary of the Heart Lake Conservation Area. A Black Walnut stand exists in the low-lying areas adjacent to the road in the approximate centre of the Conservation Area. Other common tree and shrub species observed along the northern margin of the Conservation Area include White Elm, Silver Maple, and Common Buckthorn.

Vegetation in roadside ditches and abandoned fields was relatively uniform along the length of the Study Area. In drier areas Wild Carrot, Chicory, Clovers, Common Milkweed, Thistles, Goldenrod) and Common Ragweed were common while wetter areas were dominated by Cattails and various graminoids.

4.4.2 Aquatic Environment

The Study Area straddles the boundaries of two watersheds and the jurisdictions of two Conservation Authorities. Fletcher's Creek (CVC) and its tributaries cross Mayfield Road north-southerly in the western portion of the Study Area (Chinguacousy Road to Hurontario Street). Little Etobicoke Creek (TRCA) and tributaries cross Mayfield Road north-southerly between Hurontario Street and Heart Lake Road. Surrounding land use was primarily agricultural (crop fields) and residential subdivisions.

Ten (10) current and/or modified watercourse locations were documented in the Chinguacousy Road to Hurontario Street portion of the Study Area. Etobicoke Creek and a large Stormwater Management Pond outletting to the Heart Lake Conservation Area were documented between Hurontario Street east to Heart Lake Road.

4.4.2.1 Fletcher's Creek

The Study Area contains portions of the headwaters referred to as the West, Central and East tributaries of Fletcher's Creek. These small headwater tributaries within the Study Area were classified in July 2009

following *Evaluation, Classification and Management of Headwater Drainage Features: Interim Guidelines (CVC and TRCA, 2009).*

The five (5) categories of Fish Habitat Classification are as follows:

- **Permanent –** Provides direct habitat onsite (e.g. feeding, breeding and/or migration) as a result of year round groundwater discharge and/or permanent standing surface water within a storage feature (i.e., ponds, wetlands. Habitat may be either existing or potential (i.e., existing above a barrier.
- **Seasonal –** Provides limited direct habitat on site (e.g., feeding breeding, migration and/or refuge habitat) as a result of seasonally high groundwater discharge or seasonally extended contributions from wetlands or other surface storage areas that support intermittent flow conditions, or (rarely) ephemeral flow conditions.
- **Contributing –** Provides indirect contributing habitat to downstream reaches – There are two types: i) Complex contributing habitat – result of intermittent or less commonly ephemeral surface flows – generally well vegetated features that influence flow, conveyance, attenuation, storage, infiltration, water quality, sediment, food (invertebrates) and organic matter/nutrients, and ii) Simple contributing habitat – generally as a result of ephemeral (or less commonly intermittent surface flows but generally not well vegetated features that influence the same factors as above.
- **Not Fish Habitat –** No features and/or functions associated with headwater drainage features is present – general characterized by no definition or flow, no groundwater seepage or wetland functions, and evidence of cultivation, furrowing, presence of a seasonal crop, lack or natural vegetation and fine textured soils (i.e., clay or silt)
- **Recharge zone –** Areas of groundwater recharge that maintain downstream aquatic functions via groundwater connections to streams.

For a previous study, the watercourses were visited on March 9, 2010 and April 21, 2010 with TRCA, CVC, MNR and stakeholder groups to refine the classifications. Following these site visits, revisions to the classifications were provided to the Town of Caledon in an update to the Mayfield West Phase Two Secondary Plan. The fisheries assessment of the Fletcher's Creek Tributaries for this EA is based on these final classifications.

Flow and Terrestrial Assessments were combined with Aquatic Habitat Classifications to define a Net Constraint Ranking. The headwater tributaries were classified in the Watercourse Constraint Matrix as follows in AMEC's Revised Draft (*February, 2011*). The Classifications and Net Constraint Ranking for Fletcher's Creek headwater tributaries crossing Mayfield Road are listed in **Table 4-20**.

Table 4-20 - Habitat Classifications for Fletcher's Creek Headwaters

Branch	Reach Number	Habitat Classification	Constraint Rankings
Fletcher's Creek West	MFC - R27	Simple Contributing	Low
	MFC - R24	Simple Contributing	Low
	MFC - R25	Simple Contributing	Low
Fletcher's Creek Central	MFC –R20	Simple Contributing	Low
	MFC – R18	Simple Contributing	Low
	MFC - R03	Simple contributing upstream from Mayfield Road, Seasonal downstream from Mayfield Road	Medium
	MFC – R14	Simple Contributing	Low
	MFC - R10	Simple Contributing	Low
Fletcher's Creek East	MFC – R02	Simple Contributing	Medium
	MFC – R01	Complex Contributing	Medium

Fisheries constraint rankings were established based on the habitat classifications shown in **Table 4-21**.

Table 4-21 - Fisheries Constraints Rankings

Habitat Type	Constraint Ranking	Recommended Action
Permanent Fish Habitat	High	Habitat should be protected and/or enhanced in-situ
Seasonal Fish Habitat	Medium	Habitat should be maintained or replicated so that the net productive capacity is maintained or increased
Complex Contributing, Simple Contributing and/or Not Fish Habitat	Low	Habitat can be eliminated, pending satisfaction of drainage density targets, but would not require a riparian corridor or setbacks.

The fish habitats within the Study Area are shown in **Figure 4-12** on the following page.

Only one seasonal tributary of Fletcher's Creek provides direct fish habitat in the Study Area, the watercourse that crosses Mayfield Road immediately west of McLaughlin Road (MFC-R03). This tributary has yielded extremely low numbers of warmwater bait fish numbers in the reach south of Mayfield Road during historical sampling.

Outside (south) of the Study Area, the lower reaches of Fletcher's Creek support a cool/warm fish community that includes seasonal use by rainbow trout. Fletcher's Creek and unnamed tributaries of Fletcher's Creek downstream of the Study Area are designated as occupied reaches for Redside Dace.

4.4.2.1.1 Fish Habitat – Fletcher's Creek Headwaters

The Fletcher's Creek headwaters within the CVC portion of the Study Area (Chinguacousy Road to Hurontario Street) were primarily Simple Contributing Habitat. Channels were straight or slightly sinuous. Channels were dry, not well defined and overgrown with robust terrestrial vegetation or crops. Some standing water was present at culvert inverts on the August site visit. Overhead cover was open. Substrate was primarily sand, silt and gravel at culvert inverts. Many culverts, for example shown in **Figure 4-13**, were relatively new and installed recently and passage was blocked in several culverts by recent development (subdivisions and associated stormwater management systems). Evidence of shoulder erosion was present on the south side of Mayfield Road.

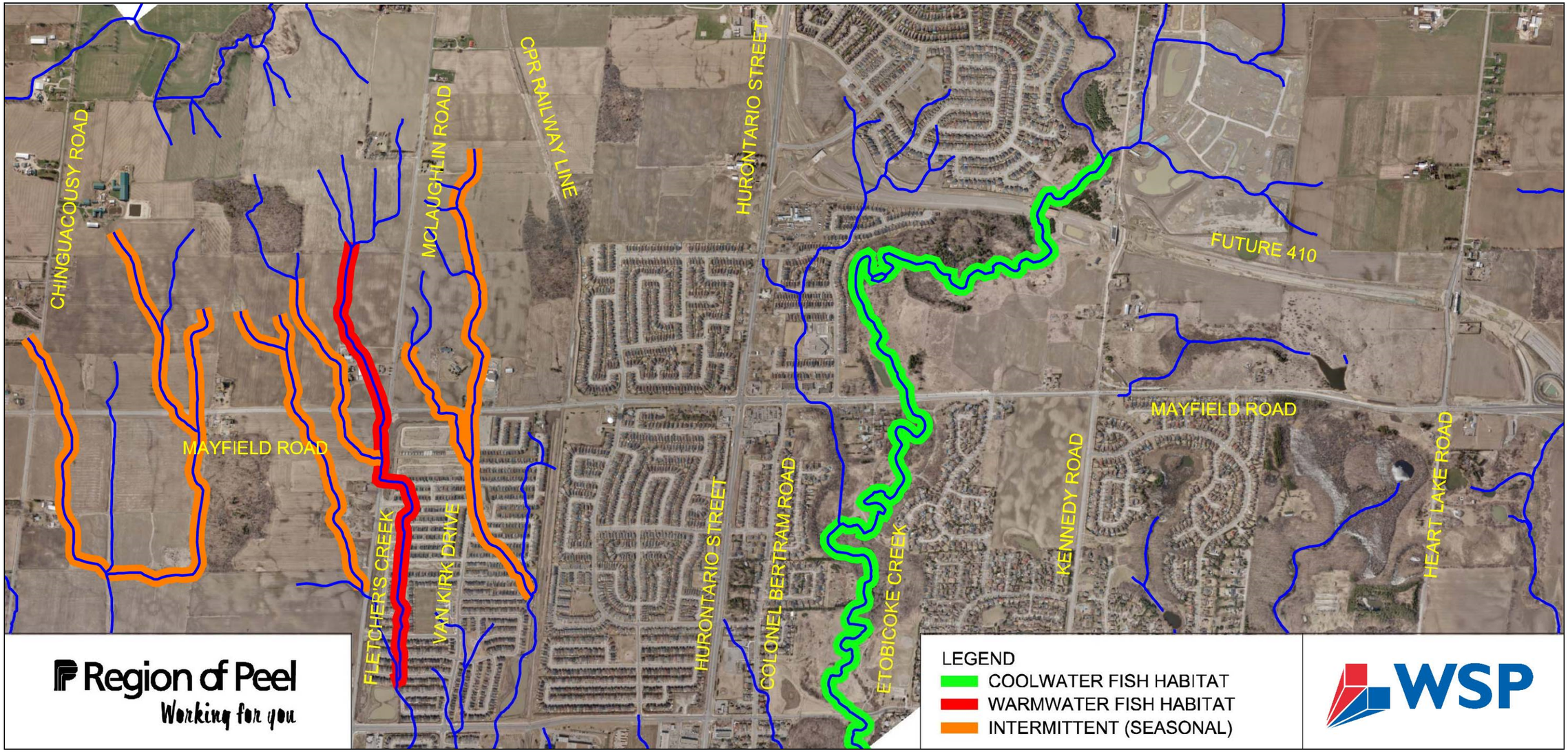

Figure 4-12 - Fish Habitats within Study Area

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Figure 4-13 - Representative conditions at mapped watercourse location north of Mayfield Road between Chinguacousy Road and Hurontario Street

WSP's habitat classification was in concurrence with recent studies for the most part. There is only one stream classified as Seasonal fish habitat, namely, the watercourse crossing Mayfield Road immediately west of McLaughlin Road (MFC-R03), and only for the section downstream (south) of Mayfield Road. Fish were visually observed on the south side of Mayfield Road in this system during the August site visit. Two discrepancies were MFC-R01 and MFC-R02, immediately west of the CPR line, which were ranked Medium for Net Constraint Ranking, but found not to have any north-south connection across Mayfield Road during WSP's August site visit. At MFC-R02, the channel remnant on the north side of Mayfield Road directed to a west-east ditch that paralleled Mayfield Road. No connecting culvert was visible on the south side of Mayfield Road. At MFC-R01, the remnant channel north of Mayfield Road was heavily vegetated. South of Mayfield Road, no channel was visible and no connecting culvert was found. A manhole cover and storm sewer grate were noted on the south side at this location.

It is important to note that while WSP is maintaining the classifications of Simple Contributing and Complex Contributing for MFC-R02 and MFC-R01 respectively (Table 1, AMEC 2010), at the time of our assessment there was discontinuity of the channel across Mayfield Road

4.4.2.2 Etobicoke Creek

The Etobicoke Creek mainstem is a permanent watercourse that flows northeasterly through the Study Area. Upstream sections of the headwaters have been straightened and impacted by livestock access, but the section of the mainstem that crosses Mayfield Road exhibits natural characteristics and a healthy riparian zone, due in part to the surrounding municipal park.

Etobicoke Creek at the Mayfield Road crossing is considered an intermediate riverine warmwater habitat. The mainstem of Etobicoke Creek contains a diverse fish community, including minnows, suckers, darters and sunfish. A total of twenty (20) fish species have been captured in the Etobicoke Creek Headwaters between Chinguacousy and McLaughlin Road. Although rainbow darters were presumed extirpated from the watershed, several were captured by TRCA in 2010, bringing the total to twenty-one (21) documented fish species.

There are no known aquatic species at risk in or in the vicinity of Etobicoke Creek within the Study Area.

The Study Area watercourses were visited by WSP's Senior Fisheries Biologist on August 4 and September 4, 2011. Due to the known ephemeral nature of many of the watercourses, field visits were timed following seasonal rains, in an attempt to capture at least standing water in the locations along Mayfield Road. 13.8 mm of rain had fallen in the previous 24 hr period prior to the August sampling and 10.2 mm in the previous 24 hr period before the September sampling date. Visual assessments of watercourse characteristics both upstream (north) and downstream (south) of Mayfield Road were conducted. Features such as watercourse permanence, morphology, flow, amount overhead cover, amount instream cover, riparian vegetation and presence were noted. Information from the review of the background documentation was field-confirmed and existing conditions were photo-documented. Fish sampling was not deemed necessary for the current study by either TRCA or CVC (pers. comm., March 11, and June 9, 2011, respectively).

4.4.2.2.1 Fish Habitat – Etobicoke Creek

The Etobicoke Creek mainstem crosses Mayfield Road within the Study Area at the Snelgrove Bridge Site specific information was obtained in 2002 (Stantec) and more recently by TRCA.

There are ten (10) documented fish species from Etobicoke Creek at the Mayfield Road crossing, ranging from warmwater generalists (rock bass) to coolwater species (darters and dace) and one introduced species (goldfish). Fish habitat in the vicinity of the existing bridge consisted of pool-riffle- run sections with refuge areas, some undercut banks, boulders, organic debris and instream and overhanging riparian vegetation. Substrate was dominated by gravels and cobble, but was overlain with a heavy layer of sedimentation. Anthropogenic round stone was also present around the existing abutments Instream vegetation was primarily emergent and submergent vegetation. Scant floating vegetation was found aside from duckweed. Riparian trees and shrubs included Manitoba maple, black willow, and red-osier dogwood. Trees were set back from the watercourse immediately up and downstream of the bridge site so that overhead cover was minimal within the right-of-way. Native and invasive vegetation included cattails, reed canary grass, purple loosestrife, tall goldenrod, viper's bugloss and Queen's Anne's Lace. Surrounding habitat is urban park and urban litter is present instream, see example in **Figure 4-14**. Fish sampling was not conducted during this field visit as per the instructions of TRCA (March 11, 2011).

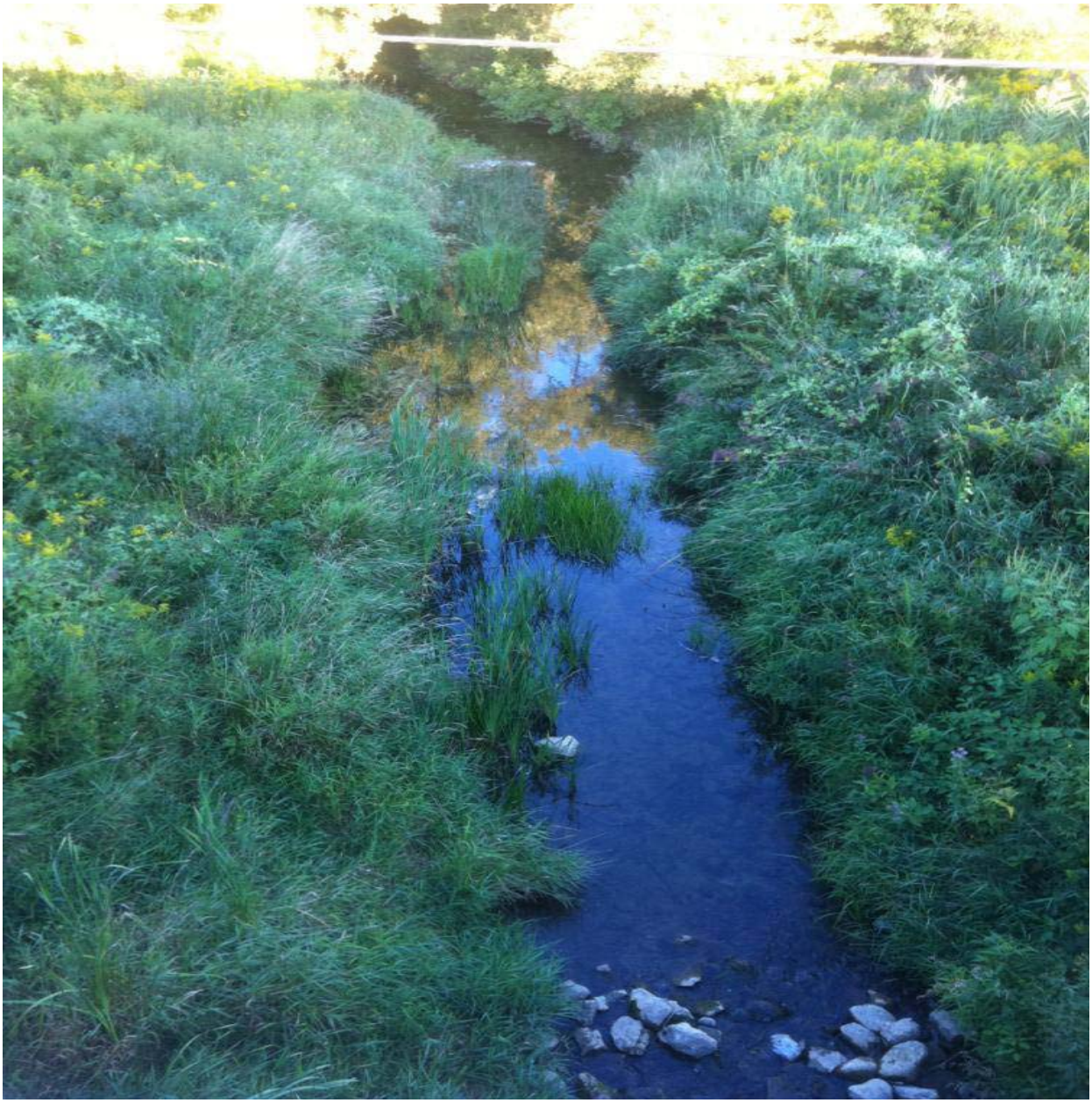

Figure 4-14 - Etobicoke Creek, immediately downstream of bridge at Mayfield Road

Water levels were low at time of sampling and a barrier to fish passage was noted underneath the bridge. A small dam from surrounding gabion stone has been constructed to cross the creek and at the water levels observed at the time of survey (September 9, 2011), was impassable to all fish species including any jumpers (trout species) that may be present.

Additional warmwater fish habitat is noted in the open water portion of the large wetland north of Mayfield Road and west of Heart Lake Road, see **Figure 4-15**. A number of small game and baitfish species have been documented, including brown bullhead, pumpkinseed, central mud minnow, fathead minnow, golden shiner and brook stickleback. Numerous ducks were noted during WSP's September field visit. A dam and drainage outlet from this pond area flows under Mayfield Road and into the wetland on the south side of Mayfield Road, but passage at this feature has been noted as impassable to all fish species.

Figure 4-15 - Additional warmwater fish habitat

In summary, the Fletcher's Creek Tributaries are primarily poorly defined drainage features through cultivated fields that are dry for the majority of the year. Due to this impermanence, these tributaries cannot support fish on year-round basis, but provide indirect (contributing) habitat to downstream reaches. Although not included in the Net Constraints Ranking of the Fletcher's Creek Headwaters, the permanence and diverse fish community of the Etobicoke Creek mainstem at the Mayfield Road crossing would be ranked as High Constraint, and the fish and fish habitat should be protected and/or enhanced in-situ in light of the proposed works.

4.4.3 Significant Areas of Natural and Scientific Interest

Significant Areas of Natural and Scientific Interest (ANSI) are defined as areas of land and water containing natural landscapes or features that have been identified as having life science or earth science values related to protection, scientific study or education.

The Natural Heritage Information Centre (NHIC) database was searched for the presence of any ANSI's on or within 120 m of the Study Area. The 40 hectare Heart Lake Forest and Bog Life Science ANSI is located southwest of the intersection of Mayfield Road and Heart Lake Road. It is characterized by variable terrain including upland deciduous forests and wetland depressions containing swamp, marsh and bog vegetation. The kettle bog has been known to support some uncommon plant species such as Virginia Chain Fern, Snake Mouth Orchid, and Eastern Dwarf Mistletoe.

4.4.4 Significant Habitat of Endangered or Threatened Species

The Provincial Policy Statement (PPS 2014) defines the significant habitat of endangered or threatened species as the habitat, as approved by the Ontario Ministry of Natural Resources (OMNR), that is

necessary for the maintenance, survival and/or the recovery of naturally occurring or reintroduced populations of endangered or threatened species, and where those areas of occurrence are occupied or habitually occupied by the species during all or any part(s) of their life cycle. The OMNR is directly responsible for identifying, listing and conducting ongoing assessments for significant endangered species and their related habitats.

A geographical search for significant or endangered species presence and associated habitat was conducted using the OMNR NHIC database. A conservative two (2) kilometre search radius surrounding the subject lands was completed as it is understood that NHIC information is based on regional reports and habitat boundaries may be variable. The species of conservation concern that were found are shown in **Table 4-22**. Of these eleven (11) records, one (1) is listed as a species of Special Concern (SC) and one is listed as Extirpated (EXP) on the Species at Risk in Ontario (SARO) and the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) Lists.

Table 4-22 - NHIC Records for Species of Conservation Concern

Species Name	Scientific Name	GRank[1] Global	SRank[1] Provincial	COSEWIC[2] Canada	SARO[3] Ontario
a moss	*Helodium paludosum*	G3G5	S1?	-	-
Amber-winged Spreadwing	*Lestes eurinus*	G4	S3	-	-
Eastern Pipistrelle	*Pipistrellus subflavus*	G5	S3?	-	-
Hart's Tongue Fern	*Asplenium scolopendrium*	G4T3	S3	SC	SC
Honey-locust	*Gleditsia triacanthos*	G5	S2	-	-
Jefferson x Blue-spotted Salamander	*Ambystoma* hybrid population 1	GNA	S2	-	-
Lilypad Clubtail	*Arigomphus furcifer*	G5	S3	-	-
Northern Hawthorn	*Crataegus dissona*	G4G5	S3	-	-
Small-footed Bat	*Myotis leibii*	G3	S2S3	-	-
Timber Rattlesnake	*Crotalus horridus*	G4	SX	EXP	EXP
Twisted Sedge	*Carex torta*	G5	SX	-	-

[1] Source: Nature Conservancy Ranking (NHIC, 2010). 1 - Critically Imperiled, 2 - Imperiled, 3 - Vulnerable, 4 - Apparently Secure, 5 - Secure, G - Global Level, S - Sub-national Rank (Ontario) – Rank Uncertain, X – Presumed Extirpated, NA – Conservation Status Rank is Not Applicable at this level.

[2] Source: Species at Risk Public Registry (SARA, 2010) COSEWIC Status and [3] Source: Species at Risk in Ontario List (SARO, 2010). EXP – Extirpated, END – Endangered, THR – Threatened, SC – Special concern, '-' - Not listed.

In addition to the element occurrences recorded in the NHIC database several other species at risk were identified as having the potential to be in the area. The bird, amphibian and reptile species identified are discussed in later sections of the report. Butternut, an endangered tree species with the potential to be in the area, was given special consideration during the site visit. A review of background information and an assessment of available habitat suggested that the significant woodland in the west end of the Study Area south of Mayfield Road, the Etobicoke Creek valleylands and the Heart Lake Conservation Area would have the highest potential for Butternut. Surveys for Butternut focused on these areas as well as all land within 10 m of the Mayfield Road right-of-way. There were no Butternuts or species at risk listed in the NHIC database observed during the site visit. Adult Monarchs were observed in several locations along the Mayfield Road right-of-way, and their larval host plant, Common Milkweed, was common along the roadside. Monarchs have been designated as a species of Special Concern on the SARO List.

4.4.5 Biophysical Inventories/Observations

4.4.5.1 Bird Populations

The Atlas of the Breeding Birds of Ontario was consulted to determine if there were any rare or endangered species known to be present within the Study Area. The Atlas uses 100 km by 100 km blocks, then further to 10 km by 10 km squares to compartmentalize geographical areas. The Study Area lies within the 10 km by 10 km square identified as 17NJ94. Species names as well as their associated habitat potential within the Study Area are listed in **Table 4-23**. These species and their potential habitat were given special consideration during the site visit.

Table 4-23 - Bird Species at Risk

Species Name	SARO	Habitat Description[1]	Study Area Habitat Potential	Field Observations
Black Tern	SC	The species requires large, shallow, quiet marshes where their floating nests are not subject to disturbance from humans or boat traffic.	Low	Species not observed
Bobolink	THR	The species build nests on the ground in dense grasses such as hayfields. Though few hayfields exist on Study Area, a crop rotation to include hay would provide the preferred habitat.	Moderate	Species not observed
Canada Warbler	SC	The species is found in a variety of forest types, but is most abundant in wet, mixed deciduous-coniferous forests with a well-developed shrub layer. Also found in riparian shrub forests.	Low	Species not observed
Chimney Swift	THR	The species feeds in flocks around water bodies due to the large amount of insects present. Nesting occurs in large, hollow trees or in the chimneys of houses in urban and rural areas.	Low	Species not observed
Common Nighthawk	SC	The species nests in areas with little to no ground vegetation, such as logged or burned-over areas, forest clearing, rock barrens, etc.	Low	Species not observed
Henslow's Sparrow	END	The species nests in old fields, pastures and wet meadows that have not been invaded by shrubs. It requires tall dense grasses that provide cover for their nests.	Low	Species not observed
Least Bittern	THR	The species breeds in stable marshes with emergent vegetation, such as cattails, and areas with open water. They are typically found in large, quiet marshes.	Moderate	Species not observed
Louisiana Waterthrush	SC	The species typically nests along pristine, headwater streams associated with large tracts of mature forest. It may also be found in heavily wooded deciduous swamps with large areas of open water.	Low	Species not observed
Northern Bobwhite	END	The species inhabits edge and grassland type habitats such as fields that are not subject to intensive agriculture.	Low	Species not observed
Olive-sided Flycatcher	SC	The species lives in forest openings and edges, particularly where tall snags and dead trees can be used for foraging perches. Breeding habitat is frequently located along wooded riparian corridors or wetlands.	Moderate	Species not observed

Table 4-23 - Bird Species at Risk

Species Name	SARO	Habitat Description[1]	Study Area Habitat Potential	Field Observations
Red-headed Woodpecker	SC	The species lives in open woodlands and woodland edges, especially in oak savannah and riparian forest, where dead trees are used for nesting and perching.	Moderate	Species not observed
Whip-poor-will	THR	The species breeds in patchy forests with clearings, and generally avoids exposed, open areas, or closed-canopy forests.	Low	Species not observed
Yellow-breasted Chat	SC	The species breeds in early successional habitats with low, dense vegetation. Such habitat can be found in abandoned agricultural fields, power-line corridors, fencerows, forest edges and openings, etc.	Low	Species not observed

(SARO designation: END = Endangered; THR = Threatened; SC = Special Concern)
[1] Source: COSEWIC reports and/or Species at Risk in Ontario (SARO) List

4.4.5.2 Wildlife

Visual observations of area wildlife were recorded during the site visit. Wildlife observations are based on incidental contact, scat evidence, and tracks, and are consistent with species known to occupy this area. NHIC records for the Eastern Pipistrelle and Small-footed Bat date back to 1952 and 1948 respectively, while data from the Atlas of Mammals suggests these bat species may have been observed in the general area between 1970 and 1993. Suitable habitat for these species, particularly bat hibernacula were not observed within the Study Area. The only mammal species observed during the site visits was the Eastern Grey Squirrel. No mammalian species at risk were observed within the Study Area.

4.4.5.3 Herpetofauna

Due to the highly disturbed nature of the Study Area, suitable habitat for amphibian and reptile species is thought to be restricted to the natural areas and wetlands along Etobicoke Creek and the Heart Lake Provincially Significant Wetland Complex. A review of the Ontario Herpetofaunal Atlas suggests that the following species at risk have the potential to be in the area: Blanding's Turtle, Eastern Musk Turtle Eastern Ribbon Snake, Milksnake and Snapping Turtle. None of these species were observed during the site visits. However, Green Frog and Northern Leopard Frog were observed in the small catchment ponds and marshy areas at the southeast corner of the Mayfield Road and Heart Lake Road intersection, and in the wetland areas north of Mayfield Road. No herptile species at risk were observed during the site visit.

4.4.6 Significant Wetlands

Wetlands are defined in the PPS as lands that are seasonally or permanently covered by shallow water, as well as lands where the water table is close to or at the surface. There are four (4) major wetland types; which are classified as swamps, marshes, bogs, and fens. A significant wetland is defined as an area identified as provincially significant by the Ministry of Natural Resources using evaluation procedures established by the Province, as amended from time to time. Accordingly, it is the responsibility of the Ministry to both identify and classify wetlands as significant in Ontario.

The Provincially Significant Heart Lake Wetland Complex is located on lands to the west and south of the intersection of Mayfield Road and Heart Lake Road. The wetland complex is composed of nine (9) individual wetlands, several of which are part of the Heart Lake Conservation Area. It is described in the NHIC database as 64% swamp and 36% marsh. This area has been identified as a Core Area within the Region of Peel Greenlands System.

Portions of the Heart Lake Wetland Complex exist on the lands immediately north of Mayfield Road and have the potential to be impacted during the construction phases of this project. The wetland area closest to Kennedy Road has been classified as a Maple Mineral Deciduous Swamp. A shallow pond classified

as a Floating-Leaved Shallow Aquatic Wetland is located to the north of the Heart Lake Conservation Area. Neither wetland is known to support endangered or threatened species.

Several stormwater ponds exist within the Study Area. The edges of these ponds have been colonized by typical wetland vegetation and provide some additional wetland habitat in the area.

4.4.7 Significant Wildlife Habitat

Wildlife habitat is defined as areas where plants, animals, and other organisms live and find adequate amounts of food, water, shelter, and space needed to sustain their populations. Specific wildlife habitats of concern may include areas where species concentrate at a vulnerable point in their annual life cycle; and areas which are important to migratory or non-migratory species.

Wildlife habitat is referred to as significant if it is ecologically important in terms of features, functions, representation or amount, and contributing to the quality and diversity of an identifiable geographic area or Natural Heritage System.

Guidelines and criteria for the identification of significant wildlife are detailed in the Significant Wildlife Habitat Technical Guide, the Natural Heritage Reference Manual, and the Significant Wildlife Decision Support System. Significant wildlife habitat is described under four main categories:

- Seasonal concentrations of animals,
- Rare vegetation communities or specialized habitats for wildlife,
- Wildlife movement corridors, and
- Habitats of species of conservation concern.

A review of available information resources did not uncover any identified significant wildlife habitat in the Study Area; however, the Peel Natural Heritage Policy Review proposed that the Heart Lake Conservation Area be designated as a significant wildlife habitat ‘highly diverse area’. These ‘highly diverse areas’ identified in the report represent 5% of the most diverse habitat patches within the Region.

4.4.8 Significant Woodlands

Significant Woodlands are defined as treed areas that provide environmental and economic benefits such as erosion prevention, water retention, and provision of habitat, recreation and the sustainable harvest of woodland products. Woodlands include treed areas, woodlots or forested areas and vary in their level of significance. The identification and assessment of significant woodlands is the responsibility of the local planning bodies, in this case the City of Brampton, Town of Caledon and Regional Municipality of Peel. Woodland significance is typically determined by evaluating key criteria which relate to woodland size, ecological function, uncommon woodland species, and economic and social value.

Few natural wooded areas remain along Mayfield Road within the Study Area. The lands which were originally cleared for agriculture have given way to an increasing number of residential developments. Natural areas are now restricted to woodland patches and low-lying areas along Etobicoke Creek and wetland areas associated with the Heart Lake Wetland Complex and Conservation Area.

In the west end of the Study Area between Chinguacousy Road and Hurontario Street, woodland exists approximately 75 m south of Mayfield Road. Three residential properties and agricultural fields lie between the woodland and Mayfield Road. The woodland has been designated as “significant” by the City of Brampton and Regional Municipality of Peel based on its size. The woodland is a deciduous forest with small plantations along the south and east boundaries. While the woodland has the potential to provide suitable habitat for species of conservation concern, it has not been identified as significant habitat for endangered or threatened species or significant wildlife habitat. There were no species of conservation concern observed. A 10 m buffer zone is required for significant woodlands in the City of Brampton.

In the east end of the Study Area between Hurontario Street and Heart Lake Road natural wooded areas exist along Etobicoke Creek, in the Heart Lake Conservation Area and along the boundaries of the

wetland areas north of Mayfield Road. The wooded areas around Etobicoke Creek and associated marsh areas have been classified as Fresh-Moist Elm Lowland. Dominant tree species observed during the site visit along Etobicoke Creek and its tributary include White Elm, Black Walnut, Black Locust, Willows, Silver Maple, Poplars and to a lesser extent Manitoba Maple and Staghorn Sumac.

The Heart Lake Conservation Area woodlands along Mayfield Road consist of two dominant forest types: a conifer plantation dominated by Scots Pine, White Spruce and Norway Spruce, and a Fresh Moist Black Walnut Lowland. Occasional White Elm, Silver Maple and Manitoba Maple are also present. Along the forest edge understory species such as Common Buckthorn, Honeysuckle, Smooth Wild Rose and Staghorn Sumac are common.

Sparsely treed areas mark the boundaries of the wetland areas to the north of Mayfield Road. Common species in these low-lying areas include Silver Maple, Green Ash, Willows, Alders, White Elm and the occasional Scots Pine. The most densely wooded area in this part of the Study Area lies to the east of the catchment pond on the northeast corner of Mayfield Road and Kennedy Road.

4.4.9 Significant Valleylands

The PPS refers to significant valleylands as “a natural area that occurs in a valley or other landform depression that has water flowing through or standing for some period of the year”. The local planning authority is responsible for identifying and evaluating significant valleylands.

Significant valleylands are associated with the Etobicoke Creek which is located east of Hurontario Street in the approximate middle of the Study Area. These valleylands are part of the City of Brampton’s parkland and open spaces system and are identified as a Core Area within the Region of Peel Greenlands System.

4.4.10 Significant Feature Summary

A summary of the significant Natural Heritage Features identified on or adjacent to the Study Area are provided in the **Table 4-24**. This summary is based on four (4) site visits and a review of available documentation pertaining to the Study Area and adjacent lands. In order to minimize the effects of the development on these natural features mitigative measures may have to be considered for all work conducted in the area.

Table 4-24 - Significant Feature Summary

Feature	Present	Comment
Fish Habitat	Yes	Etobicoke Creek which is classified as a warm water creek is present in the approximate middle of the Study Area. Several intermittent tributaries of Fletcher’s Creek cross Mayfield Road in the western portion of the Study Area between McLaughlin Road and Chinguacousy Road.
Significant ANSI	Yes	The Study Area is within 120 m of a Significant ANSI. The Heart Lake Forest and Bog Life Science ANSI are located in the southwest corner of the Mayfield Road and Heart Lake Road intersection, and is part of the Heart Lake Road Conservation Area.
Threatened or Endangered Species Habitat	No	Habitat for Threatened or Endangered species has not been identified on or within 120 m of the Study Area.
Significant Wetland	Yes	The Heart Lake Provincially Significant Wetland Complex, which is composed of 9 separate wetland areas, is located within 120 m of the Study Area in the northwest, southwest and southeast quadrants of the Mayfield Road and Heart Lake Road intersection.

Table 4-24 - Significant Feature Summary

Feature	Present	Comment
Significant Wildlife Habitat	No	Significant Wildlife Habitat has not been identified on or within 120 m of the Study Area.
Significant Woodland	Yes	The woodland located south of Mayfield Road and west of McLaughlin Road has been designated a significant woodland by the Regional Municipality of Peel and the City of Brampton. As such, a minimum 10 m setback is required for this woodland.
Significant Valleyland	Yes	Significant valleylands have been identified along the Etobicoke Creek which runs through the approximate centre of the Study Area just east of Hurontario Street.

4.4.11 Hydrogeology

4.4.11.1 Physiography

The project site is located within the South Slope physiographic region, just south of the Oak Ridges Moraine. It is in the area north of the Peel Plain that is also commonly referred to as the "North Slope" although it is considered part of the South Slope. The ground surface consists of gently undulating till plain with limited relief. Thin lake sediments are found in low-lying areas, similar to those found within the Peel Plain. Two physiographic features dominate the landscape. The Kelso moraine is a low till ridge located just to the north and running parallel to Mayfield Road. North of the ridge is a linear depression containing lake sediments. Etobicoke Creek flows through this area and around the east end of the ridge. Tributaries to Fletcher Creek rise off of the south side of the moraine. The second feature is the Brampton Esker, which rises north of Mayfield Road and runs south between Kennedy Road and Heart Lake Road. This is a palimpsest feature, as it occurred during a previous glacial period, and the land surface inherited its form from this feature. Deposition of the esker likely took place into an ice front re-entrant bordering glacial Lake Peel. It is a ridge of sand and gravel that is approximately 7 km long, 0.2 – 0.6 km in width, and 15 m high. Kettle holes and bogs are common along this feature, typically in the form of steep-sided depressions. Heart Lake is the most prominent of these kettle features. Till covers most of the esker, from 1-3 m in thickness.

4.4.11.2 Drainage

The Study Area falls within two watersheds, separated by a low ridge just north of Mayfield Road. On the south end of this ridge from Chinguacousy Road to approximately the Orangeville Railway crossing, tributaries to Fletcher's Creek drain to the south, where it enters the Credit River at Meadowvale. A number of these tributaries cross Mayfield Road, though most of them are dry at most times of the year. The lands to the east of the CPR crossing are drained by Etobicoke Creek. The headwaters flow from the north side of the Kelso moraine and around the east end, before draining south through Brampton, past the west side of Pearson Airport and into Lake Ontario. The main branch of Etobicoke Creek crosses Mayfield Road between Hurontario Street and Kennedy Road.

4.4.11.3 Surficial Geology

Surficial geology in the Study Area, shown in **Figure 4-16**, generally consists of the sandy silt to silty clay Halton Till. Depressions in the gently undulating surface tend to contain thin (1 – 3 m thick) and discontinuous layers of glaciolacustrine silts and clay. Recent alluvial deposits are located in the floodplain of Etobicoke Creek. Peat and bog deposits are found between Heart Lake Road and Kennedy Road, associated with the Brampton Esker.

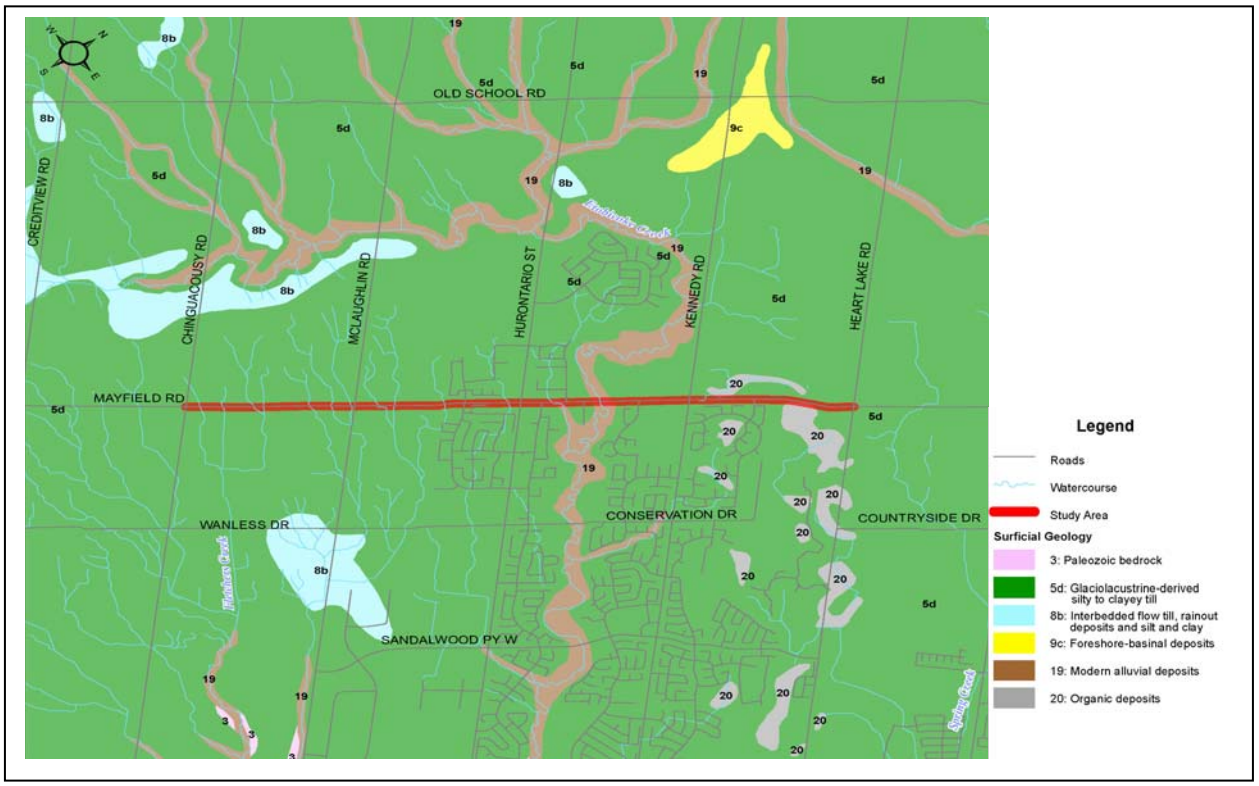

Figure 4-16 - Surficial Geology of Study Area

4.4.11.4 Subsurface Geology

The subsurface stratigraphy has been described by Karrow (2005) and is presented from youngest to oldest as follows:

- Recent Alluvium
- Organic Deposits
- Glaciolacustrine Deposit
- Halton Till
- Maple Formation
- Newmarket Till
- Sunnybrook Drift
- York Till

Recent alluvium is generally associated with deposition in the floodplains of modern watercourses. It consists of a wide range of geological materials, from gravel to sand to silt to clay. Organic material is also common in some areas. They tend to be thin (1 – 3 m) and extend at most 100 – 200 m from the streams.

Organic deposits in the Study Area tend to be associated with depressions exhibiting poor drainage, such as in the kettle bogs of the Brampton Esker. Accumulations of muck and peat are common in these areas, and tend to provide unstable ground conditions for construction. They can be anywhere from 2 – 5 m in thickness and may be thicker in places.

Glaciolacustrine deposits generally consist of fine grained silt and clay and are generally found in depressions within the Study Area. They are often laminated and display cyclic deposition / rhythmites. They tend to be thin and discontinuous (1 – 3 m in thickness) and are likely related to deposition in glacial lakes (such as Lake Peel).

Halton Till is found at ground surface over most of the Study Area and is the youngest till present. It is composed of sandy silt to silty clay and is generally up to 10 m in thickness in the Study Area. The Kelso moraine is composed of Halton Till. The Halton Till is considered to be an aquitard.

Maple formation is the loose definition given to the varied sediments that underlie the Halton Till. They consist of an assemblage of ice-contact outwash and glaciolacustrine deposits that were rapidly deposited over wide areas during glacial retreat. The Brampton Esker is considered to be part of the Maple formation. Some of these materials can be considered as aquifers.

Newmarket Till is a stony sandy till that underlies the surficial Halton Till and Maple formation. It is considered to be an aquitard.

Sunnybrook Drift is a clayey to silty till that underlies the Newmarket Till. This till likely pinches out against the rising bedrock surface, but may be present in the deep buried valley at Meadowvale.

York Till is a sandy clay till with a large number of shale clasts. It is not expected to be found west of the Humber River.

4.4.11.5 Bedrock Geology

Bedrock in the Study Area likely consists of the reddish brown Queenston Shale. Available mapping suggests that there are areas where bedrock is quite shallow (less than 8 m), such as between the Orangeville Railway tracks and just west of McLaughlin Road. In other locations, drift thickness maps suggest that the bedrock is almost 50 m below ground surface (bgs). A bedrock valley is indicated in a bedrock topography map in the area of Heart Lake Road. A bedrock valley extends from Snelgrove (Mayfield Road and Hurontario Street) to Long Branch (Lake Ontario) that is 10 – 30 m deep.

4.4.11.6 YPDT Conceptual Model

A cross-section was obtained from YPDT-CAMC along the study alignment to provide a preliminary conceptual representation of the underlying stratigraphic units. The section shows Halton till at ground surface over the entire Study Area in thicknesses ranging between 5 m and 25 m. It overlies the Oak Ridges Moraine (or equivalent) west of Chinguacousy Road, which is up to 10 m thick and directly overlies bedrock. Between Chinguacousy Road and McLaughlin Road, the Halton Till directly overlies up to 10 m of Newmarket Till and bedrock, which rises to about 10 m bgs. East of McLaughlin, the ORM underlies the surface till and is found atop the downward sloping bedrock surface, becoming up to 20 m in thickness just East of Hurontario Street. It thins from 10 m to nearly absent beneath Heart Lake Road. Beneath the ORM is the Thorncliffe formation aquifer, which is interpreted to be up to 30 m in thickness and overlying bedrock. The ORM and the Thorncliffe formation are separated by a thin wedge of Newmarket Till (up to about 8 m in thickness) east of Kennedy Road.

The section is missing several key units described in the previous section, including recent alluvium, organics, Sunnybrook and York Tills.

4.4.11.6.1 MOE Water Well Records

Water well records were obtained from MOE within 500 m of the Study Area. In the western portion of the Study Area, in the vicinity of Chinguacousy Road, clay is found at ground surface between 5 and 25 m in thickness. The clay contains up to 10 m thick layers of silt, sand and gravel, and overlies bedrock, which ranges between 15 and 50 m bgs. Bedrock rises to 5 – 10 m bgs towards McLaughlin Road, and is overlain by clay. As the alignment approaches Hurontario Street, bedrock depth increases to approximately 40 – 50 m bgs. The overburden becomes more complex as well. While a thin layer of clay is still found at ground surface (5 – 10 m in thickness), beneath this unit are interbedded layers of sand, silt and clay of varying thicknesses. These conditions persist towards Heart Lake Road, where the surficial clays become much thicker (15 – 40 m) with isolated sand, silt and gravel pockets. Groundwater levels identified in the MOE database were sporadic and typically were located near the bottom of the well. As such, these data are not considered to be a reliable indicator of actual groundwater conditions.

The data found in the MOE water well database was found to be much more complicated than the interpretations provided by the YPDT cross-section. Aside from surficial clays being identified across the entire Study Area, no specific regional aquifer / aquitard relationships could be determined from the data.

4.4.11.6.2 Geotechnical Investigation

A series of geotechnical investigations were undertaken as part of the previous widening of Mayfield Road between Hurontario Street and Heart Lake Road and as part of a watermain installation from Kennedy Street to Heart Lake Road. The initial investigation considered ground conditions in the area around the bridge crossing of Etobicoke Creek and the wetland areas adjacent to the road between Kennedy Road and Heart Lake Road. The general conditions in the vicinity of the creek crossing consisted of fill overlying recent alluvial deposits, overlying layers of non-cohesive sands and silts. Groundwater was measured to be very close to ground surface. The wetland areas posed more of a challenge, as thick deposits of peat were found. The discovery of these deposits was the impetus behind the investigations that followed.

Subsequently, boreholes were advanced along the road and in the wetland areas to determine the thickness of the peat and to provide a work plan for the construction of the road and two stormwater management (SWM) ponds. The investigations showed varying thicknesses of peat below ground surface overlying soft clayey silt, overlying layers of sand / silt and clay. Groundwater levels were found to be at ground surface within the wetlands. The peat and other compressible soils were seen as a considerable challenge in the construction of the road.

During the previous road construction, the base of the peat layer was generally found to be about 5 m bgs, although in places it was identified to be almost 15 m bgs. Due to the instability and thickness of the peat, dewatering methods were not used during the construction of the road. Instead, a large number of caissons were installed to support the road and prevent significant settling. Based on this information, it is expected that the conditions in the vicinity of the wetlands are going to be similar to those encountered during the current widening of the road, and that significant thicknesses of peat will be encountered. This is particularly true on the north side of Mayfield Road.

4.4.11.6.3 Private Wells

Approximately 150 water wells were identified within the Study Area. Of these wells, it is likely that there are a much lower number still in use due to the increased development. It is estimated that the only area where water wells may still be in use is in the rural part of the alignment west of Snelgrove. Based on existing mapping, there could be anywhere between 15-20 properties with wells potentially still in use.

The detailed hydrogeology report is included in **Appendix I**.

4.4.11.7 Contaminated Soils

Based on the existing land uses in the Study Area, the environmental risk associated with the residential and agricultural lands are low.

The prolonged use of treated wood associated with the Orangeville Rail located to the west of Hurontario Street, is a potential source of environmental concern. Localized impact of various metals and polyaromatic hydrocarbons (PAHs) are often associated with wood preservation and chemicals used on railways. Although the tracks on Mayfield Road are paved, wooden tracks can be found on either side of the road. The environmental impact associated with the railway crossing on Study Area is medium.

The waste disposal site records from the Anderson Waste Disposal Site Inventory, the MOE CA inventory and the 1991 Historical Approval Inventory a site located at the southeast corner of Kennedy Road and Mayfield Road, near the tributary of the Etobicoke Creek, in the City of Brampton was referenced. According to the well records, the shallow subsurface material in the area is mostly clay. As all the records are located downgradient of the Area and the local soil type has a low permeability and is less susceptible to contaminated groundwater flow onto the waste disposal site from adjacent properties, for the purpose of the road improvement, the environmental risk to the soil and groundwater condition of the Area associated with the former waste disposal site is low.

The fuel storage tank records identified during review present potentially contaminating activities. The fuel tanks are located in current service stations at the northeast and southwest corners of the intersection of Hurontario Street and Mayfield Road (11980 and 12011 Hurontario Street). A third and fourth record at a

different address, is located to the south of the intersection, which is down gradient to the Study Area. Based on the age and the construction of the tanks at 11980 and 12011 Hurontario, the environmental risk associated with the USTs are low to medium.

Two spills records were identified to have confirmed environmental impact to the land in the Study Area. A spill of 300L of diesel oil to the road was found to have occurred at the intersection Hurontario Street and Mayfield Road in 1995. A 50L hydraulic oil spill to the ground across from the Heart Lake Conservation area also had confirmed environmental impact to the soil at the time of the spill in 2008. A spill resulting in possible surface water environmental impact was recorded at a construction site on Mayfield Road in 2006, just east of Hurontario Street, due to equipment failure. Based on the age, quantity and surface of the road at the time of the spill, the environmental impact to the soil results from the spills are low. Although the spill record indicated possible impact from the spill at the construction site in 2006, based on the age and the flow of surface water in the area, the environmental impact to the Study Area from the spill is also low.

Details of the Contaminated Soil assessment can be found in **Appendix J**.

4.5 Existing Social Environment

4.5.1 Land Use

Mayfield Road is the municipal boundary between the City of Brampton and the Town of Caledon within the Region of Peel. The north side of Mayfield Road falls within the Town of Caledon and the south side is the City of Brampton.

4.5.1.1 Existing Land Use

Policy Statements

The current Provincial Policy Statement (PPS) was introduced in March, 2005 and revised in April, 2014. It aims to guide appropriate development while protecting resources of provincial interest, public health and safety, and the quality of the natural environment. Policies regarding Building Strong Communities focus on the orderly development of land including works necessary to meet the current and projected need for infrastructure.

The PPS also encourages the planning of infrastructure to be integrated with the planning for growth to meet the current and projected needs of the area. It also encourages the improvement of existing infrastructure prior to the development of any new infrastructure within a municipality/region. Specifically, the PPS (Section 1.6.2) states:

> *The use of existing infrastructure and public service facilities should be optimized, wherever feasible, before consideration is given to developing new infrastructure and public service facilities.*

The PPS also encourages the development of transportation systems that are safe, reliable, and encourage the free movement of persons and goods from one area to another. Specifically, the PPS (Section 1.6.5.1 and Section 1.6.5.2) states:

> *Transportation systems should be provided which are safe, energy efficient, facilitate the movement of people and goods, and are appropriate to address projected needs.*
>
> *Efficient use shall be made of existing and planned infrastructure.*

It is clear from the PPS that optimizing existing public infrastructure, including roadways, to a standard that encourages the free and safe movement of persons and goods is desirable.

Region of Peel Official Plan

The Region of Peel Official Plan (November 2008 and Working Draft October 2011) designates Mayfield Road as a major road. The official Plan also designates the lands from the railway west to Chinguacousy

Road as prime agricultural but this will be addressed by the Mayfield West Secondary Plan and the official plan amendments (ROPA 24) that have been proposed. The remaining area along Mayfield Road is currently designated as Regional Urban.

Snelgrove (which extends north and south of Mayfield Road from the railway tracks to Etobicoke Creek) is designated urban area as well as the lands on the south side of Mayfield Road (from Etobicoke Creek east to Heart Lake Road). On north side of Mayfield Road (from Etobicoke Creek east to Heart Lake Road) is designated as Rural Service Centre. West of Snelgrove area is designated Agricultural and Rural Area (north side of Mayfield Road) and Greenfield Area (south side).

Under the Greenbelt Plan Area Land Use Designations (Schedule D3 to the Region's Official Plan), the community of Mayfield is identified as Settlement Areas outside the Greenbelt.

City of Brampton Official Plan

The City of Brampton's Official Plan (October 2008) has secondary plans for Snelgrove and Mount Pleasant, which are the two areas generally on the south side of Mayfield Road.

The Snelgrove Secondary Plan extends to lands north and south of Mayfield Road from the railway tracks to Etobicoke Creek. There is commercial development along Mayfield Road from Highway 10 east. The remainder is low density residential along Mayfield Road east (to Etobicoke Creek) and west (to the railway tracks) of Highway 10. East of Highway 10, Hazard Lands are identified along Etobicoke Creek. The four corners of Highway 10 and Mayfield Road are designated as commercial (with gas stations, Tim Horton's and convenience stores present).

Town of Caledon Official Plan

The Town of Caledon Official Plan (consolidated December 2008) guides land use development within the town boundaries. The Official Plan identifies the land use for the lands along the north side of Mayfield Road as part of the Mayfield West Secondary Plan, Schedule B. The secondary plan is currently under development and has not been fully implemented. Schedule B of the Official Plan shows the lands on the north side of Mayfield Road from Heart Lake Road and going east to Snell's Hollow designated as residential policy with environmental policy in the Heart Lake Conservation Area and Etobicoke Creek areas. The lands west of the railway to Chinguacousy Road are agricultural policy with institutional (school) use east of McLaughlin Road.

4.5.1.2 Proposed/Future Land Use

Mount Pleasant Secondary Plan (City of Brampton)

Secondary Planning for the Mount Pleasant area (approved February 2010) is part of the City of Brampton's "Smart Growth" community plans. In addition, the Mount Pleasant Secondary Plan provides strong policies for future Natural Heritage System.

The Mount Pleasant Secondary Plan Area 51 includes the south side of Mayfield Road from the railway west to Chinguacousy Road. Following approval of the secondary plan, block concept plans were developed in June 2010. The block concept plan shows a mix of development on the south side of Mayfield Road. The land uses will include commercial development (at Creditview Road), low-medium density residential development and natural heritage system along the watercourse (west of Chinguacousy Road).

Mayfield West Secondary Plan (Town of Caledon)

Secondary planning for Mayfield West (MW) is part of the Town of Caledon's long-term growth management strategy. This planning area directly abuts the City of Brampton's Secondary Plans 1 (Snelgrove) and 51 (Mount Pleasant). The Mayfield West Community Development Plan Study Area includes lands west of Highway 10 to Chinguacousy Road on the north side of Mayfield Road.

The Mayfield West work program is comprised of four distinct phases. Phase 1 of the work program included a comprehensive characterization of the Study Area. Phase 2 identifies the preferred land use

scenario and submission of a Regional Official Plan Amendment Application for the next phase of growth for Mayfield West. Phase 3 involves detail design and there will be an opportunity for refinements to the land uses intended for a location within the preferred scenario. The Secondary Plan will be drafted in Phase 3. Final Recommendations and a local Official Plan Amendment will be initiated in Phase 4. Mayfield West Secondary Plan is currently in Phase 4.

The preferred scenario identified in Phase 2 indicates the desired location for the next phase of growth in Mayfield West and land use designations. No lands in the preferred scenario are located in the Greenbelt or Strategic Infrastructure Study Area (as defined in the Regional Official Plan Amendment 24 and Caledon's Official Plan Amendment 226). Between the railway and west to Chinguacousy Rd is identified as residential in the Mayfield Secondary Plan. There are two small pockets of commercial on the either side of McLaughlin Road.

Phase 2 of Mayfield West plans for population growth, but also designates new employment lands, significant commercial and retail opportunities, parks, schools and a natural heritage system. The Town of Caledon will have to submit a Regional Official Plan Amendment (ROPA) application to amend the Mayfield West Rural Service Centre settlement boundary to implement the limits of preferred land use scenario. Once ROPA 24 and the ROPA to support a settlement boundary expansion are in force, Caledon will proceed to implement a local official plan amendment for the Mayfield West Secondary Plan Area in the Town's Official Plan.

Depending on the final outcome of ROPA 24, the growth forecasts allocated to the Town of Caledon, and Mayfield West, may have to be revisited. Presently, ROPA 24 is under review by the Ministry of Municipal Affairs and Housing. The Region will not be in a position to approve Caledon's forthcoming ROPA application to expand the settlement area boundaries of Mayfield West until ROPA 24 is in force.

On June 8, 2010, Caledon's Town Council adopted OPA 226 which updated the Caledon Official Plan to bring it into conformity with the Provincial Policy Statement, Growth Plan, Greenbelt Plan and Region Official Plan. Population allocations for Mayfield West are contained in OPA 226. In 2012 OPA 226 was modified by the Town of Caledon to conform to ROPA 24 and these modifications were approved by Region of Peel Council on Oct 25, 2012. OPA 26 had been appealed to the OMB and an OMB decision approving OPA 226 was issued on October 15, 2013.

4.5.2 Archaeology

A Stage 1 Archaeological investigation was undertaken as part of the study. Additional details of the findings of the Stage 1 Archaeological Investigation can be found in **Appendix K**.

Section 1 of the Ministry of Tourism, Culture and Sport's (MTCS) 2011 Standards and Guidelines for Consultant Archaeologists discusses the objectives of a Stage 1 assessment as follows:

- To provide information about the geography, history, previous archaeological fieldwork and current land condition of the Study Area;
- To evaluate in detail the archaeological potential of the Study Area which can be used, if necessary, to support recommendations for Stage 2 Archaeological Assessment for all or parts of the property; and
- To recommend appropriate strategies for Stage 2 Archaeological Assessment, if necessary.

The Standards and Guidelines for Consultant Archaeologists list characteristics that indicate where archaeological resources are most likely to be found. Archaeological potential is confirmed when one or more features of archaeological potential are present.

As per Section 1.3.1 of the standards and guidelines, the Area meets the following criteria used for determining archaeological potential:

- Previously identified archaeological sites (i.e. Bartholomew Snell Homestead);
- Water sources: primary secondary, or past water source (i.e. Heart Lake);

- Areas of Euro-Canadian Settlement (i.e. Edmonton);
- Elevated topography (i.e. Knolls); and
- Early historic transportation routes (i.e. Chinguacousy Road)

These criteria characterize the Study Area as having potential for the identification of Aboriginal and Euro-Canadian archaeological resources.

Part of the Mayfield Road study corridor is comprised of a right-of-way (ROW). Typically, a ROW can be divided into two areas: the disturbed ROW, and ROW lands beyond the disturbed ROW. The typically disturbed ROW extends outwards from either side of the centerline of the traveled lanes, and it includes the traveled lanes and shoulders and extends to the toe of the fill slope, the top of the cut slope, or the outside edge of the drainage ditch, whichever is furthest from the centerline. Subsurface disturbance within these lands may be considered extreme and pervasive, thereby negating any archaeological potential for such lands.

ROW construction disturbance may be found to extend beyond the typical disturbed ROW area, and this generally includes additional grading, cutting and filling, additional drainage ditching, watercourse alteration or channelization, servicing, removals, intensive landscaping, and heavy construction traffic. Areas beyond the typically disturbed ROW generally require archaeological assessment in order to determine archaeological potential relative to the type or scale of disturbances that may have occurred in these zones.

The Stage 1 Archaeological Assessment (see **Appendix K**) determined that twenty-five (25) sites have been registered within 1 km of the Study Area. A review of the archaeological and historical context of the Study Area also suggested that it has potential for the identification of Aboriginal and Euro-Canadian archaeological resources.

4.5.3 Cultural Heritage

A cultural heritage assessment considers cultural heritage resources in the context of improvements to specified areas, pursuant to the Environmental Assessment Act. This assessment addresses above ground cultural heritage resources over 40 years old. Use of a 40 year threshold is a guiding principle when conducting a preliminary identification of cultural heritage resources. While identification of a resource that is 40 years or older does not confer outright heritage significance, this threshold provides a means to collect information about resources that may retain heritage value. Similarly, if a resource is slightly younger than 40 years old, this does not preclude the resource from retaining heritage value. Full details of the Cultural Heritage Assessment can be found in **Appendix L**.

The term cultural heritage resource is used to describe both cultural landscapes and built heritage features. A cultural landscape is perceived as a collection of individual built heritage features and other related features that together form farm complexes, roadscapes, and nucleated settlements. Built heritage features are typically individual buildings or structures that may be associated with a variety of human activities, such as historical settlement and patterns of architectural development.

Under the *Environmental Assessment Act*, environment is defined in Subsection 1(c) to include:

- Cultural conditions that influence the life of man or a community; and
- Any building, structure, machine, or other device or thing made by man.

The MTCS is charged under Section 2 of the *Ontario Heritage Act* with the responsibility to determine policies, priorities, and programs for the conservation, protection, and preservation of the heritage of Ontario and has published two (2) guidelines to assist in assessing cultural heritage resources as part of an environmental assessment; *Guideline for Preparing the Cultural Heritage Resource Component of Environmental Assessments*, and *Guidelines on the Man-Made Heritage Component of Environmental Assessments.*

The following resources were consulted for the preliminary identification of built heritage resources:

- The Canadian Register of Historic Places;
- The City of Brampton's Heritage Inventory; and
- The Built Heritage Resources and Cultural Heritage Landscapes Assessment for the Mayfield West Phase 2 Secondary Plan (completed by the Town of Caledon).

The landscape on either side of Mayfield Road features a combination of highly altered sections that are occupied by dense residential subdivisions and commercial development, interspersed with pockets of generally unaltered and mostly active agricultural properties. The Study Area also features a handful of residences dating to the 1950's, 1960's and 1970's that occupy small residential lots that were severed from larger agricultural properties prior to the construction of the more recent subdivisions. Unaltered areas that are still evocative of the area's agricultural roots include the areas: between Chinguacousy Road and McLaughlin Road, the north side of Mayfield Road from McLaughlin Road to the Orangeville Railway Tracks, and the north side of Mayfield Road from the Etobicoke Creek to Heart Lake Road. Other generally unaltered areas within the Study Area include the Heart Lake Conservation Area and the Etobicoke Creek valley. The tablelands are either occupied by dense residential development or currently under construction.

Due to the highly developed nature of the intersection of Mayfield Road and Hurontario Street, the only evidence of the historical settlement of Edmonton/Snelgrove, seems to be the Snelgrove Baptist Church and the St. John's Snelgrove Cemetery.

The results of the background historic research, review of secondary source material, and a site visit, revealed a Study Area with roots in nineteenth-century agricultural land use. Eight (8) cultural heritage resources were identified within the Study Area. None of the identified cultural heritage landscapes are designated under the *Ontario Heritage Act*.

4.5.4 Air Quality

A preliminary air quality assessment was undertaken to determine the existing air quality within the Study Area.

In Ontario, a significant amount of smog originates from emission sources in the United States which is the major contributor during smog events, usually occurring in the summer season (MOE, 2005). During smog episodes, the U.S. contribution to Fine Particulate Matter (PM2.5) can be as much as 90 percent near the southwest U.S. border and approximately 50 percent in the Greater Toronto Area (GTA).

The following Agencies and Organizations in Canada provide guidelines for air quality:

- MOE Ambient Air Quality Criteria (AAQC)
- Health Canada/Environment Canada National Ambient Air Quality Objectives (NAAQOs)
- Canadian Council of Ministers of the Environment (CCME) Canada Wide Standards (CWSs)

Within these guidelines, the threshold value for each contaminant and its applicable averaging period was used to assess the maximum predicted effect at sensitive receptors derived from computer simulations. The applicable averaging periods for the contaminants of interest are based on 1-, 8- and 24-hour acute (short-term) exposures.

Based on a review the ambient monitoring dataset of years 2005 to 2009, all contaminants were below their respective MOE criteria with the exception of Coarse Particulate Matter (PM10), Total Suspended Particulate Matter (TSP), and PM2.5 benzene. Benzene concentrations were based on actual measurements while PM10 and TSP concentrations were calculated based on their relationship to PM2.5. It should be noted that even though the maximum concentration of PM2.5 exceeded the CWS the guideline for PM2.5 is based on an average annual 98th percentile concentration, averaged over 3 consecutive years. Therefore, it was determined that the maximum rolling 98^{th} percentile average was 27.61 $\mu g/m^3$, which is less than the MOE guidelines.

Further details on air quality can be found in **Appendix N**.

4.6 Description of the Evaluation Methodology

The evaluation of alternative solutions was undertaken using a comparative net effects analysis. The net effects were compared using a descriptive, "reasoned argument" approach rather than assigning numerical weightings and rankings. Trade-offs considering the advantages or disadvantages of each alternative to address the problem and opportunity statement with the least environmental effects and the most technical benefits will result in a higher priority and forms the rationale for the identification of the preferred solution. This qualitative approach was chosen because numerical/quantitative rankings and weightings can pose significant evaluation difficulties that can often produce disagreement over the final results.

In order to identify the advantages and disadvantages of each alternative solution, evaluation criteria were developed within each of the following categories of consideration (representing the broad definition of the environment described in the EA Act):

- **Technical/Engineering** - having regard for the technical suitability/longevity, traffic operations, and other engineering aspects of the alternative solution.
- **Natural Environment** - having regard for protecting the natural and physical components of the environment (i.e., air, land, water and biota) including natural and/or environmentally sensitive areas.
- **Social/Land Use/Cultural Environment** - having regard for residents, neighbourhoods, businesses, development, land use framework/policies, community features, historical/archaeological remains, and heritage features.
- **Financial** – having regard for the costs associated with the alternative solution.

Within each category, the evaluation criteria were developed based on the existing characteristics/features of the Study Area, the Alternative Solutions being considered, and the Problem/Opportunity Statement. These criteria were chosen based on their ability to identify the potential environmental effects of each alternative and distinguish the strengths/weaknesses between them. The evaluation criteria developed are contained within the evaluation matrix shown in **Table 4-25**.

Once developed, the evaluation criteria were used to comparatively evaluate the Alternative Solutions and identify a Recommended Solution through a net effects analysis consisting of the following steps:

- Apply the evaluation criteria to each of the Alternative Solutions to identify the potential effects on the environment.
- Identify reasonable mitigative measures available to avoid or minimize any potential negative environmental effects on the environment.
- Apply the mitigative measures to identify the remaining net positive or negative effects on the environment.
- Identify the relative advantages and disadvantages for each Alternative Solution based on the net environmental effects.

These alternatives were comparatively evaluated based on their net effects after mitigation measures were applied. The net effects analysis is summarized in **Table 4-25**.

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Table 4-25 - Alternative Solution Evaluation Matrix

CATEGORIES OF CONSIDERATION	CRITERIA	ALTERNATIVE SOLUTIONS				
		Alternative Solution #1 Do Nothing	**Alternative Solution #2 Improve Transportation Systems Management (TSM)**	**Alternative Solution #3 Improve Travel Demand Management**	**Alternative Solution #4 Improve Parallel Roadways**	**Alternative Solution #5 Improvements Along Mayfield Road**
	DEFINITIONS	**No improvements made to the intersection. This represents the "status quo".**	**Provide improvements by improving traffic signal operations, and/or add queue jump signals for transit.**	**Promote transit and active transportation initiatives**	**Adding additional lanes on parallel roadways to attract traffic away from the corridor**	**Provide improvements by widening Mayfield Road**
Technical	Potential to accommodate the projected traffic demand	Won't accommodate projected traffic demand	Minor improvements to capacity as improvements may help reduce rate of increase in traffic congestion Traffic demand and congestion from developments within corridor will continue to increase	Potential reduction in demand as improvements may help reduce rate of increase in traffic congestion Traffic demand and congestion from developments within corridor will continue to increase	Accommodates projected traffic demand	Accommodates projected traffic demands
	Potential for improving traffic safety	Traffic demand and congestion will increase over time without modifications to operation of intersection Traffic safety will decrease over time (greater potential for accidents and injuries) with no improvements	Traffic demand and congestion expected to increase Traffic safety will decrease over time (greater potential for accidents and injuries) Marginally better than Alternative #1	Traffic demand and congestion expected to increase Traffic safety will decrease over time (greater potential for accidents and injuries) with this alternative Marginally better than Alternative #1	Mayfield Road currently performs well from traffic safety perspective Volumes of traffic expected to use parallel roadways thus traffic safety within the corridor not expected to deteriorate Opportunity to improve traffic safety on parallel roadways exists	High potential to improve traffic safety
	Potential for incorporating improvements for cyclists, pedestrians, transit, and streetscaping	No improvements for cyclist, pedestrians, transit and streetscaping	Does not allow for incorporation of improvements for cyclist, pedestrians, and streetscaping Does improve transit movement through the corridor	Does not allow for incorporation of improvements for cyclist, pedestrians, transit and streetscaping	Does not allow for incorporation of improvements for cyclist, pedestrians, transit and streetscaping on Mayfield Rd but on parallel roadways instead	Allows for incorporation of improvements for cyclist, pedestrians, transit and streetscaping
	Technical Summary	Technical issues not addressed	Technical issues not addressed	Technical issues not addressed	Addresses some technical issues	Addresses technical issues
Natural Environment	Potential for altering existing watercourses	No changes to existing watercourses since no construction is required	Low potential for altering watercourses since improvements could be undertaken on existing roadways with minimal additional construction required	No changes to the existing watercourses since no construction is required	Moderate-high potential for altering existing watercourses since parallel roadways also have similar watercourse crossings that would be impacted (issue of Redside Dace would need to be addressed depending on roads utilized)	Low-Moderate potential for altering existing watercourses since previous widening was completed to accommodate future construction of additional lanes in Etobicoke Creek area and watercourses west of CPR have only intermittent flow (issue of Redside Dace would need to be addressed)
	Potential for short-term construction related effects on downstream surface water quality	No construction related effects on downstream surface water quality	Low-moderate potential for construction related effects on downstream surface water quality	No construction related effects on downstream surface water quality	High construction related effects on downstream surface water quality but effects can be mitigated through design	Moderate-High related effects on downstream surface water quality. These effects can be mitigated through design
	Potential for altering existing terrestrial features	No effect to existing terrestrial features	Low potential for altering existing terrestrial features	No effect to existing terrestrial features	High impact to existing terrestrial features	Moderate-High impact to existing terrestrial features mainly west of Hurontario St
	Natural Environment Summary	No impact since no construction activities required	Moderate impact with use of existing roadway	No impact since no construction activities required	High Impact from construction activities on parallel roadways	Moderate impact with use of existing roadway and structures

Table 4-25 - Alternative Solution Evaluation Matrix

CATEGORIES OF CONSIDERATION	CRITERIA	ALTERNATIVE SOLUTIONS				
		Alternative Solution #1 Do Nothing	Alternative Solution #2 Improve Transportation Systems Management (TSM)	Alternative Solution #3 Improve Travel Demand Management	Alternative Solution #4 Improve Parallel Roadways	Alternative Solution #5 Improvements Along Mayfield Road
	DEFINITIONS	No improvements made to the intersection. This represents the "status quo".	Provide improvements by improving traffic signal operations, and/or add queue jump signals for transit.	Promote transit and active transportation initiatives	Adding additional lanes on parallel roadways to attract traffic away from the corridor	Provide improvements by widening Mayfield Road
Social / Cultural Environment	Potential for short-term, construction related effects such as noise, dust, or vibration and odours for area residents, businesses, community facilities, and roadway users	No short-term construction related effects	Low potential for short-term construction related effects	No short-term construction related effects	High potential for short-term construction related effects	High potential for short-term construction related effects
	Potential short-term effects on accessing adjacent properties during construction	No effect on accessing adjacent properties during construction since no physical improvements	Low potential for accessing adjacent properties during construction since no physical improvements will be done	No effect on accessing adjacent properties during construction since no physical improvements.	Very high potential to affect accessing adjacent properties during construction since no physical improvements	Moderate-High potential to affect accessing adjacent properties during construction since no physical improvements
	Potential archaeology effects	No effect to archaeological resources	Widening roadways to accommodate queue jump lanes has a low-moderate potential for impacts on archaeological resources	No effect to archaeological resources	High potential for impacts to archaeological resources if east-west roadways NORTH of Mayfield Rd are widened Low potential for impacts to archaeological resources if east-west roadways SOUTH of Mayfield Rd are widened	Low-moderate potential for impacts to archaeological resources beyond the Mayfield Rd ROW
	Potential noise increases	Minor noise increases related to increased traffic congestion (idling vehicles)	Minor noise increases related to increased traffic congestion (idling vehicles)	Minor noise increases related to increased traffic congestion (idling vehicles)	Reduction in noise due to traffic using parallel roadways Parallel roadways will have an increase in noise effects	Noise levels expected to decrease due to reduction in idling vehicles
	Potential Air Quality Impacts	Minor to no increase in Air Quality	Minor to no increase in Air Quality	Minor to no increase in Air Quality	Minor decrease in Air Quality	Minor decrease in Air Quality
	Potential for requiring private property	No private property required	Low-moderate potential for requiring private property	No private property required	Very High potential for requiring private property	Moderate-High potential for private property
Social / Cultural Summary		Minimal impact with no construction activities but congestion will increase over time	Moderate impact with minimal construction activities required but congestion will increase over time	Minimal impact with limited construction activities required but congestion will increase over time	High impact from construction activities required on parallel roads	Construction impacts but overall moderate impact with use of existing structures
Financial	Potential cost of implementation and maintenance	No capital costs, however increased traffic will require increased maintenance costs on Mayfield Rd due to higher truck volumes	Moderate capital cost, however, increased traffic will require increased maintenance costs on Mayfield Rd due to higher truck volumes	High capital cost associated with implementation and maintenance of TDM measures and initiatives Requires change in mindset in terms of travel from the perspective of the travelling public	Very High capital costs associated with widening of parallel roadways to accommodate the projected traffic volumes and maintain traffic safety on parallel roadways	High Capital costs associated with widening, however low maintenance costs will be required once construction is completed
Overall Summary		The "do nothing" alternative solution does not address the problem and does not present any opportunities to improve conditions. It will be used as a baseline measurement for which all other alternative solutions will be compared.	On its own, it does not fully address the Problem, and has a low potential to incorporate the Opportunities. It should be incorporated as part of the recommended alternative solution.	On its own, it does not fully address the Problem, and has no potential to incorporate any Opportunities. TDM initiatives should be included to help promote alternative methods of transportation to help alleviate congestion.	May not address the Problem, may have higher impacts to the environment, and has no potential to incorporate the Opportunities.	Can potentially address the Problem, and has the potential to incorporate the Opportunities.
Recommendation		Not Recommended	Not Recommended	Not Recommended	Not Recommended	Recommended Solution

4.6.1 Evaluation Results

Do Nothing

Under the "Do Nothing" alternative solution, improvements would be limited to on-going regular maintenance only for existing Mayfield Road. This alternative will not accommodate the projected future traffic volumes on Mayfield Road, nor does it address the existing functional deficiencies.

This alternative solution does not address the study problem statement and therefore not considered a reasonable solution. The Do Nothing alternative solution was eliminated from further consideration.

Improve Transportation Systems Management (TSM)

This alternative would have minor effects on the natural, social and economic environments. Technically, this alternative would have a marginal improvement to the congestion issues at the intersections but would not address the capacity issues over the long term. Furthermore, this alternative would not provide opportunities for pedestrian facilities or transportation choices other than vehicle use along this corridor.

Therefore, independently this alternative was not carried forward for further consideration.

Improve Travel Demand Management

This alternative would have minor effects on the natural, social and economic environments. Technically, this alternative can provide opportunities for transportation choices and pedestrian facilities but would not address the capacity issues over the long term.

Therefore, independently this alternative was not carried forward for further consideration.

Improve Parallel Roadways

By upgrading other parallel roadways, traffic currently using Mayfield Road could be diverted to these other improved road facilities. However, the traffic volume projections developed for Mayfield Road within the study area already assume other road network improvements will be undertaken in the area (e.g. Highway 410 Extension).

This alternative solution does not address the problem statement and therefore is not considered a reasonable solution. This alternative solution was eliminated from further consideration as a stand-alone alternative.

Improvements Along Mayfield Road

This alternative would have some adverse effects on the terrestrial/vegetation and species and habitats in addition to the impacts on the social and economic environments to accommodate the improvements along Mayfield Road. However, constructing additional turn lanes, extending existing turn lanes, installing new traffic signals or revising the traffic signal timing at intersections within the Study Area could improve the operation and capacity of the intersections on Mayfield Road. Providing additional through lanes on Mayfield Road throughout the Study Area, combined with improvements to the intersections, would increase the overall capacity of Mayfield Road and fully realize Mayfield Road's arterial function as stated in the Region and local municipalities Official Plans.

The Improvements Along Mayfield Road alternative solution addresses the capacity and functional deficiencies associated with Mayfield Road.

Based on the evaluation summary shown in **Table 4-25** and above, the technically preferred alternative solution is identified as **Alternative Solution #5 - Improvements Along Mayfield Road.** However, it should be noted that *Alternative Solution #2 - Improve Transportation Systems Management (TSM)* and

Alternative Solution #3 - Improve Travel Demand Management can be combined to the preferred solution to increase the effectiveness of the "Improvements Along Mayfield Road" alternative..

This combination of Solutions was presented to the public at Public Information Centre No. 1 for review and approval.

4.7 Confirm Preferred Solution

With public input, the technically recommended alternative solution (**Alternative Solution #5 - Improvements Along Mayfield Road**), was confirmed as the Preferred Solution and was carried forward to the next phase. It should be noted that Alternative Solution #2 and #3 were also incorporated into the preferred design.

4.8 Confirm Project Schedule Selection

In accordance with Appendix 1, Item 20 of the Municipal Class EA, the Preferred Solution will result in a Schedule 'C' undertaking because the widening of Mayfield Road between Chinguacousy Road and Heart Lake Road will result in additional lanes that will increase the capacity of roadway. Since the anticipated construction costs are expected to be greater than $2.4 M, the appropriate Schedule is 'C' (less than $2.4 M would be a Schedule 'B' undertaking).

5 Phase Three: Identification, Screening and Evaluation of Alternative Design Concepts for the Preferred Solution

5.1 Identification, Screening and Evaluation of the Alternative Design Concepts

Once the Preferred Solution was identified and the Schedule confirmed, the process moved on to Phase Three, which involved the development and evaluation of Alternative Design Concepts. The development of the Alternative Design Concepts was completed using a three-step process, as described below:

Step 1: Development and Description of Reasonable Alternative Design Concepts

The initial step involved the development of reasonable Alternative Design Concepts, reflecting the different approaches available to implementing road improvements along Leslie Street.

Step 2: Screening of the Alternative Design Concepts

Each of the Alternative Design Concepts was screened for functionality and feasibility of implementation.

Step 3: Evaluation and Identification of the Recommended Design Concept

The remaining design concepts were brought forward for a detailed net effects analysis and comparative evaluation using evaluation criteria in the same manner as the evaluation of Alternative Solutions.

The following sections describe this process in greater detail and provide the results for each step.

5.1.1 Step 1: Development and Description of Reasonable Alternative Design Concepts

The Study Area was broken up into the following seven distinct areas in order to generate reasonable alternative design concepts based on the Preferred Solution that would satisfy the Problem and Opportunity Statements:

- Chinguacousy Road to McLaughlin Road
- McLaughlin Road to Orangeville Rail
- Orangeville Rail to Hurontario Street
- Hurontario Street to Snelgrove Bridge
- Snelgrove Bridge to Kennedy Road
- Kennedy Road to Stonegate Drive
- Stonegate Drive to Heart Lake Road

The long list of alternative design concepts developed for each of these areas are listed in the sections that follow.

5.1.1.1 Chinguacousy Road to McLaughlin Road

- Alternative 1: Widening to the North Side Only
- Alternative 2: Widening to the South Side Only
- Alternative 3: Widening to both the North and South Sides

5.1.1.2 McLaughlin Road to Orangeville Rail

- Alternative 1: Widening to the North Side Only
- Alternative 2: Widening to the South Side Only
- Alternative 3: Widening to both the North and South Sides

5.1.1.3 Orangeville Rail to Hurontario Street

- Alternative 1: Widening to the North Side Only
- Alternative 2: Widening to the South Side Only
- Alternative 3: Widening to both the North and South Sides

5.1.1.4 Hurontario Street to Snelgrove Bridge

- Alternative 1: Widening to the North Side Only
- Alternative 2: Widening to the South Side Only
- Alternative 3: Widening to both the North and South Sides

5.1.1.5 Snelgrove Bridge to Kennedy Road

- Alternative 1: Widening to the North Side Only
- Alternative 2: Widening to the South Side Only
- Alternative 3: Widening to both the North and South Sides

5.1.1.6 Kennedy Road to Stonegate Drive

- Alternative 1: Widening to the North Side Only
- Alternative 2: Widening to the South Side Only
- Alternative 3: Widening to both the North and South Sides

5.1.1.7 Stonegate Drive to Heart Lake Road

- Alternative 1: Widening to the North Side Only
- Alternative 2: Widening to the South Side Only
- Alternative 3: Widening to both the North and South Sides

Regardless of the seven areas, the following roadway design treatments for Mayfield Road will be provided:

- Urban roadway cross section that includes curbs throughout.
- Boulevard to accommodate a multi-use trail on each side, except on the north side of Mayfield Road, east of Kennedy Road.

In addition, all intersections were reviewed for improvements. This included the potential for conventional, signalized intersections with new or upgraded traffic signals and/or dedicated turning lanes.

5.1.2 Step 2: Screening of the Alternative Design Concepts

5.1.2.1 Roadway Widening

Based on the various Alternative Design Concepts developed in the previous step, a screening process was used as a means of reviewing the alternatives at a “macro” level to determine if there were any critical issues associated with them that would hinder their ability to be implemented, or if they offer any

advantages relative to the other alternatives. By comparing a list of alternatives at a macro level of detail it is possible to focus activities in later steps on the most appropriate alternatives.

The first step of the screening is to use the general information available at the outset of a project to identify the major advantages and disadvantages of each alternative. When comparatively evaluated, any significant disadvantages associated with an alternative(s) will be identified, and a decision can be made to exclude the alternative(s) from further consideration. Conversely, the advantages of some alternatives will be identified and result in them being carried forward. From this process, the alternatives are "screened" to remove those that may not be reasonably implemented.

A quick assessment was done and it was determined that all alternatives were viable and would be carried forward.

5.1.2.2 Mid-block Intersections between Chinguacousy Road and McLaughlin Road

To address the concern about impacts of the two mi-block signalized intersections between Chinguacousy Road and McLaughlin Road on goods movement along Mayfield Road, additional assessment was completed on the section, Four alternatives were assessed, for which the cross section includes three through lanes per direction, with turn lanes as required. The alternatives include:

- two mid-block signalized intersections (as included in the Draft Traffic Report), one with four legs and one with three legs
- one mid-block signalized intersection with four legs
- two mid-block roundabouts, one with four legs and one with three legs
- one mid-block roundabout with four legs

To evaluate the alternatives, an evaluation matrix was developed with both quantitative and qualitative criteria. The detailed matrix is included in **Appendix D**; a summarized matrix is shown in **Table 5-1**.

The quantitative criteria applied include:

- Average travel speed along Mayfield Road;
- Average intersection delay; and
- Number of stops per vehicle.

Two-lane roundabouts were assumed for the roundabout alternatives. Along a six-lane corridor with three through lanes per direction, one lane would end prior to the roundabout approach and resume after the roundabout exit. It is expected that two-lane roundabouts would have only a small amount of additional property acquisition, compared to the standard 50.5m right-of-way. Implementing three-lane roundabouts instead of two-lane roundabouts would result in less delay and improved travel times compared to two-lane roundabouts. However, three-lane roundabouts are significantly larger and would require significantly more property acquisition near the intersections. Also, three-lane roundabouts would be more expensive and potentially have a higher collision risk than two-lane roundabouts.

As shown in **Table 5-1**, the alternative of having two mid-block signalized intersections is the preferred alternative. Though roundabouts are frequently more adept at handling traffic volumes with less stopping and delay, the roundabouts along this corridor would experience more delay and stopping than signalized intersections. Since it is expected that 10 to 15 percent of the vehicles on Mayfield Road will be trucks or other heavy vehicles, trucks will be frequently side-by-side each other and other vehicles. At a roundabout, these heavy truck movements are more difficult unless design modifications are made, such as wider entry lanes that can increase speeds and negatively impact safety. Region of Peel's Roundabout Screening Tool was used to assist in determining whether the intersections are supportive for roundabouts; these are included in Appendix D of the Roundabout Memo (**Appendix D**).

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Table 5-1 - Summarized Evaluation of Alternatives between Chinguacousy Road & McLaughlin Road

Criteria	Two Signalized Intersections	One Signalized Intersection	Two Roundabout Intersections	One Roundabout Intersection
	Comment	Comment	Comment	Comment
Intersection Capacity Analysis / Traffic Assessment	Provides excellent level of service, least amount of delay, moderate amount of stopping, and good travel speeds.	Provides very good level of service, low delay, least amount of stopping, and good travel speeds.	Provides fair level of service, high delay, more stopping, and lower travel speeds, especially westbound in PM peak hour.	Provides poor level of service, unacceptable delay, the most amounts of stopping, and the lowest travel speeds, especially westbound in PM peak hour.
Qualitative Transportation Considerations	Signalized intersections accommodate transit, visually impaired persons, and high truck volumes well, but often provide a higher collision risk for pedestrians and cyclists than roundabouts. Two intersections provide extra crossing opportunities for pedestrians and bus stops. Remainder of Mayfield corridor will be signalized, as previously determined in the Draft Traffic Report. Public education not required.	Signalized intersections accommodate transit, visually impaired persons, and high truck volumes well, but often provide a higher collision risk for pedestrians and cyclists than roundabouts. One intersection provides fewer opportunities for placing crossing facilities for pedestrians. Remainder of Mayfield corridor will be signalized, as previously determined in the Draft Traffic Report. Public education not required.	Roundabouts generally provide a lower collision risk for pedestrians and cyclists, but are not as adept at accommodating transit, visually impaired persons, and high truck volumes. Two intersections provide extra crossing opportunities for pedestrians and bus stops. Remainder of Mayfield corridor will be signalized, as previously determined in the Draft Traffic Report. Roundabouts will require careful planning and public education.	Roundabouts generally provide a lower collision risk for pedestrians and cyclists, but are not as adept at accommodating transit, visually impaired persons, and high truck volumes. One intersection provides fewer opportunities for placing crossing facilities for pedestrians. Remainder of Mayfield corridor will be signalized, as previously determined in the Draft Traffic Report. Roundabouts will require careful planning and public education.
Neighbourhood and Environmental Impacts	Signalized intersections provide aesthetics typical for signalized intersections in Region of Peel, though these intersections will fit within the planned right-of-way. Providing two collectors results in better connections within the Mount Pleasant Secondary Plan, avoids environmentally sensitive areas and improves transportation connectivity, especially for transit and active transportation.	Signalized intersections provide aesthetics typical for signalized intersections in Region of Peel, though these intersections will fit within the planned right-of-way. Providing one collector results in poorer connections within the Mount Pleasant Secondary Plan, especially if the midblock woodlot is avoided, and results in poorer transportation connectivity, with worse impacts on transit and active transportation.	Roundabouts provide the opportunity for better aesthetics than signalized intersections, though additional right-of-way is likely required. Providing two collectors results in better connections within the Mount Pleasant Secondary Plan, avoids environmentally sensitive areas and improves transportation connectivity, especially for transit and active transportation.	Roundabouts provide the opportunity for better aesthetics than signalized intersections, though additional right-of-way is likely required. Providing one collector results in poorer connections within the Mount Pleasant Secondary Plan, especially if the midblock woodlot is avoided, and results in poorer transportation connectivity, with worse impacts on transit and active transportation.
20-Year Life Cycle Cost	High-level estimate indicates this will be the most expensive alternative due to the fact that there are two intersections and that injury collision costs will likely be higher.	High-level estimate indicates this will be a less expensive alternative because only one intersection is being provided.	High-level estimate indicates this will be an expensive alternative due to the fact that there are two intersections.	High-level estimate indicates this will be the least expensive alternative because only one intersection is being provided and injury collision costs will be lower.
TOTAL	Providing signalized intersections will result in less delay and stopping and cause less disruption to adjacent developable lands compared to roundabouts. Constructing two collectors within the Mount Pleasant community will enhance transportation connectivity for all modes and provide the least disruption to mid-block environmental sensitivities.	This alternative results in the least stopping along Mayfield Road, though the removal of one of the planned collectors will have negative impacts on the structure, urban design, and transportation options within Mount Pleasant.	Roundabouts would provide improved safety compared to signalized intersections. However, more stopping and higher delay are expected with roundabouts, and the impact of further enlargement of the right-of-way will impact Mount Pleasant and Mayfield West.	High congestion at single roundabout results in unacceptable delay and the most stopping of any alternative. Removing one of the planned collectors within the Mount Pleasant community will have negative impacts on Mount Pleasant.

Legend:	Preferred	Less Preferred	Not Preferred

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Further, having two north-south collectors is more beneficial than having one north-south collector. Having one mid-block signalized intersection does result in the least amount of stopping within the network compared to other alternatives. However, having one mid-block north-south collector results in poorer overall transportation connectivity, since the spacing between parallel through routes is reduced. In particular, this has the most negative impact on transit and active transportation. Having two north-south collectors provides the opportunity for two parallel transit routes, reducing the average access distance to transit. Having two intersections on Mayfield Road also provides the opportunity for two mid-block bus stops with safe, controlled crossing facilities. Having more through roads also decreases overall travel distance for pedestrians and cyclists. Another challenge with providing only one north-south collector is the woodlot located about halfway between Chinguacousy Road and McLaughlin Road south of Mayfield Road. A single north-south collector would either pass very close to the woodlot (resulting in development primarily on only one side of the collector) or disproportionately serve only one half of the block, leaving the other half with poor north-south connectivity.

5.1.2.3 Intersection Improvements

The intersection improvements recommended were based on the results of the future traffic analysis found in the Traffic Report (see **Appendix D**).

5.1.2.3.1 Future Traffic Conditions

5.1.2.3.1.1 Future Analysis of Orangeville Rail Crossing

The analysis results for 2031 conditions indicated that the estimated queues do not reach the rail crossing from the adjacent intersections during the AM and PM peak hours.

The queuing analysis shows that there is a low chance of queuing over the rail crossing from the Cresthaven Road and Van Kirk Drive intersections with Mayfield Road. Therefore, the following alternative measures are recommended:

- Queue detector loops to allow queues to clear before they reach the track
- Use upstream traffic signals to meter traffic so that it does not queue over the crossing
- Improve signage at the rail crossing

5.1.2.3.1.2 Future Roadway Alternative Networks

The Region of Peel Road Capital Program (2010 to 2031) identifies that by 2018 Mayfield Road should be widened from two to four lanes from Chinguacousy Road to Hurontario Street and from four to six lanes from Hurontario Street to Heart Lake Road in 2021, and that by 2029 Mayfield Road from Chinguacousy Road to Hurontario Street should be further widened from four to six lanes. The Region of Peel Long Range Transportation Plan (LRTP) also shows the need to widen Mayfield Road to six lanes within the Study Area by 2031.

The future alternative roadway networks are the following:

- 2021 Do Nothing Roadway Network Alternative
  - Chinguacousy Road from Wanless Drive to Mayfield Road, widening from two to four lanes (2016)
  - McLaughlin Road from Wanless Drive to Mayfield Road, widening from two to four lanes (2021)
  - Highway 410 interchange at Highway 10 (2021)
  - Kennedy Road from Mayfield Road to south of Old School Road, widening from two to four lanes (2021)
  - Heart Lake Road from Mayfield Road to south of Old School Road, widening from two to four lanes (2021)
  - Two new intersections on Mayfield Road between McLaughlin Road and Chinguacousy Road in conjunction with new development in Mayfield West Secondary Plan Phase 2 and Mount Pleasant Secondary Plan Area 51

  - Snellview Boulevard aligned with Inder Heights Drive to the south associated with the Fernbrook Homes development
  - No changes to lane configurations on Mayfield Road relative to existing conditions.

- 2021 Capital Projects Network Alternative
  - 2021 Do Nothing Roadway Network Alternative plus widening Mayfield Road from Chinguacousy Road to Hurontario Street from two to four lanes and from Hurontario Street to Heart Lake Road from four to six lanes

- 2031 Capital Projects Network Alternative
  - Same roadway network as 2021 Capital Projects Network Alternative plus widening Mayfield Road from four to six lanes from Chinguacousy Road to Heart Lake Road

- 2031 Capital Projects Network Alternative with Roundabouts
  - Roundabouts are constructed at each intersection from Chinguacousy Road to Cresthaven Road/Robertson Davies Drive
  - Same roadway network as 21031 Capital Projects Network Alternative east of Cresthaven Road/Robertson Davies Drive

See **Appendix D** for details.

5.1.2.3.1.2.1 2021 Do Nothing Roadway Network Alternative – Traffic Analysis

The lane configurations for the 2021 Do Nothing Roadway Network Alternative are shown in

Figure 5-1. The capacity analysis results for the 2021 Do Nothing Roadway Network Alternative are provided in **Table 5-2**. See Appendix D for details.

Table 5-2 – Intersection Level of Service, 2021 Do Nothing Alternative

Intersection	AM Peak Hour			PM Peak Hour		
Movement	V/C	Delay (sec.)	LOS	V/C	Delay (sec.)	LOS
Mayfield Road and Chinguacousy Road	0.79	20	C	1.11	91	F
Mayfield Road and New Collector 1*						
Northbound Left	0.64	111	F	0.79	230	F
Southbound Left	0.70	151	F	0.64	204	F
Mayfield Road and New Collector Road 2*						
Northbound Left	0.75	122	F	1.31	451	F
Mayfield Road and McLaughlin Road	0.90	27	C	0.77	25	C
Mayfield Road and Van Kirk Drive*						
Northbound Left	0.45	239	F	0.12	243	F
Mayfield Road and Cresthaven Road/Robertson Davies Drive	1.01	54	D	0.93	35	C
Mayfield Road and Highway 10	1.01	52	D	0.96	46	D
Mayfield Road and Colonel Bertram Road	0.46	7	A	0.48	9	A
Mayfield Road and Summer Valley Drive	0.49	7	A	0.52	7	A
Mayfield Road and Valley View Drive*						
Northbound Left	0.01	15	B	0.01	13	B
Mayfield Road and Snellview Boulevard/Inder Heights Drive*						
Northbound Left	0.21	98	F	0.07	71	F
Southbound Through	0.91	157	F	1.35	419	F
Mayfield Road and Kennedy Road	0.66	71	E	1.28	82	F
Mayfield Road and Stonegate Drive*						
Northbound Left	0.39	24	C	0.11	18	C
Mayfield Road and Heart Lake Road	1.17	85	F	1.33	133	F

* For unsignalized intersections, the movement with the highest delay is reported.

The results of the capacity analysis clearly show that if no improvements are made along Mayfield Road between Chinguacousy Road and Heart Lake Road, there will not be sufficient capacity to accommodate traffic demand and vehicles will experience long delays by 2021. The operational characteristics of intersections along Mayfield Road would further worsen for 2031 conditions without roadway improvements because significant traffic growth is anticipated between 2021 and 2031.

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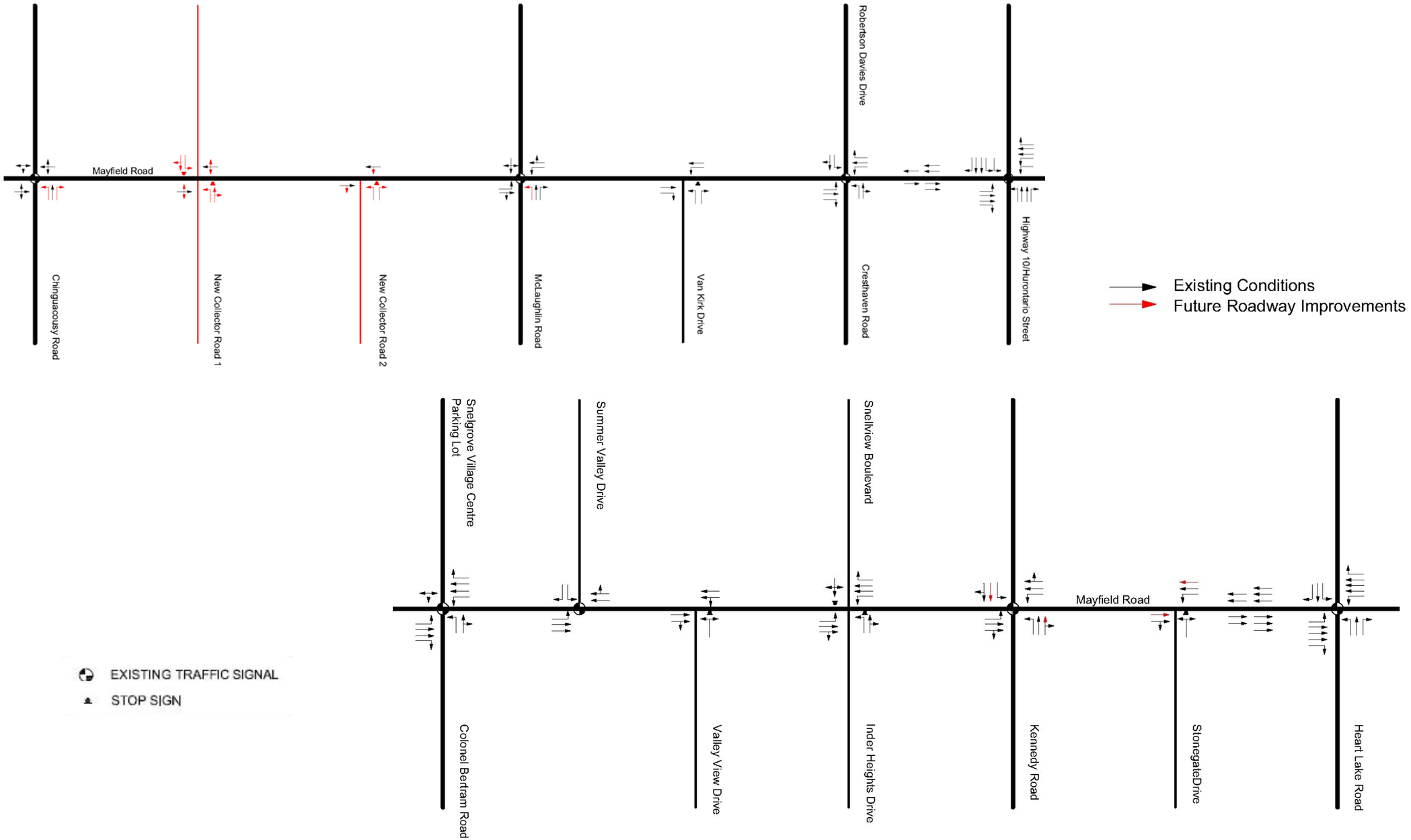

Figure 5-1 – Lane Configuration – Do Nothing 2021

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Results of the vehicle queuing analysis show that at five intersections along the corridor the predicted queue lengths for one or more turning movement would exceed the available storage length. The queues would spillback from the storage lanes into the through traffic lanes at these intersections.

5.1.2.3.1.2.2 2021 Capital Projects Network Alternative – Traffic Analysis

The improvements that are required relative to the 2021 Do Nothing Roadway Network Alternative are shown in **Figure 5-2** and including the following:

- widen Mayfield Road from two to four lanes from Chinguacousy Road to Hurontario Street
- widen Mayfield Road from four to six lanes from Hurontario Street to Heart Lake Road
- signalize Mayfield Road at Van Kirk Drive
- modify the southbound lane configuration on Heart Lake Road at Mayfield Road from an exclusive left-turn, through and right-turn lane to a dual left-turn and through/right-turn lanes
- construct a 30m southbound left turn lane, a 30m eastbound left-turn lane and a 80m westbound left-turn lane at Chinguacousy Road
- construct 30m eastbound and westbound left-turn lanes at New Collector Road 1
- construct a 30m westbound left-turn lane at New Collector Road 2
- extend the length of the westbound left-turn lane at McLaughlin Road from 30m to 60m
- extend the length of the westbound left-turn lane at Van Kirk Drive from 35m to 50m
- extend the following lengths of the storage lanes at Hurontario Street:
    - southbound right from 75m to 135m
    - westbound right from 55m to 85m
    - westbound left from 50m to 60m
    - northbound right from 60m to 105m
    - northbound left from 45m to 85m
    - eastbound right from 100m to 120m
    - eastbound left from 110m to 120m
- extend the following lengths of the storage lanes at Kennedy Road:
    - westbound left from 20m to 75m
    - northbound left from 45m to 70m
    - eastbound left from 25m to 90m
- extend the length of the westbound right-turn lane at Heart Lake Road from 155m to 195m

The capacity analysis results for the 2021 Capital Projects Network Alternative are provided in **Table 5-3**. Alternative details can found in **Appendix D**.

Table 5-3 – Intersection Level of Service, 2021 Capital Projects Network Alternative

Intersection	AM Peak Hour			PM Peak Hour		
Movement	V/C	Delay (sec.)	LOS	V/C	Delay (sec.)	LOS
Mayfield Road and Chinguacousy Road	0.39	11	B	0.59	15	B
Mayfield Road and New Collector Road 1* Southbound Left	0.39	57	F	0.28	63	F
Mayfield Road and New Collector Road 2* Northbound Left	0.33	33	D	0.25	33	D
Mayfield Road and McLaughlin Road	0.62	18	B	0.61	14	B
Mayfield Road and Van Kirk Drive	0.52	10	A	0.43	6	A
Mayfield Road and Cresthaven Road/Robertson Davies Drive	0.60	11	B	0.52	8	A
Mayfield Road and Highway 10	0.84	34	C	0.80	40	D
Mayfield Road and Colonel Bertram Road	0.33	6	A	0.35	8	A
Mayfield Road and Summer Valley Drive	0.35	6	A	0.37	6	A
Mayfield Road and Valley View Drive* Northbound Left	0.01	13	B	0.01	11	B
Mayfield Road and Snellview Boulevard/Inder Heights Drive	n/a (see note 1)			n/a (see note 1)		
Mayfield Road and Kennedy Road	0.56	25	C	0.89	35	D
Mayfield Road and Stonegate Drive* Northbound Left	0.29	17	C	0.14	10	B
Mayfield Road and Heart Lake Road	0.77	38	D	0.85	38	D

*For unsignalized intersections, the movement with the highest delay is reported.
Note 1: too many lanes for analysis

With the recommended improvements in place, the analysis of the 2021 Capital Projects Network Alternative identifies that the signalized intersections have an overall v/c ratio ranging from 0.33 to 0.84 in the AM peak hour and from 0.35 to 0.89 in the PM peak hour with no critical lane group movements, which indicates that the intersections will be operating with reserve capacity during both AM and PM peak hours. The overall LOS for signalized intersections ranges from LOS A to LOS D in the AM and PM peak hours. These are good operational characteristics for signalized intersections.

At unsignalized intersections, all individual lane group v/c ratios are below 0.85 in both the AM and PM peak hours, which indicates that the intersections are operating with reserve capacity. The northbound and southbound left-turn vehicles exiting New Collector Road 1 and New Collector Road 2 will experience the longest delays resulting in LOS E or LOS F in both the AM and PM peak hours.

Signals are not warranted at these intersections. The predicted left-turn volume for these movements that will experience longer delays are less than 50 vehicles per hour which is approximately one vehicle arriving at the intersection per minute. For low volume roadways intersecting with high volume arterial roads, this is a typical operational characteristic during peak hours in urban environments. It is important to realize that all of these left-turn movements will have other route options to enter onto Mayfield Road. These are acceptable operational characteristics for unsignalized intersections.

The results of the capacity analysis clearly shown that with the recommended roadway improvements, in addition to implementing the improvements identified in the Do Nothing Alternative, intersections along Mayfield Road can operate with satisfactory operational characteristics under the 2021 Capital Projects Network Alternative and provides significant improvements to intersection operations compared to the 2021 Do Nothing Roadway Network Alternative.

With the recommended extension of storage lanes, results of the vehicle queuing analyses show that the predicted queue lengths would not exceed the storage lengths.

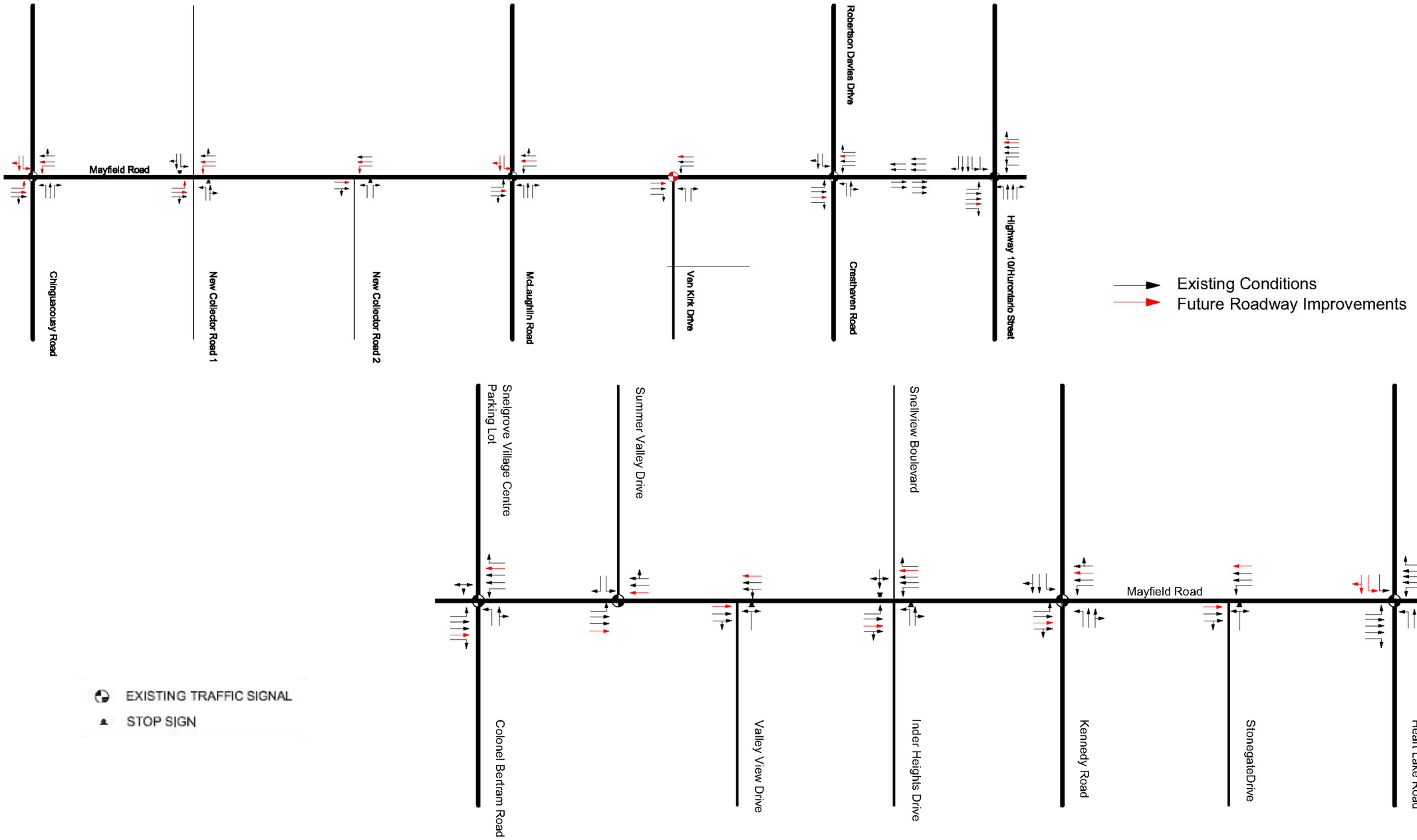

Figure 5-2 – Lane Configuration – Capital Improvements 2021

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5.1.2.3.1.2.3 2031 Capital Projects Network Alternative – Traffic Analysis

When compared to the 2021 Capital Projects Network Alternative, the Mayfield Road at Collector Road 1 and Collector Road 2 intersections warrant a signal in 2031 based on TAC volumes.

The improvements that are required relative to the 2021 Capital Projects Network Alternative are shown in **Figure 5-3** and include the following (see **Appendix D** for details):

- widen Mayfield Road from four to six lanes from Chinguacousy Road to Hurontario Street
- signalize Mayfield Road at New Collector Road 1 and New Collector Road 2
- construct a 60m eastbound right-turn lane at McLaughlin Road
- construct a second eastbound left-turn lane at Hurontario Street
- construct the following right-turn lanes at Kennedy Road:
  - 75m eastbound right
  - 55m westbound right
  - 115m northbound right
  - 140m southbound right
- modify the Heart Lake Road intersection:
  - add second southbound through lane
  - re-stripe the northbound right-turn lane to a shared through-right lane
  - two through lanes are required in each direction through the intersection; lane drop from four to two lanes must occur south of Mayfield Road
  - prohibit pedestrian crossing at the east leg of the intersection
- construct an 80m dual westbound left-turn lane at Chinguacousy Road
- extend the following lengths of the storage lanes at McLaughlin Road:
  - westbound left from 60m to 120m and protect property for dual westbound left turn lanes
  - northbound left from 30m to 50m
- extend the following lengths of the storage lanes at Cresthaven Road / Robertson Davies Drive:
  - southbound left from 30m to 70m
  - westbound right from 30m to 70m
  - eastbound left from 30m to 60m
- extend the following lengths of the storage lanes at Hurontario Street:
  - southbound right from 135m to 165m
  - westbound right from 85m to Colonel Bertram intersection
  - westbound left from 60m to 75m
  - northbound right from 105m to 150m
  - northbound left from 85m to 130m
  - eastbound right from 120m to 165m
- extend the length of the westbound left-turn lane at Colonel Bertram Road from 50m to 55m

- extend the following lengths of the storage lanes at Kennedy Road:
  - southbound left from 45m to 60m
  - westbound left from 75m to 115m
  - northbound left from 70m to 90m
  - eastbound left from 90m to 130m
- extend the following lengths of the storage lanes at Heart Lake Road:
  - southbound left from 130m to 150m
  - westbound right from 195m to 260m

The capacity analysis results for the 2021 Capital Projects Network Alternative are provided in **Table 5-4**.

Table 5-4 – Intersection Level of Service, 2031 Capital Projects Network Alternative

Intersection	AM Peak Hour			PM Peak Hour		
Movement	V/C	Delay (sec.)	LOS	V/C	Delay (sec.)	LOS
Mayfield Road and Chinguacousy Road	0.68	22	C	0.68	22	C
Mayfield Road and New Collector Road 1	0.55	9	A	0.54	8	A
Mayfield Road and New Collector Road 2	0.53	7	A	0.51	5	A
Mayfield Road and McLaughlin Road	0.73	23	C	0.87	31	C
Mayfield Road and Van Kirk Drive	0.66	11	B	0.73	8	A
Mayfield Road and Cresthaven Road/Robertson Davies Drive	0.76	17	B	0.81	21	C
Mayfield Road and Highway 10	0.99	57	E	0.96	62	E
Mayfield Road and Colonel Bertram Road	0.70	13	B	0.65	11	B
Mayfield Road and Summer Valley Drive	0.60	8	A	0.73	15	B
Mayfield Road and Valley View Drive Northbound Left	0.01	21	C	0.01	14	B
Mayfield Road and Snellview Boulevard/Inder Heights Drive	n/a (see note 1)			n/a (see note 1)		
Mayfield Road and Kennedy Road	0.76	30	C	0.93	52	D
Mayfield Road and Stonegate Drive Northbound Left	0.88	111	F	0.30	48	E
Mayfield Road and Heart Lake Road	0.96	49	D	0.96	44	D

*For unsignalized intersections, the movement with the highest delay is reported.
Note 1: too many lanes for analysis

The analysis of 2031 Capital Projects Network Alternative identifies that the signalized intersections have an overall V/C ratio ranging from 0.53 to 0.99 in the AM peak hour and from 0.51 to 0.96 in the PM peak hour with no critical lane group movements, which indicates that some intersections would have reserve capacity during peak hours and some intersections would operate near capacity (Mayfield Road intersections with Hurontario Street and Heart Lake Road). The overall LOS for signalized intersections ranges from LOS A to LOS E in the AM and PM peak hours. These are acceptable signalized intersection operational characteristics.

At unsignalized intersections, some left-turn movements attempting to turn onto Mayfield Road would experience longer delays but would have other route options to enter onto Mayfield Road and the volumes of the left-turn movements are low. These are good operational characteristics for unsignalized intersections.

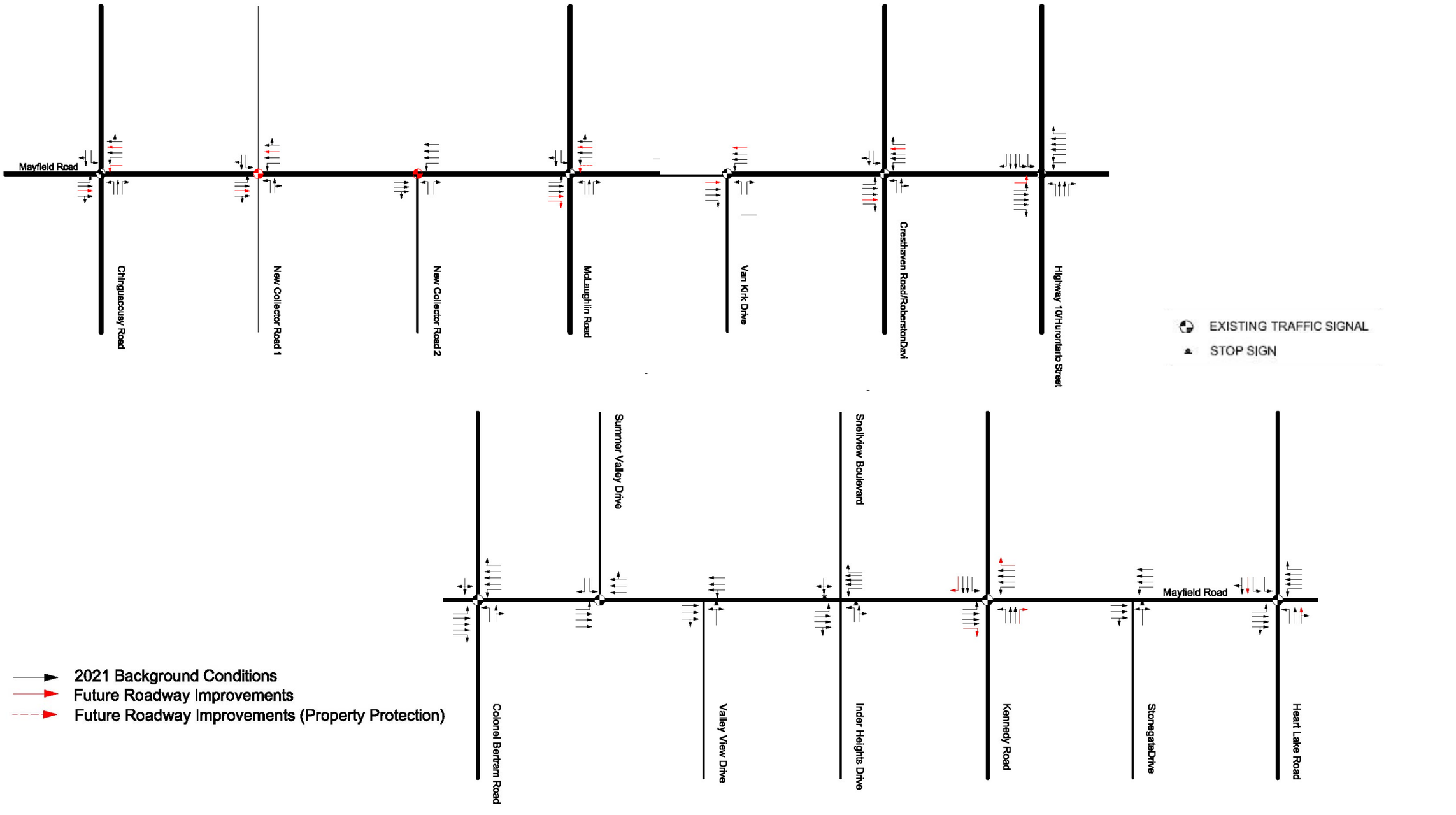

Figure 5-3 – Lane Configuration – Capital Improvements 2031

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With the recommended extension of storage lanes, results of the vehicle queuing analyses show that the predicted queue lengths would not exceed the storage lengths.

The evaluation presented in the Traffic Report shows that as presently configured, Mayfield Road will not have sufficient capacity to accommodate the anticipated traffic demand by 2021 and 2031. Implementing roundabouts along the corridor from Chinguacousy Road to Cresthaven Road would reduce the corridor speeds compared to the corridor without roundabouts. Roundabouts also result in longer overall delays when minor street traffic volumes are low compared to major street traffic volumes, require initial public education, usually cost more to construct, construction staging for retrofits is costly and complicated, and are not suitable for accommodating the high truck volumes that are anticipated on Mayfield Road.

The following corridors are recommended for the 2021 and 2031 horizon years:

- 2021 Capital Projects Network Alternative
- 2031 Capital Projects Network Alternative

The following roadway improvements are recommended:

Table 5-5 – Recommended Roadway Improvements

	Horizon YEAR	
	2021	2031
Roadway Improvements		
Mayfield Road		
Chinguacousy Road to Hurontario Street	Widen to four lanes	Widen to six lanes
Hurontario Street to Heart Lake Road	Widen to six lanes	Unchanged from 2021
Chinguacousy Road		
Wanless Drive to Mayfield Road	Widen to four lanes	Unchanged from 2021
New Collector Road 1		
Wanless Drive to Old School Road	New two lane Road	Unchanged from 2021
New Collector Road 1 at Mayfield Road		Signalize
New Collector Road 2		
Wanless Drive to Mayfield Road	New two lane Road	Unchanged from 2021
New Collector Road 2 at Mayfield Road		Signalize
McLaughlin Road		
Wanless Drive to Mayfield Road	Widen to four lanes	Unchanged from 2021
Van Kirk Drive		
Van Kirk Drive at Mayfield Road	Signalize	Unchanged from 2021
Kennedy Road		
Mayfield Road to south of Old School Road	Widen to four lanes	Unchanged from 2021
Heart Lake Road		
Mayfield Road to south of Old School Road	Widen to four lanes	Unchanged from 2021

5.1.2.4 Identification and Description of the Alternative Design Concepts

Based on the screening of the roadway alternatives and traffic analysis presented in the previous sections, the following Alternative Design Concepts were identified for detailed evaluation:

Chinguacousy Road to McLaughlin Road

Roadway improvements along this section include:

- Intersection improvement at Chinguacousy Road and Mayfield Road:
  - Provide eastbound, southbound and northbound left turn lanes
  - Provide westbound dual left turn lanes
  - Provide two (2) northbound and two (2) southbound thorough lanes south of Mayfield Road
- Provide New Collector Road 1 at approximately 450 m east of Chinguacousy Road
  - Provide traffic signals
  - Provide eastbound and westbound left turn lanes
- Provide New Collector Road 2 at approximately 450 m west of McLaughlin Road
  - Signalized T-Intersection, south of Mayfield Road
- Provide westbound left turn lane

Alternative 1: Widening to the North Side Only and roadway improvements along this section
Alternative 2: Widening to the South Side Only and roadway improvements along this section
Alternative 3: Widening to the North and South Sides and roadway improvements along this section

These three alternatives are presented in **Figure 5-4**.

McLaughlin Road to Orangeville Rail

Roadway improvements along this section include:

- Intersection improvement at McLaughlin Road and Mayfield Road:
  - Provide northbound left turn lane
  - Provide eastbound right turn lane
  - Provide two (2) northbound and two (2) southbound thorough lanes
- Intersection improvement at Van Kirk Drive and Mayfield Road T-intersection
  - Provide traffic signals

Alternative 1: Widening to the North Side Only and roadway improvements along this section
Alternative 2: Widening to the South Side Only and roadway improvements along this section
Alternative 3: Widening to the North and South Sides and roadway improvements along this section

These three alternatives are presented in **Figure 5-5**.

Orangeville Rail to Hurontario Street

Roadway improvements along this section include:

- Intersection improvement at Roberson Davies Drive/Cresthaven Road and Mayfield Road:
  - Provide eastbound and westbound right turn lanes

Alternative 1: Widening to the North Side Only and roadway improvements along this section
Alternative 2: Widening to the South Side Only and roadway improvements along this section
Alternative 3: Widening to the North and South Sides and roadway improvements along this section

These three alternatives are presented in **Figure 5-6**.

Hurontario Street to Snelgrove Bridge

Roadway improvements along this section include:

- Intersection improvement at Hurontario Street and Mayfield Road:
  - Provide eastbound double left turn lanes

Alternative 1: Widening to the North Side Only and roadway improvements along this section
Alternative 2: Widening to the South Side Only and roadway improvements along this section
Alternative 3: Widening to the North and South Sides and roadway improvements along this section

These three alternatives are presented in **Figure 5-7**.

Snelgrove Bridge to Kennedy Road

Alternative 1: Widening to the North Side Only and roadway improvements along this section
Alternative 2: Widening to the South Side Only and roadway improvements along this section
Alternative 3: Widening to the North and South Sides and roadway improvements along this section

These three alternatives are presented in **Figure 5-8**.

Kennedy Road to Stonegate Drive

Roadway improvements along this section include:

- Intersection improvement at Kennedy Road and Mayfield Road:
  - Provide eastbound, westbound, southbound and northbound right turn lanes

Alternative 1: Widening to the North Side Only and roadway improvements along this section
Alternative 2: Widening to the South Side Only and roadway improvements along this section
Alternative 3: Widening to the North and South Sides and roadway improvements along this section

These three alternatives are presented in **Figure 5-9**.

Stonegate Drive to Heart Lake Road

Alternative 1: Widening to the North Side Only and roadway improvements along this section
Alternative 2: Widening to the South Side Only and roadway improvements along this section
Alternative 3: Widening to the North and South Sides and roadway improvements along this section

These three alternatives are presented in **Figure 5-10.**

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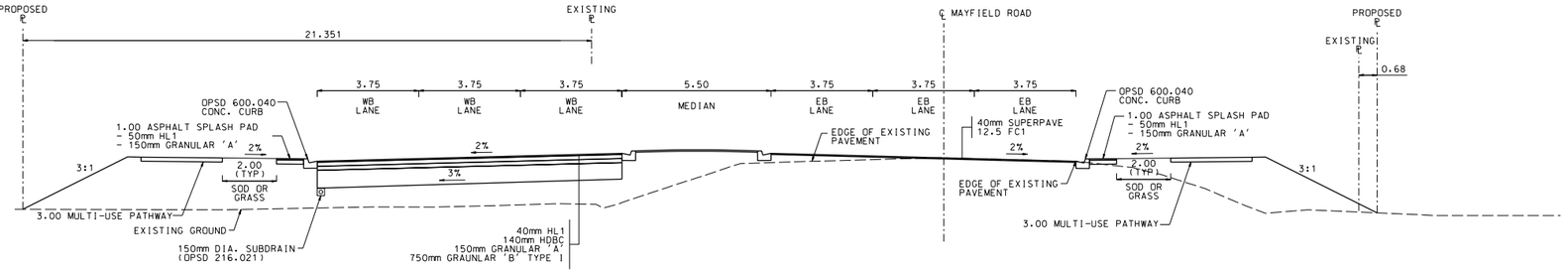
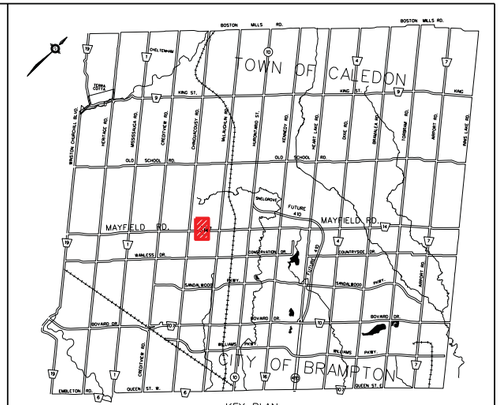


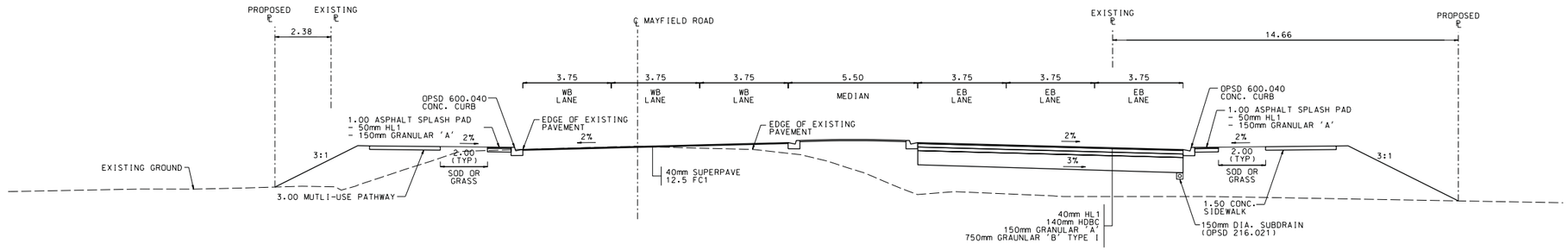
ALTERNATIVE 1 – WIDENING TO THE NORTH



KEY PLAN
(N.T.S.)

NOTES:

1. ALL DIMENSIONS SHOWN ARE IN METRES UNLESS OTHERWISE NOTED.
2. PROPOSED PROPERTY LINE IS SET BACK 1.0m FROM LIMIT OF CONSTRUCTION.



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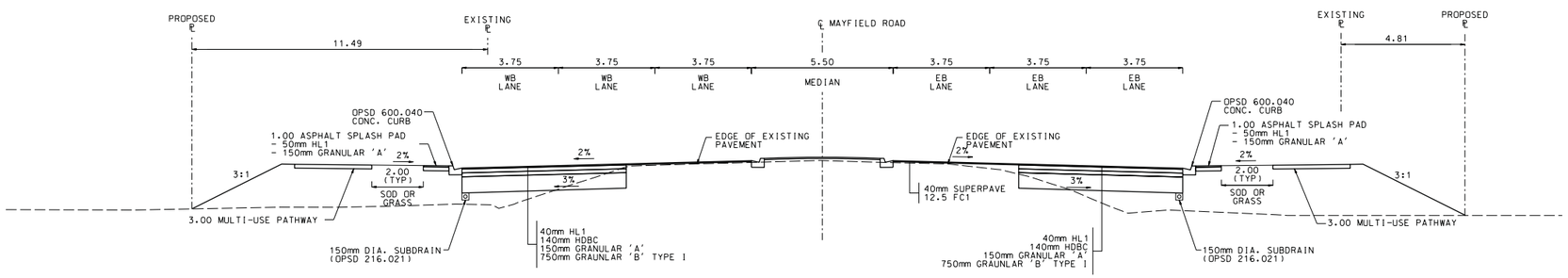

ALTERNATIVE 3 – WIDENING TO THE NORTH AND SOUTH

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MAYFIELD ROAD

CHINGUACOUSY ROAD TO MCLAUGHLIN ROAD
DESIGN ALTERNATIVE CROSS SECTIONS

CAD Area		Area	Project No. 101-17262
Checked by V.M.		Drawn by M.B.	
Date APR 2014		Sheet 1 OF 7	FIGURE 5-4

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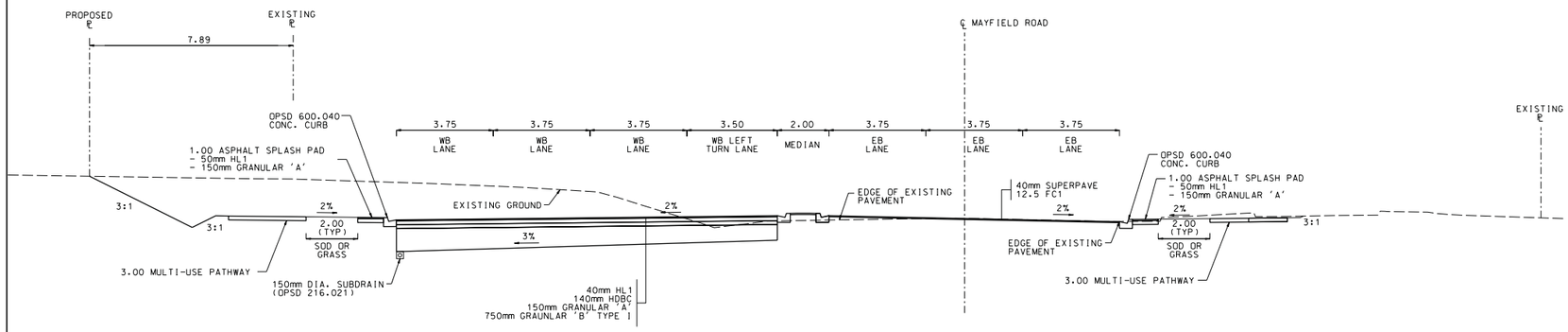

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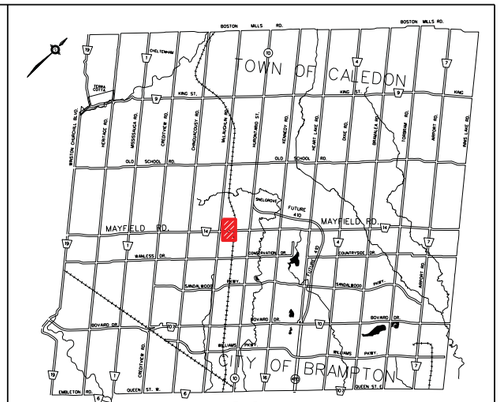

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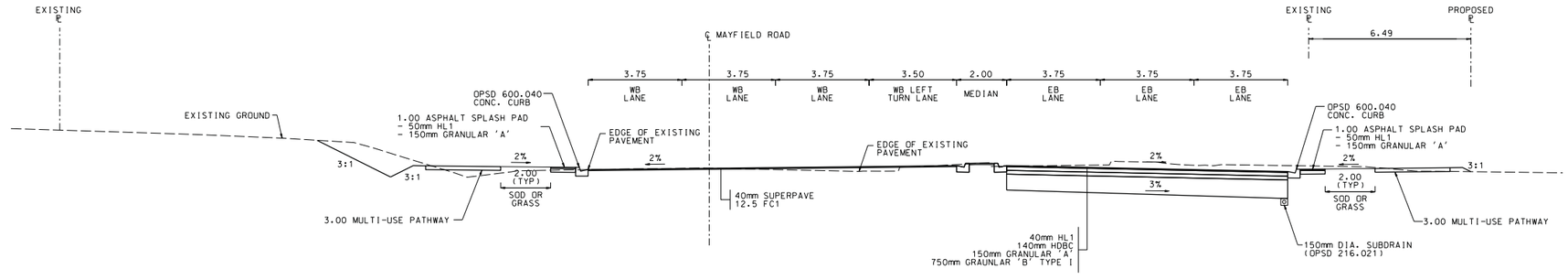

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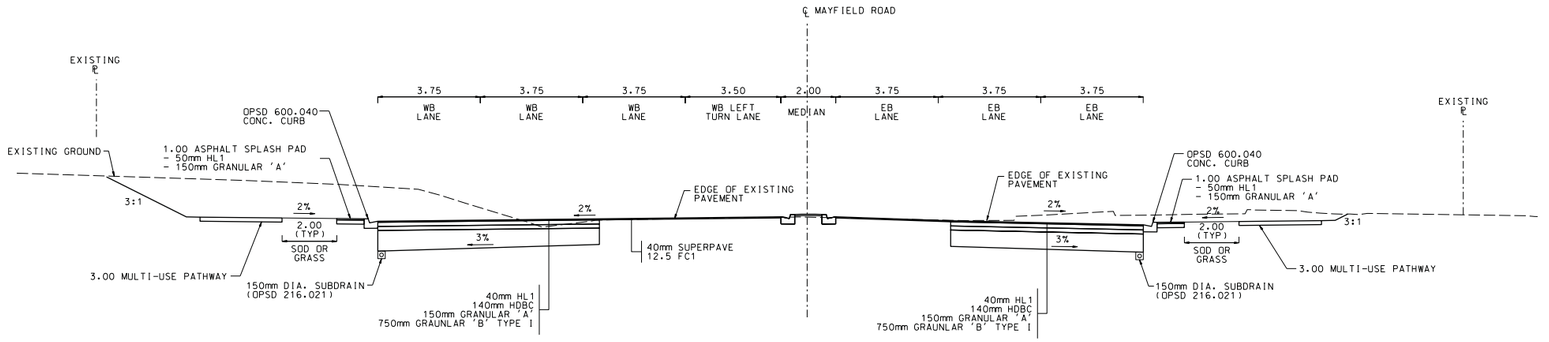

ALTERNATIVE 3 - WIDENING TO THE NORTH AND SOUTH

NOTES:

1. ALL DIMENSIONS SHOWN ARE IN MTRES UNLESS OTHERWISE NOTED.
2. PROPOSED PROPERTY LINE IS SET BACK 1.0m FROM LIMIT OF CONSTRUCTION.

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MAYFIELD ROAD

MCLAUGHLIN ROAD TO ORANGEVILLE RAIL
DESIGN ALTERNATIVE CROSS SECTIONS

CAD Area		Area	Project No. 101-17262
Checked by	V.M.	Drawn by M.B.	
Date	APR 2014	Sheet 2 OF 7	FIGURE 5-5

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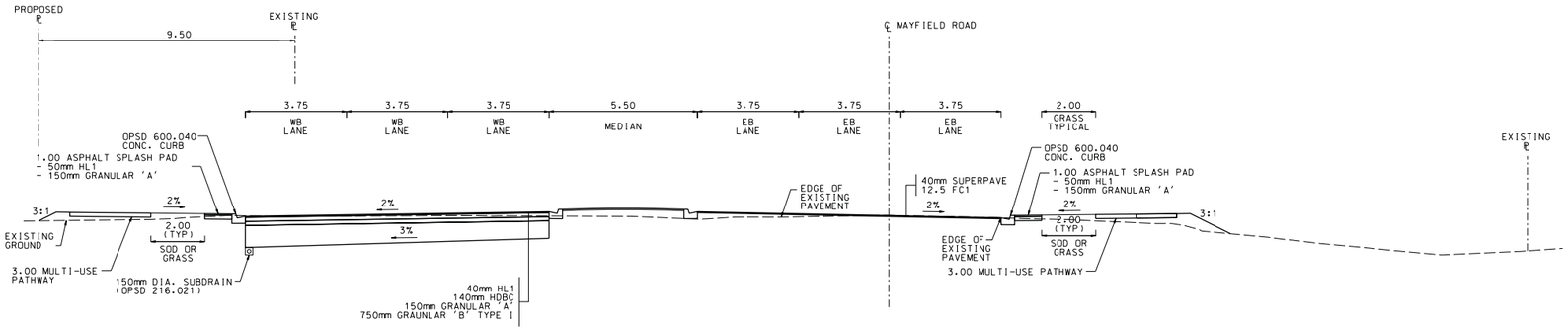

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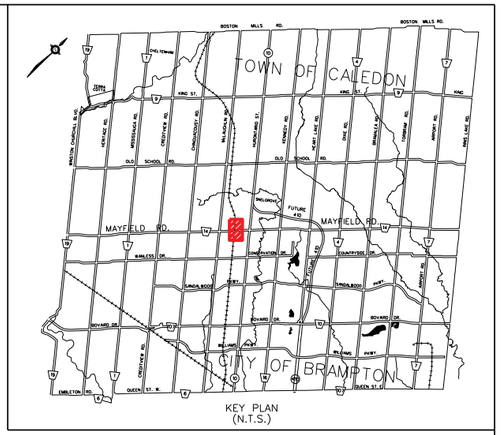

KEY PLAN
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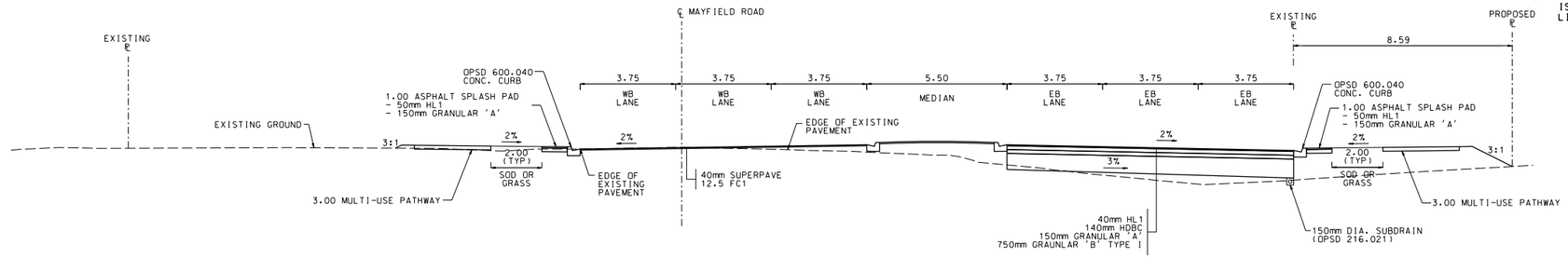

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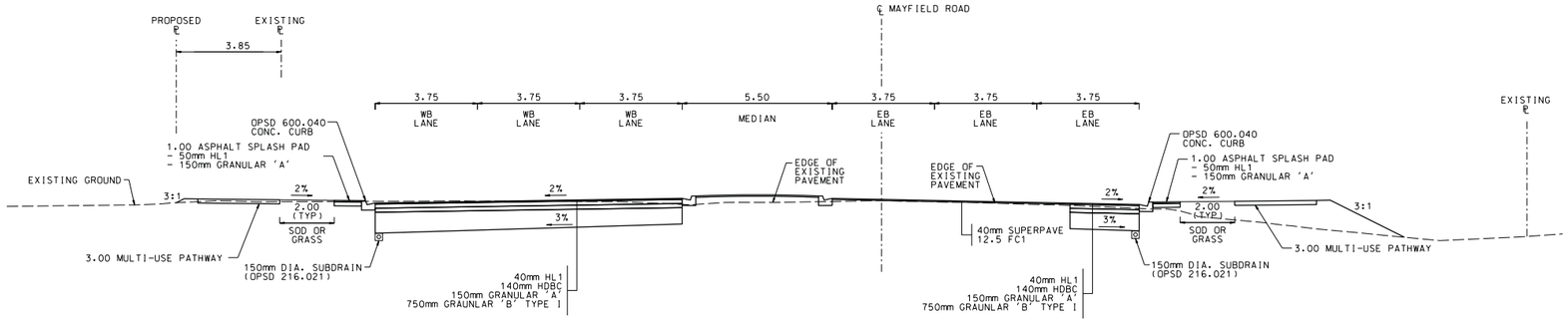

ALTERNATIVE 3 - WIDENING TO THE NORTH AND SOUTH

NOTES:

1. ALL DIMENSIONS SHOWN ARE IN MERBES UNLESS OTHERWISE NOTED.
2. PROPOSED PROPERTY LINE IS SET BACK 1.0m FROM LIMIT OF CONSTRUCTION.

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MAYFIELD ROAD

ORANGEVILLE RAIL TO HURONTARIO STREET
DESIGN ALTERNATIVE CROSS SECTIONS

CAD Area	Area	Project No. 101-17262
Checked by V.M.	Drawn by M.B.	
Date APR 2014	Sheet 3 OF 7	FIGURE 5-6

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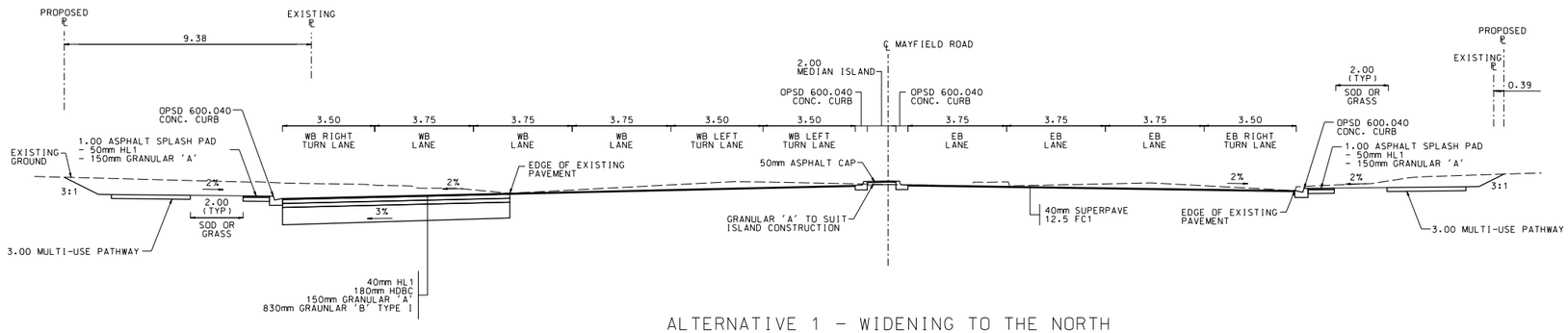
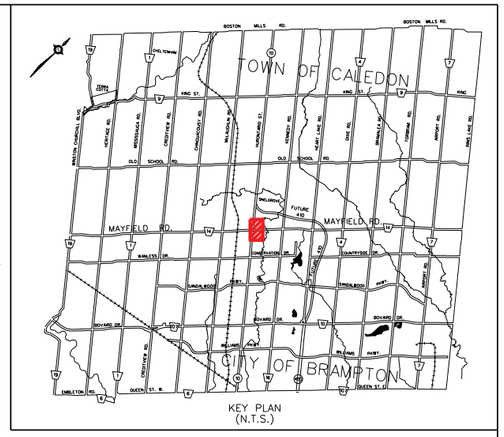
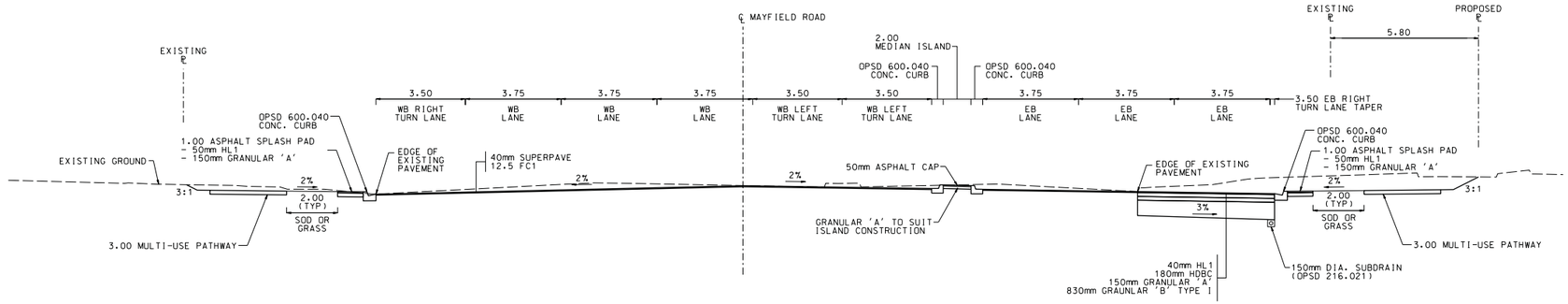
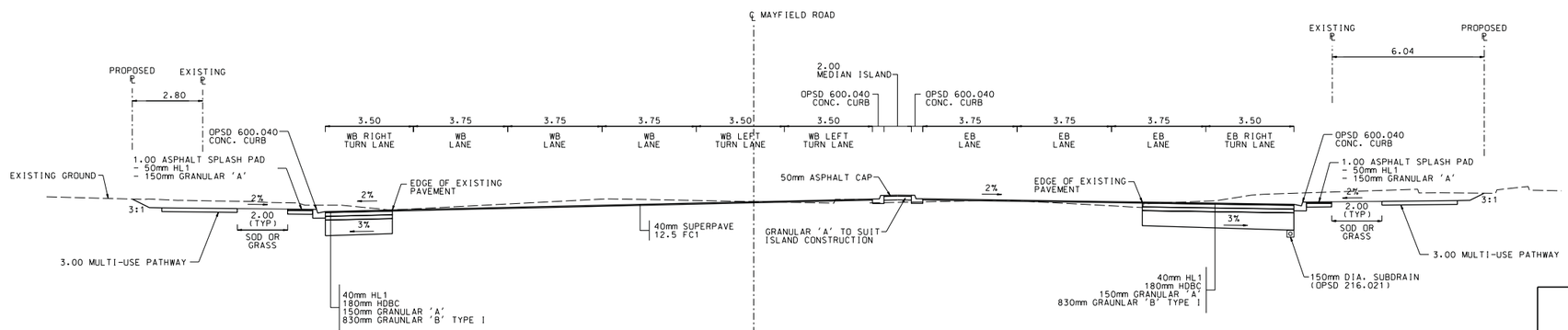


ALTERNATIVE 1 - WIDENING TO THE NORTH





ALTERNATIVE 2 - WIDENING TO THE SOUTH



ALTERNATIVE 3 - WIDENING TO THE NORTH AND SOUTH

NOTES:

1. ALL DIMENSIONS SHOWN ARE IN MERBBS UNLESS OTHERWISE NOTED.
2. PROPOSED PROPERTY LINE IS SET BACK 1.0m FROM LIMIT OF CONSTRUCTION.

NTS

WSP

Region of Peel
Working for you

MAYFIELD ROAD

HURONTARIO STREET TO SNELGROVE BRIDGE
DESIGN ALTERNATIVE CROSS SECTIONS

CAD Area	Area	Project No.	101-17262
Checked by V.M.	Drawn by M.B.		
Date APR 2014	Sheet 4 OF 7		FIGURE 5-7

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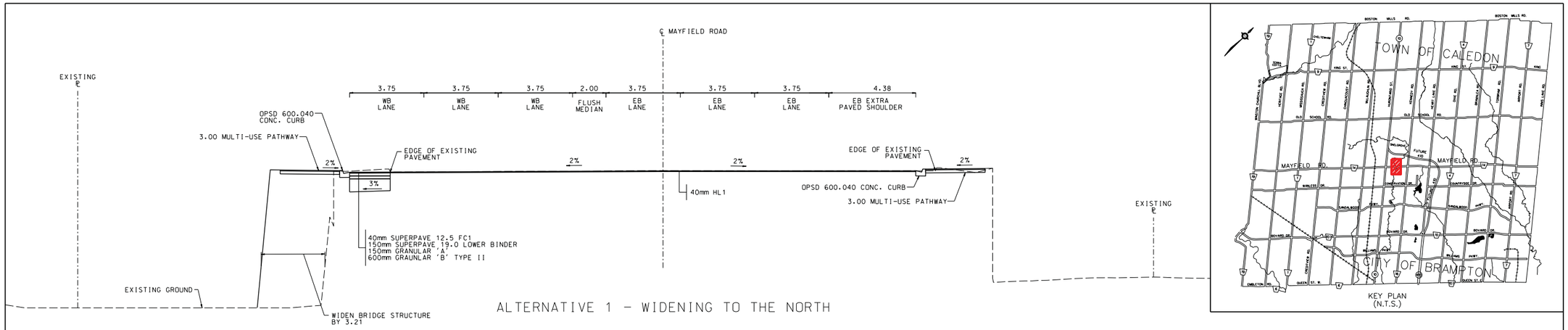
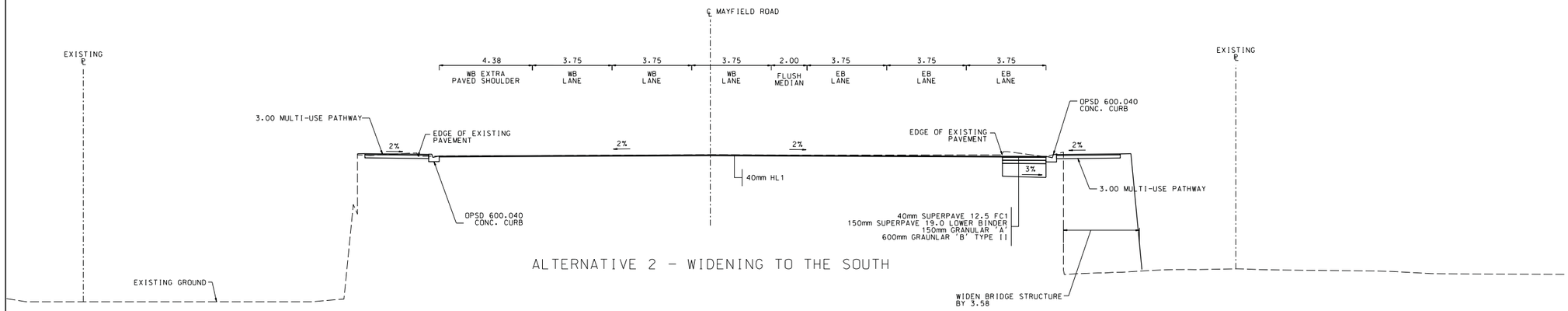


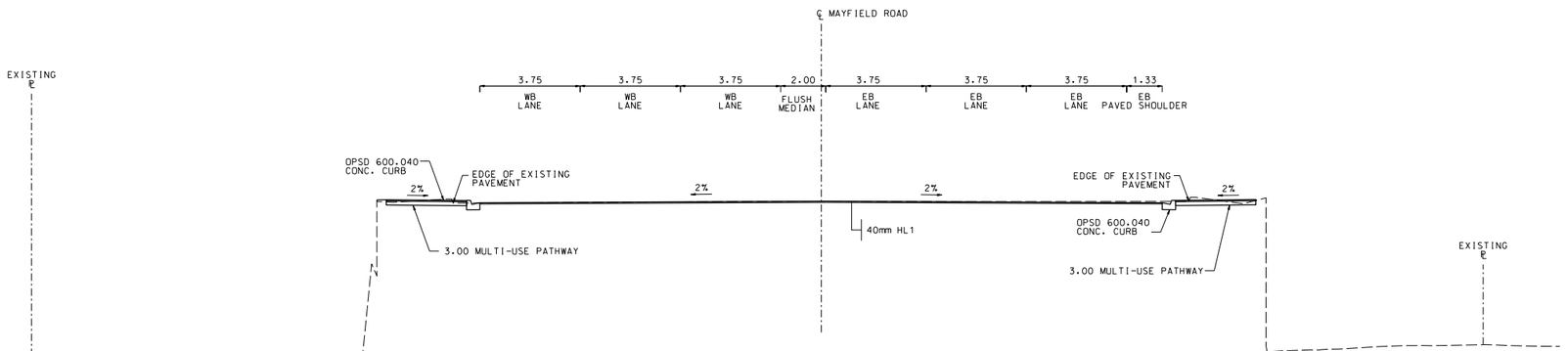
ALTERNATIVE 1 – WIDENING TO THE NORTH

NOTES:

1. ALL DIMENSIONS SHOWN ARE IN METRES UNLESS OTHERWISE NOTED.
2. PROPOSED PROPERTY LINE IS SET BACK 1.0m FROM LIMIT OF CONSTRUCTION.



ALTERNATIVE 2 – WIDENING TO THE SOUTH



ALTERNATIVE 3 – WIDENING TO THE NORTH AND SOUTH

NTS

WSP

Region of Peel
Working for you

MAYFIELD ROAD

SNELGROVE BRIDGE TO KENNEDY ROAD
DESIGN ALTERNATIVE CROSS SECTIONS

CAD Area	Area	Project No. 101-17262
Checked by V.M.	Drawn by M.B.	
Date APR 2014	Sheet 5 OF 7	FIGURE 5-8

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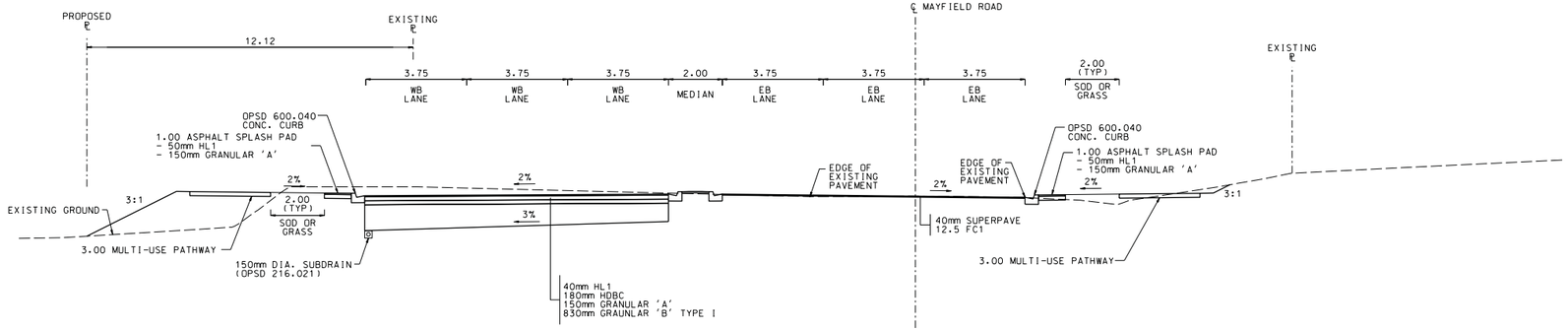
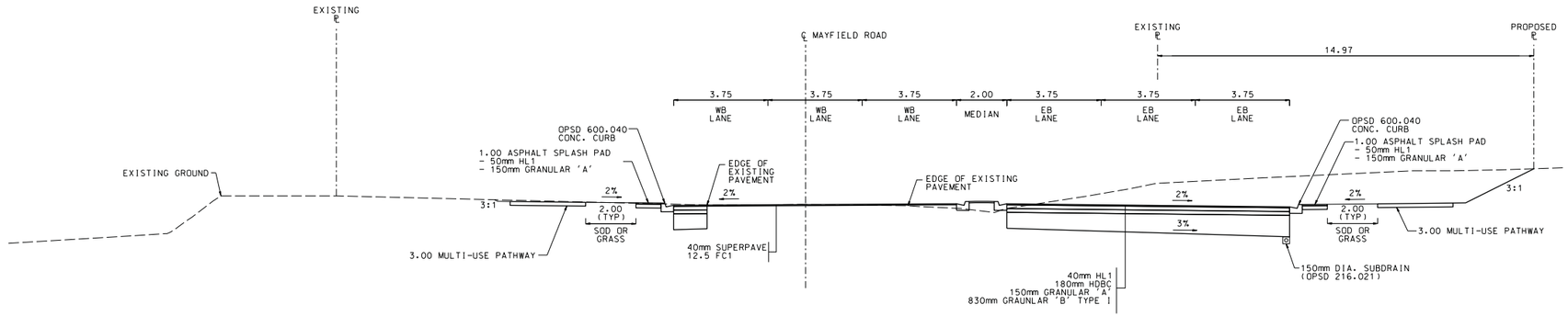
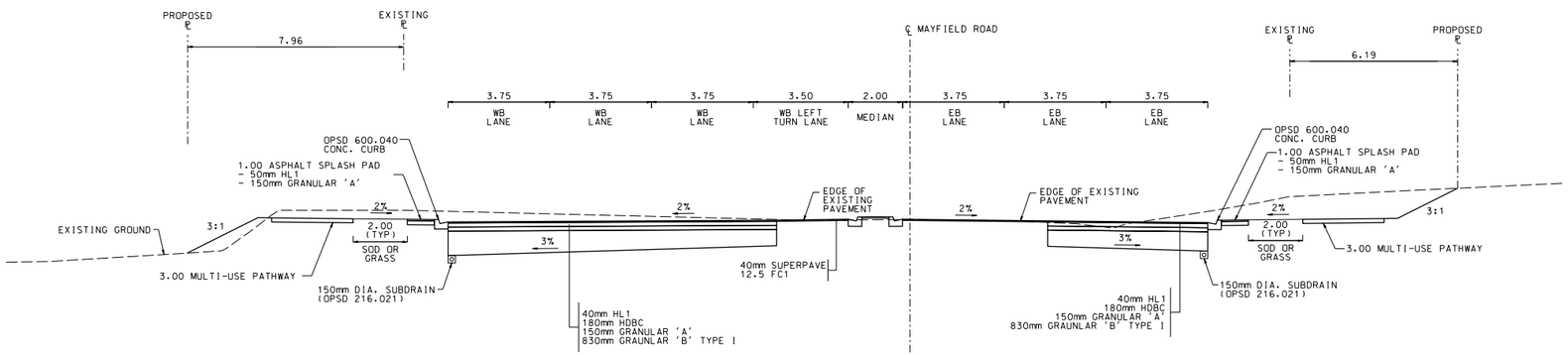


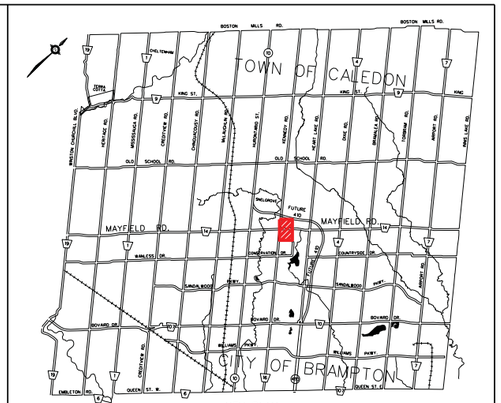
ALTERNATIVE 1 – WIDENING TO THE NORTH



ALTERNATIVE 2 – WIDENING TO THE SOUTH



ALTERNATIVE 3 – WIDENING TO THE NORTH AND SOUTH



KEY PLAN
(N.T.S.)

NOTES:

1. ALL DIMENSIONS SHOWN ARE IN MERBBS UNLESS OTHERWISE NOTED.
2. PROPOSED PROPERTY LINE IS SET BACK 1.0m FROM LIMIT OF CONSTRUCTION.

WSP

Region of Peel
Working for you

MAYFIELD ROAD

KENNEDY ROAD TO STONEGATE DRIVE
DESIGN ALTERNATIVE CROSS SECTIONS

NTS

CAD Area	Area	Project No.	101-17262
Checked by V.M.	Drawn by M.B.		
Date APR 2014	Sheet 6 OF 7		FIGURE 5-9

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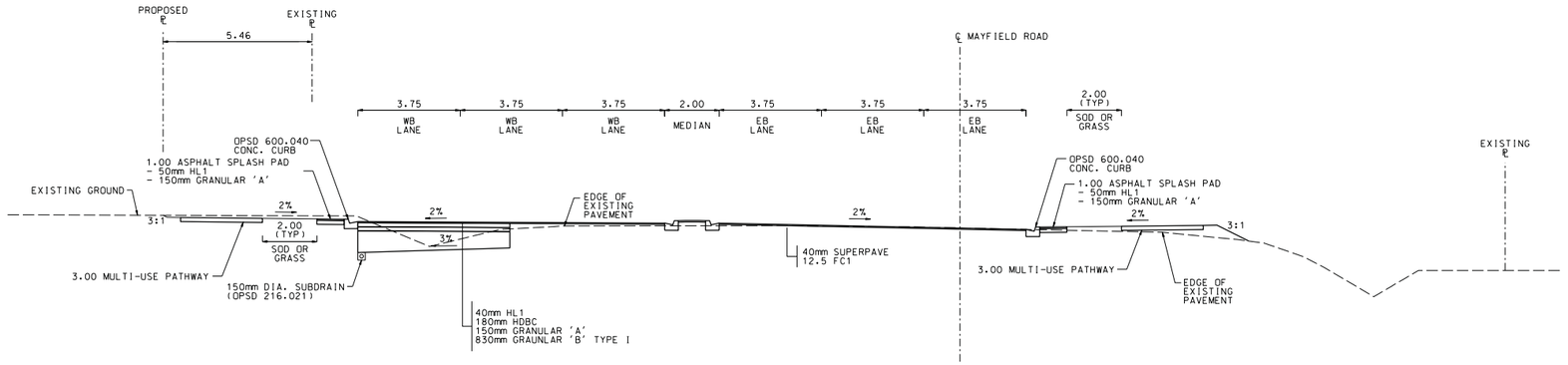
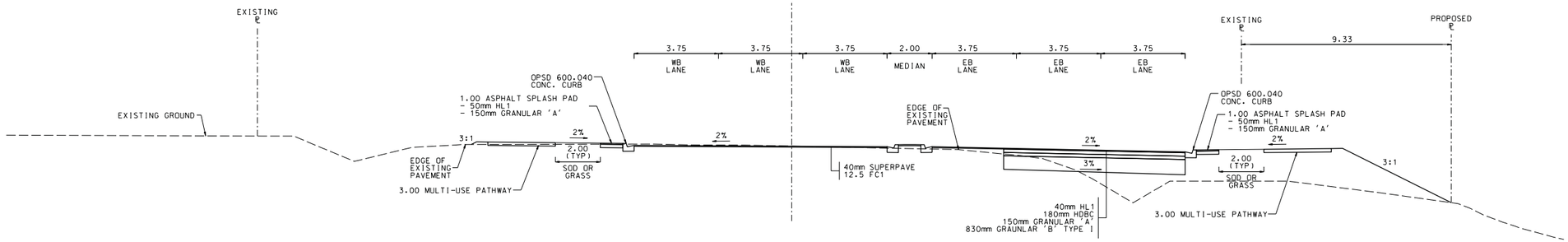


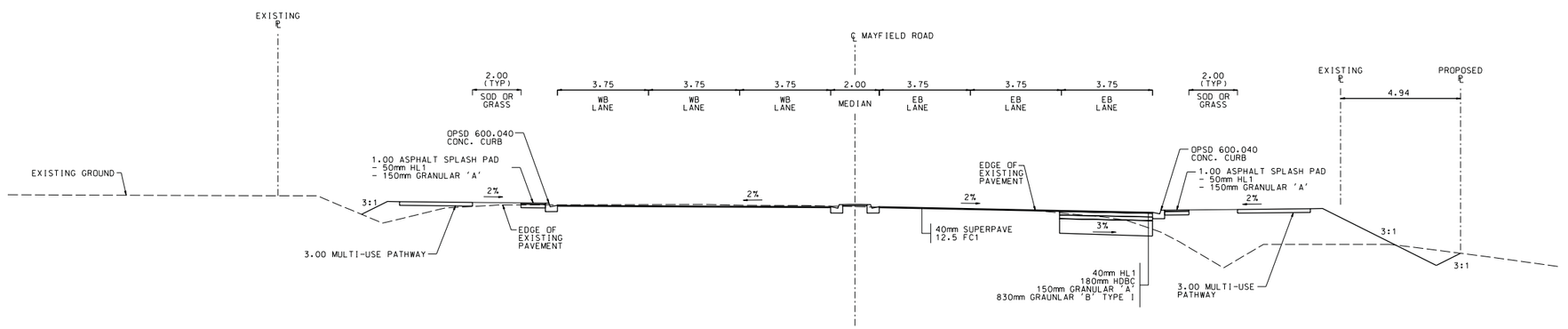
ALTERNATIVE 1 – WIDENING TO THE NORTH

NOTES:

1. ALL DIMENSIONS SHOWN ARE IN METRES UNLESS OTHERWISE NOTED.
2. PROPOSED PROPERTY LINE IS SET BACK 1.0m FROM LIMIT OF CONSTRUCTION.



ALTERNATIVE 2 – WIDENING TO THE SOUTH



ALTERNATIVE 3 – WIDENING TO THE NORTH AND SOUTH

NTS

WSP

Region of Peel
Working for you

MAYFIELD ROAD

STONEGATE DRIVE TO HEART LAKE ROAD
DESIGN ALTERNATIVE CROSS SECTIONS

CAD Area	Area	Project No. 101-17262
Checked by V.M.	Drawn by M.B.	
Date APR 2014	Sheet 7 OF 7	FIGURE 5-10

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5.1.3 Step 3: Comparative Evaluation of the Alternative Design Concepts and Identification of the Recommended Design Concept

In keeping with the evaluation methodology employed for the Alternative Solutions, the Alternative Design Concepts were subjected to a detailed net effects analysis and comparative evaluation using a "Reasoned Argument" process. This methodology uses the net effects of each alternative after the implementation of reasonable mitigation measures to identify the advantages and disadvantages (positive and negative net effects) for comparison. A reasoned argument is then used to weigh the advantages and disadvantages in order to recommend the most favourable alternative.

In order to establish the net effects and identify the advantages and disadvantages of each alternative, project-specific evaluation criteria were developed within each evaluation category (Technical/ Engineering, Natural, Social/Cultural, and Financial). The evaluation criteria were established based on a review of the Municipal Class EA document, the existing conditions of the Study Area, the Alternative Design Concepts, and the Problem and Opportunity Statements. .

Table 5-6 to **Table 5-12** presents the evaluation of road widening alternatives of the seven sections mentioned above. The evaluation of alternatives is based on a matrix that provides brief text describing the evaluation of each alternative against each criterion, supported by colour-coding of each cell within the matrix so that the comparative evaluation can be seen at a glance.

5.1.3.1 Preferred Road Widening Alternative

The preferred road widening alternative is Alternative 3 for all the sections except between Kennedy Road and Stonegate Drive where Alternative 1 is preferred. Rationale includes the following:

- Can accommodate future development;
- Meets pedestrian requirements;
- Least impacts to utilities within the ROW;
- Enhances local terrestrial communities;
- Reduces adverse effects on Heart Lake Conservation Areas on both sides of Mayfield Road;
- Equitable property taking (e.g. same amount from both sides of the road) for majority of road widening; and
- Maximizes road capacity.

Refer to **Section 8** for plan and profile drawings.

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Table 5-6 - Comparative Evaluation Summary for Chinguacousy Road to McLaughlin Road

CATEGORIES	FACTORS	CRITERIA	ALTERNATIVES		
			Alternative 1 **Widening to the North**	**Alternative 2** **Widening to the South**	**Alternative 3** **Widening to the North and South**
DESCRIPTION OF ALTERNATIVES			**Widen Mayfield Road to the North**	**Widen Mayfield Road to the South**	**Widen Mayfield Road to the North and South**
TECHNICAL	**Utility Impacts**	**Ability to minimize adverse effects on existing and planned utilities located within the Region's right-of-way**	• Existing utilities would require relocation however opportunities to accommodate the utility services within a wider boulevard can be provided • More difficult to accommodate planned infrastructure (large water feedermains)	• Existing utilities would require relocation however opportunities to accommodate the utility services within a wider boulevard can be provided • More difficult to accommodate planned infrastructure	• Existing utilities would require relocation however opportunities to accommodate the utility services within a wider boulevard can be provided • Can best accommodate planned infrastructure by better distributing utilities in ROW
	Stormwater and Drainage	**Impact to existing stormwater management and drainage facilities**	**Impacts to stormwater management and drainage facilities does not differ significantly**		
	Constructability	**Ease of Construction**	**Constructability of each alternative does not differ significantly**		
	Geometrics	**Roadway geometrics are within acceptable design standards**	**Roadway Geometrics are within desirable design standards for all alternatives**		
	Alternative modes of Transportation	**Easily able to incorporate alternative modes of transportation into the design**	**Alternative methods of transportation facilities can be incorporated into all alternatives equally.**		
NATURAL ENVIRONMENT	**Terrestrial**	**Impact to existing vegetation, wildlife, wildlife crossings. Including proximity to Areas of Natural and Scientific Interest, Wetlands, and habitats of Endangered or Threatened Species.**	• 41 identifiable trees will need to be removed to accommodate the widening • Approximately 1294m^2 will need to be removed to accommodate the widening	• 27 identifiable trees will need to be removed to accommodate the widening • Potential to affect a significant woodlot on the south side of Mayfield Road. • Approximately 2603m^2 will need to be removed to accommodate the widening	• 53 identifiable trees will need to be removed to accommodate the widening • Approximately 3501m^2 will need to be removed to accommodate the widening
			Impacts to all other criteria do not differ significantly		
	Aquatic	**Impacts to valleylands, floodplains, watercourse, waterbodies, crossings and fisheries. Including impacts to hydrogeological features**	**Impacts to existing aquatic features do not differ significantly**		
SOCIAL, LAND USE AND CULTURAL ENVIRONMENT	**Social Environment**	**Potential for short-term construction related effects (e.g. noise, dust, etc.) on area residents**	• Will result in short-term access disruptions to two (2) existing property accesses • Property owners to the north will be less affected by noise and dust as buildings are set further back from the existing roadway	• Will result in short-term access disruptions to three (3) existing property accesses • Property owners to the south will be more severely affected by construction related effects as buildings are closer to the existing roadway	• Will result in short-term access disruptions to five (5) existing property accesses • Property owners to both sides will be slightly affected by construction related effects as construction would be further away from existing buildings
	Land Use	**Impacts to existing Land Uses** **Ability to accommodate future development**	• Future developable property or easement required: 3.21 ha • Widening on the north side of the road would minimize impacts on the Mount Pleasant Block 51-2 Area	• Future developable property or easement required: 3.79 ha • Widening the south side of the road would minimize impacts on Mayfield West Phase 2 Area	• Future developable property or easement required: 3.35 ha • Widening equally on both sides of the road will take equitable amount of property from both developers
	Proximity to Built Up Areas	**Impacts to existing built-up areas**	• Will move roadway closer to properties only to the north, existing property is further from existing roadway than properties to the south	• Will move roadway closer to properties only to the south, existing properties are closer to existing roadway	• Will move roadway closer to properties to the north and south
	Archaeological and Built Heritage	**Impacts to existing archaeological or built heritage features**	**Impacts to archaeological or built-heritage features do not differ significantly**		
FINANCIAL	**Capital Costs**	**Potential capital costs**	**Moderate construction and operating costs**		
	Property Costs	**Potential property acquisition costs**	**Developer lands on both sides, property acquisition costs do not differ significantly**		
RECOMMENDATION			✘ **NOT RECOMMENDED**	✘ **NOT RECOMMENDED**	✓ **RECOMMENDED**

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Table 5-7 - Comparative Evaluation Summary for McLaughlin Road to Orangeville Rail

CATEGORIES	FACTORS	CRITERIA	ALTERNATIVES		
			Alternative 1 **Widening to the North**	**Alternative 2** **Widening to the South**	**Alternative 3** **Widening to the North and South**
DESCRIPTION OF ALTERNATIVES			Widen Mayfield Road to the North	Widen Mayfield Road to the South	Widen Mayfield Road to the North and South
TECHNICAL	**Utility Impacts**	**Ability to minimize adverse effects on existing and planned utilities located within the Region's right-of-way**	• Existing utilities would require relocation however opportunities to accommodate the utility services within a wider boulevard can be provided • More difficult to accommodate planned infrastructure (large water feedermains)	• Existing utilities would require relocation however opportunities to accommodate the utility services within a wider boulevard can be provided • More difficult to accommodate planned infrastructure	• Existing utilities would require relocation however opportunities to accommodate the utility services within a wider boulevard can be provided • Can best accommodate planned infrastructure by better distributing utilities in ROW
	Stormwater and Drainage	**Impact to existing stormwater management and drainage facilities**	**Impacts to stormwater management and drainage facilities does not differ significantly**		
	Constructability	**Ease of Construction**	**Constructability of each alternative does not differ significantly**		
	Geometrics	**Roadway geometrics are within acceptable design standards**	**Roadway Geometrics are within desirable design standards for all alternatives**		
	Alternative modes of Transportation	**Easily able to incorporate alternative modes of transportation into the design**	**Alternative methods of transportation facilities can be incorporated into all alternatives equally.**		
NATURAL ENVIRONMENT	**Terrestrial**	**Impact to existing vegetation, wildlife, wildlife crossings. Including proximity to Areas of Natural and Scientific Interest, Wetlands, and habitats of Endangered or Threatened Species.**	• 3 identifiable trees will need to be removed to accommodate the widening • Approximately 4457m^2 will need to be removed to accommodate the widening	• 6 identifiable trees will need to be removed to accommodate the widening • Potential to affect a significant woodlot on the south side of Mayfield Road. • Approximately 992m^2 will need to be removed to accommodate the widening	• 2 identifiable trees will need to be removed to accommodate the widening • Approximately 4397m^2 will need to be removed to accommodate the widening
			Impacts to all other criteria do not differ significantly		
	Aquatic	**Impacts to valleylands, floodplains, watercourse, waterbodies, crossings and fisheries. Including impacts to hydrogeological features**	**Impacts to existing aquatic features do not differ significantly**		
SOCIAL, LAND USE AND CULTURAL ENVIRONMENT	**Social Environment**	**Potential for short-term construction related effects (e.g. noise, duct, etc.) on area residents**	• Will result in short-term access disruptions to three (3) existing property accesses • Property owners to the north will be less affected by noise and dust as buildings are set further back from the existing roadway	• Will result in short-term access disruptions to one (1) existing property accesses • Property owners to the south will be more severely affected by construction related effects as buildings are closer to the existing roadway	• Will result in short-term access disruptions to four (4) existing property accesses • Property owners to both sides will be slightly affected by construction related effects as construction would be further away from existing buildings
	Land Use	**Impacts to existing Land Uses** **Ability to accommodate future development**	• Future developable property or easement required: 0.95 ha • Property Required from 6 owners • Widening on the north side of the road would impact the Mayfield West Phase 2 Area and SWM Ponds	• Residential property or easement required: 0.96 ha • Property Required from 13 owners	• Future developable property or easement required: 0.73 ha • Residential property or easement required: 0.19 ha • Property Required from 9 owners
	Proximity to Built Up Areas	**Impacts to existing built-up areas**	• Will move roadway closer to properties only to the north, existing property is currently farmland	• Will move roadway closer to properties only to the south, property for widened roadway was protected when the subdivision was being developed.	• Will move roadway closer to properties to the north and south
	Archaeological and Built Heritage	**Impacts to existing archaeological or built heritage features**	• Greatest potential for archaeological impacts	• Minimal potential for archaeological impacts	• Moderate potential for archaeological impacts
FINANCIAL	**Capital Costs**	**Potential capital costs**	**Moderate construction and operating costs**		
	Property Costs	**Potential property acquisition costs**	• Mainly farmland, moderate acquisition costs	• Residential subdivision near rail, multiple properties will have to be partial acquired.	• Minimal impact to residential subdivision and less property will be needed on the north.
RECOMMENDATION			✗ NOT RECOMMENDED	✗ NOT RECOMMENDED	✓ RECOMMENDED

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Table 5-8 - Comparative Evaluation Summary for Orangeville Rail to Hurontario Street

CATEGORIES	FACTORS	CRITERIA	ALTERNATIVES		
			Alternative 1 **Widening to the North**	**Alternative 2** **Widening to the South**	**Alternative 3** **Widening to the North and South**
DESCRIPTION OF ALTERNATIVES			**Widen Mayfield Road to the North**	**Widen Mayfield Road to the South**	**Widen Mayfield Road to the North and South**
TECHNICAL	**Utility Impacts**	**Ability to minimize adverse effects on existing and planned utilities located within the Region's right-of-way**	• Existing utilities would require relocation however opportunities to accommodate the utility services within a wider boulevard can be provided • More difficult to accommodate planned infrastructure (large water feedermains)	• Existing utilities would require relocation however opportunities to accommodate the utility services within a wider boulevard can be provided • More difficult to accommodate planned infrastructure	• Existing utilities would require relocation however opportunities to accommodate the utility services within a wider boulevard can be provided • Can best accommodate planned infrastructure by better distributing utilities in ROW
	Stormwater and Drainage	**Impact to existing stormwater management and drainage facilities**	**Impacts to stormwater management and drainage facilities does not differ significantly**		
	Constructability	**Ease of Construction**	**Constructability of each alternative does not differ significantly**		
	Geometrics	**Roadway geometrics are within acceptable design standards**	**Roadway Geometrics are within desirable design standards for all alternatives**		
	Alternative modes of Transportation	**Easily able to incorporate alternative modes of transportation into the design**	**Alternative methods of transportation facilities can be incorporated into all alternatives equally**		
NATURAL ENVIRONMENT	**Terrestrial**	**Impact to existing vegetation, wildlife, wildlife crossings. Including proximity to Areas of Natural and Scientific Interest, Wetlands, and habitats of Endangered or Threatened Species.**	• 29 identifiable trees will need to be removed to accommodate the widening • Approximately 565m^2 will need to be removed to accommodate the widening	• 40 identifiable trees will need to be removed to accommodate the widening • Approximately 1227m^2 will need to be removed to accommodate the widening	• 38 identifiable trees will need to be removed to accommodate the widening • Approximately 1258m^2 will need to be removed to accommodate the widening
			Impacts to wildlife, wildlife crossings, habitats of endangered or threatened species do not differ significantly		
	Aquatic	**Impacts to valleylands, floodplains, watercourse, waterbodies, crossings and fisheries. Including impacts to hydrogeological features**	**Impacts to existing aquatic features do not differ significantly**		
SOCIAL, LAND USE AND CULTURAL ENVIRONMENT	**Social Environment**	**Potential for short-term construction related effects (e.g. noise, duct, etc.) on area residents**	• Will result in short-term access disruptions to no existing property accesses • Property owners to the north will be less affected by noise and dust as buildings are set further back from the existing roadway	• Will result in short-term access disruptions to one (1) existing property accesses • Property owners to the south will be more severely affected by construction related effects as buildings are closer to the existing roadway	• Will result in short-term access disruptions to one (1) existing property accesses • Property owners to the south will be slightly less affected by construction related effects as construction would be further away from existing buildings
	Land Use	**Impacts to existing Land Uses** **Potential for property taking**	• Residential property or easement required: 0.71 ha • Property Required from 37 owners	• Residential property or easement required: 1.03 ha • Property Required from 15 owners	• Residential property or easement required: 0.90 ha • Property Required from 36 owners
	Proximity to Built Up Areas	**Impacts to existing built-up areas**	• Will move roadway closer to properties only to the north, property for widened roadway was protected when the subdivision was being developed.	• Will move roadway closer to properties only to the south, property for widened roadway was protected when the subdivision was being developed. Mayfield Road will be moved closer to existing properties fronting on Mayfield.	• Property for the Road Right of Way was obtained when subdivisions to the north and south were being developed
	Archaeological and Built Heritage	**Impacts to existing archaeological or built heritage features**	**Impacts to archaeological or built heritage features do not differ significantly**		
FINANCIAL	**Capital Costs**	**Potential capital costs**	**Moderate construction and operating costs**		
	Property Costs	**Potential property acquisition costs**	**Close proximity to residential subdivision or commercial properties, acquisition costs do not differ significantly.**		
RECOMMENDATION			✘ **NOT RECOMMENDED**	✘ **NOT RECOMMENDED**	✓ **RECOMMENDED**

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Table 5-9 - Comparative Evaluation Summary for Hurontario Street to Snelgrove Bridge

CATEGORIES	FACTORS	CRITERIA	ALTERNATIVES		
			Alternative 1 **Widening to the North**	**Alternative 2** **Widening to the South**	**Alternative 3** **Widening to the North and South**
DESCRIPTION OF ALTERNATIVES			**Widen Mayfield Road to the North**	**Widen Mayfield Road to the South**	**Widen Mayfield Road to the North and South**
TECHNICAL	**Utility Impacts**	**Ability to minimize adverse effects on existing and planned utilities located within the Region's right-of-way**	• Existing utilities would require relocation however opportunities to accommodate the utility services within a wider boulevard can be provided • More difficult to accommodate planned infrastructure (large water feedermains)	• Existing utilities would require relocation however opportunities to accommodate the utility services within a wider boulevard can be provided • More difficult to accommodate planned infrastructure	• Existing utilities would require relocation however opportunities to accommodate the utility services within a wider boulevard can be provided • Can best accommodate planned infrastructure by better distributing utilities in ROW
	Stormwater and Drainage	**Impact to existing stormwater management and drainage facilities**	**Impacts to stormwater management and drainage facilities does not differ significantly**		
	Constructability	**Ease of Construction**	• Will require additional property and demolition of existing buildings	• Will require widening of existing embankment and will have a high potential to affect the existing Reach of Etobicoke Creek	• Will require minimal private property, and demolition and removal of existing structures is not necessary
	Geometrics	**Roadway geometrics are within acceptable design standards**	**Roadway Geometrics are within desirable design standards for all alternatives**		
	Alternative modes of Transportation	**Easily able to incorporate alternative modes of transportation into the design**	**Alternative methods of transportation facilities can be incorporated into all alternatives equally**		
NATURAL ENVIRONMENT	**Terrestrial**	**Impact to existing vegetation, wildlife, wildlife crossings. Including proximity to Areas of Natural and Scientific Interest, Wetlands, and habitats of Endangered or Threatened Species.**	• 16 identifiable trees will need to be removed to accommodate the widening • Approximately 114m^2 will need to be removed to accommodate the widening	• 18 identifiable trees will need to be removed to accommodate the widening • Approximately 158m^2 will need to be removed to accommodate the widening	• 8 identifiable trees will need to be removed to accommodate the widening • Approximately 141m^2 will need to be removed to accommodate the widening
			Impacts to wildlife, wildlife crossings, habitats of endangered or threatened species do not differ significantly		
	Aquatic	**Impacts to valleylands, floodplains, watercourse, waterbodies, crossings and fisheries. Including impacts to hydrogeological features**	• Moderate Potential for affecting existing watercourses	• High Potential to affect existing reach of Etobicoke Creek	• Low Potential for affecting existing watercourses
			Impacts to all other aquatic criteria do not differ significantly		
SOCIAL, LAND USE AND CULTURAL ENVIRONMENT	**Social Environment**	**Potential for short-term construction related effects (e.g. noise, duct, etc.) on area residents**	• Will result in short-term access disruptions to three (3) existing property accesses • Property owners to the north will be less affected by noise and dust as buildings are set further back from the existing roadway	• Will result in short-term access disruptions to one (1) existing property accesses • Property owners to the south will be more severely affected by construction related effects as buildings are closer to the existing roadway	• Will result in short-term access disruptions to four (4) existing property accesses • Property owners to the south will be slightly less affected by construction related effects as construction would be further away from existing buildings
	Land Use	**Impacts to existing Land Uses** **Potential for property taking**	• Residential property or easement required: 0.31 ha • Business property or easement required: 0.32 ha • Property Required from 5 owners	• Residential property or easement required: 0.49 ha • Business property or easement required: 0.13 ha • Property Required from 13 owners	• Residential property or easement required: 0.39 ha • Business property or easement required: 0.025 ha • Property Required from 16 owners
	Proximity to Built Up Areas	**Impacts to existing built-up areas**	• Will impact existing commercial buildings	• Will impact existing commercial buildings	• Will not impact existing commercial buildings, but roadway will be moved closer.
	Archaeological and Built Heritage	**Impacts to existing archaeological or built heritage features**	**Impacts to archaeological or built heritage features do not differ significantly**		
FINANCIAL	**Capital Costs**	**Potential capital costs**	**Moderate construction and operating costs**		
	Property Costs	**Potential property acquisition costs**	• Moderately high cost for residential properties	• Moderately high cost for commercial properties	• Moderate acquisition costs
RECOMMENDATION			✘ **NOT RECOMMENDED**	✘ **NOT RECOMMENDED**	✓ **RECOMMENDED**

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Table 5-10 - Comparative Evaluation Summary for Snelgrove Bridge to Kennedy Road

CATEGORIES	FACTORS	CRITERIA	ALTERNATIVES		
			Alternative 1 Widening to the North	**Alternative 2 Widening to the South**	**Alternative 3 Widening to the North and South**
DESCRIPTION OF ALTERNATIVES			Widen Mayfield Road to the North	Widen Mayfield Road to the South	Widen Mayfield Road to the North and South
TECHNICAL	**Utility Impacts**	**Ability to minimize adverse effects on existing and planned utilities located within the Region's right-of-way**	• Existing utilities would require relocation however opportunities to accommodate the utility services within a wider boulevard can be provided • More difficult to accommodate planned infrastructure (large water feedermains)	• Existing utilities would require relocation however opportunities to accommodate the utility services within a wider boulevard can be provided • More difficult to accommodate planned infrastructure	• Existing utilities would require relocation however opportunities to accommodate the utility services within a wider boulevard can be provided • Can best accommodate planned infrastructure by better distributing utilities in ROW
	Stormwater and Drainage	**Impact to existing stormwater management and drainage facilities**	**Impacts to stormwater management and drainage facilities does not differ significantly**		
	Constructability	**Ease of Construction**	• Will require widening to the north of bridge structure of Etobicoke Creek	• Will require widening to the south of bridge structure of Etobicoke Creek	• No structural impacts
	Geometrics	**Roadway geometrics are within acceptable design standards**	**Roadway Geometrics are within desirable design standards for all alternatives**		
	Alternative modes of Transportation	**Easily able to incorporate alternative modes of transportation into the design**	**Alternative methods of transportation facilities can be incorporated into all alternatives equally**		
NATURAL ENVIRONMENT	**Terrestrial**	**Impact to existing vegetation, wildlife, wildlife crossings. Including proximity to Areas of Natural and Scientific Interest, Wetlands, and habitats of Endangered or Threatened Species.**	• 3 identifiable trees will need to be removed to accommodate the widening • Approximately 2075m^2 will need to be removed to accommodate the widening	• 3 identifiable trees will need to be removed to accommodate the widening • Approximately 1056m^2 will need to be removed to accommodate the widening	• 16 identifiable trees will need to be removed to accommodate the widening • Approximately 1998m^2 will need to be removed to accommodate the widening
			• High potential to affect wildlife passage	• High potential to affect wildlife passage	• Low potential to affect wildlife passage
			Impacts to all other terrestrial criteria do not differ significantly		
	Aquatic	**Impacts to valleylands, floodplains, watercourse, waterbodies, crossings and fisheries. Including impacts to hydrogeological features**	• Will require in water work to widen bridge structure	• Will require in water work to widen bridge structure	• Low impact to existing watercourses and water bodies.
			Impacts to all other aquatic criteria do not differ significantly		
SOCIAL, LAND USE AND CULTURAL ENVIRONMENT	**Social Environment**	**Potential for short-term construction related effects (e.g. noise, duct, etc.) on area residents**	• Will result in short-term access disruptions to no existing property accesses • Property owners to the north will be less affected by noise and dust as buildings are set further back from the existing roadway	• Will result in short-term access disruptions to no existing property accesses • Property owners to the south will be more severely affected by construction related effects as buildings are closer to the existing roadway	• Will result in short-term access disruptions to no existing property accesses • Property owners to the south will be slightly less affected by construction related effects as construction would be further away from existing buildings
	Land Use	**Impacts to existing Land Uses** **Potential for property taking**	• Residential property or easement required: 1.07 ha o Property Required from 6 owners •	• Future developable property or easement required: 1.00 ha o Property Required from 10 owners •	• Future developable property or easement required: 0.29 ha • Residential property or easement required: 0.81 ha o Property Required from 8 owners
	Proximity to Built Up Areas	**Impacts to existing built-up areas**	**Impacts to existing built up areas do not differ significantly**		
	Archaeological and Built Heritage	**Impacts to existing archaeological or built heritage features**	• Moderate-High Potential for archaeological impact	• Greater potential for archaeological impact	• Moderate-High Potential for archaeological impact
FINANCIAL	**Capital Costs**	**Potential capital costs**	**Moderate construction and operating costs**		
	Property Costs	**Potential property acquisition costs**	• High acquisition costs for new subdivision at northwest quadrant of Kennedy Road	• Moderate acquisition costs	• Moderately low acquisition costs
RECOMMENDATION			✘ NOT RECOMMENDED	✘ NOT RECOMMENDED	✓ RECOMMENDED

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Table 5-11 - Comparative Evaluation Summary for Kennedy Road to Stonegate Drive

CATEGORIES	FACTORS	CRITERIA	ALTERNATIVES		
			Alternative 1 **Widening to the North**	**Alternative 2** **Widening to the South**	**Alternative 3** **Widening to the North and South**
DESCRIPTION OF ALTERNATIVES			Widen Mayfield Road to the North	Widen Mayfield Road to the South	Widen Mayfield Road to the North and South
TECHNICAL	**Utility Impacts**	**Ability to minimize adverse effects on existing and planned utilities located within the Region's right-of-way**	• Existing utilities would require relocation however opportunities to accommodate the utility services within a wider boulevard can be provided • More difficult to accommodate planned infrastructure (large water feedermains)	• Existing utilities would require relocation however opportunities to accommodate the utility services within a wider boulevard can be provided • More difficult to accommodate planned infrastructure	• Existing utilities would require relocation however opportunities to accommodate the utility services within a wider boulevard can be provided • Can best accommodate planned infrastructure by better distributing utilities in ROW
	Stormwater and Drainage	**Impact to existing stormwater management and drainage facilities**			
	Constructability	**Ease of Construction**	• No changes to existing structural supports	• Acquisition of property will make construction difficult	• May require changes to existing structural support and private property
	Geometrics	**Roadway geometrics are within acceptable design standards**	**Roadway Geometrics are within desirable design standards for all alternatives**		
	Alternative modes of Transportation	**Easily able to incorporate alternative modes of transportation into the design**	**Alternative methods of transportation facilities can be incorporated into all alternatives equally**		
NATURAL ENVIRONMENT	**Terrestrial**	**Impact to existing vegetation, wildlife, wildlife crossings. Including proximity to Areas of Natural and Scientific Interest, Wetlands, and habitats of Endangered or Threatened Species.**	• 5 identifiable trees will need to be removed to accommodate the widening • Approximately 0m^2 will need to be removed to accommodate the widening	• 73 identifiable trees will need to be removed to accommodate the widening • Approximately 1581m^2 will need to be removed to accommodate the widening	• 57 identifiable trees will need to be removed to accommodate the widening • Approximately 1753m^2 will need to be removed to accommodate the widening
			Impacts to all other terrestrial criteria do not differ significantly		
	Aquatic	**Impacts to valleylands, floodplains, watercourse, waterbodies, crossings and fisheries. Including impacts to hydrogeological features**	• High potential to impact existing watercourses and water bodies	• Low potential to impact existing watercourses and water bodies	• Moderate Potential to impact existing watercourses and water bodies
			Impacts to all other aquatic criteria do not differ significantly		
SOCIAL, LAND USE AND CULTURAL ENVIRONMENT	**Social Environment**	**Potential for short-term construction related effects (e.g. noise, duct, etc.) on area residents**	• Will result in short-term access disruptions to no existing property accesses • Property owners to the north will be less affected by noise and dust as buildings are set further back from the existing roadway	• Will result in short-term access disruptions to no existing property accesses • Property owners to the south will be more severely affected by construction related effects as buildings are closer to the existing roadway	• Will result in short-term access disruptions to no existing property accesses • Property owners to the south will be slightly less affected by construction related effects as construction would be further away from existing buildings
	Land Use	**Impacts to existing Land Uses** **Potential for property taking**	• Future developable property or easement required: 0.70 ha • Property Required from 2 owners	• Residential property or easement required: 0.43 ha • Property Required from 22 owners	• Future developable property or easement required: 0.40 ha • Property Required from 2 owners
	Proximity to Built Up Areas	**Impacts to existing built-up areas**	• No impact to existing built-up areas	• Will impact existing residential buildings	• Will impact existing subdivision to the south
	Archaeological and Built Heritage	**Impacts to existing archaeological or built heritage features**	• Moderate-High potential for archaeological and built heritage impacts	• Minimal potential for archaeological and built heritage impacts	• Moderate potential for archaeological and built heritage impacts
FINANCIAL	**Capital Costs**	**Potential capital costs**	**Moderate construction and operating costs**		
	Property Costs	**Potential property acquisition costs**	• Moderately low acquisition costs	• Close proximity to residential subdivision to the south, high acquisition costs	• Close proximity to residential subdivision to the south, high acquisition costs
RECOMMENDATION			✓ **RECOMMENDED**	✘ **NOT RECOMMENDED**	✘ **NOT RECOMMENDED**

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Table 5-12 - Comparative Evaluation Summary for Stonegate Drive to Heart Lake Road

CATEGORIES	FACTORS	CRITERIA	ALTERNATIVES		
			Alternative 1 **Widening to the North**	**Alternative 2** **Widening to the South**	**Alternative 3** **Widening to the North and South**
DESCRIPTION OF ALTERNATIVES			**Widen Mayfield Road to the North**	**Widen Mayfield Road to the South**	**Widen Mayfield Road to the North and South**
TECHNICAL	**Utility Impacts**	**Ability to minimize adverse effects on existing and planned utilities located within the Region's right-of-way**	• Existing utilities would require relocation however opportunities to accommodate the utility services within a wider boulevard can be provided • More difficult to accommodate planned infrastructure (large water feedermains)	• Existing utilities would require relocation however opportunities to accommodate the utility services within a wider boulevard can be provided • More difficult to accommodate planned infrastructure	• Existing utilities would require relocation however opportunities to accommodate the utility services within a wider boulevard can be provided • Can best accommodate planned infrastructure by better distributing utilities in ROW
	Stormwater and Drainage	**Impact to existing stormwater management and drainage facilities**	**Impacts to stormwater management and drainage facilities does not differ significantly**		
	Constructability	**Ease of Construction**	**Constructability of each alternative does not differ significantly**		
	Geometrics	**Roadway geometrics are within acceptable design standards**	**Roadway Geometrics are within desirable design standards for all alternatives**		
	Alternative modes of Transportation	**Easily able to incorporate alternative modes of transportation into the design**	**Alternative methods of transportation facilities can be incorporated into all alternatives equally**		
NATURAL ENVIRONMENT	**Terrestrial**	**Impact to existing vegetation, wildlife, wildlife crossings. Including proximity to Areas of Natural and Scientific Interest, Wetlands, and habitats of Endangered or Threatened Species.**	• 7 identifiable trees will need to be removed to accommodate the widening • Approximately 343m^2 will need to be removed to accommodate the widening	• 22 identifiable trees will need to be removed to accommodate the widening • Approximately 1078m^2 will need to be removed to accommodate the widening	• 6 identifiable trees will need to be removed to accommodate the widening • Approximately 1309m^2 will need to be removed to accommodate the widening
			Impacts to all other terrestrial criteria do not differ significantly		
	Aquatic	**Impacts to valleylands, floodplains, watercourse, waterbodies, crossings and fisheries. Including impacts to hydrogeological features**	• High potential for impacting existing water bodies and watercourses	• High potential for impacting existing water bodies and watercourses	• Moderate potential for impacting existing water bodies and watercourses
			Impacts to all other aquatic criteria do not differ significantly		
SOCIAL, LAND USE AND CULTURAL ENVIRONMENT	**Social Environment**	**Potential for short-term construction related effects (e.g. noise, duct, etc.) on area residents**	• Will result in short-term access disruptions to no existing property accesses • Property owners to the north will be less affected by noise and dust as buildings are set further back from the existing roadway	• Will result in short-term access disruptions to one (1) existing property accesses • Property owners to the south will be more severely affected by construction related effects as buildings are closer to the existing roadway	• Will result in short-term access disruptions to no existing property accesses • Property owners to the south will be slightly less affected by construction related effects as construction would be further away from existing buildings
	Land Use	**Impacts to existing Land Uses** **Potential for property taking**	• Future developable property or easement required: 0.46 ha • Property Required from 3 owners	• Future developable property or easement required: 0.24 ha • Property Required from 9 owners	• Future developable property or easement required: 0.29 ha • Property Required from 3 owners
	Proximity to Built Up Areas	**Impacts to existing built-up areas**	**Impacts to existing built up areas do not differ significantly**		
	Archaeological and Built Heritage	**Impacts to existing archaeological or built heritage features**	• Moderate-High potential for archaeological impacts • Low potential built heritage impacts	• Minimal potential for archaeological impacts • Low potential for built heritage impacts	• Moderate potential for archaeological impacts • Low potential for built heritage impacts
FINANCIAL	**Capital Costs**	**Potential capital costs**	**Moderate construction and operating costs**		
	Property Costs	**Potential property acquisition costs**	• Moderate acquisition costs	• Close proximity to residential subdivision at south east quadrant of Stonegate Drive, high acquisition costs	• Moderately low acquisition costs
RECOMMENDATION			✘ **NOT RECOMMENDED**	✘ **NOT RECOMMENDED**	✓ **RECOMMENDED**

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5.2 The Recommended Design Concept

As a result of the conclusions reached through the screening and comparative evaluation steps and traffic analysis described above, the Recommended Design Concept has been identified as:

Chinguacousy Road to McLaughlin Road:

- Alternative 3: Widening to both the North and South Sides
- Intersection improvement at Chinguacousy Road and Mayfield Road:
  - Provide eastbound, southbound and northbound left turn lanes
  - Provide westbound dual left turn lanes
  - Provide two (2) northbound and two (2) southbound thorough lanes
  - Provide New Collector Road 1 at approximately 450 m east of Chinguacousy Road
    - Provide traffic signals
    - Provide two (2) northbound and two (2) southbound thorough lanes
    - Provide eastbound, westbound, southbound and northbound left turn lanes
  - Provide New Collector Road 2 at approximately 450 m west of McLaughlin Road
    - Signalized T-Intersection, south of Mayfield Road
    - Provide two (2) northbound and two (2) southbound thorough lanes
    - Provide westbound and northbound left turn lanes

McLaughlin Road to Orangeville Rail:

- Alternative 3: Widening to both the North and South Sides
- Intersection improvement at McLaughlin Road and Mayfield Road:
  - Provide northbound left turn lane
  - Provide eastbound right turn lane
  - Provide two (2) northbound and two (2) southbound thorough lanes
  - Intersection improvement at Van Kirk Drive and Mayfield Road T-intersection
    - Provide traffic signals

Orangeville Rail to Hurontario Street:

- Alternative 3: Widening to both the North and South Sides

Hurontario Street to Snelgrove Bridge:

- Alternative 3: Widening to both the North and South Sides
- Intersection improvement at Hurontario Street and Mayfield Road:
  - Provide eastbound double left turn lanes
  - Reduce southbound left turn lanes from double left turn lanes to single left turn lane

Snelgrove Bridge to Kennedy Road:

- Alternative 3: Widening to both the North and South Sides

Kennedy Road to Stonegate Drive:

- Alternative 1: Widening to the North
- Intersection improvement at Kennedy Road and Mayfield Road:
  - Provide eastbound, southbound and northbound right turn lanes
  - Reduced lane width east of Kennedy Road to 3.5 m for the through lanes and 3.3 m for the left turn lanes.

Stonegate Drive to Heart Lake Road:

- Alternative 3: Widening to both the North and South Sides

The typical sections for each section are presented in **Figure 5-11** to **Figure 5-13**.

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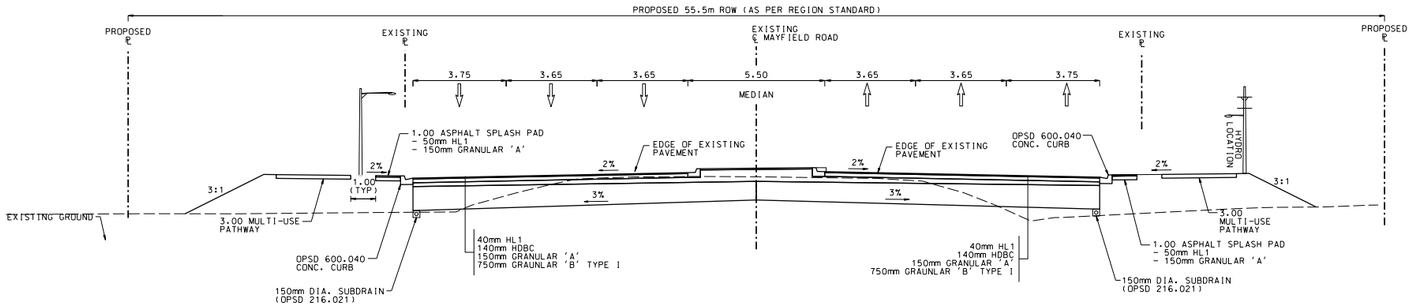
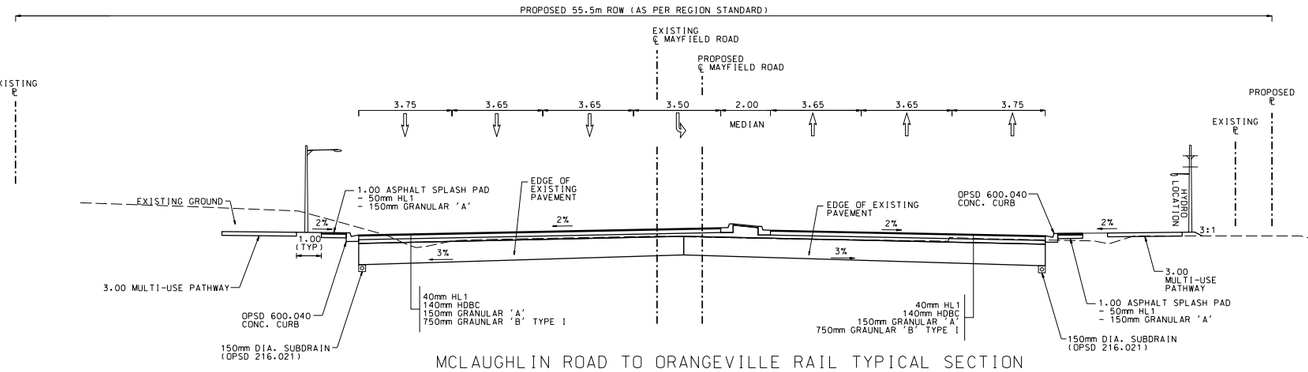


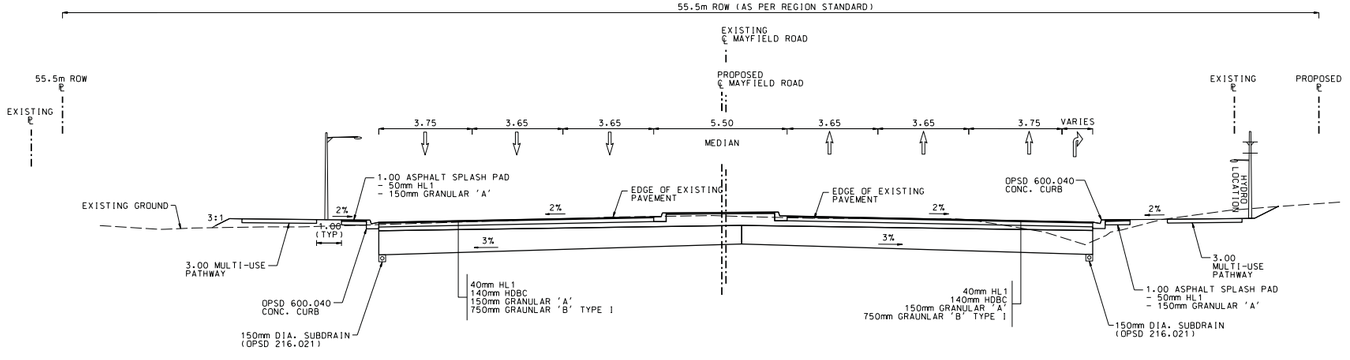
CHINGUACOUSY ROAD TO MCLAUGHLIN ROAD TYPICAL SECTION
STATION 7+900

NOTES:

1. ALL DIMENSIONS SHOWN ARE IN METRES UNLESS OTHERWISE NOTED.



MCLAUGHLIN ROAD TO ORANGEVILLE RAIL TYPICAL SECTION
STATION 9+000



ORANGEVILLE RAIL TO HURONTARIO STREET TYPICAL SECTION
STATION 9+340

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MAYFIELD ROAD

RECOMMENDED DESIGN CONCEPT
CHINGUACOUSY ROAD TO
HURONTARIO STREET

CAD Area	Area	Project No. 101-17262
Checked by V.M.	Drawn by B.F.	
Date APR 2014	Sheet 1 OF 3	FIGURE 5-11

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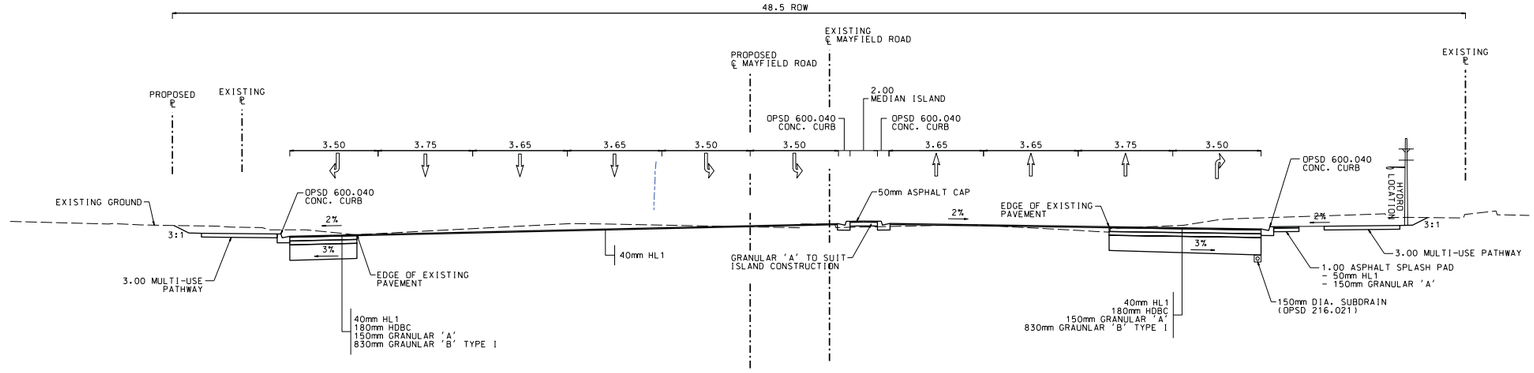
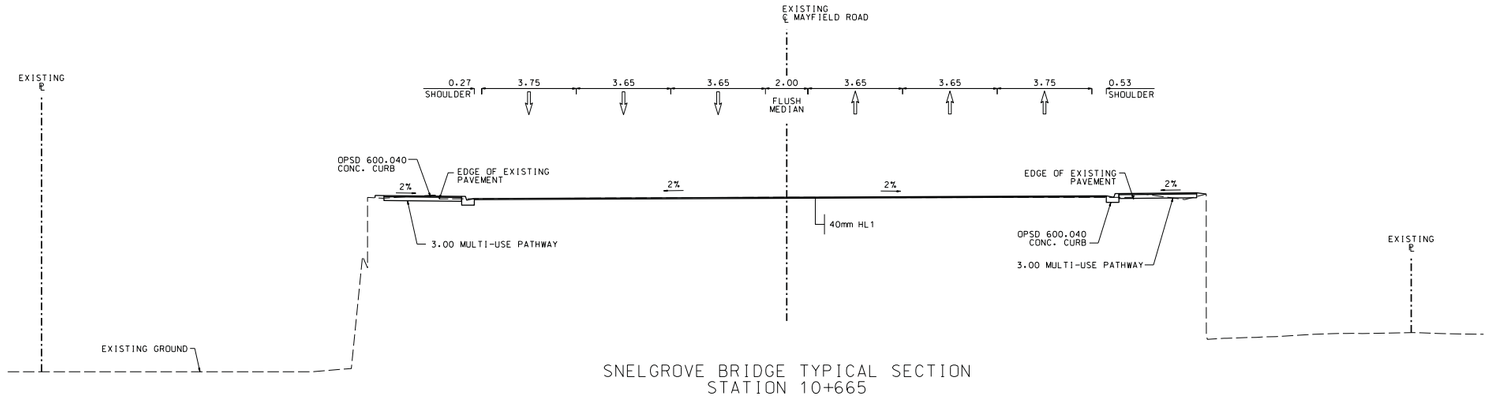
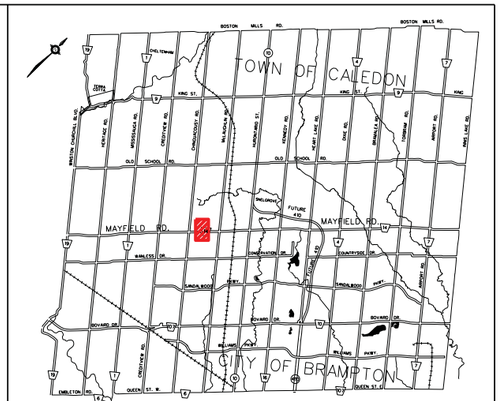


HURONTARIO STREET TO SNELGROVE BRIDGE TYPICAL SECTION
STATION 10+075



SNELGROVE BRIDGE TYPICAL SECTION
STATION 10+665



KEY PLAN
(N.T.S.)

NOTES:

1. ALL DIMENSIONS SHOWN ARE IN METRES UNLESS OTHERWISE NOTED.

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MAYFIELD ROAD

RECOMMENDED DESIGN CONCEPT
HURONTARIO STREET TO KENNEDY ROAD

CAD Area	Area	Project No.	101-17262
Checked by V.M.	Drawn by B.F.		
Date APR 2014	Sheet 2 OF 3		FIGURE 5-12

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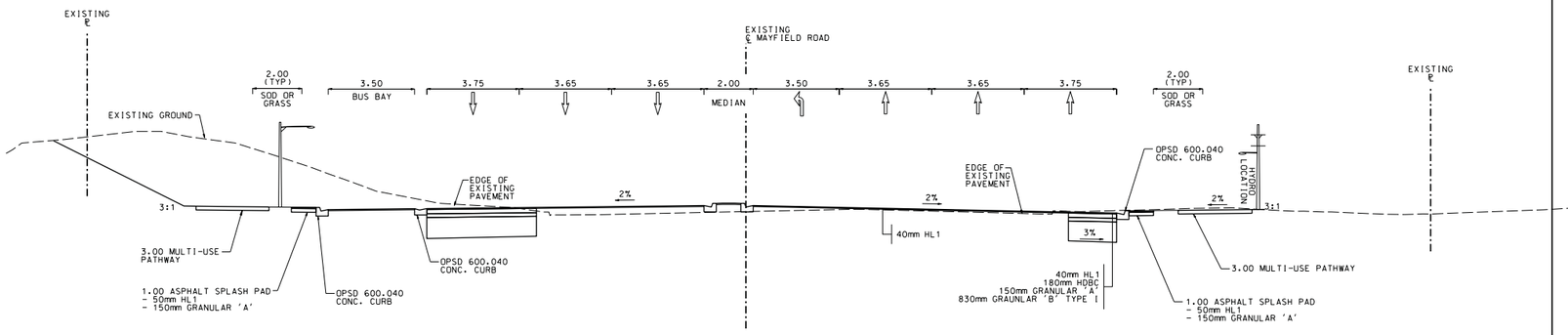
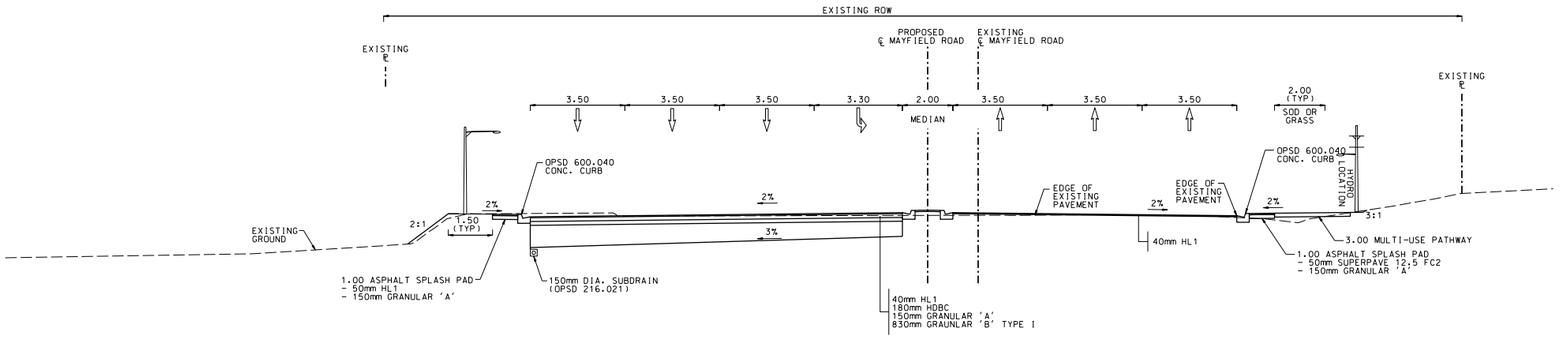


SNELGROVE BRIDGE TO KENNEDY ROAD TYPICAL SECTION
STATION 10+940

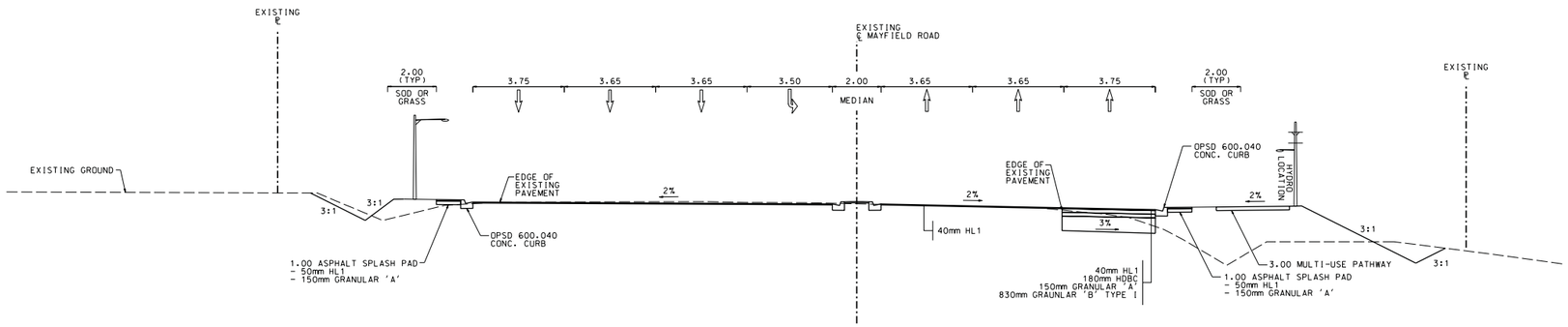
KEY PLAN
(N.T.S.)

NOTES:

1. ALL DIMENSIONS SHOWN ARE IN METRES UNLESS OTHERWISE NOTED.



KENNEDY ROAD TO STONEGATE DRIVE TYPICAL SECTION
STATION 11+564



STONEGATE DRIVE TO HEART LAKE ROAD TYPICAL SECTION
STATION 12+230

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MAYFIELD ROAD

RECOMMENDED DESIGN CONCEPT
KENNEDY ROAD TO HEART LAKE ROAD

CAD Area	Area	Project No. 101-17262
Checked by V.M.	Drawn by B.F.	
Date APR 2014	Sheet 3 OF 3	FIGURE 5-13

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6 Description, Implementation, and Monitoring of the Preferred Alternative Design

6.1 The Preferred Alternative Design Concept

Horizon Year of 2021

- Widen the road to two lanes in each direction between Chinguacousy Road and Hurontario Street;
- Widen the road to three lanes in each direction between Hurontario Street and Heart Lake Road;
- Between Chinguacousy Road and Hurontario Street, urbanize south side of roadway cross section with curb and gutter and leave north side of roadway cross section as rural with enhanced swales;
- Provide boulevard area for multi-use trails;
- Reduce southbound left turn lanes at Hurontario Intersection from dual left turn lanes to single left turn lanes;
- Provide additional turning lanes at Chinguacousy Road, New Collector Road 1, New Collector Road 2, McLaughlin Road, Hurontario Street and Kennedy Road; and
- Minimize impacts on the natural and land use environments.

Horizon Year of 2031

- Widen the road to three lanes in each direction with a centre median where appropriate;
- Urbanize roadway cross section with curb and gutter;
- Provide boulevard area for multi-use trails; and
- Minimize impacts on the natural and land use environments.

The overall Preferred Alternative Design Concept for Horizon Year of 2031 is shown in **Figure 8-1** under **Section 8**.

6.1.1 Geometrics

6.1.1.1 Horizontal Alignment

The horizontal alignment for Mayfield Road will:

- Maintain the existing horizontal alignment between:
  - Chinguacousy Road and McLaughlin Road;
  - Summer Valley Drive and Kennedy Road; and
  - Stonegate Drive and Heart Lake Road.
- Shift centreline a maximum of 2.2 m to the south between McLaughlin Road and Orangeville Rail;
- Shift centreline a maximum of 4.1 m to the north between Hurontario Street and Summer Valley Drive; and
- Shift centreline a maximum of 2.9 m to the north between Kennedy Road and Stonegate Drive.

The horizontal alignment for Mayfield Road will be designed to 90 km/h design speed between Chinguacousy Road and 100 m west of McLaughlin Road; 80 km/h design speed between 100 m west of McLaughlin Road and 305 m west of Hurontario Street; and 70 km/h design speed between 305 m west of Hurontario Street to 100 m west of Heart Lake Road.

6.1.1.2 Vertical Alignment

The vertical alignment will be designed to minimize pavement reconstruction for Mayfield Road. The vertical alignment for Mayfield Road will be designed to 90 km/h design speed between Chinguacousy Road and 100 m west of McLaughlin Road; 80 km/h design speed between 100 m west of McLaughlin

Road and 305 m west of Hurontario Street; and 70 km/h design speed between 305 m west of Hurontario Street to 100 m west of Heart Lake Road.

6.1.1.3 Turning Sight Distance

The right-turning sight distance deficiency at the signalized Summer Valley Drive intersection will be resolved as the tree obstruction will be removed when the roadway is widened to six lanes.

6.1.1.4 Cross-section

Mayfield Road will be widened to 4-lanes (2 lanes in each direction) between Chinguacousy Road and Hurontario Street in the Horizon Year of 2018 and widened to 6-lanes (3 lanes in each direction) between Hurontario Street and Heart Lake Road in the Horizon Year of 2021.

For the 4-lanes configuration, the design cross-section at the intersection will consist of a 3.75 m curb lane and a 3.65 m through lane in each travel direction, a 3.50 m right turn lane, and a 3.50 m left turn lane with 2.00 m raised island.

Outside of the intersection, the cross-section on Mayfield Road will have two 3.75 m curb lanes, two 3.65 through lanes, 5.50 m maximum width median, standard curb and gutter with 3.00 m multi-use pathways installed on south side of Mayfield Road. The multi-use trails shall be signed to indicate the appropriate uses and direction of travel wherever appropriate.

Within the section between Chinguacousy Road and Hurontario Street, an enhanced drainage swale will be provided on the north side for storm water management. This method of storm water management and treatment will be applied under the interim widening (4 lanes) and removed in the future as Mayfield Road is widened to ultimate (6 lanes) and full urban cross section. During detail design, the north side of Mayfield Road may be retained as rural during the interim widening in conjunction with the enhanced swale. The typical section of a 4-lane configuration is shown in **Figure 6-1.**

For the 6-lanes configuration, the design cross-section at the intersection will consist of three basic through lanes in each travel direction (two 3.65 m and one 3.75 m curb lane), a 3.50 m right turn lane, a 3.50 m left turn lane with 2.00 m raised island. For the road section between 305m west of Hurontario Street and west of Kennedy Road where the posted speed limit is 60 km/h, opportunity exists to reduce the through lane width to 3.50m. The reduced lane width will better correspond to the 60km/h posted speed and encourage slower speeds. The possible reduction of pavement width will be reviewed during detail design.

Outside of the intersection, the cross-section on Mayfield Road will be four 3.65 m inner through lanes, two 3.75 m curb lanes, 5.50 m maximum width median, standard curb and gutter, with 3.00 m multi-use pathways installed on both sides of Mayfield Road. The multi-use trails shall be signed to indicate the appropriate uses and direction of travel wherever appropriate. The typical section of a 6-lane configuration is shown in **Figure 6-2.**

Guiderail will be required in some segments along Mayfield Road at Etobicoke Creek and TRCA Conservation Areas where the embankment protection warrant is met.

A specific review of the following areas with high social, economic or environmental sensitivities was conducted:

- Across Etobicoke Creek Structure
- Kennedy Road to Stonegate Drive

<u>Across Etobicoke Creek Structure</u>

When the bridge was constructed, allowance was made for widening of Mayfield Road to a 6-lane cross-section. Therefore, no widening will be necessary. The asphalt will be milled and resurfaced. 3.0m multi-use trails will be provided by narrowing the existing shoulder width and there will be no boulevard or splash pad between curb and sidewalk on either side. A typical cross section is shown in **Figure 6-3**.

Kennedy Road to Stonegate Drive

In order to minimize the impacts to wetland areas at the north side while not affecting the residential subdivision on the south side, as well as to maintain the roadbed within the caisson system that was constructed during the previous widening contract, lane width for through lanes are reduced to 3.5 m and the turning lane will be 3.3 m in width. Instead of a dedicated right turn lane, the westbound right turn traffic will utilize the through curb lane. The multi-use trail will only be built on the south side and there will not be sidewalk or multi-use trail on the north side. The transit facility will be located at the southwest quadrant of Kennedy Road. In order to tie back to existing ground within the existing right-of-way on the north side, back slopes of 1.5:1 may be required at the approximate stations of 11+600 to 11+800. Further investigation regarding any required slope stabilization requirements or other alternatives such as retaining wall will be done during detail design. A typical cross section is shown in **Figure 6-4**.

For the Horizon Year of 2029, Mayfield Road will be widened ultimately to 6-lanes (3 lanes in each direction) between Chinguacousy Road and Hurontario Street, and maintain the 6-lanes cross-section built in 2021 (3 lanes in each direction) between Hurontario Street and Heart Lake Road. Typical section of final 6-lane configuration is shown in **Figure 6-5**.

6.1.1.5 Access

Accesses along Mayfield Road will not be relocated. For traffic safety reason, a continuous raised median is proposed throughout the project limits. The raised median will be constructed during Phase 2 and Phase 3 when the road is constructed to the ultimate 6-lane cross section.

Access to the remaining single family dwellings that have not been redeveloped prior to construction of the ultimate 6-lane cross section will be reviewed by the Region of Peel's Traffic Development group at detail design to determine whether it will be safe for full moves to be maintained at the particular access.

Full movement for the entrances listed below will not be allowed at the ultimate 6-lane cross section due to traffic safety concerns. They are either too close to the intersections, at an area where traffic is very busy (close to Hurontario Street commercial centres), or are already restricted at existing condition:

Station	Side of Road	Station	Side of Road	Station	Side of Road
9+735	South	10+065	North	10+418	South
9+755	South	10+095	South	10+450	South
9+800	South	10+220	South	10+480	North
9+820	South	10+285	South	10+480	South
9+862	South	10+398	North	11+020	South
9+880	South	10+403	South	11+063	South
9+940	South				

6.1.1.6 Pedestrian Access

The Developer will be responsible to ensure pedestrian access to the closest intersection if the subdivision is built during Phase 1, before the ultimate road widening.

6.1.1.7 Accessibility for Ontarians with Disabilities Act

Sidewalks and other pedestrian facilities shall be designed in compliance with the Accessibility for Ontarians with Disabilities Act (AODA). The contract drawings developed during detail design shall address all AODA requirements.

6.1.2 Active Transportation and Multi-use Trail

The Region of Peel's Active Transportation Plan identified Mayfield Road as needing pedestrian and cycling facilities. With the planned widening of Mayfield Road to a six lane cross-section with high volume and speed, it was determined that off-road multi-use trails would be the most suitable form of infrastructure. Multi-use trails ensure separation from vehicular traffic and provide a wide surface to allow pedestrians and cyclists to share the facility.

Two continuous 3.0 metre wide asphalt Multi-use Trails are proposed for the north and south sides of Mayfield Road, except between Kennedy Road and Heart Lake Road where multi-use trail is only provided on the south side. Also, due to property restraint, instead of the 3.0 m Multi-use Trail, a 1.5 m Sidewalk will be installed on the north side of Mayfield Road between Hurontario Street and Summer Valley Drive. These facilities will be constructed as per City Standards and will interface with bus stop and passenger standing areas on Mayfield Road. They will connect with pedestrian facilities provided at intersecting north-south roads.

Crossing treatments for cycling at intersections are a major area of concern when designing boulevard multi-use trails. Presently, cyclists are expected by law to dismount and walk their bicycles through crosswalks. In the new OTM Book 18, "cross-rides" are proposed as a new cycling intersection crossing treatment for use with multi-use trails. OTM Book 18 is still in draft form but will be published by the time this project enters the construction phase. Provided that certain Highway Traffic Act amendments are made as recommended, "cross-rides" should be included in the detail design phase at all intersections to permit continued riding environments for cyclists along Mayfield Road. In the event that Highway Traffic Act amendments are not adopted prior to the beginning of construction, the Region of Peel will consider alternatives to the "cross-ride" treatment at intersections.

6.1.3 Brampton Transit

Transit facilities that would be required along Mayfield Road between Chinguacousy Road and Heart Lake Road have been coordinated between Region of Peel and Brampton Transit.

During detail design, Brampton Transit will work with the Region's capital department to deal with any minor changes.

6.1.4 Pavement

The roadway improvements will require rehabilitation of the existing main lanes as well as widening to accommodate the new pavement cross-section. Preliminary recommendations for new pavement construction for the widening areas, including the recommended rehabilitation strategy for the existing main lanes, are provided in the subsequent sections. The following sections provide some of the key elements of the pavement strategy, and the detailed pavement report is included as part of the appendices.

6.1.4.1 Pavement Widening

The following new pavement depths are recommended for the widening:

Table 6-1 - Pavement Structure for Widening Mayfield Road

Pavement Structure	Chinguacousy Road to Hurontario Street	Hurontario Street to Heart Lake Road
Top Asphalt	40 mm	40 mm
Base Asphalt	40 mm / 50 mm / 50 mm (3 lifts)	60 mm / 60 mm / 60 mm (3 lifts)
Granular A	150 mm	150 mm
Granular B	750 mm	830 mm

A tack coat should be applied between the binder course and surface course asphalt layers. Binder courses must not be placed, unless the air temperature at the surface of the road is a minimum of 2°C

and rising. Surface course must not be placed, unless the air temperature at the surface of the road is at least 7°C and rising.

All topsoil, fill materials, peat and organic materials, and any unsuitable materials anticipated along the widening road should be excavated and removed off site.

6.1.4.2 Pavement Reconstruction

The following road section will need full reconstruction for the entire pavement area to provide a uniform pavement structure:

- Mayfield Road (from Station 7+208 to Station 8+708): from Chinguacousy Road to 50 m east of McLaughlin Road;
- Mayfield Road (from Station 8+708 to Station 9+808): from 50 m east of McLaughlin Road to 250m west of Hurontario Street;

The road sections from Station 8+708 to Station 9+808 has fair pavement condition with intermittent moderate to frequent slight cracking and intermittent slight to moderate alligatoring and dishing with fair rideability and slightly rough and uneven surface. Mayfield Road from Chinguacousy Road to 50 m east of McLaughlin Road (Station 7+208 to Station 8+708) has good pavement condition with very slight or slight cracking but the full reconstruction will be needed to remove the organic clayey slit layer encountered underneath the existing pavement structure at several borehole locations.

The reconstruction should be performed as follows:

- Mill or remove existing asphalt to the full depth;
- Excavate existing granular base and subbase to the full depth;
- Excavate any organic silty clay layer may encounter below the excavated pavement structure;
- Excavate for new ditches as per the OPSD 200.010;
- Perform backfill with excavated granular materials or new granular B Type I;
- Place new pavement structure as follows:

These preliminary pavement reconstruction recommendations will be confirmed during detail design.

Table 6-2 - Pavement Structure for Pavement Reconstruction at Mayfield Road

Pavement Structure	Station 7+208 to Station 9+758	Station 14+100 to Station 14+900
Top Asphalt	40 mm	40 mm
Base Asphalt	40 mm / 50 mm / 50 mm (3 lifts)	60 mm / 60 mm / 60 mm (3 lifts)
Granular A	150 mm	150 mm
Granular B	750 mm	830 mm

6.1.4.3 Pavement Rehabilitation

Based on the visual condition survey and field investigation for Mayfield Road from 250 m west of Hurontario Street to Heart Lake Road, it has good to excellent pavement condition with very slight or slight cracking with excellent to good Ride Condition. Thus, rehabilitation instead of reconstruction is recommended in conjunction with the road widening operation. Several pavement rehabilitation options such as pulverization full depth asphalt removal and mill, full depth reclamation with pre-milling and full depth reclamation without pre-milling can be considered. Detailed investigation for the existing pavement structure will be needed to establish the most feasible method giving into consideration the minimum required structural number (SN=188). Rehabilitation recommendations will be confirmed during detail design.

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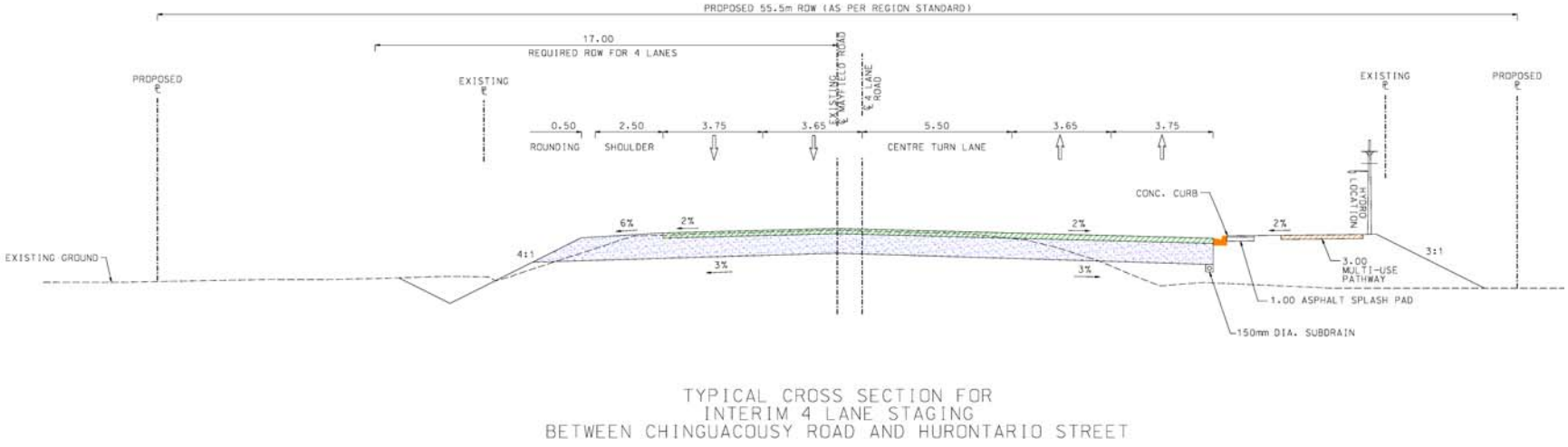
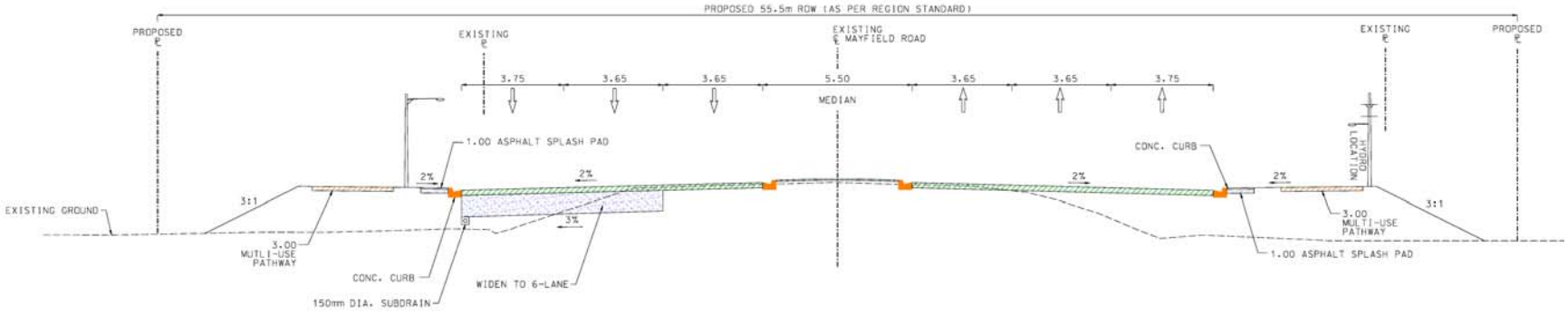
Figure 6-1 – Typical Section of a 4-Lane Roadway for Horizon Year of 2018



TYPICAL CROSS SECTION FOR
INTERIM 4 LANE STAGING
BETWEEN CHINGUACOUSY ROAD AND HURONTARIO STREET

Figure 6-2 – Typical Section of a 6-Lane Roadway for Horizon Year of 2021



TYPICAL CROSS SECTION FOR
FUTURE 6-LANE
BETWEEN HURONTARIO STREET AND HEART LAKE ROAD

Figure 6-3 – Across Etobicoke Creek Structure Typical Cross Section

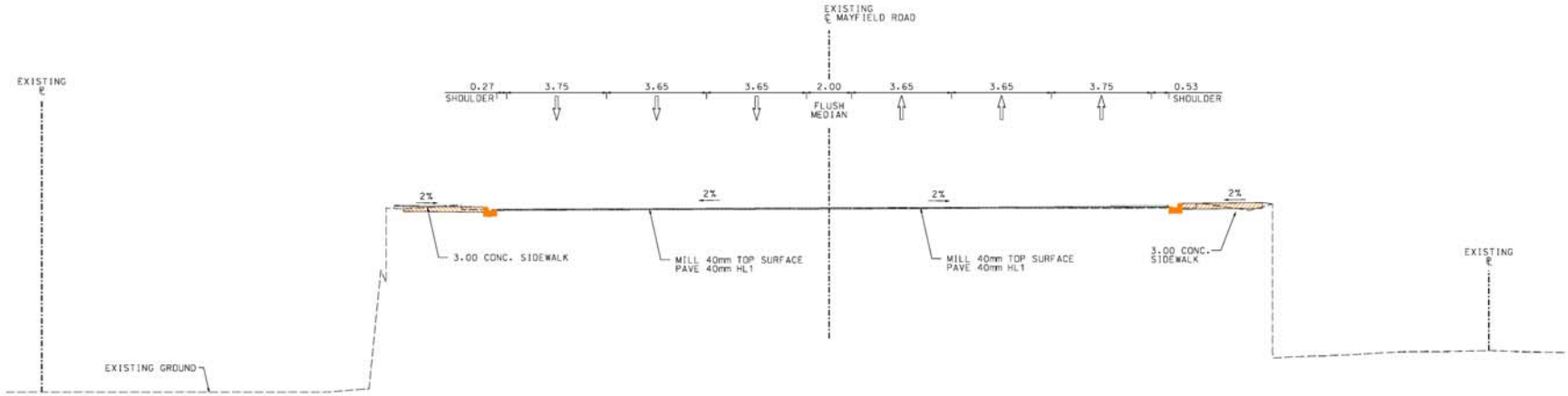


Figure 6-4 – Kennedy Road to Stonegate Drive Typical Cross Section

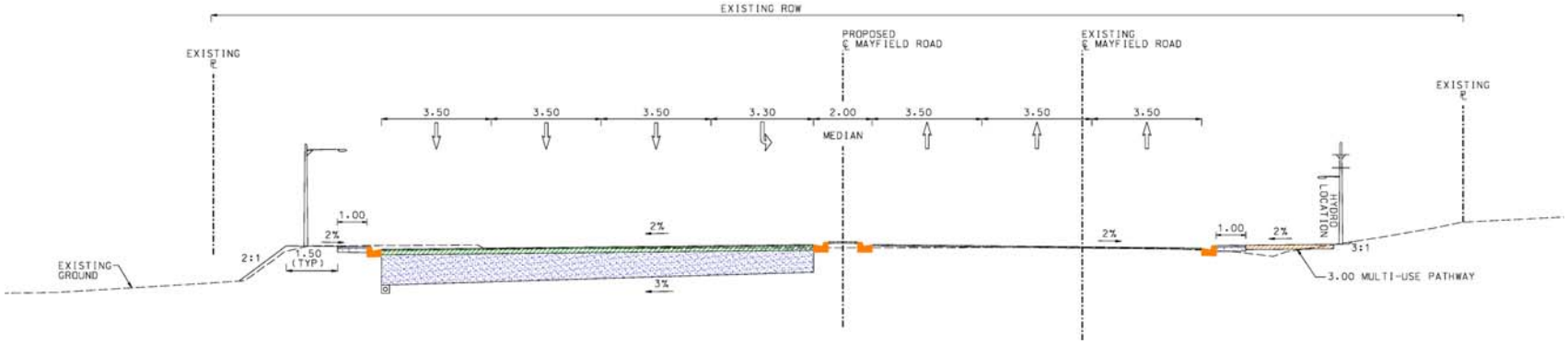
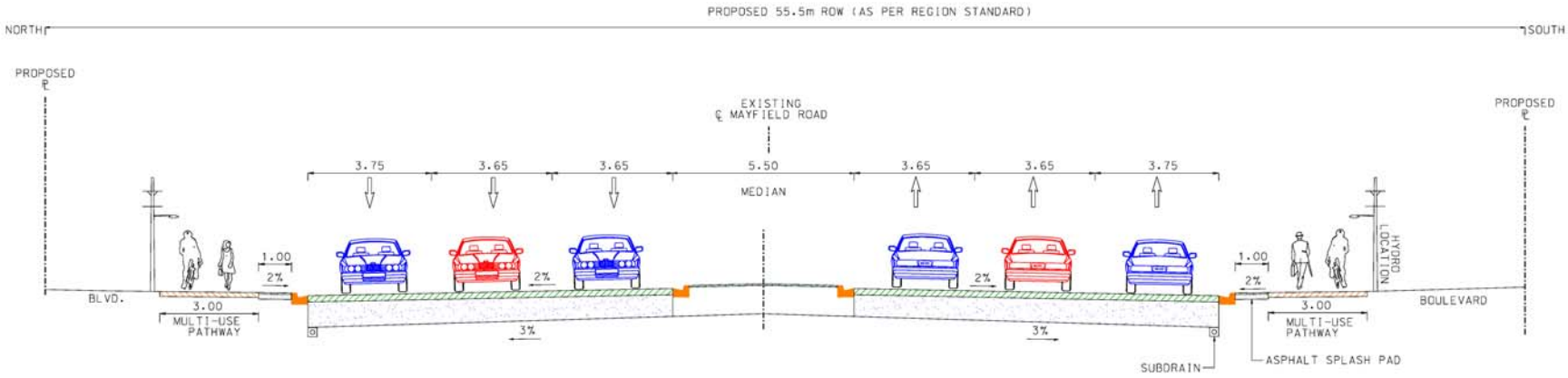


Figure 6-5 – Typical Section of final 6-Lane Configuration by 2029



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6.1.4.4 Road Widening crossing Wetland Areas

In the three wetland areas where peat deposits were encountered to significant depth, it will be necessary to remove this soft, compressible material from below the proposed road widening. Detailed foundation investigation will be required during the detail design to establish the depth and the extent of the peat layers.

It is recommended that the excavation be backfilled as close behind excavation as is practical. To protect the existing roadway from possible undermining and instability, no more than a 10 m length of excavation should be open and not backfilled at any time.

If deeper excavation is required where a thicker layer of peat and organic soil is encountered, this will require temporary support of the excavation side slopes and adjacent roadway during sub-excavation of the peat and backfilling with properly place, approved fill material. Additionally, the excavation will need to extend to sufficient width to provide proper lateral support for the road embankment. Since it is not practical to dewater the wetland area where the groundwater table is expected to be at or near surface, it is recommended that rock fill be used below the water level.

For the widening of Mayfield Road crossing wetland area 1 located north side of Mayfield Road and just east of Kennedy Road where peat deposits, loose and compressible soils were encountered to significant depth, during intersection improvements of Mayfield Road and Kennedy Road in 2012, the peat deposit and the underneath loose and compressible soils has been replaced with 0.4 MPa filler caissons with varied depths depending on the thickness of the peat and compressible soil layer within the footprint of the road widening. In addition, shoring was provided along the north edge of the new embankment using sheet piles and supported by H-piles and anchor tiebacks. Since the existing road was constructed above concrete caissons, the proposed roadway shall remain without the existing pavement area as much as possible and be contained within the concrete caissons installed. Extension of the concrete caissons to the east may have to be considered depending on the results of the foundation investigation during detail design.

6.1.4.5 Transition Treatments

Smooth transitions will be required where the new pavement meets the existing pavement at the limits of the work project.

At the ends of the work project, the tie-ins at the existing pavement should be cold planed to a depth of the surface course, full width, to ensure that the new surface course can be placed flush with the top of the existing pavement surface. The depth of cold planning shall be 50 mm. A tack coat should be utilized whenever an asphalt layer is placed on cold, or existing, asphalt courses and at all tie-ins and vertical surfaces.

6.1.4.6 Materials

<u>New Construction Materials</u>

All HMA materials should meet the requirements of the Region of Peel Specifications for Hot Mix Asphalt Paving, Materials, Sampling and Testing and be compacted to at least 97 percent of the Marshall density. PG 64-28 asphalt cement is recommended for all mixes.

All granular base and subbase materials should meet the requirements of OPSS 1010 and be compacted to at least 100 percent of the standard Proctor density.

The Geotechnical Report is included in **Appendix E** for reference.

6.1.5 Orangeville Brampton Railway

There are minor changes anticipated for the level crossing for Orangeville Brampton Railway, just east of Van Kirk Drive. The flashing red lights and crossbuck signs shall remain, with no crossing gates put in.

At the intersection of Cresthaven Road at Mayfield Road and the Orangeville rail track, the following alternative measures are recommended for 2021 and 2031:

- Queue detector loops to allow queues to clear before they reach the track
- Use upstream traffic signals to meter traffic so that it does not queue over the crossing
- Improve signage at the rail crossing

6.1.6 Drainage

6.1.6.1 Crossing Culverts

From Chinguacousy Road to the Railway Crossing

According to the "Mayfield West Comprehensive Environmental Impact Study and Management Plan – Part C: Detailed Analysis and Implementation" Study completed by AMEC Environment & Infrastructure for the Town of Caledon, November 2012, it was recommended to install six (6) stormwater management (SWM) ponds just north of Mayfield Road between Chinguacousy Road and the railway crossing. The report also stated that the design volumes of the proposed SWM ponds accounted for the future Mayfield Road widening. The proposed road profile and the storm sewer networks were designed to allow for the storm sewer outlets to discharge to the SWM ponds and achieve the water quantity and quality control required, as a result of the proposed road widening and the expected increase in flow rates.

The Study concluded that the Fletcher Creek Tributaries located between Chinguacousy Road and the Railway Crossing will be combined north of Mayfield Road and reduced to five (5) crossings, while the remaining existing crossing culverts are recommended to be abandoned as shown in **Table 6-3**.

According to CVC requirements, cross culvert C3 should be an open bottom structure. This future culvert will carry flows associated with realigned channels located in the Mayfield West and Mount Pleasant 51-2 development areas. As sufficient information is not yet available to properly size this crossing culvert, the final sizing of the open bottom crossing will be determined during detail design phase when more information on the channels is available for the development areas.

Table 6-3 – Proposed Water Crossings from Chinguacousy Road to the Railway Crossing

Existing Crossing Culvert No.	Approx. Station (New)	Existing Size wxh (mm) / Material	Recommended Size wxh (mm)	Proposed Crossing Culvert ID	Preliminary Crossing Invert Elevation (m)
1	7+348	750 PVC	1200 PVC	C1	253.38
2	7+778	600 PVC	To be abandoned		
3	7+863	900 PVC	4-6m span x 1.5 height (Terrestrial crossing with open bottom)	C2	253.38
4	8+248	600 PVC	To be abandoned		
5*	8+428	750 PVC	1200 PVC	C3	254.31
6	8+568	800 CSP	To be abandoned		
7	8+908	North end: 500 CSP South end: 600 Conc.	To be abandoned		

Existing Crossing Culvert No.	Approx. Station (New)	Existing Size wxh (mm) / Material	Recommended Size wxh (mm)	Proposed Crossing Culvert ID	Preliminary Crossing Invert Elevation (m)
8	8+948	North end: 1300 x 900 CSPA South end: 3.05 x 1.50 Conc. Box with open bottom	Culvert to remain and be extended as required	C4	254.33
9	9+138	500 CSP	To be abandoned		
10**	9+278	600 CSP	2.4 x 1.2 Box culvert	C5	252.01

* *The crossing culvert C3 as proposed by TMIG would have a diameter of 1200mm and approx. invert elevation at 254.31m. This would result in conflict in elevations between C3 and the proposed storm sewer network at this location. To avoid this conflict, it is recommended to lower the proposed culvert invert C3 invert elevation to 254.00m. If lowering C3 invert elevation is not a valid option, then proposing twin crossing culverts each of 900mm diameter (instead of single 1200mm) would resolve the elevations conflict.*

** *The existing C10 (600mm CSP at Station 9+258) will be abandoned and replaced with a new 2400x1200mm box culvert at Station 9+278.*

From the Railway Crossing to Heart Lake Road

Based on the proposed road urban cross sections, it was determined that existing crossing culverts C12 and C13 will not be required and should be abandoned. Crossing Culvert C11 was found in poor condition based on the field investigation and shall be replaced and extended as required. Crossing Culverts C15 and C16 were found to be in good to fair conditions and should be extended if required.

Table 6-4 – Proposed Water Crossings from the Railway Crossing to Heart Lake Road

Existing Crossing Culvert ID	Approx. Station (New)	Existing Size wxh (mm) / Material	Recommended Size wxh (mm)	Proposed Crossing Culvert ID
11	9+328	500 CSP	Replace existing culvert with 600mm diameter CSP	C6
12	9+368	500 CSP	To be abandoned	
C13	9+678	800 CSP	To be abandoned	
14 (Snelgrove Bridge)	10+653	The bridge was built to accommodate the proposed 6 lanes road widening and hence, No Action Required.		C7
15	11+418	700 PVC	Culvert to remain and be extended as required	C8
16	12+348	1100 Steel Pipe	Culvert to remain and be extended as required	C9

The general locations of the culvert crossings are shown in **Figure 6-6**.

After Mayfield Road is widened to 6 lanes by 2031, the headwall at the northeast quadrant of Kennedy Intersection will need to be relocated as required. The requirements for the relocation shall be investigated during detail design. During the interim phase, the ultimate crossing will be installed in their ultimate location but they will not be operational until the Mayfield West Secondary Plan and Mount Pleasant Community developments are constructed and development drainage is completed.

6.1.6.2 Preliminary Storm Sewer Design

Between the Chinguacousy Road and the railway crossing, the Mayfield Road profile is quite flat and suitable for a rural cross section. However, for the proposed urban cross section with catchbasins and storm sewer network, it was necessary to adjust the road profile to create a positive drainage scheme.

This scheme will direct runoff towards the catch basins and accommodate a storm sewer network that conveys flow to the proposed outlet locations. Storm sewer networks are designed to convey runoff generated from storms up to 10 year storm event.

6.1.6.2.1 Interim Design

By 2020, when Mayfield Road has widened to 4-lane between Chinguacousy Road and Orangeville Rail and the culverts have been installed at the ultimate locations, interim drainage pattern will be needed if the storm water management ponds proposed by Mayfield West Secondary Plan has not been built yet. Interim drainage pattern will be needed to accommodate the connections between the existing watercourses and the culverts at both the north and south sides of Mayfield Road. Temporary realignment of creeks and tributaries, as well as temporary swales may be needed to maintain the hydraulics to connect to the ultimate drainage design. Creek realignment and enhanced swales within the right of way will be provided according to TRCA/CVC and MNR standards/guidelines. During interim conditions, the storm sewers will discharge to enhanced swales within the right-of-way and/or outlet to oil grit separators. Since the construction schedules of Mayfield Road widening as well as the proposed ponds are not known, it is recommended that the MOE review the proposed interim SWM measures if required during the detail design stage of this project.

Region of Peel will coordinate with the developers to implement the interim drainage design. Actual watercourse diversions will be designed at detail design stage.

6.1.6.2.2 Ultimate Design

For between Chinguacousy Road and the railway crossing (Station 7+208 to 9+275), under ultimate conditions with six lanes constructed, the enhanced swales will be removed and the storm sewers from Mayfield Road will be picked up by future storm sewers in growth areas north of Mayfield Road and it is recommended to discharge runoff to the future six (6) developer constructed (Mayfield West Secondary Plan Area) stormwater management ponds just north of Mayfield Road. The existing driveway culverts running parallel to Mayfield Road will be removed as a result of the road widening.

It has to be noted that the increase in flow values generated between Stations 9+275 and 9+300 is not significant as this stretch is only 25m long and hence, water quantity control for this section of Mayfield Road was not considered and can be compensated by slightly over controlling flow values discharging from proposed six (6) stormwater management ponds between Chinguacousy Road and the railway crossing. Water quality control for the road section between Stations 9+275 and 9+300 will achieve Level 1 Enhanced Protection by allowing runoff to discharge to the existing grass swales located on the west side of the railway just south of Mayfield Road.

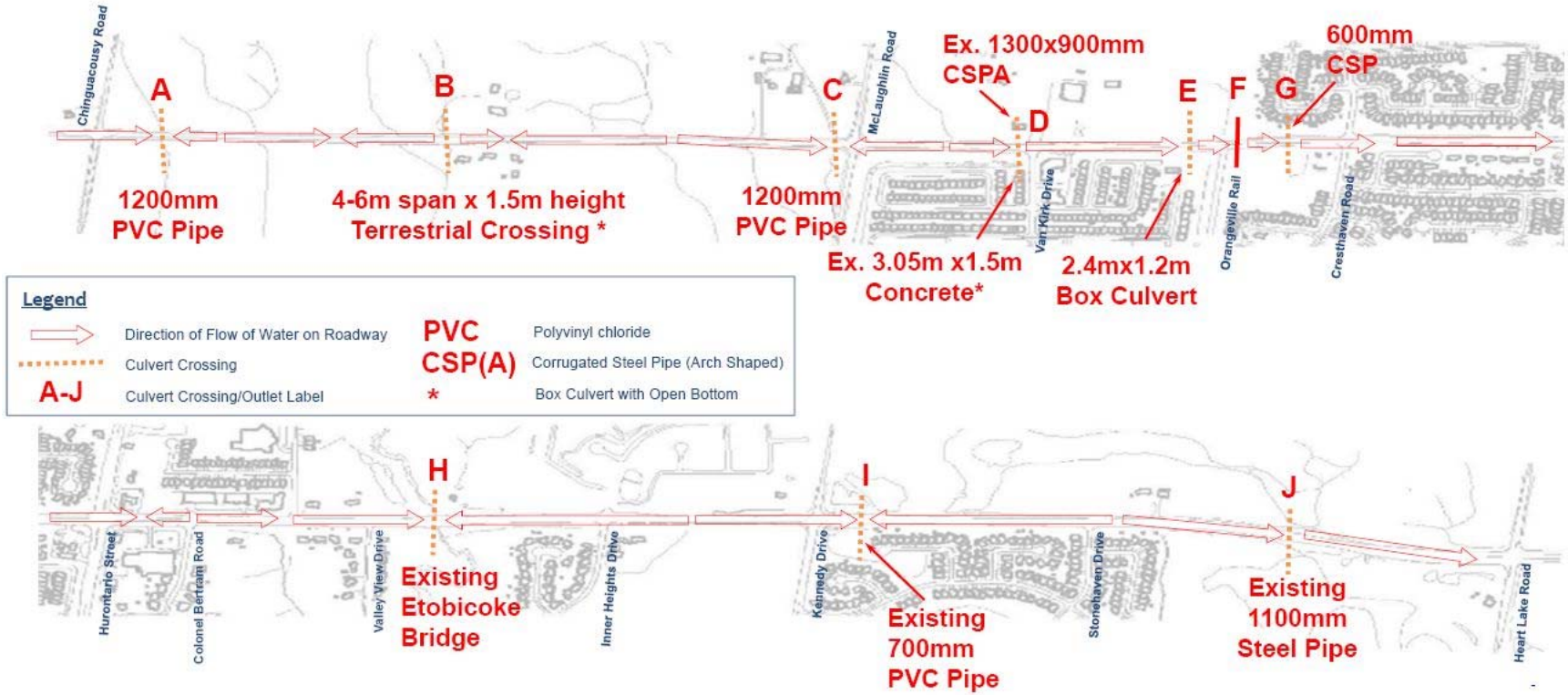
For catchment area between Stations 9+300 and 10+372, an Oil/Grit Separator (OGS) which is designed to achieve Level 1 treatment is recommended for the removal of 80% suspended solids, as per MOE Standards and approved by the TRCA/CVC during detail design (STC 9000 or equivalently approved). For flow quantity control, super pipes with orifice plates will be incorporated as part of the storm sewer network design.

For catchment area between Stations 10+372 and 10+630, an OGS which is designed to achieve Level 1 treatment is recommended for the removal of 80% suspended solids, as per MOE Standards and approved by the TRCA/CVC during detail design (STC 4000 or equivalently approved). For flow quantity control, outlet will be discharged to the existing SWM pond located on the north side of Mayfield Road just west of Etobicoke Creek.

For catchment area between Stations 10+630 and 11+213, flow quality and quantity control will be achieved by discharging flow from outlet to the existing SWM pond located on the north side of Mayfield Road just east of Etobicoke Creek.

For catchment area between Stations 11+213 and 12+070, flow quality and quantity control will be achieved by discharging flow from outlet to the existing SWM pond located at the north east corner of Mayfield Road and Kennedy Road intersection.

Figure 6-6 – Direction of Storm Drainage Flow and Location of Crossings Culvert



For catchment area between Stations 12+070 and 12+740, flow quality and quantity control will be achieved by discharging flow from outlet to the existing SWM pond located at the south west corner of Mayfield Road and Heart Lake Road intersection.

It has to be noted that OGS units are proposed for sections of the road where an Enhanced Grass Swale cannot be constructed due to the right-of-way limitations.

All crossing will require coordination with TRCA, CVC and MNR to ensure all approvals and permits are in place prior to construction.

6.1.6.3 Erosion and Sediment Control Plan

Detailed erosion and sediment control plans will be required as part of the detail design component for all phases of the construction. The erosion and sediment control plans will be subject to review and approval by the various external agencies involved in the project. These would include the Region of Peel, CVC and TRCA.

The Drainage Report is included in **Appendix G** for reference.

6.1.7 Utilities

6.1.7.1 Hydro

As the majority of Mayfield Road will be widened to both the north and south sides, almost all the hydro poles will be either on the proposed pavement or within 1 m of the proposed curb. All the impacted poles will need to be relocated and a hydro design plan prepared with the collaboration between Hydro One Network for Town of Caledon and Brampton Hydro One during detail design.

6.1.7.2 Enbridge Gas

Enbridge Gas maintains a gas line on the north side of Mayfield Road between McLaughlin Road and Hurontario Street, as well as between 180m east of Stonegate Drive to Heart Lake Road. The gas line then runs on the south side between Hurontario Street and 180m east of Stonegate Drive. The gas lines will be assessed during detail design for any required relocation prior to the improvement of Mayfield Road.

6.1.7.3 Bell

Bell Canada underground plant located along Mayfield Road on the north side between Chinguacousy Road and Heart Lake Road and on the south side between Hurontario Street and just west of Heart Lake Road will be assessed during detail design for relocation prior to construction.

6.1.7.4 Rogers Cable

Most of Rogers Cable is on existing hydro poles; however there are some sidestreets that have buried cable.

The relocation requirements and limits of relocation will be confirmed during detail design.

6.1.8 Streetscaping

Landscape plans prepared by a qualified OALA Architect will be adapted during the detail design stage. These plans will include but not limited to:

- Provide street trees as per Region of Peel ‘Regional Streetscape Policy’ and in collaboration with City of Brampton and Town of Caledon;

- Tree planted near overhead utilities to be selected to conform with Hydro easement; and
- A Vegetation Assessment will be required, prepared by a certified ISA arborist. All existing vegetation removed as part of this project will be inventoried and replaced.

6.1.9 Street Lighting and Traffic Signals

Roadway illumination will be provided for the length of the project. The standards used for the lighting will be in compliance with Region of Peel, City of Brampton and Town of Caledon requirements during detail design.

The existing traffic signals will be upgraded at the Chinguacousy Road intersection, the McLaughlin Road intersection, the Cresthaven Road/Robertson Davies Drive intersection, the Hurontario Street intersection, the Colonel Bertram Road intersection, the Summer Valley Drive intersection, the Kennedy Road intersection and the Heart Lake Road intersection. New traffic signals are proposed at the New Collector 1, at New Collector 2 and at Van Kirk Drive intersections.

Provisions for future traffic signals (underground works) at Valley View Road and at Snellview Boulevard/ Inder Heights Drive intersections will be considered during detail design. Locations identified for new or future traffic signals are to be monitored to determine the final scheduling for installation of the traffic signals as traffic warrants are satisfied.

Hydro poles are available at the intersections for power supply.

6.1.10 Region of Peel Infrastructure

The Region of Peel has scheduled in 2013 to construct two watermain pipes (750mm and 600mm diameter) on Mayfield Road, starting from Van Kirk Drive and Hurontario Street respectively and extend westerly beyond Chinguacousy Road, as a separate undertaking under the Region's Water and Wastewater Capital program. The pipeline has been designed to accommodate the future locations of crossroad culverts and terrestrial passing corridor.

A future 450mm diameter sanitary sewer is proposed to be constructed along Mayfield Road from Chinguacousy Road to approximately 1000 meters easterly under Region's project # 15-2135.

There are several watermain and sanitary crossings that are planned on the cross roads in this project. Potentially, there will be three watermain pipelines constructed on Heart Lake Road in the proximity of Mayfield Road. They are 150mm, 400mm and 900mm in diameter respectively. There is also a 300mm diameter sanitary sewer planned on Kennedy Road, southerly from Mayfield Road. The above will be built as budget allow.

6.1.11 Property Requirements

Property will be required for the improvement and widening of the roadway. The Regional right-of-way BILD Standard per Official Plan for Mayfield Road is a 50.0 m ultimate width at midblock, with a 55.5 m ultimate width at intersections with single left turning lane and 59.0 m ultimate width at intersections with dual left turning lanes. Limits of the intersection are 245 m from each side of the sideroad centreline. Opportunities exist for protection of the ultimate right-of-way standards for properties between Chinguacousy Road and Cresthaven Road/Robertson Davies Drive; and between Summer Valley Drive and Kennedy Road. For other sections of Mayfield Road, additional property beyond the existing right-of-way will be required to accommodate the multi-use trails, fill embankments and slope grading at certain locations along the full length of the project limits.

6.2 Summary of the Potential Effects and Recommended Mitigation Measures

The following identifies the potential effects associated with constructing the Preferred Alternative Design Concept, along with the recommended mitigative measures developed during the course of the Class EA in order to minimize and/or eliminate the adverse effects. A description of these environmental effects and mitigative measures is provided in below and summarized in **Table 6-7** at the end of this section.

6.2.1 Natural Environment

6.2.1.1 ANSI and Wetlands

The Heart Lake Forest and Bog Life Sciences ANSI is located southwest of the intersection of Mayfield Road and Heart Lake Road. Potential impacts to this feature include further encroachment into this feature, though no rare or endangered species were noted within the ROW. It is anticipated that impacts associated with the proposed road widening will be limited to local vegetation removal and the potential for disturbance to local wildlife, though these disturbances will be limited to the areas directly within the proposed roadway and working space. Further, portions of the Heart Lake Wetland Complex exist on the lands immediately north of Mayfield Road and have the potential to be impacted during the construction phases of this project. In order to minimize negative impacts to these features, the following mitigation measures are proposed:

- Erosion control fencing should be placed around all ongoing construction activity areas as well as adjacent to temporary storage locations for supplies, excavated materials and imported fill. Fencing should be properly installed and inspected at regular intervals and after significant rain events to confirm it is functioning properly. Fencing should be regularly cleared of silt accumulation to ensure the integrity of erosion prevention/sediment containment measures. Areas of exposed soil, especially newly graded areas that cannot be immediately stabilized with the final surface treatments should be appropriately treated to minimize erosion (e.g., straw mulch, erosion blanket, sod, or hydroseed).
- Temporarily store, handle and dispose of all materials used or generated (e.g. organics, soils, woody debris, temporary stockpiles, construction debris) during site preparation, construction and clean-up in a manner that prevents their entry to naturalized areas in the vicinity of the excavation site.
- Ensure a Spills Management Plan (including materials, instructions regarding their use, education of contract personnel, emergency contact numbers) is onsite at all times for implementation in event of accidental spill during construction. Adequate measures to prevent or capture and contain any debris and spills resulting from construction activities should be kept onsite in sufficient quantities. Staff should be orientated as to the location of materials and their proper use and disposal. All measures and procedures should conform to pertinent provincial requirements.
- Operating, refuelling and maintenance of construction equipment and the handling and storage of toxic materials (e.g. fuel, lubricants, and other chemicals) must be carried out in such a way as to avoid contamination of soils, groundwater and surface waters.
- All parts of equipment shall be free of fluid leaks and externally cleaned/degreased offsite, in a contained environment.

6.2.1.2 Fish Habitat and Valleylands

Etobicoke Creek which is classified as a warm water creek is present in the approximate middle of the Study Area. Several intermittent tributaries to Fletcher's Creek cross Mayfield Road in the western portion of the Study Area between McLaughlin Road and Chinguacousy Road.

These watercourses are likely dominated by warm-water species. Warm-water species are generally habitat generalists that are less sensitive to changes in environmental conditions when compared to cool and cold water species. Warm-water habitats are generally stable and more resilient to disturbance.

The primary risk to aquatic habitats and communities will be during the work within the watercourses and associated floodplains. Impacts to fish and fish habitat related to the proposed works will generally occur at a small extent, short duration, and low intensity.

Potential impacts to the aquatic environment as a result of the proposed culvert works may include:

- Erosion and Sediment- Erosion and sediment deposition into the watercourse may result from the construction works and surface runoff during the construction period. The introduction of sediments increases the level of total suspended solids (TSS) in the water column causing a number of factors which result in the degradation of fish habitat. Increased TSS levels may also lead to physiological stress in fish resulting in injury or mortality (Waters, 1995).

- Interference with fish passage and distribution- Fish are likely to be in permanent systems throughout the year and may occur periodically in intermittent and ephemeral systems. The disruption of fish passage at sensitive life stages may have a detrimental impact to fish populations (Tillinger and Stein, 1996). Culvert designs allowing for excessive water velocities, inadequate water depth, and perched culverts may result in a barrier to fish passage.

- Fish mortality- The proposed works may require site isolation which may potentially entrap fish within the work area resulting in injury or mortality. Installation of isolation measures may require dewatering of the existing channel. Fish salvage operations would be required to minimize potential impacts to the fish community.

- Introduction of deleterious substances- Deleterious substances may be introduced into fish habitat as a result of the construction activities. This may lead to the degradation of fish habitat.

- Habitat degradation or Loss- The footprint for the proposed works will be similar (Like for Like) to the footprint of the existing structure. Preliminary indications on the proposed works show installation of a culvert liner within the existing structure. There is the potential for the loss of fish habitat if the works extend past the current footprint.

6.2.1.2.1 Design

Many impacts to the aquatic environment as a result of water crossings (e.g., culverts) can be mitigated during the design stage. The Department of Fisheries and Oceans Canada has outlined impacts that may occur to fish and fish habitat as a result of water crossings and provided general guidelines to consider for various water crossing types. Any culvert replacements or extensions within TRCA's regulated area should be designed in accordance with TRCA standards and guidelines.

6.2.1.2.2 Operations

To minimize the potential negative impacts to watercourses during operational stages of the project, the following mitigation measures are proposed:

- The in-water construction timing window restriction for the Southern Region of Ontario in warmwater is from July 1 to March 31. No near or in-water work can occur during this time.
- Use a qualified biologist to complete fish salvage operations, monitor near-water and in-water construction activities (if required), and ensure all related mitigation measures are properly installed, maintained, and functioning effectively.
- Transfer any fish isolated in the work area using appropriate capture, handling and release techniques to prevent harm and minimize stress downstream or away from the construction area.
- Any part of equipment entering the waterbodies or operating on the bank shall be free of fluid leaks and externally cleaned/degreased.
- Operate, store and maintain (e.g., re-fuel, lubricate) all equipment and associated materials in a manner that prevents the entry of any deleterious substances to the waterbodies.
- Operating, refuelling and maintenance of construction equipment and the handling and storage of toxic materials (e.g. fuel, lubricants, form oils, paints, wood preservatives, and other chemicals) must be carried out in such a way as to avoid contamination of soils, groundwater and surface waters.
- Ensure a Spills Management Plan (including materials, instructions regarding their use, education of contract personnel, emergency contact numbers) is on-site at all times for implementation in event of accidental spill during construction. Adequate measures to prevent or capture and contain any debris and spills resulting from construction activities should be kept onsite in sufficient quantities. Staff should be orientated as to the location of materials and their proper use and disposal. All measures and procedures should conform to pertinent provincial requirements.

6.2.1.2.3 Redside Dace

Where the detail design encroaches into regulated Redside Dace habitat, current approval, mitigation and monitoring practices should be undertaken as part of the detail design study, under guidance of the Endangered Species Act, Ontario Regulation 242/08, and through consultation with the OMNR.

- Construction activities may result in the removal of vegetative cover and grading of adjacent lands, which, can lead to increased sediment delivery and erosion to the stream and its banks. Site preparation should be completed in a manner that attempts to prevent suspended sediment concentrations from exceeding 25 mg/L of background conditions in occupied reaches. In addition, site preparation and construction should follow an approved Erosion and Sediment Control Plans, including minimizing disturbed areas, stabilizing soils through erosion control blankets and revegetation efforts as soon as possible, and using multiple-barrier approach to sedimentation, effective sediment and erosion ponds and sediment traps, where applicable.
- Work within the construction timing window recommended for Redside Dace (i.e. July 1 to September 15 so as to avoid the spawning season and to stabilize the stream corridor before winter).
- Install culverts during periods when the channel is dry or with minimal flow.
- Incorporation of open-bottom culverts where possible to restore the natural flow of the stream.
- Closed-bottom culverts should be installed so that the invert is embedded a minimum of 10% (of the culvert diameter) below the stream bed. This will facilitate fish passage by ensuring that the culvert is perched during periods of low flow.
- For extension of existing culverts, the footprint of the structure should be minimized by using retaining walls to minimize disruption to riparian habitat.
- As road widening activities have the potential to adversely affect Redside Dace habitat, an Overall Benefit Permit (Permit C under Section 17 of the Endangered Species Act) will be required. Proponents are responsible for obtaining the permit prior to beginning the project.
- Consulting with MNR and other approval agencies as early in the process as possible to learn what other permits may be needed and to aid in the coordination of these approvals.

6.2.1.2.4 Erosion and Sedimentation Controls

- Erosion control fencing consisting of heavy duty siltation fencing should be placed around ongoing construction activity areas, temporary storage locations, excavated materials and imported fill.
- Temporarily store, handle and dispose of all materials used or generated (e.g. organics, soils, woody debris, temporary stockpiles, construction debris such as concrete, sheet pile, wood forms, etc.) during site preparation, construction and clean-up in a manner that prevents their entry into the waterbodies, including temporarily storing and stockpiling materials a safe distance from the waterbodies and appropriate measures to stabilize/contain them.
- Siltation fencing should be installed before work on the site begins and inspected at regular intervals and after significant rain events to confirm it is functioning properly. If any section is found to be damaged or non-functional it should be replaced immediately. Fencing should be regularly cleared of silt accumulation to ensure the integrity of erosion prevention/sediment containment measures.
- The following activities are prohibited beyond the siltation fencing: storage or stockpiling of materials; disposal of liquids; and operation of heavy machinery.
- Upon completion of construction, exposed soils should be restored to the original condition. Erosion control fencing may be removed once vegetation has been established (i.e. more than 80% cover).
- In the event that it is necessary to remove water to safely complete specific tasks (e.g. welding, etc.), the Contractor will remove the water from the trench by pumping it into an appropriate filter bag (e.g., Terrafix® Envirobag) and onto an area of undisturbed vegetation located beyond the boundaries of the work area.
- Detailed Sediment and Erosion Control (ESC) plan will be developed during detail design phase and ESC measures will be employed to ensure compliance are required.

6.2.1.3 Woodlands

Several woodland areas exist within the Study Area: one approximately 75 m south of Mayfield Road between Chinguacousy and Hurontario, one associated with Etobicoke Creek, and one associated with the Heart Lake Conservation Area. Potential impacts to these woodlands would include a loss of habitat and/or damage or removal of individual trees.

It is understood that a minimum 10 m buffer area between construction works and the woodlands will be maintained during construction. As such, direct impacts to these woodlands are not anticipated; however, to further ensure potential negative impacts on the woodlands are minimized, the following mitigation measures are proposed:

- Tree protection fencing should be installed between the areas of proposed development and the woodland boundary, when construction activities are proposed within 15 m of a woodland edge, to reduce the potential for physical damage to trees and their root systems within the woodland. Supports and bracing used to secure the barriers should be installed as close to the woodland dripline as possible, and in a way that minimizes root damage.
- Tree protection fencing should be installed before work on the Site begins and inspected regularly to ensure it is performing its intended function. If any section is found to be damaged or non-functional it should be replaced immediately.
- The following activities are prohibited beyond the tree protection fencing: storage or stockpiling of materials; disposal of liquids; and operation of heavy machinery.
- Changes to existing land contours and drainage patterns due to grading should be minimized to ensure that significant changes to the existing woodland moisture regime do not occur.
- Tree removal should conform to local, municipal, or regional by-laws, and should be performed by properly trained and accredited individuals.

- To limit disturbance to the local birds, required tree removal should be limited during their most vulnerable period, i.e. the breeding bird season (May 1st to July 31st), unless a survey by a qualified biologist confirms that there are no active nests within the tree(s) to be removed.
- Replanting for native trees removed during site preparation should be implemented according to TRCA's Post-Construction Restoration Guideline (http://www.trca.on.ca/dotAsset/40027.pdf). Compensation should occur for trees that are greater than 15 cm in diameter at breast height or as directed by the Municipality, CVC or TRCA. Tree species selected for planting should be native species that are suited to the conditions present within the Study Area. Plantings should be done by hand to reduce the potential for mechanical compaction of soils and should be performed by a qualified and knowledgeable tree planter to ensure plantings are placed in suitable sun exposures and moisture regimes.
- Once the final impact area is determined, a site-specific edge management plan and tree compensation plan should be prepared.

6.2.1.3.1 Forest Edge Management Plan

While not currently anticipated, if the removal of trees within woodland is necessary, in addition to the above-mentioned general mitigation measures, a Forest Edge Management Plan to protect the post-construction woodland edge should be included with the application. The Forest Edge Management Plan should follow the TRCA's (2004) Forest Edge Management Plan Guidelines. Edge management plans are requested when tree clearing involves an existing forest edge, and are intended to mitigate negative impacts to the remaining forest community (TRCA Forest Edge Management Plan Guidelines, 2004). Typically, impacts include:

- Direct loss of floral and faunal habitat;
- Trees along the 'new' edge may be susceptible to windthrow;
- Reduced species richness and abundance;
- Decreased biodiversity;
- Reduced stability of landforms composed of unconsolidated material;
- Regrading/fill placement along forest edges can impact root systems of retained trees, resulting in root stress/tree decline;
- Loss of canopy cover/shade, resulting in an increase in sunlight penetration;
- Some trees with thicker bark (e.g. Beech) can be susceptible to sunscale and frost cracking due to changes in light penetration;
- Changes in microclimates (increase temperatures, decreased soil moisture) resulting in desiccation;
- Site may be more susceptible to invasion by non-native species, pathogens, etc.;
- Soil compaction resulting from unrestricted vehicle and machinery operations; and,
- Loss of native seed bank.

To minimize the negative impacts on the new woodland edge, the following mitigation measures are proposed:

- Tree removal should take place at minimum one season prior to construction activities taking place in the vicinity of the new woodland edge. This will ensure the new edge has been 'pre-stressed' before construction activities begin.
- Tree protection fencing should be employed between the areas of proposed development and the new woodland boundary to reduce the potential physical damage of trees and their root systems within the woodland. Tree protection fencing should be installed before any work on the Site begins, and removed after the threat to tree and root damage effects have ceased.

- Grading should be designed to meet existing woodland grades to prevent suffocation of existing tree roots.
- A monitoring program should be established to ensure that the new woodland edge has continued health and normal growth.

6.2.1.4 Hydrogeology

6.2.1.4.1 Wetlands between Heart Lake Road and Kennedy Road

There is a large wetland area north of Mayfield Road between Heart Lake Road and Kennedy Road. Previous investigation showed varying thickness of peat below ground surface overlying soft clayey slit, overlying layers of sand/slit and clay. Groundwater levels were found to be at ground surface within the wetlands. These compressible soils have been a considerable challenge in the construction of the existing road, which included numerous geotechnical investigations and the use of caissons as a road base. As such, any additional widening outside of the existing allowance to the north is expected to require extensive work and thus would not be preferred from a hydrogeological perspective. However, during detail design, should the preferred alternative require some expansion to the north, a detailed hydrogeological assessment should be undertaken during the detail design phase, including:

- Additional boreholes / monitoring wells in the affected area(s).
- Single well hydraulic testing of monitoring wells (slug tests).
- Assessment of whether additional hydraulic testing is required (pumping tests).
- Assessment of impacts to the wetlands.
- Provide input into the design process.
- Discussion of potential dewatering requirements and the need for a Permit to Take Water (PTTW) should there be groundwater taking of more than 50,000 litres per day. If a PTTW is required for construction dewatering, a site specific monitoring program for discharge water quality and quantity, as well as mitigation program will need to be developed. The report to be prepared in support of the water taking application should include details on the management of the discharge of the water, including targets for pollutant concentrations in the discharge water (typically TSS), how these targets will be achieved, quality controls, and monitoring requirements.
- Preparation of a monitoring and mitigation plan during construction.

6.2.1.4.2 Residential Wells and Septic Systems

Based on existing aerial photography, there are several areas remaining that may be serviced by residential wells and septic systems. The first is west of McLaughlin Road, which is still rural. For this area, the following measures are recommended during the design phase:

- A residential well survey should be conducted to determine the location and use of private water wells and septic systems.
- Baseline water quality sampling and groundwater levels should be taken as part of the survey.
- Recommendations should be provided as to the potential for decommissioning / replacement of any infrastructure that is located within the proposed new road allowance.
- Recommendations should also be provided as to the potential for well interference during construction and mitigative measures to be implemented, including provision of a temporary water supply.

Over the remainder of the route, there may be scattered water wells present even though most of the area is municipally serviced by water and sewer. A well survey should be undertaken to identify any homes that may still have wells and / or septic systems. This should include water quality sampling, groundwater levels, recommendations for decommissioning / replacement of infrastructure within the proposed new road allowance, and recommendations for dealing with well interference complaints, including provision of a temporary water supply or hookup to the municipal system. The affected well

owners should be assured that they will continue to have water supplies of appropriate quality and in adequate quantities during construction. Any work done on affected wells or any replacement wells should be done pursuant to O. Reg. 903, Wells (pursuant to the Ontario Water Resources Act).

6.2.1.5 Soil Contamination

For the purposes of road improvement, special attention should be made where potentially contaminating activities are identified and where there is a potential that property acquisition will be required. A Phase I Environmental Site Assessment (ESA) and limited Phase II ESA should be completed prior to any property acquisition near the intersection of Hurontario Street and Mayfield Road. If suspected contaminated soil is identified at the time of the road construction, especially when soil will be excavated for the road widening at the railway crossing, consulting services including the collection of confirmatory soil sampling should be completed to determine proper soil disposal options. Disposal of contaminated soil should be consistent with part XV.1 of the Environmental Protection Act and Ontario Regulation 153/04, Records of Site Condition, which detail the new requirements related to site assessment and clean up.

6.2.1.6 General Mitigation Measures

In addition to the mitigation measures outlined above, general mitigation measures for works within the Study Area should include the following:

- To limit disturbance to the local birds, if feasible, construction activity could be limited during their most vulnerable period, i.e. the breeding bird season (May 1st to July 31st). Additionally, tree removal should not occur during this period, unless a nest survey by a qualified biologist suggests that no breeding birds occur in the tree(s) to be removed.
- Further consultation with the OMNR is necessary to determine if detail design encroaches into regulated Redside Dace habitat. Where the design does encroach, current approval, mitigation and monitoring practices should be undertaken as part of the detail design study, under guidance of the Endangered Species Act, Ontario Regulation 242/08, and through consultation with the OMNR.
- During construction, the Study Area should be monitored for Species at Risk as described in this report. If Species at Risk are identified, MNR and the qualified project biologist should be contacted immediately.

6.2.2 Social Environment

6.2.2.1 Temporary Impacts to Private Property

Impacts on adjacent private properties will be minimized by confining all construction activities to the working area, and the Contractor will not be allowed to enter or occupy any private property, unless prior written permission from the landowner has been obtained and provided to the Region. Should access to private property be granted, the property will be restored to its original condition or better following the completion of construction operations.

6.2.2.2 Temporary Construction Related Nuisance Effects (Noise, Vibration, Dust, Odours and Fumes)

Construction activities, specifically the operation of construction equipment, will result in a temporary increase in noise, vibration, dust and odours in the project area during the construction period. While it is anticipated that these effects will be short in duration and limited to periods of construction machinery operation, the following mitigating measures will be put in place:

- Comply with Region of Peel noise control by-laws.

- Prevent unnecessary noise by maintaining equipment in proper operating condition, including but not limited to non-defective muffler systems, properly secured components, and the lubrication of moving parts.
- Restrict use of equipment to the minimum necessary to perform the specified work.
- Noise complaints will be addressed and additional mitigative measures implemented as feasible.
- Undertake dust/debris control measures as necessary.
- Use low dust generating construction techniques/equipment.
- Maintain equipment in proper working order and operate only as required (no excessive idling) to reduce engine emissions.

6.2.2.3 Temporary Modifications to Driveway Access and Boulevards

Other than minor temporary restrictions, access will be maintained during and following construction. No temporary driveways are expected to be required during the construction period. However, if such a need arises, property owners will be notified of any temporary modifications to their driveways, as well as temporary disruptions to their access in advance of commencing such activities.

6.2.2.4 Temporary Disruption of Traffic on Roads

Traffic on Mayfield Road, and its cross-streets between Chinguacousy Road and Heart Lake Road (including these roads), will be temporarily impacted in order to undertake the works. A traffic management plan will be developed to minimize impacts, and standard traffic control measures will be implemented to safely control traffic flow. Motorists will encounter reduced speeds; however, long term lane closures are currently not anticipated. Short term lane closure may be required in order to accommodate delivery such as larger equipment. Short term lane closure will be provided outside of morning and afternoon peak periods. If lane closure is necessary, flag persons will be provided to direct traffic and work will be undertaken outside of the peak periods. Appropriate signage will be posted during these work periods.

6.2.2.5 Work Area Aesthetics

During construction, the work area will be maintained in a tidy condition, free from the accumulation of debris, waste, rubble, etc. in order to minimize the visual impact of the work area. In addition, construction sheds, site offices, other temporary structures and storage areas for materials and equipment will be grouped in a compact manner and maintained in a neat and orderly condition at all times.

6.2.2.6 Generation of Excess Materials

The proposed improvements will require excavation and filling. Various types of materials, including asphalt and soil will be generated during these project activities which will require appropriate management (e.g., the potential for wind erosion on soil stock piles).

Material identification and management measures will be used both inside and outside the construction area. All excess and unsuitable materials generated during construction will be managed appropriately. The materials may be reused as construction materials or as engineered fill. Materials may also be temporarily stockpiled in preparation for these uses or removed from the site if required. With regard to soil stockpiles, these will be compacted as much as possible in order to ensure minimal soil erosion from wind. Where an excess material management option cannot meet environmental constraints, another option must be pursued or the material must be managed as waste.

All contaminated wastes must be taken to an approved waste disposal site and transported by a licensed waste disposal carrier as per the operational constraint for the management of contaminated materials. The Contractor will be required to manage all waste materials generated by construction activities in accordance with all provincial and federal regulations/approval requirements. A copy of all approvals and agreements will be provided to the Contract Administrator (CA), including waste manifests.

6.2.2.7 Land Use

The proposed road improvements along Mayfield Road will have minimal effects on adjacent land uses. However, there are property-taking requirements that require mitigation.

The proposed undertaking requires private property from several locations along the Study Area. This property will be used for both the roadway and the required easements.

Proposed mitigation includes negotiating with property owners for property requirements. Region of Peel's Property Section will address the property-taking requirements in accordance with Region of Peel policies.

6.2.2.8 Archaeology

The Mayfield Road right-of-way (ROW) does not retain archaeological potential to previous disturbances. Additional archaeological assessment is not required for road improvements within the current ROW boundaries. The Mayfield Road ROW can be cleared of further archaeological concern.

Sections of land beyond the limits of the current Mayfield Road ROW, including all TRCA lands, exhibit archaeological potential. As the proposed Mayfield Road improvements require new lands beyond the current ROW limits, a Stage 2 Archaeological Assessment will be conducted on lands determined to have archaeological potential (**Figure 6-7** to **Figure 6-15**, areas marked in green). This work will be done in accordance with the Ministry of Tourism, Culture and Sports' (MTCS) *2011 Standards and Guidelines for Consultant Archaeologists* in order to identify any archaeological remains that may be present.

In the event that archaeological remains are found during subsequent construction activities, the consultant archaeologist, approval authority, and the Cultural Programs Unit of the Ministry of Tourism, Culture and Sport (MTCS) should be immediately notified.

6.2.2.9 Permission to Enter

"Permission to Enter" permits will be required for all the driveway access where regrading are necessary beyond the existing property line. The locations of driveway that call for regrading will be decided during detail design.

Figure 6-7: Mayfield Road (Sheet 1) - Results of Stage 1 Archaeological Assessment

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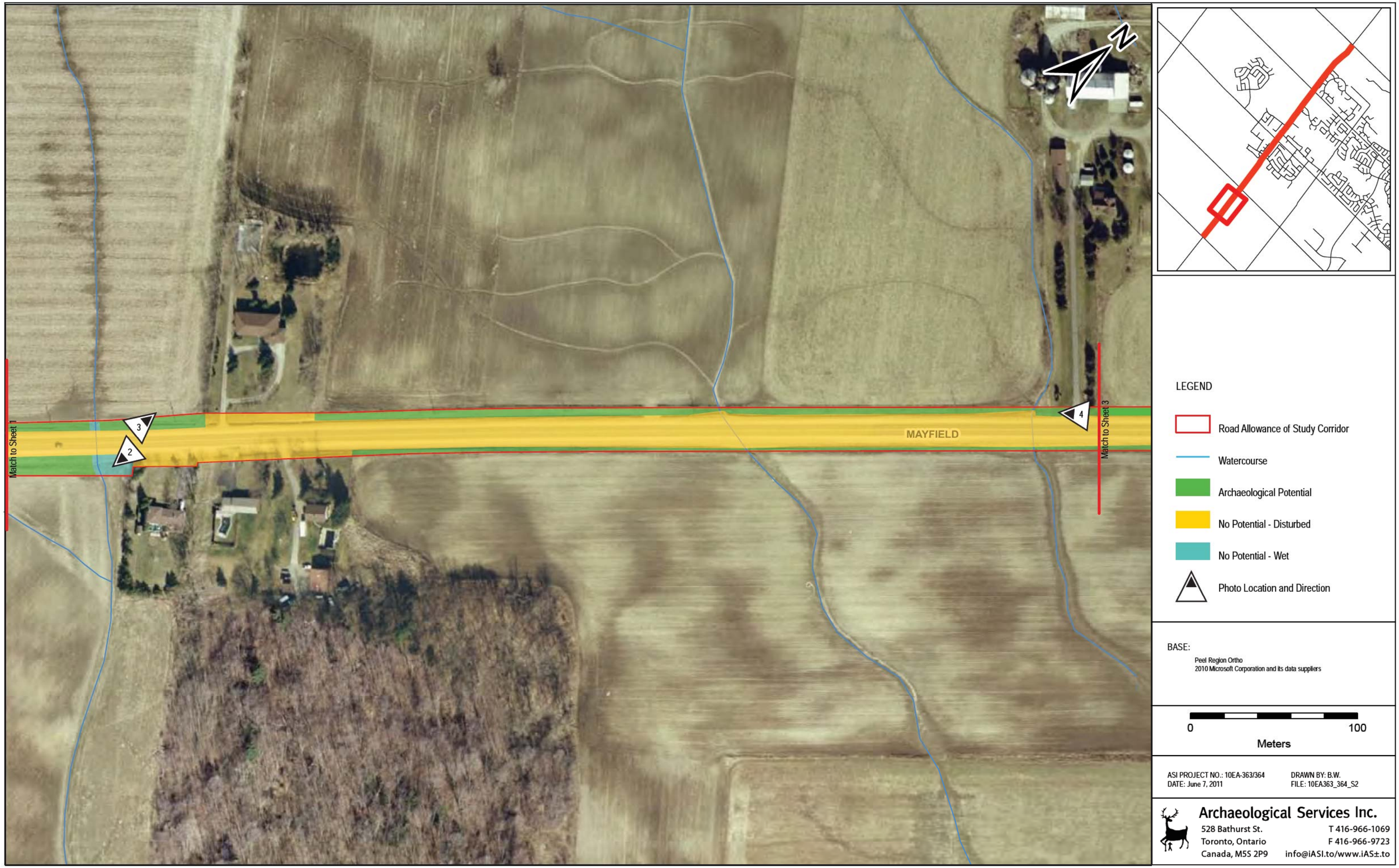

Figure 6-8: Mayfield Road (Sheet 2) - Results of Stage 1 Archaeological Assessment

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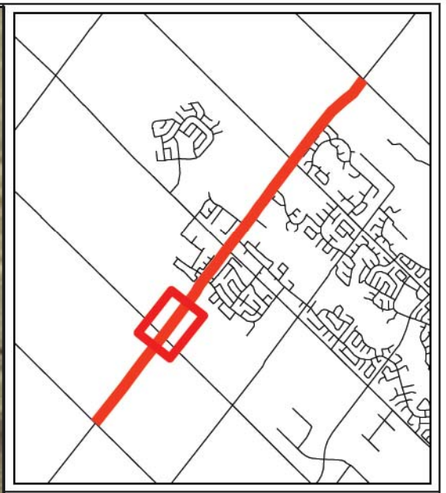

LEGEND

- Road Allowance of Study Corridor
- Watercourse
- Archaeological Potential
- No Potential - Disturbed
- No Potential - Wet
- Photo Location and Direction

BASE:

Peel Region Ortho
2010 Microsoft Corporation and its data suppliers

0 100
Meters

ASI PROJECT NO.: 10EA-363/364
DATE: June 7, 2011

DRAWN BY: B.W.
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Figure 6-9: Mayfield Road (Sheet 3) - Results of Stage 1 Archaeological Assessment

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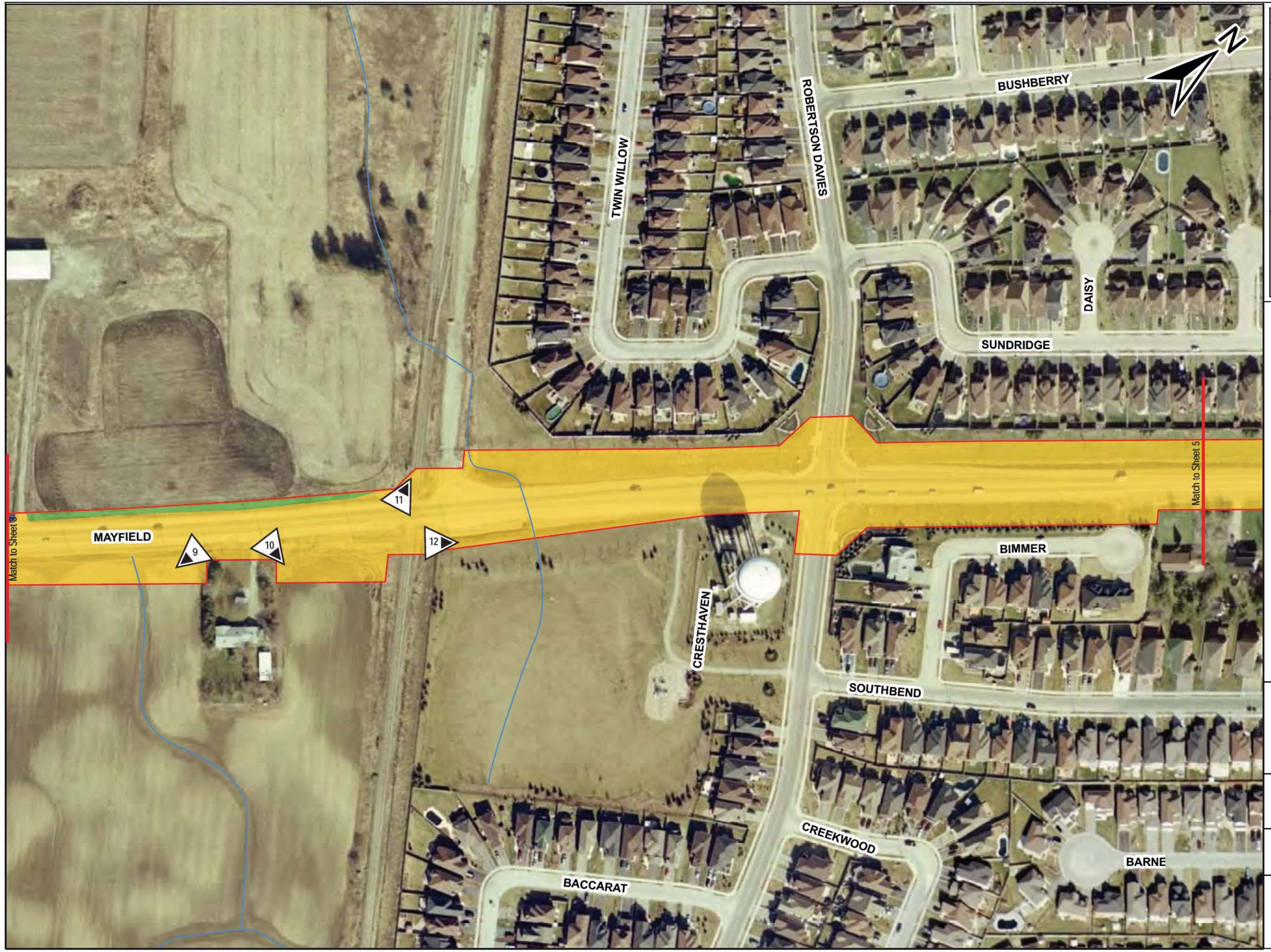

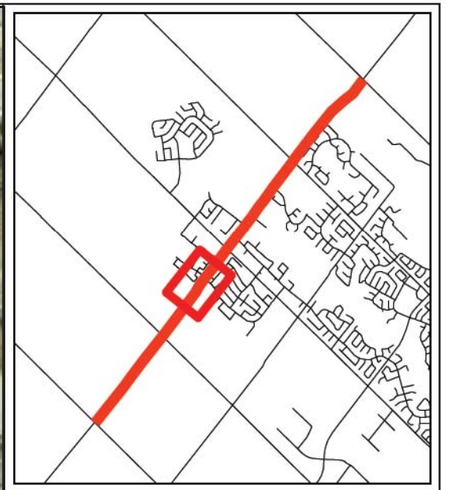

LEGEND

- Road Allowance of Study Corridor
- Watercourse
- Archaeological Potential
- No Potential - Disturbed
- Photo Location and Direction

BASE:

Peel Region Ortho
2010 Microsoft Corporation and its data suppliers

0 100
Meters

ASI PROJECT NO.: 10EA-363/364
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Figure 6-10: Mayfield Road (Sheet 4) - Results of Stage 1 Archaeological Assessment

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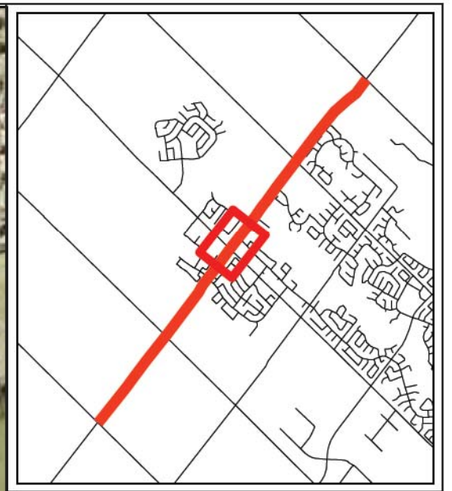

LEGEND

- Road Allowance of Study Corridor
- Watercourse
- Archaeological Potential
- No Potential - Disturbed
- No Potential - Slope
- Photo Location and Direction

BASE:

Peel Region Ortho
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0 100
Meters

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Figure 6-11: Mayfield Road (Sheet 5) - Results of Stage 1 Archaeological Assessment

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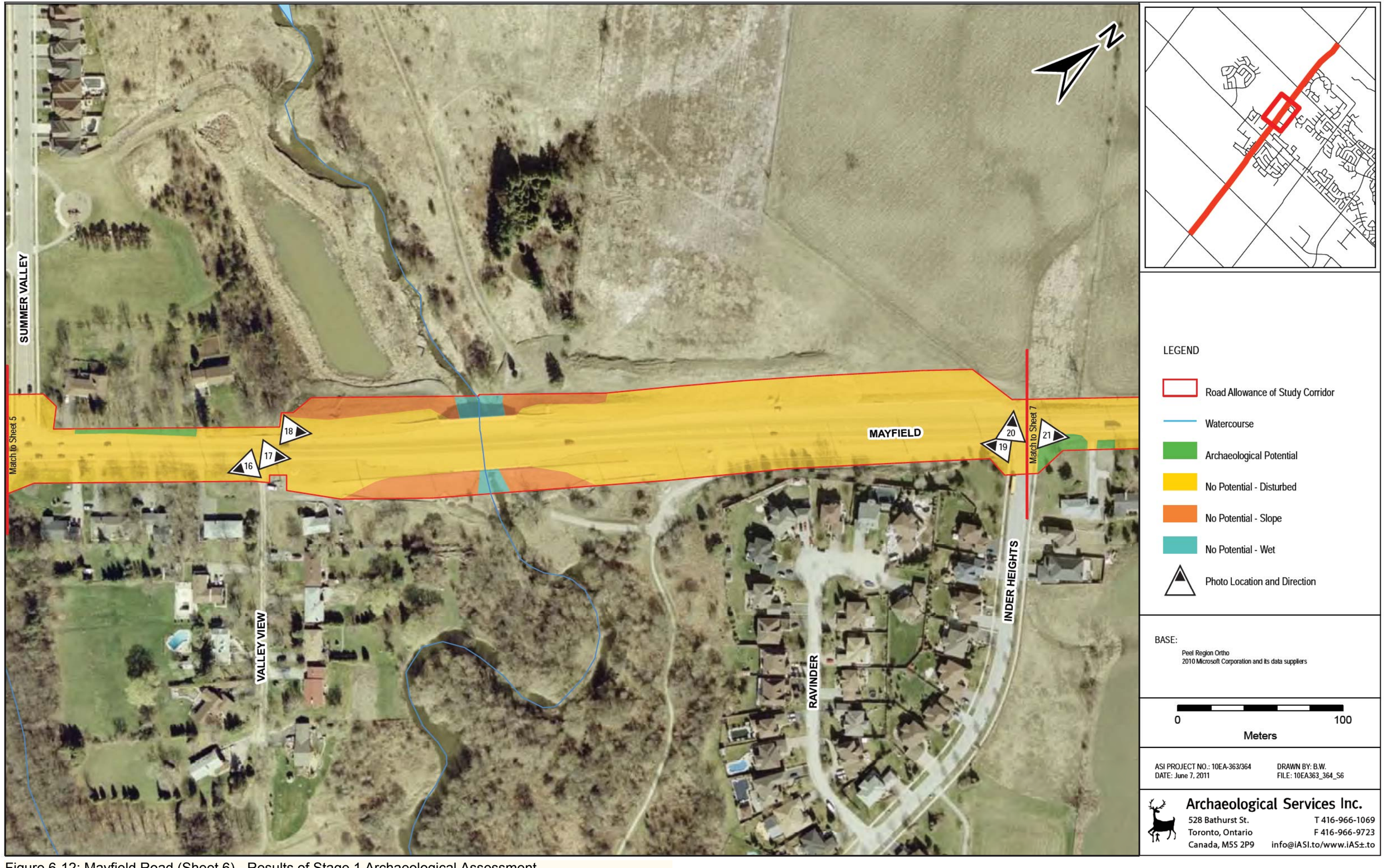

LEGEND

- Road Allowance of Study Corridor
- Watercourse
- Archaeological Potential
- No Potential - Disturbed
- No Potential - Slope
- No Potential - Wet
- Photo Location and Direction

BASE:

Peel Region Ortho
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Figure 6-12: Mayfield Road (Sheet 6) - Results of Stage 1 Archaeological Assessment

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Figure 6-13: Mayfield Road (Sheet 7) - Results of Stage 1 Archaeological Assessment

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Figure 6-14: Mayfield Road (Sheet 8) - Results of Stage 1 Archaeological Assessment

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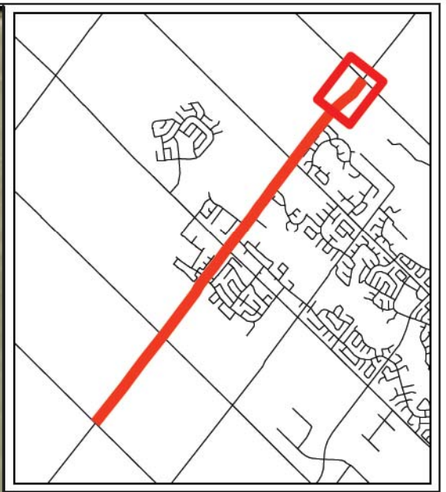

LEGEND

- Road Allowance of Study Corridor
- Watercourse
- Waterbody
- Archaeological Potential - Pedestrian Survey
- No Potential - Disturbed
- No Potential -Slope
- No Potential - Wet
- Photo Location and Direction

BASE:

Peel Region Ortho
2010 Microsoft Corporation and its data suppliers

0 100
Meters

ASI PROJECT NO.: 10EA-363/364
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Figure 6-15: Mayfield Road (Sheet 9) - Results of Stage 1 Archaeological Assessment

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6.2.2.10 Cultural Heritage

Road improvement activities should be suitably planned to avoid impacts to the eight (8) identified cultural heritage resources. **Figure 6-16** and **Figure 6-17** show the identified cultural heritage resources in relation to the preferred alternative.

Table 6-5 – Preferred Alternative – Potential Impacts to Cultural Heritage Resources

Resource	Potential Impact(s)	Proposed Mitigation Measure(s)
CHL 1	Alteration (III.2) due to encroachment on frontage, and potential removal of trees and vegetation for the construction of a sidewalk within the existing property limits.	• Implement tree protection zones to retain existing trees on the property, as feasible; • Landscape documentation should be carried out prior to construction; • Post-construction landscaping to re-establish pre-construction conditions.
CHL 2	No negative impacts anticipated since all heritage attributes are located outside of the affected area	• None
CHL 3	No negative impacts anticipated since all heritage attributes are located outside of the affected area	• None
CHL 4	No negative impacts anticipated	• None
CHL 5	Alteration (III.2) due to encroachment on frontage, and potential removal of trees and vegetation for the construction of a sidewalk within the existing property limits.	• Implement tree protection zones to retain existing trees on the property, as feasible; • Landscape documentation should be carried out prior to construction; • Post-construction landscaping to re-establish pre-construction conditions.
CHL 6	No negative impacts anticipated	• None
CHL 7	No negative impacts anticipated	• None
CHL 8	No negative impacts anticipated	• None

No negative impacts are anticipated to CHL 2, CHL 3, CHL 4, CHL 6, CHL 7, or CHL 8. Thus, no mitigation measures are recommended at these sites.

CHL1 and CHL 5 are expected to be impacted through encroachment and the potential removal of trees and/or vegetation to accommodate the addition of a sidewalk within the existing property limits. Tree protection zones should be implemented, where feasible, to retain existing trees on the properties. A cultural heritage landscape documentation report should be prepared for these properties by a qualified heritage professional prior to any landscape alteration.

Post-construction landscaping and rehabilitation plans should be undertaken in a manner that is sympathetic to the overall setting. Wherever possible, landscaping with appropriate/sympathetic historic plant materials is recommended, and fence rows should be preserved where extant.

Should future work require an expansion of the current study corridor and/or an additional Study Area, a qualified heritage consultant should be contacted in order to confirm impacts of the undertakings on potential cultural heritage resources.

Full details of the Cultural Heritage Assessment can be found in **Appendix L**.

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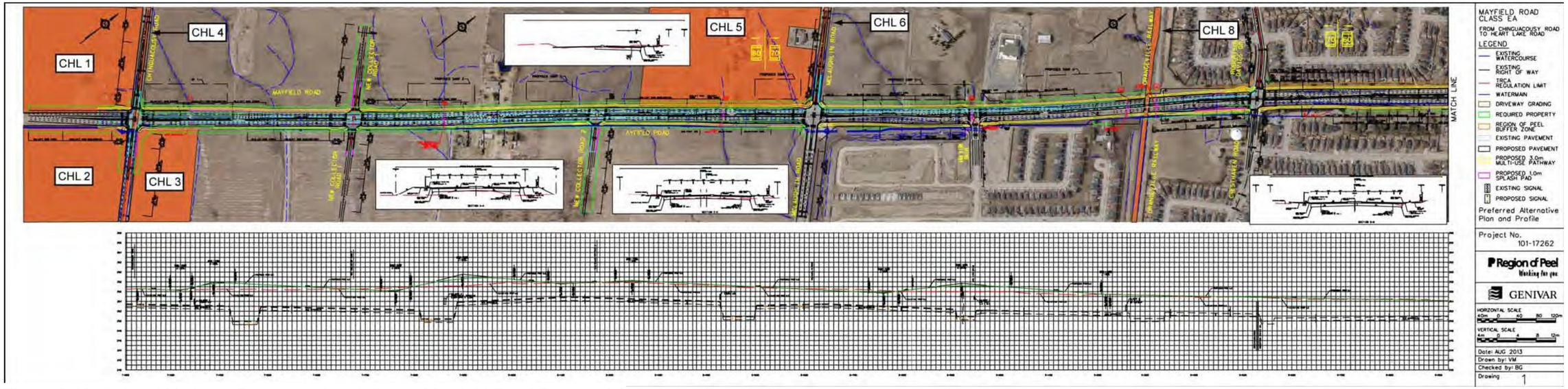

Figure 6-16: Cultural Heritage Resources in relation to Mayfield Road Preferred Alternative (west half)

Figure 6-17: Cultural Heritage Resources in relation to Mayfield Road Preferred Alternative (east half)

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6.2.2.11 Noise

According to the MTO/MOE Joint Protocol, if the future "Build-Out" sound levels are predicted to increase by less than 5 dBA, ten years after completion of the project, over the future "No-Build" sound levels then no noise mitigation is required. However, if there are increases of more than 5 dBA and the future "Build-Out" sound level is more than 55 dBA, an investigation of noise mitigation measures within the roadway right-of-way is required. The Region of Peel also has noise protocols which must be followed. Most of the criteria are similar to the MTO/MOE Joint Noise Protocol. However, Region of Peel Guidelines also requires sound levels for night time (11 p.m. – 7 a.m.) period to be evaluated.

Future "2031 No-Build" traffic projections for the roadway network were determined by applying cumulative percent annual growth on existing traffic data (average of 2005 and 2009 AADT). Three (3)% annual growth factor was applied for Mayfield Road and two (2)% was applied on the intersecting streets for estimating "2031 No-Build" traffic volume by the following relationship:

Existing Barriers

There are some existing noise barriers (fences, berms and combination thereof) within the project Study Area. Example of noise barriers are shown on photographs in **Figure 6-18** and **Figure 6-22**. The location of these noise barriers are shown on **Figure 6-23**. For the purpose of the assessment, these noise barriers were not included as part of the model inputs as the relative difference between "2031 No-Build" and "2031 Build-Out" should be similar.

Figure 6-18 - Wooden fence constructed on an elevated slope, viewed from Mayfield Road

Figure 6-19 - Noise Barrier along south side of Mayfield Road, west of Stonegate Drive

Figure 6-20 - Noise Barrier along south side of Mayfield Road at Stonegate Drive

Analysis and Results of Future Noise Assessment

Table 6-6 - Predicted Future (2031) Sound Levels presents the future daytime and night time sound levels at the forty one (41) locations.

Figure 6-21 to **Figure 6-24** depicts a visual presentation of the future daytime sound levels.

The forecasted outdoor living area (OLA) sound levels were in the range of 59 to 70 dBA for both "2031 No-Build" and "2031 Build-out" scenario and the differences between the "2031 No-Build" and "2031 Build-Out" noise levels did not exceed 5 dBA. As such, noise mitigation is not warranted for any receptors within the Study Area under the MTO/MOE Joint Noise Protocol.

As a matter of fact, some of the "2031 Build-Out" sound levels are lower than "2031 No-Build" sound levels signifying that lane widening helps in smooth flow of traffic as AADTs increases over the years and consequently noise impact lessens.

Further noise analysis can be found in **Appendix M**.

Construction Noise

Unlike the noise emitted by the operation of vehicles on the proposed expanded road, noise due to construction of roads is temporary in nature, and largely unavoidable. The noise impact levels during construction depends upon size and number of pieces of equipment being used, their types, time of operation and their proximity with the NSAs. However, with adequate controls, noise impacts can be minimized even though for some periods of time and types of work, construction sound levels will be perceptible.

Recommendations relating to the management of construction noise are summarized below.

- The contractor should obtain copies of the latest noise control by-laws from the local Municipalities of jurisdiction where the project roadways pass through. Where adherence of the local by laws is not possible and mitigation is not feasible, an exemption should be obtained from the municipality before the start of construction work.
- The MOE stipulates limits on sound emissions from various equipment used in the construction. Sound emission standards for the various types of construction equipment used on the project should be checked to ensure that they meet the specified limits contained in MOE Publication NPC-115 – "Construction Equipment". As such, all construction equipment should be operated with effective muffling devices that are in good working condition.
- Unnecessary noise emission by faulty or non-operating components of equipment should be minimized by regular maintenance of the equipment. Idling of construction equipment should be restricted to the least minimum time necessary to complete any specific task.
- Should the municipality receive any complaint from the public, the municipality staff will verify that the "general noise control measures" agreed to, are in effect. The municipality will investigate any noise concerns, warn the contractor of any problems and enforce its contract.

In selecting the appropriate construction noise control and mitigation measures, the municipality will give consideration to the technical, administrative, and economic feasibility of the various alternatives.

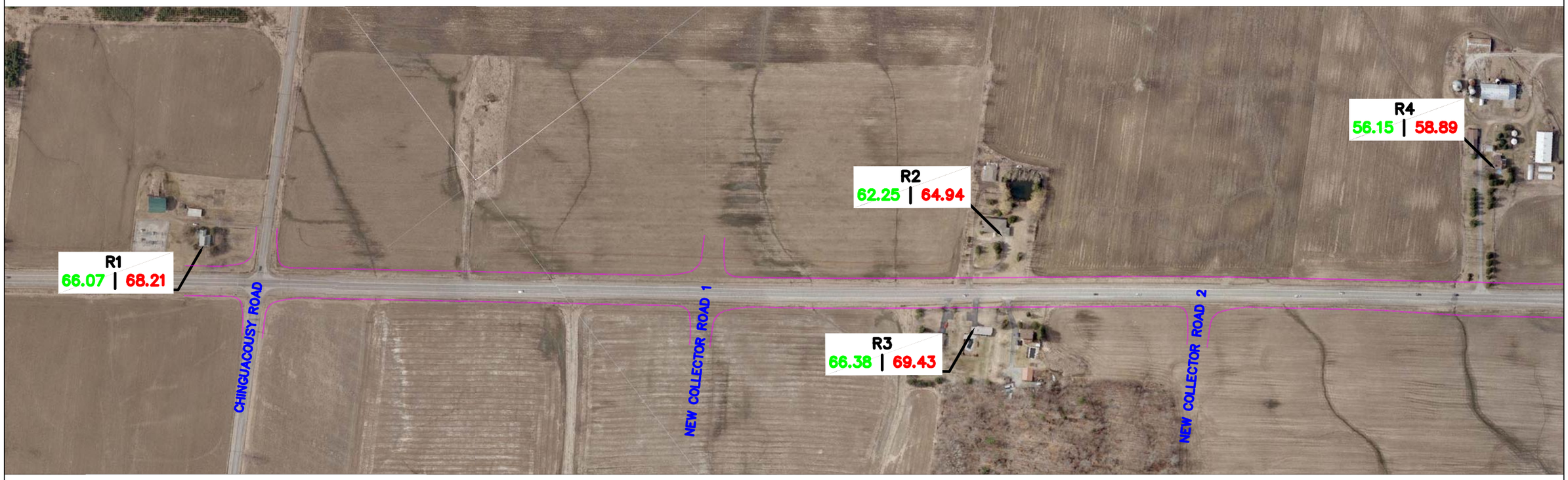
The above noted procedures are based on the construction noise provisions included in Section 8 of the MOE/MTO Noise Protocol.

Table 6-6 - Predicted Future (2031) Sound Levels

Receiver Site	Address	Receptor Relative to Corresponding Road	Road Name	Daytime Sound Level (dBA)			Nighttime Sound Level (dBA)		
				2031 No-Build	2031 Build-Out	Change (1)	2031 No-Build	2031 Build-Out	Change (1)
R1	Chinguacousy Road (4)	N	Mayfield Road	66.07	68.21	2.14	58.49	60.61	2.12
		W	Chinguacousy Road						
R2	Mayfield Road (4)	N	Mayfield Road	62.25	64.94	2.69	54.67	57.34	2.67
R3	2257 Mayfield Road	S	Mayfield Road	66.38	69.43	3.05	58.80	61.83	3.03
R4	2412 Mayfield Road	N	Mayfield Road	56.15	58.89	2.74	48.57	51.29	2.72
R5	35 Accent Circle	S	Mayfield Road	61.59	62.07	0.48	54.02	54.47	0.45
		E	McLaughlin Road						
R6	61 Accent Circle	S	Mayfield Road	60.83	62.33	1.50	53.24	54.73	1.49
R7	518 Van Kirk Drive	S	Mayfield Road	63.18	64.78	1.60	55.59	57.18	1.59
R8	2596 Mayfield Road	N	Mayfield Road	65.23	66.37	1.14	57.64	58.77	1.13
R9	151 Iceland Poppy Trail	S	Mayfield Road	67.87	69.98	2.11	60.28	62.38	2.10
R10	2626 Mayfield Road	N	Mayfield Road	58.24	59.66	1.42	50.65	52.06	1.41
R11	104 Iceland Poppy Trail	S	Mayfield Road	63.87	65.58	1.71	56.27	57.98	1.71
R12	24 Twin Willow Crescent	N	Mayfield Road	64.25	65.09	0.84	56.66	57.51	0.85
R13	16 Twin Willow Crescent	N	Mayfield Road	65.68	66.59	0.91	58.09	59.00	0.91
R14	8 Twin Willow Crescent	N	Mayfield Road	65.13	66.15	1.02	57.54	58.55	1.01
R15	104 Sunridge Street	N	Mayfield Road	65.20	66.49	1.29	57.59	58.90	1.31
		E	Robertson Davies Drive/ Cresthaven Road						
R16	6 Brimmer Place	S	Mayfield Road	68.21	69.46	1.25	60.62	61.88	1.26
		E	Robertson Davies Drive/ Cresthaven Road						
R17	88 Sunridge Street	N	Mayfield Road	67.31	68.16	0.85	59.72	60.55	0.83
R18	60 Sunridge Street	N	Mayfield Road	63.39	68.16	4.77	55.80	61.88	4.75
R19	34 Lawlor Court	N	Mayfield Road	67.07	69.30	2.23	59.48	61.69	2.21
		W	Hurontario Street						
R20	2933 Mayfield Road	S	Mayfield Road	66.92	66.35	-0.57	59.33	58.74	-0.59
R21	36 Woodcreek Drive	N	Mayfield Road	61.60	62.83	1.23	54.01	55.22	1.21
		E	Hurontario Street						

Table 6-6 - Predicted Future (2031) Sound Levels

Receiver Site	Address	Receptor Relative to Corresponding Road	Road Name	Daytime Sound Level (dBA)			Nighttime Sound Level (dBA)		
				2031 No-Build	2031 Build-Out	Change (1)	2031 No-Build	2031 Build-Out	Change (1)
R22	3085 Mayfield Road	S	Mayfield Road	64.91	64.99	0.08	57.31	57.37	0.06
R23	3151 Mayfield Road	S	Mayfield Road	66.26	69.28	3.02	58.66	61.68	3.02
R24	3142 Mayfield Road	N	Mayfield Road	66.93	68.02	1.09	59.33	60.42	1.09
R25	3203 Mayfield Road	S	Mayfield Road	65.99	68.99	3.00	58.39	61.13	2.74
R26	Mayfield Road (2)	N	Mayfield Road	64.51	67.89	3.38	56.91	60.29	3.38
R27	20 Ravinder Court	S	Mayfield Road	61.93	65.25	3.32	54.33	57.64	3.31
R28	24 Ravinder Court	S	Mayfield Road	64.88	68.18	3.30	57.28	60.58	3.30
R29	1 Inder Heights Drive	S	Mayfield Road	62.45	61.67	-0.78	54.85	54.08	-0.77
R30	3367 Mayfield Road	S	Mayfield Road	63.80	63.47	-0.33	56.20	55.86	-0.34
R31	Kennedy Road (2)	N	Mayfield Road	65.26	66.27	1.01	57.66	58.66	1.00
		W	Kennedy Road						
R32	14 Starling Court	S	Mayfield Road	61.72	61.62	-0.10	54.12	54.02	-0.10
		E	Kennedy Road						
R33	10 Kingfisher Court	S	Mayfield Road	65.03	64.49	-0.54	57.43	56.89	-0.54
		E	Kennedy Road						
R34	22 Kingfisher Court	S	Mayfield Road	66.11	68.09	1.98	58.51	60.49	1.98
R35	30 Kingfisher Court	S	Mayfield Road	66.71	65.21	-1.50	59.12	57.61	-1.51
R36	16 Sandpiper Court	S	Mayfield Road	66.22	64.78	-1.44	58.63	57.19	-1.44
R37	18 Stonegate Drive	S	Mayfield Road	68.32	66.44	-1.88	60.73	58.84	-1.89
R38	2 Chickadee Crescent	S	Mayfield Road	70.41	68.06	-2.35	62.81	60.46	-2.35
R39	12 Chickadee Crescent	S	Mayfield Road	65.89	64.31	-1.58	58.29	56.72	-1.57
R40	3742 Mayfield Road	N	Mayfield Road	62.68	63.15	0.47	55.08	55.56	0.48
R41	11900 Heart Lake Road	S	Mayfield Road	63.00	66.74	3.74	55.38	59.15	3.77
		W	Heart Lake Road						



METERS
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LEGEND:

Receptor ID
R1
2031 No–Build Sound Level: 66.07
2031 Build–Out Sound Level: 68.21

Future Alignment
Existing Noise Barrier
Existing Wood Fence

GENIVAR
600 Cochrane Drive, 5th Floor,
Markham, Ontario L3R 5K3
Tel: 905.475.7270 Fax: 905.475.5994

SCALE:	NTS
PROJECT NO.:	101-17262-00
DATE:	July 3, 2013
Drawn by:	E.T.
Approved by:	B.P.

Daytime Sound Level at Receptors in dBA
From West of Chinguacousy Rd to McLaughlin Rd

Environmental Noise Assessment
Class Environmental Assessment for Mayfield Road -- from Chinguacousy Road to Heart Lake Road

FIGURE: 6-21

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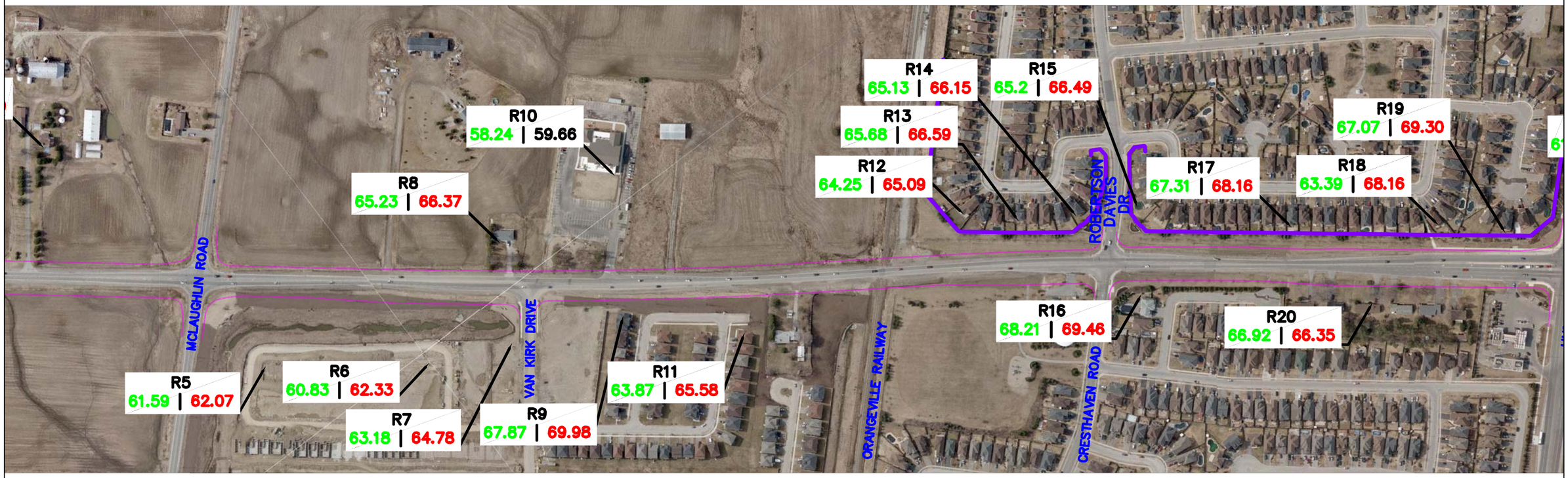

LEGEND:

Receptor ID

R1
66.07 | 68.21

2031 No–Build Sound Level

2031 Build–Out Sound Level

Future Alignment
Existing Noise Barrier
Existing Wood Fence

GENIVAR
600 Cochrane Drive, 5th Floor,
Markham, Ontario L3R 5K3
Tel: 905.475.7270 Fax: 905.475.5994

SCALE:	NTS
PROJECT NO.:	101-17262-00
DATE:	July 3, 2013
Drawn by:	E.T.
Approved by:	B.P.

Daytime Sound Level at Receptors in dBA
From to McLaughlin Rd to Hurontario St

Environmental Noise Assessment
Class Environmental Assessment for Mayfield Road -- from Chinguacousy Road to Heart Lake Road

FIGURE: 6-22

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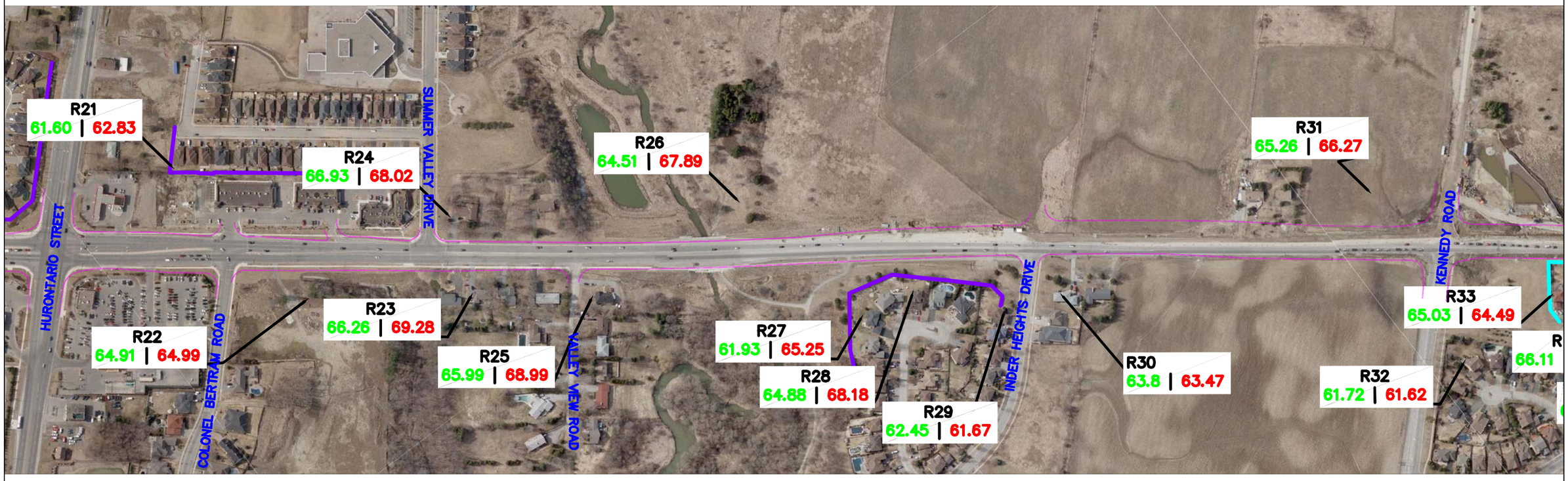

LEGEND:

Receptor ID

R1
66.07 | 68.21

2031 No–Build Sound Level

2031 Build–Out Sound Level

Future Alignment
Existing Noise Barrier
Existing Wood Fence

GENIVAR
600 Cochrane Drive, 5th Floor,
Markham, Ontario L3R 5K3
Tel: 905.475.7270 Fax: 905.475.5994

SCALE:	NTS
PROJECT NO.:	101-17262-00
DATE:	July 3, 2013
Drawn by:	E.T.
Approved by:	B.P.

Daytime Sound Level at Receptors in dBA From Hurontario St to Kennedy Rd

Environmental Noise Assessment
Class Environmental Assessment for Mayfield Road -- from Chinguacousy Road to Heart Lake Road

FIGURE: 6-23

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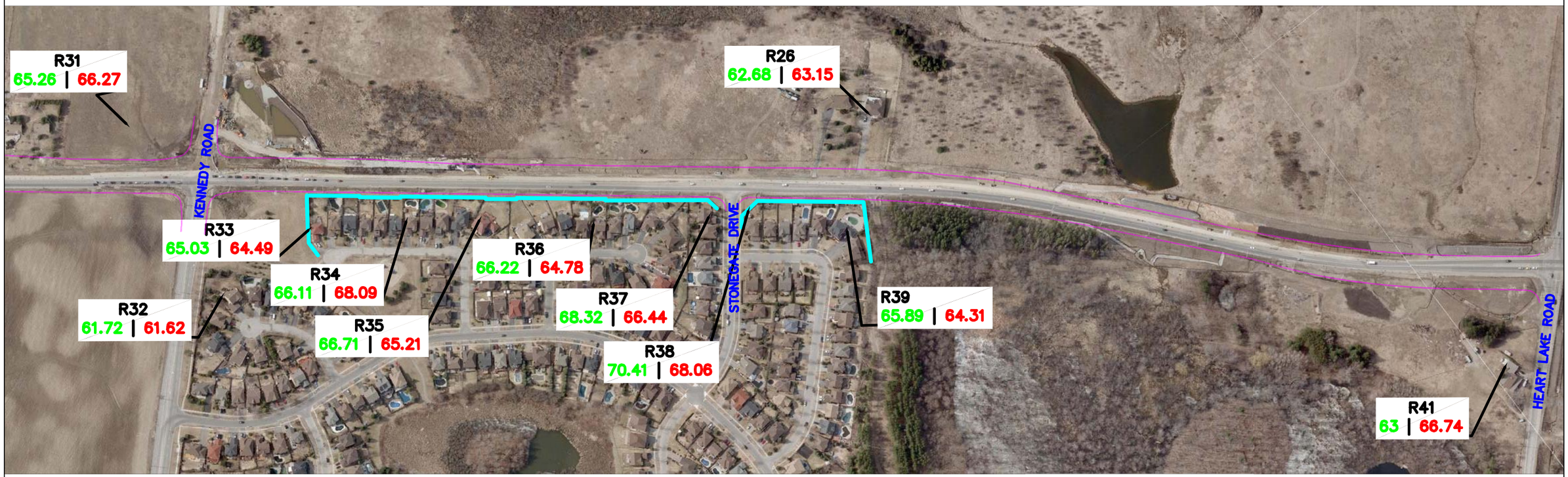

METERS
0 200 400

LEGEND:

Receptor ID
R1
2031 No–Build Sound Level: 66.07
2031 Build–Out Sound Level: 68.21

Future Alignment
Existing Noise Barrier
Existing Wood Fence

GENIVAR
600 Cochrane Drive, 5th Floor,
Markham, Ontario L3R 5K3
Tel: 905.475.7270 Fax: 905.475.5994

SCALE:	NTS
PROJECT NO.:	101-17262-00
DATE:	July 3, 2013
Drawn by:	E.T.
Approved by:	B.P.

Daytime Sound Level at Receptors in dBA
From Kennedy Rd to Heart Lake Rd

Environmental Noise Assessment
Class Environmental Assessment for Mayfield Road -- from Chinguacousy Road to Heart Lake Road

FIGURE: 6-24

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Summary

The modelling of future noise level conditions was performed using the Ontario MOE approved acoustical modelling software, STAMSON. Forty one (41) receptor locations were modeled to determine the "2031 No-Build_ and "2031 Build-Out" sound levels. The forecasted outdoor living area (OLA) sound levels were in the range of 59 to 72 dBA for both cases and the differences between the "2031 No-Build" and "2031 Build-Out" noise levels did not exceed 5 dBA level. As such, noise mitigation is not warranted for any receptors within the Study Area under the MTO/MOE Joint Noise Protocol.

6.2.2.12 Air Quality

The potential air quality impacts have been assessed for Nitrogen Dioxide, Carbon Monoxide, Fine Particulate Matter ($PM_{2.5}$), Coarse Particulate Matter (PM_{10}), Total Suspended particulate Matter (TSP), and Volatile Organic Compounds (VOCs).

The maximum combined concentrations for the future build scenario were all below their respective Ministry of Environment (MOE) guidelines or Canada Wide Standards (CWS), with the exception of PM_{10} and TSP.

The Frequency Analysis determined that the project exceeded both the PM_{10} and TSP guidelines eight (8) additional days over the five (5) year period. This equates to less than 1% of the time. The potential for chronic health concerns would be low. Due to the fact that only eight (8) additional days above the guideline for PM_{10} and TSP respectively are predicted over a five (5) year period, mitigation measures are not warranted, **Table 6-7** provides a detailed assessment of the potential impacts associated with the project and the recommended mitigative measures required to reduce these effects. These measures will be further confirmed and developed during detail design.

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Table 6-7 - Summary of Environmental Effects and Recommended Mitigation

Environmental Component	Potential Environmental Effects	Mitigation Measures
ANSI and Wetlands	• Further encroachment into this feature • Disturbance to local wildlife • Potential for erosion and sedimentation. • Accidental spills of hazardous materials during construction.	• Implement the erosion and sediment control measures to prevent sediment from entering the watercourses. • Implement Erosion Control Plans. Install temporary protective measures for erosion and sediment control, including: o Exposed soil areas will be temporarily stabilized as soon as possible to control sediment transport and erosion. In addition, natural vegetation cover will be retained wherever possible (and root grubbing minimized where possible) to provide natural erosion control. o Erosion and sediment control structures (silt fence) will be erected around all disturbed areas. o Earth stockpiles shall be enclosed with appropriate sediment and erosion control fencing. o Sediment control structures will be regularly inspected and checked after storms and repaired as required. The structures will be cleaned out when accumulated sediment reaches half the design height. o Re-stabilize and re-vegetate exposed surfaces as soon as possible, using native vegetation seed mixes and plantings or other appropriate cover, in consultation with agencies. o Adhere to all applicable permits, acts, guidelines (i.e., *Canadian Environmental Protection Act; Ontario Water Resources Act, Federal Fisheries Acts*, etc.). o Erosion and sediment control measures will be installed prior to construction and maintained within their effective limits throughout the construction and until the restoration of disturbed vegetation, rock revetments or similar are successfully completed. • Site-restoration/re-vegetation and restoration of disturbed surroundings following construction to restore riparian functions as they relate to water quality. • Restrict equipment, materials or access platforms from entering the watercourse. • Situate materials and equipment away from the watercourse in such a manner that prevents erosion and/or the deposition of any deleterious substance in the watercourse. • Suspend or limit construction activity during heavy rain. • Conduct all equipment refuelling and maintenance away from the watercourse to prevent contamination of surface waters from potential spills. In addition, maintain a spill kit suitable commercially available absorbent material on-site and ensure it is accessible, in the event that a spill occurs. • Ensure contractor has in place an emergency procedure for handling spills during the entire length of the project. • Road design includes stormceptors to manage surface water quality during the operation phase.
Fish Habitat and Valleylands	• Erosion and Sediment • Potential removal or disruption to fish and its habitat (including Redside Dace). • Disruption to fish during spawning periods.	• Observe timing restrictions to avoid spawning periods. In-water construction timing window restriction for warmwater is from July 1 to March 31. No near or in-water work can occur during this time. • Use a qualified biologist to complete fish salvage operations, monitor near-water and in-water construction activities, and ensure all related mitigation measures are properly installed, maintained and functioning effectively. • Follow erosion and sedimentation plan (see ANSI and Wetlands). • Restore habitat/disturbed areas to better conditions using native species, where possible. • Where the design does encroach into regulated Redside Dace habitat, current approval, mitigation and monitoring practices should be undertaken as part of the detail design study, under guidance of the Endangered Species Act, Ontario Regulation 242/08, and through consultation with the OMNR.

Environmental Component	Potential Environmental Effects	Mitigation Measures
Woodlands & Vegetation	• Removal of tress and vegetation. • Disturbance to local birds	• A minimum 10m buffer area between construction works and the woodlands will be maintained during construction. • All trees which are not disturbed by the construction shall be protected by perimeter fencing. • Areas within the protective fencing shall remain undisturbed and shall not be used for the storage of materials or equipment. • Changes to existing land contours and drainage patterns due to grading should be minimized. If grades around trees to be preserved are likely to change, the contractor shall be required to take such precaution as dry welling and root feeding. • Tree removal should conform to local by-laws and should be performed by properly trained and accredited individuals. Replanting for native trees removed during site preparation should be implemented according to TRCA's Post-Construction Restoration Guideline (http://www.trca.on.ca/dotAsset/40027.pdf), • No tree removal between the breeding bird season of May 1st to July 31st. • No rigging cables shall be wrapped around or installed in trees; and surplus soil, equipment, debris or materials shall not be placed over root systems of the trees within the protective fencing. No contaminants will be dumped or flushed where feeder roots or trees exist. • Where root systems of protected trees are exposed directly adjacent to or damaged by construction work, they shall be trimmed by qualified arborist and the area back filled with appropriate material to prevent desiccation. • Re-stabilize and re-vegetate exposed surfaces as soon as possible, using native vegetation seed mixes and plantings or other appropriate cover, in consultation with agencies. • Implement Forest Edge Management Plan.
Wetlands between Heart Lake Road and Kennedy Road	• Groundwater levels and peat in compressible soils	• If additional widening outside of the existing caissons, a detailed hydrogeological assessment should be undertaken during detail design.
Residential Wells and Septic Systems	• Contamination of drinking water	• For areas that are still serviced by residential wells and septic systems, a residential well survey including baseline water quality sampling and groundwater levels should be conducted. • Potential for decommissioning / replacement of any infrastructure that is within the proposed new road allowance. • Potential for well interference during construction, may consider temporary water supply.
Soil	• Contamination of soils and/or exposure of potential contaminants during construction.	• Phase I Environmental Site Assessment (ESA) and limited Phase II ESA should be completed prior to any property acquisition near the intersection of Hurontario Street and Mayfield Road. • Any soil encountered, especially at the railway crossing, during excavation that has visual staining or odours, or contains rubble, debris, cinders or other visual evidence of impacts will be analyzed to determine its quality in order to identify the appropriate disposal method. • Ensure contractor has in place an emergency procedure for handling spills during the entire length of the project.
Traffic Management	• During construction there will be temporary disruptions to traffic and access to businesses.	• Minimize construction duration (working days). • Traffic management plans for Mayfield Road will be developed as part of design process to mitigate impacts to traveling public and property access will be maintained. • Through traffic will be encouraged to use an alternate route via detours. • Affected road users and property owners will be notified in advance (e.g. signage, notices), as to construction schedule/duration and receive regular construction updates as the project moves forward including construction project manager information. • A meeting with the property owners will be held prior to construction to outline construction activities and schedule.

Environmental Component	Potential Environmental Effects	Mitigation Measures
Archaeology/Built Heritage	• Loss or disruption to built heritage and archaeological resources.	• Complete required Stage 2 Archaeological Assessment, as required. • If any archaeological and/or historical resources are discovered during the performance of the work, work in the area of the discovery is to halt. The Ministry of Culture (Archaeological Unit) will be notified for an assessment of the discovery. Work in the area of discovery will not resume until cleared to do so by the Ministry.
Acoustic Environment (noise)	• Increase in noise levels from site preparation and construction activities	• Construction activities to be restricted to daytime. • Use lower noise generating equipment / processes, where possible. • Install silencers / mufflers on equipment intakes and exhausts, where possible. • Minimize drop heights of materials. • Avoid unnecessary revving of engines and switch off equipment when not required (do not idle). • Issue contact numbers to public for any questions or complaints. • Investigate and respond to noise complaints.
Air Quality	• Emissions from the use of motorized equipment (e.g., gas or diesel exhaust) and/or emissions of dust particulate matter.	• Minimize vehicular traffic on exposed soils. • Undertake dust suppression on unpaved haul routes and other traffic areas susceptible to dust. Note that chemical dust suppressants should not be used in areas where these may harm plants, wetlands, fish and other aquatic organisms. Standard dust suppression requirements dictated by the construction contract will comply with local Municipal By-Laws for such activities. • Cover fine grained materials when transporting them. • Undertake regular cleaning of construction sites and access roads to remove construction caused debris and dust. • Prevent trucks and other vehicles from tracking soil, mud or dust onto paved streets. • Comply with posted speed limits and, as appropriate, further reduce speed when travelling on unpaved surfaces to reduce dust creation. • Minimize operation and idling of vehicles. • Investigate and address all complaints related to dust or emissions associated with construction activities. • Use and maintain emissions control devices on motorized equipment (as provided by the manufacturer of the equipment) to minimize emissions so that they remain within industry standards. • Use heavy equipment and machinery within operating specifications. • Tree planting in areas with the highest particulate impacts.

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6.3 Notice of Completion

The last step of the elevated Schedule 'C' Class EA process following documentation of Phases One, Two and Three, involves issuing a "Notice of Completion" to review agencies and the public, and filing of the ESR for public and agency review for a minimum period of 45 calendar days. Following the end of the review period, if there are no outstanding Part II Order Requests, York Region may proceed to Phase 5 of the Class EA process to complete the contract drawings and tender documents, and then move on to construction.

The notice informs stakeholders and the general public of the project's completion, the filing of the ESR, and their rights regarding the Part II Order provisions. **Appendix A** contains a copy of the notice.

6.4 Proposed Construction Monitoring

6.4.1 Prior to Construction

- Preparation of landscape plans for wetland edges, setbacks and vegetated berms;
- On-site inspections of the following to ensure proper installation:
  - Sediment and erosion control measures: and
  - Tree saving measures, such as fences installed beyond the dripline of trees to be retained.

6.4.2 During Construction

As part of implementing this project, monitoring and maintenance will be conducted during construction to ensure that:

- Individual mitigating measures are providing the expected control and/or protection;
- The mitigating measures are adequate to minimize or eliminate adverse effects;
- Additional mitigating measures are provided, if required, to address any unanticipated environmental adverse effects which arise;
- Adequate information is available for the assessment of the mitigative measures.
- Pruning of any limbs or roots (of trees to be retained) disrupted during construction;
- Fuelling and maintenance of machinery to be done at designated location away from the wetlands and watercourses; and
- Equipment movement though natural areas and setbacks to be controlled.

Environmental monitoring is to include periodic site visits and inspections throughout the course of the work by the Certified Environmental Inspector (CEI) and Region of Peel representatives, to administer the environmental control aspects of the Contract and to ensure their application and effectiveness. In the event that the CEI determines that the controls are unacceptable, the Contractor will be requested to cease those operations that are causing the issue of concern and provide the necessary mitigative measures before the operations can be re-initiated.

The results of this monitoring event should be documented in a brief report, which should be submitted to the following agencies for their review and acceptance:

- Toronto Regional Conservation Authority (TRCA);
- Credit Valley Conservation (CVC);
  - DFO – Fish Habitat Management; and
  - MNR – Aurora District Office.

6.4.3 Post Construction

- Plantings along roadside and watercourses to consist of a mixture of native woody tree and shrub species with native groundcover; and
- Effective stormwater management.

6.5 Cost Estimate

The estimated cost of the recommended alternative based on the preliminary design is as follows:

Mayfield Road from Chinguacousy Road to Heart Lake Road:

Construction Cost	
Removals/General Items	$ 2,805,000
Storm Sewers/SWM	$ 1,639,000
Culverts	$ 597,000
Roadworks	$17,206,000
Miscellaneous Allowance (traffic signals, street lights, etc.)	$ 1,154,000
Design/Contract Administration (15% of construction cost)	$ 5,085,000
Utility Relocation (3% of construction cost)	$ 1,017,000
Allowance for Streetscaping (2% of construction cost)	$ 678,000
Property Acquisition	$10,500.000
TOTAL	**$40,680,000**

The above costs are estimates only and must be updated based on detail design. 13% H.S.T. is not included in the above cost estimate. In addition, an allowance is included for streetscaping details, which will be determined during detail design. Discussions must be held with the Town of Caledon and the City of Brampton and will be subject to a cost sharing agreement.

7 Public and Agency Consultation

Throughout the planning process, a variety of communications and consultation methods were undertaken with numerous stakeholders, including the Region of Peel, Ministry of Natural Resources, Credit Valley Conservation, City of Brampton, Ministry of Aboriginal Affairs, various First Nations bands, external government review agencies, property owners including developers-consultants and other interested members of the public.

7.1 General

Several steps were undertaken to inform the affected stakeholders about this Municipal Class EA Study, obtain their input, and address their comments or concerns as much as possible as they arose. This was accomplished throughout the study beginning with the notification of study commencement, continuing through two Public Information Centres (PICs), and meetings with stakeholder groups (e.g. land developers).

The following means of communication was used in this study to ensure that all potentially affected and interested stakeholders were notified of the project.

Notices – Notices appeared in the Brampton Guardian and Caledon Enterprise to announce the Study Commencement, Public Information Centre (PIC) No. 1, PIC No. 2, as well as Study Completion. These notices were also attached to the letters issued to those on the contact lists;

Letters – Initial contact letter, invitation letter to the PICs were delivered by mail to those on the master contact list including agencies, fronting landowners including residents in the Study Area, as well as other public stakeholders;

PIC Materials – Display boards, handouts and comment sheets were produced for use during the PICs;

Webpage – The Region's main website was the host webpage for this project providing background information, relevant documents and contact information. The webpage was updated at key milestones during the span of the project. The link for the webpage was noted on all communication materials; and

Environmental Study Report (ESR) – All forms of communication and consultation with agencies and the public are included in the ESR.

Refer to **Appendices A, B, O and P** for copies of the letters, newspaper notices, and PIC materials.

7.2 Public and Agency Consultation

7.2.1 EA Phase 1 Consultation

Consultation undertaken during phase one was developed to ensure public and stakeholder interests were identified and incorporated into the EA process. The consultation process will incorporate the Ministry of Environment's (MOE) Code of Practice for Consultation in Ontario's EA process (2007).

During Phase 1 of this project, a Notice of Study Commencement was issued to surrounding property owners, government review agencies, as well as First Nation groups. Surrounding property owners and agencies also received a response form that requested if any additional comments/concerns that the agency may have regarding this study.

Notification was provided through the following means:

- Letter mailed directly to review agencies, aboriginal groups, property owners and other identified project stakeholders on December 7th, 2010.

- Newspaper advertisement published as follows:

The Brampton Guardian	a)	December 17, 2010
The Caledon Enterprise	b)	December 7, 2010

- Bulk mail to all properties within approximately 1 km of the Study Area.
- Region of Peel Website (www.peelregion.ca).

See **Appendix A** for copies of the preceding notification materials and contact lists.

The review agencies listed in **Appendix A** were consulted because of their relevance to the project. This is in keeping with the standards set out in the Municipal Class EA, which outlines guidelines for establishing contact with appropriate review agencies in relation to the nature of the project.

7.2.1.1 Development of the Technical Advisory Committee

The Technical Advisory Group (TAC) was developed by directly approaching key technical stakeholders identified as part of the overall stakeholder group. The TAC was composed of technical authorities who could provide experience and guidance on how to mitigate potential contentious issues. The following agencies and organizations were approached:

- Brampton Fire and Emergency Services
- City of Brampton
- Caledon Fire and Emergence Services
- Town of Caledon
- Dufferin Peel Catholic District School Board
- Peel District School Board
- Peel Region Police
- Credit Valley Conservation Authority
- Toronto and Region Conservation Authority
- Aboriginal Affairs and Northern Development Canada
- Ontario Provincial Police
- Ministry of Aboriginal Affairs
- Ministry of Culture
- Ministry of Municipal Affairs and Housing
- Ministry of Natural Resources
- Ministry of the Environment
- Ministry of Tourism and Culture
- Ministry of Transportation
- Orangeville Brampton Railway
- Snelgrove Plaza Inc.
- Brampton Flight Centre

Those agencies that became part of the TAC were:

- City of Brampton
- Valley Conservation Authority
- Ministry of Transportation
- Ministry of Tourism and Culture
- Ministry of Natural Resources
- Town of Caledon
- Toronto and Region Conservation Authority
- Brampton Flight Centre
- Snelgrove Plaza Inc.

7.2.1.2 Aboriginal Consultation During Phase 1

Aboriginal Consultation was undertaken from the outset to further enhance the consultation process. Contact with the following parties involved in Aboriginal issues and Aboriginal groups were undertaken at the outset of the project. Letters were mailed directly to the following parties On December 7th, 2010:

- Ministry of Aboriginal Affairs
- Aboriginal Affairs and Northern Development Canada
- Chiefs of Ontario Office
- Six Nations Council
- Six Nations of the Grand River Territory
- Peel Aboriginal Network
- Asnishinabek Nation / Union of Ontario Indians
- Chippewas of Georgina Island
- Credit River Metis Council
- Curve Lake First Nations
- Mississaugas of the New Credit First Nation
- Mississaugas of the Scugog Island
- Haudenosaunee Confederacy Chiefs Council
- Metis Nation of Ontario Head Office

7.2.2 Comments Received during Phases 1& 2

Only minor interest in the project was shown by the public and review agencies at the outset of the project, with only three agencies and no public members providing comments on the project during Phase 1 and Phase 2 (see **Table 7-1**). Select correspondence received can be found in **Appendix B**.

Table 7-1 - Summary of Comments Received During Phase 1& Phase 2

Review Agency	Summary of Comments Received	Consideration of Comments Received

Ministry of Environment	• Ministry of Environment identified issues of concern including:
	  • Ecosystem protection and restoration
	  • Surface Water
	  • Groundwater
	  • Air Quality
	  • Contaminated Soils
	  • Mitigation and Monitoring
	  • Planning and Policy
	  • Class EA Process
	  • First Nations Consultation
	• Details for each area above are listed for addressing the issues effectively.
		• The areas of concern outlined in the letter will be taken into consideration where applicable when addressing potential effects associated with the project.
		• Where possible a copy of the Draft ESR will be provided for review. This is dependent upon the project schedule.
		• Ministry of Environment were invited to become members of the TAC and subsequently joined.

Toronto and Region Conservation Authority (TRCA)	• TRCA provided to the Region the following information: • areas of interest, • service delivery standards and • recommended submissions. • TRCA noted that mapping was provided on July 30, 2010 and that a site visit with TRCA will be required to identify impacts to watercourses and wetlands as well as TRCA Property • Would like a copy of the ESR when available	• The areas of concern outlined in the letter will be taken into consideration where applicable when addressing potential effects associated with the project. • Where possible a copy of the Draft ESR will be provided for review. This is dependent upon the project schedule. • TRCA were invited to become members of the TAC and subsequently joined.
Ministry of Natural Resources (MNR)	• Watercourse crossing (if required) should be designed as open span structures outside of the bank-full channel. • Culvert placement should be such that there are no impediments to fish movement through them. • All in-water work must be completed within the	• The areas of concern outlined in the letter will be taken into consideration where applicable when addressing potential effects associated with the project. • Comments noted, will notify for continued involvement.

Table 7-1 - Summary of Comments Received During Phase 1& Phase 2

Review Agency	Summary of Comments Received	Consideration of Comments Received
	appropriate timing windows for fish species utilizing the watercourses. • Stormwater management measures for water quality control should be incorporated into the design for the road upgrades • Exposed areas should be kept to a minimum at all times in order to minimize the potential for erosion. All exposed surfaces should be re-stabilized and re-vegetated as soon as possible after construction. • Appropriate erosion and sediment controls must be used both during and after construction in order to minimize erosion and migration of silt off of the site. Erosion and sediment control measures must meet or exceed the requirements outlined in the Ministry of Transportation's Erosion and Sedimentation Control, Drainage Manual, Chapter F, and the Ministry of Natural Resources' Technical Guidelines for Erosion and Sediment Control.	• MNR was invited to be a member of the TAC and subsequently joined.
Snelgrove Plaza Inc.	• Are concerned with the disruption more construction will cause • The Region should be very cognizant with respect to accesses to existing businesses and plazas. • Disruptions to Mayfield Road raise concerns as main access is on Mayfield Road with secondary access off Colonel Bertram Way. • Surprised to see notice of more construction since Mayfield Road was recently widened less than 5 years ago. • Would like to be advised on how this study will differ from the work that was already completed.	• WSP noted that this is only a study and that actual construction (if any) would not likely be immediately implemented. • Snelgrove Plaza Inc. was invited to be members of the TAC. However, did not wish to attend meetings but would like to receive minutes of meetings as well as any additional information provided to other TAC Members.
Ministry of Tourism and Culture (MTC)	• Would like to be kept informed as the project proceeds through the EA Process. • An archaeological assessment will be required to complete the project in accordance with the EA Process. • Built heritage and Cultural Heritage Landscape will need to be examined within the Study Area • Built Heritage Checklist has been provided.	• MTC will be kept informed of the study progress and has been invited to be a member of the TAC. • An archaeological assessment will be completed as part of the study. • The provided checklist will be used to ascertain the extent of built heritage and cultural landscape.
Credit Valley Conservation (CVC)	• Only a portion of the Study Area falls within the jurisdiction of the CVC, this area is generally located west of Robertson Davies Drive / Cresthaven Road. • Permits may be required for grading or construction in the area • Alterations to watercourses in the area (i.e. culverts, bridges, ponds) will require permits. • The area falls within a regulatory storm flood plain and every effort should be made to ensure the protection of life and property from flood hazards. • A table land woodlot within the Study Area should be preserved • The Study Area is located within the Core Greenlands and is regulated by the Region • The Study Area provides contributing habitat for known species-at-risk. Consultation with MNR is advised as an Endangered Species Act permit may be required. • Watercourses in the area are managed as cool-water streams. Therefore, setbacks from watercourses must be maintained for new construction and grading • The Study Area is within the meander belt of	• CVC's comments will be taken into consideration during the EA Process. • CVC were invited to become members of the TAC and subsequently joined.

Table 7-1 - Summary of Comments Received During Phase 1& Phase 2

Review Agency	Summary of Comments Received	Consideration of Comments Received
	Fletcher's Creek. • EA Study objectives should also identify and quantify the environmental constraints and enhancement opportunities with the Study Area. • The project should include stormwater quality and quantity control measures. • Erosion and Sedimentation Control Measures should be recommended to the detail designer. • Would like to be kept informed as the project develops.	
Infrastructure Ontario (IO)	• IO does not own or manage any properties within the Study Area.	• IO was removed from future direct mailings.
Peel District School Board	• No comments at this time. • Would like to receive updates on study progress so that it may monitor and provide comments if required.	• Peel District School board will be kept up-to-date with the project findings.
Aboriginal Affairs and Northern Development Canada	• There is current litigation within the Study Area involving the Alderville, Beausoleil, Chippewas of Georgina Island, Chippewas of Rama, Curve Lake, Hiawatha, and Mississaugas of Scugog Indian Bands, vs. HTMQ and Ontario. • There is also active litigation within the Study Area involving Moose Deer Point First Nation, Chief Edward Williams vs Her Majesty the Queen in Right of Ontario. • The outcomes of the above noted litigation cases may affect the ownership of land within the Study Area.	• The EA Team will continue to follow the cases and will update Aboriginal Affairs and Northern Development Canada of any property requirements which may be required to facilitate any proposed improvements.
Rogers Cable Communication Inc.	• Rogers has aerial and buried cables within the Study Area. • Would like to be kept informed as the project develops so that they can establish potential changes, modifications or relocations as required.	• Rogers will be provided with updates as they are made available.

7.2.3 EA Phase 2 Consultation

7.2.3.1 Project Meetings

The Project Team met TRCA and the TAC during Phase 2 of the Class EA process prior to the First Public Information Centre (PIC). The meetings were held on March 11, 2011 and September 28, 2011 to:

- introduce the project and the Study Process;
- identify data collection to-date;
- convey the Problem/Opportunity Statement;
- present the findings of the Existing Conditions studies;
- identify Alternative Solutions to be considered;
- outline the study schedule; and
- identify the next steps in the study process.

The purpose of the meetings was to allow the TRCA and TAC to provide comments and input prior to presenting the collected data to the public at PIC No. 1. Summarized minutes of these meetings can be found in **Appendix O**.

Comments received during the TRCA Meeting are summarized in **Table 7-2**.

Table 7-2 - Summary of TRCA Issues

Comments Provided By	Summary of Comments Received	Consideration of Comments Received
TRCA	• Stormwater Management Quality Control	• 100 year post-development peak follows to pre-development peak flows • Enhanced level of treatment (level 1) • Recommendations for mitigation measures to be provided by WSP
TRCA	• Stormwater Management Erosion Control	• 25 mm Storm runoff detained for 48 hours • Recommendations for mitigation measures to be provided by WSP
TRCA	• Stormwater Management Water Balance	• Retention of runoff from the first 5mm rainfall onsite through infiltration, evaporation and/or reuse • Recommendations for mitigation measures to be provided by WSP
TRCA	• Effect on existing watercourses as habitats	• Fisheries Compensation Plan • Recommendations for mitigation measures to be provided by WSP
TRCA	• Increases in sediment deposits near storm water management ponds surrounding the Heart Lake Conservation Area	• Removal of sedimentation by Region of Peel and further action plan on reducing the increased sediment deposits
TRCA	• Stormwater Management Ponds do not appear to have been designed or built to accommodate design storm flows	• Review of existing storm water management ponds surround Heart Lake Conservation Area • Region of Peel to provide designs and as-builts to WSP for review
TRCA	• In water work will require a fish inventory	• WSP to conduct Detailed Fish Inventory •
TRCA	• Impacts to existing vegetation	• WSP to design Compensation Plan
TRCA	• Impacts to existing slopes within TRCA Regulated Areas	• Fill permits and design Sedimentation Control Plans will be required during detail design
TRCA	• Archaeological Impacts on TRCA Property	• TRCA to implement Archaeological study
TRCA	• Changes to existing roadway alignments	• WSP to provide preliminary roadway alignments to TRCA for review
TRCA	• Impacts to TRCA Regulated Areas	• Mitigation measures to be included in Final ESR Document

7.2.3.2 Public Information Centre No. 1

The first PIC was held on Wednesday, November 30, 2011 at the Peel Region Police Association Banquet Hall (10675 Mississauga Road, Brampton, Ontario, L7A 0B6) between 6:30PM and 8:30PM.

Notice of PIC No. 1 was provided through the following means:

- Letter mailed directly to review agencies, property owners and other identified project stakeholders on November 15, 2011
- Newspaper advertisement published as follows:

  The Brampton Guardian a) November 23, 2011

  The Caledon Enterprise b) November 25, 2011
- Bulk mail to all properties within approximately 1 km of the Study Area.
- Region of Peel Website (www.peelregion.ca).

See **Appendix A** for copies of the preceding notification materials and contact lists.

The purpose of the PIC was to present information on the problem/opportunity statement, project objectives, the Class EA processes being followed, the development and evaluation of alternative solutions to identify the recommended alternative solution. The display boards that were presented for public review can be found in **Appendix P**.

Visitors to the PIC were encouraged to review the information presented and provide comments and feedback before they left. The PIC followed a "drop-in" format in the first hour which allowed attendees to review the display information, present their comments and discuss them directly with Region of Peel and their consultants. Members of the project team were available to answer any questions at any time during the PIC. Fifteen (15) people signed the PIC attendance sheet.

7.2.3.3 Comments Received and their Consideration in the Project

Seven (7) comment sheets were received from the PIC; of the comment sheets received only one (1) was received at the PIC. The majority of the comments related to the following topics:

- Projected construction dates;
- Extent of property acquisition;
- Concerns regarding the number of proposed signalized intersections;
- Would not like to receive future correspondence; and
- Would like to continue receiving future correspondence;

Only minor interest in the project was shown by the public at the PIC, comments from PIC No. 1 are summarized below (see **Table 7-3**). Select correspondence received can be found in **Appendix B**.

Table 7-3 - Summary of Comments Received During PIC No. 1

Comments Provided By	Summary of Comments Received	Consideration of Comments Received
Clearbrook Developments Limited	• Would like to be kept informed of the study progress	• Added to list of individuals receiving project status updates and correspondence
Councillor Allan Thompson	• Expressed concern regarding the number of mid-block intersections between Chinguacousy Road and McLaughlin Road. • Further noted, that the Region's Goods Movements Working Group has recommended that no more than one (1) additional intersection be signalized	• Additional roundabout study was undertaken to identify if a roundabout could be utilized to minimize the number of signalized intersections. • Signalization will be based upon traffic requirements and recommendations
Dufferin-Peel Catholic District School Board (DPCDSB)	• Wish to be notified when improvement options are recommended as they may disrupt bus routes to schools in the future	• DPCDSB will continue to be notified of all study developments and will be provided with a copy of the PIC Materials if there is no one in attendance.
Infrastructure Ontario (formerly ORC)	• Infrastructure Ontario does not currently own any properties within the Study Area and would like to be removed from further notification lists	• Removed from further distribution of materials
Peel District School Board	• Wish to continue being informed of the Study and its findings.	• If no members of PDSB are present at the PIC, boards will be emailed for their reference/review.

Table 7-3 - Summary of Comments Received During PIC No. 1

Comments Provided By	Summary of Comments Received	Consideration of Comments Received
Resident Comment	• Would like to know when the widening of Mayfield Road between Chinguacousy Road and McLaughlin Road is slated to begin • Would like to know the extent of the widening • Would like to know if the woodlot south of property will be protected	• Widening would begin once the EA is completed and the detail design is completed. If widening is recommended, construction start is the Horizon Year 2021. • Proposed widening to be 6-lanes to accommodate future traffic • Woodlot will not be affected by work on Mayfield Road.
Resident Comment	• Would like to know the extent of the Mount Pleasant development within the context of the improvements to Mayfield Road	• Directed to Region of Peel website to obtain additional information

7.2.4 Aboriginal Consultation During Phase 2

Aboriginal Consultation was continued during Phase 2. The following First Nations and related parties were invited to PIC No. 1 by mail:

- Ministry of Aboriginal Affairs
- Aboriginal Affairs and Northern Development Canada
- Chiefs of Ontario Office
- Six Nations Council
- Six Nations of the Grand River Territory
- Peel Aboriginal Network
- Asnishinabek Nation / Union of Ontario Indians
- Chippewas of Georgina Island
- Credit River Metis Council
- Curve Lake First Nations
- Mississaugas of the New Credit First Nation
- Mississaugas of the Scugog Island
- Haudenosaunee Confederacy Chiefs Council
- Metis Nation of Ontario Head Office

Comments received during Phase Two of the project from First Nations are summarized below in **Table 7-4**). Select full correspondence received can be found in **Appendix B**.

Table 7-4 - Summary of Comments Received Regarding First Nations During Phase Two

Comments Provided By	Summary of Comments Received	Consideration of Comments Received
Curve Lake First Nations	• Please include Williams Treaty (WT) Coordinator in all future correspondence. • No concerns regarding the project as yet. • If ancestral remains are unearthed during construction, Curve Lake First Nations should be contacted immediately.	• WT Coordinator was forwarded notices of commencement and PIC. • WT Coordinator added to contact list for future correspondence. • Provisions will be included in construction tender to address the discovery of remains during construction.

Table 7-4 - Summary of Comments Received Regarding First Nations During Phase Two

Comments Provided By	Summary of Comments Received	Consideration of Comments Received
Ministry of Aboriginal Affairs (MAA)	• MAA reviews claims from First Nation and Metis Communities that have interest in: reserves, land claims or claims in litigation, existing or asserted Aboriginal treaty rights, and an interest in the project's potential environmental impacts • The project Study Area is within the territories of: Six Nations of the Grand River Territory, Haudenosaunee Confederacy Chiefs Council, and Mississaugas of the New Credit First Nations • Aboriginal Affairs and Northern Development Canada should also be consulted.	• First Nations and Metis Communities noted were already contacted.
The Credit River Metis Council **The Metis Nation of Ontario**	• Would like to review the EA planning and design process then present a report to Council. • Requested if any archaeological field work has been conducted in the area.	• Information regarding the EA Planning process is available on the Region's website and was presented at the PIC. • A Stage 1 Archaeological investigation was undertaken.

7.2.5 EA Phase 3 Consultation

7.2.5.1 Meeting with Agencies

Meeting with the Technical Advisory Committee (TAC) were held during the identification and evaluation of Alternative Design Concepts.

TAC Meeting No. 2 was held on October 17th, 2013 to discuss the following:

- Summary of TAC No.1 and PIC No.1
- Work completed since TAC No.1 and PIC No.1
- Design Alternatives
- Evaluation of Alternatives
- Overview of Preferred Design

A summary of the comments received from the TAC Meeting No. 2 and their consideration are summarized below and Appendix **O** provides the minutes from the meeting.

Table 7-5 - Summary of Comments Received During TAC Meeting No. 2

Comments Provided By	Summary of Comments Received	Consideration of Comments Received
Region of Peel	• Would like to know why average delay per vehicle for the intersection at Mayfield Road and Inder Heights Drive in the 2031 Capital Project Improvements Travel Delay Analysis maintained as red	• Inder Heights Drive will continue to be unsignalized in 2031 since traffic signals are not warranted at the intersection. The northbound left turn from Inder Heights Drive and southbound traffic from Snellview Boulevard will experience long delays due to the volume of traffic on Mayfield Road and limited gaps that will be available for making left turns onto Mayfield Road. • The southbound lane from Snellview Boulevard would have an alternate route to avoid the long delays at Mayfield Road through the subdivision, getting direct access to Kennedy Road and turn left at the signalized Kennedy Road intersection.
Region of Peel	• Needs to review the Storm Water Management Pond volumes north of Mayfield Road between Chinguacousy Road and Orangeville Railway	• Town of Caledon and Region of Peel would work together to make sure the sizing of the ponds is enough to accommodate roadway drainage at detail design stage.

Table 7-5 - Summary of Comments Received During TAC Meeting No. 2

Comments Provided By	Summary of Comments Received	Consideration of Comments Received
CVC	• Wish to confirm alternative when the SWM Ponds are not in place by 2031	• Requirements would be provided in this EA to specify interim design has to follow CVC and MNR standards/guidelines. • There is enough space within the 50.5m to 55.5m right-of-way to accommodate interim quality measures.
Region of Peel	• Would like to know if the drainage problem caused by the storm on July 8th, 2013 for Mayfield Road between Chinguacousy Road and McLaughlin Road would result in requirement changes from CVC	• CVC stated that it would most likely lead to review of regional flood mapping, which is a more long term change. For the time being, a 100-year standard is appropriate.
CVC	• How requirement of 10m setback for the Woodlot mitigation described in the proposed environmental mitigation was determined. • Suggested changing the statement to "a minimum 10m setback will be provided"	• 10m is a standard distance but the new Mayfield Road right-of-way on the south side is much more than 10m from the woodlot. • Agreed and should be incorporated into the EA.

7.2.5.2 Public Information Centre No. 2

The second Public Information Centre (PIC) was held on November 27, 2013 at the Peel Police Association Banquet Hall (10675 Mississauga Road, Brampton, Ontario, L7A 0B6) between 6:30PM and 8:30PM.

Notification of the second Public Information Centre (PIC) was provided through the following means:

- By letter mailed directly to review agencies, property owners and other identified project stakeholders on November 13, 2013.
- Newspaper advertisement published as follows:
  - The Brampton Guardian – November 14 & 21, 2013
  - The Caledon Enterprise – November 14 & 21, 2013
- Bulk mail to all properties within approximately 1 km of the Study Area.
- Region of Peel Website (www.peelregion.ca) on November 13, 2013.

See **Appendix A** for copies of the preceding notification materials and contact lists.

The purpose of the PIC was to present the design alternatives, the results of the evaluation process, the Recommended Designs, the project schedule, and the next steps. The display boards that were presented for Public review can be found in **Appendix P**.

Visitors to the PIC were encouraged to review the information presented and provide comments and feedback before they left. The PIC followed a "drop-in" format which allowed attendees to review the display information, present their comments and discuss them directly with Region of Peel and their consultants. Members of the project team were available to answer any questions at any time during the PIC. The PIC was attended by twenty-five (25) people.

7.2.5.3 Comments Received and their Consideration in the Project

There were a total of six (6) comment sheets received from the PIC; of the comment sheets received none was received at the PIC and all were submitted through e-mail, post or telephone conversations with the Project Team. **Appendix B** provides copies of all comments received, and a summary of the comments received during PIC No. 2 is listed below:

Table 7-6 - Summary of Comments Received during PIC No. 2

Comments Provided By	Summary of Comments Received	Consideration of Comments Received
Allstream Inc.	• Do not have any plant within 2m of proposed install. • Allstream has no existing plant in the area indicated in your submission. No mark-up and no objection.	• Noted.
City of Brampton – Planning & Infrastructure Services	• Region of Peel is responsible to keep existing street lighting operational at all times during the project duration. • Region of Peel is to notify the City of Brampton at 905-874-2500 before making changes to the street lighting system along the projected path of the EA.	• Noted.
Brampton Transit	• At intersections where there are dedicated right turn lanes, Brampton Transit will require farside bus bays with passenger amenities (landing pads and shelter pads). • At intersections where there is no dedicated right turn lane, Brampton Transit will require nearside bus stops with passenger amenities (landing pads and shelter pads).	• Noted.
Brampton Bicycle Advisory Committee	• Bicycle facilities that are currently available on regional roads in Brampton are both limited and lack the necessary level of continuity and safety elements. • Mayfield has the potential to be a significant east-west cycling commuter route as additional residential and commercial development continues along Brampton's northern boundary and in Caledon South. • Mayfield implementation will need to be an improvement from the current standard. • Consideration in the design should be given to the installation of bike boxes at busy intersections as well as ramps connecting the path to street level at intersections allowing access to the bike boxes and accommodating the smooth flow of cyclists through the intersection.	• Consideration for a cycling facility was included as a component of the EA. Multi-use trail has been recommended consistent with the standards provided in the Region's Active Transportation Plan. • Intersection treatment recommendation noted. Specific intersection treatments will be considered at the detailed design phase.
GHD Canada	• Tried to pull up the display boards off the website but was unsuccessful. • Would like to look at the plan and profiles to see the elevations of the truck watermains to review any crossing conflicts with the development of the Mayfield West Secondary Plan.	• Directed to Region of Peel website for PIC material including display boards and roll plan. • Directed to Region of Peel Water Group to question watermain related questions.
Resident Comment	• Like the idea of having bicycle detection at the intersections along the multi-use path along Mayfield Road. This has long been an annoyance while bicycling on the road. • Would request to use Ontario Traffic Manual Book 18 in the final design and construction of the multi-use path or bicycling facilities. Especially for the transitions from multi-use path back to the road and through intersections. Bicycles are not legally allowed to ride through a pedestrian crosswalk, and should not be expected to do so. A separate bike lane or bike box should be installed. This would help limit the negative interactions between cyclists and vehicles through intersections. • A seamless path or on road bike lane would be the best option if possible. Enjoyed	• OTM Book 18 is a draft document un-adopted by the Province of Ontario. Design standards for this EA will be in accordance with the Region's Active Transportation Plan and Streetscape Guidelines. • OTM Book 18 includes a series of recommendations that bicycles be allowed to ride through modified crosswalks called "cross-rides" which are a combination of pedestrian crosswalk and bicycle crossing treatment. These recommendations include a requirement to modify the Highway Traffic Act, which is not adopted yet. The Region will work with the Province to pilot new design practices, as appropriate for intersection treatments. • Intersection treatment recommendation noted. Specific intersection treatments will be

Comments Provided By	Summary of Comments Received	Consideration of Comments Received
	cycling on the road and do not ride very much on multi-use paths. Pedestrians always seem to believe the cyclists are riding on a "sidewalk" and intersections are more dangerous than staying in the flow of traffic.	considered at the detailed design phase.
Resident Comment	• The study was well presented. • Would like to know the impacts of road widening and watermain installation on his property.	• Directed to Region of Peel Water Group to respond to question regarding water service to resident's property. • Directed to Region of Peel Realty Group to answer concerns on property impact.
Resident Comment	• Detail showing the amount of land to be purchased by the Region of Peel for the road widening was not illustrated/detailed.	• Detailed property requisition plan will be developed during detail design.
Resident Comment	• As EA's are generally good for 5 years, will addendums have to be issued when it comes to construction as most of the implementation will occur beyond the 5 year window. What will be considered when the EA review is done after the 5 year period. • Multi-use trails are important and should tie into the existing trail system wherever possible. • The existing speed limit from just west of Hurontario to Kennedy is set at 60 km/h. You have kept this as future speed limit as well with a design of 70 km/h. This section used to be set as 80 km/h and 70 km/h. Not sure why it was reduced. In my opinion 70 km/h seems more appropriate for the cross section and land use. I would suggest this change. It was also suggested that a design speed of 80 km/h be utilized as well regardless so that if the speed limit is not changed now at least there may be possibility of changing it in the future. • In the heavy rains that occurred during August 2009, the current SWM system was overwhelmed and resulted in overland flooding of several properties on Mayfield especially at Hurontario. Please keep that in mind during the storm design. Major system needs to get out to Etobicoke Creek in case of inlet clogging etc. May want to consider side inlet CB's. • May want to include snow storage areas for winter maintenance. • In the southbound left turn lanes of Hurontario at Mayfield Road there is significant pavement buckling. The pavement markings were recently changed to eliminate one of the left turn lanes but the buckled section of asphalt needs to be corrected as it is trip hazard for pedestrians crossing the street. It is also causing ponding which has a tendency to freeze up if not salted in a timely manner. • Would like to be kept on the contact list.	• As per MEA Class EA dated 2011, construction must commerce within 10 years of the filing of the Notice of Study Completion. Construction for all phases of the project will be within the 10 year time. • Noted, will investigate during detail design. • Speed limit was reduced through Region of Peel council resolution and by-law passed on April 11, 2013. • Proposed drainage will be designed to accommodate a 100 year storm event. • Noted, usage of side inlet CB's will be considered at detail design stage. • The proposed cross section will include at least 1 m boulevard on each side to accommodate additional snow storage. • The reconstruction of the intersection will correct these existing deficiencies. Region of Peel Maintenance will review possible interim solutions to pedestrian hazards. • Added to contact list

7.2.6 Aboriginal Consultation

A notice of PIC No. 2 was sent on November 14, 2013 by mail to the following Aboriginal groups:

- Ministry of Aboriginal Affairs
- Aboriginal Affairs and Northern Development Canada
- Chiefs of Ontario Office
- Six Nations Council
- Six Nations of the Grand River Territory
- Peel Aboriginal Network
- Asnishinabek Nation / Union of Ontario Indians
- Chippewas of Georgina Island
- Credit River Metis Council
- Curve Lake First Nations
- Mississaugas of the New Credit First Nation
- Mississaugas of the Scugog Island
- Haudenosaunee Confederacy Chiefs Council
- Metis Nation of Ontario Head Office

No comments were received from the Aboriginal groups.

8 Design Criteria and Recommended Design Concept

The design criteria and recommended design concept is provided in the following section.

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Mayfield Road Design Criteria

90km/h DESIGN SPEED
(Chinguacousy Road to 100m West of McLaughlin Road)

		PROPOSED DESIGN STANDARD	MINIMUM DESIGN STANDARD	
Roadway Classification		UAD90	UAD90	RMP Official Plan Classification: Major Road
Designated ROW in OP		50m (165ft)	50m (165ft)	RMP Official Plan
Posted Speed		80km/h (Existing)	80km/h (Existing)	
Road Grade		Maximum: 5% Minimum:0.5%	Maximum: 5% Minimum:0.5%	TAC page 2.1.3.3
Sag Curve K	**Headlight**	30 - 40	30 - 40	
	Comfort	15 - 20	15 - 20	
Crest Curve K	**Stopping Sight**	32 - 53	32 - 53	
	Passing Sight	350	350	
Horizontal Curve(s)		Minimum: 1500m Maximum: 5000m	340m	TAC Table 2.1.2.6
Stopping Sight Distance		130m – 170m	130m – 170m	TAC Table 1.2.5.3
Passing Sight Distance		610m	610m	TAC Table 1.2.5.5
Superelevation		4%	6% Maximum	TAC Section 2.1.2.2
Normal Road Crossfall		-2.0%	-2.0%	Region STD
Lane Width	**Through**	3.65m	3.65m	
	Median	Minimum: 2.00m Maximum 5.50m	Minimum: 2.00m Maximum 5.50m	
	Turning	3.50m	3.50m	
Taper Lengths at Intersection	**Right**	85m	85m	
	Left	Approach Taper – 190m Bay Taper – 70m	Approach Taper – 190m Bay Taper – 70m	
Deceleration Length	**Right**	170m	170m	
	Left	170m	170m	
Minimum Island Width		2.0m	2.0m	Region STD
Minimum Shoulder Width		N/A (section is urbanized)	1.0m	Region STD
Shoulder Crossfall		N/A (section is urbanized)	4% - 6%	Region STD
Slope Grading		Front Slope: 3:1 Backslope: 3:1	3:1 Max, 4:1 to 10:1 Preferred	Region STD
Curb and Gutter Type		OPSD 600.040	OPSD 600.040	
Asphalt Splash Pad		1.0m	1.0m	Region STD
Multi-Use Trail		3.00m	3.00m	Brampton TTMP

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80km/h DESIGN SPEED
(100m West of McLaughlin Road to 305m West of Hurontario Street)

		PROPOSED DESIGN STANDARD	MINIMUM DESIGN STANDARD
Roadway Classification		UAD80	UAD80 RMP Official Plan Classification: Major Road
Designated ROW in OP		50m (165ft)	50m (165ft) RMP Official Plan
Posted Speed		70km/h	70km/h (Existing)
Road Grade		Maximum: 5% Minimum:0.5%	Maximum: 5% Minimum:0.5% TAC page 2.1.3.3
Sag Curve K	**Headlight**	25 - 32	25 - 32
	Comfort	12 - 16	12 - 16
Crest Curve K	**Stopping Sight**	24 - 36	24 - 36
	Passing Sight	310	310
Horizontal Curve(s)		5000m	250m TAC Table 2.1.2.6
Stopping Sight Distance		115m – 140m	115m – 140m
Passing Sight Distance		550m	550m
Superelevation		4%	6% Maximum TAC Section 2.1.2.2
Normal Road Crossfall		-2.0%	-2.0% Region STD
Lane Width	**Through**	3.65m	3.65m
	Median	Minimum: 2.00m Maximum 5.50m	Minimum: 2.00m Maximum 5.50m
	Turning	3.50m	3.50m
Taper Lengths at Intersection	**Right**	85m	60m
	Left	Approach Taper – 190m Bay Taper – 70m	Approach Taper – 53m Bay Taper – 46m
Deceleration Length	**Right**	170m	115m
	Left	170m	115m
Minimum Island Width		2.0m	2.0m Region STD
Minimum Shoulder Width		N/A (section is urbanized)	1.0m Region STD
Shoulder Crossfall		N/A (section is urbanized)	4% - 6% Region STD
Slope Grading		Front Slope: 3:1 Backslope: 3:1	3:1 Max, 4:1 to 10:1 Preferred Region STD
Curb and Gutter Type		OPSD 600.040	OPSD 600.040
Asphalt Splash Pad		1.0m	1.0m Region STD
Multi-Use Trail		3.00m	3.00m Brampton TTMP

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70km/h DESIGN SPEED
(305m West of Hurontario Street to 100m West of Heart Lake Road)

		PROPOSED DESIGN STANDARD		MINIMUM DESIGN STANDARD		
Roadway Classification		UAD70	Over Snelgrove Bridge (UAU70)	UAD70	RMP Official Plan Classification: Major Road	
Designated ROW in OP		50m (165ft)		50m (165ft)		RMP Official Plan
Posted Speed		60km/h		60km/h (Existing) + 80km/h (Existing)		
Road Grade		Maximum: 5%	Minimum:0.5%	Maximum: 5%	Minimum:0.5%	TAC pg 2.1.3.3
Sag Curve K	**Headlight**	20 - 25		25 - 32		
	Comfort	10 - 12		12 - 16		
Crest Curve K	**Stopping Sight**	16 - 23		24 - 36		
	Passing Sight	250		310		
Horizontal Curve(s)		Minimum: 1500m	Maximum: 5000m	190m		TAC Table 2.1.2.6
Stopping Sight Distance		95m – 110m		95m – 110m		TAC Table 1.2.5.3
Passing Sight Distance		490m		490m		TAC Table 1.2.5.5
Superelevation		4%		6% Maximum		TAC Section 2.1.2.2
Normal Road Crossfall		-2.0%		-2.0%		Region STD
Lane Width	**Through**	3.65		3.65		
	Median	2.00m		Minimum: 2.00m	Maximum 5.50m	
	Turning	3.50m		3.50m		
Taper Lengths at Intersection	**Right**	70m		60m		
	Left	Approach Taper – 150m	Bay Taper – 65m	Approach Taper – 53m	Bay Taper – 35m	
Deceleration Length	**Right**	110m		95m		
	Left	110m		95m		
Minimum Island Width		2.0m		2.0m		Region STD
Minimum Shoulder Width		N/A (section is urbanized)		2.0m		Region STD
Shoulder Crossfall		N/A (section is urbanized)		4% - 6%		Region STD
Slope Grading		Front Slope: 3:1	Backslope: 3:1	3:1 Max, 4:1 to 10:1 Preferred		Region STD
Curb and Gutter Type		OPSD 600.040		OPSD 600.040		
Asphalt Splash Pad		1.0m		1.0m		Region STD
Multi-Use Trail		3.00m		3.00m		Brampton TTMP

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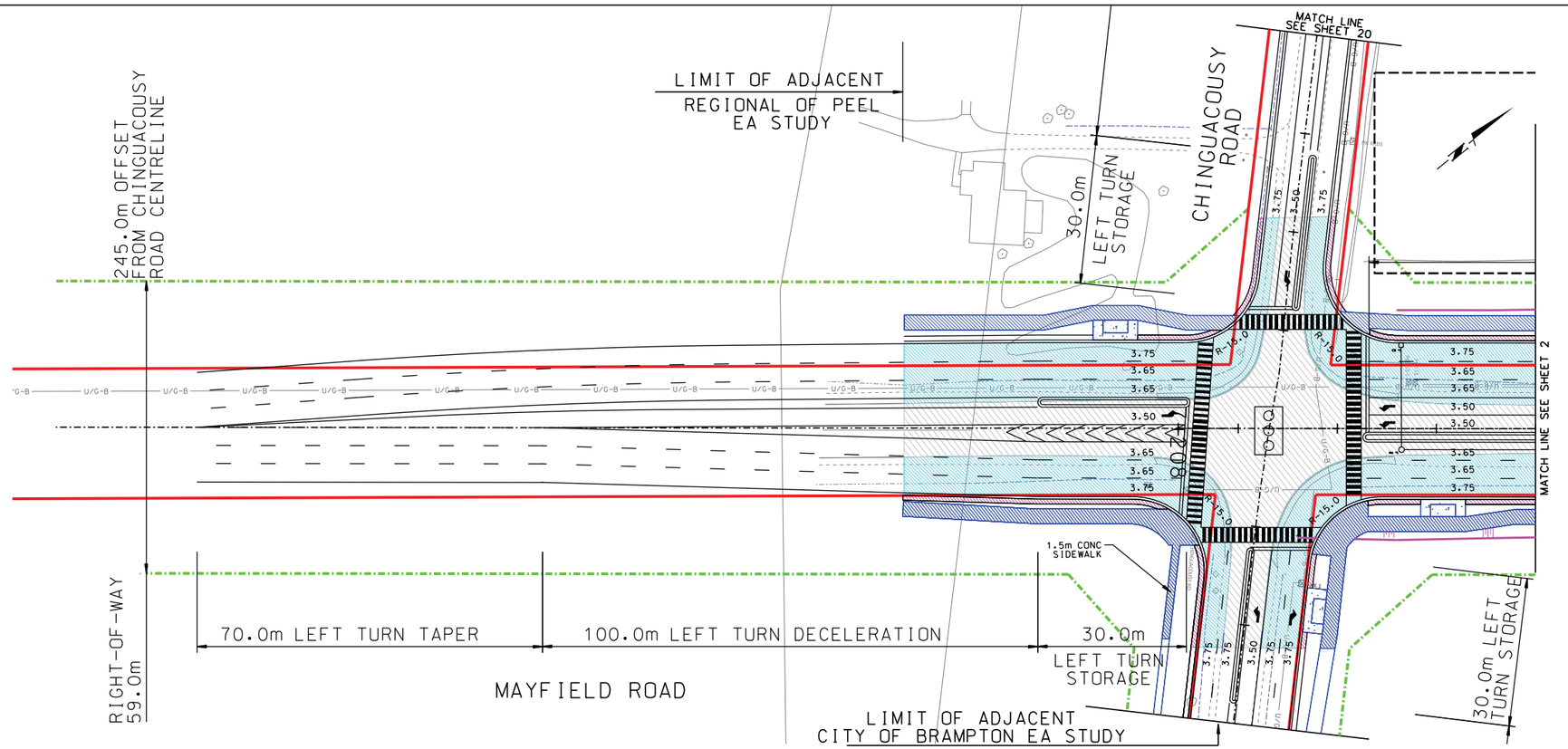
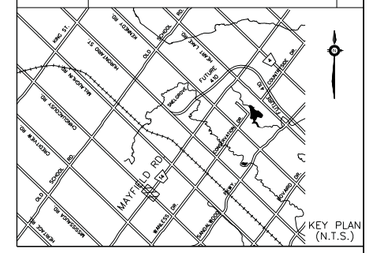
Figure 8-1 - Recommended Plan Plates



SERVICE DATA					
SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMAINS			HYDRO U/G CABLE		
TRANSIT			HYDRO ONE		
PARKS & REC.			CTV		
ONT. CLEAN WATER			COMMUNIC. CABLES		

REVISIONS		
DATE	DETAILS	INIT.



LEGEND

- EXISTING WATERCOURSE
- EXISTING RIGHT OF WAY
- PROPOSED RIGHT OF WAY
- TRCA REGULATION LIMIT
- DRIVEWAY GRADING
- REQUIRED EASEMENT
- REGION OF PEEL BUFFER ZONE
- EXISTING PAVEMENT
- PROPOSED PAVEMENT
- PROPOSED 3.0m MULTI-USE PATHWAY
- PROPOSED 1.0m SPLASH PAD
- CULVERT
- GRADING LIMITS
- EXISTING SIGNAL
- PROPOSED SIGNAL

General Notes

All Driveways Are ASPHALT Unless Otherwise Noted

All Water And Sanitary Service Locations Are Approximate And Must Be Located Accurately In The Field

All Pipes Size In mm

B.M. No. Elev.
Description
Location

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Designed by

Chkd.

Approved by

NOTICE TO CONTRACTOR

48 HOURS PRIOR TO COMMENCING WORK NOTIFY THE FOLLOWING

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HYDRO ONE NETWORKS

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ROGERS CABLE
ALLSTREAM
PSN (PUBLIC SECTOR NETWORK)
FUTUREWAY (FCI BROADBAND)

10m 0 10 20 30m HORIZONTAL SCALE

1m 0 1 2 3m VERTICAL SCALE

GENIVAR

Region of Peel
Working for you

ROAD IMPROVEMENTS AT

MAYFIELD ROAD
FROM CHINGUACOUSY ROAD TO HEART LAKE ROAD

PLAN AND PROFILE

CAD Area		Project No.	101-17262
Checked by V.M.	Drawn by M.B.	Plan No.	-D
Date JUL 2014	Sheet 1 of 23		

PROPOSED SWMP 1

80.0m LEFT TURN STORAGE

100.0m LEFT TURN DECELERATION

C1

RIGHT-OF-WAY 59.0m
245.0m OFFSET FROM
CHINGUACOUSY ROAD
CENTRELINE

130.0m LEFT TURN TAPER

MATCH LINE SEE SHEET 1

MATCH LINE SEE SHEET 3

℄ HORIZONTAL CONTROL

R=1200

OCT 7+200

OCT 7+400

OCT 7+600

PROP 1200mm PVC

70.0 LEFT TURN TAPER

MAYFIELD ROAD

Grade1 = -0.398%
Grade2 = 1.464%
K = 26.85
VC = 50.00m

Grade1 = 1.464%
Grade2 = -0.265%
K = 46.28
VC = 80.00m

BVC 7+294.92
ELEV 256.365

VPI 7+319.92
ELEV 256.266

EVC 7+344.92
ELEV 256.632

BVC 7+347.91
ELEV 256.675

VPI 7+387.91
ELEV 257.261

EVC 7+427.91
ELEV 257.155

TOP OF PAVEMENT

0.398%

1.464%

-0.265%

EXISTING GROUND

CULVERT 1
1200mm CSP

NEW WATERMAIN

256.425	256.350	256.382	256.564	256.837	257.034	257.145	257.169	257.123	257.070	257.017	256.964	256.911	256.858	256.805	256.752	PROP. ROAD ELEV.
256.46	256.35	256.41	256.41	256.43	256.47	256.49	256.49	256.45	256.49	256.48	256.35	256.41	256.40	256.39	256.44	EX. ROAD ELEV.
7+280	7+300	7+320	7+340	7+360	7+380	7+400	7+420	7+440	7+460	7+480	7+500	7+520	7+540	7+560	7+580	ROAD CHAINAGE

SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMAINS			HYDRO U/G CABLE		
TRANSIT			HYDRO ONE		
PARKS & REC.			CTV		
ONT. CLEAN WATER			COMMUNIC. CABLES		

REVISIONS

DATE	DETAILS	INIT.

KEY PLAN (N.T.S.)

LEGEND

- EXISTING WATERCOURSE
- EXISTING RIGHT OF WAY
- PROPOSED RIGHT OF WAY
- TRCA REGULATION LIMIT
- DRIVEWAY GRADING
- REQUIRED EASEMENT
- REGION OF PEEL BUFFER ZONE
- EXISTING PAVEMENT
- PROPOSED PAVEMENT
- PROPOSED 3.0m MULTI-USE PATHWAY
- PROPOSED 1.0m SPLASH PAD
- CULVERT
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All Pipes Size In mm

B.M. No. Elev.
Description
Location

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Designed by

Chkd.

Approved by

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10m 0 10 20 30m HORIZONTAL SCALE

1m 0 1 2 3m VERTICAL SCALE

WSP

Region of Peel
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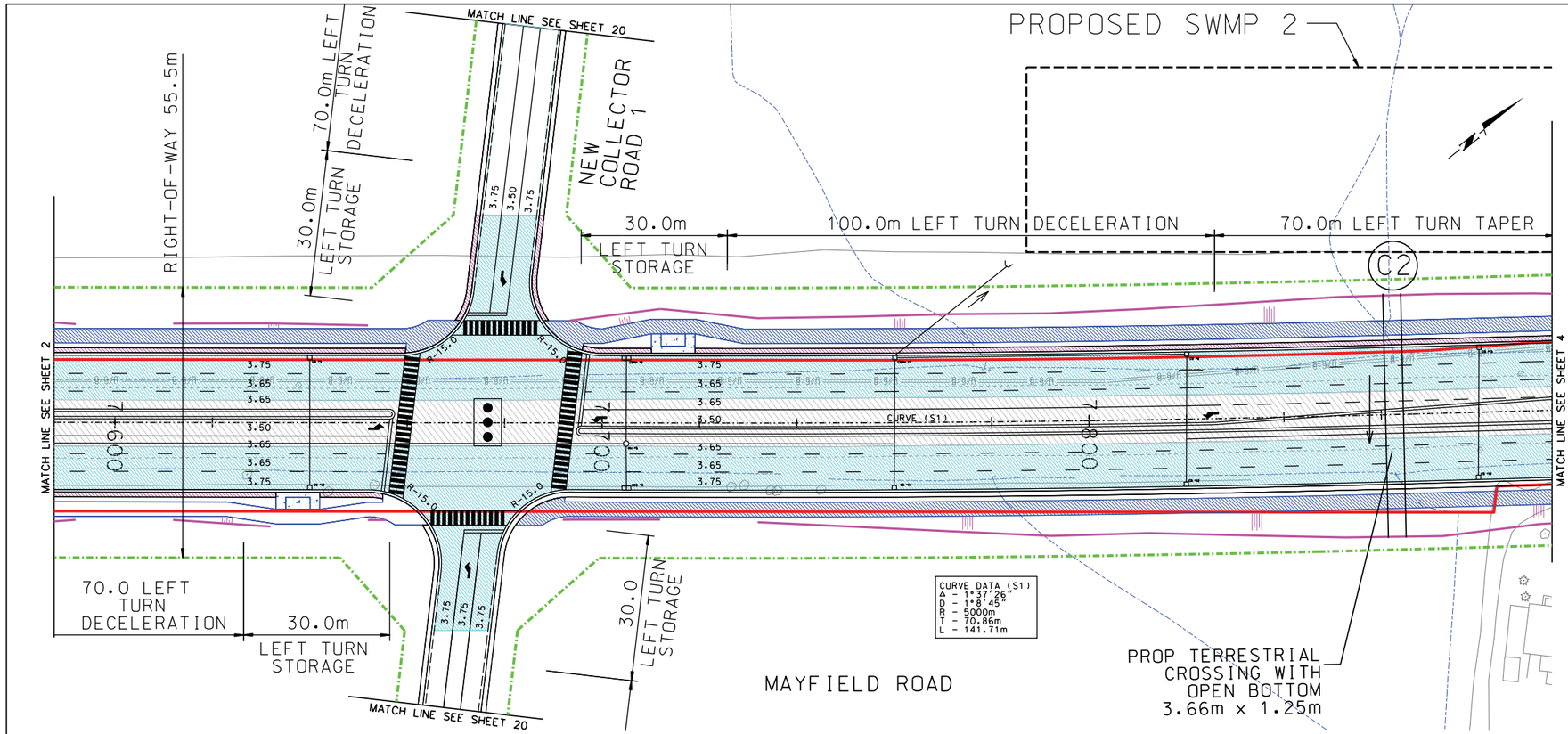
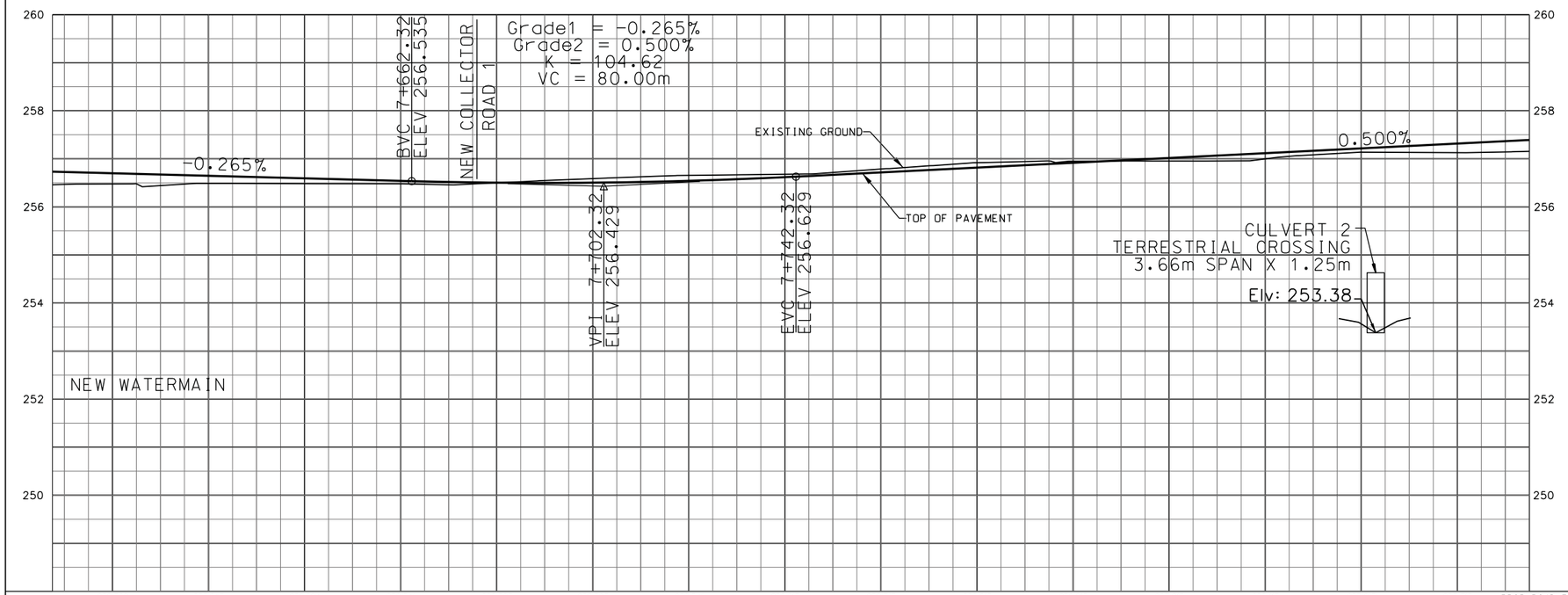
ROAD IMPROVEMENTS AT

MAYFIELD ROAD
FROM CHINGUACOUSY ROAD TO HEART LAKE ROAD

PLAN AND PROFILE

CAD Area		Project No.	101-17262
Checked by V.M.	Drawn by M.B.	Plan No.	-D
Date JUL 2014	Sheet 2 of 23		





256.700	256.647	256.594	256.541	256.503	256.503	256.541	256.617	256.717	256.817	256.917	257.017	257.117	257.217	257.317	PROP. ROAD ELEV.
256.48	256.49	256.48	256.48	256.50	256.59	256.66	256.68	256.79	256.92	256.95	256.95	257.00	257.14	257.13	EX. ROAD ELEV.
7+600	7+620	7+640	7+660	7+680	7+700	7+720	7+740	7+760	7+780	7+800	7+820	7+840	7+860	7+880	ROAD CHAINAGE

SERVICE DATA

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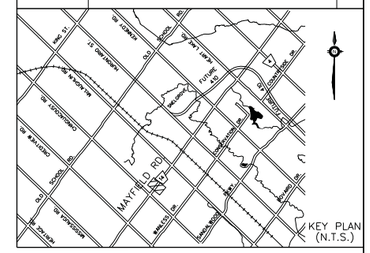
STORM SEWERS			BELL U/G CABLE		
WATERMAINS			HYDRO U/G CABLE		
TRANSIT			HYDRO ONE		
PARKS & REC.			CTV		
ONT. CLEAN WATER			COMMUNIC. CABLES		

REVISIONS

DATE	DETAILS	INIT.



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- EXISTING RIGHT OF WAY
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10m 0 10 20 30m HORIZONTAL SCALE

1m 0 1 2 3m VERTICAL SCALE

WSP

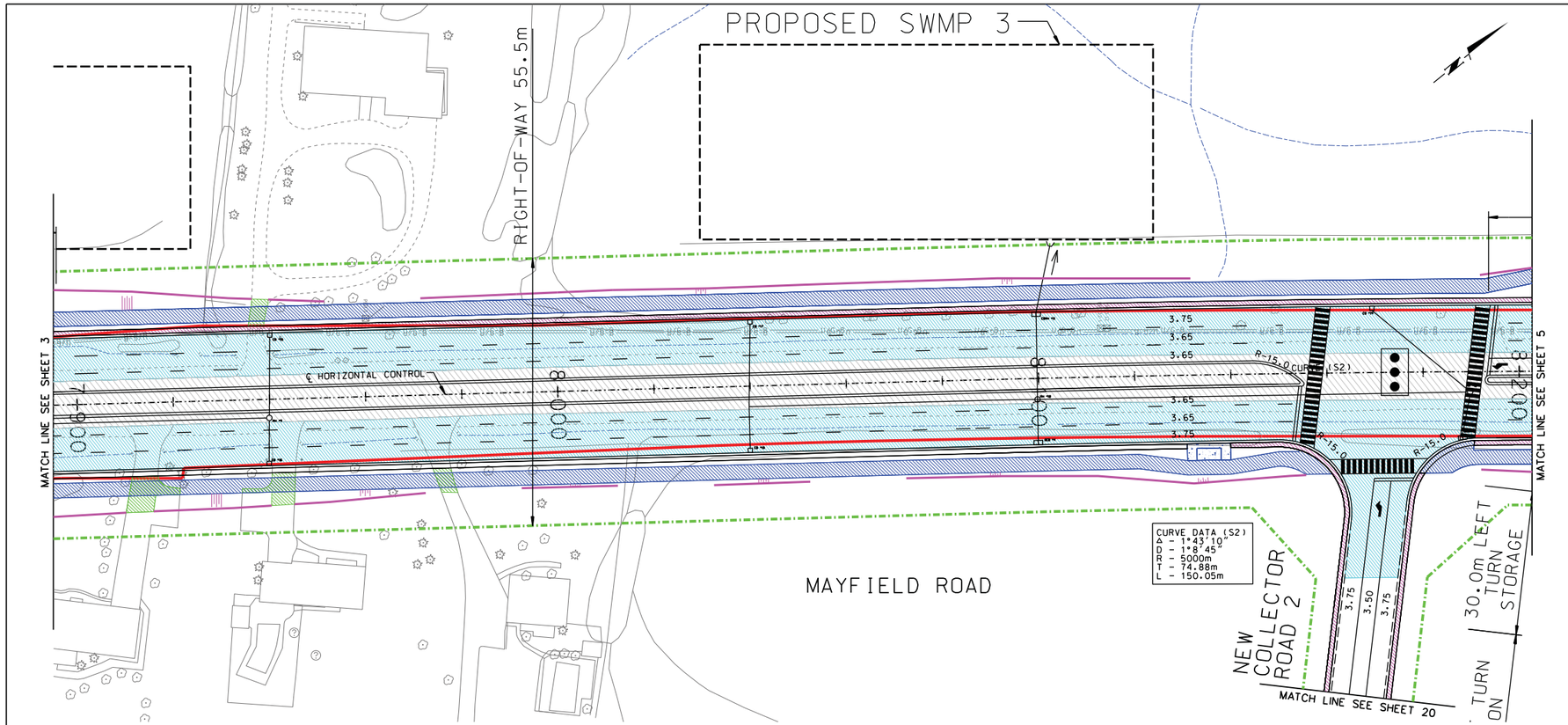
Region of Peel
Working for you

ROAD IMPROVEMENTS AT

MAYFIELD ROAD
FROM CHINGUACOUSY ROAD TO HEART LAKE ROAD

PLAN AND PROFILE

CAD Area		Project No.	101-17262
Checked by V.M.	Drawn by M.B.	Plan No.	-D
Date JUL 2014	Sheet 3 of 23		



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257.16	257.28	257.46	257.60	257.74	257.72	257.60	257.62	257.72	257.73	257.73	257.77	257.80	257.81	257.83	EX. ROAD ELEV.
7+900	7+920	7+940	7+960	7+980	8+000	8+020	8+040	8+060	8+080	8+100	8+120	8+140	8+160	8+180	ROAD CHAINAGE

SERVICE DATA

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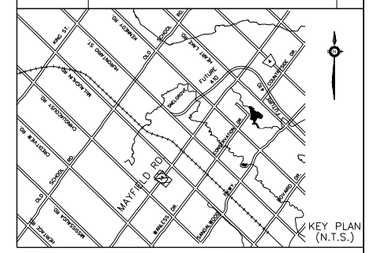
STORM SEWERS			BELL U/G CABLE		
WATERMAINS			HYDRO U/G CABLE		
TRANSIT			HYDRO ONE		
PARKS & REC.			CTV		
ONT. CLEAN WATER			COMMUNIC. CABLES		

REVISIONS

DATE	DETAILS	INIT.



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- PROPOSED RIGHT OF WAY
- TRCA REGULATION LIMIT
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- REQUIRED EASEMENT
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- EXISTING PAVEMENT
- PROPOSED PAVEMENT
- PROPOSED 3.0m MULTI-USE PATHWAY
- PROPOSED 1.0m SPLASH PAD
- CULVERT
- GRADING LIMITS
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10m 0 10 20 30m HORIZONTAL SCALE

1m 0 1 2 3m VERTICAL SCALE

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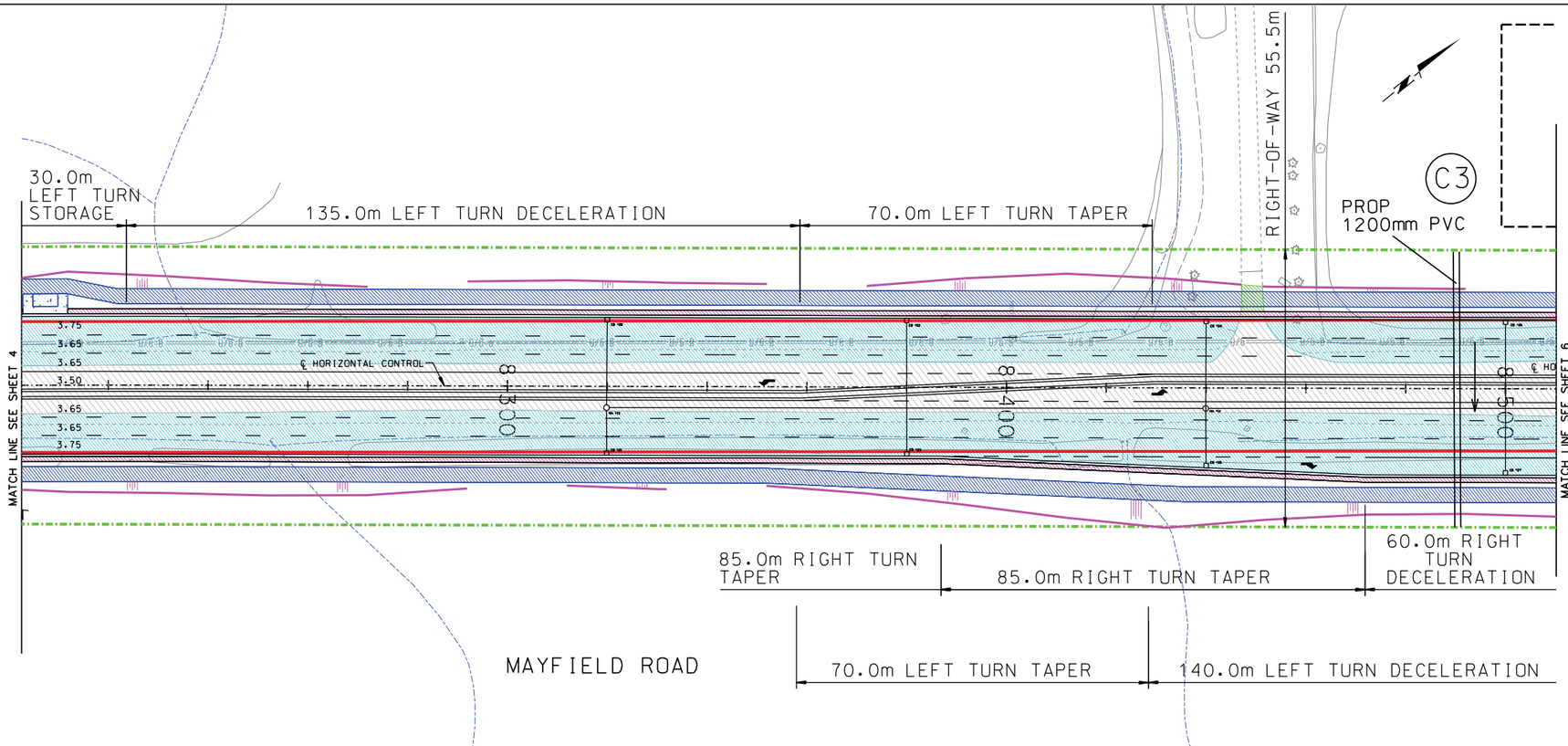
Working for you

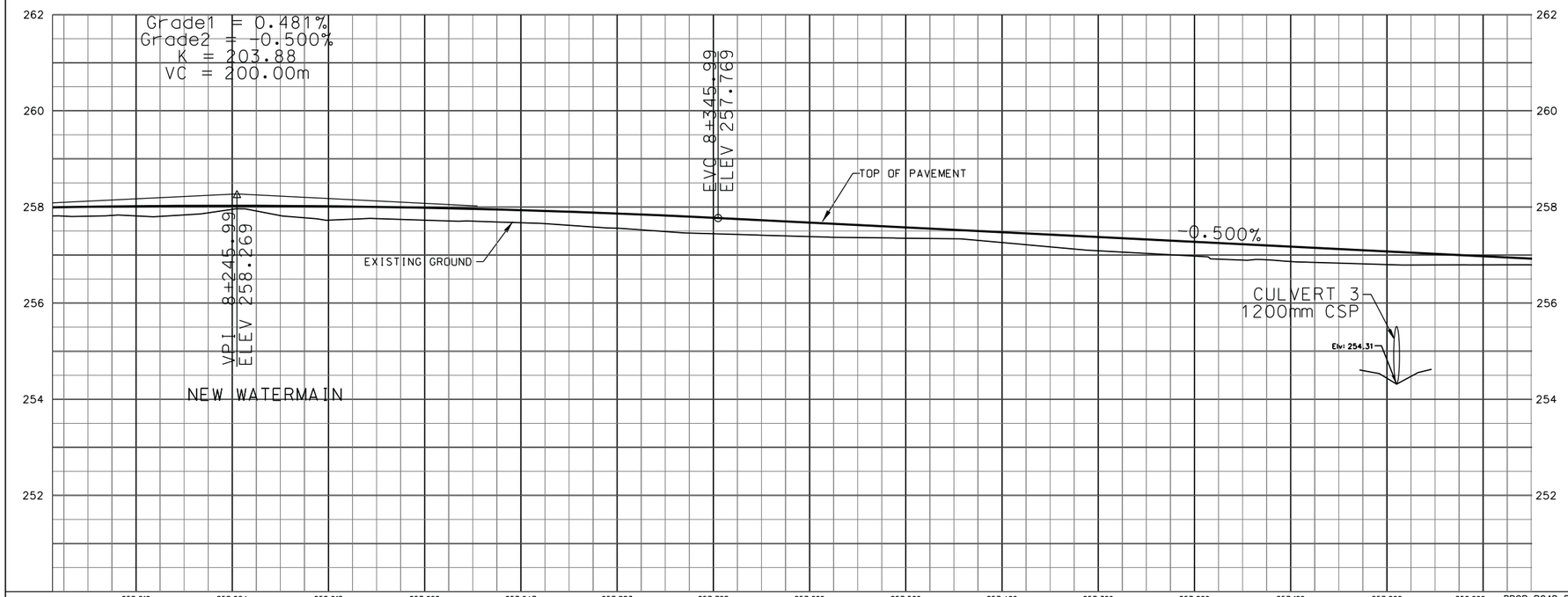
ROAD IMPROVEMENTS AT

MAYFIELD ROAD
FROM CHINGUACOUSY ROAD TO HEART LAKE ROAD

PLAN AND PROFILE

CAD Area		Project No.	101-17262
Checked by V.M.	Drawn by M.B.	Plan No.	-D
Date JUL 2014	Sheet 4 of 23		





258.010	258.024	258.018	257.992	257.947	257.883	257.798	257.699	257.599	257.499	257.399	257.299	257.199	257.099	256.999	PROP. ROAD ELEV.
257.82	257.88	257.78	257.74	257.69	257.58	257.46	257.40	257.36	257.31	257.13	257.01	256.90	256.82	256.80	EX. ROAD ELEV.
8+220	8+240	8+260	8+280	8+300	8+320	8+340	8+360	8+380	8+400	8+420	8+440	8+460	8+480	8+500	ROAD CHAINAGE

SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
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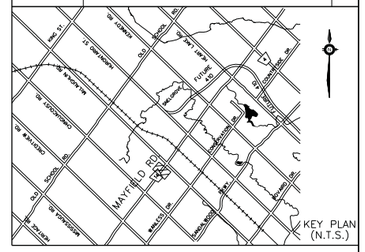
REVISIONS

DATE	DETAILS	INIT.



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- REGION OF PEEL BUFFER ZONE
- EXISTING PAVEMENT
- PROPOSED PAVEMENT
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48 HOURS PRIOR TO COMMENCING WORK NOTIFY THE FOLLOWING

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CITY OF MISSISSAUGA WORKS DEPT.
CITY OF BRAMPTON WORKS DEPT.
TOWN OF CALEDON WORKS DEPT.
BELL CANADA
ENBRIDGE INCORPORATED-GAS DISTRIBUTION
ONTARIO MINISTRY OF TRANSPORTATION
ONTARIO CLEAN WATER AGENCY
HYDRO ONE NETWORKS

CABLE TELEVISION/FIBREOPTIC PROVIDERS:
BELL CANADA
ENERSOURCE TELECOM
HYDRO ONE TELECOM
ROGERS CABLE
ALLSTREAM
PSN (PUBLIC SECTOR NETWORK)
FUTUREWAY (FGT BROADBAND)

10m 0 10 20 30m HORIZONTAL SCALE
1m 0 1 2 3m VERTICAL SCALE

WSP

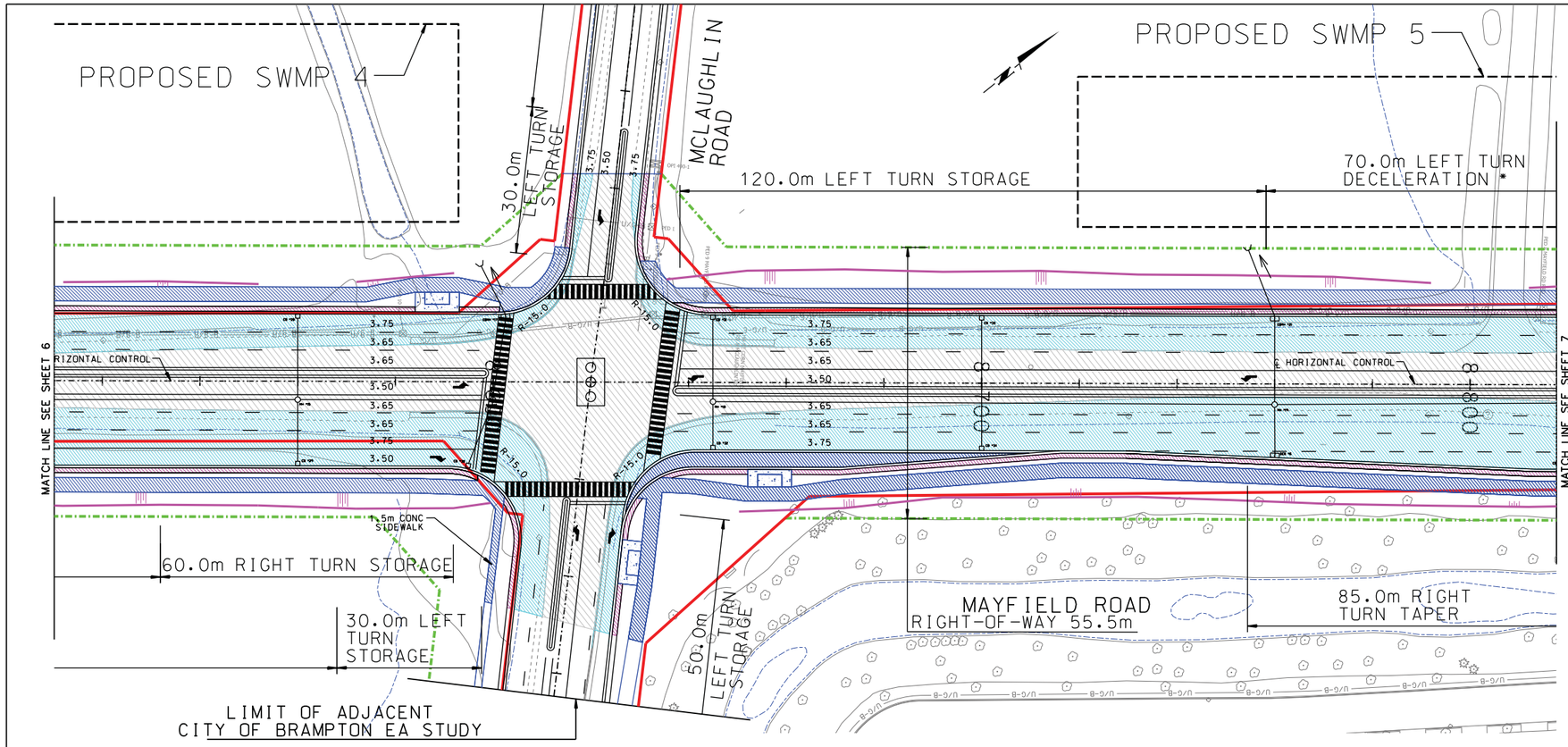
Region of Peel
Working for you

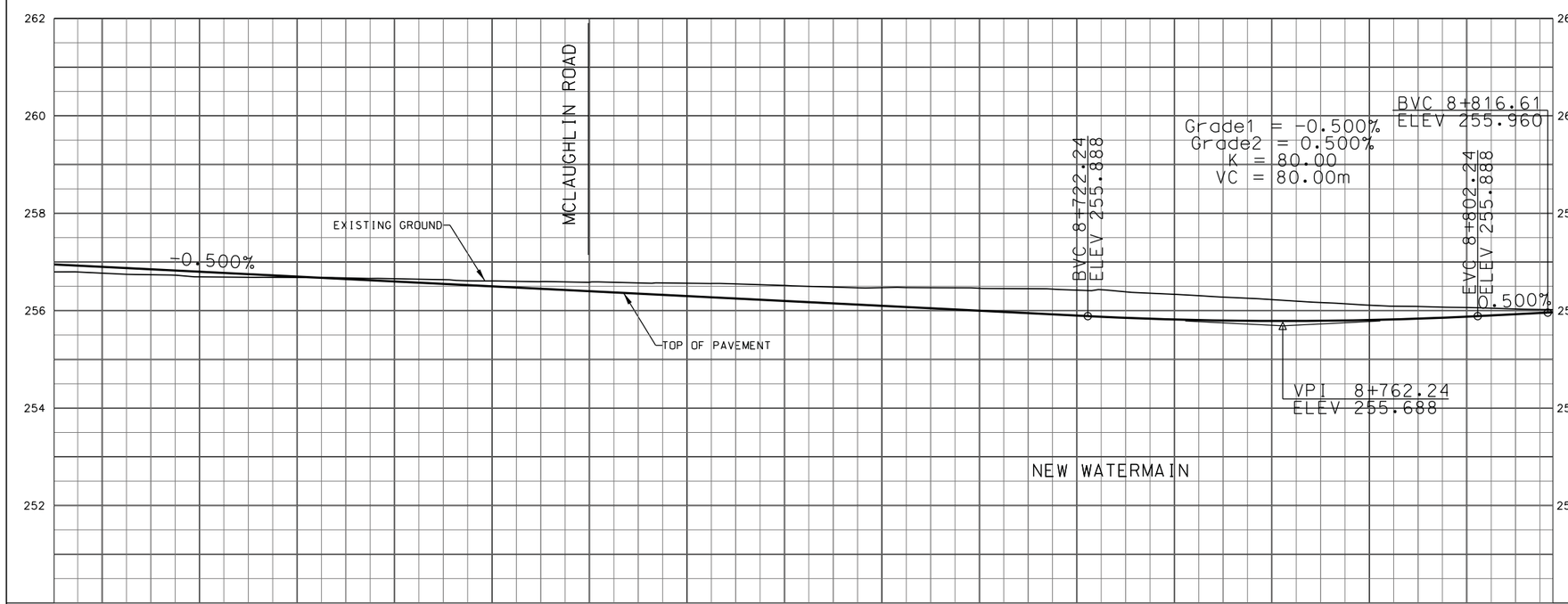
ROAD IMPROVEMENTS AT

MAYFIELD ROAD
FROM CHINGUACOUSY ROAD TO HEART LAKE ROAD

PLAN AND PROFILE

CAD Area		Project No.	101-17262
Checked by V.M.	Drawn by M.B.	Plan No.	-D
Date JUL 2014	Sheet 5 of 23		





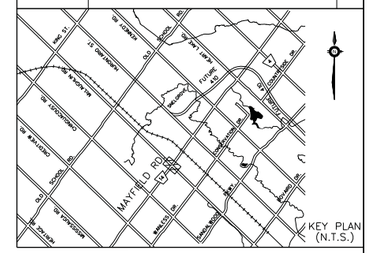
256.899	256.799	256.699	256.599	256.499	256.399	256.299	256.199	256.099	255.999	255.899	255.819	255.788	256.808	255.877	PROP. ROAD ELEV.
256.77	256.69	256.68	256.66	256.61	256.58	256.56	256.52	256.47	256.46	256.42	256.34	256.23	256.11	256.06	EX. ROAD ELEV.
8+520	8+540	8+560	8+580	8+600	8+620	8+640	8+660	8+680	8+700	8+720	8+740	8+760	8+780	8+800	ROAD CHAINAGE

SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMAINS			HYDRO U/G CABLE		
TRANSIT			HYDRO ONE		
PARKS & REC.			CTV		
ONT. CLEAN WATER			COMMUNIC. CABLES		

REVISIONS

DATE	DETAILS	INIT.



LEGEND

- EXISTING WATERCOURSE
- EXISTING RIGHT OF WAY
- PROPOSED RIGHT OF WAY
- TRCA REGULATION LIMIT
- DRIVEWAY GRADING
- REQUIRED EASEMENT
- REGION OF PEEL BUFFER ZONE
- EXISTING PAVEMENT
- PROPOSED PAVEMENT
- PROPOSED 3.0m MULTI-USE PATHWAY
- PROPOSED 1.0m SPLASH PAD
- CULVERT
- GRADING LIMITS
- EXISTING SIGNAL
- PROPOSED SIGNAL

General Notes

All Driveways Are ASPHALT Unless Otherwise Noted
All Water And Sanitary Service Locations Are Approximate And Must Be Located Accurately In The Field
All Pipes Size In mm

B.M. No. Elev.
Description
Location

The Contractor Is Responsible For Locating And Protecting All Existing Utilities Prior To And During Construction. Location Of Existing Utilities Approximate Only, To Be Verified In Field By Contractor.

Designed by

Chkd.

Approved by

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10m 0 10 20 30m — HORIZONTAL SCALE
1m 0 1 2 3m — VERTICAL SCALE

WSP

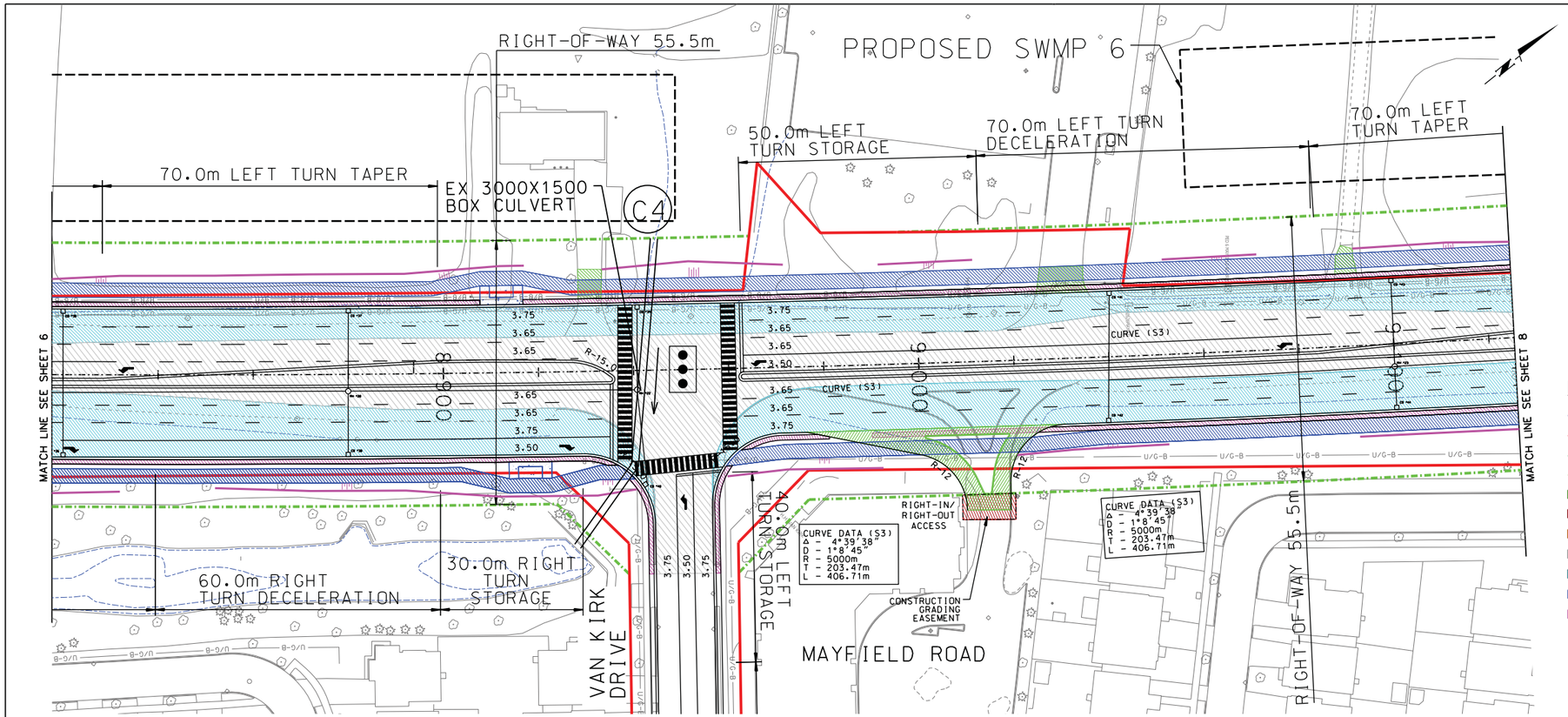
Region of Peel
Working for you

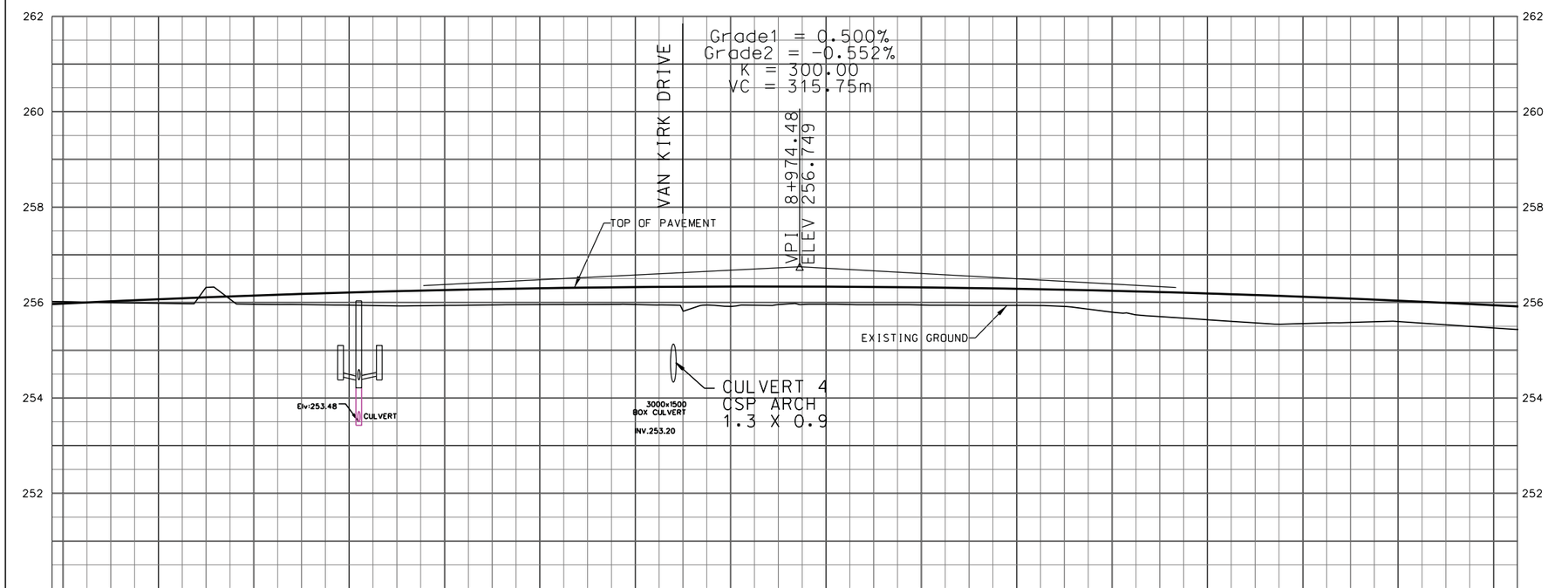
ROAD IMPROVEMENTS AT

MAYFIELD ROAD
FROM CHINGUACOUSY ROAD TO HEART LAKE ROAD

PLAN AND PROFILE

CAD Area		Project No.	101-17262
Checked by V.M.	Drawn by M.B.	Plan No.	-D
Date JUL 2014	Sheet 6 of 23		





255.977	256.068	256.145	256.210	256.261	256.299	256.323	256.334	256.332	256.316	256.287	256.245	256.189	256.121	256.038		PROP. ROAD ELEV.
256.02	255.98	255.96	255.94	255.94	255.96	255.96	255.93	255.96	255.95	255.94	255.81	255.64	255.56	255.60		EX. ROAD ELEV.
8+820	8+840	8+860	8+880	8+900	8+920	8+940	8+960	8+980	9+000	9+020	9+040	9+060	9+080	9+100		ROAD CHAINAGE

SERVICE DATA

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SAN SEWERS			GAS MAINS		
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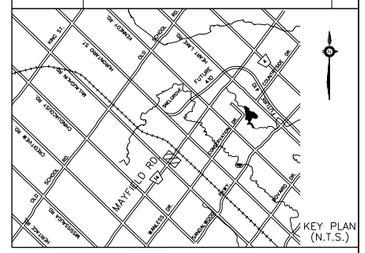
TRANSIT			HYDRO ONE		
PARKS & REC.			CTV		
ONT. CLEAN WATER			COMMUNIC. CABLES		

REVISIONS

DATE	DETAILS	INIT.



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- EXISTING WATERCOURSE
- EXISTING RIGHT OF WAY
- PROPOSED RIGHT OF WAY
- TRCA REGULATION LIMIT
- DRIVEWAY GRADING
- REQUIRED EASEMENT
- REGION OF PEEL BUFFER ZONE
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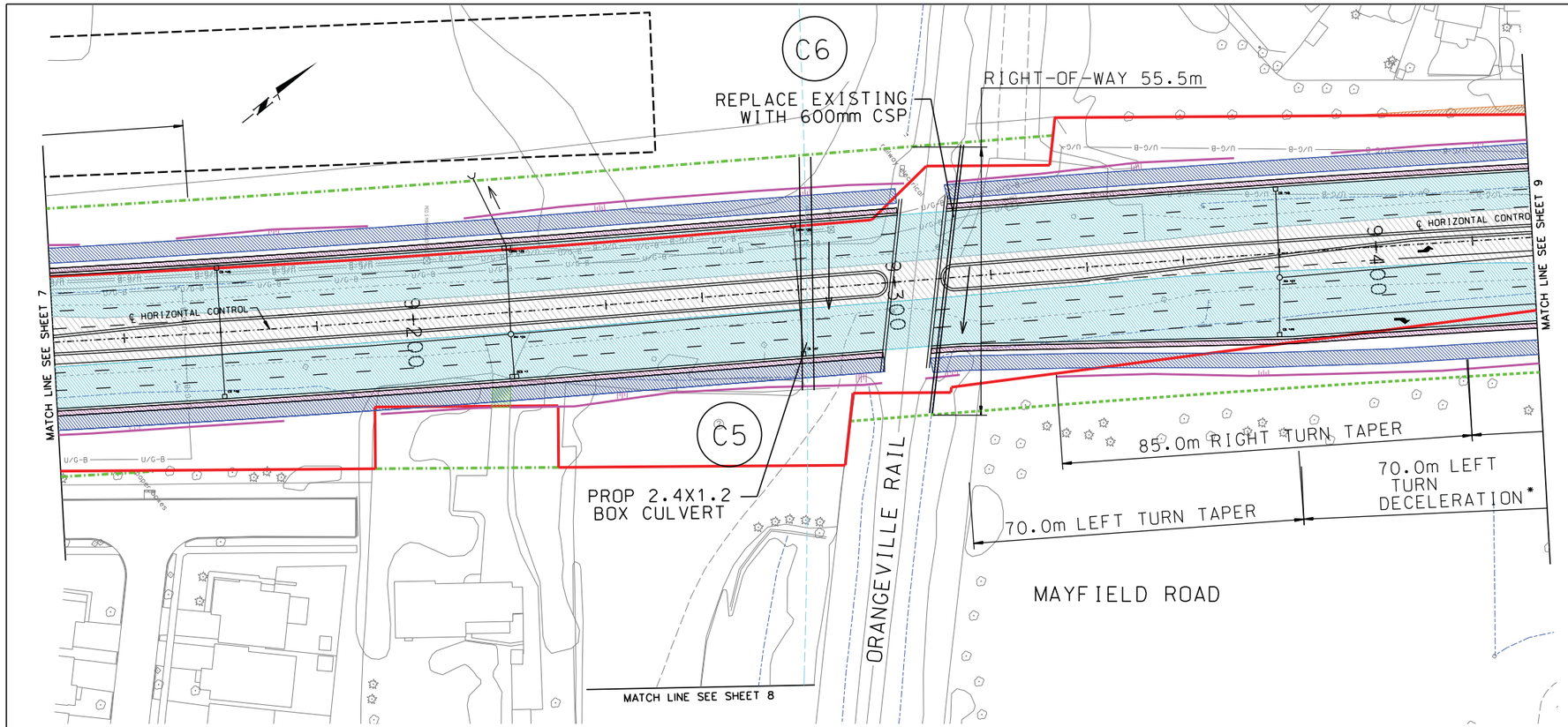
Working for you

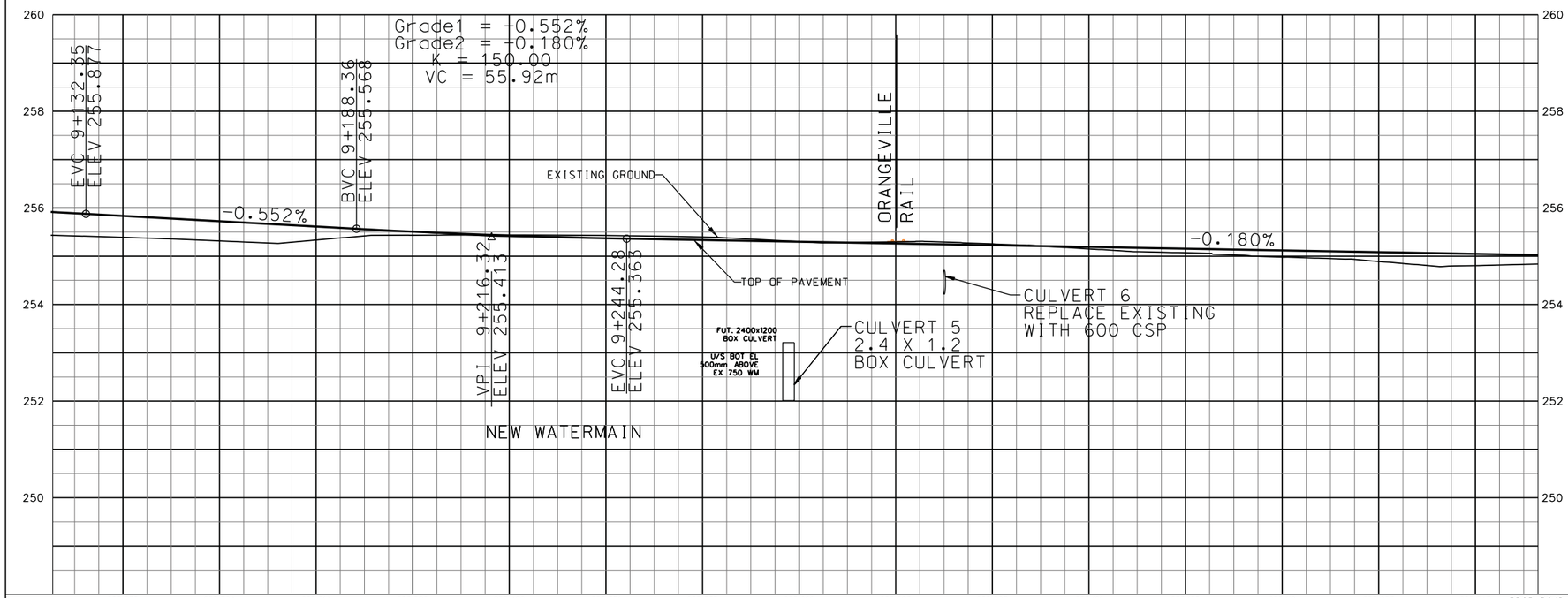
ROAD IMPROVEMENTS AT

MAYFIELD ROAD
FROM CHINGUACOUSY ROAD TO HEART LAKE ROAD

PLAN AND PROFILE

CAD Area		Project No.	101-17262
Checked by V.M.	Drawn by M.B.	Plan No.	- D
Date JUL 2014	Sheet 7 of 23		





255.835	255.724	255.614	255.508	255.426	255.371	255.335	255.299	255.263	255.227	255.191	255.155	255.119	255.083	255.047	PROP. ROAD ELEV.
255.39	255.32	255.33	255.43	255.44	255.43	255.40	255.30	255.30	255.26	255.15	255.07	254.98	254.89	254.80	EX. ROAD ELEV.
9+140	9+160	9+180	9+200	9+220	9+240	9+260	9+280	9+300	9+320	9+340	9+360	9+380	9+400	9+420	ROAD CHAINAGE

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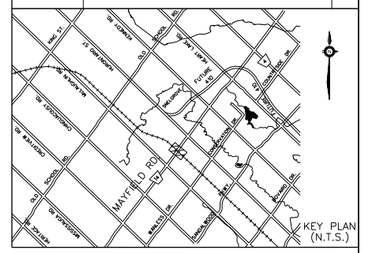
WATERMAINS			HYDRO U/G CABLE		
TRANSIT			HYDRO ONE		
PARKS & REC.			CTV		
ONT. CLEAN WATER			COMMUNIC. CABLES		

REVISIONS

DATE	DETAILS	INIT.



LEGEND

- EXISTING WATERCOURSE
- EXISTING RIGHT OF WAY
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- TRCA REGULATION LIMIT
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WSP

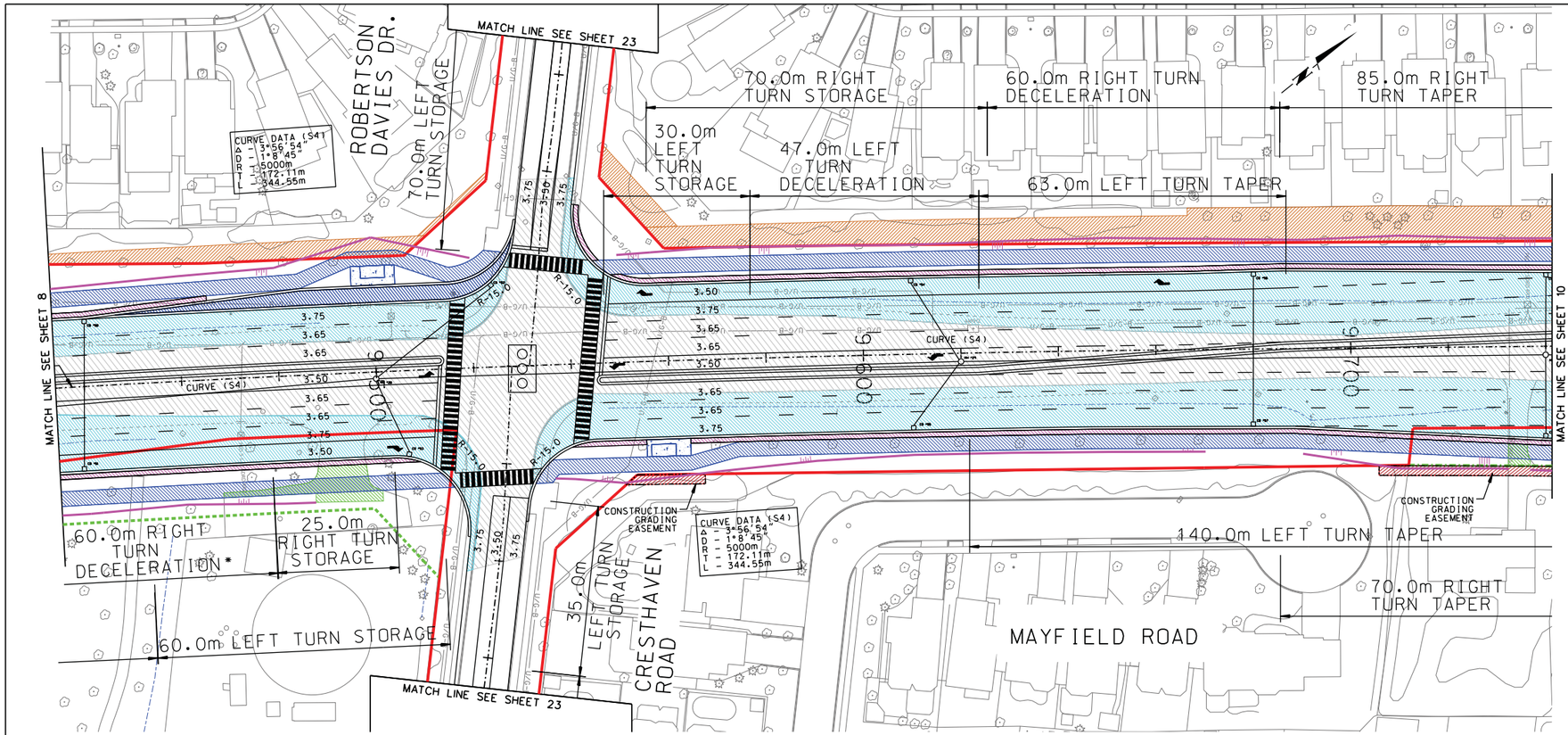
Region of Peel
Working for you

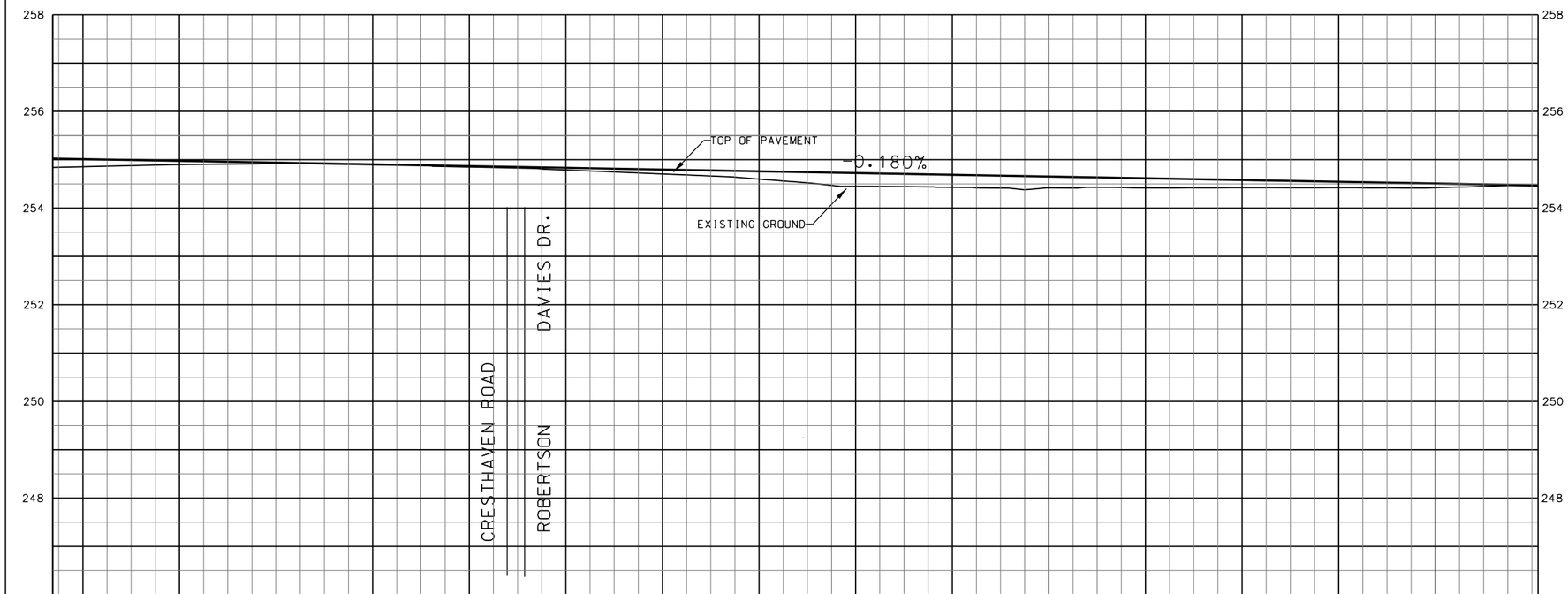
ROAD IMPROVEMENTS AT

MAYFIELD ROAD
FROM CHINGUACOUSY ROAD TO HEART LAKE ROAD

PLAN AND PROFILE

CAD Area		Project No.	101-17262
Checked by V.M.	Drawn by M.B.	Plan No.	-D
Date JUL 2014	Sheet 8 of 23		





255.011	254.975	254.939	254.903	254.867	254.832	254.798	254.760	254.724	254.688	254.652	254.616	254.580	254.544	254.508	PROP. ROAD ELEV.
254.85	254.90	254.92	254.90	254.85	254.79	254.71	254.60	254.45	254.43	254.42	254.42	254.42	254.42	254.42	EX. ROAD ELEV.
9+440	9+460	9+480	9+500	9+520	9+540	9+560	9+580	9+600	9+620	9+640	9+660	9+680	9+700	9+720	ROAD CHAINAGE

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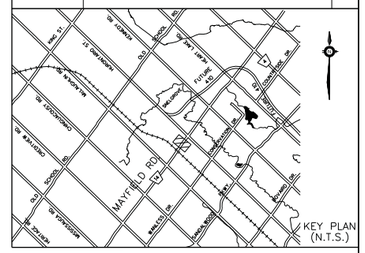
REVISIONS

DATE	DETAILS	INIT.



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- EXISTING WATERCOURSE
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WSP

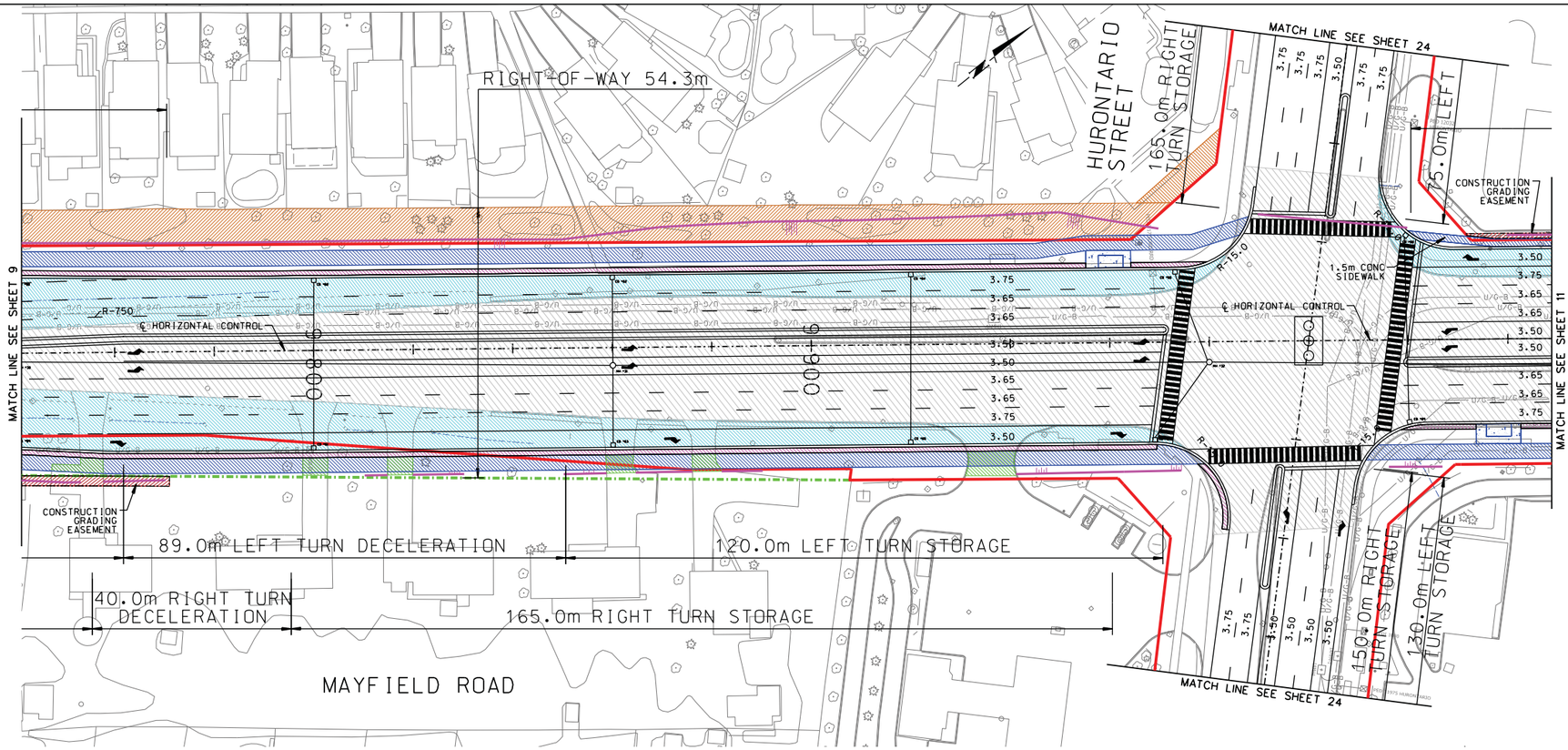
Region of Peel
Working for you

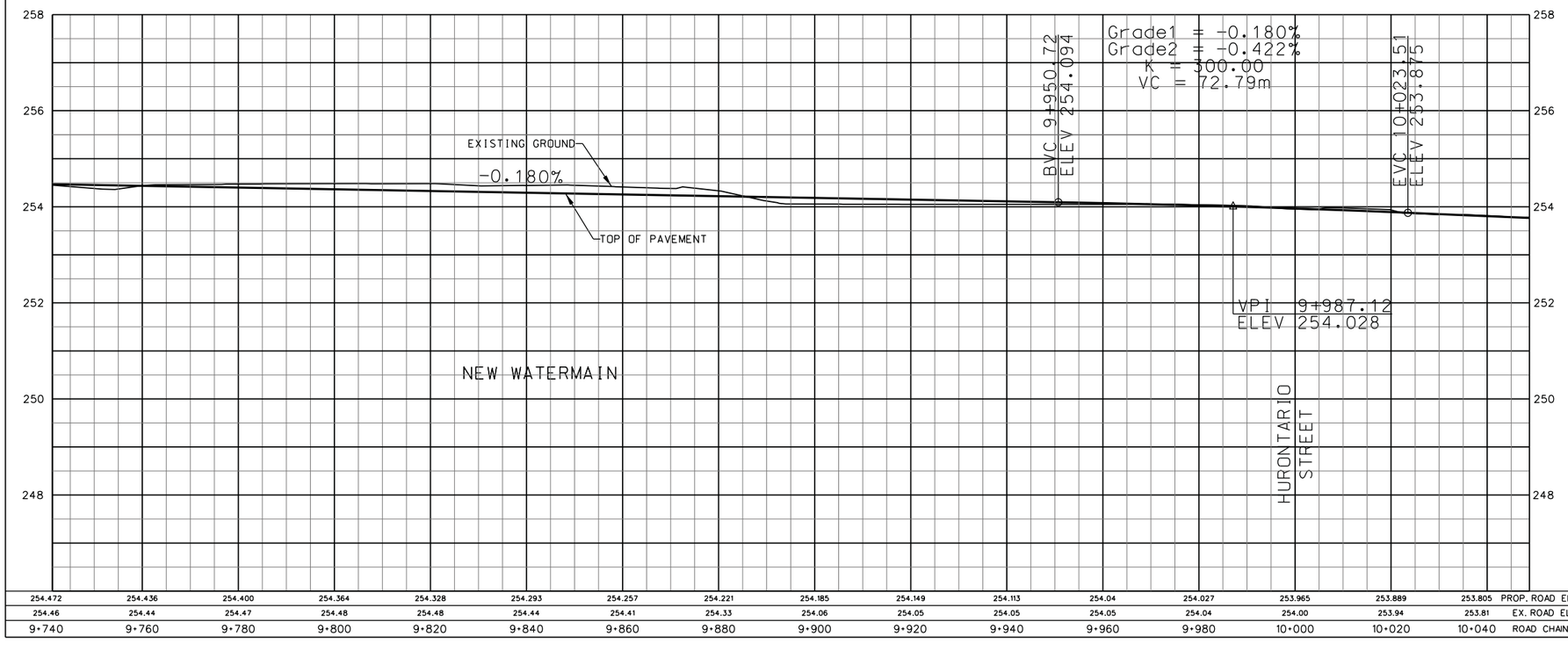
ROAD IMPROVEMENTS AT

MAYFIELD ROAD
FROM CHINGUACOUSY ROAD TO HEART LAKE ROAD

PLAN AND PROFILE

CAD Area		Project No.	101-17262
Checked by V.M.	Drawn by M.B.	Plan No.	-D
Date JUL 2014	Sheet 9 of 23		





254.472	254.436	254.400	254.364	254.328	254.293	254.257	254.221	254.185	254.149	254.113	254.04	254.027	253.965	253.889	253.805	PROP. ROAD ELEV.
254.46	254.44	254.47	254.48	254.48	254.44	254.41	254.33	254.06	254.05	254.05	254.05	254.04	254.00	253.94	253.81	EX. ROAD ELEV.
9+740	9+760	9+780	9+800	9+820	9+840	9+860	9+880	9+900	9+920	9+940	9+960	9+980	10+000	10+020	10+040	ROAD CHAINAGE

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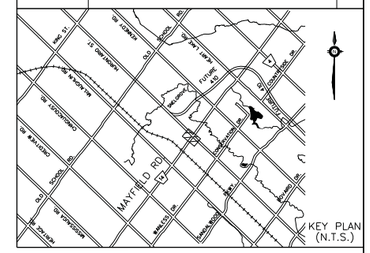
REVISIONS

DATE	DETAILS	INIT.



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PLAN AND PROFILE

CAD Area		Project No.	101-17262
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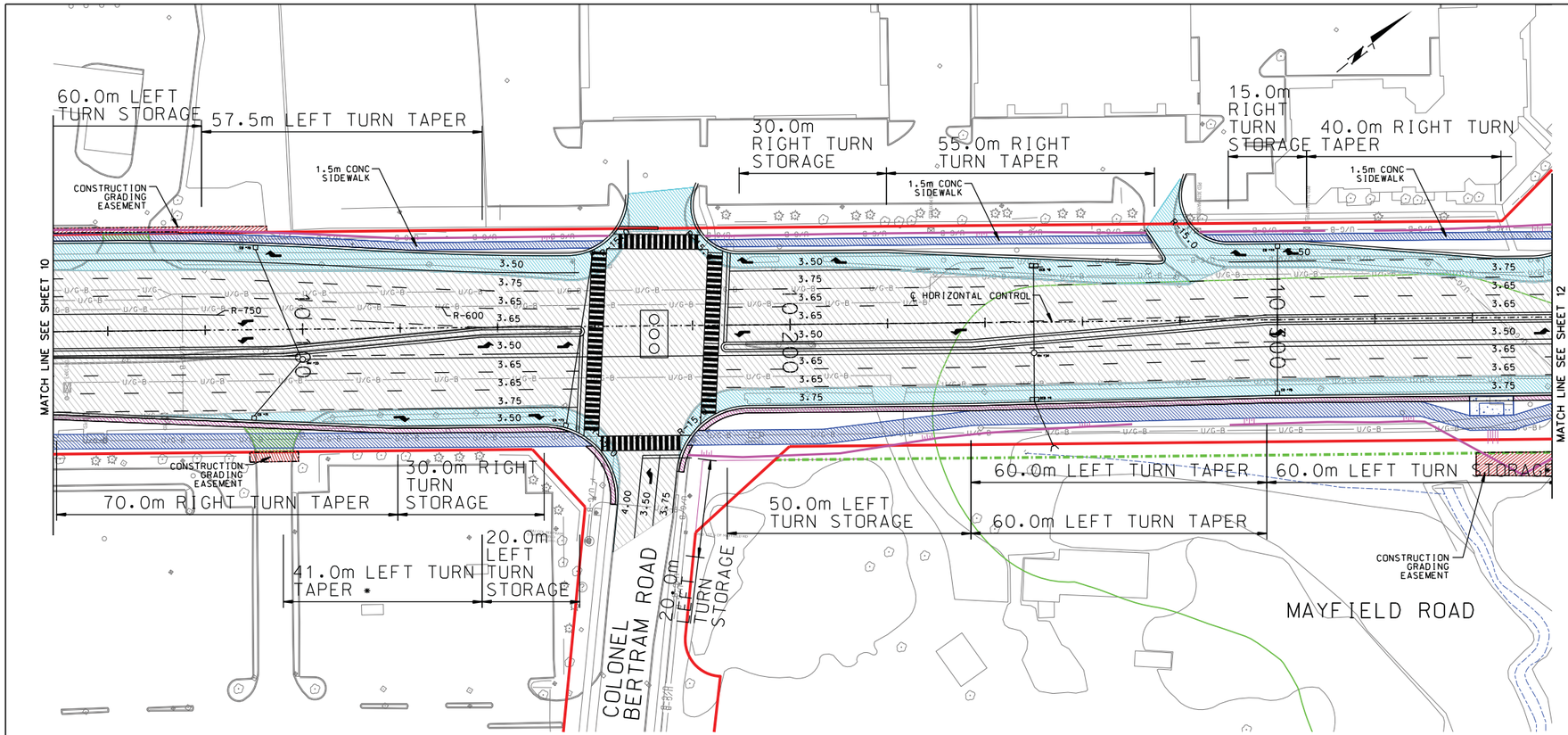
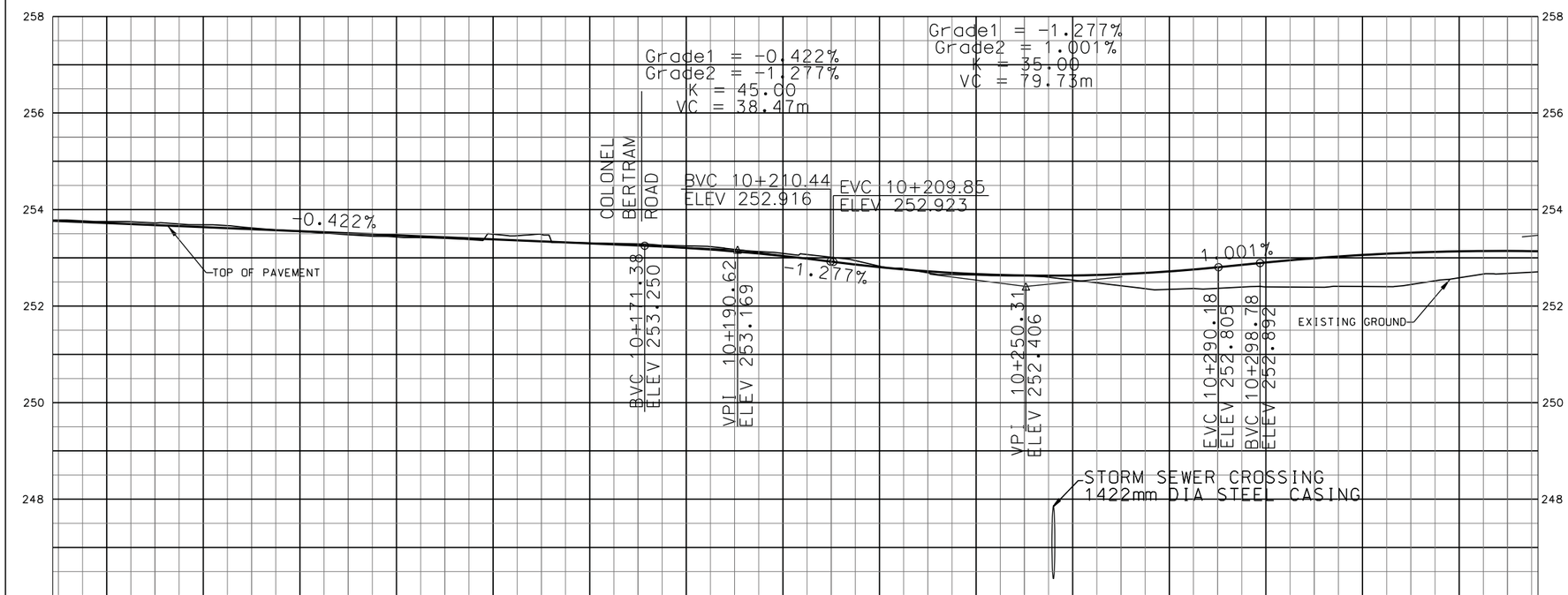
Date JUL 2014	Sheet 10 of 23		





253.720	253.636	253.552	253.467	253.383	253.298	253.205	253.038	252.807	252.663	252.633	252.718	252.904	253.059	253.134	PROP. ROAD ELEV.
253.75	253.69	253.55	253.43	253.49	253.31	253.25	253.09	252.83	252.64	252.54	252.35	252.40	252.41	252.58	EX. ROAD ELEV.
10+060	10+080	10+100	10+120	10+140	10+160	10+180	10+200	10+220	10+240	10+260	10+280	10+300	10+320	10+340	ROAD CHAINAGE

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TRANSIT			HYDRO ONE		
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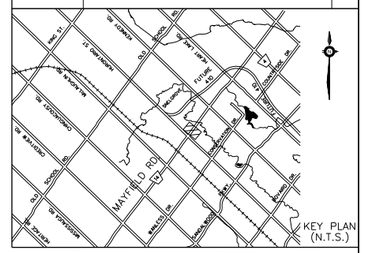
REVISIONS

DATE	DETAILS	INIT.



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The Contractor Is Responsible For Locating And Protecting All Existing Utilities Prior To And During Construction, Location Of Existing Utilities Approximate Only, To Be Verified In Field By Contractor.

Designed by

Chkd.

Approved by

NOTICE TO CONTRACTOR

48 HOURS PRIOR TO COMMENCING WORK NOTIFY THE FOLLOWING

THE REGIONAL MUNICIPALITY OF PEEL
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CITY OF BRAMPTON WORKS DEPT.
TOWN OF CALEDON WORKS DEPT.
BELL CANADA
ENBRIDGE INCORPORATED-GAS DISTRIBUTION
ONTARIO MINISTRY OF TRANSPORTATION
ONTARIO CLEAN WATER AGENCY
HYDRO ONE NETWORKS

CABLE TELEVISION/FIBREOPTIC PROVIDERS:
BELL CANADA
ENERSOURCE TELECOM
HYDRO ONE TELECOM
ROGERS CABLE
ALLSTREAM
PSN (PUBLIC SECTOR NETWORK)
FUTUREWAY (FCI BROADBAND)

10m 0 10 20 30m HORIZONTAL SCALE

1m 0 1 2 3m VERTICAL SCALE

WSP

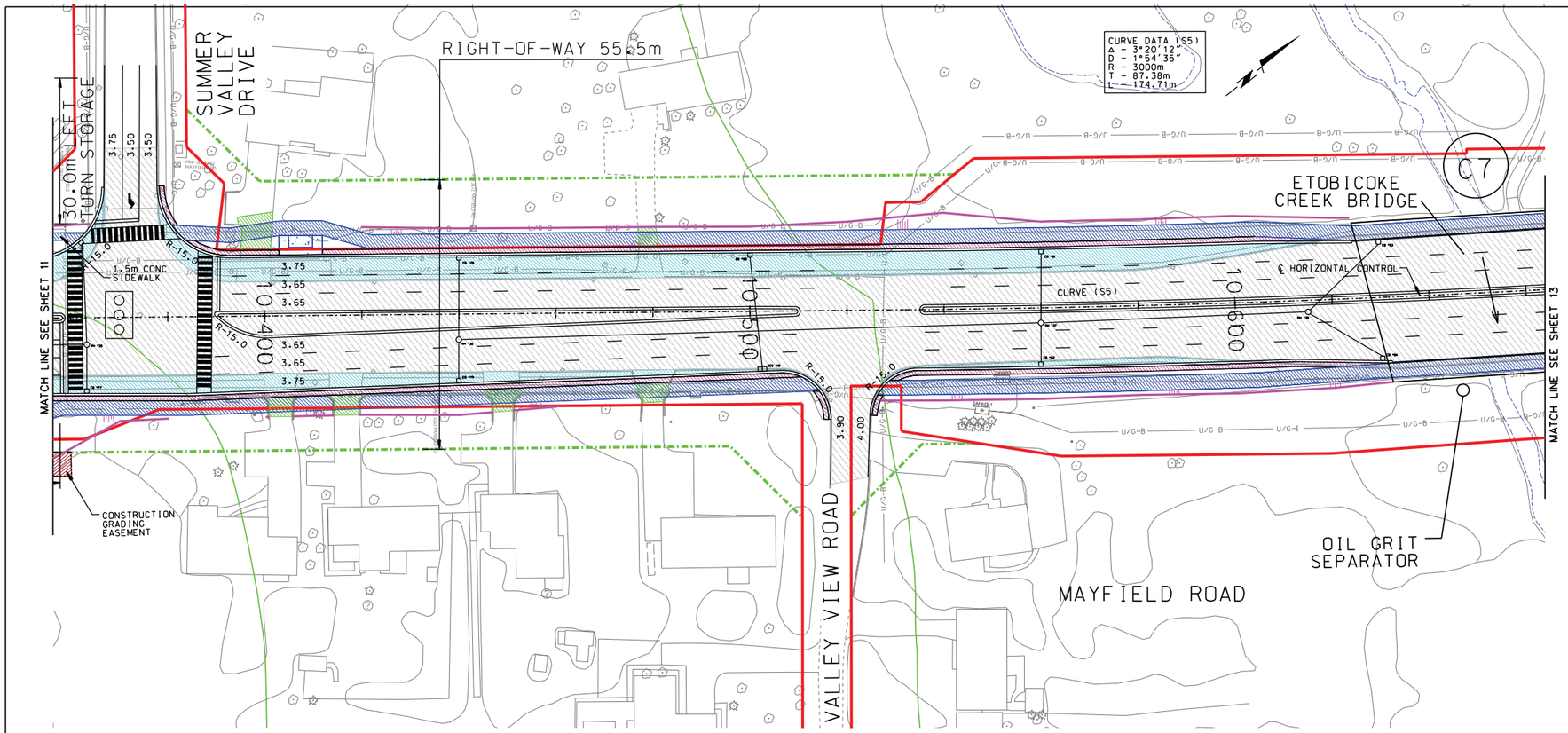
Region of Peel
Working for you

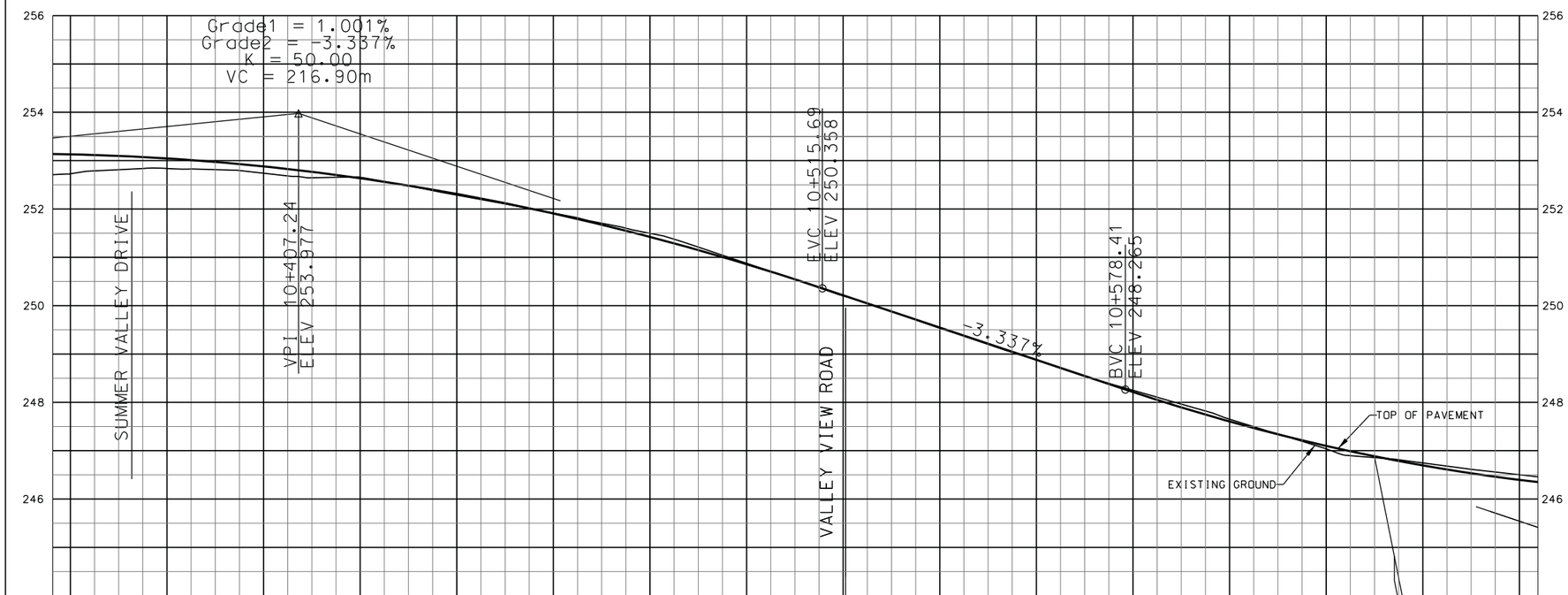
ROAD IMPROVEMENTS AT

MAYFIELD ROAD
FROM CHINGUACOUSY ROAD TO HEART LAKE ROAD

PLAN AND PROFILE

CAD Area		Project No.	101-17262
Checked by V.M.	Drawn by M.B.	Plan No.	- D
Date JUL 2014	Sheet 11 of 23		





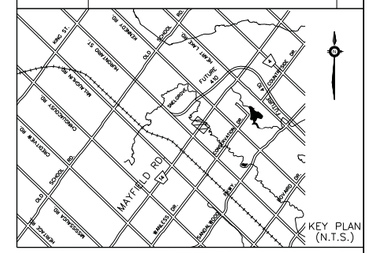
253.130	253.045	252.880	252.635	252.311	251.906	251.421	250.857	250.214	249.546	248.879	248.212	247.604	247.098	246.696	PROP. ROAD ELEV.
252.72	252.84	252.74	252.66	252.29	251.92	251.51	250.88	250.21	249.54	248.88	248.25	247.66	247.05	246.75	EX. ROAD ELEV.
10+360	10+380	10+400	10+420	10+440	10+460	10+480	10+500	10+520	10+540	10+560	10+580	10+600	10+620	10+640	ROAD CHAINAGE

SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMAINS			HYDRO U/G CABLE		
TRANSIT			HYDRO ONE		
PARKS & REC.			CTV		
ONT. CLEAN WATER			COMMUNIC. CABLES		

REVISIONS

DATE	DETAILS	INIT.



LEGEND

- EXISTING WATERCOURSE
- EXISTING RIGHT OF WAY
- PROPOSED RIGHT OF WAY
- TRCA REGULATION LIMIT
- DRIVEWAY GRADING
- REQUIRED EASEMENT
- REGION OF PEEL BUFFER ZONE
- EXISTING PAVEMENT
- PROPOSED PAVEMENT
- PROPOSED 3.0m MULTI-USE PATHWAY
- PROPOSED 1.5m SIDEWALK
- PROPOSED 1.0m SPLASH PAD
- CULVERT
- GRADING LIMITS
- EXISTING SIGNAL
- PROPOSED SIGNAL

General Notes

All Driveways Are ASPHALT Unless Otherwise Noted

All Water And Sanitary Service Locations Are Approximate And Must Be Located Accurately In The Field

All Pipes Size In mm

B.M. No. Elev.
Description
Location

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10m 0 10 20 30m HORIZONTAL SCALE

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WSP

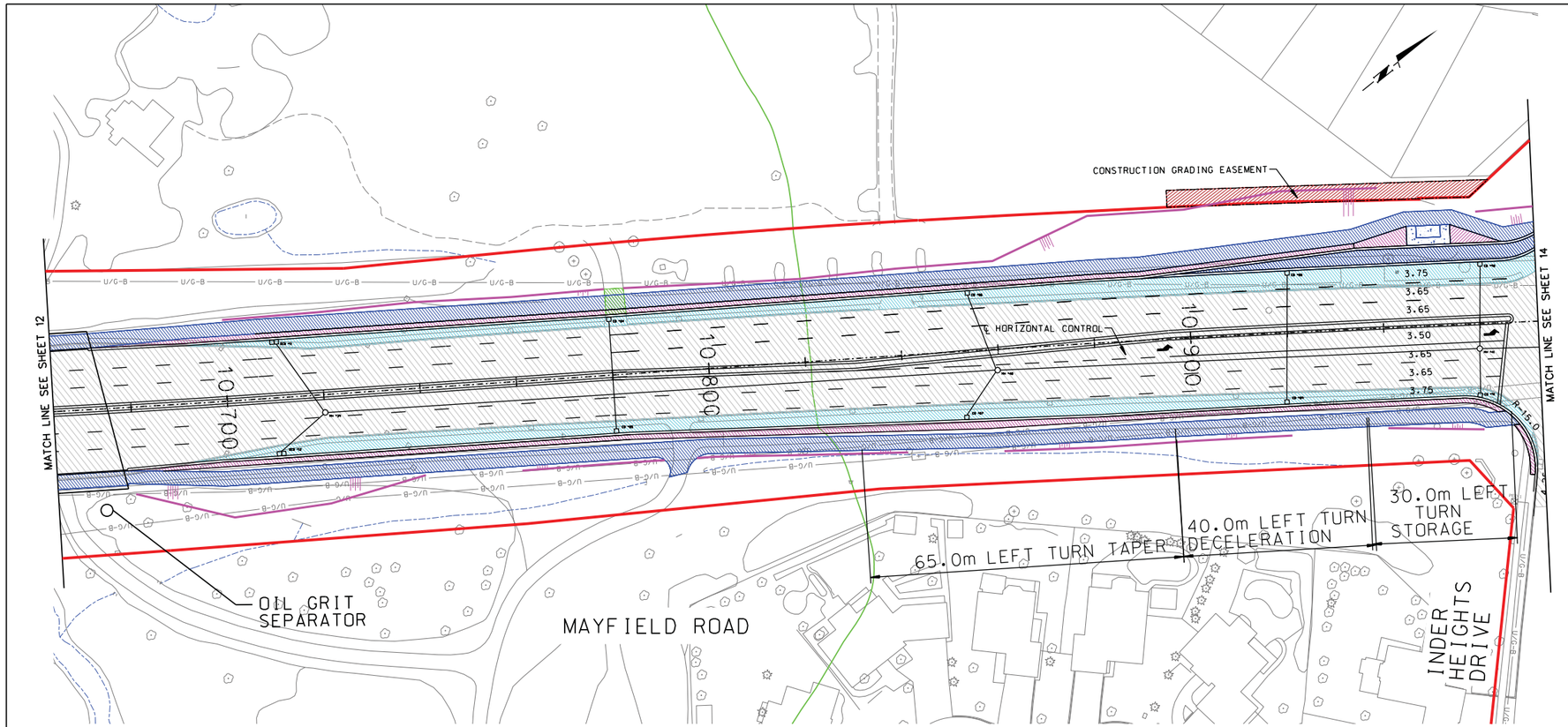
Region of Peel
Working for you

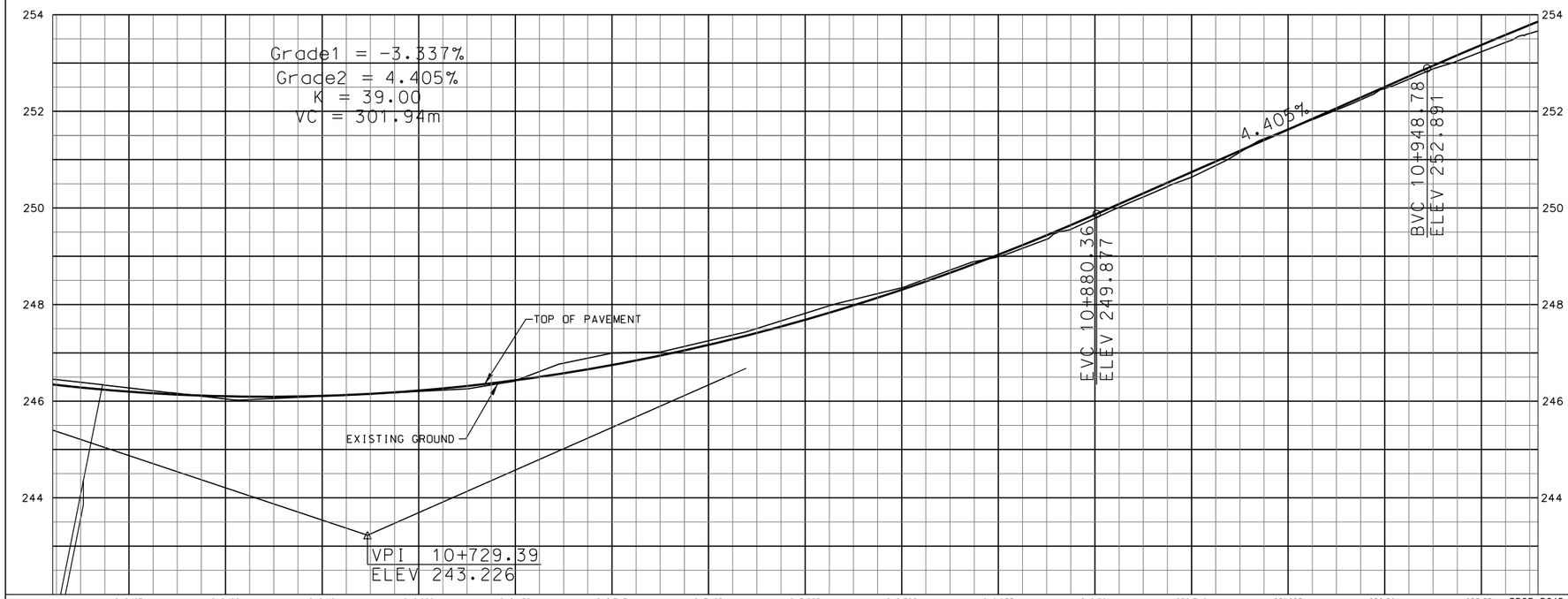
ROAD IMPROVEMENTS AT

MAYFIELD ROAD
FROM CHINGUACOUSY ROAD TO HEART LAKE ROAD

PLAN AND PROFILE

CAD Area		Project No.	101-17262
Checked by V.M.	Drawn by M.B.	Plan No.	-D
Date JUL 2014	Sheet 12 of 23		





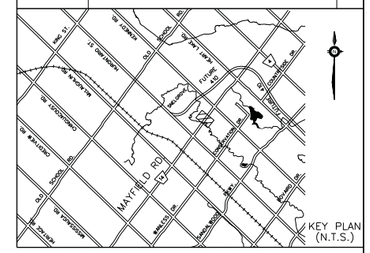
246.197	246.102	246.110	246.220	246.432	246.747	247.165	247.685	248.308	249.033	249.861	250.742	251.623	252.504	253.374	PROP. ROAD ELEV.
246.28	246.05	246.10	246.20	246.42	246.99	247.25	247.81	248.34	248.99	249.78	250.63	251.63	252.47	253.23	EX. ROAD ELEV.
10+680	10+700	10+720	10+740	10+760	10+780	10+800	10+820	10+840	10+860	10+880	10+900	10+920	10+940	10+960	ROAD CHAINAGE

SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMAINS			HYDRO U/G CABLE		
TRANSIT			HYDRO ONE		
PARKS & REC.			CTV		
ONT. CLEAN WATER			COMMUNIC. CABLES		

REVISIONS

DATE	DETAILS	INIT.



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- EXISTING WATERCOURSE
- EXISTING RIGHT OF WAY
- PROPOSED RIGHT OF WAY
- TRCA REGULATION LIMIT
- DRIVEWAY GRADING
- REQUIRED EASEMENT
- REGION OF PEEL BUFFER ZONE
- EXISTING PAVEMENT
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- PROPOSED 3.0m MULTI-USE PATHWAY
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1m 0 1 2 3m — VERTICAL SCALE

WSP

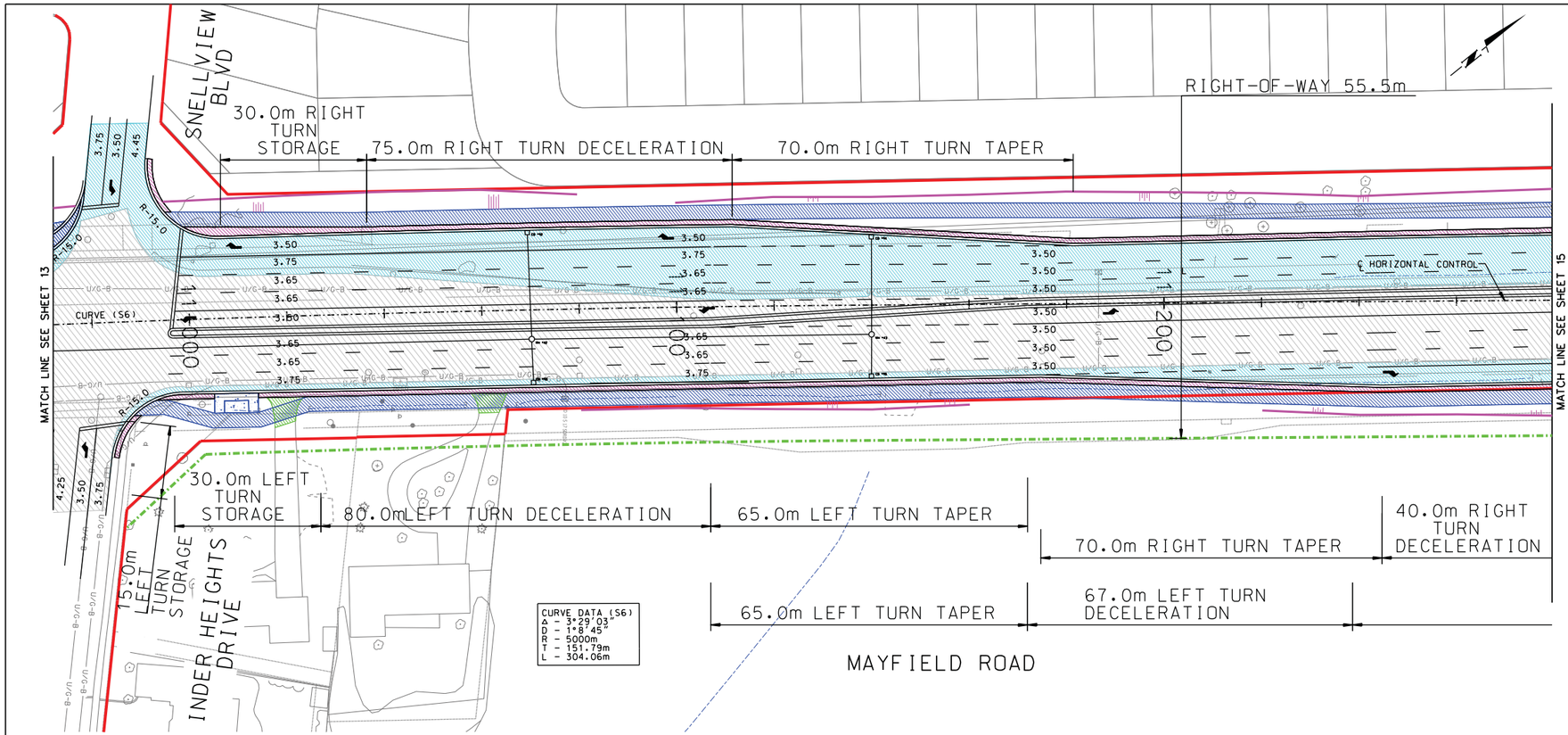
Region of Peel
Working for you

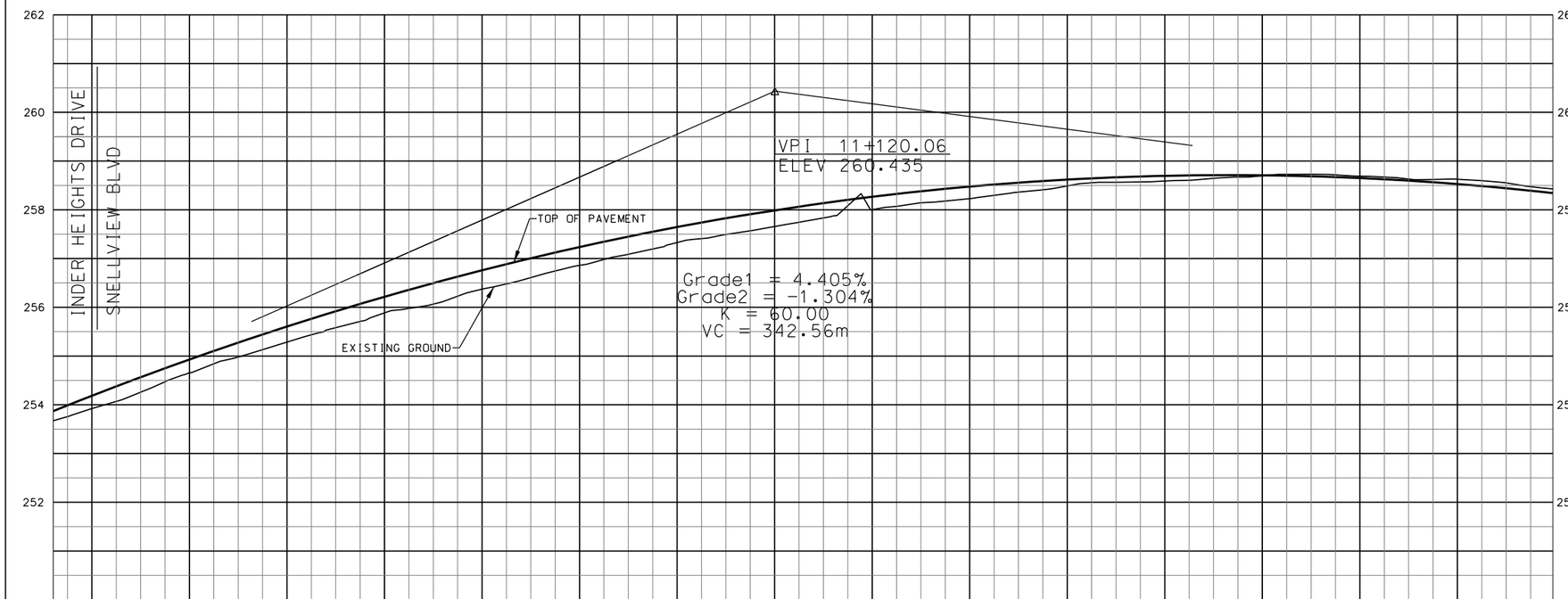
ROAD IMPROVEMENTS AT

MAYFIELD ROAD
FROM CHINGUACOUSY ROAD TO HEART LAKE ROAD

PLAN AND PROFILE

CAD Area		Project No.	101-17262
Checked by V.M.	Drawn by M.B.	Plan No.	- D
Date JUL 2014	Sheet 13 of 23		





254.185	254.928	255.605	256.215	256.759	257.236	257.646	257.990	258.267	258.477	258.621	258.697	258.708	258.651	258.528	PROP. ROAD ELEV.
253.92	254.65	255.28	255.88	256.37	256.86	257.33	257.65	258.00	258.23	258.49	258.59	258.70	258.69	258.63	EX. ROAD ELEV.
10+980	11+000	11+020	11+040	11+060	11+080	11+100	11+120	11+140	11+160	11+180	11+200	11+220	11+240	11+260	ROAD CHAINAGE

SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
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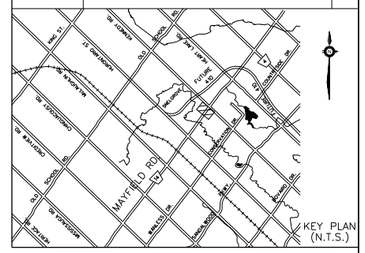
PARKS & REC.			CTV		
ONT. CLEAN WATER			COMMUNIC. CABLES		

REVISIONS

DATE	DETAILS	INIT.



LEGEND

- EXISTING WATERCOURSE
- EXISTING RIGHT OF WAY
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- TRCA REGULATION LIMIT
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WSP

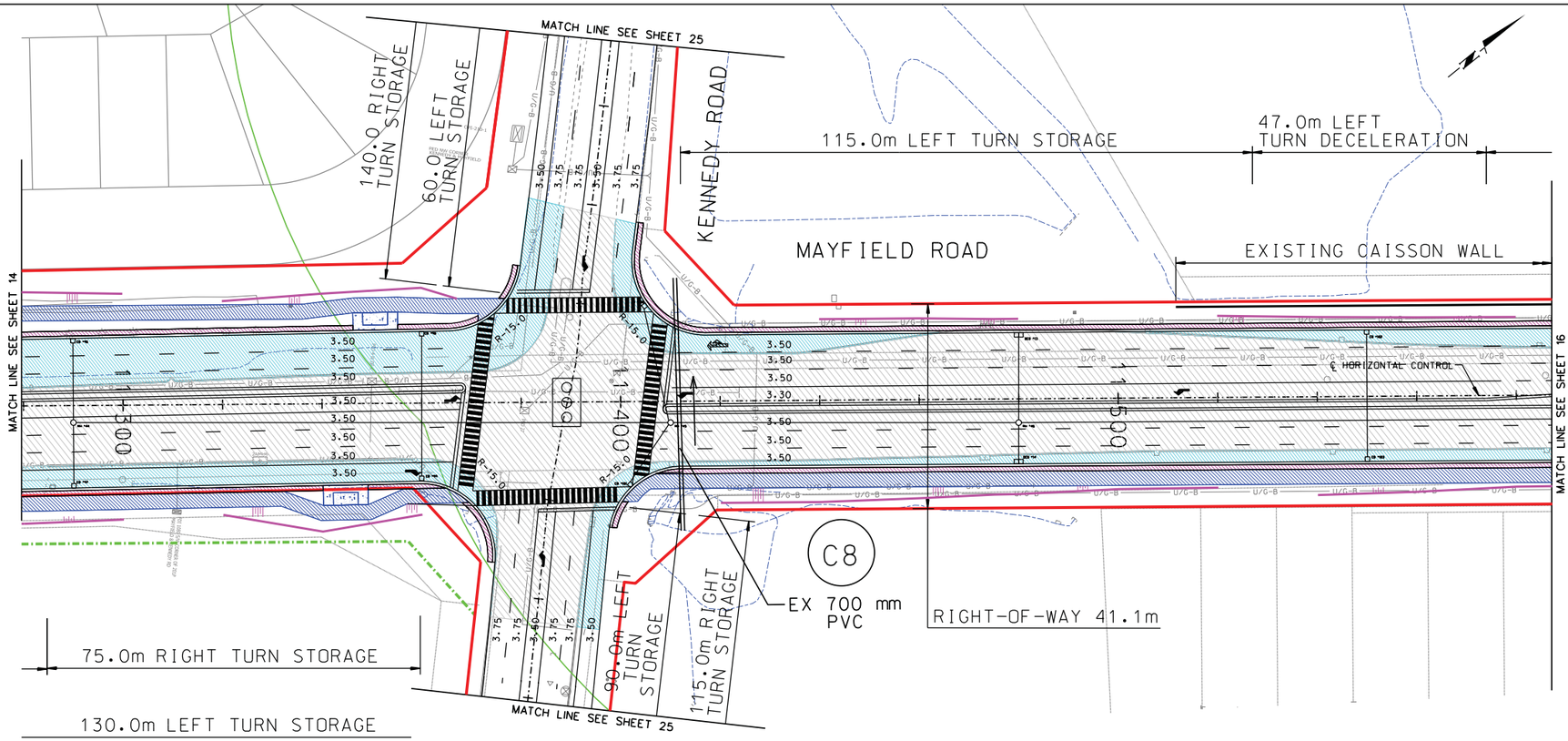
Region of Peel
Working for you

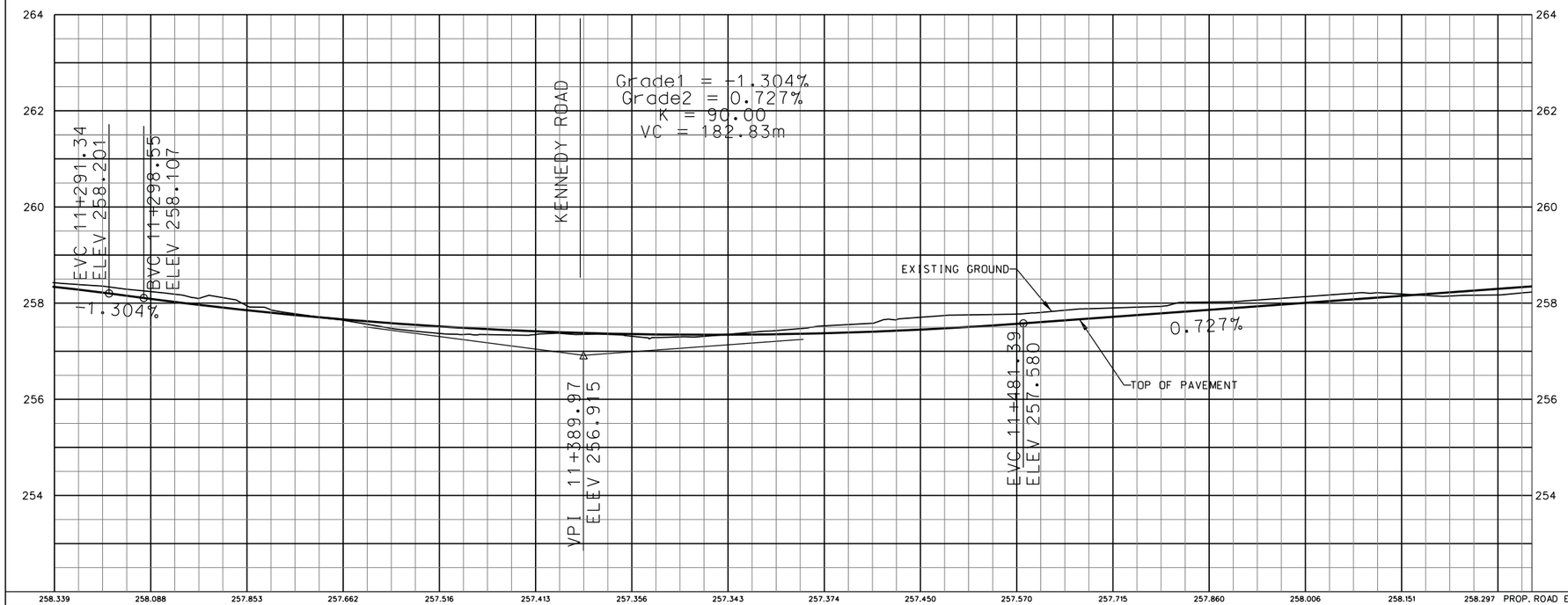
ROAD IMPROVEMENTS AT

MAYFIELD ROAD
FROM CHINGUACOUSY ROAD TO HEART LAKE ROAD

PLAN AND PROFILE

CAD Area		Project No.	101-17262
Checked by V.M.	Drawn by M.B.	Plan No.	- D
Date JUL 2014	Sheet 14 of 23		





258.339	258.088	257.853	257.662	257.516	257.413	257.356	257.343	257.374	257.450	257.570	257.715	257.860	258.006	258.151	258.297	PROP. ROAD ELEV.
258.43	258.24	257.95	257.65	257.37	257.34	257.31	257.35	257.53	257.70	257.77	257.90	258.02	258.13	258.19	258.17	EX. ROAD ELEV.
11+280	11+300	11+320	11+340	11+360	11+380	11+400	11+420	11+440	11+460	11+480	11+500	11+520	11+540	11+560	11+580	ROAD CHAINAGE

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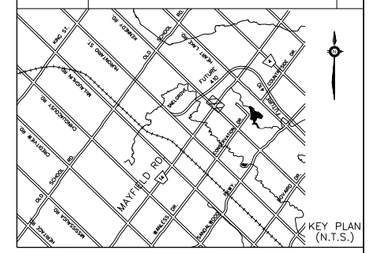
REVISIONS

DATE	DETAILS	INIT.



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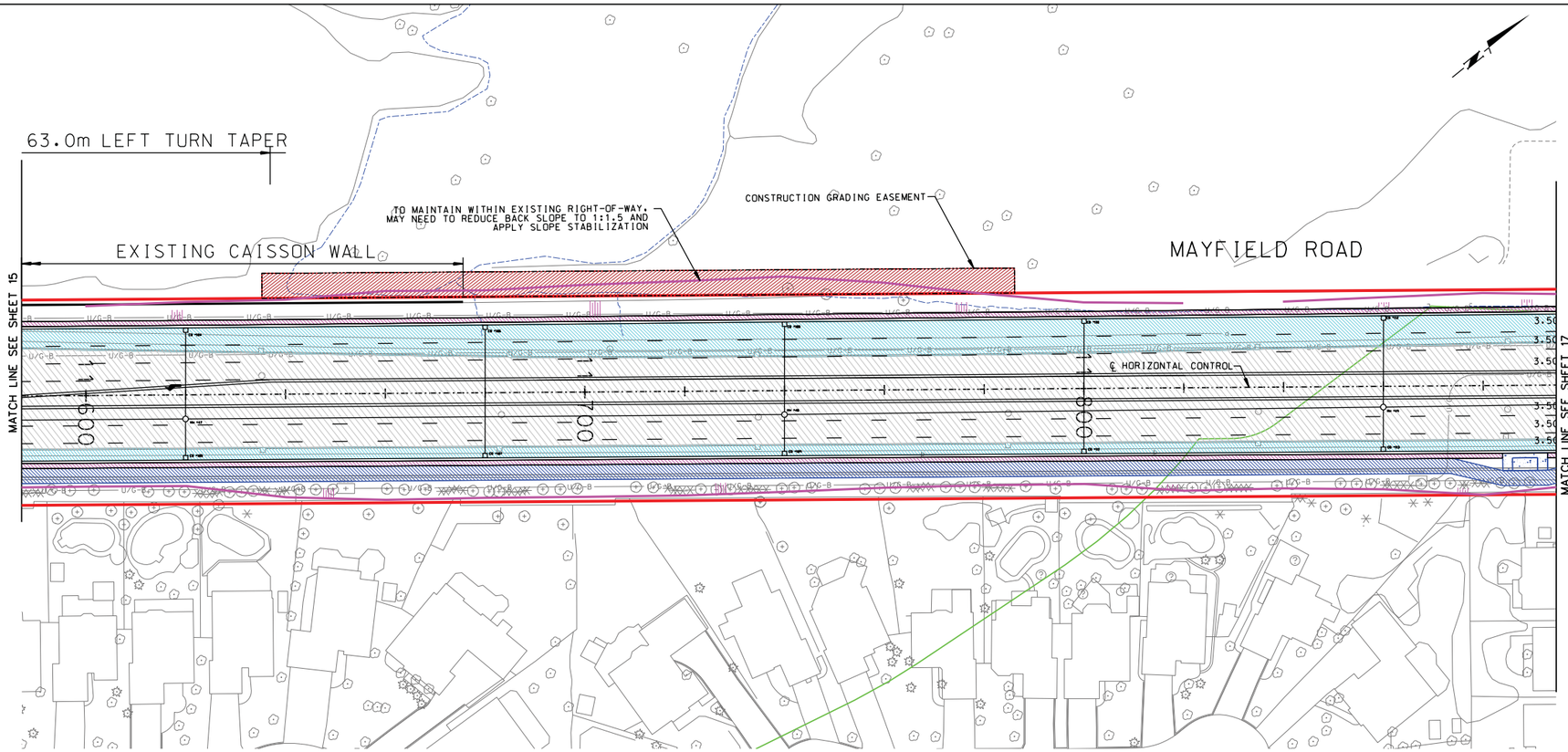
Region of Peel
Working for you

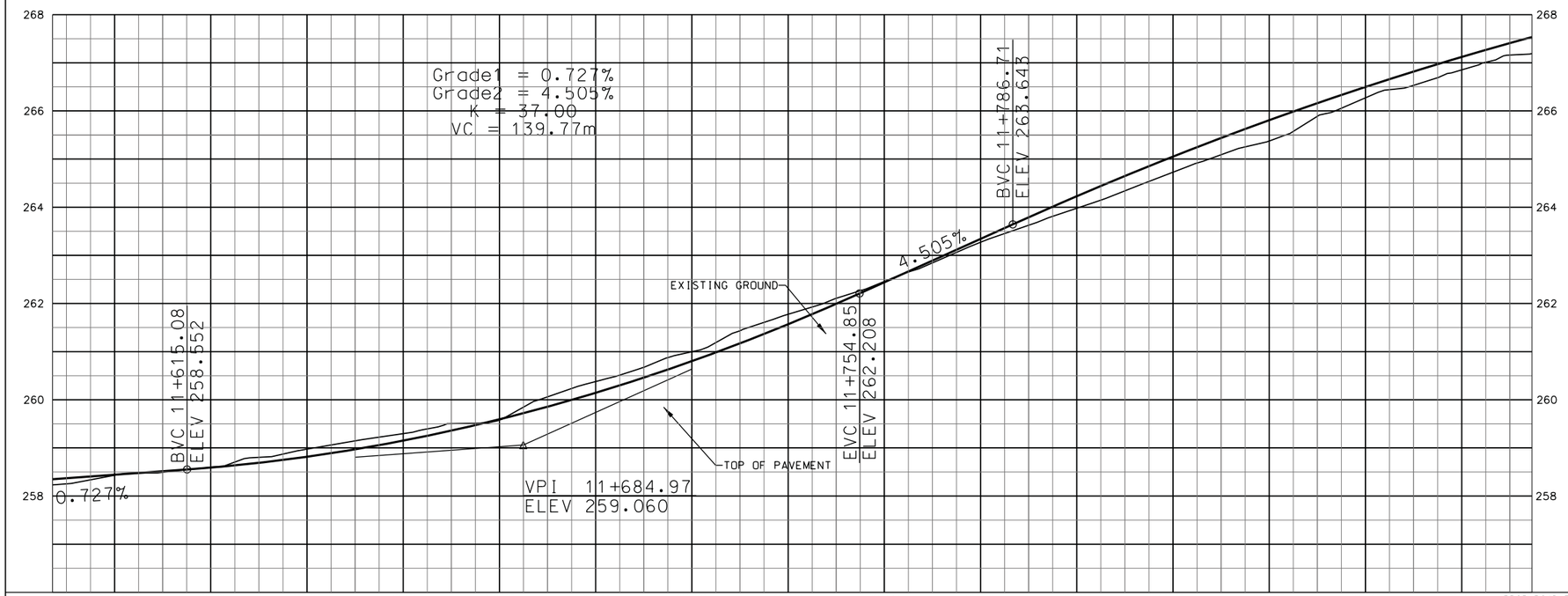
ROAD IMPROVEMENTS AT

MAYFIELD ROAD
FROM CHINGUACOUSY ROAD TO HEART LAKE ROAD

PLAN AND PROFILE

CAD Area		Project No.	101-17262
Checked by V.M.	Drawn by M.B.	Plan No.	-D
Date JUL 2014	Sheet 15 of 23		





258.442	258.591	258.817	259.151	259.593	260.144	260.802	261.569	262.440	263.341	264.227	265.051	265.807	266.497	267.121	PROP. ROAD ELEV.
258.43	258.60	258.97	259.29	259.57	260.38	261.00	261.77	262.45	263.27	263.97	264.72	265.37	266.27	266.85	EX. ROAD ELEV.
11+600	11+620	11+640	11+660	11+680	11+700	11+720	11+740	11+760	11+780	11+800	11+820	11+840	11+860	11+880	ROAD CHAINAGE

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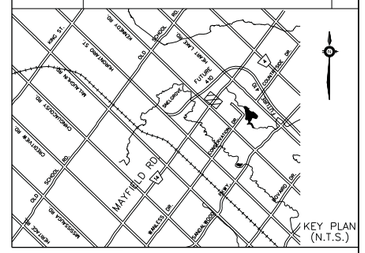

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PLAN AND PROFILE

CAD Area		Project No.	101-17262
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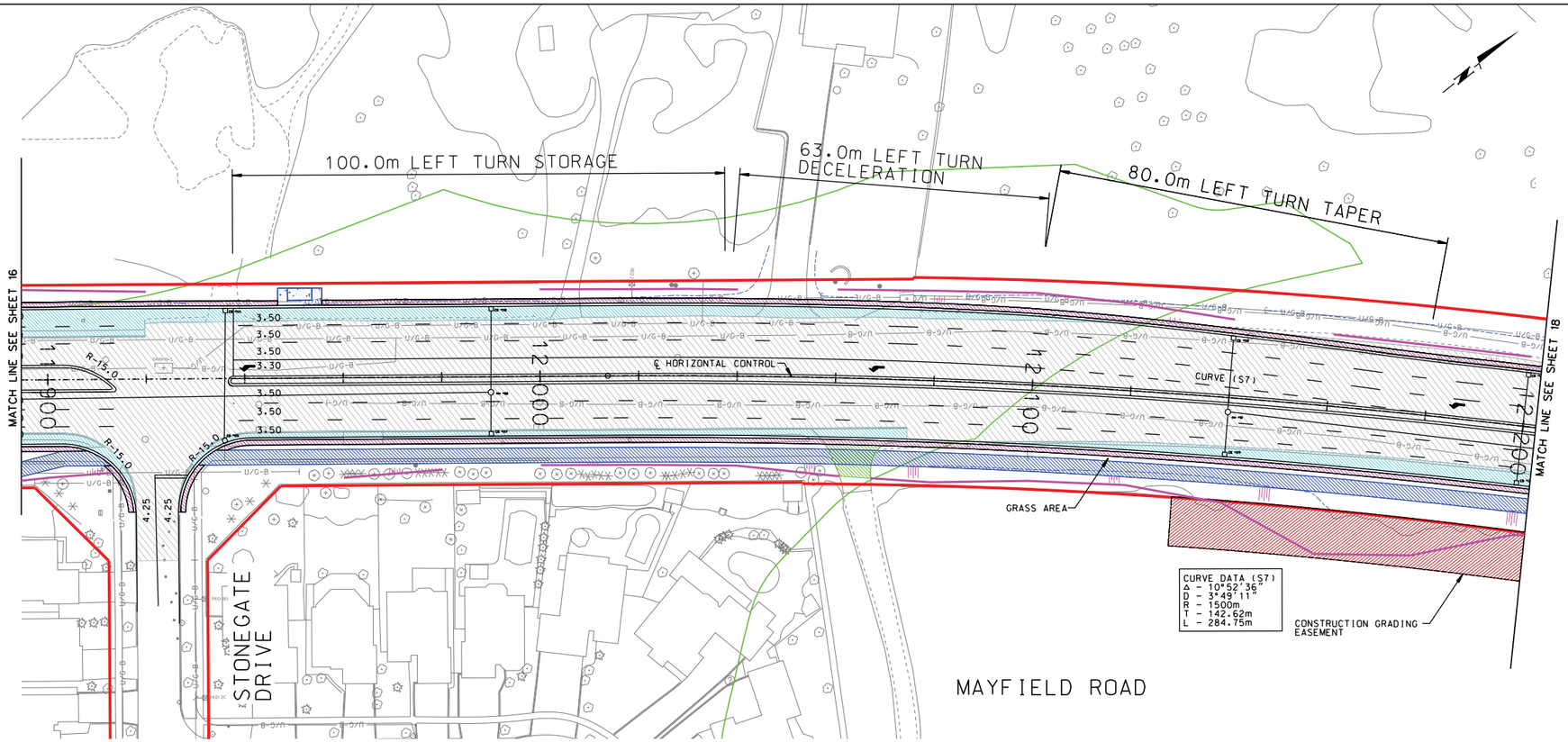
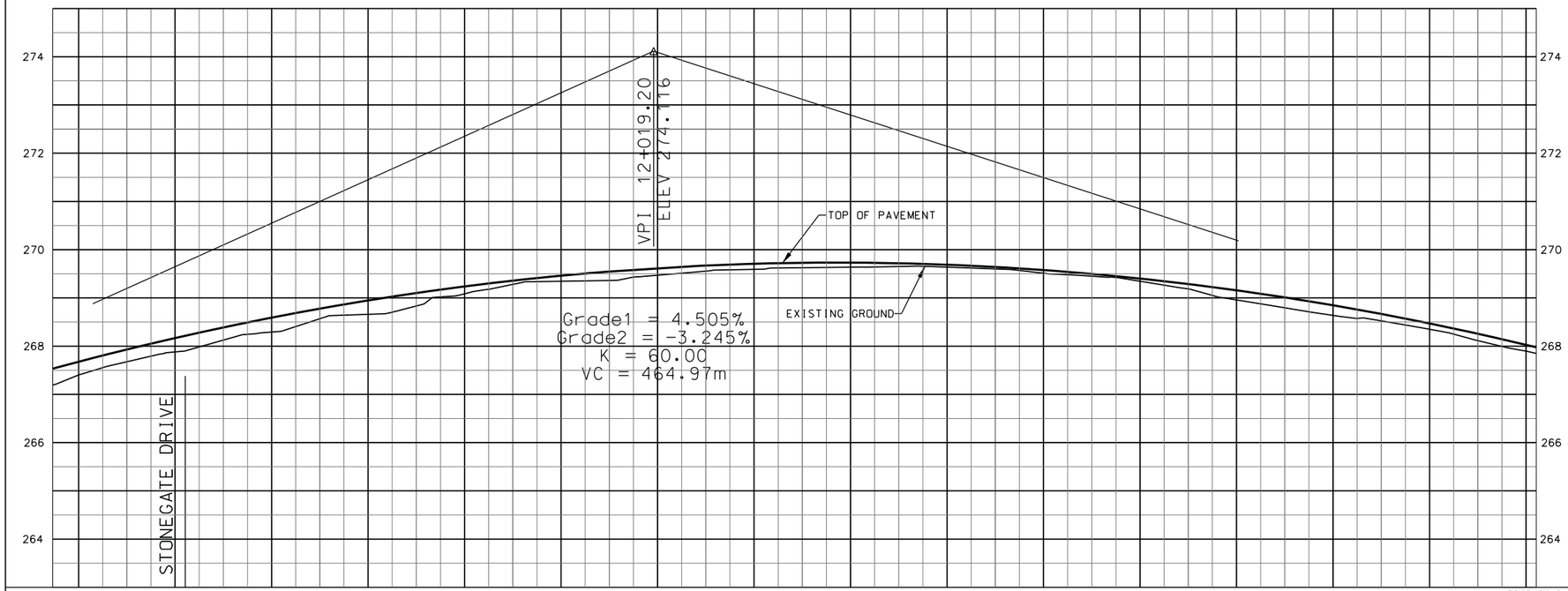
Date JUL 2014	Sheet 16 of 23		





267.677	268.167	268.591	268.947	269.237	269.461	269.617	269.707	269.731	269.687	269.577	269.401	269.157	268.847	268.471	PROP. ROAD ELEV.
267.40	267.88	268.29	268.66	269.08	269.34	269.47	269.59	269.64	269.64	269.51	269.35	268.96	268.64	268.35	EX. ROAD ELEV.
11+900	11+920	11+940	11+960	11+980	12+000	12+020	12+040	12+060	12+080	12+100	12+120	12+140	12+160	12+180	ROAD CHAINAGE

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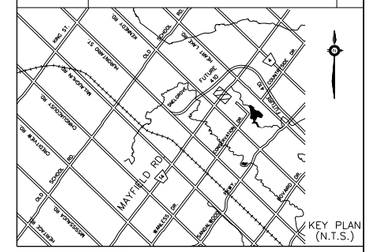
DATE	DETAILS	INIT.



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Description
Location

The Contractor Is Responsible For Locating And Protecting All Existing Utilities Prior To And During Construction, Location Of Existing Utilities Approximate Only, To Be Verified In Field By Contractor.

Designed by ____ Chkd. ____ Approved by ____

NOTICE TO CONTRACTOR

48 HOURS PRIOR TO COMMENCING WORK NOTIFY THE FOLLOWING

THE REGIONAL MUNICIPALITY OF PEEL
CITY OF MISSISSAUGA WORKS DEPT.
CITY OF BRAMPTON WORKS DEPT.
TOWN OF CALEDON WORKS DEPT.
BELL CANADA
ENBRIDGE INCORPORATED/GAS DISTRIBUTION
ONTARIO MINISTRY OF TRANSPORTATION
ONTARIO CLEAN WATER AGENCY
HYDRO ONE NETWORKS

CABLE TELEVISION/FIBREOPTIC PROVIDERS:
BELL CANADA
ENERSOURCE TELECOM
HYDRO ONE TELECOM
ROGERS CABLE
ALLSTREAM
PSN (PUBLIC SECTOR NETWORK)
FUTUREWAY (FCI BROADBAND)

10m 0 10 20 30m HORIZONTAL SCALE
1m 0 1 2 3m VERTICAL SCALE

WSP

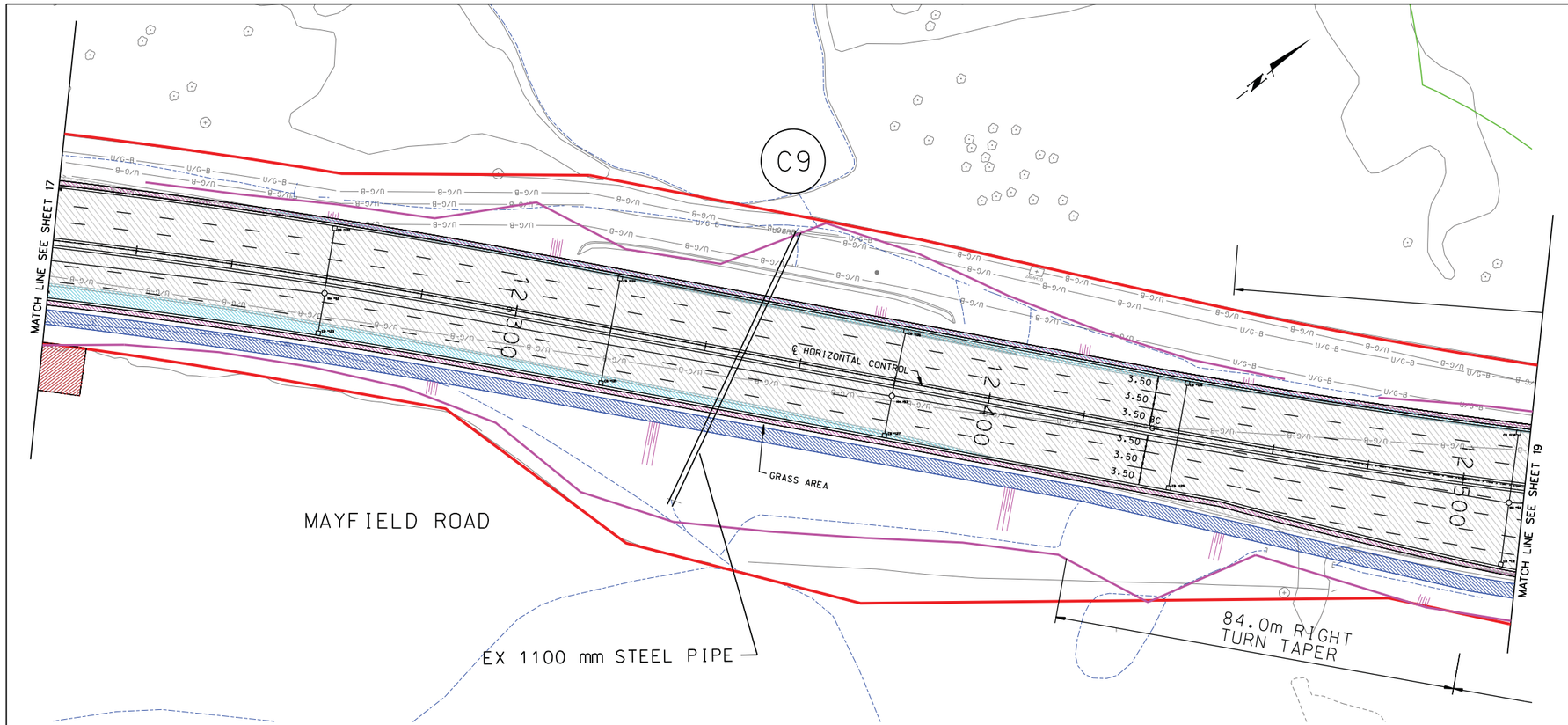
Region of Peel
Working for you

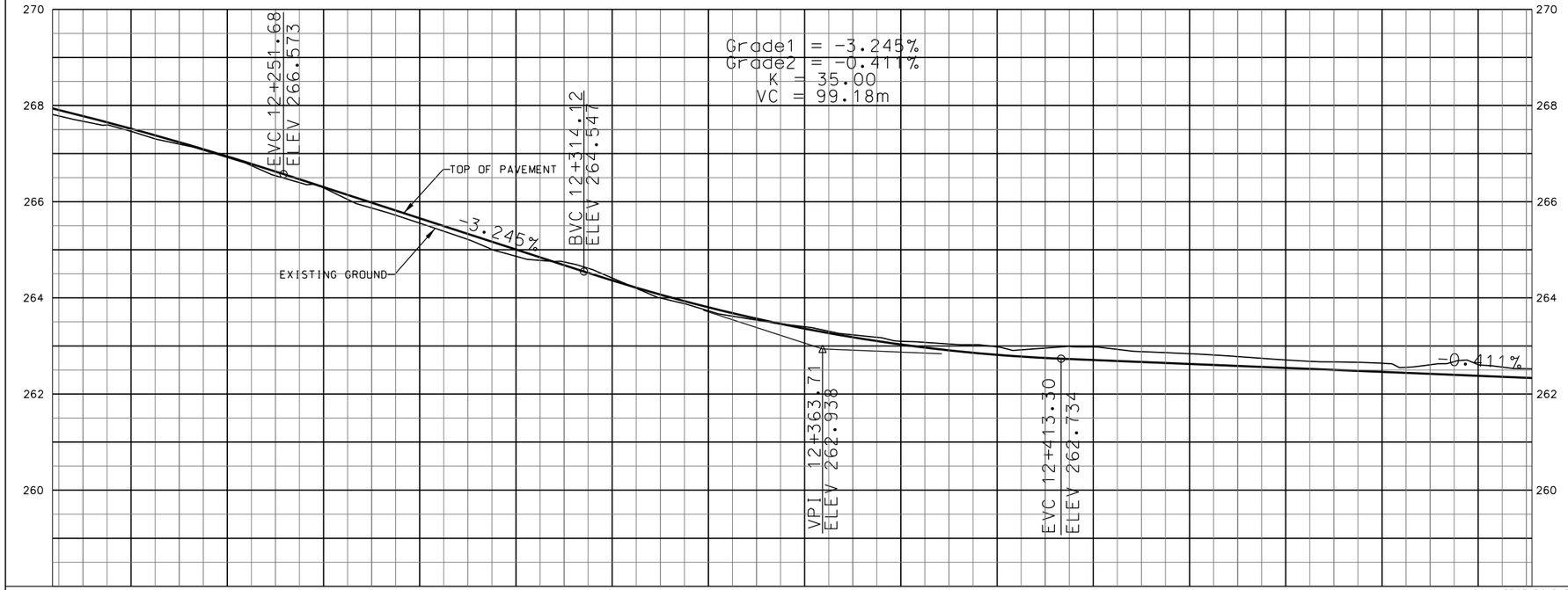
ROAD IMPROVEMENTS AT

MAYFIELD ROAD
FROM CHINGUACOUSY ROAD TO HEART LAKE ROAD

PLAN AND PROFILE

CAD Area		Project No.	101-17262
Checked by V.M.	Drawn by M.B.	Plan No.	-D
Date JUL 2014	Sheet 17 of 23		





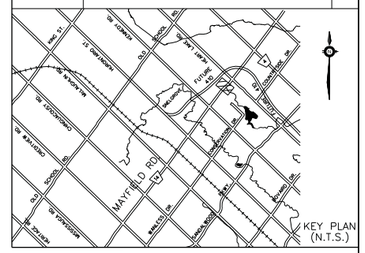
267.517	266.941	266.303	265.654	265.005	264.361	263.803	263.359	263.030	262.814	262.707	262.624	262.542	262.460	262.378	PROP. ROAD ELEV.
267.47	266.92	266.29	265.56	264.87	264.42	263.73	263.40	263.10	262.98	262.98	262.84	262.71	262.64	262.62	EX. ROAD ELEV.
12+220	12+240	12+260	12+280	12+300	12+320	12+340	12+360	12+380	12+400	12+420	12+440	12+460	12+480	12+500	ROAD CHAINAGE

SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMAINS			HYDRO U/G CABLE		
TRANSIT			HYDRO ONE		
PARKS & REC.			CTV		
ONT. CLEAN WATER			COMMUNIC. CABLES		

REVISIONS

DATE	DETAILS	INIT.



LEGEND

- EXISTING WATERCOURSE
- EXISTING RIGHT OF WAY
- PROPOSED RIGHT OF WAY
- TRCA REGULATION LIMIT
- DRIVEWAY GRADING
- REQUIRED EASEMENT
- REGION OF PEEL BUFFER ZONE
- EXISTING PAVEMENT
- PROPOSED PAVEMENT
- PROPOSED 3.0m MULTI-USE PATHWAY
- PROPOSED 1.0m SPLASH PAD
- CULVERT
- GRADING LIMITS
- EXISTING SIGNAL
- PROPOSED SIGNAL

General Notes

All Driveways Are ASPHALT Unless Otherwise Noted

All Water And Sanitary Service Locations Are Approximate And Must Be Located Accurately In The Field

All Pipes Size In mm

B.M. No. Elev.
Description
Location

The Contractor Is Responsible For Locating And Protecting All Existing Utilities Prior To And During Construction, Location Of Existing Utilities Approximate Only, To Be Verified In Field By Contractor.

Designed by

Chkd.

Approved by

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FUTUREWAY (FCI BROADBAND)

10m 0 10 20 30m HORIZONTAL SCALE

1m 0 1 2 3m VERTICAL SCALE

WSP

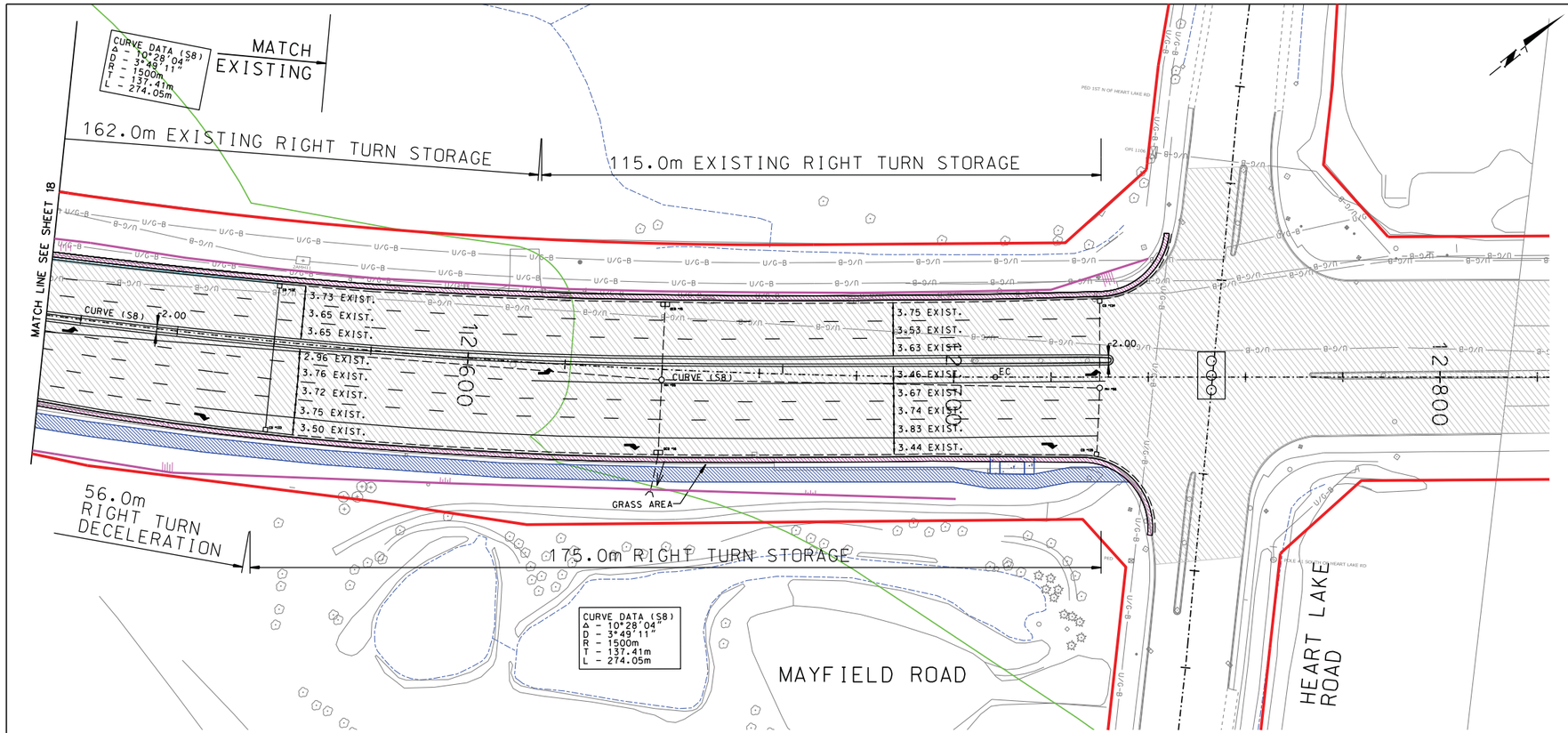
Region of Peel
Working for you

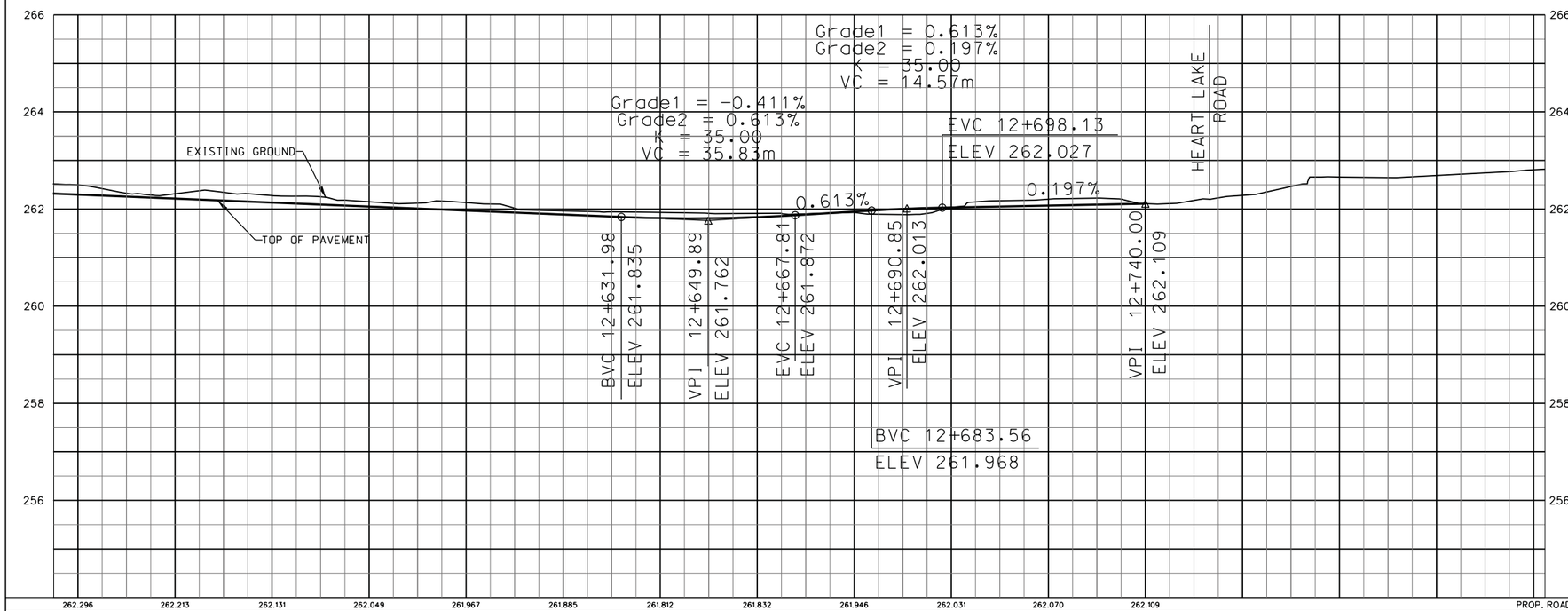
ROAD IMPROVEMENTS AT

MAYFIELD ROAD
FROM CHINGUACOUSY ROAD TO HEART LAKE ROAD

PLAN AND PROFILE

CAD Area		Project No.	101-17262
Checked by V.M.	Drawn by M.B.	Plan No.	- D
Date JUL 2014	Sheet 18 of 23		





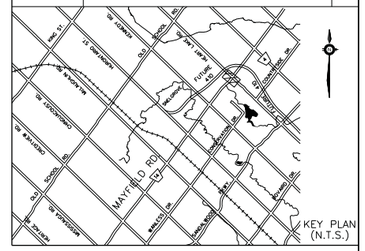
262.296	262.213	262.131	262.049	261.967	261.885	261.812	261.832	261.946	262.031	262.070	262.109					PROP. ROAD ELEV.
262.49	262.31	262.28	262.15	262.13	261.96	261.93	261.91	261.93	262.03	262.20	262.11	262.28	262.66	262.69		EX. ROAD ELEV.
12+520	12+540	12+560	12+580	12+600	12+620	12+640	12+660	12+680	12+700	12+720	12+740	12+760	12+780	12+800		ROAD CHAINAGE

SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMAINS			HYDRO U/G CABLE		
TRANSIT			HYDRO ONE		
PARKS & REC.			CTV		
ONT. CLEAN WATER			COMMUNIC. CABLES		

REVISIONS

DATE	DETAILS	INIT.



LEGEND

- EXISTING WATERCOURSE
- EXISTING RIGHT OF WAY
- PROPOSED RIGHT OF WAY
- TRCA REGULATION LIMIT
- DRIVEWAY GRADING
- REQUIRED EASEMENT
- REGION OF PEEL BUFFER ZONE
- EXISTING PAVEMENT
- PROPOSED PAVEMENT
- PROPOSED 3.0m MULTI-USE PATHWAY
- PROPOSED 1.0m SPLASH PAD
- CULVERT
- GRADING LIMITS
- EXISTING SIGNAL
- PROPOSED SIGNAL

General Notes

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All Pipes Size In mm

B.M. No. Elev.
Description
Location

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Designed by

Chkd.

Approved by

NOTICE TO CONTRACTOR

48 HOURS PRIOR TO COMMENCING WORK NOTIFY THE FOLLOWING

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TOWN OF CALEDON WORKS DEPT.
BELL CANADA
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ONTARIO CLEAN WATER AGENCY
HYDRO ONE NETWORKS

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ENERSOURCE TELECOM
HYDRO ONE TELECOM
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ALLSTREAM
PSN (PUBLIC SECTOR NETWORK)
FUTUREWAY (FCI BROADBAND)

10m 0 10 20 30m HORIZONTAL SCALE

1m 0 1 2 3m VERTICAL SCALE

WSP

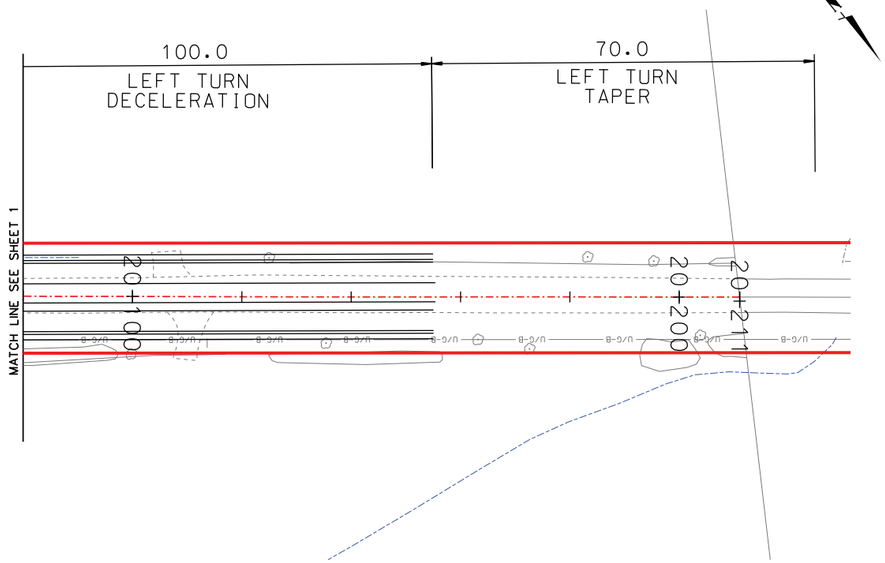
Region of Peel
Working for you

ROAD IMPROVEMENTS AT

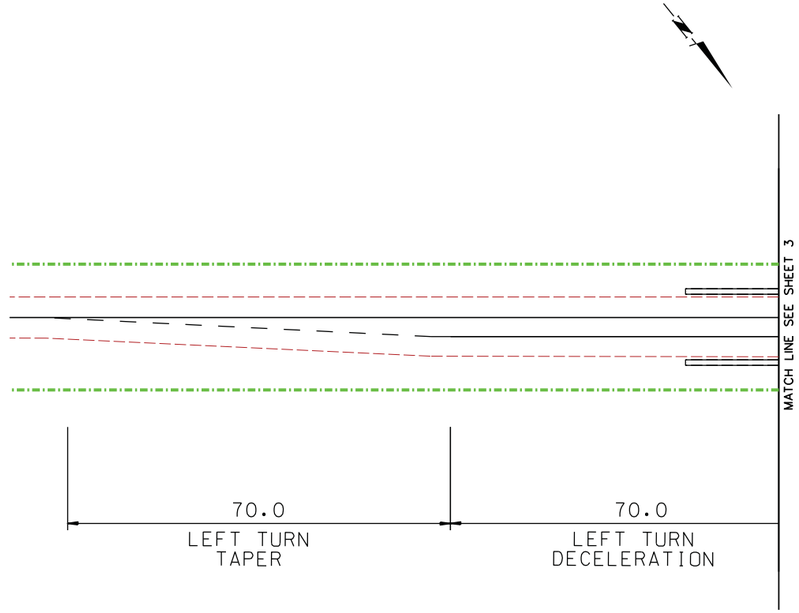
MAYFIELD ROAD
FROM CHINGUACOUSY ROAD TO HEART LAKE ROAD

PLAN AND PROFILE

CAD Area		Project No.	101-17262
Checked by V.M.	Drawn by M.B.	Plan No.	- D
Date JUL 2014	Sheet 19 of 23		



CHINGUACOUSY ROAD (NORTH)



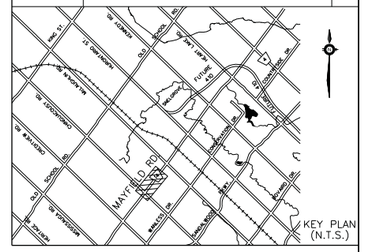
COLLECTOR ROAD 'A' (SOUTH)

SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMAINS			HYDRO U/G CABLE		
TRANSIT			HYDRO ONE		
PARKS & REC.			CTV		
ONT. CLEAN WATER			COMMUNIC. CABLES		

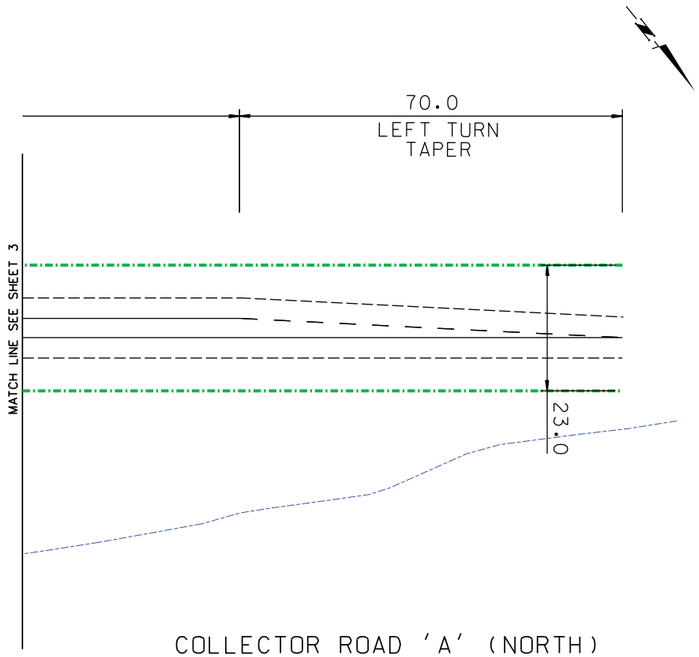
REVISIONS

DATE	DETAILS	INIT.

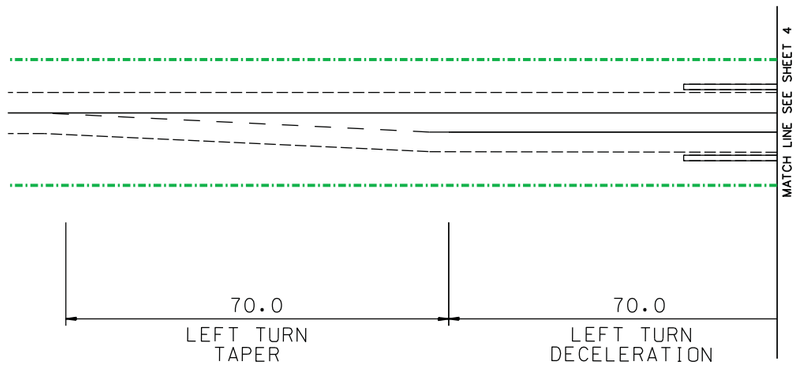


LEGEND

- EXISTING WATERCOURSE
- EXISTING RIGHT OF WAY
- PROPOSED RIGHT OF WAY (BRAMPTON/CALEDON)
- TRCA REGULATION LIMIT
- EXISTING PAVEMENT
- PROPOSED PAVEMENT
- PROPOSED 3.0m MULTI-USE PATHWAY
- PROPOSED 1.0m SPLASH PAD
- EXISTING SIGNAL
- PROPOSED SIGNAL



COLLECTOR ROAD 'A' (NORTH)



COLLECTOR ROAD 'B'

General Notes

All Driveways Are ASPHALT Unless Otherwise Noted

All Water And Sanitary Service Locations Are Approximate And Must Be Located Accurately In The Field

All Pipes Size In mm

B.M. No. Elev.
Description
Location

The Contractor Is Responsible For Locating And Protecting All Existing Utilities Prior To And During Construction. Location Of Existing Utilities Approximate Only, To Be Verified In Field By Contractor.

Designed by

Chkd.

Approved by

NOTICE TO CONTRACTOR

48 HOURS PRIOR TO COMMENCING WORK NOTIFY THE FOLLOWING

THE REGIONAL MUNICIPALITY OF PEEL
CITY OF MISSISSAUGA WORKS DEPT.
CITY OF BRAMPTON WORKS DEPT.
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ONTARIO CLEAN WATER AGENCY
HYDRO ONE NETWORKS

CABLE TELEVISION/FIBREOPTIC PROVIDERS:
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ROGERS CABLE
ALLSTREAM
PSN (PUBLIC SECTOR NETWORK)
FUTUREWAY (FCI BROADBAND)

10m 0 10 20 30m HORIZONTAL SCALE

1m 0 1 2 3m VERTICAL SCALE

WSP

Region of Peel
Working for you

ROAD IMPROVEMENTS AT

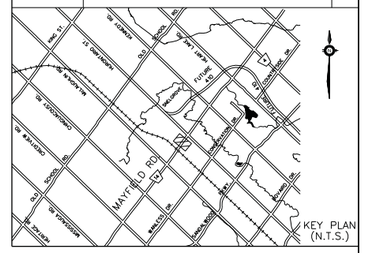
MAYFIELD ROAD
FROM CHINGUACOUSY ROAD TO HEART LAKE ROAD

CHINGUACOUSY ROAD, COLLECTOR ROAD 'A' & COLLECTOR ROAD 'B'

CAD Area			Project No. 101-17262
Checked by V.M.		Drawn by M.B.	Plan No. -D
Date JUL 2014		Sheet 20 of 23	

SERVICE DATA					
SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMAINS			HYDRO U/G CABLE		
TRANSIT			HYDRO ONE		
PARKS & REC.			CTV		
ONT. CLEAN WATER			COMMUNIC. CABLES		

REVISIONS		
DATE	DETAILS	INIT.



LEGEND

- EXISTING WATERCOURSE
- EXISTING RIGHT OF WAY
- PROPOSED RIGHT OF WAY (BRAMPTON/CALEDON)
- TRCA REGULATION LIMIT
- EXISTING PAVEMENT
- PROPOSED PAVEMENT
- PROPOSED 3.0m MULTI-USE PATHWAY
- PROPOSED 1.0m SPLASH PAD
- EXISTING SIGNAL
- PROPOSED SIGNAL

General Notes

All Driveways Are ASPHALT Unless Otherwise Noted

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All Pipes Size In mm

B.M. No.
Description
Location

Elev.

The Contractor Is Responsible For Locating And Protecting All Existing Utilities Prior To And During Construction, Location Of Existing Utilities Approximate Only, To Be Verified In Field By Contractor.

Designed by

Chkd.

Approved by

NOTICE TO CONTRACTOR

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CITY OF BRAMPTON WORKS DEPT.
TOWN OF CALEDON WORKS DEPT.
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ONTARIO CLEAN WATER AGENCY
HYDRO ONE NETWORKS

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HYDRO ONE TELECOM
ROGERS CABLE
ALLSTREAM
PSN (PUBLIC SECTOR NETWORK)
FUTUREWAY (FCI BROADBAND)

10m 0 10 20 30m — HORIZONTAL SCALE

1m 0 1 2 3m — VERTICAL SCALE

WSP

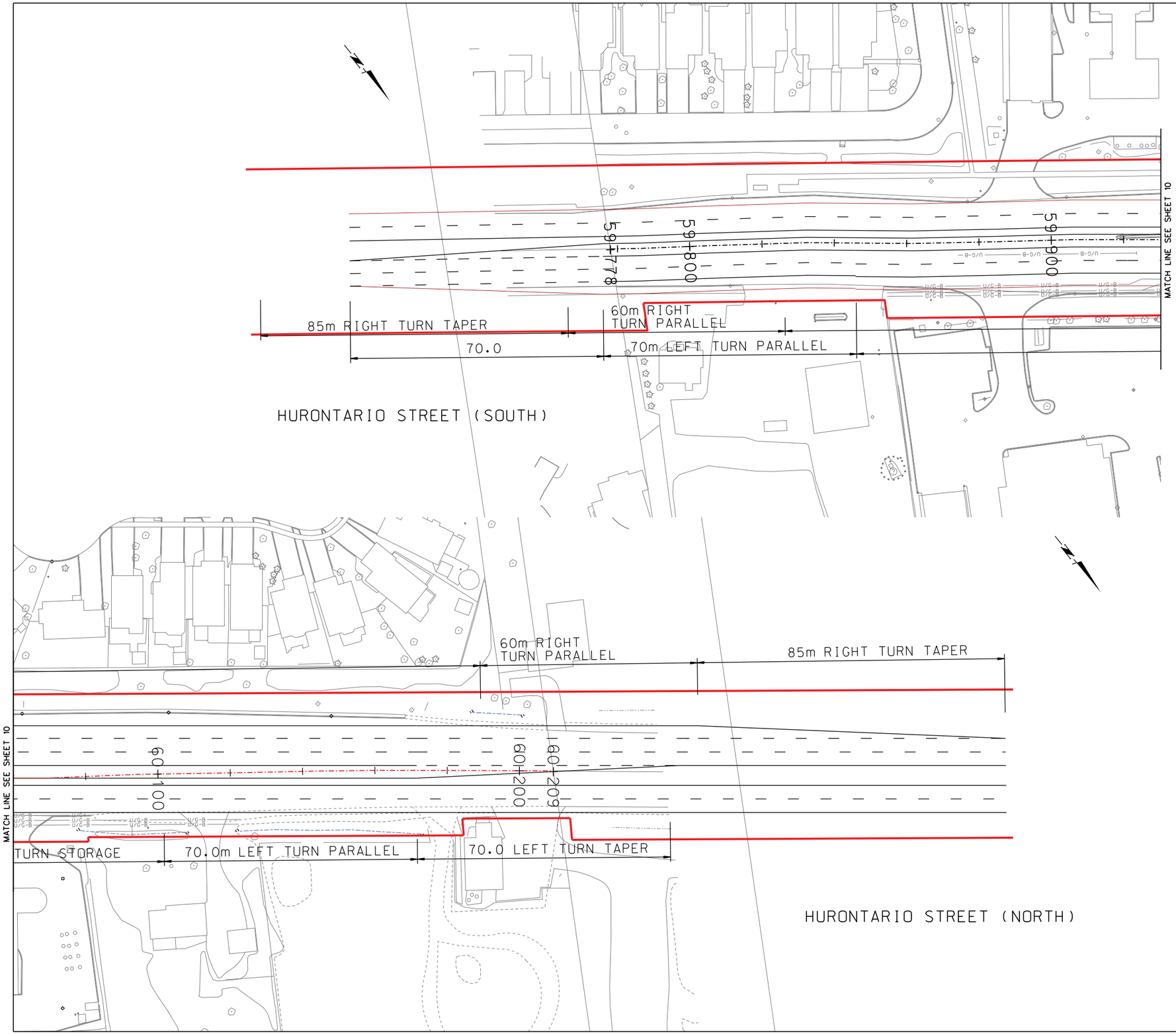
Region of Peel
Working for you

ROAD IMPROVEMENTS AT

MAYFIELD ROAD
FROM CHINGUACOUSY ROAD TO HEART LAKE ROAD

CRESTHAVEN RD/ROBERTSON DAVIES DR

CAD Area		Project No. 101-17262
Checked by V.M.	Drawn by M.B.	Plan No. -D
Date JUL 2014	Sheet 21 of 23	



SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMAINS			HYDRO U/G CABLE		
TRANSIT			HYDRO ONE		
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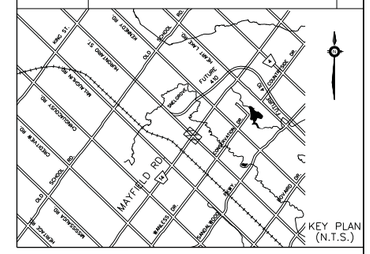
ONT. CLEAN WATER			COMMUNIC. CABLES		

REVISIONS

DATE	DETAILS	INIT.



LEGEND

- EXISTING WATERCOURSE
- EXISTING RIGHT OF WAY
- PROPOSED RIGHT OF WAY (BRAMPTON/CALEDON)
- TRCA REGULATION LIMIT
- EXISTING PAVEMENT
- PROPOSED PAVEMENT
- PROPOSED 3.0m MULTI-USE PATHWAY
- PROPOSED 1.0m SPLASH PAD
- EXISTING SIGNAL
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General Notes

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All Pipes Size In mm

B.M. No. Elev.
Description
Location

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Designed by

Chkd.

Approved by

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10m 0 10 20 30m HORIZONTAL SCALE

1m 0 1 2 3m VERTICAL SCALE

WSP

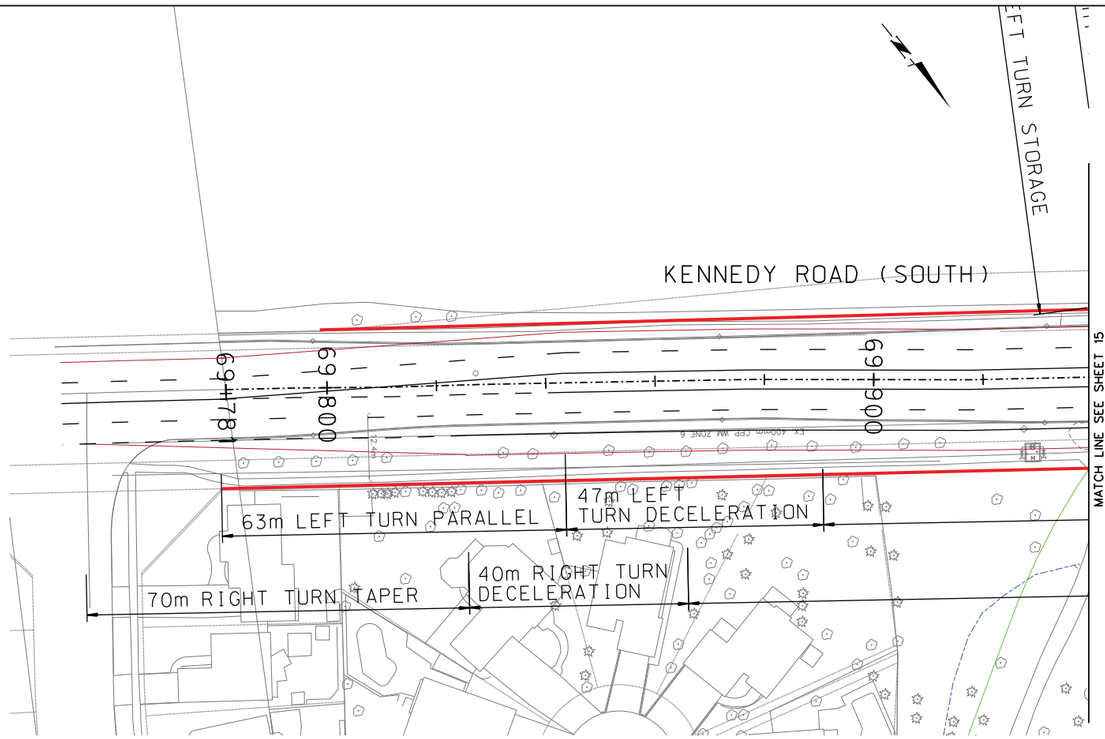
Region of Peel
Working for you

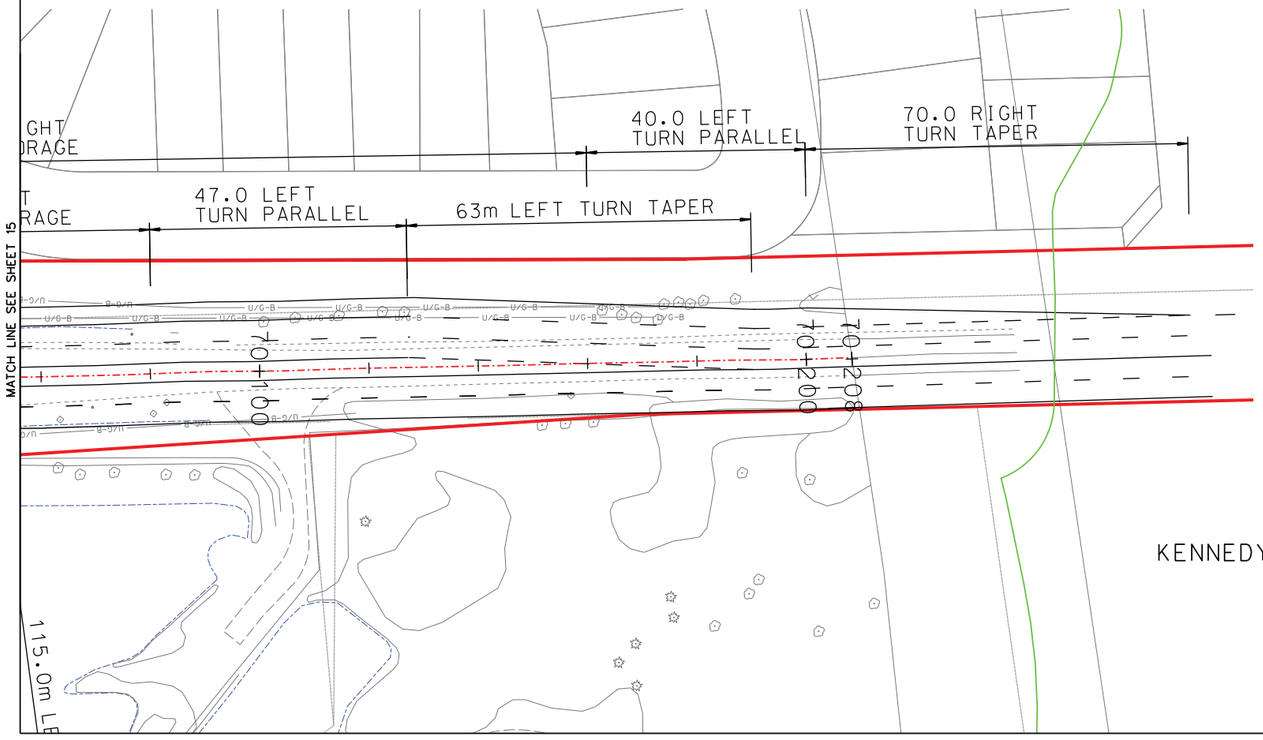
ROAD IMPROVEMENTS AT

MAYFIELD ROAD
FROM CHINGUACOUSY ROAD TO HEART LAKE ROAD

HURONTARIO STREET

CAD Area		Project No.	101-17262
Checked by V.M.	Drawn by M.B.	Plan No.	-D
Date JUL 2014	Sheet 22 of 23		





SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
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PARKS & REC.			CTV		
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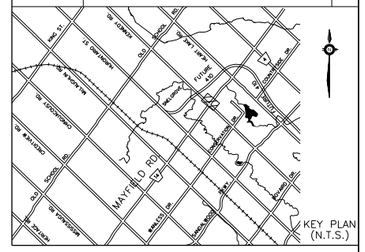
REVISIONS

DATE	DETAILS	INIT.



LEGEND

- EXISTING WATERCOURSE
- EXISTING RIGHT OF WAY
- PROPOSED RIGHT OF WAY (BRAMPTON)
- TRCA REGULATION LIMIT
- EXISTING PAVEMENT
- PROPOSED PAVEMENT
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1m 0 1 2 3m VERTICAL SCALE

WSP

Region of Peel
Working for you

ROAD IMPROVEMENTS AT

MAYFIELD ROAD
FROM CHINGUACOUSY ROAD TO HEART LAKE ROAD

KENNEDY ROAD

CAD Area		Project No.	101-17262
Checked by V.M.	Drawn by M.B.	Plan No.	-D
Date JUL 2014	Sheet 23 of 23		