Project Number:
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April/2013

Mayfield Road Improvements

Airport Road to Coleraine Drive – Class Environmental Assessment

ENVIRONMENTAL STUDY REPORT

Volume 1 of 5
Environmental Study Report

April 5, 2013

Stantec

Region of Peel
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INTRODUCTION AND THE STUDY AREA

Mayfield Road (Regional Road 14) is a major east-west arterial roadway located within the Region of Peel. Mayfield Road is under the jurisdiction of the Region of Peel, and runs from the western boundary of the Region at Winston Churchill Boulevard (Regional Road 19) to the eastern Region boundary at Regional Road 50 (formerly Provincial Highway No. 50). Mayfield Road also forms the boundary between the Town of Caledon and the City of Brampton, with the exception of the settlement of Snelgrove at Hurontario Street (Highway 10), where Mayfield Road is entirely within the City of Brampton.

The Region of Peel has undertaken this Class Environmental Assessment Study to examine the potential for improvements to the section of Mayfield Road located between Airport Road and Coleraine Drive.

The Region of Peel has undertaken this Class Environmental Assessment Study to examine the potential for improvements to the section of Mayfield Road located between Airport Road (Regional Road 7) and Coleraine Drive. This study follows the previous study of Mayfield Road improvements from Hurontario Street to Heart Lake Road completed in November 2002 and from Heart Lake Road to Airport Road completed in May 2004. The current Study Area location is illustrated in Figure 1.1 and further detailed in Figure 1.2. The Study area extends over a length of approximately 7.0 kilometers along the existing Mayfield Road corridor. After the study was commenced, a portion of The Gore Road (Regional Road 8) was added to the study, from just north of Mayfield Road to a point nearly 500 metres south of Mayfield Road as illustrated on Figure 1.2. Included on this figure also is the approximate location of a proposed future major roadway near the east end between Clarkway Drive (Brampton)/Humber Station Road (Caledon) and Coleraine Drive.

This study was also completed in parallel with and then ultimately following a separate transportation study of the 427 extension planned to the east near Coleraine Drive. The Mayfield Class EA study which commenced in late 2007 was placed on hold briefly in 2008 and the traffic study for the EA incorporated some of the pertinent observations noted in the Peel-Highway 427 Extension Area Transportation Master Plan, completed by the Region of Peel, the Town of Caledon and the City of Brampton.

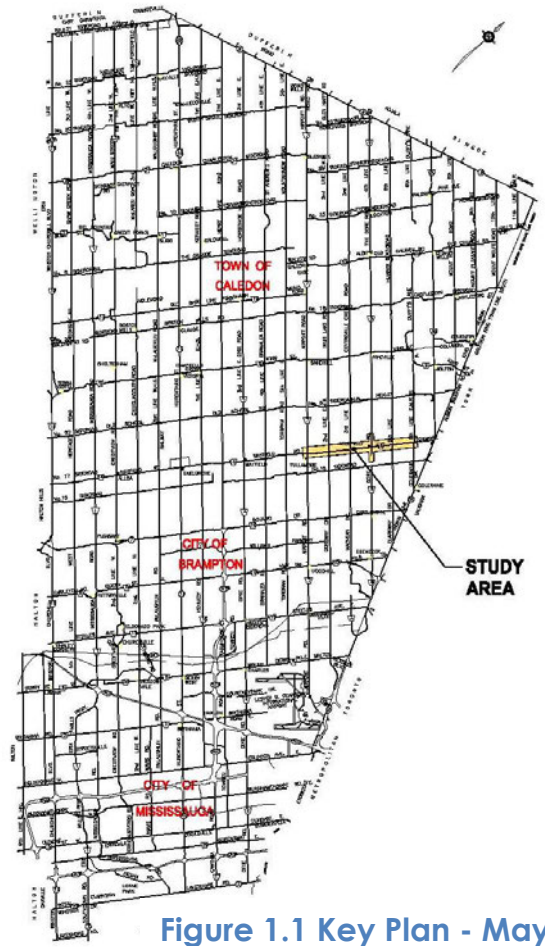


Figure 1.1 Key Plan - Mayfield

Adjacent land use is primarily rural in nature with several operating farms, some commercial enterprises and several rural residential homes with large front lot dimensions. Most of the residential homes front on to Mayfield Road with direct driveway access at the roadway. One exception is the reverse frontage development on the south side of Mayfield Road just east of Airport Road, which is located within the City of Brampton.

The historic settlements of Tullamore (at Airport Road) and Wildfield (at The Gore Road) are two significant areas recognized in the Region's Official Plan that differ from the predominately rural nature of the remaining study area.

The study area is also located within the Humber River Watershed. More specifically, the study area is located primarily within the West Humber River watershed, which flows approximately 43 km from its source and joins the Main Humber River in Toronto downstream of Albion Road. A total of 16 water crossings have been identified within the study area including the West Humber River and Salt Creek. A small, intermittent tributary of the Main branch of the Humber River also crosses the easternmost portion of the study area.

Within the study area are numerous watercourse crossings and tributaries of the West Humber River watershed system. The crossings vary from a single span bridge near the west end of the study area through numerous smaller culvert structures including concrete pipe arches, rigid frame concrete culverts with open bottoms and CSP pipe crossings of varying sizes for the smaller catchment areas. These watercourses and various related considerations are summarized in the study report

Figure 1.2 - Study Area – Mayfield Road – Airport Road to Coleraine Drive

Within the Hamlet of Wildfield there are heritage dwellings as a well as a church and cemetery, the St. Partrick's Church, which is located very close to edge of the existing roadway at The Gore Road, with frontages on both Mayfield Road at the south east corner and on the east side of The Gore Road south of Mayfield Road. Specific studies of these features were completed as part of the overall Class EA study.

CLASS ENVIRONMENTAL ASSESSMENT PROCESS

The Class Environmental Assessment for the Mayfield Road Improvements project has been undertaken in accordance with the guidelines set out in the provincially approved document titled "Municipal Class Environmental Assessment (Municipal Engineers Association, October 2000, as amended in 2007 and 2011)". The project falls within the category of a Schedule "C" Class Environmental Assessment, and included the first four (4) Phases of the study process (detailed design was not included).

As a requirement of Schedule "C" projects, the Environmental Study Report (ESR) will be filed on the public record for a minimum 30-day review period. During this

period, any member of the public, an agency, property owner or other stakeholder may request that the proponent address any concerns that they may have with the project recommendations. If any concerns cannot be resolved through consultation between the Region and the objector, then a formal request may be made to the Minister of the Environment that a Part II Order be issued. Such a request by the objector must be in writing.

A Part II Order, if granted by the Minister of the Environment, would elevate the project from a Class EA Study to an Individual EA. If this were to occur, then the project would not be able to proceed until the proponent completed an Individual EA Study. If a Part II Order was not issued, or if no requests or objections were received during the filing period, the project would be approved under the Environmental Assessment Act and could proceed to design and construction.

PUBLIC & AGENCY CONSULTATION

A Notice of Study Commencement for the Mayfield Road Class Environmental Assessment Study from Airport Road to Coleraine Drive was advertised in local newspapers. The Notice of Study Commencement was advertised in both the Brampton Guardian and Caledon Enterprise on Saturday October 6, 2007 and Wednesday October 10, 2007.

In addition, the Notice of Study Commencement was mailed to various government agencies, utility companies, property owners, residents, businesses and other identified stakeholders on October 9, 2007.

Two Public Information Centre (PIC) meetings were held at key decision points during the study. The first meeting was on June 25, 2009 at Castlemore Public School on The Gore Road and the second was held on November 16, 2011 at St. Patrick Separate School also on The Gore Road

The information presented at the PICs included the need and justification for the project, the alternative solutions and concepts being considered, the evaluation criteria and process for assessing the alternatives, the identification of a preferred design concept for the widening of Mayfield Road, the assessments of related impacts and the construction of a various new culverts, storm water management facilities and other preliminary design details. Comments requested and received from members of the public and various review and approval agencies are summarized in the study report.

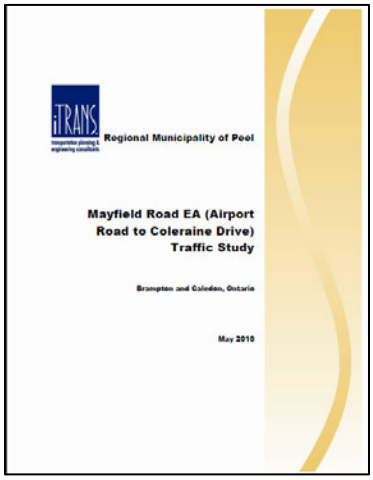
EXISTING CONDITIONS & INVENTORIES

Various inventories were gathered during the study to confirm the existing conditions including current and planned land uses, secondary planning information, traffic data and collision data, population projections, information on the natural environment

including terrestrial, aquatic and wildlife inventories, Hydrogeology (groundwater resources). tree inventory and assessment, inventories of existing municipal infrastructure including bridges and culverts, utilities and municipal services, drainage facilities and provisions, geotechnical information including pavement, soils and groundwater information, information on the potential for soil and groundwater contamination, archaeology and heritage and cultural landscape assessments.

The gathered information and related assessments were used to assist in the evaluation of potential impacts of the alternative solutions and in the development of suitable design alternatives.

DETERMINATION OF NEED AND JUSTIFICATION



In order to examine the existing and future traffic conditions based on anticipated development and resultant traffic patterns within the area, a Traffic Study was undertaken for the study area in support of the Class EA, by iTRANS Consulting on behalf of Stantec Consulting Ltd. The traffic study is included in its entirety as an Appendix to the EA study. The traffic study assessed the transportation need and justification for any potential improvements to Mayfield Road between Airport Road and Coleraine Drive.

The traffic analysis and the tasks undertaken included:

* Review of existing traffic conditions;
* Analysis of midblock road links and key intersections;
* Assessment of existing transportation deficiencies and local traffic issues;
* Assessment of the safety performance for Mayfield Road;
* Preparation of travel forecasts for the 2007, 2012, 2017 and 2032 planning horizon;
* Assessment of future corridor travel demands and deficiencies;
* Identification of road improvements to accommodate future travel demands.

Later in the process a study of modern roundabout alternatives was undertaken to address the question of whether roundabout intersections could provide the required capacity improvements to support the future of operation of Mayfield Road and its associated intersections. The roundabout concepts were eliminated from further consideration on the basis of overall future costs and the anticipated need to replace the roundabouts with conventional signalized intersections in the ultimate build-out scenario.

To determine the need for improvements to Mayfield Road and future lane requirements, travel demand forecasts were prepared for this study for the 2012, 2017 and 2032 horizon years (reflecting 5, 10, and 25 year growth from the 2007 initiation of

the traffic study). The ultimate horizon was revised later in the study to 2031 to coincide with the Region's Official planning horizon.

The following conclusions were made following the analysis:

Widening Mayfield Road to 4-lanes, signalizing most of the intersections and adding turn lanes was analyzed based on the forecasted 2012 traffic volumes. Based on the analyses it was demonstrated that upgrading to a 4-lane cross-section on Mayfield Road by 2012 would be sufficient.

The 2012 lane configuration was then analyzed utilizing the 2017 traffic forecasts to determine if any further lane improvements are required in 2017. It was found that the intersection improvements recommended for 2012 will provide sufficient capacity and maintain acceptable levels of service by 2017.

Suggested improvements are based on diminished level of service and substantial delays at most intersections as illustrated with the 4-lane scenario for horizon year 2031. Other interim improvements should be considered when levels of service and related delays at specific locations warrant improvements.

A similar analysis with 2032 traffic forecasts was also performed on the 2017 lane requirements, to determine the further long term lane requirements. When analyzing the 2031 volumes with the 2017 improvements in place it was concluded that widening to six (6) lanes is recommended in the latter portion of the design period prior to 2031.

PROBLEM STATEMENT

Based on the review of the existing conditions and forecasted traffic and development within or near the study area, and considering the prevailing natural and social conditions, the need and justification for improvements to Mayfield Road is summarized in the following Problem Statement:

"Based on projected population, employment, development forecasts and other planned road improvements, Mayfield Road between Airport Road and Coleraine Drive is expected to operate at an unacceptable Level of Service by the year 2012. Improvements must be made in order for Mayfield Road to operate at an acceptable Level of Service in the future".

ALTERNATIVE SOLUTIONS

Based on the problem statement and the need and justification for improvements, a number of Alternative Solutions to the problem(s) identified within the Study Area were developed. A total of nine (9) general alternative solutions were identified as having the potential to address the issues identified within the study area. They are as follows:

DO NOTHING

This alternative solution identifies what would happen if no action is taken to address current deficiencies within the corridor, in both the short and long terms. This assessment provides a baseline to which other project alternatives may be measured.

TRAFFIC OPERATION IMPROVEMENTS

Opportunities may exist along the Mayfield Road corridor to improve existing traffic signal timings or to add additional traffic signal systems, to optimize the amount of traffic capacity that the existing road can handle and to improve safety at various intersections.

ACCESS MANAGEMENT

Some of the existing traffic and safety operational issues, within the Mayfield Road corridor, may be attributed to vehicles attempting to enter and exit properties. Access management solutions that can be considered include consolidating or restricting driveway accesses, installing raised centre medians, and installing centre left turn lanes.

INTERSECTION IMPROVEMENTS

The addition of auxiliary lanes to accommodate turning movements at intersections may reduce traffic delay times through the various intersections and improve the flow along Mayfield Road, thereby providing additional capacity. Either new, or longer, designated left turn and right turn lanes at existing intersections, both on Mayfield Road and the cross streets, would be considered to accommodate the projected traffic volumes.

ROUNDABOUTS

Roundabouts are characterized by their lack of traffic signals and a circulating roadway providing for continual traffic flow through the intersection. Roundabouts generally provide more traffic capacity than standard signalized intersections due to their ability to reduce delays. In addition, roundabouts generally reduce the number of severe or personal injury collisions due to the reduction in conflict points and slower speeds, when compared to traditional signalized intersection. By building roundabouts the need and extent for improvements to Mayfield Road may be reduced.

WIDENING MAYFIELD ROAD

Widening Mayfield Road with additional through lanes and turn lanes to improve corridor capacity and address existing and future congestion issues.

TRANSIT SERVICE

Improving the level of transit service within the corridor, may reduce vehicle traffic on Mayfield Road, and extend the time when other improvements are necessary.

UPGRADE OTHER ROUTES

By improving other existing road corridors that perform similar functions as Mayfield Road, traffic could potentially be diverted away from Mayfield Road, and thereby reducing traffic volumes and the need and extent of improvements to Mayfield Road.

BUILD OTHER ROUTES

By building other roads or routes near the study area that will divert traffic away from Mayfield Road may reduce traffic on Mayfield Road and thereby reduce the need and extent of improvements to Mayfield Road.

Each of these alternative solutions was reviewed in detail. The evaluations concluded that widening of Mayfield Road with intersection improvements and access management, along with other planned transportation and transit system improvements would achieve the desired results.

RECOMMENDED ALTERNATIVE SOLUTION

Based on the evaluation and screening of the Alternative Solutions, "Widening of Mayfield Road" was identified as the Alternative Solution that has the best potential to address the Problem Statement and provides the best opportunity to address the capacity and level of service requirements after 2012. Moving forward, the widening of Mayfield Road will include access management options, improvements to intersections, and consideration of roundabouts at major intersections. In addition, upgrading of other routes, building other routes/roads, and providing transit service enhancements will all proceed as planned regardless of the design alternative recommended for this study.

ROUNDABOUTS

Modern roundabouts are being utilized in an increasing number of jurisdictions due to their ability to handle more traffic with less congestion than signalized intersections. Another advantage of roundabouts that often make them suitable for intersection control, is that they typically result in less severe collisions, whereas the number of conflict points (or points where vehicles may experience a collision) is reduced, especially the number of high speed, right angle collisions. Sideswipe collisions are usually not reduced, but sideswipe collisions are generally less severe from a personal injury and property damage standpoint when compared to right angle collisions.

The Roundabout Analysis indicated that the construction of two-lane roundabouts, on a 4-lane Mayfield Road corridor, would be suitable from a traffic delay and queuing perspective, at four intersections including three existing intersections. A roundabout is not deemed to be suitable for the intersection of Mayfield Road at The Gore Road. Other considerations, such as pedestrian accommodation and crossing safety may not be well served as the traffic volumes on Mayfield Road reach 2,000 vehicles in the peak hour direction and as traffic need grows beyond the provisions of four lanes.

After much discussion and deliberation, the study team concluded its recommendation that roadway alternatives with full capacity signalized intersections will be recommended in the current study as part of the preferred solution and that they will be considered further in the development of design alternatives for improvements to Mayfield Road from Airport Road to Coleraine Drive.

ROAD WIDENING

Based on the traffic study completed for the project, it was found that six lanes would ultimately be required on Mayfield Road between Airport Road and the new roadway connecting to the Highway 427 Extension (just west of Coleraine Drive) by the year 2031. The section of Mayfield Road between the new connecting roadway and Coleraine Drive would also need to be increased to four lanes wide by 2031.

Since the ultimate widening to six lanes is not needed for approximately 18 years after the completion of this study, the Region of Peel may decide to construct Mayfield Road in stages by widening initially to four lanes, and then widening to six lanes before 2032.

ROADWAY DESIGN CONCEPTS

Four (4) Alternative Design Concepts were developed for widening of Mayfield Road to six lanes. Each of the alternatives included a centre left turn lane (except within 30m of signalized intersections), and turn lanes at intersections. Each of the major intersections with Mayfield Road will be signalized (Airport Road, Goreway Drive/Innis Lake Road, McVean Drive/Centreville Creek Road, The Gore Road, Clarkway Drive/Humber Station Road and Coleraine Drive).

In addition, potential future intersections resulting from future development have been shown where advanced development details exist. All of the alternative design concepts include widening to the north away from the existing St. Patrick's Cemetery to avoid disturbing the existing grave sites and related improvements on The Gore Road are also included. In addition, just east of Airport Road where the existing subdivision exists, and property has already been obtained for a six lane widening, all alternatives include widening to the north only with the most southern property line being the existing property line for the subdivision.

All alternative design concepts illustrate the minimum road allowance or right-of-way of 50 metres, as designated in the Region of Peel Official Plan. In some instances, additional property is required in addition to the 50 metre right-of-way in order to construct embankments at culvert or bridge crossings, to construct storm water management ponds and other facilities required to satisfy existing environmental regulations.

The four Alternative Design Concepts are as follows:

DESIGN CONCEPT NO. 1 – WIDENING MAYFIELD ROAD EQUALLY ABOUT EXISTING CENTRELINE

This alternative design concept widens Mayfield Road equally about the existing centerline of Mayfield Road, with the exception of the two areas noted previously, namely at St. Patrick's Cemetery and at the newer subdivision just east of Airport Road.

With Mayfield Road widened equally about the existing centerline, new property requirements are more or less spread equally on both sides of Mayfield Road. Mayfield Road would also be widened equally into the City of Brampton and the Town of Caledon. Evaluation of this concept and the others is included in the study report.

DESIGN CONCEPT NO. 2 – WIDENING MAYFIELD ROAD TO THE NORTH, HOLDING THE EXISTING SOUTH PROPERTY LINE WHERE POSSIBLE

This alternative design concept widens all of Mayfield Road to the north into the Town of Caledon, with little or no property required from properties on the south side of Mayfield Road (City of Brampton).

Widening the road to one side tends to have a more significant impact on a smaller number of properties and in some cases resulting in the potential requirement for full property buyouts Given the desire to minimize and balance impacts, in many cases this alternative does not meet that objective and has the potential to have significant impact on certain properties.

DESIGN CONCEPT NO. 3 – WIDENING MAYFIELD ROAD TO THE SOUTH, HOLDING THE EXISTING NORTH PROPERTY LINE WHERE POSSIBLE

This alternative design concept widens all of Mayfield Road to the south into the City of Brampton, with the exception of the two areas noted previously, namely at St. Patrick's Cemetery and at the newer subdivision just east of Airport Road. The only property required on the north side of Mayfield Road is in the areas of the St. Patrick's Cemetery and the area just east of Airport Road.

Widening the road to one side tends to have a more significant impact on a smaller number of properties and in some cases resulting in the potential requirement for full

property buyouts. Given the desire to minimize and balance impacts, in many cases this alternative does not meet that objective and has the potential to have significant impact on certain properties.

DESIGN CONCEPT NO. 4 - WIDENING OF MAYFIELD ROAD ABOUT EXISTING CENTRELINE "MODIFIED" TO MINIMIZE PROPERTY IMPACTS

After initial consideration of the preceding alternatives, the study team requested consideration of an alternative that would balance the impacts more evenly and lessen impacts further on some very specific features which are of particular significance to the community. Examples include the St. Patrick's Church and Cemetery at The Gore Road, and the historic settlements of Tullamore at Airport Road and the settlement of Wildfield at The Gore Road.

Since widening equally about the existing Mayfield Road centerline potentially results in some dwellings being directly impacted a best effort is made to avoid those impacts while in other areas where there are no houses or building directly across abutting Mayfield Road Mayfield the road is designed to provide an optimum alignment from an operational standpoint while satisfying all aspects of the recommended roadway design criteria.

The proposed lane widths are modified in Wildfield to minimize the potential impacts on the community and the recommended design speed and posted speed are reduced to 60 km/hr. in comparison to the 90 km/hr. and 80 km/hr. design speeds used for the remainder of the corridor which is posted at 80 km/hr.

This alternative was refined by slightly modifying the road alignment further north or south in certain areas to reduce direct impacts to some existing houses or buildings. The areas where this was specifically undertaken are as follows:

Airport Road

At Airport Road the roadway is offset toward the north recognizing the existing property line alignment as the southern boundary of the roadway including its exposure along the existing development lands in the vicinity of Maisonneuve Boulevard within the City of Brampton.

The Gore Road at Wildfield

At Wildfield, the roadway alignment is offset toward the north to avoid impacts on the cemetery land associated with St. Patrick's Church at the southeast corner of Mayfield Road and The Gore Road. In addition to this, the lane widths are reduced to a minimum standard for the roadway through Wildfield. The decision to do this has been supported by observations made during excavations for the Stage 2 archaeological investigation undertaken adjacent to the cemetery where a footstone was exposed

during the test pitting operation. This observation suggests that there may be gravesites within or encroaching upon the roadway allowance and as a result of a past road widening. Similar concerns were expressed with regard to the Gore Road frontage at the cemetery where past study has also suggested the potential for gravesite encroachment on the existing roadway corridor. As part of this study, a recommendation has been made that a Stage 3 archaeological investigation be undertaken in conjunction with the proposed detailed design work to follow this study which includes related improvements on The Gore Road.

POTENTIAL IMPACTS AND MITIGATION

Features and conditions that required additional consideration during this study included driveway and site access, traffic noise impacts on existing dwellings, drainage and watercourse impacts, roadside drainage and roadway overtopping, endangered species provisions (Redside Dace habitat), meander belt and 100 year erosion analyses (Geomorphology), storm runoff water quality provisions, cross section options at the St. Patrick's Church and Cemetery frontage and 11962 The Gore Road, and to some degree, ongoing adjacent land development proposals.

Each of these was investigated in greater detail in association with the evaluation of design alternatives and refinement of the preferred alternative.

St. Patrick's Church and Cemetery

The St. Patrick's Church and Cemetery at 11873 The Gore Road at the south east corner of the intersection of Mayfield Road and The Gore Road is located immediately adjacent to the existing roadway corridor. The church and cemetery are located in a constrained area opposite the heritage property at 11962 the Gore Road which will be subject to required intersection improvements and widening to accommodate future community traffic growth and the need to improve future traffic operations at The Gore Road and on Mayfield Road.

St. Patrick's Church and Cemetery

Past archaeological study has suggested that there is potential for the encroachment of the road right-of-way on existing gravesites and that any widening must avoid the existing gravesites and cemetery. The Stage 2 archaeological investigation summarized in this report recommends that a Stage 3 excavation be undertaken prior to the completion of related detailed design for The Gore Road. In consideration of the potential for gravesite encroachment and the desire to avoid any further encroachment several alternative intersection layouts were developed and analyzed using various cross section designs to determine the most suitable fit with the existing constraints. Subsequent review and discussions with the heritage planners, TRCA and Church

Officials has concluded that avoidance of the area of potential gravesites is preferred and that the dwelling at 11962 The Gore Road cannot be retained or relocated on site. As a result, the dwelling will be removed and the roadway alignment shifted further to the west to avoid impact on the existing cemetery and gravesites. The additional shift will also be investigated in greater detail during the detailed design phase of the project.

11962 The Gore Road

Archaeological Services Inc. (ASI) was contracted by Stantec Consulting Ltd. to update a Cultural Heritage Impact Assessment Report previously prepared for 11962 The Gore Road in the City of Brampton (ASI February 2010).

Heritage Property - 11962 The Gore Rd.

The original cultural heritage impact assessment report was prepared in 2009 as part of the detailed design process for proposed road and sanitary improvements for The Gore Road, from 300m north of Castlemore Road to 1km north of Mayfield Road. Results of the background research, field survey, and application of heritage evaluation criteria confirmed that the subject dwelling has high heritage value.

During the study, concerns were expressed for the potential impacts on the heritage property identified at 11962 The Gore Road. In response to those concerns the study team met to discuss specific options for the proposed improvements and impacts at 11962 the Gore Road and develop a road cross section that would provide for adequate operation of the intersection at Mayfield Road and minimize negative impacts on property adjacent to the south approach to the intersection with Mayfield Road on The Gore Road. During this time, Stantec was asked to investigate and develop alternatives for the road cross section in the area immediately adjacent to the St.

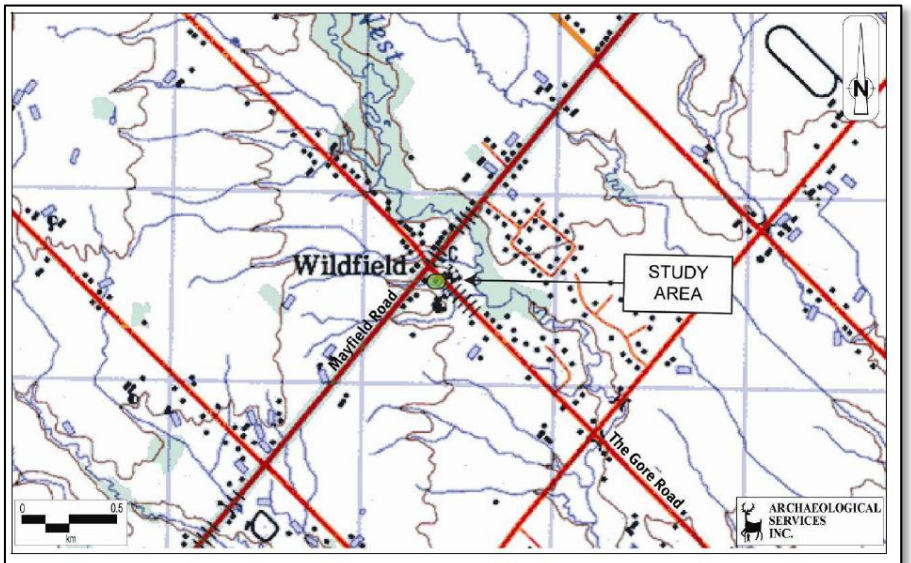


Figure 1: Location of 11962 The Gore Road in the City of Brampton [NTS Sheet: Bolton 30-M-13

Patrick's Church and Cemetery and 11962 the Gore Road. The development of alternatives also included a review of the past work undertaken as part of the *Class Environmental Study Report: The Gore Road Widening from north of Castlemore Road to north of Mayfield Road*, Regional Municipality of Peel, R.J Burnside.

The subject location is highlighted on the extracted Figure 1 from the Cultural Heritage Impact Assessment Report prepared for 11962 The Gore Road. The complete heritage report for 11962 The Gore Road is included in the study Appendix.

Stantec developed five cross sections for review and discussion was held on site with the Heritage consultant, Region Transportation Planning Staff, Region Real Estate personnel and The City of Brampton's Heritage coordinator. The sections reviewed are included in the study report and the recommended cross section CS5 is included on the following page. The plan layout for this area is also illustrated on Drawing No. P16 of the Preliminary Design Drawings.

During the heritage review it was concluded that only the main building at 11962 excluding additions is of heritage significance and as such the footprint required for relocation of the structure is much less than the footprint for the entire structure which could not be accommodated on the site without encroaching on lands owned by others. As a result, it is considered that the existing dwelling could possibly be relocated in its original configuration toward the back of the existing property and retained as a heritage site in the context of the settlement of Wildfield, which in turn would retain the context associated with its proximity to Wildfield and its geographic association with St. Patrick's Church. The details of this would have to be addressed later thorough further investigation and coordination between the Region, the City and adjacent landowners.

Subsequent to the site investigation, the Region and their real estate personnel investigated the potential to relocate the main building within the remaining property and it was concluded after much review and discussion with the Heritage planners and the Conservation Authority that the residual land would not adequately accommodate the dwelling and allow for proper municipal servicing, driveway access and parking due to the shape and size of the remaining land parcel and the proximity of the regional flood lines to the subject property. As a result, the dwelling at 11962 The Gore Road cannot be retained or relocated on site. Consequently the dwelling will be removed and the roadway alignment shifted further to the west to avoid impact on the existing cemetery and gravesites. It was concluded that opportunities for historic site identification will be investigated further by the Region during the detailed design development phase.

PREFERRED DESIGN ALTERNATIVE

Based on the detailed evaluation of four (4) roadway design concepts developed and as part of the process to develop a reasonable and practical solution to the project

need & justification, it was concluded that **"Concept 4 – Modified Widening of Mayfield Road about the Centerline"** with some additional refinements presented the best overall technical solution to the problem of increasing traffic and the need to manage that traffic within the community while reducing or limiting the potential for impacts on the local environment and the community. Impacts considered included the direct impact of encroachments on adjacent land, heritage resources, and the natural environment as a result of infrastructure expansion and related works, including consideration of the relative cost of doing so.

Each of the alternatives considered in the detailed evaluation included the following basic elements:

- Improvements were considered on Mayfield Road in the defined study area section from Airport Road to Coleraine Drive, an approximate distance of 7.0 km;
- Expansion from the existing two lane rural section to a semi urban section with four lanes in the interim and then subsequent expansion from four lanes to an ultimate six lanes by the design horizon of 2031/2032;
- Initial urbanization of the roadway at the south side of Mayfield Road in the City of Brampton;
- Semi-urban cross section in the interim period and a full urban cross section to current design standards in the ultimate time frame. Semi-urban section includes shoulders and roadside swale/ditching on the North side of Mayfield Road in the Town of Caledon, where practical
- A continuous centre two way left turn lane in the interim design and provision for an access controlled full height median in the ultimate conditions as area build out occurs;
- Four 3.75 m wide lanes and a continuous 6.0 m wide left turn lane in the interim design with raised medians only at intersections until commercial build out occurs (see plans for lane width variations at Wildfield);
- Six 3.75 m wide lanes and a continuous 6.0 m wide left turn lane in the ultimate design with provision for replacement with raised medians throughout as individual single family residential properties are compiled and the area develops (see plans for lane width variations at Wildfield);
- 3.0 m paved multi-use trail in the boulevard on the south side of Mayfield Road in the City of Brampton;
- 1.5 m wide concrete sidewalk in the boulevard on the north side of Mayfield Road in the Town of Caledon. It must be note that the Region's 2012 Active

Transportation Plan recommends a 3.0 m Multi-Use Path on both sides of Mayfield Road in the study area. The potential for a Multi-Use Path on both sides of Mayfield Road will be investigated further by the Region during the Detailed Design phase of the project;

- Roadside landscaping and trees compatible with the Region of Peel Streetscaping Toolbox and Town of Caledon and City of Brampton landscaping guidelines;
- Provision for landscaped entrance features in the settlement of Wildfield if possible;
- Replacement or extension of various culverts and bridges and extension of other culverts and bridges as required to accommodate watercourse crossings, fisheries and wildlife needs;
- Right and left turn lanes and storage at intersections;
- Provisions for dedicated Transit stops and landing areas at selected locations for westbound and eastbound transit movements;
- Transit stops for north south roadway will require further detailed study as part of separate improvements projects for those roadways;
- Roadside storm sewer drainage system and enhanced swale outlets;
- Roadside storm water management quantity and quality control features including five (5) SWM basins and numerous enhanced roadside swales and Oil Grit Separator (OGS) treatment trains for road run-off quality control at watercourse crossings with direct outlets to the watercourse.

The preferred design alternative was confirmed following the detailed evaluation of design alternatives and review of the alternatives by the study team. The preferred alternative was then formalized and presented to the public for review and comment at Public Information Centre No.2. Details of the preferred design and summarized in detail in the study report (Drawings P1A through P16).

PROPERTY IMPACTS & ACQUISITION

Property impacts were investigated in great detail for all of the roadway design alternatives and were further refined in the development of the Preferred Alternative Design - Concept 4 Modified. A summary of the property requirements is included in the property plans (Drawings P17-P28) illustrating the location and orientation of property impacts and property acquisition requirements.

Property requirements generally consist of property that is required to develop the 50m right of way requirements as identified in the Region's Official Plan and including:

- roadside storm water management facilities;
- development of enhanced outlet swales for the roadway ;
- additional lands required for the construction of road side storm water management facilities and related Oil and Grit Separator (OGS) units;
- the construction of culvert and bridge extensions or replacements; and,
- the general requirements at intersections for the development of auxiliary turning lanes for right and left turning vehicles.

Property is also required for the development of roadside transit stops and associated facilities in connection with the ultimate roadway cross section.

Utility relocations are to be accommodated within the corridor and the potential requirements for guying easements and aerial encroachments are matters to be determined and refined by the respective utility providers at the time of detailed design.

There are 133 properties impacted with 117 partial property impacts and 15 full property impacts (buy-outs) that must be acquired to accommodate the proposed ultimate roadway. The Region of Peel completed Stage 2 archeological investigations (ploughing, test pitting and field investigations) to identify any archaeological resources of concern and has completed that task as of August 2012. When required to do so, the Region of Peel will enter into negotiations with the affected property owners to secure the necessary land to accommodate the proposed works. For properties where permissions to enter were not provided Stage 2 archaeological assessment work will be completed during the detailed design phase.

TRANSIT PROVISIONS

Where space permits, dedicated transit bays have been proposed at the roadside in selected locations. Property acquisition is required for the additional property required to develop the dedicated facilities and the costs thereof are included in the overall property acquisitions and costs estimates. Transit stop locations are typically oriented to the far side of the proposed intersections in accordance with current City of Brampton transit design standards. The various transit stop locations proposed are shown on the recommended preliminary design plans.

ACTIVE TRANSPORTATION

Sidewalks and multi-use trail facilities have been incorporated in the proposed work and included in the assessment of all roadway design concepts and alternatives. A continuous 3.0 m asphalt trail is proposed on the south side for multi-use (City of Brampton) and a 1.5 m wide concrete sidewalk has been proposed on the north side

(Town of Caledon). Connections to proposed transit stops are also a part of the proposal. Consideration of the recommendations of the Region of Peel's 2012 Active Transportation Plan will also be investigated further during the detailed design phase of the project.

STRUCTURE UPGRADING AND REPLACEMENTS

Various culverts require replacement and upgrading as a result of their structural condition, general orientation, elevation and/or hydraulic capacity. Several structures also require replacement with much larger structures due to Endangered Species Act regulations and related habitat considerations.

In accordance with new guidelines established by the Ministry of Natural Resources (MNR) in 2011 during the latter part of this study it is now required that two of the existing crossing structures be upsized to bridge structures with a single span in the order of 15 to 18 m. An additional assessment of practical spans for the subject structures based on fluvial geomorphology was completed in March of 2013 and has been incorporated in the study findings and recommendations. The study plans have been revised at this time to reflect the new bridges and storm sewer modifications that would be required as a result of the MNR guideline requirements.

PHASING OF THE WORK AND CONSTRUCTION STAGING

Phasing of the Work

Phasing of the proposed work will be a function of development and community growth and will consider the nature and rate of development and related traffic growth in the community. It is anticipated that improvements are required in the current time frame starting in 2012 and leading to completion of the widening of the roadway to the interim condition of 4 lanes plus turning provisions including the continuous two-way left turn lane which will be undertaken and completed prior to 2017. It is also understood that the remaining improvements will be phased to provide the appropriate levels of service to the community and will be generally completed before the end of 2031.

It is recommended that the Region of Peel update its annual Capital Budget program to allow for the proposed works and to budget adequately for the remaining work of detailed design and construction. Capital Budgets must also be revised annually to ensure that adequate project funding is available when the improvements are needed.

Construction Staging

Construction staging in accordance with proposed phasing of the overall project will be influenced to a significant degree by the various environmental considerations that will apply to each segment of the roadway to be improved or expanded. The details of the anticipated impact are summarized in the various sections of this report and will vary considerably for each roadway segment.

The details for each specific section of the recommended alternative are summarized in the study report. The work generally includes area grading, culvert and bridge construction, Storm sewers, utilities, SWM facilities, encroachments on land and roadside natural areas and as such will be subject to approvals by the various environmental review agencies, including the MOE, MNR, Transport Canada (under the Navigable Waters Protection Act [NWPA, Amended 2012], Status of requirements to be confirmed at time of detailed design), TRCA and DFO (responsibility is transferred to the local conservation authority). Timing windows for fisheries and bird nesting periods will have a definite impact on the overall project timelines and as such each section and the details therein must be studied and refined in greater detail during the detailed design phase.

In general it is anticipated that the roadway will be constructed initially at the south side of the corridor and expanded toward the north. The initial full urbanization will occur on the City of Brampton side of Mayfield Road for the initial four lanes and followed by completion of the north side during the subsequent future widening to six lanes. The typical cross section illustrated in Drawing No. STG1 provides a general representation of the anticipated construction staging concept.

MONITORING

Monitoring of the proposed environmental mitigation measures is required before, during and after construction activities. Prior to construction, it is recommended that landscape plans be prepared for wetland edges, setbacks and vegetated berms. On-site inspections should also be undertaken to monitor the proper installation of sediment and erosion control measures, as well as tree saving measures such as fences installed beyond the drip line of retained trees.

The specific details of required mitigation, monitoring, and reporting will generally be identified during the detailed design phase and will be included in any permits and/or authorizations issued by the DFO, MNR and TRCA respectively. The general details of required mitigation, monitoring, and reporting are reviewed further in the study report.

PROJECT COST

The preliminary Opinion of Probable Cost for the recommended alternative, based on the current status of preliminary design is as follows:

Mayfield Road from Airport Road to Coleraine Drive:

Description	Amount
Preparation/Removals	$ 1,315,000.00
Storm Sewers	$ 5,525,000.00
Roadworks	$ 18,875,000.00
Traffic Signals	$ 1,500,000.00
Bridges (2 New)**	$ 5,700,000.00
Overall Benefits Plan**	$ 500,000.00
Open Bottom Culverts**	$ 3,700,000.00
Pipe Culverts	$ 250,000.00
OGS & Swales	$ 490,000.00
Storm Water Management	$ 5,000,000.00
Landscaping/Sidewalk Allowance	$ 5,650,000.00
Sub-Total Major Items	**$ 48,505,000.00**
Contingency Allowance (20%)	$ 9,701,000.00
Sub-Total Construction	**$ 58,206,000.00**
Engineering & Disbursements (12%)	$ 6,984,720.00
Streetlighting Allowance	$ 3,000,000.00
Utility Relocation Allowance	$ 1,655,000.00
Property Acquisition Allowance	$ 34,000,000.00
Contingency Allowance (20%)	$ 9,127,944.00
Total Construction, Engineering, Utilities, Streetlighting and Property**	**$103,272,664.00**

** **Costs revised in March 2013 to account for MNR acceptance of structure span sizes at watercourse crossings No. 3, 6 and 11.**

STUDY COMPLETION

The Environmental Study Report will be placed on the public record for a 30 day review period and following the review period, assuming there are no requests for a Part II Order, the study will be deemed completed. Completion of the study will permit the proponent to proceed with the detailed design and construction of the proposed works.

1.0 Introduction and Background

1.1 INTRODUCTION AND THE STUDY AREA

The Regional Municipality of Peel is responsible for the planning and management of growth within its community and determining the need for related strategic improvements to the existing transportation system. This responsibility includes the provision of improvements that will satisfy the overall growth objectives of the community and ensure that planned growth is consistent with the Region's Official Plan. In addition to this, it is also the Region's responsibility to ensure that the related facilities are provided on a timely basis and will support the Official Plans of the various local municipalities that make up the Region of Peel. The Region's responsibility includes the provision of a sustainable transportation system including its regional arterial roadway network and the implementation of timely improvements to the network to support and sustain overall community growth and the need for those facilities.

The subject of this study is Mayfield Road. Mayfield Road (Regional Road 14) is a major east-west arterial roadway located within the Region of Peel. Mayfield Road is under the jurisdiction of the Region of Peel, and runs from the western boundary of the Region at Winston Churchill Boulevard (Region Road 19) to the eastern Region boundary at Regional Road 50 (formerly Provincial Highway No. 50) as illustrated in Figure 1.1. Mayfield Road also forms the boundary between the Town of Caledon and the City of Brampton, with the exception of the settlement of Snelgrove at Hurontario Street (Highway 10), where Mayfield Road is entirely within the City of Brampton.

The Region of Peel has undertaken this Class Environmental Assessment Study to examine the potential for improvements to the section of Mayfield Road located between Airport Road and Coleraine Drive.

The Region of Peel has undertaken this Class Environmental Assessment Study to examine the potential for improvements to the section of Mayfield Road located between Airport Road (Regional Road 7) and Coleraine Drive. This study follows the previous study of Mayfield Road improvements from Hurontario Street to Heart Lake Road completed in November 2002 and from Heart Lake Road to Airport Road completed in May 2004. The current Study Area location is illustrated in Figure 1.1 and is further detailed in Figure 1.2. The Study area extends over a length of approximately 7.0 kilometers along the existing Mayfield Road corridor. After the study was commenced, a portion of The Gore Road (Regional Road 8) was added to the study, from just north of Mayfield Road to a point nearly 500 metres south of Mayfield Road as illustrated on Figure 1.2. Included on this figure also is the approximate location of a proposed future major roadway near the

east end between Clarkway Drive (Brampton)/Humber Station Road (Caledon) and Coleraine Drive.

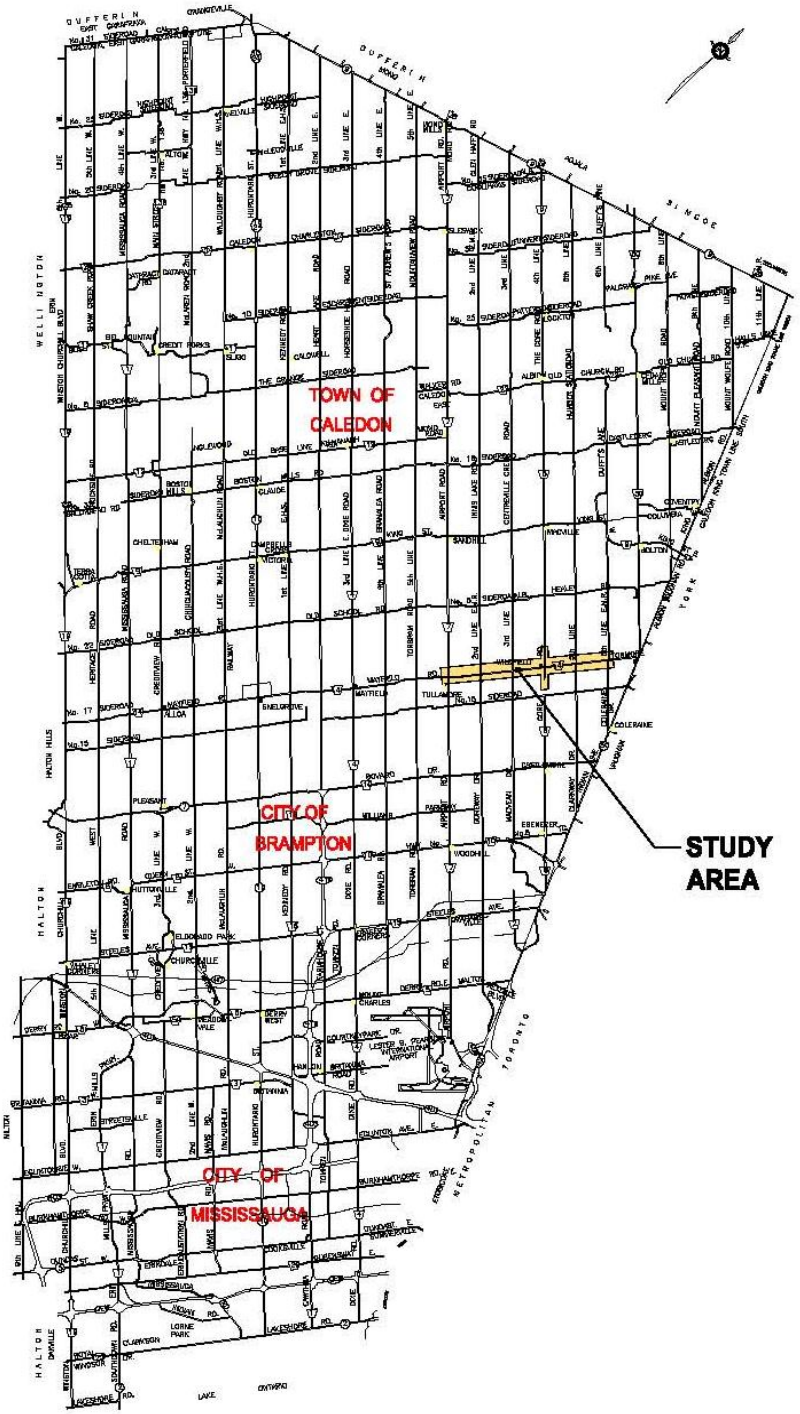


Figure 1.1 Key Plan - Mayfield Road Class Environmental Assessment

This study was also completed in parallel with and then ultimately following a separate transportation study of the 427 extension planned to the east near Coleraine Drive. The Mayfield Class EA study which commenced in late 2007 was placed on hold briefly in 2008 and the traffic study for the EA incorporated some of the pertinent observations noted in the Peel-Highway 427 Extension Area Transportation Master Plan, completed by the Region of Peel, Town of Caledon and City of Brampton.

There are a number of related studies that were completed or underway at the time of this study, and the findings of those studies have been implemented into the traffic analysis and overall findings of the study. The subject studies include:

- Mayfield Road Class EA, Heart Lake Road to Airport Road, Region of Peel
- Highway 427 Extension Environmental Assessment Study, MTO
- Peel-Highway 427 Extension Area Transportation Master Plan, Region of Peel/Town of Caledon, City of Brampton
- GTA West Corridor Environmental Assessment, MTO
- City of Brampton Transportation and Traffic Master Plan
- 2012 Region of Peel Long Range Transportation Plan
- 2012 Region of Peel Active Transportation Plan

Within the study area, Mayfield Road is a two lane roadway with some turning lane provisions at side streets and traffic signals located at major intersecting streets. The existing roadway consists of an asphalt pavement structure with gravel shoulders, with the exception of some intersection approaches where curb and gutter has been introduced, and some other areas where paved shoulders exist. The posted speed limit on Mayfield Road within the study area is generally 80 km/hr. Exceptions to the posted 80 km/hr speed limit are found between Airport Road and Goreway Drive/Innis Lake Road, and between The Gore Road and Marysfield Drive, where the posted speed limit as noted during the study is posted at 60 km/hr.

Recent capital works projects have included localized intersection improvements at Coleraine Drive including traffic signals and separately a new Regional trunk water supply feedermain construction on the south side of Mayfield Road extending from Airport Road to Goreway Drive/Innis Lake Road which is a Zone 4 Reservoir Feedermain. This work also included the restoration of localized disturbed areas prior to completion. The feedermain is 1200mm in diameter and the project is now complete. The watermain will not be in service until the Tullamore Pumping station and reservoir has been completed, which is still under construction with completion is expected in May of 2013.

Adjacent land use is primarily rural in nature with several operating farms, some commercial enterprises and several rural residential homes with large front lot dimensions. Most of the residential homes are front-lotted with direct driveway access to Mayfield Road. One exception is the reverse frontage development on the south

side of Mayfield Road just east of Airport Road, which is located within the City of Brampton.

The historic settlements of Tullamore (at Airport Road) and Wildfield (at The Gore Road) are two significant areas recognized in the Region's Official Plan that differ from the predominately rural nature of the remaining study area.

The study area is also located within the Humber River Watershed. More specifically, the study area is located primarily within the West Humber River watershed, which flows approximately 43 km from its source and joins the Main Humber River in Toronto downstream of Albion Road. A total of 16 water crossings have been identified within the study area including the West Humber River and Salt Creek. A small, intermittent tributary of the Main branch of the Humber River also crosses the easternmost portion of

Figure 1.2 - Study Area – Mayfield Road – Airport Road to Coleraine Drive

the study area.

Within the study area are numerous watercourse crossings and tributaries of the West Humber River watershed system. The crossings vary from a single span bridge near the west end of the study area through numerous smaller culvert structures including concrete pipe arches, rigid frame concrete culverts with open bottoms and CSP pipe crossings of varying sizes for the smaller catchment areas. These watercourses and various related considerations are summarized in greater detail later in this study report.

Within the Hamlet of Wildfield there are heritage dwellings as a well as a church and cemetery, the St. Partrick's Church, which is located very close to edge of the existing roadway at The Gore Road, with frontages on both Mayfield Road at the south east corner and on the east side of The Gore Road south of Mayfield Road. Specific studies of these features were completed as part of the overall Class EA study.

1.2 CLASS ENVIRONMENTAL ASSESSMENT PROCESS

This study follows the Municipal Class Environmental Assessment (Class EA) Planning and Design process is an approved five-phase planning process, mandated by the Ontario Environmental Assessment Act that applies to municipal infrastructure projects. Projects undertaken through this planning process are "classified" by municipalities into one of three "Schedule" types ranging from Schedule 'A' to Schedule 'C', in accordance with their degree of anticipated environmental impact. Schedule 'C' projects have the highest potential for environmental impacts and must proceed under the full planning and documentation procedures specified under the Municipal Class Environmental Assessment Guidelines.

The five phases of the Class EA planning and design process are summarized as follows:

Phase 1 Identify the problem (deficiency) or opportunity.

Phase 2 Identify alternative solutions to address the problem or opportunity, taking into consideration the existing environment, and select a preferred solution based on a thorough evaluation process and consultation with public, agencies and other stakeholders.

Phase 3 Examine a range of alternative design concepts for implementing the preferred solution, based on existing constraints, public and review agency input, potential environmental impacts, and methods of mitigating any negative environmental effects.

Phase 4 Document, in an Environmental Study Report (ESR), the rationale for the recommended preferred design concept, based on the planning, design and consultation process established through Phases 1 to 3. The ESR must be made available for public and agency review and comment, for a specified period of time.

Phase 5 Complete contract drawings and documents, and proceed to construction of the recommended design concept, once all environmental approvals are in place. Monitoring of construction activities and operations is warranted to ensure adherence to environmental provisions and mitigation measures noted in the ESR.

The basic Class EA process is illustrated in the following graphic provided by the Municipal Engineers Association of Ontario.

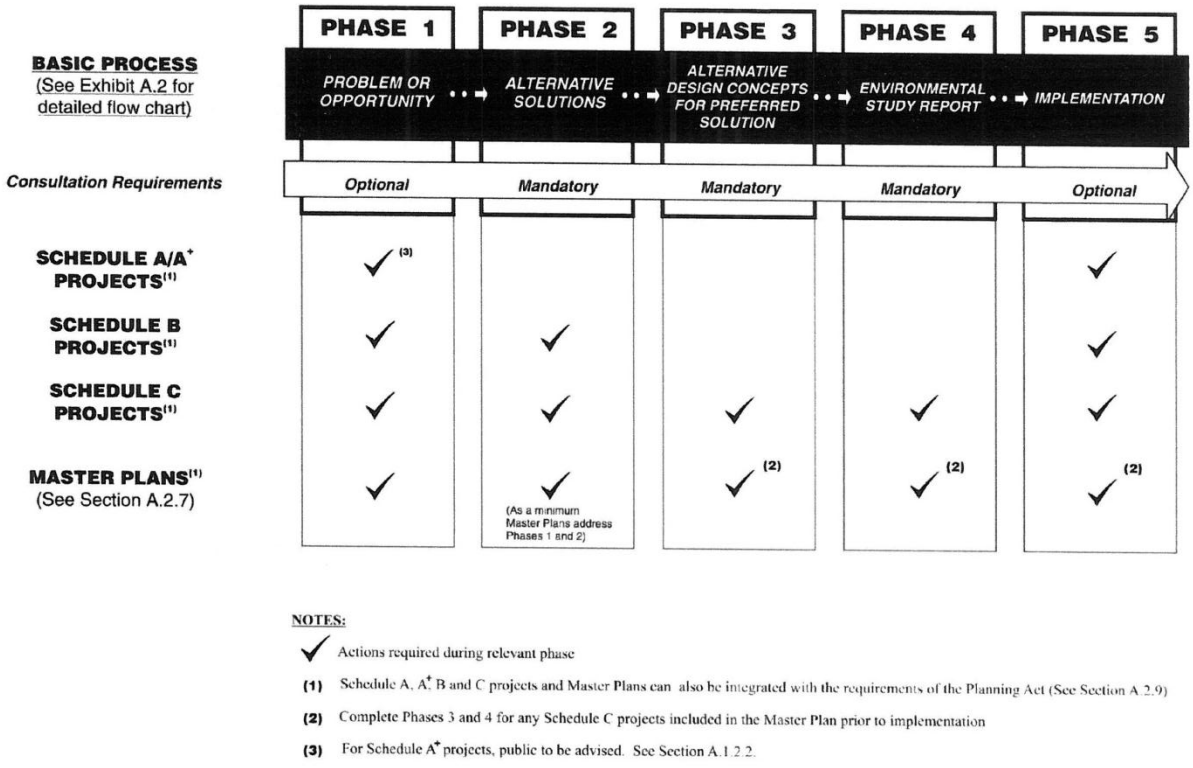


Figure 1.3 – Municipal Class EA – Basic Planning Process

The Class Environmental Assessment for the Mayfield Road Improvements project has been undertaken in accordance with the guidelines set out in the provincially approved document titled "Municipal Class Environmental Assessment (Municipal Engineers Association, October 2000, as amended in 2007 and 2011)". The project falls within the category of a Schedule "C" Class Environmental Assessment, and included the first four (4) Phases of the study process (detailed design not included).

At the outset of the project, background reports, property ownership data, land use, and other information related to the natural environment were collected and reviewed. Additional data was gathered through field investigations of natural and social environmental conditions, geotechnical conditions, contaminated soils, and topography within the Study Area. In addition, input was solicited through direct correspondence and liaison with government agencies and local interest groups.

A copy of the flow chart outlining the Municipal Class EA Planning and Design Process is provided in Figure 1.4 (see following page), courtesy of the Municipal Engineers Association (MEA).

In addition to convening two (2) Public Information Centre (PIC) meetings, and a formal Public meeting, details of the project were also reviewed at Project Team meetings, meetings with Public review agencies and Utility agency personnel at specific technical presentation meetings.

In summary, the Class Environmental Assessment for Mayfield Road has ensured, through adherence to the guiding principles of the EA process, that the following key elements of the project have been completed:

1. Consultation with affected agencies, the public, property owners, business owners, and other interest groups.

2. Consideration of a reasonable range of alternatives, including both "alternatives to" and "alternative methods of" implementing a solution.

3. Identification and consideration of the impacts of the alternatives on all aspects of the environment.

4. Completion of a thorough evaluation process that led to the selection of a preferred design concept.

5. An outline of mitigation measures to protect and/or enhance the environment, in response to agency input, public feedback and study data.

6. Documentation of the planning process in a comprehensive, clear and traceable format, which respects the decision-making principles of the EA process.

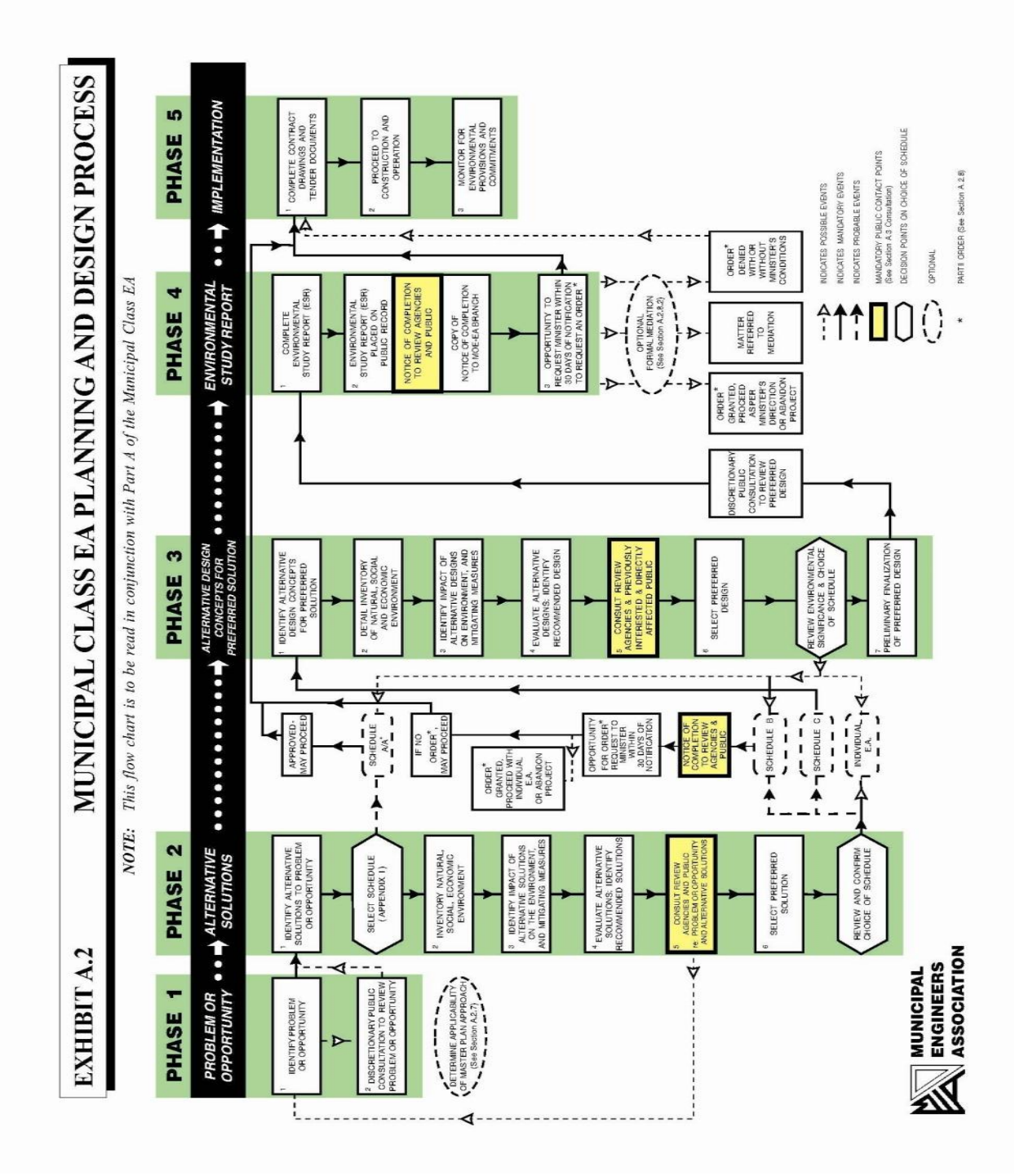


Figure 1.4 – Municipal Class EA Planning Process - Flow Chart

1.3 PART II ORDERS

Class Environmental Assessments place emphasis on both an assessment of various alternatives and on a strict protocol for public and agency consultation. The encouragement of stakeholder participation, throughout the process, is strongly recommended so that all project-related issues and concerns may be resolved before a "recommended preferred design concept" is adopted and the Environmental Study Report (ESR) is completed and filed on the public record.

If concerns are raised during the public review period that cannot be resolved through discussions with the proponent (Region of Peel), a "Part II Order" request may be submitted to the Minister of the Environment by any objector. For Schedule "C" projects, a written request must be submitted to the Minister within a minimum 30 calendar day review period after the proponent has issued the Notice of Study Completion and filed the ESR on the public record. Requests made or received after the minimum 30 calendar day review period will not be considered. Part II Order requests can be submitted to:

Minister of the Environment
77 Wellesley Street West
Ferguson Block, 11th Floor
Toronto, ON M7A 2T5
Jim.Bradley@ontario.ca

Copy to:

Ministry of the Environment
Class EAs and Declarations Section
Environmental Assessment and Approvals Branch
2 St. Clair Avenue, Floor 12
Toronto, ON M4V 1L5
Phone: 1-800-461-6290

In the event that there are no Part II Orders on the project, or the Minister denies a Part II order request (with or without conditions), then the proponent (Region of Peel) will have complied with Section 13 (3) (a) of the Environmental Assessment Act and will have the right to proceed to design and construction of the recommended preferred design concept (Phase V of the Class EA process).

The purpose of the Ontario Environmental Assessment Act is "The betterment of the people of the whole or any part of Ontario by providing for the protection, conservation and wise management in Ontario of the environment." The term Environment is applied broadly and includes the natural, social, cultural, built and economic components.

There are two basic types of Environmental Assessment (EA) processes:

Individual EA

- Requires Terms of Reference approved by the Ministry of the Environment (MOE) of Ontario.

- Requires that an EA Report be submitted to MOE for review and approval by the Province.

Class EA

- Project is approved subject to compliance within approved Class EA process for a group or "class" of projects.

Under the Class EA process, projects are categorized according to the magnitude of their anticipated environmental impact. The four specific categories are described below:

- Schedule A projects are limited in scale, have minimal adverse environmental affects and include a number of municipal maintenance and operational activities. Schedule A projects generally include normal or emergency operational and maintenance activities. Examples include sidewalk repairs, minor resurfacing and spot repairs, sewer and watermain spot repairs and replacements without capacity changes and other similar works. These projects are pre-approved and the municipality can proceed without further approval under the EA Act.

- Schedule A+ projects are also limited in scale, have minimal adverse environmental affects and include a number of municipal maintenance and operational activities. Schedule A+ projects generally include projects which have been previously communicated and approved by Municipal councils or approved through previous study. Examples include typical annual resurfacing, maintenance and replacement programs communicated through the capital budgeting process and via the Region's website. Also included are sidewalk, bike lanes and pathways within existing road allowances. These projects are pre-approved based on their limited impacts but are subject to additional notification of the public through various forms of contact which may also include notifications to directly affected persons and agencies to invite comment. These projects are not subject to a Part II Order and must be resolved through communications with Municipal Council. Following this contact the municipality may then proceed without further approval under the EA Act.

- Schedule B projects have the potential for some adverse environmental affects. Schedule B projects generally include improvements and minor expansions to existing facilities. Examples include the construction of new roadways, turn lane

modifications, minor road widening within an existing established corridor, water crossing structures at the same location and for the same capacity, new linear underground features within established corridors all with a typical constructed value of less than $2.4 Million. For these projects, the proponent is required to proceed through a screening process including consultation with directly affected public and agencies. Schedule B projects require that an Environmental Study be documented in a project file which is made available for review by the public and review agencies during the public review period.

- Schedule C projects have the potential for significant environmental affects and must proceed under the full planning and documentation procedures for a Municipal Class EA. Schedule C projects generally include the construction of new facilities and major expansions to existing facilities with a typical constructed value of greater than $2.4 Million. Schedule C projects also require that an Environmental Study Report (ESR) be prepared and filed for review by the public and review agencies.

Provided the approved Class EA planning process is followed, the proponent or municipality has complied with Section 13 (3) of the Ontario EA Act. The Class EA process ensures that an adequate Environmental Assessment process is followed for various types of projects. Class EA's place emphasis on project assessment and public and agency involvement, rather than on review and approvals. The Municipal Engineers' Class EA Planning and Design Process is illustrated in Figure 1.3. This flow chart should be read in conjunction with the Municipal Class Environmental Assessment Document produced by the Municipal Engineers' Association in June 2000 and amended in 2007 and 2011.

The planning and design for the Mayfield Road Improvement project is proceeding in accordance with a Schedule C process in accordance with the Municipal Class EA Act, since it is possible that the capacity of Mayfield Road will be increased and the total cost of improvements will be over $2.4 Million (refer to Appendix I of the MEA Municipal Class Environmental Assessment document).

Phase 4 of the Municipal Class EA Act and the preparation of a written report represents the culmination of the planning and design procedures set out in the Class EA. This report, known as the Environmental Study Report (ESR), documents the activities undertaken to date during Phases 1, 2 and 3 of the Municipal Class EA. It is intended to be a record of the decision-making process for the project and includes the following general requirements:

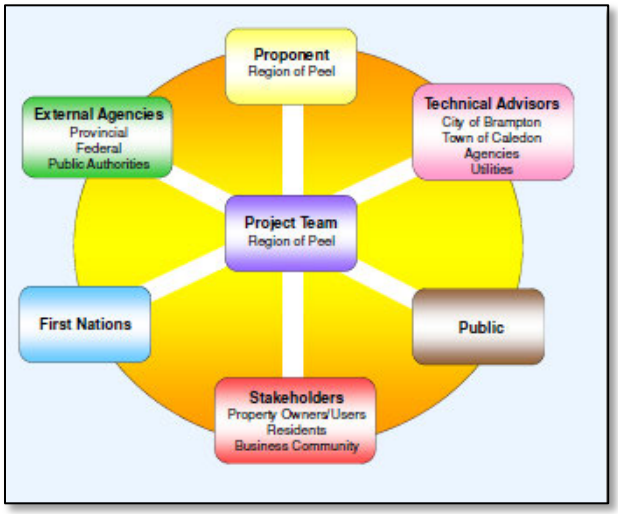
a. A description of the problem or opportunity and other background information.
b. The rationale employed in selecting the preferred solution to the problem.
c. The rationale employed in selecting the preferred design (where applicable).
d. A description of the environmental considerations and impacts.

e. The mitigation measures which will be undertaken to minimize potential environmental effects.
f. A description of the consultation process and an explanation of how concerns raised by the public and review agencies have been addressed in developing the project.
g. A description of the monitoring program which will be carried out during construction, and if necessary, a specific schedule of operations.

This ESR will be filed with the Ministry of Environment and at the Regional and Municipal Clerk Departments and placed on the Public Record for 30 Calendar days for review by the public and review agencies. The public and review agencies are notified by means of a Notice of Completion of ESR, published in local newspapers and by direct correspondence as required. During this 30 day review period, members of the public, interest groups and review agencies may request the Minister of Environment to instruct the proponent to comply with Part II of the EA Act before proceeding with the proposed undertaking. This is what is known as a "Part II Order". A person or party with a concern regarding the project should bring their concerns to the attention of the proponent. If these concerns cannot be resolved, the person or party may contact the Minister of Environment and request a Part II Order to elevate the project to an individual Environmental Assessment. This Part II Order request must be copied to the proponent. Requests made or received after the 30 Calendar day review period will not be considered by the Minister.

1.4 PROJECT COORDINATION TEAM / SCHEDULE

In September 2007, the Regional Municipality of Peel retained Stantec Consulting Ltd. to conduct a Municipal Class EA for possible improvements to Mayfield Road (Regional Road 14) between Airport Road and Coleraine Drive.



The Mayfield Road Municipal Class EA study was initiated by the Region of Peel to address the findings of other traffic and planning studies that indicated that development within and near the study area would be proceeding and additional traffic would be experienced on Mayfield Road as development within and outside the study area continues. Subsequently, the Region of Peel revised the study limits such that the project also includes a portion of The Gore Road approximately 500 meters to the south of Mayfield Road.

This project went on hold in June 2008 until May 2009 to permit and incorporate other ongoing area transportation studies that would influence the outcome of the Mayfield Road Class EA traffic analysis. Details of the traffic analysis are included with this report.

The project has been directed by a Project Coordination Team made up of staff from the Region of Peel, City of Brampton, Town of Caledon, other agencies, and Stantec Consulting including their sub-consultants. Due to the length of time this project has taken, a significant number of staff have been involved in the overall planning and coordination of the project. A list of staff members involved in the formal Project Coordination Meetings includes:

Region of Peel			
Sandy Lovisotto, former Project Manager (September 2007 to June 2008)	Jaime Acosta, former Project Manager (June 2008 to November 2008)	Solmaz Zia, former Project Manager (November 2008 to May 2011)	Hitesh Topiwala, Current Project Manager (May 2011 to Completion)
Kathy Cater	Bob Nieuwenhuysen	Gary Kocialek	Sean Ballaro
Owen Chinnery	Jose Montouto	Imre Tot	Damian Jamroz
Gayle Gorman	Lori-Ann Thomsen	Eric Chan	Hitesh Topiwala
Len Gardiner	Fred Abalos	David Melton	Margie Chung
Joe Gallagher	Eleanor Gillon	Ken Burke	Gavin Bailey
Tina Detaramani	Rani Kol	Len Gardiner	Fred Abalos
David Melton	Joe Gallagher	Hashim Ali Hamdani	Sean Nix
Liz Brock	Ryan Gulyas		

Region of Peel			
City of Brampton			
Compton Bobb	David Kuperman	Penny Young	

Town of Caledon			
Kant Chawla	David Hurst		

Other Agencies			
Sharon Lingertat, TRCA	Ben Krul, TRCA	Mark Heaton, MNR	Rob Evangelista, Hydro One Brampton
Ernie C. Vicente, Hydro One Brampton			

Stantec Consulting Ltd. (Including Sub-consultants)			
Garry Leveck, (Original) Project Manager (September 2007 to January 2009)	Dave Hallman, Sr. Project Engineer (September 2007 to January 2009) and June 2010 to February 2011)	Dave Hallman, Project Manager (January 2009 to June 2010)	John Bayley, Project Manager, (June 9, 2010 to Completion)

Stantec Consulting engaged two specialty sub-consultants on this project.

- Traffic Analysis, Safety Study & Roundabout Analysis: iTRANS Consulting
- Archaeological/Heritage: Archaeological Services Inc.

Representation from these firms is noted below:

Subconsultants			
Rebecca Sciarra, Archaeological Services Inc.	Sarah Jagelewski Archaeological Services Inc.	Peter Carruthers Archaeological Services Inc.	Lisa Merrit Archaeological Services Inc.
Ray Bacquie, iTRANS Consulting	Greig Bumstead, iTRANS Consulting		

Project Team members, municipal representatives and some agency representatives also attended Public Information Centres (PIC) which were held on Thursday, June 25, 2009 from 6:00 p.m. to 8:00 p.m. at Castlemore Public School, 9916 The Gore Road, Brampton, ON and on Wednesday, November 16, 2011 from 6:30 – 8:30 pm, at St.

Patrick Separate School, 11948 The Gore Road, at Wildfield (City of Brampton), Ontario. The Class EA study process was completed in April 2013.

1.5 NOTICE OF STUDY COMMENCEMENT AND INITIAL RESPONSES

In accordance with the Municipal Class Environmental Assessment process, a Notice of Study Commencement for the Mayfield Road Class Environmental Assessment Study from Airport Road to Coleraine Drive was advertised in local newspapers. This Notice of Study Commencement was advertised in both the Brampton Guardian and Caledon Enterprise on Saturday October 6, 2007 and Wednesday October 10, 2007. A copy of the Notice of Study Commencement can be found in Appendix A.

In addition, the Notice of Study Commencement was mailed to various government agencies, utility companies, property owners, residents, businesses and other identified stakeholders on October 9, 2007. A copy of the letter and the mailing list for this mail-out of the Notice of Study Commencement is also provided in Appendix A.

Copies of the written responses from the public and agencies are found in Appendix A and a summary of the responses are as follows:

Table 1.5.1.1 – Agency Comments – Initial Notice of Study

Respondent	Summary of Comments	Responses
MUNICIPALITIES		
Town of Caledon	• Want to be kept informed of project. Add new contacts to circulation as listed.	• Caledon staff participating on Project team, included in Municipal Circulation and invited to review meetings and PIC's
City of Brampton	• As they are prepared, provide copies of: Traffic Analysis; PIC materials, Preliminary design drawings incl. landscape features; draft property requirements, phase 1, 2 & 3 reports; Draft & final ESR. • Add contact to circulation list as noted. • Include the City on the regular Technical and Steering Committee meetings • Coordinate this study with ongoing studies in the area including: Hwy 427 Study, MTO; Hwy 427/Rd50 Arterial Network Review; Joint Peel/MTO Hwy 427/Hwy50 Transportation Master Plan; Mayfield West Secondary Plan; Goreway Drive EA; Transportation & Transit Master Plan; 2006 City's	• Brampton staff participating on Project team, included in Municipal Circulation and invited to review meetings and PIC's

Table 1.5.1.1 – Agency Comments – Initial Notice of Study		
Respondent	**Summary of Comments**	**Responses**
	Official Plan.	
LOCAL AGENCIES		
Toronto & Region Conservation (TRCA)	• Design should avoid impacts and support sustainable solutions as related to natural, socio-economic and cultural environment • Environmental concerns for this undertaking are Aquatic Species and habitat, aquifers, Regulation Limit, Regional Storm floodplains, Stream Corridors, Terrestrial Natural Heritage System, Valley Corridors, Watercourses and Wetlands • The preferred alternative must: prevent the risk associated with flooding, erosion or slope stability; protect and rehabilitate existing landforms, features & functions; provides for aquatic, terrestrial and human access; minimizes water/energy consumption and pollution; and addresses TRCA property and archaeology concerns. • TRCA will require: Notices of PIC's & handouts; Copies of Phase 1, 2, 3 & 4 reports; copies of the draft EA document; and, Notice of Study Completion.	• TRCA included in project communications and submission of technical reports, evaluations and plans for review. • Responses provided to ongoing communications and meetings with Region and TRCA staff.
Greater Toronto Airport Authority (GTAA)	• Project does not appear to have direct consequences to GTAA, and do not require further notices or correspondence.	• No further direct contact was made.
Dufferin-Peel Catholic District School Board	• Keep them informed regarding study	• Invitation to PIC's and Notice of completion was provided.
FEDERAL AGENCIES		
Transport Canada	• Transport Canada is responsible for administration of the Navigable Waters Protection Act. • If the project cross or affects a potentially navigable waterway, an application must be submitted to Transport Canada.	• Applications under the Navigable Waters Protection Act will be a part of any future detailed design for water crossing structures. Changes to the act (NWPA) were introduced in 2012 and the requirements will be confirmed at the time of detailed design.

Table 1.5.1.1 – Agency Comments – Initial Notice of Study		
Respondent	**Summary of Comments**	**Responses**
PROVINCIAL AGENCIES		
Ministry of Environment (MOE)	• Impacts to ecosystems must be avoided where possible and the ESR should describe mitigation measures to protect and enhance the local ecosystem. • All natural features need to be identified and appropriate mitigation measures developed • Recommend consulting with the MNR, DFO and local conservation authority • MNR should be contacted if special measures are required to protect rare species of flora/fauna adjacent to the Study Area • ESR should discuss levels of proposed growth, how the project addresses the growth and how road improvement will affect traffic flows • The ESR should demonstrate how the project adheres to the relevant sections of the Greenbelt Plan – should consider consulting with the Ministry of Municipal Affairs & Housing • ESR must demonstrate there are no negative impacts on natural features or ecological functions of the watercourses • ESR must address how sediment discharge from construction activities will be kept to a minimum. • Quality and Quantity control stormwater measures should be considered for all new impervious areas and where possible existing road surfaces • Strategies to address potential water quantity and erosion impacts related to stormwater into streams should be incorporated into the ESR • Groundwater wells in the area should not be affected by future construction activities • The ESR should identify if a Permit to Take Water is necessary for any identified de-watering activities	• Inventories and Impacts were investigated and documented. • Inventories and Impacts were investigated and documented. • Consultation with MNR and TRCA was undertaken as part of the study and project execution. DFO interests will be addressed initially through CA and MNR. • Traffic Analysis was undertaken. • Agency circulation was a significant part of the study process. • Evaluations determined and documented relative impacts. • Meeting storm water quantity and quality objectives was a part of the study analysis. • A hydrogeological study will be undertaken to identify potential impacts on groundwater resources. • The requirements for permits to take water will be determined during the detailed design phase of any

Table 1.5.1.1 – Agency Comments – Initial Notice of Study		
Respondent	**Summary of Comments**	**Responses**
	• The ESR should include plans and commitments to prevent and mitigate negative impacts of construction activities on the aquifer • A Contingency Plan for dealing with potential adverse effects of surface water quality should be included in the ESR • Consultation with the MNR, DFO and TRCA should be undertaken to solicit input of concerns with respect to groundwater/surface water. • The ESR should consider potential impacts due to increased noise levels due to higher traffic levels, and mitigate these potential noise increases. • Dust control measures during construction should be addressed in the ESR • Soils to be removed should be tested for contaminants prior to removal. If contaminated soils are encountered they must be disposed of in accordance with O. Reg. 153/04. • For design and construction, a best management approach should be implemented that centers on the prevention of impacts, projection of existing environment, and opportunities for rehabilitation and enhancement of impacted areas. • All waste generated during construction activities must receive proper disposal in accordance with MOE requirements. • Mitigation measures must be clearly identified in the ESR and	proposed works affecting groundwater resources or de-watering. • Preliminary study addressed the potential for impacts to the aquifer. Specific impacts if any will be investigated further during the detailed design phase. • Provisions to minimize impact on groundwater resources are included in the study recommendations • Consultation with agencies will be a part of the study process. • A preliminary noise impact analysis was undertaken to investigate potential traffic noise impacts. • Construction vibration and dust impacts will be considered during the design development and special provisions developed to address these impacts during construction. • Testing and suitable disposal of environmentally impacted soils is a part of the design development process. Initial investigations will identify potential sources of impact or contamination. Recommendations for future soil and groundwater investigations will be provided. • Construction and related earthmoving activities is not a part of the study. • The requirements for post construction monitoring will be confirmed when the details of construction and the conditions of related permitting and approvals are concluded. • Mitigation measures

Table 1.5.1.1 – Agency Comments – Initial Notice of Study		
Respondent	**Summary of Comments**	**Responses**
	regularly monitored during construction. In addition post construction monitoring is encouraged. Construction and post construction monitoring plans must be clearly identified within the ESR • The ESR should provide clear and complete documentation of the planning process in order to allow traceability of the decision making process, including consultation, comments and how comments were addressed by the proponent • The ESR should include a level of detail such that all potential impacts can be identified and appropriate mitigation measures developed. • Any supporting studies conducted during the Class EA should be referenced and included as part of the ESR • All available ministry guides should be reviewed and referenced in the ESR • A list of all subsequent permits/approvals should be included in the ESR. The proponent should consider if the project will require approval under the CEAA and document in the ESR • Potential affected Aboriginal communities should be identified by contacting various government agencies. Once the Aboriginal communities are identified, direct notification must be given to them to provide them an opportunity to participate in the public consultation.	monitoring recommendations are documented in the study report. Final requirements will be confirmed during liaison with the regulatory agencies during detailed design and approvals phase of the project. • The study ESR documents the process followed in accordance with Municipal Class EA process. • Impacts will be assessed and, documented and appropriate mitigation measures will identified in the ESR and related individual reports. • Related reports were referenced and where appropriate are included in the study appendices. • Ministry guides were referred to as applicable. • Known permitting and approvals requirements are identified in the ESR. • Notification of aboriginal groups was a part of the study. Notifications of PIC's and related opportunities for input were communicated to the public and agencies directly where applicable and generally through the news media.
Ministry of Transportation (MTO	• Project does not appear to have direct consequences to MTO, and MTO do not require further notices or correspondence.	• Further notifications were provided.
LOCAL INTEREST GROUPS		
St. Patrick's Cemetery Committee	• Want to be included in this study • As part of previous study, one grave was found on Regional	• St. Patrick's group was included in PIC notifications and related project

Table 1.5.1.1 – Agency Comments – Initial Notice of Study		
Respondent	**Summary of Comments**	**Responses**
	property on The Gore Road, and they believe there may be several graves on Regional property near Mayfield Road.	communications and notices.
FIRST NATIONS		
Union of Ontario Indians	• Recommend that a meeting be held with Anishinabek First Nations communities whose traditional territory may be affected by the project.	• The necessity for direct meetings was not identified during the study. Invitations to Public Information Centres were provided by direct mailings.
Association of Iroquois and Allied Indians (AIAI)	• Proponent should use discretion in considering the selection of a site and technology that may interfere with the exercise of First Nations rights • The provincial and federal governments must be consulted with respect to First Nations issues. • Based on archaeological finds, it may be necessary to consult with other First Nations including those that currently reside in Quebec.	• Further communications were provided during the study to advise of the findings and potential impacts, if any, on aboriginal interests. Invitations to Public Information Centres were provided by direct mailings.
Six Nations of the Grand River	• At this time Six Nations has no concerns regarding this project	• Absence of concern is noted.

2.0 Existing Conditions

2.1 GENERAL DESCRIPTION AND EXISTING CONDITIONS

Mayfield Road (Regional Road 14) is an east-west arterial road under the jurisdiction of the Region of Peel which extends from Winston Churchill Boulevard (Regional Road 19) at the western boundary with Halton Region to Regional Road 50 (formerly Provincial Highway No. 50) at the eastern boundary with the Region of York. Mayfield Road 401 is a four lane arterial roadway between Hurontario Street and Hwy, six lanes between Hwy 410 and Dixie Road and 2 lanes over the remainder.

Mayfield Road Intersection

The section of Mayfield Road under current study is from the intersection at Airport Road to the Intersection at Coleraine Drive. Within the study area Mayfield Road is generally a two-lane paved road with gravel shoulders. Within the study area Mayfield Road intersects with various north to south roadways including Airport Road, Maisonneuve Boulevard, Goreway Drive/Innis Lake Road, McVean Drive/Centreville Creek Road, The Gore Road, Marysfield Drive, Clarkway Drive/Humber Station Road and Coleraine Drive.

At the outset of the study, only three of the existing intersections were signalized; at Airport Road; Goreway Drive/Innis Lake Road; and The Gore Road. During the study, new traffic signals were installed at Coleraine Drive as part of a separate improvements project undertaken by the Region of Peel.

The current posted speed on Mayfield Road is 80 km/h, with the exception of the vicinity between Airport Road and Goreway Drive/Innis Lake Road, and between The Gore Road and Marysfield Drive, where the posted speed was 60 km/h.

A description of the intersecting roadways within the study area, advancing from the west to east at Airport Road is as follows:

Airport Road: four lane north-south arterial road under the jurisdiction of the Region of Peel (Regional Road 7);

Maisonneuve Boulevard: local two lane north-south road under the jurisdiction of the City of Brampton that ends at its northernmost point at Mayfield Road;

Goreway Drive/Innis Lake Road: two lane north-south road under the jurisdiction of the City of Brampton (Goreway Drive to the south) and the Town of Caledon (Innis Lake Road to the north);

McVean Drive/Centreville Creek Road: two lane north-south road under the jurisdiction of City of Brampton (McVean Drive to the south), and the Town of Caledon (Centreville Creek Road to the north);

The Gore Road: two-lane north-south arterial road under the jurisdiction of the Region of Peel (Regional Road 8);

Marysfield Drive: local two-lane north-south road that ends at its northernmost point at Mayfield Road, under the jurisdiction of the City of Brampton;

Clarkway Drive/Humber Station Road: two-lane north-south road, with an offset of approximately 25 metres. It is under the jurisdiction of the City of Brampton (Clarkway Drive to the south) and the Town of Caledon (Humber Station Road to the north) Traffic signals were added at this intersection during the study as part of a separate improvements project; and

Mayfield Road Intersection

Coleraine Drive: a two lane north-south road which was recently reconstructed at Mayfield Road to remove an approximate 30 meter offset at Mayfield Road. Coleraine Drive is under the jurisdiction of the City of Brampton south of Mayfield Road, and under the jurisdiction of the Town of Caledon north of Mayfield Road.

Adjacent land use is primarily rural in nature with several operating farms, some commercial enterprises and several rural residential homes. The settlement of Tullamore and the settlement of Wildfield are two significant historic settlement areas that differ from the predominately rural nature of the study area.

Natural features within the study area are confined to the watercourses associated with the west Humber River, Salt Creek and associated tributaries. The existing natural features include wetlands, floodplains, and aquatic habitat as well as isolated woodland and meadow features scattered along the route.

The following sections outline in greater detail the existing conditions based on various investigations and reports undertaken as part of this Class EA study. Specific details regarding each of the following items can be found in the respective Appendices.

2.2 LAND USE

2.2.1 General

The land use within the study area is mainly rural in nature, with new residential developments starting to be built or planned to be built. Currently the land use is mostly working farmland, with small settlements of residents (Tullamore at Airport Road, Wildfield at The Gore Road), a number of rural residential homes on relatively large parcels of land with pockets of homes concentrated in some areas, a residential subdivision (south of Mayfield Road and east of Airport Road), some commercial/industrial enterprises scattered throughout the study area including in the settlement of Tullamore, and a cemetery, and a church at Wildfield.

Within the study area, Mayfield Road forms the boundary between the City of Brampton to the south and the Town of Caledon to the North except at Tullamore where Mayfield Road is located entirely within the City of Brampton.

2.2.2 Region of Peel Official Plan

The Region of Peel Official Plan outlines a number of considerations within the Study Area that are of interest to the Community and must be considered in the study of any improvements to Mayfield Road (references in brackets refer to specific items in the Region of Peel Official Plan):

- A number of the creeks and rivers (West Humber River) crossings are part of the "Core Areas of the Greenland System (Schedule A);
- The entire area to the north of Mayfield Road within the study area (within the Town of Caledon) is considered "Prime Agricultural Area" (Schedule B);
- There are no "High Potential Mineral Aggregate Resource Areas" within the study limits (Schedule C);
- The area to the south of Mayfield Road in the City of Brampton is considered part of the Urban System. The Area to the north of Mayfield Road is considered part of the Rural System. To the north of Mayfield Road, the area between Airport Road and Innes Lake Road and between The Gore Road and Coleraine Drive is considered part of a Settlement Study Area. The western portion of the study area is within an area designated as a "Conceptual Strategic Infrastructure Study Area" (Schedule D);

- The study area is not within the Oak Ridges Moraine Conservation Plan Area (Schedule D1);

- The West Humber River near The Gore Road is considered part of the Greenbelt Area to the north of Mayfield Road, and to the south of Mayfield Road is considered as a River Valley Connection Outside the Greenbelt. The area south of Mayfield Road and an area at the north east corner of Mayfield Road and Airport Road are considered part of a Settlement Area outside the Greenbelt (Schedule D3);

- The study area is outside the Lester B. Pearson International Airport Operating Area (Schedule H);

2.2.3 Town of Caledon Official Plan

The Town of Caledon Official Plan indicates a number of considerations within the study area (references in brackets refer to specific items in the Town of Caledon Official Plan) that are of interest to the Town and must be considered in the study of any improvements to Mayfield Road:

- The area north of Mayfield Road from just west of Innis Lake Road to east of The Gore Road is classified as Agricultural Area (Schedule A);

- The area north of Mayfield Road, east of The Gore Road to east of Coleraine Drive (just east of study limits) is part of the Bolton Land Use Plan. The area west of Coleraine Drive is classified agricultural, and the area east of Coleraine Drive is part of the South Simpson Industrial Secondary Plan (Schedule C);

- The South Simpson Industrial Secondary Plan is classified as Prestige Industrial adjacent to Mayfield Road (Schedule C-5);

- There are no Rural Estate Residential Areas within the study area. However, Tullamore and Wildfield are classified as Settlement Areas (Schedule F);

- Mayfield Road is classified as High capacity Arterial (Schedule J);

- There are no Well Head Protection Areas within the study area (Schedule O);

- Mayfield Road is designated as having a designated 50 metre road right-of-way width (Schedule K);

- The Tullamore Land Use Area Plan shows Highway Commercial designation at the north east corner of Airport Rod and Mayfield Road, with a Prestige Industrial classification east of Airport Road on the north side (Schedule N);

- The study area is not within the Niagara Escarpment Plan (Appendix I);
- There are no Aggregate Resource Areas within the study area (Appendix II);

2.2.4 City of Brampton Official Plan

The City of Brampton Official Plan indicates a number of considerations within the study area (references in brackets refer to specific items in the City of Brampton Official Plan) that are of interest to the City and must be considered in the study of any improvements to Mayfield Road:

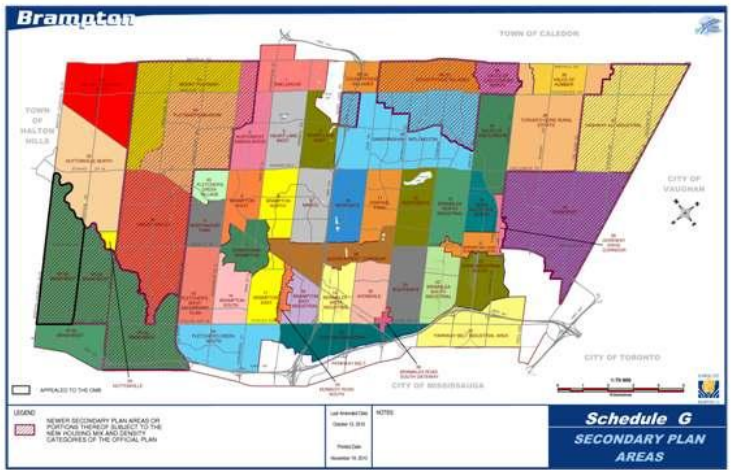
- The City of Brampton City Concept (Schedule 1) indicates the land south of Mayfield Road within the study area is classed as "Communities". It further identifies the area south and east of Goreway Drive and the area south of Mayfield Road and east of The Gore Road as "Unique Communities". It also identifies the various creeks and rivers within the study area as part of their "Open Space System";
- Airport Road and The Gore Road are identified as Primary Corridors in their Street Corridor Master Plan (Schedule 2);
- Mayfield Road is classified as a "Major Arterial; (Region)" in the City Road Hierarchy (Schedule B);
- Mayfield Road within the study area is identified as a "Secondary Transit Corridor" within the study area (according to the City's 2010 Growth Plan Official Plan Amendment);
- Citywide Path Networks are proposed for the creek corridors just east of Goreway Drive and just east of Clarkway Drive (Schedule C1);
- The creeks within the study area are classified as a "Valleyland/Watercourse Corridor" (Schedule D);
- The watercourse corridors have been identified as "Community Parks" (Schedule E);
- Within the study area there is an existing trunk watermain on Mayfield Road, with a proposed trunk watermain between Airport Road and Goreway Drive/Innis Lake Road (completed in 2012/2013) (Schedule F);

- A number of Heritage Resources have been identified within the study area in the City of Brampton's Cultural Heritage Map, which have been identified in the Heritage Impact Assessment undertaken for this project;

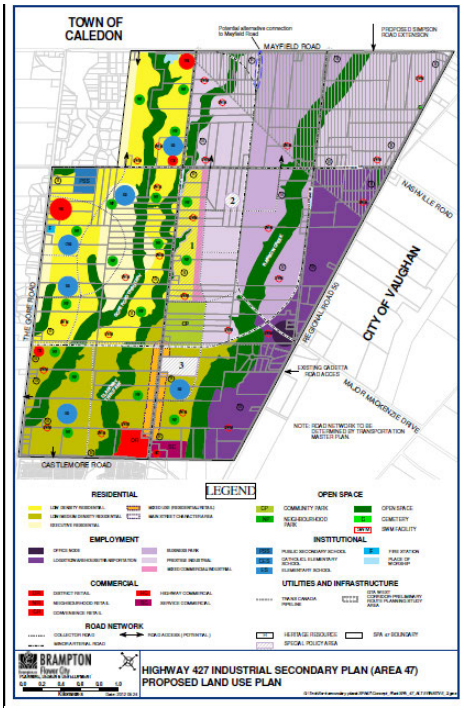
- All undeveloped land south of Mayfield Road within the study area has been identified as "Block Plan Areas" in the City of Brampton's Community Block Plan Areas (Schedule H).

2.2.5 Secondary Planning - City of Brampton

Secondary plans in the City of Brampton that are applicable to the study area include the Secondary plans for Areas 49, 26, 50 and industrial Area 47 from west to east respectively. The City of Brampton is currently undertaking secondary planning for Area 47 (the Highway 427 Industrial Planning Area). City staff expects to present a draft Official Plan Amendment including a revised land use plan and secondary plan policies for Area 47 at a statutory public meeting in 2013. Details of the status of secondary planning can be obtained at the City of Brampton's website.



Brampton Secondary Plan Areas



Brampton Secondary Plan Area 47

Lands adjacent to Mayfield Road within Area 47 are proposed to be designated Business Park and Prestige Industrial. Also proposed is a Neighborhood Commercial designation at the southwest corner of Clarkway Drive at Mayfield Road.

The Plan for Area 50 is also under review and subject to amendment at the conclusion of that review.

Lands adjacent to Mayfield Road within Plan 26 Toronto Gore Rural Estate include existing estate residential properties.

Land adjacent to Mayfield Road within the Plan 47 area includes mainly Business Park and Prestige

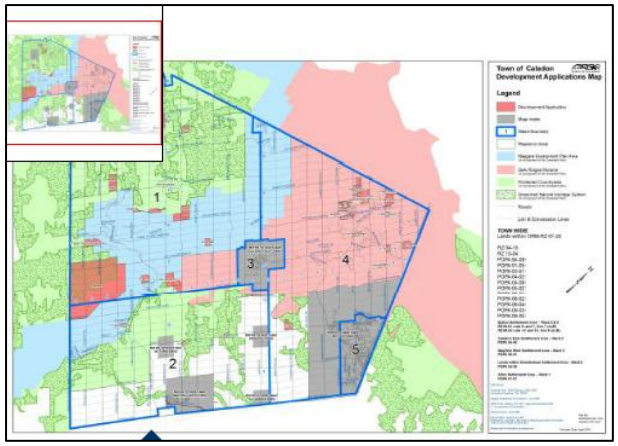
Industrial designations. Also included is a Neighborhood Commercial node at the southwest corner of Clarkway Drive at Mayfield Road.

Lands within Area 49 - Vales of Castlemore North, adjacent to Mayfield Road include planned low density residential and existing residential development.

Lands within Area 50 - Vales of the Humber, adjacent to Mayfield Road include existing residential development, planned low density residential, executive residential and executive transition residential, and proposed neighborhood commercial at the southeast corner of McVean Drive and Mayfield Road.

2.2.6 Secondary Planning - Town of Caledon

Planning in the Town of Caledon within the study area on Mayfield Road area has not been developed extensively to the secondary planning level. Current planning is limited to special policy areas at Tullamore and at Wildfield. The remaining area is generally devoid of secondary planning within Caledon.



Town of Caledon Development Planning

The Tullamore land use plan (Schedule N) includes highway commercial at the northeast corner of Airport Road and Mayfield Road, prestige industrial at Mayfield Road from Airport Road to west of Innis Lake Road/Goreway Drive and additional general industrial further to north of this area. Lands to the east between Wildfield and Coleraine Drive are part of the Town of Caledon's Bolton Land Use Area. Proposed land uses in this area remain agricultural. East of Coleraine Drive prestige industrial land uses are proposed.

2.3 NATURAL ENVIRONMENT

2.3.1 Background and Introduction

An inventory of the natural environment was undertaken by Stantec Consulting as part of this study and is summarized in the Natural Environmental Assessment report. The full report is included in Appendix E. The purpose of the assessment and report is to describe and characterize the significance and sensitivity of the natural features within the study area, identify potential environmental impacts, assess various alternatives and to recommend appropriate measures to avoid or minimize possible negative environmental impacts.

The study area is located within the Humber River Watershed, which is the largest watershed in the Toronto region covering roughly 903 km^2. Specifically, the study area is located primarily within the West Humber River watershed, which flows approximately 43 km from its source and joins the Main Humber in Toronto downstream of Albion Road. A total of 16 significant water crossings have been identified by the Toronto and Region Conservation Authority (TRCA) within the study area including the West Humber River and Salt Creek. A small, intermittent tributary of the Main branch of the Humber River also crosses the easternmost portion of the study area. The tributary locations can be found in Figures 3A to 3G of the Natural Environmental Report (Appendix E).

2.3.2 Designated/Regulated Environmental Features

TRCA Regulation Mapping, and observations made during field investigations, have identified Sixteen (16) significant watercourse crossings of Mayfield Road within the study area, which include associated wetlands, floodplains, meander belts and steep slopes. Some of the watercourses and associated features have been designated or regulated as follows:

Region of Peel Official Plan: The West Humber River corridor is a Core Area of the Greenlands System.

Town of Caledon Official Plan: Areas along the West Humber River and three of its major tributaries are identified as Environmental Protection Areas.

City of Brampton Official Plan: The West Humber River and the majority of its tributaries are Valleylands and Watercourse Corridors that form part of the Open Space system.

Greenbelt Plan (2005): The West Humber River is a major River Valley Connection between the Greenbelt and Lake Ontario.

Oak Ridges Moraine Conservation Plan: The study area is outside the Oak Ridges Moraine and therefore not subject to the Oak Ridges Moraine Conservation Plan.

2.3.3 Aquatic Resources

A background information review indicates that a total of 74 species of fish have been identified within the Humber River and its tributaries. Based on a review of the site specific data obtained from the MNR, TRCA and ROM, supplemented by electrofishing efforts completed for this project, a total of 22 fish species have historically been identified within the vicinity of the study area. Along with the summary of observations is the SRANK (Provincial (or Subnational) ranks are used

Of the 16 watercourse crossings on Mayfield Road within the study limits, two crossing locations are in areas where regulated habitat for redside dace has been identified.

by the *Natural Heritage Information Centre* (NHIC) to set protection priorities for rare species and natural communities). A summary of these species and the tributaries within which they were found is provided in Appendix E.

Redside Dace – Endangered Species

The Redside Dace habitat is found in two tributaries of the West Humber River within the study area. The tributary crossings are noted as crossings C3 and C11. Redside Dace is listed as Threatened under the provincial Endangered Species Act, and has recently (2007) been designated by the *Committee on the Status of Endangered Wildlife in Canada* (COSEWIC) as Endangered. Listing of the species under the federal *Species at Risk Act* (SARA) as Endangered is pending. The Ministry of Natural Resources confirmed in March 2013 that Crossing C6 does not provide Redside Dace habitat.

Some of these fisheries records date back to 1946 and may not reflect current watershed or habitat conditions. According to the *Humber River Fisheries Management Plan* (TRCA, 2005), the West Humber River and its tributaries are to be managed as warmwater systems. This is supported by the various warmwater indicator species historically identified within the vicinity of the study area, such as fathead minnow, brown bullhead, and largemouth bass. The cool and coldwater indicator species, such as the American brook lamprey, redside dace and pearl dace, were recorded between 1972 and 1985.

Discussion with Ministry of Natural Resources (MNR) personnel in April 2012 and March 2013 confirmed the following:

Of the 16 watercourse crossings on Mayfield Road within the study limits, two crossing locations are in areas where regulated habitat for redside dace has been identified. The locations are referenced by TRCA as location 3 and 11. The watercourses are similarly designated by the MNR as C-3 and C-11. C-3 is Salt Creek (TRCA Crossing ID No. 3) at the associated crossing of Mayfield Road approximately 350 m east of Maisonneuve Crescent, Salt Creek is identified as "Recovering Habitat" for redside dace and C-11 a tributary of the West Humber River (TRCA Crossing ID No. 11) located approximately 300 m east of The Gore Road is identified as "Occupied Habitat". It was confirmed in March 2013 by the MNR that crossing C-6 also a tributary of the West Humber River (TRCA Crossing ID No. 6) located approximately 450 m west of McVean Drive /Centreville Creek Road previously thought to be redside dace habitat is

2.3.4 Terrestrial Resources

The study area is located within the Niagara section of the Deciduous Forest Region. The lands adjacent to Mayfield Road through the study area have been impacted by past (agriculture) and present (urbanization) pressures, generally resulting

No nationally or provincially rare, threatened or endangered (terrestrial) species were recorded from the subject lands.

in only remnant vegetation communities primarily occurring along the watercourses. Several cultural units have established on abandoned lands, including old field meadows, buckthorn thickets and woodlots. Some better quality habitats occur as open wet meadows, shallow marshes and a few treed swamp communities, although floral diversity in general was limited due to anthropogenic influences and disturbance.

Ninety-three species of vascular plants were recorded from the subject lands during the inventories. The majority of the species are exotic (55%, or 51 species), on account of the highly urbanized and agricultural character of the subject lands. In contrast, there are 45%, or 42 species, considered native that are concentrated largely in the remaining willow swamp types along some watercourses and in the open wetland units.

All of the native species are ranked S5 – "very common in Ontario". There were two species of some interest in the Region of Peel:

Blunt Spike Rush

- Blunt spike-rush (*Eleocharis obtusa*) is considered uncommon (U) and was observed growing on the banks of a pond just west of Airport Road, north of Mayfield Road (Picture on left side).

- White spruce (*Picea glauca*) is considered rare (R3) in Peel. All observed species in the study area are planted trees. (Picture on right side).

White Spruce

No nationally or provincially rare, threatened or endangered species were recorded from the subject

2.3.5 Wildlife Species

During field investigations, the following incidental observations of the European starling, American robin, American crow, red-winged blackbird, raccoon, grey squirrel and white-tailed deer were noted. All of the species observed are considered common and secure in Ontario, and represent species that are tolerant to human activity.

Inventories of historical wildlife records in the vicinity of the study area were compiled to determine potential wildlife use in the study area. Although they can be useful resources in terms of identifying potential species of concern, it is important to note that the exact locations of species occurrences are not available, since observations are recorded within a 10 km by 10 km square. It is likely that many of these species do not occur within the primary area of investigation.

According to the *Atlas of the Mammals of Ontario* (Dobbyn, 1994), a total of 44 mammals have been known to exist within the vicinity of the study area. Two of these species are considered species at risk:

- The Grey Fox is considered a provincially, and federally Threatened species. There is very little evidence that the species breeds on a regular basis in Ontario, with only one documented instance of breeding (Pelee Island in 1999) in the Province (NHIC, 2008).

- The Southern Flying Squirrel is considered a federal and provincial Species of Special Concern. The species is area sensitive requiring a minimum of 20 hectares of mature deciduous forest, specifically maple with beech, hickory or oak. No suitable habitat was observed in the study area.

According to the Ontario Herpetofaunal Summary Atlas (Oldham and Weller, 2001), 16 amphibians and 12 reptiles are known to exist within the vicinity of the study area. Four of these species are considered species at risk:

- The Jefferson Salamander is considered a provincially and federally Threatened species. This species is terrestrial during its adult stage but requires vernal pools associated with upland deciduous forest for breeding. In order for juvenile salamanders to survive in these ponds, the ponds should not contain fish. No suitable breeding pools were observed within the study area.

- The Eastern Milksnake is considered a provincial and federal Species of Special Concern. This species occurs in a variety of habitat, but favours open woodlands, forest edges and agricultural fields and is commonly associated with rural areas. Potentially suitable habitat is found within agricultural fields and small woodlands within the study area.

- The Common Map Turtle is considered a provincial and federal Species of Special Concern. This species frequents large, slow moving creeks with pools and riffles, and can also be found in large bodies of water where there is a soft gravel bottom and aquatic vegetation. Potentially suitable habitat is not found within the study area.

- The Ribbon Snake is considered a provincial and federal Species of Special Conc ern. In Ontario, this species is restricted to southern Ontario, where it is usually found close to water and is particularly characteristic of wetlands that are associated with large wooded areas (Lamond, 1994). Potentially suitable habitat is not found within the study area.

Of the 106 birds recorded within the Ontario Breeding Bird Atlas (Ontario Breeding Bird Atlas, 2005) as living within the vicinity of the study area, only three species are species at risk:

- The Chimney Swift is designated as a federally Threatened species. This bird species nests mainly in the trunks of large, hollow trees, and occasionally on cave walls or in rocky crevices, however, have also adapted to roosting and nesting in chimneys. While this species may be present within the study area, breeding opportunities are limited.

- The Hooded Warbler is considered a provincially and federally Threatened species. It is also considered a locally significant species by the TRCA. This species nests in large, mature hardwood forests with tall trees and a well-closed canopy. It requires more than 15 hectares of mature, upland deciduous or mixed forest, where clearings have been created naturally or by logging. It prefers clearings with low, dense, shrubby vegetation less than two meters in height, where nests are often placed in shrubs along the forest edge. There are no woodland areas that satisfy the breeding size requirements within the study area.

- The Common Nighthawk has been identified as Threatened within Canada, although it has no formal status. This species traditionally nests on the ground in open, vegetation-free habitats, such as recently harvested forests, burnt-over areas, pastures and riverbanks, but has adapted to nest on flat, gravel-covered roofs. The study area contains some areas that may be suitable for this species, although no field observations of this species were recorded.

Area sensitive birds are typically those that have at least 20 hectares of contiguous woodland area within which to breed. Three area sensitive species were identified within the Ontario Breeding Bird Atlas as being within the vicinity of the study area,

including the oven bird, brown creeper and Blue-grey gnatcatcher. *These require a minimum of 20, 30 and 30 ha respectively*. Vegetation patches of this size do not exist within the study area.

An NHIC database search was completed for the study area, resulting in only one significant species being recorded within the vicinity of the study area – redside dace (S3). As noted elsewhere in this section, the redside dace is listed as Endangered under the provincial Endangered Species Act, and has been designated by COSEWIC as Endangered. This species is currently considered a species of Special Concern under the federal SARA. This coolwater species prefers pools and slow moving waters with undercut banks and overhanging vegetation.

A draft provincial recovery strategy (2009) is in place and provides a framework for action for responsible jurisdictions and others to secure the persistence and sustainability of Redside Dace in Ontario. The long-term goal of this recovery strategy is to restore viable populations of Redside Dace in a significant portion of their historic range in Ontario by:

- protecting existing healthy, self-sustaining populations and their habitats;
- restoring degraded populations and habitats; and
- re-introducing Redside Dace to sites of former distribution where feasible.

The recovery strategy recommends that all currently occupied and historic watercourse reaches be regulated as habitat under the ESA, including the stream and riparian area a minimum of 30 metres from the meander belt edge. In addition, it recommends that all headwater areas indirectly supporting Redside Dace be regulated under ESA habitat regulation (MNR, 2009).

A "Draft" document titled "*Guidance for Development Activities in Redside Dace protected Habitat*", February 2011, is currently being used as a guiding document for the proposed works in areas where Redside Dace habitat is identified. In agreement with the guide, the MNR generally does not support culvert extensions in regulated habitat on existing watercourses and more specifically those which exhibit endangered species habitat. As a result, meander belt analyses are required to determine meander belt widths, 100 year erosion widths and 30m vegetated riparian habitat provisions (Setbacks) at either side of the subject watercourse crossings to determine a suitable watercourse

2.3.6 Summary of Environmental Constraints

Based on the information provided in this section, and the relevant policies outlined above, the preferred alternative should consider and aim to minimize potential adverse impacts on the following natural heritage and hazard features within the study area:

- Direct fish habitat and migration within Tributaries 3 (Salt Creek), 5, 6, 11 (West Humber River), 12 and 14, as well as indirect fish habitat (flow, surface water quality) in the remaining tributaries (See Appendix E for tributary locations);
- Redside Dace Habitat protection and Overall Benefits plan are required for Crossings 3 and 11. Larger crossing spans (waterway openings) are required and included in the preliminary design of those crossings:
- Natural vegetation communities and native plant species identified within the study area, with specific attention paid to restoring and enhancing the natural corridors within the study area;
- All woodland areas and mature trees, especially along riparian corridors;
- Wetland communities identified along Tributaries 3, 6, 7, 8, 9, 10, 11, 12, 13 and 14 (See Appendix E for tributary locations);
- Maintaining natural stream morphology and minimizing excessive erosion along the various Tributaries;
- Flood flows, depths and velocities at each watercourse crossing;
- Designated Natural Heritage System features identified in various Provincial, Regional and Municipal Plans, with specific consideration for maintaining the major River Valley Connection along the West Humber River;
- Regulated areas as delineated on the TRCA Regulation mapping.

2.4 HYDROGEOLOGY

2.4.1 Background

Stantec Consulting Ltd. undertook a Hydrogeologic Assessment and prepared a Report as part of the Mayfield Road Class Environmental Assessment. The full report is included in Appendix F. The objectives of the hydrogeologic assessment were to characterize the hydrogeological setting; identify potential hydrogeological constraints; assess various alternatives; and recommend appropriate measures to avoid or minimize negative hydrogeological impacts. Specifically, the assessment involved completing the following tasks:

1. Identify aquifer and aquitard sequences;
2. Characterize areas of aquifer vulnerability;
3. Delineate areas of significant groundwater recharge and discharge; and
4. Compile this information to develop hydrogeological constraints to be used in evaluating the various roadway improvement alternatives.

These objectives were addressed mainly through completion of a desktop level review of available published mapping, records and reports, although limited field investigations and observations were also completed. For the purposes of this Hydrogeologic Assessment Report, the Study Area extends 500 m north and south of Mayfield Road within the study area, and 500 m west of Airport Road and 500 m east of Coleraine Drive at either end.

This hydrogeologic assessment has been completed primarily as a desktop review, meaning that limited field investigations and collection of site-specific data has been undertaken. As part of the desk-top review, data was reviewed from a number of sources including:

- MOE's water well record (WWR) database;
- GIS mapping for the Study Area from the Region of Peel, Ministry of Natural Resources, Ontario Geological Survey (OGS);
- A published geological report that covered the Study Area (White, 1975);
- A groundwater modeling study of the Oak Ridges Moraine (EarthFX, 2006), which included the Study Area as part of its wider model domain;
- A Toronto Region Conservation Authority (TRCA) report on the geology and groundwater resources within the Humber River Watershed (TRCA, 2008);
- A geotechnical report (Stantec, 2008) prepared for the Study Area as part of the technical appendices for this Class EA.

Regionally, the ground surface topography slopes southward toward Lake Ontario, and has been shaped somewhat by the numerous drainage features that cut through the Study Area in a roughly northwesterly to southeasterly direction. The West Humber River can be seen to have cut a steep valley into the surrounding landscape. Along the length of Mayfield Road within the Study Area the ground surface elevation ranges from a high of 238 metres above mean sea level (mAMSL) at the western extent near Airport Road, to a low of 213 mAMSL where the road crosses the West Humber River. At the eastern limits of the Study Area at Coleraine Drive the ground surface elevation is approximately 230 mAMSL.

The Study Area is located within the Humber River Watershed, which is the largest watershed in the Toronto region covering roughly 903 km2. Specifically, the Study Area is located primarily within the West Humber River subwatershed, which flows approximately 43 km from its source in the rolling hills of Caledon, over the Peel Plain in Brampton before joining the Main Humber in Toronto downstream of Albion Road.

The majority of the Study Area is underlain by fine-textured glaciolacustrine deposits of silt and clay, with the western and eastern limits underlain by clay to silt till. Modern alluvium deposits of clay, silt and sand are mapped immediately surrounding the West Humber River and four of the other unnamed tributaries, with thin lenses of clay to silt till

mapped within some of the stream valleys. Bedrock is reported to be exposed at the surface surrounding Salt Creek.

The overburden at the Site was found to be comprised mainly of clay with some sand and gravel. The clay unit is found at ground surface, typically extending to bedrock throughout most of the Study Area.

Mapping of the bedrock topography by White (1975) indicates that the bedrock elevation along Mayfield Road within the Study Area is variable, on the order of 205 to 226 mAMSL, with an overall decreasing trend in top of bedrock elevation to the south towards Lake Ontario. The bedrock is found at surface along Salt Creek and the former river valley immediately to the northeast, and MOE WWR within 500 m of the Site indicate that the top of the bedrock ranges in depth from 2 m BGS to 50 m BGS.

Within the Study Area, static groundwater elevations reported in the MOE WWR for overburden wells and bedrock wells within 500 m of the Site ranges from 5.5 m below ground surface (BGS) to 29.0 mBGS. The boreholes drilled at the Site by Stantec (2008) as part of the geotechnical investigation within the Study Area were not found to contain any standing water at their final depth of 1.5 mBGS, with the exception of two boreholes drilled adjacent to Salt Creek and West Humber River. At the completion of drilling of these two deeper boreholes, groundwater was measured in both boreholes at a static level of 2.4 mBGS. In drive-point piezometers installed as part of this hydrogeologic investigation groundwater levels ranged from 0.2 to 1.2 m in depth.

Estimates of groundwater recharge within the Humber River watershed are provided in TRCA mapping (2008). The major recharge areas are to the north of the Study Area, where the sands and gravels of the Oak Ridges Moraine are exposed at ground surface. Within the vicinity of the Study Area, the presence of till and other fine-grained deposits at surface limit groundwater recharge. Mapping by the TRCA (2008) indicates that within the Study Area annual groundwater recharge rates are less than 100 mm/year compared to areas of the Oak Ridges Moraine where groundwater recharge rates up to 300 mm/year are estimated.

A map showing groundwater discharge within the Humber River Watershed is provided in TRCA Report "Humber River State of the Watershed" Report (2008). Minor areas of groundwater discharge are noted north of Mayfield Road near the headwaters of Salt Creek, with an area of groundwater discharge to the West Humber River noted downstream from Mayfield Road. No significant groundwater discharge to either Salt Creek, the West Humber River or the unnamed tributaries are noted within the vicinity of the Study Area.

Over the period September 15 to 18, 2009, water levels in drive-point piezometers and the adjacent surface water body were monitored a total of four (4) times. At tributaries 5 and 12, groundwater discharge conditions exist, with strong upward vertical hydraulic gradients on the order of 0.36 and 0.1 m/m, respectively. At Salt Creek weaker upward

vertical hydraulic gradient on the order of 0.03 to 0.05 m/m was measured, also indicating groundwater discharge conditions. At tributary #6, the groundwater and surface water levels are approximately coincident, indicating interaction between the two but only very weak vertical hydraulic gradients. In contrast, strong downward vertical hydraulic gradients on the order of 0.6 and 0.5 m/m, respectively, were measured at West Humber River and tributary #14, indicating that groundwater discharge conditions are not anticipated.

2.4.2 Groundwater Use

There are currently no municipal supply wells within the West Humber River subwatershed, in which the Study Area is located. The estimated total daily withdrawal of groundwater (including agricultural, commercial, recreational, livestock, institutional and water supply) from the West Humber River subwatershed was 810 m3/day, compared to 8,581 m3/day in the East Humber River subwatershed and 10,389 m3/day in the Main Humber River subwatershed.

The closest municipal groundwater well to the Study Area is Kleinburg #3 (located east of the intersection of Mayfield Road and Coleraine Drive, within the Main Humber River subwatershed. Delineation of well head protection areas (WHPA) for the Kleinburg #3 municipal show that the 25-year time of travel to the Kleinburg #3 does not extend west of Highway 50 and therefore is outside of the Study Area.

The MOE WWR indicates that there are 86 private wells within 500 m of the section of Mayfield Road being considered as part of this Class EA. Of these wells, 65% (56) are completed in the shale, 23% (20) are completed in the lower overburden (silt, sand or gravel) and 8% (7) are completed in clay. Wells installed in the shale were installed at depths ranging from 4.57 mBGS to 51.82 mBGS, and the wells installed in the silt, sand and gravel range in depth from 5.49 mBGS to 60.96 mBGS. The current status of these wells has not been confirmed as part of this assessment. However, given the rural setting of the section of Mayfield Road in which the Study Area is located, with the exception of an urban subdivision noted south of Mayfield Road in the vicinity of Airport Road, it is probable that many of the wells identified within the MOE WWR are in use currently for water supply to individual residences.

2.4.3 Identification of Hydrogeological Constraints

Although it does not represent a true hydrogeological constraint, a review of the geologic conditions has indicated that there are locations within the Study Area where the depth to bedrock is shallow. Bedrock is mapped at ground surface along Salt Creek between Innis Lake Road and Airport Road, and the depth to bedrock is only a few metres between Innis Lake Road and Airport Road at Innis Lake Road and at Humber Station Road. Consideration for the shallow bedrock should be allowed for in planning for excavation in these areas.

The depth to groundwater within the Study Area, determined from drive-point piezometers, boreholes and from reported static water levels in MOE WWR, ranges from 0.2 mBGS to 29.0 mBGS. The shallowest water levels (2.4 mBGS) were reported adjacent to surface water features. Therefore, depending on the depth of excavation for the road work, dewatering may be required during construction. However, based on the fine-grained texture and relatively low permeability of the upper overburden identified as part of the geotechnical investigation, dewatering rates would not likely be significant.

Within the Study Area, several areas where groundwater discharges to surface water features have been identified. Therefore, groundwater discharge to surface water represents a potential constraint to development. The prime concern with respect to this is the temporary reduction of baseflow in the surface water features during dewatering for construction. Potential mitigation measures could include the discharge of water pumped for dewatering to the surface water features.

Within the vicinity of the Study Area, the presence of till and other fine-grained deposits at surface serve to reduce groundwater recharge. However, in areas where the bedrock is shallow and the overburden is thin, specifically near Salt Creek and Humber Station Road groundwater recharge rates may be higher. Therefore, maintaining groundwater recharge post-development is not considered a significant constraint for development.

No municipal water supply wells, or municipal well head protection areas (WPHA) are defined within the Study Area, and therefore do not represent a constraint to the project or development.

MOE WWR indicates there are 86 private wells within 500 m of the section of Mayfield Road being considered as part of this Class EA. Sixteen (16) of these wells are less than 10 m deep, which is considered relatively shallow. All except three of these wells are screened in the shale. If these wells still exist and are still in use, the quantity and quality of the water could be impacted by the proposed construction, and therefore represents a potential constraint to development.

Temporary impacts to quantity could result from dewatering during the construction. Impacts to water quality could result from dewatering or active construction. Water quality concerns related to dewatering may result from drawing impacted groundwater (i.e. from a septic system) toward private wells that are located within the zone of influence of the pumping. It is also possible that the operation of heavy equipment and excavation into the bedrock, if required, could temporarily increase turbidity and total suspended solids in the water.

A residential well survey should be conducted within the Study Area to verify the presence and status of private wells along Mayfield Road, prior to construction. If private wells are found and still in use, Stantec recommends collecting a baseline water quality sample and conducting water level monitoring before and throughout the construction period. In the event of groundwater interference, a remedial measure, such as provision of potable water to the resident, should be implemented until the water quantity and/or quality is restored to pre-construction conditions.

In order to further characterize the potential impact to the aquifer system underlying the study area, intrinsic susceptibility mapping was completed using data provided in the MOE water well records. An intrinsic susceptibility index (ISI) was calculated for each well using the method presented in MOE (2001). This method considers the depth and type of material overlying a confined aquifer to arrive at a semi-quantitative risk rating of High, Medium, or Low. The ISI at the Site ranges from High to Low. The ISI is high near Salt Creek and Humber Station Road where the bedrock is shallow and overlain by a relatively thin layer of clay. Elsewhere at the Site where the bedrock is deeper and the clay overburden is thicker, the ISI is Medium to Low.

In areas where the ISI is High, activities at the surface (e.g. road construction and road salt application) have a greater potential for impacting the groundwater. When the road is widened, more road salt would likely be applied. The potential additional impact from this could be mitigated through diverting runoff from the sensitive areas through drainage improvements or by using less or alternative de-icing agents.

The requirements for dewatering and associated requirements for a Permit to Take Water (PTTW) from the Ministry of the Environment will be investigated further during the detailed design development in particular where excavations at, or near, watercourses will be undertaken.

2.5 TREE INVENTORY

Stantec Consulting Ltd. completed a Tree Inventory and Assessment for the Mayfield Road study area. A field investigation was completed to conduct a visual assessment of trees within and adjacent to the Mayfield Road Right-of-Way (ROW). The area was examined to determine tree species including rare or endangered trees and any significant areas, general tree condition, and diameter class which is a range of measurement of the diameter of the stem 1.4 metres above the ground. General tree condition was assessed based on observed health indicators which include live buds, dead wood, structural defects and presence of disease. A full copy of the tree inventory and the Inventory plans is found in Appendix G.

Each tree was given a condition rating as follows:

Excellent: (Vigour Class 6: Healthy)
Good: (Vigour Class 5: Light Decline)

Fair: (Vigour Class 4: Moderate Decline)
Poor: (Vigour Class 3: Severe Decline)
Dead: (Vigour Class 2: Dead due to Natural Causes)
Dead: (Vigour Class 1: Dead due to Human Causes)

Trees were also assessed to identify any significant areas and endangered or rare trees. The observed trees were then given a preservation priority of High, Medium, or Low, based on the following:

High – A tree in good to fair condition and greater than the diameter class of 0 to 10cm. Trees designated 'high' are desirable to retain.

Medium – A tree in the diameter class of 0 to 10cm and can be easily transplanted if necessary, due to possible impacts from construction. Trees designated 'medium' can be transplanted or replaced.

Low – A tree that is below fair condition or dead. OR. A tree that is considered to be an invasive species. Trees designated 'low' are not desirable to retain.

A total of 1230 trees were observed within or immediately adjacent to the study area. There were no rare or endangered species observed within the project area. Trees were predominantly in good condition and therefore were given a high preservation priority (approximately 66%).

2.6 CULVERTS AND BRIDGES – CONDITION SURVEY

In 2007 Stantec Consulting undertook a visual inspection of all culverts within the study area. In addition, a recommendation for replacement was produced based on its condition. The inspection reports can be found in Appendix H of this report. A summary of the culvert inspections and recommendations is found in Table 2.8.1.1.

Existing Rigid Frame culvert at Sta. 15+156 (Crossing ID #12)

Several culverts will require repairs or replacement due to their existing condition while others will require replacement to increase hydraulic capacity, reduce roadway overtopping during major rainfall events and in some cases a full replacement is required to protect existing fisheries resources and habitat. Additional details of the various culvert replacements are discussed further in the recommendations of this report and are illustrated on the accompanying project plans. The treatment of each culvert is subject to final confirmation during the detailed design and approvals processes.

The concrete rigid frame structure located at Sta. 15+156 approximately 344 m west of Clarkway Drive/Humber Station Road was built in 1969 which makes it over 40 years old

and potentially subject to a heritage bridge impact assessment. The corrugated steel pipe arch structure located at Sta. 14+400 approximately 165 m west of Marysfield Road was reportedly built in 1940 which makes it over 40 years old and potentially subject to a heritage bridge impact assessment. The relative configuration and accessibility generally suggest that it would not warrant a heritage impact assessment as it does not exhibit any significant architectural context or aesthetic features not found with numerous rigid frame and CSP arch structures in the Region of Peel and it was not identified as a cultural heritage resource in the Archaeological Assessments or Heritage Assessment reports. It is recommended that the Region of Peel confirm this requirement with their heritage resource section during detailed design and determine the necessity for a heritage bridge assessment prior to modifying extending or removing and replacing the existing structure.

2.7 UTILITIES

2.7.1 General

There are a number of above ground and below ground utilities in the existing Mayfield Road right-of-way within the study area. Although no planning information was provided by utility companies with respect to proposed future plant within the study area, the planning for this project should assume that existing utility plant will need to be extended, relocated and/or increased in size/capacity as development in the area occurs. The requirement for coordination with the affected utility agencies is anticipated and should be considered early in the detailed design development phase to ensure that plans are known, details are understood and that related needs are accommodated in the project planning and related project schedules.

2.7.2 Hydro

2.7.2.1 Hydro One Brampton

Hydro One Brampton is responsible for providing hydro power for the City of Brampton (south of Mayfield Road). As a result, Hydro One Brampton has overhead hydro lines and poles along most of the south side of Mayfield Road within the study area. Many of the private hydro services to individual residents are buried underground.

Existing Hydro One Brampton overhead hydro line.

2.7.2.2 Hydro One Networks

Hydro One Networks is responsible for providing Hydro Power for the Town of Caledon (north side of Mayfield Road). As a result, Hydro One Networks has a number of poles and overhead lines throughout most of the Mayfield Road study limit on the north side of the road. Many of the private hydro services to individual residences are buried underground.

2.7.3 Bell Canada

Bell Canada has underground cable plant on both sides of Mayfield Road throughout the study limits. In many cases there are multiple buried cables on each side of the road, in addition to underground plant running down the side roads.

2.7.4 Rogers Cable

Rogers Cable has overhead fibre optic cable attached to the Hydro One Brampton Poles on the south side of Mayfield Road from Airport Road to Maissoneuve Boulevard. From Goreway Drive/Innes Lake Road to a point approximately 250 metres east of there is overhead coaxial cable on the north side of Mayfield Road on the Hydro One Networks pole line. In addition to the above, overhead coaxial cable exists on the Hydro One Networks poles on the north side from approximately 200 metres west of the Gore Road to approximately 320 meters east of Humber Station/Road Clarkway Drive. There is also some buried fibre optic and coaxial cable at the side roads.

2.7.5 Natural Gas

Enbridge Gas currently has existing four inch gas main within the study area. It runs on Airport Road then eastward on the south side of Mayfield Road to a point approximately 800 metres east of The Gore Road. This 4 inch gas main also extends north and south of Mayfield Road on The Gore Road.

Underground Gas Line Marker at Mayfield Road

In addition to the 4 inch (100 mm) gas main, an 8 inch (200 mm) gas main runs north and south of Mayfield Road on Coleraine Drive.

2.7.6 Watermains

On the south side of Mayfield Road the Region of Peel has a 750 mm diameter concrete pressure pipe trunk watermain throughout the entire study area. The additional watermain along Mayfield from Airport Road to Innis Lake Road is a Zone 4 Reservoir Feedermain. The Feedermain is 1200 mm in diameter and the project was completed in 2012. The watermain will not be in service until the Tullamore Pumping station and reservoir has been completed, which was still under construction at the conclusion of this study, completion is expected in May of 2013.

On the north side of Mayfield Road there is a 300 diameter watermain from Airport Road to east of Maissoneuve Boulevard, then a 300 diameter watermain from this point to McVean Drive/Centreville Creek Road, a 300 diameter watermain from that point to The Gore Road, then a 200 diameter watermain from The Gore Road to Coleraine Drive.

2.8 DRAINAGE AND STORMWATER MANAGEMENT

2.8.1 Drainage

Hydraulic and water quality issues associated with construction of Mayfield Road were investigated by Stantec Consulting as part of the study. The analyses were undertaken in order to determine whether the culverts are appropriately sized under existing conditions, to identify the appropriate dimensions of the culverts under proposed conditions, and to determine the required stormwater management controls for the project area. A copy of Stantec's "Culvert and Stormwater Management Report" can be found in Appendix I.

The *Region of Peel Design, Specification & Procedures Manual for Storm Sewers* (December 2006), indicates that culverts that cross an arterial roadway are to be designed for a 25 year storm and should have a minimum diameter of 600 mm. Major crossings (drainage areas greater than 50 ha.) are to be designed for a Regional Storm event.

A number of field inspections were carried out to assess the existing roadway culverts within the study limits. The results of this field review are summarized in Table 2.8.1.1 along with recommendations for culvert crossings associated with improvements to Mayfield Road.

Within the study area there are total of 24 (permanent and intermittent watercourse) culverts crossing the centerline of the roadway (23 on Mayfield Road and 1 on Coleraine Drive). The study has included a review of the culvert capacity and future requirements. This compares favorably with the Toronto and Region Conservation Authority's (TRCA's) inventory of 16 permanent culverts crossing Mayfield Road within the study area. It should be noted that as part of the structural inspection of the culverts (Appendix H), eight of the culverts were recommended to be replaced due to the observed poor existing condition of the culverts.

All of the culverts within the study area are located within the Humber River watershed. The drainage areas consist primarily of clay loam till with good to poor drainage, and the land use is primarily agricultural with a few hamlets and one industrial park.

A detailed surface water assessment has been completed to quantify surface drainage characteristics of lands contributing drainage through the Mayfield Road right-of-way and to assess the performance of the existing drainage system. Hydrologic event modeling was used to quantify the peak flow rates upstream of each culvert during the 25-year and 100-year rainfall events. Catchment areas were delineated and details of these catchment areas can be found in Figure 2.8.1.

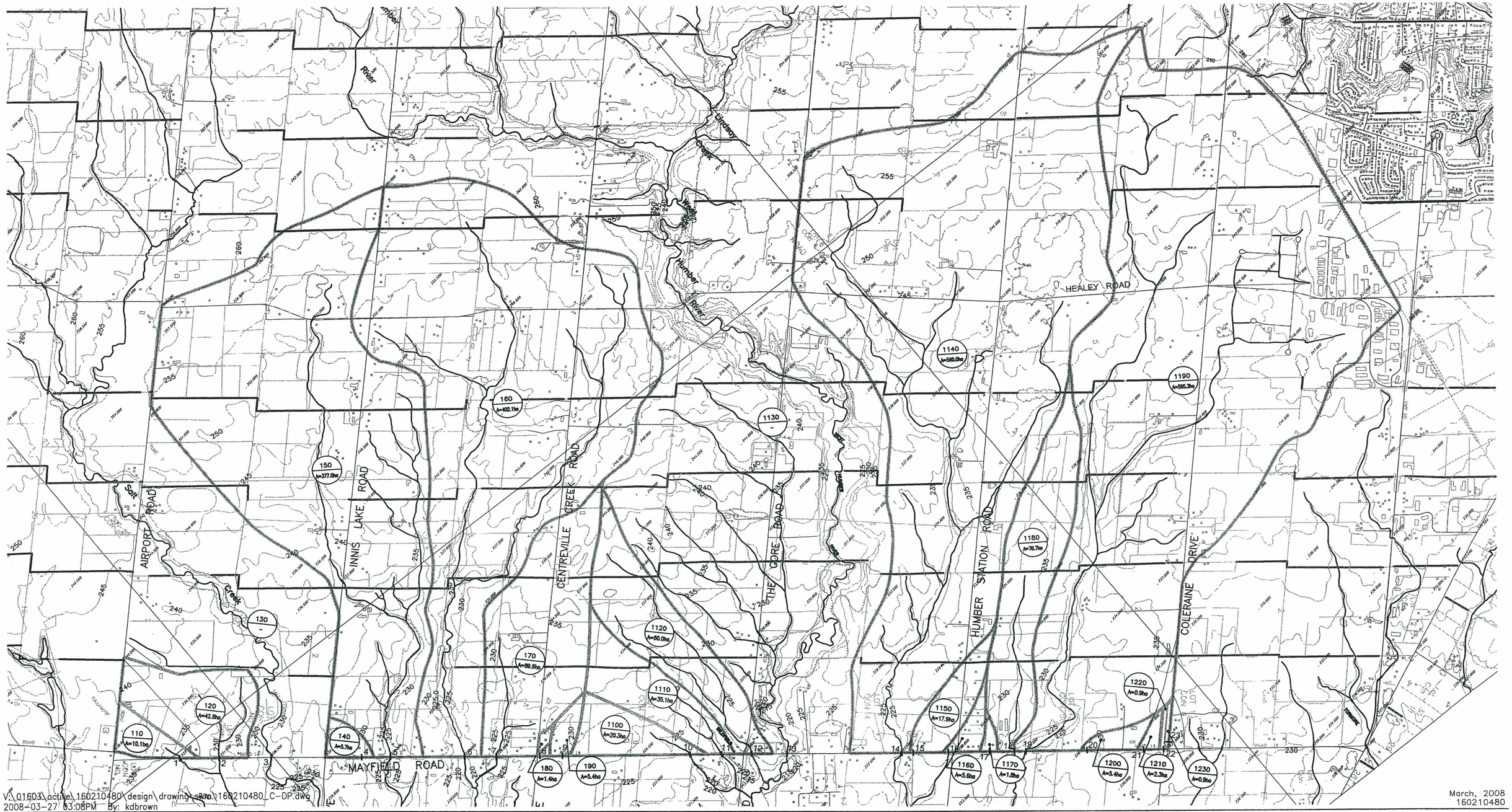
In accordance with Region of Peel criteria, culverts with less than 1.0 m of freeboard to the top-of-road elevation during the design storm may indicate that the culvert is

undersized. A check was also made to ensure that the water level upstream of the road crossing was below the roadway elevation during the 100 year rainfall event.

The conveyance capacity of each existing culvert was determined and the results are summarized in Table 2.8.1.2. Based on this analysis it is concluded that:

- Nineteen (19) culverts passed the design storm (25-year) with greater than 1.0 m of freeboard.
- Five (5) culverts passed the design storm with less than 1.0 m of freeboard.
- None of the culvert crossings overtop the roadway during the 100-year rainfall event.
- Two (2) culvert crossings would overtop the roadway during the regional storm event.
- A hydraulic analysis of the culverts that did not meet the criteria for 1.0m of freeboard and culverts that are being recommended for replacement due to structural deficiencies was also undertaken.
- The *Humber River Watershed Plan* (TRCA, 2007) and Region of Peel, City of Brampton and Town of Caledon guidelines requires that all future development control post-development peak flows to pre-development levels for all storms up to and including the 100-year storm. Since any future development would be required to maintain the existing flow rates, the proposed hydraulic analysis used the existing flows to determine the proposed culvert sizes.

Preliminary pipe sizes were developed assuming the same slope and length as existing conditions. The results of the hydraulic analysis for the culverts are summarized in Table 2.8.1.3. Only the culverts requiring replacement are shown.



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Legend

120 A=42.8ha — CATCHMENT ID / CATCHMENT AREA (ha)

Notes

1=25,000

0 250 750 1250m

Client/Project
REGION OF PEEL
MAYFIELD ROAD
ENVIRONMENTAL ASSESSMENT

Figure No.
1.0

Title
DRAINAGE AREA PLAN

Based on the completed culvert & bridge structural inspections, hydraulic analysis and review of endangered species protection requirements 23 culverts are recommended for replacement. Table 2.8.1.4 provides a summary of the culverts and rationale for replacement. The remaining culverts would be retained and extended to accommodate the proposed Mayfield Road Improvements.

In summary, of the 23 culverts requiring replacement for structural and hydraulic insufficiencies or to satisfy ESA requirements, the following conclusions can be drawn:

- 1 culvert will be replaced with a concrete storm sewer (Station 10+425)
- 9 culverts will be replaced with similar culvert sizes (Stations 10+689, 11+603, 12+787, 13+970, 15+249, 15+454, 15+693, 15+885, 16+327). These culverts have sufficient capacity but were in poor structural condition.
- 9 culverts must be increased in size strictly for hydraulic capacity (Stations 11+800, 12+300, 12+500, 12+927, 13+763, 14+177, 15+156, 15+995 and 16+700).
- 2 culverts must be increased in size to satisfy MNR's guidelines for the protection of Redside Dace habitat (Stations 11+015 and 14+400)
- 2 culverts which must be increased in size and replaced due to structural condition and capacity deficiencies (Stations 16+842 and 16+887). Note: These culverts have already been replaced as part of a separate undertaking.

The smaller existing culverts at Stations 12+787 (600 mm dia.) and 16+887 (450 mm dia.) do not have 1 m of freeboard to the existing roadway during the design rainfall (25-year) event. However, depending on the detailed design of the road and drainage system the road grades may change which could provide the appropriate freeboard requirements.

Table 2.8.1.1 – Summary of Culvert Characteristics & Recommendations

Catchment ID (1)	TRCA ID No.	Station	Drainage Area (1) (ha)	Material (2)	Shape (2)	Length (m) (2)	Existing Dimensions(2) (mm)		Condition Observations(2)	Bankfull Width (3) (m)	Required Flow Cross Section (1) (mm)		Initial Recommended Treatment(1,2)	ESA(4) Applicable	Meander Belt Analysis (Y/N) (3)	Initial Meander Belt Width (3) (m)	100 Year Erosion Rate(3) (m/100yr)	Total Meander Belt Width(3) (m)	Final Recommended Treatment	Recommended Structure		Extension (m)		Total Length (m)
							Span	Height / Diam.			Span	Height/ Diam.								Span	Height/ Diam.	Left	Right	
110	1	10+425	10.1	CSP	Circular	19.60	-	1200	Impact damage, erosion, sag in middle	-	-	675 Concrete	Poor Condition Replace	-	N	-	-	-	Replace existing CSP with new closed Concrete storm sewer crossing	-	675	13.8	13.2	46.6
120	2	10+689	42.8	CSP	Elliptical	30.60	2500	1800	Sag in culvert, holes & perforations, separated plates	2.8	-	1800 CSP	Poor Condition Realign Replace	-	Y	23.0	5.0	35.8	Realign and replace with new CSP	-	1800	11.9	11.9	54.4
130	3	11+015	N/A	Concrete	Box	25.00	9000	2600	Minor cracking & staining of abutments, barrier walls, deck soffit	8.0	9000	2600	Retain & Extend	Redside Dace Habitat	Y	48.0	10.0	61.6	Replace with larger structure for 100 year erosion limit.	18400	3000	10.1	12.9	48
140	4	11+603	5.7	CSP	Circular	21.50	-	1200	Culvert deformed, severe corrosion		-	1200 CSP	Poor Condition Replace	-	N	-	-	-	Realign and replace with new CSP	-	1200	19.6	18.6	59.7
150	5	11+800	377.0	Concrete	Box	29.40	3660	1830	Repair wide vert. cracks, patch holes in soffit	5.0	3660	1830	Retain/Repair & Extend	-	N	41	6.0	58.0	Replace with Open Bottom Rigid Frame	7200	1830	12.1	14.0	55.5
	-	11+812	377.0	CSP	Circular	20.60	-	750	Some impact damage		-	750	Retain & Extend	-	N	-	-	-	Extend 750 CSP	-	750	15.4	16.1	52.2
160	6	12+300	402.1	Concrete	Box	37.90	5500	1950	Repair spalls, delaminations, erosion	5.0	6100	2100	Retain & Extend	-	Y	42	7.3	61.6	Replace with new 6100 x 2100 open bottom conc. culvert	6100	2100	4.5	5.6	48
170	7	12+500	89.6	CSP	Circular	41.60	-	1800	Perched inlet/outlet, corrosion, deformation	3.5	-	1800 CSP	Poor Condition Replace	-	Y	23	5.0	36.5	Replace with new CSP	-	1950	10.9	15.9	68.5
180	-	12+787	1.4	CSP	Circular	23.08	-	600	Severe impact damage, perched outlet, corroded, collapsed		-	600	Insufficient Capacity and Poor Condition Replace	-	N	-	-	-	Realign and replace with new CSP	-	600	-	-	49.4
190	-	12+927	5.4	HDPE	Circular	21.60	-	450	-		-	600 HDPE	Does Not meet Minimum Size Requirement Replace	-	N	-	-	-	Replace with new 600 HDPE	-	600	15.1	16.6	53.4
1100	8	13+763	20.3	CSP	Circular	24.67	-	1050	Corrosion, deformation, perched at inlet	2.5	-	Twin 900 CSP	Insufficient Capacity and Poor Condition Replace	-	Y	20.4	5.0	32.9	Realign and replace with new twin 900mm DIA. CSP's	-	2x900	26.8	13.7	65
1110	9	13+970	35.1	PVC	Circular	30.98	-	915	PVC Liner in concrete filled CSP		-	915	Retain & Extend	-	N				Replace with new HDPE	-	915	27.3	2.3	61.2

Table 2.8.1.1 – Summary of Culvert Characteristics & Recommendations

Catchment ID (1)	TRCA ID No.	Station	Drainage Area (1) (ha)	Material (2)	Shape (2)	Length (m) (2)	Existing Dimensions(2) (mm)		Condition Observations(2)	Bankfull Width (3) (m)	Required Flow Cross Section (1) (mm)		Initial Recommended Treatment(1,2)	ESA(4) Applicable	Meander Belt Analysis (Y/N) (3)	Initial Meander Belt Width (3) (m)	100 Year Erosion Rate(3) (m/100yr)	Total Meander Belt Width(3) (m)	Final Recommended Treatment	Recommended Structure		Extension (m)		Total Length (m)
							Span	Height / Diam.			Span	Height/ Diam.								Span	Height/ Diam.	Left	Right	
1120	10	14+177	60.0	HDPE	Circular	30.70	-	1100	Armour embankments at Inlet	2.5	-	1100	Retain & Extend	-	Y	22.0	5.0	34.5	Realign and replace with new HDPE culvert	-	1200	18.4	-	48.3
1130	11	14+400	N/A	Concrete	Arch	25.00	9000	4000	Repair holes in arch crown, patch delaminations	7.5	9000	4000	Retain & Extend	Redside Dace Habitat	Y	48.0	8.0	61.1	Replace with larger structure to for 100 year erosion limit.	15600	4000	10.1	12.9	48
1140	12	15+156	560.0	Concrete	Box	20.70	6070	1250	Repair spall	4.3 d./s and 8-10 u/s	6070	1250	Retain & Extend	-	Y	71	8.0	82.8	Replace & realign with new open bottom culvert	6000	1800	11.0	18.5	50.9
1150	13	15+249	17.9	CSP	Circular	19.70	-	1200	Remove deformation, install gabions or extend outlet	Undefined	-	1200	Retain & Extend	-	Y	-	-	-	Replace with new CSP	-	1200	9.6	17.7	46.8
1160	-	15+454	5.6	CSP	Circular	20.00	-	600	Light Corrosion		-	600	Retain & Extend	-	N	-	-	-	Replace with new CSP to accommodate road/transit stop	-	600	11.1	16.6	47.8
1170	-	15+693	1.8	CSP	Circular	18.50	-	600	Light corrosion & deformation, install gabions at outlet		-	600	Retain & Extend	-	N	-	-	-	Realign and Replace with new CSP	-	600	11.1	19.4	49.4
1180	-	15+885	666.0	CSP	Circular	30.30	-	900	Light corrosion, impact damage		-	900	Insufficient Capacity Replace	-	N	-	-	-	Realign and Replace with new CSP	-	900	5.5	9.2	45.1
1190	14	15+955	666.0	Concrete	Box	21.65	4630	1590	Some cracking, spalling, honeycombing, install gabions	7.0	5480	1520	Insufficient Capacity Replace	-	N	74.4	8.0	89.5	Replace with new Concrete box culvert.	5480	1520	13.5	15.3	50.4
1200	15	16+327	5.4	CSP	Circular	20.10	-	1200	Install gabions	Undefined	-	1200	Retain & Extend	-	Y	(3)	-	-	Lower and replace with new CSP	-	1200	9.0	9.5	38.5
1210	16	16+700	2.3	CSP	Circular	20.60	-	450	Install gabions	Undefined	-	600	Does not meet minimum size requirement. Replace	-	Y	-	-	-	Replace with new CSP	-	600	5.9	7.5	40.8
1220	-	16+842	0.9	CSP	Circular	18.69	-	450	Outlet crushed blocking flow		-	600	Poor Condition Replace	-	N	-	-	-	Replaced previously.	-	NA	NA	NA	NA
1230	-	16+887	0.9	CSP	Circular	17.76	-	450	Coleraine Drive		-	600	Insufficient Capacity Replace	-	N	-	-	-	Replaced previously.	-	NA	NA	NA	NA

(1) Stormwater and Drainage Report, Stantec, October 2010 (revised August and October 2012 and April 2013)
(2) Culvert and Bridge Inspection Report, Stantec Consulting, October 2007
(3) Meander Belt and 100 Year Erosion Assessment and Addendum, Stantec Consulting, February 2012, June 2012 and March 2013
(4) ESA denotes Endangered Species Act Provisions

Table 2.8.1.2 – Existing Culvert Capacity

Catchment ID	TRCA ID No.	Drainage Area (ha)	Station	Material	Shape	U/S invert (m)	D/S invert (m)	Length (m)	Dimensions (mm)		Flow (m^3/s)		Tailwater Elev (m)	Spill Elev. (m)	Required Headwater Elev. (m)		Depth of Headwater / Height of Culvert (H/D)		Freeboard From Spill Point	
									Span	Height/ Diam.	25 yr	100 yr			25 yr	100 yr	25 yr	100 yr	25 yr	100 yr
110	1	10.1	10+425	CSP	Circular	230.01	229.83	19.60		1200	0.566	0.751	230.55	231.75	230.68	230.77	0.56	0.63	1.07	0.98
120	2	42.8	10+689	CSP	Elliptical	225.81	225.64	30.60	2500	1800	1.850	2.484	226.72	229.26	226.80	226.86	0.55	0.58	2.46	2.40
130	3	N/A	11+015	Concrete	Box	223.40	223.40	25.00	9000	2600	25.440	33.390	N/A	226.50	224.66	224.90	0.48	0.58	1.84	1.60
140	4	5.7	11+603	CSP	Circular	225.96	225.83	21.50		1200	0.304	0.420	226.55	228.79	226.59	226.62	0.52	0.55	2.20	2.17
150	5	377.0	11+812	Concrete	Box	220.91	220.92	29.40	3660	1830	8.430	11.288	222.02	223.41	222.37	222.61	0.80	0.93	1.04	0.80
	-	377.0	11+800	CSP	Circular	221.59	221.38	20.60		750	8.430	11.288	222.02	223.41	222.37	222.61	1.04	1.36	1.04	0.80
160	6	402.1	12+300	Concrete	Box	219.13	219.11	37.90	5500	1950	8.254	11.073	220.28	222.88	219.49	218.61	0.67	0.73	4.39	4.27
170	7	89.6	12+500	CSP	Circular	218.78	218.36	41.60		1800	2.604	3.554	219.44	225.30	220.12	220.37	0.74	0.88	5.18	4.93
180	-	1.4	12+787	CSP	Circular	227.28	227.06	23.08		600	0.086	0.120	227.42	228.49	227.58	227.64	0.50	0.60	0.91	0.85
190	-	5.4	12+927	PVC	Circular	227.88	227.67	21.60		450	0.219	0.295	227.94	229.74	228.44	228.61	1.24	1.62	1.30	1.13
1100	8	20.3	13+763	CSP	Circular	221.33	220.68	24.67		1050	1.120	1.546	221.31	223.13	222.39	222.62	1.01	1.23	0.74	0.51
1110	9	35.1	13+970	PVC	Circular	218.71	217.68	30.98		915	1.741	2.340	218.23	222.03	220.23	220.97	1.66	2.47	1.80	1.06
1120	10	60.0	14+177	PVC	Circular	215.92	214.50	30.70		1100	2.302	3.064	215.16	221.03	217.42	217.99	1.36	1.88	3.61	3.04
1130	11	N/A	14+400	Concrete	Arch	211.70	211.50	25.00	9000	4000	31.360	41.650	N/A	218.30	213.50	213.87	0.45	0.54	4.80	4.43
1140	12	560.0	15+156	Concrete	Box	219.53	219.62	20.70	6070	1250	9.396	12.367	220.37	222.39	220.70	220.91	0.94	1.10	1.69	1.48
1150	13	17.9	15+249	CSP	Circular	221.56	221.33	19.70		1200	0.774	1.039	222.05	223.60	222.34	222.50	0.65	0.78	1.26	1.10
1160	-	5.6	15+454	CSP	Circular	224.00	223.78	20.00		600	0.224	0.299	224.14	225.99	224.51	224.61	0.85	1.02	1.48	1.38
1170	-	1.8	15+693	CSP	Circular	225.08	224.93	18.50		600	0.262	0.392	225.29	226.83	225.51	225.60	0.72	0.87	1.32	1.23
1180	-	666.0	15+885	CSP	Circular	221.21	220.29	30.30		900	13.515	17.494	221.57	223.28	222.40	222.72	1.32	1.68	0.88	0.56
1190	14	666.0	15+955	Concrete	Box	220.73	220.62	21.65	4630	1590	13.515	17.494	221.57	223.28	222.40	222.72	1.05	1.25	0.88	0.56
1200	15	5.4	16+327	CSP	Circular	226.92	226.68	20.10		1200	0.243	0.325	227.40	228.79	227.43	227.46	0.43	0.45	1.36	1.33
1210	16	2.3	16+700	CSP	Circular	228.90	228.56	20.60		450	0.137	0.191	228.83	230.66	229.35	229.44	1.00	1.20	1.31	1.22

Table 2.8.1.2 – Existing Culvert Capacity

Catchment ID	TRCA ID No.	Drainage Area (ha)	Station	Material	Shape	U/S invert (m)	D/S invert (m)	Length (m)	Dimensions (mm)		Flow (m^3/s)		Tailwater Elev (m)	Spill Elev. (m)	Required Headwater Elev. (m)		Depth of Headwater / Height of Culvert (H/D)		Freeboard From Spill Point	
									Span	Height/ Diam.	25 yr	100 yr			25 yr	100 yr	25 yr	100 yr	25 yr	100 yr
1220	-	0.9	16+842	CSP	Circular	229.49	229.41	18.69		450	0.061	0.084	229.68	230.91	229.78	229.83	0.64	0.76	1.13	1.08
1230	-	0.9	16+887	CSP	Circular	229.38	229.51	17.76		450	0.109	0.163	229.78	230.57	229.86	229.93	1.07	1.22	0.71	0.64

Information Source - Culvert and Stormwater Management Report, October 2010 (Updated August and October 2012 and April 2013), Stantec Consulting Ltd.

Table 2.8.1.3 – Proposed Culvert Capacity

Location/ID/Area				Proposed Culverts				Hydrologic Analysis				Hydraulic Analysis - Culvert Conveyance							
								Flow (m^3/s)						Required Headwater Elev. (m)		Depth of Headwater / Height of Culvert (H/D)		Freeboard From Spill Point	
Catchment ID	TRCA ID No.	Drainage Area (ha)	Station	Material	Shape	Span (mm)	Height/ Diam. (mm)	Design Storm - 25 yr	Check Storm - 100 yr	Regional Storm (Existing Conditions flows)	Regulatory	Tailwater Elev (m)	Spill Elev. (m)	25 yr	100 yr	25 yr	100 yr	25 yr	100 yr
110	1	10.1	10+425	CSP	Circular		1200	0.566	0.751	1.173	1.470	230.42	231.75	230.76	230.86	0.55	0.63	0.99	0.89
120	2	42.8	10+689	CSP	Circular		1800	1.850	2.484	4.639	5.792	226.98	229.26	227.29	227.47	0.61	0.71	1.97	1.79
130	3	N/A	11+015	Concrete	Bridge	18400	3000	25.440	33.390	96.700	96.700	N/A	226.50	224.49	224.65	0.50	0.55	2.01	1.85
140	4	5.7	11+603	CSP	Circular		1200	0.304	0.420	0.685	0.805	226.82	228.79	226.92	226.98	0.43	0.48	1.87	1.81
150	5	377.0	11+800	Concrete	Open Box	7200	1830	8.430	11.288	29.167	43.418	221.70	224.21	221.83	221.93	0.59	0.64	2.38	2.28
	-	377.0	11+812	CSP	Circular		750	8.430	11.288	29.167	43.418	221.25	224.21	221.83	221.93	0.04	0.17	2.38	2.28
160	6	402.1	12+300	Concrete	Open Box	6100	2100	8.254	11.073	30.047	46.537	218.06	223.22	218.18	218.27	0.61	0.65	5.04	4.95
170	7	89.6	12+500	CSP	Circular		1950	2.604	3.554	8.524	11.661	219.07	225.30	220.71	220.96	0.67	0.80	4.59	4.34
180	-	1.4	12+787	CSP	Circular		600	0.083	0.112	0.176	0.202	227.29	228.49	227.70	227.76	0.49	0.59	0.79	0.73
190	-	5.4	12+927	HDPE	Circular		600	0.219	0.295	0.577	0.777	227.96	229.74	228.27	228.36	0.78	0.93	1.47	1.38
1100	8	20.3	13+763	CSP	Circular	Twin	900	1.120	1.512	2.453	2.895	221.34	223.13	221.85	222.03	0.83	1.03	1.28	1.10
1110	9	35.1	13+970	HDPE	Circular		915	1.741	2.340	3.999	5.043	219.45	222.03	220.98	221.67	1.62	2.37	1.05	0.36
1120	10	60.0	14+177	HDPE	Circular		1200	2.302	3.064	6.040	8.518	216.52	221.03	218.19	218.50	1.16	1.42	2.84	2.53
1130	11	N/A	14+400	Concrete	Bridge	15600	4000	31.360	41.650	129.970	129.970	213.20	218.30	213.04	213.28	0.31	0.37	5.26	5.02
1140	12	560.0	15+156	Concrete	Open Box	6000	1800	9.396	12.167	36.569	60.007	220.68	222.50	220.88	221.01	0.71	0.78	1.62	1.49
1150	13	17.9	15+249	CSP	Circular		1200	0.774	1.039	1.940	2.579	222.02	223.60	222.48	222.61	0.65	0.76	1.12	0.99
1160	-	5.6	15+454	CSP	Circular		600	0.224	0.299	0.582	0.793	224.16	225.99	224.63	224.73	0.72	0.88	1.36	1.26
1170	-	1.8	15+693	CSP	Circular		600	0.167	0.230	0.253	0.277	225.11	226.83	225.63	225.72	0.72	0.87	1.20	1.11
1180	-	666.0	15+885	CSP	Circular		900	13.253	17.486	46.253	71.888	221.64	223.28	222.02	222.37	-0.64	-0.26	1.26	0.91
1190	14	666.0	15+955	Concrete	Open Box	5480	1520	13.253	17.486	46.253	71.888	221.21	223.28	222.02	222.37	1.00	1.23	1.26	0.91
1200	15	5.4	16+327	CSP	Circular		1200	0.243	0.325	0.589	0.795	226.92	228.79	227.23	227.30	0.36	0.42	1.56	1.49
1210	16	2.3	16+700	CSP	Circular		600	0.137	0.184	0.282	0.327	228.80	230.66	229.40	229.47	0.67	0.79	1.26	1.19
1220	-	0.9	16+842	CSP	Circular		600	0.058	0.078	0.114	0.135	229.77	230.91	229.80	229.82	0.52	0.55	1.11	1.09
1230	-	0.9	16+887	CSP	Circular		600	0.073	0.103	0.124	0.127	229.87	230.57	229.89	229.92	0.85	0.90	0.68	0.65

Information Source - Culvert and Stormwater Management Report, October 2010 (Updated August and October 2012 and April 2013), Stantec Consulting Ltd.

The culverts at Stations 12+927 and 16+700 had sufficient capacity and were in good condition but were replaced strictly to meet minimum size criteria for culvert diameters. Several other culverts which are not deficient in condition or capacity are to be realigned and replaced as a result of the road widening and required creek alignment/realignment.

Table 2.8.1.4 – Culvert and Bridge Replacements

ID Number	Location	Structural Deficiency	Hydraulic Deficiency	MNR/DFO/ESA*	Alignment
1	10+425	✓	-	-	-
2	10+689	✓	-	-	✓
3	11+015 Salt Creek	-	-	✓	-
4	11+603	✓	-	-	✓
5	11+800	-	✓	-	-
6	12+300 W. Humber R. Trib.	-	✓	-	-
7	12+500	✓	-	-	-
-	12+787	✓	✓	-	✓
-	12+927	-	✓	-	-
8	13+763	✓	✓	-	✓
-	13+970	-	-	-	✓
9	14+177	-	✓	-	✓
11	14+400 W Humber R. Trib.	-	-	✓	-
12	15+156	-	-	-	✓

Table 2.8.1.4 – Culvert and Bridge Replacements					
ID Number	**Location**	**Structural Deficiency**	**Hydraulic Deficiency**	**MNR/DFO/ESA***	**Alignment**
13	15+249	-	-	-	✓
-	15+454	-	-	-	✓
-	15+693	-	-	-	✓
-	15+885	-	✓	-	✓
14	15+955	-	✓	-	-
15	16+327	-	-	-	✓
16	16+700	-	✓	-	-
-	16+842 **	✓	-	-	-
-	16+887 **	✓	✓	-	-

* Culvert replacement required to preserve/enhance habitat for Redside Dace; an endangered species under the Endangered Species Act (ESA). ** Modified under a separate project during the course of this study.

2.8.2 Stormwater Management (SWM)

The *Humber River Watershed Plan* (TRCA, 2007) requires that all future developments control post-development peak flows to pre-development levels for all storms up to and including the 100-year storm. It also requires that enhanced water quality control and erosion control be provided for the roadway.

The general design principles for drainage from the proposed Mayfield Road corridor include maintaining existing drainage boundaries as much as possible. Storm water management measures incorporated will vary depending on the physical location, available property, topography, ultimate road cross-section and the outlet location.

In some areas rural or semi-urban road cross sections with roadside ditches will continue to outlet to their current locations/culverts and ultimately new urban cross sections on Mayfield Road with storm sewer will also be incorporated to capture and control roadway runoff. Water quality control will be provided through the use of oil-grit separator units in line with enhanced grass-lined roadside ditches/swales which will have a minimum 0.75 m wide bottom and maintain longitudinal slopes as flat as possible to maximize the contact between vegetation and runoff prior to its outlet to

the existing natural watercourses. Existing culverts will be extended or replaced to maintain current drainage patterns and to ensure that road drainage is not mixed with other runoff. A summary of the proposed culvert replacements and extensions is included in the preceding section.

Under long-term, ultimate urban road cross sections conditions, drainage from Mayfield Road and areas to the north may be picked up by urban drainage networks (conveyance and storm water management measures) associated with development in the Town of Caledon and may be accommodated at the south in the City of Brampton through ongoing development activity. During detailed design, comprehensive drainage area maps should be developed to delineate the specific detailed drainage characteristics in the study area and any possible variations as a result of ongoing development. Water quantity and water quality control is proposed to occur in storm water management facilities in conjunction with surrounding development or separate storm water management facilities/ponds included as part of the Mayfield Road improvements. Oil and grit separator (OGS) units may also be used in specific locations where storm water management facilities are not possible.

It will be incumbent on the Region of Peel to pursue all possible opportunities to combine SWM Facilities for the road with adjacent development.

Potential SWM measures associated with this study of Mayfield Road must provide controls for only the highway right-of-way and the external areas will continue to drain to the same locations as under existing conditions. Over the course of the study it became obvious that there is insufficient space available within the road-right-of-way to provide for all of the required water quality and water quantity controls. As a consequence, blocks of land adjacent to the roadway were identified as suitable to provide for the development of required roadside storm water management facilities.

Future development in the area may provide opportunities to combine the storm water management facilities for the roadway with surrounding development, however this is not certain at this time and as such dedicated facilities must be developed to meet the current runoff quality and quantity control objectives. Under long-term, ultimate urban road cross section conditions, drainage from Mayfield Road and areas to the north may be picked up by urban drainage networks (conveyance and storm water management measures) associated with ongoing and future development in the City of Brampton. It will be incumbent on the Region of Peel to pursue all possible opportunities to combine SWM Facilities for the road with adjacent development.

Water quantity and water quality control is proposed to occur in storm water management facilities in conjunction with surrounding development. Oil and grit separator units may also be used in specific locations where storm water management facilities are not possible.

2.8.3 Meander Belt Assessment

Meander belt assessments were conducted for crossings 2, 3, 5, 6, 7, 8, 10, 11, 12, 13, 14, 15, and 16. A site visit was conducted to assess each crossing and standard TRCA meander belt delineation protocols were applied. Surrogate reaches were used to define belt width where a naturally meandering watercourse did not exist at the crossing. The 100-year erosion rates were calculated using recent and historic aerial photography. These assessments are summarized in Table 2.8.1.1 and attached in Appendix R.

2.8.4 Crossing Sizing in Redside Dace Habitat

Crossings 3 and 11 have been identified as being Redside Dace Habitat. As described in Section 2.3.3 Redside Dace is listed as Threatened under the provincial Endangered Species Act. The *DRAFT Guidance for Development Activities in Redside Dace Protected Habitat* (MNR, 2011) recommends that crossings in direct habitat should span the valley for confined valleys or span the meander belt for unconfined valleys. Crossing 3 is located in an unconfined valley and Crossing 11 is located in a confined valley. Using an alternate bridge sizing method, involving a crossing span that includes the bankfull width and the 100-year erosion distance, the proposed bridge sizes, and their associated costs were reduced as shown in Table 2.8.4. Additional details are attached in Appendix Y.

Table 2.8.4: Comparison of Bridge Spans and Costs

Crossing ID	Valley Type	MNR Crossing Recommendation	Potential Span Per MNR Guideline	Cost of MNR Span	Recommended Span	Cost of Recommended Span
3	Unconfined	Span meander-belt	56 m	$6,720,000	18.4 m	$3,100,000
11	Confined	Span valley	110 m	$13,200,000	15.6 m	$2,600,000

2.9 SOILS, PAVEMENT STRUCTURE AND CONDITION

Stantec Consulting undertook a preliminary geotechnical investigation to assess the existing pavement structure and provide preliminary comments on the suitability of the existing pavement structure to accommodate future traffic volumes, as well as assess the subsurface conditions in the area of potential widening and provide a preliminary pavement design. The fieldwork for this investigation was undertaken in April and May of 2008.

Existing Mayfield Road Section

Mayfield Road was reconstructed between Airport Road and McVean Drive in 2006 with road base structure of 475mm of Granular B, 200mm of Granular A and 150mm of Hot Mix asphalt. The section of Mayfield Road between McVean Drive and Coleraine Drive was reconstructed by means of full depth reclamation (FDR) with 120mm of foamed asphalt stabilization of pulverized pavement and 100mm of Hot Mix asphalt.

A geotechnical investigation and pavement evaluation of Mayfield Road between Airport Road and Coleraine Drive was undertaken by John Emery Geotechnical Engineering Ltd in 2007 on the newly constructed pavement. The report was provided by the Region of Peel. The investigation concluded the pavement structure within the study limits consisted of an HI-1 surface lift generally 50mm thick, underlain by either two HL-8 lifts or a single HL-8 lift and FDR material for an average asphalt layer thickness of 140mm.

The Stantec's subsurface investigation consisted of 31 auger probes in the area of potential widening including two auger probes near existing culverts. In addition, Falling Weight Deflectometer (FWD) testing of the existing asphalt pavement was completed at approximately 150m intervals over the length of the project.

It was found that the existing pavement structure is adequate to carry the projected traffic levels over an approximate 20 year period. In areas of potential pavement widening the recommended preliminary pavement structure should consist of the following:

50mm	HL-1 Surface Course
50mm	HL-8 Upper Binder Course
50mm	HL-8 Lower Binder Course
150mm	OPSS Granular A
500mm	OPSS Granular B

2.9.1 Removal of Organic Materials and Peat Deposits

In areas where Mayfield Road will be widened, existing topsoil consisting of 80mm to 325mm thickness must be stripped. Organic materials (including peat) were also encountered during the auger probes in area of The Gore Road.

In other sections of Mayfield Road outside the study area there have been significant discoveries of organic Peat deposits in low lying areas adjacent to wetlands and watercourses. Any new pavement should not be constructed over this organic material.

It is recommended that a comprehensive and focused geotechnical investigation be undertaken during the detailed design phase of the project to confirm the limits and design implications including investigation for major organic peat deposits and requirements for localized dewatering and groundwater control.

The full Preliminary Geotechnical Investigation undertaken for this project is found in Appendix J.

2.10 ARCHAEOLOGICAL ASSESSMENT AND BUILT HERITAGE

2.10.1 Stage 1 Archaeological Assessment

A Stage 1 archaeological assessment was conducted for this project by Archaeological Services Inc. (ASI). A full copy of ASI's report can be found in Appendix K. It was determined that 27 archaeological sites have been registered within two kilometres of the study corridor, but no sites have been registered within the actual study corridor. However, a review of the general physiography and local nineteenth century land uses of the study corridor suggested that it exhibits archaeological site potential.

The field review determined that although portions of the study corridor have been previously disturbed by construction activities or is low and wet, there are several areas adjacent to the Mayfield Road right of way (ROW) that remain undisturbed and contain archaeological potential.

As part of this assessment, information was from a 2004 ground penetrating radar study at St. Patrick's Cemetery at the south east corner of Mayfield Road and The Gore Road. The actual limits of the St. Patrick's Cemetery plots in or near the existing Mayfield and The Gore Road right-of-way were difficult to determine due to the heavy clay that is native to the area. Further investigations will be required to confirm the presence or absence of unmarked graves beyond the known cemetery limits.

In light of these results, the following recommendations are made:

1. The Mayfield Road ROW does not retain archaeological site potential due to previous road and residential disturbances. Additional archaeological assessment is not required, and that portion of the study corridor can be cleared of further archaeological concern;

2. A Stage 2 archaeological assessment should be conducted on lands beyond the Mayfield Road ROW determined to have archaeological potential if the proposed project is to impact these lands. This work should be done in accordance with the Ministry of Culture's draft *Standards and Guidelines for Consultant Archaeologists* (MCL 2006), in order to identify any archaeological remains that may be present; and

3. If proposed construction activities impact the Mayfield Road ROW adjacent to the St. Patrick Cemetery, a Stage 3 archaeological assessment will be required, in accordance with the Ministry of Culture's draft *Standards and Guidelines for Consultant Archaeologists* (2006), to confirm the presence or absence of unmarked

graves beyond the cemetery limits. This work should involve the removal of the topsoil with a Gradall followed by the shovel shining of the exposed surfaces and subsequent inspection for grave shafts.

The following Ministry of Culture conditions also apply:

- Should deeply buried archaeological remains be found during construction activities, the Heritage Operations Unit of the Ontario Ministry of Culture should be notified immediately.

- In the event that human remains are encountered during construction, the proponent should immediately contact both the Ministry of Culture, and the Registrar or Deputy Registrar of the Cemeteries Regulation Unit of the Ministry of Government Services, Consumer Protection Branch.

2.10.2 Built Heritage and Cultural Landscape Assessment

A Built Heritage and Cultural Landscape Assessment was undertaken by Archaeological Services Inc. to identify any built heritage and cultural landscapes within the study corridor, and to assess the impact of potential construction activities on the above ground cultural resources. A complete copy of their report is found in Appendix L.

For the purposes of the assessment, the term cultural heritage resources 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 including farms, roads and 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.

The following summarizes the findings of the field review for this assessment:

- The study area can be described as an altered, 19th century, agricultural landscape. A number of farmhouses, barns and agricultural lands are still extant and illustrate early agricultural economies that were predominant in the former Townships of Albion and Toronto Gore.
- A total of thirty cultural heritage resources were identified within the study area, as per Table 2.10.2.1.

Table 2.10.2.1 – Identified Built Heritage Features *(BHF)* and Cultural Landscape Units *(CLU)* within the Mayfield Road Study Corridor

Feature	Location	Feature Type	Designation*
BHF1	11903 Airport Rd	Residence	Identified
BHF2	11850 Airport Rd	Blacksmith Shop	Listed - Brampton
BHF3	No address NE Corner Airport Rd/Airport Rd	Barn	Identified
BHF4	No address Mayfield Rd	Residence	Identified
BHF5	No Address Mayfield Rd	Barn	Identified
BHF6	6461 Mayfield Rd	Residence	Listed - Brampton
BHF7	6791 Mayfield Rd	Residence	Identified
BHF8	No Address NW side of Mayfield NE of Centreville Ck Rd	Residence	Identified/Listed - Caledon
BHF9	11962 The Gore Rd	Residence	Listed - Brampton
BHF10	6340 Mayfield Rd	Residence	Listed – Caledon
BHF11	12031 The Gore Rd	Residence	Identified
CLU1	Airport Rd	Cemetery	Listed - Brampton
CLU2	6034 Mayfield Rd	Farmscape	Listed - Caledon
CLU3	11873 The Gore Rd		Listed – Brampton Pending OHA Designation
CLU4	6600 Mayfield Rd	Farmscape	Listed - Caledon
CLU5	7205 Mayfield rd	Farmscape	Identified
CLU6	7905 Mayfield Rd	Farmscape	Listed – Brampton Pending OHA Designation
CLU7	7904 Mayfield Rd	Farmscape	Listed - Caledon
CLU8	No Address SE side of Mayfield Rd, NE of Humber Station Rd	Remnants of Farmscape	Identified
CLU9	8410 Mayfield Rd	Farmscape	Listed – Caledon
CLU10	8522 Mayfield Rd	Farmscape	Listed - Caledon
CLU11	Mayfield Rd, segments approaching Wildfield	Farmscape	Identified
CLU12	Innes Lake Rd	Roadscape	Identified
CLU13	Centreville Creek Rd & McVean Dr.	Roadscape	Identified

Table 2.10.2.1 – Identified Built Heritage Features *(BHF)* and Cultural Landscape Units *(CLU)* within the Mayfield Road Study Corridor			
Feature	**Location**	**Feature Type**	**Designation***
CLU14	Clarkway Dr.	Roadscape	Identified
CLU15	Coleraine Dr.	Roadscape	Identified
CLU16	Salt Creek	Waterscape	Identified
CLU17	Remnants of Tullamore	Historic Settlement	Identified
CLU18	Wildfield	Historic Settlement	Identified
CLU19	The Gore Rd.	Roadscape	Identified

* *Designated*: Designated under Part IV of the Ontario Heritage Act
Listed: Listed by the City of Brampton or Town of Caledon as heritage properties
Identified: Identified during review of historic mapping and/or during field review

In summary, it is recommended that:

1. Any proposed road projects and preferred alternative designs within the study area should be suitably planned in a manner that avoids any identified, above ground, cultural heritage resources.

2. Encroachment of lands close to built heritage features and cultural landscape units should be avoided wherever possible. Where encroachment is expected, appropriate vehicular access to the resources and appropriate setbacks between structures and the road should be ensured to promote their long-term viability. Appropriate landscape screening and noise abatement measures should be developed for these resources as part of the detailed design phase. Resources that are recommended for these measures include: BHF 3, BHF 4, BHF 5, BHF 6, BHF 7, BHF 8, BHF 10, BHF 11, CLU 2, CLU 3, CLU 4, CLU 5, CLU 7, CLU 8, CLU 9, CLU 17, and CLU 18.

3. Wherever possible, landscaping with historic plant materials for berms or vegetative screens is recommended, and fence rows and hedge rows should be preserved where extant.

4. Where resources are expected to be impacted through alteration to their setting due to: minimal encroachment resulting in a reduced buffer between the resource and the road; and introduction of a six-lane road, a cultural heritage landscape documentation report should be prepared in advance of construction activities to serve as a final record of each of the resources and the study area in general. Access to enter properties should be secured to conduct photographic documentation of privately-owned resources. The results of photographic documentation activities should be compiled into a stand-alone report which should also include a review of historic maps from the nineteenth and twentieth centuries for the purposes of identifying changes to the resources over time and land use histories for resources included in the documentation report. It is recommended that the following resources be subject to heritage documentation

activities, the results of which are compiled into one report and which is archived with local repositories and filed with the City of Brampton and Town of Caledon: BHF 3, BHF 4, BHF 5, BHF 6, BHF 8, CLU 2, CLU 3, CLU 5, CLU 8, CLU 9, CLU 11, CLU 12, CLU 13, CLU 14, CLU 16, CLU 17, CLU 18 and CLU 19.

5. Where resources are expected to be impacted through alteration to their setting due to: encroachment resulting in a reduced buffer between the cultural heritage resources and the road and removal of landscape features such as vegetative screening and/or fencing; and introduction of a six-lane road, resource-specific heritage impact assessments should be conducted in advance, or at the earliest possible stages of the detailed design phase to identify landscape features that should be retained. The result of these studies should be used to inform post-construction landscaping plans, potential tree-hoarding activities during construction, and finalization of grading limits. The following resources are expected to be subject to these impacts BHF 7, CLU 4, and CLU 7 and as result should be subject to the preparation of resource specific heritage impact assessments.

6. Where resources have the potential to be removed due to significant encroachment potentially resulting in removal, resource-specific heritage impact assessments should be completed in advance, or at the earliest possible stage of the detailed design stage. Resources recommended for completion of a heritage impact assessment within this context include: BHF 10 and BHF 11.

7. Cultural heritage resources located at 11962 the Gore Road (BHF 9) are expected to be removed. A separate, resource-specific heritage impact assessment has been prepared to evaluate the heritage significance of this resource and to evaluate impacts of the undertaking and to propose appropriate conservation and/or mitigation measures. Recommendations contained therein should be considered as part of the finalization of the preferred alternative and to inform the detailed designed phase.

8. Given that a resource (11962 The Gore Road) associated with St. Patrick's Church and Cemetery (CLU 3) is expected to be removed, it is recommended that a resource-specific heritage impact assessment be completed in relation to St. Patrick's Church and Cemetery to evaluate impacts of that removal on the cultural heritage resource and to develop a range of appropriate mitigation measures.

2.10.3 Stage 2 Archaeological Assessment

A Stage 2 archaeological assessment was completed by Archaeological Services Inc. (ASI) for the lands associated with the acquisition of property for the preferred alternative. Details of this assessment and related recommendations are included in the section on the Evaluation of Alternatives and the Recommended Design Concept presented in Section 5.5 - Stage 2 Archaeology of this report.

2.11 CONTAMINATED SITE SCREENING STUDY (CSS)

Stantec Consulting Ltd. conducted a Contaminated Site Screening (CSS) along Mayfield Road between Airport Road and Coleraine Drive as part of this Class Environmental Assessment Study. The full report is included in Appendix M.

The purpose of the CSS was to provide an evaluation of known and potential environmental contamination issues within the study area. It is important to note that this study deviated from a Phase I Environmental Site Assessment in that it did not include comprehensive site walkovers or interviews as part of the site reconnaissance.

Based on the findings of the CSS, there is one potentially significant environmental contamination issue associated with the study area. This opinion is based on the following:

- A Tru-Valu service station, located at 7536 Mayfield Road and observed to operate as a retail gasoline and diesel service station, has been present immediately adjacent to the north side of Mayfield Road since at least 1984. Furthermore, based on mapping information provided by Peel Region, it appears that some of the equipment related to the Tru-Value facility may be located within the existing or potential future road allowance. The amount of equipment present, such as dispensing pumps, underground piping, or Underground Storage Tanks (UST), was not determined as part of this study.

Tru-Valu Service Station, 7536 Mayfield Road

There may also be limitations in the options available with the relocation of any excess fill material that may be generated during any future construction operations on Mayfield Road. This is primarily related to the use of road salt and the impact it may have to the soil, which may result in an elevated sodium adsorption ratio (SAR).

In order to address potential environmental contamination issues, the following is recommended:

- That the property lines be confirmed near the intersection of Mayfield Road and The Gore Road with the Tru-Valu gasoline station, and that the equipment, if any, related to the gas bar but present within the existing or future road allowance, be determined; and
- That the environmental quality of the soil and groundwater, in the vicinity of the Tru-Valu service station but within the road allowance, be assessed.

In order to address best management / regulatory compliance issues associated with potential construction/widening of Mayfield Road, the following is also recommended:

- The undertaking of chemical testing of soil samples obtained from boreholes should be completed during the design works. The chemical testing should include, but may not be limited to, sodium adsorption ratio (SAR) analysis;
- Prior to the completion of any renovations or demolition to structures, a designated substances survey should be conducted in accordance with the Occupational Health and Safety Act and Regulations.

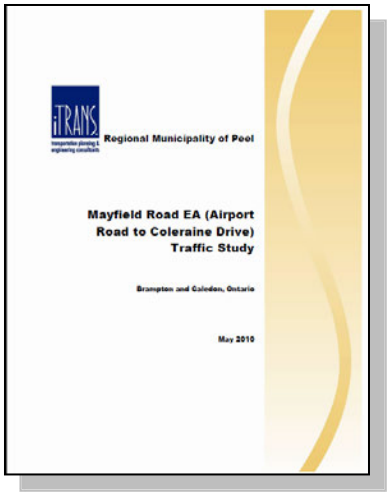
3.0 Determination of Need & Justification

3.1 TRAFFIC AND OPERATIONS REVIEW

3.1.1 Background and Traffic Analysis Approach

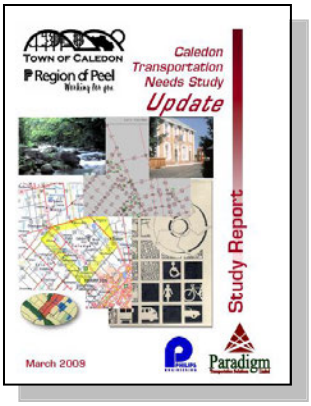
In order to examine the existing and future traffic conditions based on anticipated development and resultant traffic patterns within the area, a Traffic Study was undertaken for the study area in support of the Class EA, by iTRANS Consulting on behalf of Stantec Consulting Ltd. The traffic study is included in its entirety as Appendix N. The traffic study assessed the transportation need and justification for any potential improvements to Mayfield Road between Airport Road and Coleraine Drive.

The traffic analysis was initiated in 2007 and the tasks undertaken included:



* Review of existing traffic conditions;
* Analysis of midblock road links and key intersections;
* Assessment of existing transportation deficiencies and local traffic issues;
* Assessment of the safety performance for Mayfield Road;
* Preparation of travel forecasts for the 2007, 2012, 2017 and 2032 planning horizon;
* Assessment of future corridor travel demands and deficiencies;
* Identification of road improvements to accommodate future travel demands.

Later in the process a study of modern roundabout alternatives was undertaken to address the question of whether roundabout intersections could provide the required capacity improvements to support the future of operation of Mayfield Road and its associated intersections. The roundabout review is detailed later in this report.



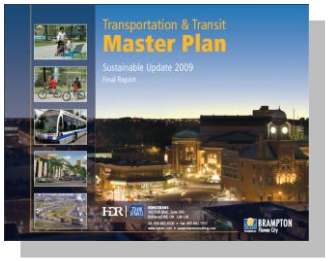
3.1.2 Background Studies

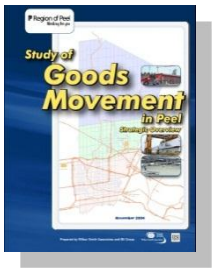
There are a number of related studies completed or which were underway at the time of the initial traffic analysis, and the findings of these studies were implemented into this traffic analysis where it was appropriate to do so. They include:

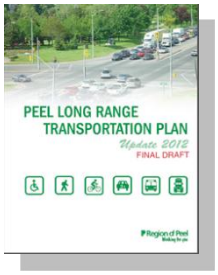
* Mayfield Road Class EA, Heart Lake Road to Airport Road,

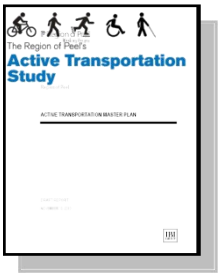
Region of Peel

* Highway 427 Extension Environmental Assessment Study, MTO
* Peel-Highway 427 Extension Area Transportation Master Plan, Region of Peel/Town of Caledon, City of Brampton
* GTA West Corridor Environmental Assessment, MTO
* City of Brampton Transportation and Transit Master Plan
* Region of Peel Long Range Transportation Plan









Additional studies have commenced and were ongoing at the conclusion of this study. The ongoing studies include:

1. The Transportation Master Plan for Secondary Plan Area 47

   The study is currently being undertaken and expected to be finalized in early 2013. A public information centre was held in June 2012 to present the preferred preliminary road network within Area 47. The study may influence the recommendation of the Arterial A2 intersection at Mayfield Road.

2. Bolton Distribution Centre (Coleraine Drive & Holland Road) Transportation Consideration - December 2011

   The study considered the transportation concerns due to the planned relocation of Canadian Tire Distribution Centre to Bolton. According to the study, the majority of the site truck traffic during peak hours will use Mayfield Road and Coleraine Drive to travel to/from the distribution centre, thus the truck percentage or volumes on Mayfield Road will be higher than the existing.

3.1.3 Existing Traffic

A review of available existing traffic information and liaison with Region staff confirmed the following Average Annual Daily Traffic (AADT) values for Mayfield Road:

Table 3.1.3.1 – Mayfield Road – Existing (2007) Average Annual Daily Traffic (AADT)			
Location	**Eastbound AADT**	**Westbound AADT**	**Two-Way AADT**
1.1 km East of Airport Road	5,870	5,790	11,660
0.6 km West of The Gore Road	5,730	5,750	11,480
2.1 km West of Hwy 50	5,610	5,120	10,730

Information Source – Region of Peel

As can be seen above, the AADT volumes decrease slightly from west to east, reflecting the role of Mayfield Road as a commuter route carrying traffic from the current urban envelope of Brampton to the rural areas northeast of Brampton and across the Peel boundary to York Region and the GTA.

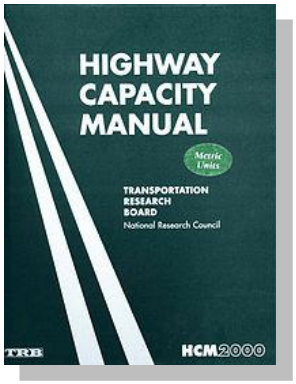
It was also found that the AM and PM peak hours correspond typically to the hours of 7:15 – 8:15 am and 4:45 – 5:45 pm respectively. In addition, approximately 25-80 trucks are using Mayfield Road during the AM and PM peak hours respectively. With the recent completion of Highway 410 to Highway 10 (Hurontario Street) north of Mayfield Road, the previously recorded truck percentages are likely to be affected.

The existing Level of Service (LOS)* at each of the intersections was analyzed, and is summarized as follows:

Table 3.1.3.2 – Mayfield Road - Existing (2007) Intersection Level of Service				
Intersection	**Signalized/ Unsignalized**	**Time Period**	**LOS***	**Comments**
Mayfield/Airport Rd	Signalized	AM Peak	B	
		PM Peak	B	
Mayfield/ Maisonneuve Blvd	Unsignalized	AM Peak	D	AM LOS is due to left turning vehicles onto Mayfield Rd.
		PM Peak	D	
Mayfield/ Goreway & Innis Lake Rds	Signalized	AM Peak	A	
		PM Peak	A	
Mayfield/ McVean & Centreville Creek Rd.	Unsignalized	AM Peak	D	Poor LOS is due to SB left, though, and right turning vehicles sharing one lane
		PM Peak	F	
Mayfield/ The Gore Road	Signalized	AM Peak	B	
		PM Peak	C	
Mayfield/	Unsignalized	AM Peak	C	

Table 3.1.3.2 – Mayfield Road - Existing (2007) Intersection Level of Service				
Intersection	**Signalized/ Unsignalized**	**Time Period**	**LOS***	**Comments**
Marysfield		PM Peak	C	
Mayfield/ Clarkway Dr.		AM Peak	C	LOS D in PM peak is due to NB left turning vehicles onto Mayfield Rd.
		PM Peak	D	
Mayfield/Humber Station Rd.	Unsignalized	AM Peak	C	
		PM Peak	C	
Mayfield/ Coleraine Dr. (S Leg)		AM Peak	C	
		PM Peak	C	
Mayfield/ Coleraine Dr. (N Leg)		AM Peak	C	
		PM Peak	C	

Information Source – Mayfield Road EA (Airport Road to Coleraine Drive) Traffic Study, May 2010, iTrans Consulting Inc.



* Level of Service (LOS) is a measure of the intersection performance or efficiency of operation expressed in terms of a delay per vehicle in seconds (sec/vehicle) and converted to a corresponding relative value of A through F. A value of LOS A suggests free flow and is representative of a low volume intersection with little or no congestion and LOS F would represent a substantial breakdown of intersection function (with unpredictable delay) resulting in what might be deemed "gridlock" or complete congestion. The desirable range of operation for typical intersections is Level of Service B through D suggesting that underutilization as in LOS A is not a wise use of tax dollars and LOS E & F are generally intolerable to the public. Intersections operating at Level of Service D or worse would typically be subjected to an intersection capacity review and the determination of reasonable operational improvements. A comparative table is provided below to clarify the various levels of service for signalized and unsignalized intersections.

  The Highway Capacity Manual** defines level-of-service for signalized and unsignalized intersections as a function of the average vehicle control delay. LOS may be calculated per-movement or per-approach for any intersection configuration; however, LOS for the intersection as a whole is only defined for signalized and all-way stop configurations.

Level of Service (LOS)	Signalized Intersection	Unsignalized Intersection	General Description (Signalized intersections)
A	≤10 sec	≤10 sec	Free Flow
B	10-20 sec	10-15 sec	Stable Flows (slight delay)
C	20-35 sec	15-25 sec	Stable flow (acceptable delays)
D	35-55 sec	25-35 sec	Approaching unstable flow

Level of Service (LOS)	Signalized Intersection	Unsignalized Intersection	General Description (Signalized intersections)
			(tolerable delay)
E	55-80 sec	35-50 sec	Unstable flow (intolerable delay)
F	≥80 sec	≥50 sec	Forced flow (jammed)

** Highway Capacity Manual, Transportation Review Board, Washington D.C., USA, 2000

A link analysis was also undertaken which, based on a theoretical maximum link capacity of 1000 vehicles per hour per lane applied to existing volumes to assess a volume to capacity (v/c) ratio for each link of Mayfield Road. Link v/c ratios higher than 0.90 (or a volume higher than 900 per lane) indicates the need for additional link or mid-block capacity. Based on this link analysis, it was found that Mayfield Road has a maximum v/c ratio of 0.73 in the AM peak hour just west of The Gore Road. The maximum v/c ratio in the PM peak hour is 0.90 just west of The Gore Road.

Based on this analysis of existing conditions in 2007, there was no need for immediate improvements. However, at the Mayfield/McVean & Centreville intersection, if the current northbound through-left-right turn lane is changed to an exclusive northbound left-turn lane and a shared through-right turn lane, the v/c in the PM peak would drop from 0.89 to 0.72 and the LOS would be very close to being improved to a LOS E.

3.1.4 Future Traffic Conditions – No Improvement

Travel demands in Northeast Brampton and surrounding areas will be influenced by changes in the provincial transportation network. Based on the results of the Highway 427 Corridor Environmental Assessment, it is anticipated that Highway 427 will be extended to the vicinity of Major Mackenzie Drive by the year 2021. In anticipation of these improvements to Highway 427, municipalities in the Regions of Peel and York are considering longer term network improvements including new link and alignment changes.

The Region of Peel, City of Brampton and Town of Caledon have undertaken the Peel-Highway 427 Extension Area Transportation Master Plan Study to assess the long term strategy for the arterial road network between Castlemore Road and Healy Road and from The Gore Road to Highway 27. The study recommends a new roadway connection referred to as "A2" arterial road extending from Major Mackenzie Drive at Highway 50 to Mayfield Road east of Clarkway Drive. It is anticipated that the timing of this proposed new link will coincide with the extension of Highway 427. This future connection is shown in general on the study plans and is subject to further study to confirm the exact location and orientation of the extension.

3.1.4.1 Projected Growth and Turn Movement Forecasts

To determine the need for improvements to Mayfield Road and future lane requirements, travel demand forecasts were prepared for this study for the 2012, 2017 and 2032 horizon years (reflecting 5, 10, and 25 year growth from the 2007 initiation of the traffic study). The ultimate horizon was revised later in the study to 2031 to coincide with the Region's Official planning horizon.

Growth rates were obtained from the Region of Peel and information from Regional Model forecasts and forecasts from the Highway 427 Class EA. In addition, background traffic from several proposed developments were included in the traffic forecast analysis.

3.1.4.2 Future Link Capacity Analysis

For the link analysis, a theoretical maximum capacity of 1000 vehicles per hour per lane was applied to the forecasted volumes to assess a volume to capacity (v/c) ratio for each link of Mayfield Road. Link volume–to-capacity ratios higher than 0.90 (or a volume higher than 900 vehicles per lane) indicates the need for additional link capacity. Table 3.1.4.2 summarizes the link capacity analysis.

Table 3.1.4.2 – Mayfield Road - Future Link Volumes

LOCATION	VOLUME (Peak Hr. Peak Direction)			Need
Mayfield Road	**Year 2012**	**Year 2017**	**Year 2032**	
Airport Rd to Maisonneuve Blvd	1397	1574	1919	6 Lanes prior to 2032
Maisonneuve Blvd to Goreway Dr./Innis Lake Rd	1423	1562	1912	6 Lanes prior to 2032
Goreway Dr./Innis Lake Rd to McVean Dr./Centreville Creek Rd	1339	1463	1776	6 Lanes prior to 2032
McVean Dr./Centreville Creek Rd to The Gore Road	1508	1653	2015	6 Lanes prior to 2032
The Gore Road to Marysfield Dr.	1475	1619	1982	6 Lanes prior to 2032
Marysfield Dr. to Clarkway Dr./Humber Station Rd	1413	1544	1882	6 Lanes prior to 2032

Table 3.1.4.2 – Mayfield Road - Future Link Volumes				
LOCATION	**VOLUME (Peak Hr. Peak Direction)**			**Need**
Mayfield Road	**Year 2012**	**Year 2017**	**Year 2032**	
Clarkway Dr./Humber Station Rd to Proposed Rd	1309	1477	1670	6 Lanes prior to 2032
Proposed Hwy 427 Road to Coleraine Dr.	1309	1477	1670	4 Lanes when proposed new arterial road built.

Information Source – Mayfield Road EA (Airport Road to Coleraine Drive) Traffic Study, May 2010, iTrans Consulting Inc.

The above summary of the link analysis highlights the need for 4 lanes on Mayfield Road throughout the study area prior to 2012. In addition, Mayfield Road will need to be widened to 6 lanes by 2031 from Airport Road to the proposed new roadway connection, Arterial Road A2, east of Clarkway Boulevard/Humber Station Road, with 4 lanes provided from the proposed new Arterial Road A2 connection to Coleraine Drive. In order to provide lane continuity with the area west of the proposed new arterial road, it may be appropriate to consider constructing 6 lanes between the new connector road and Coleraine Drive. This will be best determined at the time of need.

The link analysis findings of this study are consistent with the following studies:

- Brampton Transportation and Transit Master Plan – June 2009
- Peel-427 Extension Area Transportation Master Plan – June 2009

3.1.4.3 2012 Intersection Analysis without Mayfield Road Improvements

In addition to the capacity deficiencies on Mayfield Road identified by the link analysis, an intersection analysis was undertaken to assess the capacity deficiencies at the intersections. The 2012 intersection analysis findings are summarized as follows:

Table 3.1.4.3 – 2012 Intersection Analysis without Mayfield Road Improvements				
Intersection (2012)	**Time Period**	**V/C(1)**	**Overall V/C(2)**	**LOS**
Mayfield/Airport Rd	AM Peak	>1.00	>1.00	F
	PM Peak	>1.00	>1.00	F
Mayfield/ Maisonneuve Blvd	AM Peak	>1.00	n/a	F
	PM Peak	>1.00	n/a	F

Table 3.1.4.3 – 2012 Intersection Analysis without Mayfield Road Improvements				
Intersection (2012)	**Time Period**	**V/C(1)**	**Overall V/C(2)**	**LOS**
Mayfield/ Goreway & Innis Lake Rds	AM Peak	>1.00	>1.00	D
	PM Peak	>1.00	0.95	D
Mayfield/ McVean & Centreville Creek Rd.	AM Peak	>1.00	n/a	F
	PM Peak	>1.00	n/a	F
Mayfield/ The Gore Road	AM Peak	>1.00	>1.00	F
	PM Peak	>1.00	>1.00	F
Mayfield/ Marysfield	AM Peak	0.25	n/a	F
	PM Peak	0.62	n/a	F
Mayfield/ Clarkway Dr.	AM Peak	0.97	n/a	F
	PM Peak	>1.00	n/a	F
Mayfield/Humber Station Rd.	AM Peak	>1.00	n/a	F
	PM Peak	0.81	n/a	F
Mayfield/ Coleraine Dr. (S Leg)	AM Peak	0.53	n/a	F
	PM Peak	0.93	n/a	F
Mayfield/ Coleraine Dr. (N Leg)	AM Peak	>1.00	n/a	F
	PM Peak	>1.00	n/a	F

Information Source – Mayfield Road EA (Airport Road to Coleraine Drive) Traffic Study, May 2010, iTrans Consulting Inc.

1 v/c ratio for the critical movement and not the average for the intersection
2 overall v/c not applicable to unsignalized intersections

Based on the above Table 3.1.4.3 it is noted that several of the intersections will experience a Level of Service (LOS) of F and have v/c ratios greater than 1 – in other words most of the major intersections will be failing by 2012. Traffic levels will exceed capacity of a 2-lane arterial road by 2012 (1000 vph) and will have limited alternative routes to travel east-west across eastern Brampton to access the rest of the GTA. Based on these 2012 analysis results, intersection analysis was not required of the 2017 and 2032 forecasts on existing Mayfield Road with no improvements. However intersection analysis for 2017 and 2032 was conducted to determine long term lane requirements.

3.1.5 Future Intersection Analysis with Improvements

3.1.5.1 2012 Intersection Analysis with Turn Lane Improvements

An analysis of the projected 2012 traffic volumes were also analyzed keeping Mayfield Road as two- lanes, but providing turn lanes at the intersections, and signalizing the intersections with Mayfield Road at Maisonneuve Blvd, McVean Dr./Centreville Creek Rd, Clarkway Dr./Humber Station Rd, and Coleraine Dr. However, even with adding turn lanes and signalization, the 2012 capacity problems at the intersections could not be resolved.

3.1.5.2 2012 Intersection Analysis with Mayfield Road Widened to 4 lanes with Intersection Improvements.

Widening Mayfield Road to 4-lanes, signalizing most of the intersections and adding turn lanes was analyzed based on the forecasted 2012 traffic volumes. The results of this analysis are as follows:

Table 3.1.5.2 – 2012 Intersection Analysis with Mayfield Road Widened to 4 lanes with Intersection Improvements

Intersection	Time Period	V/C[1]	Overall V/C[2]	LOS
Mayfield/Airport Rd (Signalized)	AM Peak	0.91	0.87	D
	PM Peak	0.92	0.87	D
Mayfield/ Maisonneuve Blvd (Signalized)	AM Peak	0.62	0.55	A
	PM Peak	0.62	0.53	A
Mayfield/ Goreway & Innis Lake Rds (Signalized)	AM Peak	0.75	0.68	B
	PM Peak	0.72	0.61	B
Mayfield/ McVean & Centreville Creek Rd. (Signalized)	AM Peak	0.58	0.54	A
	PM Peak	0.64	0.58	A
Mayfield/ The Gore Road (Signalized)	AM Peak	0.59	0.61	A
	PM Peak	0.72	0.64	B
Mayfield/ Marysfield (Unsignalized)	AM Peak	0.11	n/a	E
	PM Peak	0.33	n/a	F
Mayfield/Humber Station Rd. & Clarkway Dr. (Signalized)	AM Peak	0.70	0.67	A
	PM Peak	0.63	0.57	A
Mayfield/ Coleraine Dr. (Signalized)	AM Peak	0.80	0.72	B
	PM Peak	0.64	0.59	A

Information Source – Mayfield Road EA (Airport Road to Coleraine Drive) Traffic Study, May 2010, iTrans Consulting Inc.

1 v/c ratio for the critical movement and not the average for the intersection
2 overall v/c not applicable to unsignalized intersections

Based on the above results it demonstrates that inclusion of a 4-lane cross-section on Mayfield Road by 2012 will be sufficient. It is anticipated that there will be some delays at Marysfield Drive, but the delays are not anticipated to exceed 76 seconds and does not meet the warrants for traffic signals.

The recommended lane configurations based on the forecasted 2012 traffic volumes are illustrated on Figure 3.1.5.2

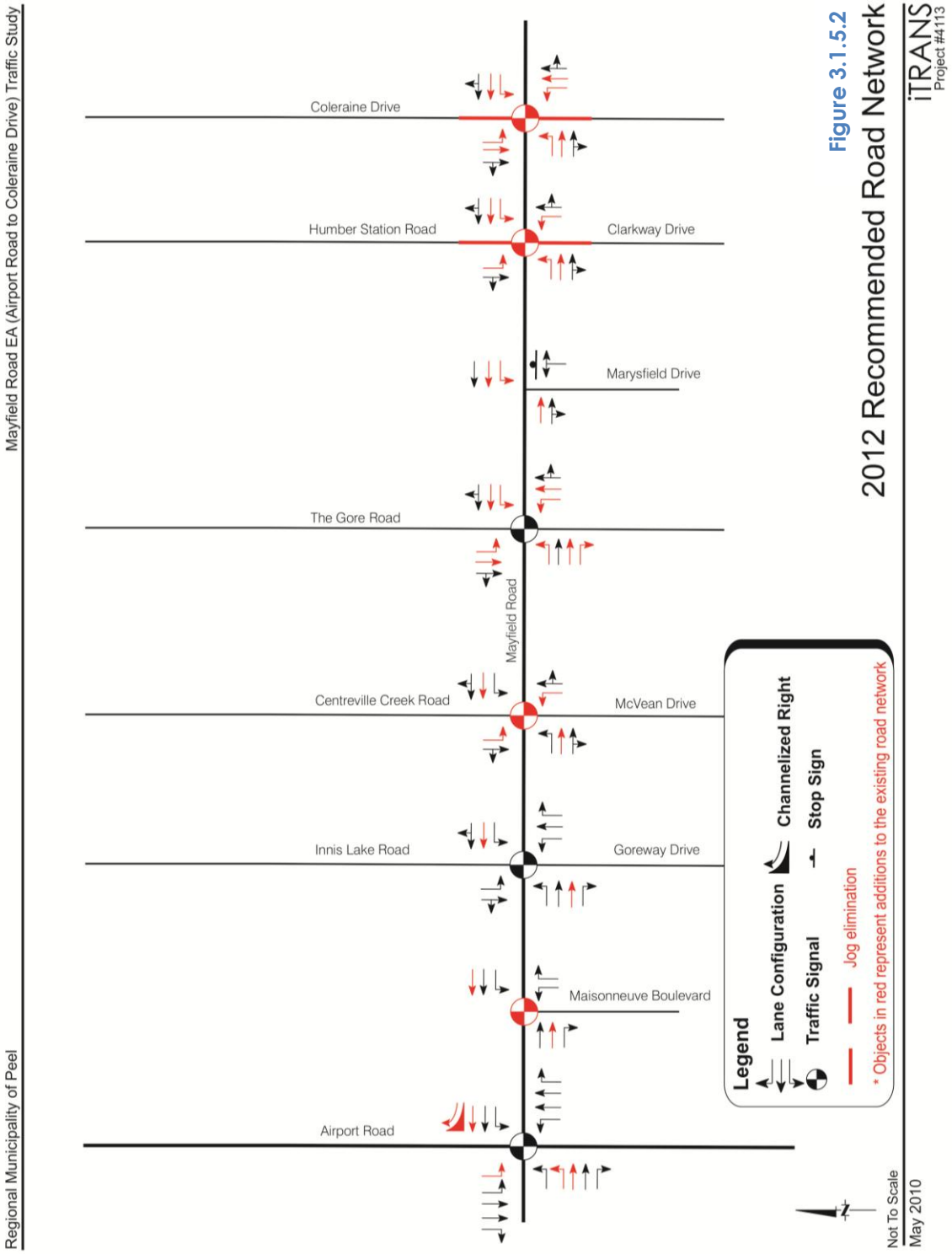

Mayfield Road EA (Airport Road to Coleraine Drive) Traffic Study
Regional Municipality of Peel
Coleraine Drive
Humber Station Road
Clarkway Drive
Marysfield Drive
The Gore Road
Mayfield Road
Centreville Creek Road
McVean Drive
Innis Lake Road
Goreway Drive
Maisonneuve Boulevard
Airport Road
Legend
Lane Configuration
Channelized Right
Traffic Signal
Stop Sign
Jog elimination
* Objects in red represent additions to the existing road network
Not To Scale
May 2010
2012 Recommended Road Network
iTRANS
Project #4113

Figure 3.1.5.2

3.1.5.3 2017 Intersection analysis with Mayfield Road Widened to 4-lanes with 2012 Intersection Improvements

The 2012 lane configuration as noted in Figure 3.1.5.2 was analyzed utilizing the 2017 traffic forecasts to determine if any further lane improvements are required in 2017. The following table summarizes the intersection operations at the signalized and unsignalized intersections.

Table 3.1.5.3 – 2017 Intersection analysis with Mayfield Road Widened to 4-lanes with 2012 Intersection Improvements

Intersection	Time Period	V/C(1)	Overall V/C(2)	LOS
Mayfield/Airport Rd (Signalized)	AM Peak	0.93	0.91	D
	PM Peak	0.93	0.92	E
Mayfield/ Maisonneuve Blvd (Signalized)	AM Peak	0.64	0.57	A
	PM Peak	0.66	0.57	A
Mayfield/ Goreway & Innis Lake Rds (Signalized)	AM Peak	0.78	0.72	B
	PM Peak	0.74	0.66	B
Mayfield/ McVean & Centreville Creek Rd. (Signalized)	AM Peak	0.63	0.55	A
	PM Peak	0.68	0.63	A
Mayfield/ The Gore Road (Signalized)	AM Peak	0.74	0.65	B
	PM Peak	0.75	0.68	B
Mayfield/ Marysfield (Unsignalized)	AM Peak	0.14	n/a	F
	PM Peak	0.45	n/a	F
Mayfield/Humber Station Rd. & Clarkway Dr. (Signalized)	AM Peak	0.73	0.71	A
	PM Peak	0.67	0.61	A
Mayfield/ Coleraine Dr. (Signalized)	AM Peak	0.88	0.79	B
	PM Peak	0.66	0.60	A

Information Source – Mayfield Road EA (Airport Road to Coleraine Drive) Traffic Study, May 2010, iTrans Consulting Inc.

1 v/c ratio for the critical movement and not the average for the intersection
2 overall v/c not applicable to unsignalized intersections

As shown in the above table, the intersection improvements recommended for 2012 will provide sufficient capacity and maintain acceptable levels of service by 2017. It is

anticipated that there will be some delays at Marysfield Drive, but the delays are not anticipated to exceed 113 seconds and does not meet the warrants for traffic signals. In addition, the v/c ratio for Airport Road exceeds 0.90 slightly, but no further improvements would be recommended for 2017.

3.1.5.4 2032 Intersection Analysis with Mayfield Road Widened to 4-lanes with 2017 Intersection Improvements

"Widening to six (6) lanes is recommended in the latter portion of the design period prior to 2031. Suggested improvements are based on diminished level of service and substantial delays at most intersections as illustrated with the 4-lane scenario for horizon year 2031. Other interim improvements should be considered when levels of service and related delays at specific locations warrant improvements."

A similar analysis with 2032 traffic forecasts was also performed on the 2017 lane requirements, to determine the further long term lane requirements. The following table summarizes the intersection operations at the intersections.

Table 3.1.5.4 – 2032 Intersection Analysis with Mayfield Road Widened to 4-lanes with 2017 Intersection Improvements

Intersection	Time Period	V/C[1]	Overall V/C[2]	LOS
Mayfield/Airport Rd (Signalized)	AM Peak	>1.00	>1.00	F
	PM Peak	>1.00	>1.00	F
Mayfield/ Maisonneuve Blvd (Signalized)	AM Peak	0.70	0.63	A
	PM Peak	0.76	0.67	A
Mayfield/ Goreway & Innis Lake Rds (Signalized)	AM Peak	0.83	0.83	B
	PM Peak	0.81	0.78	B
Mayfield/ McVean & Centreville Creek Rd. (Signalized)	AM Peak	0.66	0.61	A
	PM Peak	0.83	0.74	B
Mayfield/ The Gore Road (Signalized)	AM Peak	0.79	0.73	B
	PM Peak	0.83	0.82	B
Mayfield/ Marysfield (Unsignalized)	AM Peak	0.26	n/a	F
	PM Peak	0.94	n/a	F
Mayfield/Humber Station Rd. & Clarkway Dr. (Signalized)	AM Peak	0.84	0.80	B
	PM Peak	0.76	0.72	A
Mayfield/ Coleraine Dr. (Signalized)	AM Peak	0.90	0.87	C
	PM Peak	0.76	0.73	B

Information Source – Mayfield Road EA (Airport Road to Coleraine Drive) Traffic Study, May 2010, iTrans Consulting Inc.

1 v/c ratio for the critical movement and not the average for the intersection
2 overall v/c not applicable to unsignalized intersections

As shown in the above table, Mayfield Road at Airport Road will experience v/c ratios greater than 1.0 during both the AM and PM peak hours. However it is noted that the above calculations do not take into account the demonstrated number of additional through lanes required as part of the link analysis.

3.1.5.5 2032 Intersection Analysis with Mayfield Road Widened to 6-lanes with Intersection Improvements

An analysis was undertaken of the forecasted 2032 traffic volumes and the demonstrated need for 6 through lanes and intersection improvements on Mayfield Road developed as part of previous analyses as documented in this section. The recommended lane configuration is illustrated on Figure 3.1.5.5 below.

The results of this 2032 analysis with the recommended lane configuration are summarized as follows:

Table 3.1.5.5.1 – 2032 Intersection Analysis with Mayfield Road Widened to 6-lanes with Intersection Improvement

Intersection	Time Period	V/C(1)	Overall V/C(2)	LOS
Mayfield/Airport Rd (Signalized)	AM Peak	0.94	0.89	D
	PM Peak	0.99	0.93	E
Mayfield/ Maisonneuve Blvd (Signalized)	AM Peak	0.70	0.63	A
	PM Peak	0.76	0.67	A
Mayfield/ Goreway & Innis Lake Rds (Signalized)	AM Peak	0.82	0.82	B
	PM Peak	0.80	0.77	B
Mayfield/ McVean & Centreville Creek Rd. (Signalized)	AM Peak	0.67	0.61	A
	PM Peak	0.83	0.74	B
Mayfield/ The Gore Road (Signalized)	AM Peak	0.80	0.76	B
	PM Peak	0.83	0.80	B
Mayfield/ Marysfield (Unsignalized)	AM Peak	0.26	n/a	F
	PM Peak	0.94	n/a	F
Mayfield/Humber Station Rd. & Clarkway Dr. (Signalized)	AM Peak	0.84	0.80	B
	PM Peak	0.76	0.72	A

Table 3.1.5.5.1 – 2032 Intersection Analysis with Mayfield Road Widened to 6-lanes with Intersection Improvement				
Intersection	**Time Period**	**V/C(1)**	**Overall V/C(2)**	**LOS**
Mayfield/ Coleraine Dr. (Signalized)	AM Peak	0.90	0.86	C
	PM Peak	0.74	0.72	B

Information Source – Mayfield Road EA (Airport Road to Coleraine Drive) Traffic Study, May 2010, iTrans Consulting Inc.

1 v/c ratio for the critical movement and not the average for the intersection
2 overall v/c not applicable to unsignalized intersections

Volumes at Marysfield Drive are not expected to exceed capacity, but delays will increase to over 6 minutes for left turn lanes during peak hours. Although volumes at Marysfield Drive are anticipated to remain well below warrants for traffic signals, the volume and driver behaviour should be monitored at that time.

The total traffic queue lengths in 2032 have been calculated as indicated in the following table. These queue lengths form the basis for the turn lane storage lengths at the intersections, and should be read in conjunction with Figure xx showing the recommended lane configuration for 2032.

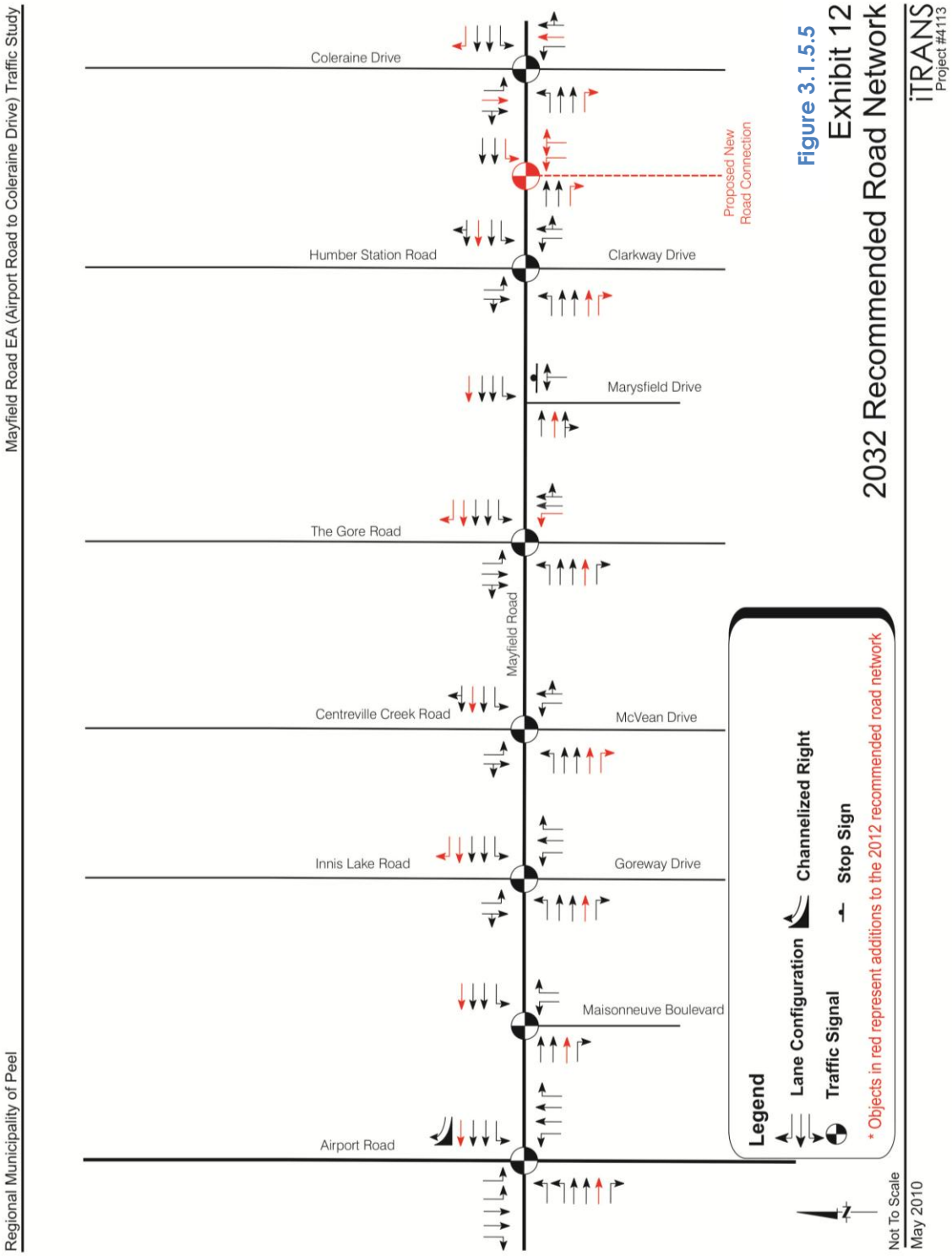

Mayfield Road EA (Airport Road to Coleraine Drive) Traffic Study
Regional Municipality of Peel
Coleraine Drive
Humber Station Road
Clarkway Drive
Marysfield Drive
The Gore Road
Mayfield Road
Centreville Creek Road
McVean Drive
Innis Lake Road
Goreway Drive
Maisonneuve Boulevard
Airport Road
Proposed New Road Connection
Legend
Lane Configuration
Channelized Right
Traffic Signal
Stop Sign
* Objects in red represent additions to the 2012 recommended road network
Not To Scale
May 2010
Figure 3.1.5.5
Exhibit 12
2032 Recommended Road Network
iTRANS
Project #4113

Table 3.1.5.5.2 – 2032 Intersection Queue Lengths - Mayfield Road		
Intersection & Movement	**AM Peak Hour**	**PM Peak Hour**
	Queue (m)	**Queue (m)**
Airport Road/Mayfield Road		
Eastbound Left Turn (1)	84	55
Eastbound Right Turn	14	<10
Westbound Left Turn	82	125
Northbound Left Turn	42	58
Northbound Right Turn	29	25
Southbound Left Turn (1)	56	97
Southbound Right Turn	18	42
Maisonneuve Blvd/Mayfield Road		
Eastbound Right Turn	<10	<10
Westbound Left Turn	<10	<10
Goreway Drive/Mayfield Road		
Eastbound Left Turn	21	22
Eastbound Right Turn	<10	<10
Westbound Left Turn	13	<10
Westbound Right Turn	<10	<10
Northbound Left Turn	30	36
Northbound Right Turn	<10	16
Southbound Left Turn	21	<10
McVean Drive/Mayfield Road		
Eastbound Left Turn	<10	<10
Eastbound Right Turn	<10	<10
Westbound Left Turn	27	<10
Northbound Left Turn	<10	<10
Southbound Left Turn	<10	<10
The Gore Road/Mayfield Road		
Eastbound Left Turn	15	32
Eastbound Right Turn	<10	<10
Westbound Left Turn	10	<10
Westbound Right Turn	<10	<10
Northbound Left Turn	17	39
Southbound Left Turn	25	16
Clarkway Drive/Mayfield Road		
Eastbound Left Turn	<10	22
Eastbound Right Turn	<10	<10
Westbound Left Turn	<10	<10
Northbound Left Turn	<10	12
Southbound Left Turn	<10	<10

Table 3.1.5.5.2 – 2032 Intersection Queue Lengths - Mayfield Road		
Intersection & Movement	**AM Peak Hour Queue (m)**	**PM Peak Hour Queue (m)**
Coleraine Drive/Mayfield Road		
Eastbound Left Turn	55	41
Eastbound Right Turn	<10	<10
Westbound Left Turn	<10	<10
Westbound Right Turn	<10	<10
Northbound Left Turn	<10	<10
Southbound Left Turn	<10	<10

Information Source – Mayfield Road EA (Airport Road to Coleraine Drive) Traffic Study, May 2010, iTrans Consulting Inc.

Note: Storage lengths should use maximum queue length rounded up to nearest 5m
(1) Dual Left Turn Lane proposed

A comparative summary of the maximum AM and PM peak period delay in seconds at each intersection is provided in Table 3.1.5.7 for the base year 2007 and the horizon years 2012, 2017 and 2031/32 with and without additional lanes. This summary provides a comparison of the relative delays and improvements anticipated for staged implementation of the road improvements and what is to be expected if the improvements are not implemented by the horizon years.

Table 3.1.5.5.3 – Mayfield Road - Intersection Peak Period Maximum Delay									
Location	**2007**		**2012**		**2017**		**2031/32**	
	Max. Delay (s)		**Max. Delay (s)**		**Max. Delay (s)**		**Max. Delay (s)**	
	AM Peak	**PM Peak**	**AM Peak**	**PM Peak**	**AM Peak**	**PM Peak**	**AM Peak**	**PM Peak**
LEGEND:								
Acceptable Delay			0 – 20 Seconds					
Tolerable Delay			Greater than 20 Seconds					
Unacceptable Delay			Greater than 55 Seconds					
Current Conditions								
Airport/Mayfield	12.5	12.6	169.7	246.1				
Maisonneuve/Mayfield	20.8	23.6	528.1	438.2				
Goreway/Innis Lake Road/Mayfield	14.5	15.7	75.4	47.6				
McVean Drive/Centreville	32.0	79.9	F	F				

Table 3.1.5.5.3 – Mayfield Road - Intersection Peak Period Maximum Delay

Location	2007 Max. Delay (s)		2012 Max. Delay (s)		2017 Max. Delay (s)		2031/32 Max. Delay (s)	
	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
Creek Road/Mayfield								
The Gore Road/Mayfield	22.2	30.7	165.0	200.9				
Marysfield Drive/Mayfield	17.3	21.3	101.3	190.1				
Clarkway Drive/Mayfield	19.0	25.6	320.0	815.8				
Humber Station Road/Mayfield	17.3	16.7	497.1	139.5				
Coleraine Drive (S. Leg)/Mayfield	15.7	15.8	83.4	107.8				
Coleraine Drive (N. Leg)/Mayfield	16.8	15.9	484.8	250.9				
Four Lanes								
Airport/Mayfield					58.1	67.2	108.9	133.2
Maisonneuve/Mayfield					16.1	16.1	18.7	19.9
Goreway/Innis Lake Road/Mayfield					23.1	18.9	39.9	32.0
McVean Drive/CentrevilleCreek Road/Mayfield					15.2	18.0	19.1	22.0
The Gore Road/Mayfield					25.4	33.0	65.8	62.7
Marysfield Drive/Mayfield					53.8	112.8	107.7	368.6
Clarkway Drive/Humber Station Road/Mayfield					24.5	16.7	31.2	22.2

Table 3.1.5.5.3 – Mayfield Road - Intersection Peak Period Maximum Delay

Location	2007		2012		2017		2031/32	
	Max. Delay (s)		Max. Delay (s)		Max. Delay (s)		Max. Delay (s)	
	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
Coleraine Drive/Mayfield					28.0	20.9	56.6	32.1
Six Lanes								
Airport/Mayfield							55.9	69.3
Maisonneuve/Mayfield							NC	NC
Goreway/Innes Lake Road/Mayfield							NC	NC
McVean Drive/Centreville Creek Road/Mayfield							NC	NC
The Gore Road/Mayfield							NC	NC
Marysfield Drive/Mayfield							NC	NC
Clarkway Drive/Humber Station Road/Mayfield							NC	NC
Coleraine Drive/Mayfield							NC	NC

Information Source – Mayfield Road EA (Airport Road to Coleraine Drive) Traffic Study, May 2010, iTrans Consulting Inc.

NC denotes – Maximum Delay in seconds not calculated
F denotes - Failure in the intersection operations with delays drastically exceeding tolerable limits.

3.1.6 Safety Performance Review

3.1.6.1 Introduction

iTRANS completed a comprehensive safety review of the study area as part of the Mayfield Road Class EA Traffic Study. Initially an office review of collision data, road geometry was undertaken and adjacent land use was reviewed to develop a list of concerns prior to undertaking a detailed field review.

3.1.6.2 Results of Safety Performance Review

Collision reports for 2003 to 2006 were obtained and reviewed to summarize the collision characteristics within the study area. A total of 79 collisions occurred on Mayfield Road or on the cross streets at Mayfield Road within the study area. A summary table of the collisions was developed to assist in identifying possible trends such as collision location, time of day and various environmental factors. A summary of the collisions is as follows:

Table 3.1.6.2 – Mayfield Road Collision Reports - 2003 to 2006

Location	Total	Injury	PDO	Collision Types
Airport Road	32	3	29	9 Angle 1 Approaching 6 Rear End 5 Sideswipe 8 Turning Movement 2 SMV Other 1 Other
Innis Lake Rd/Goreway Dr.	13	1	12	3 Angle 8 Rear End 1 Sideswipe 1 SMV Other
Centreville Creek Rd/McVean Dr	2	2	0	2 Angle
The Gore Road	5	0	5	9 Angle 1 Approaching 6 Rear End 5 Sideswipe 8 Turning Movement 2 SMV Other
Humber Station/Clarkway Dr.	9	1	8	2 Angle 4 Rear-end 1 Sideswipe 1 Turning Movement 1 SMV Other
Coleraine Dr.	2	0	2	2 Turning Movement
Road Segments (All)	16	2	14	1 Angle 4 Rear-end 1 Sideswipe 8 SMV Other 2 Other
Total	**79**	**9**	**70**	**17 Angle** **1 Approaching**

Table 3.1.6.2 – Mayfield Road Collision Reports - 2003 to 2006				
Location	**Total**	**Injury**	**PDO**	**Collision Types**
				24 Rear-end **9 Sideswipe** **12 Turning Movement** **13 SMV Other** **3 Other**

Information Source – Mayfield Road EA (Airport Road to Coleraine Drive) Traffic Study, May 2010, iTrans Consulting Inc.

NOTE: SMV = Single Motor Vehicle; PDO = Property Damage Only

The overall collision analysis findings for the entire study area corridor are:

- 46.8% of collisions occurred during peak periods (6 to 9 AM and 3 to 6 PM) (37 of 79)
- 24.7% of collisions were rear-end type (24 of 79)
- 21.5% of collisions were angle type (17 of 79)
- Majority of collisions were not caused by adverse environmental conditions (82.3% during daylight, 93.7% during clear weather, 70.9% with dry road surface)
- The majority of collisions (82.3%) occur in the functional area of intersections (65 of 79)
- There were no fatal collisions from 2003 to 2006

A field investigation was also undertaken to review lane configurations, traffic signs and signals, road geometry and sight distances for the intersections, and road segments. The following outlines the various recommendations following from the field investigation and desktop reviews.

3.1.6.3 Countermeasures

Based on the field investigation and the analysis of collisions, the following countermeasures are recommended:

3.1.6.3.1 Existing Conditions

There were few SMV collisions recorded in the study area (13 of 79, 16%). However, a number of shoulder and roadside treatments could be considered along with the improvements for Mayfield Road. Shoulder and roadside improvements may increase safety by aiding errant vehicles to regain control and safely recover to the roadway. Some shoulder and roadside improvements for the entire corridor that can be assessed in the design alternatives include:

- **Increasing the paved surface of the shoulders** to 0.5 metres (partially paved) will provide more stable recovery area for any errant vehicles. This additional width

may also provide a place for vehicles to avoid rear-end collisions, and will provide a semi turning lane for vehicles turning right into driveways. The Region may wish to consider using a surfacing material of different appearance for the shoulder than the type of material used on the travel lanes. This dissimilar appearance will help drivers to differentiate between the travel lanes and shoulder.

- Other suggested roadside improvements would involve providing an **adequate clear zone and recoverable slopes** as part of other road improvements, following the MTO or AASHTO Roadside Design Guides.

- It is noted that shoulder rumble strips do not appear to be warranted at this time along this corridor; the reported collisions do not indicate drowsy or inattentive drivers leaving the roadway.

Signs with larger letter heights, and placed in more prominent locations would provide better guidance to drivers. All intersection street name signs at intersections could be placed on existing overhead signal arms. This prominent location improves the conspicuity of the sign. In addition, the letter size should be increased, and the font should have upper and lower case letters, to match the guidelines in OTM Book 1B.

Advance signage may still be provided, however it is recommended that the current signs be replaced with signs with a larger text size/height.

To increase awareness of the potential for wildlife crossings, **wildlife warning signs** could be placed at key wildlife crossing locations, or locations where wildlife are frequently involved in collisions, as determined from recent collision records from Region of Peel Police and historic mortality records from the Ministry of Natural Resources. It is anticipated that development of the adjacent lands in some locations may affect the overall patterns for the passage of wildlife. Where vehicle-animal accidents are found to be excessive it is suggested that advisory wildlife crossing signs be provided.

Consider communicating the safety issues to Peel Region Police and Ontario Provincial Police – Caledon Detachment, and encourage increasing **enforcement** of speeding and the use of clearance intervals to mitigate the turning movement and angle collisions. Applications such as **Red light cameras** could be used as a potential tool that to assist enforcement at signalized intersections to decrease right-angle collisions of all severities and injury severity, and increase rear-end collisions of all severities and injury severity

Driveway density along Mayfield Road is low; however, the Region may wish to monitor those accesses within the functional area of intersections. Access points within the functional area of an intersection increase the number of conflict points and may reduce the safety performance of the intersection, particularly if traffic volumes on the road or using the driveway increase. Through the EA process, the Region may wish to

consider **implementing access management policies and guidelines** to minimize the potential for vehicle conflicts on intersection approaches.

3.1.6.3.2 Future Road Widening

Additional lanes for through traffic are not considered a potential measure to improve the safety performance of this section of Mayfield Road. However, it is recognized that road and intersection improvements may improve traffic flow and operations, therefore potentially reducing rear-end, angle, and turning movement collisions.

Left turn lanes were considered during the field investigation, in particular through the Hamlet of Wildfield where driveway density is greatest. Options for introducing a two way left turn lane (TWLTL) including a three-lane or five-lane cross-section can be considered. Some of the latest research suggests the following pros and cons for these options:

Three-lane cross-section (two lanes plus TWLTL):

- Expected to reduce driveway-turning collisions were driveway density is at least 3 driveways per kilometer;
- Generally favoured by residents with driveways;
- Permits two-stage turns - drivers turning left into driveways can wait for a gap in;
- traffic without feeling pressured by following vehicles, and drivers turning left out of driveways can use the TWLTL as a refuge before merging with traffic; and,
- In the US, conversion from 4 lanes to 3 lanes is known as a "road diet" and studies to date have shown safety and operational benefits.

Five-lane cross-sections (four lanes plus TWLTL):

- Less research is available; a threshold for driveway density was not found;
- Similar to 3-lane cross-section, permits two-stage turns;
- Road width can be a challenge for crossing pedestrians, and can generate negative reaction from residents unless traffic capacity is clearly needed; and,
- Operating speeds are a potential concern, particularly during off-peak periods.

Auxiliary turn lanes are recommended where turning activity is anticipated. In addition to traffic turn lane warrants, auxiliary left turn lanes should be considered to address anticipated high speed conflicts. A fifth lane for a four lane widening and a seventh lane for the ultimate configuration should be considered in road sections with multiple accesses or intersections. These are considered a practical intermediate refuge between opposing traffic movements and an effective operational enhancement.

3.2 PROBLEM STATEMENT

Based on the foregoing review of the existing conditions and forecasted traffic and development within or near the study area, and considering the prevailing natural and social conditions, the need and justification for improvements to Mayfield Road was summarized in the following Problem Statement:

"Based on projected population, employment, development forecasts and other planned road improvements, Mayfield Road between Airport Road and Coleraine Drive is expected to operate at an unacceptable Level of Service by the year 2012. Improvements must be made in order for Mayfield Road to operate at an acceptable Level of Service in the future".

4.0 Alternative Solutions

4.1 ALTERNATIVE SOLUTIONS

Based on the problem statement and the need and justification for improvements, a number of Alternative Solutions to the problem(s) identified within the Study Area were developed. A total of nine (9) general alternative solutions have been identified as having the potential to address the issues identified within the study area. They are as follows:

DO NOTHING

This alternative solution identifies what would happen if no action is taken to address current deficiencies within the corridor, in both the short and long terms. This assessment provides a baseline to which other project alternatives may be measured.

TRAFFIC OPERATION IMPROVEMENTS

Opportunities may exist along the Mayfield Road corridor to improve existing traffic signal timings or to add additional traffic signal systems, to optimize the amount of traffic capacity that the existing road can handle and to improve safety at various intersections.

ACCESS MANAGEMENT

Some of the existing traffic and safety operational issues, within the Mayfield Road corridor, may be attributed to vehicles attempting to enter and exit properties. Access management solutions that can be considered include consolidating or restricting driveway accesses, installing raised centre medians, and installing centre left turn lanes.

INTERSECTION IMPROVEMENTS

The addition of auxiliary lanes to accommodate turning movements at intersections may reduce traffic delay times through the various intersections and improve the flow along Mayfield Road, thereby providing additional capacity. Either new, or longer, designated left turn and right turn lanes at existing intersections, both on Mayfield Road and the cross streets, would be considered to accommodate the projected traffic volumes.

ROUNDABOUTS

Roundabouts are characterized by their lack of traffic signals and a circulating roadway providing for continual traffic flow through the intersection. Roundabouts

generally provide more traffic capacity than standard signalized intersections due to their ability to reduce delays. In addition, roundabouts generally reduce the number of severe or personal injury collisions due to the reduction in conflict points and slower speeds, when compared to traditional signalized intersection. By building roundabouts the need and extent for improvements to Mayfield Road may be reduced.

WIDENING MAYFIELD ROAD

Widening Mayfield Road with additional through lanes and turn lanes to improve corridor capacity and address existing and future congestion issues.

TRANSIT SERVICE

Improving the level of transit service within the corridor, may reduce vehicle traffic on Mayfield Road, and extend the time when other improvements are necessary.

UPGRADE OTHER ROUTES

By improving other existing road corridors that perform similar functions as Mayfield Road, traffic could potentially be diverted away from Mayfield Road, and thereby reducing traffic volumes and the need and extent of improvements to Mayfield Road.

BUILD OTHER ROUTES

By building other roads or routes near the study area that will divert traffic away from Mayfield Road may reduce traffic on Mayfield Road and thereby reduce the need and extent of improvements to Mayfield Road.

Each of these alternative solutions was reviewed in detail, as outlined in Section 4.2.

4.2 EVALUATION AND SCREENING OF ALTERNATIVE SOLUTIONS

Each of the Alternative Solutions described in Section 4.1 was reviewed and evaluated as to how they would address the issues identified within the project Problem Statement. The purpose of this review and evaluation is to "screen" out those alternatives that will not adequately address the needs identified for Mayfield Road, and to identify those alternative solutions that should be carried forth for further, more detailed, evaluation.

The results of this screening and the evaluation of the Alternative Solutions, is summarized in Table 4.2.1.1.

Table 4.2.1.1 – Mayfield Road Alternative Solutions Screening/Evaluation Summary

Planning Alternatives	Description	Preliminary Evaluation	Preliminary Recommendation
Do Nothing 	This alternative identifies what would happen if no action is taken to address current deficiencies within the corridor, in both the short and long terms. This assessment provides a baseline to which other project alternatives may be measured.	The traffic study completed as part of this project has found that there will be capacity deficiencies on Mayfield Road by 2012 if the "Do Nothing" alternative is followed.	Do not carry forward
Traffic Operation Improvem 	Opportunities may exist along the Mayfield Road corridor to improve existing traffic signal timings or to add additional signal systems, to optimize the amount of traffic capacity that the existing road can handle and to improve safety at various intersections.	The traffic study completed as part of this project has found that even with traffic signal improvements, there will be Level of Service deficiencies (i.e. delays) on Mayfield Road.	Do not carry forward
Access Management 	Some of the existing traffic and safety operational issues, within the Mayfield Road corridor, may be attributed to vehicles attempting to enter and exit properties. Consideration may be given to consolidating or restricting accesses, raised centre medians, and centre left turn lanes.	Closing, restructuring or combining accesses will not fully solve the capacity issues on Mayfield Road. However, access management may be considered in conjunction with the final recommended concept to enhance the operations and capacity of Mayfield Road.	Carry forward in conjunction with other recommended alternatives
Intersection Improvements 	The addition of auxiliary lanes to accommodate turning movements at Intersections may reduce traffic delay times through the various intersections and improve the flow along Mayfield Road. Consideration will be given to new designated left turn and right turn lanes at existing intersections, both on Mayfield Road and the cross streets.	The addition of turning lanes at intersections will not fully solve the capacity and operational deficiencies on Mayfield Road. However, these improvements may be considered in conjunction with the final recommended concept to enhance the operations and capacity of Mayfield Road.	Carry forward in conjunction with other recommended alternatives
Roundabouts 	Roundabouts are characterized by their lack of traffic signals and a circulating roadway providing for continual traffic flow through the intersection. Roundabouts generally provide more traffic capacity than standard signalized intersections due to their ability to reduce delays.	This alternative will be analyzed in further detail as the introduction of a series of roundabouts may reduce the extent of widening, address or reduce traffic delays and improve safety at intersections. All existing major intersections on Mayfield Road will be analyzed for the suitability of roundabouts.	Carry forward in conjunction with widening alternative solution
Widening Mayfield Road 	Widening Mayfield Road will improve corridor capacity and address existing and future congestion issues.	The widening of Mayfield Road will be considered in conjunction with other improvements, such as intersection improvements and/or roundabouts.	Carry Forward
Transit Service 	This alternative would improve the level of transit service that may be provided within the corridor, in order to reduce vehicle traffic on Mayfield Road.	The traffic study for this project included all Region and City / Town plans for increased transit service within the area. Transit service will not in itself address the capacity issues on Mayfield Road, but all planned transit service enhancements in the area will continue to be implemented regardless of the alternative chosen for Mayfield Road.	Carry forward in conjunction with other recommended alternatives
Upgrade Other Routes 	By improving other existing road corridors that perform similar functions as Mayfield Road, traffic could potentially be diverted away from Mayfield Road.	The traffic study for this project included all Region/City/Town plans for upgrading other routes in the area. This alternative in itself will not address the capacity issues on Mayfield Road. However, planned upgrades to other roads will have to be undertaken regardless of the alternative chosen for Mayfield Road.	Carry forward in conjunction with other recommended alternatives

Table 4.2.1.1 – Mayfield Road Alternative Solutions Screening/Evaluation Summary

Planning Alternatives	Description	Preliminary Evaluation	Preliminary Recommendation
Build Other Routes 	Ongoing transportation studies are currently examining this option, including the "GTA West Corridor Environmental Assessment (preliminary stages)" and the "Highway 427 Extension Project".	The traffic study for this project included the provincial plans for building other routes in the area. This alternative in itself will not address the capacity issues on Mayfield Road. However, the Construction of other planned roads in the area will have to be undertaken regardless of the alternative chosen for Mayfield Road.	Will be implemented as per existing plans regardless of solution chosen

4.3 RECOMMENDED ALTERNATIVE SOLUTION

Based on the evaluation and screening of the Alternative Solutions developed as part of this study, widening of Mayfield Road was identified as the Alternative Solution that has the best potential to address the Problem Statement and provides the best opportunity to address the capacity and level of service requirements after 2012. Moving forward, the widening of Mayfield Road will include access management options, improvements to intersections, and consideration of roundabouts at major intersections. In addition, upgrading of other routes, building other routes/roads, and providing transit service enhancements will all proceed as planned regardless of the design alternative recommended for this study.

4.4 PUBLIC INFORMATION CENTRE (PIC) NO. 1

A Public Information Centre (PIC) meeting was held on Tuesday, June 25, 2009 at Castlemore Public School located just south of the study area at 9916 The Gore Road in Brampton, Ontario. In advance of the meeting approximately 150 notices were mailed to property owners/occupants within the Study Area; in addition notices were placed in the local newspapers. Agencies with expressed and ongoing interest in the study were also circulated by direct mailing.

During the open house efforts were made by the study team to encourage all participants to sign in and provide their comments. Eighteen (18) persons signed in at the PIC and it is believed that another five to 10 additional persons attended the meeting but did not sign in.

The purpose of this PIC was to provide residents, property owners and other interested parties with information concerning the findings to date for the Mayfield Road Class Environmental Assessment Study, and to obtain input on the Alternative Solutions being considered.

A number of information boards and drawings were on display at the PIC, outlining the study process, a summary of the traffic study, the technical studies and investigations being undertaken for the project, the Problem Statement, and the Alternative Solutions

being considered and proposed for further evaluation. In addition, an air photo of the study area was displayed showing the potential limits of the designated (50 meter) Mayfield Road right-of-way if Mayfield Road was widened equally about the existing centerline. Copies of the display information, original notifications, sign-in register, handout and redacted comment forms are included in Appendix B

A handout was provided at the PIC and also sent to those who had indicated an interest in the project but were unable to attend. This handout included a comment sheet that requested comments and suggestions. A copy of the handout is included in Appendix B.

Section 4.5 summarizes the public and agency responses obtained as a result of the first PIC.

4.5 RESPONSES TO PUBLIC AND AGENCY COMMENTS

Responses to various comments forwarded by members of the public and agencies with an interest are included in the following summary table along with a brief description of the study response or actions required for resolution. Redacted responses from individuals are included in the appendices and original copies of all formal public responses are included in the project files. Only one (1) official comment form and two (2) e-mail responses were received subsequent to the meeting.

Table 4.5.1.1 – Public and Agency Comments

Respondent/Agency	Comments	Response/Resolution
Representing [redacted]	Town of Caledon Resident, with residential property, uses Mayfield Road daily. I live at [redacted] a large culvert serves both my laneway and an adjacent property, immediately to the west. When the road is expanded I would like to see separate culvert for my lane and that of my Neighbour	Drainage and culverts were reviewed in significant detail and recommendations regarding appropriate drainage features have been incorporated into the study and recommendations. Drainage work and recommendations are also subject to review and approvals by the TRCA
Representing [redacted]	Extensive comments in letter form noting concerns about access and egress to their property under current	Various supplementary studies were completed as part of the study and address the majority of the

Table 4.5.1.1 – Public and Agency Comments		
Respondent/Agency	**Comments**	**Response/Resolution**
	conditions and continuing concern regarding adding future lanes. Concerned about expansion of road on their side of Mayfield due to protected lands on the south side at Wildfield. Concerned about noise, air quality, parking impacts, trucks, value of land and other related concerns.	respondent's concerns including traffic analysis, noise assessment and access/egress reviews.
[redacted] representing the landowner group for lands identified [redacted]	Request that they be informed of future Public Information Centres.	Respondent was added to the public contact list.
Representing [redacted]	Residential property with direct access to Mayfield Road, daily user. My concern is the same as yours, safety first! It is my opinion that if you were not concerned you wouldn't have been studying this section of road from Coleraine Drive to Airport Road. This section is just like a Subdivision, and no person in their right mind would build a four lane highway through a subdivision unless 110% safe would be constructed. Because everytime we are entering our driveway we would be sitting ducks. At	Resident was added to mailing list and expressed concerns have been addressed through various study analyses including the traffic and road safety analysis.

Table 4.5.1.1 – Public and Agency Comments		
Respondent/Agency	**Comments**	**Response/Resolution**
	the presentation at your meeting I didn't see any proposal the way the road would be constructed in regard to safety.	
[redacted], representing the [redacted].	Request for review and consideration of alternative Storm Water Management Pond location for SWM Pond #3 to north side of Mayfield Road west of The Gore Road.	In person meeting was held on September 23, 2011 to review and discuss options and the proposed pond location was reviewed and revised to a suitable location on the north side of Mayfield Road near Sta. 13+600 west of The Gore Road

All pertinent Public comments and concerns are carried forward for further consideration in association with the study analyses and recommendations.

5.0 Design Concepts

5.1 ALTERNATIVE DESIGN CONCEPTS

5.1.1 Background and Introduction

Based on the results of the evaluation of alternative solutions and feedback following Public Information Centre No. 1, the Recommended Alternative Solution of Widening Mayfield Road was confirmed by the Study team. This solution includes intersection improvements, consideration of roundabouts, minimizing impacts on property and the environment, and private property access management. Other items such as upgrading or building other routes/roads, and providing enhanced transit service throughout the Region will also be implemented with all Alternative Design Concepts. The next step in the study process was to identify and assess practical design alternatives and select a preferred design alternative for presentation to the public.

5.1.2 Roadway Design Criteria

Roadway design criteria were established and refined early in the study to arrive at a suitable set of design criteria that would be applied to the development of roadway designs as part of the preferred solution. The following table summarizes the existing and proposed design criteria and which form the basis for the design alternatives prepared as part of the Class EA and preliminary design:

Table 5.1.2.1 – Roadway Design Criteria

CRITERIA/ DESCRIPTION	EXISTING CONDITIONS	URBAN ARTERIAL UNDIVIDED Controlled Access	URBAN ARTERIAL DIVIDED Controlled Access
Design Classification:	**Built up areas**: Rural Arterial Road Undivided Posted Speed 60 km/hr **Rural Areas**: Rural Arterial Road Undivided Posted Speed 80 km/hr	**Built up areas**: UAU 70, Design Speed 70 km/hr, Posted Speed 60 km/hr **Rural Areas**: UAD 90, Design Speed 90 km/hr, Posted Speed 80 km/hr	**Built up areas**: UAD 70, Design Speed 70 km/hr, Posted Speed 60 km/hr **Rural Areas**: UAD 90 Design Speed 90 km/hr, Posted Speed 80 km/hr
Cross Section:	**Right of Way:** Varies but generally 30 meters or larger.	**Right of Way**: 50 metres (165 feet nominally)	**Right of Way**: 50 metres (165 feet nominally)

Table 5.1.2.1 – Roadway Design Criteria			
CRITERIA/ DESCRIPTION	**EXISTING CONDITIONS**	**URBAN ARTERIAL UNDIVIDED Controlled Access**	**URBAN ARTERIAL DIVIDED Controlled Access**
	Road Platform: 2 paved lanes with gravel shoulders and turn lanes at Intersections. Drainage by means of ditches with some minor storm sewers in built up areas.	**Road Platform:** 6 lanes no center median. Curb & gutter with storm sewers	**Road Platform**: 6 lanes divided by 6.0 m raised median. Curb & gutter with storm sewers
Maximum Gradient:	Approx. 4% east of Goreway Drive	6.0%	6.0%
Minimum Gradient:	-	0.5%	0.5%
Crest/Sag(1) Minimum K Values	-	UAU70: Crest: SSD:32 PSD:350 Sag: SSD: 30 UAU90: Crest: SSD: 16 PSD: 250 Sag: SSD: 20	UAD70: Crest: SSD:32 PSD:350 Sag: SSD: 30 UAD90: Crest: SSD: 16 PSD: 250 Sag: SSD: 20
Minimum Stopping Sight Distance:	-	UAU70: 94 m UAU90: 131 m	UAD70: 94 m UAD90: 131 m
Equivalent Minimum "K" Factor:	-	UAU70: 16 UAU90: 32	UAD70: 16 UAD90: 32
Minimum Radius of Horizontal Curvature:	Approx. 320m @ 60kmh posted (i.e. east of Airport Road)	UAU70: 200 m UAU90: 375 m	UAD70: 200 m UAD90: 375 m
Super elevation:	-	Maximum (eMax) = 4%	Maximum (eMax) = 4%
Lane Widths(2)	Generally 3.75m through lanes	Through Lanes: 3.75 m Turn Lanes: 3.5 m	Through Lanes: 3.75 m Turn Lanes: 3.5 m
Sidewalk Width	N/A	1.5 m	1.5 m
Multi-use Trail Width	N/A	3.0 m	3.0 m

Information Source – Region of Peel Design Criteria Manual and TAC Geometric Design Guidelines.

Notes:

1. Sag SSD Values are based on "headlight control"
2. Lane widths are reduced in critical areas as compromise to impact in low speed urban areas.

5.1.3 Widening Requirements

Based on the traffic study completed for the project, it was found that six lanes would ultimately be required on Mayfield Road between Airport Road and the future new roadway connecting to the Highway 427 Extension (just west of Coleraine Drive) by the year 2031. The proposed future roadway is referred to as the "A2" arterial road. The section of Mayfield Road between the new connecting roadway and Coleraine Drive would also need to be increased to four lanes wide by 2031.

Since the ultimate widening to six lanes is not needed for approximately 20 years after the completion of this study, the Region of Peel may decide to construct Mayfield Road in stages by widening initially to four lanes, and then widening to six lanes before 2032.

Since the ultimate widening to six lanes is not needed for nearly 20 years after the completion of this study, the Region of Peel may decide to construct Mayfield Road in stages by widening initially to four lanes, and then widening to six lanes before 2032. Although Mayfield Road may not be widened to six lanes initially, it would be very ineffective and costly to buy property and relocate utilities such as Hydro, Bell, Natural Gas, watermain, etc. to suit a four lane section, and then purchase additional property from the same property owners in 10 to 15 years to relocate the utilities and infrastructure at significant additional cost. Therefore, the municipality intends to purchase the required property and relocate utilities for an ultimate six lane cross-section for Mayfield Road to minimize the total project costs and to reduce the overall disruption to the property owners and the travelling public. Although steps are being taken to accommodate the widening of Mayfield Road to six lanes, the Region of Peel may still decide to initially widen the actual road to four lanes. This decision and details of the staging will be determined and finalized prior to initial construction taking place. Phasing of the work will depend on availability of funds in the Region of Peel budget as well as timing and progression of development in the area. The possible details of phasing of the work and staging alternatives are discussed later in this report.

5.1.4 Intersection Design

In addition to the widening to six lanes, there are requirements for turn lanes at all signalized intersections within the study area to address high volume turning movements and related queuing requirements during the peak periods. These turn lane requirements are documented in the traffic study completed for this project and are summarized in the following table.

The required turn lanes and lengths must be incorporated into any of Alternative Design Concepts considered in order for Mayfield Road to operate at an acceptable level of service. In conjunction with these turn lanes the major intersections with Mayfield Road will also be signalized. The signalized intersections will be Airport Road, Goreway Drive, McVean Drive, The Gore Road, Clarkway Drive and Coleraine Drive.

Table 5.1.4.1 – Turn Lane Storage Lengths

Intersection & Movement	2017 Storage (m)	AM Peak Hour Queue length (m)	PM Peak Hour Queue length (m)	Mitigation Measures (storage m)
Airport Road / Mayfield Road				
Eastbound Left-turn1	85	84	55	
Eastbound Right-turn	80	14	<10	
Westbound Left-turn	120	82	125	Lengthen to 125
Northbound Left-turn	140	42	58	
Northbound Right-turn	65	29	25	
Southbound Left-turn1	125	56	97	
Southbound Right-turn	65	18	42	
Maisonneuve Boulevard / Mayfield Road				
Eastbound Right-turn	30	<10	<10	
Westbound Left-turn	50	<10	<10	
Goreway Drive / Mayfield Road				
Eastbound Left-turn	35	21	22	
Eastbound Right-turn	30	<10	<10	
Westbound Left-turn	40	13	<10	
Westbound Right-turn	-	<10	<10	Design as 15
Northbound Left-turn	60	30	36	
Northbound Right-turn	40	<10	16	
Southbound Left-turn	45	21	<10	
McVean Drive / Mayfield Road				

Table 5.1.4.1 – Turn Lane Storage Lengths				
Intersection & Movement	**2017 Storage (m)**	**AM Peak Hour**	**PM Peak Hour**	**Mitigation Measures**
		Queue length (m)	**Queue length (m)**	**(storage m)**
Eastbound Left-turn	50	<10	<10	
Eastbound Right-turn	-	<10	<10	Design as 15
Westbound Left-turn	65	27	<10	
Northbound Left-turn	15	<10	<10	
Southbound Left-turn	15	<10	<10	
The Gore Road / Mayfield Road				
Eastbound Left-turn	25	15	32	Lengthen to 35
Eastbound Right-turn	15	<10	<10	
Westbound Left-turn	15	10	<10	
Westbound Right-turn	-	<10	<10	Design as 15
Northbound Left-turn	35	17	39	Lengthen to 40
Southbound Left-turn	20	25	16	Lengthen to 25
Clarkway Drive / Mayfield Road				
Eastbound Left-turn	15	<10	22	Lengthen to 25
Eastbound Right-turn	-	<10	<10	Design as 15
Westbound Left-turn	15	<10	<10	
Northbound Left-turn	15	<10	12	
Southbound Left-turn	15	<10	<10	
Coleraine Drive / Mayfield Road				
Eastbound Left-turn	25	55	41	Lengthen to 55
Eastbound Right-turn	-	<10	<10	Design as 15
Westbound Left-turn	15	<10	<10	
Westbound Right-turn	-	<10	<10	Design as 15
Northbound Left-turn	15	<10	<10	
Southbound Left-turn	15	<10	<10	

Information Source – Mayfield Road EA (Airport Road to Coleraine Drive) Traffic Study, May 2010, iTrans Consulting Inc.

5.2 ROUNDABOUTS

After PIC No. 1, a separate study was undertaken to investigate the feasibility of utilizing roundabouts at the major intersections with Mayfield Road in lieu of signalized intersections. In support of this initiative, modern roundabouts are being utilized in an increasing number of jurisdictions due to their ability to handle more traffic with less congestion than signalized intersections. Another advantage of roundabouts that often make them suitable for intersection control, is that they typically result in less severe collisions, whereas the number of conflict points (or points where vehicles may experience a collision) is reduced, especially the number of high speed, right angle collisions. Sideswipe collisions are usually not reduced, but sideswipe collisions are generally less severe from a personal injury and property damage standpoint when compared to right angle collisions.

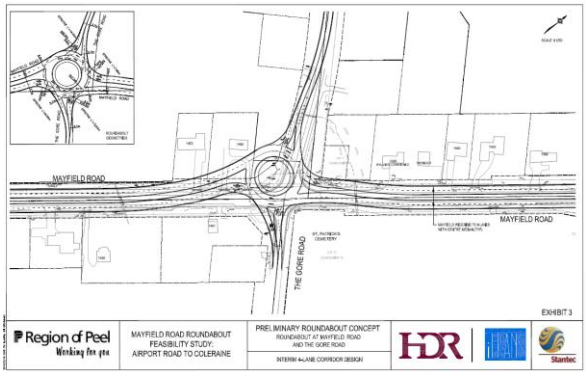
After much discussion and deliberation, the study team concluded its recommendation that roadway alternatives with full capacity signalized intersections will be recommended in the study…

Sample Roundabout

The roundabout study undertaken for this project can be found in Appendix O. The conclusions of the roundabout study are as follows:

The Roundabout Analysis indicated that the construction of two-lane roundabouts, on a 4-lane Mayfield Road corridor, would be suitable from a traffic delay and queuing perspective, at four intersections including three existing intersections. A roundabout is not deemed to be suitable for the intersection of Mayfield Road at The Gore Road. Other considerations, such as pedestrian accommodation and crossing safety may not be well served as the traffic volumes on Mayfield Road reach 2,000 vehicles in the peak hour direction.

The conclusion that roundabouts could service the traffic operational needs on Mayfield Road, to 2031, is valuable information to the Peel Region. The data illustrates that other Regional corridors may also be candidates for modern roundabouts, based on current evaluation techniques.



However, after careful consideration and discussions with Regional Staff, it is

recommended that the Region not proceed to implement modern roundabouts in this section of Mayfield Road, for the following reasons:

- Two-lane roundabouts, although suitable at four (4) intersections to the horizon year of 2031 and on a four-lane Mayfield Road corridor, will not be satisfactory in the distant future. Widening of Mayfield Road to six lanes, which is inevitable, will necessitate either upgrading the roundabouts or removal and replacement with signalized intersections.

- It is highly unlikely that Peel Region would opt for upgraded triple-lane roundabouts on Mayfield Road, once the corridor is ultimately widened to six lanes. Therefore, installation of "temporary" 2 lane roundabouts would not be a cost effective solution.

Typical Roundabout Entry/Exit

- Signalized intersections can be constructed to suit an ultimate 6 lane corridor during an interim 4 lane program. This planning reduces the throwaway costs not available with the design and construction of roundabouts.

- Providing 3 or 4 roundabouts at the furthest (east) end of the Mayfield Road corridor where no other roundabouts exist or are planned on the corridor over its entire 24.8 km length may not represent good strategic transportation planning. The consistency provided by signalized intersections within the entire Mayfield Road corridor makes good sense, despite the technical analysis presented herein.

After much discussion and deliberation, the study team concluded its recommendation that roadway alternatives with full capacity signalized intersections will be recommended in the current study as part of the preferred solution and that they will be considered further in the development of design alternatives for improvements to Mayfield Road from Airport Road to Coleraine Drive.

5.3 ACCESS MANAGEMENT

Managing existing driveway and field accesses on Mayfield Road was identified as a key concern and a means to improve on overall roadway safety and congestion challenges. Considerations such as combining existing accesses on one property, combining accesses between adjacent properties, constructing a two way left turn lane, or

…eliminating left turn access from private properties, besides increasing inconvenience for property owners, may be even more unsafe as drivers may attempt to make U-turns at intersections to access their properties…

constructing a raised centre median to eliminate left turns in/out of private properties and to reduce traffic conflict points, are all included in the study approach to access management. Table 4.3 provides a summary of the existing access types within each segment of the existing roadway from Airport Road to Coleraine Drive.

Table 5.3.1.1 – Mayfield Road Property Access/Driveways

Road Segment	Access Type	Location Within functional area of intersection (<150m)	Location Outside Functional Area of Intersection (>150m)
Airport Road to Maisonneuve Blvd.	Residential	5	4
	Commercial	0	0
	Institutional	0	0
	Agricultural/Field	1	0
Maisonneuve Blvd. to Goreway Drive/Innes Lake Road	Residential	2	7
	Commercial	0	0
	Institutional	0	0
	Agricultural/Field	1	2
Goreway Drive/Innes Lake Road to McVean Drive/Centreville Creek Road	Residential	3	20
	Commercial	1	1
	Institutional	0	0
	Agricultural/Field	1	5
McVean Drive/ Centreville Creek Road to The Gore Road	Residential	5	8
	Commercial	0	2
	Institutional	0	0
	Agricultural/Field	0	6
The Gore Road to Marysfield Road	Residential	4	2
	Commercial	1	0
	Institutional	0	0
	Agricultural/Field	0	1
Marysfield Road to Clarkway Drive/ Humber Station Road	Residential	6	10
	Commercial	0	0
	Institutional	0	0
	Agricultural/Field	0	4
Clarkway Drive/ Humber Station Road	Residential	5	15
	Commercial	0	2

Table 5.3.1.1 – Mayfield Road Property Access/Driveways			
Road Segment	**Access Type**	**Location**	**Location**
		Within functional area of intersection (<150m)	**Outside Functional Area of Intersection (>150m)**
to Coleraine Drive	Institutional	0	0
	Agricultural/Field	1	4
Total		**36**	**93**

Information Source – Mayfield Road EA Topographic Survey (Airport Road to Coleraine Drive), Stantec Consulting Ltd., 2007

In response to the significant number of individual private properties throughout the study limits, it was determined that elimination of individual access points was not necessarily practical or desirable in the short term as it would significantly interfere with the use and function of the existing properties.

Mayfield Road Private Access

Consequently, it is proposed in the short term that no existing accesses be eliminated but consideration should be given to relocating entrances where possible further from the physical area of the intersection while remaining within the functional area of the intersection. In addition, it is proposed in the short term to defer the construction of a centre median on Mayfield Road, except at signalized intersections for a length of approximately 30 metres back from the stop bar in order to maintain safe conditions at the intersections (i.e. multiple left turns occurring near the physical intersection, but outside the actual signalized intersection are unsafe and create confusion and additional conflict points for through traffic at the intersections).

In response to the desire to improve access conditions, a two way left turn lane will be provided as a interim measure throughout the study limits to allow vehicles turning left from Mayfield Road to pull out of the through lanes while waiting for a break in opposing traffic, this also provides an opportunity for vehicles turning left onto Mayfield Road to partially cross the roadway and wait for a break in through traffic to enter the stream of traffic.

As part of the property negotiations where property is required for the widening of Mayfield Road, the property owners may be asked whether combining or eliminating an access is possible. Only if the property owner agrees to an access elimination or consolidation will any action be taken on this issue. The Ultimate design incudes

provision for a continuous median in agreement with the access restrictions to be imposed as part of the future development planning process and as endorsed by Regional council.

A motion was passed by the Region of Peel on April 26, 2012 to maintain and protect the role and function of Mayfield Road as a major arterial and goods movement corridor. The motion also included the recommendation that an interim policy be enacted to limit access to Mayfield Road to two access points between concession roads for all future developments and planning instruments, including Secondary Plans and/or Block Plans, if applicable, for which secondary plan approval of access has not yet occurred in the Town of Caledon and the City of Brampton.

5.4 ROADWAY DESIGN CONCEPTS

Four (4) Alternative Design Concepts were developed for widening of Mayfield Road to six lanes. Each of the alternatives included a centre left turn lane (except within 30m of signalized intersections), and turn lanes at intersections. Each of the major intersections with Mayfield Road will be signalized (Airport Road, Goreway Drive, McVean Drive, The Gore Road, Clarkway Drive and Coleraine Drive).

Typical 4 Lane Arterial Road Section

In addition, potential future intersections resulting from future development have been shown where advanced development details exist. All of the alternative design concepts include widening to the north away from the existing St. Patrick's Cemetery to avoid disturbing the existing grave sites and related improvements on The Gore Road are also included. In addition, just east of Airport Road where the existing subdivision exists, and property has already been obtained for a six lane widening, all alternatives include widening to the north only, with the most southern property line being the existing property line for the subdivision.

All alternative design concepts illustrate the minimum road allowance or right-of-way of 50 metres, as designated in the Region of Peel Official Plan. In some instances, additional property is required in addition to the 50 metre right-of-way in order to construct embankments at culvert or bridge crossings, to construct storm water management ponds and other facilities required to satisfy existing environmental regulations.

The four Alternative Design Concepts are as follows:

5.4.1 DESIGN CONCEPT NO. 1 – WIDENING MAYFIELD ROAD EQUALLY ABOUT EXISTING CENTRELINE

This alternative design concept widens Mayfield Road equally about the existing centerline of Mayfield Road, with the exception of the two areas noted previously, namely at St. Patrick's Cemetery and at the newer subdivision just east of Airport Road.

With Mayfield Road widened equally about the existing centerline, new property requirements are more or less spread equally on both sides of Mayfield Road. Mayfield Road would also be widened equally into the City of Brampton and the Town of Caledon. Evaluation of this concept is included in the following sections. Plans illustrating this concept are included in Appendix X.

5.4.2 DESIGN CONCEPT NO. 2 – WIDENING MAYFIELD ROAD TO THE NORTH, HOLDING THE EXISTING SOUTH PROPERTY LINE WHERE POSSIBLE

This alternative design concept widens all of Mayfield Road to the north into the Town of Caledon, with little or no property required from properties on the south side of Mayfield Road (City of Brampton).

Widening the road to one side tends to have a more significant impact on a smaller number of properties and in some cases resulting in the potential requirement for full property buyouts Given the desire to minimize and balance impacts, in many cases this alternative does not meet that objective and has the potential to have significant impact on certain properties. Evaluation of this concept is included in the following sections. Plans are included in Appendix X.

5.4.3 DESIGN CONCEPT NO. 3 – WIDENING MAYFIELD ROAD TO THE SOUTH, HOLDING THE EXISTING NORTH PROPERTY LINE WHERE POSSIBLE

This alternative design concept widens all of Mayfield Road to the south into the City of Brampton, with the exception of the two areas noted previously, namely at St. Patrick's Cemetery and at the newer subdivision just east of Airport Road. The only property required on the north side of Mayfield Road is in the areas of the St. Patrick's Cemetery and the area just east of Airport Road.

Widening the road to one side tends to have a more significant impact on a smaller number of properties and in some cases resulting in the potential requirement for full property buyouts. Given the desire to minimize and balance impacts, in many cases this alternative does not meet that objective and has the potential to have significant impact on certain properties. Evaluation of this concept is included in in the following sections. Plans are included in Appendix X.

5.4.4 DESIGN CONCEPT NO. 4 - WIDENING OF MAYFIELD ROAD ABOUT EXISTING CENTRELINE "MODIFIED" TO MINIMIZE PROPERTY IMPACTS

After initial consideration of the preceding alternatives, the study team requested consideration of an alternative that would balance the impacts more evenly and lessen impacts further on some very specific features which are of particular significance to the community. Examples include the St. Patrick's Church and Cemetery, the heritage property at 11962 The Gore Road, and the historic settlements of Tullamore at Airport Road and the settlement of Wildfield at the Gore Road. The plans for this concept are included in Section 6.0 of this report.

Since widening equally about the existing Mayfield Road centerline potentially results in some dwellings being directly impacted a best effort is made to avoid those impacts while in other areas where there are no houses or building directly across abutting Mayfield Road Mayfield the road is designed to provide an optimum alignment from an operational standpoint while satisfying all aspects of the recommended roadway design criteria.

The proposed lane widths are modified in Wildfield to minimize the potential impacts on the community and the recommended design speed and posted speed are reduced to 60 km/hr. This is in comparison with the 90 km/hr. and 80 km/hr. design speeds for the remainder of the corridor and the associated 80 km/hr. posted speed.

This alternative was refined by slightly modifying the road alignment further north or south in certain areas to reduce direct impacts to some existing houses or buildings. The areas where this was specifically undertaken are as follows:

5.4.4.1 Airport Road

At Airport Road the roadway is offset toward the north recognizing the existing property line alignment as the southern boundary of the roadway including its exposure along the existing development lands in the vicinity of Maisonneuve Boulevard within the City of Brampton.

5.4.4.2 The Gore Road at Wildfield

At Wildfield, the roadway alignment is offset toward the north to avoid impacts on the cemetery land associated with St. Patrick's Church at the southeast corner of Mayfield Road and The Gore Road. In addition to this the lane widths are reduced to a minimum standard for the roadway through Wildfield. This decision has been proven through observation made during excavation for the Stage 2 archaeological excavations undertaken adjacent to the cemetery where a footstone was exposed during the test pitting operation. This observation suggests that there may be gravesites within or encroaching upon the existing roadway allowance and as a result of a past road widening undertaking. Similar concerns were expressed with regard to the Gore Road

frontage at the cemetery where past study has also suggested the potential for gravesite encroachment on the existing roadway corridor.

Given that the heritage property at 11962 The Gore Road cannot be protected satisfactorily to allow for the retention or relocation of the existing dwelling on the existing site it is proposed that the potential impacts on the adjacent St. Patrick's Church cemetery at the east side be avoided by shifting The Gore Road alignment further to the west than was originally investigated.

Region staff reviewed the constraint on the east side regarding the potential of unmarked burial sites within the ROW. It was decided that in order to respect the deceased and the sentiments of their families that the Road ROW should be shifted further west and the lands with the potential of unmarked graves be transferred to ownership of the Church after appropriate reinstatement. This will allow the Region to avoid unnecessary disturbance of the potential graves under the existing ROW.

Region staff have met with the representatives of the Church to discuss the alternatives and the Church representatives have agreed to the take ownership of the lands and make them part of the cemetery. There are ongoing discussions about the loss of parking that currently exists and the Region will work with the Church during the detailed design stage to resolve this matter.

5.5 POTENTIAL IMPACTS AND MITIGATION

Features and conditions that required additional consideration during this study included driveway and site access, traffic noise impacts on existing dwellings, drainage and watercourse impacts, roadside drainage and roadway overtopping, endangered species provisions (Redside Dace habitat), meander belt and 100 year erosion analyses (Geomorphology), storm runoff water quality provisions, cross section options at the St. Patrick's Church and Cemetery frontage and 11962 The Gore Road, and to some degree, ongoing adjacent land development proposals.

5.5.1 Specific Driveways & Sight Distances

Sight distances to driveways under both rural and urban conditions are generally a concern where minimum distances cannot be provided to permit vehicles to properly slow, safely stop or generally avoid conflicts with vehicles gaining access or egress to/from individual driveway entrances. As a rule of thumb, the number of entrances should be minimized on high volume arterial roadways and this is typically addressed in the Municipal entrance policies, guidelines and standards established by the municipality. A current

Mayfield Road Commercial Driveway

concern is the number of existing driveway along Mayfield Road including in some cases their location and orientation. Periods of higher volume present more challenging conditions for the users and as the community continues to grow these challenges will increase in both frequency and complexity.

There are approximately 129 driveways and field entrances on Mayfield Road within the study limits. Of the entrances, 36 are located within the functional intersection areas. The proximity of these access points presents some challenge to the overall operation of intersections and introduces potential points of conflict that can reduce the overall operational efficiency and safety of the intersection. Recommendations regarding intersections and driveway proximity are included in the preceding section on Access Management.

It was observed that the existing topography and roadway/driveway geometry/orientation presents some potential challenges to driveway access/egress in some areas and has an impact on existing driveway sight distances. As a result, the Consultant was instructed to undertake a detailed review of driveways in critical locations as part of the assessment of impacts and identification of required improvements and mitigation strategies.

Based on roadway topography alone (roadway has very little curvature), the key areas of concern were identified in the sections between Sta. 11+500 to Sta. 12+460 and Sta. 15+580 to Sta. 16+670, each section being about a kilometer long. Associated with each section are crest and sag vertical curves which can impact sight distances at driveways. A table which summarizes the specific review and provides a comparison of the equivalent design speed for the existing sight distances is included in Appendix O.

For the segment from Sta. 11+500 to Sta. 12+460 east of Goreway Drive Innes Lake Road and west of McVean Drive/Centreville Creek Road there are two sag vertical curves, one at Sta. 11+795 and the other at Sta. 12+313 with an intermediate crest vertical curve at Sta. 12+040. Each of the sag and crest vertical curves meets the required road design stopping sight distance criteria for the proposed design speeds, however the driveway turning sight distances were slightly less than desired with the initial profile generation. Figure 2.3.3.4 of the Transportation Association of Canada (TAC) guideline is used as the guiding reference for turning sight distance in this study.

The crest vertical curve at Sta. 11+890 to Sta. 12+190 was modified for two scenarios, one with a crest vertical curve K value of 60 and the other with a vertical curve K value of 80. In each case, the driveway turning sight distance for a design speed of 90 km/hr. would not be achieved which confirms that the existing condition does not satisfy the desired turning sight distance condition. It is noted as well that the larger K value curves lead to extended grading encroachment on adjacent private lands and as a result additional property purchase would be required to affect only a marginal improvement

in the turning sight distances at a small number of driveways some of which will be removed as part of ongoing development planning.

For the segment between Sta. 15+580 to Sta. 16+470 from east of Clarkway Drive/Humber Station Road to west of Coleraine Drive the driveway turning sight distance were also studied and it was found that with a minor profile adjustment of the crest vertical curve at Sta. 15+744 to a crest vertical curve K value of 70, improved the sight distances for two of five driveways to a design speed of 90 km/hr or better.

It is known that the future roadway improvements will include multiple lanes (either four or six with two or three in each direction) and as such lane choices will be provided that do not exist today under existing conditions. In the event that a lane change is required to avoid a slowing vehicle to complete its turn at a driveway, the through moving vehicle would have a choice of lanes that does not exist under the current conditions. In this regard, the additional lanes will provide an immediate operational improvement that will enhance driveway turning provisions until the private entrances are ultimately removed through redevelopment.

Under full urban conditions there is concern that long flatter curves do not provide a roadside grade sufficient to efficiently convey surface drainage to roadside storm inlets and can lead to localized ponding and possible icing in the winter periods. As such, there is reluctance to recommend long flat vertical curves for new urban roadways with a full urban road cross section complete with curb and gutter.

Given the ongoing acceptance of existing conditions, the low volume of turning vehicles at the private driveways, the relatively low number of driveways with less than ideal turning sight distances, concerns regarding future drainage, and the fact that future improvements will provide additional lanes and associated lane choices, it is suggested that the profile design be retained as is and refined during the detailed design phase at which time design details will be contingent upon the continuing presence of rural entrances and for the time being the initial design profile is used as the basis for determination of property impacts and grading requirements.

It is recommended that signs notifying drivers of the hidden driveways be provided in the areas where less than desirable turning sight distances are provided under existing two lane conditions. The placement of these signs should be in accordance with the recommendations of the Ontario Traffic Manual for roadside advisory signs.

5.5.2 Traffic Noise Impact Assessment

A traffic noise impact assessment was completed by Stantec Consulting to determine potential noise impacts on existing residential development as a result of the proposed improvements and resultant increases in future traffic volumes. The assessment was limited to noise predictions for the preferred design alternative Concept 4 Modified, since the variation in each alternative and more specifically the distances to specific

noise receptor locations did not vary substantially from one design alternative to the other at those key locations. The traffic noise Impact assessment is included in Appendix P.

Initially, the projected traffic volumes found in the traffic study for this ESR were used in the noise impact assessment, however the Region of Peel reported that regardless of projected traffic volumes, Region of Peel Traffic volume estimates of 48,100 vehicles per day (source: Region of Peel Transportation Planning) are used for the prediction of ultimate noise levels on six (6) lane arterial roadways in the Region of Peel.

Concerns regarding exposure of existing properties to increasing noise were expressed by Region staff and it is noted that noise mitigation measures for front lotted residential exposures are limited. In cases where rear yard outdoor living areas are exposed to Mayfield Road traffic there may be opportunities for the provision of noise barriers if required. In some locations there were concerns that the demolition of existing dwellings would expose other properties to traffic noise increases.

The results of the traffic noise impact assessment at seven (7) reverse frontage receptors (R1-R7) and seven side frontage receptors (R8-R14) indicates that the increase in traffic noise level within the design horizon will be tolerable increasing by less than 5 dBA but it is also noted that the Region of Peel and City of Brampton Noise policies require consideration of physical noise attenuation measures when predicted noise levels exceed 60 dBA.

Noise Receptors at Mayfield Rd. & Maissoneuve Dr.

5.5.2.1 Reverse-Frontage Lots (R1 to R7)

Since noise levels in the OLAs of R1 to R7 are predicted to exceed 60 dBA, consideration should be given to modifying the existing noise barrier fence for these reverse-frontage homes in connection with the proposed road widening.

The existing 2.0 m high noise barrier located along the rear of the reverse-frontage properties on Mayfield Road is predicted to be providing a 3-5dB reduction in sound levels in the OLAs. The current noise model assumes that the existing barrier is a properly constructed noise wall to achieve noise attenuation at the receptors (i.e., free of gaps and holes, and of sufficient mass – 20kg/m2).

The results from the analysis (Noise Report Table 5) indicate that increasing the existing noise barrier height to approximately 4.0m is predicted to decrease average noise levels in the OLAs of these reverse- frontage homes to less than 60 dBA and provide an additional 5dB of attenuation over existing conditions. Therefore, replacement or retrofit

of the existing noise barrier with a 4.0m high noise barrier would result in noise level decreases of approximately 5dB for the area represented by R1 to R7.

Noise mitigation measures achieving more than 5dB of attenuation are generally considered economically feasible according to both the MOE/MTO noise protocol and the Region of Peel guidelines. However, the predicted impacts of 3dB do not typically warrant consideration of noise mitigation according to the MOE/MTO protocol. Under the Region of Peel corporate policy W30-04 these locations may qualify under the noise technical criteria for the local improvement process. However, the local improvement process has other non-technical requirements to initiate construction and funding of retrofit noise barriers.

A noise barrier higher than 9.0m would be necessary to approach the provincial policy objective of 55 dBA. Noise barriers of this height (greater than 9.0m) are not considered to be practically or economically feasible. The results are summarized in the following table.

Table 5.5.2.1 – Noise Barrier Table – Reverse Frontages

Location	Future 'Build' Daytime (16-hr) L_{EQ} (dBA)	Barrier Height (m) to achieve 5dB reduction	Barrier Height (m) to achieve 60dBA noise level	Barrier Height (m) to achieve 55dBA noise level	Noise Exposure
R	65.15	5.0	5.0	more than 9.0	Rev. Frontage
R	64.81	4.0	4.0	more than 9.0	Rev. Frontage
R	63.18	5.0	4.0	more than 9.0	Rev. Frontage
R	64.76	4.0	4.0	more than 9.0	Rev. Frontage
R	64.59	4.5	4.0	more than 9.0	Rev. Frontage
R	64.76	4.0	4.0	more than 9.0	Rev. Frontage
R	64.51	4.5	4.0	more than 9.0	Rev. Frontage

Information Source – Acoustic Assessment Report, April 2013, Stantec Consulting Ltd.

5.5.2.2 Side-Frontage Lots (R8 to R14)

The side frontage lots potentially exposed to Mayfield Road Traffic are found at various locations throughout the corridor. The various locations identified are included in figures attached to the Noise Report in Appendix P. Since noise levels in the OLAs for R8 to R14 are predicted to exceed 60 dBA, consideration should be given to incorporating noise barriers into the proposed road widening where practical and economically feasible to reduce noise levels.

The results from the analysis (Table 5.5.2.1) indicate that noise barriers located at the Mayfield Road right-of-way (ROW) with heights of 4.0m are predicted to decrease average noise levels in the OLAs of these side-frontage homes to less than 60 dBA (with

the exception of R11A) and provide an additional 5dB of attenuation over existing conditions.

Table 5.5.2.2 – Noise Barrier Table – Side Frontages					
Location	**Future 'Build' Daytime (16-hr) L_{EQ} (dBA)**	**Barrier Height (m) to achieve 5dB reduction**	**Barrier Height (m) to achieve 60dBA noise level**	**Barrier Height (m) to achieve 55dBA noise level**	**Noise Exposure**
R	66.31	3.0	3.5	8.0	Side Frontage
R	64.74	3.5	3.0	6.5	Side Frontage
R	64.74	3.5	3.0	6.5	Side Frontage
R11A	69.90	2.5	5.0	more than 9.0	Side Frontage
R11B	65.33	3.0	3.0	7.0	Side Frontage
R	67.90	2.5	4.0	8.0	Side Frontage
R	63.91	3.0	2.0	5.0	Side Frontage
R	66.96	3.0	4.0	more than 9.0	Side Frontage

Information Source – Acoustic Assessment Report, April 2013, Stantec Consulting Ltd.

In order to be effective barrier returns into the subject properties or adjacent rights-of-way may be required particularly at intersections, the details of which should be assessed during the detailed design of the road widening and adjacent developments. Noise mitigation achieving more than 5dB of attenuation are generally considered economically feasible according to both the MOE/MTO noise protocol and the Region of Peel guidelines. However, the predicted impacts of 3dB do not warrant consideration of noise mitigation according to the MOE/MTO protocol. Under the Region of Peel corporate policy W30-04 these properties may qualify under the noise technical criteria for the local improvement process. However, the local improvement process has other non-technical requirements to initiate construction and funding of retrofit noise barriers.

Noise barriers with heights in excess of 5.0m would be required to approach the provincial policy objective of 55 dBA. Noise barriers in excess of 4.0m are not considered to be feasible according to the Peel Region noise guidelines, except in "extreme" situations. Results of the noise modeling indicate that the OLA of receptors that back onto Mayfield Road do not experience a predicted change in sound levels in excess of the 5 dB criterion, hence additional noise mitigation is not required in accordance with the MOE/MTO protocol. The predicted levels would result in an imperceptible change in sound between the future 'no-build' and 'build' scenarios.

5.5.2.3 Mitigation Verification and Detailed Design

At this stage recommendations for noise mitigation are conceptual in nature. The results presented in the report should be used as a guide during detailed design. During detailed design the feasible locations, extents and heights shall be determined and the

noise mitigation benefit should be re-assessed using detailed information from the design process.

It is assumed that ongoing development planning and engineering will address site specific noise impacts for future developments and their proximity to the future six lane arterial roadway.

5.5.3 Drainage Structures

The numerous watercourse crossings within the study area were investigated in detail in terms of their condition, hydraulic capacity, orientation, and relationship to the natural environment. The initial and final recommendations relative to each of the subject culverts are summarized in the earlier sections of this report. The recommended alterations are also summarized in Table 2.13.1 including replacement, repair, realignment and extension as the case may be.

Mayfield Road CSP Culvert

In terms of drainage structures, the variations for each of the alternative design concepts are so minor overall it was determined that the impacts on the existing drainage features for the most part would be equal for each of the roadway deign alternatives. As a result, the details of culverts and drainage structures were only advanced in relation to the preferred alternative Concept 4 Modified.

Mayfield Road Open Bottom Concrete Culvert

Late in the study process it was determined that the culverts at several locations (ID No. 3, 6 and 11) could not be extended as a result of newer Ministry of Natural Resources (MNR) guidelines prepared in November 2011 for the protection of endangered species habitat, although the hydraulic and structural conditions did not require a replacement structure. Location 6 was later removed from the MNR's list of structures subject to the guidelines. For these locations the identified presence of Redside Dace habitat would dictate that structure replacements are required. In accordance with the new guidelines, the basis for replacements at these locations would typically be a spanning of the meander belt and vegetative buffer which in each case was found to be excessive in comparison with the existing conditions and the prevailing conditions downstream of the crossings.

Consequently, it was recommended that a minimum practical span for each of the crossing structures be confirmed through discussions with the Ministry of Natural Resources (MNR) and included in the study recommendations. An additional analysis

was completed following further consultation with the MNR and is included as Appendix Y. The analysis concluded a reasonable structure width of 18.4 m at Crossing No. 3 and 15.6 m at Crossing No. 11. Each of these spans was based on an analysis of the predicted 100 year erosion limit and was confirmed as satisfactory through follow-up communications from the MNR in March 2013.

The project plans illustrate the new structure spans and show the original culvert crossing sizes. At present it is assumed that the new structures will be contained entirely within the 50 m road right-of-way and estimated at 48.0 m long.

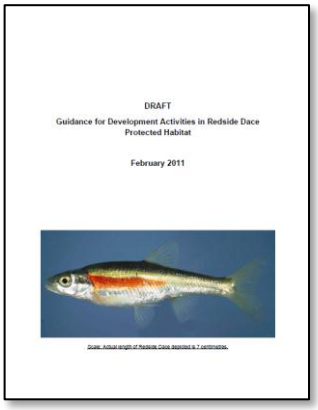
In addition to the analysis and determinations of satisfactory crossing structure spans, it was also concluded that an overall benefits plan satisfactory to the MNR and in response to the requirements of the Endangered Species Act would be required as part of the proposed undertakings at the subject watercourses and roadway crossings. The details of the overall benefits plan will be determined during the detailed design phase of the project and the subject of related permitting and approvals. A financial allowance to implement the overall benefits plan has also been added as a contingency allowance to the overall opinion of probable costs.

5.5.4 Roadway Overtopping – Drainage Management

It was identified that the potential for overtopping of the road during major storm events exists under the existing conditions at Sta. 11+800/11+812 (Crossing ID No. 5) and Sta. 15+152 (Crossing ID No. 12) only. Since the current Region policy dictates that no overtopping should occur for the Regional storm event under ultimate conditions (4 to 6 lane arterial roadway) it was identified that a conveyance improvement would be required for the existing 750 CSP/3660 x 1830 concrete culvert at crossing 5 and the 6070 x 1250 concrete culvert at crossing 12. The recommendation is that a 7200 x 1830 culvert be installed at Sta. 18+012 (crossing 5) and 6000 x 1800 culvert be installed at Sta. 15+156 (crossing 12) respectively as replacements at these locations. The storm drainage capacity analysis completed as part of the drainage and storm water analysis summarizes the pertinent data associated with these crossings. Table 2.13.1 also illustrates the culvert analyses. The resulting decrease in upstream flood elevation will remove the potential overtopping condition and satisfy the drainage objectives applicable to the project.

5.5.5 Redside Dace Habitat Provisions

It is noted in various sections of this report and the supporting Natural Environment Report that Redside Dace habitat has been identified and additionally that new Ministry of Natural Resources guidelines will be applicable to the work associated with the subject crossings containing Redside Dace habitat.


DRAFT
Guidance for Development Activities in Redside Dace Protected Habitat
February 2011

The subject crossings are TRCA ID No. 3 and 11 which are respectively Salt Creek and a tributary of the West Humber River system. The crossing at TRCA ID No. 6 was initially identified by the MNR as an occupied habitat and subject of the new guideline document but that requirement was removed following further investigation and that crossing was removed from those subject to the ESA requirements. The presence of the Redside Dace habitat requires that certain protection be provided and that the treatment of drainage works and related improvements will be subject to Endangered Species Act approvals. In this regard, the two subject culvert crossings must be replaced with larger span structures, determined respectively to be 18.4 m and 15.6 m and subject to future approvals through the MNR and TRCA permitting processes.

West Humber River

5.5.6 St. Patrick's Church and Cemetery

The St. Patrick's Church and Cemetery at 11873 The Gore Road at the south east corner of the intersection of Mayfield Road and The Gore Road is located immediately adjadcent to the existing roadway corridor. The church and cemetery are located in a constrained area opposite the heritage property at 11962 the Gore Road which will be subject to required intersection improvements and widening to accommodate future community traffic growth and the need to improve future traffic operations at The Gore Road and on Mayfield Road.

St. Patrick's Church and Cemetery

Past archaeological study has suggested that there is potential for the encroachment of the road right-of-way on existing gravesites and that any widening must avoid the existing gravesites and cemetery. The Stage 2 archaeological investigation summarized in Chapter 5 of this report recommends that a Stage 3 excavation be undertaken prior to the completion of related detailed design for The Gore Road. In consideration of the potential for gravesite encroachment and the desire to avoid any further encroachment several alternative intersection layouts were developed and analyzed using various cross section designs to determine the most suitable fit with the existing constraints. The overall intent is to permit improvements to the nearby intersection and avoid impacts on the church and cemetery and the heritage property located across the road at 11962 The Gore Road. The analysis and review is discussed further in the section titled 11962 the Gore Road.

5.5.7 11962 The Gore Road

Archaeological Services Inc. (ASI) was contracted by Stantec Consulting Ltd. to update a Cultural Heritage Impact Assessment Report previously prepared for 11962 The Gore Road in the City of Brampton (ASI February 2010).

Heritage Property - 11962 The Gore Rd.

The original cultural heritage impact assessment report was prepared by ASI for Giffels Associates Limited/IBI Group in 2009 as part of the detailed design process for proposed road and sanitary improvements for The Gore Road, from 300m north of Castlemore Road to 1km north of Mayfield Road. This original impact study of 11962 The Gore Road was undertaken in accordance with recommendations contained in the *Class Environmental Study Report: The Gore Road Widening from north of Castlemore Road to north of Mayfield Road*, Regional Municipality of Peel (Unterman McPhail Associates 2006). Results of the background research, field survey, and application of heritage evaluation criteria confirmed that the subject dwelling has high heritage value.

During the study, concerns were expressed for the potential impacts on the heritage property identified at 11962 The Gore Road. In response to those concerns the study team met to discuss specific options for the proposed improvements and impacts at 11962 the Gore Road and develop a roadway cross section that would provide for adequate operation of the intersection at Mayfield Road and minimize negative impacts on adjacent property to the south approach to the intersection on The Gore Road. During this time, Stantec was asked to investigate and develop alternatives for the road cross section in the area immediately adjacent to the St. Patrick's Church and Cemetery and 11962 the Gore Road. The development of alternatives also included a review of the past work undertaken as part of the *Class Environmental Study Report: The Gore Road Widening from north of Castlemore Road to north of Mayfield Road*, Regional Municipality of Peel, R.J Burnside.

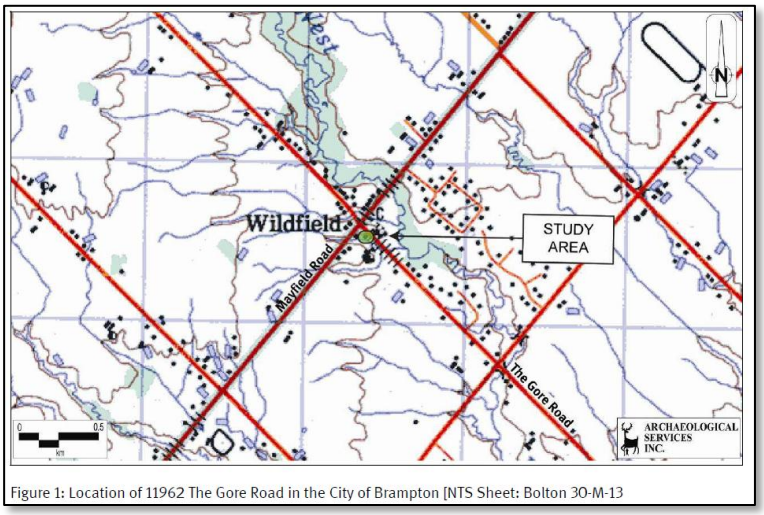


Figure 1: Location of 11962 The Gore Road in the City of Brampton [NTS Sheet: Bolton 30-M-13

The subject location is highlighted on the extracted Figure 1 from the Cultural Heritage Impact Assessment Report prepared for 11962 The Gore Road. The complete

heritage report for 11962 The Gore Road is included in Appendix L.

Stantec developed five cross sections for review and discussion was held on site with the Heritage consultant, Region Transportation Planning Staff, Region Real Estate personnel and The City of Brampton's Heritage coordinator. The sections reviewed are included in Appendix Q and the recommended cross section GS5 is included on the following page.

5.5.8 12052 The Gore Road

The built heritage assessment completed by Archaeological Services Inc. (ASI) in July 2009 identified the property at 12052 The Gore Road as a heritage resource. This resource is located some distance from the proposed works and is not anticipated to be impacted significantly.

The plan layout for this area is also illustrated on Drawing No. P16 of the Preliminary Design Drawings.

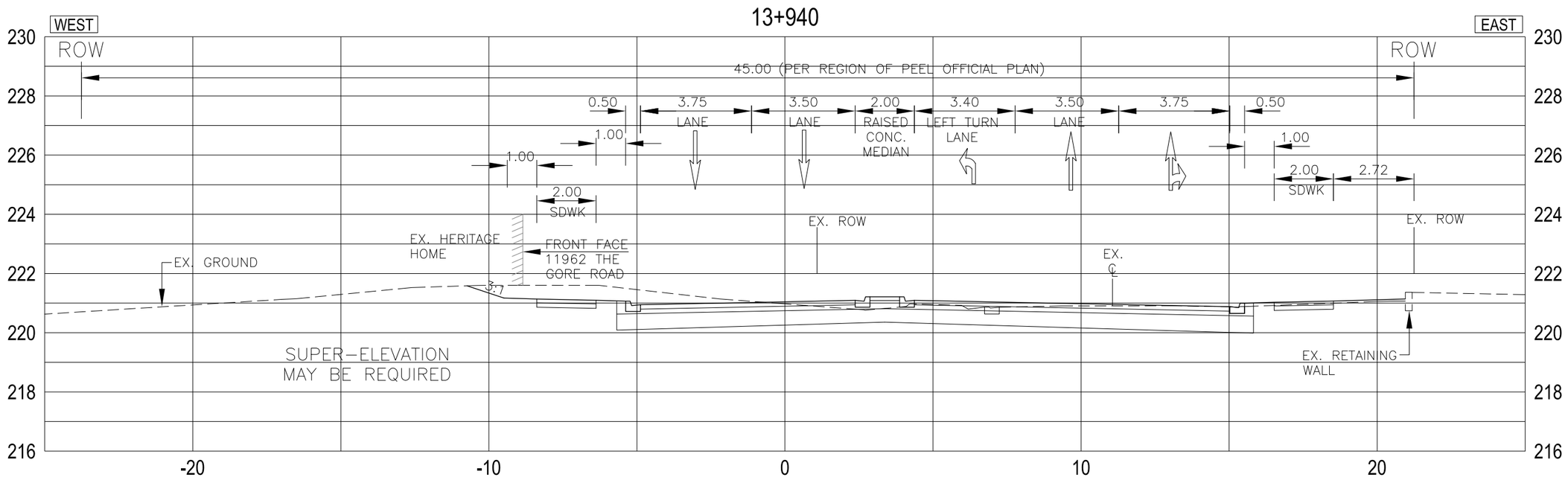
During the heritage review it was concluded that only the main building at 11962 excluding additions is of heritage significance and as such the footprint required for relocation of the structure is much less than the footprint for the entire structure which could not be accommodated on the site without encroaching on lands owned by others.

The intersection of The Gore Road and Mayfield Road presented a unique challenge and constraints to the preliminary design and the study team. The following constraints were identified:

1. Heritage Significance of the building at 11962 the Gore Road: The Cultural and Built Heritage Report identified the building as having heritage significance and required the project team to undertake a Heritage Impact Assessment for the building. The Heritage Impact Assessment was completed and following recommendations were made in order of preference:

    a. Avoid any impacts to the property;
    b. Relocate the building within the property;
    c. Relocate the building within close vicinity of the property; and
    d. If any of the above is not possible, remove the building with appropriate documentation and commemoration at the location for the heritage significance.

2. Potential of unmarked graves within the ROW. The Official Plan ROW for the Gore Road is 45m at this intersection. The recommendation was to undertake a cemetery investigation and relocate graves appropriately if found.



TYPICAL CROSS SECTION FOR 4 LANE INTERIM
CONDITION MATCHING EXISTING EAST CURB WITH
MODIFIED LANE WIDTHS (STA. 13+940)
(SAME AS MAYFIELD ROAD)

Client

Region of Peel
Working for you

Stantec

Scale

1.5m 0 1.5 3.0 4.5m

NOTE: DIMENSIONS SHOWN ARE E/P TO E/P OR LINE MARKING TO LINE MARKING
AS APPLICABLE

MAYFIELD ROAD
AIRPORT ROAD TO COLERAINE DRIVE
CLASS EA STUDY
TYPCIAL CROSS SECTION AT
11962 THE GORE ROAD

Drawn By	Checked By	Drawing No.
W.R.W.	J.C.B.	GS5
Date: 2012-10-19	Project No.: 160210480	

The proposed preliminary design was reviewed and the cross-section reduced to the minimum requirements to reduce the impacts to the extent possible. It was determined that even with the road shifted to the edge of the cemetery on the east side there will be impacts to the building on the west side and that the building will need to be relocated or removed.

In December 2011, Region's staff met with TRCA staff to determine the availability of table land on the property to evaluate possible relocation. The Region's survey crew with the direction of TRCA staff completed a stake-out for the top of bank and minimum off-set required from the bank for the relocation of the building.

The survey information and stake out was overlaid with the building footprint and it was determined that it is not possible to relocate the building on the same property.

The third option is to relocate the building in close vicinity of the site. This option is currently ruled out because it is financially and administratively not appropriate for the Region to undertake this work because:

1. The Region does not have resources to provide and support such initiatives in terms of long term maintenance and function. The property has been broken in to twice and significantly damaged. It is staff's opinion that if this continues the property poses significant hazard to the safety of the neighbouring residents.

2. The Region estimates the cost of relocation to be in the range of 3 to 5 million dollars;

3. The Region will seek, through a public process, opportunities for an organization / group / person will offer the services to relocate and maintain the property at no cost to the Region. This will be undertaken once the EA is filed for public review and approved.

5.5.9 Planned Development

During the study, several development applications were being prepared for developments in Brampton on the south side of Mayfield Road. Planned development along the south side of Mayfield Road near The Gore Road includes the "Vales of the Humber" development for which planning was ongoing during the Mayfield Road environmental study. Contact was made by developer representatives and the study team provided responses where possible to the detailed development inquiries. Feedback and inquiries received included requests for confirmation of storm water management (SWM) provisions, confirmation of SWM facility location, proposed grading and road profile, and entrance considerations associated with proposed developments.

It is anticipated that local developers will have continued interest in the details and timing of the study recommendations and that interest will continue to be pursued through the municipal planning process for the subject developments.

In one case, the study consultant was asked to consider alternative locations and strategies for the proposed SWM facility immediately east of the crossing location (ID No. 8), 400m west of the Gore Road; The requested review culminated in an additional review and meeting with the developer representatives to present the findings of the review. The review concluded that feasible options could include combining the SWM facility with a downstream facility to be constructed within the development, establishing the facility in the location already illustrated on the plans or relocating the facility to an alternate location on the north side of the roadway on lands to be confirmed. The developer expressed a preference for relocation of the facility to a location on the north side of Mayfield Road which is now illustrated on the study plans.

5.5.10 Geomorphology

A Meander Belt and 100 Year Erosion analysis was undertaken in February 2012 and updated by addendum in June 2012 and further in March 2013 to address additional crossing considerations. A summary of the findings is included in Table 2.8.1.1 along with recommendations for treatments at certain culverts and bridges within the study area. The findings of the meander belt analysis are included in detail in the Meander Belt Analysis and 100 Year Erosion Assessment contained in Appendix R.

The meander belt analyses were also used to assist in determining an appropriate crossing structure span of the watercourses at crossings 3 and 11 containing endangered species habitat (Redside Dace). A preliminary review of crossing structures was undertaken to determine the potential cost impacts and the magnitude of the work. The costing summary is included in Appendix R. Based on the stream valley configuration and the meander belt analysis it was determined that spanning the entire valley would be impractical and cost prohibitive. The meander belt widths and buffers are summarized in Table 2.13.1. Following the initial review a reduced crossing span was investigated and confirmed to be more practical and compatible with current undertakings of similar crossings downstream (i.e. Countryside Drive). The results of this review are described in the following sections of this report.

5.6 EVALUATION OF ROAD DESIGN CONCEPTS

5.6.1 Study Approach to the Evaluation of Alternatives

The Municipal Class EA process outlines the typical approach to the evaluation of alternatives. The approach to evaluation of the design alternatives strives to provide an objective assessment of the impacts of the various alternatives to the greatest extent possible and one which provides a quantifiable comparison of impacts and avoids to

the extent possible any subjective assessment which would be open to interpretation or bias of the evaluator.

The evaluation process is intended to be quantitative leading ideally to a clear favorite or preferred alternative which will be recommended for implementation. The evaluations are based on a set of criteria established prior to the evaluation and which are typical of evaluations for projects of a similar nature. The broad categories for the evaluation include the following:

1. Traffic Capacity, Operations and Safety
2. Natural Environment
3. Social Environment
4. Costs

Within each of these broad categories there are several evaluation factors to be considered. The following provides a summary of the typical evaluation criteria.

Table 5.6.1.1 – Evaluation Criteria for Mayfield Road Class EA Study

Study Element	Criteria
1) Traffic Capacity, Operations & Safety	
Existing Traffic	How does the alternative serve the currently volume of vehicular, pedestrian, transit and cycling traffic?
Forecasted Traffic/ Transportation Network	Does the alternative accommodate forecasted traffic to/from existing and future planned developments and properties?
	Will the alternative address the transportation network demand needs and be compatible with other transportation plans?
Safety	Does the alternative address identified traffic safety issues along the corridor or at specific locations?
Access Management	What effect will the alternative have on traffic access to properties fronting on Mayfield Road?
Transportation Demand Management (transit, cycling and pedestrian provisions)	How does the alternative serve future transit, cycling and pedestrian needs?
Emergency Services	How does the alternative affect emergency service response times?

Table 5.6.1.1 – Evaluation Criteria for Mayfield Road Class EA Study	
Study Element	Criteria
2) Natural Environment	
Aquatic Habitat, Fisheries and Surface Water	How does the alternative affect the aquatic life and aquatic habitats contained within the various watercourses crossing Mayfield Road?
Terrestrial Habitat	How does the alternative affect existing vegetation , i.e. trees and woodlots?
Floodplain	What effect would the alternative have on the flood plains of various watercourses?
Wetlands	What impact does the alternative have on any wetlands within the project area?
Trees (Landscaping)	Are there any impacts to existing tree plantings and tree canopies within the study limits?
Wildlife	What are the effects of the alternative on wildlife including species art risk and endangered species?
Property Contamination	Are there any known or potentially contaminated sites that require further investigation, and how will they affect any improvements or land transactions?
Storm Water Management	Are storm water management facilities required and what impact do they have on property requirements and the environment?
3) Social Environment	
Heritage and Archaeological Impacts	What impact does the alternative have on the following: Built Heritage Resources and Features, Cultural Landscapes, and Archaeological significance?
Cultural & Recreational	Are there any cultural or recreational institutions within the project area that may be affected by the alternative?
Business Impacts	How would the alternative affect existing businesses and how will businesses be affected during construction?
Construction Impacts	Is it constructible? How long will construction take?
Streetscaping	Can the alternative incorporate streetscaping features to maintain and enhance the character of the community?
	How Does the alternative impact residential and commercial properties along the corridor?

Table 5.6.1.1 – Evaluation Criteria for Mayfield Road Class EA Study	
Study Element	Criteria
Private Property Impacts	How much property will be required, if any , for the alternative?
Air Quality & Noise	What effect does the alternative have on air quality and noise levels within the project area?
4) Costs	
Utility Relocation	What would be the extent of impacts on existing utilities that must be relocated and/or protected to construct the alternative?
Initial Capital Cost	What is the initial capital cost of the alternative?
Restoration/Environmental Cost	What are the costs as a result of restoration or compensation as a result of loss of the environmental habitat?

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5.6.2 Evaluation of the Road Design Concepts (Design Alternatives)

The tables presented on the following pages provide a simplified summary of the evaluation and evaluation scores for the various roadway improvements concepts that were considered. Details of the specific evaluations are included in the project files.

Table 6.6.2.1 – Evaluation of Design Alternatives

NOTE: ALL ALTERNATIVES INCLUDE WIDENING MAYFIELD ROAD TO SIX LANES, A CENTRE TWO WAY LEFT TURN LANE AND MEDIAN ISLANDS AT INTERSECTIONS

EVALUATION CRITERIA	DESIGN CONCEPT NO. 1 WIDENING EQUALLY ABOUT EXISTING CENTRELINE	DESIGN CONCEPT NO. 2 WIDENING TO THE NORTH	DESIGN CONCEPT NO. 3 WIDENING TO THE SOUTH	DESIGN CONCEPT NO. 4 MODIFIED "EQUAL WIDENING CONCEPT" TO MINIMIZE PROPERTY IMPACTS
LEGEND:	**LEAST PREFERRED ○ (0 Pts.) ◔ (1 Pts.) (2 Pts.) ◕ (3 Pts.) MOST PREFERRED ● (4 Pts.)**			
1. Traffic Capacity, Operations, Safety				
Existing Traffic How does the alternative serve the current volume of vehicular, pedestrian and cycling traffic?	● A widened Mayfield Road including multi-use trail on south side and sidewalk on north side will serve the current vehicle, pedestrian and cycling needs			
Forecasted Traffic/ Transportation Network Does the alternative efficiently and safely handle the forecasted traffic?	● Six (6) through lanes plus turn lanes will handle forecasted traffic volumes to 2031			
Safety Does the alternative address identified traffic safety issues along the corridor or at specific locations?	● Centre two-way left turn lane provided in all locations except near intersections, where dedicated turn lanes are provided Vertical profile improvements proposed to address sight distance issues Widening and reconstruction of roadway to address pavement condition			
Access Management What effect will the alternative have on traffic access to properties fronting on Mayfield Road?	● All existing accesses maintained with full left and right turn access by means of a centre two-way left turn lane, except near intersections where the centre median is required to minimize turning conflicts near intersections/traffic signals.			
Transportation Demand Management **Transit** How does the alternative serve future transit needs?	● Proposed transit volumes incorporated into traffic forecasts. Proposed transit stops incorporated into design.			
Cycling How does the alternative serve future cycling needs?	● 3 metre wide multi-use cycling trail to be constructed on south side of new Mayfield Road right-of-way			
Pedestrians How does the alternative serve future pedestrian traffic needs?	● Room for sidewalk to be constructed on north side of right-of-way			
Emergency Services How does the alternative improve Emergency Service Response times?	● Emergency response times will improve due to additional lanes and related reductions in delays/congestion.			

Table 6.6.2.1 – Evaluation of Design Alternatives

NOTE: ALL ALTERNATIVES INCLUDE WIDENING MAYFIELD ROAD TO SIX LANES, A CENTRE TWO WAY LEFT TURN LANE AND MEDIAN ISLANDS AT INTERSECTIONS

EVALUATION CRITERIA	DESIGN CONCEPT NO. 1 WIDENING EQUALLY ABOUT EXISTING CENTRELINE	DESIGN CONCEPT NO. 2 WIDENING TO THE NORTH	DESIGN CONCEPT NO. 3 WIDENING TO THE SOUTH	DESIGN CONCEPT NO. 4 MODIFIED "EQUAL WIDENING CONCEPT" TO MINIMIZE PROPERTY IMPACTS
LEGEND:	**LEAST PREFERRED ○ (0 Pts.) ◔ (1 Pts.) ◑ (2 Pts.) ◕ (3 Pts.) MOST PREFERRED ● (4 Pts.)**			
Traffic Score	32 Points	32 Points	32 Points	32 Points
2. Natural Environment				
Aquatic Habitat, Fisheries, and Surface Water How does the alternative affect the aquatic life and aquatic habitats contained within the various watercourses crossing Mayfield Road?	◑ Culvert widening is required on both sides of Mayfield Road, and has slightly more impact on aquatic habitat than a widening to one side. However overall impacts to streams are similar for all alternatives. All impacts can be mitigated.	● Culvert widening is only required on north side of Mayfield Road, and has slightly less impact on aquatic habitat than all the other alternatives widening to one side. However overall impacts to streams are similar for all alternatives. All impacts can be mitigated.	◕ Culvert widening is only required on south side of Mayfield Road, and has slightly more impact on aquatic habitat than Concept 2. However overall impacts to streams are similar for all alternatives. All impacts can be mitigated.	◑ Culvert widening is required on both sides of Mayfield Road, and has slightly more impact on aquatic habitat than a widening to one side. However overall impacts to streams are similar for all alternatives. All impacts can be mitigated.
	◑ Culvert/bridge widening will require approval from TRCA Will require mitigation of impacts to redside dace at some watercourses			
Terrestrial Habitat (Natural) How would the alternative affect existing vegetation (i.e. trees & woodlots) and bird/animal habitat within the project area?	● No impacts to significant woodland areas or vegetation communities. Vegetation removal is limited to cultural woodland or cultural thicket communities and landscape trees.			
Floodplain What effect would the alternative have on the flood plain of various watercourses?	◑ Culvert widening will occur on both sides of Mayfield Road	◕ Culvert widening will occur on north side of Mayfield Road only.	◕ Culvert widening will occur on south side of Mayfield Road only.	◑ Culvert widening will occur on both sides of Mayfield Road
	◑ All alternatives including culvert widening and replacements will have impacts on the floodplains and will require TRCA approval. Twelve (12) culvert replacements required			
Wetlands What impacts does the alternative have on any evaluated wetlands within the project area?	◔ Several non-provincially significant wetland pockets will be impacted by all alternatives. This alternative has slightly more impacts to wetlands than Concept 2 (widening to the north). All impacts are mitigable.	◕ Several non-provincially significant wetland pockets will be impacted by all alternatives. This alternative has slightly less impacts to wetlands than the other Concepts. All impacts are mitigable	◔ Several non-provincially significant wetland pockets will be impacted by all alternatives. This alternative has slightly more impacts to wetlands than Concept 2 (widening to the north). All impacts are mitigable.	◔ Several non-provincially significant wetland pockets will be impacted by all alternatives. This alternative has slightly more impacts to wetlands than Concept 2 (widening to the north). All impacts are mitigable.

Table 6.6.2.1 – Evaluation of Design Alternatives

NOTE: ALL ALTERNATIVES INCLUDE WIDENING MAYFIELD ROAD TO SIX LANES, A CENTRE TWO WAY LEFT TURN LANE AND MEDIAN ISLANDS AT INTERSECTIONS

EVALUATION CRITERIA	DESIGN CONCEPT NO. 1 WIDENING EQUALLY ABOUT EXISTING CENTRELINE	DESIGN CONCEPT NO. 2 WIDENING TO THE NORTH	DESIGN CONCEPT NO. 3 WIDENING TO THE SOUTH	DESIGN CONCEPT NO. 4 MODIFIED "EQUAL WIDENING CONCEPT" TO MINIMIZE PROPERTY IMPACTS
LEGEND:	**LEAST PREFERRED ○ (0 Pts.) ◔ (1 Pts.) (2 Pts.) ◕ (3 Pts.) MOST PREFERRED ● (4 Pts.)**			
	◑ Hydrogeological impacts are similar for all alternatives, and are mitigable.			
Trees (Landscaping) Are there any impacts to existing tree plantings and tree canopy within the project area?	● Least impact on individual property landscaping.	◑ More impact on Individual property landscaping as compared to Concepts1 & 4.	More impact on Individual property landscaping as compared to Concepts1 & 4.	● Least impact on individual property landscaping.
	● No significant existing landscape trees on existing road allowance. Trees that need to be removed can be replaced during construction, with enhanced plantings.			
Wildlife What are the effects of the alternative on "Species At Risk/Endangered Species" within the project area?	◑ Will require mitigation of impacts to redside dace in three of the tributaries, if the streambed is disturbed. These measures include Improved water quality through SWM and enhanced erosion control, restore riparian vegetation cover through the planting of overhanging grasses, shrubs, etc., and undertake no in-water work between September 15th and June 30th.			
Property Contamination Are there any known or potentially contaminated sites that require further investigation, and how will they affect any improvements?	◑ Gas Station at North East corner of Mayfield & The Gore Road is impacted, and property is required from them. Additional ESA Investigation required. No other contaminated properties identified, but additional ESA's should be undertaken where potential environmental impacts are suspected, based on historic land uses.			
Storm Water Management Are stormwater management ponds required?	● A combination of 5 storm water management (SWM) ponds and 8 oil/grit separators are planned.			
	◑ A total of 4.20 ha of private property is required for SWM ponds	◑ A total of 3.86 ha of private property are required for SWM ponds.	◑ A total of 4.03 ha of private property is required for SWM ponds	◑ A total of 4.63 ha of private property is required for SWM ponds
Natural Environment Score	33 Points	36 Points	33 Points	33 Points

Table 6.6.2.1 – Evaluation of Design Alternatives

NOTE: ALL ALTERNATIVES INCLUDE WIDENING MAYFIELD ROAD TO SIX LANES, A CENTRE TWO WAY LEFT TURN LANE AND MEDIAN ISLANDS AT INTERSECTIONS

EVALUATION CRITERIA	DESIGN CONCEPT NO. 1 WIDENING EQUALLY ABOUT EXISTING CENTRELINE	DESIGN CONCEPT NO. 2 WIDENING TO THE NORTH	DESIGN CONCEPT NO. 3 WIDENING TO THE SOUTH	DESIGN CONCEPT NO. 4 MODIFIED "EQUAL WIDENING CONCEPT" TO MINIMIZE PROPERTY IMPACTS
LEGEND:	**LEAST PREFERRED ○ (0 Pts.) ◔ (1 Pts.) (2 Pts.) ◕ (3 Pts.) MOST PREFERRED ● (4 Pts.)**			
3. Social Environment				
Heritage and Archaeological Impacts What impact does the alternative have on the following; Built Heritage Resources and Features, Cultural Heritage Landscapes and Archaeological Impacts?	◑ St. Patrick's Cemetery not impacted. Stage 3 investigation (test dig) will be completed before the detailed design phase. Character of "Historic Settlement of Wildfield" will be impacted due to removal of some existing houses, but plaque/entrance feature can be incorporated into the design. 11962 and 12052 The Gore Road (BHF) will be impacted the same by all alternatives as the cross section on the South and north legs of The Gore Road must provide for future traffic volumes and as such is increased to four lanes with turn lanes. The options including relocation are discussed in the HIA. 12031 The Gore Road (BHF) is closer to the new road for all alternatives.			
Encroachment on St. Patrick's Cemetery at Mayfield Road Frontage	◔ 2nd most encroachment on St. Patrick's Cemetery due to shift to south within corridor.	◑ 2nd least encroachment on St. Patrick's Cemetery due to shift to north within corridor.	○ Most encroachment on St. Patrick's Cemetery due to shift to south within corridor.	● Least encroachment on St. Patrick's Cemetery due to modified lanes and shift to north within corridor.
Cultural & Recreational Are there any cultural or recreational institutions with the project area that may be affected by this alternative?	◑ St. Patrick's Church will be in construction zone, but access can be maintained during construction. No other cultural or recreational impacts are anticipated.			
Business Impacts How will the alternative affect existing businesses, and how will businesses be affected during construction Any businesses affected by a particular alternative?	● Less Impact on business properties than Concept No.2	◑ Property requirements intrude into parking lot of business at northeast corner of Mayfield/Innis Lake Rd.	● Less Impact on business properties than Concept No.2	● Less Impact on business properties than Concept No.2
	◑ Gas Station near Northeast corner of Mayfield/The Gore Road is severely impacted by all alternatives, and a full buyout is anticipated. Traffic projections have incorporated anticipated traffic from future developments in the area. Less congestion may improve overall future access to businesses. Will be disruption during construction but access will be maintained.			
Construction Impacts Is it constructible and how long will construction take?	◑ Traffic will be able to be maintained by constructing the north side, then the south side (or vice versa) while maintaining traffic on existing pavement or newly constructed pavement. Construction will likely proceed in stages (i.e. between major intersection possibly one block at a time), with construction taking approximately 1+ year for each stage.			

Table 6.6.2.1 – Evaluation of Design Alternatives

NOTE: ALL ALTERNATIVES INCLUDE WIDENING MAYFIELD ROAD TO SIX LANES, A CENTRE TWO WAY LEFT TURN LANE AND MEDIAN ISLANDS AT INTERSECTIONS

EVALUATION CRITERIA	DESIGN CONCEPT NO. 1 WIDENING EQUALLY ABOUT EXISTING CENTRELINE	DESIGN CONCEPT NO. 2 WIDENING TO THE NORTH	DESIGN CONCEPT NO. 3 WIDENING TO THE SOUTH	DESIGN CONCEPT NO. 4 MODIFIED "EQUAL WIDENING CONCEPT" TO MINIMIZE PROPERTY IMPACTS
LEGEND:	**LEAST PREFERRED ○ (0 Pts.) ◔ (1 Pts.) (2 Pts.) ◕ (3 Pts.) MOST PREFERRED ● (4 Pts.)**			
Streetscaping Can the alternative incorporate streetscaping features to maintain and enhance the character of the community?	● Opportunities for Streetscaping exist within the new designated road allowance including plantings, decorative paving materials, decorative streetlights, etc.			
Private Property Impacts • How does the alternative impact the residential and commercial properties along the corridor? • How much property will be required?	◑ 23 existing buildings are impacted the majority of which may require a complete buyout. Including buyouts, the total of impacted property is 27.98 ha of which 16.49 ha is to accommodate the works including 4.20 ha for SWM ponds, enhanced swales and culvert extensions. Portions of 137 Private Properties need to be purchased.	○ 33 existing buildings are impacted the majority of which may require a complete buyout. Including buyouts, the total of impacted property is 40.62 ha of which 17.11 ha is to accommodate the works including 3.86 ha for SWM ponds, enhanced swales and culvert extensions. Portions of 104 Private Properties need to be purchased.	◔ 22 existing buildings are impacted the majority of which may require a complete buyout. Including buyouts, the total of impacted property is 39.67 ha of which 18.08 ha is to accommodate the works which includes 4.03 ha for SWM ponds, enhanced swales and culvert extensions. Portions of 83 Private Properties need to be purchased.	◕ 16 existing buildings are impacted the majority of which may require a complete buyout. Including buyouts, the total of impacted property is 22.63 ha of which 18.18 ha is to accommodate the works which includes 5.43 ha for SWM ponds, enhanced swales and culvert extensions. Portions of 133 Private Properties need to be purchased.
Air Quality & Noise What effect does the alternative have on air quality and noise within the project area?	◑ A reduction in overall traffic delay and related vehicle idling will result in reduced exhaust air emissions and, as a result, should provide improved overall Air quality. Predicted Noise levels will increase due to projected traffic volume and will increase only marginally as a result of road widening. Predicted increase is 1 to 2 dB due to build-out scenario; All options are the same in the area of existing development at Maissoneuve Boulevard.			
Social Score	21 Points	18 Points	19 Points	25 Points

Table 6.6.2.1 – Evaluation of Design Alternatives

NOTE: ALL ALTERNATIVES INCLUDE WIDENING MAYFIELD ROAD TO SIX LANES, A CENTRE TWO WAY LEFT TURN LANE AND MEDIAN ISLANDS AT INTERSECTIONS

EVALUATION CRITERIA	DESIGN CONCEPT NO. 1 WIDENING EQUALLY ABOUT EXISTING CENTRELINE	DESIGN CONCEPT NO. 2 WIDENING TO THE NORTH	DESIGN CONCEPT NO. 3 WIDENING TO THE SOUTH	DESIGN CONCEPT NO. 4 MODIFIED "EQUAL WIDENING CONCEPT" TO MINIMIZE PROPERTY IMPACTS
LEGEND:	**LEAST PREFERRED ○ (0 Pts.) ◔ (1 Pts.) (2 Pts.) ◕ (3 Pts.) MOST PREFERRED ● (4 Pts.)**			
4. Costs				
Utility Impacts What would be the extent of impacts on existing utilities that must be relocated and/or protected to construct the alternative?	◔ Hydro/Communication poles on both sides of Mayfield Rd. Approximately 195 Hydro poles will have to be relocated under this alternative at approx. cost of approx. $975,000.	◑ Hydro/Communication poles on both sides of Mayfield Rd. Approximately 120 Hydro poles will have to be relocated under this alternative at approx. cost of approx. $600,000.	◑ Hydro/Communication poles on both sides of Mayfield Rd. Approximately 125 Hydro poles will have to be relocated under this alternative at approx. cost of approx. $625,000.	◔ Hydro/Communication poles on both sides of Mayfield Rd. Approximately 190 Hydro poles will have to be relocated under this alternative at approx. cost of approx. $935,000.
	◑ No significant impacts to existing underground gas lines, watermains, sewers or communications cables, anticipated other than minor relocations, adjustments to manholes, etc.			
Initial Capital Cost What is the estimated initial capital cost of the alternative? (including utility relocations and property acquisition/ decommissioning)	Preliminary Cost Estimate including the following: • Property Acquisition • Utility Relocations • Road and Drainage Works • Signals/Illumination/ ● • Roadside Protection and Line Markings • Bridges & Culvert Extensions and Replacement • Landscaping/Trails/Sidewalks • Engineering **TOTAL (Excl. HST) $107,047,000**	Preliminary Cost Estimate including the following: • Property Acquisition • Utility Relocations • Road and Drainage Works • Signals/Illumination/ ◑ • Roadside Protection and Line Markings • Bridges & Culvert Extensions and Replacement • Landscaping/Trails/Sidewalks • Engineering **TOTAL (Excl. HST) $125,913,000**	Preliminary Cost Estimate including the following: • Property Acquisition • Utility Relocations • Road and Drainage Works • Signals/Illumination/ ◕ • Roadside Protection and Line Markings • Bridges & Culvert Extensions and Replacement • Landscaping/Trails/Sidewalks • Engineering **TOTAL (Excl. HST) $117,898.000**	Preliminary Cost Estimate including the following: • Property Acquisition • Utility Relocations • Road and Drainage Works • Signals/Illumination/ ● • Roadside Protection and Line Markings • Bridges & Culvert Extensions and Replacement • Landscaping/Trails/Sidewalks • Engineering **TOTAL (Excl. HST) $106,421,000**
Total Cost Score	7 Points	6 Points	7 Points	7 Points
Total Overall Score	93 Points	92 Points	91 points	97 Points

5.7 PREFERRED DESIGN ALTERNATIVE

Based on the detailed evaluation of four (4) roadway design concepts developed and as part of the process to develop a reasonable and practical solution to the project need & justification, it was concluded that **"Concept 4 – Modified Widening of Mayfield Road about the Centerline"** with some additional refinements presented the best overall technical solution to the problem of increasing traffic and the need to manage that traffic within the community while reducing or limiting the potential for impacts on the local environment and the community. Impacts considered included the direct impact of encroachments on adjacent land, heritage resources, and the natural environment as a result of infrastructure expansion and related works, including consideration of the relative cost of doing so.

"Concept 4 – Modified Widening of Mayfield Road about the Centerline" with some additional refinements presented the best overall technical solution to the problem of increasing traffic…

Each of the alternatives considered in the detailed evaluation included the following basic elements:

- Improvements were considered on Mayfield Road in the defined study area section from Airport Road to Coleraine Drive, an approximate distance of 7.0 km;
- Expansion from the existing two lane rural section to a semi urban section with four lanes in the interim and then subsequent expansion from four lanes to an ultimate six lanes by the design horizon of 2031/2032;
- Initial urbanization of the roadway at the south side of Mayfield Road in the City of Brampton;
- Semi-urban cross section in the interim period and a full urban cross section to current design standards in the ultimate time frame. Semi-urban section includes shoulders and roadside swale/ditching on the North side of Mayfield Road in the Town of Caledon, where practical
- A continuous centre two way left turn lane in the interim design and provision for an access controlled full height median in the ultimate conditions as area build out occurs;
- Four 3.75 m wide lanes and a continuous 6.0 m wide left turn lane in the interim design with raised medians only at intersections until commercial build out occurs (see plans for lane width variations at Wildfield);

- Six 3.75 m wide lanes and a continuous 6.0 m wide left turn lane in the ultimate design with provision for replacement with raised medians throughout as individual single family residential properties are compiled and the area develops (see plans for lane width variations at Wildfield);

- 3.0 m paved multi-use trail in the boulevard on the south side of Mayfield Road in the City of Brampton;

- 1.5 m wide concrete sidewalk in the boulevard on the north side of Mayfield Road in the Town of Caledon. It must be note that the Region's 2012 Active Transportation Plan recommends a 3.0 m Multi-Use Path on both sides of Mayfield Road in the study area. The potential for a Multi-Use Path on both sides of Mayfield Road will be investigated further by the Region during the Detailed Design phase of the project;

- Roadside landscaping and trees compatible with the Region of Peel Streetscaping Toolbox and Town of Caledon and City of Brampton landscaping guidelines;

- Provision for landscaped entrance features in the settlement of Wildfield if possible;

- Replacement or extension of various culverts and bridges and extension of other culverts and bridges as required to accommodate watercourse crossings, fisheries and wildlife needs;

- Right and left turn lanes and storage at intersections;

- Provisions for dedicated Transit stops and landing areas at selected locations for westbound and eastbound transit movements;

- Transit stops for north south roadway will require further detailed study as part of separate improvements projects for those roadways;

- Roadside storm sewer drainage system and enhanced swale outlets;

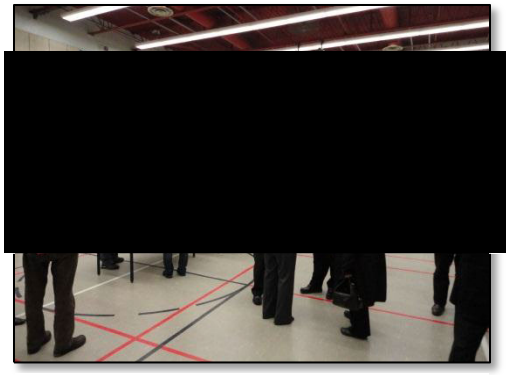
- Roadside storm water management quantity and quality control features including five (5) SWM basins and numerous enhanced roadside swales and Oil Grit Separator (OGS) treatment trains for road run-off quality control at watercourse crossings with direct outlets to the watercourse.

The preferred design alternative was confirmed following the detailed evaluation of design alternatives and review of the alternatives by the study team. The preferred alternative was then formalized and presented to the public for review and comment at Public Information Centre No.2.

5.8 PUBLIC AND AGENCY CONSULTATION

5.8.1 General

A second Public Information Centre (PIC) meeting was advertised in the Brampton Guardian and Caledon Enterprise new publications and was held on Wednesday, November 16, 2011 from 6:30 pm to 8:30 pm at the St. Patrick Separate School at 11948 The Gore Road (due to an excellent attendance and participation the session was extended to 9:00 pm to ensure all attendees had opportunity for one on one dialogue). The format used was an informal drop in style Open House venue. Staff from the project consultant, the Region of Peel and various representatives from the Local municipalities attended and responded to questions from the Public. Also in attendance were local politicians who participated in one on one and small group discussion with the attendees.



Attendance at PIC #2

There were fifty (50) persons who officially signed in the attendance register and there were several groups of people who arrived together and possibly did not sign in individually but signed in as one representative of the family or group. Attendees and participants were greeted and encouraged to sign in the open house register to document their attendance and to request additional mailing and notifications of the study progress. A copy of each of the sign-in books is retained in the project files and not included herewith to maintain privacy of the personal contact information provided.

5.8.2 Public and Agency Notification

Various agencies, members of the public, residents and all directly affected property owners within the project limits were invited to attend the Public Information Centre, view the presentation displays, ask questions and provide their input and comments at and following the Public Open house. Agencies that had expressed ongoing interest in the study following the initial contact points in the study and similarly all members of the Public requesting ongoing information as a well as all directly affected property owners were sent a direct notification by regular mail and/or e-mail if an active e-mail address was provided. Approximately 155 property owners received a direct mailing invitation to the Public Information Centre #2. Returned mailings were further researched and where possible corrected addresses were used to resend or forward notices. A summary list of

Various agencies, members of the public, residents and all directly affected property owners within the project limits were invited to attend the Public Information Centre

agencies and members of the public contacted are included in the project files and a summary list of the agencies and their addresses are included in Appendix C along with a copy of the comment and correspondences received. Where appropriate, e-mail communications have also been included.

In addition to direct notices, public notices were placed in the Brampton Guardian and Caledon Enterprise newspapers prior to the Public Information Centre and the notice was also posted on the Region of Peel's website. Copies of the newspaper notices are included in Appendix C.

5.8.3 Public Comments - Public Information Centre No. 2

There were seven (7) official comment forms submitted at and following the November 16, 2011 Public Information Centre. The comment forms received have been included in Appendix C and a summary compilation of comments is provided in the table accompanying the Appendix. A summary of the comments received is included here in Table 5.8.3.1. Redacted responses from individuals are included in the appendices and original copies of all formal public responses are included in the project files.

Table 5.8.3.1 – Public Comments - PIC No.2

Respondent	Comments	Action/Response
Representing 6[redacted]	Resident with direct access to Mayfield Road. Uses Mayfield road weekly, No comments regarding evaluations, Concerns about noise, tree impacts and planting	The traffic noise impact assessment and plans illustrating tree impacts and grading are included in the appendices and study report. Provide notice of study completion and opportunity for review of the ESR.
Interested resident, Town of Caledon	Resident of Caledon with property near [redacted] Planning to build house in the area. Interested to receive additional information on future study	Provide notice of study completion and opportunity for review of the ESR.
Representing [redacted]	Resident with direct access to Mayfield Road. Uses Mayfield road daily. Has property on [redacted] (No comments or, concerns	Provide notice of study completion and opportunity for review of the ESR.

Table 5.8.3.1 – Public Comments - PIC No.2		
Respondent	**Comments**	**Action/Response**
	noted)	
Unknown respondent, Resident of Brampton	Uses Mayfield Road weekly. Concerned about noise pollution,. Air pollution, sound barriers and effects on kids, Hydro Poles, Air brake signs,	The traffic noise impact assessment and plans illustrating hydro impacts and grading provisions are included in the appendices and study report. Provide notice of study completion and opportunity for review of the ESR.
Representing [redacted]	City of Brampton resident uses Mayfield Road Daily. Comments: 1. Bus alcoves or bus bays to reduce traffic slowdowns? 2.Noise and debris barriers?	Bus bays are illustrated on the plans according to City of Brampton requirements, noise impacts have been investigated and noise barriers would only be provided where warranted under current noise policy.
Representing [redacted]	City of Brampton Resident with direct access onto Mayfield Road uses Mayfield Road daily. (No comments or, concerns noted)	Provide notice of study completion and opportunity for review of the ESR.
Representing [redacted]	Town of Caledon Resident with direct access onto Mayfield Road, uses Mayfield Road daily. (No comments or, concerns noted)	Provide notice of study completion and opportunity for review of the ESR.

5.8.4 Agency Comments

Official comments were received from various agencies during the course of the study and through participation in the various project meetings and presentations. The following table summarizes the extracted comments from the agencies and where applicable, a response to the actions arising is provided.

Table 5.8.3.2 – Agency Comments - PIC No.2		
Agency	**Comments**	**Action/Response**
Peel District School Board	Please continue to keep the board informed of the status of this project and provide us with nay information you have available so that we may monitor its progress and provide comments as necessary.	Continue communications with the Peel District School Board and provide notice of study completion.
Toronto Area Conservation Authority (TRCA)	Comments on PIC #2 display boards provided prior to PIC. Additional detailed comments provided in response to project specific communications regarding SWM, culverts and drainage provisions.	Continue communications with the TRCA representatives, circulate draft of ESR to invite comments and provide notice of study completion.
Ministry of Natural Resources (MNR)	Comments provided through meeting with MNR personnel. Concerns expressed regarding potential impacts on Redside Dace habitat. Culvert extensions in Reside Dace protected habitat will not be accepted. Project Team referred to "*DRAFT Guidance for Development activities in Redside Dace Protected Habitat, February 2011*".	Project team will review and respond to MNR concerns through additional reviews and assessment of impacts at specific water crossings C3, C6 and C11. Practical enlarged replacement water crossing structures will be considered. Continue communications with the MNR representatives, circulate draft of ESR to invite comments and provide notice of study completion.
City of Brampton Heritage Planning	Comments on PIC #2 display boards provided prior to PIC. (No specific comments from PIC #2)	Continue communications with the City of Brampton representatives, circulate draft of ESR to invite comments and provide notice of study completion.
Town of Caledon	Comments on PIC #2 display boards provided prior to PIC. (No specific comments from PIC #2)	Continue communications with the Town of Caledon representatives, circulate draft of ESR to invite comments and provide notice of study completion.
Ministry of the	Confirmation of interest provided following	Address various comments

Table 5.8.3.2 – Agency Comments - PIC No.2		
Agency	**Comments**	**Action/Response**
Environment	Notice of Study Commencement.	through studies and assessments throughout the Class EA and continue communications with representatives of the Environmental Assessment Branch of the MOE, circulate draft of ESR to invite comments and provide notice of study completion.
Ministry of Aboriginal Affairs	Response to Region of Peel inquiry regarding First Nations and Metis interests in the project.	Continue communications with the various aboriginal groups to invite comments and provide notice of study completion.
Hydro One Networks Inc.	Response to Region of Peel communication of December 22, 2010 requesting estimate of costs for Hydro relocations.	No response was received by the conclusion of the study.

5.9 DESIGN CONCEPT RECOMMENDATION

Based on the evaluation of alternatives, agency feedback, supplementary technical reviews, minor refinements and presentation of the preferred design concept to the public at PIC No. 2 the preferred design alternative is as described in preceding Section 5.7. The Recommended Design Concept is further described with additional detail in Section 6.0 of this report.

6.0 Recommended Design Concept

6.1 DESCRIPTION OF RECOMMENDED DESIGN CONCEPT

Following a comprehensive evaluation process, the study team has confirmed the Recommended Design Alternative is "Concept 4 – Modified Widening of Mayfield Road about the Centerline". The recommended Design Concept was developed based on the various discussions, comments, investigations, studies, etc. undertaken as part of the Class Environmental Assessment Study. Figures 6.1.1.1 and 6.1.1.2 illustrate the proposed road cross section with and without median.

Following a comprehensive evaluation process, the study team has confirmed the Recommended Design Alternative is "Concept 4 – Modified Widening of Mayfield Road about the Centerline"

Figure 6.1.1 – Landscape Cross Section – Ultimate 6 Lanes Without Median

Figure 6.1.2 – Landscape Cross Section – Ultimate 6 Lanes With Median

The Recommended Design Concept is illustrated in the foldout plans included accompanying this section and is described in more detail as follows:

6.1.1 Mayfield Road – Airport Road to Maisonneuve Boulevard

Details of this section include:

Current rural cross section of two lanes plus turn lanes is upgraded to four lanes plus turn lanes with a continuous 6.0 m wide two-way left turn lane (TWTL) in the interim phase (prior to 2017) and further upgraded in the ultimate phase (prior to 2032) to six (6) lanes with turning lanes, continuous two way left turn lane. This may also include the recommended replacement of the TWTL with raised median based on adjacent area development progression. Within this section is one culvert crossing TRCA ID No. 1 and a SWM facility on the north side at Sta. 11+600 and pedestrian facilities at both sides (1.5 m concrete sidewalk on north side and 3.0 m asphalt multi-use trail on the south side). The potential for a multi-use trail on the north side will also be investigated during the detailed design phase which is recommended in the Region's 2012 Active Transportation Plan.

External roadside drainage at crossing No. 1 is captured and conveyed within a closed storm sewer system connecting to the south side and outlet directly to the watercourse on the east side Maisonneuve Boulevard.

The preliminary design for this section of Mayfield Road is represented on drawings No. P1A through P2B and a typical cross section is provided as Figure CS1-1.

Ultimate Intersection Configuration:

Airport Road:

Eastbound – three through lanes

Westbound – three through lanes

Westbound Left Turn Lane - 125 m storage/parallel lane

Westbound Right Turn Lane - 60 m storage/parallel lane

Maisonneuve Boulevard:

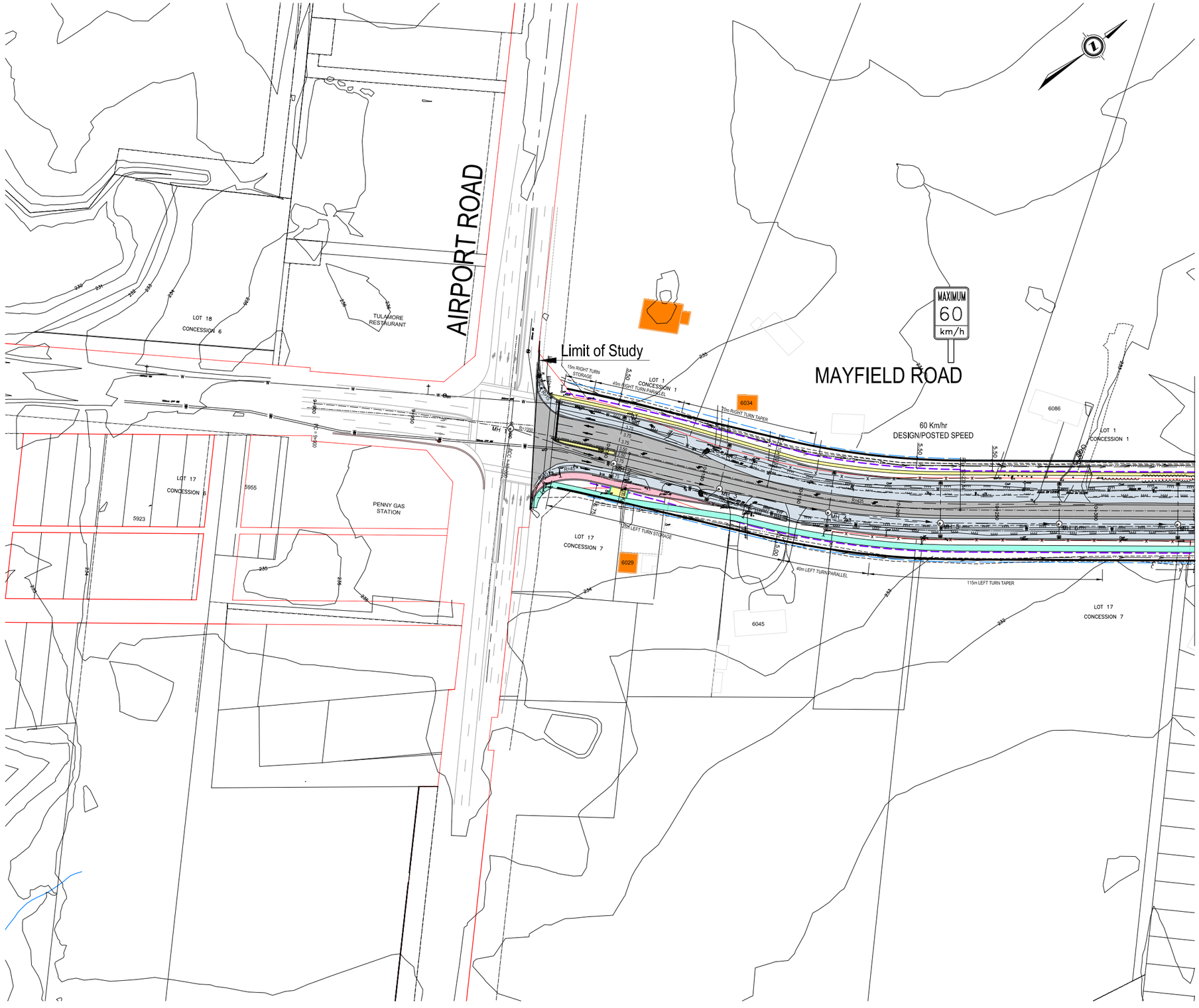
Eastbound – three through lanes

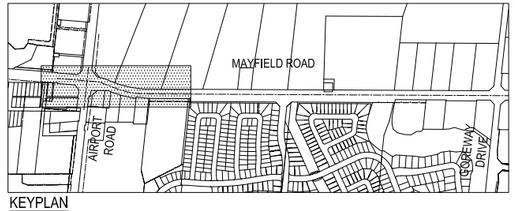
Westbound – three through lanes

Westbound Left Turn Lane – 50/40 m storage/parallel lane

Eastbound Right Turn Lane - 30/45 m storage/parallel lane

Initial construction of the four lane section will be skewed to the south with a full urban cross section on the south side and a semi-rural section retained on the north side. Deferral of the north side sidewalk may be considered subject to confirmation with the Town of Caledon.





KEYPLAN

LEGEND

- EXISTING RIGHT OF WAY
- PROPOSED RIGHT OF WAY
- APPROXIMATE GRADING LIMIT
- CALCULATED CLEAR ZONE INDICATING MINIMUM DISTANCE FROM EDGE OF PAVEMENT FOR HYDRO POLE LOCATION.
- MINIMUM OFFSET FOR GUYING EASEMENT BASED ON POLES LOCATED A MINIMUM CLEAR ZONE OFFSET FROM EDGE OF PAVEMENT. (5.0m "HYDRO ONE BRAMPTON" - SOUTHSIDE, 5.5m "HYDRO ONE NETWORKS" - NORTH SIDE.)
- 3 TRCA WATERCOURSE DESIGNATION
- OVERLAND FLOW DIRECTION
- POTENTIAL PROPERTY LINE 3.5m FROM CLEAR ZONE REQUIREMENTS
- EXISTING PAVEMENT
- PROPOSED PAVEMENT
- PROPOSED CONCRETE MEDIANS, SIDEWALKS & BUS PADS
- PROPOSED 3.0m MULTI-USE PATHWAY
- PROPOSED CONC. BUS BAY
- PROPOSED PROPERTY ACQUISITION OUTSIDE OF RIGHT OF WAY
- BUILT HERITAGE FEATURE
- FUTURE SIGNALIZED INTERSECTION

Scale

20m 0 20 40 60m HORIZONTAL SCALE

2m 0 2 4 6m VERTICAL SCALE

Stantec

Client

Region of Peel
Working for you

Drawing Title

MAYFIELD ROAD
AIRPORT ROAD TO COLERAINE DRIVE
CLASS EA STUDY REPORT
RECOMMENDED DESIGN ALTERNATIVE
PLAN
STA. 10+000 TO STA. 10+350

Drawn By	Checked By	Drawing Number
W.R.W.	J.C.B.	P1A
Date	Project No.	
2012-10-17	160210480	

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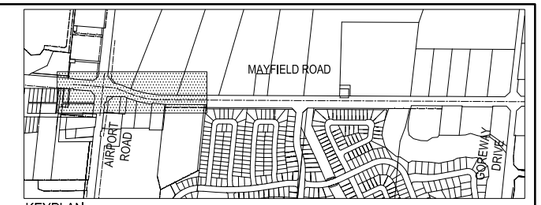

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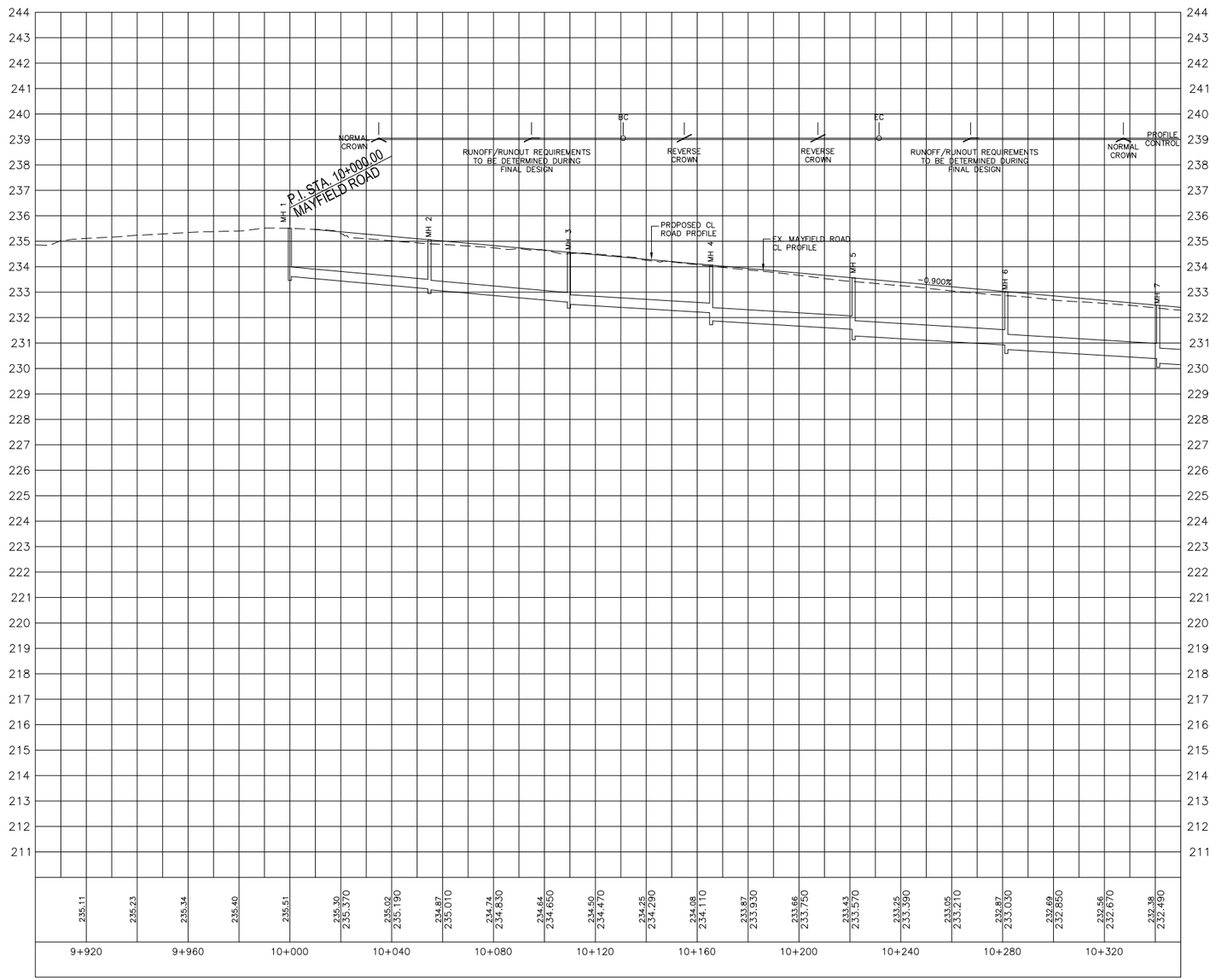

Scale

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2m 0 2 4 6m VERTICAL SCALE

Stantec

Client

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Drawing Title

MAYFIELD ROAD
AIRPORT ROAD TO COLERAINE DRIVE
CLASS EA STUDY REPORT
RECOMMENDED DESIGN ALTERNATIVE
PROFILE
STA. 10+000 TO STA. 10+350

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Date	Project No.	
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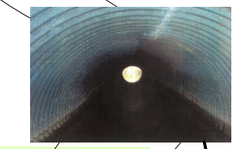
MATCHLINE STA. 10+350
SEE DRAWING P1A

FUTURE LEFT TURN LANE
TO BE CONFIRMED DURING
PLANNING PROCESS

FUTURE 6.0m
CONTINUOUS
RAISED MEDIAN

EX. 1200mm DIA. CSP
REPLACE WITH
675mm CONC. STM

SWMF 1
STORM WATER
MANAGEMENT
FACILITY REQUIRED
(+/- 0.65ha)



RE-ALIGN CREEK TO SUIT
CULVERT EXTENSION

EX. 1800mm x 2500mm
ELLIPTICAL CSP CULVERT
REPLACE WITH 1800mm DIA. CSP

FUTURE RIGHT TURN LANE
REQUIRED. UTILITIES TO BE
DESIGNED ACCORDINGLY

MAXIMUM 60 km/h

60 Km/hr
DESIGN/POSTED SPEED

LOCATION OF
POTENTIAL FUTURE
DEVELOPMENT ACCESS

MAYFIELD ROAD

LOT 1 CONCESSION 1

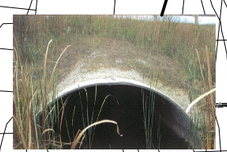
LOT 17 CONCESSION 7

MAISSONEUVE BLVD

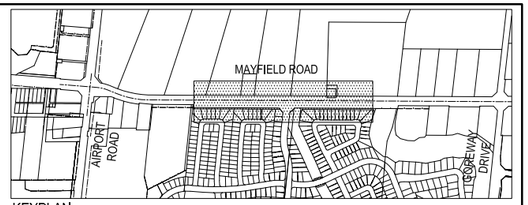
RE-ALIGN CREEK TO SUIT
CULVERT EXTENSION

INSTALL RIP RAP AS
REQUIRED (TYP.)

INSTALL HEADWALL
AS REQUIRED



MATCHLINE STA. 14+350
SEE DRAWING P3A



KEYPLAN

LEGEND

- EXISTING RIGHT OF WAY
- PROPOSED RIGHT OF WAY
- APPROXIMATE GRADING LIMIT
- CALCULATED CLEAR ZONE INDICATING MINIMUM DISTANCE FROM EDGE OF PAVEMENT FOR HYDRO POLE LOCATION.
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- PROPOSED CONC. BUS BAY
- PROPOSED PROPERTY ACQUISITION OUTSIDE OF RIGHT OF WAY
- BUILT HERITAGE FEATURE
- FUTURE SIGNALIZED INTERSECTION

Scale

20m 0 20 40 60m HORIZONTAL SCALE

2m 0 2 4 6m VERTICAL SCALE

Stantec

Client

Region of Peel
Working for you

Drawing Title

MAYFIELD ROAD
AIRPORT ROAD TO COLERAINE DRIVE
CLASS EA STUDY REPORT
RECOMMENDED DESIGN ALTERNATIVE
PLAN
STA. 10+350 TO STA. 14+350

Drawn By	Checked By	Drawing Number
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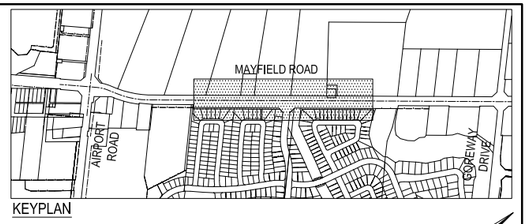

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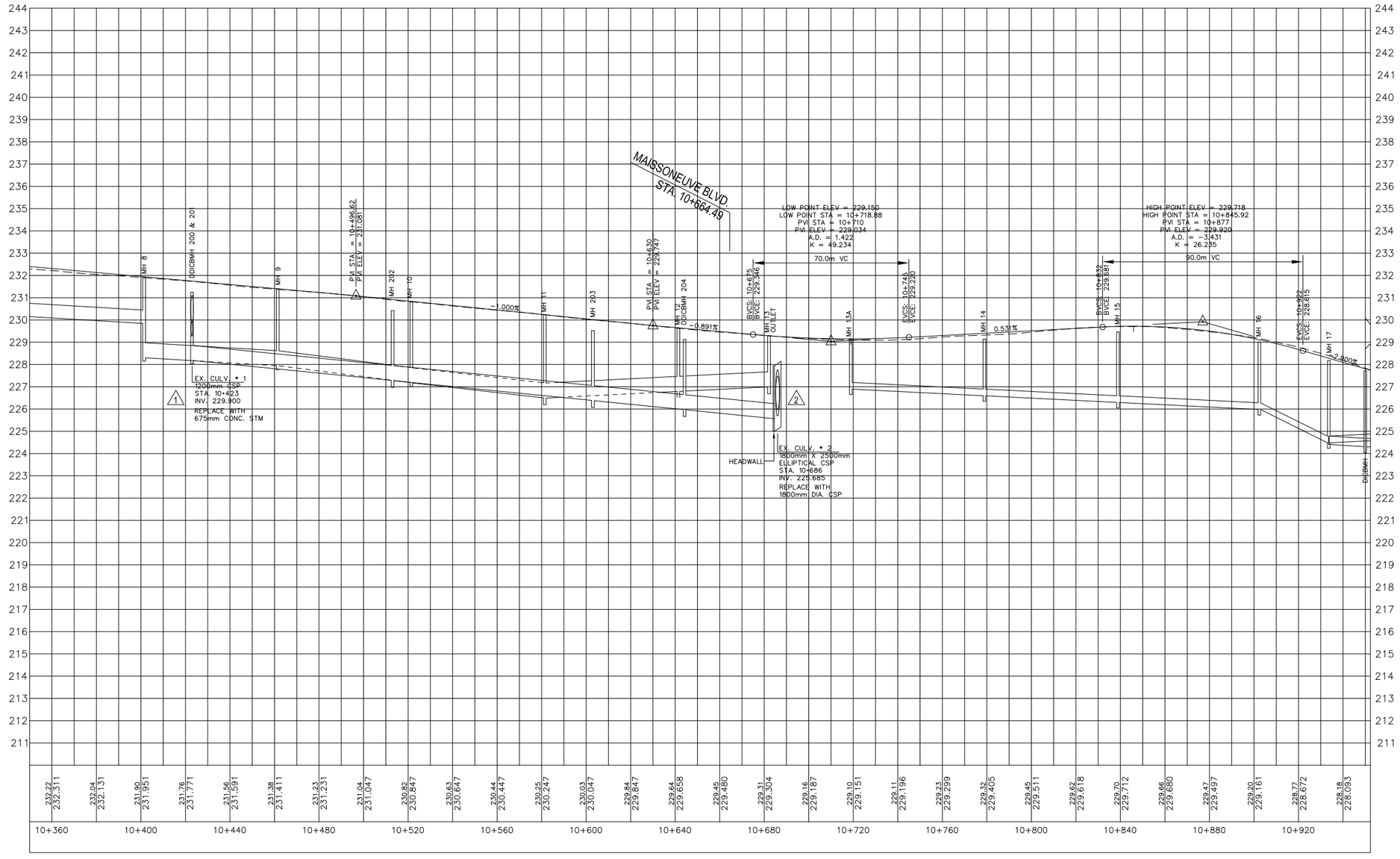

Scale

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2m 0 2 4 6m VERTICAL SCALE

Stantec

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STA. 10+350 TO STA. 14+350

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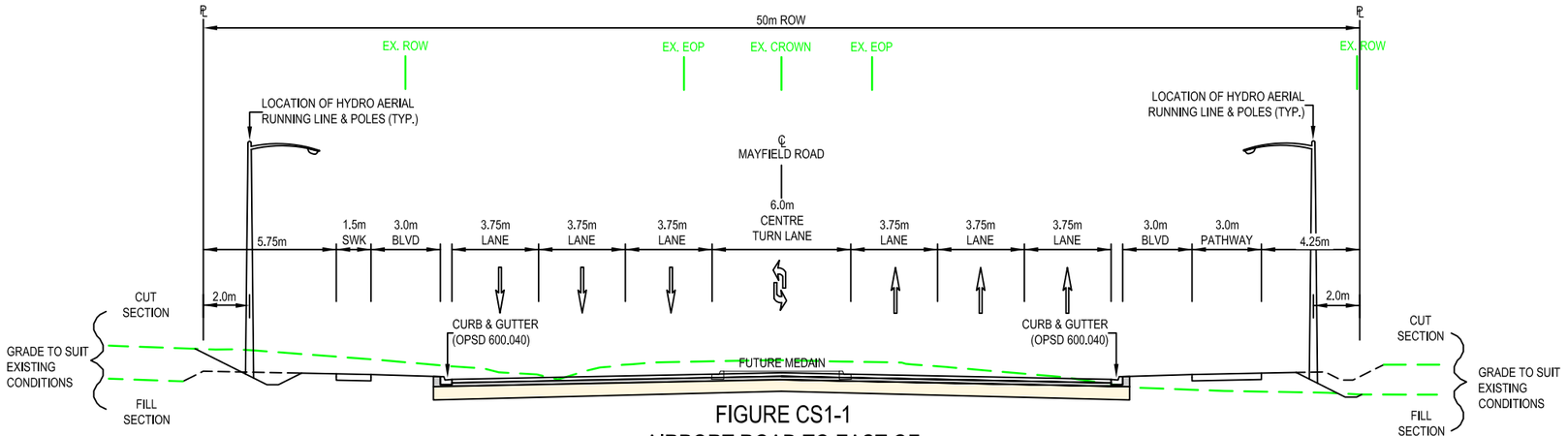

FIGURE CS1-1
AIRPORT ROAD TO EAST OF
GOREWAY DRIVE/INNIS LAKE ROAD

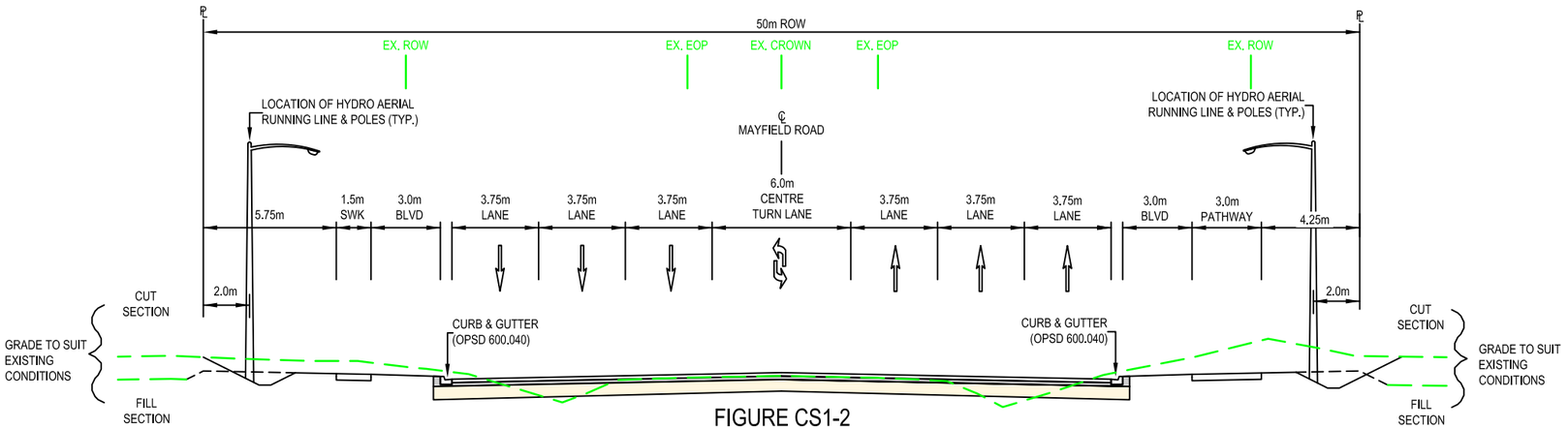

FIGURE CS1-2
EAST OF GOREWAY DRIVE/INNIS LAKE
ROAD TO EAST OF THE GORE ROAD

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Client

Region of Peel
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Drawing Title

MAYFIELD ROAD
AIRPORT ROAD TO COLERAINE DRIVE
CLASS EA STUDY REPORT
RECOMMENDED DESIGN ALTERNATIVE
"DESIGN CONCEPT 4 MODIFIED"
EQUAL WIDENING CONCEPT
TO MINIMIZE PROPERTY IMPACTS

Drawn By	Checked By	Drawing Number
W.R.W.	J.C.B.	CS1
Date	Project No.	
2012-10-17	160210480	

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2012/10/17 10:52 AM by:white, bill (kitchener)

6.1.2 Mayfield Road – Maisonneuve Boulevard to Goreway Drive/Innes Lake Road

Details of this section include:

Current rural cross section of two lanes plus turn lanes is upgraded to four lanes plus turn lanes with a continuous 6.0 m wide two-way left turn lane (TWTL) in the interim phase (prior to 2017) and further upgraded in the ultimate phase (prior to 2032) to six (6) lanes with turning lanes, continuous two way left turn lane. This may also include recommended replacement of the TWTL with raised median based on adjacent area development progression. Within this section there are two creek crossings TRCA ID No. 2 and 3, and pedestrian facilities at both sides (1.5 m concrete sidewalk on north side and 3.0 m asphalt multi-use trail on the south side). The potential for a multi-use trail on the north side will also be investigated during the detailed design phase which is recommended in the Region's 2012 Active Transportation Plan.

The preliminary design for this section of Mayfield Road is represented on drawings No. P2A through P3B and a typical cross section is provided as Figure CS1-1.

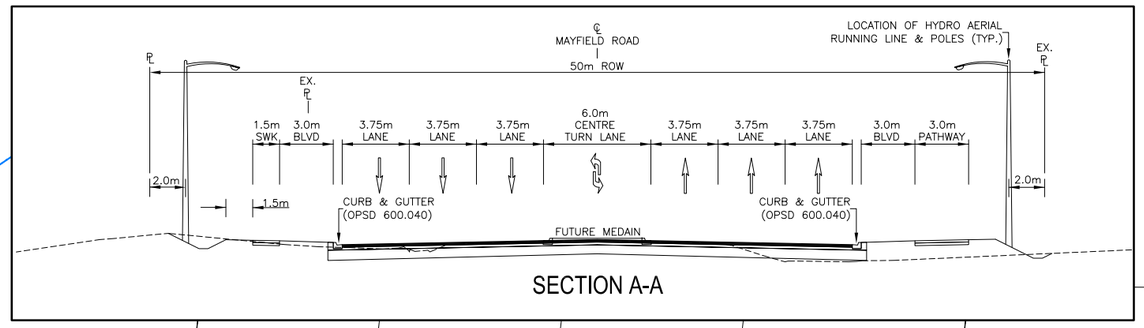
Ultimate Intersection Configuration:

Goreway Drive/Innes Lake Road:

Eastbound – three through lanes
Eastbound left turn lane – 50/60 m storage/parallel
Eastbound right turn lane – 30/45 m storage/parallel
Westbound – three through lanes
Westbound left turn lane – 40/80 m storage/parallel
Westbound right turn lane – 30/45 m storage/parallel
Northbound – one through lanes
Northbound left turn lane - 60 m storage*
Northbound right turn lane - 40 m storage*
Southbound – one through lane
Southbound left turn lane – 15/25 m storage

* Dimensions in accordance with approved 2007 Class EA Study of Goreway Drive completed by URS Canada Inc. for the City of Brampton

Initial construction of the four lane section will be skewed to the south with a full urban cross section on the south side and a semi-rural section retained on the north side. Deferral of the north side sidewalk may be considered subject to confirmation with the Town of Caledon.



SECTION A-A

BUS BAY (TYP.)

REPLACE EXISTING 9000mm x 2600mm CONC. RIGID FRAME OPEN WITH 18400mm x 3000mm CONC. SINGLE SPAN.

MATCHLINE STA. 10+950
SEE DRAWING P2A

MAYFIELD ROAD

FUTURE 6.0m CONTINUOUS RAISED MEDIAN

INNIS LAKE ROAD

145m LEFT TURN TAPER

MAXIMUM 60 km/h

MAXIMUM 80 km/h

RELOCATION OF ACCESS TO INNIS LAKE ROAD TO BE INVESTIGATED (#6520). MEDIAN ISLAND TO BE EXTENDED IF ACCESS IS RELOCATED.

60 Km/hr DESIGN SPEED

90 Km/hr DESIGN SPEED

LOT 1 CONCESSION 1

LOT 1 CONCESSION 2

LOT 17 CONCESSION 7

LOT 17 CONCESSION 8

115m LEFT TURN TAPER

40m LEFT TURN PARALLEL

35m LEFT TURN STORAGE

25m LEFT TURN PARALLEL

15m RIGHT TURN STORAGE

70m RIGHT TURN PARALLEL

75m RIGHT TURN TAPER

60m RIGHT TURN TAPER

45m RIGHT TURN PARALLEL

30m RIGHT TURN STORAGE

40m LEFT TURN STORAGE

60m LEFT TURN PARALLEL

6404 6420 6434 6520 6524 6443 6461 6539 11937

STORM SEWER OUTLET (PROPOSED OIL/GRIT SEPARATOR)

STORM SEWER OUTLET (PROPOSED OIL/GRIT SEPARATOR)

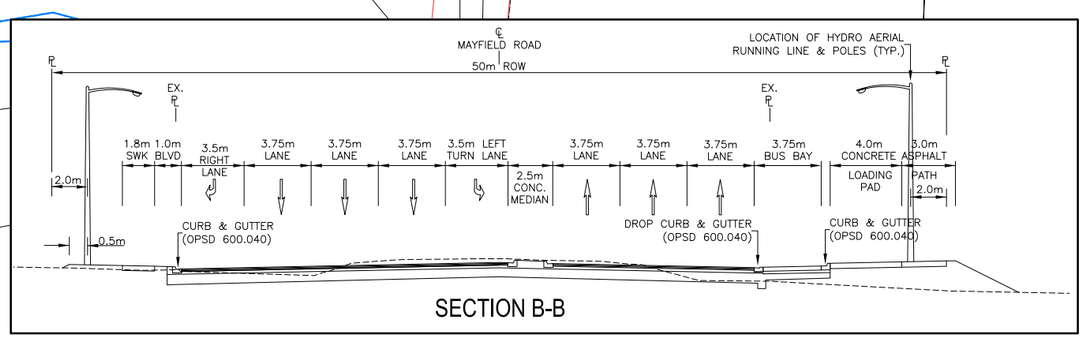
SALT CREEK

GOREWAY DRIVE

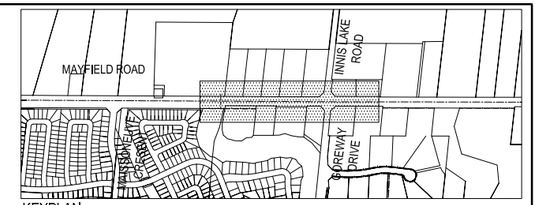
NOTE: REDSIDE DACE HABITAT INDENTIFIED AND TO BE PROTECTED IN ACCORDANCE WITH THE REQIREMENTS OF THE ENDANGERED SPECIES ACT.

FOR ADDITIONAL DETAILS ON PROPOSED LANE CONFIGURATION REFER TO GOREWAY DRIVE CLASS E.A. SEPTEMBER 2007 PREPARED BY URS CANADA INC. FOR CITY OF BRAMPTON

MATCHLINE STA. 11+550
SEE DRAWING P4A



SECTION B-B



KEYPLAN

LEGEND

- EXISTING RIGHT OF WAY
- PROPOSED RIGHT OF WAY
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- CALCULATED CLEAR ZONE INDICATING MINIMUM DISTANCE FROM EDGE OF PAVEMENT FOR HYDRO POLE LOCATION.
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- OVERLAND FLOW DIRECTION
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- PROPOSED PROPERTY ACQUISITION OUTSIDE OF RIGHT OF WAY
- BUILT HERITAGE FEATURE
- FUTURE SIGNALIZED INTERSECTION

Scale

20m 0 20 40 60m HORIZONTAL SCALE

2m 0 2 4 6m VERTICAL SCALE

Stantec

Client

Region of Peel
Working for you

Drawing Title

MAYFIELD ROAD
AIRPORT ROAD TO COLERAINE DRIVE
CLASS EA STUDY REPORT
RECOMMENDED DESIGN ALTERNATIVE
PLAN
STA. 10+950 TO STA. 11+550

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Date	Project No.	
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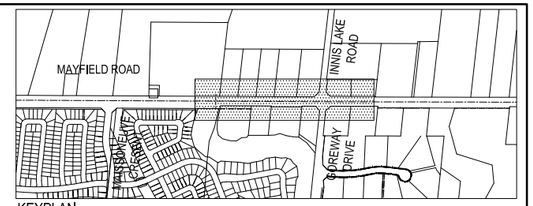

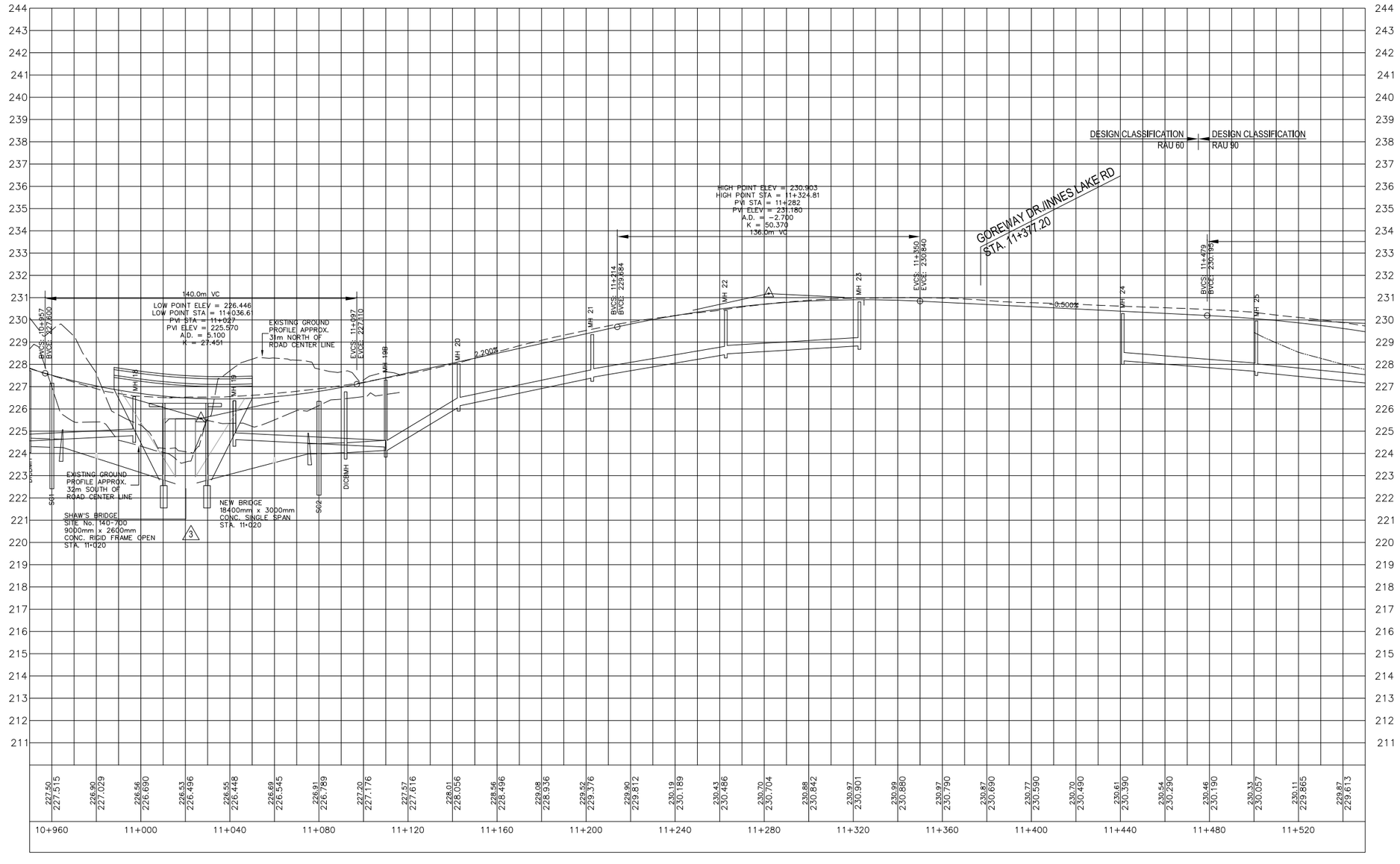

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Stantec

Client

Region of Peel
Working for you

Drawing Title

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CLASS EA STUDY REPORT
RECOMMENDED DESIGN ALTERNATIVE
PROFILE
STA. 10+950 TO STA. 11+550

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Date	Project No.	
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2013/4/4 2:18 PM by:white, bill (kitchener)

The culvert at crossing No. 2 is replaced and realigned with a new 1800 mm CSP culvert and the crossing No. 3 (Redside Dace habitat) is replaced with a new bridge structure with a minimum span of 18.4 m. Oil and grit separators (OGS) are provided east and west of crossing No. 3 on the south side.

Road drainage is directed to OGS units and enhanced swales at Crossing No. 3 via a new closed storm sewer system within the roadway.

6.1.3 Mayfield Road – Goreway Drive/Innes Lake Road to McVean Drive/Centreville Creek Drive

Details of this section include:

Current rural cross section of two lanes plus turn lanes is upgraded to four lanes plus turn lanes with a continuous 6.0 m wide two-way left turn lane (TWTL) in the interim phase (prior to 2017) and further upgraded in the ultimate phase (prior to 2032) to six (6) lanes with turning lanes, continuous two way left turn lane. This may also include recommended replacement of the TWTL with raised median based on adjacent area development progression. Within this section are also four creek crossings TRCA ID No. 4, 5, 6 and 7, a SWM facility at Sta. 12+350 and pedestrian facilities at both sides (1.5m concrete sidewalk on north side and 3.0 m asphalt multi-use trail on the south side). The potential for a multi-use trail on the north side will also be investigated during the detailed design phase which is recommended in the Region's 2012 Active Transportation Plan.

The preliminary design for this section of Mayfield Road is represented on drawings No. P3A through P6B and a typical cross section is provided as Figure CS1-2.

Ultimate Intersection Configuration:

McVean Drive/Centreville Creek Drive:

Eastbound – three through lanes
Eastbound left turn lane – 50/60 m storage/parallel
Eastbound right turn lane – 15/70 m storage/parallel
Westbound – three through lanes
Westbound left turn lane - 65/60 m storage/parallel
Westbound right turn lane – 15/70 m storage/parallel
Northbound – one through lanes
Northbound left turn lane – 15/25 m storage/parallel
Southbound – one through lanes
Southbound left turn lane – 15/25 m storage/parallel

The City of Brampton confirmed the following design improvements were proposed at the Goreway Road Intersection since the original study commenced. Plans were requested but had not provided at the time of this writing:

- West side of Goreway has 3m multi use path.
- East side of Goreway has 1.5m conc sidewalk.
- Centre median is 1.5m (Edge of pavement to edge of pavement) on crossroads w/OPSD 600.080 curb. (City of Brampton Standard)

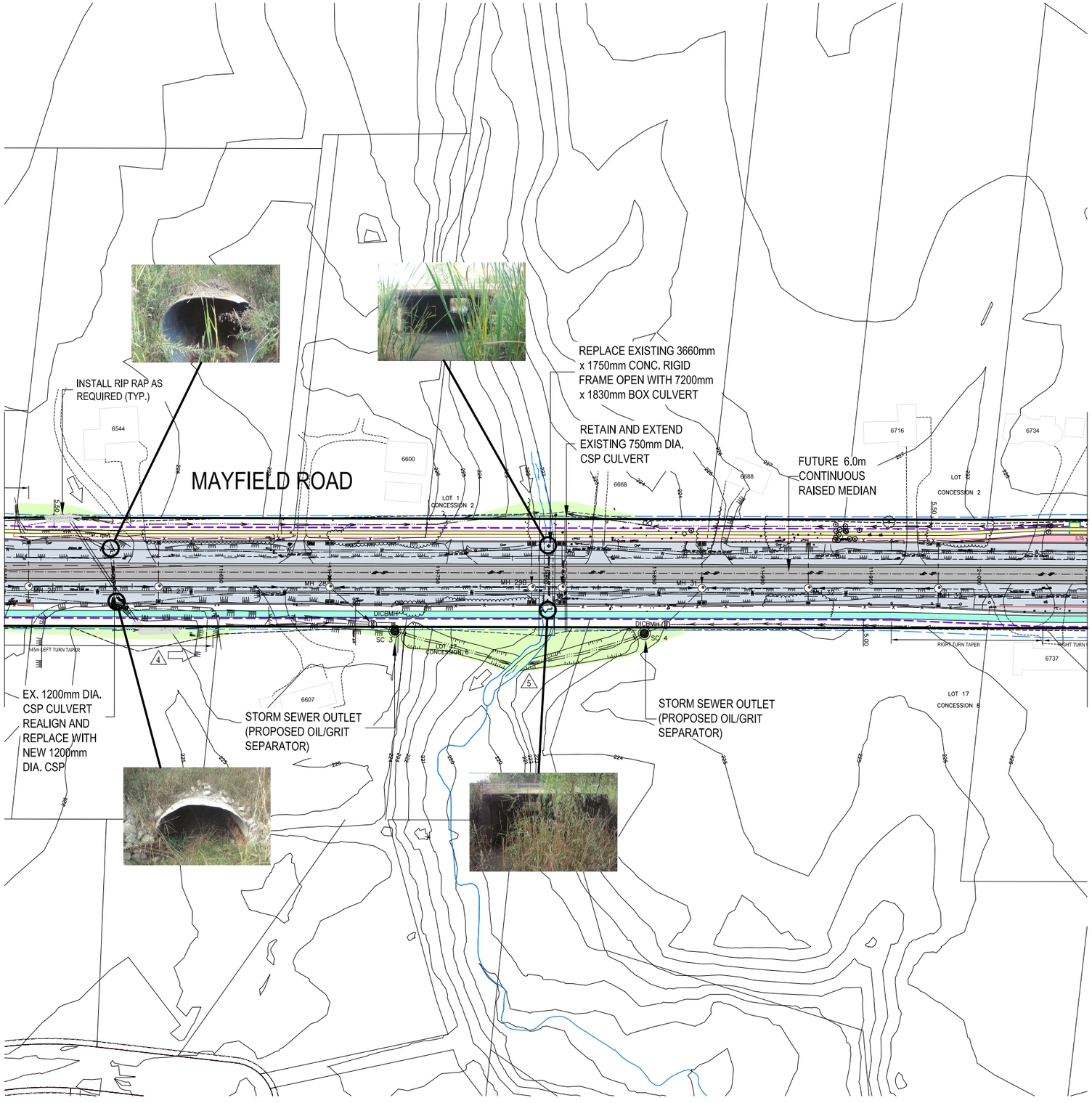
The above details will need to be confirmed with the City of Brampton during the detailed design phase.

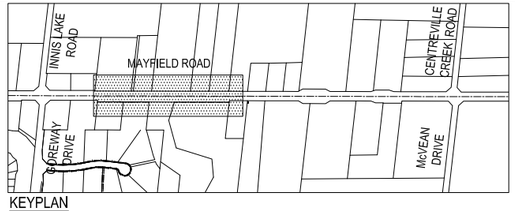
Reorientation of the driveway on the northeast corner at No.6520 Mayfield Road to a new location on Innes Lake Road should be considered.

Initial construction of the four lane section will be skewed to the south with a full urban cross section on the south side and a semi-rural section retained on the north side. Deferral of the north side sidewalk may be considered subject to confirmation with the Town of Caledon.

The culvert at crossing No. 4 is replaced and realigned with a new 1200 mm CSP culvert, the culvert at crossing No. 5 is replaced with a new 7200 x 1830 mm concrete culvert with open bottom, and the existing 5500 x 1950 mm open bottom concrete culvert at crossing No. 6 is extended to the right-of-way limit. The culvert at crossing No. 7 is replaced with a new 1950 mm CSP culvert. Oil and grit separators (OGS) are provided east and west of crossing No. 5 on the south side.

Road drainage at the west end is directed to OGS units and enhanced swales at Crossing No. 5 via a new closed storm sewer system within the roadway and at the east end is directed to the SWM facility east of crossing No. 6.





KEYPLAN

LEGEND

- EXISTING RIGHT OF WAY
- PROPOSED RIGHT OF WAY
- APPROXIMATE GRADING LIMIT
- CALCULATED CLEAR ZONE INDICATING MINIMUM DISTANCE FROM EDGE OF PAVEMENT FOR HYDRO POLE LOCATION.
- MINIMUM OFFSET FOR GUYING EASEMENT BASED ON POLES LOCATED A MINIMUM CLEAR ZONE OFFSET FROM EDGE OF PAVEMENT. (5.0m "HYDRO ONE BRAMPTON" - SOUTHSIDE, 5.5m "HYDRO ONE NETWORKS" - NORTH SIDE.)
- TRCA WATERCOURSE DESIGNATION
- OVERLAND FLOW DIRECTION
- POTENTIAL PROPERTY LINE 3.5m FROM CLEAR ZONE REQUIREMENTS
- EXISTING PAVEMENT
- PROPOSED PAVEMENT
- PROPOSED CONCRETE MEDIANS, SIDEWALKS & BUS PADS
- PROPOSED 3.0m MULTI-USE PATHWAY
- PROPOSED CONC. BUS BAY
- PROPOSED PROPERTY ACQUISITION OUTSIDE OF RIGHT OF WAY
- BUILT HERITAGE FEATURE
- FUTURE SIGNALIZED INTERSECTION

Scale

20m 0 20 40 60m HORIZONTAL SCALE

2m 0 2 4 6m VERTICAL SCALE

Stantec

Client

Region of Peel
Working for you

Drawing Title

MAYFIELD ROAD
AIRPORT ROAD TO COLERAINE DRIVE
CLASS EA STUDY REPORT
RECOMMENDED DESIGN ALTERNATIVE
PLAN
STA.11+550 TO STA. 12+050

Drawn By	Checked By	Drawing Number
W.R.W.	J.C.B.	P4A
Date	Project No.	
2012-10-17	160210480	

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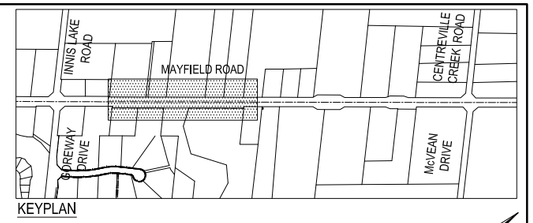

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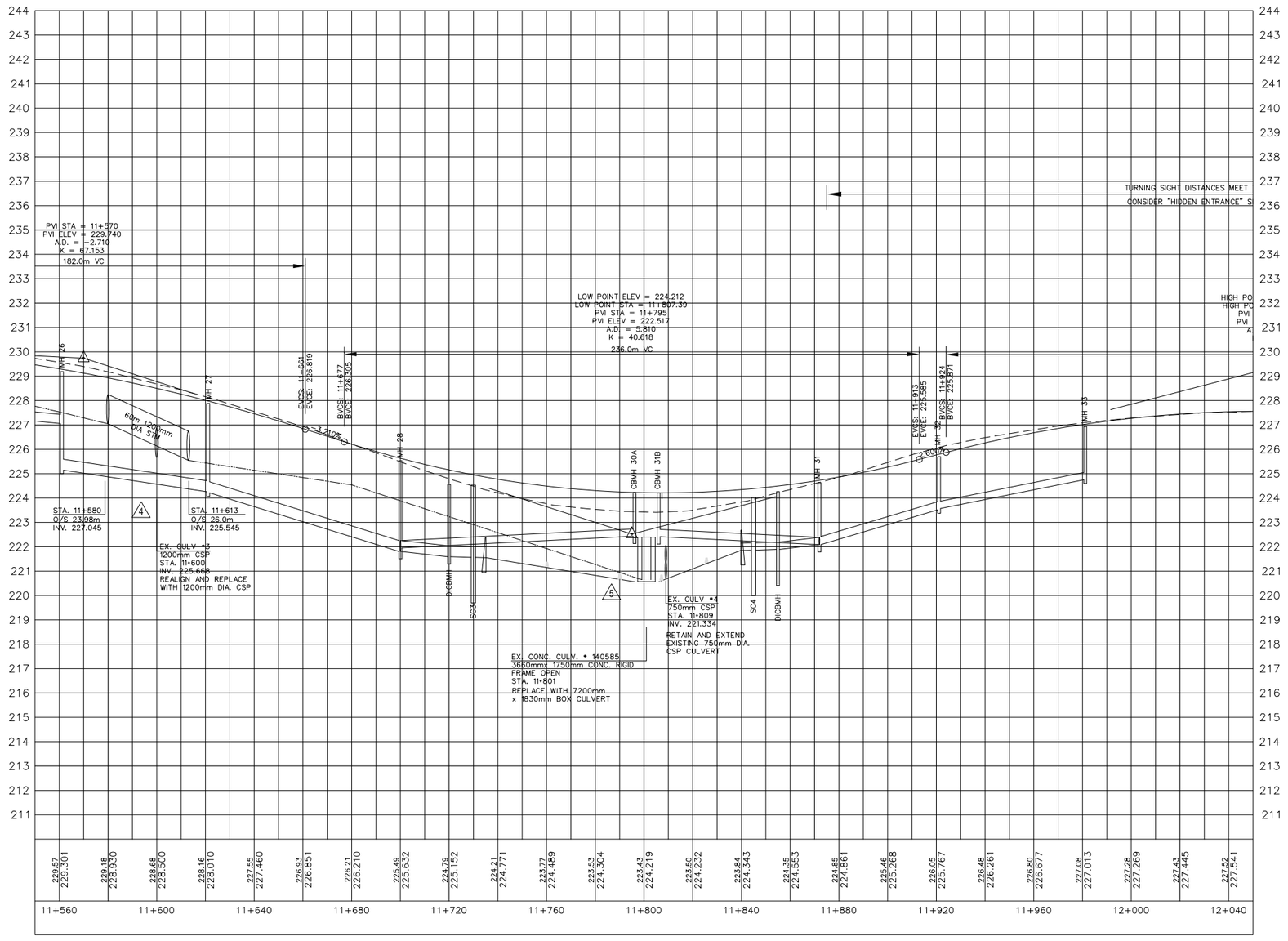

Scale

20m 0 20 40 60m HORIZONTAL SCALE

2m 0 2 4 6m VERTICAL SCALE

Stantec

Client

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Working for you

Drawing Title

MAYFIELD ROAD
AIRPORT ROAD TO COLERAINE DRIVE
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PROFILE
STA.11+550 TO STA. 12+050

Drawn By	Checked By	Drawing Number
W.R.W.	J.C.B.	P4B
Date	Project No.	
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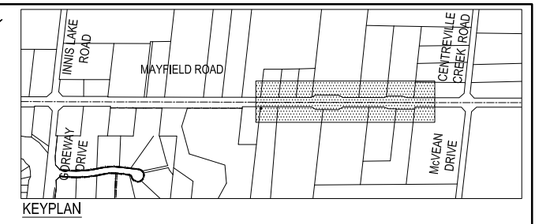

KEYPLAN

MATCHLINE STA. 12+050
SEE DRAWING P4A

RELOCATION OF EXISTING ACCESSES TO BE INVESTIGATED IN CONJUNCTION WITH DEVELOPMENT PLANNING PROCESS. (#6750 & # 6774)

SWMF 2
STORM WATER MANAGEMENT FACILITY REQUIRED
(+/- 085ha)

RE-ALIGN CREEK TO SUIT CULVERT EXTENSION

MAYFIELD ROAD

90 Km/hr DESIGN SPEED

MAXIMUM 80 km/h

6788 6774 6750 6934 6902 6960 6757 6791 6875 6889

LEFT TURN STORAGE LEFT TURN PARALLEL LEFT TURN TAPER 40m PARALLEL WINGWALL LOT 1 CONCESSION 2 145m LEFT TURN TAPER RIGHT TURN STORAGE PARALLEL 75m RIGHT TURN TAPER LOT 17 CONCESSION 8

MH 34 MH 35 MH 36 MH 37 MH 40 MH 41

6100mm x 2100mm CONCRETE RIGID FRAME OPEN

EX. 1800mm DIA. CSP CULVERT REPLACE WITH NEW 1950mm DIA. CSP

EXISTING ACCESS WILL BE REMOVED IN CONJUNCTION WITH "VALES OF HUMBER" DEVELOPMENT. (#6757, #6791, #6875 AND #6889)

FUTURE DEVELOPMENT ACCESS

LOCATION OF MEDIAN AND OTHER INTERSECTION DESIGN DETAILS ARE TO BE TO BE FINALIZED AS PART OF THE SECONDARY PLAN PROCESS. STORAGE, PARALLEL AND TAPERS FOR TURN LANES WILL BE DETERMINED AS PART OF THE SECONDARY PLAN TRAFFIC IMPACT STUDY.

MATCHLINE STA. 12+650
SEE DRAWING P6A

LEGEND

- EXISTING RIGHT OF WAY
- PROPOSED RIGHT OF WAY
- APPROXIMATE GRADING LIMIT
- CALCULATED CLEAR ZONE INDICATING MINIMUM DISTANCE FROM EDGE OF PAVEMENT FOR HYDRO POLE LOCATION.
- MINIMUM OFFSET FOR GUYING EASEMENT BASED ON POLES LOCATED A MINIMUM CLEAR ZONE OFFSET FROM EDGE OF PAVEMENT. (5.0m "HYDRO ONE BRAMPTON" - SOUTHSIDE, 5.5m "HYDRO ONE NETWORKS" - NORTH SIDE.)
- 3 TRCA WATERCOURSE DESIGNATION
- OVERLAND FLOW DIRECTION
- POTENTIAL PROPERTY LINE 3.5m FROM CLEAR ZONE REQUIREMENTS
- EXISTING PAVEMENT
- PROPOSED PAVEMENT
- PROPOSED CONCRETE MEDIANS, SIDEWALKS & BUS PADS
- PROPOSED 3.0m MULTI-USE PATHWAY
- PROPOSED CONC. BUS BAY
- PROPOSED PROPERTY ACQUISITION OUTSIDE OF RIGHT OF WAY
- BUILT HERITAGE FEATURE
- FUTURE SIGNALIZED INTERSECTION

Scale

20m 0 20 40 60m HORIZONTAL SCALE

2m 0 2 4 6m VERTICAL SCALE

Stantec

Client

Region of Peel
Working for you

Drawing Title

MAYFIELD ROAD
AIRPORT ROAD TO COLERAINE DRIVE
CLASS EA STUDY REPORT
RECOMMENDED DESIGN ALTERNATIVE
PLAN
STA. 12+050 TO STA. 12+650

Drawn By	Checked By	Drawing Number
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Date	Project No.	
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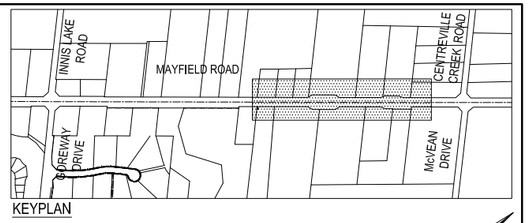

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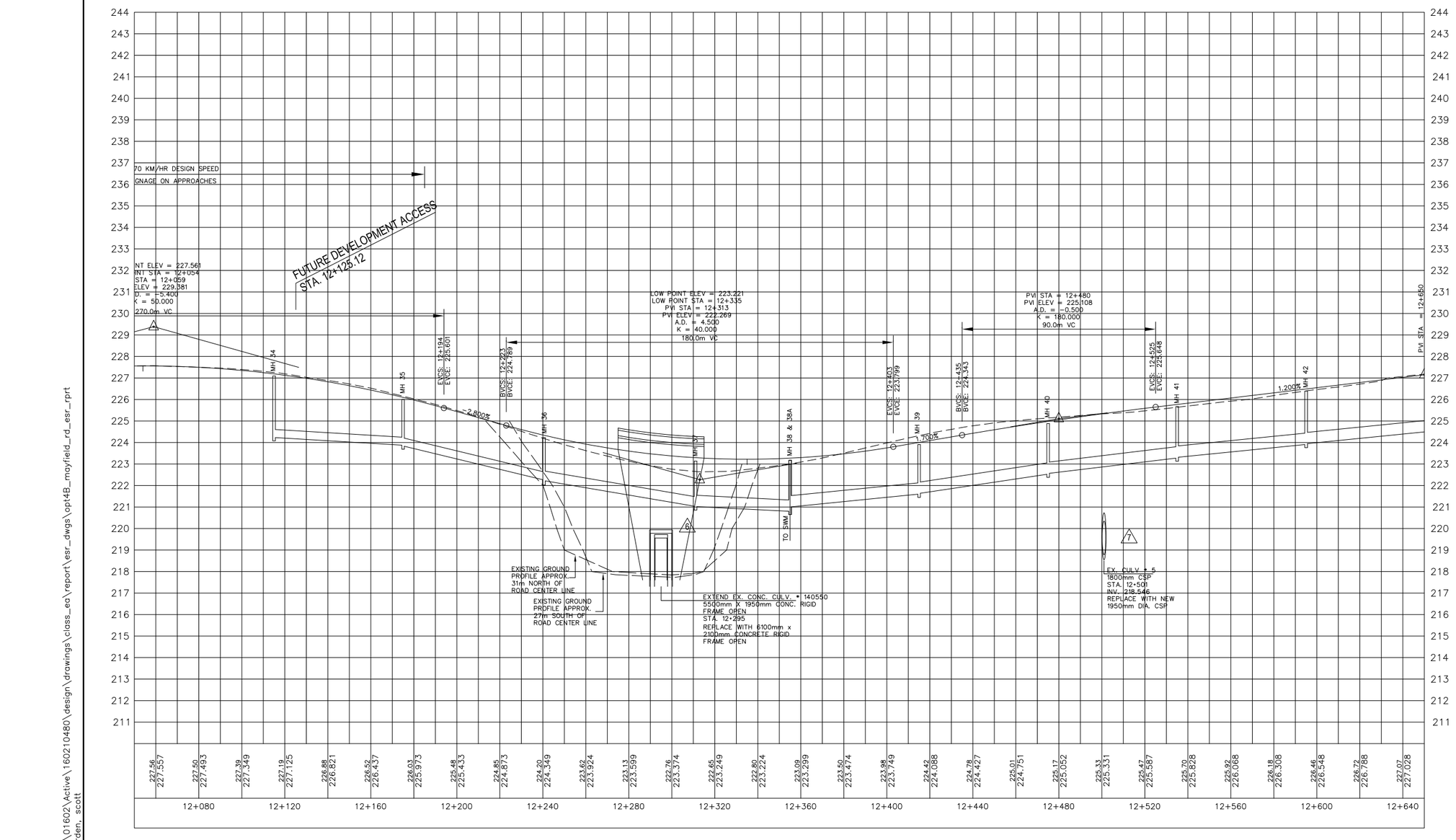

Scale

20m 0 20 40 60m HORIZONTAL SCALE

2m 0 2 4 6m VERTICAL SCALE

Stantec

Client

Region of Peel
Working for you

Drawing Title

MAYFIELD ROAD
AIRPORT ROAD TO COLERAINE DRIVE
CLASS EA STUDY REPORT
RECOMMENDED DESIGN ALTERNATIVE
PROFILE
STA. 12+050 TO STA. 12+650

Drawn By	Checked By	Drawing Number
W.R.W.	J.C.B.	P5B
Date	Project No.	
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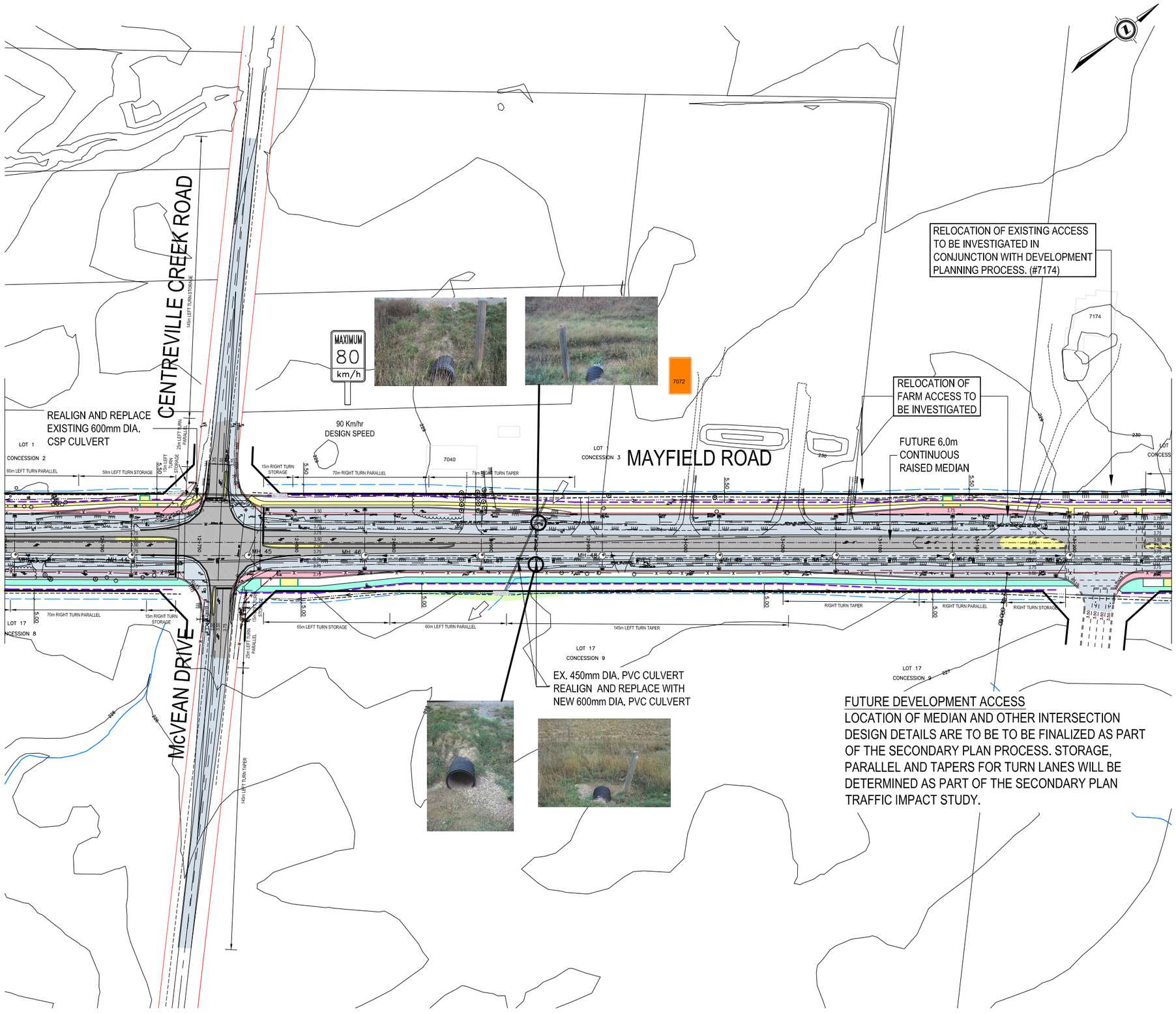

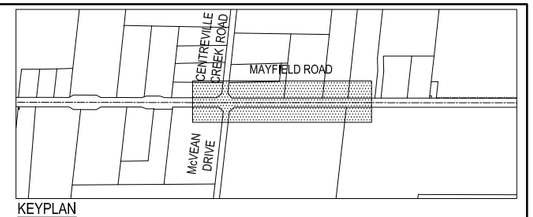

KEYPLAN

LEGEND

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- PROPOSED RIGHT OF WAY
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- PROPOSED PROPERTY ACQUISITION OUTSIDE OF RIGHT OF WAY
- BUILT HERITAGE FEATURE
- FUTURE SIGNALIZED INTERSECTION

Scale

20m 0 20 40 60m HORIZONTAL SCALE

2m 0 2 4 6m VERTICAL SCALE

Stantec

Client

Region of Peel
Working for you

Drawing Title

MAYFIELD ROAD
AIRPORT ROAD TO COLERAINE DRIVE
CLASS EA STUDY REPORT
RECOMMENDED DESIGN ALTERNATIVE
PLAN
STA. 12+650 TO STA. 13+250

Drawn By	Checked By	Drawing Number
W.R.W.	J.C.B.	P6A
Date	Project No.	
2012-10-17	160210480	

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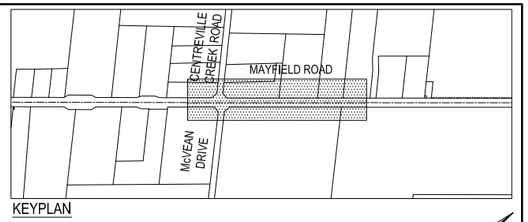

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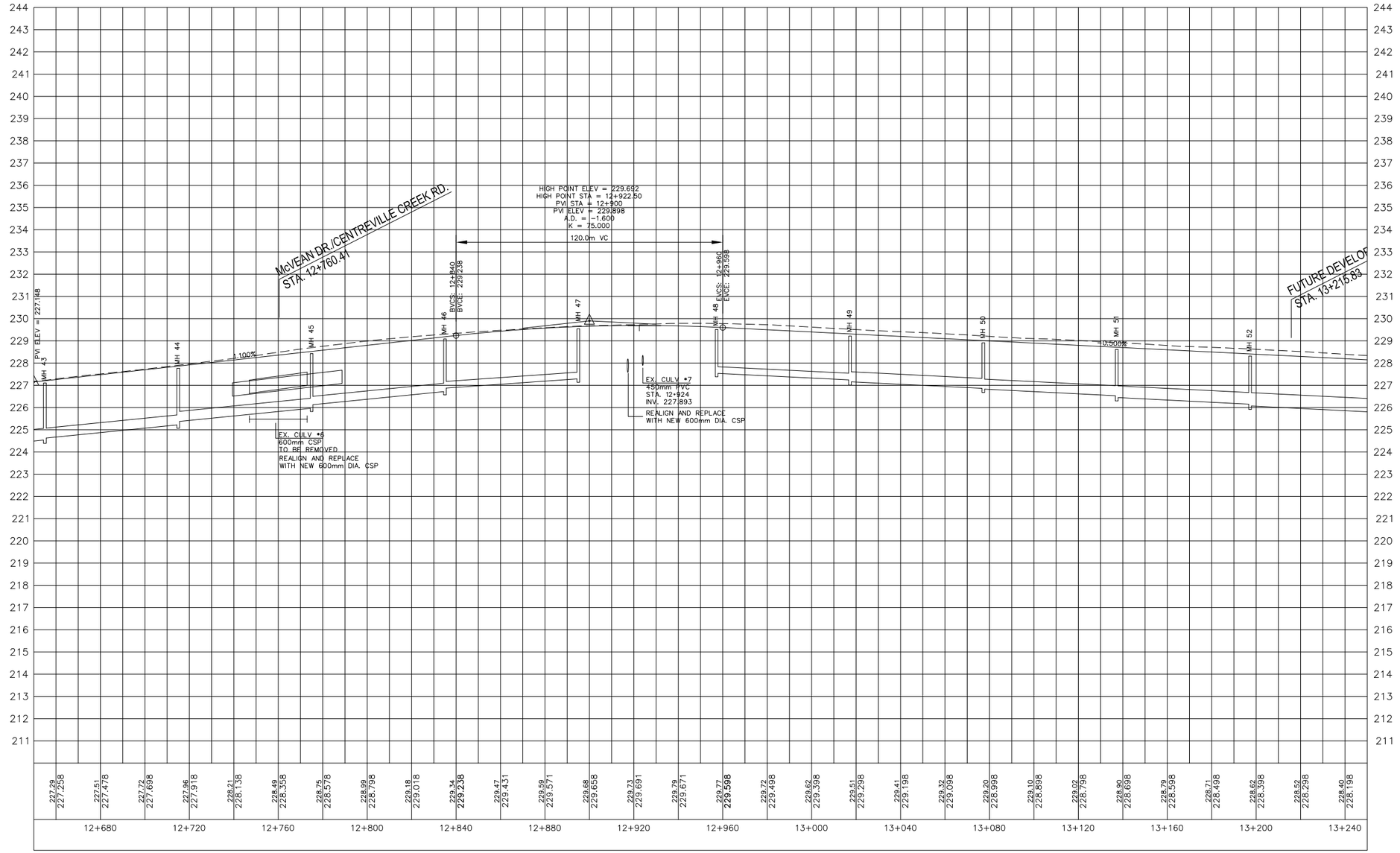

Scale

20m 0 20 40 60m HORIZONTAL SCALE

2m 0 2 4 6m VERTICAL SCALE

Stantec

Client

Region of Peel
Working for you

Drawing Title

MAYFIELD ROAD
AIRPORT ROAD TO COLERAINE DRIVE
CLASS EA STUDY REPORT
RECOMMENDED DESIGN ALTERNATIVE
PROFILE
STA. 12+650 TO STA. 13+250

Drawn By	Checked By	Drawing Number
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Date	Project No.	
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2012/10/17 6:06 PM by:white, bill (kitchener)

6.1.4 Mayfield Road – McVean Drive/Centreville Creek Drive to The Gore Road

Details of this section include:

Current rural cross section of two lanes plus turn lanes is upgraded to four lanes plus turn lanes with a continuous 6.0 m wide two-way left turn lane (TWTL) in the interim phase (prior to 2017) and further upgraded in the ultimate phase (prior to 2032) to six (6) lanes with turning lanes, continuous two way left turn lane. This may also include recommended replacement of the TWTL with raised median based on adjacent area development progression. Within this section there are three road crossings including creek crossings TRCA ID No. 8 and 9, a SWM facility at Sta. 13+600 and pedestrian facilities at both sides (1.5m concrete sidewalk on north side and 3.0 m asphalt multi-use trail on the south side). The potential for a multi-use trail on the north side will also be investigated during the detailed design phase which is recommended in the Region's 2012 Active Transportation Plan.

The preliminary design for this section of Mayfield Road is represented on drawings No. P6A through P8B and a typical cross section is provided as Figure CS1-2. The preliminary plans for The Gore Road are presented on drawings No. P15 – P16.

Ultimate Intersection Configuration:

The Gore Road:

Eastbound – three through lanes
Eastbound left turn lane - 35/40 m storage/parallel lane
Eastbound right turn lane – 15/45 m storage/parallel lane
Westbound – three through lanes
Westbound left turn lane – 15/45 m storage/parallel lane
Westbound right turn lane – 15/70 m storage/parallel lane
Northbound – two through lanes
Northbound left turn lane – 35/65 m storage/parallel lane
Southbound – two through lanes
Southbound left turn lane – 15/55 m storage

Initial construction of the four lane section on Mayfield will be skewed to the south with a full urban cross section on the south side and a semi-rural section retained on the north side. Deferral of the north side sidewalk may be considered subject to confirmation with the Town of Caledon.

Driveways at or near three corners of The Gore Road at Wildfield should be reviewed to identify opportunities for relocation further from the signalized intersection through site reconfiguration if possible. The existing parking area within the municipal road right-of way at the St. Patrick's church and cemetery at the southeast corner of The Gore Road is impacted by the proposed road widening.

MAYFIELD ROAD

MATCHLINE STA. 13+250
SEE DRAWING P6A

MATCHLINE STA. 13+750
SEE DRAWING P8A

SWMF 3
STORM WATER MANAGEMENT
FACILITY REQUIRED
(+/- 0.7ha)

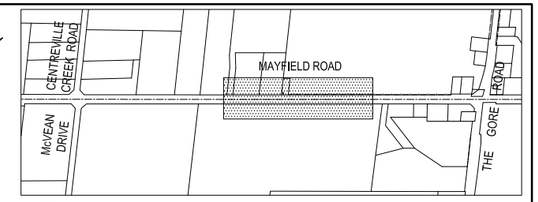
LOT 1
CONCESSION 3

LOT 17
CONCESSION 9

7212
7236
7205

EXISTING ACCESS WILL BE REMOVED IN CONJUNCTION WITH "VALES OF HUMBER" DEVELOPMENT (#7205)

FUTURE DEVELOPMENT ACCESS
LOCATION OF MEDIAN AND OTHER INTERSECTION DESIGN DETAILS ARE TO BE TO BE FINALIZED AS PART OF THE SECONDARY PLAN PROCESS. STORAGE, PARALLEL AND TAPERS FOR TURN LANES WILL BE DETERMINED AS PART OF THE SECONDARY PLAN TRAFFIC IMPACT STUDY.



KEYPLAN

LEGEND

- EXISTING RIGHT OF WAY
- PROPOSED RIGHT OF WAY
- APPROXIMATE GRADING LIMIT
- CALCULATED CLEAR ZONE INDICATING MINIMUM DISTANCE FROM EDGE OF PAVEMENT FOR HYDRO POLE LOCATION.
- MINIMUM OFFSET FOR GUYING EASEMENT BASED ON POLES LOCATED A MINIMUM CLEAR ZONE OFFSET FROM EDGE OF PAVEMENT. (5.0m "HYDRO ONE BRAMPTON" - SOUTHSIDE, 5.5m "HYDRO ONE NETWORKS" - NORTH SIDE.)
- 3 — TRCA WATERCOURSE DESIGNATION
- OVERLAND FLOW DIRECTION
- POTENTIAL PROPERTY LINE 3.5m FROM CLEAR ZONE REQUIREMENTS
- EXISTING PAVEMENT
- PROPOSED PAVEMENT
- PROPOSED CONCRETE MEDIANS, SIDEWALKS & BUS PADS
- PROPOSED 3.0m MULTI-USE PATHWAY
- PROPOSED CONC. BUS BAY
- PROPOSED PROPERTY ACQUISITION OUTSIDE OF RIGHT OF WAY
- BUILT HERITAGE FEATURE
- FUTURE SIGNALIZED INTERSECTION

Scale

20m 0 20 40 60m — HORIZONTAL SCALE

2m 0 2 4 6m — VERTICAL SCALE

Stantec

Client

Region of Peel
Working for you

Drawing Title

MAYFIELD ROAD
AIRPORT ROAD TO COLERAINE DRIVE
CLASS EA STUDY REPORT
RECOMMENDED DESIGN ALTERNATIVE
PLAN
STA. 13+250 TO STA. 13+750

Drawn By	Checked By	Drawing Number
W.R.W.	J.C.B.	P7A
Date	Project No.	
2012-10-17	160210480	

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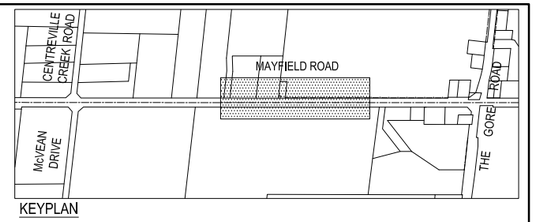

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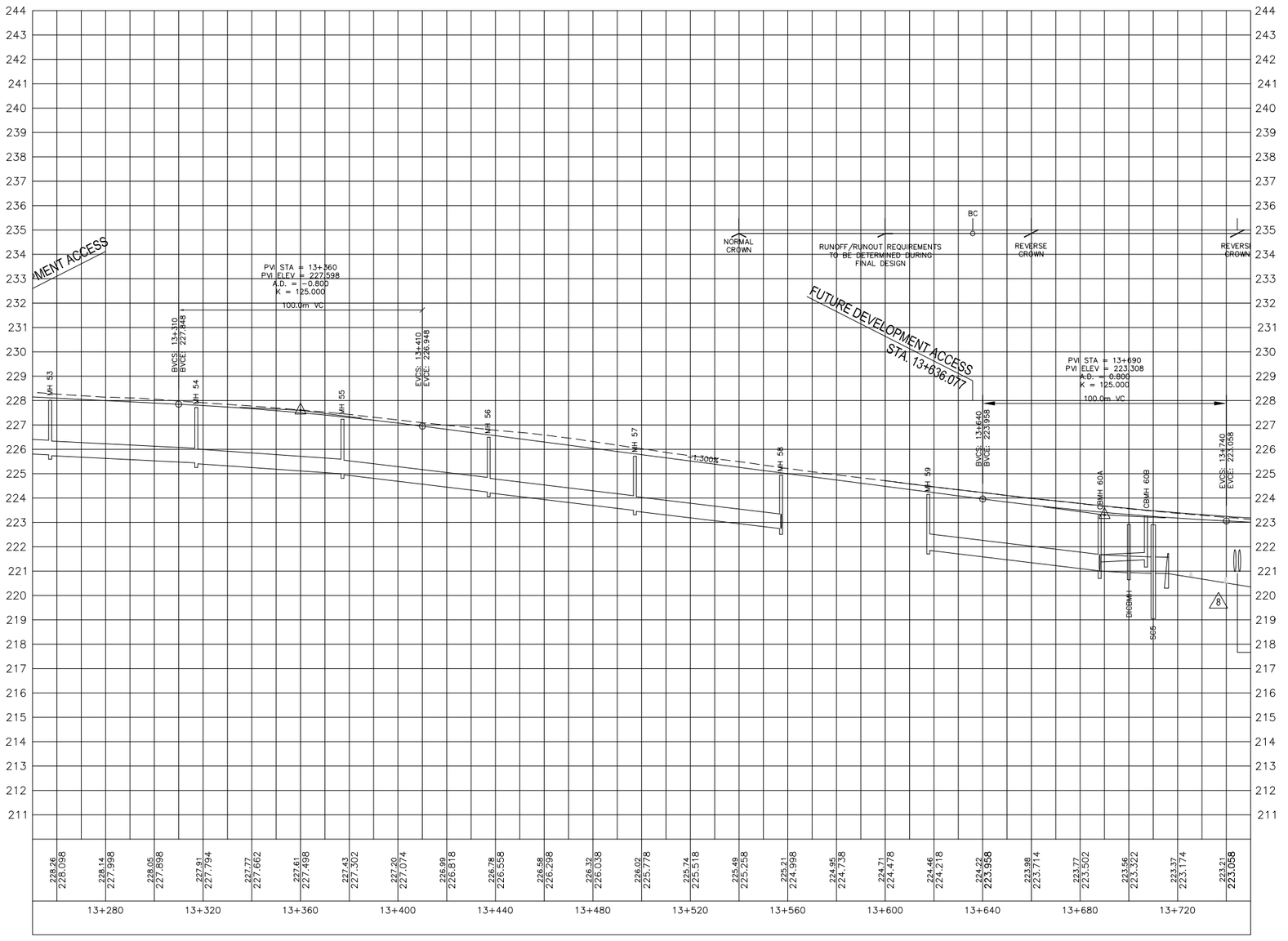

Scale

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Stantec

Client

Region of Peel
Working for you

Drawing Title

MAYFIELD ROAD
AIRPORT ROAD TO COLERAINE DRIVE
CLASS EA STUDY REPORT
RECOMMENDED DESIGN ALTERNATIVE
PROFILE
STA. 13+250 TO SAT. 13+750

Drawn By	Checked By	Drawing Number
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Date	Project No.	
2012-10-17	160210480	

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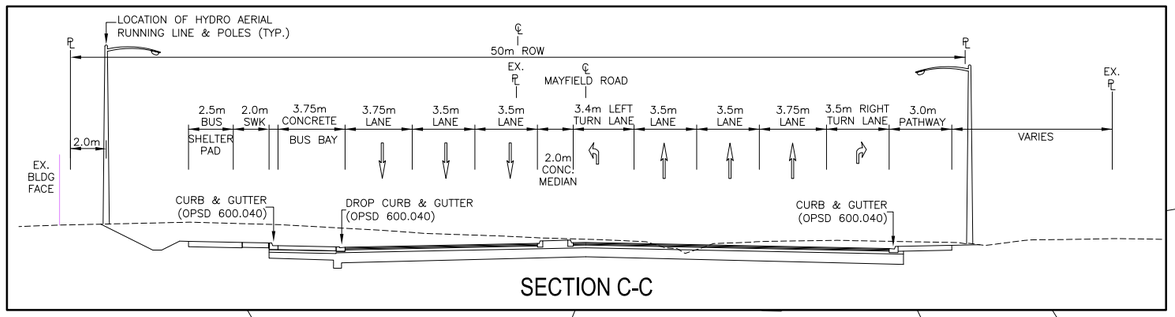
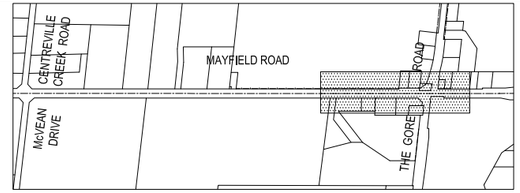


SECTION C-C



KEYPLAN

MATCHLINE STA. 13+750
SEE DRAWING P8A

MATCHLINE STA. 14+250
SEE DRAWING P9A

MAXIMUM 80 km/h

MAXIMUM 60 km/h

MAXIMUM 60 km/h

90 Km/hr DESIGN SPEED

60 Km/hr DESIGN/POSTED SPEED

60 Km/hr DESIGN/POSTED SPEED

MAYFIELD ROAD

THE GORE ROAD

POTENTIAL PROPERTY LINE FROM CLEAR ZONE REQUIREMENTS

CLEAR ZONE REQUIREMENTS

CLEAR ZONE REQUIREMENTS

LEFT-TURN TAPER

120m LEFT TURN TAPER

40m LEFT TURN PARALLEL

35m LEFT TURN STORAGE

50m LEFT TURN TAPER

LOT 1 CONCESSION 3

LOT 1 CONCESSION 4

LOT 17 CONCESSION 9

LOT 17 CONCESSION 10

GATEWAY FEATURE POTENTIAL LOCATION

ST. PATRICK'S CEMETERY

15m LEFT TURN STORAGE

45m LEFT TURN STORAGE

115m LEFT TURN TAPER

EX. 1050mm DIA. CSP CULVERT REALIGN AND REPLACE WITH TWIN 900mm DIA. CSP CULVERT

REPLACE EXISTING 915mm DIA. PE CULVERT

REPLACE EXISTING 1100mm DIA. PE CULVERT WITH 1200mm DIA. PE CULVERT

EXTEND EXISTING GABION WALL

LEGEND

- EXISTING RIGHT OF WAY
- PROPOSED RIGHT OF WAY
- APPROXIMATE GRADING LIMIT
- CALCULATED CLEAR ZONE INDICATING MINIMUM DISTANCE FROM EDGE OF PAVEMENT FOR HYDRO POLE LOCATION.
- MINIMUM OFFSET FOR GUYING EASEMENT BASED ON POLES LOCATED A MINIMUM CLEAR ZONE OFFSET FROM EDGE OF PAVEMENT. (5.0m "HYDRO ONE BRAMPTON" - SOUTHSIDE, 5.5m "HYDRO ONE NETWORKS" - NORTH SIDE.)
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- PROPOSED PROPERTY ACQUISITION OUTSIDE OF RIGHT OF WAY
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Scale

20m 0 20 40 60m HORIZONTAL SCALE

2m 0 2 4 6m VERTICAL SCALE

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AIRPORT ROAD TO COLERAINE DRIVE
CLASS EA STUDY REPORT
RECOMMENDED DESIGN ALTERNATIVE
PLAN
STA. 13+750 TO STA. 14+250

Drawn By	Checked By	Drawing Number
W.R.W.	J.C.B.	P8A
Date	Project No.	
2012-10-17	160210480	

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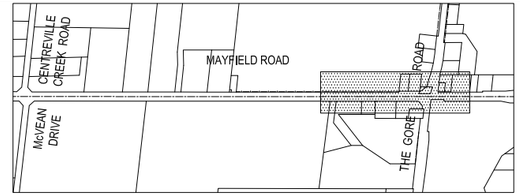
2012/10/17 6:07 PM by:white, bill (kitchener)



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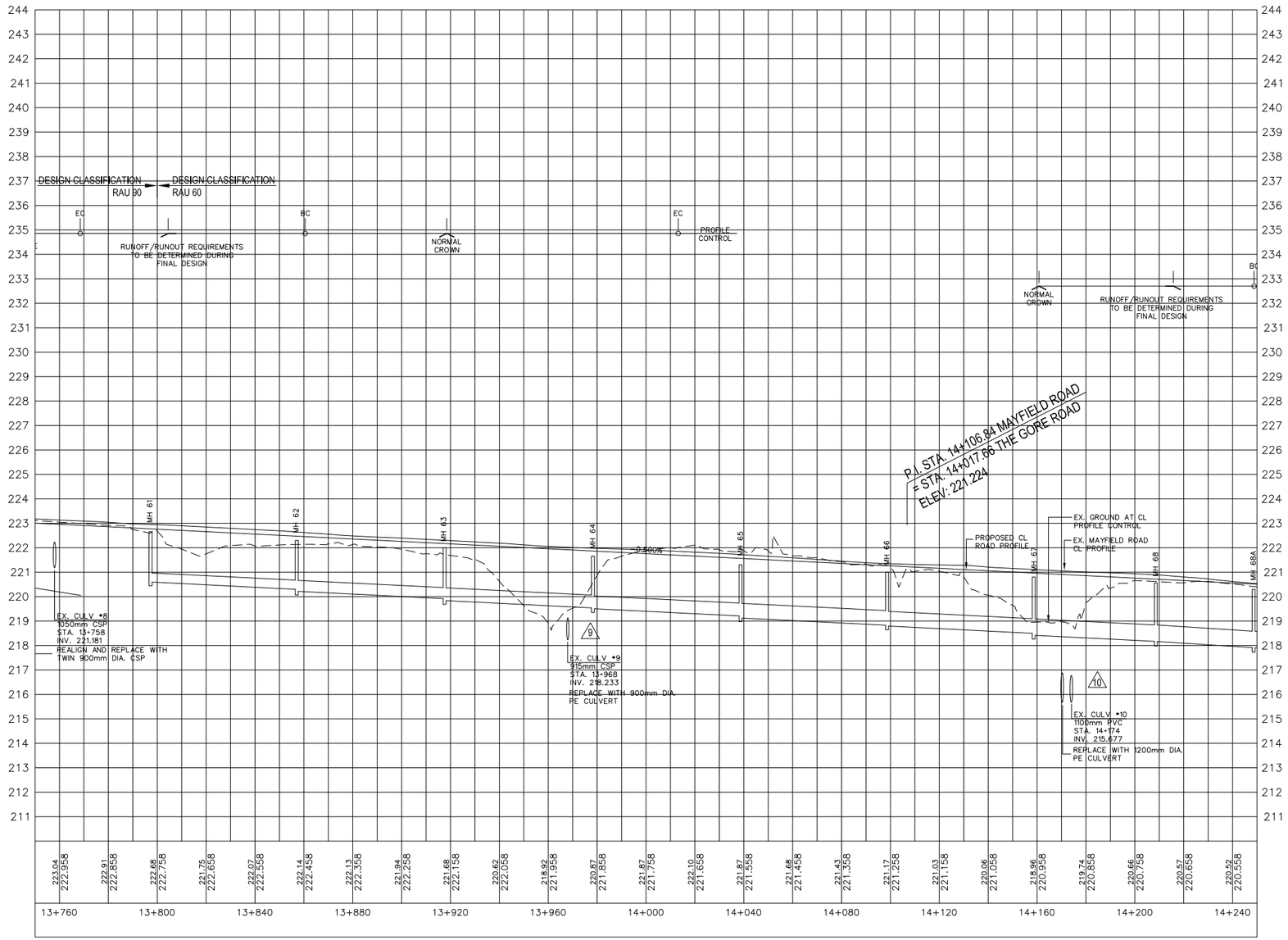

Scale

20m 0 20 40 60m HORIZONTAL SCALE

2m 0 2 4 6m VERTICAL SCALE

Stantec

Client

Region of Peel
Working for you

Drawing Title

MAYFIELD ROAD
AIRPORT ROAD TO COLERAINE DRIVE
CLASS EA STUDY REPORT
RECOMMENDED DESIGN ALTERNATIVE
PROFILE
STA. 13+750 TO STA. 14+250

Drawn By	Checked By	Drawing Number
W.R.W.	J.C.B.	P8B
Date	Project No.	
2012-10-17	160210480	

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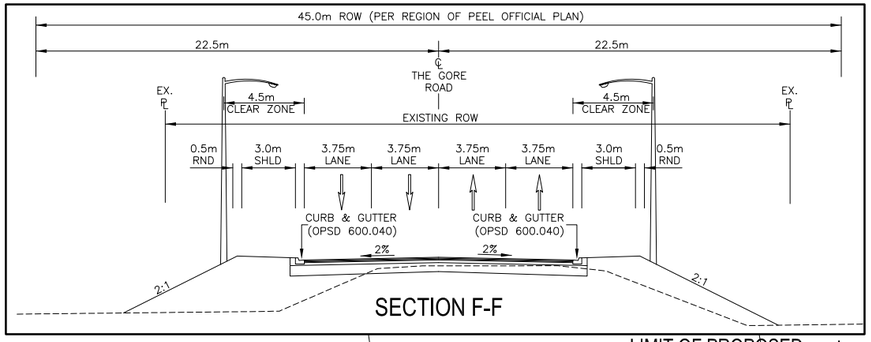
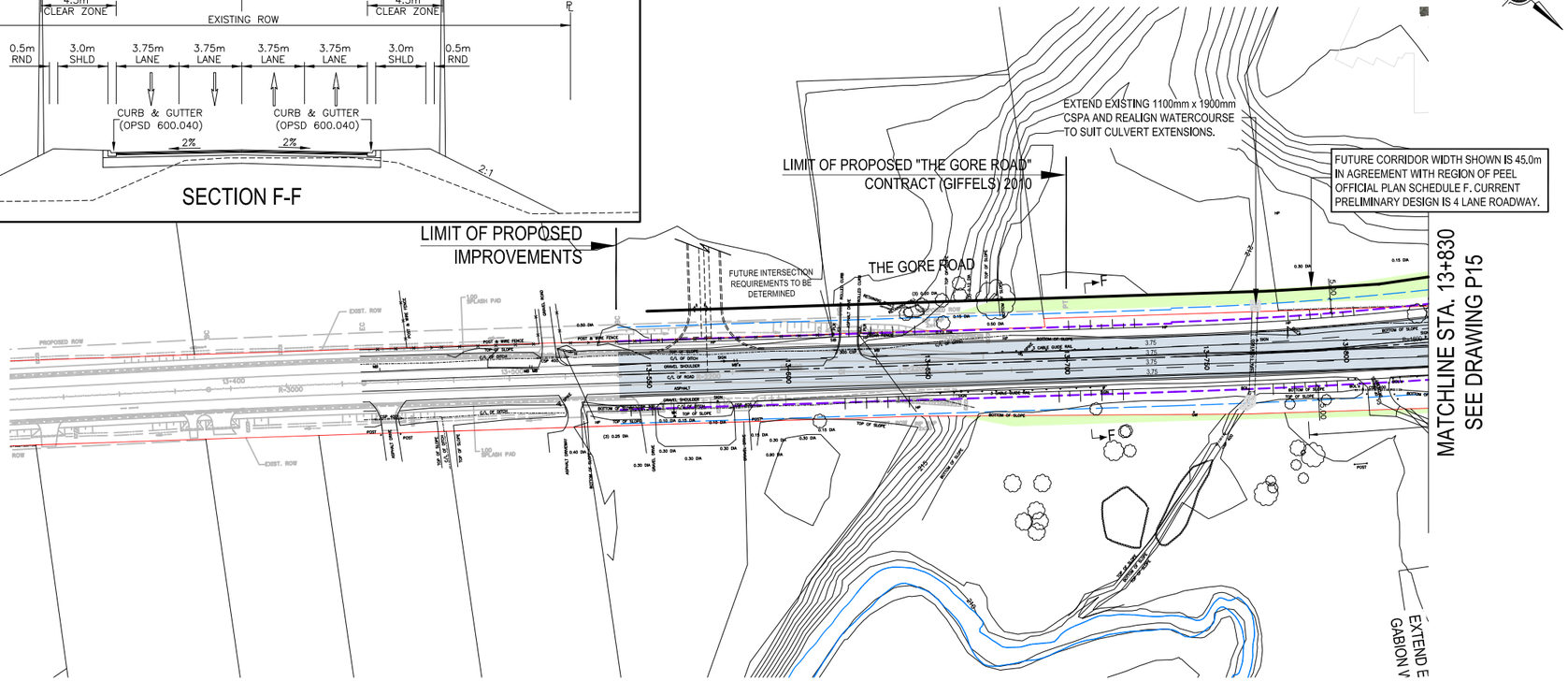
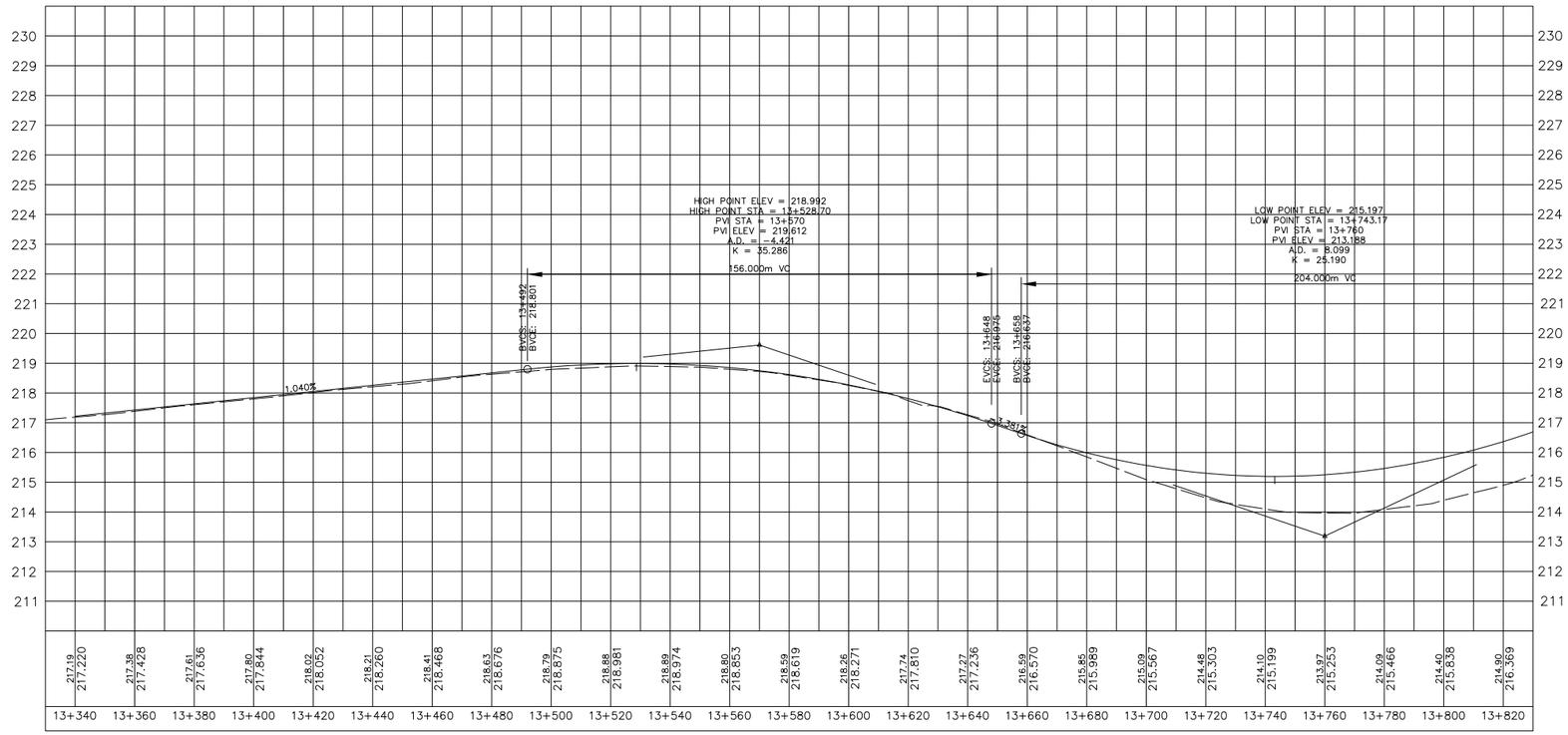
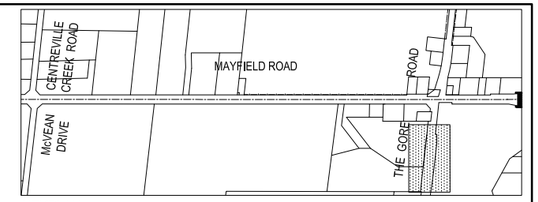


SECTION F-F







KEYPLAN

LEGEND

- EXISTING RIGHT OF WAY
- PROPOSED RIGHT OF WAY
- APPROXIMATE GRADING LIMIT
- CALCULATED CLEAR ZONE INDICATING MINIMUM DISTANCE FROM EDGE OF PAVEMENT FOR HYDRO POLE LOCATION.
- MINIMUM OFFSET FOR GUYING EASEMENT BASED ON POLES LOCATED A MINIMUM CLEAR ZONE OFFSET FROM EDGE OF PAVEMENT. (5.0m "HYDRO ONE BRAMPTON" - SOUTHSIDE, 5.5m "HYDRO ONE NETWORKS" - NORTH SIDE.)
- 3 TRCA WATERCOURSE DESIGNATION
- OVERLAND FLOW DIRECTION
- POTENTIAL PROPERTY LINE 3.5m FROM CLEAR ZONE REQUIREMENTS
- EXISTING PAVEMENT
- PROPOSED PAVEMENT
- PROPOSED CONCRETE MEDIANS, SIDEWALKS & BUS PADS
- PROPOSED 3.0m MULTI-USE PATHWAY
- PROPOSED CONC. BUS BAY
- PROPOSED PROPERTY ACQUISITION OUTSIDE OF RIGHT OF WAY
- BUILT HERITAGE FEATURE
- FUTURE SIGNALIZED INTERSECTION

Scale

20m 0 20 40 60m HORIZONTAL SCALE

2m 0 2 4 6m VERTICAL SCALE

Stantec

Client

Region of Peel
Working for you

Drawing Title

MAYFIELD ROAD
AIRPORT ROAD TO COLERAINE DRIVE
CLASS EA STUDY REPORT
RECOMMENDED DESIGN ALTERNATIVE
PLAN/PROFILE
STA. 13+550 TO STA. 13+830

Drawn By	Checked By	Drawing Number
W.R.W.	J.C.B.	P15
Date	Project No.	
2012-10-17	160210480	

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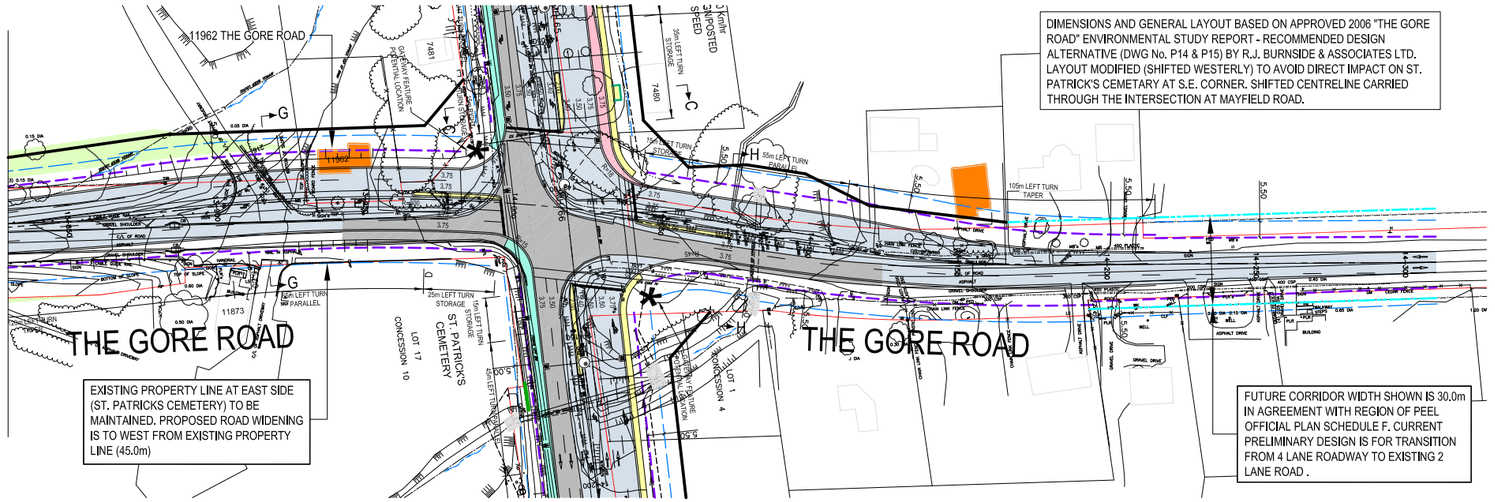
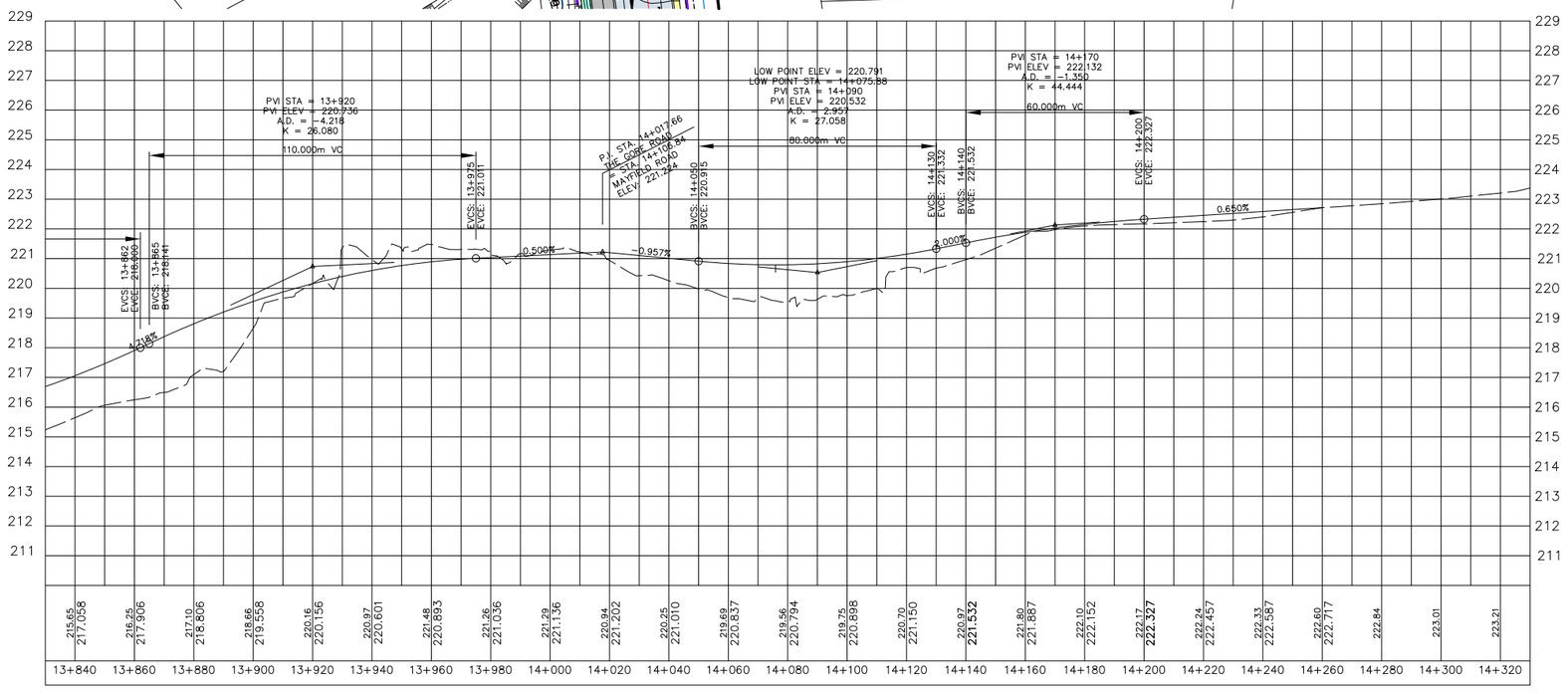
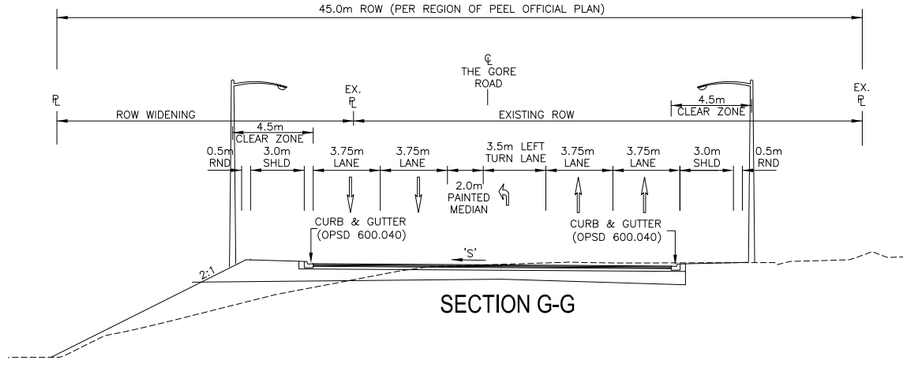
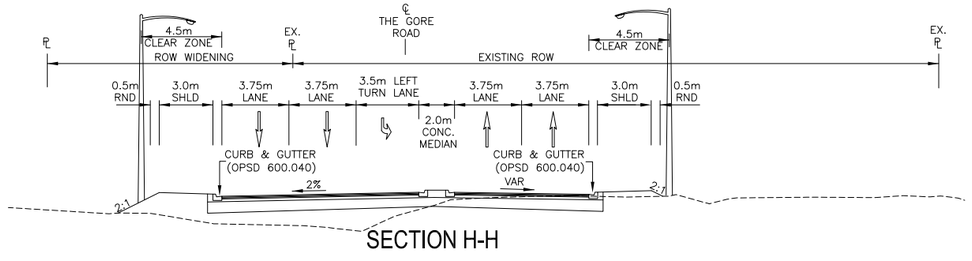
MATCHLINE STA. 13+830
SEE DRAWING P15







SECTION G-G



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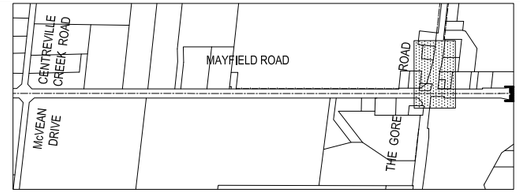

KEYPLAN

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- FUTURE SIGNALIZED INTERSECTION

Scale

20m 0 20 40 60m HORIZONTAL SCALE

2m 0 2 4 6m VERTICAL SCALE

Stantec

Client

Region of Peel
Working for you

Drawing Title

MAYFIELD ROAD
AIRPORT ROAD TO COLERAINE DRIVE
CLASS EA STUDY REPORT
RECOMMENDED DESIGN ALTERNATIVE
PLAN/PROFILE
STA. 13+830 TO STA. 14+300

Drawn By	Checked By	Drawing Number
W.R.W.	J.C.B.	P16
Date	Project No.	
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Impacts on the heritage property at 11962 The Gore Road were identified in the development of the preliminary design and the potential requirement for a Stage 3 archaeological excavation was noted to confirm the status of the gravesites adjacent to The Gore Road corridor if necessary.

Subsequent to the initial evaluation and supplementary Heritage review for 11962 The Gore Road it was concluded through discussion with the Heritage planners, the Catholic Church Diocese and the Conservation Authority that the remaining area at 11962 would be insufficient to permit proper relocation and servicing of the heritage dwelling. As a result, it is anticipated that the existing feature will be removed and/or relocated in advance of the roadwork completion and that the roadway will be shifted further west to avoid impact on the St. Patrick's Church cemetery.

Future development entrances are proposed in the vicinity of Sta. 13+200 and Sta. 13+650 in connection with the future Vales of the Humber development. The final locations of these entrances will be subject to the City of Brampton's development approvals process.

Through Wildfield the roadway design alignment is shifted toward the north to avoid negative impacts on the existing church and cemetery property at the southeast corner. Turning and through lane widths at the intersection are also reduced to minimize encroachment on adjacent property which is achieved through observation of a lower design and posted speed in this area.

A small diameter replacement culvert crossing (600 mm) is proposed at Sta. 12+915 just east of McVean Drive, the culvert at crossing No. 8 is replaced and realigned with new twin 900 mm CSP culvert, the culvert at crossing No. 9 is replaced with a new 915 mm HDPE culvert. An oil and grit separator (OGS) is provided west of crossing No. 9 on the south side.

Road drainage is directed to the OGS unit and enhanced swale at Crossing No. 9 via a new closed storm sewer system within the roadway and drainage from the west is directed to the SWM facility at Sta. 13+600 west of crossing No. 8.

6.1.5 Mayfield Road – The Gore Road to Marysfield Drive

Details of this section include:

Current rural cross section of two lanes plus turn lanes is upgraded to four lanes plus turn lanes with a continuous 6.0 m wide two-way left turn lane (TWTL) in the interim phase (prior to 2017) and further upgraded in the ultimate phase (prior to 2032) to six (6) lanes with turning lanes, continuous two way left turn lane. This may also include recommended replacement of the TWTL with raised median based on adjacent area development progression. Within this section are also two creek crossings TRCA ID No. 10 and 11, a SWM facility at Sta. 14+250 and pedestrian facilities at both sides (1.5m concrete sidewalk on north side and 3.0 m asphalt multi-use trail on the south side). The potential for a multi-use trail on the north side will also be investigated during the

detailed design phase which is recommended in the Region's 2012 Active Transportation Plan.

The preliminary design for this section of Mayfield Road is represented on drawings No. P8A through P9B and a typical cross section is provided as Figure CS2-1.

Ultimate Intersection Configuration:

Marysfield Road:

Eastbound – three through lanes
Eastbound left turn lane - TBC m storage/parallel lane
Westbound – three through lanes
Westbound left turn lane - TBC m storage/parallel lane
Northbound left turn lane - TBC m storage

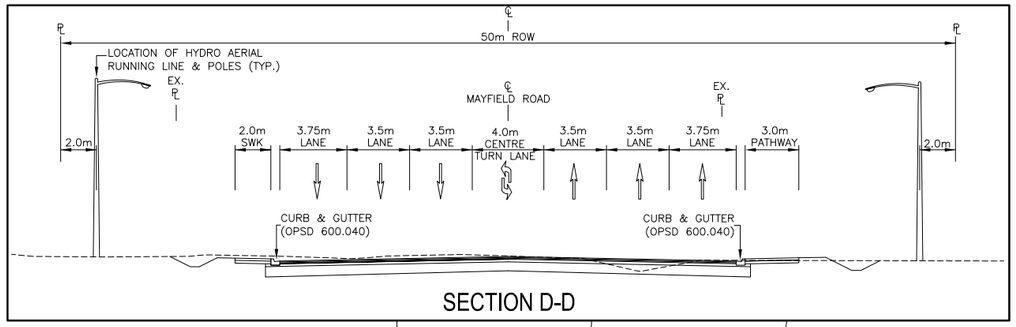
Initial construction of the four lane section will be skewed to the south with a full urban cross section on the south side and a semi-rural section retained on the north side. Deferral of the north side sidewalk may be considered subject to confirmation with the Town of Caledon.

Through Wildfield the roadway design alignment is shifted toward the north to avoid negative impacts on the existing church and cemetery property at the southeast corner. Turning and through lane widths at the intersection are also reduced to minimize encroachment on adjacent property which is achieved through observation of a lower design and posted speed in this area.

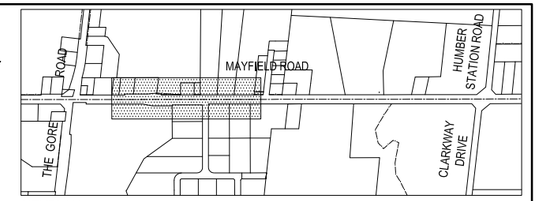
Realignment of the private entrance driveway at 7674 Mayfield Road at the Marysfield Road intersection is recommended. The location of driveways at 7650 and 7712 Mayfield Road should also be considered further during the detailed design development of the intersection at Marysfield Road.

The culvert at crossing No. 10 is replaced and realigned with a new 1200 mm HDPE culvert and the culvert at crossing No. 11 (Redside Dace habitat) is replaced with a new bridge structure with a minimum span of 15.6 m.

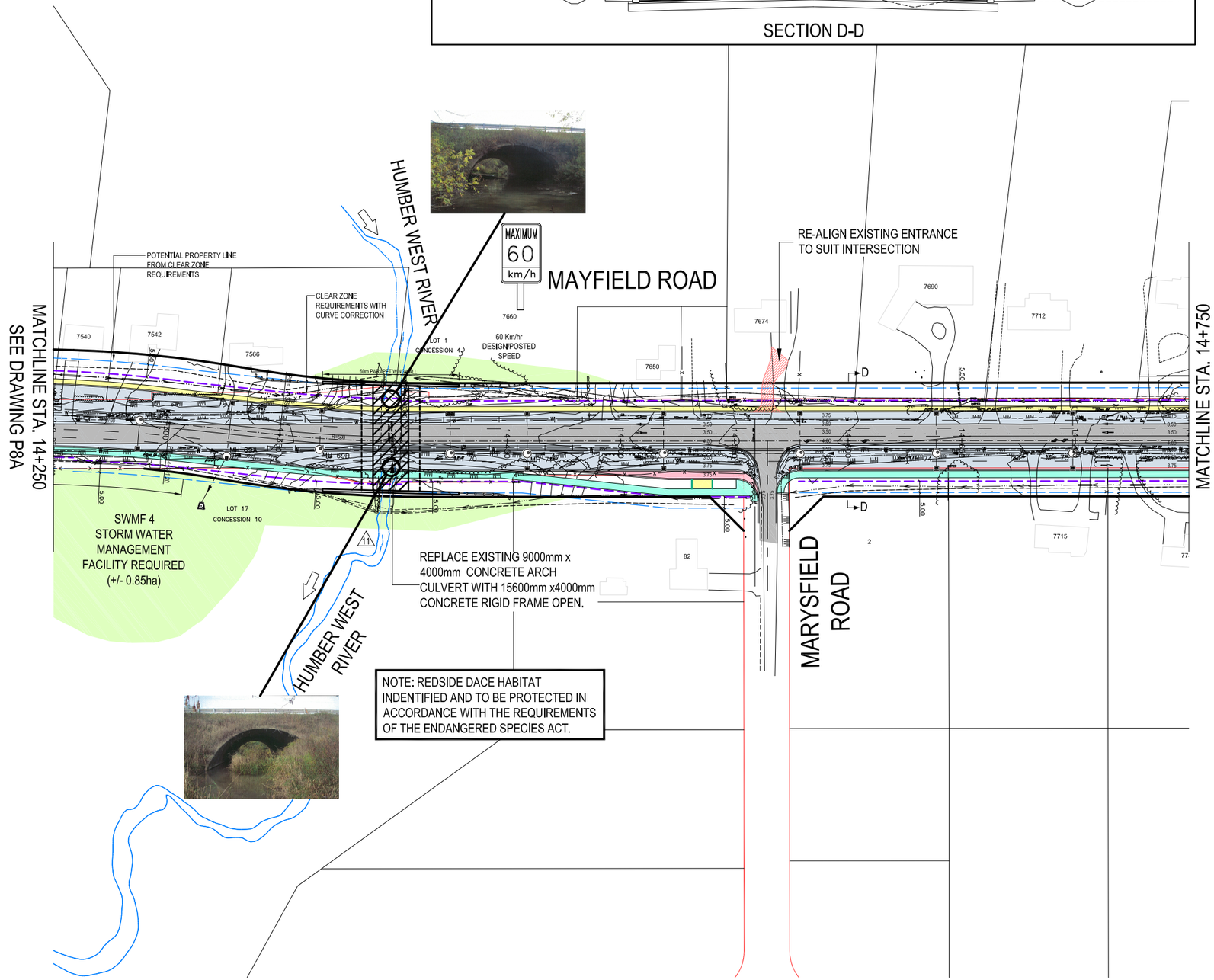
Road drainage is directed to an outlet to the SWM facility at Sta. 14+300 between crossings No. 10 and 11.



SECTION D-D



KEYPLAN



LEGEND

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- PROPOSED PROPERTY ACQUISITION OUTSIDE OF RIGHT OF WAY
- BUILT HERITAGE FEATURE
- FUTURE SIGNALIZED INTERSECTION

Scale

20m 0 20 40 60m — HORIZONTAL SCALE

2m 0 2 4 6m — VERTICAL SCALE

Stantec

Client

Region of Peel
Working for you

Drawing Title

MAYFIELD ROAD
AIRPORT ROAD TO COLERAINE DRIVE
CLASS EA STUDY REPORT
RECOMMENDED DESIGN ALTERNATIVE
PLAN
STA. 14+250 TO STA. 14+750

Drawn By	Checked By	Drawing Number
W.R.W.	J.C.B.	P9A
Date	Project No.	
2013-04-04	160210480	

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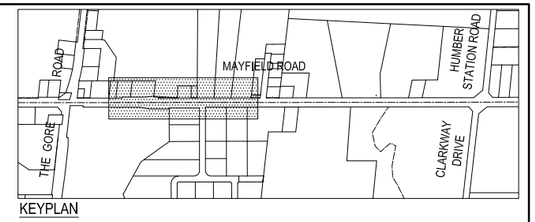

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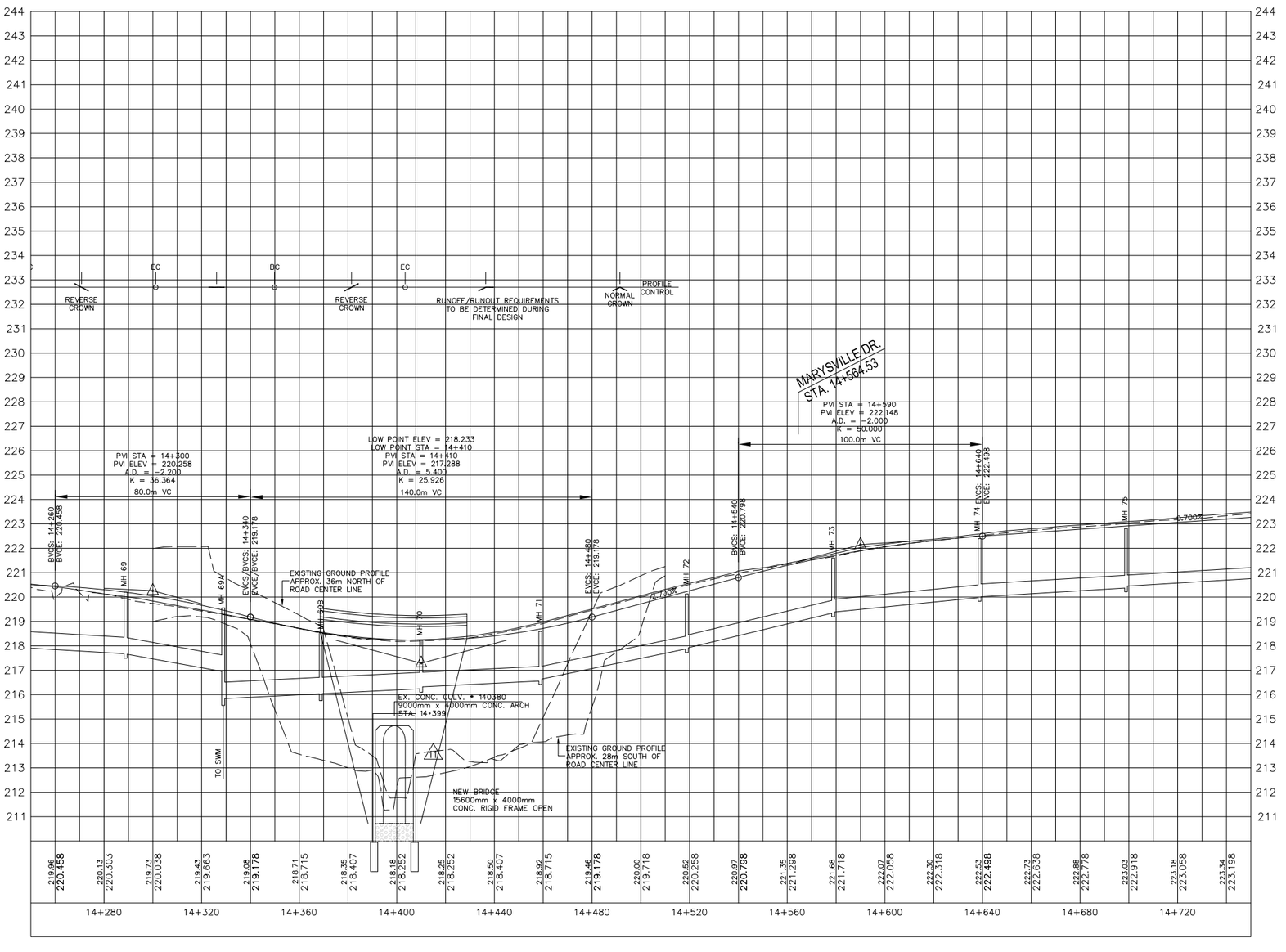

Scale

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Stantec

Client

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Drawing Title

MAYFIELD ROAD
AIRPORT ROAD TO COLERAINE DRIVE
CLASS EA STUDY REPORT
RECOMMENDED DESIGN ALTERNATIVE
PROFILE
STA. 14+250 TO STA. 14+750

Drawn By	Checked By	Drawing Number
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Date	Project No.	
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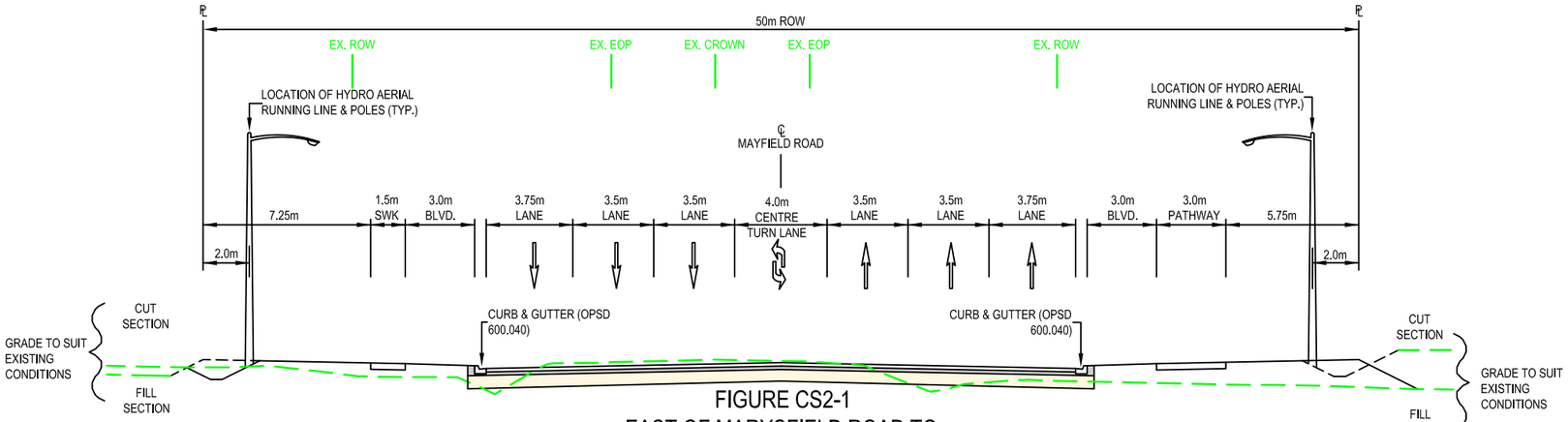

FIGURE CS2-1
EAST OF MARYSFIELD ROAD TO
WEST OF COLERAINE DRIVE

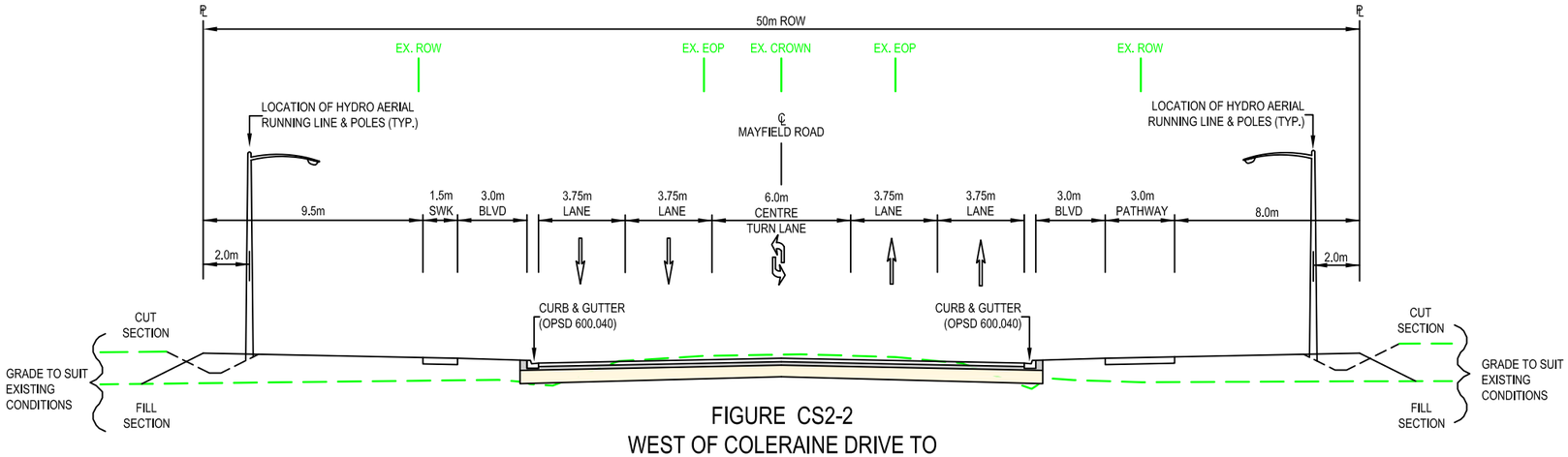

FIGURE CS2-2
WEST OF COLERAINE DRIVE TO
EAST OF COLERAINE DRIVE

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Client
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Drawing Title
MAYFIELD ROAD
AIRPORT ROAD TO COLERAINE DRIVE
CLASS EA STUDY REPORT
RECOMMENDED DESIGN ALTERNATIVE
"DESIGN CONCEPT 4 MODIFIED"
EQUAL WIDENING CONCEPT
TO MINIMIZE PROPERTY IMPACTS

Drawn By	Checked By	Drawing Number
W.R.W.	J.C.B.	CS2
Date	Project No.	
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6.1.6 Mayfield Road – Marysfield Drive to Clarkway Drive/Humber Station Road

Details of this section include:

Current rural cross section of two lanes plus turn lanes is upgraded to four lanes plus turn lanes with a continuous 6.0 m wide two-way left turn lane (TWTL) in the interim phase (prior to 2017) and further upgraded in the ultimate phase (prior to 2032) to six (6) lanes with turning lanes, continuous two way left turn lane. This may also include recommended replacement of the TWTL with raised median based on adjacent area development progression. Within this section there are two crossings TRCA ID No. 12 and 13 and pedestrian facilities at both sides (1.5m concrete sidewalk on north side and 3.0 m asphalt multi-use trail on the south side). The potential for a multi-use trail on the north side will also be investigated during the detailed design phase which is recommended in the Region's 2012 Active Transportation Plan.

The preliminary design for this section of Mayfield Road is represented on drawings No. P9A through P11B and a typical cross section is provided as Figure CS2-2.

Ultimate Intersection Configuration:

Clarkway Drive/Humber Station Road:

Eastbound – three through lanes

Eastbound left turn lane – 25/60 m storage/parallel lane

Eastbound right turn lane – 15/70 m storage/parallel lane

Westbound – three through lanes

Westbound left turn lane – 15/70 m storage

Westbound right turn lane – 15/70 m storage/parallel lane

Northbound – one through lanes

Northbound left turn lane – 15/25 m storage/parallel lane

Southbound – one through lanes

Southbound left turn lane – 15/25 m storage/parallel lane

Initial construction of the four lane section will be skewed to the south with a full urban cross section on the south side and a semi-rural section retained on the north side. Deferral of the north side sidewalk may be considered subject to confirmation with the Town of Caledon.

The culvert at crossing No. 12 is replaced and realigned with a new 6000 x 1800 mm open bottom culvert and the culvert at crossing No. 13 is replaced with a new 1200 mm CSP culvert. Another smaller local culvert (600 mm) is replaced and realigned just west of the intersection at Clarkway Drive/Humber Station Road.

Oil and grit separators (OGS) are provided east and west of crossing No. 12 on the south side of Mayfield Road.

MATCHLINE STA. 14+750
SEE DRAWING P9A

O'REILLY LANE
(PRIVATE ENTRANCE)

MAXIMUM 60 km/h

MAXIMUM 80 km/h

60 Km/hr DESIGN\POSTED SPEED

90 Km/hr DESIGN SPEED

MAYFIELD ROAD

RE-ALIGN CREEK TO SUIT CULVERT RE-ALIGNMENT

CULVERT LOCATION TO BE CONFIRMED UPON DETERMINATION OF WATERMAIN AND VALVE CHAMBER RELOCATION REQUIREMENTS

- FUTURE DEVELOPMENT APPLICATION
- ACCESS TO ALIGN WITH #7905
- FUTURE MEDIAN ISLAND

INSTALL HEADWALL AND HANDRAIL

LOT 1
CONCESSION 4

LOT 17
CONCESSION 10

7740 7760 7780 7755 7771 7904 7905

DICBMH SC 6

DICBMH SC 7

RELOCATION OF ACCESS TO BE CONSIDERED DURING FINAL DETAILED DESIGN. (#7743)

REPLACE AND REALIGN EXISTING 6070mm x 1250mm CONC. RIGID FRAME OPEN WITH 6000mm x 1800mm CULVERT

STORM SEWER OUTLET (PROPOSED OIL/GRIT SEPARATOR)

RE-ALIGN CREEK TO SUIT CULVERT RE-ALIGNMENT

INSTALL HEADWALL AND HANDRAIL

REPLACE EXISTING 1200mm DIA. CSP CULVERT

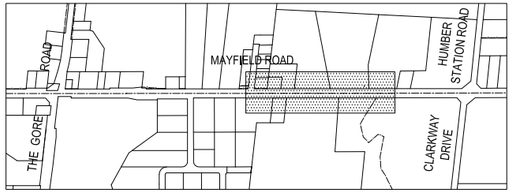
MATCHLINE STA. 15+250
SEE DRAWING P11A







KEYPLAN



LEGEND

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Scale

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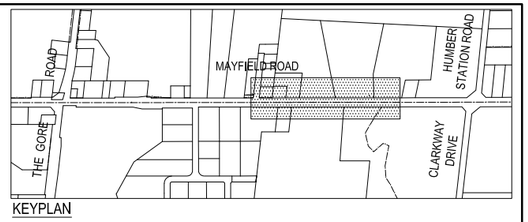

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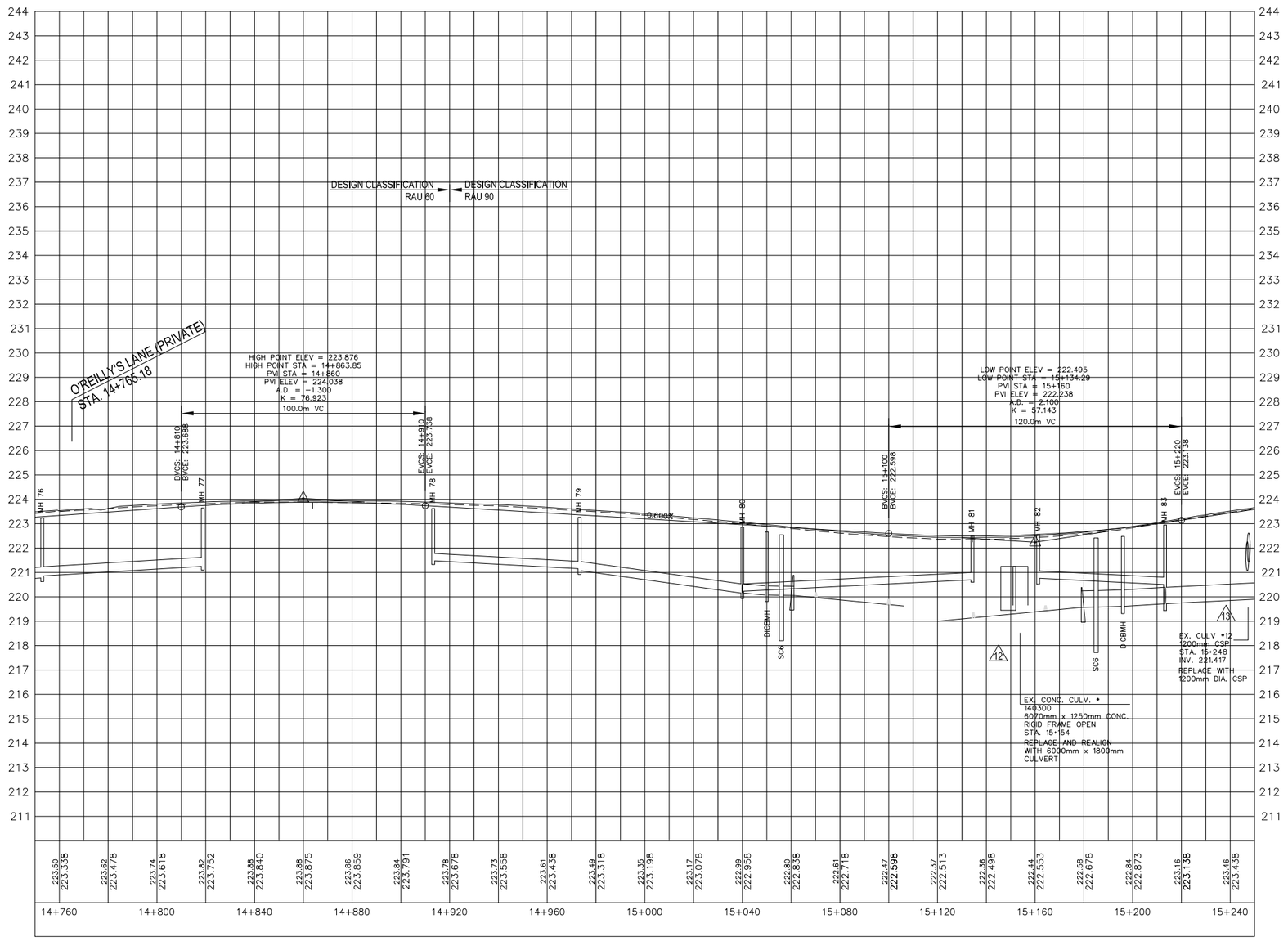

Scale

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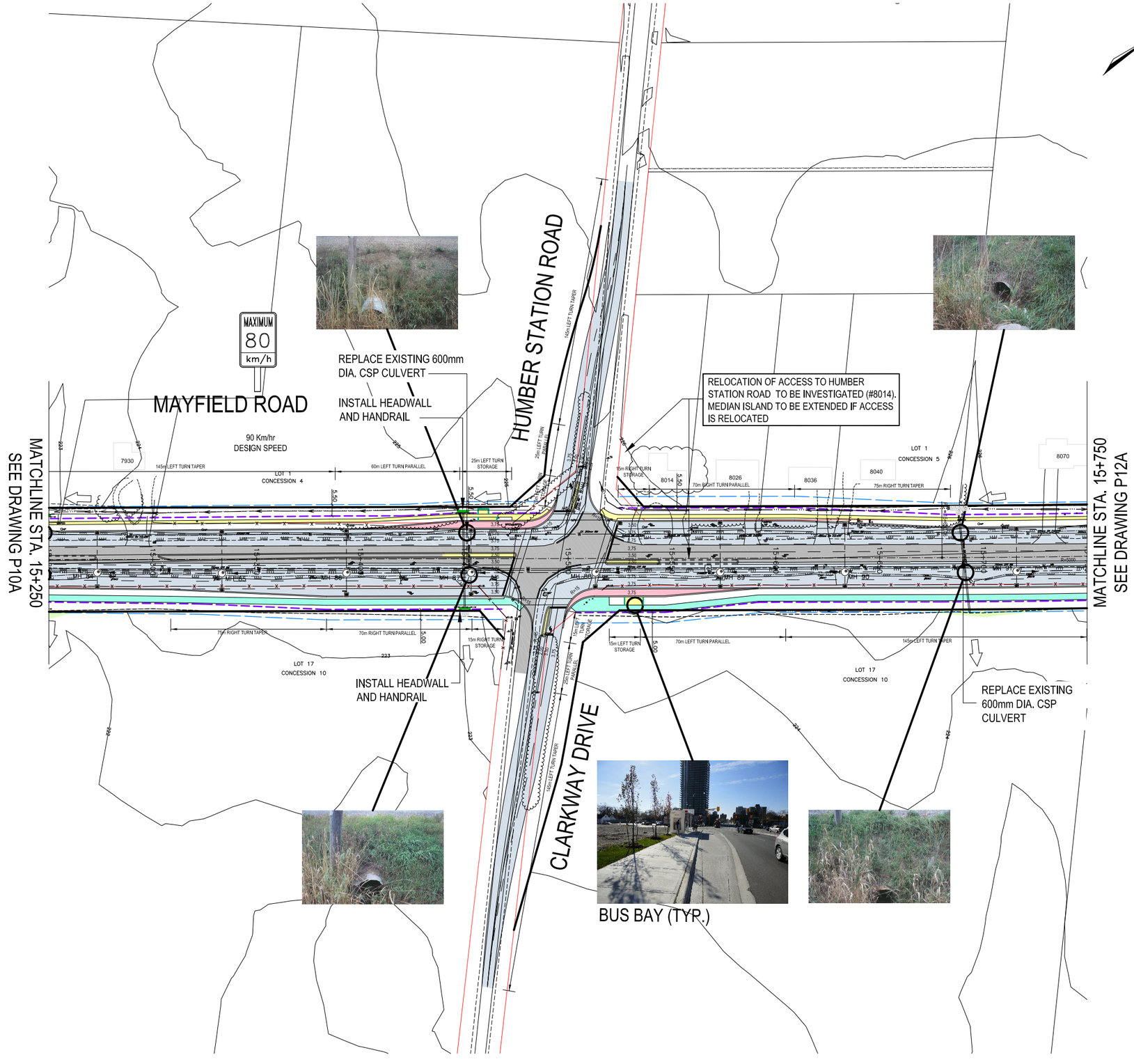

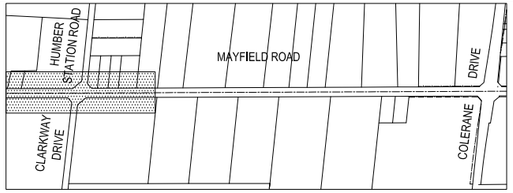

KEYPLAN

LEGEND

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Scale

20m 0 20 40 60m HORIZONTAL SCALE

2m 0 2 4 6m VERTICAL SCALE

Stantec

Client

Region of Peel
Working for you

Drawing Title

MAYFIELD ROAD
AIRPORT ROAD TO COLERAINE DRIVE
CLASS EA STUDY REPORT
RECOMMENDED DESIGN ALTERNATIVE
PLAN
STA. 15+250 TO STA. 15+750

Drawn By	Checked By	Drawing Number
W.R.W.	J.C.B.	P11A
Date	Project No.	
2012-10-17	160210480	

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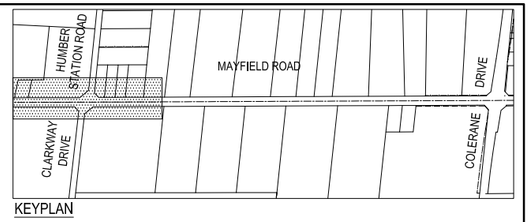

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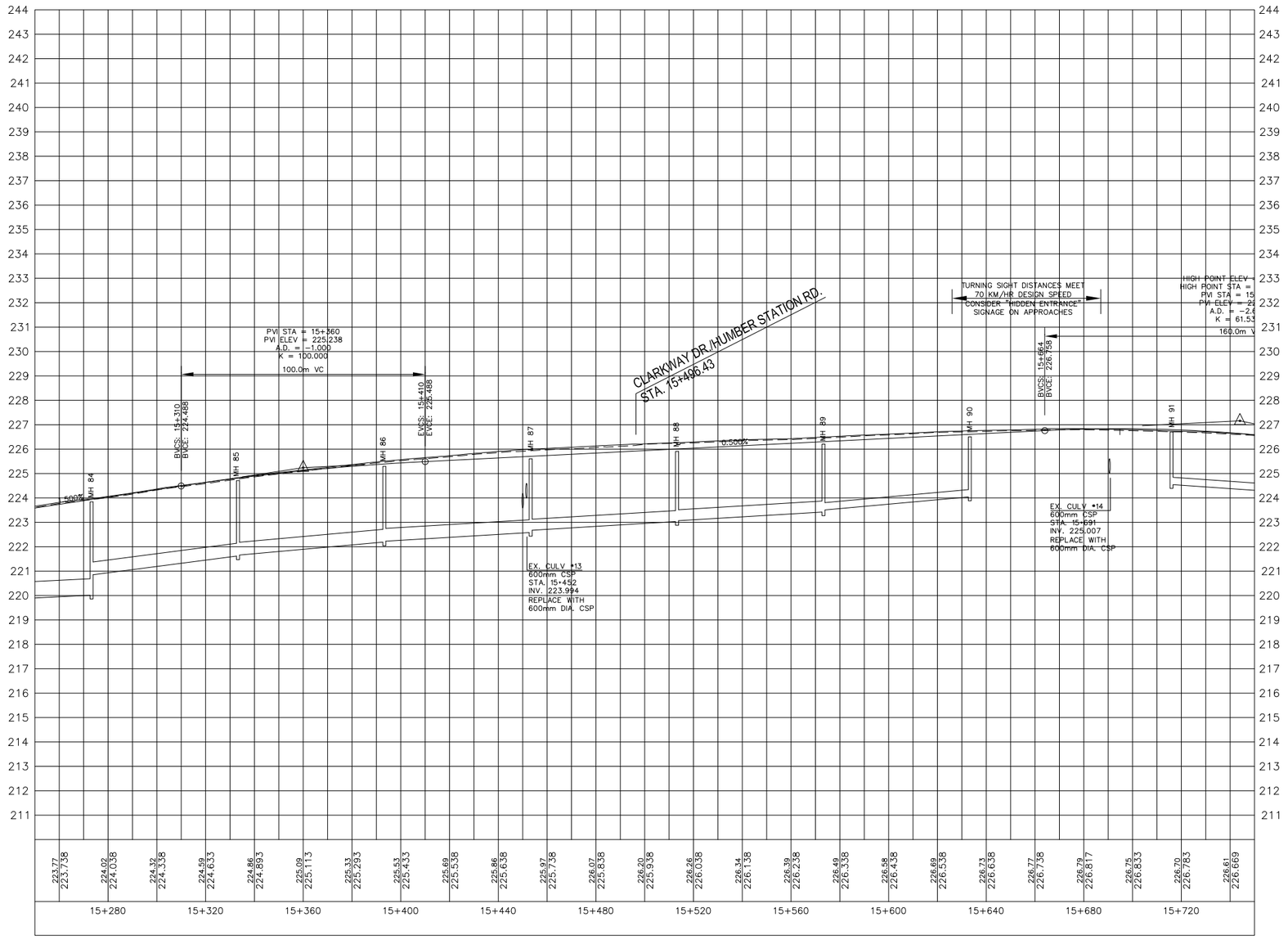

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2012-10-17	160210480	

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Road drainage from the west and east end is directed to OGS units and enhanced swales at Crossing No. 12 via a new closed storm sewer system within the roadway. A small area of drainage from east of Clarkway Drive/Humber Station Road is also directed the outlet at crossing No. 12.

6.1.7 Mayfield Road – Clarkway Drive/Humber Station Road to Coleraine Drive

Details of this section include:

Current rural cross section of two lanes plus turn lanes is upgraded to four lanes plus turn lanes with a continuous 6.0 m wide two-way left turn lane (TWTL) in the interim phase (prior to 2017) and further upgraded in the ultimate phase (prior to 2032) to six (6) lanes with turning lanes, continuous two way left turn lane the planned future extension of Major Mackenzie Drive. This may also include recommended replacement of the TWTL with raised median based on adjacent area development progression. Within this section there are three creek crossings TRCA ID No. 14, 15 and 16, smaller culvert crossings at Sta. 15+690 (600 mm) and 15+890 (900 mm), a SWM facility at Sta. 16+000 and pedestrian facilities at both sides (1.5m concrete sidewalk on north side and 3.0 m asphalt multi-use trail on the south side). The potential for a multi-use trail on the north side will also be investigated during the detailed design phase which is recommended in the Region's 2012 Active Transportation Plan.

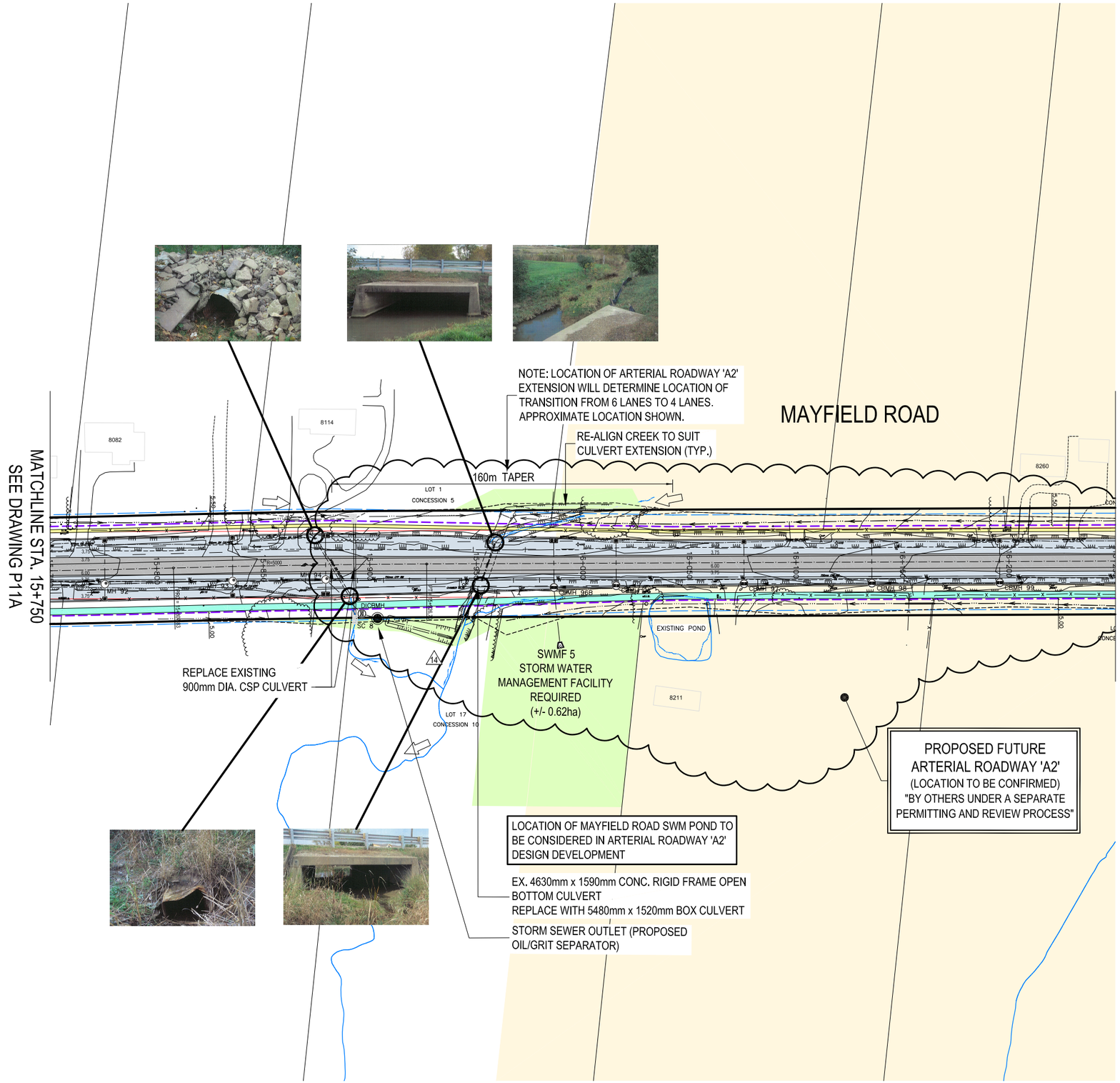
The preliminary design for this section of Mayfield Road is represented on drawings No. P11A through P14B and a typical cross section is provided as Figure CS2-2.

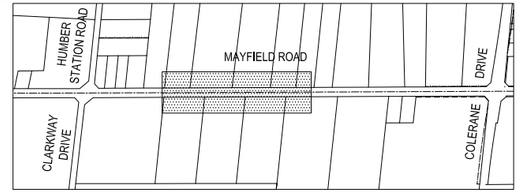
Ultimate Intersection Configuration:

Coleraine Drive:

Eastbound – three through lanes
Eastbound left turn lane – 55/60 m storage/parallel lane
Eastbound right turn lane – 15/70 m storage/parallel lane
Westbound – three through lanes
Westbound left turn lane – 15/60 m storage/parallel lane
Westbound right turn lane – 15/70 m storage/parallel lane
Northbound – one through lanes
Northbound left turn lane – 15/TBC m storage/parallel lane
Southbound – one through lanes
Southbound left turn lane – 15/TBC m storage/parallel lane

Initial construction of the four lane section from Clarkway Drive/Humber Station Road will be skewed to the south with a full urban cross section on the south side and a semi-rural section retained on the north side.





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Scale

20m 0 20 40 60m HORIZONTAL SCALE

2m 0 2 4 6m VERTICAL SCALE

Stantec

Client

Region of Peel
Working for you

Drawing Title

MAYFIELD ROAD
AIRPORT ROAD TO COLERAINE DRIVE
CLASS EA STUDY REPORT
RECOMMENDED DESIGN ALTERNATIVE
PLAN
STA. 15+750 TO STA. 16+250

Drawn By	Checked By	Drawing Number
W.R.W.	J.C.B.	P12A
Date	Project No.	
2013-04-04	160210480	

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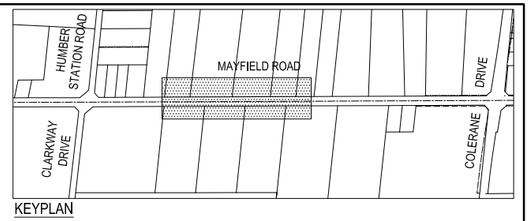

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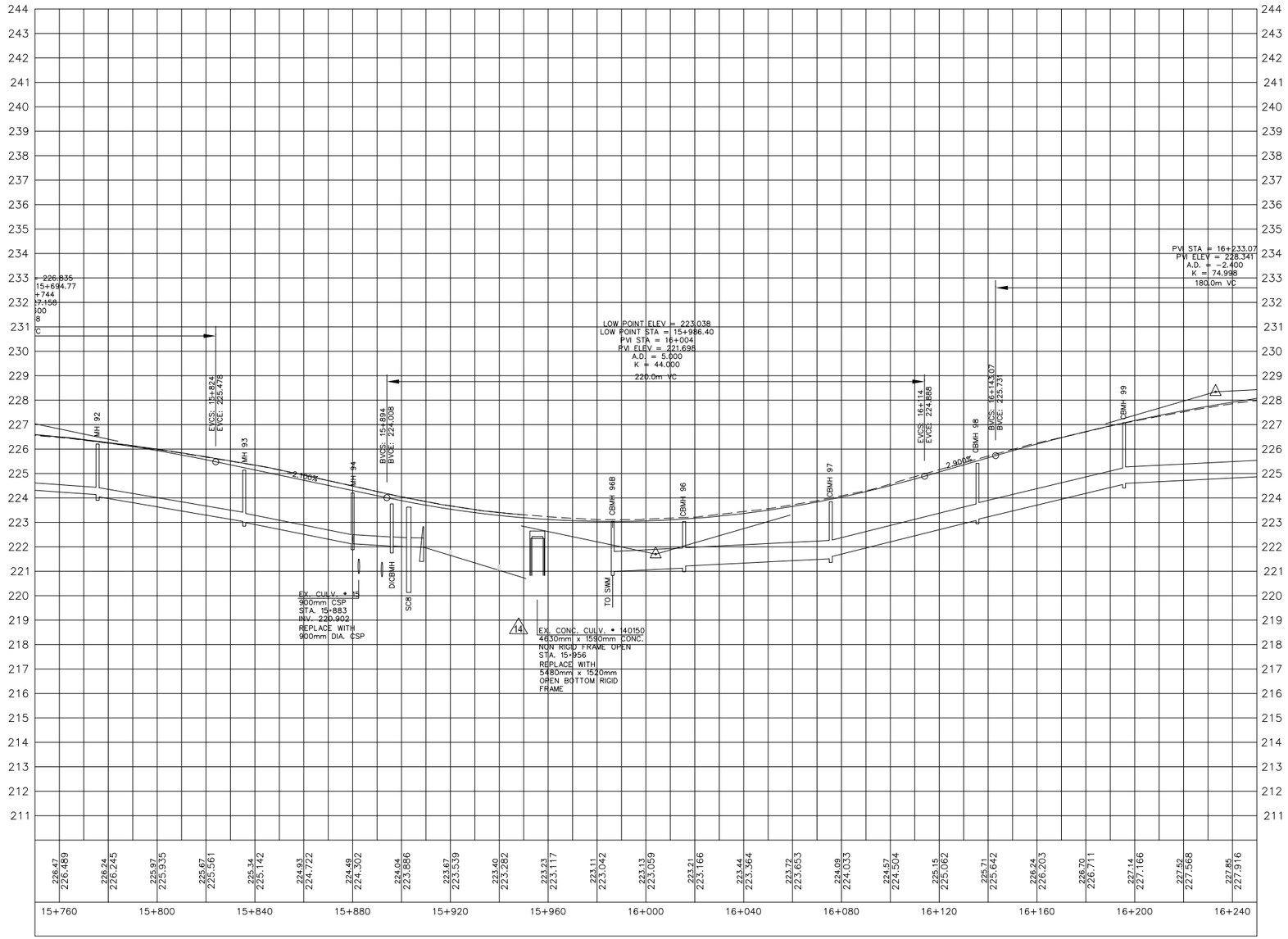

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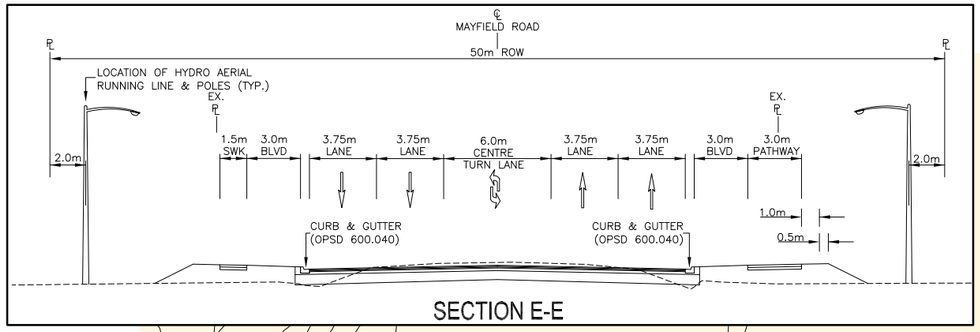
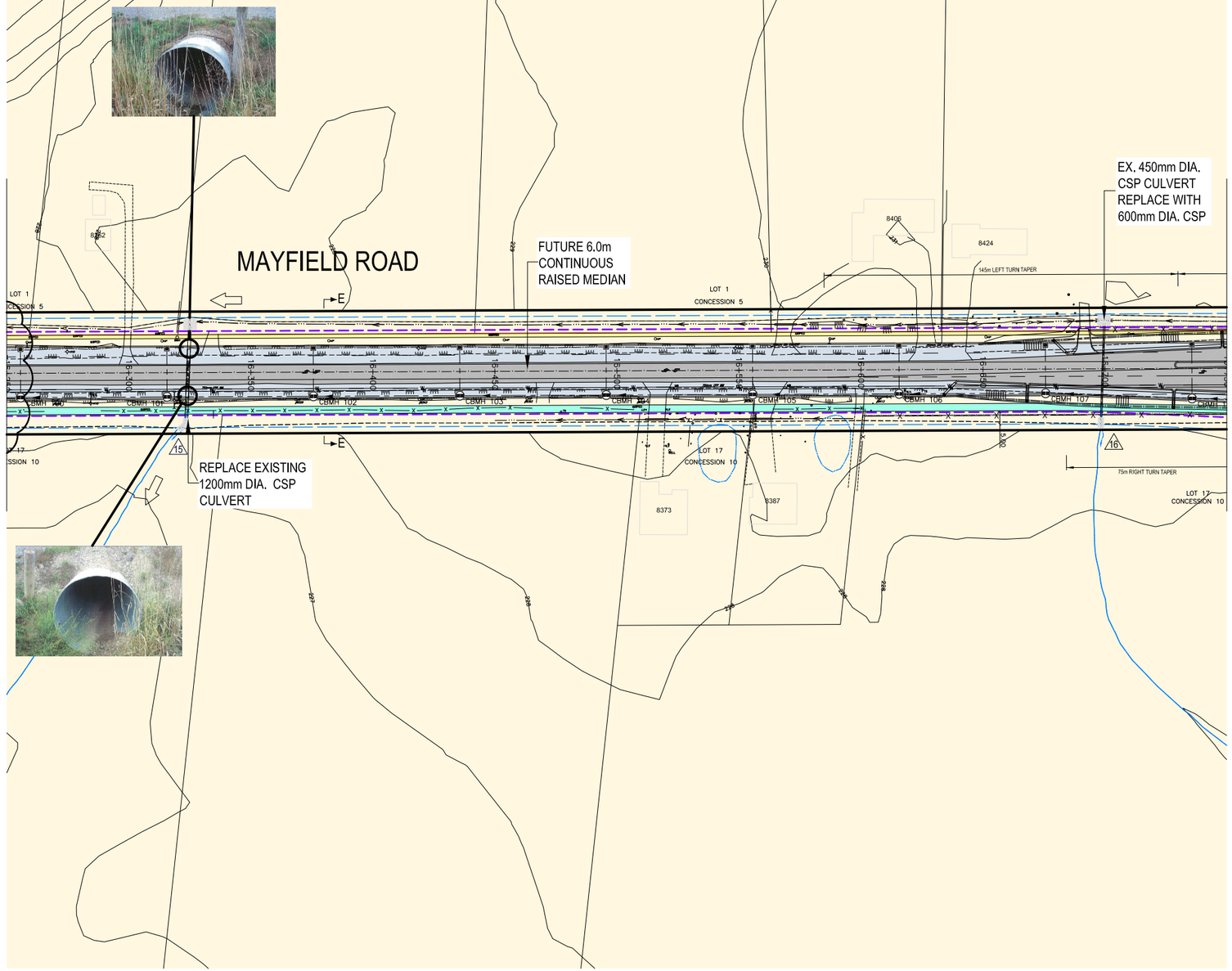
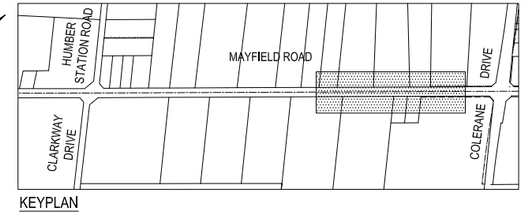


SECTION E-E





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2m 0 2 4 6m VERTICAL SCALE

Stantec

Client

Region of Peel
Working for you

Drawing Title

MAYFIELD ROAD
AIRPORT ROAD TO COLERAINE DRIVE
CLASS EA STUDY REPORT
RECOMMENDED DESIGN ALTERNATIVE
PLAN
STA. 16+250 TO STA. 16+750

Drawn By	Checked By	Drawing Number
W.R.W.	J.C.B.	P13A
Date	Project No.	
2012-10-17	160210480	

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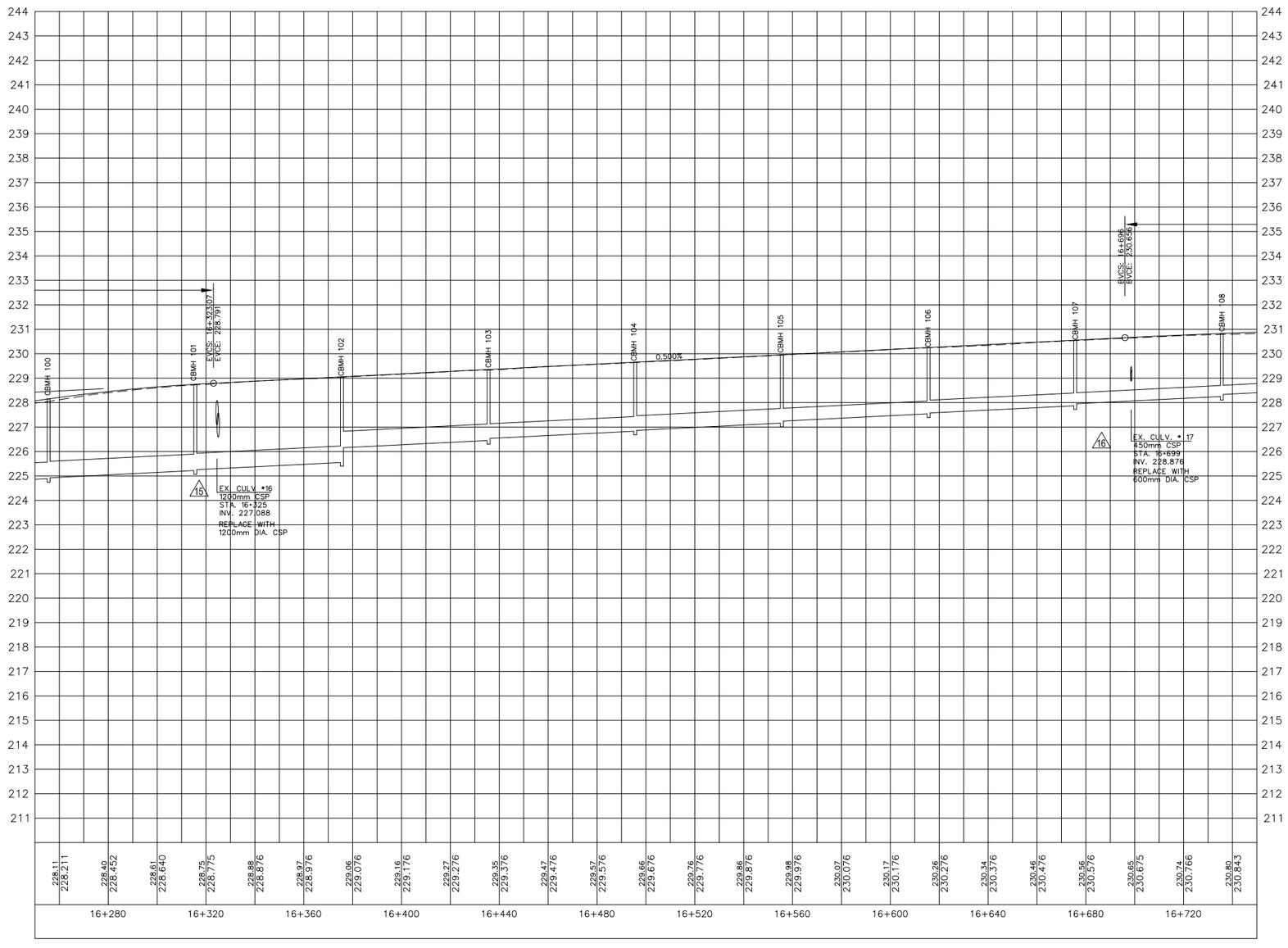

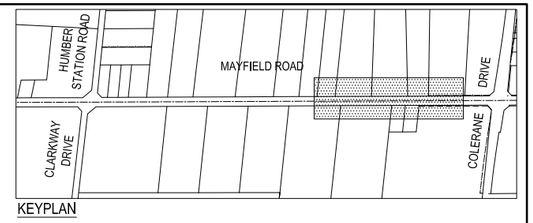

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MATCHLINE STA. 16+750
SEE DRAWING P13A

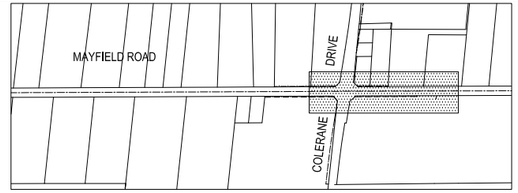
COLERAINE DRIVE

MAXIMUM 80 km/h

90 Km/hr DESIGN SPEED

Limit of Study

60m LEFT TURN PARALLEL
55m LEFT TURN STORAGE
LOT 1
CONCESSION 5
70m RIGHT TURN PARALLEL
15m RIGHT TURN STORAGE
15m LEFT TURN STORAGE
60m LEFT TURN PARALLEL
75m RIGHT TURN TAPER
145m LEFT TURN TAPER
460m PARALLEL
50m ULTIMATE ROW
LOT 17
CONCESSION 12



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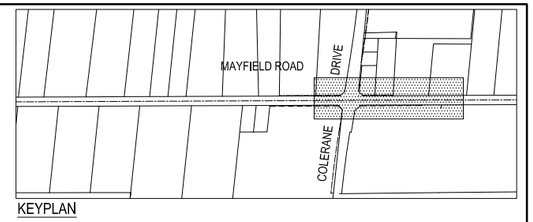

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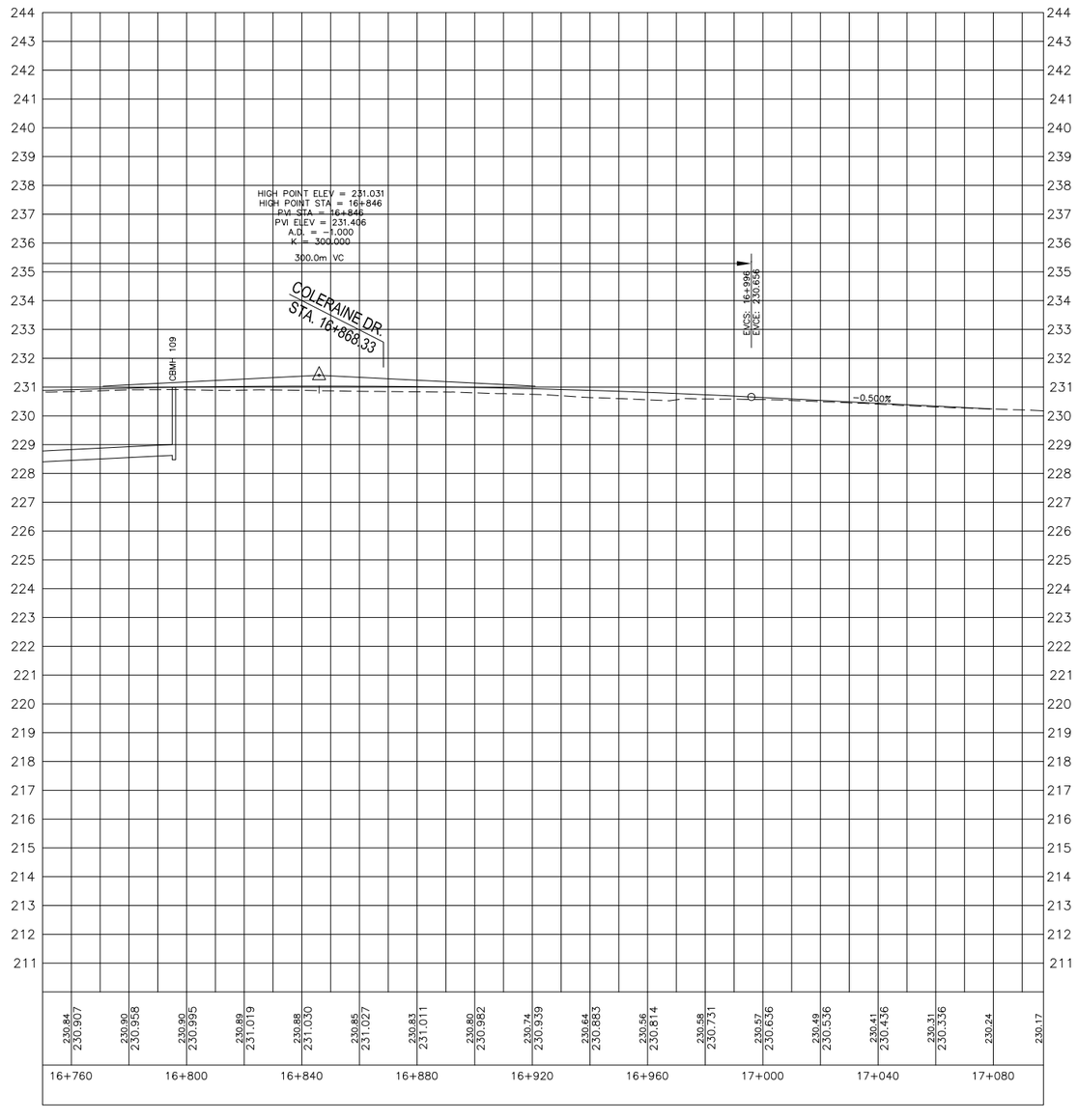

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Since the section of roadway between the proposed arterial roadway intersection, planned to intersect somewhere between Sta.16+000 and Coleraine Drive at Sta. 16+850 will only require 4 lanes in the design horizon to 2032 the roadway at that location will be constructed equally on either side of the centerline of the right-of-way. Details of the roadway alignment within this section will be subject to further review to provide the most cost effective solution in the interim period with a minimum of throw-away costs in the future. Deferral of the north side sidewalk may be considered subject to confirmation with the Town of Caledon.

Relocation of the driveway access at 8014 Mayfield Road on Mayfield Road at the northeast corner of Humber Station Road is to be considered further during the detailed design phase; If the driveway is relocated then the intersection median island can be extended across the entire frontage. If it is not then the median must be truncated to allow for property access.

The culvert at crossing No. 14 is replaced and realigned with a new 5480 x 1520 mm open bottom culvert, the culvert at crossing No. 15 is replaced with a new 1200 mm CSP culvert and the culvert at crossing No. 16 is replaced with a 600 mm CSP culvert.

An oil and grit separator (OGS) is provided west of crossing No. 14 on the south side of Mayfield Road.

Road drainage from the west is directed to the OGS units and enhanced swale at Crossing No. 14 via a new closed storm sewer system within the roadway. The drainage area from Coleraine Drive to crossing No. 14 is directed the SWM facility on the east side of crossing No. 14. The location of the SWM pond east of crossing No. 14 near Sta. 16+000 is subject to review in connection with the proposed extension and connection of Major MacKenzie Drive. The subject study area for the extension is shaded on the accompanying preliminary design drawings.

6.2 DESIGN CRITERIA

Proposed design criteria were established at the outset of the evaluation of roadway design alternatives to confirm the standards and guidelines that would be applicable to the development of practical geometric designs for various roadway options being considered.

The approved design criteria applicable to the recommended design alternative are presented in Table 5.1 included in Section 5.0.

6.3 PROPERTY IMPACTS & ACQUISITION

Property impacts were investigated in great detail for all of the roadway design alternatives and were further refined in the development of the Preferred Alternative Design - Concept 4 Modified. A summary of the property requirements is included in

Appendix T along with plans (P17-P28) illustrating the location and orientation of property impacts and property acquisition requirements.

Property requirements generally consist of property that is required to develop the 50m right of way requirements as identified in the Region's Official Plan and including:

- roadside storm water management facilities;
- development of enhanced outlet swales for the roadway ;
- additional lands required for the construction of road side storm water management facilities and related Oil and Grit Separator (OGS) units;
- the construction of culvert and bridge extensions or replacements; and,
- the general requirements at intersections for the development of auxiliary turning lanes for right and left turning vehicles.

Property is also required for the development of roadside transit stops and associated facilities in connection with the ultimate roadway cross section.

Utility relocations are to be accommodated within the corridor and the potential requirements for guying easements and aerial encroachments are matters to be determined and refined by the respective utility providers at the time of detailed design.

The following table summarizes the nature of property acquisitions for the project:

Table 6.3.1.1 – Property Acquisition - Preferred Alternative

Location/Description	50 m Right of Way (m^2)	SWM, Grading Encroachment & Swales (m^2)	Transit Stops (m^2)	Buyout (m^2)	Total[1] (m^2)
Airport Road to Goreway Drive/Innes Lake Road	17,503.8	7,913.6	183.9	8042.7	32678.2
Goreway Drive/Innes Lake Road to McVean Drive/Centreville Creek Road	21,282.0	15,368.7	285.8	13,474.9	49,277.4
McVean Drive/ Centreville Creek	33,917.0	10,413.5	355.7	5,847.5	48,536.7

Table 6.3.1.1 – Property Acquisition - Preferred Alternative					
Location/Description	**50 m Right of Way (m^2)**	**SWM, Grading Encroachment & Swales (m^2)**	**Transit Stops (m^2)**	**Buyout (m^2)**	**Total[1] (m^2)**
Road to The Gore Road					
The Gore Road to Clarkway Drive/ Humber Station Road	25,989.8	12,728.6	78.8	27,403.0	60,028.0
Clarkway Drive/ Humber Station Road to Coleraine Drive	27,671.0	7,867.8	266.9	0.0	35,805.7
Total	**126,363.6**	**54,292.2**	**1,171.1**	**54768.1**	**226,326.0**

1. Excludes area of overlapping need at full buyout properties.

There are 133 properties impacted with 117 partial property impacts and 15 full property impacts (buy-outs) that must be acquired to accommodate the proposed ultimate roadway. The Region of Peel has completed Stage 2 archeological investigations (ploughing, test pitting and field investigations) to identify any archaeological resources of concern and has completed that task as of August 2012. When required to do so, the Region of Peel will enter into negotiations with the affected property owners to secure the necessary land to accommodate the proposed works. For properties where permissions to enter were not provided Stage 2 archaeological assessment work will be completed during the detailed design phase. Details of the Stage 2 Archeological investigation are summarized in the following section.

6.4 STAGE 2 ARCHAEOLOGY

6.4.1 General

The Stage 1 archaeological assessment described in Section 2.10 identified potential archaeological resources and recommendations for Stage 2 investigation as required to advance the study and preliminary design work. A Stage 2 Archaeological investigation was required in support of the need to acquire property for the proposed roadway and related facilities.

The Stage 1 Archaeological Assessment (ASI 2008) had concluded that there is potential for the recovery of historic cultural material within the study corridor, depending on the degree of previous land disturbance. A Stage 2 Property Assessment (ASI 2012) was conducted by Archaeological Services Inc. (ASI) in accordance with the

Ontario Heritage Act and the 2011 Standards and Guidelines for Consultant Archaeologists (S & G). In this regard, a systematic Stage 2 pedestrian survey and test pit survey were completed on all lands with archaeological potential where permission to enter was granted.

The Stage 2 property survey assessed approximately 5 ha. of land on both sides of Mayfield Road from Airport Road west to Coleraine Drive in the east. Mayfield Road is currently a paved and serviced two lane road. The ROW consists of asphalt, gravel shoulders and drainage ditches. Beyond the disturbed ROW, there is a mixture of agricultural fields, both high and low density residential developments, and undeveloped mixed forests. The study corridor is located within the Humber River watersheds and is bisected by the West Humber River and Salt Creek.

All activities carried out during this assessment were completed in accordance with the terms of the Ontario Heritage Act and the Ministry of Tourism, Culture and Sport's (MTCS) 2011 Standards and Guidelines for Consultant Archaeologists (S&G).

The Objectives of the Stage 2 assessment were as follows:

- To document all archaeological resources in the study area;
- To determine whether the study area contains archaeological resources with cultural heritage value or interest that would require further assessment; and
- To recommend appropriate Stage 3 assessment strategies for archaeological sites identified.

The investigations were undertaken with permission to enter agreements from property owners provided by the Region Peel from June 28, 2011 through April 2, 2012. The findings and recommendations are documented in the Stage 2 Property Assessment report, dated August 5, 2012 included in Appendix K and the following provides a general summary of the investigation and assessment.

6.4.2 Local Registered Archaeological Sites

According to a review of the Ontario Archaeological Sites Database (OASD) conducted by Robert von Bitter (Data Coordinator for the MTCS) on February 27, 2012, 27 archaeological have been registered within a 1 km radius of the study corridor. Details of the registered sites are summarized in the Appendix K.

Of the 26 known archaeological sites registered within 1 km of the Mayfield Road, seven are located within 50 m of the study area. These sites are briefly discussed below.

Four of the seven sites were discovered during a previous ASI property assessment (ASI 2004). All four sites are located on the south side of Mayfield Road near Airport Road and were discovered in agricultural fields during pedestrian survey. This previously assessed area abuts the Mayfield Road study area.

- AkGw-264 (Tullamore Tenant) yielded 80 Euro-Canadian artifacts including ceramics, glass, and metal (ASI 2004). Examination of the various artifact classes resulted in a ministry approved recommendation that no further work was required.

- AkGw-265 (Farley) is a homestead site. It yielded 108 artifacts (ceramic, glass, and metal) suggesting it was occupied from the early to mid 19th century. ASI made a tentative recommendation that further Stage 2 archaeological assessment was needed in the surrounding area in order to determine whether or not further work at AkGw-265 was necessary (ASI 2004). The Farley site area will not be impacted by the present study.

- AkGw-266 was discovered by ASI during a pedestrian survey of an agricultural field (2004). A single, non-diagnostic, biface fragment of Onondga chert was found. ASI made a ministry approved recommendation that no further work was required due to the isolated nature of the find.

- AkGw-273 denotes the findspot of a single side-notched projectile point of Kettle Point chert. The point resembles the Early Woodland Meadowood type that dates, ca. 1000-500 B.C. ASI made the ministry approved recommendation that no further archaeological assessment was necessary due to the isolated nature of the find.

The remaining three sites were discovered following property assessments by others:

- AkGw-279 represents a findspot where a single projectile point tip of unknown chert type was discovered. This lithic artifact was discovered during a pedestrian survey of an agricultural field. Archeoworks recommended that no further work was necessary (Slocki 2005).

- AlGw-125 (Solmar H1) is located on the north side of Mayfield Road and the southwest side of Coleraine Drive and was discovered during a pedestrian survey. It is a mid-19th century homestead site that was recommended for Stage 3 assessment. This site is not located in the Stage 2 study corridor and will not be impacted by the current project.

- AlGw-151 (Hart) is located at the southwest corner of Mayfield Road and County Road 50 and is a mid-19th century homestead site. Researchers recommend that if the site cannot be protected from disturbance, further archaeological work is necessary.

6.4.3 Archaeological Sites within the Mayfield Road Project Area

6.4.3.1 Site AkGw-454

Archaeologists discovered AkGw-454 while digging test pits on a landscaped lawn on the south side of Mayfield Road. Once historic artifacts were discovered in Test Pit 1 (TP 1) 10 more test pits were dug to subsoil at a distance of 2.5 metres from TP 1. All 11 of

these test pits were positive (TP 1-11). A one metre test unit was then excavated over the location of TP 1 (Plate 45). Constrained by the boundaries of the study area, no attempt was made to define the site limits of AkGw-454 (ASI 2012: Figure 1). Based on the historic record and a commemorative historic plaque (ASI 2012: Plate 1), it was evident that the digging was on a site with a terminus post quem of the late 19th century.

General Site location: The site is located on the south side of Mayfield Road and the northeast side of The Gore Road. (ASI 2012: Plate 2). For detailed location information including GPS coordinates and detailed mapping see the report's separate Supplementary Documentation (ASI 2012).

Topography: The site was found on a raised, landscaped area adjacent to Mayfield Road and The Gore Road.

Soil Type: Medium brown clayey loam topsoil overlying yellow brown clayey subsoil.

Features of Archaeological Potential: Historical evidence showing the site has been occupied since the late 19th century and may represent remains of the Grady General Store.

Site Type: Historical Euro-Canadian.

Field Conditions: Flat, landscaped lawn.

Site Size (approximate): 10 m x 10 m.

Assessment Method: Test pit survey at 5 m intervals.

Density & Distribution: 69 artifacts were found in 11 test pits. The one metre test unit yielded 134 artifacts.

Content Summary: 127 metal artifacts, 23 faunal remains, 19 glass, 15 slag, 11 ceramics, six misc., and two bricks (Plate 47-48 and Heritage Report Appendix B).

Sample Collected: 203 artifacts were collected (100%)

Sample Description: A mix of late 19th and early 20th century artifacts.

Site Interpretation: Based on the decorative styles of the ceramics and other diagnostic artifacts, the site appears to have multiple phases dating to the late 19th and early 20th century.

Has the cultural heritage value or interest been sufficiently assessed and documented in Stage 2: No

Recommendations: Stage 3 assessment is necessary for AkGw-454.

Justification: Meets the requirements of Section 2.2 (Standard 1.c.) of the *Ministry of Tourism, Culture and Sport's (MTCS) 2011 Standards and Guidelines for Consultant Archaeologists*.

6.4.3.2 St. Patrick's Cemetery

While no artifacts were recovered in this location, the test pit survey along the northern edge of St. Patrick's Cemetery resulted in the discovery of a single buried footstone within cemetery grounds (Photo locations: Plate 28 and Plate 29). This footstone was likely covered with fill during previous construction of the adjacent overpass and may indicate that the cemetery boundaries have been encroached upon over time.

Plate 28: View southwest from the southeast side test pits on the edge of St. Patrick's Cemetery.

Plate 29: Footstone uncovered during test pit survey on the edge of St. Patrick's Cemetery

6.4.4 Analysis of Stage 2 Property Survey Results

During the course of the test pit survey a late 19th/early 20th century site was recovered. Preliminary analysis suggests that the site may be the remains of the Grady Store built during the 1880s. This store would have serviced the hamlet of Wildfield and served as a hub for the small community until 1946 when it was purchased by the Roman Catholic Episcopal Corporation for the Diocese of Toronto. The store subsequently became a Convent and was occupied by the Loretto and Felician Sisters. The Grady store was torn down in 1969 during the widening of Mayfield Road. Since the cultural heritage value is yet to be determined, further Stage 3 assessment is necessary.

The property survey results also indicate that the St. Patrick's Cemetery boundaries may require further investigation. If the project proposes to impact the lands adjacent to the cemetery, these lands will require a Stage 3 Cemetery Investigation. The purpose of this investigation is to confirm the boundaries of the cemetery to ensure that the cemetery does not extend into the study area (Ministry of Tourism, Culture and Sport's (MTCS) 2011 Standards and Guidelines for Consultant Archaeologists, Section 2.2, Guideline 4).

The following extracted map from the assessment report shows the location of investigation and observations at these locations on The Gore Road.

6.4.5 Archaeological Recommendations

During the assessment, one Euro-Canadian site, AkGw-454, was identified. Artifact analysis and archival research suggests that this locality may represent the remains of a late 19th/early 20th century Euro-Canadian site.

In light of these results the following three recommendations are made:

1. One archaeological site, AkGw-454, was identified within the Mayfield Road study area (at the southwest corner of Mayfield Road and The Gore Road in Wildfield) that has further cultural heritage value. A Stage 3 site specific archaeological assessment is recommended for AkGw-454 in accordance with the Ministry of Tourism, Culture and Sport's (MTCS) 2011 Standards and Guidelines for Consultant Archaeologists in order to clarify the nature and extent of the cultural deposits.

2. Stage 2 property assessment must be undertaken on properties identified as having archaeological potential that were not available to be assessed for this project due to lack of permission to enter.

3. If the lands adjacent to the St. Patrick's Cemetery are to be impacted by the project then these lands require a Stage 3 Cemetery Investigation in advance of construction to confirm the boundary of the cemetery and presence or absence of burials in the ROW lands. A Gradall will remove the topsoil in order that a licensed archaeologist can examine the exposed surfaces for grave shafts.

Should changes to the project design or temporary workspace requirements result in the inclusion of previously unassessed lands, these lands should be subject to a Stage 2 property assessment. 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 should be immediately notified.

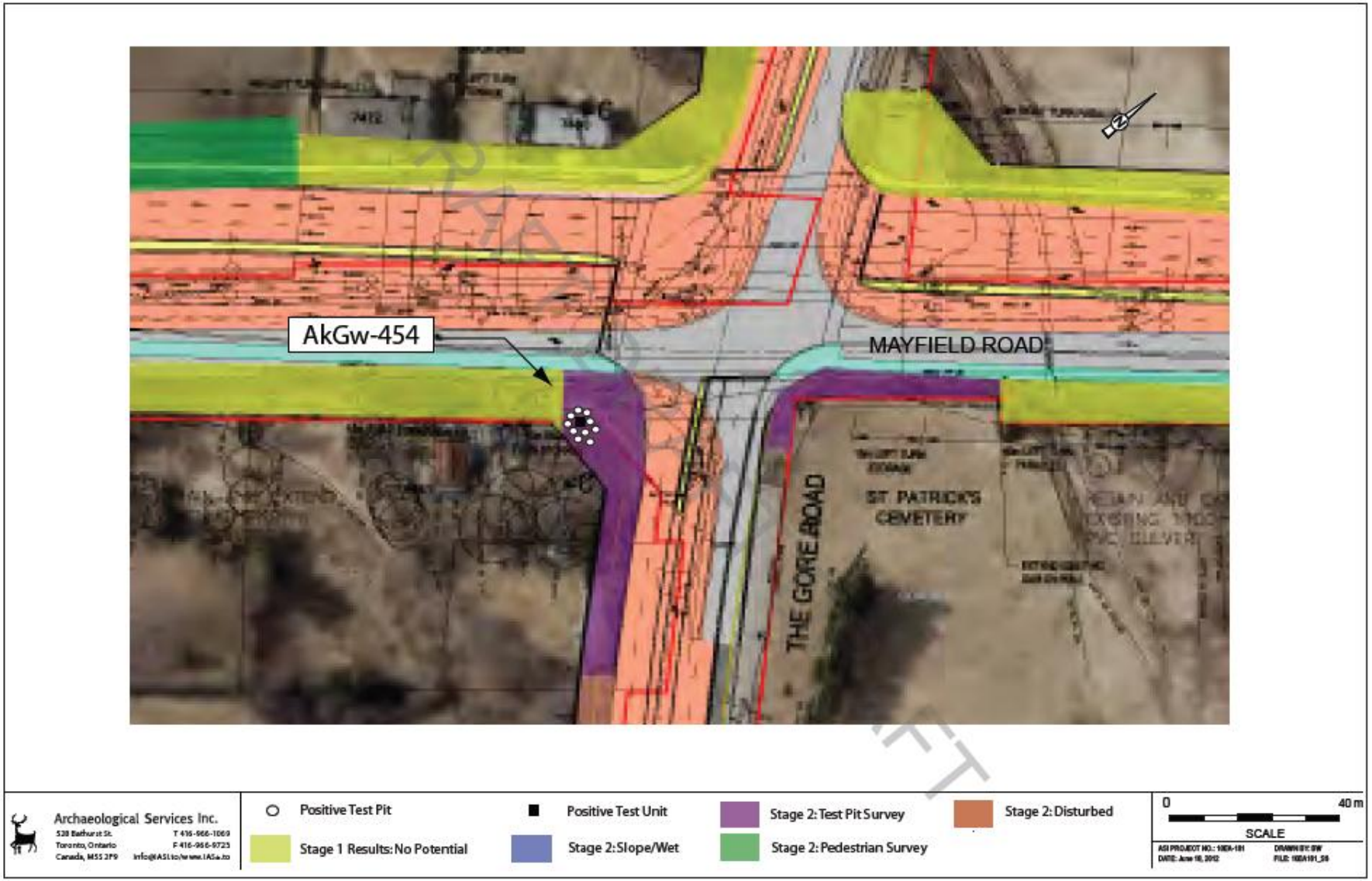


Figure 1: Location of AkGw-454 (Close up of Sheet 6)

6.5 DRIVEWAYS AND INTERSECTIONS

An assessment of driveway sight distances was undertaken and is summarized in section 4.0. The design speed of the roadway for the most part is 90 km/hr. and is reduced to 60 km/hr. in two locations between Airport Road and Goreway Drive and between Sta. 13+800, 180 m. west of The Gore Road and Sta.14+920 720 m. east of The Gore Road. In the area between Sta. 11+890 and Sta. 12+190 the existing driveway sight distance is suitable for a reduced design speed of 70 km/hr. and Sta. 15+625 and Sta. 15+810 the existing driveway sight distance is suitable for a reduced design speed of 75 km/hr. and representative of a maximum posted speed of up to 70 km/hr.

There are several driveways in locations that fall with the functional intersection area and as such may be impacted by high volumes of traffic at certain times of the day. In these situations, the potential delay and conflict between vehicles during the peak periods may be increased as a result. Since each signalized intersection will have a minimum 30 m long raised Median Island associated with the left turn lanes, it will be difficult to gain access/egress for left turning movements at several driveways that are located within 30 m of the future intersection stop bar location. As a result, the desire to undertake U-turn movements will be increased and can result in a greater risk of collision. In times of peak traffic, delays will occur if left turning residents must wait for a gap at the intersection. In the end, this may result in significant additional collision risk in the vicinity of the intersections. As the area develops and lands are converted to future development it is assumed that the controlled access policies of the Region of Peel will be implemented and individual all-movements driveways will not be permitted in the area of major intersections.

Consequently, it is recommended that alternatives be investigated further during the detailed design of the road improvements. The following is a list of individual driveways which should be investigated further to determine if an alternate alignment can be developed or an alternate location provided to relocate them further from the intersection.

Table 6.5.1.1 – Access Management - Driveway Relocation Review

Location	Proximity	Recommended Action
[redacted]	East leg of Mayfield Road at Airport road within the functional intersection area.	Driveways at this location should be reviewed for potential removal, relocation or combination to reduce potential conflicts with high volumes of traffic.
[redacted]	East leg of Mayfield /Innes Lake Road intersection within the functional area of the	Reorientation of the driveway on the northeast corner to a new location on Innes Lake

Table 6.5.1.1 – Access Management - Driveway Relocation Review		
Location	**Proximity**	**Recommended Action**
	intersection.	Road should be considered.
[redacted]	West leg of Mayfield /The Gore Road intersection within the functional area of the intersection.	Driveways at or near three corners of The Gore Road at Wildfield should be reviewed to identify opportunities for relocation further from the signalized intersection through site reconfiguration if possible.
Roadside legacy parking at the Gore Road	Adjacent to the St. Patrick's Church and Cemetery.	The currently used parking area within the municipal road right-of way at the St. Patrick's church and cemetery at the southeast corner of The Gore Road is impacted by proposed road widening.
[redacted]	East leg of Mayfield /The Gore Road intersection within the functional area of the intersection.	Driveways at or near three corners of The Gore Road at Wildfield should be reviewed to identify opportunities for relocation further from the signalized intersection through site reconfiguration if possible.
[redacted]	Opposite Marysfield Road Intersection.	Realignment of the private entrance driveway at the Marysfield Road intersection is recommended.
[redacted]	On north side, west of Marysfield Road intersection in functional area of intersection	Location should be considered further during the detailed design development of the intersection at Marysfield Road.
[redacted]	On north side, east of Marysfield Road intersection in functional area of intersection	Location should be considered further during the detailed design development of the intersection at Marysfield

Table 6.5.1.1 – Access Management - Driveway Relocation Review		
Location	**Proximity**	**Recommended Action**
		Road.
[redacted]	On Mayfield Road at the northeast corner of Humber Station Road within Functional Area of Intersection.	Review relocation to Humber Station Road during detailed Design Phase

6.6 TRANSIT PROVISIONS

Where space permits, dedicated transit bays have been proposed at the roadside in selected locations. Property acquisition is required for the additional property required to develop the dedicated facilities and the costs thereof are included in the overall property acquisitions and costs estimates. Transit stop locations are typically oriented to the far side of the proposed intersections in accordance with current City of Brampton transit design standards. The various transit stop locations proposed are shown on the recommended preliminary design plans.

6.7 ACTIVE TRANSPORTATION

Sidewalks and multi-use trail facilities have been incorporated in the proposed work and included in the assessment of all roadway design concepts and alternatives. A continuous 3.0 m asphalt trail is proposed on the south side for multi-use (City of Brampton) and a 1.5 m wide concrete sidewalk has been proposed on the north side (Town of Caledon). Connections to proposed transit stops are also a part of the proposal. Consideration of the recommendations of the Region of Peel's 2012 Active Transportation Plan will also be investigated further during the detailed design phase of the project.

6.8 LANDSCAPE DESIGN

The preliminary plans illustrate possible landscape opportunities in the corridor and on the typical cross sections contained in Section 5 but are provided here strictly as general considerations. The details of landscape design will be subject to acceptance and approvals from the respective municipalities including the Town of Caledon, City of Brampton and the Region of Peel. Landscape plans will be prepared by a qualified OALA Landscape Architect during the detailed design stage. These plans will include but not be limited to:

- Street trees and opportunities for "floral feature intersections" will be provided as per Peel Region 'Regional Streetscape Policy' including use of the Region's streetscape toolbox and collaboration with The City of Brampton's Open Space Design & Construction section;

- Consideration of gateway entrance features will be provided where appropriate at Wildfield on The Gore Road;
- Trees planted near overhead utilities will be selected to conform with Hydro easement a provide clearances in accordance with Electrical Safety Act (ESA) requirements;
- Coloured patterned concrete treatments to be installed at all intersections, to include concrete boulevard edging ("kill-strips") and similar treatments in raised median islands; and,
- Alternate materials and texture provisions will be considered for accessibility in accordance with Accessibility for Ontarians with Disabilities Act provisions for pedestrian connections.

6.9 DEVELOPMENT PROVISIONS

At the outset of the study there was very little specific information available regarding plans of subdivision and proposed future developments adjacent to the Mayfield Road Class EA study area aside from secondary planning documents and traffic and population growth data. As the study progressed, various plans have advanced to the point of specific interest in the details of proposed future improvements at Mayfield Road. Various developers have expressed interest in specific details of the Mayfield Road improvements adjacent to their proposed development lands over the past year or so, including interest in grading encroachment, land purchase, access road locations, storm drainage and storm water management provisions that may have an impact on the adjacent development. In most cases, feedback was provided through direct contact of developer representatives with the Region's Planning Department and requested responses through the Transportation Planning group.

It is assumed that development interests have initially been served thorough mandatory public contact and Public Information Centres (Notice of Study Commencement [2007], PIC #1 [2009] and PIC #2 [2011]) provided during the course of the study. Opportunities for feedback and comment have been provided at strategic points of the study and a final opportunity will be presented upon filing of this project Environmental Study Report (ESR).

6.10 STRUCTURE UPGRADING AND REPLACEMENTS

Various culverts require replacement and upgrading as a result of their structural condition, general orientation, elevation and/or hydraulic capacity. Several structures also require replacement with much larger structures due to Endangered Species Act regulations and related habitat considerations.

In accordance with new guidelines established by the Ministry of Natural Resources (MNR) in 2011 during the latter part of this study and following additional study and investigation concluded in March 2013 it is now required that the two crossing structures

(culverts) at crossing ID #3 and #11 be replaced with bridge structures with a single span of 18.4 m for crossing ID #3 and 15.6 m for crossing ID #11. The final span dimensions will be confirmed prior to completion of the detailed design phase which will follow this study. The study plans have been revised at this time to reflect the new bridges and storm sewer modifications that would be required as a result of the MNR's requirements.

A summary of the proposed culvert and bridge replacements and details is included in Table 2.8.1.1 and confirmed in Table 6.7.1.1.

6.11 STORM DRAINAGE PROVISIONS

Storm drainage provisions associated with the recommended alternative include roadside storm sewers with catch basins and catch basin maintenance holes aligned to capture roadway drainage and outlet to either Oil-water-grit separation (OGS)/enhanced swales or new roadside storm water management facilities before ultimately outletting to the numerous existing watercourses along the study route.

Quality control and enhancement will be provided as a minimum through Oil-water-grit separation and shallow flat grass lined swales at the roadside where possible, while quantity control and sediment capture will be provided in five proposed SWM facilities located adjacent to Mayfield Road. A summary of the storm drainage and SWM features for each major section of the roadway is provided in the following table. It is recommended that the Region of Peel also investigate opportunities for combined SWM facilities in proposed future developments to minimize the number of SWM facilities and maximize the effectiveness of operations and maintenance dollars.

Table 6.8.1.1 – Recommended Storm Drainage and Storm Water Management Improvements

Location	Sewer Provisions	SWM Provisions	Culverts & Bridges
Airport Road to Maisonneuve Boulevard	Closed storm sewer in roadway with outlet to SWM Pond at Sta. 10+600 near Maisonneve Boulevard Parallel sewer for external drainage on south side from crossing at Sta. 10+420 to 10+685	SWM pond SWF1 on North side at Sta. 10+600 with outlet upstream of 1800 mm culvert at Sta. 10+685	1000 mm CSP replaced with new 675 mm concrete (or 1200 mm CSP) sewer at Sta. 10+420 (TRCA Crossing ID No. 1) New 1800 CSP at Sta. 10+685 (ID No. 2)
Maisonneuve Boulevard to	Closed storm sewer in roadway from	OGS and Enhanced swales at outlets to	New 18.4 m single span Bridge crossing of Salt

Table 6.8.1.1 – Recommended Storm Drainage and Storm Water Management Improvements			
Location	**Sewer Provisions**	**SWM Provisions**	**Culverts & Bridges**
Goreway Drive/Innes Lake Road	east of Maisonneuve Bouelvard with outlet to OGS and swale at west side of Culvert Sta. 11+015 Closed storm sewer in roadway from west of Goreway Drive with outlet to OGS and swale at east side of Culvert Sta. 11+015	Crossing at Sta. 11+015	Creek (ESA – Redside Dace habitat) (ID No. 3)
Goreway Drive/Innes Lake Road to McVean Drive/Centreville Creek Drive	Closed storm sewer in roadway from east of Goreway Drive with outlet to OGS and swale at west side of Culvert at Sta.11+800 Closed storm sewer in roadway from Sta 11+980 west of McVean Drive with outlet to OGS and swale at east side of Culvert at Sta.11+800 Closed storm sewer in roadway from Sta 12+115 west of McVean Drive with outlet to SWM Pond on North side at Sta 12+355 Closed storm sewer in roadway from Sta 12+895 east of McVean Drive with outlet to SWM Pond on North side at Sta 12+355	OGS and Enhanced swales at outlets to Crossing at Sta. 11+800 SWM pond SWF2 on North side at Sta. 12+355 with outlet upstream of New 23 m single span Bridge crossing of West Humber Creek at Sta. 12+295 (ID No.6)	New 1200 mm CSP at Sta 11+603 (ID No. 4) New 7200x1830 mm open bottom Rigid Frame Culvert at Sta. 11+800 (ID No. 5) Extend existing 750 mm CSP at Sta. 11+812 Extension of existing 6100x2100 mm Open Bottom Rigid Frame culvert crossing of West Humber Creek at Sta. 12+295 (ID No. 6) New 1950 mm CSP at Sta 12+501 (ID No. 7)
McVean	Closed storm sewer	SWM Pond SWF3 on	New 600 mm PE culvert

Table 6.8.1.1 – Recommended Storm Drainage and Storm Water Management Improvements			
Location	**Sewer Provisions**	**SWM Provisions**	**Culverts & Bridges**
Drive/Centreville Creek Drive to The Gore Road	in roadway from Sta 12+958 east of McVean Drive with outlet to SWM Pond on South side at Sta 13+688 Closed storm sewer in roadway from Sta 13+728 west of the Gore Road with outlet to SWM Pond on South side at Sta 13+688 Closed storm sewer in roadway from Sta. 13+798 west of the Gore Road with outlet to SWM Pond on South east of the Gore Road at Sta. 14+330	South side at Sta 13+688 with outlet downstream of New Twin 900 mm CSP culvert at Sta.13+745 (ID No. 8)	at Sta. 12+924 New Twin 900 mm CSP culvert at Sta.13+745 (ID No. 8) New 915 mm PE culvert at Sta. 13+968 (ID No. 9)
The Gore Road to Marysfield Drive	Closed storm sewer in roadway from west of The Gore Road with outlet to SWM Pond on South side at Sta. 14+330 Closed storm sewer in roadway from 14+818 east of Marysfield Road with outlet to SWM Pond on South side west of Marysfield Road at Sta. 14+330	SWM pond SWF 4 on South side at Sta. 14+330 with outlet downstream of 1100 mm PE Culvert at Sta. 14+170 (ID No. 10)	New 1200 PE culvert at Sta. 14+170 (ID No. 10) New 15.6 m single span Bridge crossing of West Humber Creek tributary at Sta. 14+400 (ESA – Redside Dace habitat) (ID No. 11)
Marysfield Drive to Clarkway Drive/Humber Station Road	Closed storm sewer in roadway from 14+913 east of Marysfield Road with outlet to OGS and Enhanced Swale	OGS and Enhanced swales at outlets to Crossing at Sta. 15+154	New 6000x1800 mm Open Bottom Rigid Frame culvert at Sta. 15+154 (ID No. 12) New 1200 mm CSP Culvert at Sta. 15+248

Table 6.8.1.1 – Recommended Storm Drainage and Storm Water Management Improvements			
Location	**Sewer Provisions**	**SWM Provisions**	**Culverts & Bridges**
	west side of culvert at Sta. 15+154 Closed storm sewer in roadway from 15+634 east of Clarkway Drive with outlet to OGS and Enhanced Swale east side of culvert at Sta. 15+154		(ID No. 13)
Clarkway Drive/Humber Station Road to Coleraine Drive	Closed storm sewer in roadway from Sta. 15+715 east of Clarkway Drive with outlet to OGS and swale at west side of culvert at Sta. 15+956 Closed storm sewer in roadway from Sta. 16+795 east of Coleraine Drive with outlet to SWM pond on South side at Sta. 15+986	SWM pond SWF5 on South side at Sta. 15+986 with outlet downstream of New 5480x1520 mm Open Bottom Culvert at Sta. 15+956 (ID No. 14)	New 600 mm CSP culvert at Sta. 15+691 New 900 mm CSP culvert at Sta. 15+883 New 5480x1520 mm Open Bottom Culvert at Sta. 15+956 (ID No. 14) New 1200 mm CSP culvert at Sta. 16+325 (ID No. 15) New 600 mm CSP culvert at Sta. 16+699 (ID No. 16

Information Source - Culvert and Stormwater Management Report, October 2010 (Updated: October 2012 and April 2013), Stantec Consulting Ltd.

6.12 STORM WATER MANAGEMENT

Preliminary SWM controls are proposed in Table 6.9.1 and were determined based on the drainage area tributary to each outlet. The drainage areas were calculated using the proposed storm sewer system, which was based on the road grades and available cover at culvert crossings (some culverts are located such that a storm sewer cannot cross).

Where the drainage area was sufficient to maintain a SWM Facility (approximately 4 ha based on the Ministry of the Environment's Stormwater Management Planning and Design Manual (2003)) a SWM Facility has been proposed. SWM controls for smaller

drainage areas are proposed to occur through oil and grit separator units and enhanced swale outlets.

Table 6.9.1.1 – Proposed Storm Water Management Controls

Station Range	Road Length (m)	Outlet Culvert Station	Proposed SWM Control
10+000 to 10+680	680	10+690	SWM Facility SWF1 (Sta. 10+600)
10+680 to 11+020	340	11+015	Oil/grit separator west of outlet
11+020 to 11+380	360	11+015	Oil/grit separator east of outlet
11+380 to 11+800	420	11+800	Oil/grit separator west of outlet
11+800 to 12+055	255	11+800	Oil/grit separator east of outlet
12+055 to 12+920	865	12+300	SWM Facility SWF2 (Sta. 12+350)
12+920 to 13+760	840	13+763	SWM Facility SWF3 (Sta. 13+600)
13+760 to 14+865	1105	14+400	SWM Facility SWF4 (Sta. 14+250)
14+865 to 15+145	280	15+145	Oil/grit separator west of outlet
15+145 to 15+695	550	15+145	Oil/grit separator east of outlet
15+695 to 15+955	260	15+955	Oil/grit separator west of outlet
15+955 to 16+870	915	15+955	SWM Facility SWF5 east of outlet (Sta. 16+000)

Information Source - Culvert and Stormwater Management Report, October 2010 (Updated: October 2012 and April 2013), Stantec Consulting Ltd.

As noted above, five (5) storm water management (SWM) facilities are proposed within the study limits. The locations of the proposed SWM facilities are shown on the project plans for Recommended Design Alternative "Concept 4 – Modified Widening of Mayfield Road about the Centerline". The following table summarizes the location and features of the SWM basins.

Table 6.9.1.2 – Proposed Storm Water Management Facilities					
Location	**Description**	**Tributary Area (ha.)**	**Pond Type**	**Storage Volume (m3) 100 Year**	**Ex./Prop. Discharge Rate (m3/s) 100 Year**
Airport Road to Maisonneuve Boulevard	SWM pond SWF1 on North side at Sta. 10+600 with outlet upstream of 1800 mm culvert at Sta. 10+685	3.1 Ha.	0.65 Ha. Extended Detention	1,626 m3	Ex. 0.084 m^3/s Prop. 0.062
Goreway Drive/Innes Lake Road to McVean Drive/Centreville Creek Drive	SWM pond SWF2 on North side at Sta. 12+355 with outlet upstream of culvert crossing of West Humber Creek at Sta. 12+295 (ID No.6)	3.9 Ha.	0.60 Ha. Extended Detention	2,174 m3	Ex. 0.104 m^3/s Prop. 0.058
McVean Drive/Centreville Creek Drive to The Gore Road	SWM Pond SWF3 on South side at Sta 13+688 with outlet downstream of New Twin 900 mm CSP culvert at Sta.13+745 (ID No. 8)	3.1 Ha.	0.60 Ha. Extended Detention	1,635 m3	Ex. 0.084 m^3/s Prop. 0.059
The Gore Road to Marysfield Drive	SWM pond SWF4 on South side at Sta. 14+330 with outlet downstream of 1100 mm PE Culvert at Sta.	6.2 Ha	0.80 Ha. Extended Detention	3,485 m3	Ex. 0.159 m^3/s Prop. 0.090

Table 6.9.1.2 – Proposed Storm Water Management Facilities					
Location	**Description**	**Tributary Area (ha.)**	**Pond Type**	**Storage Volume (m3) 100 Year**	**Ex./Prop. Discharge Rate (m3/s) 100 Year**
	14+170 (ID No. 10)				
Clarkway Drive/Humber Station Road to Coleraine Drive	SWM pond SWF5 on South side at Sta. 15+986 with outlet downstream of New 5480x1520 mm Open Bottom Culvert at Sta 15+956 (ID No. 14)	4.1 Ha.	0.65 Ha. Extended Detention	2,254 m3	Ex. 0.109 m^3/s Prop. 0.067

Information Source - Culvert and Stormwater Management Report, October 2010 (Updated: October 2012 and April 2013), Stantec Consulting Ltd.

6.13 UTILITY RELOCATIONS AND COORDINATION

6.13.1 Future Utility Installations

It is assumed that all major utility agencies will require plant upgrades to service adjacent future development lands and will utilize the Mayfield Road corridor to provide running lines for transmission and collection systems. The future utility services will typically include Hydroelectric facilities, Traffic signals and roadway lighting, cable television, telephone and telecommunications ducts and aerial cables, as well as natural gas supply lines and various municipal services including storm sewer and sanitary sewer collection systems and potable water transmission and distribution lines. Each of these utilities and municipal services must be carefully coordinated with the proposed roadway improvements to minimize the overall project costs and inconvenience to the public.

During the study, Rogers Cable requested a review of proposed cable installation in the area of the intersection at The Gore Road on Mayfield Road. Feedback provided by the Consultant included a request for consideration of an alternative location that is compatible with the current roadway infrastructure and operation and that is also compatible with the proposed future roadway improvements summarized in this study. It is recommended that all future utility installations should consider practical future

access and maintenance requirements to minimize overall costs and potential disruption to the public.

The Region of Peel will undertake an extensive utility agency liaison and coordination process in cooperation with the City of Brampton and Town of Caledon during all future detailed design processes for improvements to Mayfield Road and the surrounding area. The purpose of this will be to ensure an orderly approach to utility installations in an effort to minimize costly delays to the work and to ensure that the required servicing for the community is undertaken in a well-planned and properly coordinated manner.

6.14 RECOMMENDED PAVEMENT DESIGN

6.14.1 Pavement Design

To accommodate future traffic and truck loading, the geotechnical investigation report recommended a pavement design as follows:

HL1 Asphalt – 50 mm Surface Course
HL8 Asphalt – 50 mm Upper Binder Course
HL8 Asphalt – 50 mm Lower Binder Course
Granular "A" Road Base – 150 mm
Granular "B" Road Sub-base – 500 mm Minimum

6.14.2 Stripping and Grading

In areas of the proposed pavement widening, it will be necessary to strip the existing topsoil, which varies between 80 mm and 325 mm. Based on the grades and culverts observed at the site, there will be requirements for fill material before the road can be widened. The native silty clay and clayey silt materials encountered in the auger probes will be suitable for reuse as earth fill.

Organic materials including Peat and Organic Silty Clay were encountered in the area of The Gore Road, from approximate station 12+700 to station 14+160. The organic soils are beneath the topsoil or sand and gravel encountered at the ground surface. The organic silty clay materials encountered in the ditches generally extended to the termination depth of the auger probes, at 1.5 m below the existing ground surface. The black Peat encountered in two auger probes (AP10 and AP14) extended to depths of up to 700 mm below the ground surface.

The organic deposits encountered in the auger probes were located within areas of potential widening, from approximately 300 m west of McVean Drive to The Gore Road. The presence and/or extent of these materials may create some design and construction challenges.

Further detailed investigation of the organic silty clay and peat material location and depths must be undertaken as part of the detailed design process to confirm the limits and related design and construction implications.

6.15 PHASING OF THE WORK AND CONSTRUCTION STAGING

6.15.1 Phasing of the Work

Phasing of the proposed work will be a function of development and community growth and will consider the nature and rate of development and related traffic growth in the community. It is anticipated that improvements are required in the current time frame starting in 2012 and leading to completion of the widening of the roadway to the interim condition of 4 lanes plus turning provisions including the continuous two-way left turn lane which will be undertaken and completed prior to 2017. It is also understood that the remaining improvements will be phased to provide the appropriate levels of service to the community and will be generally completed before the end of 2031.

It is generally anticipated that the roadway improvements and expansion will progress from west to east starting at Airport Road and will be phased sequentially to allow orderly completion of the work with a minimum of community disruption. In this regard, it is recommended that the Region of Peel update its annual Capital Budget program to allow for the proposed works and to budget adequately for the remaining work of detailed design and construction. Capital Budgets must also be revised annually to ensure that adequate project funding is available when the improvements are needed.

6.15.2 Construction Staging

Construction staging in accordance with proposed phasing of the overall project will be influenced to a significant degree by the various environmental considerations that will apply to each segment of the roadway to be improved or expanded. The details of the anticipated impact are summarized in the various sections of this report and will vary considerably for each roadway segment.

The details for each specific section of the recommended alternative are summarized in the study report. The work generally includes area grading, culvert and bridge construction, Storm sewers, utilities, SWM facilities, encroachments on land and roadside natural areas and as such will be subject to approvals by the various environmental review agencies, including the MOE, MNR, Transport Canada (under the Navigable Waters Protection Act [NWPA]), DFO and TRCA. Timing windows for fisheries and bird nesting periods will have a definite impact on the overall project timelines and as such each section and the details therein must be studied and refined in greater detail during the detailed design phase.

In general it is anticipated that the roadway will be constructed initially at the south side of the corridor and expanded toward the north. The initial full urbanization will occur on the City of Brampton side of Mayfield Road for the initial four lanes and followed by completion of the north side during the subsequent future widening to six lanes. The typical cross section illustrated in Drawing No. STG1 provides a general representation of the anticipated construction staging concept.

6.15.3 Traffic Management

Traffic management planning will be required during the detailed design phase of the assignment and will generally provide for local access, necessary detours, lane restrictions and partial or full closures where necessitated by the scope of work and the specific details associated with mitigation measures related to environmental impacts. Assessment of the anticipated impacts and mitigation measures will be included in the detailed requirements associated with agency permitting for the work.

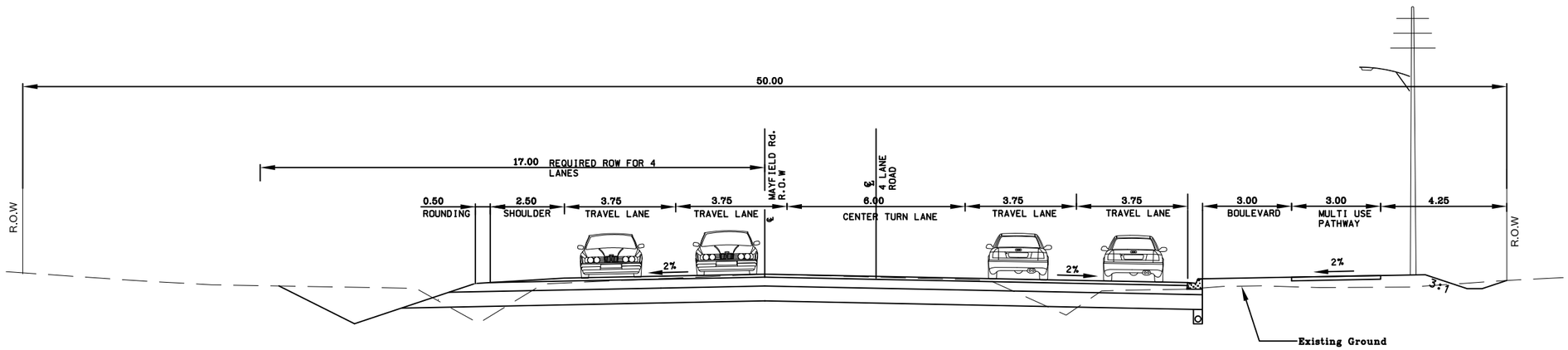
6.16 ENVIRONMENTAL IMPACTS, MITIGATION MEASURES AND MONITORING

6.16.1 General

The findings of the study include identification of various potential environmental impacts that must be satisfactorily mitigated. This will be done to protect the environment and to ensure that the permitting conditions of the various review agencies with jurisdiction over the project and the subject lands can be addressed and satisfied in a practical, timely and appropriate manner.

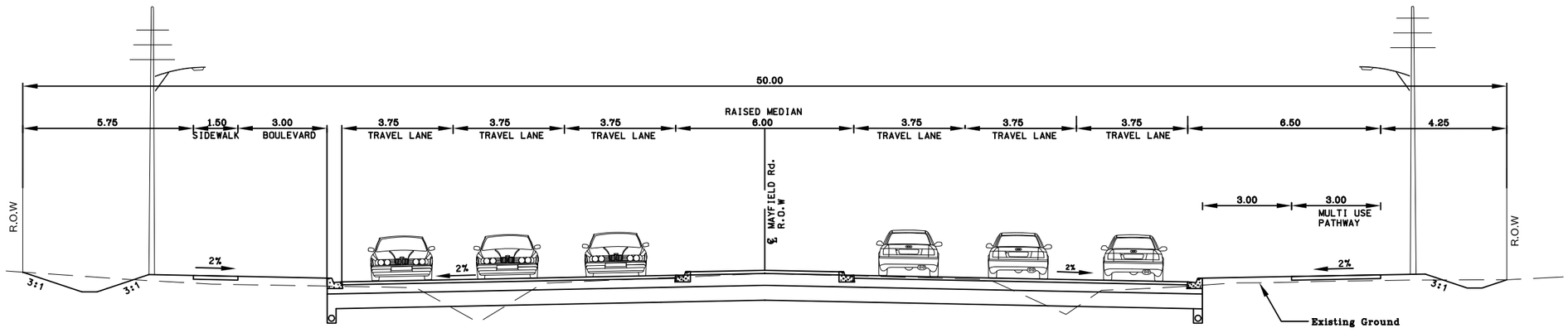
The findings of the study are a combination of the observations and assessments undertaken through various individual environmental studies that have been completed as part of the overall Class EA study. The recommendations herein are a summary of the necessary steps to satisfy the environmental regulations and assure the owner of the facility, in this case the Region of Peel, that the foreseeable impacts have been identified and that all necessary steps have been taken to assure the minimum possible impact of the undertaking on the environment.

Table 6.15.1.1 summarizes the recommended mitigation and enhancement measures, and suggested applications, to minimize and mitigate the potentially adverse environmental impacts associated with the planning, design and construction of the proposed roadway improvements. This information should be used in preparing the final detailed design plans, construction timing, coordinating agency approvals and on-going monitoring to ensure that the natural environment features identified within this report are protected, maintained, restored and enhanced (where applicable) through the implementation of the recommended alternative.



TYPICAL CROSS SECTION FOR
INTERIM 4 LANE STAGING

N.T.S.



TYPICAL CROSS SECTION FOR
FUTURE 6-LANE

N.T.S.

Stantec

Client

Region of Peel
Working for you

Drawing Title

MAYFIELD ROAD
AIRPORT ROAD TO COLERAINE DRIVE
CLASS EA STUDY REPORT
RECOMMENDED DESIGN ALTERNATIVE

CONSTRUCTION STAGING

Drawn By	Checked By	Drawing Number
W.R.W.	J.C.B.	STG1
Date	Project No.	
2012-10-17	160210480	

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2012/10/17 6:30 PM by:white, bill (kitchener)

Table 6.15.1.1 – Potential Impacts and Mitigation Measures (Fish, Wildlife and Vegetation)	
Potential Impact	Recommended Mitigation and Enhancement Measures
1. Aquatic Habitat, Fisheries and Water Quality	
Direct loss, alteration, or disruption of fish habitat	Ensure sufficient fish passage is provided during and post construction through all culvert replacements or extensions where direct fish habitat exists; The use of open bottom culverts should be considered where feasible to mitigate impacts to aquatic habitats; Countersink and backfill any new or extended culverts with natural substrate (bed material), ensuring that a low flow channel is maintained through natural substrate material to allow for fish passage; Restore vegetation and aquatic habitat (substrate) to pre-construction conditions, ensuring that any habitat features (pools, riffles, structure) are restored or enhanced; Any Harmful Alteration, Disruption or Destruction (HADD) of fish habitat that may result from the proposed roadway improvements will require prior Authorization from DFO. A compensation plan will be required for review and approval and should be discussed with TRCA staff on behalf of DFO; Opportunities to enhance riparian vegetation through the planting of other hanging grasses, shrubs and trees will improve stream cover, reduce temperature impacts, and provide allochthonous inputs (food source for various fish species). Minimum 2 years of Post construction monitoring to ensure the success of rehabilitation efforts;
Increased turbidity and siltation in downstream areas resulting in "smothered" plants and animals due to the deposition of silt and increased turbidity of surface	Ensure appropriate erosion control measures are installed and maintained throughout all phases of construction to protect exposed surfaces, control run-off and minimize the deposition of silt or suspended sediments within downstream habitats; Worksite isolation and dewatering plans should be prepared to identify appropriate isolation methods, siltation controls and dewatering measures to be implemented. ;

Table 6.15.1.1 – Potential Impacts and Mitigation Measures (Fish, Wildlife and Vegetation)	
Potential Impact	Recommended Mitigation and Enhancement Measures
watercourses	Any pumped water resulting from dewatering activities should be discharged to settling areas or through filter media before entering the surface water bodies; Utilize suitable backfill material along banks and footings; Stage construction activity to minimize the frequency and duration of any in-water work, as much as feasible; Re-vegetate all disturbed areas as soon as possible following disturbance to stabilize the area and minimize erosion potential.
Impacts on Redside Dace	Improve water quality through SWM and erosion control; Restore riparian vegetation cover through the planting of overhanging grasses, forbs and shrubs, to provide cover, shade and a source of food (insects); No in-water work will occur between September 15th and June 30th for all tributaries containing, historically containing or draining to redside dace or its habitat. While dace spawn in May, the coldwater timing window is typically applied by MNR to ensure that no unstable construction areas are prone to erosion through the winter months and during spring freshet, which reduces the risk of a sediment event in redside dace habitat areas. A review of the particular activity may assist in negotiating the timing window.
Stress on fish communities	Any fish that may occur within isolated work areas should be captured and released in accordance with appropriate MNR protocols. MNR should be consulted to confirm the appropriate fish relocation plan for watercourses potentially containing redside dace.
Reduced water quality in downstream habitat areas	Incorporate SWM measures into the design of the new roadways and intersection improvements to maintain pre-development quantity and quality of storm water run-off; Implement provisions during construction for quick and effective spill control, containment and response, ensuring cleanup materials are stored on-site for easy access; Implement accurate reporting protocols to ensure quick

Table 6.15.1.1 – Potential Impacts and Mitigation Measures (Fish, Wildlife and Vegetation)	
Potential Impact	Recommended Mitigation and Enhancement Measures
	and accurate reporting of all spills; Ensure all equipment entering the water (if deemed necessary) is properly washed and degreased prior to entering the watercourse; Ensure refueling stations are located outside of the floodplain and at least 30 m from the watercourse; Establish and maintain erosion and control measures throughout all phases of construction.
Timing effects of construction on aquatic species	Staging of work to avoid spawning and breeding activity No in-water work should occur between September 15th and June 30th in the West Humber River or any of its tributaries supporting Redside dace in accordance with MNR Fisheries timing windows All other watercourses are to be managed as warmwater systems and no in-water work should occur between March 15th and June 30th.
2. Terrestrial Habitat and Species	
Removal or disturbance of significant trees or ground flora	Minimize tree removal and bank disturbance during construction; Stabilize all disturbed areas upon completion of any grading works through re-vegetation of the disturbed areas utilizing native plant species (ex. seed and mulch, compost mix, tree and shrub planting); Direct roadway improvements away from sensitive areas, such as wetlands or pools, where feasible.
Stress on biological communities	The stress on wildlife is not anticipated to increase significantly due to the existing high traffic volumes already occurring in the area Avoid construction impacts during sensitive wildlife periods, such as breeding seasons for various fish and bird species
Introduction of exotic	Use only native species for all re-vegetation work

Table 6.15.1.1 – Potential Impacts and Mitigation Measures (Fish, Wildlife and Vegetation)	
Potential Impact	Recommended Mitigation and Enhancement Measures
species through disturbance	
Interference with ecological corridors and linkages	The existing roadway already represents an interference point to the linkage function along the various watercourses Maintain culvert diameter to maintain existing wildlife movement and migration along corridors

Information Source – Natural Environment Report, March 2011, Stantec Consulting Ltd.

The above-referenced mitigation measures are often standard procedures used at locations where in-stream or near stream works are required and where environmentally sensitive features are found. Detailed mitigation and compensation measures shall be further developed as the detailed design of the preferred alternative is finalized in consultation with the appropriate regulatory agencies.

6.17 APPROVALS

Prior to undertaking the road improvements and widening, a number of permits and approvals will need to be obtained. As a minimum, approvals will be required from the MOE, TRCA, DFO, Transport Canada and the MNR. The following are typical considerations and/or requirements that may be a part of the final implementation:

Ministry of the Environment – Applications for the approval of new storm sewer and storm water management facilities will be required.

Ministry of the Environment - Applications for Permit to Take Water (PTTW) where dewatering or diversion of flow from any watercourse by means of active pumping in excess of 50,000 litres per day will result from construction activities. The reports to be prepared in support of the applications for PPTW should include details on the management and discharge of water, including target for pollutant concentrations in the discharge water, (typically Total Suspended Solids [TSS]), how these targets will be met, quality controls that will be used, and related monitoring and reporting requirements.

TRCA – A Development, Interference with Wetlands and Alterations to Shorelines and Watercourses permit, pursuant to Ontario Regulation 166/06 will be required for

all work within regulated areas including, but not limited to, any watercourse alterations, wetland removal and any work within the floodplain.

The approvals will also require that erosion and sediment control plans be prepared in accordance with the Ministry of the Environment's guideline B-6 for Evaluating Construction Activities Impacting on Water Resources;

Department of Fisheries and Oceans - Any Harmful Alteration, Disruption or Destruction (HADD) of fish habitat that may result from the proposed roadway improvements will require prior Authorization from DFO. A compensation plan will be required for review and approval and should be discussed with TRCA staff on behalf of DFO;

Ministry of Natural Resources - The proposed road widening will require work to be undertaken at two watercourse crossings known to support Redside Dace. Redside Dace receives both species protection (under Section 9) and general habitat protection (under Section 10) of the Endangered Species Act (ESA). A permit under Section 17 (2)(c) is required for any activity that will adversely affect Redside Dace. Permits require the permit holder to undertake activities that result in an overall benefit to the affected species at the local level. The MNR Aurora District Office should be consulted prior to initiation of the permit application process.

Prepare an Overall Benefit Plan to ensure compliance with the provincial Endangered Species Act (ESA) and demonstrate that compensatory actions will be undertaken for alterations to Redside Dace habitat that will result in an overall benefit to the species

Ministry of Natural Resources – Any in-water work within the bed of the river(s) could require a Public Lands Act permit. MNR should be consulted to confirm if a permit is required.

Transport Canada – As outlined in the Navigable Waters Protection Act – any work in, upon, over, under, through or across a navigable waterway, including dredging or dam/weir construction requires approval. The Sarnia office of Transport Canada, Navigable Waters Branch, should be consulted for an Assessment of Navigability early in the final design process.

6.18 MONITORING

Monitoring of the proposed environmental mitigation measures is required before, during and after construction activities. Prior to construction, it is recommended that landscape plans be prepared for wetland edges, setbacks and vegetated berms. On-site inspections should also be undertaken to monitor the proper installation of sediment and erosion control measures, as well as tree saving measures such as fences installed beyond the drip line of retained trees.

The specific details of required mitigation, monitoring, and reporting will generally be identified during the detailed design phase and will be included in any permits and/or authorizations issued by the DFO, MNR and TRCA respectively. General requirements and actions are detailed in the following sections.

6.18.1 Monitoring During Construction

During construction, the following monitoring activities are recommended:

- Regular monitoring of the pre-construction measures to ensure maintenance and effectiveness, and that deficient measures are repaired/replaced as necessary.
- Pruning and protection of any limbs or roots (of trees to be retained) disrupted during construction.
- Fuelling and maintenance of machinery at designated locations away from any sensitive wetland areas and watercourses.
- Storage of machinery and material, fill, etc. in designated areas only.
- Control of equipment movement through natural areas and setbacks.

Given the nature of the project, it may not be considered necessary to have a full-time biologist on site to supervise construction for the entire duration of the project. Many of the routine day-to-day construction activities do not require supervision by a biologist and can be documented by regular inspection staff. However, there are certain key aspects of construction where it is considered important to have a supervising biologist on-site and this may be for extended periods while the contractor is working in sensitive areas. These include:

- Initial placement of environmental protection features such as settling ponds, silt fences, vegetation fences or any other features required day-to-day protection of natural environment features.
- In the event of a spill or any other event that has the potential to cause significant damage to the natural environment.
- During the planting of any vegetation required as mitigation or compensation for fish habitat impacts or tree loss to ensure that planting is carried out correctly.
- Upon completion of the construction project when all clean up and restoration activities have been completed.

Following each site inspection, the inspecting biologist should provide the site engineer with a written report that identifies any observed deficiencies and which provides recommendations for correction of those deficiencies.

Immediately after construction is complete the proposed plantings along the roadside and watercourses should be monitored to ensure they consist of a mixture

of native woody tree and shrub species with native ground cover. In addition, the storm water management controls should be monitored to ensure they are operating effectively and in accordance with the documented operating and maintenance requirements.

6.18.2 Post Construction Monitoring

When the project is constructed, operational monitoring should be provided to ensure that the mitigation and / or compensation measures implemented are functioning effectively and as intended. The biologist should visit the site during the first and possibly second growing seasons following construction to ensure that:

- Planted vegetation has been well established and die-off is not occurring.
- Watering/tending of new vegetation should be undertaken, and if it does not survive should be replaced with subsequent tending and monitoring.
- Erosion and sedimentation is being controlled such that suspended sediment runoff to the local watercourses is limited.
- Mitigation or compensation measures implemented with respect to aquatic habitat are functioning effectively and as planned.
- Predictions of impact with respect to aquatic and terrestrial impacts, are confirmed and no additional unanticipated impacts are occurring.

The results of the post construction monitoring should be documented in a brief report, which would be submitted to the TRCA, DFO and MNR.

6.19 OPINIONS OF PROBABLE COST

Opinions of probable cost were generated during the evaluation of various design alternatives and used as the basis for consideration of the comparative cost of each of the alternatives. The purpose of this was to provide a reasonable level of comfort for the assessment of estimated total project cost and a determination of the necessary budgetary allowances to include in the long term capital forecast of the Region of Peel.

The estimate provided is based on 2011 Region of Peel construction project unit costs and is based on the preliminary level of detail provided through the current study. It is understood at this time that the opinion of probable cost was prepared without the benefit of the precise details of various items that would be further refined and quantified during the detailed design phase and is duly acknowledged herein.

A contingency amount is included in the opinion of probable cost to account for unforeseen impacts and details that will be identified and investigated further during the detailed design phase of the project.

PROJECT COST

The preliminary Opinion of Probable Cost for the recommended alternative, based on the current status of preliminary design is as follows:

Mayfield Road from Airport Road to Coleraine Drive:

Description	Amount
Preparation/Removals	$ 1,315,000.00
Storm Sewers	$ 5,525,000.00
Roadworks	$ 18,875,000.00
Traffic Signals	$ 1,500,000.00
Bridges (2 New)**	$ 5,700,000.00
Overall Benefits Plan**	$ 500,000.00
Open Bottom Culverts**	$ 3,700,000.00
Pipe Culverts	$ 250,000.00
OGS & Swales	$ 490,000.00
Storm Water Management	$ 5,000,000.00
Landscaping/Sidewalk Allowance	$ 5,650,000.00
Sub-Total Major Items	**$ 48,505,000.00**
Contingency Allowance (20%)	$ 9,701,000.00
Sub-Total Construction	**$ 58,206,000.00**
Engineering & Disbursements (12%)	$ 6,984,720.00
Streetlighting Allowance	$ 3,000,000.00
Utility Relocation Allowance	$ 1,655,000.00
Property Acquisition Allowance	$ 34,000,000.00
Contingency Allowance (20%)	$ 9,127,944.00
Total Construction, Engineering, Utilities, Streetlighting and Property**	**$103,272,664.00**

** **Costs revised in March 2013 to account for MNR acceptance of structure span sizes at watercourse crossings No. 3, 6 and 11.**

6.19.1 Update to Opinion of Probable Cost

Following feedback from the Ministry of Natural Resources, related consideration of suitable river crossings for protected Redside Dace habitat, refinement of several stormwater management blocks, and revisitation of the property buyout requirements, the cost estimate for the recommended alternative was updated. A summary of the original preliminary estimate is included in Appendix U and the pertinent details of the updated estimate for the recommended alternative are included herein. Due to the nature of the revisions, which would be common to all alternatives, a reassessment of cost for the other alternatives was declared redundant.

The above costs are estimates only and must be updated based on the future detailed design development. The applicable 13% H.S.T. is not included in the opinion of probable cost.

An allowance is included in the estimate for streetscaping details, which will be determined further through during the detailed design phase. Discussions must be held with the City of Brampton and the Town of Caledon in conjunction with their anticipated and ongoing development planning and community development which may also be subject to a cost sharing agreement.

It should be noted that costs to include gateway features at Wildfield on The Gore Road approaches have not been included in the above opinion of probable costs.

NOTES / ASSUMPTIONS

- Preliminary estimate based on Functional plan view drawings and full depth road reconstruction
- Utility relocation costs may vary upon completion of final design and determinations of cost sharing
- No provisions have been included for works attributable to cost sharing with the City of Brampton/Town of Caledon
- Assumed - Mayfield Rd. as 6 lane New Construction
- Allowances only are provided for streetscaping details, which will be determined during detailed design. Discussions must be held with the City of Brampton and the Town of Caledon in conjunction with their respective corridor master plans and will be subject to a possible cost sharing agreement.

6.20 STUDY COMPLETION AND CLOSING STATEMENTS

The foregoing study and report are the result of a combined effort and extensive inputs from various study team members, the prime and sub-consultants, staff and council members of the Region of Peel, City of Brampton and Town of Caledon, agencies, developer representatives and various members of the public. The study commenced in late 2007 and was delayed at various times to allow parallel studies to complete their overlapping reviews and also as a result of project management changes during the study.

This Environmental Study Report will be placed on the public record for a 30 day review period and following the review period, assuming there are no requests for a Part II Order, the study will be deemed completed. Completion of the study will permit the proponent to proceed with the detailed design and construction of the proposed works.