

Environmental Study Report

Airport Road

from 1.0 km north of Mayfield Rd to 0.6 km north of King St

Schedule C Class Environmental Assessment Study



Airport Road Environmental Study Report

October

2015

for Airport Road from 1.0 km north of Mayfield Road
to 0.6 km north of King Street

Schedule C Municipal
Class Environmental
Assessment Study

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EXECUTIVE SUMMARY

The Region of Peel has completed a Schedule 'C' Municipal Class Environmental Assessment (EA) study for improvements to Airport Road between Mayfield Road and King Street. The study was conducted to support planned growth in the area and to provide for additional north-south road capacity in accordance with the Region's Long Range Transportation Plan Update 2012. This Class EA Study was undertaken using a context sensitive solutions approach to provide a complete and environmentally sound transportation and road infrastructure improvement plan for the study corridor.

Municipal Class Environmental Assessment Planning Process

The EA process followed the guidelines of the Municipal Engineers Association (MEA) Municipal Class Environmental Assessment (October 2000, as amended in 2007 and 2011). There are 4 schedules for project classification: **Schedule A, Schedule A+, Schedule B and Schedule C**, rated according to their potential environmental impact and cost. Schedule C is the most stringent of the four processes and this EA was conducted in compliance with a **Schedule C** classification.

Consultation Program

Agency and potential public stakeholders were identified at the beginning of the study and a contact list prepared for each group. Agency partners were invited to the Technical Advisory Committee (TAC) kick off meeting to review potential issues and areas of interest or concern. A list of public stakeholders was created from addresses within and adjacent to the study area. The larger public was invited to participate through placement of notices within local newspapers throughout the stages of the EA. The stakeholder lists were updated as the study progressed. Interest in the project was considered to be any feedback received from a stakeholder indicating that they could be directly affected during the planning, construction and/or operation of the proposed undertaking.

A number of methods were undertaken to ensure robust public consultation including:

Highlights Recommended Design Alternative

- *a 5-lane cross section with centre turning lane;*
- *widening around the centre line in rural areas and to the west within Sandhill;*
- *improvements to safety and congestion through roundabouts;*
- *improved sight lines for property accesses;*
- *new bridge and culverts;*
- *benefits to the habitat of endangered species;*
- *an on-street bike lane within Sandhill and paved shoulders in rural areas;*
- *improved stormwater management with new storm sewers in Sandhill and a treatment train approach in rural areas that include oil and grit separators, infiltration trenches and enhanced bio-retention swales.*

- placement of the Notice of Study Commencement, Public Information Centre 1 and 2 and Notice of Study Completion within the local Caledon newspapers on two separate dates before each event;
- scheduling of two Public Information Centres during Phases 2 and 3 of the study;
- placement of notices on the Region's website;
- informational mailings to the public and agency stakeholders including First Nations groups during various stages of the study;
- mailing of a project bulletin to the public during the study;
- receipt and response to written submissions, emails and phone calls;
- participation in meetings and telephone discussions with agencies, utilities, stakeholders, the public and Town of Caledon staff; and
- placement of this ESR on Public Record and provision of a Notice of Study Completion to agencies and the public during Phase 4 of the study.

Problem and Opportunity

The problem and opportunity statement defines the existing problem and corridor needs and if they can be addressed through road improvements. As background to creation of the problem and opportunity statement staff reviewed the Official Plan and Long Range Transportation Plan as well as various supporting studies. The Regional Official Plan Amendment 26 and the Long Range Transportation Master Plan (LRTP) 2012 Update have identified the need to widen Airport Road from 2 to 4 lanes before 2021 to lessen projected traffic congestion.

The following studies/plans and existing condition reports were reviewed and/or prepared to establish the needs and opportunities in the corridor.

Supporting Studies/Plans

1. Active Transportation Plan
2. Peel Strategic Goods Movement Network Study
3. Road Characterization Study
4. GTA West Transportation Corridor
5. Town of Caledon Transportation Needs Study Update
6. Sandhill Land Use Study (September 2012)

Study Reports

A review of existing conditions was conducted at the beginning of the study and future conditions evaluated and mitigation developed based on the recommended alternative design. Investigations were completed and prepared for the following:

- Land Use
- Natural Environment

- Traffic Study
- Roundabout Evaluation
- Utilities
- Geotechnical/Pavement
- Hydrogeology/Well Water
- Structures
- Fluvial Geomorphology
- Stormwater Drainage
- Archaeology
- Built and Cultural Heritage
- Pedestrians and Cycling
- Air Quality and Noise
- Structures
- Fisheries and Fish Habitat
- Contaminated Soil

Based on the above official plans and studies, the **Problem and Opportunity Statement** identified the need for improvements to address/accommodate:

1. existing and future traffic demands;
2. pedestrian and cyclist movements through the corridor; and
3. access control.

Development and Assessment of Alternative Planning Solutions

The following alternative solutions were considered to address the problem and opportunities within the corridor:

Do Nothing

Road Widening

Road Network Improvements

Transportation Demand Management

- maintain the status quo with no changes
- proposed 2 to 4 lane widening with centre turning lane
- intersection improvements including roundabouts and a separate roundabout evaluation
- evaluation of Airport Road and adjacent roads widening options
- improve the current operation of the transportation system by managing travel demand independent of expanding or constructing new infrastructure (e.g., shift demands to alternative modes of transportation like cycling or walking, carpooling)

After evaluation the following solutions were carried forward as criteria for the various design alternatives.

Road Widening

2 to 5 lanes

Road Network Improvements

Intersection improvements including Roundabout Evaluation

Transportation Demand Management facilities

Paved shoulders within rural limits and on-street bike lanes within Sandhill.

Transit facilities are not required.

Principal Environmental Impacts and Mitigation Measures

Land Use

The land use along the corridor outside the Sandhill Settlement Area will remain rural with development occurring within Sandhill boundaries. Future residential uses within Sandhill will not be allowed and the focus of future development will be commercial and dry industrial use.

Traffic Study

The Traffic Study showed that without improvements, the corridor will reach Level of Service F (lowest rating) by 2031 and with improvements there will be no congestion. A 5-lane cross section including a continuous centre left turn lane and intersection improvements will provide significantly improved levels of service.

Roundabout vs Signalized Intersection Analysis

An evaluation of roundabout vs signalized intersection was conducted for the King Street /Airport Road intersection and the Healey Road-Old School Road/Airport Road intersection. Analysis shows that roundabouts will function well to improve safety and congestion.

Utilities (water/sewer/gas/cable)

Location of existing utilities was provided by the utilities within the study area.

Geotechnical and Pavement

The new pavement structure will support heavy vehicles.

Hydrogeology/Well Water

- The proposed construction work will generally not involve significant excavation except in the vicinity of the three major crossings (2 culverts and one bridge).

- Residents from Mayfield Road to approximately 1.5 km north of Old School Road are generally provided with municipal piped water. Along the remaining portion of the study area the proposed construction will not result in any adverse impacts to existing private wells.
- Any affected well owners will continue to have water supplied of appropriate quality and in adequate quantities during construction. Any work done on affected wells or any replacement wells will be done pursuant to O. Reg. 903, Wells (pursuant to the Ontario Water Resources Act).

Structures

- The Norris Bridge, Deans Culvert and the Salt Creek Culvert will be removed and replaced with larger, open footing (no bottom) precast structures. Replacement will be undertaken in two stages with two lanes of traffic maintained throughout construction.
- A perched culvert (a culvert with an outlet elevated above the downstream water surface) located 930m south of King Street will be replaced.

Fluvial Geomorphology

- The Salt Creek Culvert and Norris Bridge crossings display some areas where sediment is depositing, which likely will become fish barriers during low water flow periods.
- River function would benefit from improvements to the channel form and help both fish passage and sediment transport issues.
- Replacement of the three structures and upgrades of all existing culverts will allow for the Salt Creek crossing to move naturally enhancing river function and improve Redside Dace habitat.

Drainage and Stormwater Management

- Enlargement of all three structures will prevent overtopping of the roadway.
- Nine smaller crossing culverts will be replaced and upsized to 800mm culverts.

Stormwater Quantity Control

- In rural areas, existing V-shaped ditches that currently convey stormwater to the Salt Creek system are to be improved to flat bottom infiltration ditches.
- At urban sections (from 1.2km south of Old School Road to 450m north of Davis Lane and 800m south of King Street to King Street roundabout) storm sewers will be installed to convey minor system drainage directly to culverts / receiving drainage systems.

Stormwater Quality Control

- Enhanced bio-retention swales will be implemented as a pilot project within the study area.

- Oil and grit separators will be installed to improve total suspended solid (TSS) and treat run-off water.
- Sediment and erosion control measures will be implemented during construction.

Natural Environment

Designated Natural Areas

- There are no Provincially Significant Wetlands (PSWs), Areas of Natural and Scientific Interest (ANSIs), or Environmentally Sensitive Areas (ESAs) located within 120m of the study area.
- Impacts to the Regional Greenland System of the Region of Peel and Environmental Policy Area of the Town of Caledon are expected to be minor.
- Impacts to the TRCA Terrestrial Natural Heritage System are expected to be minor.

Fisheries and Fish Habitat

- The Norris Bridge, Deans Culvert, and Salt Creek Culvert watercourse crossings directly support fish habitat, while the remaining crossings indirectly support fish habitat.
- Salt Creek is identified as Redside Dace 'recovery habitat', and thus subject to the requirements of the Ontario Endangered Species Act (ESA).

Fisheries Impact Assessment and Mitigation

- No barriers to fish passage will result from this project.
- All culverts have been enlarged and culvert lengths kept to a minimum.
- All culvert works will be performed in the dry season.
- Restoration and enhancement plans will be prepared, focusing on the three major watercourse crossings.
- An Endangered Species Act permit, if required, will be secured during detailed design.

Tree Inventory

- 151 trees will need to be removed to accommodate the road widening (i.e. trees located within the construction grading limits and 1.5m beyond).
- Trees will be replaced in keeping with Peel Region and TRCA standards.
- Suitable planting locations for replacement trees will be determined during detail design.

Wildlife and Wildlife Habitat

- The proposed road improvements are not expected to have a significant impact on wildlife habitat.

- Larger structures will improve wildlife passage.
- Clearing or disruption of vegetation or replacement of structures where birds may be nesting will be completed outside the nesting window of March 25 to August 31.
- Nesting cups are recommended on new span structures to accommodate Barn Swallows.
- Ministry and Conservation Authority permitting requirements will be followed.

Archaeology

- A Stage 2 Archaeological Assessment has been conducted for any identified areas impacted by the proposed work. The Stage 2 identified one area requiring a Stage 3 assessment which will be completed in the detailed design stage.

Cultural Heritage

- The Cultural Heritage report identified 11 Cultural Heritage Landscapes and 14 Built Heritage Resources within the study area, including 3 buildings designated under the Ontario Heritage Act. Cultural Heritage Impact Statements will be prepared for all cultural heritage resources identified as buyout properties in the recommended design alternative.

Air Quality and Noise

- Widening the road and the introduction of roundabouts will reduce congestion and lower total emissions along the route, resulting in better air quality conditions than those expected in either 2021 or 2031 if no changes are made.
- With improvements, road noise levels are expected to minimally increase (will be indistinct). No noise mitigation is required within the study area.

Contaminated Soil Screening

- A contaminated site screening was done for the study area and no obvious evidence of adverse environmental impacts was identified within the road right-of-way. However adjacent properties including a retail gas station and a number of light industrial properties were identified as potential sources of impact. During detailed design potential areas of soil contamination will be evaluated. During construction a soil management plan will be developed that includes monitoring and sampling as required.

Alternative Design Concepts

The following alternative design concepts were considered and three were evaluated in detail.

- **Do Nothing** (screened out due to traffic volumes);
- **Widen Equally About the Centre line;**
- **Widen Entirely to the West;**
- **Widen Entirely to the East** - widening to the east was not pursued for evaluation as it would require the removal of heritage buildings and negatively impact hydro locations.
- **Hybrid Widening Solution** – widen around the centre line from the south limit of the study area to approximate south limit of Sandhill; shift centre line to the west by 7.5m in Sandhill; return to existing centre line at the proposed roundabout at King Street.

The detailed analysis found that the Hybrid Design Option 3 was the most favourable option. The detailed analysis is available in **Section 4.1 of the ESR.**

Roundabout vs Signalized Intersection Analysis

An evaluation of roundabouts vs signalized intersection was conducted for the King Street /Airport Road intersection and the Healey Road-Old School Road/Airport Road intersection. Traffic Capacity, Operations, Access, Safety, Landscaping and Storm Water Management were evaluated for the signalized intersection vs roundabout for each of the following categories:

- Existing Traffic Capacity
- Forecasted Traffic/Transportation Network
- Active Transportation
- Accessibility
- Emergency/Farm Vehicle Use
- Access Management
- Business and Private Property Impacts
- Air Quality and Noise
- Landscaping
- Stormwater Management
- Initial Capital Cost
- Lifecycle Cost of the Infrastructure

The analysis was favourable for the implementation of a two lane roundabout at both Healey Rd-Old School Rd at Airport Rd and King St at Airport Rd. The detailed analysis is available in **Section 4.3 of the ESR.**

Description of the Recommended Design and Mitigation

The preliminary design is documented in detail in **Section 5** of the ESR. The following is a brief summary of some of the key commitments and mitigation of the recommended design:

- a 5-lane cross section including a continuous centre left turn lane and intersection improvements will provide significantly improved levels of service;

- widening around the centre line from the south limit of the study area to approximate south limit of Sandhill; a shift of the centre line to the west by 7.5m in Sandhill; return to the existing centre line at the proposed roundabout at King Street;
- improvements to safety and congestion through roundabouts at the Old School Road-Healey Road and King Street intersections on Airport Road;
- improved sight lines for property accesses identified with deficiencies;
- access to existing properties/entrances to be maintained during construction and after;
- an overall benefit to the habitat of endangered species created through the use of larger structures; enlarged structures allow for animal passage;
- an on-street bike lane (Active Transportation facility) within Sandhill; a paved shoulder in rural areas for cyclists; and sidewalks on both sides of the road within Sandhill and on new structures to accommodate future development; (*Please note: AT plan for Sandhill may be modified in detailed design if the planned redevelopment of adjacent lands has progressed to a point where a change makes sense.*)
- a pilot project “Safety Edge” to be installed (a safety edge is an angled finish at the pavement edge which allows for safer recovery if a vehicle runs off the pavement.);
- no impacts to Sandhill United Church and North Peel Community Church;
- the landscaping plan to follow the guidelines for the Region’s Streetscaping Toolbox;
- a formal tree preservation/planting plan to be prepared in the detailed design phase with tree removals replaced in keeping with Peel and TRCA standards; and
- improved stormwater management for the entire corridor with new storm sewers in Sandhill and a treatment train in rural sections that includes oil and grit separators, infiltration trenches and enhanced bio-retention swales .

1.0 INTRODUCTION AND BACKGROUND

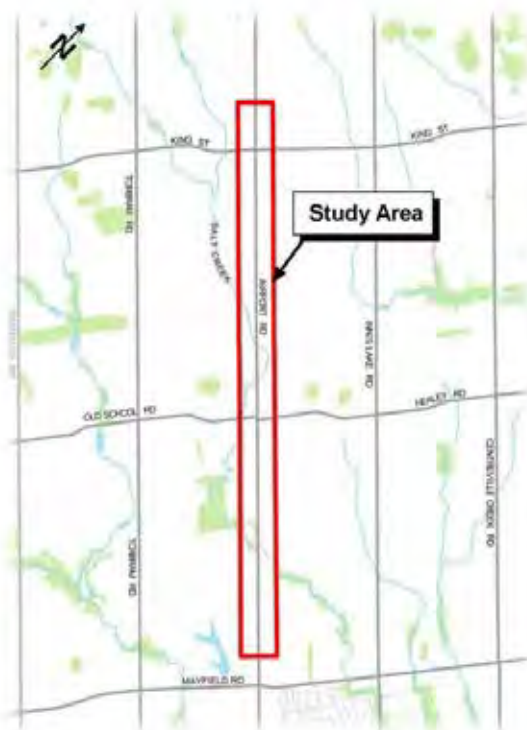
The Region of Peel has completed a Schedule 'C' Municipal Class Environmental Assessment (EA) study for improvements to Airport Road between Mayfield Road and King Street. The study was conducted to support planned growth in the area and to provide for additional north-south road capacity in accordance with the Region's Long Range Transportation Plan. This Class EA Study was undertaken using a context sensitive solutions approach to provide a comprehensive and environmentally sound transportation and road infrastructure improvement plan for the study corridor.

The Environmental Study Report (ESR) documents the need and justification for the project, the planning and design process undertaken to select the recommended alternative (including preliminary design) and measures to mitigate impacts.

1.1 STUDY AREA

Airport Road is a two lane major north-south arterial road (high traffic volume and truck traffic) with a rural cross section throughout the study area. It is experiencing traffic growth pressures as a result of residential, business and industrial development in the general area, and an increase in traffic that uses Airport Road to access tourist destinations outside the municipality.

The limits of the study area for the Regional Road corridor are illustrated in **Exhibit 1**.



Airport Road (RR #7) from 1.0 km north of Mayfield Road to 0.6 km north of King Street in the Town of Caledon

Exhibit 1 – Limits of Study Area

1.2 BACKGROUND

The Regional Municipality of Peel is one of the fastest growing municipalities in Ontario with a forecasted population growth increase of 42 percent by 2031 (1.64 million total population). The rapid growth of Peel's population and employment has led to increased demand on the transportation network, resulting in increased congestion on roads and highways.

The Region of Peel's Long Range Transportation Plan (LRTP) 2012 Update provides a policy implementation structure for the Regional Official Plan to address the transportation challenges associated with increased growth. The LRTP identified the need for improvements to Airport Road to accommodate growth up to the planning horizon year of 2031.

The following studies (related and ongoing) have been reviewed and referenced. (See Section 3.1 that shows how the studies relate to the problem and opportunity statement development.)

- Region of Peel Official Plan, Office Consolidation, 2013
- Region of Peel Long Range Transportation Plan (LRTP) update 2012
- Region of Peel Active Transportation Plan
- Region of Peel Strategic Goods Movement Network Study
- Region of Peel Road Characterization Study
- Draft Greater Toronto Area (GTA) West Transportation Development Strategy
- Caledon Area Transportation Study (CATS)
- Town of Caledon Sandhill Land Use Study

Airport Road within the study area is designated at 45 metres in the Regional Official Plan (ROP), which is more than sufficient to support a four lane cross-section. Immediately south of the study area is the Tullamore South Industrial Park, which calls for full development of industrial and retail lands by 2018. The Town of Caledon has also finalized an Official Plan Review for the Sandhill Commercial /Industrial Centre (Sandhill Land Use Study), located at the northerly limits of the study area. A series of development applications have been received by the Town related to highway commercial and trucking uses, which if approved will impact the capacity and operation of Airport Road in the future.

1.3 STUDY PURPOSE

The purpose of this Municipal Class EA study is to look at existing and proposed uses and provide a complete and environmentally sound planning process which is open to public participation that:

- improves traffic operations by addressing congestion;
- improves access management measures with potential to improve safety and traffic operations; and

- supports area development, approved growth and goods movement along the corridor.

1.4 STUDY TEAM

This Class EA study was undertaken by the Region of Peel as an in-house project and the IBI Group (Canada) Inc. was retained to undertake the technical reports, assist in defining mitigation measures and prepare the 30 percent design of the study corridor.

Team members from the Region include:

- Sally Rook, Project Manager, Infrastructure Programming and Studies
- Steve Ganesh, Manager, Infrastructure Programming and Studies
- Laverne Soodeen and Sargon Sifo, Technical Analysts, CAD Design, Infrastructure Programming and Studies
- Liz Brock, Technical Analyst, ESR, Infrastructure Programming and Studies
- Bob Nieuwenhuysen, Manager, Roads Design and Construction
- Seema Ansari, Technical Analyst, Traffic Safety
- Imre Tot, Technical Analyst, Traffic Operations
- Hashim Ali Hamdani, Technical Analyst, Traffic Development
- Joe Gallagher, Senior Capital Acquisition Agent, Realty
- Margie Chung, Principal Planner, TDM Projects

Key members from IBI Group (Canada) Inc. include:

- Allan Ortlieb, P.Eng., Project Manager
- Bruce Mori, Project Director and QC Auditor
- Rakesh Pandey, Ph.D., P.Eng., Stormwater
- Don Moore, P.Eng., Structures
- Scott Land, P.Eng., Noise
- Muhammad Khan, P.Eng., M.Eng., MITE, Roundabouts

Report information was provided by:

- Archaeology, Cultural and Heritage Reports: Archaeological Services Inc.

MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT PLANNING PROCESS

All municipal projects in Ontario are subject to Ontario's Environmental Assessment Act (EAA) which provides for the protection, conservation, and management of the environment. Activities with common characteristics and common potential effects may be assessed as part of a "class", and are subject to compliance with the pre-approved Class EA process. The Municipal Class EA is an approved Class EA process that applies to municipal infrastructure projects including roads, water, and wastewater. This process provides a comprehensive planning approach to consider several alternative solutions and evaluate their impact on a set of criteria (e.g. technical, environmental, social, cost) and determine any mitigating measures to arrive at a recommended alternative for addressing the problem (or opportunity). The process involves consultation of technical agencies and the public at the various project stages.

The Class EA process ensures that all projects are carried out with effectiveness, efficiency and fairness. This process serves as a means for understanding economic, social and environmental concerns while implementing improvements to municipal infrastructure.

- Natural Environment Report:
LGL Ltd. Environmental Research Associates
- Geotechnical, Contaminated Soil, Hydrogeology Reports: Terraprobe
- Geomorphology Report: Parrish Geomorph

Written text for the subject matter Reports has been directly quoted or paraphrased within the ESR and referenced to appendices for the full report.

1.5 MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT PLANNING PROCESS

This EA was undertaken and prepared using the guidelines of the Municipal Engineers Association (MEA) Municipal Class Environmental Assessment (October 2000, as amended in 2007 and 2011). There are 4 schedules for project classification: **Schedule A, Schedule A+, Schedule B and Schedule C**, rated according to their potential environmental impact and cost. Schedule C is the most stringent of the four processes and this EA was conducted in compliance with a Schedule C classification. A Schedule C project involves either the construction of new facilities or major expansion of existing facilities. For the existing facilities, this could include road widening, adjustments, and operational improvements.

The study has completed the first four phases of the five-phase Class EA Process. The Municipal Class EA process is characterized by a five phase planning and design process shown below and illustrated in **Exhibit 2**:



Exhibit 2 – Class EA Process

1.6 PUBLIC REVIEW AND NEXT STEPS

If after reviewing this document you have questions or concerns, please:

1. Contact the Region of Peel project manager to discuss your questions or concerns:

Sally Rook, C.Tech, PMP
Project Manager
Infrastructure Programming and Studies
Transportation Division
Region of Peel
10 Peel Centre Drive, 4th Floor, Suite B
Brampton, ON L6T 4B9
Tel: 905 791-7800 ext. 7842
Email: sally.rook@peelregion.ca

2. The project manager may arrange a meeting with you if you have significant concerns that require detailed explanation.
3. The Region will attempt to resolve the concerns but if they remain unresolved, you may request the Minister of the Environment, by order, to require the Region of Peel to comply with Part II of the Environmental Assessment Act (EAA) before proceeding with the project; this is called a Part II Order request. The Minister may make one of the following decisions:
 - deny the request with or without conditions;
 - refer the matter to mediation; or
 - require the Region of Peel to comply with Part II of the EAA by undertaking one of the following:
 - set out direction with respect to preparing the Terms of Reference and an individual EA for the undertaking; or
- declare that the Region has satisfied the requirements for the preparation of a Terms of Reference and that it must still prepare an individual EA.

Public and Agency Consultation

Communication with the affected parties (stakeholders) is an essential part of the planning process. It provides a tool for the Region to define and respond to issues before limiting decisions are made and EA documents are submitted for formal review and approval. Recognizing that public and regulatory agency consultation is a significant and an integral part of the Municipal Class EA process, a consultation program is initiated at the outset of the study and continued throughout.

To submit a Part II Order to the Minister of the Environment and Climate Change contact:

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

A copy of the Part II Order request must be forwarded by you to the attention of the project manager at the Region of Peel.

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

1.7 PUBLIC AND AGENCY CONSULTATION

A wide range of interested parties were identified and contacted at the outset of the study, to determine potential issues and areas of interest or concern. In keeping with the spirit and intent of the Municipal Class EA, a number of methods were undertaken to ensure stakeholders were kept informed:

- advertising notices in the local Caledon newspaper and direct mail to residents within the study area and to agencies, utilities and First Nations groups with an interest in the study area;
- all identified residents, agencies and interested parties were provided with a Study Update Newsletter at various stages of the study process.
- Notices, PIC Boards, Newsletters and the 30 percent preliminary design were placed on the Region's website;
- personal response to written submissions and phone calls;
- participation in meetings and telephone discussions with regulatory agencies, utilities and the public; and
- placement of this ESR for public review at the nearest library to the study area and at the Region's and Town's offices. The Notice of Study Completion was sent to regulatory agencies and the public during Phase 4 of the study.

Project Milestones are presented in **Table 1** below (see **Appendix A** for details on consultation):

Consultation Schedule	Date
Notice of Commencement	February 2, 2012
Project Kick Off Meeting	August 23, 2012
Project Bulletin	September 2012
Stakeholder Meeting (Technical Advisory Committee)	March 13, 2013
Notice of Public Information Centre No. 1	May 28, 2013
Public Information Centre No. 1	June 20, 2013
Project Bulletin	December 2013
Meeting with MNRF re Structures	September 9, 2014
Stakeholder Meeting (Technical Advisory Committee)	October 7, 2014
Notice of Public Information Centre No. 2	November 13, 2014
Public Information Centre No. 2	November 27, 2014
Completion of Environmental Study Report (ESR) and placement on Public Record	October 2015
Notice of Completion	October 2015

Table 1 – Project Milestones

1.7.1 Aboriginal Consultation

Various aboriginal and First Nations groups were contacted at the beginning of the study (see **Appendix A**). Alderville First Nations responded to the Notice of Study Commencement and informed us that the project had a low impact rating for them but that they were interested in continuing as stakeholder as the project progressed. Curve Lake First Nations responded at the beginning of the study that they do not have an interest in the project at this time. They asked to be contacted if environmental or archaeological issues arose.

2.0 EXISTING AND FUTURE CONDITIONS

A preliminary inventory was taken of all existing conditions for the natural, social and economic environments. As the study progressed reports were updated as required based on the recommended design alternative.

2.1 LAND USE

2.1.1 Sandhill

The **Sandhill Land Use Study states** that “the current Official Plan designates Sandhill as a Settlement Area and an Industrial/Commercial Centre which is intended to serve a small-scale supportive function to the Rural Service Centres of Bolton and Mayfield West. The primary intent of the designation is to serve primarily as a Highway Commercial Centre with limited industrial development.” Although “residential uses currently dominate the landscape, they are not compatible with the commercial and industrial uses currently existing and recommended within the community.”

Land use recommendations applicable to this study include:

- eliminate new and phase out existing residential uses
- encourage the conversion of existing building stock to mixed uses, particularly along King St
- promote uses necessary to service the local community, in addition to larger commercial / industrial uses particularly along King Street and at the intersection of Airport Rd and King St
- promote the primary use of land as commercial or dry industrial uses which do not require significant water usage
- provide policies to expand the permitted land uses in the event water service is extended to the Community
- consider future expansion of Sandhill Settlement Boundary
- provide policies to preserve the active farm operation within the Community

2.1.2 Rural Areas

Land use south and north of Sandhill in the study area is designated as Rural Agricultural with no change proposed at this time.

2.2 EXISTING TRAFFIC CONDITIONS

A review of the existing traffic conditions was undertaken throughout the corridor and included:

- analysis of the function of intersections and midblock road sections
- a review of the safety performance for the corridor
- an assessment of future travel demands and deficiencies

- identification of potential improvements for intersections and road sections to handle future travel demands, and
- a roundabout feasibility review for the
 - Old School Rd-Healey Rd/Airport Rd intersection, and the
 - King Street/Airport Road intersection

The existing condition of the roads within the study area is as follows:

- Airport Road (Regional Road 7) is a two lane north-south major arterial road under the Region's jurisdiction. It has a posted speed limit of 80 kilometres per hour except within the settlement community of Sandhill at the northerly limits of the study area where it has a posted speed limit of 60 kilometres per hour.
- Airport Road is identified as a Strategic Goods Movement Network Corridor which means that it is used for trucking. The current truck percentage on this section is approximately 10-15% which is considered in the medium to high range. South of the study area is the Tullamore South Industrial Park which is anticipated to be fully development by 2018. At the north limits of the study area is the Sandhill Commercial/Industrial Centre. A series of development applications are pending for highway commercial and trucking uses.
- King Street (Regional Road 9) is a two lane east-west major arterial road under the Region's jurisdiction. The posted speed limit on King Street at Airport Road is 70 kilometres per hour, and is posted at 80 kilometres per hour beyond each side of the intersection.
- Old School Road is a two lane minor arterial road under the Town of Caledon's jurisdiction and has a posted speed limit of 80 kilometres per hour. Old School Road terminates at Airport Road as an offset intersection with 30 metres of separation from Healey Road. Old School Road is currently truck prohibited.
- Healey Road is a two lane minor arterial road under the Town of Caledon's jurisdiction and has a posted speed limit of 80 kilometres per hour. Healey Road terminates at Airport Road as an offset intersection with 30 metres of separation from Old School Road. Healey Road is currently truck prohibited.

The Traffic Impact Study

The Traffic Impact Study (TIS) is a needs assessment and safety review of the study area.

The TIS was prepared by the Region of Peel's Traffic Operations group with input from the Region's Traffic Signals and Systems group, Traffic Development group and Transportation Planning group. The safety performance review was conducted by the Region's Traffic Safety group.

To determine the traffic needs a number of studies and resources were consulted including:

- the Peel Long Range Transportation Plan, 2012 Update ;
- the Caledon Transportation Needs Study Update (CATS) (2009); and
- the Region of Peel Transportation Demand Forecasting Model with 2021 and 2031 a.m. peak hour forecasts.

Traffic counts were analyzed for all intersections. Traffic analysis took into account existing and forecasted traffic for the years 2011, 2021, and 2031. Traffic capacity analysis was undertaken for all intersections and road sections for future road network scenarios. The traffic forecasts were derived by using previous studies and growth factors within the study area. Details of the Traffic Impact Study can be viewed in **Appendix D**.

2.3 FUTURE TRAFFIC NEEDS

Staff assessed the short and long term needs for improvements and determined the ultimate lane requirements based on the 2021 and 2031 planning horizons. The following is a summary of the traffic needs assessment findings:

- traffic signals are warranted at the intersection of Airport Road / Old School Road-Healey Road.
- realignment of the Airport Road / Old School Road-Healey Road intersection is recommended
- road widening to five lanes (four through lanes and a centre two way left turn) on Airport Road
- correction of sight distance deficiencies for various properties located along Airport Road: 12404, 12484, 12541, 12577, and 12618
- a two-way left turn lane is recommended in Sandhill
- a full two-lane roundabout is recommended for the Airport Road / King Street intersection by 2031
- a partial two-lane roundabout is recommended for Airport Road / Old School Road-Healey Road by 2031

Details of the Traffic Impact Study are available for review in **Appendix D**.

2.4 TRANSIT AND ACTIVE TRANSPORTATION

There are currently no transit or active transportation facilities in the study area.

The Region's Active Transportation Plan recommends:

- paved shoulders to accommodate cyclists, extend the life cycle of the shoulder, reduce maintenance costs associated with grading gravel shoulders, and
- an on-street bike lane within the community of Sandhill due to its proposed urban (curb and gutter) cross-section and numerous driveway accesses.

2.5 ROUNDABOUT SCREENING

A roundabout screening software tool called ARCADY was used to analyze the feasibility of roundabouts at the intersections within the study area and it determined that roundabouts can function at both intersections. Airport Road/King Street and Airport Road/Old School Road-Healey Road are both candidates for the implementation of a roundabout. Screening showed that detailed property requirements would need to be scoped based on a preliminary roundabout design and that a truck apron within the roundabout for use of transport trucks and farm equipment would be required.

2.6 TRAFFIC SAFETY

A road safety audit was conducted and recommends actions to further enhance safety and to increase the visibility of intersections and road segments. (Traffic Safety recommendations are contained within **Appendix D**).

The Traffic Safety audit recommends safety enhancements including:

- roundabouts to improve the traffic flow and reduce the potential of collision of left turning vehicles.
- signage (Town of Caledon Jurisdiction)
- lighting through the study area to be upgraded to the new current ANSI Roadway Lighting RP-8-00 standards
- pedestrian countdown signal heads
- geometrics
- marker posts wire upgraded to guiderail with reflectors on the support posts on the west side of Airport Road between Street 'A' and Healey Road
- pilot to install new yellow raised reflective markers in the centre line as well as white raised reflective markers on the lane markings
- snow fence: enhancing the snow fence that is installed during the winter months to address blowing snow from the open fields on either side of the roadway.
- pilot area for "Safety Edge" where the edge of the paved roadway is finished at a 30° angle

2.7 GEOTECHNICAL INVESTIGATION

A geotechnical investigation was completed to obtain information on the existing pavement and subsurface conditions. Boreholes (asphalt coring) were taken along the study area and laboratory testing of samples reviewed moisture content, particle size and load/deflection capacity.

The Airport Road pavement is in good condition and no major rehabilitation work is required. However if the recommended widening occurs, then there may be adjustments to the road geometry that would require milling of the existing pavement and repaving with a thick surface course such as HL-1 or Superpave.

New pavement for the proposed widening should consist of HL1 or Superpave for the surface course; HL8 or Superpave for the binder course; granular A for the shoulders and base material and granular B for sub-base material. All granular base materials and paving materials should meet the Ontario Provincial Standard Specifications. See **Appendix E** for the complete Geotechnical report recommendations.

2.8 NATURAL ENVIRONMENT

2.8.1 Natural Heritage Assessment

There are no Environmentally Significant Areas (ESAs), Areas of Natural and Scientific Interest (ANSIs), or Provincially Significant Wetlands (PSWs) located within the study limits. Details of the report are available in Appendix D).

2.8.2 Aquatic Habitat

- eight watercourse crossings were identified for investigation
- 10 fish species had been captured in historic collections from Salt Creek, none of which are endangered
- Redside Dace do not currently occupy Salt Creek. However the creek has been identified by the Ministry of Natural Resources and Forestry (MNRF) as **recovery habitat and is subject to the requirements of the Ontario *Endangered Species Act (ESA)***.

2.8.3 Vegetation Communities

The area consists of a mixture of cultural and wetland vegetation communities, including portions of that are already in a disturbed state as a result of the existing roadway and residential land uses. Evidence of disturbance includes a high proportion of non-native plant species that are well adapted to persist in areas that are regularly disturbed including species that are adapted to high light conditions, limited soil moisture, and species that are tolerant of salt spray.

Four types of vegetation communities were found:

- Dry-Moist Old Field Meadow (CUM1-1a to j)
- Mineral Cultural Woodland (CUW1)
- Meadow Marsh (MAM), and
- Shallow Marsh (MAS)

All of the vegetation communities identified within the study area are considered widespread and common in Ontario and are secure globally.

2.8.4 Flora

No plant species that are regulated under the Ontario Endangered Species Act or the Canada Species at Risk Act were encountered within the study area.

2.8.5 Tree Inventory

A total of 213 trees consisting of 27 species were identified along the corridor. Generally, these trees were in good to fair condition with the exception of a few in poor condition (and 5 considered dead). The trees inventoried ranged in size from 10 to 160cm Diameter at Breast Height (DBH), measured at 1.3m from the ground. No tree species that are regulated under the Ontario Endangered Species Act or Canada Species at Risk Act were encountered. Of the trees inventoried, 151 trees will need to be removed to accommodate the road widening (i.e. trees located within the grading limits and 1.5m beyond).

2.8.6 Wildlife and Habitat

The natural areas surrounding the Salt Creek crossings are considered the most significant wildlife habitat in the study area. The areas adjacent to the water courses provided nesting and food habitats for wildlife as well as travel corridors. Concrete box culverts under Airport Road connect these corridors and provide safe passage for amphibians (e.g. frogs, salamanders) and mammals. The culverts also provide site specific nesting habitat for birds. Due to the large amount of disturbed lands within the study area, these natural heritage areas around the Salt Creek crossings are significant to the wildlife using them. The areas of disturbed landscape found around the rest of the study area support minimal natural heritage features, resulting in a limited number of wildlife species generally considered urban tolerant.

2.8.7 Species at Risk

Three bird species at risk, Barn Swallow, Eastern Meadowlark and Bobolink were identified as having potential to be in the study area.

- a Barn Swallow nest was observed in the culvert at Watercourse Crossing 2. Since this structure provides nesting habitat for Barn Swallows, impacts to this habitat will need to be reviewed by the Ministry of Natural Resources and Forestry to assess any potential permit requirements under the Ontario Endangered Species Act (ESA).
- all three bird species are considered 'Threatened' and regulated under the Ontario Endangered Species Act and the Federal Species at Risk Act (SARA). Wood Thrush, an additional bird species at risk, may be present.

2.8.8 Designated Natural Areas

Designated natural areas include areas identified for protection by MNRF, TRCA, Peel and Caledon. No Provincially Significant Wetlands (PSWs), Areas of Natural and Scientific Interest (ANSIs), or Environmentally Sensitive Areas (ESAs) have been identified within 120 m of the study area.

2.9 STORMWATER AND DRAINAGE

Salt Creek currently overtops Airport Road at the three major crossings under Regional Storm conditions. With the enlargement of all three structures, overtopping of the roadway will be eliminated. The nine smaller crossing culverts within study area will all be replaced and upsized to 800mm culverts. (See **Appendix F** for the complete report.)

2.9.1 Stormwater Quantity Control

In rural areas, existing V-shaped ditches that currently convey stormwater to the Salt Creek system are to be improved to flat bottom infiltration ditches. See **Section 4.4** for further details. Within Sandhill, the road cross section will be urban, including curb and gutter. Storm sewers with oil and grit separators (a chambered concrete structure that treats road runoff), infiltration trenches and enhanced bio-retention swales to convey drainage to culverts /receiving drainage systems.

2.9.2 Stormwater Quality Control

The report recommends use of enhanced bio-retention swales as a pilot project within the study area and oil/grit separators to improve total suspended solids (TSS) and treat run-off water. Further, sediment and erosion control measures will be implemented during construction.

2.10 AIR QUALITY ASSESSMENT

The assessment focused on the impacts of common contaminants released from automobiles and trucks as they use the road and slow down to make turning movements at intersections and accesses. The study used the Do Nothing alternative as its base to evaluate against the 2021 and 2031 the horizon years. It evaluated various alternatives against the base including the installation of traffic signals at Old School Road-Healey Road/Airport Road, with and without changes to the configuration of the intersection; the installation of a roundabout at this junction; the addition of auxiliary lanes at both this junction and the King Street intersection, and the widening of Airport Road to 4 lanes which would also change the configuration at the two intersections.

If traffic flow can be maintained at or near the speed limit through much of the study area, there will only be minimal impacts to air quality at points along the route. While the full extent of Airport Road in the study area was modelled for the Do Nothing situation and a limited number of the alternatives, the emphasis was placed upon activity within 300m of the center of the various intersections. In these areas vehicles slow down due to traffic signals or turning movements with resulting changes in air quality.

The report shows that measures that reduce congestion on the road will lower the total emissions along the route, and result in better air quality conditions than those expected to exist in the two horizon years of 2021 and 2031 if no changes are made. The study indicates that under most circumstances the quantities of contaminants released from the vehicles will result in maximum predicted concentrations that are below the criteria generally used for judging air quality.

During construction, best management practices to mitigate any air quality impacts caused by construction dust will be applied. The Ministry of the Environment and Climate Change recommends the use of non-chloride dust suppressants. Before construction staff will review the list of fugitive dust prevention and control measures as set out in the document "*Cheminfo Services Inc. Best Practices for the Reduction of Air Emissions from Construction and Demolition Activities Report*", prepared for Environment Canada, March 2005. (See **Appendix M** for the complete report Air Quality Report.)

2.11 CONTAMINATED SITE SCREENING

A contaminated site screening was done for the study area and no obvious evidence of adverse environmental impact was identified within the road right-of-way. However adjacent properties including a retail gas station and a number of light industrial properties were identified as potential sources of impact. Further, a number of registered waste generators associated with the storage, handling and use of environmentally sensitive products were identified. Contaminants of concern include metals, volatile organic compounds, and petroleum hydrocarbons. Migration of pollutants would likely be through ground water. In this regard, during construction, any excavation that extends below the groundwater surface may encounter potentially contaminated soil and/or groundwater.

It is recommended that a soil management plan be developed that includes monitoring and sampling as required for evidence of those materials. If soil removed during construction is determined to be contaminated, the disposal of contaminated soil will be consistent with Part XV.1 of the Environmental Protection Act and Ontario Regulation 153/04, Records of Site Condition, which details the requirements related to site assessment and clean up. (See **Appendix I** for the complete Contaminated Site Screening report.)

2.12 NOISE REPORT

Modelling software is used to predict noise levels at sensitive residential locations and determine if levels will be unacceptable as per the Region's and Ministry of the Environment and Climate Change policies.

The Region's guidelines for noise walls (Policy W30-04) states that only existing residential sites where the house backs or sides a Regional road and experiences daytime noise levels of 60 dBA or higher will be considered for retrofit noise walls.

There are no rear facing lots in the study area and two side facing lots; 12451 Airport Road and 6025 Healey Road.

Of the two side-facing lots, only 12451 Airport Road exceeds the 60 dBA requirement. However, the difference between the predicted noise levels with and without improvements is only 0.03 dBA, which is an imperceptible increase. The noise level exceeds the maximum specified by Policy W30-04 by less than 1 dBA. Considering these two factors, mitigation of 12451 Airport Road is not recommended. (See **Appendix L** for the complete report.)

2.13 HYDROGEOLOGIC INVESTIGATION (how groundwater moves through soil and rock)

The following tasks were conducted to establish existing conditions:

- review of available background information
- subsurface investigation
- door-to-door well survey
- ground water level monitoring
- completion of Hydrogeologic assessment

The study concluded that the proposed construction works will not involve significant excavation and will not result in adverse impacts to local ground water conditions or wells. It recommends a pre-construction survey be conducted of existing wells in the area and several monitoring wells installed adjacent to the construction works to provide for independent monitoring of ground water levels. (See **Appendix H** for the complete report.)

2.14 GEOMORPHIC ASSESSMENT (how moving water shapes land forms)

A meander belt (the natural shift of a stream channel across a valley bottom) flood width and crossing risk assessment was undertaken for the 3 water crossings.

Within the defined reach (length of river), a preliminary belt width was determined to be 32.0m and after applying a 10% safety factor an optimal belt width was calculated at 38.4m. The belt widths were reviewed with other risk factors to determine whether the existing crossing structures are appropriate sizes to accommodate the geomorphic conditions. Much of the liability surrounding both the Salt Creek and West Humber Tributary crossings is due to dense vegetation. This risk is generally lessened due to the small size of the watercourses and the high degree of channel alterations.

Investigation found that the existing openings would likely support the long term form and function of each watercourse and limit risk to the proposed infrastructure change provided that

the channel form is restored at each site. Rather than increasing the structure width at each site, geomorphic function would benefit from improvements to the channel form which could be achieved through installation of material within the culverts to define the channels. (See **Appendix H** for the complete report.)

2.15 STRUCTURE INVESTIGATION REPORT

The report conducted a foundation and design assessment of the Salt Creek, Dean's Culvert and Norris Bridge structures. It recommends that the following issues be considered during the detailed design studies:

- detailed field investigations at the structure sites to confirm the thickness and founding elevation of the existing footings and the composition and properties of the fill material comprising the embankments;
- core the bedrock at the Norris Bridge site to refine the top of bedrock elevation;
- confirm the ground water level(s), perched or otherwise, at the sites; and
- confirm and further refine the preliminary geotechnical recommendations provided in the report.

The three structures are recommended to be widened to accommodate a widened Airport Road platform. (See **Appendix O** for the complete report.)

2.16 SOCIO-ECONOMIC ENVIRONMENT

2.16.1 Archaeological Assessments

The Stage 1 property assessment determined that archaeological potential exists in the study area. The existing right-of-way and some lands beyond the right-of-way has been disturbed by previous land alterations, but that archaeological potential exists in parcels of land beyond the existing Airport Road, Healey Road, Old School Road, and King Street right-of-ways.

A Stage 2 Archaeological Assessment is being conducted for any identified areas impacted by the proposed work. The Stage 2 assessment is conducted by test pit survey and/or pedestrian survey, which includes the systematic excavation of small test pits by hand at 5 m intervals conducted when ploughing or pedestrian survey is not feasible.

An historic site has been identified at 13571 Airport Road and a Stage 3 Archaeological Assessment will be conducted in the detailed design stage. (See **Appendix J** for the complete report.)

2.16.2 Built and Cultural Heritage

The Cultural Heritage report identified 11 Cultural Heritage Landscapes and 14 Built Heritage Resources within the study area, including 3 buildings designated under the Ontario Heritage Act:

- Kennedy-Breen House – located north/west quadrant of Old School Road
 - Masters House – located on the east side of Airport Road, south of King Street
 - North Peel Community Church – located on King Street, east of Airport Road
-
- There will be no impacts to these buildings or to the Sandhill United Church.
 - Heritage Impact Assessments (HIA) have or will be undertaken for:
 - Norris Bridge crossing
 - 13803 Airport Road, a mid-nineteenth century building
 - 5968 King Street, a 1.5 storey mid-nineteenth century residence
 - 13949 Airport Road, a mid-nineteenth century residence
 - Elite Gas Bar and Convenience Store
 - 5964 King Street, a log house construction after 1850
 - The Sandhill Pipes and Drums building will be evaluated for relocation.
(See **Appendix K** for the complete report.)

3.0 IDENTIFICATION AND EVALUATION OF ALTERNATIVE PLANNING SOLUTIONS

3.1 TRANSPORTATION PLANNING

The following Official Plans, Master Plans and Studies were used as background to develop the problem and opportunity statement.

3.1.1 Regional Official Plan

The Regional Official Plan Amendment 26 has identified the need to update the Regional Road Right-of-Way Requirements (ROPA Schedule F) for Airport Road (from Mayfield Road to Caledon East boundary) from a 36M to 45M right-of-way (a 2-4 lane widening).

3.1.2 Long Range Transportation Master Plan 2012 Update

In the context of this study, the LRTP has defined the need to widen Airport Road from 2 to 4 lanes before 2021 to mitigate projected traffic congestion.

The LRTP was used as background support to this study for the problem and opportunity statement.

3.1.3 Active Transportation Plan (AT)

The Region's AT Plan recommends to:

- fill gaps in sidewalks
- extend sidewalks to destinations
- pave shoulders where feasible
- discuss strategy for sidewalks / bike lanes in settlements as Regional roads urbanize.

3.1.4 Peel Strategic Goods Movement Network Study

The study has identified planning, policy, program and infrastructure investment options for enhancing the Region's ability to accommodate goods movement as part its overall investment strategy. Its objective is to develop a goods movement network in Peel to improve, prioritize and preserve goods movement corridors. There are no truck restrictions on Airport Road and it is defined as a goods movement corridor.

Peel's Long Range Transportation Master Plan (LRTP) 2012 Update

The LRTP is a document that is used to identify Peel's transportation challenges over the next 20 years. It examines current and future transportation issues and proposes strategies to help traffic congestion. One strategy is to identify the number of road lanes required to help relieve projected traffic congestion levels until 2031.

Its purpose is to:

- ensure that transportation planning decisions are made within the context of changes in provincial legislation and general transportation and land use trends
- serve as input to other studies including environmental assessments, and
- support transportation policies in the Region Official Plan (ROP).

The LRTP study is conducted as a Transportation Master Plan under the Municipal Class Environmental Assessment Process and complies with the Province of Ontario's Environment Assessment Act. The study addresses Phases 1 and 2 of the Municipal Class EA process (**see Section 1.5**).

3.1.5 Road Characterization Study (RCS)

The study integrates the Healthy by Design principles with Transportation objectives based on land use concepts. The study defines Airport Road within the study area as an industrial connector within Sandhill and as a rural road outside of Sandhill.

- RCS classifications consider adjacent land use, context sensitivity and requirements for the form and function of sections of roadway now and in the future.
- Design criteria and cross sections are shown in-line with RCS recommendations

3.1.6 Draft Greater Toronto Area (GTA) West Transportation Development Strategy

The Ministry of Transportation (MTO) is leading an Environmental Assessment (EA) of the GTA West Corridor to:

- Study long-term transportation problems and opportunities.
- Pinpoint solutions to provide better links between Urban Growth Centres.
- Analyze the study area's:
 - agriculture
 - air quality impacts
 - community
 - constructability and economic issues
 - cultural environment
 - land use
 - natural environment
 - transportation benefit

Currently the Airport Road study area falls within the broadly-defined path for the GTA West Corridor. A ramp to/from the highway may occur within the study area.

3.1.7 Town of Caledon Transportation Needs Study Update (2009)

The study findings indicated that the widening of Airport road to 4 lanes in the medium term is important to accommodate future travel needs. Improvements in the medium to long term could include additional provisions at major intersections, widening for additional through lanes in the south section from Mayfield to King Street and improvements to parallel routes such as Dixie Road.

3.1.8 Sandhill Land Use Study (September 2012)

The Study addresses the transitional nature of the Sandhill community and provides recommendations and tools to move the community from its present form into a vibrant industrial/commercial centre as intended by the Town's Official Plan.

Highlights of the report pertinent to this study include:

- eliminate new residential uses / phase out existing residential uses. Commercial and limited dry industrial uses to be encouraged;
- access to Airport Road and King Street to be provided as joint access, where possible, in accordance with Peel's standards;
- encourage high quality design in Sandhill particularly around the intersection of Airport Road and King Street;
- reassess the permitted land uses once the Environmental Assessment of Airport Road is completed;
- encourage the preparation of Urban Design Guidelines for the Community of Sandhill; and
- consider streetscape designs along both King Street and Airport Road.

3.1.9 The Caledon Trails Master Plan Update

Recommends increased trail linkages between Caledon East and Tullamore.

3.2 THE PROBLEM AND OPPORTUNITY

Phase One of the Municipal Class EA process involves documenting the factors which lead to the conclusion that an improvement or change is needed. Then a clear statement of the identified problem to be investigated is developed along with the opportunities for improvements.

The Problem and Opportunity Statement is the main starting point in the undertaking of the EA and becomes the central theme integrating elements of the project. It also assists in setting the scope of the project.

The Problem and Opportunity Statement for the Airport Road Environmental Assessment is as follows:

Improvements are needed along the Airport Road corridor to address/accommodate:

1. existing and future traffic demands
2. pedestrian and cyclist movements through the corridor, and
3. access control

3.3 DEVELOPMENT AND ASSESSMENT OF ALTERNATIVE PLANNING SOLUTIONS

Table 2 illustrates the planning exercise that was undertaken to develop and evaluate the **Alternative Planning Solutions** to address the problems and opportunities within the corridor:

PLANNING ALTERNATIVES	DESCRIPTION	POTENTIAL TO ADDRESS PROBLEM / OPPORTUNITY	RECOMMENDATION
DO NOTHING	Maintain the status quo. No improvements are planned or made.	Does not address the projected traffic growth and traffic capacity deficiencies along Airport Road.	Not carried forward
ROAD NETWORK IMPROVEMENTS	<p>INTERSECTION IMPROVEMENTS</p> <ol style="list-style-type: none"> Traffic signal improvements, possible lane configuration improvements to accommodate left and right turn lanes. Roundabout feasibility study. 	<ol style="list-style-type: none"> Traffic operations will remain at or over capacity during peak periods. Does not fully address the need and justification. Some improvements would be observed at intersections but increased delay and congestion would continue in the links between intersections. Increased delays at unsignalized intersections would be experienced. Roundabouts have the potential to increase road capacity by improving traffic flow while improving safety. 	<ol style="list-style-type: none"> Carried forward Carried forward
	<p>ROAD WIDENING</p> <p>Widen Airport Road to 4 Lanes</p>	Widen Airport Road to 4 through traffic lanes provide the highest benefit to motorists and businesses along the corridor.	Carried forward
ROAD NETWORK IMPROVEMENTS	WIDEN ALTERNATE ROUTES	Add additional lanes to other, nearby north-south roads. Nearest Regional alternate north-south routes (The Gore Road and Dixie Road) modelling shows they do not warrant widening at this time. Roads directly adjacent to Airport Road are within the Town of Caledon's jurisdiction and are not being studied for widening at this time.	Not carried forward

PLANNING ALTERNATIVES	DESCRIPTION	POTENTIAL TO ADDRESS PROBLEM / OPPORTUNITY	RECOMMENDATION
TRANSPORTATION DEMAND MANAGEMENT (TDM)	<p>TRANSIT AND ACTIVE TRANSPORTATION FACILITIES</p> <ol style="list-style-type: none"> 1. Improve transit services by connecting links as an incentive for commuters to switch from private automotive use to transit, thus reducing the need for facility improvements. 2. Create facilities that allow pedestrians and cyclists to use active transportation facilities. 	<ol style="list-style-type: none"> 1. Although TDM is encouraged by the Region as a tool to control traffic growth, currently there are no planned transit routes for this corridor. 2. Improving opportunities for Active Transportation will not significantly change capacity requirement for Airport Road; however they will be pursued in conjunction with the preferred planning solution. 	<ol style="list-style-type: none"> 1. Transit solutions are not being carried forward. 2. Active Transportation facilities are being carried forward

After evaluation the following solutions were carried forward as criteria for the various design alternatives.

Road Widening

2 to 5 lanes

Road Network Improvements

Intersection improvements including Roundabout Evaluation

Transportation Demand Management facilities

Paved shoulder (rural) and an on-street bike lane within Sandhill will be considered.

No transit facilities.

3.4 CONSULTATION

Agency and potential public stakeholders were identified at the beginning of the study and a contact list prepared for each group. Agency partners were invited to the Technical Advisory Committee (TAC) kick off meeting and to review potential issues and areas of interest or concern.

3.4.1 Notice of Commencement

The project commenced on February 2, 2012 and letters were sent to a list of public stakeholders created from addresses within and adjacent to the study area and to identified agency stakeholders. The public was invited to contact the Project Manager about the scope of the project and to stay in touch with the project as it progressed. The Notice was placed in The Caledon Enterprise newspaper on February 2, 2012 and February 9, 2012.

3.4.2 Public Information Centre (PIC) No. 1

At Phase 2 prior to PIC No. 1, agencies including MNRF, TRCA, Hydro and the Town of Caledon reviewed the content of the PIC Boards including study information to date, existing condition reports, problem and opportunity statement, planning alternatives and preferred planning solution. TAC meeting details are available in **Appendix N**.

The first PIC was held on June 20, 2013 at the Caledon Community Centre in Caledon East. The Notice was placed in The Caledon Enterprise newspaper starting 2 weeks ahead of the event on the following dates: June 4, 2013; June 6, 2013; June 11, 2013 June 13, 2013; June 18, 2013. Further, letters inviting the public to attend were sent to a list of stakeholders created from addresses within and adjacent to the study area.

Following the PIC the stakeholder list was updated to include any new interested parties. Interest in the project was considered to be any feedback received from a stakeholder indicating that they could be directly affected during the planning, construction and/or operation of the proposed undertaking. Notices are available in **Appendix A** and PIC No. 1 Boards are available in **Appendix P**.

3.4.3 Preferred Planning Solution

Based on input from stakeholders including the public and agencies following PIC No. 1, and through formal assessment by the study team, the preferred planning solution was confirmed: to widen Airport Road from 2 to 4 lanes with a centre turning lane, including AT facilities and intersection improvements.

4.0 ALTERNATIVE DESIGN CONCEPTS AND ASSESSMENT

Following the first Public Information Centre, staff reviewed feedback received and were able to confirm the preferred planning solution, to widen Airport Road with intersection improvements and incorporation of transportation demand management infrastructure.

Phase 3 of the EA involves:

- development and description of reasonable design concepts
- screening of Alternative Design Concepts
- evaluation and identification of a Recommended Design Concept

4.1 ALTERNATIVE DESIGNS

The following alternative design concepts were considered. Two were screened out and three were evaluated in detail.

- Do Nothing (screened out due to traffic volumes);
- Widen equally about the Centre line;
- Widen Entirely to the West;
- Widen Entirely to the East - widening to the east was not pursued for evaluation as it would require the removal of heritage buildings and negatively impact hydro locations.
- Hybrid Widening Solution – widen around the centre line from the south limit of the study area to approximate south limit of Sandhill; shift centre line to the west by 7.5m in Sandhill; return to existing centre line at the proposed roundabout at King Street.

Table 3 below provides the description of the **Design Concepts** and the **Screening Process** that was used to determine a Recommended Design Concept.

Table 3 - Design Concepts and the Screening Process

Category	Criteria	Criteria Indicators	Alternative 1 Widen around Centre Line	Alternative 2 Widen to the west	Alternative 3* A hybrid approach
Engineering	Constructability	Ability to minimize construction constraints & complexity. Are there opportunities for construction staging (i.e. keeping lanes open)	<ul style="list-style-type: none"> Maintain 2 lanes operational during construction. Slightly higher potential need to overbuild to avoid three stage construction 	<ul style="list-style-type: none"> Keep 2 lanes operational during construction Construction staging opportunities marginally improved (i.e. ease of two stage construction) Potential less complex staging at structures 	<ul style="list-style-type: none"> Maintain 2 lanes operational during construction. Improved staging opportunities through Sandhill Slightly higher potential need to overbuild to avoid three stage construction
	Transportation	Ability to maximize road capacity	<ul style="list-style-type: none"> Provides a 5 lane configuration – 2 northbound and 2 southbound lanes with a central turning lane 	<ul style="list-style-type: none"> Same as alternative 1 	<ul style="list-style-type: none"> Same as alternative 1
	Overall Safety	Ability to improve vehicular safety along corridor (ensure that all vehicles including farm, emergency and transport trucks can negotiate through the area and its intersections safely and efficiently)	<ul style="list-style-type: none"> 2.5M paved shoulder with Rumble Strip Safety improved by additional road capacity and central turning lane; however does not reduce conflicts at intersections 	<ul style="list-style-type: none"> Same as alternative 1 	<ul style="list-style-type: none"> Same as alternative 1
	Stormwater Management	Ability to address water quantity and quality in ROW	<ul style="list-style-type: none"> South of Sandhill flat bottom ditches with infiltration material to improve water quality and quantity recommended. Within Sandhill urban cross section will help alleviate flooding issues. 	<ul style="list-style-type: none"> Same as alternative 1 	<ul style="list-style-type: none"> Same as alternative 1

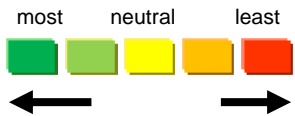
Category	Criteria	Criteria Indicators	Alternative 1 Widen around Centre Line	Alternative 2 Widen to the west	Alternative 3* A hybrid approach
Engineering	Utility Conflicts	Ability to minimize effects on utilities within ROW	<ul style="list-style-type: none"> • Impacts to hydro on both sides of the road • Sanitary sewer remains beyond west edge of pavement throughout project length • Potential isolated impacts to sanitary sewer at structure locations 	<ul style="list-style-type: none"> • Will avoid impacts to hydro south of Sandhill but will impact Hydro within Sandhill • Will require relocation of sanitary sewer on west side at structure locations. Increase costs to accommodate sanitary sewer beneath roadway • Avoids potential impact to watermain on east side at Salt Creek culvert crossing 	<ul style="list-style-type: none"> • Impacts to hydro on both sides of the road • Sanitary sewer width roadway within Sandhill • Potential isolated impacts to sanitary sewer at structure locations
Natural Environment	Terrestrial Features	Adverse effects on terrestrial species and habitats	<ul style="list-style-type: none"> • Barnswallow, Eastern Meadowlark and Bobolink, regulated as a Threatened bird species and have been observed in area – each alternative will have an equal impact on bird species. • 27 trees species identified within ROW – no endangered plant or tree species identified • Will require removal of approx. 150 trees 	<ul style="list-style-type: none"> • Similar impacts to wildlife and wildlife habitat • Similar number of trees impact (approximately 150 trees will be directly impacted) 	<ul style="list-style-type: none"> • Similar impacts to wildlife and wildlife habitat • Similar number of trees impact (approximately 150 trees will be directly impacted)

Category	Criteria	Criteria Indicators	Alternative 1 Widen around Centre Line	Alternative 2 Widen to the west	Alternative 3* A hybrid approach
Natural Environment	Terrestrial Features	Potential to enhance local terrestrial communities.	<ul style="list-style-type: none"> No protected designated natural areas Impacts to TRCA Terrestrial Natural Heritage System are expected to be minor. Some trees will need to be removed for widening however they will be replaced on a 3-1 basis Larger culverts will improve opportunity for wildlife passage 	<ul style="list-style-type: none"> Same as alternative 1 	<ul style="list-style-type: none"> Same as alternative 1
	Aquatic Features	Adverse effects on water crossings	<ul style="list-style-type: none"> 3 structures need to be replaced – Salt Creek Culvert, Deans Culvert, Norris Bridge which will require in-water work and temporary effects on watercourse crossings 	<ul style="list-style-type: none"> Same as alternative 1 	<ul style="list-style-type: none"> Same as alternative 1
		Potential to minimize impact to aquatic features	<ul style="list-style-type: none"> Salt Creek identified as Redside Dace “recovery habitat”. Improvements to structures will help minimize impact on water crossings. 	<ul style="list-style-type: none"> Grading will encroachment into pond (open aquatic eco site) located west side of Airport Road south of Norris Bridge 	<ul style="list-style-type: none"> Same as alternative 1
	Drainage	Ability to minimize infringement into floodplain	<ul style="list-style-type: none"> 3 structures will be replaced with open footing pre-cast concrete spans preventing overtopping of road during regional storm conditions 	<ul style="list-style-type: none"> Increased fill into TRCA Regulated Area north of Norris Bridge 	<ul style="list-style-type: none"> Same as alternative 1

Category	Criteria	Criteria Indicators	Alternative 1 Widen around Centre Line	Alternative 2 Widen to the west	Alternative 3* A hybrid approach
Socio-Economic Environment	Property Requirements	Amount of property required (hectares)	<ul style="list-style-type: none"> Total 15 property buy-outs (12 east side, 3 west side) Total proposed property required - 10 ha Removal of Sandhill United Church 	<ul style="list-style-type: none"> Total 14 property buy-outs (7 east side, 7 west side) Total proposed property required – 10 ha Avoids impacts to Sandhill United Church 	<ul style="list-style-type: none"> Total 13 property buy-outs (10 east side, 3 west side) Total proposed property required – 10 ha Avoids impacts to Sandhill United Church
	Accessibility to Properties	Ability to maintain/maximize access	<ul style="list-style-type: none"> Accesses will be maintained for all existing properties Centre turning lane will accommodate left turn in to properties in a safe manner 	<ul style="list-style-type: none"> Same as alternative 1 	<ul style="list-style-type: none"> Same as alternative 1
	Business Operations	Ability to enhance business attractiveness	<ul style="list-style-type: none"> Center turning lane will make access into existing businesses easier and safer especially for trucks 	<ul style="list-style-type: none"> Same as alternative 1 	<ul style="list-style-type: none"> Same as alternative 1
	Active Transportation	Ability to provide sidewalks and/or multi-use trail	<ul style="list-style-type: none"> A sidewalk is planned on both sides of the road within Sandhill 	<ul style="list-style-type: none"> Same as alternative 1 	<ul style="list-style-type: none"> Same as alternative 1
		Ability to meet cyclist requirements	<ul style="list-style-type: none"> Paved shoulder for bicycles outside of Sandhill settlement area. Online bike lanes provided within Sandhill. 	<ul style="list-style-type: none"> Same as alternative 1 	<ul style="list-style-type: none"> Same as alternative 1
	Noise	Are noise levels within acceptable parameters following widening?	<ul style="list-style-type: none"> With improvements the noise levels will remain within acceptable parameters. No noise mitigation is required. 	<ul style="list-style-type: none"> Same as alternative 1 	<ul style="list-style-type: none"> Same as alternative 1

Category	Criteria	Criteria Indicators	Alternative 1 Widen around Centre Line	Alternative 2 Widen to the west	Alternative 3* A hybrid approach
Socio-Economic Environment	Accessibility	Ability to be accessible for people with disabilities?	<ul style="list-style-type: none"> Will incorporate accessibility options such as pedestrian cross walks, countdown signals, line markings, accessible curb ramps, and tactile surfaces where feasible. Intersections will be AODA compliant 	<ul style="list-style-type: none"> Same as alternative 1 	<ul style="list-style-type: none"> Same as alternative 1
	Archaeological Resources, Heritage & Cultural Heritage Landscapes		<ul style="list-style-type: none"> Heritage structures impacted: <ul style="list-style-type: none"> Identified Sandhill United Church and Sandhill Pipes and Drums Listed historic frame building used as a 19th century District Court building Identified nineteenth-century house that is a remnant of the historic settlement of Sandhill Identified - 2 mid-nineteenth century residences of log construction on the n/w corner of King St. Identified – Elite Gas Bar Will require replacement of Norris Bridge - an identified heritage structure. 	<ul style="list-style-type: none"> Heritage structures impacted: <ul style="list-style-type: none"> Identified Sandhill Pipes and Drums building Listed historic frame building used as a 19th C District Court building Identified nineteenth-century house that is a remnant of the historic settlement of Sandhill Identified - 2 mid-nineteenth century residences of log construction on the n/w corner of King St. Identified– Elite Gas Bar Avoids impact to Sandhill Church. Will require replacement of Norris Bridge - an identified heritage structure. 	<ul style="list-style-type: none"> Same as alternative 2

Category	Criteria	Criteria Indicators	Alternative 1 Widen around Centre Line	Alternative 2 Widen to the west	Alternative 3* A hybrid approach
Construction	Capital & Operating Costs		<ul style="list-style-type: none"> Construction cost of the same order of magnitude 	<ul style="list-style-type: none"> Construction cost of the same order of magnitude Lower hydro relocation costs largely offset by other increased costs to accommodate sanitary sewer) 	<ul style="list-style-type: none"> Construction cost of the same order of magnitude
					Recommended Alternative



Alternative 3* - hybrid approach combination of Alternatives 1 and 2. Widen around the centre line from the south limit of the study area to the south limit of Sandhill. Within Sandhill shift the centre line by 7.5m to the west. Return to the existing centreline at the proposed King St and Airport Rd roundabout.

4.2 TRANSPORTATION DEMAND MANAGEMENT (TDM)

TDM was carried forward from the review of planning alternatives. The Active Transportation Plan recommends sidewalks/multi-use trails within settlement areas and a paved shoulder in rural areas for use of cyclists. For this study the following AT facilities that are recommended include:

- an on-street bike lane within Sandhill;
- a paved shoulder in rural areas for cyclists; and
- sidewalks on both sides of the road within Sandhill and on new structures

4.3 ROUNDABOUT VS SIGNALIZED INTERSECTION ANALYSIS

Intersection Improvements was carried forward from the review of planning alternatives. An analysis of signalization vs roundabout construction was conducted for the two intersections within the study corridor:

- Airport Road at King Street
- Airport Road at Old School Road-Healey Road

The intersection analysis of the above intersections is shown in **Table 4** below.

Exhibit 3 - Proposed Roundabout Configuration – King Street at Airport Road

An on-street bike lane is proposed within Sandhill. At the roundabout cyclists would have the option to join the flow of traffic or cross as a pedestrian.



Exhibit 4 - Proposed Roundabout Configuration - Old School Rd/Healey Rd at Airport Rd

In rural sections, the shoulder on both sides of Airport Road would be paved to accommodate cyclists. At the roundabout cyclists would have the option to join the flow of traffic or cross as a pedestrian.

Table 4 - ROUNDABOUT VS SIGNALIZED INTERSECTION ANALYSIS

Study Element	Criteria	Alternatives			
		Roundabout	Rating	Signals	Rating
Traffic Capacity, Operations, Access, Safety and Goods Movement					
Existing Traffic Capacity	How will the alternative serve the current volume of vehicular, pedestrian and cycling traffic?	<ul style="list-style-type: none"> will function well to move vehicles, pedestrians and cyclists through the intersection with minimal stopping will lessen delay (enhance traffic flow) as per Synchro model (traffic evaluation software) 		<ul style="list-style-type: none"> will function well to move vehicles, pedestrians and cyclists through the intersection 	
Forecasted Traffic /Transportation Network	Does the alternative accommodate forecasted traffic to the 2031 planning horizon year?	<ul style="list-style-type: none"> alternative will accommodate forecasted traffic to the 2031 planning year 		<ul style="list-style-type: none"> alternative will accommodate forecasted traffic to the 2031 planning year 	
	Will the alternative address the transportation network demand needs and be compatible with other transportation plans?	<ul style="list-style-type: none"> alternative meets network demands and is compatible with Region and Town of Caledon planning documents 		<ul style="list-style-type: none"> alternative meets network demands and is compatible with Region and Town of Caledon planning documents 	
Active Transportation (pedestrian and cycling activities)	How does the alternative serve future pedestrian needs?	<ul style="list-style-type: none"> pedestrians yield to traffic and cross one leg of traffic at a time in the indicated pedestrian crossing zone 		<ul style="list-style-type: none"> pedestrians cross at the signalized cross walk. However crossing distance is greater because of multiple lanes of traffic 	
	How does the alternative serve future cycling needs?	<ul style="list-style-type: none"> roundabouts make all turning movements slightly more comfortable for cyclists who choose to ride through the roundabout cyclists can dismount and join pedestrians at cross walk 		<ul style="list-style-type: none"> cyclists can choose to ride through the intersection joining existing traffic cyclists can dismount and join pedestrians at cross walk cyclists turning left cross the path of on-coming vehicles – a bike box can provide safety for this movement 	
Study Element	Criteria	Alternatives			

		Roundabout	Rating	Signals	Rating
Traffic Capacity, Operations, Access, Safety and Goods Movement (continued)					
Accessibility (to meet Accessibility for Ontarians with Disabilities Act (AODA) standards)	Will the alternative accommodate users who have accessibility needs (i.e. vision impaired, wheelchair, etc.)?	<ul style="list-style-type: none"> • surface indicators to be provided to accommodate users who have accessibility needs 		<ul style="list-style-type: none"> • countdown signals to be provided • auditory signals will be provided • surface indicators to accommodate users who have accessibility needs 	
Emergency / Farm Vehicle Use	How does the alternative accommodate emergency and/or farm vehicles?	<ul style="list-style-type: none"> • will convey emergency and/or farm vehicles through the intersections • use of roll-over curbs to better accommodate the larger vehicles 		<ul style="list-style-type: none"> • will convey emergency and/or farm vehicles through the intersections 	
Access Management	What effect will the alternative have on 'right-in/right-out' access restrictions to properties in the Sandhill Industrial/Commercial Centre?	<ul style="list-style-type: none"> • roundabout allows 'right-in/right-out' accesses for properties at the intersection to function as 'full moves' accesses • roundabout makes it easier for 'right-in/right-out' accesses throughout Sandhill by using roundabout to turn direction 		<ul style="list-style-type: none"> • vehicles will be unable to make left turns out of properties with 'right-in/right-out' access restrictions 	
Safety	Which alternative is safer?	<ul style="list-style-type: none"> • Intersection will be constructed to MTO and Region standards • less conflict points with other vehicles • vehicle impact less severe – mostly side-swipes with no head-on collisions • design naturally reduces vehicle speed • King Street – based on accident history potential to eliminate the angle, approaching head-on and turning collisions - of 47.5% reduction. • expected crash reduction between 19-48% for all severities • potential to reduce non-fatal type collisions by 42% • potential to eliminate the angle and turning movement collisions for a total of 27.3% reduction. • expected crash reduction of 71% • potential to reduce non-fatal collisions by 27.3% 		<ul style="list-style-type: none"> • intersection will be constructed to adhere to all Ministry of Transportation (MTO) and Region standards for safety 	
Goods Movement	Will the alternative serve to facilitate goods movement (trucking)?	<ul style="list-style-type: none"> • designed to accommodate larger turning vehicles such as transport trucks • use of roll-over curbs and apron to better accommodate large trucks, farm and emergency vehicles 		<ul style="list-style-type: none"> • truck turning movements can be accommodated through dedicated right and left turn lanes 	

Study Element	Criteria	Alternatives			
		Roundabout	Rating	Signals	Rating
Social Environment					
Heritage and Archaeological impacts	What impacts do the alternatives have on built heritage features?	<u>King at Airport</u> • two heritage churches located close to the Airport and King intersection will not be negatively affected		<u>King at Airport</u> • two heritage churches located close to the Airport and King intersection will not be negatively affected	
		<u>Healey/Old School at Airport</u> • no heritage features within the dimensions of the proposed roundabout		<u>Healey/Old School at Airport</u> • no heritage features within the dimensions of the proposed intersection	
Business and Private Property Impacts	How does the alternative impact properties at the intersection?	<u>King at Airport</u> • four full property buy-outs to construct the roundabout		<u>King at Airport</u> • four full property buy-outs to construct the signalized intersection	
		<u>Healey/Old School at Airport</u> • one full property buy-out to construct the roundabout		<u>Healey/Old School at Airport</u> • There are two options for signalization – option 1 requires two buyouts and option 2 requires one buyout	
	How much property will be required, if any for the alternative?	<u>King at Airport</u> • roundabout will require more property than the signalized intersection – approximately 0.807ha (one full buyout)		<u>King at Airport</u> • Signalized intersection will require less property than a roundabout – approximately 0.72ha (one full buyout)	
		<u>Healey/Old School at Airport</u> • roundabout will require slightly more property than either option for a signalized intersection – approximately 1.162ha (one full buyout)		<u>Healey/Old School at Airport</u> • signalized intersection Option A will require slightly less property than a roundabout – approximately 1.27ha (including two full buyouts) • signalized intersection Option B will require slightly less property than a roundabout – approximately 1.11ha (including one full buyout)	
Air Quality and Noise	What effect does the alternative have on air quality and noise levels?	• air quality is better than a signalized intersection since vehicles are not sitting idling at red lights • noise levels will be within acceptable Ministry of the Environment & Climate Change (MOECC) parameters.		• air quality and noise levels will be within acceptable Ministry of the Environment & Climate Change (MOECC) parameters	

Study Element	Criteria	Alternatives			
		Roundabout	Rating	Signals	Rating
Landscaping and Storm Water Management					
Landscaping	Will the alternative provide opportunities for landscape features?	<ul style="list-style-type: none"> centre of the roundabout will be landscaped can facilitate a 'Gateway' feature or road designation feature 		<ul style="list-style-type: none"> there is no room within the boulevard for landscaping 	
Storm Water Management	Can the alternative incorporate current storm water management practices such as LID (low impact design)?	<ul style="list-style-type: none"> LID practices can be implemented to keep water within the centre of the roundabout and store to water landscaping 		<ul style="list-style-type: none"> there is no room in the boulevard for LID practices 	
Construction Cost					
Initial Capital Cost	What is the comparative cost to construct each alternative including utility relocations, property impacts, and capital and maintenance costs?	<ul style="list-style-type: none"> the initial capital cost to construct a roundabout is greater 		<ul style="list-style-type: none"> the initial capital cost to construct a signalized intersection is less 	
Life-Cycle Cost	What is the total life-cycle cost of the alternative including the cost for construction, utility relocations, property acquisitions as well as ongoing operation and maintenance costs?	<ul style="list-style-type: none"> maintenance costs are lower than signalized intersection option 		<ul style="list-style-type: none"> maintenance costs are higher than roundabout option due mainly to signals 	
OVERALL SCORE IN POINTS			25		19

The analysis is favourable for the implementation of a two lane roundabout at Healey Rd-Old School Rd/Airport Rd and King St/ Airport Rd and is part of the recommended alternative design.

LEGEND:	LEAST PREFERRED (0 Pts.)	(1 Pts.)	(2 Pts.)	(3 Pts.)	(4 Pts.)	MOST PREFERRED
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4.4 STORMWATER MANAGEMENT OPPORTUNITIES

The study area falls within the Humber River Watershed. Salt Creek crosses the study area 3 times and is a cold water stream and recovery habitat for Redside Dace and requires **Type 1 Treatment-- Enhanced Water Quality**.

Enhanced water quality will be achieved through treatment train approach using oil and grit separators, infiltration trenches and enhanced bio-retention swales.

4.4.1 Enhanced High Retention Bioswales

Throughout the road alignment, roadside ditches will largely be enhanced to flat bottom bio-retention swales. These swales will provide an Enhanced Level (80% Suspended Solids) of removal. An enhanced high retention bio-swale is a linear stormwater LID (low impact development) system consisting of a continuously perforated pipe at a minimum slope in a sand filled trench (see **Exhibit 5** illustrated below). The enhanced high retention bioswale is part of a conveyance system and will be designed to convey large storm events with runoff rate reduction. During small storm events, volume reduction will be significant and there may be little or no discharge.

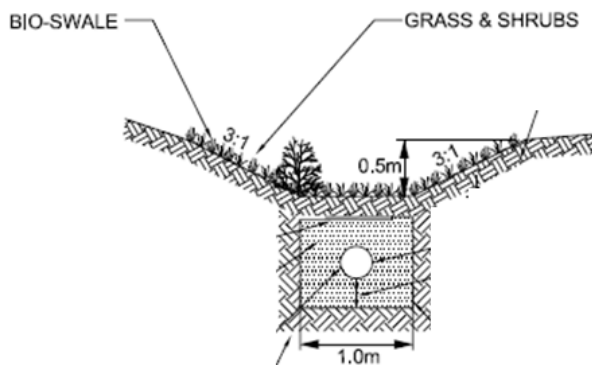


Exhibit 5

The recommended width of the bio-swale width is at least 1m. The depth will be determined by the surrounding grades and the outlet inverts (bottom of pipe). A flat bottom is recommended for improved infiltration. The high retention bio-swale will have a vegetated (grass) surface and will be placed with permeable soils (i.e. sand) surrounding a perforated drainage pipe with filter fabric surrounding the pipe and lining the trench. It will treat

Stormwater Management Practices

Stormwater management practices address both water quantity and water quality.

Water quantity control relates to proper sizing of watercourse crossings as well as conveyance and/or infiltration of road runoff for minor and major storm events. Water quantity management may also include facilities to address downstream flood and erosion potential resulting from expansion of the road surface (increased number of lanes).

The level of treatment for water quality relates to the standards defined in the watershed or sub-watershed planning study, which are dependent on the quality and sensitivity of the receiving system.

Water Quantity and Quality can be enhanced by LID (low impact design) practices including:

- Wet ponds/wetlands
- Grass swales
- Filter strips
- Bio-retention systems
- Oil and grit separators
- Storm water management ponds
- Infiltration Trenches

stormwater by filtering out contaminants being conveyed in the water. The flat bottom vegetated trench will provide storm water treatment, pollutant removal (suspended solids, nitrogen, phosphorus) by vegetation uptake. The use of vegetation improves pollutant removal rates, vegetation slows flow down and encourages sedimentation, cleans water by natural processes, encourages infiltration into the subsurface zone, which reduces flow rate and modifies the water temperature to a great extent.

The bio-swale capacity was reviewed at two critical locations, i.e. in the vicinity of the culvert at Old School Road and the culvert at the south Sandhill limit. The designed bio-swale has enough capacity to convey the 100 year flow at both locations. (See the Stormwater Management and Drainage Report in **Appendix F**).

4.5 CONSULTATION

4.5.1 Stakeholder Meetings

A Technical Advisory Committee (TAC) meeting was held on October 7, 2014 prior to Public Information Meeting No. 2. The purpose of the meeting was to review the presentation boards in advance of the PIC, design alternatives and decision-making process for the recommended design alternative. Details of the TAC meeting are available in **Appendix N**.

4.5.2 Public Information Centre No. 2

PIC No. 2 was held on November 27, 2014 at the Caledon Community Complex in Caledon East. The Notice was placed in The Caledon Enterprise newspaper starting 2 weeks ahead of the event on the following dates: November 13, 2014 and November 20, 2014.

Letters were sent to a list of public stakeholders created from addresses within and adjacent to the study area. Interest in the project was considered to be any feedback received from a stakeholder indicating that they could be directly affected during the planning, construction and/or operation of the proposed undertaking.

PIC No. 2 provided the public with the opportunity to ask questions of the project team, review updated studies and progress to date, and review the design alternatives and decision making process for the recommended design alternative. A copy of the notice and summary of comments received are available in Appendix A. PIC No. 2 boards are available for review in **Appendix P**.

5.0 DESCRIPTION OF RECOMMENDED DESIGN

The proposed design criteria for the widening of Airport Road are based on a design speed of 90 km/hour in rural sections and 70 km/hour within Sandhill as presented in **Table 1** below.

DESIGN PARAMETERS	PRESENT CONDITIONS	DESIGN STANDARDS / MINIMUMS		PROPOSED STANDARDS
		TAC	MTO	
Row Width	36m	20 - 45	N/A	45 m ⁽¹⁾
Posted Speed	80 & 60km/hr. ⁽²⁾	80 km/hr.	80 km/hr.	80 & 60km/hr. ⁽²⁾
Design Speed (D.S.)	90 & 70km/hr. ⁽³⁾	90 km/hr.	90 km/hr.	90 & 70km/hr. ⁽³⁾
Minimum Stopping Sight Distance	95 m	130-170 m	160 m	160 m
Equivalent Minimum 'K' Factor for 90km/hr. D.S.	n/a	30 – 40 Sag 32 – 53 Crest	40 Sag 50 Crest	30 Sag 32 Crest
Equivalent Minimum 'K' Factor for 70km/hr. D.S.	n/a	20 – 25 Sag 16 – 23 Crest	25 Sag 25 Crest	25 Sag 25 Crest
Minimum Radius for 70km/hr. D.S.		190 m	190 m	190 m
Minimum Radius for 90km/hr D.S		340 m	340 m	340 m
Number of Lanes	2 Lanes Rural	4	4	5 Lane Rural ⁽⁴⁾
Lane Width for 90km/hr. D.S.	2 x 3.6 m	3.5 – 3.7 m	3.5 m	3.75m Curb Lanes 3.65m Inside Lanes 3.5m Turn lanes 5.5m Median
Lane Width for 70km/hr. D.S.	2 x 3.6 m	3.5 – 3.7 m	3.5 m	3.75m Curb Lanes 3.5m Inside Lanes 3.35 -3.5m Turn lanes 5.5m Median
Boulevard Width	N/A	3.0 m	3.0m	5.5m Min.

Table 1 – Design Criteria for Airport Rd from 1.0 km north of Mayfield Rd to 0.6 km north of King St

5.1 THE PROPOSED ROAD DESIGN

5.1.1 Existing Conditions

Airport Road is currently a two lane undivided rural road with a posted speed limit of 80km/hr. The posted speed is reduced to 60km/hr within Sandhill. The existing right-of-way of Airport Road is typically 36m. The designated right-of-way for the roads within the study area is:

- Airport Road: 45.0m
- Old School Road and Healey Road: 26.0m
- King Street: 30.0m

Generally Airport Road follows a straight line throughout the study area. The existing road consists of rolling terrain. At some locations minor issues were noticed including poor sight lines and a steep road grade at Norris Bridge. These issues are corrected in the proposed road design.

The intersections of Old School Road and Healey Road at Airport Road are offset by $\pm 40m$. Traffic on both minor roads is currently controlled by stop signs which results in higher delays to east-west traffic. The traffic delays caused by the offset intersection and stop signs were considered in the development of intersection alternatives.

5.1.2 Proposed Horizontal Alignment

The south project limit is located $\pm 480m$ north of Purdue Court. For the majority of the project, the existing centreline of Airport Road is maintained and the road widening is proposed equally about the centreline. However, the proposed alignment is shifted $\pm 7.5m$ west within the Sandhill settlement area. The alignment shift was adopted to minimize impacts on existing features and properties and to avoid impacts to Sandhill United Church, an identified heritage structure. The shift in the proposed horizontal alignment begins around Station 5+070 and matches back to the existing centreline $\pm 200m$ north of King Street at station 5+880.

Understanding Road Design Terms

Sight Distance: the length of roadway ahead visible to the driver.

Alignment: road “alignment” is based on the defined center line of the road.

The **horizontal alignment** is the configuration of the roadway as seen in plan and generally consists of straight sections and horizontal curves. Defining a horizontal alignment is the starting point for the road design. It is essentially a control point of which everything is built.

The **vertical alignment** consists of straight line grades and the vertical curves used to connect them. There are two types of vertical curves, crest curves which occurs on hills, and sag curves which occur in valleys. Good road design provides smooth transition between adjacent grades.

Stations: are horizontal distances that are measured along the alignment. They are marked on the design plan in 100m increments.

Profile: is an illustration of what the road would look like if it was cut in half, right down the centerline, and then picked up and looked at from the side.

Profiles display the road surface and its slopes/curvatures at the top level and the lines of sub-grade, stone base, etc., below. They also commonly show the locations of all drainage and sanitary structures along the roadway and the in/out invert elevations for those structures as well as pipe sizing and slopes.

5.1.3 Proposed Vertical Alignment

The proposed vertical alignment was established based on a design speed of 90 km/hr for the rural section and 70km/hr in the urban section. Where possible, the existing road profile has been maintained. However where the existing grade is less than 0.5%, a minimum of 0.5% grade is proposed. Provision of minimum road cover protection at each culvert/bridge crossing was considered when establishing the proposed vertical alignment.

There are two locations where the grade difference between the existing and proposed road elevation is relatively higher than the rest of the corridor:

1. In the vicinity of the Norris Bridge (up to ± 0.8m)
2. South of Deans Culvert (up to ± 0.7m)

This was done in order to minimize impacts on adjacent properties and provide sufficient cover for the culvert and bridge.

The K-values of vertical curves used at major crossings were:

Crossings along airport road	Vertical curve K –value		
	Crest curve (South side of crossing)	Sag	Crest curve (North side of crossing)
Norris Bridge	60 ¹	30	60 ¹
Deans Culvert	200	160	120
Salt Creek Culvert	0.53% longitudinal grade		

Note 1: Addresses existing sight line deficiency in the vicinity of Norris Bridge.

Cross Sections: show what the roadway would look like if it was cut from curb to curb top down and looked at on end. Cross sections typically show the road surface and all sub-grade construction materials (pavement structure) as well as the position and number of vehicle, transit or bicycle lanes and sidewalks/multi-use trails. Cross sections also show drainage features, utilities and landscaping.

Design Speed: The design speed is a tool used to determine geometric features of a new road. Design speed may be determined by the planned operating speed, legislated speed, traffic volume or road classification and typically is greater than the posted speed.

Vertical Curve: the function of a vertical curve is to provide a smooth transition between adjacent grades along the road. The form of curve used for vertical curve design is a parabola. There are 2 kinds of vertical curves: crest curves (positive) and sag curves (negative). One of the properties of a parabola is that the rate of change of grade with respect to the length is constant. This means that a driver travelling on a crest curve has a constant sight distance throughout the curve.

K Value: The horizontal distance in metres needed to make a 1% change in grade. K is the measure of the flatness of a curve; the larger the K value the flatter the curve.

5.1.4 Cross Sections

Airport Road will be widened to provide a 4-lane cross section and a centre left turn lane within the designated 45.0m right-of-way. The project comprises both rural and urban sections of roadway. The urbanized section is planned within Sandhill. A 5.5m two-way centre left turn lane is provided throughout the corridor to enable safe turning into existing property accesses. A 3.75m curb lane (outer lane) is also provided to assist goods movement as identified in the Peel Strategic Goods Movement Network Study. Details of the typical sections are illustrated in **Exhibit 6** and **Exhibit 7** (pages 37 and 38):

It should be noted that Norris Bridge, Deans Culvert, and Salt Creek Culvert crossing are designed with 1.8m wide shoulder and 2.0m wide sidewalk at the culvert crossing.

5.1.5 Cross Slope and Superelevation

A standard 2.0% cross fall is proposed along the corridor.

At roundabout approaches the following will be provided:

- adequate signage to alert drivers about the speed reduction prior to entering the roundabout
- a reverse crown (-2.0%) to reduce lateral force

There are no areas of superelevation within the corridor.

5.2 ROUNDABOUT DESIGN

The existing intersections of Old School Road-Healey Road and King Street at Airport Road are proposed as two lane urban roundabouts with a 55.0m Inscribed Circle Diameter (ICD) and 5.0m wide circulatory roadway. The entry and exit width of approaches varies based on the number of entering and receiving lanes. However a minimum width of ± 4.2 m per lane is provided for an entry and exit lane.

Both roundabouts will be wide enough to accommodate tractor trailers or any large vehicle turning pattern in all directions. The roundabout approaches are designed with large enough entry and exit radii so that tractor trailers will be able to make a right turn without encroaching onto another lane or travelling over roadside curbs.

Rural and Urban Sections

Rural section refers to those portions of road that utilize ditches for storm water drainage and infiltration and typically have a paved shoulder that may be used for safe stopping or for bicyclists.

Urban section refers to those portions of road (within Sandhill) that utilize curbs and gutters to direct storm water from the road surface and typically have sidewalks and/or multi-use trails for pedestrians.

Cross Slope and Superelevation: On straight sections of normal two-lane roads, the pavement cross section is usually highest in the center and drains to both sides. Cross slope is used to provide drainage so that the water will run off the surface to a gutter or ditch.

On horizontal curves, the cross slope is banked (**superelevated**) to reduce steering effort and lateral force required to go around the curve.

Roundabout Terms

Inscribed Circle Diameter is the basic limit used to define the size of a roundabout. It is measured between the outer edges of the circulatory roadway.

The **Centre Island** is the raised area in the centre of a roundabout around which traffic circulates.

The **Apron** is the crossable area (with mountable curb) at the edge of the centre island which may be used by long vehicles as extra space for turning as they move through the roundabout.

Raised Splitter Islands are designed at all approaches to provide smooth transitioning of traffic into the roundabout. It also serves as a refuge area for pedestrians and cyclists crossing the road. Consideration to existing and proposed accesses to abutting properties was given while designing the lengths of these islands, which varies between 50m to 165m. No turn restrictions are intended for existing properties or future developments unless the access is located close to the intersection. In this case access would be restricted to right-in/right-out only.

3.0m wide crosswalks are provided for pedestrians at a distance of 15m from the roundabout entries and exits. It is required that all crosswalk ramps be compliant with the Accessibility for Ontarians with Disabilities Act (AODA) and may include accessible curb ramps and tactile surfaces. The proposed roundabout design will provide surface indicators at crosswalk ramps to accommodate users who have accessibility needs.

A 5.0m truck apron with mountable curb is designed with the central island to provide adequate space for larger vehicles making a left turn. The inner island will be landscaped.

The Federal Highway Administration (FHWA) recommends successive curves at roundabout approaches to slow traffic down before entering the roundabout. The suggested treatment is to create a broad radius as vehicles start to slow down, followed by a moderate radius in the middle of the approach, and finally a sharp radius prior to entering the roundabout. Flatter exiting curves are provided at each approach for acceleration and to avoid unnecessary traffic delay within the roundabouts.

The paved shoulders (in the rural section) and bike lanes (in the urban section) will be ramped into a curbed and raised multi-use path for cyclists to cross the roundabout without entering main travel lanes. This is primarily done for safety reason to provide cyclists with an off-street path for road crossing. Cyclists may also choose to enter the roundabout in the same manner as other vehicles, however not recommended. Details of the proposed roundabout geometrics are as follows:

5.2.1 Healey Road / Old School Road Intersection

- Horizontal alignments of Airport Road at the side streets is skewed at 85°
- Northbound and Southbound Approach: Two lane approaches along Airport Road in each direction.
- East approach: Two entry (westbound) and a single receiving lane (eastbound)
- West approach: Single out (eastbound) and two receiving lanes (westbound) tapered off to a single lane to match existing configuration

5.2.2 King Street Intersection

- An 8 degree deflection is provided between the existing and proposed horizontal alignment at the King Street roundabout. The deflection amount was determined by adjusting the impact to property without compromising safety and design standards.

- Northbound and Southbound Approach: Two lane approaches along Airport Road in each direction.
- West and East Approach: Flared from an existing single lane to two entry lanes at both approaches. The two receiving lanes will merge into a single lane to match existing configuration.

5.3 TYPICAL CROSS SECTIONS and RECOMMENDED DESIGN

The following exhibits illustrate the proposed rural and urban cross sections and the recommended design alternative as discussed

Exhibit 6 - Rural Section – Airport Road 1.0 km north of Mayfield Road to 610m south of King Street (south of Sandhill)

The rural mid-block cross section at the above locations features 2 north bound and 2 southbound through lanes and a centre turning lane.

- Begins at Station 0+640 and Ends at Station 4+900
- 3.65m Through Lane (inner lane)
- 3.75m Curb Lane (outer lane)
- 2.5m Paved Shoulder
- 0.5m Rounding to ditch
- 1m Flat Bottom Ditch with typical 3:1 foreslope, 2:1 backslope

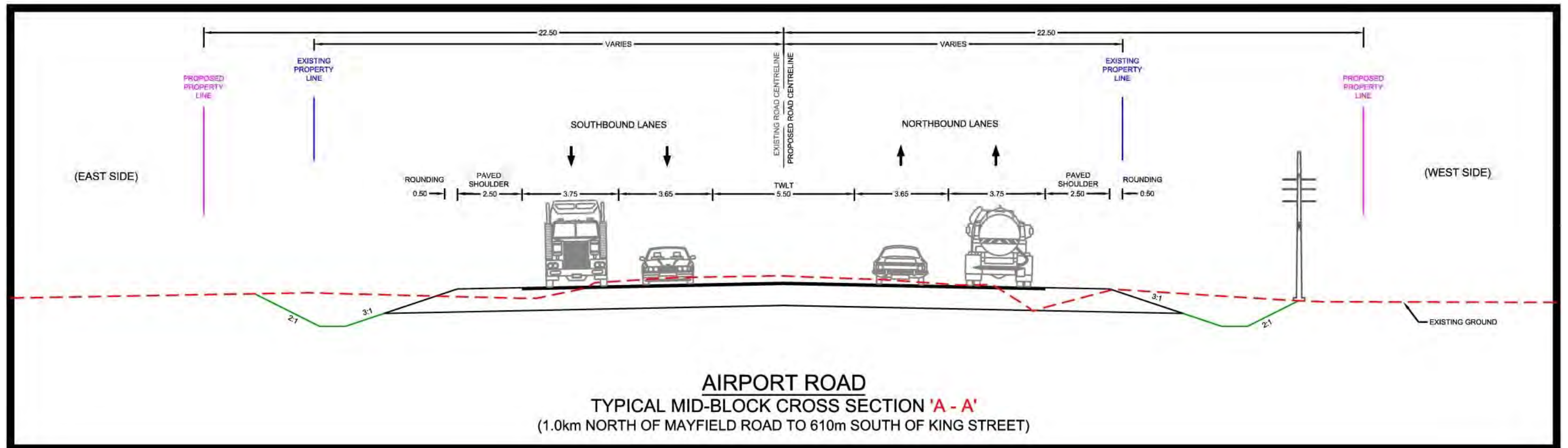
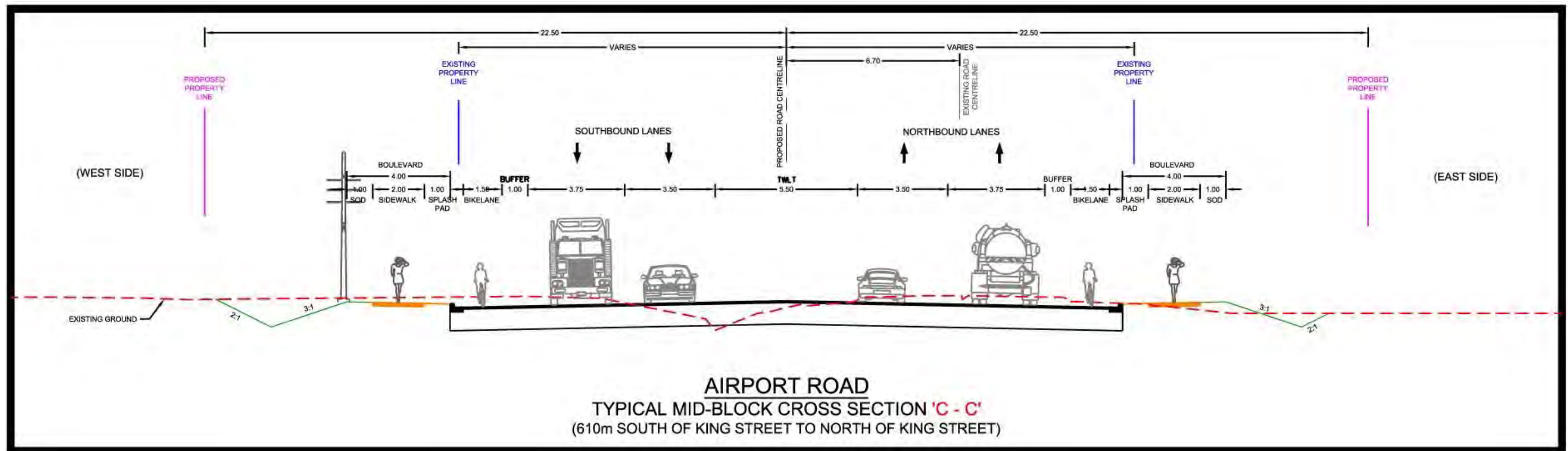
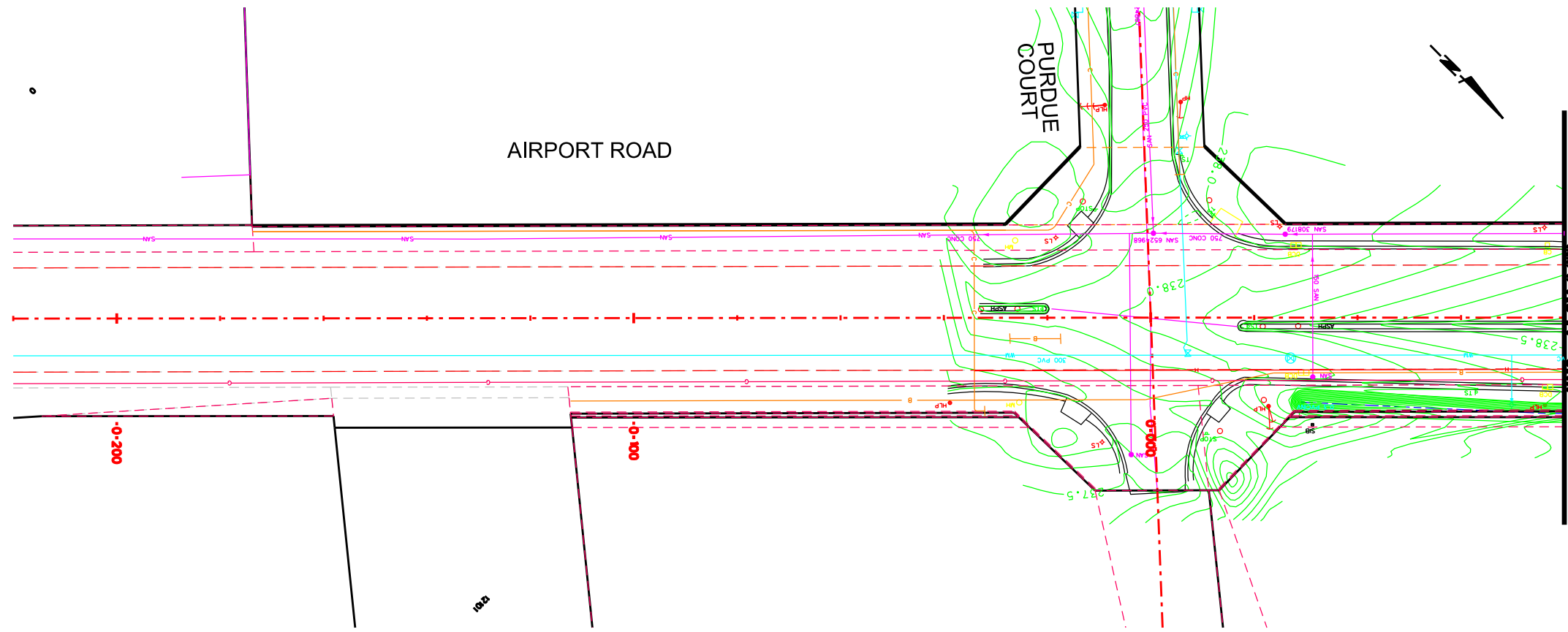


Exhibit 7 - Urban cross section – Airport Road 610m south of King Street to 0.6m north of King Street (Sandhill)

The urban cross section at the above location features 2 westbound lanes and 2 eastbound lanes with a variable median.

- Begins at Station 0+480 – Ends at Station 0+640
- Begins at Station: 4+900 Ends at Station 5+880m north of intersection
- 3.5m Through Lane (inner lane)
- 3.75m Curb Lane (outer lane)
- 1.0m Buffer
- 1.5m Bike lane
- Standard 0.5m Curb and Gutter (OPSD 600.040)
- 4.0m wide Boulevard (1.0m Splashpad, 2.0m Sidewalk, & 1.0m Sod)
- 2.0m Sidewalk
- V-Type Ditch with typical 3:1 foreslope, 2:1 Backslope



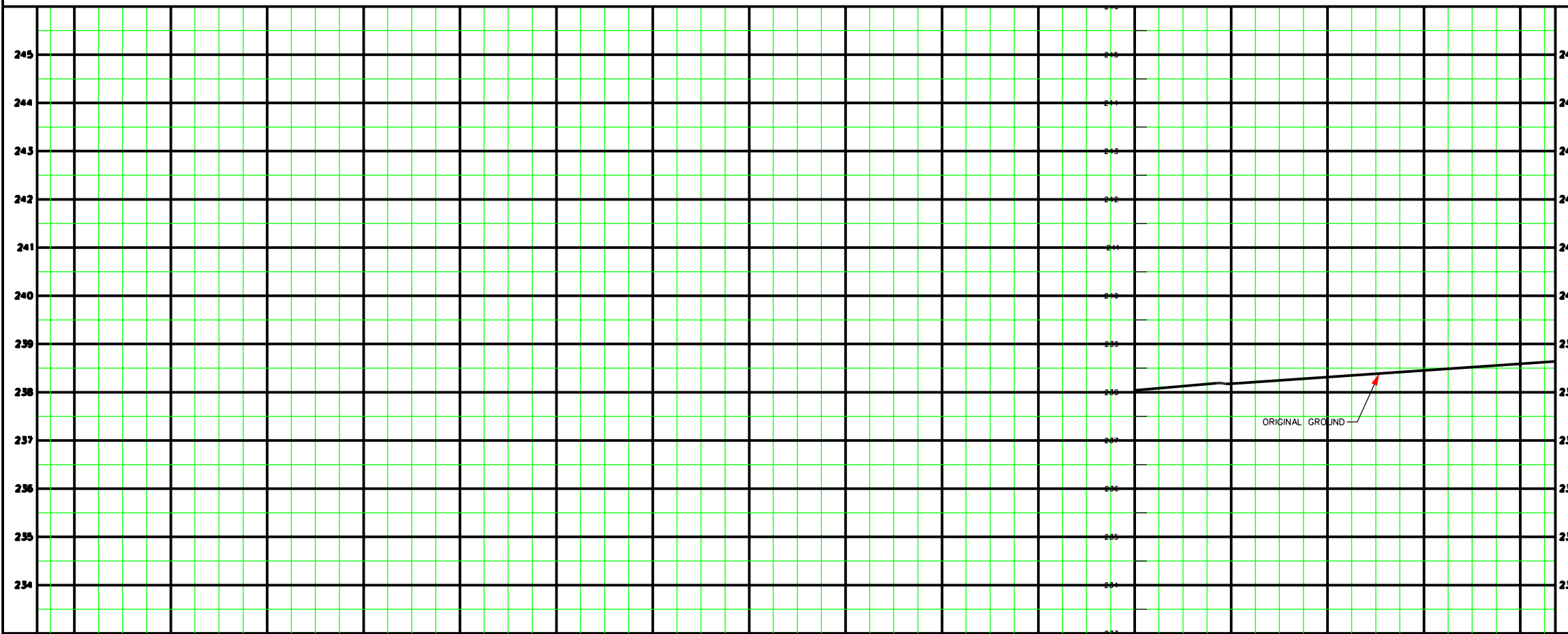


SERVICE DATA					
SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
GAS MAINS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMANS			HYDRO U/G CABLE		
TRANSIT			HYDRO ONE		
PARKS & REC.			GTU		
ONT. CLEAN WATER			COMMUNIC. CABLES		

REVISIONS		
DATE	DETAILS	INIT.

LEGEND:

- PROPOSED RIGHT OF WAY (R.O.W.)
- GRADING LIMIT
- PROPOSED PROPERTY ACQUISITION
- PROPOSED EASEMENT



General Notes

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- ⊙ Denotes Building Located
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B.M. No. Elev.

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Designed by: Approved by:

Chkd. [Signature]

NOTICE TO CONTRACTOR

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THE REGIONAL MUNICIPALITY OF PEEL	CABLE TELEVISION/FIBROPTIC PROVIDERS:
CITY OF MISSISSAUGA WORKS DEPT.	BELL CANADA
CITY OF BRAMPTON WORKS DEPT.	ENERSOURCE TELECOM
TOWN OF CALEDON WORKS DEPT.	HYDRO ONE TELECOM
BELL CANADA	ROGERS CABLE
ENBRIDGE INCORPORATED-GAS DISTRIBUTION	ALLSTREAM
ONTARIO MINISTRY OF TRANSPORTATION	PSN (PUBLIC SECTOR NETWORK)
ONTARIO CLEAN WATER AGENCY	FUTUREWAY (FIBROBROADBAND)
HYDRO ONE NETWORKS	
ENERSOURCE, HYDRO MISSISSAUGA	
HYDRO ONE BRAMPTON	



Region of Peel
Working for you

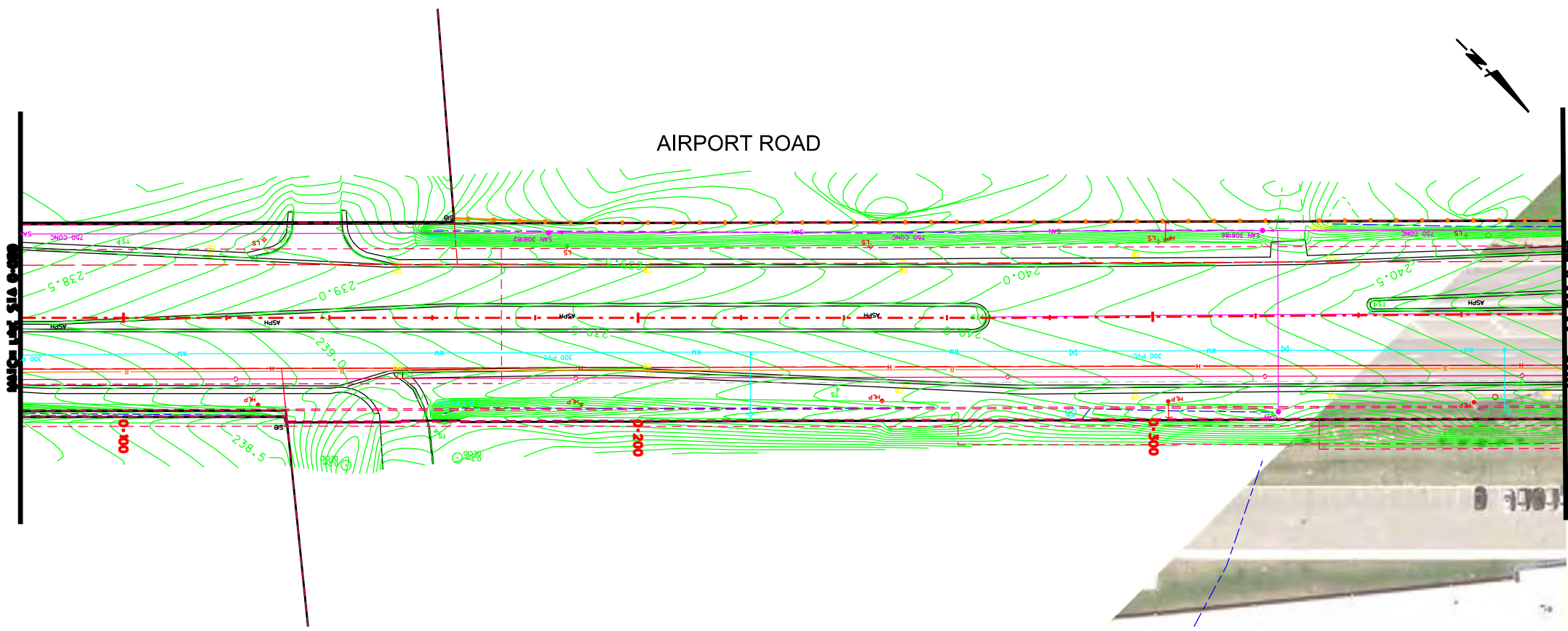
AIRPORT ROAD
(FROM PURDUE COURT TO KING STREET)

PROP. ROAD WIDENING

STA. 0+000 TO STA. 0+080

SOT. CL. OF W.M.	CAD Area	Area Z-B	Project No. 04-1310
EX. ROAD ELEV.	Checked by	Drawn by X.Y	
ROAD CHANGE	Date MAY 23, 2014	Sheet 1 of 25	Plan No.

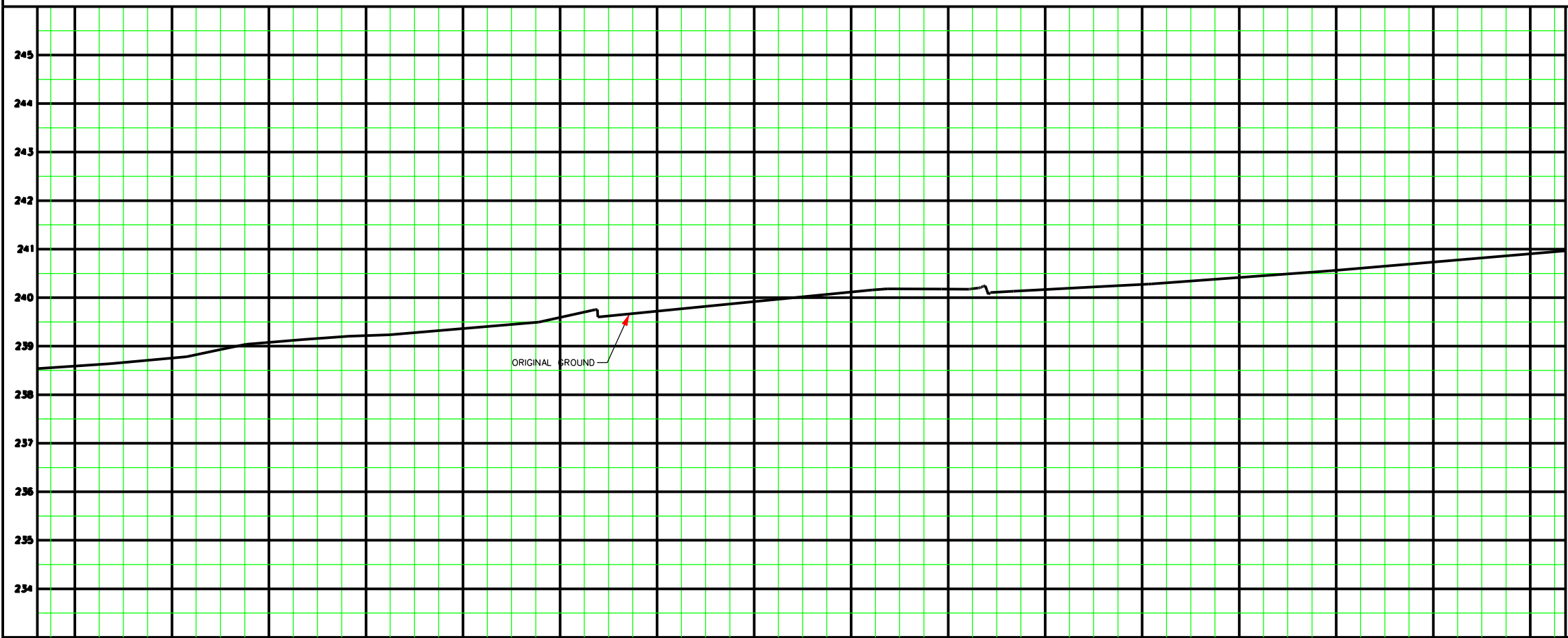
0+000 0+020 0+040 0+060



SERVICE DATA					
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WATER MAINS			BELL U/G CABLE		
TRANSIT			HYDRO U/G CABLE		
PARKS & REC.			HYDRO ONE		
ONT. CLEAN WATER			GTV		
			COMMUNIC. CABLES		

REVISIONS		
DATE	DETAILS	INIT.

KEY PLAN (N.T.S.)



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ONTARIO CLEAN WATER AGENCY	FUTUREWAY (FIBROBROADBAND)
HYDRO ONE NETWORKS	
ENERSOURCE, HYDRO MISSISSAUGA	
HYDRO ONE BRAMPTON	

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1m 0 1 2 3m VERTICAL SCALE

Region of Peel
Working for you

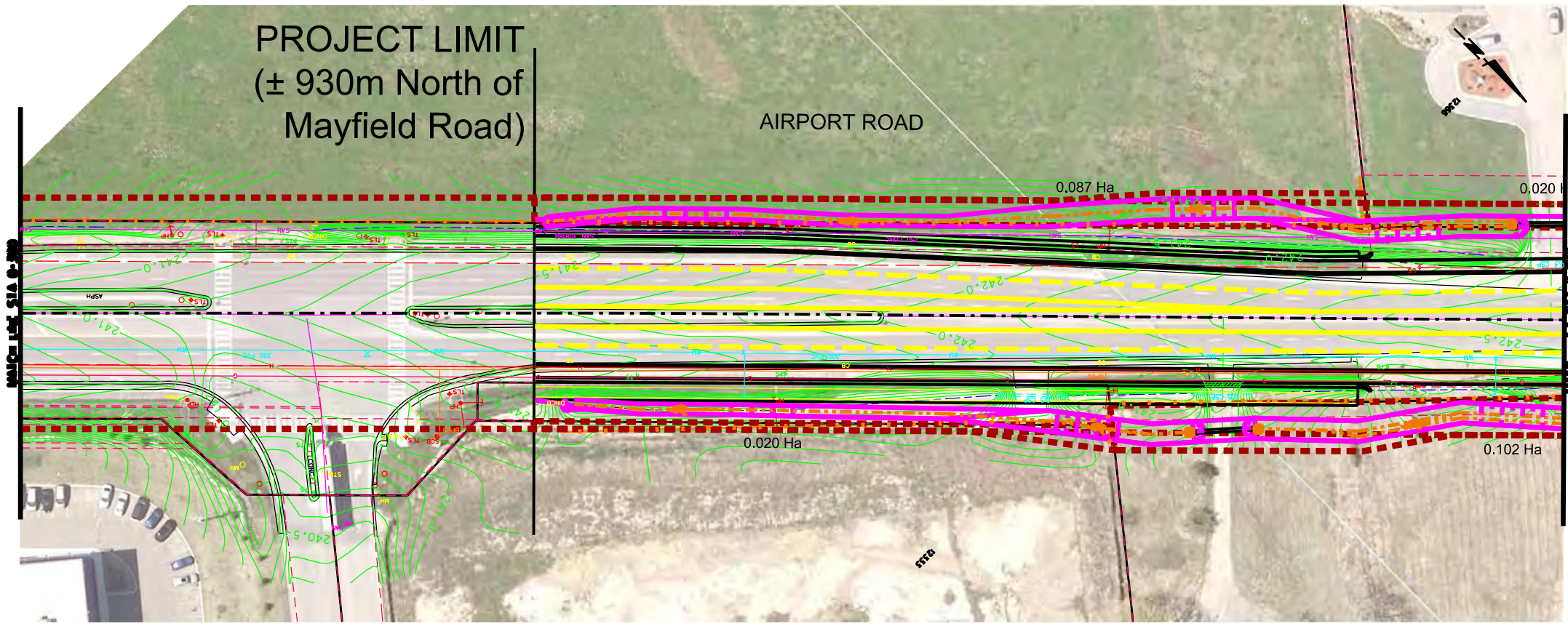
AIRPORT ROAD
(FROM PURDUE COURT TO KING STREET)

PROP. ROAD WIDENING

STA. 0+080 TO STA. 0+380

0+080	0+100	0+120	0+140	0+160	0+180	0+200	0+220	0+240	0+260	0+280	0+300	0+320	0+340	0+360
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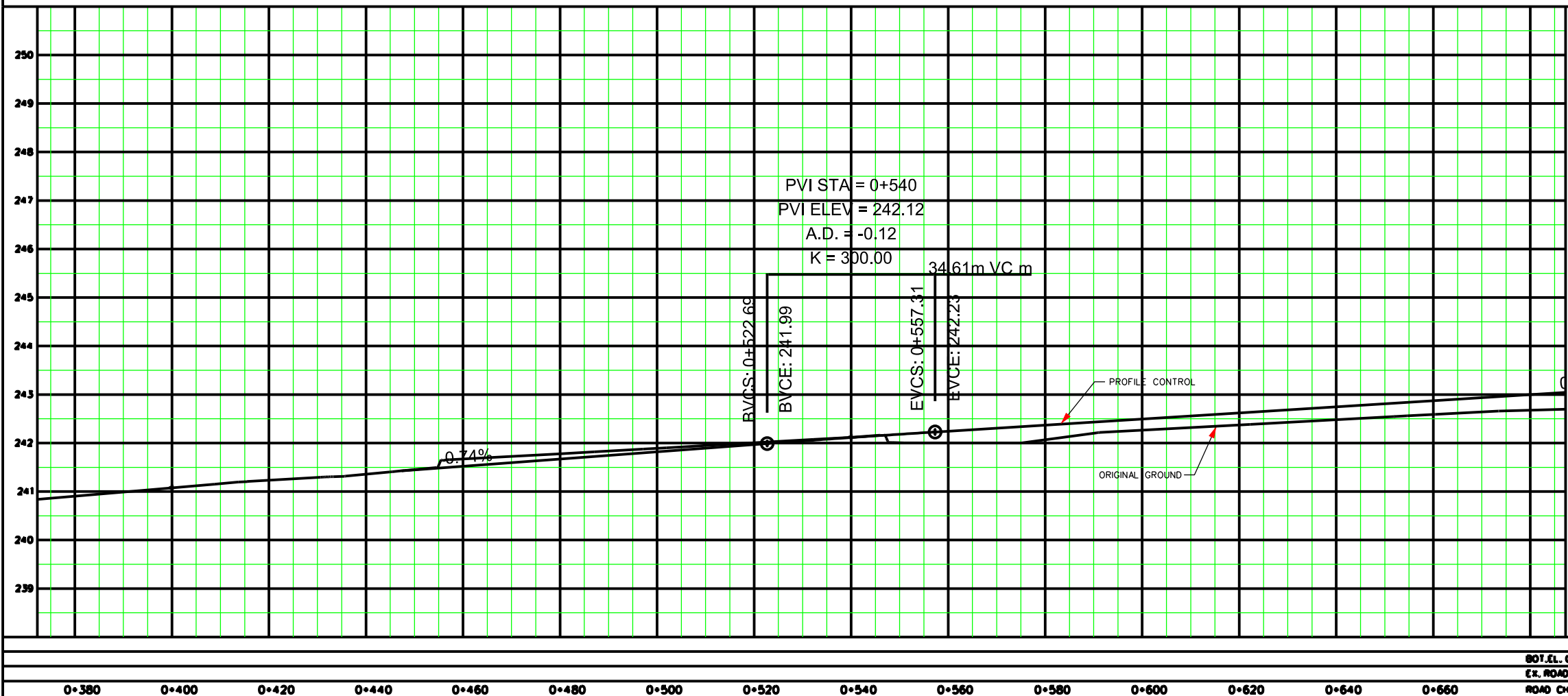
TOTAL OF W.M.	CAD Area	Area Z-B	Project No.
EX. ROAD ELEV.	Checked by	Drawn by X.Y	04-1310
ROAD CHANGE	Date MAY 23, 2014	Sheet 2 of 25	Plan No.



SERVICE DATA					
SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
GAS SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMANS			HYDRO U/G CABLE		
TRANSIT			HYDRO ONE		
PARKS & REC.			GTW		
ONT. CLEAN WATER			COMMUNIC. CABLES		

REVISIONS		
DATE	DETAILS	INIT.

KEY PLAN (N.T.S.)



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BELL CANADA	ROGERS CABLE
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ONTARIO CLEAN WATER AGENCY	FUTUREWAY (FIBROBROADBAND)
HYDRO ONE NETWORKS	
ENERSOURCE, HYDRO MISSISSAUGA	
HYDRO ONE BRAMPTON	

10m 0 10 20 30m HORIZONTAL SCALE
1m 0 1 2 3m VERTICAL SCALE

Region of Peel
Working for you

AIRPORT ROAD
(FROM PURDUE COURT TO KING STREET)

PROP. ROAD WIDENING

STA. 0+380 TO STA. 0+680

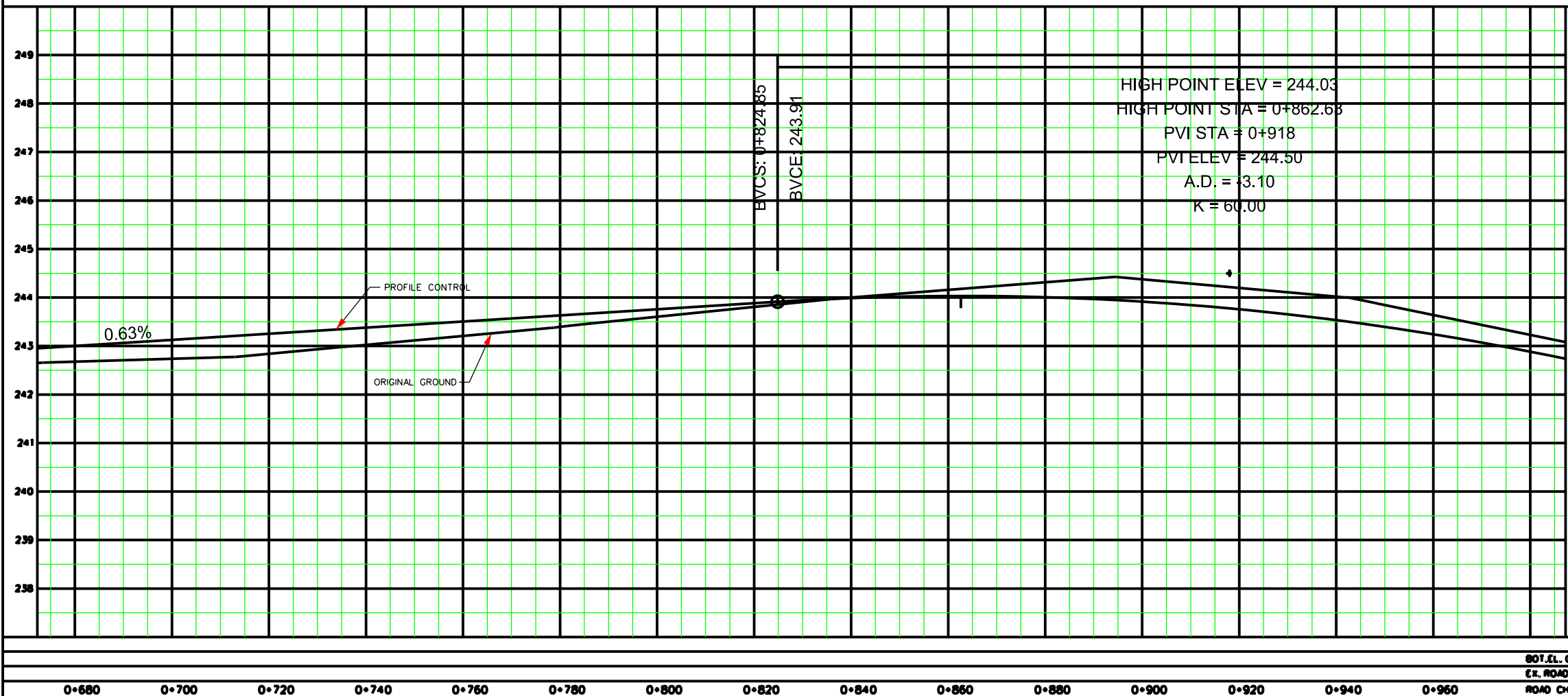
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EX. ROAD ELEV.	Checked by	Drawn by X.Y	04-1310
ROAD CHANGE	Date MAY 23, 2014	Sheet 3 of 25	Plan No.



SERVICE DATA					
SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
RAW SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMANS			HYDRO U/G CABLE		
TRANSIT			HYDRO ONE		
PARKS & REC.			GTV		
ONT. CLEAN WATER			COMMUNIC. CABLES		

REVISIONS		
DATE	DETAILS	INIT.

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ENERSOURCE, HYDRO MISSISSAUGA	
HYDRO ONE BRAMPTON	

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1m 0 1 2 3m VERTICAL SCALE

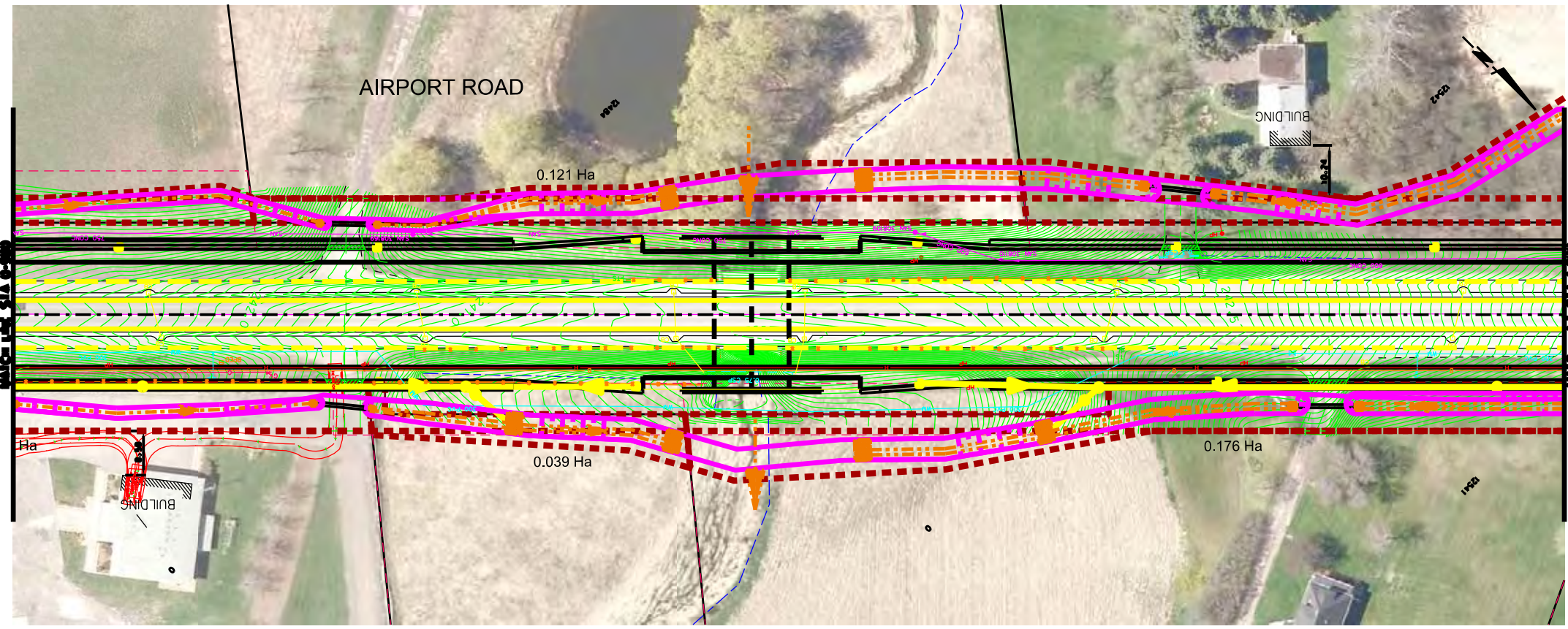
Region of Peel
Working for you

AIRPORT ROAD
(FROM PURDUE COURT TO KING STREET)

PROP. ROAD WIDENING

STA. 0+680 TO STA. 0+980

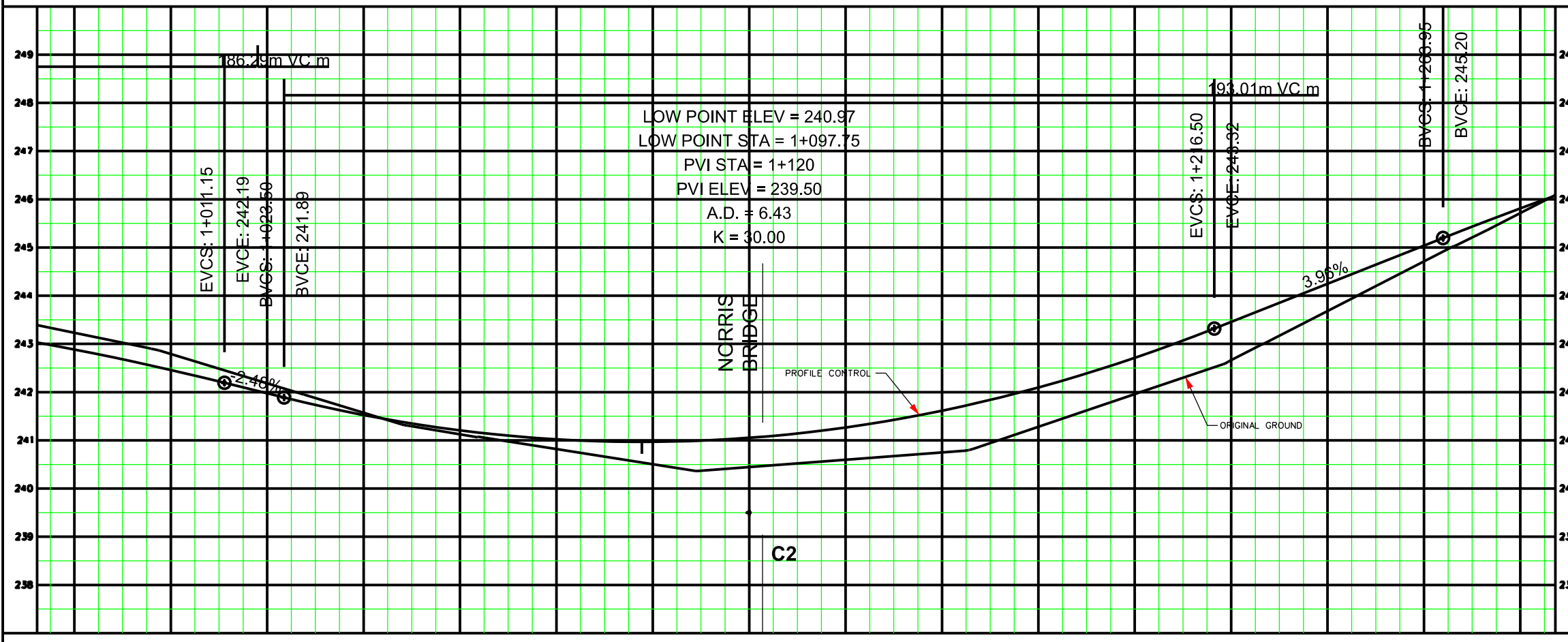
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ROAD CHANGE	Date MAY 23, 2014	Sheet 4 of 25	Plan No.



SERVICE DATA					
SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
RAIN SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMANS			HYDRO U/G CABLE		
TRANSIT			HYDRO ONE		
PARKS & REC.			GTW		
ONT. CLEAN WATER			COMMUNIC. CABLES		

REVISIONS		
DATE	DETAILS	INIT.

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Region of Peel
 Working for you

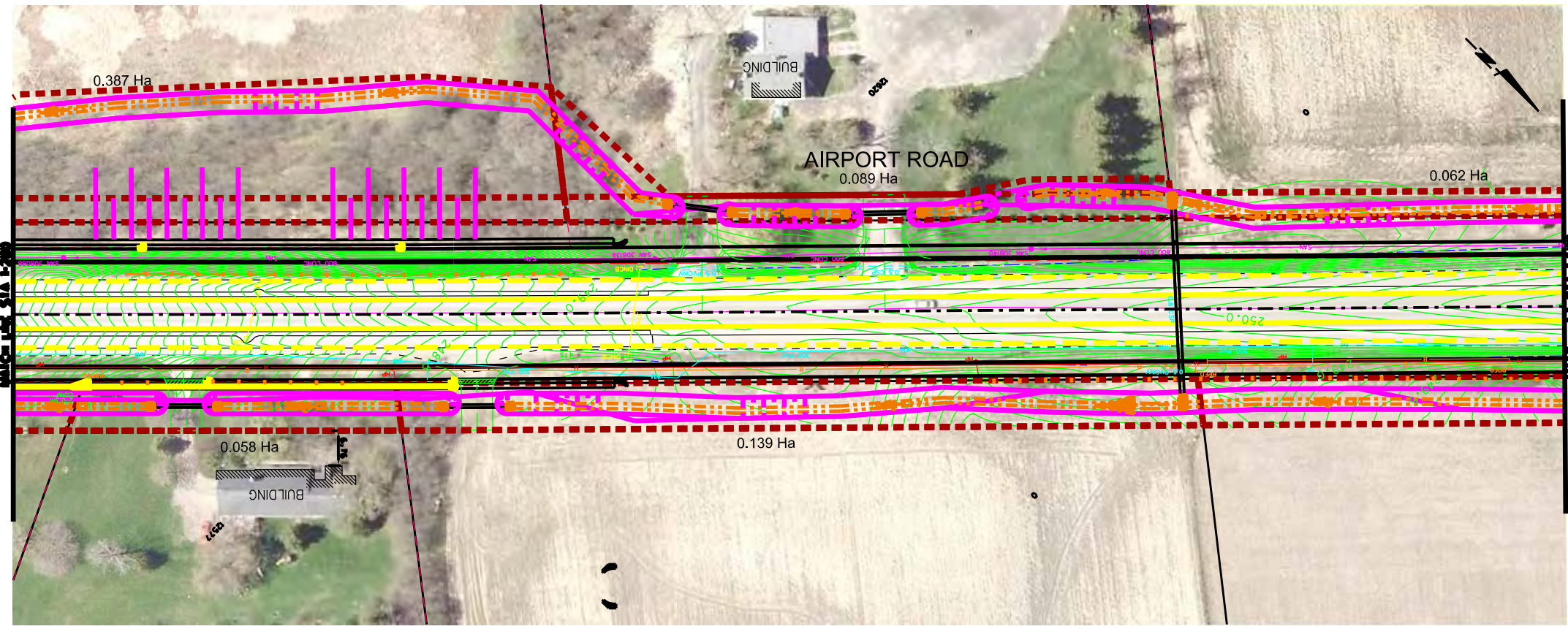
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 (FROM PURDUE COURT TO KING STREET)

PROP. ROAD WIDENING

STA. 0+980 TO STA. 1+280

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BOT. EL. OF W.M.															
EX. ROAD ELEV.															
ROAD CHANGE															

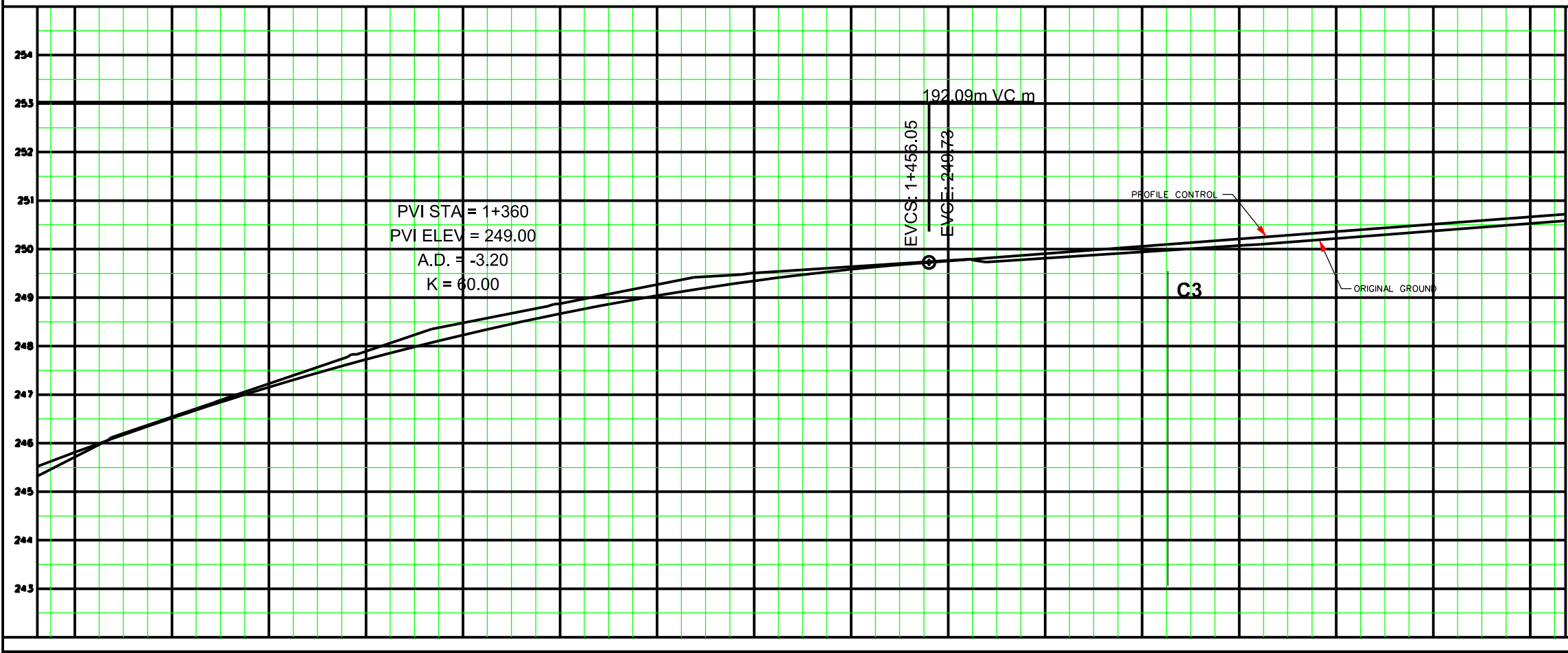
CAD Area	Area Z-B	Project No.	04-1310
Checked by	Drawn by X.Y	Sheet	5 of 25
Date	MAY 23, 2014	Plan No.	



SERVICE DATA					
SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
GAS SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMANS			HYDRO U/G CABLE		
TRANSIT			HYDRO ONE		
PARKS & REC.			GTV		
ONT. CLEAN WATER			COMMUNIC. CABLES		

REVISIONS		
DATE	DETAILS	INIT.

KEY PLAN (N.T.S.)



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BELL CANADA	ROGERS CABLE
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ONTARIO CLEAN WATER AGENCY	FUTUREWAY (FO BROADBAND)
HYDRO ONE NETWORKS	
ENERSOURCE, HYDRO MISSISSAUGA	
HYDRO ONE BRAMPTON	

10m 0 10 20 30m HORIZONTAL SCALE
1m 0 1 2 3m VERTICAL SCALE

Region of Peel
Working for you

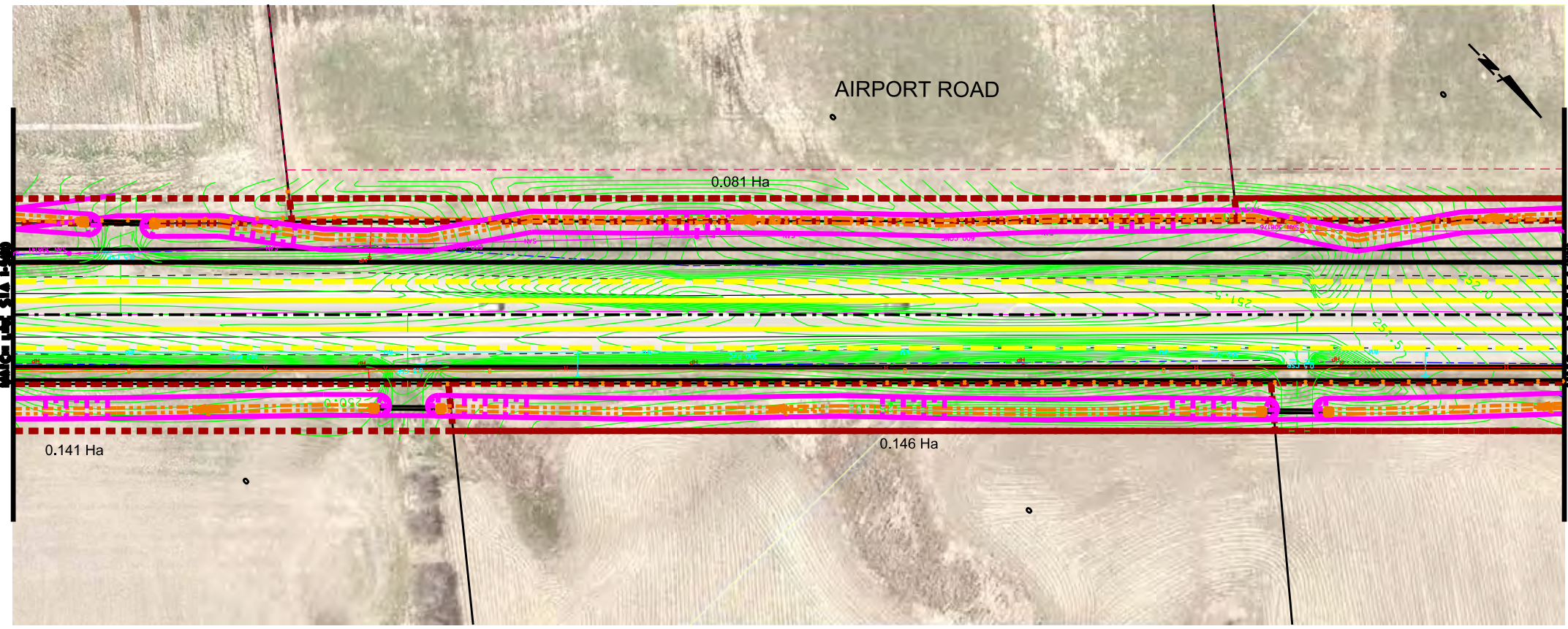
AIRPORT ROAD
(FROM PURDUE COURT TO KING STREET)

PROP. ROAD WIDENING

STA. 1+280 TO STA. 1+580

STATION	1+280	1+300	1+320	1+340	1+360	1+380	1+400	1+420	1+440	1+460	1+480	1+500	1+520	1+540	1+560
BOT. EL. OF W.M.															
EX. ROAD ELEV.															
ROAD CHANGE															

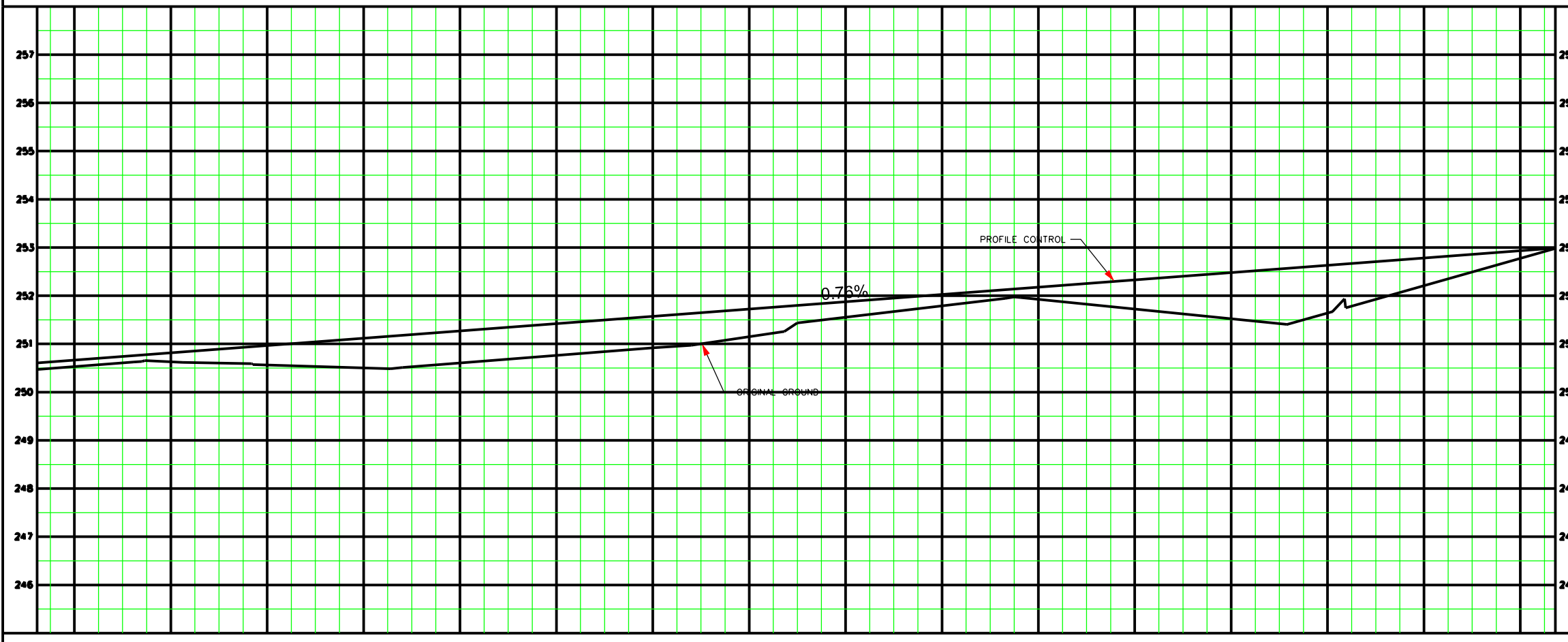
Checked by	Drawn by	Project No.	04-1310
Date	Sheet	Plan No.	
MAY 23, 2014	6 of 25		



SERVICE DATA					
SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
GAS MAINS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMANS			HYDRO U/G CABLE		
TRANSIT			HYDRO ONE		
PARKS & REC.			GTV		
ONT. CLEAN WATER			COMMUNIC. CABLES		

REVISIONS		
DATE	DETAILS	INIT.

KEY PLAN (N.T.S.)



General Notes

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- ⊙ Denotes Building Located
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B.M. No. Elev.

The Contractor is Responsible For Locating And Protecting All Existing Utilities Prior To And During Construction Location of Existing Utilities Approximate Only, To Be Verified In Field By Contractor.

Designed by: Chid Approved by: _____

NOTICE TO CONTRACTOR

48 HOURS PRIOR TO COMMENCING WORK NOTIFY THE FOLLOWING

THE REGIONAL MUNICIPALITY OF PEEL	CABLE TELEVISION/FIBROPTIC PROVIDERS:
CITY OF MISSISSAUGA WORKS DEPT.	BELL CANADA
CITY OF BRAMPTON WORKS DEPT.	ENERSOURCE TELECOM
TOWN OF CALEDON WORKS DEPT.	HYDRO ONE TELECOM
BELL CANADA	ROGERS CABLE
ENBRIDGE INCORPORATED-GAS DISTRIBUTION	ALLSTREAM
ONTARIO MINISTRY OF TRANSPORTATION	PSN (PUBLIC SECTOR NETWORK)
ONTARIO CLEAN WATER AGENCY	FUTUREWAY (FIBROBROADBAND)
HYDRO ONE NETWORKS	
ENERSOURCE, HYDRO MISSISSAUGA	
HYDRO ONE BRAMPTON	

10m 0 10 20 30m HORIZONTAL SCALE
1m 0 1 2 3m VERTICAL SCALE

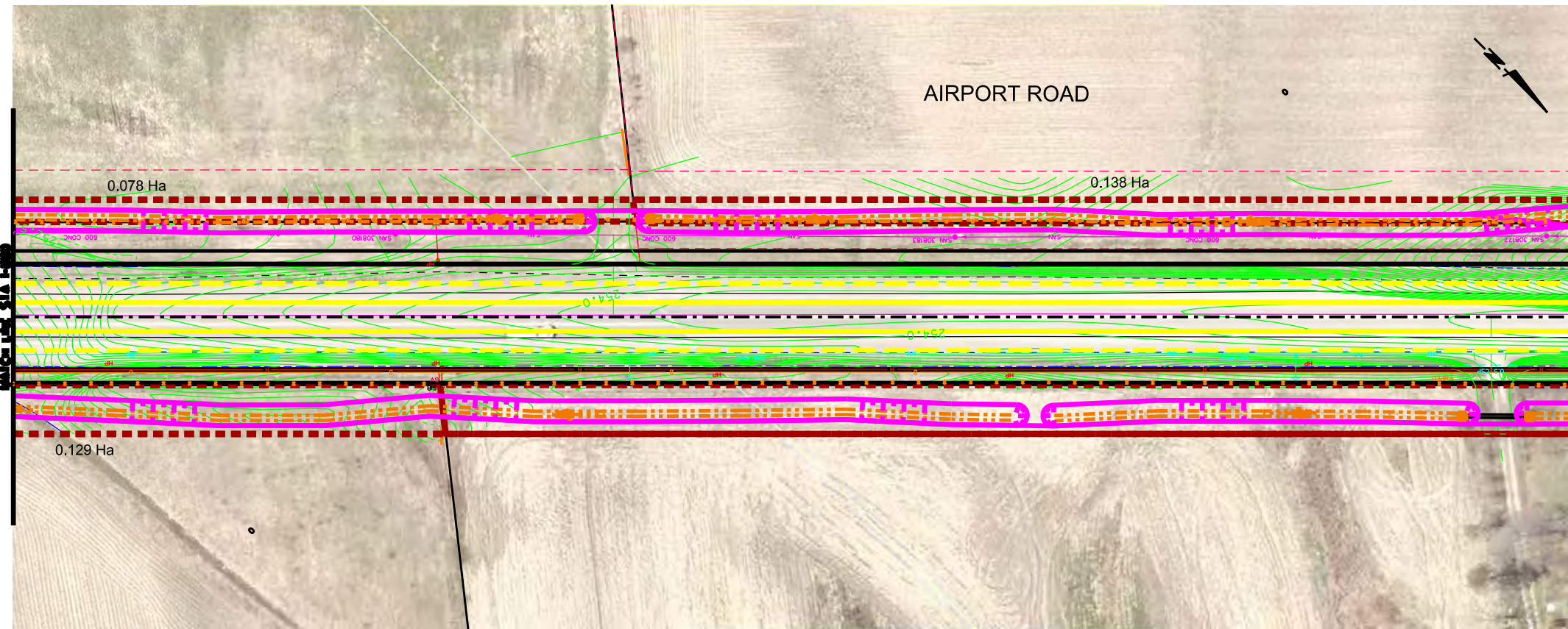
Region of Peel
Working for you

AIRPORT ROAD
(FROM PURDUE COURT TO KING STREET)

PROP. ROAD WIDENING

STA. 1-580 TO STA. 1-880

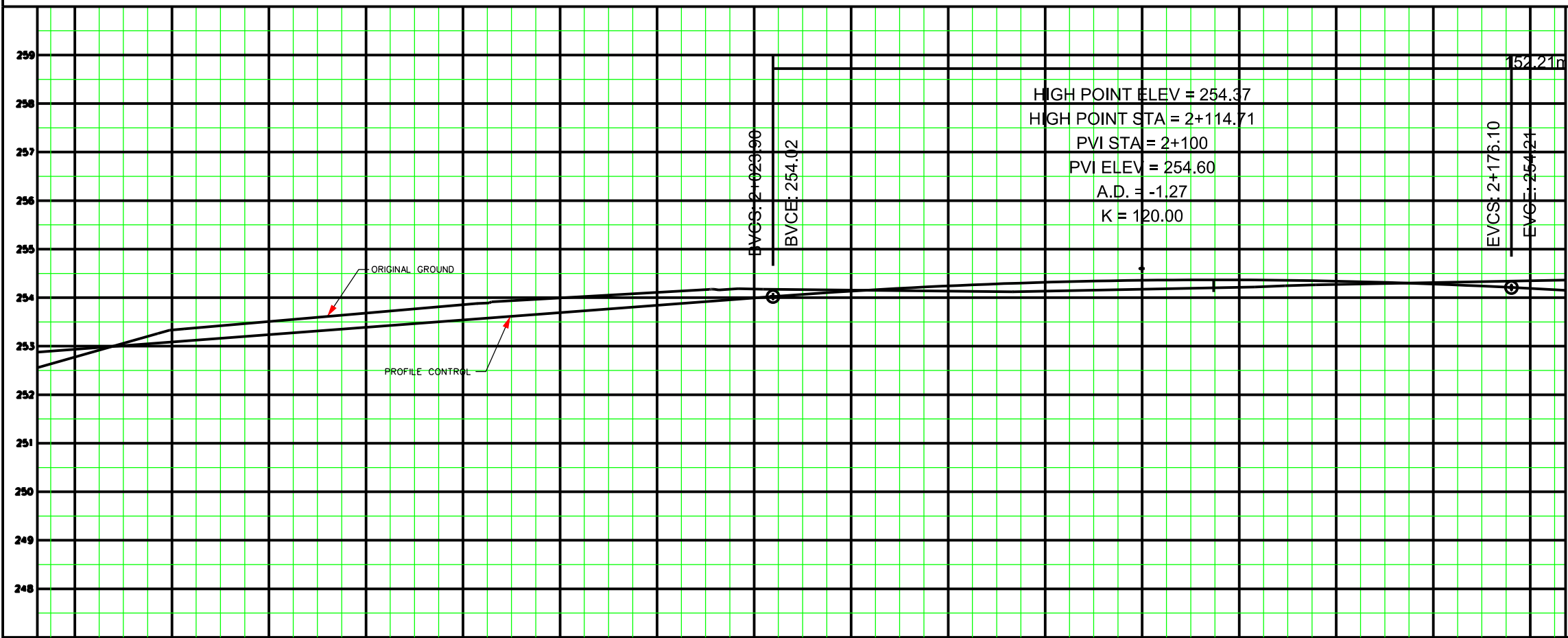
CAD Area		Area Z-B		Project No. 04-1310	
EX. ROAD ELEV.		Checked by X.Y		Drawn by X.Y	
ROAD CHANGE		Date MAY 23, 2014		Sheet 7 of 25	
1-580		1-600		1-620	
1-640		1-660		1-680	
1-700		1-720		1-740	
1-760		1-780		1-800	
1-820		1-840		1-860	



SERVICE DATA					
SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SEWER			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMANS			HYDRO U/G CABLE		
TRANSIT			HYDRO ONE		
PARKS & REC.			GTV		
ONT. CLEAN WATER			COMMUNIC. CABLES		

REVISIONS		
DATE	DETAILS	INIT.

KEY PLAN (N.T.S.)



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NOTICE TO CONTRACTOR

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CITY OF BRAMPTON WORKS DEPT.	ENERSOURCE TELECOM
TOWN OF CALEDON WORKS DEPT.	HYDRO ONE TELECOM
BELL CANADA	ROGERS CABLE
ENBRIDGE INCORPORATED-GAS DISTRIBUTION	ALLSTREAM
ONTARIO MINISTRY OF TRANSPORTATION	PSN (PUBLIC SECTOR NETWORK)
ONTARIO CLEAN WATER AGENCY	FUTUREWAY (FIBROBROADBAND)
HYDRO ONE NETWORKS	
ENERSOURCE, HYDRO MISSISSAUGA	
HYDRO ONE BRAMPTON	

10m 0 10 20 30m HORIZONTAL SCALE
1m 0 1 2 3m VERTICAL SCALE

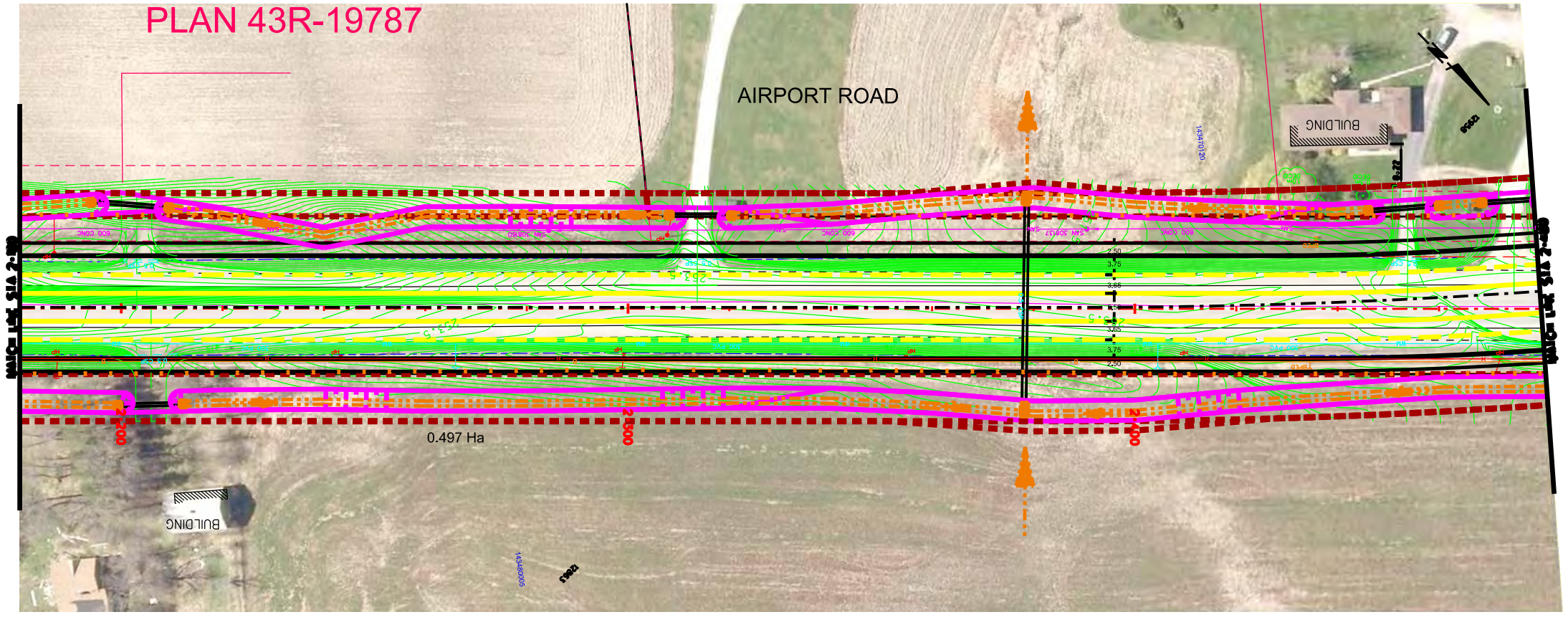
Region of Peel
Working for you

AIRPORT ROAD
(FROM PURDUE COURT TO KING STREET)

PROP. ROAD WIDENING

STA. 1+880 TO STA. 2+180

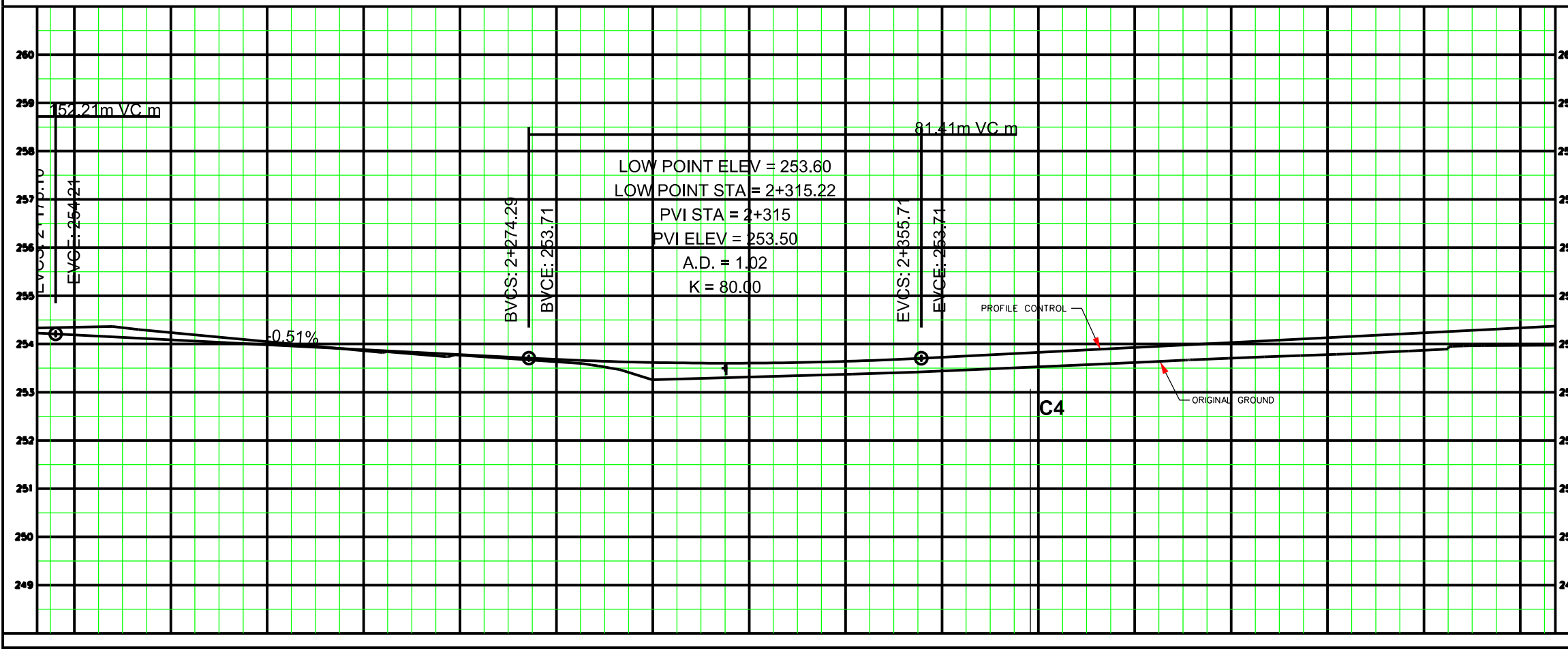
BOT. EL. OF W.M.										CAD Area		Area Z-B		Project No.		
EX. ROAD ELEV.										Checked by		Drawn by X.Y		04-1310		
ROAD CHANGE										Date MAY 23, 2014		Sheet 8 of 25		Plan No.		
1+880	1+900	1+920	1+940	1+960	1+980	2+000	2+020	2+040	2+060	2+080	2+100	2+120	2+140	2+160		



SERVICE DATA					
SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
GAS SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMANS			HYDRO U/G CABLE		
TRANSIT			HYDRO ONE		
PARKS & REC.			GTV		
ONT. CLEAN WATER			COMMUNIC. CABLES		

REVISIONS		
DATE	DETAILS	INIT.

KEY PLAN (N.T.S.)



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B.M. No. Elev.

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Designed by: Chid. Approved by:

NOTICE TO CONTRACTOR

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THE REGIONAL MUNICIPALITY OF PEEL	CABLE TELEVISION/FIBROPTIC PROVIDERS:
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CITY OF BRAMPTON WORKS DEPT.	ENERSOURCE TELECOM
TOWN OF CALEDON WORKS DEPT.	HYDRO ONE TELECOM
BELL CANADA	ROGERS CABLE
ENBRIDGE INCORPORATED-GAS DISTRIBUTION	ALLSTREAM
ONTARIO MINISTRY OF TRANSPORTATION	PSN (PUBLIC SECTOR NETWORK)
ONTARIO CLEAN WATER AGENCY	FUTUREWAY (FO BROADBAND)
HYDRO ONE NETWORKS	
ENERSOURCE, HYDRO MISSISSAUGA	
HYDRO ONE BRAMPTON	

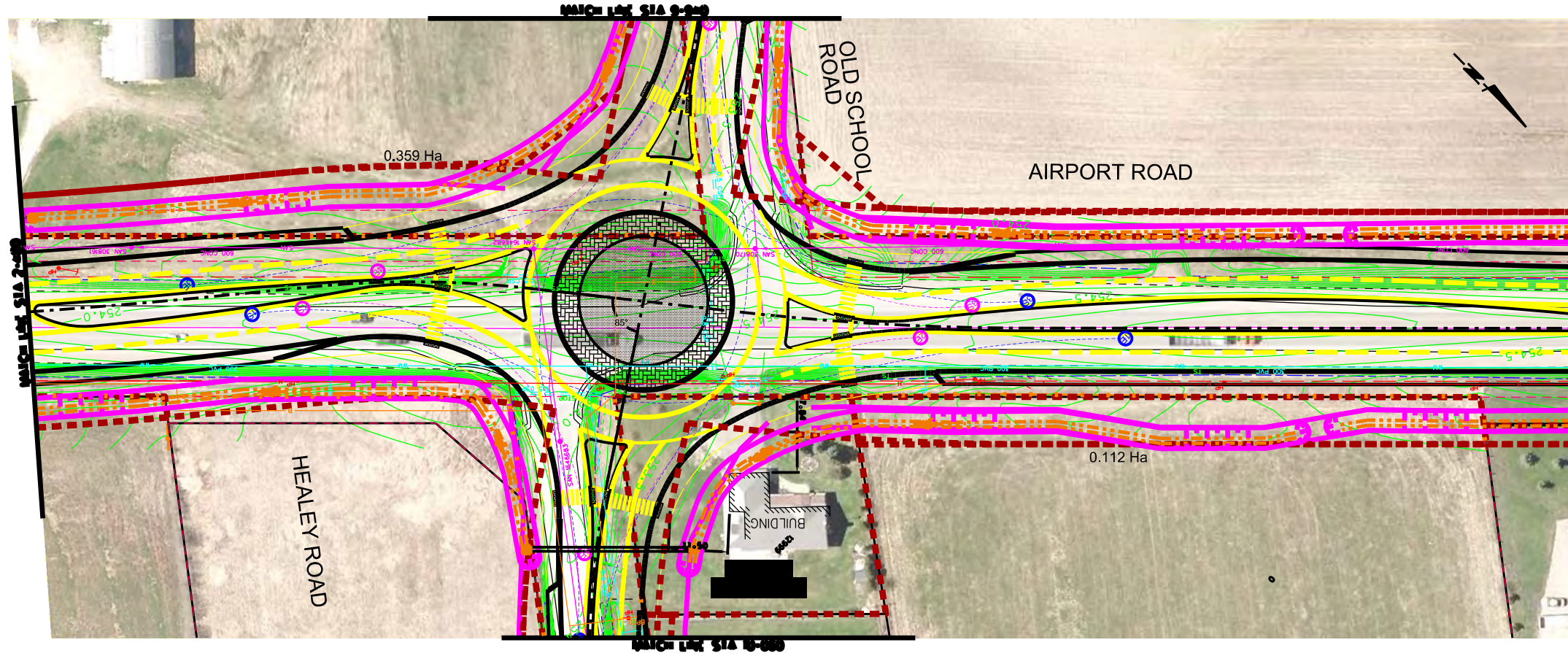
10m 0 10 20 30m HORIZONTAL SCALE
 1m 0 1 2 3m VERTICAL SCALE

Region of Peel
 Working for you

AIRPORT ROAD
 (FROM PURDUE COURT TO KING STREET)
 PROP. ROAD WIDENING

STA. 2+180 TO STA. 2+480

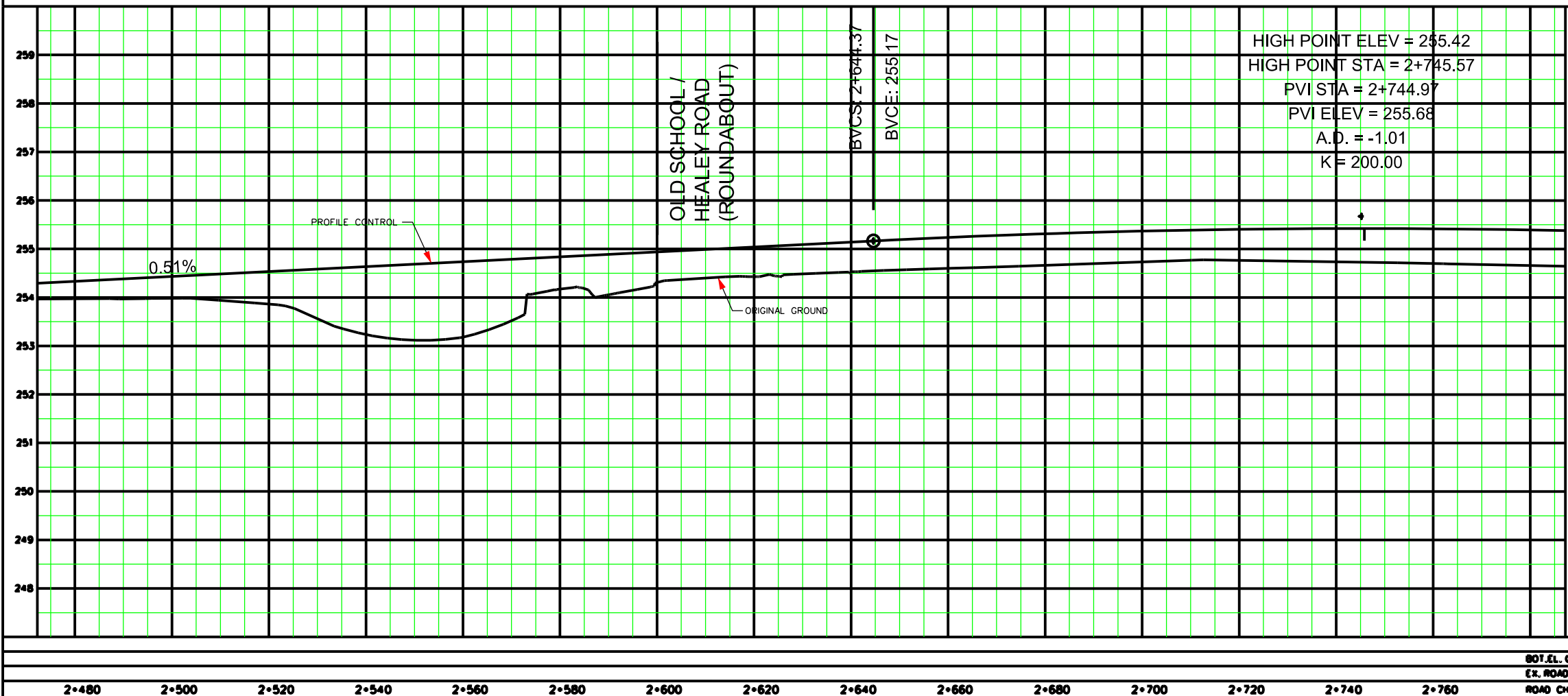
BOT. L. OF W.M.		Area Z-B		Project No. 04-1310	
EX. ROAD ELEV.	Checked by	Area	Drawn by X.Y	Date	Sheet 9 of 25
2+180				MAY 23, 2014	Plan No.
2+200					
2+220					
2+240					
2+260					
2+280					
2+300					
2+320					
2+340					
2+360					
2+380					
2+400					
2+420					
2+440					
2+460					



SERVICE DATA					
SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
GAS MAINS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMANS			HYDRO U/G CABLE		
TRANSIT			HYDRO ONE		
PARKS & REC.			CTV		
ONT. CLEAN WATER			COMMUNIC. CABLES		

REVISIONS		
DATE	DETAILS	INIT.

KEY PLAN (N.T.S.)



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Designed by: Approved by:

NOTICE TO CONTRACTOR

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BELL CANADA	ROGERS CABLE
ENBRIDGE INCORPORATED-GAS DISTRIBUTION	ALLSTREAM
ONTARIO MINISTRY OF TRANSPORTATION	PSN (PUBLIC SECTOR NETWORK)
ONTARIO CLEAN WATER AGENCY	FUTUREWAY (FCI BROADBAND)
HYDRO ONE NETWORKS	
ENERSOURCE, HYDRO MISSISSAUGA	
HYDRO ONE BRAMPTON	

10m 0 10 20 30m HORIZONTAL SCALE

1m 0 1 2 3m VERTICAL SCALE

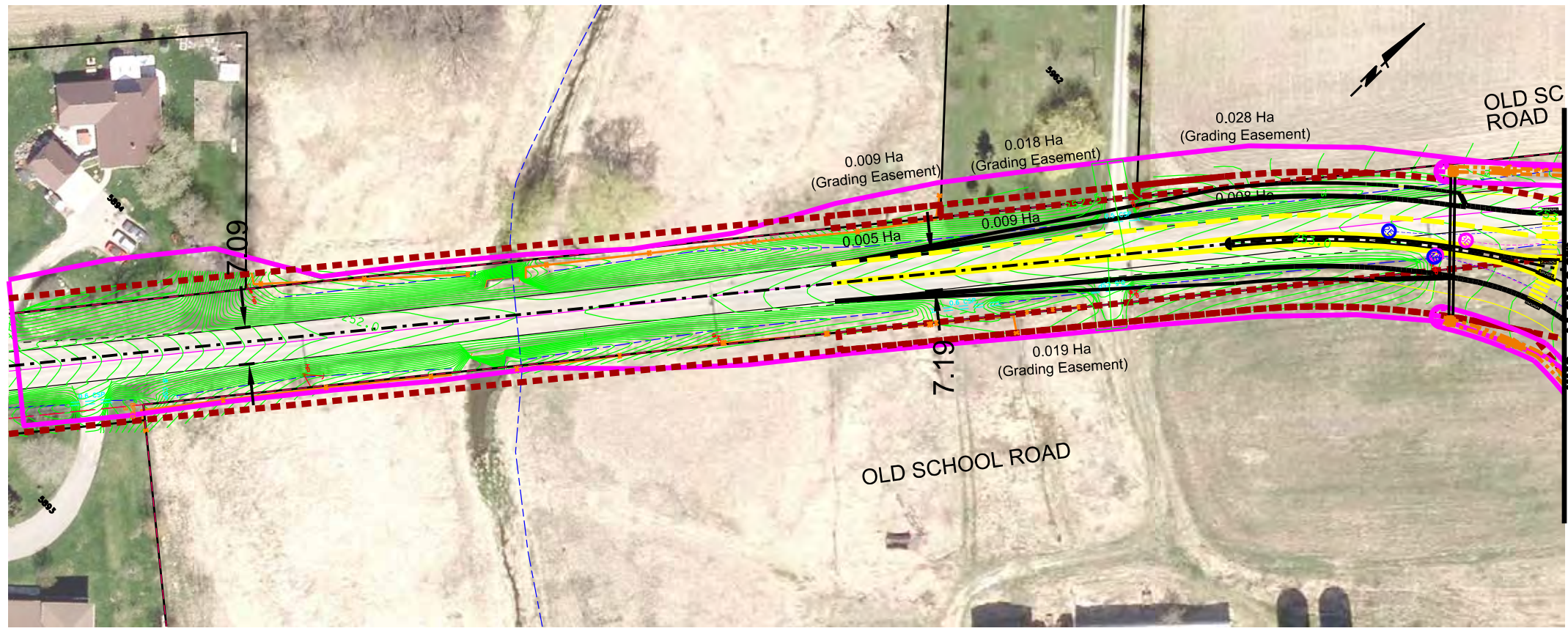
Region of Peel
Working for you

AIRPORT ROAD
(FROM PURDUE COURT TO KING STREET)

PROP. ROAD WIDENING

STA. 2+480 TO STA. 2+780

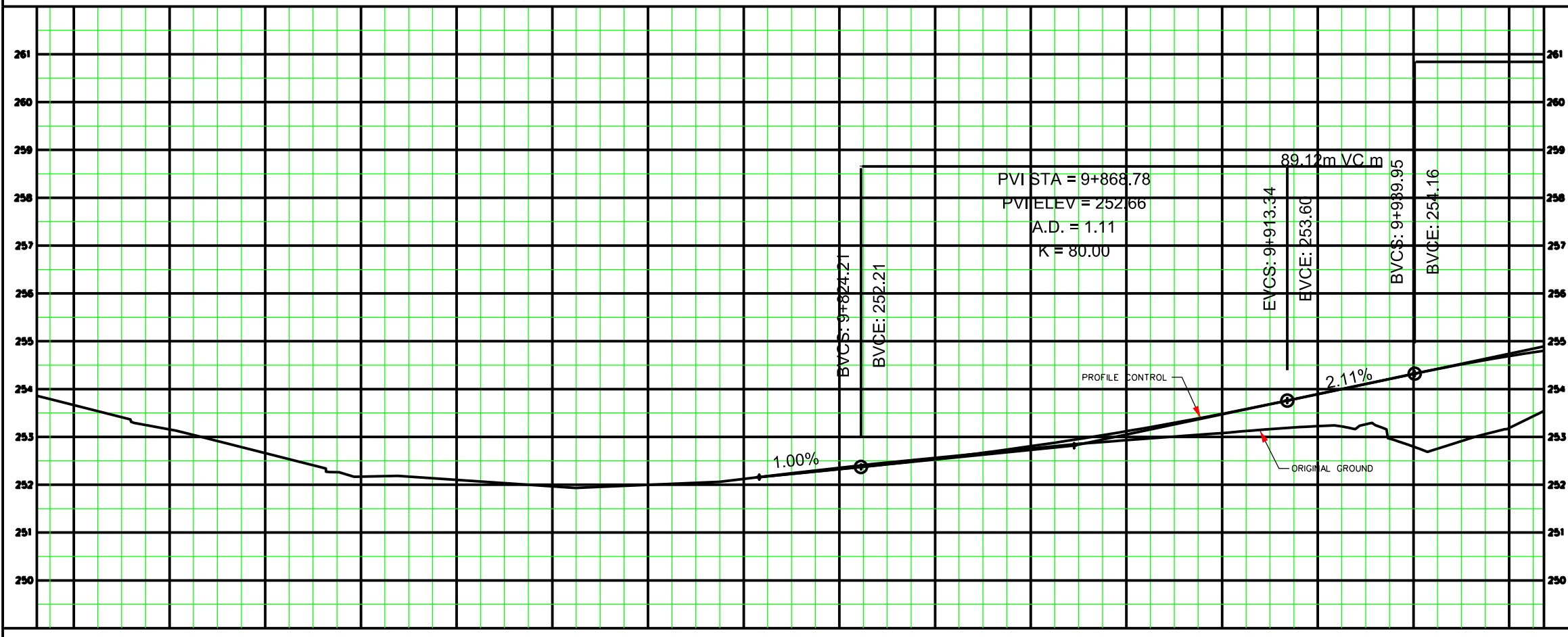
SOT. E.L. OF W.W.	CAD Area	Area Z-B	Project No.	04-1310
EX. ROAD ELEV.	Checked by	Drawn by X.Y		
ROAD CHANGE	Date MAY 23, 2014	Sheet 10 of 25	Plan No.	



SERVICE DATA					
SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
GAS MAINS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMANS			HYDRO U/G CABLE		
TRANSIT			HYDRO ONE		
PARKS & REC.			GTW		
ONT. CLEAN WATER			COMMUNIC. CABLES		

REVISIONS		
DATE	DETAILS	INIT.

KEY PLAN (N.T.S.)



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BELL CANADA	ROGERS CABLE
ENBRIDGE INCORPORATED-GAS DISTRIBUTION	ALLSTREAM
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HYDRO ONE NETWORKS	
ENERSOURCE, HYDRO MISSISSAUGA	
HYDRO ONE BRAMPTON	

10m 0 10 20 30m HORIZONTAL SCALE
1m 0 1 2 3m VERTICAL SCALE

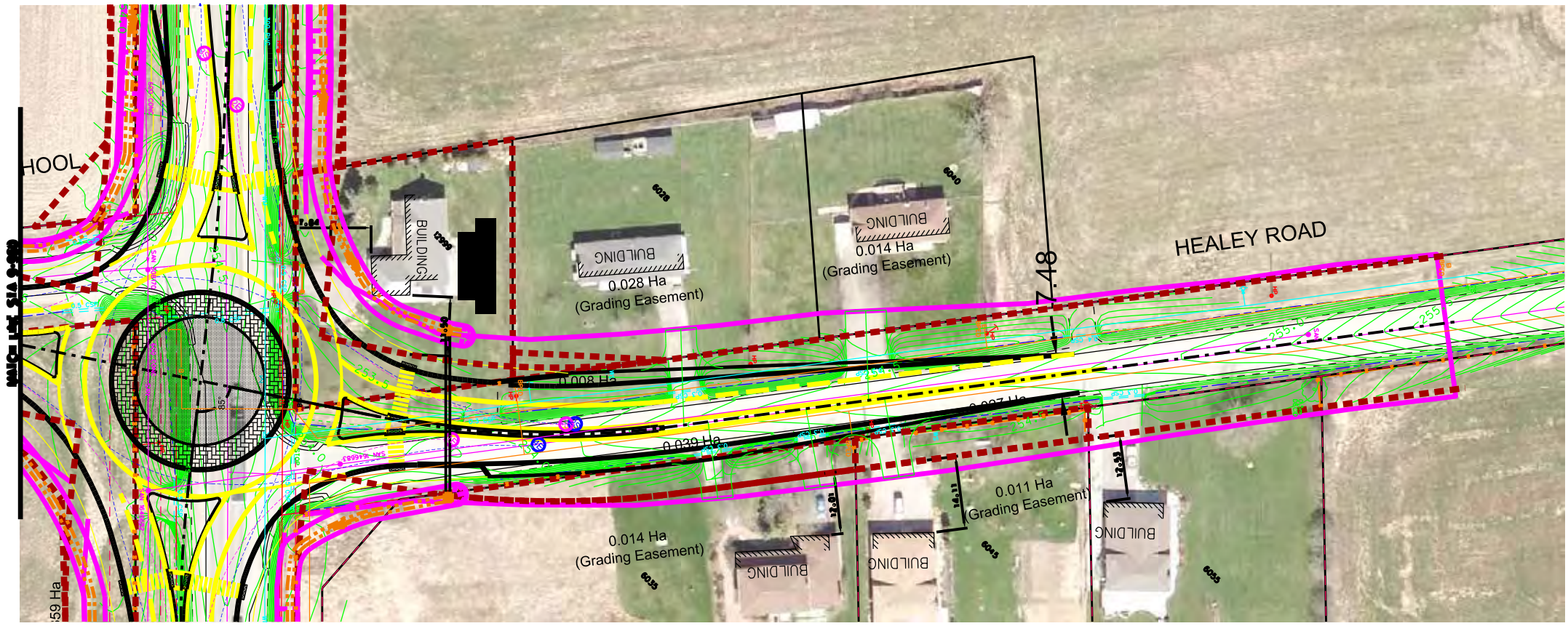
Region of Peel
Working for you

AIRPORT ROAD
(FROM PURDUE COURT TO KING STREET)

PROP. ROAD WIDENING

STA. 0+0 TO STA. 0+0

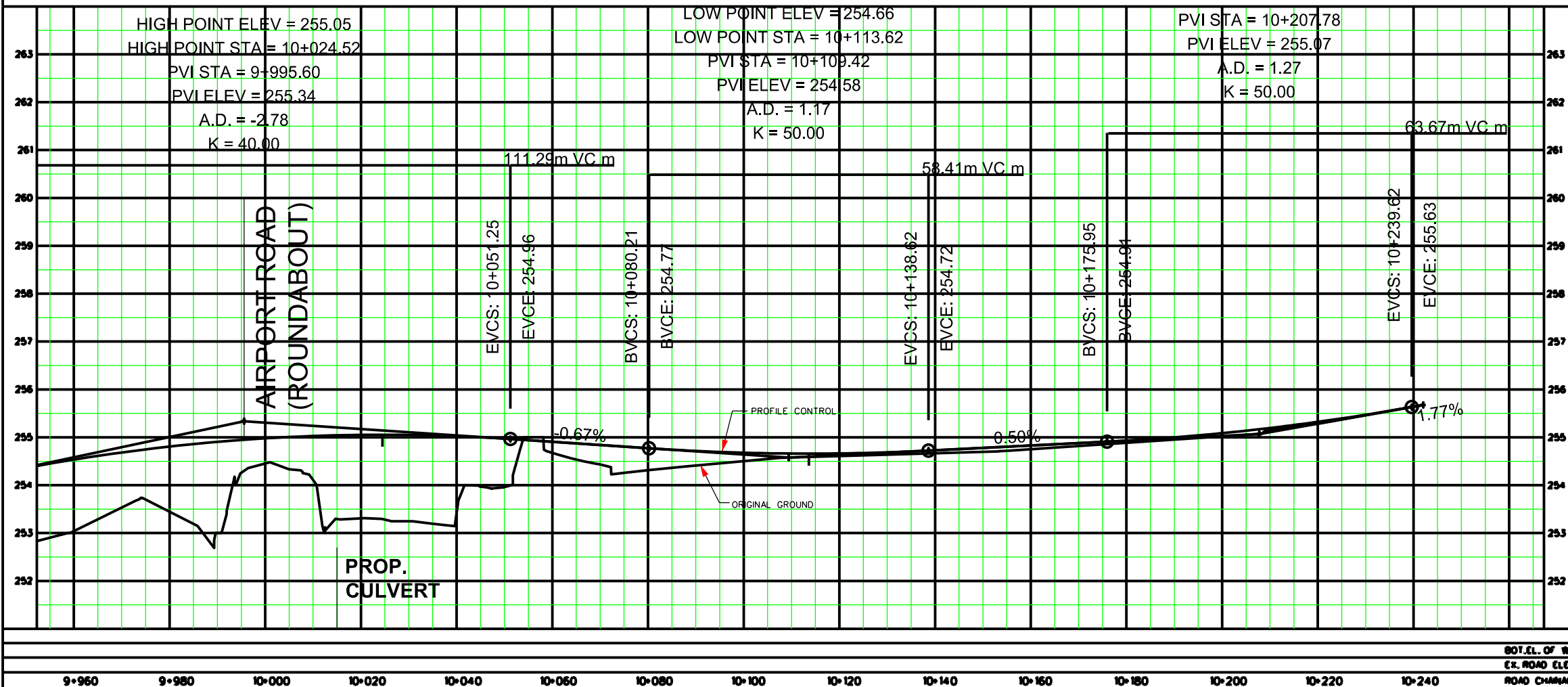
9+700	9+720	9+740	9+760	9+780	9+800	9+820	9+840	9+860	9+880	9+900	9+920	9+940
TOT. EL. OF W.M.		CAD Area		Area		Z-B		Project No.		04-1310		
EX. ROAD ELEV.		Checked by		Drawn by		X.Y		Date		MAY 23, 2014		
ROAD CHANGE		Date		Sheet		11 of 25		Plan No.		-D		



SERVICE DATA					
SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN. SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMANS			HYDRO U/G CABLE		
TRANSIT			HYDRO ONE		
PARKS & REC.			CTV		
ONT. CLEAN WATER			COMMUNIC. CABLES		

REVISIONS		
DATE	DETAILS	INIT.

KEY PLAN (N.T.S.)



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Designed by: Chid. Approved by:

NOTICE TO CONTRACTOR

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BELL CANADA	ROGERS CABLE
ENBRIDGE INCORPORATED-GAS DISTRIBUTION	ALLSTREAM
ONTARIO MINISTRY OF TRANSPORTATION	PSN (PUBLIC SECTOR NETWORK)
ONTARIO CLEAN WATER AGENCY	FUTUREWAY (FIBROBROADBAND)
HYDRO ONE NETWORKS	
ENERSOURCE, HYDRO MISSISSAUGA	
HYDRO ONE BRAMPTON	

10m 0 10 20 30m HORIZONTAL SCALE
 1m 0 1 2 3m VERTICAL SCALE

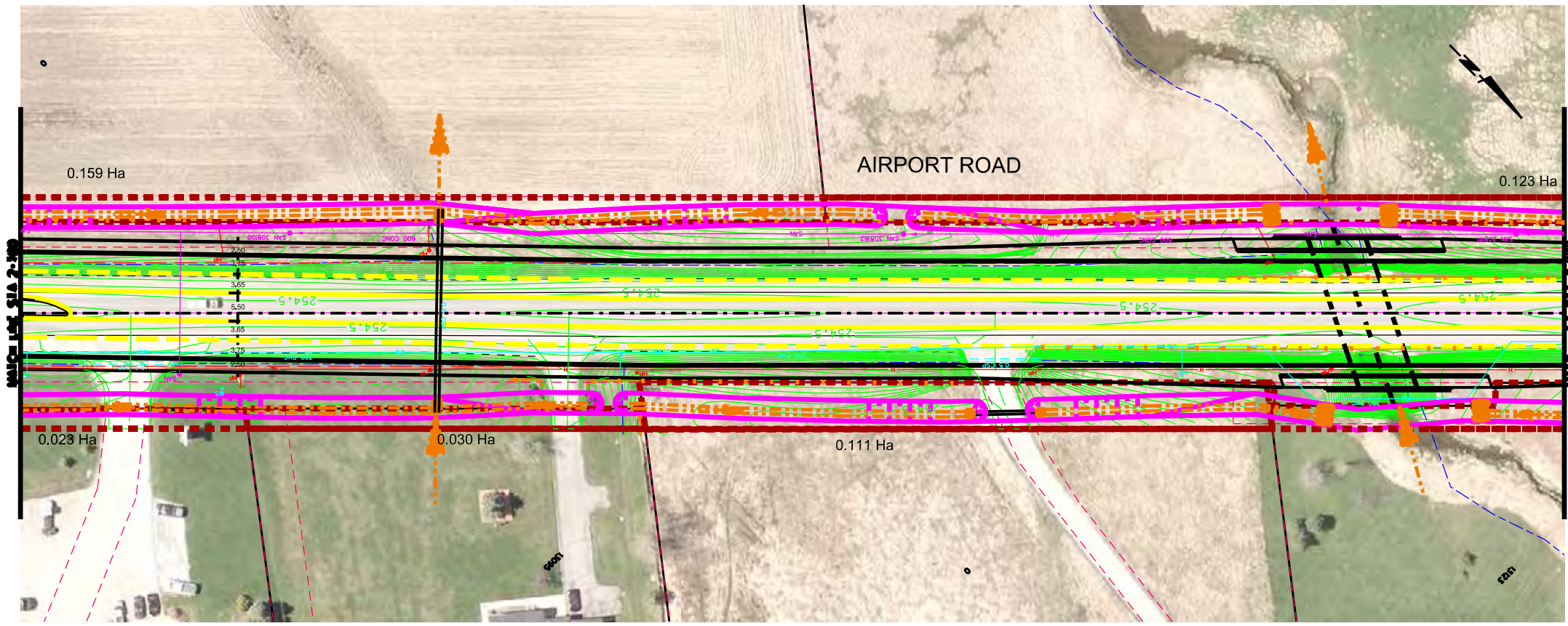
Region of Peel
Working for you

AIRPORT ROAD
(FROM PURDUE COURT TO KING STREET)

PROP. ROAD WIDENING

STA. 0+0 TO STA. 0+0

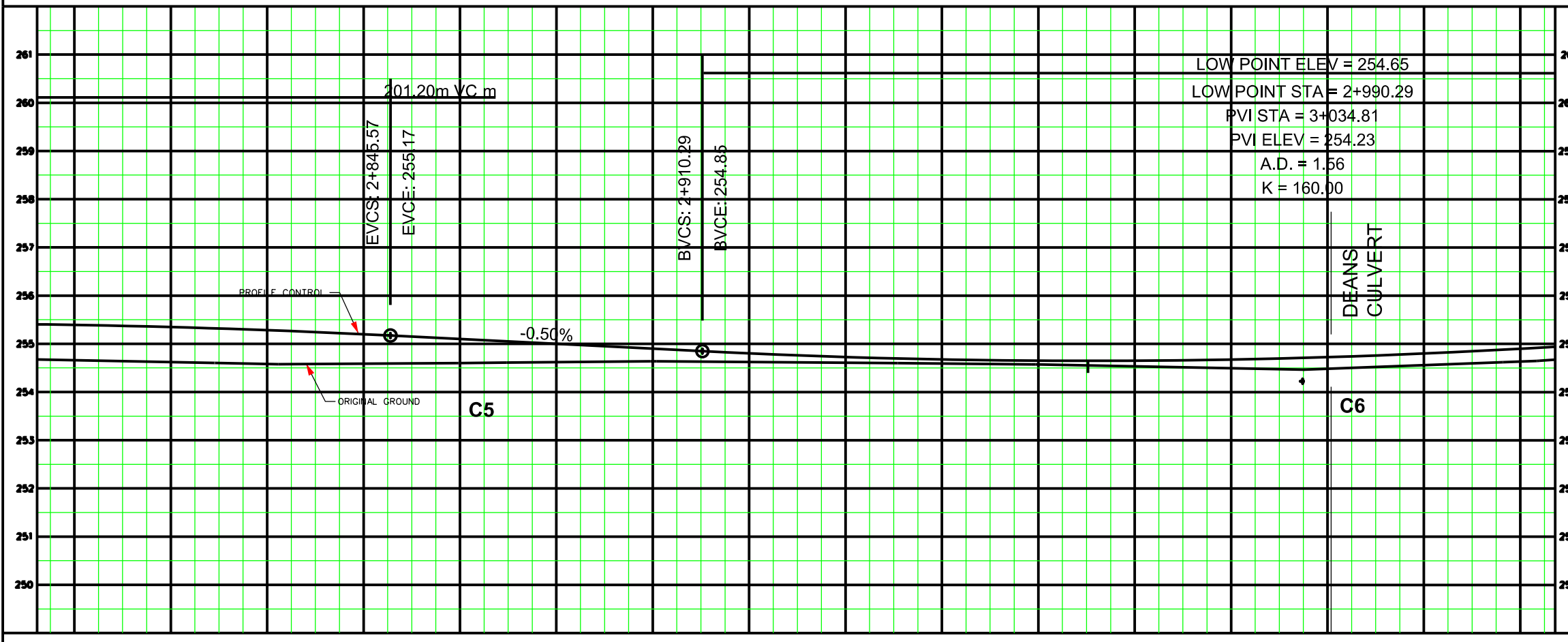
BOT. EL. OF W.M.	CAD Area	Area Z-B	Project No. 04-1310
EX. ROAD ELEV.	Checked by	Drawn by X.Y	
ROAD CHANGE	Date MAY 23, 2014	Sheet 12 of 25	Plan No.



SERVICE DATA					
SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
GAS SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMANS			HYDRO U/G CABLE		
TRANSIT			HYDRO ONE		
PARKS & REC.			GTV		
ONT. CLEAN WATER			COMMUNIC. CABLES		

REVISIONS		
DATE	DETAILS	INIT.

KEY PLAN (N.T.S.)



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HYDRO ONE NETWORKS	
ENERSOURCE, HYDRO MISSISSAUGA	
HYDRO ONE BRAMPTON	

10m 0 10 20 30m HORIZONTAL SCALE

1m 0 1 2 3m VERTICAL SCALE

Region of Peel
Working for you

AIRPORT ROAD
(FROM PURDUE COURT TO KING STREET)

PROP. ROAD WIDENING

STA. 2-780 TO STA. 3-080

2-780	2-800	2-820	2-840	2-860	2-880	2-900	2-920	2-940	2-960	2-980	3-020	3-040	3-060	3-080
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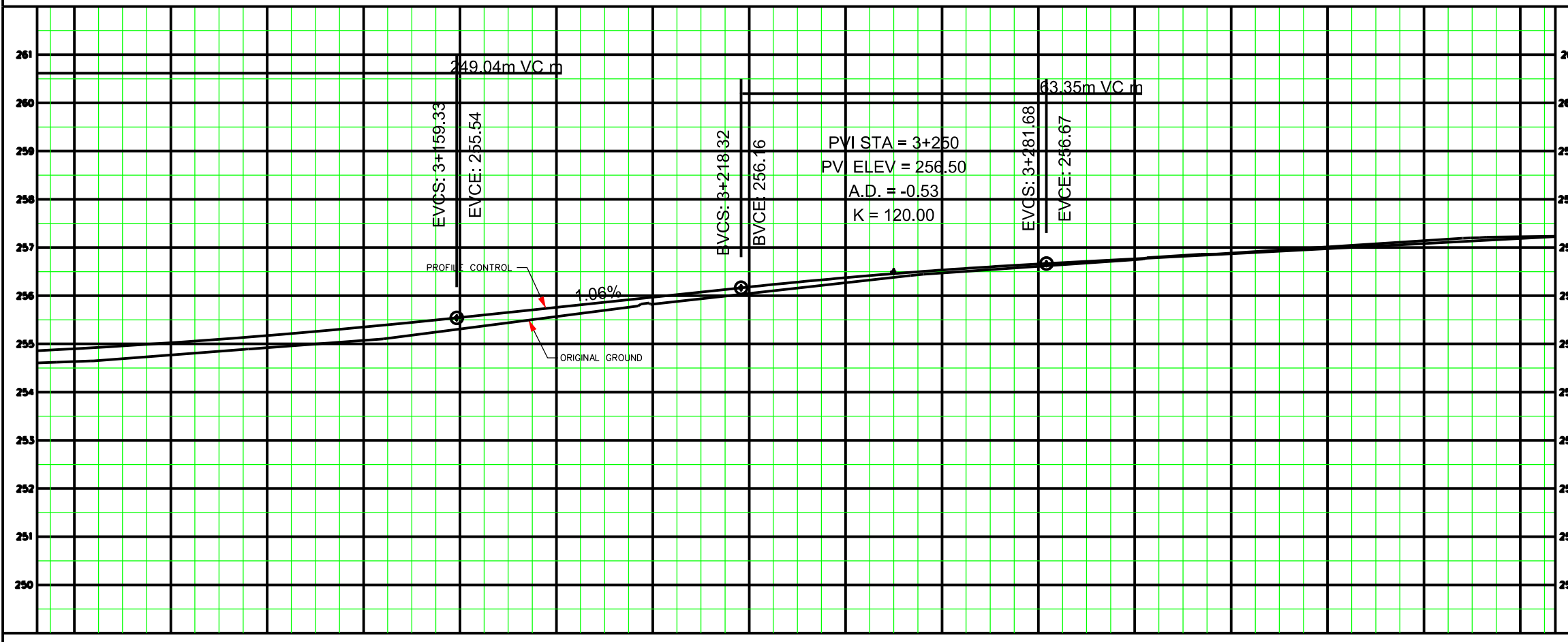
80% E.L. OF W.W.	CAD Area	Area Z-B	Project No.
EX. ROAD ELEV.	Checked by	Drawn by X.Y	04-1310
ROAD CHANGE	Date MAY 23, 2014	Sheet 13 of 25	Plan No.



SERVICE DATA					
SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
GAS MAINS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMANS			HYDRO U/G CABLE		
TRANSIT			HYDRO ONE		
PARKS & REC.			GTV		
ONT. CLEAN WATER			COMMUNIC. CABLES		

REVISIONS		
DATE	DETAILS	INIT.

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TOWN OF CALEDON WORKS DEPT.	HYDRO ONE TELECOM
BELL CANADA	ROGERS CABLE
ENBRIDGE INCORPORATED-GAS DISTRIBUTION	ALLSTREAM
ONTARIO MINISTRY OF TRANSPORTATION	PSN (PUBLIC SECTOR NETWORK)
ONTARIO CLEAN WATER AGENCY	FUTUREWAY (FIBROBROADBAND)
HYDRO ONE NETWORKS	
ENERSOURCE, HYDRO MISSISSAUGA	
HYDRO ONE BRAMPTON	

10m 0 10 20 30m HORIZONTAL SCALE

1m 0 1 2 3m VERTICAL SCALE

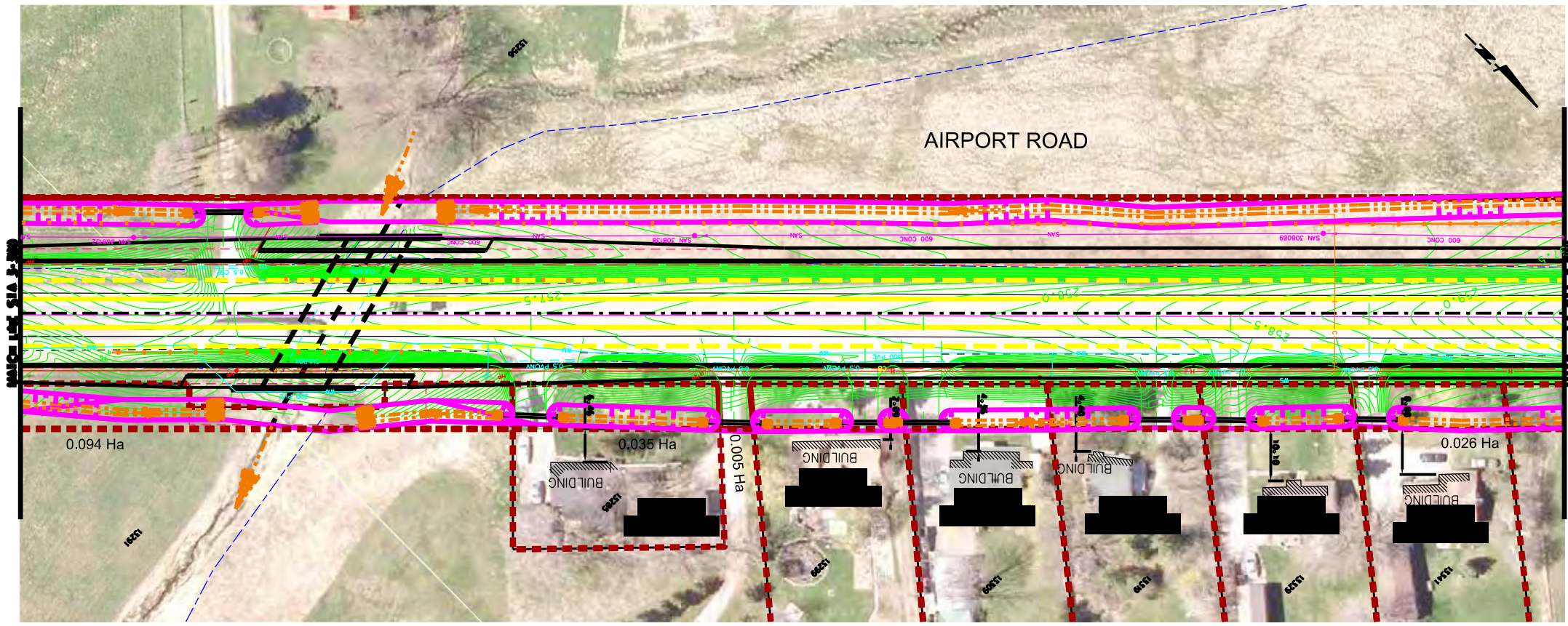
Region of Peel
Working for you

AIRPORT ROAD
(FROM PURDUE COURT TO KING STREET)

PROP. ROAD WIDENING

STA. 3+080 TO STA. 3+380

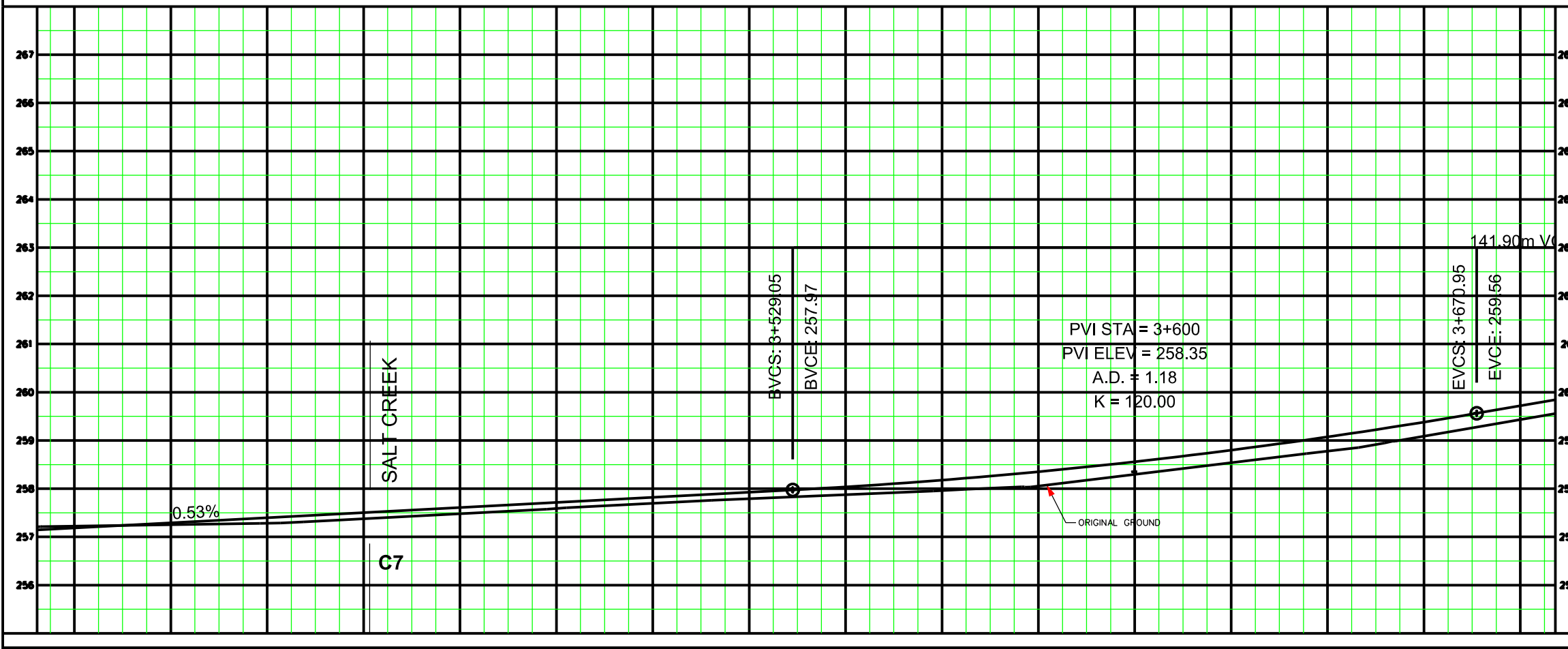
BOT. CL. OF W.M.		CAD Area		Area Z-B		Project No.	
3+080	3+100	3+120	3+140	3+160	3+180	3+200	3+220
3+240	3+260	3+280	3+300	3+320	3+340	3+360	3+380
EX. ROAD ELEV.		Checked by		Drawn by X.Y		Project No. 04-1310	
ROAD CHANGE		Date MAY 23, 2014		Sheet 14 of 25		Plan No.	



SERVICE DATA					
SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
GAS MAINS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMANS			HYDRO U/G CABLE		
TRANSIT			HYDRO ONE		
PARKS & REC.			GTV		
ONT. CLEAN WATER			COMMUNIC. CABLES		

REVISIONS		
DATE	DETAILS	INIT.

KEY PLAN (N.T.S.)



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BELL CANADA	ROGERS CABLE
ENBRIDGE INCORPORATED-GAS DISTRIBUTION	ALLSTREAM
ONTARIO MINISTRY OF TRANSPORTATION	PSN (PUBLIC SECTOR NETWORK)
ONTARIO CLEAN WATER AGENCY	FUTUREWAY (FIBROBROADBAND)
HYDRO ONE NETWORKS	
ENERSOURCE, HYDRO MISSISSAUGA	
HYDRO ONE BRAMPTON	

10m 0 10 20 30m HORIZONTAL SCALE
1m 0 1 2 3m VERTICAL SCALE

Region of Peel
Working for you

AIRPORT ROAD
(FROM PURDUE COURT TO KING STREET)

PROP. ROAD WIDENING

STA. 3+380 TO STA. 3+680

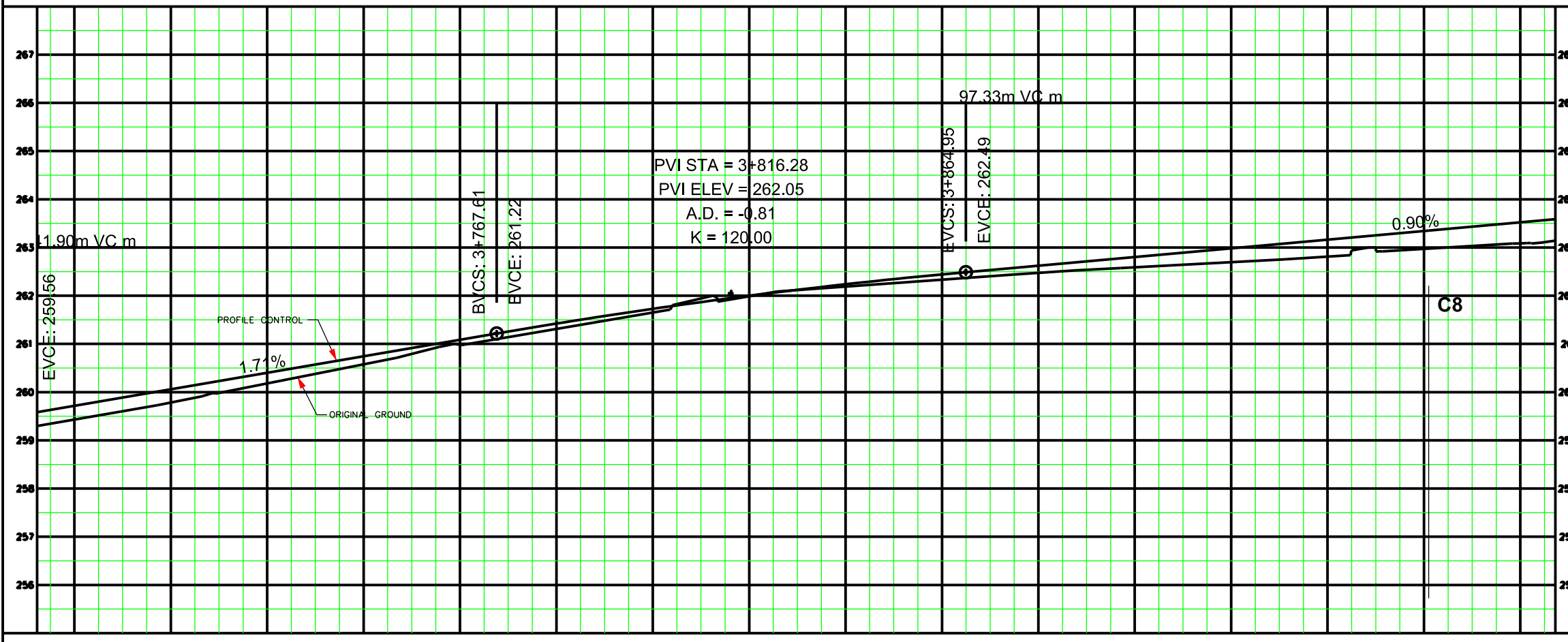
BOT. CL. OF W.M.		Area Z-B		Project No. 04-1310	
EX. ROAD ELEV.	Checked by	Area	Drawn by X.Y	Date	Sheet 15 of 25
3+380				MAY 23, 2014	Plan No. 15
3+400					
3+420					
3+440					
3+460					
3+480					
3+500					
3+520					
3+540					
3+560					
3+580					
3+600					
3+620					
3+640					
3+660					



SERVICE DATA					
SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
GAS SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMANS			HYDRO U/G CABLE		
TRANSIT			HYDRO ONE		
PARKS & REC.			GTV		
ONT. CLEAN WATER			COMMUNIC. CABLES		

REVISIONS		
DATE	DETAILS	INIT.

KEY PLAN (N.T.S.)



General Notes

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- ⊙ Denotes Building Located
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B.M. No. Elev.

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Designed by: Chid Approved by: _____

NOTICE TO CONTRACTOR

48 HOURS PRIOR TO COMMENCING WORK NOTIFY THE FOLLOWING

THE REGIONAL MUNICIPALITY OF PEEL	CABLE TELEVISION/FIBROPTIC PROVIDERS:
CITY OF MISSISSAUGA WORKS DEPT.	BELL CANADA
CITY OF BRAMPTON WORKS DEPT.	ENERSOURCE TELECOM
TOWN OF CALEDON WORKS DEPT.	HYDRO ONE TELECOM
BELL CANADA	ROGERS CABLE
ENBRIDGE INCORPORATED-GAS DISTRIBUTION	ALLSTREAM
ONTARIO MINISTRY OF TRANSPORTATION	PSN (PUBLIC SECTOR NETWORK)
ONTARIO CLEAN WATER AGENCY	FUTUREWAY (FIBROBROADBAND)
HYDRO ONE NETWORKS	
ENERSOURCE, HYDRO MISSISSAUGA	
HYDRO ONE BRAMPTON	

10m 0 10 20 30m HORIZONTAL SCALE

1m 0 1 2 3m VERTICAL SCALE

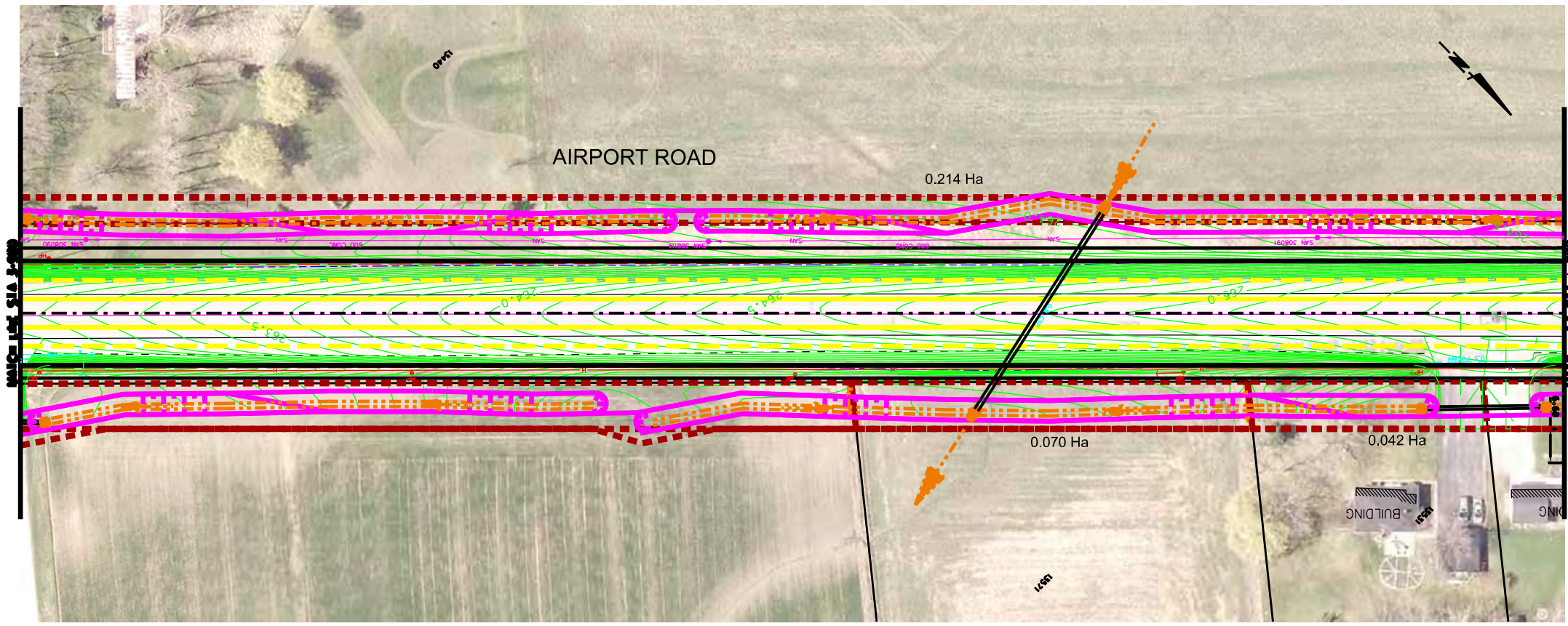
Region of Peel
Working for you

AIRPORT ROAD
(FROM PURDUE COURT TO KING STREET)

PROP. ROAD WIDENING

STA. 3+680 TO STA. 3+960

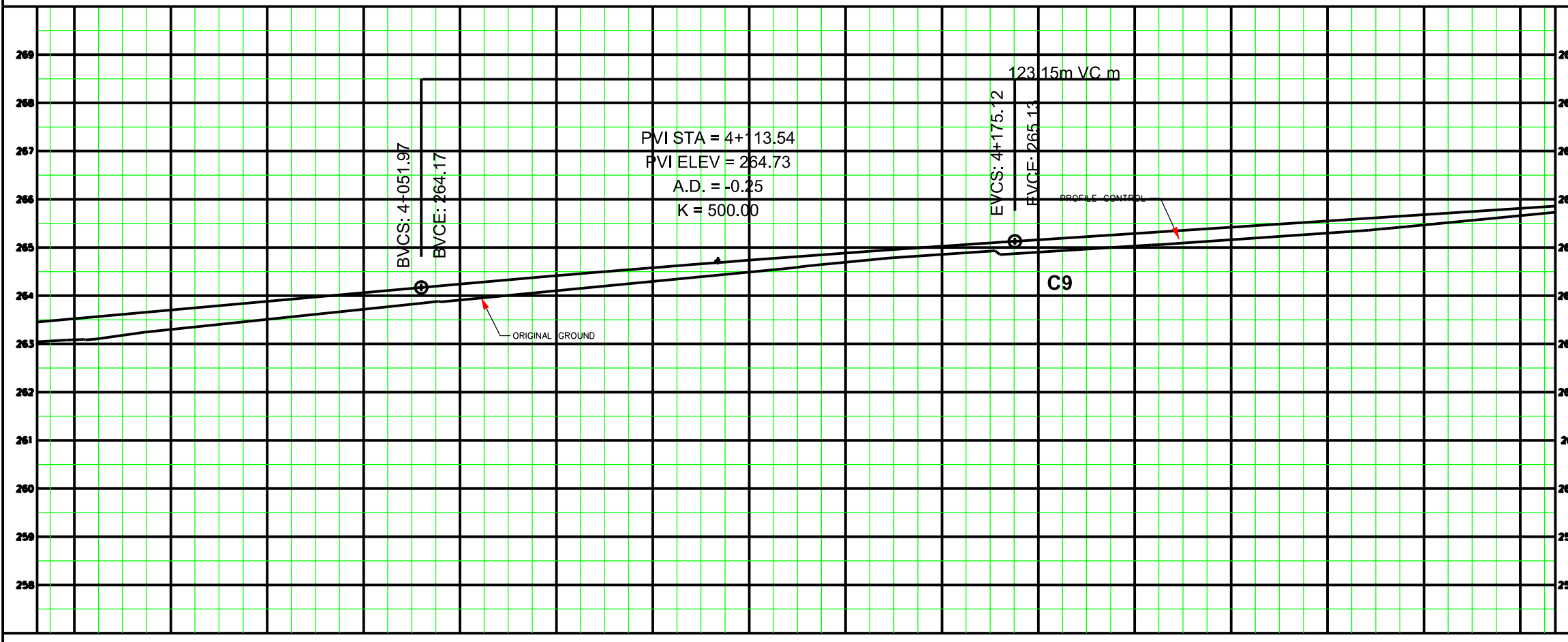
BOT. EL. OF W.M.		Area Z-B		Project No. 04-1310	
EX. ROAD ELEV.	Checked by	Area	Drawn by X.Y	Date	Sheet 16 of 25
3+680				MAY 23, 2014	Plan No. =D



SERVICE DATA					
SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
RAW SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMANS			HYDRO U/G CABLE		
TRANSIT			HYDRO ONE		
PARKS & REC.			CTV		
ONT. CLEAN WATER			COMMUNIC. CABLES		

REVISIONS		
DATE	DETAILS	INIT.

KEY PLAN (N.T.S.)



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CITY OF BRAMPTON WORKS DEPT.	ENERSOURCE TELECOM
TOWN OF CALEDON WORKS DEPT.	HYDRO ONE TELECOM
BELL CANADA	ROGERS CABLE
ENBRIDGE INCORPORATED-GAS DISTRIBUTION	ALLSTREAM
ONTARIO MINISTRY OF TRANSPORTATION	PSN (PUBLIC SECTOR NETWORK)
ONTARIO CLEAN WATER AGENCY	FUTUREWAY (FIBROBROADBAND)
HYDRO ONE NETWORKS	
ENERSOURCE, HYDRO MISSISSAUGA	
HYDRO ONE BRAMPTON	

10m 0 10 20 30m HORIZONTAL SCALE
1m 0 1 2 3m VERTICAL SCALE

Region of Peel
Working for you

AIRPORT ROAD
(FROM PURDUE COURT TO KING STREET)
PROP. ROAD WIDENING

STA. 3+980 TO STA. 4+280

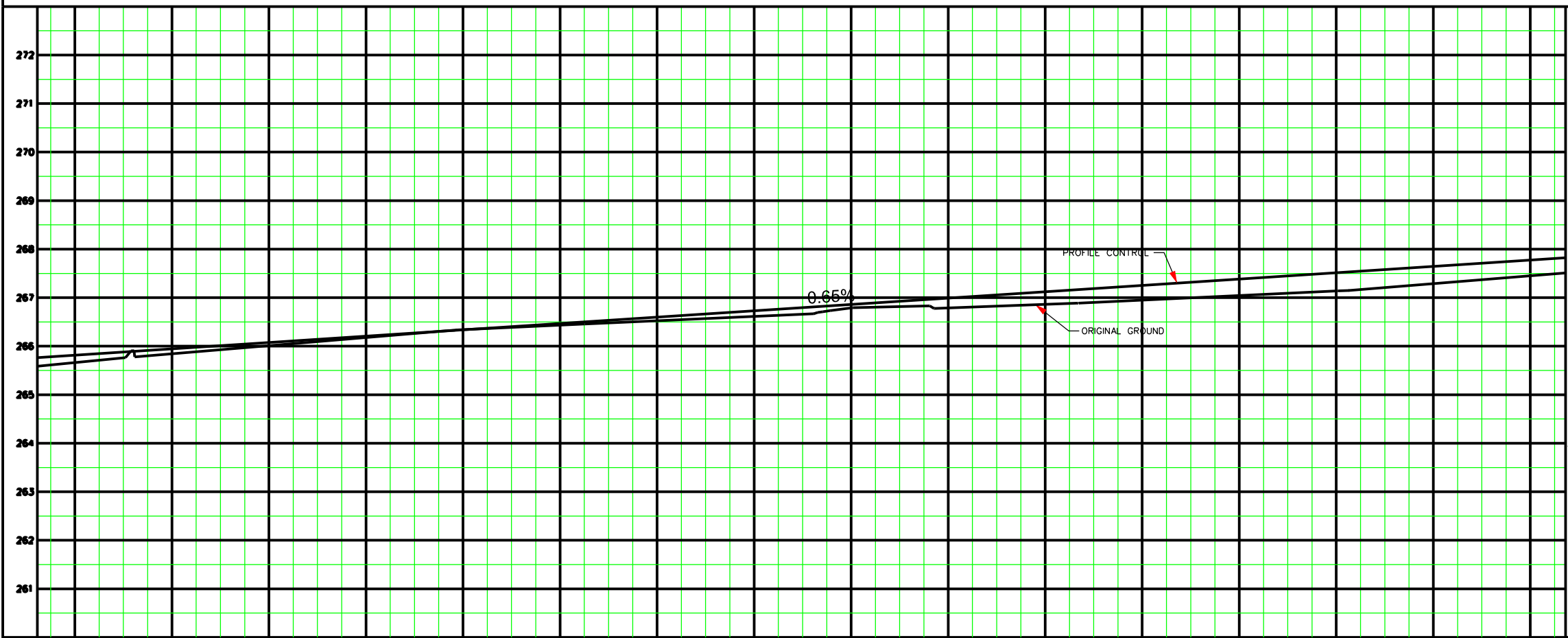
BOT. L. OF W.M.		Area Z-B		Project No. 04-1310	
EX. ROAD ELEV.	Checked by	Area	Drawn by	X.Y	Plan No.
3+980					
4+000					
4+020					
4+040					
4+060					
4+080					
4+100					
4+120					
4+140					
4+160					
4+180					
4+200					
4+220					
4+240					
4+260					
ROAD CHANGE		Date	Sheet	Plan No.	
		MAY 23, 2014	17 of 25		



SERVICE DATA					
SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
GAS MAINS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMANS			HYDRO U/G CABLE		
TRANSIT			HYDRO ONE		
PARKS & REC.			GTV		
ONT. CLEAN WATER			COMMUNIC. CABLES		

REVISIONS		
DATE	DETAILS	INIT.

KEY PLAN (N.T.S.)



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TOWN OF CALEDON WORKS DEPT.	HYDRO ONE TELECOM
BELL CANADA	ROGERS CABLE
ENBRIDGE INCORPORATED-GAS DISTRIBUTION	ALLSTREAM
ONTARIO MINISTRY OF TRANSPORTATION	PSN (PUBLIC SECTOR NETWORK)
ONTARIO CLEAN WATER AGENCY	FUTUREWAY (FIBROBROADBAND)
HYDRO ONE NETWORKS	
ENERSOURCE, HYDRO MISSISSAUGA	
HYDRO ONE BRAMPTON	

10m 0 10 20 30m HORIZONTAL SCALE
 1m 0 1 2 3m VERTICAL SCALE

Region of Peel
 Working for you

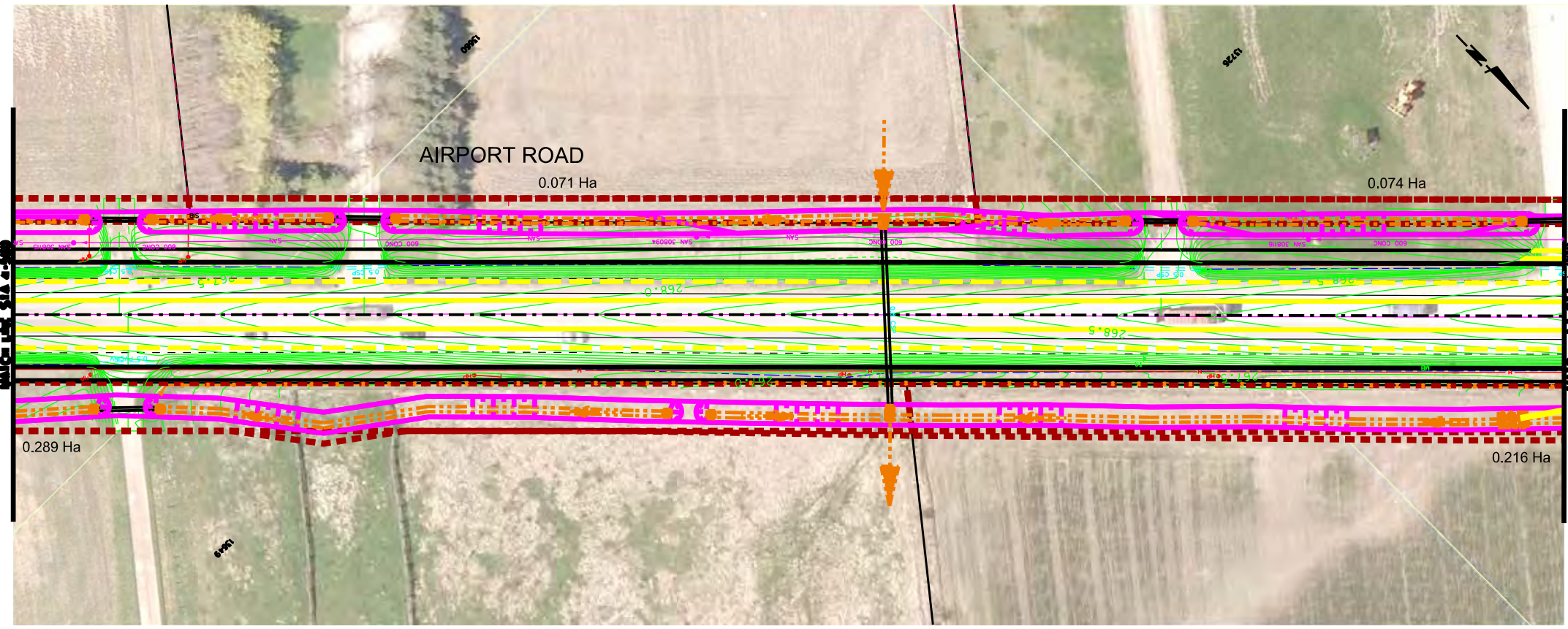
AIRPORT ROAD
 (FROM PURDUE COURT TO KING STREET)

PROP. ROAD WIDENING

STA. 4+280 TO STA. 4+580

STATION	4+280	4+300	4+320	4+340	4+360	4+380	4+400	4+420	4+440	4+460	4+480	4+500	4+520	4+540	4+560
BOT. E.L. OF W.M.															
EX. ROAD ELEV.															
ROAD CHANGE															

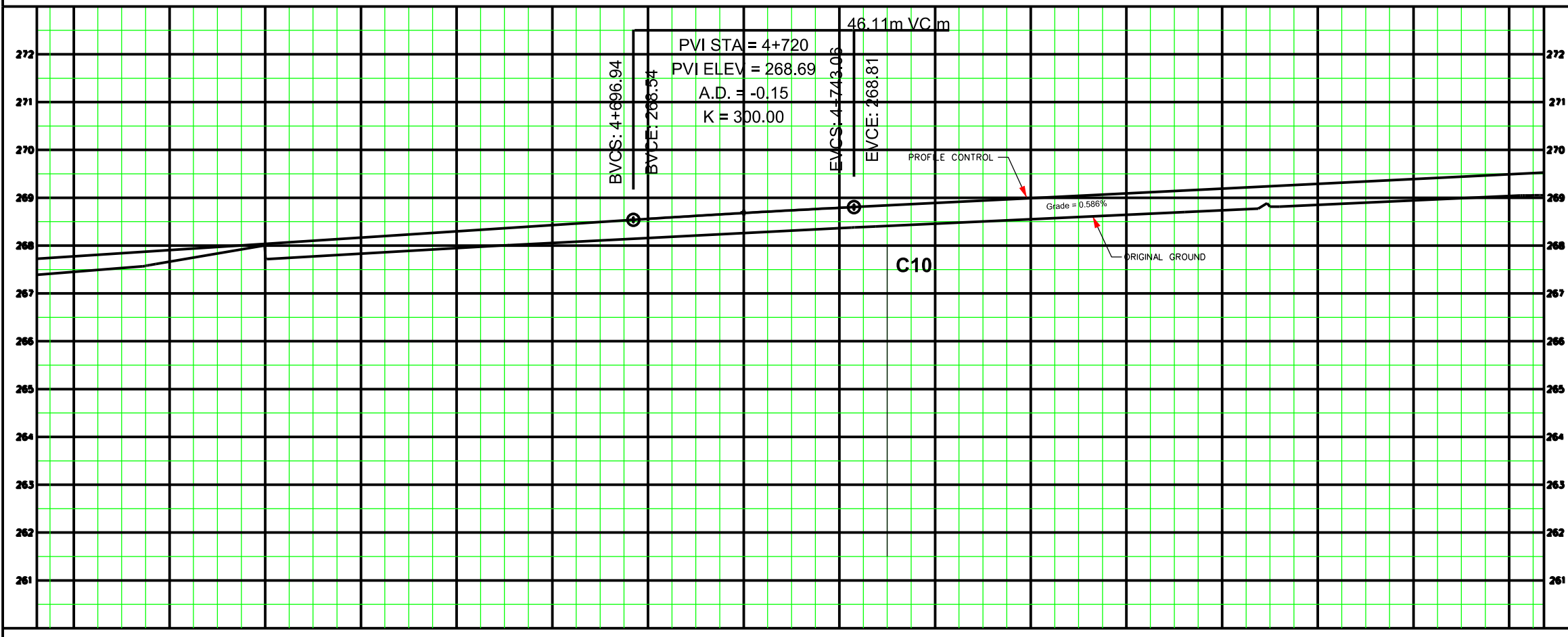
CAD Area	Area Z-B	Project No.	04-1310
Checked by	Drawn by X.Y	Sheet	18 of 25
Date	MAY 23, 2014	Plan No.	



SERVICE DATA					
SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
RAIN SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMANS			HYDRO U/G CABLE		
TRANSIT			HYDRO ONE		
PARKS & REC.			GTV		
ONT. CLEAN WATER			COMMUNIC. CABLES		

REVISIONS		
DATE	DETAILS	INIT.

KEY PLAN (N.T.S.)



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NOTICE TO CONTRACTOR

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CITY OF BRAMPTON WORKS DEPT.	ENERSOURCE TELECOM
TOWN OF CALEDON WORKS DEPT.	HYDRO ONE TELECOM
BELL CANADA	ROGERS CABLE
ENBRIDGE INCORPORATED-GAS DISTRIBUTION	ALLSTREAM
ONTARIO MINISTRY OF TRANSPORTATION	PSN (PUBLIC SECTOR NETWORK)
ONTARIO CLEAN WATER AGENCY	FUTUREWAY (FIBROBROADBAND)
HYDRO ONE NETWORKS	
ENERSOURCE, HYDRO MISSISSAUGA	
HYDRO ONE BRAMPTON	

10m 0 10 20 30m HORIZONTAL SCALE
1m 0 1 2 3m VERTICAL SCALE

Region of Peel
Working for you

AIRPORT ROAD
(FROM PURDUE COURT TO KING STREET)

PROP. ROAD WIDENING

STA. 4+580 TO STA. 4+880

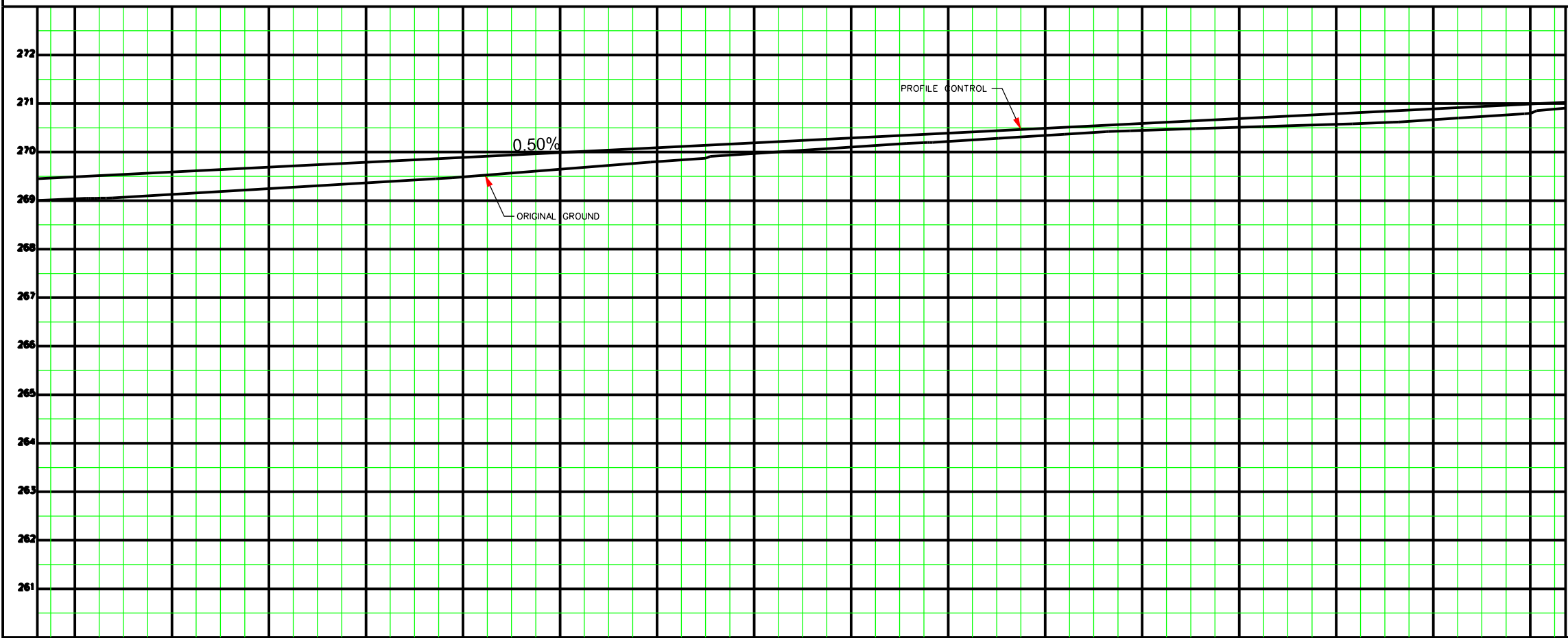
BOT. E.L. OF W.M.		Area Z-B		Project No. 04-1310	
EX. ROAD ELEV.	Checked by	Area	Drawn by X.Y	Date	Sheet
4+580				MAY 23, 2014	19 of 25
4+600					
4+620					
4+640					
4+660					
4+680					
4+700					
4+720					
4+740					
4+760					
4+780					
4+800					
4+820					
4+840					
4+860					



SERVICE DATA					
SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
GAS MAINS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMANS			HYDRO U/G CABLE		
TRANSIT			HYDRO ONE		
PARKS & REC.			CTV		
ONT. CLEAN WATER			COMMUNIC. CABLES		

REVISIONS		
DATE	DETAILS	INIT.

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BELL CANADA	ROGERS CABLE
ENBRIDGE INCORPORATED-GAS DISTRIBUTION	ALLSTREAM
ONTARIO MINISTRY OF TRANSPORTATION	PSN (PUBLIC SECTOR NETWORK)
ONTARIO CLEAN WATER AGENCY	FUTUREWAY (FO BROADBAND)
HYDRO ONE NETWORKS	
ENERSOURCE, HYDRO MISSISSAUGA	
HYDRO ONE BRAMPTON	

10m 0 10 20 30m HORIZONTAL SCALE
1m 0 1 2 3m VERTICAL SCALE

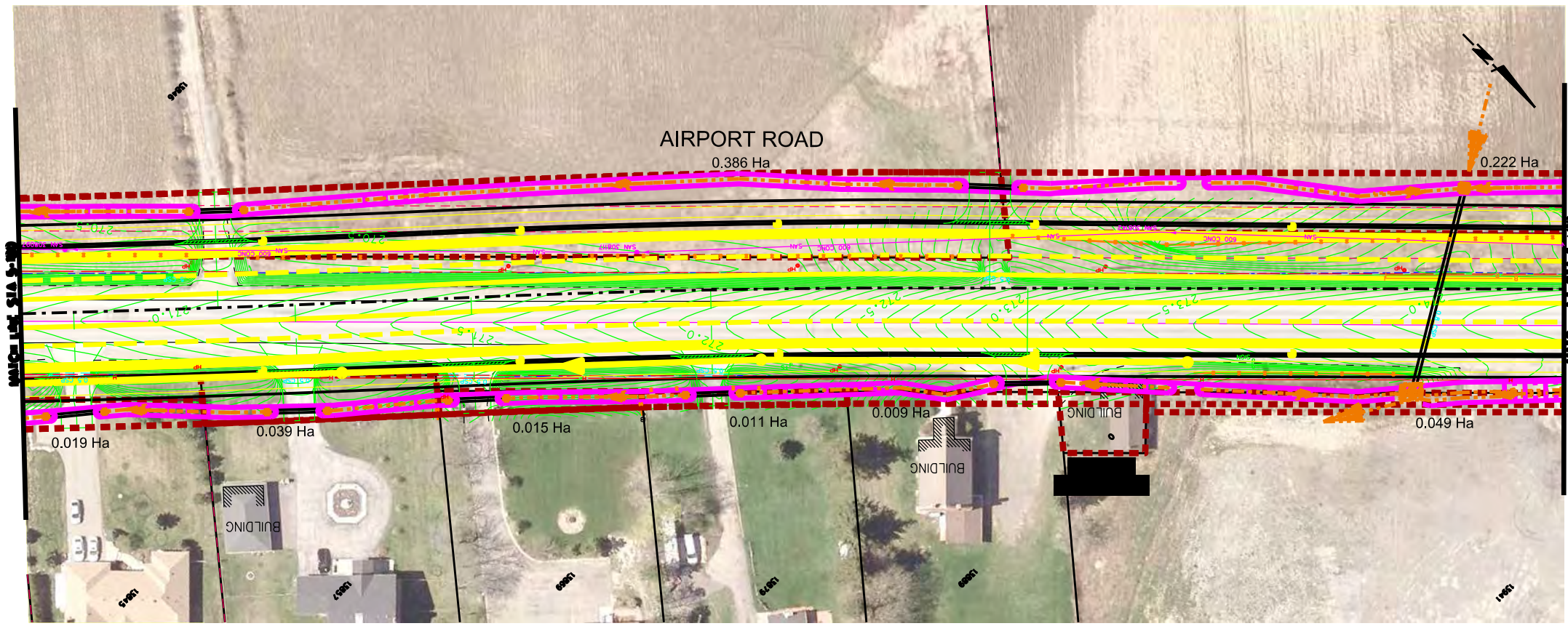
Region of Peel
Working for you

AIRPORT ROAD
(FROM PURDUE COURT TO KING STREET)
PROP. ROAD WIDENING

STA. 4+880 TO STA. 5+180

STATION	4+880	4+900	4+920	4+940	4+960	4+980	5+000	5+020	5+040	5+060	5+080	5+100	5+120	5+140	5+160	5+180
EX. ROAD ELEV.																
ROAD CHANGE																

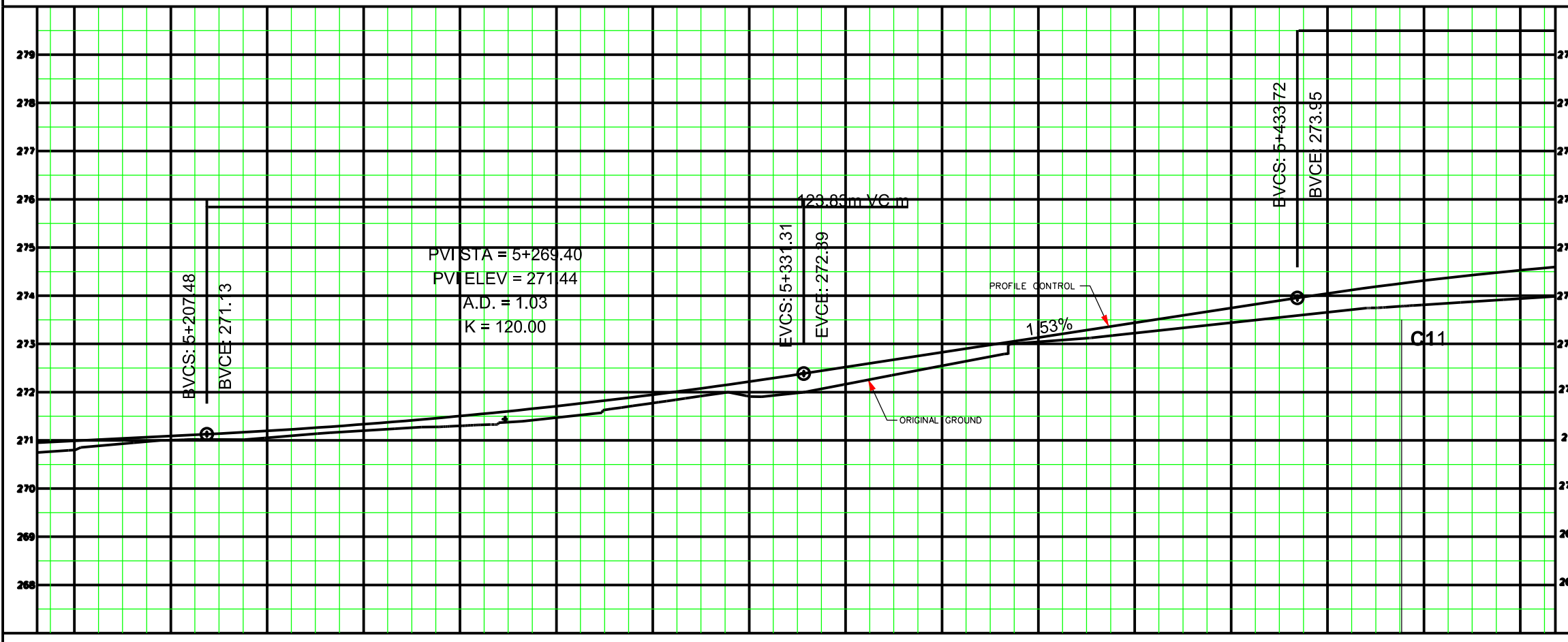
SOT. CL. OF W.M.	CAD Area	Area Z-B	Project No.	04-1310
EX. ROAD ELEV.	Checked by	Drawn by	Sheet	20 of 25
ROAD CHANGE	Date	MAY 23, 2014	Plan No.	-D



SERVICE DATA					
SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN. SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMANS			HYDRO U/G CABLE		
TRANSIT			HYDRO ONE		
PARKS & REC.			GTV		
ONT. CLEAN WATER			COMMUNIC. CABLES		

REVISIONS		
DATE	DETAILS	INIT.

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BELL CANADA	ROGERS CABLE
ENBRIDGE INCORPORATED-GAS DISTRIBUTION	ALLSTREAM
ONTARIO MINISTRY OF TRANSPORTATION	PSN (PUBLIC SECTOR NETWORK)
ONTARIO CLEAN WATER AGENCY	FUTUREWAY (FIBROPTIC)
HYDRO ONE NETWORKS	
ENERSOURCE, HYDRO MISSISSAUGA	
HYDRO ONE BRAMPTON	

10m 0 10 20 30m HORIZONTAL SCALE
1m 0 1 2 3m VERTICAL SCALE

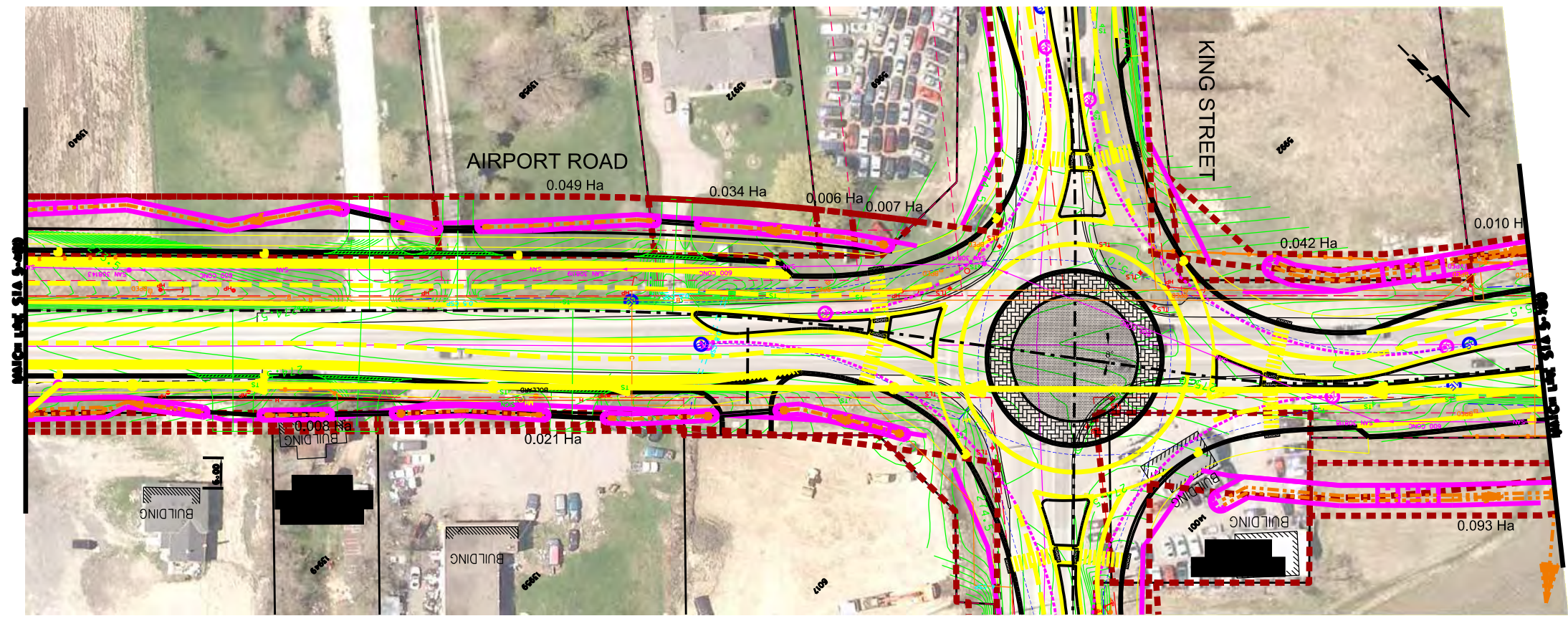
Region of Peel
Working for you

AIRPORT ROAD
(FROM PURDUE COURT TO KING STREET)

PROP. ROAD WIDENING

STA. 5+180 TO STA. 5+480

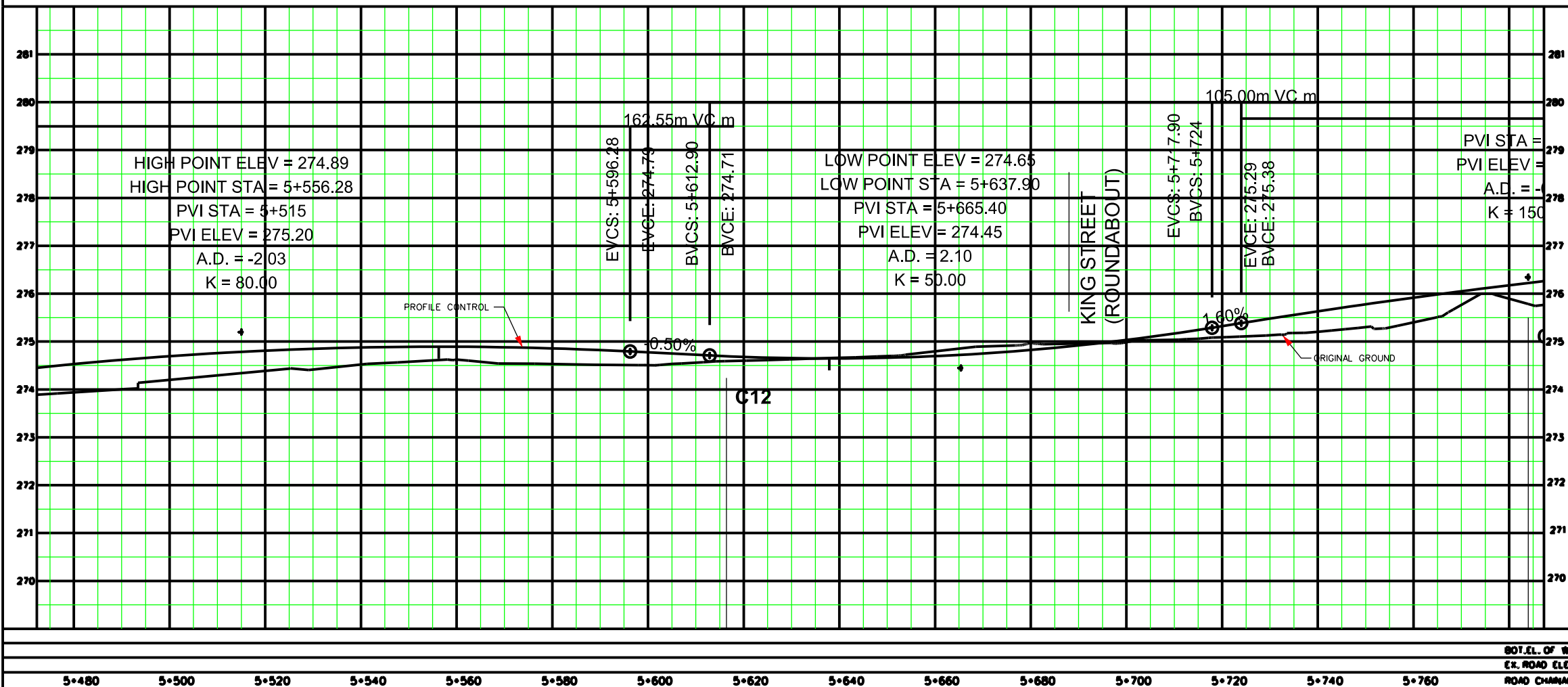
5+180	5+200	5+220	5+240	5+260	5+280	5+300	5+320	5+340	5+360	5+380	5+400	5+420	5+440	5+460																	
<table border="0"> <tr> <td>SOI. CL. OF W.M.</td> <td>CAD Area</td> <td>Area</td> <td>Z-B</td> <td>Project No.</td> <td>04-1310</td> </tr> <tr> <td>EX. ROAD ELEV.</td> <td>Checked by</td> <td>Drawn by</td> <td>X.Y</td> <td>Date</td> <td>MAY 23, 2014</td> </tr> <tr> <td>ROAD CHANGE</td> <td>Date</td> <td>Sheet</td> <td>21 of 25</td> <td>Plan No.</td> <td></td> </tr> </table>														SOI. CL. OF W.M.	CAD Area	Area	Z-B	Project No.	04-1310	EX. ROAD ELEV.	Checked by	Drawn by	X.Y	Date	MAY 23, 2014	ROAD CHANGE	Date	Sheet	21 of 25	Plan No.	
SOI. CL. OF W.M.	CAD Area	Area	Z-B	Project No.	04-1310																										
EX. ROAD ELEV.	Checked by	Drawn by	X.Y	Date	MAY 23, 2014																										
ROAD CHANGE	Date	Sheet	21 of 25	Plan No.																											



SERVICE DATA					
SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
GAS SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMANS			HYDRO U/G CABLE		
TRANSIT			HYDRO ONE		
PARKS & REC.			GTV		
ONT. CLEAN WATER			COMMUNIC. CABLES		

REVISIONS		
DATE	DETAILS	INIT.

KEY PLAN (N.T.S.)



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HYDRO ONE NETWORKS	
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HYDRO ONE BRAMPTON	

10m 0 10 20 30m HORIZONTAL SCALE
1m 0 1 2 3m VERTICAL SCALE

Region of Peel
Working for you

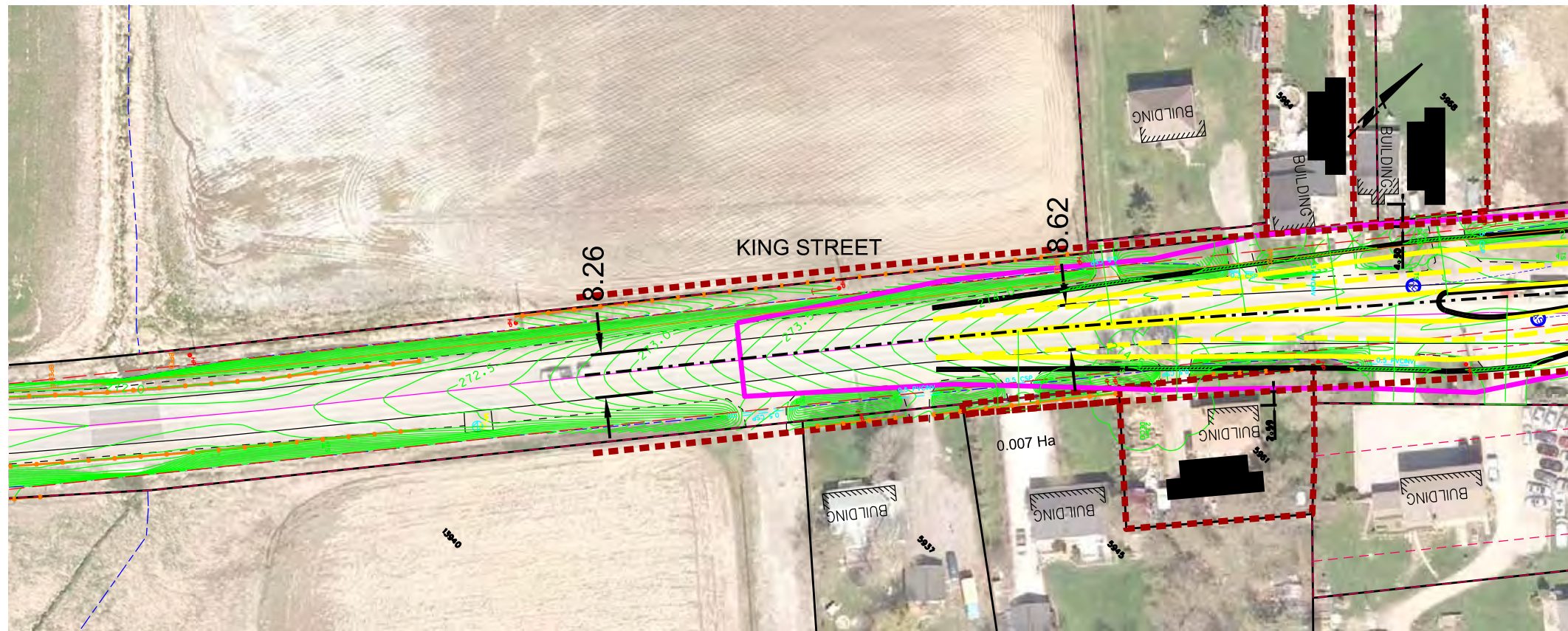
AIRPORT ROAD
(FROM PURDUE COURT TO KING STREET)

PROP. ROAD WIDENING

STA. 5+480 TO STA. 5+780

SOT. E.L. OF W.M.	CAD Area	Area Z-B	Project No.	04-1310
EX. ROAD ELEV.	Checked by	Drawn by	X.Y	
ROAD CHANGE	Date MAY 23, 2014	Sheet 22 of 25	Plan No.	

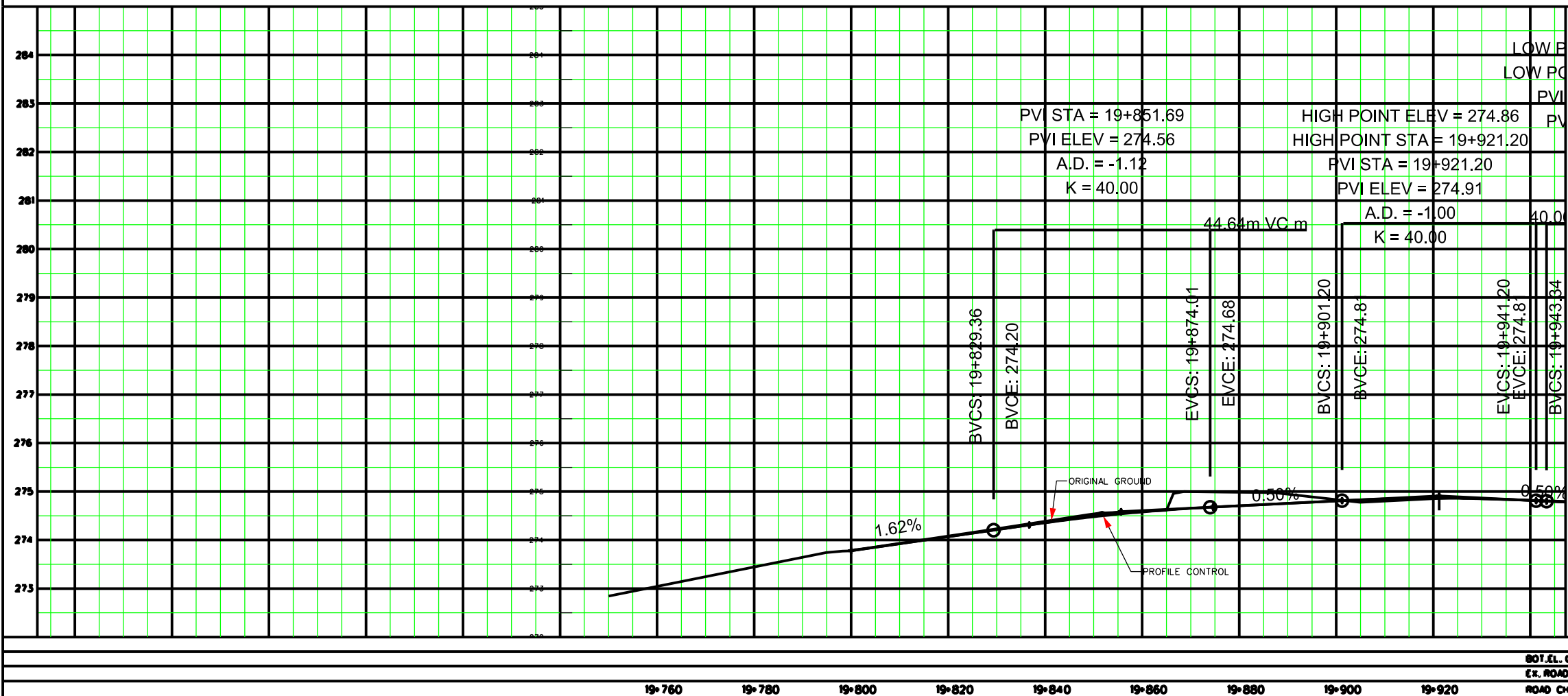
5+480 5+500 5+520 5+540 5+560 5+580 5+600 5+620 5+640 5+660 5+680 5+700 5+720 5+740 5+760



SERVICE DATA					
SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
GAS SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMANS			HYDRO U/G CABLE		
TRANSIT			HYDRO ONE		
PARKS & REC.			GTV		
ONT. CLEAN WATER			COMMUNIC. CABLES		

REVISIONS		
DATE	DETAILS	INIT.

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BELL CANADA	ROGERS CABLE
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HYDRO ONE NETWORKS	
ENERSOURCE, HYDRO MISSISSAUGA	
HYDRO ONE BRAMPTON	

10m 0 10 20 30m HORIZONTAL SCALE
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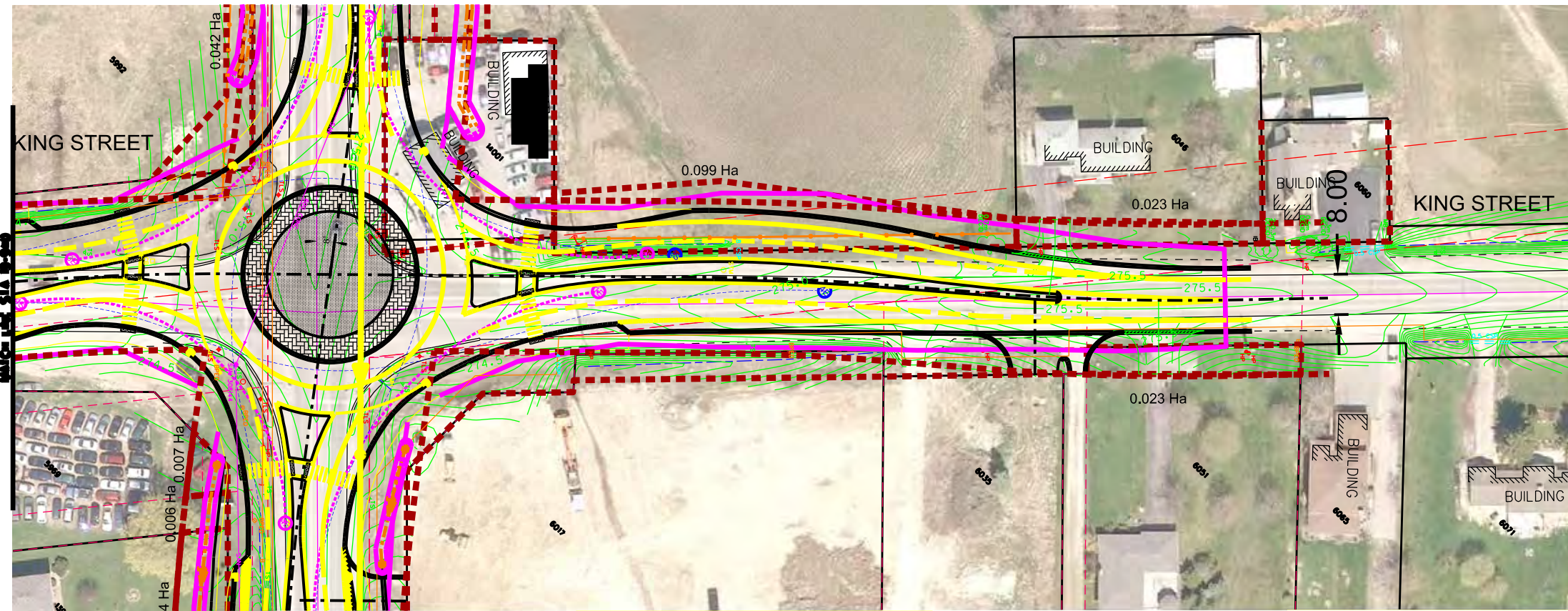
Region of Peel
Working for you

AIRPORT ROAD
(FROM PURDUE COURT TO KING STREET)

PROP. ROAD WIDENING

STA. 0+0 TO STA. 0+0

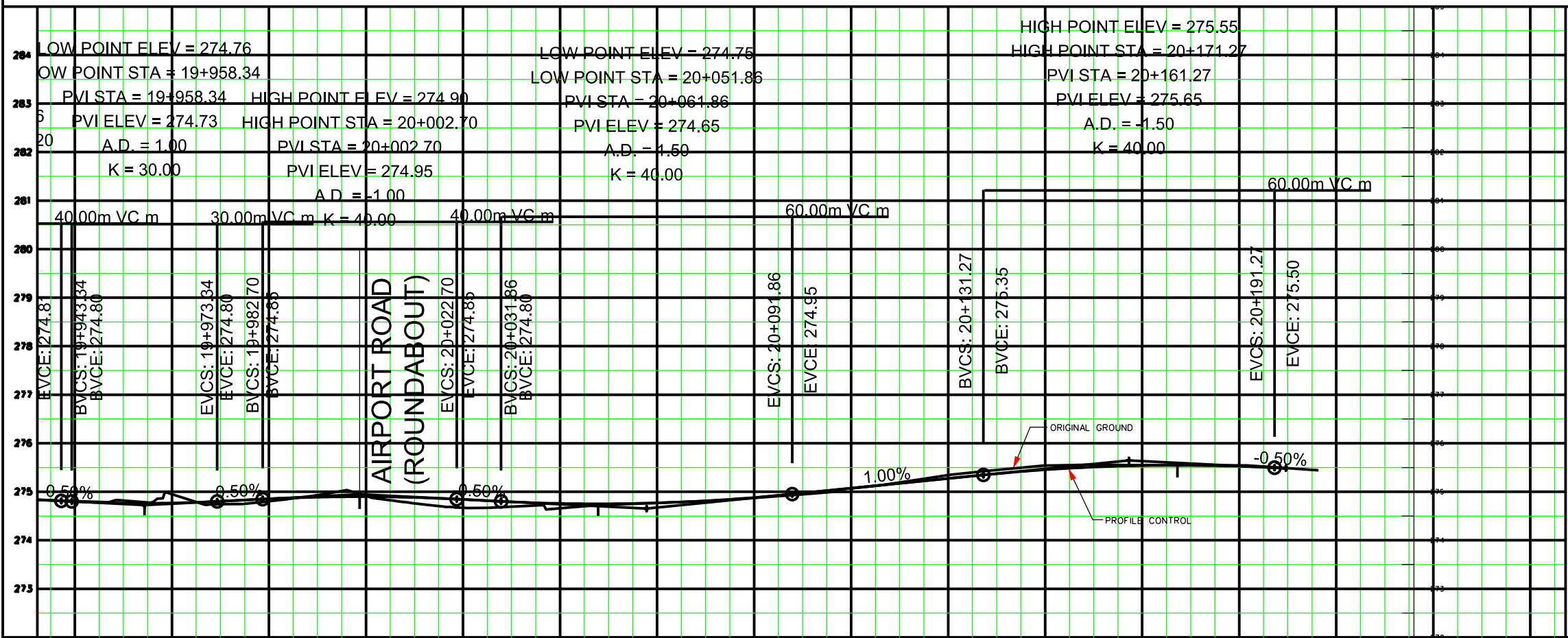
SOT. EL. OF W.M.	CAD Area	Area Z-B	Project No. 04-1310
EX. ROAD ELEV.	Checked by	Drawn by X.Y	
ROAD CHANGE	Date MAY 23, 2014	Sheet 23 of 25	Plan No. -D



SERVICE DATA					
SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
GAS SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMANS			HYDRO U/G CABLE		
TRANSIT			HYDRO ONE		
PARKS & REC.			GTV		
ONT. CLEAN WATER			COMMUNIC. CABLES		

REVISIONS		
DATE	DETAILS	INIT.

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Designed by: _____ Approved by: _____

Child: _____

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TOWN OF CALEDON WORKS DEPT.	HYDRO ONE TELECOM
BELL CANADA	ROGERS CABLE
ENBRIDGE INCORPORATED-GAS DISTRIBUTION	ALLSTREAM
ONTARIO MINISTRY OF TRANSPORTATION	PSN (PUBLIC SECTOR NETWORK)
ONTARIO CLEAN WATER AGENCY	FUTUREWAY (FIBROBROADBAND)
HYDRO ONE NETWORKS	
ENERSOURCE, HYDRO MISSISSAUGA	
HYDRO ONE BRAMPTON	

10m 0 10 20 30m HORIZONTAL SCALE
1m 0 1 2 3m VERTICAL SCALE

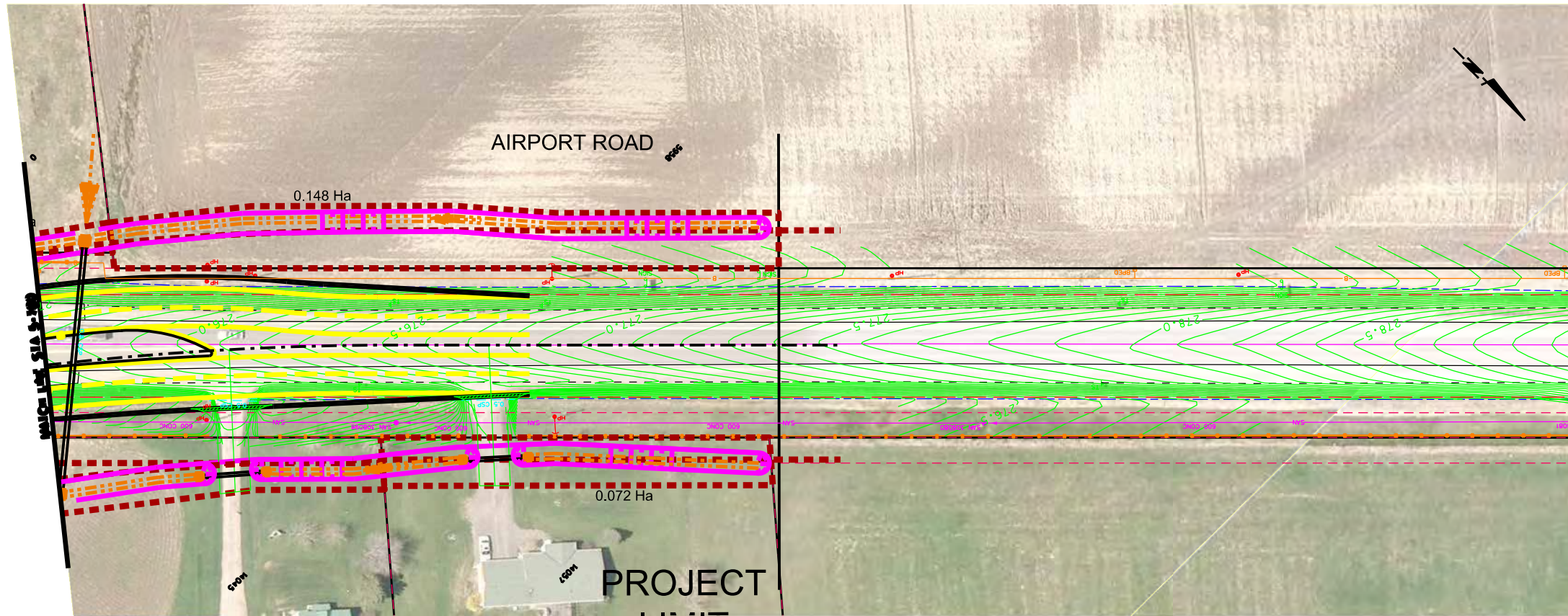
Region of Peel
Working for you

AIRPORT ROAD
(FROM PURDUE COURT TO KING STREET)

PROP. ROAD WIDENING

STA. 0+0 TO STA. 0+0

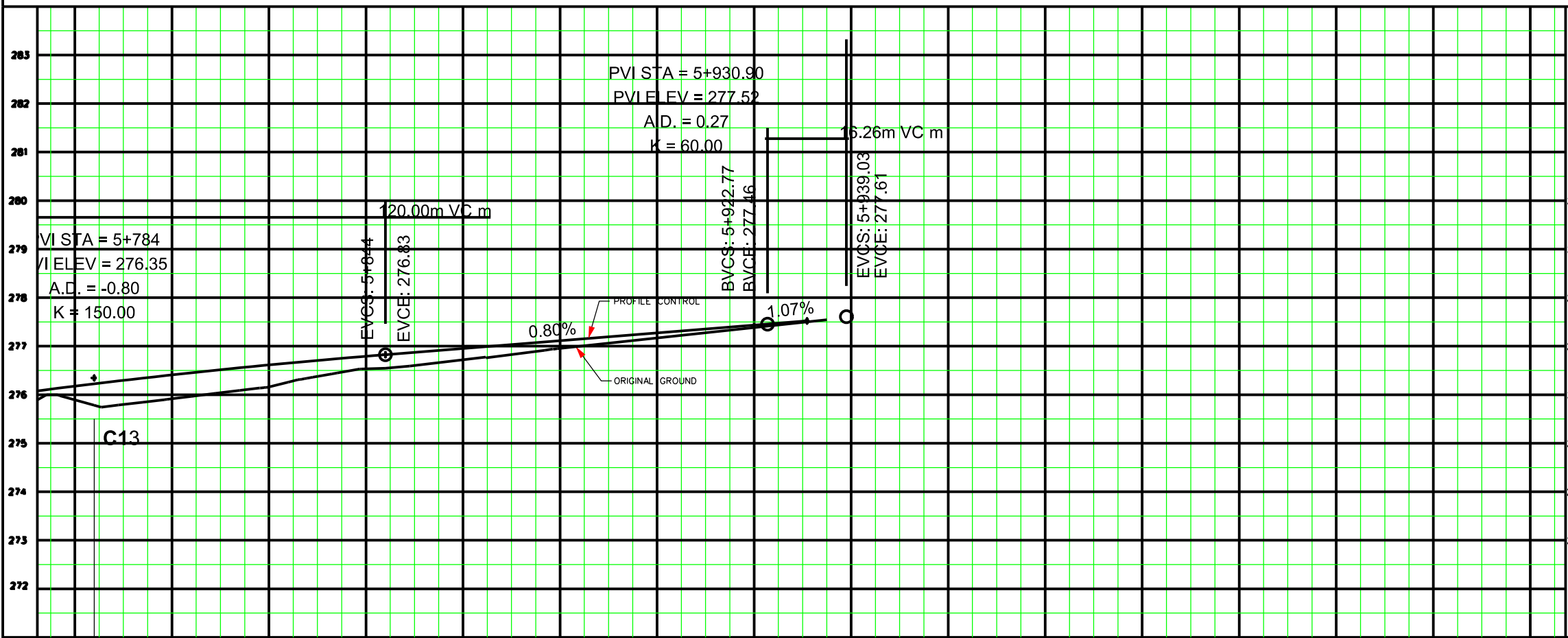
BOT. EL. OF W.M.		Area Z-B		Project No. 04-1310	
EX. ROAD ELEV.	Checked by	Area	Drawn by X.Y	Date	Sheet
19+940				MAY 23, 2014	24 of 25
19+960					
19+980					
20+000					
20+020					
20+040					
20+060					
20+080					
20+100					
20+120					
20+140					
20+160					
20+180					
20+200					
20+220					



SERVICE DATA					
SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
GAS SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMANS			HYDRO U/G CABLE		
TRANSIT			HYDRO ONE		
PARKS & REC.			GTV		
ONT. CLEAN WATER			COMMUNIC. CABLES		

REVISIONS		
DATE	DETAILS	INIT.

KEY PLAN (N.T.S.)



General Notes

- All Driveways ASPHALT Unless Otherwise Noted.
- All Service Locations Are Approximate And Must Be Located Accurately In The Field
- ⊙ Denotes Building - Not Located
- ⊙ Denotes Building Located
- Type 'B' Bedding Unless Otherwise Noted (SAN)

B.M. No. Elev.

The Contractor is Responsible For Locating And Protecting All Existing Utilities Prior To And During Construction Location of Existing Utilities Approximate Only, To Be Verified In Field By Contractor.

Designed by: Chid Approved by: _____

NOTICE TO CONTRACTOR

48 HOURS PRIOR TO COMMENCING WORK NOTIFY THE FOLLOWING

THE REGIONAL MUNICIPALITY OF PEEL	CABLE TELEVISION/FIBROPTIC PROVIDERS:
CITY OF MISSISSAUGA WORKS DEPT.	BELL CANADA
CITY OF BRAMPTON WORKS DEPT.	ENERSOURCE TELECOM
TOWN OF CALEDON WORKS DEPT.	HYDRO ONE TELECOM
BELL CANADA	ROGERS CABLE
ENBRIDGE INCORPORATED-GAS DISTRIBUTION	ALLSTREAM
ONTARIO MINISTRY OF TRANSPORTATION	PSN (PUBLIC SECTOR NETWORK)
ONTARIO CLEAN WATER AGENCY	FUTUREWAY (FIBROBROADBAND)
HYDRO ONE NETWORKS	
ENERSOURCE, HYDRO MISSISSAUGA	
HYDRO ONE BRAMPTON	

10m 0 10 20 30m HORIZONTAL SCALE
1m 0 1 2 3m VERTICAL SCALE

Region of Peel
Working for you

AIRPORT ROAD
(FROM PURDUE COURT TO KING STREET)

PROP. ROAD WIDENING

STA. 5+780 TO STA. 5+935.92

BOT. EL. OF W.M.		Area Z-B		Project No.	
5+780	5+800	5+820	5+840	5+860	5+880
5+900	5+920	5+940			
EX. ROAD ELEV.		Checked by		Drawn by X.Y	
ROAD CHANGE		Date MAY 23, 2014		Sheet 25 of 25	
				Plan No.	

6.0 IMPACTS OF THE RECOMMENDED ALTERNATIVE DESIGN

6.1 INTERSECTIONS AND VEHICLE TURNING MOVEMENTS

A realignment of the intersection of Airport Road/Old School Road-Healey Road is recommended to occur as soon as is feasible.

The analysis of signalized intersection vs roundabout was favourable for the implementation of a two lane roundabout at both Healey Rd-Old School Rd/Airport Rd and King St/Airport Rd. The detailed analysis is available in **Section 4.3 of the ESR**.

6.2 ACCESS AND SAFETY

Based on the number of developments and full-moves accesses currently in place within Sandhill, a two-way left turn lane is recommended to reduce friction and conflicts between through movements and left turning vehicles.

By 2031, a road widening to five lanes (four through lanes and a centre two way left turn) on Airport Road within the study will be required based on link level volumes and signal/roundabout analysis.

6.3 PROPERTY

The recommended alternative design is a hybrid approach with widening around the centre line at the south end of the study area to the approximate south end of Sandhill; a shift of the centre line 7.5m to the west to avoid impacts to heritage properties within Sandhill; then a return to the centre line at the roundabout at King Street.

There will be property impacts throughout the corridor; however there are **14** properties that require total buy-out based on the recommended alternative design. These properties are as follows:

13013 Airport Road – PIN 143270001
13213 Airport Road – PIN 14327-0075
13221 Airport Road – PIN 14327-0074
13285 Airport Road – PIN 143270072
13329 Airport Road – PIN 143270068
13341 Airport Road – PIN 143270067
13299 Airport Road – PIN 14327-0071
13309 Airport Road – PIN 14327-0070
13319 Airport Road – PIN 14327-0069
13789 Airport Road – PIN 14327-0051
14001 Airport Road – PIN 143280027

5964 King Street – PIN 14294-0138
5968 King Street – PIN 14294-0139
5961 King Street – PIN 14298-0133

Properties that require full buy-out have been contacted prior to PIC No. 2. Further, two buildings are recommended for demolition: 13803 Airport Road and 13949 Airport Road. The recommended design impacts the Pipe and Drum Building and a structural investigation will be conducted in the detailed design phase to determine if the building can be relocated.

As the project moves into detailed design, all property-owners who will be impacted by the widening or construction of the grading easement will be contacted. Staff met with two property owners, 13186 Airport Road and 13186 Airport Road, and committed to continuing to work with them to mitigate property impacts. At the time of the writing of this report, property impacts to 12451 Airport Road have been mitigated through design changes.

6.4 ACTIVE TRANSPORTATION PEDESTRIAN AND CYCLING FACILITIES

- An on-street bike lane adjacent to the curb (Active Transportation (AT) facility) will be provided within Sandhill with a 1m buffer between traffic and the bike lane (see **Exhibit 8** below). The shoulder will be paved for cyclists in rural areas. Sidewalks will be provided on both sides of the road within Sandhill and on new structures (culverts/bridge) to accommodate AT in the event of future development.
- A safe transition zone between roundabout and paved shoulders will be facilitated through signage or other measures.
- *(Please note: AT plan for Sandhill may be modified in detailed design if the planned redevelopment of adjacent lands has progressed to a point where a change makes sense.)*



Exhibit 8 – pictured is an example of a buffered on-street bike lane taken from the Ontario Traffic Manual Book 18 Cycling Facilities December 2013 document. The final configuration of the Sandhill AT facility will be determined in detailed design.

6.5 ACCESSIBILITY FOR ONTARIANS WITH DISABILITIES (AODA)

The Act requires that all barriers in the built environment (public spaces and buildings) be removed. The corridor design will meet or exceed requirements incorporating accessibility options such as pedestrian cross walks, countdown signals, line markings, accessible curb ramps, and tactile surfaces where feasible. At roundabouts, intersection surface indicators will be provided to accommodate users who have accessibility needs.

6.6 PAVEMENT DESIGN AND REHABILITATION OF EXISTING PAVEMENT

6.6.1 New Pavement

The design traffic calculations and the pavement designs are provided in **Appendix E**. For a design traffic of 5,600,000 ESAL's the flexible pavement structure for new construction, i.e. pavement widening is:

- Hot Mix Asphalt 150 mm
- Granular A Base 150 mm
- Granular B Type II Sub-base 300 mm
- Total Depth 600 mm

However, the pavement investigations indicate that “bathtub” construction exists i.e., the pavement thickness is greater than the thickness of the shoulder granular material which is an obstacle to reliable lateral drainage. Increasing the thickness of the granular sub-base in the widening area in order to provide reliable lateral drainage is recommended.

The recommended pavement structure for new construction (widening) is:

- Hot Mix Asphalt 150 mm
- Granular A Base 150 mm
- Granular B Type II Sub-base 600 mm
- Total Depth 900 mm

as per Design Structural Number 118 mm to 124 mm, Structural Number Provided is 156 mm.

6.6.2 Existing Pavement Rehabilitation

The rehabilitation designs were carried out using the Falling Weight Deflectometer (FWD) data as well as review of recognized design overlay standards. The FWD test is designed to impart a load pulse to the pavement surface which simulates the load produced by a rolling vehicle wheel.

The FWD data indicates that the existing pavement is structurally adequate to carry the design traffic over a service life extension of 20 years. However, the alignment drawings indicate that the vertical alignment of the roadway will be raised in some areas and lowered in other areas.

The recommended pavement rehabilitation strategies for these roadway sections are provided in Table F1 of the Geotechnical Report in **Appendix E**.

6.7 SOCIAL ECONOMIC IMPACTS

The Sandhill Land Use Study (September 2012) is recommending that current residential uses be phased out and that new residential uses not be allowed. Commercial and limited dry industrial uses will be encouraged within the settlement area. It also recommends a combining of accesses as development occurs so the number of approved accesses is reduced.

The proposed roundabouts within the study area will aid traffic seeking to access business located on either side of Airport Road. The Centre turning lane will improve safe turning by give traffic refuge as they seek to turn into businesses on the opposite side of the road.

The recommended design with intersection improvements is compatible with the goals of the Sandhill Land Use Study.

6.8 IMPACTS TO CULTURAL HERITAGE

Cultural heritage resources have been identified throughout the study corridor. Various properties have been identified for complete buyout based on the recommended alternative design. Some properties have identified cultural heritage resources. Cultural Heritage Impact Statements are being prepared for all cultural heritage resource buyout properties.

The decision about the removal or retention of these resources will be made in detailed design in conjunction with Town of Caledon recommendations.

The recommended design alternative has ensured that there are no impacts to Sandhill United Church and the North Peel Community Church.

6.9 LANDSCAPING

The landscaping plan will be determined in detailed design and will follow the guidelines of the Region's Streetscaping Toolbox.

6.10 ENVIRONMENTAL EFFECTS AND RECOMMENDED MITIGATION

6.10.1 Creating an Overall Benefit

Fish Habitat

Salt Creek crosses the study area at 12 locations (3 major, 9 minor) and the entire watercourse is recovery habitat for Redside Dace.

Sizing of the proposed structures for the 3 major crossings was discussed with the Ministry of Natural Resources and Forestry on September 9, 2014. A chart was created to compare

structure alternatives including costs. The recommended design proposes replacement of the 3 major structures as follows:

Norris' Bridge – replace with a 14.46m X3.35m conspan structure

Dean's Culvert – replace with a 10.67m X2.13m precast culvert

Salt Creek Culvert – replace with a 10.67m X2.13m precast culvert

Documentation of options considered and analysis is shown in **Table 6**. Precast Conspan structures were chosen as the preferred option to minimize capital costs in balance with minimizing the loss of endangered species habitat area. The Region commits to incorporating engineered slopes or retaining walls at the detailed design stage to further reduce the area of impact within ESA regulated habitat.

There are 9 smaller crossing culverts for tributaries along the study area that will all be replaced and upsized to 800mm culverts.

Animal Passage

The recommended design alternative is expected to have minimal impacts on wildlife habitat. The existing culvert structures will be replaced with conspan structures that allow for animal passage. Wildlife fences in the meander belt are recommended to funnel wildlife to culvert/bridge crossings.

Sediment

Salt Creek Culvert and Norris Bridge crossings display some areas where sediment is depositing, which likely become fish barriers during low-flow periods. The new expanded structures will benefit channel form, fish passage and sediment transport issues improving habitat for Redside Dace.

Birds

Clearing or disruption of vegetation or replacement of structures where birds may be nesting will be completed outside the nesting window of March 25 to August 31 and permitting requirements will be followed.

It is recommended that nesting cups be provided in new structures for Barnswallows, a Threatened bird species identified in the area. A Barnswallow study is to be conducted using MNRF's self-regulatory registry process for Barnswallow before structure replacement occurs.

Trees

Design impacts to existing trees will result in 151 trees being removed to accommodate the road widening. None of the trees are endangered species.

A total of 47 trees will be removed within the TRCA Regulation Area. Compensation for tree removals will be determined in detailed design.

6.10.2 Evaluation of Structure Alternatives at Major Watercourse Crossings

Table 6 shows the evaluation of structures for the 3 major water course crossings and how the recommended structures will provide an overall benefit to Redside dace habitat.

The Region recommends the use of conspan culverts to minimize capital costs in balance with minimizing the loss of endangered species habitat area. The Region commits to incorporating engineered slopes or retaining walls at the detailed design stage to further reduce the area of impact within ESA regulated habitat.

The table and mapping of Red Side Dace impact for each alternative are provided in detail in **Appendix G, Natural Heritage Assessment**.

Table 6 - Evaluation of Structure Alternatives at the 3 Major Watercourse Crossings

Description				Impact to Redside Dace and Fisheries Habitat					Other Factors				RECOMMENDATION	
Title	Crossing Type	Span (m)	ROW Across Structure/ Flood Plain (m)	Slope	1 Permanent Disturbance (m2)	2 Channel Impact (m2)	3 MBW Impact (m2)	4 MBW + 30 m Impact (m2)	5 Gain of floodplain /MBW/ riparian area (m2)	6 Area of Disturbance/ Fill within Floodplain (m2)	Cost (\$)	Property Impacts		Drainage/ Hydrology
CROSSING # 1 (TRCA ID 2) - NORRIS BRIDGE (Sta. 1+122)														
Existing Conditions: Concrete rigid frame; 10.7m span; Built in 1955 with no signs of distress (overall deck width = 17.2m)														
Alternative 1 – (Modified)* - Extend both sides of existing bridge/culvert	Bridge/ Culvert,	10.7m [L=50.0]	45m road ROW plus side slopes	3:1	1812.42	159.4.0	1593.1 709.0P; 884.1T	2410.3 944.1P; 1466.3T	0	12,185	\$0.7M (plus utility relocation)	1,855 m ² additional property required beyond 45m ROW limit.	Regional Storm overtops roadway (>0.22m)	Alternative 1 is not recommended for the following reasons: <ul style="list-style-type: none"> • Although the existing structure is in good condition, it has a limited service life • Need to replace existing structure to accommodate hydraulic requirements • Would provide less suitable conditions for Redside Dace habitat • Will impact existing utilities (watermain and sanitary)
Alternative 2 - Replace the culvert with Con-Span	Con-Span, with pre-cast headwall & retaining wall	14.6m (x 3.35/3.66 rise) [L=29.9]	45m road ROW plus side slopes	3:1	1431.2	50.0	1179.5 437.2P; 742.3T	2402.6 944.1P; 1458.5T	43.0	11,655	\$1.10M	1,855 m ² additional property required beyond 45m ROW limit.	Overtopping eliminated during Regional Storm conditions	Alternative 2: Replacement of the existing structure with a precast 14.64m X3.35/3.66m rise Con span is recommended for the following reasons: <ul style="list-style-type: none"> • The structure replacement can be undertaken using precast elements to reduce environmental impacts during construction. • Opportunity for improved wildlife passage and provide suitable conditions for Redside Dace habitat as structure is larger and, potentially, will allow more light penetration thus increasing riparian vegetation growth under the structure. • Barn Swallow nest observed during initial field investigations is no longer present, so new structure will not remove any nesting habitat • Meets all hydrologic / hydraulic requirements • Lower overall area of disturbance compared to Alternatives 1 and 3 • Reasonably balances benefits versus impacts/costs.
				2:1	1431.2	50.0	1149.5 437.2P; 712.3T	2222.6 944.1P; 1278.5T	43.0	11,445	\$1.15M	1,800m ²	As above	<ul style="list-style-type: none"> • As above, alternative provides for new headwalls and retaining walls at the structure (i.e. combined structure and retaining walls extend over 27m length each side); however provides for 2:1 side slopes along roadway beyond the immediate area of the structure. • No change to areas of permanent disturbance • Minor reduction to areas of temporary impact to RSD • Additional 300m of barrier protection required (conflicts at driveways) • Lower overall area of disturbance compared to Alternatives 1 and 3
Alternative 3 - Replace the culvert with 40m span Bridge	Bridge	40.0 [W=29.9]	45m road ROW plus side slopes	3:1	1431.2	50.0	829.6 437.2P; 392.4T	3568.5 944.1P; 2624.4T	395.6	13,420	\$4.99M	4,315 m ² additional property required beyond 45m	Overtopping eliminated during Regional Storm conditions	Alternative 3 is not recommended for the following reasons: <ul style="list-style-type: none"> • Structure spans the meander belt, however the fluvial study indicates that geomorphic function would most benefit from improvements to the channel form • Significantly more vegetation removal on west side of Airport Road • Road profile to be raised an additional 1.5m (2.0m total) through the sag curve to accommodate CPCI 2300 girder depth (overall length of grade raise = 440m) • Substantial increase in property impacts/ ROW requirements (grading extends

Table 6 - Evaluation of Structure Alternatives at the 3 Major Watercourse Crossings														
Description					Impact to Redside Dace and Fisheries Habitat					Other Factors				RECOMMENDATION
Title	Crossing Type	Span (m)	ROW Across Structure/ Flood Plain (m)	Slope	1 Permanent Disturbance (m2)	2 Channel Impact (m2)	3 MBW Impact (m2)	4 MBW + 30 m Impact (m2)	5 Gain of floodplain /MBW/ riparian area (m2)	6 Area of Disturbance/ Fill within Floodplain (m2)	Cost (\$)	Property Impacts	Drainage/ Hydrology	
														up to 37m east and west from the proposed centreline of Airport Road in the vicinity of the structure and 44m in fill areas on both sides, which is 14.5m and 21.5m beyond the designated 45.0m ROW respectively) <ul style="list-style-type: none"> Substantial Cost (\$3.59 M structure and \$1.41M roadway) – more than four times greater than Alternative 2 Minimal benefit versus impacts/costs
				2:1	1431.2	50.0	829.6	3343.5	395.6	13,195	\$5.03M	4,040 m ²	As above	<ul style="list-style-type: none"> As above, provides for retaining walls at the end of the structure (i.e. combined structure and retaining walls extend over 52m length each side); however provides for 2:1 side slopes along roadway beyond the immediate area of disturbance No change to areas of permanent disturbance Minor reduction to areas of temporary impact to RSD beyond MBW Additional 250m of barrier protection required
CROSSING # 2 (TRCA ID 4) - DEANS CULVERT (Sta. 3+040)														
Existing Conditions: Non-Rigid Open Footing culvert; 6.5m span; Built in 1955 with no signs of distress (overall length = 19.4m, along skew)														
Alternative 1 - Extend both sides of existing culvert	Culvert	6.5 [L=44.5, along skew]	45m road ROW plus side slopes	3:1	1789.8	111.8	1154.1 645.5P; 508.7T	2077.5 1032.6P; 1044.9T	0	8,393	\$0.52M (plus utility coordination)	Grading maintained within 45m ROW	Regional Storm overtops roadway (>0.48m)	Alternative 1 is not recommended for the following reasons: <ul style="list-style-type: none"> Although the existing structure is in good condition, it has a limited service life Hydrologic/hydraulic analysis shows the need to replace existing structure to accommodate hydraulic requirements Would provide less suitable conditions for Redside Dace habitat Will impact existing utilities (watermain and sanitary)
Alternative 2 - Replace the culvert with Con-Span	Con-Span, with pre-cast headwall & retaining wall	10.67 (x2.13/ 2.44rise) [L=31.6, along skew]	45m road ROW plus side slopes	3:1	1679.1	63.6	1049.2 582.9P; 466.3T	2077.5 1032.6P; 1044.9T	80.2	8,240	\$1.01M	Grading maintained within 45m ROW	Overtopping eliminated during Regional Storm conditions	Alternative 2: Replace the existing culvert with a precast open foot culvert (10.67m X2.13m/2.44m rise) is recommended for the following reasons: <ul style="list-style-type: none"> The structure replacement could be undertaken using precast elements to reduce environmental impacts during construction. Opportunity for improved wildlife passage and provide suitable conditions for Redside Dace habitat as structure is larger and provides for more natural geomorphic processes. Meets all hydrologic / hydraulic requirements. Lower overall area of disturbance compared to Alternatives 1 and 3 Note: Alternative provides for new headwalls and retaining walls at the structure (i.e. combined structure and retaining walls extend over 27m length each side). Shallow cut/fill (<1m) limit opportunity and/or benefits of providing 2:1 side slopes along roadway beyond the immediate area of the structure and in turn, any change to the areas of permanent or temporary disturbance.

Table 6 - Evaluation of Structure Alternatives at the 3 Major Watercourse Crossings

Description				Impact to Redside Dace and Fisheries Habitat					Other Factors				RECOMMENDATION	
Title	Crossing Type	Span (m)	ROW Across Structure/ Flood Plain (m)	Slope	1 Permanent Disturbance (m ²)	2 Channel Impact (m ²)	3 MBW Impact (m ²)	4 MBW + 30 m Impact (m ²)	5 Gain of floodplain /MBW/ riparian area (m ²)	6 Area of Disturbance/ Fill within Floodplain (m ²)	Cost (\$)	Property Impacts		Drainage/ Hydrology
Alternative 3 - Replace the culvert with 40m span Bridge	Bridge	40.0 [W=29.9, perpendicular]	45m road ROW plus side slopes	3:1	1679.1	63.6	775.5 582.8P; 192.7T	2942.6 1032.8P; 1909.8T	555.5	10,603	\$5.08M	4,072 m ² additional property required beyond 45m ROW limit, plus one residential buy-out	Overtopping eliminated during Regional Storm conditions	Alternative 3 is not recommended for the following reasons: <ul style="list-style-type: none"> Given close spacing of watercourses, catchment area does not change. Road profile will need to be raised 1.8m at both Salt Creek and Deans culvert to accommodate bridge girder depth (overall length of grade raise for both crossings = 1050m, Sta. 2+750 to Sta. 3+800; >500 m specific to this crossing) Substantial increase in property impacts/ ROW requirements. Grading extends up to 28m east and west from the proposed centreline of the Airport Road in the vicinity of the structure in fill areas, which is 5.5m beyond designated 45.0m R.O.W Substantial Cost (\$3.5M structure and \$1.58M roadway) – more than five times greater than Alternative 2 Minimal benefit versus impacts/costs
				2:1	1679.1	63.6	775.5 582.8P; 192.7T	2907.6 1032.7P; 1874.9T	555.5	10,568	\$5.12M	3,930 m ²	As above	<ul style="list-style-type: none"> As above, alternative provides for retaining walls at the end of the structure (i.e. combined structure and retaining walls extend over 52m length each side); however provides for 2:1 slopes along roadway beyond the retaining walls No change to areas of permanent disturbance Very minor reduction to areas of temporary impact to RDS Additional 250m of barrier protection required
CROSSING # 3 (TRCA ID 5) - SALT CREEK CULVERT (Sta. 3+440)														
Existing Conditions: Concrete rigid frame box culvert; 7.2m span; Built in 1960 with no signs of distress (overall length = 22.4m, along skew)														
Alternative 1 - Extend both sides of existing culvert	Culvert	7.2 [L=47.5, along skew]	45m road ROW plus side slopes	3:1	2109.2	43.5	1274.8 738.1P; 536.7T	3235.8 1327.7P; 1908.2T	0	8,640	\$0.6M (plus utility relocation)	Grading maintained within 45m ROW	Regional Storm overtops roadway (>0.49m)	Alternative 1 is not recommended for the following reasons: <ul style="list-style-type: none"> Although the existing structure is in good condition, it has a limited service life Hydrologic/hydraulic analysis shows need to replace existing structure to accommodate hydraulic requirements Provides less suitable conditions for Redside Dace habitat Will impact existing utilities (watermain and sanitary)
Alternative 2 - Replace the culvert with Con-Span	Con-Span, with pre-cast headwall & retaining wall	10.67 (x2.13/2.44rise) [L=34.5, along skew]	45m road ROW plus side slopes	3:1	1994.2	27.0	1099.6 639.6P; 460.0T	3235.9 1327.7P; 1908.2T	68.6	8,450	\$1.06M	Grading maintained within 45m ROW	Overtopping eliminated during Regional Storm conditions	Alternative 2: Replacement of the existing culvert with a precast open foot culvert (10.67m X2.13m/2.44m rise) is recommended for the following reasons: <ul style="list-style-type: none"> The structure replacement could be undertaken using precast elements to reduce environmental impacts during construction Opportunity for improved wildlife passage and provide suitable conditions for Redside Dace habitat as structure is larger and provides for more natural geomorphic processes Meets all hydrologic /hydraulic requirements Lower overall area of disturbance compared to Alternatives 1 and 3 Note: Alternative provides for new headwalls and retaining walls at the structure (i.e. combined structure and retaining walls extend over 27m length)

														each side). Shallow cut/fill (<1m) limit opportunity and/or benefits of providing 2:1 side slopes along roadway beyond the immediate area of the structure and in turn, any changes to the areas of permanent or temporary disturbance.
Alternative 3 - Replace the culvert with 40m span Bridge	Bridge	40.0 [W=29.9, perpendicular]	45m road ROW plus side slopes	3:1	1993.7	27.0	792.8 639.1P; 153.7T	4590.1 1327.6P; 3262.5T	610.0	10,070	\$5.5M	4,870 m ² additional property required beyond 45m ROW limit	Overtopping eliminated during Regional Storm conditions	Alternative 3 is not recommended for the following reasons: <ul style="list-style-type: none"> Given close spacing of watercourses, catchment area does not change. Road profile will need to be raised 1.8m at both Salt Creek and Deans culvert to accommodate bridge girder depth (overall length of grade raise for both crossings = 1050m, Sta. 2+750 to Sta. 3+800; >650 m specific to this crossing) Substantial increase in property impacts/ ROW requirements. Grading extends up to 27.5 m east and west from the proposed centreline of the Airport Road in the vicinity of the structure in fill areas, which is 5.0m beyond designated 45.0m R.O.W Substantial Cost (\$3.5M structure and \$2.0M roadway) – more than five times greater than Alternative 2 Minimal benefit versus impacts/costs
	Bridge	40.0 [W=29.9, perpendicular]		2:1	1993.7	27.0	792.8 639.1P; 153.7T	4555.1 1327.6P; 3227.5T	610.0	10,035	\$5.55M	4,730 m ²	As above	<ul style="list-style-type: none"> As above, alternative ;provides for retaining walls at the end of the structure (i.e. combined structure and retaining walls extend over 52m length each side); however provides for 2:1 slopes along roadway beyond the retaining walls. No changes to areas of permanent disturbance Very minor reduction to areas of temporary impact to RSD Additional 250m of barrier protection required

Notes:

1. Permanent Disturbance: area of the new roadway, sidewalks, etc. (excluding slopes) that is permanently lost
2. Channel Impact: area of the bankfull (high flow) channel enclosed by the new structure or requiring realignment
3. MBW Impact: area of the MBW (minus bankfull channel) impacted by grading, tree clearing, temporary construction access/staging, SWM outfalls, etc.
4. MBW + 30 m Impact: area of the MBW + 30 m (minus MBW and bankfull channel) impacted by grading, tree clearing, temporary construction access/staging, SWM outfalls, etc.
5. Gain of floodplain/MBW/riparian area: amount of habitat (minus the bankfull channel) that is gained under the new structure
6. Area of Disturbance/ Fill within Floodplain: area impacted by grading/fill within the Regulatory Flood Plain

*Alternative 1 has been modified, for the purposes of this table, to reflect a culvert extension to the toe of fill in place of a wingwall and headwall configuration

6.10.3 Summary of Proposed Natural Environment Mitigation Strategies for the Recommended Design

Element	Impact of Recommended Design	Proposed Mitigation Strategy
Air	Over the long term the Airport Road reconstruction will result in improved air quality associated with improved traffic flow and use of roundabouts. There will be short term air quality impacts from construction related to a number of different operations and sources.	During construction, best management practices to mitigate air quality impacts caused by construction dust will be applied including the use of non-chloride dust suppressants. Before construction staff will review the list of fugitive dust prevention and control measures as set out in the document " <i>Cheminfo Services Inc. Best Practices for the Reduction of Air Emissions from Construction and Demolition Activities Report</i> ", prepared for Environment Canada, March 2005.
Noise	Road noise levels will increase with widening. Residential locations affected by the increased noise levels were reviewed.	Two side facing lots were evaluated for mitigation of noise. Of the two lots, only one exceeds the 60 dBA requirement for mitigation. However, the difference between the predicted noise level with and without improvements is only 0.03 dBA, which is an imperceptible increase. The noise level exceeds the maximum specified by Policy W30-04 by less than 1 dBA. Mitigation of is not recommended.
Well Water	The proposed construction works will not involve significant excavation and will not result in adverse impacts to local ground water conditions or wells	A pre-construction survey of existing wells will be conducted and several monitoring wells will be installed adjacent to the construction works to provide for independent monitoring of ground water levels.
Stormwater /Drainage	Salt Creek is a cold water stream and recovery habitat for Redside Dace and requires Type 1 Treatment-Enhanced Water Quality.	Enhanced water quality will be achieved through a train of treatment approach for stormwater combining oil and grit separators, bio-retention swales with infiltration trenches.
Soil	The recommended alternative design will impact properties that include a retail gas station and a number of light industrial properties may be a potential source of impact.	If soil removed during construction is determined to be contaminated, its removal will be consistent with Part XV.1 of the Environmental Protection Act and Ontario Regulation 153/04, Records of Site Condition, which details the requirements related to site assessment and clean up.

Element	Impact of Recommended Design	Proposed Mitigation Strategy
Fish & Animal Habitat	Larger structures required to support the widening of the road.	<ul style="list-style-type: none"> • A conspan bridge and 2 precast open foot culverts are recommended for the 3 major creek crossings. They will improve wildlife passage and provide suitable conditions for Redside Dace habitat as the structures are larger and, potentially, will allow more light penetration thus increasing riparian vegetation growth under the structure. Nine smaller crossing culverts for tributaries will be replaced and upsized to 800mm culverts. • Salt Creek Culvert and Norris Bridge crossings display some areas where sediment is depositing, which likely become fish barriers during low-flow periods. The new expanded structures will benefit channel form, fish passage and sediment transport issues improving habitat for Redside Dace.
Trees	The recommended design impacts 151 existing trees. None of the trees are endangered species. A total of 47 trees will be removed within the TRCA Regulation Area.	<ul style="list-style-type: none"> • Compensation for tree removals will be determined in detailed design and reviewed with TRCA for those trees within its regulation area.
Birds	Clearing and grubbing of existing vegetation will take place during construction of the road widening. A Barnswallow nest was found on an existing culvert.	<ul style="list-style-type: none"> • Clearing or disruption of vegetation or replacement of structures where birds may be nesting will be completed outside the nesting window of March 25 to August 31 and permitting requirements will be followed. • Nesting cups to be provided on new structures for Barnswallows. A Barnswallow study is to be conducted using MNR's self-regulatory registry process for Barnswallow before structure replacement occurs.

7.0 NOTICE OF COMPLETION and CONSTRUCTION

7.1 NOTICE OF COMPLETION

The final step in Phase 4 of the environmental assessment process is to publish the Notice of Completion and mail it to reviewing agencies and the public. The ESR document is placed for public review with the Regional Clerk and on the Region's website, with the Town of Caledon's Clerk and at the local Library located in Caledon East. If there are no Part II Orders received for the study then the Region may proceed with the detailed design and construction of the recommended works. **Directions on how to initiate a Part II Order are given in Section 1.6 of this report.**

The Notice of Completion has been advertised twice in the Caledon Enterprise on October 8 and October 15, 2015 for a 30 day review period ending November 6, 2015. A copy of the Notice of Completion is shown in **Appendix A**.

7.2 UTILITIES

The following utility companies were contacted at the beginning of the study and invited to participate as a member of the Technical Advisory Committee. Following are the list of utilities that provided comments and locations in the study area and will continue to be consulted in the construction phase.

Utility	Comment
Hydro One	Hydro one has both overhead and underground conductor in this area Operating voltage being 16/27.6 KV. The offset of underground cable from property line is 2.5-3.5m. Hydro line locations were provided.
Enbridge Gas	indicated they have no activity in the area
Prestige Telecom Inc.	Location markings were provided.
Hydro One Grid Operations	Provided the location of existing underground facilities with ties from property line
Trans Canada Pipeline	No comment received
Trans-Northern Pipelines Inc.	No comment received
MTS – Allstream	No comment received
Canadian Pacific Railway	No comment received
BLINK Communications Inc.	No comment received
Telus Communications	No comment received
Rogers Communications	Rogers has no objection to the proposed widening. There is an aerial fibre plant located

	in the study area at King Street and Airport Road. Caution is advised.
Rogers Cable System Inc.	Rogers has a buried Fiber plant in the area.
Bell Canada	No comment received
Region of Peel Water and Sanitary Systems	Existing sanitary and watermain locations provided. No new planned servicing.

7.3 PROPOSED CONSTRUCTION MONITORING

During construction the Region will review the implementation of mitigation measures and recommended design features to ensure that they are consistent with the contract and commitments made.

A Sediment and Erosion control plan will be prepared in detailed design to reduce the impact of construction activities on the study area watershed and watercourses. The sediment and erosion control plan will meet the requirements of the Toronto and Region Conservation Authority.

The Region will consult with the Ministry of the Environment and Climate Change (MOECC) Central Region Permit to Take Water (PTTW) Coordinator prior to detailed design to confirm any approval requirements for water takings during construction or operation. This will include groundwater or surface water extraction, and the active diversion of surface water flows by pumping in exceedance of 50,000 LPD. If a PTTW is required for construction dewatering, a site specific monitoring program for discharge water quality and quantity, as well as a mitigation program will be put in place.

7.4 COST ESTIMATE

The estimated cost of the recommended design alternative at the 30 percent design stage is as follows:

Description	Millions of \$
Storm Sewer/Drainage Works	2,196,069
Road Works	13,916,668
Traffic Signals	10,000
Street Lighting Work	928,000
Structural Work	3,166,632
GRAND TOTAL	20,217,369

The above costs will be updated as the project progresses through detailed design.

