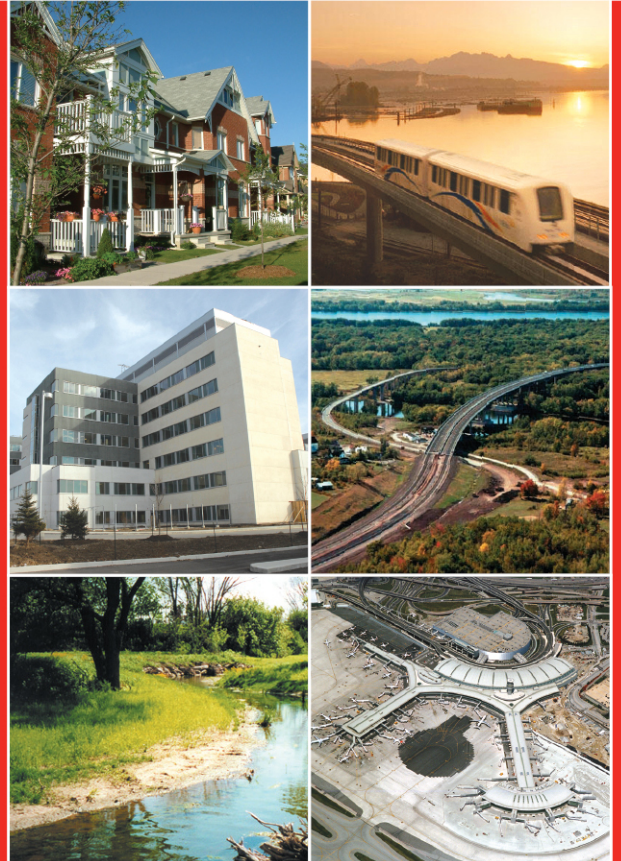


MMM Group Limited



Initial Design Report

Highway 7 New, Kitchener to Guelph, 18 km

G.W.P. 408-88-00

Prepared for the Ministry of Transportation
Group 'A' Project

COMMUNITIES
TRANSPORTATION
BUILDINGS
INFRASTRUCTURE



16.08027 E8 | April 2014

Highway 7 New Kitchener and Guelph, 18 km GWP 408-88-00

Initial Design Report

**Class Environmental Assessment for Provincial Transportation Facilities
Group 'A' Project**

April 9, 2014

Prepared for the Ministry of Transportation

A handwritten signature in blue ink, reading "Jeff Warren".

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Alla Dinerman, P. Eng.
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Ce document hautement spécialisé n'est disponible qu'en anglais en vertu du règlement 671/92, qui en exempte l'application de la Loi sur les services en français. Pour de l'aide en français veuillez communiquer avec Heather Edwardson, ministère des Transports au: (905) 704-2210.

This document is available for public review and comments for a period of thirty (30) days between April 9, 2014 and May 9, 2014 at the following locations. MTO will consider comments received in finalizing the design.

Review Locations

Ministry of the Environment
Environmental Assessment &
Approvals Branch
2 St. Clair Avenue West, Floor
12 A
Toronto, Ontario

**Regional Municipality of
Waterloo**
Clerk's Department
150 Frederick Street
Kitchener, Ontario

Township of Woolwich
69 Arthur Street South
Elmira, Ontario

**Township of
Guelph/Eramosa**
Clerk's Department
8348 Wellington Road 124
Rockwood, Ontario

Marden Branch Library
7368 Wellington Road 30
(RR5)
Marden, Ontario

Dana Porter Library
University of Waterloo
200 University Avenue West
Waterloo, Ontario

Ministry of the Environment
West Central Regional Office
119 King St. West
12th Floor
Hamilton, Ontario

County of Wellington
Clerk's Department
74 Woolwich Street
Guelph, Ontario

City of Guelph
Clerk's Department, City Hall
1 Carden Street
Guelph, Ontario

Kitchener Public Library
85 Queen Street North
Kitchener, Ontario

**Bloomington Branch
Library**
860 Sawmill Road
Bloomington, Ontario

McLaughlin Library
University of Guelph
50 Stone Road East
Guelph, Ontario

Ministry of the Environment
Guelph District Office
1 Stone Road West
Guelph, Ontario

Ministry of Transportation
West Region
Front Lobby
659 Exeter Road
London, Ontario

City of Kitchener
Clerk's Department
200 King Street West
Kitchener, Ontario

Waterloo Public Library
35 Albert Street
Waterloo, Ontario

Guelph Public Library
100 Norfolk Street
Guelph, Ontario

**Wilfred Laurier University
Library**
75 University Avenue West
Waterloo, Ontario

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Executive Summary

This report documents the Initial Design Phase for Highway 7 New from the Highway 85 (Kitchener-Waterloo Expressway) in the City of Kitchener easterly to Highway 6 (Hanlon Expressway) in the City of Guelph. The Initial Design Phase provides a more definitive configuration and footprint of the 2007 approved plan and incorporates accepted improvements recommended by the VE Study. It also summarizes commitments to be carried out during the next phase of design and throughout construction.

The planning study for the Highway 7 New project was conducted as an Individual EA which was approved by the Minister of the Environment (Minister) in March 2007. The study is documented in the 2004 Highway 7 Kitchener to Guelph Amendment to the Environmental Assessment Report, 1997. A Value Engineering (VE) Study was subsequently carried out by the Ministry of Transportation (MTO) in 2007 to identify opportunities to improve the design, provide updates and improve the overall value of the project. The proposed VE changes were documented in a Transportation Environmental Study Report (TESR) to Amend the Individual EA (May 2012) and received Environmental Clearance in October, 2012.

During the identification and evaluation of VE alternatives, consultations were held with external agencies and interested stakeholders to ensure that regulatory requirements were met and concerns raised by these groups were considered. This included Public Information Centres held in Kitchener and Guelph in May 2011. Consultation with local municipalities, counties, townships, recreational trail groups, property owners and local stakeholder groups were held during this study. Consultation and engagement with various First Nations communities was also undertaken.

The existing environmental conditions within the Highway 7 New study area were updated and documented through field investigations. The existing aquatic and terrestrial ecosystems, including species at risk and significant natural areas; archaeological and built heritage resources; socio-economic environment, groundwater conditions; contaminant and waste management; and, hydrology were assessed to identify potential impacts so that mitigation measures and strategies could be identified to be carried forward to Detailed design and construction.

Impacts to watercourses and fish habitat are mitigated as the majority of the highway crossings are structures that will span the watercourse providing fish passage and the hydrology regime that supports fish habitat is maintained. Where culverts are proposed fish habitat is considered to be indirect and therefore flow conveyance is provided but fish habitat mitigation is not required. Terrestrial habitat features affected by the highway are wetlands and upland forests. These include the provincially significant Hopewell- Bloomington Wetland, Townline Road Wetland, Ellis Creek and Marden South (part of the Marden Wetland Complex). Non-significant wetlands include the Regional Road 30 complex. The upland habitats include the deciduous forest of the Weiland Tract, patchy forest habitat of the Grand River valleyland. Vegetation removal and impacts to wildlife are not significant for the majority of these habitats.

The highway will fragment the Weiland Tract forest and Marden South wetland. It will skirt the edge of the Townline West and Townline East units and will remove the south portion, containing deciduous swamp, from the Regional Road 30 complex. The Marden South feature will be bisected creating a south and north parcel separated by the highway. For each of these features no significant species were identified and new edges created will receive forest edge management treatments to mitigate effects from sunscald, wind exposure and invasive species. Several of these features are large enough to provide forest interior habitat. Forest interior

habitat will remain for all features; however, the amount at Marden South will be significantly reduced. Wildlife studies included inventories of bird species in some woodlands, deer overwintering survey and an update to the status of the great blue heron nesting site (heronry).

The deer overwintering survey identified the movement pattern of deer in the Highway 7 New corridor. Deer overwintering was observed in some features including Hopewell Creek, Townline East and West, and Marden South. Deer movement was observed to occur east to west between Bloomingdale-Rosendale feature and Regional Road 30 Complex north of Highway 7 New which will not be affected. Deer overwintering in Marden South will be impacted as this feature will be bisected and will prevent internal movement within the unit. Movement was noted to occur north from this feature to Ariss Woods to the north. Wildlife fencing will be provided at Marden South, Townline West and Townline East to prevent wildlife access to the highway. Structures crossing the Grand River, Hopewell Creek and Ellis Creek will provide opportunities for wildlife movement.

The surficial geology, MOE water well records and field observations identify that shallow groundwater occurs at Hopewell Creek and this area also provides a groundwater discharge/recharge function. Other watercourses and wetlands occur mostly within till and groundwater contributions may be limited to shallow zones of sands, gravels and with limited groundwater discharge/recharge. Shallow overburden wells occur at shallow depths and would be susceptible to impact from construction. Deeper wells founded in bedrock would likely not be affected by construction. Further investigation of wells is required at the detailed design stage.

Archaeological investigations carried out for this design stage identified 4 sites that require Stage 4 mitigation. Stage 2 and 3 investigations are required at sites where permission to enter was not granted or the lands were in crop production and could not be accessed. This work is to be completed in the detailed design stage.

Several cultural heritage resources are identified in the study corridor. These include farm buildings and properties, and cultural landscapes. Additional investigations and mitigation measures will be determined during detailed design.

Recreational trails in the corridor include the Walter Bean Grand River Trail which travels along the Grand River Valley in the vicinity of the crossing and the Grand Valley Trail that parallels Rosendale Creek. A small section of the Walter Bean Trail will be realigned to accommodate the bridge abutment on the south side of the river. At Rosendale Creek, the Grand Valley Trail will be directed to pass beneath the structure in order to cross the highway.

The next phase of design, detailed design will involve updates to technical reports as necessary, conditions of the EA Approval will be further addressed, mitigation plans will be finalized, and consultation with interested and affected stakeholders will continue throughout the detailed design and construction stages. A Design and Construction Report (DCR) will be prepared to summarize the Class EA process and document the detailed design. The number and scope of DCRs will be dependent upon the number of contract sections. Each contract section specific DCR will be published for public review and comment. The DCRs will not be eligible for a *Part II Order* “bump-up” request.

Table of Contents

Review Locations.....	i
Project Managers – Contact Information	ii
Executive Summary	iii
1.0 Project Overview.....	1
1.1 Project History and Environmental Assessment Program	1
1.1.1 Planning and EA Study	1
1.1.2 Value Engineering Study	2
1.2 Consultation Program During VE Evaluation and Initial Design Phase	4
1.2.1 Public Information Centers	4
1.2.2 Agency and Municipal Consultation	6
1.2.3 First Nations Consultation and Engagement.....	7
2.0 Existing Conditions	7
2.1 Fish and Fish Habitat.....	8
2.1.1 Grand River Drainage Features 1 and 2	9
2.1.2 Grand River	9
2.1.3 Rosendale Creek.....	10
2.1.4 Ebycrest Tributary (Main Channel & Side Channel).....	10
2.1.5 Hopewell Creek	11
2.1.6 Tillich Drain.....	11
2.1.7 West Tributary of Ellis Creek.....	12
2.1.8 Ellis Creek	12
2.1.9 Marden Drain.....	12
2.1.10 Guelph Ditch.....	12
2.1.11 Ponds	13
2.2 Terrestrial Ecosystem	24
2.2.1 Wetlands	24
2.2.2 Vegetation	24
2.2.3 Wildlife	26
2.3 Species at Risk.....	31

2.4	Groundwater and Wells	36
2.5	Socio-Economic Environment	38
2.5.1	Governance and Population	38
2.5.2	Recreational Trails	39
2.5.3	Agriculture	41
2.6	Contaminated Property Identification and Management.....	41
2.7	Cultural Heritage – Built Heritage and Cultural Heritage Landscapes.....	44
2.7.1	Cultural Heritage Landscapes	44
2.7.2	Built Heritage Resources.....	45
2.8	Cultural Heritage – Archaeology.....	45
2.9	Surface Water / Drainage	47
2.10	Noise	47
2.11	Air Quality	47
3.0	Description of Initial Design	48
3.1	Road Network.....	48
3.2	Horizontal Alignment	48
3.3	Vertical Alignment.....	49
3.4	Typical Cross Section.....	50
3.5	KWE / Wellington Street Freeway-to-Freeway Interchange	50
3.6	Sideroads	52
3.6.1	Interchanges.....	53
3.6.2	Grade Separation	55
3.6.3	Local Road Realignments / Connections	56
3.6.4	Road Closures.....	56
3.7	Structures	56
3.7.1	Navigability	61
3.7.2	Bridge Aesthetics	61
3.8	Drainage and Stormwater Management.....	66
3.8.1	Drainage.....	66
3.8.2	Stormwater Management	74
3.9	Property Requirements.....	77

3.10	Utilities	77
3.11	Draft Design Criteria	77
4.0	Environmental Effects and Proposed Mitigation	78
4.1	Fish and Fish Habitat.....	78
4.1.1	General Environmental Effects and Mitigation Measures.....	78
4.1.2	Site Specific Environmental Effects and Mitigation Measures.....	79
4.2	Terrestrial Ecosystem	81
4.2.1	Vegetation	81
4.2.2	Wildlife	84
4.2.3	Landscape Composition	87
4.2.4	Forest Edge Management.....	88
4.3	Species at Risk.....	92
4.4	Groundwater and Wells	92
4.5	Socio-Economic Environment	94
4.5.1	Recreational Trails	94
4.5.2	Agriculture	94
4.5.3	Property Requirements	99
4.6	Contaminated Property Identification and Management.....	99
4.7	Cultural Heritage – Built Heritage and Cultural Heritage Landscapes.....	99
4.8	Cultural Heritage – Archaeology.....	102
4.9	Surface Water / Drainage	103
4.10	Erosion and Sediment Control.....	103
4.11	Noise	104
4.12	Air Quality	104
5.0	Commitments to Future Work.....	105
5.1	Commitments To Consultation, Compliance Monitoring And Permits/Approvals	105
5.1.1	Consultation and Engagement	105
5.2	Environmental Commitments	106
5.2.1	Specific Technical Discipline Study Requirements	107
5.2.2	Environmental Assessment Documentation.....	110
5.2.3	Permits, Approvals and Authorizations	110

5.2.4	Engineering, Surveys and Highway Design	111
5.2.5	Construction Documentation and Plans	112
6.0	Environmental Compliance Monitoring	132
7.0	References	136

List of Figures

Figure 1.1:	Highway 7 New Study Corridor.....	1
Figure 1.2:	Value Engineering Target Areas.....	3
Figure 2.1:	Natural Heritage and Aquatic Features (1)	16
Figure 2.2:	Natural Heritage and Aquatic Features (2)	17
Figure 2.3:	Natural Heritage and Aquatic Features (3)	18
Figure 2.4:	Natural Heritage and Aquatic Features (4)	19
Figure 2.5:	Terrestrial Ecosystem Features (1)	20
Figure 2.6:	Terrestrial Ecosystem Features (2)	21
Figure 2.7:	Terrestrial Ecosystem Features (3)	22
Figure 2.8:	Terrestrial Ecosystem Features (4)	23
Figure 2.9:	Surficial Geology and MOE Recorded Water Wells	37
Figure 2.10:	Recreational Trails.....	40
Figure 2.11:	Areas of Potential Contamination Concern (West)	42
Figure 2.12:	Areas of Potential Contamination Concern (East).....	43
Figure 3.1:	Highway 7 New Typical Sections.....	51
Figure 3.2:	Existing Drainage Conditions.....	67
Figure 3.3:	Drainage Mosaic – Kitchener, Grand River	68
Figure 3.4:	Drainage Mosaic – Ebycrest.....	69
Figure 3.5:	Drainage Mosaic – Regional Road 30.....	70
Figure 3.6:	Drainage Mosaic – Guelph Road 3.....	71
Figure 3.7:	Drainage Mosaic – Guelph, Silvercreek Parkway.....	72
Figure 3.8:	Location of Bridge Crossings.....	75

List of Tables

Table 2.1: Watercourse Location	8
Table 2.2: Summary of Existing Fish and Fish Habitat Conditions	14
Table 2.3: Summary of Species at Risk and Provincially Rare Species with the Potential to Occur in the Highway 7 Study Area	32
Table 2.4: Summary of Factors for Relative Contamination Rankings	41
Table 3.1: Proposed Interchange Locations / Types	53
Table 3.2: Proposed Grade Separations	56
Table 3.3: Recommended Structure Location / Description	58
Table 3.4: Recommended Structural Culvert Location / Description	61
Table 3.5: Retaining Wall Location and Summary Description	62
Table 3.6: Summary of Recommended Aesthetic Features	63
Table 3.7: Proposed Culverts	73
Table 4.1: Forest Interior Areas for Eight Woodlots	85
Table 4.2: Recommended Forest Edge Management	90
Table 4.3: Summary of Impacts and Mitigation for Agriculture (Table 6.4.2, EA 2004)	95
Table 4.4: Summary of Cultural Heritage Resources Requiring Additional Documentation	101
Table 5.1: Summary of Environmental Effects and Proposed Mitigation for the Initial detailed design of Highway 7 New (GWP 408-88-00)	113
Table 6.1: EA Compliance Monitoring Program.....	134
Table A 1: Summary of Evaluation of VE Recommendations and Impacts	
Table C 1: Summary of Agencies Comments during MOE Review and MTO Responses	

Appendices

Appendix A: Summary of Approved VE Recommendations	
Appendix B: Correspondence (Project Start-up, PIC, TESR Filing)	
Appendix C: Agency Comments, MOE Review and MTO Response	
Appendix D: Plan and Profile Drawings	
Appendix E: General Arrangement Drawings	
Appendix F: Design Criteria	

1.0 Project Overview

The MTO has developed the Initial Design of Highway 7 New, an 18 km four-lane divided highway extending from Highway 85 (Kitchener Waterloo Expressway) in Kitchener easterly to Highway 6 (Hanlon Expressway) in Guelph (Figure 1.1). The Individual EA for this new route was approved with conditions in March 2007 (as documented in *Highway 7 Kitchener to Guelph Amendment to the Environmental Assessment Report 1997*). Changes to the approved EA design were recommended at various locations based on a Value Engineering (VE) Study which was carried out by the MTO in 2007. These changes are documented in the TESR to Amend the Individual EA (TESR) (2012), which received environmental clearance for Right-of-Way (ROW) Designation and Proposed Expropriation on October 22nd, 2012. The Initial Design further develops and refines the approved EA design and incorporation of the VE design improvements.

1.1 Project History and Environmental Assessment Program

1.1.1 Planning and EA Study

The environmental assessment process for the Highway 7 New project began in 1989 when the Ministry of Transportation retained McCormick Rankin (MRC) to carry out the Highway 7 Planning Study – Kitchener to Guelph. The purpose of the undertaking was to address the existing transportation deficiencies in the Highway 7 corridor between Kitchener and Guelph and to provide acceptable highway service to the year 2028.

On December 23, 1997, the Ministry of Transportation (MTO) submitted the environmental assessment report (EA Report 1997) to the Ministry of Environment, seeking approval to construct a new 4-lane controlled access freeway between Kitchener and Guelph. The EA was conducted to address service, capacity and safety issues along this section of existing Highway 7. The Ministry of the Environment's (MOE) government review of the project was completed on September 18, 1998 and MOE concluded that the proponent had met the requirements of the Environmental Assessment Act (EAA). However, in response to concerns raised by local municipalities and local environmental groups, MTO requested that the decision on the EA be deferred.

MTO subsequently completed additional studies and submitted an amendment to the EA Report 1997 for review and approval. The EA amendment was formally submitted to MOE on October 29, 2004 which was followed by a government agency and public review period. A team of technical experts identified as the Government Review Team (GRT) reviewed the EA for its technical merits and to ensure that the data presented was accurate and the conclusions valid, based on the mandate of each member agency. The public also had the opportunity to review the EA and submit comments to the MOE. Additional First Nations consultation and engagement was also conducted by MTO.

The GRT review concluded that the MTO had carried out a complete and thorough EA planning process, and that the requirements of the EA had been satisfied. The undertaking was given approval to proceed subject to a number of Conditions of Approval, through an Order in Council dated March 21, 2007.

On August 22, 2007 the new route was designated as a controlled access highway under the Provincial Transportation and Highway Improvement Act to protect the corridor from development.

M:\Jobs\2008\16.08027.001\EN1 - MTO Highway 7 Kitchener-Guelph(mapping)\mxd\2011 01\Study Corridor.mxd



CLIENT
**MINISTRY OF
TRANSPORTATION**

TITLE
**Highway 7 Four Lining from Kitchener to Guelph
Study Corridor**

PREPARED BY:



Figure 1.1

A Transportation Environmental Study Report (TESR) to amend the approved Individual EA was made available for public review on May 30, 2012 for a period of 30-days, ending on June 29, 2012. The TESR documented the proposed changes to the approved design based on the further assessment of VE recommendations that were developed from the VE study carried out in 2007. A Part II Order was requested regarding potential impacts to a business including effects to future expansion opportunities and staff/business access to the property. The Part II Order was denied by the Minister of the Environment. Environmental Clearance was received on October 9, 2012.

A description of the VE Engineering Study and approved VE recommendations that have been incorporated into the Initial Design are summarized below.

1.1.2 Value Engineering Study

In 2007, the MTO undertook a VE Study to:

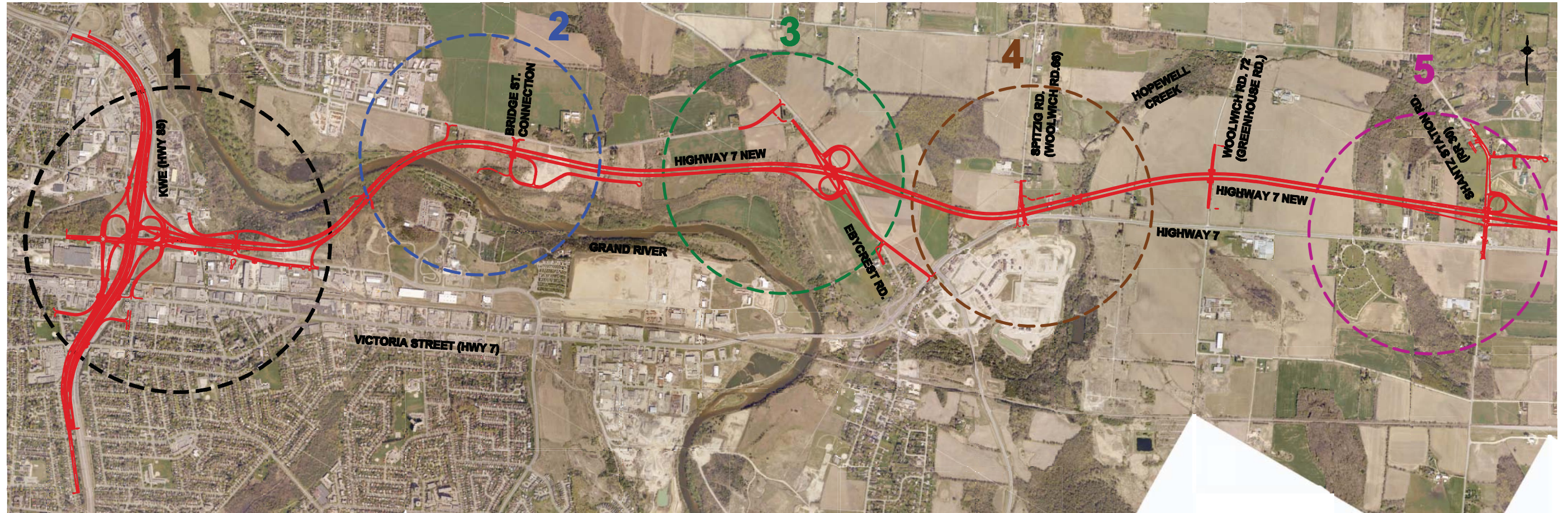
- Improve the value of the project – identify opportunities to achieve the objectives in a more effective manner; and,
- Provide update to the design – review the design to ensure it was effectively meeting the functional objectives of the project

The VE study was undertaken within a number of accepted constraints as a result of the 2007 approved EA, which included:

- The alignment of the mainline could not be significantly altered;
- Highway 7 would ultimately be no less than a four-lane divided controlled access highway;
- The interchange access points would remain the same in the ultimate configuration; and
- A rural cross section (shoulders and ditches) would be used east of the Kitchener Waterloo Expressway (KWE)

Ten (10) VE recommendations were considered for implementation into the Initial Design at five (5) site specific locations, referred to as *Value Target Areas*. Figure 1.2 shows the location of each value target area that was identified in the TESR (May 2012). Overall, the VE recommendations were not substantial changes to the approved plan; they provide the following benefits:

- Overall function and constructability;
- Operation;
- Reduced environmental impacts;
- Safety;
- Reduced property impact; and,
- Reduced costs.



Target Area 1: VE Recommendations - 1, 2, 3, 4

Target Area 2: VE Recommendations - 5

Target Area 3: VE Recommendations - 6, 7

Target Area 4: VE Recommendations - 8

Target Area 5: VE Recommendations - 9, 10

Client:



Title:

VALUE ENGINEERING (VE) TARGET AREAS

Prepared By:



Reviewer: SR

MMM: 16.08027.001.EN1

MTO: 408.88.00

Figure: 1.2

Date: MAY 2012

Nine (9) of the ten VE recommendations were incorporated into the design. The recommendations incorporated into the design include:

- Shift new ramps at the Highway 85 (Kitchener-Waterloo Expressway) and Highway 7 New freeway to freeway interchange to north of Wellington Street North
- Eliminate Riverbend Drive to Highway 7 New west on-ramp
- Shift Highway 7 New westbound off-ramp to Riverbend Drive further west
- Move on-ramp at Bridge Street to Highway 7 New westbound
- Realign Bridge Street at Ebycrest Road
- Close Ebycrest Road at Victoria Street
- Re-alignment of Spitzig Road at existing Highway 7
- Modified access north/south to Highway 7 westbound at new Shantz Station Road interchange
- Combine service road and private residential access at Shantz Station Road

In addition, municipal road improvements have been identified to improve traffic operations, including a left turn lane to Highway 7 New westbound from Silvercreek Parkway northbound, and four lanes plus a turning lane as required where Shirley Ave. is currently 2 lanes. The evaluation of the approved VE recommendations is presented in Table A-1 (**Appendix A**).

1.2 Consultation Program During VE Evaluation and Initial Design Phase

Consultation is an integral component of the Class EA process and is carried out in conjunction with transportation engineering and environmental protection principles. It involves contact with external agencies (provincial, federal, municipal); First Nations and Aboriginal communities; the public and interested stakeholders at the earliest stages to ensure decisions are made after considering environmental impacts. Public consultation is then carried out at critical design stages to provide updates and an opportunity to provide comments on the project.

Consultation was continued throughout the VE and Initial Design Phase. External agencies and interested stakeholders were contacted and informed of the proposed design and have been given an opportunity to comment on pertinent environmental issues.

Notices were published one and two weeks prior to the project start-up and the PIC in 2011 and one week prior to the filing of the TESR, advising the start of the review period. The notification for filing of the IDR for public review will appear at least one week prior to the start of the review period.

1.2.1 Public Information Centers

In 2011, the MTO presented information on the results of the VE study and the Initial Design Phase to the public. MMM and MTO staff made presentations to the councils of the Township of Woolwich, City of Kitchener, County of Wellington and the Regional Municipality of Waterloo, met with businesses and landowners and held two stakeholder group meetings in advance of the two Public Information Centres (PIC). The stakeholder meetings were held with the informally named “Shirley Avenue business group” for matters related to VE recommendations in Target Area 1 and with property owners along Ebycrest Road for matters related to VE

recommendation 7, to close Ebycrest Road at its intersection with future Fountain Street Extension.

A Notice of Public Information Centre was published one and two weeks in advance of the PICs in the Kitchener-Waterloo Record, Guelph Mercury on April 23 and April 30, 2011. The notice also appeared in the Tekawennake News and Turtle Island News on April 20 and April 27, 2011. This notice informed the public of the date and location of the PICs, including a brief summary of information to be presented, identified the MTO and Consultant project managers with contact information and explained how the public could participate in the process. A copy of the Notice is provided in **Appendix B**.

The PICs were held at two locations. The first was held on Tuesday May 3, 2011 at Bingemans, located at 425 Bingemans Centre Drive in Kitchener, ON. The second was held on Thursday May 5, 2011 at the Guelph Place Banquet Hall, located at 492 Michener Road in Guelph, ON. The PICs were an open-house drop-in style between 4:00 pm and 8:00 pm. Brief presentations were made at the PIC's.

The following information was presented on display boards at the PIC:

- Welcome;
- Project Background;
- Freedom Of Information And Protection Of Privacy;
- Environmental Assessment (EA) Process;
- What Have We Been Doing Since The EA Was Approved In 2007?;
- Value Engineering (VE) Study;
- Summary Of VE Evaluation And Conclusion;
- 2007 EA Approved Design Features;
- Natural, Physical And Social Environment Existing Conditions, Impact Assessment And Mitigation;
 - Water Crossings And Fish Habitat
 - Vegetation
 - Wetlands
 - Wildlife
 - Contaminated Waste Management
 - Groundwater And Wells
 - Archaeology
 - Cultural Heritage
 - Recreational Trails
- Plans of VE recommendations;
- Initial Design Phase Plan;
- Project Status; and,
- Where Do We Go From Here?

The detailed PIC board information is found in **Appendix B**.

Several project team members from the MTO and Consultant were available to answer questions related to the highway design, property, the environment and the Environmental Assessment (EA) process. Several comments were received as a result of the PIC; these comments and the responses provided by the MTO are summarized in the PIC Summary Report and TESR (2012) on-file with the MTO.

1.2.2 Agency and Municipal Consultation

Provincial and federal government agencies were contacted and informed of the recommended VE design changes. Letters inviting input and comment on the study were mailed on June 13, 2008, accompanied by a copy of the Notice of Study Commencement. The following is a list of agencies that received the notice:

- Provincial Ministries/Agencies:
 - Environment;
 - Tourism and Culture (now; Tourism, Culture and Sport);
 - Natural Resources;
 - Municipal Affairs and Housing;
 - Agriculture, Food and Rural Affairs;
 - Aboriginal Affairs;
 - Community, Family and Children's Services;
 - Ontario Provincial Police – Western Region; and,
 - Ontario Realty Corporation
- Federal Departments
 - Canadian Environmental Assessment Agency;
 - Environment Canada – Ontario Region;
 - Department of Fisheries and Oceans Canada; and,
 - Indian and Northern Affairs Canada.

Similar letters to those prepared for provincial and federal agencies were sent to the local municipalities, agencies and conservation authority in June, 2008. A Notice of Commencement accompanied each letter. The list of municipalities included the following:

- Municipalities/Agencies
 - Region of Waterloo;
 - County of Wellington;
 - Cities of Kitchener and Guelph;
 - Township of Guelph/Eramosa;
 - Township of Woolwich;
 - Grand River Conservation Authority; and,
 - Waterloo Regional Police Service.

Meetings/Presentations were held with the following agencies:

- Canadian Environmental Assessment Agency – Teleconference;
- Department of Fisheries and Oceans – on-site meeting;
- Ministry of Natural Resources;
- Grand River Conservation Authority;
- Region of Waterloo;
- County of Wellington;
- Township of Woolwich;
- City of Kitchener; and,
- Walter Bean Grand River Trail committee/Grand Valley Trail committee.

A summary of agency comments to the 2004 EA are presented in Table C-1, (**Appendix C**) and documented in the Review of the Environmental Assessment, Highway 7 – Kitchener to Guelph Amendment to Environmental Assessment Report 1997 (EA File No. TC-SW-02). The table includes MTO's original and on-going responses and commitments to concerns and comments identified by these agencies.

1.2.3 First Nations Consultation and Engagement

First Nations Communities that may have interest in the study area were advised of the initiation of this study and the PIC. Individual letters were mailed to the following and included a copy of the Notice of Study Commencement and the Notice of PIC:

- Alderville
- Association of Iroquois and Allied Indians
- Beausoleil
- Chippewas of Georgina Island
- Chippewas of Nawash
- Chippewas of the Thames
- Curve Lake
- Hiawatha
- Huron-Wendat
- Mississaugas of the New Credit
- Rama First Nation
- Saugeen First Nation
- Scugog Island First Nation
- Six Nations of the Grand River
- Six Nations of the Grand River Territory, Haudenosaunee Confederacy Chiefs Council
- Union of Ontario Indians – Nipissing First Nation
- United Anishnabaag Councils

The Notice of Study Commencement was published in the Turtle Island News and Tekawennake News on June 18 and June 25, 2008, the Notice of Public Information Centre was published on April 20 and April 27, 2011 was published in the Tekawennake News and the Notice of the Transportation Environmental Assessment Report was published in the Turtle Island News and Tekawennake News on May 23, 2012.

Direct consultation and engagement with the Six Nations of the Grand River Territory was undertaken by the MTO. On January 19, 2011, the MTO project team presented a project update to the Six Nations Director, Lands and Resources Department and Six Nations Eco-Centre manager and staff. Six Nations confirmed their request to monitor any further archaeological field investigations.

Six Nations, Alderville and Curve Lake First Nations have indicated an interest to be contacted in association with the undertaking and results of further archaeological investigations.

MTO is committed to further meetings and discussions with First Nations as the project progresses, and will continue to develop and update a work plan in consultation with Six Nations of the Grand River to address their concerns.

2.0 Existing Conditions

The existing environmental conditions relevant to the project have been documented and the potential impacts that may result from the construction of the project have been assessed. This section summarizes the findings of the technical environmental investigations related to: Fish and Fish Habitat, Terrestrial Ecosystems, Species at Risk, Groundwater, Socio-Economic Environments, Contaminated Property Identification and Management, Cultural Heritage

(Archaeology / Built Heritage and Landscape) and Surface Water/Drainage. Technical reports for each discipline are on file with the Ministry of Transportation.

2.1 Fish and Fish Habitat

Aquatic habitat crossings have been identified using the names for watercourses presented in the *Amended Environmental Assessment Report* (MRC/Ecoplans Limited 2004). Where a watercourse was not officially named, it was informally named for this report. For isolated ponds that were unnamed, a naming convention was assigned based on location along the alignment from west to east.

The project corridor is located within the Grand River watershed. The Grand River originates with headwaters near Dundalk, Ontario and outlets near Port Maitland, Ontario into the eastern end of Lake Erie. The Grand River flows through several urban centers, including Kitchener, and Cambridge, and is the largest inland river system in southern Ontario and the largest Canadian tributary of Lake Erie. There are three main tributaries to the Grand River, the Speed/Eramosa River, the Conestogo River and the Nith River (GRCA, 2008).

The highway corridor will cross the Middle Grand River Reach Main Stem and its tributaries as well as tributaries of the Speed River Sub-Basin. The Middle Grand River Reach originates north of Fergus, Ontario and extends southerly to Brantford, Ontario. The Speed River sub-basin originates with headwaters upstream of the Guelph Reservoir and outlets into the Grand River at the town of Preston approximately 2100 m southwest of the eastern end of the project corridor, (4000 m south of Highway 401) (GRCA, 2005). The tributaries of the Speed River in the project corridor flow south to the Speed River within the City of Guelph, Ontario.

The existing conditions are detailed in the Fish and Fish Habitat Impact Assessment Report, which is on file at the Ministry of Transportation (London) office. Table 2-1 identifies the location each watercourse or aquatic feature assessed during the Initial Design study. Figures 2.1-2.8 show the location of the watercourses and identify their sensitivity. The assessment of sensitivity for each watercourse was confirmed by the MNR. Fish community sampling and habitat descriptions were carried out in the spring and summer of 2008.

Table 2.1: Watercourse Location

Waterbody Identification	County	Location [UTM 17 T]	Structure Identification	MTO Chainage
Grand River Drainage Features 1 & 2	Waterloo	543214 4812970 ¹	—	20+300
		543295 4812966 ²		20+390
		543857 4813538 ³		21+200
Grand River	Waterloo	543947 4813692		21+500
Rosendale Creek	Waterloo	545003 4814272		22+800

¹ West Branch Drainage Feature 1

² East Branch Drainage Feature 1

³ Drainage Feature 2 near proposed bridge abutment.

Waterbody Identification	County	Location [UTM 17 T]	Structure Identification	MTO Chainage
Ebycrest Tributary Main Channel	Waterloo	546013 4814832	Culvert 8	23+960
Ebycrest Tributary Side Channel	Waterloo	546046 4814611	—	23+860
Hopewell Creek	Waterloo	547660 4815635		25+850
Tillich Drain (Tributary of Hopewell Creek)	Waterloo	549187 4816493	Culvert 16	27+593
Pond 1	Waterloo	549429 4816727	—	27+800
Pond 2	Waterloo	549631 4816717	—	27+900
West Tributary of Ellis Creek	Wellington	552648 4818696	Culvert 24	30+100
Ellis Creek	Wellington	553592 4819829		33+400
Marden Drain	Wellington	555259 4821877 ⁴	Culvert 33	36+000
Pond 3	Wellington	555544 4822364	—	36+400
Guelph Ditch ⁵	Wellington	556327 4822260 556214 4822313	Culvert 74 & Culvert 75	37+000

2.1.1 Grand River Drainage Features 1 and 2

Fish were not observed during field investigations and due to the shallow depths observed during spring field investigations, fish community sampling was not undertaken. Due to the steeply sloped channels, numerous vertical drops and poor connectivity with downstream fish communities, access to fish from the Grand River is unlikely.

These two features function primarily as drainage by conveying runoff and stormwater flow from commercial properties and forested valley lands. Due to poor connectivity to the Grand River these features function as indirect fish habitat and the sensitivity of the fishery and fish habitat has been assessed as **low**. The assessment of the fish and fish habitat sensitivity has been supported by the MNR (Pers. Comm. Art Timmerman, Management Biologist, Guelph District MNR; November 2, 2009).

2.1.2 Grand River

The Grand River supports a highly diverse warmwater fish community, with over 82 species of fish documented in the watershed and is dominated by top predators; including walleye,

⁴ The GPS location represents the approximate location of the centerline for the proposed alignment. Field investigations were not conducted at this location due to a lack of private property access.

⁵ The GPS points indicate the two separate locations where the proposed highway centerline crosses this feature. Culverts associated with this feature cross the N/S-W and S-E ramps at Silvercreek Parkway.

smallmouth bass and northern pike. Based background fish community data collected through previous survey efforts in 1997, the Grand River, at the proposed crossing, provides suitable habitat for a diverse warmwater fish community comprised of a diverse baitfish community and top predator species. The fish community data provided by the MNR and DFO also includes several provincially and federally listed species that are known or assumed to occur in the vicinity of the proposed alignment, including: Wavy-rayed Lampmussel, Silver Shiner and Greenside Darter. Further details about Species at Risk are described in Section 2.3.

The Grand River is a well-defined channel approximately 60 m wide and consists entirely of run habitat through the assessment area. The substrate composition and in-stream cover is generally consistent throughout the assessment area with minor variances in substrate composition, bank cover and density of in-stream vegetation across the channel.

Fish and Fish Habitat Sensitivity for this reach of the Grand River was determined to be **moderate**, according to the MNR. However, due to the assumed presence of the Wavy-rayed Lampmussel, which is classified as a Schedule 1 Species at Risk and the known presence of Greenside Darter, classified as Schedule 3, our sensitivity determination for the Grand River within the vicinity of the Right-of-Way (ROW) has been assessed as **high** and is supported by the MNR.

2.1.3 Rosendale Creek

This watercourse originates north of Bridge Street from the Bloomingdale-Rosendale Wetland and continues downstream through agricultural lands where it was considered to be influenced by livestock access, based on observations during the Highway 7 New Planning Study, before crossing Bridge Street (MRC/Ecoplans Limited, 2004). No evidence of livestock access occurs within the study area south of Bridge Street. South of Bridge Street this watercourse flows in a southerly direction through a valleyland with an active quarry occupying lands to the west of the creek. The valley increases in depth downstream of the proposed crossing as it flows into the Grand River Valley.

Watercress (*Nasturtium officinale*) is abundant within the limits of the ROW and observed downstream, but is limited upstream of the crossing. Marsh marigold (*Caltha palustris*) is also present within the ROW. Both plant species are indicators of groundwater.

Based on background fish community data collected upstream of the proposed crossing, this watercourse provides suitable habitat to support a coolwater baitfish community. The diverse habitat found throughout the ROW and most notably downstream of the proposed crossing provides suitable habitat with abundant riffle, pool habitat with suitable substrates for blacknose dace, creek chub and white sucker.

This watercourse has the potential to provide coldwater habitat based on recorded temperatures obtained during field investigations and evidence of groundwater input. The MNR has classified Rosendale Creek as coolwater, which supports a coolwater, generalist fish community that is not dependent on coldwater habitat. Therefore, the fishery and fish habitat sensitivity is considered to be **low**, which is consistent with the MNR assessment (Art Timmerman, MNR; Pers. Comm. March 13, 2009).

2.1.4 Ebycrest Tributary (Main Channel & Side Channel)

This unnamed tributary of the Grand River, informally named the Ebycrest Tributary, originates north of Ebycrest Road as a small wetland and generally flows in a southerly direction to the Grand River. As it crosses under Ebycrest Road and into the project corridor it flows in a

southwest direction in a valley feature that increases in depth as it flows into the Grand River Valley becoming less steep as it approaches the Grand River floodplain. Downstream of the ROW the watercourse in the steep valley receives flow from a small intermittent channel (west side channel) that originates from the tile drain outlet located in the ROW.

The lower reach of the main channel is considered to provide direct fish habitat. The upstream reach of the Ebycrest Tributary within the proposed highway ROW and the side channel are considered to be indirect fish habitat due to the number of barriers to fish passage preventing access to the upper reaches.

The MNR has classified these tributaries as having a **low** fish and fish habitat sensitivity (Art Timmerman, MNR; Pers. Comm. September 15, 2008).

2.1.5 Hopewell Creek

This watercourse originates north of the towns of Maryhill and Ariss and generally flows in a southwesterly direction through agricultural land to its confluence with the Grand River approximately 2.7 km downstream of the ROW. Within the project corridor this watercourse is considered to be a third order stream by the GRCA (GRCA, 2009). Downstream of the project corridor and approximately 300 m upstream from its confluence with the Grand River, the creek has been impounded by a weir to create an online pond, west of Woolwich Street South.

This watercourse provides direct fish habitat for a wide range of fish species. It has been classified as coolwater by the MNR and is considered to have coldwater potential through discharge conditions and restoration potential (Art Timmerman; Pers. Comm. February 27, 2009; MRC/Ecoplans Limited, 2004). The fish community supported within the watercourse consists of a number of coolwater baitfish species with top predator species and a species indicator of coldwater (mottled sculpin).

The fishery and fish habitat sensitivity has been assessed as **moderate**, consistent with the MNR assessment (Art Timmerman, MNR Pers. Comm. September 15, 2008) as it provides direct fish habitat for a complex fish community consisting of top predators, insectivores and generalists. The thermal classification and thereby in-water construction timing periods, should reflect the coolwater classification by the MNR (Art Timmerman, MNR; pers. comm. September 15, 2008).

2.1.6 Tillich Drain

This feature originates south of Victoria Street and generally flows northerly to the confluence with Hopewell Creek approximately 750 m downstream of the proposed centerline. The watercourse appears to have been channelized in many reaches including through the ROW to accommodate agricultural practices. The watercourse splits into two channels as it reaches the property just north of Victoria Street and then joins to form one channel as it crosses the ROW.

In the absence of barriers to fish passage between Hopewell Creek and the reach within the limits of proposed ROW, this watercourse is considered to provide potential habitat for baitfish species tolerant of limited flows, dense aquatic vegetation and organic/mucky substrates.

This watercourse has the potential to provide direct seasonal habitat for baitfish, but functions primarily as agricultural drainage. The fishery and fish habitat sensitivity has been assessed as **low**, consistent with the MNR assessment (Art Timmerman, MNR Pers. Comm. September 15, 2008).

2.1.7 West Tributary of Ellis Creek

This tributary to Ellis Creek originates within a forested wetland complex north of the proposed alignment. It generally flows southerly to its confluence with Ellis Creek approximately 1.1 km downstream of the proposed centerline, south of Victoria Street.

Based on the fact that several sampling programs have failed to capture fish in this intermittent watercourse, there is no suitable refuge habitat within the ROW to maintain a resident fish population and the presence of several barriers to fish passage observed downstream of the ROW, this feature functions as indirect habitat to the main channel of Ellis Creek. In addition, this intermittent feature conveys seasonal flow from runoff and forested wetland drainage downstream to Ellis Creek. As a result, the fishery and fish habitat sensitivity has been assessed as **low**, consistent with the MNR assessment (Art Timmerman, MNR Pers. Comm. September 15, 2008).

2.1.8 Ellis Creek

Ellis Creek originates east of Wellington Road 86 as agricultural drainage within the Marden South wetland complex. This watercourse has a relatively large drainage area through predominantly agricultural lands. At the crossing, the watercourse flows through active pasture lands. The GRCA states that this watercourse is capable of supporting both cold and warmwater fish communities (GRCA, 2009), while the MNR classifies the watercourse within the study area as warmwater (Art Timmerman, MNR; pers. comm. September 15, 2008).

This watercourse provides direct habitat for a coolwater fish community consisting of generalist fish species able to tolerate a wide range of thermal regimes. The thermal regime, based on recorded temperatures, appears to provide warmwater habitat within the reach at the location of the proposed crossing. The fishery and fish habitat sensitivity has been assessed as **low**, consistent with the MNR assessment (Art Timmerman, MNR Pers. Comm. September 15, 2008).

2.1.9 Marden Drain

This feature appears to function as field drainage, generally flowing southward and consists of a highly channelized path between agricultural fields and through swamp wetland within the ROW limits. Downstream beyond the ROW the flow is conveyed through a realigned channel that follows the urban roadways as roadside ditches for 17 km before converging on the east side of the Hanlon Parkway with the channel informally referred to in this report as the Guelph Ditch. The flow continues southward within the defined roadside ditch for 12 km before flowing through a 700 m piped section then continuing as surface flow for 12 km prior to discharging into the Speed River.

This feature functions primarily as a drainage feature by conveying runoff from agricultural lands. Due to limited access to the location of the proposed crossing, the sensitivity of the fishery and fish habitat in this feature is based upon on the assessment by the MNR, which assessed the fish and fish habitat of this features as **low** (Art Timmerman, MNR Pers. Comm. September 15, 2008). Further investigations may be required during a later design stage to confirm the function of this watercourse as fish habitat at the crossing.

2.1.10 Guelph Ditch

For the purpose of this project the drainage feature that crosses Curtis Drive and Silvercreek Parkway is informally identified as the "Guelph Ditch". This feature originates north of Curtis

Drive as field drainage and generally flows in a southerly direction to roadside ditches that discharge into a below ground stormwater system east of Silvercreek Parkway North.

This feature functions primarily as an intermittent drainage feature by conveying runoff from adjacent roads and agricultural lands. Water levels fluctuate in response to rain events. Although two individual brook sticklebacks were sampled within the ROW, the feature lacks permanent refuge habitat within the limits of the ROW to support a sustainable resident fish community. Furthermore, this feature has been significantly altered through channelization within the ROW. As a result, field investigations support the **low** sensitivity assessment determined by the MNR (Art Timmerman, MNR Pers. Comm. September 15, 2008).

2.1.11 Ponds

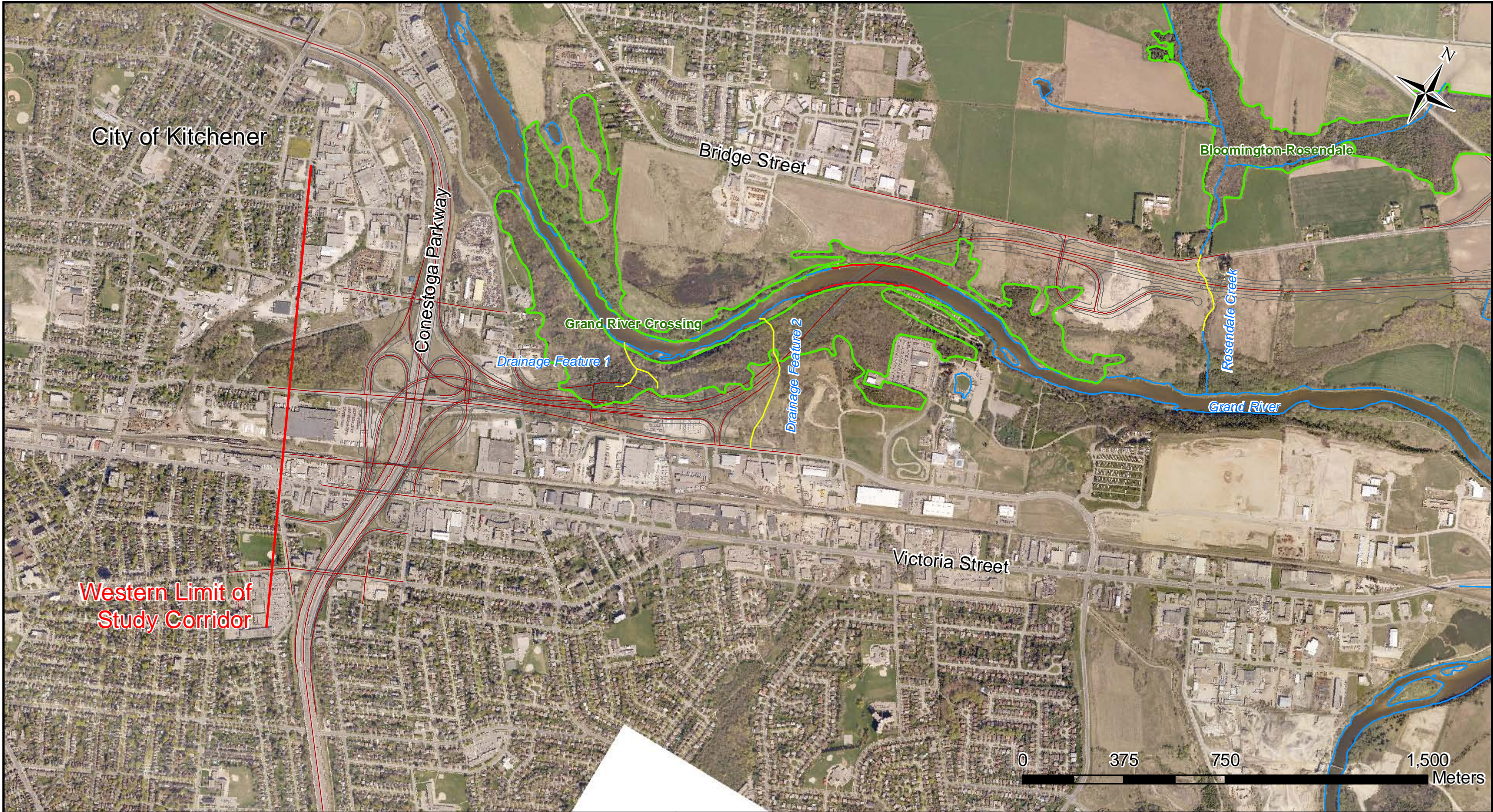
Three ponds were identified during a review of aerial photography along the highway corridor as having a potential to provide fish habitat. These are unnamed features and for this project are identified as Pond 1, 2 and 3. These ponds were assessed during field investigations to ascertain their function as direct, indirect or non-fish habitat. Although the MNR have identified these ponds as having a **low** sensitivity (Art Timmerman, MNR, pers. comm. September 15, 2008) they appear to have been constructed for agricultural purposes (i.e. irrigation, livestock use, etc.) and are not directly connected to fish habitat. As a result, they are not considered to function as fish habitat. Therefore, species and habitat sensitivity determinations are not applicable for the three ponds.

Table 2-2 provides a summary of fish community and habitat conditions for each watercourse assessed.

Table 2.2: Summary of Existing Fish and Fish Habitat Conditions

Waterbody	Flow	Substrate Type		Vegetation (riparian & in-stream)		Fish Observed (species)	Directly Supports a Fishery (Y/N)	Type of Fishery Supported	Thermal Regime (warm/cool/cold)
Grand River Drainage 1	Intermittent	<u>Sand (pools)</u>	<u>Gravel/Cobble (riffles)</u>	Forested Riparian		None	No	Indirect	Unknown
Grand River Drainage 2	Intermittent	<u>Till, Cobble, Gravel</u>	<u>Sand</u>	Forested Riparian		None	No	Indirect	Unknown
Grand River	Permanent	<u>South Bank:</u> Gravel – 40% Cobble – 20% Silt – 15% Sand – 20% Boulder – 5%	<u>North Bank:</u> Cobble – 30% Gravel – 30% Boulder – 20% Sand – 10% Silt – 10%	Submergent 60% Emergent 40%	Submergent 10% Emergent 90%	Smallmouth Bass Silver Shiner Blackside Darter Common Shiner Fantail Darter Greenside Darter Golden Redhorse Stonecat White Sucker Rock Bass Rainbow Darter	Yes	Warmwater Sportfish Warmwater Baitfish SAR Mussels Present SAR Fish Species Present	Warmwater
Rosendale Creek	Permanent	Cobble – 40% Gravel – 25% Boulder – 15% Sand – 25% Clay – 5%		Submergent 30% Emergent 70%		Brook Stickleback Blacknose Dace Creek Chub White Sucker Shiners	Yes	Coolwater Baitfish	Coolwater
Ebycrest Tributary	Permanent / Intermittent	<u>Main Channel:</u> Cobble – 10% Gravel – 70% Sand – 15% Clay – 4% Boulders – 1%	<u>Western Side Channel:</u> Boulder – 20% Cobble – 40% Gravel – 25% Sand – 5% Silt – 5% Clay – 5%	<u>Main Channel:</u> Emergent 100%	<u>Western Side Channel:</u> Emergent 100%	Brook Stickleback	Yes	Indirect (crossing) Seasonal Baitfish (confluence)	Warmwater

Waterbody	Flow	Substrate Type	Vegetation (riparian & in-stream)	Fish Observed (species)		Directly Supports a Fishery (Y/N)	Type of Fishery Supported	Thermal Regime (warm/cool/cold)
Hopewell Creek	Permanent	Cobble – 40% Gravel – 25% Boulder – 20% Sand – 15%	Submergent 20% Emergent 79% Algae 1%	Creek Chub Blacknose Dace Longnose Dace Common White Sucker Bluntnose Minnow Common Shiner Hornyhead Chub River Chub Johnny Darter Fantail Darter	Rainbow Darter Stonecat Rock Bass Northern Hog Sucker Least Darter Pumpkinseed Iowa Darter Mottled Sculpin Golden Shiner Spottail Shiner	Yes	Coolwater Baitfish with Top Predators	Coolwater
Tillich Drain Tributary of Hopewell Creek	Permanent	Organic / Muck – 100%	Emergent 90% Submergent 10%	None		Yes	Seasonal Baitfish	Warmwater
West Tributary of Ellis Creek	Intermittent	Cobble – 4% Sand – 10% Gravel – 20% Silt – 40% Boulder – 5% Muck – 24%	Emergent 100% Submergent 0%	None		No	Indirect	Warmwater
Ellis Creek	Permanent	Organic / Muck – 55% Silt – 30% Clay 15%	Emergent 75% Submergent 20% Floating 5%	Central Mudminnow Brook Stickleback		Yes	Coolwater Baitfish	Warmwater
Marden Drain	N/A	N/A	N/A	N/A		No	Indirect	Warmwater
Guelph Ditch	Intermittent	Clay – 30% Organic / Muck – 20% Sand – 30% Detritus – 20%	Emergent 100% Submergent 0%	Brook Stickleback		Yes	Coolwater Baitfish	Warmwater



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Legend

- Natural Heritage Features
- Watercourse

FISH HABITAT SENSITIVITY

- Low Sensitivity Watercourse
- Moderate Sensitivity Watercourse
- High Sensitivity Watercourse

CLIENT

MINISTRY OF TRANSPORTATION

TITLE

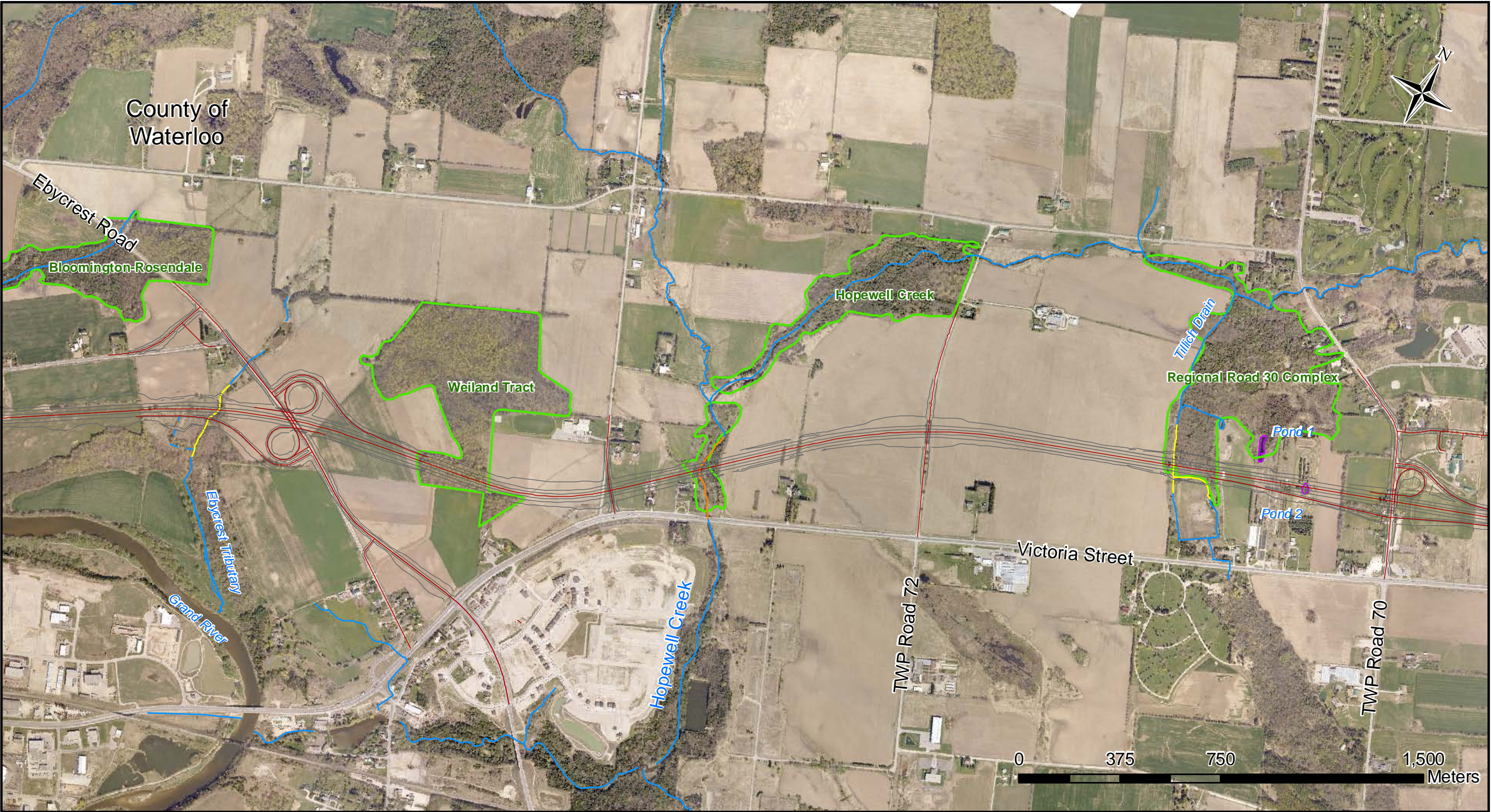
Highway 7 Four Laning from
Kitchener to Guelph
Natural Heritage and Aquatic Features



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Scale	As Shown	Figure No.	2.1

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Legend

- Natural Heritage Features
- Watercourse
- Intermittent Feature
- Other Aquatic Feature

FISH HABITAT SENSITIVITY

- Low Sensitivity Watercourse
- Moderate Sensitivity Watercourse
- High Sensitivity Watercourse

CLIENT

MINISTRY OF TRANSPORTATION

TITLE

Highway 7 Four Laning from
Kitchener to Guelph
Natural Heritage and Aquatic Features



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- Natural Heritage Features
- Watercourse

FISH HABITAT SENSITIVITY

- Low Sensitivity Watercourse
- Moderate Sensitivity Watercourse
- High Sensitivity Watercourse

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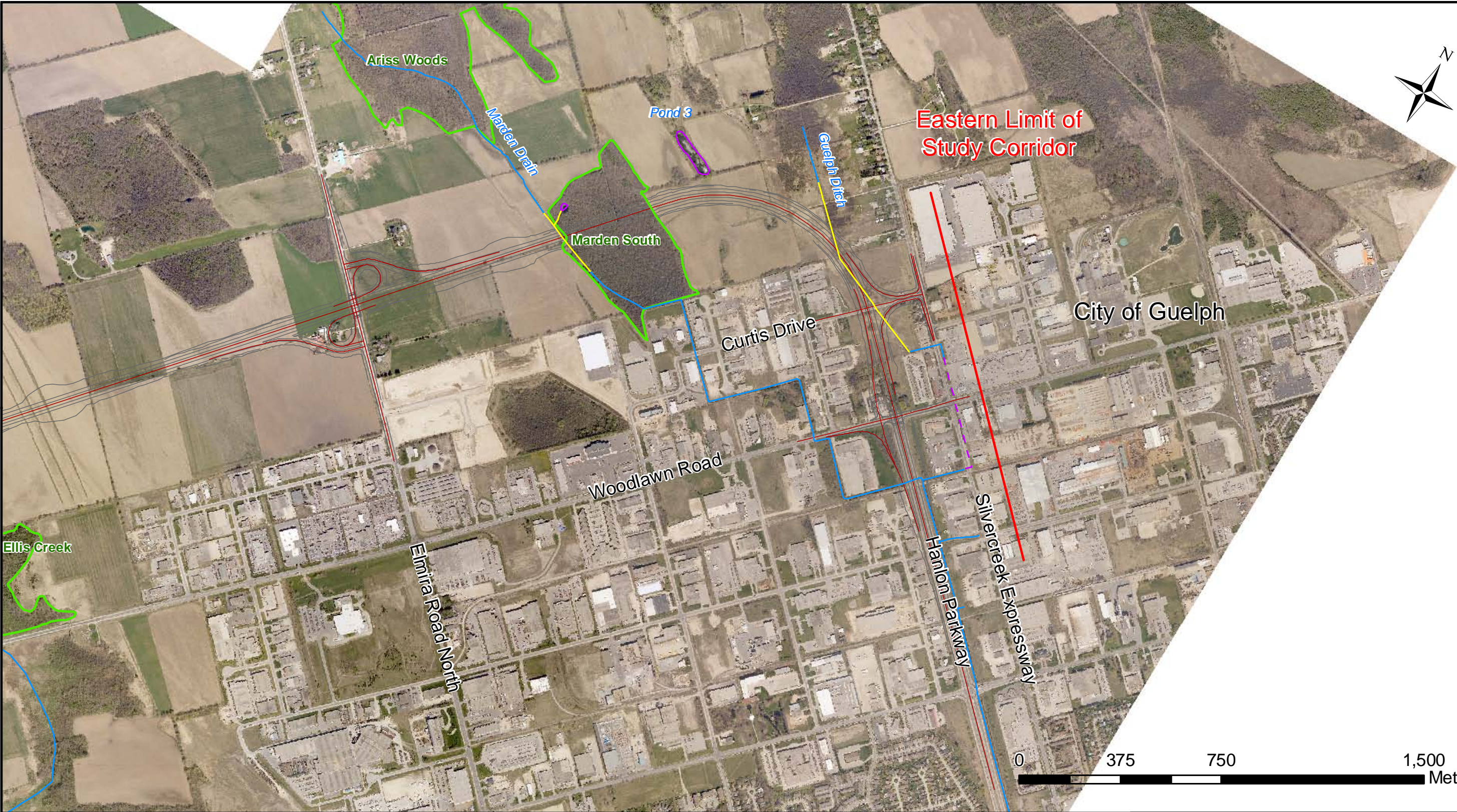
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Highway 7 Four Laning from
Kitchener to Guelph
Natural Heritage and Aquatic Features



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- Natural Heritage Features
- Watercourse
- Municipal Stormwater System
- Other Aquatic Features

FISH HABITAT SENSITIVITY

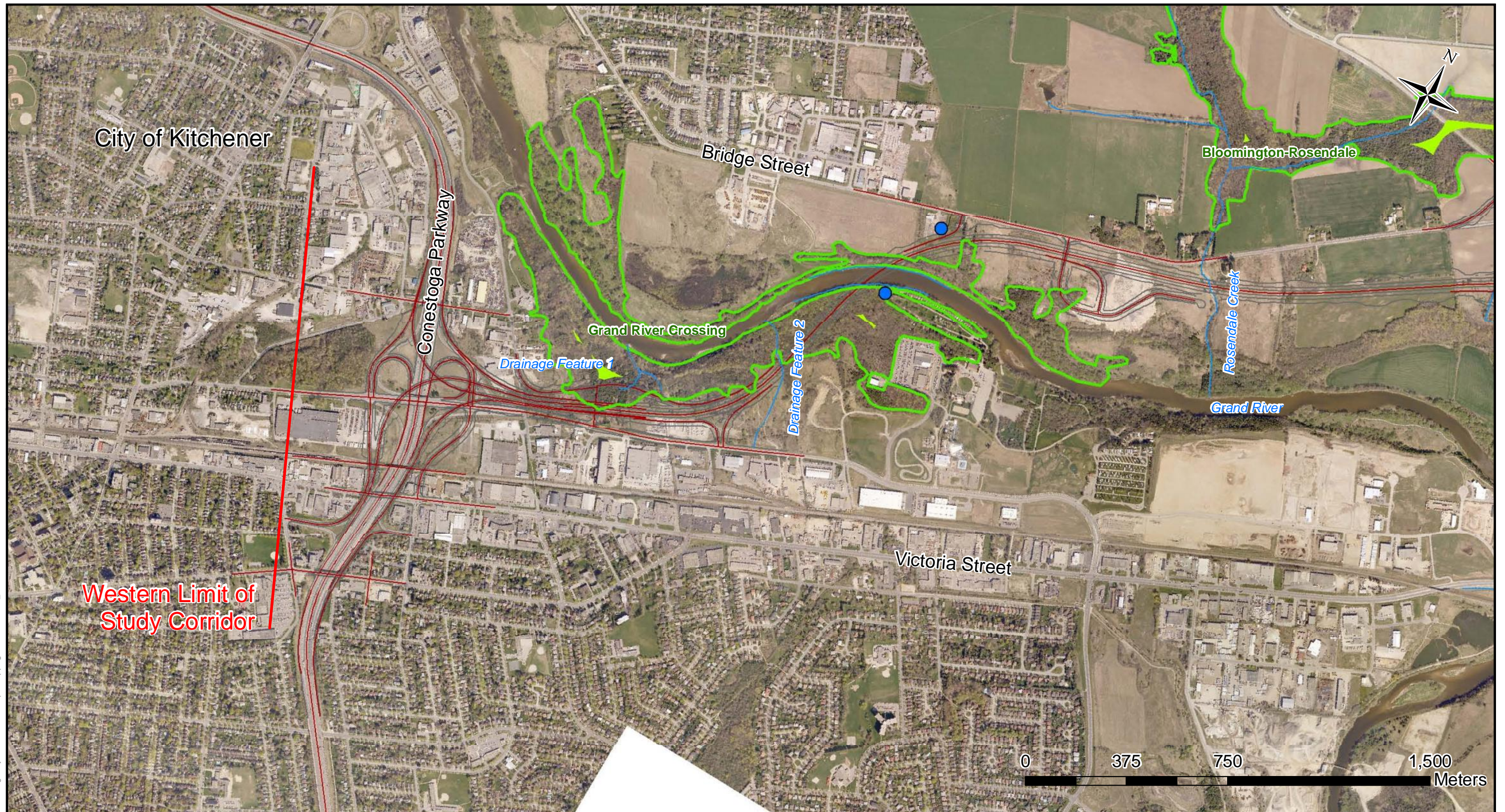
- Low Sensitivity Watercourse
- Moderate Sensitivity Watercourse
- High Sensitivity Watercourse

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MINISTRY OF TRANSPORTATION

TITLE
Highway 7 Four Laning from
Kitchener to Guelph
Natural Heritage and Aquatic Features

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- Forested Areas
- Forest Interior
- Anuran Listening Stations
- Watercourse

CLIENT

MINISTRY OF TRANSPORTATION

TITLE

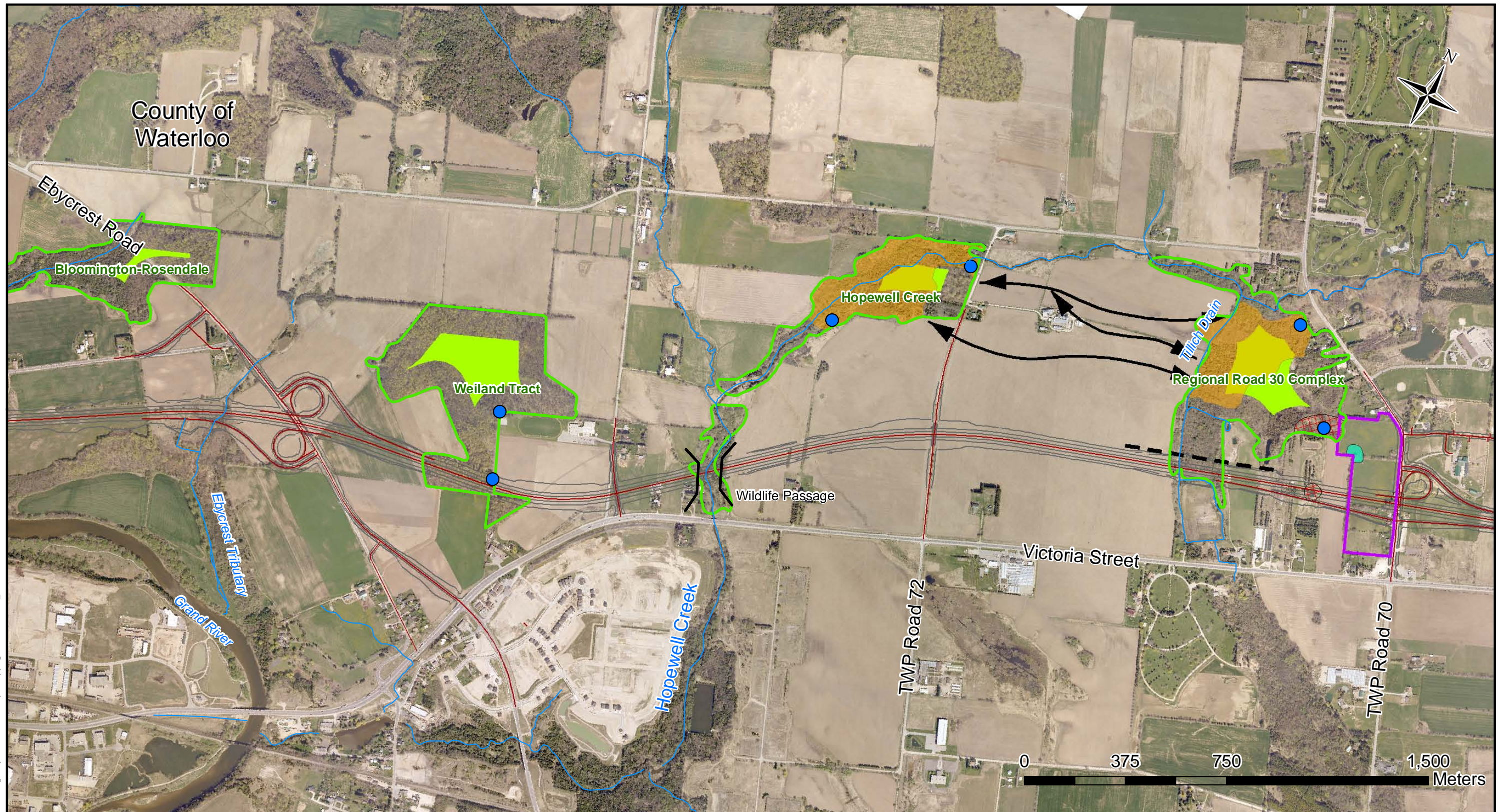
Highway 7 Four Laning from
Kitchener to Guelph
Terrestrial Ecosystem Features



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|-------------------------------------------------------------------------------------|--------------------------------|-------------------------------------------------------------------------------------|---------------------------|
|  | Forested Areas |  | Anuran Listening Stations |
|  | Forest Interior |  | MTO Property |
|  | Existing Anuran Habitat |  | Deer Movement Corridor |
|  | Anuran Enhancement Opportunity |  | Wildlife Fencing |
|  | Deer Overwintering Habitat |  | Watercourse |

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MINISTRY OF TRANSPORTATION

TITLE

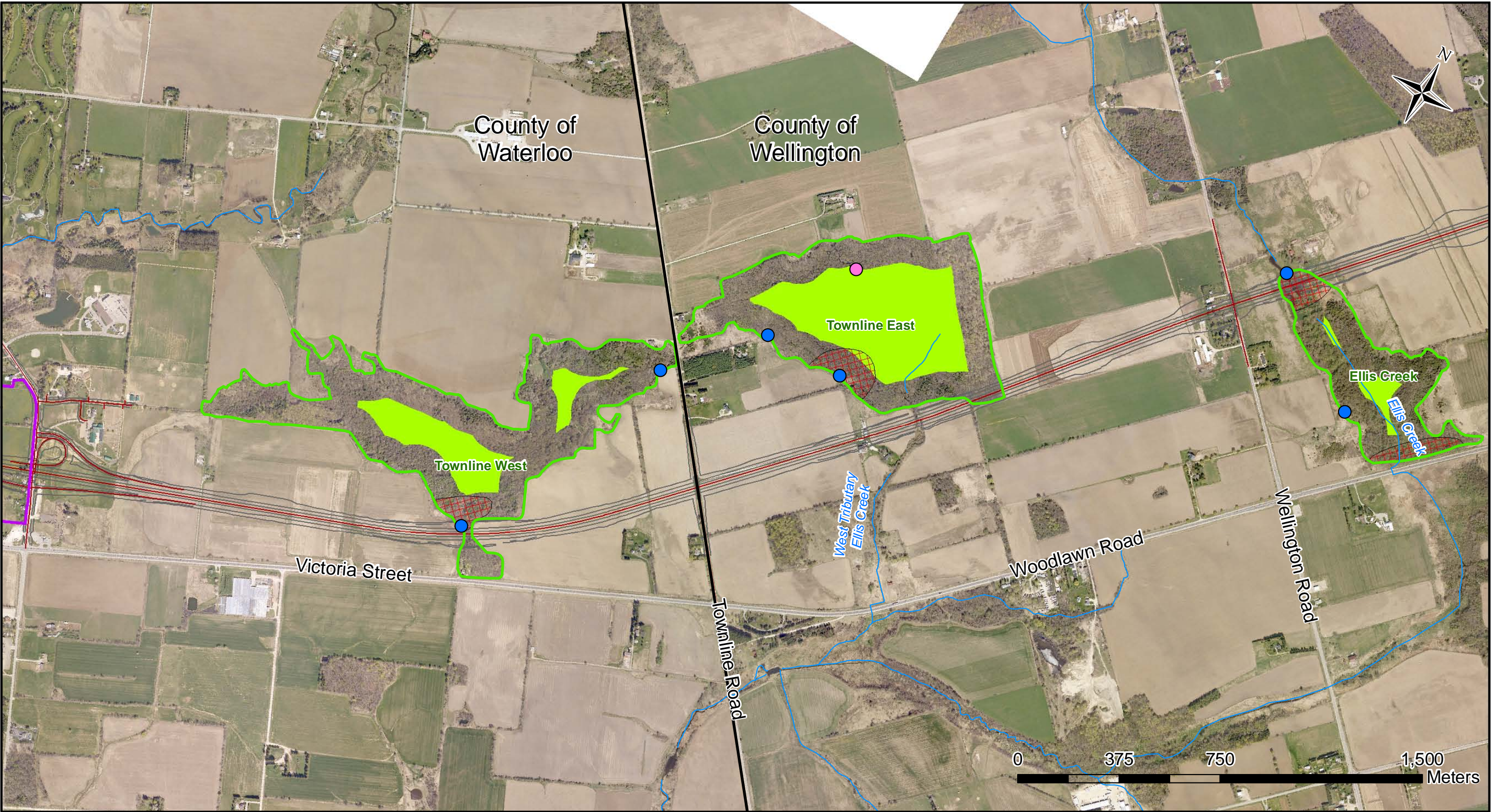
Highway 7 Four Laning from
Kitchener to Guelph
Terrestrial Ecosystem Features






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|  | Forested Areas |  | Anuran Listening Stations |
|  | Forest Interior |  | Heronry Point |
|  | Existing Anuran Habitat |  | MTO Property |
|  | Anuran Enhancement Opportunity |  | Watercourse |

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MINISTRY OF TRANSPORTATION

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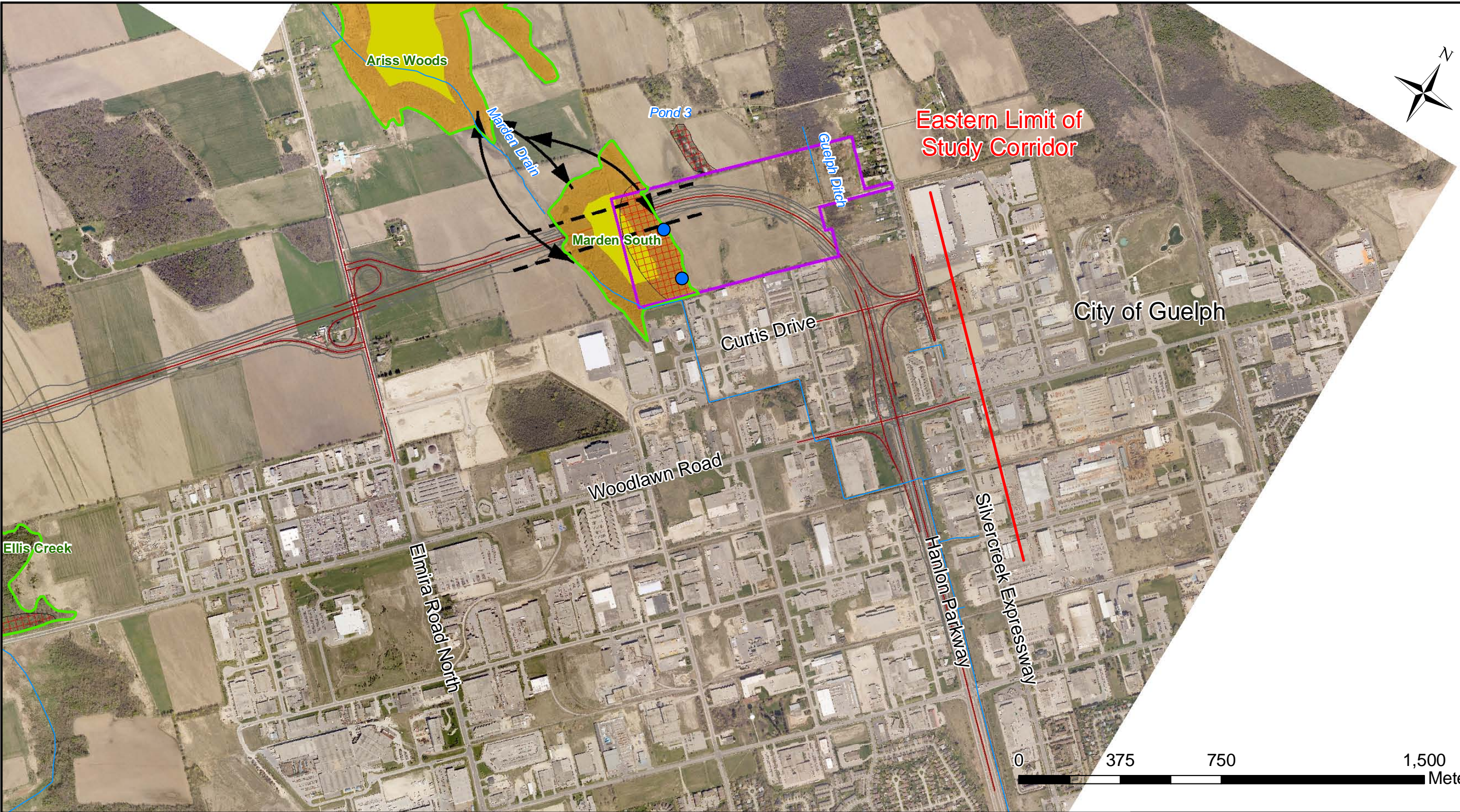
Highway 7 Four Laning from
Kitchener to Guelph
Terrestrial Ecosystem Features






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|-------------------------------------------------------------------------------------|----------------------------|-------------------------------------------------------------------------------------|---------------------------|
|  | Forested Areas |  | Anuran Listening Stations |
|  | Forest Interior |  | MTO Property |
|  | Existing Anuran Habitat |  | Deer Movement Corridor |
|  | Deer Overwintering Habitat |  | Wildlife Fencing |
| | |  | Watercourse |

CLIENT

MINISTRY OF TRANSPORTATION

TITLE

Highway 7 Four Laning from
Kitchener to Guelph
Terrestrial Ecosystem Features



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Scale	As Shown	Figure No.	2.8

2.2 Terrestrial Ecosystem

2.2.1 Wetlands

The following five wetlands occur in the study area:

- Bloomingdale-Rosendale Wetland (locally significant). This wetland is located north of Bridge Street, beyond the limits of the highway ROW and is associated with Rosendale Creek a tributary of the Grand River. (Figure 2.1, 2.2, 2.5 & 2.6)
- Hopewell Creek Riparian Woodland/Wetland (locally significant). The vegetation types found within the project limits include a willow floodplain forest, riparian meadow marsh communities and coniferous plantation on the valley slope on the east side of the creek. (Figure 2.2 & 2.6)
- Townline Wetland (now provincially significant) – includes Townline West and Townline East. This wetland is a mosaic of thicket swamp, shrub thicket and meadow marsh, moist-fresh cedar forest, mixed swamp, deciduous swamp, and soft maple swamp. (Figure 2.3 & 2.7)
- Ellis Creek Wetland (provincially significant). This wetland contains a variety of meadow marsh and deciduous swamp communities. (Figure 2.3 & 2.7)
- Marden South Wetland (provincially significant). The wetland unit associated with this project is one of nine wetland areas comprising the provincially significant Marden South Wetland complex. Marden South is predominantly a rich mixed deciduous swamp that is dominated by red maple (*Acer rubrum*) and silver maple (*Acer x freemanii*). (Figure 2.4 & 2.8).

2.2.2 Vegetation

The following description of vegetation is an update to the vegetation documented between 1999 and 2001 by Ecoplans Limited for the EA Planning Study. The current inventory results are a site specific examination of vegetation that will be impacted by the proposed highway. Vegetation is described according to the Ecological Land Classification (ELC) for Southern Ontario (Lee et al. 1995) and for each ELC a summary of the dominant species composition is presented. The vegetation is presented in association with the discrete large natural areas and features that occur in the study area. The vegetation is described in greater detail in the Terrestrial Ecosystem Impact Assessment Report (2012) on file with the MTO. Figures 2.1 to 2.8 identify the terrestrial features described in this section.

2.2.2.1 Grand River

Vegetation communities within the Grand River Valley at the crossing location include forested, open field and wetland. The communities that were identified included Dry-Fresh Deciduous Forest (FOD4), Fresh-Moist Poplar Deciduous Forest (FOD8-1), Dry-Fresh White Cedar Coniferous Forest Type (FOC2-2), Fresh-Moist White Cedar-Hemlock Coniferous Forest (FOC4-2), Fresh-Moist Willow Lowland Deciduous Forest (FOD7-3), Buckthorn Cultural Thicket (CUT1), Cultural Meadow (CUM1) and Reed Canary Grass Mineral Meadow Marsh (MAM2-2).

2.2.2.2 Ebycrest Road Valleyland

This feature is a narrow valleyland associated with the informally named Ebycrest Tributary that is found within a broad valley feature found west of Ebycrest Road and south of Bridge Street. The vegetation communities are described as: Cultural Meadow (CUM1-1), Cultural Woodland (CUW) and Red Ash Riparian Woodland.

2.2.2.3 Weiland Tract

The vegetation community along the proposed alignment is characterized as a sugar maple forest with sugar maple and bitternut hickory as the two dominant species in the canopy. Sugar maple dominated the sub-canopy and additional cover was provided by bitternut hickory, red ash and American elm. Red ash, common buckthorn and red raspberry were the most common species in the shrub layer and additional cover provided by alternate-leaved dogwood, American basswood and blackberry (*Rubus allegheniensis*). Ground cover was limited to less than 10% and included species such as (*Carex pennsylvanica*), (*Carex plantaginea*), zig-zag goldenrod, enchanter's nightshade, wild leek (*Allium triocum*), wild ginger (*Asarum canadense*) and blue cohosh (*Caulophyllum thalictroides*).

2.2.2.4 Hopewell Creek Valleyland

The vegetation communities contained within the Hopewell Creek valleyland include floodplain treed and meadow marsh communities and coniferous plantation on the valley slope on the east side of the creek. The vegetation communities are characterized as: Fresh-Moist Willow Lowland Deciduous Forest (FOD7-3), Meadow Marsh, Cultural Plantation (CUP) and Dry-Fresh White Cedar Coniferous Forest Type (FOC2-2).

2.2.2.5 Regional Road 30 Complex

The vegetation within the area of the alignment has been disturbed from a combination of access trails, former aggregate mining, drainage alteration and some dieback from either natural or anthropogenic causes from the factors described above. The vegetation includes the dominant maple deciduous swamp and an area of upland vegetation. Cultural woodland occurs at the west and south edges of the main forest unit. The two vegetation communities that make up this feature are characterized as Red Maple Mineral Deciduous Swamp (SWD3-1) and Fresh-Moist Ash Lowland Deciduous Forest (FOD7-2).

2.2.2.6 Townline West

The vegetation communities in this area include cultural meadow located at the northwest edge of the ROW, trembling aspen with other deciduous tree species along the south edge of the large woodland and includes the narrow portion that extends southerly to the woodland that adjoins Highway 7. The maple swamp extends northerly from the poplar forest in the larger unit. The vegetation communities observed within this feature include: Cultural Meadow (CUM1-1), Fresh-Moist Poplar Deciduous Forest Type (FOD8-1), Dry-Fresh Sugar Maple-Ironwood Deciduous Forest Type (FOD5-4) and Swamp Maple Mineral Deciduous Swamp Type (SWD3-3).

2.2.2.7 Townline East

The majority of the feature in the area of Highway 7 New is a maple deciduous swamp. The far easterly part of the feature is an upland mixed deciduous forest. The vegetation communities

include: Swamp Maple Mineral Deciduous Swamp (SWD3-3) and Fresh-Moist Ash Lowland Deciduous Forest Type (FOD7-2).

2.2.2.8 Ellis Creek Wetland

The meadow marsh communities that occur on site are comprised of reed canary grass and bur-reed. The vegetation communities include: Broad-leaved Sedge Mineral Meadow Marsh Type (MAM2-6), Reed-canary Grass Mineral Meadow Marsh Type (MAM2-2), Fresh-Moist Poplar Deciduous Forest Type (FOD8-1), Willow Mineral Deciduous Swamp Type (SWD4-1) and Red Maple Mineral Deciduous Swamp Type (SWD3-1).

2.2.2.9 Marden South Wetland

Only the vegetation communities in the south portion of this wetland were examined at this stage to due property access restrictions. Vegetation communities include: Swamp Maple Mineral Deciduous Swamp Type (SWD3-3), Dry-Fresh White Ash Deciduous Forest Type (FOD4-2) and Dry-Fresh Poplar Deciduous Forest Type (FOD3-1). Further investigations may be required during a later design stage to confirm the vegetation communities throughout this feature.

2.2.3 Wildlife

2.2.3.1 Breeding Birds

A breeding bird survey was conducted within the Grand River and Townline East crossing areas (Figure 2.5 and Figure 2.7). The Townline East area had not been previously surveyed while the Grand River crossing work required additional detail according to MNR/GRCA comments on the EA. Other woodlots within the study area had been surveyed for breeding birds as part of the EA Amendment of 2004 (McCormick Rankin, 2004) and for this reason were not surveyed for the current work.

Breeding birds found within the Townline East and Grand River crossing features contain no provincially rare or Species at Risk. Species found are widespread birds typical of woodland birds in southern Ontario and include a variety of non-passerines, woodpeckers, flycatchers, thrushes, warblers and other songbirds. A detailed list of these species as well as additional information identifying species which are area-sensitive, forest interior specialists and provincially declining species is provided in the Terrestrial Ecosystem Report, on file with the MTO.

Thirty-six species were detected in the Townline East feature (Figure 2.7) and all are common and widespread species typically found in deciduous swamp within southern Ontario. Of the 36 species found, fourteen are area-sensitive, seven are forest interior, and eight are declining within Ontario (Freemark and Collins, 1989, Sauer et al. 2007). Species seen are consistent with the habitat which consists almost entirely of forest or deciduous swamp with a closed canopy. Examples of such species include the wood duck (*Aix sponsa*), hairy woodpecker (*Picoides villosus*), pileated woodpecker (*Dryocopus pileatus*), eastern wood pewee (*Contopus virens*), red-eyed vireo (*Vireo olivaceus*), white-breasted nuthatch (*Sitta carolinensis*), brown creeper (*Certhia americana*), American robin (*Turdus migratorius*) and American redstart (*Setophaga ruticilla*). A minority of species found occupy small areas with a broken canopy and dense shrub and ground cover layers. Such species include willow flycatcher (*Empidonax traillii*), house wren (*Troglodytes aedon*), gray catbird (*Dumetella carolinensis*), cedar waxwing

(*Bombycilla cedrorum*), yellow warbler (*Dendroica petechia*) and common yellowthroat (*Geothlypis trichas*).

Thirty-three species were detected in the Grand River crossing feature (Figure 2.5) and all are common and widespread in southern Ontario. Of the 33 species present, nine are area-sensitive, four are forest interior and eight are declining within Ontario (Freemark and Collins, 1989, Sauer et al. 2007). Habitat on the north side of the Grand River within the vicinity of the crossing is dominated by deciduous forest adjacent to the river, while a mix of cultural meadow, cultural thicket and cultural woodland and small amounts of meadow marsh occur between the deciduous forest and Bridge Street. On the south side of the Grand River is a mosaic of habitats which is quite fragmented by openings, often early successional and supports both deciduous and coniferous stands which vary from seasonally wet to drier uplands. The variety of habitat has increased diversity beyond what would occur in more homogenous habitat. With such fragmentation, edge species such as the American woodcock (*Scolopax rusticola*), black-billed cuckoo (*Coccyzus erythrophthalmus*), downy woodpecker (*Picoides pubescens*), northern flicker (*Colaptes auratus*), willow flycatcher, northern cardinal (*Cardinalis cardinalis*) and indigo bunting (*Passerina cyanea*) predominate.

2.2.3.2 Forest Interior Habitat

Forest interior habitat is considered essential for a variety of bird species, as well as some amphibian, mammal and flora species. With widespread fragmentation of forest due to a variety of land use practices, forest interior species are showing pervasive declines as forest interior habitat is both reduced and degraded.

While the preferred alignment generally avoids forest, intrusion into forest will occur at eight woodlots. These intrusions are of significance in part due to their potential to reduce the extent of forest interior habitat within the study area and thereby reduce the diversity and numbers of forest interior birds. To predict impacts from the project on forest interior birds, we determined the current area of forest interior habitat in each of the eight woodlots where the preferred alignment will intrude into forest. We then determined the area of forest interior habitat that would result at each of the eight woodlots after highway construction. This allowed us to determine the loss of forest interior habitat, if any, at each of the eight woodlots where intrusion is to occur.

Forest interior habitat was defined as those portions of a forest 100 or more metres from a forest's edge. This definition is widely used (MNR, 2000; Freemark and Collins, 1992; Cadman, 1999). We also considered the current and future extent of what has been termed "deep forest interior" within the same eight woodlots. The term "deep forest interior" refers to portions of a forest 200 or more metres from a forest edge (Cadman, 1999). Bird species considered to be forest interior specialists were those identified in Freemark and Collins (1989).

Area sensitive forest species were also identified. Such species are considered to nest preferentially in large forests (Freemark and Collins, 1989). To a large extent, lists of forest interior and area-sensitive forest birds cover the same species (see Freemark and Collins, 1989, MNR, 2000) which suggests that most forest interior species are also area-sensitive species.

Of the eight woodlots considered, seven have interior habitat (>100 m from edge) less than seven hectares (ha) in size while the largest woodlot (Townline East) has 20.60 ha of interior habitat (Figures 2.5 – 2.8). The total area of forest interior habitat across all features is 43.74 ha. Because of its more demanding criteria, deep forest interior is found only within two woodlots

(Regional Road 30 Complex and Townline East). The amount of deep forest interior is very small (<0.03 ha) in the Regional Road 30 complex and 5.41 ha in the Townline East feature.

The area of forest interior and deep forest interior habitat present within the study area is a small fraction of the study area. This suggests that forest interior species constitute a small proportion of bird species present within the study area and that individuals of such species constitute a small proportion of all birds present within the study area.

Results of fieldwork support these conclusions. Seven forest interior species were seen within the Townline East feature while four such species were observed within the Grand River crossing feature. These numbers are small compared to the total number of species seen within the study area which was 41. Forest -interior species found within the Townline East feature were white-breasted nuthatch, brown creeper, veery, American redstart, northern waterthrush (*Seiurus noveboracensis*), hairy woodpecker (*Picoides villosus*) and pileated woodpecker (*Dryocopus pileatus*). Although this feature has the largest amount of interior habitat within the study area, expected territory sizes of species present suggest that populations of any one species will be small and susceptible to stochastic events. Over time, forest interior species within the feature can be expected to periodically disappear and then recolonize the feature.

Forest interior species found within the Grand River crossing feature were white-breasted nuthatch (*Sitta carolinensis*), brown creeper (*Certhia americana*), veery (*Toxostoma rufum*) and American Redstart (*Setophaga ruticilla*). While these forest interior species are not expected to rigidly adhere to forest interior habitat, the fragmented shape of the Grand River crossing forest and its small amount of interior habitat (0.41 ha) suggests that the number of pairs present is very limited, may be intermittently present and may function as a population sink for these species.

2.2.3.3 Great Blue Heron Nesting Site

A specialized survey was conducted within the Townline East feature (Figure 2.7) to determine the presence/absence of a great blue heronry (*Ardea herodias*). The great blue heron is a sensitive, colonial nesting species previously noted as nesting within the study area. The May 1st, 2008 survey detected 4 Great Blue Heron nests approximately 100m inside the northern boundary of the forest (Figure 2.7). Nests were noted in the canopy of maples in a treed deciduous swamp. One adult was observed at the nests. Due to the height of nests, the presence/absence of eggs could not be determined. Distance from the heronry to the preferred alignment is 525 m. Although the general location of this colony was previously known, the current study verifies that the site is presently used and provides greater precision as to location and number of nests.

The Townline East heronry is relatively small. The average colony size within Ontario is about 35 nests (Naylor, 2007). Heronries are typically occupied for about nine years (Naylor, 2007). Great blue herons appear to be declining in southern Ontario and these declines may be tied to declining numbers of anurans which are an important part of heron diets (Naylor, 2007).

2.2.3.4 Overwintering Deer Habitat

Overwintering deer are known to concentrate in natural features in the vicinity of the preferred alignment. Hopewell Creek, Townline West and East and Marden South have been identified by the OMNR as providing over-wintering deer habitat (Figure 2.6, Figure 2.7 and Figure 2.8). Because the presence of deer in these features increases the risk of vehicle-wildlife accidents, surveys were conducted in the winter of 2008 to more clearly define concentration areas and

patterns in deer movement relative to the preferred alignment. The survey used both aerial and ground transportation. Because aerial transportation facilitated surveillance, the survey expanded to cover the remaining large wooded areas adjacent to the preferred alignment. These areas are known as the Grand River crossing, Bloomingdale-Rosendale, Weiland Tract, Regional Road 30 Complex, Ellis Creek and Ariss Woods (Figure 2.5 - 2.8). Evidence of usage consisted of deer sightings and deer tracks. A deer pellet survey was also carried out to better quantify the relative abundance of deer use of these forested habitats.

Aerial Survey

Observations identified an extensive trail network throughout most of Hopewell Creek, Regional Road 30 Complex, Marden South and Ariss Woods features (Figure 2.6, and Figure 2.8). Trails were also observed leading away from each of these features. Well-developed trails were observed across the large soybean field separating Hopewell Creek and Regional Road 30 Complex features (Figure 2.6). Several trails were noted in this field running from one wooded feature to the other along an east-west orientation. These trails were parallel to and north of the preferred alignment. These observations indicate that a consistent travel corridor occurs between these two wooded areas. A deer stand observed on the east side of Hopewell Creek approximately 600m north of existing Highway 7 provides additional support for this conclusion.

Trails noted within the Marden South woodlot were continuous with trails leading northerly across open agricultural fields toward the Ariss Woods feature (Figure 2.8). Six deer were observed in the agricultural area approximately 200m to the north of Marden South, and an additional five deer were noted in Ariss Woods.

Minor trails were noted during the April 2, 2008 aerial survey at the margins of the Grand River, Weiland Tract, Townline West, Townline East and Ellis Creek features. Extensive deer tracks were not observed along the Grand River where extensive bedding areas were previously reported by the MNR during the winter of 2006/07. However, recent cutting observed in the area may have caused abandonment or reduced use, at least during this year (winter 2008).

Ground Reconnaissance Survey

Observations obtained during the two surveys support MNR data that Hopewell Creek and Marden South host deer concentrations during the wintering period. Regional Road 30 Complex also was found to support over-wintering deer. Deer travel routes were predominately along an east-west route between Hopewell Creek and Regional Road 30 Complex just north of, and parallel to, the planned alignment, and from the northern end of Marden South, northward to Ariss Woods.

The soybean crop between Hopewell Creek and Regional Road 30 appears to be a significant feeding area for deer. Deer foraging and travel within this open area might decrease significantly if a different crop was present, but deer would likely still concentrate in both the Hopewell Creek and Regional Road 30 Complex forests due to the significant conifer cover in both features.

Deer Pellet Survey

Results of the deer pellet survey are consistent with those obtained from the aerial surveys. Using both methods, winter deer use is identified to be concentrated in Hopewell Creek, Regional Road 30 Complex and Marden South features. For Regional Road 30 feature, while the aerial survey indicated winter deer use throughout the feature, the pellet survey indicated greatest use in the western portion where cedar stands provide ideal winter habitat. In Marden South the high level of deer use as determined through the pellet count is consistent with deer abundance results of the aerial survey. Deer usage is high despite the lack of conifer dominated areas excepting a small area in the northern portion of the site. Deer use is likely higher within the site than would otherwise occur due to the nearby presence of additional deer habitat a short distance to the north.

2.2.3.5 Anurans

Dedicated anuran surveys were carried out at select locations within the eight wooded natural areas along the project corridor. The survey method followed the widely used Marsh Monitoring Program during three site visits in 2008, involving two listening sites in each of the eight features.

Western chorus frog (*Pseudacris triseriata triseriata*), gray treefrog (*Hyla versicolor*), spring peeper (*P. crucifer crucifer*) and green frog (*Rana clamitans melanota*) were detected during the anuran surveys. Due to widespread declines, the Great Lake's/St. Lawrence/Canadian Shield populations of the western chorus frog are designated as Threatened at the federal level (Canadian Wildlife Service, 2009) but have no designation at the provincial level.

During anuran surveys, the green frog was found at Ellis Creek and Regional Road 30 Complex features, but these populations were at considerable distance from the preferred alignment. During fisheries fieldwork, a moderate number of green frogs were detected in several irrigation ponds to the south of the Regional Road 30 Complex feature (Figure 2.6). These irrigation ponds lie along the path of the preferred alignment. Green frogs were also observed in a pond just north of the preferred alignment to the east of Marden South (Figure 2.8).

Moderate numbers of northern leopard frogs were detected within the irrigation ponds south of the Regional Road 30 Complex (Figure 2.6) as well as within the preferred alignment's crossing of Ellis Creek (Figure 2.7 & 2.8).

During anuran surveys, the gray treefrog was found along the preferred alignment within Marden South (Figure 2.8), and just north of the alignment in the Townline East and Regional Road 30 Complex features (Figure 2.6 and 2.7). Based on calling activity, each population appeared small.

The western chorus frog and spring peeper were restricted to Townline West (Figure 2.7) and Grand River Crossing features respectively. Based on calling activity, anuran populations at both these locations appeared small and in the case of the spring peeper, well outside of the preferred alignment.

American toads (*Bufo americanus*) were heard in a small pond just north of the preferred alignment and east of the Marden South feature (Figure 2.8). The estimated size of this population was not recorded.

Observations indicate general low populations of anuran species within the preferred alignment with moderate populations within the Ellis Creek crossing and south of the Regional Road 30

complex. Green frogs and northern leopard frogs appear to be the most numerous and widespread anuran species within the study area and along the preferred alignment.

2.2.3.6 Salamanders

Salamanders were observed at two sites within the study area. Vernal pools which appeared suitable breeding habitat were also noted. An eastern newt (*Notophthalmus viridescens*) was trapped in a minnow trap on August 20th, 2008 from a small pond located east of the preferred alignment and Marden South feature (Figure 2.8). The pond is approximately 180m long and 15 cm deep with a muddy bottom underlain by gravel and rock. Abundant submergent aquatic vegetation was observed. Red-backed salamanders (*Plethodon cinereus*) were observed in the leaf litter of a deciduous forest stand in the south portion of the Regional Road 30 Complex (Figure 2.6). Although egg masses were not observed, woodland ponds within the Regional Road 30 Complex appeared to provide suitable breeding habitat for salamander species such as spotted (*Ambystoma maculatum*) and blue-spotted (*Ambystoma laterale*). The location of these ponds is approximately 200m north of the preferred alignment.

2.3 Species at Risk

A review of Species at Risk (SAR) that are known to occur in the study area and have the potential to occur in the study area is presented in Table 2-3. The species identified for assessment were obtained from a listing from the Ministry of Natural Resources Natural Heritage Information Centre (NHIC) online database as well as observations of potential habitat for species that occur in the geographical area of the project.

Species that likely occur in the study area but were not documented during investigations carried out during the Initial Design include: bobolink, eastern meadowlark and barn swallow. Both bobolink and eastern meadowlark can occupy suitable agricultural fields that are found along the highway corridor. Preferred habitat of this type includes hay fields, pasture and grassy meadows. Barn swallow uses open areas for foraging including grassy fields, farmland and wetlands. It nests in artificial structures such as barns and outbuildings, garages and road culvert. This species is expected to forage in the ROW and some existing farm buildings and other structures that are proposed for removal may have the potential to be suitable nesting sites for barn swallow.

Chimney Swift is found in and around urban centres where it may select chimneys and other manmade structures as roost or nest sites. Suitable structures located near sources of water where insects are abundant will likely be preferred. This species may occur in buildings associated with farm properties that will be removed along the highway corridor.

The only species confirmed to occur in the highway corridor is wavy-rayed lampmussel (*Lampsilis fasciola*). This information was provided through DFO SAR distribution mapping and consultation with DFO (Pers. comm. Andrea Doherty, SARA/Science Coordinator, DFO, February 2, 2009; and, DFO – SAR Mapping, 2012). The Grand River near the City of Kitchener is considered by the DFO to be one of the best locations for this species to occur due to the abundance of habitat (sand and gravel) and the presence of the host species smallmouth bass (*Micropterus dolomieu*).

Table 2.3: Summary of Species at Risk and Provincially Rare Species with the Potential to Occur in the Highway 7 Study Area

Common Name	Scientific Name	COSEWIC ¹	Species at Risk in Ontario (SARO) ²	G-Rank ³	S-Rank ⁴	Habitat Description	Species Observations/ Records	Potential Habitat Within Project Area
Barn Swallow	<i>Hirundo rustica</i>	THR	THR	G5	S4B	Uses open areas for foraging including grassy fields, pastures, agricultural crops, farmyards and wetlands. It nests mostly in artificial structures such as barns, outbuildings, garages, houses, bridges and road culverts.	Not observed	Species expected to forage in the ROW. Some farm buildings and other structures proposed for removal have the potential to provide nest habitat.
Black Redhorse	<i>Moxostoma duquesnei</i>	THR	THR	G5	S2	Black redhorse generally inhabit moderately sized, cool, clear streams. In summer, they generally prefer pools and overwinter in deeper pools. Although few studies have quantified specific habitat variables associated with the presence of black redhorse, it has been reported in streams with gradients ranging from 1.2-1.5 m/km and average annual discharge ranging from 14 to 20 m³/s in well oxygenated and relatively fertile water with July water temperature averaging approximately 20°C (COSEWIC, 2005).	Not observed	Species documented to occur between Waterloo and Paris (COSEWIC Report). Species occurrences are listed as recent (2003, 2004).
Blanding's Turtle	<i>Emydoidea blandingii</i>	THR	THR	G4	S3	Prefers shallow water, usually in large marshes, shallow lakes, and similar bodies of water. They are rather poor swimmers and often move about by walking on the bottom. Blanding's turtle may wander on land, although they usually do not travel far from water except to nest. The species overwinters at the bottom of water bodies. (MacCulloch R., 2002)	Not observed	NHIC record for this species is ranked as extant and was last observed in 1989. This species has potential to occur in the Grand River.
Bobolink	<i>Dolichonyx oryzivorus</i>	THR	THR	G5	S4B	Breeds in open grasslands, old fields, lightly-moderately grazed pastures, no-till cropland, hayfields, small grain fields, wet meadows and planted cover. In migration and in winter uses freshwater marshes, grasslands, rice and sorghum fields (NatureServe, 2011).	Not observed	Abundance of agricultural lands in ROW has potential to support bobolink.
Butternut	<i>Juglans cinerea</i>	END	END	G4	S3	Butternut is a shade intolerant species, which prefers rich, moist and well-drained soils, and is often found along the edges of streams and rivers. It can grow alone or in small groups in deciduous forests. Young seedlings and saplings can tolerate up to 60% crown closure. Common associates include basswood, black cherry, beech, black walnut, elm, hickory, oak, red maple, sugar maple, white ash and yellow birch (FGCA, 2011).	Not observed in ROW	Species documented in the Grand River valleyland adjacent to the ROW.

Common Name	Scientific Name	COSEWIC ¹	Species at Risk in Ontario (SARO) ²	G-Rank ³	S-Rank ⁴	Habitat Description	Species Observations/ Records	Potential Habitat Within Project Area
Cerulean Warbler	<i>Dendroica cerulea</i>	END	THR	G4	S3B	Breeds in mature hardwood forest with a closed canopy, especially in floodplains or other mesic conditions. In migration, occurs in various forest, woodland, second growth, and scrub habitats; forest canopy, gaps and edges, semi-open areas, usually high in trees (<i>NatureServe, 2011</i>).	Not observed	NHIC record for this species is ranked as historical, and was last observed in 1900. General character of deciduous swamp or forest found in study area may be suitable. However this species has specific habitat requirements that are not well represented in the study area. Species not documented either from EA study or from this study, and therefore identified not to be present.
Chimney Swift	<i>Chaetura pelagica</i>	THR	THR	G5	S4B S4N	Found in and around urban centres where it may nest and roost in chimneys and other manmade structures. Tends to stay close to water where food source (insects) are abundant	Not observed	May occur in buildings on farm properties that will be removed for construction of highway.
Eastern Meadowlark	<i>Sturnella magna</i>	THR	THR	G5	S4B	Breeds in open grasslands, old fields, no-till cropland, hayfields, small grain fields, savannahs, herbaceous fencerows, wet meadows and planted cover. In migration and in winter uses freshwater marshes, grasslands, rice and sorghum fields (<i>NatureServe, 2011</i>).	Not observed	Abundance of agricultural lands in ROW has potential to support bobolink.
Eastern Ribbonsnake	<i>Thamnophis sauritus septentrionalis</i>	SC	SC	G5	S3	The species is semi-aquatic and most frequently found along wetland edges. It prefers quiet, shallow water with low surrounding cover and good exposure to sunlight. Gravid females may move away from water before nesting, as females and juveniles are occasionally found in upland areas. (COSEWIC, 2002).	Not observed	NHIC record for this species is ranked as historical and was last observed in 1977. Suitable habitat is not present in the study area.
Northern Map Turtle	<i>Graptemys geographica</i>	SC	SC	G5	S3	Prefers slow rivers and lakes with mud bottoms, basking logs, and abundant aquatic vegetation. Often occur in mill ponds, oxbows, and river overflow ponds. Wintering sites include river bottoms in hollows, among rocks or other objects. (<i>Nature Serve, 2011</i>).	Not observed	NHIC record for this species is ranked as historical and was last observed in 1924. This species has potential to occur in the Grand River.
Silver Shiner	<i>Notropis photogenis</i>	SC	THR	G5	S2S3	Silver Shiner is found primarily in large streams with widths usually greater than 20 m, where it is found in deep riffles or pools adjacent to riffles with moderate to high gradients. This species is rarely in small streams or rivers, and appears to avoid areas with heavy vegetation and siltation (COSSARO, 2011).	Not observed	NHIC record for this species is ranked as historical and was last observed in 1981. Distributions of Fish Species at Risk (Grand River Conservation Authority) identify species as being present within the reach of the Grand River through the study area.

Common Name	Scientific Name	COSEWIC ¹	Species at Risk in Ontario (SARO) ²	G-Rank ³	S-Rank ⁴	Habitat Description	Species Observations/ Records	Potential Habitat Within Project Area
Snapping Turtle	<i>Chelydra serpentina</i>	SC	SC	G5	S3	Occupies all types of freshwater habitats including streams, lake, reservoirs, ponds, marshes and swamps, especially those with slow-moving waters, soft mud bottoms and abundant aquatic vegetation or submerged brush and logs (COSEWIC 2008). Preferred nesting areas are open and sunny with moist well-drained sand or soil but gravel beds, lawns and road edges will also be utilized (Harding 1997).	Not observed	Potential to be found in the Grand River. Adjacent valleyland slopes likely provide locations for nesting sites. Pond habitats identified in the study area may provide habitat although they are small in size. Other watercourses in the study area have shallower water, flowing water and firmer bottoms which would indicated that they are unsuitable to support this species.
Tuberous Indian-plantain	<i>Arnoglossum plantagineum</i>	SC	SC	G4G5	S3	Prefers open sunny areas in wet, calcareous meadows or shoreline fens (COSEWIC, 2002).	Not observed	NHIC record for this species is ranked as extant and was last observed in 1998. Suitable habitat not present in the study area.
Wavy-rayed Lampmussel	<i>Lampsilis fasciola</i>	SC	THR	G5	S1	Occupied habitats in Ontario are generally characterized as clean sand/gravel substrates, often stabilized with cobble or boulders, in steady currents at depths of up to 1 metre. The species inhabits clear rivers and streams of various sizes with steady flows and stable substrates and is typically found in gravel or sand substrates in and around riffle areas. It is most abundant in small to medium-sized streams and invariably occurs at sites that support a great diversity of other mussel species. (COSEWIC, 2010).	Not observed	NHIC record for this species is ranked as historical and was last observed in 1998. This species is identified by MNR and DFO to occupy the reach of the Grand River that occurs in the study area.
Provincially Rare Species								
Jefferson genome dominates (Jefferson X Blue-spotted Salamander, Jefferson genome dominates)	<i>Ambystoma hybrid pop. 1</i>	-	-	GNA	S2	Prefers forests with wetland, pond or vernal or other temporary pool that provide breeding habitat. Adults live on the forest floor; in the soil or in leaf litter. In early spring, they move to woodland ponds to breed. Movement and breeding occurs only at night, and most often on rainy nights (<i>MacCulloch, R., 2002</i>)	Not observed	NHIC record for this species is ranked as historical, however this species was last observed in 2003. Several swamp forests in study area may support this species.
White-tinged Sedge	<i>Carex albicans var. albicans</i>	-	-	G5T4T5	S3	Dry, open sandy or rocky woods (Oldham, M.J., and S.R. Brinker, 2009).	Not observed	NHIC record for this species is ranked as historical and was last observed in 1968. Suitable habitat not present in the study area.
Carey's Sedge	<i>Carex careyana</i>	-	-	G4G5	S2	Rich deciduous woods, often on floodplains and slopes (Oldham, M.J., and S.R. Brinker, 2009).	Not observed	NHIC record for this species is ranked as historical and was last observed in 1905. Potential habitat occurs in area of Grand River crossing.

Common Name	Scientific Name	COSEWIC ¹	Species at Risk in Ontario (SARO) ²	G-Rank ³	S-Rank ⁴	Habitat Description	Species Observations/ Records	Potential Habitat Within Project Area
Harbinger-of-spring	<i>Erigenia bulbosa</i>	-	-	G5	S3?	An early flowering spring ephemeral of rich woods and moist deciduous woods, often on floodplains. This species has been reported to have occurrences in both Wellington and Waterloo counties. (Oldham, M.J., and S.R. Brinker, 2009).	Not observed	NHIC record for this species is ranked as historical and was last observed in 1910.
American Gromwell	<i>Lithospermum latifolium</i>	-	-	G4	S3	Prefers floodplain woods (Oldham, M.J., and S.R. Brinker, 2009).	Not observed	NHIC record for this species is ranked as historical and was last observed in 1941. Suitable habitat likely not present in the study area.
Scarlet Beebalm	<i>Monarda didyma</i>	-	-	G5	S3	Prefers habitat with rich moist soil. It is considered to be a garden plant, escaped from cultivation This species has been reported to have occurrences in both Wellington and Waterloo counties. (<i>Newcomb, L, 1977</i>)	Not observed	NHIC record for this species is ranked as historical and was last observed in 1892.
Moss Phlox	<i>Phlox subulata</i>	-	-	G5	S1?	Dry, sandy, open woods and open ground. Frequently cultivated in gardens and cemeteries (Oldham, M.J., and S.R. Brinker, 2009).	Not observed	NHIC record for this species is ranked as historical and was last observed in 1974. Suitable habitat likely not present in the study area.
Braun’s Holly Fern	<i>Polystichum braunii</i>	-	-	G5	S3	Primarily in deciduous or mixed rocky woods near Lake Superior, but also at a few isolated southern Ontario sites (Oldham, M.J., and S.R. Brinker, 2009).	Not observed	NHIC record for this species is ranked as historical and was last observed in 1979. Suitable habitat likely not present in the study area.
Carolina Vetch	<i>Vicia caroliniana</i>	-	-	G5	S2	Dry oak woods, thickets, prairies (Oldham, M.J., and S.R. Brinker, 2009).	Not observed	NHIC record for this species is ranked as historical and was last observed in 1948. Suitable habitat likely not present in the study area.

LEGEND (Table 2-3):

1. COSEWIC - Committee on the Status of Endangered Wildlife in Canada (*federal status from COSEWIC May 2011*)

END Endangered - A species facing imminent extirpation or extinction.

THR Threatened - A species likely to become endangered if limiting factors are not reversed.

SC Special Concern (formerly vulnerable) - A species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.
2. SARO – Species at Risk in Ontario Status (*Provincial Status based on Endangered Species Act, 2007, Ontario Regulation 230/08, January 13, 2012*)

END The species listed in Schedule 2 are classified by COSSARO as endangered species. O. Reg. 230/08, s. 2.

THR The species listed in Schedule 3 are classified by COSSARO as threatened species. O. Reg. 230/08, s. 3.

SC The species listed in Schedule 4 are classified by COSSARO as special concern species. O. Reg. 230/08, s. 4.
3. G-RANK: Global ranks are assigned by a consensus of the network of Conservation Data Centres (CDCs), scientific experts, and the Nature Conservancy to designate a rarity rank based on the range-wide status of a species, subspecies, or variety. (*Global Status from MNR Biodiversity Explorer May 2011*)

G4 Common—usually more than 100 occurrences; usually not susceptible to immediate threats.

G5 Very common—demonstrably secure under present conditions.

T Denotes that the rank applies to a subspecies or variety
4. S-RANK: Provincial (or Subnational) ranks are used by the Natural Heritage Information Centre (NHIC) to set protection priorities for rare species and natural communities. These ranks are not legal designations. Provincial ranks are assigned in a manner similar to that described for global ranks, but consider only those factors within the political boundaries of Ontario. (*Provincial Status from MNR Biodiversity Explorer May 2011*)

S1 Critically Imperiled—Critically imperiled in the nation or state/province because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state/province.

S2 Imperiled—Imperiled in the nation or state/province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province.

S3 Vulnerable—Vulnerable in the nation or state/province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.

S#S# Range Rank —A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4).

S? Not ranked yet or rank uncertain

SZB Breeding migrants/vagrants

2.4 Groundwater and Wells

According to the Surficial Geology of Southern Ontario (OGS 2003), soils present in the vicinity of the Study Area typically consist of sandy silt glacial till (Port Stanley Till) that are expected to have low to medium permeability (Figure 2.9). The till layer is 25-35 m thick and overlies the bedrock. Glaciofluvial sands and gravels are associated with several of the watercourses, valleylands and wetlands that Highway 7 New traverses. These include the valleylands of the Grand River, Rosendale Creek and Hopewell Creek and also include the wetlands at Ellis Creek and Tillich Drain (Regional Road 30 Wetland Complex). The depth of these deposits and their elevation below ground identify whether they provide a recharge/discharge function. The wetlands and watercrossings were identified to have variable amounts of evidence of groundwater discharge such as seepage, cool water temperatures, and presence of watercress.

Groundwater at Watercourses/Wetlands

Rosendale Creek

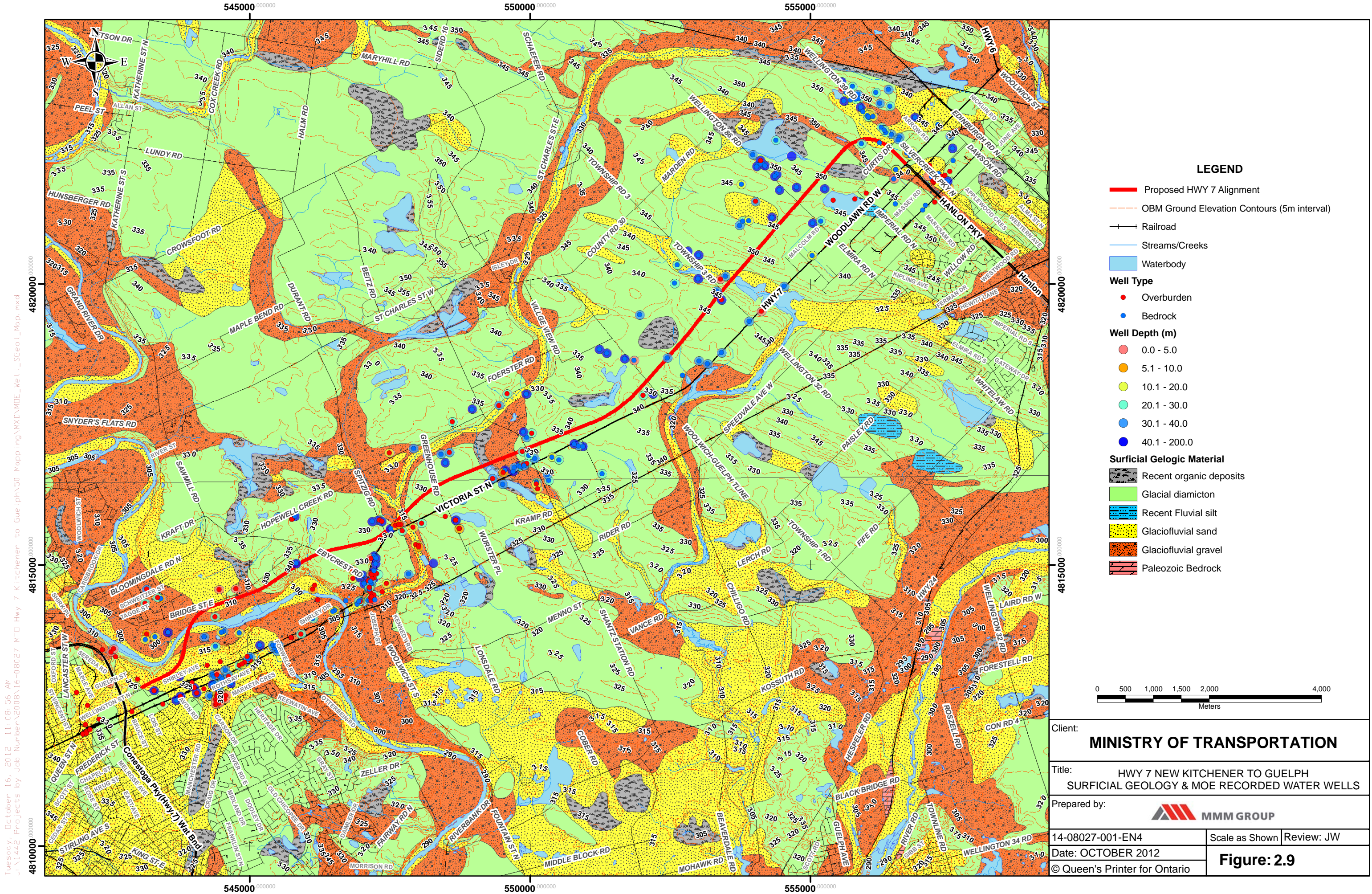
Geotechnical investigations have not been completed for this crossing. Data recorded from the fisheries investigation identify the watercourse as coldwater. At this stage of design it is not clear if the area of the crossing provides a groundwater recharge/discharge function. The coldwater conditions would indicate that upstream reaches are likely responsible for this function and that the crossing site may provide some contribution.

Hopewell Creek

Seepage and watercress were observed in the vicinity of the highway crossing. This would identify groundwater recharge. Geotechnical investigations identify some areas of sand/gravel extending a depth of 5-6 m from surface while other areas sampled included variable amounts of till extending from ground surface to greater depths. Some of the sand layer elevations intercept with the creek elevation. These conditions would indicate that the crossing site provides both a discharge and recharge function.

Tillich Drain

Geotechnical investigations have not been carried out at this location. The nearest investigations were carried out at Shantz Station Road approximately 700 m to the east. Some limited inference can be provided from this information to identify the recharge/discharge function at Tillich Drain and the adjoining swamp community. The borehole data reveals that apart from a shallow silty sand fill zone the profile is silty clay till. This may explain the presence of dug ponds at this site which may occur as a result of surface runoff being held up by the impermeable till layer. Without the benefit of site specific soils information confirmation of recharge/discharge function cannot be concluded. A general interpretation would indicate that Tillich Drain, local swamp wetlands and the ponds are supported by water that pools on surface held up by the shallow till. Tillich Drain is also supported by drainage to the south (upstream) of the highway which may provide some groundwater input.



Ellis Creek

Interpretation of groundwater conditions at Ellis Creek is provided by geotechnical investigations carried out at Guelph Road 3, approximately 200 m to the west of Ellis Creek. The soil profile identifies clayey silt and silty clay till extending from near ground surface to refusal. Water level measurements for one borehole identify water occurring from 6 to 8.5 m below surface for the months of May to August, respectively. The water elevation corresponds to the water levels interpreted for Ellis Creek and the flooded portion of the Ellis Creek Wetland. Water was recorded in a 0.5 m zone of silt with trace amounts of sand, gravel and clay. Other boreholes were dry upon completion. Site specific soils information is not available to provide an interpretation of whether the area of the crossing provides a groundwater recharge or discharge function. However, a general comment is that likely the dominant till cover would not be suitable for providing a recharge function.

Wells

There are approximately 400 water well records in the Ministry of the Environment database that are located within a 1000 m zone from the proposed highway alignment and 15 occur within 100 m of the alignment. Not all of the wells shown in the records are in use such as wells located within the highly urbanized areas that are serviced by municipal services. Of the 400 wells, approximately 203 are reported to be completed in bedrock and 45 in overburden.

Overburden wells are relatively shallow (<10 m deep) and occur in a shallow aquifer that is the weathered zone of the upper till layer and surficial sand deposits. Wells located adjacent to the natural areas tend to be shallow wells. This is in agreement with the groundwater discharge noted in these areas. The wells completed in bedrock are usually deep (>25 m deep) and are isolated from the surficial aquifer by the thick till zone.

2.5 Socio-Economic Environment

The Socio-Economic Environment considers the human and built aspects of the environment. Socio-economic features of the study area can generally be described as an urban environment consisting of residential areas and businesses at the east and west ends of the corridor with rural properties and farms in between. Scattered businesses and services are located along existing Highway 7. Highway 7 New provides access to the local communities and businesses through several interchanges. In general, the land use in the study area has not changed significantly since the EA Amendment in 2004, with the exception of some site specific changes including the continued growth of residential development at Fountain Street/Victoria Street North (existing Highway 7) population growths and details about the recreation features. Population and trail information re described in detail below.

2.5.1 Governance and Population

Highway 7 alignment will traverse six distinct municipalities, including: the Regional Municipality of Waterloo (City of Kitchener, Township of Woolwich) and County Wellington (Township of Guelph/Eramosa and City of Guelph). The population for each municipality based on the 2011 Census as reported through Statistics Canada are listed below (Statistics Canada, 2011 Census of Population), with the 2000 enumeration values as reported in the 2004 Highway 7 Planning Study EA Amendment in brackets to the right of each.

Regional Municipality of Waterloo	507,096	(417,932)
City of Kitchener	219,153	(177,858)
Woolwich	23,145	(17,537)
County Wellington	208,360	(167,396)
Township of Guelph/Eramosa	12,380	(10,272)
City of Guelph	141,097	(94,201)

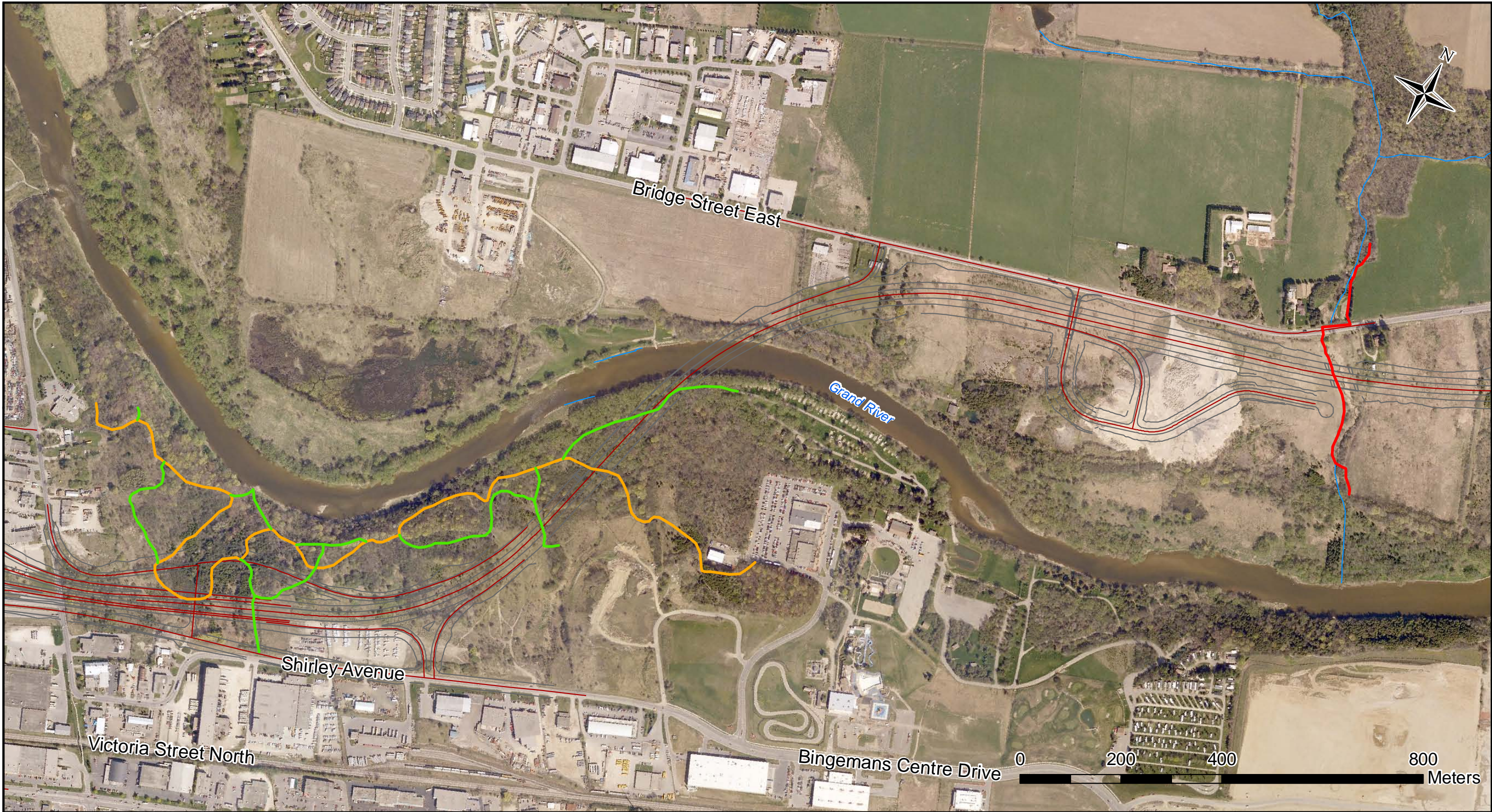
The projected population for Waterloo Region and County Wellington for 2016 to 2036 is listed below. The values are taken from the Ontario Population Projects Update, 2010 – 2031, Ontario and Its 49 Census Divisions, issued by the Ministry of Finance (Queen's Printer for Ontario, 2011).

Projected Year	Waterloo	Wellington
2016	576,000	230,100
2021	621,500	242,800
2026	668,000	256,800
2031	713,900	271,400
2031 (Smart Growth), per EA Amendment 2004	641,000	284,000

The Regional Municipality of Waterloo and the County of Wellington are projected to grow by over 260,000 over a 20 year period (annual increase of 13,000), compared to a 275,000 increase over a 26 year period (annual increase of 10,576) as indicated in the EA Amendment 2004. The population data show that the growth rate for the area is generally expected to increase compared to earlier predictions. This supports the rationale provided in the 2004 EA Amendment identifying the need to provide reasonable transportation infrastructure (capacity) to meet the expected growth in the population (demand) as an environmentally significant issue.

2.5.2 Recreational Trails

Two recreational trails occur within the study limits as shown on Figure 2.10. These trails are identified as the Walter Bean Grand Valley Recreational Trail and the Grand Valley Trail. The Walter Bean Grand River Trail traverses approximately 78 kilometers along the Grand River extending the existing Cambridge-to-Hamilton trail system as a continuous pathway through the Cities of Kitchener, Waterloo and Woolwich to north of West Montrose. Through the project limits, the trail navigates the Grand River tablelands on the south side of the Grand River. The nearest trail access points relative to the Highway 7 ROW occur at Access Point 13 (Economical Insurance Trailway) to the northwest and Access Point 12 (Bingemans) to the east. It is an accessible trail used by families, walkers, hikers and cyclists. Horses are not permitted. The path surface is gravel with a rough grade width of 4 m and trail width of 2 m. Accessibility standards are not met for the full length of the trail.



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Legend

- Walter Bean Grand River Trail
- Secondary Trails
- Grand Valley Trail
- Watercourse

CLIENT

MINISTRY OF TRANSPORTATION

TITLE

Highway 7 Four Laning from
Kitchener to Guelph
Recreational Trails



MMM GROUP

Checked	S.R.	Drawn	C.M.
Date	July 2012	Proj. No.	16.08027.001.EN1
Scale	As Shown	Figure No.	2.10

The Grand Valley Trail parallels Rosendale Creek as it travels through the project corridor. North of Bridge Street the trail travels through a portion of the Bloomingdale-Rosendale forest / wetland. At Bridge Street it makes a jog to the west and then follows the west side of Rosendale Creek southerly. In the area of the crossing the trail is a narrow earth footpath. The trail is used for walking and snowshoeing and cross-country skiing in the winter. Bikes and horses are not permitted on the trail.

2.5.3 Agriculture

Throughout the preliminary EA process agriculture was a consideration in the process leading to the selection of the Recommended Route (2002). Based on earlier studies, the majority of the soils within the study area are rated Class 1 to Class 4 for the production of field crops, and are considered to be prime agricultural land (Section 6.4; EA 2004). The project will result in the removal of prime agricultural land. During detailed design measures will be developed to control soil loss and erosion of adjacent agricultural lands as a result of construction. MTO will consult with affected farmers to address/mitigate farm infrastructure such as irrigation systems that may be affected.

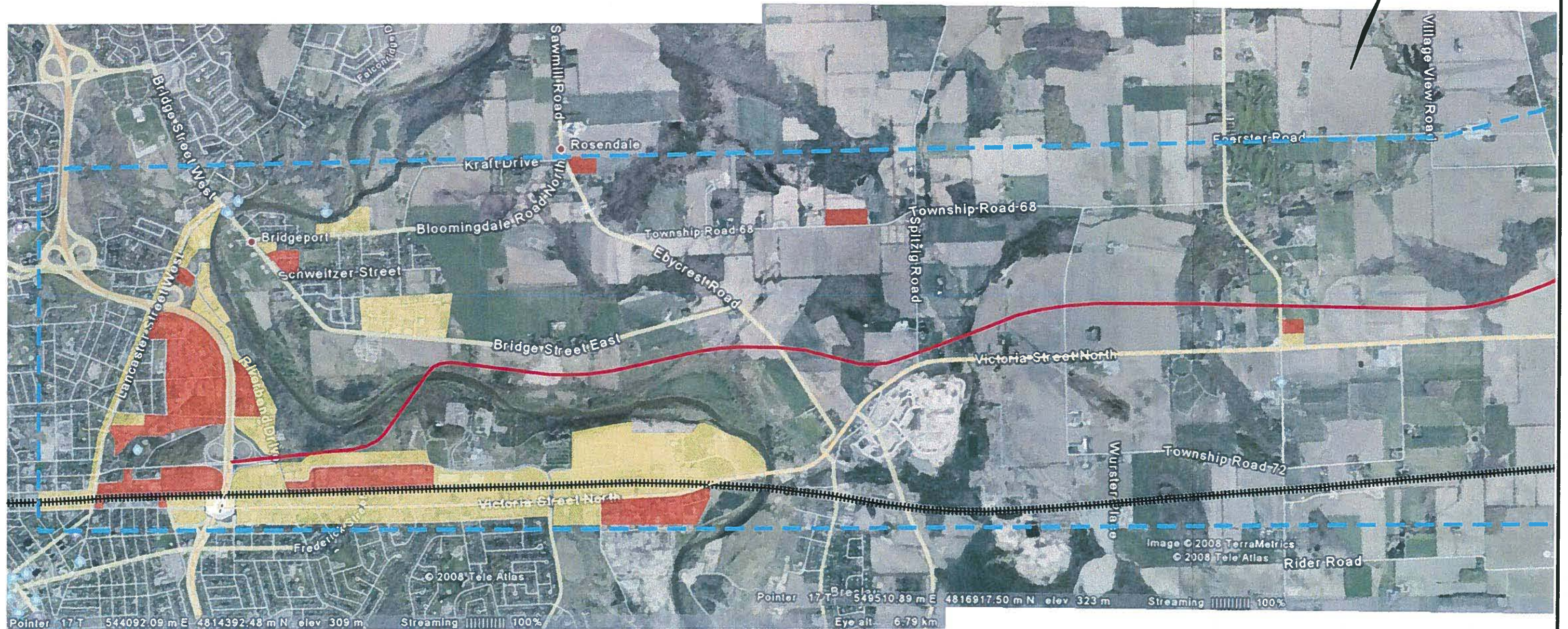
2.6 Contaminated Property Identification and Management

A Contamination Overview Study (COS) was carried out by MMM Group (2008). The objective of the COS was to identify properties/areas with the potential for site contamination within the study area. The study area for the COS extended roughly 1.5 km on either side of the existing Highway 7 between the Kitchener-Waterloo Expressway and Highway 6, covering an area of approximately 65 km² (Figure 2.11 – 2.12).

The COS was based on a review of available background material, supplemented with data collected during a windshield-level survey of activities on properties within the study area. The topographic and geologic mapping, waste disposal inventory, satellite imagery and results of the visual assessment were compiled and analyzed to evaluate the relative potential and severity for contamination. Ratings of High, Moderate or Low were applied to properties/areas within the study area. This ranking will provide guidance for future environmental follow-up work at select sites. The following Table is a summary of the factors considered in assigning the relative contamination risk (Table 2.4).

Table 2.4: Summary of Factors for Relative Contamination Rankings

Relative Risk	Description
High	These areas represent land uses that consist of industrial operations that perform activities or use products that have a high likelihood of contamination and therefore a higher risk for significant and extensive contamination. Petroleum-handling facilities, dry-cleaners, orchards, railway facilities and landfills are also included in this category
Moderate	These areas represent land uses that are primarily commercial in nature.
Low	These areas represent agriculture, parkland or residential land uses with limited commercial use.



LEGEND

- STUDY AREA BOUNDARY
- PROPOSED HWY 7
- EXISTING HWY 7
- LOW RISK POTENTIAL
- MODERATE RISK POTENTIAL
- HIGH RISK POTENTIAL




CLIENT		MINISTRY OF TRANSPORTATION	
TITLE		AREAS OF POTENTIAL CONCERN (WEST)	
		 <div> 80 Commerce Valley Dr. E. Thornhill, ON L3T 7N4 t. 905.882.1100 f. 905.882.0055 mmm@mmm.ca </div>	
Checked	A.B.	Drawn	AutoCAD/B.K.B.
Date	AUGUST 2008	Proj. No.	16-08027-001-EN3
Scale	AS SHOWN	Figure No.	2.11
		Gr.No.	001

FIG 2.1, FIG 2.2.dwg FIG 2.2 S: 114-4216(08027-001-EN3) Aug 08, 2008 - 1:20pm



LEGEND

- STUDY AREA BOUNDARY
- PROPOSED HWY 7
- EXISTING HWY 7



LOW RISK POTENTIAL



MODERATE RISK POTENTIAL



HIGH RISK POTENTIAL



CLIENT

MINISTRY OF TRANSPORTATION

TITLE

AREAS OF POTENTIAL CONCERN
(EAST)



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MMM GROUP

Checked A.B.	Drawn AutoCAD/B.K.B.
Date AUGUST 2008	Proj. No. 16-08027-001-EN3
Scale AS SHOWN	Figure No. 2.12 Gr.No. 001

According to the topographic map, the study area is located in a primarily agricultural/rural setting. Industrial/commercial areas are located at the east and west limits of the study area. Three tree nurseries, a cemetery, a campground and an old airfield are identified within the study area. A railway line is noted to cross along the southern length of the study area. No active or closed landfills and no former coal tar manufacturing or handling facilities were listed in the inventory within the study area.

Areas that pose high potential for contamination based on the visual assessment are shown in Figure 2.11 and Figure 2.12.

2.7 Cultural Heritage – Built Heritage and Cultural Heritage Landscapes

The cultural heritage resources within the project limits were documented by Unterman McPhail Associates, Heritage Resource Management Consultants in a Cultural Heritage Evaluation Report (CHER) for Direct Impacts and a separate CHER for Indirect Impacts, which are on file with the MTO (2008/2009). They identified fourteen (14) cultural heritage landscapes and three built heritage resources to be displaced or disrupted as a result of the EA Approved design of Highway 7 New between Kitchener and Guelph. Additionally, one heritage landscape was previously identified in the EA amendment resulting in a total of fifteen (15) cultural heritage landscapes. An additional built heritage resource was identified, which is to be documented in a separate report, for a total of four built heritage resources.

2.7.1 Cultural Heritage Landscapes

The documented cultural heritage landscapes include the following:

1. Farm complex at No. 806 Bridge Street East, geographic Township of Waterloo, Township of Woolwich – local cultural heritage value;
2. Farm complex at No. 5395 Woolwich-Guelph Townline, geographic Township of Waterloo, geographic Township of Guelph, Township of Guelph-Eramosa – local cultural heritage value;
3. Farm complex Nos. 5410 and 5432 Elmira Road North (Wellington Road 86), geographic Township of Guelph, Township of Guelph-Eramosa – local and possibly regional cultural heritage value;
4. Farm complex at No. 858 Bridge Street East, geographic Township of Waterloo, Township of Woolwich – local and possibly regional cultural heritage value;
5. Farm complex at No. 1000 Bridge Street East, geographic Township of Waterloo, Township of Woolwich – local and possibly regional cultural heritage value;
6. Farm complex at No. 68 Ebycrest Road, geographic Township of Waterloo, Township of Woolwich – local cultural heritage;
7. Ebycrest Road (Regional Road No. 17), geographic Township of Waterloo, Township of Woolwich – local cultural heritage;
8. Former Highway 7 alignment at Spitzig Road, geographic Township of Waterloo, Township of Woolwich – provincial cultural heritage value;
9. Greenhouse Road (Woolwich Road 72), geographic Township of Waterloo, Township of Woolwich- local cultural heritage;

10. Woolwich-Guelph Townline, geographic Township of Waterloo, Township of Woolwich and geographic Township of Guelph, Township of Guelph-Eramosa – regional cultural heritage;
11. Wellington Road 32 (Guelph Township Road 3), geographic Township of Guelph, Township of Guelph-Eramosa – local cultural heritage;
12. Farm complex at No. 5413 Wellington Road 32 (Guelph Township Road 3), geographic Township of Guelph, Township of Guelph-Eramosa – regional cultural heritage;
13. Farm complex at No. 5415 Elmira Road North (Wellington Road 86), geographic Township of Guelph, township of Guelph-Eramosa – local cultural heritage; and,
14. Farm complex at No. 5441 Elmira Road North (Wellington Road 86), geographic Township of Guelph, Township of Guelph-Eramosa – local cultural heritage.
15. The Grand River and its major tributaries are designated as a Canadian Heritage River. The designation is based on its rich cultural history including excellence of outdoor recreational activities based on natural and cultural heritage.

2.7.2 Built Heritage Resources

The documented built heritage resources include the following:

1. Residence at No. 297 Woodlawn Road West (Highway 7), geographic Township of Guelph, City of Guelph – minimal cultural heritage value;
2. Silo at No. 3014 Victoria Street North (Highway 7), geographic Township of Waterloo, Township of Woolwich – silo is the important built heritage structure ; and,
3. Former farmhouse at No. 5390 Wellington Road 32 (Guelph Township Road 3), geographic Township of Guelph, Township of Guelph-Eramosa. – regional cultural heritage value. Residence included in the Couling Collection of significant architectural structures in Guelph and Wellington County at the Wellington County Museum and Archives.
4. 1014-1026 Guelph Street, Kitchener. This is a 12-unit apartment building that was constructed in the 1940s. MTO has completed a CHER for the building as well as photo-documentation. The building has now been demolished.

2.8 Cultural Heritage – Archaeology

Stage 1, 2 and 3 Archaeological Assessments (AA) have been carried out in support of the proposed Highway 7 New. Between 1989 and 1996 several Stage 1-2 AA were carried out related to planning for Highway 7 New. Based on Stage 1 and 2 AA completed by New Directions Archaeology Ltd. in 2004, it was recommended that a Stage 3 assessment be carried out for 16 Aboriginal archaeological sites. Where permission to enter or crops were on the fields, preventing access in 2004, these Stage 2 sites were to be assessed for this study.

Stage 2

A Stage 2 Assessments was undertaken by Archeoworks in 2008 (Archeoworks Inc.). The completion of Stage 2 assessment work on several outstanding sites identified in 2004 were unable to be completed in 2008 due to the presence of crop in the field, early onset of winter and restricted access to the property.

The outstanding Stage 2 assessment properties are identified as: WT-117, WT-64, WT-65, WT-79, WT-51, WT-72a, WT-81, GT-25, and GT-26. Stage 2 assessments are to be completed prior to commencing construction in these areas.

Stage 3

Of the sites recommended for further Stage 3 investigations, at the onset of fieldwork in 2008, only 10 of 16 properties wherein each Native site was located was accessible. Stage 3 investigations involved works at the following sites:

1. Findspot Site: AiHc-296.
2. Goodview Site: AiHc-202
3. Jonas Bingeman Site: AiHc-200
4. Lawrence Bingeman Site: AiHc-201
5. Nicholas H Site
6. TP 35A-B Site: AiHc 295
7. TP 39A-D Site: AiHc-299
8. TP 41A, 43A, 46A Site: AiHc-300
9. TP 42A-F Site: AiHc-301
10. TP 45A-M Site: AiHc-302

Based on either the absence or paucity of archaeological remains recovered during the Stage 3 assessments, the following sites are to be considered free of archaeological concern: AiHc-201, AiHc-202, AiHc-295, AiHc-296, AiHc-299, AiHc-301, and Nicholas H Site.

Stage 3 archaeological assessments of the identified Aboriginal sites AiHc-297, AiHc-298, AjHc-24, AjHc-25, AjHc-26, and AjHc-30 remain outstanding and should be completed prior to construction occurring in these areas.

Due to the volume and cultural significance of the archaeological resources recovered from the Jonas Bingeman Site: AiHc-200; TP 41A, 43A, 44A, 46A Site: AiHc-300; and the TP 45A-M Site: AiHc-302, further Stage 4 mitigation is recommended for these sites. Stage 4 mitigation is to include hand block excavation within the topsoil layer where clusters of artifacts have been encountered as well as topsoil stripping surrounding the block excavation areas, to identify any subsurface features.

Six Nations, Alderville and Curve Lake First Nations have indicated an interest to be contacted in association with the undertaking and results of further archaeological investigations. Consultation will continue through the next design stage.

The remainder of the proposed highway corridor is to be considered free of further archaeological concern, except for newly identified properties based on the VE recommended designs and placement of stormwater management ponds. Additional Stage 1 & 2 archaeological assessments will be required in these areas prior to construction.

2.9 Surface Water / Drainage

A field review of the proposed culvert locations was carried out by MMM Group in September 2008 to document the characteristics of significant drainage features and supplement the data obtained through a review of available background information.

The study area is situated within the Grand River watershed. There are four major watercourses within the watershed. These are the Grand River, Rosendale Creek, Hopewell Creek and Ellis Creek. The remaining drainage system within the project limits consists of several minor streams, swales and ditches. The land uses within the study area are predominantly rural and agricultural with urban areas at the eastern and western limits of the project. The surficial soils are predominantly loam and sand over loam, interspersed with tracts of muck and peat. These soils were classified as hydrologic soil group (HSG) "BC" and "AB", which represent soils with moderate to low runoff potential.

2.10 Noise

A noise assessment was not carried out during this phase of design. A noise assessment was completed during preliminary design and documented in 1997 EA and 2004 EA Amendment to the EA (EA, 2004). The study was based on the Ministry of Transportation/ Ministry of Environment and Energy Protocol. The studies showed that an increase in noise levels (greater than 5 dBA) for noise sensitive land uses adjacent to the alignment are considered to represent an environmentally significant issue for local residents (Exhibit 3-12; EA, 2004).

The noise analysis carried out for the Recommended Route identified one hundred and sixty-eight (168) Noise Sensitive Areas (NSAs) (EA, 2004). In accordance with the Noise Protocol, noise levels were predicted for the following scenarios:

- Existing noise levels
- Future noise levels without new Highway 7 (year 2016)
- Future noise levels with new Highway 7 (year 2016).

The analysis indicated that thirty-one (31) NSAs were determined to have increases of between 5 and 10 dBA, while seven (7) locations would have an increase greater than 10 dBA.

2.11 Air Quality

An air quality assessment was not carried out during this phase of design. An air quality impact assessment was completed during preliminary design and documented in the 2004 EA Amendment, Appendix N (MTO, 2002). The results of the analysis indicate that, even under the credible worst-case scenario and conservative assumptions, the ambient concentration of carbon monoxide (CO), nitrogen dioxide (NO₂) and toxic Volatile Organic Compounds (VOCs) in the vicinity of the highway will not exceed provincial ambient air quality criteria. In fact, they will remain much below these criteria. The concentrations of fine particulate matter, on the other hand, may approach or even exceed the provincial / federal criteria for Particulate Matter, coarse dust particles less than 10 micrometers (PM₁₀) and fine particles less than 2.5 micrometers (PM_{2.5}) under credible worst-case conditions.

3.0 Description of Initial Design

The design for the approved 18 km four-lane divided highway includes a transportation corridor, consisting of a freeway, interchanges, grade-separated sideroads and local road connections.

The design for the highway component of the corridor has been developed to an Initial Design level, which further develops and refines the EA approved design and includes incorporation of recommended design improvements developed from a Value Engineering Study carried out by the MTO in 2007. The design work for all highway components of the transportation corridor has been completed to a sufficient level of detail to confirm the feasibility of the proposed infrastructure, identify the property requirements and identify environmental impacts. This design will be subject to future detailed design prior to implementation.

The following sub chapters provide an overview of the design. The environmental impacts resulting from the Design and the associated mitigation/compensation measures and strategies are detailed in Section 5.

The Design Plates (Plan and Profile Drawings) are presented in **Appendix D** (Plates 1 to 38).

3.1 Road Network

The road network consists of an 18 km four-lane divided highway, freeway-to-freeway interchange, 6 interchanges along the proposed alignment, 4 grade separations and road closure at 3 locations as described in the following sub chapters and illustrated on the Recommended Design Plates in **Appendix D**. All intersecting roads, with the exception of Curtis Drive in Guelph, will be grade separated. Curtis Drive will be closed.

The approved EA plan has been amended to incorporate the Value Engineering Recommendations documented in the approved TESR into the Initial Design Phase. The following changes to the approved EA configuration were approved, per the TESR (MMM, 2012):

- Shift new ramps at the Highway 85 (Kitchener-Waterloo Expressway) and Highway 7 New freeway to freeway interchange to north of Wellington Street North;
- Eliminate Riverbend Drive to Highway 7 New west on-ramp;
- Shift Highway 7 New westbound off-ramp to Riverbend Drive further west;
- Provide direct access to Shirley Avenue from Highway 7 New eastbound;
- Move Bridge Street to Highway 7 New westbound on-ramp further to the east;
- Realign Bridge Street at Ebycrest Road;
- Close Ebycrest Road at Victoria Street;
- Maintain existing alignment of Spitzig Road at existing Highway 7;
- Reconfigure north-west access at new Shantz Station Road interchange;
- Combine service road and private residential access at Shantz Station Road;

In addition, municipal road improvements have been identified to improve traffic operations, including a left turn lane to Highway 7 New westbound from Silvercreek Parkway northbound, and four lanes plus a turning lane as required where Shirley Ave. is currently 2 lanes.

3.2 Horizontal Alignment

The preliminary Highway 7 New mainline alignment was established in the 2004 *Highway 7*

Kitchener to Guelph Amendment to the Environment Assessment Report (1997). The resulting alignment was reviewed relative to the requirements of the Geometric Design Standards for Ontario Highways (GDSOH) and the Highway 7 New Design Criteria, and was refined to establish a recommended final alignment.

The horizontal alignment of the highway is curvilinear in nature, consisting of numerous horizontal curves connected by tangent sections. Radii for the horizontal curves range from R-525 m to R-2500 m. All horizontal alignment elements for the Highway 7 New transportation corridor meet or exceed the requirements set out in the *Geometric Design Standards for Ontario Highways* (GDSOH) for the applicable design speed of 120 km/h. The only exceptions are the curve west of Grand River (Sta. 20+700) and the last curve at the east end north of existing Highway 7 in Guelph (Sta. 36+900), where the design speed is reduced to 110 km/h on the approach to urban centers.

The preliminary alignment at the Grand River Bridge, which included a curve and spirals extended on the bridge deck in the original EA configuration, was improved by moving and reconfiguring direct on-ramp Bridge Street eastbound to Highway 7 westbound into buttonhook. This configuration results in spiral transition moved off the structure to eliminate variable differential cross-fall on the bridge deck required to comply with the superelevation requirements. This configuration results in an improved visibility and therefore safety on the approach to the bridge, improved constructability and therefore reduced risks during construction of the bridge.

A number of crossing roads and local road realignments are also required to facilitate the work as described in this chapter below.

The horizontal alignment of the Highway 7 New mainline, the interchanges, the associated crossing roads and local road realignments are presented on the Recommended Design Plan Plates in **Appendix D** (Plates 1 to 19).

The initial horizontal alignment design will be upgraded during detailed design, based on, but not limited to final structural designs, and refinements of local and cross road realignments.

3.3 Vertical Alignment

All of the vertical alignment elements (K values and grades) for the Highway 7 New mainline meet or exceed the requirements set out in the Geometric Design Standards for Ontario Highways (GDSOH) for the applicable design speed of 120 km/h. The minimum grade on Highway 7 New is 0.5%, which meets the requirements of the GDSOH for a freeway with an urban drainage system. The only location with original 0.3% grade west of Regional Road 30 (Shantz Station Road) between stations 27+200 and 28+200 was revised to a minimum 0.5m requirement to ensure drainage. The maximum grade is 3.0%, which meets the GDSOH requirements for freeways. A number of crest and sag vertical curves are located along the length of the freeway. All vertical curves meet or exceed the minimum curve requirements set forth in the GDSOH for the applicable design speed.

The profile of the transportation corridor varies throughout its length. In some locations it is below the existing ground level while in other locations it is at or above the existing ground level. The profile has been set to accommodate drainage, stormwater quantity and quality control, and groundwater considerations.

The vertical alignments of the Highway 7 New mainline, crossing roads and the associated interchanges are presented on the Recommended Design Profile Plates in **Appendix D** (see Plates 20-26).

The initial vertical alignment design will be upgraded during detailed design, based on the final drainage, stormwater and groundwater designs and considerations.

3.4 Typical Cross Section

Highway 7 New will be a four-lane rural divided controlled access freeway with a 22 m depressed grassed median in a nominal 100 m ROW extending from Highway 85 (Kitchener-Waterloo Expressway) in Kitchener to the Highway 6 (Hanlon Expressway) in Guelph. The freeway will have a functional classification of RFD120 and will be designated as a controlled access facility (Class I) with access only available at the interchanges. A 22 m wide median protects for the future widening of the highway. The exception is a short urban section where the highway passes between future Riverbend Drive and Shirley Avenue in Kitchener (between station 20+000 and 21+200; Plate 2; **Appendix D**). The entire length will have provision for a future 6-lane cross section, with the additional 2 lanes being constructed in the median.

Figure 3.1 illustrates the typical section for the Highway 7 New Mainline. Typical sections for all sections of the transportation corridor, including ramps, are provided in **Appendix D** (see Plates 20 to 38).

All through lanes will be 3.75 m in width. Minimum 1.5 m fully paved median shoulders will be provided. The outside shoulders throughout the highway corridor will be 3.0 m in width and fully paved. Where speed change lanes are required in the vicinity of interchanges, the width of these auxiliary lanes will be 3.5 m and the adjacent outside shoulder width will be 2.5 m in accordance with the GDSOH.

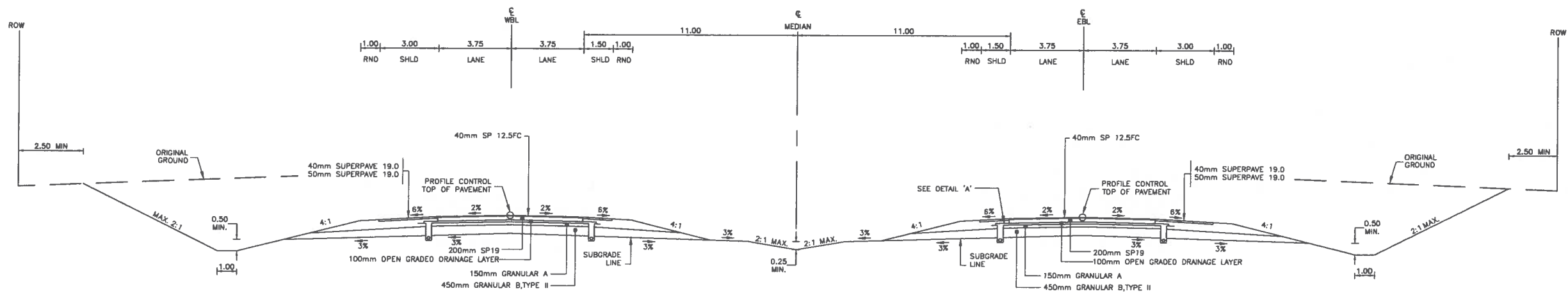
The typical cross sections will be upgraded during detailed design.

3.5 KWE / Wellington Street Freeway-to-Freeway Interchange

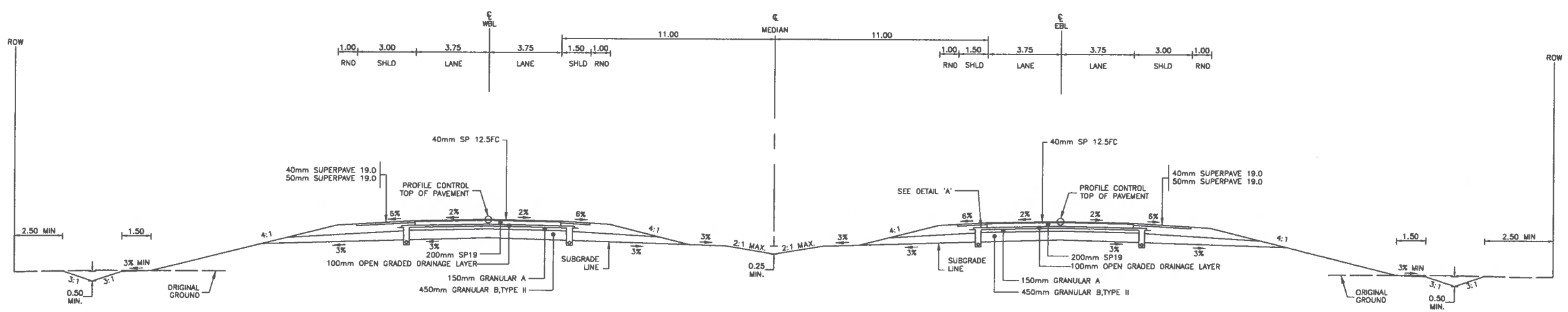
The Kitchener-Waterloo Expressway (KWE) / Wellington Street interchange, at the west project limit, connects to the proposed Highway 7 via the freeway to freeway ramps while providing local access to Wellington Street and the adjacent municipal road network (at Victoria Street, Edna Street, Shirley Avenue and Riverbend Drive).

For the purposes of discussion, the existing KWE is a north-south highway and the proposed Highway 7 is an east-west road. The freeway to freeway component includes direct ramps from Highway 7 westbound to KWE northbound and southbound and to Highway 7 eastbound from KWE northbound and southbound. The proposed interchange is shown on the Recommended Design Plates in **Appendix D**.

The interchange location and its configuration have already been determined during the initial Environmental Assessment study phase. Improvements have been incorporated in the design as part of the Value Engineering (VE) analysis and a more detailed design review of the interchange.



TYPICAL TANGENT SECTION
HIGHWAY 7 NEW
EARTH CUT



TYPICAL TANGENT SECTION
HIGHWAY 7 NEW
EARTH FILL

Client: Ministry of Transportation Ontario	Title: HIGHWAY 7 NEW TYPICAL SECTIONS	Prepared By: 	Reviewer: SR MMM: 16.08027.001.EN1 MTO: 408-88-00	Figure: 3.1 Date: October 2012
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The improvements that were implemented are:

N-E, S-E and E-S Ramps

- Move the N-E and S-E combined freeway-to-freeway ramps connections to the proposed Highway 7 eastbound north of Wellington Street; and
- Flip the profile of the N-E and E-S freeway-to-freeway ramps such that E-S ramp is now over the N-E ramp (i.e. the N-E ramp is lowered and the E-S ramp is raised).

The advantages for the above changes are listed below:

- Eliminate one structure over the Shirley Avenue and the Wellington to Victoria Street connection area;
- Eliminate 3 high skew structures;
- Ensure constructability of the S-E ramp bridge over Wellington Street;
- Improve the geometry of the N-E ramp to 80km/h; and
- Reduce the overall profile by approximately 2m at the maximum height.

Guelph Street

- The N-E and N-E/W ramp structure is lowered by approximately 5m to the same level as the currently existing southbound exit ramp from KWE thereby eliminating the need for high retaining walls.

Other design improvements include:

- *Guelph Street*: lower the profile on the east side to meet the required vertical clearance for the new E-N ramp structure;
- *N-E/W ramp*: revise profile to coincide with the changes to the N-E ramp and minimize impacts to property;
- *Wellington Street/Shirley Avenue intersection*: re-align intersection to improve geometry and sight lines;
- *Wellington Street to Edna Street Connection*: shift the section between the CNR bridge to Victoria Street slightly east to minimize impact on properties and allow construction of a retaining wall.
- *S-E ramp*: re-align from the CNR bridge to Frederick Street to meet the new structure opening;
- *Victoria Street*: profile is raised to accommodate the new structure and to meet the current vertical clearance requirement;
- *Frederick Street*: profile is raised to accommodate the new structure and to meet the current vertical clearance requirement; and
- *Bruce Street Off-ramp*: re-align slightly to the east to meet the new structure opening resulting in a long stretch of retaining wall along the east side.

3.6 Sideroads

There are a total of thirteen (13) sideroads located east of the KWE. Interchanges are proposed at 6 locations, grade separations at 4 locations and road closure at 3 locations as described in

the following sub chapters and illustrated on the Recommended Design Plates in **Appendix D** (see Plates 27-38).

3.6.1 Interchanges

The interchange locations and their configuration have already been determined during the Environmental Assessment Planning Study phase. Interchanges have undergone minor improvements as part of the VE Study.

Table 3.1 lists the locations where arterial road interchanges are proposed along with the proposed interchange type, the number of lanes on the structure and whether sidewalks and bike lanes are accommodated. The interchanges are illustrated on the Recommended Design Plates in **Appendix D** and the typical section for each structure is shown on the General Arrangement Drawing in **Appendix E**.

Table 3.1: Proposed Interchange Locations / Types

Sideroad	Interchange Type	Interchange Configuration	Number of Lanes on Structure	Sidewalk	Bike Lane
1. Riverbend Drive / Shirley Avenue	Partial	Partial Diamond (Riverbend) Partial Parclo A-4/ Buttonhook (Shirley)	3	No	No
2. Bridge Street	Partial	Partial Parclo A-4	2	Yes	No
3. Ebycrest Road (Regional Road 17)	Full	Parclo A-2	4 (incl. SCL) ⁽¹⁾	Yes	No
4. Shantz Station Road (Regional Road 30)	Full	Parclo A-2 (north side) Diamond (south side)	4 (incl. SCL and SB left turn)	No ⁽²⁾	No
5. County Road 86	Full	Parclo A-2	6 (incl. SCL)	Yes	No
6. Woodlawn Road	Partial	Combination of Parclo A-4, Button Hook and Diamond	2 (SB Structure) 3 (NB Structure)	No	No

Note: (1) Plus a 2.0m median; (2) Can be accommodated within the 2.5m shoulder.

These interchanges are described below.

1. Riverbend Drive/Shirley Avenue

Riverbend Drive will pass under Highway 7 via two new two-lane structures and ramps will permit all moves except access to Highway 7 westbound, which was eliminated from the original

EA plan as part of the VE Study. Existing Riverbend Drive will connect to Shirley Avenue via a north-south two-lane roadway between the westbound off-ramp and Shirley Avenue. All ramps will be single lane and will terminate at unsignalized intersections. The interchange configuration is unique and is described as follows: on the north side of Highway 7 the westbound traffic will exit via a direct ramp; on the south side the exit ramp from the west will be a 'button hook' configuration terminating at Shirley Avenue; and, the eastbound traffic will access the highway via a direct on-ramp at Shirley Avenue.

2. Bridge Street

Highway 7 will pass under a new service road, Bridge Street Connection, which connects to Bridge Street via a new two-lane bridge. An exit ramp will allow traffic from eastbound Highway 7 to access Bridge Street via this connection. The exit ramp terminal will intersect the connection at an unsignalized intersection. The proposed connection will be two-lane while the exit ramp will be single lane.

A buttonhook entrance ramp, from Bridge Street, located approximately 400m west of the connection will allow traffic to access westbound Highway 7 from the Bridgeport area. This ramp was moved slightly to the east of the Grand River Bridge as part of the VE Study to ensure safer operations and constructability of the bridge.

3. Ebycrest Road 17 (Regional Road 17)

A Parclo A-2 interchange configuration is proposed at Ebycrest Road. Highway 7 will pass under Ebycrest Road via a new four-lane structure and the ramps will permit all moves between the two roadways.

Ebycrest Road will remain on the existing horizontal alignment. However, its profile is raised by a maximum of 5m to accommodate the underpass bridge structure.

All ramps will be single lane. The exit ramp terminal intersections with Ebycrest Road have been widened to accommodate a separate right turn lane and will be unsignalized.

Ebycrest Road is realigned at the south end to connect with the Fountain Street Extension. Existing road section bypassed by the realignment will remain. It will terminate at the south end with a cul-de-sac and will connect at the north end with a realigned road via an entrance.

4. Shantz Station Road (Regional Road 30)

The interchange configuration is unique and is described as follows: the proposed Parclo A-2 configuration is located to the north of the highway while a Diamond configuration is located to the south; and, highway 7 will pass under Shantz Station Road via a new structure consisting of the two through lanes plus northbound speed change lane and a southbound left turn lane.

The direct N-W ramp is deferred until it is warranted by traffic volumes however property is protected for the future Parclo A-4 configuration. The southbound traffic access to westbound Highway 7 will be accomplished via a left turn connection onto the S-W ramp.

Shantz Station Road will remain on the existing horizontal alignment. However, its profile is raised by a maximum of 5 m to accommodate the underpass bridge structure.

All ramps will be single lane. The exit ramp terminal intersections with Shantz Station Road have been widened to accommodate an exclusive right turn lane and will be unsignalized.

5. County Road 86

The proposed Parclo A-2 interchange of Highway 7 with County Road 86 includes provisions for future directional ramps in the northwest and southeast quadrants, until it is warranted by traffic volumes or operating conditions. Highway 7 will pass under County Road 86 via a new six-lane structure, which includes a speed change lane in each direction.

Property will be protected for the future ramps in the northwest and southeast quadrants.

All ramps will permit all moves between the two roadways and will be single lane. The exit terminal intersections with County Road 86 have been widened to accommodate an exclusive right turn lane and will be unsignalized.

6. Woodlawn Road/Hanlon Expressway (Highway 6)

Presently, the Hanlon Expressway (Highway 6) terminates at Woodlawn Road (existing Highway 7) at a T-intersection controlled by traffic signals. The Hanlon Expressway is a controlled access facility with both at-grade intersections and interchanges. MTO's plan is to complete the upgrade of Highway 6 (Hanlon Expressway) from Highway 401 to Woodlawn Road to a controlled access freeway.

The recommended design of Highway 7 connects directly to Highway 6 to maintain the free flow of traffic movement between Kitchener and Guelph.

The proposed interchange of Highway 7 with the Hanlon Expressway is shown on Plate 19 in **Appendix D**. The proposed interchange provides continuity of the provincial highway system and allows access to the local road network. The two new structures will carry the new highway over existing Woodlawn Road: a two-lane structure for southbound traffic and a three-lane structure for northbound traffic. The S-E (northbound Highway 6 to Woodlawn Road) and N/S-W (Woodlawn Road to westbound Highway 7) moves will be facilitated with single lane ramps with the ramp terminal intersection on Silvercreek Parkway, located north of Woodlawn Road. The exit ramp will be channelized right turn only. The N-E/W (eastbound Highway 7 to Woodlawn Road), E-S and W-S (Woodlawn Road to southbound Highway 6) moves will be facilitated with single lane ramps on Woodlawn Road. The N-E/W exit ramp has been widened to accommodate an exclusive right turn lane at the ramp terminal intersection with Woodlawn Road. The entrance ramp will have channelization for the W-S move at the ramp terminal intersection with Woodlawn Road.

All ramp terminals on Woodlawn Road and Silvercreek Parkway will be controlled with traffic signals.

3.6.2 Grade Separation

Grade-separated crossings of the Highway 7 corridor, with no access to the highway, are proposed at 4 locations as listed in Table 3.2. The grade separations are illustrated on the Recommended Design Plates in **Appendix D** and the typical section for each structure is shown on the General Arrangement drawing in **Appendix E**.

Table 3.2: Proposed Grade Separations

Sideroad	Structure	Number of Lanes on Structure	Sidewalk	Bike Lane
1. Spitzig Road (Woolwich Road 66)	Sideroad over Highway 7	2	Yes	No
2. Greenhouse Road (Woolwich Road 72)	Sideroad over Highway 7	2	Yes	No
3. Townline Road	Sideroad over Highway 7	2	Yes	No
4. Guelph Road 3	Sideroad over Highway 7	2	Yes	No

3.6.3 Local Road Realignments / Connections

A number of local road realignments are required as they are displaced by the recommended Highway 7 corridor. These are illustrated on the Recommended Design Plates in **Appendix D**. Brief descriptions of the four (4) road realignments are provided below:

1. Riverbend Drive north of Highway 7 will be realigned to the east to connect to the Shirley Avenue connection. (Plate 2)
2. Shirley Avenue is realigned to connect with Wellington Street to the west. Shirley Avenue between Wellington Street to Bingemans Center Drive have been widened to four-lanes plus a center turning lane to maintain traffic operations and uniformity in service through this route. (Plates 1 & 2)
3. A section of Bridge Street is realigned to the north at Ebycrest Road to improve spacing of the intersection to the interchange and improve the angle at the intersection. (Plate 5)
4. A connection is provided from existing Ebycrest Road to Fountain Street Extension. (Plate 5, inset)

3.6.4 Road Closures

Where a local road is closed, a Cul-de-sac will be constructed as illustrated on the Recommended Design Plates in **Appendix D**. The following three (3) local roads are proposed to be closed at the Highway 7 corridor.

1. The old Shirley Avenue at the east end after the loop. (Plate 2)
2. Ebycrest Road at Highway 7. (Plate 5, inset)
3. Curtis Drive in Guelph. (Plate 19)

3.7 Structures

The structures include road crossing structures, watercourse crossing structures (bridges and culverts) and retaining walls as described in the following subsections. A brief summary of the structures is provided below. Complete details are provided in the Structural Design Reports that are on file with the MTO.

Structure type, spans and depths were determined at each structure location. Preliminary General Arrangement drawings were developed at each location to show the recommended

general layout, span lengths and sections. These drawings illustrate the conclusions of various investigations carried out to determine a feasible and economical layout for each structure.

The Structural Design Reports document the design criteria, assumptions, options considered, evaluation and recommended structure at each location. The preliminary General Arrangement drawings are intended to illustrate the recommended structures, and should not be construed as necessarily reflecting the structure to be used in the final design. It is the intent that, within the constraints and conditions presented in the Structural Design Reports and General Arrangement drawings, the designer will have the flexibility to evaluate in greater detail the layout of each structure, and hence be responsible for its structure type, appearance and span lengths.

The Structural Design Reports include a brief description of the location, horizontal and vertical alignments, environmental and hydrology issues, soil conditions and foundation recommendations, design requirements and issues, alternatives considered, cost estimates and recommended structure.

All structure components shall be analysed and designed in accordance with the Canadian Highway Bridge Design Code (CHBDC), CAN/CSA S6-06. Design live load shall be CL-625-ONT for all structures. Design details shall be in accordance with the Ontario Provincial Standard Drawings, MTO Structural Manual, Ontario Aesthetic Guidelines for Bridges manual, RSS Design Guidelines, MTO Report SO-96-01 Integral Abutment Bridges, MTO Report BO-99-03 Semi-Integral Abutment Bridges and MTO Concrete Culvert Design and Detailing Manual.

All underpass structures have been designed to accommodate the ultimate Highway 7 cross-section as established in the highway design component of the study. All cross-sections have also been based on the highway design component of the study. Sidewalks have been included on many of the municipal road bridges.

The minimum vertical clearance over travelled lanes was established as 5.0m for steel and precast concrete girder bridges and 4.8m for concrete rigid frame and slab type bridges in accordance with clause C4.4.3 of the MTO Geometric Design Standards for Ontario Highways manual.

Length and span configurations for the watercrossing structures typically define the minimum span required to satisfy the hydro-technical and geomorphic requirements for the sites based on discussions with the various design disciplines and negotiation with the review authorities. Height/elevation of watercrossing structures have been determined based on wildlife and design storm high water levels plus the appropriate additional vertical clearance.

Culverts have been based on the requirements of the MTO Concrete Culvert Design and Detailing Manual and include a 300mm thick layer of substrate material in the bottom of the culvert to reduce the water velocity at the culvert outlet, enhance fish passage and encourage natural sedimentation and replication of natural habitat. Concrete cut-off walls at each end of the culverts have also been included.

The project includes a four-level freeway-to-freeway interchange at the Kitchener-Waterloo Expressway (Highway 85) utilizing up to 350m long ramp structures and two 475m long bridges over the Grand River.

Four railway subway structures, adjacent to the KWE are included in the project. Track detouring is not feasible due to the closeness to the rail bridge over the KWE. Therefore rapid

installation of these structures, by sliding the complete structure into an open-cut excavation, is being considered.

The aesthetic classification for the structures is considered **High** for Grand River Bridges and **Medium** for all other bridges. Details regarding bridge aesthetic are described in the Bridge Aesthetics Report and summarized in Section 3.7.2.

A summary of the thirty-eight (38) structures is as follows:

- 6 Freeway-to-freeway ramp structures:
- 10 Underpasses
- 4 Overpasses
- 8 Water-crossings bridges
- 4 Railway structures
- 6 Major culverts

Table 3.3: Recommended Structure Location / Description

Location	Site No	Type	Span (m)	Width (m)
N-E/W Ramp over Guelph St.	33-525	Int NU 1600	31.0 - 25.0	12.89 - 14.07
E-N Ramp over Guelph St.	33-328	Rigid Frame	20	7.56 - 6.25
N-E Ramp over KWE	33-506	Conventional Abuts Post-Tensioned Trapezoidal Voided Deck	38.0 - 55.0 - 45.0 - 32.0	9.3
E-S Ramp over KWE	33-505	Conventional Abuts Post-Tensioned Trapezoidal Voided Deck	32 - 44 - 52.4 - 56 - 56 - 56 - 50	14.05
N-E Ramp - Ramp Overpass	33-507	Integral Abutments NU 1600	33.0 - 30.0	9.3
S-E Ramp over Wellington St.	33-508	Semi-Integral Abuts Post-Tensioned Trapezoidal Voided Deck	40.0 - 56.0 - 40.0	12.05
CNR Subways - West Side - Edna St Connection	33-521	Rigid Frame Rapid Bridge Construction	14.58	10.06

Location	Site No	Type	Span (m)	Width (m)
CNR Subways - West Side - E-S Ramp Subway	33-522	Rigid Frame Rapid Bridge Construction	17.52	10.06
CNR Subways - East Side - S-E Ramp Subway	33-523	Rigid Frame Rapid Bridge Construction	16.31	10.06
CNR Subways - East Side - Bruce St Subway	33-524	Rigid Frame Rapid Bridge Construction	15.32	10.06
Victoria Street Underpass	33-235	Conventional Abuts Post-Tensioned Solid Deck	35.0 - 37.0 - 34.0 - 23.0	18.7
Frederick Street Underpass	33-234	Conventional Abuts Post-Tensioned Trapezoidal Voided Deck	46.0 - 56.0	18.7
Riverbend Dr. Overpass WBL	33-509/2	Integral Abuts NU 1600	32.0	17.99 - 19.38
Riverbend Dr. Overpass EBL	33-509/1	Integral Abuts NU 1600	32.0	16.33 - 16.44
Grand River Bridge WBL	33-510/2	Conventional Abuts Segmental Post-Tensioned Box	45.0 - 70.0 - 80.0 - 80.0 - 120.0 - 75.0	15.05
Grand River Bridge EBL	33-510/1	Conventional Abuts Segmental Post-Tensioned Box	45.0 - 70.0 - 80.0 - 80.0 - 120.0 - 75.0	13.05 - 15.05
Bridge Street Connection Underpass	33-511	Integral Abuts NU 1600	33.6 - 36.5	13.7 - 15.78
Rosendale Creek Bridge WBL	33-512/C	Integral Abuts NU 2000	40.0	13.3
Rosendale Creek Bridge EBL	33-512/C	Integral Abuts NU 2000	40.0	13.3

Location	Site No	Type	Span (m)	Width (m)
Ebycrest Road Underpass	33-514	Conventional Abuts Post-Tensioned Trapezoidal Voided Deck	48.53 - 47.47	35.38 - 38.87
Spitzig Road Underpass	33-515	Integral Abuts NU 2000	41.0 - 41.0	13.71 - 14.19
Hopewell Creek Bridge WBL	33-516/2	Integral Abuts NU 2000	44.0	14.05
Hopewell Creek Bridge EBL	33-516/1	Integral Abuts NU 2000	44.0	14.05
Greenhouse Road Underpass	33-518	Integral Abuts NU 2000	36.5 - 36.5	13.7
Shantz Station Road Underpass	33-520	Integral Abuts NU 2000	37.5 - 35	20.99 - 21.25
Townline Road Underpass	35-602	Integral Abuts NU 2000	36.5 - 36.5	13.7
Guelph Road 3 Underpass	35-604	Integral Abuts NU 2000	34.0 - 36.0	13.7
Ellis Creek Bridge - WBL	35-605/2	Integral Abuts NU 1600	33.0 - 33.0	14.05
Ellis Creek Bridge - EBL	35-605/1	Integral Abuts NU 1600	33.0 - 33.0	14.05
Wellington County Road 86 Underpass	35-606	Integral Abuts NU 2000	40.0 - 40.0	28.85
Woodlawn Road Overpass WBL	35-608/2	Integral Abuts NU 2400	47.0	17.05
Woodlawn Road Overpass EBL	35-608/1	Integral Abuts NU 2400	47.0	14.05

Table 3.4: Recommended Structural Culvert Location / Description

Location	Site No	Type	Size (m)	Length (m)
Culvert C8	33-513/C	Rigid Frame Box	3.0 x 1.5	138.9
Culvert C15A	33-517/C	Rigid Frame Box	1.8 x 1.2	62.4
Culvert C16	33-519/C	Rigid Frame Box	3.5 x 1.5	90.8
Culvert C20	33-601/C	Rigid Frame Box	4.0 x 1.5	95.8
Culvert C24	33-603/C	Rigid Frame Box	2.4 x 1.5	62.8
Culvert C33	33-607/C	Rigid Frame Box	6.0 x 1.8	70.7

Detail design of the bridges and culverts will be completed during detailed design.

3.7.1 Navigability

The Grand River is considered by Transport Canada to be navigable waterway. In accordance with the *Navigable Waters Protection Act* (NWPA), navigability of a waterway must be maintained during and post construction. Prior to construction, approval under the NWPA will be required. The review will be initiated through submission of A *Request for Project Review*, *Navigable Waters Protection Act* form and supporting documentation for TC review during detailed design.

3.7.2 Bridge Aesthetics

The aesthetics requirements shall be considered for this project in accordance with the Canadian Highway Bridge Design Code (CAN/CSA-S6-00) and MTO Aesthetic Guidelines for Bridges for all bridge components and retaining walls.

Since this highway is completely new there is an opportunity to incorporate a theme in the exposed surfaces of the structures.

Concrete will be used as the primary building material because of the need to be compatible with a wide range of existing conditions and improved durability. Concrete can be either cast-in-place or installed as precast elements. Concrete can be surficially stained or pigmented in order to create a signature look for the highway. Concrete will also allow the use of a signature logo or group of images (First Nation pictographs/symbols) in certain components, abutments, wingwalls or retaining walls, to identify the highway.

Open abutments have been selected as the preferred configuration in order to provide a more open structure as well as to allow for unanticipated future width expansion (by underpinning) and reduce the exposure of the abutment components to chlorides.

Although there are several long retaining walls on this project, the majority of retaining walls are extensions of bridge abutments. Therefore the treatment of the retaining walls must be compatible with the bridge structures. The options for retaining walls include pigmented concrete, penetrating stains and form liners. The location and description of retaining walls are summarized in Table 3.5.

Table 3.5: Retaining Wall Location and Summary Description

Location	Site No	Wall Description	Max. Height (m)	Length (m)
N-E/W Ramp over Guelph St.	33-525	Armourstone wall along both sides of the existing channel	9.0 2.0	6 2
E-N Ramp over Guelph St.	33-328	RSS walls parallel with Guelph St, adjacent to abutments on east side	2.8	15
N-E Ramp over KWE	33-506	RSS walls along south side of ramp	3.1	23
E-S Ramp over KWE	33-505	RSS walls at west side of south abutment	2.5	25
		RSS walls in front of east abutment and on north and south sides of east abutment	9.0	53
		RSS wall adjacent to E-N ramp	6.2	260
N-E Ramp - Ramp Overpass	33-507	RSS walls in front of west abutment and on north and south sides of west abutment	3.1	23
S-E Ramp over Wellington St.	33-508	RSS wall on north side of west abutment	5.2	44
		RSS wall on south side of east abutment	5.5	100
CNR Subways - West Side - Edna St Connection	33-521	Cast-in-place concrete on north and south sides of both abutments	8.5	60
CNR Subways - West Side - E-S Ramp Subway	33-522	Cast-in-place concrete on north and south sides of both abutments	8.5	60
CNR Subways - East Side - S-E Ramp Subway	33-523	Cast-in-place concrete on north and south sides of east abutment	8.5	30
CNR Subways - East Side - Bruce St Subway	33-524	Cast-in-place concrete on north and south sides of both abutments	8.5	60
Victoria Street Underpass	33-235	RSS walls on north and south sides of west abutment	6.9	212
		RSS walls on north and south sides of east abutment	4.0	120
Frederick Street Underpass	33-234	RSS walls in front of east abutment and on north and south sides of east abutment	6.8	643
Riverbend Drive Overpass WBL	33-509/2	RSS wall parallel to ramp	1.5	159
Bridge Street Connection Underpass	33-511	RSS walls on west and east sides of north abutment	1.0	14

Location	Site No	Wall Description	Max. Height (m)	Length (m)
Ebycrest Road Underpass	33-514	RSS walls in front of north abutment and on west and east sides of north abutment	4.0	14
		RSS walls in front of south abutment and on west and east sides of south abutment	4.0	14
Hopewell Creek Bridge WBL	33-516/2	Armourstone wall in front of and north of east abutment	2.0	30
Shantz Station Road Underpass	33-520	RSS walls on west and east sides of north abutment	3.0	11
Guelph Road 3 Underpass	35-604	RSS walls on west and east sides of south abutment	1.5	24

Additional retaining walls may be added as the detailed design for the project is advanced.

Aesthetics may be improved through decorative lighting and landscaping can be used to soften the appearance of the structures and enhance interchange areas. Although decorative lighting could be used to enhance features, it is not recommended due to the largely rural location of the project.

The aesthetics of the Grand River Bridge will take into account the potential visual impact of the new crossing of a Canadian Heritage River.

A summary of recommended aesthetic treatment to the various components of the structures is presented in Table 3.6.

Table 3.6: Summary of Recommended Aesthetic Features

A = Aesthetic Treatment Recommended Blank = No Aesthetic Treatment Recommended											
Location	Site No	Landscaping	Concrete Slope Protection	Cast-in-Place Retaining Walls	RSS Walls	Barrier / Parapet Walls	Piers	Piers Round Columns	Pier Tapered Columns	Precast Girders Pigmented Sealer	Variable Depth Superstructure
N-E/W Ramp over Guelph St.	33-525		A			A	A	A		A	
E-N Ramp over Guelph St.	33-328					A					
N-E Ramp over KWE	33-506	A	A		A	A	A	A	A		
E-S Ramp over KWE	33-505	A	A		A	A	A	A	A		

A = Aesthetic Treatment Recommended Blank = No Aesthetic Treatment Recommended											
Location	Site No	Landscaping	Concrete Slope Protection	Cast-in-Place Retaining Walls	RSS Walls	Barrier / Parapet Walls	Piers	Piers Round Columns	Pier Tapered Columns	Precast Girders Pigmented Sealer	Variable Depth Superstructure
N-E Ramp - Ramp Overpass	33-507	A	A		A	A	A	A	A	A	
S-E Ramp over Wellington St.	33-508	A	A			A	A	A			
CNR Subways - West Side - Edna St Connection	33-521			A							A
CNR Subways - West Side - E-S Ramp Subway	33-522			A							A
CNR Subways - East Side - S-E Ramp Subway	33-523			A							A
CNR Subways - East Side - Bruce St Subway	33-524			A							A
Victoria Street Underpass	33-235		A		A	A	A	A	A		A
Frederick Street Underpass	33-234		A		A	A	A	A	A		
Riverbend Dr. Overpass WBL	33-509/2	A	A			A				A	
Riverbend Dr. Overpass EBL	33-509/1	A	A			A				A	
Grand River Bridge WBL	33-510/2					A	A		A		A
Grand River Bridge EBL	33-510/1					A	A		A		A
Bridge Street Connection Underpass	33-511	A				A	A	A	A	A	
Rosendale Creek Bridge WBL	33-512/C										
Rosendale Creek Bridge EBL	33-512/C										

A = Aesthetic Treatment Recommended Blank = No Aesthetic Treatment Recommended											
Location	Site No	Landscaping	Concrete Slope Protection	Cast-in-Place Retaining Walls	RSS Walls	Barrier / Parapet Walls	Piers	Piers Round Columns	Pier Tapered Columns	Precast Girders	Pigmented Sealer Variable Depth Superstructure
Ebycrest Road Underpass	33-514	A			A	A	A	A	A		
Spitzig Road Underpass	33-515					A	A	A	A	A	
Hopewell Creek Bridge WBL	33-516/2										
Hopewell Creek Bridge EBL	33-516/1										
Greenhouse Road Underpass	33-518					A	A	A	A	A	
Shantz Station Road Underpass	33-520	A				A	A	A	A	A	
Townline Road Underpass	35-602					A	A	A	A	A	
Guelph Road 3 Underpass	35-604					A	A	A	A	A	
Ellis Creek Bridge - WBL	35-605/2										
Ellis Creek Bridge - EBL	35-605/1										
Wellington County Road 86 Underpass	35-606	A				A	A	A	A	A	
Woodlawn Road Overpass WBL	35-608/2	A	A			A				A	
Woodlawn Road Overpass EBL	35-608/1	A	A			A				A	

3.8 Drainage and Stormwater Management

The study area is situated within the Grand River watershed and is within the jurisdiction of the Grand River Conservation Authority (GRCA).

The proposed Highway 7 alignment traverses through a surface water drainage system which consists of a network of streams, their tributaries and wetlands. Within the study area, there are four major watercourses namely: Grand River, Rosendale Creek, Hopewell Creek and Ellis Creek and several minor streams, swales and ditch crossings. The Grand River meanders southward along the eastern boundary of the City of Kitchener and is the larger of the watercourses in the study area. Hopewell Creek is a third order stream that flows directly to the Grand River. Ellis Creek is a tributary of the Speed River, which flows into the Grand River in Cambridge. The direction of flow is primarily from north to south except for two small catchments located west of Shantz Station Road that drain north towards a tributary of Hopewell Creek.

The approximate locations of the major watercourses are shown in Figure 3.2. The drainage catchments delineated for existing conditions are shown in Figure 3.3 to Figure 3.7.

3.8.1 Drainage

Based on the results of the study and analyses, four (4) bridges and twenty-three (23) culverts are required to maintain the existing external drainage system. In addition, several stormwater management ponds and grassed swales are required to handle the stormwater treatment and conveyance within the project limits. These structures and stormwater facilities are detailed in the Highway 7 New Kitchener to Guelph Drainage and Stormwater Management Report (MMM, 2012) and the Highway 7 New Kitchener to Guelph Hydrology Report (MMM, 2012), on file with the MTO, and summarized below.

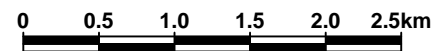
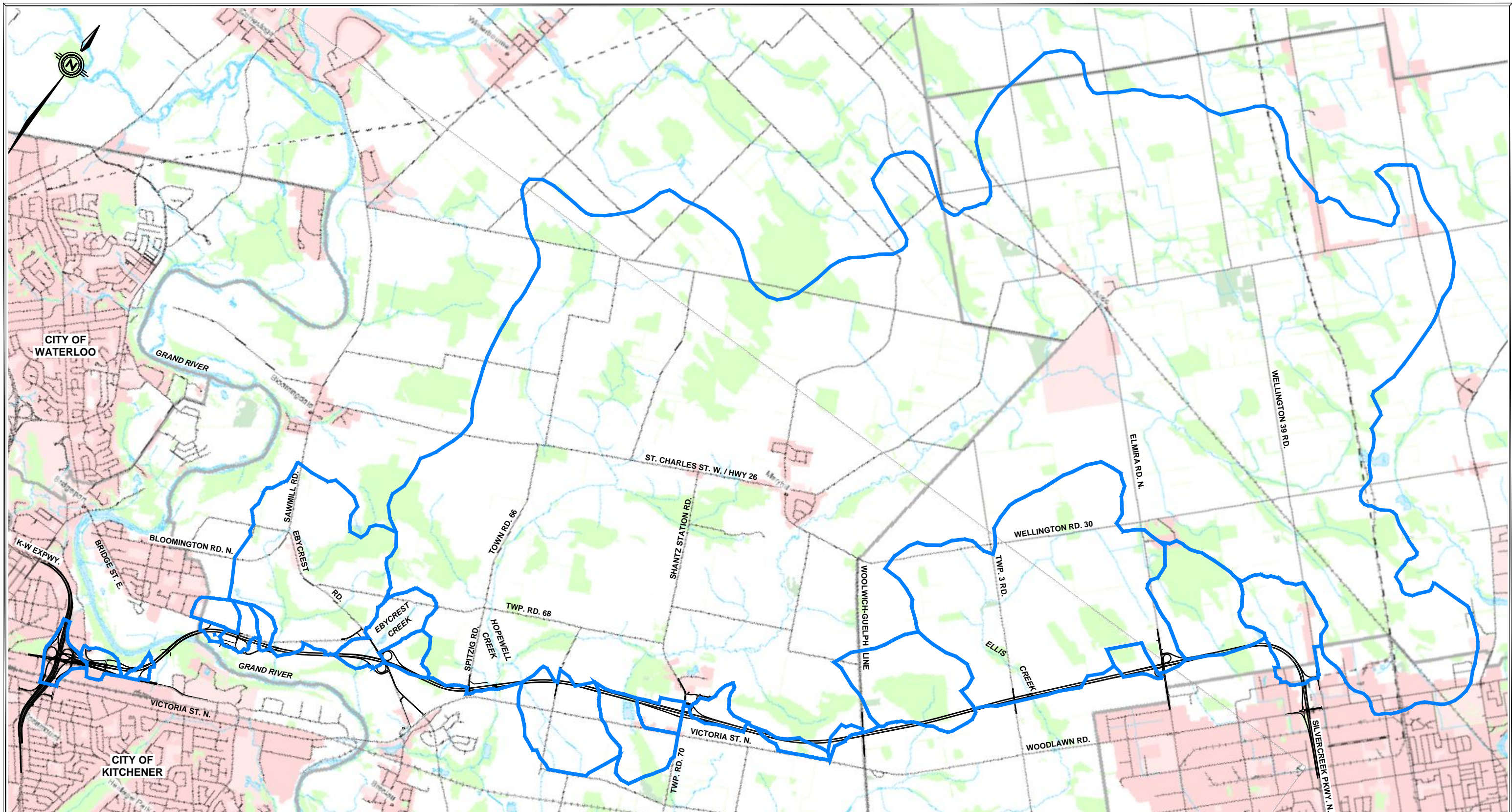
Fish and Wildlife passage requirements were considered during the study. Based on fish community and habitat sensitivities and documented wildlife movements through the study area, four culverts were designed to accommodate fish and wildlife movements. Fish passage is required at Culvert 16 (Tillich Drain) and wildlife passage is required at Culverts 20 (Townline West) and 33 (Marden South / Marden Drain).


The fish passage culverts should be designed to have a bottom lined with riverstone and a bankfull channel formed within the substrate layer to facilitate fish passage. Culvert 8, 16, 20 and 33 are designed to provide a drainage function as well as allowing fish passage and wildlife movement. In order to maintain fish passage and to accommodate movement of large wildlife at these locations, the following design recommendations were developed by MMM's biologists.

The design recommendations are as follows:

- An open-bottom box culvert with minimum opening height of 2.5 m should be used to provide room for wildlife movement.
- A low flow channel should be provided for fish passage, and a stable 1m wide (minimum) overbank area should be provided for wildlife movement.
- The top of the overbank areas should be set above the bankfull depth so that it would not be frequently flooded.
- Overbank areas should have voids filled with finer materials to provide firm footing for wildlife movement.

FIGURE 3.1 (GWP 408-88-00).dwg Existing Drainage Conditions S:\14-411\6\08027-001\WR1\REPORT 02 HWY 7 OCTOBER 2011, Nov 05, 2011 - 10:26am



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TITLE		HIGHWAY 7 — KITCHENER TO GUELPH	
		EXISTING DRAINAGE CONDITIONS	
		<div><div><div>100 Commerce Valley Dr. W. Thornhill, ON L3T 0A1 t. 905.882.1100 f. 905.882.1857 mmm@mmm.ca</div></div><div>MMM GROUP</div></div>	
		Checked J.Z.	Drawn AutoCAD/B.K.B.
		Date NOVEMBER 2011	Proj. No. 16-08027-001-WR1
		Scale AS SHOWN	Figure No. 3.2 Gr.No. 001



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LEGEND

- SUB-CATCHMENT BOUNDARY
- SUB-CATCHMENT No.
AREA (ha)
- POINT OF INTEREST



FIGURE 3.2 - 3.6 (GWP-88-001).dwg FIG 3.2 S:\14-41\1608027-001-WR\UREPORT 02 HWY 7 OCTOBER 2011 Nov 05, 2011 - 10:05am

CLIENT

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NOVEMBER 2011

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FIGURE 3.2 - 3.6 (GWP-88-00).dwg FIG 3.3 S:\14-41\1608027-001-WR\REPORT 02 HWY 7 OCTOBER 2011 Nov 05, 2011 - 10:07am

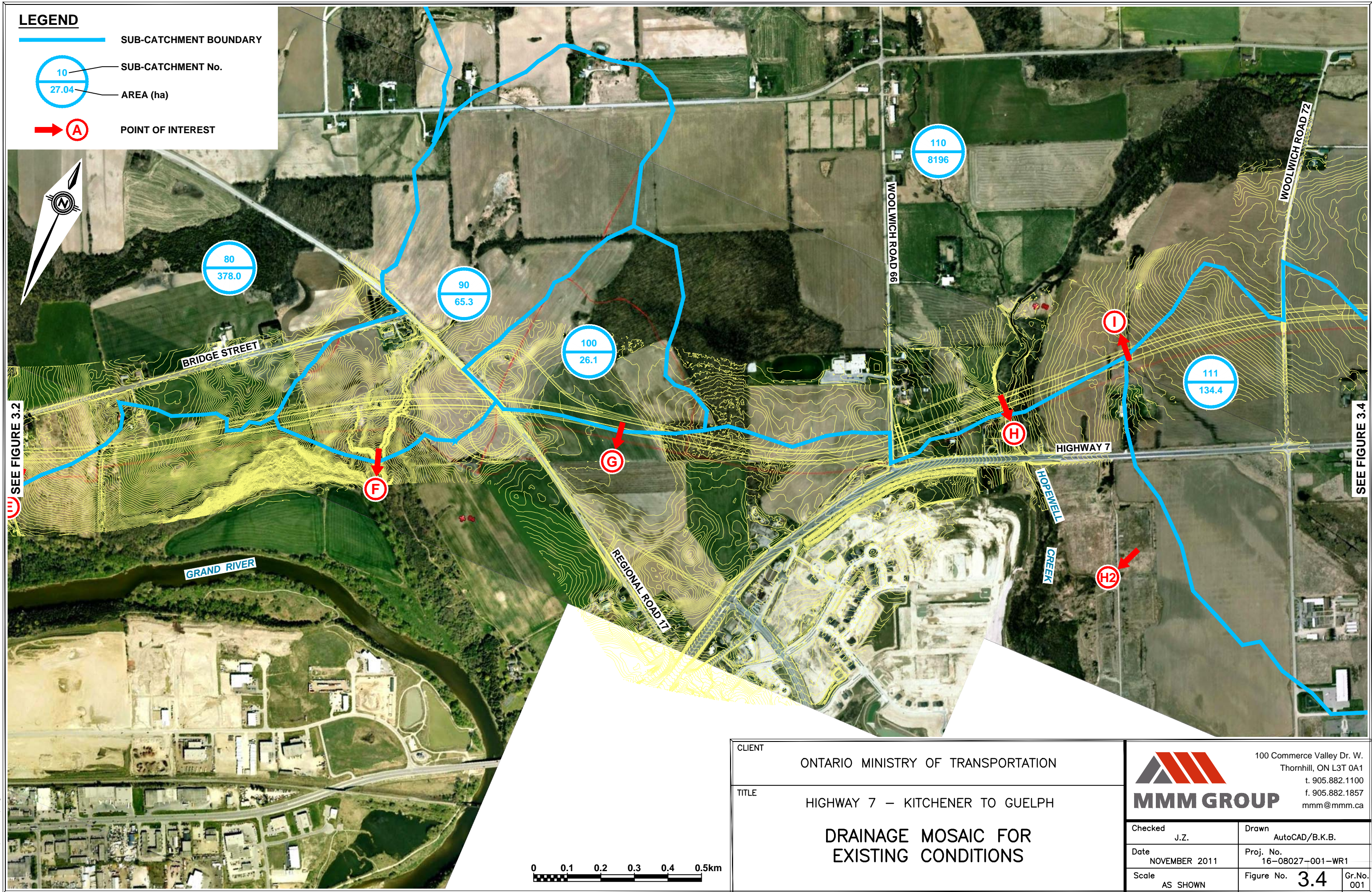
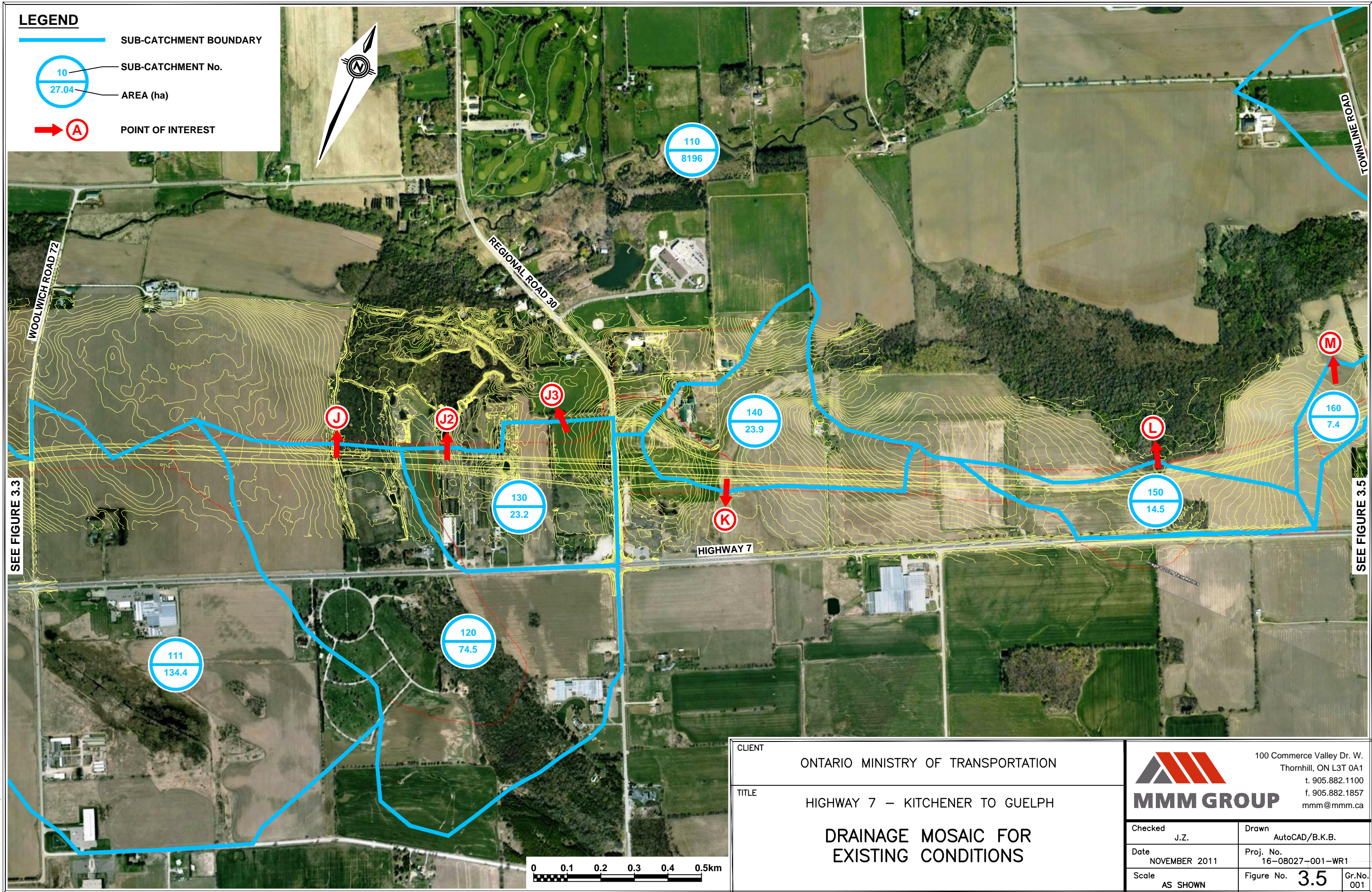


FIGURE 3.2 - 3.6 (GWP-88-00).dwg FIG 3.4 S:\14-41\1608027-001-WR\REPORT 02 HWY 7 OCTOBER 2011 Nov 05, 2011 - 10:10am



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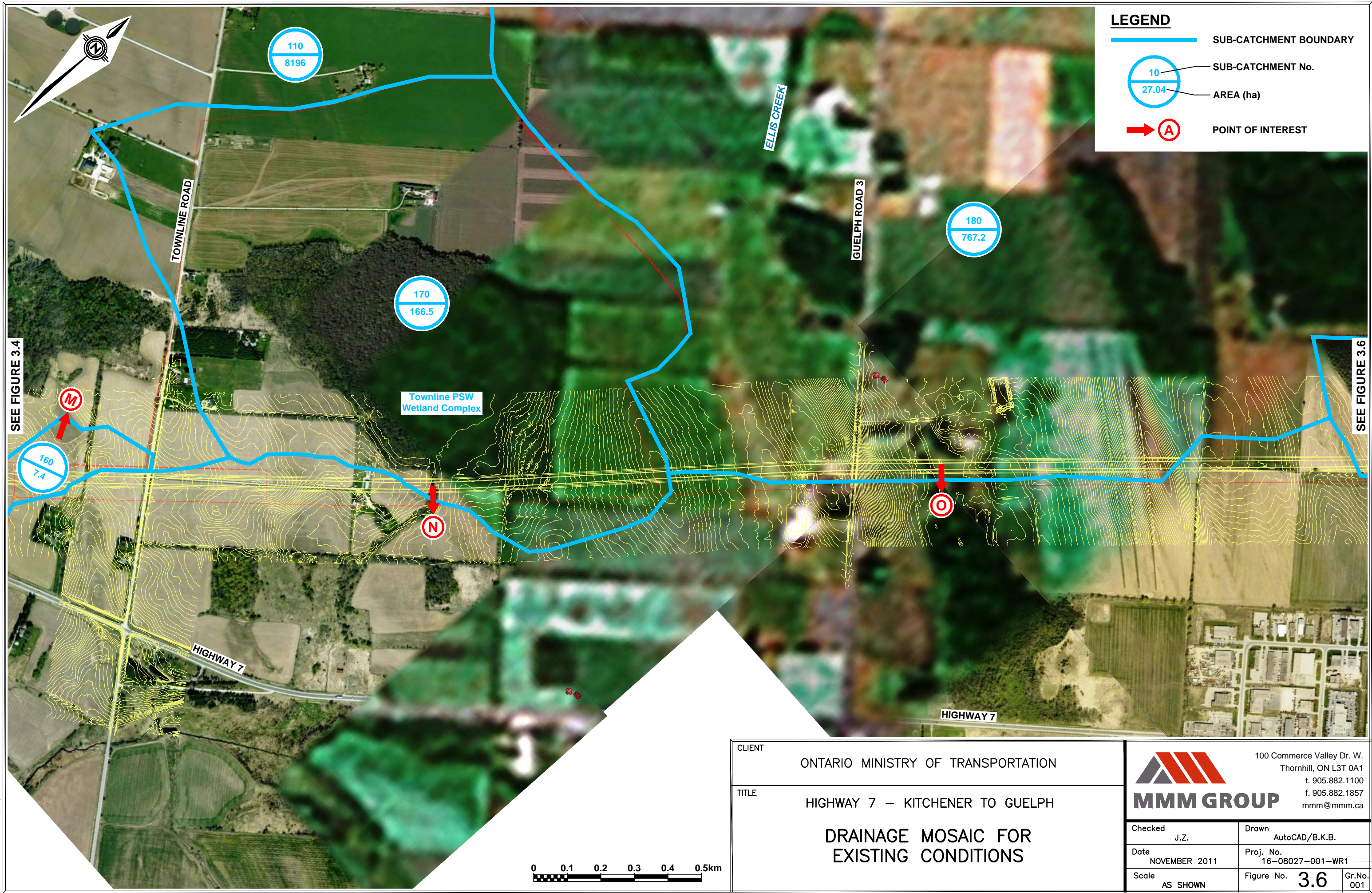
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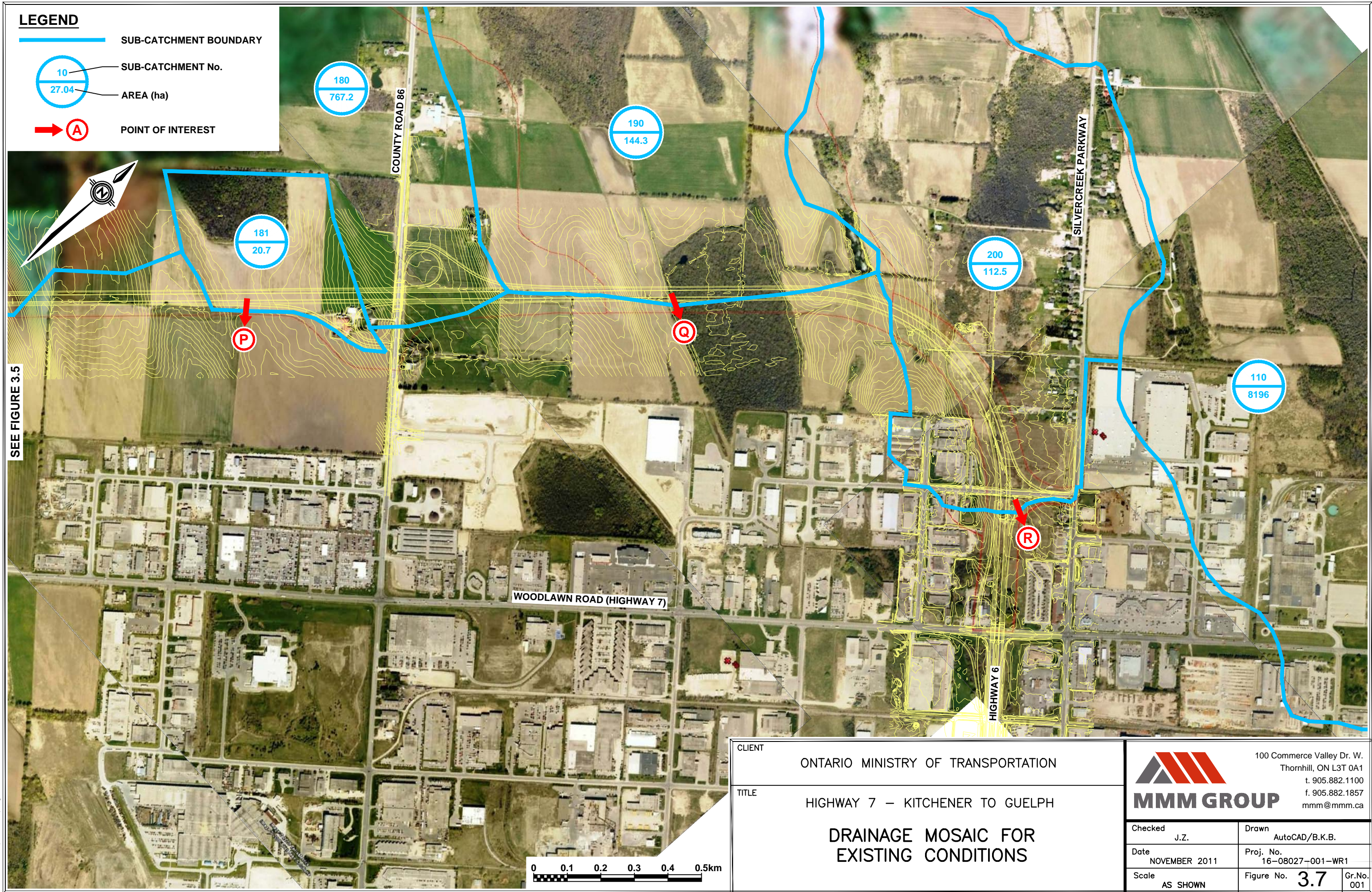
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Proj. No. 16-08027-001-WR1

Figure No. **3.5** Gr.No. 001





The proposed culverts were sized to meet hydraulic capacity requirement in accordance to the MTO design standards. The recommended sizes of the new culverts are given in Table 3.7. These culverts and additional culverts required to control the drainage within the highway corridor are shown on the Recommended Design Plates.

Table 3.7: Proposed Culverts

Culvert No.	CL Station	Passage Required		Proposed Culvert Size (mm) and Type	Total Length (m)	Slope (%)
		Fish	Wildlife			
2	21+900			1500 CSP	31.5	0.84
3	21+900			1500 CSP	30.5	0.07
4	22+357			2 X 1200 CSP	30.0	0.79
4A	22+357			2 X 1200 CSP	28.1	0.98
45A	22+351			2 X 1200 CSP	21.5	1.59
43	10+225			1200 CSP	43.4	5.45
5	22+580			1050 CSP	70.2	1.78
44A	10+545			1050 CSP	32.9	2.92
8	23+960			1650 CSP	138.9	7.01
12	24+625			2 X 1200 CSP	85.6	0.30
15A	26+207			2 X 1800 X 900 Concrete Box	62.5	0.83
16	27+593	✓		3500 X 1200 Open Box	90.8	0.21
16A	27+925			1050 Circular	88.5	0.34
19	28+750			2 X 1350 Circular	85.9	0.30
20	30+044		✓	4000 X 1200 Open Box	95.8	0.91
21	30+650			1800 x 1200 Concrete Box	29.5	0.31
22	30+650			1800 x 1200 Concrete Box	29.2	0.31
24	31+774			2 X 2400 x 1500 Concrete Box	62.8	0.31
28	34+625			1500 CSP	75.7	0.30
33	35+895		✓	6000 X 1500 Open Box	70.7	0.25
34	37+187			1500 CSP	72.3	0.41
74	37+325			1800 x 1200 Concrete Box	37.9	0.39
75	37+283			2 X 1200 CSP	36.8	0.27

The proposed highway crosses four (4) watercourses on bridges. The proposed bridges are listed below and shown in Figure 3.8:

- Grand River;
- Rosendale Creek;
- Hopewell Creek; and
- Ellis Creek.

Hydrologic and hydraulic analyses of the bridges were carried out in accordance with MTO Drainage Design Standards (2008) and established the minimum opening sizes required to avoid adverse flood impacts and to meet MTO's minimum clearance and freeboard requirements. The recommended bridge spans were also selected so as not to result in adverse aquatic habitat impacts and to accommodate wildlife passage where required. The preliminary General Arrangement Drawings for the watercourse crossing structures are provided in **Appendix E**.

Based on the Highway 7 Planning Study EA Amendment, the Grand River and Hopewell Creek are considered to be navigable. An application for approval under the Navigable Waters Protection ACT (NWPACT) will be made during detailed design.

A Preliminary Hydrology Report was prepared to document the hydrologic and hydraulic analysis carried out in support of the preliminary design of bridges required at four watercourse crossing structures and the recommended structure type and size for each crossing.

3.8.2 Stormwater Management

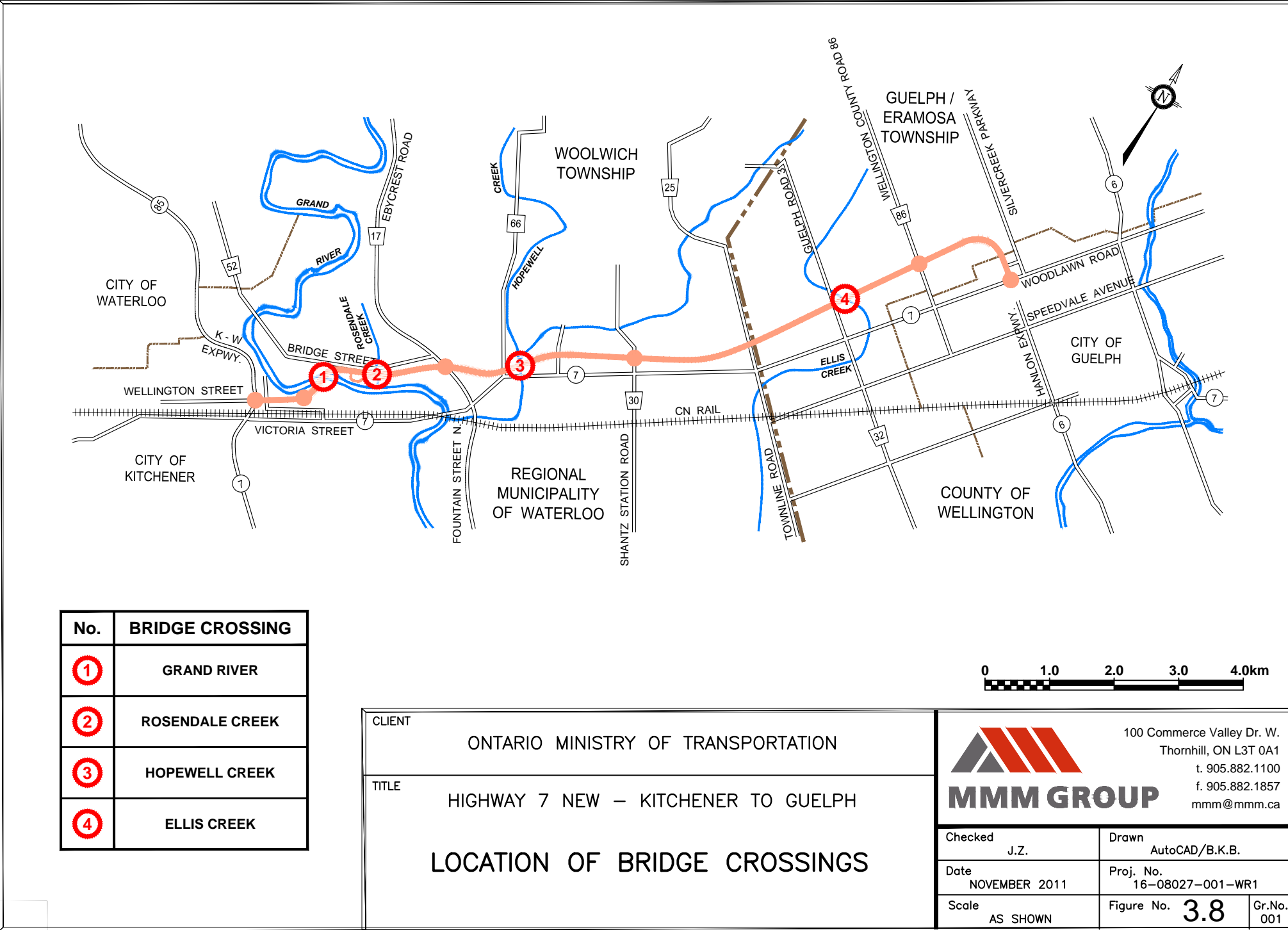
A stormwater management (SWM) strategy was defined for the Highway 7 corridor to provide water quality, quantity and erosion treatment using best management practices. Specifically, the SWM strategy for Highway 7 New shall achieve the following:

- Water Quality: maintain or enhance the quality of runoff released from the transportation corridor;
- Water Erosion: maintain or reduce potential erosion risk along the highway and receiving drainage features; and,
- Water Quantity: maintain or reduce flood risk along the highway and along receiving drainage features.

The proposed stormwater management system consists of three components: storm sewers at the Kitchener-Waterloo Expressway area and in the median where median barrier is proposed, stormwater management ponds and enhanced grass swales.

The location and approximate size of the stormwater management ponds and enhanced grass swales have been determined and are detailed on the Recommended Design Plates in **Appendix D**. Currently, twelve (12) stormwater management ponds are planned throughout the highway corridor.

Stormsewer systems are required in urban environment mainly at the Kitchener-Waterloo Expressway in Kitchener and Highway 6 in Guelph and need to be reviewed during detailed design.



Ideally, flows generated from the external drainage areas should be separated from the runoff generated from the new highway, such that the new ponds will only treat runoff generated from the new pavement.

Stormwater Ponds

Stormwater ponds represent the primary stormwater management strategy for the highway. Highway runoff is to be directed to wet ponds to be constructed at specific locations along the corridor, as shown in **Appendix D** (Plates 3, 4, 5, 7, 8, 9, 10, 13 and 15). The storages required within the wet ponds are determined as follows:

Water Quality:

- Provide an enhanced level of water quality treatment to protect downstream watercourses.
- The sizing criteria to address quality issue using stormwater wet ponds are presented in the Stormwater Management Practices Planning and Design Manual (MOE, 2003) (Table 3.7).
- Of the specified storage volume for wet ponds, 40 m³/ha is extended detention, while the remainder represents the permanent pool.

Water Erosion:

- Provide erosion control through extended detention by controlling the greater of 40 m³/ha or the runoff volume from a 25 mm rainfall event, which is determined through hydrologic simulation.
- A detention time of 24 hours was targeted in all instances, unless the outlet is susceptible to clogging due to its small size. In this case, the detention time may be reduced to a minimum of 12 hours.

Water Quantity:

- Provide water quantity control by controlling the post-development flows to existing levels.
- Quantity controls are required at three locations. Storage for peak attenuation was provided within Pond 4, 9 and 10.
- The required storage volume is determined through hydrologic simulation for the 2 to 100 year storm events.

The requirements for various components of the pond need to be achieved, namely:

- Permanent pool depth of 1 to 2 m
- Freeboard of 0.3 m
- Side slopes of 4:1 within the active storage and 3:1 above the pond to match existing ground elevations;
- Maximum water level fluctuation of 2 m for water quality/erosion active storage; and,

- Minimum 10 m setback from the pond to the toe of the road.

Grassed Swales

Flat bottomed grass swales with bottom widths ranging in sizes from 1 to 3 m are proposed for quality control where the ponds are not feasible. The critical factor governing the effectiveness of the swales with regard to water quality treatment is the velocity of the flow. The Stormwater Planning and Design Manual (MOE 2003) advises that grass swales will provide effective water quality treatment if the flow velocity during the 25 mm rainstorm is less than or equal to 0.5 m/s.

Flat-bottomed grass swales in combination with wet ponds will maintain or enhance the quality of runoff along the highway right-of-way. These swales will be designed with bottom widths ranging in sizes from 1 m to 3 m and are proposed along various sections of the highway. Hydrologic and hydraulic analyses were carried out to confirm that the proposed swales meet the following design criteria:

- The flow velocity during 25 mm rainstorm is less than or equal to 0.5 m/s.
- The water depth during 100-year event is less than 0.5 m.

The flat-bottomed grass swales are shown on the Recommended Design Plates.

3.9 Property Requirements

The right-of-way requirements for the Highway 7 corridor have been identified and are presented on the Design Plates in **Appendix D**. The ROW width is typically based on a nominal highway right-of-way of 100m with additional property requirements at interchange locations and the stormwater management ponds. The right-of-way requirements account for grading (cut and fill slopes), drainage and clear zone requirements.

In total, the Highway 7 corridor traverses approximately 120 properties, with a total of approximately 230 hectares of land required.

Currently, MTO is in the process of purchasing the necessary property for the undertaking. ,

3.10 Utilities

Local utilities, such as watermain, sewers, telephone and natural gas are located within the roadway ROW in urban areas (Kitchener and Guelph). In rural areas the utilities are limited to aerial hydro and telephone lines. Conflicts with utilities will be determined during the next phase of detailed design and the appropriate Utility companies will be contacted.

3.11 Draft Design Criteria

The draft Design Criteria is shown in **Appendix F**. The final design criteria will be completed in detailed design.

4.0 Environmental Effects and Proposed Mitigation

4.1 Fish and Fish Habitat

General and site specific mitigation measures are based on the initial impact assessment. During detailed design, the impact assessment and development of mitigation measures will be updated based on the detailed design of the bridges, culverts, and construction staging and access requirements. The following measures and those identified in Table 5.1 are to be considered along with commitments and conditions of approval for the EA Amendment, 2004 during detailed design.

4.1.1 General Environmental Effects and Mitigation Measures

A preliminary assessment of the potential for the project to result in the *Harmful Alteration, Disruption or Destruction* (HADD) of fish and fish habitat was completed based on the Initial Design details for the highway, bridges, culverts and stormwater management facilities. Although this is a preliminary assessment and final HADD determinations will be undertaken during the refinement of the Detailed Design, the following mitigation/compensation measures are anticipated to provide the basis for future mitigation/compensation works as they will address potential impacts to fish habitat.

The typical impacts to fish and fish habitat anticipated to occur at each of the proposed crossings within the project corridor include:

- Temporary loss of vegetation within the proposed ROW during construction of the new highway and associated watercourse crossings.
- Temporary loss of instream habitat resulting from vehicle and equipment access (i.e. temporary crossing) during construction.
- Permanent loss of instream vegetation and habitat within the footprint of the proposed crossing, due to shading, and the placement of piers, abutments and culvert footings.
- Introduction of sediments and deleterious substances, resulting from construction activities within the watercourses and immediately adjacent to the wetted edge of the watercourses.
- Potential alteration of fish migration and movement through the proposed crossings

The following general measures are proposed to mitigate the potential impacts anticipated to occur as a result of the construction of new watercourse crossings within the project corridor. Site specific mitigation measures are provided below and will be confirmed during the next phase of design may include, but not be limited to the following:

- Limit the amount of vegetation removed within the ROW during construction to reduce the potential impacts resulting from the temporary loss of vegetation within the ROW.
- Limit access by vehicle and equipment to prevent unnecessary encroachment into watercourses during construction to prevent destruction of instream habitat during construction of the proposed crossings.

- The disturbed ROW will be re-vegetated. This will promote the establishment of vegetation and stabilize exposed soils within the ROW. The seed mixture will be selected during detailed design, based on site conditions.
- Limit the extent of in-water work during construction of the crossings to minimize impacts to instream vegetation within the limits of the ROW and immediately upstream and downstream of the crossing ROW.
- Culverts to be designed according to the MTO's Highway Drainage Design Standards including the provisions to maintain fish passage.
- Installation of counter-sunk and lined box culverts to maintain fish passage within watercourses that provide direct fish habitat and eliminate or reduce the loss of instream habitat by the placement of structures in the water.
- Implementation and monitoring of sediment and erosion control measures to limit the introduction of sediments and deleterious substances into the watercourses during construction of the watercourse crossings.
- Timing of construction to complete the installation of proposed crossings during low flow periods and completed in the dry (i.e. coffer dams).
- For in-water works, timing of construction activities must adhere to the in-water construction timing windows approved by the MNR to limit potential impacts to sensitive periods for fish and fish habitat within the proposed ROW of the crossings. The permissible in-water timing window for watercourses excluding the Grand River occurs between July 1 and March 31, annually.
- The permissible in-water timing window for the Grand River occurs between July 1 and March 15, annually.
- Consultation with the MNR, DFO and GRCA to confirm mitigation plan requirements and implement recommended and/or required measures.
- Stormwater management plans to include provisions for the treatment of discharge to adjacent watercourses to avoid potential water quality impacts.

4.1.2 Site Specific Environmental Effects and Mitigation Measures

4.1.2.1 Indirect Fish Habitat

Within the project limits, five watercourses are considered to function as indirect fish habitat. These include the two Grand River drainage features, Ebycrest Tributary, West Tributary of Ellis Creek and Marden Drain. Based on guidance from the DFO position statement for new water crossings, a new water crossing installation on indirect fish habitat will not result in a HADD, since the main function of the watercourse to convey flow and nutrients is maintained, and fish passage is not required. Channel destabilization and sediment deposition downstream are the primary concerns.

4.1.2.2 Low Sensitivity - Direct Fish Habitat

The following three watercourses are considered to provide direct fish habitat with a low fish and fish habitat sensitivity: Rosendale Creek and Tillich Drain, Ellis Creek and Guelph Ditch. For

these crossings, fish passage is required in addition to maintaining flow and the transport of nutrients downstream. Potential impacts include: permanent loss of habitat (footprint of the structure) and temporary impacts during construction. Through the selection of open-bottom / counter-sunk and lined culvert (Tillich Drain), full span bridges (Rosendale Creek and Ellis Creek) flat bottom grassed swale realignment, it is anticipated that permanent impacts to fish and fish habitat can be mitigated by matching existing channel characteristics and function (swale).

4.1.2.3 Moderate and High Sensitivities – Direct Fish Habitat

Two crossings are considered to have a greater chance of resulting in a HADD for the watercourses they will traverse due to the sensitivity of the habitat, the sensitivity of the fish species/community inhabiting the watercourse and/or the extent, duration and intensity of the residual (non-mitigable) impacts at the crossing. These watercourses include: Grand River and Hopewell Creek. The Grand River crossing has a moderate level of uncertainty for the risk of residual impacts to affect fish and fish habitat, based on the two pier placement options for the structures (**Appendix E; Plates 15 & 16**). Potential impacts to fish and fish habitat, based on the location of the bridge crossing in relation to the sensitivity of the species and habitat present in the Grand River results in a preliminary HADD determination with a moderate level of uncertainty. It is anticipated that the effects to mobile fish (i.e. smallmouth bass) can be addressed though the improvement to in-water cover habitat while impacts to the stationary fish species (Wavyrayed Lampmussel) remains uncertain.

For Hopewell Creek, the low level of uncertainty concerning the residual impacts to fish and fish habitat results in a preliminary no-HADD determination, due to the proposed construction of a full span bridge crossing with no in-water footprint for Hopewell Creek. It is anticipated that the residual effects are minimal and are not likely to result in a HADD. It is anticipated that through the detailed design phase the uncertainty will be reduced to confirm the preliminary no-HADD determination.

Site specific mitigation measures / compensation strategies have been developed to address the preliminary impacts associated with new crossings on watercourses with moderate to high sensitivity fish and fish habitats. A summary of these measures/strategies are outlined below for the Grand River, Rosendale Creek and Hopewell Creek:

Grand River

Potential mitigation/compensation measures to address site-specific impacts at the proposed crossing of the Grand River, associated with the construction of the pier and bridge approaches, as well as the permanent footprint of the pier may include:

- The requirements for implementing the mussel relocation protocol to protect the Wavyrayed Lampmussel will include: a mussel identification, relocation and monitoring program, as determined through consultation with the DFO for Federal authorization under the SARA and/or the MNR for Provincial authorization under the ESA. These will be developed during detailed design, when the bridge designs and pier details have been finalized (i.e. size, location, area of effect during construction), as the piers/footings and their construction may result in the temporary or permanent localized loss of potential mussel and fish habitat;

- The timing of in-water construction should reflect the warmwater fish habitat determination by the MNR, to protect spring spawning species and migration of various trout and salmon species known to inhabit the Grand River watershed as well as timing restriction that may be imposed by the DFO to protect Wavyrayed Lampmussel; MNR recommends construction timing adhere to the following permissible in-water timing window between July 1 and March 15 of each year of Construction
- Isolation of the work area where the pier footings will be constructed to limit the introduction of sediments and other deleterious substances into the watercourse and to allow work to be completed in the dry; and,
- Improvement to in-water habitat to address potential loss of fish habitat under the pier footprint through the introduction of large cobble/boulder size material in the vicinity of the piers to increase the mid-channel cover opportunities which are currently limited in this reach. The increase to mid-channel cover would likely benefit Smallmouth Bass (host for Wavyrayed Lampmussel). It is anticipated that in-water works will still accommodate the requirement for maintaining navigability in the Grand River.

Hopewell Creek

Hopewell Creek is classified as **Moderate** sensitivity fish and fish habitat, based on the diverse fish community inhabiting this watercourse. A full span bridge with the placement of piers and abutments outside of the active channel are recommended at this watercourse crossing to minimize temporary in-water works and impacts to fish and fish habitat, and avoid permanent loss of in-water habitat, which is consistent with the proposed structure at the Hopewell Creek crossing (**Appendix E; Plates 22 & 23**).

The permissible in-water timing window for Hopewell Creek occurs annually between July 1 and March 31.

4.2 Terrestrial Ecosystem

These mitigation measures described in this section are intended to be consider along with commitments and conditions of approval related to the 2004 EA during detailed design. These measures are intended to address concerns related to potential impacts to: wetlands, forest and woodland edges, regionally significant flora, upland forest and wetlands and vegetation related impacts associated with watercourse crossings, sediment and erosion control, and wildlife habitat/passage.

4.2.1 Vegetation

Vegetation impacts are associated with the intrusion into wetland and forest units. There are no significant vegetation communities or species located at the crossing locations. Where a new forest edge is created a Forest Edge Management Plan is discussed below which provides measures to treat the new edge at the time of construction (Section Forest Edge Management). Measures are identified for each crossing where appropriate. The details of the measures will be established during the detailed design stage.

Develop vegetation restoration/enhancement plans in consultation with MNR and GRCA to offset vegetation removals, including the following..

- An initial approach for permanent forest and wetland vegetation removals/habitat loss at a 1:1 ratio. Continue to work with MNR and GRCA to identify priority areas for habitat replacement and develop/finalize the approach to offset the impacts to vegetation communities/habitat features that adequately reflect the ecological functions that will be lost.
- Prepare post-construction restoration plans for the river valley crossing and forest blocks that will be disturbed during construction to offset vegetation removals.
- Re-stabilize and re-vegetate all exposed surfaces as soon as possible following construction, using appropriate seed mixes and planting or other appropriate cover.

Both short term and long term impacts on vegetation, including wetlands should be considered during detailed design. Based on guidance from the EA Amendment (2004), the design team will consider the following temporary measures:

- Temporary erosion and sediment control measures, per OPSS 577 and Guidelines in Sediment and Erosion Control EPP
- Clear delineation of vegetation clearing and retention zones on contract drawings with on-site direction and confirmation during construction
- Vegetation removal and protection to be conducted in accordance with appropriate OPSS, including OPSS 201 and OPSS 565-1, supplemented by guidelines provided in the Clearing and Grubbing EPP.
- Proper removal and felling of trees, consideration for damaged plants along cleared edges, including hazards and windthrow susceptible trees.
- Requirements for appropriate product handling and spills management procedures and equipment to be in place prior to construction.
- Requirement for inspections to be undertaken during key construction periods at key locations to ensure environmental protection measures are implemented and working, and any required remedial action is taken.

In addition, the following long term measures will be considered during detailed design:

- Final planting approaches are to be developed and reviewed with the agencies
- Tree management activities to be undertaken as required for both driver safety and health of the balance of the woodland unit, per Clearing and Grubbing EPP
- Review and consider options for alignment shift refinements and footprint reductions to further reduce canopy removal, such as the use of retaining walls, 2:1 embankment slopes, benching, and adjustment of curve radii.
- Consider provision for edge plantings along the perimeter of forest/wetland edges that would benefit from new edge interiors from drying winds, sun exposure, and salt spray. Strategies will consider the use of native plantings to infill gaps in natural areas and to provide replacement planting where vegetation is removed.
- Careful consideration for the use of herbicides applied within the ROW to address site-specific concerns regarding noxious weeds adjacent to agricultural land and/or in

response to complaints. Refer to regulations under the Pesticides Act for further guidance.

4.2.1.1 Grand River Crossing

The new crossing structures will span a large part of the valleyland and thus minimize the amount of vegetation removal. The majority of vegetation occurs on the south side of the river. The alignment will span through areas of cultural meadow, cultural thicket and cultural woodland. One of the cultural thicket communities is dominated by the invasive European buckthorn and therefore some of its removal is regarded as a net benefit to the valleyland ecosystem. Some amount of willow floodplain vegetation will be removed for construction access and individual tall specimens will be removed where they interfere with the height of the structure. Some small amount of the abundant cedar and hemlock slope forest may be impacted on the west side at the south crossing.

It is identified that a number of large sugar maple specimens are located at the top of the valley slope adjacent to the crossing. The location of these specimens was identified in the field and they were determined to be greater than 150 m north of the closest point of disturbance.

Impacts from vegetation removal can be mitigated by replanting the disturbed area beneath the structure with a native lowland seed mix, shrubs and trees.

4.2.1.2 Weiland Tract

The alignment travels through the south end of the feature near its narrowest width. The south end of the feature will be removed leaving the much larger area of the feature to the north intact. The community type to be removed is an upland sugar maple forest. Although this forest type is not well represented in the study area it is a common community in the region. The new forest edge that is created will occur at the narrowest width of the feature, approximately 100 m in length. Forest Edge Management measures will be applied to mitigate the effects to this feature.

4.2.1.3 Regional Road 30 Complex

The alignment will be constructed along the south limit of this large feature through red maple swamp and an area that had been disturbed through vegetation removal and minor grading. The red maple swamp area also shows some amount of disturbance including minor trails and an abundant ground cover of garlic mustard. Mitigating the effects of creation of a new forest edge are addressed in the Forest Edge Management measures.

4.2.1.4 Townline West Wetland

The highway travels through a narrow length of poplar – sugar maple community that connects the large wetland feature to the north and the small sugar maple forest unit to the south. The vegetation removed from this linkage is not significant. The limit of grading will extend to the south edge of the large wetland unit but will not extend into this feature. Therefore there is no expected impact to vegetation and mitigation measures are not required. The south limit of the highway will create a new forest edge on the north face of the sugar maple woodland. Forest Edge Management measures can be implemented to mitigate the potential effects to the woodland.

4.2.1.5 Townline East Wetland

The north limit of the highway alignment occurs at the south edge of this feature. The highway will intrude into the forest approximately 100 m at its greatest extent. This occurs along the east half of the feature. At this location the forest transitions into an upland forest, and does not impact the swamp forest which occupies the west portion of this feature. The newly created forest edge will have a south exposure and will be vulnerable to impacts. Forest Edge Management measures that will be implemented for this site to mitigate future potential impacts to the forest are presented in Table 4.1.

4.2.1.6 Ellis Creek Wetland

The location of the crossing of the Ellis Creek Wetland is in an area of meadow marsh, open water marsh and cultural meadow. There are only a few scattered trees (willow) in this area. The centre of the wetland will be spanned which will maintain the marsh vegetation in this area. The span will maintain the hydrology function at this crossing and thus will maintain the vegetation type. The impact to vegetation at this crossing is negligible and there are no mitigation measures recommended.

4.2.1.7 Marden South

The highway will sever this wetland. The tall canopy cover removed at the crossing will impact the newly created edges. The form of wetland at the new edge may change as it is opened up and some amount of drainage may pool at the edge of the highway embankment. An area of meadow marsh may develop along this edge. Aggressive species such as cattail, reed canary grass and common reed grass could become established in this area.

The highway will isolate the north portion of the wetland from the south portion. The highway will occur in a fill and drainage will be directed toward the Marden Drain, located at the west side of the feature, through roadside ditches. Existing and post construction drainage is from west to east on the west side of the wetland and from east to west on the east side of the wetland. The larger portion of the wetland post construction is to the south of the highway. It is anticipated that the hydraulic conditions that support this wetland portion will generally be the same post-construction. A small amount of runoff that would have been held in the wetland will now flow into the roadside ditch.

Minor vegetation removal is associated with the crossing of Rosendale Creek, Ebycrest Road Tributary and Hopewell Creek.

4.2.2 Wildlife

In this project area wildlife communities are strongly associated with the large wetland and forest block habitats and the larger watercourses and valleylands such as the Grand River and Hopewell Creek. Impacts to wildlife habitat are presented in terms of loss of forest interior habitat associated with intrusion into these large habitat features. The effects of this are focused on forest interior and area sensitive bird species. The other potential impacts relates to creating barriers to north-south wildlife movement in the landscape or within habitat areas where the highway travels through.

To protect the identified heronry within the Townline Wetland the detailed design will consider the following:

- No timber harvest to be undertaken within 500 m of large colonies (> 50 nests) during the breeding season (April to August). Forest edge intrusion may be avoidable through minor route refinements.
- Timing restrictions if any are to be determined and reviewed through consultation with the MNR.

Buffers associated with the protection of nesting birds other than herons will be confirmed during detailed design.

Wildlife timing constraints will be confirmed through consultation with the MNR during detailed design to protect sensitive life stages.

4.2.2.1 Effect to Forest Interior Habitat

Table 4.1 on the following page identifies the results of the assessment of loss of forest interior habitat resulting from the intrusion of the highway into habitat areas that based on their size provide forest interior habitat.

Table 4.1: Forest Interior Areas for Eight Woodlots

Woodlot Name	Forest Interior area* (ha)		
	Before Construction	After Construction	Loss
Grand River crossing	0.41	0.04	0.37
Weiland Tract	3.17	3.17	0
Hopewell Creek	1.93	1.93	0
Regional Road 30 Complex	5.58	5.58	0
Townline West	6.85	6.85	0
Townline East	20.60	20.30	0.30
Ellis Creek	1.09	1.09	0
Marden South	4.11	1.16	2.95
TOTAL	43.74	40.12	3.62

*Forest Interior is defined as 100 m or more from forest edge.

The results identify that amongst 8 woodland/wetland habitats they provide a cumulative forest interior habitat of 43.74 ha and following highway construction the total forest interior habitat will be 40.12 ha for a loss of 3.62 ha. The largest loss of forest interior habitat occurs at the Marden

South Wetland (2.95 ha) as this habitat unit is severed into unequal halves. Forest interior habitat is preserved for the majority of the features as the highway skirts the edge or intrudes in a minor way into the feature. There is no opportunity to mitigate the amount of forest interior habitat at Marden South that will be removed; however, 1.16 ha of forest interior habitat will remain and is expected to be used, but to a lesser extent.

4.2.2.2 Effects to Wildlife Movement

Impacts to wildlife movement are discussed in terms of deer movement through the landscape and general wildlife movement within the habitat features.

Deer Movement in Landscape

Deer are abundant in the Marden South Wetland and were identified to move between this feature and Ariss Woods to the north. There is only a small area of conifer cover in the north portion of this habitat feature but would not on its own explain the abundance of deer in this habitat. Based on the pellet count deer remain in this habitat. The highway will sever the feature and thus create a barrier to north-south movement. To reduce potential impacts to deer from vehicle collisions it is recommended that wildlife fencing be installed on both sides of the highway through this feature. The opportunity to provide passage for deer was investigated, and based on two conditions, it was identified that a passage for deer was not feasible. The first constraint, based on the highway profile through this area, was that a culvert height of 2.5 to 3 m sufficient to allow deer to pass could affect available cover for the roadway. The second constraint related to the culvert intersecting the roadside ditch and creating a wet culvert and re-directing drainage intended for the Marden Drain. Deer use of the habitat will be reduced however some use of the north portion is anticipated as the conifer cover will remain intact and access to woodland/wetlands to the north will remain available.

Based on the results of the wintering deer survey deer occupy habitat in the Regional Road 30 Complex and Hopewell Creek Wetland and move in an east-west direction between these features. The area of movement occurred to the north of the highway alignment through an agricultural field. This movement corridor is not expected to change as it is parallel to the highway and is approximately 200 m north of the alignment. Although the field the deer travelled through was cultivated with soy bean it is unlikely that the movement is the result of the type of crop present.

Deer have been reported by the MNR to occupy the Grand River valleyland in the vicinity of the crossing. The aerial survey did not identify an abundance of deer in this area however, during the fall vegetation survey there was evidence of deer presence in the form of bedding areas, tracks and pellets, but no animals were observed. The bridge over the Grand River will span the majority of the valleyland. This will provide opportunity for deer and other wildlife to move easily through the valley at this location. Local movement out of the valleyland to the tableland in this area of the crossing will be lost.

As deer are noted to occupy the portions of the Hopewell Creek valleyland north of the highway it is likely that deer move through the valleyland including the area of the highway crossing. At this location the highway will span the valleyland with a 3.7 m minimum clearance above original ground and have a span length of 44.0 m (**Appendix E**; Plates 22 & 23,). Due to the skew of the watercourse at the crossing, there are variable widths of overbank to allow wildlife as large as deer to pass beneath the bridge.

Deer crossing signs should be considered where practical during detailed design along with other measures to improve deer crossing awareness and help to reduce the risk of road mortality (EA, 2004).

Local Wildlife Movement in Habitat Features

Local wildlife movement, excluding deer (discussed above) within habitat features may be impacted where the alignment intrudes or severs the feature. This occurs at the Ellis Creek Wetland and Marden South Wetland. For all other features, the highway occurs adjacent to, or intrudes into, the edge.

At Ellis Creek the highway crosses the open water portion of the marsh. The crossing will be a span structure that provides a 3 m clearance over a length of approximately 45 m. This will allow for the local movement of amphibians, turtles and waterfowl which use this habitat on a seasonal basis when the creek is flooded. This also promotes the movement of water to freshen the wetland and move nutrients and food sources from upstream into the wetland. It also provides opportunities for aquatic mammals and terrestrial based mammals when water levels are lower to move through the Ellis Creek system.

As discussed above, Marden South Wetland will be severed into two portions. It is anticipated that the highway will provide a barrier to local wildlife movement within the wetland. To mitigate this potential impact the Marden Drain culvert includes a 1 m wide overbank area that is raised above the low flow channel to provide wildlife movement opportunities (**Appendix E**; Plate 17).

Culverts to be provided at Rosendale Creek as well as the other tributaries/drains along the alignment and where cross-drainage is required should be reviewed during detailed design to determine where wildlife crossing opportunities can be accommodated. This review should include consideration for the culver size and configuration that will improve opportunities for safe wildlife passage (EA, 2004). The bridge structures designed to cross the Grand River, Hopewell Creek and Ellis Creek are anticipated to maintain movement opportunities for both aquatic and terrestrial wildlife species; therefore, reducing the risk of road mortalities at these locations (EA, 2004).

4.2.3 Landscape Composition

During detailed design a Landscaping Composition Report with landscaping plans shall be developed for the project. It shall take into consideration:

- Landscaping and restoration of disturbed areas associated with the Grand River bridge crossing to soften the visual and physical intrusion impact of the bridge within the context of a Canadian Heritage River.
- Landscape types:
 - Gateway Landscapes, which provide an aesthetic, sculptural and memorable gateway to highlight significant landscapes within the project limits including municipal boundaries, heritage sites, etc. Where applicable, the design should consider integrating a gateway and welcome feature.
 - Screening Landscapes, which create a visual and noise screen/barrier separating the highway from adjacent properties and road infrastructure.
 - Stormwater Management Landscapes, which combine stormwater management with landscape amenities.

- Ecological Landscapes should consider ecological protection landscapes, ecological enhancement landscapes and ecological restoration landscapes, within the context of regulatory requirements under provincial and/or federal legislation.
- Roadside Landscapes, which may include geometrically strong plantings and structural elements that provide a green, aesthetic driving experience for users of the highway.
- Trail Landscapes should be considered within the Grand River valley in consultation with the Walter Bean Grand Valley Recreational Trail and the Grand Valley Trail associations.

Snow hedging innovations that prevent snow from drifting onto highways shall be developed during detailed design in an effort to reduce the need for salt during highway operation.

4.2.4 Forest Edge Management

Forest edge management is identified for a number of woodland/wetland features where construction of the highway will create a new forest edge. These features include Weiland Tract, Regional Road 30 Complex, Townline West, Townline East and Marden South. Other features such as Grand River, Hopewell Creek and Ellis Creek that the highway traverses will not result in a new forest edge. In developing the management recommendations it is assumed that clearing will occur to the edge of the ROW but grubbing will only occur to the limit required in order to carry out grading and therefore some amount of grading and grubbing will not occur up to the edge of the ROW. Table 4-2 provides the recommendations for forest edge management for each of the features where a new edge will be created. The recommendations provided are to be updated with greater detail, site specific design and confirmation of species to be planted at the detailed design stage, in consultation with the MNR and GRCA.

The discussion that follows provides a general description of the new edge conditions that will be created for each site and the specific issues to be addressed associated with the new edge.

The east-west alignment of the highway where it bisects a woodland will create a new north facing and south facing edge. The north facing edge is generally less susceptible to the newly created exposure to sunlight; however, it will be exposed to northerly and westerly winds. A new north facing exposure will occur at the Weiland Tract, Townline West and Marden South features. The ROW limit will skirt the edge of the north parcel at Townline West and the majority of Townline East resulting in a reduced impact and therefore less concern for forest edge effects. The highway will fragment Marden South into a north and south parcel and in the case of Regional Road 30 complex will remove a portion of the south section of this feature. In addition to the recommended plantings to address impacts to the forest edge (Table 4.2), features such as Townline West, Townline East and Regional Road 30 complex contain the invasive, non-native European buckthorn (*Rhamnus cathartica*). This species is shade tolerant but is better able to become established from the better light conditions at the forest edge. Therefore it is recommended that management include removal of buckthorn within a specified distance from the new forest edge and that these be replaced with native shrub species.

It is recommended that upon completion of clearing and grubbing that forest edge plantings including invasive species removal, occur in the next favourable time for planting rather than waiting for completion of highway construction. Salt tolerant screening plantings can occur at

the same time if appropriate. This will help to reduce the stresses to the new forest edge and will also help to reduce the opportunity for European buckthorn and other invasives to become established in the forest edge.

A Forest Edge Management plan shall be developed by a qualified Landscape Architect during detailed design, incorporating treatments for features impacts by the highway. The forest edge management treatments will consider: planting a new forest edge, control invasive species, grubbing/grading and monitoring.

Table 4.2: Recommended Forest Edge Management

Woodland	Edge Effect	Treatment			
		Planting at New Forest Edge	Control Invasive Species	Grubbing/Grading	Monitoring
Weiland Tract <ul style="list-style-type: none">Mature deciduous forest containing combination of shade tolerant/intolerant species	<ul style="list-style-type: none">Woodland fragmented creating new north edge (south parcel) and south edge (north parcel)Effects: south edge susceptible to soil drying, increased sunlight changing ground flora, invasion by invasive species	<ul style="list-style-type: none">Plant 2 m tall trembling aspen, 1 m tall nannyberry, chokecherry at/within new forest edge (north/south) to initiate protection from wind, sunscald and drying of soilsPlant double row of white spruce or equivalent salt tolerant species at forest edge	<ul style="list-style-type: none">Remove buckthorn for distance of 20 m within forest edge (south facing edge) and replace with native shrub species such as chokecherry, nannyberry	<ul style="list-style-type: none">Not required	<ul style="list-style-type: none">Invasive species. Yearly for 5 years from time of ROW clearing
Townline West <ul style="list-style-type: none">ROW – North Edge; poplar forest edge consisting of mostly shade intolerant species; maple swamp extending to the north;ROW – South Edge; sugar maple deciduous forest	<ul style="list-style-type: none">Woodland fragmented creating new north edge (south parcel) and south edge (north parcel)Effects: ROW to extends just to the south edge of large feature resulting in limited removal of tree edge vegetationsouth edge susceptible to soil drying, but mitigated by dense understory of buckthorn and sun tolerant species (poplar, elm); light increase into edge will increase opportunity for buckthorn to extend into the wetland6 m fill will provide some benefit to reducing exposure to wind effects	<ul style="list-style-type: none">Plant 2 m tall trembling aspen, 1 m tall nannyberry, chokecherry at/within new forest edge (north facing) to initiate protection from wind, sunscald and drying of soils;Plant double row of white spruce or equivalent salt tolerant species at forest edge	<ul style="list-style-type: none">Remove buckthorn for distance of 20 m within forest edge (south facing edge) and replace with native shrub species such as chokecherry, nannyberry	<ul style="list-style-type: none">Grub only what is required for grading. Cut stems left in place to promote suckering, seed bank is left to germinate ground cover, microtopography left to maintain drainage characteristics	<ul style="list-style-type: none">Monitor effectiveness of buckthorn control yearly for 5 years from time of ROW clearing
Townline East <ul style="list-style-type: none">Maple swamp along west portion of the featureUpland red ash mixed forest along east portion of the feature	<ul style="list-style-type: none">Effects: ROW to extend just to the south edge of large feature resulting in negligible/limited removal of swamp vegetation and some removal of ash forestNew edge of ash forest susceptible to soil drying, sun scald of some tree species that are moderately shade tolerantLight increase into edge will increase opportunity for buckthorn to extend farther into the forest	<ul style="list-style-type: none">Plant 2 m tall trembling aspen, black walnut, 1 m tall nannyberry, chokecherry at/within new forest edge at upland ash community to initiate protection from wind, sunscald and drying of soils;Plant double row of white spruce or equivalent salt tolerant species at forest edge	<ul style="list-style-type: none">Remove buckthorn for distance of 20 m within forest edge and replace with native shrub species such as chokecherry, nannyberry	<ul style="list-style-type: none">Grub only what is required for grading. Cut stems left in place to promote suckering, seed bank is left to germinate ground cover, microtopography left to maintain drainage characteristics	<ul style="list-style-type: none">Monitor effectiveness of buckthorn control yearly for 5 years from time of ROW clearing

Woodland	Edge Effect	Treatment			
		Planting at New Forest Edge	Control Invasive Species	Grubbing/Grading	Monitoring
Regional Road 30 Complex <ul style="list-style-type: none">Feature is a red ash swamp	<ul style="list-style-type: none">Effects: ROW to extend into forest creating a new south-facing edgeSubcanopy and shrub layer generally open creating conditions for exposure and drying organic soil layerGarlic mustard is present in feature; increased available light may allow species to extend farther into featureMajority of tree species are considered moderately shade tolerant	<ul style="list-style-type: none">Plant 2 m tall eastern white cedar and bur oak within the new forest edge (15 m strip)Plant double row of white spruce or equivalent salt tolerant species at forest edge	<ul style="list-style-type: none">Remove buckthorn/garlic mustard for distance of 20 m within forest edge and replace with native shrubs red elderberry and nannyberry	<ul style="list-style-type: none">Grub only what is required for grading. Cut stems left in place to promote suckering, seed bank is left to germinate ground cover, microtopography left to maintain drainage characteristics	<ul style="list-style-type: none">Monitor effectiveness of buckthorn/garlic mustard control yearly for 5 years from time of ROW clearing
Marden South <ul style="list-style-type: none">Mature deciduous maple swamp with maple species able to tolerate increased sunlight exposure	<ul style="list-style-type: none">Woodland fragmented creating new north edge (south parcel) and south edge (north parcel)Microclimate effects expected (increased sunlight, drying surface soils)	<ul style="list-style-type: none">Plant 2 m tall eastern white cedar and balsam poplar within the new forest edge (15 m strip)Seed area at new forest edge with custom wetland (marsh) seed mix		<ul style="list-style-type: none">Grub only what is required for grading. Cut stems left in place to promote suckering, seed bank is left to germinate ground cover, microtopography left to maintain drainage characteristics	<ul style="list-style-type: none">Not required

4.3 Species at Risk

Species at Risk that are known to occur in the study area include the wavy-rayed lampmussel that is located in the Grand River at the crossing. Pier construction will result in some in-water work. To mitigate the potential impact to this species a mussel removal/relocation undertaking will be carried out prior to construction. Fisheries and Oceans Canada (DFO) has developed a protocol for removal/relocation of mussel species and this will be carried out at the appropriate time (Mackie et al, 2008). Consultation with the MNR is required at the detailed design stage to identify any permit requirements.

Due to the variability of crop type in a given field from year to year it is unknown to what extent suitable habitat for bobolink and eastern meadowlark is present within the highway corridor. Therefore, it is proposed that the type of crop in production at the time of detailed design be used as the indicator of available habitat. Determination of suitable habitat will be based on conducting a breeding survey for these species following the protocol established by the MNR. Removal of habitat can be mitigated by the creation or enhancement of bobolink/meadowlark habitat outside of the ROW. The requirement for habitat creation/enhancement will be determined through consultation with the MNR.

Barn swallow is likely found in the study area. Barn swallows may nest in buildings/structures that will be removed during highway construction. Chimney swift may also be present in the study area where they could specifically occupy chimneys associated with farm houses. Some of the removals include farm buildings which are typical nesting sites for this species. If nests are identified in buildings/structures to be removed, the numbers of nests are to be identified and the buildings/structures removed during the non-nesting period for this species. Mitigation can include the construction of artificial nest structures in suitable habitat either adjacent to the ROW or in suitable habitat in natural areas such as Conservation Areas.

Louisiana waterthrush (*Parkesia motacilla*) is designated as Special Concern under the ESA. This species had been reported to be using the Ellis Creek wetland. A survey to confirm the presence of this species was carried out in 2005 following the survey protocol guidelines identified by the Canadian Wildlife Service. The species was not found and is not considered further in the assessment of impacts.

4.4 Groundwater and Wells

Areas of shallow groundwater as described in section 2.4 are identified to provide a groundwater recharge/discharge function. Within the location of the highway crossing, construction works have the potential to impact the local discharge and recharge function. This includes the direct removal of recharge area taken up by the footprint of the structure and affecting discharge by altering the below surface flow path due to the depth of foundations. These areas of potential effect are Rosendale Creek, Hopewell Creek, Tillich Drain (Regional Road 30 Complex) and Ellis Creek.

Rosendale Creek crossing will involve variable fill and cut of 1 m. This small change in surficial cover is expected to not affect groundwater. Groundwater is identified to be shallow in this area based on well logs showing a well depth of 0-5 m in overburden. Foundations would likely alter the local flow path and may require dewatering during construction. Further detailed assessment of groundwater conditions at this crossing is required to identify mitigation measures during construction and post construction to ensure that groundwater functions is maintained.

At Hopewell Creek, highway construction will result in a 3-4 m cut to the west and 2-3 m fill to the east. The cut has the potential to intercept the shallow aquifer that is identified in this area. MOE water well records indicate that the wells occur in overburden and range from 5-30 m in depth. The shallow groundwater may be more vulnerable to the cut (intercept groundwater) and fill (affect recharge at the footprint) at this location and thus may alter local groundwater inputs to the watercourse. This is to be investigated further at detailed design to identify mitigation measures to maintain groundwater function at this location.

At Tillich Drain, the highway will be in a fill that ranges from 2-8 m. It is identified that wells at this location are at a depth of 20-40 m and are founded in bedrock. The soil profile from available information indicates a dominant till cover. Compared to other locations along the corridor this specific location does not appear to support a shallow aquifer to the extent that it can provide a sufficient water supply. However, seepage was noted in the watercourse adjacent to the pond under spring conditions indicating at least seasonal groundwater inputs. Further investigation at this crossing is required to confirm whether mitigation to address impacts to groundwater recharge/discharge it to be provided in detailed design.

At the Ellis Creek crossing the highway will occur in fill up to 6 m. The majority of wells in this area are founded in bedrock and occur at depths of 20-40 m. Geotechnical investigations at Guelph Road 3 where a 12 m cut is proposed, identify the soils to be composed of clayey silt till and very dense sandy silt till. The deep cut to the west and fill over the wetland may affect the seasonal shallow groundwater table by changing the flow path to the wetland. This is to be investigated further at detailed design.

Wells that are relatively shallow (<10 m deep), large in diameter and are close to the alignment are most vulnerable and have the highest potential to be impacted. These wells are completed in a shallow aquifer and as such may not have good protection from surface impacts. The wells completed in bedrock are usually deep (>25 m) are constructed by drilling and cased and are less likely to be impacted from surface disturbance associated with highway construction.

In accordance with the EA Amendment 2004, additional work will be undertaken, where required to ensure that any shallow wells at risk from construction are identified. Those at risk for impact will be investigated and monitored in advance of construction. A groundwater management plan will be developed during detailed design to focus on areas within at least 120 m of the watercourses and wetlands where cuts are required and within which influence from intercepted groundwater might occur. The design of watercourse and wetland structures will incorporate specific groundwater maintenance measures as required based on site-specific review and additional geotechnical work during detailed design. Groundwater seepage zones associated with wetland areas and creek valleys along the alignment will be further field-checked during detailed design stage. This information will be used in determining the final form of any required mitigation that will be identified during the detailed design stage (such as seepage flow maintenance drains, provision of fee-draining granular in fill areas).

Monitoring of private drinking water supply wells for groundwater quality and quantity will be undertaken during detailed design. The MTO will assess the potential for interception or redirection of groundwater movements that recharge domestic wells or that emerge as seepage zones in wetland and creek valleys. The design of watercourse and wetland structures will incorporate specific groundwater maintenance measures as required based on site-specific review and additional geotechnical work during detailed design.

Potential impacts to groundwater/seepage zones associated with wetland areas and creek valleys along the alignment will be further field-checked to determine the extent of potential

interference. The information will be used to determine the final form of required mitigation, including but not limited to: seepage flow maintenance drains, and provisions for free-draining granular in-fill areas.

Further assessment is required during detailed design to identify location, status and impacts to wells. The physical location of the wells are to be verified in the field and locations updated. This will identify residences or structures but for which there are no well records but they obviously need a water supply.

If the wells are within or in close proximity to the highway ROW and no longer in use, then the wells may have to be abandoned / decommissioned as per Ontario Reg. 903.

4.5 Socio-Economic Environment

4.5.1 Recreational Trails

The crossing of the Grand River will impact the Walter Bean Grand River Trail on the south side of the River. The trail is impacted at the point of the bridge abutment. At this point the trail will be realigned to travel around the abutment beneath the structure (**Appendix D**; Plate 3 and **Appendix E**; Plates 15 & 16). It is expected that trail use in the area of the Grand River bridge will not be affected after construction has been completed.

The highway will cross the Grand Valley Trail that parallels Rosendale Creek. At this location two bridge structures are proposed to allow the westbound and eastbound lanes to span the watercourse. The span will be 40 m, which is sufficient to allow pedestrians and cyclists to pass beneath the crossing. As a result, trail continuity will be maintained at this location. (**Appendix D**; Plate 4, and **Appendix E**; Plates 18 & 19)

During detailed design, trail realignment designs, landscaping plans and construction staging/access plans will take into consideration through on-going consultations with trail associations and local municipalities.

4.5.2 Agriculture

Potential impacts, mitigation strategies and residual effects based on the assessment carried out during the preliminary design are presented in Table 4.3. This table was originally presented in Table 6.4.2 of the 2004 EA. The mitigation strategy is to be addressed during detailed design.

Based on consultation with local stakeholders, the VE option involving Ebycrest Road was modified to give access priority to farm equipment to agricultural lands to the north (east and west) over access to Victoria Street North.

Table 4.3: Summary of Impacts and Mitigation for Agriculture (Table 6.4.2, EA 2004)

Issue	Comment and Impacts	Mitigation Strategy	Residual Effects
Agricultural Land Crossed	About 144 ha of agricultural land will be removed for ROW construction. This total includes about 15 ha of idle agricultural land south of Bridge Street. This is an unavoidable removal to accommodate alignment.	Property acquisition will be limited to only those lands required for the ROW. Compensation for purchase of land will be at market value according to MTO guidelines	Approval of the new alignment will provide security of tenure for farmers who have been uncertain of the future location of Highway 7 for many years Viability of remaining farms will vary depending on size of residual parcels and access. Discussions with Woolwich Township staff revealed that even 5 ha parcels will support hobby farm or other farm activities. Of the 22 property code areas crossed by the ROW, seven (7) range from 40 to 80 ha in area, and fragmented parcels range from 10 to 40 ha in area.
Specialty Crop Operations Affected	Two operations affected just west of Shantz Station Road, and Pick Your Own Berry Operation affected east of Shantz Station Road.	Property acquisition will be limited to only those lands required for the ROW. Compensation for purchase of land will be at market value according to MTO guidelines.	Loss or reduction of use.
Field Crop Areas	Eight property blocks supporting field crops are crossed by the Recommended Route (2002)	Property acquisition will be limited to only those lands required for the ROW. Compensation for purchase of land will be at market value according to MTO guidelines.	Loss or reduction of use.

Issue	Comment and Impacts	Mitigation Strategy	Residual Effects
Dairy/Livestock Operations	<p>Eight property blocks supporting dairy/livestock are crossed by the Recommended Route (2002)</p> <p>Difficult to mitigate effects where competing tradeoffs occur between resources</p>	<p>Difficult to mitigate effects where competing tradeoffs occur between resources.</p> <p>Some shifts in the Recommended Route (2002) such as the west end, avoided livestock operations that were affect by the Recommended Plan (1997)</p> <p>Property acquisition will be limited to only those lands required for the ROW. Compensation for purchase of land will be at market value according to MTO guidelines.</p>	Loss of some portions and anticipated reduction of use, depending on size and nature of residual parcels.
Farm Access Effects	<p>There are eight property blocks for which access will be removed or made limited by the Recommended Route (2002)</p> <p>Access to some farm properties and/or within a property will be affected in cases where the alignment severs a property or otherwise presents a barrier that does not exist at present.</p>	<p>Access issues and barrier concerns will be negotiated between MTO and affected landowners on a case by case basis during detailed design. The mitigation approach may take several forms in order to address concerns. Provision of alternate access is one approach that will be considered.</p>	<p>Variable depending on the nature of access impact and ability to mitigate.</p> <p>Successful resolution of access requirements after the highway is in place will reduce residual effects to the extent possible.</p>

Issue	Comment and Impacts	Mitigation Strategy	Residual Effects
Farm Equipment Movements	Farm equipment at present moves along sections of existing Highway 7, creating risk for both farm vehicles and faster moving traffic.	Wherever possible, separation of slower moving farm equipment from higher speed traffic is desirable	The Recommended Route (2002) will reduce the potential for the type of conflicts that presently occur on existing Highway 7 between commuter/through traffic and farm equipment. The new alignment is expected to attract the longer distance higher-speed commuter traffic, leaving the existing Highway 7 available for more local traffic use and movement by farm equipment (thereby reducing conflicts with higher speed traffic).
Capital Investment Effects	Eleven property blocks are affected by the Recommended Route (2002). The effects vary in extent, from edge intrusion, fragmentation, or separation from an irrigation water source. Difficult to mitigated effects where competing tradeoffs occur between resources.	MTO will review alternative irrigation water source with affected landowner Property acquisition will be limited to only those lands required for the ROW. Compensation for purchase of land will be at market value according to MTO guidelines.	Loss of some portions and anticipated reduction of use, depending on size and nature of residual parcels.
Agricultural Severances	Twelve parcels have been identified as having significant severances from the Recommended Route 2002.	As noted in the text, alignment shifts that were implemented to avoid or reduce intrusion in wetland blocks have resulted in some farm property severances where property lines could not be followed.	Loss of some portions and anticipated reduction of use, depending on size and nature of residual parcels.

Issue	Comment and Impacts	Mitigation Strategy	Residual Effects
Farm Community Effects.	<p>New highway alignments can result in farm community effects when the cohesiveness and inter-relationship of the existing farm community is fragmented by a roadway.</p> <p>It is recognized that a new alignment could encourage no-farm related development in the area between the new alignment and existing Highway 7. This is reviewed under Community effects and Land Use (Section 6.2.1, EA 2004)</p>	<p>The Recommended Route (2002) is in the same general vicinity of the Recommended Plan (1997). In this setting it has been noted that farm uses area somewhat transitional in nature because of the influence of existing Highway 7.</p> <p>Municipalities play an important role in promoting and maintaining agricultural land uses and farm community cohesiveness (through Official Plans and land use policies). The Township of Woolwich has specifically reiterated its intent to promote this objective.</p>	<p>The major farm community setting further to the north, which is characterized by a number of major agricultural operations, has been avoided by the Recommended Route (2002).</p> <p>Impacts on the farming community are softened somewhat by its transitional nature with the influence of existing Highway 7, and the presence of a number of leased lands along the route (ration of owner-operated to leased properties about 13:8)</p>
Tile Drain / Farm Fence Impacts.	Highway construction may result in damage to existing tile drains and farm fence materials	Contract provisions will be developed for the management, repair and/or reinstatement of affected farm fences and tile drains. These provisions incorporate relevant OPSS specifications and/or existing MTO specifications for tile drain and fence repair.	None are anticipated with proper implementation of the stated measures.

4.5.3 Property Requirements

MTO will purchase only the amount of land required to build the highway, unless the effects on an individual property are so great that the entire parcel must be purchased. Each property will be evaluated on its own merits to determine whether the total property is to be purchased, or whether a “partial taking” is sufficient (MTO 2004, Section 6.2.1).

Property evaluations and negotiations with affected landowners and stakeholders for property requirements for the highway have been initiated and will continue through detailed design to construction.

4.6 Contaminated Property Identification and Management

Based on the 2008 COS, no sources of actual soil and groundwater contamination were observed. However, several potential sources of soil and groundwater were identified. A Preliminary Site Screening and/or Phase 1 Environmental Site Assessment is recommended for those properties with a High potential for contamination should they be located near (i.e. within 100 m) of the final highway alignment (Figure 2.11 & 2.12).

It further recommended that the COS report be updated during detailed design to confirm the assessment ranking for the risk of contamination due to potential changes in property ownership, and identify new properties which may not have been captured during the 2008 survey. The results of this revised survey will provide the basis for further investigations.

Additional field investigations and assessments will be completed during detailed design in accordance with the procedures and guidelines under Section 3.6 of the current ERHD. At a minimum, permission to enter private lands within the study area will be required for all properties with a moderate to high potential for the risk of contamination to facilitate field investigations.

4.7 Cultural Heritage – Built Heritage and Cultural Heritage Landscapes

Roadway design and construction may potentially affect cultural heritage resources in several ways. The effects may include displacement through removal or demolition and/or disruption by the introduction of physical, visual, audible or atmospheric elements that are not in keeping with the character of the cultural heritage resources and/or their setting. Of the nineteen cultural heritage resources currently identified, thirteen cultural resources (11 cultural heritage landscapes and 2 built heritage resources) will be disrupted as a result of the new Highway 7 alignment. Furthermore, six cultural resources (4 cultural heritage landscapes and 2 built heritage resource) will be displaced as a result of the new Highway 7 alignment. Additional resources, which are considered to meet the cultural heritage criteria for assessment potentially affected by the project, will be confirmed during detailed design.

The following eleven cultural heritage landscapes and two built heritage resources are anticipated to be disrupted (indirect impact) as a result of the Highway 7 New project.

- Farm complex at No. 858 Bridge Street East, geographic Township of Waterloo, Township of Woolwich;
- Farm complex at No. 1000 Bridge Street East, geographic Township of Waterloo, Township of Woolwich;

- Farm complex at No. 68 Ebycrest Road, geographic Township of Waterloo, Township of Woolwich;
- Ebycrest Road (Regional Road No. 17), geographic Township of Waterloo, Township of Woolwich;
- Former Highway 7 alignment at Spitzig Road, geographic Township of Waterloo, Township of Woolwich;
- Greenhouse Road (Woolwich Road 72), geographic Township of Waterloo, Township of Woolwich;
- Woolwich-Guelph Townline, geographic Township of Waterloo, Township of Woolwich and geographic Township of Guelph, Township of Guelph-Eramosa;
- Wellington Road 32 (Guelph Township Road 3), geographic Township of Guelph, Township of Guelph-Eramosa;
- Farm complex at No. 5413 Wellington Road 32 (Guelph Township Road 3), geographic Township of Guelph, Township of Guelph-Eramosa;
- Farm complex at No. 5415 Elmira Road North (Wellington Road 86), geographic Township of Guelph, Township of Guelph-Eramosa; and,
- Farm complex at No. 5441 Elmira Road North (Wellington Road 86), geographic Township of Guelph, Township of Guelph-Eramosa.
- Silo at No. 3014 Victoria Street North (Highway 7), geographic Township of Waterloo, Township of Woolwich; and
- Former farmhouse at No. 5390 Wellington Road 32 (Guelph Township Road 3), geographic Township of Guelph, Township of Guelph-Eramosa.

The following four cultural heritage landscapes and two built heritage resources are anticipated to be displaced (direct impact) as a result of the Highway 7 New project.

- Farm complex at No. 806 Bridge Street East, geographic Township of Waterloo, Township of Woolwich;
- Farm complex at No. 5395 Woolwich-Guelph Townline, geographic Township of Waterloo, geographic Township of Guelph, Township of Guelph-Eramosa; and
- Farm complex at Nos. 5410 / 5432 Elmira Road North (Wellington Road 86), geographic Township of Guelph, Township of Guelph-Eramosa.
- Residence at No. 297 Woodlawn Road West (Highway 7), geographic Township of Guelph, City of Guelph.
- No. 5390 Wellington Road 32 (Guelph Township Road 3), geographic Township of Guelph, Township of Guelph-Eramosa.
- 1014-1026 Guelph Street, Kitchener. This is a 12-unit apartment building that was constructed in the 1940s. MTO has completed a CHER for the building as well as photo-documentation. The building has now been demolished.

Documentation of floor plans for the following four (4) heritage landscapes and resources will need to be completed in a subsequent stage of detailed design when property access to the interiors has been obtained. Several of the properties identified for documentation were not accessible for site review and photography. As a result, the documentation for five (5) of the properties listed above includes an historical summary and observations and photographs taken from the public roadway. Further documentation of these sites will need to be completed in a subsequent stage of the detailed design when access to the properties has been obtained.

The ten (10) cultural heritage resources that currently require additional documentation are outlined in the following table.

Table 4.4: Summary of Cultural Heritage Resources Requiring Additional Documentation

Property	Documentation Requirement
5395 Woolwich-Guelph Townline	CHER – Building Interior
5410 / 5432 Elmira Road North	CHER – Building Interior
297 Woodlawn Road West	CHER – Building Interior (in progress)
806 Bridge Street East	CHER – Building Interior
No. 858 Bridge Street East, Township of Woolwich	CHER – property and building interior
No. 1000 Bridge Street East, Township of Woolwich	CHER – property and building interior
No. 5413 Wellington Road 32 (Guelph Township Road 3), Township of Guelph-Eramosa	CHER – property and building interior
No. 5415 Elmira Road North (Wellington Road 86), Township of Guelph-Eramosa;	CHER – property and building interior
No. 5441 Elmira Road North (Wellington Road 86), Township of Guelph-Eramosa.	CHER – property and building interior
No. 5390 Wellington Road 32 (Guelph Township Road 3), geographic Township of Guelph, Township of Guelph-Eramosa.	CHER – Building Interior

The Cultural Heritage Resource Documentation Reports prepared as part of the Initial detailed design serves as the initial documentation of these resources and may serve as mitigation if they are impacted directly or indirectly. Additional structures within the study area may meet the criteria for a cultural heritage assessment as the detailed design proceeds. It is recommended that structures anticipated to be forty years old during construction, or are forty (40) years or older during detailed design be identified for additional investigations. The documentation of these structures will be carried out in accordance with the standards and guidelines for built heritage and cultural heritage landscapes under section 3.7 of the ERHD.

The Grand River is designated as a Canadian Heritage River, which will require an evaluation and documentation to address this cultural heritage landscape. This will involve consultation with the MNR as they are the responsible agency for Ontario's Canadian Heritage Rivers. Evaluation will be required to determine if the project will have the potential to affect the Grand River's classification as a heritage river and to determine what mitigation measures or strategies are required to maintain the heritage status. Part of the mitigation is to include maintaining the aquatic and valley corridor linkages, and incorporating the Walter Bean trail in the structure design.

4.8 Cultural Heritage – Archaeology

The completion of Stage 2, 3 and 4 archaeological investigations are required prior to construction. Documentation of the findings serves as the mitigation for impacts that may occur from highway construction. Outstanding archaeological investigations are required at the following locations:

- Stage 2 assessments are to be completed prior to commencing construction in the following areas: WT-117, WT-64, WT-65, WT-79, WT-51, WT-72a, WT-81, GT-25, GT-26;
- Stage 3 archaeological assessments of the identified Aboriginal sites AiHc-297, AiHc-298, AjHc-24, AjHc-25, AjHc-26, and AjHc-30 remain outstanding and should be completed prior to construction occurring in these areas;
- Sites of seven (7) stormwater management facilities, including: Ponds 4, and 7-12
- Properties where access to lands was not granted during the Initial Design; and,
- Sites of five (5) VE recommendations, incorporated into the design, which have not been previously assessed, including: VE Options 5, 7, 8, 9 & 10.

Due to the volume and cultural significance of the archaeological resources recovered from the Jonas Bingeman Site: AiHc-200; TP 41A, 43A, 44A, 46A Site: AiHc-300; and the TP 45A-M Site: AiHc-302, further Stage 4 mitigation is recommended for these sites. Stage 4 mitigation is to include hand block excavation within the topsoil layer where clusters of artifacts have been encountered as well as topsoil stripping surrounding the block excavation areas, to identify any subsurface features.

Clearance and/or acceptance of the archaeological assessment findings by the Ministry of Tourism, Culture and Sport (MTCS) is required prior to commencement of utility relocations.

Six Nations, Alderville and Curve Lake First Nations will be contacted in relation to archaeological undertakings during detailed design.

It is recommended that development not proceed before receiving confirmation that the *Ministry of Tourism, Culture and Sport* (MTCS) has entered all submitted archaeological reports into the provincial register of reports.

Should previously unknown or unassessed deeply buried archaeological resources be uncovered during development, they may be a new archaeological site and therefore subject to Section 48 (1) of the *Ontario Heritage Act*. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed archaeologist to carry out archaeological fieldwork, in compliance with Section 48 (1) of the *Ontario Heritage Act*.

The *Cemeteries Act*, R.S.O. 1990 c. C.4 and the *Funeral, Burial and Cremation Services Act*, 2002, S.O. 2002, c.33 (when proclaimed in force) require that any person discovering human remains must notify the police or coroner and the Registrar of Cemeteries at the *Ministry of Consumer Services*.

4.9 Surface Water / Drainage

Based on the hydrologic and hydraulic analyses for the Grand River, Rosendale Creek, Hopewell Creek and Ellis Creek, the bridge spans and clearances were selected to ensure that the preliminary design of the structures meets MTO drainage design standards and will not result in adverse flood and ecological impacts.

The proposed Grand River structure satisfies MTO drainage standards. It is anticipated that potential impacts to fish habitat from the placement of the piers can be mitigated and are described in Section 4.1.

The proposed Rosendale Creek, Hopewell Creek and Ellis Creek structures satisfy MTO drainage standards. Fish habitat will not be adversely affected by the recommended structures and wildlife passage is provided.

4.10 Erosion and Sediment Control

When soils are exposed during construction activity that involves the removal of natural vegetative cover, there is a high potential to cause large magnitude, short-term sediment export from the site. To protect the receiving water and environmentally sensitive areas that are down-gradient from the exposed areas, on-site sediment controls are required during construction. The following are general recommendations for the implementation of standard sediment and erosion control measures for the project. Detailed plans, including construction phasing for individual culverts will be developed at a later stage of design and will be shown on contract drawings. All sediment and erosion control measures shall be designed in accordance with MTO standard specification and the effectiveness to protect features determined through consultation with the review / regulatory agencies, where applicable (i.e. MNR, GRCA, DFO).

During detailed design, the MTO will undertake an Erosion and Sediment Overview Risk Assessment and develop a two-part Erosion and Sediment Control Plan (ESCP) (Main and Supplemental) for each stage of construction, as per Section 3.1.3 of the *MTO Environmental Guide Erosion and Sediment Control During Construction of Highway Projects*.

As part of a comprehensive project strategy focused on minimizing disruption and degradation of the environment, the sediment and erosion control plan will consider measures that are flexible to incorporate and are based on current techniques available at the time of construction. The following measures shall be considered during development of the plan:

- Sediment and erosion control works must be in place prior to the commencement of each stage of construction and maintained or adjusted as required, and not removed until the end of the construction period, when the site has been stabilized.
- Construction phasing will be scheduled to minimize the extent and period to which disturbed soils are exposed to weathering. As such, all disturbed areas must be stabilized as quickly as possible. Stabilization of disturbed areas may be accomplished by sodding, seeding, mulching, hydroseeding and planting. Temporary measures may employ the use of biodegradable erosion control blankets or other suitable methods.

- To minimize sediment wash off to the receiving watercourses, it is recommended that the bottom of all side swales be lined immediately with an erosion resistant material such as a bio-degradable blanket or other effective methods. The lining should be 2 m wide so that it extends entirely across the bottom of the swales and 0.5 m along the side slopes
- All topsoil stock piles must be located away from natural features and drainage ways.

To retain sediment on-site, continuous silt fencing will be installed downstream of all exposed areas. In addition, temporary check dams will be placed in roadside ditches, immediately upstream of cross culvert inlets and outlets. Check dams will also be placed in the roadside drainage system during construction in sections where the slope is excessive. The above noted sedimentation and erosion controls should be routinely inspected after each storm and cleaned out as required, to ensure that the controls remain effective.

4.11 Noise

For the thirty-eight (38) receivers indicated in Section 2.10 (Exhibit 6-2; EA, 2004), which would experience noise increases greater than 5 dBA, noise mitigation will be considered during the detailed design stage. A decision to provide noise mitigation must consider the following:

- MTO will investigate noise control measures within the ROW
- Noise control measures, if applied, will be designed to achieve levels as close to 55 dBA, or pre-construction ambient noise levels as is technically or economically feasible
- Noise control measures, where applied, would be cost effective and achieve a minimum attenuation of 5 dBA averaged over the first row receivers.

Twenty-five of the thirty-eight NSAs are anticipated to have future noise levels that meet the provincial objective of 55 dBA. Of the remaining thirteen NSAs, one NSA (Receiver 9) would exceed 60 dBA and of the remaining twelve NSAs one will exceed 64 dBA (Receiver 87).

Recent changes to noise study guidelines will be taken into account when undertaking noise studies during detailed design. This includes, but is not limited to, confirming that the most exposed side of a residential property be considered as a noise sensitive area (NSA), where previously only the backyard was considered.

4.12 Air Quality

The primary cause for anticipated particulate levels is the background level for PM₁₀ and PM_{2.5} at the site and across the province. Highway traffic, through re-entrained dust, vehicle exhaust, and brake and tire wear, is only a small contributor.

Given the small contribution of the highway to the local air quality, it was not considered feasible to provide any project-specific mitigation measures (EA, 2004, Section 6.3.6).

In 2012 section 3.10 "Air" was developed and added to the ERHD. This section of the ERHD provides guidance on the overall air quality/greenhouse gas scope of assessment, as well as the assessment types for Group 'A' project scenarios such as Highway 7. As such, the air quality assessments carried out during earlier stages of design should be updated to reflect current assessment requirements.

5.0 Commitments to Future Work

This section presents the environmental and general design details to be carried forward and completed during detailed design. Table 5.1 provides a summary of the environmental issues and potential effects identified for the construction of Highway 7 New, as described in this report and also details specific commitments to be carried forward and addressed in the detailed design stage, including commitments identified in the EA Amendment (2004), MOE review of the project and EA Conditions of Approval.

The remainder of the assessment will be carried out under the MTO Class EA process, which will apply to design, construction and operations/maintenance at the detailed design level. Design and Construction Reports (DCRs) are mandatory under the current Class EA given that the EA Report does not document detailed design. DCRs will be filed on a section-by-section basis during detailed design (usually by contract) for each section of highway, documenting the design, the commitments for construction and any necessary commitments for environmental concerns, maintenance/operations and monitoring requirements.

5.1 Commitments To Consultation, Compliance Monitoring And Permits/Approvals

The Ministry of Transportation (MTO) is committed to maintaining consultation efforts to keep interested parties informed of activities, future design phases and project implementation. In addition, MTO is committed to ensuring that compliance monitoring is conducted relative to the commitments made during the EA and subsequent phases. The section below describes the approach that will be used to achieve successful consultation, ensure compliance monitoring, obtain required permits and approvals, and provide environmental management.

5.1.1 Consultation and Engagement

The detailed design stage will continue the consultation process carried out during the route-planning and preliminary design, and initial detailed design phase of the EA, and will involve federal and provincial agencies, municipalities, interest groups, First Nations and the public. The method of consultation will be confirmed at the start of detailed design and be outlined in a Consultation Plan, consistent with Section 4 of the ERHD (MTO, 2013).. At a minimum, consultation will involve additional Public Information Centres (PICs) and/or Community Information Sessions (CIS), meetings, and public notices.

The Ministry of Transportation is committed to the development of consultation plans that will assist future design phases of the project. Generally these consultation plans will involve an outline of committed communications with agencies, municipalities, the public, property owners and other stakeholders as deemed necessary. Consultation plans will also involve an outline of committed communications with First Nations. The plans will be made available for public input at the outset of the future design phase to ensure they outline appropriate commitments made during the EA, VE study and Initial Design phase. Examples of components of the future consultation plan can include:

- Commitments outlined in the EA Amendment 2004 and during Review of the EA (MTO, 2005) relative to commitments to further work with public and external agency stakeholders etc. in addressing environmental impacts. Commitments to agencies summarized in Table C-1 in **Appendix C** are based on comments received during the MOE review. In addition, on-going consultation commitments made during the Initial Design are to be considered during detailed design;

- Future discussions concerning property;
- Consultation and engagement with Six Nations of the Grand River and consultation with other First Nations during future design stages,
- Consultation with the MNR related to project requirements for works associated with a Canadian Heritage River;
- Consultation with the Grand River Conservation Authority to allow them the opportunity to provide input to the detailed design process in relation to mitigation of impacts on natural features for which they are responsible, along the alignment; and,
- Consult with the MNR and DFO related to requirements under the *Endangered Species Act*, *Species at Risk Act* and *Fisheries Act*.

All background study files and documentation, including the study mailing list will be provided to future design teams.

On-going consultation with stakeholders, including: residents, landowners, businesses and community interest groups will continue throughout the detailed design phase of the project. This may involve meetings, presentations and/or distribution of information material. The intent of the consultations is to provide opportunities for discussions to address outstanding concerns of stakeholder groups or individuals with an interest in the project.

A Highway 7 Municipal Advisory Group (MAG) will be established at the start of detailed design and is to include representatives from local municipalities directly related to the Highway 7 New alignment, emergency medical services, and may include local police and public transportation representatives. The intent of the advisory group is to identify and have a clear understanding of transportation concerns related to municipal infrastructure, roads, utilities and property, and discusses the issues to develop solutions, where applicable. The MAG will establish a meeting schedule at the first meeting, which will outline how often they will meet through the detailed design process.

5.1.1.1 Public Information Centre

A minimum of one Public Information Centre (PIC) is to be held during the detailed design phase to present to final Highway 7 corridor alignment, summary of new studies and plans completed during detailed design, and results of the environmental assessment process. Consistent with the PICs held during the Initial Design Phase, the PIC material shall be presented in consecutive PICs at two separate locations. Artist rendering of aesthetic components of the detailed design shall be considered during preparation of the PIC display material. These renderings may include:

- Grand River crossing with the associated trail realignments, landscaping, wildlife and cultural heritage design components;
- Landscaping plans related to gateway designs, visual screening and ecological protection and restoration landscapes

5.2 Environmental Commitments

In accordance with the Environmental Reference for Highway Design (ERHD), the environmental technical discipline studies and documentation will need to be updated in detailed

design to take into consideration the passage of time (change in existing conditions), new policies and guidelines, and refinement of the design (change in the potential impacts). It is anticipated that the following reports will be updated during detailed design:

- The fish and fish habitat impact assessment report: this is required to reflect the current methodologies and requirements for the MTO Fisheries Protocol and to update the understanding of existing conditions, in order to effectively determine potential impacts.
- Update the terrestrial ecosystem impact assessment report to update the understanding of existing conditions and complete new studies related to species at risk.
- Update and/or complete new Built Heritage and Cultural Heritage Landscape documentation for cultural resources not previously evaluated, or where additional documentation is required.
- Update archaeological resource documentation to address areas within the project limits not previously evaluated, including but not limited to utility installations.

Details of the technical studies and reports are provided below.

5.2.1 Specific Technical Discipline Study Requirements

Technical studies were carried out during the preliminary and Initial Design Phases. It is anticipated that additional work will be required during detailed design to satisfy regulatory requirements and MTO's expectations for each environmental specialty area in accordance with the current version of the Environmental Reference for Highway Design (ERHD).

5.2.1.1 Fish and Fish Habitat

The fish and fish habitat impact assessment completed during the Initial Design is to be updated through additional field investigations where required to satisfy the process and procedures outlined in the most recent version of the MTO/DFO/OMNR *Protocol for Protecting Fish and Fish Habitat on Provincial Undertakings – Version 2 (2013)*, and the most recent version of the Environmental guide for Fish and Fish Habitat. Based on the revised impact assessment, mitigation measures will be developed and incorporated into the design and presented in the contract documentation and plans.

The analysis of fish and fish habitat sensitivity is to be confirmed and the categorization of project risk will be completed during detailed design. The risk will be completed by the Fisheries Assessment Specialist and determined through use of DFO's RMF (Risk Management Frameworks).

The specific expectations for monitoring of the construction works will be determined during detailed design. For works requiring Fisheries Act Authorization, monitoring is to be performed by a qualified Fisheries Contract Specialist as per MTO Standard Special Provision 199F58, fisheries Act Authorization compliance – Oversight, Monitoring, and Documentation. For works without a Fisheries Act Authorization, but where in-water works or potential for impacts to fish and fish habitat it is to be determined if MTO non-standard Special Provision ENVR0002 is warranted.

5.2.1.2 Terrestrial Ecosystem

The terrestrial ecosystem existing conditions and impact assessment completed during the Initial Design is to be updated through additional field investigations to confirm the natural environment characteristics within the project limits. This will include updates to the vegetation community mapping, which is to be completed using the Ecological Land Classification (ELC) protocol, dedicated surveys for reptiles and amphibians, breeding bird surveys, and dedicated surveys for species at risk.

5.2.1.3 Species at Risk

Species are continually reviewed and assessed for listing under the ESA and SARA. During detailed design, MNR and DFO are to be consulted to determine what species and habitat should be assessed in relation to the detailed design of the project. Section 3.14 of the ERHD will be applicable during detailed design. At the time of this report Section 3.14 is under development.

In order to facilitate MNR's review and screening of the proposed works under the ESA, SAR specific investigations and evaluations are to be undertaken and completion of the appropriate MNR forms will be required. The forms may include: Information Gathering Form for activities that may affect species or habitat protected under the ESA (IGF), Avoidance Alternatives Form for activities that may require an overall benefit permit under clause 17(2)(c) of the ESA. (AAF)

5.2.1.4 Groundwater and Wells

The groundwater/well assessment study will be updated to address environmental commitments and encompass additional studies as may be required to assess potential impacts from detailed designs. Additional studies and well monitoring programs will be established to confirm potential impacts to wells, determine the requirement for decommissioning of wells, and further the assessment of groundwater/seepage interference impacts.

5.2.1.5 Surface Water / Drainage

During detailed design the stormwater management plans are to be developed. This will include the design of the stormwater management ponds, highway drainage and treatment facilities, and coordination with landscaping, environmental and structural disciplines. Design drawings will be prepared and stormwater/drainage reports will be updated.

5.2.1.6 Socio-Economic Environment

Confirm potential impacts resulting from property access restrictions and property acquisitions to be finalized during detailed design. Document the outcomes and decisions from the on-going stakeholder consultations, MAG and from consultation undertaken related to addressing socio economic concerns.

5.2.1.7 Contaminated Properties

Update the Contamination Overview Study (COS) to reflect current land uses and property ownership at detailed design. The work undertaken during detailed design will identify past and present site activities; evaluate the existing environmental liabilities, current environmental performance, and environmental risk of a property; and determine where and how to undertake contamination management within the study area.

Based on the updated COS, MTO will initiate Preliminary Site Screening and Phase I Environmental Site Assessments (ESAs) where required. Additional work may be required to complete Phase II ESA, Screening Level Risk Evaluation (SLRE) and Site Management tasks, as required.

5.2.1.8 Erosion and Sediment Control

An Erosion and Sediment Control risk assessment is to be carried out during detailed design and documented in an ESC risk assessment report. Based on the results of the risk assessment an Erosion and Sediment Control Plan (ESCP) will be developed and implemented during construction.

5.2.1.9 Cultural Heritage

Archaeology

Undertake outstanding Stage 2 and 3 archaeological assessments and complete currently identified Stage 4 mitigations. During detailed design, review utility and infrastructure relocation to identify if there are undisturbed areas outside of the highway ROW that need to be assessed for archaeological resource potential.

Built Heritage and Cultural Landscapes

The Grand River is classified as a Canadian Heritage River. As such, the detailed design shall include design considerations that maintain the Heritage River classification. Consultation with the MNR will be required during detailed design as they responsible agency for Ontario's Canadian Heritage Rivers.

Buildings that are newly identified as being over 40 years old and will be impacted directly will need to be evaluated and the results documented in a Cultural Heritage Evaluation Report (CHER). The documentation shall include floor plans and photographic documentation of building interiors, etc.

5.2.1.10 Landscape Composition

Hire a qualified Landscape Architect to develop the landscape composition plan for the project. The MTO will establish a Context-Sensitive Solutions process, involving a collaborative effort between the MTO, design team, Grand River Conservation Authority, Ministry of Natural Resources, local municipalities and Trail association representatives.

The landscape composition plan will be incorporated into the detailed design.

5.2.1.11 Noise

Construction shall be carried out in accordance with local municipal by-laws. Duration of any work outside of the time period identified in the by-law will require, as necessary, an exemption to the by-law. Therefore, during detailed design, the requirements for noise by-law exemptions will need to be confirmed.

The noise study will need to be updated to reflect current standards and protocols as well as incorporate new information derived from updated traffic studies carried out during detailed design.

5.2.1.12 Air Quality

Undertake a Comprehensive Local and Regional Air quality (AQ) and (Greenhouse Gas) GHG Emission Impact Assessment during detailed design as per the new Environmental Guide: Recommended Approach for Assessing and Mitigating the AQ & GHG Emissions of Provincial Transportation Projects (June 2012). The study will update or develop mitigation measures to be incorporated into the design (ERHD, 2013).

5.2.2 Environmental Assessment Documentation

The documentation required for the detailed design is a Design and Construction Report (DCR) as per the current Class EA. The components of the environmental assessment program and upgrading of the highway designs completed during detailed design for each section of the project or construction contract will be documented in a section specific DCR. The DCRs for each contract section will be provided to appropriate external ministries/agencies and first nations communities to follow up on concerns identified during the consultation process. Each DCR is to be made available for public review, for a period of 30-days at publicly accessible locations. It is recommended that locations used during the preliminary design and Initial Design phases be selected for placement of the DCRs for public review.

Environmental Synopsis: will be prepared at or near the completion of the detailed design stage as a means of summarizing the environmental protection plan that has been developed for implementation of the project. This will ensure continuity in commitments and approaches to environmental protection between design and construction stages.

Annual Compliance Report: This report is to be prepared and submitted annually in accordance with the EA Approval.

5.2.3 Permits, Approvals and Authorizations

The following permits / approvals will be secured during detailed design in order for the project to proceed to construction.

- **NPA – Navigation Protection Act:** Consultation with Transport Canada (TC) is required to satisfy the NPA for watercourses deemed by TC to be a navigable waterway.
- **SARA – Species at Risk Act:** This federal legislation is applicable to species occurring within the project limits that are afforded protection under SARA. Consultation with the appropriate agencies will be required. These include Environment Canada (EC), and Fisheries and Oceans Canada (DFO). An example of a species to which this legislation applies is the wavy-rayed lampmussel. Where there is an overlap of legislation for the same species at the provincial (ESA) and federal level (SARA), consultation with the agencies will be required to determine which agencies will assume the lead for approvals.
- **ESA – Endangered Species Act:** This provincial legislation is applicable to species occurring within the project limits that are afforded protection under sections 9 and 10 of the ESA.
- **PTTW – Permit to Take Water:** An application for consumptive and non-consumptive uses will be required for construction.
- **Fisheries Act:** The DFO is to be notified through submission of the appropriate risk assessment for works considered to result in low, moderate, or high risk of serious harm

to fish and fish habitat within the project limits. An offsetting plan will be developed through a staged process as required, undertaken cooperatively with the DFO, per Section 8.0 of “The Fish Guide” or as specified in the Fisheries Productivity Investment Policy: A Proponent’s Guide to Offsetting (Eco DFO, 2013).

- **Noise Bylaws:** Review noise bylaws that are in force within the Region, Municipality and/or Township to determine requirements for an exemption related to construction noise.
- **Municipal Approvals and Agreements:** Property Agreements (easements, encroachment agreements) – Agreements will be required to obtain the necessary rights for lands that are currently owned by the municipalities and will be required for the approved design.
- **Road Occupancy Permits** – Permits may be required for construction of the approved design on the existing road right-of-ways, sidewalks and boulevards
- **Road Closure By-Law** – A municipal by-law may be required for the permanent closure of existing roads a the Highway 7 right-of-way in accordance with the Municipal Act and the Municipal Class EA Process. Council resolutions for any local roads detours (if they are required). Need to consult on this.
- **Road Entrance Permits** – Permits may be required for closing and establishing new entrances on existing regional roads
- **Regional Utility-Infrastructure Relocation** – Agreements or permits will be required for the relocation of any regionally owned utilities or infrastructure (i.e. watermains, forcemains, etc.)
- **Health Unit approvals** – Permits may be required for the replacement of existing septic systems and wells and for the decommissioning of existing wells for those systems affected by the approved design.
- **Sign Permits** – Permits may be required for the replacements, restoration or establishment of signs along regional roads subject to any permitting and/or construction requirements.
- **CNR/Railway Act Approval** – Approval will be required where the construction of Highway 7 will require work over, under and adjacent to a railway.

5.2.4 Engineering, Surveys and Highway Design

This section describes the engineering and technical designs, and environmental assessments that will be undertaken to advance the design of Highway 7 New through detailed design to construction and achieve the environmental commitments and conditions for approval.

The Initial Design Phase will be upgraded through additional design and site surveys to complete the Highway 7 New design in order to proceed to construction. The following items and tasks will be undertaken and completed during the next stage of design and will be documented in the DCRs for the project:

- Upgrading of the Highway 7 New Initial Design to detailed design; this is to include all design components to satisfy MTO’s design requirements and the Design and Construction Report.

- Structural design of all bridges and culverts within the project limits including the update and completion of Structural Design Reports
- Development of the construction staging plan
- Complete the electrical design, including illumination and traffic signals. This is to include all warrants.
- Geotechnical investigations and surveys are to be completed to facilitate the upgrade of the Initial Design to detailed design for foundations and pavement.
- Stormwater management ponds are to be further developed and completed during detailed design
- Traffic studies and updated traffic forecasts are to be considered during detailed design, which is to be documented in a traffic study analysis report that can be used as the basis for determining illumination and traffic signal warrants, and developing construction staging plans.

5.2.5 Construction Documentation and Plans

The following plans will be developed during detailed design: Compensation Plan/Offsetting Plan; and, Environmental Protection Plan.

A Compensation Plan or Offsetting Plan will be developed, as required for works anticipated to result in the serious harm to fish, such that works have the potential to contravene the *Fisheries Act*.

Environmental Protection Plan: An environmental protection plan (EPP) will be developed during detailed design and is to include updates to the EPP guideline sheets developed during preliminary design. This will include an update of the Environmental Protection Plan (EPP) guideline sheets, which have been provided to illustrate measures that may be employed during subsequent stages of the Highway 7 project for: Clearing and Grubbing, Grading, Dewatering, Erosion and Sediment Control Installation, Equipment Maintenance & Fuelling, and Pile Driving.

Table 5.1: Summary of Environmental Effects and Proposed Mitigation for the Initial detailed design of Highway 7 New (GWP 408-88-00)

I.D. #	Issues / Concerns Potential Effects	Concerned Agencies	I.D. #	Mitigation/Protection/Monitoring/Commitments to Future Work
1.0	Environmental Assessment <ul style="list-style-type: none">Conditions of Approval	Government Review Team MOE MTO	1.1	<ul style="list-style-type: none">Review and address environmental and design commitments identified as a condition of EA Approvals or commitment made during preliminary design (MOE, 2007):<ul style="list-style-type: none">“1.0 The Proponent shall comply with the provisions of the EA all of which are incorporated herein by reference except as provided in these conditions and except as provided in any other approvals or permits that may be issued.”“2.0 These conditions do not prevent more restrictive conditions being imposed under other statutes.”“3.0 Where a document is required for the Public Record, it shall be provided to the Director for filing with the Public Record maintained for this undertaking. Additional copies of such documents will be provided by the Proponent for public access to:<ul style="list-style-type: none">The Regional Director;The Clerk’s offices of the Regional Municipality of Waterloo, County of Wellington, City of Kitchener, City of Guelph, Township of Woolwich, and Township of Guelph/Eramosa; andThe Proponent’s head office.”“4.0 The Proponent shall implement the commitments made and recorded in Appendices B and C of the ministry Review, except as provided for in these conditions or as provided by other approvals, authorizations or permits required for the undertaking.”“4.1 The Proponent shall consult with Six Nations of the Grand River during the detailed design phase of the undertaking, pursuant to the workplan developed jointly by the Proponent and Six Nations of the Grand River, which forms a part of the EA.”“4.2 The Proponent (MTO) shall prepare and submit to the Director for the Public Record an Environmental Assessment Compliance Monitoring Program. The Program shall be prepared for the monitoring of the Proponents fulfillment of the provisions of the EA for mitigation measures, public consultation, and additional studies and work to be carried out, and of all other commitments made during the preparation of the EA and the subsequent review of the EA for mitigation measures, public consultation and additional studies to be carried out. The Program shall be submitted one year from the date of approval of the undertaking or 60 days before the commencement of construction, whichever is earlier. A statement must accompany the Program when submitted to the Director indicating that the Program is intended to fulfill this condition. The Program, as amended by the Director, must be carried out by the Proponent.”“4.3 The Proponent shall prepare an annual Compliance Report which describes compliance with the conditions of approval as set out in the Notice of Approval and which describes the results of the Environmental Assessment Compliance Monitoring Program. The first Compliance Report shall be submitted no later than April 30th following the date of the Directors acceptance of the Compliance Monitoring Program and on the anniversary of this date thereafter, for which the Compliance Report shall cover the previous calendar year. The Proponent shall submit to the Director for placement on the Public Record a copy of the Compliance Report. The Proponent shall submit Compliance Reports until all conditions are satisfied. When all conditions have been satisfied, the Proponent shall indicate in the Compliance Report that this is the final submission.”

I.D. #	Issues / Concerns Potential Effects	Concerned Agencies	I.D. #	Mitigation/Protection/Monitoring/Commitments to Future Work
	<ul style="list-style-type: none">Future Environmental Assessment Documentation		1.2	<ul style="list-style-type: none">Prepare and file Design and Construction Reports (DCR) for each detailed design section, which is to include detailed mitigation measures. The DCRs are to be filed for public review, for a period of 30-days and are not be eligible for a Part II Order “bump-up” request.
			1.3	<ul style="list-style-type: none">Update Environmental Protection Plan guideline sheets for: clearing & grubbing, grading, dewatering, erosion and sediment control installation, equipment maintenance & fuelling, and pile driving.
	<ul style="list-style-type: none">Environmental Documentation and Studies		1.4	<ul style="list-style-type: none">Develop an Environmental Protection Plan (EPP) during detailed design.
			1.5	<ul style="list-style-type: none">Undertake environmental studies to update the results of studies undertaken during Initial detailed design stages.
2.0	Fish and Fish Habitat – General	MTO DFO MNR GRCA	2.1	<ul style="list-style-type: none">Update Fish and Fish Habitat Report, with additional work conducted in compliance with the process and procedures outlined in the current MTO/DFO/OMNR Protocol for Protecting Fish and Fish Habitat on Provincial Transportation Undertakings and the current version of the Environmental Guide for Fish and Fish Habitat.
			2.2	<ul style="list-style-type: none">Undertake additional field investigations as required, including investigations within lands where access restrictions were in place during preliminary and initial detailed design phases.
	<ul style="list-style-type: none">Minimize impacts to fish habitat and communities by constructing during the permissible in-water construction period		2.3	Excluding the Grand River, which has a specific timing window, the permissible In-water timing window to be applied to construction staging for in-water and near-water works for all watercourses, is: <ul style="list-style-type: none">Warmwater: July 1 to December 31 and from January 1 to March 31
			2.4	<ul style="list-style-type: none">Implement surface water protection mitigation measures, such as sediment and erosion control measures to protect fish and aquatic habitat during construction and vegetation protection measures.
			2.5	<ul style="list-style-type: none">Detailed sediment and erosion measures to be developed during detailed design.
			2.6	<ul style="list-style-type: none">Develop and implement a Compensation or Offsetting Plan for works that are considered to result in the ‘Serious Harm to Fish’. This is to be carried out through Consultation with MNR, DFO.
			2.7	<ul style="list-style-type: none">Obtain <i>Fisheries Act</i> Authorization where required, or complete MTO Notification forms for Low Risk to meet requirements under the current Protocol.
			2.8	<ul style="list-style-type: none">Hire a Fisheries Contract Specialist during Construction to monitor works for which a <i>Fisheries Act Authorization</i> has been issued to ensure the proper implementation of the terms and conditions, including applicable Compensation Plans.
			2.9	<ul style="list-style-type: none">Marden Drain (Culvert 33): Due to access restrictions during Initial Design phase, further investigations will be required during the detailed design stage to confirm the function of this watercourse as fish habitat at the crossing.
			2.10	<ul style="list-style-type: none">Direct any construction runoff to vegetative filtering/detention areas, including stormwater management ponds, prior to release to creeks, rivers and associated wetlands.
			2.11	<ul style="list-style-type: none">Design structure to maintain low flow, flood flow and any groundwater discharge that may be apparent during predesign field investigation.
			2.12	<ul style="list-style-type: none">Roadway SWM design – maximize runoff filtering/quality and infiltration (where feasible).

I.D. #	Issues / Concerns Potential Effects	Concerned Agencies	I.D. #	Mitigation/Protection/Monitoring/Commitments to Future Work
			2.13	<ul style="list-style-type: none">Ensure construction runoff detention and filtering to avoid the transport of deleterious substances to sensitive natural areas.
3.0	Fish and Fish Habitat – Feature Specific Design Considerations, Mitigation Strategies and Recommendations	MTO DFO MNR GRCA		
	<ul style="list-style-type: none">Grand River		3.1	<ul style="list-style-type: none">Implement timing constraints for the protection of critical spawning and incubation periods for the sportfish fishery. The special permissible in-water timing window for the Grand River is: July 1 to December 31 and from January 1 to March 15.
			3.2	<ul style="list-style-type: none">Structural design will include geotechnical and hydraulic analysis to ensure structure design does not cause unacceptable backwater scouring, flood flow constriction or upstream/downstream erosion problems.
			3.3	<ul style="list-style-type: none">Minimize the footprint of the working area after construction of the bridge supports.
			3.4	<ul style="list-style-type: none">Consider the Steep north bank during development of construction staging plans and consider isolating the abutments during construction.
	<ul style="list-style-type: none">Hopewell Creek & Tributary		3.5	<ul style="list-style-type: none">Bridge design to minimize in-water footprint and impacts to fish and fish habitat.
			3.6	<ul style="list-style-type: none">Incorporate seasonal swale flow in Hopewell Creek structure design.
	<ul style="list-style-type: none">Ellis Creek		3.7	<ul style="list-style-type: none">Design structure to maintain low flow, flood flow and any groundwater discharge that may be apparent during predesign field investigation.
			3.8	<ul style="list-style-type: none">Review any wetland vegetation and edge management requirements (if applicable) during detailed design.
			3.9	<ul style="list-style-type: none">Replace organics with granular footing for structural stability and to maintain shallow groundwater movement.
	<ul style="list-style-type: none">Marden Drain		3.10	<ul style="list-style-type: none">Complete fish and fish habitat field investigations to document existing conditions and evaluate impacts to this feature, in accordance with the current Protocol.
			3.11	<ul style="list-style-type: none">During detailed design, confirm the need for timing constraints with the MNR based on the results of field investigations.
			3.12	<ul style="list-style-type: none">Ensure structures maintain low flow and flood flow to prevent upstream ponding and downstream erosion.
4.0	Forests / Vegetation	MNR EC GRCA	4.1	<ul style="list-style-type: none">Maximize protection of off-ROW vegetation by implementing construction protection measures identified in the General Mitigation Strategy (EA, 2004).
	Impacts to Forest / Woodland Edges		4.2	<ul style="list-style-type: none">Detailed forest edge management plans building on the recommendations provided in the Initial detailed design to be developed during detailed design for implementation. Forest edge management treatments will consider the following: Planting a new forest edge, control invasive species, grubbing/grading and monitoring.
	Short term impacts on vegetation including wetlands		4.3	<ul style="list-style-type: none">Temporary erosion and sediment control measures will be installed prior to construction, and maintained throughout construction (See OPSS 577 and Guidelines in Sediment and Erosion Control EPP).

I.D. #	Issues / Concerns Potential Effects	Concerned Agencies	I.D. #	Mitigation/Protection/Monitoring/Commitments to Future Work
			4.4	<ul style="list-style-type: none">ROW vegetation clearing zones and vegetation retention zones will be clearly delineated on both construction drawings and in the field and will be field confirmed with the contractor prior to clearing and grading.
			4.5	<ul style="list-style-type: none">Vegetation removal and protection measures will be conducted in accordance with OPSS 201(tree clearing) and OPSS 565-1 (tree protection) supplemented by guidelines provided in the Clearing and Grubbing EPP. Vegetation that does not require removal for purposes of the construction will be protected through the installation and maintenance of temporary vegetation protection measures.
			4.6	<ul style="list-style-type: none">Trees to be removed will be felled into the ROW (and away from watercourses) to avoid disturbance to off-ROW vegetation as well as aquatic areas.
			4.7	<ul style="list-style-type: none">Edges of cleared areas will be reviewed. Damaged trees will be checked and treated, or removed. Hazard and windthrow susceptible trees will be identified and removed.
			4.8	<ul style="list-style-type: none">The contractor will be required to have appropriate product handling and spills management procedures and equipment in place prior to construction.
			4.9	<ul style="list-style-type: none">Inspection will be undertaken during key construction periods and at key locations to ensure environmental protection measures are implemented and working and any required remedial action is undertaken.
	Long term impacts on vegetation including wetlands		4.10	<ul style="list-style-type: none">Review opportunities for footprint reduction during detailed design in order to further reduce canopy removal. Consider measures such as retaining walls, 2:1 embankment slopes, benching, and adjustment of curve radii to achieve these objectives. The final selection of appropriate measures will need to consider local site conditions, environmental protection objectives and site specific road design requirements.
			4.11	<ul style="list-style-type: none">Final planting approaches will be developed and reviewed with the agencies during detailed design.
			4.12	<ul style="list-style-type: none">Tree management activities will be undertaken as required for both driver safety and health of the balance of the woodland unit (See guidelines in Clearing and Grubbing EPP).
			4.13	<ul style="list-style-type: none">Herbicides are applied in the ROW only to address site-specific concerns regarding noxious weeds adjacent to agricultural land and/or in response to complaints. The handling and application of herbicides are regulated under the Pesticides Act.
			4.14	<ul style="list-style-type: none">The final drainage design will assess upstream and downstream drainage patterns and requirements to ensure that flood risk and erosion risk is properly managed, and that appropriate cross drainage is provided where required.
			4.15	<ul style="list-style-type: none">Grand River<ul style="list-style-type: none">During detailed design, review opportunities for ROW buffer/edge management plantings in the Grand River valley crossing area.Bridge footprint to be minimized to extent possible.During detailed design, consider techniques that will maintain seepage flow wherever potentially affected by the roadway and/or bridge structure.Review need for vegetation screening planting north of the river crossing.SWM facilities (Pond 4) to be provided for runoff quality treatment prior to release to floodplain and river.

I.D. #	Issues / Concerns Potential Effects	Concerned Agencies	I.D. #	Mitigation/Protection/Monitoring/Commitments to Future Work
5.0	Wetlands	MNR GRCA		
	<ul style="list-style-type: none">Protection of Wetlands During Construction		5.1	<ul style="list-style-type: none">Implement sediment and erosion measures for work within or adjacent to all wetlands.
			5.2	<ul style="list-style-type: none">Hydrology of wetlands to be maintained during and post construction.
			5.3	<ul style="list-style-type: none">Marden South Wetland: Due to access restrictions during the Initial Design phase, further investigations may be required during the detailed design stage to confirm the vegetation communities and wildlife in this feature.
			5.4	<ul style="list-style-type: none">Weiland Forest Tract, Hopewell Riparian Woodland/Wetland [LSW], Townline West Wetland, Townline East Wetland, Ellis Creek Wetland, Marden Wetland [PSW]<ul style="list-style-type: none">Undertake edge management review during detailed design to confirm edge management requirements (if any) identified in the Initial detailed design.During detailed design, review opportunities for planting a protective buffer within the ROW adjacent to the forest section.
			5.5	<ul style="list-style-type: none">Hopewell Riparian Woodland/Wetland [LSW]<ul style="list-style-type: none">Salvage any excavated organic material for subsequent landscaping or restoration work.
			5.6	<ul style="list-style-type: none">Townline West Wetland<ul style="list-style-type: none">Careful consideration of drainage design at the narrow lobe crossing to avoid adverse wetland hydrology changes (to be assessed during detailed design).SWM facilities (Pond 10) to be provided for highway runoff quality treatment prior to release to wetland area to north.Careful consideration of tributary crossing design to avoid adverse wetland hydrology changes or downstream erosion concerns.
			5.7	<ul style="list-style-type: none">Ellis Creek Wetland<ul style="list-style-type: none">Bridge proposed at wetland crossing.Implement mitigation strategies for sediment control and management of surface water.SWM facilities (Pond 11 & 12) to be provided for runoff quality treatment prior to release to the Ellis Creek wetland.Salvage any excavated organic material for subsequent landscaping or restoration work.
			5.8	<ul style="list-style-type: none">Marden Wetland [PSW]<ul style="list-style-type: none">Careful consideration of drainage design to avoid adverse wetland hydrology changes.Design crossing structures to maintain cross flows and facilitate terrestrial wildlife movement opportunities.Implement mitigation strategies for sediment control and management of surface water.

I.D. #	Issues / Concerns Potential Effects	Concerned Agencies	I.D. #	Mitigation/Protection/Monitoring/Commitments to Future Work
6.0	Wildlife	MNR	6.1	<ul style="list-style-type: none">Consult with the MNR to confirm species specific and/or location specific timing restrictions required to protect birds and other wildlife.
	<ul style="list-style-type: none">Forest Dependent / Wetland Birds		6.2	<ul style="list-style-type: none">Additional mitigation measures will be developed during detailed design for water quality, vegetation and wetland protection. These measures shall be incorporated into the design and implemented during construction to ensure wildlife habitat benefits.
	<ul style="list-style-type: none">Heronry – Townline Wetland		6.3	<ul style="list-style-type: none">Update the status of the heronry during detailed design and construction and undertake agency consultations as required.
			6.4	<ul style="list-style-type: none">Review status of heronry at Townline Wetland to confirm if any mitigation measures are required. Implement a 500 m buffer around heronry colonies >50 nests where tree harvest is restricted and forest edge intrusion is to be avoided.
	<ul style="list-style-type: none">Waterfowl/Water Bird Habitat		6.5	<ul style="list-style-type: none">Design considerations for waterfowl/water bird habitat within Ellis Creek and the associated wetland area will be incorporated into highway and structural designs, as well as construction staging plans.
			6.6	<ul style="list-style-type: none">The Grand River crossing will utilize a high level bridge structure that will span the river and shoreline areas.
	<ul style="list-style-type: none">Amphibian Breeding		6.7	<ul style="list-style-type: none">Mitigation measures have been identified for runoff quality control, protection of surface water resources, and vegetation/wetland protection. Implementation of these measures will have direct benefit to amphibian (and reptile) habitat.
	<ul style="list-style-type: none">Protection of Migratory Birds During Construction		6.8	<ul style="list-style-type: none">To minimize impacts to migratory birds, vegetation clearing should be scheduled to avoid the nesting period between April 1 and July 31 during each year of construction. Same window is to apply to the demolition of buildings/structures that may support nesting barn swallow, chimney swift and other species.
			6.9	<ul style="list-style-type: none">Confirm the extent of buffers that may be required to protect individual species within associated habitat areas during detailed design.
			6.10	<ul style="list-style-type: none">In the event that a bird nest is discovered during vegetation clearing or other construction, work should cease and the area within the specified limit from the nest, and the area avoided until the nesting effort has been completed as determined by an avian biologist.
	<ul style="list-style-type: none">Driver/Wildlife Vehicle Collisions and White-tailed Deer Winter Concentration Use		6.11	<ul style="list-style-type: none">Provide wildlife fencing where the highway occurs adjacent to the large habitat features to prevent wildlife from accessing the highway. These features include:<ul style="list-style-type: none">Marden South, Townline East, Townline West, Regional Road 30 Complex and Weiland Tract
			6.12	<ul style="list-style-type: none">The requirement for funnel fencing to direct wildlife to pass beneath structures is to be investigated at the detailed design stage.
			6.13	<ul style="list-style-type: none">Bridge structures will be provided at the Grand River, Hopewell Creek, and Ellis Creek locations. These structures will maintain movement opportunities for both aquatic and terrestrial wildlife species.
			6.14	<ul style="list-style-type: none">Deer crossing signs and good driver visibility are to be considered during detailed design to assist in deer crossing awareness to help reduce road mortality risk.
			6.15	<ul style="list-style-type: none">Provide wildlife passage beneath the structure for wetland wildlife groups based on the size of opening developed during the Initial Design phase.

I.D. #	Issues / Concerns Potential Effects	Concerned Agencies	I.D. #	Mitigation/Protection/Monitoring/Commitments to Future Work
7.0	Regional Rare Species	MNR GRCA	7.1	<ul style="list-style-type: none">Undertake additional field investigations to confirm presence of regionally rare plants, wildlife habitats, and nesting/breeding habitats.
	<ul style="list-style-type: none">Regionally Significant Flora		7.2	<ul style="list-style-type: none">Conduct vegetation surveys for regionally significant flora within the project footprint and develop appropriate mitigation strategies to minimize potential impacts to individuals and habitat.
			7.3	<ul style="list-style-type: none">Update Terrestrial Ecosystems Report in accordance with the current version of the ERHD.
8.0	Species at Risk	MNR DFO EC	8.1	<ul style="list-style-type: none">Complete the MNR Information Gathering Form (IGF) and Avoidance Alternative Form (AAF) and submit to MNR for review under sections 9 and 10 of the ESA, subject to the technical requirements of Section 3.14 of the current ERHD.
			8.2	<ul style="list-style-type: none">Consultation with the MNR will be required in order to confirm the permitting and species survey requirements prior to construction.
			8.3	<ul style="list-style-type: none">Obtain SARA and ESA permits as required
	<ul style="list-style-type: none">Potential Impact to Wavy-rayed Lampmussel		8.4	<ul style="list-style-type: none">Prior to construction conduct removal/relocation of individuals that may be impacted from the works at the Grand River crossing. Develop removal/relocation plan in accordance with protocol developed by MNR and DFO and obtain Species at Risk and/or ESA permit to carry out the work.
	<ul style="list-style-type: none">Potential Impact to Bobolink, Eastern Meadowlark, Barn Swallow and Chimney Swift		8.5	<ul style="list-style-type: none">For each of these species conduct a breeding/nesting survey in areas of potential habitat in accordance with MNR survey protocols. Consult with the MNR and carry out the works necessary to obtain a Species at Risk permit, if required.
	<ul style="list-style-type: none">Potential Impact to Butternut		8.6	<ul style="list-style-type: none">Conduct inventory in areas of suitable habitat for butternut including woodlands and fencerows.
			8.7	<ul style="list-style-type: none">For any specimens found that may be affected by the work a health assessment is to be carried out by a certified butternut health assessor.
			8.8	<ul style="list-style-type: none">As required, make submissions to the MNR for approvals based on the number of individuals identified (Notice of Butternut Impact or Permit).
	<ul style="list-style-type: none">Potential Impact to Jefferson Salamander		8.9	<ul style="list-style-type: none">Conduct assessment to determine presence/absence of Jefferson Salamander at the following sites:<ul style="list-style-type: none">Grand River crossing (upland forest on south side)Weiland TractTownline East Complex –deciduous upland forest on south side of highway and wetland on north side
			8.10	<ul style="list-style-type: none">For each site, assess habitat potential (presence of suitable breeding pools) and conduct survey to determine presence/absence.
	<ul style="list-style-type: none">Newly listed SAR Species		8.11	<ul style="list-style-type: none">Where there is a change in the status of a species, additional surveys or a review of potential impacts may be required under Sections 9 and 10 of the <i>Endangered Species Act</i> and the <i>Species at Risk Act</i>.
			8.12	<ul style="list-style-type: none">Consult with MNR to confirm additional species to be investigated and the survey protocol to be used.

I.D. #	Issues / Concerns Potential Effects	Concerned Agencies	I.D. #	Mitigation/Protection/Monitoring/Commitments to Future Work
9.0	Surface Water	MOE GRCA MTO		
			9.1	<ul style="list-style-type: none">Update Drainage and Storm Water Management Report.
			9.2	<ul style="list-style-type: none">The initial SWM drainage design, which outlines a drainage strategy for the alignment that addresses water quality, runoff controls, and protection of watercourses and wetlands, will be updated during detailed design.
			9.3	<ul style="list-style-type: none">Develop mitigation measures during detailed design and implement prior to and throughout construction, in order to reduce the frequency and extent of excessive flows from highway ditches, drainage will incorporate SWM principles.
			9.4	<ul style="list-style-type: none">Runoff will be directed to enhanced ditches and water quality swales, and SWM facilities will be designed and located to provide appropriate control of runoff.
	<ul style="list-style-type: none">Stormwater Management		9.5	<ul style="list-style-type: none">The preliminary SWM drainage strategy maximizes the quality of highway runoff and provides some peak flow control for the benefit of adjacent natural areas. This strategy will be developed further during detailed design and reviewed with agencies prior to implementation.
	<ul style="list-style-type: none">Short Term water quality (During Construction)		9.6	<ul style="list-style-type: none">During detailed design, mitigation measures will be developed based on the information available at that time. Mitigation measures will be developed to meet the principles identified below.
			9.7	<ul style="list-style-type: none">The guidelines provided in the EPPs for Erosion and Sediment Control (ESC), Dewatering, and Grading will provide supplementary guidance on environmental protection during development of ESC, dewatering and grading plans during detailed design.
			9.8	<ul style="list-style-type: none">During Construction, the following measures are to be implemented:<ul style="list-style-type: none">Exposed construction areas in the vicinity of any watercourse should be kept to a minimum at all times to minimize the potential for erosion (ref OPSS 182).Erosion and sediment control structures will be designed, installed, maintained and removed according to MTO guidelines and OPSS 577.Exposed surfaces will be re-stabilized and re-vegetated as soon as possible. Natural vegetation cover will be retained wherever possible (and root grubbing minimized where possible) to provide natural erosion control (OPSS 206, 503, 507, 572).Sediment control structures will be routinely inspected as well as checked after storms and repaired as required.In dust sensitive areas, dust will be controlled through the use of water or calcium chloride (OPSS 506).Dewatering of construction areas will ensure that the water is properly filtered prior to release to a receiving area (ref OPSS 518).
	<ul style="list-style-type: none">Erosion & Sediment Risk from Vegetation Removal		9.9	<ul style="list-style-type: none">The EPP to provide a checklist of protection measures pertinent to vegetation removal, grubbing, grading, erosion and sediment control, that and are to be incorporated into the design.
	<ul style="list-style-type: none">Potential Impediment to Lateral Flow		9.10	<ul style="list-style-type: none">During detailed design, creek/drain flow and dispersed wetland flow in areas including the Ellis Creek and Marden Wetland crossings will be considered in development of drainage and structure design.

I.D. #	Issues / Concerns Potential Effects	Concerned Agencies	I.D. #	Mitigation/Protection/Monitoring/Commitments to Future Work
	<ul style="list-style-type: none">Potential Changes to Channel Morphology		9.11	<ul style="list-style-type: none">Where channel relocation is required, the detailed design process will take into account the existing stream gradients.
			9.12	<ul style="list-style-type: none">Consultation with regulatory agencies will be undertaken during development of the drainage design.
	<ul style="list-style-type: none">Salt Spray and Runoff and Other Contaminants		9.13	<ul style="list-style-type: none">MTO employs and recognizes the importance of best salt management practices and will continue to implement the latest winter maintenance technologies as per the MTO Salt Management Plan.
			9.14	<ul style="list-style-type: none">During detailed design buffer plantings using salt-tolerant species have also been identified as a possible mitigation measure. During detailed design, the need and feasibility of such plantings will be considered as part of the landscape plan.
			9.15	<ul style="list-style-type: none">Highway runoff will be directed to enhanced ditches and water quality swales as well as to strategically located SWM facilities providing Level 1 (highest) quality control. The SWM drainage design is intended to maximize removal of sediments and associated metals and other contaminants and therefore maximize the quality of runoff eventually released to a receiving area.
	<ul style="list-style-type: none">Highway Roadside Maintenance		9.16	<ul style="list-style-type: none">Herbicides may be applied in the ROW to address site-specific concerns regarding noxious weeds adjacent to agricultural land and/or in response to complaints; however, the handling and application of herbicides are regulated under the Pesticides Act.
	<ul style="list-style-type: none">Spills During Construction and Operation		9.17	<ul style="list-style-type: none">A spills management and product handling plan will be developed during detailed design to address site specific and task specific risks. The plan will take into consideration the following:<ul style="list-style-type: none">All spills will be immediately controlled and reported as stipulated in the regulations.Vehicle maintenance and fuelling should be carried out in maintenance areas in the works yards or at commercial garages whenever possible.In the field, refuelling of vehicles should be carried out at designated areas where conditions will allow the containment of any accidentally spilled fuel.Refuelling should not occur within 30 m of any watercourse or wetland or within 100 m of a private residence (or private residence well).Construction vehicles should be maintained to minimize leaks. When detected, leaks will be repaired immediately.
			9.18	<ul style="list-style-type: none">Obtain PTTW to manage surface water during construction.
10.0	Groundwater Resources	MTO MOE GRCA	10.1	<ul style="list-style-type: none">Update Groundwater Report in accordance with the current ERHD, and incorporate mitigation measures into the design.
	<ul style="list-style-type: none">Impacts to wells		10.2	<ul style="list-style-type: none">Further assessment is required during detailed design to identify impacts to wells. Information on the well physical location and status will be verified and updated during detailed design. Those at risk for impact will be investigated and monitored in advance of construction.
			10.3	<ul style="list-style-type: none">Identify potential impact from construction and develop mitigation measures to ensure that potable water supplies are maintained.

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			10.4	<ul style="list-style-type: none">Develop a groundwater management plan to focus on areas within at least 120 m of the watercourses and wetlands where cuts are required and within which influence from intercepted groundwater might occur.
			10.5	<ul style="list-style-type: none">Further investigations required to address potential impacts to shallow wells in the area of Bridge Street eastbound direct on-ramp to Highway 7 westbound.
	<ul style="list-style-type: none">Decommissioned Wells		10.6	<ul style="list-style-type: none">Any wells that must be closed or removed as part of construction will be decommissioned by a licenced well contractor as per Ontario Reg. 309.
	<ul style="list-style-type: none">Potential Groundwater/Seepage Interference		10.7	<ul style="list-style-type: none">Groundwater seepage zones associated with wetland areas and creek valleys along the alignment will be field-checked during the detailed design stage. This information will be used in determining the final form of any required mitigation that will be identified during the detailed design stage (such as seepage flow maintenance drains, provision of free-draining granular in fill areas).
			10.8	<ul style="list-style-type: none">The design of watercourse and wetland structures will incorporate specific groundwater maintenance measures as required based on site-specific review and additional geotechnical work during detailed design.
	<ul style="list-style-type: none">Well Interference and Impact Resolution		10.9	<ul style="list-style-type: none">Where construction work such as pile driving, ditching results in loss of water or damage to wells, investigation of the potentially affected wells will be carried out and previous findings updated.
			10.10	<ul style="list-style-type: none">If a complaint concerning a well problem is identified during highway construction, MTO will review the situation with the landowner in the field. Further response/action will depend on the findings of well water testing, and discussions with the landowner.
			10.11	<ul style="list-style-type: none">MTO will be responsible for provision of appropriate water supply, on either a temporary or permanent basis; if it is determined that highway construction/operation has resulted in a measurable impact to well operation and/or water quality.
			10.12	<ul style="list-style-type: none">If, during the course of the investigation other wells in the locale of the complaint are determined to be contaminated, MTO will advise the well owners of any potential health hazards and on the information on which the advice was based. MTO will recommend that the owner contact the local medical officer of health for further advice concerning household well use.
	<ul style="list-style-type: none">Permits / Authorizations		10.13	<ul style="list-style-type: none">Obtain a PTTW to manage groundwater during construction.
11.0	Landscape Composition	MTO	11.1	<ul style="list-style-type: none">A Landscape Composition Report will be completed by a licensed landscape architect during detailed design in accordance with the current ERHD.
			11.2	<ul style="list-style-type: none">Consider snow hedging/wind break innovation plans during detailed design and incorporate where recommended.
			11.3	<ul style="list-style-type: none">Landscape composition within the Grand River valley will take into consideration the visual and physical intrusion of the highway and bridge crossing of a Canadian Heritage River.
			11.4	<ul style="list-style-type: none">Landscape composition throughout the corridor will take into consideration difference landscape types including woodlands, wetlands, watercrossings, agricultural lands and slopes.
			11.5	<ul style="list-style-type: none">Develop a Context-Sensitive Solutions Process to landscaping design requirements during detailed design.
			11.6	<ul style="list-style-type: none">Prepare landscape plans for the contract that will include items such as gateways, screening, stormwater management, ecological (protection & restoration), roadside and trails, that are developed during detailed design.

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12.0	Noise		12.1	<ul style="list-style-type: none">Undertake a new Noise Assessment during detailed design as per Environmental Guide for Noise, October 2006 and implement mitigation measures, subject to requirements identified in Section 3.4 of the current ERHD.
	<ul style="list-style-type: none">By-law Exemptions	Municipalities MOE MTO Local Farm Operators	12.2	<ul style="list-style-type: none">Confirm noise by-law exemptions during detailed design and update the Noise Study to reflect the updated traffic study results, changes in the mitigation criteria when sound level is in excess of 65 dBA or if sound is increased by 5 dBA above existing conditions, and new criteria for the selection/identification of Noise Sensitive Areas (NSAs) to address the most exposed side of a residential property, where previously on the backyard was considered.
			12.3	<ul style="list-style-type: none">Construction to be carried out in accordance with local municipal by-laws. Duration of any work outside of the time period identified in the by-law will require, as necessary, an exemption to the by-law.
			12.4	<ul style="list-style-type: none">Where receivers are anticipated to experience an increase greater than 5 dBA noise mitigation designs must consider the following during detailed design:<ul style="list-style-type: none">MTO will investigate noise control measures within the ROWNoise control measures, if applied, will be designed to achieve levels as close to 55 dBA, or pre-construction ambient noise levels as is technically or economically feasibleNoise control measures, where applied, would be cost effective and achieve a minimum attenuation of 5 dBA averaged over the first row receivers.
13.0	Contaminated Property		13.1	<ul style="list-style-type: none">MTO will follow a site screening protocol in order to identify potential areas of contaminated soil, prior to property acquisition. If a contaminated property is purchased, then environmental site assessments and remediation activities will be undertaken, in accordance with MOE regulations.
			13.2	<ul style="list-style-type: none">Undertake a new Contaminant Overview Study (COS) to update the levels of potential contamination for properties within the project limits previously identified in the 2008 COS. The new COS is to provide a current list of properties and associated contamination risk level.
			13.3	<ul style="list-style-type: none">Conduct a Phase 1 Environmental Site Assessment for those properties identified as having potential to contain contaminated soil. Complete Phase 2 ESA Reports, and Prepare Remedial Work Plan and Site Remediation Report as required.
			13.4	<ul style="list-style-type: none">If contaminated property escapes detection during the design process, and unexpected contamination is identified during construction, the material will be investigated. Contaminated soil will be disposed of in a manner acceptable for its classification. Consultation with MOE will be undertaken, as required. Contaminated materials will be considered in further during detailed design.
	<ul style="list-style-type: none">Management of Excess Materials		13.5	EA 2004: <ul style="list-style-type: none">For each waste material, an MTO/MOE protocol identifies management options both within and outside the construction area. Re-use or recycling is the preferred approach for excess materials. MTO encourages the re-use of materials, such as excess asphalt by accepting crushed asphalt in Granular "A" and recycled material in specified asphalt binder courses, (typically, the first 'layer' of asphalt). For this project, an appropriate proportion of recycled material will be determined during the design stage.
			13.6	<ul style="list-style-type: none">Within the limits of the right-of-way, materials such as asphalt, concrete and earth, may be re-used as construction materials. Materials may also be temporarily stockpiled inside the right-of-way in preparation for these uses.

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			13.7	<ul style="list-style-type: none">The options for managing excess materials outside of the right-of-way include re-use, stockpiling for re-use, disposal as waste and, for certain materials, disposal as fill. Site protection is provided through specific constraints adapted from existing legislation.
			13.8	<ul style="list-style-type: none">Management of excess materials outside the right-of-way also requires the contractor to obtain written agreements with property owners. Where a re-use/recycling option cannot meet the established constraints, another option must be pursued or the material must be disposed of as waste.
14.0	Air	MOE MTO	14.1	<ul style="list-style-type: none">Undertake a Comprehensive local and Regional Air quality (AQ) and (Greenhouse Gas)GHG Emission Impact Assessment during detailed design as per the new Environmental Guide: Recommended Approach for Assessing and Mitigating the AQ &GHG Emissions of Provincial Transportation Projects (June 2012). Implement mitigation measures (ERHD, 2013).
			14.2	<ul style="list-style-type: none">Provide protection / mitigation measures during construction to ensure contaminants are not released to the environment.
15.0	Built Heritage & Cultural Heritage Landscape Resources	MTCS MTO		
	<ul style="list-style-type: none">Mitigate removal of built heritage and cultural heritage features		15.1	<ul style="list-style-type: none">Confirm indirect and direct impacts to cultural heritage landscapes and build heritage resources and update cultural heritage reports as identified in the IDR.
			15.2	<ul style="list-style-type: none">Complete documentation of properties/structures forty (40) years of age and older prior to construction. Investigations shall be in compliance with applicable guidelines and standards for Built Heritage and Cultural Heritage Landscapes, per the current ERHD.

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			15.3	<ul style="list-style-type: none">Where a potential for displacement is known and may affect cultural heritage landscape units comprising built heritage features (i.e., farm complexes, or any identified individual built heritage features) then the following mitigation measures are recommended:<ul style="list-style-type: none">During the detailed design the Ministry of Transportation should inform the individual municipal authorities as to which cultural heritage resources will be disrupted or displaced by the undertaking.During the detailed design stage those built heritage features, such as residences and agricultural structures, that will be displaced and which have been deemed to be of local heritage interest, should be documented through photography and a detailed historical report.At the end of the detailed design stage those additional cultural heritage landscapes not documented in this IDR that include built heritage features deemed to be of local heritage interest to be displaced or disrupted should be documented through photography, a site plan and a physical description of the cultural heritage landscape and the individual built features.Other cultural heritage landscape features, i.e., roadscape, should be documented photographically prior to displacement or disruption.Prior to demolition, floor plans are to be completed to accompany required documentation report for those buildings of local or regional interest that will be demolished.Where cultural heritage resources such as residences, farmhouses, barns and other associated agricultural outbuildings are to be displaced, and relocation is not feasible or possible, a salvage plan for the building should be prepared. Qualified contractors should be selected for the salvage process.Consult with local historical board to identify interest to obtain salvaged materials and relocation of buildings.
	<ul style="list-style-type: none">Additional Surveys		15.4	<ul style="list-style-type: none">Additional documentation including floor plans will be required for the following for heritage landscapes and resources as access to the property and/or building interiors was not granted during Initial Design:<ul style="list-style-type: none">5395 Woolwich-Guelph Townline5410 & 5432 Elmira Road North297 Woodlawn Road West806 Bridge Street East
			15.5	<ul style="list-style-type: none">Additional documentation for the following cultural heritage sites will be required as access to the properties was not granted during Initial Design<ul style="list-style-type: none">No. 858 Bridge Street East, Township of WoolwichNo. 1000 Bridge Street East, Township of WoolwichNo. 5413 Wellington Road 32 (Guelph Township Road 3), Township of Guelph-EramosaNo. 5415 Elmira Road North (Wellington Road 86), Township of Guelph-Eramosa; and,No. 5441 Elmira Road North (Wellington Road 86), Township of Guelph-Eramosa.

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	<ul style="list-style-type: none">Mitigate Effect to Aesthetics of Grand River as a Canadian Heritage River	Parks Canada (Canadian Heritage Rivers Board Secretariat) MNR	15.6	<ul style="list-style-type: none">Consider the heritage status of the Grand River during the detailed design stage with respect to design measures, landscaping, and restoration of disturbed areas in order to soften the visual and physical intrusion impact.
			15.7	<ul style="list-style-type: none">Aquatic and valley corridor linkages are to be maintained.
			15.8	<ul style="list-style-type: none">Walter Bean Trail will be incorporated in the structure design.
			15.9	<ul style="list-style-type: none">Agency Consultation will be undertaken with the MNR:<ul style="list-style-type: none">Managing Director of Ontario Parks Branch, MNR, P.O. Box 7000, 300 Water Street; Peterborough, ON K9J 8M5.
16.0	Archaeological Resources	MTCS	16.1	<ul style="list-style-type: none">Complete Stage 2, 3 and 4 archaeological assessments of properties that are outstanding from the Initial Design Phase and are to be completed prior to construction in these areas:<ul style="list-style-type: none">Stage 2 Sites: WT-117, WT-64, WT-65, WT-79, WT-51, WT-72a, WT-81, GT-25, GT-26Stage 3 Sites: Aboriginal sites AiHc-297, AiHc-298, AjHc-24, AjHc-25, AjHc-26, and AjHc-30Stage 4 Sites: Jonas Bingeman Site: AiHc-200; TP 41A, 43A, 44A, 46A; Site: AiHc-300; and the TP 45A-M Site: AiHc-302
	<ul style="list-style-type: none">Stormwater Management Facilities		16.2	<ul style="list-style-type: none">Conduct Stage I/II archaeological assessment at stormwater management facility sites that have not been included in previous archaeological assessments. These include ponds 4, 7, 8, 9, 10, 11 and 12.
	<ul style="list-style-type: none">VE Recommendations		16.3	<ul style="list-style-type: none">Conduct Stage I/II archaeological assessment at the sites of VE recommendations that have been incorporated into the design. Some of the sites occur within areas that have been cleared of further archaeological concern. Sites that require further archaeological assessment include VE sites 5, 7, 8, 9 and 10.
	<ul style="list-style-type: none">Mitigate impact to sites of potential archaeological resources		16.4	<ul style="list-style-type: none">Prepare documentation and submit to the Ministry of Tourism Culture and Sport (MTCS) for review and acceptance.
			16.5	<ul style="list-style-type: none">Stage 3 archaeological assessment is required for property to the east of VE recommendation 8 (Woolwich Road 66 / Spitzig Road realignment close to existing at the approach to Highway 7).
			16.6	<ul style="list-style-type: none">Stage 4 Mitigation is to include hand block excavation within the topsoil layer where clusters of artifacts have been encountered as well as topsoil stripping surrounding the block excavation areas, to identify any subsurface features.
			16.7	<ul style="list-style-type: none">Should deeply buried archaeological remains be found on the property during construction activities, the Ministry of Culture and Six Nations of the Grand River should be notified immediately.
			16.8	<ul style="list-style-type: none">Should previously unknown or unassessed deeply buried archaeological resources be uncovered during development, they may be a new archaeological site and therefore subject to Section 48 (1) of the Ontario Heritage Act. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed archaeologist to carry out archaeological fieldwork, in compliance with Section 48 (1) of the Ontario Heritage Act.

I.D. #	Issues / Concerns Potential Effects	Concerned Agencies	I.D. #	Mitigation/Protection/Monitoring/Commitments to Future Work
			16.9	<ul style="list-style-type: none">It is recommended that development not proceed before receiving confirmation that the Ministry of Tourism, Culture and Sport (MTCS) has entered all submitted archaeological reports into the provincial register of reports.
			16.10	<ul style="list-style-type: none">The Cemeteries Act, R.S.O. 1990 c. C.4 and the Funeral, Burial and Cremation Services Act, 2002, S.O. 2002, c.33 (when proclaimed in force) require that any person discovering human remains must notify the police or coroner and the Registrar of Cemeteries at the Ministry of Consumer Services.
17.0	First Nations <ul style="list-style-type: none">Consultation and Engagement	Mississaugas of the New Credit First Nation Six Nations of the Grand River Curve Lake First Nation Alderville First Nation	17.1	<ul style="list-style-type: none">Six Nations of the Grand River are to be contacted in association with the undertaking and results of archaeological investigations.
			17.2	<ul style="list-style-type: none">Continue to consult and engage Six Nations of the Grand River and Mississaugas of the New Credit First Nation. Continue to discuss and update the Work Plan with Six Nations as per Condition 4.1 of the Conditions of Approval.
			17.3	<ul style="list-style-type: none">MTO is committed to further meetings and discussions with First Nations as the project progresses, and will continue to develop and update a work plan in consultation with Six Nations of the Grand River to address their concerns.
			17.4	<ul style="list-style-type: none">Alderville First Nation and Curve Lake First Nation have also indicated an interest to be contacted in association with the undertaking and results of archaeological investigations.
18.0	Recreational Trails		18.1	<ul style="list-style-type: none">Require consultation with City of Kitchener / Grand Valley Trail Association on designing the realignment of a section of the trail that is impacted.
	<ul style="list-style-type: none">Impacts to Walter Bean Grand River Trail and Grand Valley Trail	City of Kitchener Grand Valley Trail Association Township of Woolwich	18.2	<ul style="list-style-type: none">MTO to meet with City of Kitchener, Township of Woolwich and the Grand Valley Trail group to confirm the detailed design for the Walter Bean Trail realignment and passage through culvert for Grand Valley Trail at Rosendale Creek crossing.
			18.3	<ul style="list-style-type: none">During detailed design, make provision for the Walter Bean Grand River Trail at the Grand River Crossing.
			18.4	<ul style="list-style-type: none">During detailed design investigate, provide design and obtain approval from the relevant municipalities/stakeholders for the following:<ul style="list-style-type: none">providing access across a gully/slope in the area of the trail near Riverbend Drive for maintenance vehicles - stated abovetrail access from the Shirley Avenue cul-de-sac to Riverbend Drive at the crossing of Highway 7 New in this area – stated aboveRealignment of Walter Bean Grand River Trail in relation to the Riverbend Drive to Highway 7 westbound on-ramp
			18.5	<ul style="list-style-type: none">Provide signage and fencing to alert and protect users during construction.

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19.0	Emergency Services	OPP Local Police Department Emergency Services Fire Department EMS			
	<ul style="list-style-type: none">Access During ConstructionEmergency Services		19.1	<ul style="list-style-type: none">Consultation with emergency services (police, fire and ambulance) will be required to present the construction staging plans and to finalize contract provisions to minimize impacts to traffic.	
			19.2	<ul style="list-style-type: none">Emergency Services shall be notified a minimum of two weeks prior to any road closures, or access restrictions. Minimum Emergency Services to be contacted include the following:	
			19.3	HSD Cambridge – OPP 500 Beaverdale Road, Cambridge Ontario, N3C 2V3 Phone: (519) 654-0150; fax: (519) 654-9650	Guelph –Wellington Emergency Medical Services 160 Clair Road West, Guelph, Ontario, N1L 1G1 Phone: (519) 824-1677, Fax: (519) 824-5960
				Region of Waterloo Emergency Medical Services 120 Maple Grove Road, Cambridge Ontario, N3H 4R6 Phone: (519) 650-8295; fax: (519) 650-3855	Kitchener Fire Department Headquarters 270 Strasburg Road, Kitchener Ontario Phone: (519) 741-2495
				Waterloo Fire Rescue Headquarters 470 Columbia Street West, Waterloo Ontario, N2T 2Y6 Phone: (519) 884-2121; fax: (519) 884-0242	Guelph Fire Services Guelph City Hall, 1 Carden Street, Guelph, Ontario, N1H 3A1 Fire Chief’s Office: (519) 824-6590
				Guelph Police Service 15 Wyndam Street South, Guelph, ON N1H 4C6 20.0 Phone: (519) 824-1212	Waterloo Regional Police Service 200 Maple Grove Road, P.O. Box 3070, Cambridge Ontario, N3H 5M1 Phone: (519) 653-7700; fax: (519) 650-1793
	Property Access	Local Landowners Residents Local Businesses MTO			
	<ul style="list-style-type: none">Commercial and Residential Properties Impacts		20.1	<ul style="list-style-type: none">Permanent and temporary limited interest properties have to be acquired and encroachment easement secured for the construction of the project.	
			20.2	<ul style="list-style-type: none">The need for temporary construction easements and / or permission to enter will be determined during the detailed design phase.	
			20.2	<ul style="list-style-type: none">Affected owners will be consulted when the plans have been finalized.	
			20.3	<ul style="list-style-type: none">Access to property during construction will be maintained.	

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			20.4	<ul style="list-style-type: none"> Access issues and barrier concerns will be negotiated between MTO and affected landowners on a case by case basis during detailed design. The mitigation approach may take several forms in order to address concerns. Provision of alternate access is one approach that will be considered.
			20.5	<ul style="list-style-type: none"> MTO to consult further with affected commercial property owners during detailed design stage as a result of VE recommendation #1.
			20.6	<ul style="list-style-type: none"> Owners of displaced businesses, residences, including residences on agricultural properties or those that will be severed and/or reduced in size will be compensated per MTO guidelines.
21.0	Agriculture & Farm Operations			
	<ul style="list-style-type: none"> Agricultural land crossed <ul style="list-style-type: none"> Specialty Crop Operations Field Crop Areas Dairy/Livestock Operations Capital Investment Farm Equipment Movements Farm Community Tile Drain / Farm Fence 	Local Farm Operators Property Owner MTO	21.1	<ul style="list-style-type: none"> During detailed design consult with farm operators and where appropriate develop mitigation measures to prevent impacts to active farm operations and operator access through the lands.
			21.2	<ul style="list-style-type: none"> MTO will review alternative irrigation water source with affected landowners during detailed design.
			21.3	<ul style="list-style-type: none"> Property acquisition will be limited to only those lands required for the ROW. Compensation for purchase of land will be at market value according to MTO guidelines.
			21.4	<ul style="list-style-type: none"> Wherever possible, separation of slower moving farm equipment from higher speed traffic is desirable. This will be considered during detailed design.
			21.5	<ul style="list-style-type: none"> Municipalities will be engaged during detailed design to provide input to changes that may alter the current interaction between Highway 7 new and surrounding agricultural land uses and farm communities.
			21.6	<ul style="list-style-type: none"> Contract provisions will be developed for the management, repair and/or reinstatement of affected farm fences and tile drains. These provisions will incorporate relevant OPSS specifications and/or existing MTO specifications for tile drain and fence repair.
22.0	Soil Conservation	Local Farm Operators Property Owners OMAFRA MTO		
	<ul style="list-style-type: none"> Agricultural Soils 		22.1	<ul style="list-style-type: none"> Remove and stockpile soils taken from agricultural fields during excavation and grading.
			22.2	<ul style="list-style-type: none"> Stabilize stockpiles to prevent erosion and runoff.
			22.3	<ul style="list-style-type: none"> Identify opportunities to reinstate soils on same lands for agricultural purposes.
	<ul style="list-style-type: none"> Wetland Soils 		22.4	<ul style="list-style-type: none"> Organic soils removed from wetland areas should be stockpiled and managed for potential re-use.
			22.5	<ul style="list-style-type: none"> Consider opportunities to use organic soils for landscape planting areas.
23.0	Navigable Waterway	TC MTO Public	23.1	<ul style="list-style-type: none"> The Grand River is considered to be a navigable waterway. Navigability of watercourses to be confirmed during detailed design.

I.D. #	Issues / Concerns Potential Effects	Concerned Agencies	I.D. #	Mitigation/Protection/Monitoring/Commitments to Future Work
	<ul style="list-style-type: none">Navigation of Waterways During and Post Construction		23.2	<ul style="list-style-type: none">A request for review under the Navigation Protection Act through Transport Canada (TC) will be required. The review will be initiated through submission of A <i>Request for Project Review, Navigable Waters Protection Act</i> form and supporting documentation for TC review. Special provisions and operational constraints identified by TC shall be included in contract documents where applicable and shall be adhered to by the Contractor.
			23.3	<ul style="list-style-type: none">Navigational opening shall be maintained during and post construction per the general arrangement drawings for the Grand River. Minimum navigational opening is 6000 x 1500 for both EBL and WBL (to be confirmed in detailed design).
24.0	Erosion and Sediment Control	MNR DFO GRCA		
	<ul style="list-style-type: none">Effects to Property and Adjacent Natural Habitats		24.1	<ul style="list-style-type: none">Prepare a Risk Assessment and Two Part ESCP (Main and Supplemental) Plan, and implement the plan during construction.
			24.2	<ul style="list-style-type: none">With guidance from the Erosion and Sediment Risk Assessment, erosion and sediment control structures will be designed, installed, maintained and removed according to MTO guidelines and policies in effect at time of design and construction.
			24.3	<ul style="list-style-type: none">Erosion control measures should be flexible to incorporate current techniques available at the time of construction.
			24.4	<ul style="list-style-type: none">The extent and duration of exposed soil areas, particularly near sensitive features (such as watercourses, valleys, woodlands and wetlands), should be minimized to the extent possible. Contingency measures should be in place to handle unexpected weather events that could result in extensive sediment transport.
			24.5	<ul style="list-style-type: none">Exposed surfaces will be re-stabilized and re-vegetated as soon as possible. Natural vegetation cover will be retained wherever possible (and root grubbing minimized where possible) to provide natural erosion control (ref: OPSS 201, 206, 503, 507, 572).
			24.6	<ul style="list-style-type: none">Sediment control structures will be routinely inspected as well as checked after storms and repaired as required.
			24.7	<ul style="list-style-type: none">Construction inspection will be provided to ensure that measures are in place and working properly prior to and throughout construction.
			24.8	<ul style="list-style-type: none">The EPP sheets for Sediment and Erosion Control, Clearing and Grubbing and Grading will be updated during detailed design and used for guidance in the development of the mitigation specifications.
25.0	Traffic	MTO	25.1	<ul style="list-style-type: none">MTO to monitor traffic at Regional Road 30 (Shantz Station Road) to identify when direct N-W on-ramp to Highway 7 is warranted. Post construction traffic monitoring requirements to be identified during detailed design.
			25.2	<ul style="list-style-type: none">Confirm requirements for the installation of traffic signals at the ramp terminals.
			25.3	<ul style="list-style-type: none">Undertake a traffic study in accordance with the Ministry of Transportation “General Guidelines for the Preparation of Traffic Impact Studies”.

I.D. #	Issues / Concerns Potential Effects	Concerned Agencies	I.D. #	Mitigation/Protection/Monitoring/Commitments to Future Work
			25.4	<ul style="list-style-type: none">The traffic analysis and/or traffic study, as required, will be carried out to determine the scope and requirements for illumination, traffic signal warrants, to aid in the development of the construction staging plan during detailed design, update traffic impact information on the road network and update traffic projections.
26.0	Utility and Infrastructure <ul style="list-style-type: none">Regional Utility/Infrastructure Relocation	Utilities Municipalities County / Region MTO	26.1	<ul style="list-style-type: none">Identify conflicts and develop a relocation plan for approval. Agreements or permits will be required for the relocation of any regionally owned utilities or infrastructure (i.e. watermains, forcemains, stormsewer system, etc.).
27.0	Road Closures	OMB MTO	27.1	<ul style="list-style-type: none">Ontario Municipal Board (OMB) road closings will be required where existing roads or unopened road allowances cross the proposed highway corridor.
28.0	Community	Landowners Businesses Stakeholders	28.1	<ul style="list-style-type: none">Review the comments and mitigation measures outlined in Table 6.1 of the 2004 Amendment to the EA and address outstanding requirements and recommendations during detailed design.
29.0	Special Policy Areas	MNR ROW Wellington County City of Kitchener	29.1	<ul style="list-style-type: none">Confirm the requirements for special policy areas identified in Section 6.2.2 of the 2004 EA, including but not limited to:<ul style="list-style-type: none">ESAs & ANSIs – Environmentally Sensitive Areas (ESA), Environmentally Sensitive Policy Areas (ESPA), MNR designated Areas of Natural Scientific Interest (ANSI), Provincially Significant Wetlands (PSW), and Locally Significant Wetlands (LSW);Agriculture – Agricultural Resource Policy AreasMineral Aggregate – Mineral Aggregate Resource Policies: aggregate policy areasGrand River Corridor – Canadian Heritage River as identified in Items 12.6 to 12.9 of this commitments table.

6.0 Environmental Compliance Monitoring

On December 23, 1997, the Ministry of Transportation (MTO) submitted the environmental assessment report (EA Report 1997), seeking approval to construct a 4-lane controlled access freeway between Kitchener and Guelph. The EA was conducted to address service, capacity and safety issues along this section of Highway 7. The Ministry of the Environment's government review of the project was completed on September 18, 1998 and MOE concluded that the proponent had met the requirements of the Environmental Assessment Act (EAA). However, in response to concerns raised by local municipalities and local environmental groups, MTO requested that the decision on the EA be deferred. MTO subsequently completed additional studies and submitted an amendment to the EA Report 1997 for review and approval. The EA amendment was formally submitted on October 29, 2004 which was followed by a government agency and public review period. A team of technical experts were brought together to form the **Government Review Team (GRT)**. The GRT reviewed the EA for its technical merits and to ensure that the data presented was accurate and the conclusions valid, based on the mandate of each member agency. The public also had the opportunity to review the EA and submit comments to the MOE.

The GRT review concluded that the MTO had carried out a complete and thorough EA planning process, and that the requirements of the EAA had been satisfied. The undertaking was given approval to proceed subject to a number of Conditions of Approval, through an Order in Council dated March 21, 2007.

Condition 4.2 of EA Approval requires that:

"The Proponent (MTO) shall prepare and submit to the Director for the Public Record an Environmental Assessment Compliance Monitoring Program. The Program shall be prepared for the monitoring of the Proponents fulfillment of the provisions of the EA for mitigation measures, public consultation, and additional studies and work to be carried out, and of all other commitments made during the preparation of the EA and the subsequent review of the EA for mitigation measures, public consultation and additional studies to be carried out. The Program shall be submitted one year from the date of approval of the undertaking or 60 days before the commencement of construction, whichever is earlier. A statement must accompany the Program when submitted to the Director indicating that the Program is intended to fulfill this condition. The Program, as amended by the Director, must be carried out by the Proponent."

Condition 4.3 of the EA Approval requires that:

"The Proponent shall prepare an annual Compliance Report which describes compliance with the conditions of approval as set out in the Notice of Approval and which describes the results of the Environmental Assessment Compliance Monitoring Program. The first Compliance Report shall be submitted no later than April 30th following the date of the Directors acceptance of the Compliance Monitoring Program and on the anniversary of this date thereafter, for which the Compliance Report shall cover the previous calendar year. The Proponent shall submit to the Director for placement on the Public Record a copy of the Compliance Report. The Proponent shall submit Compliance Reports until all conditions are satisfied. When all conditions have been satisfied, the Proponent shall indicate in the Compliance Report that this is the final submission."

The EA was completed at the Preliminary Design level of detail in order to identify a freeway corridor location.

EA approval allows MTO to designate the alignment under the Public Transportation and Highway Improvement Act.

This will enable municipalities to identify the corridor location in their Official Plans.

The actual timing of the project is dependent upon Provincial priorities and availability of funds. Many of the conditions of EAA approval relate to additional studies to address the construction stage impacts of the highway. These activities therefore cannot be detailed at this point in time.

The purpose of this submission is to outline how MTO proposes to comply with the above conditions of the Notice of Approval, namely conducting an Environmental Assessment Compliance Monitoring Program.

What will be monitored for Compliance?

Chapter 6 of the EA (tables 6.1 through to 6.4.2) documents the commitments made during the EA study. Additional studies, further public consultation and monitoring requirements, were required as part of the EAA Notice of Approval.

The Compliance Monitoring Program (CMP) outlines:

- What will be monitored/addressed for compliance;
- What indicators will be used to measure compliance;
- How data will be collected;
- How compliance and effectiveness will be measured; and
- When the activity will occur.

Table 6.1 outlines how conditions of EA approval and mitigation measures committed to in the EA will be monitored for compliance during the design and construction of the project. During detailed design, annual Compliance Monitoring Reports will be submitted to MOE.

Table 6.1: EA Compliance Monitoring Program

What will Be Monitored	What Indicators Will be Used	How Will Data be Collected	How Will Compliance and Effectiveness be Measured	When Will Activity Occur
Condition 1, Comply with all provisions of the EA	<ul style="list-style-type: none"> - Conditions of Approval - Mitigation and commitments identified in Tables 6.1 through to 6.4.2 of the EA Report 	<ul style="list-style-type: none"> - MTO review of the project at each stage of design and construction. - MTO to collect data and conduct studies. - MTO to consult with the public and government review agencies 	<ul style="list-style-type: none"> - Documentation that includes individual studies completed by MTO. - Submission of Annual Compliance Reports (ACR). - Public Notices and Public meetings. - Placement on the public record as noted in the Notice of Approval. - Implementation of study recommendations 	<ul style="list-style-type: none"> - Ongoing throughout life of project
Provide further opportunities for public consultation during detailed design	<ul style="list-style-type: none"> - Public consultation record – newspaper notices, letters, public meetings 	<ul style="list-style-type: none"> - Record of activity kept during detailed design process 	<ul style="list-style-type: none"> - Meetings held to inform and update stakeholders/public on progress of Highway design. - Information and study team (consultant/MTO) present at stakeholder meetings/public information centres to address issues and concerns. - Comment sheets to be made available at meetings. - Record of consultant/MTO response to comments at public meetings and throughout the detailed design process. 	<ul style="list-style-type: none"> - Throughout detailed design stage.
Condition 4, Implement the commitments made and recorded in Appendices B and C of the ministry Review of the Environmental Assessment	<ul style="list-style-type: none"> - Conditions of Approval - Mitigation and Commitments recorded in Appendices B and C of the ministry Review of the EA. 	<ul style="list-style-type: none"> - MTO review of the project at each stage of design and construction. - MTO to collect data and conduct studies. - MTO to consult with the public and government review agencies 	<ul style="list-style-type: none"> - Documentation that includes individual studies completed by MTO. - Submission of Annual Compliance Reports (ACR). - Public Notices and Public meetings. - Placement on the public record as noted in the Notice of Approval. - Implementation of study recommendations. 	<ul style="list-style-type: none"> - Ongoing throughout life of project
Condition 4.1, Consult with Six Nations of the Grand River pursuant to the workplan developed jointly	<ul style="list-style-type: none"> - Conditions of Approval - Commitments recorded in the MTO/Six Nations Work Plan 	<ul style="list-style-type: none"> - MTO to consult and engage Six Nations - MTO review of the project at each stage of design and construction. - MTO to collect data and conduct studies. 	<ul style="list-style-type: none"> - Documentation that includes individual studies completed by MTO. - Submission of Annual Compliance Reports (ACR). - Public Notices and Public meetings. - Placement on the public record as noted in the Notice of Approval. - Implementation of study recommendations. 	<ul style="list-style-type: none"> - Ongoing throughout life of project
Condition 4.2, Submission of Compliance Monitoring Plan (CMP)	<ul style="list-style-type: none"> - Filing of CMP with the Ministry of the Environment (MOE), and other agencies as identified in the Notice of Approval. 	<ul style="list-style-type: none"> - Submission of the CMP 	<ul style="list-style-type: none"> - Director's review and comments on the CMP. 	<ul style="list-style-type: none"> - June 2008
Condition 4.3, Annual Compliance Report (ACR)	<ul style="list-style-type: none"> - Filing of ACR with the MOE and other agencies as identified in the Notice of Approval. 	<ul style="list-style-type: none"> - Documenting activities completed within the year 	<ul style="list-style-type: none"> - Submission of ACR by MTO. 	<ul style="list-style-type: none"> - April 2009 and annual submission of ACR thereafter, until completion of project.

Monitoring Program

As outlined in Table 6-1, the majority of activities to be monitored for compliance will occur during the design and construction of the project. The design and construction of the project will be subject to MTO's Class Environmental Assessment for Provincial Facilities (Class EA), which requires MTO to consult with the public and government review agencies, prior to the commencement of construction. Annual Monitoring Reports will provide a status update of the project and monitoring activities, and provide a summary of the activities that occurred during the year.

Annual monitoring reports for Highway 7 New have been prepared and submitted to the MOE up to and including the April 2012 report. These reports identify how the commitments have been met up to April 2012 and are on file with the MTO.

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- *CNR Edna Street Connection Subway CNR E-S Ramp Subway, Sites 35-521 & 35-522,*
- *CNR S-E Ramp Subway CNR Wellington Street to Victoria Street Connection Subway, Sites 33-523 & 35-524,*
- *Culverts, Sites 33-513/C, 33-517/C, 33-519/C, 35-601/C, 35-603/C & 35-607/C,*
- *Ebycrest Road Underpass, Site 33-514*
- *Ellis Creek Bridge EBL/WBL, Site 33-605/1&2,*
- *E-N Ramp over Guelph Street, Site 33-238,*
- *E-S Ramp Highway 85 Overpass, Site 33-505,*
- *Frederick Street Underpass, Site 33-234,*
- *Grand River Bridge EBL/WBL, Site 33-510/1&2,*
- *Greenhouse Road Underpass Site 33-518,*
- *Guelph Road 3 Underpass, Site 35-604,*
- *Hopewell Creek Bridge EBL/WBL, Site 33-516/1&2,*
- *N-E Ramp – Ramp Overpass, Site 33-507,*
- *N-E Ramp Hwy 85 Overpass, Site 33-506,*
- *N-E/W Ramp Guelph St. Overpass, Site 33-525,*
- *Riverbend Drive Overpass EBL/WBL (Highway 7/Shirley Ave), Site 33-509/1&2,*
- *Rosendale Creek Bridge EBL/WBL, Site 33-512/C,*
- *S-E Ramp over Wellington Street North, Site 33-508,*
- *Shantz Station Road Underpass, Site 33-520,*
- *Spitzig Road Underpass, Site 33-515,*
- *Townline Road Underpass, Site 35-602,*
- *Victoria Street Underpass, Site 33-235,*
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Appendix A: Summary of Approved VE Recommendations

Table A 1: Summary of Evaluation of VE Recommendations and Impacts

Location And Target Area	VE Recommendation #	2004 EA Approved Design	VE Recommendation	Evaluation and Potential Impacts				Conclusions/ Recommendations Step 3	Mitigation
				Traffic and Transportation	Socio-Economic	Natural Environment	Cost		
	1	Ramps N-E & S-E merge south of Wellington Street (bridge over Highway 7 not constructible)	Move ramps N-E & S-E merge to the north of Wellington Street (bridge over Highway 7 constructible)	Improves constructability Geometry of N-E ramp improved to 80 km/h NS-E terminal location results in further minor deficiency in weaving length on Highway 7 to Shirley Ave. off-ramp	Commercial properties affected at Highway 85 N to E movement and along Edna Street to Wellington Street connection No change from EA	No wetlands, vegetation, fisheries or aquatic habitat Disturbed interchange No change from EA	No impact on cost Improvement is dictated by constructability only	Ensures constructability, reduces bridge span and improves geometry of NE ramp VE recommendation recommended for incorporation into design APPROVED	MTO to consult further with affected commercial property owners at detailed design stage
Kitchener-Waterloo Expressway (KWE) Interchange Target Area 1	2	Highway 7 N-E & S-E off ramp to Shirley Avenue	Eliminate Highway N-E & S-E off-ramp to Shirley Avenue. Maintain existing access routes through local roads	Eliminates weaving deficiency on Highway 7 New; eastbound potential collisions reduced by 40% Eliminates redundant ramps Creates inconveniences of indirect travel, which is similar to the existing condition Increases traffic on Shirley Avenue and Wellington Street New Riverbend Drive to Shirley Avenue connection is available to accomplish this movement	Reduces land and property acquisition requirements Substantial improvement from safety, operations and human factors point of view Alignment does not impact adjacent commercial property along Shirley Avenue	No wetlands, fisheries or aquatic habitat Removal of vegetation has minor effect on wildlife habitat Removal of small amount of CUM/CUW vegetation from Highway 7 New to Shirley Avenue	EA option is more costly compared to the VE recommendation Off-ramp is an additional cost	VE recommendation not recommended for incorporation into design Although VE recommendation has many advantages, the EA approved design will be retained based on feedback from stakeholders EA option is recommended for incorporation into design. APPROVED	MTO to consult further with affected commercial property owners at detailed design stage
	3	Riverbend Drive on-ramp to Highway 7 westbound	Eliminate Riverbend Drive to Highway 7 westbound on-ramp	Eliminates weaving deficiency on Highway 7 New; westbound for vehicles destined for Highway 85 south; potential collisions reduced by 40% Eliminates redundant ramps Creates inconveniences of indirect travel, which is similar to the existing condition	Reduces impact on Walter Bean Grand River Trail Substantial improvement from safety, operations and human factors point of view	Ramp moved away from valleyland Reduces the amount of fill required in the Grand River tableland/valleyland (fill, vegetation removal, loss of wildlife habitat) compared to EA	Avoids the need for a retaining wall at the Grand River Decreases in construction costs	VE recommendation recommended for incorporation into design Less impact compared to the EA APPROVED	Realignment of Walter Bean Grand River Trail required in this area

Location And Target Area	VE Recommendation #	2004 EA Approved Design	VE Recommendation	Evaluation and Potential Impacts				Conclusions/ Recommendations Step 3	Mitigation
				Traffic and Transportation	Socio-Economic	Natural Environment	Cost		
	4	Highway 7 westbound off-ramp to Riverbend Drive is partially on Grand River structure	Shift Highway 7 Westbound off-ramp to Riverbend Drive further west and off the Grand River structure (Works only with Option 1/3 above)	Reduces flare on the bridge Improves constructability	Reduces impact on Walter Bean Grand River Trail	Reduces the amount of impact to the Grand River tableland/valleyland (fill, vegetation removal, loss of wildlife habitat) compared to EA	Decreases in construction cost	VE recommendation recommended for incorporation into design Less impact compared to the EA APPROVED	Realignment of Walter Bean Grand River Trail required in this area
Grand River Crossing and Bridge Street Target Area 2	5	Bridge Street eastbound direct on-ramp to Highway 7 westbound	Move and reconfigure direct W-S on-ramp (into buttonhook) to Highway 7 westbound	Improves weave condition between Bridge Street on-ramp and Riverbend Drive exit ramp Creates possibility of access to WB Highway 7 from Westbound Bridge Street (via left turn) Eliminates issues with reversed pavement slopes and flare on the bridge Reduces potential for roll-over accidents Improves visibility at the bridge approach Improves bridge constructability	Property required Similar sound level at noise sensitive area (Close proximity of Highway 7 New)	No wetlands, fisheries or aquatic habitat in area Removal of small amount of landscape vegetation on property Removal of vegetation has minor effect on wildlife habitat Close proximity of cut (excavation) to private wells. 2 shallow wells (0-5m deep) in overburden	Major cost savings Avoids potential construction premiums	VE recommendation recommended Less impact compared to EA APPROVED	Further investigation required to address potential impacts to shallow wells in area
Bridge Street / Regional Road 17 (Ebycrest) Target Area 3	6	Bridge Street to retain current alignment at intersection with Regional Road 17	Realign Bridge Street at Regional Road 17 to provide greater spacing and improve angle of the intersection	Improves visibility and turning movements at the intersection Improves safety and operations along the sideroad; potential for vehicular conflicts reduced at the access to the interchange Improvements are consistent with MTO highway access management best practices	Loss of agricultural land Severs agricultural fields and property Minor sound level decrease at noise sensitive area south of Bridge Street Minor sound level increase at noise sensitive area north of Bridge Street	No watercourse/fisheries No impact to wildlife, wetlands and vegetation No wells in the vicinity	Increased construction and property costs	VE recommendation recommended for incorporation into design APPROVED	MTO to compensate property owner regarding potential loss of agricultural land/productivity

Location And Target Area	VE Recommendation #	2004 EA Approved Design	VE Recommendation	Evaluation and Potential Impacts				Conclusions/ Recommendations Step 3	Mitigation
				Traffic and Transportation	Socio-Economic	Natural Environment	Cost		
Regional Road 17 (Ebycrest Road) Target Area 3	7	Ebycrest Road connection to Fountain Street Extension for access to Highway 7 New	Close existing Ebycrest Road at Fountain Street Extension (maintain emergency access) Provide a cul-de-sac at the north end and maintain access to Victoria Street (existing Highway 7)	Eliminates potential intra- regional traffic through residential area Addresses MTO access control concern in the vicinity of the interchange Reduces the number of access points in proximity to the interchange Reduces potential for vehicular conflicts Reduces the traffic load on the intersection with existing Highway 7	No change to properties No effect on crop field Emergency response not affected Lessens noise associated with removal of higher volume local traffic <u>VE Modified</u> Farm equipment able to access lands east of Ebycrest Road via connection at Fountain Street extension Maintains cultural landscape attribute of Ebycrest Road	No watercourses/fisheries No impact to wildlife, wetlands or vegetation 1 shallow well (5-10m) deep) in overburden	Minor decrease in construction costs	EA recommendation with modification (cul- de-sac on Ebycrest Road at Victoria Street) recommended to address public concerns Design is an improvement to the approved EA APPROVED	Cul-de-sac at Victoria Street to have Emergency Gate
Woolwich Road 66 (Spitzig Road) Target Area 4	8	Woolwich Road 66 realigned to the west to connect with Highway 7	Maintain existing Woolwich Road 66 alignment. Realign close to existing at the approach to Highway 7	Eliminates major sideroad realignment and major property impacts Improves traffic operations Improves geometry to conform to standards of 80km/h Reduces sightlines along Highway 7 at current Woolwich Road 66 intersection is similar to existing (90 km/h design achieved on Highway 7, 10 km/h safety margin above posted speed). Bridge on a straight line improves visibility Requires a temporary road closure	Minor additional property required from adjacent farm (access road) Reduces impact to school property Minor effect on crop field New construction costs	No impact on watercourses/fisheries No impact to wildlife, wetlands and vegetation 1 shallow well (5-10m) deep in overburden	Major cost savings in construction and property acquisition	Design is an improvement compared to the approved EA VE recommendation recommended for incorporation into design Safer road High socio-economic impacts avoided (farm land, school property) APPROVED	Areas immediately to east requires Stage 3 archaeological assessment

Location And Target Area	VE Recommendation #	2004 EA Approved Design	VE Recommendation	Evaluation and Potential Impacts				Conclusions/ Recommendations Step 3	Mitigation
				Traffic and Transportation	Socio-Economic	Natural Environment	Cost		
Regional Road 30 (Shantz Station Road)	9	Direct N-W ramp from Regional Road 30 to Highway 7 New	Convert north interchange configuration to Parclo A2 (replace a direct free flow N-W ramp with a left turn onto S-W loop ramp) Defers N-W direct ramp until warranted	Left turn access may contribute to traffic congestion, but traffic volumes are low Potential for reduced visibility at ramp terminals. Best mitigated with signage and illumination	Design revision contained within existing disturbed footprint of interchange	No watercourses / fisheries No impact to wildlife and wetlands Minimal impact on vegetation (deferred N-W ramp) No impact to wells	Although new construction costs associated with the addition of a left turn lane there is an overall cost savings Funds spent when warranted	VE recommendation recommended for incorporation into design EA approved design is deferred until warranted Build parclo A-2 and add exclusive left turn lane Protect for Parclo A-4 APPROVED	MTO to monitor traffic to identify when direct N-W on-ramp to Highway 7 is warranted Install traffic signals at the ramp terminals
Target Area 5	10	New residential access in close proximity to the interchange	Combine Service Road and private access	Reduces number of access points on sideroad Reduces potential for vehicular conflicts and traffic delays in proximity to the interchange	Single farm property purchase Access shortened and maintained private Farm property severed (equestrian)	No watercourses/fisheries No impact to wildlife and wetlands Minimal impact on vegetation east of Shantz Station Road Removal of fencerow adjacent to residence	Additional construction and property costs	VE recommendation accepted for incorporation into design APPROVED	MTO to consult further with affected property owner at detailed design stage

Appendix B: Correspondence (Project Start-up, PIC, TESR Filing)

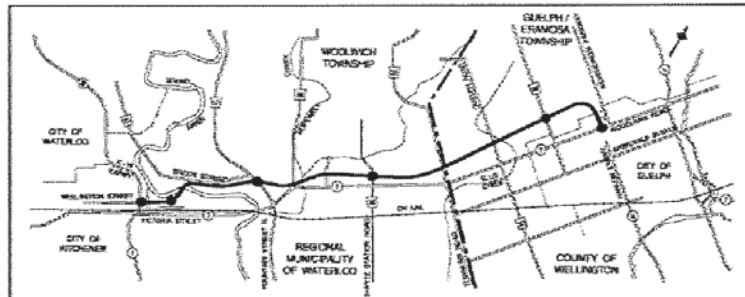
ONTARIO GOVERNMENT NOTICE NOTICE OF DETAIL DESIGN STUDY COMMENCEMENT

**Highway 7 New Alignment – Kitchener to Guelph, 18 km
G.W.P. 408-88-00**

THE STUDY

The Ministry of Transportation, Ontario (MTO) has retained MMM Group to commence the Detail Design and Class Environmental Assessment Study for a new alignment of Highway 7 along an 18 km four-lane divided freeway between the Kitchener-Waterloo Expressway (Highway 85) in Kitchener easterly to the Hanlon Expressway (Highway 6) in Guelph as shown on the **Key Plan** below. The study documented in the 2004 *Highway 7 Kitchener to Guelph Amendment to the Environmental Assessment Report, 1997* was conducted under the Individual EA process and was approved by the Minister of the Environment in March 2007.

This study will develop the design to approximately 30% Detail Design completion in order to define the project configuration, and will provide the scope and direction for the completion of Detail Design. Detail Design alternatives will be generated to capitalize on transportation opportunities and to minimize design and construction-related environmental impacts. Future separate follow-up study(s) will be undertaken to complete Detail Design.



THE PROCESS

This study is following an approved planning process for a Group "A" project under the *Class Environmental Assessment for Provincial Transportation Facilities (MTO 2000)* with the opportunity for public input. A Public Information Centre (PIC) will be scheduled to present for public review and comment details of the Detail Design 30% completion. The MTO and Consultant staff will be available to answer questions and receive your input at that time.

A Detail Design Report will be prepared to document the Detail Design 30% completion, including: the results of investigations, consultation and mitigation measures. The Detail Design Report will be made available for a 30-day public review period with public notice advising of the start of the review period. There will be no opportunity for a 'Bump-Up' (Part II Order) of the Detail Design Report. In accordance with the *Class Environmental Assessment for Provincial Transportation Facilities (MTO 2000)*, as part of future separate follow-up study(s), Design and Construction Report(s) will be filed at completion of Detail Design.

COMMENTS

We are interested in hearing any comments you may have about this study. Comments and information regarding this project are being collected to assist the study team in meeting the requirements of the *Environmental Assessment Act*. This information will be maintained on file for use during the project and may be included in project documentation. With the exception of personal information, all comments will become part of the public record in accordance with the *Freedom of Information and Protection of Privacy Act, R.S.O., 1990, c.F.31*.

If you wish to have your name added to the mailing list or provide comments please contact either:

Ms. Alla Dinerman, P.Eng.
Senior Project Manager
Transportation Engineering
MMM Group Limited
80 Commerce Valley Dr. East
Thornhill, ON L3T 7N4
Tel.: 905-882-1100, ext. 276
Toll-free: 1-866-311-2266
Fax: 905-882-0055
E-mail: DinermanA@mmm.ca

Mr. Dennis Regan
Senior Project Manager
Ministry of Transportation
Southwestern Region
Planning and Design Section
659 Exeter Road
London, ON N6E 1L3
Tel.: 519-873-4548
Fax: 519-873-4600
E-mail: Dennis.Regan@Ontario.ca

NOTICE OF PUBLIC INFORMATION CENTRE

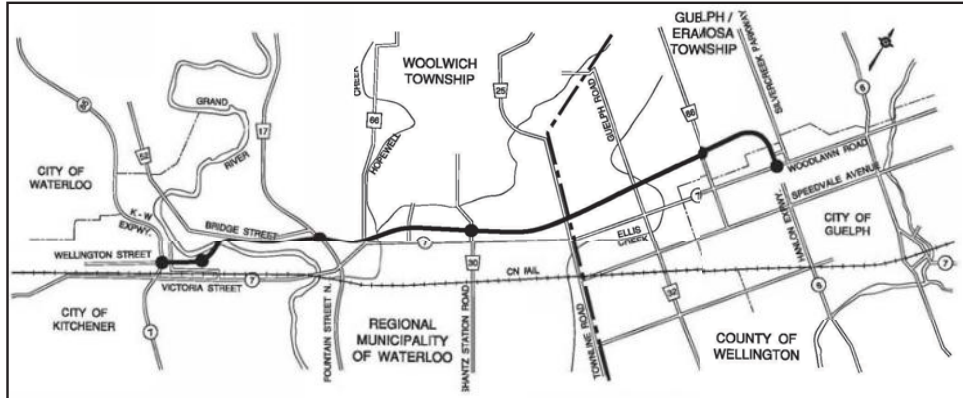
Highway 7 New – Kitchener to Guelph, 18 km
G.W.P. 408-88-00

THE STUDY

The **Ministry Of Transportation, Ontario (MTO)** has retained **MMM Group** to complete the initial phase of design for Highway 7 New, an 18 km four-lane divided freeway between Highway 85 (Kitchener-Waterloo Expressway) in Kitchener easterly to Highway 6 (Hanlon Expressway) in Guelph as shown on the **Key Plan** below. The Individual Environmental Assessment (EA) for this new route was documented in the 2004 *Highway 7 Kitchener to Guelph Amendment to the Environmental Assessment Report, 1997* and was approved by the Minister of the Environment in March 2007.

As part of the initial phase of design for the project, the MTO has undertaken a Value Engineering (VE) study to assess design alternatives at site-specific locations to enhance the safety and function of the highway and minimize design and construction-related environmental impacts for the approved EA Alignment (2007). The VE study resulted in design improvements for access at five interchanges in the approved EA alignment, listed below:

- Kitchener-Waterloo Freeway to Freeway interchange
- Woolwich Road (Spitzig Road) interchange
- Grand River Bridge and Bridge Street
- Regional Road 30 (Shantz Station Road) interchange
- Regional Road 17 (Ebycrest Road) interchange



PUBLIC INFORMATION CENTRE

Public Information Centres (PICs) have been scheduled to present the recommendations of the VE study and information related to the initial phase of detail design of the overall project. The PICs will be held at the following two locations:

Date: **Tuesday, May 3, 2011**
Location: **Bingemans Ballroom A/B**
425 Bingemans Centre Drive
Kitchener, ON N2B 3X7

Open House: **4 p.m. to 8 p.m.**

Date: **Thursday, May 5, 2011**
Location: **Guelph Place Banquet Hall**
492 Michener Road
Guelph, ON N1K 1C6

Open House: **4 p.m. to 8 p.m.**

The PICs will be a drop-in style open house format with brief presentations made at 5:30 p.m. and 7 p.m. The MTO and Consultant staff will be available to answer questions and receive your input at that time. The same material will be presented at both PICs.

THE PROCESS

This study is following an approved planning process for a Group 'A' project under the *Class Environmental Assessment for Provincial Transportation Facilities (2000)* with the opportunity for public input.

A Transportation Environmental Study Report (TESR) to amend the Individual EA will be prepared to document the VE recommendations and a Design Report will be prepared to document the initial phase of the 2007 EA Approved Design. The two reports will be made available for a 30-day public review period with public notice advising of the start of each review period.

COMMENTS

We are interested in hearing any comments you may have about this study. Comments and information regarding this project are being collected to assist the study team in meeting the requirements of the Environmental Assessment Act. This information will be maintained on file for use during the project and may be included in project documentation. With the exception of personal information, all comments will become part of the public record in accordance with the Freedom of Information and Protection of Privacy Act R.S.O., 1990, c.F.31.

If you wish to have your name added to the mailing list or provide comments, please contact either:

Ms. Alla Dinerman, P.Eng.
Senior Project Manager
Transportation Engineering
MMM Group Limited
100 Commerce Valley Drive West
Thornhill, ON L3T 0A1
tel: 905-882-7212
fax: 905-882-0055
e-mail: DinermanA@mmm.ca

Mr. Robert Bakalarczyk, P.Eng.
Senior Project Engineer
Ministry of Transportation
West Region
Planning and Design Section
659 Exeter Road, 3rd Floor
London, ON N6E 1L3
tel: 519-873-4602
fax: 519-873-4600
e-mail: Robert.Bakalarczyk@ontario.ca

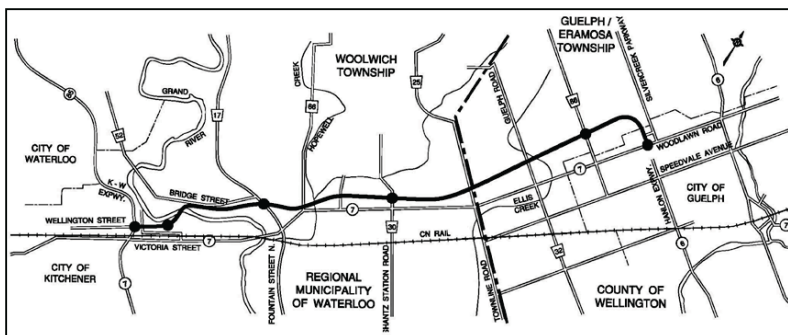
NOTICE OF TRANSPORTATION ENVIRONMENTAL STUDY REPORT

To Amend the Approved Individual Environmental Assessment Highway 7 New – Kitchener To Guelph

The **Ministry of Transportation (MTO)** is proposing some site-specific improvements to the approved Individual Environmental Assessment (EA) for Highway 7 New, an 18 km four-lane divided freeway between Highway 85 (Kitchener-Waterloo Expressway) in Kitchener easterly to Highway 6 (Hanlon Expressway) in Guelph as shown on the **Key Plan** below (G.W.P. 408-88-00). The Individual EA for this new route was documented in the 2004 *Highway 7 Kitchener to Guelph Amendment to the Environmental Assessment Report, 1997*, and was approved by the Minister of the Environment with conditions in March 2007. An evaluation of design alternatives identified in a Value Engineering (VE) Study was completed by MTO and presented at two Public Information Centres (PICs) held on May 3, 2011 (Kitchener) and May 5, 2011 (Guelph). Based on the evaluation and comments received, MTO recommends the following VE design improvements to enhance the safety and function of the future new highway, and minimize design and construction-related environmental impacts:

- shift new ramps at the Highway 85 (Kitchener-Waterloo Expressway) and Highway 7 New freeway to freeway interchange to north of Wellington Street North
- eliminate Riverbend Drive to Highway 7 New west on-ramp
- shift Highway 7 New westbound off-ramp to Riverbend Drive further west
- provide direct access to Shirley Avenue from Highway 7 New eastbound
- move on-ramp at Bridge Street to Highway 7 New westbound
- realign Bridge Street at Ebycrest Road
- close Ebycrest Road at Victoria Street
- maintain existing alignment of Spitzig Road at existing Highway 7
- reconfigure north-west access at new Shantz Station Road interchange
- combine service road and private residential access at Shantz Station Road

In addition, municipal road improvements have been identified to improve traffic operations, including a left turn lane to Highway 7 New westbound from Silvercreek Parkway northbound, and four lanes plus a turning lane as required where Shirley Avenue is currently two lanes.



Transportation Environmental Study Report to Amend the Approved Individual EA

A Transportation Environmental Study Report (TESR) has been prepared as an Addendum to the approved Individual EA to document the evaluation of proposed changes, and identify the anticipated environmental effects, and proposed mitigation measures. The MTO and their consultant, MMM Group, have followed the requirements for amending the approved Individual EA, as specified in the *Class Environmental Assessment for Provincial Transportation Facilities* (2000). The TESR will be available for a 30-day public review period from **Wednesday, May 30, 2012 to Friday, June 29, 2012**. Interested persons are encouraged to review this document and provide comments in writing to the Consultant Project Manager or the MTO Project Manager by **June 29, 2012** at the addresses provided below. If, after consulting with the Ministry's consultant and staff, you have significant unresolved concerns, you have the right to request the Minister of the Environment (Ferguson Block, 11th Floor, 77 Wellesley Street West, Toronto, ON M7A 2T5) to make a Part II Order. The Minister of the Environment must receive your Part II Order request by **June 29, 2012**. A copy of the request should be forwarded to the Ministry of Transportation and Consultant at the addresses listed below. For more information on the Part II Order request process, you are encouraged to contact the Ministry of the Environment. *Only the changes noted in this TESR are eligible for the Part II Order. The balance of the concept of the undertaking as outlined in the approved Individual EA is not subject to change.*

The TESR is available for review at the following locations beginning **May 30, 2012** during regular business hours:

Ministry of the Environment
Environmental Assessment & Approvals Branch
2 St. Clair Avenue West, Floor 12 A
Toronto, Ontario

Regional Municipality of Waterloo
Clerk's Department
150 Frederick Street
Kitchener, Ontario

City of Guelph
Clerk's Department, City Hall
1 Carden Street
Guelph, Ontario

Township of Woolwich
69 Arthur Street South
Elmira, Ontario

Marden Branch Library
7368 Wellington Road 30 (RR5)
Marden, Ontario

Dana Porter Library
University of Waterloo
200 University Avenue West
Waterloo, Ontario

Ministry of the Environment
West Central Regional Office
119 King Street West, 12th Floor
Hamilton, Ontario

County of Wellington
Clerk's Department
74 Woolwich Street
Guelph, Ontario

City of Kitchener
Clerk's Department
200 King Street West
Kitchener, Ontario

Kitchener Public Library
85 Queen Street North
Kitchener, Ontario

Bloomingdale Branch Library
860 Sawmill Road
Bloomingdale, Ontario

McLaughlin Library
University of Guelph
50 Stone Road East
Guelph, Ontario

Ministry of the Environment
Guelph District Office
1 Stone Road West
Guelph, Ontario

Ministry of Transportation
West Region, Front Lobby
659 Exeter Road
London, Ontario

Township of Guelph/Eramosa
Clerk's Department
8348 Wellington Road 124
Rockwood, Ontario

Waterloo Public Library
35 Albert Street
Waterloo, Ontario

Guelph Public Library
100 Norfolk Street
Guelph, Ontario

Wilfred Laurier University Library
75 University Avenue West
Waterloo, Ontario

An Initial Design Report to document the initial phase of the design based on the 2007 approved EA and the VE design improvements will be prepared and made available later this year for a separate 30-day public review period with public notice advising of the start of the review period.

For further information or to submit comments, please contact:

Ms. Alla Dinerman, P.Eng.
Senior Project Manager
Transportation Engineering
MMM Group Limited
100 Commerce Valley Drive West
Thornhill, ON L3T 0A1
tel: 905-882-7212
fax: 905-882-0055
e-mail: DinermanA@mmm.ca

Mr. Robert Bakalarczyk, P.Eng.
Senior Project Engineer
Ministry of Transportation, West Region
Planning and Design Section
659 Exeter Road, 3rd Floor
London, ON N6E 1L3
tel: 519-873-4602
fax: 519-873-4600
e-mail: Robert.Bakalarczyk@ontario.ca

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

June 13, 2008
16.08027.E2.2

Ms. Louise Knox
Ontario Regional Director
Canadian Environmental Assessment Agency (CEAA)
55 St. Clair Avenue East
9th Floor
Toronto, ON M4T 1M2

Dear Ms. Knox,

**Subject: Project Commencement for Detail Design – Highway 7 New Alignment
Kitchener to Guelph, 18 km, G.W.P. 408-88-00**

The Ministry Of Transportation has retained MMM Group to commence the Detail Design and Class Environmental Assessment for a new alignment of Highway 7 along an 18 km four-lane divided freeway between Kitchener-Waterloo Expressway (Highway 85) in Kitchener easterly to the Hanlon Expressway (Highway 6) in Guelph. The study documented in the 2004 *Highway 7 Kitchener to Guelph Amendment to the Environmental Assessment Report, 1997* was conducted under the Individual EA process and was approved by the Minister of the Environment in March 2007.

This study will develop the design to approximately 30% Detail Design completion in order to define the project configuration, and will provide the scope and direction for the completion of Detail Design. Detail Design alternatives will be generated to capitalize on transportation opportunities and to minimize design and construction-related environmental impacts. Future separate follow-up study(s) will be undertaken to complete Detail Design.

This study is following an approved planning process for a Group 'A' project under the Class Environmental Assessment for Provincial Transportation Facilities (MTO 2000) with the opportunity for public input. A Public Information Centre (PIC) will be scheduled to present details for public review and comment on the 30% Detail Design. The MTO and Consultant staff will be available to answer questions and receive your input at that time.

A Detail Design Report will be prepared to document the Detail Design 30% completion, including: the results of investigations, consultation and mitigation measures. The Detail Design Report will be made available for a 30-day public review period with public notice advising of the start of the review period. There will be no opportunity for a 'Bump-Up' (Part II Order) of the Detail Design Report. In accordance with the *Class Environmental Assessment for Provincial Transportation Facilities (MTO 2000)*, as part of future separate follow-up study(s), Design and Construction Report(s) will be filed at completion of Detail Design.

We look forward to receiving your comments on this project. If you would like additional information, please contact the undersigned at (905) 882-4211 x276, toll free 1-866-311-2266 or by email at DinermanA@mmm.ca.

Yours very truly,
MMM GROUP LIMITED



Alla Dinerman, P.Eng.
Senior Project Manager
Transportation Engineering

BUILDINGS
C. CASTRO, D. Regan, MTO
R. Elijah, MTO
J. Warren, MMM

MMM Group Limited
100 Commerce Valley Drive West,
Thornhill, Ontario, L3T 0A1
t: 905.882.1100 | f: 905.882.0055

www.mmm.ca

April 15, 2011
1608027.001 E2.2

Environmental Assessment Coordinator
Ministry of the Environment – Guelph District Office
1 Stone Road West
Guelph, ON N1G 4Y2

**Subject: Initial Phase of Design - Highway 7 New from Kitchener to Guelph, GWP 408-88-00
Public Information Centre**

Dear Sir or Madam,

The Ministry Of Transportation, Ontario (MTO) has retained MMM Group to complete the initial phase of design for Highway 7 New, an 18 km four-lane divided freeway between Highway 85 (Kitchener-Waterloo Expressway) in Kitchener easterly to Highway 6 (Hanlon Expressway) in Guelph. As part of the initial phase of design for the project, the Ministry has undertaken a Value Engineering (VE) study to assess design alternatives at site specific locations to minimize design and construction-related environmental impacts for the approved EA Alignment (2007). The VE study resulted in design improvements for access at five interchanges in the approved EA alignment, as listed in the attached notice.

We invite you to attend an advance viewing of Public Information (PIC) displays for review ministries and agencies prior to the opening of the PIC for the general public

Date:	Tuesday May 3, 2011
Location:	Bingemans Park – Ballroom A/B 425 Bingemans Centre Drive Kitchener, Ontario N2B 3X7
Time:	2:00pm to 3:00pm

Please refer to the attached public notice for additional information. We look forward to your attendance at this session of the PIC and to receiving your comments on this project. If you would like additional information, please contact the undersigned by phone (905) 882-7212 or by email at dinermana@mmm.ca.

Yours very truly,

MMM GROUP LIMITED

A handwritten signature in black ink, appearing to read "Alla Dinerman", written over a horizontal line.

Alla Dinerman, P. Eng.
Senior Project Manager
Transportation Engineering

cc: Rob Bakalarczyk (MTO), Susan Wagter (MTO), Jeff Warren (MMM)

MMM Group Limited
100 Commerce Valley Drive West,
Thornhill, Ontario, L3T 0A1
t: 905.882.1100 | f: 905.882.0055

www.mmm.ca

May 21, 2012
16.08027.E2.3

Mr. Rob Dobos
Head - Environmental Assessment Section
Environment Canada
867 Lakeshore Road
P.O. Box 5050
Burlington, ON L7R 4A6

Dear Mr. Dobos,

Subject: Notice of Transportation Environmental Study Report to Amend the Approved Individual Environmental Assessment; Highway 7 New – Kitchener to Guelph G.W.P. 408-88-00

The Ministry Of Transportation, Ontario (MTO) has retained MMM Group to complete the initial phase of design for Highway 7 New, an 18 km four-lane divided freeway between Highway 85 (Kitchener-Waterloo Expressway) in Kitchener easterly to Highway 6 (Hanlon Expressway). The Individual EA for this new route was documented in the 2004 Highway 7 Kitchener to Guelph Amendment to the Environmental Assessment Report, 1997 and was approved by the Minister of the Environment with conditions in March 2007. An evaluation of design alternatives identified in a Value Engineering (VE) Study was completed by MTO and presented at two Public Information Centres held on May 3, 2011 (Kitchener) and May 5, 2011 (Guelph). Based on the evaluation and comments received, MTO recommends the following VE design improvements to enhance the safety and function of the future new highway and minimize design and construction-related environmental impacts:

- Shift new ramps at the Highway 85 (Kitchener-Waterloo Expressway) and Highway 7 New freeway to freeway interchange to north of Wellington Street North
- Eliminate Riverbend Drive to Highway 7 New west on-ramp
- Shift Highway 7 New westbound off-ramp to Riverbend Drive further west
- Provide direct access to Shirley Avenue from Highway 7 New eastbound
- Move on-ramp at Bridge Street to Highway 7 New westbound
- Realign Bridge Street at Ebycrest Road
- Close Ebycrest Road at Victoria Street
- Maintain existing alignment of Spitzig Road at existing Highway 7
- Reconfigure north-west access at new Shantz Station Road interchange
- Combine service road and private residential access at Shantz Station Road

In addition, municipal road improvements have been identified to improve traffic operations, including a left turn lane to Highway 7 New westbound from Silvercreek Parkway northbound, and four lanes plus a turning lane as required where Shirley Ave. is currently 2 lanes.

Under the Class Environmental Assessment (Class EA) for Provincial Transportation Facilities (2000), this project is identified as a Group 'A' project. This study is following an approved planning process with the opportunity for public input. Public consultation for the project included a newspaper notification of study commencement, letters to agencies, First Nations and relevant stakeholders. A Transportation Environmental Study Report (TESR) has been prepared as an Addendum to the approved Individual EA to document the evaluation of proposed changes, and identify the anticipated environmental effects and proposed mitigation measures. The MTO and their consultant, MMM Group, have followed the requirements for amending the approved Individual EA as specified in the Class Environmental Assessment (Class EA) for Provincial Transportation Facilities (2000).

The TESR will be available for a 30-day public review period from **May 30, 2012** to **June 29, 2012**. Only the changes noted in this TESR are eligible for the Part II Order. The balance of the concept of the undertaking as outlined in the approved Individual EA is not subject to change. For more information on the Part II Order request process, you are encouraged to contact the Ministry of the Environment. A copy of the newspaper notice has been provided for your reference, which includes a list of locations where the document may be reviewed.

We look forward to receiving your comments on this project by **June 29, 2012**. If you would like additional information, please contact the undersigned by phone at (905) 882-7212, or by email at dinermana@mmm.ca.

Yours truly,
MMM Group Limited



Alla Dinerman, P.Eng.
Senior Project Manager, Partner
Transportation Engineering

C.C. Rob Bakalarczyk (MTO), Susan Wagter (MTO), Jeff Warren (MMM)

Table B-1: Summary of Agency Contacts

Title	First Name	Last Name	Job Title	Company	Address1	Address 2	City
FEDERAL – MMM Mailings							
Ms.	Heather	Ducharme	Program Officer	Canadian Environmental Assessment Agency (CEAA)	55 St. Clair Avenue East	9 th Floor	Toronto
Ms.	Louise	Knox	Ontario Regional Director	Canadian Environmental Assessment Agency (CEAA)	55 St. Clair Avenue East	9 th Floor	Toronto
Mr.	Rob	Dobos	Head Environmental Assessment Section Great Lakes and Corporate Affairs	Environment Canada Ontario Region	867 Lakeshore Road	P.O. Box 5050	Burlington
Mr.	David	Gibson	Fish Habitat Biologist	Fisheries and Oceans Canada	District Office, 3027 Harvester Road, Unit 304		Burlington
Mr.	Don	Boswell	Senior Claims Analyst, Specific Claims Branch	Indian and Northern Affairs Canada	10 Wellington Street	Room 1310	Hull, QC
Mr.	Franklin	Roy	Director, Litigation Management and Resolution Branch	Indian and Northern Affairs Canada	10 Wellington Street	25 Eddie 1430	Gatineau, QC
Ms.	Louise	Trepanier	Director, Claims East of Manitoba Comprehensive Claims Branch	Indian and Northern Affairs Canada	10 Wellington Street	Room 1310	Hull, QC
PROVINCIAL – MMM Mailings							
Ms.	Cathy	Wilson-Pinkney	Manager, Marketing and Communications	Ministry of Agriculture, Food and Rural Affairs	1 Stone Road West, 2 nd Floor		Guelph
Mr.	Alan	Kary	Deputy Director Policy and Relationships Branch	Ministry of Aboriginal Affairs	720 Bay Street	4 th Floor	Toronto
Ms.	Ria	Tzimas	Counsel - Crown Law Office	Ministry of the Attorney General	720 Bay Street	8 th Floor	Toronto
			Regional Director – Central Office	Ministry of Community, Family and Children's Services		74 Woolwich Street	Guelph
Ms.	Ragini	Dayal	Heritage Advisor	Ministry of Culture		400 University Avenue, 4 th Floor	Toronto
Mr.	Michael	Harrison	Supervisor, Project Review Unit	Ministry of the Environment	Environmental Assessment and Approval Branch	2 St. Clair Avenue West, Floor 12A	Toronto
			Environmental Assessment Coordinator	Ministry of the Environment – Guelph District Office	1 Stone Road West		Guelph
			Regional Director, West Central Office	Ministry of Municipal Affairs and Housing	1 Stone Road West		Guelph
Mr.	Al	Murray	Area Supervisor	Ministry of Natural Resources	1 Stone Road West		Guelph
Mr.	Bill	Dennis	Chief Superintendent	Ontario Provincial Police, Western Region Headquarters	6355 Westminster Drive, Box 57, Lambeth Station		London
Mr.	Alan	Sawyer	Environmental Assessment Facilitator	Ontario Realty Corporation		1 Stone Road West, 4 th Floor	Guelph
Municipalities – MMM Mailings							

Transportation Environmental Study Report to Amend the
Individual Environmental Assessment (approved 2007)
Highway 7 New Kitchener to Guelph, 18 km

Ministry of Transportation

GWP 408-88-00

Title	First Name	Last Name	Job Title	Company	Address1	Address 2	City
Mr.	John	Hammer	Manager	Region of Waterloo	Transportation & Environmental Services, Transportation Division	150 Frederick Street	Kitchener
Mr.	Rob	Wells	Area Planner	Region of Waterloo	Planning /Development	150 Frederick Street	Kitchener
Mr.	Gary	Cousins	Senior Planner	County of Wellington	Planning Department	74 Woolwich Street	Guelph
Mr.	Gordon	Ough, P.Eng.	Manager	County of Wellington	Engineering Services Department	Administration Centre, 74 Woolwich Street	Guelph
Mr.	Jim	Riddell	Director	City of Guelph	Community and Development Services	2 Wyndham St North, 2nd Floor	Guelph
Mr.	Grant	Murphy	Director	City of Kitchener	Engineering Services	9th Floor, Berlin Tower City Hall, P.O. Box 1118 200 King Street West	Kitchener
Mr.	Jeff	Willmer	Director	City of Kitchener	Planning Department	6th Floor, Berlin Tower City Hall, P.O. Box 1118 200 King Street West	Kitchener
Mr.	Larry Van Wyck	Manager	Public Works	Township of Guelph/Eramosa	PO Box 3000, 8348 Wellington Road 124		Rockwood
Mr.	Dan	Kennaley	Director of Engineering & Planning Services	Township of Woolwich	Planning and Development	69 Arthur Street South, P.O. Box 158, Elmira, ON N3B 2Z6	Elmira
Conservation Authorities – MMM Mailings							
Mr.	Joe	Farwell	Manager Engineering, Planning and Watershed Restoration	Grand River Conservation Authority	400 Clyde Road, PO Box 729		Cambridge
MPP – MMM Mailings							
Ms.	Liz	Sandals	MPP Guelph	Constituency Office	Suite 102, 173 Woolwich Street		Guelph
Ms.	Elizabeth	Witmer	MPP Kitchener-Waterloo	Constituency Office	375 University Ave East		Waterloo
Ms.	Leanna	Pendergast	MPP Kitchener-Conestoga	Constituency Office	230-1170 Fischer-Hallman Road		Kitchener
Mr.	Ted	Arnott	MPP Wellington-Halton Hills	Constituency Office	181 St. Andrew Street East	2 nd Floor	Fergus
Mr.	John	Milloy	MPP Kitchener Centre	Constituency Office	6C-1770 King Street East		Kitchener
First Nations – MTO Mailing							
Chief	Jeff R.	Marsden		Alderville First Nation	PO Box 46, RR #4		Roseneath
Chief	Valerie	Monague		Beausoleil First Nation (Christian Island)	1 O-Gema Street Christian Island		Cedar Point
Chief	Brett	Mooney		Chippewas of Georgina Island	RR#2, PO Box 12		Sutton West
Chief	Sharon	Stinson-Henry		Chippewas of Mnjikaning (Rama)	5884 Rama Road, Suite 200		Rama

Transportation Environmental Study Report to Amend the
Individual Environmental Assessment (approved 2007)
Highway 7 New Kitchener to Guelph, 18 km

Ministry of Transportation

GWP 408-88-00

Title	First Name	Last Name	Job Title	Company	Address1	Address 2	City
Chief	Keith	Knott		Curve Lake First Nation	22 Winookeeda Road		Curve Lake
Chief	Laurie	Carr		Hiawatha First Nation	123 Paudash Street, RR#2		Keene
Councillor	Luc	Laine	Chief in Charge of Land Claims	Wendake Meeting Ground of Nations	225 rue chef Michel Laveau		Wendake, QC
Chief	Chris	Nahrgang		Kawartha Nishnawbe First Nation	RR#4		Burleigh Falls
Chief	Tracy	Gauthier		Mississaugas of Scugog Island	22521 Island Road		Port Perry
Chief	Bryan	LaForme		Mississaugas of the New Credit First Nation	RR#6, 2789 Mississauga Road		Hagersville
Chief	William K.	Montour		Six Nations of the Grand River Territory	PO Box 5000		Ohsweken
			Executive Director	United Anishnabaag Councils	1024 Mississauga Road		Buckhorn
Mr.	Allan	Dokis	Intergovernmental Affairs Director	Union of Ontario Indians - Nippising First Nation		PO Box 711, Highway 17	North Bay
Ms.	Adrienne	Poulette	Senior Policy & Government Relations	Association of Iroquois and Allied Indians	387 Princess Avenue		London
LOCAL SERVICES/BOARDS/ASSOCIATIONS – MMM Mailings							
Mr.	Richard	Francki	Chief of Plan and Planning Services	Conseil Scolaire de District Catholique Centre-Sud	110 Drewry Avenue		Toronto
m.	Jean Luc	Bernard	Director of Education	Conseil scolaire de district du Centre Sud-Ouest	116 Cornelius Pkwy		North York
Mr.	Dennis	Cuomo	Manager of Planning	Upper Grand District School Board	Main Office - 500 Victoria Road North		Guelph
Mr.	John	Forestell	Administrator of Plant and Operations	Wellington Catholic District School Board	75 Woolwich Street		Guelph
Mr.	Dave	Bennett	Manager	Waterloo Catholic District School Board	Planning Department	35 Weber Street W, Unit A, PO Box 91116	Kitchener
			Director	Waterloo Region District School Board	51 Ardel Avenue		Kitchener
Ms.	Ken	Hunsberger	President	Waterloo Federation of Agriculture	RR#2		Baden
			Traffic Services Staff Sergeant	Waterloo Regional Police Service	P.O.Box 3070, 200 Maple Grove Road		Cambridge
Mr.	Tim	Beckett	Fire Chief	Kitchener Fire Headquarters	270 Strasburg Road		Kitchener
Mr.	Ian	McLean	President and CEO	Greater Waterloo Chamber of Commerce	80 Queen Street North	P.O. Box 2367	Kitchener
Mr.	Lloyd	Longfield	President	Guelph Chamber of Commerce	15-485 Silvercreek Parkway N.		Guelph
			Fire Chief	Guelph Fire Services	50 Wyndham Street South		Guelph
Mr.	Rick	Pedersen	Fire Chief	Township of Woolwich	Fire Services	69 Arthur Street South, P.O. Box 158	Elmira
Utilities – Mailings							
Mr.	John	LaChapelle	Manager, Development and Municipal Control Centre	Bell Canada	Floor 5 Blue, 100 Borough Drive		Toronto
Mr.	D.A.	Reynolds	Technical Support Engineer	CN Rail	277 Front St. West		Toronto
Mr.	David	Lukianow	Manager of Public Works	CP Railway	1290 Central Parkway West	Suite 707	Mississauga

Title	First Name	Last Name	Job Title	Company	Address1	Address 2	City
Mr.	Brian	McCormick	Manager, Environmental Services and Approvals	Hydro One Networks Inc.	483 Bay Street, 14 th Floor, North Tower		Toronto
Ms.	Melanie	Labaj	Manager, Planning Department	Rogers Cable	301 Marwood Drive		Oshawa
Mr.	Rob	Kendel	Land Manager (Ontario)	TransCanada Pipelines	PO Box 1000, Station M		Calgary, AB
Mr.	Fatish	Carpal	Coordinator of Crossings and Facilities	Trans Northern Pipelines	45 Vogell Road, suite 310		Richmond Hill
Mr.	Greg	Tetrault	Manager, Gas Management Services	Union Gas	Head Office 50 Keil Drive North		Chatham

Table B-2: MPP Representative Contact List

Riding/Constituency	Title	Full Name	Address
Guelph	Ms.	Liz Sandals	173 Woolwich Street
Kitchener Centre	Hon.	John Millow	1770 King Street East Unit 6C
Kitchener-Conestoga	Ms.	Leeanna Pendergast	1187 Fischer-Hallman Road Unit 624, 2nd Floor
Kitchener-Waterloo	Mrs.	Elizabeth Witmer	375 university Avenue East
Wellington-Halton Hills	Mr.	Ted Arnott	181 St. Andrew Street East 2nd Floor

**Highway 7 New
Kitchener to Guelph, 18 km**

WELCOME!

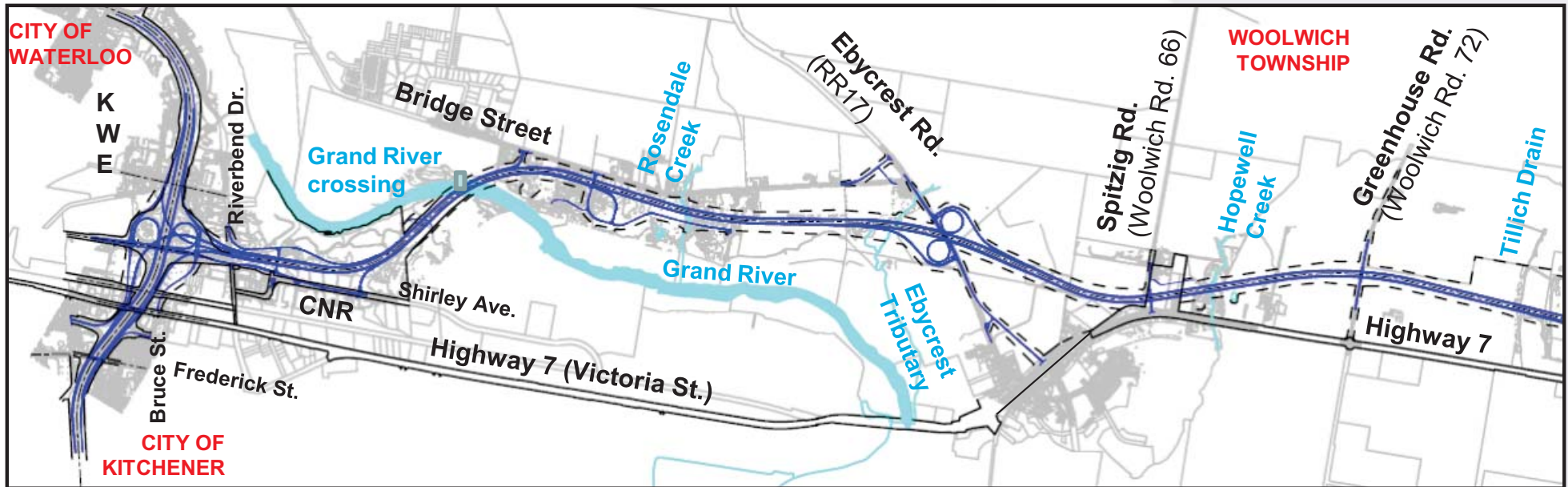
- ❖ Welcome to the Public Information Centre for the approved Highway 7 New between Highway 85 (Kitchener-Waterloo Expressway) in Kitchener easterly to Highway 6 (Hanlon Expressway) in Guelph
- ❖ This Public Information Centre (PIC) presents the recommendations from the Value Engineering (VE) study, and the initial phase of design for the overall project
- ❖ The Project Team, comprised of staff from the Ministry of Transportation and their Consultant, MMM Group, are available to provide information, answer your questions and listen to your ideas and concerns
- ❖ Presentations will be made at 5:30 and 7:00
- ❖ Subject to public input we are seeking EA approval for the recommended VE options
- ❖ Your comments are welcome and can be submitted on comment sheets, which are provided for your use

**Highway 7 New
Kitchener to Guelph, 18 km**

PROJECT BACKGROUND

- ❖ This project received approval under the Environmental Assessment Act in 2007
- ❖ MTO has protected the corridor from development through designation in the land registry office
- ❖ A Value Engineering (VE) Study was initiated in 2007 to further evaluate some site specific design features of the approved EA
- ❖ This Public Information Centre (PIC) is being held to present the recommendations from the VE study and the initial phase of design of the overall project
- ❖ The initial phase of design provides a more definitive configuration and footprint of the 2007 EA approved plan and incorporates improvements recommended by the VE study

New Highway 7 - Kitchener to Guelph, Recommended Plan



Region of Waterloo, County of Wellington, City of Kitchener, City of Guelph, Township of Woolwich, Township of Guelph-Eramosa



**Highway 7 New
Kitchener to Guelph, 18 km**

**FREEDOM OF INFORMATION AND
PROTECTION OF PRIVACY**

- ❖ Comments and information regarding the project are being collected to assist the Ministry of Transportation (MTO) in meeting the requirements of the *Environmental Assessment Act*
- ❖ This material will be maintained on file for use during the project and may be included in project documentation
- ❖ With the exception of personal information, all comments will become part of the public record in accordance with the *Freedom of Information and Protection of Privacy Act R.S.O., 1990, c.F.31*.
- ❖ You are encouraged to contact the Project Team if you have any questions regarding the above information

**Highway 7 New
Kitchener to Guelph, 18 km**

**ENVIRONMENTAL ASSESSMENT
(EA) PROCESS**

- ❖ The Highway 7 New EA was approved in 2007 by the Minister of the Environment
- ❖ The design for this project is now being conducted in accordance with the requirements of the *Class Environmental Assessment for Provincial Transportation Facilities* (2000)
- ❖ Consultation carried out by MTO for the Initial Phase of Design has included meetings with regulatory agencies, municipalities and local stakeholders
- ❖ Meetings were held with stakeholders directly affected by the VE recommendations
- ❖ A Transportation Environmental Study Report (TESR) to amend the Individual EA will be prepared and submitted for a 30-day public review period with opportunity to request a Part II order ('bump-up') on the VE recommendations documented in the TESR. The TESR will address only the VE recommendations as these represent a change to the approved design

Highway 7 New

Kitchener to Guelph, 18 km

- ❖ Next, an Initial Design Report to document the initial phase of design of the entire project will be prepared and filed for a 30-day public review. There is no opportunity to request a Part II order ('bump-up') of this report
- ❖ If there are issues regarding the VE recommendations that cannot be resolved the MTO can proceed with the detail design and construction as per the approved 2007 EA design

**Highway 7 New
Kitchener to Guelph, 18 km**

**WHAT HAVE WE BEEN DOING
SINCE THE EA WAS APPROVED IN
2007?**

- ❖ Horizontal and vertical design of the new highway
- ❖ Extensive foundation investigation for the structures
- ❖ Preliminary design of 41 structures
- ❖ Environmental inventory and impact assessment of design on aquatic and terrestrial habitat and species, archaeological and built heritage resources
- ❖ The Overall property requirements identified
- ❖ Consultation with First Nations, municipalities and agencies with respect to the project and specifically the recommended VE Options

**Highway 7 New
Kitchener to Guelph, 18 km**

VALUE ENGINEERING (VE) STUDY

What is Value Engineering?

- ❖ Value Engineering is an organized review of a project by a group of specialists that:
 - Identifies the functions of the project
 - Establishes a cost for the functions
 - Generates alternative ways of performing the functions at a lower cost or to otherwise improve the design
- ❖ The Study Team developed and evaluated feasible VE alternatives and are presenting our recommendations for their implementation into the overall plan
- ❖ Overall, the VE recommendations are not substantial changes to the approved plan
- ❖ They enhance the safety and function of the highway, reduce property and environmental impacts as well as costs
- ❖ Following the 30 day review period for the Transportation Environmental Study Report and resolution of any Part II orders, VE recommendations will be incorporated into the initial phase of design

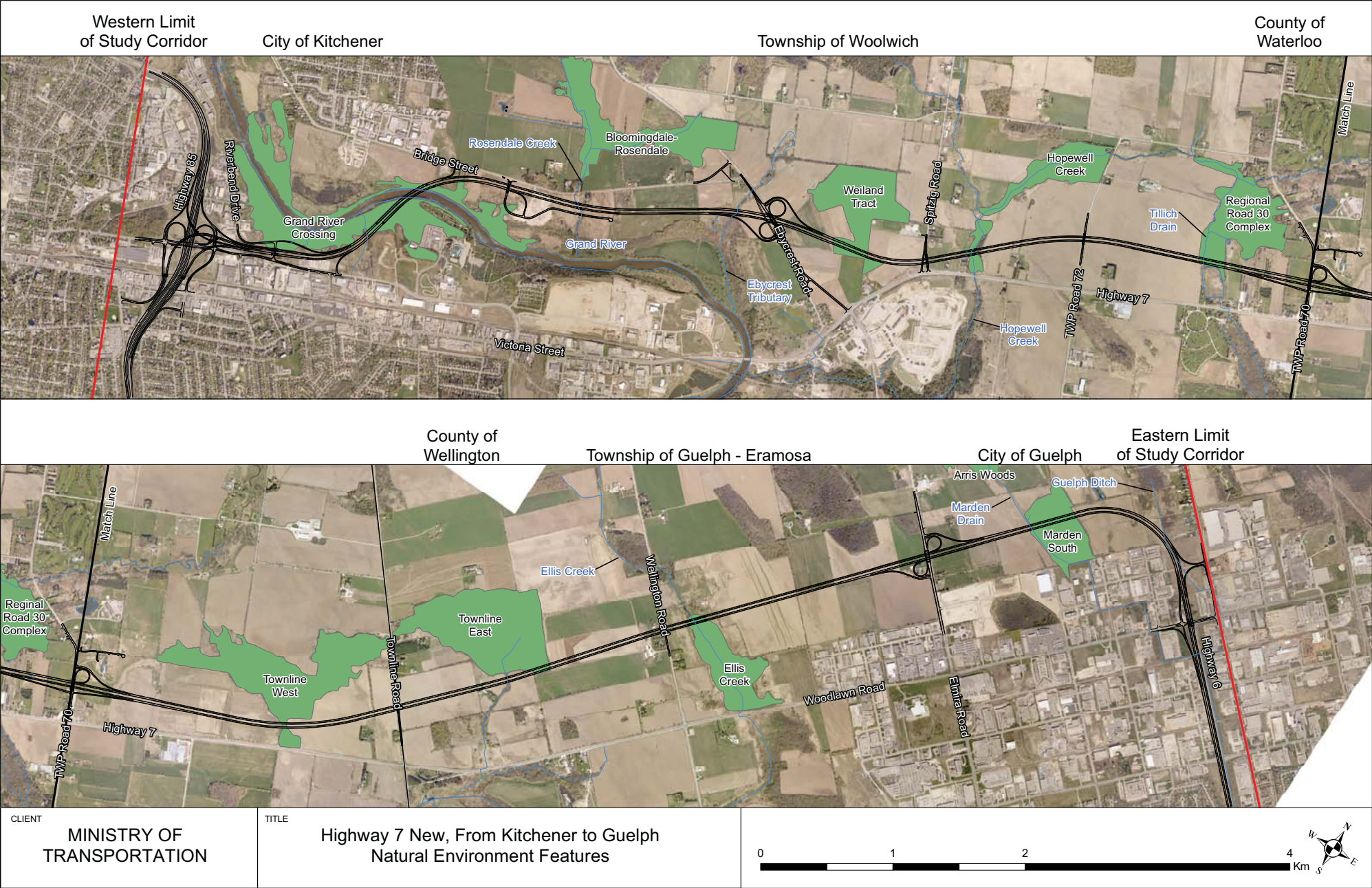
**Highway 7 New
Kitchener to Guelph, 18 km
SUMMARY OF VE EVALUATION
AND CONCLUSION**

- ❖ VE recommendations result in improvements at 5 site specific locations with respect to:
 - Overall function and constructability
 - Operation
 - Reduced environmental impacts
 - Safety
 - Reduced property impact
 - Reduced costs
- ❖ We appreciate your feedback and comments
- ❖ After your feedback is received/addressed we are planning to publish a Transportation Environmental Study Report (TESR) to amend the 2007 approved EA with the recommendations from the Value Engineering Study

Highway 7 New
Kitchener to Guelph, 18 km

2007 EA APPROVED DESIGN
FEATURES

- ❖ Four-lane median divided highway from Highway 85 (K-W Expressway) in Kitchener to Highway 6 (Hanlon Expressway) in Guelph, approximately 18 km
- ❖ A freeway to freeway interchange at the K-W Expressway, with local access to Wellington Street and the municipal road network;
- ❖ Interchanges at Bridge Street (partial), Ebycrest Road, Shantz Station Road, Elmira Road North and Woodlawn Road;
- ❖ Grade separated crossings at Spitzig Road, Greenhouse Road, Townline Road and Guelph Road
- ❖ Crossings of the Grand River, Rosendale Creek, Hopewell Creek and Ellis Creek



Highway 7 New
Kitchener to Guelph, 18 km
NATURAL, PHYSICAL AND SOCIAL ENVIRONMENT EXISTING
CONDITIONS, IMPACT ASSESSMENT AND MITIGATION

The features of the natural, cultural and social environment that have been assessed during development of the initial phase of design include:

Feature / Resource	Potential Impact	Mitigation Measures
<u>Water Crossings and Fish Habitat</u> <ul style="list-style-type: none">• Coldwater/coolwater and warmwater fish habitat provided in 10 watercourse crossings• Species at Risk<ul style="list-style-type: none">○ <i>Wavy-rayed Lampmussel</i> occurs in Grand River at crossing	<ul style="list-style-type: none">• Alteration of fish migration and movement through the new crossings• Loss of in-stream vegetation and habitat resulting from the footprint of new crossings• Introduction of sediments to watercourses during construction may affect water quality	<ul style="list-style-type: none">• Construct bridges over major watercourses to maintain fish passage• Create a low flow channel in culvert crossings• Minimize vegetation removal within the highway Right-of-Way• Timing of construction during permissible in-water window• Relocate mussels and monitor where required• Erosion and sediment controls during construction

Highway 7 New Kitchener to Guelph, 18 km

Feature / Resource	Potential Impact	Mitigation Measures
<p><u>Vegetation</u></p> <ul style="list-style-type: none"> • Forest Interior Habitat in 8 woodlands in highway corridor • Large sugar maple trees in area of Grand River crossing • Species at Risk <ul style="list-style-type: none"> ○ Butternut tree adjacent to Grand River crossing 	<ul style="list-style-type: none"> • Vegetation removal • No impact to butternut or large maple trees at Grand River crossing 	<ul style="list-style-type: none"> • Alignment selected during planning stage to minimize the amount of vegetation removed • Implement “edge management” to reduce impacts associated with new forest edge • Re-plant/seed areas of fish/wildlife habitat to promote cover • Removals to occur outside migratory bird nesting period

Highway 7 New Kitchener to Guelph, 18 km

Feature / Resource	Potential Impact	Mitigation Measures
<p>Wetlands</p> <ul style="list-style-type: none"> • Provincially Significant Wetlands Include: <ul style="list-style-type: none"> ○ Townline West Wetland ○ Ellis Creek Wetland ○ Marden South Wetland • Locally significant wetlands include: <ul style="list-style-type: none"> ○ Bloomingdale-Rosendale Wetland ○ Hopewell Creek Riparian Wetland 	<p>Removal of vegetation and drainage alteration at Marden South wetland</p> <p>Bridge piers placed in Ellis Creek wetland</p>	<ul style="list-style-type: none"> • Alignment selected during planning stage to minimize impact to wetlands <p>Marden South Wetland</p> <ul style="list-style-type: none"> • Provide culverts through the crossing to equalize water levels to maintain vegetation communities <p>Ellis Creek Wetland</p> <ul style="list-style-type: none"> • Construct bridge piers outside of the open water portion of the wetland (Ellis Creek and adjacent riparian area) • Maintain seasonal water levels

Highway 7 New

Kitchener to Guelph, 18 km

Feature / Resource	Potential Impact	Mitigation Measures
<u>Wildlife</u> <ul style="list-style-type: none"> • Deer overwintering areas at Hopewell Creek forest (west of Greenhouse Road) • forest wetland in Regional Road 30 Complex (west of Shantz Station Road) • Marden South swamp forest west of Silver Creek Parkway 	<ul style="list-style-type: none"> • Wildlife movement may be impacted by highway • Highway will cross several watercourse/valleyland features that provide wildlife movement corridors 	<ul style="list-style-type: none"> • Bridges over major watercourses and some wetlands have been designed to allow wildlife to move beneath <ul style="list-style-type: none"> ○ Deer used as the target size • Wildlife passage incorporated into the designs for: <ul style="list-style-type: none"> ○ Grand River ○ Hopewell Creek ○ Ellis Creek • Fencing to be installed on the north side of the highway at the Marden South Wetland crossing to prevent deer moving onto the highway
<u>Contaminant and Waste Management</u>	<ul style="list-style-type: none"> • Several potential sources of soil and groundwater contamination were identified 	<ul style="list-style-type: none"> • Preliminary site screening and/or Phase 1 Environmental Site Assessment is recommended for properties with a High potential for contamination within 100 m of the final highway alignment

Highway 7 New Kitchener to Guelph, 18 km

Feature / Resource	Potential Impact	Mitigation Measures
<u>Groundwater and Wells</u> <ul style="list-style-type: none"> • Some wells in shallow aquifer (< 10 m deep) • majority of wells in deeper aquifer in bedrock (> 25 m deep) 	<ul style="list-style-type: none"> • Deep wells (> 25 m deep) in bedrock <ul style="list-style-type: none"> ◦ Impacts to deep wells are not anticipated • Shallow wells (< 10 m deep) within 100 m of the alignment <ul style="list-style-type: none"> ◦ Potential impacts to shallow wells 	<ul style="list-style-type: none"> • Location of wells identified in the field and updated • Identify well and water supply for those properties for which there is no well record • Confirm properties where water is provided through municipal supply • Further assessment and protection mitigation will be developed in the next stage of design
<u>Archaeology</u> <ul style="list-style-type: none"> • Several Aboriginal archaeological sites identified and documented according to provincial protocol and standards 	<ul style="list-style-type: none"> • Stage 2 investigations completed where permission to enter received • 7 of 10 Stage 3 sites cleared of archaeological concern 	<ul style="list-style-type: none"> • Stage 4 mitigation recommended for 3 sites • Stage 2 investigations required for some properties • Further archaeological investigations to be carried out in the next stage of design

Highway 7 New Kitchener to Guelph, 18 km

Feature / Resource	Potential Impact	Mitigation Measures
<u>Cultural Heritage</u> <ul style="list-style-type: none"> • 14 cultural heritage landscapes <ul style="list-style-type: none"> ○ farm complexes ○ rural road settings • 3 built heritage resources <ul style="list-style-type: none"> ○ buildings 	<ul style="list-style-type: none"> • Indirect impacts anticipated for <ul style="list-style-type: none"> ○ 11 cultural heritage landscapes ○ 2 built heritage resources ○ 5 additional sites • Direct impacts anticipated for <ul style="list-style-type: none"> ○ 3 cultural heritage landscapes ○ 1 built heritage resource 	<ul style="list-style-type: none"> • Cultural Heritage Evaluation Report (CHER) has been prepared to document the cultural heritage significance of each cultural landscape, resource and building • Additional documentation of the interiors, including floor plans of buildings will be needed in later stages of design • Access to 5 unassessed sites will be required to complete documentation
<u>Recreational Trails</u> <ul style="list-style-type: none"> • Walter Bean Grand Valley Recreational Trail • Grand Valley Trail 	<ul style="list-style-type: none"> • Impacts to the alignment of the trails where they cross the highway alignment 	<ul style="list-style-type: none"> • Realignment of the trails to maintain access through the area

**Highway 7 New
Kitchener to Guelph, 18 km**

PROJECT STATUS

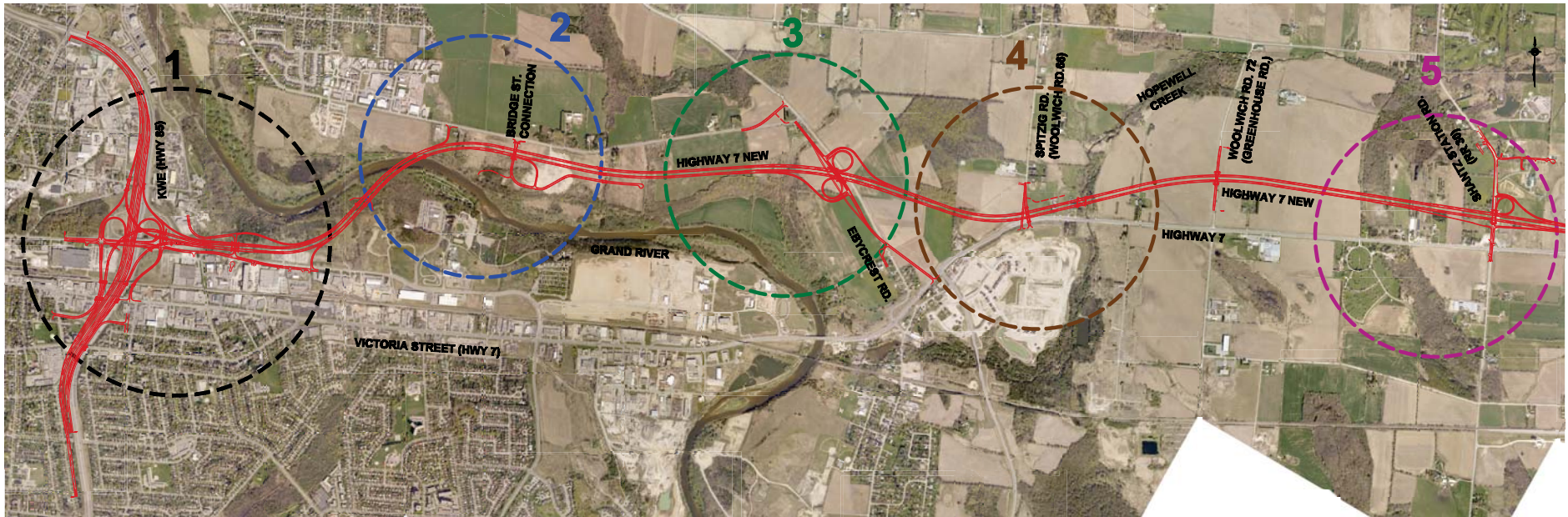
- ❖ The project is currently not on the Ministry's Southern Highways Program but will be considered as part of the future plan based on provincial priorities and available funding
- ❖ The Ministry will continue to take steps such as property acquisition to advance the project so we can proceed to construction once funding becomes available
- ❖ This fall, the Ministry will begin to purchase the remaining required properties for the project
- ❖ Property acquisition is expected to take at least 30 months given the number of properties
- ❖ Once started, we estimate that it will take a minimum of 5 years to construct

**Highway 7 New
Kitchener to Guelph, 18 km**

WHERE DO WE GO FROM HERE?

- ❖ Consider comments received about the VE recommendations.
- ❖ Prepare a Transportation Environmental Study Report (TESR) to amend the Individual EA for the VE recommendations. TESSR will be available for a 30-day public review period with opportunity to request a Part II order ('bump-up')
- ❖ Next, prepare an Initial Design Report to document the initial phase of design and submit for a 30-day public review with no opportunity to request a Part II order ('bump-up')
- ❖ Following the 30 day review periods and resolution of any Part II order requests, the project may proceed to the final stages of the Detail Design
- ❖ The final stages of the Detail Design process will further develop measures to mitigate impacts and secure all applicable permits and approvals from regulatory agencies.

Value Engineering Target Areas



Target Area 1: Kitchener-Waterloo Expressway Freeway to Freeway Interchange (VE Recommendations: 1, 2, 3, 4)

Target Area 2: Grand River Bridge and Bridge Street (VE Recommendations: 5)

Target Area 3: Regional Road 17 (Ebycrest Rd.) Interchange (VE Recommendations: 6, 7)

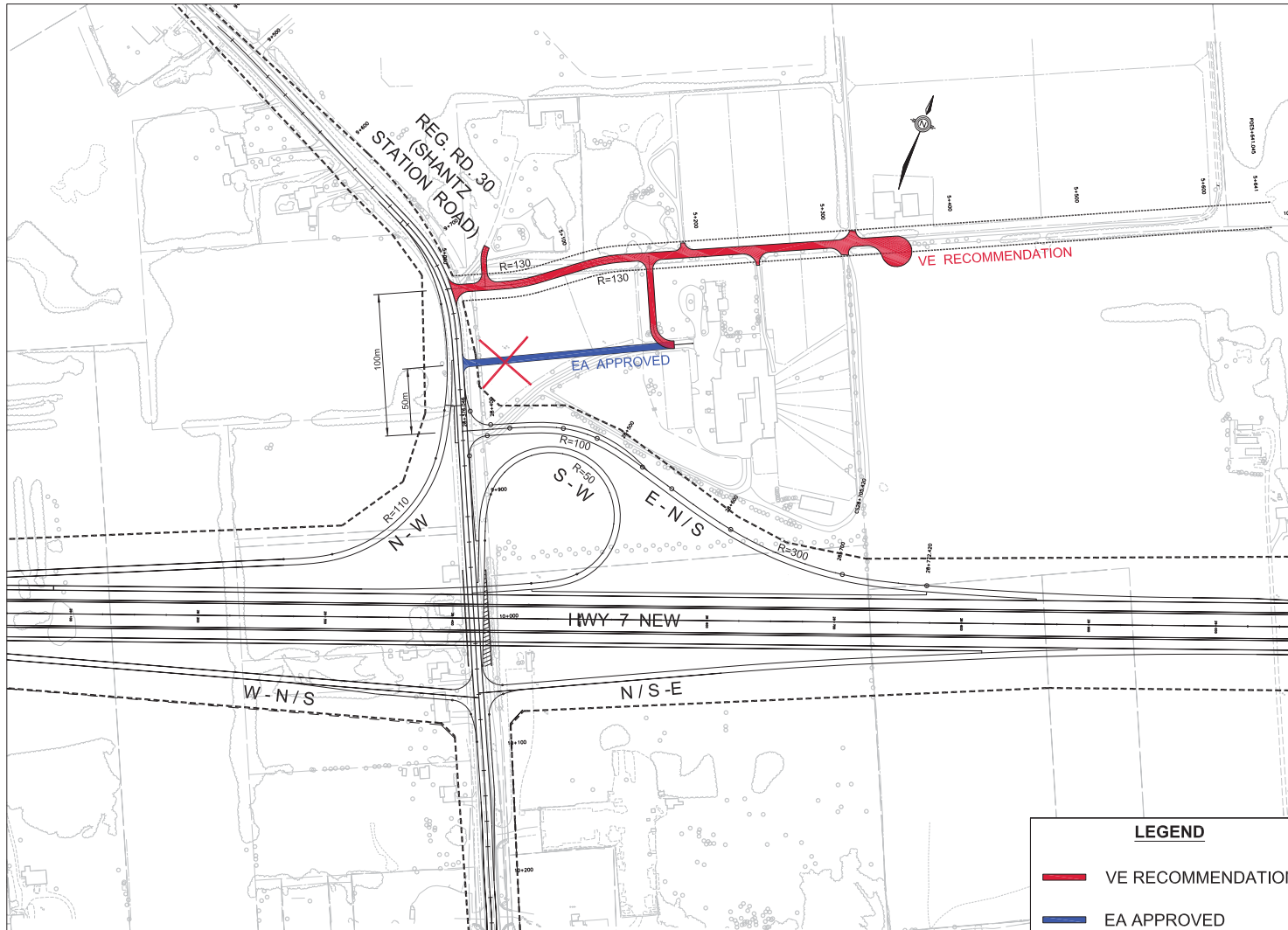
Target Area 4: Woolwich Road 66 (Spitzig Rd.) (VE Recommendations: 8)

Target Area 5: Regional Road 30 (Shantz Station Rd.) Interchange (VE Recommendations: 9, 10)

Value Engineering (VE) Recommendations

Target Area 5 - Regional Road 30 (Shantz Station Rd.) (10)

10 - Combine Service Road and Private Residential



EA Approved

- New residential access in close proximity to the interchange

VE Recommendation

- Combine this access with existing public service road to increase spacing to interchange

Advantages

- Reduces number of access points on sideroad
- Reduces potential for vehicular conflicts & traffic delays in proximity to the Interchange

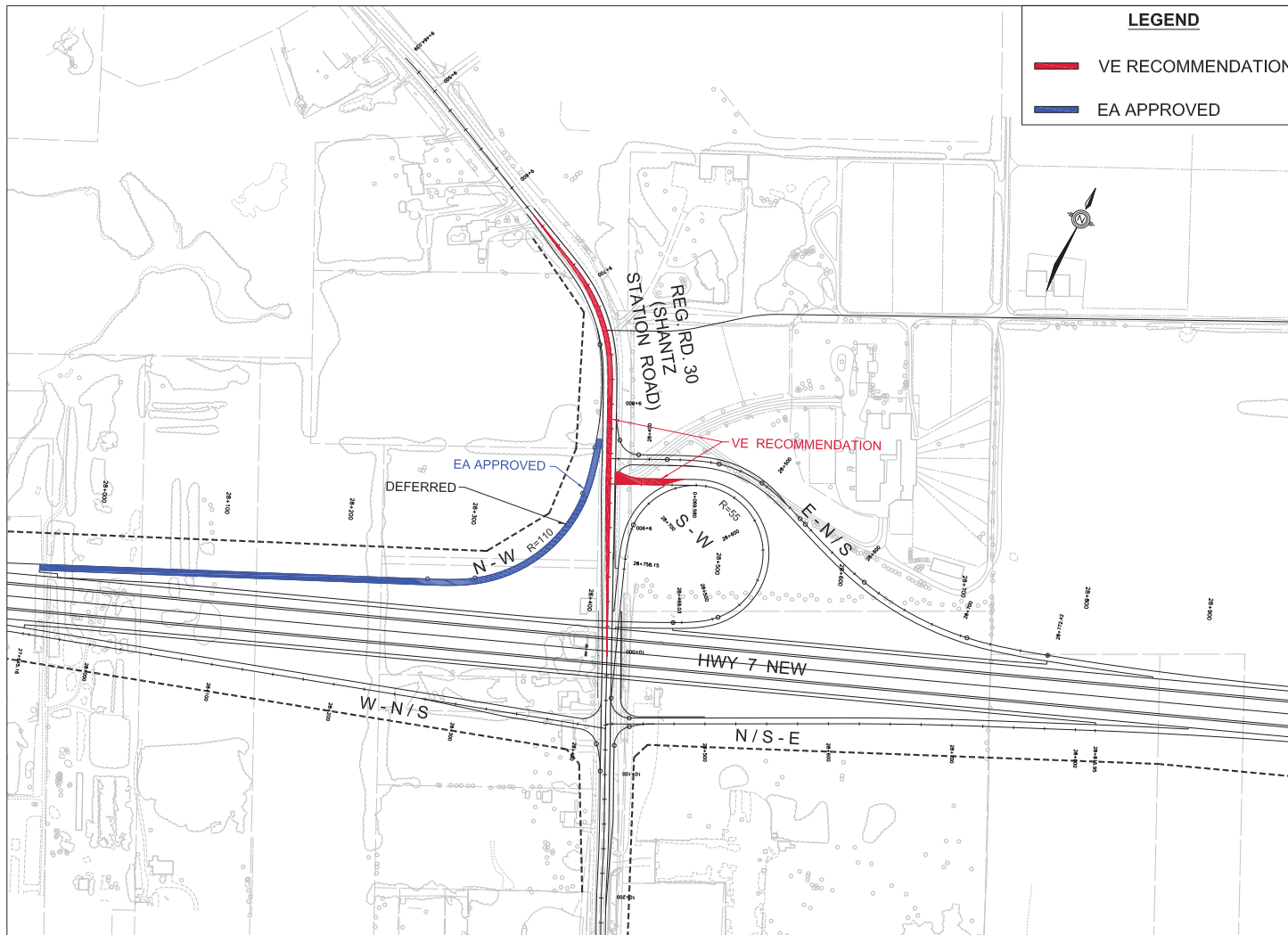
Disadvantages

- Very minor additional construction costs

Value Engineering (VE) Recommendations

Target Area 5 - Regional Road 30 (Shantz Station Rd.) (9)

9 - Convert North Interchange Configuration to Parclo A2 (Protect for A-4)



EA Approved

- Parclo A-4 configuration in the north quadrant of the interchange with a direct, i.e. free flow, N-W ramp movement

VE Recommendation

- Convert the north portion of the interchange to Parclo A2, i.e. replace a direct free flow N-W ramp movement with a left turn lane onto the S-W loop ramp
- Defer construction of the direct N-W Ramp (protect property for A-4), and associated costs until warranted by traffic volumes

Advantages

- Results in cost savings, funds spent when warranted

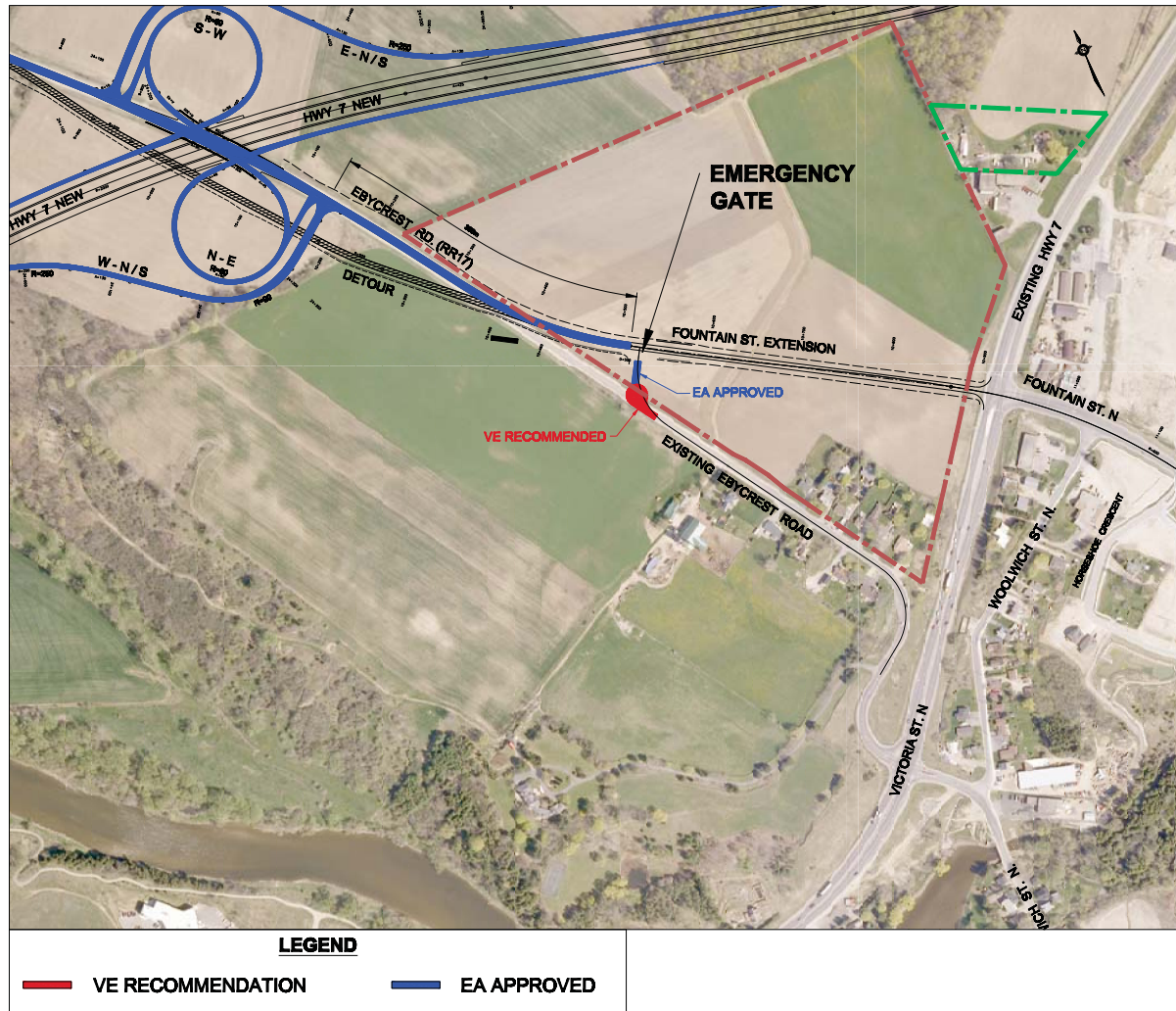
Disadvantages

- Left turn access may contribute to traffic congestion, but traffic volumes are low
- Potential for reduced visibility at ramp terminals, but mitigated with signage & illumination

Value Engineering (VE) Recommendations

Target Area 3 - Regional Road 17 (Ebycrest Rd.) Interchange (7)

7 - Close Existing Ebycrest Road North of Exist. Hwy 7 and Provide Cul-de-Sac



EA Approved

- Ebycrest Road is converted to local access when connected to the future extension of Fountain Street

VE Recommendation

- Close existing Ebycrest Road and remove the entrance from the future Fountain Street extension
- Add gated access to RR17 to facilitate emergency vehicles access

Advantages

- Reduces number of access points at interchange
- Eliminates potential intra-regional traffic through residential area
- Reduces traffic at existing Ebycrest Rd./Hwy 7 intersection with steep profile
- Maintains emergency response route as confirmed with RMW Emergency Medical Service

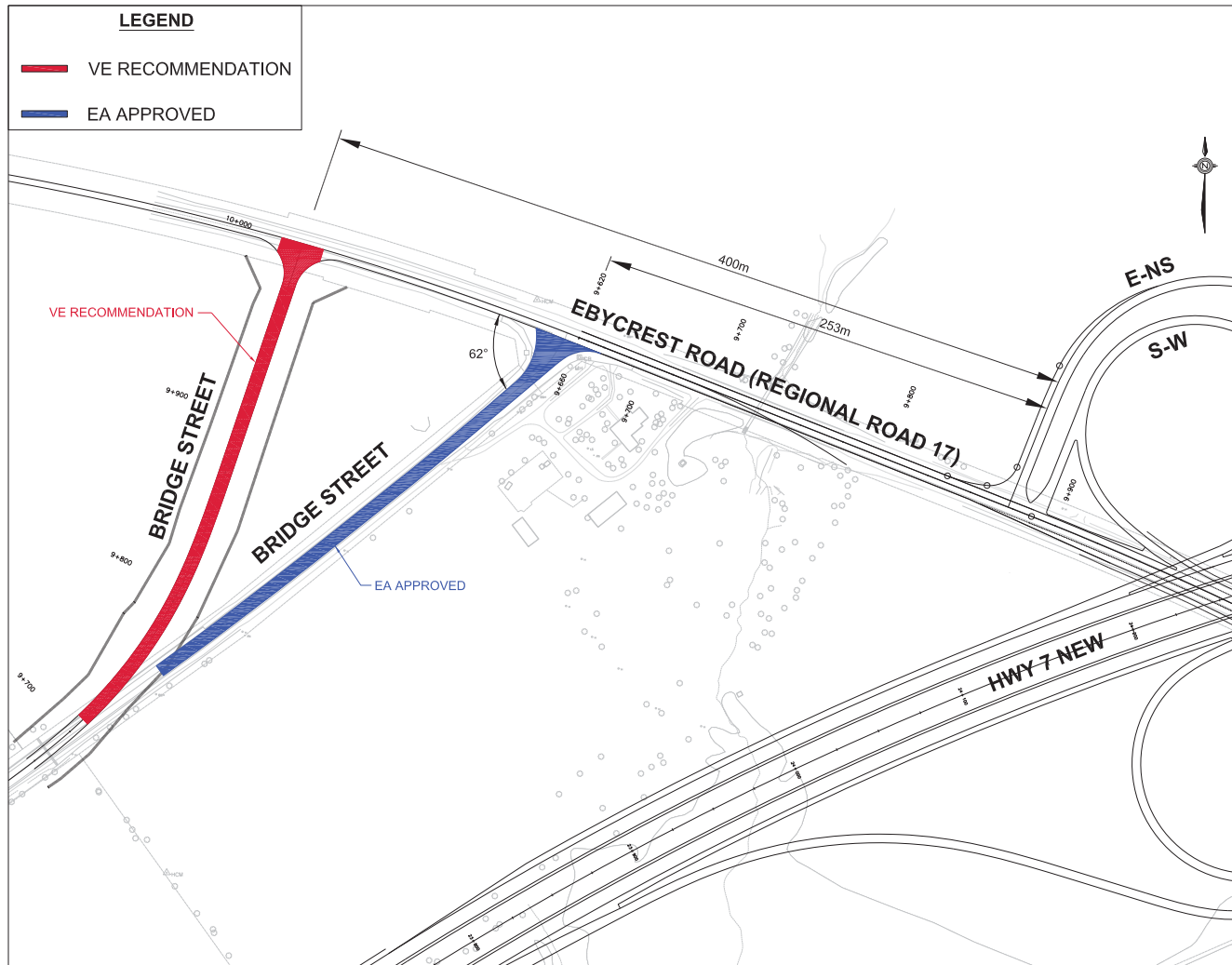
Disadvantages

- Loss of a direct access from/to interchange for 12 residences

Value Engineering (VE) Recommendations

Target Area 3 - Regional Road 17 (Ebycrest Rd.) Interchange (6)

6 - Realign Bridge Street at RR17 to Provide Greater Spacing



EA Approved

- The existing Bridge Street intersection at skew and in close proximity to the proposed interchange and will affect safety and traffic operations

VE Recommendation

- Move existing ramp further away from the interchange and improve the angle at the intersection from 60° to 90°

Advantages

- Improves visibility and turning movements at intersection
- Improves spacing of intersection to the interchange
- Improves safety and operations along sideroad, potential for vehicular conflicts reduced at the interchange access
- Improvements consistent with MTO access management best practices

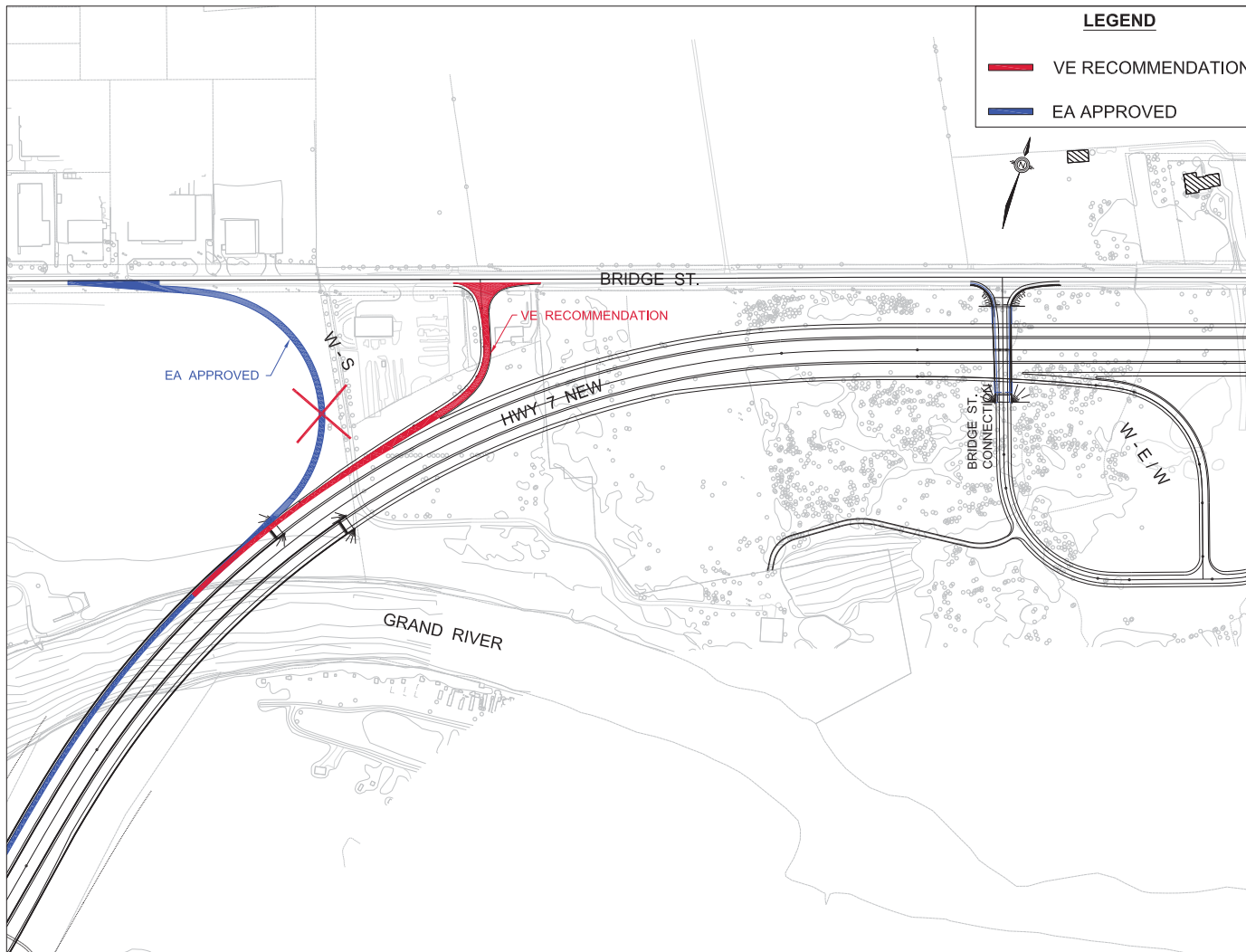
Disadvantages

- Property and environmental impact - loss of a portion of crops field
- Additional minor construction & property costs

Value Engineering (VE) Recommendations

Target Area 2 - Grand River Bridge and Bridge Street (5)

5 - Move and Reconfigure Direct W-S On-Ramp into Buttonhook



EA Approved

- Direct Bridge St. W- Hwy 7 W on-ramp that ties with highway at the bridge
- Results in a flare and variable reversed pavement slopes due to opposite direction curves
- Poor visibility and potential for roll-over accidents at bridge approach
- Increases risks and potential additional costs during construction

VE Recommendation

- Shift ramp terminal to the east in a buttonhook configuration (intersection connection with Bridge St.)

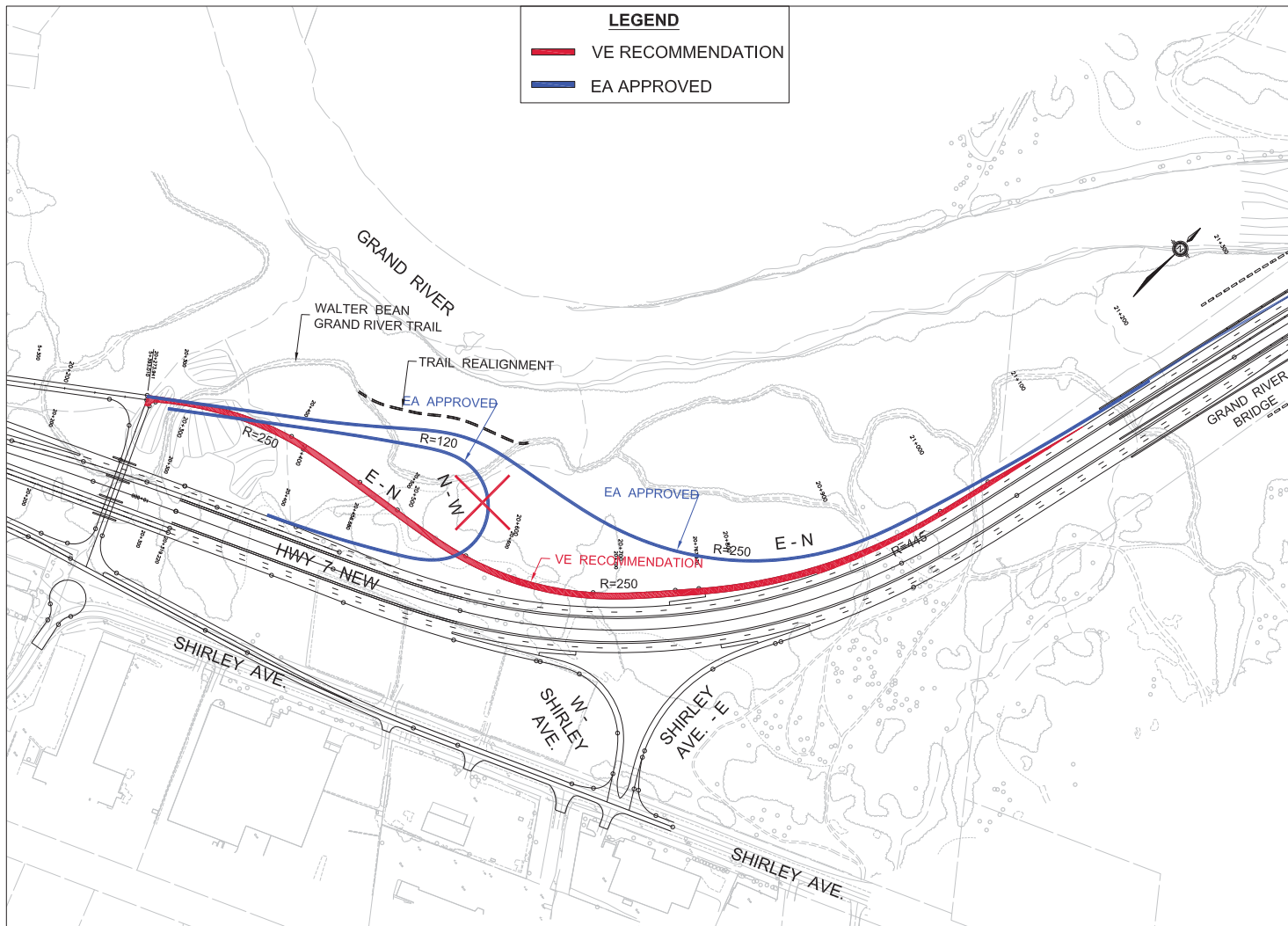
Advantages

- Allows elimination of flare and adverse variable reversed pavement slopes, provides uniform pavement slopes
- Significantly improves bridge geometry and constructability and ensures cost savings
- Improves safety by increasing visibility at the approach and reduces potential for roll-over accidents

Value Engineering (VE) Recommendations

Target Area 1 - Kitchener-Waterloo Expressway Freeway to Freeway Interchange (4)

4 - Shift Hwy 7 WB Off-Ramp to Riverbend Further West and off the Grand River Structure



EA Approved

- Hwy 7 E-Riverbend Dr. Off-Ramp speed change lane is on the Grand River bridge

VE Recommendation

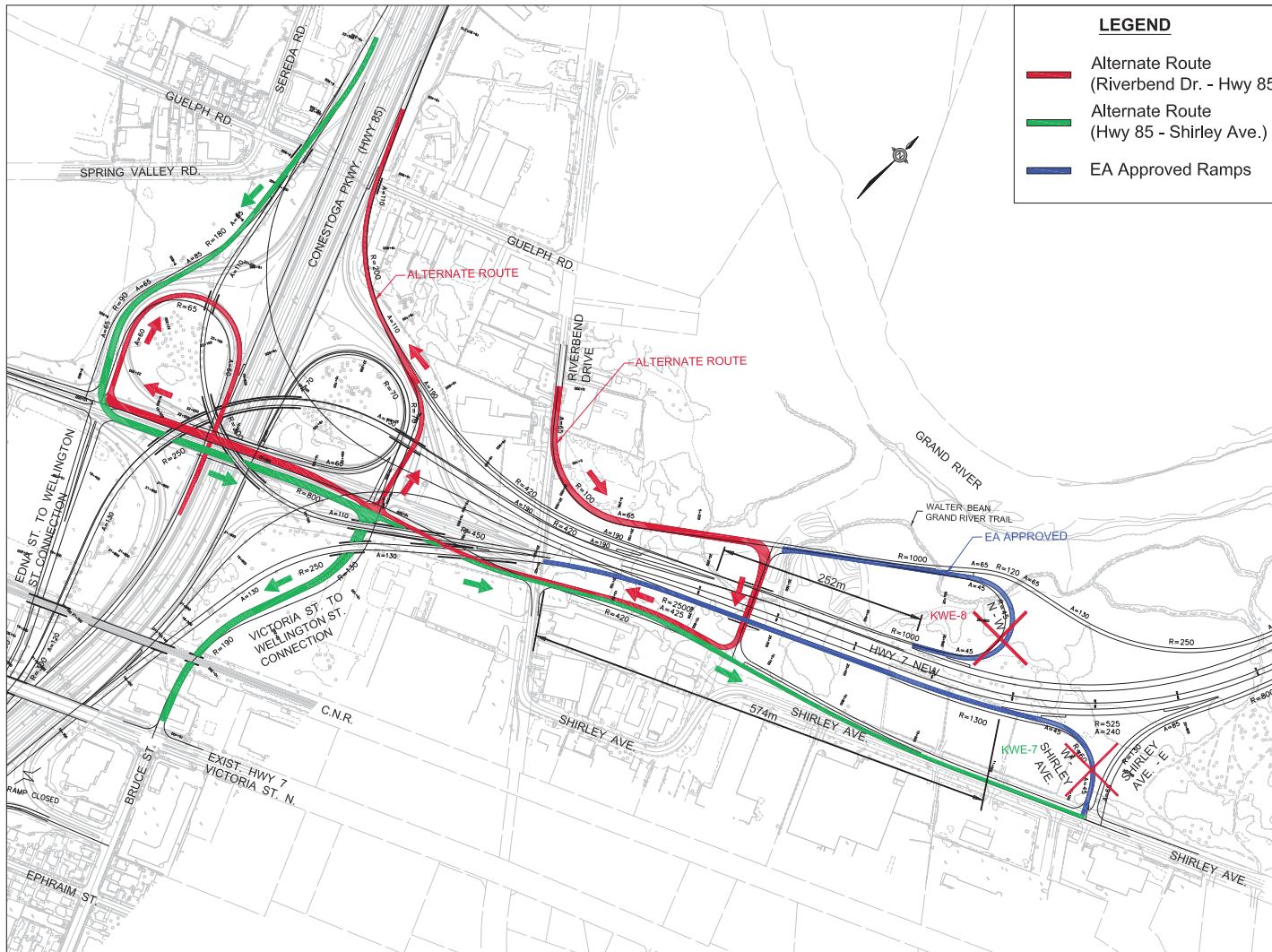
- Move Hwy 7 E-Riverbend Dr. Off-Ramp off the Grand River bridge

Advantages

- Reduces flare and the associated costs on the bridge
- Reduces fill in the river valley
- Reduces impact to Walter Bean Grand River Trail
- Allows elimination of Riverbend Dr.- Hwy 7 WB ramp in KWE-7 VE recommendation

Target Area 1 - Kitchener-Waterloo Expressway Freeway to Freeway Interchange (2 & 3)

2 & 3 - Eliminate Riverbend Dr. to Hwy 7 On-Ramp and W-Shirley Ave. Off-Ramp



EA Approved

- Two ramps, Riverbend Dr. N - W and W - Shirley Ave., to accommodate direct access/egress to the highway
- Ramp geometry results in short weaving sections

VE Recommendation

- Eliminate direct ramps, as alternate routes are available through local roads

Advantages

- Eliminates weaving deficiencies on new Hwy 7 – potential for collisions reduced by 40% (estimated at VE)
- Removes redundant ramps – access to Hwy 85 maintained via available local routes at Wellington St.
- Substantial improvement from safety, operations and human factors point of view

Disadvantages

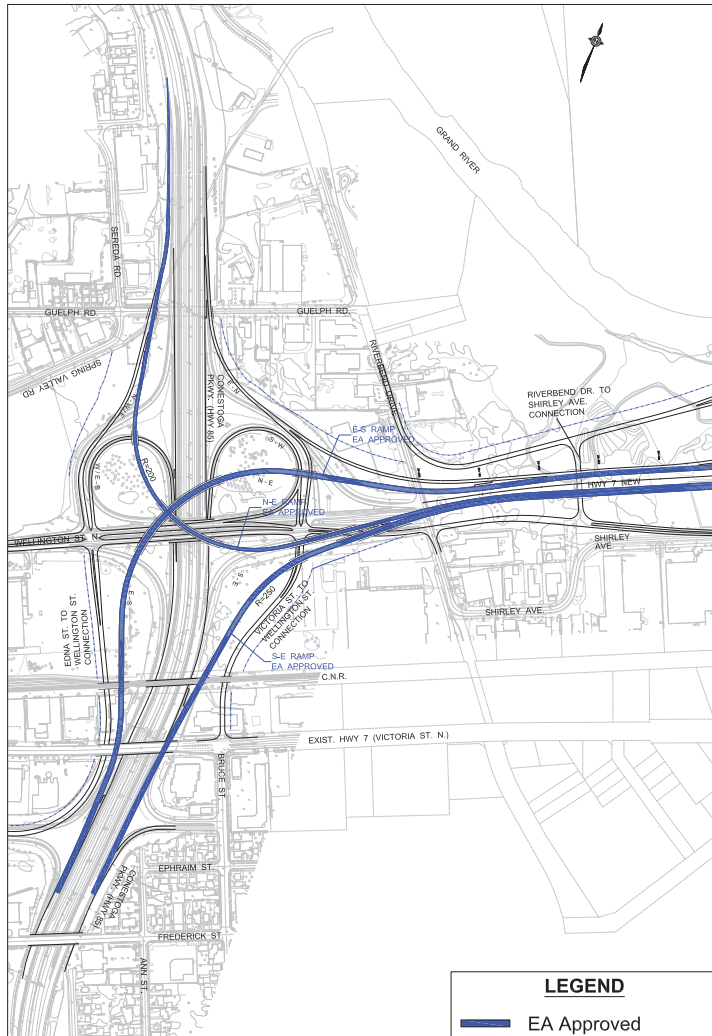
- Inconvenience of indirect travel, but similar to existing condition
- Adds traffic on Shirley and Wellington to access Hwy 85

Value Engineering (VE) Recommendations

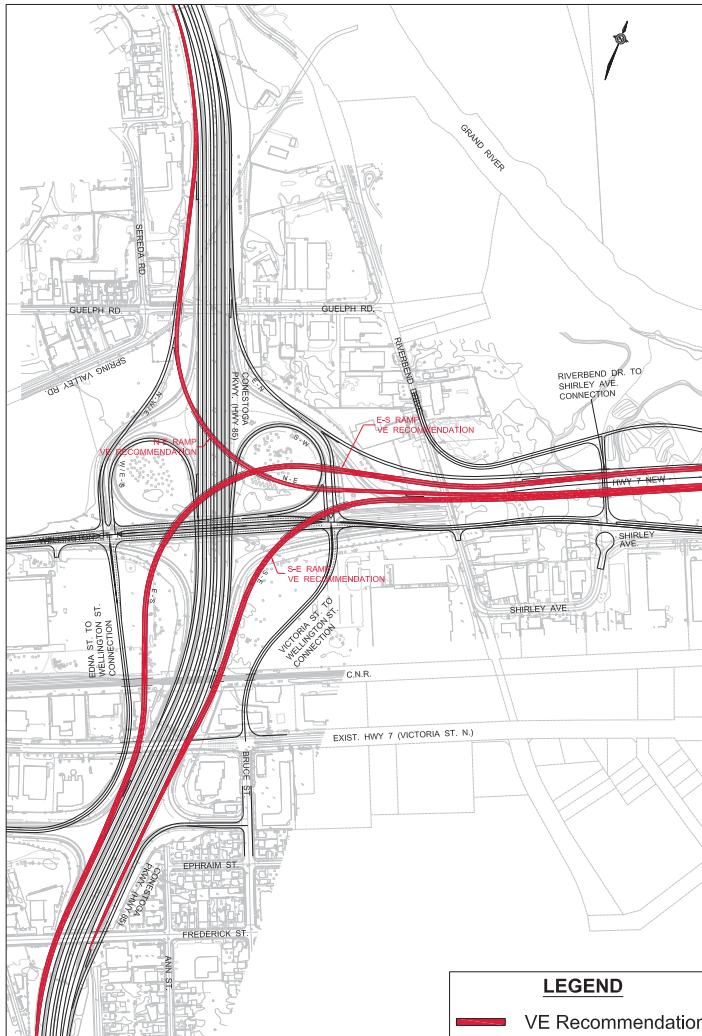
Target Area 1 - Kitchener-Waterloo Expressway Freeway to Freeway Interchange (1)

1 - Move Ramps N-E and S-E to the North of Hwy 7

EA Approved



VE Recommendation



EA Approved

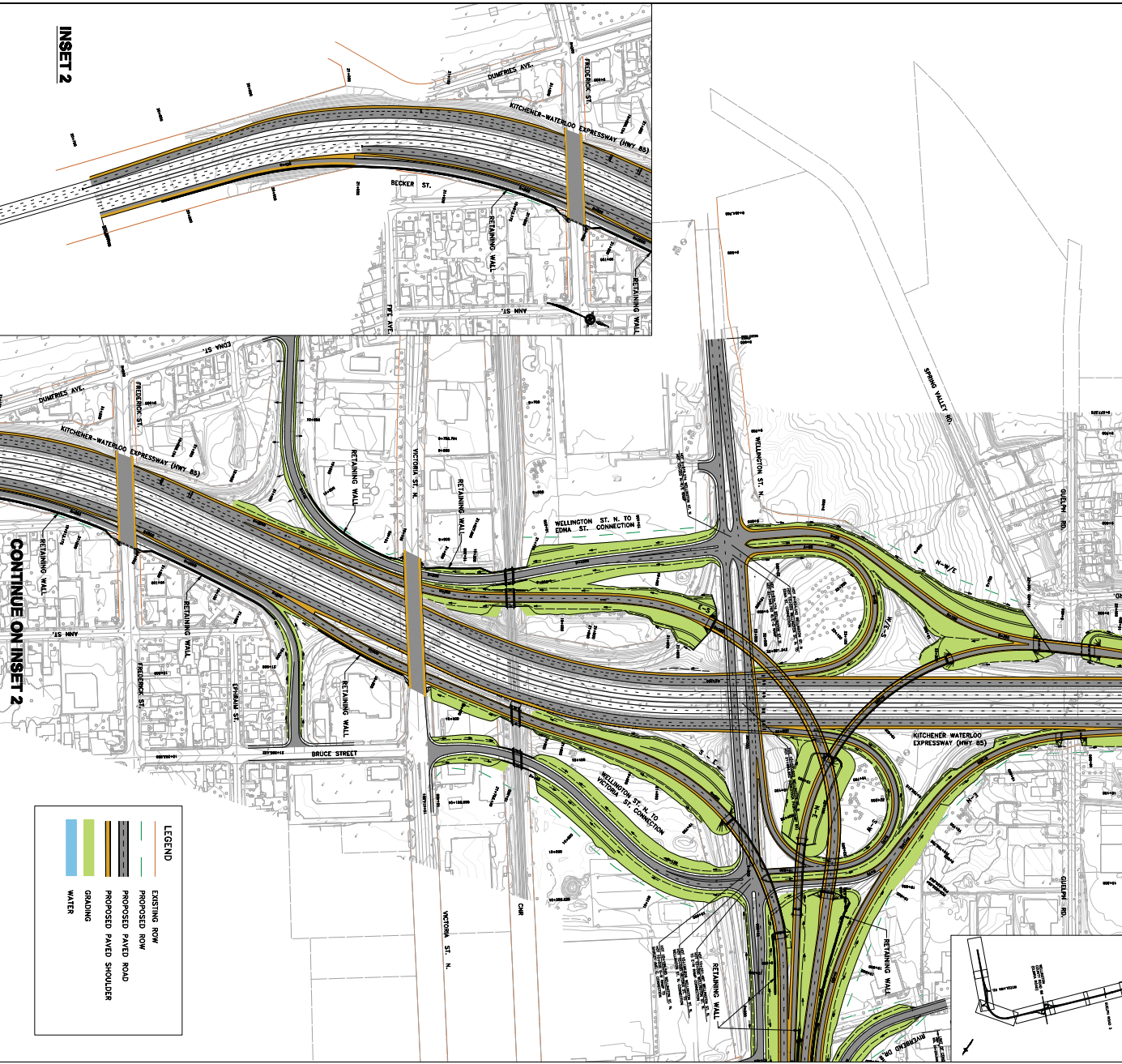
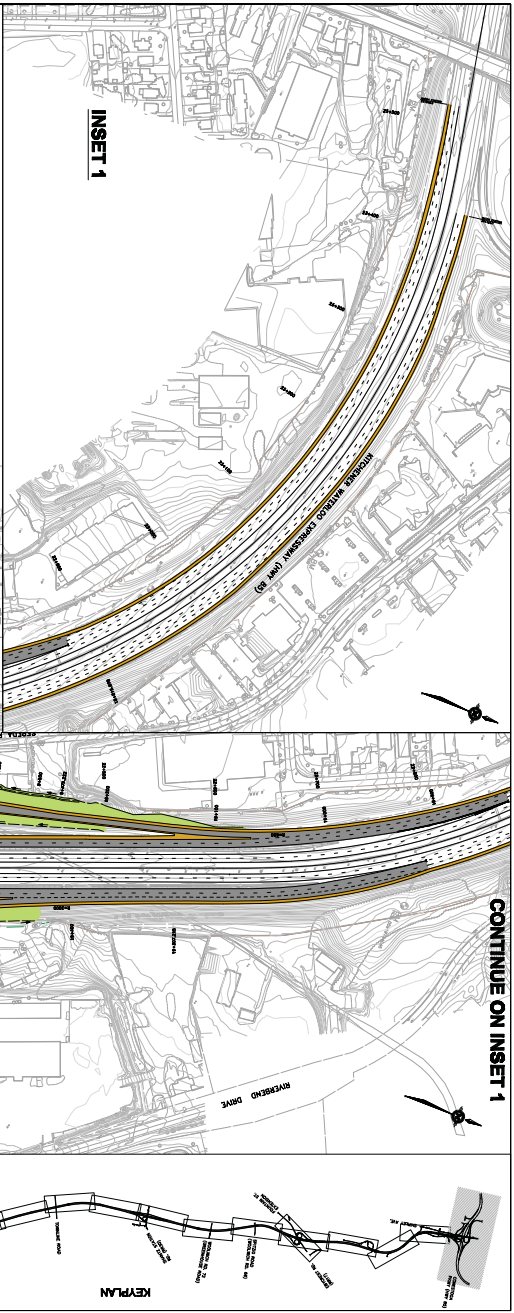
- N-E and S-E combined freeway-to-freeway ramp crossing south of Hwy 7
- Bridge across Wellington St. is not constructible in the EA configuration due to large skew

VE Recommendation

- Move freeway-to-freeway ramp crossing north of Hwy 7 to ensure constructability

Advantages

- Ensures constructability
- Reduces bridge span and improves geometry of N-E ramp to 80km/h



INSET 2

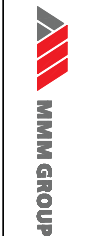
INSET 1

CONTINUE ON INSET 1

CONTINUE ON INSET 2

- LEGEND**
- EXISTING ROW
 - PROPOSED ROW
 - PROPOSED PAVED ROAD
 - PROPOSED PAVED SHOULDER
 - GRAZING
 - WATER

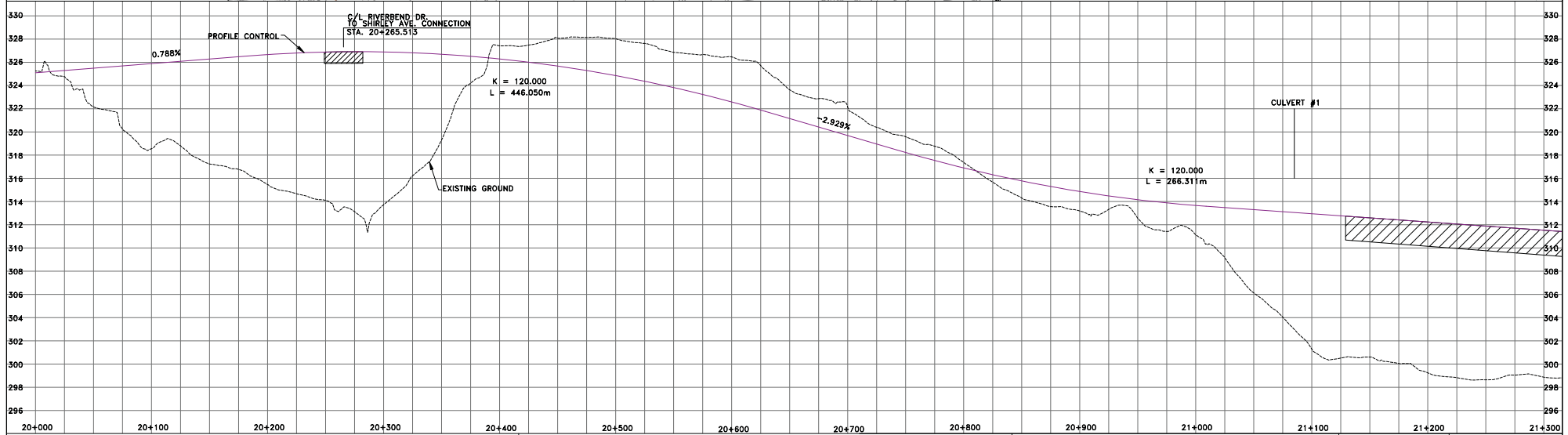
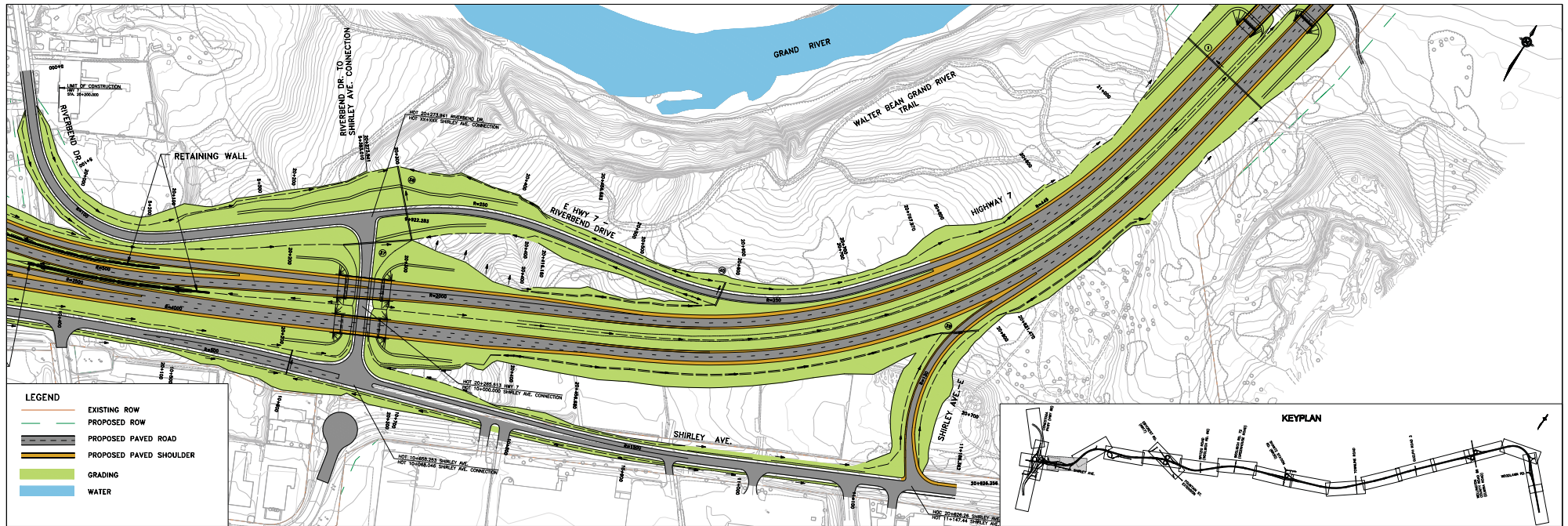
HIGHWAY 7 NEW - KITCHENER TO GUELPH
2007 EA APPROVED PLAN (WITH RECOMMENDED
VE MODIFICATIONS)
G.M.P. 408 - 08 - 00



PLAN & PROFILE

SCALE
1cm = 30m
Horizontal

PLATE
1



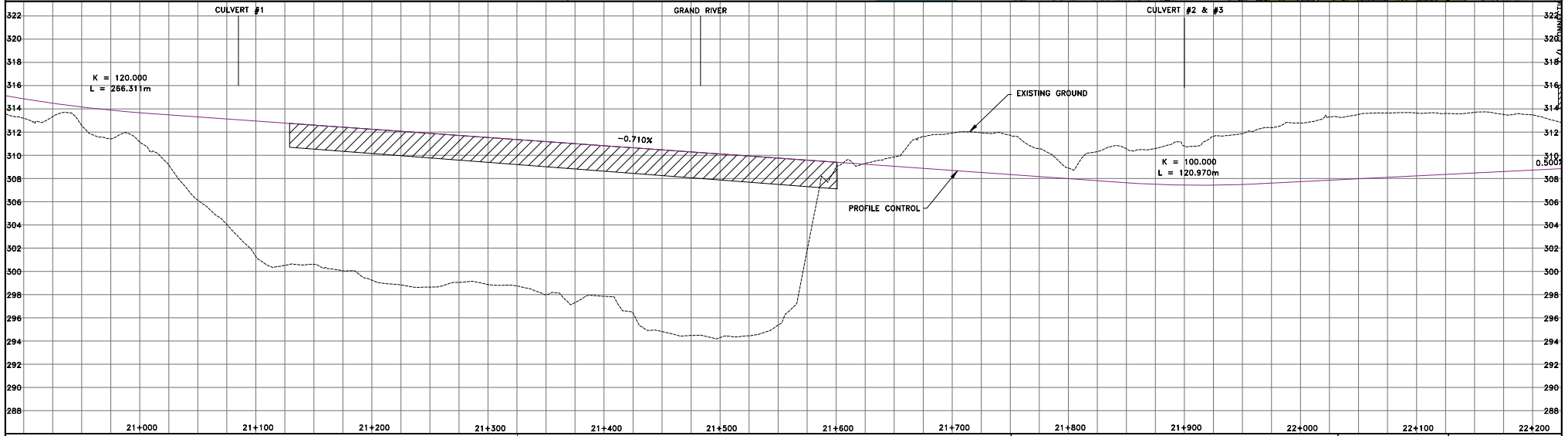
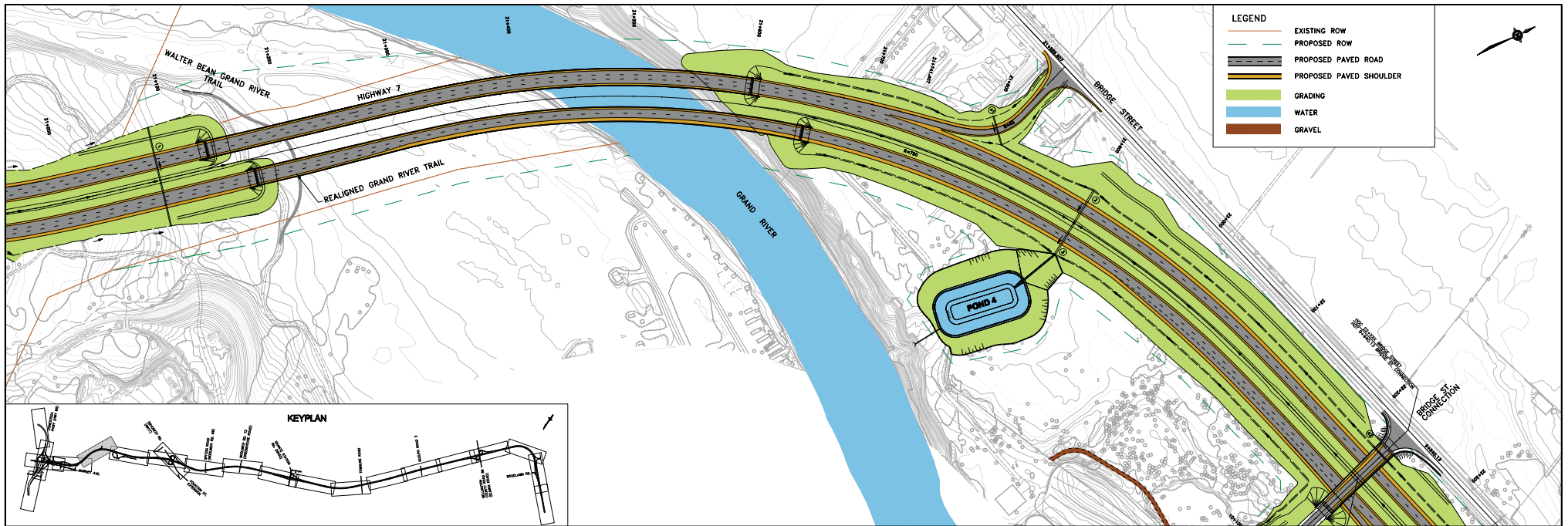
HIGHWAY 7 NEW - KITCHENER TO GUELPH
2007 EA APPROVED PLAN (WITH RECOMENDED VE MODIFICATIONS)
G.W.P. 408 - 88 - 00



PLAN & PROFILE

SCALE
15m 0 30m
Horizontal

PLATE
2



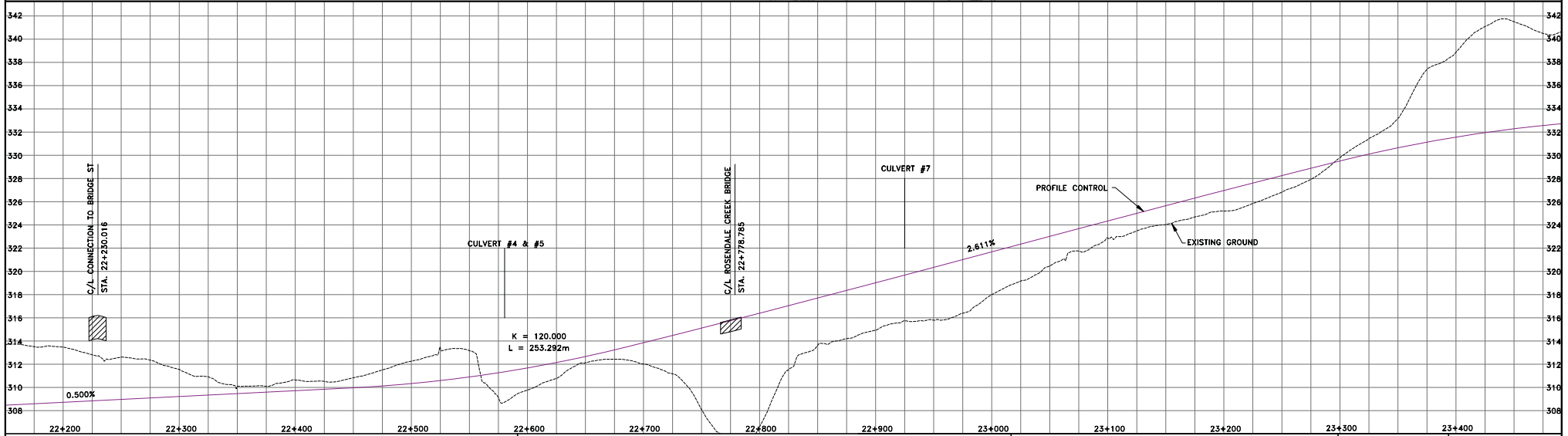
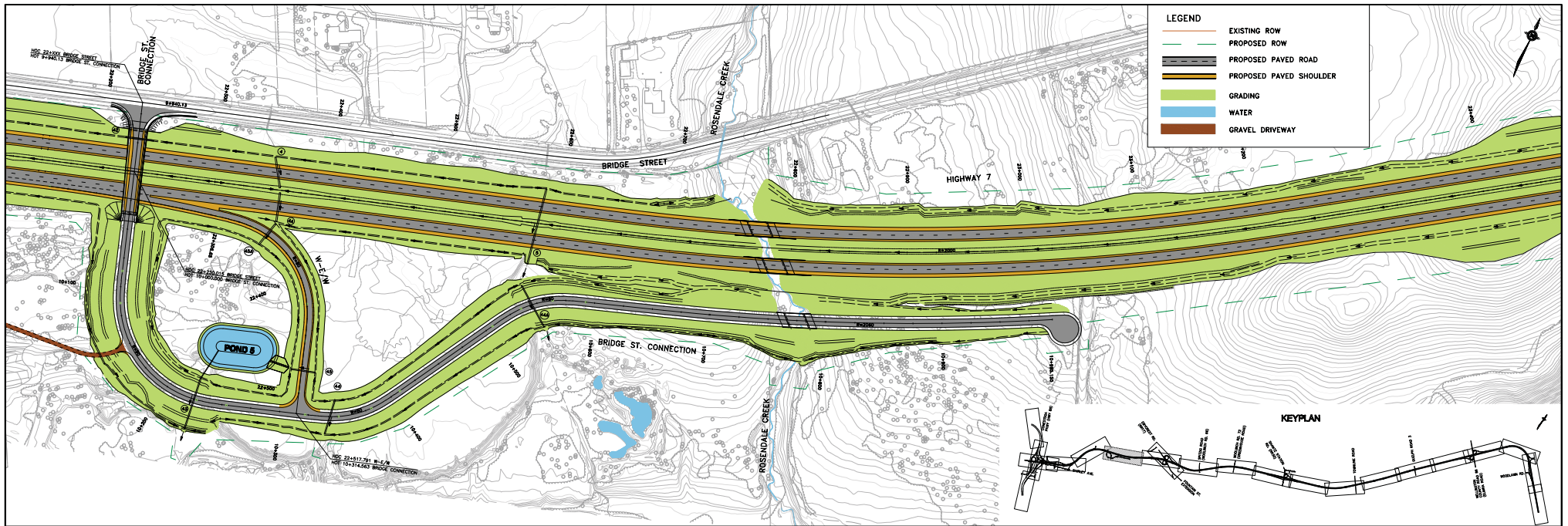
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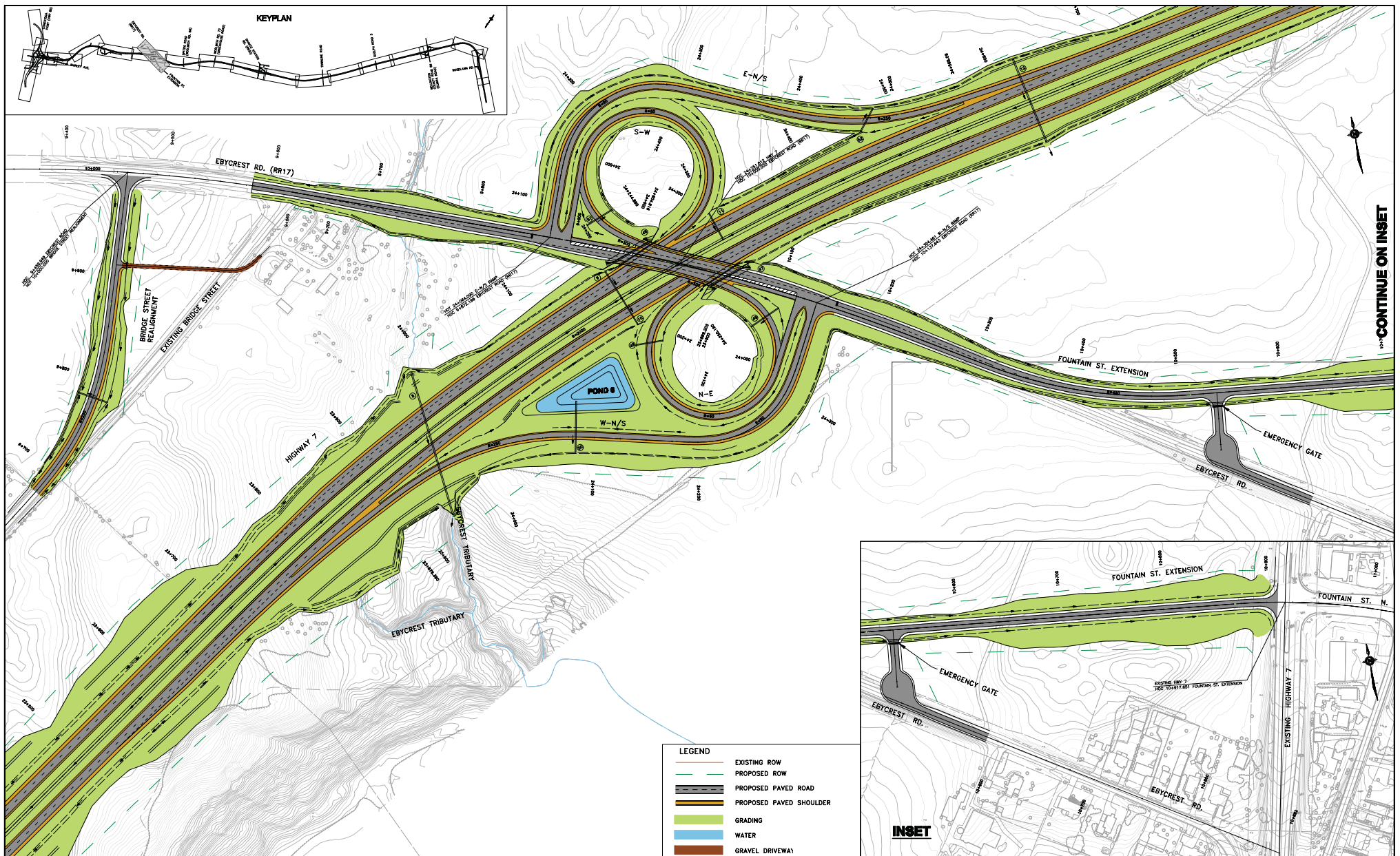


PLAN & PROFILE

SCALE
 15m 0 30m
 Horizontal

PLATE
3





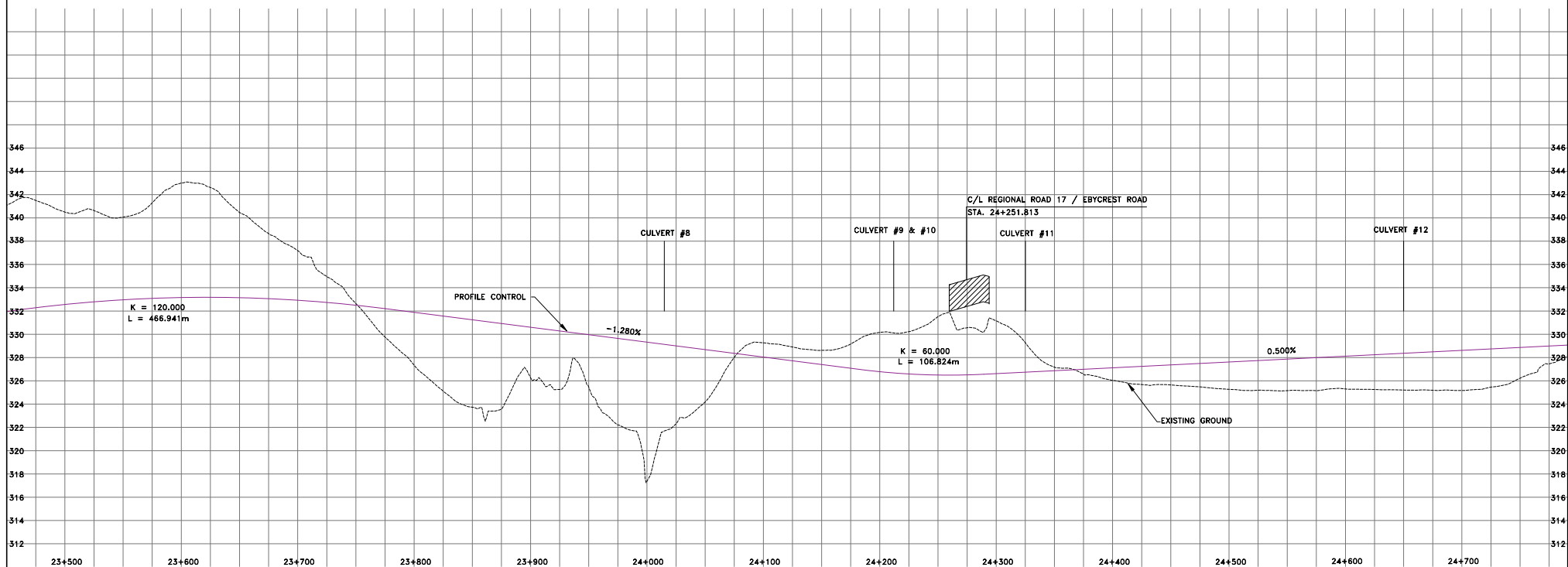
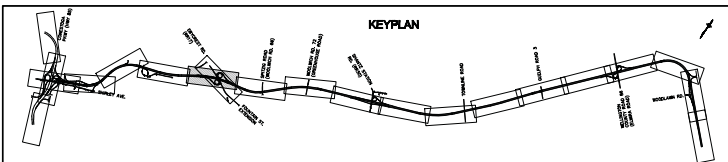
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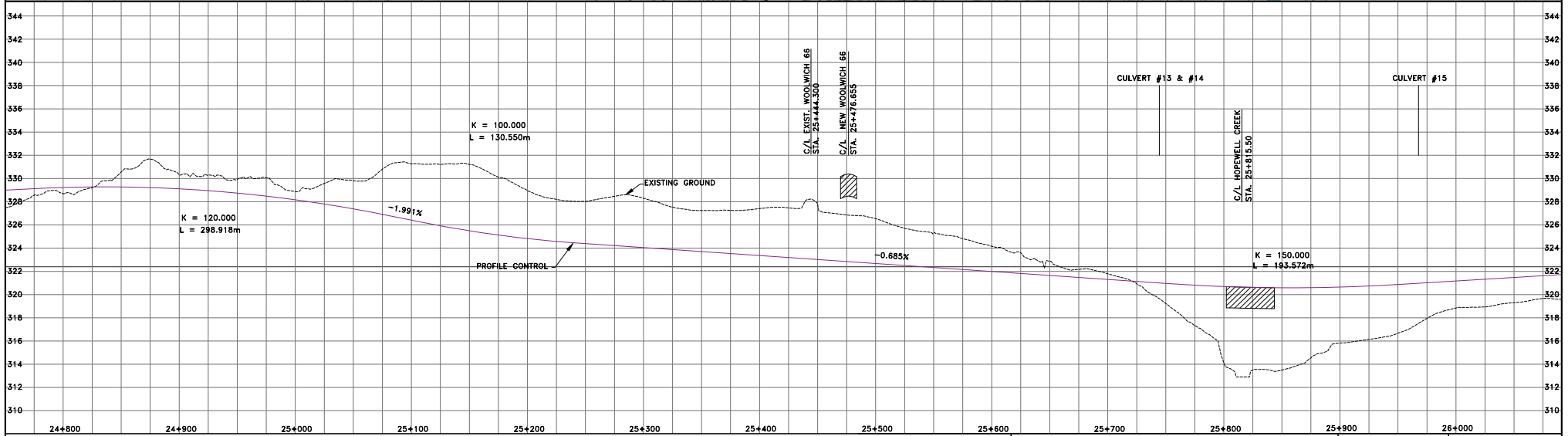
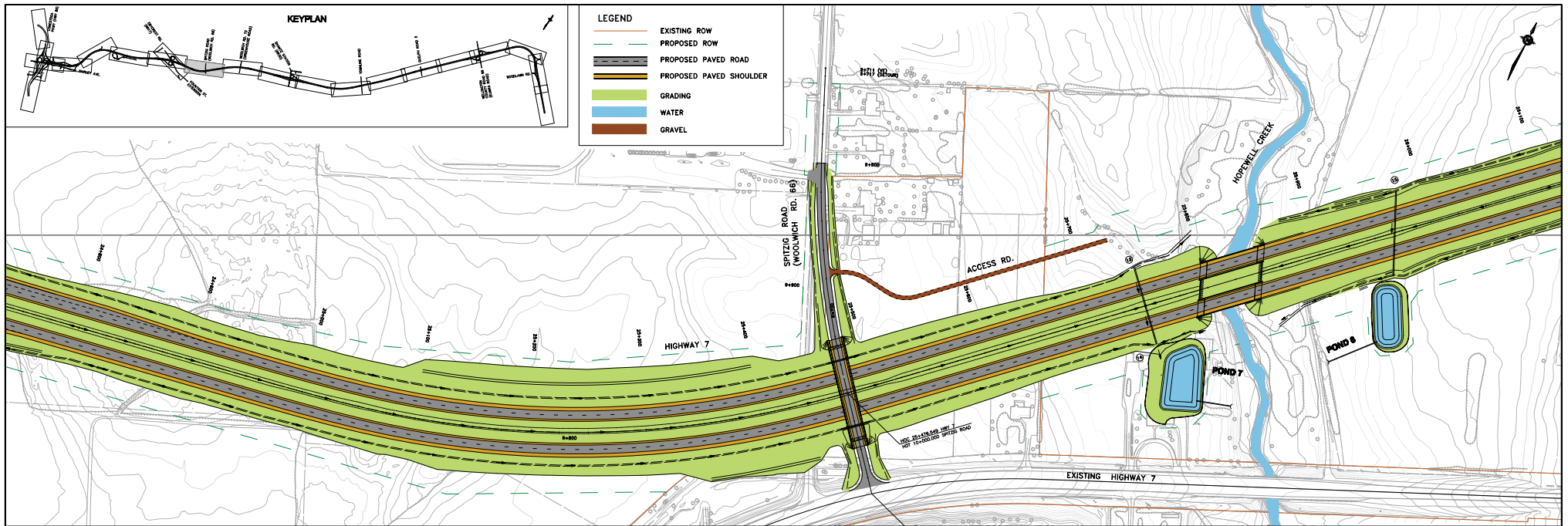


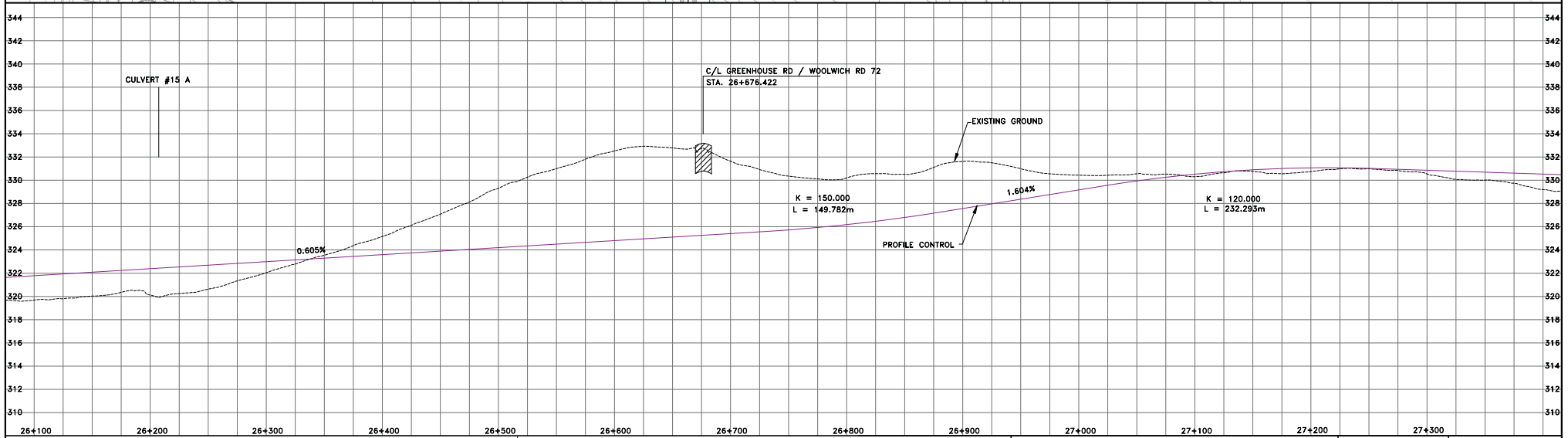
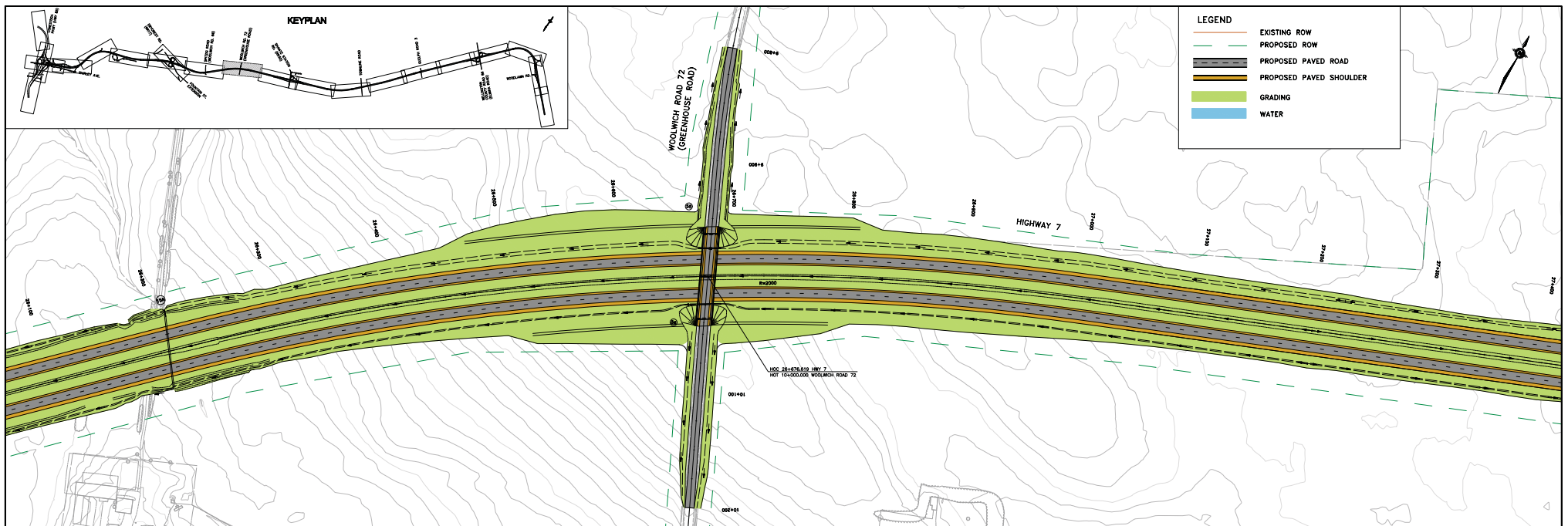
PLAN & PROFILE

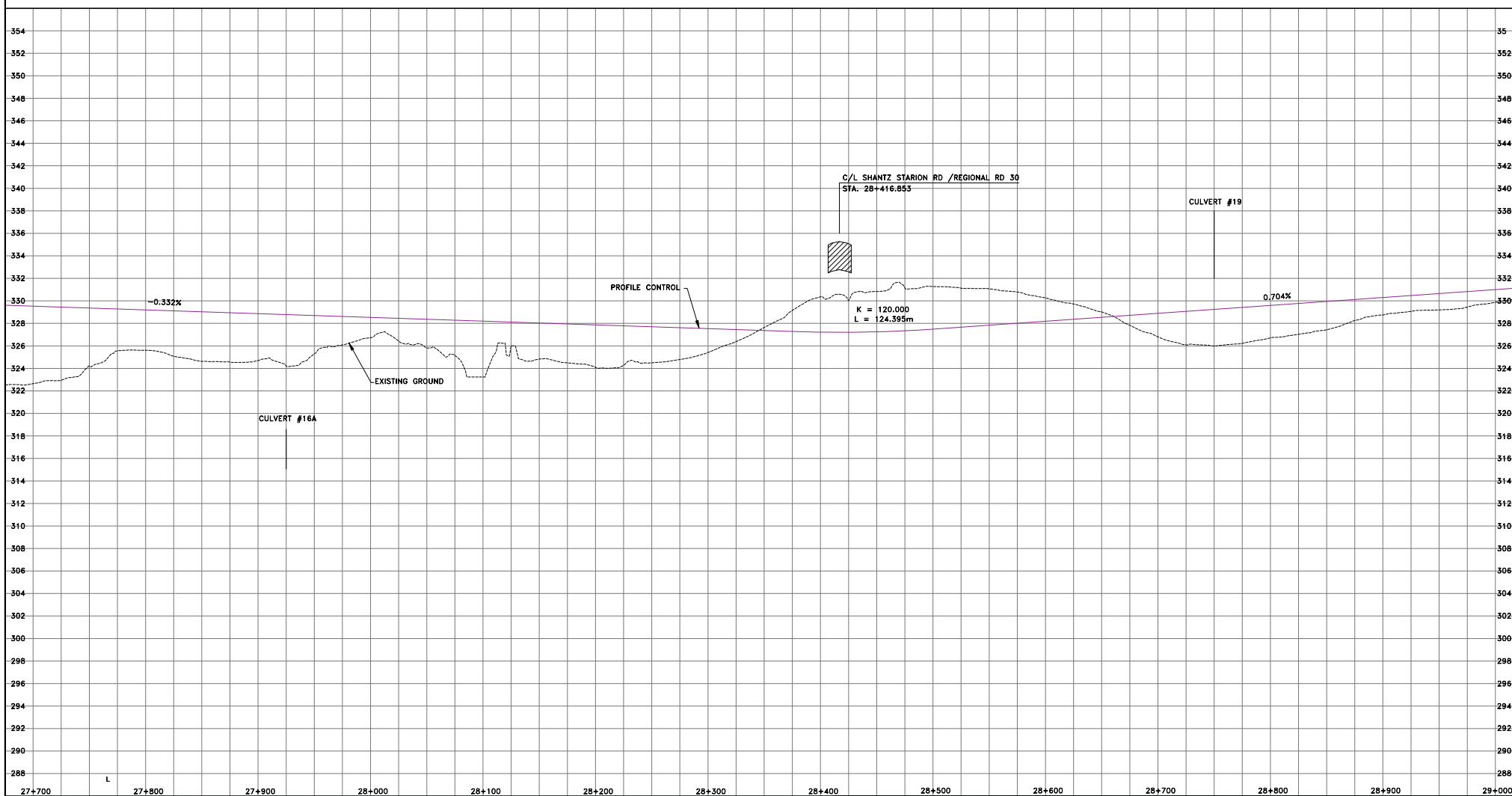
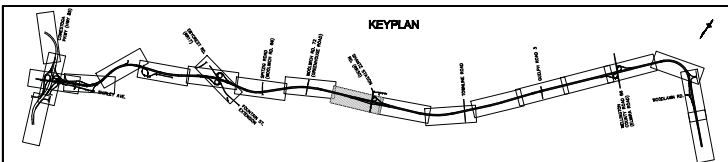
SCALE
 15m 0 30m
 Horizontal

PLATE
5









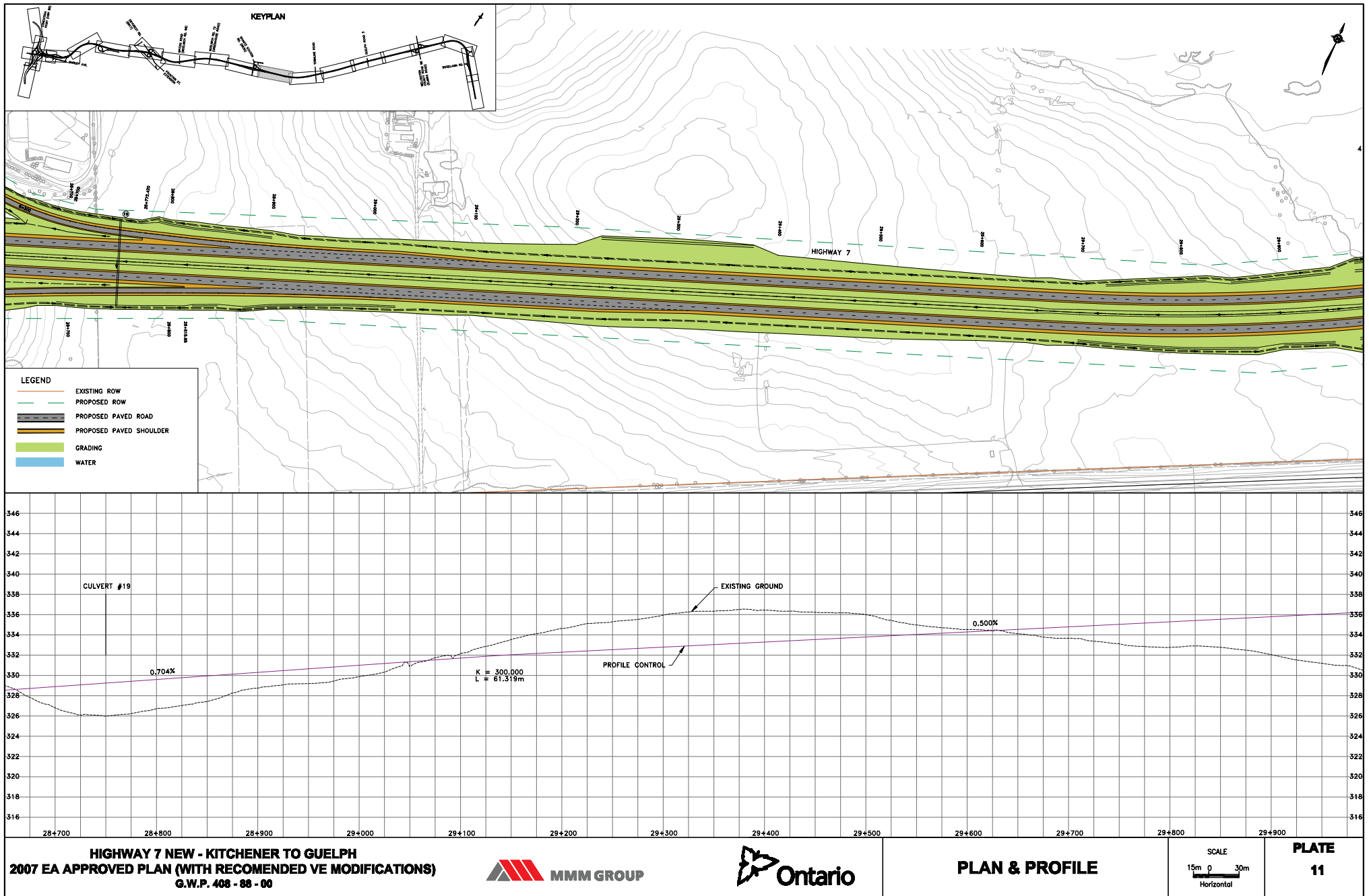
HIGHWAY 7 NEW - KITCHENER TO GUELPH
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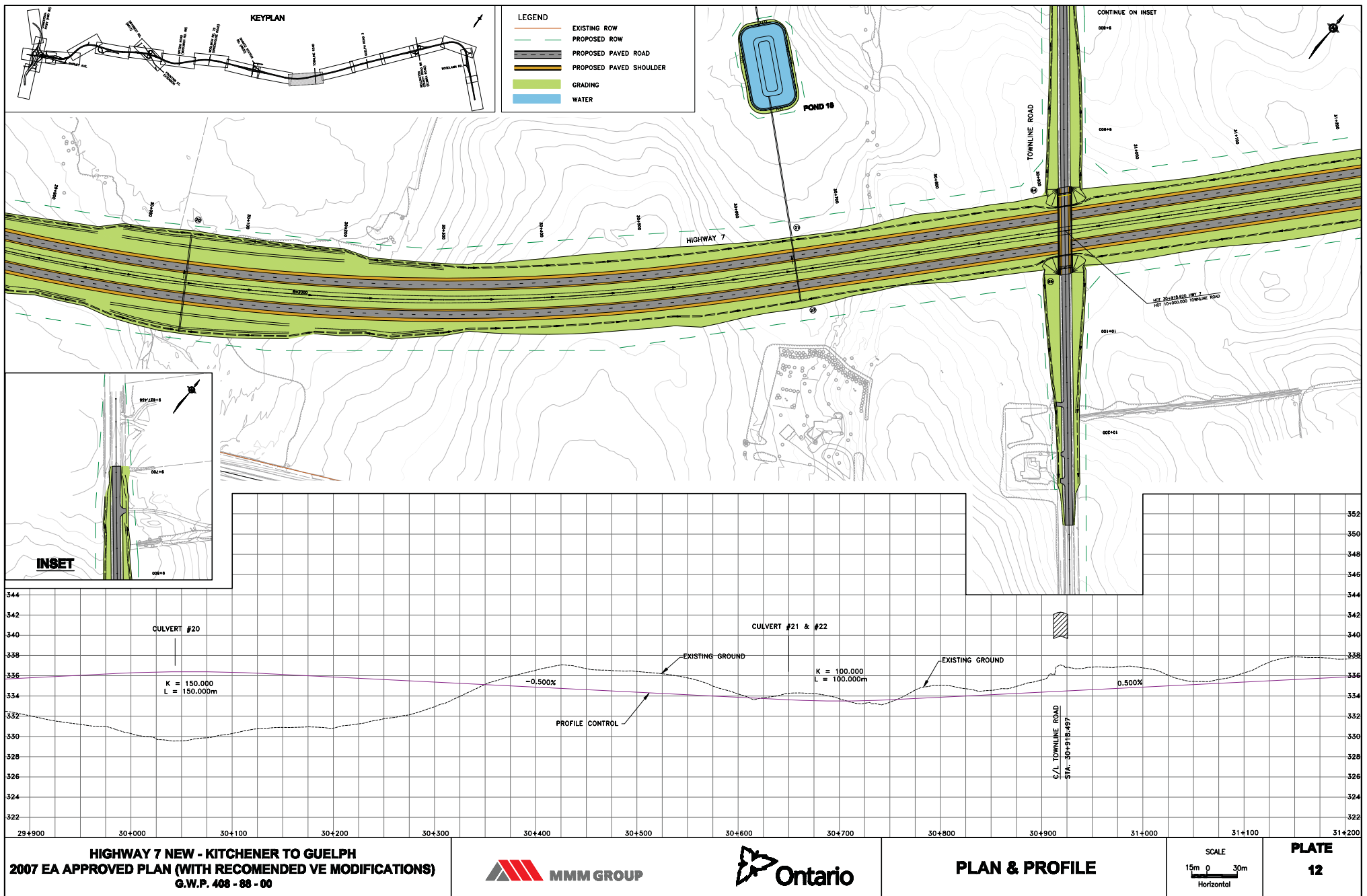


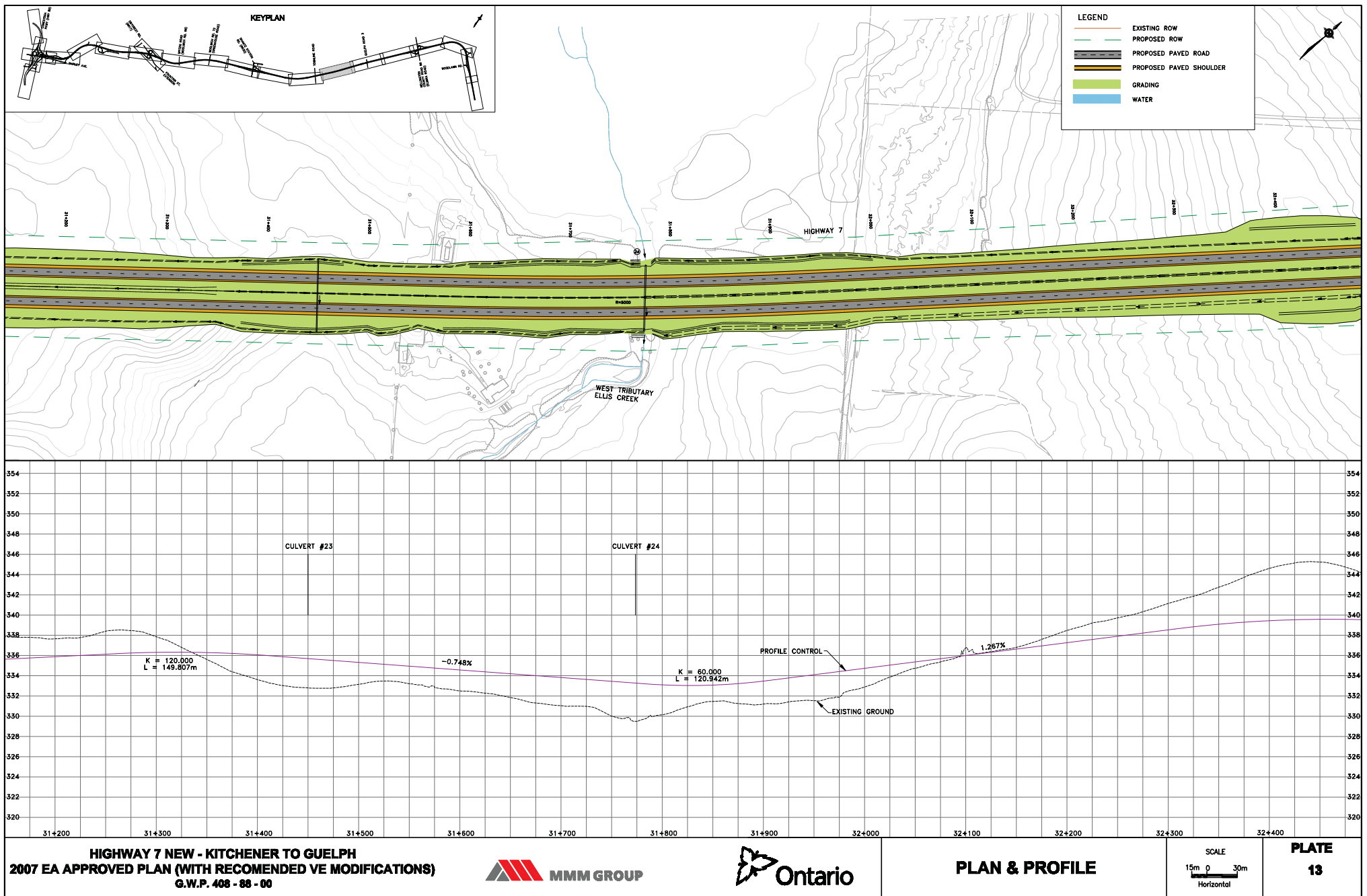
PLAN & PROFILE

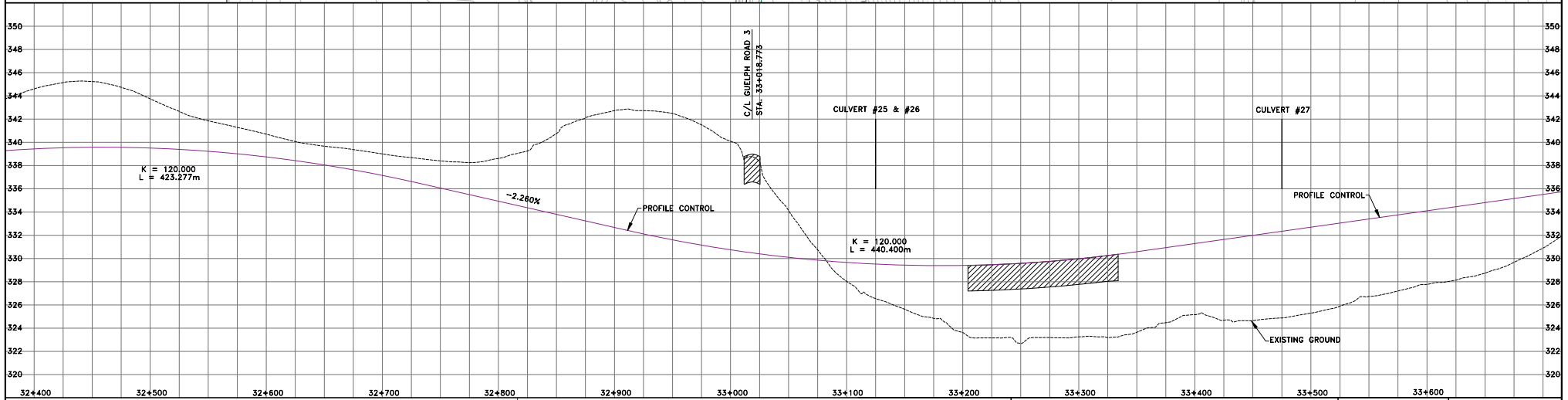
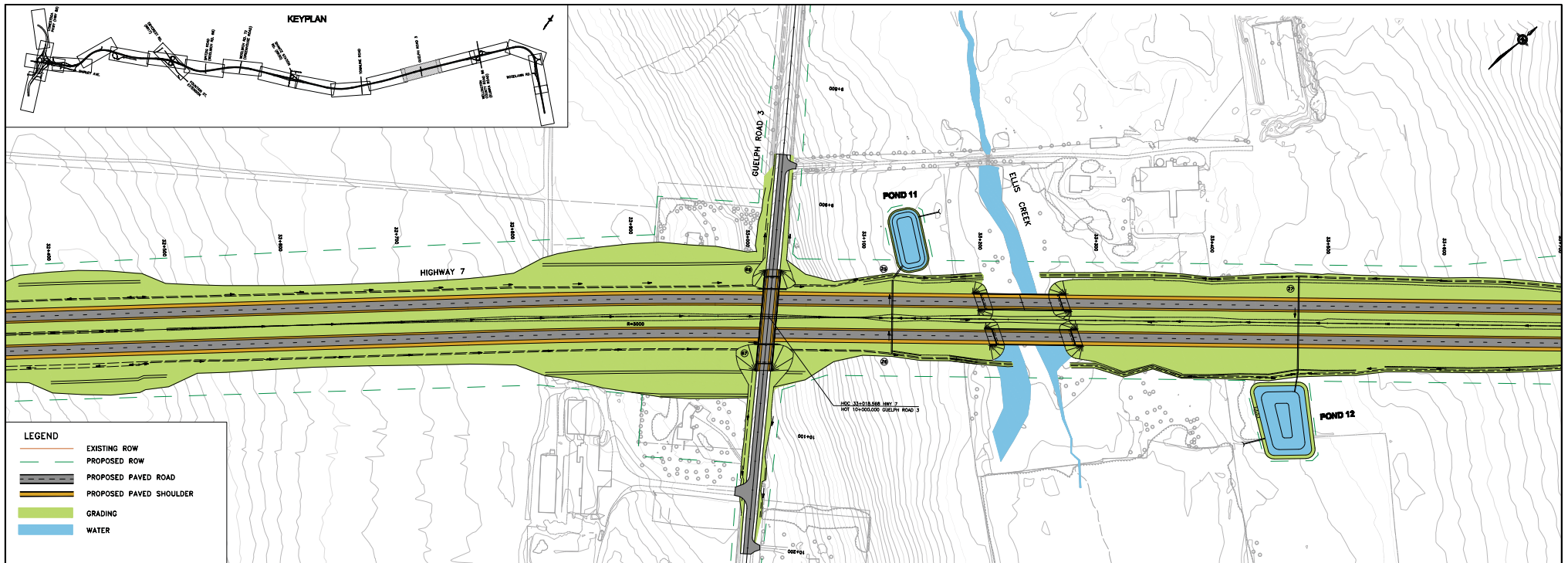
SCALE
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 Horizontal

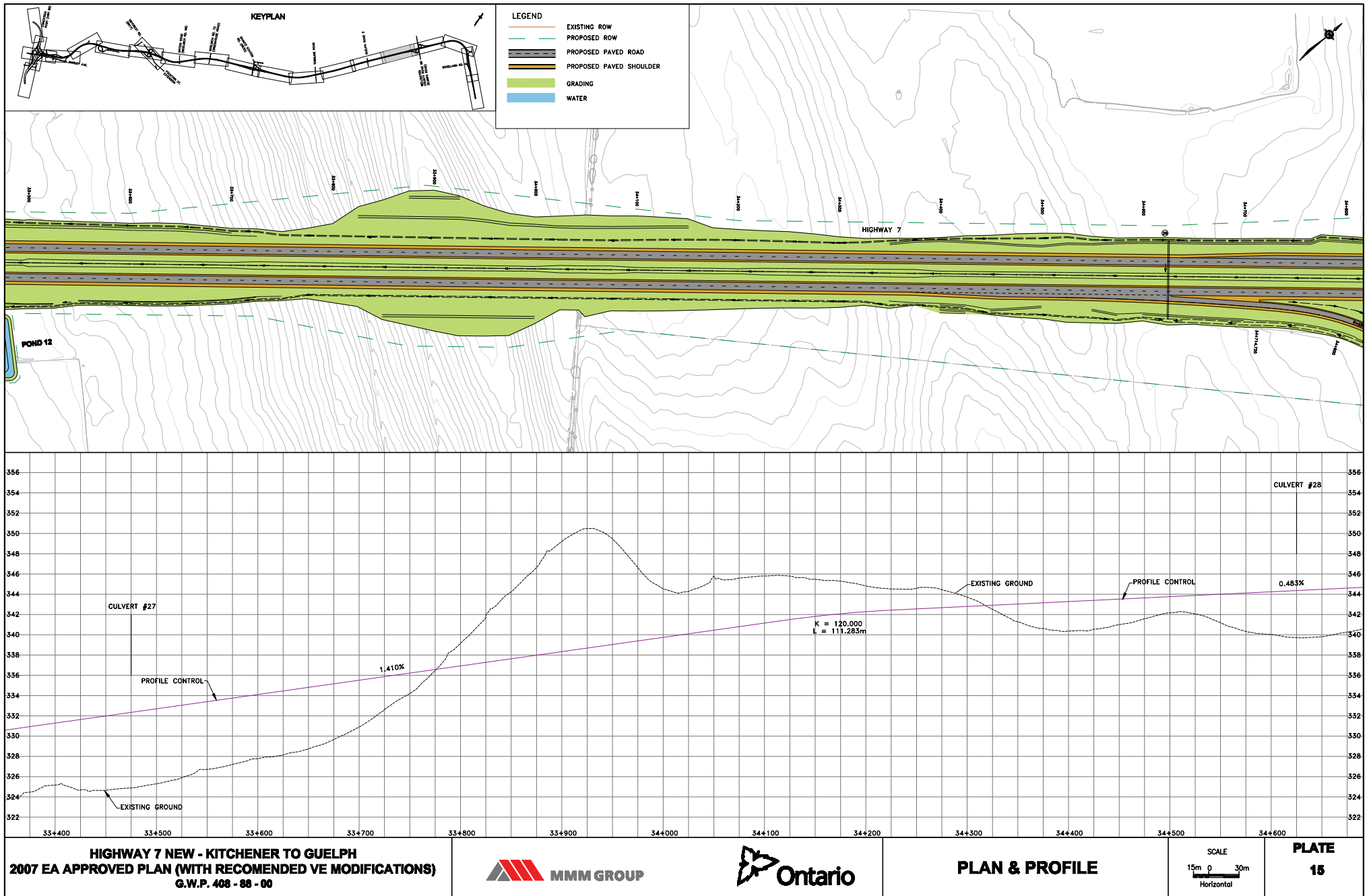
PLATE
10

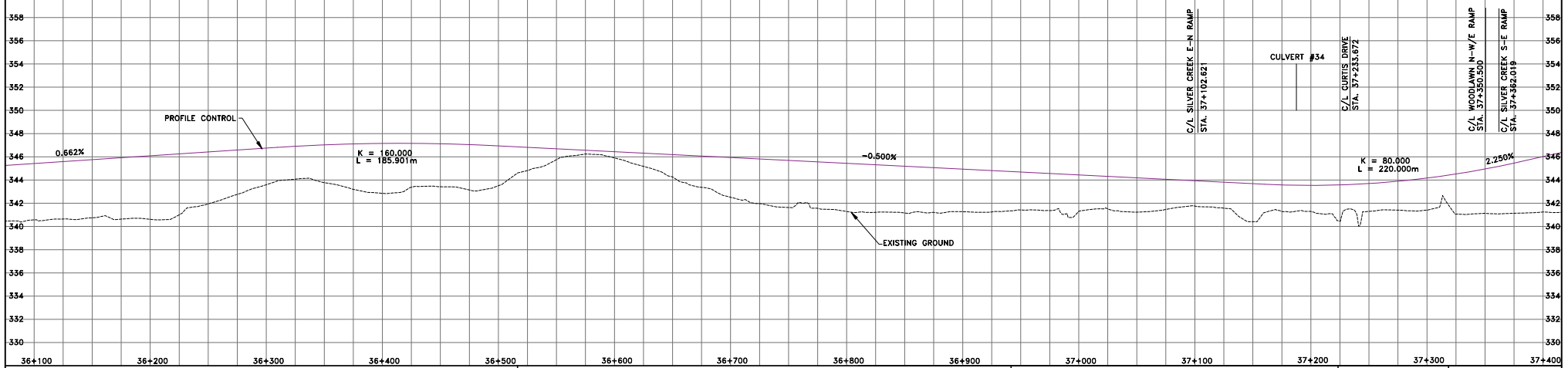


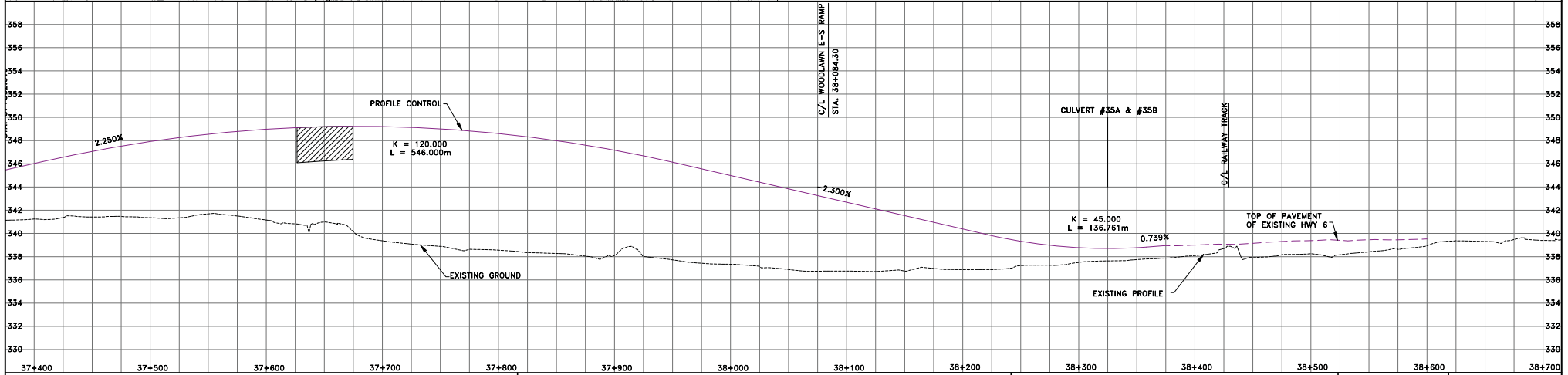
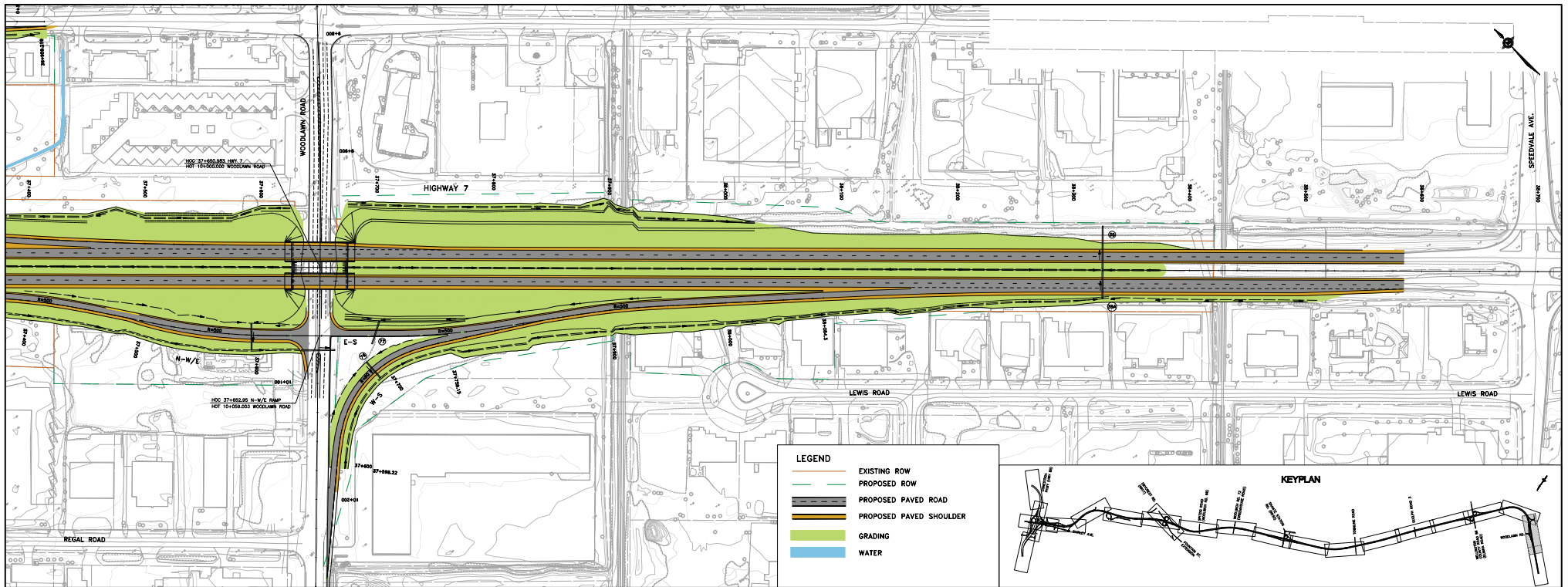












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2007 EA APPROVED PLAN (WITH RECOMMENDED VE MODIFICATIONS)
 G.W.P. 408 - 88 - 00



PLAN & PROFILE

SCALE
 15m 0 30m
 Horizontal

PLATE
18

HIGHWAY 7 NEW
Kitchener to Guelph, 18 km
G.W.P. 408-88-00

Public Information Centre

Tuesday May 3, 2011 (4:00pm to 8:00pm)
Bingemans – Ballroom A/B
425 Bingemans Centre Drive
Kitchener, ON

Your comments are appreciated. Please drop your completed comment sheet in the box provided or by mail/fax by **Friday May 20, 2011** to:

Ms. Alla Dinerman, P.Eng.
Senior Project Manager
MMM Group Limited
100 Commerce Valley Drive West
Thornhill, Ontario, L3T 0A1
Tel: (905) 882-7212, Fax: (905) 882-0055
E-mail: DinermanA@mmm.ca

COMMENTS:

- regarding the access to Shirley, it strikes me as cumbersome for patrons of local business to access the street based on the new VE recommendations from #85 Highway south bound. The original EA access is more seamless and beneficial for businesses on Shirley
- Bingemans for example is a large tourist attraction in our area that needs simplified access. The original EA assessment provides this but the revised makes signage and access difficult.
- Westbound access is more effective and simple.

Thank you for your participation.

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E-mail: DinermanA@mmm.ca

COMMENTS:

PLEASE SEND ME A PDF FILE OF THE PROJECT
BOARDS

I AM PARTICULARLY INTERESTED IN THE ~~EASTERN~~ WESTERN
(KITCHENER) END OF THE PROJECT

Thank you for your participation.

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COMMENTS:

Please a digital Copy
of plan 1,9 aerial photo
of Highway ending at River Bend and
Shady ave.

Great planning and finished date time
approx 2025?

Thank you for your participation.

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E-mail: DinermanA@mmm.ca

COMMENTS:

AS A REACTOR IN K-W, I WOULD
APPRECIATE AN ELECTRONIC ~~PH~~ COPY OF
THE MAPS, SATELITE IMAGES WITH OVERLAYS
AND TEXT DETAILS SHOWN IN THIS PRESENTATION.

GREAT PLAN! I LOVE THAT WE ARE
GOING WITH A NEW, LIMITED ACCESS, 4 LANE
HIGHWAY - MUCH SAFER AND LESS DISRUPTIVE
THAN WIDENING EXISTING HWY #7. THE INTERCHANGES
SHOWN MAKE SENSE - PERFECT PLAN!
LET'S GET THIS BUILT!

Thank you for your participation.

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Thornhill, Ontario, L3T 0A1
Tel: (905) 882-7212, Fax: (905) 882-0055
E-mail: DinermanA@mmm.ca

COMMENTS:

I WOULD LIKE ENGINEERED DRAWINGS OF
LAYOUT OF THE SHIRLEY AVE AREA 1
PROPOSED CHANGES ~~ON~~ REGARDING THE ELIMINATION
OF ORIGINALLY PROPOSED ON/OFF ACCESS
TO NEW HWY FROM SHIRLEY AVE.

EMAIL IS FINE

Thank you for your participation.

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MMM Group Limited
100 Commerce Valley Drive West
Thornhill, Ontario, L3T 0A1
Tel: (905) 882-7212, Fax: (905) 882-0055
E-mail: DinermanA@mmm.ca

COMMENTS:

Question

With regards to SJK School at 2201 Shantz Station Rd. it appears there will be a Service Rd. located on [redacted] South boundary (between our School & the new highway 7.)

[redacted] wondered if there was any possibility of having a tie in to our property from that Service Road.

It would cause traffic congestion through our small lane off of Shantz Station Rd.?
Perhaps one-way onto our property & one way out?

Thank you for your participation.

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E-mail: DinermanA@mmm.ca

COMMENTS:

Concerned with elimination of ramps
to / from Shirley (From Hwy 1)

Please provide pdf file so we
can further assess with other
Shirley Ave businesses

Thank you for your participation.

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E-mail: DinermanA@mmm.ca

COMMENTS:

The properties on the existing # 7 highway east of Shantz Station Rd will have their properties severed. The back portions of these properties will be land locked. What will become of these ^{severed} properties.

The adjacent lands are wetlandlands & woodlands. It would be beneficial to have these parcels left to naturalize as buffers to the ~~was~~ existing woodlands wetlands.

Thank you for your participation.

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E-mail: DinermanA@mmm.ca

COMMENTS:

Consider recommendations of GTA-West
Individual EA and a possible link/
connection between the two.

GTA West has its Western study limits
within close proximity to Highway 7 New's
Eastern limits, and it would be a
very logical connection.

Thank you for your participation.

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COMMENTS:

- PLEASE NOTE THAT I HAVE SIMILAR COMMENTS THAT WILL BE SUBMITTED AS PART OF THE "BUSINESS & STAKEHOLDERS MEETING" THAT I ATTENDED APRIL 28, 2011. See COMMENTS BELOW:
- 1.) PLEASE ALLOW YOUR TRAFFIC PROTECTIONS FROM THE CORSTOGA EXPRESSWAY TO BINGEMANS CENTRE DRIVE. THERE ARE 4 EXIST. LANES (5 ON BINGEMANS CENTRE DRIVE) AT BOTH ENDS OF YOUR PROPOSED RECONSTRUCTION OF SHIRLEY AVENUE. FROM WHAT WE SEE - YOU ARE PROPOSING THIS NEW ROAD LINK TO STAY AT 2 LANES.
- CHECK TRAFFIC PROJECTIONS THAT WERE PROVIDED IN MRC'S ENVIRONMENTAL STUDY REPORT FOR THE "LACKNER BOULEVARD AND SHIRLEY AVENUE LOCATION STUDY" DATED DEC. 2000.
 - 2.) DISAGREE WITH THE REMOVAL OF THE "W-SHIRLEY SIDE RAMP". THIS WILL CREATE TREMENDOUS TRAFFIC ON THE NORTHBOUND RAMP TO WELLINGTON TO SHIRLEY AVE. DEFINITELY WILL NEED MORE THAN 2 LANES.
 - 3.) AS WELL DISAGREE WITH REMOVAL OF KWE-8 RAMP. WHILE I RECOGNIZE THERE ARE "WEAVING PROBLEMS" THIS WAS ADDRESSED IN THE 2007 APPROVED E.A. IT WAS OK THEN - WHY NOT NOW?
- Thank you for your participation.

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E-mail: DinermanA@mmm.ca

COMMENTS:

I am not happy about the following, but am hopeful my concerns will be alleviated in the next design phase.

① Water filtration pond (#1 on map) has been placed in a way that effectively eliminates our ability to access or use the western half of our residential property.

Solution: Re align pond so that it lies adjacent to the highway + thus further north on land that does not belong to us. Drainage pipes could cross our land if needed, to the river, but caution should be taken with the design as bank is NOT stable in area where pipes are illustrated in present design.

② Exit ramp to Bridge St. E should be moved to the east slightly. This would provide a longer ramp with a gentler curvature, allowing traffic to enter onto highway at a better speed, with greater visibility of what traffic is coming on highway itself. (An entry ramp on a curve is not the safest thing in the first place!)

Thank you for your participation.

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③ Our business will have some spacing problems but maps are too small to tell exactly what those issues are.

☐ Please check (✓) if you do not require a response to your comments

④ The driveway for our house will have to be to the north of our cedar woods + pond area, as it is designated schedule 11 land. This means we would need a right of way over



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COMMENTS:

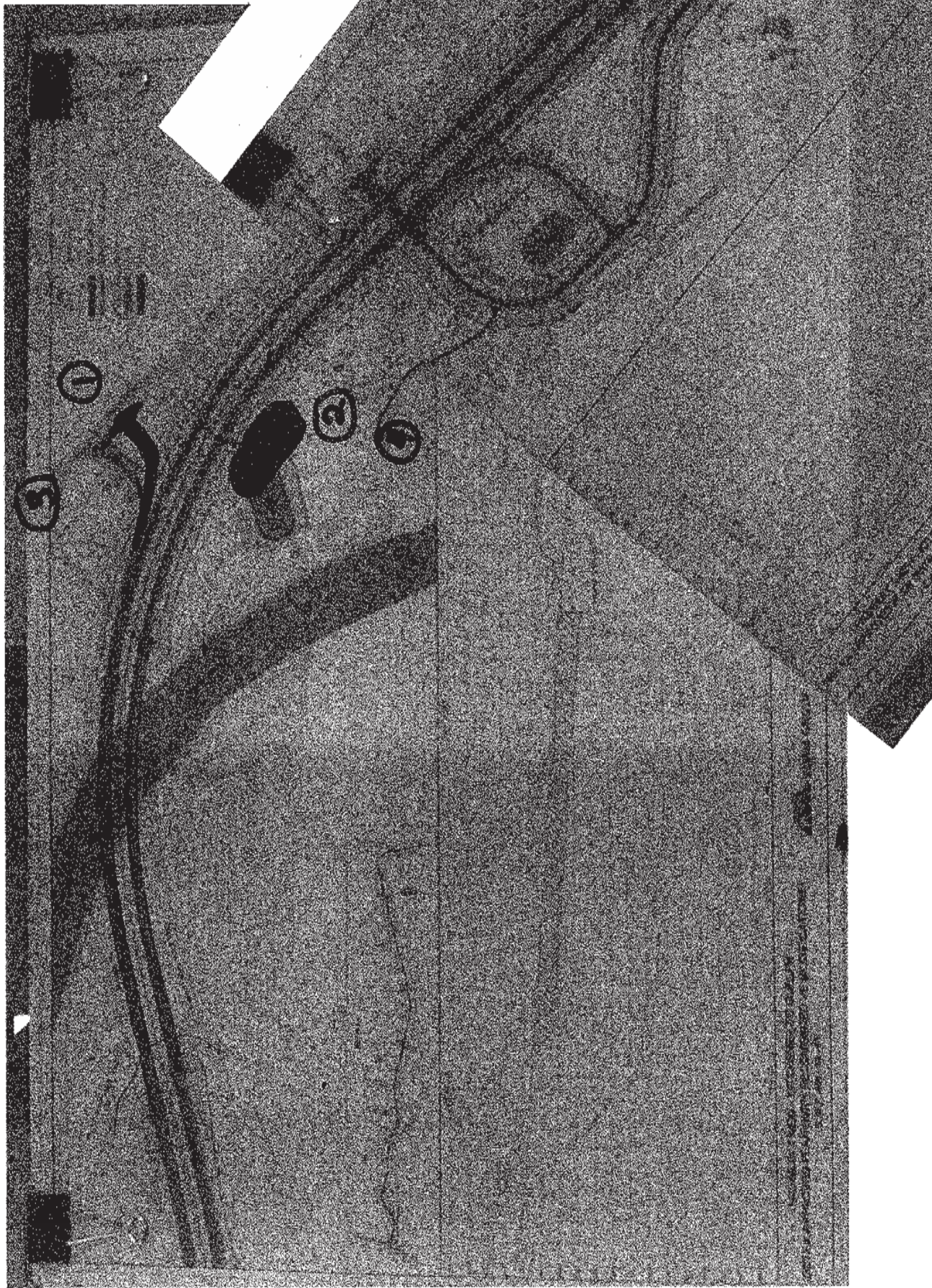
Taking Land from the east side of my commercial property makes it impossible to unload tractor trailers. We made it clear from day one, that we could not lose any industrial land. If the land ~~to be~~ size is reduced in any way, an outside industrial crane way would have to be installed (at the expense of the MTO) in order to continue in business.

The ministry has mislead us every step of the way through this land acquisition process. Taking more land to the south of my residential land for a drainage pond (thus cutting my land in 2 both east/west and north/south). Moving the highway exit ramp + drainage pond, were items that were never discussed with us. This whole process has been poorly handled.

Thank you for your participation.

Comments and information regarding this project are being collected to assist the Ministry of Transportation in completing design of the project and in meeting its requirements under the Environmental Assessment Act. They will be maintained on file for use during the study and may be included in study documentation. With the exception of personal information, all comments will become part of the public record in accordance with the Freedom of Information and Privacy Act R.S.O., 1990, c.F.31.

☐ Please check (✓) if you do not require a response to your comments



- As discussed in the information session, the business owners in this area spent much effort and time working with the MTO to create a layout that made the best sense for both traffic flow and access for the businesses – why has this not be put aside with no discussion? What are the reasoning's for making changes from the unified acceptance?
- In your presentations, you should be shown in animation how the traffic will flow through these options, as well you are not showing any traffic lights, which should also be highlighted, as it has become clear during your presentation that this will likely cause significant delays and gridlock
 - In the VE option, how will we access both in bound and out bound on our business operations at 40 Shirley Avenue, as the traffic flow will prevent turns during most times of the day

Submitted May 3, 2011

Our comments as follows regarding the proposed items:

- as you have stated, that Shirley Ave will remain 2 lanes:
 - this will never be able handle the current and future traffic that these changes will be generating
 - from Wellington street (4lanes) to your proposed Shirley Ave (2lanes) to Bingemans Centre Drive (5lanes); this bottle neck should be obvious
 - there will be no room for transport trucks coming in and out of businesses to make their proper turns on the road way
 - with only 2 lanes, people turning left will block traffic during peak flows
 - you are adding traffic to the use of this area, there is no way this will handle the traffic effiently
 - Wellington street
 - Victoria street
 - Edna street
 - Riverbend
 - Expressway ramping
 - Does not account for the increased business development along Bingemans Centre Drive or the Rockway Holdings property and further
- your stated traffic counts do not take into account peak uses, do not take into account the increased usage that will be achieved; do not match the City of Kitchener's information that made their decision to make Bingemans Centre Drive 5 lanes several years ago – clearing this will continue
- We can appreciate your change for the removal of the ramping on the side of the Grand River, however removal of the ramp leading onto Shirley Ave, makes no sense what so ever; again with the volume of traffic and the usage of this route will require this direct access from the expressway

Sonia Rankin

From: Alla Dinerman
Sent: Wednesday, May 04, 2011 2:30 PM
To: [REDACTED]
Cc: Sonia Rankin; Jeff Warren
Subject: RE: item missing from our list

[REDACTED]

Thank you very much for your input. We will add this point to our list of items to consider and address.

Regards,
Alla.

Alla Dinerman, P.Eng.

Senior Project Manager, Transportation Engineering
Partner
MMM Group Limited
100 Commerce Valley Drive West
Thornhill, Ontario, Canada L3T 0A1
t: (905) 882-7212 | f: (905) 882-0055 | c: 647-223-6335
DinermanA@mmm.ca | www.mmm.ca

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Please consider the environment before printing this e-mail and/or its attachments.

From: [REDACTED]
Sent: Wednesday, May 04, 2011 2:15 PM
To: Alla Dinerman
Subject: item missing from our list

Hi Alla,

I neglected to include the item that I had mentioned during the meeting:

- * Proper Signage – way finding
- * this will be a key to ensure that the travelling public fully knows where things are and how to get there.

HIGHWAY 7 NEW
Kitchener to Guelph, 18 km
G.W.P. 408-88-00

Public Information Centre

Thursday May 5, 2011 (4:00pm to 8:00pm)
Guelph Place Banquet Hall
492 Michener Road
Guelph, ON

*Your comments are appreciated. Please drop your completed comment sheet in the box provided or by mail/fax by **Friday May 20, 2011** to:*

Ms. Alla Dinerman, P.Eng.
Senior Project Manager
MMM Group Limited
100 Commerce Valley Drive West
Thornhill, Ontario, L3T 0A1
Tel: (905) 882-7212, Fax: (905) 882-0055
E-mail: DinermanA@mmm.ca

COMMENTS:

Marden South

Thank you for your participation.

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Senior Project Manager
MMM Group Limited
100 Commerce Valley Drive West
Thornhill, Ontario, L3T 0A1
Tel: (905) 882-7212, Fax: (905) 882-0055
E-mail: DinermanA@mmm.ca

COMMENTS:

Re: Target area #3 - Bridge St Realignment

We have a concern about the safe access in & out of our driveway due to reduced visibility of traffic with the changed direction of the road.

We would appreciate some feed back on this & thank you for your consideration

Thank you for your participation.

Comments and information regarding this project are being collected to assist the Ministry of Transportation in completing design of the project and in meeting its requirements under the Environmental Assessment Act. They will be maintained on file for use during the study and may be included in study documentation. With the exception of personal information, all comments will become part of the public record in accordance with the Freedom of Information and Privacy Act R.S.O., 1990, c.F.31.

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Thornhill, Ontario, L3T 0A1
Tel: (905) 882-7212, Fax: (905) 882-0055
E-mail: DinermanA@mmm.ca

COMMENTS:

part 31 like the at first + still don't
What impact will the bridge
at Kossuth Rd over to Kitchener
have on traffic on 7 highway lane.
This bridge is already under construction
and will be finished before you
start 7 highway to GUELPH.

Thank you for your participation.

Comments and information regarding this project are being collected to assist the Ministry of Transportation in completing design of the project and in meeting its requirements under the Environmental Assessment Act. They will be maintained on file for use during the study and may be included in study documentation. With the exception of personal information, all comments will become part of the public record in accordance with the Freedom of Information and Privacy Act R.S.O., 1990, c.F.31.

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HIGHWAY 7 NEW
Kitchener to Guelph, 18 km
G.W.P. 408-88-00

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492 Michener Road
Guelph, ON

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Senior Project Manager
MMM Group Limited
100 Commerce Valley Drive West
Thornhill, Ontario, L3T 0A1
Tel: (905) 882-7212, Fax: (905) 882-0055
E-mail: DinermanA@mmm.ca

COMMENTS:

Please send me Plate #17 (intersection of Silvercreek)
digital copy.

Thank you for your participation.

Comments and information regarding this project are being collected to assist the Ministry of Transportation in completing design of the project and in meeting its requirements under the Environmental Assessment Act. They will be maintained on file for use during the study and may be included in study documentation. With the exception of personal information, all comments will become part of the public record in accordance with the Freedom of Information and Privacy Act R.S.O., 1990, c.F.31.

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G.W.P. 408-88-00

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492 Michener Road
Guelph, ON

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Senior Project Manager
MMM Group Limited
100 Commerce Valley Drive West
Thornhill, Ontario, L3T 0A1
Tel: (905) 882-7212, Fax: (905) 882-0055
E-mail: DinermanA@mmm.ca

COMMENTS:

Please provide me with a e-copy of the Hwy
7 package.

Thank you for your participation.

Comments and information regarding this project are being collected to assist the Ministry of Transportation in completing design of the project and in meeting its requirements under the Environmental Assessment Act. They will be maintained on file for use during the study and may be included in study documentation. With the exception of personal information, all comments will become part of the public record in accordance with the Freedom of Information and Privacy Act R.S.O., 1990, c.F.31.

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Senior Project Manager
MMM Group Limited
100 Commerce Valley Drive West
Thornhill, Ontario, L3T 0A1
Tel: (905) 882-7212, Fax: (905) 882-0055
E-mail: DinermanA@mmm.ca

COMMENTS:

Can I get a copy of plate #14 please.



Thank you for your participation.

Comments and information regarding this project are being collected to assist the Ministry of Transportation in completing design of the project and in meeting its requirements under the Environmental Assessment Act. They will be maintained on file for use during the study and may be included in study documentation. With the exception of personal information, all comments will become part of the public record in accordance with the Freedom of Information and Privacy Act R.S.O., 1990, c.F.31.

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Senior Project Manager
MMM Group Limited
100 Commerce Valley Drive West
Thornhill, Ontario, L3T 0A1
Tel: (905) 882-7212, Fax: (905) 882-0055
E-mail: DinermanA@mmm.ca

COMMENTS:

Please send digital copy of the following
① Natural Environment Features
② Plan + profile - plate 16
③ drawing North of Plate 16

Concerns:

Storm water issues @ North and North West of plate 16 - please provide storm water ~~man~~ extraction plan and future plan with volumes under regulatory specifications

Thank you for your participation.

Comments and information regarding this project are being collected to assist the Ministry of Transportation in completing design of the project and in meeting its requirements under the Environmental Assessment Act. They will be maintained on file for use during the study and may be included in study documentation. With the exception of personal information, all comments will become part of the public record in accordance with the Freedom of Information and Privacy Act R.S.O., 1990, c.F.31.

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Senior Project Manager
MMM Group Limited
100 Commerce Valley Drive West
Thornhill, Ontario, L3T 0A1
Tel: (905) 882-7212, Fax: (905) 882-0055
E-mail: DinermanA@mmm.ca

COMMENTS:

- (1) VE analysis should include examination of appropriate phasing of construction - i.e. west portion from Fountain St west is more likely to be justified than the eastern portion and east portion should be built only after the Hanlon has all at grade intersections replaced.
- (2) Woodlawn/Silver Creek access in Guelph should be reexamined; current provision for westbound access from Woodlawn via Silver Creek is inadequate.
- (3) Stormwater ponds are no longer the preferred management option for stormwater. Redesign of ponds, replacing with water quality control systems with high removal efficiency for all pollutants (including nutrients, road salt) is required.
- (4) Reports must deal explicitly with bicycle users at access lane intersections with collector roads.

Thank you for your participation.

Comments and information regarding this project are being collected to assist the Ministry of Transportation in completing design of the project and in meeting its requirements under the Environmental Assessment Act. They will be maintained on file for use during the study and may be included in study documentation. With the exception of personal information, all comments will become part of the public record in accordance with the Freedom of Information and Privacy Act R.S.O., 1990, c.F.31.

☐ Please check (✓) if you do not require a response to your comments

Ministry of Transportation
West Region

659 Exeter Road
London, Ontario N6E 1L3
Telephone: (519) 873-4500
Facsimile: (519) 873-4600

Ministère des Transports
Région de l'Ouest

659, chemin Exeter
London (Ontario) N6E 1L3
Téléphone : (519) 873-4500
Télécopieur : (519) 873-4600



April 4, 2011

**RE: Highway 7 New –Kitchener to Guelph, WP 408-88-00
Response to Questions and Comments**

Thank you for your email of September 10, 2010 containing questions and comments related to the above noted project. I am pleased to provide the following responses.

Q1.) Have warrants been completed at any new intersections to determine if signals are required? If so, have roundabouts been considered?

A1.) A traffic analysis was not included in this initial phase of design. This will be undertaken during the next phase of design.

Q2.) Has a Synchro analysis been done at all the new/altered intersections? In particular, there is a concern with the new ramp terminal on Victoria Street. The width of the bridge limits the ability to lengthen storage lanes if required. As there is no widening of this structure shown, there is concern these terminals will cause queuing issue on the highway and local roads. This concern is also duplicated on Wellington Street, but that road is under the jurisdiction of the City of Kitchener today.

A2.) As mentioned in the response to question 1, a traffic analysis was not completed as part of this initial phase of design. This will be completed in the next phase of design. We are currently reviewing rehabilitation and replacement options for the Victoria Street Bridge as part of this project. Once we have decided on a preferred option, we can discuss this further with Regional staff.

Q3.) When the Synchro analysis is completed, the Region would like to discuss it to make sure the Region can add necessary improvements on Regional Roads to the capital program for timely construction.

A3.) The Ministry will make this information available to you when it is completed in the next phase of design.

Q4.) It is not clear how pedestrians and cyclists on Wellington Street, Riverbend Drive And Shirley Avenue will be accommodated. We have had a number of discussions with MTO staff regarding these active modes and would like to address these issues. It would also be advantageous to the operations of all the ramp terminals to remove the active modes where possible and accommodate them separately.

A4.) Since it has been some time since these issues have been discussed and the initial design is near completion, I would suggest that a meeting be arranged between the MTO, our consultant and Regional staff after this consultation period has been completed to discuss these specific issues.

Q5.) Will reference plans be completed that show MTO's jurisdiction?

A5.) Reference plans will be completed.

Q6.) The recently completed Regional Master Plan recommends protecting for a full-clover leaf interchange long term at Shantz Station Road and Highway 7. Can the land be protected now for this long term need. We can add it to the Region's official plan as a long term corridor protection policy.

A6.) The interchange that is currently planned for Shantz Station Road and the New Highway 7 consists of a Parclo A configuration on the north side and a diamond configuration on the south side. A diamond configuration was selected for the south side due to the close proximity that existing Highway 7 will be to the interchange. The Ministry cannot protect property at this location without an addendum to the approved EA. The option of a full Parclo A interchange was not recommended from the VE Study and is not part of this EA addendum.

Q7.) How is the closure of Ebycrest being dealt with? The Region would like to participate in the process and suggest that the Township be involved as well.

A7.) Since the Ministry is the proponent of this project, we will take the lead in the closure of Ebycrest Road. We would welcome the support and participation of the Region and the Township in this process.

Q8.) Is there a plan to illuminate the highway and will the impacted properties be advised?

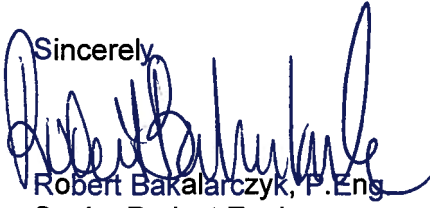
A8.) The plan is only to provide illumination at the Grand River Bridge and partial illumination at the interchanges.

Q9.) What is the timing of the EA addendum?

A9.) The EA addendum is expected to be published for public review this summer.

If you have any further comments or questions, please do not hesitate to contact me at (519) 873-4602.

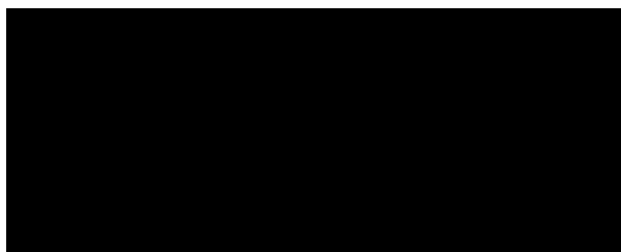
Sincerely,

A handwritten signature in blue ink, appearing to read 'Robert Bakalarczyk', written over the printed name.

Robert Bakalarczyk, P.Eng
Senior Project Engineer
Planning and Design
West Region

MMM Group Limited
100 Commerce Valley Drive West,
Thornhill, Ontario, L3T 0A1
t: 905.882.1100 | f: 905.882.0055
www.mmm.ca

January 16, 2012
1608027- E3.4



Subject: Highway 7 New, Kitchener to Guelph (GWP 408-88-00)
Public Information Centre – May 5, 2011; Response to Comment

On behalf of the Ministry of Transportation (MTO), MMM Group Limited would like to thank you for attending the Public Information Centre (PIC) on May 3, 2011 and for meeting with the MTO Project Manager, Robert Bakalarczyk on June 2 to further discuss your interest in obtaining an additional access to St. John's-Kilmarnock School property via the Municipal Road associated with Value Engineering (VE) Option at this location. Since your meeting, the ministry has further reviewed this VE Option and has determined that only a private access may be required, rather than a Municipal Road. Once this VE Option has been finalized, we will contact you regarding the final outcome.

Thank you for bringing this matter to our attention. Should you require clarification or additional information please contact the undersigned by phone (905) 882-7212 or by email at dinermana@mmm.ca.

Yours very truly,

MMM GROUP LIMITED

A handwritten signature in black ink, appearing to read "Alla Dinerman".

Alla Dinerman, P. Eng.
Senior Project Manager
Transportation Engineering

cc: Rob Bakalarczyk (MTO), Susan Wagter (MTO), Jeff Warren (MMM)

M:\Jobs\2008\16.08027.001.EN1 - MTO Highway 7 Kitchener-Guelph\E2 Public Consultation\E2.4 PIC v2\PIC Letters\2011_03_28 MPP-MP-Letter DRAFT.doc

Sonia Rankin

From: Alla Dinerman
Sent: Wednesday, May 11, 2011 10:38 AM
To: [REDACTED]
Cc: Bakalarczyk, Robert (MTO); Sonia Rankin; Wagter, Susan (MTO); Jeff Warren
Subject: RE: New Highway 7 - G.W.P. 408-88-00

[REDACTED]

Thank you very much for your interest in this project.

We will be happy to add your name to the mailing list and provide you with a digital copy of the PIC displays. Should we use the address below to send you a CD with this information?

There is no definitive timing for construction yet. This project is currently listed in the Southern Highways Program under "Planning for the Future." On an annual basis, this project will be considered for construction as part of the future Southern Highways Program, based on provincial priorities and availability of funding. The Ministry of Transportation will continue to move this project forward until the funding for construction becomes available.

Acquisition of all of the properties needed for the project must be completed before construction could begin. Given the number of owners (over 110), this will take a minimum of 30 months. The Ministry has now identified both the financial and staffing resources to undertake the acquisition of all of the properties that are required for this project. It is expected that property acquisition will commence fall 2011.

The Ontario government recognizes how important it is to support growing communities like Kitchener. This is why they are committed to building the new Highway 7 to ease traffic congestion, enhance safety and accommodate growth in the area.

Sincerely,
Alla.

Alla Dinerman, P.Eng.

Senior Project Manager, Transportation Engineering

Partner

MMM Group Limited

100 Commerce Valley Drive West

Thornhill, Ontario, Canada L3T 0A1

t: (905) 882-7212 | f: (905) 882-0055 | c: 647-223-6335

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Please consider the environment before printing this e-mail and/or its attachments.

Sent: Tuesday, May 10, 2011 5:45 PM
To: Alla Dinerman; Robert.Bakalarczyk@ontario.ca
Subject: New Highway 7 - G.W.P. 408-88-00

Good afternoon Ms. Dinerman and Mr. Bakalarczyk,

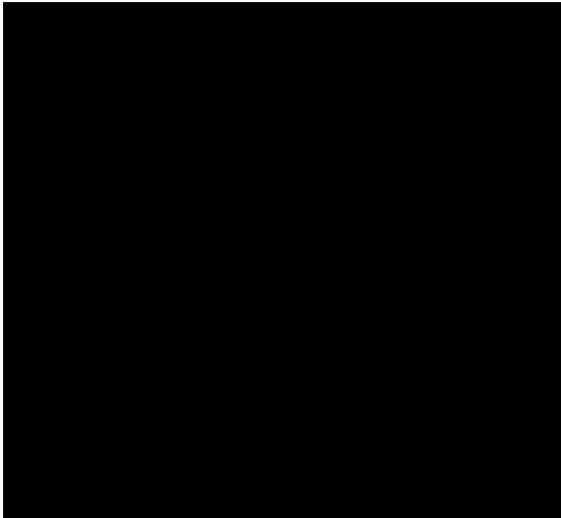
I wasn't able to attend the PIC sessions last week, but wondered if you can add me to the e-mail/ mailing list.

Not sure if the PIC presentation is available digitally or you could provide a link to any background information.

I live in south end of Guelph and commute to downtown Kitchener. I am also a land use planner doing work in the area.

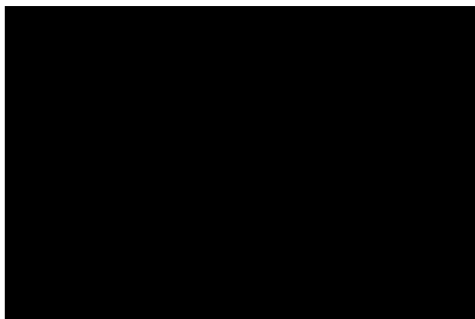
This road is an important transportation route and is long overdue to be constructed. I believe this road is a very important element to assist in promoting and enhancing the regional economy.

Is there any general timing for the construction of this road at this point?



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December 2, 2011
16.08027 - E3.4



**Subject: Highway 7 New, Kitchener to Guelph GWP 408-88-00
Public Information Centre, May 2011; Information Request Package,**

On behalf of the Ministry of Transportation, MMM Group Limited would like to thank you for your interest in the Highway 7 New project from Kitchener to Guelph and for your recognition of the importance of the project.

In response to your request, we wish to provide you with a digital copy of the Public Information Centre (PIC) display material for your reference. The display material was made available for public review at both PICs, in Kitchener on Tuesday May 3, 2011 and in Guelph on Thursday May 5, 2011. The PIC display boards describe the recommendations of the Value Engineering (VE) study and provide information related to the initial phase of detail design for the overall project. We have also added you to the contact list for the project.

The timing of construction has not yet been determined as it is based on several factors including: available funding and the completion of property acquisitions. At this time, property acquisitions are proposed to commence in the fall (2011).

We trust that the information provided on the enclosed CD is satisfactory. Should you require clarification or additional information please contact the undersigned by phone (905) 882-7212 or by email at dinermana@mmm.ca.

Yours very truly,
MMM GROUP LIMITED

A handwritten signature in black ink, appearing to read "Alla Dinerman", enclosed within a circular scribble.

Alla Dinerman, P. Eng.
Senior Project Manager
Transportation Engineering

cc: Rob Bakalarczyk (MTO), Susan Wagter (MTO), Jeff Warren (MMM)

Attach. CD

Sonia Rankin

From: Yana Fomin
Sent: Thursday, May 05, 2011 2:01 PM
To: [REDACTED]
Cc: Alla Dinerman
Subject: HWY 7 New, Kitchener to Guelph Project - Public Information Meeting
Attachments: VE 4.pdf; VE 2&3.pdf

Sent on behalf of Alla Dinerman

[REDACTED]

Further to your request at our Public Information meeting held on May 3rd, 2011, please find attached PDF files of the display boards depicting the HWY 7 New design recommendations in the KWE area.

Sincerely,

Alla Dinerman, P.Eng.

Senior Project Manager, Transportation Engineering
Partner

MMM Group Limited

100 Commerce Valley Drive West

Thornhill, Ontario, Canada L3T 0A1

t: (905) 882-7212 | f: (905) 882-0055 | c: 647-223-6335

DinermanA@mmm.ca | www.mmm.ca

Sonia Rankin

From: Yana Fomin
Sent: Thursday, May 05, 2011 2:07 PM
To: [REDACTED]
Cc: Alla Dinerman
Subject: HWY 7 New, Kitchener to Guelph Project - Public Information Meeting
Attachments: VE 4.pdf; HWY7 New P1-2.pdf; VE 2&3.pdf

Sent on behalf of Alla Dinerman

[REDACTED]

Further to your request at our Public Information meeting held on May 3rd, 2011, please find attached PDF files of the display boards depicting the HWY 7 New design recommendations in the KWE area.

Sincerely,

Alla Dinerman, P.Eng.

Senior Project Manager, Transportation Engineering
Partner

MMM Group Limited

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t: (905) 882-7212 | f: (905) 882-0055 | c: 647-223-6335

DinermanA@mmm.ca | www.mmm.ca

Sonia Rankin

From: Yana Fomin
Sent: Thursday, May 05, 2011 2:13 PM
To: [REDACTED]
Cc: Alla Dinerman
Subject: HWY 7 New, Kitchener to Guelph Project - Public Information Meeting
Attachments: VE 9.pdf; VE 1.pdf

Sent on behalf of Alla Dinerman

[REDACTED]

Further to your request at our Public Information meeting held on May 3rd, 2011, please find attached PDF files of the display boards depicting the HWY 7 New design recommendations in the KWE area.

Sincerely,

Alla Dinerman, P.Eng.

Senior Project Manager, Transportation Engineering
Partner

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t: (905) 882-7212 | f: (905) 882-0055 | c: 647-223-6335

DinermanA@mmm.ca | www.mmm.ca

Sonia Rankin

From: Yana Fomin
Sent: Thursday, May 05, 2011 1:56 PM
To: [REDACTED]
Cc: Alla Dinerman
Subject: HWY 7 New, Kitchener to Guelph Project - Public Information Meeting
Attachments: VE 9.pdf; VE 1.pdf

Sent on behalf of Alla Dinerman

[REDACTED]

Further to your request at our Public Information meeting held on May 3rd, 2011, please find attached PDF files of the display boards depicting the HWY 7 New design recommendations in the KWE area.

Sincerely,

Alla Dinerman, P.Eng.

Senior Project Manager, Transportation Engineering
Partner

MMM Group Limited

100 Commerce Valley Drive West

Thornhill, Ontario, Canada L3T 0A1

t: (905) 882-7212 | f: (905) 882-0055 | c: 647-223-6335

DinermanA@mmm.ca | www.mmm.ca

Sonia Rankin

From: Yana Fomin
Sent: Thursday, May 05, 2011 1:57 PM
To: [REDACTED]
Cc: Alla Dinerman
Subject: HWY 7 New, Kitchener to Guelph Project - Public Information Meeting
Attachments: HWY7 New-PLATE-PIC.pdf

Sent on behalf of Alla Dinerman

[REDACTED]

Further to your request at our Public Information meeting held on May 3rd, 2011, please find attached PDF files of the display boards depicting the HWY 7 New design recommendations in the KWE area.

Sincerely,

Alla Dinerman, P.Eng.

Senior Project Manager, Transportation Engineering
Partner

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DinermanA@mmm.ca | www.mmm.ca

Sonia Rankin

From: Yana Fomin
Sent: Thursday, May 05, 2011 1:59 PM
To: [REDACTED]
Cc: Alla Dinerman
Subject: HWY 7 New, Kitchener to Guelph Project - Public Information Meeting
Attachments: VE 4.pdf; VE 2&3.pdf

Sent on behalf of Alla Dinerman



Further to your request at our Public Information meeting held on May 3rd, 2011, please find attached PDF files of the display boards depicting the HWY 7 New design recommendations in the KWE area.

Sincerely,

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Senior Project Manager, Transportation Engineering
Partner

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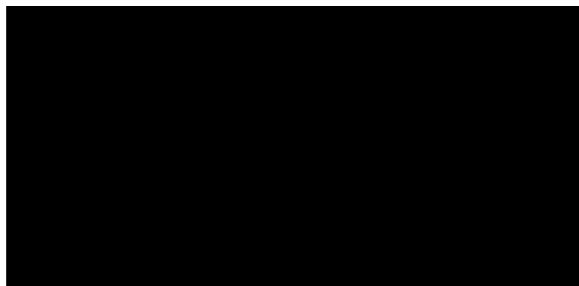
t: (905) 882-7212 | f: (905) 882-0055 | c: 647-223-6335

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May 31, 2011
16.08027.E3.4



**Subject: Highway 7 New, Kitchener to Guelph
Information Request Package, Public Information Centre, May 2011
GWP 408-88-00**

On behalf of the Ministry of Transportation, MMM Group Limited would like to thank you for your interest in the Highway 7 New project from Kitchener to Guelph.

In response to your request, we wish to provide you with a digital copy of the Public Information Centre (PIC) display material for your reference. The display material was made available for public review at both PICs, in Kitchener on Tuesday May 3, 2011 and in Guelph on Thursday May 5, 2011. The PIC display boards describe the recommendations of the Value Engineering (VE) study and provide information related to the initial phase of detail design for the overall project

We trust that the information provided on the enclosed CD is satisfactory. Should you require clarification or additional information please contact the undersigned by phone (905) 882-7212 or by email at dinermana@mmm.ca.

Yours very truly,
MMM GROUP LIMITED



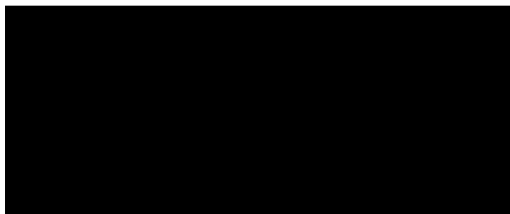
Alla Dinerman, P. Eng.
Senior Project Manager
Transportation Engineering
cc: Rob Bakalarczyk (MTO), Susan Wagter (MTO), Jeff Warren (MMM)

Attach.

MMM Group Limited
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www.mmm.ca

May 31, 2011
16.08027.E3.4



**Subject: Highway 7 New, Kitchener to Guelph
Information Request Package, Public Information Centre, May 2011
GWP 408-88-00**

On behalf of the Ministry of Transportation, MMM Group Limited would like to thank you for your attendance at the Public Information Centre (PIC) on May 5th, 2011 and your interest in the Highway 7 New project from Kitchener to Guelph.

In response to your request, we wish to provide you with a digital copy of the PIC display material for your reference. The display material was made available for public review at both PICs, in Kitchener on Tuesday May 3, 2011 and in Guelph on Thursday May 5, 2011. The PIC display boards describe the recommendations of the Value Engineering (VE) study and provide information related to the initial phase of detail design for the overall project

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Yours very truly,
MMM GROUP LIMITED

A handwritten signature in black ink, appearing to read 'Alla Dinerman'.

Alla Dinerman, P. Eng.
Senior Project Manager
Transportation Engineering

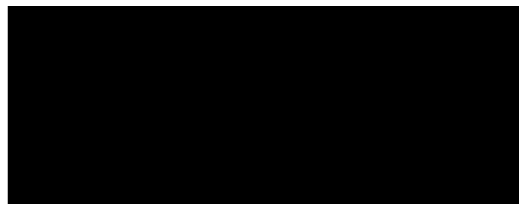
cc: Rob Bakalarczyk (MTO), Susan Wagter (MTO), Jeff Warren (MMM)

Attach.

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May 31, 2011
16.08027.E3.4



**Subject: Highway 7 New, Kitchener to Guelph
Information Request Package, Public Information Centre, May 2011
GWP 408-88-00**

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Alla Dinerman, P. Eng.
Senior Project Manager
Transportation Engineering

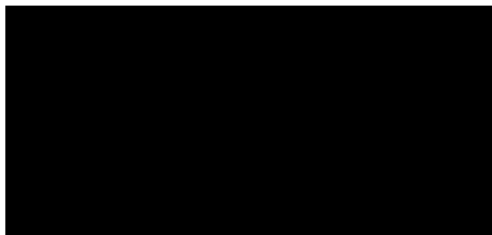
cc: Rob Bakalarczyk (MTO), Susan Wagter (MTO), Jeff Warren (MMM)

Attach

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www.mmm.ca

January 16, 2012
16.08027- E3.4



Subject: Highway 7 New, Kitchener to Guelph GWP 408-88-00
Information Request Package, Public Information Centre, May 5, 2011

On behalf of the Ministry of Transportation, MMM Group Limited would like to thank you for your interest in the Highway 7 New project from Kitchener to Guelph. In response to your request, we wish to provide you with a digital copy of Plate #17 for your reference. Plate #17 shows the alignment of Highway 7 New at the eastern limit of the project, in Guelph. This section of the alignment shows the proposed access between Silvercreek Parkway at Curtis Drive and Highway 7 New.

We trust that the information provided on the enclosed CD is satisfactory. Should you require clarification or additional information please contact the undersigned by phone (905) 882-7212 or by email at dinermana@mmm.ca.

Yours very truly,
MMM GROUP LIMITED

A handwritten signature in black ink, appearing to read "Alla Dinerman".

Alla Dinerman, P. Eng.
Senior Project Manager
Transportation Engineering

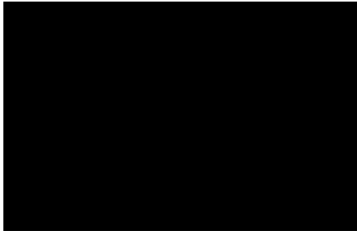
cc: Rob Bakalarczyk (MTO), Susan Wagter (MTO), Jeff Warren (MMM)

Attach. CD

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www.mmm.ca

December 2, 2011
16.08027- E3.4



Subject: Highway 7 New, Kitchener to Guelph GWP 408-88-00
Information Request Package, Public Information Centre, May 5, 2011

On behalf of the Ministry of Transportation, MMM Group Limited would like to thank you for your interest in the Highway 7 New project from Kitchener to Guelph. In response to your request, we wish to provide you with a digital copy of the Public Information Centre (PIC) display material for your reference. The display material was made available for public review at both PICs, in Kitchener on Tuesday May 3, 2011 and in Guelph on Thursday May 5, 2011. The PIC display boards describe the recommendations of the Value Engineering (VE) study and provide information related to the initial phase of detail design for the overall project.

We trust that the information provided on the enclosed CD is satisfactory. Should you require clarification or additional information please contact the undersigned by phone (905) 882-7212 or by email at dinermana@mmm.ca.

Yours very truly,
MMM GROUP LIMITED

A handwritten signature in black ink, appearing to read "Alla Dinerman".

Alla Dinerman, P. Eng.
Senior Project Manager
Transportation Engineering

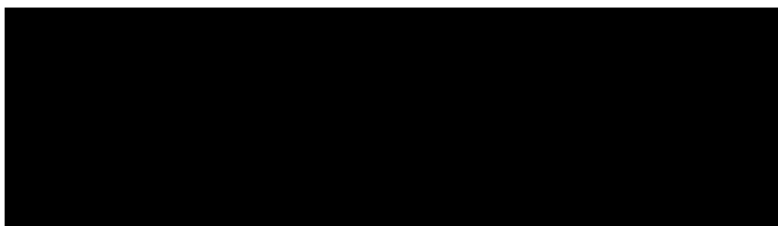
cc: Rob Bakalarczyk (MTO), Susan Wagter (MTO), Jeff Warren (MMM)

Attach. CD

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www.mmm.ca

December 20, 2011
1608027 - E3.4



**Subject: Highway 7 New, Kitchener to Guelph (GWP 408-88-00)
Public Information Centre – May 5, 2011; Response to Comment,**

On behalf of the Ministry of Transportation (MTO), MMM Group Limited would like to thank you for attending the Public Information Centre (PIC) on May 5, 2011 and for providing comments regarding the initial phase of detailed design of Highway 7 New, from Kitchener to Guelph.

We note that your concern relates to the potential impacts on traffic on existing Highway 7 following completion of the Grand River bridge currently under construction between Kossuth Road and Fairway Road. This project is being carried out by the Regional Municipality of Waterloo (Region), so the Region is responsible for considering potential traffic impacts to the traffic on Highway 7 and providing any traffic management measures, if required. Please contact the Regional Municipality of Waterloo, if you require additional information. We have included a copy of the key contacts for the Fairway Road Extension (Contract 2010-016) for your convenience.

We trust that the information provided is sufficient to address your concerns. Should you require clarification or additional information please contact the undersigned by phone (905) 882-7212 or by email at dinermana@mmm.ca.

Yours very truly,

MMM GROUP LIMITED



Alla Dinerman, P. Eng.
Senior Project Manager
Transportation Engineering

cc: Rob Bakalarczyk (MTO), Susan Wagter (MTO), Jeff Warren (MMM); **John Stephenson, (ROW)**

Encl: Fairway Road Extension Key Contacts

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COMMUNITIES

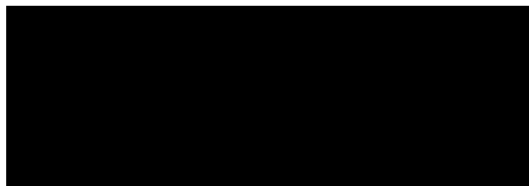
TRANSPORTATION

BUILDINGS

INFRASTRUCTURE

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December 20, 2011
16-08027-D11.6



**Subject: Highway 7 New, Kitchener to Guelph – GWP 408-88-00
Public Information Centre – May 3, 2011**

Thank you for attending the recent Public Information Centre (PIC) regarding the Ministry of Transportation's Highway 7 New between Kitchener and Guelph, and for completing a comment sheet. The following is provided in response to your concerns on the potential impact of the proposed design based on the Value Engineering Study to your residential property as well as your business (Nelson Stone Centre).

We have reviewed the location of the stormwater management pond which was originally placed in a way that eliminated access to the western half of your residential property. We have relocated the pond completely outside of your property limits. However, the drainage pipe from the pond will still need to cross your property so it can outlet to the river. MTO will require a permanent easement of approximately 21m wide and 60m long for the construction and maintenance of the outlet pipe. These dimensions are preliminary at this stage and the actual size of the easement will be finalized during the next phase of design. The updated pond location as well as the easement is shown on the attached plan. In addition, your concern about the stability of the river bank for the outlet pipe is duly noted and we will ensure that a detail foundation investigation is conducted during the next phase of the design.

We have also reviewed the Bridge Street on-ramp alignment 
 in detail based on your concerns. We have determined that we can shift the alignment further east by approximately 25m and construct a 15m long retaining wall to eliminate all impacts on the east side of your commercial property. The updated ramp alignment is shown on the attached plan.

Since the current entrance to your residential property is being bisected by the Approved Route we have provided you a new entrance off the Bridge Street Connection. The land for the new entrance will be transferred to you.

We trust the foregoing addresses your comments. Once again, thank you for bringing your concerns to our attention. Should you have any further questions or concerns, please do not hesitate to contact me.

Yours very truly,
MMM GROUP LIMITED

A handwritten signature in black ink, appearing to read "Alla Dinerman".

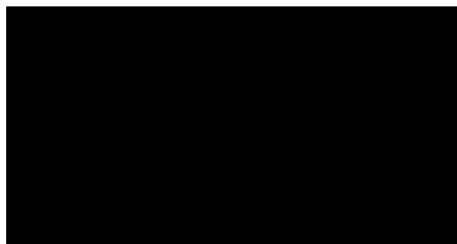
Alla Dinerman, P.Eng
Senior Project Manager
Transportation Engineering

cc: R. Bakalarczyk, MTO
S. Wagter, MTO
J. Warren, MMM

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December 20, 2011
16-08027-D11.6



**Subject: Highway 7 New, Kitchener to Guelph – GWP 408-88-00
Public Information Centre – May 3, 2011**

Thank you for attending the recent Public Information Centre (PIC) regarding the Ministry of Transportation's Highway 7 New between Kitchener and Guelph, and for providing your comments. The following is provided in response to your concerns regarding the proposed 2 lane cross section on Shirley Avenue and the impact it could have on Eagle Bridge's shipping operations.

We have reviewed the proposed 2 lane cross section on Shirley Avenue between Wellington Street and Bingemans Centre Drive. In order to provide efficient traffic operations and maintain a reasonable uniformity in service along this route, Shirley Avenue will be revised to have a 4 lane cross-section plus a left turn lane as warranted. The plan is currently being updated to reflect this change.

We trust the foregoing addresses your comments. Once again thank you for your interest in the project. Should you have any further questions or concerns, please do not hesitate to contact me.

Yours very truly,

MMM GROUP LIMITED

A handwritten signature in black ink, appearing to read 'Alla Dinerman'.

Alla Dinerman, P. Eng.
Senior Project Manager
Transportation Engineering

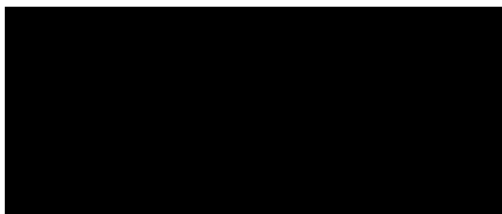
cc: Rob Bakalarczyk (MTO), Susan Wagter (MTO), Jeff Warren (MMM)

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December 20, 2011
16-08027-D11.6



**Subject: Highway 7 New, Kitchener to Guelph – GWP 408-88-00
Public Information Centre – May 3, 2011**

Thank you for attending the recent Public Information Centre (PIC) regarding the Ministry of Transportation's Highway 7 New between Kitchener and Guelph, and for completing a comment sheet. The following is provided in response to your concerns on the potential impact of the proposed design based on the Value Engineering Study to your residential property as well as your business [REDACTED].

We have reviewed the Bridge Street on-ramp [REDACTED] [REDACTED] in detail based on your concerns. We have determined that we can shift the alignment further east by approximately 25m and construct a 15m long retaining wall to eliminate all impacts on the east side of your commercial property. The updated ramp alignment is shown on the attached plan.

We have reviewed the location of the stormwater management pond which was originally placed in a way that eliminated access to the western half of your residential property. We have relocated the pond completely outside of your property limits. However, the drainage pipe from the pond will still need to cross your property so it can outlet to the river. MTO will require a permanent easement of approximately 21m wide and 60m long for the construction and maintenance of the outlet pipe. These dimensions are preliminary at this stage and the actual size of the easement will be finalized during the next phase of design. The updated pond location as well as the easement is shown on the attached plan. In addition, your concern about the stability of the river bank for the outlet pipe is duly noted and we will ensure that a detail foundation investigation is conducted during the next phase of the design.

We trust the foregoing addresses your comments. Once again, thank you for bringing your concerns to our attention. Should you have any further questions or concerns, please do not hesitate to contact me.

Yours very truly,
MMM GROUP LIMITED

A handwritten signature in black ink, appearing to read "A. Dinerman", enclosed within a circular scribble.

Alla Dinerman, P. Eng.
Senior Project Manager
Transportation Engineering

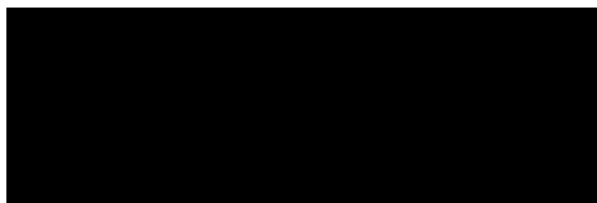
cc: Rob Bakalarczyk (MTO), Susan Wagter (MTO), Jeff Warren (MMM)

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December 20, 2011
16-08027-D11.6



Subject: Highway 7 New, Kitchener to Guelph – GWP 408-88-00
Public Information Centre – May 5, 2011

Thank you for attending the recent Public Information Centre (PIC) regarding the Ministry of Transportation's Highway 7 New between Kitchener and Guelph, and for completing a comment sheet. The following is provided in response to your concerns on the safe in and out access of your driveway due to reduced visibility of traffic with the proposed Bridge St realignment.

We have reviewed the realignment of Bridge St in detail based on your concerns. During the Value Engineering Study that was undertaken for this project, a number of alternatives were considered. It was determined that the proposed design provides a safe and effective solution for this location given the anticipated traffic volumes, operating conditions, surrounding land use and terrain.

To illustrate the available visibility to on-coming traffic for the in and out access to your driveway, we have enclosed plans (Figures 1 and 3) which show the sight lines for the proposed design as well as the present condition. Cross sections (Figures 2 and 4) were taken along each of these sight lines to illustrate the relative elevations of your driveway to the realignment of Bridge Street.

For the present condition, the available stopping sight distance for the exit movement is 210m while the left turn enter movement is 215m which exceeds the requirement of 185m based on a 100km/h design speed (80km/h posted), according to the MTO Geometric Design Manual (GDM). However, we understand that your sightline is obstructed by the existing guiderail which is illustrated on the top cross section of Figure 2.

For the proposed realignment of Bridge St., in order to minimize impacts to property the design speed is reduced to 80 km/h (60km/h posted) which requires a stopping sight distance of 135m. The available stopping sight distance for the exit movement is 287m while the left turn enter movement is 297m. These distances, as illustrated in the middle and bottom cross sections of Figure 2 and Figure 4, significantly exceed the minimum requirement for an 80 km/h design speed according to the GDM.

In summary, the proposed realignment of Bridge St. has no visibility impact to the access of your driveway. In fact with the reduced speed and raised profile of the new roadway it actually improves the available stopping sight distance as compared to the present condition.

We trust the foregoing addresses your comment. Once again thank you for your interest in the project. Should you have any further questions or concerns, please do not hesitate to contact me.

Yours very truly,

MMM GROUP LIMITED

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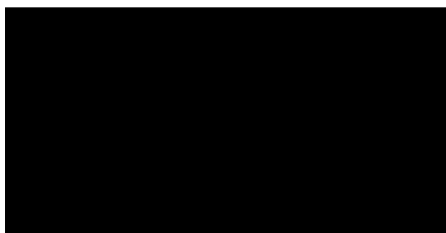
Alla Dinerman, P. Eng.
Senior Project Manager
Transportation Engineering

cc: R. Bakalarczyk, MTO
S. Wagter, MTO
J. Warren, MMM

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December 20, 2011
16-08027-D11.6




**Subject: Highway 7 New, Kitchener to Guelph – GWP 408-88-00
Public Information Centre – May 3, 2011**

Thank you for attending the recent Public Information Centre (PIC) regarding the Ministry of Transportation's Highway 7 New between Kitchener and Guelph. The following is provided in response to your request.

The overall configuration of the Kitchener Waterloo (KWE) interchange (Figure 1) was investigated in detail in the original Environmental Assessment (EA) and preliminary design phase of the project and has been reviewed again as part of the ongoing detail design work. A number of alternatives have been considered and the proposed design provides a safe and effective solution for this location given the anticipated traffic volumes, operating conditions, surrounding land use and terrain.

The Wellington Street to Edna Street connection road was approved as part of the original EA to replace the direct on and off ramps from southbound KWE to Edna Street which are being closed. This connector road on the west side of the KWE is an extension of the southbound exit ramp to Wellington Street. It is proposed as a two lane, two-way road.

Your property  will be directly impacted by the Wellington Street to Edna Street connection. MTO has minimized the impact to your property by designing a retaining wall. However, MTO will still require approximately 700m² of your property, as shown in Figure 2, to accommodate this connection road.

We trust the foregoing addresses your comment. Once again thank you for your interest in the project. Should you have any further questions or concerns, please do not hesitate to contact me.

Yours very truly,

MMM GROUP LIMITED

A handwritten signature in black ink, appearing to read "Alla Dinerman", enclosed within a circular scribble.

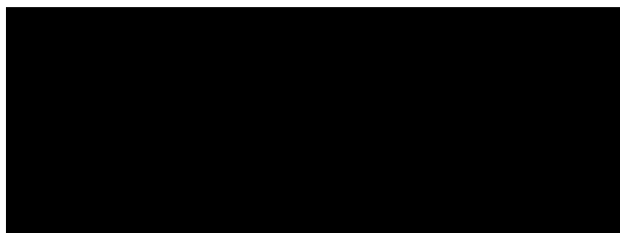
Alla Dinerman, P. Eng.
Senior Project Manager
Transportation Engineering
cc: R. Bakalarczyk, MTO
S. Wagter, MTO
J. Warren

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December 20, 2011
1608027 - E3.4



**Subject: Highway 7 New, Kitchener to Guelph (GWP 408-88-00)
Public Information Centre – May 5, 2011; Response to Comment,**

On behalf of the Ministry of Transportation (MTO), MMM Group Limited would like to thank you for attending the Public Information Centre (PIC) on May 5, 2011 and for providing comments regarding the initial phase of detailed design of Highway 7 New, from Kitchener to Guelph.

We note that your concern relates to the potential impacts on traffic on existing Highway 7 following completion of the Grand River bridge currently under construction between Kossuth Road and Fairway Road. This project is being carried out by the Regional Municipality of Waterloo (Region), so the Region is responsible for considering potential traffic impacts to the traffic on Highway 7 and providing any traffic management measures, if required. Please contact the Regional Municipality of Waterloo, if you require additional information. We have included a copy of the key contacts for the Fairway Road Extension (Contract 2010-016) for your convenience.

We trust that the information provided is sufficient to address your concerns. Should you require clarification or additional information please contact the undersigned by phone (905) 882-7212 or by email at dinermana@mmm.ca.

Yours very truly,

MMM GROUP LIMITED

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Alla Dinerman, P. Eng.
Senior Project Manager
Transportation Engineering

cc: Rob Bakalarczyk (MTO), Susan Wagter (MTO), Jeff Warren (MMM); John Stephenson, (ROW)

Encl: Fairway Road Extension Key Contacts

M:\Jobs\2008\16.08027.001.EN1 - MTO Highway 7 Kitchener-Guelph\E3 Correspondence\E3.4 Interested Stakeholders\PIC Responses\2011 12 20 Mail out\2011 12 2 Stahlbaum.doc

COMMUNITIES

TRANSPORTATION

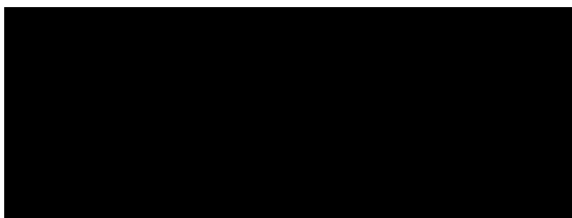
BUILDINGS

INFRASTRUCTURE

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www.mmm.ca

December 2, 2011
1608027-E3.4



Subject: Highway 7 New, Kitchener to Guelph (GWP 408-88-00)
Public Information Centre – May 5, 2011; Response to Comment

On behalf of the Ministry of Transportation (MTO), MMM Group Limited would like to thank you for attending the Public Information Centre (PIC) on May 5, 2011 and for providing comments regarding the initial phase of detailed design of Highway 7 New, from Kitchener to Guelph.

We would like to take this opportunity to respond to your comments.

1. Construction Staging

Construction staging plans will be developed at the future detail design stage when all design components have been finalized and a contract is prepared.

2. Westbound Access to Highway 7 New from Woodlawn and Silvercreek Parkway

Access to Highway 7 New from Woodlawn travelling in a westerly direction will be from Silvercreek Parkway. Based on comments received, the ministry has revised the plans to provide a northbound left turn lane on Silvercreek Parkway to access Highway 7 New westbound.

3. Stormwater Management Design

For this study, various stormwater management practices were evaluated to identify feasible stormwater management practices using pre-defined evaluation criteria (physical suitability of site, sediment removal benefits, water quality benefits, erosion control benefits, flood control benefits, maintenance requirements, and capital cost). It was concluded that a combination of stormwater management ponds and grassed swales would best meet the stormwater management criteria.

4. Bicycle Lanes Crossing over Highway 7 New

The MTO does not plan to provide bicycle lanes on the regional roads that form interchanges with Highway 7 New, as this would be a regional or local municipal undertaking. Please contact the appropriate municipality or regional government for further information.

Thank you for bringing these matters to our attention. Should you require clarification or additional information please contact the undersigned by phone (905) 882-7212 or by email at dinermana@mmm.ca.

Yours very truly,

MMM GROUP LIMITED

A handwritten signature in black ink, appearing to read "Alla Dinerman".

Alla Dinerman, P. Eng.
Senior Project Manager
Transportation Engineering

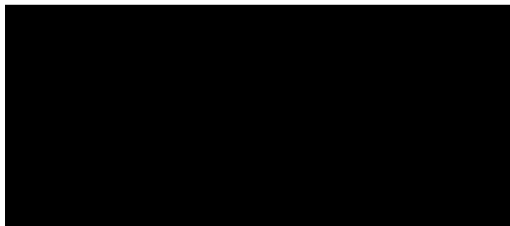
cc: Rob Bakalarczyk (MTO), Susan Wagter (MTO), Jeff Warren (MMM); John Hammer (ROW)

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December 2, 2011
1608027 - E3.4



Subject: Highway 7 New, Kitchener to Guelph (GWP 408-88-00)
Public Information Centre – May 3, 2011; Response to Comment

On behalf of the Ministry of Transportation (MTO), MMM Group Limited would like to thank you for attending the stakeholder meeting for Ebycrest Road property owners and residents, and for providing comments regarding the recommended Value Engineering (VE) option to construct a cul-de-sac on Ebycrest Road.

Based on comments received at the meeting regarding the location of the cul-de-sac on Ebycrest Road, the ministry has recommended relocating the cul-de-sac from the north end of Ebycrest Road to the south end. This design will be documented in the Transportation Environmental Study Report (TESR) to amend the approved Individual EA for Highway 7 New. We will notify you when the TESR is available for public review.

Thank you for bring this matter to our attention. Should you require clarification or additional information please contact the undersigned by phone (905) 882-7212 or by email at dinermana@mmm.ca.

Yours very truly,

MMM GROUP LIMITED



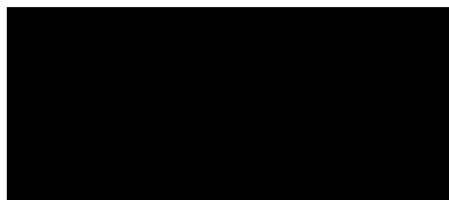
Alla Dinerman, P. Eng.
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Transportation Engineering

cc: Rob Bakalarczyk (MTO), Susan Wagter (MTO), Jeff Warren (MMM)

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December 2, 2011
1608027-E3.4



**Subject: Highway 7 New, Kitchener to Guelph (GWP 408-88-00)
Public Information Centre – May 3, 2011; Response to Comment**

On behalf of the Ministry of Transportation (MTO), MMM Group Limited would like to thank you for attending the Public Information Centre (PIC) on May 3, 2011 and for providing comments regarding the initial phase of detailed design of Highway 7 New, from Kitchener to Guelph. We appreciate this opportunity to respond.

You identified concerns regarding access to Shirley Avenue from Highway 85 (southbound) for local businesses, based on the VE recommendation shown at the PIC. Based on comments received, the MTO has revised the plans to include the direct off-ramp to Shirley Avenue as approved in the Highway 7 New Environmental Assessment.

In addition, you expressed a concern about the complexity of signage and access to businesses, with a focus on the potential effect to Bingemans. A highway signage plan will be developed during the future detail design stage to identify sign locations and information to drivers in accordance with MTO traffic operations requirements.

Thank you for bringing these matters to our attention. Should you require clarification or additional information please contact the undersigned by phone (905) 882-7212 or by email at dinermana@mmm.ca.

Yours very truly,

MMM GROUP LIMITED

A handwritten signature in black ink, appearing to read 'Alla Dinerman'.

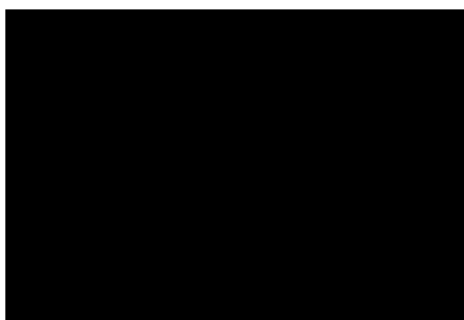
Alla Dinerman, P. Eng.
Senior Project Manager
Transportation Engineering

cc: Rob Bakalarczyk (MTO), Susan Wagter (MTO), Jeff Warren (MMM)

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December 2, 2011
1608027- E3.4



Subject: Highway 7 New, Kitchener to Guelph (GWP 408-88-00)
Public Information Centre – May 3, 2011; Response to Comment

On behalf of the Ministry of Transportation (MTO), MMM Group Limited would like to thank you for attending the Public Information Centre (PIC) on May 3, 2011 and for providing comments regarding the initial phase of detailed design of Highway 7 New, from Kitchener to Guelph. Thank you for your comments on the local knowledge of traffic patterns along the existing two lane Highway 7/Victoria Street North at Belgian Nursery and for your support, regarding the importance of the project.

Your comments indicated that you are interested in knowing the timing of construction, and requested clarification on the construction staging. Currently, the new Highway 7 project between Kitchener and Guelph is listed in the 2011 Southern Highways Program under "Planning for the Future-Future Southern Ontario Projects". On an annual basis, future expansion projects, such as the new Highway 7, are considered for inclusion onto the Southern Highways Program based on province-wide priorities and available funding. The ministry remains committed to building this highway and we will continue to move the project forward so that construction can commence when the funding becomes available. The staging of construction will be developed during the future detail design stage.

We trust that the information provided is sufficient to address your concerns. Should you require clarification or additional information please contact the undersigned by phone (905) 882-7212 or by email at dinermana@mmm.ca.

Yours very truly,

MMM GROUP LIMITED

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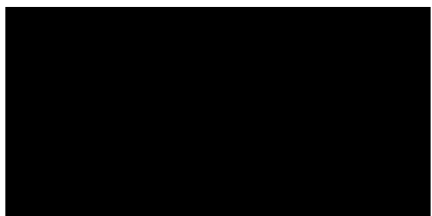
Alla Dinerman, P. Eng.
Senior Project Manager
Transportation Engineering

cc: Rob Bakalarczyk (MTO), Susan Wagter (MTO), Jeff Warren (MMM)

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December 2, 2011
1608027- E3.4



Subject: Highway 7 New, Kitchener to Guelph (GWP 408-88-00)
Public Information Centre – May 5, 2011; Response to Comment

On behalf of the Ministry of Transportation (MTO), MMM Group Limited would like to thank you for attending the Public Information Centre (PIC) on May 3, 2011 and for providing your comments. The following is provided in response to your concerns with lack of a direct access to downtown Kitchener when travelling on new Highway 7 from Guelph, the complexity of the proposed access and the impact it would have on travel time and the City of Kitchener's on-going development and improvement plans for the downtown core.

We appreciate your comment that motorists coming from Guelph would have to exit the new highway well in advance and then travel through a local road network to reach downtown Kitchener, which would make the route complicated and add more travel time. The access route you are referring to is on Highway 7 westbound through the exit ramp west of the Grand River onto the Riverbend Drive connection to Shirley Avenue. This access is intended to serve the local road network in a similar manner to the access which exists today. However, there will be a direct access via a new freeway-to-freeway ramp westbound onto Highway 85 (KW Expressway) southbound, which will take motorists directly to the Ottawa Street off-ramp access to King Street. King Street can then be used to access downtown Kitchener. This makes the most clear and direct route linking Guelph and downtown Kitchener.

During the detail design stage, a signage plan will be developed for Highway 7 New access/egress for motorists travelling between Kitchener and Guelph in order to make the directions clear and intuitive. Provincial highway signage will identify signage locations and information to drivers in accordance with MTO traffic operations requirements.

You have also raised a concern regarding the additional time and difficulty motorists will have traveling from Waterloo and areas located to the north. The new westbound freeway-to-freeway ramp onto southbound Highway 85 (KW Expressway) that was mentioned previously, conflicts with the existing ramp that provides access to Frederick Street and Victoria Street on the west side of Highway 85 (KW Expressway). As a result, a significant portion of this existing ramp will need to be removed. In order to continue to provide this access to Victoria Street and Frederick Street for motorists coming from the north, the new connection road which you have mentioned from the North-East/West ramp terminal at Wellington Street to Edna Street is required.

With respect to your concern regarding earlier decisions related to the existing Highway 85 (KW Expressway) and the current access to streets in the downtown core, including King Street, these were made prior to the Highway 7 New Environmental Assessment (EA). As you can appreciate, during the design of Highway 85 (KW Expressway) a number of competing issues including property impacts, traffic operations, safety and, environmental impacts had to be balanced in order to achieve consensus on the overall plan.

The MTO has consulted with the City of Kitchener throughout the entire (EA) process as well as during the Value Engineering (VE) Study, to incorporate their concerns and requirements.

Thank you for bringing your concerns to our attention. We trust the foregoing addresses your comments. Should you require clarification or additional information please contact the undersigned by phone (905) 882-7212 or by email at dinermana@mmm.ca.

Yours very truly,

MMM GROUP LIMITED

A handwritten signature in black ink, appearing to read "Alla Dinerman".

Alla Dinerman, P. Eng.
Senior Project Manager
Transportation Engineering

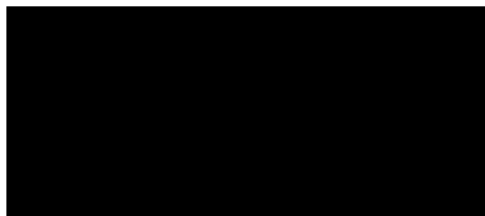
cc: Rob Bakalarczyk (MTO), Susan Wagter (MTO), Jeff Warren (MMM)

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December 2, 2011
1608027 - E3.4



Subject: Highway 7 New, Kitchener to Guelph (GWP 408-88-00)
Public Information Centre – May 5, 2011; Response to Comment

On behalf of the Ministry of Transportation (MTO), MMM Group Limited would like to thank you for attending the Public Information Centre (PIC) on May 5, 2011 and for providing comments regarding the initial phase of detailed design of Highway 7 New, from Kitchener to Guelph. At the time of the PIC, you indicated a concern regarding how stormwater management will be implemented in the final design to address additional water volumes resulting from the construction of Highway 7 New.

A stormwater management plan for the new Highway 7 is documented in the "Highway 7: Kitchener to Guelph Drainage and Stormwater Management Preliminary Design Report" prepared for the MTO by McCormick Rankin Corporation (April 2004). In this report, various management practices were evaluated to identify feasible stormwater management practices using pre-defined evaluation criteria (physical suitability of site, sediment removal benefits, water quality benefits, erosion control benefits, flood control benefits, maintenance requirements, and capital cost). It was concluded that a combination of stormwater management ponds and grassed swales (roadside ditches) would best meet the stormwater management criteria.

The majority of the highway runoff on the north side of Highway 7 New in the general area of the County Road 86/Elmira Road interchange will be captured and conveyed by grassed swales (roadside ditches) to either existing water crossings or new stormwater management ponds located east and west of this new interchange. The existing drainage system on County Road 86 will be maintained and a portion of the runoff from the north side of the East-North/South ramp will be conveyed to this system. The grassed swales (roadside ditches) and the other stormwater management features will be designed and constructed to ensure that they have the required capacity and provide effective water quality treatment.

As requested, hard copies of the natural environment features, Plate 16 (plan/profile) and drawings north of Plate 16 are provided with this letter.

We trust that this addresses your concern. Should you require clarification or additional information please contact the undersigned by phone (905) 882-7212 or by email at dinermana@mmm.ca.

Yours very truly,

MMM GROUP LIMITED

A handwritten signature in black ink, appearing to read "Alla Dinerman", written over a horizontal line.

Alla Dinerman, P. Eng.
Senior Project Manager
Transportation Engineering

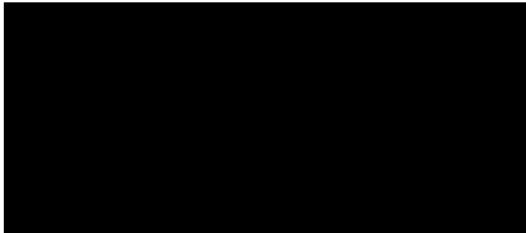
cc: Rob Bakalarczyk (MTO), Susan Wagter (MTO), Jeff Warren (MMM)

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December 2, 2011
1608027- E3.4



**Subject: Highway 7 New, Kitchener to Guelph (GWP 408-88-00)
Public Information Centre – May 3, 2011; Response to Comment**

On behalf of the Ministry of Transportation (MTO), MMM Group Limited would like to thank you for attending the Public Information Centre (PIC) on May 3, 2011 and for providing comments regarding the initial phase of detailed design of Highway 7 New, from Kitchener to Guelph.

You had asked what the ministry intends to do about the surplus land that will be severed by the Highway 7 New alignment. Once the project has been completed, the Ministry will prepare an inventory of surplus properties. Any surplus property that is deemed to be not required for any future Highway 7 New requirements may be made available for sale.

We trust that this addresses your concern. Should you require clarification or additional information please contact the undersigned by phone (905) 882-7212 or by email at dinermana@mmm.ca.

Yours very truly,

MMM GROUP LIMITED

A handwritten signature in black ink, appearing to read 'Alla Dinerman'.

Alla Dinerman, P. Eng.
Senior Project Manager
Transportation Engineering

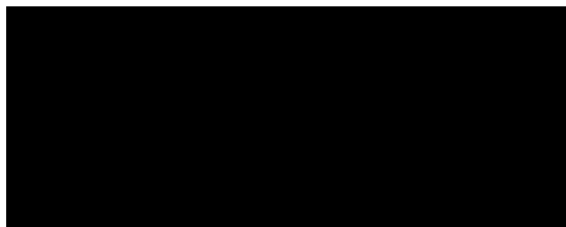
cc: Rob Bakalarczyk (MTO), Susan Wagter (MTO), Jeff Warren (MMM)

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December 2, 2011
1608027- E3.4



Subject: Highway 7 New, Kitchener to Guelph (GWP 408-88-00)
Public Information Centre – May 3, 2011; Response to Comment

On behalf of the Ministry of Transportation (MTO), MMM Group Limited would like to thank you for attending the Public Information Centre (PIC) on May 3, 2011 and for providing comments regarding the initial phase of detailed design of Highway 7 New, from Kitchener to Guelph. We appreciate this opportunity to address your comments.

You identified concerns regarding access to Shirley Avenue from Highway 85 (southbound) for local businesses, based on the Value Engineering (VE) recommendations. Based on comments received, the ministry has decided to keep the direct off-ramp to Shirley Avenue as approved in the Individual EA for Highway 7 New.

As requested, an electronic copy of Area 1, displayed during the PIC, was provided via email on May 5, 2011.

Thank you for bringing this matter to our attention. Should you require clarification or additional information please contact the undersigned by phone (905) 882-7212 or by email at dinermana@mmm.ca.

Yours very truly,

MMM GROUP LIMITED

A handwritten signature in black ink, appearing to read "Alla Dinerman".

Alla Dinerman, P. Eng.
Senior Project Manager
Transportation Engineering

cc: Rob Bakalarczyk (MTO), Susan Wagter (MTO), Jeff Warren (MMM)

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December 2, 2011
1608027-E3.4

**Subject: Highway 7 New, Kitchener to Guelph (GWP 408-88-00)
Shirley Avenue Business Group Meeting – April 28, 2011; Response to Comments**

On behalf of the Ministry of Transportation (MTO), MMM Group Limited would like to thank you for attending the Business and Stakeholder meeting on April 28th for Highway 7 New from Kitchener to Guelph. We also note that you (L. Bingeman) attended the Public Information Centre (PIC) on May 3, 2011 for the project and provided additional comments. The project team has considered your comments and would like to take this opportunity to respond.

1. Proposed Removal of Direct Off-Ramp to Shirley Avenue

The MTO identified improvements to specific design elements of the approved Highway 7 New Environmental Assessment (EA) through a Value Engineering (VE) study which recommended modifications to the approved plan.

Based on your comments regarding the proposed recommendation to remove the Highway 85 N/S direct off-ramp to Shirley Avenue, the MTO has revised the plans to re-instate the direct off-ramp to Shirley Avenue as originally approved in the EA.

2. Proper Signage Required to Direct Traffic to Destinations.

Provincial highway signage will be determined during the future detail design stage, in accordance with MTO traffic operations requirements.

3. Shirley Avenue a 2 Lane Roadway

Based on your comments regarding 2 lanes on Shirley Avenue, the ministry has revised the plans to provide four lanes plus a turning lane as required on Shirley Avenue.

Thank you for bringing these matters to our attention. Should you require clarification or additional information please contact the undersigned by phone (905) 882-7212 or by email at dinermana@mmm.ca.

Yours very truly,

MMM GROUP LIMITED

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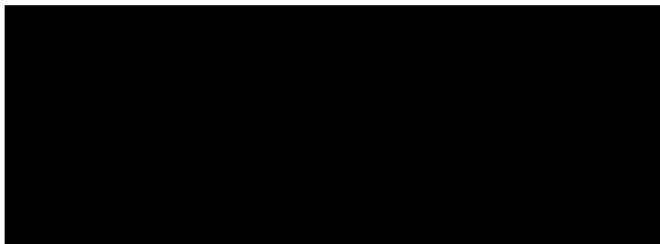
Alla Dinerman, P. Eng.
Senior Project Manager
Transportation Engineering

cc: Rob Bakalarcyk (MTO), Susan Wagter (MTO), Jeff Warren (MMM)

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May 7, 2011
1608027 - E3.4



Subject: Highway 7 New, Kitchener to Guelph (GWP 408-88-00)
Public Information Centre – May 3, 2011; Response to Comments

On behalf of the Ministry of Transportation (MTO), MMM Group Limited would like to thank you for attending the Public Information Centre (PIC) on May 3, 2011. We also acknowledge receipt of your e-mail dated May 19, 2011 with respect to your attendance at the Shirley Avenue Business and Stakeholder Meeting held on April 28th, 2011. We would like to take this opportunity to respond to your comments.

1. Proposed Removal of Direct S-E Off-Ramp to Shirley Avenue

Based on comments received, the MTO has decided to leave the direct off-ramp to Shirley Avenue as originally approved in the 2007 Highway 7 New Individual Environmental Assessment (EA).

2. Proposed Removal of Direct N-W On-Ramp to Hwy 7 Westbound

During the Value Engineering (VE) Study, MTO completed a traffic and human factors analysis due to concerns raised over the short weaving distance. This analysis indicated that the 250 m weaving length is insufficient for westbound traffic to cross over 2 lanes (with potentially 3 lanes in the future) to access southbound Highway 85 (Kitchener Waterloo Expressway). MTO considered shifting the ramp further to the east to increase the weaving length, but determined that this would result in significant impacts to the Riverbend Road off-ramp from Highway 7 New westbound, greater environmental impacts to the Grand River Valley, would require a wider bridge over the Grand River and would result in another weaving section with the Bridge St. to Hwy 7 Westbound on-ramp. Based on the environmental impacts, construction complexities, safety concern and significant costs associated with relocating the ramp and widening the bridge, MTO has determined that

shifting the ramp is not a feasible alternative. Considering that an alternate route is available, MTO is recommending the removal of this ramp as the preferred alternative.

3. Number of Lanes on Shirley Avenue

We have reviewed the proposed 2-lane cross section on Shirley Avenue between Wellington Street and Bingemans Centre Drive. In order to provide efficient traffic operations and maintain a reasonable uniformity in service along this route, Shirley Avenue will be revised to have a 4 lane cross-section plus a left turn lane as warranted. The plan is currently being updated to reflect this change.

4. Number of Traffic Lights on Wellington Street

At this stage of initial design, we have identified the need for two traffic lights along Wellington Street at the Highway 85 (Kitchener Waterloo Expressway) interchange. They will be at the N – E/W Ramp Terminal/Edna Street Connection and S-E/W Ramp/Wellington Street/Shirley Avenue/Victoria Street Connection Intersection.

With respect to your comment regarding the EA process, MTO is planning to publish a Transportation Environmental Study Report to amend the Individual EA. The TESR will document the recommended changes, and identify the anticipated environmental effects and proposed mitigation measures. The TESR will be available for a 30-day public review period and you will be notified of the dates and locations for viewing the document. Only the changes noted in the TESR are the subject of the amendment to the approved Individual EA. The balance of the concept of the undertaking as outlined in the approved Individual EA is not subject to change.

Thank you for bringing these matters to our attention. Should you require clarification or additional information please contact the undersigned by phone (905) 882-7212 or by email at dinermana@mmm.ca.

Yours very truly,

MMM GROUP LIMITED

A handwritten signature in black ink, appearing to read "Alla Dinerman".

Alla Dinerman, P. Eng.
Senior Project Manager
Partner
Transportation Engineering

cc: Rob Bakalarczyk (MTO), Susan Wagter (MTO), Jeff Warren (MMM)

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January 16, 2012
1608027 - E3.4

Subject: Highway 7 New, Kitchener to Guelph (GWP 408-88-00)
Public Information Centre – May 5, 2011; Response to Comment

On behalf of the Ministry of Transportation (MTO), MMM Group Limited would like to thank you for attending the Public Information Centre (PIC) for the Highway 7 New project in Guelph on May 5, 2011. The following is provided in response to your concerns regarding the new alignment of Highway 7 through a portion of the Marden wetland and the description of the Marden wetland provided in the project documentation.

The new alignment for Highway 7 was determined through a comprehensive and thorough Individual Environmental Assessment (EA) process with significant public consultation and involvement. Following the initial EA submission, the Minister of Transportation made a commitment in 1999 to review the route proposed in the 1997 Environmental Assessment Report. At that time, several new alignment alternatives were identified in response to concerns raised by ministries regarding the potential impacts to wetlands across the study area.

All of the wetlands, including the Marden wetland, were considered during the EA evaluation process, along with all of the other factors including other natural environment factors, socio-economic and cultural/heritage factors, and engineering factors. Based on the EA evaluation process, the ministry identified the preferred alignment alternative which achieved the best overall balance of transportation engineering objectives, individual environmental factor impacts and

overall environmental impact, including input that was received through consultation on those issues. Although the alignment does impact the southern part of the Marden wetland, it avoids the larger Marden wetland area to the north, as well as minimizes impacts to the other sensitive wetland areas within the study area.

The new alignment for Highway 7 was approved by in 2007. The ministry is now recommending improvements to the overall function, operation and safety of the approved plan based on the Value Engineering study at select locations. However, the ministry is not considering any revisions to the approved main alignment of new Highway 7, including the area of the Marden wetland.

Our recent assessment of the Marden wetland is consistent with the previous inventory and assessment. A terrestrial impact assessment report that includes the description of the Marden wetland has been prepared as part of the Initial Design Report that will be available in 2012. Please find attached excerpts from the terrestrial report specific to the Marden South Wetland. We will notify you by letter when the Initial Design Report is available for viewing.

We trust the foregoing addresses your concerns. Thank you for bringing your concerns to our attention. Should you have any further questions or concerns, please do not hesitate to contact me by phone (905) 882-7212 or by email at dinermana@mmm.ca.

Yours very truly,

MMM GROUP LIMITED

A handwritten signature in black ink, appearing to read "Alla Dinerman", written over a horizontal line.

Alla Dinerman, P. Eng.
Senior Project Manager
Transportation Engineering

cc: Rob Bakalarczyk (MTO), Susan Wagter (MTO), Jeff Warren (MMM)

encl. Figure 1: Marden South Wetland
Marden South Wetland Technical information

Appendix C: Agency Comments, MOE Review and MTO Response

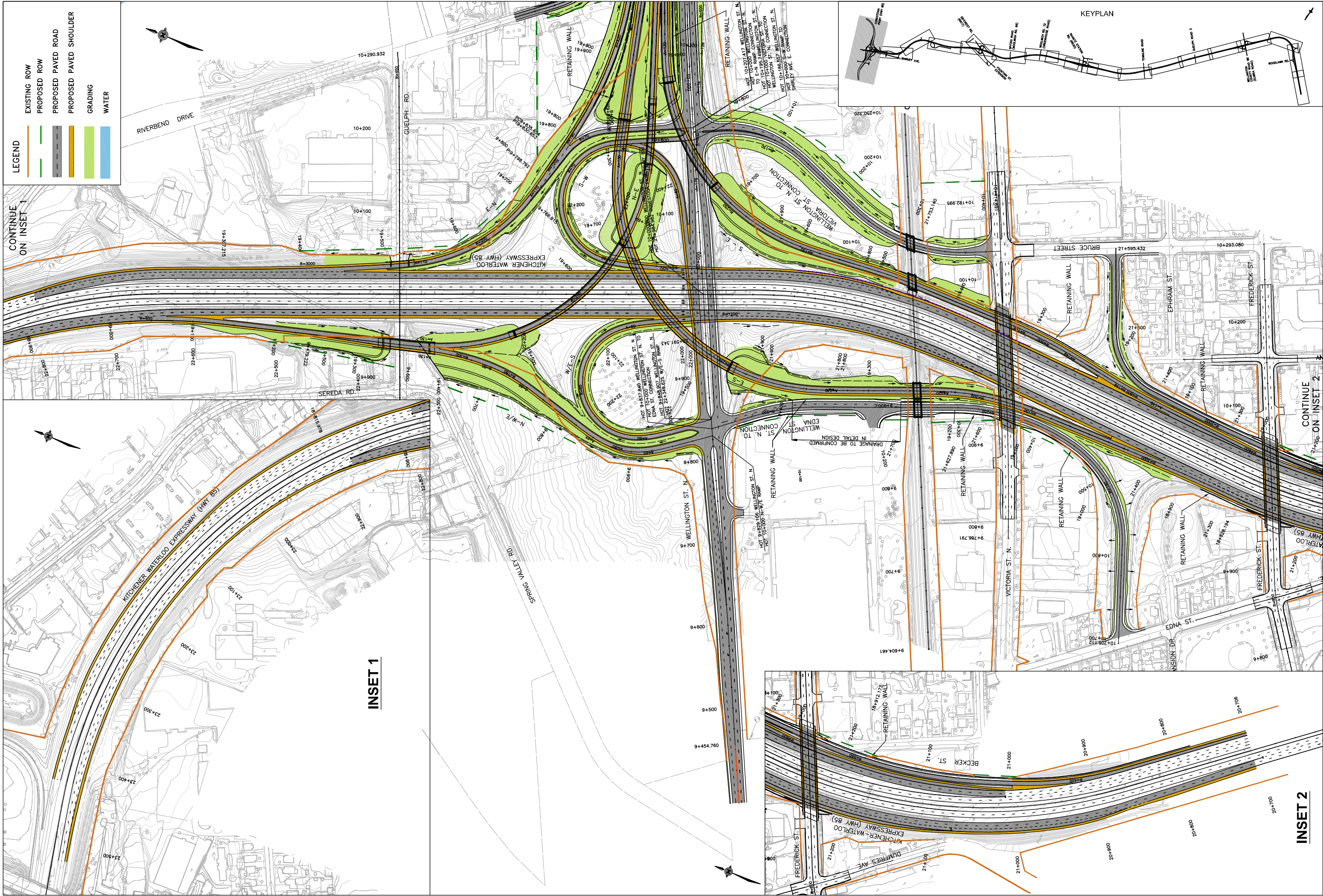
Table C 1: Summary of Agencies Comments during MOE Review and MTO Responses

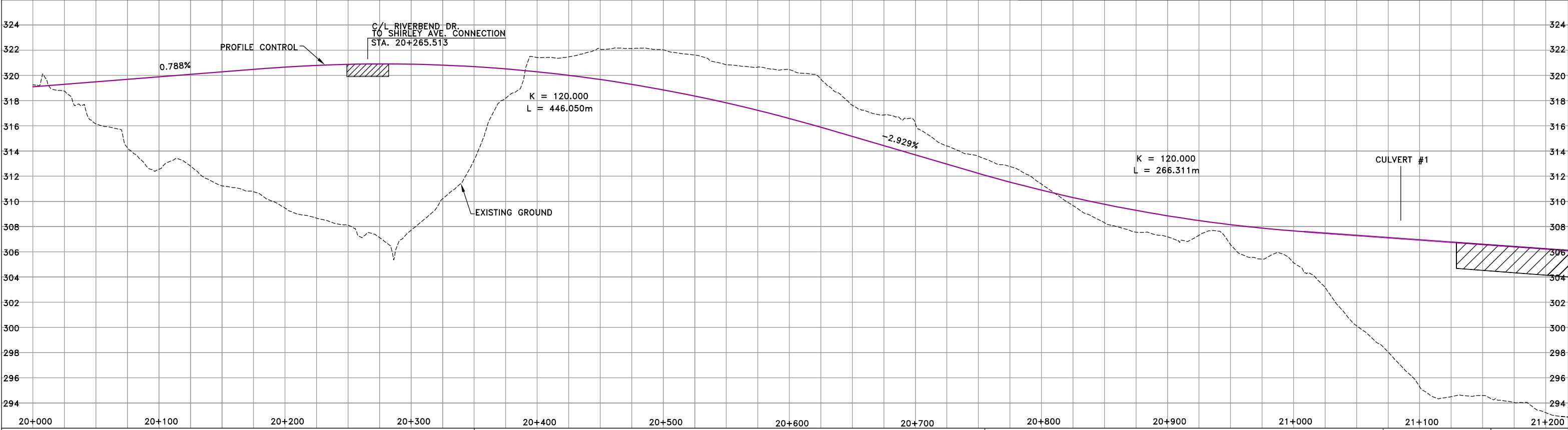
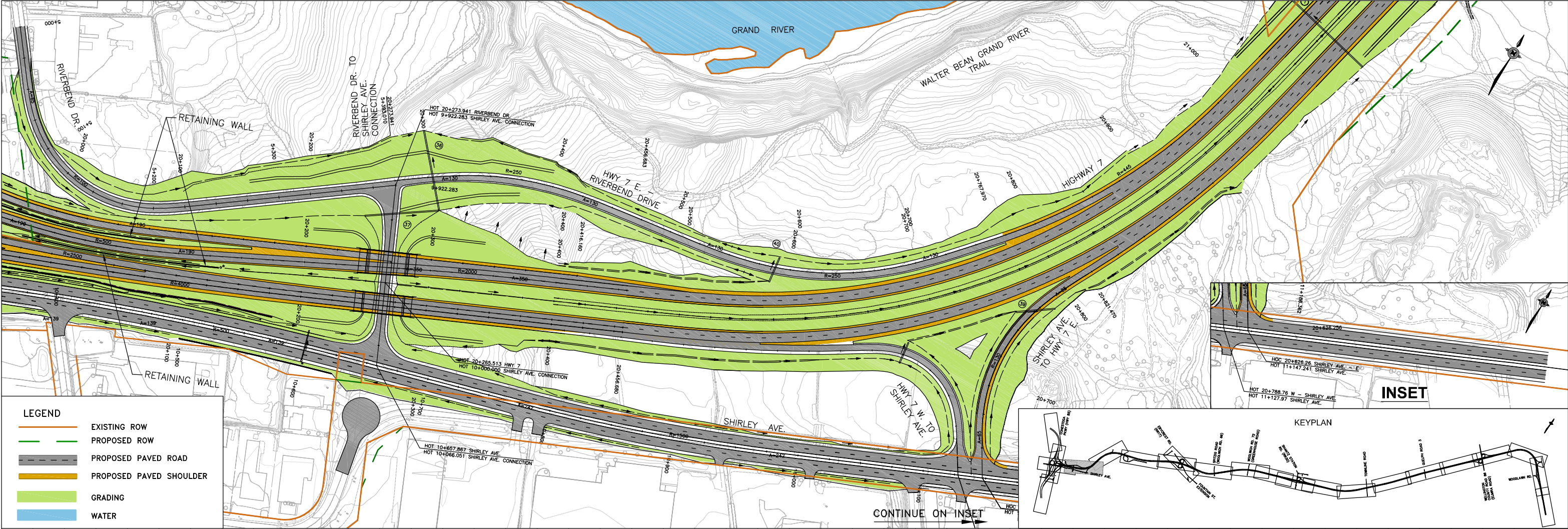
Submitter – GRT	Issue/Comment	Proponent Response 2005	Commitments During Initial Designs 2007-2014
Ministry of Culture	<ul style="list-style-type: none">Is in concurrence with all recommendations made in the Stage 1 and 2 archaeological assessment reports to date	<ul style="list-style-type: none">No response required	<ul style="list-style-type: none">Carry out additional archaeological assessments as required during future Detail Design studies
Ministry of Culture	<ul style="list-style-type: none">Level of impact on individual heritage locations not clearly statedDoes not appear to show evaluations of the levels of significance for local or regional heritage features.Like to follow up with the planners on next phase of project to review impacts and mitigation measures for cultural landscape features	<ul style="list-style-type: none">Timing for design and construction is not yet knownConsultation with external agencies and the public will take place during the Detail Design stage at which point the impacts and mitigation measures for built and cultural landscape features will be addressedMinistry of Culture will be a key stakeholder during the Detail Design stage	<ul style="list-style-type: none">Investigations / documentation of built heritage features conducted during Initial Design. Further documentation for some locations required prior to demolition.MTO will follow MTCS process/requirements for work to be carried out during Detail Design
Ministry of Agriculture and Food	<ul style="list-style-type: none">Is satisfied with the provided information	<ul style="list-style-type: none">No response required	<ul style="list-style-type: none">No specific requirements to address in Initial Design
Transport Canada	<ul style="list-style-type: none">Applications for formal approval under Section 5(1) of the NWPA will be requiredTransport Canada will be a Responsible Authority for the assessment of this project	<ul style="list-style-type: none">Where permits are required, application will be made during future Detail Design studies	<ul style="list-style-type: none">Where permits are required, application will be made during future Detail Design studies
Grand River Conservation Authority	<ul style="list-style-type: none">No additional comments on circulated reportsWishes to comment and provide input to the design process in relation to mitigation of impacts along the route	<ul style="list-style-type: none">GRCA will be a key stakeholder during Detail Design stage	<ul style="list-style-type: none">GRCA will continue to be a key stakeholder.
Ministry of Natural Resources	<ul style="list-style-type: none">Supports the Recommended Route (2002) on condition that MTO addresses concerns and issues of the MNROffers specific details to also be considered in the EA (groundwater discharge, aquatic resources and fisheries, vegetation and wetlands, wildlife, special policy areas)Questions if a more southernly alignment is available to enhance wetland protectionRequests assurance that an independent environmental inspector will be on-site at all time to monitor constructionMore detailed description of planned monitoring and reporting processesClarification that the interchange at County Rd 86 will not affect Marden South PSW Complex.	<ul style="list-style-type: none">Funding approval will be needed before construction takes place.Clarification and/or more committed statements about mitigation measures will be provided when information from the Preliminary Design stage is updated, and new information is collected.New information provided will be collected and considered during Detail Design stage.MTO will follow the MTO-MNR Fisheries Protocol regarding protection of fisheries resources that may be impacted.Natural area enhancement is tempered to a degree by issues of property ownership and long-term management.The project team will determine the environmental inspection needs for the Construction Administration of the construction contract. Inspection and reporting related to specific environmental features will be required based on the identified conditions in the corridor.The proposed interchange is sufficiently removed as to not impact the Marden South PSW Complex. This will be reviewed during Detail Design	<ul style="list-style-type: none">Clarification and more committed statements about mitigation measures were developed during Initial Design. These will be updated and finalized during Detail Design as new information is collected, as the design is finalized and construction methods developed.MTO-MNR Fisheries Protocol followed for fisheries investigations during the Initial Design stage. Changes to the Fisheries Act (November 25, 2013) will be incorporated into the updated fisheries impact assessment during Detail Design.The project team will determine the environmental inspection needs for the Construction Administration of the construction contract during Detail Design. Inspection and reporting related to specific environmental features will be required based on the identified conditions in the corridor.The approved alignment required bisecting one of the wetland units in the Marden South PSW complex. Potential impacts to the wetland included changes to hydrology and preventing wildlife movement. Drainage plan includes providing water flow and connectivity between the two separated portions of the unit and the same culvert will provide movement opportunities for smaller wildlife. Fencing is to be provided to prevent the movement of deer from the wetland to the highway.

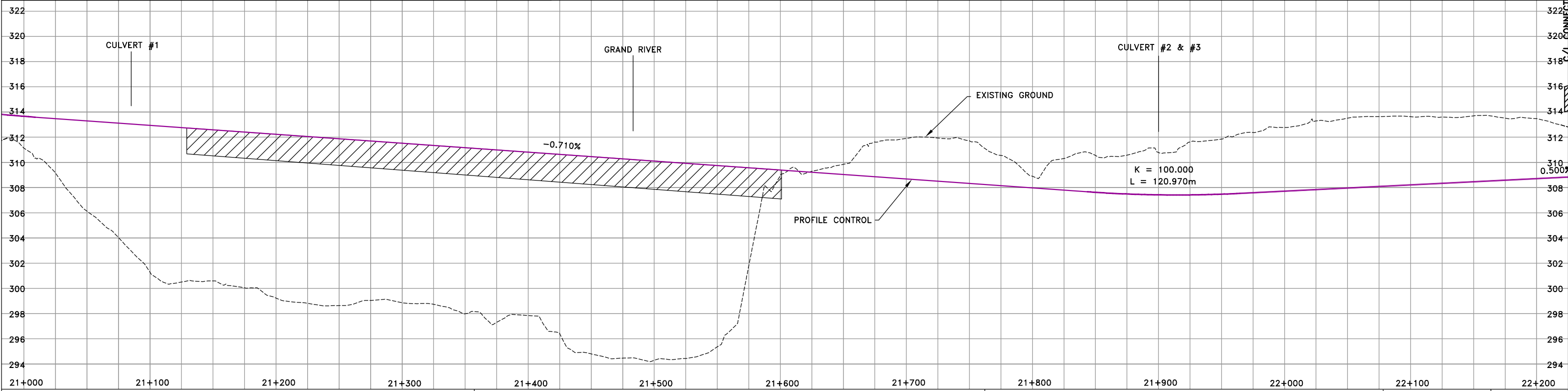
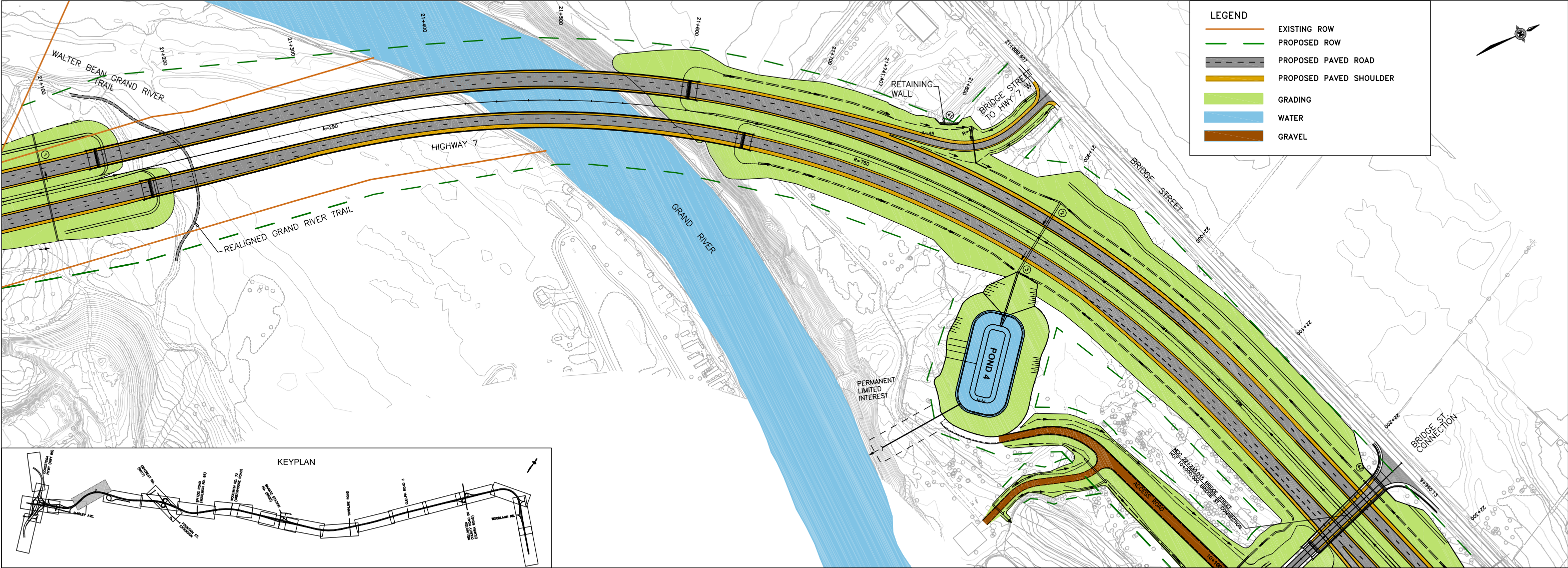
Submitter – GRT	Issue/Comment	Proponent Response 2005	Commitments During Initial Designs 2007-2014
Environmental Assessment Officer, Environment Canada	<ul style="list-style-type: none"> • A federal environmental assessment would not be triggered • Wishes to discuss deficiencies of the EA with MTO • Shift alignment as far as possible to decrease impacts on Heronry colonies and include mitigation measures for migratory birds • Reduce impacts on forest interior habitat and include amount of predicted impact to these areas • A “Species at Risk” section should be added including species contained in the Species at Risk Act (SARA). • Minimize surface water and groundwater effects in accordance with the <i>Fisheries Act</i>. • MTO to develop a monitoring program for hydrologic flows across impacted wetlands. • Re-vegetate disturbed areas with native species • Enhance mitigation measures to reduce impacts on air quality (i.e. use new or well maintained heavy equipment and machinery) 	<ul style="list-style-type: none"> • More detailed engineering and environmental investigations will be carried out in the Detail Design studies. • Issues related to Detail Design, migratory birds, species at risk, water quality, wetlands, biodiversity, and atmosphere/air quality can be fully considered and addressed during subsequent Detail Design studies, when new information is collected. • Staff will be contacting Mr. Read at a further time to discuss possible future surveys of the presence of Louisiana Waterthrush at the Ellis Creek Wetland. 	<ul style="list-style-type: none"> • VE Studies and design refinement carried out during Initial Design stage. • Environmental investigations for: Fisheries, Terrestrial Ecosystems, Contaminated Properties, Groundwater and Wells, Surface Water/Drainage, Archaeology and Built Heritage were carried out during Initial Design; where required, the result of these environmental investigations and those carried out during Preliminary Design stages will be updated during Detail Design to reflect changes in regulations and to address changes in the existing conditions over time within the study area. • Louisiana Waterthrush: A survey to confirm the presence of this species was carried out in 2005 following the survey protocol guidelines identified by the Canadian Wildlife Service. The species was not found and is not considered further in the assessment of impacts. • Species are regularly uplisted and downlisted for protection under the Endangered Species Act (provincial) and the Species at Risk Act (federal). Therefore, during Detail Design, additional surveys for provincial species at risk and federally listed species will be completed to assess current potential impacts to new and previously listed species that may be affected by the proposed works.
Ministry of Municipal Affairs and housing	<ul style="list-style-type: none"> • Satisfied with the EA Amendment 	<ul style="list-style-type: none"> • No response required 	<ul style="list-style-type: none"> • No specific requirements to address in Initial Design
Air Policy and Climate Change Branch	<ul style="list-style-type: none"> • No Comment 	<ul style="list-style-type: none"> • No response required 	<ul style="list-style-type: none"> • No specific requirements to address in Initial Design
EAAB – Air and Noise Unit	<ul style="list-style-type: none"> • No Comment 	<ul style="list-style-type: none"> • No response required 	<ul style="list-style-type: none"> • No specific requirements to address in Initial Design
EAAB – EAPC	<ul style="list-style-type: none"> • No comment 	<ul style="list-style-type: none"> • No response required 	<ul style="list-style-type: none"> • No specific requirements to address in Initial Design

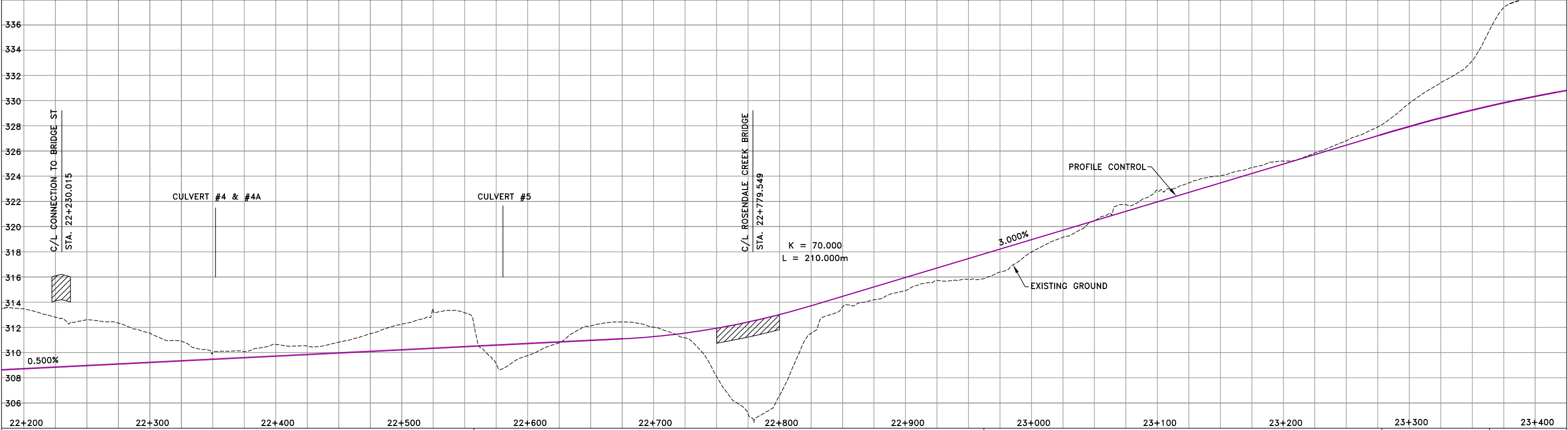
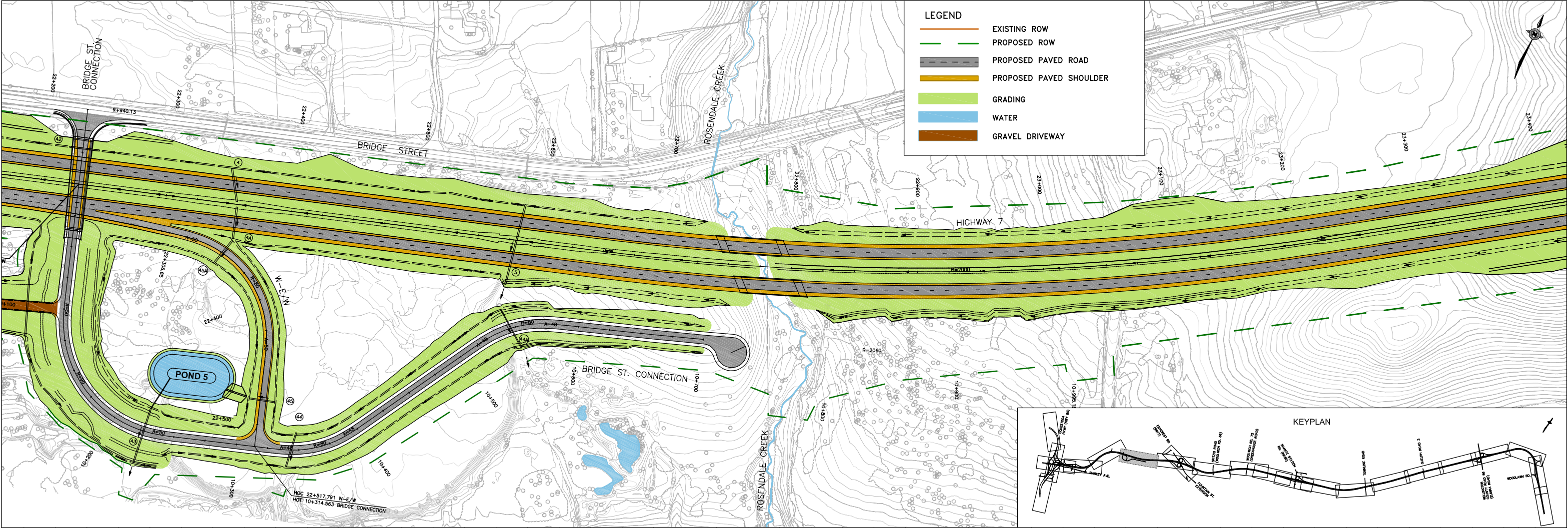
Submitter – GRT	Issue/Comment	Proponent Response 2005	Commitments During Initial Designs 2007-2014
Environmental Assessment & Planning Coordinator Air, Pesticides and Environmental Planning	<ul style="list-style-type: none"> • Include a map showing groundwater discharge areas • Clarify the reasons why the water table is much deeper than the static water level • More specific mitigation measures should be developed to address concerns in Section 2.8. • Shallow overburden aquifers should be identified and mapped and steps taken to protect these resources. • Highway runoff and impacts should be addressed • Impacts to groundwater should include analysis of typical road salt and herbicide parameters • Further characterize the sensitive areas including groundwater sources • Design stage of the project should be implemented after monitoring and contingency plans have been reviewed by the ministry. • No commitment given ensuring all contractors will be made aware of environmental considerations and standards during the construction phase 	<ul style="list-style-type: none"> • Funding approval will be needed before construction takes place. MOE will be a key stakeholder during Detail Design takes place. MOE will be a key stakeholder during Detail Design. • The potential impacts to groundwater resources, air quality, and surface waters will be fully considered and addressed during subsequent Detail Design studies, when information from this Preliminary Design study is updated, and new information is collected. 	<ul style="list-style-type: none"> • Undertake a Comprehensive local and Regional Air quality (AQ) and (Greenhouse Gas)GHG Emission Impact Assessment during Detail Design as per the new Environmental Guide: Recommended Approach for Assessing and Mitigating the AQ &GHG Emissions of Provincial Transportation Projects (June 2012). Implement mitigation measures (ERHD, 2013). • Mapping of groundwater sensitivities carried out during Initial Design • Assessment of impacts and mitigation to be developed during Detail Design.
Woolwich Council Township of Woolwich	<ul style="list-style-type: none"> • Supports the Preferred Alternative RC1 • Requests the MTO to fund the construction of the Breslau By-Pass as part of the project • Requests that the MTO move as quickly as possible towards construction of the new highway • Council's January 2002 resolution supporting the selected route remains valid 	<ul style="list-style-type: none"> • MTO previously committed to construct the Breslau By-Pass if the new Highway 7 is constructed before the municipalities construct the Breslau By-Pass. As of 2003 the Breslau By-Pass was already under construction, therefore MTO does not anticipate that they will be constructing any portion of the Breslau By-Pass 	<ul style="list-style-type: none"> • Continue to consult with the Township of Woolwich during Detail Design.
Environment and Transportation Group The City of Guelph	<ul style="list-style-type: none"> • Guelph City Council supports Recommended Route (2002) • Requests MTO participate in the Guelph and Wellington Transportation Study • Requests MTO to implement intersection upgrades to the Hanlon prior to construction • Urges the province to begin construction as soon as possible 	<ul style="list-style-type: none"> • The new Highway 7 route will tie in to the Hanlon Expressway at the existing Hanlon/Woodlawn Road intersection. Upgrades to the existing road network required to accommodate the construction of the interchange will be part of this project. • MTO is undertaking a Traffic Operations Study of the intersections along the Hanlon between Highway 401 and Woodlawn Road. • Will participate in the Guelph and Wellington Transportation Study 	<ul style="list-style-type: none"> • Upgrades to the existing road network have been incorporated into the Initial Design Report (IDR) • Continue to consult with the City of Guelph during Detail Design.
Regional Municipality of Waterloo	<ul style="list-style-type: none"> • Council of the Regional Municipality of Waterloo endorses the EA Amendment and Recommended Route (2002) • Request that the project be initiated as soon as possible. 	<ul style="list-style-type: none"> • Funding approval will be needed before construction takes place. 	<ul style="list-style-type: none"> • Continue to consult with the Regional Municipality of Waterloo during Detail Design.

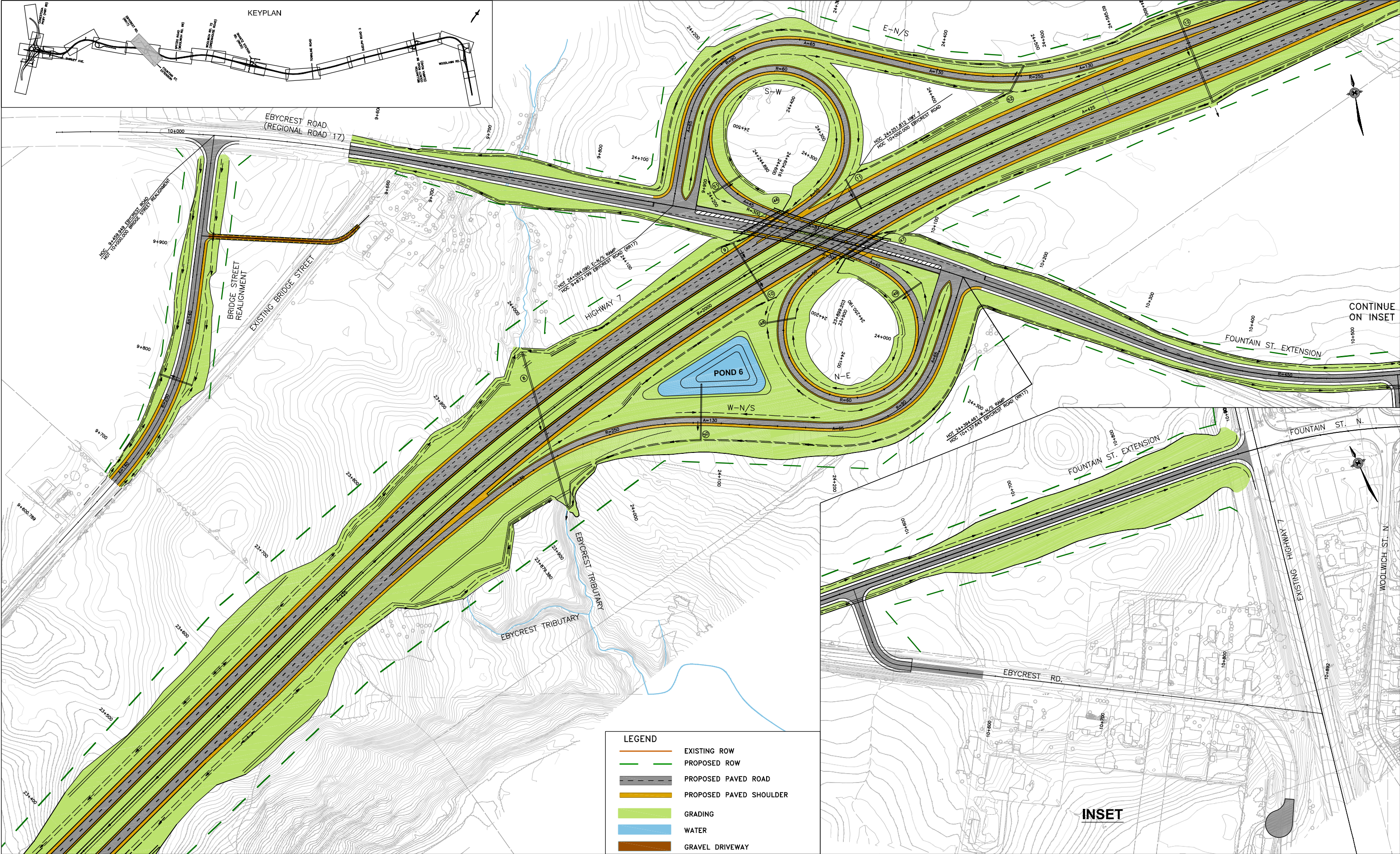
Appendix D: Plan and Profile Drawings

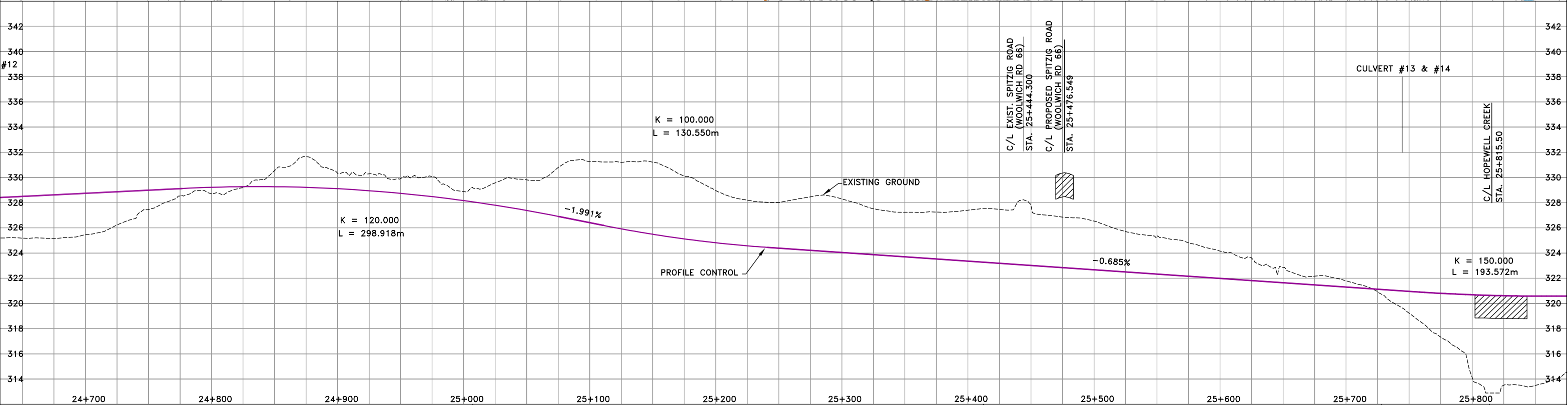
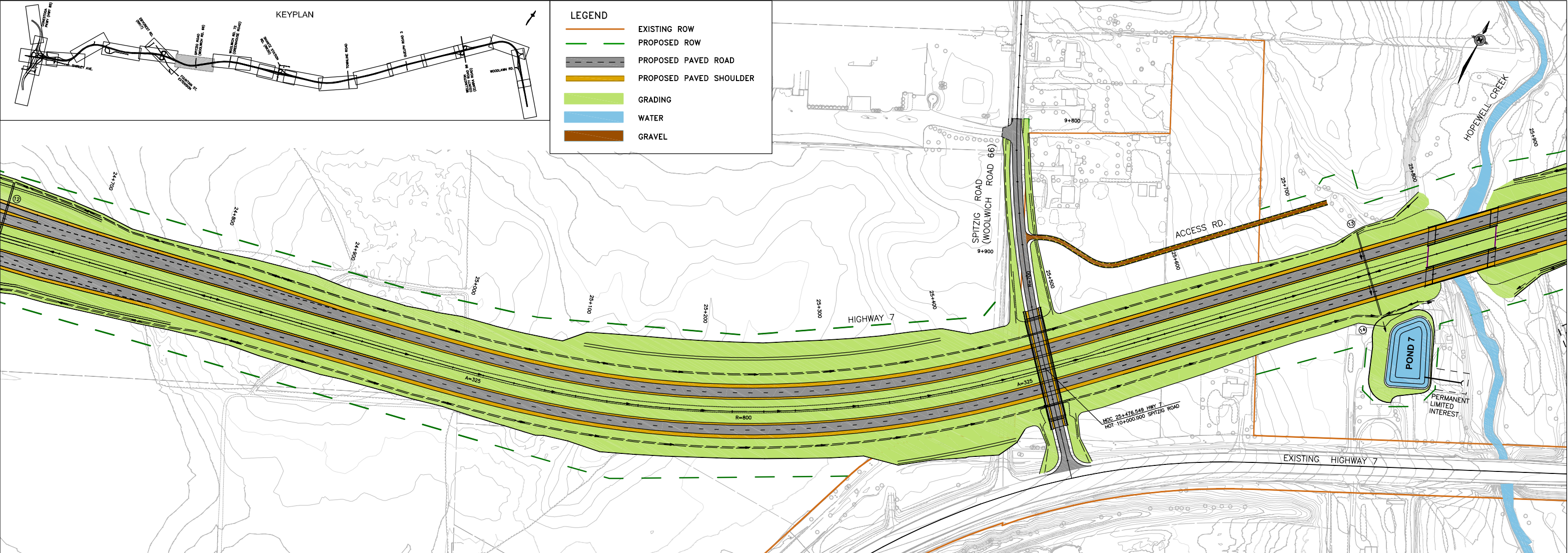


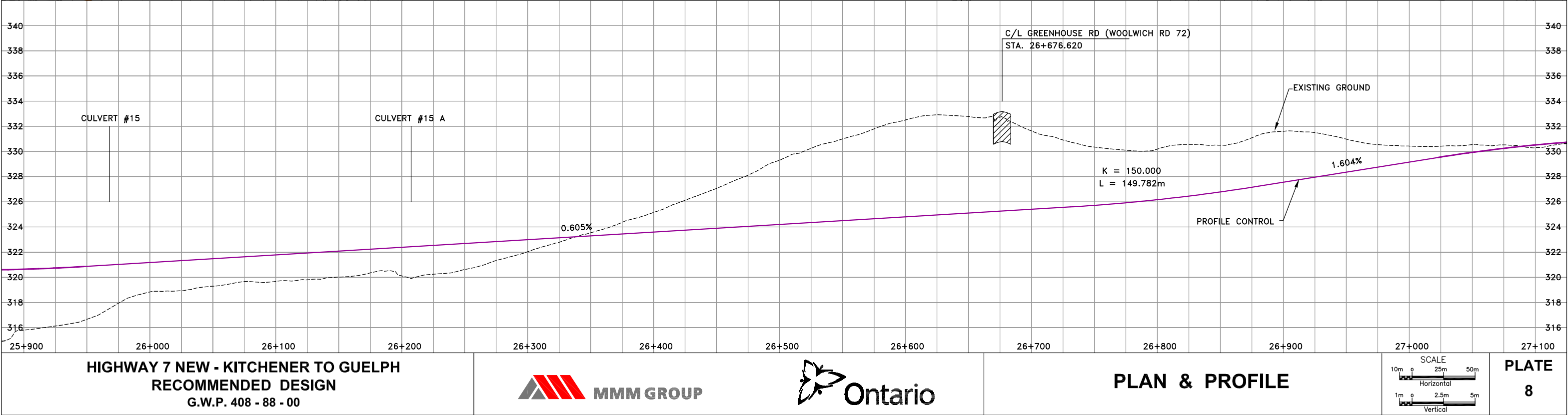
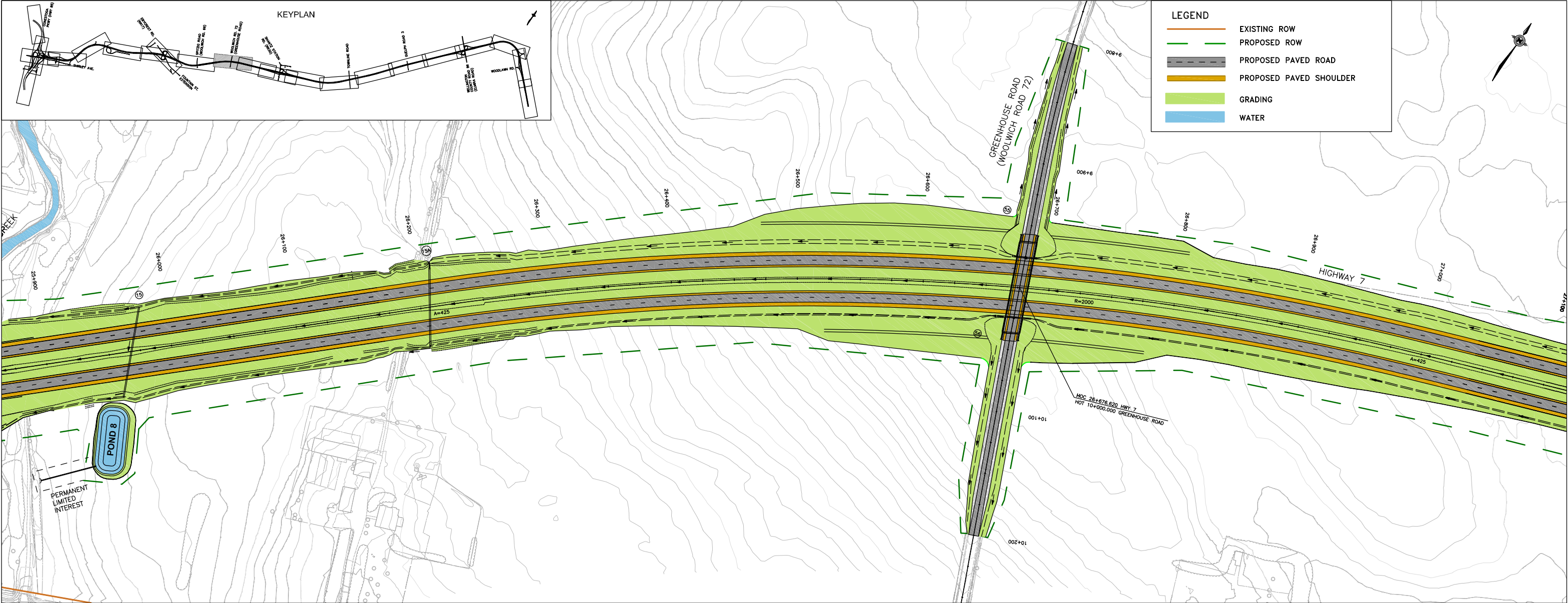


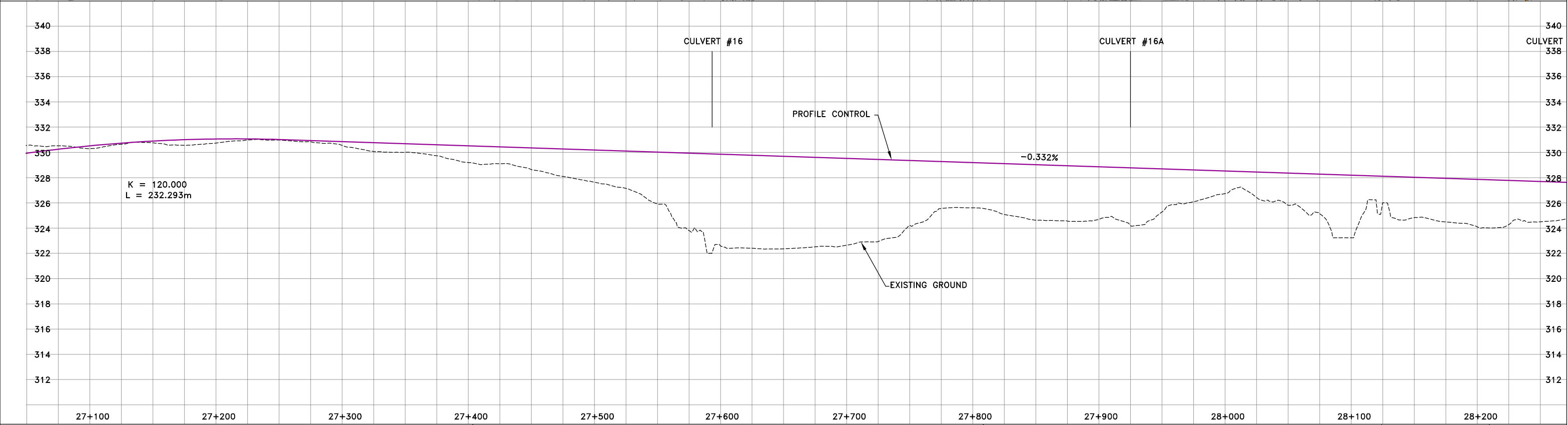
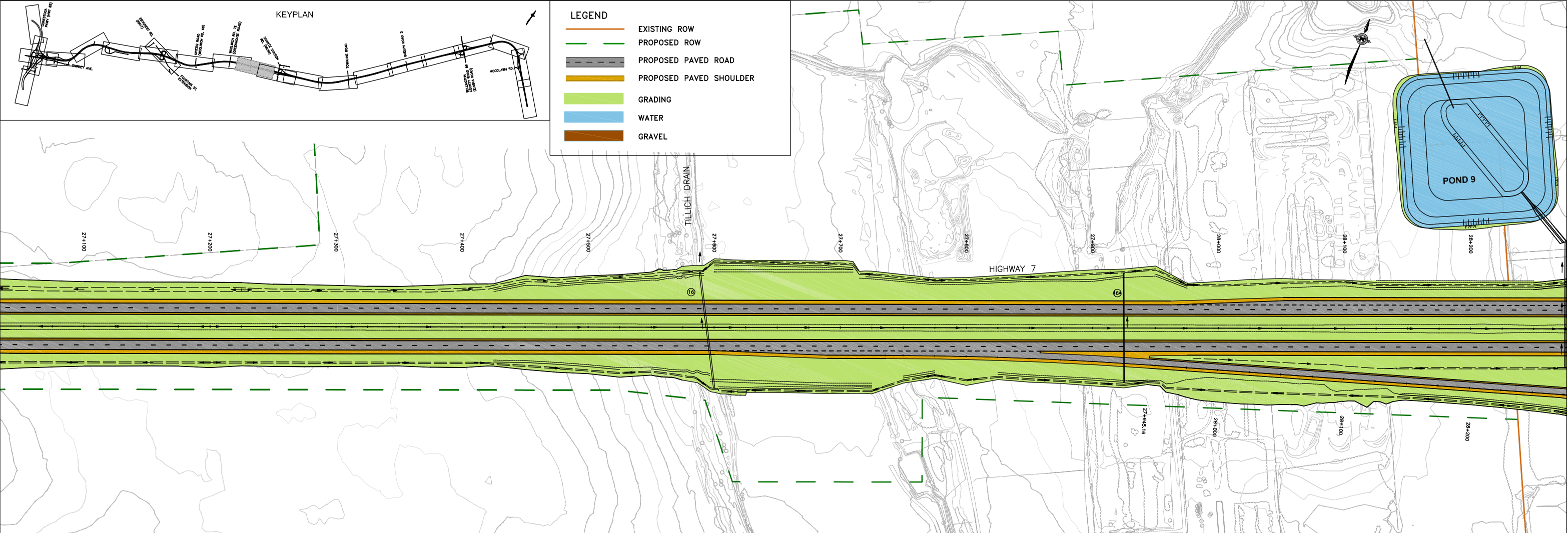


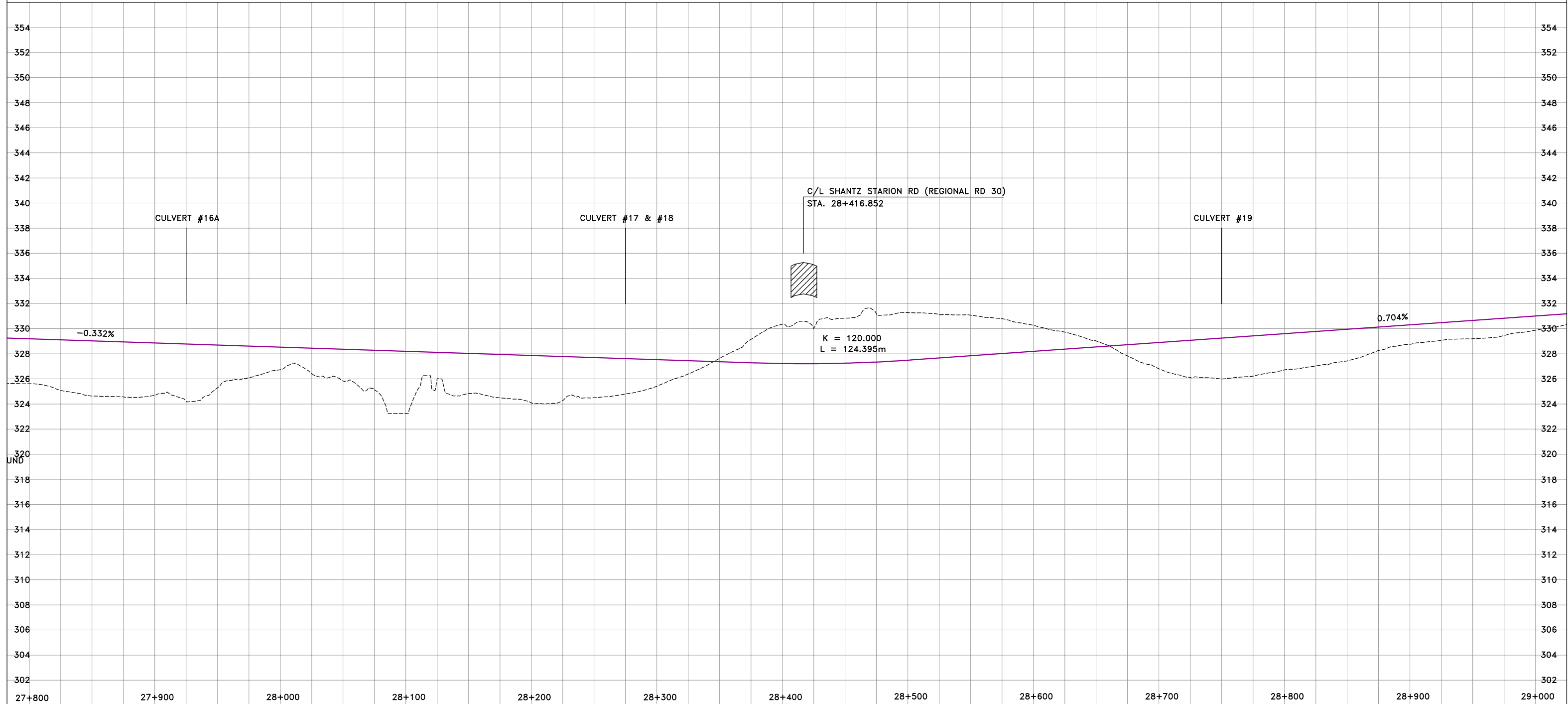
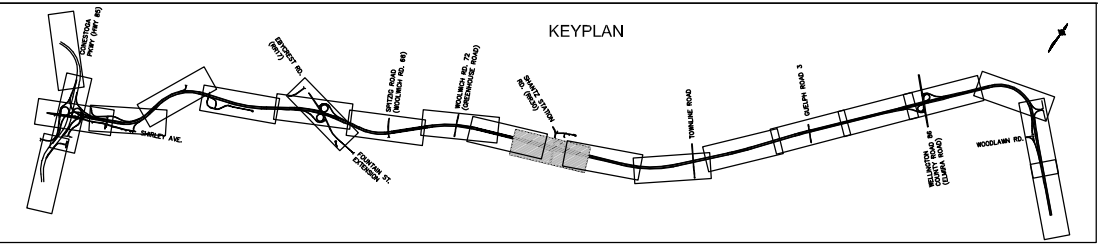


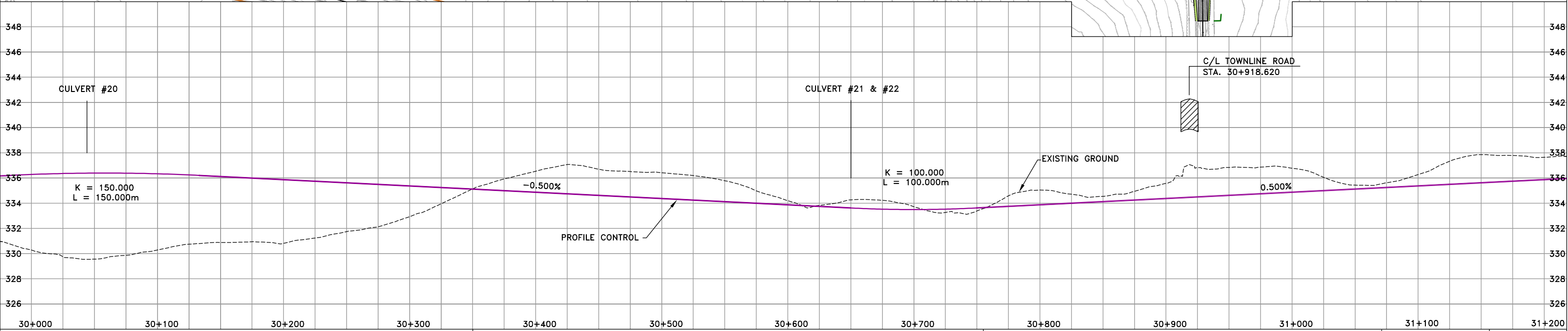
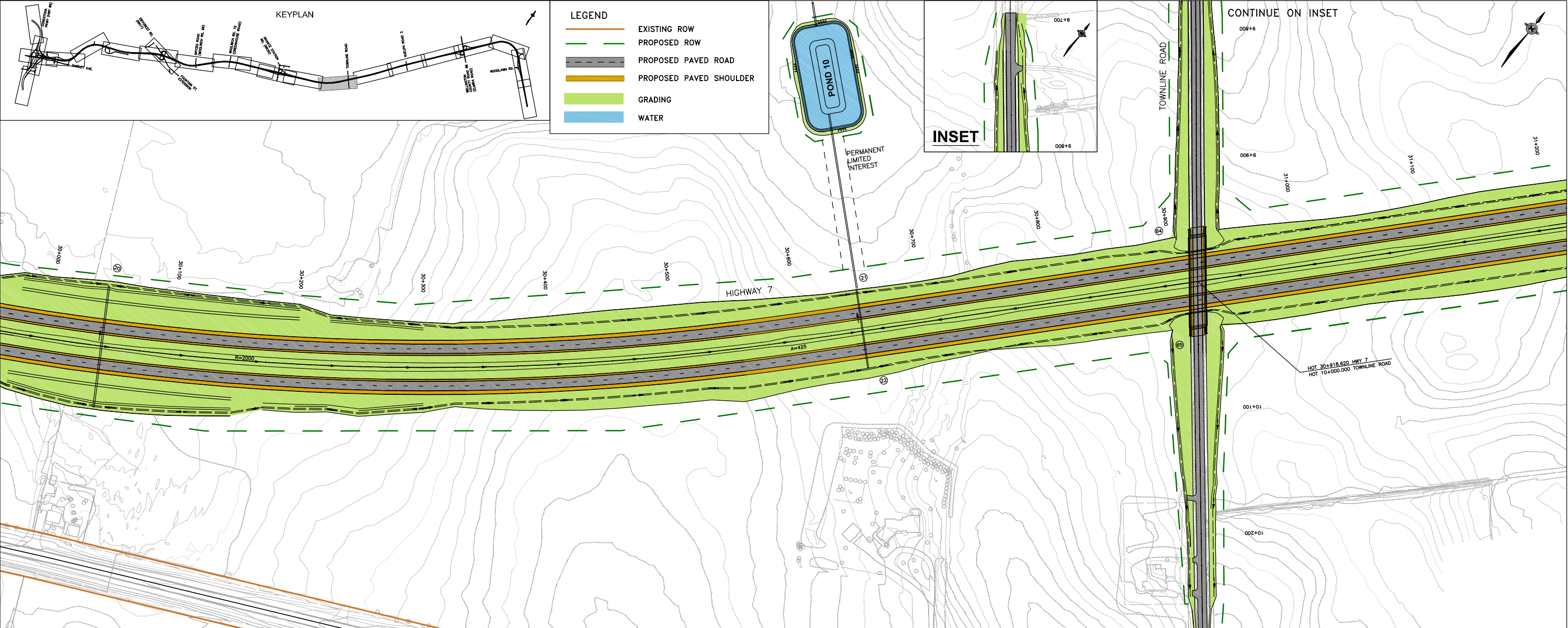


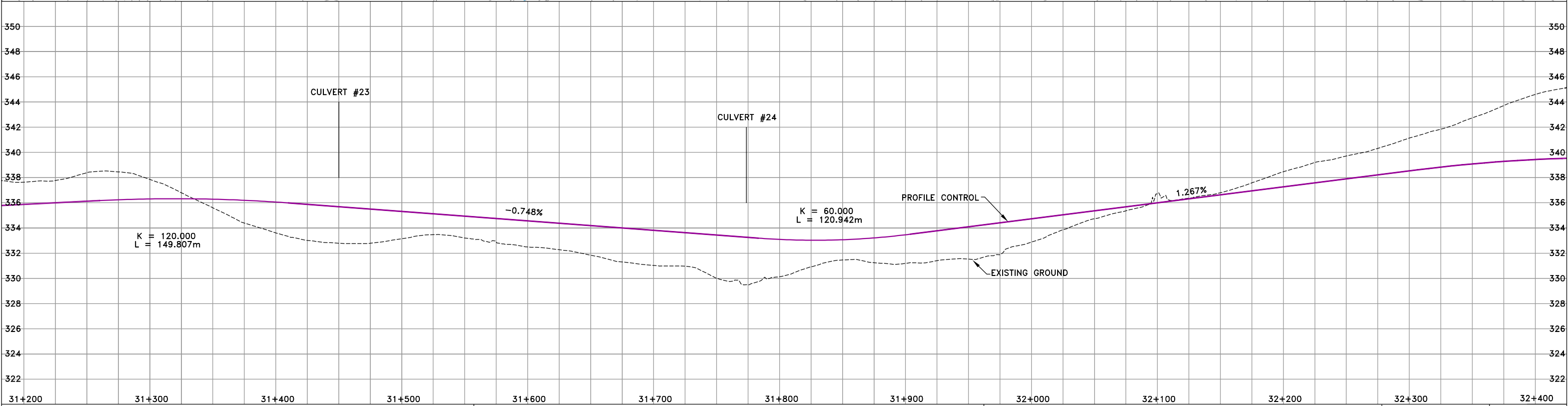
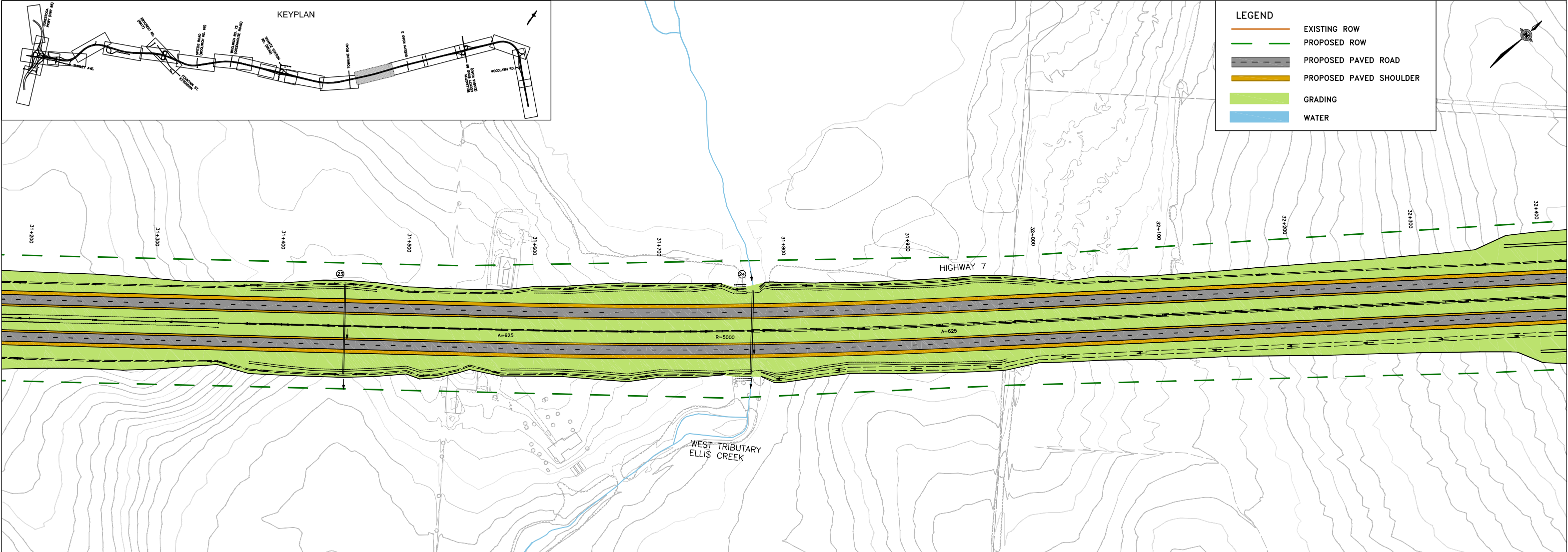


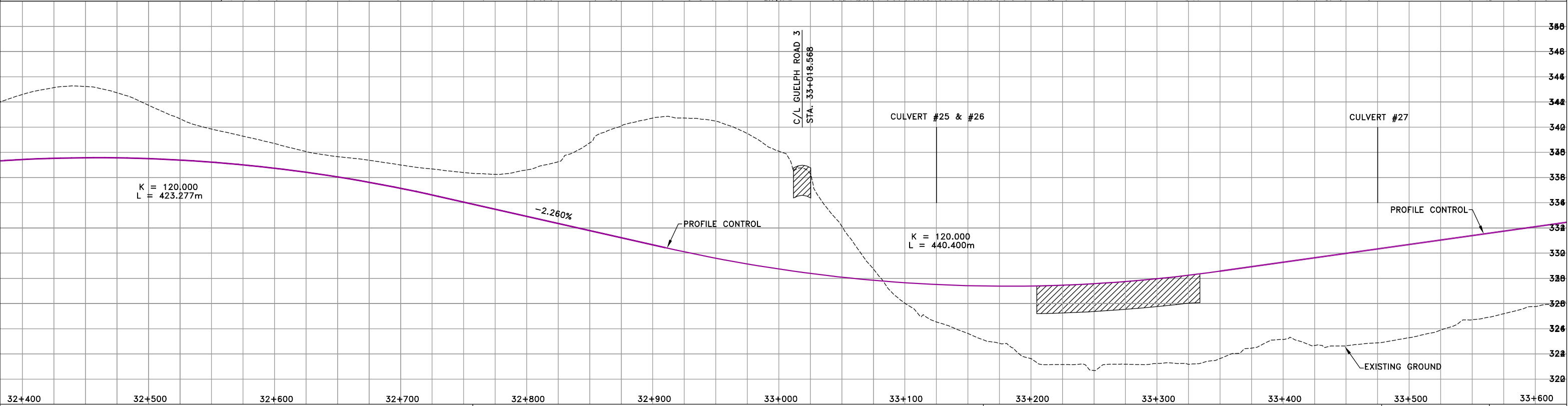
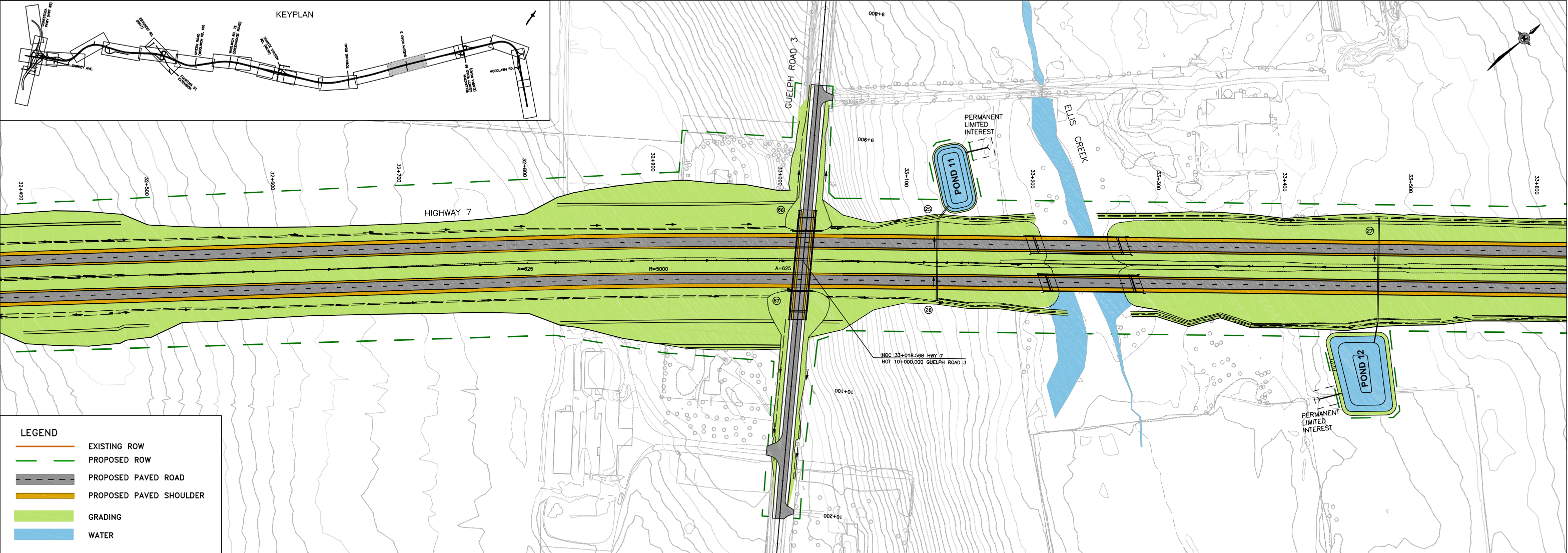


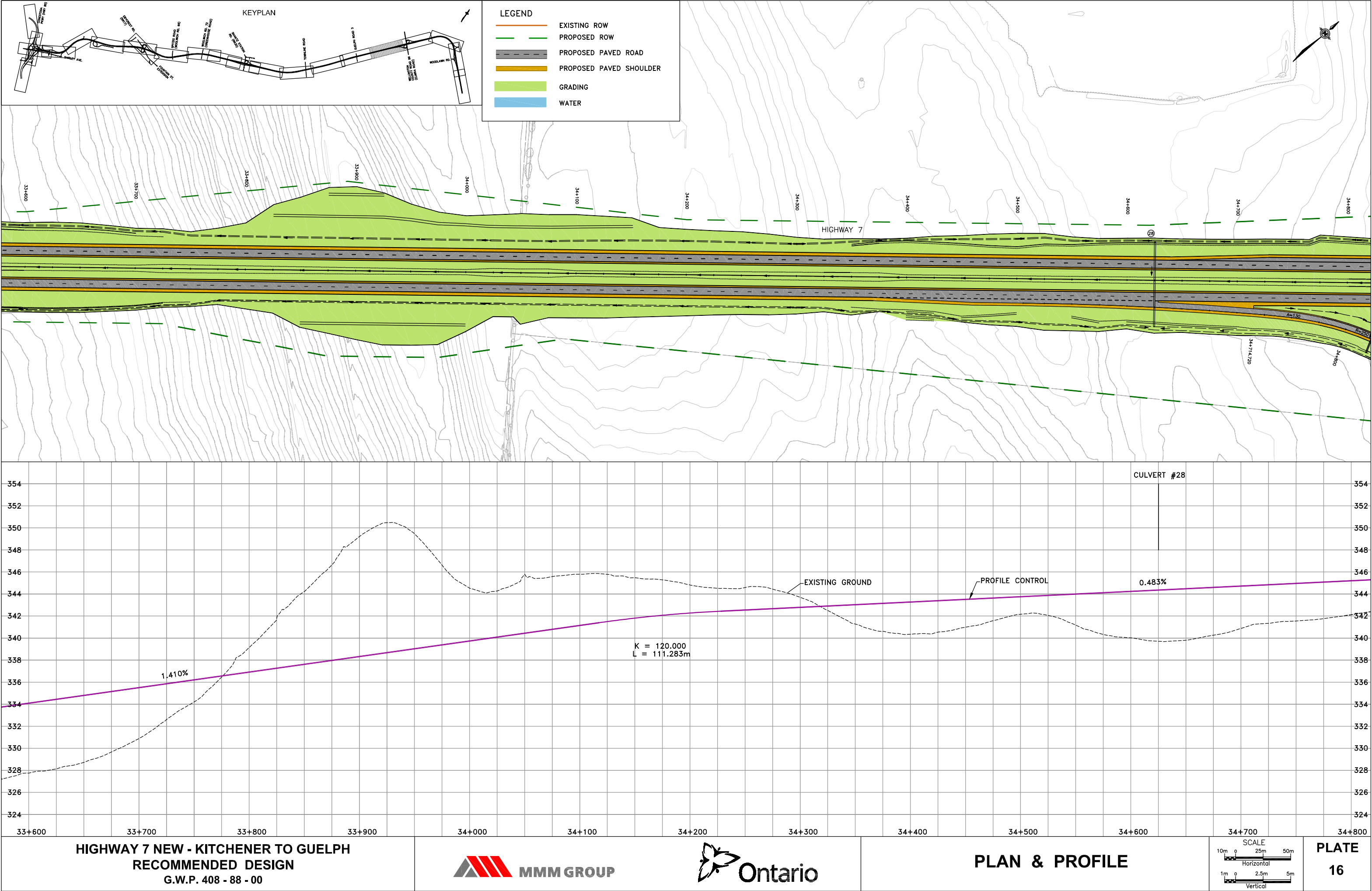


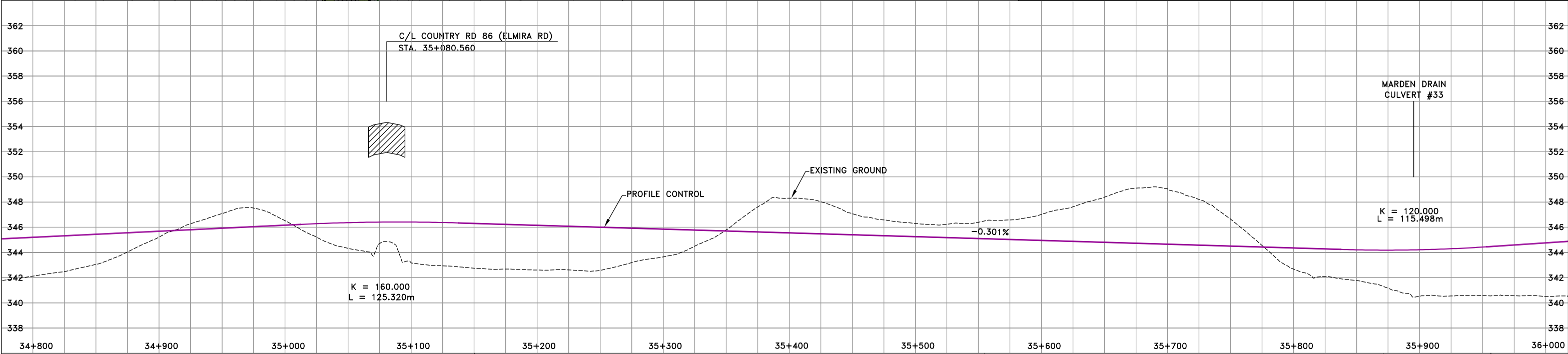
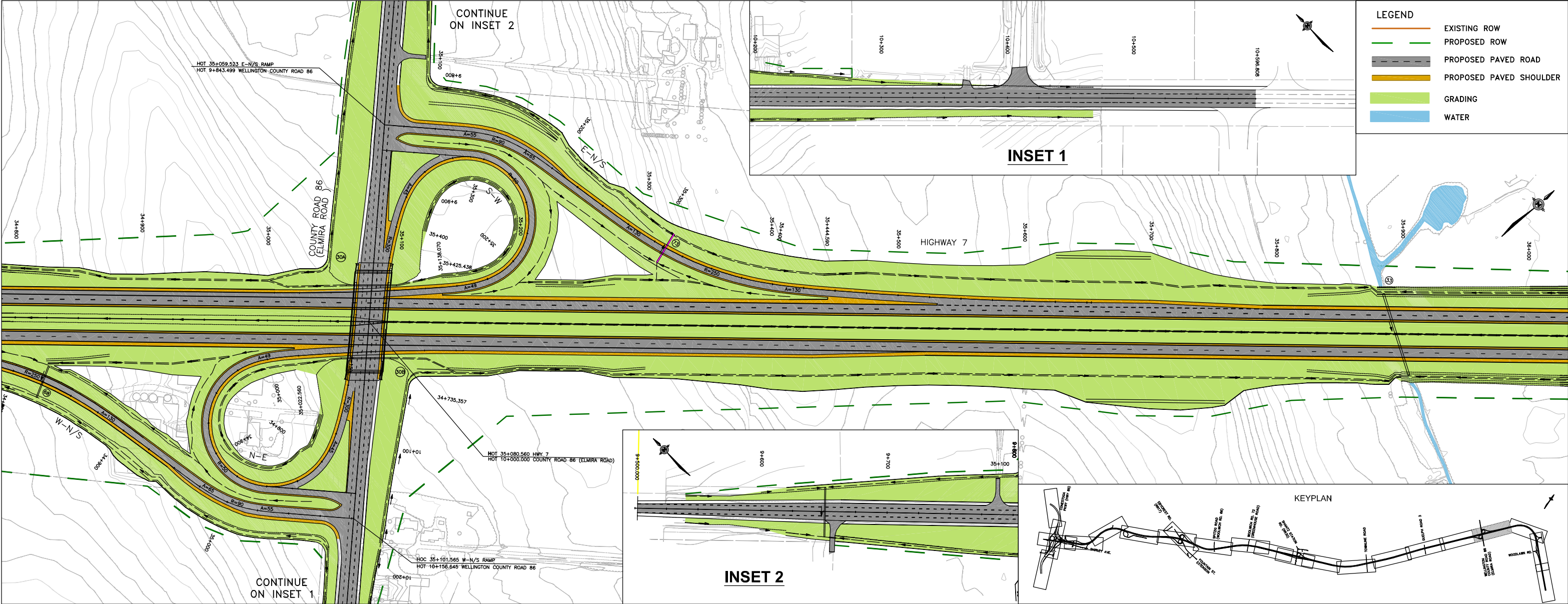


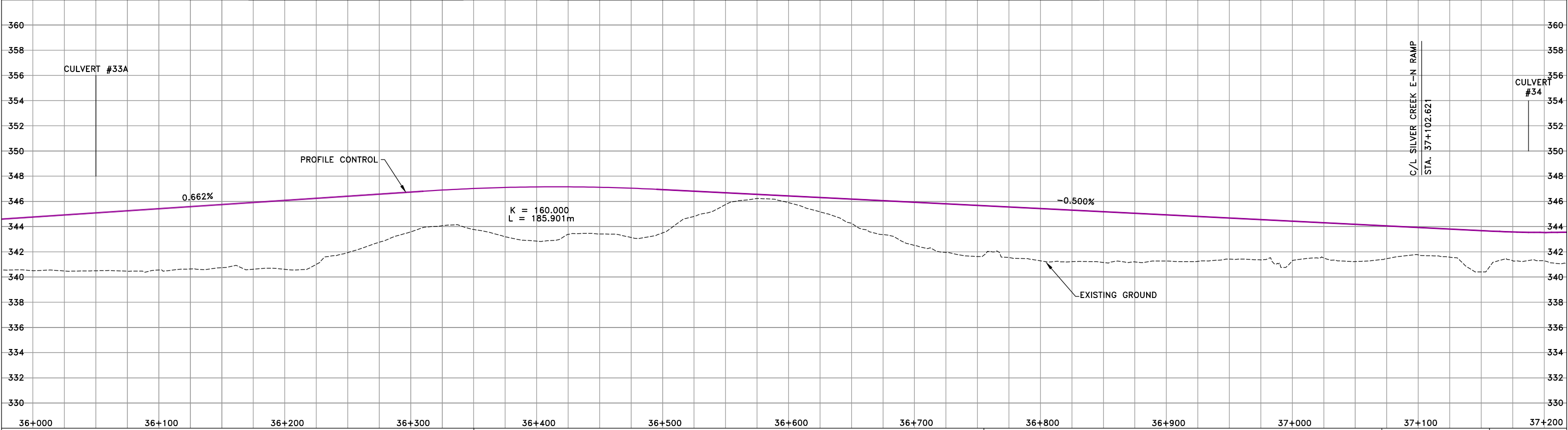
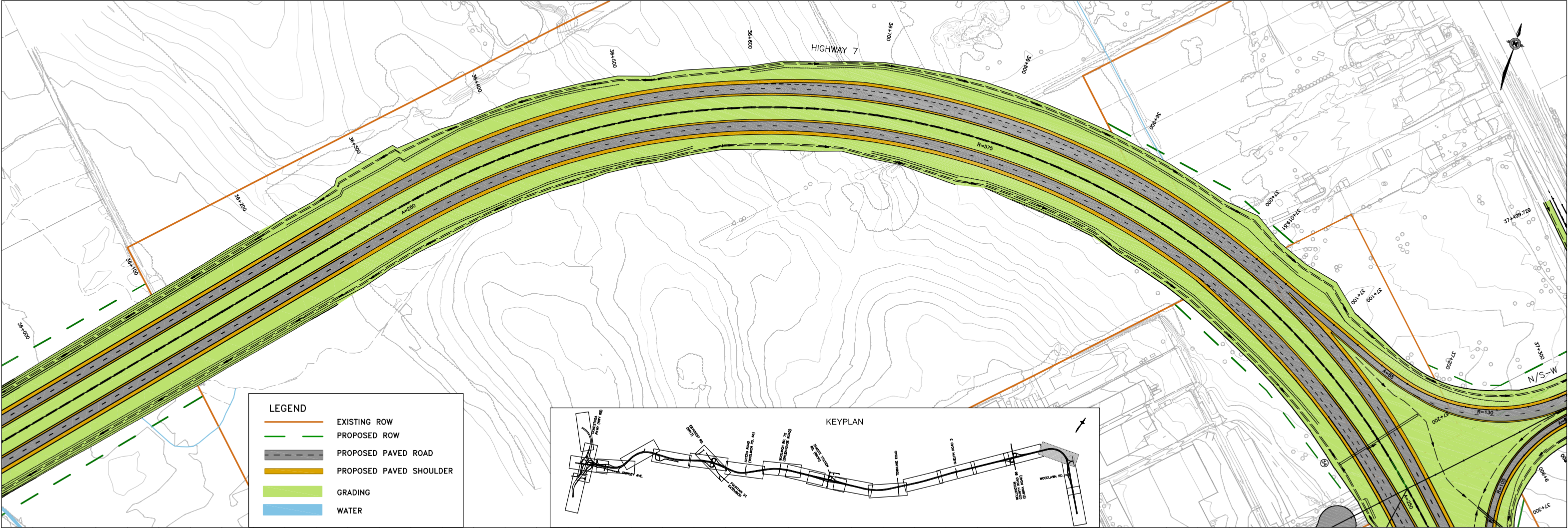


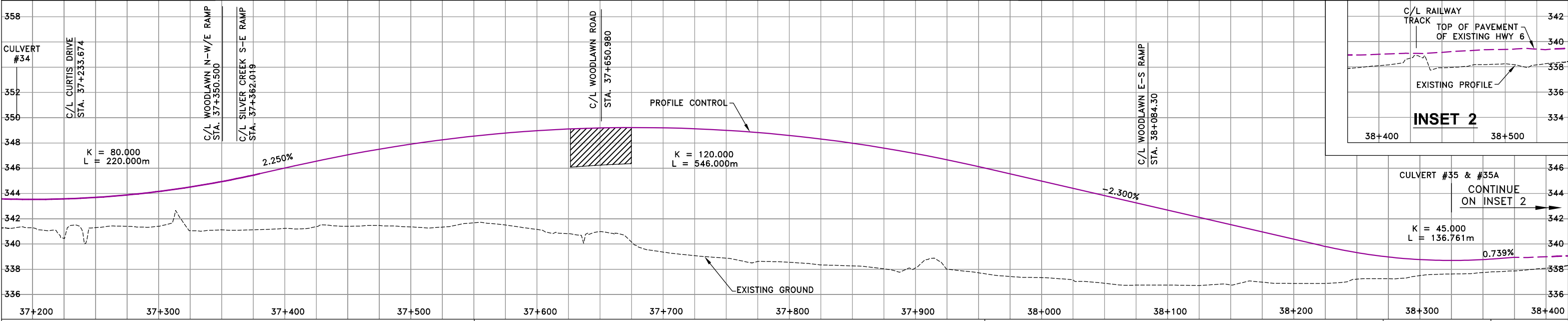
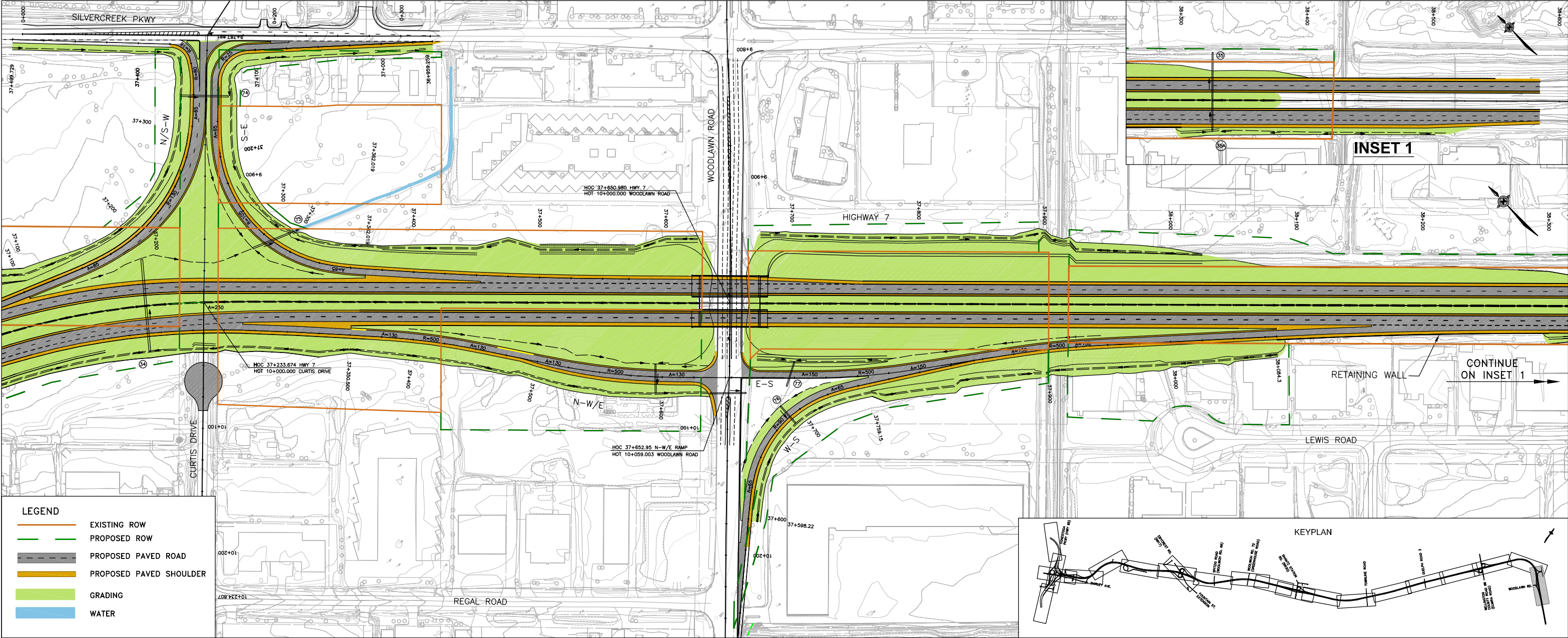


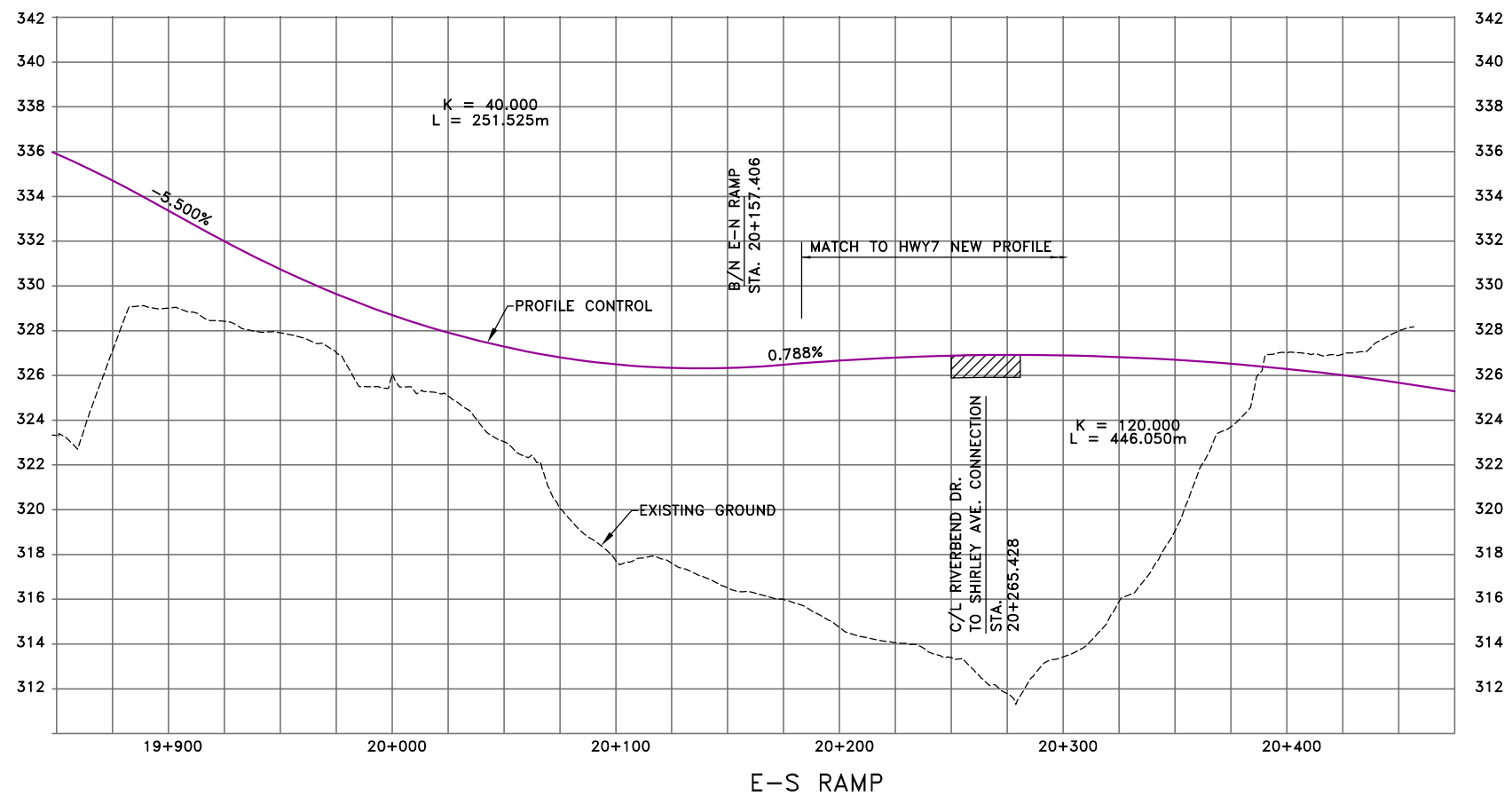
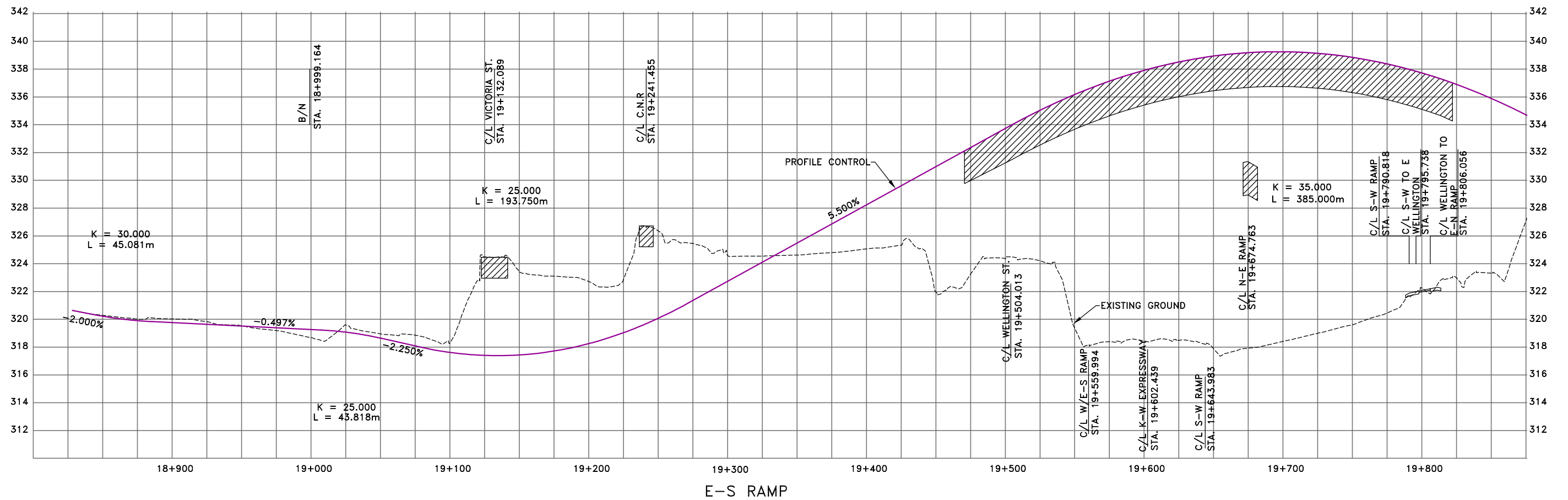


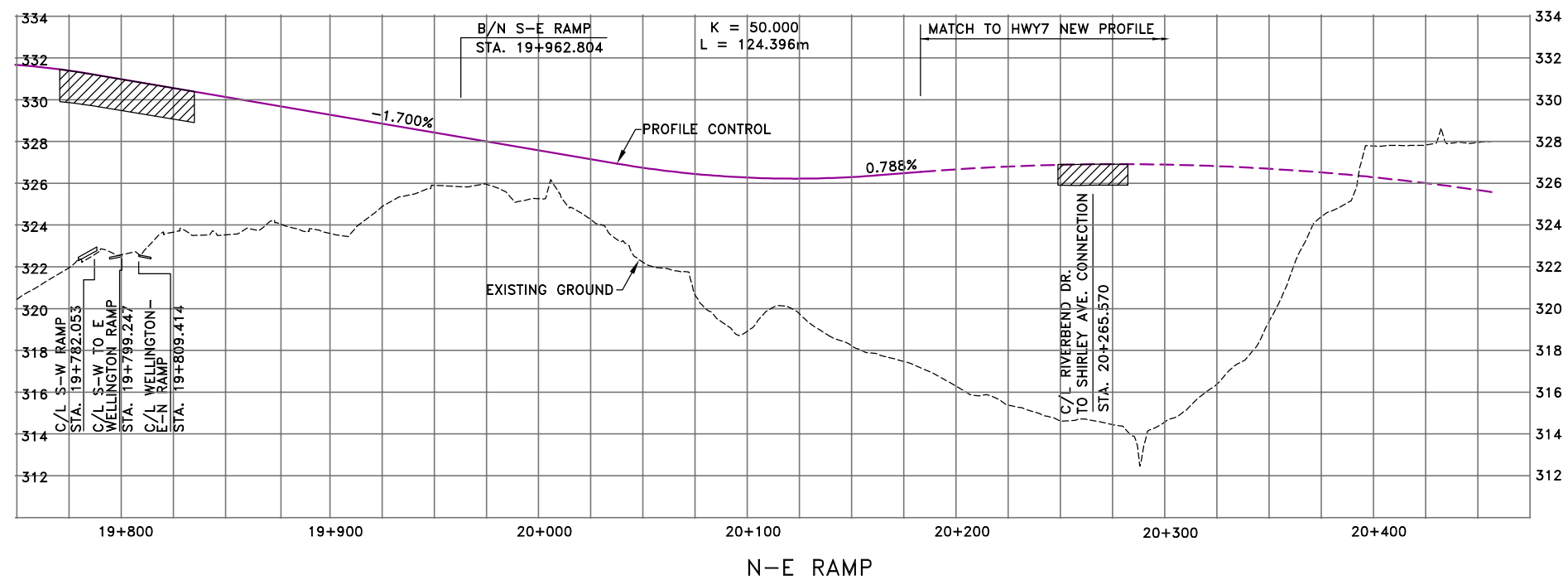
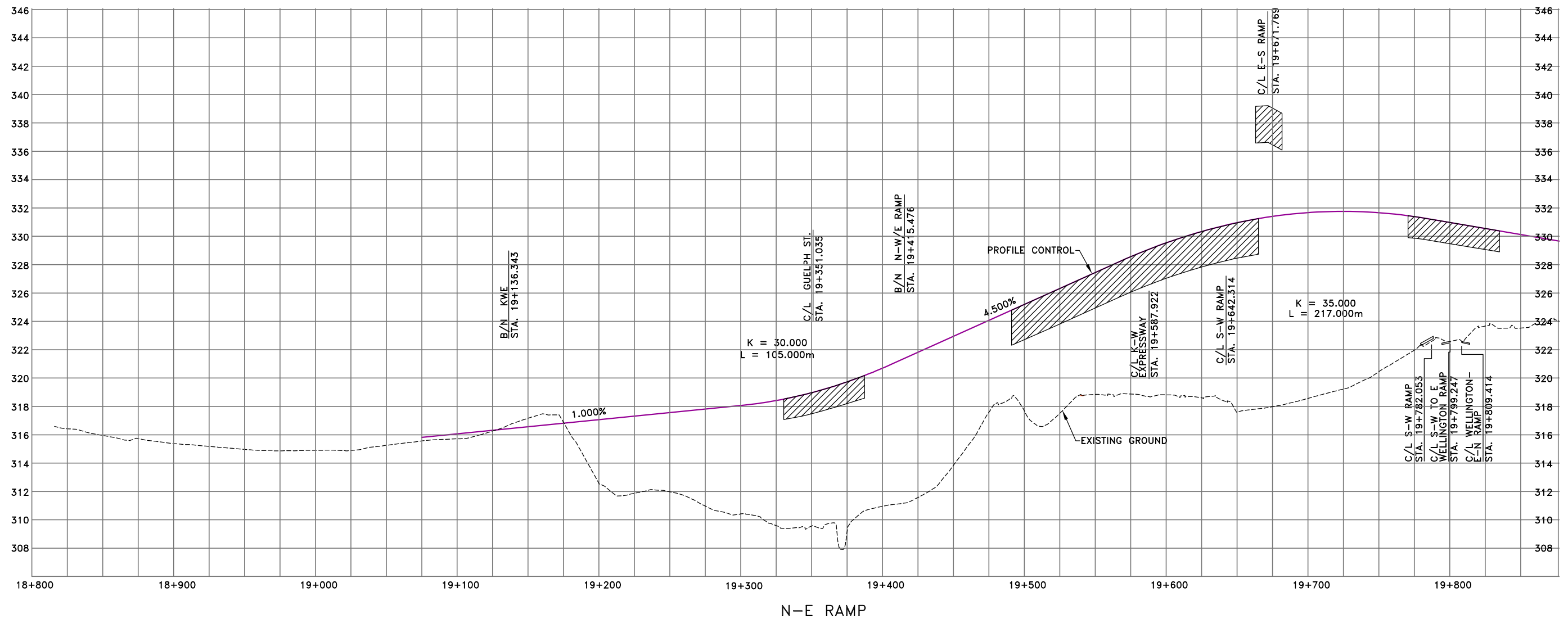


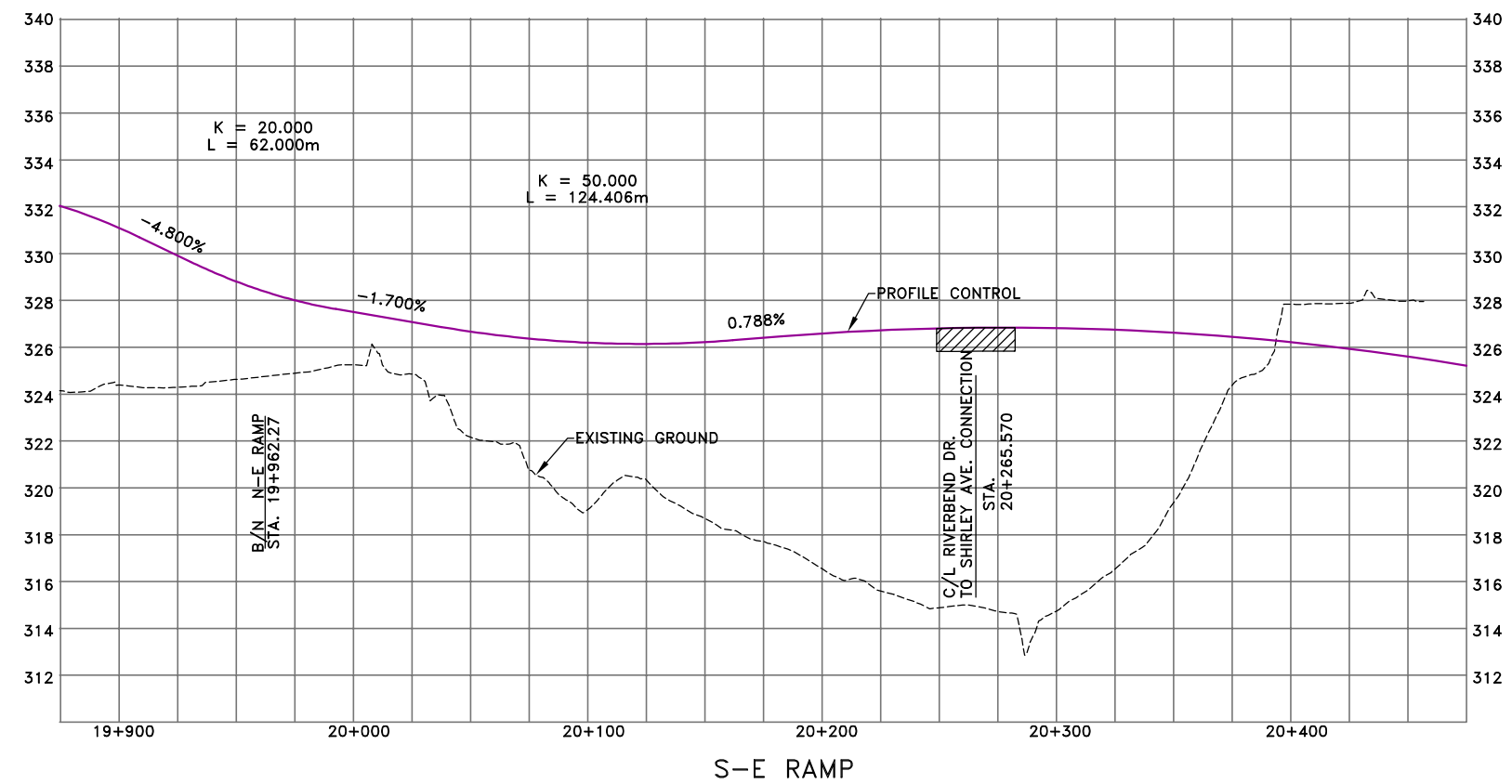
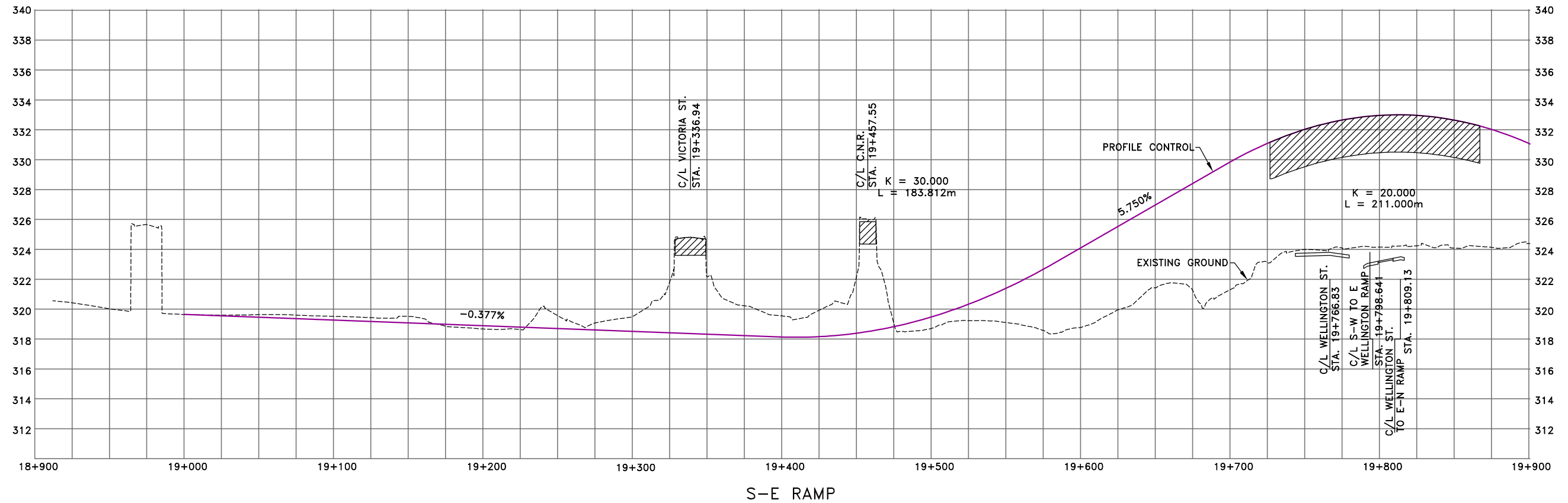


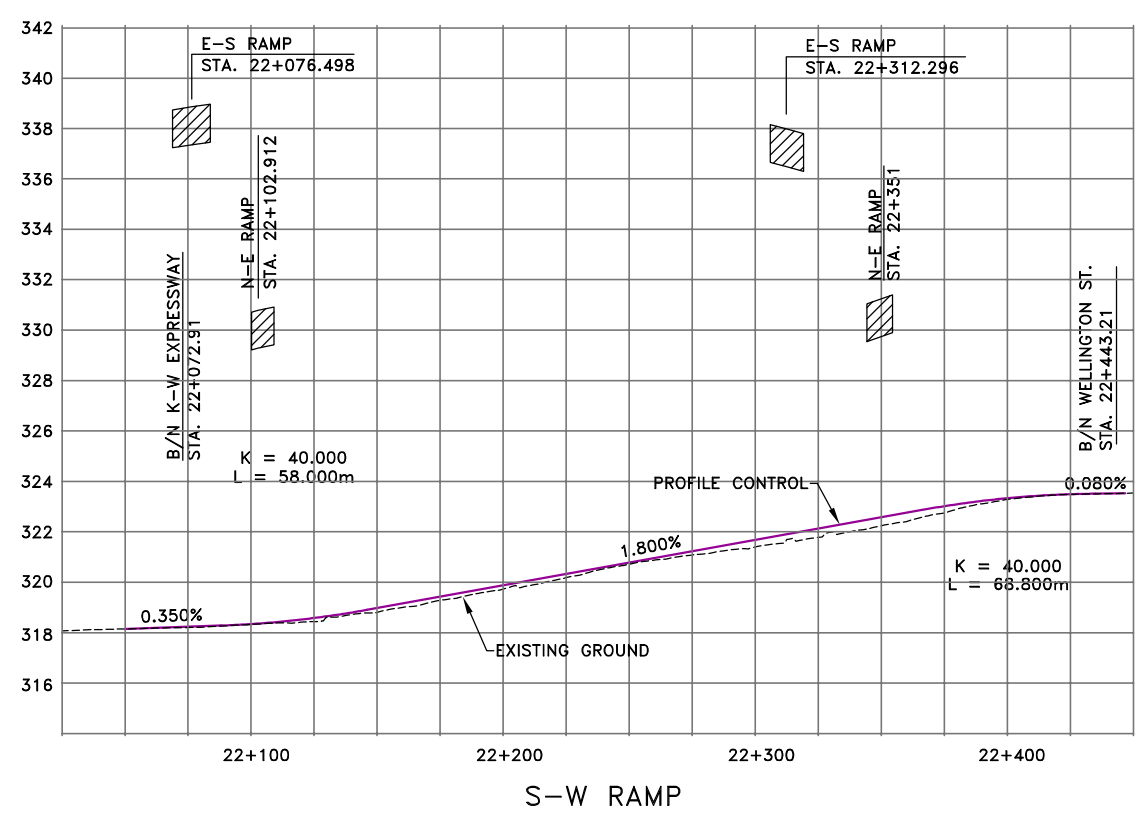
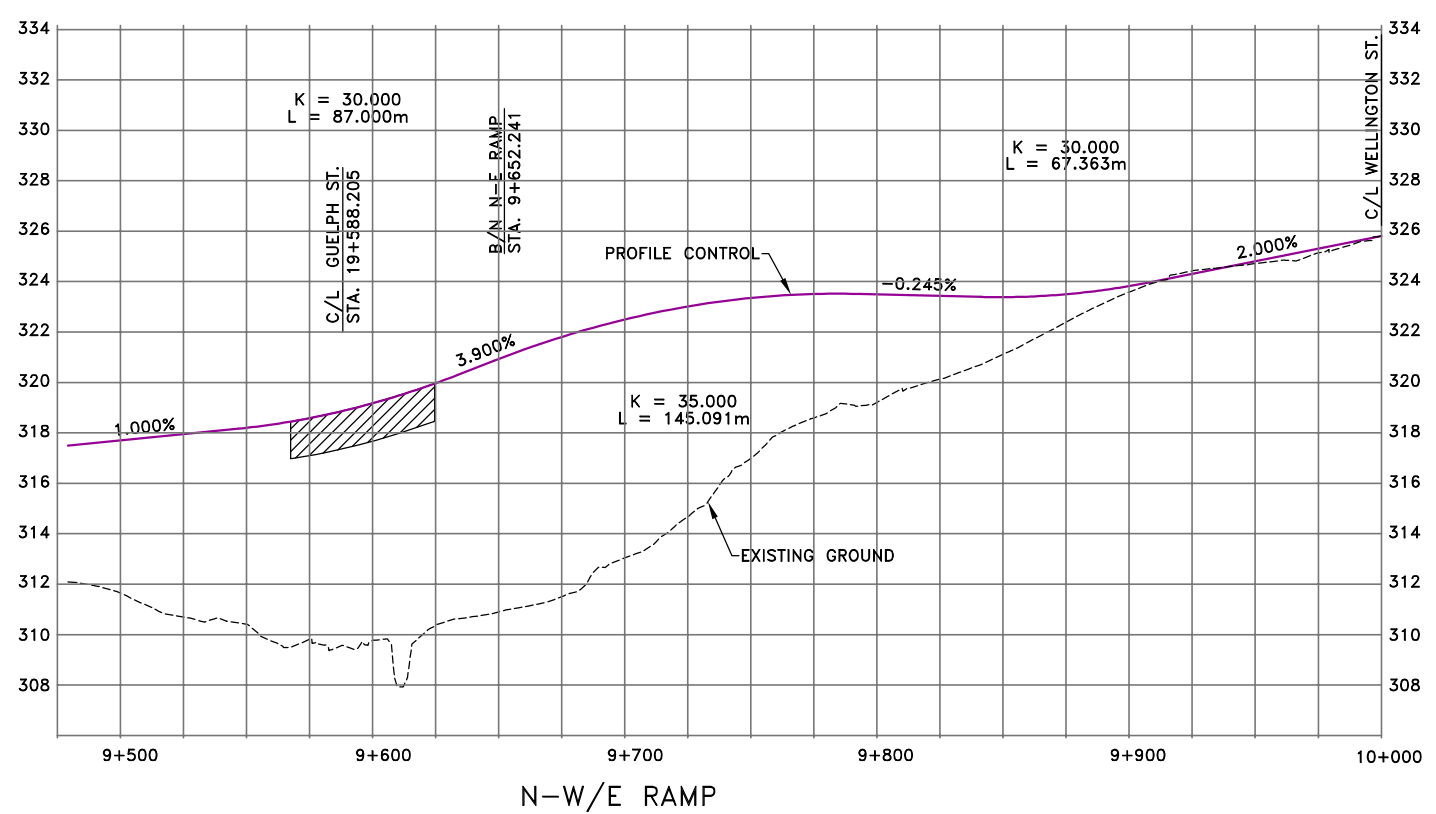
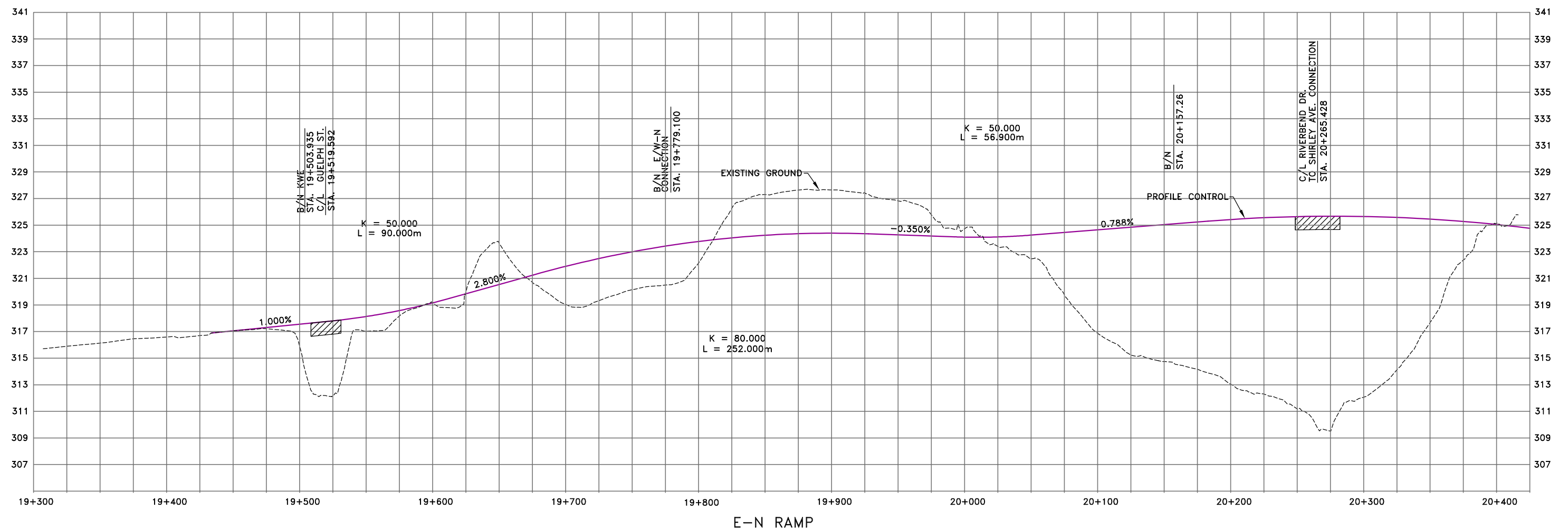


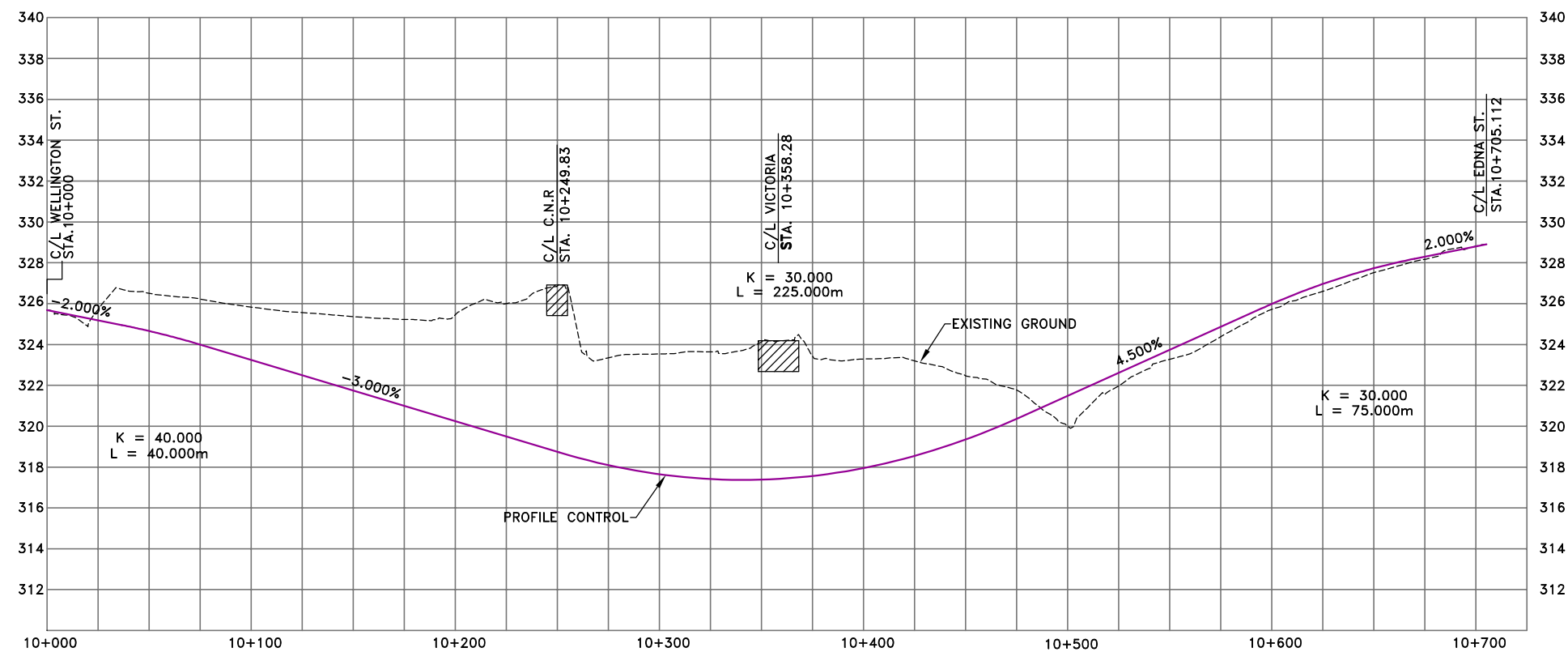




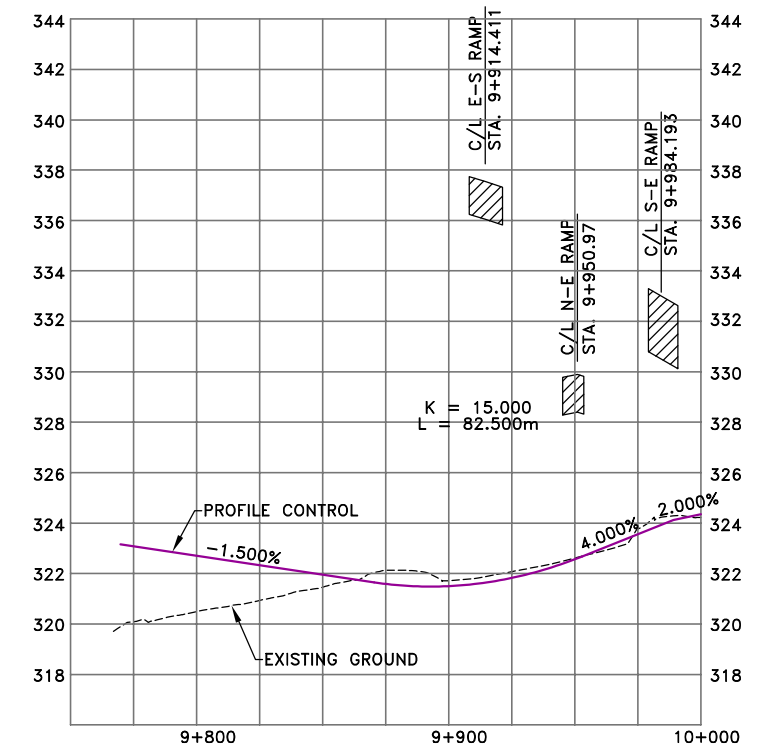




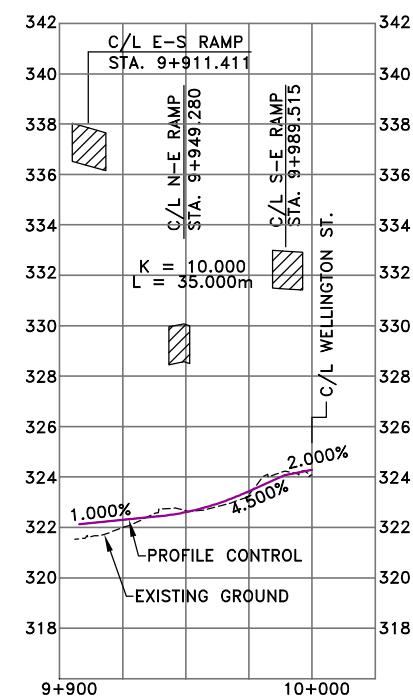




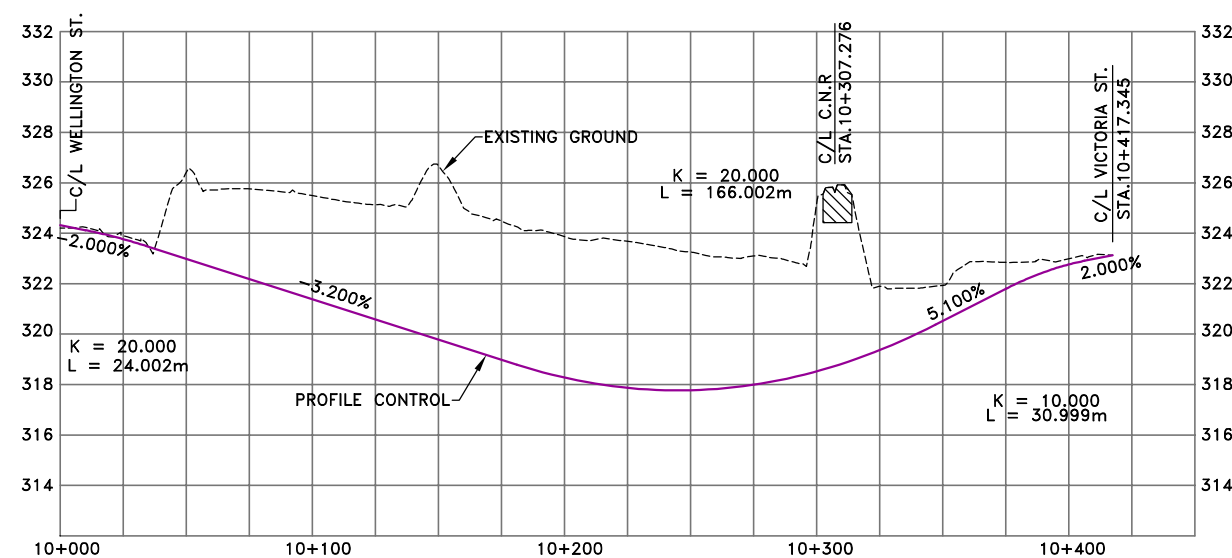
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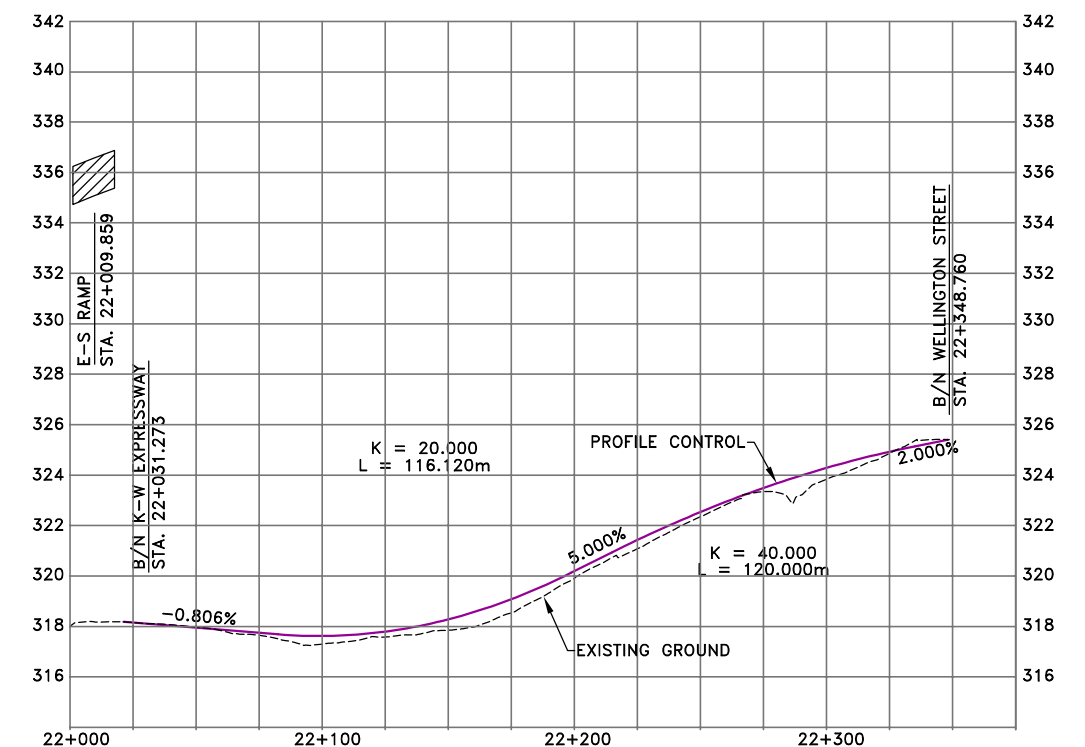
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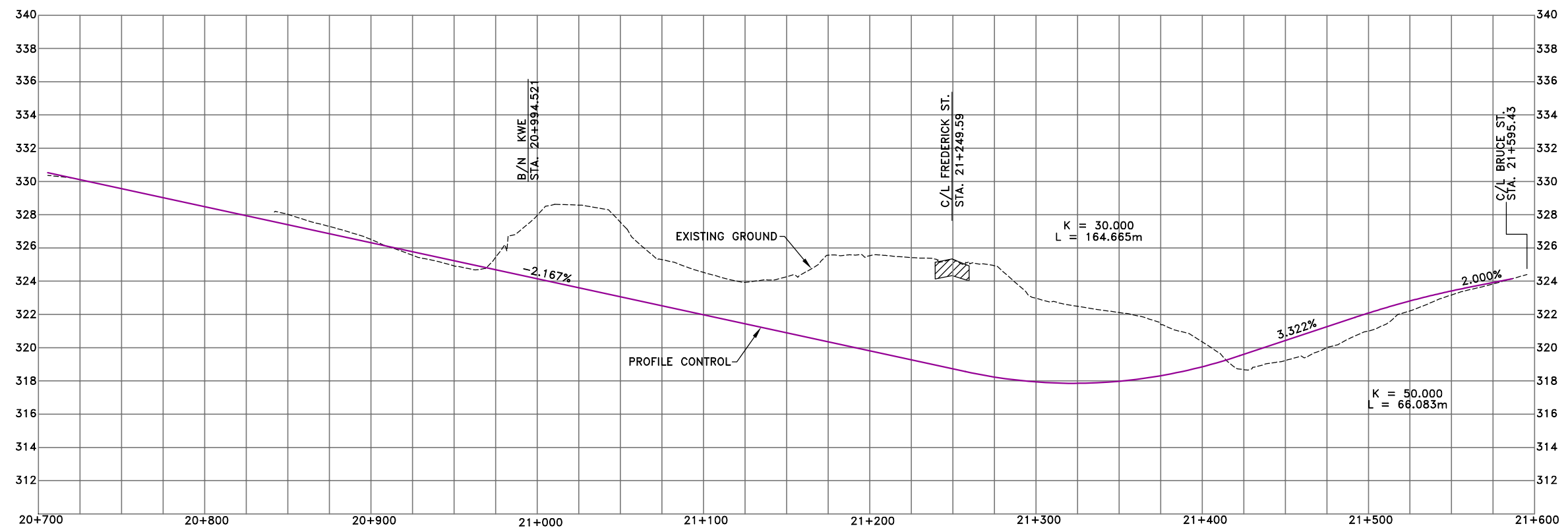
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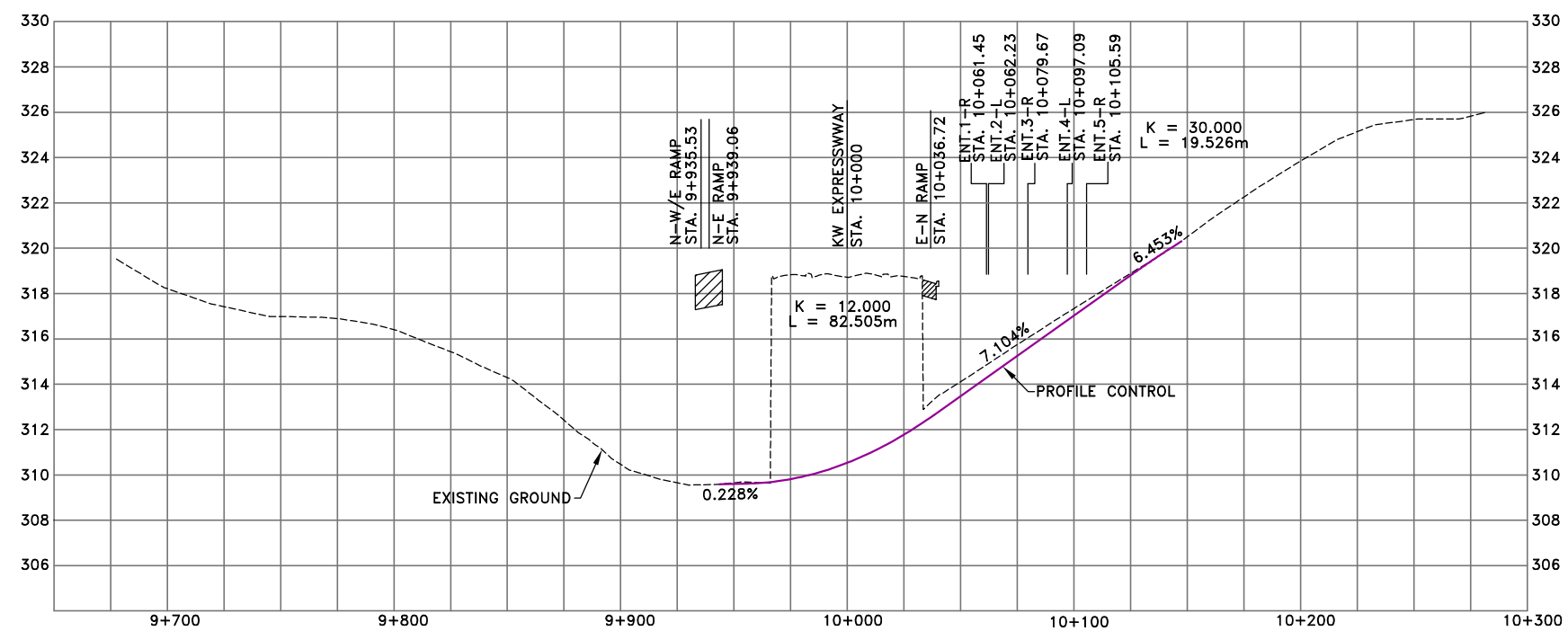
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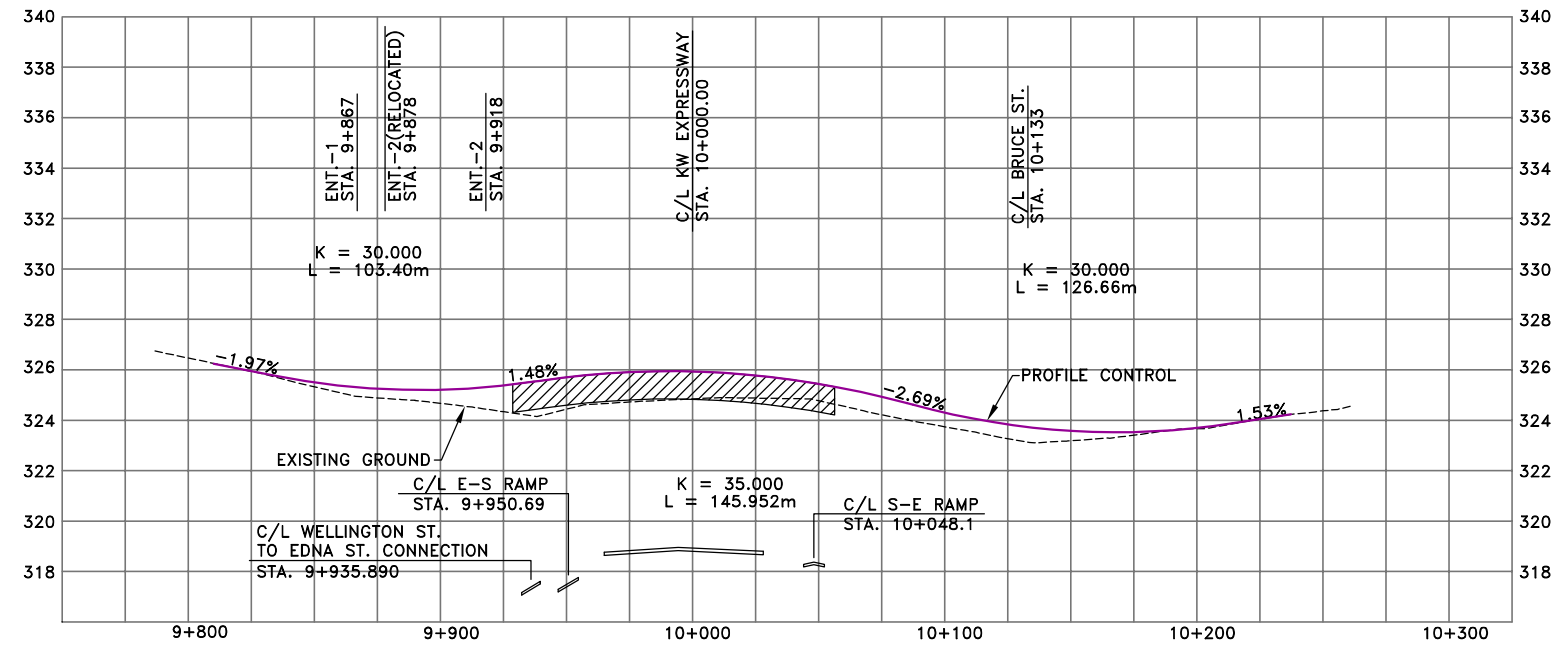
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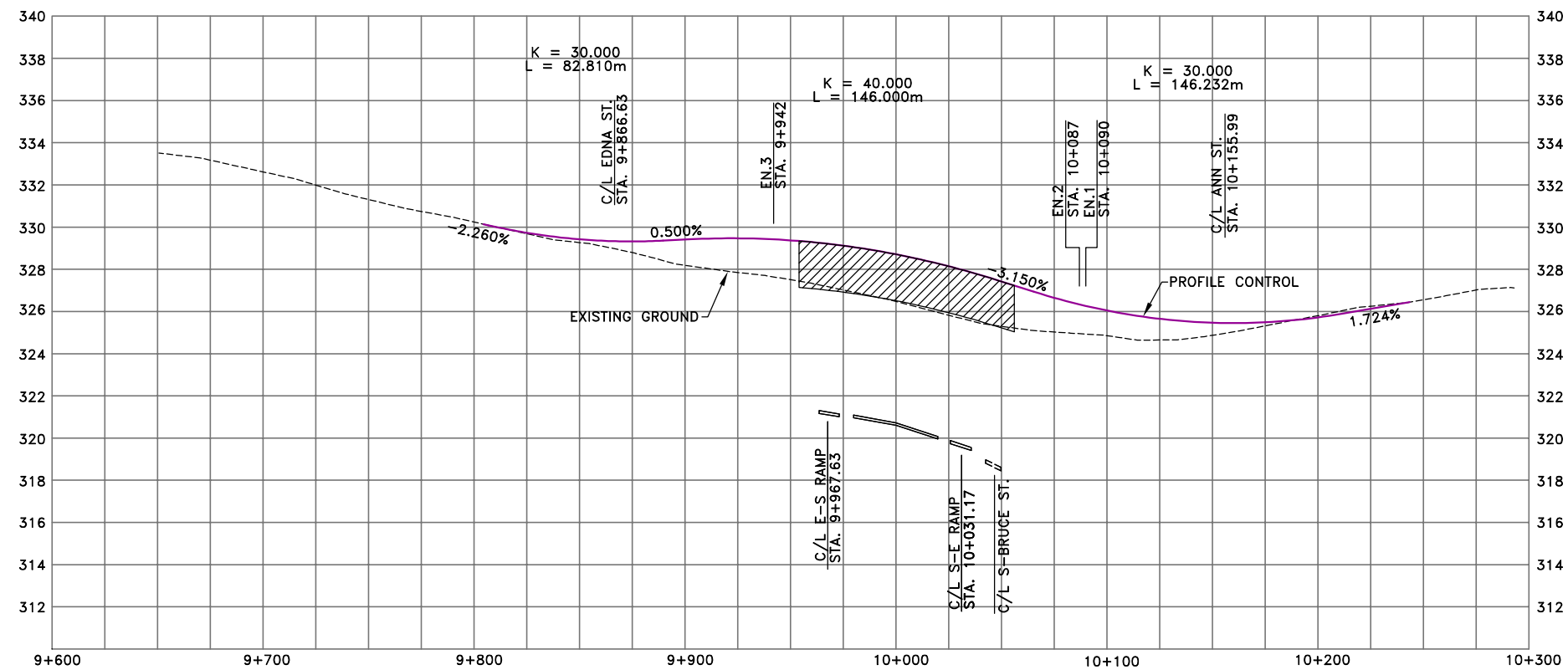
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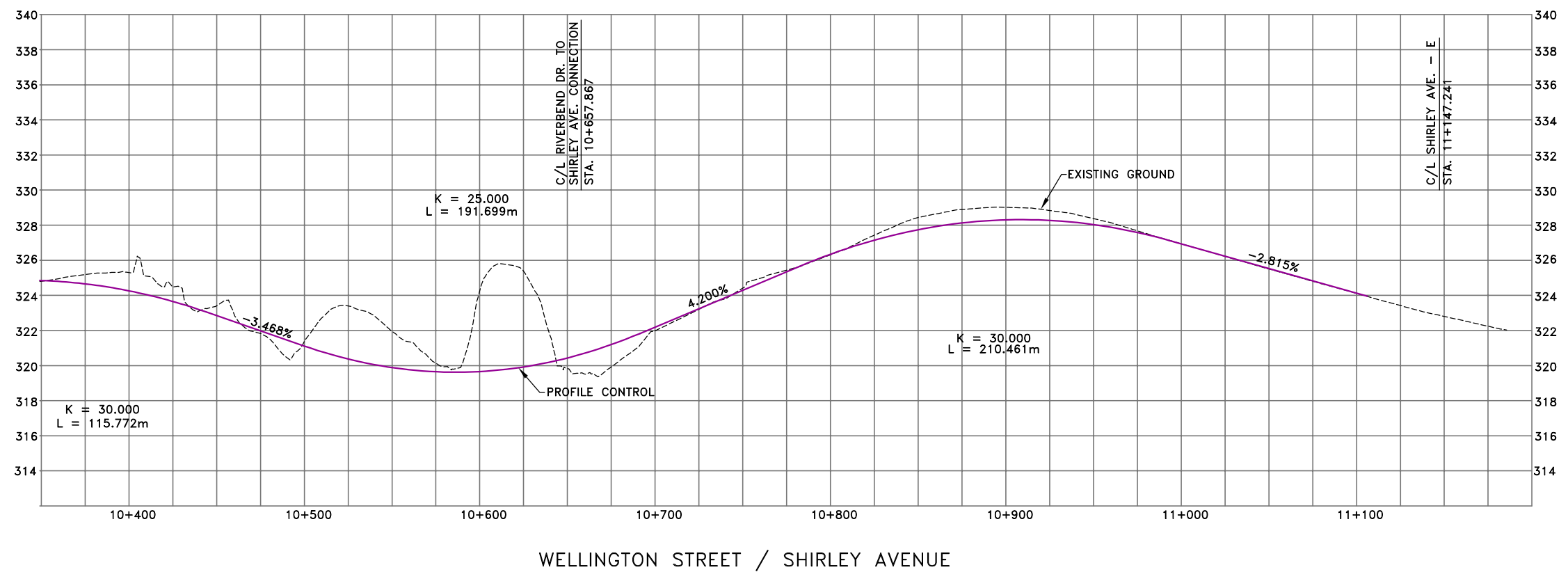
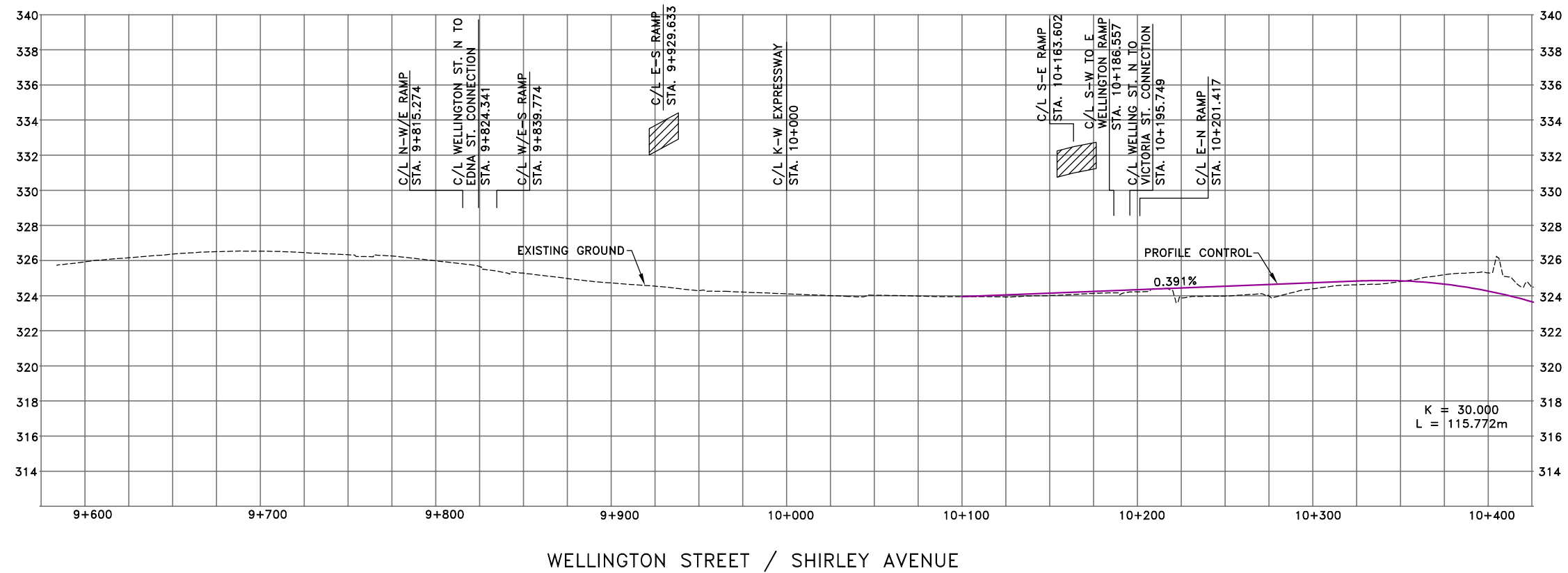
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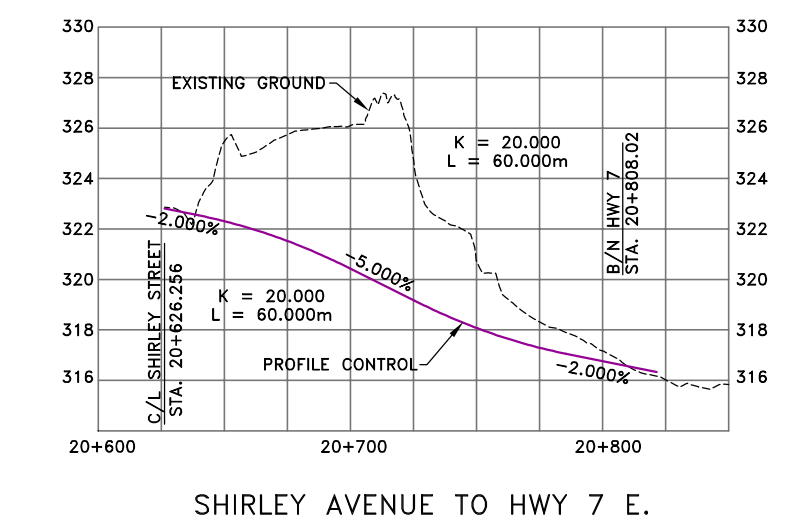
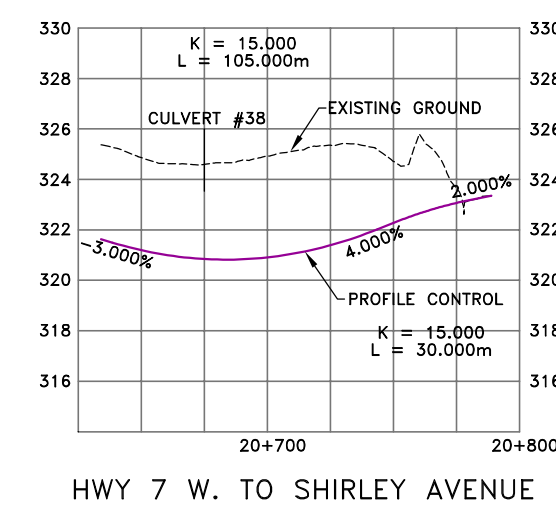
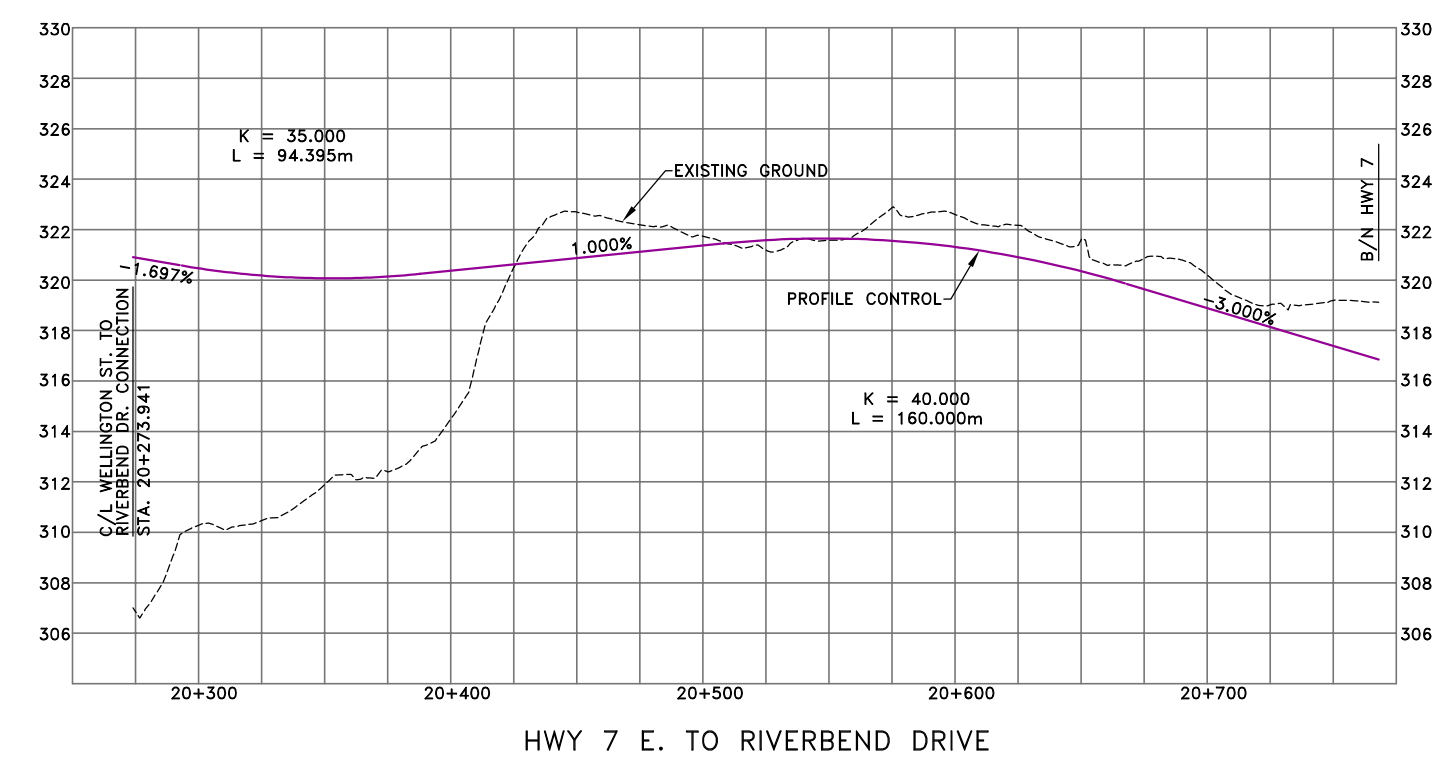
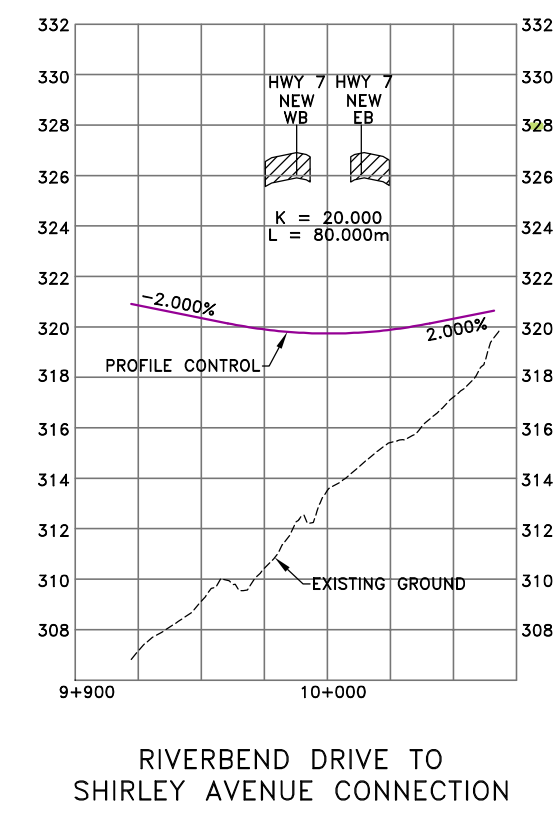
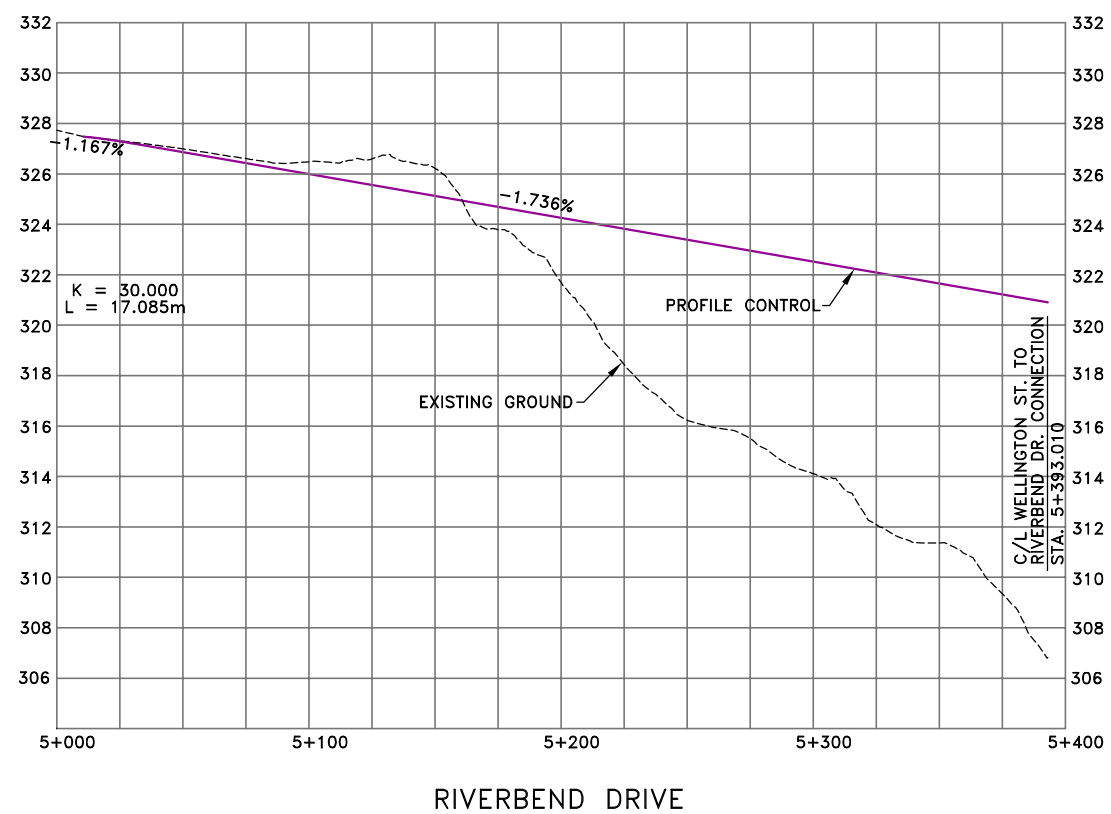


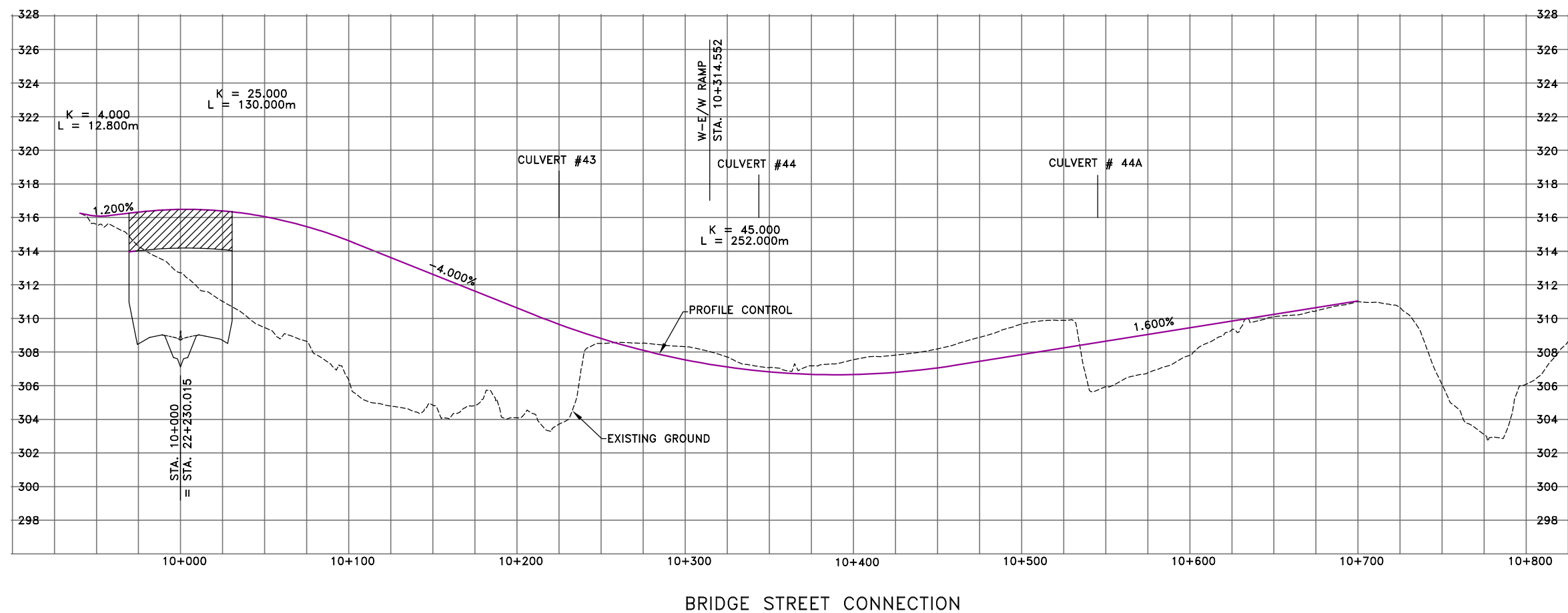
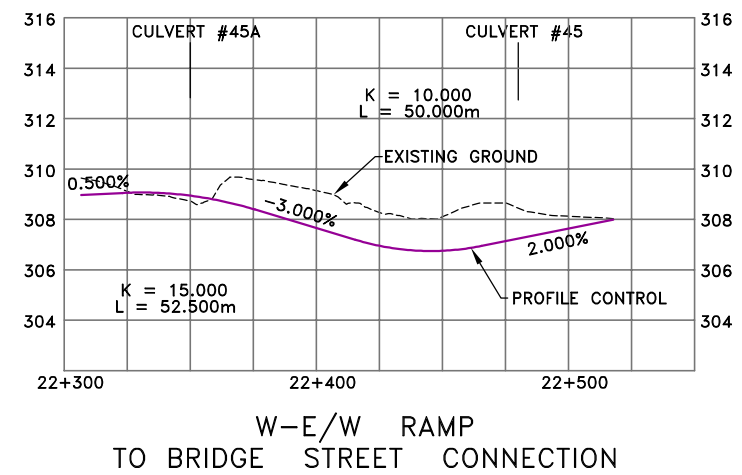
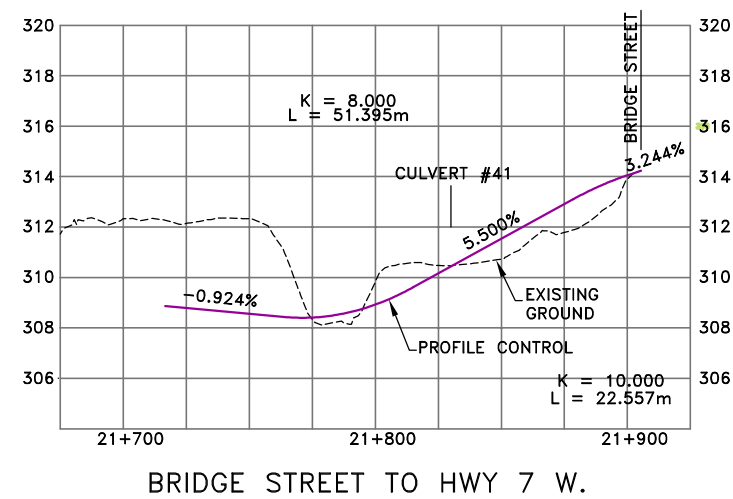
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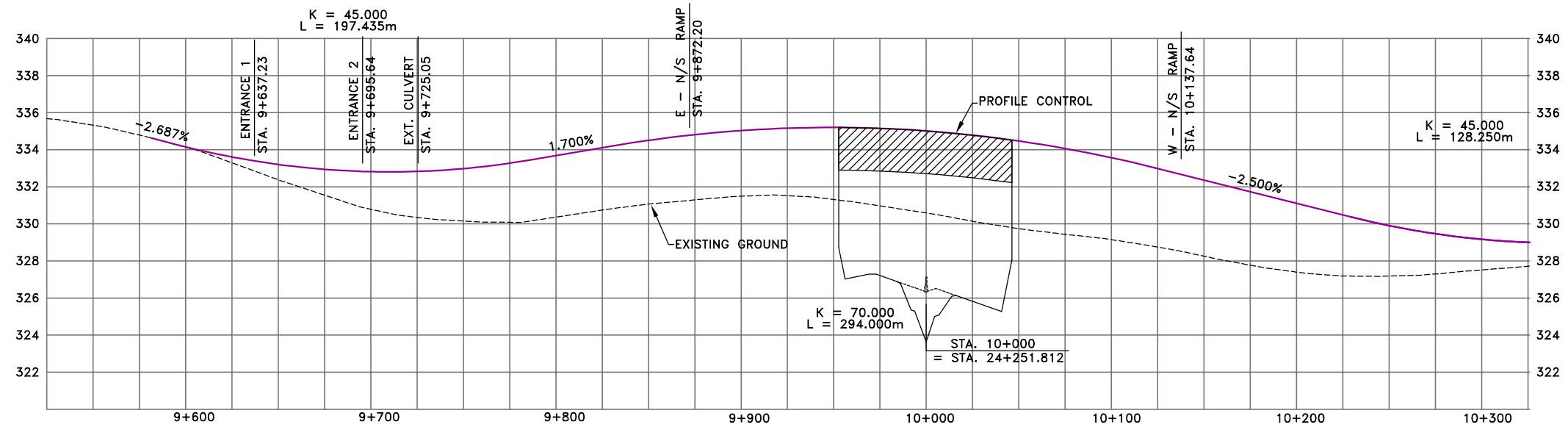


FREDERICK STREET PROFILE

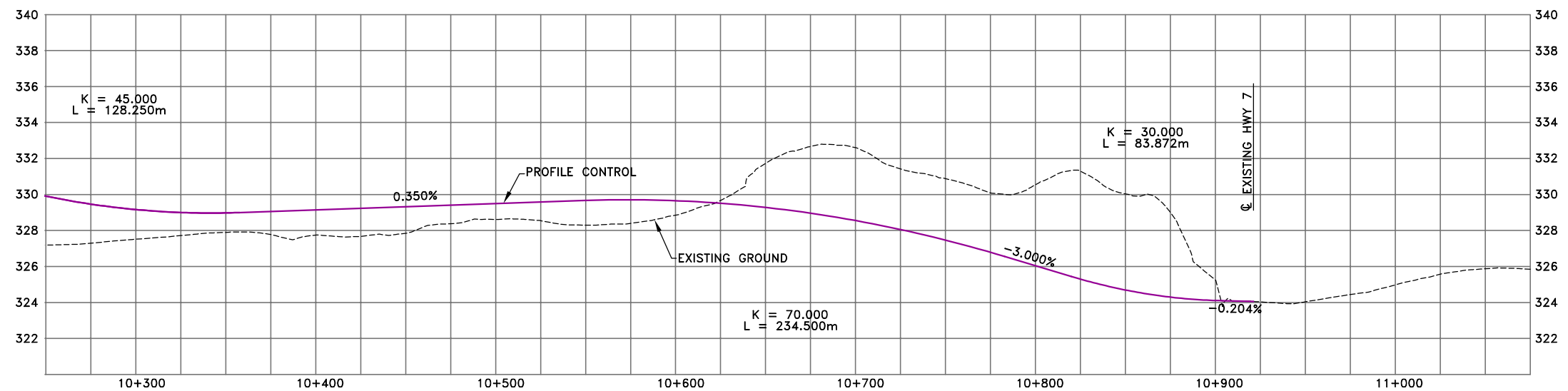




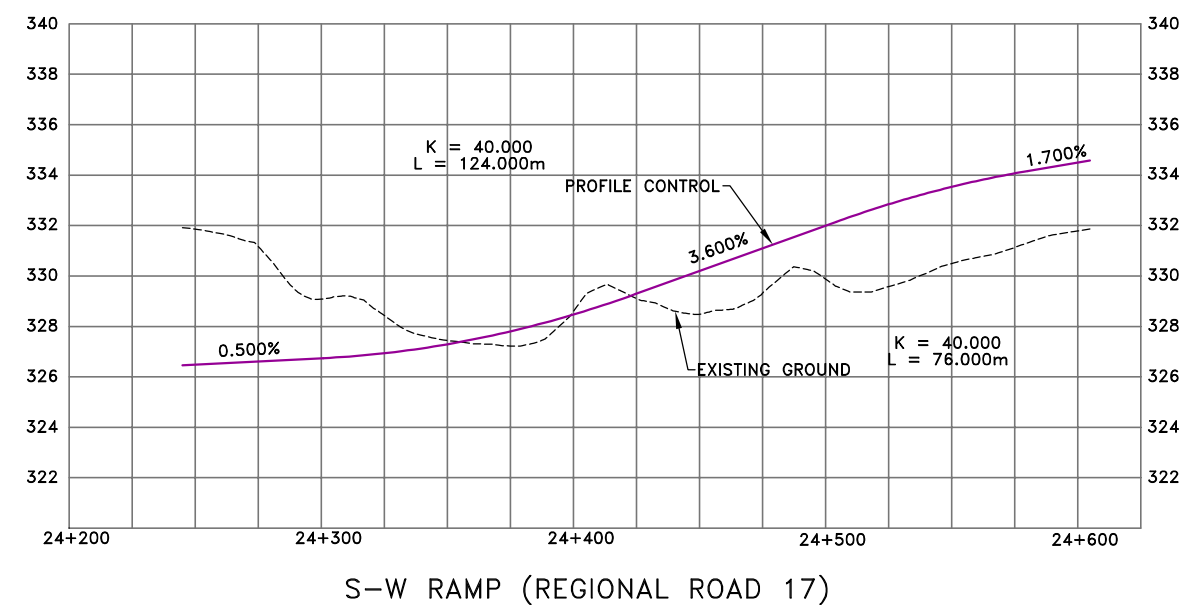
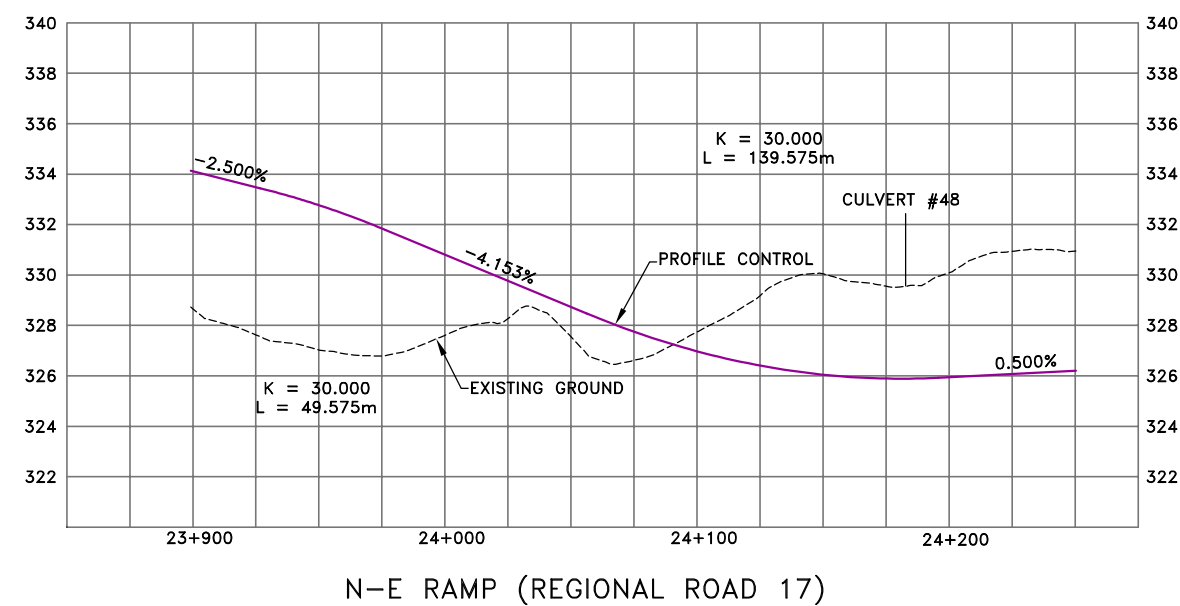
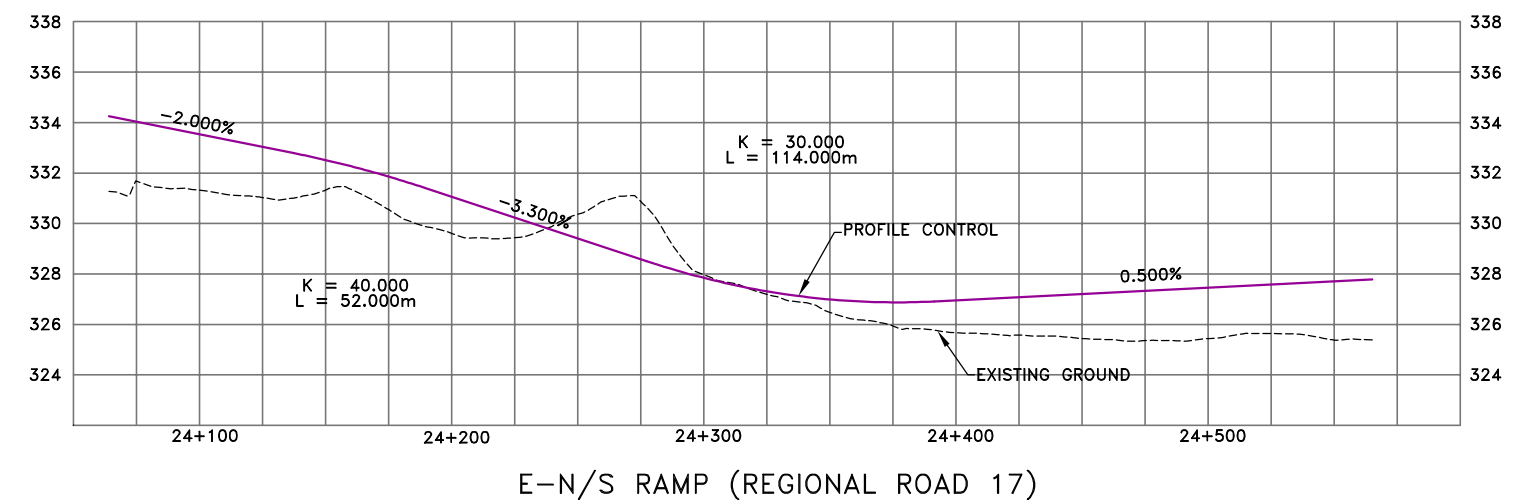
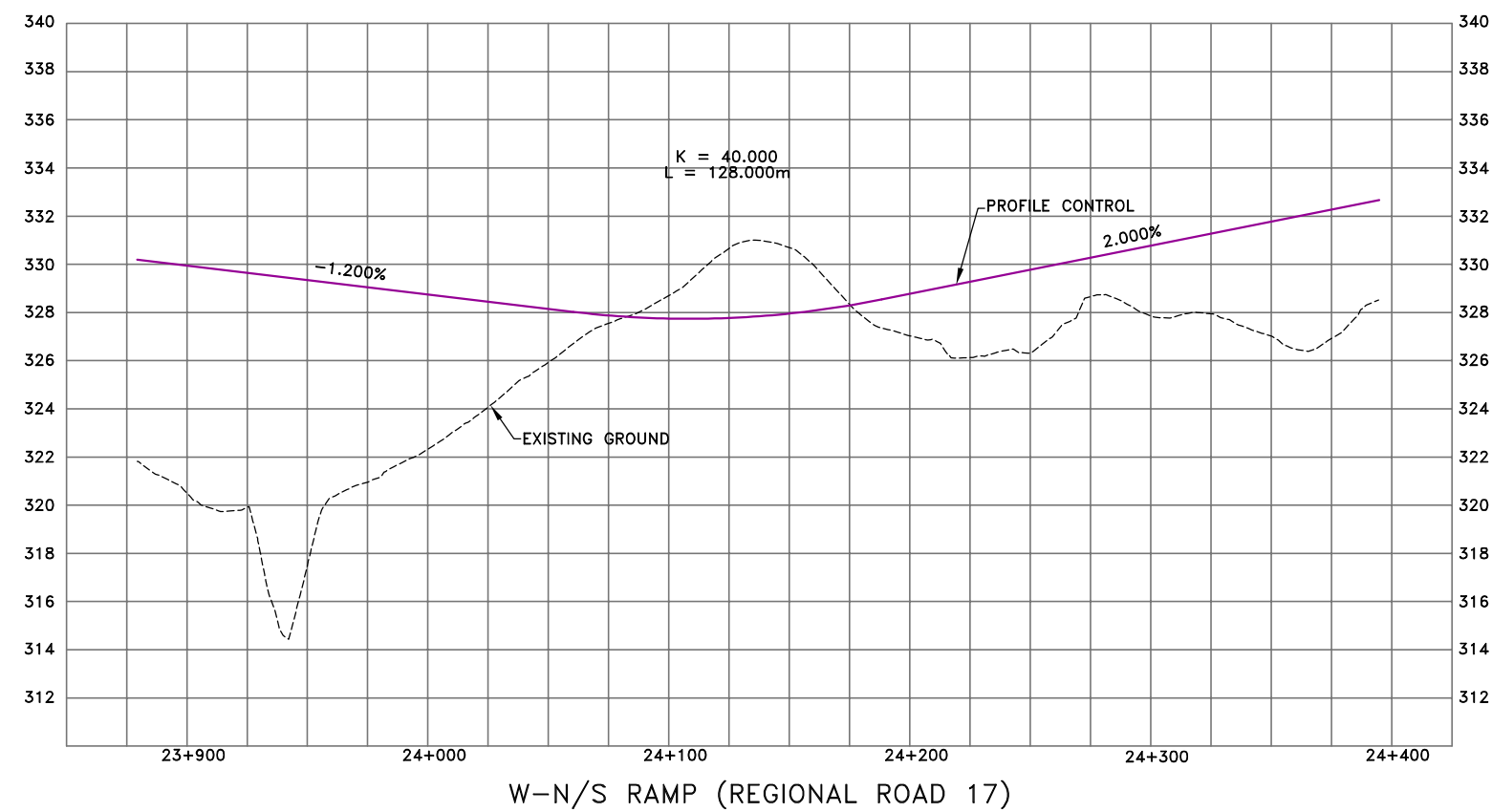


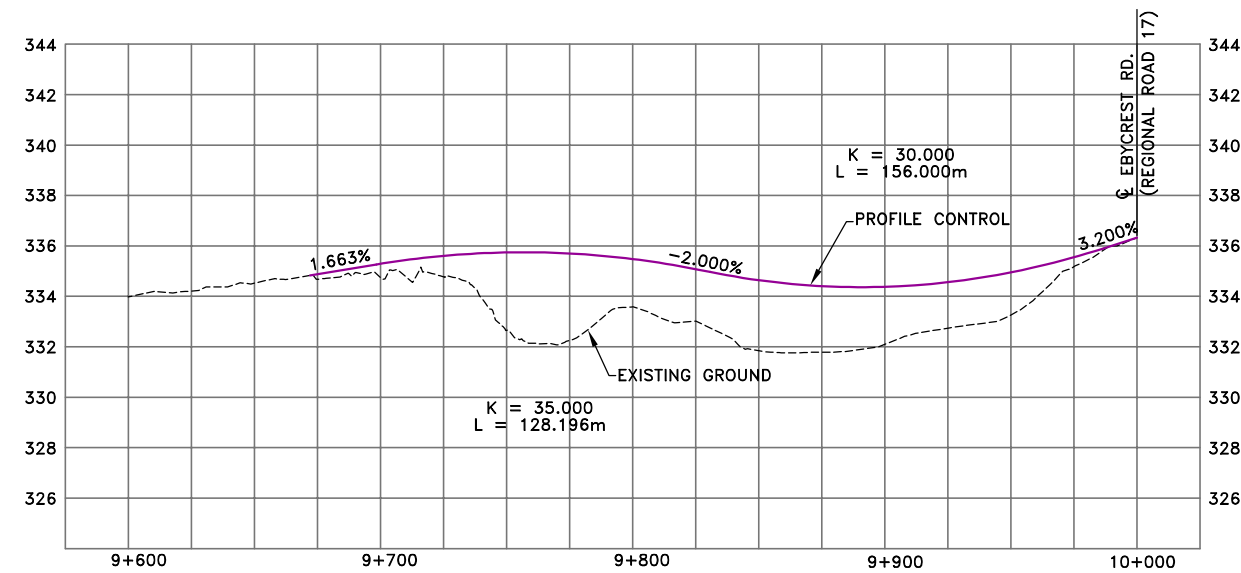


EBYCREST ROAD (REGIONAL ROAD 17)

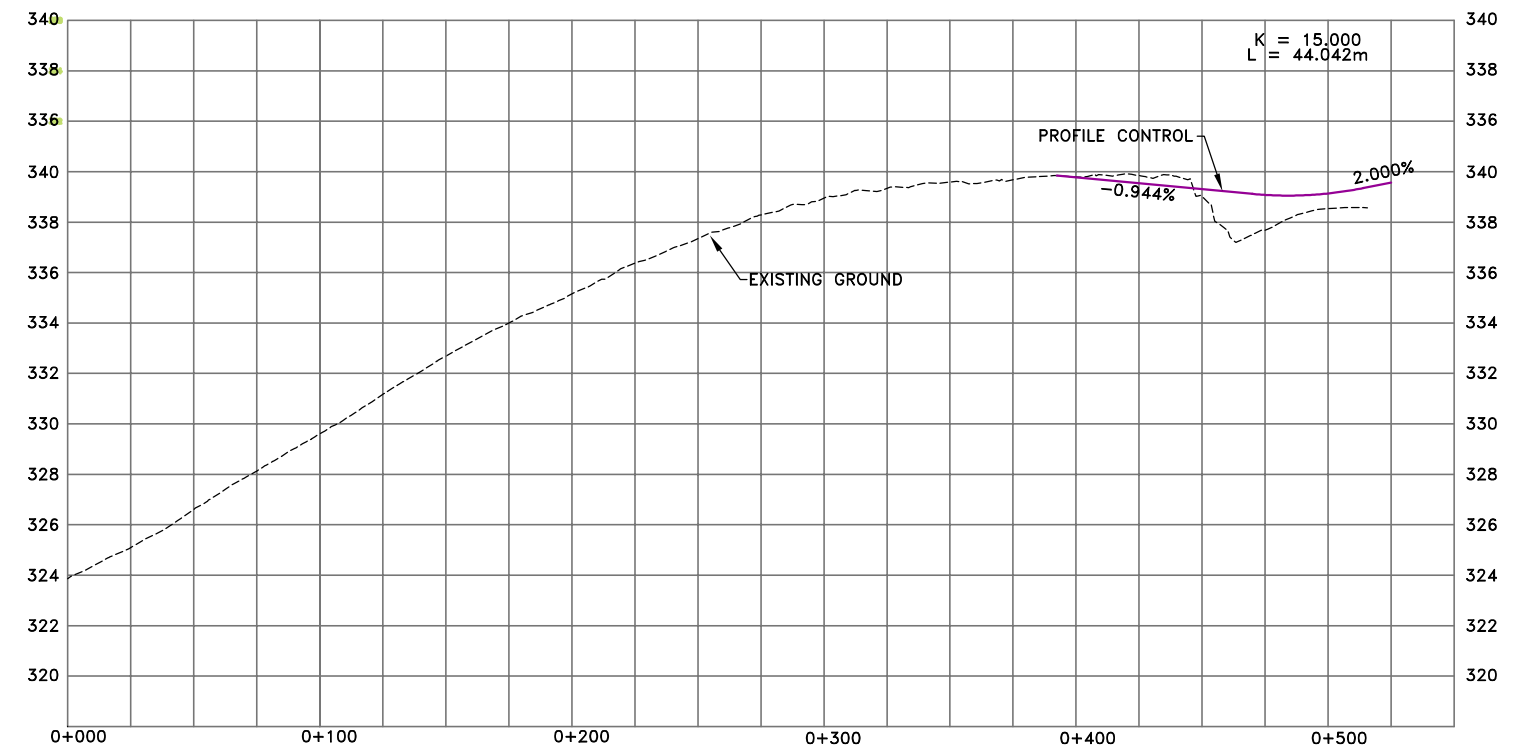


EBYCREST ROAD (REGIONAL ROAD 17)

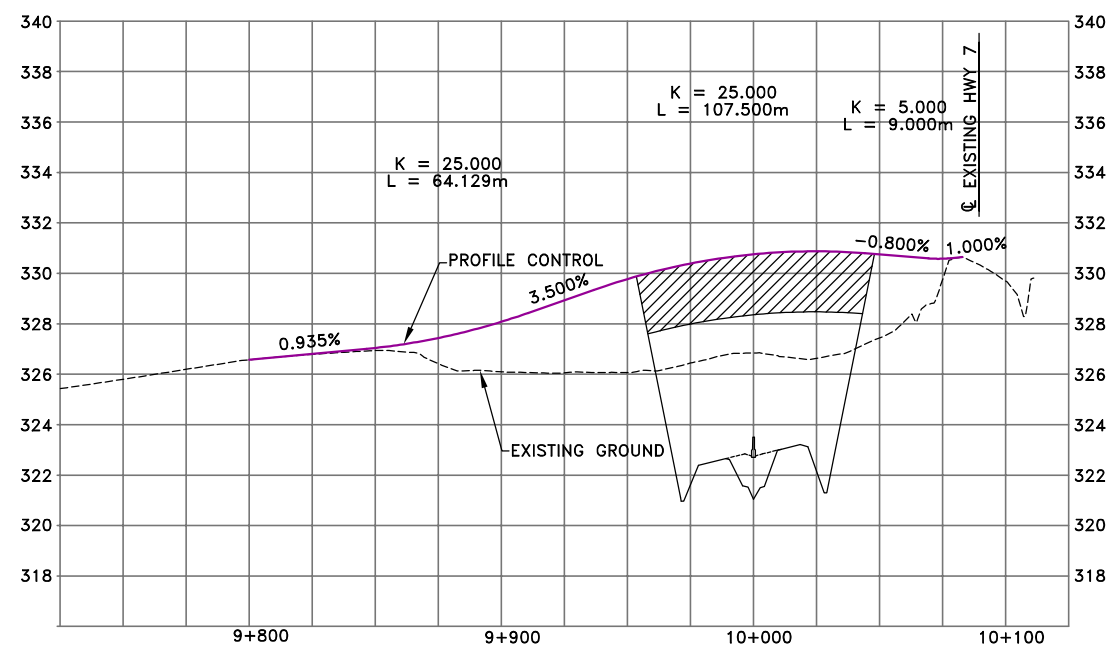




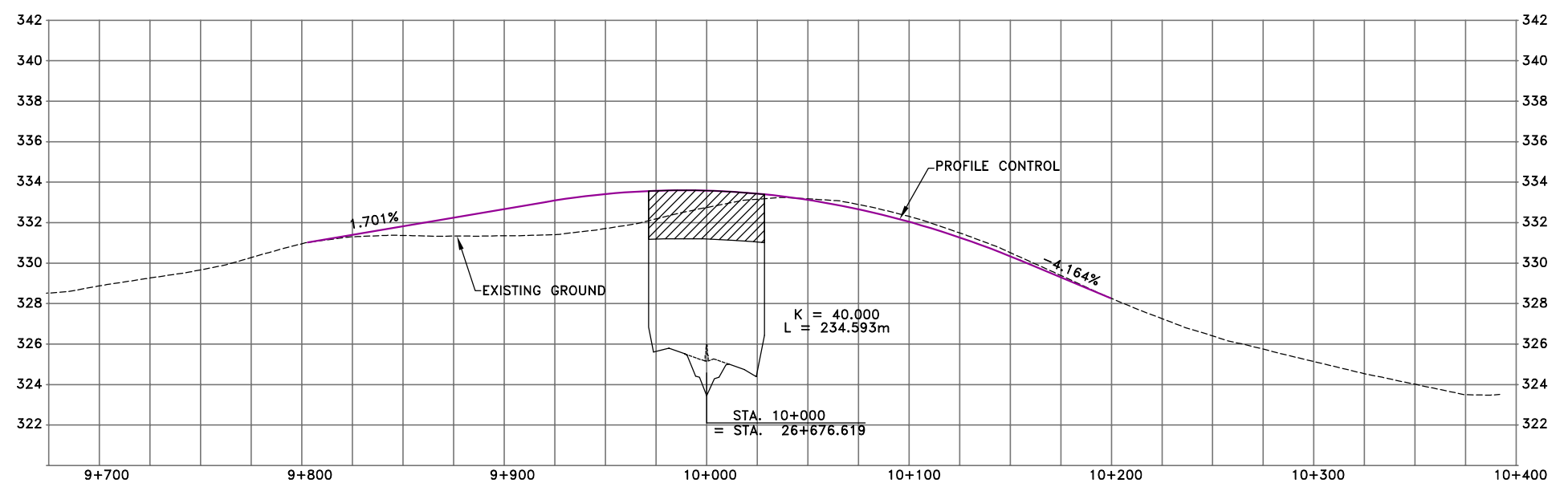
BRIDGE STREET RE-ALIGNMENT



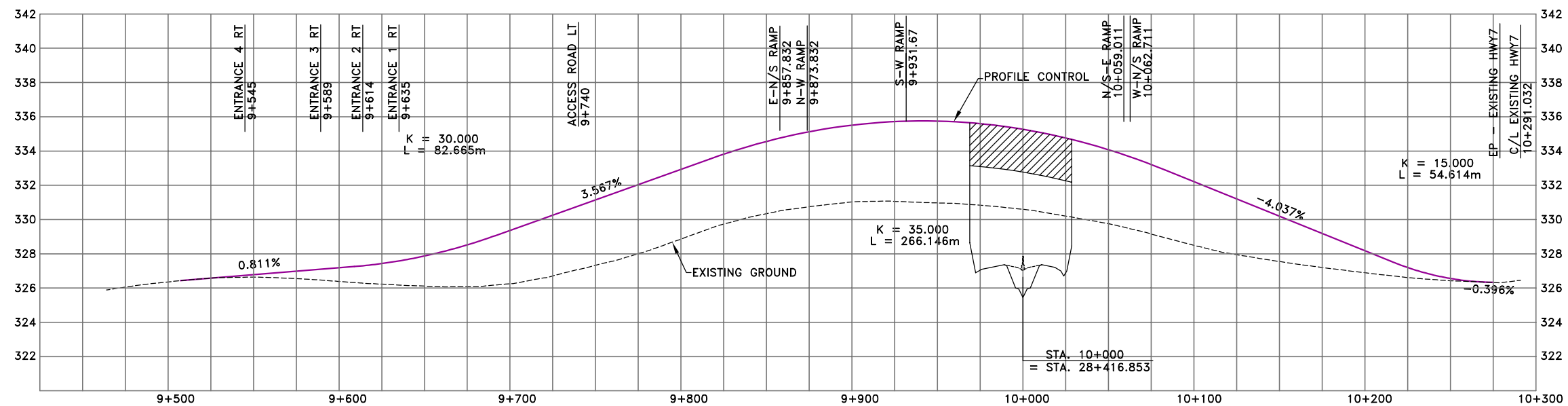
EBYCREST ROAD CONNECTION
TO FOUNTAIN STREET EXTENSION



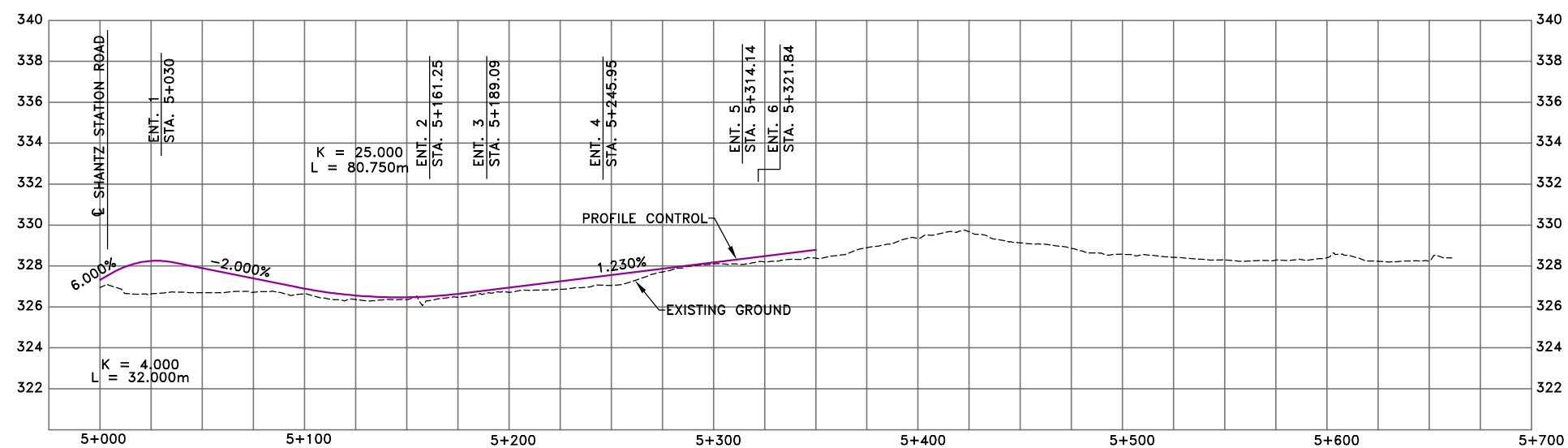
SPITZIG ROAD (WOOLWICH ROAD 66)



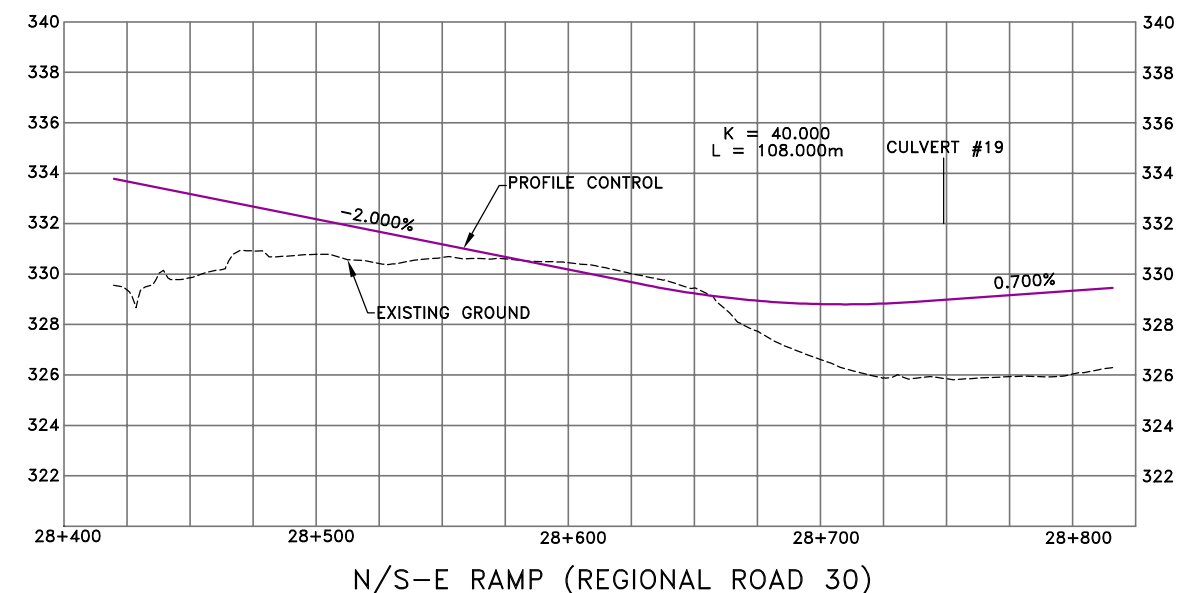
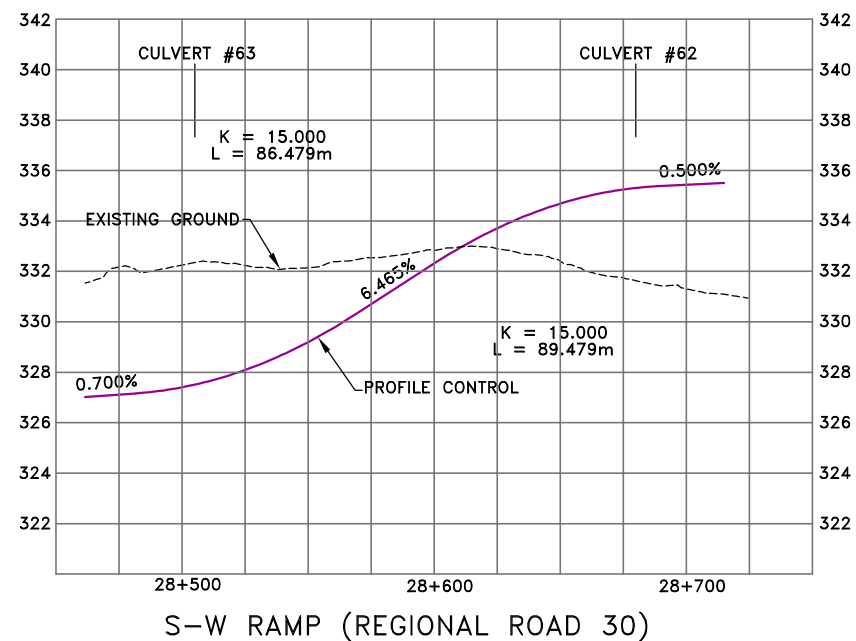
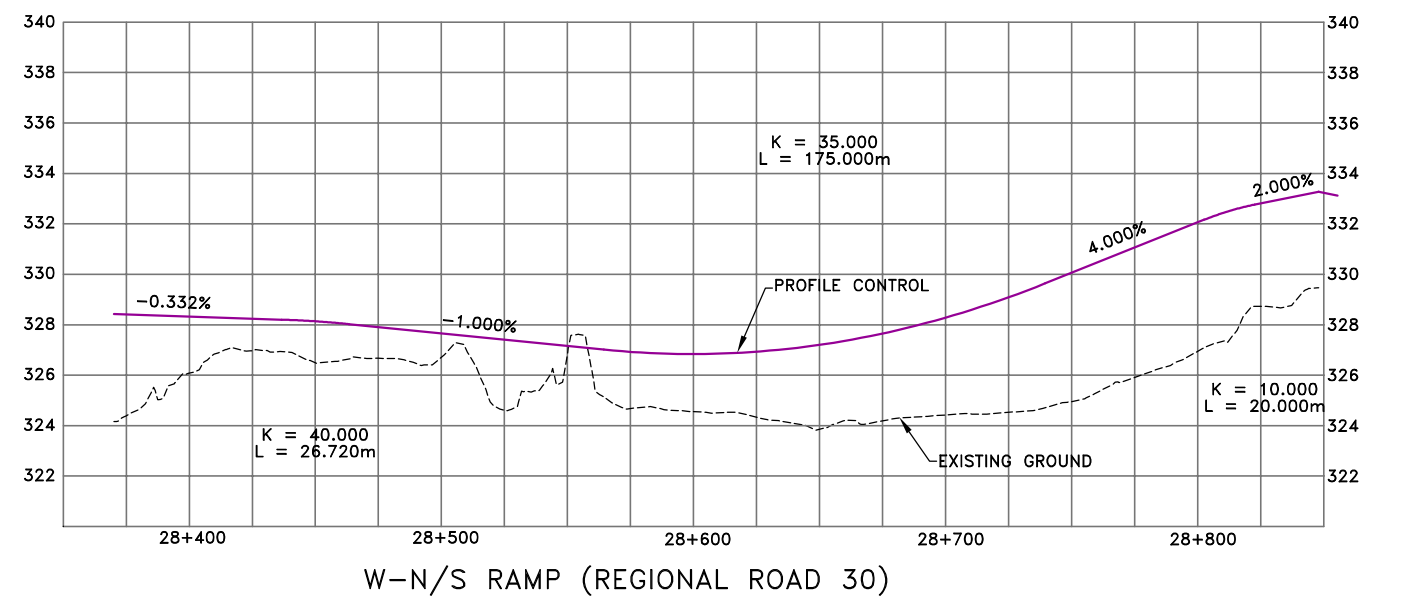
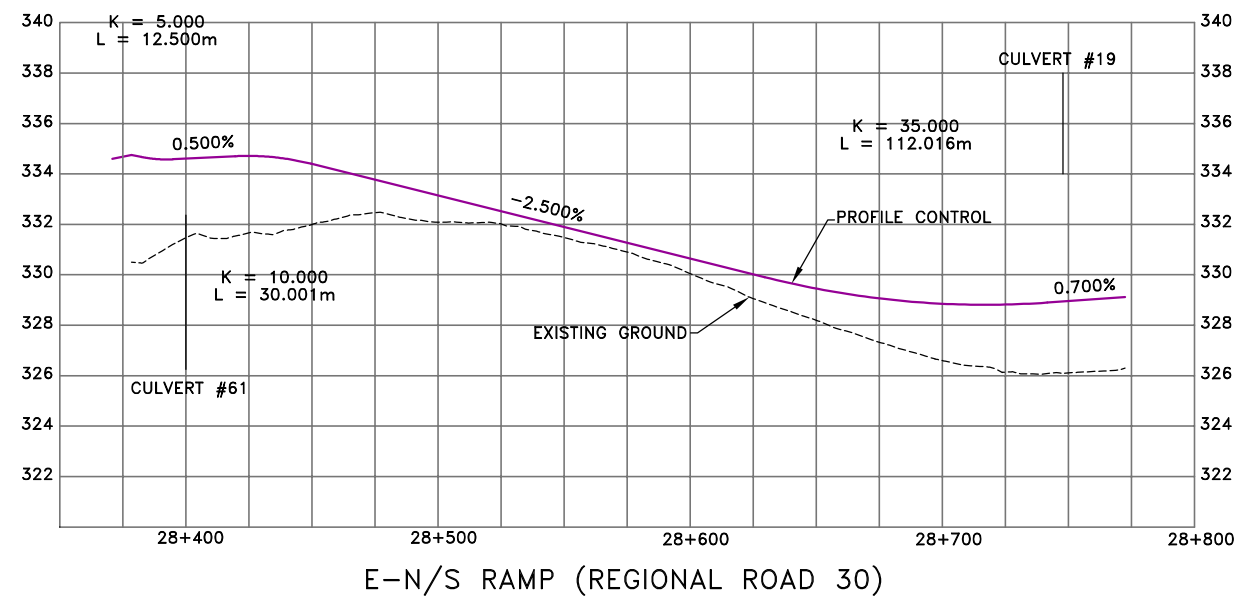
GREENHOUSE ROAD (WOOLWICH ROAD 72)

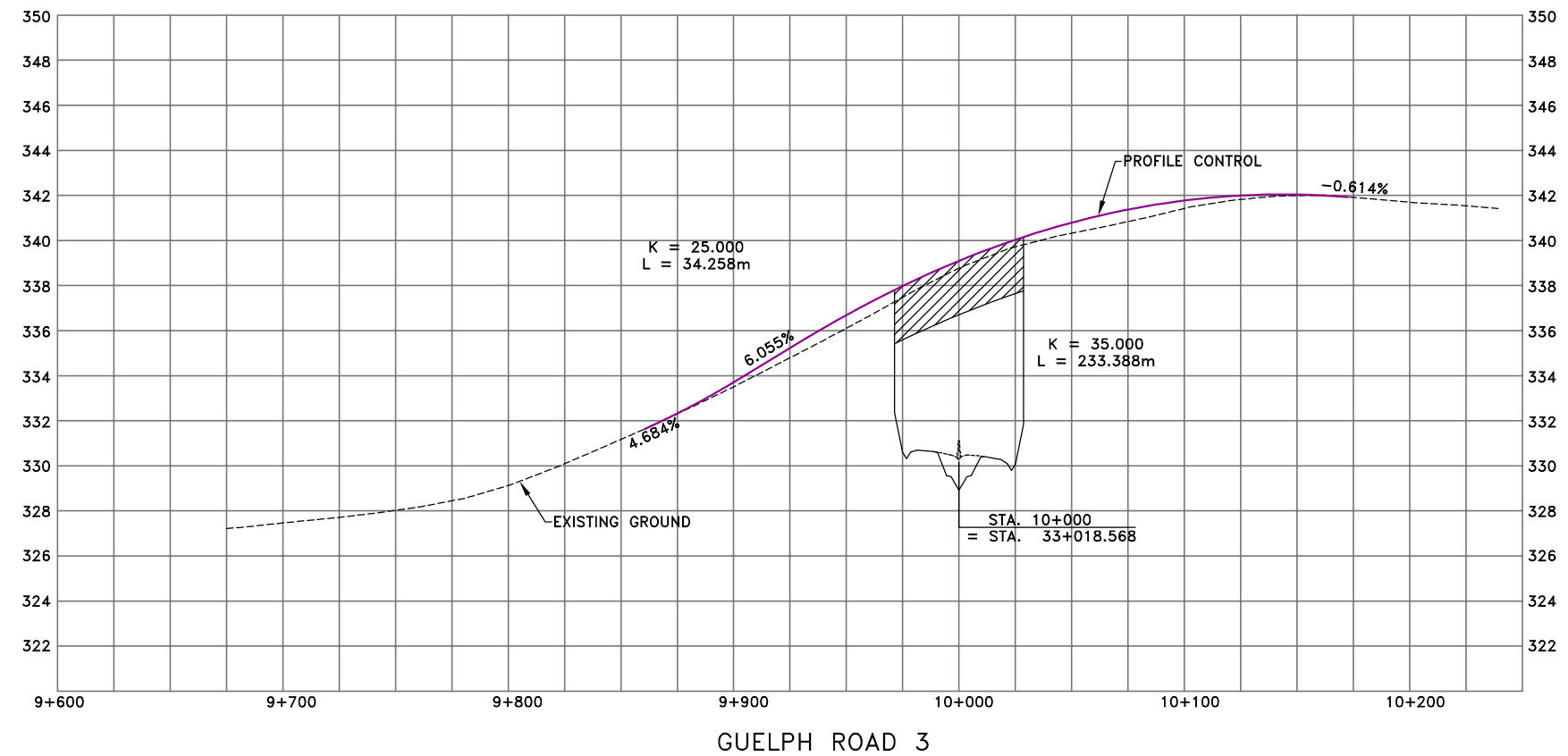
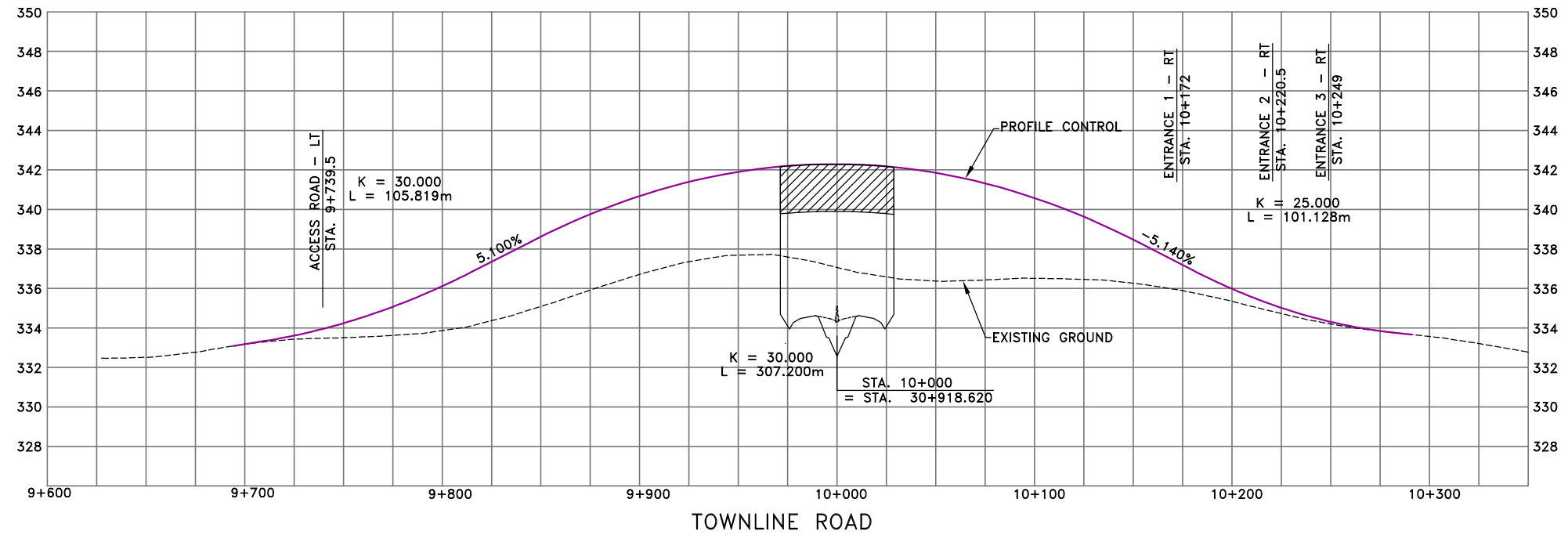


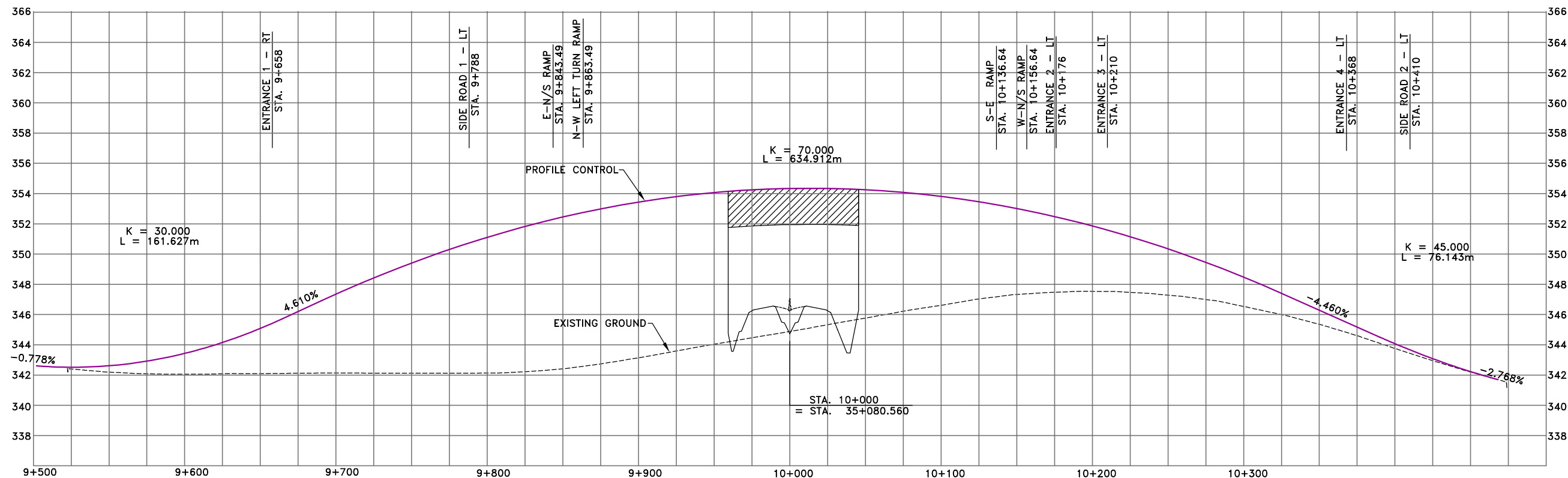
SHANTZ STATION ROAD (REGIONAL ROAD 30)



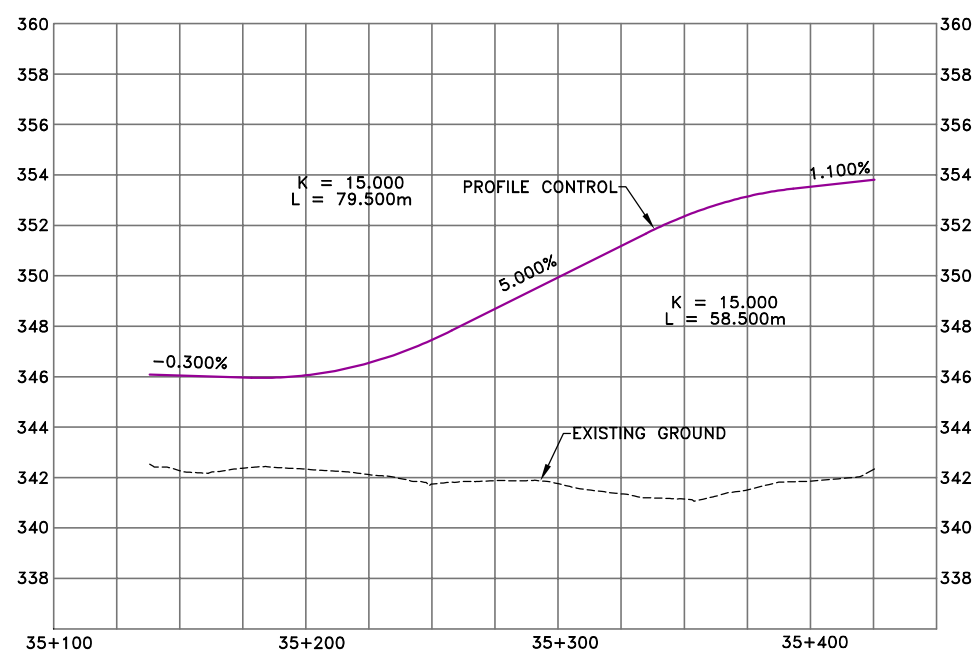
ACCESS ROAD (REGIONAL ROAD 30)



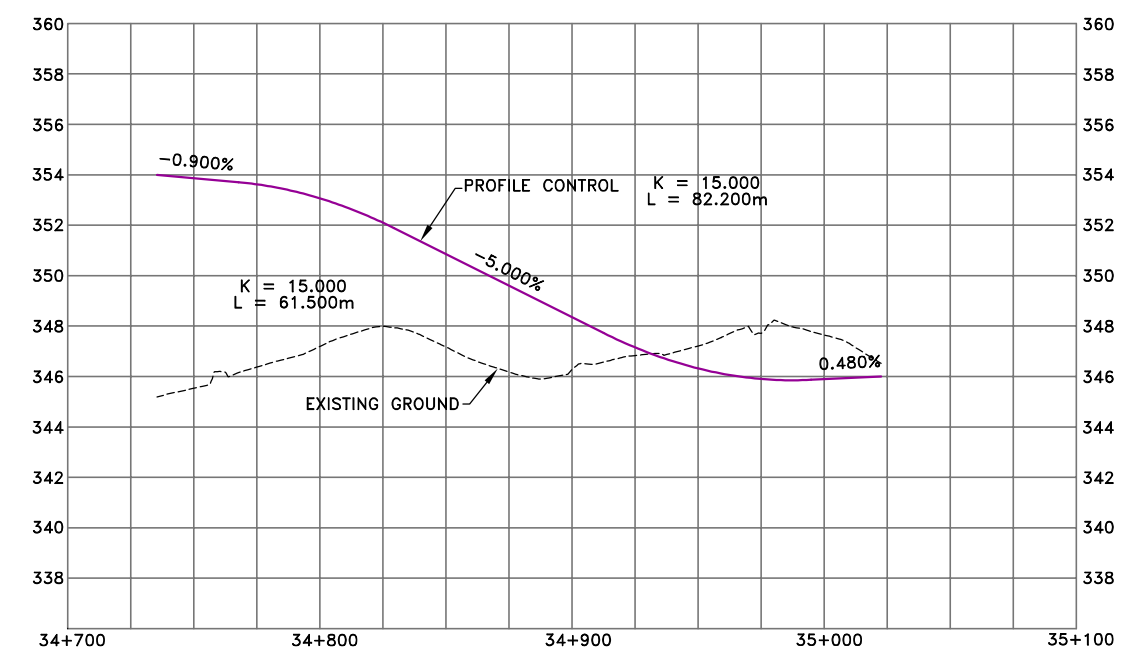




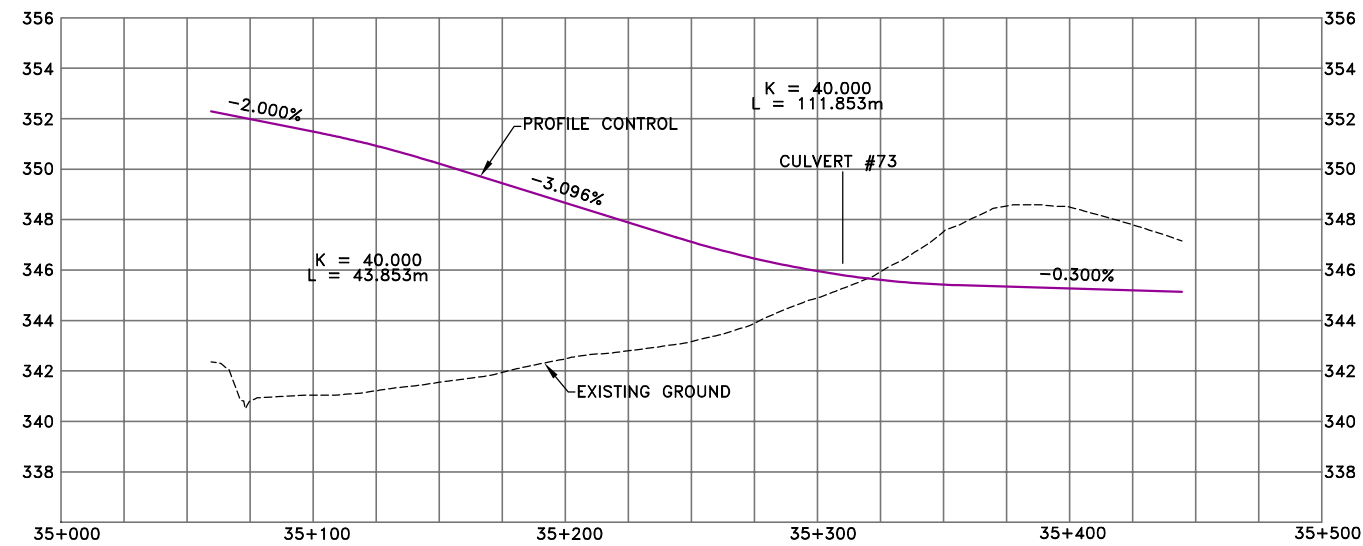
ELMIRA ROAD (COUNTY ROAD 86)



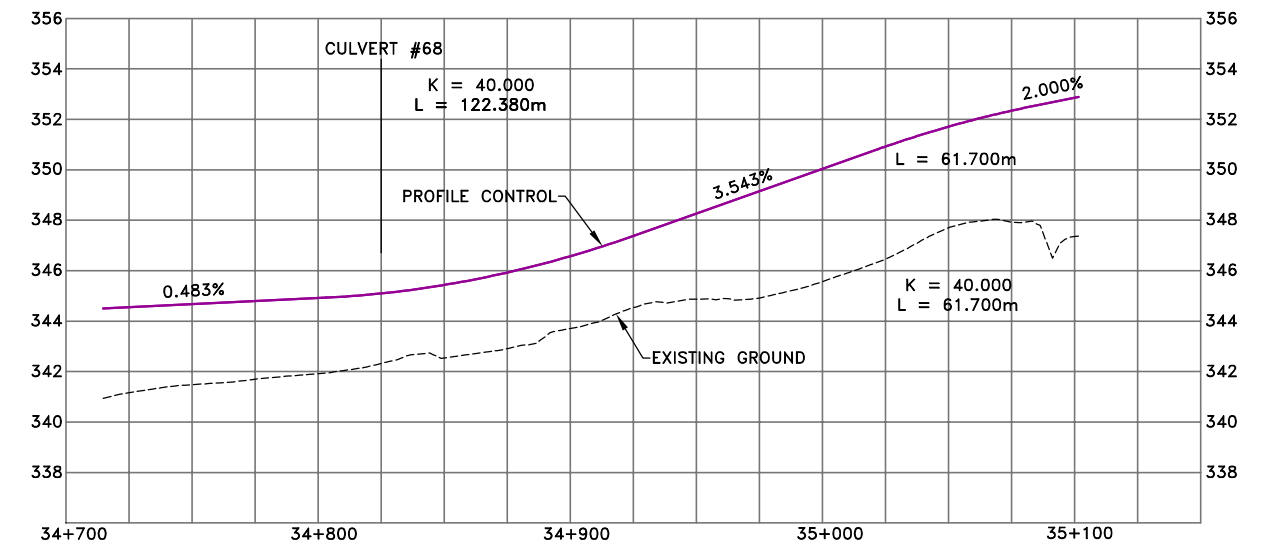
S-W RAMP (COUNTY ROAD 86)



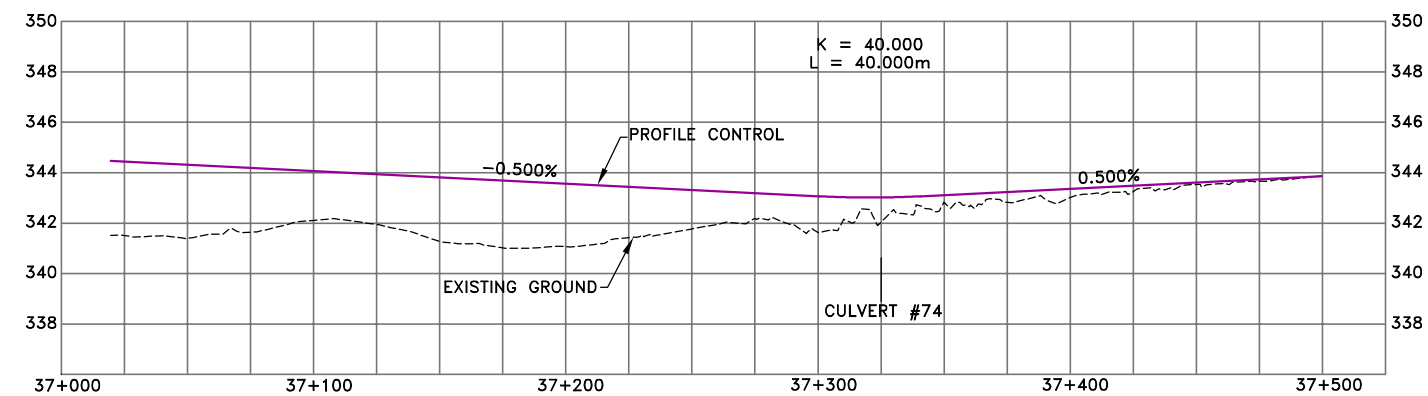
N-E RAMP (COUNTY ROAD 86)



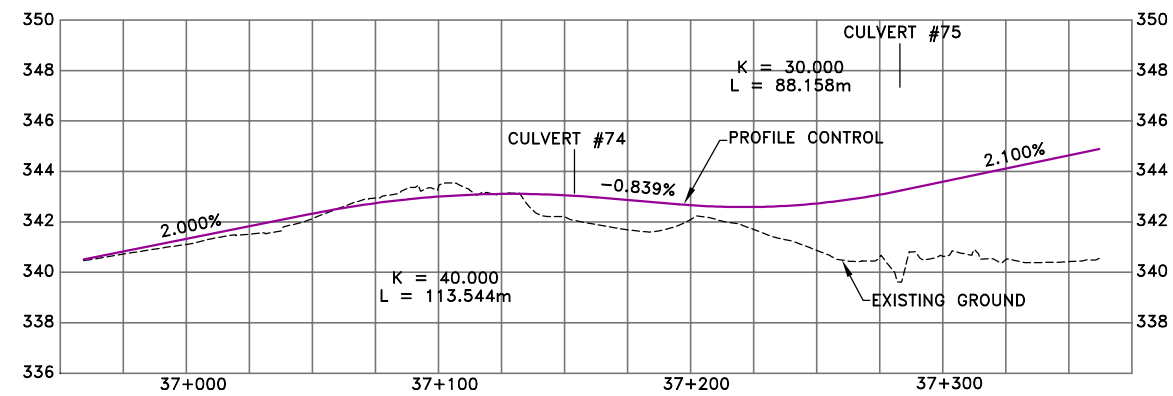
E-N/S RAMP (CROUNTY ROAD 86)



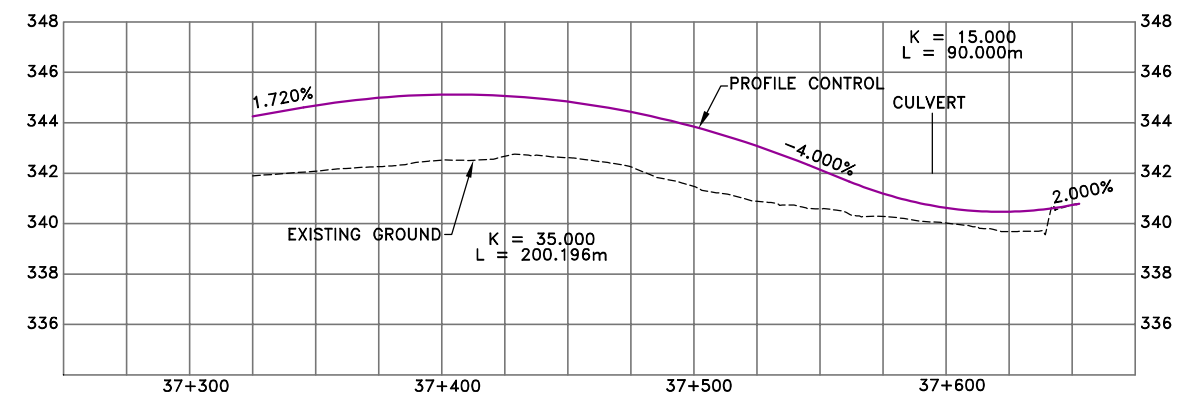
W-N/S RAMP (COUNTY ROAD 86)



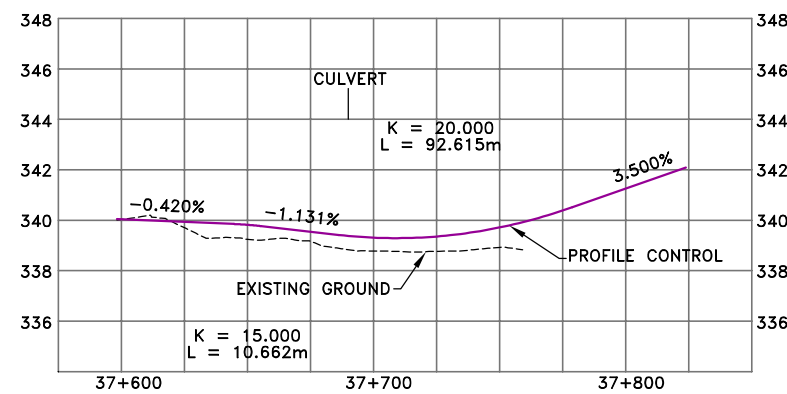
N/S-W RAMP (SILVERCREEK PARKWAY)



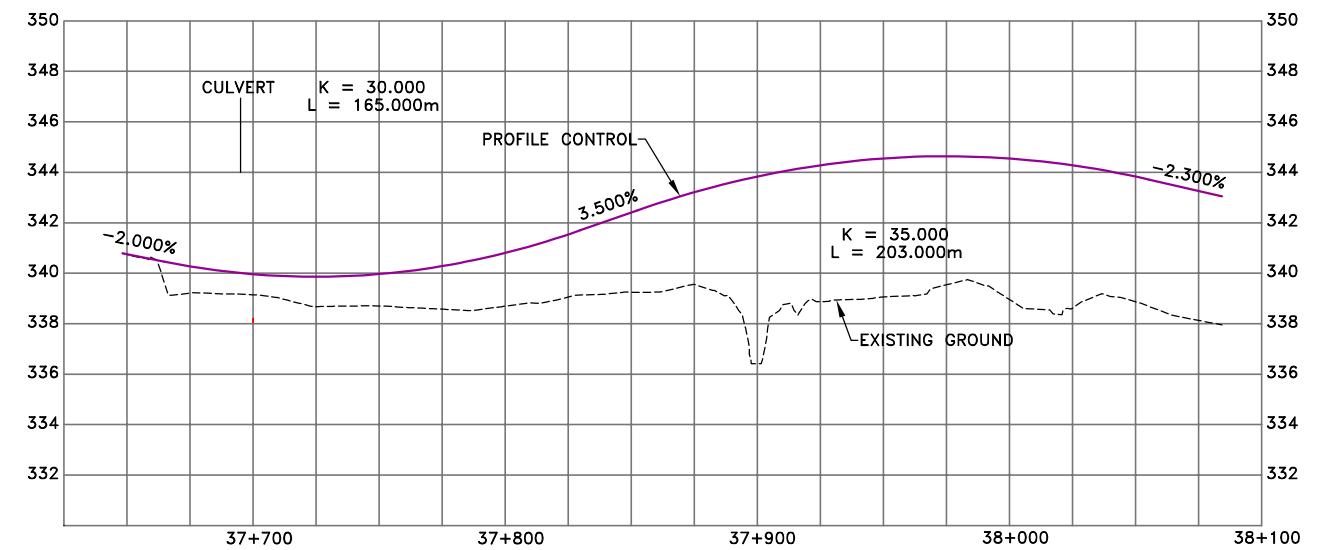
S-E RAMP (SILVERCREEK PARKWAY)



N-W/E RAMP (WOODLAWN)



W-S RAMP (WOODLAWN)



E-S RAMP (WOODLAWN)

Appendix E: General Arrangement Drawings

**Hwy 7
New Alignment
Kitchener to Guelph**

GWP 408-88-00

**MTO Southwest Region
P.O. 3006-E-0099**

MMM Project No.: 16-08027

GENERAL ARRANGEMENT DRAWINGS



No.	Location	Site No
BRIDGES		
1	N-E/W Ramp over Guelph St.	33-525
2	E-N Ramp over Guelph St.	33-328
3	N-E Ramp over KWE – Options 1, 2	33-506
4	E-S Ramp over KWE – Options 1, 2	33-505
5	N-E Ramp - Ramp Overpass – Options 1, 2, 3, 4	33-507
6	S-E Ramp over Wellington St.	33-508
7	CNR Subways - West Side - Edna St Connection	33-521
8	CNR Subways - West Side - E-S Ramp Subway	33-522
9	CNR Subways - East Side - S-E Ramp Subway	33-523
10	CNR Subways - East Side - Wellington St to Victoria St Connection Subway	33-524
11	Victoria Street Underpass	33-235
12	Frederick Street Underpass	33-234
13	Riverbend Drive Overpass WBL	33-509/2
14	Riverbend Drive Overpass EBL	33-509/1
15	Grand River Bridge WBL – Options 1, 2, 3	33-510/2
16	Grand River Bridge EBL – Options 1, 2, 3	33-510/1
17	Bridge Street Connection Underpass	33-511
18	Rosendale Creek Bridge WBL	33-512/C
19	Rosendale Creek Bridge EBL	33-512/C
20	Ebycrest Road Underpass	33-514
21	Spitzig Road Underpass	33-515
22	Hopewell Creek Bridge WBL	33-516/2
23	Hopewell Creek Bridge EBL	33-516/1
24	Greenhouse Road Underpass	33-518
25	Shantz Station Road Underpass	33-520
26	Townline Road Underpass	35-602
27	Guelph Road 3 Underpass	35-604
28	Ellis Creek Bridge - WBL	35-605/2
29	Ellis Creek Bridge - EBL	35-605/1
30	Wellington County Road 86 Underpass	35-606
31	Woodlawn Road Overpass WBL	35-608/2
32	Woodlawn Road Overpass EBL	35-608/1
CULVERTS		
	Culvert C8	33-513/C
	Culvert C15A	33-517/C
	Culvert C16	33-519/C
	Culvert C20	33-601/C
	Culvert C24	33-603/C
	Culvert C33	33-607/C

Hwy 7 New - Kitchener to Guelph - Structure Summary

No.	Location	Site No	Type	Span (m)	Width (m)	Deck Area	Note
1	N-E/W Ramp over Guelph St.	33-525	Int NU 1600	31.0 - 25.0	12.89 - 14.07	755	1
2	E-N Ramp over Guelph St.	33-328	Rigid Frame	20	6.7	134	
3	N-E Ramp over KWE	33-506	Conventional Post-Tensioned Trapezoidal Voided Deck	38.0 - 55.0 - 45.0 - 32.0	9.3	1581	
4	E-S Ramp over KWE	33-505	Conventional Post-Tensioned Trapezoidal Voided Deck	32-44-52.4-56-56-56-50	14.05	4867	
5	N-E Ramp - Ramp Overpass	33-507	Int NU 1600	33.0 - 30.0	9.3	586	1
6	S-E Ramp over Wellington St.	33-508	Semi-Int Post-Tensioned Trapezoidal Voided Deck	40.0 - 56.0 - 40.0	12.05	1639	
7	CNR Subways - West Side - Edna St Connection	33-521	Rigid Frame RBR	14.58	10.06	147	2, 4
8	CNR Subways - West Side - E-S Ramp Subway	33-522	Rigid Frame RBR	17.52	10.06	176	2, 4
9	CNR Subways - East Side - S-E Ramp Subway	33-523	Rigid Frame RBR	16.31	10.06	164	2, 4
10	CNR Subways - East Side - Wellington St to Victoria St Connection Subway	33-524	Rigid Frame RBR	15.32	10.06	154	2, 4
11	Victoria Street Underpass	33-235	Conventional Post-Tensioned Solid Deck	35.0 - 37.0 - 34.0 - 23.0	18.7	2450	1, 5
12	Frederick Street Underpass	33-234	Conventional Post-Tensioned Trapezoidal Voided Deck	46.0 - 56.0	18.7	1907	1, 5
13	Riverbend Dr. Overpass WBL	33-509/2	Int NU 1600	32.0	17.99 - 19.38	598	
14	Riverbend Dr. Overpass EBL	33-509/1	Int NU 1600	32.0	16.33 - 16.44	524	
15	Grand River Bridge WBL	33-510/2	Conventional Segmental Post- Tensioned Box	45.0 - 70.0 - 80.0 - 80.0 - 130.0 - 75.0	15.05	6264	
16	Grand River Bridge EBL	33-510/1	Conventional Segmental Post- Tensioned Box	45.0 - 70.0 - 80.0 - 80.0 - 130.0 - 75.0	13.05 - 15.05	6434	
17	Bridge Street Connection Underpass	33-511	Int NU 1600	33.6 - 36.5	13.7 - 15.78	1033	
18	Rosendale Creek Bridge WBL	33-512/C	Int NU 2000	40.0	13.3	532	
19	Rosendale Creek Bridge EBL	33-512/C	Int NU 2000	40.0	13.3	532	
20	Ebycrest Road Underpass	33-514	Conventional Post-Tensioned Trapezoidal Voided Deck	48.53 - 47.47	35.38 - 38.87	3564	1
21	Spitzig Road Underpass	33-515	Int NU 2000	41.0 - 41.0	13.71 - 14.19	1144	
22	Hopewell Creek Bridge WBL	33-516/2	Int NU 2000	44.0	14.05	618	3
23	Hopewell Creek Bridge EBL	33-516/1	Int NU 2000	44.0	14.05	618	
24	Greenhouse Road Underpass	33-518	Int NU 2000	36.5 - 36.5	13.7	1000	
25	Shantz Station Road Underpass	33-520	Int NU 2000	37.5 - 35	20.99 - 21.25	1531	
26	Townline Road Underpass	35-602	Int NU 2000	36.5 - 36.5	13.7	1000	
27	Guelph Road 3 Underpass	35-604	Int NU 2000	34.0 - 36.0	13.7	959	1
28	Ellis Creek Bridge - WBL	35-605/2	Int NU 1600	33.0 - 33.0	14.05	927	
29	Ellis Creek Bridge - EBL	35-605/1	Int NU 1600	33.0 - 33.0	14.05	927	
30	Wellington County Road 86 Underpass	35-606	Int NU 2000	40.0 - 40.0	28.85	2308	
31	Woodlawn Road Overpass WBL	35-608/2	Int NU 2400	47.0	17.05	801	
32	Woodlawn Road Overpass EBL	35-608/1	Int NU 2400	47.0	14.05	660	
	Culvert C8	33-513/C	Rigid Frame Box	3.0 x 1.5	138.7		
	Culvert C15A	33-517/C	Rigid Frame Box	1.8 x 1.2	62.4		
	Culvert C16	33-519/C	Rigid Frame Box	3.5 x 1.5	90.8		
	Culvert C20	33-601/C	Rigid Frame Box	4.0 x 1.5	95.7		
	Culvert C24	33-603/C	Rigid Frame Box	2.4 x 1.5	62.8		
	Culvert C33	33-607/C	Rigid Frame Box	6.0 x 1.8	70.6		

- Notes:
- 1

Includes RSS walls
- 2

Rapid replacement using sliding
- 3

Not including armour stone wall
- 4

Includes retaining walls
- 5

Excludes demolition of existing structure

- Legend:
- Int


Integral Abutment
- Semi-Int


Semi-Integral Abutment

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

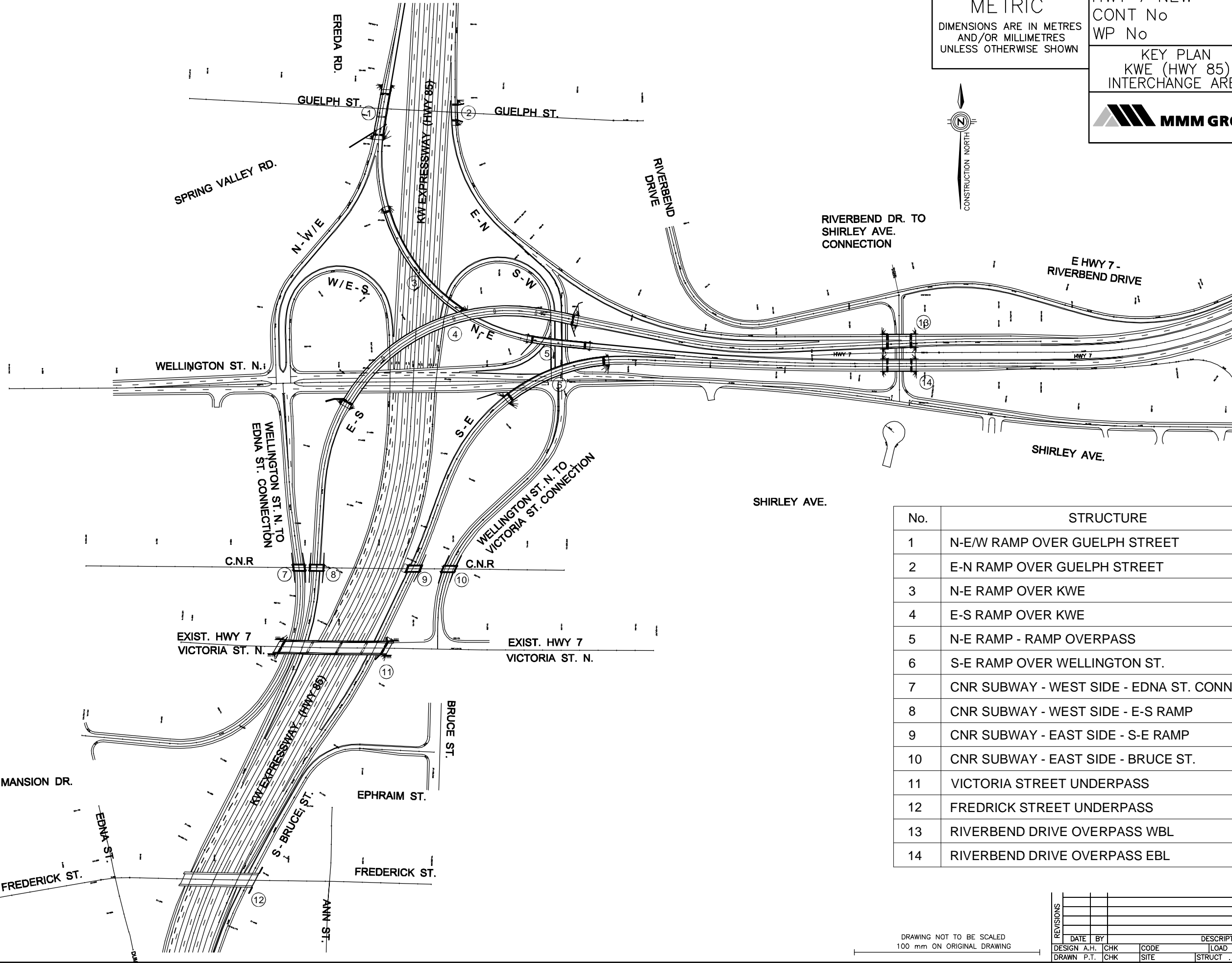
HWY 7 NEW
CONT No
WP No

KEY PLAN
KWE (HWY 85)
INTERCHANGE AREA

MMM GROUP



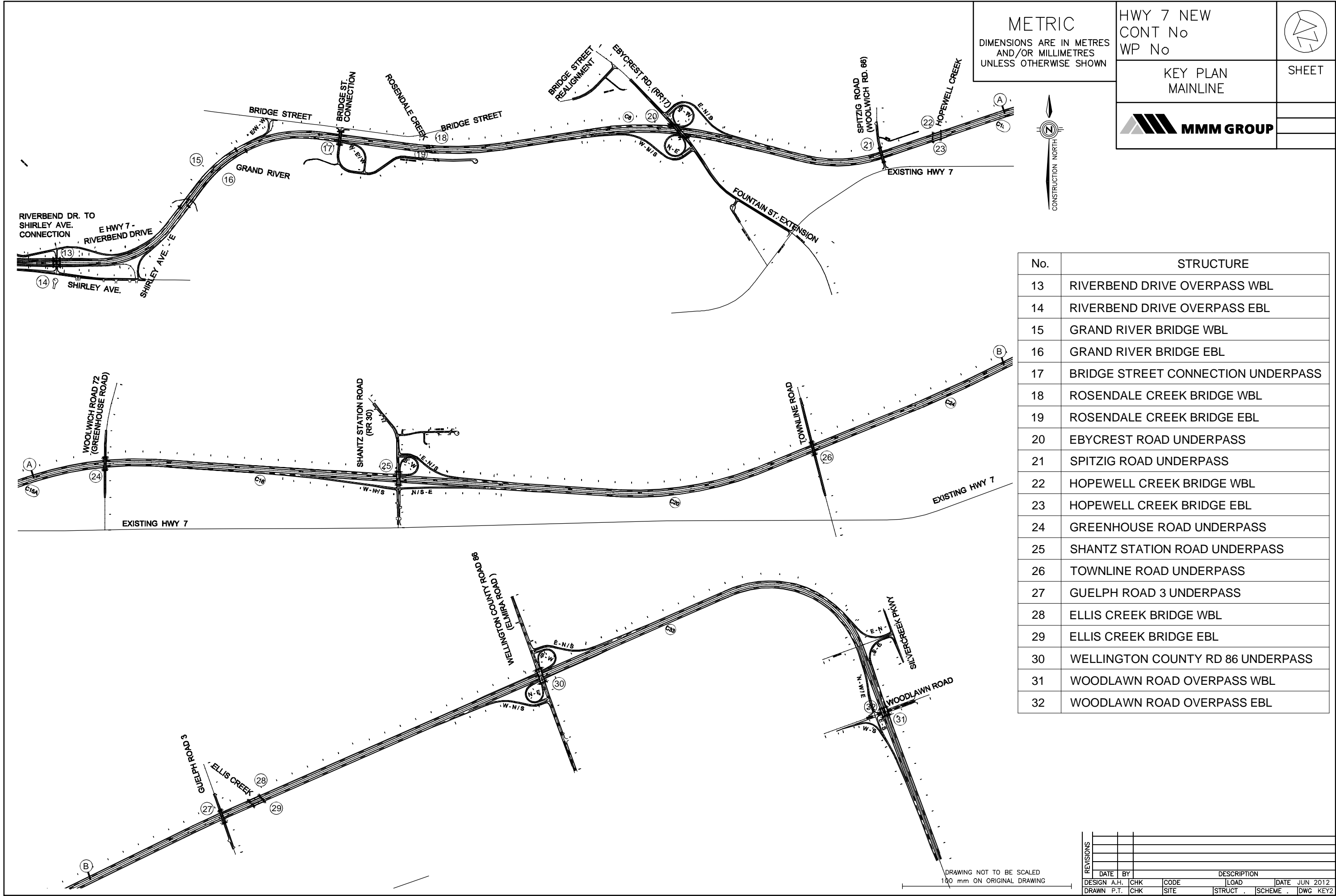
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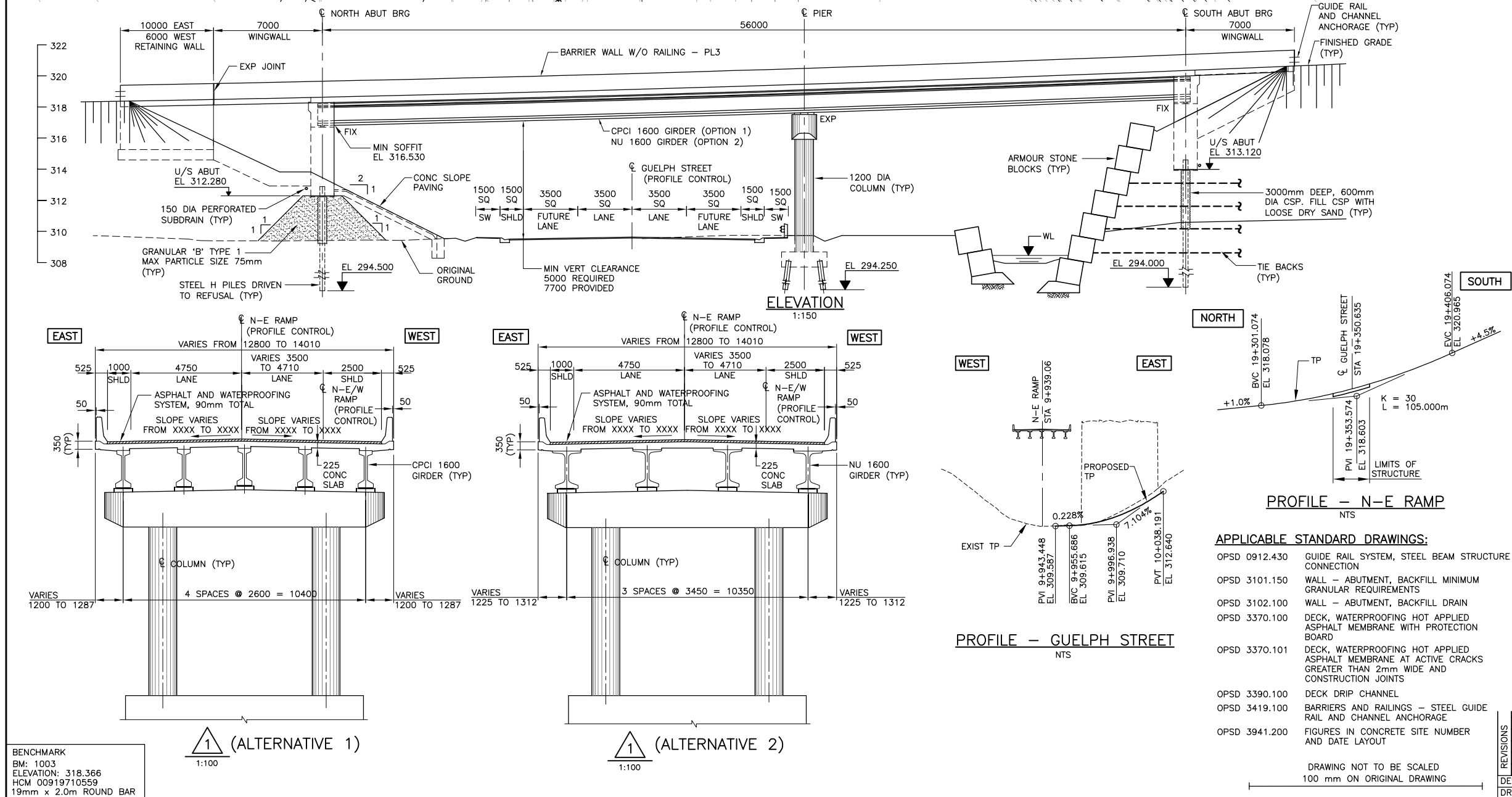
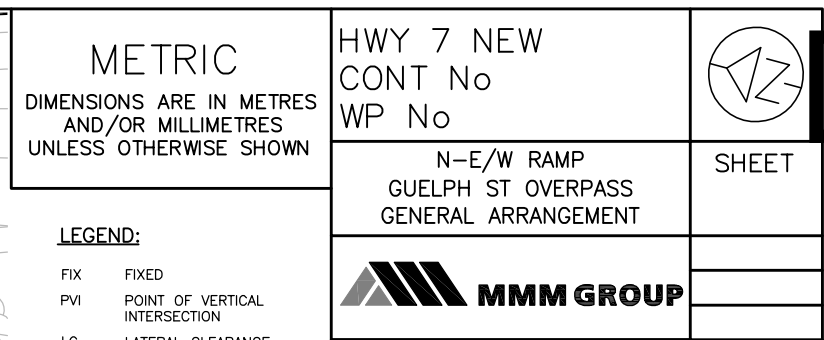


No.	STRUCTURE
1	N-E/W RAMP OVER GUELPH STREET
2	E-N RAMP OVER GUELPH STREET
3	N-E RAMP OVER KWE
4	E-S RAMP OVER KWE
5	N-E RAMP - RAMP OVERPASS
6	S-E RAMP OVER WELLINGTON ST.
7	CNR SUBWAY - WEST SIDE - EDNA ST. CONNECTION
8	CNR SUBWAY - WEST SIDE - E-S RAMP
9	CNR SUBWAY - EAST SIDE - S-E RAMP
10	CNR SUBWAY - EAST SIDE - BRUCE ST.
11	VICTORIA STREET UNDERPASS
12	FREDRICK STREET UNDERPASS
13	RIVERBEND DRIVE OVERPASS WBL
14	RIVERBEND DRIVE OVERPASS EBL

DRAWING NOT TO BE SCALED
100 mm ON ORIGINAL DRAWING

REVISIONS					
DATE	BY	DESCRIPTION	CODE	LOAD	DATE JUN 2012
DESIGN A.H.	CHK				
DRAWN P.T.	CHK	SITE	STRUCT	SCHEME	DWG KEY1





RES S OWN	<h1 style="margin: 0;">HWY 7 NEW</h1> <h2 style="margin: 0;">CONT No</h2> <h2 style="margin: 0;">WP No</h2>	
	N-E/W RAMP GUELPH ST OVERPASS GENERAL ARRANGEMENT	SHEET

GENERAL NOTES

- 1 **CLASS OF CONCRETE**

PRECAST PRESTRESSED BEAMS
 CPCI 50 MPa
 NU 70 MPa HPC

REMAINDER 30 MPa

2. **CLEAR COVER TO REINFORCING STEEL**

FOOTINGS 100 ± 25

DECK TOP 70 ± 20
 BOT 40 ± 10

REMAINDER 70 ± 20 UNLESS OTHERWISE NOTED

3. **REINFORCING STEEL**

REINFORCING STEEL SHALL BE GRADE 400W UNLESS OTHERWISE SPECIFIED.

BAR MARKS WITH PREFIX 'C' DENOTE COATED BARS.

STAINLESS REINFORCING STEEL SHALL BE TYPE 316LN OR DUPLEX 2205 AND HAVE A MINIMUM YIELD STRENGTH OF 500 MPa, UNLESS OTHERWISE SPECIFIED.

BAR MARKS WITH PREFIX 'S' DENOTE STAINLESS STEEL BARS.

UNLESS SHOWN OTHERWISE, TENSION LAP SPLICES SHALL BE CLASS B.

BAR HOOKS SHALL HAVE STANDARD HOOK DIMENSIONS USING MINIMUM BEND DIAMETERS, WHILE STIRRUPS AND TIES SHALL HAVE MINIMUM HOOK DIMENSIONS, ALL HOOKS SHALL BE IN ACCORDANCE WITH THE STRUCTURAL STANDARD DRAWINGS SS12-1 AND SS12-2, UNLESS INDICATED OTHERWISE.

4. **GLASS FIBRE REINFORCED POLYMER (GFRP)**

GFRP REINFORCING BARS SHALL BE GRADE I, GRADE II OR GRADE III AS SPECIFIED IN THE CONTRACT DOCUMENTS.

THE NOMINAL DIAMETER, TENSILE MODULUS OF ELASTICITY AND GUARANTEED MINIMUM TENSILE STRENGTH SHALL BE AS SPECIFIED IN THE CONTRACT DOCUMENTS.

BAR MARKS WITH THE PREFIX GI DENOTE GRADE I GFRP BARS, BAR MARKS WITH THE PREFIX GII DENOTE GRADE II GFRP BARS, AND BAR MARKS WITH THE PREFIX GIII DENOTE GRADE III GFRP BARS.

5. **CONSTRUCTION NOTES**

BACKFILL SHALL NOT BE PLACED BEHIND THE ABUTMENTS UNTIL THE DECK SLAB IS IN PLACE AND HAS REACHED 25 MPa STRENGTH.

BACKFILL SHALL BE PLACED SIMULTANEOUSLY BEHIND BOTH ABUTMENTS KEEPING THE HEIGHT OF THE BACKFILL APPROXIMATELY THE SAME. AT NO TIME SHALL THE DIFFERENCE IN ELEVATION BE GRATER THAN 500mm.

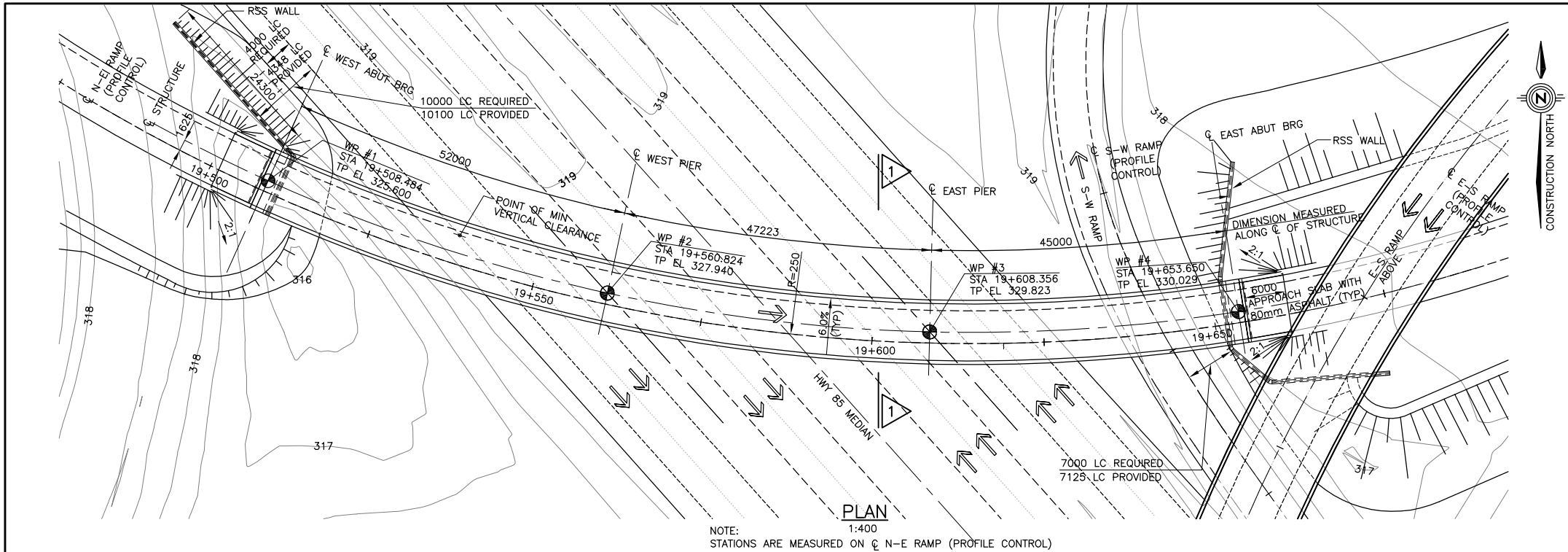
CONSTRUCT ABUTMENTS AND WINGWALLS TO THE BEARING SEAT ELEVATIONS. THE CONTRACTOR SHALL SUPPLY TEMPORARY LATERAL BRACING FOR THE ABUTMENTS. FORMWORK AND LATERAL BRACING SHALL NOT BE REMOVED UNTIL THE CONCRETE IN DECK HAS REACHED 25 MPa STRENGTH.

THE CONTRACTOR SHALL ESTABLISH THE BEARING SEAT ELEVATIONS BY DEDUCTING THE ACTUAL BEARING THICKNESSES FROM THE TOP OF BEARING ELEVATIONS. IF THE ACTUAL BEARING THICKNESSES ARE DIFFERENT FROM THOSE GIVEN WITH THE BEARING DESIGNATION DATA, THE CONTRACTOR SHALL ADJUST THE REINFORCING STEEL TO SUIT.

LIST OF DRAWINGS:

P1	GENERAL ARRANGEMENT
----	---------------------

- 1 CLASS OF CONCRETE 30 MPa
2. CLEAR COVER TO REINFORCING STEEL
- | | |
|-----------|--------------------------------|
| FOOTINGS | 100 ± 25 |
| DECK | TOP 70 ± 20 |
| | BOT 50 ± 10 |
| REMAINDER | 70 ± 20 UNLESS OTHERWISE NOTED |
3. REINFORCING STEEL
- REINFORCING STEEL SHALL BE GRADE 400W UNLESS OTHERWISE SPECIFIED.
- BAR MARKS WITH PREFIX 'C' DENOTE COATED BARS.
- STAINLESS REINFORCING STEEL SHALL BE TYPE 316LN OR DUPLEX 2205 AND HAVE A MINIMUM YIELD STRENGTH OF 500 MPa, UNLESS OTHERWISE SPECIFIED.
- BAR MARKS WITH PREFIX 'S' DENOTE STAINLESS STEEL BARS.
- UNLESS SHOWN OTHERWISE, TENSION LAP SPLICES SHALL BE CLASS B.
- BAR HOOKS SHALL HAVE STANDARD HOOK DIMENSIONS USING MINIMUM BEND DIAMETERS, WHILE STIRRUPS AND TIES SHALL HAVE MINIMUM HOOK DIMENSIONS, ALL HOOKS SHALL BE IN ACCORDANCE WITH THE STRUCTURAL STANDARD DRAWINGS SS12-1 AND SS12-2, UNLESS INDICATED OTHERWISE.
4. GLASS FIBRE REINFORCED POLYMER (GFRP)
- GFRP REINFORCING BARS SHALL BE GRADE I, GRADE II OR GRADE III AS SPECIFIED IN THE CONTRACT DOCUMENTS.
- THE NOMINAL DIAMETER, TENSILE MODULUS OF ELASTICITY AND GUARANTEED MINIMUM TENSILE STRENGTH SHALL BE AS SPECIFIED IN THE CONTRACT DOCUMENTS.
- BAR MARKS WITH THE PREFIX GI DENOTE GRADE I GFRP BARS, BAR MARKS WITH THE PREFIX GII DENOTE GRADE II GFRP BARS, AND BAR MARKS WITH THE PREFIX GIII DENOTE GRADE III GFRP BARS.
5. RETAINED SOIL SYSTEM
- RETAINED SOIL SYSTEM WALLS SHALL HAVE THE FOLLOWING ATTRIBUTES:
- | | |
|--------------|---------------------------------|
| APPLICATION: | FALSE ABUTMENTS/RETAINING WALLS |
| GEOMETRY: | VERTICAL |
| PERFORMANCE: | HIGH |
| APPEARANCE: | HIGH |
- ALL PANELS SHALL HAVE ARCHITECTURAL FINISH TEXTURE.
6. CONSTRUCTION NOTES
- BACKFILL SHALL NOT BE PLACED BEHIND THE ABUTMENTS UNTIL THE DECK SLAB IS IN PLACE AND HAS REACHED 25 MPa STRENGTH.
- BACKFILL SHALL BE PLACED SIMULTANEOUSLY BEHIND BOTH ABUTMENTS KEEPING THE HEIGHT OF THE BACKFILL APPROXIMATELY THE SAME. AT NO TIME SHALL THE DIFFERENCE IN ELEVATION BE GRATER THAN 500mm.
- CONSTRUCT ABUTMENTS AND WINGWALLS TO THE BEARING SEAT ELEVATIONS. THE CONTRACTOR SHALL SUPPLY TEMPORARY LATERAL BRACING FOR THE ABUTMENTS. FORMWORK AND LATERAL BRACING SHALL NOT BE REMOVED UNTIL THE CONCRETE IN DECK HAS REACHED 25 MPa STRENGTH.
- THE CONTRACTOR SHALL ESTABLISH THE BEARING SEAT ELEVATIONS BY DEDUCTING THE ACTUAL BEARING THICKNESSES FROM THE TOP OF BEARING ELEVATIONS. IF THE ACTUAL BEARING THICKNESSES ARE DIFFERENT FROM THOSE GIVEN WITH THE BEARING DESIGNATION DATA, THE CONTRACTOR SHALL ADJUST THE REINFORCING STEEL TO SUIT.
- THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, DETAILS AND ELEVATIONS OF THE EXISTING STRUCTURE THAT ARE RELEVANT TO THE WORK SHOWN ON THE DRAWINGS PRIOR TO COMMENCEMENT OF THE WORK. ANY DISCREPANCIES SHALL BE REPORTED TO THE CONTRACT ADMINISTRATOR AND THE PROPOSED ADJUSTMENT OF THE WORK REQUIRED TO MATCH THE EXISTING STRUCTURE SHALL BE SUBMITTED FOR APPROVAL.



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

HWY 7 NEW
CONT No
WP No



3

N-E RAMP
HWY 85 OVERPASS
GENERAL ARRANGEMENT
ALTERNATIVE 1

SHEET

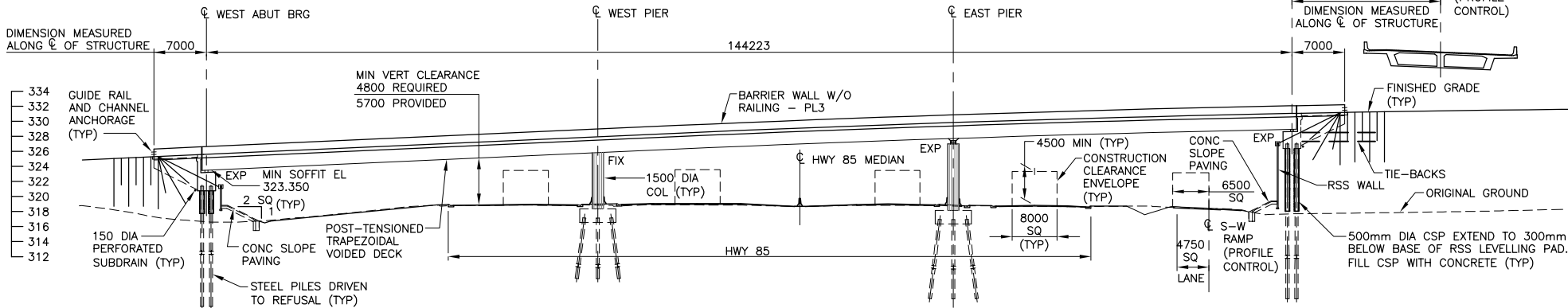


GENERAL NOTES

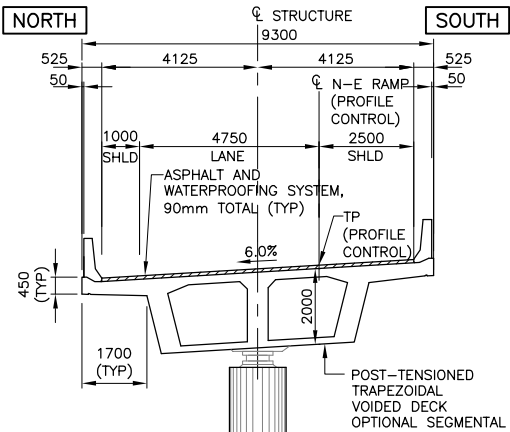
- CLASS OF CONCRETE**
DECK AND PIER COLUMNS 35 MPa
REMAINDER 30 MPa
- CLEAR COVER TO REINFORCING STEEL**
FOOTINGS 100 ± 25
DECK TOP SLAB, TOP 70 ± 20
BOT SLAB, TOP 40 ± 10
WEBS 50 ± 10
REMAINDER 70 ± 20 UNLESS OTHERWISE NOTED
- REINFORCING STEEL**
REINFORCING STEEL SHALL BE GRADE 400W UNLESS OTHERWISE SPECIFIED.
BAR MARKS WITH PREFIX 'C' DENOTE COATED BARS.
STAINLESS REINFORCING STEEL SHALL BE TYPE 316LN OR DUPLEX 2205 AND HAVE A MINIMUM YIELD STRENGTH OF 500 MPa, UNLESS OTHERWISE SPECIFIED.
BAR MARKS WITH PREFIX 'S' DENOTE STAINLESS STEEL BARS.
UNLESS SHOWN OTHERWISE, TENSION LAP SPLICES SHALL BE CLASS B.
BAR HOOKS SHALL HAVE STANDARD HOOK DIMENSIONS USING MINIMUM BEND DIAMETERS, WHILE STIRRUPS AND TIES SHALL HAVE MINIMUM HOOK DIMENSIONS, ALL HOOKS SHALL BE IN ACCORDANCE WITH THE STRUCTURAL STANDARD DRAWINGS SS12-1 AND SS12-2, UNLESS INDICATED OTHERWISE.
- GLASS FIBRE REINFORCED POLYMER (GFRP)**
GFRP REINFORCING BARS SHALL BE GRADE I, GRADE II OR GRADE III AS SPECIFIED IN THE CONTRACT DOCUMENTS.
THE NOMINAL DIAMETER, TENSILE MODULUS OF ELASTICITY AND GUARANTEED MINIMUM TENSILE STRENGTH SHALL BE AS SPECIFIED IN THE CONTRACT DOCUMENTS.
BAR MARKS WITH THE PREFIX GI DENOTE GRADE I GFRP BARS, BAR MARKS WITH THE PREFIX GII DENOTE GRADE II GFRP BARS, AND BAR MARKS WITH THE PREFIX GIII DENOTE GRADE III GFRP BARS.
- RETAINED SOIL SYSTEM**
RETAINED SOIL SYSTEM WALLS SHALL HAVE THE FOLLOWING ATTRIBUTES:
APPLICATION: FALSE ABUTMENTS/RETAINING WALLS
GEOMETRY: VERTICAL
PERFORMANCE: HIGH
APPEARANCE: HIGH
- CONSTRUCTION NOTES**
THE CONTRACTOR SHALL ESTABLISH THE BEARING SEAT ELEVATIONS BY DEDUCTING THE ACTUAL BEARING THICKNESSES FROM THE TOP OF BEARING ELEVATIONS. IF THE ACTUAL BEARING THICKNESSES ARE DIFFERENT FROM THOSE GIVEN WITH THE BEARING DESIGNATION DATA, THE CONTRACTOR SHALL ADJUST THE REINFORCING STEEL TO SUIT.

APPLICABLE STANDARD DRAWINGS:

- | | |
|---------------|-----------------------------------------------------------------------------------------------------------------|
| OPSD 0912.430 | GUIDE RAIL SYSTEM, STEEL BEAM STRUCTURAL CONNECTION |
| OPSD 3101.150 | WALLS - ABUTMENT, BACKFILL MINIMUM GRANULAR REQUIREMENTS |
| OPSD 3102.100 | WALLS ABUTMENT BACKFILL DRAIN |
| OPSD 3370.100 | DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE WITH PROTECTION BOARD |
| OPSD 3370.101 | DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE AT ACTIVE CRACKS GREATER THAN 2mm WIDE AND CONSTRUCTION JOINTS |
| OPSD 3390.100 | DECK DRIP CHANNEL |
| OPSD 3419.100 | BARRIERS AND RAILINGS - STEEL GUIDE RAIL AND CHANNEL ANCHORAGE |
| OPSD 3941.200 | FIGURES IN CONCRETE SITE NUMBER AND DATE LAYOUT |



ELEVATION
1:400



WEST

EAST

SOUTH

WEST

SOUTH

NORTH

PROFILE - N-E RAMP
NTS

PROFILE - S-W RAMP
NTS

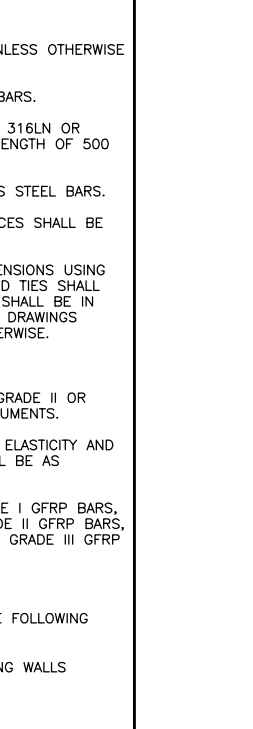
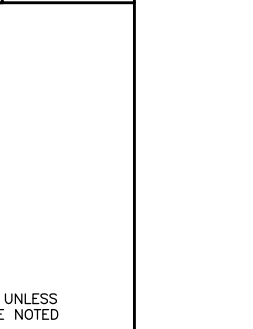
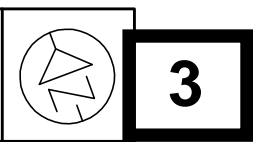
PROFILE - HWY 85
NTS

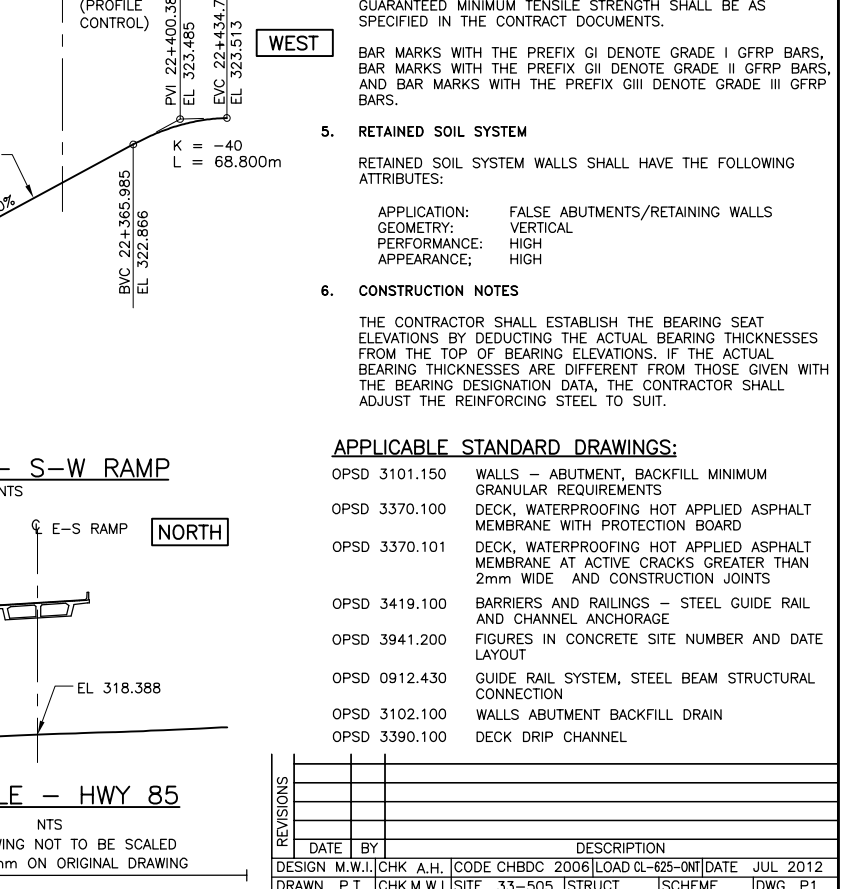
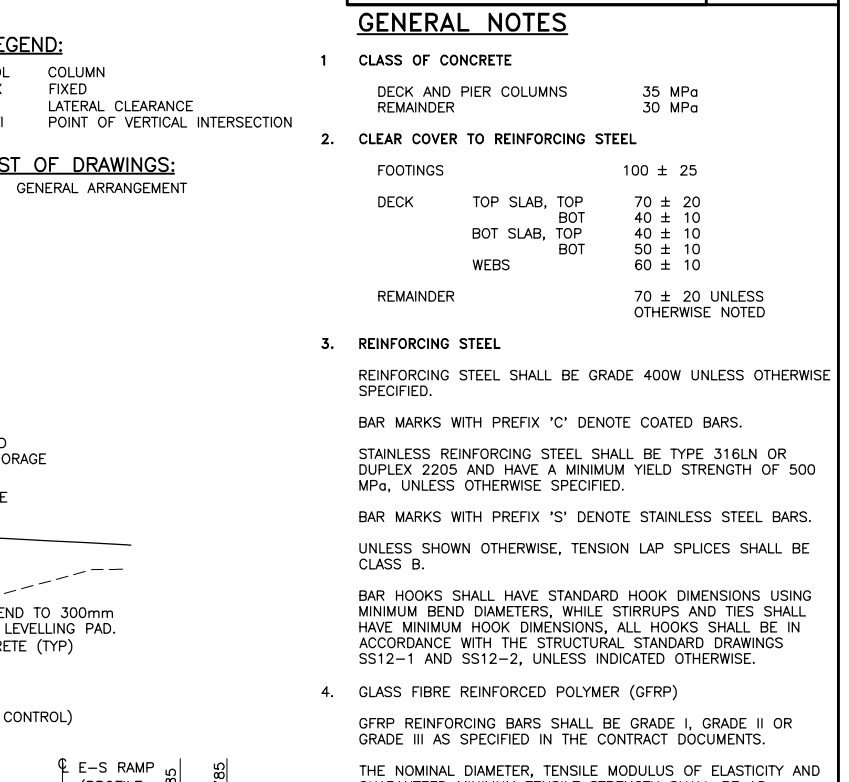
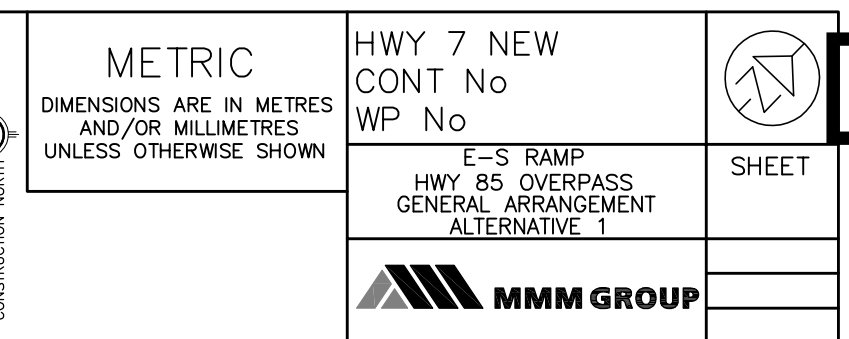
BENCHMARK
BM: 105
ELEVATION: 318.707
HCP 105
19mm x 2.0m ROUND BAR

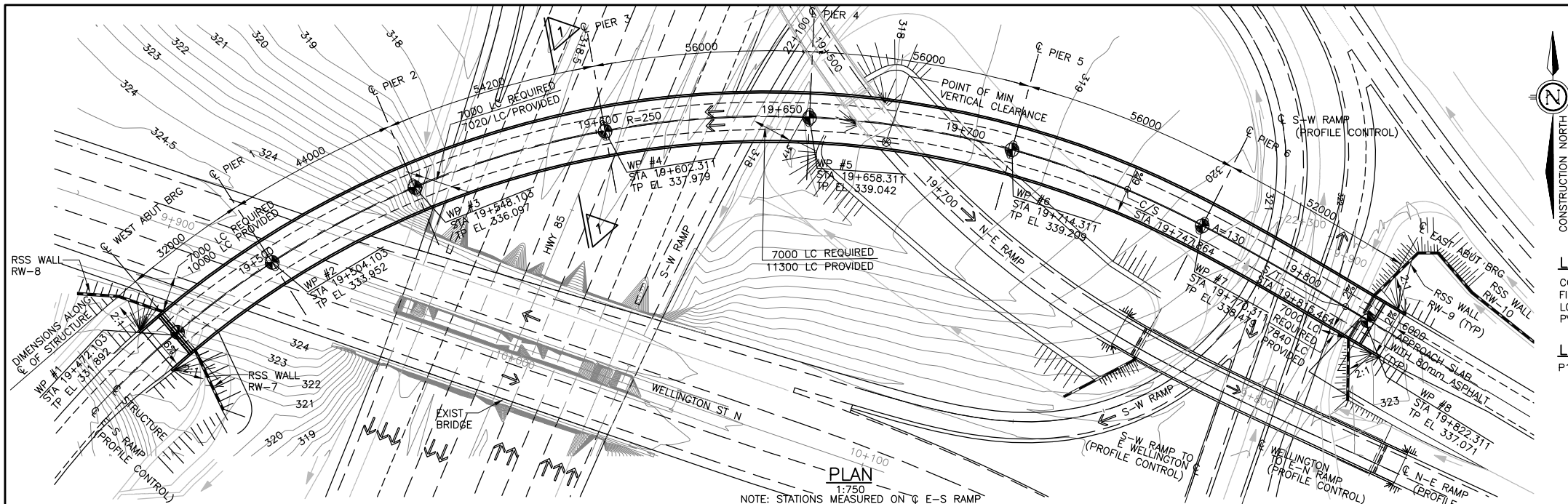


DRAWING NOT TO BE SCALED
100 mm ON ORIGINAL DRAWING

REVISIONS	DATE	BY	DESCRIPTION
DESIGN	M.W.I.	CHK A.H.	CODE CHBDC 2006 [LOAD CL-825-0M] DATE JUL 2012
DRAWN	P.T.	CHK M.W.I.	SITE 33-506 [STRUCT .] [SCHEME .] [DWG P1]

[illegible]



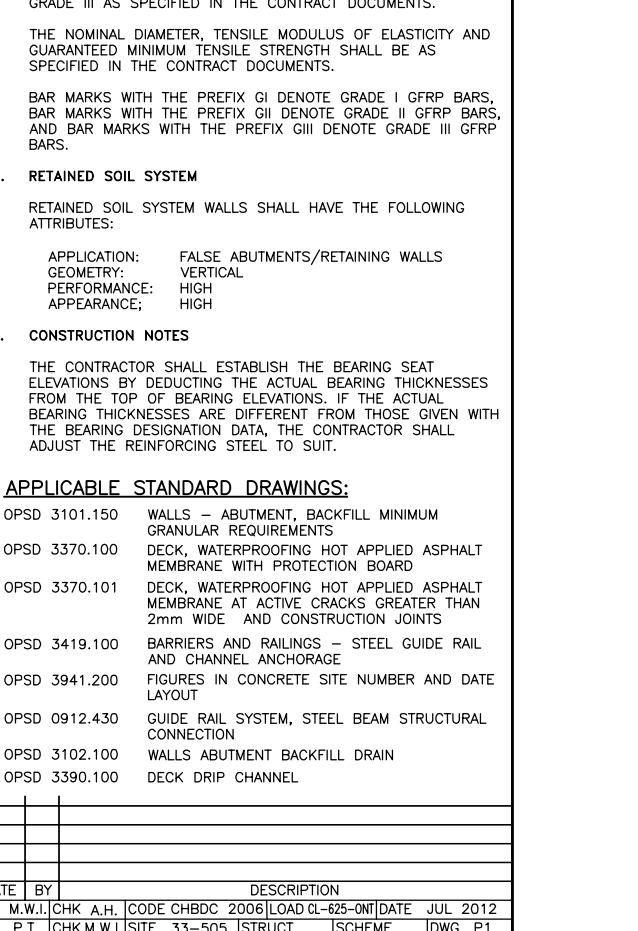
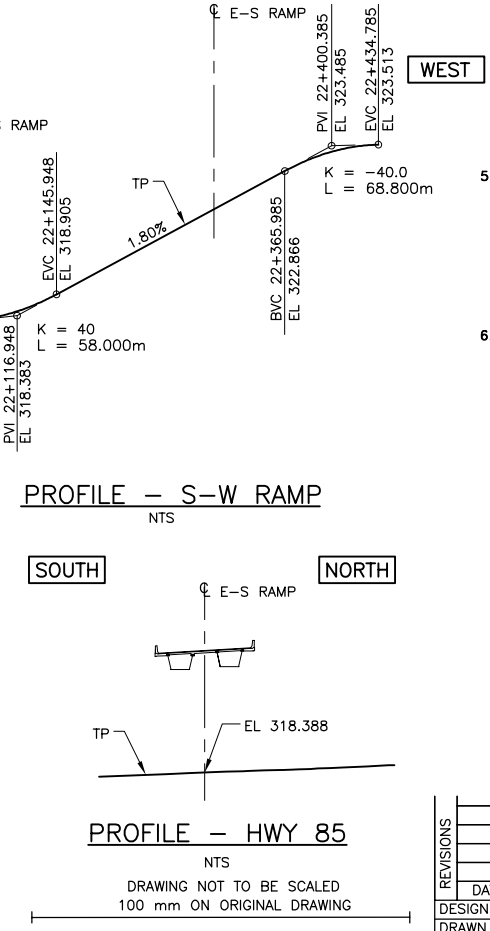
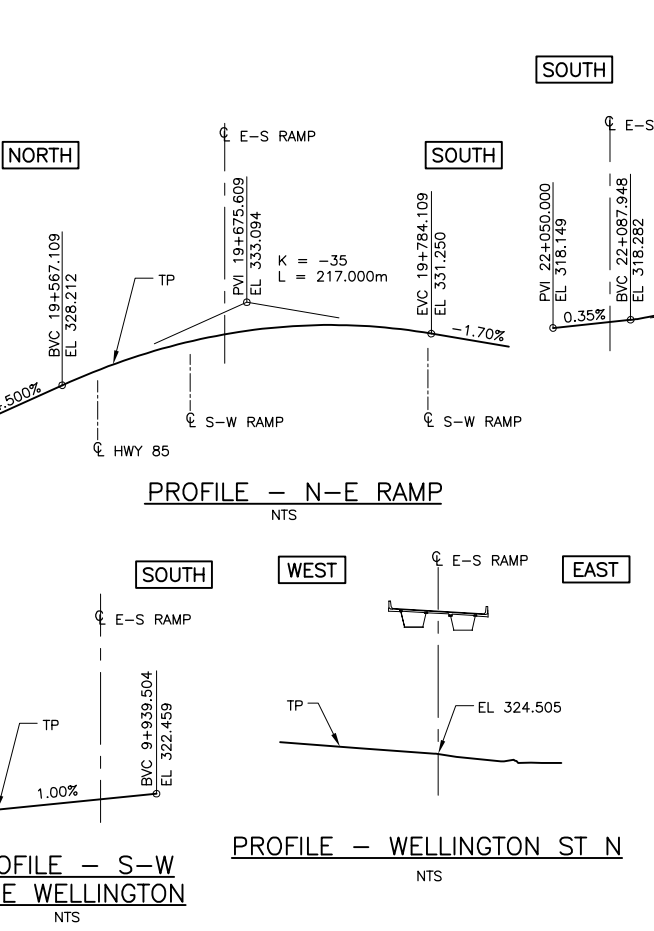
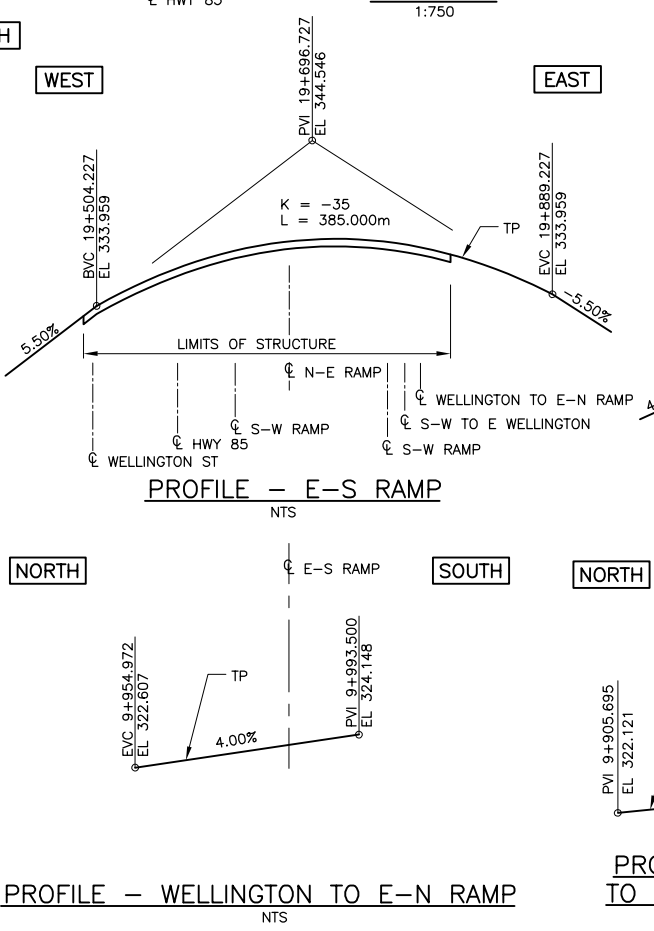
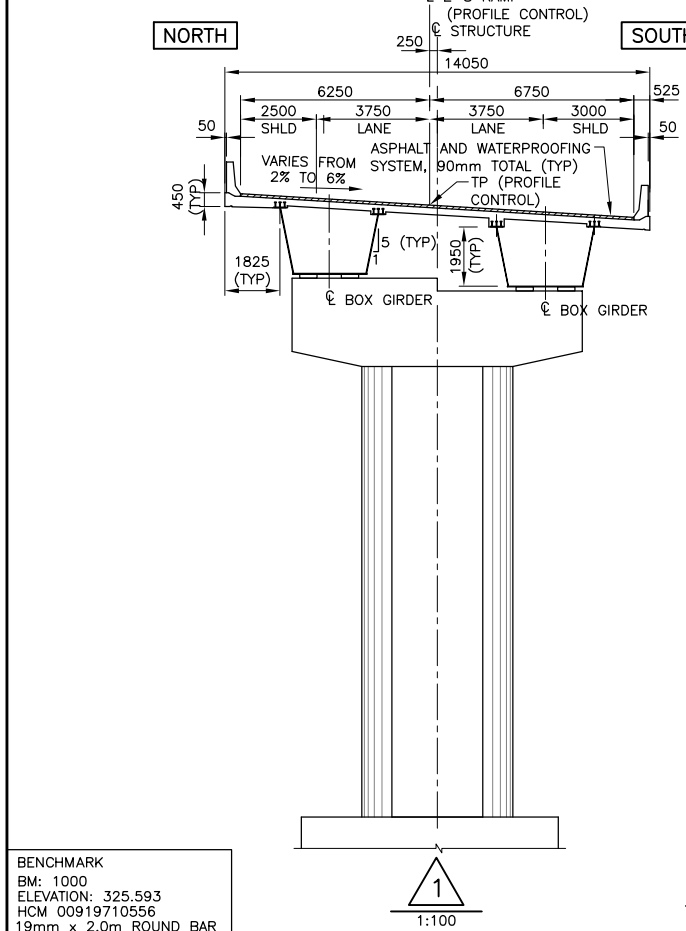
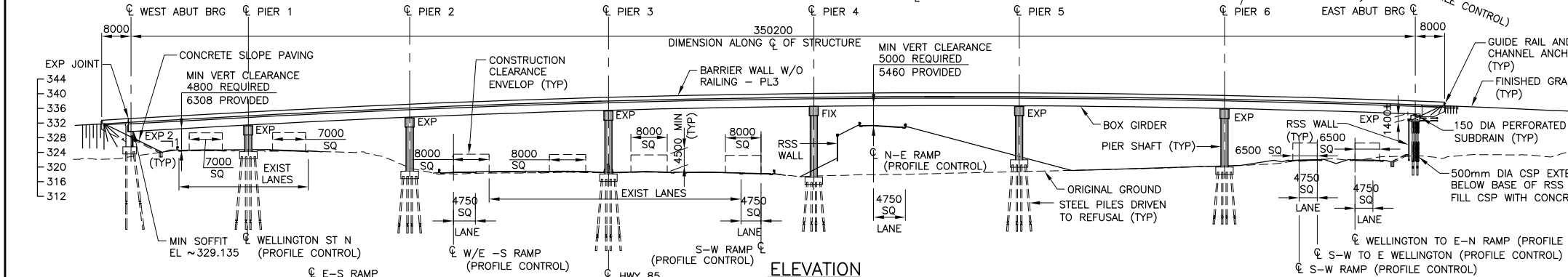


METRIC
DIMENSIONS ARE IN METRES
AND/OR MILLIMETRES
UNLESS OTHERWISE SHOWN

HWY 7 NEW
CONT No
WP No

E-S RAMP
HWY 85 OVERPASS
GENERAL ARRANGEMENT
ALTERNATIVE 2

MMM GROUP



LEGEND:
COL COLUMN
FIX FIXED
LC LATERAL CLEARANCE
PVI POINT OF VERTICAL INTERSECTION

LIST OF DRAWINGS:
P1 GENERAL ARRANGEMENT

- ### GENERAL NOTES
- CLASS OF CONCRETE**

DECK AND PIER COLUMNS	35 MPa
REMAINDER	30 MPa
 - CLEAR COVER TO REINFORCING STEEL**

FOOTINGS	100 ± 25
DECK	TOP SLAB, TOP 70 ± 20
	BOT 40 ± 10
	BOT SLAB, TOP 40 ± 10
	BOT 50 ± 10
WEBS	60 ± 10
REMAINDER	70 ± 20 UNLESS OTHERWISE NOTED
 - REINFORCING STEEL**

REINFORCING STEEL SHALL BE GRADE 400W UNLESS OTHERWISE SPECIFIED.

BAR MARKS WITH PREFIX 'C' DENOTE COATED BARS.

STAINLESS REINFORCING STEEL SHALL BE TYPE 316LN OR DUPLEX 2205 AND HAVE A MINIMUM YIELD STRENGTH OF 500 MPa, UNLESS OTHERWISE SPECIFIED.

BAR MARKS WITH PREFIX 'S' DENOTE STAINLESS STEEL BARS.

UNLESS SHOWN OTHERWISE, TENSION LAP SPLICES SHALL BE CLASS B.

BAR HOOKS SHALL HAVE STANDARD HOOK DIMENSIONS USING MINIMUM BEND DIAMETERS, WHILE STIRRUPS AND TIES SHALL HAVE MINIMUM HOOK DIMENSIONS, ALL HOOKS SHALL BE IN ACCORDANCE WITH THE STRUCTURAL STANDARD DRAWINGS SS12-1 AND SS12-2, UNLESS INDICATED OTHERWISE.
 - GLASS FIBRE REINFORCED POLYMER (GFRP)**

GFRP REINFORCING BARS SHALL BE GRADE I, GRADE II OR GRADE III AS SPECIFIED IN THE CONTRACT DOCUMENTS.

THE NOMINAL DIAMETER, TENSILE MODULUS OF ELASTICITY AND GUARANTEED MINIMUM TENSILE STRENGTH SHALL BE AS SPECIFIED IN THE CONTRACT DOCUMENTS.

BAR MARKS WITH THE PREFIX GI DENOTE GRADE I GFRP BARS, BAR MARKS WITH THE PREFIX GII DENOTE GRADE II GFRP BARS, AND BAR MARKS WITH THE PREFIX GIII DENOTE GRADE III GFRP BARS.
 - RETAINED SOIL SYSTEM**

RETAINED SOIL SYSTEM WALLS SHALL HAVE THE FOLLOWING ATTRIBUTES:

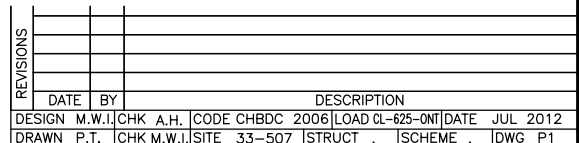
APPLICATION:	FALSE ABUTMENTS/RETAINING WALLS
GEOMETRY:	VERTICAL
PERFORMANCE:	HIGH
APPEARANCE:	HIGH
 - CONSTRUCTION NOTES**

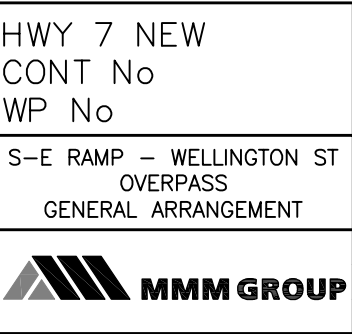
THE CONTRACTOR SHALL ESTABLISH THE BEARING SEAT ELEVATIONS BY DEDUCTING THE ACTUAL BEARING THICKNESSES FROM THE TOP OF BEARING ELEVATIONS. IF THE ACTUAL BEARING THICKNESSES ARE DIFFERENT FROM THOSE GIVEN WITH THE BEARING DESIGNATION DATA, THE CONTRACTOR SHALL ADJUST THE REINFORCING STEEL TO SUIT.

APPLICABLE STANDARD DRAWINGS:			
OPSD 3101.150	WALLS - ABUTMENT, BACKFILL MINIMUM GRANULAR REQUIREMENTS		
OPSD 3370.100	DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE WITH PROTECTION BOARD		
OPSD 3370.101	DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE AT ACTIVE CRACKS GREATER THAN 2mm WIDE AND CONSTRUCTION JOINTS		
OPSD 3419.100	BARRIERS AND RAILINGS - STEEL GUIDE RAIL AND CHANNEL ANCHORAGE		
OPSD 3941.200	FIGURES IN CONCRETE SITE NUMBER AND DATE LAYOUT		
OPSD 0912.430	GUIDE RAIL SYSTEM, STEEL BEAM STRUCTURAL CONNECTION		
OPSD 3102.100	WALLS ABUTMENT BACKFILL DRAIN		
OPSD 3390.100	DECK DRIP CHANNEL		
REVISIONS			
DATE	BY	DESCRIPTION	
DESIGN M.W.I.	CHK A.H.	CODE CHBDC 2006[LOAD CL-625-0M]	DATE JUL 2012
DRAWN P.T.	CHK M.W.I.	SITE 33-505 [STRUCT .]	SCHEME . [DWG P1]

BENCHMARK
BM: 1000
ELEVATION: 325.593
HCM 00919710556
19mm x 2.0m ROUND BAR

DRAWING NOT TO BE SCALED
100 mm ON ORIGINAL DRAWING





1. **CLASS OF CONCRETE**

DECK AND PIER COLUMNS	35 MPa
REMAINDER	30 MPa
2. **CLEAR COVER TO REINFORCING STEEL**

FOOTINGS	100 ± 25
DECK	
TOP SLAB, TOP	70 ± 20
BOT	40 ± 10
BOT SLAB, TOP	40 ± 10
BOT	50 ± 10
WEBS	60 ± 10
REMAINDER	70 ± 20 UNLESS OTHERWISE NOTED
3. **REINFORCING STEEL**

REINFORCING STEEL SHALL BE GRADE 400W UNLESS OTHERWISE SPECIFIED.

BAR MARKS WITH PREFIX 'C' DENOTE COATED BARS.

STAINLESS REINFORCING STEEL SHALL BE TYPE 316LN OR DUPLEX 2205 AND HAVE A MINIMUM YIELD STRENGTH OF 500 MPa, UNLESS OTHERWISE SPECIFIED.

BAR MARKS WITH PREFIX 'S' DENOTE STAINLESS STEEL BARS.

UNLESS SHOWN OTHERWISE, TENSION LAP SPLICES SHALL BE CLASS B.

BAR HOOKS SHALL HAVE STANDARD HOOK DIMENSIONS USING MINIMUM BEND DIAMETERS, WHILE STIRRUPS AND TIES SHALL HAVE MINIMUM HOOK DIMENSIONS. ALL HOOKS SHALL BE IN ACCORDANCE WITH THE STRUCTURAL STANDARD DRAWINGS SS12-1 AND SS12-2, UNLESS INDICATED OTHERWISE.
4. **GLASS FIBRE REINFORCED POLYMER (GFRP)**

GFRP REINFORCING BARS SHALL BE GRADE I, GRADE II OR GRADE III AS SPECIFIED IN THE CONTRACT DOCUMENTS.

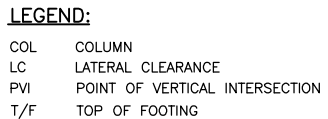
THE NOMINAL DIAMETER, TENSILE MODULUS OF ELASTICITY AND GUARANTEED MINIMUM TENSILE STRENGTH SHALL BE AS SPECIFIED IN THE CONTRACT DOCUMENTS.

BAR MARKS WITH THE PREFIX GI DENOTE GRADE I GFRP BARS, BAR MARKS WITH THE PREFIX GII DENOTE GRADE II GFRP BARS, AND BAR MARKS WITH THE PREFIX GIII DENOTE GRADE III GFRP BARS.
5. **RETAINED SOIL SYSTEM**

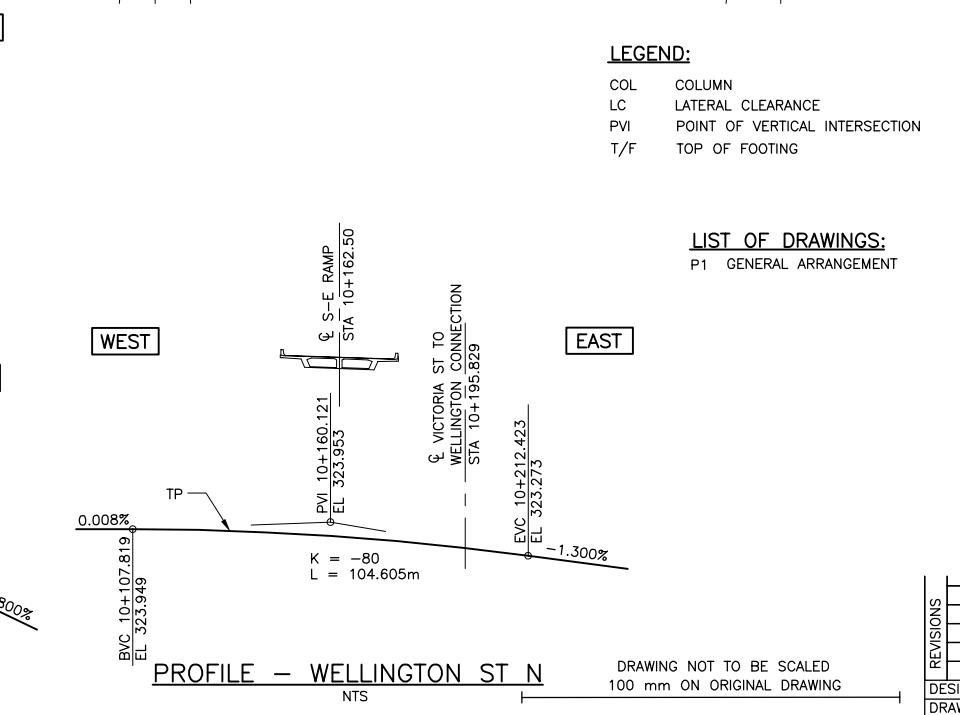
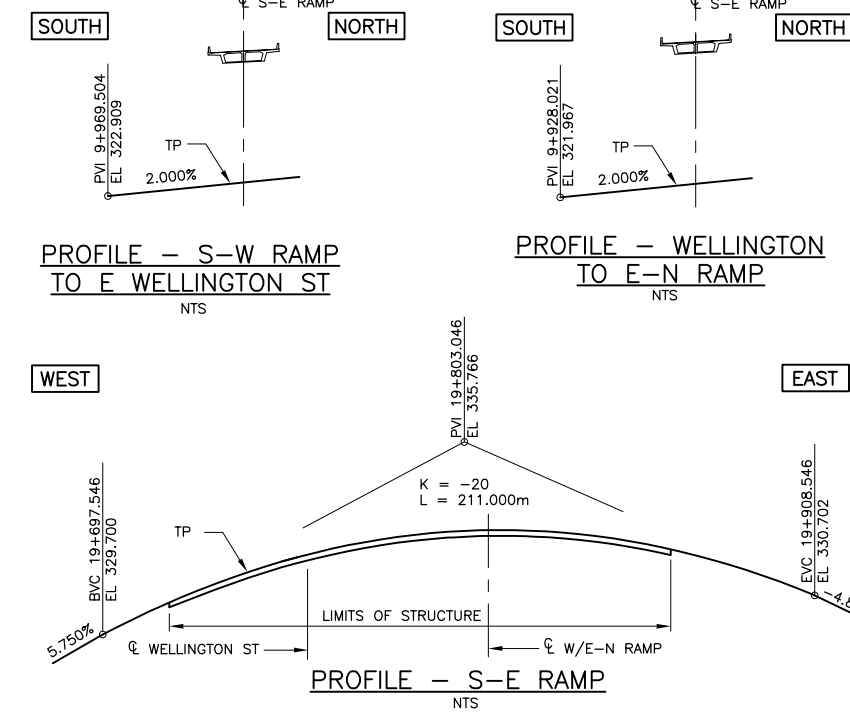
RETAINED SOIL SYSTEM WALLS SHALL HAVE THE FOLLOWING ATTRIBUTES:

APPLICATION:	FALSE ABUTMENTS/RETAINING WALLS
GEOMETRY:	VERTICAL
PERFORMANCE:	HIGH
APPEARANCE:	HIGH

ALL PANELS SHALL HAVE ARCHITECTURAL FINISH TEXTURE.



LIST OF DRAWINGS:
P1 GENERAL ARRANGEMENT




REV	DESCRIPTION									
	DATE	BY								
DESIGN	M.W.I.	CHK	A.H.	CODE	CHBDC	2006	LOAD	CL-625-00T	DATE	JUL 2012
DRAWN	P.T.	CHK	M.W.I.	SITE	33-508	STRUCT	.	SCHEME	.	DWG P1

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

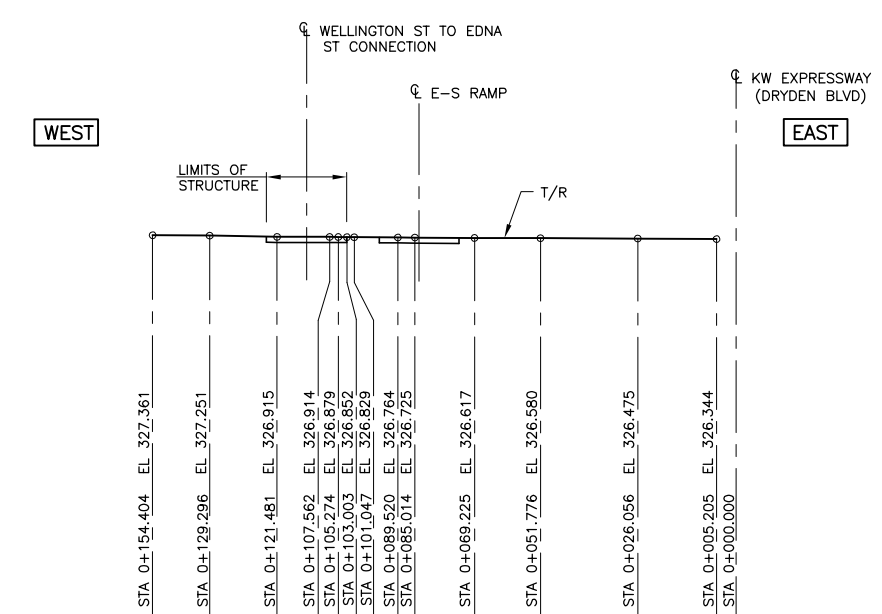
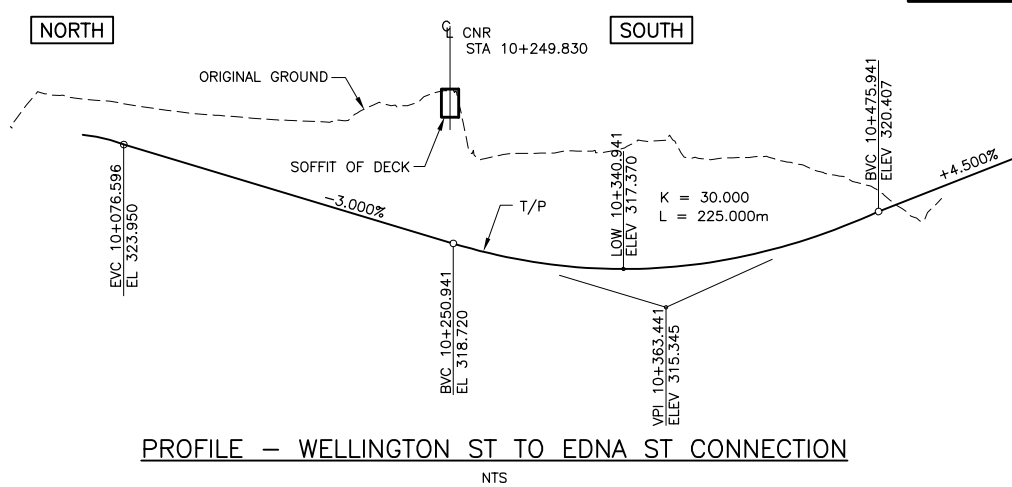
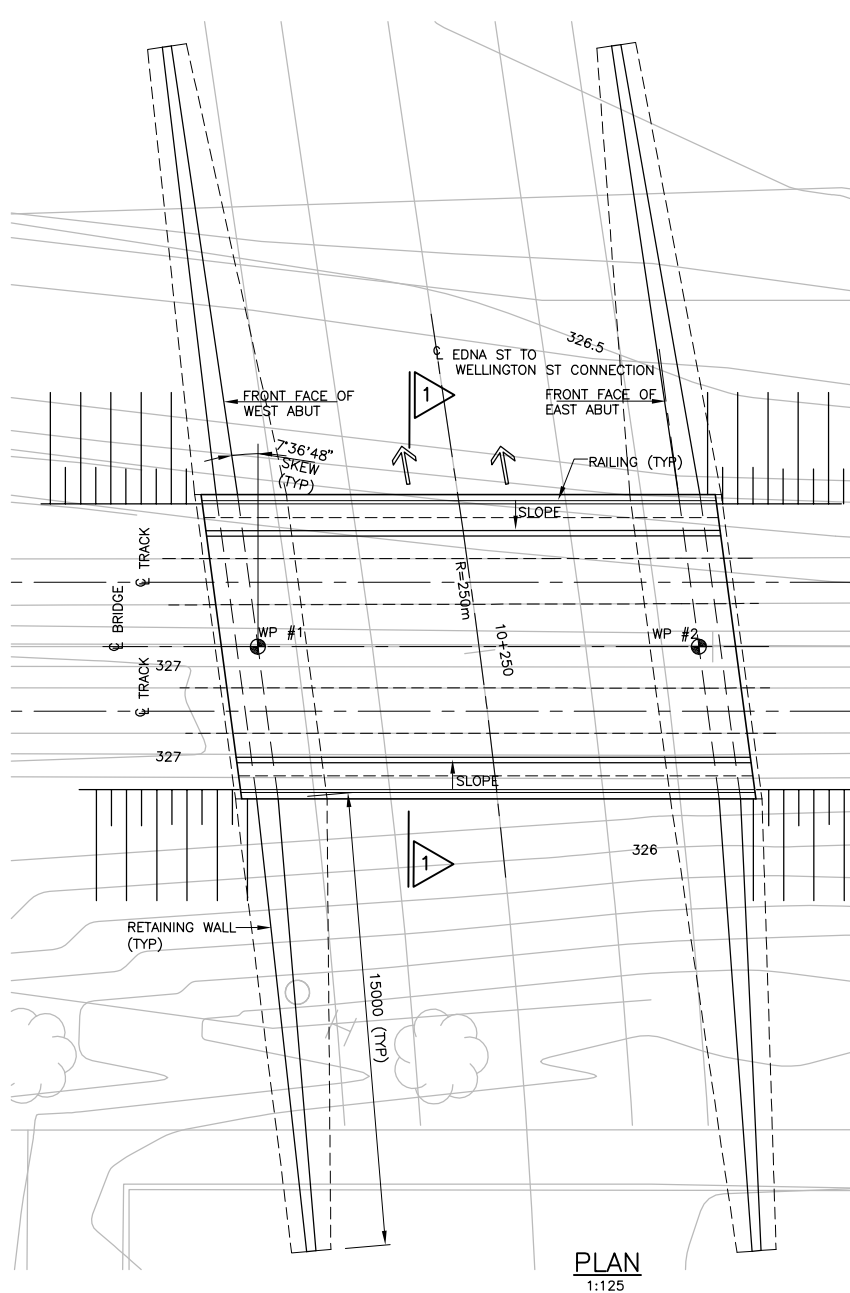
HWY 7 NEW
CONT No
WP No

CNR EDNA STREET
CONNECTION SUBWAY
GENERAL ARRANGEMENT

MMM GROUP



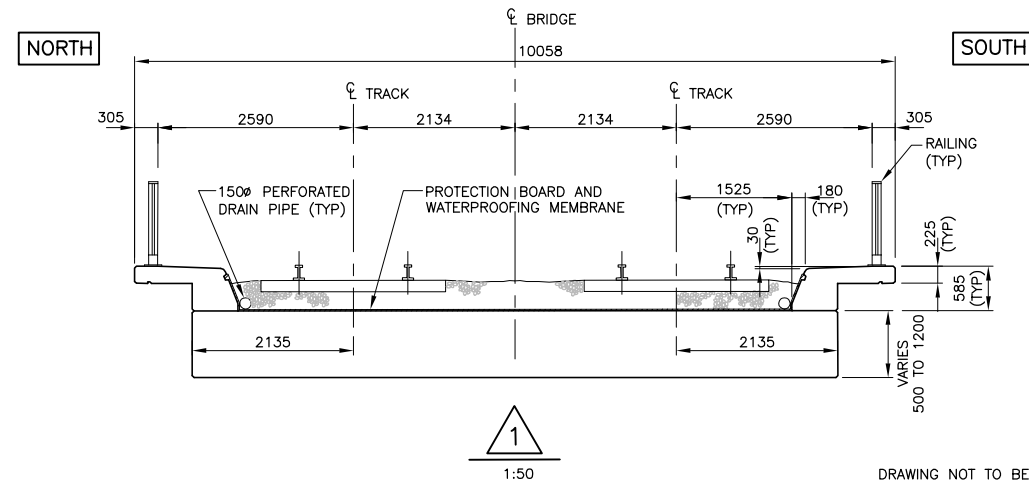
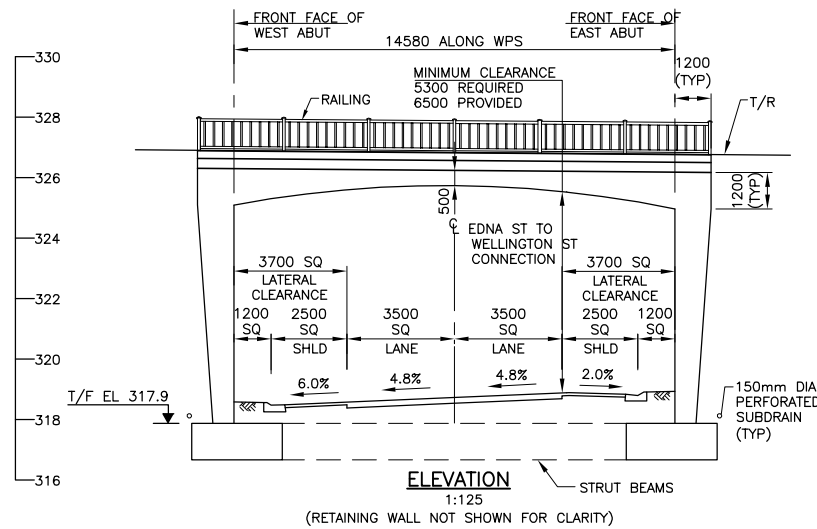
7



- GENERAL NOTES:**
- DESIGN:
CN BRIDGE AND CONCRETE RETAINING WALLS SHALL BE IN ACCORDANCE WITH AMERICAN RAILWAY ENGINEERING AND MAINTENANCE-OF-WAY ASSOCIATION (AREMA)-MANUAL FOR RAILWAY ENGINEERING, 2010, CN GUIDELINES FOR DESIGN OF RAILWAY STRUCTURES, REVISION JANUARY 2006.
DESIGN LIVE LOAD IS COOPER E90 LOADING.
DESIGN DEAD LOAD INCLUDES 710mm THICKNESS OF BALLAST.
 - CLASS OF CONCRETE: 35 MPa
 - MINIMUM CLEAR COVER TO REINFORCING STEEL:
FOOTINGS 75
DECK TOP 65
BOTTOM 50
REMAINDER UNLESS OTHERWISE NOTED 65
 - REINFORCING STEEL:
REINFORCING STEEL SHALL BE GRADE 400W UNLESS OTHERWISE NOTED.
BAR MARKS WITH PREFIX 'C' DENOTE COATED BARS.
UNLESS INDICATED OTHERWISE, TENSION LAP SPLICES SHALL BE CLASS B.
BAR HOOKS SHALL HAVE STANDARD HOOK DIMENSIONS USING MINIMUM BEND DIMENSIONS. STIFFUPS AND TIES SHALL HAVE MINIMUM HOOK DIMENSIONS.
FOR CN BRIDGE ALL HOOKS SHALL BE IN ACCORDANCE WITH AREMA CHAPTER 8, UNLESS INDICATED OTHERWISE.
 - RAILWAY BRIDGE WATERPROOFING SHALL BE IN ACCORDANCE WITH CN WATERPROOFING DETAILS PROVIDED IN GUIDELINES FOR DESIGN OF RAILWAY STRUCTURES.

LEGEND:
T/F TOP OF FOOTING
WP WORKING POINT
VPI VERTICAL POINT OF INTERSECTION

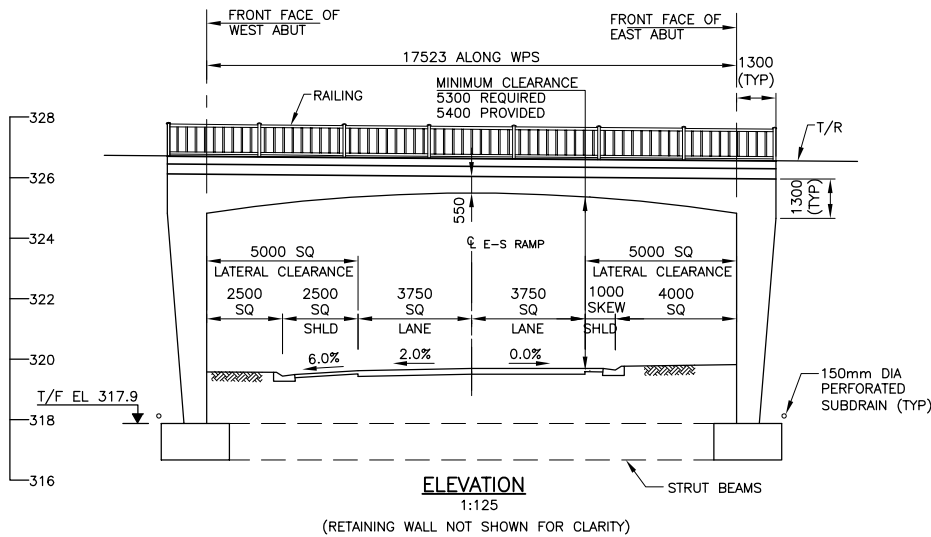
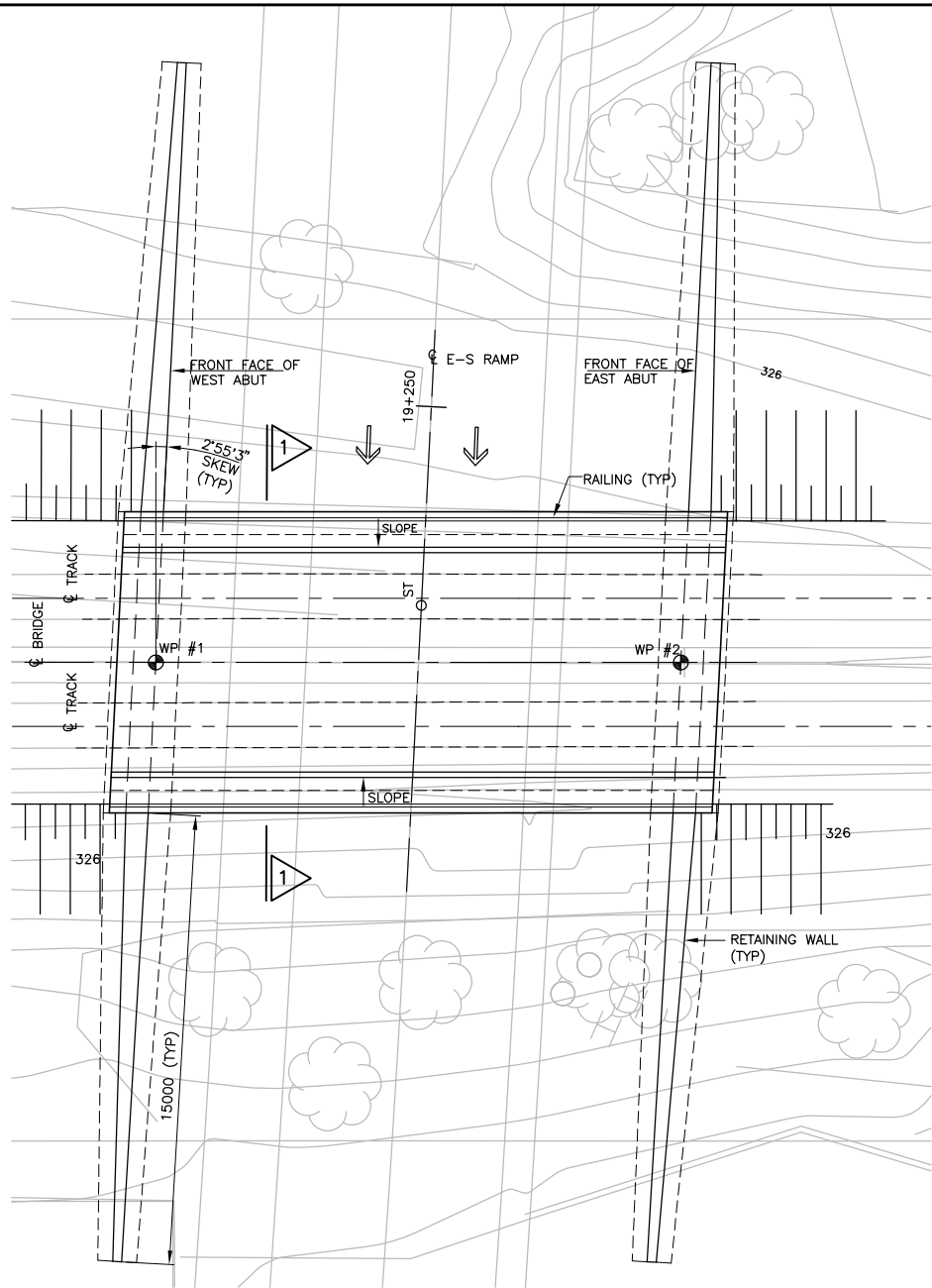
- LIST OF DRAWING**
P1 GENERAL ARRANGEMENT
- CN APPLICABLE STANDARD DRAWINGS**
CN TD-05-L-1m LOCATION FOR BRIDGE NAME PLATE
CN C3m CAST IN PLACE CONCRETE BRIDGE DECK WATERPROOFING DETAILS



BENCHMARK
BM: 1007
ELEVATION: 320.285
HCM 00919744044
19mm x 2.0m ROUND BAR

REVISIONS		DATE		BY	DESCRIPTION
DESIGN	M.Z.	CHK	A.H.	CODE CHBDC 2006	LOAD COOPER E90
DRAWN	P.T.	CHK	M.Z.	SITE 33-521	STRUCT . SCHEME . DWG P1

DRAWING NOT TO BE SCALED
100 mm ON ORIGINAL DRAWING



BENCHMARK
BM: 1007
ELEVATION: 320.285
HCM 00919744044
19mm x 2.0m ROUND BAR

WP #	STATION	TOP OF DECK ELEVATION
1	0+092.647	326.782
2	0+075.124	326.657

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

HWY 7 NEW
CONT No
WP No

CNR E-S RAMP SUBWAY
GENERAL ARRANGEMENT



8

SHEET

GENERAL NOTES:

- DESIGN:
CN BRIDGE AND CONCRETE RETAINING WALLS SHALL BE IN ACCORDANCE WITH AMERICAN RAILWAY ENGINEERING AND MAINTENANCE-OF-WAY ASSOCIATION (AREMA)-MANUAL FOR RAILWAY ENGINEERING, 2010, CN GUIDELINES FOR DESIGN OF RAILWAY STRUCTURES, REVISION JANUARY 2006.
DESIGN LIVE LOAD IS COOPER E90 LOADING.
DESIGN DEAD LOAD INCLUDES 710mm THICKNESS OF BALLAST.
- CLASS OF CONCRETE: 35 MPa
- MINIMUM CLEAR COVER TO REINFORCING STEEL:
FOOTINGS 75
DECK
TOP 65
BOTTOM 50
REMAINDER UNLESS OTHERWISE NOTED 65
- REINFORCING STEEL:
REINFORCING STEEL SHALL BE GRADE 400W UNLESS OTHERWISE NOTED.
BAR MARKS WITH PREFIX 'C' DENOTE COATED BARS.
UNLESS INDICATED OTHERWISE, TENSION LAP SPLICES SHALL BE CLASS B.
BAR HOOKS SHALL HAVE STANDARD HOOK DIMENSIONS USING MINIMUM BEND DIMENSIONS. STIFFUPS AND TIES SHALL HAVE MINIMUM HOOK DIMENSIONS.
FOR CN BRIDGE ALL HOOKS SHALL BE IN ACCORDANCE WITH AREMA CHAPTER 8, UNLESS INDICATED OTHERWISE.
- RAILWAY BRIDGE WATERPROOFING SHALL BE IN ACCORDANCE WITH CN WATERPROOFING DETAILS PROVIDED IN GUIDELINES FOR DESIGN OF RAILWAY STRUCTURES.

LEGEND:

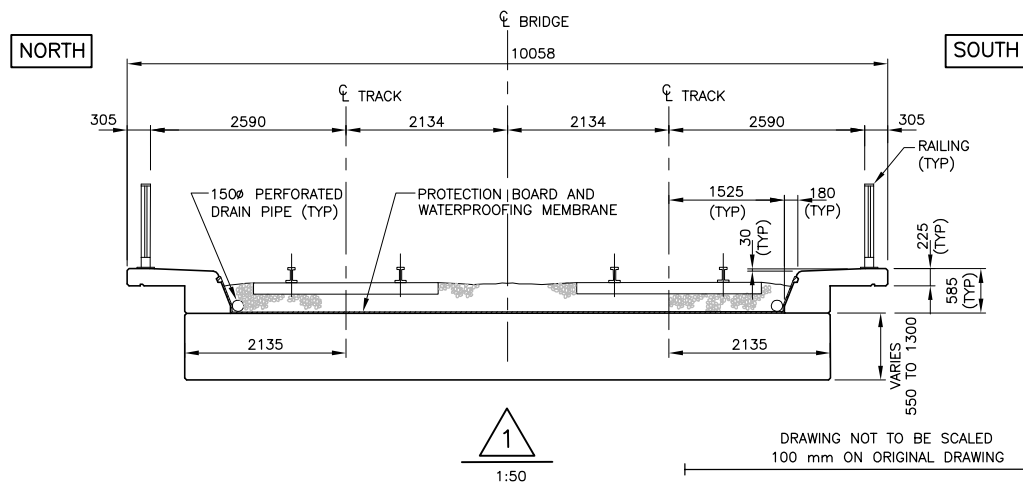
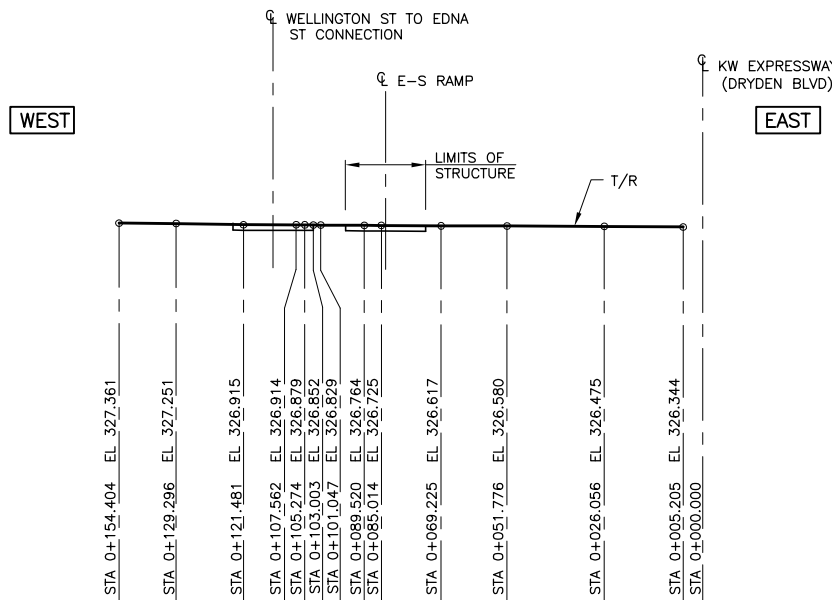
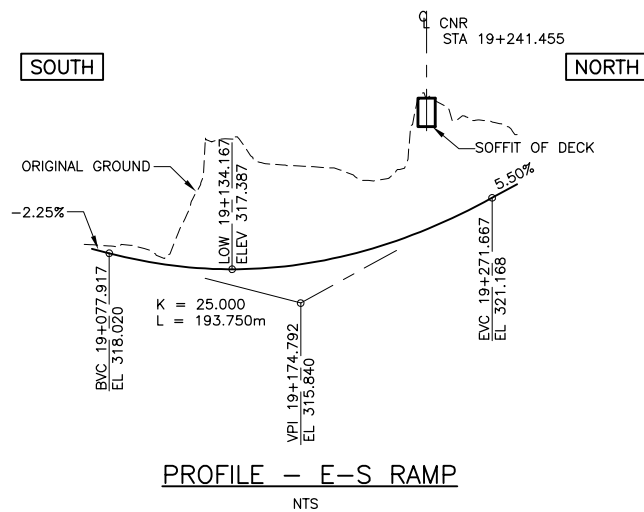
T/F TOP OF FOOTING
WP WORKING POINT
VPI VERTICAL POINT OF INTERSECTION

LIST OF DRAWING

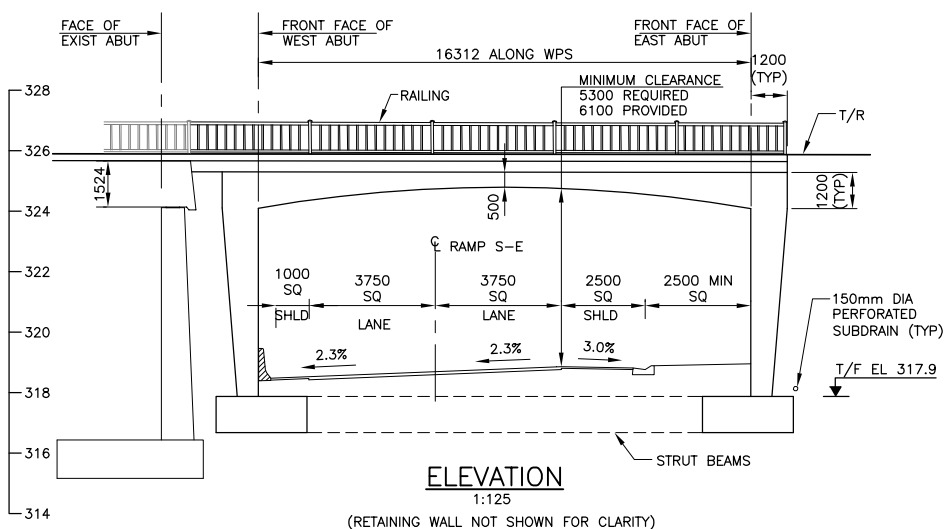
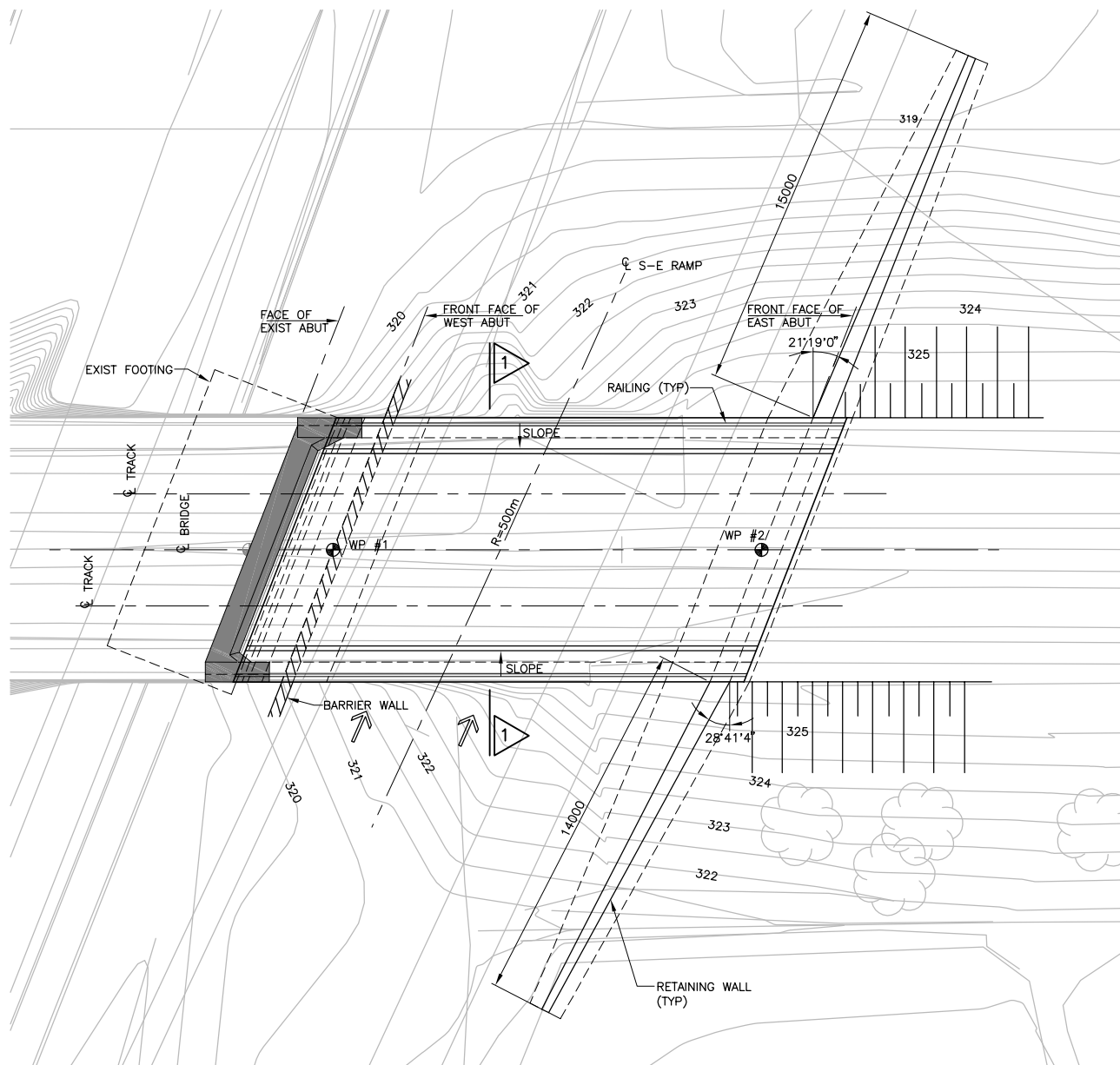
P1 GENERAL ARRANGEMENT

CN APPLICABLE STANDARD DRAWINGS

CN TD-05-L-1m LOCATION FOR BRIDGE NAME PLATE
CN C3m CAST IN PLACE CONCRETE BRIDGE DECK WATERPROOFING DETAILS



REVISIONS	DATE	BY	DESCRIPTION
DESIGN	M.Z.	CHK A.H.	CODE CHBDC 2006[LOAD COOPER E90]DATE JUL 2012
DRAWN	P.T.	CHK M.Z.	SITE 33-522[STRUCT .]SCHEME .DWG P1



BENCHMARK
BM: 1007
ELEVATION: 320.285
HCM 00919744044
19mm x 2.0m ROUND BAR

WP #	STATION	TOP OF DECK ELEVATION
1	0+039.003	326.177
2	0+055.315	326.085

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

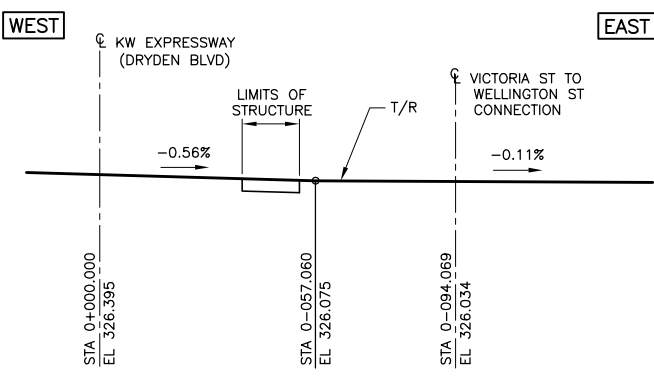
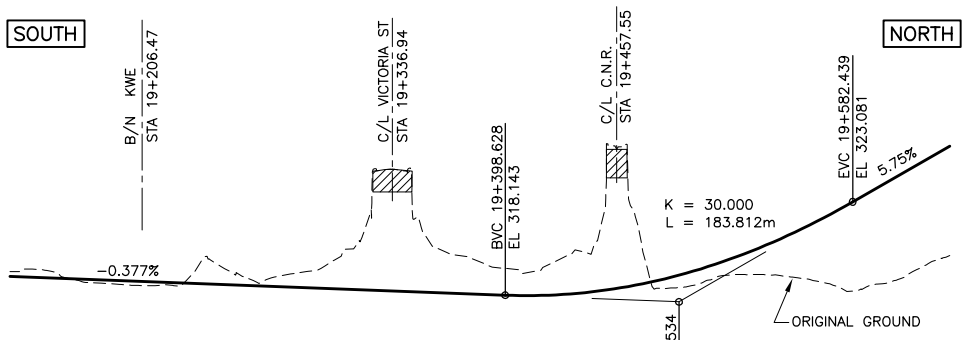
HWY 7 NEW
CONT No
WP No

CNR S-E RAMP SUBWAY
GENERAL ARRANGEMENT

MMM GROUP

9

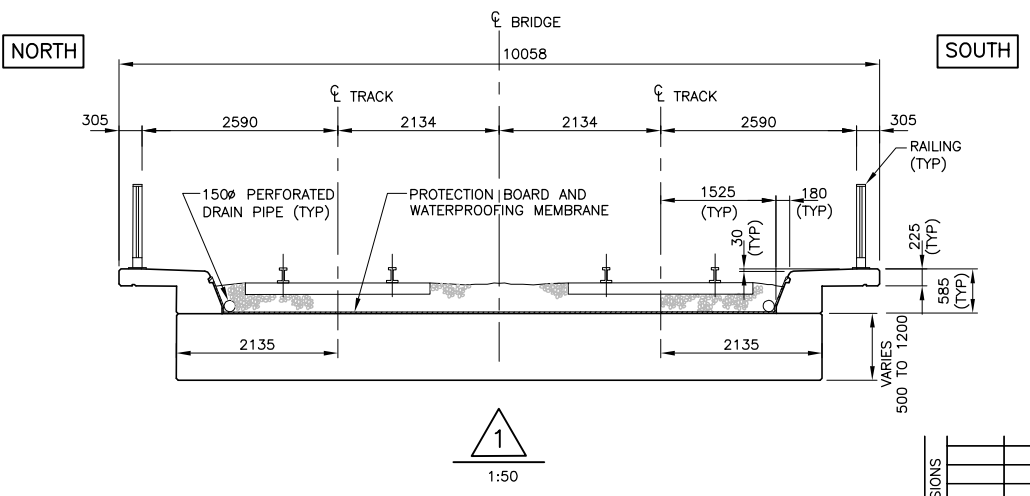
SHEET



- GENERAL NOTES:**
- DESIGN:
CN BRIDGE AND CONCRETE RETAINING WALLS SHALL BE IN ACCORDANCE WITH AMERICAN RAILWAY ENGINEERING AND MAINTENANCE-OF-WAY ASSOCIATION (AREMA)-MANUAL FOR RAILWAY ENGINEERING, 2010, CN GUIDELINES FOR DESIGN OF RAILWAY STRUCTURES, REVISION JANUARY 2006.
DESIGN LIVE LOAD IS COOPER E90 LOADING.
DESIGN DEAD LOAD INCLUDES 710mm THICKNESS OF BALLAST.
 - CLASS OF CONCRETE: 35 MPa
 - MINIMUM CLEAR COVER TO REINFORCING STEEL:
FOOTINGS 75
DECK
TOP 65
BOTTOM 50
REMAINDER UNLESS OTHERWISE NOTED 65
 - REINFORCING STEEL:
REINFORCING STEEL SHALL BE GRADE 400W UNLESS OTHERWISE NOTED.
BAR MARKS WITH PREFIX 'C' DENOTE COATED BARS.
UNLESS INDICATED OTHERWISE, TENSION LAP SPLICES SHALL BE CLASS B.
BAR HOOKS SHALL HAVE STANDARD HOOK DIMENSIONS USING MINIMUM BEND DIMENSIONS. STIFFUPS AND TIES SHALL HAVE MINIMUM HOOK DIMENSIONS.
FOR CN BRIDGE ALL HOOKS SHALL BE IN ACCORDANCE WITH AREMA CHAPTER 8, UNLESS INDICATED OTHERWISE.
 - RAILWAY BRIDGE WATERPROOFING SHALL BE IN ACCORDANCE WITH CN WATERPROOFING DETAILS PROVIDED IN GUIDELINES FOR DESIGN OF RAILWAY STRUCTURES.

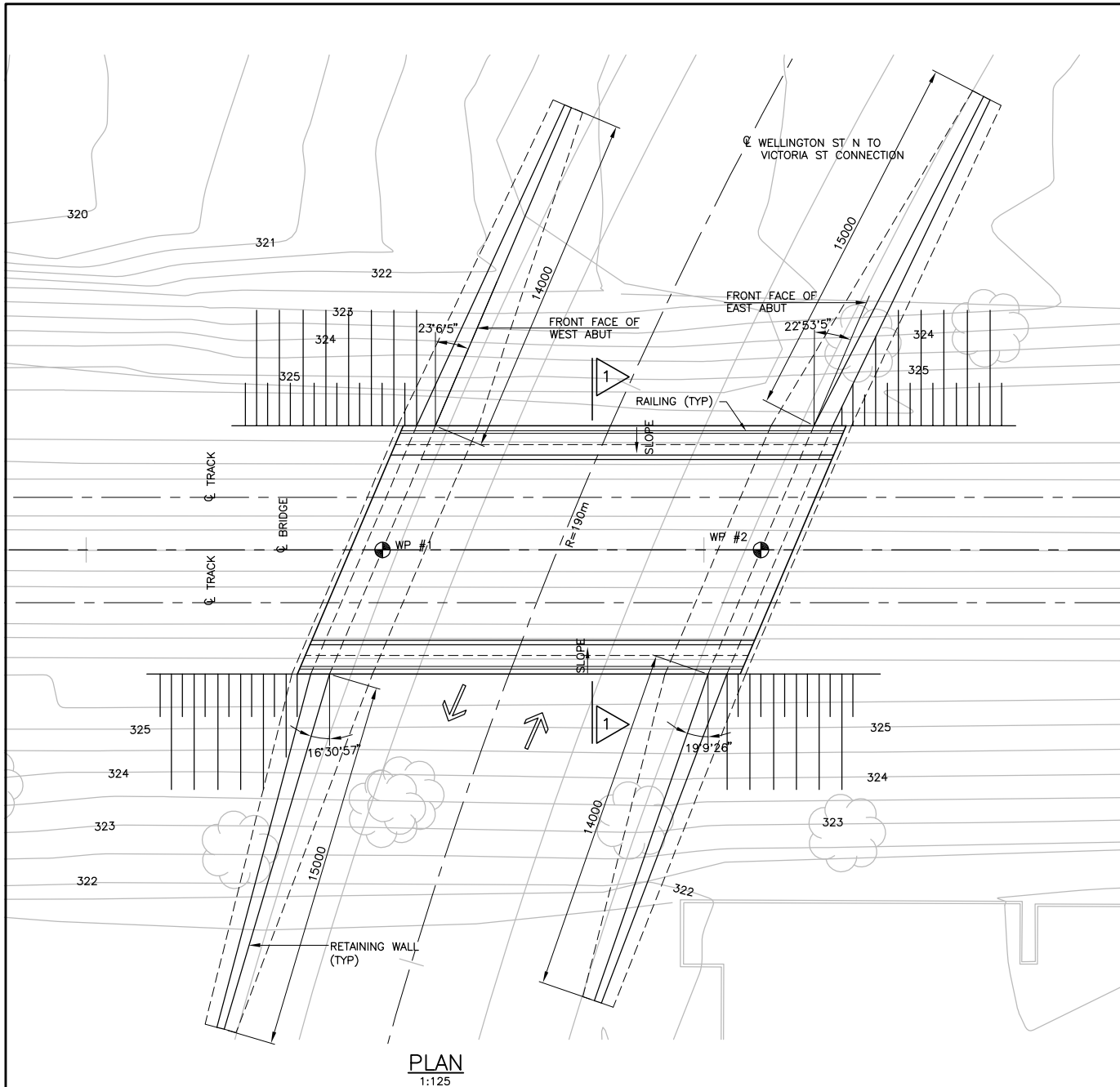
- LEGEND:**
- T/F TOP OF FOOTING
WP WORKING POINT
VPI VERTICAL POINT OF INTERSECTION

- LIST OF DRAWING**
- P1 GENERAL ARRANGEMENT
- CN APPLICABLE STANDARD DRAWINGS**
- CN TD-05-L-1m LOCATION FOR BRIDGE NAME PLATE
CN C3m CAST IN PLACE CONCRETE BRIDGE DECK WATERPROOFING DETAILS

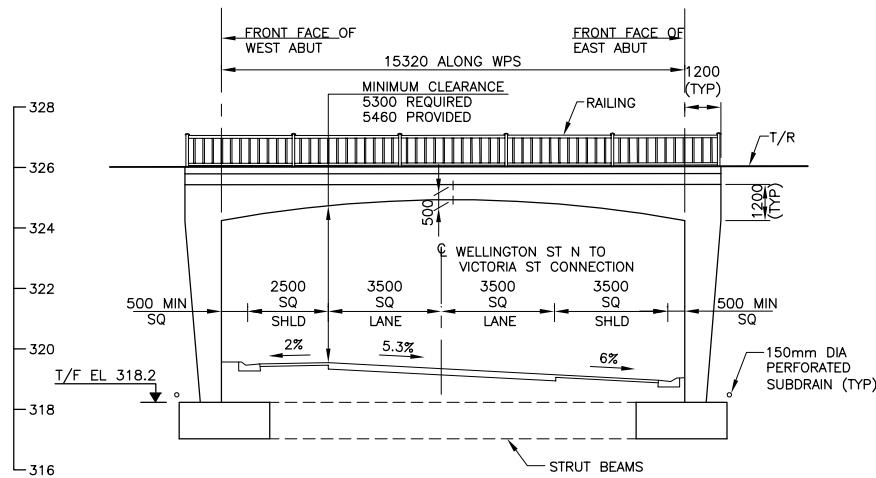


DRAWING NOT TO BE SCALED
100 mm ON ORIGINAL DRAWING

REVISIONS	DATE	BY	DESCRIPTION
DESIGN	M.Z.	CHK A.H.	CODE CHBDC 2006[LOAD COOPER E90]DATE JUL 2012
DRAWN	D.S./P.T.	CHK M.Z.	SITE 33-523 STRUCT . SCHEME . DWG P1



PLAN
1:125

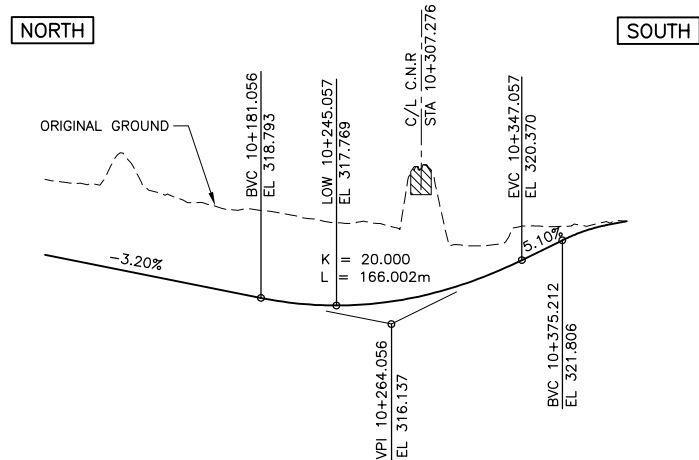


ELEVATION
1:125

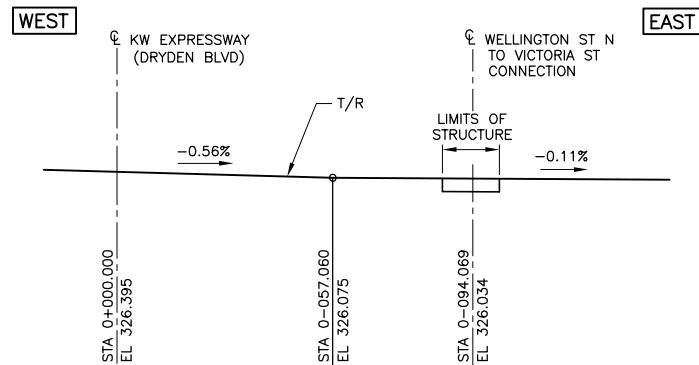
(RETAINING WALL NOT SHOWN FOR CLARITY)

BENCHMARK
BM: 1007
ELEVATION: 320.285
HCM 00919744044
19mm x 2.0m ROUND BAR

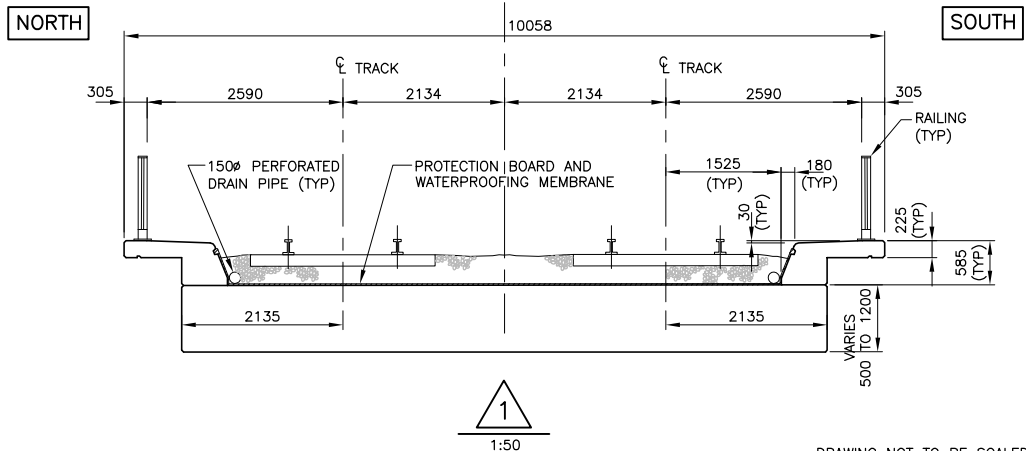
WP #	STATION	TOP OF DECK ELEVATION
1	0+086.992	326.042
2	0+102.312	326.025



PROFILE – WELLINGTON ST N TO
VICTORIA ST CONNECTION
NTS



PROFILE – EXISTING MAIN TRACK
NTS



1
1:50

DRAWING NOT TO BE SCALED
100 mm ON ORIGINAL DRAWING

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

HWY 7 NEW
CONT No
WP No
CNR WELLINGTON STREET TO
VICTORIA STREET
CONNECTION SUBWAY
GENERAL ARRANGEMENT



SHEET

10

GENERAL NOTES:

- DESIGN:
CN BRIDGE AND CONCRETE RETAINING WALLS SHALL BE IN ACCORDANCE WITH AMERICAN RAILWAY ENGINEERING AND MAINTENANCE-OF-WAY ASSOCIATION (AREMA)-MANUAL FOR RAILWAY ENGINEERING, 2010, CN GUIDELINES FOR DESIGN OF RAILWAY STRUCTURES, REVISION JANUARY 2006.
DESIGN LIVE LOAD IS COOPER E90 LOADING.
DESIGN DEAD LOAD INCLUDES 710mm THICKNESS OF BALLAST.
- CLASS OF CONCRETE: 35 MPa
- MINIMUM CLEAR COVER TO REINFORCING STEEL:
FOOTINGS 75
DECK
TOP 65
BOTTOM 50
REMAINDER UNLESS OTHERWISE NOTED 65
- REINFORCING STEEL:
REINFORCING STEEL SHALL BE GRADE 400W UNLESS OTHERWISE NOTED.
BAR MARKS WITH PREFIX 'C' DENOTE COATED BARS.
UNLESS INDICATED OTHERWISE, TENSION LAP SPLICES SHALL BE CLASS B.
BAR HOOKS SHALL HAVE STANDARD HOOK DIMENSIONS USING MINIMUM BEND DIMENSIONS. STIFFUPS AND TIES SHALL HAVE MINIMUM HOOK DIMENSIONS.
FOR CN BRIDGE ALL HOOKS SHALL BE IN ACCORDANCE WITH AREMA CHAPTER 8, UNLESS INDICATED OTHERWISE.
- RAILWAY BRIDGE WATERPROOFING SHALL BE IN ACCORDANCE WITH CN WATERPROOFING DETAILS PROVIDED IN GUIDELINES FOR DESIGN OF RAILWAY STRUCTURES.

LEGEND:

T/F TOP OF FOOTING
WP WORKING POINT
VPI VERTICAL POINT OF INTERSECTION

LIST OF DRAWING

P1 GENERAL ARRANGEMENT

CN APPLICABLE STANDARD DRAWINGS

CN TD-05-L-1m LOCATION FOR BRIDGE NAME PLATE
CN C3m CAST IN PLACE CONCRETE BRIDGE DECK WATERPROOFING DETAILS

REVISIONS	DATE	BY	DESCRIPTION
DESIGN	M.Z.	CHK A.H.	CODE CHBDC 2006[LOAD COOPER E90]DATE JUL 2012
DRAWN	D.S./P.T.	CHK M.Z.	SITE 33-524[STRUCT .][SCHEME .][DWG P1]

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

HWY 7 NEW
CONT No
WP No

RIVERBEND DRIVE OVERPASS
WBL
GENERAL ARRANGEMENT



SHEET



GENERAL NOTES

- CLASS OF CONCRETE**

PRECAST PRESTRESSED BEAMS	
CPCI	50 MPa
NU	70 MPa HPC
REMAINDER	30 MPa
- CLEAR COVER TO REINFORCING STEEL**

DECK	TOP	70 ± 20
	BOT	40 ± 10
REMAINDER		70 ± 20 UNLESS OTHERWISE NOTED
- REINFORCING STEEL**

REINFORCING STEEL SHALL BE GRADE 400W UNLESS OTHERWISE SPECIFIED.

BAR MARKS WITH PREFIX 'C' DENOTE COATED BARS.

STAINLESS REINFORCING STEEL SHALL BE TYPE 316LN OR DUPLEX 2205 AND HAVE A MINIMUM YIELD STRENGTH OF 500 MPa, UNLESS OTHERWISE SPECIFIED.

BAR MARKS WITH PREFIX 'S' DENOTE STAINLESS STEEL BARS.

UNLESS SHOWN OTHERWISE, TENSION LAP SPLICES SHALL BE CLASS B.

BAR HOOKS SHALL HAVE STANDARD HOOK DIMENSIONS USING MINIMUM BEND DIAMETERS, WHILE STIRRUPS AND TIES SHALL HAVE MINIMUM HOOK DIMENSIONS; ALL HOOKS SHALL BE IN ACCORDANCE WITH THE STRUCTURAL STANDARD DRAWINGS SS12-1 AND SS12-2, UNLESS INDICATED OTHERWISE.
- GLASS FIBRE REINFORCED POLYMER (GFRP)**

GFRP REINFORCING BARS SHALL BE GRADE I, GRADE II OR GRADE III AS SPECIFIED IN THE CONTRACT DOCUMENTS.

THE NOMINAL DIAMETER, TENSILE MODULUS OF ELASTICITY AND GUARANTEED MINIMUM TENSILE STRENGTH SHALL BE AS SPECIFIED IN THE CONTRACT DOCUMENTS.

BAR MARKS WITH THE PREFIX GI DENOTE GRADE I GFRP BARS, BAR MARKS WITH THE PREFIX GII DENOTE GRADE II GFRP BARS, AND BAR MARKS WITH THE PREFIX GIII DENOTE GRADE III GFRP BARS.
- CONSTRUCTION NOTES**

BACKFILL SHALL NOT BE PLACED BEHIND THE ABUTMENTS UNTIL THE DECK SLAB IS IN PLACE AND HAS REACHED 25 MPa STRENGTH.

BACKFILL SHALL BE PLACED SIMULTANEOUSLY BEHIND BOTH ABUTMENTS KEEPING THE HEIGHT OF THE BACKFILL APPROXIMATELY THE SAME. AT NO TIME SHALL THE DIFFERENCE IN ELEVATION BE GRATER THAN 500mm.

CONSTRUCT ABUTMENTS AND WINGWALLS TO THE BEARING SEAT ELEVATIONS. THE CONTRACTOR SHALL SUPPLY TEMPORARY LATERAL BRACING FOR THE ABUTMENTS. FORMWORK AND LATERAL BRACING SHALL NOT BE REMOVED UNTIL THE CONCRETE IN DECK HAS REACHED 25 MPa STRENGTH.

THE CONTRACTOR SHALL ESTABLISH THE BEARING SEAT ELEVATIONS BY DEDUCTING THE ACTUAL BEARING THICKNESSES FROM THE TOP OF BEARING ELEVATIONS. IF THE ACTUAL BEARING THICKNESSES ARE DIFFERENT FROM THOSE GIVEN WITH THE BEARING DESIGNATION DATA, THE CONTRACTOR SHALL ADJUST THE REINFORCING STEEL TO SUIT.

APPLICABLE STANDARD DRAWINGS:

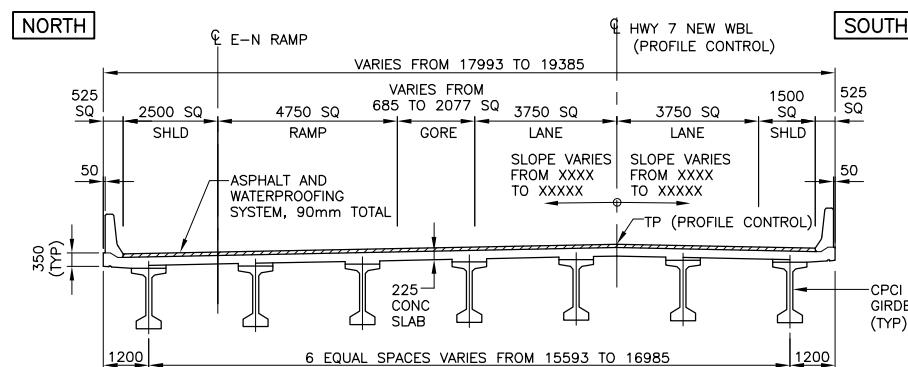
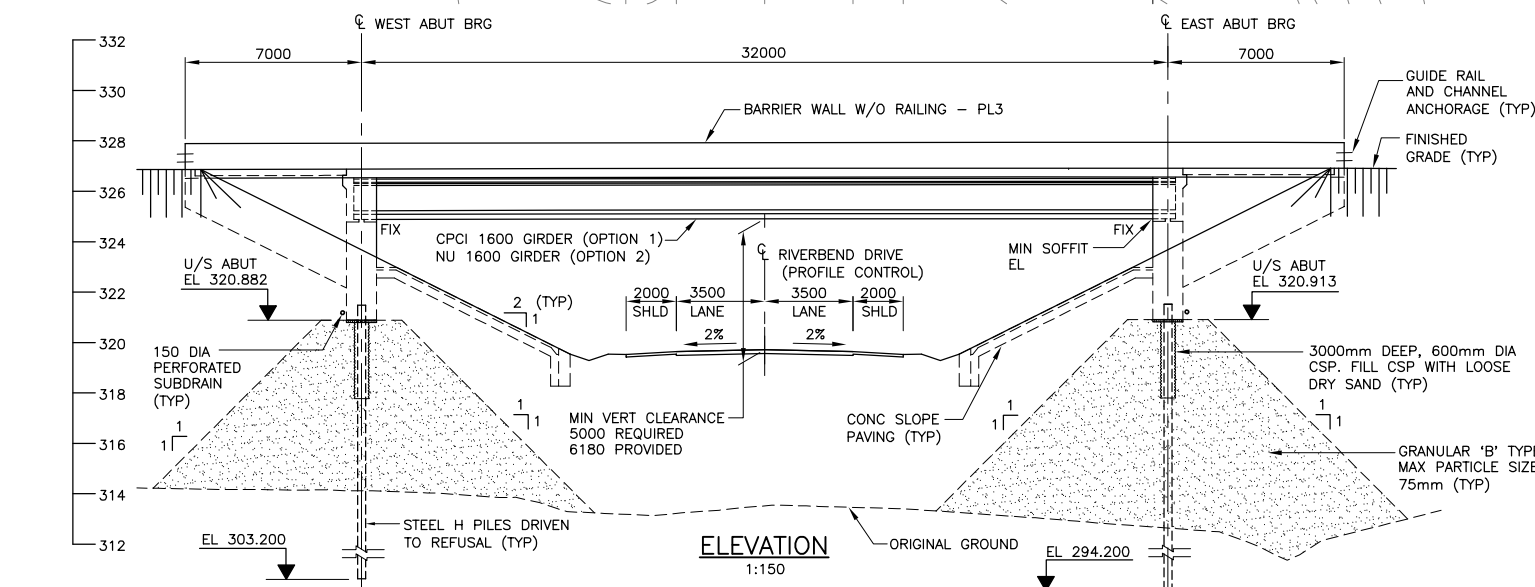
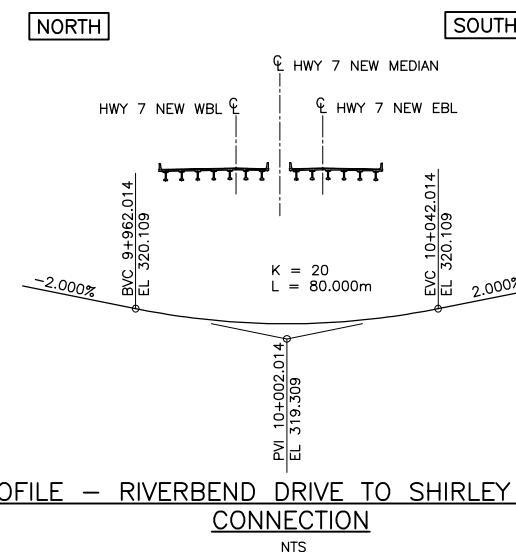
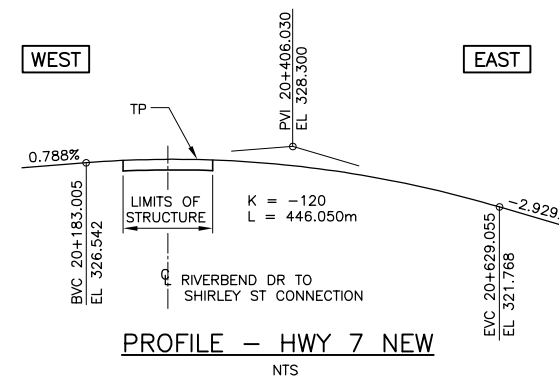
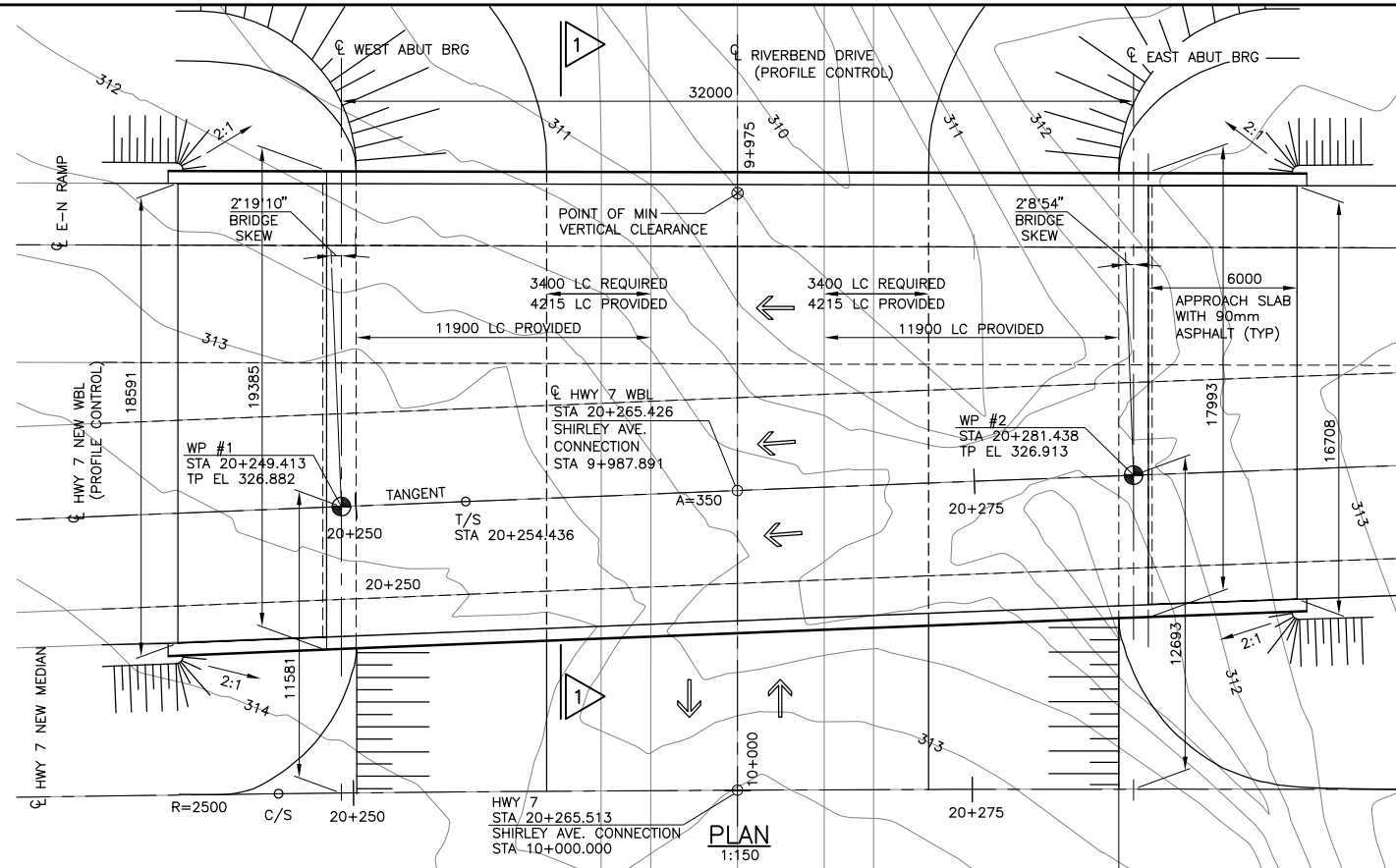
OPSD 0912.430	GUIDE RAIL SYSTEM, STEEL BEAM STRUCTURAL CONNECTION
OPSD 3101.150	WALLS - ABUTMENT, BACKFILL MINIMUM GRANULAR REQUIREMENTS
OPSD 3102.100	WALLS ABUTMENT BACKFILL DRAIN
OPSD 3370.100	DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE WITH PROTECTION BOARD
OPSD 3370.101	DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE AT ACTIVE CRACKS GREATER THAN 2mm WIDE AND CONSTRUCTION JOINTS
OPSD 3390.100	DECK DRIP CHANNEL
OPSD 3419.100	BARRIERS AND RAILINGS - STEEL GUIDE RAIL AND CHANNEL ANCHORAGE
OPSD 3941.200	FIGURES IN CONCRETE SITE NUMBER AND DATE LAYOUT

LIST OF DRAWINGS:

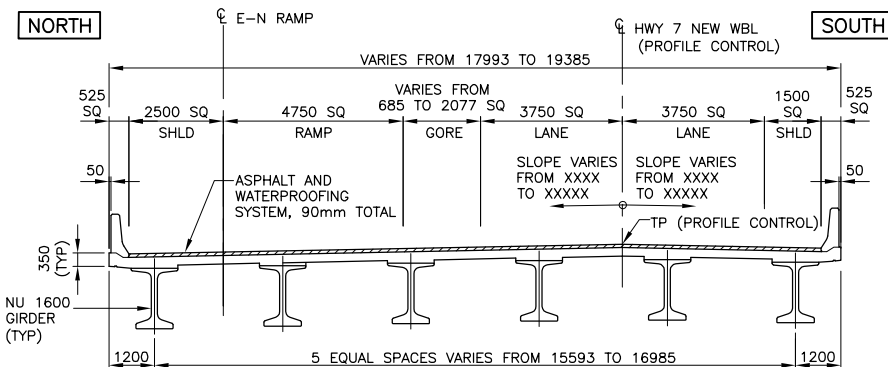
P1 GENERAL ARRANGEMENT

LEGEND:

FIX	FIXED
LC	LATERAL CLEARANCE
PVI	POINT OF VERTICAL INTERSECTION



1 (ALTERNATIVE 1)
1:100

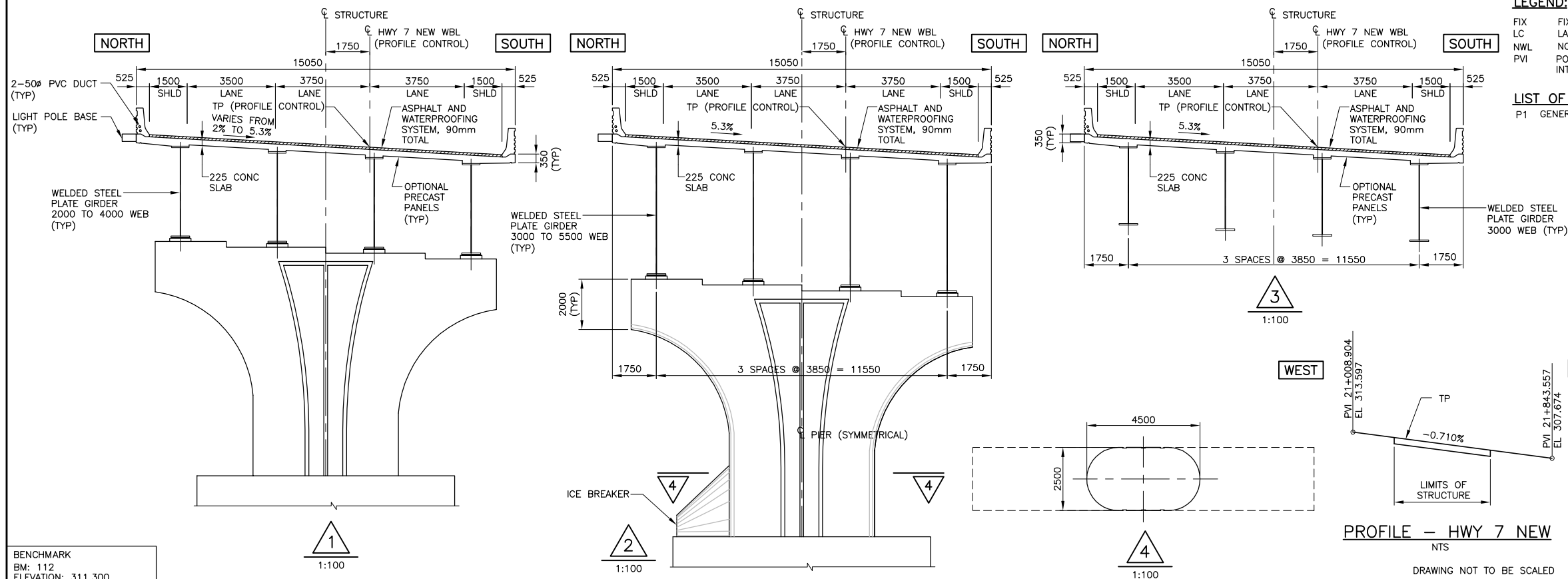
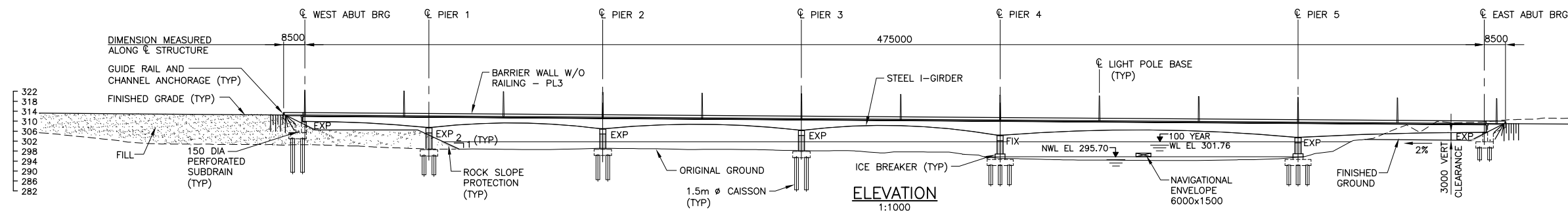
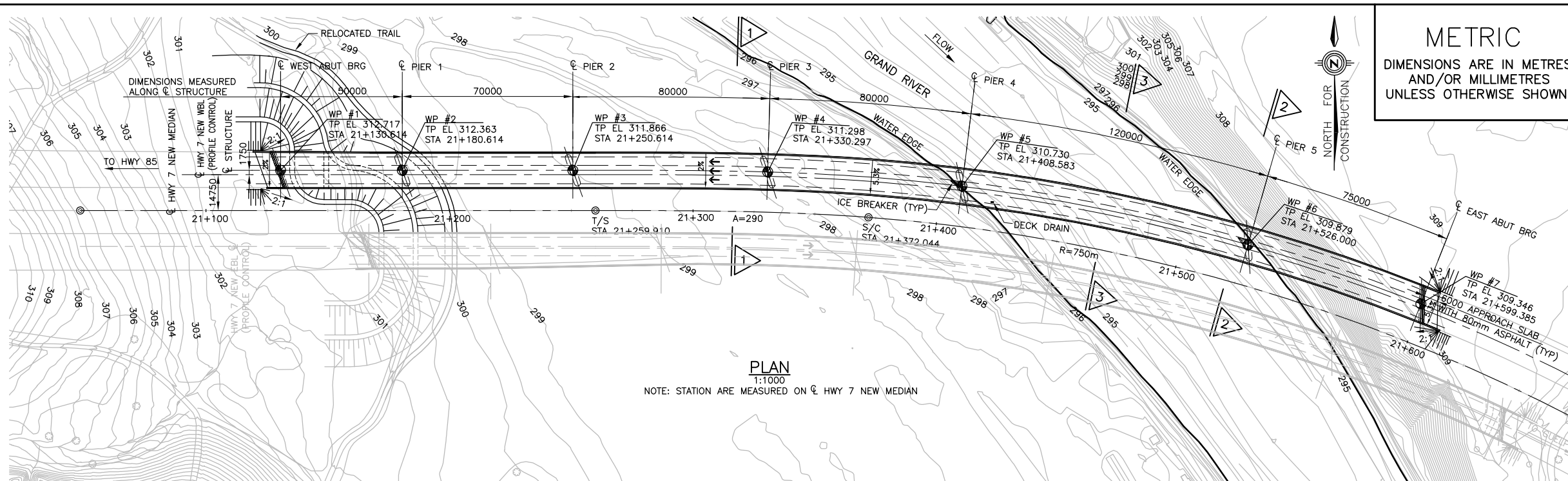


1 (ALTERNATIVE 2)
1:100

BENCHMARK
BM: 111
ELEVATION: 328.367
HCP 111
19mm x 2.0m ROUND BAR

DRAWING NOT TO BE SCALED
100 mm ON ORIGINAL DRAWING

REVISIONS	DATE	BY	DESCRIPTION
DESIGN	M.W.I.	CHK A.H.	CODE CHBDC 2006[LOAD CL-625-0M]
DRAWN	P.T.	CHK M.W.I.	SITE 33-509/2]STRUCT . [SCHEME . [DWG P1



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

HWY 7 NEW
CONT No .
WP No .

GRAND RIVER BRIDGE
WBL
GENERAL ARRANGEMENT
ALTERNATIVE 1



GENERAL NOTES

1. **CLASS OF CONCRETE**

DECK AND PIERS	50 MPa
REMAINDER	30 MPa
 2. **CLEAR COVER TO REINFORCING STEEL**

FOOTINGS	100 ± 25
DECK	TOP BOT
	70 ± 20 40 ± 10
REMAINDER	70 ± 20 UNLESS OTHERWISE NOTED
 3. **REINFORCING STEEL**

REINFORCING STEEL SHALL BE GRADE 400W UNLESS OTHERWISE SPECIFIED.

BAR MARKS WITH PREFIX 'C' DENOTE COATED BARS.

STAINLESS REINFORCING STEEL SHALL BE TYPE 316LN OR DUPLEX 2205 AND HAVE A MINIMUM YIELD STRENGTH OF 500 MPa, UNLESS OTHERWISE SPECIFIED.

BAR MARKS WITH PREFIX 'S' DENOTE STAINLESS STEEL BARS.

UNLESS SHOWN OTHERWISE, TENSION LAP SPLICES SHALL BE CLASS B.

BAR HOOKS SHALL HAVE STANDARD HOOK DIMENSIONS USING MINIMUM BEND DIAMETERS, WHILE STIRRUPS AND TIES SHALL HAVE MINIMUM HOOK DIMENSIONS, ALL HOOKS SHALL BE IN ACCORDANCE WITH THE STRUCTURAL STANDARD DRAWINGS SS12-1 AND SS12-2, UNLESS INDICATED OTHERWISE.
 4. **GLASS FIBRE REINFORCED POLYMER (GFRP)**

GFRP REINFORCING BARS SHALL BE GRADE I, GRADE II OR GRADE III AS SPECIFIED IN THE CONTRACT DOCUMENTS.

THE NOMINAL DIAMETER, TENSILE MODULUS OF ELASTICITY AND GUARANTEED MINIMUM TENSILE STRENGTH SHALL BE AS SPECIFIED IN THE CONTRACT DOCUMENTS.

BAR MARKS WITH THE PREFIX GI DENOTE GRADE I GFRP BARS,
BAR MARKS WITH THE PREFIX GII DENOTE GRADE II GFRP BARS,
AND BAR MARKS WITH THE PREFIX GIII DENOTE GRADE III GFRP BARS.
 5. **CONSTRUCTION NOTES**

THE CONTRACTOR SHALL ESTABLISH THE BEARING SEAT ELEVATIONS BY DEDUCTING THE ACTUAL BEARING THICKNESSES FROM THE TOP OF BEARING ELEVATIONS. IF THE ACTUAL BEARING THICKNESSES ARE DIFFERENT FROM THOSE GIVEN WITH THE BEARING DESIGNATION DATA, THE CONTRACTOR SHALL ADJUST THE REINFORCING STEEL TO SUIT.

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OPSD 911.381	GUIDE RAIL SYSTEM, CONCRETE BARRIER, PERMANENT TRANSITION INSTALLATION, CONCRETE BARRIER TO STRUCTURE WINGWALL
OPSD 912.430	GUIDE RAIL SYSTEM, STEEL BEAM STRUCTURAL CONNECTION
OPSD 3101.150	WALLS – ABUTMENT, BACKFILL MINIMUM GRANULAR REQUIREMENTS
OPSD 3102.100	WALLS ABUTMENT BACKFILL DRAIN
OPSD 3340.151	DECK DRAINS WITH LONGITUDINAL BAR OPENINGS
OPSD 3349.100	DECK DRAINS--DRAINAGE OF NEW DECK BELOW ASPHALT WEARING SURFACE
OPSD 3360.100	DECK LIGHT POLE BASES--STRUCTURE WITH BARRIER WALL
OPSD 3390.100	DECK DRIP CHANNEL
OPSD 3370.100	DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE WITH PROTECTION BOARD
OPSD 3370.101	DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE AT ACTIVE CRACKS GREATER THAN 2mm WIDE AND CONSTRUCTION JOINTS
OPSD 3419.100	BARRIERS AND RAILINGS – STEEL GUIDE RAIL AND CHANNEL ANCHORAGE
OPSD 3941.200	FIGURES IN CONCRETE SITE NUMBER AND DATE LAYOUT

[illegible]



HWY 7 NEW
CONT No .
WP No .

GRAND RIVER BRIDGE
EBL
GENERAL ARRANGEMENT
ALTERNATIVE 1

MMM GROUP

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

- ### GENERAL NOTES
- CLASS OF CONCRETE**

DECK AND PIERS	50 MPa
REMAINDER	30 MPa
 - CLEAR COVER TO REINFORCING STEEL**

FOOTINGS	100 ± 25
DECK TOP	70 ± 20
DECK BOT	40 ± 10
REMAINDER	70 ± 20 UNLESS OTHERWISE NOTED
 - REINFORCING STEEL**

REINFORCING STEEL SHALL BE GRADE 400W UNLESS OTHERWISE SPECIFIED.

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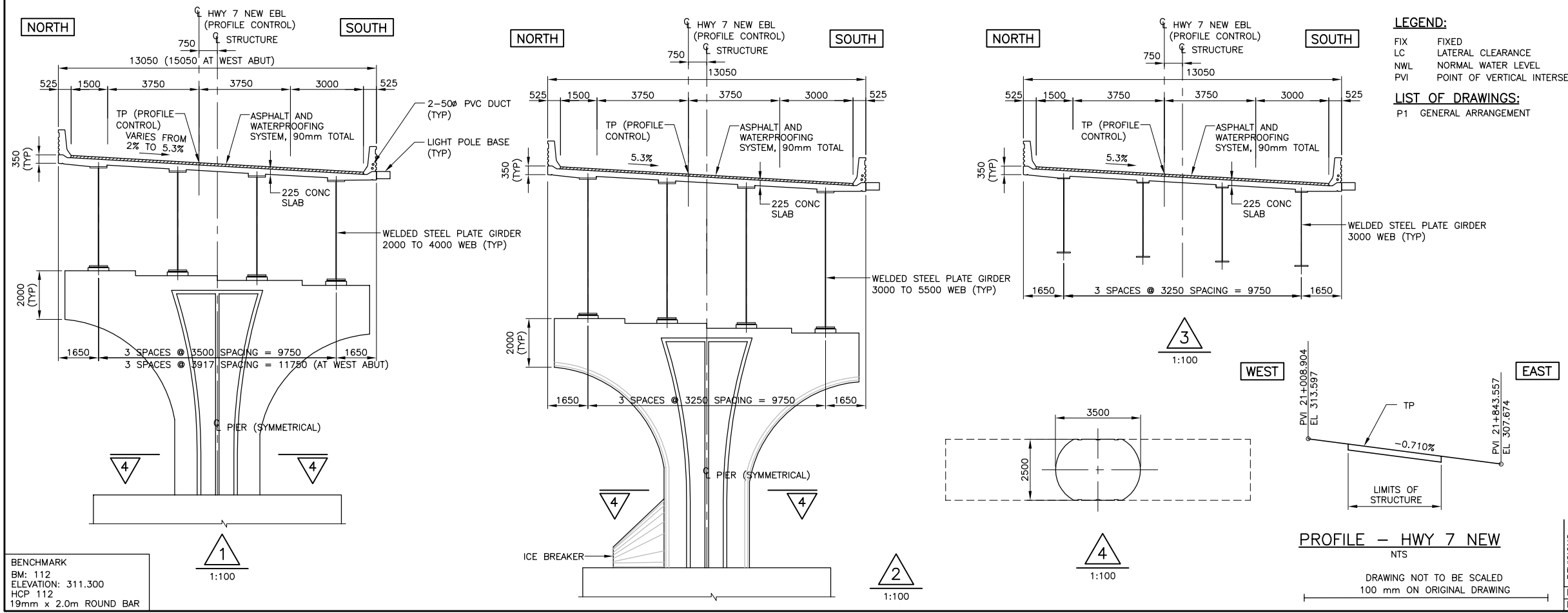
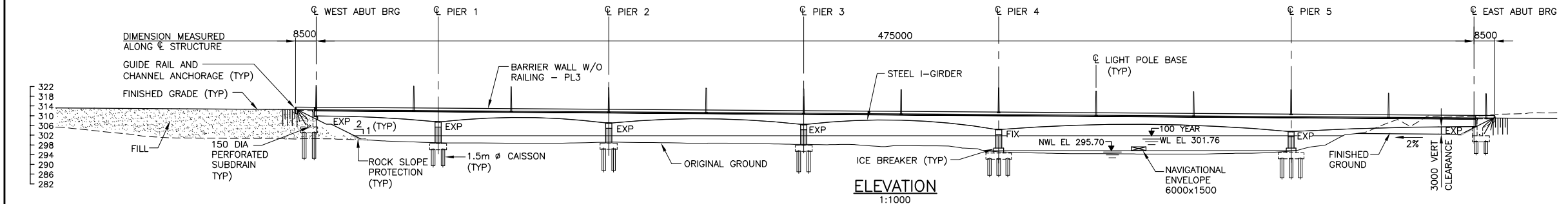
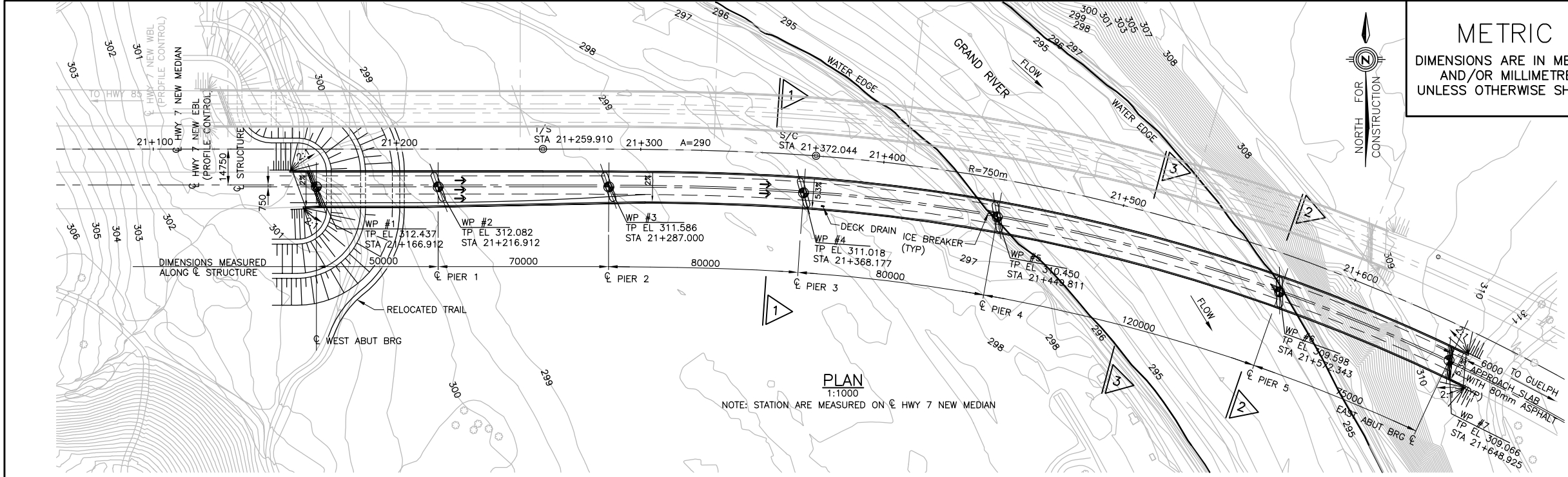
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 - CONSTRUCTION NOTES**

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OPSD 3340.151	DECK DRAINS WITH LONGITUDINAL BAR OPENINGS			
OPSD 3349.100	DECK DRAINS--DRAINAGE OF NEW DECK BELOW ASPHALT WEARING SURFACE			
OPSD 3360.100	DECK LIGHT POLE BASES--STRUCTURE WITH BARRIER WALL			
OPSD 3390.100	DECK DRIP CHANNEL			
OPSD 3370.100	DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE WITH PROTECTION BOARD			
OPSD 3370.101	DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE AT ACTIVE CRACKS GREATER THAN 2mm WIDE AND CONSTRUCTION JOINTS			
OPSD 3419.100	BARRIERS AND RAILINGS - STEEL GUIDE RAIL AND CHANNEL ANCHORAGE			
OPSD 3941.200	FIGURES IN CONCRETE SITE NUMBER AND DATE LAYOUT			
REVISIONS				
DATE	BY	DESCRIPTION		
DESIGN M.W.I.	CHK A.H.	CODE CHBDC 2006[LOAD CL-625-0M]	DATE JUL 2012	
DRAWN P.T.	CHK M.W.I.	SITE 33-510/1[STRUCT.]	SCHEME .	DWG P1

BENCHMARK
BM: 112
ELEVATION: 311.300
HCP 112
19mm x 2.0m ROUND BAR

PROFILE - HWY 7 NEW
NTS
DRAWING NOT TO BE SCALED
100 mm ON ORIGINAL DRAWING



16

HWY 7 NEW
CONT No .
WP No .

GRAND RIVER BRIDGE
EBL
GENERAL ARRANGEMENT
ALTERNATIVE 2



GENERAL NOTES

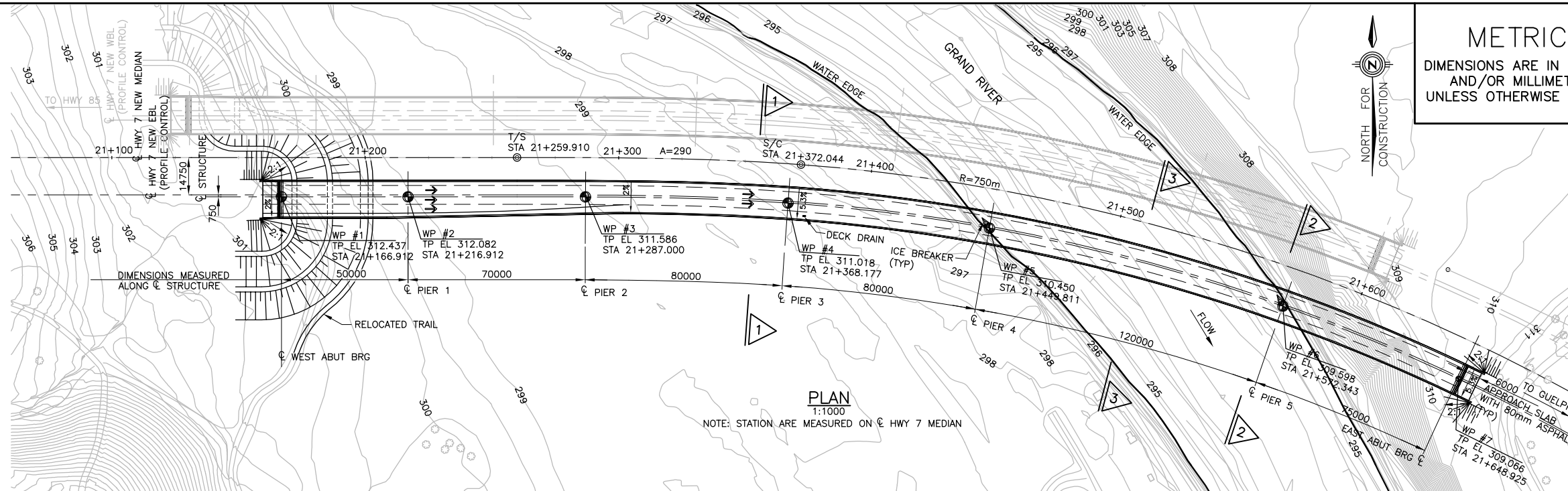
- CLASS OF CONCRETE**
SEGMENTAL BOX GIRDER, DECK AND PIERS 50 MPa
REMAINDER 30 MPa
- CLEAR COVER TO REINFORCING STEEL**
FOOTINGS 100 ± 25
DECK TOP SLAB, TOP 70 ± 20
BOT 40 ± 10
BOT SLAB, TOP 40 ± 10
BOT 50 ± 10
WEBS 60 ± 10
REMAINDER 70 ± 20 UNLESS OTHERWISE NOTED
- REINFORCING STEEL**
REINFORCING STEEL SHALL BE GRADE 400W UNLESS OTHERWISE SPECIFIED.
BAR MARKS WITH PREFIX 'C' DENOTE COATED BARS.
STAINLESS REINFORCING STEEL SHALL BE TYPE 316LN OR DUPLEX 2205 AND HAVE A MINIMUM YIELD STRENGTH OF 500 MPa, UNLESS OTHERWISE SPECIFIED.
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- CONSTRUCTION NOTES**
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OPSD 3102.100	WALLS ABUTMENT BACKFILL DRAIN
OPSD 3339.101	DECK, VOIDS-ACCESS HATCH FOR CONCRETE BRIDGES-INSTALLATION
OPSD 3340.151	DECK DRAINS WITH LONGITUDINAL BAR OPENINGS
OPSD 3349.100	DECK DRAINS-DRAINAGE OF NEW DECK BELOW ASPHALT WEARING SURFACE
OPSD 3360.100	DECK LIGHT POLE BASES-STRUCTURE WITH BARRIER WALL
OPSD 3390.100	DECK DRIP CHANNEL
OPSD 3370.100	DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE WITH PROTECTION BOARD
OPSD 3370.101	DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE AT ACTIVE CRACKS GREATER THAN 2mm WIDE AND CONSTRUCTION JOINTS
OPSD 3419.100	BARRIERS AND RAILINGS - STEEL GUIDE RAIL AND CHANNEL ANCHORAGE
OPSD 3941.200	FIGURES IN CONCRETE SITE NUMBER AND DATE LAYOUT

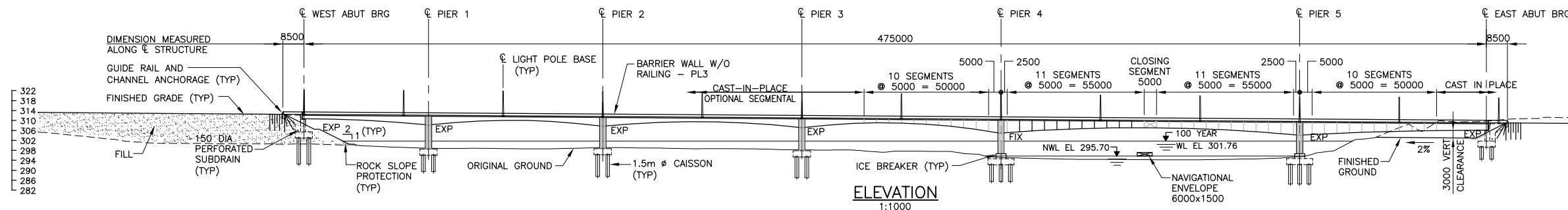
DATE	BY	DESCRIPTION
DESIGN M.W.I.	CHK A.H.	CODE CHBDC 2006[LOAD CL-625-0M]
DRAWN P.T.	CHK M.W.I.	SITE 33-510/1]STRUCT .
		SCHEME .
		DWG P1

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

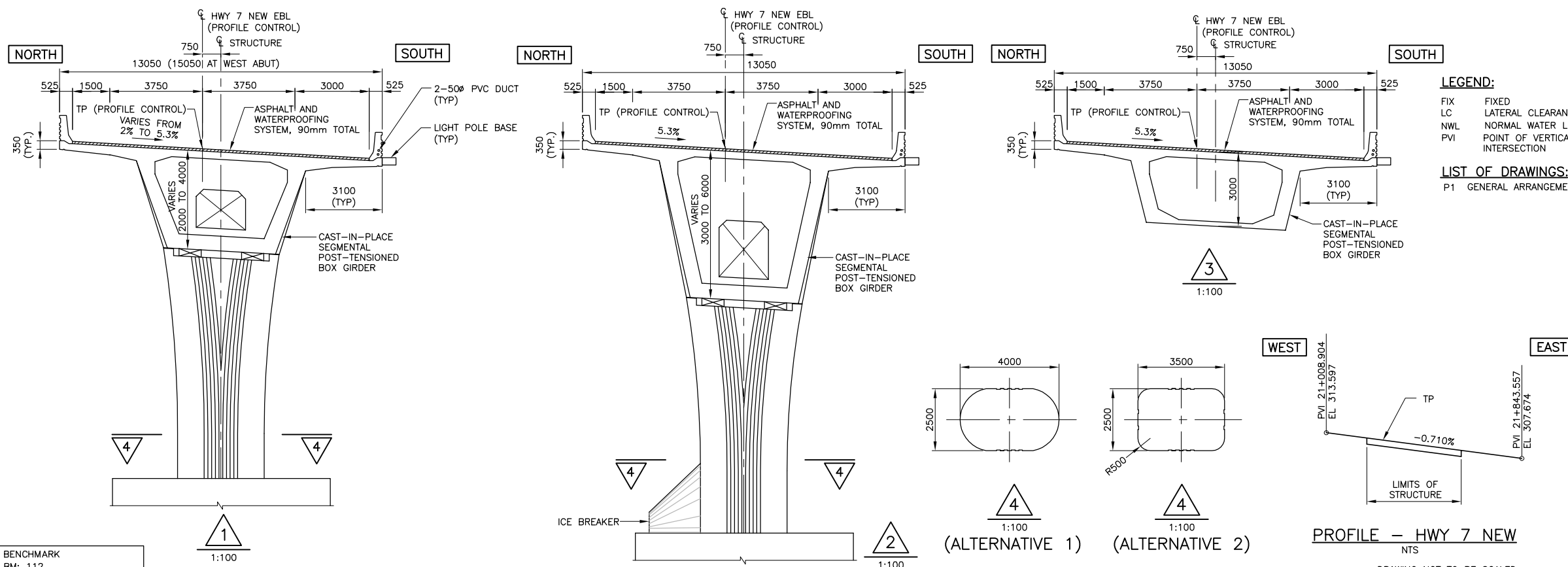


PLAN
1:1000

NOTE: STATION ARE MEASURED ON E HWY 7 MEDIAN



ELEVATION
1:1000



LEGEND:

FIX FIXED
LC LATERAL CLEARANCE
NWL NORMAL WATER LEVEL
PVI POINT OF VERTICAL INTERSECTION

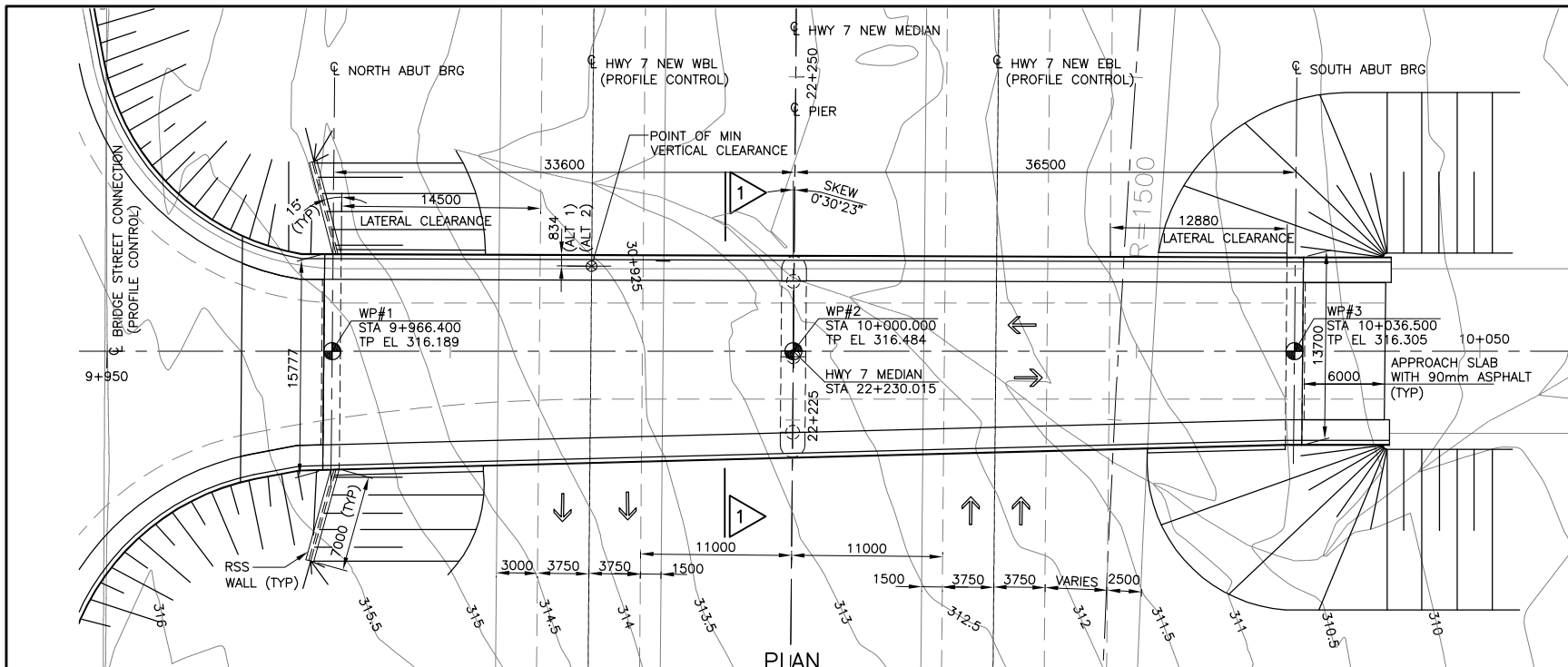
LIST OF DRAWINGS:

P1 GENERAL ARRANGEMENT

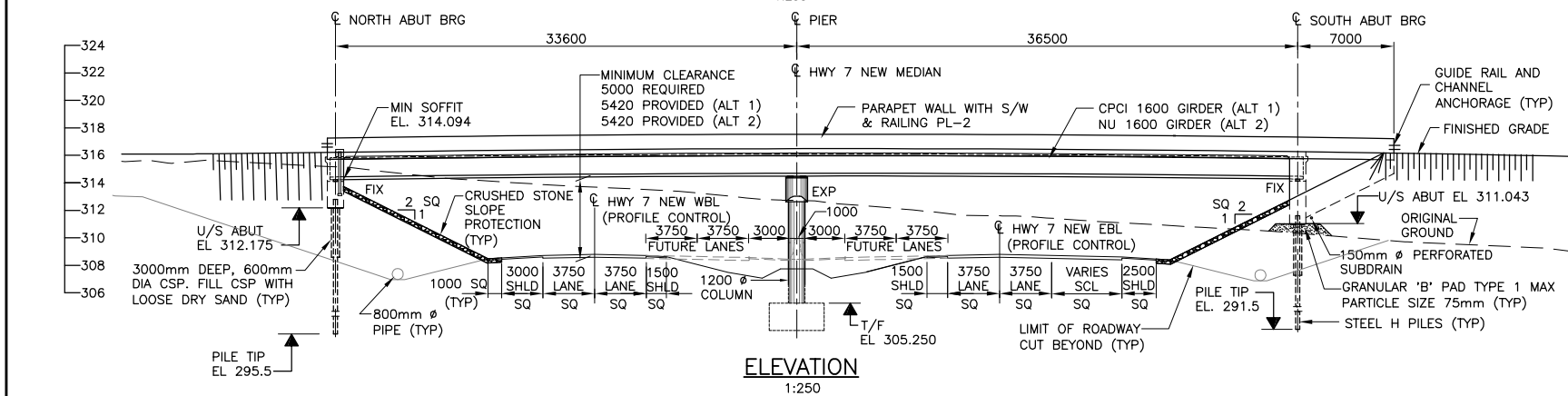
PROFILE - HWY 7 NEW
NTS

DRAWING NOT TO BE SCALED
100 mm ON ORIGINAL DRAWING

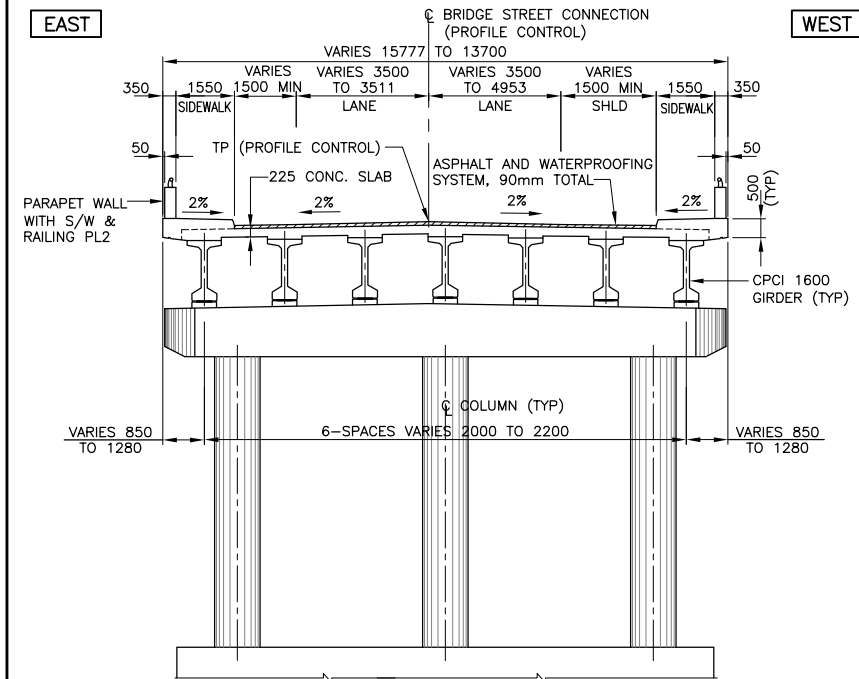
BENCHMARK
BM: 112
ELEVATION: 311.300
HCP 112
19mm x 2.0m ROUND BAR



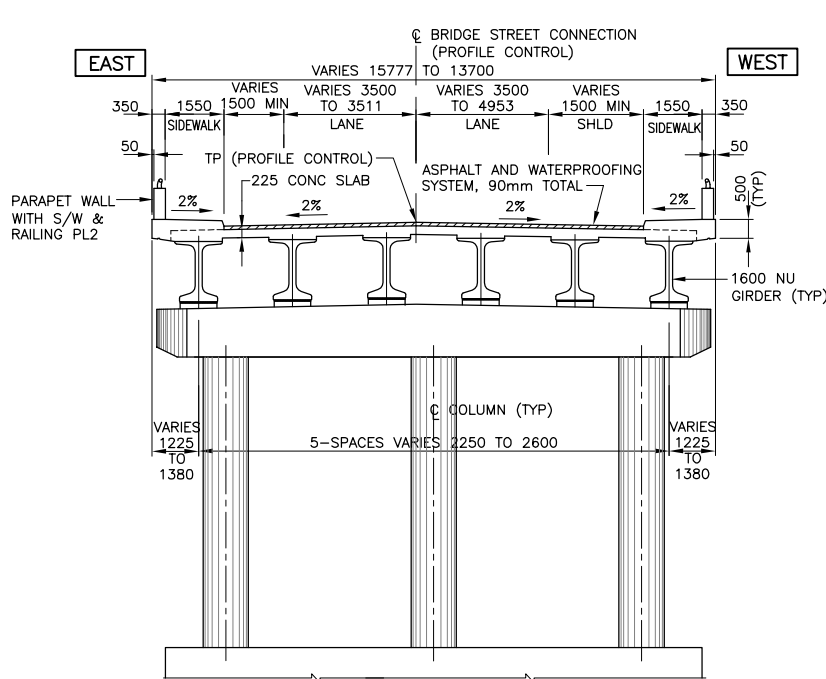
PLAN
1:250



ELEVATION
1:250



1 (ALTERNATIVE 1)
1:100



1 (ALTERNATIVE 2)
1:100

BENCHMARK
BM: 113
ELEVATION: 316.181
HCP 113
19mm x 2.0m ROUND BAR

LEGEND:
FIX FIXED
PVI POINT OF VERTICAL INTERSECTION
T/F TOP OF FOOTING
(TYP) TYPICAL

LIST OF DRAWINGS:
P1 GENERAL ARRANGEMENT

APPLICABLE STANDARD DRAWINGS:

OPSD 3101.150 WALLS - ABUTMENT, BACKFILL MINIMUM GRANULAR REQUIREMENTS
OPSD 3370.100 DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE WITH PROTECTION BOARD
OPSD 3370.101 DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE AT ACTIVE CRACKS GREATER THAN 2mm WIDE AND CONSTRUCTION JOINTS
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OPSD 3941.200 FIGURES IN CONCRETE SITE NUMBER AND DATE LAYOUT
OPSD 0912.430 GUIDE RAIL SYSTEM, STEEL BEAM STRUCTURAL CONNECTION
OPSD 3102.100 WALLS ABUTMENT BACKFILL DRAIN
OPSD 3390.100 DECK DRIP CHANNEL

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

HWY 7 NEW
CONT No .
WP No

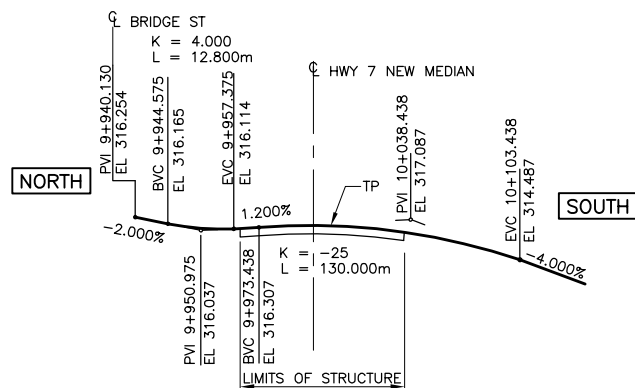
BRIDGE STREET CONNECTION
UNDERPASS
GENERAL ARRANGEMENT

17

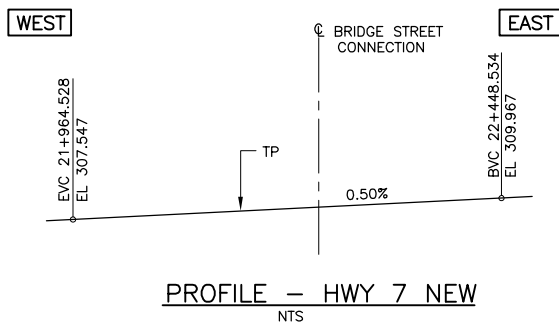
SHEET

GENERAL NOTES

- CLASS OF CONCRETE**
PRECAST PRESTRESSED BEAMS
CPCI 50 MPa
NU 70 MPa HPC
REMAINDER 30 MPa
- CLEAR COVER TO REINFORCING STEEL**
FOOTINGS 100 ± 25
DECK TOP 70 ± 20
BOT 40 ± 10
REMAINDER 70 ± 20 UNLESS OTHERWISE NOTED
- REINFORCING STEEL**
REINFORCING STEEL SHALL BE GRADE 400W UNLESS OTHERWISE SPECIFIED.
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- RETAINED SOIL SYSTEM**
RETAINED SOIL SYSTEM WALLS SHALL HAVE THE FOLLOWING ATTRIBUTES:
APPLICATION: FALSE ABUTMENTS/RETAINING WALLS
GEOMETRY: VERTICAL
PERFORMANCE: HIGH
APPEARANCE: HIGH
ALL PANELS SHALL HAVE ARCHITECTURAL FINISH TEXTURE.
- CONSTRUCTION NOTES**
BACKFILL SHALL NOT BE PLACED BEHIND THE ABUTMENTS UNTIL THE DECK SLAB IS IN PLACE AND HAS REACHED 25 MPa STRENGTH.
BACKFILL SHALL BE PLACED SIMULTANEOUSLY BEHIND BOTH ABUTMENTS KEEPING THE HEIGHT OF THE BACKFILL APPROXIMATELY THE SAME. AT NO TIME SHALL THE DIFFERENCE IN ELEVATION BE GREATER THAN 500mm.
CONSTRUCT ABUTMENTS AND WINGWALLS TO THE BEARING SEAT ELEVATIONS. THE CONTRACTOR SHALL SUPPLY TEMPORARY LATERAL BRACING FOR THE ABUTMENTS. FORMWORK AND LATERAL BRACING SHALL NOT BE REMOVED UNTIL THE CONCRETE IN DECK HAS REACHED 25 MPa STRENGTH.
THE CONTRACTOR SHALL ESTABLISH THE BEARING SEAT ELEVATIONS BY DEDUCTING THE ACTUAL BEARING THICKNESSES FROM THE TOP OF BEARING ELEVATIONS. IF THE ACTUAL BEARING THICKNESSES ARE DIFFERENT FROM THOSE GIVEN WITH THE BEARING DESIGNATION DATA, THE CONTRACTOR SHALL ADJUST THE REINFORCING STEEL TO SUIT.



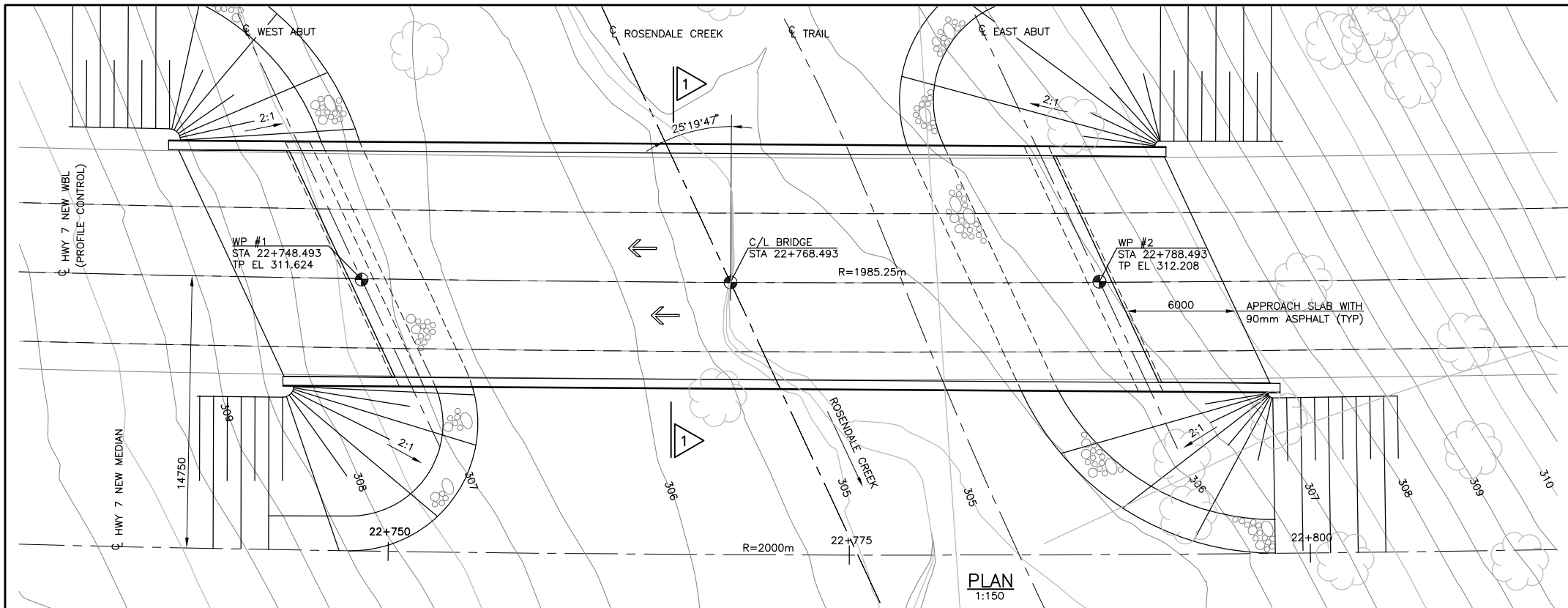
PROFILE - BRIDGE STREET CONNECTION
NTS



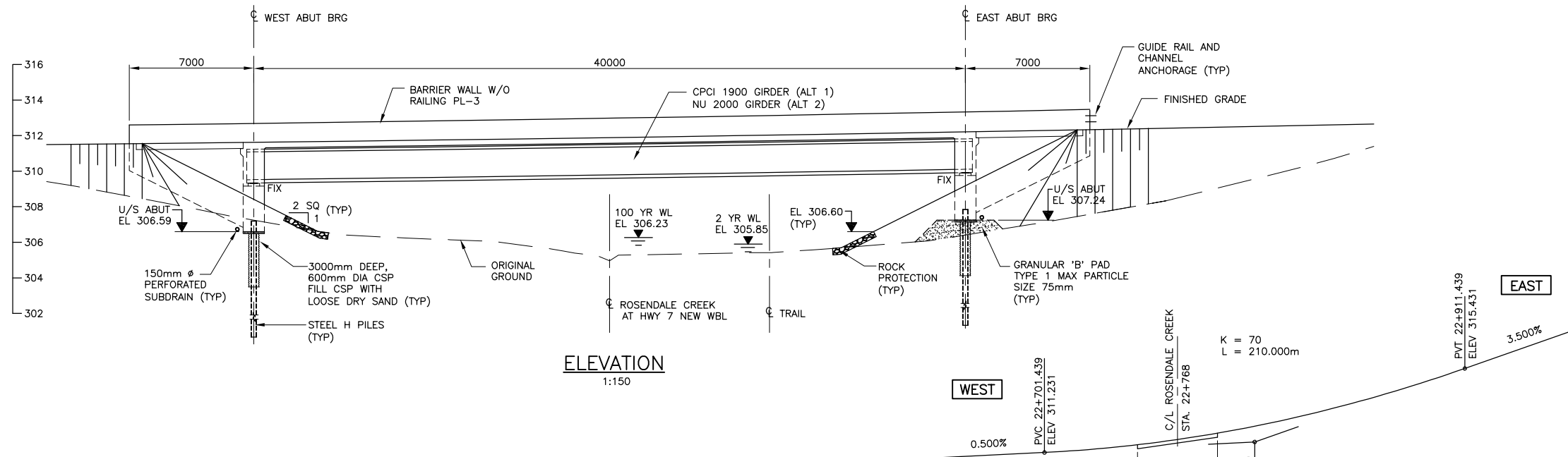
PROFILE - HWY 7 NEW
NTS

DRAWING NOT TO BE SCALED
100 mm ON ORIGINAL DRAWING

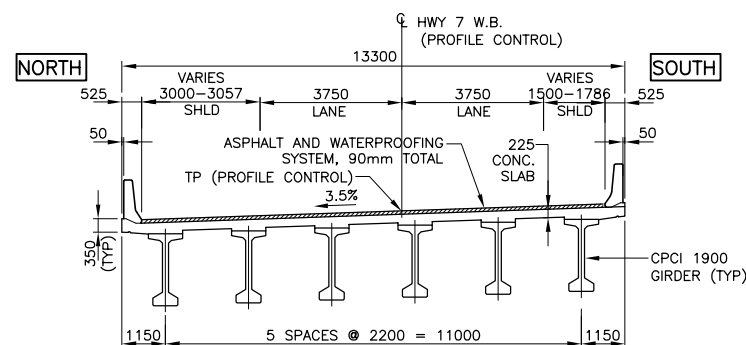
REVISIONS		DATE	BY	DESCRIPTION
DESIGN	M.Z.	CHK	A.H.	CODE CHBDC 2006[LOAD CL-625-0MT]DATE JUL 2012
DRAWN	D.S.	CHK	M.Z.	SITE 33-511[STRUCT .]SCHEME .DWG P1



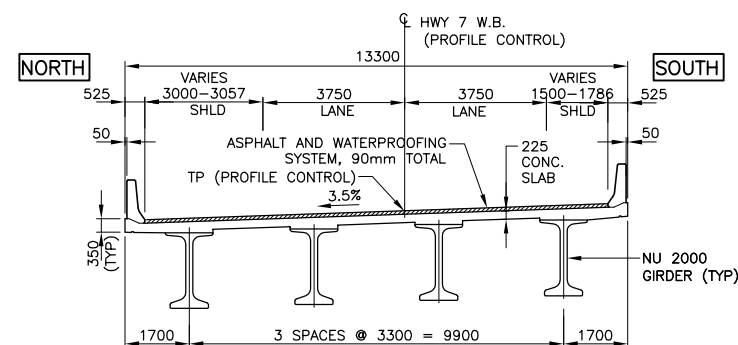
PLAN
1:150



ELEVATION
1:150



1 (ALTERNATIVE 1)
1:100



1 (ALTERNATIVE 2)
1:100

BENCHMARK
BM: 113
ELEVATION: 316.181
HCP 113
19mm x 2.0m ROUND BAR

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

HWY 7 NEW CONT No WP No	
ROSENDALE CREEK BRIDGE WBL GENERAL ARRANGEMENT	SHEET

18

GENERAL NOTES

- CLASS OF CONCRETE**

PRECAST PRESTRESSED BEAMS	
CPCI	50 MPa
NU	70 MPa HPC
REMAINDER	30 MPa
- CLEAR COVER TO REINFORCING STEEL**

DECK	TOP	70 ± 20
	BOT	40 ± 10
REMAINDER		70 ± 20 UNLESS OTHERWISE NOTED
- REINFORCING STEEL**

REINFORCING STEEL SHALL BE GRADE 400W UNLESS OTHERWISE SPECIFIED.

BAR MARKS WITH PREFIX 'C' DENOTE COATED BARS.

STAINLESS REINFORCING STEEL SHALL BE TYPE 316LN OR DUPLEX 2205 AND HAVE A MINIMUM YIELD STRENGTH OF 500 MPa, UNLESS OTHERWISE SPECIFIED.

BAR MARKS WITH PREFIX 'S' DENOTE STAINLESS STEEL BARS.

UNLESS SHOWN OTHERWISE, TENSION LAP SPLICES SHALL BE CLASS B.

BAR HOOKS SHALL HAVE STANDARD HOOK DIMENSIONS USING MINIMUM BEND DIAMETERS, WHILE STIRRUPS AND TIES SHALL HAVE MINIMUM HOOK DIMENSIONS, ALL HOOKS SHALL BE IN ACCORDANCE WITH THE STRUCTURAL STANDARD DRAWINGS SS12-1 AND SS12-2, UNLESS INDICATED OTHERWISE.
- GLASS FIBRE REINFORCED POLYMER (GFRP)**

GFRP REINFORCING BARS SHALL BE GRADE I, GRADE II OR GRADE III AS SPECIFIED IN THE CONTRACT DOCUMENTS.

THE NOMINAL DIAMETER, TENSILE MODULUS OF ELASTICITY AND GUARANTEED MINIMUM TENSILE STRENGTH SHALL BE AS SPECIFIED IN THE CONTRACT DOCUMENTS.

BAR MARKS WITH THE PREFIX GI DENOTE GRADE I GFRP BARS, BAR MARKS WITH THE PREFIX GII DENOTE GRADE II GFRP BARS, AND BAR MARKS WITH THE PREFIX GIII DENOTE GRADE III GFRP BARS.
- CONSTRUCTION NOTES**

BACKFILL SHALL NOT BE PLACED BEHIND THE ABUTMENTS UNTIL THE DECK SLAB IS IN PLACE AND HAS REACHED 25 MPa STRENGTH.

BACKFILL SHALL BE PLACED SIMULTANEOUSLY BEHIND BOTH ABUTMENTS KEEPING THE HEIGHT OF THE BACKFILL APPROXIMATELY THE SAME. AT NO TIME SHALL THE DIFFERENCE IN ELEVATION BE GRATER THAN 500mm.

CONSTRUCT ABUTMENTS AND WINGWALLS TO THE BEARING SEAT ELEVATIONS. THE CONTRACTOR SHALL SUPPLY TEMPORARY LATERAL BRACING FOR THE ABUTMENTS. FORMWORK AND LATERAL BRACING SHALL NOT BE REMOVED UNTIL THE CONCRETE IN DECK HAS REACHED 25 MPa STRENGTH.

THE CONTRACTOR SHALL ESTABLISH THE BEARING SEAT ELEVATIONS BY DEDUCTING THE ACTUAL BEARING THICKNESSES FROM THE TOP OF BEARING ELEVATIONS. IF THE ACTUAL BEARING THICKNESSES ARE DIFFERENT FROM THOSE GIVEN WITH THE BEARING DESIGNATION DATA, THE CONTRACTOR SHALL ADJUST THE REINFORCING STEEL TO SUIT.

LIST OF DRAWINGS:

P1 GENERAL ARRANGEMENT

LEGEND:

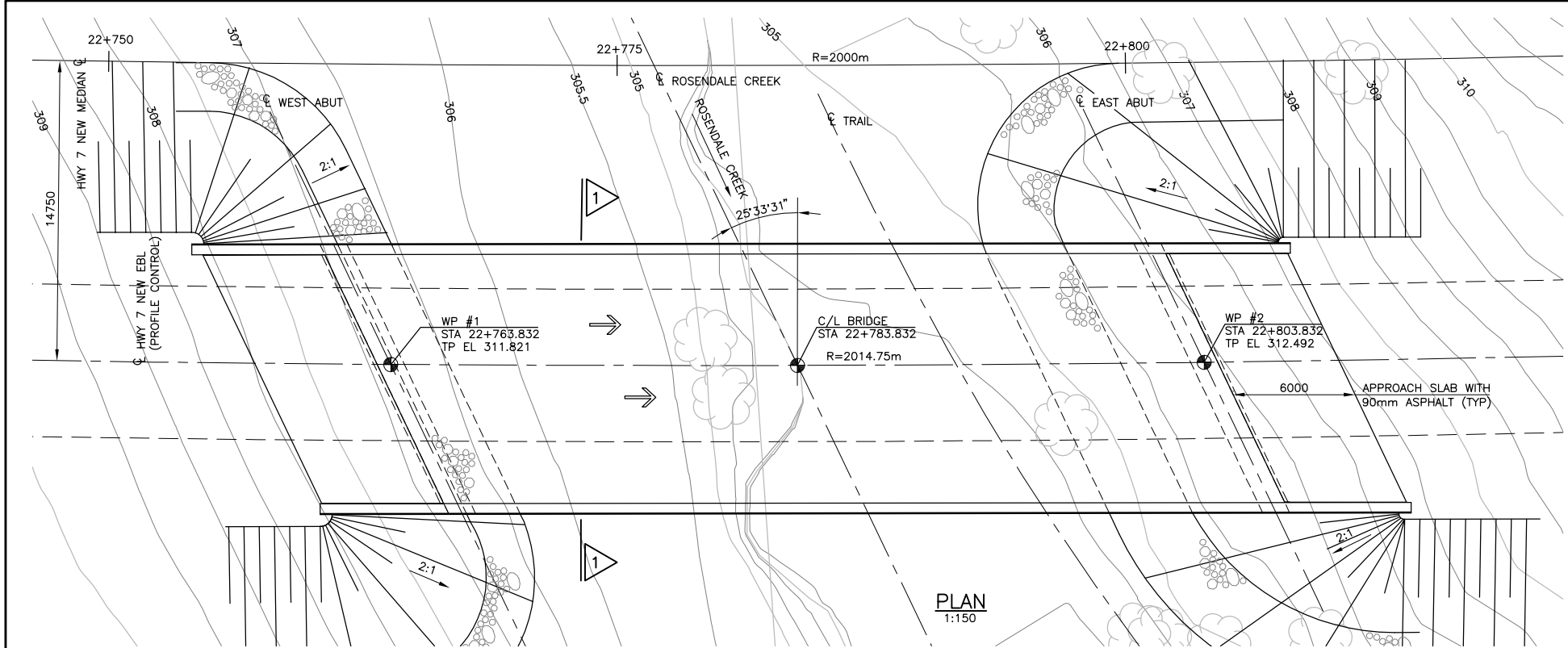
B/F BOTTOM OF FOOTING
VPI VERTICAL POINT OF INTERSECTION
YR YEAR

APPLICABLE STANDARD DRAWINGS:

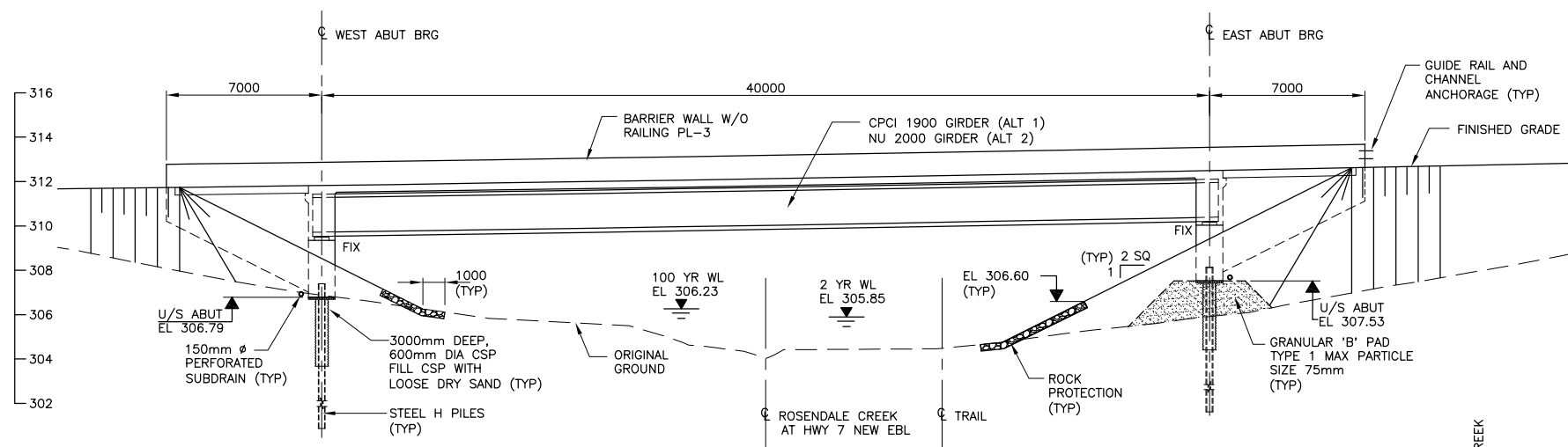
OPSD 3101.150	WALL - ABUTMENT, BACKFILL MINIMUM GRANULAR REQUIREMENTS
OPSD 3370.100	DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE WITH PROTECTION BOARD
OPSD 3370.101	DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE AT ACTIVE CRACKS GREATER THAN 2mm WIDE AND CONSTRUCTION JOINTS
OPSD 3419.100	BARRIERS AND RAILINGS - STEEL GUIDE RAIL AND CHANNEL ANCHORAGE
OPSD 3941.200	FIGURES IN CONCRETE SITE NUMBER AND DATE LAYOUT

DRAWING NOT TO BE SCALED
100 mm ON ORIGINAL DRAWING

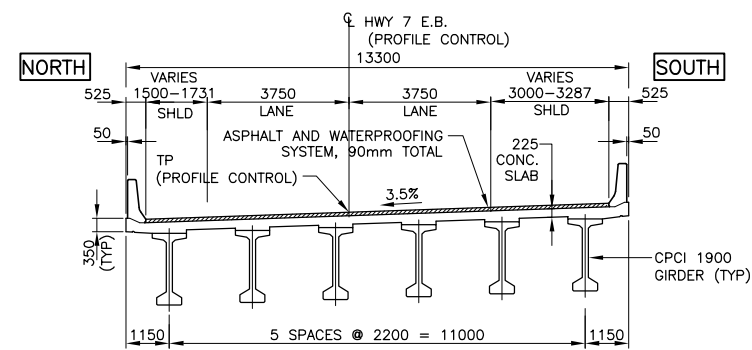
REVISIONS	DATE	BY	DESCRIPTION
DESIGN	M.Z.	CHK A.H.	CODE CHBDC 2006[LOAD CL-625-0M]
DRAWN	D.S.	CHK M.Z.	SITE 33-512/C/STRUCT .
			SCHEME .
			DWG P1



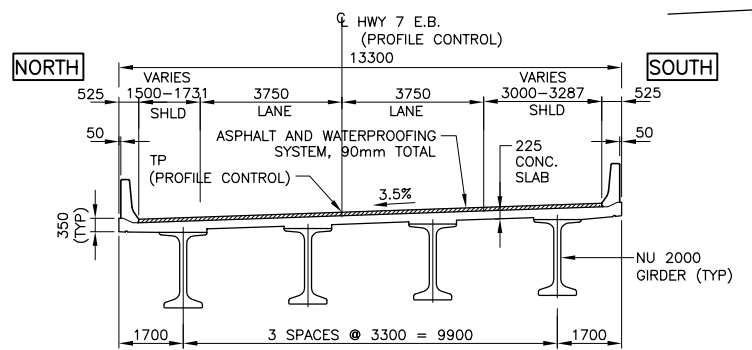
PLAN
1:150



ELEVATION
1:150



1 (ALTERNATIVE 1)
1:100



1 (ALTERNATIVE 2)
1:100

BENCHMARK
BM: 113
ELEVATION: 316.181
HCP 113
19mm x 2.0m ROUND BAR

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

HWY 7 NEW
CONT No
WP No

ROSENDALE CREEK BRIDGE
EBL
GENERAL ARRANGEMENT

MMM GROUP



SHEET

- LEGEND:**
- B/F BOTTOM OF FOOTING
VPI VERTICAL POINT OF INTERSECTION
YR YEAR
- APPLICABLE STANDARD DRAWINGS:**
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- OPSD 3419.100 BARRIERS AND RAILINGS - STEEL GUIDE RAIL AND CHANNEL ANCHORAGE
- OPSD 3941.200 FIGURES IN CONCRETE SITE NUMBER AND DATE LAYOUT

GENERAL NOTES

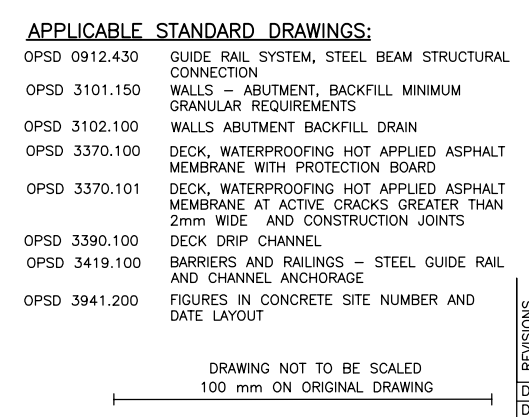
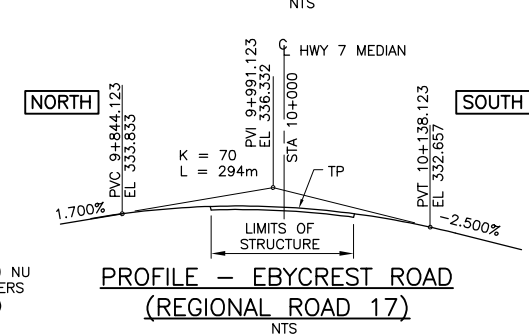
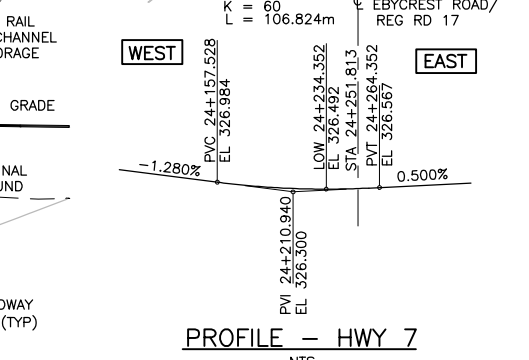
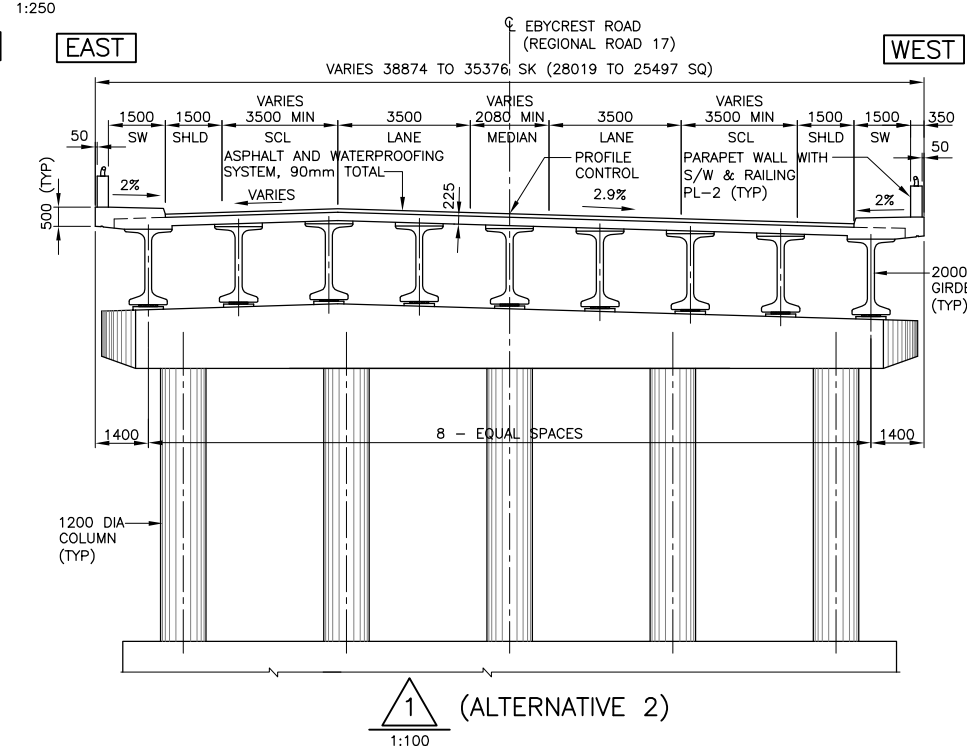
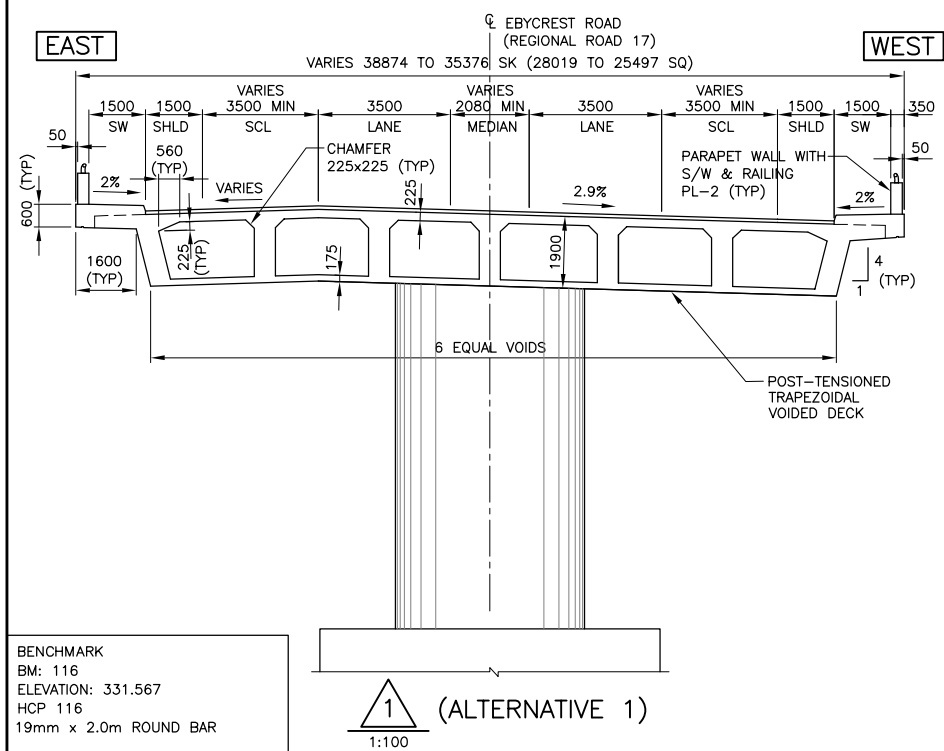
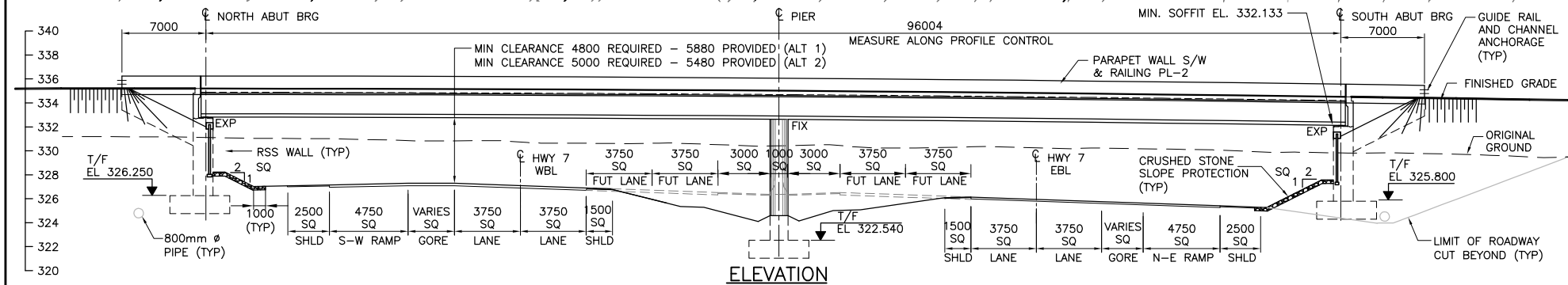
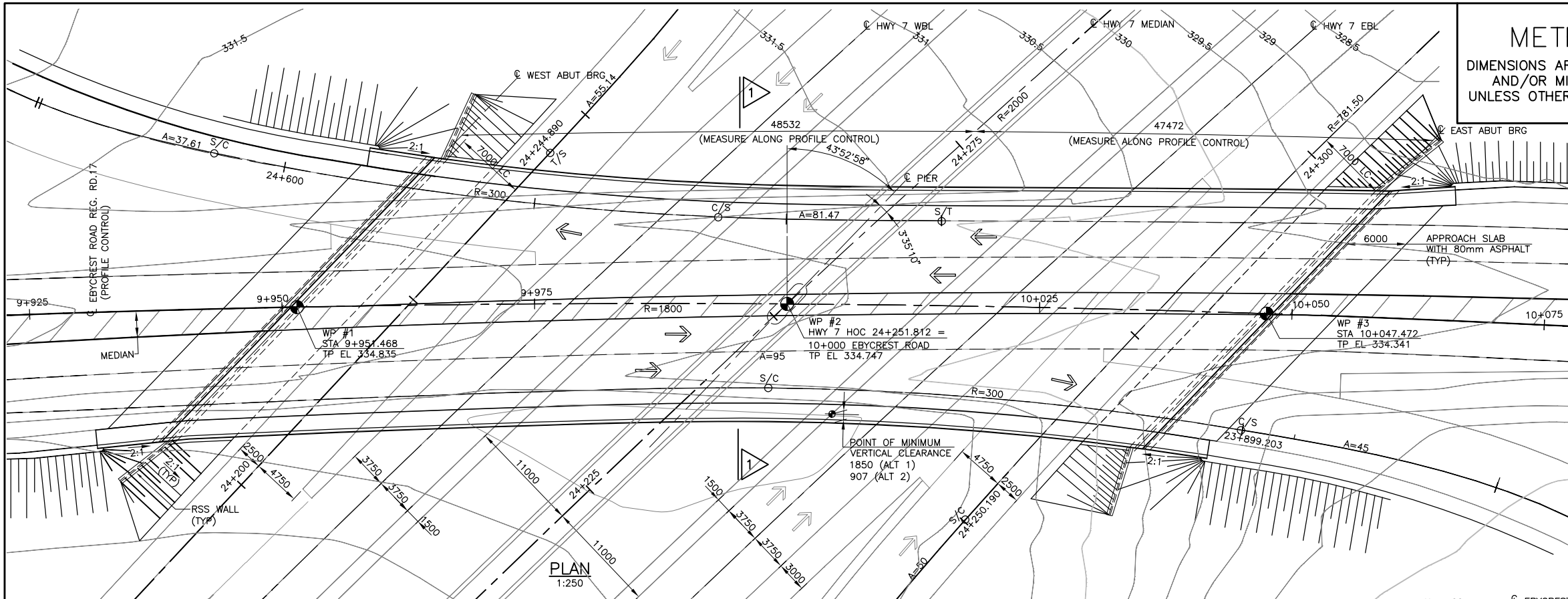
- CLASS OF CONCRETE**
PRECAST PRESTRESSED BEAMS
CPCI 50 MPa
NU 70 MPa HPC
REMAINDER 30 MPa
- CLEAR COVER TO REINFORCING STEEL**
DECK TOP 70 ± 20
BOT 40 ± 10
REMAINDER 70 ± 20 UNLESS OTHERWISE NOTED
- REINFORCING STEEL**
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BACKFILL SHALL BE PLACED SIMULTANEOUSLY BEHIND BOTH ABUTMENTS KEEPING THE HEIGHT OF THE BACKFILL APPROXIMATELY THE SAME. AT NO TIME SHALL THE DIFFERENCE IN ELEVATION BE GRATER THAN 500mm.
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LIST OF DRAWINGS:
P1 GENERAL ARRANGEMENT

PROFILE HWY 7 NEW
NTS

DRAWING NOT TO BE SCALED
100 mm ON ORIGINAL DRAWING

REVISIONS	DATE		BY		DESCRIPTION	
	DATE	BY	CHK	APP	DESCRIPTION	
DESIGN	M.Z.	CHK	A.H.	CODE CHBDC 2006	LOAD CL-625-0MT	DATE JUL 2012
DRAWN	D.S.	CHK	M.Z.	SITE 33-512/C	STRUCT .	SCHEME . DWG P1



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

HWY 7 NEW
CONT No
WP No

EBYCREST ROAD
(R.R. 17) UNDERPASS
GENERAL ARRANGEMENT

MMM GROUP



20

SHEET

GENERAL NOTES

- CLASS OF CONCRETE**

DECK	30 MPa
POST-TENSIONED DECK AND PIERS	35 MPa
PRECAST PRESTRESSED BEAMS	
NU	70 MPa HPC
REMAINDER	30 MPa
- CLEAR COVER TO REINFORCING STEEL**

FOOTINGS	100 ± 25
DECK	
TOP SLAB, TOP	70 ± 20
BOT	40 ± 10
BOT SLAB, TOP	40 ± 10
BOT	50 ± 10
WEBS	60 ± 10
REMAINDER	70 ± 20 UNLESS OTHERWISE NOTED
- REINFORCING STEEL**

REINFORCING STEEL SHALL BE GRADE 400W UNLESS OTHERWISE SPECIFIED.

BAR MARKS WITH PREFIX 'C' DENOTE COATED BARS.

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BAR MARKS WITH THE PREFIX GI DENOTE GRADE I GFRP BARS, BAR MARKS WITH THE PREFIX GII DENOTE GRADE II GFRP BARS, AND BAR MARKS WITH THE PREFIX GIII DENOTE GRADE III GFRP BARS.
- RETAINED SOIL SYSTEM**

RETAINED SOIL SYSTEM WALLS SHALL HAVE THE FOLLOWING ATTRIBUTES:

APPLICATION:	FALSE ABUTMENTS/RETAINING WALLS
GEOMETRY:	VERTICAL
PERFORMANCE:	HIGH
APPEARANCE:	HIGH

ALL PANELS SHALL HAVE ARCHITECTURAL FINISH TEXTURE.
- CONSTRUCTION NOTES**

THE CONTRACTOR SHALL ESTABLISH THE BEARING SEAT ELEVATIONS BY DEDUCTING THE ACTUAL BEARING THICKNESSES FROM THE TOP OF BEARING ELEVATIONS. IF THE ACTUAL BEARING THICKNESSES ARE DIFFERENT FROM THOSE GIVEN WITH THE BEARING DESIGNATION DATA, THE CONTRACTOR SHALL ADJUST THE REINFORCING STEEL TO SUIT.

LEGEND:

FIX	FIXED
PVI	POINT OF VERTICAL INTERSECTION
T/F	TOP OF FOOTING

LIST OF DRAWINGS:

P1 GENERAL ARRANGEMENT

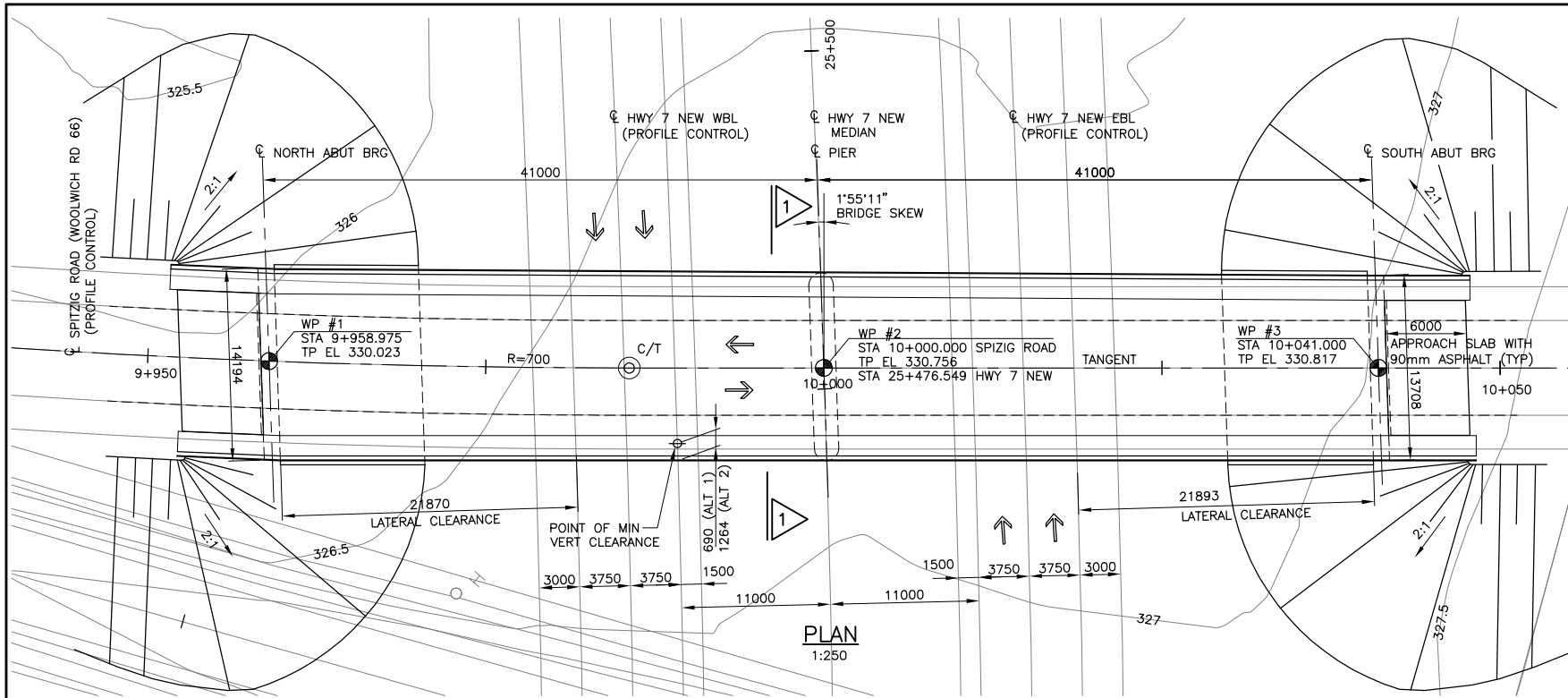
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DRAWN	R.S.	CHK M.Z.	SITE 33-514[STRUCT .]
			SCHEME .
			DWG P1

BENCHMARK
BM: 116
ELEVATION: 331.567
HCP 116
19mm x 2.0m ROUND BAR

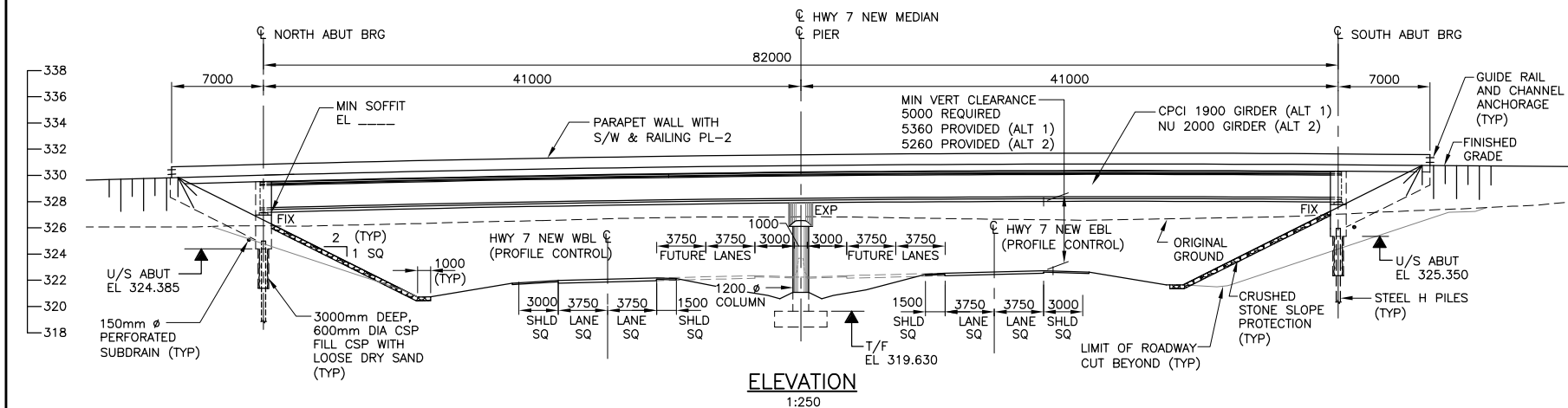
1 (ALTERNATIVE 1)
1:100

1 (ALTERNATIVE 2)
1:100

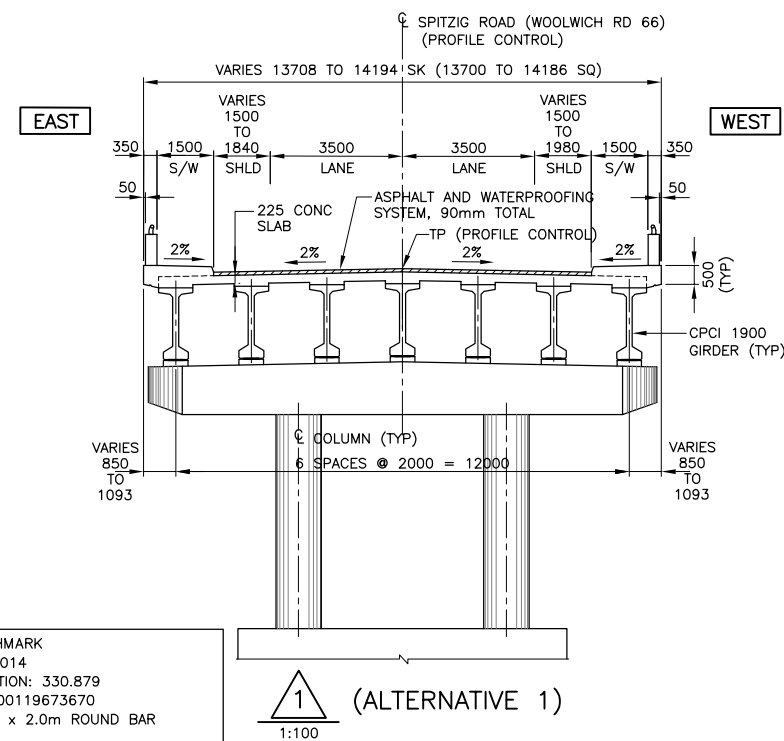
DRAWING NOT TO BE SCALED
100 mm ON ORIGINAL DRAWING



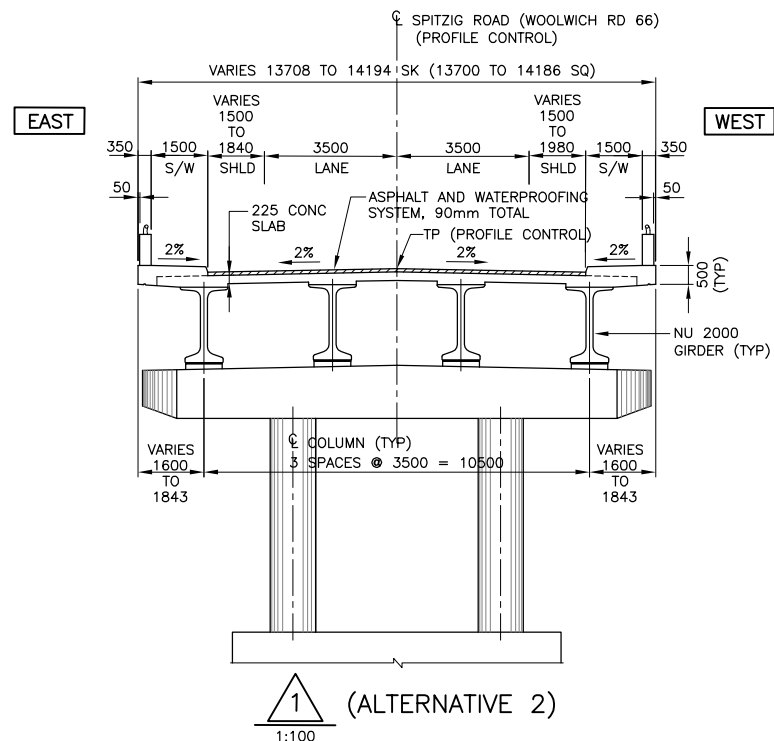
PLAN
1:250



ELEVATION
1:250





(ALTERNATIVE 1)



(ALTERNATIVE 2)

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

HWY 7 NEW CONT No WP No	
SPITZIG ROAD (WOOLWICH ROAD 66) UNDERPASS GENERAL ARRANGEMENT	SHEET
	

21

GENERAL NOTES

- CLASS OF CONCRETE**

PRECAST PRESTRESSED BEAMS	50 MPa
CPCI	70 MPa HPC
NU	
REMAINDER	30 MPa
- CLEAR COVER TO REINFORCING STEEL**

DECK	TOP	70 ± 20
	BOT	40 ± 10
REMAINDER		70 ± 20 UNLESS OTHERWISE NOTED
- REINFORCING STEEL**

REINFORCING STEEL SHALL BE GRADE 400W UNLESS OTHERWISE SPECIFIED.

BAR MARKS WITH PREFIX 'C' DENOTE COATED BARS.

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BAR MARKS WITH PREFIX 'S' DENOTE STAINLESS STEEL BARS.

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BAR HOOKS SHALL HAVE STANDARD HOOK DIMENSIONS USING MINIMUM BEND DIAMETERS, WHILE STIRRUPS AND TIES SHALL HAVE MINIMUM HOOK DIMENSIONS, ALL HOOKS SHALL BE IN ACCORDANCE WITH THE STRUCTURAL STANDARD DRAWINGS SS12-1 AND SS12-2, UNLESS INDICATED OTHERWISE.
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GFRP REINFORCING BARS SHALL BE GRADE I, GRADE II OR GRADE III AS SPECIFIED IN THE CONTRACT DOCUMENTS.

THE NOMINAL DIAMETER, TENSILE MODULUS OF ELASTICITY AND GUARANTEED MINIMUM TENSILE STRENGTH SHALL BE AS SPECIFIED IN THE CONTRACT DOCUMENTS.

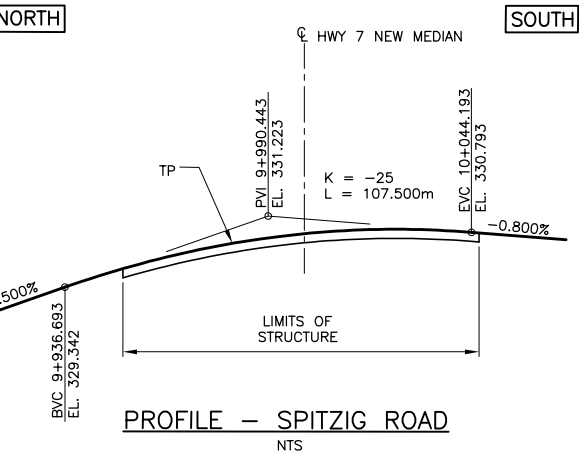
BAR MARKS WITH THE PREFIX GI DENOTE GRADE I GFRP BARS, BAR MARKS WITH THE PREFIX GII DENOTE GRADE II GFRP BARS, AND BAR MARKS WITH THE PREFIX GIII DENOTE GRADE III GFRP BARS.
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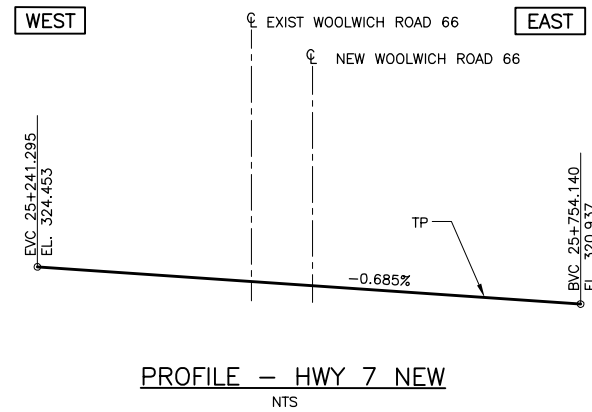
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PROFILE - SPITZIG ROAD
NTS



PROFILE - HWY 7 NEW
NTS

APPLICABLE STANDARD DRAWINGS:

OPSD 3101.150	FIGURES IN CONCRETE SITE NUMBER AND DATE LAYOUT
OPSD 3370.100	DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE WITH PROTECTION BOARD
OPSD 3370.101	DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE AT ACTIVE CRACKS GREATER THAN 2mm WIDE AND CONSTRUCTION JOINTS
OPSD 3419.100	BARRIERS AND RAILINGS - STEEL GUIDE RAIL AND CHANNEL ANCHORAGE
OPSD 3941.200	WALLS - ABUTMENT, BACKFILL MINIMUM GRANULAR REQUIREMENTS
OPSD 0912.430	GUIDE RAIL SYSTEM, STEEL BEAM STRUCTURAL CONNECTION
OPSD 3102.100	WALLS ABUTMENT BACKFILL DRAIN
OPSD 3390.100	DECK DRIP CHANNEL

LEGEND:

FIX	FIXED
PVI	POINT OF VERTICAL INTERSECTION
T/F	TOP OF FOOTING

BENCHMARK
BM: 1014
ELEVATION: 330.879
HCM 00119673670
19mm x 2.0m ROUND BAR



(ALTERNATIVE 1)



(ALTERNATIVE 2)

DRAWING NOT TO BE SCALED
100 mm ON ORIGINAL DRAWING

REVISIONS	DATE	BY	DESCRIPTION
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METRIC
DIMENSIONS ARE IN METRES
AND/OR MILLIMETRES
UNLESS OTHERWISE SHOWN

HWY 7 NEW
CONT No
WP No



22

HOPEWELL CREEK BRIDGE
WBL
GENERAL ARRANGEMENT

SHEET



GENERAL NOTES

- CLASS OF CONCRETE**
PRECAST PRESTRESSED BEAMS
CPCI 50 MPa
NU 70 MPa HPC
REMAINDER 30 MPa
- CLEAR COVER TO REINFORCING STEEL**
DECK TOP 70 ± 20
BOT 40 ± 10
REMAINDER 70 ± 20 UNLESS OTHERWISE NOTED
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BAR MARKS WITH THE PREFIX GI DENOTE GRADE I GFRP BARS, BAR MARKS WITH THE PREFIX GII DENOTE GRADE II GFRP BARS, AND BAR MARKS WITH THE PREFIX GIII DENOTE GRADE III GFRP BARS.
- CONSTRUCTION NOTES**
BACKFILL SHALL NOT BE PLACED BEHIND THE ABUTMENTS UNTIL THE DECK SLAB IS IN PLACE AND HAS REACHED 25 MPa STRENGTH.
BACKFILL SHALL BE PLACED SIMULTANEOUSLY BEHIND BOTH ABUTMENTS KEEPING THE HEIGHT OF THE BACKFILL APPROXIMATELY THE SAME. AT NO TIME SHALL THE DIFFERENCE IN ELEVATION BE GRATER THAN 500mm.
CONSTRUCT ABUTMENTS AND WINGWALLS TO THE BEARING SEAT ELEVATIONS. THE CONTRACTOR SHALL SUPPLY TEMPORARY LATERAL BRACING FOR THE ABUTMENTS. FORMWORK AND LATERAL BRACING SHALL NOT BE REMOVED UNTIL THE CONCRETE IN DECK HAS REACHED 25 MPa STRENGTH.
THE CONTRACTOR SHALL ESTABLISH THE BEARING SEAT ELEVATIONS BY DEDUCTING THE ACTUAL BEARING THICKNESSES FROM THE TOP OF BEARING ELEVATIONS. IF THE ACTUAL BEARING THICKNESSES ARE DIFFERENT FROM THOSE GIVEN WITH THE BEARING DESIGNATION DATA, THE CONTRACTOR SHALL ADJUST THE REINFORCING STEEL TO SUIT.

LIST OF DRAWINGS:

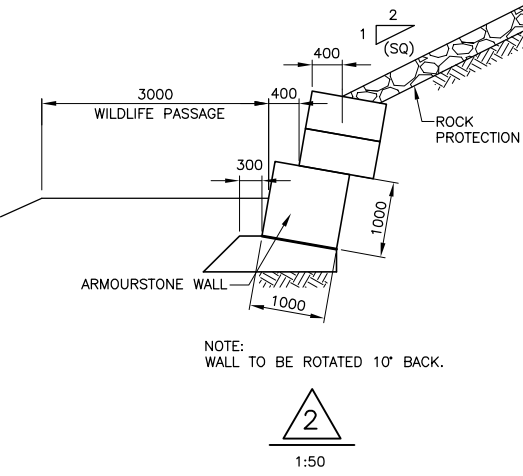
P1 GENERAL ARRANGEMENT

LEGEND:

FIX FIXED
PVI POINT OF VERTICAL INTERSECTION

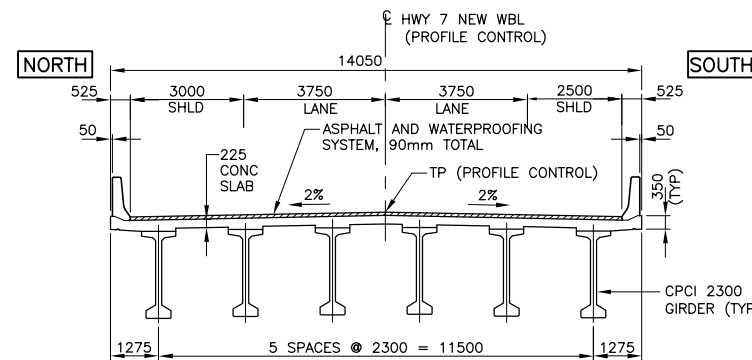
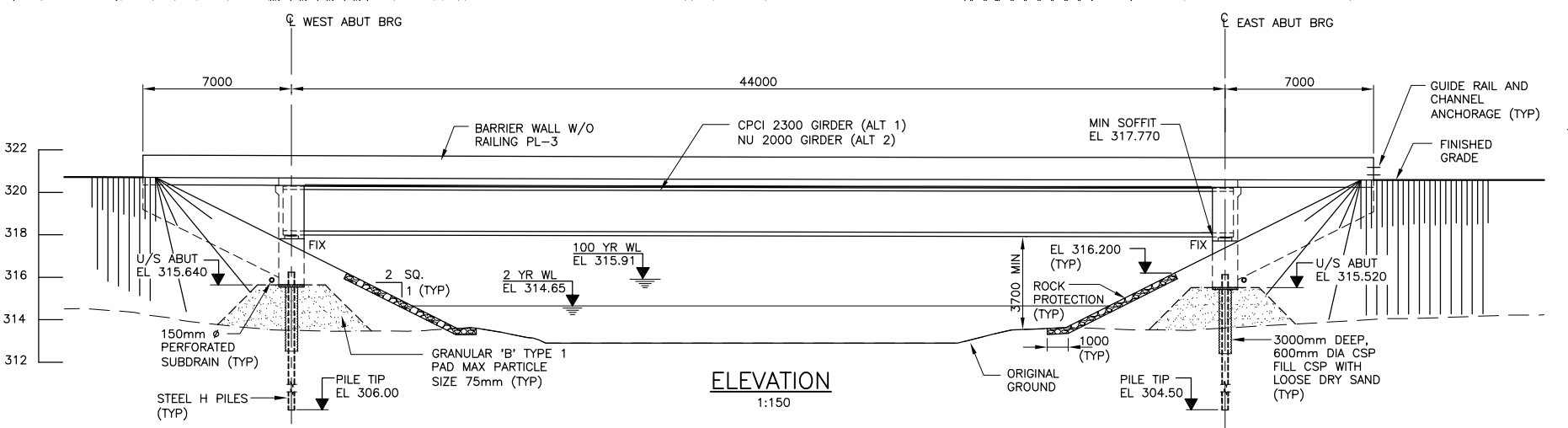
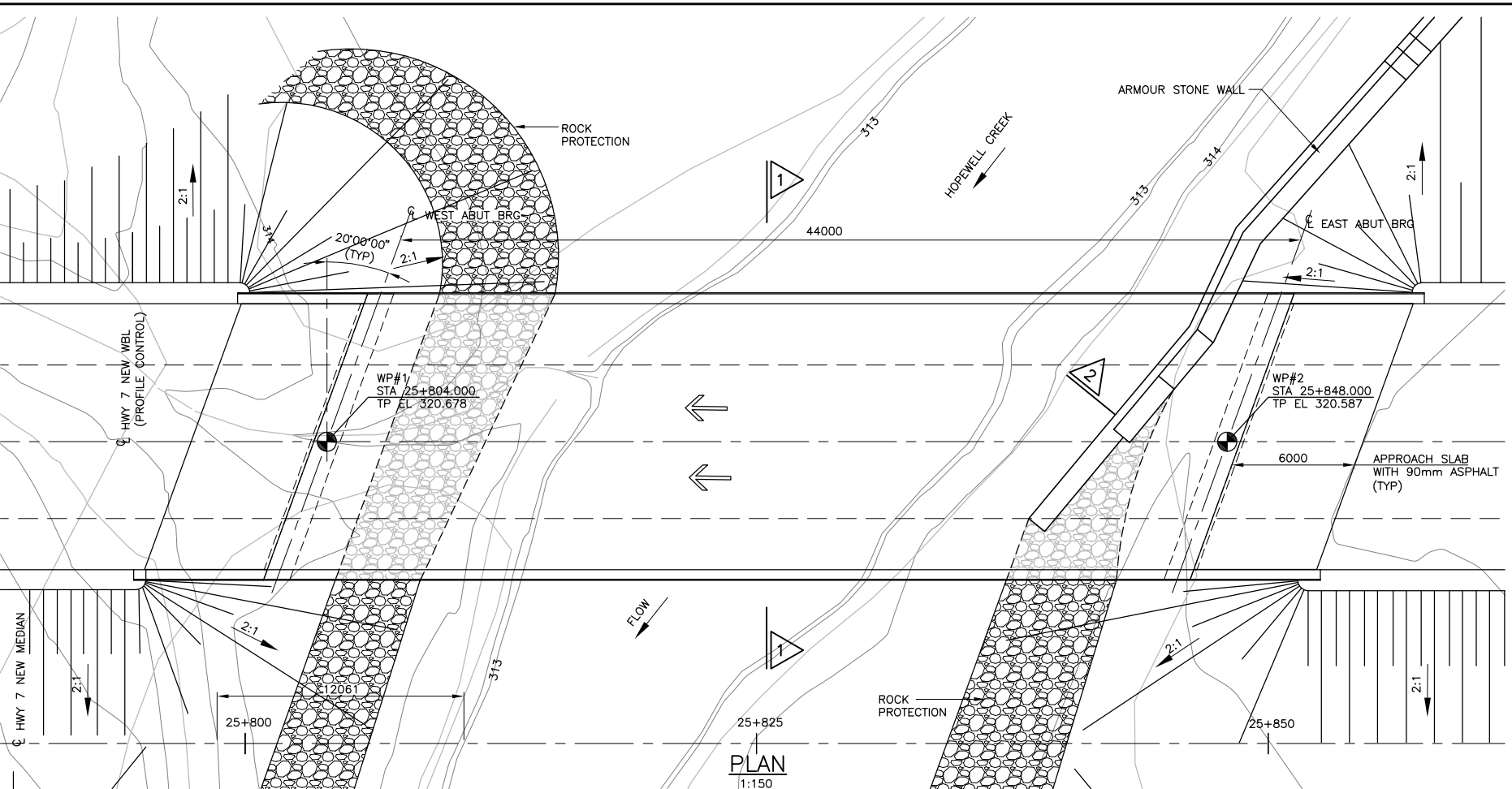
APPLICABLE STANDARD DRAWINGS:

- OPSD 3101.150 WALL - ABUTMENT, BACKFILL MINIMUM GRANULAR REQUIREMENTS
- OPSD 3370.100 DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE WITH PROTECTION BOARD
- OPSD 3370.101 DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE AT ACTIVE CRACKS GREATER THAN 2mm WIDE AND CONSTRUCTION JOINTS
- OPSD 3419.100 BARRIERS AND RAILINGS - STEEL GUIDE RAIL AND CHANNEL ANCHORAGE
- OPSD 3941.200 FIGURES IN CONCRETE SITE NUMBER AND DATE LAYOUT
- OPSD 0912.430 GUIDE RAIL SYSTEM, STEEL BEAM STRUCTURAL CONNECTION
- OPSD 3102.100 WALLS ABUTMENT BACKFILL DRAIN
- OPSD 3390.100 DECK DRIP CHANNEL

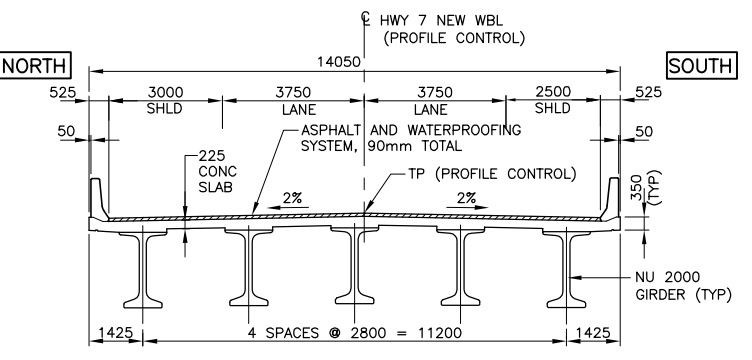


PROFILE-HWY 7 NEW
NTS

DRAWING NOT TO BE SCALED
100 mm ON ORIGINAL DRAWING



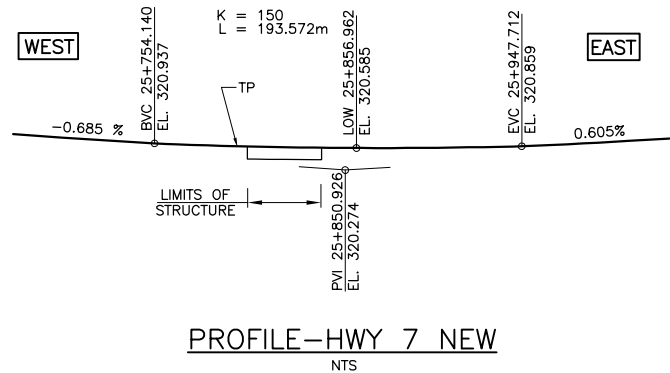
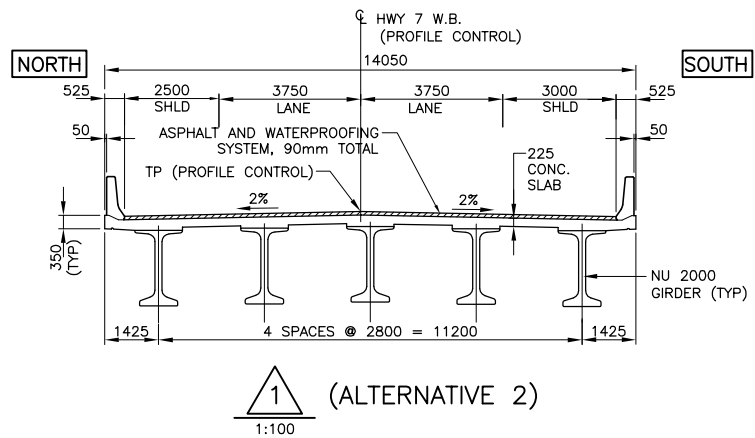
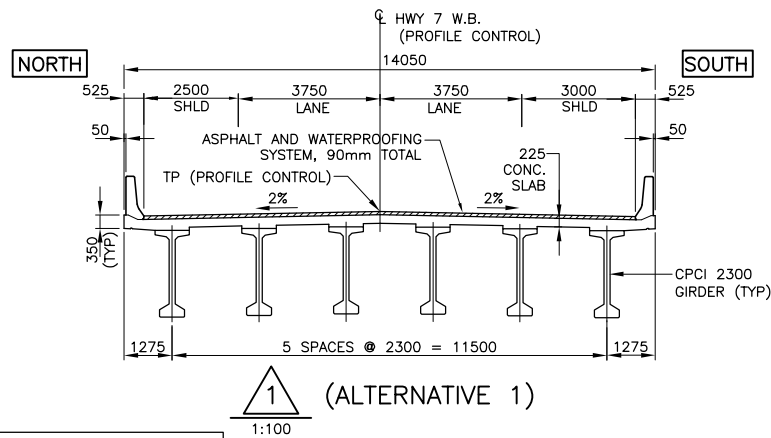
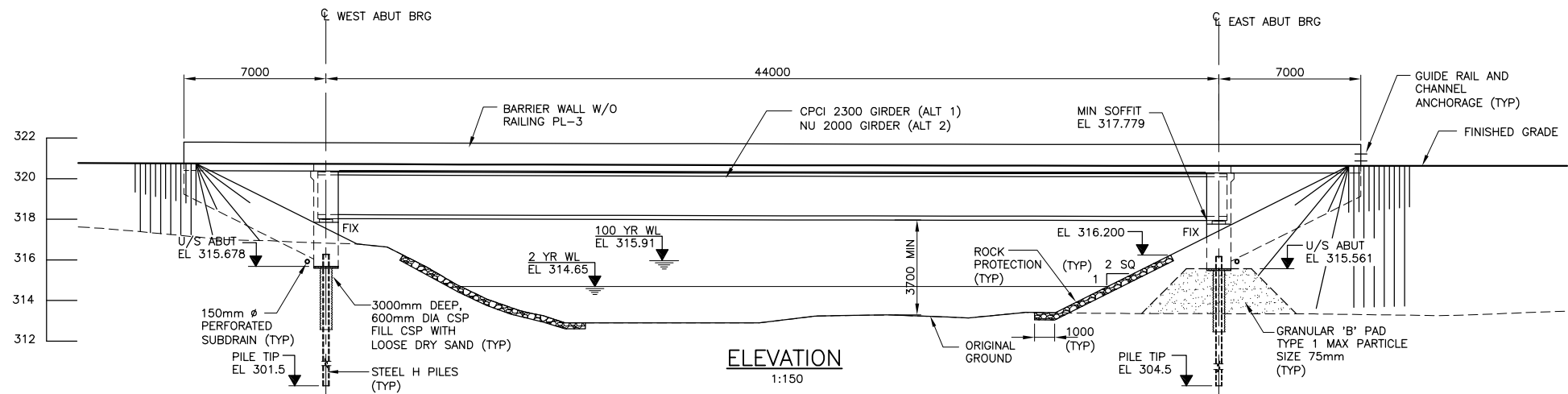
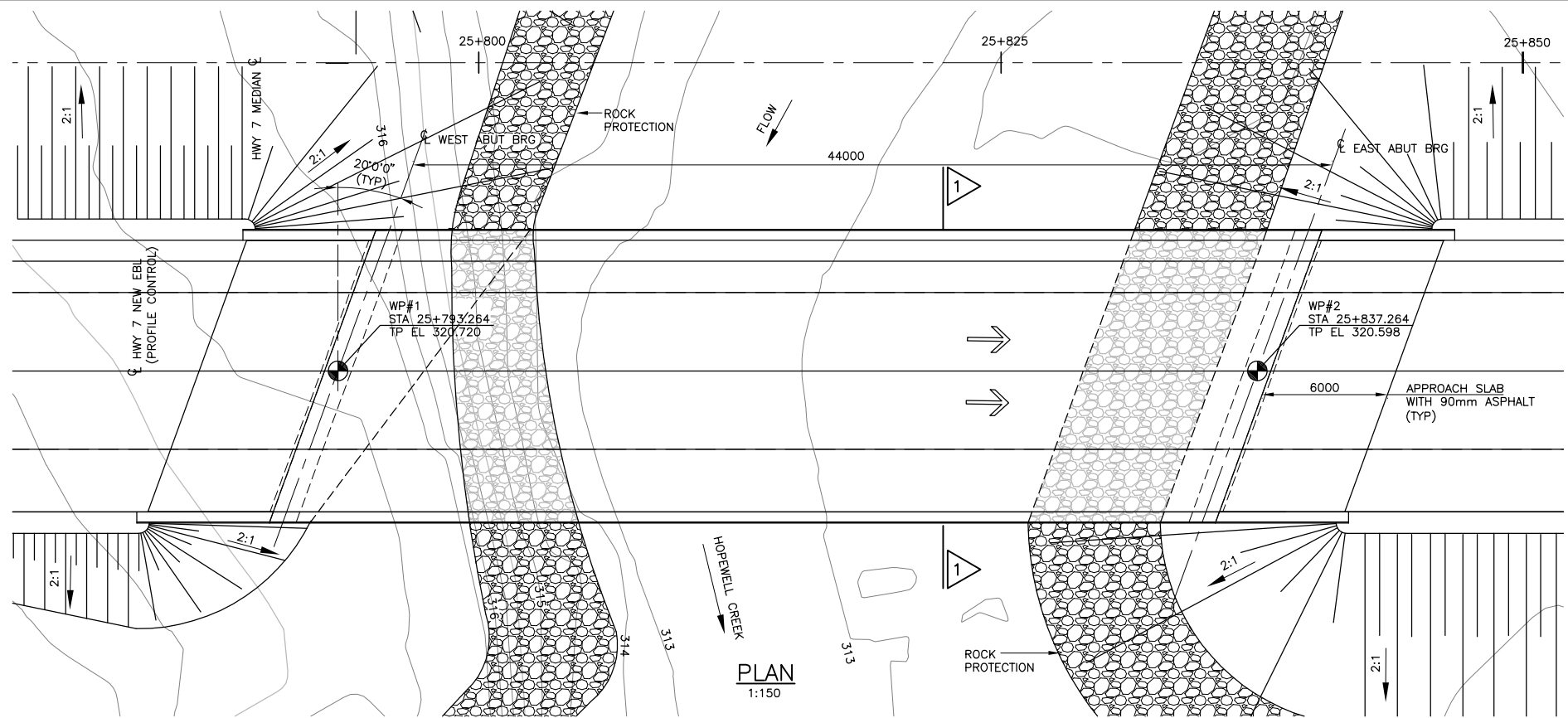
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1:100



1 (ALTERNATIVE 2)
1:100

BENCHMARK
BM: 1016
ELEVATION: 321.539
HCM 00919710581
19mm x 2.0m ROUND BAR

REVISIONS	DATE	BY	DESCRIPTION
DESIGN	M.Z.	CHK A.H.	CODE CHBDC 2006[LOAD CL-625-0M]
DRAWN	D.S.	CHK M.Z.	SITE 33-516/2[STRUCT .
			SCHEME .
			DWG P1



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

HWY 7 NEW CONT No WP No	
HOPEWELL CREEK BRIDGE EBL GENERAL ARRANGEMENT	SHEET

23

GENERAL NOTES

- CLASS OF CONCRETE**

PRECAST PRESTRESSED BEAMS	
CPCI	50 MPa
NU	70 MPa HPC
REMAINDER	30 MPa
- CLEAR COVER TO REINFORCING STEEL**

DECK	TOP	70 ± 20
	BOT	40 ± 10
REMAINDER		70 ± 20 UNLESS OTHERWISE NOTED
- REINFORCING STEEL**

REINFORCING STEEL SHALL BE GRADE 400W UNLESS OTHERWISE SPECIFIED.

BAR MARKS WITH PREFIX 'C' DENOTE COATED BARS.

STAINLESS REINFORCING STEEL SHALL BE TYPE 316LN OR DUPLEX 2205 AND HAVE A MINIMUM YIELD STRENGTH OF 500 MPa, UNLESS OTHERWISE SPECIFIED.

BAR MARKS WITH PREFIX 'S' DENOTE STAINLESS STEEL BARS.

UNLESS SHOWN OTHERWISE, TENSION LAP SPLICES SHALL BE CLASS B.

BAR HOOKS SHALL HAVE STANDARD HOOK DIMENSIONS USING MINIMUM BEND DIAMETERS, WHILE STIRRUPS AND TIES SHALL HAVE MINIMUM HOOK DIMENSIONS. ALL HOOKS SHALL BE IN ACCORDANCE WITH THE STRUCTURAL STANDARD DRAWINGS SS12-1 AND SS12-2, UNLESS INDICATED OTHERWISE.
- GLASS FIBRE REINFORCED POLYMER (GFRP)**

GFRP REINFORCING BARS SHALL BE GRADE I, GRADE II OR GRADE III AS SPECIFIED IN THE CONTRACT DOCUMENTS.

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APPLICABLE STANDARD DRAWINGS:

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OPSD 3370.100	DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE WITH PROTECTION BOARD
OPSD 3370.101	DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE AT ACTIVE CRACKS GREATER THAN 2mm WIDE AND CONSTRUCTION JOINTS
OPSD 3419.100	BARRIERS AND RAILINGS - STEEL GUIDE RAIL AND CHANNEL ANCHORAGE
OPSD 3941.200	FIGURES IN CONCRETE SITE NUMBER AND DATE LAYOUT
OPSD 0912.430	GUIDE RAIL SYSTEM, STEEL BEAM STRUCTURAL CONNECTION
OPSD 3102.100	WALLS ABUTMENT BACKFILL DRAIN
OPSD 3390.100	DECK DRIP CHANNEL

LIST OF DRAWINGS:

P1 GENERAL ARRANGEMENT

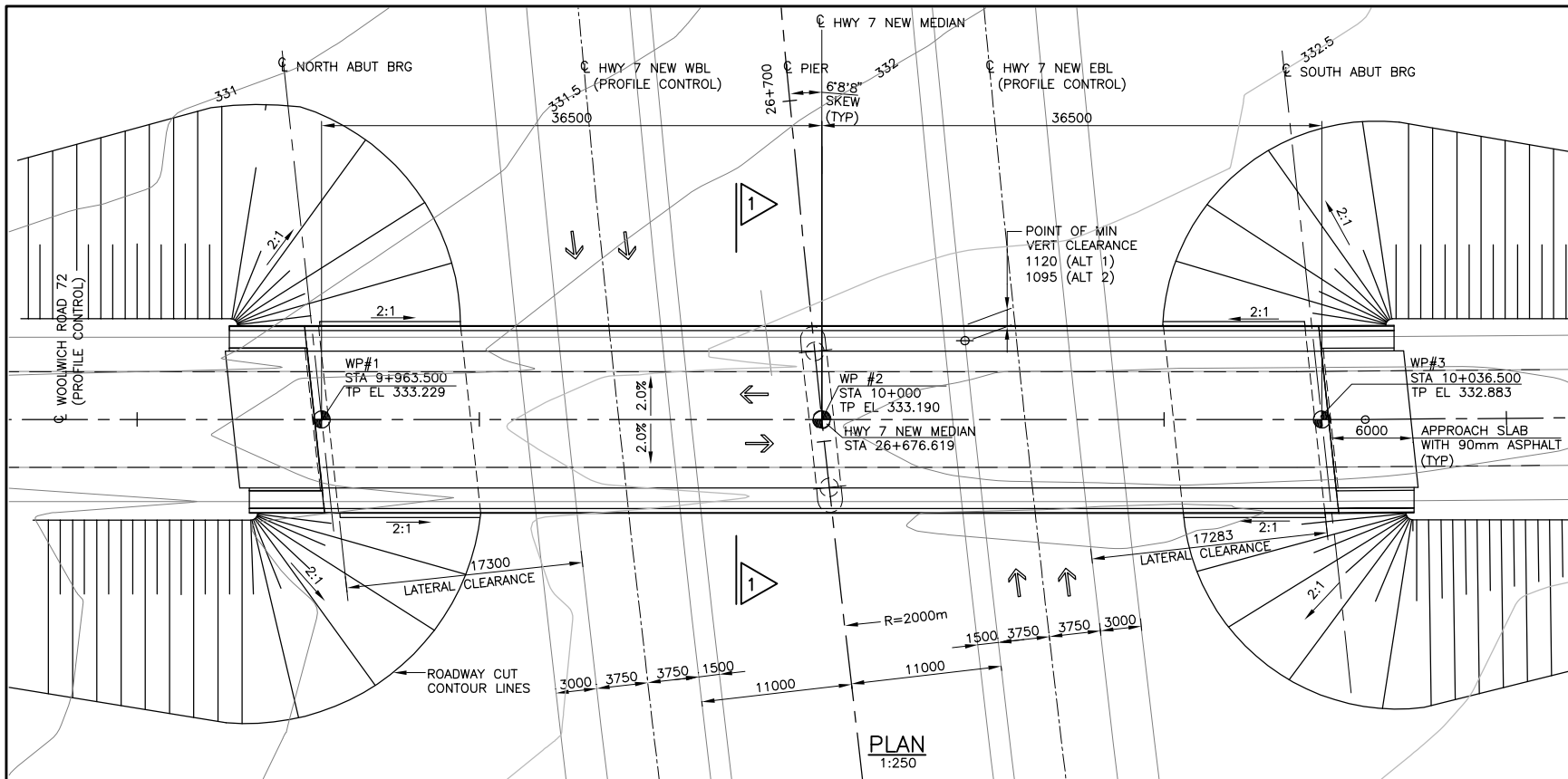
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PVI	POINT OF VERTICAL INTERSECTION

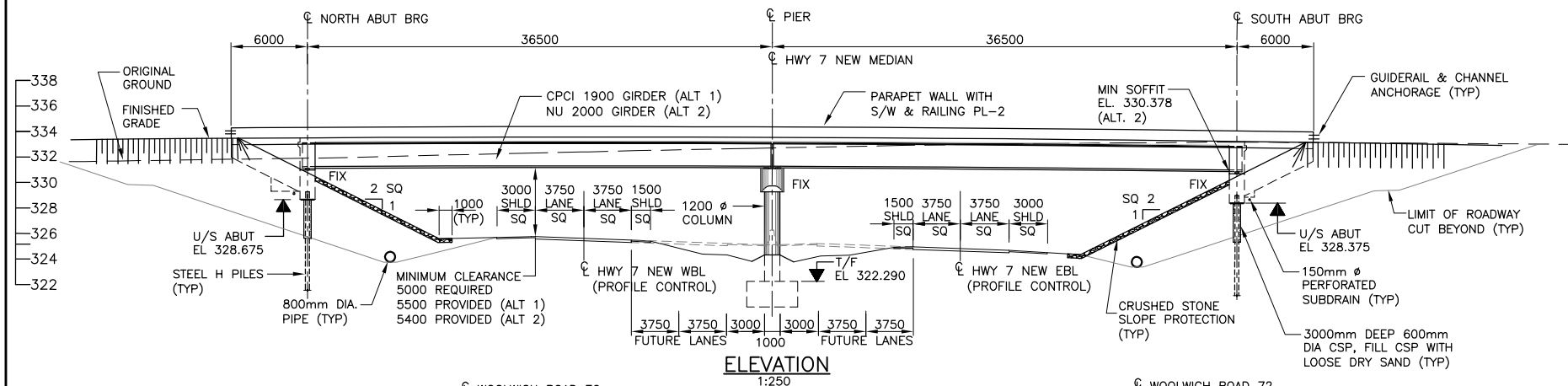
BENCHMARK
BM: 1016
ELEVATION: 321.539
HCM 00919710581
19mm x 2.0m ROUND BAR

DRAWING NOT TO BE SCALED
100 mm ON ORIGINAL DRAWING

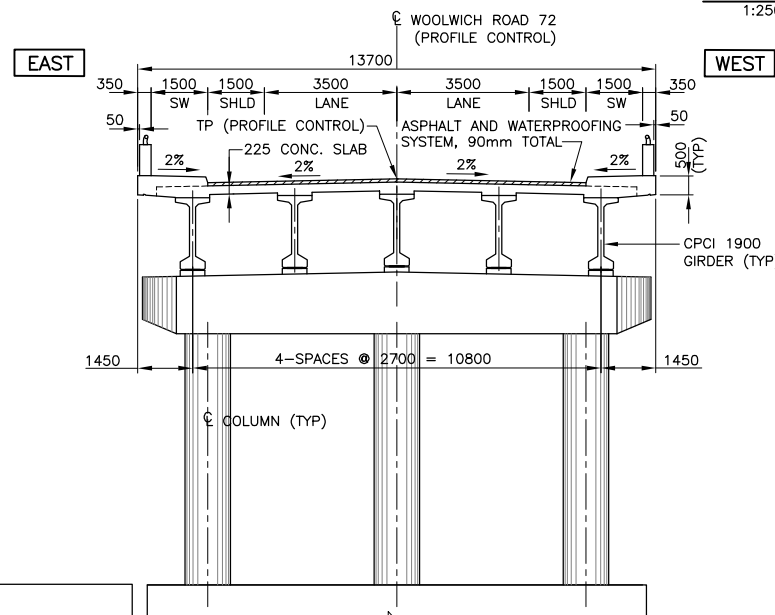
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DRAWN	D.S.	CHK M.Z.	SITE 33-516/1]STRUCT . [SCHEME . [DWG P1



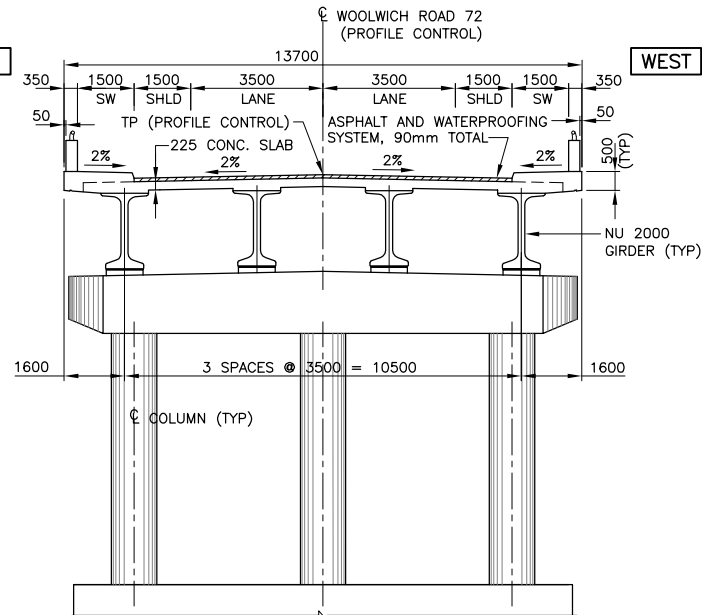
PLAN
1:250



ELEVATION
1:250



(ALTERNATIVE 1)
1:100

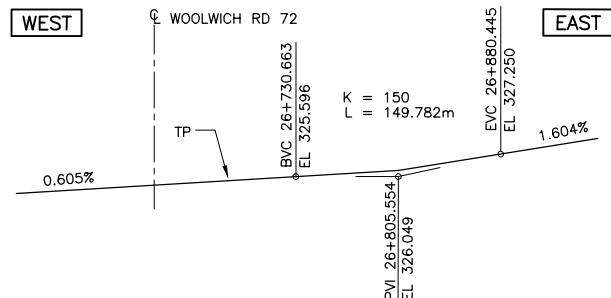


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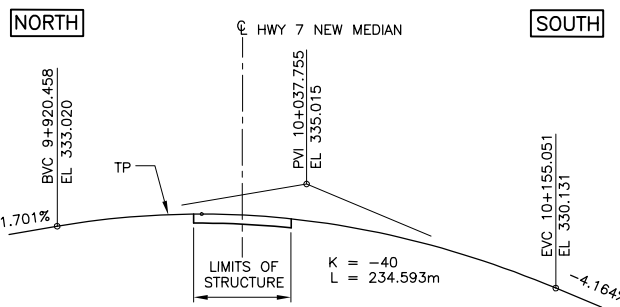
LEGEND:
FIX FIXED
PVI POINT OF VERTICAL INTERSECTION
T/F TOP OF FOOTING
(TYP) TYPICAL

LIST OF DRAWINGS:
P1 GENERAL ARRANGEMENT

APPLICABLE STANDARD DRAWINGS:
OPSD 3101.150 WALLS - ABUTMENT, BACKFILL MINIMUM GRANULAR REQUIREMENTS
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OPSD 3102.100 WALLS ABUTMENT BACKFILL DRAIN
OPSD 3390.100 DECK DRIP CHANNEL



PROFILE - HWY 7 NEW
NTS



PROFILE - WOOLWICH ROAD 72
NTS

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

HWY 7 NEW
CONT No
WP No

GREENHOUSE ROAD (WOOLWICH
ROAD 72) UNDERPASS
GENERAL ARRANGEMENT



24

SHEET

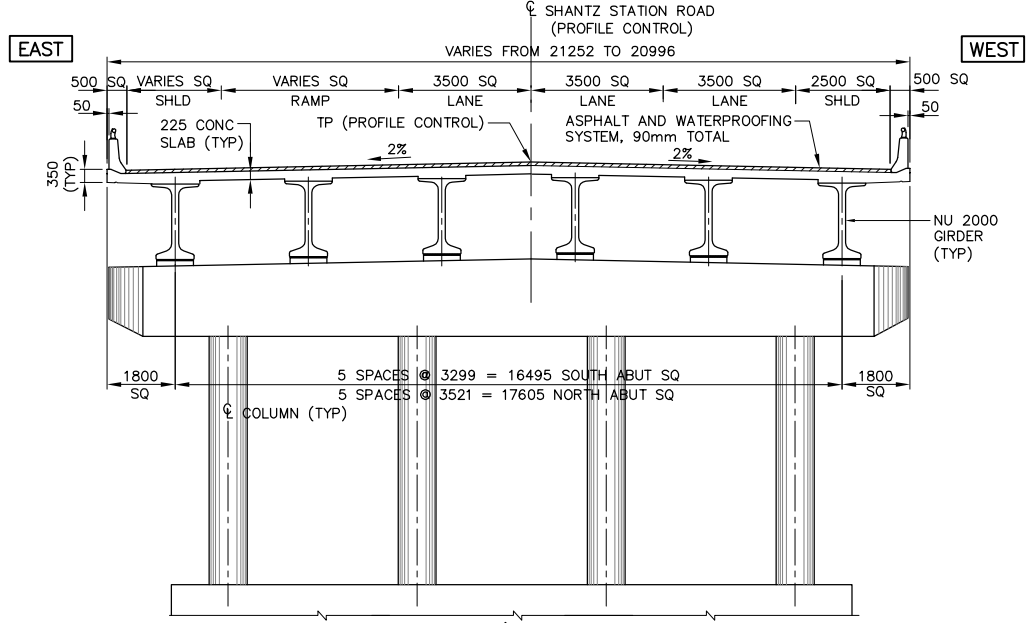
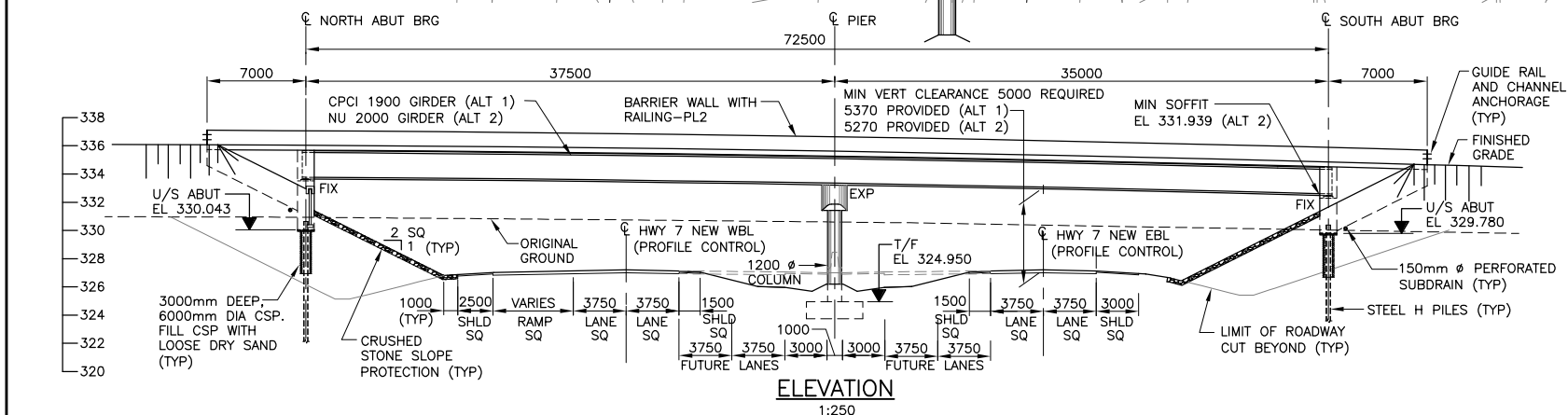
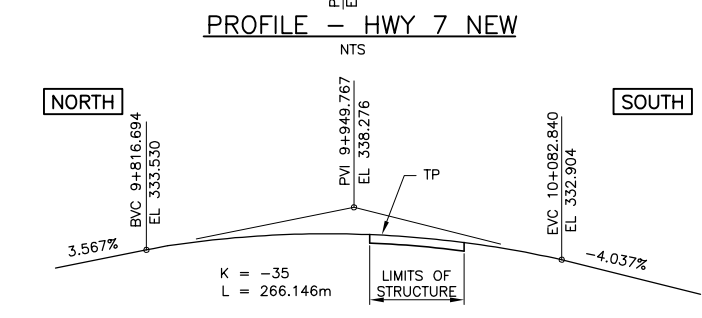
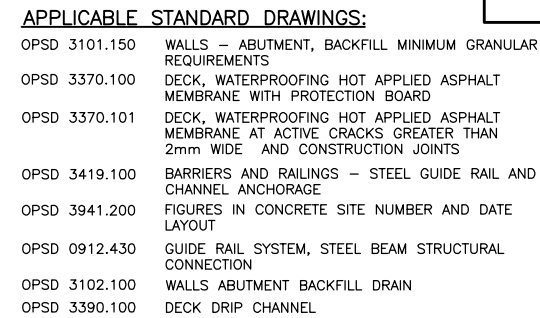
GENERAL NOTES

- CLASS OF CONCRETE**
PRECAST PRESTRESSED BEAMS
CPCI 50 MPa
NU 70 MPa HPC
REMAINDER 30 MPa
- CLEAR COVER TO REINFORCING STEEL**
DECK TOP 70 ± 20
DECK BOT 40 ± 10
REMAINDER 70 ± 20 UNLESS OTHERWISE NOTED
- REINFORCING STEEL**
REINFORCING STEEL SHALL BE GRADE 400W UNLESS OTHERWISE SPECIFIED.
BAR MARKS WITH PREFIX 'C' DENOTE COATED BARS.
STAINLESS REINFORCING STEEL SHALL BE TYPE 316LN OR DUPLEX 2205 AND HAVE A MINIMUM YIELD STRENGTH OF 500 MPa, UNLESS OTHERWISE SPECIFIED.
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BENCHMARK
BM: 125
ELEVATION: 332.913
HCP 125
19mm x 2.0m ROUND BAR

DRAWING NOT TO BE SCALED
100 mm ON ORIGINAL DRAWING

REVISIONS						
	DATE	BY	DESCRIPTION		DATE	
DESIGN	M.Z.	CHK	A.H.	CODE CHBDC 2006[LOAD CL-825-0M]	DATE	JUL 2012
DRAWN	D.S.	CHK	M.Z.	SITE 33-518 [STRUCT .]	SCHEME .	DWG P1



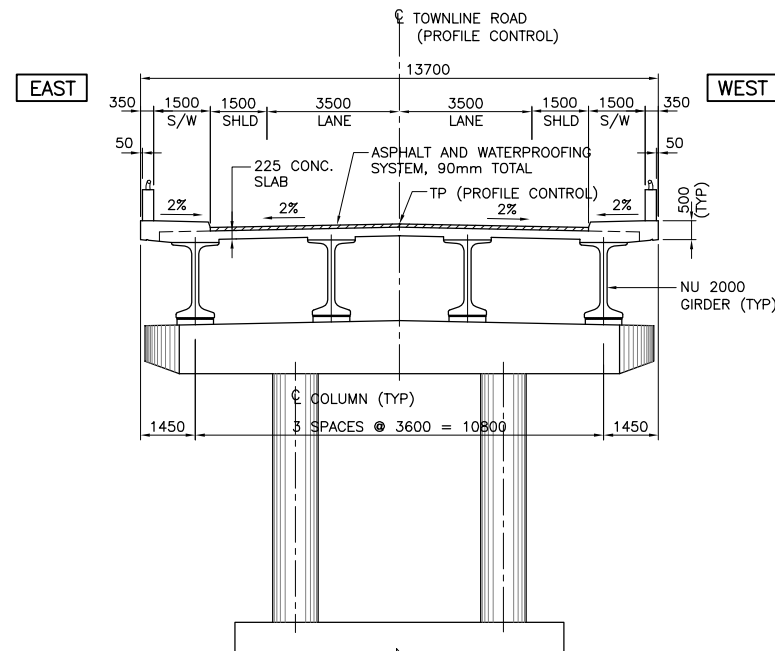
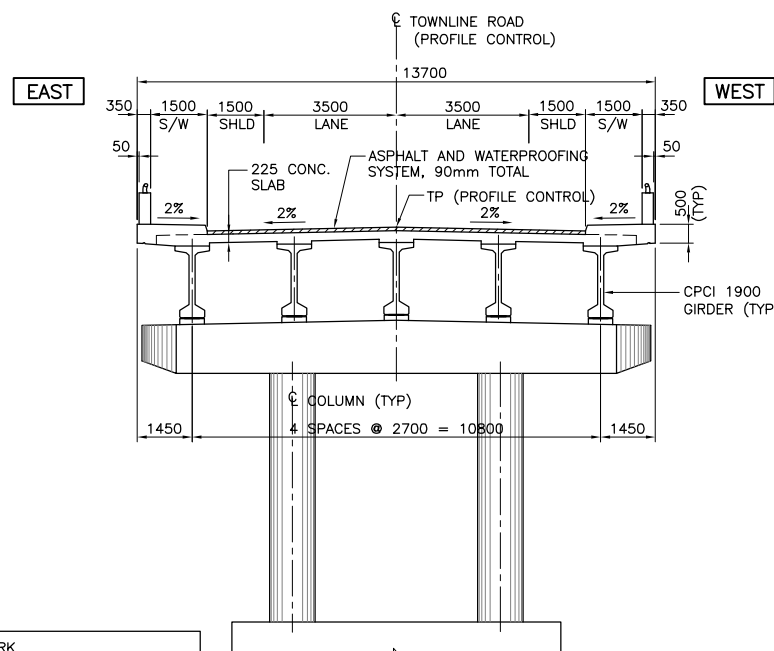
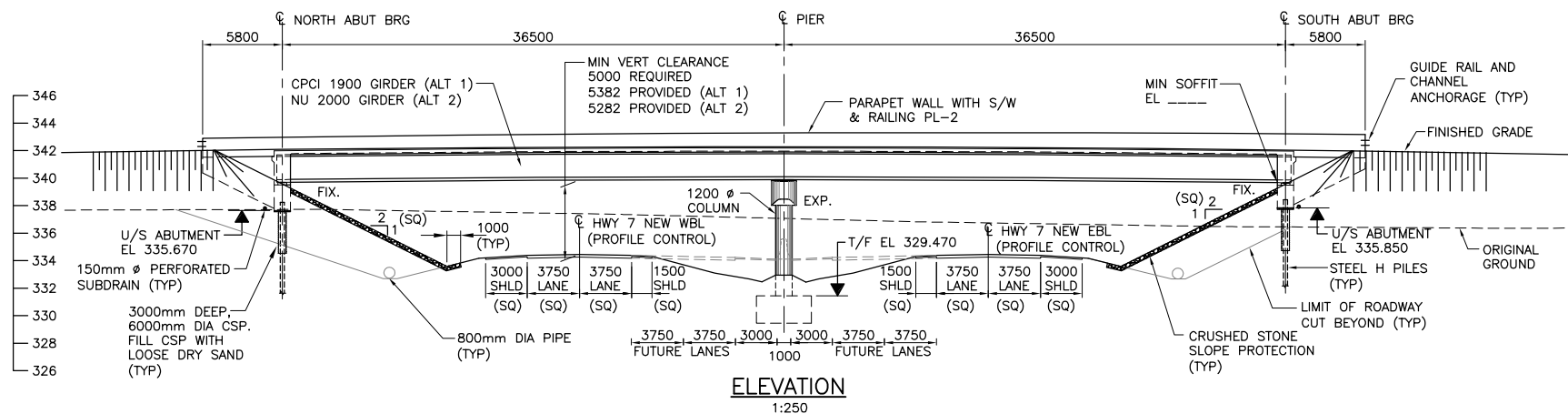
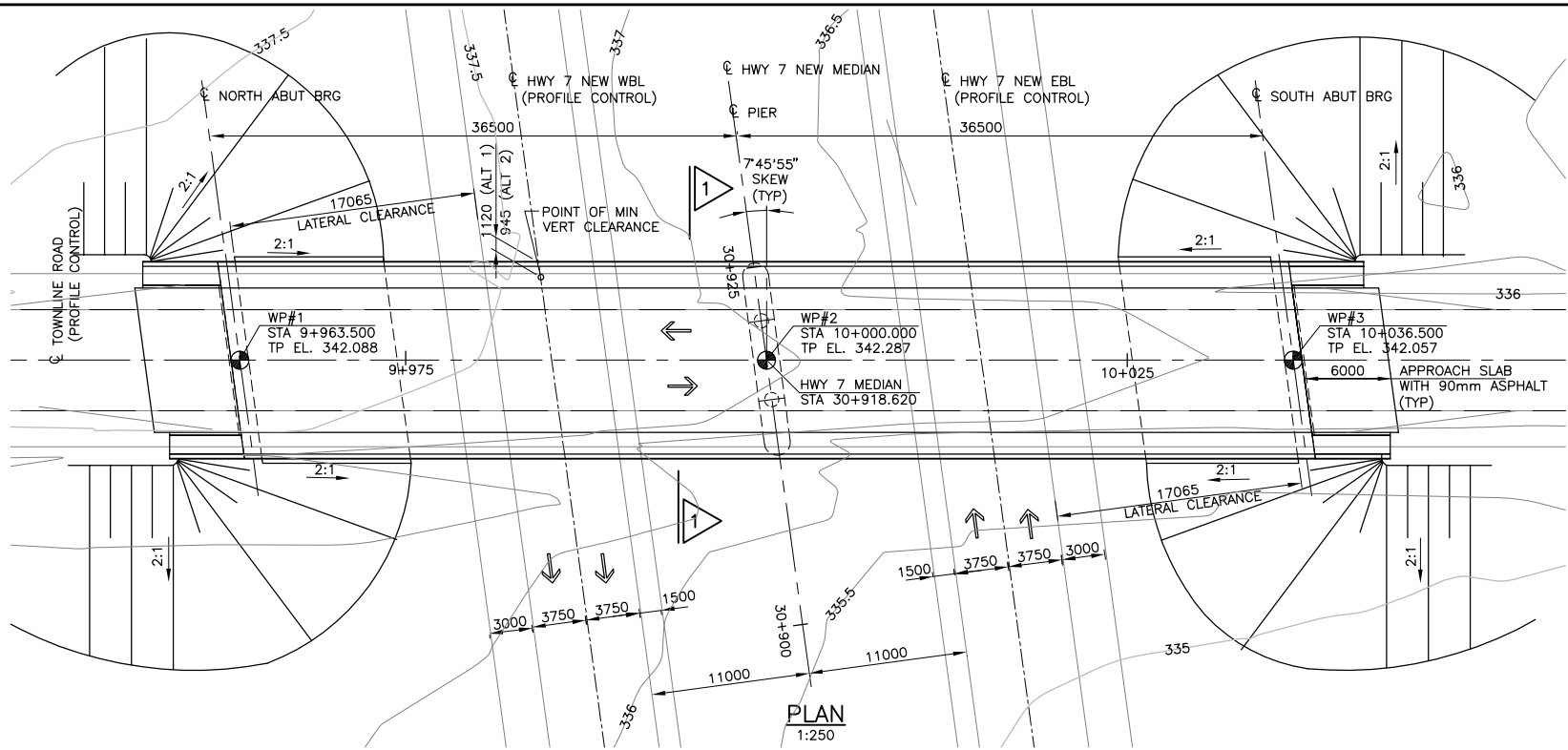
DRAWING NOT TO BE SCALED
100 mm ON ORIGINAL DRAWING

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P1 GENERAL ARRANGEMENT

[illegible]



BENCHMARK
BM: 154
ELEVATION: 337.089
HCP 154
19mm x 2.0m ROUND BAR

1 (ALTERNATIVE 1)
1:100

1 (ALTERNATIVE 2)
1:100

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

HWY 7 NEW
CONT No
WP No



26

TOWNLIN ROAD
UNDERPASS
GENERAL ARRANGEMENT

SHEET



GENERAL NOTES

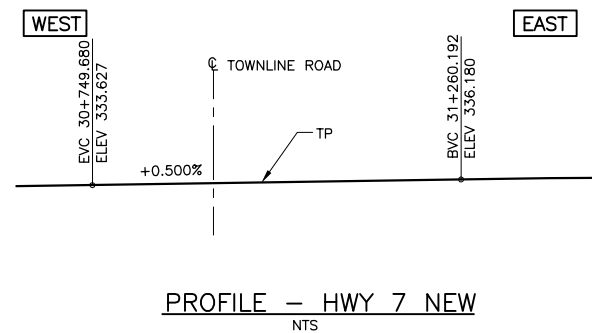
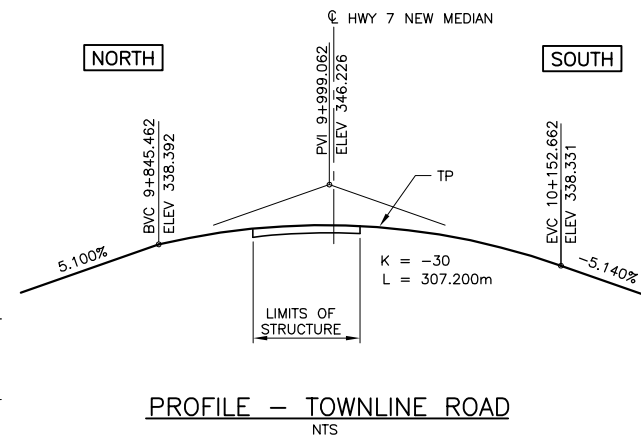
- CLASS OF CONCRETE**
PRECAST PRESTRESSED BEAMS
CPCI 50 MPa
NU 70 MPa HPC
REMAINDER 30 MPa
- CLEAR COVER TO REINFORCING STEEL**
DECK TOP 70 ± 20
BOT 40 ± 10
REMAINDER 70 ± 20 UNLESS OTHERWISE NOTED
- REINFORCING STEEL**
REINFORCING STEEL SHALL BE GRADE 400W UNLESS OTHERWISE SPECIFIED.
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LEGEND:

FIX FIXED
PVI POINT OF VERTICAL INTERSECTION
T/F TOP OF FOOTING

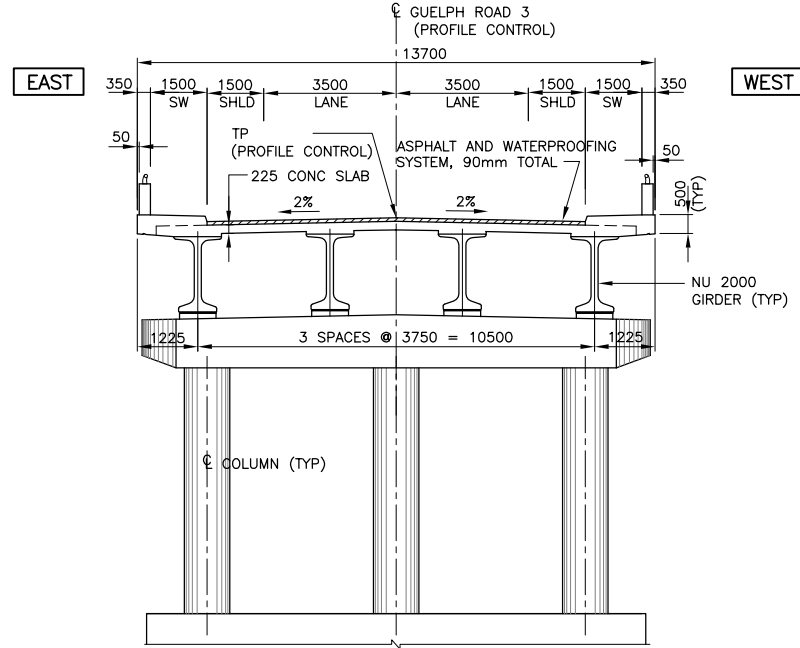
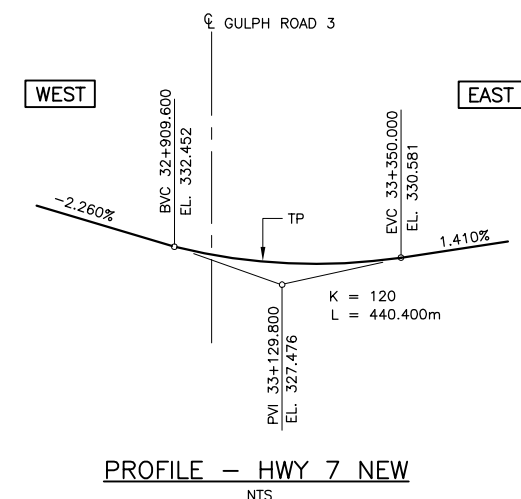
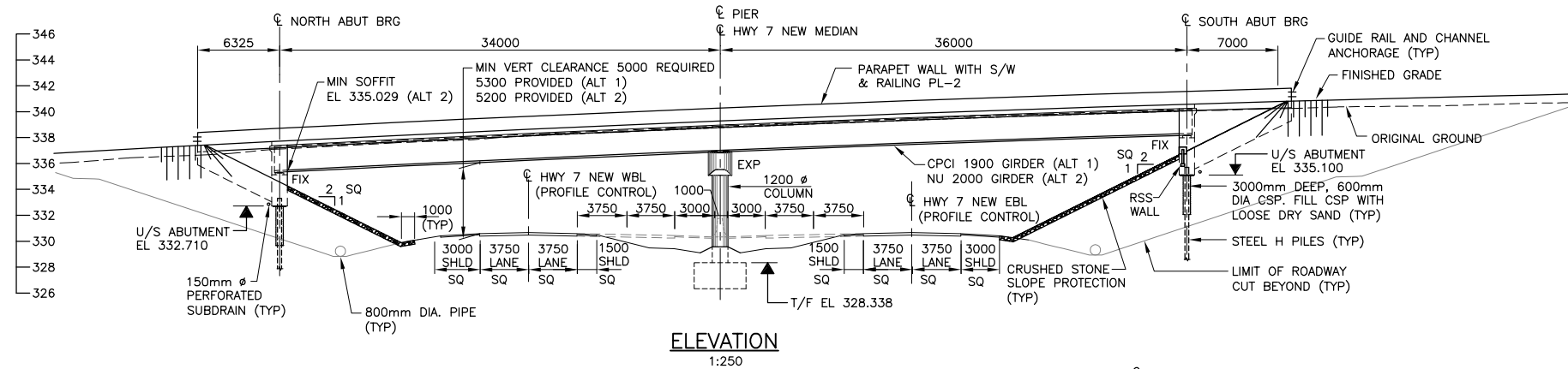
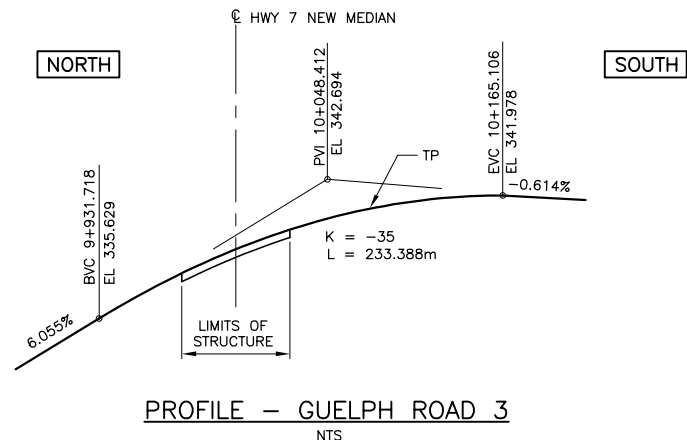
LIST OF DRAWINGS:

P1 GENERAL ARRANGEMENT



DRAWING NOT TO BE SCALED
100 mm ON ORIGINAL DRAWING

REVISIONS						
	DATE	BY	DESCRIPTION		DATE	
			DESIGN	M.Z. CHK A.H. CODE CHBDC 2006[LOAD CL-625-0M]	DATE JUL 2012	
			DRAWN	D.S. CHK M.Z. SITE 35-602[STRUCT .]	SCHEME .	DWG P1



BENCHMARK
BM: 137
ELEVATION: 336.181
HCP 137
19mm x 2.0m ROUND BAR

1 (ALTERNATIVE 1)
1:100

1 (ALTERNATIVE 2)
1:100

DRAWING NOT TO BE SCALED
100 mm ON ORIGINAL DRAWING

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

HWY 7 NEW
CONT No
WP No

GUELPH ROAD 3
UNDERPASS
GENERAL ARRANGEMENT



27

GENERAL NOTES

- | | |
|--------------------------------------------|--------------------------------|
| 1 CLASS OF CONCRETE | |
| PRECAST PRESTRESSED BEAMS | |
| CPCI | 50 MPa |
| NU | 70 MPa HPC |
| REMAINDER | 30 MPa |
| 2. CLEAR COVER TO REINFORCING STEEL | |
| FOOTINGS | 100 ± 25 |
| DECK | 70 ± 20 |
| BOT | 40 ± 10 |
| REMAINDER | 70 ± 20 UNLESS OTHERWISE NOTED |

3. REINFORCING STEEL
- REINFORCING STEEL SHALL BE GRADE 400W UNLESS OTHERWISE SPECIFIED.

BAR MARKS WITH PREFIX 'C' DENOTE COATED BARS.

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4. GLASS FIBRE REINFORCED POLYMER (GFRP)
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BAR MARKS WITH THE PREFIX GII DENOTE GRADE II GFRP BARS,
AND BAR MARKS WITH THE PREFIX GIII DENOTE GRADE III GFRP
BARS.

5. **RETAINED SOIL SYSTEM**
- RETAINED SOIL SYSTEM WALLS SHALL HAVE THE FOLLOWING ATTRIBUTES:

APPLICATION: FALSE ABUTMENTS/RETAINING WALLS
GEOMETRY: VERTICAL
PERFORMANCE: HIGH
APPEARANCE: HIGH

ALL PANELS SHALL HAVE ARCHITECTURAL FINISH TEXTURE.

6. CONSTRUCTION NOTES
- BACKFILL SHALL NOT BE PLACED BEHIND THE ABUTMENTS UNTIL THE DECK SLAB IS IN PLACE AND HAS REACHED 25 MPa STRENGTH.

BACKFILL SHALL BE PLACED SIMULTANEOUSLY BEHIND BOTH ABUTMENTS KEEPING THE HEIGHT OF THE BACKFILL APPROXIMATELY THE SAME. AT NO TIME SHALL THE DIFFERENCE IN ELEVATION BE GRATER THAN 500mm.

CONSTRUCT ABUTMENTS AND WINGWALLS TO THE BEARING SEAT ELEVATIONS. THE CONTRACTOR SHALL SUPPLY TEMPORARY LATERAL BRACING FOR THE ABUTMENTS. FORMWORK AND LATERAL BRACING SHALL NOT BE REMOVED UNTIL THE CONCRETE IN DECK HAS REACHED 25 MPa STRENGTH.

THE CONTRACTOR SHALL ESTABLISH THE BEARING SEAT ELEVATIONS BY DEDUCTING THE ACTUAL BEARING THICKNESSES FROM THE TOP OF BEARING ELEVATIONS. IF THE ACTUAL BEARING THICKNESSES ARE DIFFERENT FROM THOSE GIVEN WITH THE BEARING DESIGNATION DATA, THE CONTRACTOR SHALL ADJUST THE REINFORCING STEEL TO SUIT.

LEGEND:

FIX	FIXED
PVI	POINT OF VERTICAL INTERSECTION
T/F	TOP OF FOOTING

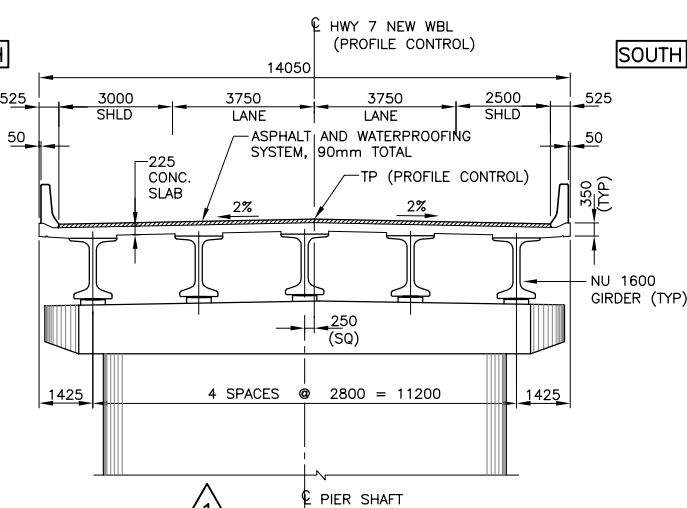
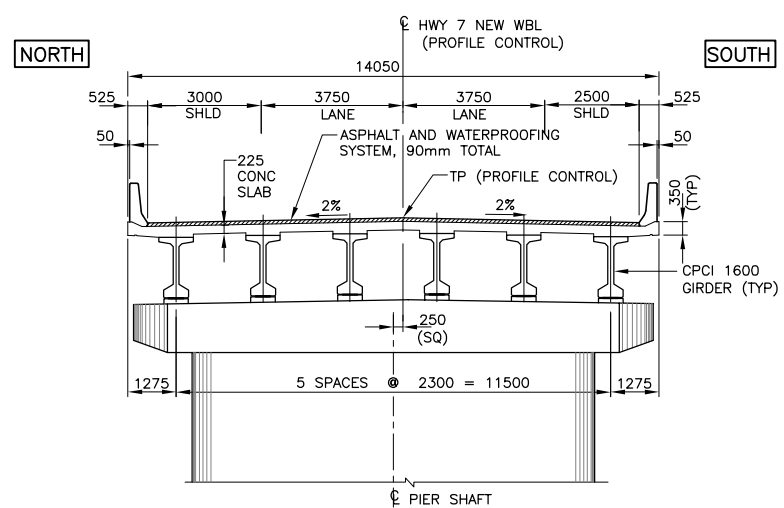
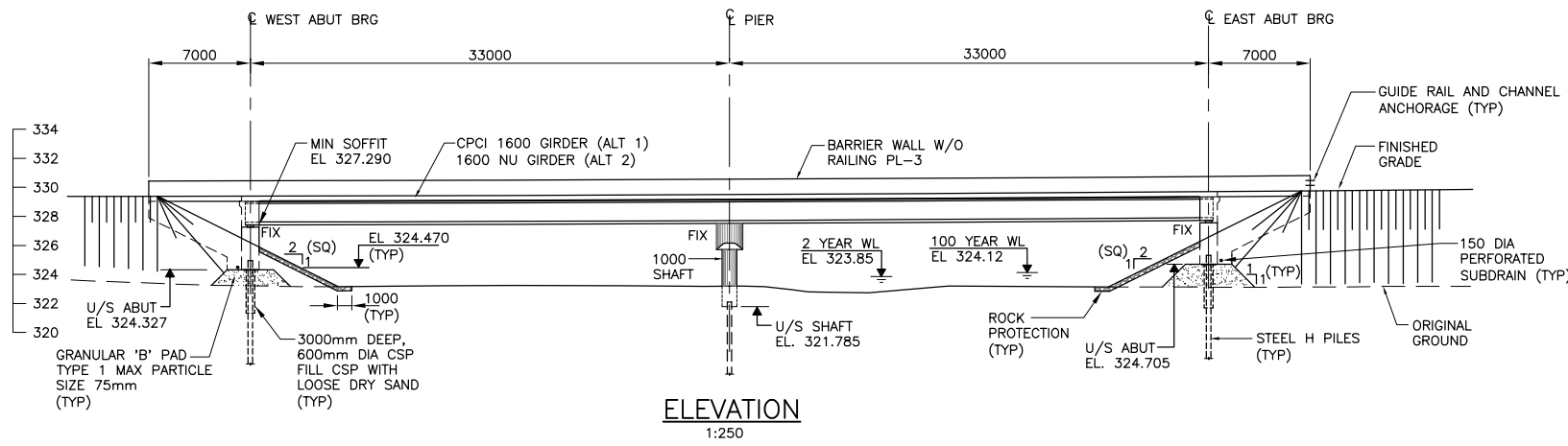
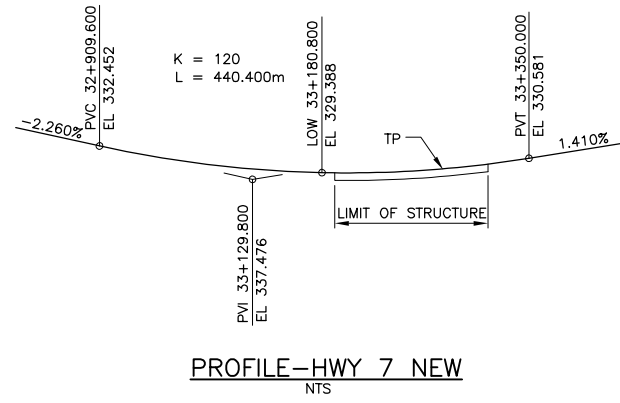
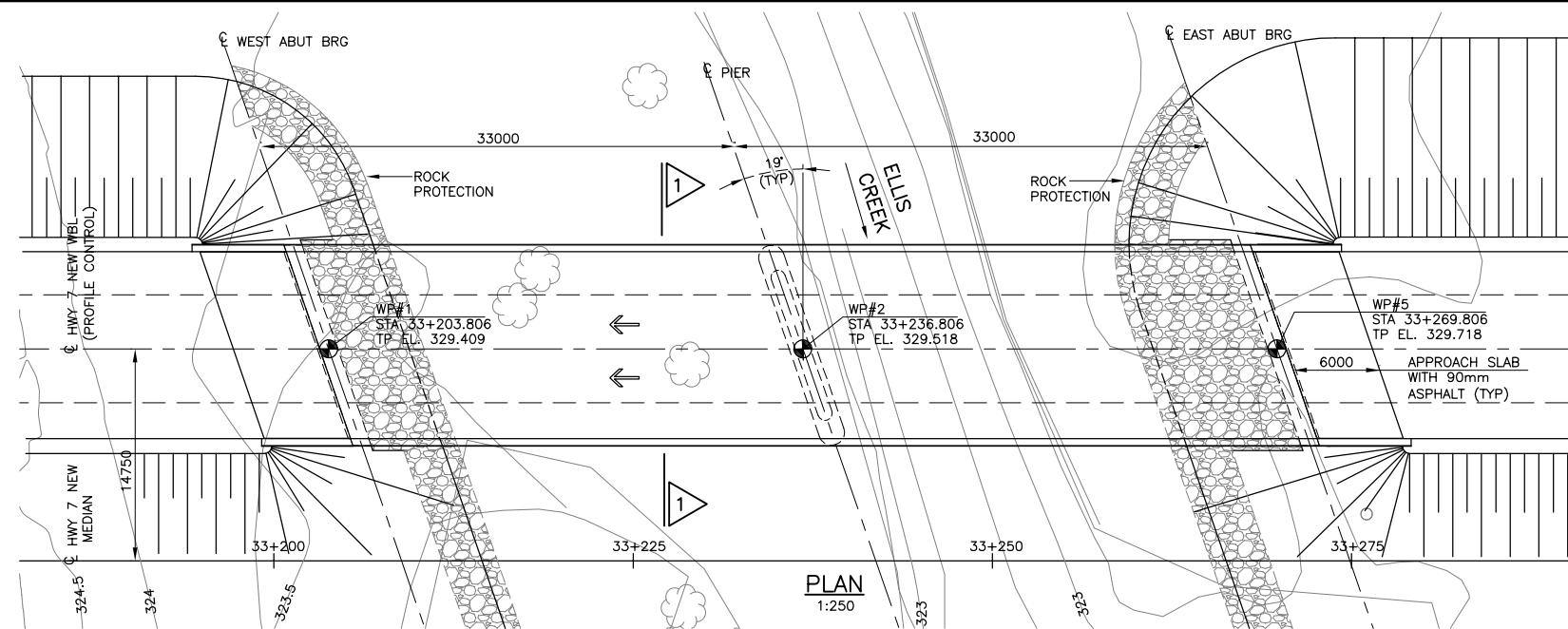
LIST OF DRAWINGS:

P1 GENERAL ARRANGEMENT

APPLICABLE STANDARD DRAWINGS:

OPSD 3101.150	WALLS - ABUTMENT, BACKFILL MINIMUM GRANULAR REQUIREMENTS
OPSD 3370.100	DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE WITH PROTECTION BOARD
OPSD 3370.101	DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE AT ACTIVE CRACKS GREATER THAN 2mm WIDE AND CONSTRUCTION JOINTS
OPSD 3419.100	BARRIERS AND RAILINGS - STEEL GUIDE RAIL AND CHANNEL ANCHORAGE
OPSD 3941.200	FIGURES IN CONCRETE SITE NUMBER AND DATE LAYOUT
OPSD 0912.430	GUIDE RAIL SYSTEM, STEEL BEAM STRUCTURAL CONNECTION
OPSD 3102.100	WALLS ABUTMENT BACKFILL DRAIN
OPSD 3390.100	DECK DRIP CHANNEL

REVISIONS								
	DATE	BY	DESCRIPTION					
	DESIGN M.Z.	CHK A.H.	CODE CHBDC	2006	LOAD CL-625-0N1	DATE	JUL 2012	
	DRAWN D.S.	CHK M.Z.	SITE	35-604	STRUCT .	SCHEME .	DWG	P1



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

HWY 7 NEW
CONT No .
WP No .

ELLIS CREEK BRIDGE
WBL
GENERAL ARRANGEMENT

MMM GROUP

- ### GENERAL NOTES
- CLASS OF CONCRETE**
PRECAST PRESTRESSED BEAMS
CPCI 50 MPa
NU 70 MPa HPC
REMAINDER 30 MPa
 - CLEAR COVER TO REINFORCING STEEL**
DECK TOP 70 ± 20
BOT 40 ± 10
REMAINDER 70 ± 20 UNLESS OTHERWISE NOTED
 - REINFORCING STEEL**
REINFORCING STEEL SHALL BE GRADE 400W UNLESS OTHERWISE SPECIFIED.
BAR MARKS WITH PREFIX 'C' DENOTE COATED BARS.
STAINLESS REINFORCING STEEL SHALL BE TYPE 316LN OR DUPLEX 2205 AND HAVE A MINIMUM YIELD STRENGTH OF 500 MPa, UNLESS OTHERWISE SPECIFIED.
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 - GLASS FIBRE REINFORCED POLYMER (GFRP)**
GFRP REINFORCING BARS SHALL BE GRADE I, GRADE II OR GRADE III AS SPECIFIED IN THE CONTRACT DOCUMENTS.
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APPLICABLE STANDARD DRAWINGS:

- | | |
|---------------|-----------------------------------------------------------------------------------------------------------------|
| OPSD 3101.150 | WALL - ABUTMENT, BACKFILL MINIMUM GRANULAR REQUIREMENTS |
| OPSD 3370.100 | DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE WITH PROTECTION BOARD |
| OPSD 3370.101 | DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE AT ACTIVE CRACKS GREATER THAN 2mm WIDE AND CONSTRUCTION JOINTS |
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| OPSD 3941.200 | FIGURES IN CONCRETE SITE NUMBER AND DATE LAYOUT |
| OPSD 0912.430 | GUIDE RAIL SYSTEM, STEEL BEAM STRUCTURAL CONNECTION |
| OPSD 3102.100 | WALLS ABUTMENT BACKFILL DRAIN |
| OPSD 3390.100 | DECK DRIP CHANNEL |

LIST OF DRAWINGS:

P1 GENERAL ARRANGEMENT

LEGEND:

COL	COLUMN
FIX	FIXED
PVI	POINT OF VERTICAL INTERSECTION

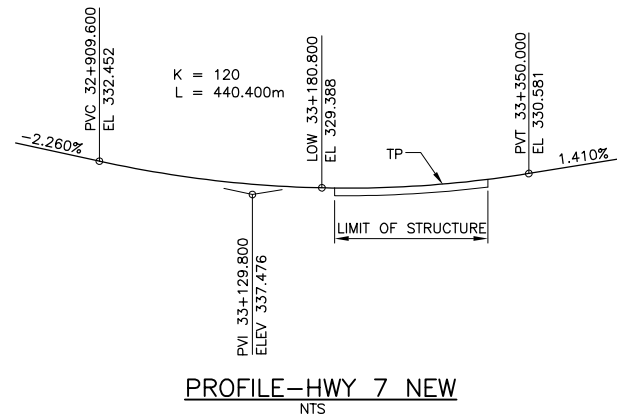
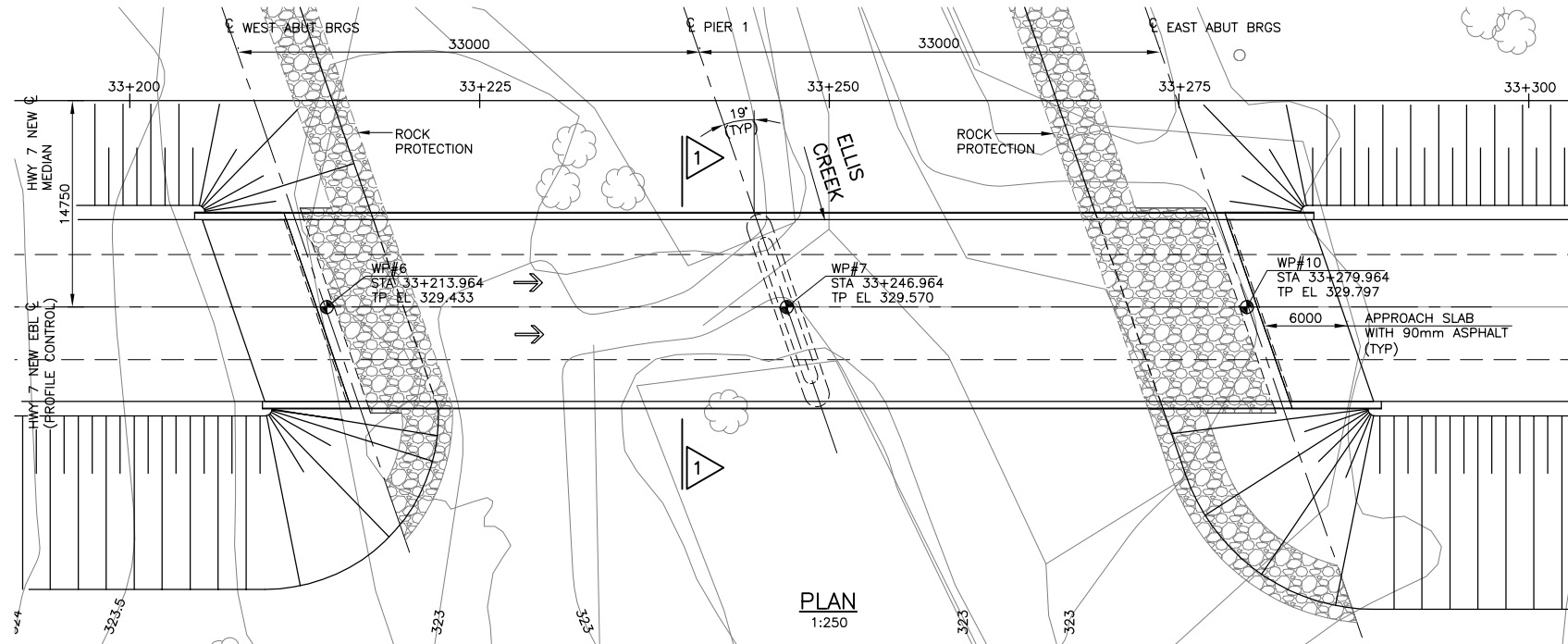
BENCHMARK
BM: 137
ELEVATION: 336.181
HCP 137
19mm x 2.0m ROUND BAR

1 (ALTERNATIVE 1)
1:100

1 (ALTERNATIVE 2)
1:100

DRAWING NOT TO BE SCALED
100 mm ON ORIGINAL DRAWING

REVISIONS	DATE	BY	DESCRIPTION
DESIGN	M.Z.	CHK A.H.	CODE CHBDC 2006[LOAD CL-625-0NT]DATE JUL 2012
DRAWN	D.S.	CHK M.Z.	SITE 35-605/2[STRUCT . [SCHEME . [DWG P1



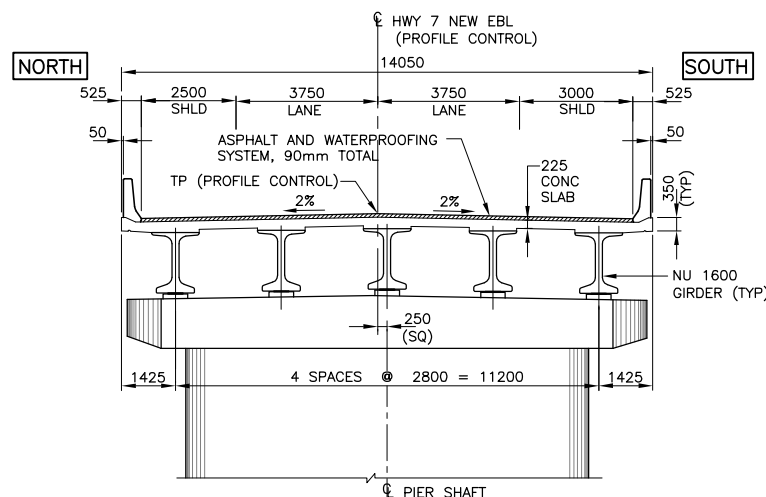
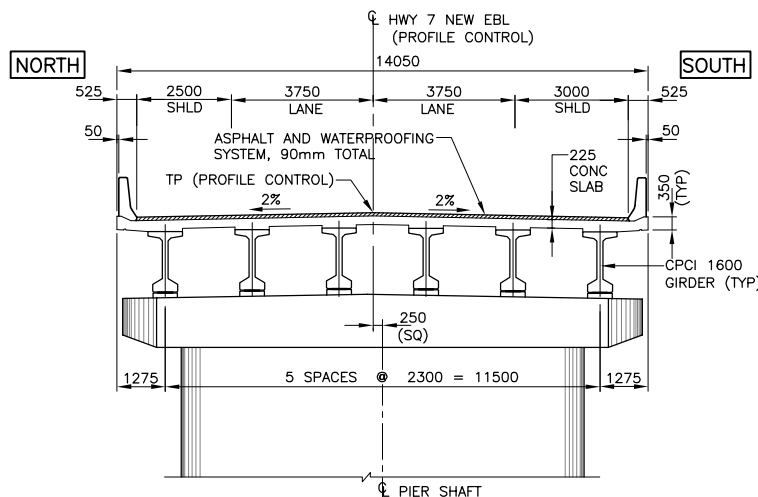
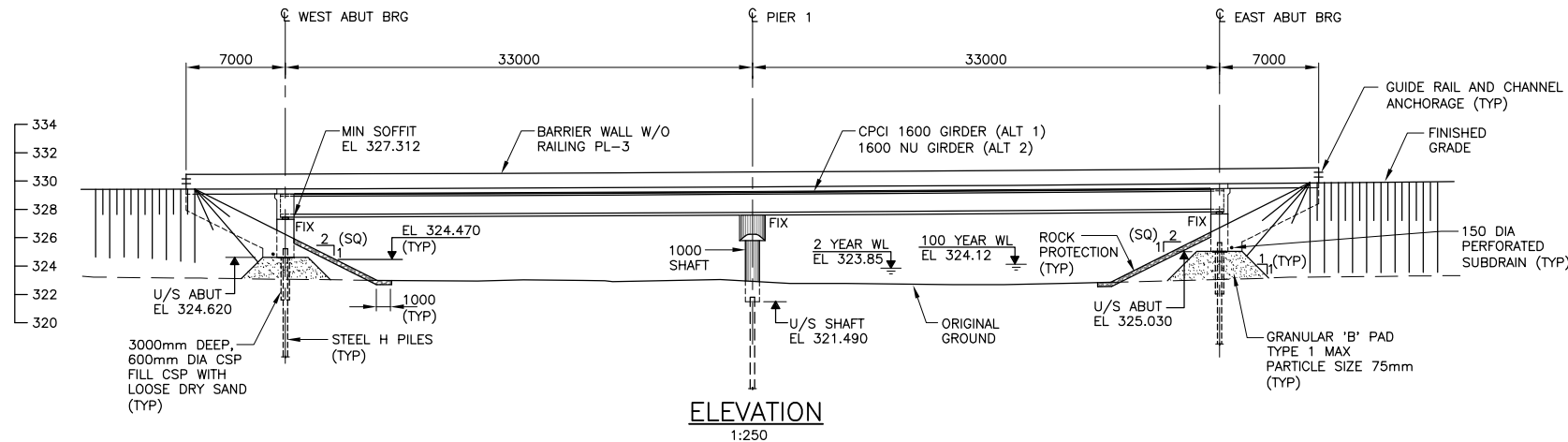
METRIC
DIMENSIONS ARE IN METRES
AND/OR MILLIMETRES
UNLESS OTHERWISE SHOWN

HWY 7 NEW CONT No WP No	
ELLIS CREEK BRIDGE EBL GENERAL ARRANGEMENT	SHEET

29

GENERAL NOTES

- CLASS OF CONCRETE**
PRECAST PRESTRESSED BEAMS
CPCI 50 MPa
NU 70 MPa HPC
REMAINDER 30 MPa
- CLEAR COVER TO REINFORCING STEEL**
DECK TOP 70 ± 20
BOT 40 ± 10
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APPLICABLE STANDARD DRAWINGS:

OPSD 3101.150	WALL - ABUTMENT, BACKFILL MINIMUM GRANULAR REQUIREMENTS
OPSD 3370.100	DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE WITH PROTECTION BOARD
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OPSD 3390.100	DECK DRIP CHANNEL

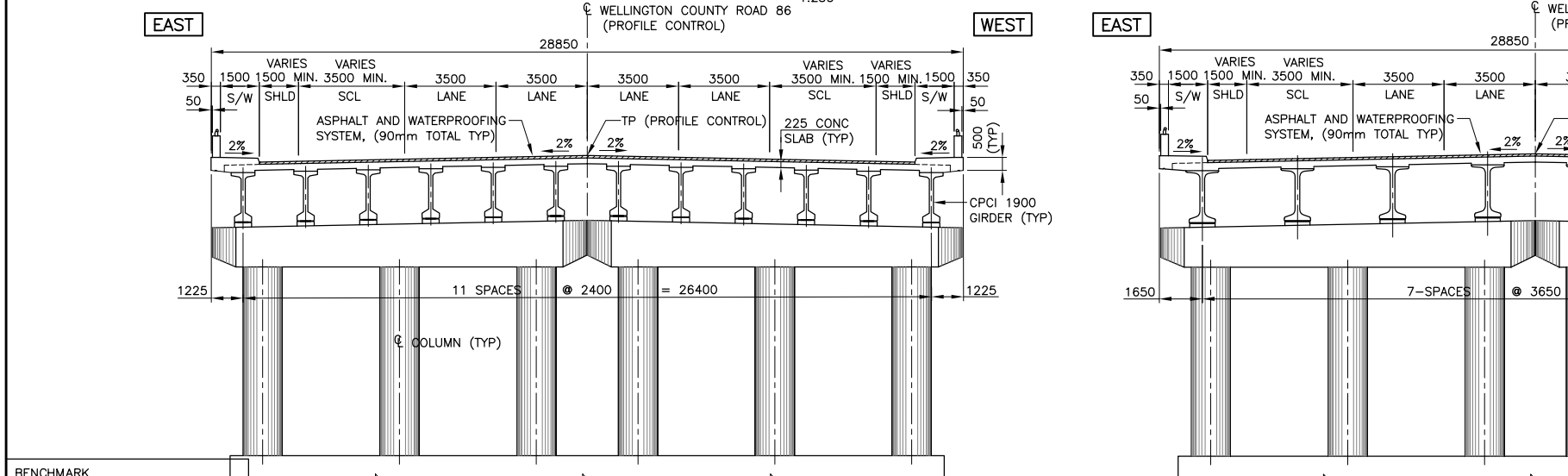
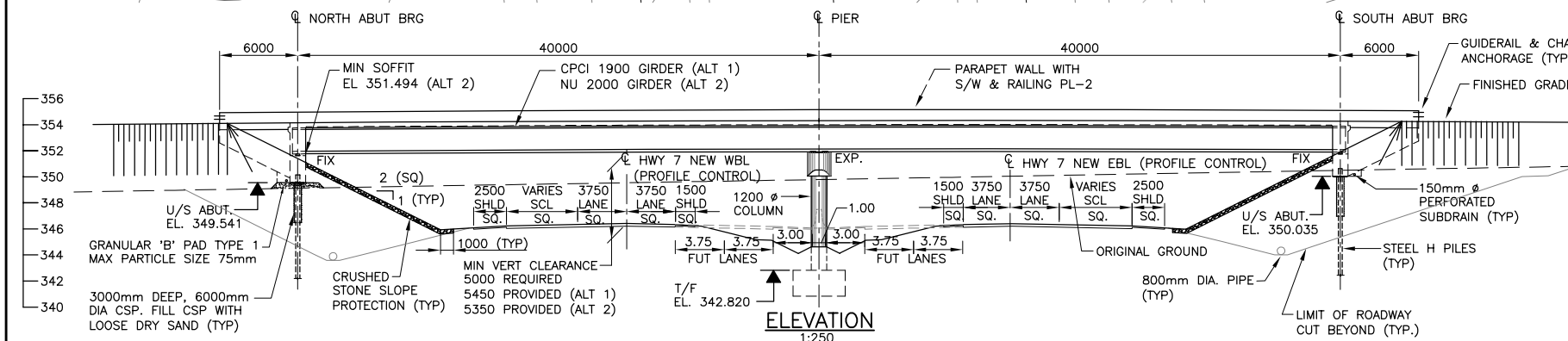
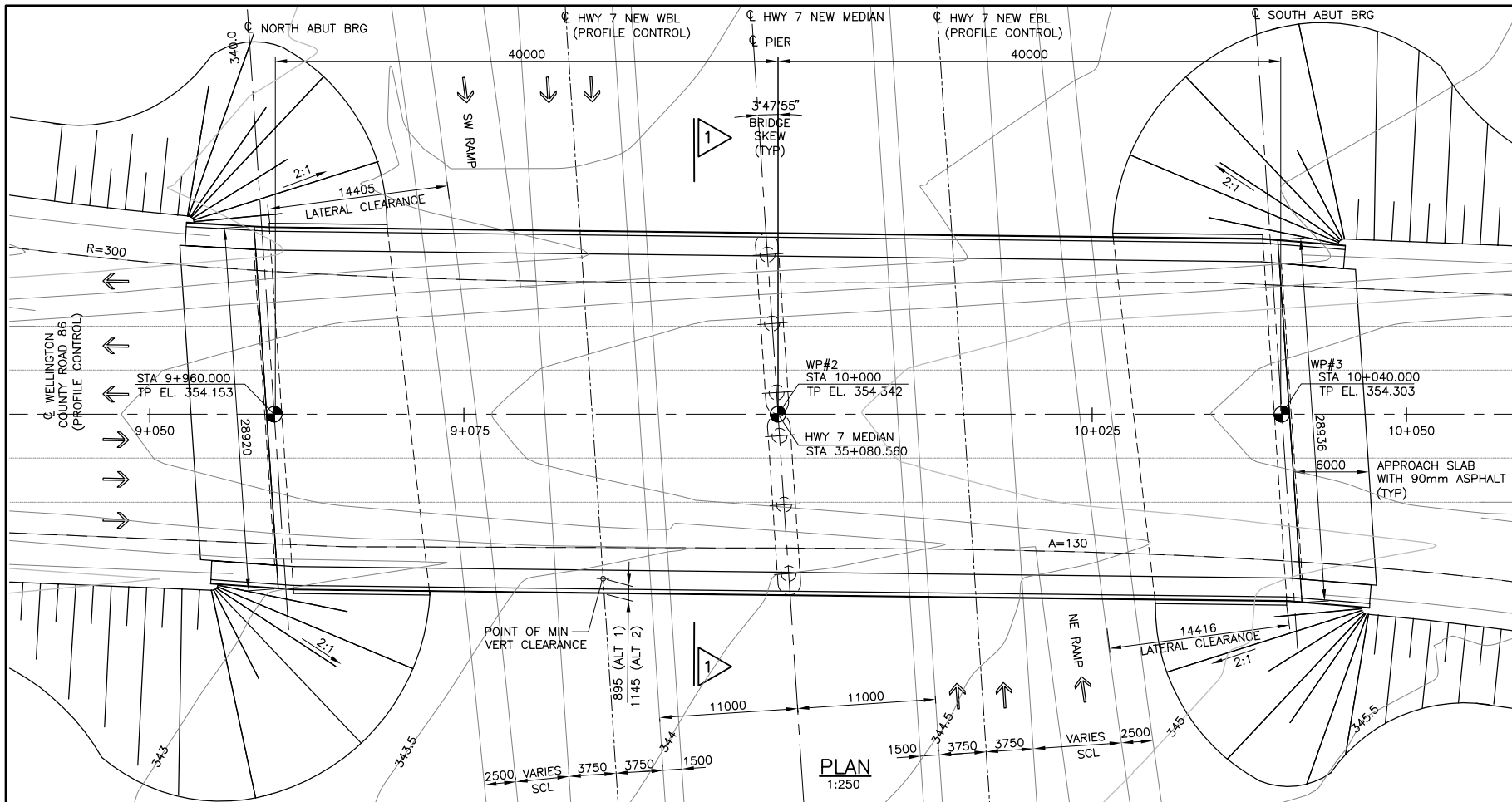
BENCHMARK
BM: 137
ELEVATION: 336.181
HCP 137
19mm x 2.0m ROUND BAR

1 (ALTERNATIVE 1)
1:100

1 (ALTERNATIVE 2)
1:100

DRAWING NOT TO BE SCALED
100 mm ON ORIGINAL DRAWING

REVISIONS	DATE	BY	DESCRIPTION
DESIGN	M.Z.	CHK A.H.	CODE CHBDC 2006[LOAD CL-625-0M]
DRAWN	D.S.	CHK M.Z.	SITE 35-605/1]STRUCT . [SCHEME . [DWG P1



BENCHMARK
BM: 139
ELEVATION: 344.414
HCP 139
19mm x 2.0m ROUND BAR

1 (ALTERNATIVE 1)
1:125

1 (ALTERNATIVE 2)
1:125

DRAWING NOT TO BE SCALED
100 mm ON ORIGINAL DRAWING

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

HWY 7 NEW
CONT No
WP No

WELLINGTON COUNTY ROAD 86
UNDERPASS
GENERAL ARRANGEMENT

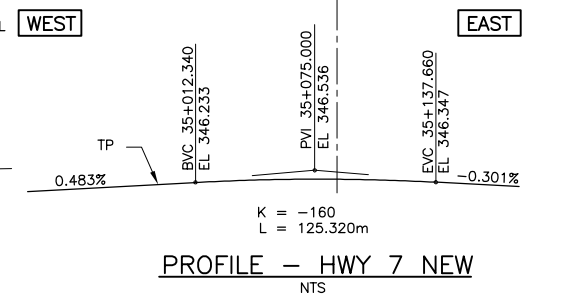
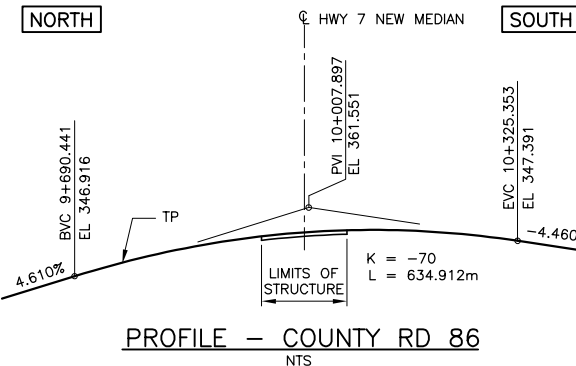


30

SHEET

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OPSD 3390.100 DECK DRIP CHANNEL



GENERAL NOTES

- CLASS OF CONCRETE
PRECAST PRESTRESSED BEAMS
CPCI 50 MPa
NU 70 MPa HPC
REMAINDER 30 MPa
- CLEAR COVER TO REINFORCING STEEL
DECK TOP 70 ± 20
BOT 40 ± 10
REMAINDER 70 ± 20 UNLESS OTHERWISE NOTED
- REINFORCING STEEL
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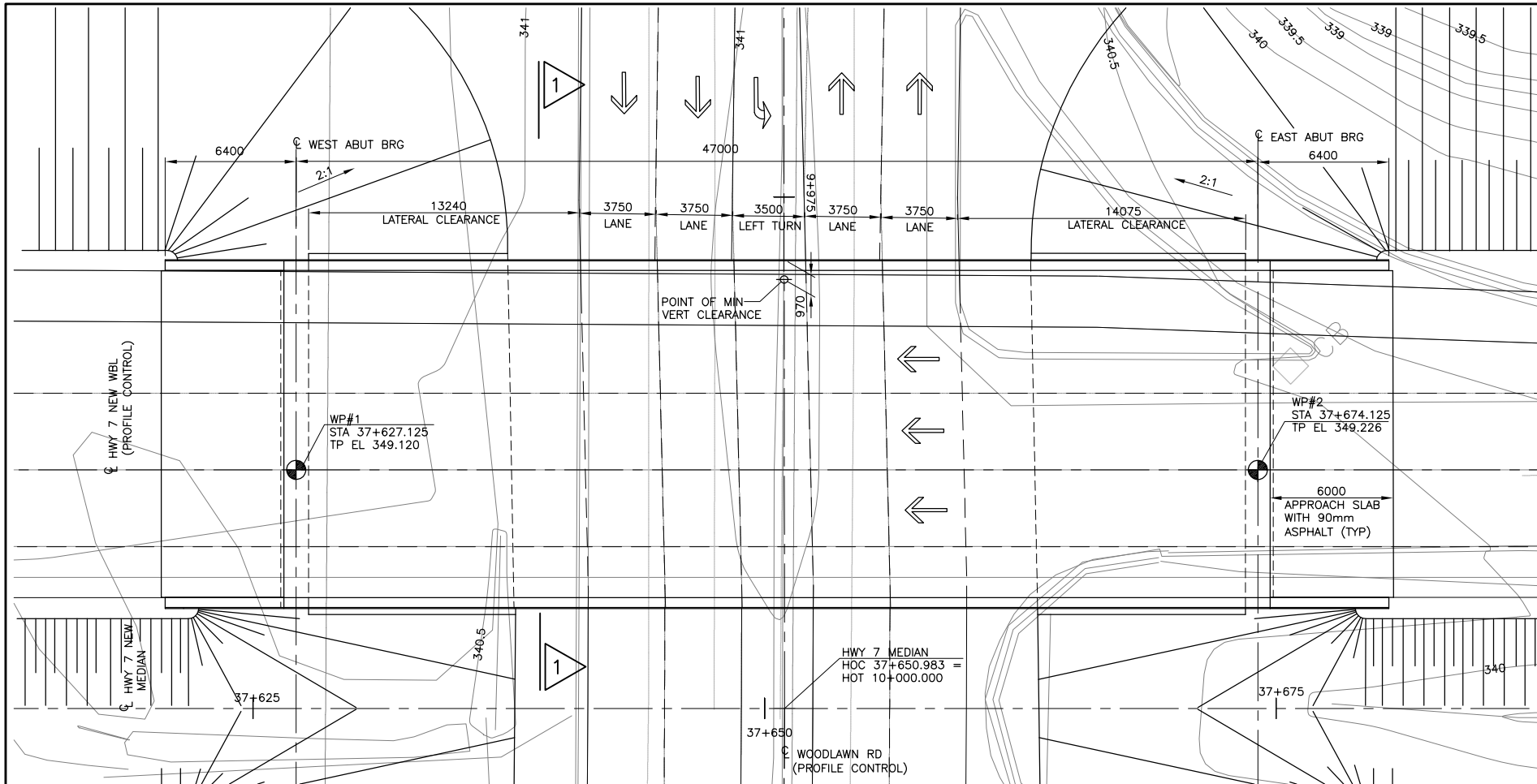
LEGEND:

- FIX FIXED
PVI POINT OF VERTICAL INTERSECTION
SCL SPEED CHANGE LANE
T/F TOP OF FOOTING

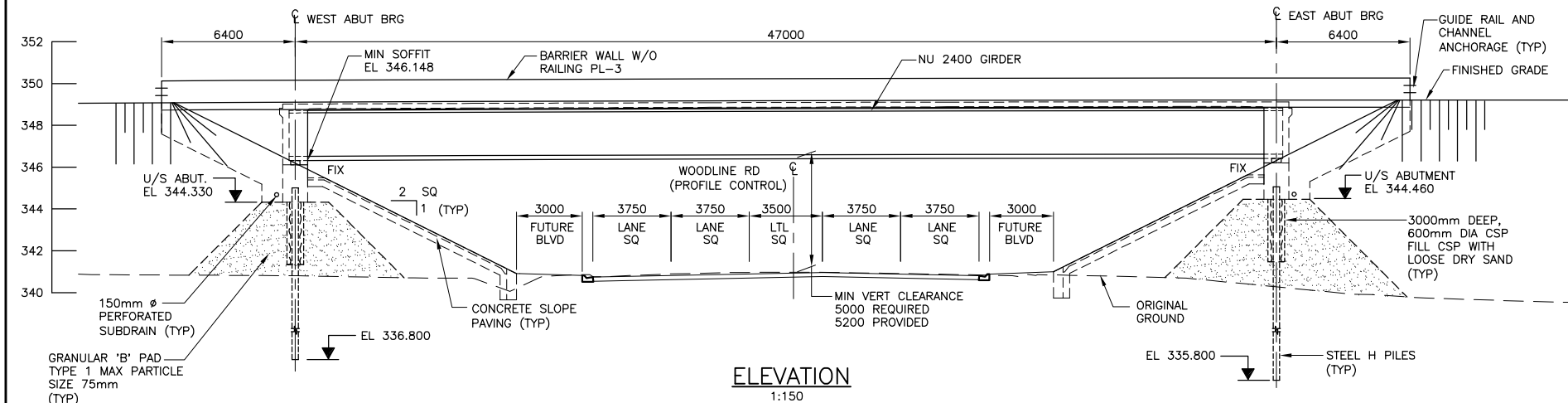
LIST OF DRAWINGS:

P1 GENERAL ARRANGEMENT

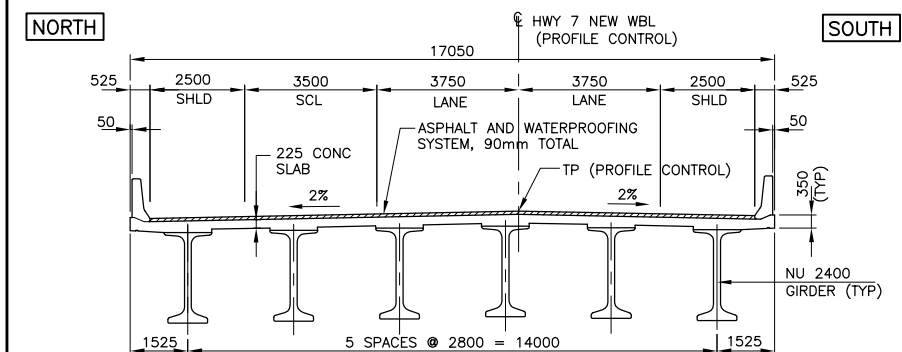
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	DATE	BY	DESCRIPTION		DATE	
			DESIGN	M.Z. CHK A.H. CODE CHBDC 2006[LOAD CL-825-0M]	DATE	JUL 2012
			DRAWN	D.S. CHK M.Z. SITE 35-606[STRUCT .]	SCHEME	DWG P1



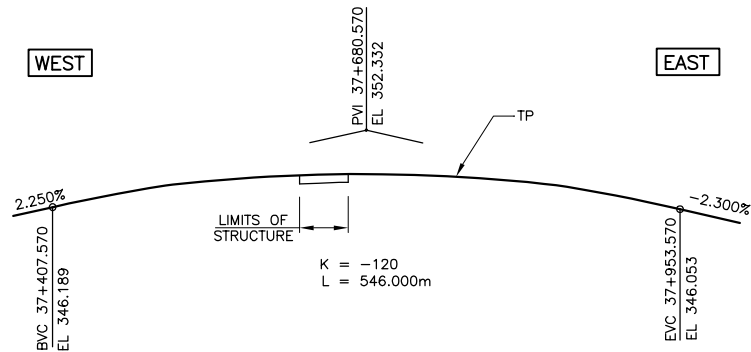
PLAN
1:150



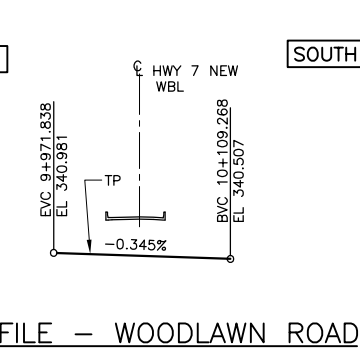
ELEVATION
1:150



1
1:100



PROFILE - HWY 7 NEW
NTS



PROFILE - WOODLAWN ROAD
NTS

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

HWY 7 NEW CONT No WP No	
WOODLAWN ROAD OVERPASS WBL GENERAL ARRANGEMENT ALTERNATIVE 2	SHEET

31

LIST OF DRAWINGS:

PB1 GENERAL ARRANGEMENT

LEGEND:

LTL LEFT TURN LANE
SCL SPEED CHANGING LANE
PVI POINT OF VERTICAL INTERSECTION

APPLICABLE STANDARD DRAWINGS:

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OPSD 3390.100 DECK DRIP CHANNEL

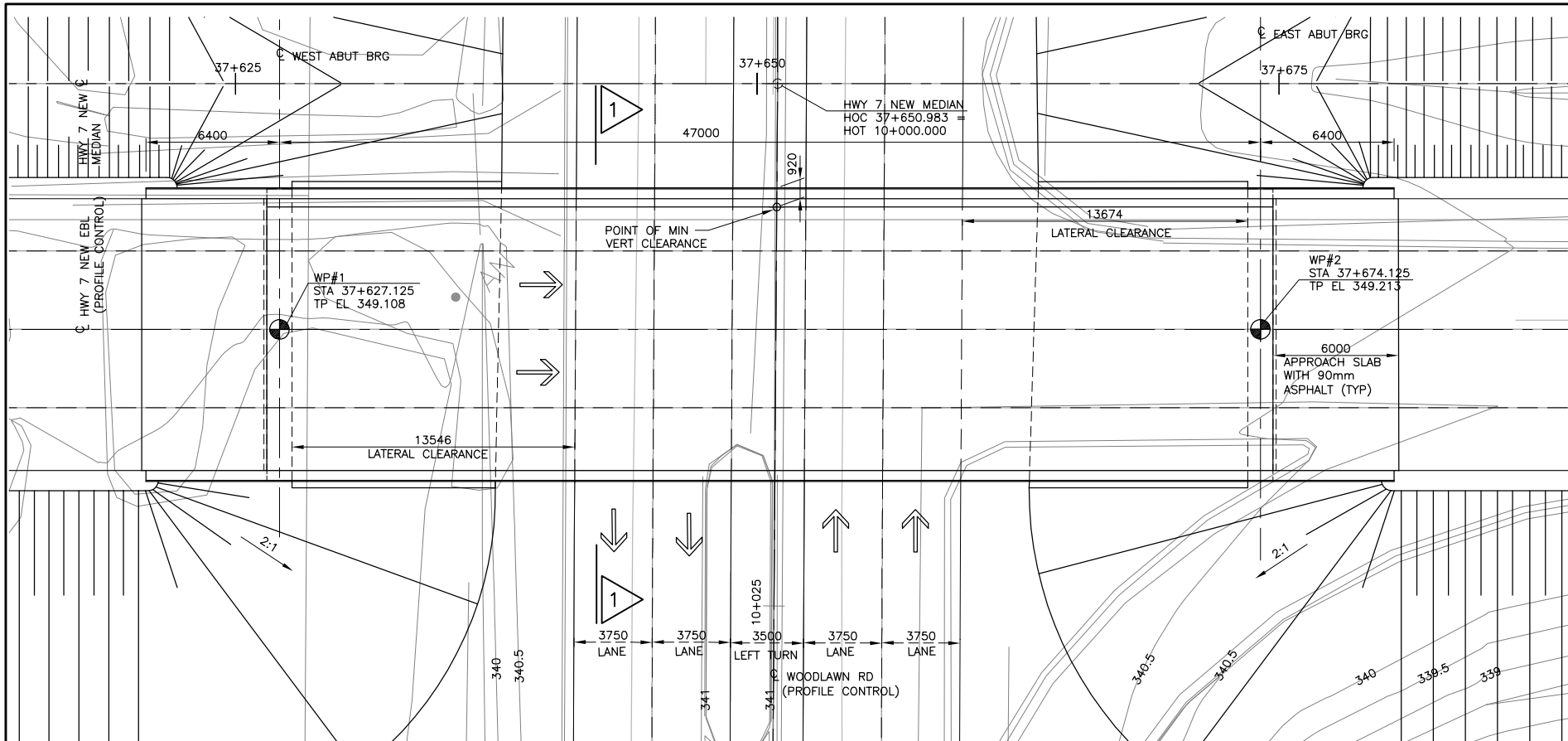
GENERAL NOTES

- CLASS OF CONCRETE
PRECAST PRESTRESSED BEAMS
CPCI 50 MPa
NU 70 MPa HPC
REMAINDER 30 MPa
- CLEAR COVER TO REINFORCING STEEL
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BOT 40 ± 10
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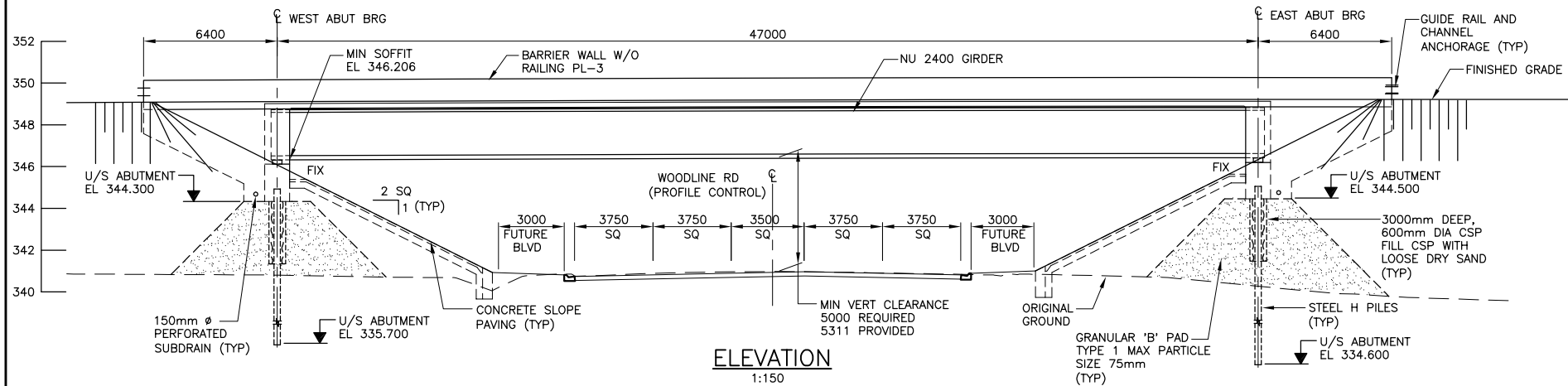
BENCHMARK
BM: 142
ELEVATION: 340.777
HCP 142
19mm x 2.0m ROUND BAR

DRAWING NOT TO BE SCALED
100 mm ON ORIGINAL DRAWING

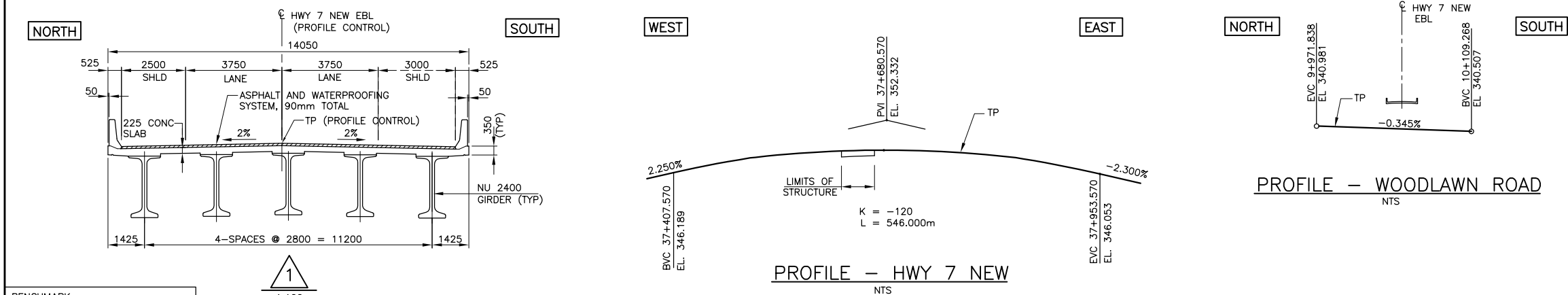
REVISIONS	DATE	BY	DESCRIPTION
DESIGN	M.Z.	CHK A.H.	CODE CHBDC 2006[LOAD CL-625-0M]
DRAWN	D.S.	CHK M.Z.	SITE 35-608/2[STRUCT . [SCHEME . [DWG PB1



PLAN
1:150



ELEVATION
1:150



PROFILE - HWY 7 NEW
NTS

PROFILE - WOODLAWN ROAD
NTS

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

HWY 7 NEW
CONT No
WP No

WOODLAWN ROAD
OVERPASS EBL
GENERAL ARRANGEMENT
ALTERNATIVE 2

MMM GROUP



32

SHEET

GENERAL NOTES

- CLASS OF CONCRETE
 - PRECAST PRESTRESSED BEAMS
 - CPCI 50 MPa
 - NU 70 MPa HPC
 - REMAINDER 30 MPa
- CLEAR COVER TO REINFORCING STEEL
 - DECK
 - TOP 70 ± 20
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 - REMAINDER 70 ± 20 UNLESS OTHERWISE NOTED
- REINFORCING STEEL

REINFORCING STEEL SHALL BE GRADE 400W UNLESS OTHERWISE SPECIFIED.

BAR MARKS WITH PREFIX 'C' DENOTE COATED BARS.

STAINLESS REINFORCING STEEL SHALL BE TYPE 316LN OR DUPLEX 2205 AND HAVE A MINIMUM YIELD STRENGTH OF 500 MPa, UNLESS OTHERWISE SPECIFIED.

BAR MARKS WITH PREFIX 'S' DENOTE STAINLESS STEEL BARS.

UNLESS SHOWN OTHERWISE, TENSION LAP SPLICES SHALL BE CLASS B.

BAR HOOKS SHALL HAVE STANDARD HOOK DIMENSIONS USING MINIMUM BEND DIAMETERS, WHILE STIRRUPS AND TIES SHALL HAVE MINIMUM HOOK DIMENSIONS, ALL HOOKS SHALL BE IN ACCORDANCE WITH THE STRUCTURAL STANDARD DRAWINGS SS12-1 AND SS12-2, UNLESS INDICATED OTHERWISE.
- GLASS FIBRE REINFORCED POLYMER (GFRP)

GFRP REINFORCING BARS SHALL BE GRADE I, GRADE II OR GRADE III AS SPECIFIED IN THE CONTRACT DOCUMENTS.

THE NOMINAL DIAMETER, TENSILE MODULUS OF ELASTICITY AND GUARANTEED MINIMUM TENSILE STRENGTH SHALL BE AS SPECIFIED IN THE CONTRACT DOCUMENTS.

BAR MARKS WITH THE PREFIX GI DENOTE GRADE I GFRP BARS, BAR MARKS WITH THE PREFIX GII DENOTE GRADE II GFRP BARS, AND BAR MARKS WITH THE PREFIX GIII DENOTE GRADE III GFRP BARS.
- CONSTRUCTION NOTES

BACKFILL SHALL NOT BE PLACED BEHIND THE ABUTMENTS UNTIL THE DECK SLAB IS IN PLACE AND HAS REACHED 25 MPa STRENGTH.

BACKFILL SHALL BE PLACED SIMULTANEOUSLY BEHIND BOTH ABUTMENTS KEEPING THE HEIGHT OF THE BACKFILL APPROXIMATELY THE SAME. AT NO TIME SHALL THE DIFFERENCE IN ELEVATION BE GRATER THAN 500mm.

CONSTRUCT ABUTMENTS AND WINGWALLS TO THE BEARING SEAT ELEVATIONS. THE CONTRACTOR SHALL SUPPLY TEMPORARY LATERAL BRACING FOR THE ABUTMENTS. FORMWORK AND LATERAL BRACING SHALL NOT BE REMOVED UNTIL THE CONCRETE IN DECK HAS REACHED 25 MPa STRENGTH.

THE CONTRACTOR SHALL ESTABLISH THE BEARING SEAT ELEVATIONS BY DEDUCTING THE ACTUAL BEARING THICKNESSES FROM THE TOP OF BEARING ELEVATIONS. IF THE ACTUAL BEARING THICKNESSES ARE DIFFERENT FROM THOSE GIVEN WITH THE BEARING DESIGNATION DATA, THE CONTRACTOR SHALL ADJUST THE REINFORCING STEEL TO SUIT.

BENCHMARK
BM: 142
ELEVATION: 340.777
HCP 142
19mm x 2.0m ROUND BAR



DRAWING NOT TO BE SCALED
100 mm ON ORIGINAL DRAWING


REVISIONS						
	DATE	BY	DESCRIPTION		DATE	
	DESIGN	M.Z.	CHK	A.H.	CODE CHBDC 2006[LOAD CL-625-0M]	DATE JUL 2012
	DRAWN	D.S.	CHK	M.Z.	SITE 35-608/1]STRUCT .	[SCHEME .
					[DWG	PB1

CULVERT No.	HWY	SITE NUMBER	STATION	SKEW NUMBER	INVERT ELEVATION (m)		ELEVATION OF NORMAL WATER LEVEL (m) (2-YEAR DESIGN FLOW)		LENGTH (m)		No. OF CELL	DIMENSIONS (mm)								MIN. DEPTH OF COVER (m)	MAX. DEPTH OF COVER (m)	WINGWALL & HEADER WALL REQ'D * (Y OR N)	WATERPROOF SYSTEM REQ'D (Y OR N)
					LEFT	RIGHT	UPSTREAM	DOWNSTREAM	'LL'	'LR'		'B'	'H'	'S'	'T'	'W'	'Wb'	'Wt1'	'd1'				
C8	HWY 7 NEW	33-513/C	23+960	112°	321.020	311.291	321.61	311.67	57.0	82.00	1	3000	1500	400	450	370	600	3000	600	9.20	13.20	N	N
C15A	HWY 7 NEW	33-517/C	26+207	97°	319.617	320.136	320.57	320.14	32.1	30.3	2	1800	1200	220	230	210	-	-	-	1.09	1.47	N	N
C16	HWY 7 NEW	33-519/C	27+594	79°	321.979	322.170	322.75	322.23	42.0	48.8	1	3500	1500	380	480	370	900	3500	650	5.80	5.90	N	N
C20	HWY 7 NEW	33-601/C	30+044	90°	328.580	329.450	329.80	328.90	48.6	47.1	1	4000	1500	410	550	390	600	3000	600	5.70	5.70	N	N
C24	HWY 7 NEW	35-603/C	31+774	92°	329.530	329.340	330.29	330.06	30.9	31.9	2	2400	1800	230	260	230	-	-	-	2.00	3.60	N	N
C33	HWY 7 NEW	32-607/C	35+895	72°	340.540	340.360	341.34	340.87	32.3	38.3	1	6000	1800	390	450	360	1400	5000	900	1.63	1.76	N	N

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

HWY 7 NEW
CONT No
WP No

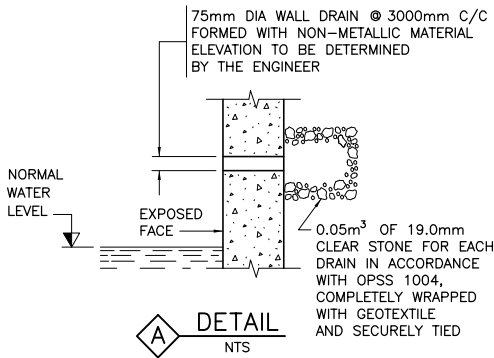
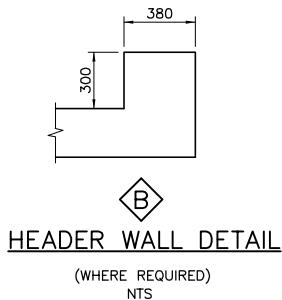
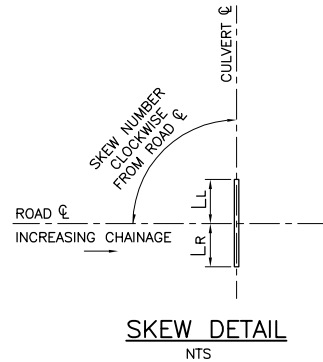
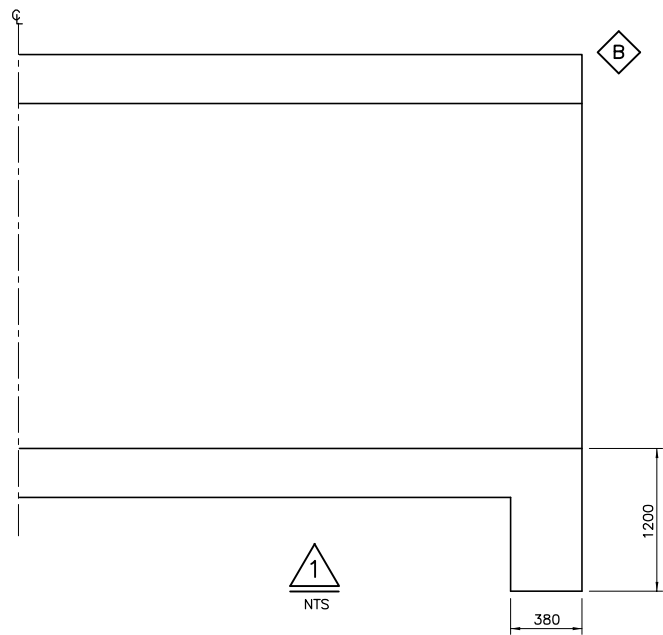
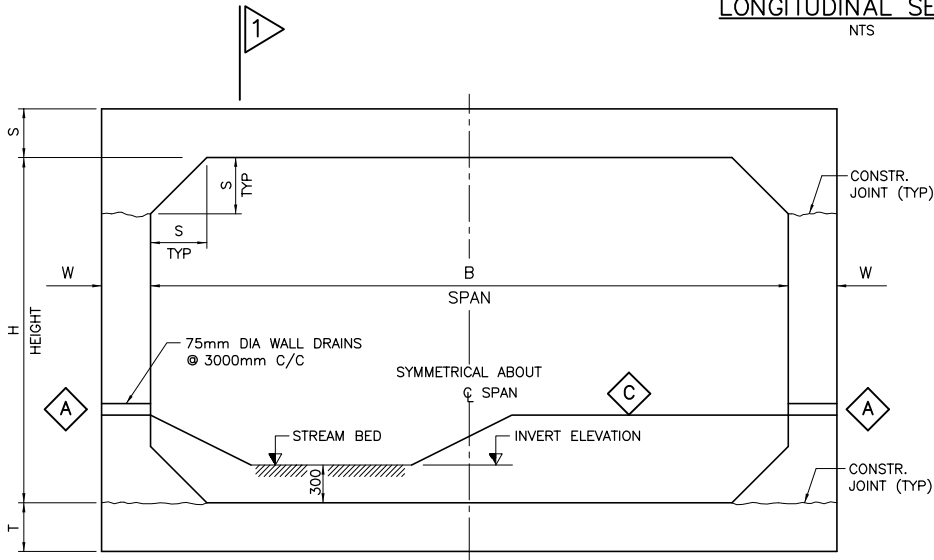
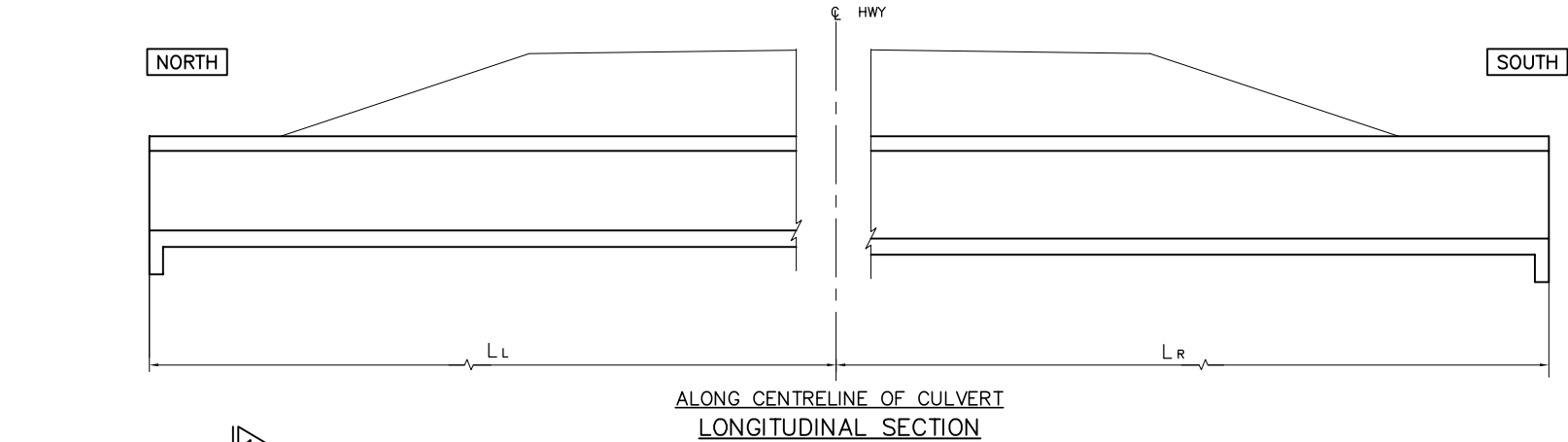
C8,C15A,C16,C20.C24 & C33
RIGID FRAME BOX CULVERT



SHEET

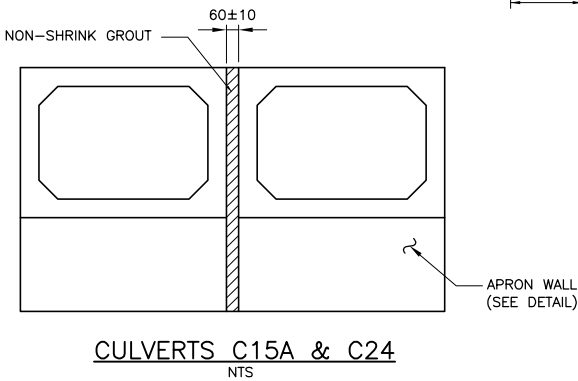
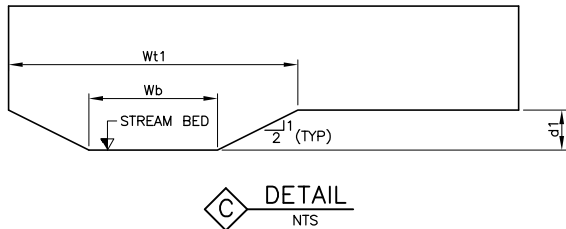
- GENERAL NOTES:
- 1 CLASS OF CONCRETE TO BE 30MPa
 - 2 CLEAR COVER TO REINFORCING STEEL
BOTTOM OF TOP SLAB 40 ± 10 FOR SLABS ≤ 300 THICK
50 ± 10 FOR SLABS > 300 THICK
BOTTOM OF BOTTOM SLAB 100 ± 25
REMAINDER 60 ± 20 UNLESS OTHERWISE NOTED
 - 3 REINFORCING STEEL SHALL BE GRADE 400W UNLESS OTHERWISE SPECIFIED.

- CONSTRUCTION NOTES:
- 1 BACKFILL SHALL BE PLACED SIMULTANEOUSLY BEHIND BOTH SIDES OF CULVERT KEEPING THE HEIGHT OF THE BACKFILL APPROXIMATELY THE SAME. AT NO TIME SHALL THE DIFFERENCE IN ELEVATION BE GREATER THAN 500mm.
 - 2 SUPPORTS FOR REINFORCING STEEL SHALL BE AS PER OPSD-3329.101 AND OPSD-3329.100 ON FORMED SURFACES. ON NON-FORMED SURFACES, CONCRETE BLOCKS (MIN. 20MPa) SHALL BE USED.



APPLICABLE STANDARD DRAWINGS
OPSD 3941.200 FIGURES IN CONCRETE SITE NUMBER AND DATE LAYOUT
OPSD 803.010 BACKFILL AND COVER FOR CONCRETE CULVERTS

MODIFIED	
STANDARD DRAWING APRIL 2011	SS114-2
RIGID FRAME BOX CULVERT	



DRAWING NOT TO BE SCALED
100 mm ON ORIGINAL DRAWING

REVISIONS		DATE		BY		DESCRIPTION	
DESIGN	CHK	CODE CHBDC 2006	LOAD CL-625-ONT	DATE	JULY 2012		
DRAWN	R.S.	CHK	SITE SEE TABLE	STRUCT	SCHEME	IDWG	1

Appendix F: Design Criteria

G.W.P. NO. 480-88-00
DISTRICT NO. Southwestern Region
HWY No. 7
TYPE OF PROJECT: G, D, GB, P, Tr. Signals, Illum. & Struct.

LOCATION: From the Kitchener-Waterloo Expressway (Highway 85) in Kitchener easterly to the Hanlon Expressway (Highway 6) in Guelph **LENGTH :** 18.5 km
LIMITS: FROM STA. 20+150 PLAN _____ TO STA. 38+590 PLAN _____

Regional Municipality of Waterloo City of Kitchener and Guelph and Town of Woolwich and Guelph-Eramosa
Highway 7

	PRESENT CONDITIONS	DESIGN STANDARDS	PROPOSED STANDARDS
HIGHWAY CLASSIFICATION	N/A	RFD 120	RFD 120 ^(a)
MINIMUM STOPPING SIGHT DISTANCE (m)	N/A	245	245
EQUIVALENT MINIMUM 'K' FACTORS	N/A	Crest – 120 Sag - 60	Crest – 120 Sag - 60
GRADES MAXIMUM (%)	N/A	3	3
MINIMUM RADIUS (m)	N/A	650	525 ^(b)
PAVEMENT WIDTH (m)	N/A	4 x 3.75	4 x 3.75
SHOULDER WIDTH (m)	N/A	1.0 m LT/ 3.0 m RT	1.5 m LT/ ^(c) 3.0 m RT
SHOULDER ROUNDING (m)	N/A	1.0	1.0
MEDIAN WIDTH (m)	N/A	22	22
R.O.W. WIDTH (m)	N/A	100	100
POSTED SPEED (km/h)	N/A	100	100 ^(d)
MISCELLANEOUS	N/A	N/A	N/A

Recommended by:

Robert Bakalarczyk, Project Engineer
Planning and Design Section

Alla Dinerman, Senior Project Manager
MMM Group Limited

Approved by:

Manager
Highway Engineering

Manager
Traffic Office

Approval Date: _____

Approval Date: _____

G.W.P. NO. 480-88-00
DISTRICT NO. Southwestern Region
HWY No. 7
TRAFFIC DATA:

Location	Traffic - AADT		
	Existing Highway 7		New Highway 7
	1999 / 2000	2021 with New Highway 7 in Place	2021
West (KWE to Grand River)	25,300 – 34,400	20,000 – 23,400	42,000 – 46,000
Central (Grand River to Guelph Road 3)	22,000 – 23,000	11,000 – 13,000	30,000 – 32,000
East (Guelph Road 3 to Hanlon Expressway)	20,500 – 26,100	20,000 – 24,000	32,000 – 35,000

Notes:

- a) This four-lane section of Highway 7 will have a functional classification of RFD120 and for purposes of Corridor Control will be designated as a controlled access facility (Class I) with access only available at interchanges. The following reduction in speed is accepted in the following zones:
 - West of Grand River Bridge, Sta. 21+100 – reduced to 110 km/h
 - North of existing Highway 7 in Guelph, Station 36+100 – reduced to 110km/h
- b) A radius curve less than the standard 650 m radius is proposed for the following curves:
 - 525 m radius - west of the Grand River (Station 20+800)
 - 575 m radius - north of existing Highway 7 in Guelph (Station 36+700)
 - This is consistent with a 110 km/h speed within reduced speed urban zone.
- c) Left shoulder is increased to 1.5 m as per current freeway standards. Both left side and right side shoulder will be fully paved.
- d) The typical posted speed will be 100 km/h; however, there will be speed reductions to 90 km/h in both the City of Kitchener and City of Guelph.

G.W.P. NO. 480-88-00
DISTRICT NO. Southwestern Region
HWY No. 7
Remarks:

1) Scope of Work

The purpose of the project is to take the approved 2004 *Highway 7 Kitchener to Guelph Amendment to the Environmental Assessment Report 1997* and develop the Initial Design (30% Detail Design).

The project involves a new controlled access highway between Kitchener and Guelph, including:

- Four-lane divided highway with a 22 m depressed median extending from Highway 85 (Kitchener-Waterloo Expressway) in Kitchener to the Highway 6 (Hanlon Expressway) in Guelph, approximately 18.5 km;
- A freeway to freeway interchange at the K-W Expressway, with local access to Wellington Street and the municipal road network;
- Planned interchanges at Bridge Street (partial), Ebycrest Road (RR17), Shantz Station Road (RR30), Elmira Road North (County Road 86) and Woodlawn Road;
- Watercourse crossings of the Grand River, Rosendale Creek, Hopewell Creek and Ellis Creek; and
- Grade separated crossings at Riverbend Drive to Shirley Ave Connection, Bridge St. Connection, Spitzig Road (Woolwich Road 66), Greenhouse Road (Woolwich Road 72), Townline Road and Guelph Road 3.

Interchanges

i) Wellington Street

	PRESENT CONDITIONS	DESIGN STANDARDS	PROPOSED STANDARDS
ROAD CLASSIFICATION	UAD 110	UAD 110	UAD110
MINIMUM STOPPING SIGHT DISTANCE	170 m	215 m	170 m ⁽¹⁾
EQUIVALENT MINIMUM 'K' FACTOR	Crest - 40 Sag - 40	Crest – 90 Sag – 50	Crest - 40 ⁽²⁾ Sag - 40
GRADES MAXIMUM	0.5 %	6 %	1.6%
MINIMUM RADIUS	Tangent	525 m	Tangent
PAVEMENT WIDTH	4 x 3.5 m	4 x 3.5 m	4 x 3.5 m
SHOULDER WIDTH	2.5m	2.5 m	2.5 m
SHOULDER ROUNDING	N/A	0.5 m	N/A
MEDIAN WIDTH	N/A	Variable	Variable
R.O.W. WIDTH	30-50m	30m	30-50 m
POSTED SPEED	60 - 90 km/h	90 km/h	60 - 90 km/h

G.W.P. NO. 480-88-00
DISTRICT NO. Southwestern Region
HWY No. 7

ii) Riverbend Drive

	PRESENT CONDITIONS	DESIGN STANDARDS	PROPOSED STANDARDS
ROAD CLASSIFICATION	RAU 50	RAU 50	RAU 50
MINIMUM STOPPING SIGHT DISTANCE	N/A	65 m	65 m
EQUIVALENT MINIMUM 'K' FACTOR	N/A	Crest – 8 Sag – 12	Crest - 30 No Sag
GRADES MAXIMUM	N/A	12 %	1.74%
MINIMUM RADIUS	N/A	90 m	100 m
PAVEMENT WIDTH	2 x 3.5 m	2 x 3.5 m	2 x 3.5 m
SHOULDER WIDTH	N/A	2.0m	2.0m
SHOULDER ROUNDING	N/A	0.5m	0.5m
MEDIAN WIDTH	N/A	N/A	N/A
R.O.W. WIDTH	18m	20m	20 m
POSTED SPEED	N/A	40 km/h	40 km/h

iii) Shirley Avenue

	PRESENT CONDITIONS	DESIGN STANDARDS	PROPOSED STANDARDS
ROAD CLASSIFICATION	RAU 70	RAU 70	RAU 70
MINIMUM STOPPING SIGHT DISTANCE	N/A	110 m	110 m
EQUIVALENT MINIMUM 'K' FACTOR	N/A	Crest – 25 Sag – 25	Crest - 30 Sag - 25
GRADES MAXIMUM	N/A	6.0 -12 %	4.2%
MINIMUM RADIUS	N/A	190 m	1500 m
PAVEMENT WIDTH	2 x 3.5 m	2 x 3.5 m	4 x 3.5 m
SHOULDER WIDTH	2.5m-3.0m	2.5m	2.5m
SHOULDER ROUNDING	0.5m	0.5m	0.5m
MEDIAN WIDTH	N/A	N/A	5m
R.O.W. WIDTH	30m	30m	30 m
POSTED SPEED	N/A	50 km/h	50 km/h

Note: Shirley Avenue will be realigned to connect with Wellington Street. The existing Shirley Avenue east of the 'button hook' will be closed and converted to a cul-de-sac.

G.W.P. NO. 480-88-00
DISTRICT NO. Southwestern Region
HWY No. 7

iv) Bridge Street Connection

	PRESENT CONDITIONS	DESIGN STANDARDS	PROPOSED STANDARDS
ROAD CLASSIFICATION	N/A	RLU 70	RLU 70
MINIMUM STOPPING SIGHT DISTANCE	N/A	110 m	110 m
EQUIVALENT MINIMUM 'K' FACTOR	N/A	Crest – 25 Sag – 25	Crest - 25 Sag - 45
GRADES MAXIMUM	N/A	6.0 -12%	4.0%
MINIMUM RADIUS	N/A	190 m	80 m
PAVEMENT WIDTH	N/A	2 x 3.5 m	2 x 3.5 m
SHOULDER WIDTH	N/A	2.5m	2.5 m
SHOULDER ROUNDING	N/A	0.5m	0.5 m
MEDIAN WIDTH	N/A	N/A	N/A
R.O.W. WIDTH	N/A	20m	20 m
POSTED SPEED	N/A	50 km/h	50 km/h

v) Ebycrest Road (Regional Road 17)

	PRESENT CONDITIONS	DESIGN STANDARDS	PROPOSED STANDARDS
ROAD CLASSIFICATION	RAU 100	RAU 100	RAU 100
MINIMUM STOPPING SIGHT DISTANCE	N/A	185 m	185 m
EQUIVALENT MINIMUM 'K' FACTOR	N/A	Crest –70 Sag – 45	Crest - 70 Sag - 45
GRADES MAXIMUM	2.2%	6.0 - 8.0%	3.0%
MINIMUM RADIUS	1500 m	420 m	450 m
PAVEMENT WIDTH	2 x 3.5 m	2 x 3.5 m	2 x 3.5 m
SHOULDER WIDTH	2.5-3.0m	2.5m	2.5m
SHOULDER ROUNDING	0.5m	0.5m	0.5m
MEDIAN WIDTH	N/A	N/A	N/A
R.O.W. WIDTH	26 m	30m	30 m
POSTED SPEED	80 km/h	80km/h	80 km/h

Note: South of the interchange Ebycrest Road is realigned to connect with the Fountain Street extension. The existing Ebycrest Road intersection at existing Highway 7 will be closed and converted to a cul-de-sac.

G.W.P. NO. 480-88-00
DISTRICT NO. Southwestern Region
HWY No. 7

vi) Shantz Station Road (Regional Road 30)

	PRESENT CONDITIONS	DESIGN STANDARDS	PROPOSED STANDARDS
ROAD CLASSIFICATION	RAU 80	RAU 80	RAU 80
MINIMUM STOPPING SIGHT DISTANCE	N/A	135 m	135 m
EQUIVALENT MINIMUM 'K' FACTOR	N/A	Crest – 35 Sag – 30	Crest –35 Sag - 30
GRADES MAXIMUM	0.5%	6.0 %	4.0%
MINIMUM RADIUS	100 m	250 m	135m ⁽³⁾
PAVEMENT WIDTH	2 x 3.5 m	2 x 3.5 m	2 x 3.5 m
SHOULDER WIDTH	2.5m	2.5m	2.5m
SHOULDER ROUNDING	0.5m	0.5m	0.5m
MEDIAN WIDTH	N/A	N/A	N/A
R.O.W. WIDTH	25 m	35m	35 m
POSTED SPEED	60 km/h	60 km/h	60 km/h

vii) Country Road 86 (Elmira Road)

	PRESENT CONDITIONS	DESIGN STANDARDS	PROPOSED STANDARDS
ROAD CLASSIFICATION	RAU 100	RAU 100	RAU 100
MINIMUM STOPPING SIGHT DISTANCE	N/A	185 m	185 m
EQUIVALENT MINIMUM 'K' FACTOR	N/A	Crest –70 Sag – 45	Crest - 70 Sag - 30 ⁽⁴⁾
GRADES MAXIMUM	3 %	6.0%	4.6%
MINIMUM RADIUS	Tangent	420 m	Tangent
PAVEMENT WIDTH	2 x 3.5 m	2 x 3.50 m	4 x 3.50 m
SHOULDER WIDTH	3.5m	2.5m	2.5m
SHOULDER ROUNDING	0.5m	0.5m	0.5m
MEDIAN WIDTH	N/A	N/A	N/A
R.O.W. WIDTH	36 m	36 m	36 m
POSTED SPEED	80 km/h	80km/h	80 km/h

G.W.P. NO. 480-88-00
DISTRICT NO. Southwestern Region
HWY No. 7

viii) Woodlawn Road

	PRESENT CONDITIONS	DESIGN STANDARDS	PROPOSED STANDARDS
ROAD CLASSIFICATION	UAU 80	UAU 80	UAU 80
MINIMUM STOPPING SIGHT DISTANCE	415 m	135 m	415 m
EQUIVALENT MINIMUM 'K' FACTOR	Crest – 40 Sag – 30	Crest – 35 Sag – 30	Crest – 40 Sag – 30
GRADES MAXIMUM	0.93%	6.0%	0.93%
MINIMUM RADIUS	Tangent	420 m	Tangent
PAVEMENT WIDTH	4 x 3.75 m	4 x 3.75 m	4 x 3.75 m
SHOULDER WIDTH	N/A	2.5m	N/A
SHOULDER ROUNDING	N/A	0.5m	N/A
MEDIAN WIDTH	N/A	N/A	N/A
R.O.W. WIDTH	30 – 40 m	30-40 m	30 –40 m
POSTED SPEED	60 km/h	60km/h	60 km/h

Sideroads

i) Spitzig Road (Woolwich Road 66)

Spitzig Road will pass over future Highway 7 via a new structure. A total of two 3.50 m lanes with 2.5 m shoulders and will be protected on a nominal 20 m right-of-way.

	PRESENT CONDITIONS	DESIGN STANDARDS	PROPOSED STANDARDS
ROAD CLASSIFICATION	RCU 70	RCU 70	RCU 70
MINIMUM STOPPING SIGHT DISTANCE	110 m	110 m	110m
EQUIVALENT MINIMUM 'K' FACTOR	Crest – 15 Sag – 18	Crest – 25 Sag – 25	Crest – 25 Sag – 25
GRADES MAXIMUM	N/A	6.0 %	3.5%
MINIMUM RADIUS	N/A	190 m	700m
PAVEMENT WIDTH	2 x 3.3m	2 x 3.5 m	2 x 3.5 m
SHOULDER WIDTH	1.5m	2.5m	2.5m
SHOULDER ROUNDING	0.5m	0.5m	0.5m
MEDIAN WIDTH	N/A	N/A	N/A
R.O.W. WIDTH	20m	20m	20m
POSTED SPEED	50km/h	50 km/h	50km/h

G.W.P. NO. 480-88-00
DISTRICT NO. Southwestern Region
HWY No. 7

ii) Greenhouse Road (Woolwich Road 72)

Greenhouse will pass over future Highway 7 via a new structure. A total of two 3.50 m lanes with 2.5 m shoulders and will be protected on a nominal 40m right-of-way.

	PRESENT CONDITIONS	DESIGN STANDARDS	PROPOSED STANDARDS
ROAD CLASSIFICATION	RCU 70	RCU 70	RCU 70
MINIMUM STOPPING SIGHT DISTANCE	N/A	110 m	110m
EQUIVALENT MINIMUM 'K' FACTOR	Crest – 15 Sag – 18	Crest – 25 Sag – 25	Crest – 40 No sag
GRADES MAXIMUM	N/A	6.0 %	4.16%
MINIMUM RADIUS	N/A	190 m	1050m
PAVEMENT WIDTH	N/A	2 x 3.5 m	2 x 3.5 m
SHOULDER WIDTH	N/A	2.5m	2.5m
SHOULDER ROUNDING	N/A	0.5m	0.5m
MEDIAN WIDTH	N/A	N/A	N/A
R.O.W. WIDTH	12m	20 – 30m	40 – 50m
POSTED SPEED	50km/h	50 km/h	50km/h

iii) Townline Road

Townline Road will pass over future Highway 7 via a new structure. A total of two 3.50 m lanes with 2.5 m shoulders and will be protected on a nominal 40 m right-of-way.

	PRESENT CONDITIONS	DESIGN STANDARDS	PROPOSED STANDARDS
ROAD CLASSIFICATION	RCU 70	RCU 70	RCU 70
MINIMUM STOPPING SIGHT DISTANCE	110 m	110 m	110m
EQUIVALENT MINIMUM 'K' FACTOR	Crest – 15 Sag – 18	Crest – 25 Sag – 25	Crest – 30 Sag – 25
GRADES MAXIMUM	N/A	6.0 %	5.14%
MINIMUM RADIUS	N/A	190 m	tangent
PAVEMENT WIDTH	N/A	2 x 3.5 m	2 x 3.5 m
SHOULDER WIDTH	N/A	2.5m	2.5m
SHOULDER ROUNDING	N/A	0.5m	0.5m
MEDIAN WIDTH	N/A	N/A	N/A
R.O.W. WIDTH	16m	20 – 30m	40 – 50m
POSTED SPEED	50km/h	50 km/h	50km/h

G.W.P. NO. 480-88-00
DISTRICT NO. Southwestern Region
HWY No. 7

iv) Guelph Road 3

Guelph Road 3 will pass over future Highway 7 via a new structure. A total of two 3.50 m lanes with 2.5 m shoulders and will be protected on a nominal 20 m right-of-way.

	PRESENT CONDITION	DESIGN STANDARD	PROPOSED STANDARD
ROAD CLASSIFICATION	RCU 70	RCU 70	RCU 70
MINIMUM STOPPING SIGHT DISTANCE	N/A	110 m	110m
EQUIVALENT MINIMUM 'K' FACTOR	N/A	Crest – 25 Sag – 25	Crest – 35 No Sag
GRADES MAXIMUM	N/A	6.0-12.0 %	6.06 %
MINIMUM RADIUS	N/A	190 m	Tangent
PAVEMENT WIDTH	2 x 3.25m	2 x 3.5 m	2 x 3.5 m
SHOULDER WIDTH	2.5m	2.5m	2.5m
SHOULDER ROUNDING	0.5m	0.5m	0.5m
MEDIAN WIDTH	N/A	N/A	N/A
R.O.W. WIDTH	20m	20-26m	30m
POSTED SPEED	50 km/h	50 km/h	50 km/h

v) Curts Drive

Curtis Drive will be closed.

G.W.P. NO. 480-88-00
DISTRICT NO. Southwestern Region
HWY No. 7
Wellington Street Interchange Ramps

		E-S	S-E	E-N	N-E	N-E/W
	PRESENT CONDITIONS	PROPOSED STANDARDS	PROPOSED STANDARDS	PROPOSED STANDARDS	PROPOSED STANDARDS	PROPOSED STANDARDS
DESIGN SPEED	N/A	80 km/h	80 km/h	80 km/h	80 km/h	80 km/h
MINIMUM STOPPING SIGHT DISTANCE	N/A	135 m	105m ⁽⁶⁾	135 m	135 m	105 m ⁽⁹⁾
EQUIVALENT MINIMUM 'K' FACTOR	N/A	C-35 S-25	C-20 ⁽⁷⁾ S-20	C-80 S-50	C - 35 S-30	C-35 S-30
GRADES MAXIMUM	N/A	5.5 %	5.75 %	2.8 %	4.5 %	3.9%
MINIMUM RADIUS	N/A	250 m	250 m	200 m ⁽⁸⁾	250 m	90m ⁽¹⁰⁾
PAVEMENT WIDTH	N/A	2 x 3.75 m	2 x 3.75 m	4.75 m	4.75 m	4.75 m
SHOULDER WIDTH	N/A	2.5 m RT 1.0 m LT ⁽⁵⁾	2.5 m RT 1.0 m LT	2.5 m RT 1.0 m LT	2.5 m RT 1.0 m LT	2.5 m RT 1.0 m LT
SHOULDER ROUNDING	N/A	0.5 m	0.5 m	0.5 m	0.5 m	0.5 m
MEDIAN WIDTH	N/A	N/A	N/A	N/A	N/A	N/A
R.O.W. WIDTH	N/A	N/A	Varies	Varies	N/A	Varies
POSTED SPEED	N/A	60 km/h	60 km/h	60 km/h	60 km/h	60 km/h

	WELLINGTON ST TO EDNA ST CONNECTION		WELLINGTON ST TO VICTORIA ST CONNECTION	
	PRESENT CONDITION	PROPOSED STANDARDS	PROPOSED STANDARDS	
DESIGN SPEED	N/A	60 km/h ⁽¹¹⁾	60 km/h	
MINIMUM STOPPING SIGHT DISTANCE	N/A	85 m	85 m	
EQUIVALENT MINIMUM K FACTOR	N/A	C-30 S-30	S – 20	
GRADES MAXIMUM	N/A	4.5 %	5.1%	
MINIMUM RADIUS	N/A	140 m	130 m	
PAVEMENT WIDTH	N/A	2 x 3.5 m	2 x 3.5 m	
SHOULDER WIDTH	N/A	2.5 m	2.5m ⁽¹⁰⁾	
SHOULDER ROUNDING	N/A	0.5 m	0.5 m	
MEDIAN WIDTH	N/A	N/A	N/A	
R.O.W. WIDTH	N/A	Varies	Varies	
POSTED SPEED	N/A	50 km/h	50 km/h	

Notes:

- (1) The standard minimum stopping sight distance is 215 m for a 110 km/h design speed. The existing Wellington Street profile is being maintained across the Kitchener - Waterloo Expressway, therefore, no improvements to the minimum stopping sight distance are proposed. The existing minimum stopping sight distance provides for a design speed that is approximately equal to the posted speed (60 - 90 km/h). Wellington Street will be an arterial road and the design speed could be reduced to 90 km/h.
- (2) The standard vertical crest and sag curve for a 110 km/h design speed is K = 90 and K= 50, respectively. The existing Wellington Street profile is being maintained across the Kitchener-Waterloo Expressway, therefore, no improvements to the vertical geometry are being proposed. Wellington Street will be an arterial road and the design speed could be reduced to 90 km/h.
- (3) The desirable radius for an 80 km/h design speed is 250 m. In order to maintain existing Shantz Station Road alignment, the minimum radius will be 135m.
- (4) The standard sag curve for a 100 km/h design speed is K= 45. In order to minimize the impact to property, the sag curve will be K = 30.

G.W.P. NO. 480-88-00DISTRICT NO. Southwestern RegionHWY No. 7

- (5) E-S ramp left shoulder will be 3.0m on the bridge due to sight line requirement.
- (6) The minimum stopping sight distance is 135 m for an 80 km/h design speed. In order to provide the S-E ramp connection between the Kitchener - Waterloo Expressway and proposed Highway 7, as well as fit through an existing structure, the vertical geometry was reduced and as a result the minimum stopping sight distance was reduced. The proposed minimum stopping sight distance provides for a design speed that is greater than the posted speed (60 km/h).
- (7) The standard vertical crest and sag curve for an 80 km/h design speed is $K = 35$ and $K = 30$, respectively. In order to provide the S-E ramp connection between the Kitchener - Waterloo Expressway and proposed Highway 7 as well as fit through an existing structure, the vertical geometry was reduced. The proposed vertical geometry provides for a design speed that is greater than the posted speed (60 km/h).
- (8) The desirable radius for an 80 km/h design speed is 250 m, and the minimum acceptable radius is 200 m. In order to reduce property impacts adjacent to the E-N ramp the minimum radius was used.
- (9) The minimum stopping sight distance is 135 m for an 80-km/h-design speed. In order to provide the N - E/W ramp connection and maintain the existing intersection with Wellington Street the vertical geometry was reduced and as a result the minimum stopping sight distance was reduced. The proposed minimum stopping sight distance provides for a design speed that is greater than the posted speed (60 km/h).
- (10) The desirable radius for an 80-km/h-design speed is 250 m, and the minimum acceptable radius is 200 m. In order to reduce property impacts adjacent to the N-E/W ramp and maintain the existing intersection with Wellington Street the existing 90 m radius was maintained.
- (11) Right shoulder will be 3.5m under the bridge due to northbound sight line requirement.

2) Limits of Project

The limits of the project extend from the Kitchener-Waterloo Expressway (Sta. 20+150) in the City of Kitchener easterly to the Hanlon Expressway (38+585) in the City of Guelph.

3) Adjacent Projects/History

- MTO GWP 44-88-00 and 44-88-01 - Upgrading the Hanlon Expressway (Highway 6) between Woodlawn Road (Highway 7) ' and Highway 401 to a fully controlled access highway.
- MTO GWP 65-76-05 - Highway 6 realignment between Maddaugh Road (Highway 6 south) and Wellington Road 34 (at the Hanlon Expressway)
- MTO GWP 14-00-00 - Northerly Extension of the Hanlon Expressway (Highway 6) to Highway 6 at Marden Region of Waterloo - construction of Breslau Bypass from Highway 7 southerly.

4) Construction Staging

Staging of construction suggested in the EA based on conventional contract bidding is from the Wellington Street interchange in Kitchener easterly to Speedvale Avenue in Guelph. The staging plan has the project being completed in three phases. The first phase would be the middle (Central) section of the highway, the second phase would be at the western end and the third phase would be at the eastern end. Three phasing sections are:

Central from Regional Road 17 interchange to County Road 86

1. Complete construction (including structures) from Regional Road 17 easterly to Regional Road 30.
2. Complete construction (including structures) from Regional Road 30 easterly to County Road 86.

West from KWE interchange to Regional Road 17

3. Structures from KWE easterly to and including Regional Road 17 (advance contract).
4. Grading, granular and paving of highway from KWE easterly to Regional Road 17.

East from County Road 86 interchange to Woodlawn Road/Highway 6

5. Complete construction (including structures) from County Road 86 (Elmira Road) easterly then southerly to connection with Hanlon Expressway, north of the proposed Speedvale Avenue interchange.

5) Property

Property to accommodate the Highway right-of-way, interchanges, and storm water management facilities will be

G.W.P. NO. 480-88-00
DISTRICT NO. Southwestern Region
HWY No. 7

purchased prior to construction. It is expected that property acquisition will commence fall 2011.

6) Illumination

Specific illumination requirements to be determined during detail design.

7) Traffic Signals

The traffic signals within the new Highway 7 corridor will be provided in the future when warranted at the following locations:

- Wellington Street / N-E/W ramp /Edna Street connector road
- Wellington Street / Bruce Street Extension / KWE ramp terminal
- Woodlawn Road / N-W/E ramp / E-S ramp

Underground provisions at each of the interchange ramp terminal intersection should be considered in detail design.

8) Freeway Traffic Management System

A Freeway Traffic Management System is not being considered on this project.

9) Traffic Counting Stations

Specific traffic counting station locations to be determined during detailed design.

10) Structures

Structural Reference Number (SRN)	Location	Site No	Structural Reference Number (SRN)	Description	Site No
Bridges					
1	N-E/W Ramp over Guelph St.	33-525	17	Bridge Street Connection Underpass	33-511
2	E-N Ramp over Guelph St.	33-328	18	Rosendale Creek Bridge WBL	33-512/C
3	N-E Ramp over KWE – Options 1 and 2	33-506	19	Rosendale Creek Bridge EBL	33-512/C
4	E-S Ramp over KWE – Options 1 and 2	33-505	20	Ebycrest Road Underpass	33-514
5	N-E Ramp – Ramp Overpass – Options 1, 2, 3 and 4	33-507	21	Spitzig Road Underpass	33-515
6	S-E Ramp over Wellington St.	33-508	22	Hopewell Creek Bridge WBL	33-516/2
7	CNR Subways – West Side – Edna St. Connection	33-521	23	Hopewell Creek Bridge EBL	33-516/1
8	CNR Subways – West Side – E-S Ramp Subway	33-522	24	Greenhouse Road Underpass	33-518
9	CNR Subways – East Side – S-E Ramp Subway	33-523	25	Shantz Station Road Underpass	33-520
10	CNR Subways – East Side – Bruce St. Subway	33-524	26	Townline Road Underpass	35-602
11	Victoria Street Underpass	33-235	27	Guelph Road 3 Underpass	35-604
12	Frederick Street Underpass	33-234	28	Ellis Creek Bridge WBL	35-605/2
13	Riverbend Drive Overpass WBL	33-509/2	29	Ellis Creek Bridge EBL	35-605/1

G.W.P. NO. 480-88-00
DISTRICT NO. Southwestern Region
HWY No. 7

14	Riverbend Drive Overpass EBL	33-509/1	30	County Road 86 Underpass	35-606
15	Grand River Bridge WBL – Options 1, 2 and 3	33-510/2	31	Woodlawn Road Overpass WBL	35-608/2
16	Grand River Bridge EBL – Options 1, 2 and 3	33-510/1	32	Woodlawn Road Overpass EBL	35-608/1
Culverts					
	Culvert C8	33-513/C		Culvert C20	33-601/C
	Culvert C15A	33-517/C		Culvert C24	33-603/C
	Culvert C16	33-519/C		Culvert C33	33-607/C

11) Private/Commercial Entrances

Highway 7 is being planned as a Controlled Access Highway; therefore, there would be no direct access from private or commercial entrances. Access only provided via interchanges.

12) Railways

There will be four new crossings of a CN subdivision main line in the City of Kitchener in the vicinity of the Kitchener-Waterloo interchange, which are Edna St Connection, E-S Ramp, S-E Ramp and Victoria St Connection.

The 'spur lines' south of Woodlawn Road in Guelph cross the Hanlon Expressway at two locations. It is proposed to close the northerly one of these lines when Highway 7 is constructed.

13) River Crossings

There will be watercourse crossings of the Grand River, Rosedale Creek, Hopewell Creek, and Ellis Creek. Structure openings could be found in structure GAs.

14) Utilities

Local utilities, such as watermain, sewers, telephone, etc., are located within the roadway rights-of-way in urban areas (Kitchener and Guelph). In rural areas the utilities are limited to aerial hydro and telephone lines. Utility authorities will need to be contacted during detail design phase.

15) Pedestrian Trail

Provisions for pedestrian trails within the new Highway 7 right-of-way are not being considered for this project. The Walter Bean Trail will cross the right-of-way under the proposed Grand River Bridge.

16) Pipe Lines

There are no pipeline crossings on this project.

17) Municipal Drains

There are no municipal drains within the limits of this project.

18) Drainage

Drainage work will consist of roadway ditches, culverts, and flat bottom swales for water quality enhancement and several storm water management facilities.

Preliminary sizing for centerline culverts to maintain the external drainage system has been completed to meet hydraulic capacity requirement and to ensure compatibility with the recommended design.

G.W.P. NO. 480-88-00**DISTRICT NO.** Southwestern Region**HWY No.** 7

A preliminary stormwater management strategy include storm sewers in urban areas, ponds and enhanced grass swales to provide water quality, quantity and erosion treatment using best management practices.

Internal drainage culverts for the highway will need to be sized during detail design.

19) Signing

Signing will be constructed to current standards.

Overhead signing will be provided for the ultimate highway design. Overhead signs should be incorporated with the interchange at the Kitchener-Waterloo Expressway (Highway 85), and with the interchange at the Hanlon Expressway.

20) Sidewalks

There will not be any sidewalks on this project, with the exception of sidewalks on structures.

21) Patrol Yards

The requirement for patrol yards will be investigated during detail design.

22) Landscaping

A detailed landscaping plan will be developed during detail design.

23) Bicycle Transportation

Provisions for bicycle paths within the new Highway 7 right-of-way are not being considered for this project.

24) Transit

Transit is not being considered for this project.

25) Environmental Assessment

This Highway 7 project is subject to the formal requirements of the Environmental Assessment Act. An amendment to the Environmental Assessment Report was submitted to the Ministry of Environment (MOE) and upon a 30-day review period found that it meets all EA requirements. This project may now proceed to construction. Following this approval, Design and Construction Report(s) will be prepared as required to document detail design and contract preparation.

26) Legal Agreements

There are no legal agreements for this project at this time.

27) Connecting Links

Not applicable.

28) Assumptions, Designations, Transfers and Closures

Temporary assumptions of portions of municipal roads will be required to carry out construction. Portions of roadways not required for highway purposes will be reverted to the municipalities upon completion of construction.

Roads affected are:

- | | | |
|---------------------|--------------------|-----------------------------|
| • Wellington Street | • Regional Road 17 | • Guelph Road 3 |
| • Riverbend Drive | • Woolwich Road 66 | • Wellington County Road 86 |
| • Shirley Avenue | • Woolwich Road 72 | • Silvercreek Parkway |
| • Bruce Street | • Regional Road 30 | • Curtis Drive |
| • Bridge Street | • Townline Road | • Woodlawn Road |
| • Victoria Street | • Frederick Street | • Edna Street |
| • Ann Street | | |

G.W.P. NO. 480-88-00**DISTRICT NO.** Southwestern Region**HWY No.** 7

Riverbend Drive, in Kitchener, at future Highway 7 will be closed. Traffic will be realigned to use a new crossing road. Curtis Drive, in Guelph, will also be closed.

Existing Highway 7 will be transferred to local municipal jurisdiction upon completion of the Highway 7 realignment.

29) Initial Design Report

As part of the Environmental Assessment Study, the initial design of Highway 7 and associated interchanges was carried out and documented in the Initial Design Report.