THE GORE ROAD IMPROVEMENTS CLASS ENVIRONMENTAL STUDY REPORT FROM PATTERSON SIDE ROAD TO HIGHWAY 9

APPENDICES:

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[THE DIFFERENCE IS OUR PEOPLE]

Appendix A

Road Safety

A1 Road Safety Audit

A2 White-Tailed Deer Motor Vehicle Collisions Report - Town of Caledon

BURNSIDE
[THE DIFFERENCE IS OUR PEOPLE]

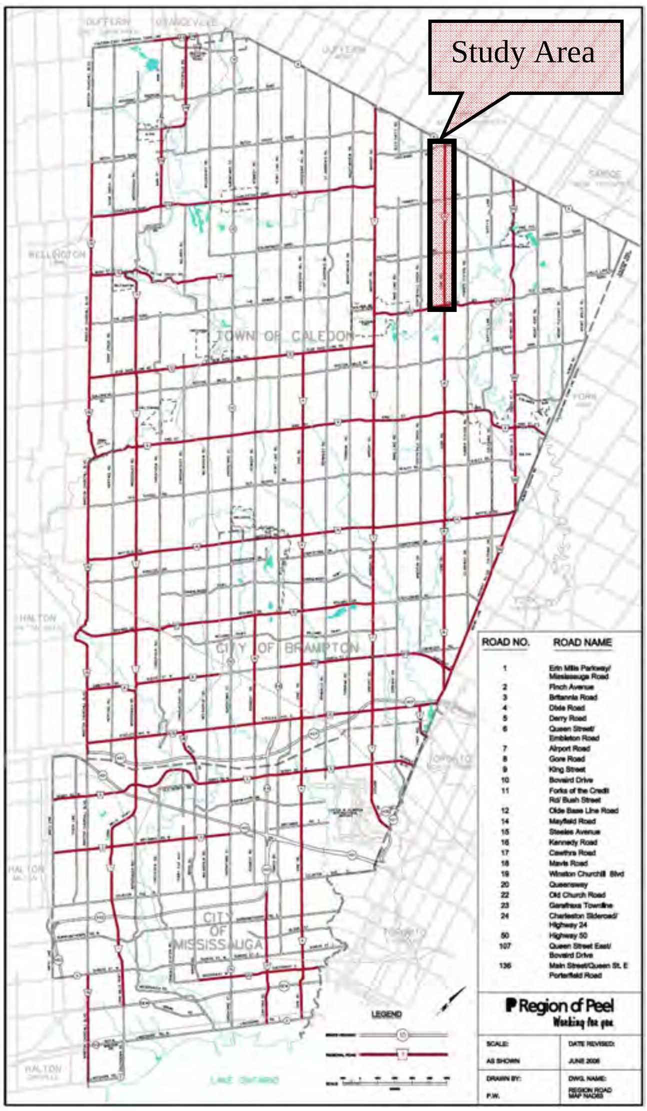
Appendix A1
Road Safety Audit

Region of Peel

Road Safety Audit

The Gore Road EA Project # 10-4385

Reconstruction from Patterson Sideroad to Highway 9



July 2013

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The Gore Road from Patterson Sideroad to Highway 9

Road Safety Audit

This report results from a detailed Road Safety Audit (RSA) carried out for The Gore Road (Regional Road 8) from Patterson Sideroad to Highway 9 (approximately 6.3 km), including both the intersections.

1. Background

The Region of Peel has initiated a Class 'B' Environmental Assessment (EA) – Project # 10-4385 of The Gore Road for the existing two lane road. The purpose of this audit was to examine the facility's safety performance and to identify engineering related factors and opportunities for improvement, as well as report on potential road safety improvements and identify road related contributing risk factors to collisions.

It is acknowledged that safety is one of many considerations that the Region of Peel needs to balance in undertaking any capital project, including, but not necessarily limited to; cost, environmental protection, congestion management, and community impacts. This report is focused on safety, with the anticipation that in general, the issues identified will be considered in the planning process.

2. Study Area

The study area consists of The Gore Road from 25m north of Patterson Sideroad to south of Highway 9. For the purpose of this audit, the intersection of Highway 9 which is to the north of the northern limit of the study area has been included to provide a definite boundary to the study area, approximately 6.3 km **(Figure 1)**.

The Gore Road is a two-lane (single lane per direction), hard-surfaced, rural roadway serving an arterial function in the northeast quadrant of the Region of Peel in the Town of Caledon. For the purposes of this report, The Gore Road will be described as running in a north-south direction. The topography in the study area for The Gore Road is rolling terrain with horizontal curves.

The Gore Road has no traffic signals in the study area and has a posted speed limit of 70 km/h from Patterson Sideroad in the south, to Highway 9 in the north.

The study area has five stop controlled intersections: Patterson Sideroad, Finnerty Sideroad South, Finnerty Sideroad North, Coolihans Sideroad and Highway 9.

The pavement width is nominally 7.0m, with gravel shoulders for The Gore Road. The land use contiguous to the study area is rural agricultural and low-density rural residential.

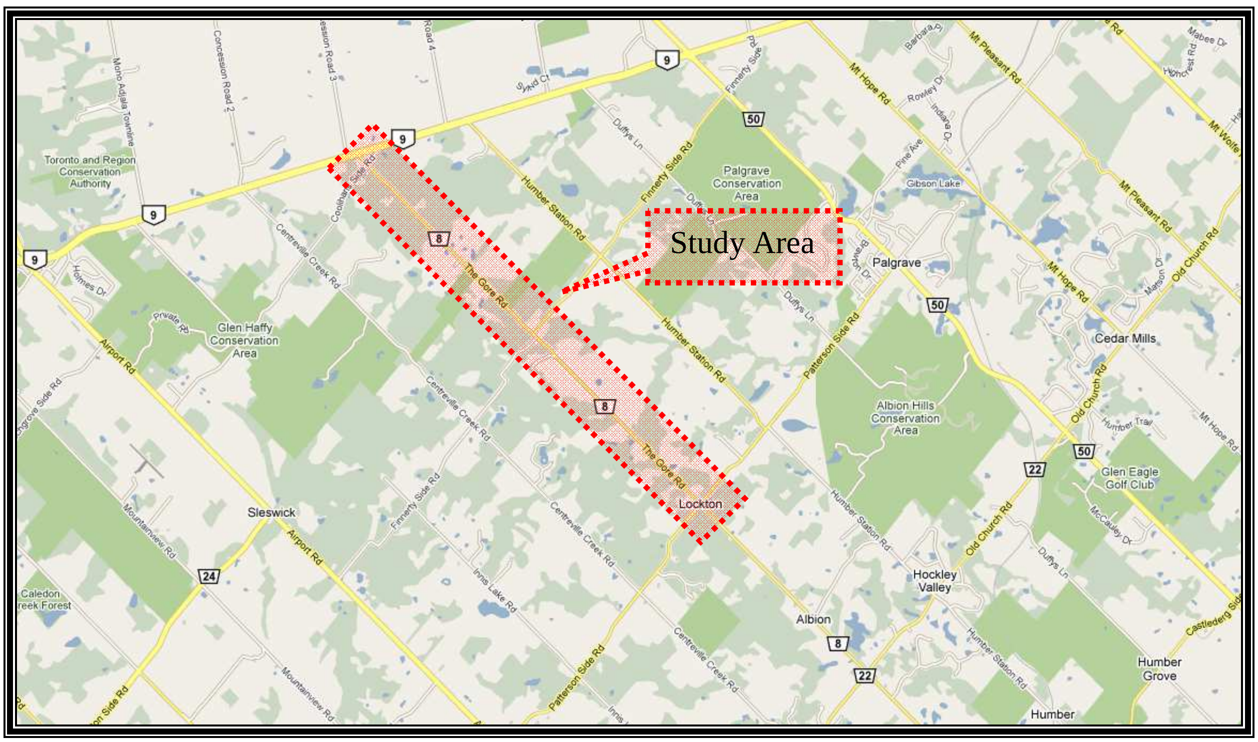

Figure 1: Study Area (Source: Google Maps)

1. **The Gore Road at Patterson Sideroad:** Patterson Sideroad is a two lane (single lane per direction), hard-surfaced, rural roadway under the jurisdiction of the Town of Caledon. It is a stop controlled intersection with a posted speed limit of 60km/h. It is located in the sag of a vertical curve **(Figure 2)**.

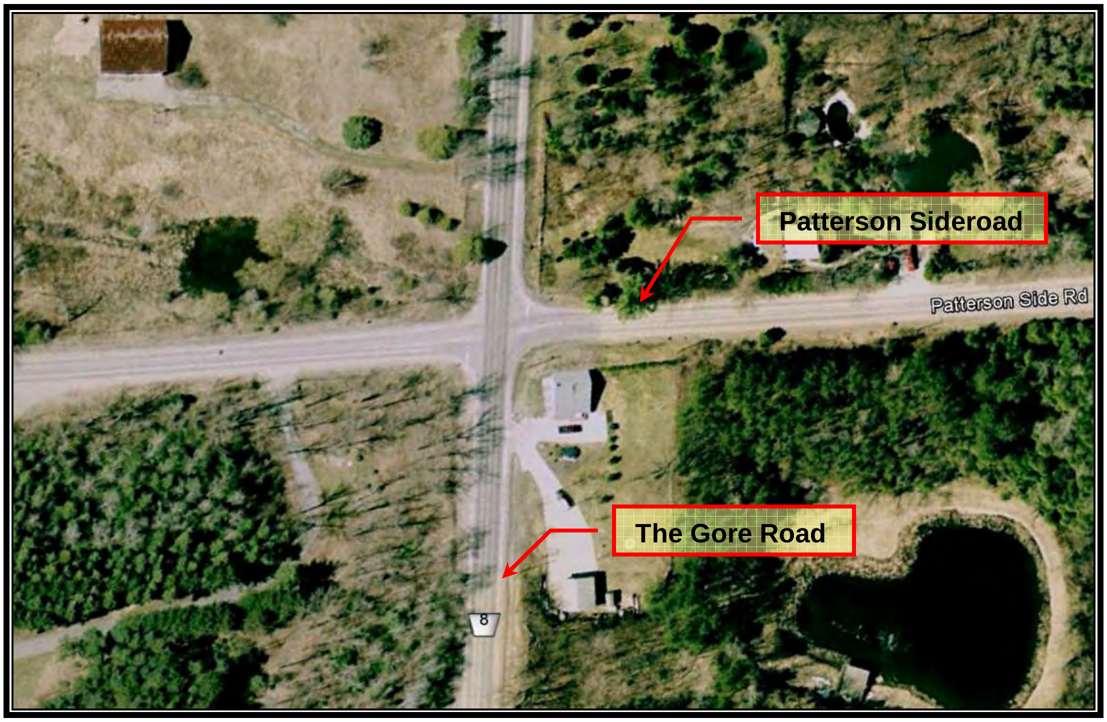

Figure 2: The Gore Road at Patterson Sideroad (Source: Google Earth)

2. **The Gore Road at Finnerty Sideroad North and Finnerty Sideroad South:** Finnerty Sideroad is a two lane (single lane in each direction) rural roadway under the jurisdiction of the Town of Caledon. There is a 60m offset between the east and the west leg of the intersection. The offset intersections are stop controlled at The Gore Road. They run in an east/west direction with a posted speed limit of 80km/h. The west leg is called Finnerty Sideroad South and the east leg is called Finnerty Sideroad North. The travelled surface of both the legs of this roadway is gravel. The intersections are located in a horizontal reverse curve **(Figure 3)**.

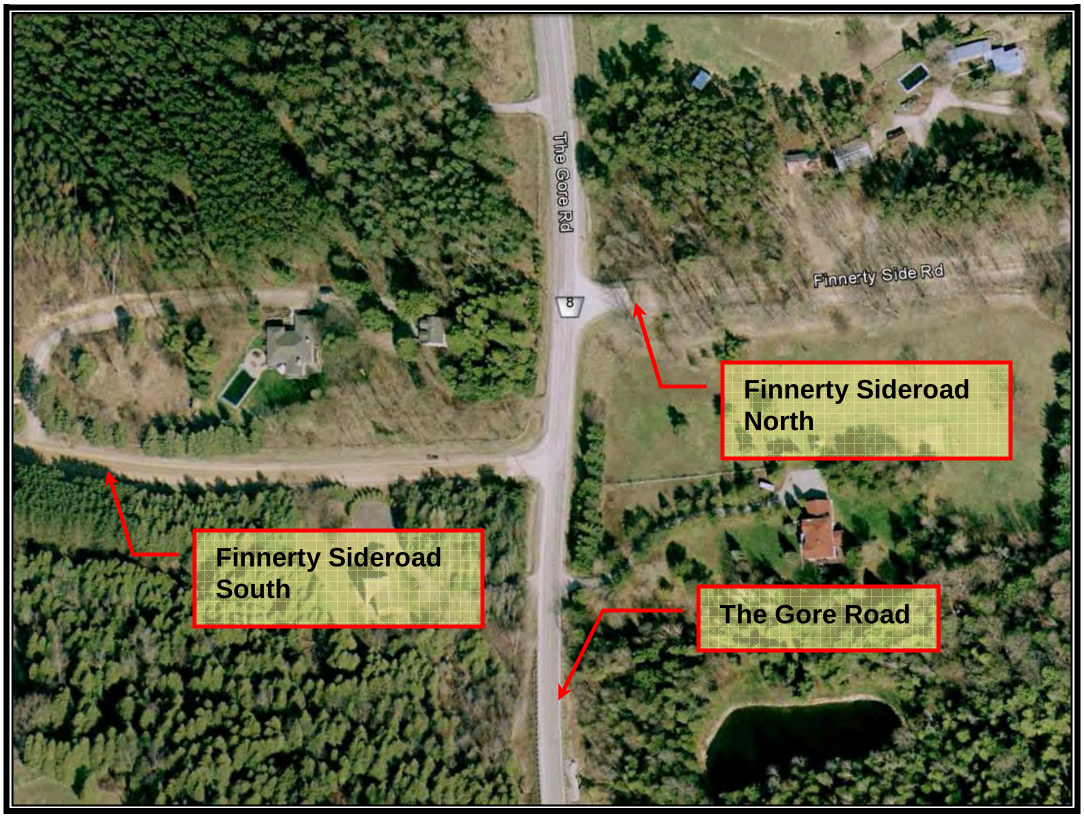

Figure 3: The Gore Road at Finnerty Sideroad North and Finnerty Sideroad South (Source: Google Earth)

3. **The Gore Road at Coolihans Sideroad:** Coolihans Sideroad is a two lane (single lane in each direction) rural roadway under the jurisdiction of the Town of Caledon. The intersection is stop controlled at The Gore Road. It runs in an east-west direction with a posted speed limit of 80km/h. The travelled surface on the east leg of this intersection is gravel **(Figure 4)**.

4. **The Gore Road at Highway 9:** Highway 9 is a 3 lane arterial road under the jurisdiction of the Ministry of Transportation (MTO). The Gore Road at this intersection is stop controlled. Highway 9 runs in an east-west direction with a posted speed limit of 80km/h. The travelled surface of this roadway is asphalt.

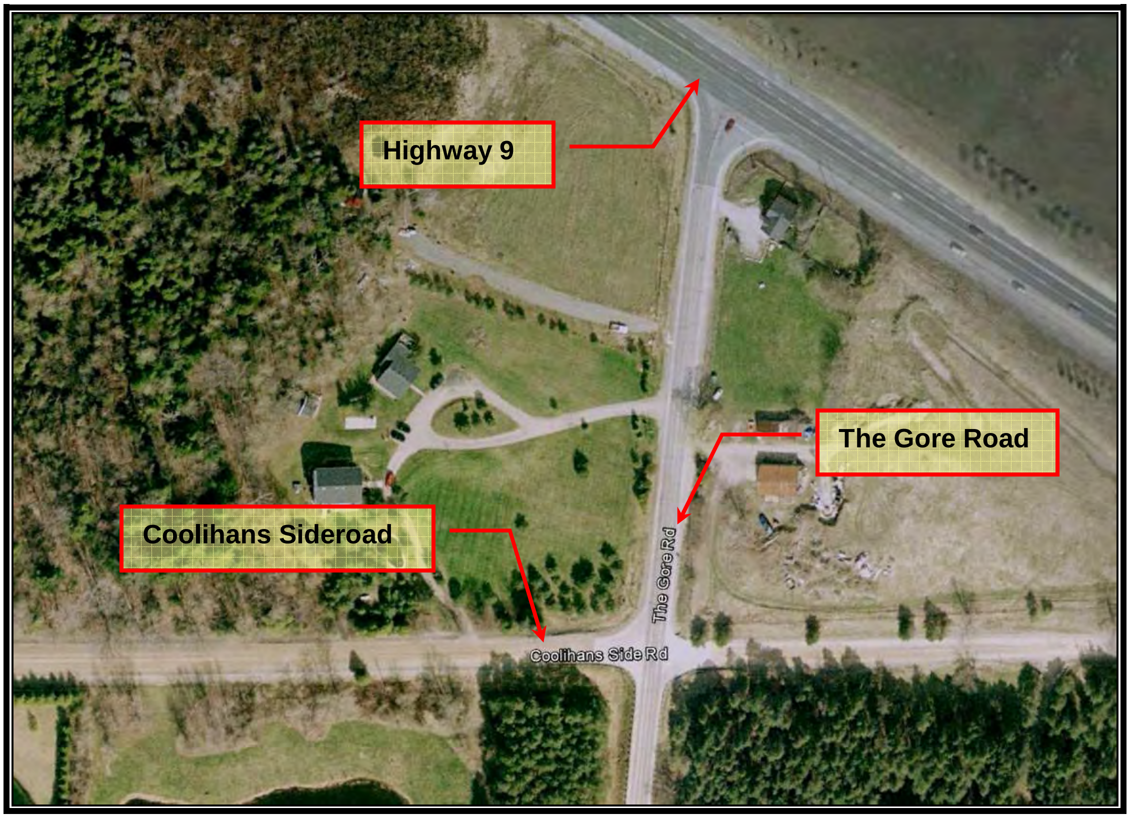

Figure 4: The Gore Road at Coolihans Sideroad and Highway 9 (Source: Google Earth)

3. Methodology

3.1. Collision History

The first step in this audit consisted of conducting an in-office review. A collision analysis of the most recent five years of collision data was undertaken. This preliminary review was undertaken for the following reasons:

1. To identify the dominant collision type and collision frequency in the study area in the past five years;
2. To acquire documented evidence of collision data to identify casual patterns that may indicate underlying issues;
3. To calculate the collision rates for the study area;
4. To conduct a safety review for possible inclusion in this EA.

The statistics reported below include our most recent five year reportable collision history from 2005 to 2009.

The results identified 41 reportable collisions occurring during the review period in the study area on The Gore Road from Patterson Sideroad to Highway 9 over the five year review period. A summary of reported collisions is presented in **Table 1** and the results of collisions per year are presented as a bar graph in **Exhibit 1**.

Location	Fatal	Injury	PDO	Total	Collision Type
The Gore Road at Patterson Sideroad	0	0	3	3	Angle (3)
The Gore Road between Patterson Sideroad and Finnerty Sideroad South	0	0	16	16	SMV – Animal or pedestrian (10) SMV Other (5) Other (1)
The Gore Road at Finnerty Sideroad South	0	0	0	0	No Reported Collisions
The Gore Road between Finnerty Sideroad South and Finnerty Sideroad North	0	0	0	0	No Reported Collisions
The Gore Road at Finnerty Sideroad North	0	0	0	0	No Reported Collisions
The Gore Road between Finnerty Sideroad North and Coolihans Sideroad	0	2	17	19	SMV – Animal or pedestrian (13) Rear End (1) SMV other (4) Angle (1)
The Gore Road at Coolihans Sideroad	0	0	0	0	No Reported Collisions
The Gore Road between Coolihans Sideroad and Highway 9	0	0	1	1	Sideswipe (1)
The Gore Road at Highway 9	0	0	2	2	SMV other (1) Rear End (1)
Total	**0**	**2**	**39**	**41**	

Table 1: Summary of Reported Collisions along The Gore Road (2005 - 2009)

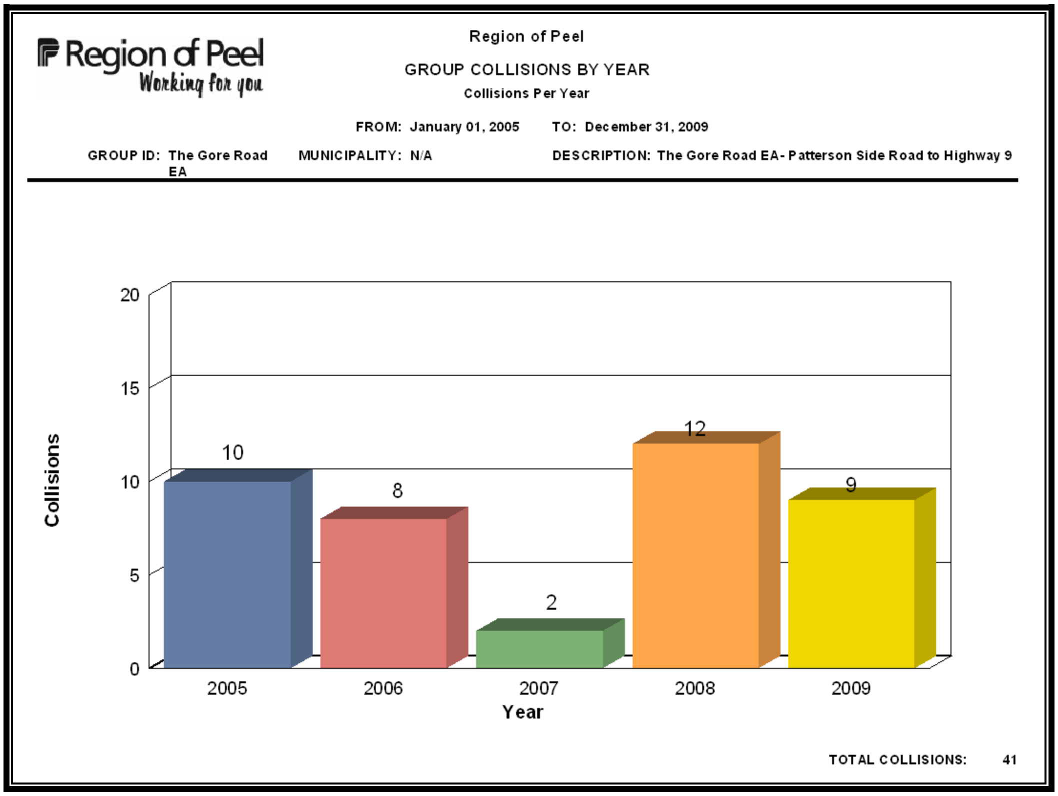

Exhibit 1: Collisions per Year (2005 - 2009)

The “SMV-animal or pedestrian” type of collisions were the dominant type of collisions (56.1%) followed by “SMV – Other” (24.4%) and “Right Angle” (9.8%) type of collisions **(Exhibit 2)**; it should be noted that all of the “SMV-animal or pedestrian” type of collisions for this zone involved animals. The majority of the collisions in the study area (95.1%) were of the “Property Damage Only” type **(Exhibit 3)**. There were no pedestrian related collisions or fatal collisions in the study area during the review period.

Further, the majority of the collisions (85.4%) occurred under clear environmental conditions **(Exhibit 4)** and favourable road conditions **(Exhibit 5).** The average collision rate in the study area in the previous five years is 1.02. (The collision rate is 0.97 if Highway 9 is excluded, which is beyond the project limits but has been included to provide a definite boundary to the study area).

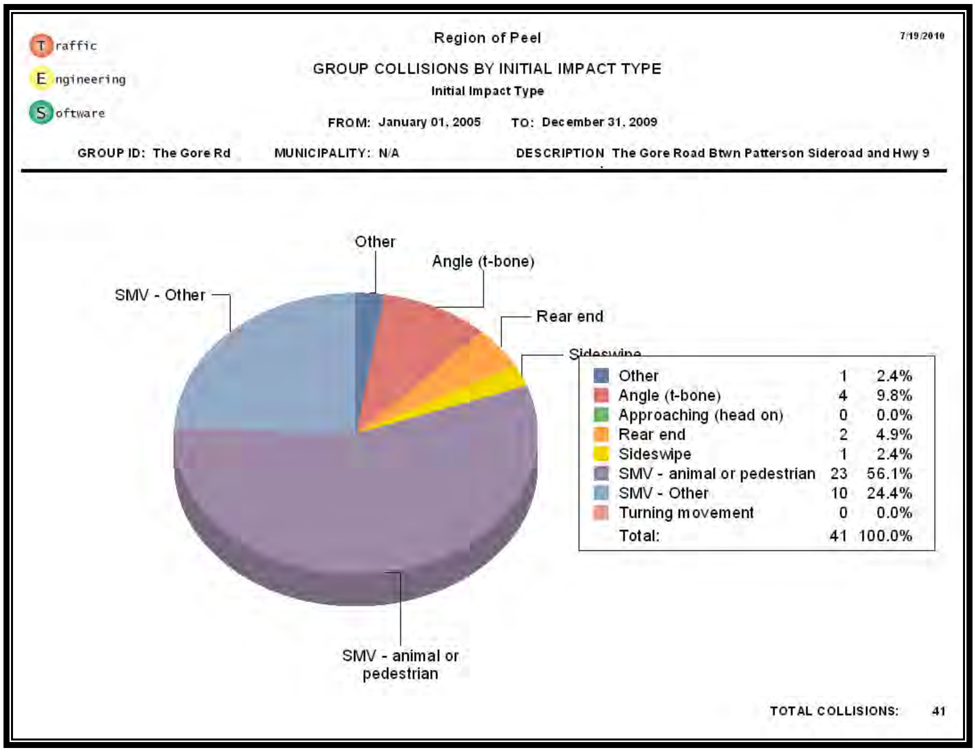

Exhibit 2: Collisions by Impact Type (2005 - 2009)

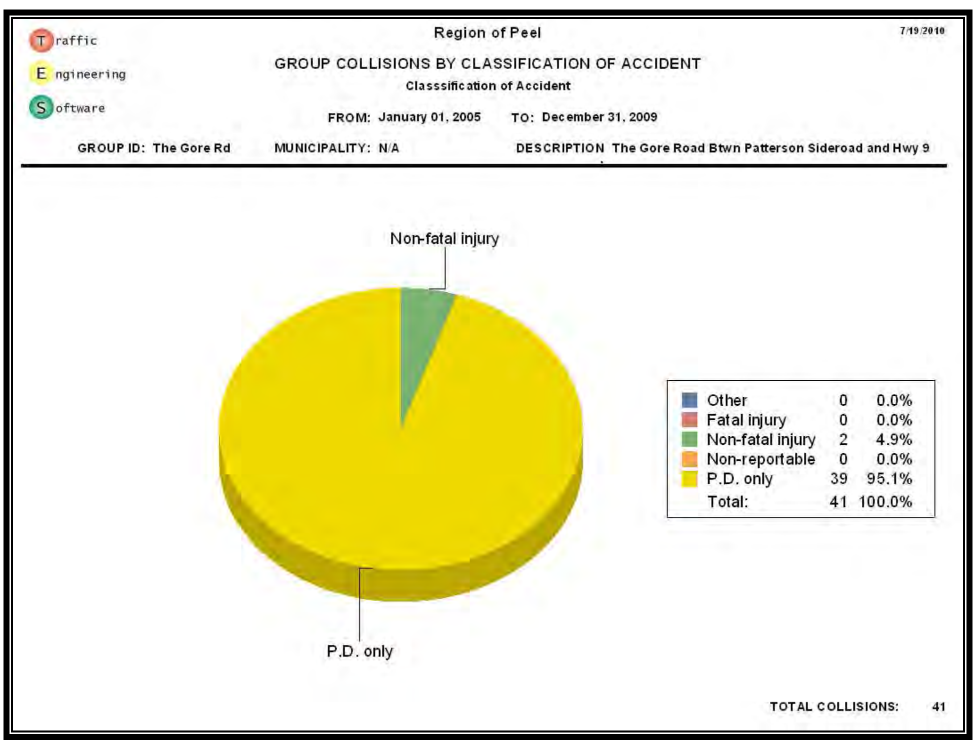

Exhibit 3: Classification of Accident (2005 - 2009)

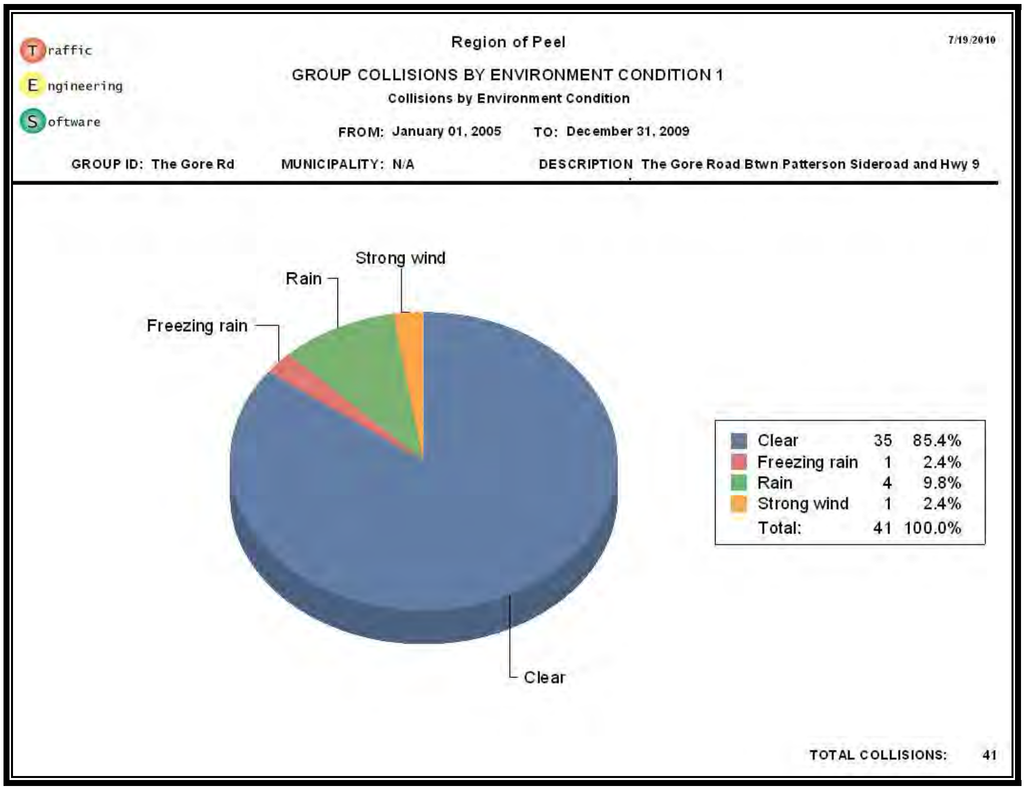

Exhibit 4: Collisions by Environment Condition (2005 - 2009)

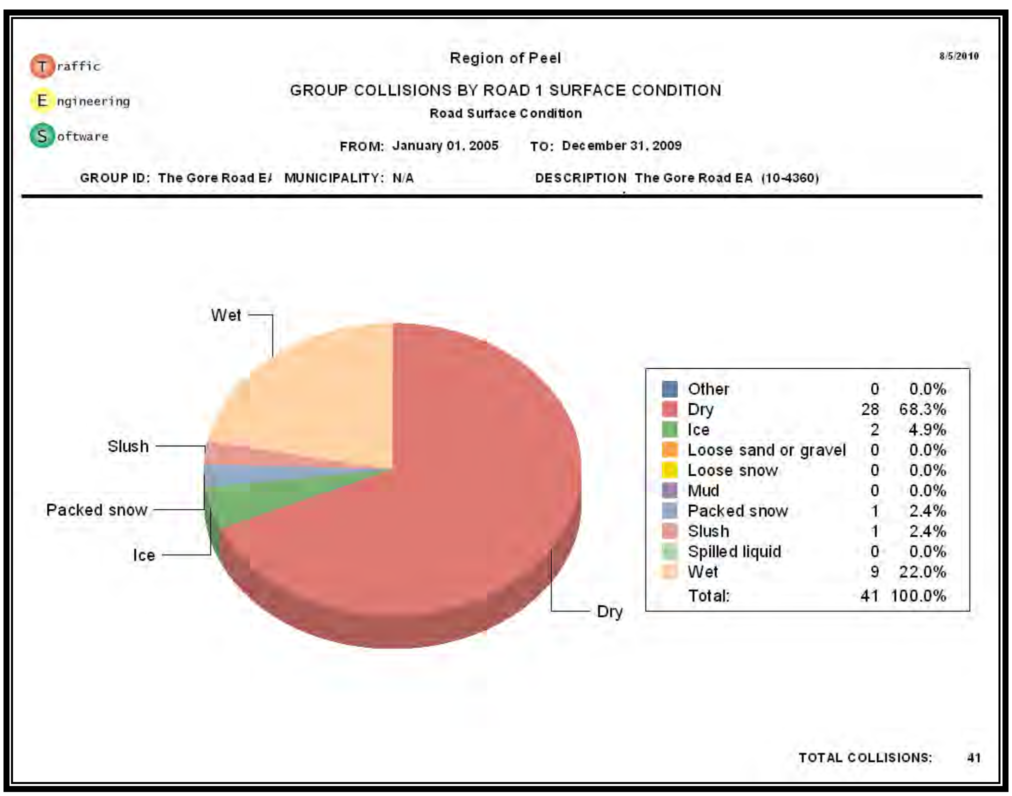

Exhibit 5: Collisions by Road Surface Condition (2005 - 2009)

Historically speaking, our records indicate an increase (8.7%) in the year 2009 in the number of animal related collisions occurring in the study area **(Exhibit 6**).

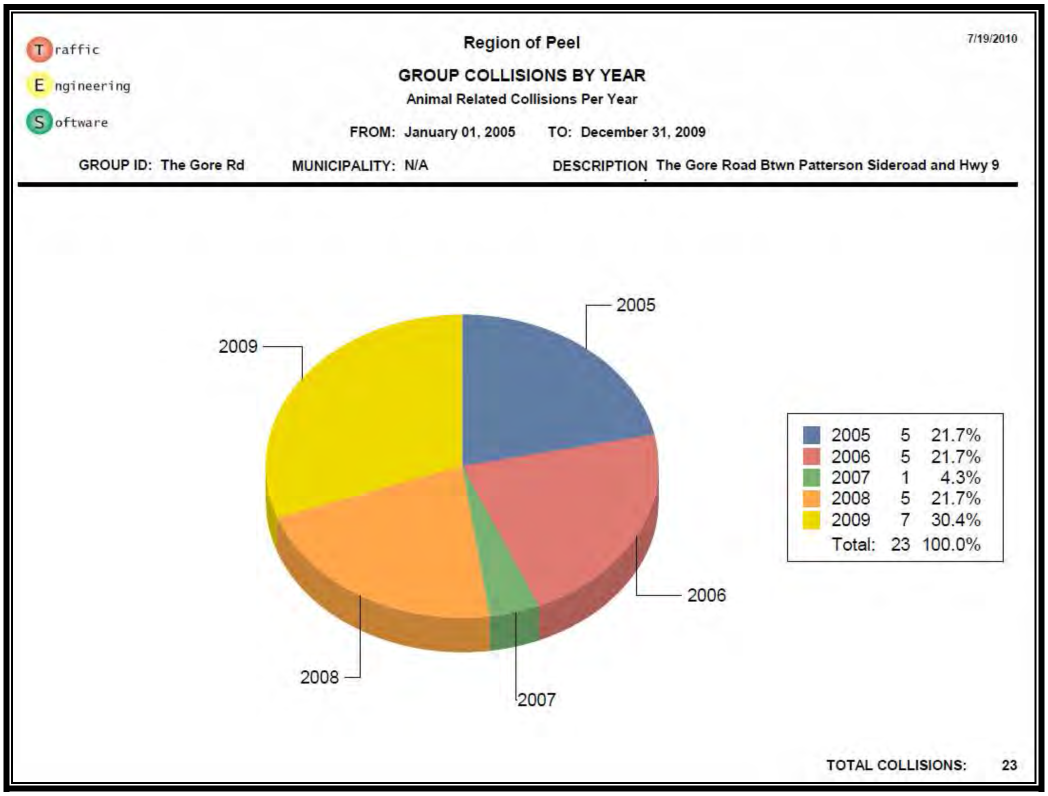

Exhibit 6: Animal Related Collisions (2005 - 2009)

The number of animal related collisions on The Gore Road between Patterson Sideroad and Finnerty Sideroad South is 24.4% **(Exhibit 7)** and between Finnerty Sideroad North and Coolihans Sideroad is 31.7% **(Exhibit 8)** of the total reported collisions in the study area over a five year period. The average collision rate in the study area for the previous five years (2005 - 2009) is 1.02. Detailed collision history has been provided in **Appendix 'A'**.

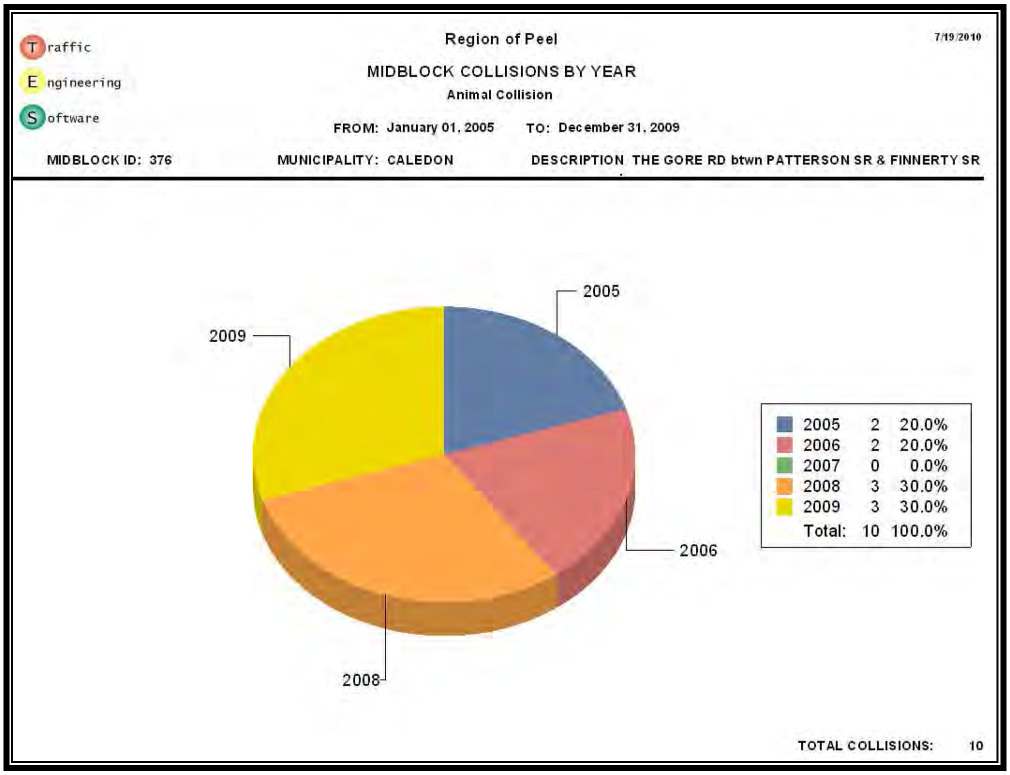

Exhibit 7: The Gore Road between Patterson Sideroad and Finnerty Sideroad South: Animal Related Collisions (2005 - 2009)

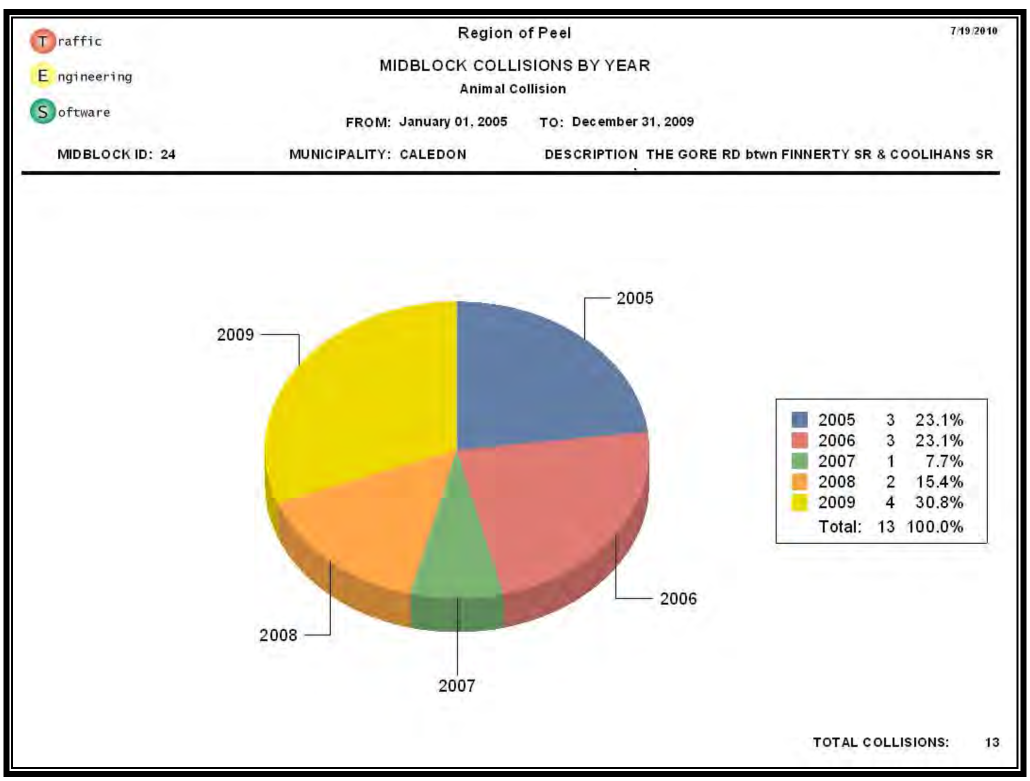

Exhibit 8: The Gore Road between Finnerty Sideroad North and Coolihans Sideroad: Animal Related Collisions (2005 - 2009)

3.2. Site Investigation

The second phase of the investigation consisted of site visits on June 29, 2010, and July 14, 2010. Although no significant increase in the number or severity of collisions were identified in our preliminary collision history review, staff have taken a proactive approach to safety by conducting on-site reviews to determine what elements could be enhanced in the study area.

The site investigation consisted of a positive guidance review and conformance check to determine what role information deficiencies and violation of driver expectations may have played in contributing to crash potential. The site investigations consisted of:

- Review of the geometric elements of intersections including lane configuration
- Signing review
- Assess traffic operations and conflicts
- Identify potential hazards
- Sight distances
- Illumination
- Pavement markings/ pavement condition

3.2.1. Potential Safety Enhancements

During the site visits a number of potential safety enhancements were identified within the project study area. The enhancements on The Gore Road as well as on the municipal roads intersecting it have been identified. The safety enhancements identified on municipal roads are under the jurisdiction of the Town of Caledon. They are as follows:

- Advance “street name” signs are missing on:

    1. South leg of The Gore Road at Finnerty Sideroad South in the northbound direction.

2. East leg of the Patterson Sideroad approaching The Gore Road in the westbound direction.
3. Finnerty Sideroad approaching The Gore Road in both the westbound and eastbound direction.

- Object marker signs (Wa-33L and Wa-33R) are missing for the guide rails on the east leg of Patterson Sideroad 150m from the intersection, this is under the jurisdiction of the Town of Caledon (**Figure 5)**.

Figure 5: East leg of Patterson Sideroad, object marker signs missing

- Posted speed limit signs (Rb-1a (80)) are missing on:
    1. Both the east and west legs of Coolihans Sideroad.
    2. On both Finnerty Sideroad North and Finnerty Sideroad South.
- The advance 'Stop Ahead' sign (Wb-1) on Finnerty Sideroad North approaching The Gore Road is hidden in foliage.
- Considering the posted speed limit and the alignment of the roadway, relatively small street name signs were noted at the intersection of The Gore Road at Finnerty Sideroad North **(Figure 6)**.

Figure 6: The Gore Road at Finnerty Sideroad North, small street name sign

- It has been identified that certain areas within the project limit have guide rail deficiencies. Exact locations should be identified through the cross section drawings obtained through the topographical survey. Some of the identified locations for the installation of the guide rail are provided in **Appendix "C"**.
- Chevrons need to be replaced at the horizontal curve to the north of the intersection of The Gore Road at Finnerty Sideroad North **(Figure 7)**.

Figure 7: Replace chevrons on The Gore Road north of Finnerty Sideroad North

- Chevrons are required at the following horizontal curves to provide positive guidance to motorists regarding the sharp curve in the roadway:
  1. Approximately 400m south of Coolihans Sideroad near 18878 The Gore Road **(Figure 8)**.
  2. On the road section to the north of the intersection of The Gore Road at Finnerty Sideroad North **(Figure 9)**.

Figure 8: Chevrons required 200m north of Finnerty Sideroad North

Figure 9: Chevrons required on The Gore Road north of Finnerty Sideroad North

- Insufficient sightlines have been noted at the intersections within the study area **(Table 2)**. Sight distance requirements must be considered both for vehicles approaching the intersection and departing from the stopped position at the intersection. Minimum sight line distances were obtained from Transportation Association of Canada (TAC), and field investigations were conducted.

  Sightline distances are obtained in the field by observing a target board 0.3m above the pavement from a driver's vantage point of 1.05m above the roadway. Sightline studies are typically conducted from 3m behind the stop bar, but in instances when the sight lines are restricted they can be improved when the vehicle rolls up to the extended curb (Rolling Sight Distance). The following scenarios were considered:

  1. **Stopping Sight Distance**: It is the least sight distance required to come to a stop under a given set of prevailing vehicle, pavement and climatic conditions. It is the sum of the distance travelled during the perception and reaction time and the braking distance. Minimum distance required based on the design speed of 80km/h is 115-140m.
  2. **Departure Sight Distance:** It is the sight distance available from a point where vehicles are required to stop on the intersecting road, while drivers are looking left and right along the major roadway, before entering the intersection. Departure Sight Distance is considered for each of the three manoeuvres that may occur at an intersection, crossing, turning left, and turning right. Minimum distance required based on the design speed of 80km/h is 260m.
  3. **Rolling Sight Distance**: It is the distance available from where vehicles stop at the stop bar then roll their vehicles forward to the extended curb line of the major roadway, while drivers are looking left and right along the major roadway, before entering the intersection. This is permissible provided the operator brings the vehicle to a full stop as per the HTA.

Sight Line photos taken at the locations have been provided in **Appendix “B”**.

Sight Line Study - The Gore Road				
Posted Speed: 70 km/hr		Required Stopping Sight Distance: **115-140m****		
Design Speed: **80 km/hr***		Required Departure Sight Distance: **260m****		
Intersection	**Direction of Travel**	**Stopping Sight Distance (m)**	**Departure Sight Distance (m)**	**Rolling Sight Distance (m)**
The Gore Road @ Patterson Sideroad East Leg	NB	204.7	**131.5**	169.0
The Gore Road @ Patterson Sideroad East Leg	SB	141.7	**222**	223.0
The Gore Road @ Patterson Sideroad West Leg	NB	151.3	**133.3**	160.0
The Gore Road @ Patterson Sideroad West Leg	SB	161.8	**110**	231.0
The Gore Road @ Finnerty Sideroad South	NB	263.0	317	267.0
The Gore Road @ Finnerty Sideroad South	SB	**96.0**	**122.2**	150.0
The Gore Road @ Finnerty Sideroad North	NB	179.7	**178.1**	207.0
The Gore Road @ Finnerty Sideroad North	SB	192.3	**168.8**	200.0
The Gore Road @ Coolihans Sideroad East Leg	NB	145.3	**231.3**	293.0
The Gore Road @ Coolihans Sideroad East Leg	SB	Clear Sightlines up to Hwy 9		
The Gore Road @ Coolihans Sideroad West Leg	NB	147.5	**233.5**	294.0
The Gore Road @ Coolihans Sideroad West Leg	SB	Clear Sightlines up to Hwy 9		

*The design speed varies through the study area, assumed design speed 80km/h

**Min. SSD (Level grade, wet pavement with ABS) TAC (Table 1.2.5.3) (m)

Table 2: Sight Line Study

4. Conclusions

This report identifies potential safety enhancements in the study area and contains recommendations that should be implemented to further enhance the safety and conspicuousity of the intersections and road segments in the study area.

Further, this review incorporates recommended signage enhancements that may be beyond the jurisdiction of the Regional Municipality of Peel. It is recommended that the Town of Caledon be advised to any signing that encroaches on their jurisdiction. Whether these enhancements are implemented will be at the sole discretion of the town of Caledon.

5. Recommendations

- It is recommended that Advance "Street Name" signs be installed to provide positive guidance and advance notice to motorists on:
    1. The south leg of the intersection of The Gore Road at Finnerty Sideroad South for the northbound direction.
    2. East leg of Patterson Sideroad approaching The Gore Road in the westbound direction.
    3. On both Finnerty Sideroad North and Finnerty Sideroad South approaching The Gore Road.
- Object marker signs (Wa-33R and Wa-33L) be installed for the guide rails on the east leg of the Patterson Sideroad 150m from the intersection.
- It is recommended that 80km/h posted speed limit signs (Rb-1A (80)) be installed on both the east and west leg of the intersection of Finnerty Sideroad and also on the intersection of Coolihans Sideroad, approximately 50 metres to the east (for eastbound traffic) and west (for westbound traffic) of the intersections. As both these roads are under the jurisdiction of the Town of Caledon, staff will need to coordinate these works.
- Prune the tree obscuring the visibility of the 'Stop Ahead' (Wb-1) sign on Finnerty Sideroad North.
- It is recommended that larger more prominent street name signing be installed for both the offset legs of the intersection of The Gore Road at Finnerty

Sideroad to enhance the safety and conspicuousity of the intersection, particularly in night time and inclement weather conditions.

- It has been identified that certain areas within the project limit may benefit with the installation of guide rail for the safety of vehicles that might run off road during unfavourable road and weather conditions. Exact locations should be identified through the cross section drawings obtained through the topographical survey. Some locations would not require a guide rail if a 3.0m shoulder could be established.
- As a proactive measure to reduce the potential for single motor vehicle run-off-the-road type of collisions due to inclement weather and low visibility conditions, longitudinal rumble strips adjacent to the edge line should be installed within the project zone. This measure with its tactile vibration and audible rumbling has been shown to reduce this type of crash.
- It is recommended that new raised reflective markers be installed in the centre line of the horizontal curve south of 18114 The Gore Road to enhance the alignment of the roadway during low visibility conditions. Further, the existing raised reflective markers in the study area will need to be reinstalled as part of the resurfacing project.

Figure 10: Raised reflective markers recommended north of Finnerty Sideroad North

- It is recommended that the Chevrons be replaced at the horizontal curve 150m to the north of the intersection of The Gore Road at Finnerty Sideroad North (**Figure 11**).
- Chevrons need to be installed at the horizontal curves approximately 400m south of Coolihans Sideroad near 18878 The Gore Road and on the road section north of the intersection of The Gore Road at Finnerty Sideroad North.
- If it is within the scope of the project, it is recommended that the horizontal and vertical alignment issues at the intersections be reviewed to potentially improve the sightline deficiencies.
- Additional deer crossing signs (Wc-111) should be installed with the hazard length tab (Wa-6t (3.0 km)) immediately downstream of the offset intersection of Finnerty Sideroad in both the directions. If the trend continues, it would be advisable to implement additional physical measures to control the vehicle/deer collisions.

1. The use of deer fencing along the study area to help reduce vehicle/deer collisions should be considered.
2. One of the mitigative measures to address conflicts between humans and deer population, as per the "Strategy for Preventing and Managing Human-Deer Conflicts in Southern Ontario" report, might include one of the general approaches of altering the deer population densities.

Traffic
Engineering
Software

Region of Peel

8/17/2010

ACCIDENT ANALYSIS BY LOCATION REPORT

Consice Report

FROM: January 01, 2005 TO: December 31, 2009

INTERSECTION ID: INT_254 MUNICIPALITY:CALEDON DESCRIPTION PATTERSON SR @ THE GORE RD

Accident ID	Date & Time	Environment Condition 1	Light	Road 1 Surface Condition	Initial Impact Type	Classification of Accident
05000911	25-Aug-05 10:40a	Clear	Daylight	Dry	Angle (t-bone)	P.D. only
08020965	18-Nov-08 7:25a	Clear	Daylight	Dry	Angle (t-bone)	P.D. only
09000394	16-Mar-09 3:45p	Clear	Daylight	Dry	Angle (t-bone)	P.D. only

LOCATION TOTAL COLLISIONS: 3

PATTERSON SR @ THE GORE RD

ID: INT_254

From: 01-Jan-2005 To: 31-Dec-2009

Collisions Summary

Head On	0
Right Angle	3
Rear End	0
Sideswipe	0
Turning Movement	0
SMV - Animal/Pedestrian	0
SMV - Fixed Obj./Unatt. Veh.	0
Other	0
Unable to draw	0
Total	3

Legend

Head On
Other
Right Angle
Injury
Rear End
Fatal
Sideswipe
At Fault
Turning movement
SMV - Animal/Pedestrian
SMV - Fixed Obj./Unatt. Veh.

Traffic
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Region of Peel

ACCIDENT ANALYSIS BY LOCATION REPORT

Consice Report

FROM: January 01, 2005 TO: December 31, 2009

MIDBLOCK ID: 376 **MUNICIPALITY:CALEDON** **DESCRIPTION THE GORE RD btwn PATTERSON SR & FINNERTY SR**

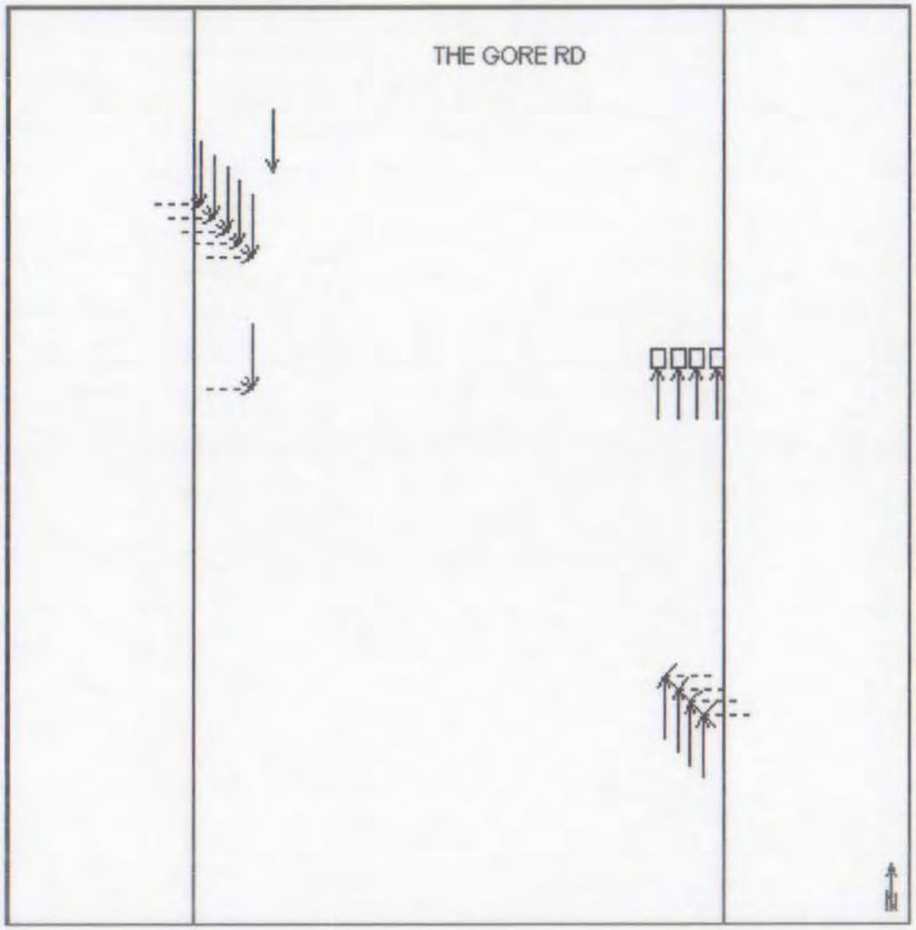
Accident ID	Date & Time	Environment Condition 1	Light	Road 1 Surface Condition	Initial Impact Type	Classification of Accident
05000176	26-Jan-05 11:25p	Clear	Dark	Dry	SMV - animal or pedestrian	P.D. only
05000328	07-Mar-05 6:50a	Rain	Dark	Wet	SMV - animal or pedestrian	P.D. only
06000292	02-Mar-06 6:15a	Clear	Daylight	Dry	SMV - animal or pedestrian	P.D. only
65000098	07-Jun-06 3:25p	Clear	Daylight	Dry	SMV - animal or pedestrian	P.D. only
06000821	31-Jul-06 3:12p	Clear	Daylight	Dry	SMV - Other	P.D. only
61000334	09-Dec-06 3:50a	Clear	Dark	Wet	SMV - Other	P.D. only
08000005	02-Jan-08 9:15p	Clear	Dark	Packed snow	SMV - Other	P.D. only
08000024	09-Jan-08 6:00a	Strong wind	Dark	Wet	Other	P.D. only
08020282	10-Jun-08 12:30p	Clear	Daylight	Dry	SMV - Other	P.D. only
08021037	08-Oct-08 3:00p	Clear	Dark	Dry	SMV - animal or pedestrian	P.D. only
08021022	09-Dec-08 10:30p	Rain	Dark	Ice	SMV - Other	P.D. only
08021120	18-Dec-08 6:00a	Clear	Dark	Dry	SMV - animal or pedestrian	P.D. only
09031288	18-Dec-08 6:00p	Clear	Dark, artificial	Dry	SMV - animal or pedestrian	P.D. only
09000256	11-Feb-09 6:00a	Clear	Dark	Dry	SMV - animal or pedestrian	P.D. only
09001283S	22-Nov-09 5:30p	Clear	Dark	Dry	SMV - animal or pedestrian	P.D. only
10008057	30-Nov-09 3:15a	Clear	Dark	Dry	SMV - animal or pedestrian	P.D. only

LOCATION TOTAL COLLISIONS: 16

THE GORE RD btwn PATTERSON SR & FINNERTY SR

ID: 376

From: 01-Jan-2005 To: 31-Dec-2009



Collisions Summary

Head On	0
Right Angle	0
Rear End	0
Sideswipe	0
Turning Movement	0
SMV - Animal/Pedestrian	10
SMV - Fixed Obj./Unatt. Veh.	4
Other	1
Unable to draw	1
Total	16

Legend

- Head On
- Other
- Right Angle
- Injury
- Rear End
- Fatal
- Sideswipe
- Turning movement
- SMV - Animal/Pedestrian
- SMV - Fixed Obj./Unatt. Veh.

Traffic
Engineering
Software

Region of Peel

8/17/2010

ACCIDENT ANALYSIS BY LOCATION REPORT

Consice Report

FROM: January 01, 2005 TO: December 31, 2009

MIDBLOCK ID: 24 **MUNICIPALITY:CALEDON** **DESCRIPTION** **THE GORE RD btwn FINNERTY SR & COOLIHANS SR**

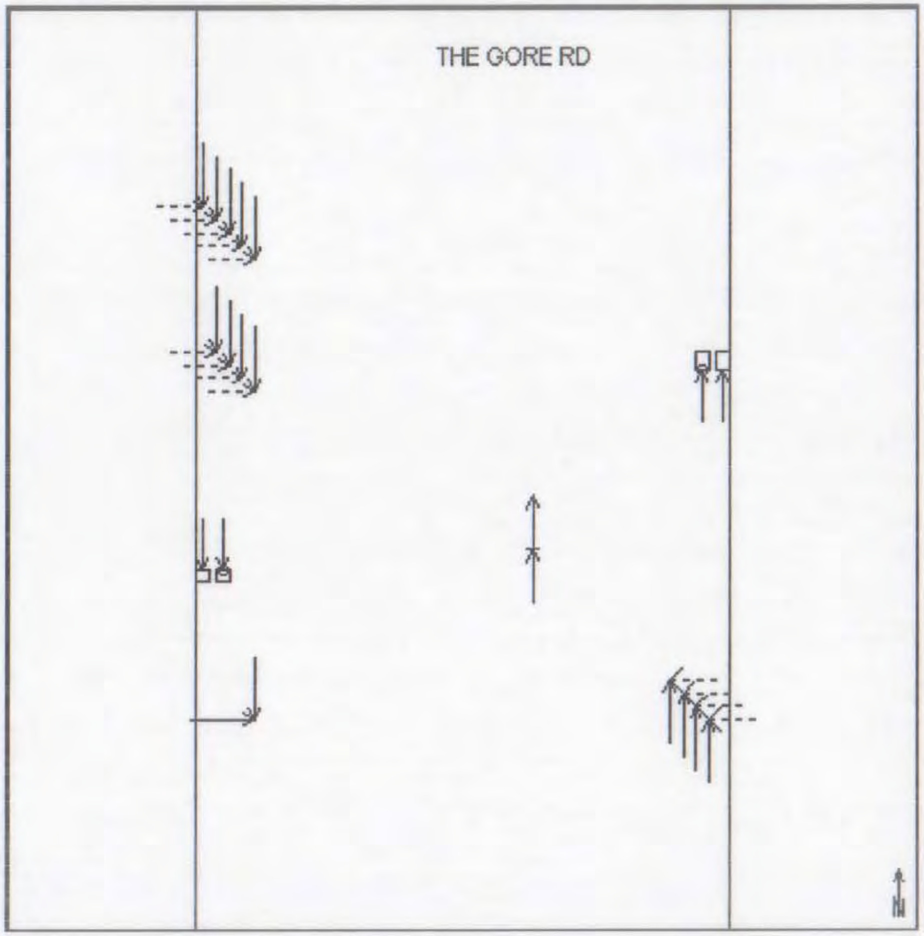
Accident ID	Date & Time	Environment Condition 1	Light	Road 1 Surface Condition	Initial Impact Type	Classification of Accident
05000155	24-Jan-05 7:05a	Clear	Daylight	Wet	SMV - animal or pedestrian	P.D. only
05000170	26-Jan-05 5:50a	Clear	Dark	Slush	SMV - Other	P.D. only
05000248	14-Feb-05 8:45a	Freezing rain	Daylight	Ice	SMV - Other	P.D. only
05000439	07-Apr-05 4:30p	Clear	Daylight	Dry	Rear end	P.D. only
05001308	26-Nov-05 12:40a	Clear	Dark	Wet	SMV - animal or pedestrian	P.D. only
06000019	29-Dec-05 6:00p	Clear	Dusk	Wet	SMV - animal or pedestrian	P.D. only
06000031	13-Jan-06 7:50a	Clear	Daylight	Dry	Angle (t-bone)	P.D. only
06000336	11-Mar-06 12:30a	Clear	Dark	Dry	SMV - animal or pedestrian	P.D. only
60000510	03-May-06 5:20a	Clear	Dawn	Dry	SMV - animal or pedestrian	P.D. only
06001027	29-Sep-06 9:00a	Clear	Daylight	Dry	SMV - animal or pedestrian	P.D. only
07000135S	31-Jan-07 4:30a	Clear	Dark	Wet	SMV - animal or pedestrian	P.D. only
07000961	07-Sep-07 6:00p	Clear	Daylight	Dry	SMV - Other	Non-fatal injury
08000038	11-Jan-08 7:50a	Rain	Daylight	Wet	SMV - animal or pedestrian	P.D. only
08020110	10-Apr-08 3:58p	Clear	Daylight	Dry	SMV - Other	Non-fatal injury
08020761	28-Oct-08 9:10p	Clear	Dark	Dry	SMV - animal or pedestrian	P.D. only
09000088	13-Jan-09 1:45a	Clear	Dark	Dry	SMV - animal or pedestrian	P.D. only
09000534	22-Apr-09 9:00p	Clear	Dark	Dry	SMV - animal or pedestrian	P.D. only
09000503	23-Apr-09 9:00a	Clear	Daylight	Dry	SMV - animal or pedestrian	P.D. only
10000021	29-Dec-09 1:30a	Clear	Dark	Dry	SMV - animal or pedestrian	P.D. only

LOCATION TOTAL COLLISIONS: 19

THE GORE RD btwn FINNERTY SR & COOLIHANS SR

ID: 24

From: 01-Jan-2005 To: 31-Dec-2009



Collisions Summary

Head On	0
Right Angle	1
Rear End	1
Sideswipe	0
Turning Movement	0
SMV - Animal/Pedestrian	13
SMV - Fixed Obj./Unatt. Veh.	4
Other	0
Unable to draw	0
Total	19

Legend

Head On
Other
Right Angle
Injury
Rear End
Fatal
Sideswipe
Turning movement
SMV - Animal/Pedestrian
SMV - Fixed Obj./Unatt. Veh.

Traffic
Engineering
Software

Region of Peel

ACCIDENT ANALYSIS BY LOCATION REPORT

Consice Report

FROM: January 01, 2005 TO: December 31, 2009

MIDBLOCK ID: 220 MUNICIPALITY:CALEDON DESCRIPTION THE GORE RD btwn COOLIHANS SR & 9 HY

Accident ID	Date & Time	Environment Condition 1	Light	Road 1 Surface Condition	Initial Impact Type	Classification of Accident
09000393	16-Mar-09 10:00a	Clear	Daylight	Dry	Sideswipe	P.D. only

LOCATION TOTAL COLLISIONS: 1

THE GORE RD btwn COOLIHANS SR & 9 HY

ID: 220

From: 01-Jan-2005 To: 31-Dec-2009

Collisions Summary

Head On	0
Right Angle	0
Rear End	0
Sideswipe	1
Turning Movement	0
SMV - Animal/Pedestrian	0
SMV - Fixed Obj./Unatt. Veh.	0
Other	0
Unable to draw	0
Total	1

Legend

Head On
Other
Right Angle
Injury
Rear End
Fatal
Sideswipe
Turning movement
SMV - Animal/Pedestrian
SMV - Fixed Obj./Unatt. Veh.

T raffic
E ngineering
S oftware

Region of Peel

8/17/2010

ACCIDENT ANALYSIS BY LOCATION REPORT

Consice Report

FROM: January 01, 2005 TO: December 31, 2009

INTERSECTION ID: INT_50 MUNICIPALITY:CALEDON DESCRIPTION 9 HY @ THE GORE RD

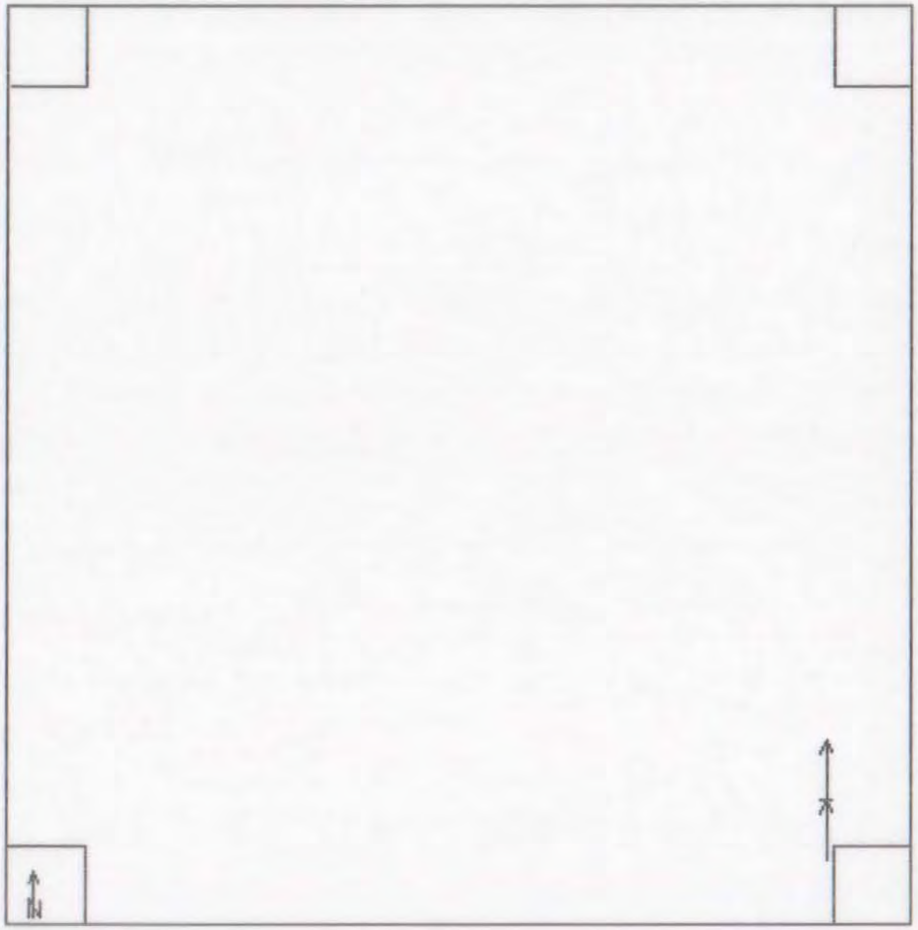
Accident ID	Date & Time	Environment Condition 1	Light	Road 1 Surface Condition	Initial Impact Type	Classification of Accident
05001203	11-Nov-05 3:09a	Clear	Daylight	Dry	SMV - Other	P.D. only
08020839	07-Nov-08 6:00p	Rain	Dark	Wet	Rear end	P.D. only

LOCATION TOTAL COLLISIONS: 2

9 HY @ THE GORE RD

ID: INT_50

From: 01-Jan-2005 To: 31-Dec-2009



Collisions Summary

Head On	0
Right Angle	0
Rear End	1
Sideswipe	0
Turning Movement	0
SMV - Animal/Pedestrian	0
SMV - Fixed Obj./Unatt. Veh.	0
Other	0
Unable to draw	1
Total	2

Legend

Head On
Other
Right Angle
Injury
Rear End
Fatal
Sideswipe
At Fault
Turning movement
SMV - Animal/Pedestrian
SMV - Fixed Obj./Unatt. Veh.

APPENDIX ‘B’

INTERSECTION SIGHT LINES

The Gore Road (RR8) at Patterson Sideroad Sight Lines

RR8 @ Patterson Sideroad east leg looking north

RR8 @ Patterson Sideroad east leg looking south

RR8 @ Patterson Sideroad west leg looking north

RR8 @ Patterson Sideroad west leg looking south

The Gore Road (RR8) at Finnerty Sideroad Sight Lines

RR8 @ Finnerty Sideroad South looking north

RR8 @ Finnerty Sideroad South looking south

RR8 @ Finnerty Sideroad North looking north

RR8 @ Finnerty Sideroad North looking south

The Gore Road (RR8) at Coolihans Sideroad Sight Lines

RR8 @ Coolihans Sideroad east leg looking North

RR8 @ Coolihans Sideroad east leg looking south

RR8 @ Coolihans Sideroad west leg looking north

RR8 @ Coolihans Sideroad west leg looking south

APPENDIX ‘C’

GUIDE RAIL DEFICIENCIES

Unrecoverable slopes on The Gore Rd
between Patterson Sideroad and Highway 9

Exhibit 1: Northeast quadrant of The Gore Road, east edge

Exhibit 2: Northwest quadrant of The Gore Road, west edge

Exhibit 3: 635m north of The Gore Rd @ Patterson SR, east edge

Exhibit 4: Approximately 870m north of The Gore Rd @ Patterson SR, west edge

Exhibit 5: Approximately 745m north of The Gore Rd @ Patterson SR, east edge

Exhibit 6: Approximately 745m north of The Gore Rd @ Patterson S R, west edge

Exhibit 7: Approximately 825m north of The Gore Rd @ Finnerty SR, east edge

Exhibit 8: 300m north of The Gore Rd @ Finnerty SR, west edge

Exhibit 9: Approximately 630m north of The Gore Rd @ Finnerty SR, west edge

Exhibit 10: Approximately 1.5 km north of The Gore Rd @ Finnerty SR, east edge

Exhibit 11: Approximately 765m north of The Gore Rd @ Finnerty SR, east edge

Exhibit 12: – Approximately 1.2km south of The Gore Rd @ Coolihans SR, east edge

Exhibit 13: Approximately 1.2km south of The Gore Rd @ Coolihans SR, west edge

Exhibit 14: Approximately 800m south of The Gore Rd @ Coolihans SR, east edge

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Appendix A2
White-Tailed Deer Motor Vehicle Collisions Report – Town of Caledon

White-Tailed Deer
Motor Vehicle Collisions

Town of Caledon

January 2001 to December 2007

Laura Elchyshyn
Mark Heaton
Ontario Ministry of Natural Resources
Aurora District

January 2009

Table of Contents

List of Tables and Figures

Introduction

The Town of Caledon is located within the Region of Peel. Caledon is bordered by Highway 9 in the north, Mayfield Road in the south, Winston Churchill Boulevard in the west, and Caledon-King Town Line in the east.

Data pertaining to motor vehicle collisions involving deer (DMVC) within the Town of Caledon has been collected from the local detachment of the Ontario Provincial Police. Data collected from January 2001 to December 2007 was provided for analysis and inclusion in this report. This information was digitized to visually represent areas and the frequency of DMVCs within the municipality.

The purpose of this report is to examine areas within the Town of Caledon where white-tailed deer and motor vehicle collisions occur and the frequency of those occurrences. This analysis is being provided to assist those agencies and stakeholders with an interest in local deer populations and more specifically motor vehicle collisions involving deer (OPP, Ministry of Transportation, Ministry of Natural Resources, Town of Caledon, Region of Peel), to determine high incidence areas and potential options for addressing concerns in those areas. The incidence of DMVCs may be attributed to a number of factors including landscape features, land use, status of deer populations, traffic volumes and speeds. These factors are not discussed in detail in this report. This report offers general recommendations for consideration in dealing with awareness, prevention and management of DMVCs in high risk areas within the Town of Caledon.

Method

The DMVC data was obtained from the Caledon detachment of the Ontario Provincial Police and includes data from January 2001 to December 2007. The data was organized in a spreadsheet by date, time of day, closest major intersection, and whether the collision was a result of a direct hit with a deer or in the attempt of avoiding a deer collision. This data was then used to plot approximate locations of the collisions in Google Earth to obtain latitude and longitude coordinates. Using the Canadian Spatial Reference System, latitude and longitude data was then converted to a UTM (Universal Transverse Mercator) coordinate. This data was organized to create the data used for the digitizing process. Using a spreadsheet, the collision data was further organized to obtain the frequency of collisions by location, time of day, and time of year.

A Geographic Information System (GIS) was used to digitize the data. Collisions are symbolized as points at the nearest intersection to the occurrence. A symbol represents the frequency of a collision occurring at the intersection or address.

Sources of Error

One sources of error within the data is where there is an insufficient amount of information recorded regarding the collision. This includes occurrences where no major intersection was provided or there was insufficient information to determine the nearest intersection where the collision occurred.

Sources of error using Google Earth include using an approximate location of where the collision occurred. Collisions were plotted only at specified major intersections or exact addresses. This may over or under represent the actual number of collisions occurring at the intersection.

Results

Collision Clusters

Figure 1 represents the locations and total numbers of DMVCs in the Town of Caledon during the period from January 2001 to December 2007. There appears to have been a collision at almost every major intersection. The greatest number of collisions occurred at the intersection of Airport Road and Charleston Side Road (39 collisions) and at Old Church Road and the Gore Road (36 collisions). The least number of reported collisions occurred within areas of development such as downtown areas.

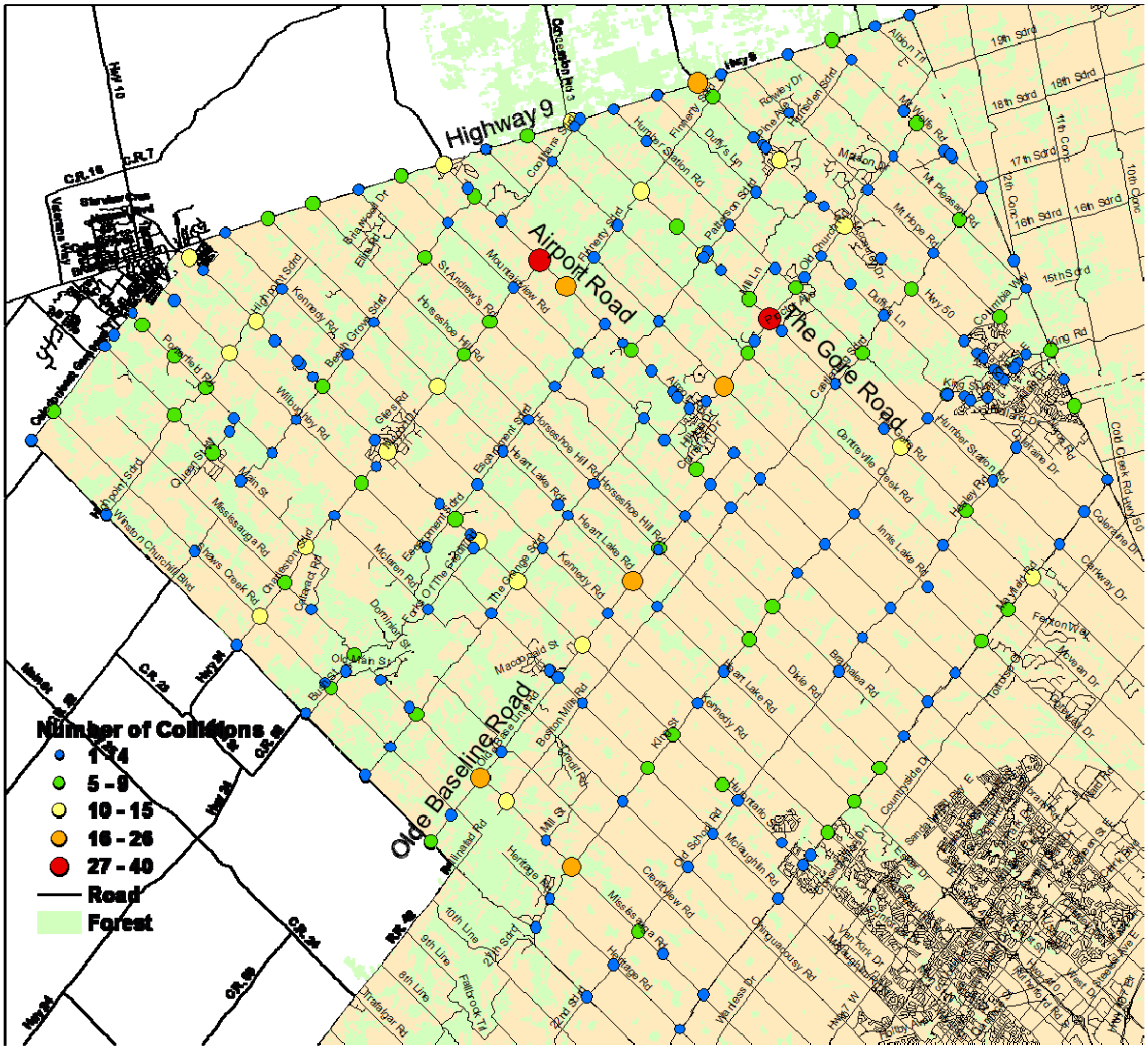


Figure 1: Frequency of deer motor vehicle collisions in the Town of Caledon from January 2001 to December 2007.

Other significant collision clusters include Airport Road & Finnerty Side Road, Innis Lake Road & Old Church Road, Highway 9 & Highway 50, and Mississauga Rd and Highway 10 where 16-26 collisions occurred within the 7 year span.

Annual & Monthly Totals

Table 1 represents the total number of DMVCs by month and by year for the time period from January 2001 to December 2007. The month of November has the greatest frequency of reported collisions. In 2001, 35 collisions occurred, and in 2004, 54 collisions were reported. The month of July has the least number of reported collisions with the lowest rate of 1 in 2002, and the greatest incidence of 10 in 2006.

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	**TOTAL**
Year													
2001	3	2	9	3	7	7	7	7	2	20	35	16	**118**
2002	26	5	8	5	13	8	1	4	4	20	39	22	**155**
2003	10	5	7	7	14	14	3	2	3	22	52	30	**169**
2004	12	3	7	5	14	9	2	8	5	24	54	28	**171**
2005	20	10	8	8	9	10	4	3	6	27	52	20	**177**
2006	16	7	14	13	13	14	10	4	6	31	46	15	**189**
2007	21	8	6	6	13	13	6	6	4	5	53	14	**155**
TOTAL	**108**	**40**	**59**	**47**	**83**	**75**	**33**	**34**	**30**	**149**	**331**	**145**	**1134**

Table 1: Total number of deer motor vehicle collisions by month and year (direct hit and avoidance) from January 2001 to December 2007.

2006 had the highest incidence of total collisions of 189, whereas in 2001, there were only 118 reported collisions. The average annual number of motor vehicle collisions is 162 collisions for the seven year period. This, on average, is 1 DMVC every two days.

Figure 2, represents the monthly percentage of reported collisions for the period from 2001 to 2007. November has the greatest percentage with 26% and July through September have the lowest percentage of 3% each.

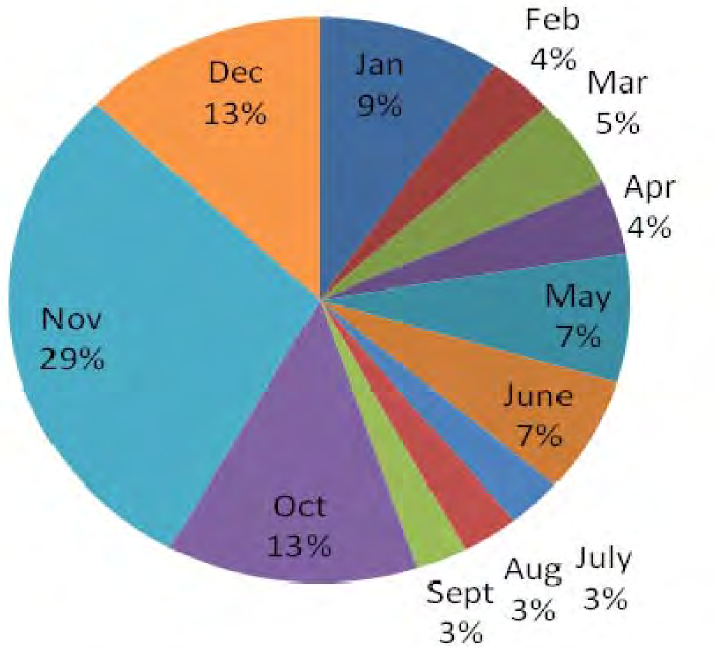


Figure 2: Monthly percentages of total DMVCs from 2001-2007.

Most Common Period

Table 2 represents the most common period of DMVC collisions for two week periods in the month of November. The average number of DMVCs is greatest during the first two weeks of November with 26.1 collisions and lowest during the last two weeks of November with 21 collisions .

	November 1-14	**November 7-21**	**November 15-30**
Year			
2001	18	16	17
2002	17	22	22
2003	36	26	16
2004	26	24	28
2005	28	24	24
2006	25	24	21
2007	33	27	19
AVG	**26.1**	**23.3**	**21**

Table 2: Frequency of deer MVC for two week periods during November 2001 to 2007.

Time of Day

An analysis of the data concludes that the majority of collisions occurred during low light conditions between dusk and dawn.

Discussion

Collision Clusters

The areas with the most common collision occurrences are Airport Road and Charleston Side Road with 39 deer MVC. Old Church Road and The Gore Road experienced 34 reported collisions. Airport Road and The Gore Road are highly travelled roadways which may account for high collision rates. This is also apparent on roadways such as Highway 10 and Mississauga Road.

The Airport Road and Charleston Side Road intersection is surrounded by forest and farmers fields which provide food sources and habitat for deer. This may also contribute to high number of deer collisions. Old Church Road and The Gore Road intersection is also moderately forested with a small creek corridor.

Annual and Monthly Totals

Variations in annual totals of deer motor vehicle accidents may be related to increases or decreases in the deer population or may be related to climate or other environmental conditions. Periods of drought, colder air temperatures and other factors may affect breeding and feeding patterns. Deer breeding typically occurs from October through December. Migration from summer range to winter range usually also occurs in December depending on snow accumulation. During the late fall deer seek high energy food sources to help build accumulations of body fat for the winter. They may travel over larger distances to access row crops like corn and soybeans. This is a period of high deer activity and is reflected in an increase of motor vehicle collisions during this period. As seen in **Figure 2**, over 50% of all collisions occur during this time. November has the greatest number of collisions at 26%.

Seasonal Locations

The data was organized to compare seasonal collision locations. There are no apparent differences when comparing spring and fall data. Collision locations occur in similar areas with more frequent accidents occurring during the fall months.

Most Common Period

Overall, the first two weeks of November experience the greatest frequency of deer MVC. Again, this is attributed to breeding period activity and shorter daylight hours.

Time of Day

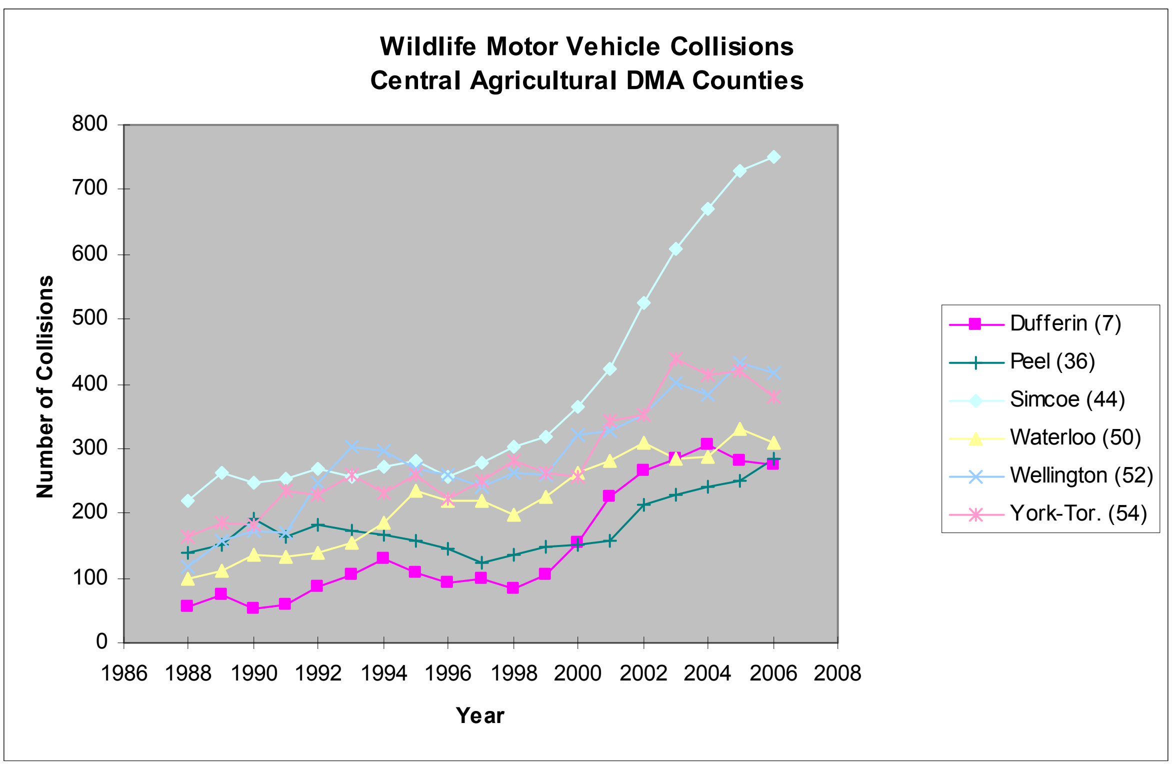
Collisions are greatest during the hours from dusk till dawn. This is when deer are more difficult to spot along roadways and deer tend to be more active outside of daylight hours.

Recommendations

Referring to the data in **Table 1**, deer- related collisions appear to be relatively stable within the past five years in the Town of Caledon. However, the number of collisions appears to be high on an annual basis which raises the need to improve driver awareness and safety.

Deer populations throughout much of Southern Ontario have been increasing in recent years. The table below illustrates wildlife motor vehicle collision data collected by the Ontario Ministry of Transportation between 1988 to 2006 for county and regional municipalities near or adjacent to the Town of Caledon. These data represent all wildlife collisions that would have resulted in an accident report. In the majority of cases in Southern Ontario collisions with wildlife resulting in enough damage to require a police investigation are associated with deer. As the figure illustrates, most of these municipalities are experiencing a similar increasing trend in deer vehicle accidents. Simcoe County has experienced the sharpest increase in collisions during this period.

There is a strong correlation between the number of deer motor vehicle accidents and the density of the deer population in an area. MNR uses this information as one indicator in the trend of local deer populations.



When deer populations increase the number of human-deer conflicts such as deer vehicle collisions and crop damage complaints usually increase as well.

Obviously, road safety is a major concern when deer densities are high.

There are several technologies or management approaches for potentially improving driver safety and awareness. These include:

- in-vehicle technologies with new cars being equipped with infrared or heat sensors for enhanced night vision
- external vehicle deer whistles
- roadside lighting
- reducing speed limits in high risk areas or during high risk periods
- deer crossing signs (improved size and hazard lighting) in high-risk areas
- maximizing hunting opportunities to reduce deer density through regulated hunting
- exclusion fencing
- constructing wildlife crossings for roadways.

Many of the above techniques have been tried in various jurisdictions around North America with varied success. Throughout North America the most effective means of controlling deer populations is through regulated hunting. MNR has responded to the increasing trend in deer populations in recent years by expanding recreational hunting opportunities significantly. This has included expanding the length of archery seasons and gun seasons and offering additional seals allowing hunters to harvest multiple numbers of deer in many areas.

Within the Town of Caledon there is currently only an archery season for deer that is open from October 1 to December 31. Additional seals are also available allowing hunters to harvest up to six additional deer during the season. There is also a proposal currently to add two more weeks to the archery season from January 1 to January 15th. There is currently no gun season for deer within the Town of Caledon but this is an option that could be explored with the municipality to further help control the deer population.

Conclusion

With high deer collision occurrences within the Town of Caledon, it is necessary for road managers to further investigate and pursue effective means of communicating high risk areas to drivers. Planning and design of road reconstruction projects should incorporate wildlife crossings and exclusion fencing in high risk areas. Continued deer collision reporting and tracking is needed to monitor frequency and trends. This information can be used for community education and awareness.

In 2005, the Ontario Government initiated the development of a Strategy for Preventing and Managing Human-Deer Conflicts in Southern Ontario. The initiative was developed as part of a collaborative approach involving several provincial Ministries and a diverse group of stakeholders. This strategy was recently released and provides a strategic approach to addressing human-deer conflicts in Southern Ontario. The strategy can be accessed at http://www.mnr.gov.on.ca/244545.pdf .

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Appendix B

Tree Inventory and Butternut Health Assessment

APPENDIX 1. TREE ASSESSMENT METHODOLOGY

DBH (cm): Diameter at breast height, 1.4 m above ground, measured in centimeters. Two or more numbers denotes the DBH of each stem/trunk for trees with multiple stems/trunks.

Crown Reserve (metres): Crown diameter (tree's canopy) measured in meters.

Tree Condition Rating:

Excellent
Balanced, full crown; limbs and branches well spaced; moderate to high vigour
No structural defects; biologically healthy with no diseases / disease symptoms; no crown dieback

Good
Full crown with small, incomplete sections; limbs and branches mostly well spaced; moderate vigour
Presence of very minor structural defects and/or very minor diseases / disease symptoms; very minor dieback (<10%)

Fair
Crown not full or with large incomplete sections; some limbs and branches missing and/or not well spaced; moderate to poor vigour
Presence of minor structural defects and/or minor diseases / disease symptoms; moderate dieback (10-30%)

Poor
Crown severely unbalanced or with very reduced (<30%) live crown; many limbs and branches missing; severely poor vigour
Presence of major structural defects and/or presence of major diseases / disease symptoms; severe dieback (>30%)

Dead
No leaves, no buds, fine branchlets/twigs missing or dried out and brittle, bark peeling off, limbs or branches fallen off, decay present and may be extensive

Notes: *This rating system is a synthesis of the rating system of the City of London and Aboud & Associates (Tree Inventory and Assessment Methodology). It was prepared by Steven Aboud and reviewed by Kevin Butt. Its purpose is to create a system that is efficient to use (including use digital collection using PDA, etc.) and easy to understand. Many municipalities use the Dead to Excellent rating system.*

APPENDIX 2. TREE DATA - WEST SIDE OF GORE ROAD BETWEEN PATTERSON SIDEROAD AND HWY 9
Data Collected on June 21 and July 15, 2011

Tree No.	Individual Tree	Tree Group	Tree Species (Common Name) *See Appendix 4 for botanical names or recorded trees*	DBH (cm)	Crown Reserve (m)	Tree Condition	Recommendation Based on Tree Condition	Recommendation Based on Grading Impacts	Final Recommendation	% of Tree Group to be Removed (Approx.)
W1	X		White Elm	35	8	Fair	P	P	**P**	-
W2	X		White Cedar	65	8	Fair	P	R	**R**	-
W3	X		White Ash	28,30	8	Fair	P	R	**R**	-
W4	X		Sugar Maple	65	10	Fair	P	R	**R**	-
W5	X		Sugar Maple	75	4	Poor	R	R	**R**	-
W6	X		White Ash	25	6	Good	P	R	**R**	-
W7	X		Sugar Maple	65	5	Poor	R	R	**R**	-
W8	X		Sugar Maple	75	5	Poor	R	R	**R**	-
W9		X	11 White Ash. 10 White Cedar, 9 White spruce, 3 Red Oak, 1 Apple, 1 Black Cherry	>20	-	Good	P	P/R	**P/R**	25
W10		X	25 Red Pine in ROW	>20	-	Majority Good, A few Poor	P	P/R	**P/R**	>80
W11		X	Immature White Cedar thicket in ROW	<15	-	Good	P	P/R	**P/R**	20
W12		X	6 Red Pine, 2 White Cedar	>20	-	Good	P	P/R	**P/R**	40
W13		X	Forest edge with 3 Trembling Aspen and 3 White Ash	>20	-	Aspen = Fair; Ash = Poor	P/R	P/R	**P/R**	60
W14		X	23 Sugar Maple, 12 White Cedar, 2 White Ash, 1 Black Cherry	>20	-	Good	P	P/R	**P/R**	60
W15		X	Immature White Cedar and Trembling Aspen	<20	-	-	-	R	**R**	100
W16		X	38 White Cedar, 2 Black Cherry, 2 Trembling Aspen, 2 Sugar Maple, 1 White Ash	>20	-	Good	P	P/R	**P/R**	65
W17		X	4 White Cedar, 2 White Ash, 1 Sugar Maple	>20	-	Fair	P	P/R	**P/R**	60
W18	X		Trembling Aspen	30	7	Fair	P	R	**R**	-
W19	X		White Ash	26	5	Poor	R	R	**R**	-
W20	-	-	Cattail Marsh - no trees	-	-	-	-	P/R	**P/R**	-
W21	X		Trembling Aspen	22	5	Fair	P	P	**P**	-
W22		X	Cattail Marsh with sparse immature trees of White Cedar and White Elm	<15	-	Good	P	P/R	**P/R**	70
W23		X	4 White Cedar, 2 White Ash, 1 Sugar Maple	>20	-	Poor	R	P/R	**P/R**	60
W24	X		Sugar Maple	100	16	Fair	P	R	**R**	-
W25	X		Hemlock	40	7	Good	P	P	**P**	-
W26	X		Black Cherry	26	6	Fair	P	R	**R**	-
W27		X	12 White Cedar, 3 White Ash, 2 Ironwood, 2 Sugar Maple	>20	-	Good	P	P/R	**P/R**	40
W28	X		White Ash	35,40	12	Poor	R	R	**R**	-
W29		X	12 White Cedar, 10 White Ash, 2 Black Cherry	>20	-	Good (Ash = Poor)	P/R	P/R	**P/R**	30
W30	X		White Elm	22	4	Poor	R	R	**R**	-
W31	X		White Willow	45,55,65	15	Poor	R	R	**R**	-

APPENDIX 2. TREE DATA - WEST SIDE OF GORE ROAD BETWEEN PATTERSON SIDEROAD AND HWY 9
Data Collected on June 21 and July 15, 2011

Tree No.	Individual Tree	Tree Group	Tree Species (Common Name) *See Appendix 4 for botanical names or recorded trees*	DBH (cm)	Crown Reserve (m)	Tree Condition	Recommendation Based on Tree Condition	Recommendation Based on Grading Impacts	Final Recommendation	% of Tree Group to be Removed (Approx.)
W32	X		White Ash	60	12	Poor	R	R	**R**	-
W33	X		White Ash	22	5	Poor	R	R	**R**	-
W34	X		Sugar Maple	32	6	Fair	P	P	**P**	-
W35	X		Red Pine	24	5	Fair	P	P	**P**	-
W36	X		Green Ash	50	12	Poor	R	R	**R**	-
W37		X	2 Norway Maple, 7 Green Ash, 3 White spruce	>30	-	Fair - Poor	P/R	P/R	**P/R**	
W38	X		Green Ash	30	-	Poor	R	P	**R**	-
W39	X		Green Ash	35	-	Dead	R	P	**P**	-
W40	X		Green Ash	35	-	Dead	R	P	**P**	-
W41		X	7 Black Locust, 5 Scots Pine, 2 Austrian Pine, 1 European Larch	>20	-	Good	P	P/R	**P/R**	10
W42	X		Green Ash	26	6	Good	P	P	**P**	-
W43	X		Black Cherry	32	7	Good	P	P	**P**	-
W44	X		Black Cherry	32,30	8	Fair	P	P	**P**	-
W45		X	9 Sugar Maple, 7 Green Ash, 1 White Cedar, 1 Black Cherry	>20	-	Fair - Good (Ash = Poor)	P/R	P/R	**P/R**	65
W46	X		Green Ash	35,40	10	Poor	R	R	**R**	-
W47	X		Black Cherry	30	5	Poor	R	R	**R**	-
W48	X		Green Ash	28	6	Poor	R	R	**R**	-
W49	X		White Cedar	50	8	Fair	P	R	**R**	-
W50	X		White Cedar	50	8	Fair	P	R	**R**	-
W51		X	Cattail Marsh with sparse immature trees of White Elm, White Birch, Black Ash and and dead White Cedar	<20	-	Dead Cedars, otherwise good	P/R	P/R	**P/R**	60
W52	X		Basswood	26	5	Poor	R	R	**R**	-
W53		X	Majority is immature trees with 1 mature Trembling Aspen, 1 Black Locust and 1 White Cedar	>20	-	Good	P	P/R	**P/R**	25
W54		X	Hedgerow of Black Locust. All trees are immature (<20cm), with the exception of 6 in ROW that are immature multi-stemmed.	<20	-	Fair - Good	P	P/R	**P/R**	50
W55	X		White Elm	32	8	Fair	P	R	**R**	-
W56	X		Green Ash	28	7	Fair	P	R	**R**	-
W57		X	Immature spruce plantation/thicket with immature Trembling Aspen	<20	-	Good	P	P/R	**P/R**	65
W58		X	Immature White Cedar and Trembling Aspen	<20	-	Good	P	P/R	**P/R**	<10
W59		X	White Spruce Plantation outside ROW	>20	-	Good	P	P/R	**P/R**	<10
W60	X		Black Cherry	75	10	Poor	R	R	**R**	-
W61	X		White Ash	50	8	Poor	R	R	**R**	-
W62	X		White Ash	55	10	Poor	R	R	**R**	-
W63	X		White Ash	15,20	6	Fair	P	R	**R**	-

APPENDIX 2. TREE DATA - WEST SIDE OF GORE ROAD BETWEEN PATTERSON SIDEROAD AND HWY 9
Data Collected on June 21 and July 15, 2011

Tree No.	Individual Tree	Tree Group	Tree Species (Common Name) *See Appendix 4 for botanical names or recorded trees*	DBH (cm)	Crown Reserve (m)	Tree Condition	Recommendation Based on Tree Condition	Recommendation Based on Grading Impacts	Final Recommendation	% of Tree Group to be Removed (Approx.)
W64	X		White Ash	10	6	Fair	P	R	**R**	-
W65		X	Red Pine Plantation outside ROW	>20	-	Good	P	P/R	**P/R**	15
W66		X	White Spruce - Red Pine Plantation outside ROW	>20	-	Good	P	P/R	**P/R**	15
W67	X		Sugar Maple	>30	-	Dead	R	R	**R**	-
W68	X		Sugar Maple	>30	-	Dead	R	R	**R**	-
W69		X	2 Red Pine and 1 White Spruce outside ROW	>20	-	Good	P	P	**P**	0
W70		X	Largetooth Aspen and Red Pine outside ROW	>20	-	Fair	P	P/R	**P/R**	5
W71	X		White Cedar	45	5	Poor	R	R	**R**	-
W72	X		White Cedar	38	5	Fair	P	R	**R**	-
W73		X	Red Pine and immature Trembling Aspen outside ROW	20	-	Good	P	P/R	**P/R**	<5
W74		X	Immature Black Locust	<20	-	Good	P	P/R	**P/R**	<10
W75		X	Immature White Cedar, Scots Pine and Largetooth Aspen on very steep slope	<20	-	Good	P	P/R	**P/R**	20
W76		X	Forest edge of White Cedar, Trembling Aspen, Green Ash and Balsam Poplar	>20	-	Fair. Some Cedar dead	P/R	P/R	**P/R**	30
W77		X	Plantation of White spruce, Eastern White Pine and Red Pine	>20	-	Good	P	P	**P**	0
W78		X	Immature White Cedar, Scots Pine and White spruce on slope	<20	-	Good	P	P	**P**	0
W79		X	Mature Red Pine - Scots Pine plantation mixed with immature Trembling Aspen at edge	>20	-	Good	P	P	**P**	0
W80		X	Immature Scots Pine plantation in ROW	<20	-	Good	P	P	**P**	0
W81		X	Mature Red Pine plantation	>20	-	Good	P	P	**P**	0
W82		X	Immature Trembling Aspen and Scots Pine	<20	-	Good	P	P/R	**P/R**	60
W83	X		Sensitive Fern marsh with 1 mature Trembling Aspen	>20	-	Good	P	P	**P**	0
W84		X	Mature Red Pine plantation mixed with Ash	>20	-	Good	P	P	**P**	0
W85		X	Dead patch of Red Pine	>20	-	Dead	R	P/R	**P/R**	20
W86		X	Mature Red Pine plantation mixed with Trembling Aspen & regen of ash	>20	-	Good	P	P	**P**	0
W87		X	Immature regen of Scots Pine and White spruce in ROW	<20	-	Good	P	P/R	**P/R**	60
W88		X	Immature Trembling Aspen and Willow lowland forest on either side of stream	<20	-	Good	P	P/R	**P/R**	75
W89		X	Hardwood forest up to edge of ROW with American Beech, Black Cherry, Basswood, White Ash and Sugar Maple	>20	-	Good	P	P/R	**P/R**	15
W90		X	6 open-grown White Ash in ROW	>20	-	Poor	R	P/R	**P/R**	60
W91	X		Black Cherry	22,28,28	5	Poor	R	R	**R**	-
W92	X		Trembling Aspen	36	7	Poor	R	R	**R**	-

APPENDIX 2. TREE DATA - WEST SIDE OF GORE ROAD BETWEEN PATTERSON SIDEROAD AND HWY 9
Data Collected on June 21 and July 15, 2011

Tree No.	Individual Tree	Tree Group	Tree Species (Common Name) *See Appendix 4 for botanical names or recorded trees*	DBH (cm)	Crown Reserve (m)	Tree Condition	Recommendation Based on Tree Condition	Recommendation Based on Grading Impacts	Final Recommendation	% of Tree Group to be Removed (Approx.)
W93		X	Mature Red Pine plantation outside of ROW	>20	-	Good	P	P	**P**	0
W94		X	Immature regeneration of Trembling Aspen, White Ash and Staghorn Sumac	<20	-	Good	P	P	**P**	0
W95		X	Mature Red Pine plantation with understory of White Ash outside ROW	>20	-	Fair	P	P/R	**P/R**	15
W96		X	Mature Red Pine plantation outside ROW	>20	-	Good	P	P	**P**	0
W97		X	Eastern White Pine plantation outisde ROW with small amount of immature White Cedar and White Ash in ROW	<20	-	Good	P	P/R	**P/R**	<10
W98	X		White Cedar	65,60,28	7	Poor	R	R	**R**	-
W99	X		White Cedar	35,55	7	Poor	R	R	**R**	-
W100	X		White Elm	45	12	Fair	P	R	**R**	-
W101	X		Apple	15,15,22	7	Good	P	R	**R**	-
W102	X		Apple	20,30 28,22	7	Poor	R	R	**R**	-
W103	X		Basswood	65,65	15	Good	P	R	**R**	-
W104	X		Basswood	60,50, 40,30,30	15	Good	P	R	**R**	-
W105		X	Immature Scots Pine and White Cedar regen on slope	<20	-	Good	P	P	**P**	0
W106		X	12 Scots Pine	>20	-	Fair	P	P	**P**	0
W107	X		Norway Maple	>20	8	Excellent	P	P	**P**	-
W108	X		Norway Maple	>20	7	Excellent	P	P	**P**	-
W109	X		Norway Maple	>20	7	Excellent	P	P	**P**	-
W110	X		Norway Maple	>20	6	Excellent	P	P	**P**	-
W111	X		Thornless Honey Locust	>20	7	Excellent	P	P	**P**	-
W112	X		Thornless Honey Locust	>20	8	Excellent	P	P	**P**	-
W113	X		Colorado Spruce	20	6	Excellent	P	P	**P**	-
W114	X		Colorado Spruce	20	5	Excellent	P	R	**R**	-
W115	X		Sugar Maple	90	12	Poor	R	R	**R**	-
W116	X		Silver Maple	25,25,30 30,40,15	15	Fair	P	R	**R**	-
W117	X		Silver Maple	30	8	Poor	R	R	**R**	-
W118		X	White spruce Plantation	>20	-	Good	P	P/R	**P/R**	5
W119		X	Dead Carolina Poplar	>20	-	Dead	R	P/R	**R**	100
W120		X	Immature Trembling Aspen grove	<20	-	Fair	P	P	**P**	0
W121	X		Balsam Poplar	28	-	Fair	P	P	**P**	-
W122	X		Black Cherry	>30	-	Good	P	P	**P**	-
W123	X		White Ash	>30	-	Good	P	P	**P**	-
W124	X		Sugar Maple	>30	-	Fair	P	R	**R**	-

APPENDIX 2. TREE DATA - WEST SIDE OF GORE ROAD BETWEEN PATTERSON SIDEROAD AND HWY 9
Data Collected on June 21 and July 15, 2011

Tree No.	Individual Tree	Tree Group	Tree Species (Common Name) *See Appendix 4 for botanical names or recorded trees*	DBH (cm)	Crown Reserve (m)	Tree Condition	Recommendation Based on Tree Condition	Recommendation Based on Grading Impacts	Final Recommendation	% of Tree Group to be Removed (Approx.)
W125	X		White Ash	>30	-	Poor	R	P	**R**	-
W126	X		White Ash	>30	-	Poor	R	R	**R**	-
W127	X		White Ash	>30	-	Fair	P	R	**R**	-
W128	X		Carolina Poplar	75	20	Fair	P	R	**R**	-
W129	X		Carolina Poplar	40,50	15	Poor	R	R	**R**	-
W130	X		Carolina Poplar	50	15	Fair	P	R	**R**	-
W131	X		Carolina Poplar	75	20	Fair	P	R	**R**	-
W132	X		Sugar Maple	90	12	Poor	R	R	**R**	-
W133	X		White Ash	40	12	Fair	P	R	**R**	-
W134	X		White Ash	28	8	Fair	P	R	**R**	-
W135	X		White Ash	35	8	Fair	P	R	**R**	-
W136	X		Basswood	35,35, 50,30,30	16	Fair	P	R	**R**	-
W137		X	Forest edge of White spruce, White Cedar, White Ash and Eastern White Pine outside ROW	>20	-	Good	P	P	**P**	0
W138		X	Forest edge of White Cedar and Trembling Aspen outside ROW	>20	-	Fair	P	P	**P**	0
W139		X	Immature mixed swamp of White Birch, White Cedar, Tamarack, Eastern White Pine, White Elm and White spruce	<20	-	Good	P	P/R	**P/R**	10
W140		X	Conifer plantation on lawn with 11 Colorado Spruce, 10 Red Pine, 2 White spruce and 1 large Black Walnut	>20	-	Poor to Good	P/R	P	**P**	0
W141		X	Conifer plantation on lawn with 9 Red Pine and 3 Colorado Spruce	>20	-	Fair to Good	P	P/R	**P/R**	5
W142		X	Conifer plantation with 3 Red Pine, 2 Eastern White Pine, 2 White spruce and 3 White Ash	>20	-	Good	P	P/R	**P/R**	<5
W143		X	3 Red Pine (good), 1 European Larch (good) and 1 large Carolina Poplar (dead)	>20	-	Good +1 dead	P/R	P	**P**	0
W144	X		White spruce	>20	-	Good	P	P	**P**	-
W145	X		Red Pine	>20	-	Good	P	P	**P**	-
W146	X		Red Pine	>20	-	Good	P	P	**P**	-
W147	X		White spruce	>20	-	Good	P	P	**P**	-
W148	X		European Larch	>20	-	Good	P	P	**P**	-
W149	X		European Larch	>20	-	Good	P	P	**P**	-
W150	X		White Ash	>20	-	Good	P	P	**P**	-
W151	X		Acer rubrum	>20	-	Good	P	P	**P**	-
W152	X		Acer rubrum	>20	-	Good	P	P	**P**	-
W153	X		European Larch	>20	-	Good	P	P	**P**	-
W154		X	6 large dead Carolina Poplar	>50	-	Dead	R	P	**R**	100

APPENDIX 2. TREE DATA - WEST SIDE OF GORE ROAD BETWEEN PATTERSON SIDEROAD AND HWY 9
Data Collected on June 21 and July 15, 2011

Tree No.	Individual Tree	Tree Group	Tree Species (Common Name) *See Appendix 4 for botanical names or recorded trees*	DBH (cm)	Crown Reserve (m)	Tree Condition	Recommendation Based on Tree Condition	Recommendation Based on Grading Impacts	Final Recommendation	% of Tree Group to be Removed (Approx.)
W155		X	Mature conifer plantation (Norway Spruce dominant with Scots Pine and White spruce)	>30	-	Good	P	P	**P**	0
W156		X	Immature Scots Pine in ROW	<20	-	Good	P	P/R	**P/R**	20
W157		X	Dead or dying Carolina Poplar and spruce	>20	-	Poor	R	P	**R**	100
W158		X	Mature Eastern White Pine plantation outside ROW	>30	-	Good	P	P	**P**	0
W159		X	Row of Red Cedar in ROW	<20	-	Good	P	P	**P**	0
W160		X	5 Red Cedar and 1 Norway Maple	>20	-	Good	P	P	**P**	0
W161		X	16 Red Cedar	>20	-	Good	P	P	**P**	0
W162		X	Immature Scots Pine with White spruce and White Cedar on steep slope. 5 of the Scots Pine are mature and >20cm DBH	< and > 20	-	Good	P	P/R	**P/R**	<5
W163		X	~25 mature Scots Pine in plantation. Immature regeneration of Scots Pine closer to road.	>20	-	Good	P	P/R	**P/R**	15
W164		X	Mature European Larch plantation outside ROW	>20	-	Good	P	P	**P**	0
W165		X	Immature White Cedar	<20	-	Good	P	P/R	**P/R**	40
W166		X	Mature Scots Pine plantation outside ROW	>20	-	Good	P	P/R	**P/R**	<5
W167		X	Mature Scots Pine plantation with an understory of White Ash outside ROW	>20	-	Good	P	P/R	**P/R**	10
W168	X		Scots Pine	20	6	Fair	P	P	**P**	-
W169	X		Scots Pine	20	5	Good	P	P	**P**	-
W170	X		Scots Pine	20	5	Good	P	P	**P**	-
W171	X		Scots Pine	20	5	Fair	P	P	**P**	-
W172	X		Scots Pine	20	5	Fair	P	P	**P**	-
W173		X	Immature group of White Cedar, Trembling Aspen and Red Cedar	<20	-	Fair	P	R	**R**	100
W174	X		Colorado Spruce	20	5	Excellent	P	P	**P**	-
W175	X		Colorado Spruce	20	5	Excellent	P	P	**P**	-
W176	X		Colorado Spruce	20	5	Excellent	P	P	**P**	-
W177		X	5 immature Douglas Fir	<20	3	Good	P	P/R	**P**	0
W178	X		Scots Pine	20	6	Good	P	P	**P**	0
W179	X		Scots Pine	20	6	Good	P	P	**P**	0
W180	X		Colorado Spruce	<20	5	Excellent	P	P	**P**	-
W181	X		Colorado Spruce	<10	4	Fair	P	P	**P**	-

APPENDIX 2. TREE DATA - WEST SIDE OF GORE ROAD BETWEEN PATTERSON SIDEROAD AND HWY 9
Data Collected on June 21 and July 15, 2011

Tree No.	Individual Tree	Tree Group	Tree Species (Common Name) *See Appendix 4 for botanical names or recorded trees*	DBH (cm)	Crown Reserve (m)	Tree Condition	Recommendation Based on Tree Condition	Recommendation Based on Grading Impacts	Final Recommendation	% of Tree Group to be Removed (Approx.)

WEST SIDE OF THE GORE ROAD TOTALS:

104		= Total No. of Individual Trees
	76	= Total No. of Tree Groups

Total Trees/Tree Groups to be Preserved (P) Based on Condition	131
Total Trees/Tree Groups to be Removed (R) Based on Condition	40
Total Trees/Tree Groups to be Partially Preserved (P/R) Based on Condition	8

Total Trees/Tree Groups to be Preserved (P) Based on Grading Impacts	71
Total Trees/Tree Groups to be Removed (R) Based on Grading Impacts	61
Total Trees/Tree Groups to be Partially Preserved (P/R) Based on Grading Impacts	49

Total Trees/Tree Groups to be Preserved (P) - Final Recommendation	68
Total Trees/Tree Groups to be Removed (R) - Final Recommendation	66
Total Trees/Tree Groups to be Partially Preserved (P/R) - Final Recommendation	47

APPENDIX 3. TREE DATA - EAST SIDE OF GORE ROAD BETWEEN PATTERSON SIDEROAD AND HWY 9
Data Collected on June 21 and July 15, 2011

Tree No.	Individual Tree	Tree Group	Tree Species (Common Name) *See Appendix 4 for botanical names of recorded trees*	DBH (cm)	Crown Reserve (m)	Tree Condition	Recommendation Based On Tree Condition	Recommendation Based On Grading Impacts	Final Recommendation	% of Tree Group to be Removed (Approx.)
E1		X	8 trees of Norway Spruce & White Spruce	12-15	3	Excellent	P	R	**R**	100
E2		X	3 trees of Sugar Maple	20-25	8	Excellent	P	R	**R**	100
E3	X		White Cedar	28	5	Poor	R	P	**R**	-
E4	X		Black Walnut	55	8	Excellent	P	P	**P**	-
E5	X		Silver Maple	55	8	Fair	P	P	**P**	-
E6	X		White Cedar	22	3	Poor	R	P	**R**	-
E7	X		Silver Maple	75	12	Fair	P	P	**P**	-
E8	X		Norway Maple	60	8	Good	P	P	**P**	-
E9	X		Black Cherry	45,35	8	Good	P	P	**P**	-
E10		X	White Cedar	15-35	5	Excellent	P	P	**P**	0
E11		X	25 White Cedar, 3 Green Ash, 1 American Beech	15-40	5-8	Excellent	P	P/R	**P/R**	<10
E12		X	5 White Cedar, 4 Green Ash, 3 Trembling Aspen, 1 Black Cherry	10-25	3-5	Fair	P	P/R	**P/R**	30
E13		X	Dead standing White Cedar	-	-	Dead	R	P/R	**R**	100
E14		X	Numerous (>100) immature White Cedar	5-10	-	Good	P	P/R	**P/R**	50
E15		X	6 mature Red Pine	-	-	-	-	P	**P**	0
E16		X	8 Green Ash	15-25	-	-	-	P	**P**	0
E17		X	12 White Cedar, 1 Green Ash	10-30	3-8	Good	P	P/R	**P/R**	10
E18		X	Immature Green Ash and White Elm	<20	-	-	-	P	**P**	0
E19	X		Green Ash	40	10	Poor	R	P	**R**	-
E20		X	Offsite trees 1-3m from ROW: 4 Trembling Aspen, 2 Red Maple, 2 Green Ash, 1 Sugar Maple	-	-	-	-	P	**P**	0
E21		X	Apple	30	5	Poor	R	P	**R**	-
E22		X	White Cedar	45,42	8	Excellent	P	P	**P**	-
E23		X	White Elm	28	8	Good	P	R	**R**	-
E24		X	White Elm	20	5	Good	P	R	**R**	-
E25		X	Green Ash	42	8	Poor	R	R	**R**	-
E26		X	7 Green Ash, 3 White Elm	15-25	3-5	Excellent	P	P/R	**P/R**	10
E27		X	3 Sugar Maple, 3 Black Cherry, 2 White Elm, 1 Green Ash, 1 Apple	12-20	3-5	Good	P	P	**P**	0
E28	X		White Elm	32	8	Excellent	P	R	**R**	-
E29	X		Basswood	25,10	8	Excellent	P	R	**R**	-
E30	X		Black Cherry	22	5	Good	P	R	**R**	-
E31	X		Scots Pine	21	8	Fair	P	P	**P**	-
E32		X	Mature Red Pine Plantation outside ROW	>20	-	-	-	P	**P**	0
E33		X	9 White Cedar	5-20	3-5	Good	P	P	**P**	0
E34		X	3 Green Ash, 3 Basswood	-	-	-	-	P	**P**	0

APPENDIX 3. TREE DATA - EAST SIDE OF GORE ROAD BETWEEN PATTERSON SIDEROAD AND HWY 9
Data Collected on June 21 and July 15, 2011

Tree No.	Individual Tree	Tree Group	Tree Species (Common Name) *See Appendix 4 for botanical names of recorded trees*	DBH (cm)	Crown Reserve (m)	Tree Condition	Recommendation Based On Tree Condition	Recommendation Based On Grading Impacts	Final Recommendation	% of Tree Group to be Removed (Approx.)
E35	X		Basswood	40	8	Good	P	R	**R**	-
E36	X		Basswood	38	12	Excellent	P	R	**R**	-
E37		X	Immature dead and dying Green Ash and White Cedar	<20	-	Dead	R	P/R	**R**	100
E38	X		Green Ash	20,10,20	8	Poor	R	R	**R**	-
-		X	White Cedar Swamp with dead Green Ash	-	-	Good - Poor	P/R	P/R	**P/R**	20
E39		X	Immature Sugar Maple, Green Ash and Basswood	<20	-	-	-	P/R	**P/R**	5
E40	X		Sugar Maple	75	12	Excellent	P	R	**R**	-
E41	X		Green Ash	62	10	Excellent	P	R	**R**	-
E42	X		White Ash	52	10	Fair	P	R	**R**	-
E43	X		White Ash	55	10	Fair	P	R	**R**	-
E44	X		White Ash	65	12	Fair	P	R	**R**	-
E45	X		White Ash	106	12	Fair	P	R	**R**	-
E46		X	5 Green Ash, 2 Black Cherry	20-30	5-8	Good	P	P	**P**	0
E47	X		Basswood	40	8	Fair	P	P	**P**	-
E48		X	Hedgerow with 5 Black Cherry, 4 Basswood and 3 Green Ash outside ROW	>20	-	-	-	P	**P**	0
E49		X	White Cedar	10-25	3-8	Poor	R	P/R	**R**	100
E50	X		Basswood	5-20	8	Fair	P	P	**P**	-
E51	X		White Elm	22	8	Good	P	R	**R**	-
E52	X		Basswood	15,20	8	Fair	P	R	**R**	-
E53	X		Basswood	20	5	Fair	P	R	**R**	-
E54		X	14 Green Ash	12-20	3-5	Poor	R	P/R	**R**	100
E55	X		Green Ash	70	12	Poor	R	P	**R**	-
E56	X		Sugar Maple	55	12	Excellent	P	P	**P**	-
E57	X		Green Ash	45	10	Fair	P	P	**P**	-
E58	X		Green Ash	20	8	Poor	R	P	**R**	-
E59	X		Green Ash	22	8	Excellent	P	P	**P**	-
E60	X		Green Ash	25	10	Fair	P	P	**P**	-
E61	X		Green Ash	28	10	Excellent	P	P	**P**	-
E62	X		Black Cherry	22	5	Poor	R	P	**R**	-
E63	X		Green Ash	25	8	Good	P	R	**R**	-
E64	X		Green Ash	30	10	Poor	R	R	**R**	-
E65	X		Sugar Maple	50	12	Excellent	P	R	**R**	-
E66		X	Mixed Spruce Hedgerow outside ROW	-	-	-	-	P	**P**	0
E67	X		Green Ash	27	10	Good	P	R	**R**	-
E68	X		Sugar Maple	20	10	Good	P	P	**P**	-
E69	X		White Cedar	35	8	Poor	R	P	**R**	-

APPENDIX 3. TREE DATA - EAST SIDE OF GORE ROAD BETWEEN PATTERSON SIDEROAD AND HWY 9
Data Collected on June 21 and July 15, 2011

Tree No.	Individual Tree	Tree Group	Tree Species (Common Name) *See Appendix 4 for botanical names of recorded trees*	DBH (cm)	Crown Reserve (m)	Tree Condition	Recommendation Based On Tree Condition	Recommendation Based On Grading Impacts	Final Recommendation	% of Tree Group to be Removed (Approx.)
E70	X		Sugar Maple	35	12	Good	P	P	**P**	-
E71	X		Green Ash	28	12	Good	P	R	**R**	-
E72	X		Black Cherry	14	5	Good	P	R	**R**	-
E73	X		Green Ash	32	8	Fair	P	R	**R**	-
E74	X		Green Ash	34	8	Good	P	R	**R**	-
E75	X		Green Ash	16	5	Good	P	R	**R**	-
E76	X		Green Ash	32,34,40	12	Poor	R	R	**R**	-
E77	X		Green Ash	22	8	Good	P	R	**R**	-
E78	X		Scots Pine	18	8	Good	P	P	**P**	-
E79	X		Scots Pine	16	5	Good	P	P	**P**	-
E80	X		White Spruce	12	5	Poor	R	R	**R**	-
E81		X	White Spruce group outside ROW	-	-	-	-	P	**P**	0
E82		X	Austrian Pine Plantation	30-35	-	Excellent	P	P	**P**	0
E83	X		Green Ash	20	6	Fair	P	P	**P**	-
E84		X	3 White Cedar	20	5	Good	P	P	**P**	0
E85		X	10 Trembling Aspen, 3 White Elm and 1 White Birch	12-25	3-5	Excellent	P	P	**P**	0
E86		X	Green Ash Woodland outside ROW with a few White Birch and Basswood	-	-	-	-	P/R	**P/R**	<10
E87		X	White Cedar, White Elm and Basswood on either side of stream outside ROW	-	-	-	-	P/R	**P/R**	10
E88		X	White Elm, White Cedar and Green Ash outside ROW	-	-	-	-	P/R	**P/R**	40
E89	X		Black Cherry	48	8	Poor	R	R	**R**	-
E90		X	Immature White Cedar and Green Ash Hedgerow	<20	-	Fair	P	P/R	**P/R**	20
E91		X	Immature White Cedar and Green Ash Hedgerow	<20	-	Good	P	P/R	**P/R**	<10
E92		X	Norway Spruce Plantation outside ROW	20-25	-	Good	P	P	**P**	0
E93		X	Mature White Cedar	>20	-	Good	P	P	**P**	0
E94	X		Black Cherry	55	18	Fair	P	P	**P**	-
E95		X	12 White Cedar	10-50	3-8	Fair	P	P	**P**	0
E96		X	15 White Cedar	30-50	8	Excellent	P	P/R	**P/R**	<5
E97		X	Immature White Spruce	<20	-	Good	P	P/R	**P/R**	70
E98		X	Immature White Spruce and Scots Pine	<20	-	Good	P	P	**P**	0
E99		X	Immature and mature White Cedar forest with 3 mature Scots Pine along roadside	14-25	3-5	Good	P	P/R	**P/R**	30
E100	X		White Spruce	20	5	Excellent	P	P	**P**	-
E101		X	Mid-aged White Spruce Plantation outside ROW	15-25	-	Good	P	P	**P**	0
E102		X	Mature Eastern White Pine with mid-aged White Spruce, Green Ash and Red Oak outside ROW	15-30	-	Good	P	P	**P**	0
E103		X	Immature Green Ash Woodland outside ROW	<20	-	Fair	P	P	**P**	0

APPENDIX 3. TREE DATA - EAST SIDE OF GORE ROAD BETWEEN PATTERSON SIDEROAD AND HWY 9
Data Collected on June 21 and July 15, 2011

Tree No.	Individual Tree	Tree Group	Tree Species (Common Name) *See Appendix 4 for botanical names of recorded trees*	DBH (cm)	Crown Reserve (m)	Tree Condition	Recommendation Based On Tree Condition	Recommendation Based On Grading Impacts	Final Recommendation	% of Tree Group to be Removed (Approx.)
E104		X	Mid-aged Green Ash - Trembling Aspen Woodland outside ROW	20	-	Good	P	P	**P**	0
E105		X	White Cedar Woodland outside ROW	-	-	-	-	P/R	**P/R**	30
E106	X		Green Ash	43	10	Excellent	P	R	**R**	-
E107		X	Green Ash - White Cedar Woodland outside ROW				-	P/R	**P/R**	60
E108		X	Green Ash Woodland outside ROW	-	-	-	-	P/R	**P/R**	10
E109	X		Green Ash	20,20	5	Fair	P	P	**P**	-
E110	X		Green Ash	18	5	Good	P	P	**P**	-
E111		X	Immature and sparse Scots Pine, Green Ash and White Cedar inside ROW	<20	-	Good	P	P	**P**	0
E112		X	Immature Trembling Aspen inside ROW	<20	-	Good	P	P	**P**	0
E113		X	Mid-aged White Spruce - Eastern White Pine Plantation outside ROW	-	-	-	-	P/R	**P/R**	5
E114		X	Immature White Cedar Hedgerow	10-20	-	Good	P	P/R	**P/R**	<10
E115		X	Mid-aged White Cedar Hedgerow	10-40	-	Good	P	P/R	**P/R**	10
E116	X		Apple	20	8	Good	P	R	**R**	-
E117		X	Mid-aged Austrian Pine Plantation outside ROW	20-30	-	Good	P	P	**P**	0
E118		X	Silver Maple, Red Pine, Eastern White Pine and White Spruce Plantation outside ROW	15-25	-	Good	P	P/R	**P/R**	5
E119		X	Mid-aged White Spruce - Eastern White Pine Plantation	15-25	-	Good	P	P	**P**	0
E120		X	4 mid-aged Silver Maple outside ROW	15-25	-	Good	P	P	**P**	0
E121		X	3 mature Carolina Poplar outside ROW	>30	-	Good	P	P	**P**	0
E122		X	5 mid-aged Silver Maple outside ROW	20-30	-	Good	P	P	**P**	0
E123	X		White Cedar	32	5	Fair	P	R	**R**	-
E124		X	Immature White Cedar - White Ash Forest outside ROW	15-25	-	Good	P	P/R	**P/R**	<10
E125		X	Immature Green Ash regeneration and Staghorn Sumac	<20	-	Good	P	P/R	**P/R**	35
E126	X		Basswood	30	10	Excellent	P	P	**P**	-
E127		X	Immature Basswood, Green Ash and White Elm. Some White Cedar and White Elm is dead.	<20	-	Fair	P	P/R	**P/R**	10
E128	X		Green Ash	20	8	Poor	R	P	**R**	-
E129	X		Basswood	22	8	Excellent	P	P	**P**	-
E130	X		Green Ash	18	8	Poor	R	P	**R**	-
E131		X	Mixed immature woodland of White Birch, Green Ash, White Elm, Basswood and dead White Cedar at south end.	<20	-	Fair	P	P/R	**P/R**	<5
E132	X		Green Ash	35	12	Good	P	R	**R**	-
E133	X		Green Ash	35	12	Good	P	R	**R**	-
E134	X		Manitoba Maple	48	15	Fair	P	R	**R**	-
E135	X		Red Pine	20	12	Excellent	P	R	**R**	-

APPENDIX 3. TREE DATA - EAST SIDE OF GORE ROAD BETWEEN PATTERSON SIDEROAD AND HWY 9
Data Collected on June 21 and July 15, 2011

Tree No.	Individual Tree	Tree Group	**Tree Species (Common Name)** *See Appendix 4 for botanical names of recorded trees*	DBH (cm)	Crown Reserve (m)	Tree Condition	Recommendation Based On Tree Condition	Recommendation Based On Grading Impacts	Final Recommendation	% of Tree Group to be Removed (Approx.)
E136	X		Red Pine	16	8	Good	P	R	**R**	-
E137	X		White Birch	24	8	Poor	R	R	**R**	-
E138	X		Red Pine	24	5	Excellent	P	P	**P**	-
E139	X		Red Pine	24	5	Good	P	R	**R**	-
E140		X	Mature Norway Spruce - Scots Pine Plantation outside ROW	>20	-	Good	P	P	**P**	0
E141		X	Mature Red Pine Plantation outside ROW	-	-	-	-	P	**P**	0
E142	X		Scots Pine	25	8	Excellent	P	R	**R**	-
E143	X		Scots Pine	22	5	Excellent	P	R	**R**	-
E144	X		Eastern White Pine	25	8	Excellent	P	P	**P**	-
E145	X		Green Ash	20	10	Excellent	P	R	**R**	-
E146	X		White Spruce	18	5	Excellent	P	R	**R**	-
E147		X	4 Eastern White Pine	20-35	8	Excellent	P	P/R	**P/R**	50
E148	X		Carolina Poplar	>35	-	Dead	R	R	**R**	-
E149	X		Scots Pine	25	8	Fair	P	R	**R**	-
E150	X		Carolina Poplar	45	15	Poor	R	R	**R**	-
E151	X		Green Ash	15	5	Excellent	P	P	**P**	-
E152	X		Scots Pine	15	5	Good	P	P	**P**	-
E153	X		Carolina Poplar	32	8	Poor	R	R	**R**	-
E154		X	18 Red Pine inside ROW	15-22	5-8	Good	P	P/R	**P/R**	30
E155		X	Red Pine Plantation outside ROW	-	-	Good	P	P	**P**	0
E156	X		Butternut	50	12	Poor	R	P	**R**	-
E157	X		White Spruce	22	8	Excellent	P	R	**R**	-
E158	X		White Spruce	25	5	Excellent	P	P	**P**	-
E159	X		Colorado Spruce	20	5	Excellent	P	P	**P**	-
E160	X		Sugar Maple	55	15	Excellent	P	P	**P**	-
E161		X	Trees in ROW: 9 White Cedar, 5 Green Ash, 5 Trembling Aspen, 4 White Elm and 2 Scots Pine	15-20	3-5	Good	P	P/R	**P/R**	25
E162		X	Immature Scots Pine	<20	-	Fair - Good	P	P/R	**P/R**	40
E163		X	Immature and sparse Scots Pine	<20	-	Fair - Good	P	P	**P**	0
E164	X		Sugar Maple	40	12	Fair	P	R	**R**	-
E165	X		Basswood	12,24,40,40	12	Good	P	R	**R**	-
E166		X	Red Pine Plantation outside ROW	>20	-	Good	P	P/R	**P/R**	10
E167	X		Green Ash	30,30	8	Poor	R	R	**R**	-
E168	X		Green Ash	28,30	15	Poor	R	R	**R**	-
E169	X		White Ash	8,8,8	5	Fair	P	P	**P**	-
E170	X		White Ash	8,8,8	5	Fair	P	P	**P**	-
E171	X		White Willow	65	18	Fair	P	R	**R**	-

APPENDIX 3. TREE DATA - EAST SIDE OF GORE ROAD BETWEEN PATTERSON SIDEROAD AND HWY 9
Data Collected on June 21 and July 15, 2011

Tree No.	Individual Tree	Tree Group	Tree Species (Common Name) *See Appendix 4 for botanical names of recorded trees*	DBH (cm)	Crown Reserve (m)	Tree Condition	Recommendation Based On Tree Condition	Recommendation Based On Grading Impacts	Final Recommendation	% of Tree Group to be Removed (Approx.)
E172	X		Manitoba Maple	8	3	Fair	P	P	**P**	-
E173	X		Green Ash	10	3	Fair	P	P	**P**	-

TREE TOTALS - EAST SIDE OF THE GORE ROAD:

97		= Total No. of Individual Trees
	77	= Total No. of Tree Groups

Total Trees/Tree Groups to be Preserved (P) Based on Condition	**128**
Total Trees/Tree Groups to be Removed (R) Based on Condition	**27**
Total Trees/Tree Groups to be Partially Preserved (P/R) Based on Condition	**1**

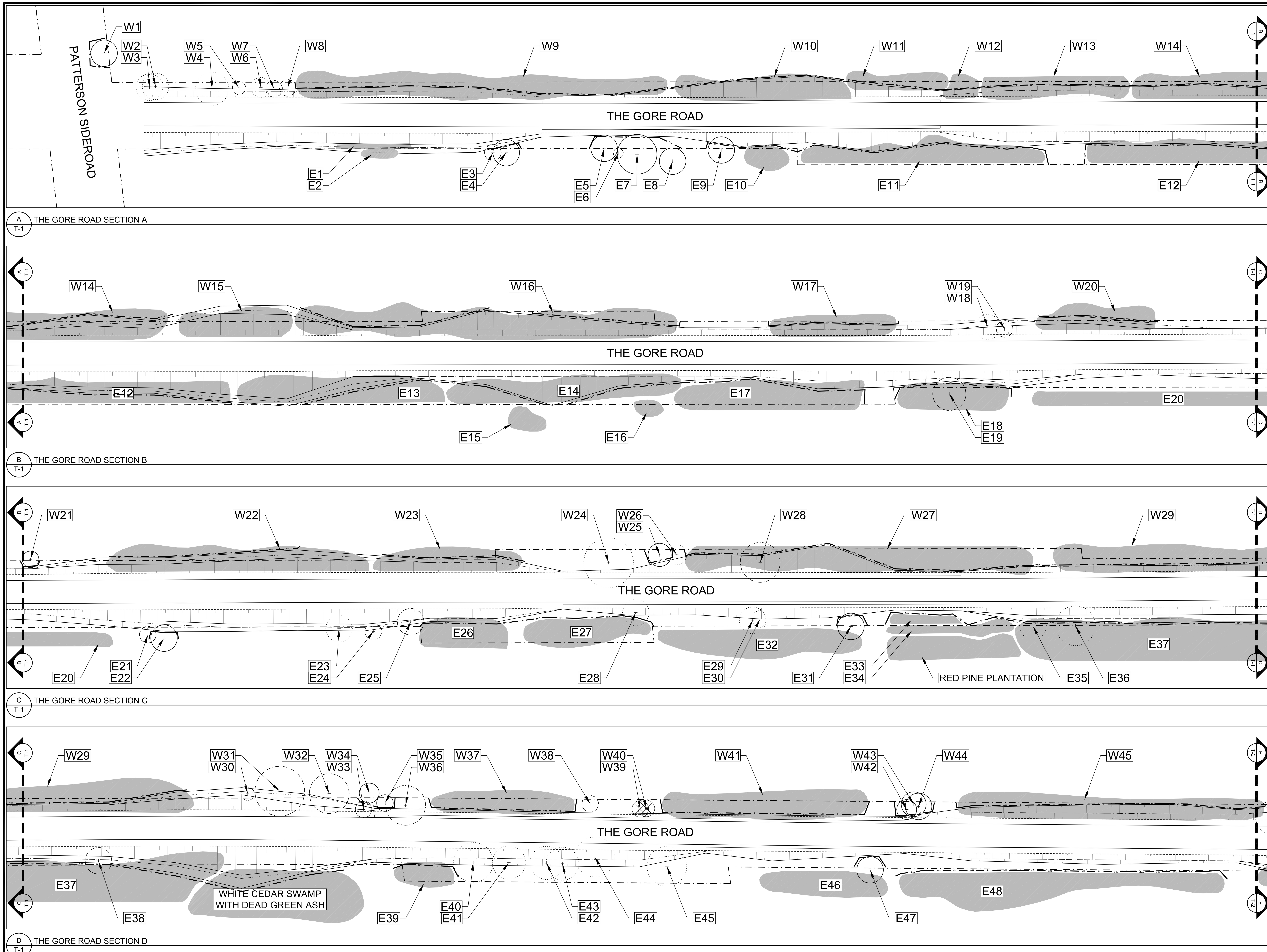
Total Trees/Tree Groups to be Preserved (P) Based on Grading Impacts	**82**
Total Trees/Tree Groups to be Removed (R) Based on Grading Impacts	**57**
Total Trees/Tree Groups to be Partially Preserved (P/R) Based on Grading Impacts	**35**

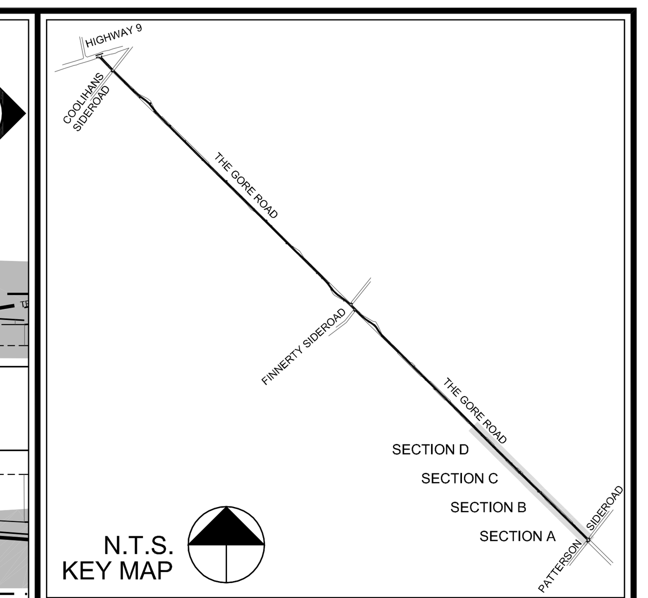
Total Trees/Tree Groups to be Preserved (P) - Final Recommendation	**71**
Total Trees/Tree Groups to be Removed (R) - Final Recommendation	**72**
Total Trees/Tree Groups to be Partially Preserved (P/R) - Final Recommendation	**31**

APPENDIX 4. COMMON AND BOTANICAL NAMES OF RECORDED TREE SPECIES
Gore Road Tree Inventory between Patterson Sideroad and Highway 9, July 2011

	Common Name	Botanical Name
1	Manitoba Maple *	*Acer negundo* *
2	Norway Maple *	*Acer platanoides* *
3	Red Maple	*Acer rubrum*
4	Silver Maple	*Acer saccharinum*
5	Sugar Maple	*Acer saccharum*
6	White Birch	*Betula papyrifera*
7	American Beech	*Fagus grandifolia*
8	White Ash	*Fraxinus americana*
9	Black Ash	*Fraxinus nigra*
10	Green Ash	*Fraxinus pennsylvanica*
11	Thornless Honey Locust *	*Gleditsia triacanthos var. inermis* *
12	Butternut	*Juglans cinerea*
13	Black Walnut	*Juglans nigra*
14	Red Cedar	*Juniperus virginiana*
15	European Larch *	*Larix decidua* *
16	Tamarack	*Larix laricina*
17	Apple *	*Malus pumila* *
18	Ironwood	*Ostrya virginiana*
19	Norway Spruce *	*Picea abies* *
20	White Spruce	*Picea glauca*
21	Colorado Spruce *	*Picea pungens* *
22	Austrian Pine *	*Pinus nigra* *
23	Red Pine	*Pinus resinosa*
24	Eastern White Pine	*Pinus strobus*
25	Scots Pine *	*Pinus sylvestris* *
26	Balsam Poplar	*Populus balsamifera*
27	Largetooth Aspen	*Populus grandidentata*
28	Trembling Aspen	*Populus tremuloides*
29	Carolina Poplar *	*Populus x canadensis* *
30	Black Cherry	*Prunus serotina*
31	Douglas Fir *	*Pseudotsuga menziesii* *
32	Red Oak	*Quercus rubra*
33	Black Locust *	*Robinia pseudoacacia* *
34	White Willow *	*Salix alba* *
35	Willow Species	*Salix* sp.
36	White Cedar	*Thuja occidentalis*
37	Basswood	*Tilia americana*
38	Hemlock	*Tsuga canadensis*
39	White Elm	*Ulmus americana*

* Non-native (exotic) species





LEGEND:

T1	EXISTING TREE TREE NUMBER, CIRCLE ILLUSTRATES APPROXIMATE CROWN RESERVE
	PRESERVE TREE TREE IS IN FAIR, GOOD OR EXCELLENT CONDITION
	REMOVE TREE TREE IS IN POOR CONDITION
	REMOVE TREE TREE IS IN CONFLICT WITH PROPOSED DEVELOPMENT
	REMOVE TREE TREE IS IN POOR CONDITION AND IS IN CONFLICT WITH PROPOSED DEVELOPMENT
	REMOVE TREE TREE IS DEAD
T1	TREE GROUP
	PROPOSED GRADING
	PROPOSED SWALE
	ROAD RIGHT-OF-WAY
TPF	TREE PROTECTION FENCE

GENERAL NOTES

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4. Erect tree protection fence prior to the commencement of any construction or grading, maintain tree protection barrier throughout entire duration of construction work.
5. Any soils and vegetation within tree protection zone damaged by the Contractor shall be restored to the satisfaction of the Region by the Contractor at no additional cost.
6. Prune and mitigate limbs and roots damaged by construction work in accordance with most current International Society of Arboriculture standards.
7. Final action for offsite trees recomended for preservation or removal due to structural and biological health to be determined by individual landowners subject to the approval of the Region.

INFORMATION SOURCES

1. BASE INFORMATION OBTAINED FROM R.J. BURNSIDE & ASSOCIATES LIMITED.
2. TREE DATA COLLECTED BY ABOUD & ASSOCIATES INC. ON JUNE 21 AND JULY 15, 2011.

No.	Description	By	Date
0	FIRST SUBMISSION	BM	SEP-11

REVISIONS: All previous issues of this drawing are superceded

ABOUD & ASSOCIATES INC.
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Title:

GORE ROAD TREE INVENTORY

Project:

GORE ROAD IMPROVEMENTS FROM PATTERSON SIDEROAD TO HIGHWAY 9
SCHEDULE B MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT
REGION OF PEEL

Date: SEPTEMBER 2011
Project: AA10-57A
Scale: 1:500
Designer: BM
Drawn: MM, BM
Checked: KB

Drawing No:

T-1

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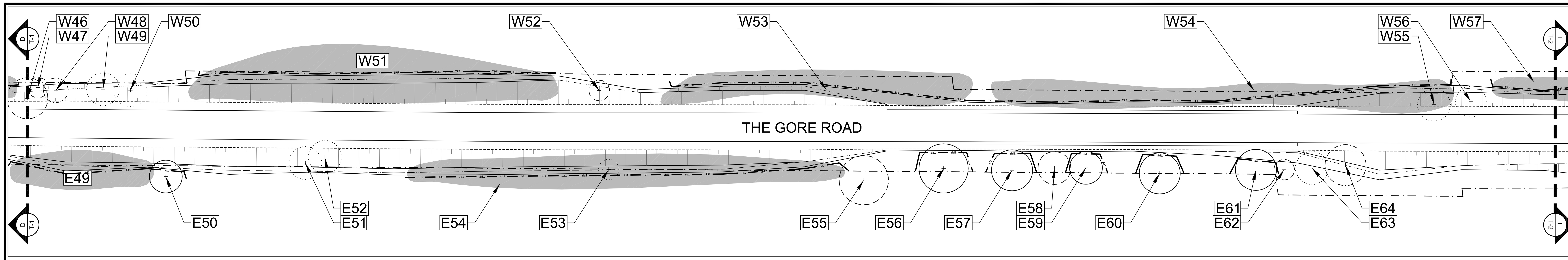

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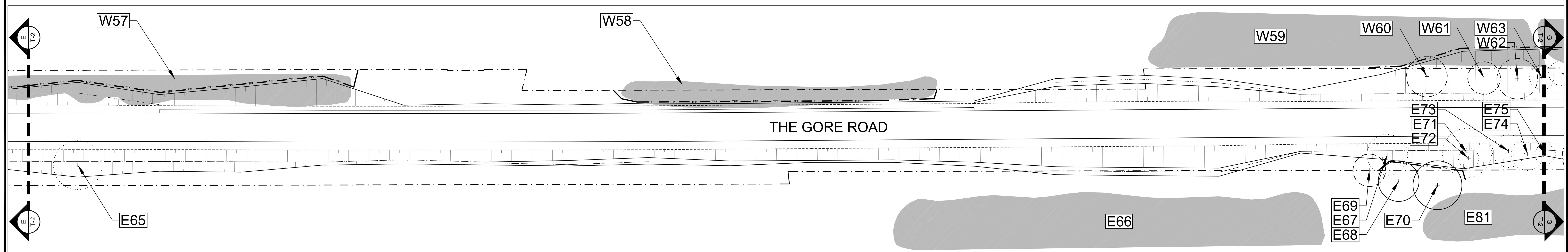

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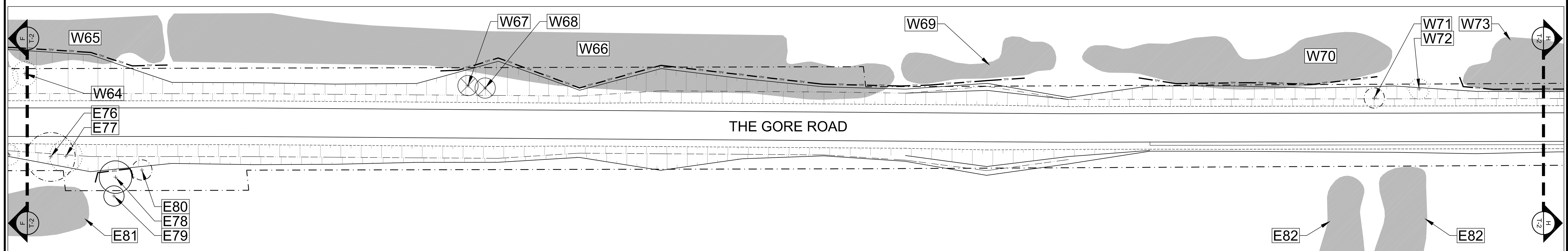

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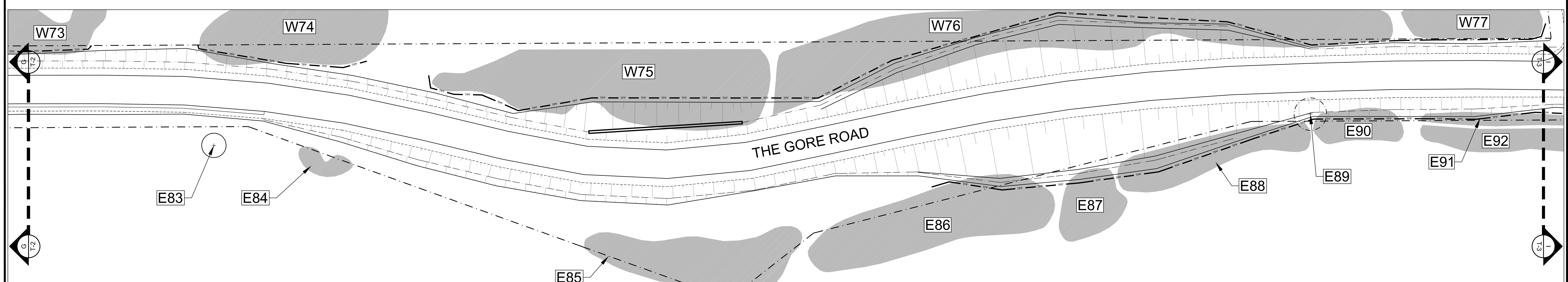

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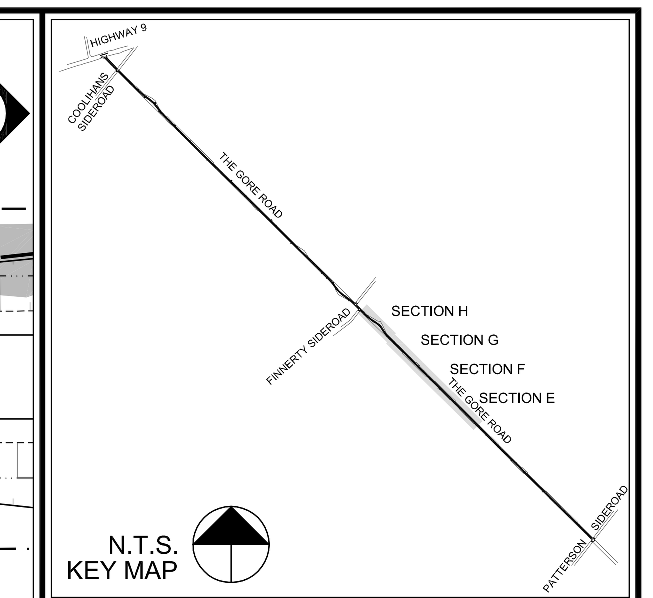

LEGEND:

- EXISTING TREE — TREE NUMBER, CIRCLE ILLUSTRATES APPROXIMATE CROWN RESERVE
- PRESERVE TREE — TREE IS IN FAIR, GOOD OR EXCELLENT CONDITION
- REMOVE TREE — TREE IS IN POOR CONDITION
- REMOVE TREE — TREE IS IN CONFLICT WITH PROPOSED DEVELOPMENT
- REMOVE TREE — TREE IS IN POOR CONDITION AND IS IN CONFLICT WITH PROPOSED DEVELOPMENT
- REMOVE TREE — TREE IS DEAD
- TREE GROUP
- PROPOSED GRADING
- PROPOSED SWALE
- ROAD RIGHT-OF-WAY
- TREE PROTECTION FENCE

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REGION OF PEEL

Date: SEPTEMBER 2011
Project: AA10-57A
Scale: 1:500
Designer: BM
Drawn: MM, BM
Checked: KB

Drawing No: **T2**

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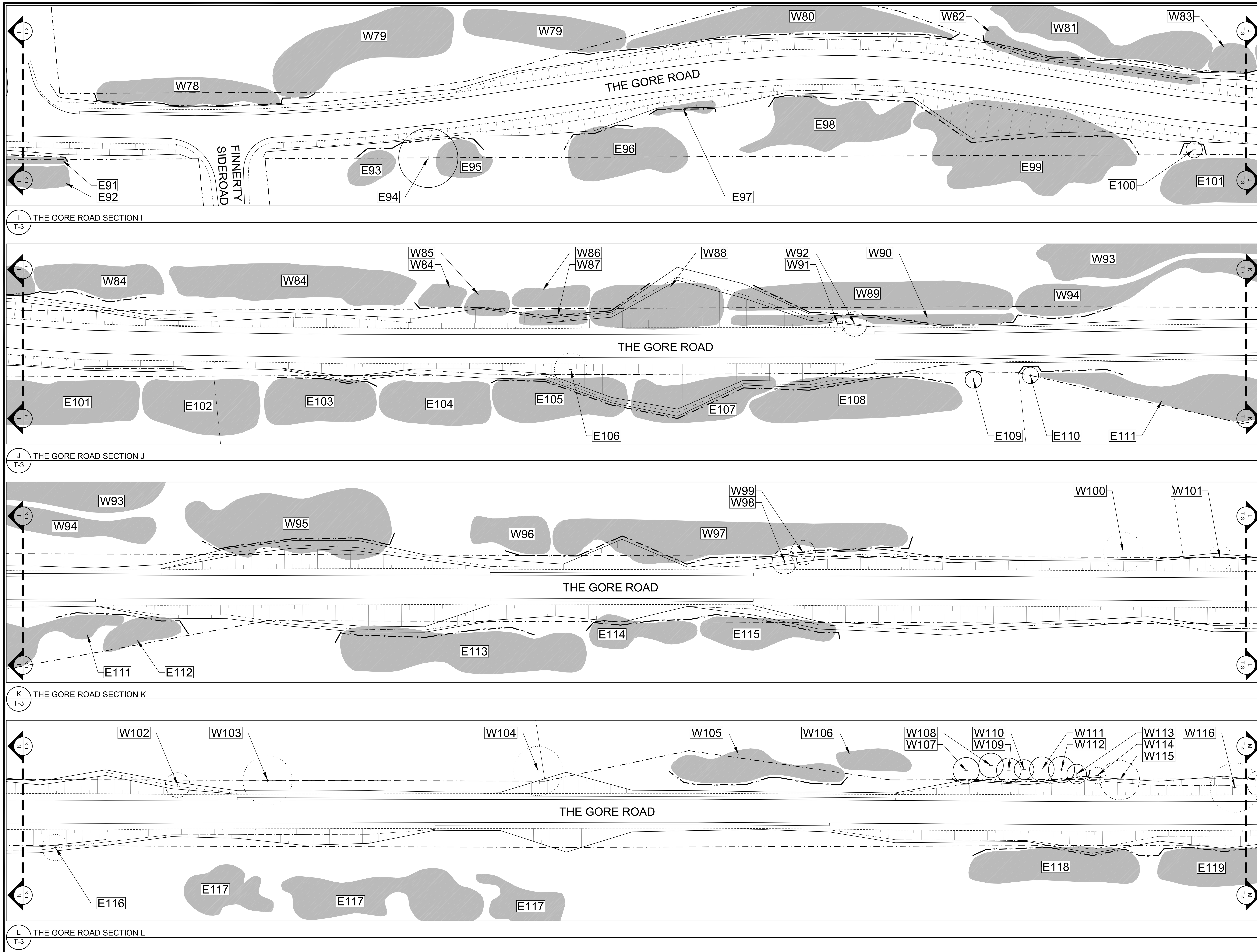

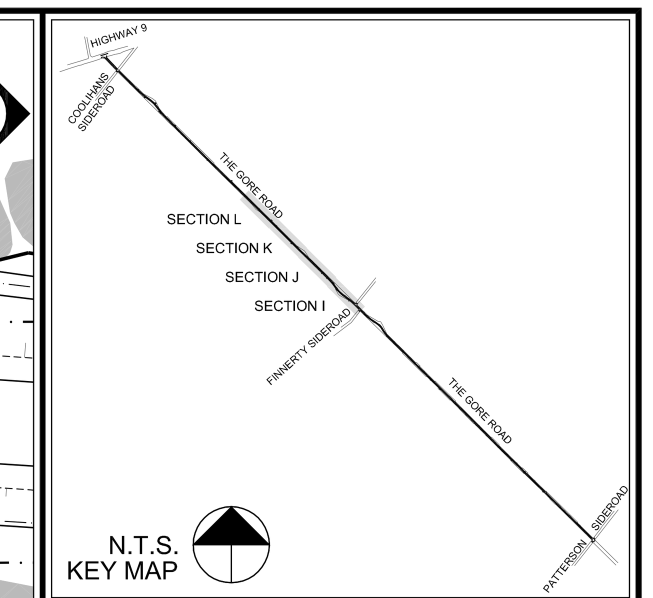

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REGION OF PEEL

Date: SEPTEMBER 2011
Project: AA10-57A
Scale: 1:500
Designer: BM
Drawn: MM, BM
Checked: KB

Drawing No:

T3

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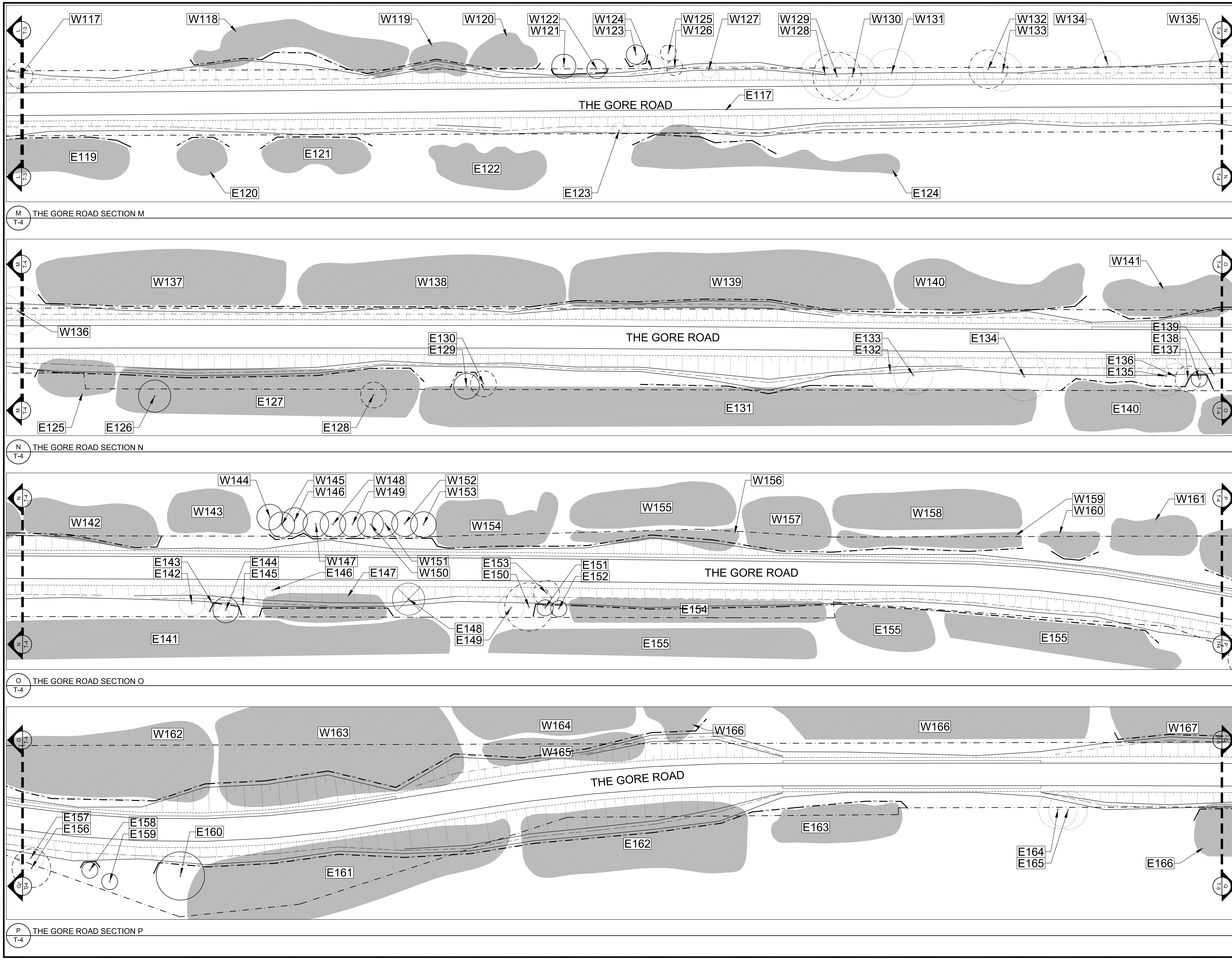

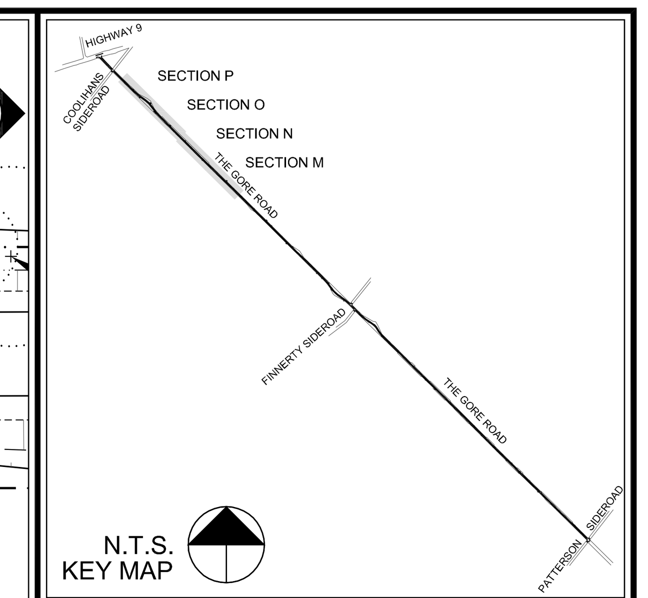

LEGEND:

EXISTING TREE
TREE NUMBER, CIRCLE ILLUSTRATES APPROXIMATE CROWN RESERVE

PRESERVE TREE
TREE IS IN FAIR, GOOD OR EXCELLENT CONDITION

REMOVE TREE
TREE IS IN POOR CONDITION

REMOVE TREE
TREE IS IN CONFLICT WITH PROPOSED DEVELOPMENT

REMOVE TREE
TREE IS IN POOR CONDITION AND IS IN CONFLICT WITH PROPOSED DEVELOPMENT

REMOVE TREE
TREE IS DEAD

T1 TREE GROUP

PROPOSED GRADING

PROPOSED SWALE

ROAD RIGHT-OF-WAY

TPF TREE PROTECTION FENCE

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2. Contractor shall verify all conditions in the field and report any discrepancies to the Project Arborist prior to commencement of work.
3. Contractor shall locate all underground and overhead utilities prior to commencement of any work. All utilities not necesarily shown on this plan, Aboud & Associates assumes no responsibility for the accuracy of any utilities on this plan.
4. Erect tree protection fence prior to the commencement of any construction or grading, maintain tree protection barrier throughout entire duration of construction work.
5. Any soils and vegetation within tree protection zone damaged by the Contractor shall be restored to the satisfaction of the Region by the Contractor at no additional cost.
6. Prune and mitigate limbs and roots damaged by construction work in accordance with most current International Society of Arboriculture standards.
7. Final action for offsite trees recomended for preservation or removal due to structural and biological health to be determined by individual landowners subject to the approval of the Region.

INFORMATION SOURCES

1. BASE INFORMATION OBTAINED FROM R.J. BURNSIDE & ASSOCIATES LIMITED.
2. TREE DATA COLLECTED BY ABOUD & ASSOCIATES INC. ON JUNE 21 AND JULY 15, 2011.

No.	Description	By	Date
0	FIRST SUBMISSION	BM	SEP-11

REVISIONS: All previous issues of this drawing are superceded

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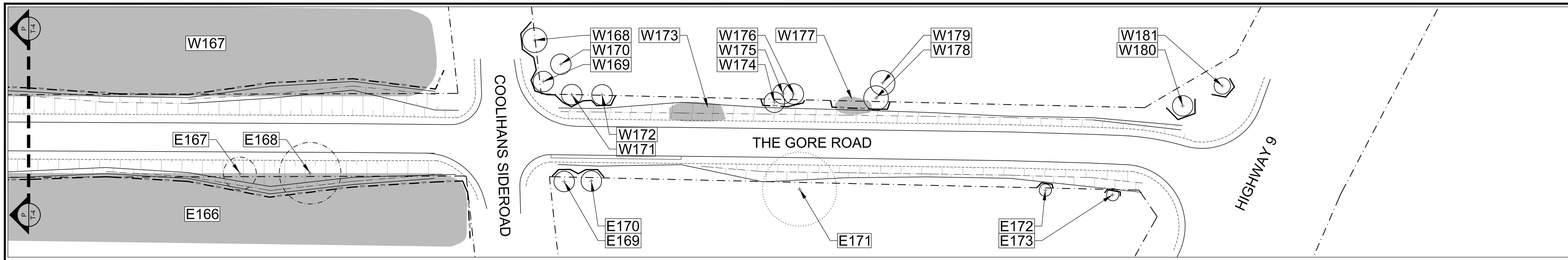
Title:
GORE ROAD TREE INVENTORY

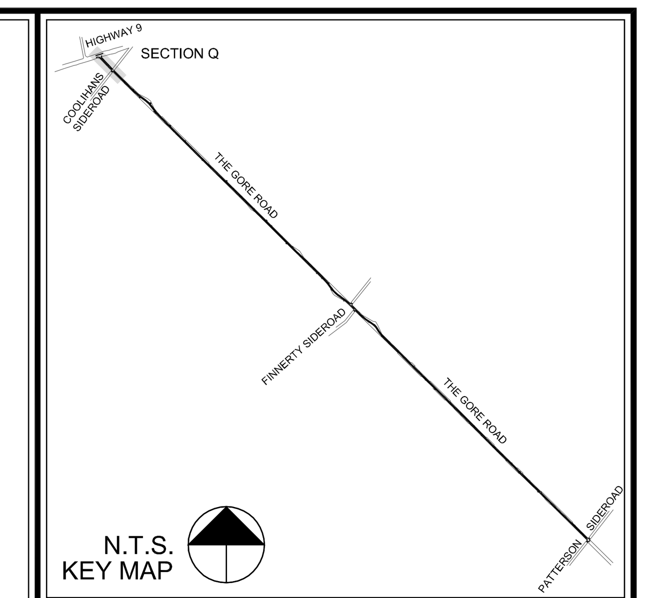
Project:
GORE ROAD IMPROVEMENTS FROM PATTERSON SIDEROAD TO HIGHWAY 9
SCHEDULE B MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT
REGION OF PEEL

Date: SEPTEMBER 2011
Project: AA10-57A
Scale: 1:500
Designer: BM
Drawn: MM, BM
Checked: KB

Drawing No:
T4

FILEPATH: S:\A+A PROJECTS\2010\10-57A GORE ROAD TREE INVENTORY\CAD\AA CAD\AA10-57A TP 2011-07-28.DWG CTB: ABOUD2007.ctb PLOTTED:28-Jul-11 11:59 AM





Q
T-5
THE GORE ROAD SECTION Q

Appendix 2. West Side of Gore Road - Trees and Tree Group Data

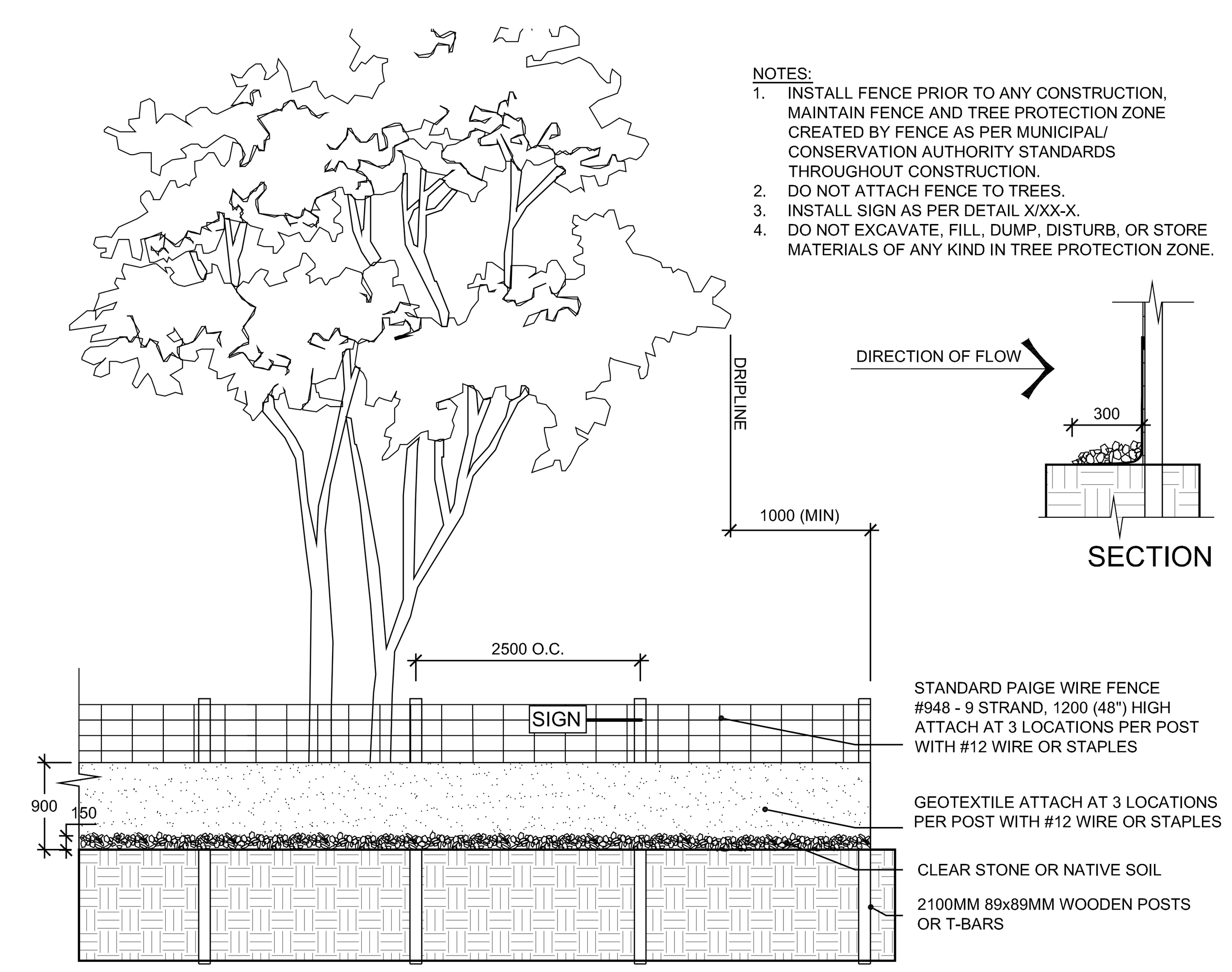
Tree No.	Individual Tree	Tree Group	Tree Species (Common Name) See Appendix 4 for botanical names of recorded trees	DBH (cm)	Crown Reserve (m)	Tree Condition	Recommendation Based on Tree Condition	Recommendation Based On Grading Impacts	Final Recommendation	% of Tree Group to be Removed (Approx.)
W1	X		White Elm	35	8	Fair	P	P	P	-
W2	X		White Cedar	65	8	Fair	P	R	R	-
W3	X		White Ash	28,30	8	Fair	P	R	R	-
W4	X		Sugar Maple	65	10	Fair	P	R	R	-
W5	X		Sugar Maple	75	4	Poor	R	R	R	-
W6	X		White Ash	25	6	Good	P	R	R	-
W7	X		Sugar Maple	65	5	Poor	R	R	R	-
W8	X		Sugar Maple	75	5	Poor	R	R	R	-
W9		X	11 White Ash, 10 White Cedar, 9 White spruce, 3 Red Oak, 1 Apple, 1 Black Cherry	>20	-	Good	P	P/R	P/R	25
W10		X	25 Red Pine in ROW	>20	-	Majority Good, A few Poor	P	P/R	P/R	>80
W11		X	Immature White Cedar thicket in ROW	<15	-	Good	P	P/R	P/R	20
W12		X	6 Red Pine, 2 White Cedar	>20	-	Good	P	P/R	P/R	40
W13		X	Forest edge with 3 Trembling Aspen and 3 White Ash	>20	-	Aspen = Fair; Ash = Poor	P/R	P/R	P/R	60
W14		X	23 Sugar Maple, 12 White Cedar, 2 White Ash, 1 Black Cherry	>20	-	Good	P	P/R	P/R	60
W15		X	Immature White Cedar and Trembling Aspen	<20	-	-	-	R	R	100
W16		X	38 White Cedar, 2 Black Cherry, 2 Trembling Aspen, 2 Sugar Maple, 1 White Ash	>20	-	Good	P	P/R	P/R	65
W17		X	4 White Cedar, 2 White Ash, 1 Sugar Maple	>20	-	Fair	P	P/R	P/R	60
W18	X		Trembling Aspen	30	7	Fair	P	R	R	-
W19	X		White Ash	26	5	Poor	R	R	R	-
W20			Cattail Marsh - no trees	-	-	-	-	P/R	P/R	-
W21	X		Trembling Aspen	22	5	Fair	P	P	P	-
W22		X	Cattail Marsh with sparse immature trees of White Cedar and White Elm	<15	-	Good	P	P/R	P/R	70
W23		X	4 White Cedar, 2 White Ash, 1 Sugar Maple	>20	-	Poor	R	P/R	P/R	60
W24	X		Sugar Maple	100	16	Fair	P	R	R	-
W25	X		Hemlock	40	7	Good	P	P	P	-
W26	X		Black Cherry	26	6	Fair	P	R	R	-
W27		X	12 White Cedar, 3 White Ash, 2 Ironwood, 2 Sugar Maple	>20	-	Good	P	P/R	P/R	40
W28	X		White Ash	35,40	12	Poor	R	R	R	-
W29		X	12 White Cedar, 10 White Ash, 2 Black Cherry	>20	-	Good (Ash = Poor)	P/R	P/R	P/R	30
W30	X		White Elm	22	4	Poor	R	R	R	-
W31	X		White Willow	45,55,65	15	Poor	R	R	R	-
W32	X		White Ash	60	12	Poor	R	R	R	-
W33	X		White Ash	22	5	Poor	R	R	R	-
W34	X		Sugar Maple	32	6	Fair	P	P	P	-
W35	X		Red Pine	24	5	Fair	P	P	P	-
W36	X		Green Ash	50	12	Poor	R	R	R	-
W37		X	2 Norway Maple, 7 Green Ash, 3 White spruce	>30	-	Fair - Poor	P/R	P/R	P/R	
W38	X		Green Ash	30	-	Poor	R	P	R	-
W39	X		Green Ash	35	-	Dead	R	P	P	-
W40	X		Green Ash	35	-	Dead	R	P	P	-
W41		X	7 Black Locust, 5 Scots Pine, 2 Austrian Pine, 1 European Larch	>20	-	Good	P	P/R	P/R	10
W42	X		Green Ash	26	6	Good	P	P	P	-
W43	X		Black Cherry	32	7	Good	P	P	P	-
W44	X		Black Cherry	32,30	8	Fair	P	P	P	-
W45		X	9 Sugar Maple, 7 Green Ash, 1 White Cedar, 1 Black Cherry	>20	-	Fair - Good (Ash = Poor)	P/R	P/R	P/R	65
W46	X		Green Ash	35,40	10	Poor	R	R	R	-
W47	X		Black Cherry	30	5	Poor	R	R	R	-
W48	X		Green Ash	28	6	Poor	R	R	R	-
W49	X		White Cedar	50	8	Fair	P	R	R	-
W50	X		White Cedar	50	8	Fair	P	R	R	-
W51		X	Cattail Marsh with sparse immature trees of White Elm, White Birch, Black Ash and and dead White Cedar	<20	-	Dead Cedars, otherwise good	P/R	P/R	P/R	60
W52	X		Basswood	26	5	Poor	R	R	R	-
W53		X	Majority is immature trees with 1 mature Trembling Aspen, 1 Black Locust and 1 White Cedar	>20	-	Good	P	P/R	P/R	25
W54		X	Hedgerow of Black Locust. All trees are immature (<20cm), with the exception of 6 in ROW that are immature multi-stemmed.	<20	-	Fair - Good	P	P/R	P/R	50
W55	X		White Elm	32	8	Fair	P	R	R	-
W56	X		Green Ash	28	7	Fair	P	R	R	-
W57		X	Immature spruce plantation/thicket with immature Trembling Aspen	<20	-	Good	P	P/R	P/R	65
W58		X	Immature White Cedar and Trembling Aspen	<20	-	Good	P	P/R	P/R	<10
W59		X	White Spruce Plantation outside ROW	>20	-	Good	P	P/R	P/R	<10
W60	X		Black Cherry	75	10	Poor	R	R	R	-
W61	X		White Ash	50	8	Poor	R	R	R	-
W62	X		White Ash	55	10	Poor	R	R	R	-
W63	X		White Ash	15,20	6	Fair	P	R	R	-
W64	X		White Ash	10	6	Fair	P	R	R	-
W65		X	Red Pine Plantation outside ROW	>20	-	Good	P	P/R	P/R	15
W66		X	White Spruce - Red Pine Plantation outside ROW	>20	-	Good	P	P/R	P/R	15
W67	X		Sugar Maple	>30	-	Dead	R	R	R	-
W68	X		Sugar Maple	>30	-	Dead	R	R	R	-
W69		X	2 Red Pine and 1 White Spruce outside ROW	>20	-	Good	P	P	P	0
W70		X	Largetooth Aspen and Red Pine outside ROW	>20	-	Fair	P	P/R	P/R	5
W71	X		White Cedar	45	5	Poor	R	R	R	-
W72	X		White Cedar	38	5	Fair	P	R	R	-
W73		X	Red Pine and immature Trembling Aspen outside ROW	20	-	Good	P	P/R	P/R	<5
W74		X	Immature Black Locust	<20	-	Good	P	P/R	P/R	<10
W75		X	Immature White Cedar, Scots Pine and Largetooth Aspen on very steep slope	<20	-	Good	P	P/R	P/R	20
W76		X	Forest edge of White Cedar, Trembling Aspen, Green Ash and Balsam Poplar	>20	-	Fair. Some Cedar dead	P/R	P/R	P/R	30
W77		X	Plantation of White spruce, Eastern White Pine and Red Pine	>20	-	Good	P	P	P	0
W78		X	Immature White Cedar, Scots Pine and White spruce on slope	<20	-	Good	P	P	P	0
W79		X	Mature Red Pine - Scots Pine plantation mixed with immature Trembling Aspen at edge	>20	-	Good	P	P	P	0
W80		X	Immature Scots Pine plantation in ROW	<20	-	Good	P	P	P	0
W81		X	Mature Red Pine plantation	>20	-	Good	P	P	P	0
W82		X	Immature Trembling Aspen and Scots Pine	<20	-	Good	P	P/R	P/R	60
W83	X		Sensitive Fern marsh with 1 mature Trembling Aspen	>20	-	Good	P	P	P	0
W84		X	Mature Red Pine plantation mixed with Ash	>20	-	Good	P	P	P	0
W85		X	Dead patch of Red Pine	>20	-	Dead	R	P/R	P/R	20
W86		X	Mature Red Pine plantation mixed with Trembling Aspen & regen of ash	>20	-	Good	P	P	P	0
W87		X	Immature regen of Scots Pine and White spruce in ROW	<20	-	Good	P	P/R	P/R	60
W88		X	Immature Trembling Aspen and Willow lowland forest on either side of stream	<20	-	Good	P	P/R	P/R	75
W89		X	Hardwood forest up to edge of ROW with American Beech, Black Cherry, Basswood, White Ash and Sugar Maple	>20	-	Good	P	P/R	P/R	15
W90		X	6 open-grown White Ash in ROW	>20	-	Poor	R	P/R	P/R	60
W91	X		Black Cherry	22,28,28	5	Poor	R	R	R	-
W92	X		Trembling Aspen	36	7	Poor	R	R	R	-
W93		X	Mature Red Pine plantation outside of ROW	>20	-	Good	P	P	P	0
W94		X	Immature regeneration of Trembling Aspen, White Ash and Staghorn Sumac	<20	-	Good	P	P	P	0
W95		X	Mature Red Pine plantation with understory of White Ash outside ROW	>20	-	Fair	P	P/R	P/R	15
W96		X	Mature Red Pine plantation outside ROW	>20	-	Good	P	P	P	0
W97		X	Eastern White Pine plantation outisde ROW with small amount of immature White Cedar and White Ash in ROW	<20	-	Good	P	P/R	P/R	<10
W98	X		White Cedar	65,60,28	7	Poor	R	R	R	-
W99	X		White Cedar	35,55	7	Poor	R	R	R	-
W100	X		White Elm	45	12	Fair	P	R	R	-
W101	X		Apple	15,15,22	7	Good	P	R	R	-
W102	X		Apple	20,30 28,22	7	Poor	R	R	R	-
W103	X		Basswood	65,65	15	Good	P	R	R	-
W104	X		Basswood	60,50, 40,30,30	15	Good	P	R	R	-
W105		X	Immature Scots Pine and White Cedar regen on slope	<20	-	Good	P	P	P	0
W106		X	12 Scots Pine	>20	-	Fair	P	P	P	0
W107	X		Norway Maple	>20	8	Excellent	P	P	P	-
W108	X		Norway Maple	>20	7	Excellent	P	P	P	-
W109	X		Norway Maple	>20	7	Excellent	P	P	P	-
W110	X		Norway Maple	>20	6	Excellent	P	P	P	-
W111	X		Thornless Honey Locust	>20	7	Excellent	P	P	P	-
W112	X		Thornless Honey Locust	>20	8	Excellent	P	P	P	-
W113	X		Colorado Spruce	20	6	Excellent	P	P	P	-
W114	X		Colorado Spruce	20	5	Excellent	P	R	R	-
W115	X		Sugar Maple	90	12	Poor	R	R	R	-
W116	X		Silver Maple	25,25,30 30,40,15	15	Fair	P	R	R	-
W117	X		Silver Maple	30	8	Poor	R	R	R	-
W118		X	White spruce Plantation	>20	-	Good	P	P/R	P/R	5
W119		X	Dead Carolina Poplar	>20	-	Dead	R	P/R	R	100
W120		X	Immature Trembling Aspen grove	<20	-	Fair	P	P	P	0
W121	X		Balsam Poplar	28	-	Fair	P	P	P	-
W122	X		Black Cherry	>30	-	Good	P	P	P	-
W123	X		White Ash	>30	-	Good	P	P	P	-
W124	X		Sugar Maple	>30	-	Fair	P	R	R	-
W125	X		White Ash	>30	-	Poor	R	P	R	-
W126	X		White Ash	>30	-	Poor	R	R	R	-
W127	X		White Ash	>30	-	Fair	P	R	R	-
W128	X		Carolina Poplar	75	20	Fair	P	R	R	-
W129	X		Carolina Poplar	40,50	15	Poor	R	R	R	-
W130	X		Carolina Poplar	50	15	Fair	P	R	R	-
W131	X		Carolina Poplar	75	20	Fair	P	R	R	-
W132	X		Sugar Maple	90	12	Poor	R	R	R	-
W133	X		White Ash	40	12	Fair	P	R	R	-
W134	X		White Ash	28	8	Fair	P	R	R	-
W135	X		White Ash	35	8	Fair	P	R	R	-
W136	X		Basswood	35,35, 50,30,30	16	Fair	P	R	R	-
W137		X	Forest edge of White spruce, White Cedar, White Ash and Eastern White Pine outside ROW	>20	-	Good	P	P	P	0
W138		X	Forest edge of White Cedar and Trembling Aspen outside ROW	>20	-	Fair	P	P	P	0
W139		X	Immature mixed swamp of White Birch, White Cedar, Tamarack, Eastern White Pine, White Elm and White spruce	<20	-	Good	P	P/R	P/R	10
W140		X	Conifer plantation on lawn with 11 Colorado Spruce, 10 Red Pine, 2 White spruce and 1 large Black Walnut	>20	-	Poor to Good	P/R	P	P	0
W141		X	Conifer plantation on lawn with 9 Red Pine and 3 Colorado Spruce	>20	-	Fair to Good	P	P/R	P/R	5
W142		X	Conifer plantation with 3 Red Pine, 2 Eastern White Pine, 2 White spruce and 3 White Ash	>20	-	Good	P	P/R	P/R	<5
W143		X	3 Red Pine (good), 1 European Larch (good) and 1 large Carolina Poplar (dead)	>20	-	Good +1 dead	P/R	P	P	0
W144	X		White spruce	>20	-	Good	P	P	P	-
W145	X		Red Pine	>20	-	Good	P	P	P	-
W146	X		Red Pine	>20	-	Good	P	P	P	-
W147	X		White spruce	>20	-	Good	P	P	P	-
W148	X		European Larch	>20	-	Good	P	P	P	-
W149	X		European Larch	>20	-	Good	P	P	P	-
W150	X		White Ash	>20	-	Good	P	P	P	-
W151	X		Acer rubrum	>20	-	Good	P	P	P	-
W152	X		Acer rubrum	>20	-	Good	P	P	P	-
W153	X		European Larch	>20	-	Good	P	P	P	-
W154		X	6 large dead Carolina Poplar	>50	-	Dead	R	P	R	100
W155		X	Mature conifer plantation (Norway Spruce dominant with Scots Pine and White spruce)	>30	-	Good	P	P	P	0
W156		X	Immature Scots Pine in ROW	<20	-	Good	P	P/R	P/R	20
W157		X	Dead or dying Carolina Poplar and spruce	>20	-	Poor	R	P	R	100
W158		X	Mature Eastern White Pine plantation outside ROW	>30	-	Good	P	P	P	0
W159		X	Row of Red Cedar in ROW	<20	-	Good	P	P	P	0
W160		X	5 Red Cedar and 1 Norway Maple	>20	-	Good	P	P	P	0
W161		X	16 Red Cedar	>20	-	Good	P	P	P	0
W162		X	Immature Scots Pine with White spruce and White Cedar on steep slope. 5 of the Scots Pine are mature and >20cm DBH	< and > 20	-	Good	P	P/R	P/R	<5
W163		X	~25 mature Scots Pine in plantation. Immature regeneration of Scots Pine closer to road.	>20	-	Good	P	P/R	P/R	15
W164		X	Mature European Larch plantation outside ROW	>20	-	Good	P	P	P	0
W165		X	Immature White Cedar	<20	-	Good	P	P/R	P/R	40
W166		X	Mature Scots Pine plantation outside ROW	>20	-	Good	P	P/R	P/R	<5
W167		X	Mature Scots Pine plantation with an understory of White Ash outside ROW	>20	-	Good	P	P/R	P/R	10
W168	X		Scots Pine	20	6	Fair	P	P	P	-
W169	X		Scots Pine	20	5	Good	P	P	P	-
W170	X		Scots Pine	20	5	Good	P	P	P	-
W171	X		Scots Pine	20	5	Fair	P	P	P	-
W172	X		Scots Pine	20	5	Fair	P	P	P	-
W173		X	Immature group of White Cedar, Trembling Aspen and Red Cedar	<20	-	Fair	P	R	R	100
W174	X		Colorado Spruce	20	5	Excellent	P	P	P	-
W175	X		Colorado Spruce	20	5	Excellent	P	P	P	-
W176	X		Colorado Spruce	20	5	Excellent	P	P	P	-
W177		X	5 immature Douglas Fir	<20	3	Good	P	P/R	P	0
W178	X		Scots Pine	20	6	Good	P	P	P	0
W179	X		Scots Pine	20	6	Good	P	P	P	0
W180	X		Colorado Spruce	<20	5	Excellent	P	P	P	-
W181	X		Colorado Spruce	<10	4	Fair	P	P	P	-
			WEST SIDE OF THE GORE ROAD TOTALS:							
	104		= Total No. of Individual Trees							
		76	= Total No. of Tree Groups							
			Total Trees/Tree Groups to be Preserved (P) Based on Condition				131			
			Total Trees/Tree Groups to be Removed (R) Based on Condition				40			
			Total Trees/Tree Groups to be Partially Preserved (P/R) Based on Condition				9			
			Total Trees/Tree Groups to be Preserved (P) Based on Grading Impacts					71		
			Total Trees/Tree Groups to be Removed (R) Based on Grading Impacts					61		
			Total Trees/Tree Groups to be Partially Preserved (P/R) Based on Grading Impacts					48		
			Total Trees/Tree Groups to be Preserved (P) - Final Recommendation						56	
			Total Trees/Tree Groups to be Removed (R) - Final Recommendation						77	
			Total Trees/Tree Groups to be Partially Preserved (P/R) - Final Recommendation						47	

Appendix 3. East Side of Gore Road - Trees and Tree Group Data

Tree No.	Individual Tree	Tree Group	Tree Species (Common Name) See Appendix 4 for botanical names of recorded trees	DBH (cm)	Crown Reserve (m)	Tree Condition	Recommendation Based On Tree Condition	Recommendation Based On Grading Impacts	Final Recommendation	% of Tree Group to be Removed (Approx.)
E1		X	8 trees of Norway Spruce & White Spruce	12-15	3	Excellent	P	R	R	100
E2		X	3 trees of Sugar Maple	20-25	8	Excellent	P	R	R	100
E3	X		White Cedar	28	5	Poor	R	P	R	-
E4	X		Black Walnut	55	8	Excellent	P	P	P	-
E5	X		Silver Maple	55	8	Fair	P	P	P	-
E6	X		White Cedar	22	3	Poor	R	P	R	-
E7	X		Silver Maple	75	12	Fair	P	P	P	-
E8	X		Norway Maple	60	8	Good	P	P	P	-
E9	X		Black Cherry	45,35	8	Good	P	P	P	-
E10		X	White Cedar	15-35	5	Excellent	P	P	P	0
E11		X	25 White Cedar, 3 Green Ash, 1 American Beech	15-40	5-8	Excellent	P	P/R	P/R	<10
E12		X	5 White Cedar, 4 Green Ash, 3 Trembling Aspen, 1 Black Cherry	10-25	3-5	Fair	P	P/R	P/R	30
E13		X	Dead standing White Cedar	-	-	Dead	R	P/R	R	100
E14		X	Numerous (>100) immature White Cedar	5-10	-	Good	P	P/R	P/R	50
E15		X	6 mature Red Pine	-	-	-	-	P	P	0
E16		X	8 Green Ash	15-25	-	-	-	P	P	0
E17		X	12 White Cedar, 1 Green Ash	10-30	3-8	Good	P	P/R	P/R	10
E18		X	Immature Green Ash and White Elm	<20	-	-	-	P	P	0
E19	X		Green Ash	40	10	Poor	R	P	R	-
E20		X	Offsite trees 1-3m from ROW: 4 Trembling Aspen, 2 Red Maple, 2 Green Ash, 1 Sugar Maple	-	-	-	-	P	P	0
E21	X		Apple	30	5	Poor	R	P	R	-
E22	X		White Cedar	45,42	8	Excellent	P	P	P	-
E23	X		White Elm	28	8	Good	P	R	R	-
E24	X		White Elm	20	5	Good	P	R	R	-
E25	X		Green Ash	42	8	Poor	R	R	R	-
E26		X	7 Green Ash, 3 White Elm	15-25	3-5	Excellent	P	P/R	P/R	<10
E27		X	3 Sugar Maple, 3 Black Cherry, 2 White Elm, 1 Green Ash, 1 Apple	12-20	3-5	Good	P	P	P	0
E28	X		White Elm	32	8	Excellent	P	R	R	-
E29	X		Basswood	25,10	8	Excellent	P	R	R	-
E30	X		Black Cherry	22	5	Good	P	R	R	-
E31	X		Scots Pine	21	8	Fair	P	P	P	-
E32		X	Mature Red Pine Plantation outside ROW	>20	-	-	-	P	P	0
E33		X	9 White Cedar	5-20	3-5	Good	P	P	P	0
E34		X	3 Green Ash, 3 Basswood	-	-	-	-	P	P	0
E35	X		Basswood	40	8	Good	P	R	R	-
E36	X		Basswood	38	12	Excellent	P	R	R	-
E37		X	Immature dead and dying Green Ash and White Cedar	<20	-	Dead	R	P/R	R	100
E38	X		Green Ash	20,10,20	8	Poor	R	R	R	-
-		X	White Cedar Swamp with dead Green Ash	-	-	Good - Poor	P/R	P/R	P/R	20
E39		X	Immature Sugar Maple, Green Ash and Basswood	<20	-	-	-	P/R	P/R	5
E40	X		Sugar Maple	75	12	Excellent	P	R	R	-
E41	X		Green Ash	62	10	Excellent	P	R	R	-
E42	X		White Ash	52	10	Fair	P	R	R	-
E43	X		White Ash	55	10	Fair	P	R	R	-
E44	X		White Ash	65	12	Fair	P	R	R	-
E45	X		White Ash	106	12	Fair	P	R	R	-
E46		X	5 Green Ash, 2 Black Cherry	20-30	5-8	Good	P	P	P	0
E47	X		Basswood	40	8	Fair	P	P	P	-
E48		X	Hedgerow with 5 Black Cherry, 4 Basswood and 3 Green Ash outside ROW	>20	-	-	-	P	P	0
E49		X	White Cedar	10-25	3-8	Poor	R	P/R	R	100
E50	X		Basswood	5-20	8	Fair	P	P	P	-
E51	X		White Elm	22	8	Good	P	R	R	-
E52	X		Basswood	15,20	8	Fair	P	R	R	-
E53	X		Basswood	20	5	Fair	P	R	R	-
E54		X	14 Green Ash	12-20	3-5	Poor	R	P/R	R	100
E55	X		Green Ash	70	12	Poor	R	P	R	-
E56	X		Sugar Maple	55	12	Excellent	P	P	P	-
E57	X		Green Ash	45	10	Fair	P	P	P	-
E58	X		Green Ash	20	8	Poor	R	P	R	-
E59	X		Green Ash	22	8	Excellent	P	P	P	-
E60	X		Green Ash	25	10	Fair	P	P	P	-
E61	X		Green Ash	28	10	Excellent	P	P	P	-
E62	X		Black Cherry	22	5	Poor	[illegible]	[illegible]	R	-
E63	X		Green Ash	30	5	Good	[illegible]	[illegible]	R	-
E64	X		Green Ash	20	10	Good	[illegible]	[illegible]	R	-
E65	X		Sugar Maple	30	12	Excellent	[illegible]	[illegible]	R	-
E66		X	Mixed Spruce Hedgerow outside ROW	-	-	-	-	[illegible]	P	0
E67	X		Green Ash	27	10	Good	[illegible]	[illegible]	R	-
E68	X		Sugar Maple	20	10	Good	[illegible]	[illegible]	P	-
E69	X		White Cedar	20	5	Good	[illegible]	[illegible]	R	-
E70	X		Sugar Maple	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	P	-
E71	X		Green Ash	28	12	[illegible]	[illegible]	[illegible]	R	-
E72	X		Black Cherry	14	5	Good	[illegible]	[illegible]	R	-
E73	X		Green Ash	20	8	Fair	[illegible]	[illegible]	R	-
E74	X		Green Ash	34	8	Good	[illegible]	[illegible]	R	-
E75	X		Green Ash	18	8	Good	[illegible]	[illegible]	R	-
E76	X		Green Ash	32,34,45	12	Poor	[illegible]	[illegible]	R	-
E77	X		Green Ash	22	8	Good	[illegible]	[illegible]	R	-
E78	X		Scots Pine	18	8	Good	[illegible]	[illegible]	P	-
E79	X		Scots Pine	16	5	Good	[illegible]	[illegible]	P	-
E80	X		White Spruce	12	5	Poor	[illegible]	[illegible]	R	-
E81		X	White Spruce group outside ROW	-	-	-	-	[illegible]	P	0
E82		X	Austrian Pine Plantation	30-35	-	[illegible]	[illegible]	[illegible]	P	0
E83	X		Green Ash	20	8	Fair	[illegible]	[illegible]	P	-
E84		X	3 White Cedar	20	8	Fair	[illegible]	[illegible]	P	0
E85		X	10 Trembling Aspen, 3 White Elm and 1 White Birch	12-20	3-5	Excellent	[illegible]	[illegible]	P	0
E86		X	Green Ash Woodland outside ROW with a few White Birch and Basswood	-	-	-	-	[illegible]	P/R	<10
E87		X	Green Ash, White Elm and Basswood on either side of stream outside ROW	-	-	-	-	[illegible]	P/R	10
E88		X	White Elm, White Cedar and Green Ash outside ROW	-	-	-	-	[illegible]	P/R	40
E89	X		Black Cherry	45	8	Poor	[illegible]	[illegible]	R	-
E90		X	Immature White Cedar and Green Ash Hedgerow	<20	-	Fair	[illegible]	[illegible]	P/R	20
E91		X	Immature White Cedar and Green Ash Hedgerow	<20	-	Good	[illegible]	[illegible]	P/R	<10
E92		X	Norway Spruce Plantation outside ROW	20-25	-	Good	[illegible]	[illegible]	P	0
E93		X	Mature White Cedar	>20	-	Good	[illegible]	[illegible]	P	0
E94	X		Black Cherry	55	18	Fair	[illegible]	[illegible]	[illegible]	[illegible]
E95		X	12 White Cedar	10-30	3-8	Fair	[illegible]	[illegible]	[illegible]	[illegible]
E96		X	13 White Cedar	20-50	8	Good	[illegible]	[illegible]	[illegible]	[illegible]
E97		X	Immature White Spruce	<20	-	Good	[illegible]	[illegible]	[illegible]	[illegible]
E98		X	Immature White Spruce and Scots Pine	<20	-	Good	[illegible]	[illegible]	[illegible]	[illegible]
E99		X	Immature and mature White Cedar forest with 3 mature Scots Pine along roadside	10-25	3-5	Good	[illegible]	[illegible]	[illegible]	[illegible]
E100	X		White Spruce	20	5	Good	[illegible]	[illegible]	[illegible]	[illegible]
E101		X	Mid-aged White Spruce Plantation outside ROW	15-20	-	Good	[illegible]	[illegible]	[illegible]	[illegible]
E102		X	Mixed Eastern White Pine with mid-aged White Spruce, Green Ash and Red Oak outside ROW	15-30	-	Good	[illegible]	[illegible]	[illegible]	[illegible]
E103		X	Immature Green Ash Woodland outside ROW	<20	-	Fair	[illegible]	[illegible]	[illegible]	[illegible]
E104		X	Mid-aged Green Ash - Trembling Aspen Woodland outside ROW	20	-	Good	[illegible]	[illegible]	[illegible]	[illegible]
E105		X	White Cedar Woodland outside ROW	-	-	-	-	[illegible]	[illegible]	[illegible]
E106	X		Green Ash	43	15	Excellent	[illegible]	[illegible]	[illegible]	[illegible]
E107		X	Green Ash - White Cedar Woodland outside ROW	-	-	-	-	[illegible]	[illegible]	[illegible]
E108		X	Green Ash Woodland outside ROW	-	-	-	-	[illegible]	[illegible]	[illegible]
E109	X		Green Ash	20,20	5	Fair	P	P	P	-
E110	X		Green Ash	18	5	Good	P	P	P	-
E111		X	Immature and sparse Scots Pine, Green Ash and White Cedar inside ROW	<20	-	Good	P	P	P	0
E112		X	Immature Trembling Aspen inside ROW	<20	-	Good	P	P	P	0
E113		X	Mid-aged White Spruce - Eastern White Pine Plantation outside ROW	-	-	-	-	P/R	P/R	5
E114		X	Immature White Cedar Hedgerow	10-20	-	Good	P	P/R	P/R	<10
E115		X	Mid-aged White Cedar Hedgerow	10-40	-	Good	P	P/R	P/R	10
E116	X		Apple	20	8	Good	P	R	R	-
E117		X	Mid-aged Austrian Pine Plantation outside ROW	20-30	-	Good	P	P	P	0
E118		X	Silver Maple, Red Pine, Eastern White Pine and White Spruce Plantation outside ROW	15-25	-	Good	P	P/R	P/R	5
E119		X	Mid-aged White Spruce - Eastern White Pine Plantation	15-25	-	Good	P	P	P	0
E120		X	4 mid-aged Silver Maple outside ROW	15-25	-	Good	P	P	P	0
E121		X	3 mature Carolina Poplar outside ROW	>30	-	Good	P	P	P	0
E122		X	5 mid-aged Silver Maple outside ROW	20-30	-	Good	P	P	P	0
E123	X		White Cedar	32	5	Fair	P	R	R	-
E124		X	Immature White Cedar - White Ash Forest outside ROW	15-25	-	Good	P	P/R	P/R	<10
E125		X	Immature Green Ash regeneration and Staghorn Sumac	<20	-	Good	P	P/R	P/R	35
E126	X		Basswood	30	10	Excellent	P	P	P	-
E127		X	Immature Basswood, Green Ash and White Elm. Some White Cedar and White Elm is dead.	<20	-	Fair	P	P/R	P/R	10
E128	X		Green Ash	20	8	Poor	R	P	R	-
E129	X		Basswood	22	8	Excellent	P	P	P	-
E130	X		Green Ash	18	8	Poor	R	P	R	-
E131		X	Mixed immature woodland of White Birch, Green Ash, White Elm, Basswood and dead White Cedar at south end.	<20	-	Fair	P	P/R	P/R	<5
E132	X		Green Ash	35	12	Good	P	R	R	-
E133	X		Green Ash	35	12	Good	P	R	R	-
E134	X		Manitoba Maple	48	15	Fair	P	R	R	-
E135	X		Red Pine	20	12	Excellent	P	R	R	-
E136	X		Red Pine	16	8	Good	P	R	R	-
E137	X		White Birch	24	8	Poor	R	R	R	-
E138	X		Red Pine	24	5	Excellent	P	P	P	-
E139	X		Red Pine	24	5	Good	P	R	R	-
E140		X	Mature Norway Spruce - Scots Pine Plantation outside ROW	>20	-	Good	P	P	P	0
E141		X	Mature Red Pine Plantation outside ROW	-	-	-	-	P	P	0
E142	X		Scots Pine	25	8	Excellent	P	R	R	-
E143	X		Scots Pine	22	5	Excellent	P	R	R	-
E144	X		Eastern White Pine	25	8	Excellent	P	P	P	-
E145	X		Green Ash	20	10	Excellent	P	R	R	-
E146	X		White Spruce	18	5	Excellent	P	R	R	-
E147		X	4 Eastern White Pine	20-35	8	Excellent	P	P/R	P/R	50
E148	X		Carolina Poplar	>35	-	Dead	R	R	R	-
E149	X		Scots Pine	25	8	Fair	P	R	R	-
E150	X		Carolina Poplar	45	15	Poor	R	R	R	-
E151	X		Green Ash	15	5	Excellent	P	P	P	-
E152	X		Scots Pine	15	5	Good	P	P	P	-
E153	X		Carolina Poplar	32	8	Poor	R	R	R	-
E154		X	18 Red Pine inside ROW	15-22	5-8	Good	P	P/R	P/R	30
E155		X	Red Pine Plantation outside ROW	-	-	Good	P	P	P	0
E156	X		Butternut	50	12	Poor	R	P	R	-
E157	X		White Spruce	22	8	Excellent	P	R	R	-
E158	X		White Spruce	25	5	Excellent	P	P	P	-
E159	X		Colorado Spruce	20	5	Excellent	P	P	P	-
E160	X		Sugar Maple	55	15	Excellent	P	P	P	-
E161		X	Trees in ROW: 9 White Cedar, 5 Green Ash, 5 Trembling Aspen, 4 White Elm and 2 Scots Pine	15-20	3-5	Good	P	P/R	P/R	25
E162		X	Immature Scots Pine	<20	-	Fair - Good	P	P/R	P/R	40
E163		X	Immature and sparse Scots Pine	<20	-	Fair - Good	P	P	P	0
E164	X		Sugar Maple	40	12	Fair	P	R	R	-
E165	X		Basswood	12,24,40,40	12	Good	P	R	R	-
E166		X	Red Pine Plantation outside ROW	>20	-	Good	P	P/R	P/R	10
E167	X		Green Ash	30,30	8	Poor	R	R	R	-
E168	X		Green Ash	28,30	15	Poor	R	R	R	-
E169	X		White Ash	8,8,8	5	Fair	P	P	P	-
E170	X		White Ash	8,8,8	5	Fair	P	P	P	-
E171	X		White Willow	65	18	Fair	P	R	R	-
E172	X		Manitoba Maple	8	3	Fair	P	P	P	-
E173	X		Green Ash	10	3	Fair	P	P	P	-
			EAST SIDE OF THE GORE ROAD TOTALS:							
	97		= Total No. of Individual Trees							
		77	= Total No. of Tree Groups							
			Total Trees/Tree Groups to be Preserved (P) Based on Condition				128			
			Total Trees/Tree Groups to be Removed (R) Based on Condition				27			
			Total Trees/Tree Groups to be Partially Preserved (P/R) Based on Condition				1			
			Total Trees/Tree Groups to be Preserved (P) Based on Grading Impacts					82		
			Total Trees/Tree Groups to be Removed (R) Based on Grading Impacts					57		
			Total Trees/Tree Groups to be Partially Preserved (P/R) Based on Grading Impacts					35		
			Total Trees/Tree Groups to be Preserved (P) - Final Recommendation						71	
			Total Trees/Tree Groups to be Removed (R) - Final Recommendation						72	
			Total Trees/Tree Groups to be Partially Preserved (P/R) - Final Recommendation						31	

Appendix 4. Common and Botanical Names

	Common Name	Botanical Name
1	Manitoba Maple *	*Acer negundo* *
2	Norway Maple *	*Acer platanoides* *
3	Red Maple	*Acer rubrum*
4	Silver Maple	*Acer saccharinum*
5	Sugar Maple	*Acer saccharum*
6	White Birch	*Betula papyrifera*
7	American Beech	*Fagus grandifolia*
8	White Ash	*Fraxinus americana*
9	Black Ash	*Fraxinus nigra*
10	Green Ash	*Fraxinus pennsylvanica*
11	Thornless Honey Locust *	*Gleditsia triacanthos var. inermis* *
12	Butternut	*Juglans cinerea*
13	Black Walnut	*Juglans nigra*
14	Red Cedar	*Juniperus virginiana*
15	European Larch *	*Larix decidua* *
16	Tamarack	*Larix laricina*
17	Apple *	*Malus pumila* *
18	Ironwood	*Ostrya virginiana*
19	Norway Spruce *	*Picea abies* *
20	White Spruce	*Picea glauca*
21	Colorado Spruce *	*Picea pungens* *
22	Austrian Pine *	*Pinus nigra* *
23	Red Pine	*Pinus resinosa*
24	Eastern White Pine	*Pinus strobus*
25	Scots Pine *	*Pinus sylvestris* *
26	Balsam Poplar	*Populus balsamifera*
27	Largetooth Aspen	*Populus grandidentata*
28	Trembling Aspen	*Populus tremuloides*
29	Carolina Poplar *	*Populus x canadensis* *
30	Black Cherry	*Prunus serotina*
31	Douglas Fir *	*Pseudotsuga menziesii* *
32	Red Oak	*Quercus rubra*
33	Black Locust *	*Robinia pseudoacacia* *
34	White Willow *	*Salix alba* *
35	Willow Species	Salix sp.
36	White Cedar	*Thuja occidentalis*
37	Basswood	*Tilia americana*
38	Hemlock	*Tsuga canadensis*
39	White Elm	*Ulmus americana*



NOTES:
1. INSTALL FENCE PRIOR TO ANY CONSTRUCTION, MAINTAIN FENCE AND TREE PROTECTION ZONE CREATED BY FENCE AS PER MUNICIPAL/ CONSERVATION AUTHORITY STANDARDS THROUGHOUT CONSTRUCTION.
2. DO NOT ATTACH FENCE TO TREES.
3. INSTALL SIGN AS PER DETAIL X/XX-X.
4. DO NOT EXCAVATE, FILL, DUMP, DISTURB, OR STORE MATERIALS OF ANY KIND IN TREE PROTECTION ZONE.

1
T-5
TYPICAL TREE PROTECTION FENCE DETAIL
N.T.S.

LEGEND:

T1 EXISTING TREE — TREE NUMBER, CIRCLE ILLUSTRATES APPROXIMATE CROWN RESERVE
PRESERVE TREE — TREE IS IN FAIR, GOOD OR EXCELLENT CONDITION
REMOVE TREE — TREE IS IN POOR CONDITION
REMOVE TREE — TREE IS IN CONFLICT WITH PROPOSED DEVELOPMENT
REMOVE TREE — TREE IS IN POOR CONDITION AND IS IN CONFLICT WITH PROPOSED DEVELOPMENT
REMOVE TREE — TREE IS DEAD
T1 TREE GROUP
PROPOSED GRADING
PROPOSED SWALE
ROAD RIGHT-OF-WAY
TPF TREE PROTECTION FENCE

GENERAL NOTES

1. All dimensions are in metres.
2. Contractor shall verify all conditions in the field and report any discrepancies to the Project Arborist prior to commencement of work.
3. Contractor shall locate all underground and overhead utilities prior to commencement of any work. All utilities not necesarily shown on this plan, Aboud & Associates assumes no responsibility for the accuracy of any utilities on this plan.
4. Erect tree protection fence prior to the commencement of any construction or grading, maintain tree protection barrier throughout entire duration of construction work.
5. Any soils and vegetation within tree protection zone damaged by the Contractor shall be restored to the satisfaction of the Region by the Contractor at no additional cost.
6. Prune and mitigate limbs and roots damaged by construction work in accordance with most current International Society of Arboriculture standards.
7. Final action for offsite trees recomended for preservation or removal due to structural and biological health to be determined by individual landowners subject to the approval of the Region.

INFORMATION SOURCES

1. BASE INFORMATION OBTAINED FROM R.J. BURNSIDE & ASSOCIATES LIMITED.
2. TREE DATA COLLECTED BY ABOUD & ASSOCIATES INC. ON JUNE 21 AND JULY 15, 2011.

No.	Description	By	Date
0	FIRST SUBMISSION	BM	SEP-11

REVISIONS: All previous issues of this drawing are superceded

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Title:
GORE ROAD TREE INVENTORY

Project:
GORE ROAD IMPROVEMENTS FROM PATTERSON SIDEROAD TO HIGHWAY 9
SCHEDULE B MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT
REGION OF PEEL

Date: SEPTEMBER 2011
Project: AA10-57A
Scale: 1:500
Designer: BM
Drawn: MM, BM
Checked: KB

Drawing No:
T5

BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

Appendix C

Breeding Bird Survey

THE GORE ROAD BREEDING BIRD SURVEY

November 2011

***Prepared For*:**
R.J. Burnside & Associates
292 Speedvale Avenue West, Unit 7
Guelph ON   N1H 1C4

***Prepared By*:**
North-South Environmental Inc.
35 Crawford Crescent, Suite U5, PO Box 518
Campbellville ON   L0P 1B0

Table of Contents

List of Appendices

1.0 INTRODUCTION

The Gore Road is a major arterial road extending from Highway 9 near Mono Mills, south to Highway 50 (near the north end of Mississauga). The study area for this project extends from Highway 9, south to Patterson Sideroad, just north of Lockton. Traffic volumes have been projected to increase by 1% per year until 2031 (Region of Peel 2010): over 20 years, this would thus be an increase from approximately 3600 vehicles to 4320 vehicles. This section of the road is currently a paved, 2-lane road, and the pavement has deteriorated. Therefore it is proposed that this portion of the road be re-constructed to accommodate a paved shoulder, to improve vertical and horizontal sightlines and to address deficient pavement condition and insufficient base condition. North-South Environmental (NSE) was retained in May of 2011 to complete a breeding bird survey along this portion of The Gore Road in order to determine the breeding birds present along the route and provide advice on potential impacts from the proposed road improvements on breeding birds.

2.0 METHODS

Prior to fieldwork, the databases for the breeding Bird Atlas of Ontario and Natural Heritage Information Centre (NHIC) were screened for breeding bird records in the area of the study site. Breeding bird surveys were conducted in early summer according to Breeding Bird Atlas protocol and consisted of two visits spanning the season to ensure:

1) early and late-nesting species are captured by the surveys, and
2) greater certainty of breeding status.

Surveys were conducted on May 28th and July 2nd, 2011 between 5 am and 9:30 am. As this is a fairly busy road, both breeding bird surveys were conducted on weekends in order to be able to listen for birds calling without as much noise interference from passing cars.

Certainty of breeding observations was assessed according to Ontario Breeding bird Atlas protocols (Bird Studies Canada 2007). Observations were assessed as follows (for all assessments, birds must be observed during their breeding season):

- Possible breeding: observation of a bird in suitable nesting habitat, or a singing male in suitable nesting habitat,
- Probable breeding: permanent territory presumed through registration of territorial song on at least 2 days, a week or more apart, at the same place; observation of a pair in suitable nesting habitat, observation of courtship or display between a male and female or 2 males, including courtship feeding or copulation; visiting probable nest site; agitated behaviour or anxiety calls of an adult; brood patch on adult female or cloacal protuberance on adult male; nest-building or excavation of a nest hole.
- Confirmed breeding: distraction display or injury feigning; used nest or egg shell foud (occupied or laid within the period of the study); recently fledged young or downy young, including young incapable of sustained flight; adults leaving or entering nest site in circumstances indicating occupied nest; adult carrying faecal sac; adult carrying food for young; nest containing eggs; nest with young heard or seen.

During the first field visit, the need for a whip-poor-will (provincially Threatened species) survey was evaluated and it was determined that no suitable habitat existed within the study area, therefore a whip-poor-will survey was not conducted.

After data was collected in the field, it was entered into an Access database in order to compile the data and screen for significant species.

3.0 RESULTS

3.1 Fauna

Forty-eight bird species were documented from the study area during the 2011 breeding bird surveys (Appendix 1). All species noted within the study area are native to Ontario. Of the 48 species documented within the study area, there were 31 probable breeders, 16 possible breeders, and one species (great blue heron) was noted only foraging adjacent to the road; no evidence was found to indicate breeding.

3.2 General Description of Study Area

The study area is located on the Oak Ridges Moraine in a rural area with agricultural and natural areas dominating the landscape. The natural areas along the route are generally very large (with a low edge-to-interior ratio) and well-connected to other natural areas. This provides great opportunity for area-sensitive species to find forest-interior breeding habitat. Also the high diversity of vegetation communities within and surrounding the study area provides for habitat diversity for local breeding birds.

3.2.1 Vegetation Communities

Seven vegetation communities were found within the study area including: deciduous forest, mixed forest, coniferous forest, coniferous plantation, cultural woodland, cultural meadow/pasture, and deciduous swamp. The majority of the study area consisted of cultural meadow/pasture, mixed forest, and cultural plantation. Deciduous swamp and deciduous forest were only present within one small area immediately along The Gore Road, however from air photo interpretation it appears as though these two community types were more prevalent further back from the road, outside of the study area. White cedar coniferous forest was only observed in one location along The Gore Road.

Deciduous Forest

There were very few deciduous forest vegetation communities along this section of The Gore Road. These deciduous forests contained species typical of forests in southern Ontario including: red-eyed vireo, eastern wood-pewee, and great crested flycatcher. Since these deciduous forests were part of a larger forest patch, they also provided habitat for area-sensitive birds typical of larger forest patches (black-throated green warbler and ovenbird).

Mixed Forest
Mixed forest was one of the most prevalent vegetation communities along The Gore Road. The mixed forest communities contained birds typical of both deciduous and coniferous communities such as northern flicker, black-capped chickadee, red-eyed vireo, and northern cardinal. Due to the large size of the mixed forest communities, there was an abundance of bird species that inhabit large forest patches and those that are area-sensitive (*i.e.* white-breasted nuthatch, black-throated blue warbler, pileated woodpecker, and ovenbird).

Coniferous Forest
There was one Eastern white cedar coniferous forest patch along the section of The Gore Road within the study area. It was not a large forest patch, but was connected to an extensive mixed forest complex. There were seven species documented from this densely-treed forest community, some of which were heard from the edge of the community and are not necessarily typical of cedar forests (vesper sparrow, blue jay, and cedar waxwing). However, the remaining species documented from this forest are typical of dense forest communities including area-sensitive forest species (ovenbird, white-throated sparrow), and a diversity of generalist species such as northern flicker and black-capped chickadee.

Coniferous Plantation
Coniferous plantation was abundant along the length of the study area. Therefore, an abundance of species were documented from this community type. Coniferous plantations are typically uniform communities; however they can also contain habitat variation due to wind/deadfall which creates canopy gaps and opportunities for a more varied vegetation community structure. Cultural plantation along The Gore Road occasionally had dense thicket vegetation in the understory. Therefore coniferous plantations provide appropriate breeding habitat for an abundance of bird species. Species documented from these cultural plantations along The Gore Road included many area-sensitive species (pine warbler, magnolia warbler, black-and-white warbler) and other generalist species (eastern phoebe, red-breasted nuthatch, Baltimore oriole, and mourning warbler).

Cultural Woodland
This community was located at the intersection of The Gore Road and Patterson Sideroad. The cultural woodland consisted of interspersed trees, shrubs, and residential homes and mowed lawns. The majority of the species heard calling from this small vegetation community were habitat generalists including American goldfinch, mourning dove, black-capped chickadee, northern cardinal and blue jay. However, one area-sensitive species, ovenbird, was heard calling from far back within this community during the second round of breeding bird surveys. This small cultural woodland community is continuous with a large forested area which continues further to the northeast.

Cultural Meadow/Pasture
Open meadow and pasture were dominant features in the landscape surrounding The Gore Road study area. All open meadows and pastures encountered contained similar old field plant species and their vegetation community structure was similar, therefore for the purposes of characterizing breeding bird habitat, these two communities were grouped together. Due to the vast area that open meadow and pasture communities cover within the study area, many birds

typical of interspersed hedgerows, open meadow/pasture habitats were documented including: gray catbird, Baltimore oriole, song sparrow, and American goldfinch. However, many significant and/or area-sensitive species were documented from this community type as well. Such species included bobolink, grasshopper sparrow, eastern meadowlark, American redstart, vesper sparrow and savannah sparrow. There were periodic wet patches located in depressions within the cultural meadow/pasture community. These wet depressions were typically dominated by reed-canary grass (*Phalaris arundinacea*) and contained an abundance of red-winged blackbirds.

Deciduous Swamp

There was only one deciduous swamp vegetation community within the study area. Therefore only seven bird species were heard calling from this community. Of these seven bird species, two species were typical inhabitants of wetlands (common yellowthroat and red-winged blackbird), four species were typical of treed areas (blue jay, black-capped chickadee, northern cardinal, and American robin), and one species heard from the edge was typical of open communities (song sparrow). With this being a smaller community surrounded by other habitat types, there was some overlap in habitat usage and the swamp was used as perching sites for singing males in adjacent habitats, but there were no bird species specific to deciduous swamp habitat.

3.3 Species located within the vicinity of the road.

Red-winged blackbirds were documented in great abundance in wet depressions that were occasionally located along the edge of The Gore Road. Other species that were consistently heard along the edge of the road included chipping sparrow, vesper sparrow, black-capped chickadee, song sparrow, American robin, American goldfinch, indigo bunting, mourning dove, cedar waxwing, eastern kingbird, northern cardinal, blue jay, and pine warbler. With the exception of pine warbler (an area-sensitive species) these species not significant and are found frequently near roads.

Other species that were heard or observed less frequently (once or twice) along the road include: pileated woodpecker, common yellowthroat, red-eyed vireo, and mallard. Of these birds, the only species of interest is the area-sensitive pileated woodpecker which was observed from the road, foraging within a cultural plantation.

3.4 Areas of Highest Diversity

The two vegetation communities with the highest species diversity were the cultural meadow/pasture and the mixed forest. The data for the mixed forest and meadow/pasture communities could be slightly skewed due to the fact that there was a great abundance of these communities present within the study area. Therefore more data was collected from these vegetation communities. The cultural meadow contained 36 bird species and the mixed forest contained 26 species. Other communities with relatively high species diversity include the cultural plantation (24 species), deciduous forest (15 species), and cultural woodland (13 species). The coniferous forest and deciduous swamp communities (the smallest within the study area) had the least amount of species diversity (eight and seven species, respectively).

3.5 Area-Sensitive Species

There were 16 area-sensitive species noted during the breeding bird surveys. One of these species is a typically wetland bird: alder flycatcher. Four of these bird species were typical of large open meadows: savannah sparrow, grasshopper sparrow, eastern meadowlark, and bobolink. The remaining eleven species were typical of large tracts of forests, plantations, and thickets: least flycatcher, pileated woodpecker, red-breasted nuthatch, white-breasted nuthatch, magnolia warbler, black-throated green warbler, black-throated blue warbler, pine warbler, black-and-white warbler, American redstart and ovenbird.

3.6 Significant Species

A search of the NHIC database resulted in no records of significant bird species within the vicinity of the study area.

3.6.1 Provincially Significant Species

One species noted within the study area, bobolink, is protected (along with its habitat) by the Endangered Species Act in Ontario. It is considered federally Threatened as designated by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). Additionally, this species is considered Threatened within Ontario, as determined by the Ontario Ministry of Natural Resources' (MNR) Committee on the Status of Species at Risk in Ontario (COSSARO).

This bird was documented from a large cultural meadow/pasture on the southwest side of The Gore Road, just southeast of the intersection of The Gore Road and Finnerty Sideroad. Bobolink was only heard calling during the first breeding bird survey. Documentation of a bird twice within the same area at least one week apart is considered evidence of probable breeding (as described in Section 2). As this species was documented within suitable breeding habitat but only seen once, it was recorded as a possible breeding record. However, this observation should be treated conservatively as a probable breeding record, as bobolink tend to breed early in the season, and if the singing male had finished breeding by the time the second survey was conducted it would have been less vocal (moreover, bobolinks become less active and vocal as the breeding season progresses). It was not noted immediately along the road, but was at a distance of approximately 80 m from the road edge. However, this species undoubtedly uses most of the cultural meadow community during nesting as bobolink are very active during nesting.

This species, and its habitat, is protected by the Endangered Species Act in Ontario. The Minister of the Environment may issue a permit under clause 17 (2) c of the Endangered Species Act that authorises a proponent to engage in an activity that would otherwise be prohibited by the ESA if the Minister is of the opinion that

> i) an overall benefit to the species will be achieved within a reasonable time through the conditions of the permit;
>
> ii) reasonable alternatives have been considered, including alternatives that would not negatively affect the species, and the best alternative has been adopted; and

iii) reasonable steps to minimize negative impacts on individual members of the species are required by conditions of the permit.

3.6.2 Federally Significant Species

In addition to being considered a provincially significant species, Bobolink (discussed in the previous section) is also considered a federally significant species. There are two additional species considered provincially threatened that have not yet been evaluated by the Committee on the Status of Species at Risk in Ontario (COSSARO): barn swallow and eastern meadowlark.

Barn swallows were recently (May 2011) evaluated as Threatened in Canada by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and are therefore under consideration for Threatened or Special Concern status in Ontario pending an assessment by the Committee on the Status of Species at Risk in Ontario (COSSARO). Barn swallows were noted as probable breeders within the study area and were observed in three cultural meadow/pasture areas. All barn swallows were noted foraging near barns and sheds which could provide potential breeding habitat for this species. This species' habitat is not protected by the Endangered Species Act in Ontario, but is protected as Significant Wildlife Habitat under the Provincial Policy Statement (PPS 2005).

Eastern meadowlark were also recently evaluated as Threatened in Canada by COSEWIC and are being considered for Threatened or Special Concern status in Ontario by COSSARO. Eastern meadowlark was heard calling from a cultural meadow on the northeast side of the road. This bird was documented as a singing male calling during the first round of breeding bird surveys, but not the second, therefore its breeding status is possible within the study area. This bird was heard calling approximately 40 m from the edge of the road. Similarly, this species is not protected by the Endangered Species Act in Ontario, but its habitat is protected as Significant Wildlife Habitat under the PPS.

3.6.3 Regionally Significant Species

Fifteen species documented from within the study area are considered to be significant by the Toronto and Region Conservation Authority (TRCA). The majority of these species are ranked as L3 (*restricted occurrence and/or requires specific site conditions; generally occurs in natural rather than cultural areas* (TRCA 2008)). However three of these regionally significant species are ranked L2 (*typically occurs in high quality natural areas and under highly specific site conditions; probably at risk in the Toronto area* (TRCA 2008): wild turkey, black-throated green warbler, and black-throated blue warbler. None of these three species were heard calling close to the road and they were all heard calling from within large continuous communities. Wild turkey was documented from two large cultural meadow/pasture communities. Black-throated green warblers were documented from four locations along The Gore Road; within mixed and deciduous forests. Black-throated blue warbler was documented from two locations within mixed forest communities.

3.7 Significant Wildlife Habitat

Many of the vegetation communities within the study area are considered to be Significant Wildlife Habitat (SWH; as defined by the Provincial Policy Statement 2005) because they contain area-sensitive and/or rare, uncommon, or declining species. With the exception of deciduous swamp, each of the vegetation community ecosites identified along the edge of the proposed road expansion would be considered to be Significant Wildlife Habitat due to the presence of area-sensitive species. The cultural meadow/pasture ecosite also meets the criteria for SWH due to the presence of bobolink, barn swallow, and eastern meadowlark; species which are rare or declining. It is not permissible to develop within SWH unless it can be demonstrated that there will be no impacts on the features or functions for which the area is identified.

4.0 DISCUSSION OF POTENTIAL IMPACTS

4.1 Direct Impacts on Bird Species

Direct impacts of the proposed road improvements would occur if habitat were removed, or if soil conditions were altered by changes in drainage. All improvements will occur within the existing road right-of-way (ROW), though some grading will extend outside the ROW. Drainage may be improved where required per Toronto and Region Conservaiton Authority's recommendations and based on the Storm Water Management Report recommendations for storm events. There will be no direct impacts on bird species due to road improvements. There are no changes expected in drainage in watercourses that might affect habitat for birds. There will be no increase in deicing salts or other contaminants.

4.2 Indirect Impacts on Bird Species

Indirect impacts on birds can result from increased traffic volumes, which result in increased noise. The improvements to the road are required because of poor sightlines and deteriorating pavement, not because of traffic volumes. However, increases in traffic volume for The Gore Road are predicted to be 1% per year until 2031 (the end year predictions were provided). Thus, there will be a 10% traffic increase by 2021, and a 20% increase in volume by 2031. The following provides an analysis of potential impacts of this increase, if any.

The effects of road noise on wildlife can travel up to hundreds of metres from the edge of a main road, depending on traffic volumes. Traffic noise above visual disturbance, air pollutants, or predators along roads is the primary cause for breeding birds to re-locate outside of the area of influence of a road (Forman and Deblinger 2000). However, road effects have generally been seen with traffic volumes in the tens of thousands per day, with few studies conducted on forest-nesting birds adjacent to roads with lower traffic volumes. One study found that sensitive forest interior species are typically found in decreased density (one third less) in forests approximately 650 m from a main road, defined as a 4-lane road with speed limits ranging from 73-89 km/hr, with 30,000 to 50,000 per day (Forman and Deblinger 2000). Thus, projected traffic volumes in the vicinity of The Gore Road are well below those shown to affect breeding birds, though the threshold where effects on breeding birds are seen is not known.

There are nine forest area-sensitive species documented from within the study area. Many of these species were located at only one location along the length of the study area. There is the potential for some species to be displaced further back from the road once the proposed road re-construction is underway. Forested habitat is prevalent in this area, and many of the forest communities which would be affected by the proposed road re-construction continue great distances from the road. Vegetation communities that were not prevalent within the study area (deciduous forest, coniferous forest, and deciduous swamp) are prevalent further to the northeast and southwest of The Gore Road. Overall, there is a vast amount of similar natural forested habitat and cultural plantation greater than 650 m from the proposed road re-construction which could provide breeding bird habitat for these potentially displaced species. However, if it is assumed that suitable habitat is already occupied by other birds, it is likely that the numbers of breeding birds along The Gore Road could potentially be reduced during the construction phase.

A study on grassland birds found that a light traffic volume of 3000-8000 vehicles/day had no significant effect on grassland bird distribution while on a street with moderate traffic of 8000-15,000 vehicles, there was no effect on bird presence although regular breeding was reduced for 400 m from a road (Foreman et al. 2002). With traffic predicted to increase at 1% per year, traffic volumes will be approximately 4300 vehicles per day in 20 years, well below the volumes shown to affect grassland birds. Grassland birds will not be affected by the road improvements, except potentially during construction. Four grassland area-sensitive bird species are located within the study area including bobolink, which is protected by the Endangered Species Act, savannah sparrow, grasshopper sparrow, and eastern meadowlark. Large open meadows and pasture are prevalent in the landscape surrounding The Gore Road.

Based on air-photo interpretation there is also a considerable area of wetlands within the general landscape around the study area. These wetlands could potentially provide habitat for the relocation of wetland species.

5.0 CONCLUSIONS

There are no predicted long-term impacts of the road improvements on grassland breeding bird species with predicted increases in traffic volumes. However, there may be the potential for short-term impacts due to construction because of disturbance, grading and noise level increase. Overall, breeding densities within the direct vicinity of the proposed road widening may decrease in both forest and grassland habitats during the construction phase of the proposed road improvement. Critical breeding habitat will not be lost, as there is similar habitat adjacent to the zone of influence for all species documented during the 2011 breeding bird survey. Some birds may be displaced to other habitat further away from the road, if habitat is not already occupied by other birds. However, if suitable habitats are occupied, as is likely the case, there will be a decrease of area-sensitive grassland and forest birds in the vicinity of the road during construction.

During the construction phase there is the potential for impacts to bobolink and eastern meadowlark as the road is in the vicinity of these species' habitat. Bobolink and eastern meadowlark are susceptible to disturbance and noise, as noted above. Bobolink and eastern meadowlark are also considered area-sensitive, preferring to nest over 100 m from field edges because of the potential for predators. Eastern meadowlark was heard calling near the edge of the road, therefore it is likely that the eastern meadowlark would be negatively affected during the construction phase. This species would be forced to move further north into the cultural meadow/pasture community.

6.0 RECOMMENDATIONS

Although traffic volumes and associated road noise are not expected to increase, it is recommended that the road edge adjacent to forest areas be screened by vegetation to reduce noise levels as much as possible on forest-nesting breeding birds, as this habitat is more limited for birds along The Gore Road and thresholds are not known. Removal of vegetation along the edge of the road in forested areas should be minimized as much as possible.

Planting of screening vegetation is not recommended for grassland areas because grassland birds are sensitive to edges with vegetation that could conceal predators. All construction should be undertaken as much as possible during seasons when birds do not breed (*i.e.* from late July to late April).

7.0 REFERENCES

Forman, R.T., and R.D. Deblinger. 2000. The Ecological Road-Effect Zone of a Massachusetts (U.S.A.) Suburban Highway. Conservation Biology. **14**(1). Pages 36-46.

Foreman, R.T.T., B. Reineking and A.M. Hersperger. 2002. Road traffic and nearby grassland bird patterns in a suburbanizing landscape. Environmental Management 29: 782-800.

Toronto and Region Conservation Authority. 2008. Toronto and Region Conservation Authority's Terrestrial Natural Heritage Program. Vegetation Community and Species Ranking and Scoring Method. Page 15.

APPENDIX 1. BREEDING BIRD SURVEY

Appendix 1. Breeding bird survey results documented from the The Gore Road study area. All species documented from the study area are native to Ontario.

* indicates an area-sensitive species

** indicates an area-sensitive and provincially threatened species (COSEWIC and MNR).

	Scientific Name	Common Name	Rarity Status			Breeding Status[1]	Vegetation Community						
			G Rank	S Rank	TRCA		CUM	CUW	CUP	FOD	FOM	FOC	SWD
	Anas platyrhynchos	Mallard	G5	S5	L5	PO	x						
	Meleagris gallopavo	Wild Turkey	G5	S5	L2	PR	x						
	Ardea herodias	Great Blue Heron	G5	S5	L3	FO	x						
	Zenaida macroura	Mourning Dove	G5	S5	L5	PR	x	x	x				
	Colaptes auratus	Northern Flicker	G5	S4B	L4	PR		x			x	x	
*	*Dryocopus pileatus*	Pileated Woodpecker	G5	S5	L3	PR			x		x		
	Contopus virens	Eastern Wood-pewee	G5	S4B	L4	PR	x			x	x		
*	*Empidonax alnorum*	Alder Flycatcher	G5	S5B	L4	PO	x						
*	*Empidonax minimus*	Least Flycatcher	G5	S4B	L3	PO	x						
	Sayornis phoebe	Eastern Phoebe	G5	S5B	L4	PR	x		x				
	Tyrannus tyrannus	Eastern Kingbird	G5	S4B	L5	PR	x				x		
	Myiarchus crinitus	Great Crested Flycatcher	G5	S4B	L4	PR				x	x		
	Vireo gilvus	Warbling Vireo	G5	S5B	L5	PR	x		x				
	Vireo olivaceus	Red-eyed Vireo	G5	S5B	L4	PR	x	x		x	x		

[1] Breeding Status codes: PO = possible, PR = probable, FO = foraging (non-breeding status)

	Scientific Name	Common Name	Rarity Status			Breeding Status[1]	Vegetation Community						
			G Rank	S Rank	TRCA		CUM	CUW	CUP	FOD	FOM	FOC	SWD
	Cyanocitta cristata	Blue Jay	G5	S5	L5	PR	x	x	x	x	x	x	x
	Corvus brachyrhynchos	American Crow	G5	S5B	L5	PR	x	x	x	x	x		
	Hirundo rustica	Barn Swallow	G5	S4B	L4	PR	x						
	Poecile atricapillus	Black-capped Chickadee	G5	S5	L5	PR	x	x	x	x	x	x	x
*	*Sitta canadensis*	Red-breasted Nuthatch	G5	S5	L4	PO			x				
*	*Sitta carolinensis*	White-breasted Nuthatch	G5	S5	L4	PO					x		
	Troglodytes aedon	House Wren	G5	S5B	L5	PR			x		x		
	Hylocichla mustelina	Wood Thrush	G5	S4B	L3	PO					x		
	Turdus migratorius	American Robin	G5	S5B	L5	PR	x		x	x	x		x
	Dumetella carolinensis	Gray Catbird	G5	S4B	L4	PR	x						
	Bombycilla cedrorum	Cedar Waxwing	G5	S5B	L5	PR	x	x	x	x	x	x	
	Dendroica petechia	Yellow Warbler	G5	S5B	L5	PO	x		x				
*	*Dendroica magnolia*	Magnolia Warbler	G5	S5B	L3	PO			x				
*	*Dendroica caerulescens*	Black-throated Blue Warbler	G5	S5B	L2	PO					x		
*	*Dendroica virens*	Black-throated Green Warbler	G5	S5B	L2	PR				x	x		
*	*Dendroica pinus*	Pine Warbler	G5	S5B	L3	PR	x		x		x		
*	*Mniotilta varia*	Black-and-white Warbler	G5	S5B	L3	PO			x				
*	*Setophaga ruticilla*	American Redstart	G5	S5B	L4	PO	x						
*	*Seiurus aurocapillus*	Ovenbird	G5	S4B	L3	PR		x		x	x	x	

Scientific Name		Common Name	Rarity Status			Breeding Status[1]	Vegetation Community						
			G Rank	S Rank	TRCA		CUM	CUW	CUP	FOD	FOM	FOC	SWD
	Geothlypis trichas	Common Yellowthroat	G5	S5B	L4	PR	x			x			x
	Spizella passerina	Chipping Sparrow	G5	S5B	L5	PR	x		x		x		
	Pooecetes gramineus	Vesper Sparrow	G5	S4B	L3	PR	x	x	x	x	x	x	
*	*Passerculus sandwichensis*	Savannah Sparrow	G5	S4B	L4	PR	x						
*	*Ammodramus savannarum*	Grasshopper Sparrow	G5	S4B	L3	PO	x						
	Melospiza melodia	Song Sparrow	G5	S5B	L5	PR	x		x				x
	Zonotrichia albicollis	White-throated Sparrow	G5	S5B	L3	PR	x	x			x	x	
	Cardinalis cardinalis	Northern Cardinal	G5	S5	L5	PR	x	x	x	x	x		x
	Passerina cyanea	Indigo Bunting	G5	S4B	L4	PR	x		x		x		
**	*Dolichonyx oryzivorus*	Bobolink	G5	S4B	L3	PO	x						
	Agelaius phoeniceus	Red-winged Blackbird	G5	S5	L5	PR	x		x		x		x
*	*Sturnella magna*	Eastern Meadowlark	G5	S4B	L4	PO	x						
	Molothrus ater	Brown-headed Cowbird	G5	S4B	L5	PO	x						
	Icterus galbula	Baltimore Oriole	G5	S4B	L5	PO	x		x				
	Carduelis tristis	American Goldfinch	G5	S5B	L5	PR	x		x	x	x		

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Appendix D
Public and Agency Consultation Program

D1 Notice of Commencement
D2 Public Information Centre
D3 Agency Contact List
D4 Agency Correspondence
D5 Stakeholder Correspondence

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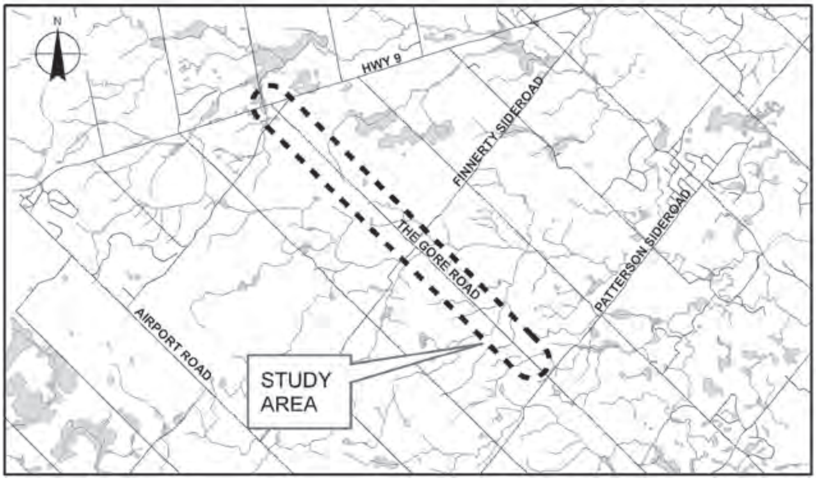
Appendix D1

Notice of Commencement

NOTICE OF STUDY COMMENCEMENT

THE GORE ROAD IMPROVEMENTS FROM PATTERSON SIDE ROAD TO HIGHWAY 9
CLASS ENVIRONMENTAL ASSESSMENT STUDY

The Study



The Regional Municipality of Peel has initiated a Class Environmental Assessment (EA) study for the proposed rehabilitation of The Gore Road from approximately 25 metres north of Patterson Side Road to Highway 9 in the Town of Caledon. The proposed rehabilitation of The Gore Road is being considered to address the deteriorating pavement with sub-standard shoulder areas / lack of proper ditching and visibility restrictions throughout the road's rolling terrain. The site location and approximate extent of the Study Area are shown on the Plan provided.

The Process

This study is being carried out in accordance with the requirements of a Schedule "B" undertaking as outlined in the Municipal Engineers Association *Municipal Class Environmental Assessment document* (2000, as amended in 2007). The Class Environmental Assessment planning process includes public and review agency consultation, evaluation of alternatives, assessment of the effects of the proposed works and identification of measures to mitigate any adverse impacts.

Public consultation is vital to this study. The Region wants to ensure that anyone interested in this study has the opportunity to get involved and provide input before any decisions are made on the project's design and implementation. As such, The Region is interested in receiving comments on the proposed work. Any comments received will form part of the public record (with the exception of personal information).

Upon completion of the study, a Project File will be prepared for public review and comment for a period of 30 days. Subject to comments received and the receipt of necessary approvals, the Region intends to proceed with the planning, design and construction of this project.
To provide comment or to request additional information concerning this project, please contact either of the following Project Team members:

Sally Rook
Public Works
The Regional Municipality of Peel
9445 Airport Rd., 3rd Floor
Brampton, ON L6S 4J3
Tel: 905-791-7800 Ext. 7842 / 888-919-7800
Fax: 905-791-1442
E-Mail: *Sally.Rook@peelregion.ca*

Leonard Rach, P. Eng.
Project Manager
R. J. Burnside & Associates Limited
15 Townline
Orangeville, ON L9W 3R4
Tel: 1-800-265-9662 Ext. 302
Fax: 519-941-8120
E-Mail: *Leonard.Rach@rjburnside.com*

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

This Notice first issued on November 9th, 2010.

Region of Peel
Working for you

November 9, 2010

«Title» «First_Name» «Last_Name»
«Position»
«AgencyOrganization»
«Address»

Dear «Title» «Last_Name»:

Re: Notice of Study Commencement
The Gore Road Improvements from Patterson Side Road to Highway 9
Class Environmental Assessment Study
File No.: MTB 019424

The Regional Municipality of Peel has initiated a Class Environmental Assessment (EA) study for the proposed rehabilitation of The Gore Road from approximately 25 m north of Patterson Side Road to Highway 9 in the Town of Caledon. The site location and approximate extent of the Study Area are shown on the Plan provided.

The Gore Road is identified as a Major Road within in the Region's Official Plan. Major Roads are intended to accommodate the efficient and safe movement of moderate to heavy volumes of traffic. The Gore Road is characterized by severe rolling terrain and currently has with sub standard shoulders. The proposed rehabilitation of The Gore Road is being considered to address the deteriorating pavement, sub-standard shoulder areas/lack of proper ditching and visibility restrictions throughout its rolling terrain. This provides the Region with an opportunity to implement improvements to enhance the safety and the operation of The Gore Road.

The study is being carried out in accordance with the planning and design process for Schedule 'B' projects as outlined in the Municipal Class Environmental Assessment (October 2000, as amended in 2007). A key component of the study will be consultation with stakeholders (public and agencies). Input and comments received from public and agencies will be incorporated into the planning and design of this project. Upon completion of the study, a Project File Report (PFR) will be prepared for public review and comment for a period of 30 days. Subject to comments received and the receipt of necessary approvals, the Region of Peel intends to proceed with the planning, design and construction of this project.

At this stage of the process, the Region is requesting that your agency provide comments and/or concerns with the proposed project. Specifically, the Region is seeking information on:

- Policies, positions or guidelines implemented or administered by your agency that may affect implementation of improvements to The Gore Road;
- Background information that is pertinent to the compilation of an environmental inventory of the general area of study;
- Any preliminary comments or concerns that your agency has on the proposed projects; and,
- Other projects proposed within or near the general area of study.

In this regard, we are enclosing a Response Form which will assist the study team in understanding your agencies issues and continued involvement in this EA study.

A Burnside staff member may also contact your office in the near future to determine the most efficient and appropriate way to obtain information.

It is essential to the success of this project that the concerns of your agency, and other stakeholders, are identified early in the planning process, such that the appropriate environmental protection measures are incorporated into the overall project design. Your input and questions are encouraged. To provide the study team with your comments or for further information please contact Sally Rook at 1-888-919-7800 or by email at sally.rook@peelregion.ca.

Please indicate to us your interest in providing input to this project by responding to our letter by December 9, 2010. All interested stakeholders will be kept up-to-date on project status by means of future mailings, or inclusion in project meeting, as deemed appropriate.

Your participation in this EA study is much appreciated.

Yours truly,

Region of Peel

Sally Rook
Project Manager

Enc. Notice of Commencement
Response Form

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Region of Peel
Working for you

BURNSIDE

Project Response Form

The Gore Road Improvements from Patterson Side Road to Highway 9
Class Environmental Assessment Study

We are interested in knowing your thoughts on this project and request that you answer the following questions:

a) What do you perceive to be the positive and/or negative effects of this project?

____

____

____

b) Do you perceive any "critical" issues that must be addressed as part of this project?

____

____

____

Please check the most appropriate statement:

☐ We wish to be kept informed about the project's progress and would like to remain on the study contact list. We have comments to provide. They are:
Attached ☐ Will be provided at a later date ☐

☐ We wish to be kept informed about the project's progress and would like to remain on the study contact list. At the present time, we have no significant concerns/comments to provide.

☐ We have no concerns about the project and wish to be removed from the study contact list.

Name: ______________________________
(Please Print)

Phone No.: ______________________________

Agency: ______________________________

Signed : ______________________________

Date: ______________________________

Continued on back

Please return this completed form by December 9th, 2010 to:

Sally Rook
Public Works
The Regional Municipality of Peel
9445 Airport Road, 3rd Floor
Brampton, ON L6S 4J3
Tel: 905 791 7800 ext. 7842 / 888-919-7800
Fax: 905 791 1442
E-mail: Sally.Rook@peelregion.ca

019424_Gore Road EA Agency Response Form.doc
2010-11-04 4:44 PM

November 9, 2010

«TITLE» «FIRST_NAME» «LAST_NAME»
«MAILING1»
«MAILING2»
«CITY_PROVINCE» «POSTAL_CODE»

Re: Notice of Study Commencement
The Gore Road Improvements from Patterson Side Road to Highway 9
Class Environmental Assessment Study
File No.: MTB 019424

Dear «TITLE» «LAST_NAME»:

The Regional Municipality of Peel has initiated a Class Environmental Assessment (EA) study for the proposed rehabilitation of The Gore Road from approximately 25 m north of Patterson Side Road to Highway 9 in the Town of Caledon. The site location and approximate extent of the Study Area are shown on the Plan provided.

The Gore Road is identified as a Major Road within in the Region's Official Plan. Major Roads are intended to accommodate the efficient and safe movement of moderate to heavy volumes of traffic. The Gore Road is characterized by severe rolling terrain and currently has with sub standard shoulders. The proposed rehabilitation of The Gore Road is being considered to address the deteriorating pavement, sub-standard shoulder areas/lack of proper ditching and visibility restrictions throughout its rolling terrain. This provides the Region with an opportunity to implement improvements to enhance the safety and the operation of The Gore Road.

The study is being carried out in accordance with the planning and design process for Schedule 'B' projects as outlined in the Municipal Class Environmental Assessment (October 2000, as amended in 2007). A key component of the study will be consultation with stakeholders (public and agencies). Input and comments received from public and agencies will be incorporated into the planning and design of this project. Upon completion of the study, a Project File Report (PFR) will be prepared for public review and comment for a period of 30 days. Subject to comments received and the receipt of necessary approvals, the Region of Peel intends to proceed with the planning, design and construction of this project.

It is essential to the success of this project that your concerns are identified early in the planning process, such that the appropriate environmental protection measures are incorporated into the overall project design. Your input and questions are encouraged. Please provide any comments and an expression of your interest in this project by completing and returning the enclosed Response Form by December 9, 2010 to Sally Rook at 1-888-919-7800 or by email at sally.rook@peelregion.ca. All interested stakeholders will be kept up-to-date on project status by means of future mailings.

Your participation in this EA study is much appreciated.

Yours truly,

Region of Peel

Sally Rook
Project Manager

Enc. Notice of Commencement
Response Form

019424_Gore Road EA Stakeholder NOCm Letter.doc
05/11/2010 9:51 AM

Region of Peel
Working for you

BURNSIDE

Project Response Form

The Gore Road Improvements from Patterson Side Road to Highway 9
Class Environmental Assessment Study

We are interested in knowing your thoughts on this project and request that you answer the following questions:

a) What do you perceive to be the positive and/or negative effects of this project?

____

____

____

b) Do you perceive any “critical” issues that must be addressed as part of this project?

____

____

____

Please check the most appropriate statement:

☐ We wish to be kept informed about the project’s progress and would like to remain on the study contact list. We have comments to provide. They are:
Attached ☐ Will be provided at a later date ☐

☐ We wish to be kept informed about the project’s progress and would like to remain on the study contact list. At the present time, we have no significant concerns/comments to provide.

☐ We have no concerns about the project and wish to be removed from the study contact list.

Name: ________________________________
(Please Print)

Phone No.: ________________________________

Address: ________________________________

Please return this completed form by December 9th, 2010 to:

Sally Rook
Public Works
The Regional Municipality of Peel
9445 Airport Road, 3rd Floor
Brampton, ON L6S 4J3
Tel: 905 791 7800 ext. 7842 / 888-919-7800
Fax: 905 791 1442
E-mail: Sally.Rook@peelregion.ca

019424_Gore Road EA Stakeholder Response Form.doc
2010-11-04 4:44 PM

[THE DIFFERENCE IS OUR PEOPLE]

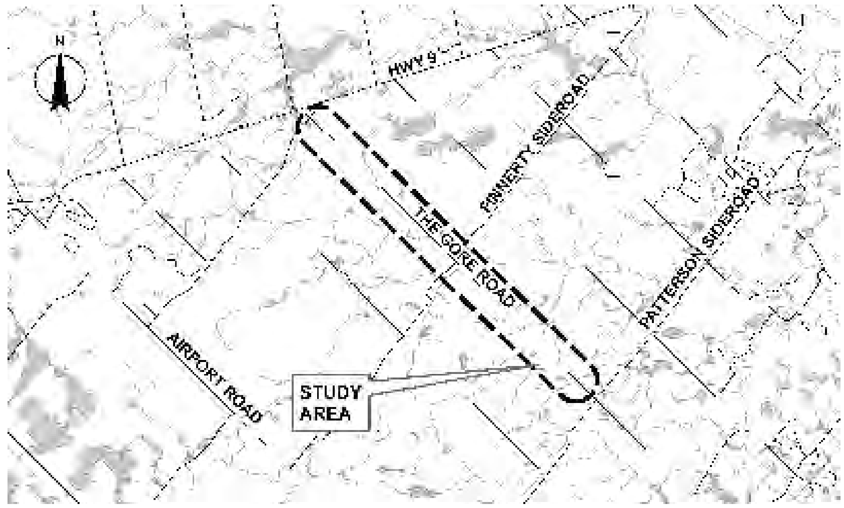
Appendix D2

Public Information Centre

NOTICE OF PUBLIC INFORMATION CENTRE
THE GORE ROAD IMPROVEMENTS
FROM PATTERSON SIDE ROAD TO HIGHWAY 9
CLASS ENVIRONMENTAL ASSESSMENT STUDY

The Study

The Region of Peel is undertaking a Class Environmental Assessment (EA) for the rehabilitation of The Gore Road from approximately 25m north of Patterson Side Road to Highway 9 in the Town of Caledon. The rehabilitation of The Gore Road is being considered to address the deteriorating pavement, sub-standard shoulder areas, lack of proper ditching and visibility restrictions throughout the road's rolling terrain. The site location and approximate extent of the Study Area are shown on the Plan provided.



The Process

This study is being carried out in accordance with the requirements of a Schedule "B" undertaking as outlined in the Municipal Engineers Association *Municipal Class Environmental Assessment document* (2000, as amended in 2007and 2011). The Municipal Class Environmental Assessment (EA) planning process includes public and agency consultation, evaluation of alternatives, assessment of the effects of the proposed works and identification of measures to mitigate any adverse impacts.

Public consultation is vital to this study. The Public Information Centre will provide information on the proposed project: present need and justification for improvements; alternate solutions and design concepts considered; and, will obtain input and comments on the preliminary preferred solution and design concept identified by the Study Team. Any comments received through the course of the EA will form part of the public record (with the exception of personal information).

<u>Public Information Centre</u>

Time:	Thursday May 23, 2013
Location:	Caledon Community Complex 6215 Old Church Road, Caledon
Time:	6:30 pm to 8:30 pm

Upon completion of the study, a Project File will be prepared for public review and comment for a period of 30 days. Subject to comments received and the receipt of necessary approvals, the Region intends to proceed with the planning, design and construction of this project.

To provide comment or to request additional information concerning this project, please contact either of the following Project Team members:

Sally Rook, C.Tech. PMP
Project Manager
The Regional Municipality of Peel
10 Peel Centre Drive, Suite B, 4th Floor
Brampton, ON L6T 4B9
Tel: 905-791-7800 Ext. 7842 / 800-919-7800
Fax: 905-791-1442
E-Mail: Sally.Rook@peelregion.ca

Leonard Rach, P. Eng.
Project Manager
R. J. Burnside & Associates Limited
15 Townline
Orangeville, ON L9W 3R4
Tel: 1-800-265-9662 Ext. 302
Fax: 519-941-8120
E-Mail: Leonard.Rach@rjburnside.com

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

The Region of Peel is committed to ensure that all Regional services, programs and facilities are inclusive and accessible for persons with disabilities. Please contact the Project Manager if you need any disability accommodations to participate in the PIC.

This Notice first issued on May 9, 2013.

Municipal Class Environmental Assessment

The Gore Road Improvements

Patterson Sideroad to Highway 9

PUBLIC INFORMATION CENTRE

Date:	Thursday May 23, 2013
Location:	Caledon Community Complex 6215 Old Church Road, Caledon
Time:	6:30pm – 8:30pm

Region of Peel
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1 Welcome

- Please sign in and take a comment sheet
- If you have any questions, our team is available to help you
- Place your completed comment sheets in the Comment Box or send to either of the project team members noted by June 6, 2013

2 Purpose

The purpose of this Public Information Centre (PIC) is to:

- Describe the proposed project
- Present alternative solutions and design concepts considered
- Identify a preliminary preferred solution and recommended design concept
- Seek your input and comments on the preliminary preferred solution and design concepts
- Explain what will happen next

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3 Study Area

Region of Peel
Working for you

4 Municipal Class EA Process

Phases

Phase 1: PROBLEM OR OPPORTUNITY

☑ Identify and describe the problem and opportunities

Phase 2: Alternative Solutions

☑ Identify alternative solutions to the problem
☑ Inventory the natural, social, economic & cultural environments
☑ Identify the impact of the alternative solutions after mitigation
☑ Evaluate the alternative solutions with consideration of environmental and technical impacts
☑ Identify a recommended alternative solution

Phase 3: Alternative Design Concepts for the Preferred Solution

☑ Confirm preference for recommended solution
☑ Identify alternative designs to implement the preferred solution
☑ Inventory the natural, social, economic & cultural environments
☑ Identify the impact of the alternative designs after mitigation
☑ Evaluate alternative designs with consideration of the impacts (preliminary recommendation made)
☑ Confirm the recommended design concept

Phase 4: Project File Report

❑ Complete an Project File Report (PFR) which sets out all of the activities undertaken to date through Phases 1, 2 & 3
❑ Notify the public and government agencies of completion of the PFR and of the PART II Order provision in the EA Act
❑ Place PFR on public record for 30 calendar days for review

Phase 5: Implementation

❑ Proceed to design and construction of the project
❑ Property acquisition and utility relocation
❑ Initiate construction as appropriate
❑ Monitor for environmental provisions and commitments

Notice of Study Commencement

PIC Winter 2013

- Needs and Justification
- Planning Alternative Solution
- Evaluation of Planning Alternative Solution
- Preliminary Preferred Solution
- Alternative designs for the preferred solution
- Evaluation of alternative design concepts
- Preliminary recommended design concept

We are here

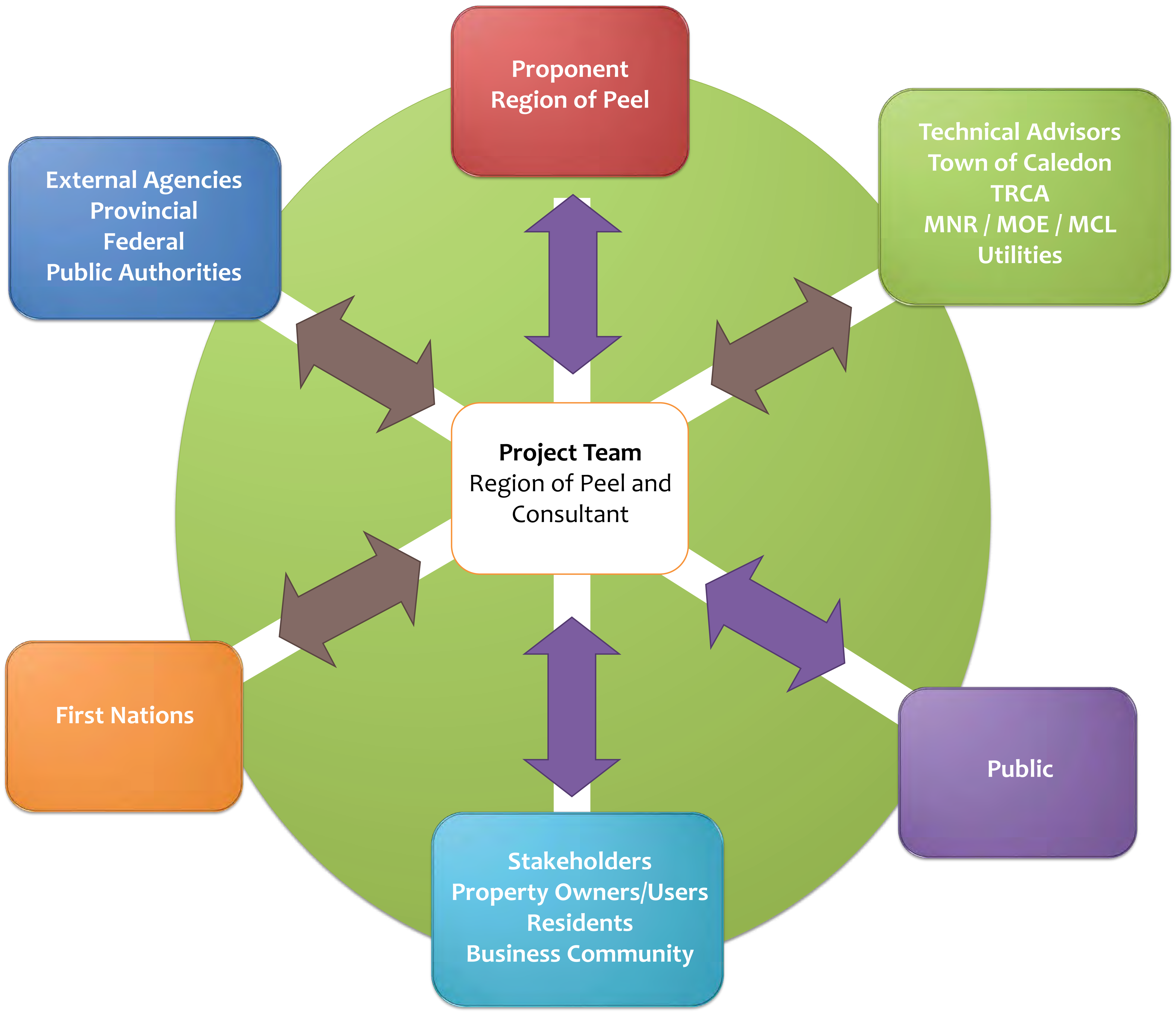
Notice of Study Completion and Filing the PFR

Spring 2013

5 Study Objectives and Organization

Study Objectives

- Address the deteriorating condition of The Gore Road
- Identify opportunities to enhance the roadway
- Develop and evaluate design concepts for the reconstruction of the existing roadway
- Complete a functional design
- Prepare a formal Project File Report (PFR) to document the study findings and recommendations



Widening of the roadway is not being considered

6 Strategic Plan and Term of Council Priorities for 2011-2014

This Environmental Assessment supports a number of actions and initiatives related to transportation and environment in the Region's Strategic Plan Goals and Actions and the Term of Council Priorities.

- **Environment**
  Protect, enhance and restore the environment
- **Transportation**
  Support and influence sustainable transportation systems
- **Public Safety**
  Ensure a safe Peel community
- **Community Health**
  Improve active transportation facilities

Region of Peel
Working for you

7 Road Characteristics

- A two-lane rural arterial road providing access to existing residential and farm properties
- Trucks are prohibited on The Gore Road except for local deliveries
- Open ditches and narrow shoulders
- 70 km/h speed limit
- Study area consists of 5 intersections within a distance of 6.3 km
- There are no turn lanes
- There are no traffic signals along the roadway

8 Community Concerns

Comment (based on feedback from Residents)	Response	Follow-up Action
Poor visibility on Finnerty Sideroad	Vertical and horizontal sight lines will be improved as part of this EA study.	None required
Speeding / reduction in speed limit	Propose to retain the 70 km/h speed limit. Conducted speed study and reviewed accident history, speed limit reduction was not warranted.	Notified OPP of concerns raised. Speed calming tools will be utilized after construction including VATCS signs and speed radar trailers.
Heavy truck and vehicular traffic associated with improvements to the existing road	No heavy trucks allowed on the Gore Road as per By-law other than for local deliveries.	Further enforcement may be requested post construction. Ensure 'No Truck' signage is appropriately applied along the corridor.
Pedestrian safety and safety entering and exiting driveways	Safety concerns have been incorporated into this EA study. Paved shoulders will accommodate pedestrians and cyclists. Rumble strip safety pilot will include thin Rumble Strips, on the white line and includes gaps for turning. Driveway sightlines will also be addressed wherever possible in this study and further defined during detailed design.	Further considered and defined during detail design.
Replacement of culverts to improve drainage in the area	A drainage stormwater study has been completed during this EA study to incorporate drainage improvements into the detailed design for The Gore Road. A fluvial geomorphology assessment was also conducted in order to provide input to the drainage stormwater study.	Any/all culvert works will be completed in consultation with TRCA and permitting requirements to minimize impacts to aquatic habitat and fish spawning areas.
Potential impacts to the aesthetics and the natural environment	The Gore Road Improvements EA Study goal is to maintain the existing cultural and natural aesthetics of the area while improving the quality of The Gore Road and addressing the pavement condition. A Cultural Heritage Assessment Report, Stage 1 Archaeological Assessment, Breeding Bird Study and Natural Environment Review have been completed to date.	A Stage 2 Archaeological Assessment has started and will be completed in the Spring 2013 upon finalization of the preliminary design.
Highway 9/The Gore Road Intersection	This intersection is under the jurisdiction of the Ministry of Transportation (MTO). MTO are currently conducting a Highway 9 EA in this area and their preliminary plans calls for the future signalization of The Gore Road/Highway 9 intersection together with minor road widening to accommodate left turn lanes on Highway 9 and a northbound right/left turn lane on The Gore Road at Highway 9 plus the closure of the Coolihans Sideroad intersection at Highway 9.	Will continue to co-ordinate our plans for The Gore Road with the MTO's plans for this intersection.

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9 Problems Identified

- Pavement condition has deteriorated and requires rehabilitation/reconstruction
- Need for improved base and slope stabilization
- Poor sight lines and visibility of hidden entrances and intersections
- Road structure, road shoulders and road drainage require upgrading to meet current design and safety standards


Pavement cracking

Region of Peel
Working for you

10 Opportunities for Improvements

Reconstructing The Gore Road will provide an opportunity to:

- Improve safety for all roadway users
- Include Active Transportation facilities
- Improvements in stormwater quantity and quality with flat bottom ditches

Improved pavement surface

11 2010 Safety Review

The Region of Peel completed a review to examine safety performance of The Gore Road and to identify engineering related factors and opportunities. It looked at:

- Collision history – 41 collisions between 2005 and 2009
- Dominant type of accident involving vehicle and animal
- Site Investigation
  - Intersections including lane configuration
  - Road signing
  - Traffic operations and conflicts
  - Potential hazards
  - Sight distances
  - Street lighting
  - Pavement markings/ pavement condition

12 Traffic Volume Figures

FIGURE 1

2010 TRAFFIC VOLUMES
THE GORE ROAD PATTERSON SIDEROAD TO HIGHWAY 9

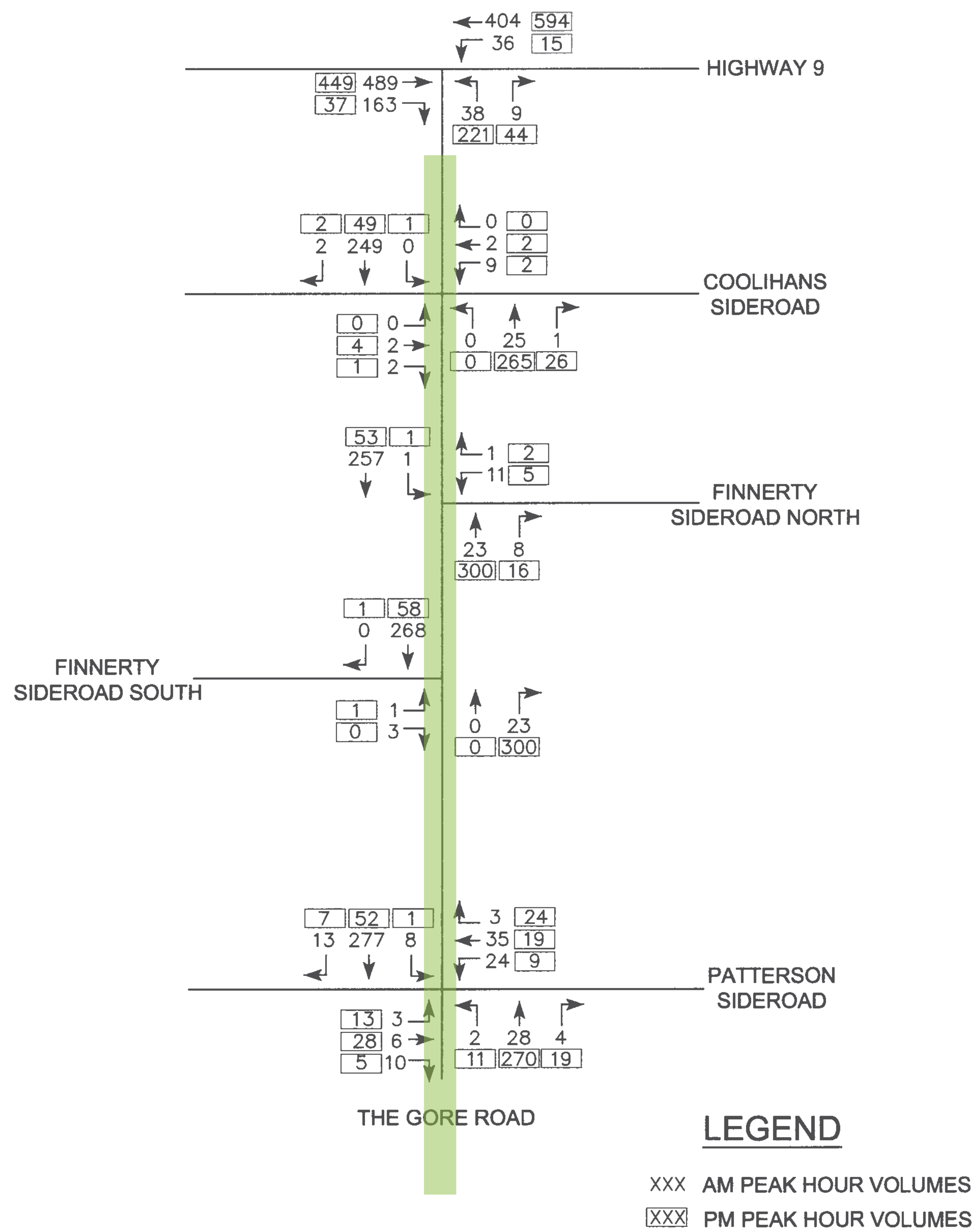


FIGURE 2

2021 TRAFFIC VOLUMES
THE GORE ROAD - PATTERSON SIDEROAD TO HIGHWAY 9

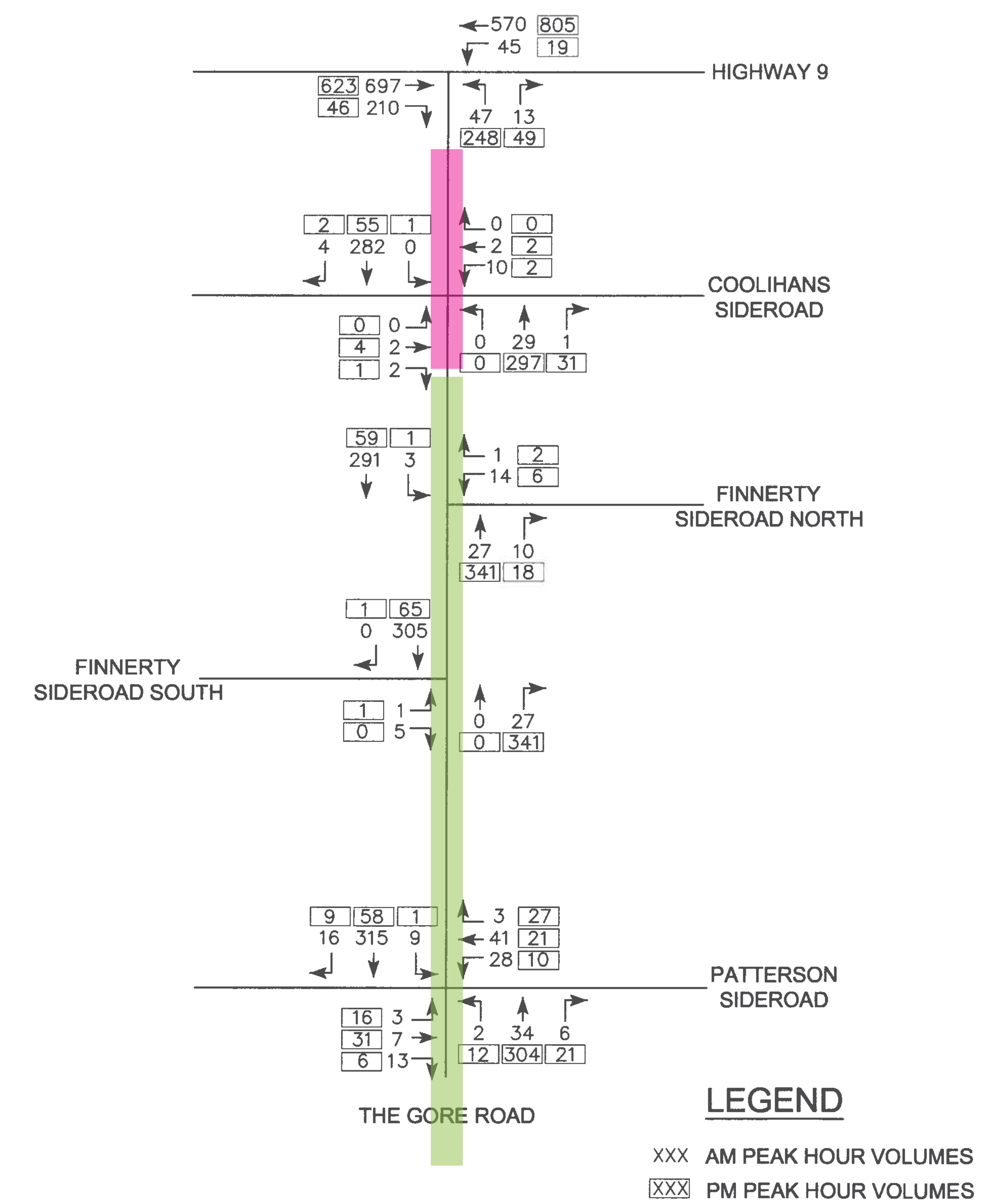
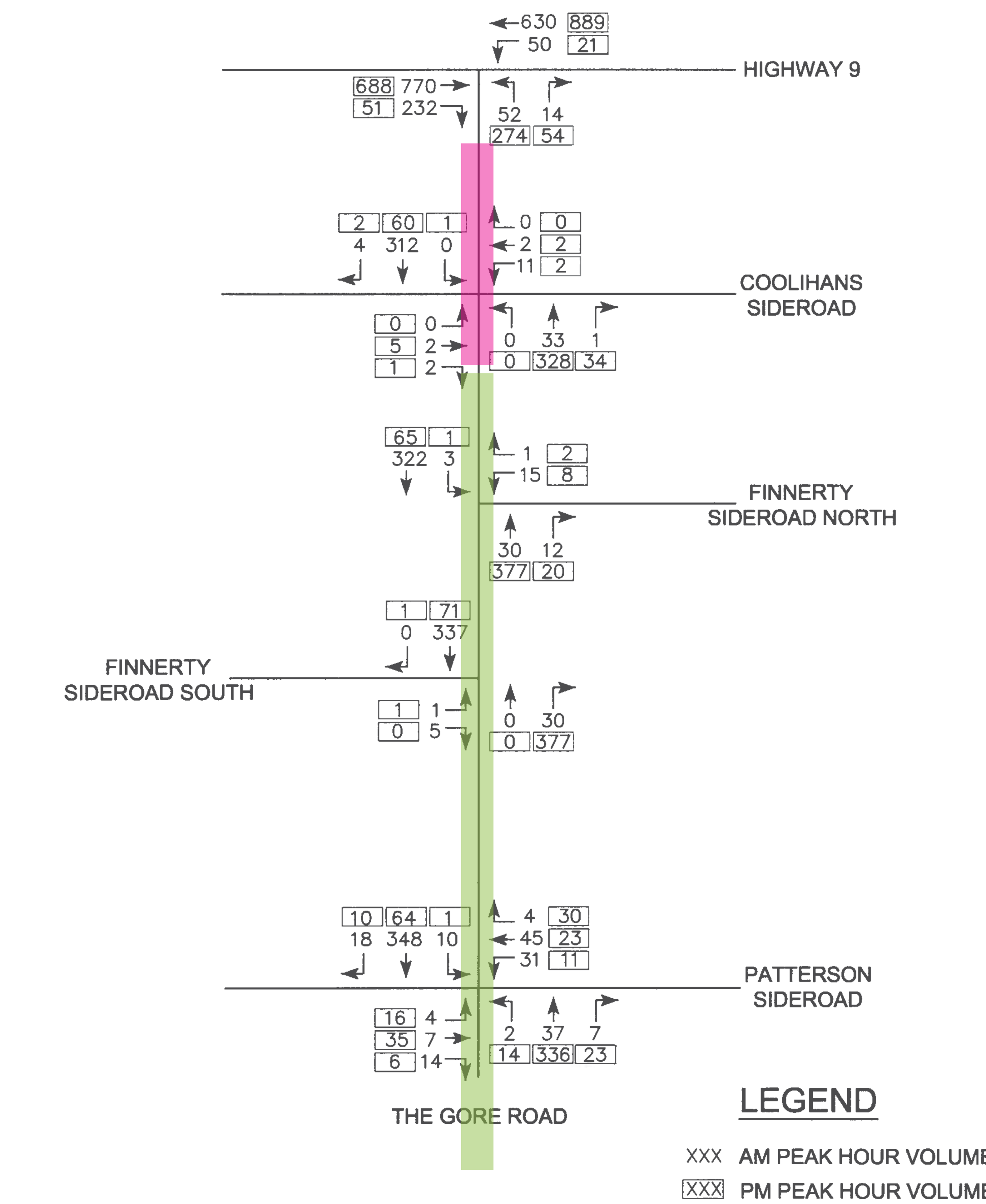


FIGURE 3

2031 TRAFFIC VOLUMES
THE GORE ROAD - PATTERSON SIDEROAD TO HIGHWAY 9



Level of Service (LOS) for study corridor shows sufficient capacity (no road widening or additional turning lanes required).

Level of Service (LOS) for study corridor shows sufficient capacity deficiency/excessive delays that would be resolved with a traffic control signal at Highway 9 and The Gore Road..

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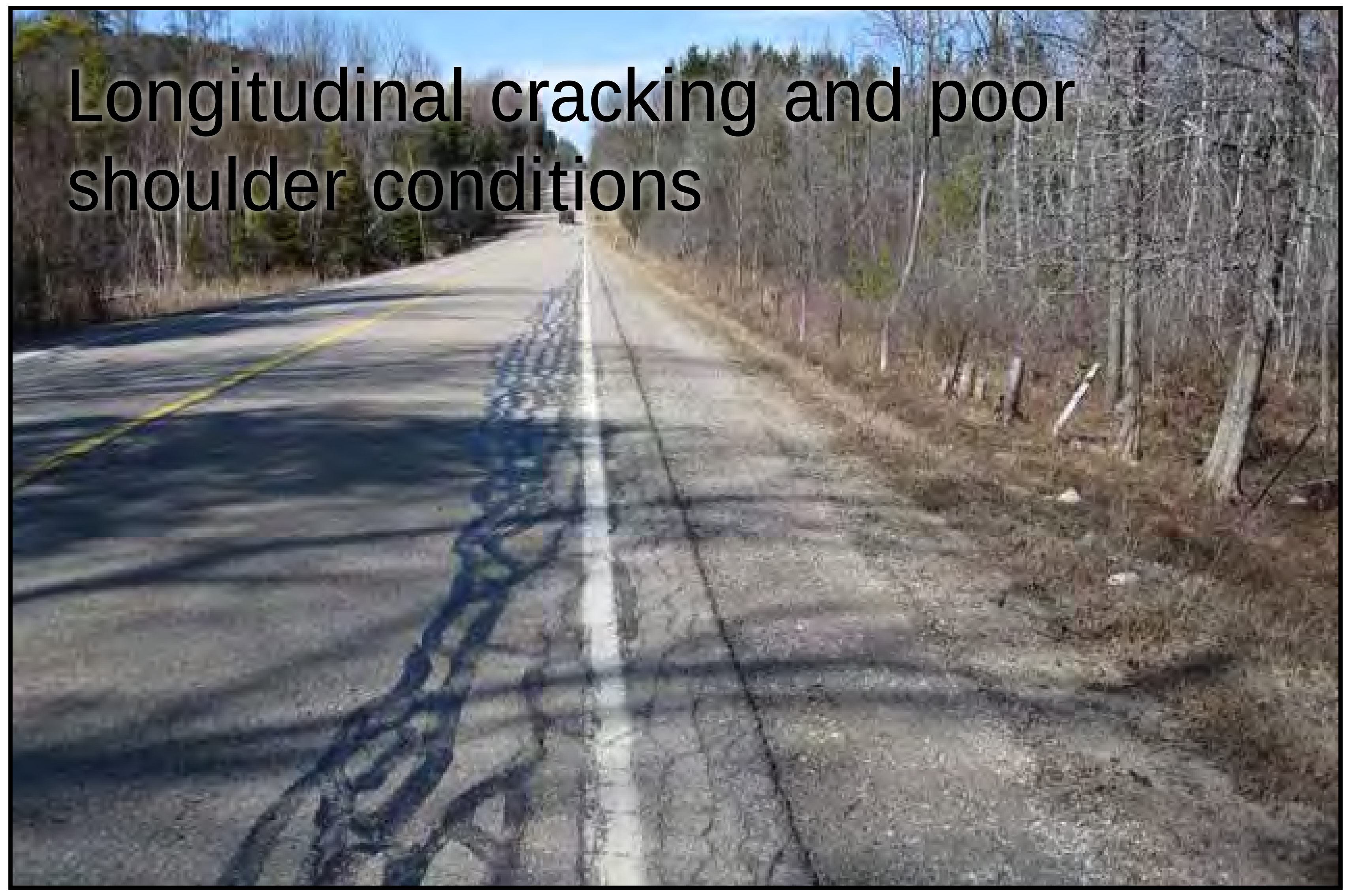
13 Deficiencies along the Study Area

Structural Deficiencies



Region of Peel
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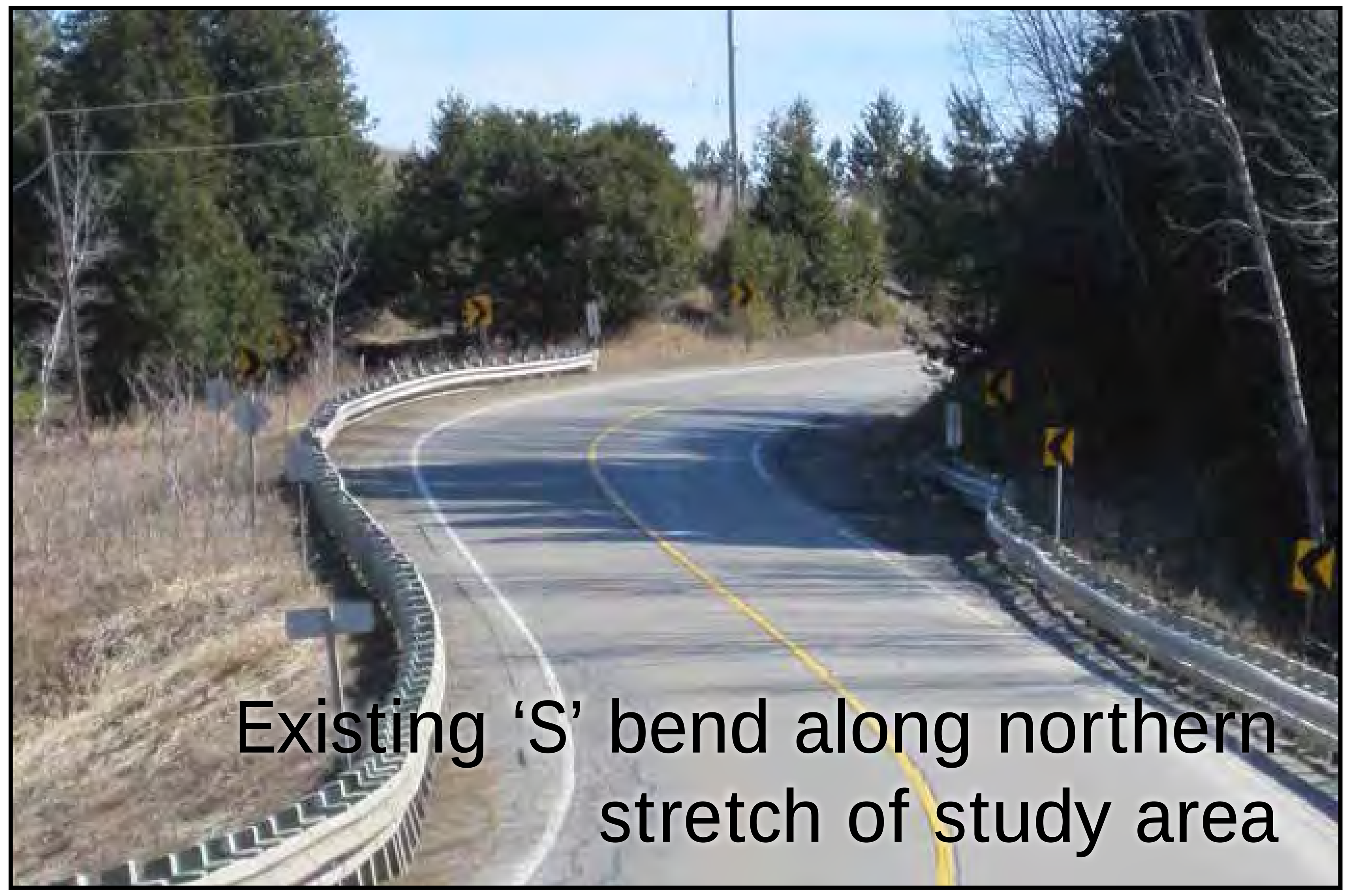
14 Deficiencies along the Study Area

Sightline Deficiencies


Current signage used to identify sightline deficiencies


Bruce Trail crossing with poor sightlines


Existing ‘S’ bend along northern stretch of study area

‘S’ bend signage

15 Socio Economic and Cultural Environment

Socio Economic

- Primarily rural residential and farmland
- Hydro One and Bell Canada within the road right-of-way

Cultural

- A Stage 1 Archaeological Assessment was completed in March 2011
- Majority of the roadway has been disturbed
- Few undisturbed areas remain with archaeological potential
- Stage 2 Archaeological Assessment has commenced and will be completed in Spring 2013

16 Natural Environment

- The nearby Caledon Hill Complex Life Science Site includes wetlands and is a source area for the Humber River watershed and has been identified as a candidate Life Science Area of Natural or Scientific Interest by the Ministry of Natural Resources

- The Tree Inventory identified one Species at Risk (SAR), a Butternut, south of Coolihans Sideroad. A Butternut Health Assessment indicated the tree is non-retainable and in poor health

- 33 vegetation community types identified including: Meadows, Plantations, Savannahs, Thickets, Woodlands, Coniferous Forest, Deciduous Forest, Mixed Forest, Marshes and Swamps

17 Natural Environment

- The lands within the study area are identified as "Natural Core Areas" of the Oak Ridges Moraine

- The Oak Ridges Moraine Conservation Plan allows for improvements to transportation facilities and related structures provided environmental impacts are minimized

- 10 culvert crossings inspected:
  - 4 permanent watercourses with direct fish habitat
  - 6 seasonal watercourses providing indirect habitat

18 Natural Environment

The following species were observed in the study area during field studies:

- Breeding bird “Bobolink”, a SAR, designated as ‘Threatened’
- 16 ‘area sensitive’ breeding birds
- Milksnake, a SAR, designated as ‘Special Concern’ (observed dead at roadside)
- 2 breeding amphibian species; Spring Peeper and Gray Tree Frog

The Northern Map Turtle, a SAR, designated as ‘Special Concern’, was identified through a database search; however, was not observed in the field.

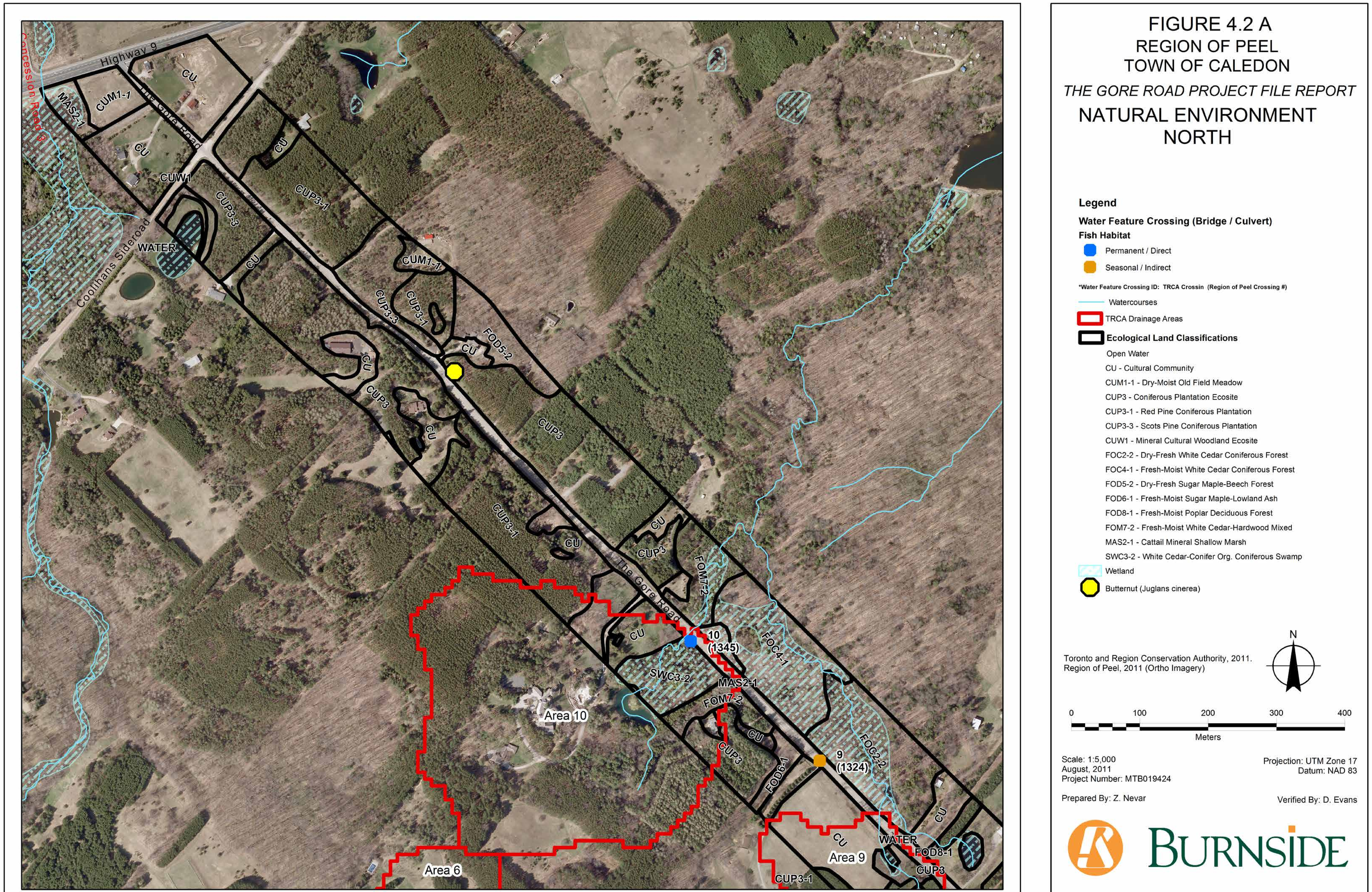
19 Roadside Wetlands

Roadside wetland

Wetland signage

Fencerow surrounding a roadside wetland

20 Natural Environment Figure 4.2A



Region of Peel
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21 Natural Environment Figure 4.2B

FIGURE 4.2 B
REGION OF PEEL
TOWN OF CALEDON
THE GORE ROAD PROJECT FILE REPORT

NATURAL ENVIRONMENT
NORTHWEST

Legend

Water Feature Crossing (Bridge / Culvert)

Fish Habitat

- Permanent / Direct
- Seasonal / Indirect

*Water Feature Crossing ID: TRCA Crossing (Region of Peel Crossing #)

- Watercourses
- TRCA Drainage Areas

Ecological Land Classifications

- Open Water
- CU - Cultural Community
- CUM1-1 - Dry-Moist Old Field Meadow
- CUP2 - Mixed Plantation Ecosite
- CUP3 - Coniferous Plantation Ecosite
- CUP3-1 - Red Pine Coniferous Plantation
- CUT1 - Mineral Cultural Thicket Ecosite
- CUT1-1 - Sumac Cultural Thicket
- CUW1 - Mineral Cultural Woodland Ecosite
- FOC2-2 - Dry-Fresh White Cedar Coniferous Forest
- FOD3-1 - Dry-Fresh Poplar Deciduous Forest
- FOD5-10 - Dry-Fresh Sugar Maple-White Birch-Poplar
- FOD5-8 - Dry-Fresh Sugar Maple-White Ash Forest
- FOD7-3 - Fresh-Moist Willow Lowland Forest
- FOM3-2 - Dry-Fresh Sugar Maple-Hemlock Mixed
- FOM4-2 - Dry-Fresh White Cedar-Poplar Mixed
- FOM7-2 - Fresh-Moist White Cedar-Hardwood Mixed
- MAM2-2 - Reed-canary Grass Mineral Meadow Marsh
- MAS2-1 - Cattail Mineral Shallow Marsh
- SWC3-2 - White Cedar-Conifer Org. Coniferous Swamp
- SWM1-1 - White Cedar-Hardwood Mineral Mixed Swamp
- Wetland

N

Toronto and Region Conservation Authority, 2011.
Region of Peel, 2011 (Ortho Imagery)

0 100 200 300 400
Meters

Scale: 1:5,000
August, 2011
Project Number: MTB019424

Projection: UTM Zone 17
Datum: NAD 83

Prepared By: Z. Nevar

Verified By: D. Evans

BURNSIDE

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Region of Peel
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22 Natural Environment Figure 4.2C

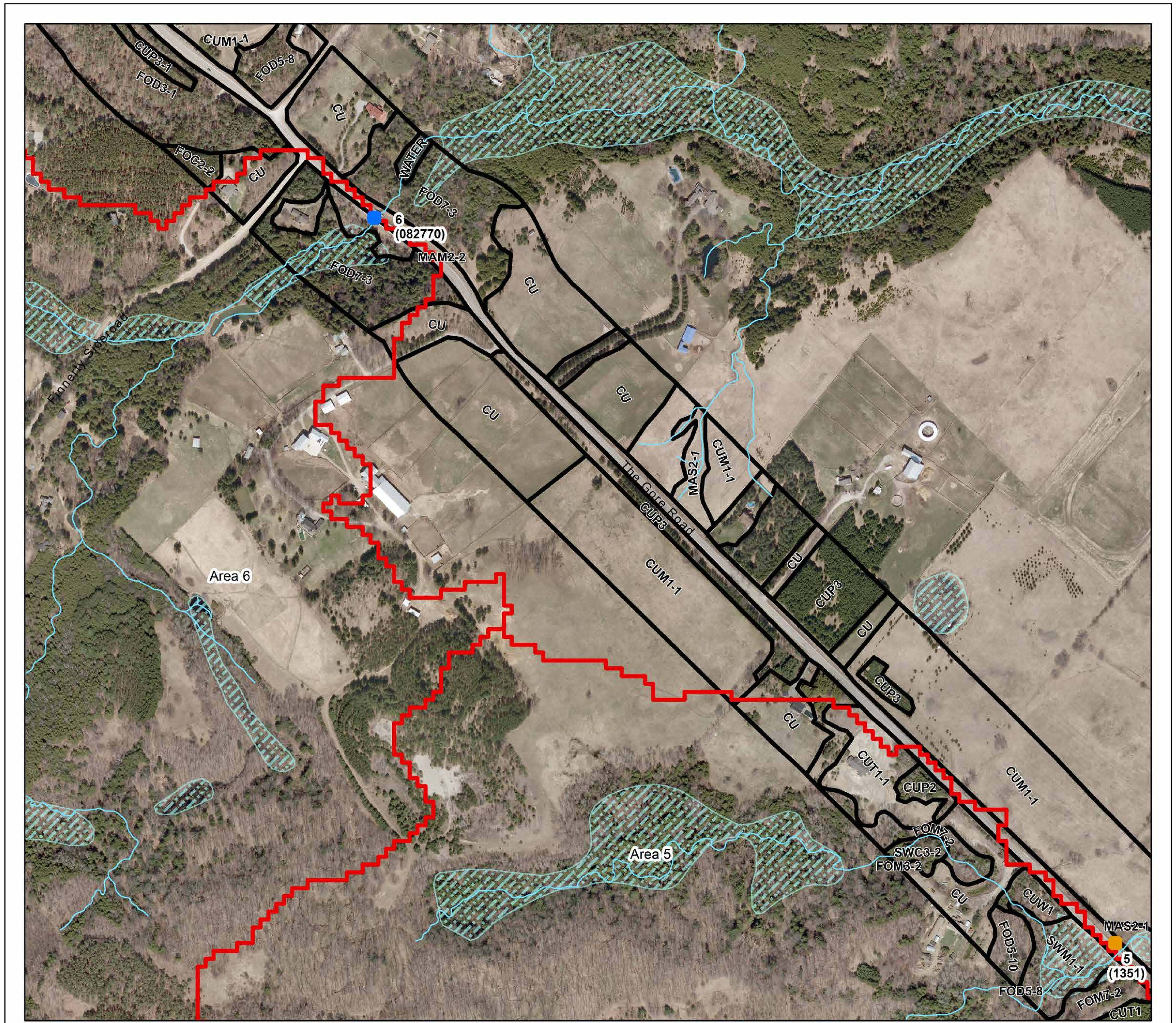

FIGURE 4.2 C
REGION OF PEEL
TOWN OF CALEDON
THE GORE ROAD PROJECT FILE REPORT
NATURAL ENVIRONMENT
SOUTHEAST

Legend

Water Feature Crossing (Bridge / Culvert)

Fish Habitat

- Permanent / Direct
- Seasonal / Indirect

***Water Feature Crossing ID: TRCA Crossin (Region of Peel Crossing #)**

- Watercourses
- TRCA Drainage Areas

Ecological Land Classifications

- CU - Cultural Community
- CUM1-1 - Dry-Moist Old Field Meadow
- CUP2 - Mixed Plantation Ecosite
- CUP3 - Coniferous Plantation Ecosite
- CUP3-1 - Red Pine Coniferous Plantation
- CUP3-2 - White Pine Coniferous Plantation
- CUP3-3 - Scots Pine Coniferous Plantation
- CUS1 - Mineral Cultural Savannah Ecosite
- CUT1 - Mineral Cultural Thicket Ecosite
- CUT1-1 - Sumac Cultural Thicket
- CUW1 - Mineral Cultural Woodland Ecosite
- FOC2-2 - Dry-Fresh White Cedar Coniferous Forest
- FOC4-1 - Fresh-Moist White Cedar Coniferous Forest
- FOD3-1 - Dry-Fresh Poplar Deciduous Forest
- FOD4 - Dry-Fresh Deciduous Forest
- FOD5-10 - Dry-Fresh Sugar Maple-White Birch-Poplar
- FOD5-8 - Dry-Fresh Sugar Maple-White Ash Forest
- FOD8-1 - Fresh-Moist Poplar Deciduous Forest
- FOM4-2 - Dry-Fresh White Cedar-Poplar Mixed
- FOM7-2 - Fresh-Moist White Cedar-Hardwood Mixed
- MAM2-2 - Reed-canary Grass Mineral Meadow Marsh
- MAS2-1 - Cattail Mineral Shallow Marsh
- SBS1 - Shrub Sand Barren Ecosite
- SWC1-1 - White Cedar-Mineral Coniferous Swamp
- SWC3-1 -White Cedar-Org. Coniferous Swamp
- SWD4-3 - WhiteBirch-Poplar Mineral Deciduous Swamp
- SWM1-1 - White Cedar-Hardwood Mineral Mixed Swamp
- SWM4-1 - White Cedar-Hardwood Organic Mixed Swamp
- Wetland

Toronto and Region Conservation Authority, 2011.
Region of Peel, 2011 (Ortho Imagery)

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0 100 200 300 400
Meters

Scale: 1:5,000
August, 2011
Project Number: MTB019424

Projection: UTM Zone 17
Datum: NAD 83

Prepared By: Z. Nevar

Verified By: D. Evans

BURNSIDE

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Region of Peel
Working for you

Natural Environment Figure 4.2D

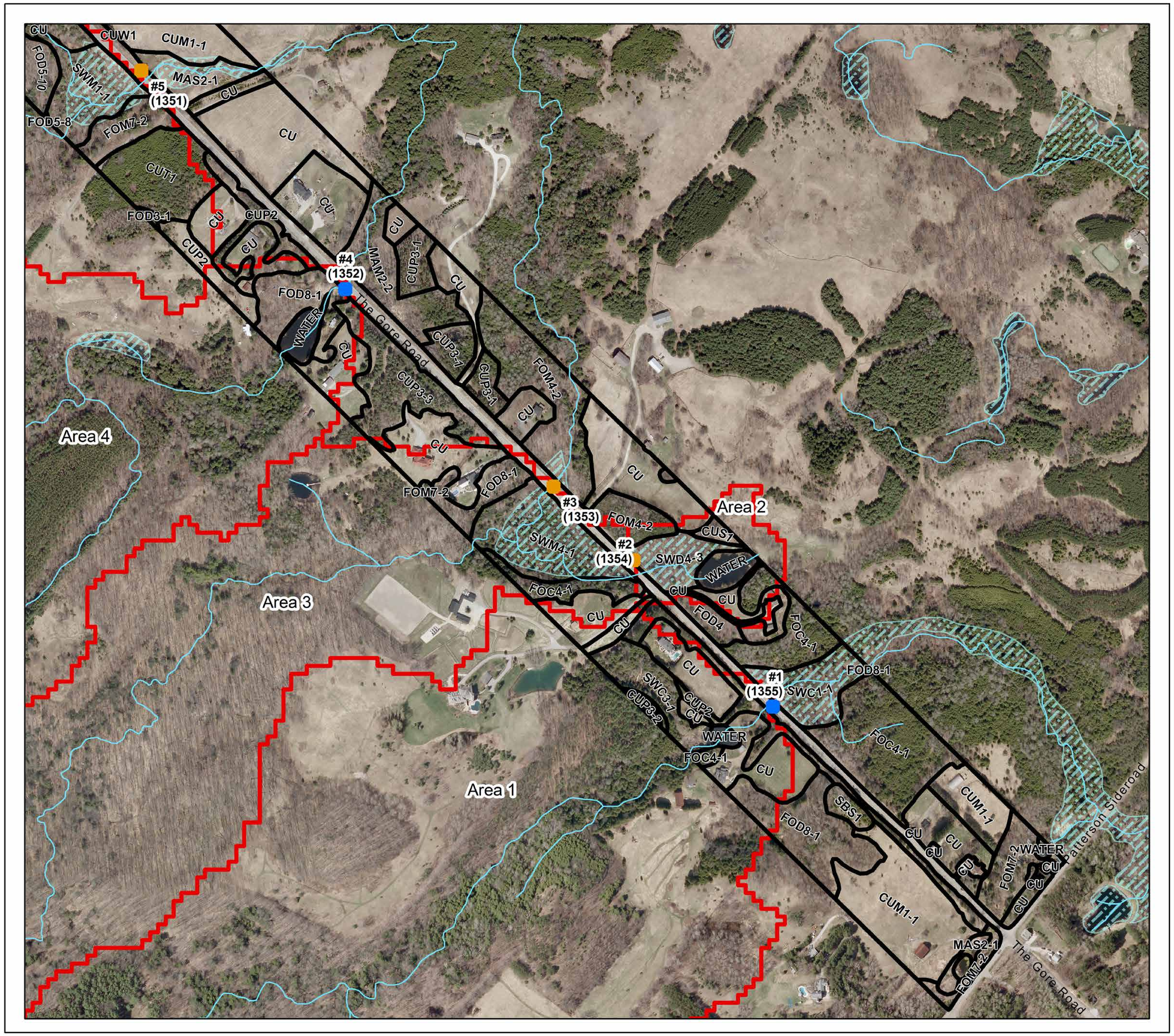

FIGURE 4.2 D
REGION OF PEEL
TOWN OF CALEDON

THE GORE ROAD PROJECT FILE REPORT

NATURAL ENVIRONMENT
SOUTH

Legend

Water Feature Crossing (Bridge / Culvert)

Fish Habitat

- Permanent / Direct
- Seasonal / Indirect

*Water Feature Crossing ID: TRCA Crossin (Region of Peel Crossing #)

- Watercourses
- TRCA Drainage Areas
- **Ecological Land Classifications**

CU - Cultural Community
CUM1-1 - Dry-Moist Old Field Meadow
CUP2 - Mixed Plantation Ecosite
CUP3 - Coniferous Plantation Ecosite
CUP3-1 - Red Pine Coniferous Plantation
CUP3-2 - White Pine Coniferous Plantation
CUP3-3 - Scots Pine Coniferous Plantation
CUS1 - Mineral Cultural Savannah Ecosite
CUT1 - Mineral Cultural Thicket Ecosite
CUT1-1 - Sumac Cultural Thicket
CUW1 - Mineral Cultural Woodland Ecosite
FOC2-2 - Dry-Fresh White Cedar Coniferous Forest
FOC4-1 - Fresh-Moist White Cedar Coniferous Forest
FOD3-1 - Dry-Fresh Poplar Deciduous Forest
FOD4 - Dry-Fresh Deciduous Forest
FOD5-10 - Dry-Fresh Sugar Maple-White Birch-Poplar
FOD5-8 - Dry-Fresh Sugar Maple-White Ash Forest
FOD8-1 - Fresh-Moist Poplar Deciduous Forest
FOM4-2 - Dry-Fresh White Cedar-Poplar Mixed
FOM7-2 - Fresh-Moist White Cedar-Hardwood Mixed
MAM2-2 - Reed-canary Grass Mineral Meadow Marsh
MAS2-1 - Cattail Mineral Shallow Marsh
SBS1 - Shrub Sand Barren Ecosite
SWC1-1 - White Cedar-Mineral Coniferous Swamp
SWC3-1 -White Cedar-Org. Coniferous Swamp
SWD4-3 - WhiteBirch-Poplar Mineral Deciduous Swamp
SWM1-1 - White Cedar-Hardwood Mineral Mixed Swamp
SWM4-1 - White Cedar-Hardwood Organic Mixed Swamp
Wetland

N

Toronto and Region Conservation Authority, 2011.
Region of Peel, 2011 (Ortho Imagery)

0 100 200 300 400
Meters

Scale: 1:5,000
August, 2011
Project Number: MTB019424

Projection: UTM Zone 17
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Prepared By: Z. Nevar

Verified By: D. Evans

BURNSIDE

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Alternative Solutions

Planning Alternatives	Description	Potential to Address Problem
Do Nothing	• Provides a base to compare other alternatives • No measures are considered to modify The Gore Road	• Eliminated from further consideration as it does not address the problem / opportunity statement
Rehabilitate Existing Two Lanes	• Addresses the current pavement distress otherwise the roadway would remain unchanged.	• Provides limited opportunities to enhance safety, road shoulders and drainage water • Partially addresses the problem / opportunity statement
Two Lane Full Reconstruction	• Provides the opportunity to improve the: - vertical / horizontal alignment of The Gore Road - shoulder areas and drainage - active transportation opportunities and sightlines • Context sensitive solutions that are compatible with adjacent land use are reflected in the design.	• Fully addresses the problem/opportunity statement and is carried forward for further consideration

25 Preferred Alternative Solution

Technically preferred alternative solution:

- Two-lane full reconstruction to improve vertical/horizontal alignment
- Improve shoulder areas for safe stopping and road stability
- Improve drainage
- Provide a paved shoulder to improve active transportation facilities (bike, pedestrian and horseback)

Region of Peel
Working for you

26 Evaluation of Alternative Designs

CRITERIA FOR EVALUATING ALTERNATIVES	70 km/h Design Speed	80 km/h Design Speed	70 km/h Design Speed or Higher
Natural Environment Rating:	**Most Preferred**	Least Preferred	Partially Preferred
•Designated Features •Water Quality and Quantity •Floodplain Lands •Terrestrial Habitat •Aquatic Habitat	Minimal impact over existing conditions. Works occur within the existing right-of-way and some outside of the existing right-of-way. Overall improvement with the replacement of the existing culverts. Flood conveyance expected to improve. In-water works would be required. Opportunity to improve aquatic habitat.	High impact over existing conditions. In a number of areas works would extend beyond the existing right-of-way. Overall improvement with the replacement of the existing culverts. Flood conveyance expected to improve. In-water works would be required. Opportunity to improve aquatic habitat.	Minimal impact over existing conditions. Works would primarily occur within the existing right-of-way. Some work may be required outside of the existing right-of-way. Overall improvement with the replacement of the existing culverts. Flood conveyance is expected to improve. In-water works would be required. Opportunity to improve aquatic habitat.

27 Evaluation of Alternative Designs

CRITERIA FOR EVALUATING ALTERNATIVES	70 km/h Design Speed	80 km/h Design Speed	70 km/h Design Speed or Higher
Socio-economic/ Cultural Environment Rating:	Partially Preferred	Least Preferred	**Most Preferred**
•Maintaining the character of the area and surrounding lands	Minimal impact. Works occur within existing right-of-way. Maintains rural characteristics and aesthetics of roadway.	Moderate to high impact. Works occur outside of the existing right-of-way. Significant impact to rural characteristics and aesthetics of the roadway.	Minimal impact. Works occur within and outside of the existing right-of-way. Maintains the rural characteristics and aesthetics of the roadway.
•Conformity to Local Municipal plans	Does not fully address the need to maintain The Gore Road as a Arterial Road.	Addresses the need to maintain The Gore Road as a Arterial Road and accommodates Active Transportation needs.	Addresses the need to maintain The Gore Road as a major road and accommodates Active Transportation needs.
•Effect on Property / Land Acquisition	Property acquisition will be minimal with some property required outside of the existing right-of-way.	Large amounts of the property would be required throughout the study area and beyond the existing right-of-way.	Property acquisition will be minimal with some property required outside of the existing right-of-way.
•Heritage Resources (archaeological features, built heritage and cultural heritage landscapes)	Stage 2 Archaeological Assessment will be completed prior to construction. Landscaping will be designed to minimize any disruptive effects on designated properties.	Stage 2 Archaeological Assessment will be completed prior to construction. Landscaping improvements will be designed to minimize any potential disruptive effects on designated properties.	Stage 2 Archaeological Assessment will be completed prior to construction. Landscaping will be designed to minimize any potential disruptive effects on designated properties.

28 Evaluation of Alternative Designs

CRITERIA FOR EVALUATING ALTERNATIVES	70 km/h Design Speed	80 km/h Design Speed	70 km/h Design Speed or Higher
Financial Factors Rating:	**Most Preferred**	Least Preferred	Partially Preferred
Estimated Capital Costs and Total Estimated Cost (25 year planning horizon)	Low expense for potential road reconstruction. Moderate expense associated with utility relocations	High expense for potential road reconstruction. High expense associated with utility relocations	Moderate expense for potential road reconstruction. Moderate expense associated with utility relocations
Technical Factors Rating:	Least Preferred	**Most Preferred**	Partially Preferred
Addresses Technical Safety Concerns/Strategies	•Accommodates future operational requirements •Does not fully address safety requirements to be maintained as an Arterial Road •Accommodates Active Transportation needs for The Gore Road •Sightlines at driveways remain an issue	•Accommodates / exceeds future operational and safety requirements for The Gore Road to be maintained as an Arterial Road •Accommodates / exceeds Active Transportation needs • Provides improved shoulder areas for improved road stability and safe stopping •Sightlines at driveways are improved	•Addresses safety requirements for The Gore Road •Accommodate future operational requirements to be maintained as an Arterial Road • Accommodates Active Transportation needs •Provides improved shoulder areas for improved road stability and safe stopping. •Sightlines at driveways are improved
RECOMMENDED ALTERNATIVE	Not Recommended	Not Recommended	**Recommended**

Region of Peel
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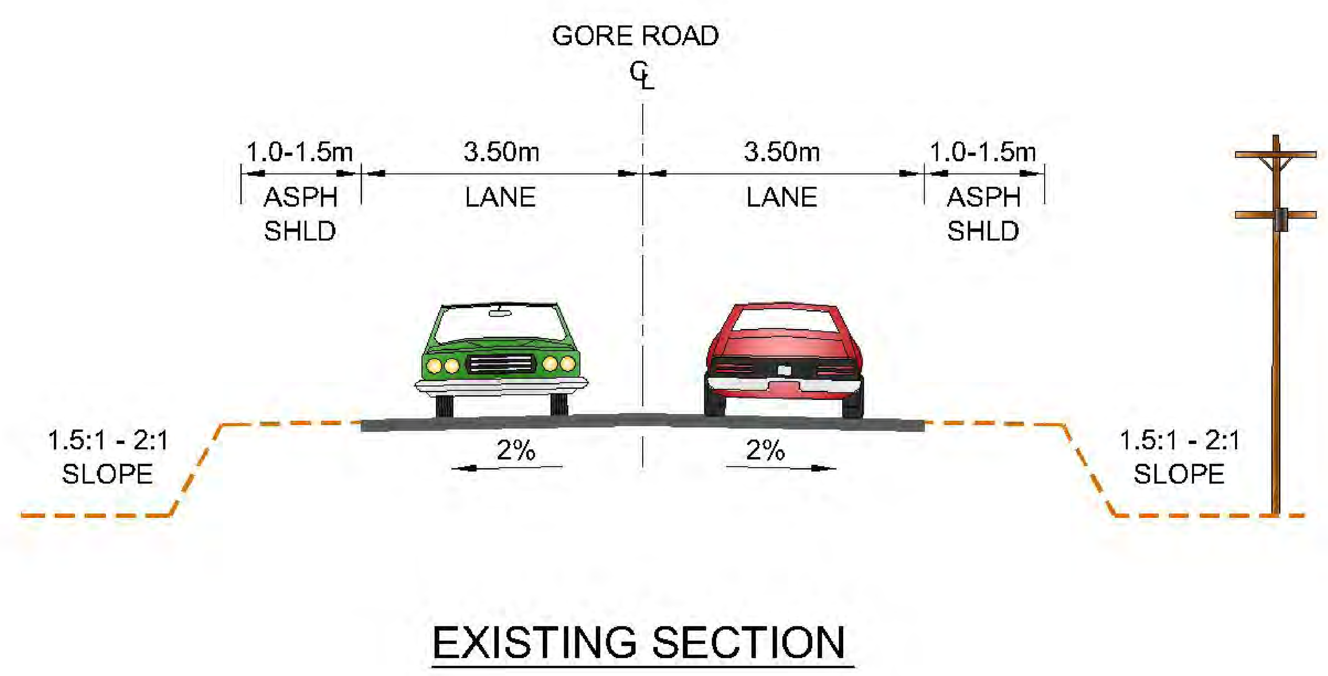
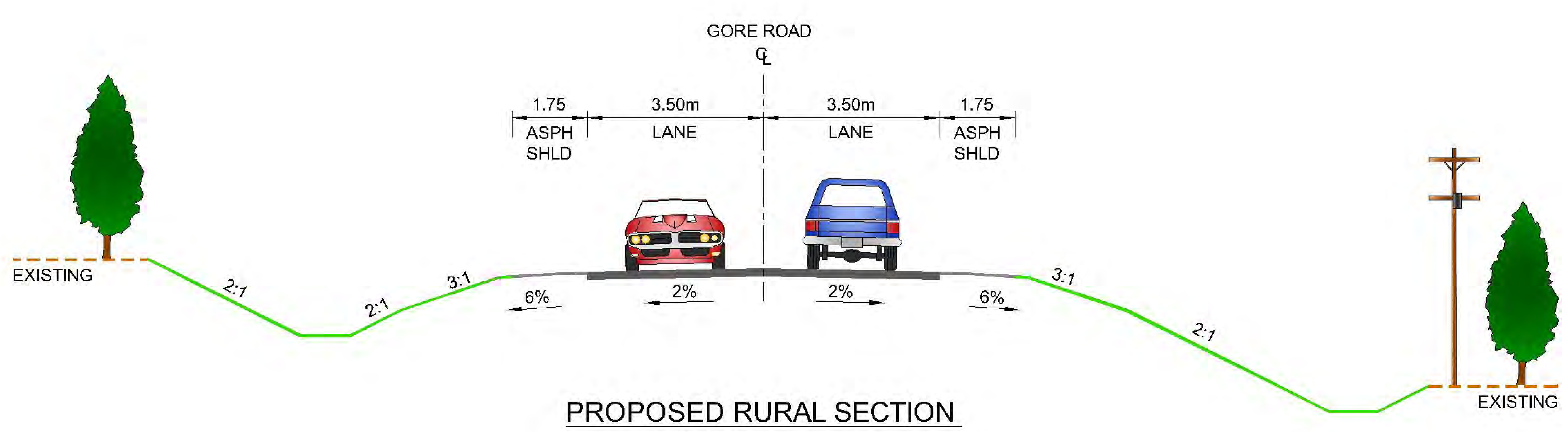
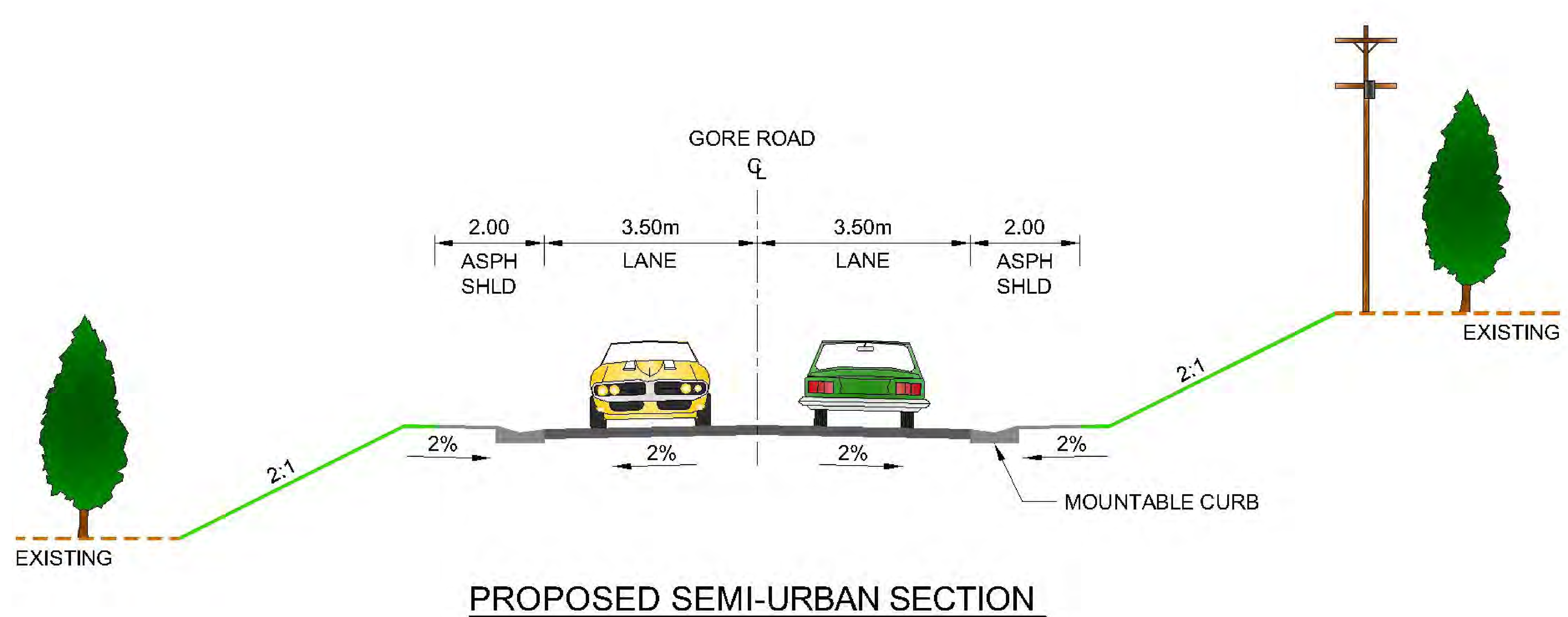
Typical Cross sections







Semi urban cross section is used to minimize property acquisition requirements

30 Streetscaping and Landscaping Plan

- Any removed trees will be replanted at a 3:1 ratio
- Species chosen will be reflective of those naturally found in the study area
- Details are provided on the Rolls Plans available at the PIC tonight

Restoration Plan

LANDSCAPE RESTORATION AREAS SUMMARY

All disturbed soils within the limit of construction are to be restored. Restoration recommendations are based on two criteria. The first is based on the optimum clear zone requirement from the edge of pavement. Based on the Region of Peel Streetscape Toolbox (July 2010) the optimum per the Transportation Association of Canada is 6 to 6.5 metres on rural roads with a design speed of 70 to 80 kh/h. This zone must be clear of all hazards (such as trees and shrubs with trunk diametres over 100mm measured 150-300mm from the ground) and disturbed soils within the clear zone are recommended to be restored with perennial seed mixes. Areas of disturbance beyond the clear zone are recommended to be restored with a combination of woody (tree and shrub) and herbaceous (seed mix) vegetation.

The Region of Peel Streetscape Toolbox does consider the use of break-away or frangible shrubs (shrubs with trunk diametres less than 100mm measured 150-300mm from the ground) within the clear zone, however use of shrubs within this area is generally not recommended as this may affect flow and maintenance of roadside ditches and affect visibility. In the event that the Town or Region wish to enhance the existing gateway signage south of Highway 9 with frangible shrubs, detailed planting design should have consideration for ditch function/maintenance and sight line visibility.

The second criteria is based on the existing and proposed ecology of a potential restoration area. There is considerable variation in the ecology of roadside vegetation within the study area. Potential restoration areas identified range from wetlands to dry upland slopes:

WET RESTORATION AREAS:
Post-construction soils will be predominantly saturated and will retain water so that wetland conditions exist. Growing conditions will support native trees like Tamarack and shrubs like Sandbar Willow. Generally associated with: marshes, swamps and riparian (riverside) areas.

DRY RESTORATION AREAS:
Post-construction soils will be well-drained or will shed water so that upland (i.e. dry land) conditions exist. Growing conditions will support native trees like Sugar Maple and shrubs like Grey Dogwood. Generally associated with: forests, plantations, meadows, hedgerows and manicured residential landscapes.

Based on these two criteria two distinct recommended species lists are provided for future detailed designs. All recommended landscape restoration species are native to southern Ontario (with the exception of the Region of Peel standard Turf mix to be used in area of existing resident maintained manicured turf areas). The TRCA Flora Species Scoring and Ranking (March 2010) for each species is provided. While some species are not common to TRCA jurisdiction, they are included in the recommended species lists due to their exceptional restoration qualities in roadside environments.

GUIDERAIL AESTHETICS:
Region of Peel standard guiderails will be required on significant stretches of the road and in some cases on both sides of the road as part of future detail design. While important for safety, the use of a single material (galvanized steel) and potential future layout will change the existing aesthetic character of the road. Given the required clear zone of 6-metres from edge of pavement, the Region of Peel Streetscape Toolbox allows for vines with frangible stems to be planted at the base of the guiderail to soften and enhance the aesthetic of the guiderail. Appropriate native species include:

- Thicket Creeper (Parthenocissus inserta) - L5
- Virginia Creeper (Parthenocissus quinquefolia) - L4
- Virgin's Bower (Clematis virginiana) - L5

All species are common in rural areas of TRCA jurisdiction. The one drawback of planting the vines under or near the guiderails is that they will be inadvertently cut back during routine grass cutting maintenance.

LANDSCAPE RESTORATION PLANT QUANTITIES AND SPACING

Based on the required replacement ratio of 3 replacement trees per 1 tree removed, 1428 trees must be planted. Approximately 3703m2 is available for planting within limits of disturbance. The Region of Peel Streetscape Toolbox provides two recommendations regarding plant layout standards:

- Typical streetscape type larger caliper trees (>40mm caliper nursery stock) are to be spaced at 5 to 8 metres on-centre
  - If large trees are planted at 5 metres on-centre there is space available for approximately 741 trees
- Typical naturalization type smaller trees (125cm to 300cm tall nursery stock) are to be spaced at 2.5 to 3.5 metres on-centre
  - If small trees are planted at 2.5 metres on-centre there is space available for approximately 1482 trees.

In addition to trees, it is recommended that shrubs be planted in continuous beds on 3:1 slopes (with exception of roadside ditches) to stabilize slopes, reduce long term maintenance costs, improve aesthetics and provide local wildlife habitat and cover. In the event that an insufficient quantity of trees are able to be planted to achieve the 3:1 replacement ratio, consideration could be given to the use of shrubs at a rate of 10 shrubs = 1 tree to achieve the ratio.

It is recommended that future detailed designs be comprised of a blend of large trees, small trees and shrubs to meet the required replacement ratio based on restoration area specific goals and functions. For example, smaller naturalization trees in wetland and riparian areas, larger trees adjacent to existing residential manicured lawn areas.

To provide diversity in restoration plantings, no single species should account for more than 20% of the total tree or shrub quantity.

WET RESTORATION AREA RECOMMENDED SPECIES

WOODY VEGETATION:
DECIDUOUS TREES
Red Maple (Acer rubrum) – L4
Silver Maple (Acer saccharinum) – L4

CONIFEROUS TREES
Tamarack (Larix laricina) – L3
Balsam Fir (Abies balsamea) – L3
Eastern White Cedar (Thuja occidentalis) – L5

SHRUBS
Red Osier Dogwood (Cornus sericea) – L5
Ninebark (Physocarpus opulifolius) – L3
Narrow Heart-Leaved Willow (Salix eriocephala) – L4
Sandbar Willow (Salix exigua) – L5
Common Elderberry (Sambucus canadensis) – L5
Nannyberry (Viburnum lentago) – L5

HERBACEOUS SEED MIXES:
RURAL DITCH MIX
25% Fowl Bluegrass (Poa palustris) – L5
25% Fox Sedge (Carex vulpinoidea) – L5
25% Switchgrass (Panicum virgatum) – L3
25% Virginia Wild Rye (Elymus virginicus) – L5
+ Nurse Crop Annual Ryegrass (Lolium multiflorum)

NATURAL WETLAND MIX
5% Blue Vervain (Verbena hastata) – L5
5% Blunt Broom Sedge (Carex scoparia) – L3
1% Flat Topped Aster (Aster umbellatus) – L3
30% Fox Sedge (Carex vulpinoidea) – L5
5% Fringed Sedge (Carex crinata) – L3
8% Green Bulrush (Scirpus atrovirens) – L5
1% New England Aster (Aster novae-angliae) – L5
1% Rice Cutgrass (Leersia oryzoides) – L5
1% Soft Rush (Juncus effusus) – L4
1% Spotted Joe Pye Weed (Eupatorium maculatum) – L5
1% Square Stemmed Monkey Flower (Mimulus ringens) – L5
1% Swamp Milkweed (Asclepias incarnata) – L4
35% Virginia Wild Rye (Elymus virginicus) – L5
5% Wool Grass (Scirpus cyperinus) – L3
+ Nurse Crop Annual Ryegrass (Lolium multiflorum)

DRY RESTORATION AREA RECOMMENDED SPECIES

WOODY VEGETATION:
DECIDUOUS TREES
Sugar Maple (Acer saccharum) – L5
Common Hackberry (Celtis occidentalis) – L+
Bur Oak (Quercus macrocarpa) – L4
Red Oak (Quercus rubra) – L4
Basswood (Tilia americana) – L5

CONIFEROUS TREES
White Spruce (Picea glauca) – L3
Eastern Red Cedar (Juniperus Virginiana) – L5

SHRUBS
Grey Dogwood (Cornus racemosa) – L5
Bush Honeysuckle (Diervilla lonicera) – L4
Ninebark (Physocarpus opulifolius) – L3
Staghorn Sumac (Rhus typhina) – L5
Fragrant Sumac (Rhus aromatica) – L+

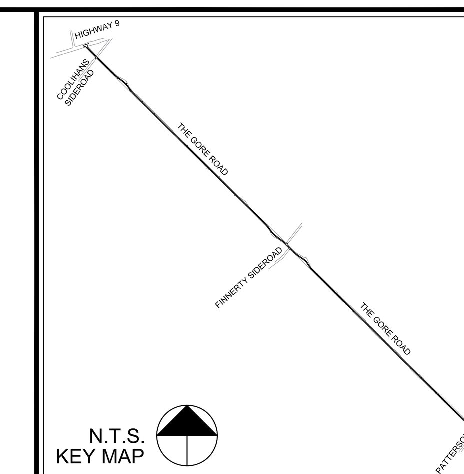
HERBACEOUS SEED MIXES:
UPLAND SLOPE DRY MIX
40% Big Bluestem (Andropogon gerardii) - L3
10% Black Eyed Susan (Rudbeckia hirta) - L4
10% Canada Goldenrod (Solidago Canadensis) - L5
5% Grass-leaved Goldenrod (Euthamia graminifolia) - L5
5% Grey-stemmed Goldenrod (Solidago nemoralis) - L5
5% Heath Aster (Aster ericoides) - L5
10% New England Aster (Aster novae-angliae) - L5
5% Panicled Aster Aster simplex/lanceolatus) - L5
10% Purple-stemmed Aster (Aster punicens) - L5
+ Nurse Crop Annual Ryegrass (Lolium multiflorum)

MANICURED TURF MIX
40% Shortstop Tall Fescue
40% Mustang Tall Fescue
20% Bronco Kentucky Bluegrass
*Region of Peel Standard "Futura Boulevard" by Pickseed Canada Inc. to restore existing turf areas

TRCA FLORA SPECIES SCORING AND RANKING (MARCH 2010)
L1 - L3 Regional Species of Concern
L4 Urban Species of Concern
L5 Not a Concern at This Time
L+ Non-native Species
L+? Origin uncertain or disputed
LX Species is extirpated from TRCA Jurisdiction
LH Species is a Hybrid

TREE REMOVAL AND AVAILABLE WOODY RESTORATION AREA SUMMARY

TREE REMOVALS DUE TO GRADING WEST SIDE	QUANTITY (each)
Total Individual Trees to be Removed (R) Based on Grading Impacts	58
Total Trees within Tree Groups to be Removed (R) Based on Grading Impacts	242
Total West Side	300
TREE REMOVALS DUE TO GRADING EAST SIDE	
Total Individual Trees to be Removed (R) Based on Grading Impacts	55
Total Trees within Tree Groups to be Removed (R) Based on Grading Impacts	121
Total East Side	176
SUMMARY	
TOTAL TREE ESTIMATED TREE REMOVALS	**476**
TOTAL ESTIMATED TREE REPLACEMENTS (3:1 RATIO)	**1428**
AVAILABLE WOODY (TREE AND SHRUB) RESTORATION PLANTING AREA WITHIN LIMITS OF DISTURBANCE AND BEYOND CLEAR ZONE SETBACK (AS IDENTIFIED ON DRAWINGS L1 - L5)	**QUANTITY (square metres)**
Wet Restoration Area	1865
Dry Restoration Area	1838
TOTAL AVAILABLE WOODY RESTORATION AREA	3703



N.T.S.
KEY MAP

LEGEND:

- EXISTING TREE — TREE NUMBER, CIRCLE ILLUSTRATES APPROXIMATE CROWN RESERVE
- PRESERVE TREE — TREE IS IN FAIR, GOOD OR EXCELLENT CONDITION
- REMOVE TREE — TREE IS IN POOR CONDITION
- REMOVE TREE — TREE IS IN CONFLICT WITH PROPOSED DEVELOPMENT
- REMOVE TREE — TREE IS IN POOR CONDITION AND IS IN CONFLICT WITH PROPOSED DEVELOPMENT
- REMOVE TREE — TREE IS DEAD
- T1 TREE GROUP
- PROPOSED GRADING
- PROPOSED SWALE
- ROAD RIGHT-OF-WAY
- OVERHEAD LINES
- TPF TREE PROTECTION FENCE
- 6.0M CLEAR ZONE SETBACK FROM EDGE OF PAVEMENT (NO WOODY VEGETATION)
- DRY RESTORATION AREA
- WET RESTORATION AREA

INFORMATION SOURCES
1. BASE INFORMATION OBTAINED FROM R.J. BURNSIDE & ASSOCIATES LIMITED.
2. TREE DATA COLLECTED BY ABOUD & ASSOCIATES INC. ON JUNE 21 AND JULY 15, 2011.

No.	Description	By	Date
0	30% SUBMISSION	MN	NOV-11

REVISIONS: All previous issues of this drawing are superceded

ABOUD & ASSOCIATES INC.
Consulting Arborists • Ecologists • Landscape Designers
591 Woolwich Street . Guelph . Ontario . Canada . N1H 3Y5
T:519.822.6839 . F:519.822.4052 . info@aboudtng.com . www.aboudtng.com

Title:
TREE PRESERVATION PRELIMINARY LANDSCAPE RESTORATION PLAN

Project:
GORE ROAD IMPROVEMENTS FROM PATTERSON SIDEROAD TO HIGHWAY 9
SCHEDULE B MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT
REGION OF PEEL

Date: NOVEMBER 2011
Project: AA10-57A
Scale: 1:500
Designer: MN
Drawn: MN, RA
Checked: MN

Drawing No:
L6

FILEPATH: S:\A+A PROJECTS\2010\10-57B GORE ROAD STREETSCAPE PLAN\CAD\AA CAD\AA10-57A STREETSCAPE 2011-11-17.DWG CTB: ABOUD2007.ctb PLOTTED:17-Nov-11 2:55 PM

32 Potential Impacts and Mitigation

Potential Impact	Description of Impact	Mitigation
Surface Water Quality	•Potential for sediments to enter watercourse as a result of restoration activities • Potential for localized water quality impacts as a result of spills	•Disturbed areas will be minimized as much as possible. •Erosion and sediment control measures installed on-site and maintained throughout the project •In-water works timed appropriately in consultation with TRCA. Permits will be obtained •Contractor required to develop a spills prevention and contingency plan
Dust / Noise / Air Quality	•Temporary nuisance noise during construction activities •Increased dust in air from construction activities	•Enforcement of noise control measures (restricted hours of operation and use of appropriate machinery/mufflers. •Regular wetting of road surfaces to control dust
Archaeology / Heritage	•Potential to expose items of archaeological interest is minimal. •Grading works may require working outside of the existing right-of-way	•Stage 2 Archaeological Assessment required in areas not previously disturbed by development outside right-of-way. Started Fall 2012 and will be completed Spring/Summer 2013
Aquatic Environment	•Potential water quality impairments (sediment loading; fuels and lubricants from machinery) •In-water works will be required	•Discussions required with TRCA and MNR during detailed design to confirm appropriate mitigation measures •TRCA and MNR permits will be obtained

33 Potential Impacts and Mitigation

Potential Impact	Description of Impact	Mitigation
Terrestrial Environment	•Loss of vegetation/Habitat loss •No designated species identified	•Minimize disturbance to existing vegetation. •Disturbed areas will be stabilized and revegetated on project completion and restored to a pre-disturbed state. 476 trees to be removed and restored with 1,428 trees and shrubs based on a 3:1 restoration ratio
Property Use	•Property acquisition required in some areas to accommodate rehabilitation and geometric improvements •Existing driveways will need to be updated	•Minimal property acquisition anticipated. •Semi-urban cross section used in appropriate areas to minimize property requirements •Disturbed areas will be restored
Health and Safety	•Potential safety hazard from construction activities, heavy equipment and increased traffic	•Contactor required to implement Health and Safety Plan
Traffic Management	•Potential nuisance impacts to traffic during construction	•Traffic management plan and proposed construction staging to minimize inconveniences to the motoring public

34 Additional Project Upgrades

- **Retaining walls** will be implemented at some locations to minimize property grading
- **Driveway grades** will be maintained to existing conditions or improved
- **New driveway culverts** will be installed at all properties
- All circular **cross culverts** will be replaced with 600mm (24”) diameter culverts to meet current standards
- At six locations, circular cross culverts will be replaced with even larger sizes and buried by 300mm (12”) to accommodate fluvial processes and ensure adequate fish passage
- Pilot location for various road ecology initiatives in partnership with Toronto and Region Conservation Authority


New Stone Retaining Wall

New Driveway Culvert


Existing Cross Culvert


New Cross Culvert

35 Pilot Project for Traffic Safety and Active Transportation

The Region of Peel will pilot a proactive safety measure shown to systematically reduce run-off-road events.

Narrow rumble strips will be added under the white lane markers to act as an alert to drivers who may cross into the paved shoulder.

This will make The Gore Road safer for pedestrians, cyclists and motorists.

Traditional – No room for cycling

Narrow rumble strips are thinner, on the white line and include gaps for turning

Region of Peel
Working for you

36 Speed Calming

- Speed calming tools utilized post construction including flashing warning signs and speed radar trailers to assist in the enforcement of speed limits

- These tools are used within the Region of Peel as a speed reduction measure

VATCS Sign

Speed Radar Trailer

Next Steps

- Review and finalize preferred solution in light of comments received
- Finalize the Project File Report (PFR)
- File the PFR for a 30-day public and agency review in Spring 2013
- Reconstruction of The Gore Road is anticipated in 2016/2017

38 Thank you for your participation

How can you provide comments on the project?

Please complete the comment sheet and place in the comment box, or send comments by email/fax/letter to either of the following project team members by **Thursday June 6, 2013.**

You can view tonight's information boards again on our website:
www.peelregion.ca/pw/roads/environ-assess/index-caledon.htm

Sally Rook, C. Tech. PMP
Project Manager
Regional Municipality of Peel
10 Peel Centre Drive, Suite B, 4th Floor
Brampton, Ontario L6T 4B9
Phone: 905-791-7800 ext. 7842
Toll Free: 1-800-919-7800
Fax: 905-791-1442
Email: sally.rook@peelregion.ca

Leonard Rach, P. Eng.
Project Manager
R. J. Burnside & Associates Limited
15 Townline
Orangeville, ON L9W 3R4
Tel: 1-800-265-9662 Ext. 302
Fax: 519-941-8120
E-Mail: leonard.rach@rjburnside.com

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BURNSIDE

Municipal Class Environmental Assessment
The Gore Road Improvements - Patterson Sideroad to Highway 9

PUBLIC COMMENT SHEET

Public Information Centre:
Thursday May 23, 2013 (6:30 – 8:30 pm)
Caledon Community Complex
6215 Old Church Road, Caledon

Nam[redacted]
Addr[redacted]
Posta[redacted]
Telep[redacted]
Emai[redacted]

The Region of Peel (Region) has identified the need to rehabilitate a portion of The Gore Road from 25m north of Patterson Sideroad to Highway 9. R.J. Burnside & Associates Limited has been retained by the Region to review alternatives to address the deteriorating pavement, sub-standard shoulder areas, lack of proper ditching and visibility restrictions throughout the road's rolling terrain. This questionnaire is your opportunity to comment on this study and indicate your concerns and preferences. Your views are important to us.

1. **My interest is: (please check all that apply)**

[✓] residential property
[✓] commercial/ industrial property
[ ] member of interest group
[ ] agency representative
[ ] other:____________________
[ ] pedestrian/ public safety
[ ] recreational interest
[ ] general interest

2. **Comments/Questions/Suggestions (additional space on back of page):**

We are concerned about the impacts to the trees along the road adjacent to my property [redacted] The Gore Road. I appreciate the planned retaining wall structure that has been included but would like to see a similar retaining wall from Station [redacted] to reduce the ditch width, improve the safety of my entrance into the property and reduce the impact of the ditching on the entrance gates as well as the trees along the property line.

[redacted]

June 17th 2013

Fw: The Gore Road Improvements - Patterson Sideroad to Highway 9 - Comments

Leonard Rach to: Jennifer Vandermeer 06/21/2013 10:29 AM

Cc: John Velick

----- Forwarded by Leonard Rach/RJB on 06/21/2013 10:28 AM -----

From:	"Rook, Sally" <Sally.Rook@peelregion.ca>
To:	[redacted]
Cc:	'Leonard Rach' <Leonard.Rach@rjburnside.com>, "Farah, Jibril" <Jibril.Farah@peelregion.ca>, "Turner, Melissa" <Melissa.Turner@peelregion.ca>, [redacted]
Date:	06/20/2013 03:11 PM
Subject:	RE: The Gore Road Improvements - Patterson Sideroad to Highway 9 - Comments

Hi [redacted]

Thank you for your comment sheet emailed recently regarding impacts to your property specifically from Station 590 to 625.

We acknowledge that there will be some property impacts along the total frontage of the property due to the proposed design but there is no work being proposed on private property in the area of Station 590 to 625.

As discussed at the recent PIC, the wooden fence and stone gate will need to be relocated within the private property limits and out of the Region's right-of-way. The exact details of relocating the fencing and gate back to the property line will be incorporated into a Property Impact Plan created in consultation between yourself and the Region during the detail design stage.

Reducing the ditch width is not possible as the 0.75m bottom width is a minimum requirement set out by the Toronto Region Conservation Authority. Every attempt was made to reduce property impacts through the use of retaining walls where this mitigation measure would result in a reduction of required property. Between Stations 590 and 625, retaining wall would not be appropriate since the road is at existing grade and a wall would not mitigate any property impacts.

During detail design every effort will be made to preserve as many trees as possible. However, for any trees that must be removed that are within private property, the Region will replace these trees and this will be detailed in the previously mentioned Property Impact Plan.

As for the comment regarding safety at the entrance, the road is on a tangent in this location and the sight lines have been assessed and meet required Ministry of Transportation Ontario standards (min. stopping sight distance of 110 metres) for the existing road configuration.

Your comment sheet will be included as a matter of record in the EA Project File. Please don't hesitate to contact us if you have any further questions or concerns.

Thank you,

Sally Rook, C.Tech., PMP | Project Manager
Infrastructure Programming & Studies | Public Works
Region of Peel | 10 Peel Centre Dr., Suite B, 4th Floor, Brampton ON L6T 4B9
Tel. 905-791-7800 ext. 7842
REGION OF PEEL ■■■ **working for you**

From: [redacted]
Sent: June 17, 2013 4:38 PM
To: Rook, Sally; leonard.rach@rjburnside.com
Cc: [redacted]
Subject: The Gore Road Improvements - Patterson Sideroad to Highway 9 - Comments

Dear Ms Rook and Mr. Rach,

On behalf of [redacted]

Please see enclosed comments form.

BURNSIDE
[The Difference is our People]

Appendix D3
Agency Contact List

The Gore Road Improvements Project - Agency Contact List
Region of Peel
R.J. Burnside and Associates Limited Project No. MTB 019424

Agency/Organization	Title	First Name	Last Name	Position	Address	Contact Information	Notes	Comments Received	Response Given
A. Federal Government Agencies									
Canadian Environmental Protection Agency Ontario Region	Mr.	Danny	Epstein	Regional Director	4905 Dufferin Street, 2nd Floor Downsview, ON M3H 5T4	Tel: (416) 739-5851 Fax: (416) 739-4159 Email: danny.epstein@ec.gc.ca	Removed from list on May 6, 2013 by JV, CEAA does not apply to this project.		
Environment Canada Ontario Region	Mr.	Rob	Dobos	Manager, Environmental Assessment Section	867 Lakeshore Road, PO Box 5050 Burlington, ON L7R 4AR	Tel: (905) 336-4948 Fax: (905) 336-8901 E-mail: rob.dobos@ec.gc.ca			
Fisheries and Oceans Canada Southern Ontario District Office	Mr.	Paul	Savoie	Regional Environmental Assessment Analyst	District Office, 3027 Harvester Road, Unit 304 Burlington, ON L7R 4K3	Tel: (905) 639-8687 Fax: (905) 639-3549			
Health Canada Ontario Region	Sir / Madam			Regional Environmental Assessment Coordinator	180 Queen Street West Toronto, ON M5V 3L7	Tel: Fax: E-mail:			
Parks Canada Historic Sites and Monument Board of Canada	Ms	Marie-Josee	Lemieux		25 Eddy Street Gatineau, QC K1A 0M5	Tel: (819) 997-4059 Fax: E-mail:		NOCm comment form received Dec 8, 10 indicating that they have no concerns and would like to be removed from the circulation list.	
Canadian Transport Agency	Ms	Jeannette	Anderson	Enforcement Officer	4900 Yonge Street, Suite 300 Toronto, ON M2N 6A5	Tel: (416) 952-7895 Fax: (416) 952-7897 E-mail: Ontario Region			
Transport Canada Ontario Region (PHE) Environment and Engineering				Environmental Assessment Coordinator	4900 Yonge Street, Suite 300 Toronto, ON M2N 6A5	E-mail: EnviroOnt@tc.gc.ca		E-mail received Jan 17, 11 indicating that an application or CEAA Screening should be prepared for any works in navigable waterways.	
B. Provincial Government Agencies									
Ministry of Environment Environmental Assessment and Approvals Branch	Mr.	D. Jeffrey	Dea	Project Officer – EA Project Coordination Section	2 St. Clair Avenue West, 14th Floor Toronto, ON M4V 1L5	E-Mail: MEA.NOTICES.EAAB@ontario.ca	**E-mail / Mail Notice of Completion only.**		
Ministry of Environment – Central Region	Ms	Dorothy	Moszynski	Environmental Resource Planner & EA Coordinator	5775 Yonge Street, 9th Floor North York, ON M2M 4J1	Tel: (416) 326-4886 E-Mail: Dorothy.moszynski@ontario.ca		Letter received Dec 6, 10 providing TSS comments and standard information with regard to ecosystem protection and restoration; surface water; groundwater; dust and noise; servicing and facilities; contaminated soils; mitigation and monitoring; planning and policy; class EA process; and first nations consultation. Would like a draft copy of the EA prior to filing the NOCp.	
Ministry of Natural Resources Aurora District	Mr.	Bohdan	Kowalyk	Aurora District Forester	50 Bloomington Road West, R.R. #2	Tel: (905) 713-7714 Fax: (905) 713-7360		Email received Jan 5, 2012 providing a link to the Forestry	Email sent Jan 5, 2012 requesting information regarding

Agency/Organization	Title	First Name	Last Name	Position	Address	Contact Information	Notes	Comments Received	Response Given
					Aurora, ON L4G 3G8	E-mail: Bohdan.Kowalyk@ontario.ca		Management Plan Tax Incentive Program Guide http://www.mnr.gov.on.ca/en/Business/Forests/2ColumnSubPage/STEL02_166346.html. Bohdan advised that there is only one area threshold and that is 4 hectares (9.88 acres) of forest which excludes buildings. A managed forest plan approver is required to approve a plan.	the Forestry Management Plan Tax Incentive Program.
Ministry of Natural Resources Aurora District	Mr.	Mark	Heaton	Fish and Wildlife Biologist	50 Bloomington Road West, R.R. #2 Aurora, ON L4G 3G8	Tel: (905) 713-7406 Fax: (905) 713-7360 E-mail: Mark.Heaton@ontario.ca			
Ministry of Natural Resources Aurora District	Ms	Melinda	Thompson-Black	Species at Risk Biologist	50 Bloomington Road West, R.R. #2 Aurora, ON L4G 3G8	Tel: (905) 713-7406 Fax: (905) 713-7360 E-mail:		Email sent March 19, 11 requesting information on natural heritage and element occurrences. Letter received May 24, 2011 identifying Butternut, Bobolink, Snapping Turtle, sensitive plant species and historic records for the northern map turtle within the vicinity of the study area. A permit may be required if any works may pose harm to these species. Natural heritage features recorded for this area include the Provincially Significant Harris Wetland Complex, a number of identified wetlands, the Humber Headwaters and Albion Hills Forest ANSI's as well as two Environmentally Significant Areas.	
Ministry of Natural Resources Aurora District	Ms	Jackie	Burkart	District Planner	50 Bloomington Road West, R.R. #2 Aurora, ON L4G 3G8	Tel: (905) 713-7368 Email: Kackie.Burkart@ontario.ca ESA.Aurora@ontario.ca	Added to list May 14, 2013 as per email received from Jackie Burkart May 10, 2013.	Email comment received from Jackie Burkart May 10, 2013. Noted that if any Species at Risk found within study area, should be reported to the Aurora office by email at ESA.Aurora@ontario.ca. Also noted that tree removal and wetland disturbance should be avoided or minimized.	Action Items: Report any Species at Risk found within study area to the Aurora MNR office by email: ESA.Aurora@ontario.ca.
Ministry of Agriculture and Environmental & Land Use	Ms	Susan	Motkaluk	Manager	1 Stone Road West, 3rd Floor SE Guelph, ON N1G 4Y2	Tel: Fax: E-mail:	Removed from list on May 6, 2013 by JV and		

Agency/Organization	Title	First Name	Last Name	Position	Address	Contact Information	Notes	Comments Received	Response Given
Policy							replaced with David Cooper.		
Ministry of Agriculture, Food and Rural Affairs- Environmental and Land Use Policy	Mr.	David	Cooper	Manager	1 Stone Road West, 3rd Floor South Guelph, ON N1G 4Y2		Added to list on May 6, 2013 by JV replacing Susan Motkaluk.		
Ministry of Culture	Mr.	Winston	Wong	Heritage Planner – Central	400 University Avenue, 4th Floor Toronto, ON M7A 2R9	Tel: (416) 314-7147 Fax: (416) 314-7175 E-mail: Winston.Wong@ontario.ca	Removed from list on May 6, 2013 by JV and replaced with Rosi Zirger.		
Ministry of Tourism, Culture and Sport Culture Services Unit, Programs and Services Branch	Ms	Rosi	Zirger	Heritage Planner – Central Ontario	401 Bay Street, Suite 1700 Toronto, ON M7A 0A7		Added to list on May 6, 2013 by JV replacing Winston Wong.		
Ministry of Municipal Affairs and Housing	Mr.	Bruce	Singbush	Manager	2nd Floor, 777 Bay Street Toronto, ON M5G 2E5	Tel: (416) 585-6564 Fax: (416) 585-6882 E-mail: bruce.singbush@ontario.ca			
Ministry of Municipal Affairs and Housing Oak Ridges Moraine Policy Team	Sir / Madam			Provincial Planning and Environmental Services Branch	777 Bay Street, 14th Floor Toronto, ON M5G 2E5	Tel: Fax: E-mail:			
Ministry of Public Infrastructure and Renewal Places to Grow	Ms	Tija	Dirks	Manager	777 Bay Street, North Tower, 14th Floor Toronto, ON M5G 2P5	Tel: (416) 325-1546	Removed from list on May 6, 2013 by JV and replaced with Andrew Theoharis.		
Ministry of Infrastructure - Ontario Growth Secretariat, Growth Policy, Planning and Analysis Branch	Mr.	Andrew	Theoharis	Manager (A), Growth Policy	777 Bay Street, 4th Floor, Suite 425 Toronto, ON M5G 2E5		Added to list on May 6, 2013 by JV replacing Tija Dirks.		
Ministry of Transportation - Central Region Engineering Office	Ms	Alice	Kam	Project Engineer	1201 Wilson Avenue, 5th Floor, Bldg D Downsview, ON M3M 1J8	Tel: (416) 235-5531 Fax: (416) 325-3436 E-mail: alice.kam@ontario.ca	Project Manager for Highway 9 @ The Gore Road intersection MTO Environmental Assessment	Email received on July 26, 2011 advising that the MTO has done some existing condition analysis (collision, geometric deficiency and operational analysis's) at the intersection of Highway 9 and the Gore Road in the Town of Caledon as well as their consultant is currently identifying design alternatives. In addition, the MTO has requested that their consultant identify additional options to realign Gore Road and	Email response from Region of Peel on July 26, 2011 indicating that they have asked Burnside to focus on Patterson Sideroad to Coolihans Sideroad and then tie into the Ministry's study from Coolihan's Sideroad to Highway 9. The Region advised that if the MTO decides to install signals with no turn lanes and or realignment, then the Region will need to complete its design work to ensure

Agency/Organization	Title	First Name	Last Name	Position	Address	Contact Information	Notes	Comments Received	Response Given
								Concession Road 3. It is expected that the MTO's project will achieve 30% milestone mid-September and at that time a "technically preferred alternative" will be identified. Email received Nov 30. 2011 indicating that a preferred alternative to address The Gore Road and Highway 89 intersection has not been identified to date. The preferred alternative will likely be selected in Feb/Mar of 2012.	property requirements are identified for the PIC end of Nov. 2011. The Region also suggested that the MTO's technically preferred alternative can be presented at the PIC however if a preferred alternative has not been identified at that time, the Region will circle the intersection and indicate that it is under a separate MTO study and provide contact information for the MTO. The Region has also requested that the MTO keeps them informed on the developments and progress of their study.
Ministry of Transportation - Central Region Engineering Office	Mr.	Lou	Politano	Manager	1201 Wilson Avenue, 5th Floor, Bldg D Downsview, ON M3M 1J8	Tel: (416) 235-5484 Fax: (416) 325-3436 E-mail: lou.politano@ontario.ca	Removed from list on May 6, 2013 by JV and replaced with Jason White.		
Ministry of Transportation - Central Region Engineering Office	Mr.	Jason	White	Manager (Acting)	1201 Wilson Avenue, 4th Floor, Bldg D Downsview, ON M3M 1J8		Added to list on May 6, 2013 by JV replacing Lou Politano.		
Hydro One Networks Inc.	Ms	Jen	Long		1080 Millwood Road, Building C Toronto, ON M4H 1A2	Tel: (416) 467-4530 E-mail: HanmengJen.Long@HydroOne.com		NOCm response received Dec 17, 10 indicating that no further consultation with Hydro One is required if there are no changes to the current information.	May need to be circulated for PIC/Preliminary design information.
Hydro One Inc.	Ms	Doreen	Stermann	Senior Planning Technician, Hydro One Zone 2		Tel: (905) 627-6031 E-mail: Doreen.Stermann@HydroOne.com	Sent Letters 1 and 2 to Doreen to initiate Line Relocation Procedure (Jan 13, 12).	Email sent Jan 16, 12 outlining the earlier telephone conversion including: Hydro One has no future plans to upgrade it's network along the proposed Gore Rd corridor Hydro One is in the process of marking up drawings showing its existing plant	

Agency/Organization	Title	First Name	Last Name	Position	Address	Contact Information	Notes	Comments Received	Response Given
								Burnside noted that the project is still in the EA/Preliminary Design phase, and as such, Letters 4 and 5 would be forwarded later, during detail design. Hydro One noted that a meeting would not be necessary until detail design.. Hydro One noted that, to be conservative, the Region should allow up to one year for Hydro One to develop a relocation design	
Hydro One Inc.	Mr.	Tony	Ierullo	Manager	483 Bay Street, NorthTower, 14th Floor Toronto, ON M5G 2P5	Tel: (416) 345-5213 Fax: (416) 345-5395 E-mail: ierullo@HydroOne.com			
Hydro One Networks Inc.	Mr.	Les	Koch	Transmission Lines Sustainment Manager	483 Bay Street, 15th Floor Toronto, ON M5G 2P5	Tel: (416) 345-5338 E-mail: Walter.Leslie.Koch@HydroOne.com	Removed from list on May 6, 2013 based on communication from Jen Long.	Email received Nov 11, 12 indicating future correspondence should be forwarded to Les Koch and not George Juhn.	
Hydro One Networks Inc.	Mr.	Cyrus	Elmpak-Mackie	Transmission Lines Sustainment , System Investment	483 Bay Street, 15th Floor Toronto, ON M5G 2P5	Tel: (416) 345-1265 Email: Cyrus.Elmpak-Mackie@HydroOne.com	Added to list May 14, 2013 as per email received from Mr. Cyrus Elmpak-Mackie May 10, 2013.	Email comment received from Mr. Elmpak-Mackie May 10, 2013. Noted that preliminary assessment found no Hydro One Transmission Facilities in the subject area. No further consultation with Hydro One Networks Inc. is required if no changes are made to current information.	Contact if any changes to study area, or current information regarding the site.
GO Transit	Mr.	Michael	Wolczyk	Manager Marketing and Planning	20 Bay Street, Suite 600 Toronto, ON M5J 2W3	Tel: Fax: E-mail:	Removed from list on May 6, 2013 by JV and replaced with Dan Francey.		
GO Transit - Environmental Compliance	Mr.	Dan	Francey	Manager, Environmental Liaison	20 Bay Street, Suite 600 Toronto, ON M5J 2W3		Added to list on May 6, 2013 by JV replacing Michael Wolczyk.		
Niagara Escarpment Commission	Sir / Madam			Director	232 Guelph Street Georgetown, ON L7G 4B1	Tel: Fax: E-mail:	Removed from list on May 6, 2013 by JV and replaced with Michael Baran.		

Agency/Organization	Title	First Name	Last Name	Position	Address	Contact Information	Notes	Comments Received	Response Given
Niagara Escarpment Commission- Peel Region	Mr.	Michael	Baran	Planner	232 Guelph Street Georgetown, ON L7G 4B1		Added to list on May 6, 2013 by JV replacing Director.		
Ontario Power Generation	Mr.	Steve	Hounssell	Senior Advisor, Sustainable Development	700 University Avenue Toronto, ON M5G 1X6	Tel: (416) 592-2766 Fax: (416) 592-7097 E-mail: steve.hounsell@opg.com	Removed from list on May 6, 2013 by JV as OPG does not have any plants in area, not triggered by screening criteria.		
Ontario Provincial Police	Mr.	Michael	Grodzinski	Operational Planning and resources	7750 Hurontario Street Brampton, ON L6V 3W6	Tel: (905) 453-3311 Fax: (905) 451-1638			
Ontario Provincial Police	Sergeant	Rick	MacKay		6211 Old Church Road Caledon East, ON L7C 1J7	Tel: (905) 584-2241 Fax: (905) 584-2188		NOCm response form received Nov 15, 10 indicating they would like to be kept informed on the project.	
Infrastructure Ontario	Ms	Hoeun	Heng	Reporting Specialist GTA/Southwest	1 Dundas Street West, Suite 2000 Toronto, ON M5G 2L5	Tel: (416) 327-2768 Fax: (416) 212 1131 E-mail: Hoeun.Heng@infrastructureontario.ca		NOCm letter response received Dec 14, 10 indicating that there are no ORC lands in the vicinity of the Site and to remove ORC from the circulation list.	Removed from circulation.
C. Municipal Agencies – Town of Caledon Contacts									
Town of Caledon	Mr.	Richard	Whitehead	Regional Councillor – Ward 3/4	6311 Old Church Road Caledon, ON L7C 1J6	Tel: (905) 584-2272 / (888) Caledon Fax: (905) 584-4325			
Town of Caledon	Mayor	Marolyn	Morrison	Mayor	6311 Old Church Road Caledon, ON L7C 1J6	Tel: (905) 584-2272 / (888) Caledon Fax: (905) 584-4325			
Town of Caledon	Mr.	Nick	deBoer	Area Councillor – Ward ¾	6311 Old Church Road Caledon, ON L7C 1J6	Tel: (905) 584-2272 / (888) Caledon Fax: (905) 584-4325			
Town of Caledon	Mr.	Jeremy	Schembri	Energy & Environment Coordinator	6311 Old Church Road Caledon, ON L7C 1J6	Tel: (905) 584-2272 / (888) Caledon Fax: (905) 584-4325			
Town of Caledon	Mr.	Craig	Campbell	Public Works Director	6311 Old Church Road Caledon, ON L7C 1J6	Tel: (905) 584-2272 / (888) Caledon Fax: (905) 584-4325		Letter received Apr 16, 12 from Public Works department providing comments with regard to improvement they would like incorporated into the design including the following: - Check accident collision histories at intersections in	Response letter sent May 17, 12 indicating the following: - Signing improvements and improving clear zone sight lines will be incorporated into detailed design. - Existing property and environmental impacts can

Agency/Organization	Title	First Name	Last Name	Position	Address	Contact Information	Notes	Comments Received	Response Given
								the study area. - - No concerns with the sag north of Patterson Sideroad - Would like to see Finnerty Sideroad and Coolihans aligned - Will the CSP at the west leg of Finnerty Sideroad require upgrading or replacement?	not be justified at this time to realign Finnerty and Coolihans Sideroad. - The CSP at the west leg of Finnerty is appropriately sized and will be cleaned out during construction.
Town of Caledon	Mr.	Kant	Chawla	Senior Transportation Planner	6311 Old Church Road Caledon, ON L7C 1J6	Tel: (905) 584-2272 / (888) Caledon Fax: (905) 584-4325		Response form received Nov 16, 10 indicating that careful consideration should be given while designing the Hwy 9/Gore Road intersection. Would like to be kept informed on the project. E-mail received Nov 30, 10 indicating concerns with pavement condition, sub-standard shoulders, lack of ditching and visibility restrictions. Town is interested in any proposed intersection improvements at Highway 9. No meeting required at this time. Information forwarded to the Manager of Roads and Fleet Services to look at issues identified by Town.	
Town of Caledon	Mr.	Jeoff	Hebbert	Technical Development Coordinator	6311 Old Church Road Caledon, ON L7C 1J6	Tel: (905) 584-2272 Fax: (905) 584-4325			
Town of Caledon	Ms	Mary	Hall	Director of Planning and Development	6311 Old Church Road Caledon, ON L7C 1J6	Tel: (905) 584-2272 / (888) Caledon Fax: (905) 584-4325			
Town of Caledon	Mr.	Todd	Salter	Manager of Policy	6311 Old Church Road Caledon, ON L7C 1J6	Tel: (905) 584-2272 / (888) Caledon Fax: (905) 584-4325			
D. Aboriginal Agencies									
Ministry of Aboriginal Affairs	Mr.	David	Fraser	Correspondence Manager	160 Bloor Street East, Suite 400 Toronto, ON M7A 2E6	Tel: (416) 314-9379 Fax: (416) 325-0142 Email: david.fraser@ontario.ca	Removed from contact list on May 6, 2013 by JV as received letter from MAA Consultation Unit, consultation with agency complete.		
Ministry of Aboriginal Affairs Policy and Relationships Branch	Mr.	Alan	Kary	Deputy Director	720 Bay Street, 4th Floor Toronto, ON M5G 2K1	Fax: (416) 326-4017 E-mail: Alan.Kary@ontario.ca	Removed from contact list on May 6, 2013 by JV as received		

Agency/Organization	Title	First Name	Last Name	Position	Address	Contact Information	Notes	Comments Received	Response Given
							letter from MAA Consultation Unit, consultation with agency complete.		
Ministry of Aboriginal Affairs Aboriginal and Ministry Relationships Branch	Ms	Pam	Wheaton	Director	160 Bloor Street East, 9th Floor Toronto ON M7A 2E6	Tel: (416) 326-4053 Fax: (416) 326-4017 E-mail: Pam.Wheaton@Ontario.ca	Removed from contact list on May 6, 2013 by JV as received letter from MAA Consultation Unit, consultation with agency complete.		
Ministry of Aboriginal Affairs - Aboriginal and Ministry Relationships	Ms	Ashley	Johnson	Advisor – Consultation Unit	160 Bloor Street East, 9th Floor Toronto ON M7A 2E6	E-mail: ashley.johnson@ontario.ca	Changed contact for Mississaugas of New Credit First Nation. Removed from contact list on May 6, 2013 by JV as received letter from MAA Consultation Unit, consultation with agency complete.	Letter received Jan 11, 11 in response to NOCm from Heather Levecque, Manager, Consultation Unit, indicating First Nations and INAC individuals to be circulated on the project. Changed contact to Ashley as per e-mail received Feb 7, 11.	
Ministry of Aboriginal Affairs Aboriginal and Ministry Relationships Branch	Mr.	Francois	Lachance	Senior Policy Advisor	160 Bloor Street East, 9th Floor Toronto, ON M7A 2E6	Phone: (416) 326-4754 Fax: (416) 326-4017 E-mail: francois.lachance@ontario.ca	Removed from contact list on May 6, 2013 by JV as received letter from MAA Consultation Unit, consultation with agency complete.		
Indian and Northern Affairs Canada - Environment Unit	Sir / Madam			Environmental Assessment Coordination	25 St. Clair Avenue East, 8th Floor Toronto, ON M4T 1M2	E-mail: EACoordination_ON@inac-ainc.gc.ca	Removed from contact list on May 6, 2013 by JV as received letter INAC Specific Claims and Litigation Branches with information for circulation to individual First Nations,		

Agency/Organization	Title	First Name	Last Name	Position	Address	Contact Information	Notes	Comments Received	Response Given
							consultation with agency complete.		
Indian and Northern Affairs Canada – Specific Claims Branch	Mr.	Don	Boswell		10 Wellington Street, Room 1310 Gatineau, QC K1A 0H4	Tel: (819) 953-1940 Fax: (819) 997-9873 E-mail: bowselld@inac.gc.ca	Removed from contact list on May 6, 2013 by JV as received letter INAC Specific Claims and Litigation Branches with information for circulation to individual First Nations, consultation with agency complete.	E-mail received Nov 18, 10 advising that First Nations should be contacted directly and providing web links to identify First Nations within the vicinity of the study area and to identify any claims within the study area.	
Indian and Northern Affairs Canada – Comprehensive Claims Branch	Ms	Louise	Trepanier	Director, Claims East of Manitoba	10 Wellington Street, Room 1310 Gatineau, QC K1A 0H4	Fax: (819) 953-3109 Email: trepanierl@inac.gc.ca	Removed from contact list on May 6, 2013 by JV as received letter INAC Specific Claims and Litigation Branches with information for circulation to individual First Nations, consultation with agency complete.		
Indian and Northern Affairs Canada – Litigation Management and Resolution Branch	Ms	Josee	Beauregard	Litigation Team Leader	25 Eddy Street Gatineau, QC K1A 0H4	Tel: (819) 994-1947	Removed from contact list on May 6, 2013 by JV as received letter INAC Specific Claims and Litigation Branches with information for circulation to individual First Nations, consultation with agency complete.	Letter received Dec 9, 10 identifying the "*Six Nations of the Grand River of Indians v. Attorney general for Canada and Her Majesty the Queen in Right of Ontario, Ontario Superior Court of Justice, files in Brantford, court reference number 406/95*; and the "*Alderville Indian Band, Beausoleil Indian Band, Chippewas of Georgina Island Indian Band, Chippewas of Rama Indian Band, Curve Lake Band, Hiawatha Indian Band, Mississaugas of Scugog Indian Band* v. HTMQ and Ontario (Third Party), Federal Court of	

Agency/Organization	Title	First Name	Last Name	Position	Address	Contact Information	Notes	Comments Received	Response Given
								Canada, File din Montreal, Court file reference # T-195-92' court case. Changed contact from Marc-Andre Millaire to Josee Beauregard.	
Union of Ontario Indians	Mr.	Allan	Dokis	Director - Intergovernmental Affairs	Nippissing First Nation, PO Box 611 North Bay, ON P1B 8J8	Tel: (705) 654-4661	Removed from list on May 6, 2013 by JV and replaced with Glen Hare.		
Union of Ontario Indians	Mr.	Glen	Hare	Deputy Grand Chief	PO Box 711 North Bay, ON P1B 8J8		Added to list on May 6, 2013 by JV replacing Allan Dokis.		
Métis Nation of Ontario	Sir / Madam			Métis Consultation Unit	500 Old St. Patrick Street, Unit D Ottawa, ON K1N 9G4	Fax: (613) 725-4225			
Six Nations of the Grand River	Chief	William K.	Montour		P.O. Box 5000 Ohsweken, ON NOA 1MO	Tel: (519) 445-2201 E-mail: arleenmaracle@sixnations.ca	JV updated email address per master agency list on May 6, 2013.		
Saugeen Ojibway Nation	Mr.	Jake	Linklater	Case Manager	RR# 5 Wiarton, ON N0H 2T0	Tel: (519) 534-5507 Fax: (519) 534-5525 E-mail: jakelinklater@saugeenojibwaynation.ca			
Chippewas of Georgina Island	Ms	Janice	Taylor	Contact Administrator	R.R. #2, P.O. Box N13 Sutton West, ON L0E 1R0	Tel: (705) 437-1337 Fax: (705) 437-4597			
Hiawatha First Nation	Chief	Laurie	Carr		123 Paudash Street R.R.#2 Keene, ON K0L 2G0	Tel: (705) 295-4421 Email: info@hiawathafn.ca Website: http://www.hiawathafirstnation.com/index.html			
Mississaugas of New Credit First Nation	Chief	Bryan	Laforme		2789 Mississauga Road R.R. #6 Hagersville, ON N0A 1H0	Tel: (905) 768-1133 E-mail: bryanlaforme@newcreditfirstnation.com		Updated contact on Jan 19, 11 based on correspondence received from MAA.	
Alderville First Nation	Ms	Denise	Graham	Band Administrator	11696 2nd Line Road, P.O. Box 46 Roseneath, ON K0K 2X0	(905)352-2929			
Beausoleil First Nation	Chief	Roland	Monague		1 Ogema Street Christian Island, ON L0K1C0	Tel: (705) 247-2051 Fax: (705) 247-2239 Email: info@chimnissing.ca Website: http://www.chimnissing.ca/admin.html		NOCm circulated on Dec 14, 10 via e-mail.	
Chippewas of Mnjikaning First Nation (Rama)	Chief	Sharon	Stinson Henry		5884 Rama Road, Suite 200 Rama, ON L0K 1T0	http://www.mnjikaning.ca/contact.asp Tel: (705) 325-3611		NOCm circulated on Dec 14, 10 via mail. Letter received	

Agency/Organization	Title	First Name	Last Name	Position	Address	Contact Information	Notes	Comments Received	Response Given
						Toll-free: 1-866-854-2121 Fax: (705) 325-0879		Jan 3, 2011 indicating that the correspondence had been forwarded to Ms Karry-Sandy McKenzie, Barrister & Solicitor for review.	
Chippewas of Mnjikaning First Nation (Rama)	Ms	Sandy	McKenzie	Barrister & Solicitor	8 Creswick Court Barrie, ON L4M 2J7	Tel: (705) 792-5087 E-mail: k.a.sandy-mckenzie@rogers.com		Added to circulation List as per letter received from Rama First Nation on Jan 3, 2011.	
Curve Lake First Nation						Email: dutytoconsult@curvelakefn.ca		NOCm circulated on Dec 14, 10 via e-mail.	
Mississaugas of Scugog Island First Nation	Ms	Kathy	Brant	Contact Administrator	R.R. #5, 22521 Island Road Port Perry, ON L9L 1B6	Phone: (905) 985-3337 Fax: (905) 985-8828		NOCm circulated on Dec 14, 10 via mail.	
E. Utilities									
Enbridge Gas Distribution Inc.	Mr.	Mike	McGivery	Special Project Supervisor	500 Consumers Road North York, ON M2J 1P8	Tel: (416) 495-5065			
Enbridge Gas Distribution Inc.	Mr.	Tony	Ciccone	Manager, Distribution Analysis – Distribution Planning	P.O. Box 650 Scarborough, ON M1K 5E3	Tel: (416) 758-7966 Fax: (416) 758-4374	E-mail from Diana Beaulne, Right of Way Approval Technician E-mail: Diana.Beaulne@enbridge.com Diana Beaulne Invited to information meeting 12/01/03 held on Jan. 24 (emailed by JV)	E-mail received Nov 26, 10 indicating that Enbridge has several buried plant locations within the study area, however the scope of the project is too general at this point. Will need to consult with during detailed design. Diana Responded 12/01/05 with drawings indicating no plant within job limits (plant along Hwy 9 only).	
Enbridge Gas Distribution Inc.	Mr.	Vince	Cina	Supervisor – Planning and Design	500 Consumers Road North York, ON M2J 1P8				
Enbridge Gas Distribution Inc.	Mr.	Russ	McLean	Manager, GIS and Records Administration	Planning Department 500 Consumers Road North York, ON M2J 1P8	Tel: (416) 758-7930 E-mail: russ.mclean@enbridge.com			
Enbridge Pipelines Ltd.	Sir / Madam			Manager, Distribution Analysis – Distribution Planning	801 Upper Canada Drive P.O. Box 128 Sarnia, ON N7T 7H8	Tel: Fax: E-mail:			
Trans Canada Pipeline	Ms	Darlene	Presley	Lehman and Associates Planning Consultant	97 Collier Street Barrie, ON L4M 1H2	Tel: (705) 627-2302		NOCm response form received Nov 15, 10 indicating they have no concerns and would like to be removed from the circulation list.	

Agency/Organization	Title	First Name	Last Name	Position	Address	Contact Information	Notes	Comments Received	Response Given
Trans-Northern Pipelines Inc	Sir / Madam			Coordinator - Crossings and Facilities	45 Vogell Road, Suite 310 Richmond Hill, ON L4B 3P6	Tel: Fax: E-mail:			
MTS – Allstream	Ms	Christine	Anderson		50 Worcester Road Etobicoke, ON M9M 5X2	Tel: (416) 649-7527 E-mail: Christine.anderson@mtsallstream.com	Removed from list on May 6, 2013 by JV and replaced with Doug Daniels and Utility Circulations.		
MTS – Allstream	Mr.	Doug	Daniels	Project Supervisor	50 Worcester Road Etobicoke, ON M9M 5X2	doug.daniels@mtsallstream.com; Cc: Ian Fleming: Utility.Circulations@mtsallstream.com	Added to list on May 6, 2013 by JV replacing Christine Anderson.		
Canadian Pacific Railway	Mr.	Andre	Lapalme		Suite 400, Windsor Station, P.O. Box 6042 Centre Ville, Montréal, QC H3C 3E4				
Canadian Pacific Railway	Mr.	S.	Soper		2025 McCowan Road Scarborough, ON M1F 4A8				
BLINK Communications Inc.	Mr.	Brian	Kilbride	Implementation Coordinator	861 Redwood Square Oakville, ON L6L 6N3	Tel: (905) 825-4424 Ext 4023 E-mail: bkilbride@blink.ca		Comment form received from Mr. Stephen Andrews on Nov 10, 10 indicating that there are no concerns with the project and they wish to be removed from the circulation.	Removed from circulation.
Telus Communications	Mr.	Stephen	Hoy	Network Planning Manager	2700 Matheson Blvd. East 5th Floor, West Tower Mississauga, ON L4W 4V9	Tel: (905) 804-6223 E-mail: Stephen.hoy@telus.com		NOCm comment form received Dec 16, 10 indicating that they have no concerns and would like to be removed from the circulation list.	Removed from circulation list.
Rogers Communications	Ms	Marian	Wright	Planning Co-ordinator	3573 Wolfedale Road Mississauga, ON L5C 3T6	Tel: (905) 897-3914 / (888) 764-3771 E-mail: Marion.Wright@rci.rogers.com	Edgar Henriquez Invited to information meeting 12/01/03 held on Jan. 24 (emailed by JV) Response from Darryl Dimitroff ((416) 509-8772, darryl.dimitroff@rci.rogers.com) on Jan 4, 2012 – no plant on Gore Rd. Plant on south side of Hwy 9	NOCm comment form from Edgar Henriquez ((905) 897-6457) received Nov 25, 10 indicating that they would like to remain on the circulation list. *edgar.henriquez@rci.rogers.com* Response from Darryl Dimitroff 12/01/03 ((416) 509-8772, darryl.dimitroff@rci.rogers.com) on Jan 4, 2012 – no plant on Gore Rd. Plant on south side of Hwy 9 hydro poles, but outside study area. Rogers will not attend meeting.	

Agency/Organization	Title	First Name	Last Name	Position	Address	Contact Information	Notes	Comments Received	Response Given
							hydro poles, but outside study area. Rogers will not attend meeting.		
Bell Canada	Ms	Colleen	Murphy	Access Network Provisioning	444 Millard Avenue Flr2 Newmarket ON L3Y 2A3	Tel: (905)853-4043 Cell: (416) 209-6904 Fax: (416) 701-6489 E-mail: colleen.murphy@bell.ca	Wendy Lefebvre Invited to information meeting Jan 3, 12 held on Jan. 24, 12 (emailed by JV)	Email received Jan 10, 12 indicating that the project contact will be Colleen Murphy. Changed contact from Wendy Lefebvre. Phone conversation and email response sent Jan 13,12: • Bell has no future plans to upgrade their plant along the Gore Rd corridor • Bell has both buried and aerial lines along the corridor • Bell's infrastructure is in conflict with the Region's proposed road works and will require relocation • Bell's infrastructure is minor in nature and relocation should be straightforward	
Bell Canada	Mr.	Scott	Moon	Implementation Department	5115 Creekbank Road, 3rd Floor, West Tower Mississauga, ON L4W 5R1	Tel: (905) 219-4558 Cell: (416) 209-6904 Fax: (416) 701-6489 E-mail: scott.moon@bell.ca	Scott Moon Invited to information meeting held on Jan. 24 (emailed by JV)		
F. Other Agencies									
Toronto and Region Conservation Authority	Ms	Sharon	Lingertat	Acting Senior Planner, Environmental Assessments	5 Shoreham Drive Downsview, ON M3N 1S4	Tel: (416) 661-6600 X 5717 Fax: (416) 661-6898 E-mail: slingertat@trca.on.ca		Letter received via e-mail Nov 16, 10 and provided a copy of their response to the draft terms of reference dated April 22, 10. Noted that natural features, regulation limits, flood plain, etc.was sent to the Region on May 3 & 21, 10. Advised that the study area includes many wetlands, watercourses and other significant natural features and that a site visit with TRCA would be required with TRCA to identify natural features that need to be considered in the preferred solution. Site meeting scheduled for 10 am June 17, 2011.	Email sent November 23, 2011 providing a list of reports for comment provided to date including the Stage 1 Archaeological Assessment, Tree Inventory, Butternut Health Assessment, Streetscaping, Breeding Bird Survey, Stormwater/Drainage Report, Existing Conditions Background Report – Cultural Heritage, PIC Boards, Model Data, Landscape Plans, Geotech and current design. Email sent Jan 16, 12 providing a copy of the current Preliminary Design.

Agency/Organization	Title	First Name	Last Name	Position	Address	Contact Information	Notes	Comments Received	Response Given
								NOCm letter response received on June 27, 2011 indicating that a site visit with TRCA, Region of Peel and Burnside staff on June 17, 2011 was conducted in order to identify watercourse and wetland features within the study limits along the Gore Road. The results of the site visit were provided in the "watercourse crossing table" as well as a map showing the location of each watercourse within the study area. A total of ten watercourse crossings were identified and all have the potential for fish habitat. E-mail received on August 16, 2011 indicating that the "watercourse crossing table" has been updated to reflect the revised cold water timing window from June 15 to Sep. 15. The hydraulics analysis information was also updated and provided in a separate email dated August 16, 2011. A hydraulic analysis is required for any crossing that has an upstream drainage area greater than 50 ha. Letter received Dec 19, 2011 providing comments related to the SWM Report and Hydraulic Assessment, Natural Features Report, and Property Requirements to be addressed during the EA and/or detailed design. Letter received Jan 4, 2012 providing comments based on review of the Geotechnical Report. Indicated that in areas of excavation vegetation, peat, topsoil and deleterious substances should be removed in areas where backfilling is required. Potential hydrogeology issues will also need to be	

Agency/Organization	Title	First Name	Last Name	Position	Address	Contact Information	Notes	Comments Received	Response Given
								resolved during detailed design prior to final signoff on the geotechnical report. .Impacts to adjacent natural features will need to be mitigated and included in the EA as well as addressed during detailed design.	
Peel District School Board	Mr.	Stephen	Hare	Senior Planner	H.J.A. Brown Education Centre 5650 Hurontario Street Mississauga, ON L5R 1C6				
Peel District School Board	Mr.	Paul	Mountford	Intermediate Planner Officer Planning and Accommodation Dept	H.J.A. Brown Education Centre 5650 Hurontario Street Mississauga, ON L5R 1C6	Tel: (905) 890-1010 X 2217		NOCm response form received Nov 12, 10 indicating they would like to be kept informed on the project. Letter received from Paul Mountford, May 10, 2013 indicating that PDSB would like to be kept informed on the project.	
Dufferin – Peel Catholic District Board	Ms	Stephanie	Cox	Acting Senior Planner	40 Matheson Blvd West Mississauga, ON L5R 1C5	Tel: (905) 890-1221		NOCm comment form received Nov 26, 10 indicating that they would like to remain on the circulation list.	
Dufferin – Peel Roman Catholic Separate	Ms	Beth	Bjarnason	Manager, Planning Department	2350 Hurontario Street Mississauga, ON L5B 1N1				
Coalition of Concerned Citizens	Sir/Madam				RR#1 Terra Cotta, ON L0P 1N0	Tel: (905) 838-4333 Fax: (905) 702-1640 E-mail: admin@coalitioncaledon.com		Mail returned on Nov 19, 10. E-mailed letter, notice and response form on Nov 19, 10.	
The Humber Watershed Alliance	Ms	L.	Griffin	Chair	95 Mercury Road Toronto, ON M9W 3H4				
Caledon Countryside Alliance	Ms	N.	Ross		83 Scott Street Belfountain, ON L0N 1B0				
Peel Regional Police	Mr.	John	Nielson	Superintendent Division 11	7750 Hurontario Street Brampton, ON L6V 3W6	Tel: (905) 453-3311		Removed from circulation list as per response below.	
Peel Regional Police Corporate Planning and Resources	Mr.	Mike	Grodzinski	Inspector of Operational Planning	7750 Hurontario Street Brampton, ON L6V 3W6	Tel: (905) 453-2121		NOCm comment form received from Sergeant S. Wollaston Nov 18, 10 indicating they believe a positive benefit with the project is the safe movement of the ever increasing flow of traffic on this roadway. Would like to be removed from the mailing list.	
Peel Fire and Emergency Services	Mr.	Garry	Morden	Fire Chief	15 Fairview Road West Mississauga, ON L5B 1K7	Tel: (905) 615-3777 Fax: (905) 615-3773		Removed from list. Deceased	
Peel Fire and Emergency Services	Mr.	John	McDougall	Fire Chief	15 Fairview Road West Mississauga, ON L5B 1K7	Tel: (905) 615-3777 Fax: (905) 615-3773		Removed from list. Outside of study area.	
Region of Peel Ambulance	Mr.	Peter	Dundas	Director	5299 Maingate Drive	Tel: (905) 791-7800 Ext 3921	Contact removed	Resent letter on Nov. 11, 2010.	

Agency/Organization	Title	First Name	Last Name	Position	Address	Contact Information	Notes	Comments Received	Response Given
Services					Mississauga, ON L4W 1G6		May 14, 2013 as per email received from Mr. Dana Ralph Banke from Region of Peel Ambulance Services on May 9, 2013.		
Peel Region Paramedic Services	Mr	Dana	Ralph	Banke	5299 Maingate Drive Mississauga, ON L4W 1G6	Tel: (905) 791-7800 Ext 3931 Cell : (416) 678-9546 Fax: (905) 206-9738	Contact added May 14, 2013 by AG to replace Peter Dundas from Region of Peel Ambulance Sevices as per email comment received from Mr. Dana Ralph Banke on May 9, 2013	Email comment received from Mr. Dana Ralph Banke on May 9, 2013. Requested that Peel Region Paramedic Services be notified well in advance of any closures, detours, or hazards resulting from project-related work that could affect access.	Email response sent by Leonard Rach on May 10, 2013 confirming that the Peel Region Ambulance Services would be apprised of any situations that may affect their operations. Action Items: Advise agency of any upcoming closures, detours or hazards well in advance, to ensure no limitations to service provision.
HDR / iTRANS	Ms	Christine	Hawryluk	Transportation Engineer	HDR/iTRANS 100 York Boulevard, Suite 300 Richmond Hill, ON L4B 1J8	Tel: (905) 882.4100 x 5364 Fax: (905) 882.1557 E-mail: christine.hawryluk@hdrinc.com	Consultant for Highway 9 @ The Gore Road intersection MTO Environmental Assessment	E-mail received March 1, 11 requesting to be added to the circulation list.	
HDR / iTRANS	Mr.	Joseph	Arcaro	Consultant Project Manager	HDR/iTRANS 100 York Boulevard, Suite 300 Richmond Hill, ON L4B 1J8	Tel: (905) 882.4100 x 5364 Fax: (905) 882.1557 E-mail: Joseph.Arcaro@hdrinc.com	Consultant Project Manager for Highway 9 @ The Gore Road intersection MTO Environmental Assessment	E-mail received March 1, 11 requesting to be added to the circulation list.	

Red Text – Do not send further correspondence

BURNSIDE
[THE DIFFERENCE IS OUR PEOPLE]

Appendix D4
Agency Correspondence

Region of Peel
Working for you

BURNSIDE

Project Response Form

The Gore Road Improvements from Patterson Side Road to Highway 9 Class Environmental Assessment Study

We are interested in knowing your thoughts on this project and request that you answer the following questions:

a) What do you perceive to be the positive and/or negative effects of this project?

b) Do you perceive any "critical" issues that must be addressed as part of this project?

Please check the most appropriate statement:

☐ We wish to be kept informed about the project's progress and would like to remain on the study contact list. We have comments to provide. They are:
Attached ☐ Will be provided at a later date ☐

☐ We wish to be kept informed about the project's progress and would like to remain on the study contact list. At the present time, we have no significant concerns/comments to provide.

☑ We have no concerns about the project and wish to be removed from the study contact list.

Name: Marie-Josée Lemieux
(Please Print)

Phone No.: (819) 997-4059

Agency: Parks Canada / Historic Sites and Monuments Board of Canada

Signed: M Lemieux

Date: December 8, 2010

Continued on back

Region of Peel
Working for you

BURNSIDE

Project Response Form

The Gore Road Improvements from Patterson Side Road to Highway 9
Class Environmental Assessment Study

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____

____

____

b) Do you perceive any "critical" issues that must be addressed as part of this project?

____

____

____

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Attached ☐ Will be provided at a later date ☐

☑ We wish to be kept informed about the project's progress and would like to remain on the study contact list. At the present time, we have no significant concerns/comments to provide.

☐ We have no concerns about the project and wish to be removed from the study contact list.

Name: Stephanie Cox, Acting Senior Planner
(Please Print)

Phone No.: 905-890-0708 x 24163

Agency: Dufferin-Peel Catholic District School Board

Signed: Stephanie Cox

Date: Nov. 26, 2010

Continued on back

Region of Peel
Working for you

BURNSIDE

Project Response Form

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  Attached ☐ Will be provided at a later date ☐
- ☑ We wish to be kept informed about the project's progress and would like to remain on the study contact list. At the present time, we have no significant concerns/comments to provide.
- ☐ We have no concerns about the project and wish to be removed from the study contact list.

Name: EDGAR HENRIQUEZ
(Please Print)

Phone No.: 905.897.6457

Agency: ROGERS COMMUNICATIONS

Signed: E Henriquez

Date: 25 NOV 2010

Continued on back

Public Works
9445 Airport Rd., 3rd Floor, Brampton, ON L6S 4J3
Tel: 905-791-7800 www.peelregion.ca

blink
ONE CONNECTION. *INFINITE POSSIBILITIES.*

Blink Communications Inc.
P.O. Box 1900,
861 Redwood Square
Oakville, ON L6J 5E3
T. 905.825.4421
TF. 1.877.BLINK IP (254.6547)
F. 905.825.5948

Fax

To: SALLY ROOK - REGION OF PEEL

Fax: 905-791-1442 Pages: 2 (including cover pg.)

Phone: 905-791-7800X7842 Date: NOV/10/2010

Re: SEE ATTACHED. CC:

☐ Urgent ☐ For Review ☐ Please Comment ☐ Please Reply ☐ Please Recycle

• Comments:

www.blink.ca

Region of Peel
Working for you

BURNSIDE

Project Response Form

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Attached ☐ Will be provided at a later date ☐

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☑ We have no concerns about the project and wish to be removed from the study contact list.

Name: STEPHEN ANDREWS
(Please Print)

Phone No.: 905-825-4421 X 4036

Agency: BLINK COMMUNICATIONS.

Signed:

Date: NOV/10/2010

Continued on back

Public Works
9445 Airport Rd., 3rd Floor, Brampton, ON L6S 4J3
Tel: 905-791-7800 www.peelregion.ca

FW: Fire Chief City of Mississauga
Rook, Sally
to:
'Erica Anderson'
11/11/2010 01:43 PM
Cc:
'Leonard Rach'
Show Details

History: This message has been replied to.

Hi Erica,

Please make note of the contact information updates below. We don't need to resend to Mississauga Fire & Emergency Services since we are way out of Mississauga's limits but we should try to resend to Peter Dundas. I have the following contact information for him:

Peter F. Dundas
Chief and Director, Paramedic Services
5299 Maingate Drive
Mississauga, ON
L4W 1G6

Thanks,

Sally Rook PMP
Acting Project Manager
Public Works, Transportation
The Region of Peel
905-791-7800 ext. 7842
rooks@peelregion.ca

From: Carol Cocomello [mailto:Carol.Cocomello@mississauga.ca]
Sent: November 10, 2010 2:02 PM
To: Rook, Sally
Subject: Fire Chief City of Mississauga

Dear Ms. Rook:

This is to let you know that any correspondence coming to Mississauga Fire & Emergency Services should be directed to John McDougall, Fire Chief - Garry Morden passed away a few years ago.

Also included in the envelope was a letter to Peter Dundas, Region of Peel Ambulance Services - he is not located at Fire Headquarters so can you please resend the letter to him.

Also looking more closely at the letter I do not believe this property is even in Mississauga. You should direct this inquiry to Brampton Fire.

Thank you.

Carol

Carol Cocomello
Executive Assistant to Chief McDougall
Mississauga Fire & Emergency Services
905-615-3755

Fw: Peel Gore Rd Improvements from Patterson Sideroad to Highway 9
Leonard Rach to: Erica Anderson, Ron Goddard 11/11/2010 09:05 AM
Cc: Mike Sullivan

----- Forwarded by Leonard Rach/RJB on 11/11/2010 09:04 AM -----

From:	"Kowalyk, Bohdan (MNR)" <bohdan.kowalyk@ontario.ca>
To:	<Sally.Rook@peelregion.ca>
Cc:	<Leonard.Rach@rjburnside.com>
Date:	11/10/2010 07:03 PM
Subject:	Peel Gore Rd Improvements from Patterson Sideroad to Highway 9

Hello Sally,

The notice of study commencement has been received. At this time it can be stated that the study area contains a number of sensitive stream crossings and significant forest edges of major candidate life science Areas of Natural and Scientific Interest.

It is expected that appropriate study and mitigation measures will be undertaken, including a search for significant species (such as the endangered Butternut) which may be potentially affected.

You may keep me informed about the project's progress.

If there are any questions, please let me know.

Regards,

Bohdan Kowalyk, R.P.F.

Aurora District Forester

Ontario Ministry of Natural Resources

50 Bloomington Road West

Aurora, Ontario L4G 0L8

Phone: 905-713-7714

Fax: 905-713-7360

Email: Bohdan.Kowalyk@Ontario.ca

Re: The Gore Road Improvments from Patterson Side Road to Highway 9
Leonard Rach to: HanmengJen.Long 11/12/2010 01:20 PM
Cc: Leslie.Koch, sally.rook, Erica Anderson

Thank you for the updated contact information.We will as requested place Les Koch on our Hydro One contact list for future mail outs.

Regards,
Leonard Rach P.Eng.
Project Manager
R.J.Burnside & Assoc. Ltd.

Hi Ms. Rook and Mr. Rach, 11/12/2010 01:09:59 PM

From:	<HanmengJen.Long@HydroOne.com>
To:	<sally.rook@peelregion.ca>, <leonard.rach@rjburnside.com>
Cc:	<Leslie.Koch@HydroOne.com>
Date:	11/12/2010 01:09 PM
Subject:	The Gore Road Improvments from Patterson Side Road to Highwa 9

Hi Ms. Rook and Mr. Rach,

Please send any future letters regarding the subject EA to the following manager at Hydro One, **not** George Juhn.

Mr. Les Koch
Manager, Lines Sustainment
Hydro One Networks Inc.
483 Bay Street, North Tower, 15th Floor,
Toronto, ON M5G2P5

Thank you,

Jen Long
Transmission Lines Sustainment
System Investment, Asset Management
Hydro One Networks Inc.
Tel: 416-345-4421
HanmengJen.Long@HydroOne.com

Sally Roel C.

Region of Peel
Working for you

BURNSIDE

Project Response Form

The Gore Road Improvements from Patterson Side Road to Highway 9 Class Environmental Assessment Study

We are interested in knowing your thoughts on this project and request that you answer the following questions:

a) What do you perceive to be the positive and/or negative effects of this project?

b) Do you perceive any "critical" issues that must be addressed as part of this project?

Please check the most appropriate statement:

☐ We wish to be kept informed about the project's progress and would like to remain on the study contact list. We have comments to provide. They are:
Attached ☐ Will be provided at a later date ☐

☒ We wish to be kept informed about the project's progress and would like to remain on the study contact list. At the present time, we have no significant concerns/comments to provide.

☐ We have no concerns about the project and wish to be removed from the study contact list.

Name: PAUL MOUNTFORD
(Please Print)

Phone No.: 905-890-1010 x2217

Agency: PEEL DISTRICT SCHOOL BOARD

Signed: Paul Mountford

Date: 10-11-12

Continued on back

Region of Peel
Working for you

BURNSIDE

Project Response Form

The Gore Road Improvements from Patterson Side Road to Highway 9 Class Environmental Assessment Study

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Careful consideration must be given while designing the Gore Road/Highway 9 intersection.

Please check the most appropriate statement:

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Attached ☐ Will be provided at a later date ☐

☑ We wish to be kept informed about the project's progress and would like to remain on the study contact list. At the present time, we have no significant concerns/comments to provide. We wish to be a part of the complete process.

☐ We have no concerns about the project and wish to be removed from the study contact list.

Name: KANT CHAWLA
(Please Print)

Phone No.: 905-584-2272 ext 4293

Agency: Town of Caledon

Signed:

Date: November 15, 2010

Continued on back

Region of Peel
Working for you

BURNSIDE

Project Response Form

The Gore Road Improvements from Patterson Side Road to Highway 9 Class Environmental Assessment Study

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☐ We have no concerns about the project and wish to be removed from the study contact list.

Name: Rick MacKay Sergeant # 9328
(Please Print)

Phone No.: 905-584-2241

Agency: Ontario Provincial Police - Caledon Detachment

Signed:

Date: 15 Nov 2010

Continued on back

Public Works
9445 Airport Rd., 3rd Floor, Brampton, ON L6S 4J3
Tel: 905-791-7800 www.peelregion.ca

1/2

Region of Peel
Working for you

BURNSIDE

Project Response Form

The Gore Road Improvements from Patterson Side Road to Highway 9
Class Environmental Assessment Study

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☒ We have no concerns about the project and wish to be removed from the study contact list.

Name: DARLENE PRESLEY
(Please Print)

Phone No.: 705-627-2302

Agency: LEHMAN & ASSOCIATES ON BEHALF OF TRANSCANADA PIPELINE LIMITED

Signed:

Date: Nov. 15/10

Continued on back

Public Works
9445 Airport Rd., 3rd Floor, Brampton, ON L6S 4J3
Tel: 905-791-7800 www.peelregion.ca

2/2

Region of Peel
Working for you

2nd Fax

BURNSIDE

Project Response Form

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Class Environmental Assessment Study

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☐ We wish to be kept informed about the project's progress and would like to remain on the study contact list. At the present time, we have no significant concerns/comments to provide.

☒ We have no concerns about the project and wish to be removed from the study contact list.

Name: DARLENE PRESLEY
(Please Print)

Phone No.: 705-627-2302

Agency: LEHMAN & ASSOCIATES ON BEHALF OF TRASCANADA PIPELINE LIMITED

Signed:

Date: Nov. 15/10

Please update your circulation records for TRANSCANADA
LEHMAN & ASSOCIATES
97 COLLIER ST.
BARRIE, ON L4M 1A2 Attn: Darlene Presley

Continued on back

Public Works
9445 Airport Rd., 3rd Floor, Brampton, ON L6S 4J3
Tel: 905-791-7800 www.peelregion.ca

Thank you!

TORONTO AND REGION Conservation

for The Living City

November 16, 2010 CFN 43948

BY MAIL AND EMAIL (Leonard.Rach@rjburnside.com)

Mr. Leonard Rach
Project Manager
R.J. Burnside & Associates Limited
15 Townline
Orangeville, ON L9W 3R4

Dear Mr. Rach:

Re: Response to Notice of Commencement
The Gore Road (Patterson Side Road to Highway 9)
Municipal Class Environmental Assessment - Schedule B
Humber River Watershed; Town of Caledon; Regional Municipality of Peel

Toronto and Region Conservation Authority (TRCA) staff received the Notice of Commencement for the above noted Environmental Assessment (EA) on November 10, 2010. It is our understanding that the purpose of this EA is to examine the need for proposed rehabilitation of The Gore Road from approximately 25 m north of Patterson Side Road to Highway 9 in the Town of Caledon.

Attached, please find a copy of our response to the draft Terms of Reference, dated April 22, 2010, which outlines the TRCA areas of interest, includes the Service Delivery Standards, and identifies recommended submissions. Please note that mapping (natural features, regulation limits, flood plain) was sent to Sally Rook at the Region of Peel on May 3, 2010 and May 21, 2010. It is also important to reiterate that this study area is highly sensitive, as most of the land is covered by wetlands, watercourses and other significant natural features. A site visit will be required with TRCA staff at the commencement of the EA to identify natural features to be considered in the preferred solution.

Should you have any questions, or to arrange the site visit, please contact me at extension 5717 or by email at slingertat@trca.on.ca.

Yours truly,

Sharon Lingertat

Sharon Lingertat
Planner II, Environmental Assessment Planning
Planning and Development

Encl.: TRCA letter dated April 22, 2010

BY EMAIL

cc:	Peel:	Sally Rook (Sally.Rook@peelregion.ca)
	TRCA:	Beth Williston, Manager, Environmental Assessments
		Quentin Hanchard, Manager, Development, Planning and Regulation
		Margie Kenedy, Assistant Archaeologist
		George Leja, Coordinator, Real Estate
		David Burnett, Manager, Regional and Provincial Policy
		Gary Wilkins, Humber River Watershed Specialist

F:\Home\Public\Development Services\EA\Letters for Mailing\43948 - NoC.doc

TORONTO AND REGION
Conservation
for The Living City

April 22, 2010

CFN 43948

BY MAIL AND EMAIL (Sally.Rook@peelregion.ca)

Ms. Sally Rook
Regional Municipality of Peel
9445 Airport Road, 3rd Floor
Brampton, ON L6S 4J3

Dear Ms. Rook:

Re: Response to Draft Terms of Reference
The Gore Road (Patterson Side Road to Highway 9)
Municipal Class Environmental Assessment - Schedule B
Humber River Watershed; Town of Caledon; Regional Municipality of Peel

Toronto and Region Conservation Authority (TRCA) staff received the draft Terms of Reference (ToR) for the above-noted Environmental Assessment (EA) on April 16, 2010. It is our understanding that the purpose of this EA is to examine the need for road improvements within the above-noted study area. The Gore Road currently consists of 2 through lanes and there are 36 culvert crossings that will need to be considered.

Staff has reviewed the draft report and specific comments are provided in Appendix A. Based on a preliminary desktop review, the study area is highly sensitive as the majority of the area is covered by wetlands, watercourses and a significant amount of natural cover. As mentioned in the draft ToR, a site visit will be required with TRCA staff at the commencement of the EA process to identify watercourse and wetland features, and to confirm proximity of vegetation to the roadside area.

TRCA Areas of Interest

Staff has identified the following Areas of Interest within the study area:

Regulated Areas

- Regulation Limit
- Crest of Slope
- Meander Belt
- Regulatory Flood Plain
- Regulated Wetlands
- Watercourses

TRCA Program and Policy Areas

- Aquatic Species and Habitat
- Aquifers and Hydrogeological Features
- Archaeological and Heritage Resources
- Conservation Land (TRCA property)
- Environmentally Significant Areas
- Habitat Implementation Plans
- Terrestrial Natural Heritage Strategy
- Terrestrial Species and Habitat

Provincial and Federal Program Areas

- Areas of Natural and Scientific Interest
- Greenbelt
- Oak Ridges Moraine

Available mapping and program information regarding these Areas of Interest will be sent under separate cover for your reference. Please ensure that the status, potential impacts and opportunities for enhancement related to these Areas of Interest are documented and assessed through a review of background material, technical study, field assessment and detailed evaluation, as appropriate.

Selection of Alternatives

In consideration of TRCA's *Valley and Stream Corridor Management Program*, Ontario Regulation 166/06, and TRCA's other programs and policies, staff requires that the preferred alternative meets the following criteria:

1. Prevents the risk associated with flooding, erosion or slope instability.
2. Protects and rehabilitates existing landforms, features and functions.
3. Provides for aquatic, terrestrial and human access.
4. Minimizes water/energy consumption and pollution.
5. Addresses TRCA property and heritage resource concerns.

TRCA Review

Prior to selecting the preferred alternative solution, please arrange a meeting to discuss issues that relate to our program and policy concerns. In addition, please add TRCA's Humber River Watershed Specialist, Gary Wilkins, to the project mailing list to receive any public information updates.

A copy of the TRCA Environmental Assessment Review Program Service Delivery Standards, and a summary chart is enclosed for your reference. We recommend you refer to these submission standards during the study to facilitate TRCA review. Please provide the following submissions to expedite TRCA review.

- Notices of public meetings and display material and handouts
- Four hard copies of the Phases 1 and 2 Report
- Four hard copies of the Draft EA Document, and
- One hard copy and one digital copy of the Final EA Document.

Should you have any questions, please contact me at extension 5717 or by email at slingertat@trca.on.ca.

Yours truly,

Sharon Lingertat

Sharon Lingertat
Planner II, Environmental Assessment Planning
Planning and Development

Encl.: TRCA Areas of Interest Summary Table
Service Delivery Standards
Recommended TRCA Contact Points
Appendix A: TRCA Comments
Application for Permission to Enter TRCA Property

BY EMAIL
cc: Peel: Hitesh Topiwala (Hitesh.Topiwala@peelregion.ca)
TRCA: Beth Williston, Manager, Environmental Assessments
Quentin Hanchard, Manager, Development, Planning and Regulation
Carolyn Woodland, Director, Planning and Development
Margie Kenedy, Assistant Archaeologist
George Leja, Coordinator, Real Estate
David Burnett, Manager, Regional and Provincial Policy
Gary Wilkins, Humber River Watershed Specialist

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APPENDIX A
TRCA STAFF COMMENTS ON THE DRAFT TERMS OF REFERENCE

1. Section 3.1,2 – Under Existing Natural Environment Assessment Report please also include watercourses, consideration for environmentally significant areas and areas of natural and scientific interest. This section should also identify the need to conduct Ecological Land Classification (ELC) work, including a vegetation survey, for the ecological communities in the vicinity of the road improvements.

2. Section 3.1.2 - The "Wildlife" bullet point may not be specific enough. Amphibian and bird studies should be conducted along with an assessment of the fisheries (including habitat) in the vicinity of the work area. It is important that fisheries issues are separately identified.

3. As part of Phase I a site visit will be required with TRCA staff to identify watercourses and wetlands within the study limits.

4. Section 3.1.3.2, Drainage and Stormwater Management Report – It is noted that hydrologic and hydraulic analysis will be carried out for all culvert and bridge structures for the 10-year event through the Regional storm. TRCA staff will be looking for a hydraulic analysis of the 2 through 100-year and Regional events for all *regulated watercourses* to confirm that any modifications to crossing structures will not increase upstream flood levels.

5. Section 3.1.3.2, Drainage and Stormwater Management Report – TRCA staff does not require fluvial geomorphology assessments or meander belt assessments for all new or modified crossings. The locations where a fluvial geomorphology assessment will be required will be determined once a site visit has been conducted and the locations of watercourses and flood plain impacts are identified.

6. There is no discussion in Phase III, Stormwater Management Report about the geomorphic impacts of new or modified stream crossings and how those will be considered during the EA process.

7. Please ensure a hydrogeology report is included as one of the deliverables for this EA. Impacts to watercourse and wetland features as a result of any groundwater takings will need to be determined early in the design of the EA. Should groundwater dewatering be required, the hydrogeology report will need to address items such as the zone of influence, expected duration of dewatering, quantity of dewatering, impacts to surface features and discharge of dewatered material.

8. Section 3.1.3.3 indicates that the consultant will make provision for 40 boreholes. It should be noted that boreholes within TRCA regulated areas will require a permit under our Routine Infrastructure Works protocol. The consultant should make provision for these approvals and allow for appropriate timing for this work.

9. Section 3.1, last paragraph, states that watercourse crossings will be confirmed by TRCA staff. Please also add that wetlands will also be confirmed by TRCA staff on site.

10. Section 3.3 discusses Stage 2 and 3 archaeological investigations. TRCA property is located on the east and west sides of The Gore Road, north of Finnerty Side Road. Please indicate in the ToR that should TRCA lands be impacted, the Stage 1 report will need to be provided to TRCA staff for review. Any additional investigations on TRCA lands will be completed by TRCA Archaeology staff and a separate fee will be charged for this work. The Application for Permission to Enter TRCA Property is attached for your reference.

11. Please ensure that 4 hard copies of the Draft EA and 2 copies of the final EA for TRCA review are included in the total number of copies indicated in the ToR.

12. Section 3.3 discusses Credit Valley Conservation requirements. Please revise to read, "..., TRCA Guidelines and TRCA regulation policies and the Canadian Highway...".

13. The preferred design as discussed in Section 3.3 should not only include a streetscaping component, but also a restoration/compensation component for any loss of significant natural habitat such as wetland features or forest cover, as well as detrimental indirect impacts to existing habitat.

14. The draft EA in Section 3.3 should also discuss impacts to TRCA lands, wetlands and watercourses, and restoration/compensation for the loss of habitat, as required.

15. There may be redside dace (RSD) implications in the area. The Ministry of Natural Resources (MNR) will need to be consulted.

TORONTO AND REGION Conservation for The Living City

TRCA AREAS OF INTEREST

EA Requirements

Document and assess the status, potential impacts and opportunities for enhancement that relate to the following Areas of Interest through a review of background material, technical study, field assessment and detailed evaluation, as appropriate. Make reference to the applicable Program and Policy documents. Include in the EA Document appendices any minutes, structure summary sheets for watercourses or wetlands, or other material collected through meetings with TRCA staff. Natural features may need to be confirmed on site by TRCA staff.

Area of Interest / Data Availability	Program and Policy Concerns
TRCA REGULATED AREAS	
Regulation Limit	In accordance with Ontario Regulation 166/06 (Development, Interference with Wetlands and Alterations to Shorelines and Watercourses), a permit is required from the TRCA prior to any development (e.g. construction) if, in the opinion of TRCA, the control of flooding, erosion, dynamic beaches or pollution or the conservation of land may be affected. The Regulation Limit defines the greater of the natural hazards associated with Ontario Regulation 166/06 (listed below). NOTE: The Regulation Limit provides a geographical screening tool for determining if Ontario Regulation 166/06 will apply to a given proposal. Through site assessment or other investigation, it may be determined that areas outside of the defined Regulation Limit require permits under Ontario Regulation 166/06. Any development within the Regulation Limit must comply with the applicable sections of TRCA's *Valley and Stream Corridor Management Program*.
Crest of Slope	Valley and stream corridors are dynamic systems that provide important natural functions and linkages for the physical, chemical and biological processes of wildlife, watercourses, and other natural features. The Crest of Slope identifies the physical limit of these corridors; however, due to ecological sensitivities, development restrictions typically extend beyond the actual Crest of Slope.
Meander Belt	Channel migration has a significant impact on infrastructure, structures and property located near river systems. Determining channel stability is important to ensure that damage from erosion, down-cutting or other natural channel processes is avoided. TRCA may require a meander belt delineation study or fluvial geomorphology analysis to confirm that any development does not conflict with natural channel processes.
Regulatory Flood Plain	The Regulatory Flood Plain is the approved standard used in a particular watershed to define the limit of the flood plain for regulatory purposes. Within TRCA's jurisdiction, the Regulatory Flood Plain is based on the greater of the regional storm, Hurricane Hazel, and the 100 year flood. Any development or alterations to existing structures within the Regulatory Flood Plain may introduce risk to life or property, and may not be compatible with existing natural features. TRCA's framework for Flood Plain Management is the *Valley and Stream Corridor Management Program*. TRCA may require a flood study or hydraulic update to confirm that there will be no impacts to the storage or conveyance of flood waters.
Regulated Wetlands	Wetlands are sensitive natural habitats that play an important role in numerous physical, chemical and biological processes, including storm water control, natural habitat and water quality improvement. Most wetlands are designated by the Ministry of Natural Resources as Provincially Significant or Locally Significant. Other wetlands have also been identified on a site specific basis by TRCA. All of these are regulated under Ontario Regulation 166/06.
Watercourses	Typically, watercourses are associated with aquatic species and habitat. Any alteration or interference to a watercourse (e.g. straightening, diverting, realigning, altering baseflow) has the potential to impact fish communities, but may also affect the Regulatory Flood Plain, erosion or other natural channel processes.

TRCA PROGRAM AND POLICY AREAS *Note: Additional program and policy information may be available at www.trca.on.ca, or by request.*	
Aquatic Species and Habitat	Under the *Fisheries Act*, the Harmful Alteration, Disruption or Destruction (HADD) of fish habitat is prohibited, unless authorized by Fisheries and Oceans Canada (DFO). TRCA reviews projects under the *Fisheries Act* based on our Level III Agreement with DFO to ensure that any potential impacts to fish habitat are appropriately mitigated, or that adequate compensation is provided where a HADD is unavoidable. Alternatives should be designed with appropriate mitigation measures to avoid a HADD. If a HADD is unavoidable, a suitable compensation plan must be developed, and Authorization from DFO will be required. TRCA may require a quantification and assessment of existing conditions and proposed changes to fish habitat and communities to confirm impacts to these resources.
Aquifers and Hydrogeological Features	The extraction and discharge of groundwater has the potential to negatively impact surrounding natural features. Even small amounts of groundwater extraction may reduce contributions to groundwater dependent features such as wetlands, springs, or fish spawning habitat. In addition, the discharge of groundwater must be controlled to avoid impacts to watercourses and fish habitat from erosion, sedimentation and water quality concerns. TRCA may require geotechnical or hydrogeological investigations to confirm dewatering and discharge requirements, and to identify appropriate mitigation measures.
Archaeological and Heritage Resources	TRCA watershed strategies include recommendations for the management of archaeological and heritage resources in accordance with Ministry of Culture and Municipal standards. Preserve and protect archaeological resources where possible. TRCA may require a Stage 1, 2, 3, or 4 archaeological assessment to confirm impacts to these resources. Note that an archaeological investigation by TRCA's archaeological staff must precede any disturbance to TRCA property, at the cost of the proponent. Scheduling will be subject to weather, seasonal programs and other field work.
Conservation Land (TRCA Property)	If TRCA property is needed for the implementation of the preferred alternative, permission and approval from TRCA and the Minister of Natural Resources are required. The design must demonstrate that TRCA program and policy objectives are met. Formal approval typically takes 12 to 18 months from the completion of the EA document. As noted above, an archaeological investigation by TRCA's archaeological staff must precede any disturbance to TRCA property. Applicable programs and strategies for works on TRCA property may include: *TRCA Strategy for Public Use of Authority Lands, TRCA Greenspace Strategy, Archaeological Resource Management Procedures: Guidelines*, master plans for specific conservation lands, watershed strategies, or other programs or policies referenced in this document.
Environmentally Significant Areas	Environmentally Significant Areas have been identified by TRCA based on a set of ecological criteria regarding the function, significance and rarity of the features or species found in the area.
Habitat Implementation Plans	TRCA staff has identified management opportunities for habitat restoration and enhancement on TRCA property and some privately owned lands. The Habitat Implementation Plans target priority sites to improve natural form and function based on targets in the watershed strategies. Detailed plans have been developed or implemented for certain sites, while other locations have been identified for future work. Consultation with TRCA should take place to ensure that impacts to priority areas are avoided, or that opportunities to implement restoration plans are identified.
Terrestrial Natural Heritage Strategy	TRCA has identified the need to improve both the quality and quantity of terrestrial habitat. TRCA's *Terrestrial Natural Heritage Strategy* sets measurable targets for attaining a healthier natural system by creating an expanded and targeted land base. It includes strategic directions for stewardship and securement of the land base, a land use policy framework to help achieve the target system,

	and other implementation mechanisms.
Terrestrial Species and Habitat	The terrestrial system includes landscape features, vegetation communities and flora and fauna species. Terrestrial species and habitat should be assessed based on their conservation status according to sensitivity to disturbance and specialized ecological needs, as well as rarity. TRCA may require a site assessment and terrestrial inventory to confirm impacts to these resources. TRCA's *Terrestrial Natural Heritage Strategy* may be applicable to any work that impacts terrestrial species and habitat. In addition, relevant legislation (e.g. *Migratory Bird Convention Act*, *Species at Risk Act*) should be applied.
PROVINCIAL AND FEDERAL PROGRAM AREAS	
Areas of Natural and Scientific Interest	Areas of Natural and Scientific Interest are designated areas of land and water containing natural landscapes or features identified as having values in the life or earth sciences related to protection, scientific study or education. Contact the Ministry of Natural Resources for more details.
Greenbelt	The Greenbelt consists of approximately 728,000 hectares of environmentally sensitive land and agricultural land in the Golden Horseshoe. The *Greenbelt Plan* identifies limits to urbanization to provide permanent protection to the agricultural land base and the ecological features and functions occurring within this landscape. Contact the Ministry of Municipal Affairs and Housing for more details. Alternatives must conform with Section 4.2 of the *Greenbelt Plan*.
Oak Ridges Moraine	The Oak Ridges Moraine is an environmentally sensitive, geological landform in south central Ontario, covering 190,000 hectares. The *Oak Ridges Moraine Conservation Plan* provides land use and resource management direction for the land and water within the Moraine. Contact the Ministry of Municipal Affairs and Housing for more details. Alternatives must conform with Section 41 of the *Oak Ridges Moraine Conservation Plan*.

TRCA Environmental Assessment Review
Service Delivery Standards

Part 4: Environmental Assessment Document

Task #	Task Name	Lead Responsibility	Duration[1]	Task Details	TRCA Staff Involvement	
					Required	Optional
4	**Environmental Assessment Document** **Definitions for EA Documents:** **Municipal Schedule A or equivalent - no report** **Municipal Schedule B or equivalent - complete Phase 1 and 2 Report - this report is the Project File** **Municipal Schedule C or equivalent - complete Phase 1, 2, 3 and 4 Reports - the Phase 4 Report is the Environmental Study Report (ESR)** **Individual EA - complete Terms of Reference; Complete Phase 1, 2, 3 and 4 Reports - the Phase 4 Report is the Environmental Assessment (EA)**					
4.1	Prepare and Submit Phase 1 and 2 Report	Proponent	60	Proponent shall prepare Phase 1 and 2 report and technical appendices, and submit to TRCA Project Manager		
4.2	Circulate Phase 1 and 2 Report	TRCA Project Manager	3[3]	TRCA Project Manager shall circulate Phase 1 and 2 Report and technical appendices This is the draft project file for Schedule B Municipal Class EAs	Planner I Planner II	
4.3	Review Phase 1 and 2 Report	TRCA Project Manager	15	TRCA Project Manager and technical staff shall review Phase 1 and 2 Report and technical appendices	Planner I Planner II	Technical Staff
4.4	Issue TRCA Phase 1 and 2 Report Response Letter	TRCA Project Manager	5	TRCA Project Manager shall provide a response letter on the Phase 1 and 2 Report; additional technical studies may be identified	Planner I Planner II	Technical Staff
4.5	Meet on TRCA Phase 1 and 2 Report Comments	Proponent	1[2]	Proponent shall meet with TRCA Project Manager and technical staff to discuss comments on the Phase 1 and 2 Report at the TRCA offices	Planner I Planner II	Technical Staff

Task #	Task Name	Lead Responsibility	Duration[1]	Task Details	TRCA Staff Involvement	
					Required	Optional
4.6	Prepare and Submit Notice of Public Information Centre #1	Proponent	20	Proponent shall submit the Notice of Public Information Centre (PIC) and the TRCA Project Manager will attend, as required		Planner II
4.7	TRCA Response to Notice of Public Information Centre #1	TRCA Project Manager	3	TRCA Project Manager shall respond to the proponent regarding the Notice of PIC and request copies of PIC material for review For Schedule B Municipal Class EAs, go to Task 4.18.	Planner I Planner II	
4.8	Prepare and Submit Phase 3 Report	Proponent	60	Proponent shall prepare Phase 3 report and revised technical studies, and submit to TRCA Project Manager		
4.9	Circulate Phase 3 Report	TRCA Project Manager	3[3]	TRCA Project Manager shall circulate Phase 3 Report and revised technical studies	Planner I Planner II	
4.10	Review Phase 3 Report	TRCA Project Manager	15	TRCA Project Manager and technical staff shall review Phase 3 Report	Planner I Planner II	Technical Staff
4.11	Issue TRCA Phase 3 Report Response Letter	TRCA Project Manager	5	TRCA Project Manager shall provide a response letter on Phase 3 Report Depending on the scope of the EA, TRCA staff may be prepared to issue preliminary detailed design requirements at this stage	Planner I Planner II	Technical Staff
4.12	Prepare and Submit Notice of Public Information Centre #2	Proponent	20	Proponent shall submit the Notice of PIC and the TRCA Project Manager will attend as required		Planner II
4.13	TRCA Response to Public Information Centre Notice #2	TRCA Project Manager	3	The TRCA Project Manager shall respond to the proponent regarding the Notice of PIC, and handouts or display material that may be provided	Planner I Planner II	
4.14	Prepare and Submit Draft EA Document	Proponent	60	Proponent shall prepare draft EA document and revised technical studies, and submit to TRCA Project Manager		
4.15	Screen and Circulate Draft EA Document	TRCA Project Manager	5[3]	TRCA Project Manager shall: • review draft EA document • discuss with technical staff • circulate to technical staff, as required	Planner I Planner II	

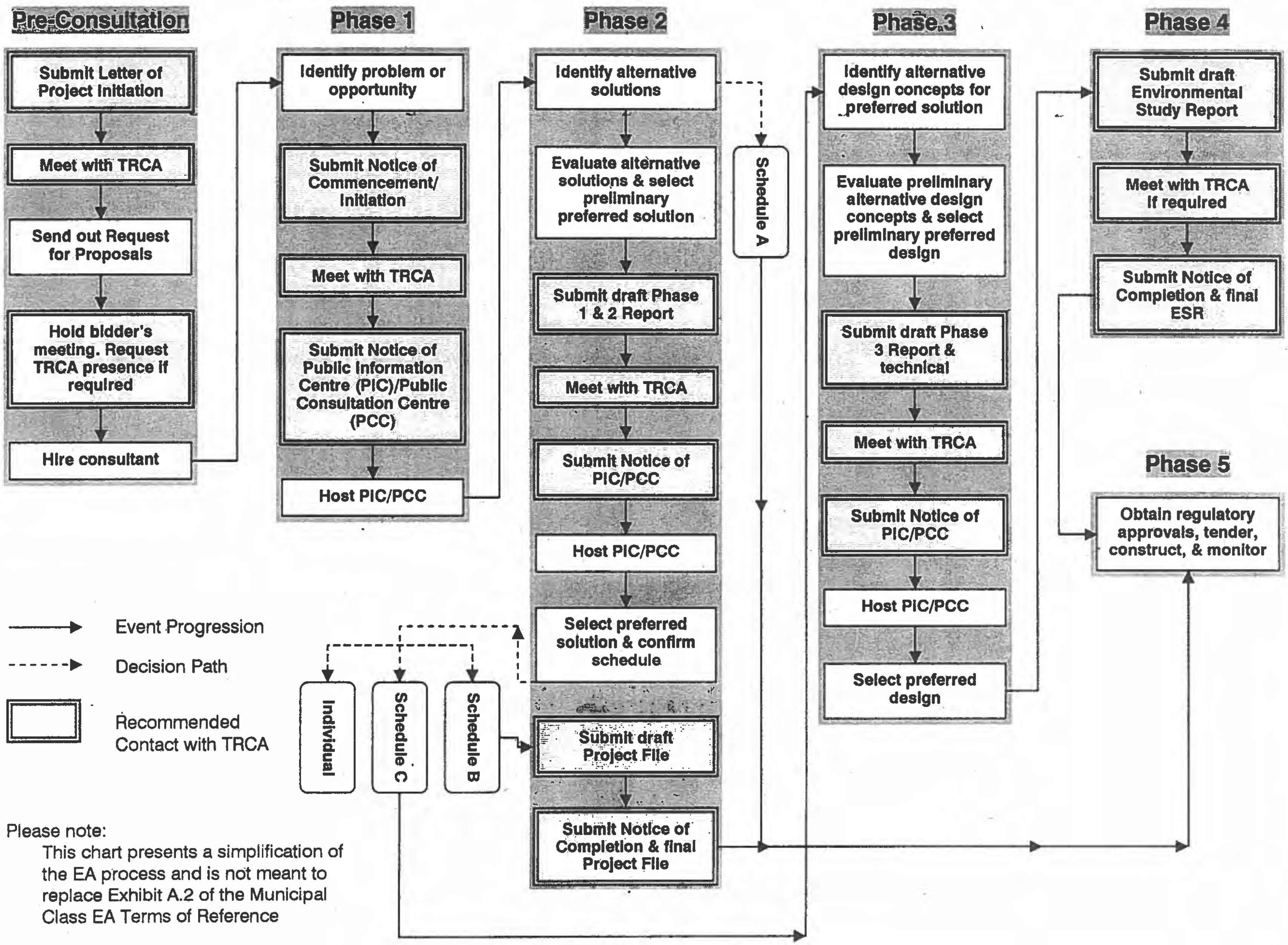
Task #	Task Name	Lead Responsibility	Duration[1]	Task Details	TRCA Staff Involvement	
					Required	Optional
4.16	Review Draft EA Document	TRCA Project Manager	7	TRCA Project Manager and technical staff shall review draft EA document ***Note: If the Phase 1, 2 and 3 reports were not submitted then TRCA requires a 30 day review period***	Planner I Planner II	Technical Staff
4.17	Issue TRCA Draft EA Document Response Letter	TRCA Project Manager	3	TRCA Project Manager shall provide a response letter on draft EA document Depending on the scope of the EA, TRCA staff may be prepared to issue preliminary detailed design requirements at this stage	Planner I Planner II	Technical Staff
4.18	Finalize EA Document	Proponent	15	Proponent shall address TRCA comments on the EA document		
4.19	Issue Notice of Completion and Final EA Document	Proponent	20	Proponent shall submit the Notice of Completion and final EA document to the TRCA Project Manager and one copy of the Notice of Completion to the TRCA Watershed Specialist		
4.20	Circulate Final EA Document	TRCA Project Manager	5[3]	TRCA Project Manager shall review final EA document and circulate, as required	Planner I Planner II	
4.21	Review Final EA Document	TRCA Project Manager	10	TRCA Project Manager and technical staff shall review final EA document and discuss outstanding issues, as required ***Note: If the Phase 1, 2 and 3 reports were not submitted then TRCA requires a 30 day review period***	Planner I Planner II	Technical Staff
4.22	Issue TRCA Notice of Completion and EA Document Response Letter	TRCA Project Manager	5	TRCA Project Manager shall provide a response letter on the final EA document	Planner I Planner II	Technical Staff

Task #	Task Name	Lead Responsibility	Duration[1]	Task Details	TRCA Staff Involvement	
					Required	Optional
4.23	Debriefing on Consultant Performance (Exit Questionnaire)	TRCA Project Manager	20	Upon request and for discussion, the TRCA Project Manager will provide the Municipal Project Manager with a summary of performance in relation to the service delivery standards for both the Municipal and TRCA Teams, in an agreed upon format	Planner I Planner II	

[1] Duration is in non-consecutive business days
[2] Meetings will be scheduled within 10 days of request
[3] Review period commences the day after receipt

Service Delivery Standards

Recommended TRCA Contact Points in the Municipal Class EA Planning & Design Process



Please note:
This chart presents a simplification of the EA process and is not meant to replace Exhibit A.2 of the Municipal Class EA Terms of Reference

TORONTO AND REGION Conservation for The Living City

FOR OFFICE USE ONLY	MoC #: ______
Arch CFN: ______	Arch Contact: ______
Prop CFN: ______	Prop Contact: ______
Plan CFN: ______	Plan Contact: ______

APPLICATION FOR PERMISSION TO ENTER TRCA PROPERTY

Please read, complete each section, date and sign this application

20.01.10

Project Description			
Project Name:			
Project Location (address):			
Nearest Major Intersection:			
Regional Municipality:		**Local Municipality:**	
Proposed Construction Start Date:			
Description of Proposed Work:			
Project Type:	**Project Works**(e.g., road widening, storm water management facility) *NOTE: TRCA Archaeological Investigation required – see page 3*	☐	
	Site Testing (e.g., environmental tests, boreholes) *NOTE: TRCA Archaeological Investigation may be required – see page 3*	☐	
	Site Reconniassance or Survey (e.g., no site disturbance required) *NOTE: TRCA Archaeological Investigation not required*	☐	

Compensation: *Compensation for the use of TRCA land will be negotiated with the proponent by the TRCA Planning and Development Division, in consultation with the TRCA Property Department, through the commenting process established for applications submitted under the Planning Act, Environmental Assessment Act or Ontario Regulation 166/06, as appropriate.*

Proponent			
Contact Name:			
Organization:			
Mailing Address:		**Postal Code:**	
Phone # (bus):		**Phone # (cell):**	
Fax #:		**Email:**	

Consultant/Agent			
Contact Name:			
Company Name:			
Mailing Address:		**Postal Code:**	
Phone # (bus):		**Phone # (cell):**	
Fax #:		**Email:**	

Please complete, sign and return pages 1 and 2 of this application

Toronto and Region Conservation for The Living City

Submission Requirements		
Requirement	**Detail**	**Encl.**
Application Form	Completed and Signed by Proponent (2 pages) Three (3) copies required	☐
Review fees (payable to *Toronto and Region Conservation Authority*)	**Project Type:** 1. Project Works: $5800 plus GST *(as of July 1, 2010 HST will be charged)* 2. Site Testing: to be determined in consultation with the TRCA Archaeologist *Review fees are charged in accordance with the TRCA Fee Schedule for Archaeological Investigations (page 3 of this application form). The TRCA GST# is* 108088584 RT0001.	☐
Plans	Three (3) hard copies and a digital .pdf or .tif copy of a plan or plans, showing:	☐
	a key map for the general location of the proposed works	☐
	topographical information	☐
	road names	☐
	landmarks (houses, fences, etc.)	☐
	natural features (woodlots, watercourses, wetlands, etc.)	☐
	TRCA property boundary	☐
	municipal property boundary	☐
	other property boundaries and ownership details	☐
	proposed construction limit	☐
	proposed project (including staging, storage and	☐

Submit application and review fees to: Planning and Development Division
Toronto and Region Conservation Authority
Planning and Development
5 Shoreham Drive, Downsview, ON M3N 1S4

Signature of Proponent:	**Date:**

Please complete, sign and return pages 1 and 2 of this application

Fee Schedule for Archaeological Investigations

In accordance with provisions in the Conservation Authorities Act, all works on TRCA's lands require an archaeological investigation by ***TRCA's Archaeologist****. TRCA's comprehensive watershed strategies recommend that heritage resources in the watershed be protected in accordance with Ministry of Culture's standards. The TRCA watershed strategies are available on our website at www.trca.on.ca.*

A review fee is required to further process your archaeological application. A site visit will be scheduled upon receipt. Please note that archaeological investigations are subject to weather conditions, seasonal conditions and scheduling. Following fieldwork, a report will be sent to the Ministry of Culture (see below). Construction activities MAY NOT occur prior to receipt of Ministry of Culture concurrence with the report recommendations by the TRCA's Archaeologist (as per Part VI of the Ontario Heritage Act). Note: Formal approval may take 12 to 18 months. It is the responsibility of the proponent through the public consultation requirements of the EA process to undertake First Nations consultation. TRCA Archaeologists may also be required to consult directly with relevant descendant populations depending upon the results of the fieldwork.

Type of Assessment	Tasks Required[1]	Fee
Stage 1 - Evaluation of Archaeological Potential	1. project set-up (plan review, meetings, emails, phone correspondences) 2. property inspection 3. background study (review of geographic, land use, historical information) 4. report of Stage 1 findings, including recommendations for assessment strategies if applicable	$5800 plus *GST (as of July 1, 2010 HST will be charged)* *GST#* 108088584 RT0001
Stage 2 - Property Assessment[2]	1. review of Stage 1 report 2. fieldwork survey of the entire subject property 3. report of Stage 2 findings, including recommendations for specific investigations of heritage resources 4. long-term duration of artifacts and project documentation	
Stage 3 - Site-Specific Assessment[3]	1. investigation of areas containing heritage resources to determine site character 2. report of Stage 3 findings, including discussions for mitigation strategies with the proponent, the Ministry and local or descendant communities (tends to create a pause between Stage 3 and Stage 4)	TBD**
Stage 4 - Mitigation of Development Impacts[3]	1. development of long-term protection strategies or complete site excavation and documentation within the project area and/or monitoring 2. report of Stage 4 excavation	TBD**
Stage 2, 3 or 4 – Protection of Artifacts	1. long-term storage of artifacts 2. education and outreach 3. provision of access to descendant peoples	TBD***

1 As per the current Ministry of Tourism and Culture's Standards and Guidelines for Consulting Archaeologists."
2 *If required – Stage 1 work may determine that the subject property has been too greatly impacted to contain archaeological and/or built heritage resources.*
3 *If required – Stage 2 fieldwork may determine that no archaeological or built heritage resources will be impacted by the proposed change in land use or construction program.*
* *Additional fees will be applied for large or complex projects that require more than standard Stage 1 work.*
** *Stage 2, 3 and 4 fees to be determined and discussed with the proponent prior to the initiation of fieldwork. Interim invoices will be issued for these additional fees, as required.*
*** *Additional fees to be determined and discussed with the proponent if artifacts are found during Stage 2, 3 or 4 investigations*

FW: The Gore Road Improvements from Patterson Side Road to Highway 9 - Class Environmental Assessment Study - File No.: MTB 019424, Notice of Study Commencement

Rook, Sally to: 'Leonard Rach' 11/18/2010 12:07 PM

Cc: Erica Anderson

History: This message has been replied to.

FYI and action.

Thanks,

Sally Rook PMP
Acting Project Manager
Public Works, Transportation
The Region of Peel
905-791-7800 ext. 7842
rooks@peelregion.ca

-----Original Message-----
From: Don Boswell [mailto:Don.Boswell@ainc-inac.gc.ca]
Sent: November 18, 2010 10:43 AM
To: Rook, Sally
Cc: Ralph Vachon
Subject: The Gore Road Improvements from Patterson Side Road to Highway 9 - Class Environmental Assessment Study - File No.: MTB 019424, Notice of Study Commencement

I am writing in response to your letter of November 9, 2010 inquiring about claims in the above noted area.

In determining your duty to consult, you may wish to contact the First Nations in the vicinity of your area of interest to advise them of your intentions. To do this you may:

find the Reserves in your area of interest by consulting a map of the region such as the Province of Ontario Ministry of Aboriginal Affairs online map at
http://www.aboriginalaffairs.gov.on.ca/english/services/firstnations.asp;
then
search for the First Nations located on those Reserves by using the INAC Search by Reserve site at
http://pse5-esd5.ainc-inac.gc.ca/fnp/Main/Search/SearchRV.aspx?lang=eng.

To determine the First Nations in your area of interest who have submitted claims please consult the Reporting Centre on Specific Claims at
http://pse4-esd4.ainc-inac.gc.ca/SCBRI/Main/ReportingCentre/External/ExternalReporting.aspx?lang=eng.

It should be noted that the reports available on the INAC website are updated regularly and therefore, you may want to check this site often for updates. In accordance with legislative requirements, confidential information has not been disclosed.

Please rest assured that it is the policy of the Government of Canada as expressed in The Specific Claims Policy and Process Guide that:

"in any settlement of specific native claims the government will take third party interests into account. As a general rule, the government will not accept any settlement which will lead to third parties being dispossessed."

We can only speak directly to claims filed under the Specific Claims Policy in the Province of Ontario. We cannot make any comments regarding potential or future claims, or claims filed under other departmental policies. This includes claims under Canada's Comprehensive Claims Policy or legal action by a First Nation against the Crown. You may wish to contact the Assessment and Historical Research Directorate at (819) 994-6453, the Consultation and Accommodation Unit at (613) 944-9313 and Litigation Management and Resolution Branch at (819) 934-2185 directly for more information.

You may also wish to visit http://www.ainc-inac.gc.ca/ai/mr/is/acp/acp-eng.asp on the INAC website for information regarding the Federal Action Plan on Aboriginal Consultation and Accommodation.

To the best of our knowledge, the information we have provided you is current and up-to-date. However, this information may not be exhaustive with regard to your needs and you may wish to consider seeking information from other government and private sources (including Aboriginal groups). In addition, please note that Canada does not act as a representative for any Aboriginal group for the purpose of any claim or the purpose of consultation.

I hope this information will be of assistance to you. I trust that this satisfactorily addresses your concerns.

Sincerely,

Don Boswell
Senior Claims Analyst
Ontario Research Team
Specific Claims Branch

Region of Peel
Working for you

BURNSIDE

Project Response Form

The Gore Road Improvements from Patterson Side Road to Highway 9 Class Environmental Assessment Study

We are interested in knowing your thoughts on this project and request that you answer the following questions:

a) What do you perceive to be the positive and/or negative effects of this project?

SAFE MOVEMENT OF EVER-INCREASING FLOW OF TRAFFIC ON THIS ROADWAY.

b) Do you perceive any "critical" issues that must be addressed as part of this project?

NO.

Please check the most appropriate statement:

☐ We wish to be kept informed about the project's progress and would like to remain on the study contact list. We have comments to provide. They are:
Attached ☐ Will be provided at a later date ☐

☐ We wish to be kept informed about the project's progress and would like to remain on the study contact list. At the present time, we have no significant concerns/comments to provide.

☒ We have no concerns about the project and wish to be removed from the study contact list.

Name: SUPT. S. WOLLASTON
(Please Print)
Phone No.: 905-453-2121 ext. 2110
Agency: PEEL REGIONAL POLICE
Signed: [signature]
Date: 18 November 2010.

Continued on back

FW: Class Environmental Assessment
Rook, Sally
to:
Erica Anderson
11/26/2010 03:02 PM
Cc:
'Leonard Rach'
Show Details

Thanks,

Sally Rook PMP
Acting Project Manager
Public Works, Transportation
The Region of Peel
905-791-7800 ext. 7842
rooks@peelregion.ca

From: Diana Beaulne [mailto:Diana.Beaulne@enbridge.com]
Sent: November 26, 2010 2:49 PM
To: Rook, Sally
Subject: Class Environmental Assessment

Thank you for your letter informing us of your future planned work. Enbridge has buried plant in numerous locations throughout your planned work area. Currently the scope of your project is too general to determine if a conflict exists. During the engineering design of your project please send us copies of your plans per normal procedure so we may review.

Kind Regards,

Diana Beaulne
Right of Way Approval Technician
Enbridge Gas Distribution Inc.
Distrubution Planning 4th Floor
500 Consumers Rd
North York, ON.
M2J 1P8

markups@enbridge.com

Tel: 416-495-5160
FAx: 416-758-4373

Ministry of the Environment

Central Region
Technical Support Section

5775 Yonge Street, 8th Floor
North York, OntarioM2M 4J1

Tel.: (416) 326-6700
Fax: (416) 325-6347

Ministère de l'Environnment

Région du Centre
Section d'appui technique

5775, rue Yonge, 8ième étage
North York, Ontario M2M 4J1

Tél. : (416) 326-6700
Téléc. : (416) 325-6347

Ontario

December 6, 2010

File: EA02-03-05

Sally Rook
Public Works
The Regional Municipality of Peel
9445 Airport Rd, 3rd Floor
Brampton ON L6S4J3

RE: TSS Comments:
The Gore Road Improvements from Patterson Side Road to Highway 9
Region of Peel
Class Environmental Assessment
Response to Notice of Commencement

Dear Ms. Rook:

This letter is our response to the Notice of Study Commencement for the above noted project. This response acknowledges that Region has indicated that its study is following the approved environmental planning process for a **Schedule 'B'** project under the *Municipal Engineers Association Municipal Class Environmental Assessment* (Class EA).

Based on the information submitted, we have identified the following issues of concern with respect to the proposed undertaking:

- Ecosystem Protection and Restoration
- Surface Water
- Groundwater
- Dust and Noise
- Servicing and Facilities
- Contaminated Soils
- Mitigation and Monitoring
- Planning and Policy
- Class EA Process
- First Nations Consultation

We are providing the following general comments to assist you and your project team members in effectively addressing these issues:

Ecosystem Protection and Restoration

- Any impacts to ecosystem form and function must be avoided where possible. The Project File should describe any proposed mitigation measures and how project planning will protect and enhance the local ecosystem.

- All natural heritage features should be identified and described in detail to assess potential impacts and to develop appropriate mitigation measures. Our records confirm that the following sensitive environmental features are located within or adjacent to the Study Area:

    - Areas of Natural and Scientific Interest (ANSIs)
    - Environmentally Sensitive Areas (ESAs)

Dust and Noise

- Dust and noise control measures should be addressed and included in the construction plans to ensure that nearby residential and other sensitive land uses within the Study Area are not adversely affected during construction activities. If dust suppressants are proposed to be used, we recommend the use of non-chloride based compounds to protect water quality.

- The Project File should consider the potential impacts of increased noise levels during the operation of the undertaking due to potentially higher traffic volumes resulting from this project. The proponent should explore all potential measures to mitigate significant noise impacts during the assessment of alternatives.

Contaminated Soils

- Since the removal or movement of soils may be required, appropriate tests to determine contaminant levels from previous land uses or dumping should be undertaken. If the soils are contaminated, you must determine how and where they are to be disposed of, consistent with *Part XV.1 of the Environmental Protection Act (EPA)* and Ontario Regulation 153/04, Records of Site Condition, which details the new requirements related to site assessment and clean up. We recommend contacting the MOE Halton Peel District Office in Burlington for further consultation if contaminated sites are present.

- The location of any underground storage tanks should be included in the Project File. Measures should be identified to ensure the integrity of these tanks and to ensure an appropriate response in the event of a spill. The MOE Spills Action Centre must be contacted in such an event.

- Any current or historical waste disposal sites should be identified in the Project File. The status of these sites should be determined to confirm whether approval pursuant to Section 46 of the *Environmental Protection Act* may be required for land uses on former disposal sites.

- The Project File should identify any underground transmission lines in the Study Area. The owners should be consulted to avoid impacts to this infrastructure, including potential spills.

Mitigation and Monitoring

- Design and construction reports and plans should be based on a best management approach that centres on the prevention of impacts, protection of the existing environment, and opportunities for rehabilitation and enhancement of any impacted areas.

- All waste generated during construction must be disposed of in accordance with MOE requirements.

- Contractors must be made aware of all environmental considerations so that all environmental standards and commitments for both construction and operation are met. Mitigation measures should be clearly referenced in the Project File and regularly monitored during the construction stage of the project. In addition, we encourage proponents to conduct post-construction monitoring to ensure all mitigation measures have been effective and are functioning properly. The proponent's construction and post-construction monitoring plans should be documented in the Project File.

Planning and Policy

- The *Oak Ridges Moraine Conservation Plan, 2001,* contains policies that protect the Moraine's government contacts.

- Once identified, you are advised to provide notification directly to the Aboriginal peoples who may be affected by the project and provide them with an opportunity to participate in any planned public consultation sessions and comment on the project.

Thank you for the opportunity to comment on this project. Please ensure that Dorothy Moszynski, MOE Central Region **EA and Planning Coordinator**, is placed on the project mailing list. We recommend a draft copy of the Project File be circulated to this office prior to the filing of the final draft, allowing approximately 30-days review time for the ministry's technical reviewers to provide comments. Please also forward our office the Notice of Completion and Project File when completed. Should you or any members of your project team have any questions regarding the above, please contact me at (416) 326-5745.

Yours sincerely,

Dorothy Moszynski
Environmental Resource Planner and EA Coordinator
Air, Pesticides and Environmental Planning

c. Dave Fumerton, York Durham District Office, MOE
Central Region EA File
A & P File

Affaires indiennes
et du Nord Canada

Indian and Northern
Affairs Canada

www.ainc.gc.ca

www.inac.gc.ca

Votre référence - Your file

Notre référence - Our file

Sally Rook
Project Manager
The Regional Municipality of Peel
9445 Airport Rd., 3rd Floor
Brampton, Ontario L6S 4J3

Dear Ms. Rook

Re: Notice of Study Commencement: The Gore Road Improvements from Patterson Side Road to Highway 9 Class Environmental Assessment

I am writing in response to your letter of November 9, 2010 addressed to Marc-André Millaire inquiring about any claims that may affect the subject property. I regret that we were unable to respond earlier.

We can inform you that our inventory includes active litigation in the vicinity of this property. They are *Six Nations of the Grand River Band of Indians v. Attorney General for Canada and Her Majesty the Queen in Right of Ontario, Ontario Superior Court of Justice, filed in Brantford, court reference number 406/95;* and

Alderville Indian Band, Beausoleil Indian Band, Chippewas of Georgina Island Indian Band, Chippewas of Rama Indian Band, Curve Lake Indian Band, Hiawatha Indian Band, Mississaugas of Scugog Indian Band v. HTMQ and Ontario (Third Party), Federal Court of Canada, filed in Montreal, Court file reference # T-195-92.

I am unable to comment with respect to the possible effect of these claims as the cases have not yet been adjudicated and any statement regarding the outcome of the litigation would be speculative at this point. It is recommended that you consult legal counsel as to the effect these actions could have on the lands you are concerned with.

If you are interested in further details about these claims, copies of the pleadings can be obtained from the Court for a fee. Please contact the appropriate Court Registry Office and make reference to the court file numbers listed above.

We cannot make any comments regarding claims filed under other departmental policies. For information on any claims you should also contact Don Boswell of the Specific Claims Branch at (819) 953-1940 to inquire about any Specific Claims. To inquire about any current Comprehensive Claims, please contact Nicole Cheechoo of Treaty and Aboriginal Government Central Operations at (819) 997-3499.

If you have any further questions please do not hesitate to contact me at (819)994-1947. Also, please note that all future requests of this nature should no longer be addressed to Marc-André Millaire. Instead, could you kindly modify your distribution list to send these requests to the following destination:

Josée Beauregard, Ontario/Nunavut Team
Indian and Northern Affairs
LITIGATION MANAGEMENT AND RESOLUTION BRANCH
25 Eddy Street
Gatineau, Quebec
K1A 0H4

Sincerely,

Josée Beauregard
Litigation Team Leader
Eastern Litigation Directorate
Litigation Management and Resolution Branch

December 14, 2010

To Ms. Sally Rook,

RE: Notice of Study Commencement – Gore Rd Improvements from Patterson Side Road to Highway 9 Class EA Study
File #: MTB 019424

Thank you for circulating Ontario Realty Corporation (ORC) on your Notice of Study Commencement. The ORC is the strategic manager of the government's real property with a mandate of maintaining and optimizing value of the portfolio, while ensuring real estate decisions reflect public policy objectives of the government.

Our preliminary review of your notice and supporting information indicates that ORC-managed property is not within your study area. We have no other concerns with this undertaking. Please remove ORC from your circulation list with respect to this project.

Thank you for the opportunity to provide initial comments on this undertaking. If you have any questions I can be reached at the contacts below.

Sincerely,

L. Myslicki

Lisa Myslicki
Environmental Coordinator
Ontario Realty Corporation - Professional Services
1 Dundas Street West,
Suite 2000, Toronto, Ontario
M5G 2L5
(416) 212-3768
lisa.myslicki@ontariorealty.ca

Region of Peel
Working for you

BURNSIDE

Project Response Form

The Gore Road Improvements from Patterson Side Road to Highway 9
Class Environmental Assessment Study

We are interested in knowing your thoughts on this project and request that you answer the following questions:

a) What do you perceive to be the positive and/or negative effects of this project?

b) Do you perceive any "critical" issues that must be addressed as part of this project?

Please check the most appropriate statement:

☐ We wish to be kept informed about the project's progress and would like to remain on the study contact list. We have comments to provide. They are:
Attached ☐ Will be provided at a later date ☐

☐ We wish to be kept informed about the project's progress and would like to remain on the study contact list. At the present time, we have no significant concerns/comments to provide.

☒ We have no concerns about the project and wish to be removed from the study contact list.

Name: STEVE HOY
(Please Print)

Phone No.: ~~905~~ 416 883 6636

Agency: TELUS

Signed: [signature]

Date: Dec 16 '10

Continued on back

FW: The Gore Road Improvements from Patterson Side Road to Highway 9 Class EA
Rook, Sally
to:
Erica Anderson
12/17/2010 11:14 AM
Cc:
'Leonard Rach'
Show Details

FYI

Sally Rook PMP
Acting Project Manager
Public Works, Transportation
The Region of Peel
905-791-7800 ext. 7842
rooks@peelregion.ca

From: HanmengJen.Long@HydroOne.com [mailto:HanmengJen.Long@HydroOne.com]
Sent: December 17, 2010 10:49 AM
To: Rook, Sally
Cc: Leslie.Koch@HydroOne.com; ierullo@HydroOne.com
Subject: The Gore Road Improvements from Patterson Side Road to Highway 9 Class EA

Dear Ms. Rook,

In our initial review, we can confirm that there are no Hydro One Transmission Facilities in the subject area.

Please be advised that this is only a preliminary assessment based on current information. No further consultation with Hydro One Networks Inc. is required if no changes are made to the current information.

If you have any further questions or concerns, please feel free to contact me.

Regards,

Jen Long
Transmission Lines Sustainment
System Investment, Asset Management
Hydro One Networks Inc.
Tel: 416-345-4421
HanmengJen.Long@HydroOne.com

Chippewas of RAMA
First Nation

5884 Rama Road, Suite 200
Rama, Ontario L0K 1T0
T 705.325.3611 F 705.325.0879

A Proud Progressive First Nation Community

January 3, 2011

Region of Peel
Public Works
9445 Airport Road, 3rd Floor
Brampton, ON L6S 4J3

Attention: Sally Rook, Project Manager

Re: Notice of Study Commencement
The Gore Road Improvements from Patterson Side Road to Highway 9
Class Environmental Assessment Study
Your File No.: MTB 019424

Dear Ms. Rook:

As a member of the Williams Treaties First Nations, Rama First Nation acknowledges receipt of your letter of December 14, 2010, which was received December 20, 2010.

A copy of your letter has been forwarded to Karry Sandy-McKenzie, Barrister & Solicitor, Coordinator for Williams Treaties First Nations for further review and response directly to you. Please direct all future correspondence and inquiries, with a copy to Rama First Nation, to Ms. Sandy-McKenzie at 8 Creswick Court, Barrie, ON L4M 2J7 or her e-mail address at k.a.sandy-mckenzie@rogers.com. Her telephone number is (705) 792-5087.

We appreciate your taking the time to share this important information with us.

Sincerely,

Sharon Stinson Henry

Chief Sharon Stinson Henry

c: Council, Rama First Nation
Jeff Hewitt, General Counsel
Karry Sandy-McKenzie, Coordinator Williams Treaties First Nations
Chief Roland Monague Portfolio Chief for Williams Treaties Nations

Ministry of Aboriginal Affairs

160 Bloor St. East, 9th Floor
Toronto, ON M7A 2E6
Tel: (416) 326-4740
Fax: (416) 325-1066
www.aboriginalaffairs.gov.on.ca

Ministère des Affaires Autochtones

160, rue Bloor Est, 9e étage
Toronto ON M7A 2E6
Tél. : (416) 326-4740
Téléc. : (416) 325-1066
www.aboriginalaffairs.gov.on.ca

Ontario

JAN 1 1 2010

Reference: 716

Ms. Sally Rook, Project Manager
Public Works
9445 Airport Rd., 3rd Floor
Brampton, ON L6S 4J3

Re: Notice of Study Commencement
The Gore Road Improvements from Patterson Side Road to Highway 9
Class Environmental Assessment Study
File No.: MTB 019424

Dear Ms. Rook:

Thank you for your inquiry dated November 9, 2010 regarding the above-noted project.

As a member of the government review team, the Ministry of Aboriginal Affairs (MAA) identifies First Nation and Métis communities who may have the following interests in the area of your project:

- reserves;
- land claims or claims in litigation against Ontario;
- existing or asserted Aboriginal or treaty rights, such as harvesting rights; or
- an interest in your project's potential environmental impacts.

MAA is not the approval or regulatory authority for your project, and receives very limited information about projects in the early stages of their development. In circumstances where a Crown-approved project may negatively impact a claimed Aboriginal or treaty right, the Crown may have a duty to consult the Aboriginal community advancing the claim. The Crown often delegates procedural aspects of its duty to consult to proponents. Please note that the information in this letter should not be relied on as advice about whether the Crown owes a duty to consult in respect of your project, or what consultation may be appropriate. Should you have any questions about your consultation obligations, please contact the appropriate ministry.

You should be aware that many First Nations and Métis communities either have or assert rights to hunt and fish in their traditional territories. For First Nations, these territories typically include lands and waters outside of their reserves.

In some instances, project work may impact aboriginal archaeological resources. If any Aboriginal archaeological resources could be impacted by your project, you should contact your regulating or approving Ministry to inquire about whether any additional Aboriginal communities should be contacted. Aboriginal communities with an interest in archaeological resources may include communities who are not presently located in the vicinity of the proposed project.

With respect to your project, and based on the brief materials you have provided, we can advise that the project appears to be located in an area where the Mississaugas of the New Credit First Nation may have existing or asserted rights or claims in MAA's land claims process or litigation, that could be impacted by your project. Contact information is below:

Mississaugas of the New Credit First Nation 2789 Mississauga Rd., R.R. #6 HAGERSVILLE, Ontario NOA 1HO	Chief Bryan LaForme (905) 768-1133 (Fax) 768-1225 bryanlaforme@newcreditfirstnation.com

The Government of Canada sometimes receives claims that Ontario does not receive, or with which Ontario does not become involved. For information about possible claims in the area, MAA recommends you contact the following federal contacts:

Ms. Janet Townson Claims Analyst, Ontario Team Specific Claims Branch Indian and Northern Affairs Canada 1310-10 Wellington St. Gatineau, QC K1A 0H4 Tel: (819) 953-4667 Fax: (819) 997-9873	Mr. Sean Darcy Manager Assessment and Historical Research Indian and Northern Affairs Canada 10 Wellington St. Gatineau, QC K1A 0H4 Tel: (819) 997-8155 Fax: (819) 997-1366

For federal information on litigation contact:

Mr. Marc-André Millaire
Litigation Team Leader for Ontario
Litigation Management and Resolutions Branch
Indian and Northern Affairs Canada
10 Wellington St.
Gatineau, QC K1A 0H4
Tel: (819) 994-1947
Fax: (819) 953-1139

Additional details about your project or changes to it that suggest impacts beyond what you have provided to date may necessitate further consideration of which Aboriginal communities may be affected by or interested in your undertaking. If you think that further consideration may be required, please bring your inquiry to whatever government body oversees the regulatory process for your project.

The information upon which the above comments are based is subject to change. First Nation or Métis communities can make claims at any time, and other developments can occur that could result in additional communities being affected by or interested in your undertaking.

Yours truly,

Heather Levecque

Heather Levecque
Manager, Consultation Unit
Aboriginal Relations and Ministry Partnerships Division

Fw: Gore Road Improvements - Patterson Side Road to Highway 9, Town of Caledon (Class EA), NEATS 27810

Leonard Rach to: Erica Anderson 01/18/2011 08:41 AM

----- Forwarded by Leonard Rach/RJB on 01/18/2011 08:41 AM -----

From:	EnviroOnt <EnviroOnt@tc.gc.ca>
To:	"'sally.rook@peelregion.ca'" <sally.rook@peelregion.ca>, "'leonard.rach@rjburnside.com'" <leonard.rach@rjburnside.com>
Date:	01/17/2011 04:39 PM
Subject:	Gore Road Improvements - Patterson Side Road to Highway 9, Town of Caledon (Class EA), NEATS 27810

Hello,

Thank you for the information regarding the above referenced project. Please in future forward correspondence on this project to the undersigned.

We have reviewed the information, and note the following:

Transport Canada is responsible for the administration of the *Navigable Waters Protection Act* (NWPA), which prohibits the construction or placement of any "works" in navigable waters without first obtaining approval. If any of the related project undertakings cross or affect a potentially navigable waterway, the proponent should prepare and submit an application in accordance with the requirements as outlined in the attached Application Guide. Any questions about the NWPA application process should be directed to the Navigable Waters Protection Program at **1-866-821-6631** or NWPontario-PENontario@tc.gc.ca.

Please note that certain approvals under the *Navigable Waters Protection Act* trigger the requirement for a federal environmental assessment under the *Canadian Environmental Assessment Act* (CEAA). The proponent may therefore wish to consider incorporating CEAA requirements into the project.

Please contact us if there are any questions or concerns.

Thank you,

Environmental Assessment Coordinator
Transport Canada, Ontario Region
Environment & Engineering (PHE)
4900 Yonge St., 4th Fl., Toronto, ON M2N 6A5
Email: EnviroOnt@tc.gc.ca

NWP_App_Guide_EN.pdf

RE: Class EA Study - The Gore Road Improvements

Leonard Rach to: Hawryluk, Christine 03/02/2011 09:17 AM

Cc: "Kam, Alice (MTO)", Erica Anderson, "Topiwala, Hitesh", "Arcaro, Joseph", "Rook, Sally"

Hi Christine,

This will confirm that we will add Joe Arcaro's name as well as yours to our study contact list. For your information I am the consultant Project Manager for The Gore Road EA.

Regards, Len

From: "Hawryluk, Christine" <Christine.Hawryluk@hdrinc.com>
To: "Rook, Sally" <Sally.Rook@peelregion.ca>
Cc: "Arcaro, Joseph" <Joseph.Arcaro@hdrinc.com>, "Kam, Alice (MTO)" <Alice.Kam@ontario.ca>, 'Leonard Rach' <Leonard.Rach@rjburnside.com>, Erica Anderson <Erica.Anderson@rjburnside.com>, "Topiwala, Hitesh" <Hitesh.Topiwala@peelregion.ca>
Date: 03/01/2011 12:36 PM
Subject: RE: Class EA Study - The Gore Road Improvements

Hi Sally,

We (MTO/HDR|iTRANS) will also keep you informed on the progress of our study and will add you to our stakeholder contact list.

I forgot to mention in my original email that Joseph Arcaro (cc'd on this email) is the Consultant Project Manager on our study. I will be assisting him. Please include both Joseph and myself on any correspondence relating to your study that is sent to Alice Kam (MTO Project Engineer).

Thank you,

Christine Hawryluk, P.Eng.
Transportation Engineer

HDR | iTRANS
100 York Boulevard, Suite 300 | Richmond Hill, ON | L4B 1J8
Phone: 905.882.4100 x 5364 | Fax: 905.882.1557 | Email: christine.hawryluk@hdrinc.com
www.hdrinc.com
www.itransconsulting.com

Please note our email addresses have recently changed. Please update your records.

From: Rook, Sally [mailto:Sally.Rook@peelregion.ca]
Sent: Tuesday, March 01, 2011 12:00 PM
To: Hawryluk, Christine
Cc: Arcaro, Joseph; Kam, Alice (MTO); 'Leonard Rach'; Erica Anderson; Topiwala, Hitesh
Subject: RE: Class EA Study - The Gore Road Improvements

Hi Christine,

I have forwarded the Consultant for this project (R.J. Burnside) your contact information and added you to the contact list.

We are just starting preliminary design, and for now, are focusing our efforts from Coolihan's SR south to Patterson SR pending further information from you on the scope of work you foresee at this intersection.

Going forward, I would appreciate you keeping me informed of your progress and plans so that we can co-ordinate our efforts. Our current schedule calls for several studies to be undertaken this Spring that include the approx. 175 metres between Coolihan's SR and Hwy. 9 if required, we can send you that information as it is available. Since this is a Schedule "B" EA there will only one Public Information Centre and it is currently in the schedule for the end of November 2011. I would like to meet with you before that date to ensure what we present to the public is co-ordinated and accurate.

Thanks,

Sally Rook PMP | Technical Analyst
Transportation Program Planning | Public Works
Region of Peel | 9445 Airport Rd., 3rd Floor, Brampton ON L6S 4J3
Tel. 905-791-7800 ext. 7842

From: Hawryluk, Christine [mailto:Christine.Hawryluk@hdrinc.com]
Sent: March 1, 2011 10:46 AM
To: Rook, Sally
Cc: Arcaro, Joseph; Kam, Alice (MTO)
Subject: Class EA Study - The Gore Road Improvements

Hi Sally,

I am working with Alice Kam at MTO on the PDR and Class EA Assessment of 8 intersections across Central Region; which includes the intersection of Highway 9 & The Gore Road. I would therefore like to be included on any notifications for Peel Region's Class EA Study of The Gore Road.

Please add me to the project contact list for **The Gore Road Improvements Class Environmental Assessment Study (from Patterson Side Road to Highway 9)**. My contact information is below.

Kind Regards,

Christine Hawryluk, P.Eng.
Transportation Engineer

HDR | iTRANS
100 York Boulevard, Suite 300 | Richmond Hill, ON | L4B 1J8
Phone: 905.882.4100 x 5364 | Fax: 905.882.1557 | Email: christine.hawryluk@hdrinc.com
www.hdrinc.com
www.itransconsulting.com

Please note our email addresses have recently changed. Please update your records.

March 2, 2012

Via: Email

Sharon Lingertat
Acting Senior Planner, Environmental Assessment Planning
Toronto and Region Conservation Authority
5 Shoreham Drive
Downsview, ON M3N 1S4

Dear Sharon Lingertat:

Re: SWM/Natural Features/Property Requirements Review
The Gore Road Improvements from Patterson Side Road to Highway 9
Class Environmental Assessment Study (Schedule B)
File No.: MTB019424

Thank you for the comments provided in your letter dated December 19, 2011 with regard to Stormwater Management, Natural Features and Property Requirements prepared for The Gore Road Improvements (Patterson Sideroad to Highway 9) Schedule B Municipal Class Environmental Assessment Project File Report. The following sections outline the updates and our responses to the comments provided in Appendix A: TRCA Comments.

Stormwater Management (SWM)

Item 1:
The 6 and 12-hour AES storm distributions were received from the TRCA on February 2, 2012. The hydrologic modelling has been updated and the 6-hour storm was determined to generate the highest peak flow rates of these two distributions. As such the SWM report and hydraulic calculations have been updated accordingly.

Item 2:
A hydraulic assessment was completed for culverts 1352 and 1355 to assess the impact of the proposed culvert replacements on the Regional Floodplain. The results of this assessment indicate that the upstream and downstream water surface elevations will decrease as a result of the proposed works.

An existing hydraulic model was received from the TRCA for culvert N3 on February 2, 2012. The road deck is proposed to be raised at this location, but will have no impact on the Regional Floodplain as the Regional flow rate is conveyed without overtopping the road.

More details have been added to Section 6.0 of the SWM report.

Item 3:
The proposed design has been updated to provide additional water quality controls within the roadside ditches to provide a minimum ‘enhanced’ treatment for stormwater quality control. The MOE criteria for “enhanced” water quality control will be provided through the use of wet swales which are identified in the MOE 2003 SWM manual as “ideal for highway runoff in low lying or flat terrain areas.” The proposed roadside ditches have been widened to a minimum 1.0 m bottom width, with rock check dams placed every 100 m. These controls will ensure that flows from the 25 mm storm will not exceed 0.5 m/s, and that a storage volume of 60 m^3/ha is provided to allow sediment particles to settle. Grasses in the ditches will be unmaintained to provide maximum water quality potential.

Item 4:
HY-8 models for each of the proposed culvert crossings were prepared to ensure that there will be no negative impact on the Regional Floodplain upstream and downstream of the culverts. The revised SWM report is attached.

Item 5:
A Fluvial Geomorphic Study will be confirmed based further discussion with TRCA.

Item 6:
The Regional flow rate provided in Table 1 was received from an older hydrology model on a different project. It has been updated to provide the flow rates received from the TRCA on February 2, 2012.

Item 7:
All proposed property acquisitions and permission requirements are illustrated on the plan and profile drawings provided on January 16, 2012 to TRCA by Burnside.

Item 8:
The SWM report has been updated to reference the TRCA’s Erosion and Sediment Control Guidelines for Urban construction. Detailed sediment and erosion control drawings and notes will be completed as part of detailed design.

Item 9:
The recommendations and conclusions section of the SWM report has been updated to provide the requested table. The table will also be provided in the Environmental Assessment document. Mapping will also reflect the locations of the identified crossings.

<u>Natural Features</u>

Item 10:
We acknowledge that based on a review of the existing tree assessment and inventory that TRCA require a comprehensive restoration plan at the detailed design stage. A more complete submission which identifies the natural features impacted as a result of the proposed works (road and grading), and identifies and quantifies the vegetation to be

removed and wetland area lost is also required and will be provided at a later date once the Preliminary design has been approved and finalized.

Property Requirements:

Item 11: TRCA property affected? Archaeological investigation?
On January 16, 2012 a copy of the proposed design showing the property acquisition areas was provided to TRCA. It is also noted that TRCA has tentatively scheduled archaeological investigations in the spring of 2012. The Archaeology Report has been provided to date. The final Cultural Heritage Evaluation Report will be provided for review with the Draft Environmental Assessment document.

Item 12: Is it possible to show the proposed grading and property requirements with an ortho layer?
TRCA would like to see a figure showing the proposed grading and property requirements on a map with the natural environment information included. This can be provided at a later date once the Preliminary design has been approved and finalized.

Please contact me at Sally.Rook@peelregion.ca or (905) 791-7800 X 7842 if you would like to discuss further.

Yours truly,

Region of Peel

Sally Rook, PMP
Project Manager

c.c.: Leonard Rach / Erica Anderson, R.J. Burnside & Associates

019424_Gore Road Response to TRCA RE SWM Review.doc
29/02/2012 9:37 AM

RE: GORE ROAD Patterson to Hwy.9 EA
David Atkins
to:
'Leonard Rach', Kant Chawla
12/01/2010 03:32 PM
Cc:
'Doug Keenie', 'Erica Anderson', "'hitesh.topiwala@peelregion.ca'", 'Ron Goddard', "'sally.rook@peelregion.ca'"
Show Details

I have forwarded the Study on to our Manager of Roads & Fleet Services to look into the issues raised in relation to Town roads.

David Atkins, P.Eng
Manager of Engineering Services
Public Works Department
Town of Caledon
(905) 584-2272, ext, 4128

From: Leonard Rach [mailto:Leonard.Rach@rjburnside.com]
Sent: December 1, 2010 3:04 PM
To: Kant Chawla
Cc: David Atkins; Doug Keenie; Erica Anderson; hitesh.topiwala@peelregion.ca; Ron Goddard; sally.rook@peelregion.ca
Subject: RE: GORE ROAD Patterson to Hwy.9 EA

Hi Kant,

Thanks for your response. I'll leave the decision for a meeting at this stage in your lap.

In terms of a TCS installation at Hwy 9 & Gore, based on our traffic data the existing LOS is C in the pm peak and B in the am; by 2021 the LOC drops to a D in the pm peak with the NB at an F with a delay of 645s; by 2031 the pm LOS drops into an E range. Based on these results a TCS is likely warranted within our planning period.

On another matter the Region completed a safety audit of this section of Gore and has picked up some deficiencies on your approach roads that we would like to share with you. Perhaps the best way of dealing with this is to share the safety report with your staff before a meeting is arranged.

For your info I'm attaching a copy of the Region's Safety Report for staff review at this time.

Thanks, Len

From: Kant Chawla <Kant.Chawla@caledon.ca>
To: 'Leonard Rach' <Leonard.Rach@rjburnside.com>
Cc: "sally.rook@peelregion.ca" <sally.rook@peelregion.ca>, "hitesh.topiwala@peelregion.ca" <hitesh.topiwala@peelregion.ca>, Ron Goddard <Ron.Goddard@rjburnside.com>, Erica Anderson <Erica.Anderson@rjburnside.com>, Doug Keenie <Doug.Keenie@rjburnside.com>, David Atkins <David.Atkins@caledon.ca>
Date: 11/30/2010 03:51 PM
Subject: RE: GORE ROAD Patterson to Hwy.9 EA

Thanks Leonard. Besides concerns regarding the deterioration of existing pavement, sub-standard shoulder areas lack of ditching and visibility restrictions, town is keen on seeing how the required intersection improvements (Highway 9 and Gore Road) will be proposed in the present undertaking.

I am note sure if a meeting is required at this juncture, however I am requesting David to advise of any other issue which Burnside should be aware of at this stage.

Regards,
Kant

KANT CHAWLA, MPlng, MCIP, RPP
Sr. Transportation Planner

Planning & Development|Town of Caledon
Tel: (905) 584-2272 ext:4293 | Fax: (905) 584-4325
email : kant.chawla@caledon.ca
website: www.caledon.ca | 6311, Old Church Road, Caledon, ON L7C 1J6

From: Leonard Rach [mailto:Leonard.Rach@rjburnside.com]
Sent: Tuesday, November 30, 2010 3:17 PM
To: Kant Chawla
Cc: sally.rook@peelregion.ca; hitesh.topiwala@peelregion.ca; Ron Goddard; Erica Anderson; Doug Keenie
Subject: GORE ROAD Patterson to Hwy.9 EA

Hi Kant,

Burnside have been hired to undertake an Environmental Assessment Study of The Gore Road between Patterson Sideroad and Highway 9. In that regard, we would like to arrange a meeting with the Town staff to brief the staff on the study, present any findings to date, and to get your input on any issues that the Town considers important.

May I suggest that we meet some time during the week of Dec.13th. Perhaps you could suggest an appropriate date and time to meet at your offices and I would send out the meeting notice to you and the Region staff as a confirmation.

Thank you,
Leonard Rach P.Eng.
Project Manager
R.J.Burnside & Assoc. Ltd.
Tel# 519-941-5331/1-800-941-8120

**** CONFIDENTIALITY NOTICE ****

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If you have received this communication in error please notify the sender at the above email address and delete this email immediately.

Thank you.

****

RE: GORE ROAD Patterson to Hwy .9 EA

Leonard Rach to: Kant Chawla 12/01/2010 03:04 PM

Cc: David Atkins, Doug Keenie, Erica Anderson, "hitesh.topiwala@peelregion.ca", Ron Goddard, "sally.rook@peelregion.ca"

From: Leonard Rach/RJB

To: Kant Chawla <Kant.Chawla@caledon.ca>

Cc: David Atkins <David.Atkins@caledon.ca>, Doug Keenie <Doug.Keenie@rjburnside.com>, Erica Anderson <Erica.Anderson@rjburnside.com>, "hitesh.topiwala@peelregion.ca" <hitesh.topiwala@peelregion.ca>, Ron Goddard <Ron.Goddard@rjburnside.com>,

1 attachment

Road.PDF

Hi Kant,

Thanks for your response. I'll leave the decision for a meeting at this stage in your lap.

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Thanks, Len

From: Kant Chawla <Kant.Chawla@caledon.ca>

To: 'Leonard Rach' <Leonard.Rach@rjburnside.com>

Cc: "sally.rook@peelregion.ca" <sally.rook@peelregion.ca>, "hitesh.topiwala@peelregion.ca" <hitesh.topiwala@peelregion.ca>, Ron Goddard <Ron.Goddard@rjburnside.com>, Erica Anderson <Erica.Anderson@rjburnside.com>, Doug Keenie <Doug.Keenie@rjburnside.com>, David Atkins <David.Atkins@caledon.ca>

Date: 11/30/2010 03:51 PM
Subject: RE: GORE ROAD Patterson to Hwy.9 EA

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Regards,
Kant

KANT CHAWLA, MPlng, MCIP, RPP
Sr. Transportation Planner

Planning & Development|Town of Caledon
Tel: (905) 584-2272 ext:4293 | Fax: (905) 584-4325
email : kant.chawla@caledon.ca
website: www.caledon.ca | 6311, Old Church Road, Caledon, ON L7C 1J6

From: Leonard Rach [mailto:Leonard.Rach@rjburnside.com]
Sent: Tuesday, November 30, 2010 3:17 PM
To: Kant Chawla
Cc: sally.rook@peelregion.ca; hitesh.topiwala@peelregion.ca; Ron Goddard; Erica Anderson; Doug Keenie
Subject: GORE ROAD Patterson to Hwy.9 EA

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May I suggest that we meet some time during the week of Dec.13th. Perhaps you could suggest an appropriate date and time to meet at your offices and I would send out the meeting notice to you and the Region staff as a confirmation.

Thank you,

Leonard Rach P.Eng.
Project Manager
R.J.Burnside & Assoc. Ltd.
Tel# 519-941-5331/1-800-941-8120

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If you have received this communication in error please notify the sender at the above email address and delete this email immediately.

Thank you.

****

Southern Region
Aurora District Office
50 Bloomington Road
Aurora, ON L4G 0L8

Ministry of
Natural Resources

Ministere des
Richesses Naturelles

May 24, 2011

Christopher Pfohl, C.E.T.
Aquatic Resource Specialist
R.J. Burnside & Associates Limited
Guelph, ON N1H 1C4
Chris.Pfohl@rjburnside.com

Re: The Gore Road Improvements, from Patterson Sideroad to Highway 9
Regional Municipality of Peel

Dear Mr. Pfohl,

In your email dated May 19, 2011 you requested information on natural heritage features and element occurrences occurring on or adjacent to the above mentioned location.

The MNR has records of Butternut, Bobolink, Snapping Turtle, a sensitive plant species as well as historic records of Northern Map Turtle in the vicinity of your study area. Some of these species receive protection under the *Endangered Species Act 2007* and thus, a permit may be required if the work you are proposing could cause harm to these species and/or their habitats.

Natural heritage features recorded for your area include the Provincially Significant Harris Wetland Complex, a number of identified wetlands, the Humber Headwaters and Albion Hills Forest ANSI's as well as two Environmentally Significant Areas.

This species at risk information is highly sensitive and is not intended for any person or project unrelated to this undertaking. Please do not include any specific information in reports that will be available for public record. As you complete your fieldwork in these areas, please report all information related to any species at risk to the NHIC and to our office. This will assist with updating our database.

If you have any questions or comments, please do not hesitate to contact me at 905-713-7425.

Sincerely,

Melinda Thompson-Black

Melinda Thompson-Black
Species at Risk Biologist
Ontario Ministry of Natural Resources, Aurora District

Re: MTB019424 Gore Road Site Meeting Schedule B EA
Sharon Lingertat
to:
Erica Anderson
06/02/2011 09:34 AM
Show Details

History: This message has been replied to and forwarded.

Hi Erica,

The ecologist and I are available on Friday, June 17 at 10am to meet on site. Please let me know if that date and time will work for your group. We'll need to ID all watercourses and wetlands within the study area for consideration and inclusion in the EA.

Regards,
Sharon Lingertat
Acting Senior Planner, Environmental Assessment Planning
Toronto and Region Conservation Authority
5 Shoreham Drive, Toronto, ON M3N 1S4
Ph: 416 661-6600 ext. 5717
Fax: 416-661-6898
Web: www.trca.on.ca

Erica Anderson <Erica.Anderson@rjburnside.com>

06/01/2011 12:32 PM

To Sharon Lingertat <SLingertat@trca.on.ca>
cc
Subject Re: MTB019424 Gore Road Site Meeting Schedule B EA

Hi Sharon,

Yes. the study area is from just north of Patterson Sideroad to Highway 9.

BURNSIDE

Erica Anderson, B.Sc. (Env.)
Environmental Assessment Specialist

R.J. Burnside & Associates Limited
292 Speedvale Avenue West, Unit 20
Guelph, Ontario N1H 1C4
Erica.Anderson@rjburnside.com
tel: 519-823-4995 x465

fax: 519.836.5477
www.rjburnside.com

From: Sharon Lingertat <SLingertat@trca.on.ca>
To: Erica Anderson <Erica.Anderson@rjburnside.com>
Cc: Chris Pfohl <Chris.Pfohl@rjburnside.com>
Date: 06/01/2011 12:30 PM
Subject: Re: MTB019424 Gore Road Site Meeting Schedule B EA

Hi Erica,

We're dealing with several files right now along The Gore. Is this Patterson to Hwy 9?

Thanks,
Sharon Lingertat
Acting Senior Planner, Environmental Assessment Planning
Toronto and Region Conservation Authority
5 Shoreham Drive, Toronto, ON M3N 1S4
Ph: 416 661-6600 ext. 5717
Fax: 416-661-6898
Web: www.trca.on.ca

Erica Anderson <Erica.Anderson@rjburnside.com>

06/01/2011 12:25 PM

To slingertat@trca.on.ca
cc Chris Pfohl <Chris.Pfohl@rjburnside.com>
Subject MTB019424 Gore Road Site Meeting Schedule B EA

Hi Sharon,

I wanted to check and see if TRCA was interested in having a Site meeting with regard to the Gore Road Environmental Assessment to go over any specific areas of interest.

Our field staff will be going out this month so I was hoping to coordinate a date with you.

BURNSIDE

Erica Anderson, B.Sc. (Env.)
Environmental Assessment Specialist

R.J. Burnside & Associates Limited
292 Speedvale Avenue West, Unit 20
Guelph, Ontario N1H 1C4
Erica.Anderson@rjburnside.com
tel: 519-823-4995 x465
fax: 519.836.5477
www.rjburnside.com

Thank you."

June 27, 2011 CFN 43948

BY MAIL AND EMAIL (Leonard.Rach@rjburnside.com)

Mr. Leonard Rach
Project Manager
R.J. Burnside & Associates Limited
15 Townline
Orangeville, ON L9W 3R4

Dear Mr. Rach:

Re: Watercourse Crossing Chart
The Gore Road (Patterson Side Road to Highway 9)
Municipal Class Environmental Assessment - Schedule B
Humber River Watershed; Town of Caledon; Regional Municipality of Peel

Toronto and Region Conservation Authority (TRCA) staff received the Notice of Commencement for the above noted Environmental Assessment (EA) on November 10, 2010, and a response was sent on November 16, 2010. It is our understanding that the purpose of this EA is to examine the need for proposed rehabilitation of The Gore Road from approximately 25 m north of Patterson Side Road to Highway 9 in the Town of Caledon.

A site visit was conducted with TRCA, Peel Region and R.J. Burnside staff on June 17, 2011 to identify watercourse and wetland features within the study limits along The Gore Road. The results of the site visit are summarized in the enclosed Watercourse Crossing Table along with a map showing the locations of each watercourse for your reference.

Should you have any questions please contact me at extension 5717 or by email at slingertat@trca.on.ca.

Yours truly,

Sharon Lingertat

Sharon Lingertat
Acting Senior Planner, Environmental Assessment Planning
Planning and Development

Encl.: TRCA Watercourse Crossing Table
Location Map

BY EMAIL
cc: Peel: Sally Rook (Sally.Rook@peelregion.ca)
TRCA: Beth Williston, Senior Manager, Environmental Assessment Planning
Quentin Hanchard, Senior Manager, Development, Planning and Regulation
Gary Wilkins, Humber River Watershed Specialist

F:\Home\Public\Development Services\EA\Letters for Mailing\43948 - Watercourse Crossing Chart.doc

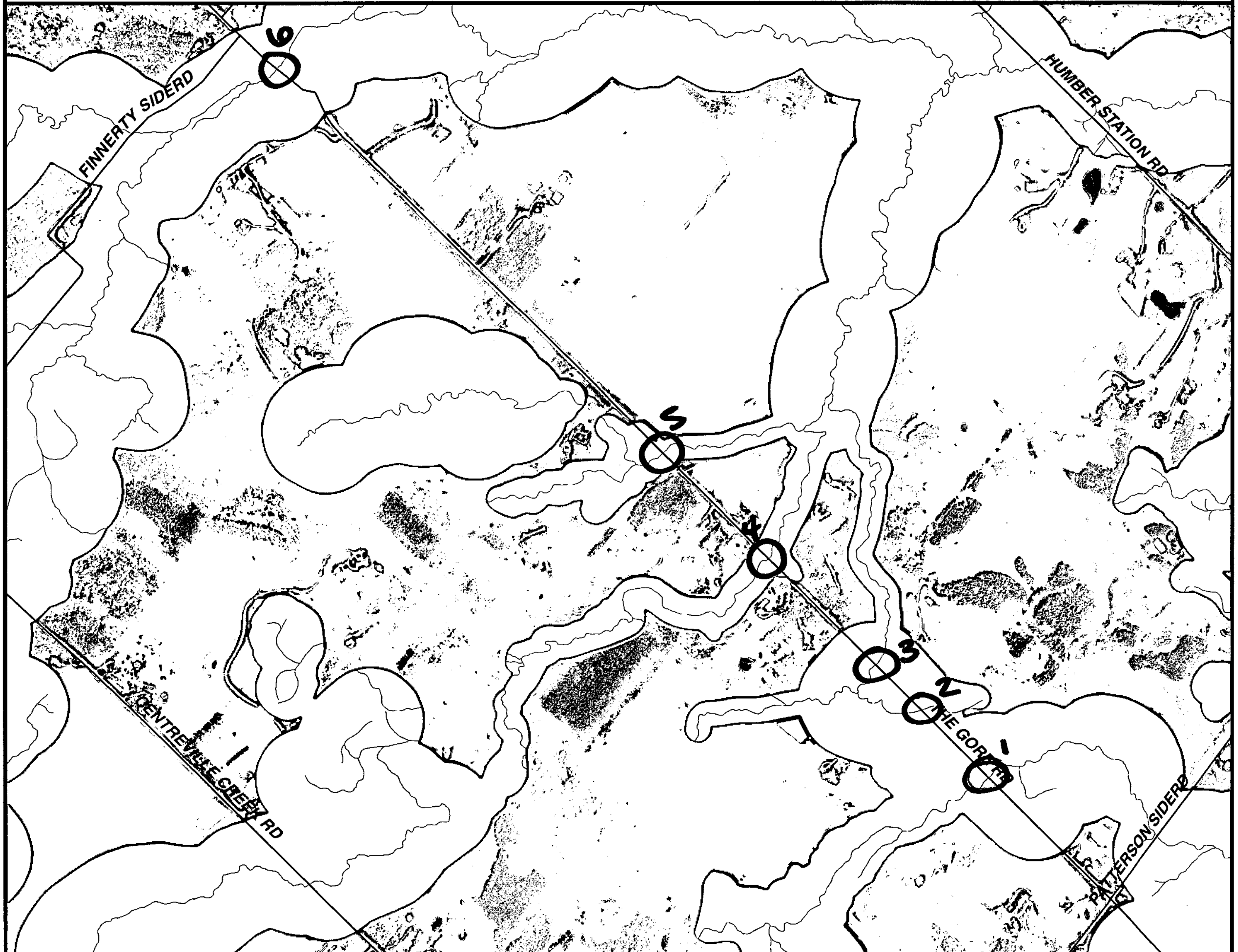
TORONTO AND REGION Conservation for The Living City

WATERCOURSE CROSSING TABLE

DATE CHART LAST REVISED: Friday, June 24, 2011
DATE OF SITE VISIT: Friday, June 17, 2011
PROJECT NAME: **The Gore Road (Patterson to Highway 9)**
PROPONENT: Region of Peel
MUNICIPAL PROJECT MANAGER: Sally Rook
TRCA PROJECT MANAGER: Sharon Lingertat
TRCA FILE # CFN 43948

		Site 1	Site 2	Site 3	Site 4	Site 5	Site 6	Site 7	Site 8	Site 9	Site 10
GEOGRAPHIC AREA											
	TRCA Property in the vicinity?	No	No	No	No	No	No	Yes	Yes	No	No
ONTARIO REG. 97/04 - "DEVELOPMENT, INTERFERENCE WITH WETLANDS & ALTERATION											
	Within a Regulated Area	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
	Within a Wetland/Area of Interference ?	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
	Within a Watercourse?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Within a Regional Storm Floodplain*?	Yes	TBD	Yes	Yes	Yes	Yes	TBD	TBD	TBD	TBD
	(<50 ha upstream drainage/>50ha upstream drainage)*										
	*= Regional Storm Floodplain										
FISHERIES REVIEW											
	Fish Habitat	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Timing Window	*Redside Dace	*Redside Dace	*Redside Dace	*Redside Dace	*Redside Dace	*Redside Dace	*Redside Dace	*Redside Dace	*Redside Dace	*Redside Dace
EXISTING STRUCTURE DETAILS											
Proponent will fill in	Existing Structure *(L x W x H and type)*										
	Open or Closed Footed?										
	Structural Integrity of Existing Culvert?										
	Hydraulic Capacity of existing structure is *(adequate/inadequate)* to convey Regional Storm?										
PROPOSED STRUCTURE DETAILS											
Proponent will fill in	Proposed Structure *(L x W x H and type)*										
	Open or Closed Footed?										
	Extension only proposed? *(Y/N)*										
	Removal, Replacement only proposed?										
REQUIREMENTS											
	Hydraulic Analysis Required?	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
	Meander Belt Analysis Required?	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
	100-year Erosion Limit Required?	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
	Groundwater Upwellings *(will dictate open footed culvert)*	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
	Geotechnical Report Required	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SUMMARY OF APPROVALS REQUIRED											
	"Development" permit required? *(Y/N)*	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	HADD (Y/N/TBD)	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Proponent will fill in	MNR contacted? (PROPONENT WILL FILL IN)Y? N?										
Proponent will fill in	Transport Canada contacted for navigable waterway?										
ADDITIONAL NOTES											
*Redside Dace unless otherwise indicated by MNR. Please provide correspondence from MNR if available. Cold water timing window will apply if not redside dace. **TBD - requirements will be confirmed once we understand what works are proposed at those crossings.								TRCA property located on the east side of The Gore Road	TRCA property located on the west side of The Gore Road		

The Gore (Patterson to Hwy 9)



1:13,938

Legend

- Watershed Boundary
- Local Boundary
- Regional Boundary
- Watercourses_TRCA
- Regulation Limit

Disclaimer:
The Data used to create this map was compiled from a variety sources & dates. The T.R.C.A. takes no responsibility for errors or omissions in the data and retains the right to make changes & corrections at anytime without notice. For further information about the data on this map, please contact the T.R.C.A. GIS Department. (416) 661-6600

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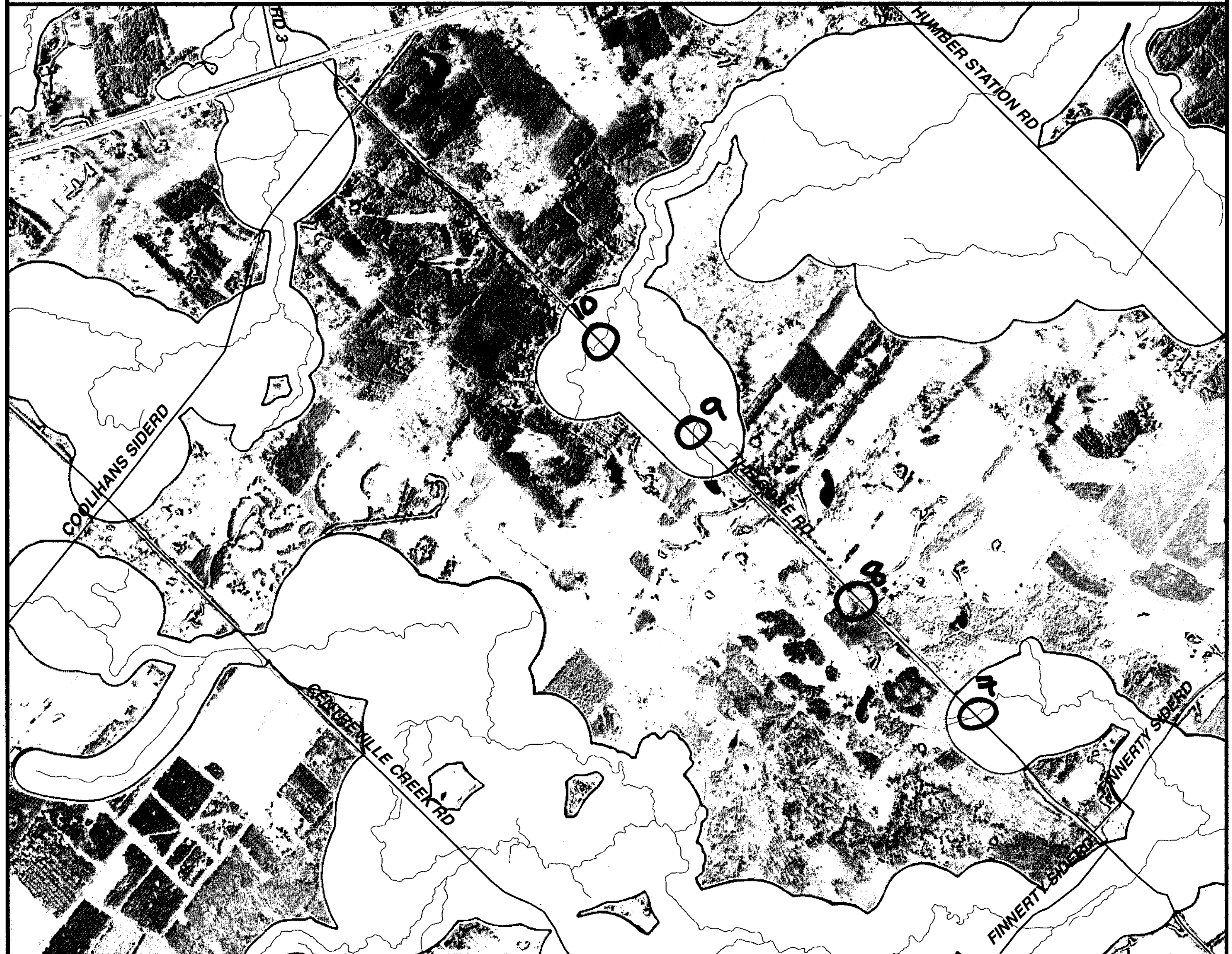
Ortho-photography: First Base Solutions

Toronto and Region Conservation for The Living City

The Gore (Patterson to Hwy 9)



1:16,790

Legend

- Watershed Boundary
- Local Boundary
- Regional Boundary
- Watercourses_TRCA
- Regulation Limit

Disclaimer:
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Ortho-photography: First Base Solutions

Toronto and Region Conservation for The Living City

Fw: The Gore & Hwy 9
Leonard Rach to: Erica Anderson 07/26/2011 10:31 AM

fyi
----- Forwarded by Leonard Rach/RJB on 07/26/2011 10:30 AM -----

From:	"Rook, Sally" <Sally.Rook@peelregion.ca>
To:	"'Kam, Alice (MTO)'" <Alice.Kam@ontario.ca>
Cc:	"Hawryluk, Christine" <Christine.Hawryluk@hdrinc.com>, "Arcaro, Joseph" <Joseph.Arcaro@hdrinc.com>, 'Leonard Rach' <Leonard.Rach@rjburnside.com>, John Velick <John.Velick@rjburnside.com>
Date:	07/26/2011 09:37 AM
Subject:	RE: The Gore & Hwy 9

Thanks for the update Alice. We are asking our design consultant to focus on Patterson SR to Coolihan's SR and then tie in with what you are doing from Coolihan's SR to Hwy 9. That being said, if you choose to just install signals with no turn lanes and/or realignment then we will need to finish this design work to ensure that any property requirements are clearly identified for our PIC at the end of November 2011.

It would be great if we can show your preferred alternative at that PIC but if you don't have anything by then we will just circle the intersection and show that it is currently under a separate MTO study with contact info. provided.

Please keep us informed as you progress, I will touch base with you by end of September if I haven't heard from you by then.

Thanks,

Sally Rook PMP | Technical Analyst
Transportation Program Planning | Public Works
Region of Peel | 9445 Airport Rd., 3rd Floor, Brampton ON L6S 4J3
Tel. 905-791-7800 ext. 7842

From: Kam, Alice (MTO) [mailto:Alice.Kam@ontario.ca]
Sent: July 26, 2011 9:25 AM
To: Rook, Sally
Cc: Hawryluk, Christine; Arcaro, Joseph
Subject: RE: The Gore & Hwy 9

Hi Sally,

We have done some existing condition analysis (collision, geometric deficiency and operational analysis's) at this location and our consultant is currently identifying design alternatives. In particular, during our last progress meeting we have asked our consultant to look into some additional options to realign Gore Road and Concession Road 3 (make it a 4 legged intersection). However, nothing is confirmed at this point. Our project will meet 30% milestone around mid-September and by then we will have a "technically preferred alternative" to carry forward.

If the Region has any specific concern regarding our study, please let me know.

Regards,
Alice

Alice Kam | **P.Eng, Project Engineer**
Ministry of Transportation | Central Region | Planning & Design, Hamilton-Niagara
4th Floor, Building D, 1201 Wilson Ave | Downsview, ON M3M 1J8
t 416.235.5531 | f 416.235.3576 | alice.kam@ontario.ca

From: Rook, Sally [mailto:Sally.Rook@peelregion.ca]
Sent: July 26, 2011 9:08 AM
To: Kam, Alice (MTO)
Subject: The Gore & Hwy 9

Hi Alice,

Have you made any decisions on what is going to happen with the intersection of Highway 9 and The Gore Road in Caledon? As you probably recall, I am doing an EA to reconstruct The Gore and want to ensure that we co-ordinate at this intersection.

Any updates or information you have would be appreciated.

Thanks,

Sally Rook PMP | Project Manager
Transportation Program Planning | Public Works
Region of Peel | 9445 Airport Rd., 3rd Floor, Brampton ON L6S 4J3
Tel. 905-791-7800 ext. 7842

R E G I O N O F P E E L ■■■ **working for you**

From: Kam, Alice (MTO) [mailto:Alice.Kam@ontario.ca]
Sent: February 23, 2011 1:29 PM
To: Rook, Sally
Subject: RE: The Gore Road EA

Hi Sally,

I would like to confirm that MTO is currently doing a PDR and Class EA assessment at 8 intersections across Central Region (Assignment #: 2009-E-0078). The intersection of Highway 9 at Gore Road is one of them. This project has started in Nov 2010.

Thanks,
Alice

Alice Kam
Project Engineer (A)
Hamilton & Niagara, Highway Engineering

Ministry of Transportation
Central Region
(416)-235-5531

TORONTO AND REGION
Conservation
for The Living City

Transmittal

DATE:	**August 16, 2011**		
ATTENTION:	**Proponent:**	Sally Rook (Sally.Rook@peelregion.ca)	**Send by Email**
	Consultant:	Mr. Leonard Rach (Leonard.Rach@rjburnside.com) R.J. Burnside & Associates Limited 15 Townline Orangeville, ON L9W 3R4	**Send by Email and Mail**
REGARDING:	**CFN:**	43948	
	Project Name:	The Gore Road (Patterson Sideroad to Highway 9)	
	TRCA Project Management	Sharon Lingertat, extension 5717 or email slingertat@trca.on.ca	

Further to the Minutes of Meeting (June 17, 2011) and the letter received from the Ministry of Natural Resources (MNR) dated May 24, 2011, I have updated the watercourse crossing chart to reflect the revised timing window. The hydraulic analysis information has also been updated and a digital copy of the map showing drainage areas for each of the crossings has been sent in a separate email (August 16, 2011) for your reference.

Please give me a call if you have any questions.

Regards,
Sharon Lingertat
Acting Senior Planner, Environmental Assessment Planning
Toronto and Region Conservation Authority
5 Shoreham Drive, Toronto, ON M3N 1S4
Ph: 416 661-6600 ext. 5717
Fax: 416-661-6898
Web: www.trca.on.ca

Encl: Watercourse crossing table (revised August 12, 2011)

TORONTO AND REGION **Conservation** for The Living City

Watercourse Crossing Table

DATE CHART LAST REVISED: Friday, August 12, 2011
DATE OF SITE VISIT: Friday, June 17, 2011
PROJECT NAME: **The Gore Road (Patterson to Highway 9)**
PROPONENT: Region of Peel
MUNICIPAL PROJECT MANAGER: Sally Rook
TRCA PROJECT MANAGER Sharon Lingertat
TRCA FILE # CFN 43948

		Site 1	Site 2	Site 3	Site 4	Site 5	Site 6	Site 7	Site 8	Site 9	Site 10
GEOGRAPHIC AREA											
	TRCA Property in the vicinity?	No	No	No	No	No	No	Yes	Yes	No	No
ONTARIO REG. 166/06 - "DEVELOPMENT, INTERFERENCE WITH WETLANDS & ALTERATIONS TO SHORELINES & WATERCOURSES".											
	Within a Regulated Area	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
	Within a Wetland/Area of Interference ?	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
	Within a Watercourse?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Within a Regional Storm Floodplain*? *(Y/N)* *(<50 ha upstream drainage/>50ha* upstream drainage)* *= Regional Storm Floodplain	Yes	No	Yes	Yes	Yes	Yes	No	No	No	No
FISHERIES REVIEW											
	Fish Habitat	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Timing Window?	June 15 to September 15	June 15 to September 15	June 15 to September 15	June 15 to September 15	June 15 to September 15	June 15 to September 15	June 15 to September 15	June 15 to September 15	June 15 to September 15	June 15 to September 15
EXISTING STRUCTURE DETAILS											
Proponent will fill in	Existing Structure *(L x W x H and type)*										
	Open or Closed Footed?										
	Structural Integrity of Existing Culvert?										
	Hydraulic Capacity of existing structure is (adequate/inadequate) to convey Regional Storm?										
PROPOSED STRUCTURE DETAILS											
Proponent will fill in	Proposed Structure *(L x W x H and type)*										
	Open or Closed Footed?										
	Extension only proposed? *(Y/N)*										
	Removal, Replacement only proposed?										
REQUIREMENTS											
	Hydraulic Analysis Required? *(Y/N)*	Yes	No	Yes	Yes	Yes	Yes	No	No	No	No
	Meander Belt Analysis Required? *(Y/N)*	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
	100-year Erosion Limit Required? *(Y/N)*	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
	Groundwater Upwellings *(will dictate open footed culvert)*	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
	Geotechnical Report Required (to determine if spread footings or piles are needed)?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SUMMARY OF APPROVALS REQUIRED											
TRCA will fill in [redacted]	[redacted] Development permit required? [redacted]	[redacted] Yes [redacted]	[redacted] Yes [redacted]	[redacted] Yes [redacted]	[redacted] Yes [redacted]	[redacted] Yes [redacted]	[redacted] Yes [redacted]	[redacted] Yes [redacted]	[redacted] Yes [redacted]	[redacted] Yes [redacted]	[redacted] Yes [redacted]
	HADD (Y/N/TBD)	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Proponent will fill in	MNR contacted? (PROPONENT WILL FILL IN)Y? N?										
Proponent will fill in	Transport Canada contacted for navigable waterway? (Y/N)										
ADDITIONAL NOTES											
*MNR correspondence provided regarding redside dace. Cold water timing window will apply **The timing window and hydraulic analysis sections have been updated based on new information received. A hydraulic analysis is required for any crossing that has an upstream drainage area greater than 50 ha.								TRCA property located on the east side of The Gore Road	TRCA property located on the west side of The Gore Road		

RE: Caledon Butternut Question
Kevin Butt
to:
Kowalyk, Bohdan (MNR)
10/17/2011 02:34 PM
Show Details

4 Attachments

Tree Pix.pdf BHA retainable tree analysis.pdf Drawing T4 Gore Road Tree Inventory - AA10-57A - 2011-09-07.pdf

BHA Forms 1 and 2.pdf

Bohdan,
As discussed last week, please see the BHA information for the offsite butternut tree. The attached information is:

1) Pictures: Location on a map, and images of the trunk and crown
2) The BHA retainability analysis calculation
3) Forms 1 and 2
4) Drawing T4 that was prepared for the Region (see red notes at lower left hand corner)

The tree circle shown on the plan illustrates the crown reserve (12 metres diameter) of this open grown tree. The tree protection zone distance (protective radius) that has been adopted by all southern Ontario municipalities for this size of tree would be approximately 3 metres from the trunk. I understand the plan shows encroachment into the crown reserve and there is obviously encroachment into the 25m butternut protective radius, but I don't think that this tree will be significantly impacted by the proposed road work. Furthermore, the tree is non-retainable, as is clear in the photos.

I'll send through hard copies of the submission to you this week.

Thanks Bohdan!

Kevin Butt, B.Sc.(Env.), Eco. Rest. Cert. . Terrestrial Ecologist .
ISA Certified Arborist No. ON-0861A
PNWISA Certified Tree Risk Assessor No. 714
Butternut Health Assessor No. 062
ABOUD & ASSOCIATES INC. 591 Woolwich Street . Guelph . Ontario . N1H 3Y5
T:519.822.6839 . F:519.822.4052 www.aboudtng.com . kevin@aboudtng.com

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From: Kowalyk, Bohdan (MNR) [mailto:bohdan.kowalyk@ontario.ca]
Sent: Tuesday, October 11, 2011 11:28 AM
To: Kevin Butt
Subject: RE: Caledon Butternut Question

Kevin,

Send me a map showing the location of the tree and the Region's proposed site alterations, as well as the BHA information and a picture showing the tree condition. If it is clear that the tree is not retainable then it is probably not worth bothering the homeowner unless he/she requests it.

Bohdan Kowalyk, R.P.F.
OMNR Aurora District Forester

905-713-7714

From: Kevin Butt [mailto:Kevin@aboudtng.com]
Sent: Tuesday, October 11, 2011 10:28 AM
To: Kowalyk, Bohdan (MNR)
Subject: Caledon Butternut Question

Bohdan,
I completed a BHA for a tree in Caledon in July as a component of a tree assessment for road upgrade project for the Region of Peel. I wanted to wait to see if there was any proposed encroachment into the 25m protective radius before sending anything to you.

The tree is in really poor shape and not retainable but there is encroachment into the 25m radius. It appeared to be in the Region's right-of-way during the field assessment but the survey pinpoints it in the adjacent private property.

I've got the BHA information I can send you. I don't have any information for the adjacent homeowner. I don't believe there will be impacts to the tree as a result of the road construction.

Question: How should I be reporting this information to you? Just send it all in? Can I alter the BHA letter to address it to the Region rather than try to track down the homeowner?

Thanks for your help Bohdan!

Kevin Butt, B.Sc.(Env.), Eco. Rest. Cert. . Terrestrial Ecologist .
ISA Certified Arborist No. ON-0861A
PNWISA Certified Tree Risk Assessor No. 714
Butternut Health Assessor No. 062
ABOUD & ASSOCIATES INC. 591 Woolwich Street . Guelph . Ontario . N1H 3Y5
T:519.822.6839 . F:519.822.4052 www.aboudtng.com . kevin@aboudtng.com

MTB019424 The Gore Road Materials for Review
Erica Anderson to: SLingertat 11/23/2011 11:45 AM
Cc: sally.rook, Leonard Rach, Doug Keenie, John Velick

Hi Sharon,

To date we have sent you quite a few reports with regard to The Gore Road for the TAC meeting on Tuesday November 29, 2011.

Here is a list of the reports/materials sent to date. We are forwarding a hard copy of the streetscaping to be received tomorrow since the figures are large.

Stage 1 Archaeological Assessment
Tree Inventory
Butternut Health Assessment
Streetscaping
Breeding Bird Survey
Stormwater/Drainage Report
Existing Conditions Background Report - Cultural Heritage
PIC Boards

I have attached a copy of the current design for your review as well prior to the meeting.

111117-Prelim Design Hybrid DS (11x17).pdf

MTB019424 Gore Road Materials for TRCA Review - More Studies

Erica Anderson to: Sharon Lingertat 11/23/2011 09:18 AM

Cc: "Rook, Sally", Leonard Rach, Doug Keenie

Hi Sharon,

I have attached a copy of the PIC boards and the Breeding Bird Study completed for The Gore Road for you review prior to the TAC meeting on Nov 29, 2011.

Could you please confirm receipt of the attachments?

019424_Gore Road Breeding Bird Survey.pdf 019424_Gore Road PIC Boards.pdf

"Sharon Lingertat" Thank you! 10/28/2011 09:48:58 AM

From: "Sharon Lingertat" <SLingertat@trca.on.ca>
To: "Erica Anderson" <Erica.Anderson@rjburnside.com>
Date: 10/28/2011 09:48 AM
Subject: Re: MTB019424 Gore Road Materials for TRCA Review

Thank you!

Thank you,
Sharon Lingertat
Acting Senior Planner, Environmental Assessment Planning
Toronto and Region Conservation Authority
5 Shoreham Drive, Toronto, ON M3N 1S4
Ph: 416-661-6600 x5717
Fax: 416-661-6898
Web: www.trca.on.ca

From: Erica Anderson [Erica.Anderson@rjburnside.com]
Sent: 10/28/2011 09:18 AM AST
To: Sharon Lingertat
Subject: Re: MTB019424 Gore Road Materials for TRCA Review

Hi Sharon,

I will arrange to have it sent out today. Most of the pages are letter size except for the drawings provided in the Tree Inventory.

BURNSIDE

Erica Anderson, B.Sc. (Env.)
Environmental Assessment Specialist

R.J. Burnside & Associates Limited
292 Speedvale Avenue West, Unit 20
Guelph, Ontario N1H 1C4
Erica.Anderson@rjburnside.com
tel: 519-823-4995 x465
fax: 519.836.5477
www.rjburnside.com

From: Sharon Lingertat <SLingertat@trca.on.ca>
To: "Erica Anderson (via Thru)" <Erica.Anderson@rjburnside.com>
Date: 10/28/2011 09:16 AM
Subject: Re: MTB019424 Gore Road Materials for TRCA Review

Hi Erica,

Can you please send me a hard copy of the information you need for us to review.

Thank you,
Sharon Lingertat
Acting Senior Planner, Environmental Assessment Planning
Toronto and Region Conservation Authority
5 Shoreham Drive, Toronto, ON M3N 1S4
Ph: 416 661-6600 ext. 5717
Fax: 416-661-6898
Web: www.trca.on.ca

"Erica Anderson (via Thru)" <Erica.Anderson@rjburnside.com>

10/27/2011 11:03 AM

To slingertat@trca.on.ca
cc
Subject MTB019424 Gore Road Materials for TRCA Review

This email includes secure access to files: Access Secured R.J. Burnside Files Here*- Expires Friday 11/4/2011 3:59 AM (UTC)*

* If the link above does not work, copy the following URL to a web browser:
https://files.rjburnside.com/ExDn.aspx?id=027OH8SC5MW

Hi Sharon,

I have attached copies of the Tree Inventory and Butternut Health Assessment documents, Stage 1 Archaeological Assessment, and Cultural Heritage Evaluation Report,for your review. As requested if you could have comments back by November 29th or provide them at the TAC meeting.

Other message recipients:
From: Erica.Anderson@rjburnside.com
To: slingertat@trca.on.ca

Cc: sally.rook@peelregion.ca, doug.keenie@rjburnside.com, leonard.rach@rjburnside.com

Reply To All

Thru Tracking: T478-027-79122-91442

www.thruinc.com

*"*PLEASE CONSIDER THE ENVIRONMENT WHEN DECIDING TO PRINT THIS MESSAGE**

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Thank you."

FW: Highway 9/The Gore Road
Rook, Sally
to:
Ganesh, Steve, 'Leonard Rach', 'Erica Anderson'
11/30/2011 12:18 PM
Show Details

FYI

Sally Rook PMP | Technical Analyst
Transportation Program Planning | Public Works
Region of Peel | 10 Peel Centre Dr., Suite B, 4th Floor, Brampton ON L6T 4B9
Tel. 905-791-7800 ext. 7842

REGION OF PEEL ■■■ working for you

From: Dow, Tammy [mailto:Tammy.Dow@hdrinc.com]
Sent: November 30, 2011 10:33 AM
To: Rook, Sally; Kam, Alice (MTO)
Cc: Arcaro, Joseph
Subject: RE: Highway 9/The Gore Road

Good morning Sally,

I apologize for not getting back to you sooner. We have not identified a preferred alternative for the Highway 9/Peel Road 8 (The Gore Road)/Concession 3 intersection. Based on our revised project schedule, the preferred alternative for this intersection will not be selected until the new year (February/March). If the project schedule is revised and the preferred alternative is selected prior to the end of January, I will pass that information onto you.

Best regards,
Tammy

TAMMY DOW
M.SC.E., P.ENG., CVS

HDR Corporation
Project Manager

231 Shearson Crescent, Suite 206 | Cambridge, ON N1T 1J5
t: 519-621-7886 ext. 5956 | c: 519-777-0985
tammy.dow@hdrinc.com | hdrinc.com
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From: Rook, Sally [mailto:Sally.Rook@peelregion.ca]
Sent: Wednesday, November 16, 2011 12:55 PM
To: Dow, Tammy
Subject: Highway 9/The Gore Road

Hi Tammy,

Just looking for an update on the Hwy 9/The Gore Road intersection EA/improvements. Have you identified your preferred solution yet? I know you received our latest design, I had asked my consultant RJ Burnside to hold off on anything at the intersection and await your results but we are coming up to our PIC (end of January) and it would be good to at least outline what the plans for this intersection are.

Thanks,

Sally Rook PMP | Technical Analyst
Transportation Program Planning | Public Works
Region of Peel | 10 Peel Centre Dr., Suite B, 4th Floor, Brampton ON L6T 4B9
Tel. 905-791-7800 ext. 7842

Fw: The Gore Road
Sharon Lingertat
to:
Rook, Sally
12/01/2011 11:18 AM
Cc:
Erica.Anderson
Show Details

I also have the geotech reports which will be circulate for review and comment!

----- Forwarded by Sharon Lingertat/MTRCA on 12/01/2011 11:18 AM -----

Sharon Lingertat/MTRCA

12/01/2011 11:14 AM

To "Rook, Sally" <Sally.Rook@peelregion.ca>
cc
Subject The Gore Road

Hi Sally,

I've now received the following information:

- Tree Inventory Plans (T1 to T5)
- Butternut Assessment
- Tree Assessment

(reviewed by our ecologist - comments to follow)

- SWM report
- Preliminary property requirements
- Model
- PIC boards

(under review by engineering)

- Landscape Plans
- Bird Survey

(I'd like to hold off on circulating this to the ecologist until the wetland/list of tree removals assessment is ready so that he can review together)

- Archaeology Stage 1 Report

(I will hold off on circulating to Archaeology as we are unsure as to whether our lands will be impacted and how much - once this information is received I'll be in a position to send this over to them)

Please give me a call if you have any questions or would like to discuss.

Thank you,
Sharon Lingertat
Acting Senior Planner, Environmental Assessment Planning
Toronto and Region Conservation Authority
5 Shoreham Drive, Toronto, ON M3N 1S4
Ph: 416 661-6600 ext. 5717
Fax: 416-661-6898
Web: www.trca.on.ca

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Thank you."

FW: The Gore Road Improvements from Patterson Side Road to Highway 9 Class EA
Rook, Sally
to:
Erica Anderson
12/17/2010 11:14 AM
Cc:
'Leonard Rach'
Show Details

History: This message has been replied to.

FYI

Sally Rook PMP
Acting Project Manager
Public Works, Transportation
The Region of Peel
905-791-7800 ext. 7842
rooks@peelregion.ca

From: HanmengJen.Long@HydroOne.com [mailto:HanmengJen.Long@HydroOne.com]
Sent: December 17, 2010 10:49 AM
To: Rook, Sally
Cc: Leslie.Koch@HydroOne.com; ierullo@HydroOne.com
Subject: The Gore Road Improvements from Patterson Side Road to Highway 9 Class EA

Dear Ms. Rook,

In our initial review, we can confirm that there are no Hydro One Transmission Facilities in the subject area.

Please be advised that this is only a preliminary assessment based on current information. No further consultation with Hydro One Networks Inc. is required if no changes are made to the current information.

If you have any further questions or concerns, please feel free to contact me.

Regards,

Jen Long
Transmission Lines Sustainment
System Investment, Asset Management
Hydro One Networks Inc.
Tel: 416-345-4421
HanmengJen.Long@HydroOne.com

TORONTO AND REGION **Conservation** for The Living City

December 19, 2011 CFN 43948

BY MAIL AND EMAIL (Sally.Rook@peelregion.ca)

Ms. Sally Rook
Regional Municipality of Peel
10 Peel Centre Drive, Suite B, 4th Floor
Brampton, ON L6T 4B9

Dear Ms. Rook:

Re: **Response to Background Report Submissions**
The Gore Road Improvements (Patterson Side Road to Highway 9)
Municipal Class Environmental Assessment (EA) - Schedule B
Humber River Watershed; Town of Caledon; Regional Municipality of Peel

Toronto and Region Conservation Authority (TRCA) staff met Region of Peel and consulting staff on site in June 2011 to identify watercourses and wetlands within the study area (10 areas identified). Staff has since received the documents listed below for review. Based on this information it is our understanding that all culverts will need to be replaced, with the exception of the culvert at crossing N3 which will be cleaned out and extended. Detailed comments are provided in Appendix A.

Received October 31, 2011
- Butternut Tree Assessment; dated August 30, 2011
- Tree Assessment Methodology and Appendices
- Drawings T1 to T5 – Gore Road Tree Inventory; dated September 2011

Received November 15, 2011
- Stormwater Management Report; dated November 2011

Received November 16, 2011
- SWMHYMO and HY-8 Models

Received November 17, 2011
- Plan and Profile Drawings (showing property requirements)

Received November 29, 2011
- Report on the Stage 1 Archaeological Assessment of The Gore Road; dated March 28, 2011
- Interim Report: Existing Conditions: Built Heritage & Cultural Heritage Landscapes; dated May 2011
- Drawings L1 to L6 – Tree Preservation, Preliminary Landscape, Restoration Plans; dated November 2011
- Public Information Centre (PIC) Boards
- The Gore Road Breeding Bird Survey; dated November 2011
- Geotechnical Investigation; dated May 2011
- Background information related to the EA was also received

Comments provided in this letter are based on information received between October 31, 2011 and November 17, 2011. As noted in email correspondence dated December 1, 2011, review of the remaining items will be held until a complete submission is received as it is our understanding, based on the meeting held on November 29, 2011 with the Region and consultant, that further information regarding impacts to wetlands, watercourses and loss of vegetation will be provided. It was also noted during that meeting that details regarding TRCA property impacts will follow. Once the additional items are provided I will be in a position to circulate the items received on November 29, 2011 to ecology and archaeology staff. It should also be noted that comments will be provided under separate cover for the geotechnical report as this is currently under review by technical staff.

Should you have any questions, please contact me at extension 5717 or by email at slingertat@trca.on.ca.

Yours truly,

Sharon Lingertat

Sharon Lingertat
Acting Senior Planner, Environmental Assessment Planning
Planning and Development

Encl: Application for Permission to Enter TRCA Property

BY EMAIL

cc: Consultant: Erica Anderson (Erica.Anderson@rjburnside.com)
TRCA: Beth Williston, Senior Manager, Environmental Assessment Planning
Quentin Hanchard, Senior Manager, Development, Planning and Regulation
Gary Wilkins, Humber River Watershed Specialist
Edlyn Wong, Real Estate Coordinator
Margie Kenedy, Acting Archaeologist

F:\Letters for Mailing\43948 – Ecology and Engineering

APPENDIX A: TRCA COMMENTS

ITEM	TRCA COMMENTS (December 19, 2011)	RESPONSE
Stormwater Management (SWM)		
1.	TRCA staff noted within the SWM report (section 3.6) the 2 to 100-year storm flows where calculated using the SCS type II and Chicago storm distribution which is a standard practice. However, the approved Humber River Hydrology report and modeling prepared by Aquafor Beech (November 2002) was completed using the 6 and 12-hour AES storm distribution. As such, the hydrology modeling submitted for review must utilize the same storm distribution. Please update the hydrologic model and select the most conservative flows in the analysis. The Region may obtain the AES storm distribution files by contacting Jairo Morelli at jmorelli@trca.on.ca. The hydrology modeling will be reviewed further, with the next submission. Please provide a digital copy of the updated SWMHYMO model with the next submission along with a hard copy as the one presented in Appendix A.	
2.	A hydraulic assessment for existing and post-development conditions is required to ensure there is no impact to the Regional Floodplain both upstream and downstream of crossings. For small tributary areas it will not be necessary to provide this level of detail. However, this is required in areas such as culverts 1352, 1355, and N3 as we require the Region to demonstrate that no adverse impact would result in private property, as a result of the proposed works. To obtain a copy of the hydraulic modeling for culverts 1352, 1355 and N3 please contact Jairo Morelli at jmorelli@trca.on.ca.	
3.	While the use of road side swales for stormwater quality control is an acceptable approach, please note that water quality treatment measures for all roadway areas should provide a minimum "enhanced" treatment according to Ministry of the Environment (MOE) standards. Even though there will be no increase in the number of travel lanes, the widening of the road deck may result in a significant increase in paved area. Runoff from certain areas may not receive adequate water quality treatment through vegetation (especially those where semi-urban road sections are proposed) as water flows overland to the Humber River. The EA should discuss the type and extent of measures proposed. Please provide flat bottomed grass swales, where feasible.	
4.	Section 6.0 of the SWM report indicates that slight increases to the road deck elevation are proposed at crossings 1352, 1353, 1354, 1355 and N3, but that these changes are not significant enough to have a major impact on existing flood elevations. Please provide details on the methodologies that were used to assess the impact on water surface elevations upstream and downstream of the above mentioned crossings.	
5.	It should be noted that where culverts are proposed to be replaced, and the existing water features have been identified as being watercourses by TRCA staff, we typically require that the replacement crossing span the meander belt width or the 100-year erosion limit of the watercourse. Further morphology assessment is required to determine the type/size/span of the replacement structure at crossing 1352. Please conduct a fluvial geomorphic study and submit it to TRCA staff for review.	

ITEM	TRCA COMMENTS (December 19, 2011)	RESPONSE
6.	Please clarify the source of the Regional flow rate provided in Table 1 of the SWM report. While the table presents a flow of 32.40m^3/s (TRCA flow), the regional flow as derived from the current TRCA watershed model at the crossing near Finnerty Road is 38.28 m^3/s. Please contact Jairo Morelli at jmorelli@trca.on.ca to acquire flow rate information and associated hydraulic modeling.	
7.	It is noted on some stretches of the proposed roadway that the side slopes of the roadside drainage ditches will extend past the property limits for the roadway allowance. Please indicate whether the Region intends to acquire all property and what contingencies are being considered should permission to grade on existing properties not be forthcoming.	
8.	Please ensure that where the proposed reconstruction crosses a watercourse, the sediment and erosion controls are adequate enough to insure that maximum watercourse protection is achieved. Please make reference to the TRCA's Erosion and Sediment Control Guidelines for Urban construction (available at www.sustainabletechnolgies.ca) and indicate that the criteria contained within that guideline will be applied. At the detailed design stage, plans will need to indicate which erosion and sediment control techniques will be used on site.	
9.	The EA should include a table that clearly identifies sizes for existing culverts/bridges, proposed sizes for any extensions or replacements and a map that shows the locations of those crossings. The map and table should clearly correspond with those watercourses and wetlands identified on site, within the TRCA regulated areas.	
Natural Features		
10.	At this time staff has no comments on the arborist report, tree assessment and tree inventory. However, a more complete submission is required which identifies the natural features impacted as a result of the proposed works (road and grading). The report should identify and quantify the vegetation needed to be removed and wetland area(s) lost. The report should also identify impacts to watercourses as a result of the works. A comprehensive restoration plan will be required at the detailed design stage.	
Property Requirements		
11.	It is unclear whether TRCA lands will be impacted as a result of the proposed works. Please provide details showing property impacts (i.e., distance requirements into the property from the existing paved road and area). Should TRCA property be required (for the road work, access, grading) TRCA Archaeology staff will need to complete the investigations on our lands. The application is enclosed for your reference. It should also be noted that a separate fee will be charged for those investigations, as per the application. Our archaeologists have tentatively scheduled investigations for next spring 2012, should they be required. The archaeology and cultural heritage report provided on November 29, 2011 will be provided for review to our staff once confirmation of property requirements is provided.	
12.	In several locations it appears that a significant amount of property will need to be acquired . Please minimize grading limits to the extent possible. It would also be helpful to show the proposed grading and property requirements on a map that contains an ortho layer to clearly depict the natural heritage features.	

TORONTO AND REGION Conservation for The Living City

FOR OFFICE USE ONLY	MoC #: ____________
Arch CFN: ____________	Arch Contact: ____________
Prop CFN: ____________	Prop Contact: ____________
Plan CFN: ____________	Plan Contact: ____________

APPLICATION FOR PERMISSION TO ENTER TRCA PROPERTY

Please read, complete each section, date and sign this application

20.01.10

Project Description			
Project Name:			
Project Location (address):			
Nearest Major Intersection:			
Regional Municipality:		**Local Municipality:**	
Proposed Construction Start Date:			
Description of Proposed Work:			
Project Type:	**Project Works**(e.g., road widening, storm water management facility) *NOTE: TRCA Archaeological Investigation required – see page 3*	☐	
	Site Testing (e.g., environmental tests, boreholes) *NOTE: TRCA Archaeological Investigation may be required – see page 3*	☐	
	Site Reconniassance or Survey (e.g., no site disturbance required) *NOTE: TRCA Archaeological Investigation not required*	☐	

***Compensation:** Compensation for the use of TRCA land will be negotiated with the proponent by the TRCA Planning and Development Division, in consultation with the TRCA Property Department, through the commenting process established for applications submitted under the Planning Act, Environmental Assessment Act or Ontario Regulation 166/06, as appropriate.*

Proponent			
Contact Name:			
Organization:			
Mailing Address:		**Postal Code:**	
Phone # (bus):		**Phone # (cell):**	
Fax #:		**Email:**	

Consultant/Agent			
Contact Name:			
Company Name:			
Mailing Address:		**Postal Code:**	
Phone # (bus):		**Phone # (cell):**	
Fax #:		**Email:**	

Please complete, sign and return pages 1 and 2 of this application

Submission Requirements		
Requirement	**Detail**	**Encl.**
Application Form	Completed and Signed by Proponent (2 pages) Three (3) copies required	☐
Review fees (payable to *Toronto and Region Conservation Authority*)	**Project Type:** 1. Project Works: $5800 plus GST *(as of July 1, 2010 HST will be charged)* 2. Site Testing: to be determined in consultation with the TRCA Archaeologist *Review fees are charged in accordance with the TRCA Fee Schedule for Archaeological Investigations (page 3 of this application form). The TRCA GST# is* 108088584 RT0001.	☐
Plans	Three (3) hard copies and a digital .pdf or .tif copy of a plan or plans, showing:	☐
	a key map for the general location of the proposed works	☐
	topographical information	☐
	road names	☐
	landmarks (houses, fences, etc.)	☐
	natural features (woodlots, watercourses, wetlands, etc.)	☐
	TRCA property boundary	☐
	municipal property boundary	☐
	other property boundaries and ownership details	☐
	proposed construction limit	☐
	proposed project (including staging, storage and	☐
Submit application and review fees to:	Planning and Development Division *Toronto and Region Conservation Authority* *Planning and Development* *5 Shoreham Drive, Downsview, ON M3N 1S4*	

Signature of Proponent:	**Date:**

Please complete, sign and return pages 1 and 2 of this application

Fee Schedule for Archaeological Investigations

In accordance with provisions in the Conservation Authorities Act, all works on TRCA's lands require an archaeological investigation by ***TRCA's Archaeologist****. TRCA's comprehensive watershed strategies recommend that heritage resources in the watershed be protected in accordance with Ministry of Culture's standards. The TRCA watershed strategies are available on our website at www.trca.on.ca.*

A review fee is required to further process your archaeological application. A site visit will be scheduled upon receipt. Please note that archaeological investigations are subject to weather conditions, seasonal conditions and scheduling. Following fieldwork, a report will be sent to the Ministry of Culture (see below). Construction activities MAY NOT occur prior to receipt of Ministry of Culture concurrence with the report recommendations by the TRCA's Archaeologist (as per Part VI of the Ontario Heritage Act). Note: Formal approval may take 12 to 18 months. It is the responsibility of the proponent through the public consultation requirements of the EA process to undertake First Nations consultation. TRCA Archaeologists may also be required to consult directly with relevant descendant populations depending upon the results of the fieldwork.

Type of Assessment	Tasks Required[1]	Fee
Stage 1 - Evaluation of Archaeological Potential	1. project set-up (plan review, meetings, emails, phone correspondences) 2. property inspection 3. background study (review of geographic, land use, historical information) 4. report of Stage 1 findings, including recommendations for assessment strategies if applicable	$5800 plus *GST (as of July 1, 2010 HST will be charged)* *GST#* 108088584 RT0001
Stage 2 - Property Assessment[2]	1. review of Stage 1 report 2. fieldwork survey of the entire subject property 3. report of Stage 2 findings, including recommendations for specific investigations of heritage resources 4. long-term duration of artifacts and project documentation	
Stage 3 - Site-Specific Assessment[3]	1. investigation of areas containing heritage resources to determine site character 2. report of Stage 3 findings, including discussions for mitigation strategies with the proponent, the Ministry and local or descendant communities (tends to create a pause between Stage 3 and Stage 4)	TBD**
Stage 4 - Mitigation of Development Impacts[3]	1. development of long-term protection strategies or complete site excavation and documentation within the project area and/or monitoring 2. report of Stage 4 excavation	TBD**
Stage 2, 3 or 4 – Protection of Artifacts	1. long-term storage of artifacts 2. education and outreach 3. provision of access to descendant peoples	TBD***

1 As per the current Ministry of Tourism and Culture's Standards and Guidelines for Consulting Archaeologists."
2 *If required – Stage 1 work may determine that the subject property has been too greatly impacted to contain archaeological and/or built heritage resources.*
3 *If required – Stage 2 fieldwork may determine that no archaeological or built heritage resources will be impacted by the proposed change in land use or construction program.*
* *Additional fees will be applied for large or complex projects that require more than standard Stage 1 work.*
** *Stage 2, 3 and 4 fees to be determined and discussed with the proponent prior to the initiation of fieldwork. Interim invoices will be issued for these additional fees, as required.*
*** *Additional fees to be determined and discussed with the proponent if artifacts are found during Stage 2, 3 or 4 investigations*

TORONTO AND REGION **Conservation**

for The Living City

January 4, 2012 CFN 43948

BY MAIL AND EMAIL (Sally.Rook@peelregion.ca)

Ms. Sally Rook
Regional Municipality of Peel
10 Peel Centre Drive, Suite B, 4th Floor
Brampton, ON L6T 4B9

Dear Ms. Rook:

Re: Response to Geotechnical Investigations
The Gore Road Improvements (Patterson Side Road to Highway 9)
Municipal Class Environmental Assessment (EA) - Schedule B
Humber River Watershed; Town of Caledon; Regional Municipality of Peel

Toronto and Region Conservation Authority (TRCA) staff received the Geotechnical Investigation Report dated May 2011, on November 29, 2011. It is our understanding that there is the potential for significant groundwater dewatering in certain areas where excavation is required and that it is recommended to remove all vegetation, peat, topsoil and deleterious materials in areas where backfilling is required.

Staff has reviewed the above-noted report and potential hydrogeology issues will need to be resolved at the detailed design stage. Design cross-sections and bridge/culvert crossing details will also be required for final geotechnical signoff. In addition, impacts to adjacent natural features (i.e., wetlands, vegetation) will need to be mitigated. Details of those measures should be noted in the Environmental Assessment report and will also need to be addressed at the design stage.

Should you have any questions, please contact me at extension 5717 or by email at slingertat@trca.on.ca.

Yours truly,

Sharon Lingertat

Sharon Lingertat
Acting Senior Planner, Environmental Assessment Planning
Planning and Development

BY EMAIL

cc: Consultant:	Erica Anderson (Erica.Anderson@rjburnside.com)
TRCA:	Beth Williston, Senior Manager, Environmental Assessment Planning
	Quentin Hanchard, Senior Manager, Development, Planning and Regulation
	Gary Wilkins, Humber River Watershed Specialist

F:\Letters for Mailing\43948 – Geotech.doc

RE: MTB019424 Gore Road EA Forestry Tax Incentive Program
Kowalyk, Bohdan (MNR)
to:
Erica Anderson
01/05/2012 11:10 AM
Cc:
"Leonard Rach"
Show Details

History: This message has been replied to and forwarded.

1 Attachment

image001.gif

Hello Erica,

Information on the Managed Forest Tax Incentive Program is available at:
http://www.mnr.gov.on.ca/en/Business/Forests/2ColumnSubPage/STEL02_166346.html.

There is only one area threshold and that is 4 hectares (9.88 acres) of forest which excludes buildings. A managed forest plan approver is required to approve a plan.

If there are any questions, let me know.

Regards,

Bohdan Kowalyk, R.P.F.
OMNR Aurora District Forester
905-713-7714

From: Erica Anderson [mailto:Erica.Anderson@rjburnside.com]
Sent: Thursday, January 05, 2012 10:08 AM
To: Kowalyk, Bohdan (MNR)
Cc: Leonard Rach
Subject: MTB019424 Gore Road EA Forestry Tax Incentive Program

Happy New Year Bohdan,

I was wondering if you could point me in the right direction. I am looking for more information on the Tax Incentive Program for Privately managed forested areas. Specifically I was wondering if there are tax incentive brackets based on acreage of forested areas managed by private land owners. If so, what are the different acreage requirements for the tax incentive brackets?

BURNSIDE

Erica Anderson, B.Sc. (Env.)
Environmental Assessment Specialist

R.J. Burnside & Associates Limited
292 Speedvale Avenue West, Unit 20
Guelph, Ontario N1H 1C4
Erica.Anderson@rjburnside.com
tel: 519-823-4995 x465
fax: 519.836.5477
www.rjburnside.com

Fw: Gore Road EA - Utility Meeting (MTB019424)
Leonard Rach to: Erica Anderson 01/13/2012 12:07 PM

fyi
----- Forwarded by Leonard Rach/RJB on 01/13/2012 12:07 PM -----

From:	John Velick/RJB
To:	colleen.murphy@bell.ca, sally.rook@peelregion.ca
Cc:	Doug Keenie/RJB@RJB, Leonard Rach/RJB@RJB
Date:	01/13/2012 12:03 PM
Subject:	Re: FW: Gore Road EA - Utility Meeting (MTB019424)

Colleen

This email is to summarise our telephone conversation held on January 13, 2012:

- Bell has no future plans to upgrade their plant along the Gore Rd corridor
- Bell has both buried and aerial lines along the corridor
- Bell's infrastructure is in conflict with the Region's proposed road works and will require relocation
- Bell's infrastructure is minor in nature and relocation should be straightforward
- The EA is expected to close in March 2012 with construction in 2014

Thank for your input.

John

"colleen.murphy@bell.ca" Hi John, I will be unable to attend this m... 01/10/2012 07:58:52 AM

From:	"colleen.murphy@bell.ca" <colleen.murphy@bell.ca>
To:	"'John.Velick@rjburnside.com'" <John.Velick@rjburnside.com>
Date:	01/10/2012 07:58 AM
Subject:	FW: Gore Road EA - Utility Meeting (MTB019424)

Hi John,
I will be unable to attend this meeting however I will be the Bell Canada representative for the project. If you could let me know the possible timing for the project it would be greatly appreciated.

Thank you in advance,

Colleen Murphy
Bell Canada
Access Network Provisioning
444 Millard Avenue Flr2
Newmarket On
L3Y 2A3
Telephone: 905-853-4043
Fax: 905-895-3872
From: Lefebvre, Wendy L (N027081)
Sent: January 3, 2012 2:41 PM
To: Marshall, Maureen (N330289)
Subject: FW: Gore Road EA - Utility Meeting (MTB019424)

Does Newmarket do this portion of the Gore Rd?

Best Regards,

Wendy Lefebvre
PH: (705) 722-2467
CELL: (705) 794-8599
email: wendy.lefebvre@bell.ca
Bell

From: John Velick [mailto:John.Velick@rjburnside.com]
Sent: January 3, 2012 2:18 PM
To: Diana.Beaulne@enbridge.com; edgar.henriquez@rci.rogers.com; hitesh.topiwala@peelregion.ca; peter.hatziioannou@hydroOne.com; sally.rook@peelregion.ca; Moon, Scott (P020131); Lefebvre, Wendy L (N027081)
Cc: File Collingwood
Subject: Gore Road EA - Utility Meeting (MTB019424)

Good afternoon,

On behalf of the Region of Peel, R.J. Burnside & Associates is undertaking a Schedule B Environmental Assessment for The Gore Road, from Patterson Side Road to Highway 9 (see attached Key Plan).

The purpose of this e-mail is to invite you to an information meeting where we can apprise you of the project details and you can voice your comments regarding any relevant issues that you suggest should be identified.

A preliminary design has been completed and is attached. In general, the work will involve:

- Reconstruction of the existing road along the existing horizontal alignment
- Altering the vertical alignment to improve safety
- The intersection at The Gore Raod and Highway 9 is not part of this project as it is currently being reviewed under a separate EA by MTO.
-

At this time, you may wish to review the need for changes or upgrades to your plant in this corridor and if any are required, consider carrying out the work in advance or as part of the Region`s project.

Please let me know if you are available to attend. Your assistance is greatly appreciated.

Meeting Details:
January 24, 2012, 1:00PM - 3:30PM
10 Peel Centre Dr., Suite B, 4th Floor, Room 911, Brampton

Kind Regards,

John

John Velick
Project Engineer

R.J. Burnside & Associates Limited
3 Ronell Crescent
Collingwood, Ontario L9Y 4J6
John.Velick@rjburnside.com
tel: 705.446.0515 x423
fax: 705.446.2399
www.rjburnside.com

[attachment "Gore Rd - Design.pdf" deleted by John Velick/RJB] [attachment "KEY MAP.jpg" deleted by John Velick/RJB]

Fw: Gore Rd - Hydro One (MTB019424)

Leonard Rach to: Erica Anderson 01/16/2012 10:03 AM

fyi

----- Forwarded by Leonard Rach/RJB on 01/16/2012 10:03 AM -----

From: John Velick/RJB
To: Doreen.Stermann@HydroOne.com, sally.rook@peelregion.ca
Cc: Leonard Rach/RJB@RJB, Doug Keenie/RJB@RJB, File Collingwood/RJB@RJB
Date: 01/16/2012 10:00 AM
Subject: Gore Rd - Hydro One (MTB019424)

Doreen

This email is to summarize for the Region our telephone conversation held on January 16, 2012:

- Hydro One has no future plans to upgrade it's network along the proposed Gore Rd corridor
- Hydro One is in the process of marking up drawings showing its existing plant
- Burnside noted that the project is still in the EA/Preliminary Design phase, and as such, Letters 4 and 5 would be forwarded later, during detail design. Hydro One noted that a meeting would not be necessary until detail design..
- Hydro One noted that, to be conservative, the Region should allow up to one year for Hydro One to develop a relocation design

Thank for your input.

John

Re: Gore Road EA - TRCA Impacts (MTB019424)
Sharon Lingertat
to:
John Velick
01/26/2012 01:55 PM
Cc:
Doug Keenie, Erica Anderson, File Collingwood, Leonard Rach, sally.rook
Show Details

Hi John,

Thanks for the revised property requirements. It looks like you'll need some land, particularly on the east side. Please clarify why the road must extend so far into the property (and wetland) at this location when the property acquisition requirements seem to narrow just to the north of TRCA land?

As noted in previous correspondence, our archaeology and property departments will need to be involved. Comments were also provided in a letter dated December 19, 2011 regarding minimizing the grading, property requirements to the extent possible. Will a response to those comments (i.e., rationale for the property requirements) be provided along with a submission of the other outstanding items for review?

Thank you,
Sharon Lingertat
Acting Senior Planner, Environmental Assessment Planning
Toronto and Region Conservation Authority
5 Shoreham Drive, Toronto, ON M3N 1S4
Ph: 416 661-6600 ext. 5717
Fax: 416-661-6898
Web: www.trca.on.ca

John Velick <John.Velick@rjburnside.com>

01/16/2012 10:07 AM

To SLingertat@trca.on.ca
cc Leonard Rach <Leonard.Rach@rjburnside.com>, sally.rook@peelregion.ca, Erica Anderson <Erica.Anderson@rjburnside.com>, Doug Keenie <Doug.Keenie@rjburnside.com>, File Collingwood <FileCollingwood@rjburnside.com>
Subject Gore Road EA - TRCA Impacts (MTB019424)

Hi Sharon

I’ve attached our latest preliminary design drawings for the Gore Rd. Pages P12-P15 show impacts to TRCA lands.

Thanks

John

John Velick
Project Engineer

R.J. Burnside & Associates Limited
3 Ronell Crescent
Collingwood, Ontario L9Y 4J6
John.Velick@rjburnside.com
tel: 705.446.0515 x423
fax: 705.446.2399
www.rjburnside.com

[attachment "Gore Rd - Preliminary Design.pdf" deleted by Sharon Lingertat/MTRCA]

Re: Gore Road EA - TRCA Impacts (MTB019424)
John Velick to: SLingertat, Erica Anderson 01/31/2012 10:19 AM
Cc: Leonard Rach, Doug Keenie, File Collingwood, sally.rook

Hi Sharon

Property requirements in this area (approx. Sta 3+540-3+640) extend quite far due to the large fill embankment. The cross section on sheet P13 of the design drawings illustrates this. The proposed design minimizes property impacts in this area by:

- Ensuring that the road isn't built any higher than it already is by following the existing road profile. The higher the road the bigger the impact.
- Using the maximum allowable side slopes of 2:1 as recommended in the geotech report. Any steeper and the embankment would become unstable.

Impacts north of this section narrow because the road enters a cut section, where curb and gutter is used. Curb and gutter reduces impacts in cut areas by eliminating the need for ditches. There would be no benefit using them in the fill areas to the south.

Please note that exact impacts will be determined during detail design.

Erica will incorporate the above in her responses to TRCA`s letter dated December 19, 2011, along with the other outstanding items.

John

Sharon Lingertat Hi John, Thanks for the revised property require... 01/26/2012 01:55:27 PM

From: Sharon Lingertat <SLingertat@trca.on.ca>
To: John Velick <John.Velick@rjburnside.com>
Cc: Doug Keenie <Doug.Keenie@rjburnside.com>, Erica Anderson <Erica.Anderson@rjburnside.com>, File Collingwood <FileCollingwood@rjburnside.com>, Leonard Rach <Leonard.Rach@rjburnside.com>, sally.rook@peelregion.ca
Date: 01/26/2012 01:55 PM
Subject: Re: Gore Road EA - TRCA Impacts (MTB019424)

Hi John,

Thanks for the revised property requirements. It looks like you'll need some land, particularly on the east side. Please clarify why the road must extend so far into the property (and wetland) at this location when the property acquisition requirements seem to narrow just to the north of TRCA land?

As noted in previous correspondence, our archaeology and property departments will need to be involved. Comments were also provided in a letter dated December 19, 2011 regarding minimizing the grading, property requirements to the extent possible. Will a response to those comments (i.e., rationale for the property requirements) be provided along with a submission of the other outstanding items for review?

Thank you,
Sharon Lingertat
Acting Senior Planner, Environmental Assessment Planning
Toronto and Region Conservation Authority

5 Shoreham Drive, Toronto, ON M3N 1S4
Ph: 416 661-6600 ext. 5717
Fax: 416-661-6898
Web: www.trca.on.ca

John Velick <John.Velick@rjburnside.com>	To	SLingertat@trca.on.ca
	cc	Leonard Rach <Leonard.Rach@rjburnside.com>, sally.rook@peelregion.ca, Erica Anderson <Erica.Anderson@rjburnside.com>, Doug Keenie <Doug.Keenie@rjburnside.com>, File Collingwood <FileCollingwood@rjburnside.com>
01/16/2012 10:07 AM	Subject	Gore Road EA - TRCA Impacts (MTB019424)

Hi Sharon

I've attached our latest preliminary design drawings for the Gore Rd. Pages P12-P15 show impacts to TRCA lands.

Thanks

John

BURNSIDE

John Velick
Project Engineer

R.J. Burnside & Associates Limited
3 Ronell Crescent
Collingwood, Ontario L9Y 4J6
John.Velick@rjburnside.com
tel: 705.446.0515 x423
fax: 705.446.2399
www.rjburnside.com

immediately.

Thank you.

**[attachment "Gore Rd - Preliminary Design.pdf" deleted by Sharon Lingertat/MTRCA]

Re: Gore Road EA - TRCA Impacts (MTB019424)
Sharon Lingertat
to:
John Velick
02/01/2012 10:50 AM
Cc:
Doug Keenie, Erica Anderson, File Collingwood, Leonard Rach, sally.rook, Margie Kenedy, Brennan Paul
Show Details

Hi John,

Thanks for the clarification.

As you know, additional property requirements will need to go through our property section and will require investigations by our archaeologists. In addition, wetlands appear to be located within these specific areas, so staff will need an analysis of the natural features impacted and wetland areas/habitat lost (all of which will need to be considered in the EA and the restoration plans, as noted in previous correspondence). Once the Region has confirmed property requirements, we will need the area staked so that archaeology can begin their work.

We look forward to receiving additional information through the EA as it becomes available.

Thank you,
Sharon Lingertat
Acting Senior Planner, Environmental Assessment Planning
Toronto and Region Conservation Authority
5 Shoreham Drive, Toronto, ON M3N 1S4
Ph: 416 661-6600 ext. 5717
Fax: 416-661-6898
Web: www.trca.on.ca

John Velick <John.Velick@rjburnside.com>

01/31/2012 10:19 AM

To SLingertat@trca.on.ca, Erica Anderson <Erica.Anderson@rjburnside.com>
cc Leonard Rach <Leonard.Rach@rjburnside.com>, Doug Keenie <Doug.Keenie@rjburnside.com>, File Collingwood <FileCollingwood@rjburnside.com>, sally.rook@peelregion.ca
Subject Re: Gore Road EA - TRCA Impacts (MTB019424)

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Impacts north of this section narrow because the road enters a cut section, where curb and gutter is used. Curb and gutter reduces impacts in cut areas by eliminating the need for ditches. There would be no benefit using them in the fill areas to the south.

Please note that exact impacts will be determined during detail design.

Erica will incorporate the above in her responses to TRCA`s letter dated December 19, 2011, along with the other outstanding items.

John

BURNSIDE

John Velick
Project Engineer

R.J. Burnside & Associates Limited
3 Ronell Crescent
Collingwood, Ontario L9Y 4J6
John.Velick@rjburnside.com
tel: 705.446.0515 x423
fax: 705.446.2399
www.rjburnside.com

From: Sharon Lingertat <SLingertat@trca.on.ca>
To: John Velick <John.Velick@rjburnside.com>
Cc: Doug Keenie <Doug.Keenie@rjburnside.com>, Erica Anderson <Erica.Anderson@rjburnside.com>, File Collingwood <FileCollingwood@rjburnside.com>, Leonard Rach <Leonard.Rach@rjburnside.com>, sally.rook@peelregion.ca
Date: 01/26/2012 01:55 PM
Subject: Re: Gore Road EA - TRCA Impacts (MTB019424)

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Thank you,

Sharon Lingertat
Acting Senior Planner, Environmental Assessment Planning
Toronto and Region Conservation Authority
5 Shoreham Drive, Toronto, ON M3N 1S4
Ph: 416 661-6600 ext. 5717
Fax: 416-661-6898
Web: www.trca.on.ca

John Velick <John.Velick@rjburnside.com>

01/16/2012 10:07 AM

To SLingertat@trca.on.ca

cc Leonard Rach <Leonard.Rach@rjburnside.com>, sally.rook@peelregion.ca, Erica Anderson <Erica.Anderson@rjburnside.com>, Doug Keenie <Doug.Keenie@rjburnside.com>, File Collingwood <FileCollingwood@rjburnside.com>

Subject Gore Road EA - TRCA Impacts (MTB019424)

Hi Sharon

I've attached our latest preliminary design drawings for the Gore Rd. Pages P12-P15 show impacts to TRCA lands.

Thanks

John

BURNSIDE

John Velick
Project Engineer

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Collingwood, Ontario L9Y 4J6
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tel: 705.446.0515 x423
fax: 705.446.2399
www.rjburnside.com

**[attachment "Gore Rd - Preliminary Design.pdf" deleted by Sharon Lingertat/MTRCA]

*"*PLEASE CONSIDER THE ENVIRONMENT WHEN DECIDING TO PRINT THIS MESSAGE**

Toronto and Region Conservation Authority Confidentiality Notice:

TOWN OF CALEDON

MEMORANDUM

Public Works Department

RECEIVED

APR 16 2012

PUBLIC WORKS
REGION OF PEEL

DATE: February 21, 2012

TO: John Hasselbacher

FROM: Bruno Knoepfli

SUBJECT: Comments - The Gore Road, Region of Peel Project No. MTB019424

- Check - whether the accident collision histories at the intersections of Patterson Srd., Finnerty Srd. and Coolihas Srd. warrant any road design modifications.
- Sag north of Patterson Srd., design K=10.00 vs. min 16 (design standard). This should not be a concern.
- Can the east & west leg approaches at the Finnerty Srd. be centered within the R.O.W. at The Gore Road intersection?
- Can the east leg approach at the Coolihans Srd. be centered within the R.O.W. at The Gore Road intersection?
- Does the existing CSP at the west leg of Finnerty Srd require upgrading or replacement?

B. Knoepfli

Type Name Here
Type Position Here

TOWN HALL
6311 Old Church Road, Caledon, ON L7C 1J6
905.584.2272 | 1.888.CALEDON | FAX 905.584.4325 | www.caledon.ca

Date: May 17, 2012
File #: 10-4385

Public Works Department
Town of Caledon
6311 Old Church Road
Caledon, ON L7C 1J6

Attention: John Hasselbacher

Re: The Gore Road Improvements from Patterson Sideroad to Highway 9

In response to your comments dated February 21, 2012 pertaining to The Gore Road EA project, please consider the following response:

- *Check whether the accident collision histories at the intersection of Patterson Sideroad and Coolihans Sideroad warrant any design modifications.*

Based on the Region's April 2012 Safety Audit Report, there were three reported collisions at The Gore Road/Patterson Sideroad intersection in the five-year period between 2005 and 2009. There were no reported collisions at The Gore Road/Coolihans Sideroad intersection over the 2005-2009 period.

The Safety audit Report recommended various signing improvements at these locations which will be incorporated into the detail design. As well, localized pruning will be incorporated to improve the clear zone sight lines. Beyond these improvements, no other improvements were warranted at this time.

- *Sag north of Patterson Sideroad, design K=10.00 vs. min 16 (design standard). This should not be a concern.*

Comment noted.

- *Can the east and west leg approaches at the Finnerty Sideroad be centered within the right-of-way (ROW) at The Gore Road intersection?*

Centering the approach would require shifting the horizontal alignment of Finnerty Sideroad. This shift would need to be developed upstream from the intersection to provide a smooth transition. In our view the existing property and environmental impacts associated with a jog elimination cannot be justified at this point in time. Of concern in a possible jog elimination solution is the fact that lands in the vicinity of the western leg of the Finnerty Sideroad intersection are within the TRCA drainage area which provides habitat for birds and animals. From a safety perspective, there were no reported collisions at The Gore Road/Finnerty Sideroad intersections over the 2005-2009 period.

Localized pruning and enhanced signing will be incorporated in this location in detail design to help mitigate sight line deficiencies and improve the clear zone.

- *Can the east leg approach at the Coolihans Sideroad be centered within the ROW at The Gore Road intersection?*

As noted in our response for "design modifications at Coolihans Sideroad and The Gore Road", there are no warrants for design alterations at this location.

- *Does the existing CSP at the west leg of Finnerty Sideroad require upgrading or replacement?*

The culvert is in good condition with an estimated life expectancy of 20 years. It will need to be cleaned out during construction. It is adequately sized at 600mm.

For your information and review, I am also enclosing a copy of our 2012 Road Safety Audit Report for The Gore Road project.

Yours truly,

Sally Rook

Sally Rook, C.Tech, PMP
Project Manager, Transportation Program Planning
Region of Peel

SR:km

Enclosure: 2012 Road Safety Audit Report

c. Leonard Rach, P.Eng. - R.J. Burnside & Associates Limited

RE: Fw: Gore Road EA (Patterson Side Road to Hwy 9) - Hydro Property Requirements MTB019424
Matthew.Casey
to:
John.Velick
11/19/2012 11:03 AM
Cc:
Leonard.Rach, FileCollingwood
Hide Details
From: <Matthew.Casey@HydroOne.com>

To: <John.Velick@rjburnside.com>

Cc: <Leonard.Rach@rjburnside.com>, <FileCollingwood@rjburnside.com>

1 Attachment

image001.gif

I had another look. I don't think we will need any more property than is already planned. The vast majority of the poles that are in conflict can go back were they are and the few that have to move are in areas where property is already going to be taken.

Thanks,

Matt
From: John Velick [mailto:John.Velick@rjburnside.com]
Sent: Monday, November 19, 2012 9:58 AM
To: CASEY Matthew
Cc: Leonard Rach; File Collingwood
Subject: RE: Fw: Gore Road EA (Patterson Side Road to Hwy 9) - Hydro Property Requirements MTB019424

Matt,

If possible, poles should be put back where they were, but any poles too close to the road (within 3m from the edge of the driving lane) or in the proposed ditch will need to be moved. For those poles, we'd like you to establish whether they can be accommodated within the right-of-way. If they can't, we'd like you to indicate on the drawings how much property would be required to relocate them.

Thanks

John

From: <Matthew.Casey@HydroOne.com>
To: <John.Velick@rjburnside.com>
Date: 11/19/2012 07:14 AM
Subject: RE: Fw: Gore Road EA (Patterson Side Road to Hwy 9) - Hydro Property Requirements

---

John,

I have a funny feeling that I haven't gotten all the info on this one. Are you guys asking for a specific offset from the travelled portion of the road? (Usually we just put the poles back were they are, only moving them when they are in conflict with a widened roadway)

Thanks,

Matt
From: John Velick [mailto:John.Velick@rjburnside.com]
Sent: Friday, November 16, 2012 9:13 AM
To: CASEY Matthew
Cc: Leonard Rach; sally.rook@peelregion.ca; File Collingwood; ZONE 2 SCHEDULING; WILLIAMS Maurice
Subject: Re: Fw: Gore Road EA (Patterson Side Road to Hwy 9) - Hydro Property Requirements

Hi Matt

I'm not sure if Maurice told you, but we need to know what property is required for your pole relocations (if any). We don't need a full relocation design, just what property would be required for poles or guying. I've attached a sample of what we need that Maurice did for his end of the project. I've also attached our design again here for your reference, both plan view and cross sections at pole conflicts. I know you weren't involved at the start of this job, but I first requested Hydro One's property estimates back in July and the timeline for this project is getting tight, so if you could get this back to me as soon as possible it would be appreciated.

Thank you for your assistance and please contact me if you have any questions.

John

From: Leonard Rach/RJB
To: John Velick/RJB@RJB
Cc: Doug Keenie/RJB@RJB
Date: 11/15/2012 08:57 AM
Subject: Fw: Gore Road EA (Patterson Side Road to Hwy 9) - Hydro Property Requirements

---

Please review for added property requirements + any design impacts and advise me. Thanks, Len

BURNSIDE

John Velick, P.Eng.
Project Engineer

R.J. Burnside & Associates Limited
3 Ronell Crescent
Collingwood, Ontario L9Y 4J6
John.Velick@rjburnside.com
tel: 705.446.0515 x423
fax: 705.446.2399
www.rjburnside.com

BURNSIDE

John Velick, P.Eng.
Project Engineer

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fax: 705.446.2399
www.rjburnside.com

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If you have received this communication in error please notify the sender at the above email address and delete this email immediately.

Thank you.

****

----- Forwarded by Leonard Rach/RJB on 11/15/2012 08:54 AM -----

From: <Matthew.Casey@HydroOne.com>
To: <Leonard.Rach@rjburnside.com>,
Cc: <Zone2Scheduling@HydroOne.com>
Date: 11/15/2012 08:04 AM
Subject: Gore Road EA (Patterson Side Road to Hwy 9) - Hydro Property Requirements

---

Leonard,

Please find a marked up copy of the section of your project that is in the Orangeville area. There are several poles that will need to be changed to allow for the grade changes and a few that will need to be moved to allow for widening / ditching.

Thanks,

Matt Casey
ADET
Hydro One Orangeville
519-941-1211 x3258[attachment "mark up.pdf" deleted by John Velick/RJB]

FW: Highway 9/The Gore Road
Rook, Sally
to:
'Jennifer Vandermeer', Dominique Evans
01/18/2013 09:15 AM
Cc:
Leonard Rach
Hide Details
From: "Rook, Sally" <Sally.Rook@peelregion.ca>
To: 'Jennifer Vandermeer' <Jennifer.Vandermeer@rjburnside.com>, Dominique Evans <Dominique.Evans@rjburnside.com>,
Cc: Leonard Rach <Leonard.Rach@rjburnside.com>

2 Attachments

2011.12.08 Traffic Ops Memo - Stream 1 - Hwy 9 Excerpts.pdf Hwy9-The Gore Plan with aerial.pdf

Hi Dominique,

Could you please update the PIC boards to reflect this new information? This item is specifically mentioned on slide 8. I am going to bring this info. to my update meeting on the 24th.

Could you also update the study area map on slide 3 to show the MTO study area circle to include where Coolihan's meets Hwy 9.

Thanks,

Sally Rook, C.Tech., PMP | Project Manager
Transportation Program Planning | Public Works
Region of Peel | 10 Peel Centre Dr., Suite B, 4th Floor, Brampton ON L6T 4B9
Tel. 905-791-7800 ext. 7842
REGION OF PEEL ■■■ working for you

From: Dow, Tammy [mailto:Tammy.Dow@hdrinc.com]
Sent: January 17, 2013 9:18 PM
To: Kam, Alice (MTO); Arcaro, Joseph
Cc: Leonard Rach; Rook, Sally; 'kmitchell@lgl.com'
Subject: RE: Highway 9/The Gore Road

Sally,

Since your Oct. 2, 2012 meeting with Joseph Arcaro (HDR) and Alice Kam (MTO), the preliminary design drawing for the Highway 9/The Gore Road intersection has been revised to include a separate right and left turn lane on The Gore Road at the intersection. The revised drawing is attached. I have also included the Highway 9/The Gore Road Level of Service Analysis that was undertaken and documented in our Traffic Operational Analysis Stream 1 memo dated Dec. 8, 2011.

Best regards,
Tammy

TAMMY DOW
M.SC.E., P.ENG., CVS

HDR Corporation
Project Manager

231 Shearson Crescent, Suite 206 | Cambridge, ON N1T 1J5
t: 519-621-7886 ext. 5956 | c: 519-777-0985
tammy.dow@hdrinc.com | hdrinc.com
Follow Us – Architizer | Facebook | Twitter | YouTube | Flickr

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From: Kam, Alice (MTO) [mailto:Alice.Kam@ontario.ca]
Sent: Tuesday, January 15, 2013 2:34 PM
To: Arcaro, Joseph; Dow, Tammy
Cc: Leonard Rach; Rook, Sally
Subject: RE: Highway 9/The Gore Road

Joseph/Tammy,
Could you please give an update to Sally including our latest plan and the meeting minute?
Thanks a lot,
Alice

From: Rook, Sally [mailto:Sally.Rook@peelregion.ca]
Sent: January 15, 2013 8:17 AM
To: Kam, Alice (MTO)
Cc: Leonard Rach
Subject: RE: Highway 9/The Gore Road

Hi Alice,

I am preparing for The Gore Road PIC and would like to include an update on the Hwy 9 intersection as per our meeting a couple of months ago.

I have not received minutes of that meeting yet but recall the following:

- The intersection meets warrants for signalization
- Hwy 9 will be widened to accommodate dedicated right and left turn lanes onto The Gore
- Coolihan's SR may have east reach access to Hwy 9 closed (under review by Town of Caledon)
- No timeline for project, pending budget availability

Can you please confirm the above is correct and please forward the minutes from our meeting to include in my project file.

Thanks,

Sally Rook, C.Tech., PMP | Project Manager
Transportation Program Planning | Public Works
Region of Peel | 10 Peel Centre Dr., Suite B, 4th Floor, Brampton ON L6T 4B9
Tel. 905-791-7800 ext. 7842
REGION OF PEEL ■■■ working for you

KEYPLAN	SCALES	HIGHWAY 9 AND THE GORE ROAD	DWG No.
	20m 0 50m HORIZONTAL	PRELIMINARY DESIGN	1

FILENAME: M:\MTO\5917 TPM for Prelim Design of Traffic Controls\5.0 Design\5.2 Design\Active\Designs\60% Preliminary Design\Hwy 9 & Gore\Shee5917-New_Construction-Plan-Profile Hwy9-Gore_intersection.dwg
PLOTDATE: Dec 14, 2012 - 4:41pm
PLOTTED BY: ycheong

Toronto and Region Conservation
for The Living City

February 22, 2013

CFN 43948

BY MAIL AND EMAIL (Sally.Rook@peelregion.ca)

Ms. Sally Rook
Regional Municipality of Peel
10 Peel Centre Drive, Suite B, 4th Floor
Brampton, ON L6T 4B9

Dear Ms. Rook:

Re: Response to Stormwater Management Report (Revised January 2013) and Road Ecology
The Gore Road Improvements (Patterson Side Road to Highway 9)
Municipal Class Environmental Assessment (EA) - Schedule B
Humber River Watershed; Town of Caledon; Regional Municipality of Peel

Toronto and Region Conservation Authority (TRCA) staff received the Stormwater Management (SWM) Report dated November 2011, Revised January 2013 for the above-noted project on January 21, 2013. Staff has reviewed the revised report and comments are provided in Appendix A.

In addition, a meeting was held on February 6, 2013 to discuss the Region of Peel Road Ecology Study. At the meeting TRCA staff identified this section of The Gore Road as a high priority area for possible enhancements to landscape and wildlife regional connectivity. We understand that the Region of Peel is interested in pursuing opportunities for wildlife passage and signage at this site. Details including recommendations and a monitoring program are being prepared by TRCA staff and will be submitted under separate cover.

It is also our understanding that the Region of Peel is considering reducing the bottom width of the swales to 0.75 m to allow for an additional safety factor for vehicles. A reduced width to 0.75 m is acceptable, however, TRCA staff will require supporting calculations and details, as identified in the appendix.

Should you have any questions, please contact me at extension 5717 or at slingertat@trca.on.ca.

Yours truly,

Sharon Lingertat

Sharon Lingertat
Senior Planner, Environmental Assessment Planning
Planning and Development

BY E-MAIL
cc: Burnside:
TRCA: Beth Williston, Senior Manager, Environmental Assessment Planning
Quentin Hanchard, Senior Manager, Development, Planning and Regulation
Gary Wilkins, Humber Watershed Specialist

C:\Documents And Settings\TRCA\Desktop\A File\43948 - Revised SWM Report - Response Letter.Docx

Tel. 416.661.6600, 1.888.872.2344 | Fax. 416.661.6898 | info@trca.on.ca | 5 Shoreham Drive, Downsview, ON M3N 1S4

APPENDIX A

#	TRCA COMMENTS (December 19, 2011)	TRCA COMMENTS (February 22, 2013)
Stormwater Management (SWM)		
1.	TRCA staff noted within the SWM report (section 3.6) the 2 to 100-year storm flows where calculated using the SCS type II and Chicago storm distribution which is a standard practice. However, the approved Humber River Hydrology report and modeling prepared by Aquafor Beech (November 2002) was completed using the 6 and 12-hour AES storm distribution. As such, the hydrology modeling submitted for review must utilize the same storm distribution. Please update the hydrologic model and select the most conservative flows in the analysis. The Region may obtain the AES storm distribution files by contacting Jairo Morelli at jmorelli@trca.on.ca. The hydrology modeling will be reviewed further, with the next submission. Please provide a digital copy of the updated SWMHYMO model with the next submission along with a hard copy as the one presented in Appendix A.	It appears that the hydrologic model was updated and the 6-hours AES storm distribution selected at the location producing the most conservative results which is acceptable. Please provide a copy of the digital SWMHYMO model including both the 6-hour and 12-hours AES storm distributions for review.
2.	A hydraulic assessment for existing and post-development conditions is required to ensure there is no impact to the Regional Floodplain both upstream and downstream of crossings. For small tributary areas it will not be necessary to provide this level of detail. However, this is required in areas such as culverts 1352, 1355, and N3 as we require the Region to demonstrate that no adverse impact would result in private property, as a result of the proposed works. To obtain a copy of the hydraulic modeling for culverts 1352, 1355 and N3 please contact Jairo Morelli at jmorelli@trca.on.ca.	A copy of the HEC-RAS model is no longer required as no culvert modifications are proposed for N3. Please provide an updated digital copy of the HY-8 Model output.
3.	While the use of road side swales for stormwater quality control is an acceptable approach, please note that water quality treatment measures for all roadway areas should provide a minimum "enhanced" treatment according to Ministry of the Environment (MOE) standards. Even though there will be no increase in the number of travel lanes, the widening of the road deck may result in a significant increase in paved area. Runoff from certain areas may not receive adequate water quality treatment through vegetation (especially those where semi-urban road sections are proposed) as water flows overland to the Humber River. The EA should discuss the type and extent of measures proposed. Please provide flat bottomed grass swales, where feasible.	An assessment of the proposed water quality control measure at each crossing location was completed and calculations provided in Appendix B. It should be noted that the wet swales calculations are based on a bottom width of 1.0 m and 2:1 (H:V) side slopes. The maximum recommended side slope per the Ontario Ministry of the Environment (OMOE) *Stormwater Management Planning and Design Manual* (OMOE 2003) is 2.5:1. It is also understood that the Region of Peel is considering reducing the swales' bottom width to 0.75 m which is acceptable. However, please provide supporting calculations based on the selected bottom width, along with details of the swale cross section. If feasible, please provide maximum side slopes of 2.5:1, as recommended by the OMOE. The consultant may also refer to TRCA's Low Impact Development Stormwater Management Planning and Design Guide (2010) for design details on enhanced swales (Section 4.8). If the side slopes cannot be achieved then please clarify why.
4.	Section 6.0 of the SWM report indicates that slight increases to the road deck elevation are proposed at crossings 1352, 1353, 1354, 1355 and N3, but that these changes are not significant enough to have a major impact on existing flood elevations. Please provide details on the methodologies that were used to assess the impact on water surface elevations upstream and downstream of the above mentioned crossings.	Please refer to comment #2 above.
5.	It should be noted that where culverts are proposed to be replaced, and the existing water features have been identified as being watercourses by TRCA staff, we typically require that the replacement crossing span the meander belt width or the 100-year erosion limit of the watercourse. Further morphology assessment is required to determine the type/size/span of the replacement structure at crossing 1352. Please conduct a fluvial geomorphic study and submit it to TRCA staff for review.	A morphology assessment has been completed by Parish Geomorphic. Recommended span for crossings 1352 and 1355 are 2.0 m and 2.5 m respectively. No further information is required.
6.	Please clarify the source of the Regional flow rate provided in Table 1 of the SWM report. While the table presents a flow of 32.40m^3/s (TRCA flow), the regional flow as derived from the current TRCA	Addressed. No further information is required.

#	TRCA COMMENTS (December 19, 2011)	TRCA COMMENTS (February 22, 2013)
	watershed model at the crossing near Finnerty Road is 38.28 m^3/s. Please contact Jairo Morelli at jmorelli@trca.on.ca to acquire flow rate information and associated hydraulic modeling.	
7.	It is noted on some stretches of the proposed roadway that the side slopes of the roadside drainage ditches will extend past the property limits for the roadway allowance. Please indicate whether the Region intends to acquire all property and what contingencies are being considered should permission to grade on existing properties not be forthcoming.	No information has been provided regarding potential impacts of the roadside drainage on private properties. Grading on these areas should be minimized to the maximum extent possible. Please indicate what contingencies are being considered should grading on private properties not be allowed.
8.	Please ensure that where the proposed reconstruction crosses a watercourse, the sediment and erosion controls are adequate enough to insure that maximum watercourse protection is achieved. Please make reference to the TRCA's Erosion and Sediment Control Guidelines for Urban construction (available at www.sustainabletechnolgies.ca) and indicate that the criteria contained within that guideline will be applied. At the detailed design stage, plans will need to indicate which erosion and sediment control techniques will be used on site.	Erosion and Sediment control plan for the proposed works has been deferred to the detailed design stage which is acceptable. No further information is required at this stage.
9.	The EA should include a table that clearly identifies sizes for existing culverts/bridges, proposed sizes for any extensions or replacements and a map that shows the locations of those crossings. The map and table should clearly correspond with those watercourses and wetlands identified on site, within the TRCA regulated areas.	a) Table 8 summarizing existing and proposed culvert lengths and sizes has been provided. Table 8 indicates that existing Culvert 1356 (1000 mm diameter CSP) will be replaced with a 600 mm diameter CSP. However, the HY-8 output indicates that the culvert size will remain the same. Please clarify or adjust Table 8, accordingly. It was also our understanding that road works would not extend to this intersection. Please clarify. b) Please include a map showing the location of the culverts/bridges.
Natural Features		
10.	At this time staff has no comments on the arborist report, tree assessment and tree inventory. However, a more complete submission is required which identifies the natural features impacted as a result of the proposed works (road and grading). The report should identify and quantify the vegetation needed to be removed and wetland area(s) lost. The report should also identify impacts to watercourses as a result of the works. A comprehensive restoration plan will be required at the detailed design stage.	Table 7.1 indicates recommended structure sizes for reaches G2-2 and G12-2 that are less than the bankfull width. Although the recommended structure size is larger than the existing culvert size, the installation of structures that are less than bankfull width will likely result in an undesirable loss of aquatic habitat through the lengthening of the existing culverts. Please ensure that impacts to aquatic habitat are considered in the final design of the crossing structures. Please also ensure that our previous comments are addressed as part of the EA including proposed restoration/compensation measures.
Property Requirements		
11.	It is unclear whether TRCA lands will be impacted as a result of the proposed works. Please provide details showing property impacts (i.e., distance requirements into the property from the existing paved road and area). Should TRCA property be required (for the road work, access, grading) TRCA Archaeology staff will need to complete the investigations on our lands. The application is enclosed for your reference. It should also be noted that a separate fee will be charged for those investigations, as per the application. Our archaeologists have tentatively scheduled investigations for next spring 2012, should they be required. The archaeology and cultural heritage report provided on November 29, 2011 will be provided for review to our staff once confirmation of property requirements is provided.	TRCA staff have completed their investigations on the required TRCA land (east side of The Gore Road) and have cleared the site. The report will be prepared and sent to the Ministry of Tourism, Culture and Sport.
12.	In several locations it appears that a significant amount of property will need to be acquired. Please minimize grading limits to the extent possible. It would also be helpful to show the proposed grading and property requirements on a map that contains an ortho layer to clearly depict the natural heritage features.	As previously requested, please clearly show proposed works (30% design) on an ortho layer in the EA.

Fw: Environmental Study - Gore Road Improvements
Jennifer Vandermeer to: Ashley Gallaugher 05/13/2013 09:21 AM

----- Forwarded by Jennifer Vandermeer/RJB on 05/13/2013 09:21 AM -----

From: Leonard Rach/RJB
To: "Banke, Dana" <Dana.Banke@peelregion.ca>,
Cc: "Rook, Sally" <Sally.Rook@peelregion.ca>, Jennifer Vandermeer/RJB@RJB
Date: 05/10/2013 08:59 AM
Subject: Re: Environmental Study - Gore Road Improvements

Good Morning Mr. Banke,

Thank you for your email expressing interest in our EA study for The Gore Road. We will certainly keep Peel's Regional Paramedic Service apprised of any situation that might affect your operation / accessibility on The Gore Road.

Leonard Rach P.Eng.
Project Manager
R.J.Burnside & Assoc. Ltd.

"Banke, Dana" Please be advised that our interest in the study... 05/09/2013 10:57:47 AM

From: "Banke, Dana" <Dana.Banke@peelregion.ca>
To: "Rook, Sally" <Sally.Rook@peelregion.ca>, "'leonard.rach@rjburnside.com'" <leonard.rach@rjburnside.com>,
Date: 05/09/2013 10:57 AM
Subject: Environmental Study - Gore Road Improvements

Please be advised that our interest in the study and any subsequent construction or development is limited to being kept aware of any closures, detours or hazards that would limit or impede access to the area or those areas of the community which would require our response to traverse through the area.

Please ensure that we are advised well in advance so that we can disseminate the information on alternate routes or anticipated delays.

Regards

Mr. D. R. Banke

Dana Ralph Banke MEmergMgt BHSc(Pre-Hospital Care)
Supervisor, Risk and Audit
Peel Regional Paramedic Services
5299 Maingate Drive
Mississauga, ON L4W 1G6
Tel: 905-791-7800 ext 3931
Fax: 905-206-9738
Cell: 416-678-9546
dana.banke@peelregion.ca
www.peelregion.ca
REGION OF PEEL ■■■ **working for you**

Fw: The Gore Road Improvements From Patterson Road to Highway 9 Class EA
Jennifer Vandermeer to: Ashley Gallaugher 05/13/2013 09:42 AM

----- Forwarded by Jennifer Vandermeer/RJB on 05/13/2013 09:42 AM -----

From: Leonard Rach/RJB
To: Jennifer Vandermeer/RJB@RJB, sally.rook@peelregion.ca,
Date: 05/13/2013 08:44 AM
Subject: Fw: The Gore Road Improvements From Patterson Road to Highway 9 Class EA

FYI
----- Forwarded by Leonard Rach/RJB on 05/13/2013 08:43 AM -----

From: <Cyrus.Elmpak-Mackie@HydroOne.com>
To: <leonard.rach@rjburnside.com>,
Cc: <w.d.kloostra@HydroOne.com>, <ierullo@HydroOne.com>
Date: 05/10/2013 03:40 PM
Subject: The Gore Road Improvements From Patterson Road to Highway 9 Class EA

Dear Mr. Rach,

In our initial review, we can confirm that there are no Hydro One Transmission Facilities in the subject area.

Please be advised that this is only a preliminary assessment based on current information. No further consultation with Hydro One Networks Inc. is required if no changes are made to the current information.

If you have any further questions or concerns, please feel free to contact me.

Regards,

Cyrus Elmpak-Mackie
Transmission Lines Sustainment, System Investment
Asset Management, Hydro One Networks Inc.
483 Bay Street, 15th Floor
Toronto, Ontario
M5G 2P5
Phone: 416-345-1265
Cyrus.Elmpak-Mackie@HydroOne.com

Fw: Notice of PIC Gore Road Improvements Patterson to Highway 9
Jennifer Vandermeer to: Ashley Gallaugher 05/13/2013 09:43 AM

----- Forwarded by Jennifer Vandermeer/RJB on 05/13/2013 09:43 AM -----

From:	Leonard Rach/RJB
To:	Jennifer Vandermeer/RJB@RJB,
Date:	05/13/2013 08:45 AM
Subject:	Fw: Notice of PIC Gore Road Improvements Patterson to Highway 9

----- Forwarded by Leonard Rach/RJB on 05/13/2013 08:45 AM -----

From:	"Burkart, Jackie (MNR)" <Jackie.Burkart@ontario.ca>
To:	"Sally.Rook@peelregion.ca" <Sally.Rook@peelregion.ca>,
Cc:	"Leonard.Rach@rjburnside.com" <Leonard.Rach@rjburnside.com>, "Heaton, Mark (MNR)" <mark.heaton@ontario.ca>
Date:	05/10/2013 02:05 PM
Subject:	Notice of PIC Gore Road Improvements Patterson to Highway 9

Good afternoon Sally,

MNR has recieved the subject notice of PIC. Please be adevised that during the course of your fieldwork, any Species at Risk found within the study area should be reported to this office ESA.Aurora@ontario.ca . Tree removal and wetland disturbance should be avoided /minimised.

Sincerely,

Jackie Burkart

District Planner, Aurora District
Ministry of Natural Resources
905-713-7368
Jackie.Burkart@ontario.ca

Notice PIC.PDF

ALDERVILLE FIRST NATION
11696 Second Line
P.O. Box 46
Roseneath, Ontario K0K 2X0
Phone: (905) 352-2011
Fax: (905) 352-3242

Chief : James R. Marsden
Councillor: Pam Crowe
Councillor: Wesley Marsden Jr.
Councillor: Dave Mowat

July 11, 2013

The Regional Municipality of Peel
10 Peel Centre Dr., Suite B, 4th Flr.
Brampton, Ontario

Att: Sally Rook
Project Manager

Re: The Gore Road Improvements
From Patterson Side Rd to Hwy 9
Class Environmental Assessment Study

Dear Ms. Rook,

Thank you for your consultation request to Alderville First Nation regarding **The Gore Road Improvements From Patterson Side Road to Hwy 9, Class Environmental Assessment Study** which is being proposed within our Traditional and Treaty Territory. We appreciate the fact that **The Regional Municipality of Peel** recognizes the importance of First Nations Consultation and that your office is conforming to the requirements within the Duty to Consult Process.

As per the Alderville First Nation Consultation Protocol, your proposed project is deemed a level 3, having minimal potential to impact our First Nations' rights, therefore, please keep Alderville apprised of any archaeological findings, burial sites or any environmental impacts, should any occur. I can be contacted at the mailing address above or electronically via email, at the email address below.

In good faith and respect,

Dave Simpson dsimpson@aldervillefirstnation.ca
Lands and Resources

Communications Officer Tele: (905) 352-2662
Alderville First Nation Fax: (905) 352-3242

RE: The Gore Road Improvements from Patterson Sideroad to Highway 9 Sch B Class EA Project File Report - DRAFT for Review

Jennifer Vandermeer to: Moszynski, Dorothy (ENE) 08/08/2013 03:38 PM

Cc: "Panko, Dan (ENE)", "Dufresne, Tina (ENE)", Sally.Rook, Leonard Rach, Doug Keenie

Hi Dorothy,

Thank-you very much for your prompt review of the draft PFR for The Gore Road Class EA (Patterson Sideroad to Highway 9). We will incorporate your comments in the final report and will contact you if we have any further questions.

Best regards,

BURNSIDE

Jennifer Vandermeer, P.Eng.
Environmental Engineer

R.J. Burnside & Associates Limited
292 Speedvale Avenue West, Unit 20
Guelph, Ontario N1H 1C4
Jennifer.Vandermeer@rjburnside.com
tel: 519.823.4995 x 467
fax: 519.836.5477
www.rjburnside.com

"Moszynski, Dorothy (ENE)" Dear Jennifer, Please see attached co... 08/08/2013 03:30:13 PM

From: "Moszynski, Dorothy (ENE)" <Dorothy.Moszynski@ontario.ca>
To: Jennifer Vandermeer via Thru <jennifer.vandermeer@rjburnside.com>,
Cc: "Dufresne, Tina (ENE)" <Tina.Dufresne@ontario.ca>, "Panko, Dan (ENE)" <Dan.Panko@ontario.ca>
Date: 08/08/2013 03:30 PM
Subject: RE: The Gore Road Improvements from Patterson Sideroad to Highway 9 Sch B Class EA Project File Report - DRAFT for Review

---

Dear Jennifer,

Please see attached comments, I've also sent you a paper copy.

Sincerely,

Dorothy Moszynski, MCIP, RPP
Environmental Resource Planner & EA Coordinator
Ministry of Environment Central Region, Technical Support Section
5775 Yonge Street, 8th Fl.
North York, ON M2M 4J1
Tel: (416) 326-3469
Fax: (416) 325-6347
dorothy.moszynski@ontario.ca

From: Jennifer Vandermeer via Thru [mailto:jennifer.vandermeer@rjburnside.com]
Sent: August 02, 2013 9:15 AM
To: Moszynski, Dorothy (ENE)
Subject: The Gore Road Improvements from Patterson Sideroad to Highway 9 Sch B Class EA Project File Report - DRAFT for Review

This email includes secure access to files:
Access Secured R.J. Burnside Files Here *- Expires Saturday 8/10/2013 3:59 AM (UTC)*
* If the link above does not work, copy the following URL to a web browser:
https://files.rjburnside.com/ExDn.aspx?id=027HF7CGPLL

Dear Ms Moszynski,

Further to my email of July 29, please find attached a link to download the draft Project File Report for review and comment.

If you have any questions about the draft PFR please do not hesitate to contact me.

Best regards,

Jennifer Vandermeer, P.Eng.
Environmental Engineer

R.J. Burnside & Associates Limited
292 Speedvale Avenue West, Unit 20
Guelph, Ontario N1H 1C4
Jennifer.Vandermeer@rjburnside.com
tel: 519.823.4995 x 467
fax: 519.836.5477
www.rjburnside.com

Other message recipients:
From: jennifer.vandermeer@rjburnside.com
To: dorothy.moszynski@ontario.ca
Cc: sally.rook@peelregion.ca, leonard.rach@rjburnside.com, doug.keenie@rjburnside.com
Reply To All

Thru Tracking: T478-027-55944-34599

 TheGore_draftPfile_comments.PDF

Ministry of the Environment

Central Region
Technical Support Section

5775 Yonge Street
8th Floor
Toronto, ON, M2M 4J1
Tel.: 416-326-6700
Fax: 416-325-6347

Ministère de l'Environnement

Région du Centre
Section d'appui technique

5775, rue Yonge12e étage
8e étage
Toronto, ON, M2M 4J1
Tél. 416-325-6966
Téléc: 41-325-6347

Ontario

August 8, 2013

File: EA01-06-05

Jennifer Vandermeer, P.Eng.
Environmental Engineer
R.J. Burnside & Associates Limited
292 Speedvale Avenue W, Unit 20
Guelph, Ontario N1H 1C4

RE: The Gore Road Improvements, from Patterson Sideroad to Highway 9
Regional Municipality of Peel
Class Environmental Assessment
Response to Draft Project File Report

Dear Ms. Vandermeer,

The draft Project File Report for the above project has been reviewed and the following comments are offered for your consideration.

- In the Executive Summary page iv, you may wish to mention that an interested person may also request the proponent to conduct a higher level of study (ie. Schedule "C") for the project. Please see the Municipal Class EA document- page A-36 for more details.
- The report should mention existing groundwater conditions and whether there are any groundwater wells in the area. If so, Section 7.2 of the report should detail how any impacts to well users will be mitigated.

Thank you for the opportunity to comment on this project. Please contact me if you have any questions at (416) 326-3469.

Yours sincerely,

Dorothy Moszynski
Environmental Resource Planner and EA Coordinator
Air, Pesticides and Environmental Planning

c. Tina Dufresne, Manager, Halton Peel District Office, MOE
Sally Rook, Project Manager, Peel Region
Dan Panko, Supervisor APEP Unit, Central Region MOE
Central Region EA File
A & P File

The Gore Road PFR - comments from Region of Peel
Rook, Sally
to:
Leonard Rach, 'Jennifer Vandermeer'
08/30/2013 12:54 PM
Hide Details
From: "Rook, Sally" <Sally.Rook@peelregion.ca>
To: Leonard Rach <Leonard.Rach@rjburnside.com>, 'Jennifer Vandermeer' <Jennifer.Vandermeer@rjburnside.com>,

Hi,

I have circulated the draft PFR internally and the following sections provided comments (see below):

Program Planning Comments –
Section 4.9 “Socio-Economic Factors” outlines Peel wide stats for housing, socio-economics and dwelling type based on a 2006 census dataset. Since the report is being published in 2013 we should request that Burnside use the approved 2011 data found on the Stats Canada website. The text in this section gives a “Regional” perspective which is more appropriate for say a Master Plan but has little relevance to the purpose of this undertaking.

The upfront text in 4.9 documents Regional stats without linkage to the study area and the conclusions set out on Page 52 “Socio-Economic/Cultural” are specific to the purpose of the undertaking and the design parameters. Ideally the two should jive.

My recommendation to Burnside is to remove Section 4.9 as it has little relevance to the EA undertaking and merits of their conclusion and re-draft a new 4.9 that speaks to Caledon based stats specific to the study area which will then mesh with the statements on Page 52.

Traffic Safety Comments –
Page ii - Description of the Selected Design, 3rd bullet & Page 49 – 6.2 Preferred Design Concept, 3rd bullet

- Change ‘*white line markers’ to* Edge line pavement marking

AT –
Please include additional details for rumble strips. To accommodate the cyclists, the skip pattern is introduced to allow cyclists to enter and exit the paved shoulder. This section should discuss the skip pattern design to accommodate the cyclists.

I have not received comments from any external Agencies that were circulated.

Please amend the report to reflect the above comments.

Thanks,

Sally Rook, C.Tech., PMP | Project Manager
Infrastructure Programming & Studies | Public Works
Region of Peel | 10 Peel Centre Dr., Suite B, 4th Floor, Brampton ON L6T 4B9
Tel. 905-791-7800 ext. 7842

R E G I O N O F P E E L ■■■ **working for you**

RE: The Gore Road PFR
Jennifer Vandermeer to: Heaton, Mark (MNR) 10/30/2013 02:07 PM
Cc: "Burkart, Jackie (MNR)", "Rook, Sally", Leonard Rach, Doug Keenie

Hello Mark,

Thank-you very much for your comments on the draft Project File Report. We have incorporated your comments and will be issuing the final report for the 30-day review period shortly.

Best regards,

BURNSIDE

Jennifer Vandermeer, P.Eng.
Environmental Engineer

R.J. Burnside & Associates Limited
292 Speedvale Avenue West, Unit 20
Guelph, Ontario N1H 1C4
Jennifer.Vandermeer@rjburnside.com
tel: 519.823.4995 x 467
fax: 519.836.5477
www.rjburnside.com

"Heaton, Mark (MNR)" Hello Sally and Jennifer, Reviewed the proj... 10/24/2013 04:01:20 PM

From:	"Heaton, Mark (MNR)" <mark.heaton@ontario.ca>
To:	"Rook, Sally" <Sally.Rook@peelregion.ca>, "jennifer.vandermeer@rjburnside.com" <jennifer.vandermeer@rjburnside.com>,
Cc:	"Burkart, Jackie (MNR)" <Jackie.Burkart@ontario.ca>
Date:	10/24/2013 04:01 PM
Subject:	RE: The Gore Road PFR

Hello Sally and Jennifer,

Reviewed the project report.

A couple of items to consider:

1) sediment and erosion control measures should be inspected following every rain event. Currently the proposal is to check after 15mm events – this is insufficient. Inspections should be done by a Certified Inspector of Sediment and Erosion Control (training offered through TRCA)
2) Further discussion will be needed with MNR on the use of wildlife fencing at detailed design stage.
3) MNR should be consulted during detailed design stage to further refine proposed grading in the evaluated wetlands. MNR is concerned with proposed wetland loss and alterations to wetland drainage. Use of alternative slope designs should be further explored at detailed design to avoid/reduce grading within evaluated wetlands. Further discussions on potential alteration of wetland drainage will need to occur at detailed design stage. Avoidance is preferred.

Wildlife and fisheries sections were well written.

Regards,

Mark Heaton
Fish and Wildlife Biologist
OMNR Aurora

From: Rook, Sally [mailto:Sally.Rook@peelregion.ca]
Sent: October 22, 2013 3:11 PM
To: Heaton, Mark (MNR)
Subject: The Gore Road PFR

Hi Mark,

Neal mentioned that you were reviewing my PFR this week.

You're the last outstanding review and I'm getting pressure to file. Can you confirm that you will be able to complete your review by the end of this week?

Thanks,

Sally Rook, C.Tech., PMP | Project Manager
Infrastructure Programming & Studies | Public Works
Region of Peel | 10 Peel Centre Dr., Suite B, 4th Floor, Brampton ON L6T 4B9
Tel. 905-791-7800 ext. 7842
REGION OF PEEL ■■■ **working for you**

Toronto and Region **Conservation**

for The Living City

September 10, 2013

CFN 43948

BY MAIL AND EMAIL (Sally.Rook@peelregion.ca)

Ms. Sally Rook
Regional Municipality of Peel
10 Peel Centre Drive, Suite B, 4th Floor
Brampton, ON L6T 4B9

Dear Ms. Rook:

Re: Response to Draft Project File Report
The Gore Road Improvements (Patterson Sideroad to Highway 9)
Municipal Class Environmental Assessment (EA) - Schedule B
Humber River Watershed; Town of Caledon; Regional Municipality of Peel

Toronto and Region Conservation Authority (TRCA) staff received the draft Project File Report (PFR) dated July 2013, the digital model and Appendices E, F, G, L, M on August 6, 2013. Appendices B, C and J were received on August 23, 2013.

It is our understanding that this project involves the full reconstruction of two lanes along The Gore Road from Patterson Sideroad to Highway 9. Work will involve widening and paving the shoulder areas to allow for improved road side stops and road base stability, vertical and horizontal alignments and drainage. Ten (10) watercourses were identified in the field by TRCA staff. Of those 10 crossings, all of the culverts will be replaced with the exception of culvert N3 (TRCA crossing 6).

While staff has no objection in principle to the preferred alternative, the comments provided in Appendix A must be addressed in the final PFR and included as an appendix.

Please ensure TRCA receives a copy of the Notice of Study Completion, as well as one (1) complete hard copy (including all appendices) and one (1) digital copy of the final PFR. The final document should be accompanied by a covering letter which uses the numbering scheme provided in this letter and identifies how these comments have been addressed. Materials may be submitted on discs, via e-mail (if less than 2.5 MB), or through file transfer protocol (FTP) sites (if posted for a minimum of two weeks).

Should you have any questions, please contact me at extension 5717 or at slingertat@trca.on.ca.

Sincerely,

Slingertat

Sharon Lingertat
Senior Planner, Environmental Assessment Planning
Planning and Development

BY E-MAIL

cc: Burnside: Jennifer Vandermeer (Jennifer.Vandermeer@rjburnside.com)
TRCA: Beth Williston, Senior Manager, Environmental Assessment Planning
Quentin Hanchard, Senior Manager, Development, Planning and Regulation
Victoria McGrath, Humber Watershed Specialist

C:\Users\TRCA\Documents\A\43948 - Draft EA Response.Docx

APPENDIX A

#	TRCA COMMENTS (September 10, 2013)	RESPONSE
Stormwater Management (SWM)		
1.	At the detailed design stage, once final grades and road profiles are available, it must be confirmed that the proposed culverts have sufficient capacity to pass the design flows (Regional or 25-year storm, depending on the site) without creating an adverse impact on properties upstream and downstream of each crossing.	Acknowledged, to be confirmed during the detailed design phase of the project
2.	At the detailed design stage a qualified professional must confirm the stability of the soils and potential erosion issues (created by lateral flows) in areas where wet swales with side slopes at 2:1 are proposed. Wet swales steeper than 2.5:1 are not typically supported by TRCA staff. However, we understand that this configuration has been used to minimize grading onto private lands. Where possible, providing flatter slopes is highly recommended.	Acknowledged, to be confirmed during the detailed design phase of the project
Natural Features		
3.	a) Mitigation for tree removals has been proposed at a 3:1 ratio. It is often preferable on larger scale projects to provide compensation by area rather than by quantities of trees as it allows for a more comprehensive approach to restoring ecological function as opposed to replacing trees. It would be TRCA staff's preference that an area be restored using trees and shrubs that equals the area impacted through the road works. This appears to be approximately 1.2 hectares. This work should occur on publically owned land. Please include a discussion in the report that speaks to examining various compensation opportunities using this approach. Further discussion will be required at the detailed design stage. b) Please note that the fill related to the road work may limit the ecological function and viability of trees and shrubs planted on the embankment due to the low quality of the soil. Please explore opportunities to accommodate the restoration work in nearby, appropriate areas.	Acknowledged. Additional text has been provided in Section 7.6A of the Project File Report Acknowledged. Additional text has been provided in Section 7.6A of the Project File Report
4.	Approximately 0.45 hectares of wetland will be lost as a result of the road work. Please provide a discussion in the PFR related to opportunities to mitigate the loss of wetland communities and clearly identify what is being done to minimize encroachment into the adjacent wetlands.	Acknowledged. Additional text has been provided in Section 7.6A of the Project File Report
5.	Section 7.4 indicates that daily inspections of erosion and sediment controls will occur. Section 8.0 indicates that ESC inspections will occur weekly. Please clarify.	Acknowledged. Executive Summary and Sections 7.1, 7.4 and 8.0 of Project File Report have been updated to note that erosion control measures will be inspected daily and following rain events during the resident inspection period by a Certified Inspector of Sediment and Erosion Control
6.	Section 4.3.5 indicates that TRCA staff is concerned about the effects on upstream wetlands of replacing culverts to allow for positive drainage. While this is true, it should be noted that this does not in itself preclude the option of creating positive drainage. However, ecological impacts on the upstream wetlands should be assessed and agreed upon prior to settling on this as an option. Further discussion will be required at the design stage.	Acknowledged. Additional Text has been provided in Section 4.3.5 of the project file
7.	It is noted in Section 4.2.6 that the Region of Peel will look at mitigation measures for wildlife movement as identified through the Region of Peel Road Ecology Study. Baseline monitoring is currently underway through TRCA for this area. Please ensure that provisions for this work (i.e., costs) are considered at the Request for Proposal stage for the design and that TRCA staff are contacted at the start of the design stage to ensure appropriate structures are included in the road design and at the correct locations.	Achnowledged. Additional text has been provided in Section 4.2.6, 2nd Paragraph of the project file Report
Groundwater/Geotechnical		
8.	Issues expressed in the geotechnical report regarding potential impacts to groundwater resources should be identified in the PFR. Specifically it is noted that all the crossing structures may require	Acknowledged. A new section discussing the Existing Hydrogeological Conditions of the Study area has been added (Section 4.4).

#	TRCA COMMENTS (September 10, 2013)	RESPONSE
	dewatering, with the exception of the box culvert at Crossing N3. It is recommended that Section 7.2 (Groundwater) be revised to include hydrogeology related concerns that will need to be addressed at the detailed design stage.	Section 7.2 has also been updated to provide mitigation measures for potential impacts to Groundwater Supply.
9.	On pages 17 to 19 of the Geotechnical Investigation Report, it is acknowledged that the proposed road embankment side slopes were assessed to be too steep and inadequately stable over the long-term. Therefore, it is proposed in the report that the embankment sides be designed to be less steep, specifically flatter than 1.75H:1V and 2H:1V for heights lower than and greater than 2 m, respectively. In order to minimize the risk for localized slope instability and soil erosion of the side faces, it is recommended that the criteria listed below be applied to the highest possible degree as it relates to geotechnical design: • No slope inclination of a proposed embankment should be steeper than 2H:1V, where possible • Side slopes should not be designed with a straight face over heights greater than 4 m. Flat benches should be incorporated in the cross-sectional design at each 4 m of height, or adequate retaining walls used • Soil composition should be carefully selected to avoid inclusion of sorts and fractions undergoing changes of volume in combination or contact with water • The degree of compaction should be increased to 100% of the Standard Proctor Maximum Dry Density • Road construction in wet or frost season should be avoided	Acknowledged. The criteria recommended by TRCA will be incorporated as much as possible during the detailed design process
TRCA Lands		
10.	The Stage 2 archaeological assessment has been completed on TRCA lands and no cultural material was encountered. As a result, there are no further archaeological concerns as it relates to TRCA property within the study limits. However, if there is a deviation from the agreed upon project area, additional assessment may be necessary. Furthermore, if any deeply buried deposits or human remains are encountered, all activities will need to cease and the TRCA Archaeology Resource Management Services as well as the proper authorities will need to be contacted immediately.	Acknowledged.

RE: The Gore Road Improvements Class EA (Schedule B) Project File Report - DRAFT for Review
Rook, Sally
to:
Leonard Rach
10/30/2013 02:04 PM
Cc:
'Jennifer Vandermeer'
Hide Details
From: "Rook, Sally" <Sally.Rook@peelregion.ca>
To: Leonard Rach <Leonard.Rach@rjburnside.com>,
Cc: 'Jennifer Vandermeer' <Jennifer.Vandermeer@rjburnside.com>

Hi Len,

I spoke with John at a recent meeting for another Caledon project on September 18th. I relayed these details and he was satisfied with our response.

Thanks,

Sally Rook, C.Tech., PMP | Project Manager
Infrastructure Programming & Studies | Public Works
Region of Peel | 10 Peel Centre Dr., Suite B, 4th Floor, Brampton ON L6T 4B9
Tel. 905-791-7800 ext. 7842

REGION OF PEEL ■■■ **working for you**

Hi Sally,

In regard to John Hasselbacher's comment on improving The Gore Road, we have reviewed the situation and propose the following response with your approval:-

We have reviewed our design in this section and feel it has addressed sight line issues as much as practicable. Sight lines from the north are not an issue in both the existing and proposed condition. Sight lines from the south have been improved by increasing the vertical curve from K=14 to K=20, which fulfills the 70km/h design speed requirement. This K value cannot be increased without negatively affecting the previous curve at Sta. 2+668. Any increase would also affect the depth of fill over the existing box culvert which we would like to avoid.

In regard to the Gore/Finnerty intersection the safety audit of the corridor recommended "larger more prominent street name signing be installed for both offset legs" to enhance safety and conspicuousity of the intersection.

I'll leave the decision with you if you want Burnside to respond or leave it with you. Len

----- Forwarded by Leonard Rach/RJB on 09/17/2013 08:55 AM ----

----- Forwarded by Jennifer Vandermeer/RJB on 09/16/2013 01:38 PM -----

From: John Hasselbacher <John.Hasselbacher@caledon.ca>
To: Jennifer Vandermeer via Thru <jennifer.vandermeer@rjburnside.com>,
Date: 09/09/2013 11:05 AM
Subject: RE: The Gore Road Improvements Class EA (Schedule B) Project File Report - DRAFT for Review

---

Jennifer,

I received the email regarding the review of the Project File Report and your follow up voicemail. I have had a chance to review the report and have a couple of comments regarding the report and the preferred alternative.

In general I do not object to the improvements proposed. However, I think that every effort should be made to improve upon the intersection of the Gore Road and Finnerty Sideroad and where feasible improve the vertical alignment of the Gore Road to provide proper stopping sight distances.

I have no further comments at this time.

John Hasselbacher, C.E.T.
Manager
Engineering Services
Public Works Department

Town of Caledon
6311 Old Church Road
Caledon, Ontario L7C 1J6

905.584.2272 x.4128
www.caledon.ca

From: Jennifer Vandermeer via Thru [mailto:jennifer.vandermeer@rjburnside.com]
Sent: Thursday, September 05, 2013 12:24 PM
To: John Hasselbacher
Subject: The Gore Road Improvements Class EA (Schedule B) Project File Report - DRAFT for Review

This email includes secure access to files:
Access Secured R.J. Burnside Files Here - *Expires Friday 9/13/2013 3:59 AM (UTC)*
* If the link above does not work, copy the following URL to a web browser:
https://files.rjburnside.com/ExDn.aspx?id=0279DU68DN5

Dear Mr. Hasselbacher and Ms Drummond,

It has come to my attention that you may not have received the draft Project File Report (PFR) for the above mentioned project for review and comment. Attached is a link to the report and report appendices. On behalf of the Region of Peel and Burnside team, we would be grateful if you could review this draft report in the next few weeks so that we can proceed with finalizing the PFR and posting it for public review.

Ms Drummond, I know that you have received and reviewed the Cultural Heritage Assessment Report by Unterman McPhail and indicated your were okay with their revised report on July 6, 2012, but please let me know if you have any other comments on the draft PFR itself.

If you have any questions about the draft PFR please do not hesitate to contact me.

Best regards,

Jennifer Vandermeer, P.Eng.
Environmental Engineer

R.J. Burnside & Associates Limited
292 Speedvale Avenue West, Unit 20
Guelph, Ontario N1H 1C4
Jennifer.Vandermeer@rjburnside.com
tel: 519.823.4995 x 467
fax: 519.836.5477
www.rjburnside.com

Other message recipients:
From: jennifer.vandermeer@rjburnside.com
To: john.hasselbacher@caledon.ca, sally.drummond@caledon.ca
Cc: sally.rook@peelregion.ca, leonard.rach@rjburnside.com, doug.keenie@rjburnside.com
Reply To All

Thru Tracking: T478-027-72533-59441
www.thruinc.com

Appendix D5

Stakeholder Correspondence

Region of Peel
Working for you

BURNSIDE

Project Response Form

The Gore Road Improvements from Patterson Side Road to Highway 9 Class Environmental Assessment Study

We are interested in knowing your thoughts on this project and request that you answer the following questions:

a) What do you perceive to be the positive and/or negative effects of this project?

Increased traffic including trucks which are not permitted & still use Gore. There will be more accidents with higher volume

b) Do you perceive any "critical" issues that must be addressed as part of this project?

The traffic volume & speed is already a critical issue. Due to hills & curves it is dangerous for school buses with the number of people using Gore Road as a by-pass →

Please check the most appropriate statement:

☒ We wish to be kept informed about the project's progress and would like to remain on the study contact list. We have comments to provide. They are:
Attached ☒ Will be provided at a later date ☐

☐ We wish to be kept informed about the project's progress and would like to remain on the study contact list. At the present time, we have no significant concerns/comments to provide.

☐ We have no concerns about the project and wish to be removed from the study contact list.

Name: [redacted]

Phone No.:

Address:

Please return this completed form by December 9th, 2010 to:

Sally Rook
Public Works
The Regional Municipality of Peel
9445 Airport Road, 3rd Floor
Brampton, ON L6S 4J3
Tel: 905 791 7800 ext. 7842 / 888-919-7800
Fax: 905 791 1442
E-mail: Sally.Rook@peelregion.ca

Improvements should be made to Airport Road & Highway 50 to facilitate higher volumes of traffic. It was our understanding the Coleraine Drive was intended to divert traffic also.

There is also the consideration of wildlife on the road. There is a flock (or more) of wild turkeys frequently on the road, as well as deer, turtles, raccoons etc.

b/ continued → Our driveway & many others along Gore are hidden due to the hills & curves. In order for us to exit our driveway we MUST roll down our car windows, turn off the heat/air & turn off the radio to "listen" for traffic. We can only exit when there is no northbound traffic in order to permit those cars speeding past our driveway to safely pass us. If they were doing the limit, which is 70 there would not be a problem, but we all know that speeding is a common problem on the Gore Road.

If this project does go ahead, there should be four way stops at every intersection to slow traffic. also, lights will be needed at the Gore Road & Highway 9.

Region of Peel
Working for you

BURNSIDE

Project Response Form

The Gore Road Improvements from Patterson Side Road to Highway 9
Class Environmental Assessment Study

We are interested in knowing your thoughts on this project and request that you answer the following questions:

a) What do you perceive to be the positive and/or negative effects of this project?

- DISRUPTION TO ALREADY HEAVY TRAFFIC FLOW IS A CONCERN

b) Do you perceive any "critical" issues that must be addressed as part of this project?

- WILL THERE BE ANY SIGNIFICANT ALTERATION TO THE STEEP HILL LOCATED ON THE GORE SOUTH OF THE GORE / FINNERTY SIDEROAD INTERSECTION?

Please check the most appropriate statement:

☐ We wish to be kept informed about the project's progress and would like to remain on the study contact list. We have comments to provide. They are:
Attached ☐ Will be provided at a later date ☐

☑ We wish to be kept informed about the project's progress and would like to remain on the study contact list. At the present time, we have no significant concerns/comments to provide.

☐ We have no concerns about the project and wish to be removed from the study contact list.

Name: [redacted]
Phone No.:
Address:

Please return this completed form by December 9th, 2010 to:

Sally Rook
Public Works
The Regional Municipality of Peel
9445 Airport Road, 3rd Floor
Brampton, ON L6S 4J3
Tel: 905 791 7800 ext. 7842 / 888-919-7800
Fax: 905 791 1442
E-mail: Sally.Rook@peelregion.ca

010424_Gore Road EA Stakeholder Response Form.doc
2010-11-04 4:44 PM

Region of Peel
Working for you

BURNSIDE

Project Response Form

The Gore Road Improvements from Patterson Side Road to Highway 9 Class Environmental Assessment Study

We are interested in knowing your thoughts on this project and request that you answer the following questions:

a) What do you perceive to be the positive and/or negative effects of this project?

THIS ROAD IS A RACETRACK FOR COMMUTERS LIVING FURTHER NORTH, WITH NO CONSIDERATION FOR ENTERING LOCAL TRAFFIC, WILDLIFE OR ~~ANYTHING ELSE THAT MIGHT STRAY INTO THEIR FRANTIC PATH.~~ MAKING SO CALLED IMPROVEMENTS WILL ONLY WORSEN THE SITUATION.

b) Do you perceive any "critical" issues that must be addressed as part of this project?

PUT IN SOME SPEED BUMPS OR JUST LET THE ROAD DETERIORATE TO WHAT IT ONCE WAS. IE. A QUIET DIRT COUNTRY RD. THEN ~~COMMUTER TRAFFIC MIGHT BE DEFLECTED~~ TO HWY 50 OR AIRPORT RD BOTH OF WHICH ARE MORE CAPABLE ~~of HANDLING IT.~~

Please check the most appropriate statement:

☑ We wish to be kept informed about the project's progress and would like to remain on the study contact list. We have comments to provide. They are:
Attached ☐ Will be provided at a later date ☐

☐ We wish to be kept informed about the project's progress and would like to remain on the study contact list. At the present time, we have no significant concerns/comments to provide.

☐ We have no concerns about the project and wish to be removed from the study contact list.

Name: [redacted]

Phone No.:

Address:

Please return this completed form by December 9th, 2010 to:

Sally Rook
Public Works
The Regional Municipality of Peel
9445 Airport Road, 3rd Floor
Brampton, ON L6S 4J3
Tel: 905 791 7800 ext. 7842 / 888-919-7800
Fax: 905 791 1442
E-mail: Sally.Rook@peelregion.ca

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2010-11-04 4:44 PM

Region of Peel
Working for you

BURNSIDE

Project Response Form

The Gore Road Improvements from Patterson Side Road to Highway 9 Class Environmental Assessment Study

We are interested in knowing your thoughts on this project and request that you answer the following questions:

a) What do you perceive to be the positive and/or negative effects of this project?

more traffic, digging out ditches that don't need to be causing erosion

b) Do you perceive any "critical" issues that must be addressed as part of this project?

Please check the most appropriate statement:

☐ We wish to be kept informed about the project's progress and would like to remain on the study contact list. We have comments to provide. They are:
Attached ☐ Will be provided at a later date ☐

☑ We wish to be kept informed about the project's progress and would like to remain on the study contact list. At the present time, we have no significant concerns/comments to provide.

☐ We have no concerns about the project and wish to be removed from the study contact list.

Name: [redacted]
Phone No.:
Address:

Please return this completed form by December 9th, 2010 to:

Sally Rook
Public Works
The Regional Municipality of Peel
9445 Airport Road, 3rd Floor
Brampton, ON L6S 4J3
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2010-11-04 4:44 PM

Region of Peel
Working for you

BURNSIDE

Project Response Form

The Gore Road Improvements from Patterson Side Road to Highway 9
Class Environmental Assessment Study

We are interested in knowing your thoughts on this project and request that you answer the following questions:

a) What do you perceive to be the positive and/or negative effects of this project?

By reducing curves and getting less visibility restrictions you are encouraging faster driving. Already average speed in morning & evening traffic is 100K per Hour.

b) Do you perceive any "critical" issues that must be addressed as part of this project?

More road racing would be encouraged - Road quality improvement is good but speed limit must not be increased.

Please check the most appropriate statement:

☐ We wish to be kept informed about the project's progress and would like to remain on the study contact list. We have comments to provide. They are:
Attached ☑ Will be provided at a later date ☐

☐ We wish to be kept informed about the project's progress and would like to remain on the study contact list. At the present time, we have no significant concerns/comments to provide.

☐ We have no concerns about the project and wish to be removed from the study contact list.

Name: [redacted]

Phone No.:

Address:

Please return this completed form by December 9th, 2010 to:

Sally Rook
Public Works
The Regional Municipality of Peel
9445 Airport Road, 3rd Floor
Brampton, ON L6S 4J3
Tel: 905 791 7800 ext. 7842 / 888-919-7800
✓ Fax: 905 791 1442
E-mail: Sally.Rook@peelregion.ca

019424_Gore Road EA Stakeholder Response Form.doc
2010-11-04 4:44 PM

Region of Peel
Working for you

BURNSIDE

Project Response Form

The Gore Road Improvements from Patterson Side Road to Highway 9 Class Environmental Assessment Study

We are interested in knowing your thoughts on this project and request that you answer the following questions:

a) What do you perceive to be the positive and/or negative effects of this project?

I travel often on the Gore Road and any improvements would be greatly appreciated.

b) Do you perceive any "critical" issues that must be addressed as part of this project?

- Straightening the 2 major road bends and guard rails on the slopes.

Please check the most appropriate statement:

☒ We wish to be kept informed about the project's progress and would like to remain on the study contact list. We have comments to provide. They are:
Attached ☒ Will be provided at a later date ☐

☒ We wish to be kept informed about the project's progress and would like to remain on the study contact list. At the present time, we have no significant concerns/comments to provide.

☐ We have [redacted]

Name: [redacted]

Phone No.:

Address:

Please return this completed form by December 9th, 2010 to:

Sally Rook
Public Works
The Regional Municipality of Peel
9445 Airport Road, 3rd Floor
Brampton, ON L6S 4J3
Tel: 905 791 7800 ext. 7842 / 888-919-7800
Fax: 905 791 1442
E-mail: Sally.Rook@peelregion.ca

019424_Gore Road EA Stakeholder Response Form.doc
2010-11-04 4:44 PM

Region of Peel
Working for you

BURNSIDE

Project Response Form

The Gore Road Improvements from Patterson Side Road to Highway 9
Class Environmental Assessment Study

We are interested in knowing your thoughts on this project and request that you answer the following questions:

a) What do you perceive to be the positive and/or negative effects of this project?

positive: improved road as that below study area
negative: traffic delays during project

b) Do you perceive any "critical" issues that must be addressed as part of this project?

Please check the most appropriate statement:

- ☐ We wish to be kept informed about the project's progress and would like to remain on the study contact list. We have comments to provide. They are:
  Attached ☐ Will be provided at a later date ☐
- ☒ We wish to be kept informed about the project's progress and would like to remain on the study contact list. At the present time, we have no significant concerns/comments to provide.
- ☐ We have no concerns about the project and wish to be removed from the study contact list.

Name: [redacted]

Phone No.:

Address:

Please return this completed form by December 9th, 2010 to:

Sally Rook
Public Works
The Regional Municipality of Peel
9445 Airport Road, 3rd Floor
Brampton, ON L6S 4J3
Tel: 905 791 7800 ext. 7842 / 888-919-7800
Fax: 905 791 1442
E-mail: Sally.Rook@peelregion.ca

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2010-11-04 4:44 PM

Region of Peel
Working for you

BURNSIDE

Project Response Form

The Gore Road Improvements from Patterson Side Road to Highway 9 Class Environmental Assessment Study

We are interested in knowing your thoughts on this project and request that you answer the following questions:

a) What do you perceive to be the positive and/or negative effects of this project?
Wider shoulders would result in a better road and therefore more traffic, higher speeds and more collisions with wild life

b) Do you perceive any "critical" issues that must be addressed as part of this project?
Where will the ditches drain to and how will that affect the wetlands adjacent to the road

Please check the most appropriate statement:

☒ We wish to be kept informed about the project's progress and would like to remain on the study contact list. We have comments to provide. They are:
Attached ☒ Will be provided at a later date ☐

☐ We wish to be kept informed about the project's progress and would like to remain on the study contact list. At the present time, we have no significant concerns/comments to provide.

☐ We have no concerns about the project and wish to be removed from the study contact list.

Name: [redacted]

Phone No.:

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December 8, 2010

With the widening of the shoulders we would assume more road allowance would necessitate the acquiring of additional land. What procedure would be employed, by purchase or expropiation.

Would fences be replaced?

If the property line is changed what affect will that have on property that is under the managed Forest Plan?

Thank you for keeping us informed

[redacted]

Region of Peel
Working for you

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Project Response Form

The Gore Road Improvements from Patterson Side Road to Highway 9 Class Environmental Assessment Study

We are interested in knowing your thoughts on this project and request that you answer the following questions:

a) What do you perceive to be the positive and/or negative effects of this project?

DESTRUCTION OF A VERY ATTRACTIVE ROAD

b) Do you perceive any "critical" issues that must be addressed as part of this project?

S CURVE AT FINNERTY

Please check the most appropriate statement:

- [x] We wish to be kept informed about the project's progress and would like to remain on the study contact list. We have comments to provide. They are:
  Attached ☐ Will be provided at a later date ☐

- [ ] We wish to be kept informed about the project's progress and would like to remain on the study contact list. At the present time, we have no significant concerns/comments to provide.

- [ ] We have no concerns about the project and wish to be removed from the study contact list.

Name: [redacted]

Phone No [redacted]

Address: [redacted]

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The Gore Road Improvements from Patterson Side Road to Highway 9 Class Environmental Assessment Study

We are interested in knowing your thoughts on this project and request that you answer the following questions:

a) What do you perceive to be the positive and/or negative effects of this project?

b) Do you perceive any "critical" issues that must be addressed as part of this project?

Please check the most appropriate statement:

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Project Response Form

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Class Environmental Assessment Study

We are interested in knowing your thoughts on this project and request that you answer the following questions:

a) What do you perceive to be the positive and/or negative effects of this project?

The positive effect would be addressing the visibility restrictions on The Gore Rd.

b) Do you perceive any "critical" issues that must be addressed as part of this project?

No

Please check the most appropriate statement:

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Attached ☐ Will be provided at a later date ☐

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The Gore Road Improvements from Patterson Side Road to Highway 9 Class Environmental Assessment Study

We are interested in knowing your thoughts on this project and request that you answer the following questions:

a) What do you perceive to be the positive and/or negative effects of this project?

Negative effect:
The Gore Road is presently heavily travelled - a short cut from Airport Road to Hwy 7.
It will become a main highway & destroy our

b) Do you perceive any "critical" issues that must be addressed as part of this project?

safety in walking, riding bikes
horseback riding & disturb our peace
[illegible]!
The above safety issues!

Please check the ~~most appropriate~~ statement:

☒ We wish to be kept informed about the project's progress and would like to remain on the study contact list. We have comments to provide. They are:
Attached ☐ Will be provided at a later date ☐ Generally, the above comments.

☐ We wish to be kept informed about the project's progress and would like to remain on the study contact list. At the present time, we have no significant concerns/comments to provide.

☐ We ha[redacted]

Name:

Phone No.:

Address:

Please return this completed form by December 9th, 2010 to: [redacted]

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We are interested in knowing your thoughts on this project and request that you answer the following questions:

a) What do you perceive to be the positive and/or negative effects of this project?

I believe positive effects such as those on Gore Rd South of Paterson Sideroad (protective barriers adjacent to deep ditches, paving of entraces to driveways etc) are very desirable

b) Do you perceive any "critical" issues that must be addressed as part of this project?

Please check the most appropriate statement:

☐ We wish to be kept informed about the project's progress and would like to remain on the study contact list. We have comments to provide. They are:
Attached ☐ Will be provided at a later date ☐

☑ We wish to be kept informed about the project's progress and would like to remain on the study contact list. At the present time, we have no significant concerns/comments to provide. except as in "a" above

☐ We have no concerns about the project and wish to be removed from the study contact list.

Name: [redacted]

Phone N[redacted]

Address: [redacted]

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[redacted]

FAX COVER SHEET

DATE: DEC 6 2010

TO: MS SALLY ROOKE FAX: 905-791-1442

FROM: [redacted]

RE: FILE NO MTB 019424

Number of pages including cover sheet 3

MESSAGE

HARD COPY MAILED UNDER SEPARATE COVER

December 6, 2010

Sally Rook
Public Works
The Regional Municipality of Peel
9445 Airport Road, 3rd Floor
Brampton ON L6S 4J3

Subject: File #MTB019424
Gore Road Improvements

Dear Ms. Rook:

In response to your letter of November 9, 2010, we would be interested to know more specifics of the project before commenting, i.e. Are you planning to widen the road.

We have some specific requirements re our property and the road.

1) The culvert under the Gore Road south of our gate entrance must be replaced as it is set too low and has become silted and blocked, causing a water backup on my property which has resulted in the loss of hardwood trees and is becoming swampland. There are two streams that cross my property which provide the water that flows under the Gore Road culvert. This plugged culvert situation will have to be addressed regardless of any other work done on the road, as the loss of trees in this area is lowering the value of the property.

2) Several years ago additional guardrails were installed on either side of our driveway. The guardrail north of our driveway had to be removed because of a visibility issue which caused an unsafe exit from the driveway. We do not wish to have any guardrails to the north of our driveway.

I am quite willing to meet with anyone at the site to review the above.

Yours truly,

[redacted]

Region of Peel
Working for you

BURNSIDE

Project Response Form

The Gore Road Improvements from Patterson Side Road to Highway 9 Class Environmental Assessment Study

We are interested in knowing your thoughts on this project and request that you answer the following questions:

a) What do you perceive to be the positive and/or negative effects of this project?

b) Do you perceive any "critical" issues that must be addressed as part of this project?

SEE ATTACHED LETTER.

Please check the most appropriate statement:

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Attached ☒ Will be provided at a later date ☐

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Phone No.:

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Region of Peel
Working for you

BURNSIDE

Project Response Form

The Gore Road Improvements from Patterson Side Road to Highway 9 Class Environmental Assessment Study

We are interested in knowing your thoughts on this project and request that you answer the following questions:

a) What do you perceive to be the positive and/or negative effects of this project?

BETTER ROAD CONDITIONS. NEGATIVE => HEAVY TRUCK USE EG, GRAVEL ETC.

b) Do you perceive any "critical" issues that must be addressed as part of this project?

ADDRESSING BETTER SIGHT LINES, TRAFFIC LIGHTS AT HWY9 AND GORE RD.

Please check the most appropriate statement:

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Attached ☐ Will be provided at a later date ☒

☒ We wish to be kept informed about the project's progress and would like to remain on the study contact list. At the present time, we have no significant concerns/comments to provide.

☐ We have no concerns about the project and wish to be removed from the study contact list.

Name: [redacted]

Phone No.:

Address:

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E-mail: Sally.Rook@peelregion.ca

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FW: Gore Road EA study
Rook, Sally
to:
'Erica Anderson'
11/11/2010 03:24 PM
Cc:
'Leonard Rach'
Show Details

I have replied to the homeowner (see below) and have asked our Traffic group to pull files in regards to the history here for our information and records. Please log this response.

Thanks,

Sally Rook PMP
Acting Project Manager
Public Works, Transportation
The Region of Peel
905-791-7800 ext. 7842
rooks@peelregion.ca

From: Rook, Sally
Sent: November 11, 2010 3:22 PM
To: [redacted]
Subject: RE: Gore Road EA study

Thank you for your email. We have made note of your driveway access issue and will make sure that it is documented and considered as we move forward with this project.

Best regards,

Sally Rook PMP
Acting Project Manager
Public Works, Transportation
The Region of Peel
905-791-7800 ext. 7842
rooks@peelregion.ca

From: [redacted]
Sent: November 11, 2010 2:01 PM
To: Rook, Sally
Subject: Gore Road EA study

Dear Ms Rook

We [redacted] are residents/land owners at [redacted] The Gore Road.

We wish to be kept informed about the project's progress and would like to remain on the study contact list. We have comments to provide as follows:

1- our "grandfathered" access to the Gore Road from our property as its north end was deemed to be unsafe by Peel region and the access was granted at the south end of the property

2- our driveway was constructed at the designated south end access as per the Peel region

3- we identified to the Peel region that there were safety risks both entering and leaving the driveway

4- Peel region, kindly, undertook to move our driveway access further south in an attempt to resolve the safety risks both entering and leaving the driveway

5- unfortunately the safety risks both entering and leaving the driveway still exist and furthermore the "new part" of the driveway causes me (Nancie) difficulties with my vehicle in the wintermonths

We look forward to reviewing this with you further.

Regards

[redacted]

Region of Peel
Working for you

BURNSIDE

Project Response Form

The Gore Road Improvements from Patterson Side Road to Highway 9 Class Environmental Assessment Study

We are interested in knowing your thoughts on this project and request that you answer the following questions:

a) What do you perceive to be the positive and/or negative effects of this project?

more & more traffic which always travels well over the speed limit on this road

b) Do you perceive any "critical" issues that must be addressed as part of this project?

speed control and access from sideroads

Please check the most appropriate statement:

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Attached ☒ Will be provided at a later date ☐

☐ We wish to be kept informed about the project's progress and would like to remain on the study contact list. At the present time, we have no significant concerns/comments to provide.

☐ We have no concerns about the project and wish to be removed from the study contact list.

Name: [redacted]
Phone No.:
Address:

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Brampton, ON L6S 4J3
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E-mail: Sally.Rook@peelregion.ca

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2010-11-04 4:44 PM

The Gore Road EA
Rook, Sally
to:
[redacted]
12/09/2010 11:01 AM
Cc:
'Leonard Rach', Erica Anderson
Show Details

Mr. [redacted]

Thank you for responding to our recent Notice of Study Commencement for Gore Road Improvements.

In terms of identifying what improvements that will be recommended, as you can appreciate that we are only in the beginning stages of our study and it would be premature to comment on improvements at this stage. We will of course review your specific property concerns that you have raised and take them into consideration when developing our recommendations.

In terms of process, once we have developed some options and a preliminary recommended plan for improvements to The Gore Road, we plan on holding a Public Information Centre (PIC) to share our findings with the public and to solicit feedback. Everyone on our contact list will be advised of the timing of this PIC as well as study updates from time to time.

While it would be premature to meet at this time, we will keep your name on our study contact list and keep you apprised of study developments.

Best regards,

Sally Rook PMP
Project Manager
Public Works, Transportation
The Region of Peel
905-791-7800 ext. 7842
rooks@peelregion.ca

Region of Peel
Working for you

BURNSIDE

Project Response Form

The Gore Road Improvements from Patterson Side Road to Highway 9
Class Environmental Assessment Study

We are interested in knowing your thoughts on this project and request that you answer the following questions:

a) What do you perceive to be the positive and/or negative effects of this project?

b) Do you perceive any "critical" issues that must be addressed as part of this project?

West - East
Maintain drainage ditches beneath road to permit part groundwater to flow downstream to South Humber River.

Please check the most appropriate statement:

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Attached ☐ Will be provided at a later date ☐

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☐ We have no concerns about the project and wish to be removed from the study contact list.

Name: [redacted]

Phone No.:

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There is also the consideration of wildlife on the road.
There is a flock (or more) of wild turkeys frequently on
the road, as well as deer, turtles, racoons etc.

b/ continued → Our driveway + many others along
Gore are hidden due to the hills + curves.
In order for us to exit our driveway we
MUST roll down our car windows, turn off
the heat/air + turn off the radio to
"listen" for traffic. We can only exit
when there is no northbound traffic
in order to permit those cars speeding
past our driveway to safely pass us.
If they were doing the limit, which is
70 there would not be a problem, but
we all know that speeding is a common
problem on the Gore Road.
If this project does go ahead, there should be
four way stops at every intersection to
slow traffic. also, lights will be needed
at the Gore Road + Highway 9.

Region of Peel
Working for you

BURNSIDE

Project Response Form

The Gore Road Improvements from Patterson Side Road to Highway 9
Class Environmental Assessment Study

We are interested in knowing your thoughts on this project and request that you answer the following questions:

a) What do you perceive to be the positive and/or negative effects of this project?

- DISRUPTION TO ALREADY HEAVY TRAFFIC FLOW IS A CONCERN

b) Do you perceive any "critical" issues that must be addressed as part of this project?

- WILL THERE BE ANY SIGNIFICANT ALTERATION TO THE STEEP HILL LOCATED ON THE GORE SOUTH OF THE GORE / FINNERTY SIDEROAD INTERSECTION?

Please check the most appropriate statement:

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Project Response Form

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We are interested in knowing your thoughts on this project and request that you answer the following questions:

a) What do you perceive to be the positive and/or negative effects of this project?

THIS ROAD IS A RACETRACK FOR COMMUTERS LIVING FURTHER NORTH, WITH NO CONSIDERATION FOR ENTERING LOCAL TRAFFIC, WILDLIFE OR ANYTHING ELSE THAT MIGHT STRAY INTO THEIR FRANTIC PATH. MAKING SO CALLED IMPROVEMENTS WILL ONLY WORSEN THE SITUATION.

b) Do you perceive any "critical" issues that must be addressed as part of this project?

PUT IN SOME SPEED BUMPS OR JUST LET THE ROAD DETERIORATE TO WHAT IT ONCE WAS. IE. A QUIET DIRT COUNTRY RD. THEN COMMUTER TRAFFIC MIGHT BE DEFLECTED TO HWY 50 OR AIRPORT RD BOTH OF WHICH ARE MORE CAPABLE OF HANDLING IT.

Please check the most appropriate statement:

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We are interested in knowing your thoughts on this project and request that you answer the following questions:

a) What do you perceive to be the positive and/or negative effects of this project?

more traffic, digging out ditches that don't need to be causing erosion

b) Do you perceive any "critical" issues that must be addressed as part of this project?

Please check the most appropriate statement:

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We are interested in knowing your thoughts on this project and request that you answer the following questions:

a) What do you perceive to be the positive and/or negative effects of this project?

By reducing curves and getting less visibility restrictions you are encouraging faster driving - Already average speed in morning & evening traffic is 100K per Hour.

b) Do you perceive any "critical" issues that must be addressed as part of this project?

More road racing would be encouraged - Road quality improvement is good but speed limit must not be increased.

Please check the most appropriate statement:

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We are interested in knowing your thoughts on this project and request that you answer the following questions:

a) What do you perceive to be the positive and/or negative effects of this project?

I travel often on the Gore Road and any improvements would be greatly appreciated.

b) Do you perceive any "critical" issues that must be addressed as part of this project?

- Straightening the 2 major road bands and guard rails on the slopes.

Please check the most appropriate statement:

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☐ We have [redacted]st.

Name:

Phone No.:

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Working for you

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Project Response Form

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We are interested in knowing your thoughts on this project and request that you answer the following questions:

a) What do you perceive to be the positive and/or negative effects of this project?

positive: improved road as that below study area
negative: traffic delays during project

b) Do you perceive any "critical" issues that must be addressed as part of this project?

Please check the most appropriate statement:

☐ We wish to be kept informed about the project's progress and would like to remain on the study contact list. We have comments to provide. They are:
Attached ☐ Will be provided at a later date ☐

☒ We wish to be kept informed about the project's progress and would like to remain on the study contact list. At the present time, we have no significant concerns/comments to provide.

☐ We have no concerns about the project and wish to be removed from the study contact list.

Name: [redacted]

Phone No.:

Address:

Please return this completed form by December 9th, 2010 to:

Sally Rook
Public Works
The Regional Municipality of Peel
9445 Airport Road, 3rd Floor
Brampton, ON L6S 4J3
Tel: 905 791 7800 ext. 7842 / 888-919-7800
Fax: 905 791 1442
E-mail: Sally.Rook@peelregion.ca

019424_Gore Road EA Stakeholder Response Form.doc
2010-11-04 4:44 PM

Region of Peel
Working for you

BURNSIDE

Project Response Form

The Gore Road Improvements from Patterson Side Road to Highway 9 Class Environmental Assessment Study

We are interested in knowing your thoughts on this project and request that you answer the following questions:

a) What do you perceive to be the positive and/or negative effects of this project?

Wider shoulders would result in a better road and therefore more traffic, higher speeds and more collisions with wild life

b) Do you perceive any "critical" issues that must be addressed as part of this project?

Where will the ditches drain to and how will that affect the wetlands adjacent to the road

Please check the most appropriate statement:

☒ We wish to be kept informed about the project's progress and would like to remain on the study contact list. We have comments to provide. They are:
Attached ☒ Will be provided at a later date ☐

☐ We wish to be kept informed about the project's progress and would like to remain on the study contact list. At the present time, we have no significant concerns/comments to provide.

☐ We have no concerns about the project and wish to be removed from the study contact list.

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December 8, 2010

With the widening of the shoulders we would assume more road allowance would necessitate the acquiring of additional land. What procedure would be employed, by purchase or expropriation.

Would fences be replaced?

If the property line is changed what affect will that have on property that is under the managed Forest Plan?

Thank you for keeping us informed

[redacted]

Region of Peel
Working for you

BURNSIDE

Project Response Form

The Gore Road Improvements from Patterson Side Road to Highway 9 Class Environmental Assessment Study

We are interested in knowing your thoughts on this project and request that you answer the following questions:

a) What do you perceive to be the positive and/or negative effects of this project?

DESTRUCTION OF A VERY ATTRACTIVE ROAD

b) Do you perceive any "critical" issues that must be addressed as part of this project?

S CURVE AT FINNERTY

Please check the most appropriate statement:

☑ We wish to be kept informed about the project's progress and would like to remain on the study contact list. We have comments to provide. They are:
Attached ☐ Will be provided at a later date ☐

☐ We wish to be kept informed about the project's progress and would like to remain on the study contact list. At the present time, we have no significant concerns/comments to provide.

☐ We have no concerns about the project and wish to be removed from the study contact list.

Name: [redacted]

Phone No [redacted]

Address: [redacted]

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Public Works
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Region of Peel
Working for you

BURNSIDE

Project Response Form

The Gore Road Improvements from Patterson Side Road to Highway 9 Class Environmental Assessment Study

We are interested in knowing your thoughts on this project and request that you answer the following questions:

a) What do you perceive to be the positive and/or negative effects of this project?

b) Do you perceive any "critical" issues that must be addressed as part of this project?

Please check the most appropriate statement:

☐ We wish to be kept informed about the project's progress and would like to remain on the study contact list. We have comments to provide. They are:
Attached ☐ Will be provided at a later date ☐

☐ We wish to be kept informed about the project's progress and would like to remain on the study contact list. At the present time, we have no significant concerns/comments to provide.

☑ We have no concerns about the project and wish to be removed from the study contact list.

Name: [redacted]

Phone No.:

Address:

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Region of Peel
Working for you

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Project Response Form

The Gore Road Improvements from Patterson Side Road to Highway 9 Class Environmental Assessment Study

We are interested in knowing your thoughts on this project and request that you answer the following questions:

a) What do you perceive to be the positive and/or negative effects of this project?

The positive effect would be addressing the Visibility restrictions on The Gore Rd.

b) Do you perceive any "critical" issues that must be addressed as part of this project?

No

Please check the most appropriate statement:

☐ We wish to be kept informed about the project's progress and would like to remain on the study contact list. We have comments to provide. They are:
Attached ☐ Will be provided at a later date ☐

☐ We wish to be kept informed about the project's progress and would like to remain on the study contact list. At the present time, we have no significant concerns/comments to provide.

☑ We have no concerns about the project and wish to be removed from the study contact list.

Name: [redacted]

Phone No.:

Address:

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Region of Peel
Working for you

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Project Response Form

The Gore Road Improvements from Patterson Side Road to Highway 9
Class Environmental Assessment Study

We are interested in knowing your thoughts on this project and request that you answer the following questions:

a) What do you perceive to be the positive and/or negative effects of this project?

Negative effect:
The Gore Road is presently heavily travelled - a short cut from Airport Road to Hwy 7.
It will become a main highway & destroy our

b) Do you perceive any "critical" issues that must be addressed as part of this project?

safety in walking, riding bikes, horseback riding & destruct our peace everyone Gardens! The above safety issues!

Please check ~~the most appropriate~~ statement:

☒ We wish to be kept informed about the project's progress and would like to remain on the study contact list. We have comments to provide. They are:
Attached ☐ Will be provided at a later date ☐ Generally, the above comments.

☐ We wish to be kept informed about the project's progress and would like to remain on the study contact list. At the present time, we have no significant concerns/comments to provide.

☐ We have no concerns about the project and wish to be removed from the study contact list.

Name: [redacted]

Phone No. [redacted]

Address: [redacted]

Please return this completed form by December 9th, 2010 to: [redacted]

Sally Rook
Public Works
The Regional Municipality of Peel
9445 Airport Road, 3rd Floor
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Region of Peel
Working for you

BURNSIDE

Project Response Form

The Gore Road Improvements from Patterson Side Road to Highway 9 Class Environmental Assessment Study

We are interested in knowing your thoughts on this project and request that you answer the following questions:

a) What do you perceive to be the positive and/or negative effects of this project?

I believe positive effects such as those on Gore Rd South of Paterson Sideroad (protective barriers adjacent to deep ditches), paving of entraces to driveways etc) are very desirable

b) Do you perceive any "critical" issues that must be addressed as part of this project?

Please check the most appropriate statement:

☐ We wish to be kept informed about the project's progress and would like to remain on the study contact list. We have comments to provide. They are:
Attached ☐ Will be provided at a later date ☐

☑ We wish to be kept informed about the project's progress and would like to remain on the study contact list. At the present time, we have no significant concerns/comments to provide. except as in "a" above

☐ We have no concerns about the project and wish to be removed from the study contact list.

Name: [redacted]

Phone N

Address:

Please return this completed form by December 9th, 2010 to:

Sally Rook
Public Works
The Regional Municipality of Peel
9445 Airport Road, 3rd Floor
Brampton, ON L6S 4J3
Tel: 905 791 7800 ext. 7842 / 888-919-7800
Fax: 905 791 1442
E-mail: Sally.Rook@peelregion.ca

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2010-11-04 4:44 PM

[redacted]

FAX COVER SHEET

DATE: DEC 6 2010

TO: Ms Sally Rook

FAX: 905-791-1442

FROM: [redacted]

RE: File No MTB 019424

Number of pages including cover sheet 3

MESSAGE

Hard Copy Mailed Under
Separate Cover

December 6, 2010

Sally Rook
Public Works
The Regional Municipality of Peel
9445 Airport Road, 3rd Floor
Brampton ON L6S 4J3

Subject: File #MTB019424
Gore Road Improvements

Dear Ms. Rook:

In response to your letter of November 9, 2010, we would be interested to know more specifics of the project before commenting, i.e. Are you planning to widen the road.

We have some specific requirements re our property and the road.

1) The culvert under the Gore Road south of our gate entrance must be replaced as it is set too low and has become silted and blocked, causing a water backup on my property which has resulted in the loss of hardwood trees and is becoming swampland. There are two streams that cross my property which provide the water that flows under the Gore Road culvert. This plugged culvert situation will have to be addressed regardless of any other work done on the road, as the loss of trees in this area is lowering the value of the property.

2) Several years ago additional guardrails were installed on either side of our driveway. The guardrail north of our driveway had to be removed because of a visibility issue which caused an unsafe exit from the driveway. We do not wish to have any guardrails to the north of our driveway.

I am quite willing to meet with anyone at the site to review the above.

Yours truly,

[redacted]

Region of Peel
Working for you

BURNSIDE

Project Response Form

The Gore Road Improvements from Patterson Side Road to Highway 9 Class Environmental Assessment Study

We are interested in knowing your thoughts on this project and request that you answer the following questions:

a) What do you perceive to be the positive and/or negative effects of this project?

b) Do you perceive any "critical" issues that must be addressed as part of this project?

SEE ATTACHED LETTER.

Please check the most appropriate statement:

☒ We wish to be kept informed about the project's progress and would like to remain on the study contact list. We have comments to provide. They are:
Attached ☒ Will be provided at a later date ☐

☐ We wish to be kept informed about the project's progress and would like to remain on the study contact list. At the present time, we have no significant concerns/comments to provide.

☐ We have no concerns about the project and wish to be removed from the study contact list.

Name: [redacted]

Phone No.:

Address:

Please return this completed form by December 9th, 2010 to:

Sally Rook
Public Works
The Regional Municipality of Peel
9445 Airport Road, 3rd Floor
Brampton, ON L6S 4J3
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Fax: 905 791 1442
E-mail: Sally.Rook@peelregion.ca

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Region of Peel
Working for you

BURNSIDE

Project Response Form

The Gore Road Improvements from Patterson Side Road to Highway 9 Class Environmental Assessment Study

We are interested in knowing your thoughts on this project and request that you answer the following questions:

a) What do you perceive to be the positive and/or negative effects of this project?

BETTER ROAD CONDITIONS. NEGATIVE → HEAVY TRUCK USE EG, GRAVEL ETC.

b) Do you perceive any "critical" issues that must be addressed as part of this project?

ADDRESSING BETTER SIGHT LINES, TRAFFIC LIGHTS AT HWY 9 AND GORE RD.

Please check the most appropriate statement:

☐ We wish to be kept informed about the project's progress and would like to remain on the study contact list. We have comments to provide. They are:
Attached ☐ Will be provided at a later date ☒

☒ We wish to be kept informed about the project's progress and would like to remain on the study contact list. At the present time, we have no significant concerns/comments to provide.

☐ We have no concerns about the project and wish to be removed from the study contact list.

Name: [redacted]

Phone No.:

Address:

Please return this completed form by December 9th, 2010 to:

Sally Rook
Public Works
The Regional Municipality of Peel
9445 Airport Road, 3rd Floor
Brampton, ON L6S 4J3
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Fax: 905 791 1442
E-mail: Sally.Rook@peelregion.ca

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2010-11-04 4:44 PM

FW: Gore Road EA study
Rook, Sally
to:
'Erica Anderson'
11/11/2010 03:24 PM
Cc:
'Leonard Rach'
Show Details

I have replied to the homeowner (see below) and have asked our Traffic group to pull files in regards to the history here for our information and records. Please log this response.

Thanks,

Sally Rook PMP
Acting Project Manager
Public Works, Transportation
The Region of Peel
905-791-7800 ext. 7842
rooks@peelregion.ca

From: Rook, Sally
Sent: November 11, 2010 3:22 PM
To: [redacted]
Subject: RE: Gore Road EA study

Thank you for your email. We have made note of your driveway access issue and will make sure that it is documented and considered as we move forward with this project.

Best regards,

Sally Rook PMP
Acting Project Manager
Public Works, Transportation
The Region of Peel
905-791-7800 ext. 7842
rooks@peelregion.ca

From: [redacted]
Sent: November 11, 2010 2:01 PM
To: Rook, Sally
Subject: Gore Road EA study

Dear Ms Rook

We [redacted] are residents/land owners at [redacted] The Gore Road.

We wish to be kept informed about the project's progress and would like to remain on the study contact list. We have comments to provide as follows:

1- our "grandfathered" access to the Gore Road from our property as its north end was deemed to be unsafe by Peel region and the access was granted at the south end of the property

2- our driveway was constructed at the designated south end access as per the Peel region

3- we identified to the Peel region that there were safety risks both entering and leaving the driveway

4- Peel region, kindly, undertook to move our driveway access further south in an attempt to resolve the safety risks both entering and leaving the driveway

5- unfortunately the safety risks both entering and leaving the driveway still exist and furthermore the "new part" of the driveway causes me (Nancie) difficulties with my vehicle in the wintermonths

We look forward to reviewing this with you further.

Regards

[redacted]

Region of Peel
Working for you

BURNSIDE

Project Response Form

The Gore Road Improvements from Patterson Side Road to Highway 9 Class Environmental Assessment Study

We are interested in knowing your thoughts on this project and request that you answer the following questions:

a) What do you perceive to be the positive and/or negative effects of this project?

more & more traffic which always travels well over the speed limit on this road

b) Do you perceive any "critical" issues that must be addressed as part of this project?

speed control and access from sideroads

Please check the most appropriate statement:

☒ We wish to be kept informed about the project's progress and would like to remain on the study contact list. We have comments to provide. They are:
Attached ☒ Will be provided at a later date ☐

☐ We wish to be kept informed about the project's progress and would like to remain on the study contact list. At the present time, we have no significant concerns/comments to provide.

☐ We have no concerns about the project and wish to be removed from the study contact list.

Name: [redacted]

Phone No.:

Address:

Please return this completed form by December 9th, 2010 to:

Sally Rook
Public Works
The Regional Municipality of Peel
9445 Airport Road, 3rd Floor
Brampton, ON L6S 4J3
Tel: 905 791 7800 ext. 7842 / 888-919-7800
Fax: 905 791 1442
E-mail: Sally.Rook@peelregion.ca

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2010-11-04 4:44 PM

The Gore Road EA
Rook, Sally
to:
[redacted]
12/09/2010 11:01 AM
Cc:
'Leonard Rach', Erica Anderson
Show Details

Mr. [redacted]

Thank you for responding to our recent Notice of Study Commencement for Gore Road Improvements.

In terms of identifying what improvements that will be recommended, as you can appreciate that we are only in the beginning stages of our study and it would be premature to comment on improvements at this stage. We will of course review your specific property concerns that you have raised and take them into consideration when developing our recommendations.

In terms of process, once we have developed some options and a preliminary recommended plan for improvements to The Gore Road, we plan on holding a Public Information Centre (PIC) to share our findings with the public and to solicit feedback. Everyone on our contact list will be advised of the timing of this PIC as well as study updates from time to time.

While it would be premature to meet at this time, we will keep your name on our study contact list and keep you apprised of study developments.

Best regards,

Sally Rook PMP
Project Manager
Public Works, Transportation
The Region of Peel
905-791-7800 ext. 7842
rooks@peelregion.ca

Region of Peel
Working for you

BURNSIDE

Project Response Form

The Gore Road Improvements from Patterson Side Road to Highway 9
Class Environmental Assessment Study

We are interested in knowing your thoughts on this project and request that you answer the following questions:

a) What do you perceive to be the positive and/or negative effects of this project?

____

____

____

b) Do you perceive any "critical" issues that must be addressed as part of this project?

West – East
Maintain drainage ditches beneath road
to permit pond + groundwater to flow downstream
to East Humber River.

Please check the most appropriate statement:

☒ We wish to be kept informed about the project's progress and would like to remain on the study contact list. We have comments to provide. They are:
Attached ☐ Will be provided at a later date ☐

☒ We wish to be kept informed about the project's progress and would like to remain on the study contact list. At the present time, we have no significant concerns/comments to provide.

☐ We have no concerns about the project and wish to be removed from the study contact list.

Name: [redacted]

Phone No.:

Address:

Please return this completed form by December 9th, 2010 to:

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[The Difference is our People]

Appendix E
The Gore Road: Mitigation and Monitoring Proposal for Wildlife Connectivity

Toronto and Region Conservation
for The Living City

April 9, 2013

CFN 43948

BY E-MAIL ONLY (Sally.Rook@peelregion.ca)

Ms. Sally Rook
Regional Municipality of Peel
10 Peel Centre Drive, Suite B, 4th Floor
Brampton, ON L6T 4B9

Dear Ms. Rook:

Re: Road Ecology Mitigation and Monitoring Plan
The Gore Road Improvements (Patterson Side Road to Highway 9)
Municipal Class Environmental Assessment (EA) - Schedule B
Humber River Watershed; Town of Caledon; Regional Municipality of Peel

Toronto and Region Conservation Authority (TRCA) staff met with the Region of Peel on February 6, 2013 to discuss the Peel Road Ecology Study, including strategic locations within the Region of Peel where mitigation measures may be used to minimize the impacts of road networks, particularly on amphibians associated with wetland and forest habitats.

Further to that discussion, it was identified that The Gore Road from Patterson Side Road to Highway 9, which is currently proceeding through an Environmental Assessment (EA), has been identified as one of these strategic locations. The Region of Peel expressed an interest in possibly implementing some mitigating measures through their road design. As a result, TRCA staff have prepared and enclosed a Mitigation and Monitoring Proposal for Wildlife Connectivity along The Gore Road between Patterson Side Road and Highway 9.

It is our understanding that this report will be included as an appendix in the EA report and carried forward to the detailed design phase for further consideration and possible implementation. It should also be noted that a baseline survey is recommended to inform mitigation strategies at the detailed design stage which would need to be conducted prior to design submissions.

Should you have any questions or would like to setup a meeting or conference call to discuss please contact me at extension 5717 or at slingertat@trca.on.ca.

Sincerely,

Sharon Lingertat

Sharon Lingertat
Senior Planner, Environmental Assessment Planning
Planning and Development

Encl: The Gore Road: Mitigation and Monitoring Proposal for Wildlife Connectivity

BY E-MAIL
cc: TRCA: Beth Williston, Senior Manager, Environmental Assessment Planning
Quentin Hanchard, Senior Manager, Development, Planning and Regulation
Gary Wilkins, Humber River Watershed Specialist

C:\Documents And Settings\TRCA\Desktop\A File\43948 - The Gore (Patterson To Hwy 9) - OREG Mitigation Monitoring Plan.Docx

The Region of Peel Road Ecology Case Study

The Gore Road:
Mitigation and Monitoring Proposal
for Wildlife Connectivity

April, 2013

Toronto and Region Conservation for The Living City

Report prepared by:	Sue Hayes, Project Manager Watershed Monitoring and Reporting Section, Ecology Division
	Namrata Shrestha, Landscape Ecologist Research and Development Section, Ecology Division
Reviewed by:	Scott Jarvie, Manager Watershed Monitoring and Reporting Section, Ecology Division
	Deborah Martin-Downs, Director Ecology Division

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1. Introduction

Urbanization within the Greater Toronto Area (GTA) is expected to continue based on the anticipated population growth of the region over the next decade. With this growth it is expected that new roadways will be constructed and existing ones expanded in order to facilitate the faster movement of people and goods throughout. However, many studies have shown the multiple and widespread ecological effects of road systems on natural areas. These include altered hydrology, water quality, microclimate, vegetation dynamics, wildlife interactions, and habitat loss and fragmentation. Reduced connectivity for wildlife results in population fragmentation, reduced resource accessibility, and increases in human wildlife conflict (e.g. wildlife-vehicle collisions), which can have substantial cumulative impacts on the ability of wildlife to persist in the landscape unless such effects are mitigated using a range of options (Forman 1995, Jaeger *et al.* 2005).

The Region of Peel Road Ecology Study (TRCA, *in prep*), through application of analytical desk-top models, predicted a number of strategic locations within the Region of Peel, where application of appropriate mitigation measures will likely minimize the impacts of road networks on wildlife movement, particularly amphibians associated with wetland and forest habitats. These strategic locations signify two things (i) the road segments with high potential for amphibian road mortality, and (ii) the critical areas for maintaining long term regional connectivity among wetland habitats to facilitate population persistence in the landscape. Given that the desktop models were based on multiple sources of available data and were predictive models, the next logical steps in this study are twofold. First, it is important to collect baseline data specific to the predicted strategic locations to validate the model, and second, to apply the appropriate mitigation measures to minimize the barrier effects of roads on amphibian movement. Furthermore, it is imperative to implement a pre and post-construction monitoring plan to evaluate the effectiveness of the mitigation measures to inform future applications.

The Gore Road between Patterson and Finnerty Side Roads has been identified as one of the strategic locations in the Peel Urban Road Ecology Study. This particular road segment is important from both road mortality and regional connectivity perspectives. This is an excellent opportunity to serve as a pilot case study to implement the mitigation and monitoring recommendations coming out of the Peel Urban Road Ecology Study given that, the Environmental Assessment is expected to be completed this spring 2013 and the detailed design phase is anticipated to begin in 2014.

The purpose of this document is to provide a summary of the most relevant information on mitigation and monitoring for The Gore Road to be considered in the detailed design phase. It is important to note that while the benefits of this particular pilot case study may be limited due to the fact that this proposal is being drafted at the end of the EA phase when the crossing structures (type, size, and locations) have already been determined, it is worth highlighting that this case study will contribute significantly as a pilot to the larger database of case studies that will continue to be a part of ongoing urban road ecology initiatives in the Region of Peel.

2. Mitigation Measure Recommendations

Given that the Gore Road is at the end of the EA phase and is going to the detailed design phase the mitigation strategies presented here are constrained to accommodate the pre-determined crossing structures (type, size, and locations) that are likely based on factors other than wildlife movement. Recognizing that there are limitations, there are still several options that are available at this stage of the planning process that could provide benefit to wildlife movement while keeping the currently determined crossing structures, which are described in detail in the following sections.

These are general recommendations, which can be refined more at the detailed design phase after the baseline information on wildlife presence, movement, and mortality is collected specifically in and around the study area.

2.1 Key Features of Amphibian and Reptile Ecopassages

Previous studies have demonstrated that there are some key design elements of ecopassages for amphibian and reptiles that are important for the overall success of the mitigation project. These are:

1. The amount of light penetration into the tunnel,
2. The amount of moisture in the tunnel,
3. The substrate of the tunnel, and
4. A funnel wall

Amphibian and reptiles regulate their body temperature through exchange with their surroundings and are therefore sensitive to changes in temperature. Smaller tunnels are generally darker and colder than larger tunnels; as more light is able to penetrate as the size increases. This is referred to as the openness ratio and is calculated by taking the cross sectional area of the culvert opening and dividing by the length of the culvert. The openness ratio recommended for turtles and snakes is 0.25 (Ecoplans Limited 2008). The openness ratio is not only important for reducing the temperature gradient from outside to inside the culvert, it is also important as many nocturnal amphibians use celestial navigation in order to migrate to and from breeding ponds.

Given that amphibians and reptiles are sensitive to changes in temperature, the substrate of the culvert will be an important feature in the mitigation. Natural substrates are needed in order to reduce the temperature gradient. Wood chips can help to maintain a level of moisture and a few small logs placed throughout the tunnel provide cover. The aim is to make the environment inside of the culvert as close as possible to the environment outside of the tunnel. Culverts inundated with water are not suitable ecopassages; however, culverts that are too dry are also not suitable for most amphibians and reptiles. Ideally, ecopassages for amphibians and reptiles should be constructed with open grates across the top of the structure to allow for increased light, moisture and humidity. Open grates are placed flush with the road surface.

A funnel wall is a necessary structure as it prevents amphibians and reptiles from travelling across the road surface and directs them to the ecopassage. There are many suitable materials that can be used in the construction of the wall as long as they provide a solid smooth surface so that amphibians cannot climb over the structure. Materials such as armourstone, concrete and plastic have been used in other similar projects. Factors to consider in determining the most appropriate material will be the long-term durability of the product given the extreme climatic conditions of the region. In addition, the wall should be high enough that animals cannot jump over it towards the road and designed so that it angles back away from the road with a lip on the top (Figure 1) to facilitate egress for animals trapped within the road corridor. The placement of the wall needs to be angled so that wildlife is funneled towards the culvert entrance.

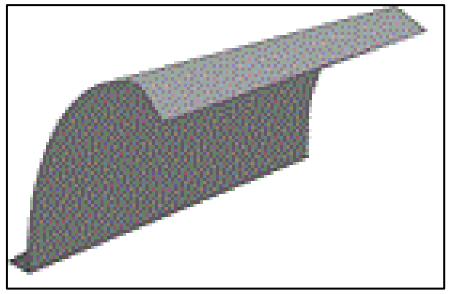

Figure 1: ACO wildlife ecopassage fence design.

All options for mitigation outlined below assume that baseline road mortality surveys have been completed and that the data identifies a need for mitigation measures to be implemented within the study area. A total of eight culverts have been identified by the Region as needing to be upgraded; specifically by increasing the size and length of the culvert.

Without the initial baseline surveys it is difficult to determine how many culverts will need to be modified for the purposes of facilitating amphibian and/or reptile movement across the roadway in advance. However, based on a preliminary orthophotography exercise it appears that culvert #9, #3, #2 and #1 are good candidates for needing some form of mitigation. This is based on the type of habitat on either side of the road and known locations of breeding wetland habitat for amphibians.

2.1.1 Option 1 – Minimum mitigation

Mitigation under Option 1 assumes that the culvert type and dimensions proposed by the Region will be used and that they will be installed at precisely the same location as the previous culverts.

The minimum mitigation option would be based on the above stated criteria. The bases of the culverts will need to be lined with a natural substrate that is collected from within the study area. Based on the proposed culvert dimensions provided by the Region, two of the eight culverts that are going to increase in size are only increasing to 0.6 m. The proposed length (Culvert #2 = 15.8 m and Culvert #9 = 19.0 m) for these two culverts is such that the openness ratio would be 0.02 and 0.01 respectively. Mitigation would not be appropriate considering that the addition of a natural substrate would reduce the openness ratio even further. For the remaining six tunnels the proposed size may be appropriate for mitigation (independent of the results from baseline field survey). A funnel wall will be needed to guide wildlife to the tunnel. The length and angle of the wall will be dependent on the characteristics of the area including habitat availability and land ownership. Installation of walkway ledges (see Figures 2 and 3) into the culverts was suggested by the Region, however, this mitigation measure is generally only applied to culverts for the facilitation of movement of smaller mammals. It is not known if this strategy would be successful for amphibians but it is anticipated that it would not as they require natural moist substrates.

Figure 3: Wire mesh walkway installed in metal culvert (photo credit: Foreman 2004).

Figure 2:: Concrete walkway installed in box culvert (photo credit: Jaeger et al. 2012).

2.1.2 Option 2 – Enhancement with additional ecopassages installed

Mitigation for amphibian and/or reptile ecopassages under Option 2 assumes that the benefit of the existing culvert placement and suggested upgrades would be limited as ecopassages. Thus, under this option, specifically designed ecopassages for amphibians and reptiles are placed in appropriate locations based on field data collected in addition to the existing culverts. Based on the current state of science and practice there are a few effective and reasonable options for tunnel materials.

<u>ACO Wildlife Tunnels</u>

These ecopassages are constructed with open grates across the top to allow for optimum light, temperature, and moisture within the tunnel (Figures 4 and 5). A natural substrate will need to be added to the floor of the tunnel including soils from within the study area and cover objects such as small branches / logs and boulders. These tunnels are designed so that when set into the road they are flush with the road surface.

There has been some skepticism over the use of this design in cold climates. Frost heaving has been voiced as a concern, however if the tunnels are implemented correctly this will not be an issue. Maintenance will need to be conducted on these tunnels approximately once every 5 years as the slots across the top will allow for sand and salt to enter. However, the slots are small so minimal material will enter.

There are several examples of this product being used in Canada. Most recently, in 2012 three ACO Wildlife ecopassages were installed at Long Point Causeway in Norfolk County, Ontario. Monitoring will begin this year. In addition, there was four of this type of ecopassage put in at

Waterton Lakes National Park, Alberta in 2008. From the follow-up monitoring they have found a significant reduction in road mortality of amphibians.

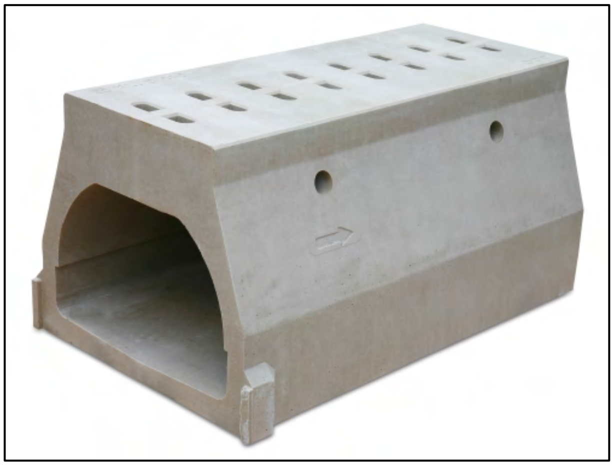

Figure 4: ACO Wildlife amphibian tunnel design with air slots.

Figure 5: ACO Wildlife amphibian tunnel flush with road surface.

Box and Concrete Elliptical Culverts

Concrete elliptical (Figure 6) and box culverts have also been shown to be effective provided that the openness ratio allows for enough light to penetrate into the tunnel. A recommended height for box culverts is 1.7 m as this would require the least change in the profile of the road (Ecoplans Limited 2008). If the road length was 20 m, the width of the box culvert would need to be approximately 3 m in order to give an openness ratio of 0.25. Again, these culverts will need to be lined with a natural substrate.

Figure 6: Concrete elliptical ecopassage (photo credit: Ecoplans Limited).

Regardless of the type of tunnel used, funnel fencing will be needed to direct the animals towards the tunnel and prevent them from crossing the road. The design of the fencing shown in Figure 1, would be appropriate as the 'lip' will prevent animals from climbing or jumping over.

2.2 Additional Mitigation Measures for Other Wildlife

The Ontario Ministry of Natural Resources (MNR) completed a study in 2009 (MNR 2009) that looked at white-tailed deer motor vehicle collisions within the Town of Caledon from January 2001 to December 2007. Based on data received from the Ontario Provincial Police, they found that the stretch of The Gore Road between Patterson and Finnerty Sideroad have had several motor vehicle collisions with deer during this time period. At the corner of Finnerty Sideroad and The Gore Road as well at the corner of Patterson and The Gore Road there were 10 to 15 collisions, with an additional 5 to 9 reported between these two points on The Gore Road. Based on these results mitigation measures would be appropriate within this study area.

The MNR made several recommendations within their report for mitigation options. One of their key findings was that the highest number of collisions occurred during the first two weeks of November. This is the time of year when white-tailed deer are more active as they are within their breeding period and this is also the time of reduced daylight hours. Some of the recommendations made by the MNR were to install deer crossing signs in high-risk areas, reduce speed limits within high-risk areas or high-risk periods, installing exclusion fencing and to educate local residents of the issue. In addition, they have recommended maximizing hunting opportunities to reduce deer populations within the area.

Given that this stretch of road indicated elevated levels of motor vehicle collisions with deer but was not as significant as other areas in Caledon such as Airport Road and Charleston Side Road, a middle-ground approach may be best given limited resources available. Educating local residents in addition to placing deer crossing signs with flashing lights during high-risk times (October through until January) may have the greatest success in mitigation.

3. Cost Estimate for Mitigation Options

Cost estimates provided below are for materials only and are meant for the purpose of general discussion only.

Table 1: Preliminary cost estimate for mitigation options

Mitigation Options	Cost Estimate for Materials
Option 1	
Culvert • CSP culvert (1350 mm diameter)	$550
Fencing • ACO wildlife fencing	$50 per m
Option 2	
Ecopassage • ACO wildlife tunnel • Box culvert (3.0 m x 1.7 m) • Concrete elliptical (1.9 m x 3.0 m)	$700 per m $3,500 - $4,000 per m $3,500 - $4,000 per m
Fencing • Armourstone • ACO wildlife fencing	$1,000 per m $50 per m

4. Monitoring Plan

Given that The Gore Road is serving as a pilot case study for the broader Peel Urban Road Ecology Study (TRCA, *in prep*] the objectives of the monitoring plan proposed here are threefold:

1. Validation of the desk-top landscape connectivity modelling. Baseline road mortality field surveys will provide data to inform the accuracy of the model and possibly to refine this level of analysis.

2. Initial baseline road mortality surveys will assist in determining if mitigation measures are needed at this particular location and if so, what measures would be most appropriate and where for the detailed design stage.

3. If mitigation measures are implemented, the monitoring data will demonstrate whether or not the strategies employed are functioning in the manner originally intended.

The suggested monitoring plan for The Gore Road Improvements project has three main components. First, an initial baseline survey should be conducted in order to inform mitigation strategies. Once mitigation measures are determined to be needed a short-term monitoring program begins after the road improvement projects have been fully implemented and are completed. The last component is the implementation of a long-term monitoring program to ensure continued success of the initial project.

4.1 Baseline Survey (to start in 2013)

Road surveys to investigate if amphibian and reptile species are attempting to cross the road are required in order to determine the “hot-spots” for mortality in addition to what species are crossing and if there is a specific time of year when the issue is more pronounced / significant. This data would not only identify the need for mitigation but also the specific location(s) within the study area. The validation of the desktop models will also be accomplished using this data.

Due to the unpredictability of amphibian movements from year to year, it is recommended that at least two years of baseline surveys are conducted before determining the appropriate mitigation measures. Nevertheless, if the detailed design has proceeded to a stage in 2014 that requires finalization, one year of baseline data will be used to make the final decisions after ensuring that that there is a need for such mitigation.

Recommendation:

1. Amphibian Road Mortality Survey

   These surveys would focus on peak periods for amphibian movements (March/ April, May, June). The spring movement is generally described as a mass migration and is a key time to ensure surveys are conducted as this is when many amphibians are killed on roadways. Six to eight surveys during this period are to be conducted once the overnight temperatures are above freezing and spring rains begin. Surveys will be conducted after sunset and will consist of walking the roadside with flashlights and documenting all wildlife crossing the road. An additional six surveys will be conducted throughout May and June when weather conditions are appropriate to capture the later breeding amphibian movements.

2. Reptile Road Mortality Survey

These surveys will target peak periods for reptiles. Turtles are most susceptible to being road-kill during the month of June. Six surveys should be conducted during daylight hours by slowly driving and walking along the road and documenting all turtles. Snake surveys would be most appropriate in September / October (the period when snakes are attracted to the basking opportunities presented by open roads) and would follow a similar protocol to turtles. It is recommended that six to eight surveys are conducted during this time period.

4.2 Short-term Monitoring (post construction for 2 consecutive years)

A short-term monitoring program should be implemented post-construction and carried out for a full two years. Data from this type of monitoring will help to identify any initial changes with the mitigation measure that may be corrected for better results.

Several assumptions are made for the following recommendation and cost estimate. First, it is assumed that some form of mitigation measure(s) are needed within this study area. Second, that the selected mitigation will include some form of modification to the existing CSP culverts and/or the construction of separate eco-passages together with, the installation of fencing that will direct animals towards the culvert.

Recommendation:

1. Pitfall traps and road mortality surveys

The use of pitfall traps along the edge of the funnel fencing and culvert entrance are standard techniques in order to determine if the fencing is in the appropriate location and of the appropriate design. Additional road-kill surveys are also conducted during the same period to also ensure the mitigation measure is working appropriately. These surveys should be conducted during the spring amphibian movement (March/April) peak period for turtles (June) and snakes (September /October).

2. Installation of cameras in culverts

The use of wildlife cameras in culverts can be a useful technique in order to determine whether or not the culverts are being used by wildlife and by which species. This technique can provide more information over a longer period of time. Cameras could be set-up in the spring and left to run during the warmer summer months. Periodic checks would be made to ensure equipment is running properly and to download the data.

4.3 Long-term Monitoring (5 years post construction)

A long-term monitoring program should be implemented in order to continue documenting the success of the mitigation measure(s). Some land-use changes in the surrounding landscape could have implications on the perceived effectiveness of the project. There could be changes to the type of species, the number of species and the locations of where they actually cross the road. It is recommended that

Recommendation:

1. Road Mortality and Funnel Fencing Surveys

   Road mortality surveys should focus on the spring amphibian movement (March/April), peak period for turtles (June) and snakes (September /October). During the spring amphibian road mortality surveys the funnel fencing should also be checked to note observations of amphibians in order to infer continued culvert usage.

2. Fencing and Culvert Maintenance

   The funnel fencing will need to be checked periodically to ensure that it is still in working order. Vegetation such as shrubs, trees and vines should not be allowed to grow next to this structure as wildlife such as some species of frogs will be able to use the vegetation to climb over the fence. In addition, the culvert will need to be checked to ensure that it is not blocked with debris. Garbage and sediment should be cleared.

5. Cost Estimate for Monitoring Plan

These cost estimates are based on scope of work outlined in the monitoring plan. It is recommended that two years of baseline survey data be compiled before finalizing the mitigation design. However, it is recognized that timing for this project may restrict these surveys to one year. A 2% annually increase was taken into account for rise in inflation from year to year. Maintenance costs associated with the tunnels and fencing is not included in these estimates.

Table 2: Estimated costs for baseline survey, short-term, and long-term monitoring plan

Monitoring Schedule	Staffing & Reporting Costs	Vehicle & Equipment Costs	Total Cost
Baseline Survey 2013	Staffing: $13,000	Vehicles (incl. fuel and insurance): $2,000 GPS unit, flashlights, batteries: $500	Year 2014: $15,500
Baseline Survey 2014	Staffing: $13,500 Reporting:$1,500 *(submitted at the end of the year ~ 2015)*	Vehicles (incl. fuel and insurance): $2,500	Year 2015: $17,500
Short-term Monitoring Post-construction (assumed 1st year to be in 2019)	Staffing: $8,000	Vehicles (incl. fuel and insurance): $3,000 Pitfall traps, small tools: $500 Cameras (assumption that a total of 4 culverts are with cameras): $2,000	Year 2019: $13,500
Short-term Monitoring Post-construction (2nd year in 2020)	Staffing: $8,200 Reporting: $2,000 *(submitted at the end of 2nd year of monitoring ~ 2020)*	Vehicles (incl. fuel and insurance): $3,300	Year 2020: $13,500
Long-term Monitoring (anticipated to be in 2023)*	Staffing: $9,000 Reporting: $2,000 *(submitted at the end of the year ~ 2023)*	Vehicles (incl. fuel and insurance): $3,500	Year 2023: 14,500* *(* Anticipate rolling into the TRCA's existing long-term regional monitoring programs.)*

6. References

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Jaeger, J., Bélanger-Smith., Paspaliaris, M., and A. Clevenger. 2012. Monitoring the effectiveness of wildlife passages for medium-sized and small mammals along HW 175.

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BURNSIDE
[THE DIFFERENCE IS OUR PEOPLE]

Appendix F
Aquatic Habitat Mapping and Photo Record

FIGURE 4.2 A
REGION OF PEEL
TOWN OF CALEDON

THE GORE ROAD PROJECT FILE REPORT

AQUATIC ENVIRONMENT - NORTH

Legend

Water Feature Crossing (Bridge / Culvert)

Fish Habitat

- Permanent / Direct
- Seasonal / Indirect
- TRCA Drainage Areas
- Watercourses

***Water Feature Crossing ID: TRCA Crossing #**
(Region of Peel Crossing #)

Toronto and Region Conservation Authority, 2011.
Region of Peel, 2011 (Ortho Imagery)

N

0 100 200 300 400
Meters

Scale: 1:5,000
August, 2011
Project Number: MTB019424

Projection: UTM Zone 17
Datum: NAD 83

Prepared By: Z. Nevar

Verified By: D. Evans

BURNSIDE

E:\Project\M Jobs\MT Jobs\MTB019424 (GORE RD 2011)\Map\019424 AQUATIC SP NORTH.mxd

FIGURE 4.2 B
REGION OF PEEL
TOWN OF CALEDON

THE GORE ROAD PROJECT FILE REPORT

AQUATIC ENVIRONMENT - NORTHWEST

Legend

Water Feature Crossing (Bridge / Culvert)

Fish Habitat

- Permanent / Direct
- Seasonal / Indirect
- TRCA Drainage Areas
- Watercourses

***Water Feature Crossing ID: TRCA Crossing # (Region of Peel Crossing #)**

Toronto and Region Conservation Authority, 2011.
Region of Peel, 2011 (Ortho Imagery)

N

0 100 200 300 400
Meters

Scale: 1:5,000
August, 2011
Project Number: MTB019424

Projection: UTM Zone 17
Datum: NAD 83

Prepared By: Z. Nevar

Verified By: D. Evans

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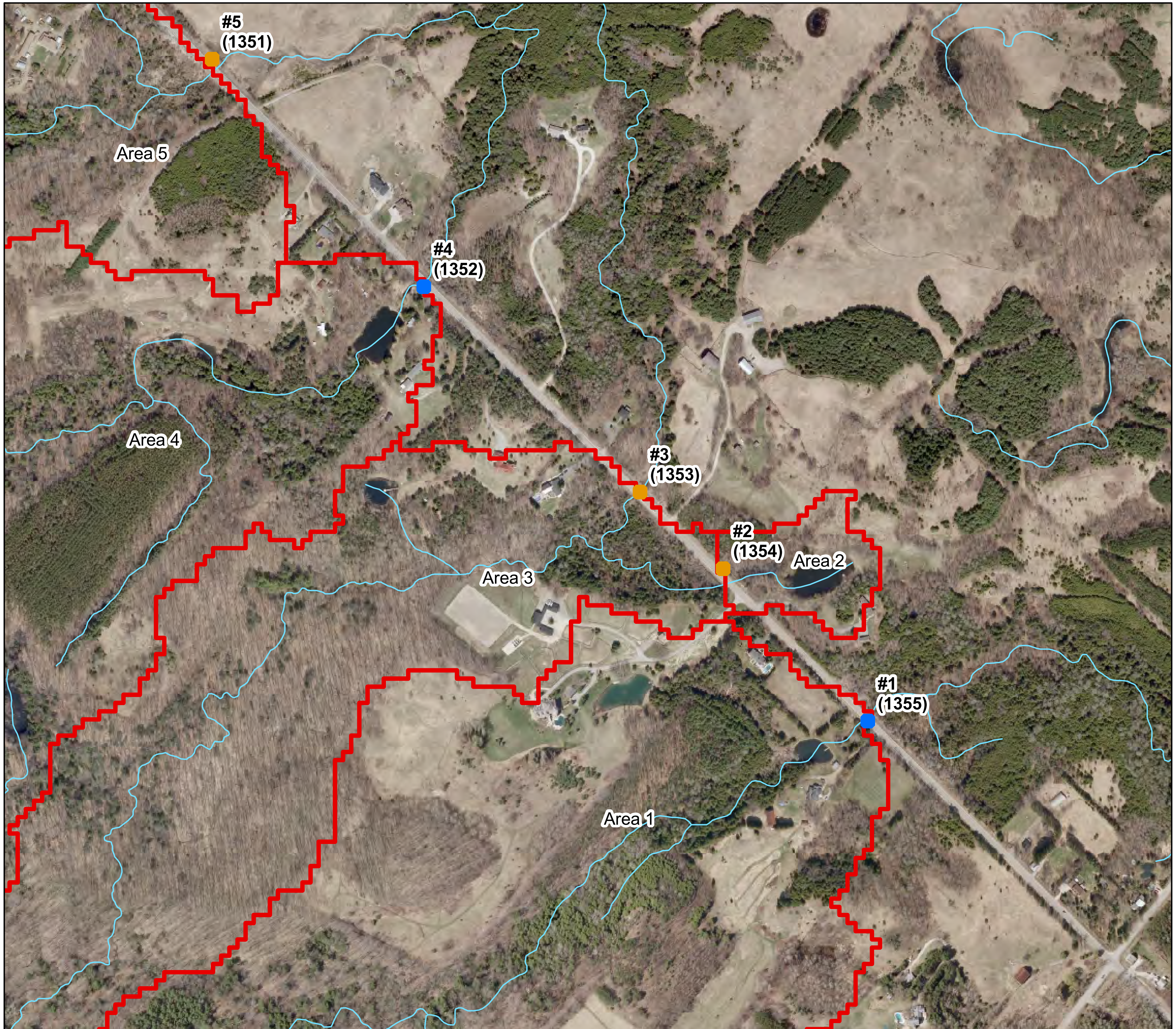

FIGURE 4.2 D
REGION OF PEEL
TOWN OF CALEDON

THE GORE ROAD PROJECT FILE REPORT

AQUATIC ENVIRONMENT - SOUTH

Legend

Water Feature Crossing (Bridge / Culvert)

Fish Habitat

- Permanent / Direct
- Seasonal / Indirect
- TRCA Drainage Areas
- Watercourses

***Water Feature Crossing ID: TRCA Crossing #**
(Region of Peel Crossing #)

Toronto and Region Conservation Authority, 2011.
Region of Peel, 2011 (Ortho Imagery)

N

0 100 200 300 400
Meters

Scale: 1:5,000
August, 2011
Project Number: MTB019424

Projection: UTM Zone 17
Datum: NAD 83

Prepared By: Z. Nevar

Verified By: D. Evans

BURNSIDE

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FIGURE 4.2 C

REGION OF PEEL
TOWN OF CALEDON

THE GORE ROAD PROJECT FILE REPORT

AQUATIC ENVIRONMENT - SOUTHEAST

Legend

Water Feature Crossing (Bridge / Culvert)

Fish Habitat

- Permanent / Direct
- Seasonal / Indirect
- TRCA Drainage Areas
- Watercourses

***Water Feature Crossing ID: TRCA Crossing #**
(Region of Peel Crossing #)

Toronto and Region Conservation Authority, 2011.
Region of Peel, 2011 (Ortho Imagery)

N

0 100 200 300 400
Meters

Scale: 1:5,000
August, 2011
Project Number: MTB019424

Projection: UTM Zone 17
Datum: NAD 83

Prepared By: Z. Nevar

Verified By: D. Evans

BURNSIDE

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Photo 1, Crossing #1 (1355) looking upstream.

Photo 2, Crossing #1 (1355) looking at the outlet of the culvert.

Photo 3, Crossing #2 (1354), looking upstream.

Photo 4, Crossing # 2 (1354), looking at the culvert outlet.

Photo 5, Crossing #3 (1353) looking upstream.

Photo 6, Crossing #3 (1353) looking downstream.

Photo 7, Crossing #4 (1352) looking upstream.

Photo 8, Crossing #4 (1352) looking at the outlet of the culvert, note stream gradient.

Photo 9, Crossing #5 (1351) looking at the inlet of the CSP.

Photo 10, Crossing #5 (1351) looking at the culvert outlet, note that it is perched.

Photo 11, Crossing #6 (082770) looking upstream.

Photo 12, Crossing #6 (082770) looking a the box culvert.

Photo 13, Crossing #6 (082770) looking downstream.

Photo 14, Crossing #5 (1347) looking at the ponded area west of Gore Road.

Photo 15, Crossing #7 (1347) looking at the outlet channel.

Photo 16, Crossing #7 (1347), looking east from Gore Rd.

Photo 17, Crossing #8 (1346) looking west at wetland upstream of the road culvert.

Photo 18, Crossing #8 (1346) looking east at a cattail area where the culvert outlets.


Photo 19, Crossing #9 (N1) looking west at the upstream channel.


Photo 20, Crossing #9 (N1) looking at the culvert outlet.

Photo 21, Crossing #10 (1345) looking at the channel upstream of the culvert.

Photo 22, Crossing #10 (1345) looking downstream at the plunge pool and elevated culvert.

GENERAL INFORMATION

PROJECT #:	PROJECT DESCRIPTION:	DAY:	MONTH:	YEAR:
MTB019424	Gore Rd	17	JUNE	11

Is STREAM REALIGNMENT required for this section:

Yes | No | Unknown

COLLECTORS:	WEATHER CONDITIONS:	TIME STARTED:	TIME FINISHED:
CHRIS & DEVIN	overcast	12:40	1:20

PHOTOS NUMBERS AND DESCRIPTIONS: See olympus Camera

LOCATION

NAME OF WATERBODY:	DRAINAGE SYSTEM:	CROSSING #:	STATION #:
	TRCA#1	CULVERT 1355	1355

LOCATION OF CROSSING: THE GORE RD APPROX 300m N of PATTERSON

UTM EASTING & NORTHING:	MTO CHAINAGE:
TOWNSHIP: Peel Region	MNR DISTRICT: Aurora

LAND USE AND POLLUTION

SURROUNDING LAND USE:	SOURCES OF POLLUTION:
RURAL/RESIDENTIAL	ROADWAY, REFUSE

EXISTING STRUCTURE TYPE

Bridge	Box Culvert	Open Foot Culvert	CSP	N/A
Other Describe:			Size (w x h) m2	0.8 m dia.

SECTION TYPE AND MORPHOLOGY

SECTION IDENTIFIER:	SECTION LOCATION: (include on habitat map)
	E. SIDE OF GORE RD (DOWNSTREAM) #1355

TYPE:	Stream / river	Channelized	Permanent	Intermittent	Ephemeral	ASSOCIATED WETLAND:

TOTAL SECTION LENGTH (m): | CURRENT VELOCITY (m/s):

SUB-SECTION(S)	Run	Pool	Riffle PRIMARILY/	Flats	Inside culvert	Other
Percentage of area		0	90	10		
mean depth wetted (m)			0.04m	0.04m		
mean width wetted (m)			0.70m	0.60m		
Mean bankfull width (m)			0.4m	~2.6m		
Mean bankfull depth(m)			2.8m	~0.4m		
Substrate			SAND & GRAVEL SEE COMMENTS	Sand & Gravel		

Bedrock Br	Boulder Bo	Cobble Co	Gravel Gr	Sand Sa	Silt Si	Clay Cl	Muck Mu	Detritus D

BANK STABILITY

	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Upstream Bank	✓			
Right Upstream Bank	✓			

HABITAT

IN-STREAM COVER (% surface area): 70% LRG WOODY DEBRIS	Undercut banks 10%	Boulders	Cobble	Large Woody Debris Instream Overhanging	Organic debris	Vascular plants Instream Overhanging	None

SHORE COVER (% stream shaded):	100 – 90 %	90 – 60%	60- 30%	30 – 1%	None
		70%			

VEGETATION TYPE (%): 0	Submergent	Floating	Emergent	None
				✓
Predominant Species				

MIGRATORY OBSTRUCTIONS:	None	Seasonal - LIMITING DEPTH	Permanent - CULVERT

POTENTIAL CRITICAL HABITAT LIMITING:	Spawning - NO	Evidence of Groundwater - yes, small downstream	Other

POTENTIAL ENHANCEMENT OPPORTUNITIES:

LOWER CULVERT/ROCKY RAMP FOR FISH MIGRATION

COMMENTS :

MINNOWS OBSERVED, DEER TRACKS, IRON STAINING ALONG BANKS
DIRECT FISH HABITAT, LARGE WOODY DEBRIS THROUGHOUT

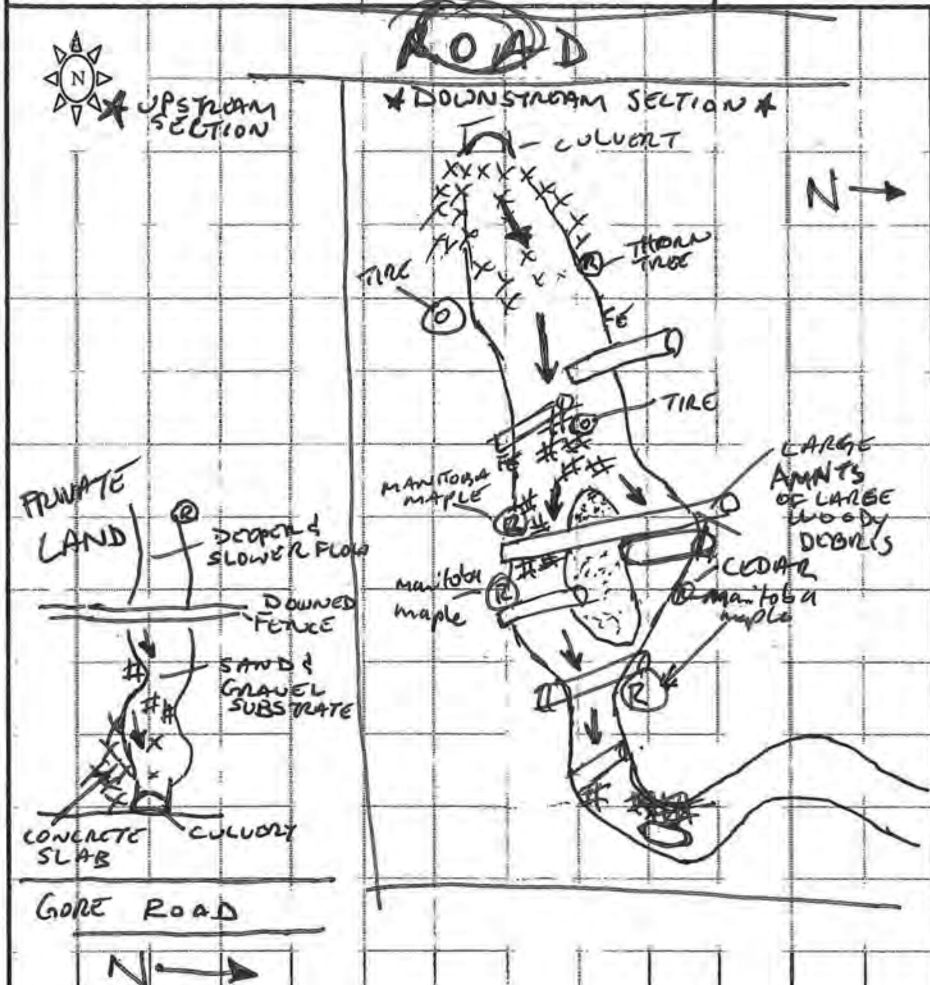
-RIP-RAP & CONCRETE SLAB OBSERVED AT FOOT OF CULVERT

- CYPRINIDS

UPSTREAM - WEST SIDE OF RD.
SIMILAR TO EAST - RIP RAP NEAR CULVERT; SIGNIFICANTLY LESS WOODY DEBRIS
-MINNOW SPECIES OBSERVED
- SHALLOW DEPTH - APPROX 4 cm

Additional Notes Appended? No Yes number of pages ________

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):



PROJECT #: MTB09424

MAPPER: CP

NAME OF WATERBODY:

CROSSING #: 1355, TRCA#1

STATION #:

DATE: DD-MMM-YY 17-06-11

LEGEND

- **10d** depth (cm)
- **6w** width
- ➡ Riffle
- ⇨ Run/Glide
- ⬭ Pool
- ▮ Island/Bar
- ░ Fine Substrate
- ### Gravel Substrate
- **oOooO** Cobble /Boulder
- * * * Debris
- **CT** Cattail
- **SV/FV** Submerg/Float Veg
- **EV** Emergent Vegetation
- **W** Watercress
- **Fe** Iron Staining
- *//////* Eroded Bank
- **XXX** Riprap / Other Stabilization
- Instream Log/Tree
- **^^^** Dam/Weir/Obstruction
- ® Riparian Tree
- ├► Seep/Spring
- -------- Undercut Bank
- ▬ Barrier to Fish Movement
- **-S-** Seasonal Barrier
- **-x--x-** Fence line
- └┘ Culvert

PROFILE: **Horz. Scale** **Vert. Scale**

GENERAL INFORMATION

PROJECT #:	PROJECT DESCRIPTION:	DAY:	MONTH:	YEAR:
MTB 019424	GORE RD	12	07	2011

Is STREAM REALIGNMENT required for this section:

Yes No Unknown

COLLECTORS:	WEATHER CONDITIONS:	TIME STARTED:	TIME FINISHED:
CP	Sunny		

PHOTOS NUMBERS AND DESCRIPTIONS: See olympus

LOCATION

NAME OF WATERBODY:	DRAINAGE SYSTEM:	CROSSING #:	STATION #:
		TRCA #2+3	1354 + 1353

LOCATION OF CROSSING: Both north of 1355

UTM EASTING & NORTHING:	**MTO CHAINAGE:**
TOWNSHIP: Peel Region	**MNR DISTRICT:** Aurora

LAND USE AND POLLUTION

SURROUNDING LAND USE:	SOURCES OF POLLUTION:
Rural	Road Salt

EXISTING STRUCTURE TYPE

Bridge	Box Culvert	Open Foot Culvert	CSP	N/A

Other Describe: Size (w x h) m2 See MH Notes

SECTION TYPE AND MORPHOLOGY

SECTION IDENTIFIER:	SECTION LOCATION: (include on habitat map)

TYPE:	Stream / river	Channelized	Permanent	Intermittent	Ephemeral	ASSOCIATED WETLAND:
					✓	minor cattail areas

TOTAL SECTION LENGTH (m): **CURRENT VELOCITY (m/s):** NA

SUB-SECTION(S)	Run	Pool	Riffle	Flats	Inside culvert	Other
						No defined
Percentage of area						Chanel @1353
mean depth wetted (m)						Chanel is lined
mean width wetted (m)						with cattails @ 1354
Mean bankfull width (m)						
Mean bankfull depth(m)						
Substrate						

Bedrock Br	Boulder Bo	Cobble Co	Gravel Gr	Sand Sa	Silt Si	Clay Cl	Muck Mu	Detritus D

BANK STABILITY				
	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Upstream Bank	✓			
Right Upstream Bank	✓			

HABITAT							
IN-STREAM COVER (% surface area):	**Undercut banks**	**Boulders**	**Cobble**	**Large Woody Debris** Instream Overhanging	**Organic debris**	**Vascular plants** Instream Overhanging	**None** ✓

SHORE COVER (% stream shaded):	**100 – 90 %**	**90 – 60%**	**60- 30%**	**30 – 1%**	**None** N/A

VEGETATION TYPE (%):	**Submergent**	**Floating**	**Emergent** 100%	**None**
Predominant Species			cattails + Grasses	

MIGRATORY OBSTRUCTIONS:	**None**	**Seasonal**	**Permanent** ✓
POTENTIAL CRITICAL HABITAT LIMITING:	**Spawning**	**Evidence of Groundwater**	**Other**

POTENTIAL ENHANCEMENT OPPORTUNITIES:

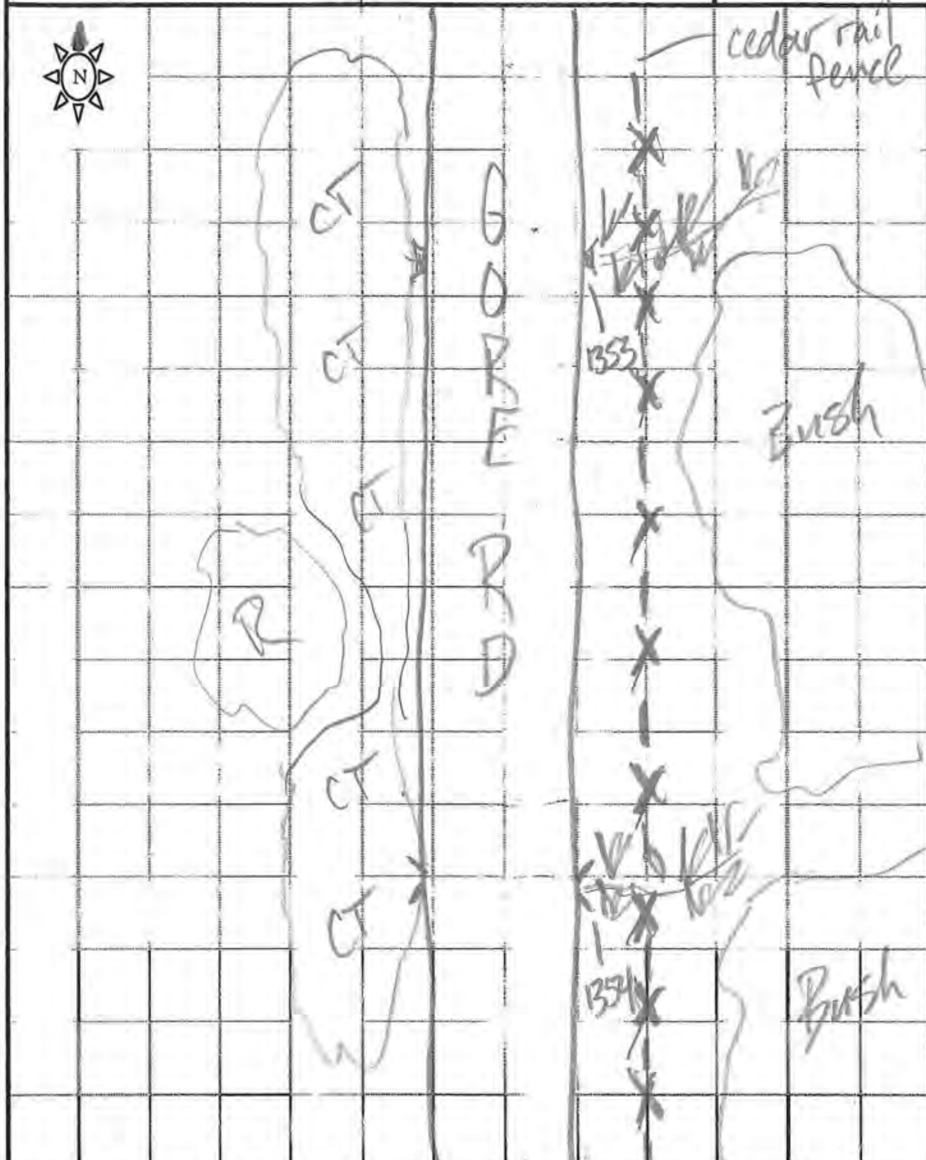
- None

COMMENTS :

- Not direct fish habitat
- Potential headwater drainage feature
- Cattail areas on West side of road, East side grasses
- No defined channel
- Seasonal flow

Additional Notes Appended? **No** **Yes number of pages** ________

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):



PROJECT #: MTB019424

MAPPER: CP

NAME OF WATERBODY:

CROSSING #: TRCA #2 + 3

STATION #: 1353 + 1354

DATE: DD-MMM-YY 12-07-11

LEGEND

- **10d** depth (cm)
- **6w** width
- ➡ Riffle
- ⇨ Run/Glide
- ⬭ Pool
- ▓ Island/Bar
- ░ Fine Substrate
- **###** Gravel Substrate
- **oOooO** Cobble /Boulder
- *** * *** Debris
- **CT** Cattail
- **SV/FV** Submerg/Float Veg
- **EV** Emergent Vegetation
- **W** Watercress
- **Fe** Iron Staining
- ***//////*** Eroded Bank
- **XXX** Riprap / Other Stabilization
- Instream Log/Tree
- **^^^** Dam/Weir/Obstruction
- ® Riparian Tree
- ├► Seep/Spring
- **--------** Undercut Bank
- **▬** Barrier to Fish Movement
- **-S-** Seasonal Barrier
- **-x--x-** Fence line
- └┘ Culvert

PROFILE: **Horz. Scale** **Vert. Scale**

GENERAL INFORMATION

PROJECT #:	PROJECT DESCRIPTION:	DAY:	MONTH:	YEAR:
MTB019424	GORE RD	12	07	2011

Is STREAM REALIGNMENT required for this section:

Yes   No (circled)   Unknown

COLLECTORS:	WEATHER CONDITIONS:	TIME STARTED:	TIME FINISHED:
CP	Sunny		

PHOTOS NUMBERS AND DESCRIPTIONS: See Olympus

LOCATION

NAME OF WATERBODY:	DRAINAGE SYSTEM:	CROSSING #:	STATION #:
		TRCA#4	1352

LOCATION OF CROSSING: South of 1351

UTM EASTING & NORTHING:	MTO CHAINAGE:

TOWNSHIP:	MNR DISTRICT:
	Aurora

LAND USE AND POLLUTION

SURROUNDING LAND USE:	SOURCES OF POLLUTION:
Rural	Road Salt

EXISTING STRUCTURE TYPE

Bridge	Box Culvert	Open Foot Culvert	CSP	N/A

Other Describe: Size (w x h) m2

SECTION TYPE AND MORPHOLOGY

SECTION IDENTIFIER:	SECTION LOCATION: (include on habitat map)

TYPE:	Stream / river	Channelized	Permanent	Intermittent	Ephemeral	ASSOCIATED WETLAND:
			✓			

TOTAL SECTION LENGTH (m): 20m u/s 30m d/s   **CURRENT VELOCITY (m/s):** ~0.30m/s

SUB-SECTION(S)	Run	Pool	Riffle	Flats	Inside culvert	Other
	d/s		d/s	u/s		
Percentage of area	50%		50%	100%		
mean depth wetted (m)	0.10m		varible 0.15m	~0.25m		
mean width wetted (m)	0.60m		1.2m	0.50m		
Mean bankfull width (m)	1.2m		2.5m	0.80m		
Mean bankfull depth(m)	0.40m		0.50m	0.35m		
Substrate	GR		GR/CO	Si/Mu		

Bedrock	Boulder	Cobble	Gravel	Sand	Silt	Clay	Muck	Detritus
Br	Bo	Co	Gr	Sa	Si	Cl	Mu	D

BANK STABILITY

	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Upstream Bank	✓			
Right Upstream Bank	✓			

HABITAT

IN-STREAM COVER (% surface area):	**Undercut banks**	**Boulders**	**Cobble**	**Large Woody Debris**	**Organic debris**	**Vascular plants**	**None**
			d/s 10%	**Instream** NA **Overhanging**		**Instream** **Overhanging** 30% Grasses	

SHORE COVER (% stream shaded):	**100 – 90 %**	**90 – 60%**	**60- 30%**	**30 – 1%**	**None**
			✓		

VEGETATION TYPE (%):	**Submergent**	**Floating**	**Emergent**	**None**
				✓
Predominant Species				

MIGRATORY OBSTRUCTIONS:	**None**	**Seasonal** ✓ Cobble ramp	**Permanent**

POTENTIAL CRITICAL HABITAT LIMITING:	**Spawning**	**Evidence of Groundwater**	**Other**

POTENTIAL ENHANCEMENT OPPORTUNITIES:

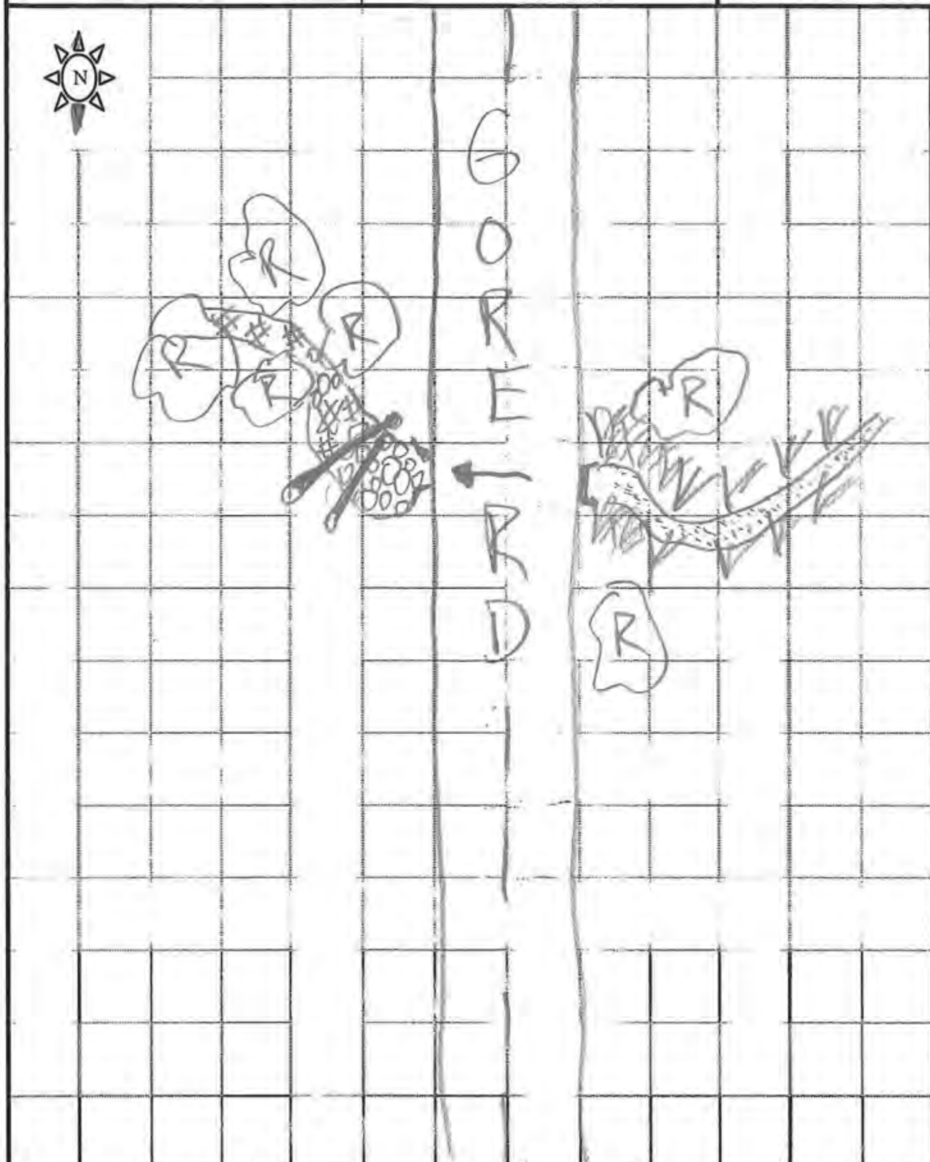
- extend cobble ramp to allow for passage during low flow
- fill in voids in cobble ramp so water flows over substrate

COMMENTS:

- Direct fish habitat observed d/s and u/s
- upstream is ditch like channel
- downstream provides better flow + substrate
- barrier @ culvert

Additional Notes Appended? **No** **Yes number of pages** ________

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):



PROJECT #: MTB019424

MAPPER: CP

NAME OF WATERBODY:

CROSSING #: TRCA #4

STATION #: 1352

DATE: DD-MMM-YY 12-07-2011

LEGEND

10d depth (cm)
6w width

➡ Riffle
⇨ Run/Glide
⬭ Pool
▓ Island/Bar

░ Fine Substrate
Gravel Substrate

oOooO Cobble /Boulder
* * * Debris

CT Cattail
SV/FV Submerg/Float Veg

EV Emergent Vegetation
W Watercress

Fe Iron Staining
/////// Eroded Bank

XXX Riprap / Other Stabilization

Instream Log/Tree
^^^ Dam/Weir/Obstruction

® Riparian Tree

├► Seep/Spring
-------- Undercut Bank

▬ Barrier to Fish Movement
-S- Seasonal Barrier

-x--x- Fence line
└┘ Culvert

PROFILE: **Horz. Scale** **Vert. Scale**

GENERAL INFORMATION				
PROJECT #: MTB0194Z4	**PROJECT DESCRIPTION:** GORE RD	**DAY:** 12	**MONTH:** 07	**YEAR:** 2011

Is STREAM REALIGNMENT required for this section:

Yes **No** Unknown

COLLECTORS:	**WEATHER CONDITIONS:**	**TIME STARTED:**	**TIME FINISHED:**
CP	Sunny		

PHOTOS NUMBERS AND DESCRIPTIONS: See Oylumpus

LOCATION			
NAME OF WATERBODY:	**DRAINAGE SYSTEM:**	**CROSSING #:** TRCA#5	**STATION #:** 1351

LOCATION OF CROSSING: South of box culvert

UTM EASTING & NORTHING:	**MTO CHAINAGE:**
TOWNSHIP:	**MNR DISTRICT:** Aurora

LAND USE AND POLLUTION	
SURROUNDING LAND USE: Rural / Pasture	**SOURCES OF POLLUTION:** Road Salt / Agriculture

EXISTING STRUCTURE TYPE

Bridge	Box Culvert	Open Foot Culvert	CSP	N/A

Other Describe: Size (w x h) m2 450mm ?

SECTION TYPE AND MORPHOLOGY

SECTION IDENTIFIER:	**SECTION LOCATION:** (include on habitat map)

TYPE:	Stream / river	Channelized	Permanent	Intermittent	Ephemeral	**ASSOCIATED WETLAND:**
					✓	Small wetland Area on W. side

TOTAL SECTION LENGTH (m):	**CURRENT VELOCITY (m/s):**

SUB-SECTION(S)	Run	Pool	Riffle	Flats	Inside culvert	Other
						No flow / cattails
Percentage of area				100%		No defined channel
mean depth wetted (m)				<0.10m		
mean width wetted (m)				~0.20m		
Mean bankfull width (m)				/		
Mean bankfull depth(m)				/		
Substrate				Si/Sa		

Bedrock Br	Boulder Bo	Cobble Co	Gravel Gr	Sand Sa	Silt Si	Clay Cl	Muck Mu	Detritus D

BANK STABILITY

	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Upstream Bank	✓			
Right Upstream Bank	✓			

HABITAT

IN-STREAM COVER (% surface area):	**Undercut banks**	**Boulders**	**Cobble**	**Large Woody Debris**	**Organic debris**	**Vascular plants**	**None**
				Instream		**Instream** cattails	✓
				Overhanging		**Overhanging**	

SHORE COVER (% stream shaded):	**100 – 90 %**	**90 – 60%**	**60- 30%**	**30 – 1%**	**None**

VEGETATION TYPE (%):	**Submergent**	**Floating**	**Emergent**	**None**
			cattails	
Predominant Species				

MIGRATORY OBSTRUCTIONS:	**None** N/A	**Seasonal**	**Permanent**
POTENTIAL CRITICAL HABITAT LIMITING:	**Spawning** N/A	**Evidence of Groundwater**	**Other**

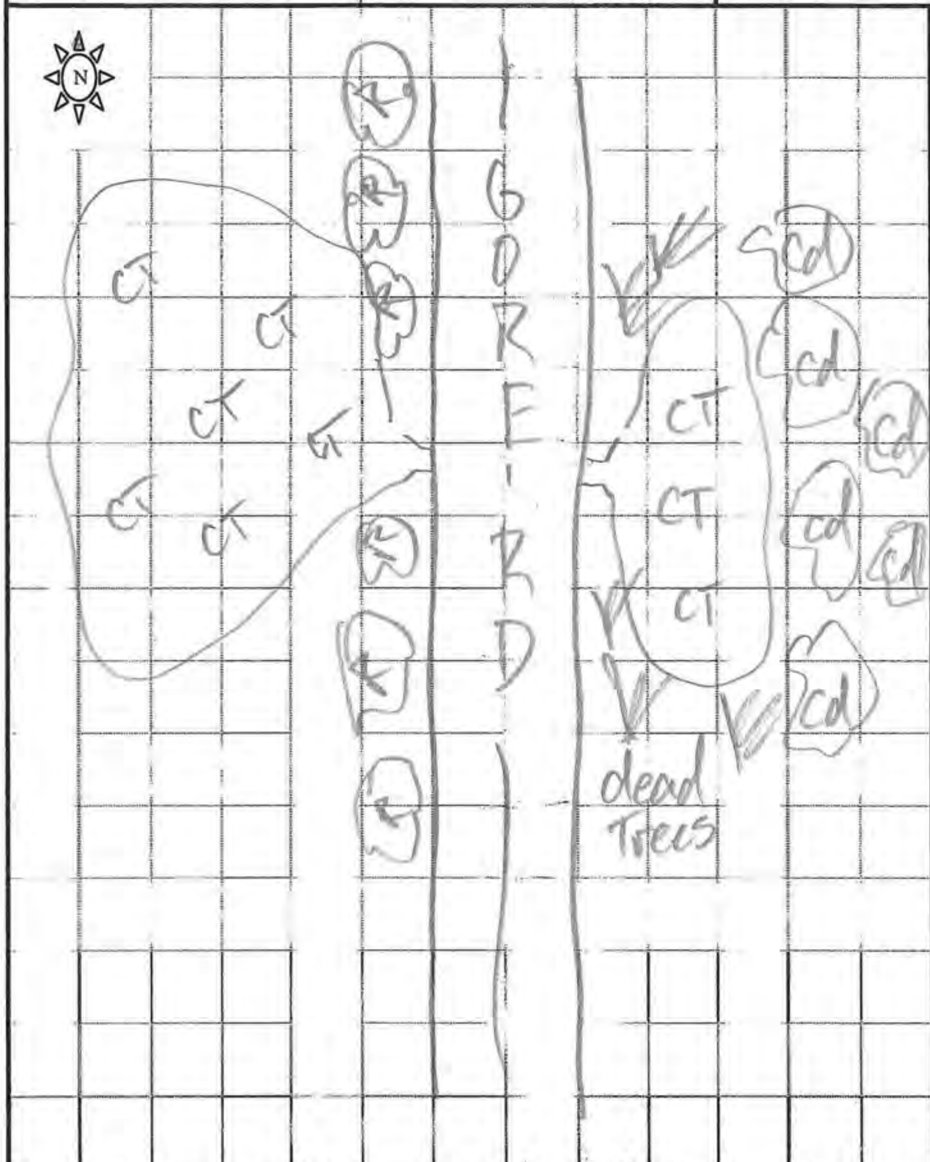
POTENTIAL ENHANCEMENT OPPORTUNITIES:

COMMENTS :

- No defined channel
- cattail wet area / headwater drainage feature
- Not direct Fish habitat

Additional Notes Appended? **No** **Yes number of pages** ______

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):



PROJECT #: MTB019424

MAPPER: CP

NAME OF WATERBODY:

CROSSING #: TRCA#5

STATION #: 1351

DATE: DD-MMM-YY 12-07-11

LEGEND

10d depth (cm)
6w width

➡ Riffle
⇨ Run/Glide
⬭ Pool
▓ Island/Bar

░ Fine Substrate
Gravel Substrate

oOooO Cobble /Boulder
*** Debris

CT Cattail
SV/FV Submerg/Float Veg

EV Emergent Vegetation
W Watercress

Fe Iron Staining
/////// Eroded Bank

XXX Riprap / Other Stabilization

Instream Log/Tree
^^^ Dam/Weir/Obstruction

® Riparian Tree

|► Seep/Spring
-------- Undercut Bank

▬ Barrier to Fish Movement
-S- Seasonal Barrier

-x--x- Fence line
└┘ Culvert

PROFILE: **Horz. Scale** **Vert. Scale**

GENERAL INFORMATION

PROJECT #:	PROJECT DESCRIPTION:	DAY:	MONTH:	YEAR:
MTB 019424	GORE RD	12	07	2011

Is STREAM REALIGNMENT required for this section:

Yes No Unknown

COLLECTORS:	WEATHER CONDITIONS:	TIME STARTED:	TIME FINISHED:
CP	Sunny		

PHOTOS NUMBERS AND DESCRIPTIONS: See Olympus

LOCATION

NAME OF WATERBODY:	DRAINAGE SYSTEM:	CROSSING #:	STATION #:
		TRCA#6	No. 082770

LOCATION OF CROSSING: South of Station#1347

UTM EASTING & NORTHING:	MTO CHAINAGE:
TOWNSHIP:	MNR DISTRICT: Aurora

LAND USE AND POLLUTION

SURROUNDING LAND USE:	SOURCES OF POLLUTION:
Rural	Road Salt

EXISTING STRUCTURE TYPE

Bridge	Box Culvert	Open Foot Culvert	CSP	N/A

Other Describe: see MH notes Size (w x h) m2

SECTION TYPE AND MORPHOLOGY

SECTION IDENTIFIER:	SECTION LOCATION: (include on habitat map)

TYPE:	Stream / river	Channelized	Permanent	Intermittent	Ephemeral	ASSOCIATED WETLAND:
			✓			

TOTAL SECTION LENGTH (m): CURRENT VELOCITY (m/s):

SUB-SECTION(S)	Run	Pool d/s	Riffle	Flats (upstream)	Inside culvert Box	Other
Percentage of area		30%	50%	100%	Concrete	
mean depth wetted (m)		0.75m	0.30m	0.25m	0.25m	
mean width wetted (m)		3.5m	3.0m	3.5m	5.0m	
Mean bankfull width (m)		6.0m	5.5m	4.5m	see MH notes	
Mean bankfull depth(m)		1.8m	1.0m	0.75m	seasonal barrier	
Substrate		Sa/GR	GR/Co	Si/Sa/GR	baffels in culvert	

Bedrock Br	Boulder Bo	Cobble Co	Gravel Gr	Sand Sa	Silt Si	Clay Cl	Muck Mu	Detritus D

BANK STABILITY

	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Upstream Bank	✓			
Right Upstream Bank	✓			

HABITAT

IN-STREAM COVER (% surface area):	**Undercut banks**	**Boulders**	**Cobble**	**Large Woody Debris**	**Organic debris**	**Vascular plants**	**None**
	5%	3%	10%	**Instream** 2% **Overhanging** 2%		**Instream** **Overhanging** 2% willow shrubs	

SHORE COVER (% stream shaded):	**100 – 90 %**	**90 – 60%**	**60- 30%**	**30 – 1%**	**None**
		✓			

VEGETATION TYPE (%):	**Submergent**	**Floating**	**Emergent**	**None**
				✓
Predominant Species				

MIGRATORY OBSTRUCTIONS:	**None**	**Seasonal** ✓ culvert	**Permanent**

POTENTIAL CRITICAL HABITAT LIMITING:	**Spawning**	**Evidence of Groundwater**	**Other**

POTENTIAL ENHANCEMENT OPPORTUNITIES:

- remove seasonal barrier w rocky ramp d/s

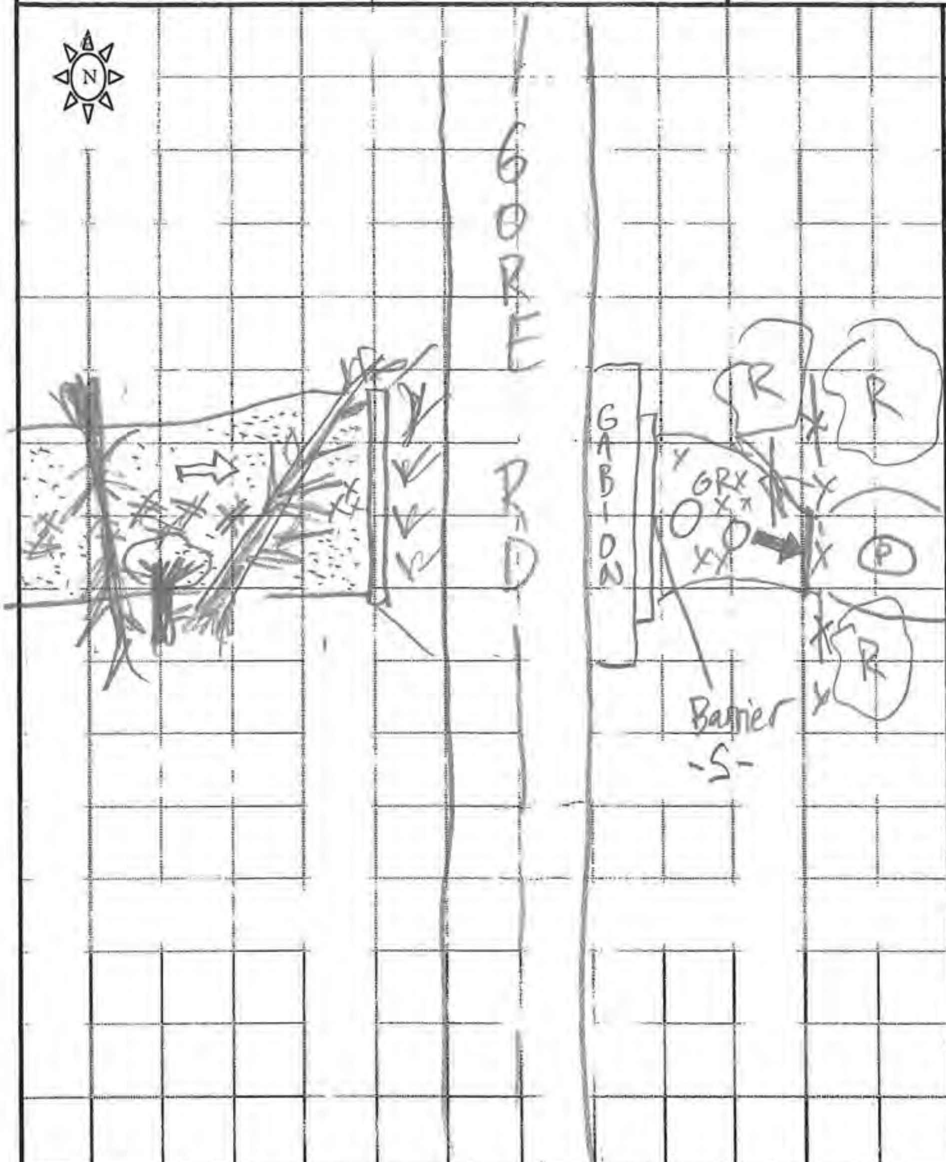
COMMENTS :

- Coldwater habitat, trout observed
- high quality u/s d/s
- private property downstream
- Flow station d/s ? stream work w T bar + log placement
- Cedar bush u/s

Additional Notes Appended? **No** **Yes number of pages** ________

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):

PROJECT #:	MTB019424
MAPPER:	CP
NAME OF WATERBODY:	
CROSSING #:	TRCA#6
STATION #:	No. 082770
DATE: DD-MMM-YY	12-07-11



LEGEND

- **10d** depth (cm)
- **6w** width
- ➡ Riffle
- ⇨ Run/Glide
- ⬭ Pool
- ▓ Island/Bar
- ░ Fine Substrate
- ### Gravel Substrate
- **oOooO** Cobble /Boulder
- * * * Debris
- **CT** Cattail
- **SV/FV** Submerg/Float Veg
- **EV** Emergent Vegetation
- **W** Watercress
- **Fe** Iron Staining
- ***///////*** Eroded Bank
- **XXX** Riprap / Other Stabilization
- Instream Log/Tree
- **^^^** Dam/Weir/Obstruction
- ® Riparian Tree
- |▶ Seep/Spring
- -------- Undercut Bank
- **—** Barrier to Fish Movement
- **-S-** Seasonal Barrier
- **-x--x-** Fence line
- └┘ Culvert

PROFILE: **Horz. Scale** **Vert. Scale**

GENERAL INFORMATION

PROJECT #: MTB019424	PROJECT DESCRIPTION: GORE RD	DAY: 12	MONTH: 07	YEAR: 2011

Is STREAM REALIGNMENT required for this section:

Yes No Unknown

COLLECTORS: CP	WEATHER CONDITIONS:	TIME STARTED:	TIME FINISHED:

PHOTOS NUMBERS AND DESCRIPTIONS: See Olympus

LOCATION

NAME OF WATERBODY:	DRAINAGE SYSTEM:	CROSSING #: TRCA#7	STATION #: 1347

LOCATION OF CROSSING: South of Culvert #1346

UTM EASTING & NORTHING:	MTO CHAINAGE:
TOWNSHIP:	MNR DISTRICT: Aurora

LAND USE AND POLLUTION

SURROUNDING LAND USE: Rural	SOURCES OF POLLUTION: Road Salt

EXISTING STRUCTURE TYPE

Bridge	Box Culvert	Open Foot Culvert	CSP	N/A

Other Describe: Size (w x h) m2 ≈ 450 mm damaged

SECTION TYPE AND MORPHOLOGY

SECTION IDENTIFIER:	SECTION LOCATION: (include on habitat map)

TYPE:	Stream / river	Channelized	Permanent	Intermittent	Ephemeral	ASSOCIATED WETLAND:
			✓		✓	west side of Road

TOTAL SECTION LENGTH (m): CURRENT VELOCITY (m/s): No flow / Dry

SUB-SECTION(S)	Run	Pool	Riffle	Flats	Inside culvert	Other
						No flow Dry
Percentage of area				100%		
mean depth wetted (m)				0.10		
mean width wetted (m)				0.25		
Mean bankfull width (m)				0.35		
Mean bankfull depth(m)				0.15		
Substrate				Silt		

Bedrock Br	Boulder Bo	Cobble Co	Gravel Gr	Sand Sa	Silt Si	Clay Cl	Muck Mu	Detritus D

BANK STABILITY

	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Upstream Bank	✓			
Right Upstream Bank	✓			

HABITAT

IN-STREAM COVER (% surface area):	**Undercut banks**	**Boulders**	**Cobble**	**Large Woody Debris**	**Organic debris**	**Vascular plants**	**None**
				Instream		Instream cattails	
				Overhanging		Overhanging	

SHORE COVER (% stream shaded):	**100 – 90 %**	**90 – 60%**	**60- 30%**	**30 – 1%**	**None**

VEGETATION TYPE (%):	**Submergent**	**Floating**	**Emergent**	**None**
Predominant Species		lilly pad (white)	in wetland	

MIGRATORY OBSTRUCTIONS:	**None**	**Seasonal**	**Permanent**
		✓	

POTENTIAL CRITICAL HABITAT LIMITING: NA	**Spawning**	**Evidence of Groundwater**	**Other**

POTENTIAL ENHANCEMENT OPPORTUNITIES:

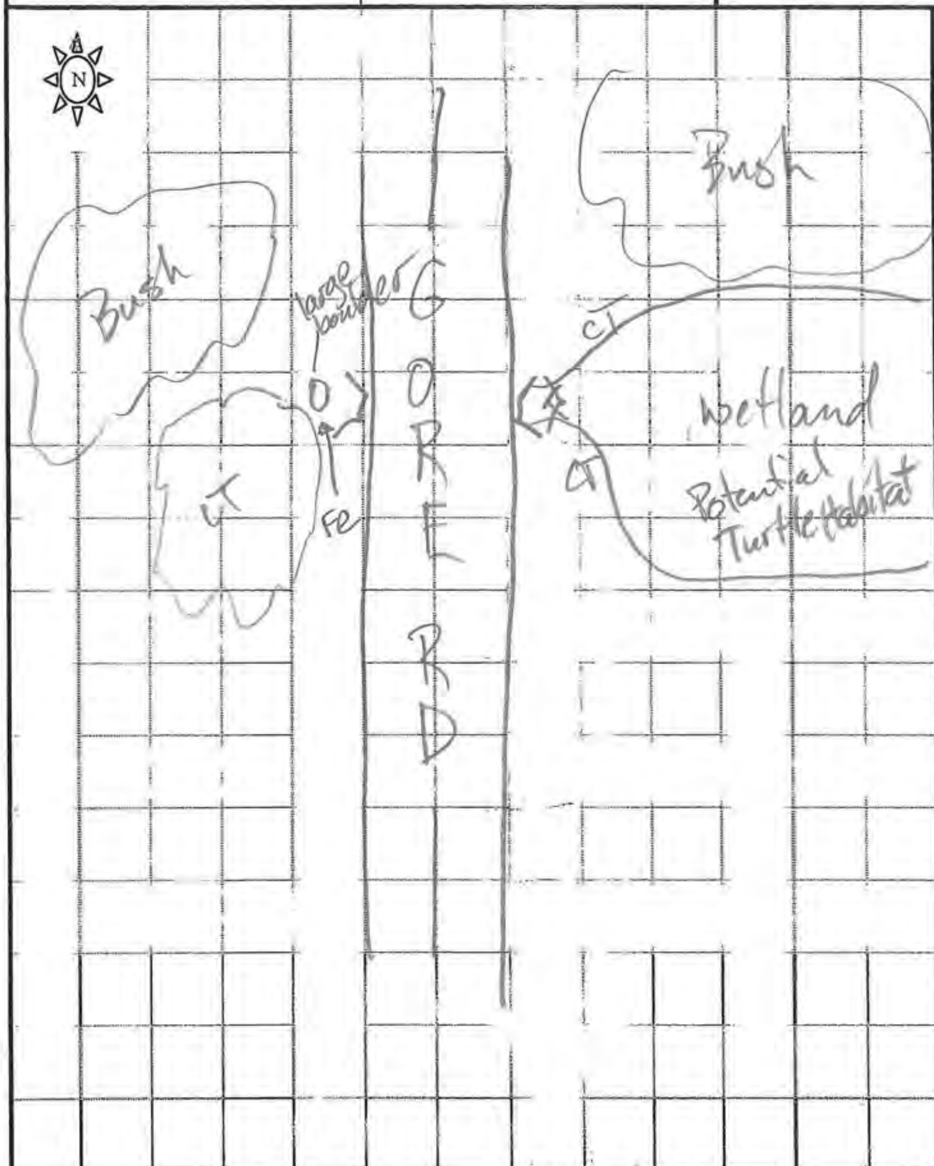
NA

COMMENTS :

- Wetland on West side provides amphibian breeding habitat
- potential for snapping turtle to be present
- barrier at outlet of wetland u/s of culvert
- iron staining on soils east of Gore Rd. culvert

Additional Notes Appended? **No** **Yes number of pages** ______

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):



PROJECT #: MTB019424

MAPPER: CP

NAME OF WATERBODY:

CROSSING #: TRCA# 7

STATION #: 1347

DATE: DD-MMM-YY 12-07-11

LEGEND

10d depth (cm)
6w width

➡ Riffle
⇨ Run/Glide
⬭ Pool
▓ Island/Bar

░ Fine Substrate
Gravel Substrate

oOooO Cobble /Boulder
* * * Debris

CT Cattail
SV/FV Submerg/Float Veg

EV Emergent Vegetation
W Watercress

Fe Iron Staining
////// Eroded Bank

XXX Riprap / Other Stabilization

Instream Log/Tree
^^^ Dam/Weir/Obstruction

® Riparian Tree

Seep/Spring
-------- Undercut Bank

— Barrier to Fish Movement
-S- Seasonal Barrier

-x--x- Fence line
Culvert

PROFILE: **Horz. Scale** **Vert. Scale**

GENERAL INFORMATION

PROJECT #:	PROJECT DESCRIPTION:	DAY:	MONTH:	YEAR:
MTB019424	GORE RD	12	7	2011

Is STREAM REALIGNMENT required for this section:

Yes No (circled) Unknown

COLLECTORS:	WEATHER CONDITIONS:	TIME STARTED:	TIME FINISHED:
CP	Sunny		

PHOTOS NUMBERS AND DESCRIPTIONS:

LOCATION

NAME OF WATERBODY:	DRAINAGE SYSTEM:	CROSSING #:	STATION #:
		TRCA#8	1346

LOCATION OF CROSSING: Culvert# 1346

UTM EASTING & NORTHING:	MTO CHAINAGE:
TOWNSHIP:	**MNR DISTRICT:** Aurora

LAND USE AND POLLUTION

SURROUNDING LAND USE:	SOURCES OF POLLUTION:
Rural	Road Salt

EXISTING STRUCTURE TYPE

Bridge	Box Culvert	Open Foot Culvert	CSP	N/A

Other Describe: Size (w x h) m2 ? buried

SECTION TYPE AND MORPHOLOGY

SECTION IDENTIFIER:	SECTION LOCATION: (include on habitat map)

TYPE:	Stream / river	Channelized	Permanent	Intermittent	Ephemeral	ASSOCIATED WETLAND:
					✓	Small wetland feature on W. side of road

TOTAL SECTION LENGTH (m): **CURRENT VELOCITY (m/s):**

SUB-SECTION(S)	Run	Pool	Riffle	Flats	Inside culvert	Other
Percentage of area						No defined
mean depth wetted (m)						Channel
mean width wetted (m)						
Mean bankfull width (m)						
Mean bankfull depth(m)						
Substrate						

Bedrock Br	Boulder Bo	Cobble Co	Gravel Gr	Sand Sa	Silt Si	Clay Cl	Muck Mu	Detritus D

BANK STABILITY

	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Upstream Bank	✓			
Right Upstream Bank	✓			

HABITAT

IN-STREAM COVER (% surface area):	**Undercut banks**	**Boulders**	**Cobble**	**Large Woody Debris**	**Organic debris**	**Vascular plants**	**None**
				Instream **Overhanging**		**Instream** cattails **Overhanging**	

SHORE COVER (% stream shaded):	**100 – 90 %**	**90 – 60%**	**60- 30%**	**30 – 1%**	**None**

VEGETATION TYPE (%):	**Submergent**	**Floating**	**Emergent**	**None**
Predominant Species				

MIGRATORY OBSTRUCTIONS:	**None**	**Seasonal**	**Permanent**
POTENTIAL CRITICAL HABITAT LIMITING:	**Spawning**	**Evidence of Groundwater**	**Other**

POTENTIAL ENHANCEMENT OPPORTUNITIES:

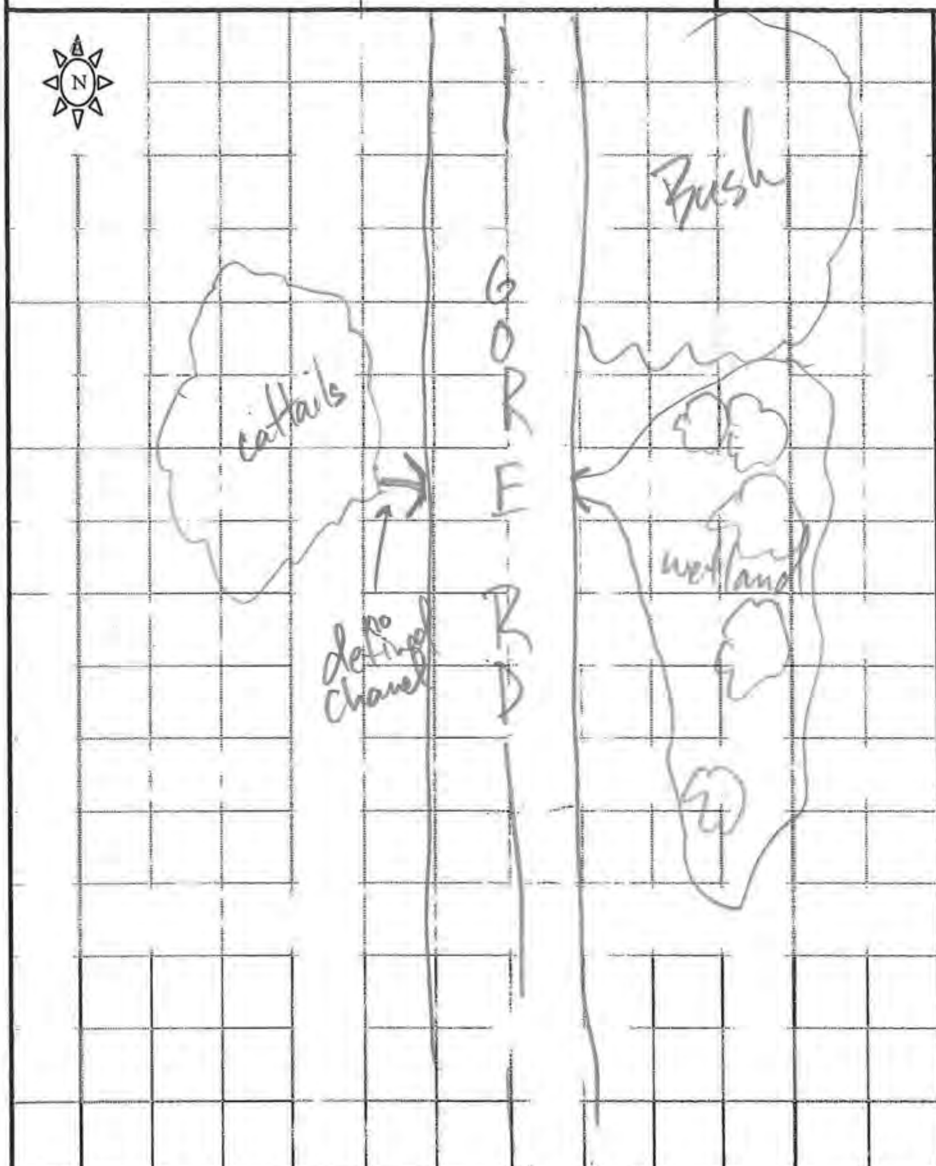
Maintain wetland feature by controlling outlet flow from culvert

COMMENTS :

-No defined channel
-Not direct fish habitat, although wetland may have fish?
-Wetland feature on W. side provides amphibian breeding habitat
-Turtles using wetland feature

Additional Notes Appended? **No** **Yes number of pages** ________

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):



PROJECT #: MTB019424

MAPPER: CP

NAME OF WATERBODY:

CROSSING #: TRCA#8

STATION #: 1346

DATE: DD-MMM-YY 12-07-11

LEGEND

10d depth (cm)
6w width

➡ Riffle
⇨ Run/Glide
⬭ Pool
▓ Island/Bar

░ Fine Substrate
Gravel Substrate

oOooO Cobble /Boulder
* * * Debris

CT Cattail
SV/FV Submerg/Float Veg

EV Emergent Vegetation
W Watercress

Fe Iron Staining
/////// Eroded Bank

XXX Riprap / Other Stabilization

⊂⊃ Instream Log/Tree
^^^ Dam/Weir/Obstruction

® Riparian Tree

├► Seep/Spring
-------- Undercut Bank

▬ Barrier to Fish Movement
-S- Seasonal Barrier

-x--x- Fence line
└┘ Culvert

PROFILE: **Horz. Scale** **Vert. Scale**

GENERAL INFORMATION

PROJECT #:	PROJECT DESCRIPTION:	DAY:	MONTH:	YEAR:
MTB019424	GORE RD	12	07	2011

Is STREAM REALIGNMENT required for this section:

Yes No Unknown

COLLECTORS:	WEATHER CONDITIONS:	TIME STARTED:	TIME FINISHED:
CP	Sunny Hot	10:00am	10:30am

PHOTOS NUMBERS AND DESCRIPTIONS: See Olympus

LOCATION

NAME OF WATERBODY:	DRAINAGE SYSTEM:	CROSSING #:	STATION #:
	Palgrave ?	TRCA#9	N

LOCATION OF CROSSING:
South of Culvert #1345

UTM EASTING & NORTHING:	MTO CHAINAGE:
TOWNSHIP:	**MNR DISTRICT:** Aurora

LAND USE AND POLLUTION

SURROUNDING LAND USE:	SOURCES OF POLLUTION:
Rural	Road Salt

EXISTING STRUCTURE TYPE

Bridge	Box Culvert	Open Foot Culvert	CSP	N/A

Other Describe: Size (w x h) m2 450mm

SECTION TYPE AND MORPHOLOGY

SECTION IDENTIFIER: US/DS
SECTION LOCATION: (include on habitat map)

TYPE:	Stream / river	Channelized	Permanent	Intermittent	Ephemeral	ASSOCIATED WETLAND:
					✓	Small pond (dug) s/of culvert

TOTAL SECTION LENGTH (m): 10
CURRENT VELOCITY (m/s): NA

SUB-SECTION(S)	Run	Pool	Riffle	Flats	Inside culvert	Other Ditch (Dry)
Percentage of area						no defined
mean depth wetted (m)						channel
mean width wetted (m)						
Mean bankfull width (m)						
Mean bankfull depth(m)						
Substrate						

Bedrock Br	Boulder Bo	Cobble Co	Gravel Gr	Sand Sa	Silt Si	Clay Cl	Muck Mu	Detritus D

BANK STABILITY

	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Upstream Bank	✓			
Right Upstream Bank	✓			

HABITAT

IN-STREAM COVER (% surface area):	Undercut banks	Boulders	Cobble	Large Woody Debris	Organic debris	Vascular plants	None
				Instream		Instream grasses	
				Overhanging		Overhanging	

SHORE COVER (% stream shaded):	100 – 90 %	90 – 60%	60- 30%	30 – 1%	None

VEGETATION TYPE (%):	Submergent	Floating	Emergent	None
Predominant Species				

MIGRATORY OBSTRUCTIONS:	None	Seasonal ✓ low water seasonal flow	Permanent

POTENTIAL CRITICAL HABITAT LIMITING:	Spawning	Evidence of Groundwater	Other

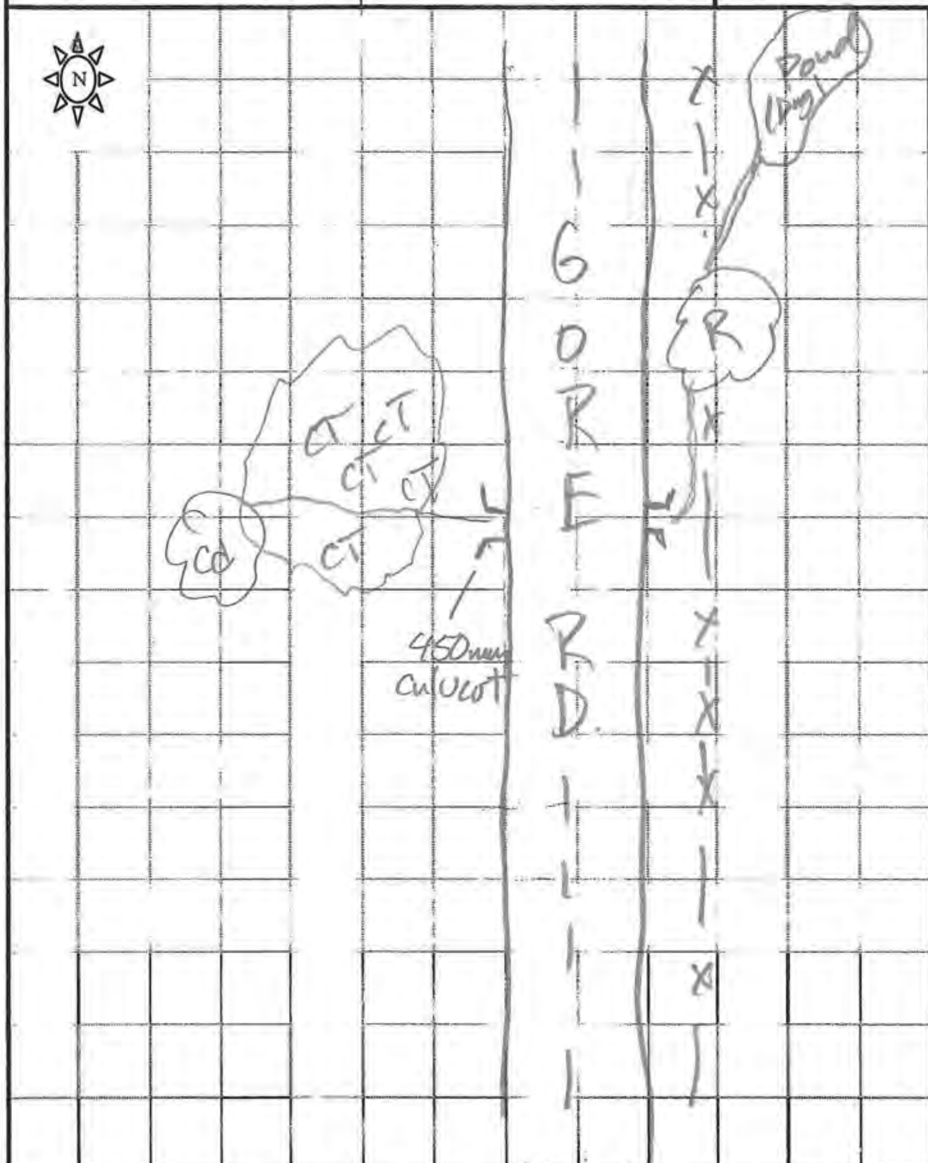
POTENTIAL ENHANCEMENT OPPORTUNITIES:

COMMENTS :

- Not direct fish habitat due to seasonal changes in water levels
- Dry, soil is damp, no flowing water

Additional Notes Appended? **No** **Yes number of pages** ______

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):



PROJECT #: MTB019424

MAPPER: CP

NAME OF WATERBODY:

CROSSING #: TRCA#9

STATION #: N

DATE: DD-MMM-YY 12-07-11

LEGEND

10d depth (cm)
6w width

➡ Riffle
⇨ Run/Glide
⬭ Pool
▮ Island/Bar

░ Fine Substrate
Gravel Substrate

oOooO Cobble /Boulder
* * * Debris

CT Cattail
SV/FV Submerg/Float Veg

EV Emergent Vegetation
W Watercress

Fe Iron Staining
/////// Eroded Bank

XXX Riprap / Other Stabilization

Instream Log/Tree
^^^ Dam/Weir/Obstruction

® Riparian Tree

|► Seep/Spring
-------- Undercut Bank

— Barrier to Fish Movement
-S- Seasonal Barrier

-x--x- Fence line
⊔ Culvert

PROFILE: **Horz. Scale** **Vert. Scale**

GENERAL INFORMATION

PROJECT #:	PROJECT DESCRIPTION:	DAY:	MONTH:	YEAR:
MTB019424	Gore Rd.	17	June	2011

Is STREAM REALIGNMENT required for this section:

Yes No Unknown

COLLECTORS:	WEATHER CONDITIONS:	TIME STARTED:	TIME FINISHED:
Chris & Devin	Sunny & overcast	1:20 pm	2:00 pm

PHOTOS NUMBERS AND DESCRIPTIONS:

LOCATION

NAME OF WATERBODY:	DRAINAGE SYSTEM:	CROSSING #:	STATION #:
		TRCA#10	1345

LOCATION OF CROSSING:
N. end of Gore Rd. south of Collihans

UTM EASTING & NORTHING:	MTO CHAINAGE:
TOWNSHIP: Region of Peel	**MNR DISTRICT:** Aurora

LAND USE AND POLLUTION

SURROUNDING LAND USE:	SOURCES OF POLLUTION:
Rural	Road,

EXISTING STRUCTURE TYPE

Bridge	Box Culvert	Open Foot Culvert	CSP	N/A

Other Describe: ⊗ elevated ≈ 1.25m Size (w x h) m2 0.625 m

SECTION TYPE AND MORPHOLOGY

SECTION IDENTIFIER:	SECTION LOCATION: (include on habitat map)
	1345

TYPE:	Stream / river	Channelized	Permanent	Intermittent	Ephemeral	ASSOCIATED WETLAND:
			✓			on west side of Road

TOTAL SECTION LENGTH (m):	CURRENT VELOCITY (m/s):
10m	0.01m slow

SUB-SECTION(S)	Run	Pool	Riffle	Flats	Inside culvert	Other
Percentage of area		80%		20%		
mean depth wetted (m)		0.25m		0.05m		
mean width wetted (m)		2.0m		≈0.60m		
Mean bankfull width (m)		2.8m		≈1.8m		
Mean bankfull depth(m)		1.25 ⊗ - plunge/erosion		≈ 0.5m		
Substrate		SA/GR		SA/GR	⊗ debris @ d/s side of pool	

Bedrock Br	Boulder Bo	Cobble Co	Gravel Gr	Sand Sa	Silt Si	Clay Cl	Muck Mu	Detritus D
			✓	✓				

BANK STABILITY	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Upstream Bank	✓			
Right Upstream Bank	✓			

HABITAT

IN-STREAM COVER (% surface area):	**Undercut banks**	**Boulders**	**Cobble**	**Large Woody Debris**	**Organic debris**	**Vascular plants**	**None**
				Instream ✓		**Instream**	
				Overhanging ✓		**Overhanging**	

SHORE COVER (% stream shaded):	**100 – 90 %**	**90 – 60%**	**60- 30%**	**30 – 1%**	**None**
		✓			

VEGETATION TYPE (%):	**Submergent**	**Floating**	**Emergent**	**None**
				✓
Predominant Species				

MIGRATORY OBSTRUCTIONS:	**None**	**Seasonal**	**Permanent**
			✓ culvert

POTENTIAL CRITICAL HABITAT LIMITING:	**Spawning**	**Evidence of Groundwater**	**Other**

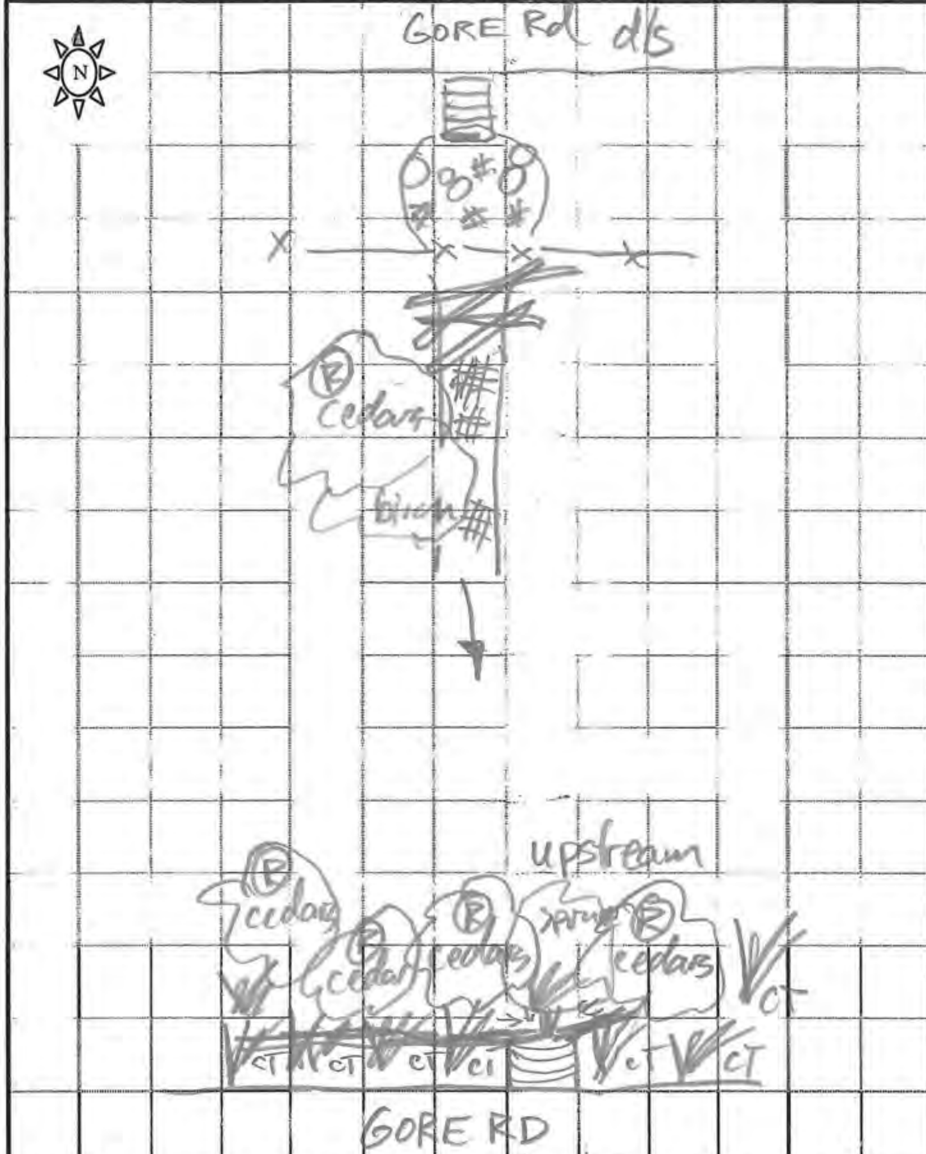
POTENTIAL ENHANCEMENT OPPORTUNITIES:

COMMENTS :

- Major plunge pool on d/s side of culvert
- u/s side is wetland, close to road due to shoulder

Additional Notes Appended? **No** **Yes number of pages** ______

SECTION IDENTIFIER:	SECTION LOCATION: 1345	SECTION LENGTH (m):	SCALE (cm / m):



PROJECT #: MTB019424

MAPPER: CP

NAME OF WATERBODY:

CROSSING #: TRCA #10

STATION #: 1345

DATE: DD-MMM-YY 17-06-11

LEGEND

10d depth (cm)
6w width

➡ Riffle
⇨ Run/Glide
⬭ Pool
▓ Island/Bar

░ Fine Substrate
Gravel Substrate

oOooO Cobble /Boulder
* * * Debris

CT Cattail
SV/FV Submerg/Float Veg

EV Emergent Vegetation
W Watercress

Fe Iron Staining
/////// Eroded Bank

XXX Riprap / Other Stabilization

Instream Log/Tree
^^^ Dam/Weir/Obstruction

® Riparian Tree

Seep/Spring
-------- Undercut Bank

— Barrier to Fish Movement
-S- Seasonal Barrier

-x--x- Fence line
Culvert

PROFILE: **Horz. Scale** **Vert. Scale**

BURNSIDE
[THE DIFFERENCE IS OUR PEOPLE]

Appendix G
Stormwater Management Report

Stormwater Management Report

Schedule B Environmental Assessment Study for The Gore Road from Patterson Side Road to Highway 9

Prepared By:

R.J. Burnside & Associates Limited
292 Speedvale Avenue West Unit 20 Guelph ON N1H 1C4

Prepared for:

Region of Peel

November 2011
Revised June 2013

Project No: 10-4385
RJB File No: MTB019424

Stormwater Management Report for The Gore Road (Patterson Side Road to Highway 9)
June 2013

Record of Revisions

Revision	Date	Description
0	November 15, 2011	Initial Submission to Region of Peel
1	February 14, 2012	Second Submission to Region of Peel
2	March 2, 2012	Revision to Second Submission to Region of Peel
3	January 18, 2013	Submission to TRCA
4	June 26, 2013	Draft Project File Report

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Tables

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Appendices

1.0 Introduction

R.J. Burnside & Associates Limited (Burnside) has been retained by the Regional Municipality of Peel (Region) to complete a Schedule 'B' Class Environmental Assessment (EA) Study to evaluate the existing conditions and identify potential improvements for The Gore Road between Patterson Side Road and Highway 9 in the Town of Caledon.

As part of this study, the Region has requested a detailed hydrologic and hydraulic assessment be completed for the existing Gore Road culvert crossings. As such, this stormwater management report has been prepared to address issues of conveyance, water quality and flooding with the existing culvert crossings as well as identifying potential hydraulic improvements within the study area. Map 1 (enclosed) illustrates the location of all relevant culvert crossings as well as the contributing drainage area.

2.0 Design Criteria

The hydrologic and hydraulic design criteria have been established based on the Region design guidelines, MOE water quality guidelines, as well as the Ministry of Transportation (MTO) guidelines for a rural arterial collector road.

As such, major crossings will be sufficiently designed to convey the Regional storm and minor crossings will be sufficiently designed to convey the 25-year storm without overtopping the roadway. The minimum culvert diameter for roadway crossings is 600mm. As such, all existing culvert crossings smaller than this diameter are proposed to be replaced, unless the scheduled year for replacement is greater than life expectancy of the road works. For this project the road improvements are expect to last until 2031.

In addition, the span of the culverts must take fluvial geomorphologic processes into consideration where existing watercourses have been identified by the Toronto Region Conservation Authority (TRCA).

3.0 Hydrology

3.1 General

The drainage limits of each catchment have been determined based on Ontario Base Mapping contours. In general, existing topographic features indicate that overland sheet flow occurs from the southwest to northeast, towards the direction of The Gore Road. There are also several well established drainage tributaries which convey flows to the existing crossing locations.

3.2 Soil Conditions

According to the Peel County soil map, prepared for the Department of Agriculture in 1953, the predominant soil is Pontypool Sandy Loam with some Bottom Land soils around the major watercourse tributaries. A hydrologic soil group of AB was chosen as the most representative for all catchment areas. The Runoff Curve Number for the individual drainage areas were computed by calculating weighted curve numbers based on the corresponding land use and soil type. A summary of these calculations for each drainage area is included in **Appendix A**. The hydrologic soil groups were determined in accordance with the Ontario Ministry of Transportation (MTO) soil classification system.

3.3 Land Use Patterns

Each catchment area was subdivided into meadow/field and wooded land uses based on the aerial photography illustrated in the Gore Road Overall Watershed Plan included in the back pocket of this report.

3.4 Hydrologic Model

The hydrologic model SWMHYMO was used to assess peak flows for each drainage area. SWMHYMO is a derivative of the original HYMO program and is similar to the OTTHYMO89 model. SWMHYMO is recognized throughout the industry and by various ministries as being an effective method by which runoff can be determined based on topography, soil conditions and land use. Due to the nature of this drainage area and the relatively low imperious level of each catchment, the NASHYD command was used to assess peak flows.

3.5 Time of Concentration

The airport method was used to calculate the time of concentration. The time of concentration is a function of “time to peak” which represents the time from the beginning of rainfall to the peak of the runoff hydrograph. It is indicative of the basin response to storm events. It depends on the physical characteristics of the watershed such as length, slope, area and surface cover. Estimates of time to peak were determined using the catchment area time of concentration by computing the travel time across the catchment. The required flow lengths and slopes were determined from the topographic mapping. A detailed summary of all hydrologic calculations is included in **Appendix A**.

3.6 Rainfall Data

In order to conform with the Humber River Hydrology report and modeling prepared by Aquafor Beech (November 2002), the 6 and 12-hour AES rainfall distributions were used for the 2 to 100 year storm event calculations. The Regional storm event was based on the Hurricane Hazel storm.

When comparing flows generated by the 6 and 12-hour storm distributions, the 6-hour storm was determined to generate the highest peak flows. As such the 6-hour AES storm distribution was used for design purposes. The peak flow rates for each catchment area and all storm distributions are included in **Appendix B**.

3.7 Existing Hydrology Data

Existing hydrologic flow data was provided for the large box culvert crossing (N3) near Finnerty Sideroad by the TRCA. The flows to this crossing were also calculated in SWMHYMO by Burnside using the 6-hour AES storm distribution. Both sets of peak flow data are illustrated in **Table 1** below.

Table 1: Peak Flow Rates to Crossing N3 near Finnerty Sideroad

Computed By	Area (ha)	Peak Flows to The Gore Road						
		2-year (m^3/s)	5-year (m^3/s)	10-year (m^3/s)	25-year (m^3/s)	50-year (m^3/s)	100-year (m^3/s)	Hazel (m^3/s)
TRCA	1597.2	1.67	2.88	3.93	5.13	6.18	7.27	38.27
Burnside	1617.8	2.94	5.84	8.24	11.72	14.63	17.75	79.22

By comparing the two sets of hydrologic data, the Burnside flows were found to be much greater than those provided by the TRCA. This provides confidence that the Burnside model results for the adjacent catchments are conservative.

3.8 Hydrologic Results

Using the site drainage areas as illustrated in the Gore Road Overall Watershed Plan and the program SWMHYMO, the total flows were determined for the 2 to 100 year and Regional storm events. These flows are summarized in **Table 2** below. The SWMHYMO runs for the 6-hour AES storm distribution can be found in **Appendix C**.

Table 2: Peak Flows to The Gore Road Culvert Crossings

Crossing	Area (ha)	Peak Flows to The Gore Road (6-hour AES Storm Distribution)						
		2-year (m^3/s)	5-year (m^3/s)	10-year (m^3/s)	25-year (m^3/s)	50-year (m^3/s)	100-year (m^3/s)	Hazel (m^3/s)
1344	2.6	0.01	0.02	0.03	0.05	0.06	0.07	0.20
1345	27.1	0.08	0.16	0.23	0.33	0.42	0.52	1.74
1346	19.3	0.07	0.14	0.20	0.29	0.36	0.44	1.35
1347	24.5	0.09	0.17	0.25	0.36	0.45	0.55	1.69
1348	9.0	0.04	0.09	0.12	0.17	0.22	0.27	0.71
1349	3.7	0.02	0.04	0.06	0.09	0.11	0.13	0.31
1350	2.3	0.01	0.02	0.03	0.05	0.06	0.07	0.18
1351	50.6	0.15	0.29	0.42	0.60	0.75	0.91	3.31
1352	225.5	0.37	0.73	1.04	1.49	1.86	2.26	10.44
1353	62.3	0.15	0.30	0.42	0.59	0.74	0.90	3.61
1354	1.1	0.01	0.01	0.01	0.02	0.03	0.03	0.09
1355	91.3	0.19	0.39	0.55	0.78	0.98	1.20	5.05
1356	8.9	0.03	0.07	0.09	0.13	0.17	0.21	0.63
N3	1617.8	2.94	5.84	8.24	11.72	14.63	17.75	79.22
N2	1.9	0.01	0.02	0.03	0.05	0.06	0.07	0.16
N1	15.1	0.07	0.13	0.19	0.27	0.34	0.41	1.14

4.0 Fluvial Geomorphologic Assessment

Parish Geomorphic was retained to complete a Fluvial Geomorphologic Stream Crossing Assessment for the crossings identified as watercourses by the TRCA. Of these 10 crossings, study reaches were delineated for 7 of them and recommended sizes were provided. A summary of these recommended sizes in shown in **Table 3** below. The complete fluvial geomorphologic assessment is included in **Appendix G**.

Table 3: Recommended Culvert Span at Watercourse Locations

Crossing	Recommended Span (m)
1345	1.5
1347	1.5
N3	8.0
1352	2.0
1353	2.0
1355	2.5
1356	1.0

The recommendations included in the fluvial geomorphologic assessment indicate that the use of CSPs is not desirable as “the cross-sectional area is proportionally smaller than that of a box culvert.” However, the added expense for replacing CSPs with box culverts at these locations is extremely cost prohibitive. Preliminary discussions with the TRCA have indicated that embedding CSPs will provide a sufficient bed width to allow geomorphological processes to take place. As such, the minimum culvert diameter at these locations is to correspond with the recommended span provided in **Table 3** and an embedment depth of 300 mm is to be provided. A more detailed analysis of the embedment depth at each culvert replacement location will be completed as part of detailed design to ensure that there is sufficient cover and appropriate invert elevations to accommodate the large pipe diameters.

5.0 Hydraulics

5.1 General

A culvert inspection report was completed for Gore Road in 2006 to identify the locations and condition of all existing crossing structures. In addition, a Biennial Culvert Inspection Report was completed for the large box culvert crossing near Finnerty Sideroad (N3) on May 20, 2010. This report has been used as a reference for existing culvert dimensions.

As part of this hydraulic study, a topographic survey was provided by the Region. This survey information was used to determine the inverts and culvert dimensions of the existing crossing structures.

In reviewing the available information, there were several culvert crossings from the inspection report that were not picked up in the Region survey. These crossings include 1346, 1349, 1350, 1351 and 1354. As such, the upstream invert of these structures has been estimated based on the estimated ditch invert. In addition, the upstream invert for crossing 1348 was found to be below the downstream invert resulting in an adverse slope and computational errors. To account for these crossings, and remain conservative, the slopes have been assumed to be 0.1%; however, the actual inverts and slopes should be confirmed prior to construction.

Two culvert crossings that were surveyed by the Region were not included in the inspection report. As such, these culverts have been added to the road profile and have been named N2 and N1 respectively.

There were also some discrepancies in the culvert sizes between the Region survey and the inspection report. In cases where the surveyed dimensions conflict with the 2006 inspection report, the surveyed dimensions were used. A summary of the existing culvert information is shown in **Table 4** below.

Table 4: The Gore Road Existing Culvert Dimensions Summary

Culvert ID	TRCA ID	Station	Culvert Description	Upstream Invert (m)	Downstream Invert (m)	Length (m)	Expected Year of Replacement
1344	N/A	6+307	400mm dia. CSP	321.29	321.80	32.4	2031
1345	10	5+128	500mm dia. CSP	321.48	321.46	17.6	2026
1346*	8	4+051	600mm dia. CSP	320.58	319.83	23.4	2031
1347	7	3+572	600mm dia. CSP	313.85	313.50	25.6	2011
1348	N/A	2+448	400mm dia. CSP	306.47	306.66	14.4	2041
1349*	N/A	2+338	460mm dia. CSP	307.33	307.87	12.5	2036
1350*	N/A	2+199	460mm dia. CSP	311.03	310.16	17.4	2041
1351*	5	1+558	800x500mm Elliptical	300.61	301.11	18.0	2016
1352	4	1+190	800mm dia. CSP	301.36	301.04	15.1	2031
1353	3	0+819	700mm dia. CSP	303.01	302.90	14.1	2031
1354*	2	0+690	400mm dia. CSP	303.35	303.61	13.8	2031
1355	1	0+428	1000mm dia. CSP	297.24	297.09	17.0	2026
1356	N/A	0+022	1000mm dia. CSP	299.88	299.29	15.6	2031
N3	6	2+890	5150x2100mm Concrete Box	296.52	296.48	20.2	2086
N2	N/A	4+459	500mm dia. CSP	331.22	331.21	18.5	2041
N1	9	4+734	400mm dia. CSP	324.39	324.18	15.0	2021

*Inverts have been modified or estimated due to discrepancies in survey information

Note that all crossing culverts, with the exception of 1348, 1349, 1350, N2 and N3 are scheduled to be replaced as part of these roadway improvements.

5.2 Hydraulic Modeling

The software program HY-8, has been used to analyze culvert hydraulics at each location within the study area. HY-8 is derived by the United States Federal Highway Administration and is recognized throughout the industry and by various ministries as being an effective method by which culvert hydraulics can be analyzed.

5.3 Hydraulic Methodology

The tailwater data was estimated for each crossing based on available survey information and contour data. However, all culverts were determined to be inlet controlled.

5.4 Existing Culvert Hydraulics

The existing capacity of each culvert was determined by calculating the flow rate at a headwater elevation equal to the centerline of the existing roadway. This represents the maximum conveyance that will occur prior to overtopping of the Gore Road. Each of these culvert capacities was compared to the peak flow rates estimated in the hydrologic study to determine an approximate return period. A detailed summary of the existing conditions HY-8 hydraulic model is included in **Appendix D**. A summary of the existing culvert capacities is shown in **Table 5** below.

Table 5: The Gore Road Existing Culvert Capacity Summary

Crossing	Centreline Road Elevation (m)	Culvert Capacity (m^3/s)	Estimated Return Period
1344	322.87	0.20	Hazel
1345	324.53	0.62	100-year
1346*	322.48	0.64	100-year
1347	319.60	1.25	100-year
1348	309.02	0.35	100-year
1349*	308.67	0.34	Hazel
1350*	311.13	0.13	100-year
1351*	303.36	1.66	100-year
1352	304.30	2.83	100-year
1353	304.55	1.78	100-year
1354*	304.80	0.25	Hazel
1355	300.90	3.22	100-year
1356	302.70	2.76	Hazel
N3	301.77	56.46	100-year
N2	333.63	0.53	Hazel
N1	326.00	0.28	25-year

*Inverts have been modified or estimated due to discrepancies in survey information

In accordance with the design criteria, all existing culverts are appropriately sized to provide hydraulic conveyance under the existing roadway profile.

5.5 Proposed Culvert Hydraulics

As part of the Gore Road improvements, the shoulders of the road are proposed to be paved. While this will not increase the number of travel lanes, it will require raising and widening of the existing road deck. As such, lengthening of existing culvert structures will be required at some locations.

The proposed culvert alignments were determined by using the existing culvert slope for each culvert and extending upstream and downstream, where necessary, to determine the proposed inverts. The proposed culvert dimensions were determined based on the established design criteria.

The maximum conveyance capacity for each culvert was calculated based on a headwater elevation equal to the proposed centerline of the roadway. Each of the proposed culvert capacities was compared to the peak flow rates estimated in the hydrologic study to determine an approximate return period.

The minimum culvert diameter was set at 600mm for all crossing locations based on the Region design guidelines. In addition, the minimum culvert diameters for watercourse crossings were set based on the recommended spans provided in the geomorphologic assessment and summarized in **Table 3** of this report.

Crossings 1351, 1352, 1353, 1355 and N3 have been identified as major crossings and will be required to convey the Regional storm without overtopping the roadway. The remaining locations were determined to be minor crossings and therefore require capacity for the 25-year storm.

A detailed summary of the proposed conditions HY-8 hydraulic model is included in **Appendix E**. A summary of the proposed culvert dimensions and capacities is shown in **Table 6** below.

Table 6: The Gore Road Proposed Culvert Dimensions and Capacity Summary

Crossing	Culvert Description	Invert (m)		Length (m)	Roadway Elevation (m)	Culvert Capacity (m^3/s)	Estimated Return Period
		U/S	D/S				
1344	600mm dia. CSP	321.80	321.29	32.4	322.87	0.51	Hazel
1345	1500mm dia. CSP	321.48	321.46	19.6	323.46	5.28	100
1346	600mm dia. CSP	320.58	320.55	23.4	322.32	0.64	100
1347	1500mm dia. CSP	313.89	313.43	33.6	318.85	6.90	Hazel
1348	600mm dia. CSP	306.47	306.45	15.4	308.36	0.72	Hazel
1349	600mm dia. CSP	306.26	306.24	15.0	307.26	0.44	Hazel
1350	600mm dia. CSP	309.13	309.11	18.9	310.13	0.42	Hazel
1351	1200mm dia. CSP	300.61	300.59	20.5	303.18	3.47	Hazel
1352	2000mm dia. CSP	301.30	300.91	22.6	304.54	10.47	Hazel
1353	2000mm dia. CSP	303.01	302.88	17.1	304.79	5.44	Hazel
1354	600mm dia. CSP	303.35	303.33	15.8	304.87	0.61	Hazel
1355	2500mm dia. CSP	297.29	297.04	27.0	301.24	18.34	Hazel
1356	1000mm dia. CSP	299.94	299.14	21.1	302.70	2.05	Hazel
N3	5150x2100mm Concrete Box	296.52	296.48	20.2	302.76	63.58	Hazel
N2	600mm dia. CSP	331.22	331.21	20.0	333.26	0.70	Hazel
N1	600mm dia. CSP	324.40	324.14	19.0	326.12	0.69	Hazel

Structure 1356 represents the south limit of the study area and has been evaluated for capacity and length. The existing 1000mm diameter CSP has sufficient capacity to convey up to the Regional Storm event but will be replaced to accommodate the wider road cross-section.

In summary, all culverts are proposed to be removed and replaced with the exception of N3. Although the geomorphologic assessment recommends the widening of culvert N3, the Biennial Culvert Inspection Report indicates that the culvert is in good condition and the hydraulic analysis indicates it has sufficient capacity. As such, culvert N3 is not proposed to be widened or lengthened as part of this roadway reconstruction.

It is noted that although the existing culvert 1346 has the required capacity, it was identified as needing replacement in the culvert inventory assessment, and will therefore be replaced. The TRCA has also noted that the invert elevations for culvert 1345 create a potential fish passage barrier. As such, culvert 1345 will be adjusted in detailed design to overcome this barrier.

6.0 Water Quality Control

The proposed roadway improvements will have a very minor impact on the water quality at each crossing location, however MOE criteria for “enhanced” water quality is required prior to discharge into any watercourse. As such, the roadside ditches will be used as wet swales which are identified in the MOE 2003 SWM manual as “ideal for highway runoff in low lying or flat terrain areas.” The swales are proposed to have a wide bottom, with check dams placed strategically along the ditch to create storage units and slow flow velocity. A storage volume of $60m^3$/ha of drainage area has been satisfied in accordance with the MOE manual and the volumes are presented in the a ‘Wet Swale Design’ spreadsheet in **Appendix F**. Grasses in the ditches will be unmaintained to provide additional water quality benefits.

Sideslopes on the swales have been assumed to be 2:1 at this preliminary design stage, to minimize grading onto private property. The priority will definitely be to avoid grading onto private property but even at 2:1, some backslopes may encroach onto private property. Where this occurs, the Region will consider the following forms of mitigation:

- secure a Permission to Enter (PTE) agreement with the landowner to allow for the grading to occur without any additional compensation;
- consider retaining walls, likely constructed of gabion baskets, as a means to reduce the limit of grading;
- consider an offer to purchase the property impacted by the grading.

These options are presented on the design drawings (color shading) where grading will potentially extend on to private properties.

Conversely, if it is determined at the detailed design stage that there is sufficient room to accommodate gentler sideslopes (than 2:1) without encroachment onto private property, flatter sideslopes will be considered at that time.

7.0 Flooding Impacts

The proposed roadway improvements will have very little impact on the existing flood elevations. Changes to the road deck elevation will have the greatest impact at the crossing locations. However, these elevations are either unchanged or decreased for the majority of the crossings locations. Slight increases to the road deck are proposed at crossings 1352, 1353, 1354, 1355 and N3, however these changes are not significant enough to have a major impact on existing flood elevations.

The TRCA has requested that the impact on the floodplain for large tributary areas be assessed. As such Regional flood elevations were determined using HY-8 for culverts 1352 and 1355. An existing HEC-RAS model was provided by the TRCA for culvert N3, however there was no impact on the floodline as the existing road deck is already above the Regional storm elevation and no culvert modifications are proposed at this location. **Table 7** illustrates that the culvert renovations will have no negative impact on the Regional Floodplain.

Table 7: The Gore Road Proposed Regional Storm Water Surface Elevations

Crossing	Regional Flow (m^3/s)	Upstream Water Level (m)			Downstream Water Level (m)		
		Existing	Proposed	Difference	Existing	Proposed	Difference
1352	10.435	304.67	304.53	-0.14	301.94	301.94	0.00
1355	5.047	301.04	298.85	-2.19	297.82	297.82	0.00
N3	38.28	299.26	299.26	0.00	298.81	298.81	0.00

8.0 Sediment and Erosion Controls

All construction works will have appropriate Sediment and Erosion Controls in accordance with the TRCA's Erosion and Sediment Control Guidelines for Urban construction. Detailed drawings and notes will be prepared as part of detailed design.

9.0 Recommendations and Conclusions

This stormwater management report was prepared in support of the Gore Road Schedule ‘B’ Class Environmental Assessment (EA) Study for the Region. A detailed hydrologic and hydraulic analysis was completed to assess the conveyance of each existing crossing structure and to recommend proposed improvements as part of the new roadway alignment. Fluvial geomorphologic assessments were also completed at watercourse crossing locations to ensure that sufficient culvert span is provided.

As a result of this analysis, it was determined that the majority of the crossing structures will need to be removed and replaced to meet the minimum design criteria. A summary of the works required for each crossing location are illustrated in **Table 8** below.

Table 8: The Gore Road Existing and Proposed Culvert Dimensions

Culvert ID	TRCA ID	Feature	Existing Dimensions		Proposed Dimensions	
			Size	Length (m)	Size	Length (m)
1344	N/A	None	400mm dia. CSP	32.4	600mm dia. CSP	32.4
1345	10	Watercourse	500mm dia. CSP	17.6	1500mm dia. CSP	19.6
1346	8	Wetland	600mm dia. CSP	23.4	600mm dia. CSP	23.4
1347	7	Wetland	600mm dia. CSP	25.6	1500mm dia. CSP	33.6
1348	N/A	None	400mm dia. CSP	14.4	600mm dia. CSP	15.4
1349	N/A	None	460mm dia. CSP	12.5	600mm dia. CSP	15.0
1350	N/A	None	460mm dia. CSP	17.4	600mm dia. CSP	18.9
1351	5	Wetland	800x500mm Elliptical	18.0	1200mm dia. CSP	20.5
1352	4	Watercourse	800mm dia. CSP	15.1	2000mm dia. CSP	22.6
1353	3	Watercourse	700mm dia. CSP	14.1	2000mm dia. CSP	17.1
1354	2	Wetland	400mm dia. CSP	13.8	600mm dia. CSP	15.8

Culvert ID	TRCA ID	Feature	Existing Dimensions		Proposed Dimensions	
			Size	Length (m)	Size	Length (m)
1355	1	Watercourse	1000mm dia. CSP	17.0	2500mm dia. CSP	27.0
1356	N/A	None	1000mm dia. CSP	15.6	1000mm dia. CSP	21.1
N3	6	Watercourse	5150x2100mm Concrete Box	20.2	5150x2100mm Concrete Box	20.2
N2	N/A	None	500mm dia. CSP	18.5	600mm dia. CSP	20.0
N1	9	Wetland	400mm dia. CSP	15.0	600mm dia. CSP	19.0

The proposed roadway improvements were determined to have very minor impacts to the existing flood elevations and will not negatively impact adjacent properties.

Yours truly,

R.J. Burnside & Associates Limited

Tony Elias, P.Eng.
Senior Water Resource Engineer

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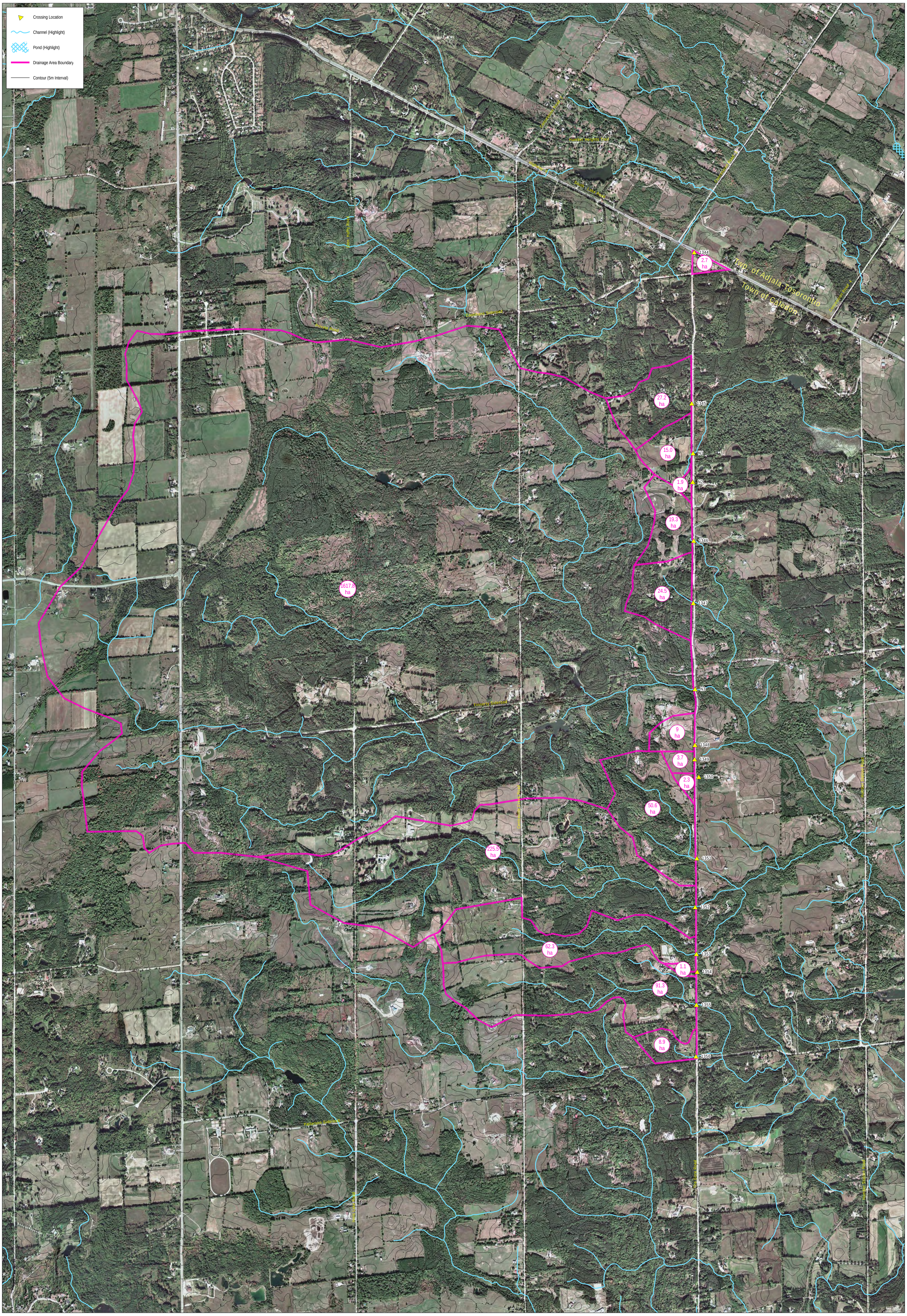
Drawings



NOTES:

1. Imagery on this map is provided by Microsoft Corp. via the Environmental Systems Research Instutute (ESRI) Inc. Premium Mapping Service.

DATA SOURCES:

1. Ministry of Natural Resources, © Queen's Printer for Ontario 2. Natural Resources Canada © Her Majesty the Queen in Right of Canada 3. © Digital Globe Inc. (see note 1)

DISCLAIMER:

R.J. Burnside & Associates Limited and the above mentioned sources and agencies are not responsible for the accuracy of the spatial, temporal, or other aspects of the data represented on this map. It is recommended that users confirm the accuracy of the information represented.

This map is the product of a Geographic Information System (GIS). The data represented on this map may be subject to updates and future reproductions may not be identical.

No.	Revision	Date
1	First Draft / Working Map	07 March, 2011
2	Final map.	01 November, 2011

Grid North

Datum: NAD 83
Projection: UTM Zone 17

0 500 1,000
Meters

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Client:
Town of Caledon
Gore Road Improvements

Title
Gore Road
Patterson Sideroad to Highway 9
Overall Watershed Plan

Compilation	Checked	Map Number
P. Stubbert	C. Proctor	1
Scale: 1:12,500	Project: MTB019424	

Path: \\192.168.7.3\gis\Project\M Jobs\MT Jobs\MTB019424 (GORE RD 2011)\Map\019424 Drainage Area Plan.mxd

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Appendix A

SWMHYMO Input Parameters

Project Name: Gore Road Improvements
Project No: MTB019424
Location: Town of Caledon
Designer: Chris Proctor
Date: 8-Apr-2011
Date Modified: 3-Nov-2011

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SCS Curve Number, Initial Abstraction, and Time of Concentration Reference Sheet

SCS Curve Number Data

Hydrologic Soil Group	SCS Curve Number (AMCII)					
	Forest/Woodlot	Meadow/Field	Crop	Lawn/Grass	Pavement	Water
A	30	39	66	44	98	100
AB	44	50	71	55	98	100
B	58	61	76	65	98	100
BC	65	68	79	71	98	100
C	71	74	82	76	98	100
CD	74	78	84	79	98	100
D	77	80	86	82	98	100

CN (I)= 4.2CN(II)/(10-0.058CN(II)) CN (III)= 23CN(II)/(10+0.13CN(II))

NOTE: Standhyd commands - CN value is based solely on the pervious surfaces only.
Nashyd commands - CN value is based on a composite of both the pervious and impervious surfaces

Initial Rainfall Abstraction Data

	Initial Rainfall Abstraction, Ia (mm)					
Land Use	Forest/Woodlot	Meadow/Field	Crop	Lawn/Grass	Pavement	Water
Ia	10	8	7	5	2	0

Runoff Coefficient Data

Hydrologic Soil Group	Land Use, Crop, and Management									
	Forest/Woodlot	Meadow/Field	CULTIVATED (RC, PM)	CULTIVATED (RC, CM)	CULTIVATED (SG, PM)	CULTIVATED (SG, CM)	CULTIVATED (M)	URBAN RES. (30% Imp)	URBAN RES. (55% Imp)	URBAN RES. (70% Imp)
A	0.060	0.100	0.550	0.500	0.350	0.200	0.300	0.300	0.425	0.500
AB	0.095	0.150	0.600	0.525	0.375	0.210	0.325	0.350	0.475	0.550
B	0.130	0.200	0.650	0.550	0.400	0.220	0.350	0.400	0.525	0.600
BC	0.145	0.225	0.675	0.600	0.425	0.235	0.375	0.425	0.566	0.650
C	0.160	0.250	0.700	0.650	0.450	0.250	0.400	0.450	0.606	0.700
CD	0.180	0.275	0.725	0.675	0.475	0.275	0.425	0.475	0.647	0.750
D	0.200	0.300	0.750	0.700	0.500	0.300	0.450	0.500	0.688	0.800

Legend	RC	SG	PM	M	CM
	Row Crop	Small Grains	Poor Management	Meadow	Conservative Management

Estimating Travel Velocity Using Bransby Williams and Aiport Method

Bransby Williams Formula - For 'C' greater than or equal to 0.40

$$t_c = \frac{0.057 * L}{S^{0.2} * A^{0.1}}$$

t_c = Time of Concentration
L = Length of Longest Flow Path
S = Slope
A = Catchment Area

Airport Formula - For 'C' less than 0.40

$$t_c = \frac{3.26*(1.1-C)*L^{0.5}}{S^{0.33}}$$

t_c = Time of Concentration
L = Length of Longest Flow Path
S = Slope
C = Runoff Coefficient

Estimating Travel Velocity Using Uplands Method

V = (x)(S)$^{0.5}$ (Refer to Fig 3.12 Velocities for Upland method for estimating travel time for overland flow)

V= Velocity
S= Slope
x = Land Cover Coefficient **(see below)**

x =	0.6	Forest with Heavy Ground Litter, hay meadow (overland flow)
	1.5	Trash Fallow or Minimum Tillage cultivation, strip cropped woodland(overland flow)
	2.3	Short grass pasture (overland flow)
	2.7	Cultivated Straight row (overland flow)
	3.0	Nearly bare untilled (overland flow) or alluvial fans located in the Western mountain Regions
	4.6	Grassed Waterway
	6.1	Paved Areas (sheet flow); small upland gullies

Time of Concentration for One Land Use on Flow Path

$Tc_1 = L_1 / V_1$ $Tp = 0.67 \times Tc_1$

Total Time of Concentration for Multiple Land Uses on Flow Path

$Tc_{total} = Tc_1 + Tc_2 + Tc_3 + Tc_4 + Tc_5$ $Tp_{total} = Tp_1 + Tp_2 + Tp_3 + Tp_4 + Tp_5$

Project Name:	Gore Road Improvements
Project No:	MTB019424
Location:	Town of Caledon
Designer:	Chris Proctor
Date:	8-Apr-2011
Date Modified:	3-Nov-2011

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Crossing 1344

SWMHYMO Nashyd Modelling Parameters

Composite Curve Number and Initial Abstraction Calculation

Hydrologic Soil Group	Total Area per Various Land Use (ha)					
	Forest/Woodlot	Meadow/Field	Crop	Lawn/Grass	Pavement	Water
A						
AB		2.62				
B						
BC						
C						
CD						
D						

Total area (ha):	2.62	Composite CN(I):	30	Composite Ia (mm)	8.0
Pervious area (ha):	2.62	Composite CN(II):	50		
Impervious area (ha):	0.0	Composite CN(III):	70		

Composite Runoff Coefficient Calculation

Hydrologic Soil Group	Land Use, Crop, and Management									
	Forest/Woodlot	Meadow/Field	Crop (RC, PM)	Crop (RC, CM)	Crop (SG, PM)	Crop (SG, CM)	Crop (M)	URBAN RES. (30% Imp)	URBAN RES. (55% Imp)	URBAN RES. (70% Imp)
A										
AB		2.62								
B										
BC										
C										
CD										
D										

Total area (ha) : 2.62   Composite Runoff Coefficient, C : 0.15

Time of Concentration Calculation

Method	Airport
Length (m)	250
h_1 (m)	325
h_2 (m)	320
Δh (m)	5
Slope (%)	2.00
Tc (hr)	0.651
Tp (hr)	0.436

Project Name: Gore Road Improvements
Project No: MTB019424
Location: Town of Caledon
Designer: Chris Proctor
Date: 8-Apr-2011
Date Modified: 3-Nov-2011

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Crossing 1345

SWMHYMO Nashyd Modelling Parameters

Composite Curve Number and Initial Abstraction Calculation

Hydrologic Soil Group	Total Area per Various Land Use (ha)					
	Forest/Woodlot	Meadow/Field	Crop	Lawn/Grass	Pavement	Water
A						
AB	22.74	4.33				
B						
BC						
C						
CD						
D						
Total area (ha):	27.07		Composite CN(I): 26		Composite Ia (mm)	9.7
Pervious area (ha):	27.07		Composite CN(II): 45			
Impervious area (ha):	0.0		Composite CN(III): 65			

Composite Runoff Coefficient Calculation

Hydrologic Soil Group	Land Use, Crop, and Management									
	Forest/Woodlot	Meadow/Field	Crop (RC, PM)	Crop (RC, CM)	Crop (SG, PM)	Crop (SG, CM)	Crop (M)	URBAN RES. (30% Imp)	URBAN RES. (55% Imp)	URBAN RES. (70% Imp)
A										
AB	22.74	4.33								
B										
BC										
C										
CD										
D										

Total area (ha) : 27.07   Composite Runoff Coefficient, C : 0.10

Time of Concentration Calculation

Method	Airport
Length (m)	572
h_1 (m)	345
h_2 (m)	325
Δh (m)	20
Slope (%)	3.50
Tc (hr)	0.858
Tp (hr)	0.575

Project Name: Gore Road Improvements
Project No: MTB019424
Location: Town of Caledon
Designer: Chris Proctor
Date: 8-Apr-2011
Date Modified: 3-Nov-2011

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Crossing 1346

SWMHYMO Nashyd Modelling Parameters

Composite Curve Number and Initial Abstraction Calculation

Hydrologic Soil Group	Total Area per Various Land Use (ha)					
	Forest/Woodlot	Meadow/Field	Crop	Lawn/Grass	Pavement	Water
A						
AB	3.54	15.71				
B						
BC						
C						
CD						
D						

Total area (ha):	19.25	Composite CN(I):	29	Composite Ia (mm)	8.4
Pervious area (ha):	19.25	Composite CN(II):	49		
Impervious area (ha):	0.0	Composite CN(III):	69		

Composite Runoff Coefficient Calculation

Hydrologic Soil Group	Land Use, Crop, and Management									
	Forest/Woodlot	Meadow/Field	Crop (RC, PM)	Crop (RC, CM)	Crop (SG, PM)	Crop (SG, CM)	Crop (M)	URBAN RES. (30% Imp)	URBAN RES. (55% Imp)	URBAN RES. (70% Imp)
A										
AB	3.54	15.71								
B										
BC										
C										
CD										
D										

Total area (ha) : 19.25   Composite Runoff Coefficient, C : 0.14

Time of Concentration Calculation

Method	Airport
Length (m)	560
h_1 (m)	337
h_2 (m)	321
Δh (m)	16
Slope (%)	2.86
Tc (hr)	0.875
Tp (hr)	0.586

Project Name: Gore Road Improvements
Project No: MTB019424
Location: Town of Caledon
Designer: Chris Proctor
Date: 8-Apr-2011
Date Modified: 3-Nov-2011

Crossing 1347

SWMHYMO Nashyd Modelling Parameters

Composite Curve Number and Initial Abstraction Calculation

Hydrologic Soil Group	Total Area per Various Land Use (ha)					
	Forest/Woodlot	Meadow/Field	Crop	Lawn/Grass	Pavement	Water
A						
AB	11.47	13.00				
B						
BC						
C						
CD						
D						

Total area (ha):	24.47	Composite CN(I):	27	Composite Ia (mm)	8.9
Pervious area (ha):	24.47	Composite CN(II):	47		
Impervious area (ha):	0.0	Composite CN(III):	67		

Composite Runoff Coefficient Calculation

Hydrologic Soil Group	Land Use, Crop, and Management									
	Forest/Woodlot	Meadow/Field	Crop (RC, PM)	Crop (RC, CM)	Crop (SG, PM)	Crop (SG, CM)	Crop (M)	URBAN RES. (30% Imp)	URBAN RES. (55% Imp)	URBAN RES. (70% Imp)
A										
AB	11.47	13.00								
B										
BC										
C										
CD										
D										

Total area (ha) : 24.47 **Composite Runoff Coefficient, C :** 0.12

Time of Concentration Calculation

Method	Airport
Length (m)	545
h_1 (m)	346
h_2 (m)	322
Δh (m)	24
Slope (%)	4.40
Tc (hr)	0.760
Tp (hr)	0.509

Project Name: Gore Road Improvements
Project No: MTB019424
Location: Town of Caledon
Designer: Chris Proctor
Date: 8-Apr-2011
Date Modified: 3-Nov-2011

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Crossing 1348

SWMHYMO Nashyd Modelling Parameters

Composite Curve Number and Initial Abstraction Calculation

Hydrologic Soil Group	Total Area per Various Land Use (ha)					
	Forest/Woodlot	Meadow/Field	Crop	Lawn/Grass	Pavement	Water
A						
AB		8.95				
B						
BC						
C						
CD						
D						

Total area (ha):	8.95	Composite CN(I):	30	Composite Ia (mm)	8.0
Pervious area (ha):	8.95	Composite CN(II):	50		
Impervious area (ha):	0.0	Composite CN(III):	70		

Composite Runoff Coefficient Calculation

Hydrologic Soil Group	Land Use, Crop, and Management									
	Forest/Woodlot	Meadow/Field	Crop (RC, PM)	Crop (RC, CM)	Crop (SG, PM)	Crop (SG, CM)	Crop (M)	URBAN RES. (30% Imp)	URBAN RES. (55% Imp)	URBAN RES. (70% Imp)
A										
AB		8.95								
B										
BC										
C										
CD										
D										

Total area (ha) : 8.95   Composite Runoff Coefficient, C : 0.15

Time of Concentration Calculation

Method	Airport
Length (m)	325
h_1 (m)	322
h_2 (m)	307
Δh (m)	15
Slope (%)	4.62
Tc (hr)	0.563
Tp (hr)	0.377

Project Name:	Gore Road Improvements
Project No:	MTB019424
Location:	Town of Caledon
Designer:	Chris Proctor
Date:	8-Apr-2011
Date Modified:	3-Nov-2011

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Crossing 1349

SWMHYMO Nashyd Modelling Parameters

Composite Curve Number and Initial Abstraction Calculation

Hydrologic Soil Group	Total Area per Various Land Use (ha)					
	Forest/Woodlot	Meadow/Field	Crop	Lawn/Grass	Pavement	Water
A						
AB		3.71				
B						
BC						
C						
CD						
D						

Total area (ha):	3.71	Composite CN(I):	30	Composite Ia (mm)	8.0
Pervious area (ha):	3.71	Composite CN(II):	50		
Impervious area (ha):	0.0	Composite CN(III):	70		

Composite Runoff Coefficient Calculation

Hydrologic Soil Group	Land Use, Crop, and Management									
	Forest/Woodlot	Meadow/Field	Crop (RC, PM)	Crop (RC, CM)	Crop (SG, PM)	Crop (SG, CM)	Crop (M)	URBAN RES. (30% Imp)	URBAN RES. (55% Imp)	URBAN RES. (70% Imp)
A										
AB		3.71								
B										
BC										
C										
CD										
D										

Total area (ha) : 3.71   Composite Runoff Coefficient, C : 0.15

Time of Concentration Calculation

Method	Airport
Length (m)	200
h_1 (m)	322
h_2 (m)	310
Δh (m)	12
Slope (%)	6.00
Tc (hr)	0.405
Tp (hr)	0.271

Project Name:	Gore Road Improvements
Project No:	MTB019424
Location:	Town of Caledon
Designer:	Chris Proctor
Date:	8-Apr-2011
Date Modified:	3-Nov-2011

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Crossing 1350

SWMHYMO Nashyd Modelling Parameters

Composite Curve Number and Initial Abstraction Calculation

Hydrologic Soil Group	Total Area per Various Land Use (ha)					
	Forest/Woodlot	Meadow/Field	Crop	Lawn/Grass	Pavement	Water
A						
AB	0.60	1.71				
B						
BC						
C						
CD						
D						

Total area (ha):	2.31	Composite CN(I):	28	Composite Ia (mm)	8.5
Pervious area (ha):	2.31	Composite CN(II):	48		
Impervious area (ha):	0.0	Composite CN(III):	68		

Composite Runoff Coefficient Calculation

Hydrologic Soil Group	Land Use, Crop, and Management									
	Forest/Woodlot	Meadow/Field	Crop (RC, PM)	Crop (RC, CM)	Crop (SG, PM)	Crop (SG, CM)	Crop (M)	URBAN RES. (30% Imp)	URBAN RES. (55% Imp)	URBAN RES. (70% Imp)
A										
AB	0.60	1.71								
B										
BC										
C										
CD										
D										

Total area (ha) : 2.31 Composite Runoff Coefficient, C : 0.14

Time of Concentration Calculation

Method	Airport
Length (m)	124
h_1 (m)	315
h_2 (m)	312
Δh (m)	3
Slope (%)	2.42
Tc (hr)	0.437
Tp (hr)	0.293

Project Name: Gore Road Improvements
Project No: MTB019424
Location: Town of Caledon
Designer: Chris Proctor
Date: 8-Apr-2011
Date Modified: 3-Nov-2011

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Crossing 1351

SWMHYMO Nashyd Modelling Parameters

Composite Curve Number and Initial Abstraction Calculation

Hydrologic Soil Group	Total Area per Various Land Use (ha)					
	Forest/Woodlot	Meadow/Field	Crop	Lawn/Grass	Pavement	Water
A						
AB	14.57	36.01				
B						
BC						
C						
CD						
D						

Total area (ha):	50.58	Composite CN(I):	28	Composite Ia (mm)	8.6
Pervious area (ha):	50.58	Composite CN(II):	48		
Impervious area (ha):	0.0	Composite CN(III):	68		

Composite Runoff Coefficient Calculation

Hydrologic Soil Group	Land Use, Crop, and Management									
	Forest/Woodlot	Meadow/Field	Crop (RC, PM)	Crop (RC, CM)	Crop (SG, PM)	Crop (SG, CM)	Crop (M)	URBAN RES. (30% Imp)	URBAN RES. (55% Imp)	URBAN RES. (70% Imp)
A										
AB	14.57	36.01								
B										
BC										
C										
CD										
D										

Total area (ha) : 50.58 **Composite Runoff Coefficient, C :** 0.13

Time of Concentration Calculation

Method	Airport
Length (m)	1195
h_1 (m)	350
h_2 (m)	303
Δh (m)	47
Slope (%)	3.93
Tc (hr)	1.157
Tp (hr)	0.775

Project Name:	Gore Road Improvements
Project No:	MTB019424
Location:	Town of Caledon
Designer:	Chris Proctor
Date:	8-Apr-2011
Date Modified:	3-Nov-2011

Crossing 1352

SWMHYMO Nashyd Modelling Parameters

Composite Curve Number and Initial Abstraction Calculation

Hydrologic Soil Group	Total Area per Various Land Use (ha)					
	Forest/Woodlot	Meadow/Field	Crop	Lawn/Grass	Pavement	Water
A						
AB	88.96	136.50				
B						
BC						
C						
CD						
D						

Total area (ha):	225.46	Composite CN(I):	28	Composite Ia (mm)	8.8
Pervious area (ha):	225.46	Composite CN(II):	48		
Impervious area (ha):	0.0	Composite CN(III):	68		

Composite Runoff Coefficient Calculation

Hydrologic Soil Group	Land Use, Crop, and Management									
	Forest/Woodlot	Meadow/Field	Crop (RC, PM)	Crop (RC, CM)	Crop (SG, PM)	Crop (SG, CM)	Crop (M)	URBAN RES. (30% Imp)	URBAN RES. (55% Imp)	URBAN RES. (70% Imp)
A										
AB	88.96	136.50								
B										
BC										
C										
CD										
D										

Total area (ha) : 225.46

Composite Runoff Coefficient, C : 0.13

Time of Concentration Calculation

Method	Airport
Length (m)	4085
h_1 (m)	381
h_2 (m)	305
Δh (m)	76
Slope (%)	1.86
Tc (hr)	2.755
Tp (hr)	1.846

Project Name: Gore Road Improvements
Project No: MTB019424
Location: Town of Caledon
Designer: Chris Proctor
Date: 8-Apr-2011
Date Modified: 3-Nov-2011

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Crossing 1353

SWMHYMO Nashyd Modelling Parameters

Composite Curve Number and Initial Abstraction Calculation

Hydrologic Soil Group	Total Area per Various Land Use (ha)					
	Forest/Woodlot	Meadow/Field	Crop	Lawn/Grass	Pavement	Water
A						
AB	8.41	53.88				
B						
BC						
C						
CD						
D						

Total area (ha):	62.29	Composite CN(I):	29	Composite Ia (mm)	8.3
Pervious area (ha):	62.29	Composite CN(II):	49		
Impervious area (ha):	0.0	Composite CN(III):	69		

Composite Runoff Coefficient Calculation

Hydrologic Soil Group	Land Use, Crop, and Management									
	Forest/Woodlot	Meadow/Field	Crop (RC, PM)	Crop (RC, CM)	Crop (SG, PM)	Crop (SG, CM)	Crop (M)	URBAN RES. (30% Imp)	URBAN RES. (55% Imp)	URBAN RES. (70% Imp)
A										
AB	8.41	53.88								
B										
BC										
C										
CD										
D										

Total area (ha) : 62.29   Composite Runoff Coefficient, C : 0.14

Time of Concentration Calculation

Method	Airport
Length (m)	2200
h_1 (m)	360
h_2 (m)	306
Δh (m)	54
Slope (%)	2.45
Tc (hr)	1.818
Tp (hr)	1.218

Project Name:	Gore Road Improvements
Project No:	MTB019424
Location:	Town of Caledon
Designer:	Chris Proctor
Date:	8-Apr-2011
Date Modified:	3-Nov-2011

BURNSIDE

Crossing 1354

SWMHYMO Nashyd Modelling Parameters

Composite Curve Number and Initial Abstraction Calculation

Hydrologic Soil Group	Total Area per Various Land Use (ha)					
	Forest/Woodlot	Meadow/Field	Crop	Lawn/Grass	Pavement	Water
A						
AB		1.11				
B						
BC						
C						
CD						
D						

Total area (ha):	1.11	Composite CN(I):	30	Composite Ia (mm)	8.0
Pervious area (ha):	1.11	Composite CN(II):	50		
Impervious area (ha):	0.0	Composite CN(III):	70		

Composite Runoff Coefficient Calculation

Hydrologic Soil Group	Land Use, Crop, and Management									
	Forest/Woodlot	Meadow/Field	Crop (RC, PM)	Crop (RC, CM)	Crop (SG, PM)	Crop (SG, CM)	Crop (M)	URBAN RES. (30% Imp)	URBAN RES. (55% Imp)	URBAN RES. (70% Imp)
A										
AB		1.11								
B										
BC										
C										
CD										
D										

Total area (ha) : 1.11 Composite Runoff Coefficient, C : 0.15

Time of Concentration Calculation

Method	Airport
Length (m)	230
h_1 (m)	310
h_2 (m)	306
Δh (m)	4
Slope (%)	1.74
Tc (hr)	0.653
Tp (hr)	0.438

Project Name: Gore Road Improvements
Project No: MTB019424
Location: Town of Caledon
Designer: Chris Proctor
Date: 8-Apr-2011
Date Modified: 3-Nov-2011

BURNSIDE

Crossing 1355

SWMHYMO Nashyd Modelling Parameters

Composite Curve Number and Initial Abstraction Calculation

Hydrologic Soil Group	Total Area per Various Land Use (ha)					
	Forest/Woodlot	Meadow/Field	Crop	Lawn/Grass	Pavement	Water
A						
AB	40.84	50.42				
B						
BC						
C						
CD						
D						

Total area (ha):	91.26	Composite CN(I):	27	Composite Ia (mm)	8.9
Pervious area (ha):	91.26	Composite CN(II):	47		
Impervious area (ha):	0.0	Composite CN(III):	67		

Composite Runoff Coefficient Calculation

Hydrologic Soil Group	Land Use, Crop, and Management									
	Forest/Woodlot	Meadow/Field	Crop (RC, PM)	Crop (RC, CM)	Crop (SG, PM)	Crop (SG, CM)	Crop (M)	URBAN RES. (30% Imp)	URBAN RES. (55% Imp)	URBAN RES. (70% Imp)
A										
AB	40.84	50.42								
B										
BC										
C										
CD										
D										

Total area (ha) : 91.26 Composite Runoff Coefficient, C : 0.13

Time of Concentration Calculation

Method	Airport
Length (m)	2100
h_1 (m)	352
h_2 (m)	301
Δh (m)	51
Slope (%)	2.43
Tc (hr)	1.814
Tp (hr)	1.216

Project Name: Gore Road Improvements
Project No: MTB019424
Location: Town of Caledon
Designer: Chris Proctor
Date: 8-Apr-2011
Date Modified: 3-Nov-2011

BURNSIDE

Crossing 1356

SWMHYMO Nashyd Modelling Parameters

Composite Curve Number and Initial Abstraction Calculation

Hydrologic Soil Group	Total Area per Various Land Use (ha)					
	Forest/Woodlot	Meadow/Field	Crop	Lawn/Grass	Pavement	Water
A						
AB	4.25	4.68				
B						
BC						
C						
CD						
D						

Total area (ha):	8.93	Composite CN(I):	27	Composite Ia (mm)	9.0
Pervious area (ha):	8.93	Composite CN(II):	47		
Impervious area (ha):	0.0	Composite CN(III):	67		

Composite Runoff Coefficient Calculation

Hydrologic Soil Group	Land Use, Crop, and Management									
	Forest/Woodlot	Meadow/Field	Crop (RC, PM)	Crop (RC, CM)	Crop (SG, PM)	Crop (SG, CM)	Crop (M)	URBAN RES. (30% Imp)	URBAN RES. (55% Imp)	URBAN RES. (70% Imp)
A										
AB	4.25	4.68								
B										
BC										
C										
CD										
D										

Total area (ha) : 8.93 **Composite Runoff Coefficient, C :** 0.12

Time of Concentration Calculation

Method	Airport
Length (m)	545
h_1 (m)	331
h_2 (m)	302
Δh (m)	29
Slope (%)	5.32
Tc (hr)	0.715
Tp (hr)	0.479

Project Name:	Gore Road Improvements
Project No:	MTB019424
Location:	Town of Caledon
Designer:	Chris Proctor
Date:	8-Apr-2011
Date Modified:	7-Nov-2011

BURNSIDE

Crossing N3

SWMHYMO Nashyd Modelling Parameters

Composite Curve Number and Initial Abstraction Calculation

Hydrologic Soil Group	Total Area per Various Land Use (ha)					
	Forest/Woodlot	Meadow/Field	Crop	Lawn/Grass	Pavement	Water
A						
AB	598.34	698.38	321.08			
B						
BC						
C						
CD						
D						

Total area (ha):	1617.80	Composite CN(I):	31	Composite Ia (mm)	8.5
Pervious area (ha):	1617.80	Composite CN(II):	52		
Impervious area (ha):	0.0	Composite CN(III):	71		

Composite Runoff Coefficient Calculation

Hydrologic Soil Group	Land Use, Crop, and Management									
	Forest/Woodlot	Meadow/Field	Crop (RC, PM)	Crop (RC, CM)	Crop (SG, PM)	Crop (SG, CM)	Crop (M)	URBAN RES. (30% Imp)	URBAN RES. (55% Imp)	URBAN RES. (70% Imp)
A										
AB	598.34	1019.46		321.08						
B										
BC										
C										
CD										
D										

Total area (ha) : 1938.88 Composite Runoff Coefficient, C : 0.20

Time of Concentration Calculation

Method	Airport
Length (m)	6290
h_1 (m)	455
h_2 (m)	300
Δh (m)	155
Slope (%)	2.46
Tc (hr)	2.901
Tp (hr)	1.944

Project Name:	Gore Road Improvements
Project No:	MTB019424
Location:	Town of Caledon
Designer:	Chris Proctor
Date:	8-Apr-2011
Date Modified:	7-Nov-2011

Crossing N2

SWMHYMO Nashyd Modelling Parameters

Composite Curve Number and Initial Abstraction Calculation

Hydrologic Soil Group	Total Area per Various Land Use (ha)					
	Forest/Woodlot	Meadow/Field	Crop	Lawn/Grass	Pavement	Water
A						
AB		1.88				
B						
BC						
C						
CD						
D						

Total area (ha):	1.88	Composite CN(I):	30	Composite Ia (mm)	8.0
Pervious area (ha):	1.88	Composite CN(II):	50		
Impervious area (ha):	0.0	Composite CN(III):	70		

Composite Runoff Coefficient Calculation

Hydrologic Soil Group	Land Use, Crop, and Management									
	Forest/Woodlot	Meadow/Field	Crop (RC, PM)	Crop (RC, CM)	Crop (SG, PM)	Crop (SG, CM)	Crop (M)	URBAN RES. (30% Imp)	URBAN RES. (55% Imp)	URBAN RES. (70% Imp)
A										
AB		1.88								
B										
BC										
C										
CD										
D										

Total area (ha) : 1.88 Composite Runoff Coefficient, C : 0.15

Time of Concentration Calculation

Method	Airport
Length (m)	110
h_1 (m)	335
h_2 (m)	331
Δh (m)	4
Slope (%)	3.64
Tc (hr)	0.354
Tp (hr)	0.237

Project Name:	Gore Road Improvements
Project No:	MTB019424
Location:	Town of Caledon
Designer:	Chris Proctor
Date:	8-Apr-2011
Date Modified:	7-Nov-2011

BURNSIDE

Crossing N1

SWMHYMO Nashyd Modelling Parameters

Composite Curve Number and Initial Abstraction Calculation

Hydrologic Soil Group	Total Area per Various Land Use (ha)					
	Forest/Woodlot	Meadow/Field	Crop	Lawn/Grass	Pavement	Water
A						
AB	1.74	13.31				
B						
BC						
C						
CD						
D						

Total area (ha):	15.05	Composite CN(I):	29	Composite Ia (mm)	8.2
Pervious area (ha):	15.05	Composite CN(II):	49		
Impervious area (ha):	0.0	Composite CN(III):	69		

Composite Runoff Coefficient Calculation

Hydrologic Soil Group	Land Use, Crop, and Management									
	Forest/Woodlot	Meadow/Field	Crop (RC, PM)	Crop (RC, CM)	Crop (SG, PM)	Crop (SG, CM)	Crop (M)	URBAN RES. (30% Imp)	URBAN RES. (55% Imp)	URBAN RES. (70% Imp)
A										
AB	1.74	13.31								
B										
BC										
C										
CD										
D										

Total area (ha) : 15.05 Composite Runoff Coefficient, C : 0.14

Time of Concentration Calculation

Method	Airport
Length (m)	400
h_1 (m)	345
h_2 (m)	325
Δh (m)	20
Slope (%)	5.00
Tc (hr)	0.612
Tp (hr)	0.410

BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

Appendix B

Summary of Peak Flow Rates

Project Name: Gore Road Improvements
Project No: MTB019424
Location: Town of Caledon
Designer: Chris Proctor
Date: 8-Apr-2011
Date Modified: 6-Feb-2012

AES Storm Distribution (6-hour) Caledon

Event	1344	1345	1346	1347	1348	1349	1350	1351	1352	1353	1354	1355	1356	N3	N2	N1
2	0.012	0.076	0.072	0.085	0.043	0.022	0.011	0.145	0.367	0.152	0.005	0.192	0.032	2.939	0.012	0.067
5	0.023	0.159	0.142	0.173	0.086	0.043	0.023	0.292	0.734	0.297	0.010	0.386	0.065	5.840	0.023	0.134
10	0.033	0.229	0.201	0.246	0.122	0.061	0.033	0.415	1.040	0.417	0.014	0.547	0.093	8.239	0.033	0.190
25	0.047	0.333	0.286	0.355	0.174	0.087	0.047	0.596	1.485	0.591	0.020	0.784	0.133	11.718	0.047	0.272
50	0.059	0.421	0.358	0.446	0.218	0.109	0.059	0.748	1.860	0.738	0.025	0.983	0.168	14.634	0.059	0.340
100	0.072	0.517	0.435	0.545	0.266	0.133	0.073	0.913	2.263	0.895	0.030	1.198	0.205	17.753	0.072	0.414
HAZEL	0.200	1.737	1.348	1.688	0.706	0.309	0.182	3.310	10.435	3.605	0.085	5.047	0.625	79.218	0.158	1.144

AES Storm Distribution (12-hour) Caledon

Event	1344	1345	1346	1347	1348	1349	1350	1351	1352	1353	1354	1355	1356	N3	N2	N1
2	0.013	0.081	0.076	0.090	0.046	0.022	0.012	0.154	0.432	0.167	0.005	0.214	0.034	3.477	0.012	0.072
5	0.023	0.156	0.138	0.169	0.083	0.039	0.021	0.287	0.794	0.303	0.010	0.396	0.064	6.350	0.021	0.131
10	0.031	0.218	0.190	0.234	0.113	0.053	0.029	0.396	1.088	0.413	0.013	0.545	0.088	8.674	0.028	0.178
25	0.043	0.308	0.263	0.327	0.156	0.073	0.041	0.553	1.510	0.570	0.018	0.758	0.123	11.987	0.038	0.246
50	0.053	0.383	0.323	0.403	0.191	0.089	0.050	0.683	1.858	0.700	0.022	0.935	0.152	14.703	0.047	0.302
100	0.063	0.464	0.388	0.487	0.229	0.107	0.060	0.824	2.235	0.840	0.027	1.127	0.183	17.633	0.056	0.362
HAZEL	0.200	1.737	1.348	1.688	0.706	0.309	0.182	3.310	10.435	3.605	0.085	5.047	0.625	79.218	0.158	1.144

```
2     Metric units
*#****************************************************************************
*#  Project Name: [Gore Road Improvements]    Project Number: [MTB019424]
*#  Date        : 11/7/2011 3:04:16 PM
*#  Modeller    : [Chris Proctor]
*#  Company     : R.J. Burnside & Associates Ltd.
*#  License #   :  3877524
*#****************************************************************************
*% 2-year AES Storm Distribution for Caledon, ON. (6-hour)
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[1]
*%                   ["2AES6.stm"] <--storm filename
*%-----------------|----------------------------------------------------------|
READ STORM          STORM_FILENAME=["STORM.001"]
*%-----------------|----------------------------------------------------------|
CALIB NASHYD        ID=[2], NHYD=["1344"], DT=[2]min, AREA=[2.62](ha),
                    DWF=[0.0](cms),  CN\C=[50], IA=[8](mm),
                    N=[3], TP=[0.44]hrs,
                    RAINFALL=[ , , , , ](mm\hr), END=-1
*%-----------------|----------------------------------------------------------|
CALIB NASHYD        ID=[3], NHYD=["1345"], DT=[2]min, AREA=[27.07](ha),
                    DWF=[0.0](cms),  CN\C=[45], IA=[10](mm),
                    N=[3], TP=[0.57]hrs,
                    RAINFALL=[ , , , , ](mm\hr), END=-1
*%-----------------|----------------------------------------------------------|
CALIB NASHYD        ID=[4], NHYD=["1346"], DT=[2]min, AREA=[19.25](ha),
                    DWF=[0.0](cms),  CN\C=[49], IA=[8](mm),
                    N=[3], TP=[0.59]hrs,
                    RAINFALL=[ , , , , ](mm\hr), END=-1
*%-----------------|----------------------------------------------------------|
CALIB NASHYD        ID=[5], NHYD=["1347"], DT=[2]min, AREA=[24.47](ha),
                    DWF=[0.0](cms),  CN\C=[47], IA=[9](mm),
                    N=[3], TP=[0.51]hrs,
                    RAINFALL=[ , , , , ](mm\hr), END=-1
*%-----------------|----------------------------------------------------------|
CALIB NASHYD        ID=[6], NHYD=["1348"], DT=[2]min, AREA=[8.95](ha),
                    DWF=[0.0](cms),  CN\C=[50], IA=[8](mm),
                    N=[3], TP=[0.38]hrs,
                    RAINFALL=[ , , , , ](mm\hr), END=-1
*%-----------------|----------------------------------------------------------|
CALIB NASHYD        ID=[7], NHYD=["1349"], DT=[2]min, AREA=[3.71](ha),
                    DWF=[0.0](cms),  CN\C=[50], IA=[8](mm),
                    N=[3], TP=[0.27]hrs,
                    RAINFALL=[ , , , , ](mm\hr), END=-1
*%-----------------|----------------------------------------------------------|
CALIB NASHYD        ID=[8], NHYD=["1350"], DT=[2]min, AREA=[2.31](ha),
                    DWF=[0.0](cms),  CN\C=[48], IA=[9](mm),
                    N=[3], TP=[0.29]hrs,
                    RAINFALL=[ , , , , ](mm\hr), END=-1
*%-----------------|----------------------------------------------------------|
CALIB NASHYD        ID=[9], NHYD=["1351"], DT=[2]min, AREA=[50.58](ha),
                    DWF=[0.0](cms),  CN\C=[48], IA=[9](mm),
                    N=[3], TP=[0.78]hrs,
                    RAINFALL=[ , , , , ](mm\hr), END=-1
*%-----------------|----------------------------------------------------------|
CALIB NASHYD        ID=[2], NHYD=["1352"], DT=[2]min, AREA=[225.46](ha),
                    DWF=[0.0](cms),  CN\C=[48], IA=[9](mm),
                    N=[3], TP=[1.85]hrs,
                    RAINFALL=[ , , , , ](mm\hr), END=-1
*%-----------------|----------------------------------------------------------|
CALIB NASHYD        ID=[3], NHYD=["1353"], DT=[2]min, AREA=[62.29](ha),
                    DWF=[0.0](cms),  CN\C=[49], IA=[8](mm),
                    N=[3], TP=[1.22]hrs,
                    RAINFALL=[ , , , , ](mm\hr), END=-1
*%-----------------|----------------------------------------------------------|
CALIB NASHYD        ID=[4], NHYD=["1354"], DT=[2]min, AREA=[1.11](ha),
                    DWF=[0.0](cms),  CN\C=[50], IA=[8](mm),
```



```
                    N=[3], TP=[0.44]hrs,
                    RAINFALL=[ , , , , ](mm\hr), END=-1
*%-----------------|----------------------------------------------------------|
CALIB NASHYD        ID=[5], NHYD=["1355"], DT=[2]min, AREA=[91.26](ha),
                    DWF=[0.0](cms),  CN\C=[47], IA=[9](mm),
                    N=[3], TP=[1.22]hrs,
                    RAINFALL=[ , , , , ](mm\hr), END=-1
*%-----------------|----------------------------------------------------------|
CALIB NASHYD        ID=[6], NHYD=["1356"], DT=[2]min, AREA=[8.93](ha),
                    DWF=[0.0](cms),  CN\C=[47], IA=[9](mm),
                    N=[3], TP=[0.48]hrs,
                    RAINFALL=[ , , , , ](mm\hr), END=-1
*%-----------------|----------------------------------------------------------|
CALIB NASHYD        ID=[7], NHYD=["N3"], DT=[2]min, AREA=[1617.8](ha),
                    DWF=[0.0](cms),  CN\C=[52], IA=[9](mm),
                    N=[3], TP=[1.94]hrs,
                    RAINFALL=[ , , , , ](mm\hr), END=-1
*%-----------------|----------------------------------------------------------|
CALIB NASHYD        ID=[8], NHYD=["N2"], DT=[2]min, AREA=[1.88](ha),
                    DWF=[0.0](cms),  CN\C=[50], IA=[8](mm),
                    N=[3], TP=[0.24]hrs,
                    RAINFALL=[ , , , , ](mm\hr), END=-1
*%-----------------|----------------------------------------------------------|
CALIB NASHYD        ID=[9], NHYD=["N1"], DT=[2]min, AREA=[15.05](ha),
                    DWF=[0.0](cms),  CN\C=[49], IA=[8](mm),
                    N=[3], TP=[0.41]hrs,
                    RAINFALL=[ , , , , ](mm\hr), END=-1
*%-----------------|----------------------------------------------------------|
*% 5-year AES Storm Distribution for Caledon, ON. (6-hour)
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[2]
*%                   ["5AES6.stm"] <--storm filename
*%-----------------|----------------------------------------------------------|
*% 10-year AES Storm Distribution for Caledon, ON. (6-hour)
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[3]
*%                   ["10AES6.stm"] <--storm filename
*%-----------------|----------------------------------------------------------|
*% 25-year AES Storm Distribution for Caledon, ON. (6-hour)
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[4]
*%                   ["25AES6.stm"] <--storm filename
*%-----------------|----------------------------------------------------------|
*% 50-year AES Storm Distribution for Caledon, ON. (6-hour)
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[5]
*%                   ["50AES6.stm"] <--storm filename
*%-----------------|----------------------------------------------------------|
*% 100-year AES Storm Distribution for Caledon, ON. (6-hour)
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[6]
*%                   ["100AES6.stm"] <--storm filename
*%-----------------|----------------------------------------------------------|
*% Hurricane Hazel Storm Distribution (12-hour)
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[7]
*%                   ["Hzl12h15.stm"] <--storm filename
*%-----------------|----------------------------------------------------------|
FINISH
```

```
==============================================================================

   SSSSS  W   W  M   M  H   H  Y   Y  M   M   OOO        999    999    =========
   S      W W W  MM MM  H   H   Y Y   MM MM  O   O      9   9  9   9
   SSSSS  W W W  M M M  HHHHH    Y    M M M  O   O  ##  9   9  9   9   Ver  4.05
       S   W W   M   M  H   H    Y    M   M  O   O       9999   9999   Sept 2011
   SSSSS   W W   M   M  H   H    Y    M   M   OOO           9      9   =========
                                                        9   9  9   9   # 3877524
        StormWater Management HYdrologic Model           999    999    =========

 *****************************************************************************
 **************************** SWMHYMO Ver/4.05  ****************************
 *********  A single event and continuous hydrologic simulation model  *********
 *********     based on the principles of HYMO and its successors      *********
 *********                OTTHYMO-83 and OTTHYMO-89.                   *********
 *****************************************************************************
 ********* Distributed by:  J.F. Sabourin and Associates Inc.          *********
 *********                  Ottawa,  Ontario: (613) 836-3884           *********
 *********                  Gatineau, Quebec: (819) 243-6858           *********
 *********                  E-Mail: swmhymo@jfsa.Com                   *********
 *****************************************************************************

 +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
 +++++++++ Licensed user: R.J. Burnside & Associates Ltd.              +++++++++
 +++++++++              Brampton            SERIAL#:3877524            +++++++++
 +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

 *****************************************************************************
 *********           ++++++ PROGRAM ARRAY DIMENSIONS ++++++            *********
 *********           Maximum value for ID numbers  :     10            *********
 *********           Max. number of rainfall points: 105408            *********
 *********           Max. number of flow points    : 105408            *********
 *****************************************************************************

 ***** DESCRIPTION SUMMARY TABLE HEADERS (units depend on METOUT in START) *****
 *****-------------------------------------------------------------------*****
 *****    ID:  Hydrograph IDentification numbers, (1-10).                *****
 *****  NHYD:  Hydrograph reference numbers, (6 digits or characters).   *****
 *****  AREA:  Drainage area associated with hydrograph, (ac.) or (ha.). *****
 ***** QPEAK:  Peak flow of simulated hydrograph, (ft^3/s) or (m^3/s).   *****
 ***** TpeakDate_hh:mm is the date and time of the peak flow.            *****
 *****  R.V.:  Runoff Volume of simulated hydrograph, (in) or (mm).      *****
 *****  R.C.:  Runoff Coefficient of simulated hydrograph, (ratio).      *****
 *****     *:  see WARNING or NOTE message printed at end of run.        *****
 *****    **:  see  ERROR  message printed at end of run.                *****
 *****************************************************************************
 *****************************************************************************

::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::

 *****************************************************************************

 **********************   S U M M A R Y   O U T P U T   **********************
 *****************************************************************************
 *       DATE: 2012-02-02     TIME: 16:35:55     RUN COUNTER: 000017         *
 *****************************************************************************
 * Input   filename: W:\019424~1\6-HOUR~2\AES6.dat                           *
 * Output  filename: W:\019424~1\6-HOUR~2\AES6.out                           *
 * Summary filename: W:\019424~1\6-HOUR~2\AES6.sum                           *
 * User comments:                                                            *
 * 1:________________________________________________________________________*
 * 2:________________________________________________________________________*
 * 3:________________________________________________________________________*
 *****************************************************************************
```



```
#******************************************************************************
#  Project Name: [Gore Road Improvements]    Project Number: [MTB019424]
#  Date        : 11/7/2011 3:04:16 PM
#  Modeller    : [Chris Proctor]
#  Company     : R.J. Burnside & Associates Ltd.
#  License #   :  3877524
#******************************************************************************
 RUN:COMMAND#
 001:0001---------------------------------------------------------------------
     START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  =   1 ]
 001:0002---------------------------------------------------------------------
     READ STORM
      Filename = STORM.001
      Comment  = 2-Year AES Storm Distribution (6-hour) Caledon, ON.

      [SDT=15.00:SDUR=   6.25:PTOT=  36.00]
 001:0003--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:1344           2.62     .012 No_date    3:15    2.78 .077
      [CN= 50.0: N= 3.00]
      [Tp=  .44:DT= 2.14]
 001:0004--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:1345          27.07     .076 No_date    3:30    2.01 .056
      [CN= 45.0: N= 3.00]
      [Tp=  .57:DT= 2.14]
 001:0005--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       04:1346          19.25     .072 No_date    3:27    2.68 .074
      [CN= 49.0: N= 3.00]
      [Tp=  .59:DT= 2.14]
 001:0006--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       05:1347          24.47     .085 No_date    3:23    2.33 .065
      [CN= 47.0: N= 3.00]
      [Tp=  .51:DT= 2.14]
 001:0007--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       06:1348           8.95     .043 No_date    3:06    2.78 .077
      [CN= 50.0: N= 3.00]
      [Tp=  .38:DT= 2.14]
 001:0008--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       07:1349           3.71     .022 No_date    2:55    2.78 .077
      [CN= 50.0: N= 3.00]
      [Tp=  .27:DT= 2.14]
 001:0009--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       08:1350           2.31     .011 No_date    2:57    2.41 .067
      [CN= 48.0: N= 3.00]
      [Tp=  .29:DT= 2.14]
 001:0010--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       09:1351          50.58     .145 No_date    3:47    2.41 .067
      [CN= 48.0: N= 3.00]
      [Tp=  .78:DT= 2.14]
 001:0011--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:1352         225.46     .367 No_date    5:06    2.41 .067
      [CN= 48.0: N= 3.00]
      [Tp= 1.85:DT= 2.14]
 001:0012--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:1353          62.29     .152 No_date    4:21    2.68 .074
      [CN= 49.0: N= 3.00]
      [Tp= 1.22:DT= 2.14]
 001:0013--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       04:1354           1.11     .005 No_date    3:15    2.78 .077
      [CN= 50.0: N= 3.00]
      [Tp=  .44:DT= 2.14]
 001:0014--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       05:1355          91.26     .192 No_date    4:23    2.33 .065
```

```
     [Tp= 1.22:DT= 2.00]
 001:0015--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       06:1356       8.93     .064 No_date   12:26    5.86 .111
     [CN= 47.0: N= 3.00]
     [Tp=  .48:DT= 2.00]
 001:0016--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       07:N3      1617.80    4.957 No_date   14:18    6.95 .131
     [CN= 52.0: N= 3.00]
     [Tp= 1.94:DT= 2.00]
 001:0017--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       08:N2         1.88     .025 No_date   12:10    6.77 .128
     [CN= 50.0: N= 3.00]
     [Tp=  .24:DT= 2.00]
 001:0018--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       09:N1        15.05     .137 No_date   12:20    6.55 .124
     [CN= 49.0: N= 3.00]
     [Tp=  .41:DT= 2.00]
  ** END OF RUN :   1

*******************************************************************************




 RUN:COMMAND#
 002:0001-----------------------------------------------------------------------
    START
     [TZERO =    .00 hrs on        0]
     [METOUT=   2    (1=imperial, 2=metric output)]
     [NSTORM=   1 ]
     [NRUN  =   2 ]
#*******************************************************************************
#  Project Name: [Gore Road Improvements]    Project Number: [MTB019424]
#  Date        : 11/7/2011 3:04:16 PM
#  Modeller    : [Chris Proctor]
#  Company     : R.J. Burnside & Associates Ltd.
#  License #   :  3877524
#*******************************************************************************
 002:0002------------------------------------------------------------------------
    READ STORM
     Filename = STORM.001
     Comment  = 5-Year SCS Type-II Storm Distribution (24-hour) Fergus, ON.
     [SDT=12.00:SDUR=  24.00:PTOT=  71.10]
 002:0003--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:1344       2.62     .045 No_date   12:22   12.56 .177
     [CN= 50.0: N= 3.00]
     [Tp=  .44:DT= 2.00]
 002:0004--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       03:1345      27.07     .303 No_date   12:32   10.05 .141
     [CN= 45.0: N= 3.00]
     [Tp=  .57:DT= 2.00]
 002:0005--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       04:1346      19.25     .258 No_date   12:32   12.16 .171
     [CN= 49.0: N= 3.00]
     [Tp=  .59:DT= 2.00]
 002:0006--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       05:1347      24.47     .329 No_date   12:28   11.07 .156
     [CN= 47.0: N= 3.00]
     [Tp=  .51:DT= 2.00]
 002:0007--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       06:1348       8.95     .170 No_date   12:18   12.56 .177
     [CN= 50.0: N= 3.00]
     [Tp=  .38:DT= 2.00]
 002:0008--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       07:1349       3.71     .088 No_date   12:10   12.56 .177
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```
     [CN= 50.0: N= 3.00]
     [Tp=  .27:DT= 2.00]
 002:0009--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       08:1350       2.31     .047 No_date   12:12   11.43 .161
     [CN= 48.0: N= 3.00]
     [Tp=  .29:DT= 2.00]
 002:0010--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       09:1351      50.58     .517 No_date   12:46   11.43 .161
     [CN= 48.0: N= 3.00]
     [Tp=  .78:DT= 2.00]
 002:0011--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:1352     225.46    1.205 No_date   14:08   11.43 .161
     [CN= 48.0: N= 3.00]
     [Tp= 1.85:DT= 2.00]
 002:0012--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       03:1353      62.29     .488 No_date   13:18   12.16 .171
     [CN= 49.0: N= 3.00]
     [Tp= 1.22:DT= 2.00]
 002:0013--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       04:1354       1.11     .019 No_date   12:22   12.56 .177
     [CN= 50.0: N= 3.00]
     [Tp=  .44:DT= 2.00]
 002:0014--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       05:1355      91.26     .645 No_date   13:18   11.07 .156
     [CN= 47.0: N= 3.00]
     [Tp= 1.22:DT= 2.00]
 002:0015--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       06:1356       8.93     .126 No_date   12:26   11.07 .156
     [CN= 47.0: N= 3.00]
     [Tp=  .48:DT= 2.00]
 002:0016--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       07:N3      1617.80    9.544 No_date   14:14   13.00 .183
     [CN= 52.0: N= 3.00]
     [Tp= 1.94:DT= 2.00]
 002:0017--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       08:N2         1.88     .048 No_date   12:08   12.56 .177
     [CN= 50.0: N= 3.00]
     [Tp=  .24:DT= 2.00]
 002:0018--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       09:N1        15.05     .262 No_date   12:20   12.16 .171
     [CN= 49.0: N= 3.00]
     [Tp=  .41:DT= 2.00]
  ** END OF RUN :   2

*******************************************************************************




 RUN:COMMAND#
 003:0001-----------------------------------------------------------------------
    START
     [TZERO =    .00 hrs on        0]
     [METOUT=   2    (1=imperial, 2=metric output)]
     [NSTORM=   1 ]
     [NRUN  =   3 ]
#*******************************************************************************
#  Project Name: [Gore Road Improvements]    Project Number: [MTB019424]
#  Date        : 11/7/2011 3:04:16 PM
#  Modeller    : [Chris Proctor]
#  Company     : R.J. Burnside & Associates Ltd.
#  License #   :  3877524
#*******************************************************************************
 003:0002------------------------------------------------------------------------
    READ STORM
```

```
      Filename = STORM.001
      Comment  = 10-Year SCS Type-II Storm Distribution (24-hour) Fergus, ON.
      [SDT=12.00:SDUR=  24.00:PTOT=  83.10]
 003:0003--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:1344       2.62     .062 No_date   12:22   17.14 .206
      [CN= 50.0: N= 3.00]
      [Tp=  .44:DT= 2.00]
 003:0004--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:1345      27.07     .426 No_date   12:32   13.93 .168
      [CN= 45.0: N= 3.00]
      [Tp=  .57:DT= 2.00]
 003:0005--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       04:1346      19.25     .357 No_date   12:32   16.61 .200
      [CN= 49.0: N= 3.00]
      [Tp=  .59:DT= 2.00]
 003:0006--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       05:1347      24.47     .459 No_date   12:26   15.23 .183
      [CN= 47.0: N= 3.00]
      [Tp=  .51:DT= 2.00]
 003:0007--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       06:1348       8.95     .234 No_date   12:18   17.14 .206
      [CN= 50.0: N= 3.00]
      [Tp=  .38:DT= 2.00]
 003:0008--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       07:1349       3.71     .121 No_date   12:10   17.14 .206
      [CN= 50.0: N= 3.00]
      [Tp=  .27:DT= 2.00]
 003:0009--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       08:1350       2.31     .066 No_date   12:12   15.72 .189
      [CN= 48.0: N= 3.00]
      [Tp=  .29:DT= 2.00]
 003:0010--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       09:1351      50.58     .720 No_date   12:46   15.72 .189
      [CN= 48.0: N= 3.00]
      [Tp=  .78:DT= 2.00]
 003:0011--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:1352     225.46    1.675 No_date   14:06   15.72 .189
      [CN= 48.0: N= 3.00]
      [Tp= 1.85:DT= 2.00]
 003:0012--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:1353      62.29     .674 No_date   13:18   16.61 .200
      [CN= 49.0: N= 3.00]
      [Tp= 1.22:DT= 2.00]
 003:0013--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       04:1354       1.11     .026 No_date   12:22   17.14 .206
      [CN= 50.0: N= 3.00]
      [Tp=  .44:DT= 2.00]
 003:0014--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       05:1355      91.26     .899 No_date   13:18   15.23 .183
      [CN= 47.0: N= 3.00]
      [Tp= 1.22:DT= 2.00]
 003:0015--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       06:1356       8.93     .175 No_date   12:24   15.23 .183
      [CN= 47.0: N= 3.00]
      [Tp=  .48:DT= 2.00]
 003:0016--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       07:N3      1617.80   13.213 No_date   14:12   17.80 .214
      [CN= 52.0: N= 3.00]
      [Tp= 1.94:DT= 2.00]
 003:0017--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       08:N2         1.88     .066 No_date   12:08   17.14 .206
      [CN= 50.0: N= 3.00]
      [Tp=  .24:DT= 2.00]
 003:0018--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       09:N1        15.05     .361 No_date   12:20   16.61 .200
      [CN= 49.0: N= 3.00]
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      [Tp=  .41:DT= 2.00]
  ** END OF RUN :   3

*******************************************************************************




 RUN:COMMAND#
 004:0001-----------------------------------------------------------------------
     START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  =   4 ]
#******************************************************************************
#  Project Name: [Gore Road Improvements]    Project Number: [MTB019424]
#  Date        : 11/7/2011 3:04:16 PM
#  Modeller    : [Chris Proctor]
#  Company     : R.J. Burnside & Associates Ltd.
#  License #   :  3877524
#******************************************************************************
 004:0002------------------------------------------------------------------------
     READ STORM
      Filename = STORM.001
      Comment  = 25-Year SCS Type-II Storm Distribution (24-hour) Fergus, ON.
      [SDT=12.00:SDUR=  24.00:PTOT=  98.30]
 004:0003--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:1344       2.62     .086 No_date   12:22   23.68 .241
      [CN= 50.0: N= 3.00]
      [Tp=  .44:DT= 2.00]
 004:0004--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:1345      27.07     .605 No_date   12:30   19.55 .199
      [CN= 45.0: N= 3.00]
      [Tp=  .57:DT= 2.00]
 004:0005--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       04:1346      19.25     .499 No_date   12:32   22.99 .234
      [CN= 49.0: N= 3.00]
      [Tp=  .59:DT= 2.00]
 004:0006--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       05:1347      24.47     .647 No_date   12:26   21.22 .216
      [CN= 47.0: N= 3.00]
      [Tp=  .51:DT= 2.00]
 004:0007--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       06:1348       8.95     .327 No_date   12:18   23.68 .241
      [CN= 50.0: N= 3.00]
      [Tp=  .38:DT= 2.00]
 004:0008--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       07:1349       3.71     .169 No_date   12:10   23.68 .241
      [CN= 50.0: N= 3.00]
      [Tp=  .27:DT= 2.00]
 004:0009--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       08:1350       2.31     .093 No_date   12:12   21.88 .223
      [CN= 48.0: N= 3.00]
      [Tp=  .29:DT= 2.00]
 004:0010--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       09:1351      50.58    1.013 No_date   12:46   21.88 .223
      [CN= 48.0: N= 3.00]
      [Tp=  .78:DT= 2.00]
 004:0011--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:1352     225.46    2.356 No_date   14:04   21.88 .223
      [CN= 48.0: N= 3.00]
      [Tp= 1.85:DT= 2.00]
 004:0012--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:1353      62.29     .942 No_date   13:16   22.99 .234
```

```
      [CN= 49.0: N= 3.00]
      [Tp= 1.22:DT= 2.00]
 004:0013--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       04:1354       1.11     .037 No_date   12:22   23.68 .241
      [CN= 50.0: N= 3.00]
      [Tp=  .44:DT= 2.00]
 004:0014--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       05:1355      91.26    1.267 No_date   13:16   21.22 .216
      [CN= 47.0: N= 3.00]
      [Tp= 1.22:DT= 2.00]
 004:0015--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       06:1356       8.93     .247 No_date   12:24   21.22 .216
      [CN= 47.0: N= 3.00]
      [Tp=  .48:DT= 2.00]
 004:0016--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       07:N3      1617.80   18.485 No_date   14:10   24.63 .251
      [CN= 52.0: N= 3.00]
      [Tp= 1.94:DT= 2.00]
 004:0017--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       08:N2         1.88     .092 No_date   12:08   23.68 .241
      [CN= 50.0: N= 3.00]
      [Tp=  .24:DT= 2.00]
 004:0018--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       09:N1        15.05     .505 No_date   12:20   22.99 .234
      [CN= 49.0: N= 3.00]
      [Tp=  .41:DT= 2.00]
  ** END OF RUN :   4

*******************************************************************************




 RUN:COMMAND#
 005:0001------------------------------------------------------------------------
     START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  =   5 ]
#******************************************************************************
#  Project Name: [Gore Road Improvements]    Project Number: [MTB019424]
#  Date        : 11/7/2011 3:04:16 PM
#  Modeller    : [Chris Proctor]
#  Company     : R.J. Burnside & Associates Ltd.
#  License #   :  3877524
#******************************************************************************
 005:0002-------------------------------------------------------------------------
     READ STORM
      Filename = STORM.001
      Comment  = 50-Year SCS Type-II Storm Distribution (24-hour) Fergus, ON.
      [SDT=12.00:SDUR=  24.00:PTOT= 109.50]
 005:0003--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:1344       2.62     .106 No_date   12:22   28.98 .265
      [CN= 50.0: N= 3.00]
      [Tp=  .44:DT= 2.00]
 005:0004--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:1345      27.07     .753 No_date   12:30   24.15 .221
      [CN= 45.0: N= 3.00]
      [Tp=  .57:DT= 2.00]
 005:0005--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       04:1346      19.25     .615 No_date   12:32   28.16 .257
      [CN= 49.0: N= 3.00]
      [Tp=  .59:DT= 2.00]
 005:0006--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
```



```
     CALIB NASHYD       05:1347      24.47     .801 No_date   12:26   26.10 .238
      [CN= 47.0: N= 3.00]
      [Tp=  .51:DT= 2.00]
 005:0007--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       06:1348       8.95     .402 No_date   12:18   28.98 .265
      [CN= 50.0: N= 3.00]
      [Tp=  .38:DT= 2.00]
 005:0008--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       07:1349       3.71     .208 No_date   12:10   28.98 .265
      [CN= 50.0: N= 3.00]
      [Tp=  .27:DT= 2.00]
 005:0009--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       08:1350       2.31     .115 No_date   12:12   26.89 .246
      [CN= 48.0: N= 3.00]
      [Tp=  .29:DT= 2.00]
 005:0010--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       09:1351      50.58    1.253 No_date   12:46   26.89 .246
      [CN= 48.0: N= 3.00]
      [Tp=  .78:DT= 2.00]
 005:0011--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:1352     225.46    2.913 No_date   14:04   26.89 .246
      [CN= 48.0: N= 3.00]
      [Tp= 1.85:DT= 2.00]
 005:0012--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:1353      62.29    1.161 No_date   13:16   28.16 .257
      [CN= 49.0: N= 3.00]
      [Tp= 1.22:DT= 2.00]
 005:0013--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       04:1354       1.11     .045 No_date   12:22   28.98 .265
      [CN= 50.0: N= 3.00]
      [Tp=  .44:DT= 2.00]
 005:0014--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       05:1355      91.26    1.569 No_date   13:16   26.10 .238
      [CN= 47.0: N= 3.00]
      [Tp= 1.22:DT= 2.00]
 005:0015--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       06:1356       8.93     .305 No_date   12:24   26.10 .238
      [CN= 47.0: N= 3.00]
      [Tp=  .48:DT= 2.00]
 005:0016--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       07:N3      1617.80   22.771 No_date   14:10   30.15 .275
      [CN= 52.0: N= 3.00]
      [Tp= 1.94:DT= 2.00]
 005:0017--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       08:N2         1.88     .114 No_date   12:08   28.98 .265
      [CN= 50.0: N= 3.00]
      [Tp=  .24:DT= 2.00]
 005:0018--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       09:N1        15.05     .622 No_date   12:20   28.16 .257
      [CN= 49.0: N= 3.00]
      [Tp=  .41:DT= 2.00]
  ** END OF RUN :   5

*******************************************************************************




 RUN:COMMAND#
 006:0001------------------------------------------------------------------------
     START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  =   6 ]
```

```
#***************************************************************************
#  Project Name: [Gore Road Improvements]    Project Number: [MTB019424]
#  Date        : 11/7/2011 3:04:16 PM
#  Modeller    : [Chris Proctor]
#  Company     : R.J. Burnside & Associates Ltd.
#  License #   :  3877524
#***************************************************************************
 006:0002------------------------------------------------------------------------
     READ STORM
      Filename = STORM.001
      Comment  = 100-Year SCS Type-II Storm Distribution (24-hour) Fergus, ON
      [SDT=12.00:SDUR=  24.00:PTOT= 120.70]
 006:0003--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:1344       2.62     .128 No_date   12:22   34.64 .287
      [CN= 50.0: N= 3.00]
      [Tp=  .44:DT= 2.00]
 006:0004--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:1345      27.07     .913 No_date   12:30   29.10 .241
      [CN= 45.0: N= 3.00]
      [Tp=  .57:DT= 2.00]
 006:0005--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       04:1346      19.25     .740 No_date   12:32   33.68 .279
      [CN= 49.0: N= 3.00]
      [Tp=  .59:DT= 2.00]
 006:0006--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       05:1347      24.47     .967 No_date   12:26   31.34 .260
      [CN= 47.0: N= 3.00]
      [Tp=  .51:DT= 2.00]
 006:0007--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       06:1348       8.95     .483 No_date   12:18   34.64 .287
      [CN= 50.0: N= 3.00]
      [Tp=  .38:DT= 2.00]
 006:0008--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       07:1349       3.71     .250 No_date   12:10   34.64 .287
      [CN= 50.0: N= 3.00]
      [Tp=  .27:DT= 2.00]
 006:0009--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       08:1350       2.31     .138 No_date   12:12   32.25 .267
      [CN= 48.0: N= 3.00]
      [Tp=  .29:DT= 2.00]
 006:0010--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       09:1351      50.58    1.512 No_date   12:44   32.25 .267
      [CN= 48.0: N= 3.00]
      [Tp=  .78:DT= 2.00]
 006:0011--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:1352     225.46    3.512 No_date   14:02   32.25 .267
      [CN= 48.0: N= 3.00]
      [Tp= 1.85:DT= 2.00]
 006:0012--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:1353      62.29    1.395 No_date   13:16   33.68 .279
      [CN= 49.0: N= 3.00]
      [Tp= 1.22:DT= 2.00]
 006:0013--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       04:1354       1.11     .054 No_date   12:22   34.64 .287
      [CN= 50.0: N= 3.00]
      [Tp=  .44:DT= 2.00]
 006:0014--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       05:1355      91.26    1.893 No_date   13:16   31.34 .260
      [CN= 47.0: N= 3.00]
      [Tp= 1.22:DT= 2.00]
 006:0015--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       06:1356       8.93     .368 No_date   12:24   31.34 .260
      [CN= 47.0: N= 3.00]
      [Tp=  .48:DT= 2.00]
 006:0016--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       07:N3      1617.80   27.359 No_date   14:10   36.04 .299
```



```
      [CN= 52.0: N= 3.00]
      [Tp= 1.94:DT= 2.00]
 006:0017--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       08:N2         1.88     .136 No_date   12:08   34.64 .287
      [CN= 50.0: N= 3.00]
      [Tp=  .24:DT= 2.00]
 006:0018--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       09:N1        15.05     .748 No_date   12:20   33.68 .279
      [CN= 49.0: N= 3.00]
      [Tp=  .41:DT= 2.00]
  ** END OF RUN :   6

*******************************************************************************

 RUN:COMMAND#
 007:0001------------------------------------------------------------------------
     START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  =   7 ]
#***************************************************************************
#  Project Name: [Gore Road Improvements]    Project Number: [MTB019424]
#  Date        : 11/7/2011 3:04:16 PM
#  Modeller    : [Chris Proctor]
#  Company     : R.J. Burnside & Associates Ltd.
#  License #   :  3877524
#***************************************************************************
 007:0002------------------------------------------------------------------------
     READ STORM
      Filename = STORM.001
      Comment  = HURRICANE HAZEL REGIONAL STORM (12-hour)
      [SDT=15.00:SDUR=  12.00:PTOT= 212.00]
 007:0003--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:1344       2.62     .200 No_date   10:17   90.86 .429
      [CN= 50.0: N= 3.00]
      [Tp=  .44:DT= 2.14]
 007:0004--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:1345      27.07    1.737 No_date   10:36   79.63 .376
      [CN= 45.0: N= 3.00]
      [Tp=  .57:DT= 2.14]
 007:0005--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       04:1346      19.25    1.348 No_date   10:39   88.85 .419
      [CN= 49.0: N= 3.00]
      [Tp=  .59:DT= 2.14]
 007:0006--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       05:1347      24.47    1.688 No_date   10:26   84.20 .397
      [CN= 47.0: N= 3.00]
      [Tp=  .51:DT= 2.14]
 007:0007--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       06:1348       8.95     .706 No_date   10:11   90.86 .429
      [CN= 50.0: N= 3.00]
      [Tp=  .38:DT= 2.14]
 007:0008--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       07:1349       3.71     .309 No_date   10:04   90.86 .429
      [CN= 50.0: N= 3.00]
      [Tp=  .27:DT= 2.14]
 007:0009--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       08:1350       2.31     .182 No_date   10:04   86.18 .407
      [CN= 48.0: N= 3.00]
      [Tp=  .29:DT= 2.14]
 007:0010--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
```

```
    CALIB NASHYD      09:1351      50.58    3.310 No_date   11:06   86.18 .407
     [CN= 48.0: N= 3.00]
     [Tp=  .78:DT= 2.14]
 007:0011---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      02:1352     225.46   10.435 No_date   12:06   86.18 .407
     [CN= 48.0: N= 3.00]
     [Tp= 1.85:DT= 2.14]
 007:0012---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      03:1353      62.29    3.605 No_date   11:28   88.85 .419
     [CN= 49.0: N= 3.00]
     [Tp= 1.22:DT= 2.14]
 007:0013---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      04:1354       1.11     .085 No_date   10:17   90.86 .429
     [CN= 50.0: N= 3.00]
     [Tp=  .44:DT= 2.14]
 007:0014---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      05:1355      91.26    5.047 No_date   11:28   84.20 .397
     [CN= 47.0: N= 3.00]
     [Tp= 1.22:DT= 2.14]
 007:0015---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      06:1356       8.93     .625 No_date   10:21   84.20 .397
     [CN= 47.0: N= 3.00]
     [Tp=  .48:DT= 2.14]
 007:0016---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      07:N3      1617.80   79.218 No_date   12:09   94.20 .444
     [CN= 52.0: N= 3.00]
     [Tp= 1.94:DT= 2.14]
 007:0017---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      08:N2         1.88     .158 No_date   10:02   90.86 .429
     [CN= 50.0: N= 3.00]
     [Tp=  .24:DT= 2.14]
 007:0018---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      09:N1        15.05    1.144 No_date   10:13   88.85 .419
     [CN= 49.0: N= 3.00]
     [Tp=  .41:DT= 2.14]
 007:0002-----------------------------------------------------------------------
     FINISH
--------------------------------------------------------------------------------
********************************************************************************
    WARNINGS / ERRORS / NOTES
    -------------------------
  Simulation ended on 2011-11-07     at 15:08:37
================================================================================
```

[THE DIFFERENCE IS OUR PEOPLE]

Appendix C

SWMHYMO Model Files

(6-hr AES)

```
================================================================================

   SSSSS  W   W  M   M  H   H  Y   Y  M   M   OOO        999    999    =========
   S      W W W  MM MM  H   H   Y Y   MM MM  O   O      9   9  9   9
   SSSSS  W W W  M M M  HHHHH    Y    M M M  O   O  ##  9   9  9   9   Ver  4.05
       S   W W   M   M  H   H    Y    M   M  O   O       9999   9999   Sept 2011
   SSSSS   W W   M   M  H   H    Y    M   M   OOO           9      9   =========
                                                        9   9  9   9   # 3877524
        StormWater Management HYdrologic Model           999    999    =========

 ******************************************************************************
 ***************************** SWMHYMO Ver/4.05  *****************************
 *********  A single event and continuous hydrologic simulation model  *********
 *********     based on the principles of HYMO and its successors      *********
 *********                 OTTHYMO-83 and OTTHYMO-89.                  *********
 ******************************************************************************
 ********* Distributed by:  J.F. Sabourin and Associates Inc.          *********
 *********                  Ottawa,  Ontario: (613) 836-3884           *********
 *********                  Gatineau, Quebec: (819) 243-6858           *********
 *********                  E-Mail: swmhymo@jfsa.Com                   *********
 ******************************************************************************

 ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
 +++++++++ Licensed user: R.J. Burnside & Associates Ltd.              +++++++++
 +++++++++                Brampton              SERIAL#:3877524        +++++++++
 ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

 ******************************************************************************
 *********            ++++++ PROGRAM ARRAY DIMENSIONS ++++++           *********
 *********            Maximum value for ID numbers  :     10           *********
 *********            Max. number of rainfall points: 105408           *********
 *********            Max. number of flow points    : 105408           *********
 ******************************************************************************


 *********************   D E T A I L E D   O U T P U T   *********************
 ******************************************************************************
 *        DATE: 2012-02-02     TIME: 16:35:55     RUN COUNTER: 000017          *
 ******************************************************************************
 * Input   filename: W:\019424~1\6-HOUR~2\AES6.dat                             *
 * Output  filename: W:\019424~1\6-HOUR~2\AES6.out                             *
 * Summary filename: W:\019424~1\6-HOUR~2\AES6.sum                             *
 * User comments:                                                              *
 * 1:__________________________________________________________________________*
 * 2:__________________________________________________________________________*
 * 3:__________________________________________________________________________*
 ******************************************************************************

--------------------------------------------------------------------------------
-
001:0001------------------------------------------------------------------------
-
*#******************************************************************************
*#  Project Name: [Gore Road Improvements]    Project Number: [MTB019424]
*#  Date        : 11/7/2011 3:04:16 PM
*#  Modeller    : [Chris Proctor]
*#  Company     : R.J. Burnside & Associates Ltd.
*#  License #   :  3877524
*#******************************************************************************
--------------------
| START            |  Project  dir.: W:\019424~1\6-HOUR~2\

--------------------  Rainfall dir.: W:\019424~1\6-HOUR~2\
```

```
    TZERO =   .00 hrs on        0
    METOUT=   2 (output = METRIC)
    NRUN  = 001
    NSTORM=   1
           #  1=2AES6.stm
-----------------------------------------------------------------------------------
-
001:0002---------------------------------------------------------------------------
-
--------------------
| READ STORM       |    Filename: TEST
| Ptotal=  36.00 mm|    Comments: TEST
--------------------
              TIME    RAIN |   TIME    RAIN |   TIME    RAIN |   TIME    RAIN
               hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr
               .25    .000 |   2.00  12.240 |   3.75   5.040 |   5.50    .720
               .50    .720 |   2.25  12.240 |   4.00   2.880 |   5.75    .720
               .75    .720 |   2.50  33.120 |   4.25   2.880 |   6.00    .720
              1.00    .720 |   2.75  33.120 |   4.50   1.440 |   6.25    .720
              1.25    .720 |   3.00   9.360 |   4.75   1.440 |
              1.50   4.320 |   3.25   9.360 |   5.00    .720 |
              1.75   4.320 |   3.50   5.040 |   5.25    .720 |

-----------------------------------------------------------------------------------
-
001:0003---------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD       |   Area    (ha)=    2.62   Curve Number   (CN)=50.00
| 02:1344   DT= 2.00 |   Ia      (mm)=   8.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .440

     Unit Hyd Qpeak  (cms)=     .227

     PEAK FLOW       (cms)=     .012 (i)
     TIME TO PEAK    (hrs)=    3.250
     RUNOFF VOLUME    (mm)=    2.780
     TOTAL RAINFALL   (mm)=   36.000
     RUNOFF COEFFICIENT   =     .077

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-----------------------------------------------------------------------------------
-
001:0004---------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD       |   Area    (ha)=   27.07   Curve Number   (CN)=45.00
| 03:1345   DT= 2.00 |   Ia      (mm)=  10.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .570

     Unit Hyd Qpeak  (cms)=    1.814

     PEAK FLOW       (cms)=     .076 (i)
     TIME TO PEAK    (hrs)=    3.500
     RUNOFF VOLUME    (mm)=    2.009
     TOTAL RAINFALL   (mm)=   36.000
     RUNOFF COEFFICIENT   =     .056

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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-
001:0005-----------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD        |   Area    (ha)=   19.25   Curve Number   (CN)=49.00
| 04:1346   DT= 2.00 |   Ia      (mm)=   8.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .590

     Unit Hyd Qpeak  (cms)=    1.246

     PEAK FLOW       (cms)=     .072 (i)
     TIME TO PEAK    (hrs)=    3.464
     RUNOFF VOLUME    (mm)=    2.682
     TOTAL RAINFALL   (mm)=   36.000
     RUNOFF COEFFICIENT   =     .074

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------------------------------------------------------------------------
-
001:0006-----------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD        |   Area    (ha)=   24.47   Curve Number   (CN)=47.00
| 05:1347   DT= 2.00 |   Ia      (mm)=   9.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .510

     Unit Hyd Qpeak  (cms)=    1.833

     PEAK FLOW       (cms)=     .085 (i)
     TIME TO PEAK    (hrs)=    3.393
     RUNOFF VOLUME    (mm)=    2.326
     TOTAL RAINFALL   (mm)=   36.000
     RUNOFF COEFFICIENT   =     .065

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------------------------------------------------------------------------
-
001:0007-----------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD        |   Area    (ha)=    8.95   Curve Number   (CN)=50.00
| 06:1348   DT= 2.00 |   Ia      (mm)=   8.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .380

     Unit Hyd Qpeak  (cms)=     .900

     PEAK FLOW       (cms)=     .043 (i)
     TIME TO PEAK    (hrs)=    3.107
     RUNOFF VOLUME    (mm)=    2.780
     TOTAL RAINFALL   (mm)=   36.000
     RUNOFF COEFFICIENT   =     .077

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------------------------------------------------------------------------
-
001:0008-----------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD        |   Area    (ha)=    3.71   Curve Number   (CN)=50.00
| 07:1349   DT= 2.00 |   Ia      (mm)=   8.000   # of Linear Res.(N)= 3.00
```

```
----------------------   U.H. Tp(hrs)=    .270

     Unit Hyd Qpeak  (cms)=     .525

     PEAK FLOW       (cms)=     .022 (i)
     TIME TO PEAK    (hrs)=    2.929
     RUNOFF VOLUME    (mm)=    2.780
     TOTAL RAINFALL   (mm)=   36.000
     RUNOFF COEFFICIENT   =     .077

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------------
-
001:0009------------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD       |   Area    (ha)=    2.31   Curve Number   (CN)=48.00
| 08:1350   DT= 2.00 |   Ia      (mm)=   9.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .290

     Unit Hyd Qpeak  (cms)=     .304

     PEAK FLOW       (cms)=     .011 (i)
     TIME TO PEAK    (hrs)=    2.964
     RUNOFF VOLUME    (mm)=    2.412
     TOTAL RAINFALL   (mm)=   36.000
     RUNOFF COEFFICIENT   =     .067

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------------
-
001:0010------------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD       |   Area    (ha)=   50.58   Curve Number   (CN)=48.00
| 09:1351   DT= 2.00 |   Ia      (mm)=   9.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .780

     Unit Hyd Qpeak  (cms)=    2.477

     PEAK FLOW       (cms)=     .145 (i)
     TIME TO PEAK    (hrs)=    3.786
     RUNOFF VOLUME    (mm)=    2.413
     TOTAL RAINFALL   (mm)=   36.000
     RUNOFF COEFFICIENT   =     .067

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------------
-
001:0011------------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD       |   Area    (ha)=  225.46   Curve Number   (CN)=48.00
| 02:1352   DT= 2.00 |   Ia      (mm)=   9.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=   1.850

     Unit Hyd Qpeak  (cms)=    4.655

     PEAK FLOW       (cms)=     .367 (i)
     TIME TO PEAK    (hrs)=    5.107
```

```
     RUNOFF VOLUME    (mm)=    2.413
     TOTAL RAINFALL   (mm)=   36.000
     RUNOFF COEFFICIENT   =     .067

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------------
-
001:0012------------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD       |   Area    (ha)=   62.29   Curve Number   (CN)=49.00
| 03:1353   DT= 2.00 |   Ia      (mm)=   8.000   # of Linear Res.(N)= 3.00
---------------------   U.H. Tp(hrs)=   1.220

     Unit Hyd Qpeak  (cms)=    1.950

     PEAK FLOW       (cms)=     .152 (i)
     TIME TO PEAK    (hrs)=    4.357
     RUNOFF VOLUME    (mm)=    2.682
     TOTAL RAINFALL   (mm)=   36.000
     RUNOFF COEFFICIENT   =     .074

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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-
001:0013------------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD       |   Area    (ha)=    1.11   Curve Number   (CN)=50.00
| 04:1354   DT= 2.00 |   Ia      (mm)=   8.000   # of Linear Res.(N)= 3.00
---------------------   U.H. Tp(hrs)=    .440

     Unit Hyd Qpeak  (cms)=     .096

     PEAK FLOW       (cms)=     .005 (i)
     TIME TO PEAK    (hrs)=    3.250
     RUNOFF VOLUME    (mm)=    2.779
     TOTAL RAINFALL   (mm)=   36.000
     RUNOFF COEFFICIENT   =     .077

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------------
-
001:0014------------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD       |   Area    (ha)=   91.26   Curve Number   (CN)=47.00
| 05:1355   DT= 2.00 |   Ia      (mm)=   9.000   # of Linear Res.(N)= 3.00
---------------------   U.H. Tp(hrs)=   1.220

     Unit Hyd Qpeak  (cms)=    2.857

     PEAK FLOW       (cms)=     .192 (i)
     TIME TO PEAK    (hrs)=    4.393
     RUNOFF VOLUME    (mm)=    2.326
     TOTAL RAINFALL   (mm)=   36.000
     RUNOFF COEFFICIENT   =     .065

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

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001:0015------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD       |   Area    (ha)=    8.93   Curve Number   (CN)=47.00
| 06:1356   DT= 2.00 |   Ia      (mm)=   9.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .480

     Unit Hyd Qpeak  (cms)=     .711

     PEAK FLOW       (cms)=     .032 (i)
     TIME TO PEAK    (hrs)=    3.357
     RUNOFF VOLUME    (mm)=    2.326
     TOTAL RAINFALL   (mm)=   36.000
     RUNOFF COEFFICIENT   =     .065

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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-
001:0016------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD       |   Area    (ha)= 1617.80   Curve Number   (CN)=52.00
| 07:N3     DT= 2.00 |   Ia      (mm)=   9.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=   1.940

     Unit Hyd Qpeak  (cms)=   31.852

     PEAK FLOW       (cms)=    2.939 (i)
     TIME TO PEAK    (hrs)=    5.179
     RUNOFF VOLUME    (mm)=    2.788
     TOTAL RAINFALL   (mm)=   36.000
     RUNOFF COEFFICIENT   =     .077

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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-
001:0017------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD       |   Area    (ha)=    1.88   Curve Number   (CN)=50.00
| 08:N2     DT= 2.00 |   Ia      (mm)=   8.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .240

     Unit Hyd Qpeak  (cms)=     .299

     PEAK FLOW       (cms)=     .012 (i)
     TIME TO PEAK    (hrs)=    2.893
     RUNOFF VOLUME    (mm)=    2.780
     TOTAL RAINFALL   (mm)=   36.000
     RUNOFF COEFFICIENT   =     .077

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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-
001:0018------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD       |   Area    (ha)=   15.05   Curve Number   (CN)=49.00
```

```
| 09:N1     DT= 2.00 |   Ia      (mm)=   8.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .410

     Unit Hyd Qpeak  (cms)=    1.402

     PEAK FLOW       (cms)=     .067 (i)
     TIME TO PEAK    (hrs)=    3.179
     RUNOFF VOLUME    (mm)=    2.682
     TOTAL RAINFALL   (mm)=   36.000
     RUNOFF COEFFICIENT   =     .074

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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-
001:0019----------------------------------------------------------------------------
-
  ** END OF RUN :   1

*******************************************************************************




--------------------
| START             |  Project  dir.: W:\019424~1\6-HOUR~2\

--------------------  Rainfall dir.: W:\019424~1\6-HOUR~2\

    TZERO =   .00 hrs on        0
    METOUT=   2 (output = METRIC)
    NRUN  = 002
    NSTORM=   1
           #  1=5AES6.stm
------------------------------------------------------------------------------------
-
002:0002----------------------------------------------------------------------------
-
*#******************************************************************************
*#  Project Name: [Gore Road Improvements]    Project Number: [MTB019424]
*#  Date        : 11/7/2011 3:04:16 PM
*#  Modeller    : [Chris Proctor]
*#  Company     : R.J. Burnside & Associates Ltd.
*#  License #   :  3877524
*#******************************************************************************
------------------------------------------------------------------------------------
-
002:0002----------------------------------------------------------------------------
-
--------------------
| READ STORM        |    Filename: 5-Year AES Storm Distribution (6-hour) C
| Ptotal=  47.81 mm|    Comments: 5-Year AES Storm Distribution (6-hour) C
--------------------
              TIME    RAIN |   TIME    RAIN |   TIME    RAIN |   TIME    RAIN
               hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr
               .25    .000 |   2.00  16.250 |   3.75   6.690 |   5.50    .960
               .50    .960 |   2.25  16.250 |   4.00   3.820 |   5.75    .960
               .75    .960 |   2.50  43.980 |   4.25   3.820 |   6.00    .960
              1.00    .960 |   2.75  43.980 |   4.50   1.910 |   6.25    .960
              1.25    .960 |   3.00  12.430 |   4.75   1.910 |
              1.50   5.740 |   3.25  12.430 |   5.00    .960 |
              1.75   5.740 |   3.50   6.690 |   5.25    .960 |
```

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002:0003------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD       |   Area    (ha)=    2.62   Curve Number   (CN)=50.00
| 02:1344   DT= 2.00 |   Ia      (mm)=   8.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .440

     Unit Hyd Qpeak  (cms)=     .227

     PEAK FLOW       (cms)=     .023 (i)
     TIME TO PEAK    (hrs)=    3.179
     RUNOFF VOLUME    (mm)=    5.394
     TOTAL RAINFALL   (mm)=   47.810
     RUNOFF COEFFICIENT   =     .113

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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-
002:0004------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD       |   Area    (ha)=   27.07   Curve Number   (CN)=45.00
| 03:1345   DT= 2.00 |   Ia      (mm)=  10.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .570

     Unit Hyd Qpeak  (cms)=    1.814

     PEAK FLOW       (cms)=     .159 (i)
     TIME TO PEAK    (hrs)=    3.429
     RUNOFF VOLUME    (mm)=    4.105
     TOTAL RAINFALL   (mm)=   47.810
     RUNOFF COEFFICIENT   =     .086

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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-
002:0005------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD       |   Area    (ha)=   19.25   Curve Number   (CN)=49.00
| 04:1346   DT= 2.00 |   Ia      (mm)=   8.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .590

     Unit Hyd Qpeak  (cms)=    1.246

     PEAK FLOW       (cms)=     .142 (i)
     TIME TO PEAK    (hrs)=    3.429
     RUNOFF VOLUME    (mm)=    5.210
     TOTAL RAINFALL   (mm)=   47.810
     RUNOFF COEFFICIENT   =     .109

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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002:0006------------------------------------------------------------------------
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| CALIB NASHYD        |   Area    (ha)=   24.47   Curve Number   (CN)=47.00
| 05:1347   DT= 2.00 |   Ia      (mm)=   9.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .510

     Unit Hyd Qpeak  (cms)=    1.833

     PEAK FLOW       (cms)=     .173 (i)
     TIME TO PEAK    (hrs)=    3.321
     RUNOFF VOLUME    (mm)=    4.631
     TOTAL RAINFALL   (mm)=   47.810
     RUNOFF COEFFICIENT   =     .097

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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-
002:0007-----------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD        |   Area    (ha)=    8.95   Curve Number   (CN)=50.00
| 06:1348   DT= 2.00 |   Ia      (mm)=   8.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .380

     Unit Hyd Qpeak  (cms)=     .900

     PEAK FLOW       (cms)=     .086 (i)
     TIME TO PEAK    (hrs)=    3.071
     RUNOFF VOLUME    (mm)=    5.394
     TOTAL RAINFALL   (mm)=   47.810
     RUNOFF COEFFICIENT   =     .113

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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-
002:0008-----------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD        |   Area    (ha)=    3.71   Curve Number   (CN)=50.00
| 07:1349   DT= 2.00 |   Ia      (mm)=   8.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .270

     Unit Hyd Qpeak  (cms)=     .525

     PEAK FLOW       (cms)=     .043 (i)
     TIME TO PEAK    (hrs)=    2.929
     RUNOFF VOLUME    (mm)=    5.394
     TOTAL RAINFALL   (mm)=   47.810
     RUNOFF COEFFICIENT   =     .113

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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-
002:0009-----------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD        |   Area    (ha)=    2.31   Curve Number   (CN)=48.00
| 08:1350   DT= 2.00 |   Ia      (mm)=   9.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .290

     Unit Hyd Qpeak  (cms)=     .304
```

```
     PEAK FLOW       (cms)=     .023 (i)
     TIME TO PEAK    (hrs)=    2.964
     RUNOFF VOLUME    (mm)=    4.797
     TOTAL RAINFALL   (mm)=   47.810
     RUNOFF COEFFICIENT   =     .100

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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002:0010----------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD       |   Area    (ha)=   50.58   Curve Number   (CN)=48.00
| 09:1351   DT= 2.00 |   Ia      (mm)=   9.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .780

     Unit Hyd Qpeak  (cms)=    2.477

     PEAK FLOW       (cms)=     .292 (i)
     TIME TO PEAK    (hrs)=    3.714
     RUNOFF VOLUME    (mm)=    4.797
     TOTAL RAINFALL   (mm)=   47.810
     RUNOFF COEFFICIENT   =     .100

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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-
002:0011----------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD       |   Area    (ha)=  225.46   Curve Number   (CN)=48.00
| 02:1352   DT= 2.00 |   Ia      (mm)=   9.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=   1.850

     Unit Hyd Qpeak  (cms)=    4.655

     PEAK FLOW       (cms)=     .734 (i)
     TIME TO PEAK    (hrs)=    5.036
     RUNOFF VOLUME    (mm)=    4.797
     TOTAL RAINFALL   (mm)=   47.810
     RUNOFF COEFFICIENT   =     .100

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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-
002:0012----------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD       |   Area    (ha)=   62.29   Curve Number   (CN)=49.00
| 03:1353   DT= 2.00 |   Ia      (mm)=   8.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=   1.220

     Unit Hyd Qpeak  (cms)=    1.950

     PEAK FLOW       (cms)=     .297 (i)
     TIME TO PEAK    (hrs)=    4.286
     RUNOFF VOLUME    (mm)=    5.210
     TOTAL RAINFALL   (mm)=   47.810
     RUNOFF COEFFICIENT   =     .109
```

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     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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002:0013-------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD       |   Area    (ha)=    1.11   Curve Number   (CN)=50.00
| 04:1354   DT= 2.00 |   Ia      (mm)=   8.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .440

     Unit Hyd Qpeak  (cms)=     .096

     PEAK FLOW       (cms)=     .010 (i)
     TIME TO PEAK    (hrs)=    3.179
     RUNOFF VOLUME    (mm)=    5.393
     TOTAL RAINFALL   (mm)=   47.810
     RUNOFF COEFFICIENT   =     .113

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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-
002:0014-------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD       |   Area    (ha)=   91.26   Curve Number   (CN)=47.00
| 05:1355   DT= 2.00 |   Ia      (mm)=   9.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=   1.220

     Unit Hyd Qpeak  (cms)=    2.857

     PEAK FLOW       (cms)=     .386 (i)
     TIME TO PEAK    (hrs)=    4.321
     RUNOFF VOLUME    (mm)=    4.631
     TOTAL RAINFALL   (mm)=   47.810
     RUNOFF COEFFICIENT   =     .097

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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-
002:0015-------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD       |   Area    (ha)=    8.93   Curve Number   (CN)=47.00
| 06:1356   DT= 2.00 |   Ia      (mm)=   9.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .480

     Unit Hyd Qpeak  (cms)=     .711

     PEAK FLOW       (cms)=     .065 (i)
     TIME TO PEAK    (hrs)=    3.286
     RUNOFF VOLUME    (mm)=    4.631
     TOTAL RAINFALL   (mm)=   47.810
     RUNOFF COEFFICIENT   =     .097

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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-
002:0016-------------------------------------------------------------------------
-
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----------------------
| CALIB NASHYD       |   Area    (ha)= 1617.80   Curve Number   (CN)=52.00
| 07:N3     DT= 2.00 |   Ia      (mm)=   9.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=   1.940

     Unit Hyd Qpeak  (cms)=   31.852

     PEAK FLOW       (cms)=    5.840 (i)
     TIME TO PEAK    (hrs)=    5.107
     RUNOFF VOLUME    (mm)=    5.512
     TOTAL RAINFALL   (mm)=   47.810
     RUNOFF COEFFICIENT   =     .115

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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002:0017--------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD       |   Area    (ha)=    1.88   Curve Number   (CN)=50.00
| 08:N2     DT= 2.00 |   Ia      (mm)=   8.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .240

     Unit Hyd Qpeak  (cms)=     .299

     PEAK FLOW       (cms)=     .023 (i)
     TIME TO PEAK    (hrs)=    2.893
     RUNOFF VOLUME    (mm)=    5.394
     TOTAL RAINFALL   (mm)=   47.810
     RUNOFF COEFFICIENT   =     .113

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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-
002:0018--------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD       |   Area    (ha)=   15.05   Curve Number   (CN)=49.00
| 09:N1     DT= 2.00 |   Ia      (mm)=   8.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .410

     Unit Hyd Qpeak  (cms)=    1.402

     PEAK FLOW       (cms)=     .134 (i)
     TIME TO PEAK    (hrs)=    3.143
     RUNOFF VOLUME    (mm)=    5.210
     TOTAL RAINFALL   (mm)=   47.810
     RUNOFF COEFFICIENT   =     .109

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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002:0019--------------------------------------------------------------------------
-
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-
002:0002--------------------------------------------------------------------------
-
  ** END OF RUN :   2
```

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********************************************************************************




--------------------
| START            |  Project  dir.: W:\019424~1\6-HOUR~2\

--------------------  Rainfall dir.: W:\019424~1\6-HOUR~2\

    TZERO =   .00 hrs on        0
    METOUT=   2 (output = METRIC)
    NRUN  = 003
    NSTORM=   1
           #  1=10AES6.stm
--------------------------------------------------------------------------------
-
003:0002------------------------------------------------------------------------
-
*#*****************************************************************************
*#  Project Name: [Gore Road Improvements]    Project Number: [MTB019424]
*#  Date        : 11/7/2011 3:04:16 PM
*#  Modeller    : [Chris Proctor]
*#  Company     : R.J. Burnside & Associates Ltd.
*#  License #   :  3877524
*#*****************************************************************************
--------------------------------------------------------------------------------
-
003:0002------------------------------------------------------------------------
-
--------------------
| READ STORM       |    Filename: 10-Year AES Storm Distribution (6-hour)
| Ptotal=  55.69 mm|    Comments: 10-Year AES Storm Distribution (6-hour)
--------------------
              TIME    RAIN |   TIME    RAIN |   TIME    RAIN |   TIME    RAIN
               hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr
               .25    .000 |   2.00  18.940 |   3.75   7.800 |   5.50   1.110
               .50   1.110 |   2.25  18.940 |   4.00   4.460 |   5.75   1.110
               .75   1.110 |   2.50  51.240 |   4.25   4.460 |   6.00   1.110
              1.00   1.110 |   2.75  51.240 |   4.50   2.230 |   6.25   1.110
              1.25   1.110 |   3.00  14.480 |   4.75   2.230 |
              1.50   6.680 |   3.25  14.480 |   5.00   1.110 |
              1.75   6.680 |   3.50   7.800 |   5.25   1.110 |

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003:0003------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD       |   Area    (ha)=    2.62   Curve Number   (CN)=50.00
| 02:1344   DT= 2.00 |   Ia      (mm)=   8.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .440

     Unit Hyd Qpeak  (cms)=     .227

     PEAK FLOW       (cms)=     .033 (i)
     TIME TO PEAK    (hrs)=    3.179
     RUNOFF VOLUME    (mm)=    7.538
     TOTAL RAINFALL   (mm)=   55.690
     RUNOFF COEFFICIENT   =     .135

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
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003:0004------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD       |   Area    (ha)=   27.07   Curve Number   (CN)=45.00
| 03:1345   DT= 2.00 |   Ia      (mm)=  10.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .570

     Unit Hyd Qpeak  (cms)=    1.814

     PEAK FLOW       (cms)=     .229 (i)
     TIME TO PEAK    (hrs)=    3.393
     RUNOFF VOLUME    (mm)=    5.862
     TOTAL RAINFALL   (mm)=   55.690
     RUNOFF COEFFICIENT   =     .105

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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-
003:0005------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD       |   Area    (ha)=   19.25   Curve Number   (CN)=49.00
| 04:1346   DT= 2.00 |   Ia      (mm)=   8.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .590

     Unit Hyd Qpeak  (cms)=    1.246

     PEAK FLOW       (cms)=     .201 (i)
     TIME TO PEAK    (hrs)=    3.393
     RUNOFF VOLUME    (mm)=    7.288
     TOTAL RAINFALL   (mm)=   55.690
     RUNOFF COEFFICIENT   =     .131

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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003:0006------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD       |   Area    (ha)=   24.47   Curve Number   (CN)=47.00
| 05:1347   DT= 2.00 |   Ia      (mm)=   9.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .510

     Unit Hyd Qpeak  (cms)=    1.833

     PEAK FLOW       (cms)=     .246 (i)
     TIME TO PEAK    (hrs)=    3.321
     RUNOFF VOLUME    (mm)=    6.544
     TOTAL RAINFALL   (mm)=   55.690
     RUNOFF COEFFICIENT   =     .118

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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003:0007------------------------------------------------------------------------
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| CALIB NASHYD        |   Area    (ha)=    8.95   Curve Number   (CN)=50.00
| 06:1348   DT= 2.00 |   Ia      (mm)=   8.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .380

     Unit Hyd Qpeak  (cms)=     .900

     PEAK FLOW       (cms)=     .122 (i)
     TIME TO PEAK    (hrs)=    3.071
     RUNOFF VOLUME    (mm)=    7.539
     TOTAL RAINFALL   (mm)=   55.690
     RUNOFF COEFFICIENT   =     .135

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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003:0008---------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD        |   Area    (ha)=    3.71   Curve Number   (CN)=50.00
| 07:1349   DT= 2.00 |   Ia      (mm)=   8.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .270

     Unit Hyd Qpeak  (cms)=     .525

     PEAK FLOW       (cms)=     .061 (i)
     TIME TO PEAK    (hrs)=    2.929
     RUNOFF VOLUME    (mm)=    7.539
     TOTAL RAINFALL   (mm)=   55.690
     RUNOFF COEFFICIENT   =     .135

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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003:0009---------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD        |   Area    (ha)=    2.31   Curve Number   (CN)=48.00
| 08:1350   DT= 2.00 |   Ia      (mm)=   9.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .290

     Unit Hyd Qpeak  (cms)=     .304

     PEAK FLOW       (cms)=     .033 (i)
     TIME TO PEAK    (hrs)=    2.929
     RUNOFF VOLUME    (mm)=    6.773
     TOTAL RAINFALL   (mm)=   55.690
     RUNOFF COEFFICIENT   =     .122

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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003:0010---------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD        |   Area    (ha)=   50.58   Curve Number   (CN)=48.00
| 09:1351   DT= 2.00 |   Ia      (mm)=   9.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .780

     Unit Hyd Qpeak  (cms)=    2.477
```

```
     PEAK FLOW       (cms)=     .415 (i)
     TIME TO PEAK    (hrs)=    3.679
     RUNOFF VOLUME    (mm)=    6.773
     TOTAL RAINFALL   (mm)=   55.690
     RUNOFF COEFFICIENT   =     .122

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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003:0011----------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD       |   Area    (ha)=  225.46   Curve Number   (CN)=48.00
| 02:1352   DT= 2.00 |   Ia      (mm)=   9.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=   1.850

     Unit Hyd Qpeak  (cms)=    4.655

     PEAK FLOW       (cms)=    1.040 (i)
     TIME TO PEAK    (hrs)=    5.000
     RUNOFF VOLUME    (mm)=    6.773
     TOTAL RAINFALL   (mm)=   55.690
     RUNOFF COEFFICIENT   =     .122

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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003:0012----------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD       |   Area    (ha)=   62.29   Curve Number   (CN)=49.00
| 03:1353   DT= 2.00 |   Ia      (mm)=   8.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=   1.220

     Unit Hyd Qpeak  (cms)=    1.950

     PEAK FLOW       (cms)=     .417 (i)
     TIME TO PEAK    (hrs)=    4.250
     RUNOFF VOLUME    (mm)=    7.288
     TOTAL RAINFALL   (mm)=   55.690
     RUNOFF COEFFICIENT   =     .131

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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003:0013----------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD       |   Area    (ha)=    1.11   Curve Number   (CN)=50.00
| 04:1354   DT= 2.00 |   Ia      (mm)=   8.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .440

     Unit Hyd Qpeak  (cms)=     .096

     PEAK FLOW       (cms)=     .014 (i)
     TIME TO PEAK    (hrs)=    3.179
     RUNOFF VOLUME    (mm)=    7.538
     TOTAL RAINFALL   (mm)=   55.690
     RUNOFF COEFFICIENT   =     .135
```

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     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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003:0014------------------------------------------------------------------------
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----------------------
| CALIB NASHYD       |   Area    (ha)=   91.26   Curve Number   (CN)=47.00
| 05:1355   DT= 2.00 |   Ia      (mm)=   9.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=   1.220

     Unit Hyd Qpeak  (cms)=    2.857

     PEAK FLOW       (cms)=     .547 (i)
     TIME TO PEAK    (hrs)=    4.286
     RUNOFF VOLUME    (mm)=    6.544
     TOTAL RAINFALL   (mm)=   55.690
     RUNOFF COEFFICIENT   =     .118

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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003:0015------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD       |   Area    (ha)=    8.93   Curve Number   (CN)=47.00
| 06:1356   DT= 2.00 |   Ia      (mm)=   9.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .480

     Unit Hyd Qpeak  (cms)=     .711

     PEAK FLOW       (cms)=     .093 (i)
     TIME TO PEAK    (hrs)=    3.250
     RUNOFF VOLUME    (mm)=    6.544
     TOTAL RAINFALL   (mm)=   55.690
     RUNOFF COEFFICIENT   =     .118

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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003:0016------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD       |   Area    (ha)= 1617.80   Curve Number   (CN)=52.00
| 07:N3     DT= 2.00 |   Ia      (mm)=   9.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=   1.940

     Unit Hyd Qpeak  (cms)=   31.852

     PEAK FLOW       (cms)=    8.239 (i)
     TIME TO PEAK    (hrs)=    5.107
     RUNOFF VOLUME    (mm)=    7.754
     TOTAL RAINFALL   (mm)=   55.690
     RUNOFF COEFFICIENT   =     .139

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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003:0017------------------------------------------------------------------------
-
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----------------------
| CALIB NASHYD       |   Area    (ha)=    1.88   Curve Number   (CN)=50.00
| 08:N2     DT= 2.00 |   Ia      (mm)=   8.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .240

     Unit Hyd Qpeak  (cms)=     .299

     PEAK FLOW       (cms)=     .033 (i)
     TIME TO PEAK    (hrs)=    2.893
     RUNOFF VOLUME    (mm)=    7.538
     TOTAL RAINFALL   (mm)=   55.690
     RUNOFF COEFFICIENT   =     .135

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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003:0018--------------------------------------------------------------------------
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----------------------
| CALIB NASHYD       |   Area    (ha)=   15.05   Curve Number   (CN)=49.00
| 09:N1     DT= 2.00 |   Ia      (mm)=   8.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .410

     Unit Hyd Qpeak  (cms)=    1.402

     PEAK FLOW       (cms)=     .190 (i)
     TIME TO PEAK    (hrs)=    3.107
     RUNOFF VOLUME    (mm)=    7.288
     TOTAL RAINFALL   (mm)=   55.690
     RUNOFF COEFFICIENT   =     .131

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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003:0019--------------------------------------------------------------------------
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003:0002--------------------------------------------------------------------------
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003:0002--------------------------------------------------------------------------
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  ** END OF RUN :   3

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--------------------
| START            |  Project  dir.: W:\019424~1\6-HOUR~2\

--------------------  Rainfall dir.: W:\019424~1\6-HOUR~2\

    TZERO =   .00 hrs on        0
    METOUT=   2 (output = METRIC)
    NRUN  = 004
    NSTORM=   1
```

```
          #  1=25AES6.stm
-------------------------------------------------------------------------------------
-
004:0002-----------------------------------------------------------------------------
-
*#*******************************************************************************
*#  Project Name: [Gore Road Improvements]    Project Number: [MTB019424]
*#  Date        : 11/7/2011 3:04:16 PM
*#  Modeller    : [Chris Proctor]
*#  Company     : R.J. Burnside & Associates Ltd.
*#  License #   :  3877524
*#*******************************************************************************
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004:0002-----------------------------------------------------------------------------
-
--------------------
| READ STORM       |    Filename: 25-Year AES Storm Distribution (6-hour)
| Ptotal=  65.59 mm|    Comments: 25-Year AES Storm Distribution (6-hour)
--------------------
              TIME    RAIN |   TIME    RAIN |   TIME    RAIN |   TIME    RAIN
               hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr
               .25    .000 |   2.00  22.300 |   3.75   9.180 |   5.50   1.310
               .50   1.310 |   2.25  22.300 |   4.00   5.250 |   5.75   1.310
               .75   1.310 |   2.50  60.350 |   4.25   5.250 |   6.00   1.310
              1.00   1.310 |   2.75  60.350 |   4.50   2.620 |   6.25   1.310
              1.25   1.310 |   3.00  17.060 |   4.75   2.620 |
              1.50   7.870 |   3.25  17.060 |   5.00   1.310 |
              1.75   7.870 |   3.50   9.180 |   5.25   1.310 |

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004:0003-----------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD       |   Area    (ha)=    2.62   Curve Number   (CN)=50.00
| 02:1344   DT= 2.00 |   Ia      (mm)=   8.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .440

     Unit Hyd Qpeak  (cms)=     .227

     PEAK FLOW       (cms)=     .047 (i)
     TIME TO PEAK    (hrs)=    3.143
     RUNOFF VOLUME    (mm)=   10.644
     TOTAL RAINFALL   (mm)=   65.590
     RUNOFF COEFFICIENT   =     .162

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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004:0004-----------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD       |   Area    (ha)=   27.07   Curve Number   (CN)=45.00
| 03:1345   DT= 2.00 |   Ia      (mm)=  10.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .570

     Unit Hyd Qpeak  (cms)=    1.814

     PEAK FLOW       (cms)=     .333 (i)
     TIME TO PEAK    (hrs)=    3.393
     RUNOFF VOLUME    (mm)=    8.443
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     TOTAL RAINFALL   (mm)=   65.590
     RUNOFF COEFFICIENT   =     .129

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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004:0005------------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD       |   Area    (ha)=   19.25   Curve Number   (CN)=49.00
| 04:1346   DT= 2.00 |   Ia      (mm)=   8.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .590

     Unit Hyd Qpeak  (cms)=    1.246

     PEAK FLOW       (cms)=     .286 (i)
     TIME TO PEAK    (hrs)=    3.393
     RUNOFF VOLUME    (mm)=   10.301
     TOTAL RAINFALL   (mm)=   65.590
     RUNOFF COEFFICIENT   =     .157

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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004:0006------------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD       |   Area    (ha)=   24.47   Curve Number   (CN)=47.00
| 05:1347   DT= 2.00 |   Ia      (mm)=   9.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .510

     Unit Hyd Qpeak  (cms)=    1.833

     PEAK FLOW       (cms)=     .355 (i)
     TIME TO PEAK    (hrs)=    3.286
     RUNOFF VOLUME    (mm)=    9.336
     TOTAL RAINFALL   (mm)=   65.590
     RUNOFF COEFFICIENT   =     .142

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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004:0007------------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD       |   Area    (ha)=    8.95   Curve Number   (CN)=50.00
| 06:1348   DT= 2.00 |   Ia      (mm)=   8.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .380

     Unit Hyd Qpeak  (cms)=     .900

     PEAK FLOW       (cms)=     .174 (i)
     TIME TO PEAK    (hrs)=    3.036
     RUNOFF VOLUME    (mm)=   10.644
     TOTAL RAINFALL   (mm)=   65.590
     RUNOFF COEFFICIENT   =     .162

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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004:0008------------------------------------------------------------------------------
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----------------------
| CALIB NASHYD       |   Area    (ha)=    3.71   Curve Number   (CN)=50.00
| 07:1349   DT= 2.00 |   Ia      (mm)=   8.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .270

     Unit Hyd Qpeak  (cms)=     .525

     PEAK FLOW       (cms)=     .087 (i)
     TIME TO PEAK    (hrs)=    2.893
     RUNOFF VOLUME    (mm)=   10.644
     TOTAL RAINFALL   (mm)=   65.590
     RUNOFF COEFFICIENT   =     .162

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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004:0009------------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD       |   Area    (ha)=    2.31   Curve Number   (CN)=48.00
| 08:1350   DT= 2.00 |   Ia      (mm)=   9.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .290

     Unit Hyd Qpeak  (cms)=     .304

     PEAK FLOW       (cms)=     .047 (i)
     TIME TO PEAK    (hrs)=    2.929
     RUNOFF VOLUME    (mm)=    9.653
     TOTAL RAINFALL   (mm)=   65.590
     RUNOFF COEFFICIENT   =     .147

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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004:0010------------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD       |   Area    (ha)=   50.58   Curve Number   (CN)=48.00
| 09:1351   DT= 2.00 |   Ia      (mm)=   9.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .780

     Unit Hyd Qpeak  (cms)=    2.477

     PEAK FLOW       (cms)=     .596 (i)
     TIME TO PEAK    (hrs)=    3.679
     RUNOFF VOLUME    (mm)=    9.653
     TOTAL RAINFALL   (mm)=   65.590
     RUNOFF COEFFICIENT   =     .147

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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-
004:0011------------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD       |   Area    (ha)=  225.46   Curve Number   (CN)=48.00
| 02:1352   DT= 2.00 |   Ia      (mm)=   9.000   # of Linear Res.(N)= 3.00
```

```
----------------------  U.H. Tp(hrs)=   1.850

     Unit Hyd Qpeak  (cms)=    4.655

     PEAK FLOW       (cms)=    1.485 (i)
     TIME TO PEAK    (hrs)=    4.964
     RUNOFF VOLUME    (mm)=    9.653
     TOTAL RAINFALL   (mm)=   65.590
     RUNOFF COEFFICIENT   =     .147

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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004:0012----------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD       |   Area    (ha)=   62.29   Curve Number   (CN)=49.00
| 03:1353   DT= 2.00 |   Ia      (mm)=   8.000   # of Linear Res.(N)= 3.00
----------------------  U.H. Tp(hrs)=   1.220

     Unit Hyd Qpeak  (cms)=    1.950

     PEAK FLOW       (cms)=     .591 (i)
     TIME TO PEAK    (hrs)=    4.250
     RUNOFF VOLUME    (mm)=   10.301
     TOTAL RAINFALL   (mm)=   65.590
     RUNOFF COEFFICIENT   =     .157

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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004:0013----------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD       |   Area    (ha)=    1.11   Curve Number   (CN)=50.00
| 04:1354   DT= 2.00 |   Ia      (mm)=   8.000   # of Linear Res.(N)= 3.00
----------------------  U.H. Tp(hrs)=    .440

     Unit Hyd Qpeak  (cms)=     .096

     PEAK FLOW       (cms)=     .020 (i)
     TIME TO PEAK    (hrs)=    3.143
     RUNOFF VOLUME    (mm)=   10.644
     TOTAL RAINFALL   (mm)=   65.590
     RUNOFF COEFFICIENT   =     .162

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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004:0014----------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD       |   Area    (ha)=   91.26   Curve Number   (CN)=47.00
| 05:1355   DT= 2.00 |   Ia      (mm)=   9.000   # of Linear Res.(N)= 3.00
----------------------  U.H. Tp(hrs)=   1.220

     Unit Hyd Qpeak  (cms)=    2.857

     PEAK FLOW       (cms)=     .784 (i)
     TIME TO PEAK    (hrs)=    4.250
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```
     RUNOFF VOLUME    (mm)=    9.336
     TOTAL RAINFALL   (mm)=   65.590
     RUNOFF COEFFICIENT   =     .142

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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004:0015------------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD        |   Area    (ha)=    8.93   Curve Number   (CN)=47.00
| 06:1356   DT= 2.00 |   Ia      (mm)=   9.000   # of Linear Res.(N)= 3.00
---------------------   U.H. Tp(hrs)=    .480

     Unit Hyd Qpeak  (cms)=     .711

     PEAK FLOW       (cms)=     .133 (i)
     TIME TO PEAK    (hrs)=    3.250
     RUNOFF VOLUME    (mm)=    9.336
     TOTAL RAINFALL   (mm)=   65.590
     RUNOFF COEFFICIENT   =     .142

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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004:0016------------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD        |   Area    (ha)= 1617.80   Curve Number   (CN)=52.00
| 07:N3     DT= 2.00 |   Ia      (mm)=   9.000   # of Linear Res.(N)= 3.00
---------------------   U.H. Tp(hrs)=   1.940

     Unit Hyd Qpeak  (cms)=   31.852

     PEAK FLOW       (cms)=   11.718 (i)
     TIME TO PEAK    (hrs)=    5.071
     RUNOFF VOLUME    (mm)=   11.003
     TOTAL RAINFALL   (mm)=   65.590
     RUNOFF COEFFICIENT   =     .168

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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004:0017------------------------------------------------------------------------------
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----------------------
| CALIB NASHYD        |   Area    (ha)=    1.88   Curve Number   (CN)=50.00
| 08:N2     DT= 2.00 |   Ia      (mm)=   8.000   # of Linear Res.(N)= 3.00
---------------------   U.H. Tp(hrs)=    .240

     Unit Hyd Qpeak  (cms)=     .299

     PEAK FLOW       (cms)=     .047 (i)
     TIME TO PEAK    (hrs)=    2.857
     RUNOFF VOLUME    (mm)=   10.644
     TOTAL RAINFALL   (mm)=   65.590
     RUNOFF COEFFICIENT   =     .162

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
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004:0018--------------------------------------------------------------------------
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----------------------
| CALIB NASHYD       |   Area    (ha)=   15.05   Curve Number   (CN)=49.00
| 09:N1     DT= 2.00 |   Ia      (mm)=   8.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .410

     Unit Hyd Qpeak  (cms)=    1.402

     PEAK FLOW       (cms)=     .272 (i)
     TIME TO PEAK    (hrs)=    3.107
     RUNOFF VOLUME    (mm)=   10.301
     TOTAL RAINFALL   (mm)=   65.590
     RUNOFF COEFFICIENT   =     .157

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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004:0019--------------------------------------------------------------------------
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004:0002--------------------------------------------------------------------------
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004:0002--------------------------------------------------------------------------
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004:0002--------------------------------------------------------------------------
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  ** END OF RUN :   4

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--------------------
| START            |  Project  dir.: W:\019424~1\6-HOUR~2\

--------------------  Rainfall dir.: W:\019424~1\6-HOUR~2\

    TZERO =   .00 hrs on        0
    METOUT=   2 (output = METRIC)
    NRUN  = 005
    NSTORM=   1
           #  1=50AES6.stm
----------------------------------------------------------------------------------
-
005:0002--------------------------------------------------------------------------
-
*#*******************************************************************************
*#  Project Name: [Gore Road Improvements]    Project Number: [MTB019424]
*#  Date        : 11/7/2011 3:04:16 PM
*#  Modeller    : [Chris Proctor]
*#  Company     : R.J. Burnside & Associates Ltd.
*#  License #   :  3877524
```

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*#******************************************************************************
--------------------------------------------------------------------------------
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005:0002------------------------------------------------------------------------
-
--------------------
| READ STORM        |    Filename: 50-Year AES Storm Distribution (6-hour)
| Ptotal=  73.00 mm|    Comments: 50-Year AES Storm Distribution (6-hour)
--------------------
              TIME    RAIN |   TIME    RAIN |   TIME    RAIN |   TIME    RAIN
               hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr
               .25    .000 |   2.00  24.820 |   3.75  10.220 |   5.50   1.460
               .50   1.460 |   2.25  24.820 |   4.00   5.840 |   5.75   1.460
               .75   1.460 |   2.50  67.160 |   4.25   5.840 |   6.00   1.460
              1.00   1.460 |   2.75  67.160 |   4.50   2.920 |   6.25   1.460
              1.25   1.460 |   3.00  18.980 |   4.75   2.920 |
              1.50   8.760 |   3.25  18.980 |   5.00   1.460 |
              1.75   8.760 |   3.50  10.220 |   5.25   1.460 |

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005:0003------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD       |   Area    (ha)=    2.62   Curve Number   (CN)=50.00
| 02:1344   DT= 2.00 |   Ia      (mm)=   8.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .440

     Unit Hyd Qpeak  (cms)=     .227

     PEAK FLOW       (cms)=     .059 (i)
     TIME TO PEAK    (hrs)=    3.143
     RUNOFF VOLUME    (mm)=   13.244
     TOTAL RAINFALL   (mm)=   73.000
     RUNOFF COEFFICIENT   =     .181

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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005:0004------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD       |   Area    (ha)=   27.07   Curve Number   (CN)=45.00
| 03:1345   DT= 2.00 |   Ia      (mm)=  10.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .570

     Unit Hyd Qpeak  (cms)=    1.814

     PEAK FLOW       (cms)=     .421 (i)
     TIME TO PEAK    (hrs)=    3.357
     RUNOFF VOLUME    (mm)=   10.628
     TOTAL RAINFALL   (mm)=   73.000
     RUNOFF COEFFICIENT   =     .146

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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005:0005------------------------------------------------------------------------
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----------------------
| CALIB NASHYD       |   Area    (ha)=   19.25   Curve Number   (CN)=49.00
```

```
| 04:1346   DT= 2.00 |   Ia      (mm)=   8.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .590

     Unit Hyd Qpeak  (cms)=    1.246

     PEAK FLOW       (cms)=     .358 (i)
     TIME TO PEAK    (hrs)=    3.393
     RUNOFF VOLUME    (mm)=   12.828
     TOTAL RAINFALL   (mm)=   73.000
     RUNOFF COEFFICIENT   =     .176

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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005:0006------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD       |   Area    (ha)=   24.47   Curve Number   (CN)=47.00
| 05:1347   DT= 2.00 |   Ia      (mm)=   9.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .510

     Unit Hyd Qpeak  (cms)=    1.833

     PEAK FLOW       (cms)=     .446 (i)
     TIME TO PEAK    (hrs)=    3.286
     RUNOFF VOLUME    (mm)=   11.689
     TOTAL RAINFALL   (mm)=   73.000
     RUNOFF COEFFICIENT   =     .160

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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005:0007------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD       |   Area    (ha)=    8.95   Curve Number   (CN)=50.00
| 06:1348   DT= 2.00 |   Ia      (mm)=   8.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .380

     Unit Hyd Qpeak  (cms)=     .900

     PEAK FLOW       (cms)=     .218 (i)
     TIME TO PEAK    (hrs)=    3.036
     RUNOFF VOLUME    (mm)=   13.244
     TOTAL RAINFALL   (mm)=   73.000
     RUNOFF COEFFICIENT   =     .181

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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005:0008------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD       |   Area    (ha)=    3.71   Curve Number   (CN)=50.00
| 07:1349   DT= 2.00 |   Ia      (mm)=   8.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .270

     Unit Hyd Qpeak  (cms)=     .525

     PEAK FLOW       (cms)=     .109 (i)
```

```
     TIME TO PEAK    (hrs)=    2.893
     RUNOFF VOLUME    (mm)=   13.244
     TOTAL RAINFALL   (mm)=   73.000
     RUNOFF COEFFICIENT   =     .181

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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005:0009---------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD       |   Area    (ha)=    2.31   Curve Number   (CN)=48.00
| 08:1350   DT= 2.00 |   Ia      (mm)=   9.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .290

     Unit Hyd Qpeak  (cms)=     .304

     PEAK FLOW       (cms)=     .059 (i)
     TIME TO PEAK    (hrs)=    2.929
     RUNOFF VOLUME    (mm)=   12.076
     TOTAL RAINFALL   (mm)=   73.000
     RUNOFF COEFFICIENT   =     .165

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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005:0010---------------------------------------------------------------------------
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----------------------
| CALIB NASHYD       |   Area    (ha)=   50.58   Curve Number   (CN)=48.00
| 09:1351   DT= 2.00 |   Ia      (mm)=   9.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .780

     Unit Hyd Qpeak  (cms)=    2.477

     PEAK FLOW       (cms)=     .748 (i)
     TIME TO PEAK    (hrs)=    3.643
     RUNOFF VOLUME    (mm)=   12.077
     TOTAL RAINFALL   (mm)=   73.000
     RUNOFF COEFFICIENT   =     .165

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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005:0011---------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD       |   Area    (ha)=  225.46   Curve Number   (CN)=48.00
| 02:1352   DT= 2.00 |   Ia      (mm)=   9.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=   1.850

     Unit Hyd Qpeak  (cms)=    4.655

     PEAK FLOW       (cms)=    1.860 (i)
     TIME TO PEAK    (hrs)=    4.964
     RUNOFF VOLUME    (mm)=   12.077
     TOTAL RAINFALL   (mm)=   73.000
     RUNOFF COEFFICIENT   =     .165

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
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005:0012------------------------------------------------------------------------
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----------------------
| CALIB NASHYD       |   Area    (ha)=   62.29   Curve Number   (CN)=49.00
| 03:1353   DT= 2.00 |   Ia      (mm)=   8.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=   1.220

     Unit Hyd Qpeak  (cms)=    1.950

     PEAK FLOW       (cms)=     .738 (i)
     TIME TO PEAK    (hrs)=    4.214
     RUNOFF VOLUME    (mm)=   12.828
     TOTAL RAINFALL   (mm)=   73.000
     RUNOFF COEFFICIENT   =     .176

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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005:0013------------------------------------------------------------------------
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----------------------
| CALIB NASHYD       |   Area    (ha)=    1.11   Curve Number   (CN)=50.00
| 04:1354   DT= 2.00 |   Ia      (mm)=   8.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .440

     Unit Hyd Qpeak  (cms)=     .096

     PEAK FLOW       (cms)=     .025 (i)
     TIME TO PEAK    (hrs)=    3.143
     RUNOFF VOLUME    (mm)=   13.244
     TOTAL RAINFALL   (mm)=   73.000
     RUNOFF COEFFICIENT   =     .181

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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005:0014------------------------------------------------------------------------
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----------------------
| CALIB NASHYD       |   Area    (ha)=   91.26   Curve Number   (CN)=47.00
| 05:1355   DT= 2.00 |   Ia      (mm)=   9.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=   1.220

     Unit Hyd Qpeak  (cms)=    2.857

     PEAK FLOW       (cms)=     .983 (i)
     TIME TO PEAK    (hrs)=    4.250
     RUNOFF VOLUME    (mm)=   11.689
     TOTAL RAINFALL   (mm)=   73.000
     RUNOFF COEFFICIENT   =     .160

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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005:0015------------------------------------------------------------------------
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| CALIB NASHYD        |   Area    (ha)=    8.93   Curve Number   (CN)=47.00
| 06:1356   DT= 2.00 |   Ia      (mm)=   9.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .480

     Unit Hyd Qpeak  (cms)=     .711

     PEAK FLOW       (cms)=     .168 (i)
     TIME TO PEAK    (hrs)=    3.214
     RUNOFF VOLUME    (mm)=   11.689
     TOTAL RAINFALL   (mm)=   73.000
     RUNOFF COEFFICIENT   =     .160

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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005:0016--------------------------------------------------------------------
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----------------------
| CALIB NASHYD        |   Area    (ha)= 1617.80   Curve Number   (CN)=52.00
| 07:N3     DT= 2.00 |   Ia      (mm)=   9.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=   1.940

     Unit Hyd Qpeak  (cms)=   31.852

     PEAK FLOW       (cms)=   14.634 (i)
     TIME TO PEAK    (hrs)=    5.036
     RUNOFF VOLUME    (mm)=   13.724
     TOTAL RAINFALL   (mm)=   73.000
     RUNOFF COEFFICIENT   =     .188

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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005:0017--------------------------------------------------------------------
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----------------------
| CALIB NASHYD        |   Area    (ha)=    1.88   Curve Number   (CN)=50.00
| 08:N2     DT= 2.00 |   Ia      (mm)=   8.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .240

     Unit Hyd Qpeak  (cms)=     .299

     PEAK FLOW       (cms)=     .059 (i)
     TIME TO PEAK    (hrs)=    2.857
     RUNOFF VOLUME    (mm)=   13.244
     TOTAL RAINFALL   (mm)=   73.000
     RUNOFF COEFFICIENT   =     .181

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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005:0018--------------------------------------------------------------------
-
----------------------
| CALIB NASHYD        |   Area    (ha)=   15.05   Curve Number   (CN)=49.00
| 09:N1     DT= 2.00 |   Ia      (mm)=   8.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .410

     Unit Hyd Qpeak  (cms)=    1.402
```

```
     PEAK FLOW       (cms)=     .340 (i)
     TIME TO PEAK    (hrs)=    3.107
     RUNOFF VOLUME    (mm)=   12.828
     TOTAL RAINFALL   (mm)=   73.000
     RUNOFF COEFFICIENT   =     .176

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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005:0019------------------------------------------------------------------------
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005:0002------------------------------------------------------------------------
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005:0002------------------------------------------------------------------------
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005:0002------------------------------------------------------------------------
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005:0002------------------------------------------------------------------------
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  ** END OF RUN :   5

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| START            |  Project  dir.: W:\019424~1\6-HOUR~2\

--------------------  Rainfall dir.: W:\019424~1\6-HOUR~2\

    TZERO =   .00 hrs on        0
    METOUT=   2 (output = METRIC)
    NRUN  = 006
    NSTORM=   1
           #  1=100AES6.stm
--------------------------------------------------------------------------------
-
006:0002------------------------------------------------------------------------
-
*#******************************************************************************
*#  Project Name: [Gore Road Improvements]    Project Number: [MTB019424]
*#  Date        : 11/7/2011 3:04:16 PM
*#  Modeller    : [Chris Proctor]
*#  Company     : R.J. Burnside & Associates Ltd.
*#  License #   :  3877524
*#******************************************************************************
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006:0002------------------------------------------------------------------------
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--------------------
| READ STORM       |    Filename: 100-Year AES Storm Distribution (6-hour)
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| Ptotal=  80.31 mm|    Comments: 100-Year AES Storm Distribution (6-hour)
--------------------
              TIME    RAIN |   TIME    RAIN |   TIME    RAIN |   TIME    RAIN
               hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr
               .25    .000 |   2.00  27.300 |   3.75  11.240 |   5.50   1.610
               .50   1.610 |   2.25  27.300 |   4.00   6.420 |   5.75   1.610
               .75   1.610 |   2.50  73.880 |   4.25   6.420 |   6.00   1.610
              1.00   1.610 |   2.75  73.880 |   4.50   3.210 |   6.25   1.610
              1.25   1.610 |   3.00  20.880 |   4.75   3.210 |
              1.50   9.640 |   3.25  20.880 |   5.00   1.610 |
              1.75   9.640 |   3.50  11.240 |   5.25   1.610 |

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006:0003------------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD       |   Area    (ha)=    2.62   Curve Number   (CN)=50.00
| 02:1344   DT= 2.00 |   Ia      (mm)=   8.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .440

     Unit Hyd Qpeak  (cms)=     .227

     PEAK FLOW       (cms)=     .072 (i)
     TIME TO PEAK    (hrs)=    3.143
     RUNOFF VOLUME    (mm)=   16.024
     TOTAL RAINFALL   (mm)=   80.310
     RUNOFF COEFFICIENT   =     .200

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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006:0004------------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD       |   Area    (ha)=   27.07   Curve Number   (CN)=45.00
| 03:1345   DT= 2.00 |   Ia      (mm)=  10.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .570

     Unit Hyd Qpeak  (cms)=    1.814

     PEAK FLOW       (cms)=     .517 (i)
     TIME TO PEAK    (hrs)=    3.357
     RUNOFF VOLUME    (mm)=   12.983
     TOTAL RAINFALL   (mm)=   80.310
     RUNOFF COEFFICIENT   =     .162

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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006:0005------------------------------------------------------------------------------
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----------------------
| CALIB NASHYD       |   Area    (ha)=   19.25   Curve Number   (CN)=49.00
| 04:1346   DT= 2.00 |   Ia      (mm)=   8.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .590

     Unit Hyd Qpeak  (cms)=    1.246

     PEAK FLOW       (cms)=     .435 (i)
     TIME TO PEAK    (hrs)=    3.357
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```
     RUNOFF VOLUME    (mm)=   15.530
     TOTAL RAINFALL   (mm)=   80.310
     RUNOFF COEFFICIENT   =     .193

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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006:0006--------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD       |   Area    (ha)=   24.47   Curve Number   (CN)=47.00
| 05:1347   DT= 2.00 |   Ia      (mm)=   9.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .510

     Unit Hyd Qpeak  (cms)=    1.833

     PEAK FLOW       (cms)=     .545 (i)
     TIME TO PEAK    (hrs)=    3.250
     RUNOFF VOLUME    (mm)=   14.215
     TOTAL RAINFALL   (mm)=   80.310
     RUNOFF COEFFICIENT   =     .177

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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006:0007--------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD       |   Area    (ha)=    8.95   Curve Number   (CN)=50.00
| 06:1348   DT= 2.00 |   Ia      (mm)=   8.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .380

     Unit Hyd Qpeak  (cms)=     .900

     PEAK FLOW       (cms)=     .266 (i)
     TIME TO PEAK    (hrs)=    3.036
     RUNOFF VOLUME    (mm)=   16.024
     TOTAL RAINFALL   (mm)=   80.310
     RUNOFF COEFFICIENT   =     .200

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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006:0008--------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD       |   Area    (ha)=    3.71   Curve Number   (CN)=50.00
| 07:1349   DT= 2.00 |   Ia      (mm)=   8.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .270

     Unit Hyd Qpeak  (cms)=     .525

     PEAK FLOW       (cms)=     .133 (i)
     TIME TO PEAK    (hrs)=    2.893
     RUNOFF VOLUME    (mm)=   16.024
     TOTAL RAINFALL   (mm)=   80.310
     RUNOFF COEFFICIENT   =     .200

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
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006:0009------------------------------------------------------------------------
-
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| CALIB NASHYD       |   Area    (ha)=    2.31   Curve Number   (CN)=48.00
| 08:1350   DT= 2.00 |   Ia      (mm)=   9.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .290

     Unit Hyd Qpeak  (cms)=     .304

     PEAK FLOW       (cms)=     .073 (i)
     TIME TO PEAK    (hrs)=    2.929
     RUNOFF VOLUME    (mm)=   14.677
     TOTAL RAINFALL   (mm)=   80.310
     RUNOFF COEFFICIENT   =     .183

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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006:0010------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD       |   Area    (ha)=   50.58   Curve Number   (CN)=48.00
| 09:1351   DT= 2.00 |   Ia      (mm)=   9.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .780

     Unit Hyd Qpeak  (cms)=    2.477

     PEAK FLOW       (cms)=     .913 (i)
     TIME TO PEAK    (hrs)=    3.643
     RUNOFF VOLUME    (mm)=   14.677
     TOTAL RAINFALL   (mm)=   80.310
     RUNOFF COEFFICIENT   =     .183

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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006:0011------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD       |   Area    (ha)=  225.46   Curve Number   (CN)=48.00
| 02:1352   DT= 2.00 |   Ia      (mm)=   9.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=   1.850

     Unit Hyd Qpeak  (cms)=    4.655

     PEAK FLOW       (cms)=    2.263 (i)
     TIME TO PEAK    (hrs)=    4.929
     RUNOFF VOLUME    (mm)=   14.677
     TOTAL RAINFALL   (mm)=   80.310
     RUNOFF COEFFICIENT   =     .183

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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006:0012------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD       |   Area    (ha)=   62.29   Curve Number   (CN)=49.00
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```
| 03:1353   DT= 2.00 |   Ia      (mm)=   8.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=   1.220

     Unit Hyd Qpeak  (cms)=    1.950

     PEAK FLOW       (cms)=     .895 (i)
     TIME TO PEAK    (hrs)=    4.214
     RUNOFF VOLUME    (mm)=   15.530
     TOTAL RAINFALL   (mm)=   80.310
     RUNOFF COEFFICIENT   =     .193

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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006:0013-------------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD       |   Area    (ha)=    1.11   Curve Number   (CN)=50.00
| 04:1354   DT= 2.00 |   Ia      (mm)=   8.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .440

     Unit Hyd Qpeak  (cms)=     .096

     PEAK FLOW       (cms)=     .030 (i)
     TIME TO PEAK    (hrs)=    3.143
     RUNOFF VOLUME    (mm)=   16.023
     TOTAL RAINFALL   (mm)=   80.310
     RUNOFF COEFFICIENT   =     .200

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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006:0014-------------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD       |   Area    (ha)=   91.26   Curve Number   (CN)=47.00
| 05:1355   DT= 2.00 |   Ia      (mm)=   9.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=   1.220

     Unit Hyd Qpeak  (cms)=    2.857

     PEAK FLOW       (cms)=    1.198 (i)
     TIME TO PEAK    (hrs)=    4.214
     RUNOFF VOLUME    (mm)=   14.215
     TOTAL RAINFALL   (mm)=   80.310
     RUNOFF COEFFICIENT   =     .177

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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006:0015-------------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD       |   Area    (ha)=    8.93   Curve Number   (CN)=47.00
| 06:1356   DT= 2.00 |   Ia      (mm)=   9.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .480

     Unit Hyd Qpeak  (cms)=     .711

     PEAK FLOW       (cms)=     .205 (i)
```

```
     TIME TO PEAK    (hrs)=    3.214
     RUNOFF VOLUME    (mm)=   14.215
     TOTAL RAINFALL   (mm)=   80.310
     RUNOFF COEFFICIENT   =     .177

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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006:0016-------------------------------------------------------------------------------
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----------------------
| CALIB NASHYD       |   Area    (ha)= 1617.80   Curve Number   (CN)=52.00
| 07:N3     DT= 2.00 |   Ia      (mm)=   9.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=   1.940

     Unit Hyd Qpeak  (cms)=   31.852

     PEAK FLOW       (cms)=   17.753 (i)
     TIME TO PEAK    (hrs)=    5.036
     RUNOFF VOLUME    (mm)=   16.630
     TOTAL RAINFALL   (mm)=   80.310
     RUNOFF COEFFICIENT   =     .207

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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006:0017-------------------------------------------------------------------------------
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----------------------
| CALIB NASHYD       |   Area    (ha)=    1.88   Curve Number   (CN)=50.00
| 08:N2     DT= 2.00 |   Ia      (mm)=   8.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .240

     Unit Hyd Qpeak  (cms)=     .299

     PEAK FLOW       (cms)=     .072 (i)
     TIME TO PEAK    (hrs)=    2.857
     RUNOFF VOLUME    (mm)=   16.024
     TOTAL RAINFALL   (mm)=   80.310
     RUNOFF COEFFICIENT   =     .200

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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006:0018-------------------------------------------------------------------------------
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----------------------
| CALIB NASHYD       |   Area    (ha)=   15.05   Curve Number   (CN)=49.00
| 09:N1     DT= 2.00 |   Ia      (mm)=   8.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .410

     Unit Hyd Qpeak  (cms)=    1.402

     PEAK FLOW       (cms)=     .414 (i)
     TIME TO PEAK    (hrs)=    3.071
     RUNOFF VOLUME    (mm)=   15.530
     TOTAL RAINFALL   (mm)=   80.310
     RUNOFF COEFFICIENT   =     .193

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
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006:0019-------------------------------------------------------------------------
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006:0002-------------------------------------------------------------------------
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006:0002-------------------------------------------------------------------------
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006:0002-------------------------------------------------------------------------
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006:0002-------------------------------------------------------------------------
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006:0002-------------------------------------------------------------------------
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  ** END OF RUN :   6

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--------------------
| START            |  Project  dir.: W:\019424~1\6-HOUR~2\

--------------------  Rainfall dir.: W:\019424~1\6-HOUR~2\

    TZERO =   .00 hrs on        0
    METOUT=   2 (output = METRIC)
    NRUN  = 007
    NSTORM=   1
           #  1=Hzl12h15.stm
---------------------------------------------------------------------------------
-
007:0002-------------------------------------------------------------------------
-
*#******************************************************************************
*#  Project Name: [Gore Road Improvements]    Project Number: [MTB019424]
*#  Date        : 11/7/2011 3:04:16 PM
*#  Modeller    : [Chris Proctor]
*#  Company     : R.J. Burnside & Associates Ltd.
*#  License #   :  3877524
*#******************************************************************************
---------------------------------------------------------------------------------
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007:0002-------------------------------------------------------------------------
-
--------------------
| READ STORM       |    Filename: HURRICANE HAZEL REGIONAL STORM (12-hour)
| Ptotal= 212.00 mm|    Comments: HURRICANE HAZEL REGIONAL STORM (12-hour)
--------------------
              TIME    RAIN |   TIME    RAIN |   TIME    RAIN |   TIME    RAIN
```

hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
.25	6.000	3.25	13.000	6.25	23.000	9.25	53.000
.50	6.000	3.50	13.000	6.50	23.000	9.50	53.000
.75	6.000	3.75	13.000	6.75	23.000	9.75	53.000
1.00	6.000	4.00	13.000	7.00	23.000	10.00	53.000
1.25	4.000	4.25	17.000	7.25	13.000	10.25	38.000
1.50	4.000	4.50	17.000	7.50	13.000	10.50	38.000
1.75	4.000	4.75	17.000	7.75	13.000	10.75	38.000
2.00	4.000	5.00	17.000	8.00	13.000	11.00	38.000
2.25	6.000	5.25	13.000	8.25	13.000	11.25	13.000
2.50	6.000	5.50	13.000	8.50	13.000	11.50	13.000
2.75	6.000	5.75	13.000	8.75	13.000	11.75	13.000
3.00	6.000	6.00	13.000	9.00	13.000	12.00	13.000

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007:0003---------------------------------------------------------------------------
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| CALIB NASHYD       |   Area    (ha)=    2.62   Curve Number   (CN)=50.00
| 02:1344   DT= 2.00 |   Ia      (mm)=   8.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .440

     Unit Hyd Qpeak  (cms)=     .227

     PEAK FLOW       (cms)=     .200 (i)
     TIME TO PEAK    (hrs)=   10.286
     RUNOFF VOLUME    (mm)=   90.865
     TOTAL RAINFALL   (mm)=  212.001
     RUNOFF COEFFICIENT   =     .429

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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007:0004---------------------------------------------------------------------------
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----------------------
| CALIB NASHYD       |   Area    (ha)=   27.07   Curve Number   (CN)=45.00
| 03:1345   DT= 2.00 |   Ia      (mm)=  10.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .570

     Unit Hyd Qpeak  (cms)=    1.814

     PEAK FLOW       (cms)=    1.737 (i)
     TIME TO PEAK    (hrs)=   10.607
     RUNOFF VOLUME    (mm)=   79.627
     TOTAL RAINFALL   (mm)=  212.001
     RUNOFF COEFFICIENT   =     .376

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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007:0005---------------------------------------------------------------------------
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----------------------
| CALIB NASHYD       |   Area    (ha)=   19.25   Curve Number   (CN)=49.00
| 04:1346   DT= 2.00 |   Ia      (mm)=   8.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .590

     Unit Hyd Qpeak  (cms)=    1.246
```

```
     PEAK FLOW       (cms)=    1.348 (i)
     TIME TO PEAK    (hrs)=   10.643
     RUNOFF VOLUME    (mm)=   88.854
     TOTAL RAINFALL   (mm)=  212.001
     RUNOFF COEFFICIENT   =     .419

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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007:0006---------------------------------------------------------------------------
-
----------------------
| CALIB NASHYD       |   Area    (ha)=   24.47   Curve Number   (CN)=47.00
| 05:1347   DT= 2.00 |   Ia      (mm)=   9.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .510

     Unit Hyd Qpeak  (cms)=    1.833

     PEAK FLOW       (cms)=    1.688 (i)
     TIME TO PEAK    (hrs)=   10.429
     RUNOFF VOLUME    (mm)=   84.199
     TOTAL RAINFALL   (mm)=  212.001
     RUNOFF COEFFICIENT   =     .397

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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007:0007---------------------------------------------------------------------------
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| CALIB NASHYD       |   Area    (ha)=    8.95   Curve Number   (CN)=50.00
| 06:1348   DT= 2.00 |   Ia      (mm)=   8.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .380

     Unit Hyd Qpeak  (cms)=     .900

     PEAK FLOW       (cms)=     .706 (i)
     TIME TO PEAK    (hrs)=   10.179
     RUNOFF VOLUME    (mm)=   90.865
     TOTAL RAINFALL   (mm)=  212.001
     RUNOFF COEFFICIENT   =     .429

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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007:0008---------------------------------------------------------------------------
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| CALIB NASHYD       |   Area    (ha)=    3.71   Curve Number   (CN)=50.00
| 07:1349   DT= 2.00 |   Ia      (mm)=   8.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .270

     Unit Hyd Qpeak  (cms)=     .525

     PEAK FLOW       (cms)=     .309 (i)
     TIME TO PEAK    (hrs)=   10.071
     RUNOFF VOLUME    (mm)=   90.865
     TOTAL RAINFALL   (mm)=  212.001
     RUNOFF COEFFICIENT   =     .429
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     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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007:0009--------------------------------------------------------------------------
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| CALIB NASHYD       |   Area    (ha)=    2.31   Curve Number   (CN)=48.00
| 08:1350   DT= 2.00 |   Ia      (mm)=   9.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .290

     Unit Hyd Qpeak  (cms)=     .304

     PEAK FLOW       (cms)=     .182 (i)
     TIME TO PEAK    (hrs)=   10.071
     RUNOFF VOLUME    (mm)=   86.182
     TOTAL RAINFALL   (mm)=  212.001
     RUNOFF COEFFICIENT   =     .407

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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007:0010--------------------------------------------------------------------------
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| CALIB NASHYD       |   Area    (ha)=   50.58   Curve Number   (CN)=48.00
| 09:1351   DT= 2.00 |   Ia      (mm)=   9.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .780

     Unit Hyd Qpeak  (cms)=    2.477

     PEAK FLOW       (cms)=    3.310 (i)
     TIME TO PEAK    (hrs)=   11.107
     RUNOFF VOLUME    (mm)=   86.182
     TOTAL RAINFALL   (mm)=  212.001
     RUNOFF COEFFICIENT   =     .407

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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007:0011--------------------------------------------------------------------------
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| CALIB NASHYD       |   Area    (ha)=  225.46   Curve Number   (CN)=48.00
| 02:1352   DT= 2.00 |   Ia      (mm)=   9.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=   1.850

     Unit Hyd Qpeak  (cms)=    4.655

     PEAK FLOW       (cms)=   10.435 (i)
     TIME TO PEAK    (hrs)=   12.107
     RUNOFF VOLUME    (mm)=   86.182
     TOTAL RAINFALL   (mm)=  212.001
     RUNOFF COEFFICIENT   =     .407

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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007:0012--------------------------------------------------------------------------
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| CALIB NASHYD       |   Area    (ha)=   62.29   Curve Number   (CN)=49.00
| 03:1353   DT= 2.00 |   Ia      (mm)=   8.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=   1.220

     Unit Hyd Qpeak  (cms)=    1.950

     PEAK FLOW       (cms)=    3.605 (i)
     TIME TO PEAK    (hrs)=   11.464
     RUNOFF VOLUME    (mm)=   88.854
     TOTAL RAINFALL   (mm)=  212.001
     RUNOFF COEFFICIENT   =     .419

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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007:0013------------------------------------------------------------------------
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| CALIB NASHYD       |   Area    (ha)=    1.11   Curve Number   (CN)=50.00
| 04:1354   DT= 2.00 |   Ia      (mm)=   8.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .440

     Unit Hyd Qpeak  (cms)=     .096

     PEAK FLOW       (cms)=     .085 (i)
     TIME TO PEAK    (hrs)=   10.286
     RUNOFF VOLUME    (mm)=   90.865
     TOTAL RAINFALL   (mm)=  212.001
     RUNOFF COEFFICIENT   =     .429

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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007:0014------------------------------------------------------------------------
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----------------------
| CALIB NASHYD       |   Area    (ha)=   91.26   Curve Number   (CN)=47.00
| 05:1355   DT= 2.00 |   Ia      (mm)=   9.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=   1.220

     Unit Hyd Qpeak  (cms)=    2.857

     PEAK FLOW       (cms)=    5.047 (i)
     TIME TO PEAK    (hrs)=   11.464
     RUNOFF VOLUME    (mm)=   84.199
     TOTAL RAINFALL   (mm)=  212.001
     RUNOFF COEFFICIENT   =     .397

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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007:0015------------------------------------------------------------------------
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----------------------
| CALIB NASHYD       |   Area    (ha)=    8.93   Curve Number   (CN)=47.00
| 06:1356   DT= 2.00 |   Ia      (mm)=   9.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .480

     Unit Hyd Qpeak  (cms)=     .711
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     PEAK FLOW       (cms)=     .625 (i)
     TIME TO PEAK    (hrs)=   10.357
     RUNOFF VOLUME    (mm)=   84.199
     TOTAL RAINFALL   (mm)=  212.001
     RUNOFF COEFFICIENT   =     .397

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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007:0016------------------------------------------------------------------------------
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| CALIB NASHYD       |   Area    (ha)= 1617.80   Curve Number   (CN)=52.00
| 07:N3     DT= 2.00 |   Ia      (mm)=   9.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=   1.940

     Unit Hyd Qpeak  (cms)=   31.852

     PEAK FLOW       (cms)=   79.218 (i)
     TIME TO PEAK    (hrs)=   12.143
     RUNOFF VOLUME    (mm)=   94.201
     TOTAL RAINFALL   (mm)=  212.001
     RUNOFF COEFFICIENT   =     .444

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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007:0017------------------------------------------------------------------------------
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| CALIB NASHYD       |   Area    (ha)=    1.88   Curve Number   (CN)=50.00
| 08:N2     DT= 2.00 |   Ia      (mm)=   8.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .240

     Unit Hyd Qpeak  (cms)=     .299

     PEAK FLOW       (cms)=     .158 (i)
     TIME TO PEAK    (hrs)=   10.036
     RUNOFF VOLUME    (mm)=   90.865
     TOTAL RAINFALL   (mm)=  212.001
     RUNOFF COEFFICIENT   =     .429

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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007:0018------------------------------------------------------------------------------
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| CALIB NASHYD       |   Area    (ha)=   15.05   Curve Number   (CN)=49.00
| 09:N1     DT= 2.00 |   Ia      (mm)=   8.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .410

     Unit Hyd Qpeak  (cms)=    1.402

     PEAK FLOW       (cms)=    1.144 (i)
     TIME TO PEAK    (hrs)=   10.214
     RUNOFF VOLUME    (mm)=   88.854
     TOTAL RAINFALL   (mm)=  212.001
     RUNOFF COEFFICIENT   =     .419
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(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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007:0019-------------------------------------------------------------------------
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007:0002-------------------------------------------------------------------------
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007:0002-------------------------------------------------------------------------
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007:0002-------------------------------------------------------------------------
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007:0002-------------------------------------------------------------------------
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007:0002-------------------------------------------------------------------------
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      FINISH
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*********************************************************************************
*
     WARNINGS / ERRORS / NOTES
     -------------------------
   Simulation ended on 2012-02-02     at 16:35:56
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Appendix D

HY-8 Model Output

Existing Conditions

Table 1 - Culvert Summary Table: 1356

Total Discharge (cms)	Culvert Discharge (cms)	Headwater Elevation (m)	Inlet Control Depth (m)	Outlet Control Depth (m)	Flow Type	Normal Depth (m)	Critical Depth (m)	Outlet Depth (m)	Tailwater Depth (m)	Outlet Velocity (m/s)	Tailwater Velocity (m/s)
0.00	0.00	299.88	0.000	0.0*	0-NF	0.000	0.000	0.000	0.000	0.000	0.000
1.00	1.00	300.79	0.914	0.0*	1-S2n	0.436	0.571	0.437	0.401	3.031	1.133
2.00	2.00	301.64	1.760	0.0*	5-S2n	0.672	0.810	0.673	0.554	3.561	1.357
3.00	2.78	302.73	2.855	2.312	7-M2c	1.000	0.928	0.918	0.665	3.704	1.506
4.00	2.83	302.81	2.927	2.378	7-M2c	1.000	0.935	0.924	0.756	3.748	1.621
5.00	2.86	302.86	2.980	2.424	7-M2c	1.000	0.939	0.924	0.833	3.789	1.715
5.00	2.86	302.86	2.980	2.424	7-M2c	1.000	0.939	0.924	0.833	3.789	1.715
7.00	2.91	302.95	3.066	2.499	7-M2c	1.000	0.947	0.937	0.963	3.828	1.868
8.00	2.93	302.98	3.104	2.532	7-M2c	1.000	0.950	0.956	1.020	3.817	1.932
9.00	2.95	303.02	3.139	2.562	7-M2c	1.000	0.953	0.964	1.072	3.825	1.990
10.00	2.97	303.05	3.173	2.591	7-M2c	1.000	0.956	0.970	1.121	3.838	2.043

Site Data - 1356

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 m

Inlet Elevation: 299.88 m

Outlet Station: 15.60 m

Outlet Elevation: 299.29 m

Number of Barrels: 1

Culvert Data Summary - 1356

Barrel Shape: Circular

Barrel Diameter: 1000.00 mm

Barrel Material: Corrugated Steel

Embedment: 0.00 mm

Barrel Manning's n: 0.0240

Inlet Type: Conventional

Inlet Edge Condition: Thin Edge Projecting

Inlet Depression: NONE

Roadway Data for Crossing: 1356

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 20.00 m

Crest Elevation: 302.70 m

Roadway Surface: Paved

Roadway Top Width: 8.50 m

Table 2 - Culvert Summary Table: 1355

Total Discharge (cms)	Culvert Discharge (cms)	Headwater Elevation (m)	Inlet Control Depth (m)	Outlet Control Depth (m)	Flow Type	Normal Depth (m)	Critical Depth (m)	Outlet Depth (m)	Tailwater Depth (m)	Outlet Velocity (m/s)	Tailwater Velocity (m/s)
0.00	0.00	297.24	0.000	0.0*	0-NF	0.000	0.000	0.000	0.000	0.000	0.000
1.00	1.00	298.22	0.928	0.980	2-M2c	0.688	0.571	0.573	0.401	2.149	1.133
2.00	2.00	299.03	1.775	1.787	7-M2c	1.000	0.810	0.812	0.554	2.928	1.357
3.00	3.00	300.49	3.249	3.156	7-M2c	1.000	0.961	0.976	0.665	3.868	1.506
4.00	3.26	300.98	3.740	3.577	7-M2c	1.000	0.999	0.000	0.756	1.#IO	1.621
5.00	3.29	301.04	3.798	3.626	6-FFc	1.000	1.000	1.000	0.833	4.184	1.715
5.00	3.29	301.04	3.798	3.626	6-FFc	1.000	1.000	1.000	0.833	4.184	1.715
7.00	3.33	301.13	3.889	3.703	6-FFc	1.000	1.000	1.000	0.963	4.241	1.868
8.00	3.35	301.17	3.928	3.736	6-FFc	1.000	1.000	1.000	1.020	4.266	1.932
9.00	3.37	301.20	3.965	3.767	6-FFc	1.000	1.000	1.000	1.072	4.288	1.990
10.00	3.38	301.24	3.999	3.796	6-FFc	1.000	1.000	1.000	1.121	4.310	2.043

Site Data - 1355

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 m

Inlet Elevation: 297.24 m

Outlet Station: 17.00 m

Outlet Elevation: 297.09 m

Number of Barrels: 1

Culvert Data Summary - 1355

Barrel Shape: Circular

Barrel Diameter: 1000.00 mm

Barrel Material: Corrugated Steel

Embedment: 0.00 mm

Barrel Manning's n: 0.0240

Inlet Type: Conventional

Inlet Edge Condition: Thin Edge Projecting

Inlet Depression: NONE

Roadway Data for Crossing: 1355

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 20.00 m

Crest Elevation: 300.90 m

Roadway Surface: Paved

Roadway Top Width: 8.50 m

Table 3 - Culvert Summary Table: 1354

Total Discharge (cms)	Culvert Discharge (cms)	Headwater Elevation (m)	Inlet Control Depth (m)	Outlet Control Depth (m)	Flow Type	Normal Depth (m)	Critical Depth (m)	Outlet Depth (m)	Tailwater Depth (m)	Outlet Velocity (m/s)	Tailwater Velocity (m/s)
0.00	0.00	303.35	0.000	0.0*	0-NF	0.000	0.000	0.000	0.000	0.000	0.000
1.00	0.26	304.88	1.026	1.529	7-M2c	0.400	0.360	0.359	0.401	2.208	1.133
2.00	0.27	304.94	1.067	1.589	7-M2c	0.400	0.364	0.364	0.554	2.242	1.357
3.00	0.27	304.99	1.101	1.638	7-M2c	0.400	0.367	0.364	0.665	2.287	1.506
4.00	0.28	305.03	1.131	1.681	7-M2c	0.400	0.370	0.365	0.756	2.318	1.621
5.00	0.28	305.07	1.159	1.721	7-M2c	0.400	0.372	0.369	0.833	2.336	1.715
5.00	0.28	305.07	1.159	1.721	7-M2c	0.400	0.372	0.369	0.833	2.336	1.715
7.00	0.29	305.14	1.202	1.792	7-M2c	0.400	0.376	0.369	0.963	2.391	1.868
8.00	0.29	305.18	1.225	1.825	7-M2c	0.400	0.378	0.373	1.020	2.401	1.932
9.00	0.30	305.21	1.247	1.857	7-M2c	0.400	0.380	0.381	1.072	2.396	1.990
10.00	0.30	305.24	1.268	1.888	7-M2c	0.400	0.382	0.387	1.121	2.404	2.043

Site Data - 1354

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 m

Inlet Elevation: 303.35 m

Outlet Station: 13.80 m

Outlet Elevation: 303.33 m

Number of Barrels: 1

Culvert Data Summary - 1354

Barrel Shape: Circular

Barrel Diameter: 400.00 mm

Barrel Material: Corrugated Steel

Embedment: 0.00 mm

Barrel Manning's n: 0.0240

Inlet Type: Conventional

Inlet Edge Condition: Thin Edge Projecting

Inlet Depression: NONE

Roadway Data for Crossing: 1354

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 20.00 m

Crest Elevation: 304.80 m

Roadway Surface: Paved

Roadway Top Width: 8.50 m

Table 4 - Culvert Summary Table: 1353

Total Discharge (cms)	Culvert Discharge (cms)	Headwater Elevation (m)	Inlet Control Depth (m)	Outlet Control Depth (m)	Flow Type	Normal Depth (m)	Critical Depth (m)	Outlet Depth (m)	Tailwater Depth (m)	Outlet Velocity (m/s)	Tailwater Velocity (m/s)
0.00	0.00	303.01	0.000	0.0*	0-NF	0.000	0.000	0.000	0.000	0.000	0.000
1.00	1.00	303.99	0.929	0.980	2-M2c	0.723	0.571	0.573	0.401	2.149	1.133
2.00	1.81	304.58	1.572	1.561	7-M2c	1.000	0.772	0.775	0.554	2.774	1.357
3.00	1.88	304.65	1.644	1.632	7-M2c	1.000	0.788	0.789	0.665	2.829	1.506
4.00	1.93	304.71	1.697	1.684	7-M2c	1.000	0.798	0.799	0.756	2.868	1.621
5.00	1.97	304.75	1.741	1.728	7-M2c	1.000	0.805	0.806	0.833	2.900	1.715
5.00	1.97	304.75	1.741	1.728	7-M2c	1.000	0.805	0.806	0.833	2.900	1.715
7.00	2.04	304.83	1.820	1.805	7-M2c	1.000	0.816	0.819	0.963	2.968	1.868
8.00	2.07	304.87	1.855	1.838	7-M2c	1.000	0.820	0.825	1.020	2.996	1.932
9.00	2.10	304.90	1.889	1.871	7-M2c	1.000	0.825	0.829	1.072	3.022	1.990
10.00	2.13	304.93	1.921	1.902	7-M2c	1.000	0.829	0.834	1.121	3.047	2.043

Site Data - 1353

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 m

Inlet Elevation: 303.01 m

Outlet Station: 14.10 m

Outlet Elevation: 302.90 m

Number of Barrels: 1

Culvert Data Summary - 1353

Barrel Shape: Circular

Barrel Diameter: 1000.00 mm

Barrel Material: Corrugated Steel

Embedment: 0.00 mm

Barrel Manning's n: 0.0240

Inlet Type: Conventional

Inlet Edge Condition: Thin Edge Projecting

Inlet Depression: NONE

Roadway Data for Crossing: 1353

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 20.00 m

Crest Elevation: 304.55 m

Roadway Surface: Paved

Roadway Top Width: 8.50 m

Table 5 - Culvert Summary Table: 1352

Total Discharge (cms)	Culvert Discharge (cms)	Headwater Elevation (m)	Inlet Control Depth (m)	Outlet Control Depth (m)	Flow Type	Normal Depth (m)	Critical Depth (m)	Outlet Depth (m)	Tailwater Depth (m)	Outlet Velocity (m/s)	Tailwater Velocity (m/s)
0.00	0.00	301.36	0.000	0.0*	0-NF	0.000	0.000	0.000	0.000	0.000	0.000
1.00	1.00	302.28	0.922	0.0*	1-S2n	0.516	0.571	0.517	0.401	2.439	1.133
2.00	2.00	303.13	1.768	1.604	2-M2c	0.889	0.810	0.812	0.554	2.924	1.357
3.00	2.85	304.33	2.968	2.655	7-M2c	1.000	0.937	0.923	0.665	3.775	1.506
4.00	2.89	304.40	3.044	2.719	7-M2c	1.000	0.944	0.927	0.756	3.825	1.621
5.00	2.92	304.46	3.097	2.764	7-M2c	1.000	0.949	0.949	0.833	3.819	1.715
5.00	2.92	304.46	3.097	2.764	7-M2c	1.000	0.949	0.949	0.833	3.819	1.715
7.00	2.97	304.54	3.184	2.837	7-M2c	1.000	0.956	0.970	0.963	3.839	1.868
8.00	2.99	304.58	3.222	2.869	7-M2c	1.000	0.959	0.974	1.020	3.857	1.932
9.00	3.01	304.62	3.257	2.898	7-M2c	1.000	0.962	0.977	1.072	3.876	1.990
10.00	3.03	304.65	3.291	2.926	7-M2c	1.000	0.965	0.980	1.121	3.895	2.043

Site Data - 1352

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 m

Inlet Elevation: 301.36 m

Outlet Station: 15.10 m

Outlet Elevation: 301.04 m

Number of Barrels: 1

Culvert Data Summary - 1352

Barrel Shape: Circular

Barrel Diameter: 1000.00 mm

Barrel Material: Corrugated Steel

Embedment: 0.00 mm

Barrel Manning's n: 0.0240

Inlet Type: Conventional

Inlet Edge Condition: Thin Edge Projecting

Inlet Depression: NONE

Roadway Data for Crossing: 1352

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 20.00 m

Crest Elevation: 304.30 m

Roadway Surface: Paved

Roadway Top Width: 8.50 m

Table 6 - Culvert Summary Table: 1351

Total Discharge (cms)	Culvert Discharge (cms)	Headwater Elevation (m)	Inlet Control Depth (m)	Outlet Control Depth (m)	Flow Type	Normal Depth (m)	Critical Depth (m)	Outlet Depth (m)	Tailwater Depth (m)	Outlet Velocity (m/s)	Tailwater Velocity (m/s)
0.00	0.00	300.61	0.000	0.0*	0-NF	0.000	0.000	0.000	0.000	0.000	0.000
1.00	1.00	302.02	1.213	1.406	7-M2c	0.800	0.607	0.610	0.401	2.433	1.133
2.00	1.68	303.41	2.500	2.796	7-M2c	0.800	0.760	0.765	0.554	3.388	1.357
3.00	1.70	303.47	2.569	2.865	7-M2c	0.800	0.766	0.778	0.665	3.417	1.506
4.00	1.72	303.53	2.621	2.917	7-M2c	0.800	0.770	0.782	0.756	3.450	1.621
5.00	1.74	303.57	2.667	2.961	7-M2c	0.800	0.774	0.785	0.833	3.481	1.715
5.00	1.74	303.57	2.667	2.961	7-M2c	0.800	0.774	0.785	0.833	3.481	1.715
7.00	1.77	303.65	2.746	3.040	7-M2c	0.800	0.780	0.791	0.963	3.533	1.868
8.00	1.79	303.69	2.782	3.075	7-M2c	0.800	0.783	0.778	1.020	3.581	1.932
9.00	1.80	303.72	2.817	3.109	7-M2c	0.800	0.786	0.783	1.072	3.598	1.990
10.00	1.81	303.75	2.849	3.141	7-M2c	0.800	0.788	0.762	1.121	3.668	2.043

Site Data - 1351

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 m

Inlet Elevation: 300.61 m

Outlet Station: 17.40 m

Outlet Elevation: 300.59 m

Number of Barrels: 1

Culvert Data Summary - 1351

Barrel Shape: Circular

Barrel Diameter: 800.00 mm

Barrel Material: Corrugated Steel

Embedment: 0.00 mm

Barrel Manning's n: 0.0240

Inlet Type: Conventional

Inlet Edge Condition: Thin Edge Projecting

Inlet Depression: NONE

Roadway Data for Crossing: 1351

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 20.00 m

Crest Elevation: 303.36 m

Roadway Surface: Paved

Roadway Top Width: 8.50 m

Table 7 - Culvert Summary Table: 1350

Total Discharge (cms)	Culvert Discharge (cms)	Headwater Elevation (m)	Inlet Control Depth (m)	Outlet Control Depth (m)	Flow Type	Normal Depth (m)	Critical Depth (m)	Outlet Depth (m)	Tailwater Depth (m)	Outlet Velocity (m/s)	Tailwater Velocity (m/s)
0.00	0.00	310.65	0.000	0.0*	0-NF	0.000	0.000	0.000	0.000	0.000	0.000
1.00	0.15	311.22	0.452	0.567	7-M2c	0.460	0.274	0.274	0.401	1.498	1.133
2.00	0.17	311.27	0.484	0.624	7-M2c	0.460	0.286	0.287	0.554	1.550	1.357
3.00	0.18	311.32	0.511	0.672	7-M2c	0.460	0.296	0.297	0.665	1.592	1.506
4.00	0.19	311.36	0.535	0.714	7-M2c	0.460	0.305	0.306	0.756	1.628	1.621
5.00	0.20	311.40	0.555	0.754	7-M2c	0.460	0.312	0.312	0.833	1.657	1.715
5.00	0.20	311.40	0.555	0.754	7-M2c	0.460	0.312	0.312	0.833	1.657	1.715
7.00	0.21	311.48	0.594	0.825	7-M2c	0.460	0.324	0.324	0.963	1.712	1.868
8.00	0.22	311.51	0.613	0.858	7-M2c	0.460	0.329	0.330	1.020	1.737	1.932
9.00	0.23	311.54	0.630	0.889	7-M2c	0.460	0.333	0.334	1.072	1.760	1.990
10.00	0.23	311.57	0.647	0.920	7-M2c	0.460	0.337	0.339	1.121	1.782	2.043

Site Data - 1350

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 m

Inlet Elevation: 310.65 m

Outlet Station: 17.40 m

Outlet Elevation: 310.63 m

Number of Barrels: 1

Culvert Data Summary - 1350

Barrel Shape: Circular

Barrel Diameter: 460.00 mm

Barrel Material: Corrugated Steel

Embedment: 0.00 mm

Barrel Manning's n: 0.0240

Inlet Type: Conventional

Inlet Edge Condition: Thin Edge Projecting

Inlet Depression: NONE

Roadway Data for Crossing: 1350

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 20.00 m

Crest Elevation: 311.13 m

Roadway Surface: Paved

Roadway Top Width: 8.50 m

Table 8 - Culvert Summary Table: 1349

Total Discharge (cms)	Culvert Discharge (cms)	Headwater Elevation (m)	Inlet Control Depth (m)	Outlet Control Depth (m)	Flow Type	Normal Depth (m)	Critical Depth (m)	Outlet Depth (m)	Tailwater Depth (m)	Outlet Velocity (m/s)	Tailwater Velocity (m/s)
0.00	0.00	307.33	0.000	0.0*	0-NF	0.000	0.000	0.000	0.000	0.000	0.000
1.00	0.35	308.74	1.064	1.413	7-M2c	0.460	0.402	0.405	0.401	2.246	1.133
2.00	0.36	308.80	1.112	1.474	7-M2c	0.460	0.407	0.409	0.554	2.292	1.357
3.00	0.37	308.85	1.151	1.523	7-M2c	0.460	0.411	0.411	0.665	2.338	1.506
4.00	0.37	308.90	1.186	1.567	7-M2c	0.460	0.414	0.413	0.756	2.374	1.621
5.00	0.38	308.94	1.219	1.607	7-M2c	0.460	0.417	0.417	0.833	2.397	1.715
5.00	0.38	308.94	1.219	1.607	7-M2c	0.460	0.417	0.417	0.833	2.397	1.715
7.00	0.39	309.01	1.278	1.679	7-M2c	0.460	0.423	0.421	0.963	2.454	1.868
8.00	0.40	309.04	1.305	1.712	7-M2c	0.460	0.425	0.423	1.020	2.480	1.932
9.00	0.40	309.07	1.332	1.744	7-M2c	0.460	0.428	0.422	1.072	2.514	1.990
10.00	0.40	309.10	1.349	1.775	7-M2c	0.460	0.429	0.423	1.121	2.532	2.043

Site Data - 1349

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 m

Inlet Elevation: 307.33 m

Outlet Station: 12.50 m

Outlet Elevation: 307.32 m

Number of Barrels: 1

Culvert Data Summary - 1349

Barrel Shape: Circular

Barrel Diameter: 460.00 mm

Barrel Material: Corrugated Steel

Embedment: 0.00 mm

Barrel Manning's n: 0.0240

Inlet Type: Conventional

Inlet Edge Condition: Thin Edge Projecting

Inlet Depression: NONE

Roadway Data for Crossing: 1349

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 20.00 m

Crest Elevation: 308.67 m

Roadway Surface: Paved

Roadway Top Width: 8.50 m

Table 9 - Culvert Summary Table: 1348

Total Discharge (cms)	Culvert Discharge (cms)	Headwater Elevation (m)	Inlet Control Depth (m)	Outlet Control Depth (m)	Flow Type	Normal Depth (m)	Critical Depth (m)	Outlet Depth (m)	Tailwater Depth (m)	Outlet Velocity (m/s)	Tailwater Velocity (m/s)
0.00	0.00	306.47	0.000	0.0*	0-NF	0.000	0.000	0.000	0.000	0.000	0.000
1.00	0.36	309.09	1.741	2.622	6-FFc	0.400	0.400	0.400	0.401	2.858	1.133
2.00	0.36	309.15	1.784	2.684	6-FFc	0.400	0.400	0.400	0.554	2.897	1.357
3.00	0.37	309.20	1.818	2.733	6-FFc	0.400	0.400	0.400	0.665	2.928	1.506
4.00	0.37	309.25	1.848	2.777	6-FFc	0.400	0.400	0.400	0.756	2.955	1.621
5.00	0.37	309.29	1.875	2.817	6-FFc	0.400	0.400	0.400	0.833	2.980	1.715
5.00	0.37	309.29	1.875	2.817	6-FFc	0.400	0.400	0.400	0.833	2.980	1.715
7.00	0.38	309.36	1.925	2.889	6-FFc	0.400	0.400	0.400	0.963	3.024	1.868
8.00	0.38	309.39	1.948	2.922	6-FFc	0.400	0.400	0.400	1.020	3.044	1.932
9.00	0.38	309.42	1.970	2.954	6-FFc	0.400	0.400	0.400	1.072	3.063	1.990
10.00	0.39	309.45	1.991	2.985	6-FFc	0.400	0.400	0.400	1.121	3.081	2.043

Site Data - 1348

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 m

Inlet Elevation: 306.47 m

Outlet Station: 14.40 m

Outlet Elevation: 306.45 m

Number of Barrels: 1

Culvert Data Summary - 1348

Barrel Shape: Circular

Barrel Diameter: 400.00 mm

Barrel Material: Corrugated Steel

Embedment: 0.00 mm

Barrel Manning's n: 0.0240

Inlet Type: Conventional

Inlet Edge Condition: Thin Edge Projecting

Inlet Depression: NONE

Roadway Data for Crossing: 1348

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 20.00 m

Crest Elevation: 309.02 m

Roadway Surface: Paved

Roadway Top Width: 8.50 m

Table 10 - Culvert Summary Table: 1347

Total Discharge (cms)	Culvert Discharge (cms)	Headwater Elevation (m)	Inlet Control Depth (m)	Outlet Control Depth (m)	Flow Type	Normal Depth (m)	Critical Depth (m)	Outlet Depth (m)	Tailwater Depth (m)	Outlet Velocity (m/s)	Tailwater Velocity (m/s)
0.00	0.00	313.85	0.000	0.0*	0-NF	0.000	0.000	0.000	0.000	0.000	0.000
1.00	1.00	317.61	2.654	3.762	6-FFc	0.600	0.600	0.600	0.401	3.537	1.133
2.00	1.26	319.68	4.040	5.829	6-FFc	0.600	0.600	0.600	0.554	4.458	1.357
3.00	1.27	319.74	4.080	5.889	6-FFc	0.600	0.600	0.600	0.665	4.481	1.506
4.00	1.27	319.79	4.113	5.938	6-FFc	0.600	0.600	0.600	0.756	4.501	1.621
5.00	1.28	319.83	4.142	5.981	6-FFc	0.600	0.600	0.600	0.833	4.518	1.715
5.00	1.28	319.83	4.142	5.981	6-FFc	0.600	0.600	0.600	0.833	4.518	1.715
7.00	1.29	319.91	4.193	6.058	6-FFc	0.600	0.600	0.600	0.963	4.548	1.868
8.00	1.29	319.94	4.216	6.092	6-FFc	0.600	0.600	0.600	1.020	4.562	1.932
9.00	1.29	319.98	4.239	6.125	6-FFc	0.600	0.600	0.600	1.072	4.574	1.990
10.00	1.30	320.01	4.260	6.157	6-FFc	0.600	0.600	0.600	1.121	4.587	2.043

Site Data - 1347

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 m

Inlet Elevation: 313.85 m

Outlet Station: 25.60 m

Outlet Elevation: 313.50 m

Number of Barrels: 1

Culvert Data Summary - 1347

Barrel Shape: Circular

Barrel Diameter: 600.00 mm

Barrel Material: Corrugated Steel

Embedment: 0.00 mm

Barrel Manning's n: 0.0240

Inlet Type: Conventional

Inlet Edge Condition: Thin Edge Projecting

Inlet Depression: NONE

Roadway Data for Crossing: 1347

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 20.00 m

Crest Elevation: 319.60 m

Roadway Surface: Paved

Roadway Top Width: 8.50 m

Table 11 - Culvert Summary Table: 1346

Total Discharge (cms)	Culvert Discharge (cms)	Headwater Elevation (m)	Inlet Control Depth (m)	Outlet Control Depth (m)	Flow Type	Normal Depth (m)	Critical Depth (m)	Outlet Depth (m)	Tailwater Depth (m)	Outlet Velocity (m/s)	Tailwater Velocity (m/s)
0.00	0.00	320.58	0.000	0.0*	0-NF	0.000	0.000	0.000	0.000	0.000	0.000
1.00	0.65	322.53	1.318	1.948	7-M2c	0.600	0.516	0.520	0.401	2.503	1.133
2.00	0.67	322.60	1.363	2.017	7-M2c	0.600	0.521	0.525	0.554	2.543	1.357
3.00	0.68	322.65	1.397	2.069	7-M2c	0.600	0.525	0.529	0.665	2.573	1.506
4.00	0.69	322.69	1.427	2.114	7-M2c	0.600	0.528	0.531	0.756	2.598	1.621
5.00	0.70	322.73	1.454	2.155	7-M2c	0.600	0.531	0.533	0.833	2.628	1.715
5.00	0.70	322.73	1.454	2.155	7-M2c	0.600	0.531	0.533	0.833	2.628	1.715
7.00	0.71	322.81	1.504	2.228	7-M2c	0.600	0.536	0.536	0.963	2.672	1.868
8.00	0.72	322.84	1.527	2.261	7-M2c	0.600	0.538	0.539	1.020	2.687	1.932
9.00	0.73	322.87	1.549	2.294	7-M2c	0.600	0.541	0.541	1.072	2.705	1.990
10.00	0.73	322.90	1.570	2.325	7-M2c	0.600	0.543	0.543	1.121	2.722	2.043

Site Data - 1346

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 m

Inlet Elevation: 320.58 m

Outlet Station: 23.40 m

Outlet Elevation: 320.55 m

Number of Barrels: 1

Culvert Data Summary - 1346

Barrel Shape: Circular

Barrel Diameter: 600.00 mm

Barrel Material: Corrugated Steel

Embedment: 0.00 mm

Barrel Manning's n: 0.0240

Inlet Type: Conventional

Inlet Edge Condition: Thin Edge Projecting

Inlet Depression: NONE

Roadway Data for Crossing: 1346

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 20.00 m

Crest Elevation: 322.48 m

Roadway Surface: Paved

Roadway Top Width: 8.50 m

Table 12 - Culvert Summary Table: 1345

Total Discharge (cms)	Culvert Discharge (cms)	Headwater Elevation (m)	Inlet Control Depth (m)	Outlet Control Depth (m)	Flow Type	Normal Depth (m)	Critical Depth (m)	Outlet Depth (m)	Tailwater Depth (m)	Outlet Velocity (m/s)	Tailwater Velocity (m/s)
0.00	0.00	321.48	0.000	0.0*	0-NF	0.000	0.000	0.000	0.000	0.000	0.000
1.00	0.63	324.58	2.166	3.100	6-FFc	0.500	0.500	0.500	0.401	3.186	1.133
2.00	0.63	324.65	2.216	3.169	6-FFc	0.500	0.500	0.500	0.554	3.228	1.357
3.00	0.64	324.70	2.254	3.221	6-FFc	0.500	0.500	0.500	0.665	3.259	1.506
4.00	0.65	324.75	2.287	3.265	6-FFc	0.500	0.500	0.500	0.756	3.285	1.621
5.00	0.65	324.79	2.317	3.306	6-FFc	0.500	0.500	0.500	0.833	3.309	1.715
5.00	0.65	324.79	2.317	3.306	6-FFc	0.500	0.500	0.500	0.833	3.309	1.715
7.00	0.66	324.86	2.370	3.380	6-FFc	0.500	0.500	0.500	0.963	3.352	1.868
8.00	0.66	324.89	2.395	3.413	6-FFc	0.500	0.500	0.500	1.020	3.371	1.932
9.00	0.67	324.93	2.418	3.446	6-FFc	0.500	0.500	0.500	1.072	3.390	1.990
10.00	0.67	324.96	2.441	3.477	6-FFc	0.500	0.500	0.500	1.121	3.408	2.043

Site Data - 1345

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 m

Inlet Elevation: 321.48 m

Outlet Station: 17.60 m

Outlet Elevation: 321.46 m

Number of Barrels: 1

Culvert Data Summary - 1345

Barrel Shape: Circular

Barrel Diameter: 500.00 mm

Barrel Material: Corrugated Steel

Embedment: 0.00 mm

Barrel Manning's n: 0.0240

Inlet Type: Conventional

Inlet Edge Condition: Thin Edge Projecting

Inlet Depression: NONE

Roadway Data for Crossing: 1345

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 20.00 m

Crest Elevation: 324.53 m

Roadway Surface: Paved

Roadway Top Width: 8.50 m

Table 13 - Culvert Summary Table: 1344

Total Discharge (cms)	Culvert Discharge (cms)	Headwater Elevation (m)	Inlet Control Depth (m)	Outlet Control Depth (m)	Flow Type	Normal Depth (m)	Critical Depth (m)	Outlet Depth (m)	Tailwater Depth (m)	Outlet Velocity (m/s)	Tailwater Velocity (m/s)
0.00	0.00	321.80	0.000	0.0*	0-NF	0.000	0.000	0.000	0.000	0.000	0.000
1.00	0.20	322.95	0.712	1.153	7-M2c	0.400	0.324	0.325	0.401	1.856	1.133
2.00	0.21	323.01	0.732	1.212	7-M2c	0.400	0.327	0.329	0.554	1.880	1.357
3.00	0.21	323.06	0.749	1.261	7-M2c	0.400	0.329	0.331	0.665	1.900	1.506
4.00	0.21	323.10	0.764	1.303	7-M2c	0.400	0.331	0.333	0.756	1.917	1.621
5.00	0.22	323.14	0.777	1.343	7-M2c	0.400	0.333	0.335	0.833	1.933	1.715
5.00	0.22	323.14	0.777	1.343	7-M2c	0.400	0.333	0.335	0.833	1.933	1.715
7.00	0.22	323.21	0.801	1.415	7-M2c	0.400	0.336	0.338	0.963	1.961	1.868
8.00	0.22	323.25	0.812	1.448	7-M2c	0.400	0.337	0.339	1.020	1.974	1.932
9.00	0.23	323.28	0.823	1.479	7-M2c	0.400	0.338	0.341	1.072	1.987	1.990
10.00	0.23	323.31	0.834	1.510	7-M2c	0.400	0.340	0.342	1.121	1.999	2.043

Site Data - 1344

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 m

Inlet Elevation: 321.80 m

Outlet Station: 32.40 m

Outlet Elevation: 321.29 m

Number of Barrels: 1

Culvert Data Summary - 1344

Barrel Shape: Circular

Barrel Diameter: 400.00 mm

Barrel Material: Corrugated Steel

Embedment: 0.00 mm

Barrel Manning's n: 0.0240

Inlet Type: Conventional

Inlet Edge Condition: Thin Edge Projecting

Inlet Depression: NONE

Roadway Data for Crossing: 1344

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 20.00 m

Crest Elevation: 322.87 m

Roadway Surface: Paved

Roadway Top Width: 8.50 m

Table 14 - Culvert Summary Table: N1

Total Discharge (cms)	Culvert Discharge (cms)	Headwater Elevation (m)	Inlet Control Depth (m)	Outlet Control Depth (m)	Flow Type	Normal Depth (m)	Critical Depth (m)	Outlet Depth (m)	Tailwater Depth (m)	Outlet Velocity (m/s)	Tailwater Velocity (m/s)
0.00	0.00	331.22	0.000	0.0*	0-NF	0.000	0.000	0.000	0.000	0.000	0.000
1.00	0.54	333.69	1.654	2.468	7-M2c	0.500	0.483	0.490	0.401	2.741	1.133
2.00	0.54	333.75	1.700	2.534	7-M2c	0.500	0.486	0.493	0.554	2.780	1.357
3.00	0.55	333.80	1.736	2.585	7-M2c	0.500	0.489	0.487	0.665	2.826	1.506
4.00	0.56	333.85	1.767	2.629	7-M2c	0.500	0.492	0.475	0.756	2.889	1.621
5.00	0.56	333.89	1.795	2.670	7-M2c	0.500	0.494	0.473	0.833	2.921	1.715
5.00	0.56	333.89	1.795	2.670	7-M2c	0.500	0.494	0.473	0.833	2.924	1.715
7.00	0.57	333.96	1.846	2.743	7-M2c	0.500	0.498	0.000	0.963	1.#IO	1.868
8.00	0.58	334.00	1.870	2.776	7-M2c	0.500	0.500	0.000	1.020	1.#IO	1.932
9.00	0.58	334.03	1.893	2.808	6-FFc	0.500	0.500	0.500	1.072	2.950	1.990
10.00	0.58	334.06	1.915	2.839	6-FFc	0.500	0.500	0.500	1.121	2.970	2.043

Site Data - N1

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 m

Inlet Elevation: 331.22 m

Outlet Station: 18.50 m

Outlet Elevation: 331.21 m

Number of Barrels: 1

Culvert Data Summary - N1

Barrel Shape: Circular

Barrel Diameter: 500.00 mm

Barrel Material: Corrugated Steel

Embedment: 0.00 mm

Barrel Manning's n: 0.0240

Inlet Type: Conventional

Inlet Edge Condition: Thin Edge Projecting

Inlet Depression: NONE

Roadway Data for Crossing: N1

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 20.00 m

Crest Elevation: 333.63 m

Roadway Surface: Paved

Roadway Top Width: 8.50 m

Table 15 - Culvert Summary Table: N2

Total Discharge (cms)	Culvert Discharge (cms)	Headwater Elevation (m)	Inlet Control Depth (m)	Outlet Control Depth (m)	Flow Type	Normal Depth (m)	Critical Depth (m)	Outlet Depth (m)	Tailwater Depth (m)	Outlet Velocity (m/s)	Tailwater Velocity (m/s)
0.00	0.00	324.39	0.000	0.0*	0-NF	0.000	0.000	0.000	0.000	0.000	0.000
1.00	0.29	326.08	1.204	1.687	7-M2c	0.400	0.376	0.372	0.401	2.383	1.133
2.00	0.30	326.14	1.243	1.747	7-M2c	0.400	0.380	0.381	0.554	2.396	1.357
3.00	0.30	326.19	1.275	1.796	7-M2c	0.400	0.382	0.388	0.665	2.411	1.506
4.00	0.30	326.23	1.304	1.840	7-M2c	0.400	0.385	0.391	0.756	2.436	1.621
5.00	0.31	326.27	1.330	1.880	7-M2c	0.400	0.387	0.393	0.833	2.461	1.715
5.00	0.31	326.27	1.330	1.880	7-M2c	0.400	0.387	0.393	0.833	2.461	1.715
7.00	0.31	326.34	1.377	1.952	7-M2c	0.400	0.391	0.396	0.963	2.505	1.868
8.00	0.32	326.37	1.399	1.984	7-M2c	0.400	0.392	0.397	1.020	2.527	1.932
9.00	0.32	326.41	1.420	2.016	7-M2c	0.400	0.394	0.379	1.072	2.597	1.990
10.00	0.32	326.44	1.440	2.047	7-M2c	0.400	0.396	0.378	1.121	2.624	2.043

Site Data - N2

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 m

Inlet Elevation: 324.39 m

Outlet Station: 15.00 m

Outlet Elevation: 324.18 m

Number of Barrels: 1

Culvert Data Summary - N2

Barrel Shape: Circular

Barrel Diameter: 400.00 mm

Barrel Material: Corrugated Steel

Embedment: 0.00 mm

Barrel Manning's n: 0.0240

Inlet Type: Conventional

Inlet Edge Condition: Thin Edge Projecting

Inlet Depression: NONE

Roadway Data for Crossing: N2

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 20.00 m

Crest Elevation: 326.00 m

Roadway Surface: Paved

Roadway Top Width: 8.50 m

Table 16 - Culvert Summary Table: N3

Total Discharge (cms)	Culvert Discharge (cms)	Headwater Elevation (m)	Inlet Control Depth (m)	Outlet Control Depth (m)	Flow Type	Normal Depth (m)	Critical Depth (m)	Outlet Depth (m)	Tailwater Depth (m)	Outlet Velocity (m/s)	Tailwater Velocity (m/s)
0.00	0.00	296.52	0.000	0.0*	0-NF	0.000	0.000	0.000	0.000	0.000	0.000
5.00	5.00	297.31	0.787	0.793	2-M2c	0.474	0.459	0.459	0.833	2.117	1.715
20.00	20.00	298.52	1.951	2.003	2-M2c	1.195	1.156	1.153	1.497	3.367	2.432
30.00	30.00	299.15	2.634	2.623	2-M2c	1.586	1.515	1.511	1.768	3.855	2.693
40.00	40.00	299.96	3.442	3.175	2-M2c	2.100	1.836	1.831	1.986	4.241	2.894
50.00	50.00	300.98	4.461	3.785	6-FFc	2.100	2.100	2.100	2.173	4.623	3.060
60.00	57.72	301.94	5.417	4.359	6-FFc	2.100	2.100	2.100	2.338	5.337	3.203
70.00	59.82	302.22	5.702	4.529	6-FFc	2.100	2.100	2.100	2.486	5.531	3.329
80.00	61.41	302.45	5.925	4.661	6-FFc	2.100	2.100	2.100	2.622	5.678	3.442
90.00	62.76	302.64	6.120	4.777	6-FFc	2.100	2.100	2.100	2.747	5.803	3.545
100.00	63.97	302.82	6.299	4.883	6-FFc	2.100	2.100	2.100	2.864	5.915	3.639

Site Data - N3

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 m

Inlet Elevation: 296.52 m

Outlet Station: 20.20 m

Outlet Elevation: 296.48 m

Number of Barrels: 1

Culvert Data Summary - N3

Barrel Shape: Concrete Box

Barrel Span: 5150.00 mm

Barrel Rise: 2100.00 mm

Barrel Material: Concrete

Embedment: 0.00 mm

Barrel Manning's n: 0.0120

Inlet Type: Conventional

Inlet Edge Condition: Square Edge (90º) Headwall

Inlet Depression: NONE

Roadway Data for Crossing: N3

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 20.00 m

Crest Elevation: 301.77 m

Roadway Surface: Paved

Roadway Top Width: 8.50 m

BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

Appendix E

HY-8 Model Output

Proposed Conditions

Culvert Summary Table: 1356

Total Discharge (cms)	Culvert Discharge (cms)	Headwater Elevation (m)	Inlet Control Depth (m)	Outlet Control Depth (m)	Flow Type	Normal Depth (m)	Critical Depth (m)	Outlet Depth (m)	Tailwater Depth (m)	Outlet Velocity (m/s)	Tailwater Velocity (m/s)
0.00	0.00	299.94	0.000	0.0*	0-NF	0.000	0.000	0.000	0.000	0.000	0.000
0.06	0.06	300.08	0.141	0.0*	1-S2n	0.072	0.077	0.074	0.137	0.970	0.595
0.13	0.13	300.14	0.202	0.0*	1-S2n	0.106	0.121	0.108	0.196	1.230	0.722
0.13	0.13	300.15	0.206	0.0*	1-S2n	0.108	0.123	0.108	0.199	1.268	0.728
0.25	0.25	300.26	0.317	0.0*	1-S2n	0.166	0.191	0.167	0.276	1.573	0.868
0.32	0.32	300.31	0.368	0.0*	1-S2n	0.191	0.222	0.191	0.307	1.705	0.920
0.38	0.38	300.36	0.422	0.0*	1-S2n	0.216	0.249	0.216	0.335	1.807	0.965
0.44	0.44	300.42	0.476	0.0*	1-S2n	0.237	0.276	0.237	0.360	1.912	1.004
0.50	0.50	300.47	0.530	0.0*	1-S2n	0.259	0.300	0.260	0.383	1.991	1.039
0.57	0.57	300.52	0.581	0.0*	1-S2n	0.281	0.323	0.281	0.405	2.070	1.071
0.63	0.63	300.57	0.630	0.0*	1-S2n	0.301	0.347	0.301	0.425	2.147	1.100

Site Data - 1356

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 m

Inlet Elevation: 299.64 m

Outlet Station: 21.10 m

Outlet Elevation: 298.84 m

Number of Barrels: 1

Culvert Data Summary - 1356

Barrel Shape: Circular

Barrel Diameter: 1000.00 mm

Barrel Material: Corrugated Steel

Embedment: 300.00 mm

Barrel Manning's n: 0.0240 (top and sides)

Manning's n: 0.0350 (bottom)

Inlet Type: Conventional

Inlet Edge Condition: Thin Edge Projecting

Inlet Depression: NONE

Roadway Data for Crossing: 1356

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 20.00 m

Crest Elevation: 302.70 m

Roadway Surface: Paved

Roadway Top Width: 8.50 m

Tailwater Channel Data - 1356

Tailwater Channel Option: Trapezoidal Channel

Bottom Width: 0.50 m

Side Slope (H:V): 2.00 (_:1)

Channel Slope: 0.0100

Channel Manning's n: 0.0350

Channel Invert Elevation: 299.14 m

Culvert Summary Table: 1355

Total Discharge (cms)	Culvert Discharge (cms)	Headwater Elevation (m)	Inlet Control Depth (m)	Outlet Control Depth (m)	Flow Type	Normal Depth (m)	Critical Depth (m)	Outlet Depth (m)	Tailwater Depth (m)	Outlet Velocity (m/s)	Tailwater Velocity (m/s)
0.00	0.00	297.29	0.000	0.0*	0-NF	0.000	0.000	0.000	0.000	0.000	0.000
0.50	0.50	297.68	0.284	0.386	3-M1t	0.223	0.197	0.248	0.248	1.099	1.361
0.78	0.78	297.78	0.400	0.487	3-M1t	0.276	0.262	0.312	0.312	1.312	1.539
1.51	1.51	298.03	0.602	0.738	3-M1t	0.418	0.403	0.438	0.438	1.736	1.844
2.02	2.02	298.18	0.718	0.887	3-M1t	0.492	0.483	0.505	0.505	1.968	1.991
2.52	2.52	298.31	0.822	1.016	3-M1t	0.559	0.552	0.563	0.563	2.172	2.111
3.03	3.03	298.43	0.919	1.136	2-M2c	0.626	0.620	0.624	0.614	2.314	2.214
3.53	3.53	298.55	1.010	1.256	2-M2c	0.687	0.683	0.686	0.661	2.424	2.305
4.04	4.04	298.65	1.095	1.361	2-M2c	0.742	0.738	0.744	0.704	2.524	2.385
4.54	4.54	298.75	1.193	1.461	2-M2c	0.796	0.792	0.798	0.743	2.621	2.459
5.05	5.05	298.85	1.291	1.558	2-M2c	0.851	0.847	0.850	0.781	2.711	2.526

Site Data - 1355

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 m

Inlet Elevation: 296.99 m

Outlet Station: 17.00 m

Outlet Elevation: 296.74 m

Number of Barrels: 1

Culvert Data Summary - 1355

Barrel Shape: Circular

Barrel Diameter: 2500.00 mm

Barrel Material: Corrugated Steel

Embedment: 300.00 mm

Barrel Manning's n: 0.0240 (top and sides)

Manning's n: 0.0350 (bottom)

Inlet Type: Conventional

Inlet Edge Condition: Thin Edge Projecting

Inlet Depression: NONE

Roadway Data for Crossing: 1355

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 20.00 m

Crest Elevation: 301.24 m

Roadway Surface: Paved

Roadway Top Width: 8.50 m

Tailwater Channel Data - 1355

Tailwater Channel Option: Trapezoidal Channel

Bottom Width: 1.00 m

Side Slope (H:V): 2.00 (_:1)

Channel Slope: 0.0230

Channel Manning's n: 0.0350

Channel Invert Elevation: 297.04 m

Culvert Summary Table: 1354

Total Discharge (cms)	Culvert Discharge (cms)	Headwater Elevation (m)	Inlet Control Depth (m)	Outlet Control Depth (m)	Flow Type	Normal Depth (m)	Critical Depth (m)	Outlet Depth (m)	Tailwater Depth (m)	Outlet Velocity (m/s)	Tailwater Velocity (m/s)
0.00	0.00	303.35	0.000	0.0*	0-NF	0.000	0.000	0.000	0.000	0.000	0.000
0.01	0.01	303.46	0.084	0.109	2-M2c	0.110	0.058	0.059	0.046	0.628	0.328
0.02	0.02	303.50	0.122	0.150	2-M2c	0.156	0.079	0.084	0.069	0.752	0.410
0.02	0.02	303.51	0.128	0.160	2-M2c	0.165	0.084	0.088	0.073	0.773	0.424
0.04	0.04	303.56	0.175	0.212	2-M2c	0.226	0.119	0.119	0.101	0.904	0.507
0.04	0.04	303.59	0.200	0.237	2-M2c	0.256	0.132	0.134	0.114	0.960	0.541
0.05	0.05	303.61	0.216	0.259	2-M2c	0.284	0.144	0.147	0.126	1.009	0.570
0.06	0.06	303.63	0.235	0.280	2-M2c	0.311	0.156	0.159	0.137	1.054	0.595
0.07	0.07	303.65	0.252	0.299	2-M2c	0.337	0.168	0.170	0.147	1.094	0.618
0.08	0.08	303.67	0.269	0.318	2-M2c	0.364	0.181	0.181	0.156	1.131	0.639
0.09	0.09	303.69	0.285	0.335	2-M2c	0.392	0.190	0.191	0.165	1.165	0.658

Site Data - 1354

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 m

Inlet Elevation: 303.35 m

Outlet Station: 15.80 m

Outlet Elevation: 303.33 m

Number of Barrels: 1

Culvert Data Summary - 1354

Barrel Shape: Circular

Barrel Diameter: 600.00 mm

Barrel Material: Corrugated Steel

Embedment: 0.00 mm

Barrel Manning's n: 0.0240

Inlet Type: Conventional

Inlet Edge Condition: Thin Edge Projecting

Inlet Depression: NONE

Roadway Data for Crossing: 1354

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 20.00 m

Crest Elevation: 304.87 m

Roadway Surface: Paved

Roadway Top Width: 8.50 m

Tailwater Channel Data - 1354

Tailwater Channel Option: Trapezoidal Channel

Bottom Width: 0.50 m

Side Slope (H:V): 2.00 (_:1)

Channel Slope: 0.0100

Channel Manning's n: 0.0350

Channel Invert Elevation: 303.33 m

Culvert Summary Table: 1353

Total Discharge (cms)	Culvert Discharge (cms)	Headwater Elevation (m)	Inlet Control Depth (m)	Outlet Control Depth (m)	Flow Type	Normal Depth (m)	Critical Depth (m)	Outlet Depth (m)	Tailwater Depth (m)	Outlet Velocity (m/s)	Tailwater Velocity (m/s)
0.00	0.00	303.01	0.000	0.0*	0-NF	0.000	0.000	0.000	0.000	0.000	0.000
0.36	0.36	303.33	0.289	0.324	3-M1t	0.232	0.180	0.259	0.259	0.865	0.918
0.59	0.59	303.45	0.374	0.441	3-M1t	0.318	0.239	0.335	0.335	1.061	1.054
1.08	1.08	303.65	0.545	0.639	3-M1t	0.455	0.360	0.456	0.456	1.379	1.243
1.44	1.44	303.77	0.651	0.763	3-M2t	0.543	0.428	0.525	0.525	1.569	1.341
1.81	1.81	303.89	0.747	0.876	3-M2t	0.622	0.496	0.585	0.585	1.738	1.422
2.17	2.17	303.99	0.837	0.982	3-M2t	0.699	0.553	0.638	0.638	1.893	1.491
2.53	2.53	304.09	0.934	1.081	3-M2t	0.769	0.607	0.686	0.686	2.037	1.552
2.89	2.89	304.19	1.033	1.176	3-M2t	0.840	0.661	0.731	0.731	2.173	1.606
3.25	3.25	304.28	1.133	1.267	3-M2t	0.909	0.709	0.772	0.772	2.303	1.655
3.61	3.61	304.37	1.232	1.356	3-M2t	0.978	0.755	0.810	0.810	2.428	1.701

Site Data - 1353

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 m

Inlet Elevation: 302.71 m

Outlet Station: 17.10 m

Outlet Elevation: 302.58 m

Number of Barrels: 1

Culvert Data Summary - 1353

Barrel Shape: Circular

Barrel Diameter: 2000.00 mm

Barrel Material: Corrugated Steel

Embedment: 300.00 mm

Barrel Manning's n: 0.0240 (top and sides)

Manning's n: 0.0350 (bottom)

Inlet Type: Conventional

Inlet Edge Condition: Thin Edge Projecting

Inlet Depression: NONE

Roadway Data for Crossing: 1353

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 20.00 m

Crest Elevation: 304.79 m

Roadway Surface: Paved

Roadway Top Width: 8.50 m

Tailwater Channel Data - 1353

Tailwater Channel Option: Trapezoidal Channel

Bottom Width: 1.00 m

Side Slope (H:V): 2.00 (_:1)

Channel Slope: 0.0100

Channel Manning's n: 0.0350

Channel Invert Elevation: 302.88 m

Culvert Summary Table: 1352

Total Discharge (cms)	Culvert Discharge (cms)	Headwater Elevation (m)	Inlet Control Depth (m)	Outlet Control Depth (m)	Flow Type	Normal Depth (m)	Critical Depth (m)	Outlet Depth (m)	Tailwater Depth (m)	Outlet Velocity (m/s)	Tailwater Velocity (m/s)
0.00	0.00	301.30	0.000	0.0*	0-NF	0.000	0.000	0.000	0.000	0.000	0.000
1.04	1.04	301.83	0.534	0.0*	1-S2n	0.352	0.353	0.353	0.342	1.777	1.814
1.49	1.49	301.96	0.664	0.020	1-S2n	0.430	0.437	0.434	0.410	2.002	1.998
3.13	3.13	302.40	1.100	0.200	1-S2n	0.681	0.695	0.682	0.590	2.543	2.433
4.18	4.18	302.69	1.385	0.287	1-S2n	0.817	0.826	0.818	0.677	2.780	2.622
5.22	5.22	303.10	1.647	1.801	2-M2c	0.951	0.942	0.944	0.751	2.984	2.777
6.26	6.26	303.32	1.909	2.025	2-M2c	1.086	1.050	1.052	0.817	3.204	2.910
7.31	7.31	303.54	2.179	2.238	2-M2c	1.231	1.147	1.149	0.877	3.429	3.027
8.35	8.35	303.77	2.468	2.454	2-M2c	1.415	1.234	1.237	0.932	3.661	3.132
9.40	9.40	304.13	2.834	2.706	2-M2c	1.700	1.314	1.318	0.982	3.896	3.227
10.44	10.44	304.53	3.227	3.069	7-M2c	1.700	1.383	1.387	1.030	4.148	3.314

Site Data - 1352

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 m

Inlet Elevation: 301.00 m

Outlet Station: 22.60 m

Outlet Elevation: 300.61 m

Number of Barrels: 1

Culvert Data Summary - 1352

Barrel Shape: Circular

Barrel Diameter: 2000.00 mm

Barrel Material: Corrugated Steel

Embedment: 300.00 mm

Barrel Manning's n: 0.0240 (top and sides)

Manning's n: 0.0350 (bottom)

Inlet Type: Conventional

Inlet Edge Condition: Thin Edge Projecting

Inlet Depression: NONE

Roadway Data for Crossing: 1352

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 20.00 m

Crest Elevation: 304.54 m

Roadway Surface: Paved

Roadway Top Width: 8.50 m

Tailwater Channel Data - 1352

Tailwater Channel Option: Trapezoidal Channel

Bottom Width: 1.00 m

Side Slope (H:V): 2.00 (_:1)

Channel Slope: 0.0290

Channel Manning's n: 0.0350

Channel Invert Elevation: 300.91 m

Culvert Summary Table: 1351

Total Discharge (cms)	Culvert Discharge (cms)	Headwater Elevation (m)	Inlet Control Depth (m)	Outlet Control Depth (m)	Flow Type	Normal Depth (m)	Critical Depth (m)	Outlet Depth (m)	Tailwater Depth (m)	Outlet Velocity (m/s)	Tailwater Velocity (m/s)
0.00	0.00	300.61	0.000	0.0*	0-NF	0.000	0.000	0.000	0.000	0.000	0.000
0.33	0.33	301.13	0.451	0.517	2-M2c	0.601	0.300	0.305	0.247	1.459	0.896
0.60	0.60	301.31	0.621	0.703	2-M2c	0.900	0.411	0.415	0.338	1.728	1.059
0.99	0.99	301.53	0.830	0.924	2-M2c	1.200	0.537	0.540	0.437	2.014	1.214
1.32	1.32	301.71	0.993	1.095	2-M2c	1.200	0.626	0.627	0.503	2.214	1.311
1.66	1.66	301.87	1.157	1.260	2-M2c	1.200	0.704	0.705	0.561	2.396	1.390
1.99	1.99	302.02	1.332	1.411	2-M2c	1.200	0.773	0.775	0.612	2.571	1.458
2.32	2.32	302.24	1.525	1.635	7-M2c	1.200	0.839	0.839	0.659	2.744	1.517
2.65	2.65	302.49	1.742	1.877	7-M2c	1.200	0.893	0.897	0.702	2.921	1.570
2.98	2.98	302.75	1.990	2.138	7-M2c	1.200	0.948	0.949	0.741	3.106	1.619
3.31	3.31	303.03	2.270	2.421	7-M2c	1.200	0.989	0.995	0.778	3.301	1.663

Site Data - 1351

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 m

Inlet Elevation: 300.61 m

Outlet Station: 20.50 m

Outlet Elevation: 300.59 m

Number of Barrels: 1

Culvert Data Summary - 1351

Barrel Shape: Circular

Barrel Diameter: 1200.00 mm

Barrel Material: Corrugated Steel

Embedment: 0.00 mm

Barrel Manning's n: 0.0240

Inlet Type: Conventional

Inlet Edge Condition: Thin Edge Projecting

Inlet Depression: NONE

Roadway Data for Crossing: 1351

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 20.00 m

Crest Elevation: 303.18 m

Roadway Surface: Paved

Roadway Top Width: 8.50 m

Tailwater Channel Data - 1351

Tailwater Channel Option: Trapezoidal Channel

Bottom Width: 1.00 m

Side Slope (H:V): 2.00 (_:1)

Channel Slope: 0.0100

Channel Manning's n: 0.0350

Channel Invert Elevation: 300.59 m

Culvert Summary Table: 1350

Total Discharge (cms)	Culvert Discharge (cms)	Headwater Elevation (m)	Inlet Control Depth (m)	Outlet Control Depth (m)	Flow Type	Normal Depth (m)	Critical Depth (m)	Outlet Depth (m)	Tailwater Depth (m)	Outlet Velocity (m/s)	Tailwater Velocity (m/s)
0.00	0.00	309.13	0.000	0.0*	0-NF	0.000	0.000	0.000	0.000	0.000	0.000
0.02	0.02	309.29	0.122	0.155	2-M2c	0.163	0.079	0.084	0.069	0.752	0.410
0.04	0.04	309.35	0.175	0.217	2-M2c	0.238	0.119	0.119	0.101	0.904	0.507
0.05	0.05	309.38	0.208	0.254	2-M2c	0.286	0.138	0.141	0.121	0.988	0.557
0.07	0.07	309.43	0.252	0.305	2-M2c	0.357	0.168	0.170	0.147	1.094	0.618
0.09	0.09	309.47	0.285	0.342	2-M2c	0.417	0.190	0.191	0.165	1.165	0.658
0.11	0.11	309.51	0.314	0.376	2-M2c	0.493	0.208	0.210	0.181	1.228	0.692
0.13	0.13	309.54	0.342	0.408	2-M2c	0.600	0.226	0.227	0.196	1.286	0.722
0.14	0.14	309.57	0.369	0.439	2-M2c	0.600	0.243	0.243	0.209	1.340	0.748
0.16	0.16	309.60	0.395	0.469	2-M2c	0.600	0.257	0.259	0.222	1.389	0.772
0.18	0.18	309.63	0.421	0.497	2-M2c	0.600	0.272	0.273	0.234	1.435	0.794

Site Data - 1350

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 m

Inlet Elevation: 309.13 m

Outlet Station: 18.90 m

Outlet Elevation: 309.11 m

Number of Barrels: 1

Culvert Data Summary - 1350

Barrel Shape: Circular

Barrel Diameter: 600.00 mm

Barrel Material: Corrugated Steel

Embedment: 0.00 mm

Barrel Manning's n: 0.0240

Inlet Type: Conventional

Inlet Edge Condition: Thin Edge Projecting

Inlet Depression: NONE

Roadway Data for Crossing: 1350

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 20.00 m

Crest Elevation: 310.13 m

Roadway Surface: Paved

Roadway Top Width: 8.50 m

Tailwater Channel Data - 1350

Tailwater Channel Option: Trapezoidal Channel

Bottom Width: 0.50 m

Side Slope (H:V): 2.00 (_:1)

Channel Slope: 0.0100

Channel Manning's n: 0.0350

Channel Invert Elevation: 309.11 m

Culvert Summary Table: 1349

Total Discharge (cms)	Culvert Discharge (cms)	Headwater Elevation (m)	Inlet Control Depth (m)	Outlet Control Depth (m)	Flow Type	Normal Depth (m)	Critical Depth (m)	Outlet Depth (m)	Tailwater Depth (m)	Outlet Velocity (m/s)	Tailwater Velocity (m/s)
0.00	0.00	306.26	0.000	0.0*	0-NF	0.000	0.000	0.000	0.000	0.000	0.000
0.03	0.03	306.46	0.162	0.196	2-M2c	0.205	0.108	0.110	0.093	0.868	0.484
0.06	0.06	306.54	0.233	0.276	2-M2c	0.303	0.155	0.157	0.136	1.049	0.593
0.09	0.09	306.59	0.285	0.334	2-M2c	0.385	0.190	0.191	0.165	1.165	0.658
0.12	0.12	306.66	0.339	0.395	2-M2c	0.508	0.224	0.225	0.194	1.280	0.719
0.16	0.16	306.71	0.385	0.447	2-M2c	0.600	0.252	0.253	0.217	1.370	0.763
0.19	0.19	306.76	0.429	0.495	2-M2c	0.600	0.277	0.278	0.238	1.450	0.801
0.22	0.22	306.80	0.473	0.543	2-M2c	0.600	0.301	0.301	0.257	1.526	0.834
0.25	0.25	306.85	0.516	0.590	2-M2c	0.600	0.322	0.323	0.274	1.597	0.864
0.28	0.28	306.90	0.559	0.638	2-M2c	0.600	0.343	0.344	0.290	1.665	0.891
0.31	0.31	306.95	0.604	0.690	2-M2c	0.600	0.363	0.363	0.305	1.731	0.916

Site Data - 1349

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 m

Inlet Elevation: 306.26 m

Outlet Station: 15.00 m

Outlet Elevation: 306.24 m

Number of Barrels: 1

Culvert Data Summary - 1349

Barrel Shape: Circular

Barrel Diameter: 600.00 mm

Barrel Material: Corrugated Steel

Embedment: 0.00 mm

Barrel Manning's n: 0.0240

Inlet Type: Conventional

Inlet Edge Condition: Thin Edge Projecting

Inlet Depression: NONE

Roadway Data for Crossing: 1349

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 20.00 m

Crest Elevation: 307.26 m

Roadway Surface: Paved

Roadway Top Width: 8.50 m

Tailwater Channel Data - 1349

Tailwater Channel Option: Trapezoidal Channel

Bottom Width: 0.50 m

Side Slope (H:V): 2.00 (_:1)

Channel Slope: 0.0100

Channel Manning's n: 0.0350

Channel Invert Elevation: 306.24 m

Culvert Summary Table: 1348

Total Discharge (cms)	Culvert Discharge (cms)	Headwater Elevation (m)	Inlet Control Depth (m)	Outlet Control Depth (m)	Flow Type	Normal Depth (m)	Critical Depth (m)	Outlet Depth (m)	Tailwater Depth (m)	Outlet Velocity (m/s)	Tailwater Velocity (m/s)
0.00	0.00	306.47	0.000	0.0*	0-NF	0.000	0.000	0.000	0.000	0.000	0.000
0.07	0.07	306.76	0.250	0.294	2-M2c	0.332	0.167	0.169	0.146	1.090	0.616
0.14	0.14	306.90	0.366	0.426	2-M2c	0.600	0.241	0.241	0.208	1.334	0.745
0.17	0.17	306.94	0.407	0.472	2-M2c	0.600	0.264	0.265	0.228	1.410	0.782
0.28	0.28	307.12	0.566	0.648	2-M2c	0.600	0.346	0.347	0.292	1.676	0.896
0.35	0.35	307.26	0.672	0.787	7-M2c	0.600	0.389	0.390	0.325	1.826	0.949
0.43	0.43	307.43	0.792	0.958	7-M2c	0.600	0.427	0.428	0.354	1.975	0.995
0.50	0.50	307.62	0.930	1.152	7-M2c	0.600	0.460	0.462	0.381	2.129	1.035
0.57	0.57	307.84	1.092	1.366	7-M2c	0.600	0.489	0.491	0.405	2.292	1.071
0.64	0.64	308.08	1.280	1.606	7-M2c	0.600	0.512	0.516	0.427	2.472	1.104
0.71	0.71	308.33	1.496	1.864	7-M2c	0.600	0.535	0.536	0.448	2.665	1.134

Site Data - 1348

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 m

Inlet Elevation: 306.47 m

Outlet Station: 15.40 m

Outlet Elevation: 306.45 m

Number of Barrels: 1

Culvert Data Summary - 1348

Barrel Shape: Circular

Barrel Diameter: 600.00 mm

Barrel Material: Corrugated Steel

Embedment: 0.00 mm

Barrel Manning's n: 0.0240

Inlet Type: Conventional

Inlet Edge Condition: Thin Edge Projecting

Inlet Depression: NONE

Roadway Data for Crossing: 1348

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 20.00 m

Crest Elevation: 308.36 m

Roadway Surface: Paved

Roadway Top Width: 8.50 m

Tailwater Channel Data - 1348

Tailwater Channel Option: Trapezoidal Channel

Bottom Width: 0.50 m

Side Slope (H:V): 2.00 (_:1)

Channel Slope: 0.0100

Channel Manning's n: 0.0350

Channel Invert Elevation: 306.45 m

Culvert Summary Table: 1347

Total Discharge (cms)	Culvert Discharge (cms)	Headwater Elevation (m)	Inlet Control Depth (m)	Outlet Control Depth (m)	Flow Type	Normal Depth (m)	Critical Depth (m)	Outlet Depth (m)	Tailwater Depth (m)	Outlet Velocity (m/s)	Tailwater Velocity (m/s)
0.00	0.00	313.89	0.000	0.0*	0-NF	0.000	0.000	0.000	0.000	0.000	0.000
0.17	0.17	314.11	0.201	0.225	3-M1t	0.143	0.124	0.227	0.227	0.564	0.781
0.34	0.34	314.24	0.303	0.350	3-M1t	0.219	0.189	0.318	0.318	0.783	0.937
0.36	0.36	314.26	0.316	0.365	3-M1t	0.229	0.198	0.327	0.327	0.808	0.952
0.68	0.68	314.44	0.470	0.546	3-M1t	0.335	0.298	0.438	0.438	1.106	1.120
0.84	0.84	314.52	0.541	0.630	3-M1t	0.385	0.346	0.485	0.485	1.241	1.185
1.01	1.01	314.60	0.608	0.707	3-M1t	0.431	0.388	0.526	0.526	1.366	1.241
1.18	1.18	314.67	0.682	0.780	3-M1t	0.477	0.427	0.563	0.563	1.484	1.291
1.35	1.35	314.74	0.755	0.850	3-M1t	0.519	0.465	0.598	0.598	1.595	1.335
1.52	1.52	314.81	0.829	0.917	3-M1t	0.561	0.500	0.629	0.629	1.702	1.375
1.69	1.69	314.87	0.902	0.980	3-M1t	0.603	0.533	0.659	0.659	1.805	1.412

Site Data - 1347

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 m

Inlet Elevation: 313.59 m

Outlet Station: 33.60 m

Outlet Elevation: 313.13 m

Number of Barrels: 1

Culvert Data Summary - 1347

Barrel Shape: Circular

Barrel Diameter: 1500.00 mm

Barrel Material: Corrugated Steel

Embedment: 300.00 mm

Barrel Manning's n: 0.0240 (top and sides)

Manning's n: 0.0350 (bottom)

Inlet Type: Conventional

Inlet Edge Condition: Thin Edge Projecting

Inlet Depression: NONE

Roadway Data for Crossing: 1347

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 20.00 m

Crest Elevation: 318.85 m

Roadway Surface: Paved

Roadway Top Width: 8.50 m

Tailwater Channel Data - 1347

Tailwater Channel Option: Trapezoidal Channel

Bottom Width: 0.50 m

Side Slope (H:V): 2.00 (_:1)

Channel Slope: 0.0100

Channel Manning's n: 0.0350

Channel Invert Elevation: 313.43 m

Culvert Summary Table: 1346

Total Discharge (cms)	Culvert Discharge (cms)	Headwater Elevation (m)	Inlet Control Depth (m)	Outlet Control Depth (m)	Flow Type	Normal Depth (m)	Critical Depth (m)	Outlet Depth (m)	Tailwater Depth (m)	Outlet Velocity (m/s)	Tailwater Velocity (m/s)
0.00	0.00	320.58	0.000	0.0*	0-NF	0.000	0.000	0.000	0.000	0.000	0.000
0.14	0.14	321.01	0.355	0.428	2-M2c	0.600	0.235	0.235	0.203	1.313	0.735
0.27	0.27	321.24	0.547	0.657	2-M2c	0.600	0.337	0.338	0.285	1.645	0.884
0.29	0.29	321.28	0.575	0.700	2-M2c	0.600	0.350	0.351	0.295	1.689	0.900
0.54	0.54	322.06	1.025	1.480	7-M2c	0.600	0.480	0.480	0.396	2.226	1.057
0.68	0.61	322.34	1.195	1.756	7-M2c	0.600	0.502	0.506	0.438	2.391	1.119
0.81	0.61	322.35	1.205	1.773	7-M2c	0.600	0.503	0.507	0.476	2.401	1.172
0.95	0.62	322.37	1.214	1.787	7-M2t	0.600	0.504	0.510	0.510	2.402	1.219
1.08	0.62	322.38	1.220	1.798	7-M2t	0.600	0.505	0.541	0.541	2.300	1.261
1.22	0.62	322.39	1.216	1.809	7-M2t	0.600	0.505	0.570	0.570	2.219	1.299
1.35	0.61	322.40	1.212	1.819	7-M2t	0.600	0.504	0.597	0.597	2.174	1.334

Site Data - 1346

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 m

Inlet Elevation: 320.58 m

Outlet Station: 23.40 m

Outlet Elevation: 320.55 m

Number of Barrels: 1

Culvert Data Summary - 1346

Barrel Shape: Circular

Barrel Diameter: 600.00 mm

Barrel Material: Corrugated Steel

Embedment: 0.00 mm

Barrel Manning's n: 0.0240

Inlet Type: Conventional

Inlet Edge Condition: Thin Edge Projecting

Inlet Depression: NONE

Roadway Data for Crossing: 1346

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 20.00 m

Crest Elevation: 322.32 m

Roadway Surface: Paved

Roadway Top Width: 8.50 m

Tailwater Channel Data - 1346

Tailwater Channel Option: Trapezoidal Channel

Bottom Width: 0.50 m

Side Slope (H:V): 2.00 (_:1)

Channel Slope: 0.0100

Channel Manning's n: 0.0350

Channel Invert Elevation: 320.55 m

Culvert Summary Table: 1345

Total Discharge (cms)	Culvert Discharge (cms)	Headwater Elevation (m)	Inlet Control Depth (m)	Outlet Control Depth (m)	Flow Type	Normal Depth (m)	Critical Depth (m)	Outlet Depth (m)	Tailwater Depth (m)	Outlet Velocity (m/s)	Tailwater Velocity (m/s)
0.00	0.00	321.48	0.000	0.0*	0-NF	0.000	0.000	0.000	0.000	0.000	0.000
0.17	0.17	321.77	0.207	0.286	3-M2t	0.322	0.126	0.230	0.230	0.572	0.787
0.33	0.33	321.89	0.299	0.406	3-M2t	0.484	0.186	0.314	0.314	0.774	0.931
0.52	0.52	322.00	0.400	0.521	3-M2t	0.657	0.255	0.389	0.389	0.970	1.048
0.70	0.70	322.09	0.479	0.613	3-M2t	0.817	0.304	0.444	0.444	1.123	1.128
0.87	0.87	322.18	0.551	0.696	3-M2t	1.031	0.353	0.491	0.491	1.260	1.194
1.04	1.04	322.25	0.621	0.774	3-M2t	1.200	0.395	0.533	0.533	1.387	1.250
1.22	1.22	322.33	0.697	0.848	3-M2t	1.200	0.435	0.571	0.571	1.507	1.300
1.39	1.39	322.40	0.773	0.919	3-M2t	1.200	0.475	0.605	0.605	1.620	1.345
1.57	1.57	322.47	0.848	0.989	3-M2t	1.200	0.509	0.637	0.637	1.729	1.385
1.74	1.74	322.54	0.924	1.057	3-M2t	1.200	0.543	0.667	0.667	1.835	1.422

Site Data - 1345

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 m

Inlet Elevation: 321.18 m

Outlet Station: 19.60 m

Outlet Elevation: 321.16 m

Number of Barrels: 1

Culvert Data Summary - 1345

Barrel Shape: Circular

Barrel Diameter: 1500.00 mm

Barrel Material: Corrugated Steel

Embedment: 300.00 mm

Barrel Manning's n: 0.0240 (top and sides)

Manning's n: 0.0350 (bottom)

Inlet Type: Conventional

Inlet Edge Condition: Thin Edge Projecting

Inlet Depression: NONE

Roadway Data for Crossing: 1345

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 20.00 m

Crest Elevation: 324.53 m

Roadway Surface: Paved

Roadway Top Width: 8.50 m

Tailwater Channel Data - 1345

Tailwater Channel Option: Trapezoidal Channel

Bottom Width: 0.50 m

Side Slope (H:V): 2.00 (_:1)

Channel Slope: 0.0100

Channel Manning's n: 0.0350

Channel Invert Elevation: 321.46 m

Culvert Summary Table: 1344

Total Discharge (cms)	Culvert Discharge (cms)	Headwater Elevation (m)	Inlet Control Depth (m)	Outlet Control Depth (m)	Flow Type	Normal Depth (m)	Critical Depth (m)	Outlet Depth (m)	Tailwater Depth (m)	Outlet Velocity (m/s)	Tailwater Velocity (m/s)
0.00	0.00	321.80	0.000	0.0*	0-NF	0.000	0.000	0.000	0.000	0.000	0.000
0.02	0.02	321.94	0.127	0.142	2-M2c	0.084	0.084	0.088	0.073	0.773	0.424
0.04	0.04	321.98	0.184	0.0*	1-S2n	0.124	0.125	0.125	0.107	0.946	0.522
0.05	0.05	322.00	0.205	0.0*	1-S2n	0.138	0.138	0.138	0.121	1.008	0.557
0.08	0.08	322.06	0.263	0.0*	1-S2n	0.178	0.179	0.178	0.155	1.140	0.637
0.10	0.10	322.10	0.296	0.0*	1-S2n	0.198	0.200	0.199	0.174	1.214	0.678
0.12	0.12	322.13	0.328	0.0*	1-S2n	0.219	0.220	0.219	0.191	1.279	0.712
0.14	0.14	322.16	0.359	0.0*	1-S2n	0.239	0.240	0.239	0.207	1.330	0.742
0.16	0.16	322.24	0.388	0.440	2-M2c	0.257	0.256	0.257	0.221	1.383	0.770
0.18	0.18	322.27	0.417	0.471	2-M2c	0.274	0.272	0.273	0.234	1.435	0.794
0.20	0.20	322.30	0.445	0.498	2-M2c	0.292	0.288	0.289	0.247	1.485	0.817

Site Data - 1344

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 m

Inlet Elevation: 321.80 m

Outlet Station: 32.40 m

Outlet Elevation: 321.29 m

Number of Barrels: 1

Culvert Data Summary - 1344

Barrel Shape: Circular

Barrel Diameter: 600.00 mm

Barrel Material: Corrugated Steel

Embedment: 0.00 mm

Barrel Manning's n: 0.0240

Inlet Type: Conventional

Inlet Edge Condition: Thin Edge Projecting

Inlet Depression: NONE

Roadway Data for Crossing: 1344

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 20.00 m

Crest Elevation: 322.87 m

Roadway Surface: Paved

Roadway Top Width: 8.50 m

Tailwater Channel Data - 1344

Tailwater Channel Option: Trapezoidal Channel

Bottom Width: 0.50 m

Side Slope (H:V): 2.00 (_:1)

Channel Slope: 0.0100

Channel Manning's n: 0.0350

Channel Invert Elevation: 321.29 m

Culvert Summary Table: N1

Total Discharge (cms)	Culvert Discharge (cms)	Headwater Elevation (m)	Inlet Control Depth (m)	Outlet Control Depth (m)	Flow Type	Normal Depth (m)	Critical Depth (m)	Outlet Depth (m)	Tailwater Depth (m)	Outlet Velocity (m/s)	Tailwater Velocity (m/s)
0.00	0.00	324.40	0.000	0.0*	0-NF	0.000	0.000	0.000	0.000	0.000	0.000
0.11	0.11	324.76	0.319	0.360	2-M2c	0.221	0.214	0.215	0.186	1.248	0.702
0.23	0.23	324.92	0.484	0.525	2-M2c	0.330	0.309	0.309	0.263	1.551	0.845
0.27	0.27	324.98	0.543	0.582	2-M2c	0.368	0.337	0.338	0.285	1.645	0.884
0.46	0.46	325.25	0.844	0.854	7-M2c	0.600	0.441	0.443	0.366	2.039	1.012
0.57	0.57	325.63	1.093	1.234	7-M2c	0.600	0.490	0.492	0.406	2.297	1.072
0.68	0.68	326.08	1.410	1.678	7-M2c	0.600	0.527	0.530	0.441	2.587	1.123
0.80	0.70	326.14	1.457	1.741	7-M2c	0.600	0.532	0.533	0.473	2.634	1.168
0.91	0.70	326.15	1.468	1.754	7-M2c	0.600	0.533	0.534	0.502	2.643	1.208
1.03	0.71	326.17	1.476	1.766	7-M2c	0.600	0.534	0.534	0.529	2.651	1.245
1.14	0.71	326.18	1.486	1.775	7-M2t	0.600	0.535	0.554	0.554	2.595	1.279

Site Data - N1

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 m

Inlet Elevation: 324.40 m

Outlet Station: 19.00 m

Outlet Elevation: 324.14 m

Number of Barrels: 1

Culvert Data Summary - N1

Barrel Shape: Circular

Barrel Diameter: 600.00 mm

Barrel Material: Corrugated Steel

Embedment: 0.00 mm

Barrel Manning's n: 0.0240

Inlet Type: Conventional

Inlet Edge Condition: Thin Edge Projecting

Inlet Depression: NONE

Roadway Data for Crossing: N1

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 20.00 m

Crest Elevation: 326.12 m

Roadway Surface: Paved

Roadway Top Width: 8.50 m

Tailwater Channel Data - N1

Tailwater Channel Option: Trapezoidal Channel

Bottom Width: 0.50 m

Side Slope (H:V): 2.00 (_:1)

Channel Slope: 0.0100

Channel Manning's n: 0.0350

Channel Invert Elevation: 324.14 m

Culvert Summary Table: N2

Total Discharge (cms)	Culvert Discharge (cms)	Headwater Elevation (m)	Inlet Control Depth (m)	Outlet Control Depth (m)	Flow Type	Normal Depth (m)	Critical Depth (m)	Outlet Depth (m)	Tailwater Depth (m)	Outlet Velocity (m/s)	Tailwater Velocity (m/s)
0.00	0.00	331.22	0.000	0.0*	0-NF	0.000	0.000	0.000	0.000	0.000	0.000
0.02	0.02	331.39	0.167	0.156	2-M2c	0.188	0.075	0.079	0.064	0.704	0.395
0.03	0.03	331.43	0.164	0.211	2-M2c	0.274	0.110	0.112	0.095	0.876	0.489
0.05	0.05	331.48	0.204	0.256	2-M2c	0.350	0.136	0.138	0.118	0.977	0.551
0.05	0.05	331.48	0.208	0.259	2-M2c	0.360	0.138	0.141	0.121	0.988	0.557
0.08	0.08	331.55	0.267	0.329	2-M2c	0.600	0.179	0.179	0.155	1.127	0.637
0.10	0.10	331.58	0.294	0.361	2-M2c	0.600	0.196	0.197	0.170	1.187	0.670
0.11	0.11	331.61	0.320	0.391	2-M2c	0.600	0.212	0.214	0.184	1.242	0.699
0.13	0.13	331.64	0.345	0.419	2-M2c	0.600	0.228	0.229	0.197	1.292	0.725
0.14	0.14	331.67	0.369	0.447	2-M2c	0.600	0.243	0.243	0.209	1.340	0.748
0.16	0.16	331.69	0.393	0.474	2-M2c	0.600	0.256	0.257	0.221	1.383	0.770

Site Data - N2

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 m

Inlet Elevation: 331.22 m

Outlet Station: 20.00 m

Outlet Elevation: 331.21 m

Number of Barrels: 1

Culvert Data Summary - N2

Barrel Shape: Circular

Barrel Diameter: 600.00 mm

Barrel Material: Corrugated Steel

Embedment: 0.00 mm

Barrel Manning's n: 0.0240

Inlet Type: Conventional

Inlet Edge Condition: Thin Edge Projecting

Inlet Depression: NONE

Roadway Data for Crossing: N2

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 20.00 m

Crest Elevation: 333.26 m

Roadway Surface: Paved

Roadway Top Width: 8.50 m

Tailwater Channel Data - N2

Tailwater Channel Option: Trapezoidal Channel

Bottom Width: 0.50 m

Side Slope (H:V): 2.00 (_:1)

Channel Slope: 0.0100

Channel Manning's n: 0.0350

Channel Invert Elevation: 331.21 m

Culvert Summary Table: N3

Total Discharge (cms)	Culvert Discharge (cms)	Headwater Elevation (m)	Inlet Control Depth (m)	Outlet Control Depth (m)	Flow Type	Normal Depth (m)	Critical Depth (m)	Outlet Depth (m)	Tailwater Depth (m)	Outlet Velocity (m/s)	Tailwater Velocity (m/s)
0.00	0.00	296.52	0.000	0.0*	0-NF	0.000	0.000	0.000	0.000	0.000	0.000
7.92	7.92	297.62	1.067	1.101	3-M1t	0.643	0.624	0.890	0.890	1.728	1.906
11.72	11.72	297.92	1.373	1.403	3-M1t	0.833	0.810	1.068	1.068	2.132	2.110
23.77	23.77	298.74	2.202	2.225	7-M1t	1.346	1.297	1.468	1.468	3.145	2.529
31.69	31.69	299.28	2.759	2.710	7-M1t	1.649	1.572	1.665	1.665	3.696	2.721
39.61	39.61	299.93	3.407	3.155	3-M2t	2.100	1.824	1.834	1.834	4.194	2.879
47.53	47.53	300.71	4.188	3.610	7-M2c	2.100	2.059	2.054	1.983	4.493	3.015
55.45	55.45	301.64	5.120	4.199	4-FFf	2.100	2.100	2.100	2.118	5.128	3.135
63.38	63.38	302.73	6.211	4.972	4-FFf	2.100	2.100	2.100	2.241	5.860	3.242
71.30	65.49	303.07	6.551	5.274	4-FFf	2.100	2.100	2.100	2.355	6.055	3.340
79.22	66.71	303.28	6.759	5.492	4-FFf	2.100	2.100	2.100	2.462	6.169	3.429

Site Data - N3

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 m

Inlet Elevation: 296.52 m

Outlet Station: 20.20 m

Outlet Elevation: 296.48 m

Number of Barrels: 1

Culvert Data Summary - N3

Barrel Shape: Concrete Box

Barrel Span: 5150.00 mm

Barrel Rise: 2100.00 mm

Barrel Material: Concrete

Embedment: 0.00 mm

Barrel Manning's n: 0.0120

Inlet Type: Conventional

Inlet Edge Condition: Square Edge (90º) Headwall

Inlet Depression: NONE

Roadway Data for Crossing: N3

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 20.00 m

Crest Elevation: 302.76 m

Roadway Surface: Paved

Roadway Top Width: 8.50 m

Tailwater Channel Data - N3

Tailwater Channel Option: Trapezoidal Channel

Bottom Width: 2.00 m

Side Slope (H:V): 3.00 (_:1)

Channel Slope: 0.0100

Channel Manning's n: 0.0350

Channel Invert Elevation: 296.48 m

Appendix F

Wet Swale Design Calculations

Project Name: Gore Road Improvements
Project No: MTB019424
Location: Town of Caledon
Designer: Chris Proctor
Date: 3-Feb-12
Date Modified: 7-Feb-12

Drainage width	10 m
25mm Unit Flow	0.08 $m^3/s/ha$
100-year Unit Flow	0.27 $m^3/s/ha$
Manning's 'n'	0.040
Water Quality Volume	60 m^3/ha

Wet Swale Design

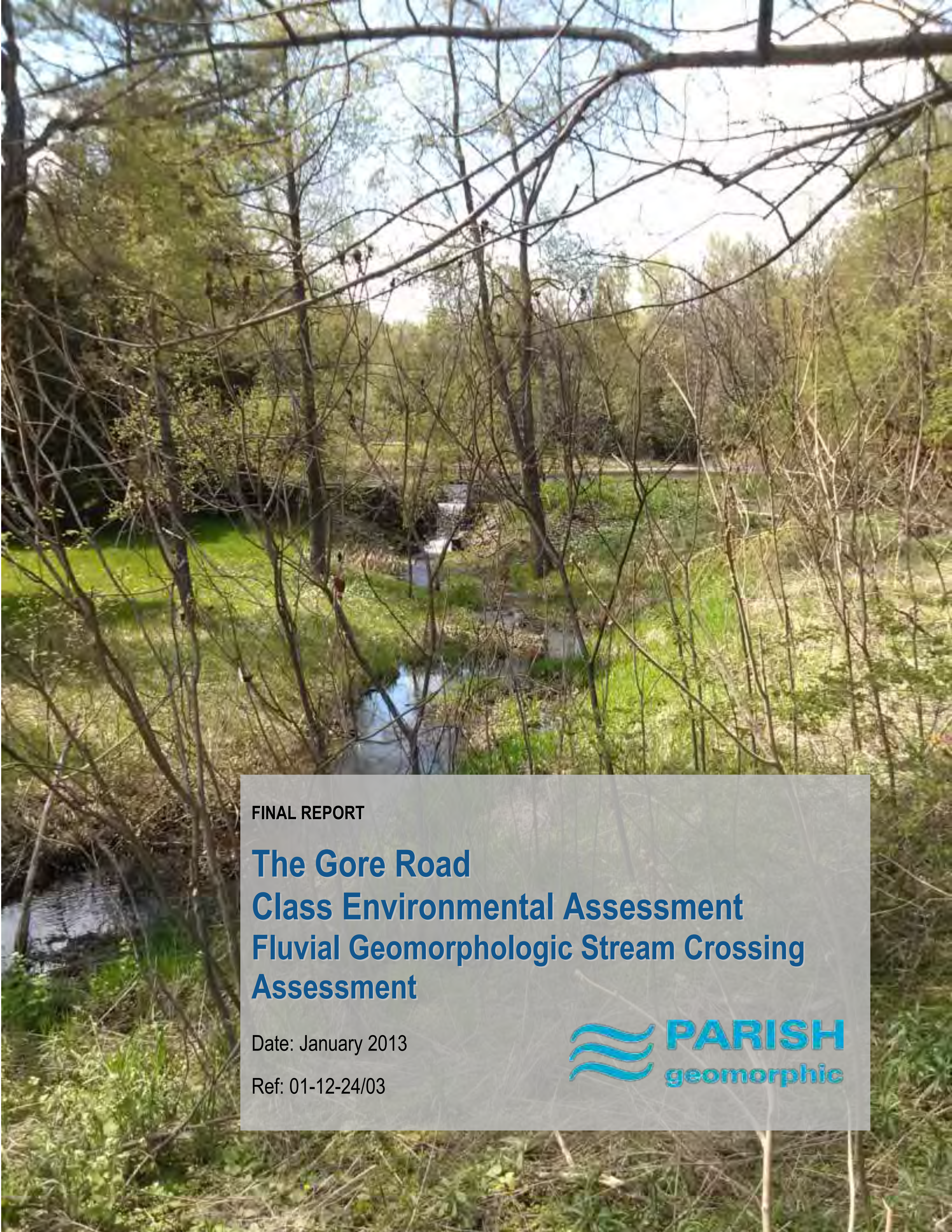
Crossing	Swale Location	Station		Swale Length (m)	Contributing Area (ha)	Road Slope (%)	Flow (m^3/s)	Storage Volume Required (m^3)	Check Dam Height (m)	Swale Dimensions						Number of Dams Required	Dam Spacing (m)	Storage Volume Provided (m^3)
		From	To				25mm			Length(m)	Width(m)	Depth(m)	Side Slope	Velocity (m/s)	Volume(m^3) per Dam			
1345	NE	5544	5128	416	0.416	6.25	0.033	25.0	0.6	416	0.75	0.043	2	0.71	5.6	5	83	28
	NW	5544	5128	416	0.416	6.25	0.033	25.0	0.6	416	0.75	0.043	2	0.71	5.6	5	83	28
	SE	4926	5128	202	0.202	1.75	0.016	12.1	0.6	202	0.75	0.041	2	0.36	20.1	1	202	20
	SW	4926	5128	202	0.202	1.75	0.016	12.1	0.6	202	0.75	0.041	2	0.36	20.1	1	202	20
N1	NE	4926	4734	192	0.192	1.01	0.015	11.5	0.6	192	0.75	0.046	2	0.30	34.8	1	192	35
	NW	4926	4734	192	0.192	1.01	0.015	11.5	0.6	192	0.75	0.046	2	0.30	34.8	1	192	35
	SE	4360	4734	374	0.374	2.71	0.030	22.4	0.6	374	0.75	0.051	2	0.52	13.0	2	187	26
	SW	4360	4734	374	0.374	2.71	0.030	22.4	0.6	374	0.75	0.051	2	0.52	13.0	2	187	26
N2	SE	4360	4459	99	0.099	2.71	0.008	5.9	0.6	99	0.75	0.023	2	0.32	13.0	1	99	13
	SW	4360	4459	99	0.099	2.71	0.008	5.9	0.6	99	0.75	0.023	2	0.32	13.0	1	99	13
1346	NE	4360	4051	309	0.309	7.52	0.025	18.5	0.6	309	0.75	0.034	2	0.67	4.7	4	77	19
	NW	4360	4051	309	0.309	7.52	0.025	18.5	0.6	309	0.75	0.034	2	0.67	4.7	4	77	19
	SE	3940	4051	111	0.111	1.98	0.009	6.7	0.6	111	0.75	0.028	2	0.30	17.7	1	111	18
	SW	3940	4051	111	0.111	1.98	0.009	6.7	0.6	111	0.75	0.028	2	0.31	17.7	1	111	18
1347	NE	3780	3572	208	0.208	4.82	0.017	12.5	0.6	208	0.75	0.031	2	0.51	7.3	2	104	15
	NW	3780	3572	208	0.208	4.82	0.017	12.5	0.6	208	0.75	0.031	2	0.51	7.3	2	104	15
N3	NE	3290	2890	400	0.4	4.60	0.032	24.0	0.6	400	0.75	0.046	2	0.63	7.6	4	100	31
	NW	3290	2890	400	0.4	4.60	0.032	24.0	0.6	400	0.75	0.046	2	0.63	7.6	4	100	31
	SE	2630	2890	260	0.26	7.55	0.021	15.6	0.6	260	0.75	0.031	2	0.63	4.6	4	65	19
	SW	2630	2890	260	0.26	7.55	0.021	15.6	0.6	260	0.75	0.031	2	0.63	4.6	4	65	19
1348	NE	2630	2448	182	0.182	3.46	0.015	10.9	0.6	182	0.75	0.031	2	0.43	10.1	2	91	20
	NW	2630	2448	182	0.182	3.46	0.015	10.9	0.6	182	0.75	0.031	2	0.43	10.1	2	91	20
1349	NE	2630	2338	292	0.292	3.46	0.023	17.5	0.6	292	0.75	0.041	2	0.51	10.1	2	146	20
	NW	2630	2338	292	0.292	3.46	0.023	17.5	0.6	292	0.75	0.041	2	0.51	10.1	2	146	20
	SE	1980	2338	358	0.358	6.17	0.029	21.5	0.6	358	0.75	0.039	2	0.67	5.7	4	90	23
	SW	1980	2338	358	0.358	6.17	0.029	21.5	0.6	358	0.75	0.039	2	0.67	5.7	4	90	23
1350	SE	1980	2199	219	0.219	6.17	0.018	13.1	0.6	219	0.75	0.029	2	0.56	5.7	3	73	17
	SW	1980	2199	219	0.219	6.17	0.018	13.1	0.6	219	0.75	0.029	2	0.55	5.7	3	73	17
1351	NE	1980	1558	422	0.422	4.74	0.034	25.3	0.6	422	0.75	0.047	2	0.65	7.4	4	106	30
	NW	1980	1558	422	0.422	4.74	0.034	25.3	0.6	422	0.75	0.047	2	0.65	7.4	4	106	30
	SE	1350	1558	208	0.208	4.13	0.017	12.5	0.6	208	0.75	0.032	2	0.48	8.5	2	104	17
	SW	1350	1558	208	0.208	4.13	0.017	12.5	0.6	208	0.75	0.032	2	0.48	8.5	2	104	17
1352	NE	1350	1190	160	0.16	4.18	0.013	9.6	0.6	160	0.75	0.027	2	0.44	8.4	2	80	17
	NW	1350	1190	160	0.16	4.18	0.013	9.6	0.6	160	0.75	0.027	2	0.44	8.4	2	80	17
	SE	970	1190	220	0.22	2.94	0.018	13.2	0.6	220	0.75	0.037	2	0.44	11.9	2	110	24
	SW	970	1190	220	0.22	2.94	0.018	13.2	0.6	220	0.75	0.037	2	0.44	11.9	2	110	24
1353	NE	970	819	151	0.151	3.91	0.012	9.1	0.6	151	0.75	0.027	2	0.42	9.0	2	76	18
	NW	970	819	151	0.151	3.91	0.012	9.1	0.6	151	0.75	0.027	2	0.42	9.0	2	76	18
	SE	610	819	209	0.209	0.25	0.017	12.5	0.6	209	0.75	0.074	2	0.19	140.4	1	209	140
	SW	610	819	209	0.209	0.25	0.017	12.5	0.6	209	0.75	0.074	2	0.19	140.4	1	209	140
1354	SE	610	690	80	0.08	0.25	0.006	4.8	0.6	80	0.75	0.042	2	0.14	140.4	1	80	140
	SW	610	690	80	0.08	0.25	0.006	4.8	0.6	80	0.75	0.042	2	0.14	140.4	1	80	140
1355	NE	610	428	182	0.182	3.60	0.015	10.9	0.6	182	0.75	0.031	2	0.44	9.8	2	91	20
	NW	610	428	182	0.182	3.60	0.015	10.9	0.6	182	0.75	0.031	2	0.44	9.8	2	91	20
	SE	200	428	228	0.228	4.33	0.018	13.7	0.6	228	0.75	0.033	2	0.51	8.1	2	114	16
	SW	200	428	228	0.228	4.33	0.018	13.7	0.6	228	0.75	0.033	2	0.50	8.1	2	114	16
1356	NE	200	22	178	0.178	2.58	0.014	10.7	0.6	178	0.75	0.034	2	0.39	13.6	1	178	14
	NW	200	22	178	0.178	2.58	0.014	10.7	0.6	178	0.75	0.040	2	0.44	13.6	1	178	14

BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

Appendix G

Fluvial Geomorphologic Stream Crossing Assessment



FINAL REPORT

The Gore Road Class Environmental Assessment

Fluvial Geomorphologic Stream Crossing Assessment

Date: January 2013

Ref: 01-12-24/03

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Reference:	01-12-24/03

Drafted by:	John McDonald, M.Sc.
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Date checked:	January 10, 2013
Approved by:	John Parish P.Geo
Date of approval:	January 14, 2013

Contents

1. Introduction

The Region of Peel has retained R.J. Burnside & Associates to undertake a Schedule "B" Class Environmental Assessment (EA) Study. The study evaluates existing conditions and identifies potential improvements to The Gore Road between Highway 9 and Patterson Side Road in the Town of Caledon, ON. PARISH Geomorphic Ltd. has been retained by R.J. Burnside & Associates to provide geomorphological input into their Stormwater Management Report for this study which addresses the hydrologic and hydraulic considerations for the watercourse crossings along The Gore Road between Highway 9 and Patterson Side Road.

1.1 Study Area

The drainage network surrounding The Gore Road between Highway 9 and Patterson Sideroad contributes flow to the main branch of the Humber River. There are 16 culvert crossings within this corridor **(Figure 1.1)**. Of these crossings, 7 have undergone fluvial geomorphological investigation (Crossing #: 2, 6, 7, 12, 13, 15, 16).

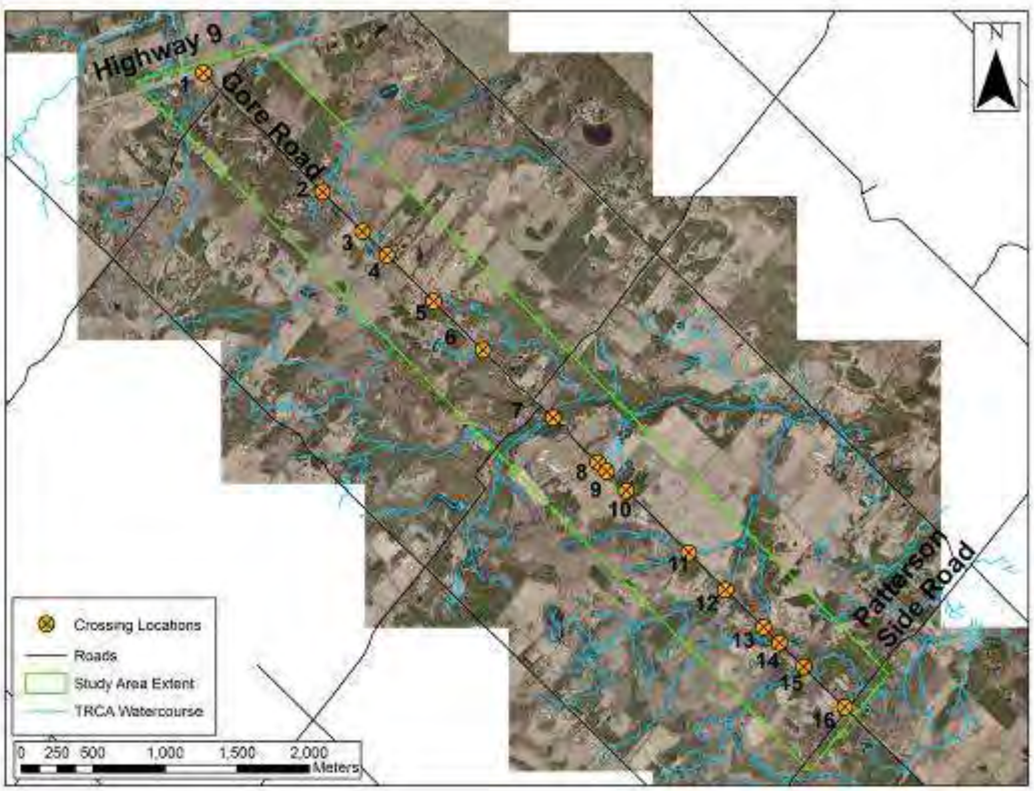

Figure 1.1: Extent of the study area – The Gore Road from Highway 9 to Patterson Sideroad. These crossing ID labels were used by PGL in this study.

1.2 Aims and Objectives

Watercourse crossings are typically evaluated according to a risk-based approach which collectively reviews geomorphic conditions within the vicinity of each crossing and identifies risks associated with the placement, sizing and structure type at each location. In order to evaluate each of the seven watercourse crossings and estimate appropriate structure sizes, the following tasks were completed:

- Collect and review pertinent background information, including topographic mapping, historic aerial images, and previous reports;
- Delineate the meander belt width based on existing and historical planform and empirical relations;
- Complete field-truthing to verify existing conditions;
- Provide comments and recommendations relating to the location, size and configuration of the road crossing for the improvements to The Gore Road using a risk-based approach.

2. Background Review

R.J. Burnside was retained by the Region of Peel to undertake a Schedule “B” Class Environmental Assessment to document existing conditions and to identify potential improvements to The Gore Road between Highway 9 and Patterson Sideroad in the Town of Caledon. A component of this study was the completion of a detailed hydrologic and hydraulic assessment for all culvert crossings within the study corridor. A stormwater management report was prepared to address conveyance, water quality and flooding with the existing culvert crossings and to identify potential hydraulic improvements within the study area.

This report documented that road runoff is conveyed primarily through grass-lined ditches on the east and west sides of The Gore Road. Due to the gently rolling topography, as well as the number of wetlands and watercourses (intermittent swales, creeks, etc.), stormwater flow is conveyed in an easterly pattern consistent with the overall drainage pattern of the geographic area. As such, a detailed hydrologic and hydraulic assessment for the existing Gore Road culvert crossings was completed, and issues of conveyance, water quality and flooding with the existing culvert crossings as well as identifying potential hydraulic improvements within the study area were addressed in this report. As a result of this analysis, it was determined that the majority of the crossing structures will need to be removed and replaced to meet the minimum design criteria. A summary of the existing crossings is provided in **Table 2.1**.

Table 2.1: Summary of existing culvert crossings within the study.

Peel Culvert ID	Station	Culvert Description	Current Length (m)
1356	0+022	1000mm Ø CSP	15.6
1355	0+428	1000mm Ø CSP	17.0
1354	0+690	400mm Ø CSP	13.8
1353	0+819	700mm Ø CSP	14.1
1352	1+190	800mm Ø CSP	15.1
1351	1+558	800x500mm Elliptical	18.0
1350	2+199	460mm Ø CSP	17.4
1349	2+338	460mm Ø CSP	12.5
1348	2+448	400mm Ø CSP	14.4
N3	2+890	5150x2100mm Concrete Box	20.2
1347	3+572	600mm Ø CSP	25.6
1346	4+051	600mm Ø CSP	23.4
N2	4+459	500mm Ø CSP	18.5
N1	4+734	400mm Ø CSP	15.0
1345	5+128	500mm Ø CSP	17.6
1344	6+307	400mm Ø CSP	32.4

As part of the stormwater management work, an Aquatic Conditions assessment of 10 culvert crossings was also completed to determine the potential for fish habitat, assess available aquatic habitat, potential impacts based on design/construction, and determine suitable mitigation measures. Of these crossings, four (Culvert #1345, N3, 1352, and 1355) are permanent watercourses with direct fish habitat and six (Culvert #N1, 1346, 1347, 1351, 1353, and 1354) are seasonally-flowing watercourses providing indirect habitat. Existing aquatic conditions were determined based on available habitat, morphology, fish presence, surrounding land uses and anthropogenic inputs. A summary of aquatic conditions noted at these crossings, as well as any culvert issues that were identified, is provided in **Table 2.2.**

Table 2.2 – Summary of aquatic and fish habitat conditions within the study area (From field visit with Toronto and Region Conservation Authority).

Peel Region ID	Flow Regime	Fish Habitat	Identified Culvert Issues
1355	Permanent	Direct	Seasonal fish passage barrier
1354	Ephemeral	Indirect	Culvert inundated with soil, may be causing upstream ponding during high flows
1353	Ephemeral	Indirect	Culvert inundated with soil, may be causing upstream ponding during high flows
1352	Permanent	Direct	Seasonal fish passage barrier
1351	Ephemeral	Indirect	None
N3	Permanent	Direct	Possible seasonal fish passage barrier
1347	Ephemeral	Possible Direct	None
1346	Ephemeral	Indirect	Culvert elevation has caused upstream ponding, but has promoted amphibian breeding habitat
N1	Ephemeral	Indirect	None
1345	Permanent	Direct	Fish passage barrier (perched)

3. Reach Delineation

In order to characterize the geomorphological form and function of watercourses upstream and downstream of The Gore Road between Highway 9 and Patterson Side Road, the channels are partitioned into reaches.

Reaches are lengths of channel that display similar valley setting, channel planform, floodplain materials, and land-use/cover. Reach length will vary with channel scale since the morphology of low-order watercourse will vary over a smaller distance than those of higher-order watercourse. At the reach scale, characteristics of the stream corridor exert a direct influence on channel form, function and processes.

A total of 14 study reaches were delineated for 7 crossings within The Gore Road study corridor. Some of these reaches traverse the road in order to characterize geomorphic conditions within vicinity of the crossing structures. These reaches are primarily based on land-use and hydrologic controls (i.e. ponds and confluence with higher order channels). Furthermore, reach designation and subsequent work were limited by entry permissions from property owners. **Figures 3.1 and 3.2** display the 16 crossings within the study area, as well as reach delineations. Detail including reach labels can be seen in **Appendix A**. Watercourses in these maps were not verified to be correct in the field. Therefore reach breaks are in approximate locations when compared to the actual position of the channel.

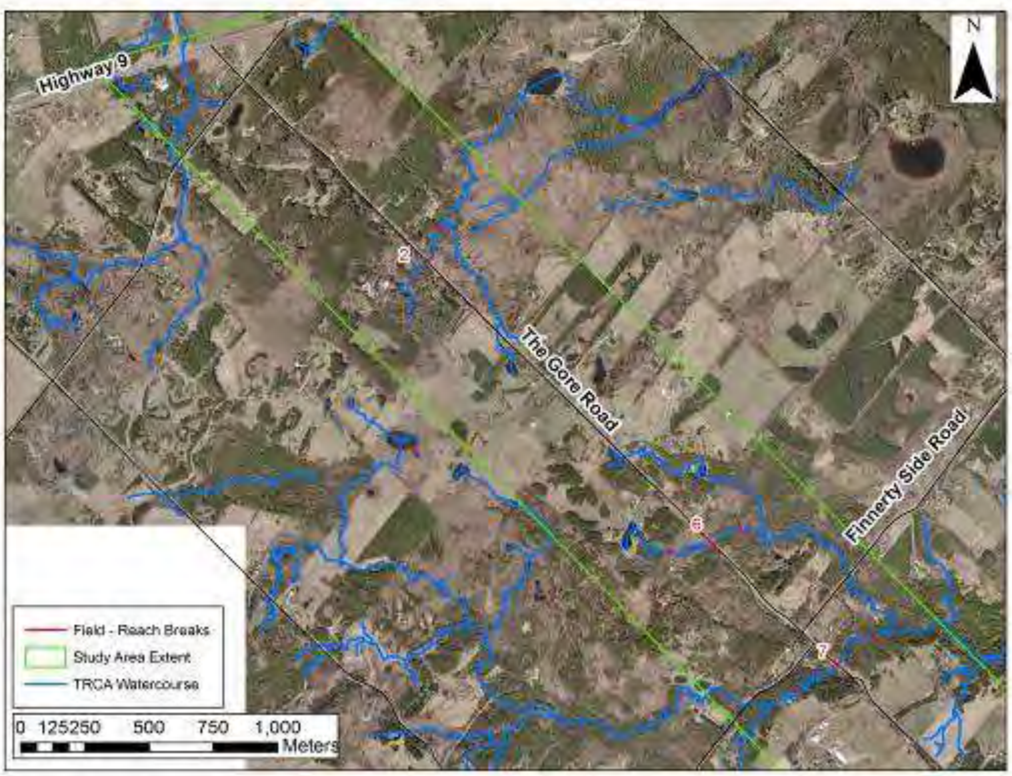

Figure 3.1: Delineated reaches for watercourses within the study area (Crossings 2, 6, and 7).

Figure 3.2: Delineated reaches for watercourses within the study area (Crossings 12, 13, 15, and 16).

4. Historical Assessment

4.1 Migration Rate Analysis

River and stream systems are dynamic landscape features. Over time, their configuration and position within the floodplain changes as a result of meander evolution, development and migration processes. These lateral and down-valley planform adjustments are typically quantified over a 100-year period by means of a migration rate analysis. These 100-year erosion rates are determined by measuring the distance from known control points to a governing meander bend over the available historical record.

Due to issues with channel scale and degree of riparian cover, the calculation of accurate migration rates is not always feasible. In such cases, historic planform overlays can provide further understanding of the degree of relative planform adjustment as well as disparity between analyzed images. In this study, available historical photos did not provide sufficient coverage of the entire study area and the size of these low-order streams and obstruction from woodlots made channel identification difficult. Therefore, a migration rate analysis could not be completed.

4.2 Historic Land Use

Although available historical photos from 1954 did not cover the entire study area, patterns of land use change are apparent. In 1954, the primary land use was agriculture, as it remains today. But changes include the development of ponds on private property and planting of woodlots. It is also apparent that the number of dwellings along The Gore Road and the surrounding area has increased.

5. Field Reconnaissance – Existing Conditions

In order to provide insight regarding existing geomorphic conditions and document any evidence of active erosion, site visits were conducted in November of 2012. During the visit, channel conditions along the study reaches were evaluated using two established synoptic surveys: the Rapid Geomorphic Assessment (RGA) and Rapid Stream Assessment Technique (RSAT).

5.1 Rapid Geomorphic Assessment

The Rapid Geomorphic Assessment (RGA) was designed by the Ontario Ministry of Environment (2003) to assess reaches in rural and urban channels. This qualitative technique documents indicators of channel instability. Observations are quantified using an index that identifies channel sensitivity based on the presence or absence of evidence of aggradation, degradation, channel widening, and planimetric adjustment. Examples of these include the presence of bar forms, exposed infrastructure, head cutting due to knick point migration, fallen or leaning trees and exposed tree roots, channel scour along the bank toe, transition of the channel from single thread to multiple thread, and cut-off channels. Overall, the index produces values that indicate whether the channel is stable/in regime (score ≤0.20), stressed/transitional (score 0.21-0.40), or adjusting (score ≥0.40) (**Table 5.1**).

Table 5.1: RGA Classification

Factor Value	***Classification***	***Interpretation***
≤0.20	In Regime or Stable (Least Sensitive)	The channel morphology is within a range of variance for streams of similar hydrographic characteristics – evidence of instability is isolated or associated with normal river meander propagation processes
0.21-0.40	Transitional or Stressed (Moderately Sensitive)	Channel morphology is within the range of variance for streams of similar hydrographic characteristics but the evidence of instability is frequent
≥0.41	In Adjustment (Most Sensitive)	Channel morphology is not within the range of variance and evidence of instability is wide spread

5.2 Rapid Stream Assessment Technique

The Rapid Stream Assessment Technique (RSAT) was developed by John Galli at the Metropolitan Washington Council of Governments (Galli, 1996). The RSAT provides a more qualitative and broader assessment of the overall health and functions of a reach. This system integrates visual estimates of channel conditions and numerical scoring of stream parameters using six categories: channel stability, erosion and deposition, instream habitat, water quality, riparian conditions, and biological indicators. Once a condition has been assigned a score, these scores are totaled to produce an overall rating that is based on a 50 point scoring system, divided into three classes: low (<20), moderate (20-35), and high (>35).

While the RSAT scores streams from a more biological and water quality perspective than the RGA, this information is also of relevance within a geomorphic context. This is based on the fundamental notion that, in general, the types of physical features that generate good fish habitat tend to represent good geomorphology as well (i.e., fish prefer a variety of physical conditions – pools provide resting areas while riffles provide feeding areas and contribute oxygen to the water – good riparian conditions provide shade and food – woody debris and overhanging banks provide shade). Additionally, the RSAT approach includes semi-quantitative measures of bankfull dimensions, type of substrate, vegetative cover, and channel disturbance.

5.3 RGA/RSAT Results

The degree of observed stability throughout the study area was relative to channel scale or hydrologic order. Reaches G2-1 and G6-1 were *undefined* in terms of channel dimensions and morphology. These reaches were observed as marshes or wetlands. Reach G2-1 was located within a marshy area that contained multiple pathways for drainage, none of which could be defined as a channel. Reach 6-1 was identified as wetland habitat with a large wetland pond located 5m upstream of the culvert. Rapid Assessments were not applicable at these sites. Of the more defined sections, three reaches produced RGA scores indicating stability concerns. **Reach G7-1 was rated as 'in adjustment' (0.45) and reaches G7-2, G2-2 and G15-3 were scored as high-transitional (0.4, 0.37 and 0.37 respectively).** Widening was consistently observed as the dominant geomorphic process occurring throughout each. Remaining reaches are of less concern in terms of stability and scored as low-transitional or in regime/stable. RSAT scores indicate that overall these channels are of moderate stream health. A complete summary of the RGA and RSAT results is provided in **Tables 5.2 and 5.3**, respectively. Photos from the reach walks are available in **Appendix B**.

Table 5.2: Summary of RGA results for West Humber River Tributaries crossing The Gore Road between Patterson Side Road and Highway 9.

Reach	Factor Value				Stability Index	Condition
	Aggradation	Degradation	Widening	Planimetric Adjustment		
G2-1	n/a	n/a	n/a	n/a	n/a	(wetland)
G2-2	0.44	0.43	0.63	0.00	0.37	Transitional
G6-1	n/a	n/a	n/a	n/a	n/a	(wetland)
G6-2	0.00	0.00	0.25	0.00	0.06	In Regime
G7-1	0.33	0.29	0.75	0.43	0.45	In Adjustment
G7-2	0.44	0.29	0.88	0.00	0.40	Transitional
G12-1	0.33	0.29	0.63	0.00	0.31	Transitional
G12-2	0.53	0.00	0.00	0.00	0.14	In Regime
G13-1	0.56	0.29	0.00	0.29	0.28	Transitional
G13-2	0.44	0.29	0.50	0.00	0.31	Transitional
G15-1	0.33	0.14	0.25	0.00	0.18	In Regime
G15-2	0.11	0.00	0.13	0.00	0.06	In Regime
G15-3	0.56	0.29	0.63	0.00	0.37	Transitional
G16-1	0.11	0.00	0.00	0.00	0.03	In Regime

Table 5.3: Summary of RSAT results for West Humber River Tributaries crossing The Gore Road between Patterson Side Road and Highway 9.

Reach	Factor Value						Overall Score	Condition
	Channel stability	Scour / deposition	Instream Habitat	Water Quality	Riparian Condition	Biological Indicators		
Max. Score	**11**	**8**	**8**	**8**	**7**	**8**	**50**	
G2-1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	(marsh/wetland)
G2-2	5	5	4	6	6	3	29	Moderate
G6-1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	(wetland)
G6-2	6	5	2	2	5	2	22	Moderate
G7-1	3	4	6	6	5	5	29	Moderate
G7-2	4	6	6	6	5	4	31	Moderate
G12-1	6	6	6	6	5	5	34	Moderate
G12-2	6	3	2	3	4	2	20	Moderate
G13-1	6	4	4	4	5	4	27	Moderate
G13-2	5	4	5	5	4	4	27	Moderate
G15-1	6	6	2	4	5	2	25	Moderate
G15-2	5	4	4	5	5	5	28	Moderate
G15-3	5	4	4	5	5	5	28	Moderate
G16-1	6	4	4	5	4	3	26	Moderate

6. Meander Belt Width

The contour information and aerial imagery available for this study were insufficient for the initial mapping exercises typically carried out as a part of the belt width delineation procedure. Historical air photographs from 1954 did not cover the entire study area, and although recent (2011) ortho-imagery was provided, the scale of the channel coupled with obstruction by woodlots rendered them ineffective for desktop analysis. Furthermore, existing watercourse shapefiles from TRCA and OBM were not verifiable in the field and only provide an approximation of the channel position.

Typically, a preliminary meander belt width is delineated for the reaches in the vicinity of the subject crossing locations. First, a meander belt axis is identified, following the general down-valley orientation of the meander pattern. The meander belt is essentially centered along the meander axis. Second, the preliminary meander belt is established by drawing lines parallel to the governing outermost meanders of the existing channel planform, following the meander axis. The distance between the two lines is measured and used to represent the width of the preliminary meander belt. In the absence of sufficient data for meander belt width delineation, empirical formulas are available to use based on field collected channel dimensions.

6.1 Empirical Analysis

Meander belt widths can be determined using empirical relations based on channel parameters. The following equations (**Table 6.1**) provide an estimate of meander belt width dimensions according to bankfull width, hydraulic depth, and maximum depth. These relations are based on measurements of real watercourses, however; the transferability to watercourses that are situated within southern Ontario is limited due to differences in hydrologic regime, drainage area, and general controlling factors. Reviewed collectively, they provide a data set from which to corroborate results attained through use of the standard belt width delineation procedures. Measured dimensions were completed at the time of the rapid assessments and used as input parameters. **Table 6.2** summarizes meander belt width dimensions for all study reaches. Maps displaying belt width dimensions are included in **Appendix C.**

Table 6.1: Empirical formulas for estimating meander belt width dimensions.

Meander Belt Empirical Analysis	
Source	**Equation**
Williams (1986) - width (m)	$4.3W^{1.12}$
Ward (2002) - width (ft) - no factor of safety	$4.8W^{1.08}$
Lorenz et al. (1985) - width (m)	$7.53W^{1.01}$
Bridge and Mackey (1993) - hydraulic depth (m)	$59.9D^{1.8}$
Collinson (1978) - maximum depth (m)	$65.6\, D_{max}{}^{1.57}$

Table 6.2: Empirical formulas for estimating meander belt width dimensions.

Meander Belt Widths												
	G2-2	G6-2	G7-1	G7-2	G12-1	G12-2	G13-1	G13-2	G15-1	G15-2	G15-3	G16-1
Preliminary Widths (m)	13	6	47	61	16	30	6	15	5	14	15	9

7. Crossing Assessment – Data Integration

To provide insight towards structure sizing of watercourse crossings in the study area, a risk-based procedure was followed. In general, the two primary factors that must be considered from a geomorphic perspective when evaluating crossing design are the potential for (1) channel migration/erosion and (2) channel incision. These two risk factors are affected by the following structure design parameters:

1. Channel migration/erosion (lateral instability):
   a. Length
   b. Span
   c. Skew

2. Channel incision (vertical instability):
   a. Invert (footing or bed)
   b. Length

In order to evaluate these risk factors, a geomorphic risk assessment protocol has been developed to assess a crossing structure in terms of the existing local geomorphic conditions (**Figure 7.1**). This risk assessment protocol typically provides a site-specific process to evaluate and determine whether the crossing structure size is appropriate from a geomorphic perspective. The protocol is based on existing and historic conditions that are applied to provide insight as to whether the structure is likely to be at risk given the projected future climate conditions. The following factors are considered within the protocol:

a) **Channel Size**: The potential for lateral channel movement and erosion tends to increase with stream size. Headwater streams tend to exhibit low rates of lateral migration due to the stabilizing influence of vegetation on the channel bed and banks. Erosive forces in larger watercourses tend to exceed the stabilizing properties of vegetation and result in higher migration rates.

b) **Valley Setting**: Watercourses with wide, flat floodplains and with low valley and channel slopes tend to migrate laterally across the floodplain over time. Watercourses that are confined in narrow, well drained valleys are less likely to erode laterally but are more susceptible to down-cutting and channel widening, particularly where there are changes to upstream land use. Typically the classification of the valley will fall into one of three categories: confined, partially confined, and unconfined.

c) **Meander Belt Width**: The meander belt width represents the maximum expression of the meander pattern within a channel reach. Therefore, this width/corridor covers the lateral area that the channel could potentially occupy over time. This value has been used by regulatory agencies for corridor delineation associated with natural hazards and the meander belt width is typically of a similar dimension to the regulatory floodplain. The use of the meander belt width for structure sizing has been established as a criterion by some regulatory agencies and certainly represents a very conservative approach.

d) **Meander Amplitude**: The meander amplitude and wavelength are important parameters to ensure that channel processes and functions can be maintained within the crossing. For the purposes of this protocol, the meander amplitude of the watercourse would be measured in vicinity of the crossing and used as a guide to determine the relative risk to the structure. The number of meander wavelengths to be considered is both

dependent on the scale of the watercourse and the degree of valley confinement. These were measured in the field during the rapid assessments.

e) **Rapid Geomorphic Assessment (RGA) Score**: An RGA score is essentially a measure of the stability of the channel. Channels that are unstable tend to be actively adjusting and thus are sensitive to the possible effects of the proposed crossing. Accordingly, there is more risk associated with unstable channels. While the actual RGA score will be reported, there are three levels of stability: 0-0.20 is stable; 0.21-0.40 is moderately stable; >0.40 is unstable.

f) **100-year Migration Rates**: Using historical aerial photographs, migration rates may be quantified (where possible) for each crossing location. A higher migration rate indicates a more unstable system and higher geomorphic risk.

Based on review of the existing and proposed improvements along The Gore Road, a majority of the proposed watercourse crossings sites are appropriately located in terms of orientation to the channel. The Gore Road crosses many of the identified watercourses at sections of channel near perpendicular to flow. A field and photo review of channel planform revealed that prominent meander amplitudes measured 1.2 to 8.0m and were generally at a distance well-upstream of the crossing (5-20m). Amplitudes measured for reaches downstream of the crossing pose less risk than upstream because meanders tend to migrate in a downstream direction. Risk associated with the migration tendencies of meander features lessens with distance. A qualitative review of conditions surrounding each existing crossing structure was provided by the rapid assessments and revealed whether the current structures may be undersized or contributing to any stability issues. A summary of reviewed risk parameters and the resulting structure size recommendations are provided in **Table 7.1**. Reaches within the vicinity of the crossing were used to size each culvert rather than those at a distance. For example, existing ponds created breaks between reaches and it is assumed that these ponds will not be removed. Therefore if necessary, the reach of channel between the pond and road was used to size the structure. Plots of estimated meander belt widths and measured amplitudes for reaches adjacent-to or crossing The Gore Road are located in **Appendix C.**

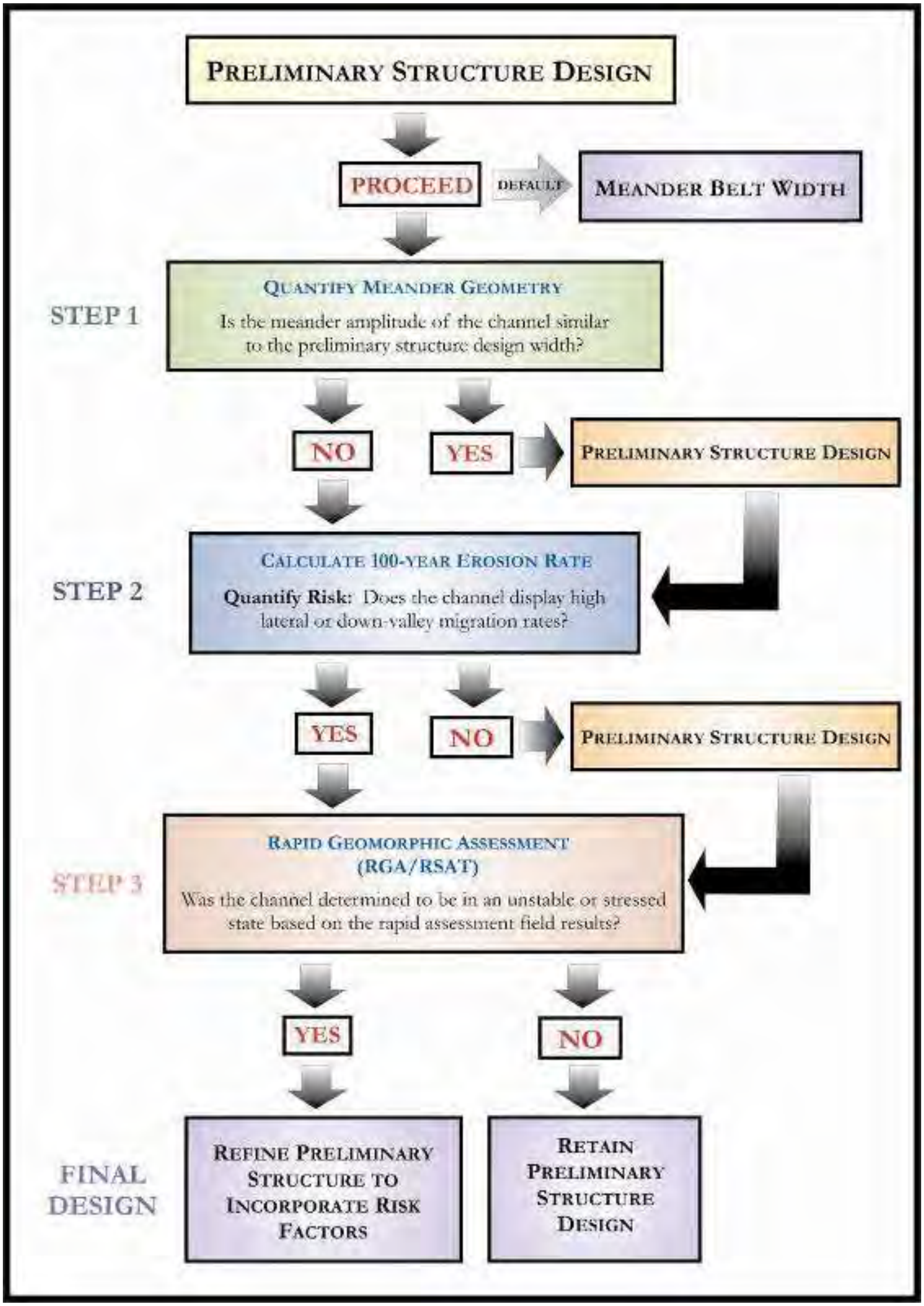

Figure 7.1: Geomorphic risk assessment protocol for span recommendations (PARISH Geomorphic Ltd, 2006).

Table 7.1: Summary of available risk assessment parameters.

Reach	Preliminary Belt Width (m)	Modified	Meander Amplitude (distance u/s or d/s) (m)	Bankfull Width (m) [at crossing]	Valley Setting	RGA score	Existing Structure		Recommended Structure Size
							Width(m)	Condition (Pooling/Erosion)	
G2-1	n/a	Pond u/s	n/a	1.0	Unconfined/ marshy	n/a (wetland)	0.61	u/s is fine	1.5m
G2-2	12.8	No	1.2 (10m d/s)	2.28	unconfined	0.37 (widening)	0.61	d/s perched culvert, scouring	1.5m
G6-1	n/a	Pond/wetland	n/a	0.8	unconfined	n/a (wetland)	0.65	u/s is fine	1.5m
G6-2	6.2	Pond/wetland	n/a	1.2	unconfined	0.06	0.65	d/s is fine	1.5m
G7-1	46.6	No	8 (15m u/s)	5.4	unconfined	0.45 (widening)	5m	Scour around structure	8m
G7-2	60.6	Artificial riffles/weirs	5m (20m d/s)	5.7	Unconfined	0.40 (widening)	5m	Scrour around structure	8m
G12-2	29.6	Pond and weir	1.5 (5m u/s)	3.5	unconfined	0.14 (aggrading)	0.78m	Good./Slight pooling u/s	2m
G13-1	6.1	Flows parallel to road u/s(ditch), Wood fence across channel d/s road	1m (20m u/s)	1m	unconfined	0.28 (agrading)	0.8m	Good/Slight ponding u/s	2m
G15-2	14.4	Pond/berm u/s, Wood fence across channel immediately u/s road	2.15 (10m u/s)	1.3	unconfined	0.06	0.8m	Scour u/s, bank collapse.	2.5m
G15-3	14.8	Rip Rap/boulder weirs	1 (10m d/s)	1.5	Unconfined	0.37 (widening/ aggrading)	0.8	Scour/perched d/s	2.5m
G16-1	9	Fence u/s, boulder u/s, private culvert (0.6m) d/s	n/a	1.2	unconfined	0.03	0.8	Erosion u/s and d/s	1m

8. Conclusions & Recommendations

A risk assessment was applied to seven proposed crossings along The Gore Road for tributaries of the West Humber River. This assessment reviewed background information, which included past documents, aerial photos, and contour mapping. Study reaches were identified using desktop analyses and further assessed in the field within the limits of property access permissions. During the field investigation, indicators of active geomorphic processes were noted, channel dimensions were measured, and a stability index was provided for each study reach.

A wide array of watercourse types cross The Gore Road study area, ranging from a defined system with 5.7m bankfull width to intermittent drainage lines with no defined bed or banks. Four of the observed reaches displayed stability issues, including G7-1, G7-2, G2-2 and G15-3, and the primarily mode of adjustment is widening. These reaches displayed permanent flow and relatively large bankfull dimensions compared to the smaller channels in the study. Recommended structure types and sizes were provided for each identified watercourse crossing. These recommendations were based on a collective review of basic risk-assessment parameters that consider the site-specific geomorphic conditions (**Table 8.1**).

There are a few more recommendations that need to be made based on risk factors in addition to the sizing proposed in **Tables 7.1 and 8.1**. First, the plans show that, with the exception of the box culvert at Crossing 7 (PGL G7-1, G7-2), any proposed culvert replacements will either be completed using single or twin CSP's. From a geomorphic perspective the use of CSP's are not desirable because the cross-sectional area is proportionally smaller than that of a box culvert. This has a bearing with respect to maintaining substrate or embeddedness during high flow events. However, it is recognized that geomorphological analysis is only a part of the decision process and that the ultimate structure type and size will be chosen based on a number of factors. Secondly, as previously mentioned, the alignment of culverts for the proposed road improvements are mostly suitable because the road crosses the channel perpendicular to flow at most locations. However, at Crossing 12 (Reach G12-2), there is a willow tree immediately upstream of the crossing, causing flow to divert around it, creating a tight meander bend. Widening this culvert and adjusting the skew towards the bend will help accommodate the flow through the crossing. Alternatively, removal of the willow tree along with the suggested widening of the culvert might improve the crossing. If the latter is a preferred option, banks will need to be planted in the vicinity of the crossing to replace the shear strength lost by removing the tree which currently limits bank erosion through this section of channel. Finally, at crossing 16 (PGL: G16-1), there is a culvert within the property immediately downstream of the crossing that was put in place to pipe the channel under a manicured lawn. Currently this appears to be in good shape, and is of a sufficient size, but to ensure connectivity between culverts and avoid any scour or flanking of the culvert, placement of rip rap on the bed and banks at the downstream end of the road culvert is recommended.

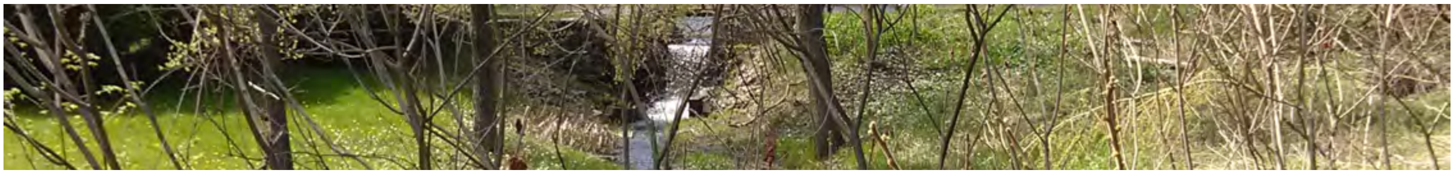

Table 8.1: Recommended crossing structures along The Gore Road corridor from Highway 9 to Patterson Sideroad.

Peel Region ID	Crossing ID (PGL)	Recommended Size (m)
1345	Crossing 2	1.5
1347	Crossing 6	1.5
N3	Crossing 7	8.0
1352	Crossing 12	2.0
1353	Crossing 13	2.0
1355	Crossing 15	2.5
1356	Crossing 16	1.0

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Appendix A

Reach break maps

Figure A-1: Crossing 2 reach breaks.

Figure A-2: Crossing 6 reach breaks.

Figure A-3: Crossing 7 reach breaks.

Figure A-4: Crossing 12 reach breaks.

Figure A-5: Crossing 13 reach breaks.

Figure A-6: Crossing 15 reach breaks.

Figure A-7: Crossing 16 reach breaks.

Appendix B

Photographic Record
(November 2012)

Photo B-1: Reach G2-1 undefined channel.

Photo B-2: Reach G2-2; defined, enlarging channel downstream of road.

Photo B-3: Reach G6-1; wetland pond upstream of road.

Photo B-4: Reach G6-2; short stretch of defined channel immediately downstream of road.

Photo B-5: Reach G6-2; multiple, undefined drainage lines further downstream from road.

Photo B-6: Reach G7-1; major wood debris and channel widening (view is looking upstream).

Photo B-7: Reach G7-2; coarse bed material, channel widening and falling trees.

Photo B-8: Reach G12-1; major wood debris and widening (upstream of pond).


Photo B-9: Reach G12-2; tight meander around Willow tree into culvert.

Photo B-10: Reach G13-1; channel through grasses and shrubs immediately upstream of culvert.

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Photo B-12: Reach G13-2; coarse material and widening channel.

Photo B-13: Reach G15-2; widening channel and fence flowing into undersized culvert.

Photo B-14: Reach G15-3; channel widening and major wood debris/fallen trees immediately downstream of road.

Photo B-15: Small defined channel flowing into culvert, boulders at opening.

Photo B-15: Slight scour and widening between culverts on downstream side of The Gore Rd.

Appendix C

Meander Belt Width and Measured Ampltude Maps

Figure C-1: Crossing 2 estimated meander belt width and measured amplitude.

Figure C-2: Crossing 6 estimated meander belt width.

Figure C-3: Crossing 7 estimated meander belt widths and measured amplitudes.

Figure C-4: Crossing 12 estimated meander belt widths and measured amplitudes.

Figure C-5: Crossing 13 estimated meander belt widths and measured amplitudes.

Figure C-6: Crossing 15 estimated meander belt widths and measured amplitudes.

Figure C-7: Crossing 16 estimated meander belt width.

BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

Appendix H

Cultural Heritage Resource Assessment

CULTURAL HERITAGE RESOURCE ASSESSMENT REPORT
BUILT HERITAGE RESOURCES &
CULTURAL HERITAGE LANDSCAPES

CLASS ENVIRONMENTAL ASSESSMENT STUDY
THE GORE ROAD IMPROVEMENTS FROM
PATTERSON SIDE ROAD TO HIGHWAY 9
TOWN OF CALEDON
REGIONAL MUNICIPALITY OF PEEL

June 2012

Prepared for:
R.J. Burnside & Associates Limited

Prepared by:

UNTERMAN McPHAIL ASSOCIATES
HERITAGE RESOURCE MANAGEMENT CONSULTANTS

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BUILT HERITAGE RESOURCES &
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1.0 INTRODUCTION

1.1 Purpose of Report

R. J. Burnside & Associates Limited retained Unterman McPhail Associates, Heritage Management Resource Consultants, to undertake a cultural heritage resource assessment of built heritage resources and cultural heritage landscapes for the Regional Municipality of Peel's Class Environmental Assessment Study for The Gore Road Improvements from Side Road to Highway 9, Town of Caledon, Regional Municipality of Peel ***(Figure 1)***. The proposed rehabilitation of The Gore Road is being considered to address the deteriorating pavement with sub-standard shoulder areas/lack of proper ditching and visibility restrictions throughout the road's rolling terrain. This study is being carried out in accordance with the requirements of a Schedule "B" undertaking as outlined in the Municipal Engineers Association's Municipal Class Environmental Assessment (EA) document *(2000, as amended in 2007).*

The study corridor extends generally in a north to south direction along The Gore Road from just approximately 25 metres north of Patterson Side Road to Highway 9, Town of Caledon, Regional Municipality of Peel.

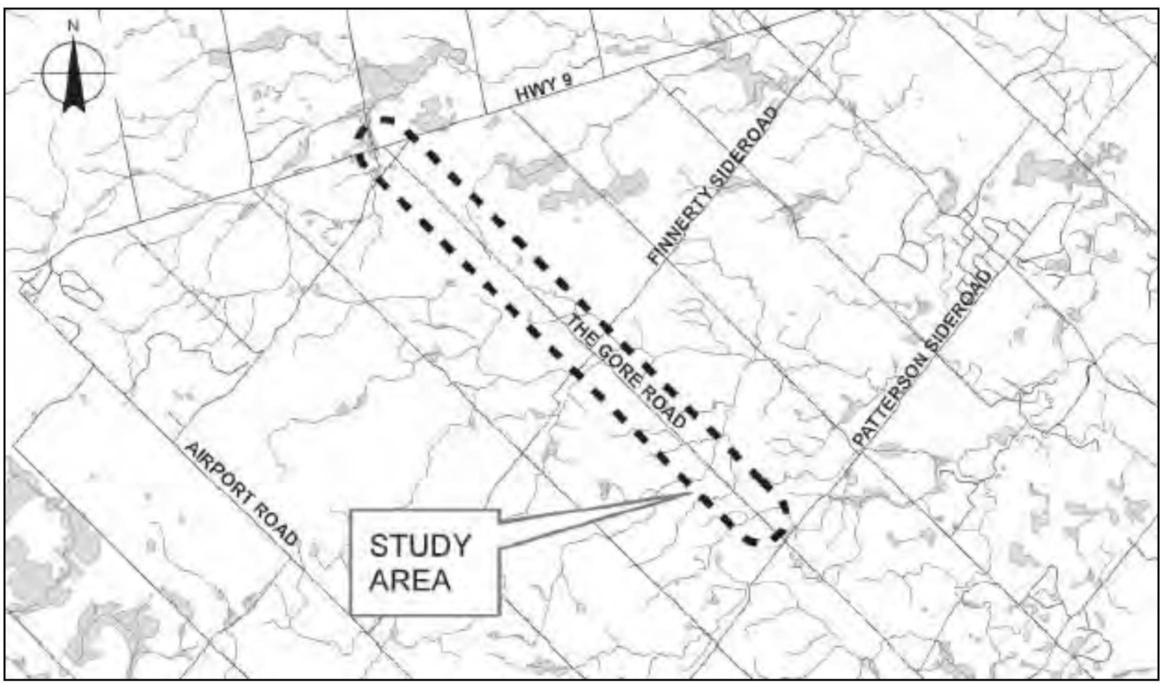


Figure 1. The Gore Road Study Corridor Map between Patterson Side Road and Highway 9 [R.J. Burnside, 2011].

2.0 ENVIRONMENTAL ASSESSMENT & CULTURAL HERITAGE RESOURCES

The need for the identification, evaluation, management and conservation of Ontario's heritage is acknowledged as an essential component of environmental assessment and municipal planning in Ontario.

For the most part, the analysis of cultural heritage resources in the study area addresses those aboveground, person-made heritage resources over 40 years old. The application of this rolling forty year principle is an accepted federal and provincial practice for the preliminary identification of cultural heritage resources that may be of heritage value. However, its application does not imply that all built heritage resources or cultural heritage landscapes that are over forty years of age and older are worthy of the same levels of protection or preservation.

2.1 Ontario Environmental Assessment Act (EAA)

Environmental assessments are undertaken under the *Ontario Environmental Assessment Act.* The EAA provides for the protection, conservation and wise management of Ontario's environment. It defines environment in a broad sense that includes natural, social, cultural, economic and built environments. This broad definition of the environment makes the assessment of the impact of the undertaking on cultural heritage resources part of the standard environmental assessment process in Ontario. Environmental assessments made under the EAA therefore assess and address the impact of the undertaking on cultural heritage resources.

The analysis throughout the study process addresses that part of the *Environmental Assessment Act*, subsection 1(c), which defines *"environment"* to include:

> *"...cultural conditions that influence the life of humans or a community";*

as well as,

> "*any building, structure, machine or other device or thing made by humans*".

Infrastructure undertakings such as road improvements may potentially affect cultural heritage resources in a number of 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.

2.1.1 Municipal Class Environmental Assessment (MCEA)

The Municipal Class Environmental Assessment (October 2000, as amended in 2007 & 2011) outlines a procedure whereby municipalities can comply with the requirements of the Environmental Assessment Act. It identifies potential positive and negative effects of projects such as road improvements, facility expansions or to facilitate a new service. The process includes an extensive evaluation of impacts on the natural and social environment. The Municipal Class EA applies to municipal infrastructure projects including roads, water and wastewater projects.

Since projects undertaken by municipalities can vary in their environmental impact, such projects are classified in terms of schedules. Schedule A generally includes normal or emergency operational and maintenance activities where the environmental effects of these activities are usually minimal, and therefore these projects are pre-approved. Schedule B generally includes improvements and minor expansions to existing facilities where there is the potential for some adverse environmental impacts and therefore, the municipality is required to proceed through a screening process including consultation with those who may be affected. Schedule C generally includes the construction of new facilities and major expansions to existing facilities, and these projects proceed through a five phased environmental assessment planning process.

2.2 Ontario Heritage Act (OHA)

The *OHA* gives the Ontario Ministry of Tourism, Culture and Sport (MTCS) the responsibility for the conservation, protection and preservation of Ontario's culture heritage resources. Section 2 of the *Ontario Heritage Act* (*OHA*) charges the Minister with the responsibility to,

> *"...determine policies, priorities and programs for the conservation, protection and preservation of the heritage of Ontario."*

MTCS describes heritage buildings and structures, cultural heritage landscapes and archaeological resources as cultural heritage resources. Since cultural heritage resources may be impacted adversely by both public and private land development, it is incumbent upon planning and approval authorities to consider heritage resources when making planning decisions.

Heritage attributes, in relation to a property, are defined in the *OHA* as the attributes of the property that cause it to have cultural heritage value or interest. Part IV of the *OHA* enables municipalities to list, and to designate by by-law properties of cultural value or interest after consultation with its municipal advisory committee, if one is appointed. Under *OHA* subsection 27 (1), the municipal clerk is required to keep a current register of properties of cultural heritage value or interest located in their municipality. The municipal register must include all properties designated under Part IV of the *OHA* by the municipality or by the Minister of Tourism, Culture and Sport. Municipal designation of heritage resources under Part IV the *OHA* publicly recognizes and promotes awareness of heritage properties, provides a process for ensuring that changes to a heritage property are appropriately managed and that these changes respect the property's heritage value. This includes protection from demolition. Once a property has been designated and notice has been given to the Ontario Heritage Trust, the property is then listed on the provincial register of heritage properties.

The alteration process under the *OHA* section 33 helps to ensure the heritage attributes of a designated property, and therefore its heritage value, are conserved. If an owner of a designated property wishes to make alterations to the property that affects the property's heritage attributes, the owner must obtain written consent from the council. This applies not only to the alteration of the buildings or structures but to alterations of other aspects of the designated property such as landscape features or natural features that have been identified as heritage attributes.

The *OHA* subsection 27 (1.2) also allows a property that is not designated, but considered to be of cultural heritage interest or value by the municipal council, to be placed on the register. This is commonly referred to as "listing". In many cases, listed (non-designated properties) are candidates for designation protection under *OHA* section 29. Once a property is listed under the *OHA*, any application to demolish the building on a listed property is delayed for 60 days under *OHA* 27(3).

2.3 Ministry of Tourism, Culture and Sport (MTCS)

MTCS is responsible for the administration of the *Ontario Heritage Act* and for determining policies, priorities and programs for the conservation, protection and preservation of Ontario's heritage, which includes cultural heritage landscapes, built heritage and archaeological resources. It provides guidelines to assist in the assessment of cultural heritage resources identified as part of an environmental assessment. They include the *Guideline for Preparing the Cultural Heritage Resource Component of Environmental Assessments* (October 1992), and, *Guidelines on the Man-Made Heritage Component of Environmental Assessments* (1980). The *Guidelines on the Man-Made Heritage Component of Environmental Assessments* state:

> "*When speaking of man-made heritage we are concerned with works of man and the effects of his activities in the environment rather than with moveable human artifacts or those environments that are natural and completely undisturbed by man.*"

The guidelines state one may distinguish broadly between two basic ways of visually experiencing cultural heritage resources in the environment, that is, as cultural heritage landscapes and as built heritage. Cultural heritage landscapes are a geographical area perceived as a collection of individual person-made built heritage resources set into a whole such as historical settlements, farm complexes, waterscapes, roadscapes, railways, etc. They emphasize the interrelationship of people and the natural environment and convey information about the processes and activities that have shaped a community. Cultural heritage landscapes may be organically evolved landscapes as opposed to designed landscapes. Some are ‘continuing landscapes’, which maintain the historic use and continue to evolve, while others are ‘relict landscapes’ where the evolutionary process has come to an end but important landscape or built heritage resources from its historic use are still visible. Built heritage comprises individual, person-made or modified, parts of a cultural heritage landscape such as buildings or structures of various types including, but not limited to, cemeteries, planting and landscaping structures, etc.

The guidelines also describe the attributes necessary for the identification and evaluation of any discrete aggregation of person-made features or cultural heritage landscapes and the attributes necessary for the identification and evaluation of built heritage resources.

MTCS also provides other written publications to assist municipalities and communities in the understanding of identification, evaluation and conservation of cultural heritage resources in Ontario.

3.0 ASSESSMENT METHODOLOGY

3.1 Introduction

For the purposes of this built heritage resource and cultural heritage landscape assessment, Unterman McPhail Associates undertook the following tasks:

- the identification of major historical themes and activities for The Gore Road study corridor through historical research and a review of topographical and historical mapping;
- the identification of associated cultural heritage landscapes and built heritage resources within and adjacent to The Gore Road study corridor through major historical themes and activities and historic mapping;
- a survey of the lands within and adjacent to The Gore Road study corridor;
- the identification of sensitivities for change to built heritage resources and cultural heritage landscapes through the review of the historical information, the results of the survey and the proposed improvements to The Gore Road study corridor; and
- the provision of general mitigation recommendations respecting the effects of the proposed improvements to The Gore Road improvements.

Unterman McPhail Associates undertook a windshield survey of the study area in April 2011. Cultural heritage landscapes and principal, above ground built heritage sources older than forty years of age within and adjacent to The Gore Road were identified at this time.

3.2 Public Consultation and Recognition

The Town of Caledon Heritage Register (September 2011) was consulted as well as the *Town of Caledon Built Heritage Resources, Report of Findings* (2008) and the *Town of Caledon Cultural Heritage Landscape Inventory* (March 2009) in regard to local heritage recognition.

Furthermore, the Heritage Planner for the Town of Caledon was contacted for information regarding properties included on its built heritage inventory and its municipal heritage register and properties municipally designated under the *Ontario Heritage Act.* The Heritage Planner confirmed that No. 18696 The Gore Road is municipally designated under Part IV of the *Ontario Heritage Act* and included on the Town's Heritage Register. As well, No. 7532 Patterson Side Road, which is located adjacent to The Gore Road study corridor is also a municipally designated property and included on the Town's Heritage Register. The Gore Road is not included as a cultural heritage landscape in the document *Town of Caledon Cultural Heritage Landscape Inventory* (March 2009).

A plaque erected by the Town of Caledon commemorates the former hamlet of Lockton at the intersection of The Gore Road and Patterson Side Road.

4.0 HISTORICAL SUMMARY

4.1 Albion Township

In 1783, the chiefs of the Mississauga Indians agreed to sell the British government a tract of land stretching from Cataraqui near Kingston to the Etobicoke Creek along the north shore of Lake Ontario. This land acquisition was further clarified in a confirmatory treaty in 1805 and constituted the southern portion of what is now the Regional Municipality of Peel. Lands forming Albion Township (now in the Town of Caledon) were acquired from the Mississauga First Nation in 1818. Albion Township, which forms the eastern area of the Town of Caledon, was named in 1819 by deputy surveyor general James G. Chewett. With the townships Caledon and Chinguacousy, Albion was established as part of the 'New Survey', which was laid out in different orientation of concessions and lot dimensions from that of the 'Old Survey' of the southern part of Peel County. The 200 acre lots were typically granted in square 100 acre parcels with the frontage along laid out along eleven, north to south concession roads. Completed in 1819, the survey system imposed a settlement grid system on the land that persists to this day.

Administratively Albion Township was located in the east riding of the York County in the Home District. Township meetings were held prior to the official formation of Albion Township in 1850. From 1851 to 1866, the lands of Peel County were part of the United Counties of York and Peel. In 1866, Peel became a separate entity with Brampton as its county seat in 1866. In 1867, the Township of Cardwell was created as political riding and it consisted of the four townships of Albion, Caledon, Mono and Adjala.

William and Mary Horan arrived in Canada in the early 1790s. William worked on the Rideau Canal, living in Ottawa and was accidently killed on the job in 1808. Mary Horan received an indemnity for the death of her husband from the Crown in the form of 200 acres of land in Albion Township in Concessions 6 and 11. The family arrived in Albion between 1809 and 1810. Mary Horan married Simon Scully, an early Albion settler. Within a year of the township survey the initial clearing and settlement period in the township's history began.[1] By 1821, the population of Albion approximated 120 people, and 62 acres of land had been cleared.[2] William Horan, eldest son of Mary, acquired the Crown patent for the east half of Lots 26 and 17, Concession 4. William and his wife Hannah had fifteen children; several family members were settled along the 4th Concession, or The Gore Road, in the vicinity of Lockton by the mid 1870s. Other families who owned land along The Gore Road between Lockton and the northern township boundary included Finnerty, Wallace, Lock and Adams.

By 1840, Albion Township had a population on 1500 people.[3] *Smith's Gazetteer* (1846) described Albion Township as,

> *A Township in the Home District; is bounded on the east by the townships of King and Vaughan; on the north by Adjala and Tecumseth; on the south-west by Caledon and Chinguacousy; and on the south-east by the Gore of Toronto…41,829 acres are taken up, 10,000 of which are under cultivation. The north and north-east of the township are hilly and broken, with a great deal of pine land; in the south the township the land is better, and there are some good farms. There are four grist and two saw mills, and two distilleries in the township. Population of Albion in 1842, 2,154.*[4]

The first settlements in the township tended to be located along the waterways and their tributaries. As roads developed, settlements were established at the intersection of the more important routes. The late 1820s were a time of agricultural progress and by 1830 Albion had many prosperous wheat farmers. The 1830s saw a dramatic drop in the demand for wheat; in the1840, export demand for wheat increased again bringing prosperity to Albion farmers. From 1853 onwards there was a boom in the overseas demand for wheat. Albion Township wheat brought a price of $2.40 a bushel. With this prosperity Albion farmers built new barns and a house.[5] However, the prosperity derived

[1] Esther Heyes, Ester. *The story of Albion* (Bolton, Ontario: c1968) 32, 33.
[2] The Corporation of the County of Peel. *A History of Peel County to mark its Centenary as a Separate County 1867-1967* (Brampton, Ont.: Charters Publishing Company Limited, November 1967) 228.
[3] Heyes, 106.
[4] Wm. H. Smith, *Smith's Canadian Gazetteer* (Toronto: H. & W. Rowsell, 1846) 2.
[5] Heyes, 197.

from wheat production was short lived. With the depletion of the fertility of the township soil and the arrival of the wheat midge by 1860 the boom was over.

Between 1861 and 1871, there was a noticeable drop in the amount of township land in wheat production. Barley crops replaced wheat crops in Albion partially due to the midge infestation and partially to meet a demand from American farmers for brewing. Barley production lasted until when the McKinley Tariff reduced trade to the United States to a minimum. Barley also contributed to the weakening of the township soil. Oats were grown into the early 20th century. Stock raising, swine production and dairying were also conducted on the township farms throughout the 19th and into the twentieth century.[6]

By the mid 19th century numerous settlement centres had been established throughout the township including, but not limited to, Bolton, Castleberg, Centreville, Columbia, Lockton, Mackville, Mount Wolfe, Palgrave and Sleswick. As well, several border communities developed such as Caledon East, Mono Mills, Mono Road, Sandhill and Tullamore. The principal settlement roads in the New Survey of Peel County were Hurontario Street, the Mono Road and The Gore Road. The Gore Road was shown on the c1850 Rottenburg map. By 1859, Tremaine's map ***(Appendix)*** shows The Gore Road following the surveyed alignment of the 4th Concession in Albion Township from the southern boundary with the Gore of Toronto Township to its northern boundary with Dufferin County. Twenty-Five Side Road, now Patterson Side Road, and Thirty Side Road, now Finnerty Side Road, are shown on the Tremaine Map as well. John Finnerty owned property on Lot 31, Concession 4, the north side of Finnerty Side Road fronting onto The Gore Road. The Finnerty Schoolhouse was located on the property to the east of The Gore Road.

By the late 1850s, the township population had risen to 4000 people; ten years later in 1860, it reached its peak at 5000 people.[7] Tremaine's map (1859) shows an agricultural landscape that is continued into the late 1870s and depicted in the *Illustrated Historical Atlas* (1877) ***(Appendix)*** as a well-developed agricultural landscape with numerous farmsteads and orchards and opened concession and sideroads. The Toronto Grey and Bruce Railway cut through the southern part of the township while the Hamilton & Northwestern Railway cut through the northern part.

Early 20th century topographical maps continue to show the agricultural character of the area along The Gore Road from Patterson Side Road to Highway 9 ***(Appendix)***. For the most part, the study corridor has remained in agricultural use and maintained a rural character throughout most of the 20th century.

[6] Ibid, 198-199.
[7] Ibid, 106.

In 1974, the Regional Municipality of Peel was created from the County of Peel. The former Township of Albion was included in the new Town of Caledon, which is bounded by the City of Brampton on the south, King Township in York Region on the east, New Tecumseth, Adjala-Tosorontio and Mono Townships and the Town of Orangeville on the north and Erin Township on the west.

4.1.1 Lockton

Archibald Lock, a veteran of the Battle of Waterloo who immigrated to Canada in 1820, met and married widow Sarah Irwin on the sea voyage. Sarah Locke had family in Albion Township, and Locke and his new family joined them, settling on a military grant on Lot 35, Concession 3. In 1845, two sons of Locke, Archibald and Gabriel bought Lot 26, Concession 4. Archibald Locke established a village plan of subdivision on Lot 26. Originally referred to as "The Pines", the small hamlet was renamed Lockton. A small Roman Catholic mission church was built on Lot 25, Concession 3 at Lockton c1834.[8] A new church built on Lot 21, Concession 3 replaced it at a later date. Lockton's population grew from 50 to 150 people in the mid 19th century.

Tremaine's map (1859) shows Lockton as having a blacksmith shop on the northwest corner of the intersection, the Rossney Inn on the southwest corner and a store on the southeast corner. Over the years, Archibald Lock operated a dry goods store, provided butchering services and meat, acted as postmaster and operated the Rossney Hotel with its dancing academy. By 1864, the community had a second general store, two blacksmith shops, a millinery, a soap and candle maker, a mille, wagonmaker, lumber merchant, carpenter and cabinet maker and two shoemakers and three doctors.[9]

The population of Lockton peaked in the early 1870s, and then, due to the railway being built through Centreville to the south, its population decreased considerably. The general store moved to Caledon East in 1901 and the hotel was destroyed by fire in 1904. The blacksmith shop was closed a few years later. The community of Lockton continued to be shown on 20th century topographical maps. An historical plaque erected by the Town of Caledon commemorates the former community.

[8] Ibid, 203.
[9] Ibid, 282-283.

5.0 IDENTIFICATION OF CULTURAL HERITAGE LANDSCAPES AND BUILT HERITAGE RESOURCES

5.1 Introduction

For the purposes of cultural heritage landscape and built heritage resource identification, this section provides a brief description of the existing environment of the study corridor, and the associated principal built heritage resources and cultural heritage landscapes.

5.2 Description of the Existing Environment

The study lands are located in the Oak Ridges Moraine physiographic region of Southern Ontario. The moraine is hilly in topography and largely composed of sandy and gravel soils. A number of small watercourses within the watershed of the Humber River cross The Gore Road.

Located in the geographic township of Albion, now within the Town of Caledon, The Gore Road is a two lane, north to south, Regional rural arterial road that provides access for existing residential and farm properties and conveys inter-regional commuter traffic. Arterial roads accommodate moderate traffic volumes with a right-of-way of 30m, a posted speed limit of 70 km/hr in rural areas and local truck traffic. The study corridor is characterized by a hilly topography, steep grades, reduced sightlines due to ‘S’ bends that are signed, very narrow shoulders and deep ditches. Intersections within the study corridor occur at Finnerty Side Road and Coolihan’s Side Road. Patterson Side Road is located to the immediate south of the study corridor. King’s Highway 9 is located at the north end of the study corridor. Generally, former and existing farmscapes and rural residences on subdivided lots are set back a distance from the road and screened by vegetation. Rail fencing is found in numerous locations along the length of the study corridor. The side trail of the Bruce Trail crosses The Gore Road approximately half way between Finnerty Side Road and Coolihan’s Side Road. The Great Pine Ridge Trail crosses The Gore Road at Finnerty Side Road.

The 19th century crossroads settlement of Lockton is located at the intersection of The Gore Road and Patterson Side Road. It is represented in the landscape by a few 19th century buildings, both on The Gore Road and Patterson Side Road. The Town of Caledon has erected a plaque commemorating the historical settlement.

5.2 Description of Identified Cultural Heritage Resources

A number of cultural heritage landscapes and built heritage resources were identified within and adjacent The Gore Road study corridor between Patterson Side Road and Highway 9 including roadscapes, farm complexes and residences. The majority of the identified built heritage resources are set a distance back from the roadside. The field survey findings of The Gore Road study corridor are listed in Table 1.

The Town of Caledon identified two (2) properties adjacent to The Gore Road study corridor that are included in the report *Town of Caledon Built Heritage Resources Report of Findings* (October 7, 2008). They are:

- No. 17412 The Gore Road ***(BHR 5)***; and
- No. 17479 The Gore Road ***(CHL 6)***.

The Town also confirmed the following five (5) properties are currently included on its built heritage inventory, namely:

- No. 7532 Patterson Side Road ***(CHL 2)***;
- No. 17243 The Gore Road ***(BHR 4)***;
- No. 17715 The Gore Road ***(CHL 7)***;
- Nos. 18460 &18464 The Gore Road ***(CHL 10)***; and
- No. 19037 The Gore Road ***(BHR 13)***.

The Town of Caledon Heritage Register (September 2011) includes one (1) municipally designated property on The Gore Road, namely:

- No. 18696 The Gore Road ***(BHR 11)***.

There is one (1) municipally designated property adjacent to the study corridor on Patterson Side Road, namely:

- No. 7532 Patterson Side Road ***(CHL 2)***.

The following explanatory notes provide background material on the information contained in Table 1.

- Sites are numbered and mapped generally from south to north along The Gore Road study corridor.
- Resources are identified by category: Cultural Heritage Landscape (CHL) or Built Heritage Resource (BHR) and by type.
- The municipal address, when applicable, locates the identified cultural heritage resources.
- A brief description of the cultural heritage resource, e.g., notable landscape features, structures on the property, construction period(s), building materials, roof shape, number of storeys, important architectural details, architectural style or influence and alterations/additions, is based upon information gained from the public roadway.

Digital photographs are supplied for those cultural heritage resources visible from the public roadway.

TABLE 1: IDENTIFIED CULTURAL HERITAGE LANDSCAPES (CHL) AND BUILT HERITAGE RESOURCES (BHR) LOCATED WITHIN OR ADJACENT TO THE STUDY CORRIDOR OF THE GORE ROAD FROM NORTH OF PATTERSON SIDE ROAD TO HIGHWAY 9

Site #	Resource Type	Category	Location	Type, Description, Heritage Recognition	Digital Photograph
1.	CHL	Transportation	**Within the Study Corridor** The Gore Road (Between Lots 26 to 36, Con. 3 and 4, geographical township of Albion) Town of Caledon.	Roadscape The Gore Road is a rural, two lane, rural paved road with a centre line with narrow gravel shoulders, grassy ditches. It has several curves and traverses a hilly terrain. It was opened for vehicular traffic by the mid 19th century along the road allowance provided on the original Albion Township survey. The road is shown on the 1859 Tremaine map and on the 1877 *Illustrated Historical Atlas* township map as an open road, In 1877 there was a easterly deviation of the road alignment immediately to the south of Finnerty Side Road.	 The Gore Road south from Finnerty Side Road showing windy road.  View south on The Gore Road from No. 17733 showing hilly terrain.

TABLE 1: IDENTIFIED CULTURAL HERITAGE LANDSCAPES (CHL) AND BUILT HERITAGE RESOURCES (BHR) LOCATED WITHIN OR ADJACENT TO THE STUDY CORRIDOR OF THE GORE ROAD FROM NORTH OF PATTERSON SIDE ROAD TO HIGHWAY 9

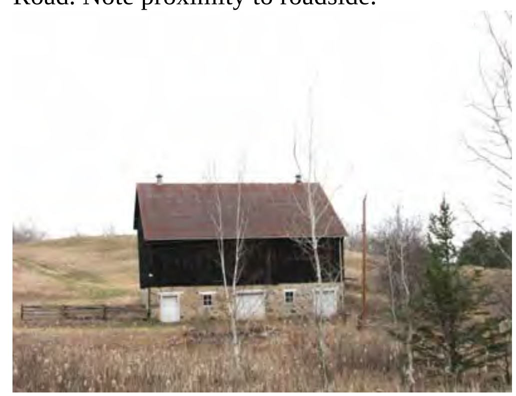
Site #	Resource Type	Category	Location	Type, Description, Heritage Recognition	Digital Photograph
2.	CHL	Residential: Historical Settlement	**Within and Adjacent to the Study Corridor** Intersection of The Gore Road and Patterson Side Road (Lots 25 and 26, Con. 3 and 4, geographical township of Albion) Town of Caledon.	Historical Settlement of Lockton Established in the mid 19th century, this historical settlement is shown on the 1859 Tremaine Map and the 1877 *Illustrated Historical Atlas* map. Lockton continues to be shown on 20th century topographical maps and 21st century area maps. Within the study corridor, the historical settlement of Lockton includes: o No. 17043 The Gore Road, a residence, age undetermined, with a driveshed/garage. Adjacent to the study corridor, the historical community of Lockton includes: o No. 7454 Patterson Side Road, a barn; o No. 7532 Patterson Side Road, "Lockton Spinney", a log residence probably built in the early 1820s by Crown Patentee John Jaffary or Archibald Locke Jr. in the late 1840s; and,	 Residence located at No. 17043 The Gore Road. Note proximity to roadside.  Barn located at No. 7454 Patterson Side Road.

TABLE 1: IDENTIFIED CULTURAL HERITAGE LANDSCAPES (CHL) AND BUILT HERITAGE RESOURCES (BHR) LOCATED WITHIN OR ADJACENT TO THE STUDY CORRIDOR OF THE GORE ROAD FROM NORTH OF PATTERSON SIDE ROAD TO HIGHWAY 9

Site #	Resource Type	Category	Location	Type, Description, Heritage Recognition	Digital Photograph
				o No. 16991 The Gore Road, now a residence, was a former general store, and post office until 1901, with a circa 1875-1899 date of construction. **The Town of Caledon confirmed the adjacent property located at No. 7532 Patterson Side Road is municipally designated and included on the Town's Heritage Register.**	 View to front (south) elevation of log house located at No. 7532 Patterson Side Road.  Former general store, now a residence, located at No. 16991 The Gore Road.

TABLE 1: IDENTIFIED CULTURAL HERITAGE LANDSCAPES (CHL) AND BUILT HERITAGE RESOURCES (BHR) LOCATED WITHIN OR ADJACENT TO THE STUDY CORRIDOR OF THE GORE ROAD FROM NORTH OF PATTERSON SIDE ROAD TO HIGHWAY 9

Site #	Resource Type	Category	Location	Type, Description, Heritage Recognition	Digital Photograph
3.	CHL	Agricultural	**Adjacent to the Study Corridor** No. 17130 The Gore Road, east side (Lot 26, Con. 4, geographical township of Albion) Town of Caledon.	Farm Complex The Town of Caledon indicates the estimated construction date of the farmhouse is 1850-1874; it is not visible from the roadside. An older barn and some outbuildings are partially visible. The buildings are set a distance back from the roadway.	 View to older barn and outbuildings at No. 17130 The Gore Road.
4.	BHR	Religious	**Adjacent to the Study Corridor** No. 17243 The Gore Road, east side (Lot 27, Con. 4, geographical township of Albion) Town of Caledon.	Albion Hills Bible Church, Outdoor Adventure Camp This mid 19^{th} C. two storey log building, probably built by William Horan Jr., has a gable roof, a 3 bay front elevation with centre door and flanking window openings. Church history indicates Margaret and Ken Dickson relocated an old barn from Mississauga to the site for retreats. The house and frame are set back from the road. **Included on The Town of Caledon Built Heritage Inventory (2008).**	 View of front (west) elevation of residence.

TABLE 1: IDENTIFIED CULTURAL HERITAGE LANDSCAPES (CHL) AND BUILT HERITAGE RESOURCES (BHR) LOCATED WITHIN OR ADJACENT TO THE STUDY CORRIDOR OF THE GORE ROAD FROM NORTH OF PATTERSON SIDE ROAD TO HIGHWAY 9

Site #	Resource Type	Category	Location	Type, Description, Heritage Recognition	Digital Photograph
5.	BHR	Residential	**Adjacent to the Study Corridor** No. 17412 The Gore Road, west side (Lot 28, Con. 3, geographical township of Albion) Town of Caledon.	Residence Built circa 1850-1874, this two storey log house, probably built by John Wallace who bought the 100 acre property from the Canada Land Company in 1846, has a side gable roof that faces southward. The building is set a distance back from the roadway. John Wallace is shown as the property owner on the 1877 *Illustrated Historical Atlas* map and owned several properties in the vicinity of Lockton. **Included on The Town of Caledon Built Heritage Inventory (2008).**	 View southwest to front (east) elevation of the residence at No. 17412 The Gore Road.
6.	CHL	Agricultural	**Adjacent to the Study Corridor** No. 17479 The Gore Road, east side (Lot 28, Con. 4, geographical township of Albion) Town of Caledon.	Farm Complex This property includes a vernacular, 1 ½ storey frame farmhouse with a gable roof built between 1850-1874. The farmhouse and a gambrel roof barn are set a distance back from the roadway. John Horan is shown as the property owner on the 1877 *Illustrated Historical Atlas* map. A building and an orchard are located in the southwest corner of the lot in 1877.	 View east to farmhouse at No. 17479.

TABLE 1: IDENTIFIED CULTURAL HERITAGE LANDSCAPES (CHL) AND BUILT HERITAGE RESOURCES (BHR) LOCATED WITHIN OR ADJACENT TO THE STUDY CORRIDOR OF THE GORE ROAD FROM NORTH OF PATTERSON SIDE ROAD TO HIGHWAY 9

Site #	Resource Type	Category	Location	Type, Description, Heritage Recognition	Digital Photograph
				The Town of Caledon confirmed (2011) the property is included on its built heritage inventory.	 Gambrel barn at No. 17479 The Gore Road.
7.	CHL	Agricultural	**Adjacent to the Study Corridor** No. 17715 The Gore Road, east side (Lot 29, Con. 4, geographical township of Albion) Town of Caledon.	Farm Complex The Town of Caledon reports the property contains a log farmhouse, not visible from the roadside, with an undetermined date of construction, as well as a gable barn and outbuildings. The buildings are set back from the roadway. Henry Horan is shown as the property owner on the 1877 *Illustrated Historical Atlas* map. Two buildings and an orchard are shown on the property. **The Town of Caledon confirmed (2011) the property is included on its built heritage inventory**.	 View to gable barn and outbuildings at No. 17715 The Gore Road.

TABLE 1: IDENTIFIED CULTURAL HERITAGE LANDSCAPES (CHL) AND BUILT HERITAGE RESOURCES (BHR) LOCATED WITHIN OR ADJACENT TO THE STUDY CORRIDOR OF THE GORE ROAD FROM NORTH OF PATTERSON SIDE ROAD TO HIGHWAY 9

Site #	Resource Type	Category	Location	Type, Description, Heritage Recognition	Digital Photograph
8.	CHL	Agricultural	**Adjacent to the Study Corridor** No. 17886 The Gore Road, west side (Lot 30, Con. 3, geographical township of Albion) Town of Caledon.	Farm Complex This property is known as the Coffey Creek Farm. The buildings are set a distance back from the roadway. The property appears to contain some older agricultural buildings; a farmhouse is not visible from the road. Henry Wilson is shown as the property owner on the 1877 *Illustrated Historical Atlas* map with a building set a distance back from The Gore Road closer to Finnerty Side Road.	 View northwest to barn complex at No. 17886 The Gore Road.  View west to older barn on site No. 17886 The Gore Road.

TABLE 1: IDENTIFIED CULTURAL HERITAGE LANDSCAPES (CHL) AND BUILT HERITAGE RESOURCES (BHR) LOCATED WITHIN OR ADJACENT TO THE STUDY CORRIDOR OF THE GORE ROAD FROM NORTH OF PATTERSON SIDE ROAD TO HIGHWAY 9

Site #	Resource Type	Category	Location	Type, Description, Heritage Recognition	Digital Photograph
9.	CHL	Transportation	**Within the Study Corridor** Finnerty Side Road (Between Lots 30 and 31, Con. 3 and 4, geographical township of Albion) Town of Caledon.	Roadscape Finnerty Side Road is a local rural roadscape running east to west. Opened by the mid 19th century as a sideroad allowance of the original Albion Township survey, it is shown on as an open road on the 1859 Tremaine map and the 1877 *Illustrated Historical Atlas* map. The jog in the sideroad is an irregularity of the original 19th century township survey. Members of the Finnerty family owned the south part of Lot 31, Concession 4 in 1877.	 View west to The Gore Road showing the jog in intersection of Finnerty Side Road.
10.	CHL	Agricultural	**Adjacent to the Study Corridor** Nos. 18460 &18464 The Gore Road, west side (Lot 33, Con. 3, geographical township of Albion) Town of Caledon.	Farm Complex The Town of Caledon reports a stone outbuilding on-site was built between 1850-1874. A stone foundation wall is located near the road. Other buildings on-site are not visible. Hugh Atchison was the property owner on the 1877 *Illustrated Historical Atlas* map. **The Town of Caledon confirmed (2011) the property is included on its built heritage inventory**.	 Stone wall of a building on site without a roof.

TABLE 1: IDENTIFIED CULTURAL HERITAGE LANDSCAPES (CHL) AND BUILT HERITAGE RESOURCES (BHR) LOCATED WITHIN OR ADJACENT TO THE STUDY CORRIDOR OF THE GORE ROAD FROM NORTH OF PATTERSON SIDE ROAD TO HIGHWAY 9

Site #	Resource Type	Category	Location	Type, Description, Heritage Recognition	Digital Photograph
11.	BHR	Residential	**Adjacent to the Study Corridor** No. 18696 The Gore Road, west side (Part East ½ Lot 34, Con. 3, geographical township of Albion) Town of Caledon	Residence The Town of Caledon reports this log house referred to as the Farrell-Haney Residence was built c1840s. It is not clearly visible from the roadside due to vegetation. M. & T. Farrell are shown as the property owners on the 1877 *Illustrated Historical Atlas* map. **This property is municipally designated under the OHA and included on the Town's Heritage Register.**	 View to west from the roadside to the log residence at No. 18696 The Gore Road.
12.	CHL	Transportation	**Within the Study Corridor** Coolihan's Side Road, (Between Lots 35 and 16, Con. 3 and 4, geographical township of Albion) Town of Caledon	Roadscape Coolihan's Side Road is a local rural gravel road with grassy ditches that runs east to west and intersects with The Gore Road. Surveyed as a sideroad allowance as part of the original Albion Township survey, it is shown as a seasonal or unopened road allowance on the 1877 *Illustrated Historical Atlas* map. A 1926 topographical map indicates it was opened only to the west side of The Gore Road at that time.	 View west on Coolihan's Side Road to the intersection with The Gore Road.

TABLE 1: IDENTIFIED CULTURAL HERITAGE LANDSCAPES (CHL) AND BUILT HERITAGE RESOURCES (BHR) LOCATED WITHIN OR ADJACENT TO THE STUDY CORRIDOR OF THE GORE ROAD FROM NORTH OF PATTERSON SIDE ROAD TO HIGHWAY 9

Site #	Resource Type	Category	Location	Type, Description, Heritage Recognition	Digital Photograph
13.	BHR	Other	**Adjacent to the Study Corridor** No. 19037 The Gore Road, east side (Lot 36, Con. 4, geographical township of Albion) Town of Caledon.	Log Structure The Town of Caledon reports that the log structures on-site have a construction date of before 1850. The property seems to be associated with the residence to the north at Highway 9. The age of the residence at Highway 9 is undetermined. A blacksmith shop was shown on site on the 1877 *Illustrated Historical Atlas* map with the initials J.C. as the owner of 5 ½ acres of land. **The Town of Caledon confirmed (2011) that the log buildings are included on its built heritage inventory**.	 Log building to south of residence at No. 19037 The Gore Road.  Residence at No. 19037 The Gore Road.

6.0 POTENTIAL EFFECTS OF UNDERTAKING ON CULTURAL HERITAGE RESOURCES

6.1 Introduction

This section provides a preliminary assessment of the potential adverse effects of the proposed road reconstruction on The Gore Road study corridor. The conservation of cultural heritage resources in planning is considered to be a matter of public interest. Generally, changes to a road such as realignment and other improvements may have the potential to adversely affect cultural heritage landscapes and built heritage resources by displacement and/or disruption during, as well as after construction. Built heritage resources and/or cultural heritage landscapes may experience displacement, i.e., removal, if they are located within the rights-of-way of the undertaking. There may also be potential for disruption, or indirect impacts, to cultural heritage resources by the introduction of physical, visual, audible or atmospheric elements that are not in keeping with their character and, or setting. Where impacts may occur it is important to follow the Parks Canada *Standards and Guidelines for the Conservation of Historic Places in Canada* and the MTC's *Eight Guiding Principles in the Conservation of Built Heritage Properties.* (2007).

6.2 Description of Potential Effects

The technically preferred alternative design for The Gore Road EA is two lane full reconstruction to improve the vertical/horizontal alignment, improve shoulder areas for safe stopping and road stability, improve drainage, provide a paved shoulder on both sides for bicycle, pedestrian traffic and farm vehicle use. The work is to be primarily contained within the ROW. It is anticipated that there will be minimal property acquisition along the study corridor.

6.2.1 Direct Impacts

There will one (1) direct impact, i.e., removal or demolition, of identified built heritage resources or cultural heritage landscapes as a result of the technically preferred alternative design namely The Gore Road ***(CHL 1)*** .

Urban improvements and widening of The Gore Road will result in change to the existing rural character and setting of the roadscape. There will be some minor tree removal. Generally fencing will not be disturbed. However, if some sections of rail fencing located within areas of property acquisition are affected by the undertaking, they will be rebuilt or replaced.

6.2.2 Indirect Impacts

There will be temporary noise during the construction activities and increased dust in the air from construction activities. Some grading work may occur outside the existing right-of-way (ROW). There will be some property acquisition that may affect agricultural land.

The historical settlement of Lockton **(CHL 2)** is located adjacent to the south limit of the study corridor. The residence situated at No. 17043 The Gore Road, and located within the historical settlement of Lockton, is located close to the road right-of-way. It will lose some frontage due to property acquisition.

7.0 MITIGATION RECOMMENDATIONS

A proposed undertaking should not adversely affect cultural heritage resources and intervention should be managed in such a way that its impact is sympathetic with the value of the resources. When the nature of the undertaking is such that adverse impacts are unavoidable it may be necessary to implement management or mitigation strategies that alleviate the deleterious effects to cultural heritage resource. Mitigation is the process of causing lessening or negating anticipated adverse impacts to cultural heritage resources and may include, but are not limited to, such actions as avoidance, monitoring, protection, relocation, remedial landscaping, documentation of the cultural heritage landscape and/or built heritage resource if to be demolished or relocated, salvage of building materials.

The principal heritage philosophy for the protection of cultural heritage resources is retention in situ. The protection of built heritage resources is to preserve in situ the structures and their material integrity to the maximum extent possible, consistent with public safety. If a built heritage resource is to be vacated due to property acquisition for removal or demolition, it should be properly secured from entry and vandalism and offered to prospective interested parties for removal off-site. If no interested parties come forward to move the building off-site, a qualified built heritage consultant should prepare a list of salvageable elements of the residence and a reputable contractor should salvage the building in a reasonable period of time.

7.1 Direct Impacts

The existing rural character of The Gore Road ***(CHL 1)***, such as mature tree lines and rail fencing, should be protected along the length of the study corridor where possible. Avoidance of mature trees and tree lines is the recommended option. This will preserve the existing character of the roadscape. A photographic documentation of the linear corridor of the roadscape should be prepared prior to construction and a report provided to the Town of Caledon.

7.2 Indirect Impacts

The following mitigation actions are recommended for the identified indirect impacts to cultural heritage resources.

- No. 17043 The Gore Road — A Cultural Heritage Impact Assessment report should be prepared prior to any construction activities to determine if the residence located at No. 17043 The Gore Road and associated with the historical settlement of Lockton is of heritage value or interest. If the residence is determined to be of heritage value, mitigation shall include consideration of moving the building back on its site, protection from construction activities and monitoring of vibration impacts in the vicinity of the residence. If the building is vacated as a result of the road improvements, it shall be properly secured and protected from vandalism and maintained in good condition. This report shall be provided to the Town of Caledon.

- Lockton ***(CHL 2)*** — It is recommended that prior to construction activities a Cultural Heritage Documentation Report be prepared to document with photographs the context of the historical settlement hamlet of Lockton. The report will include a physical description of the settlement, an annotated photographic documentation of the associated heritage resources with photo key plans, and a location map. This report shall be provided to the Town of Caledon.

SOURCES

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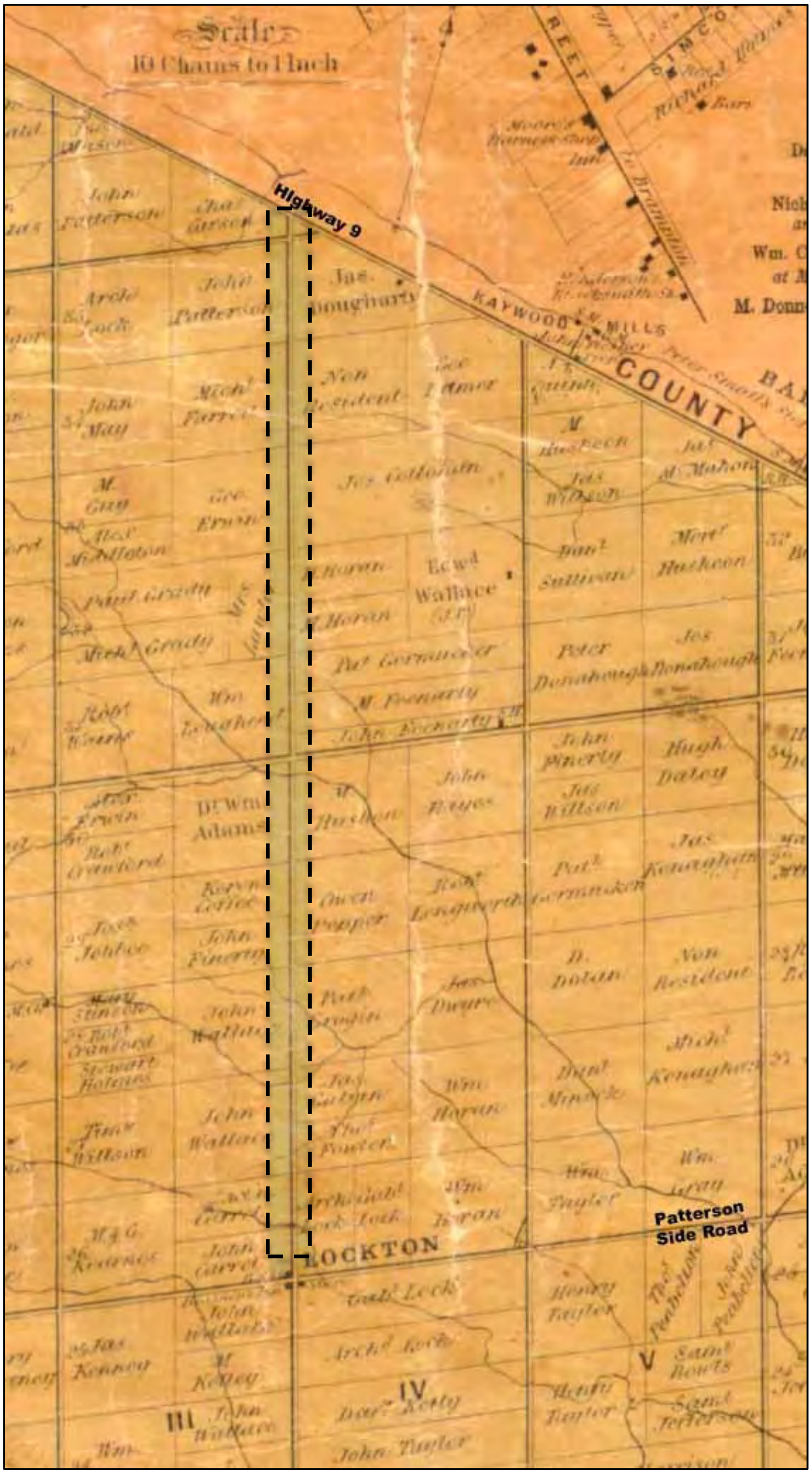
APPENDIX A:
HISTORICAL MAPS



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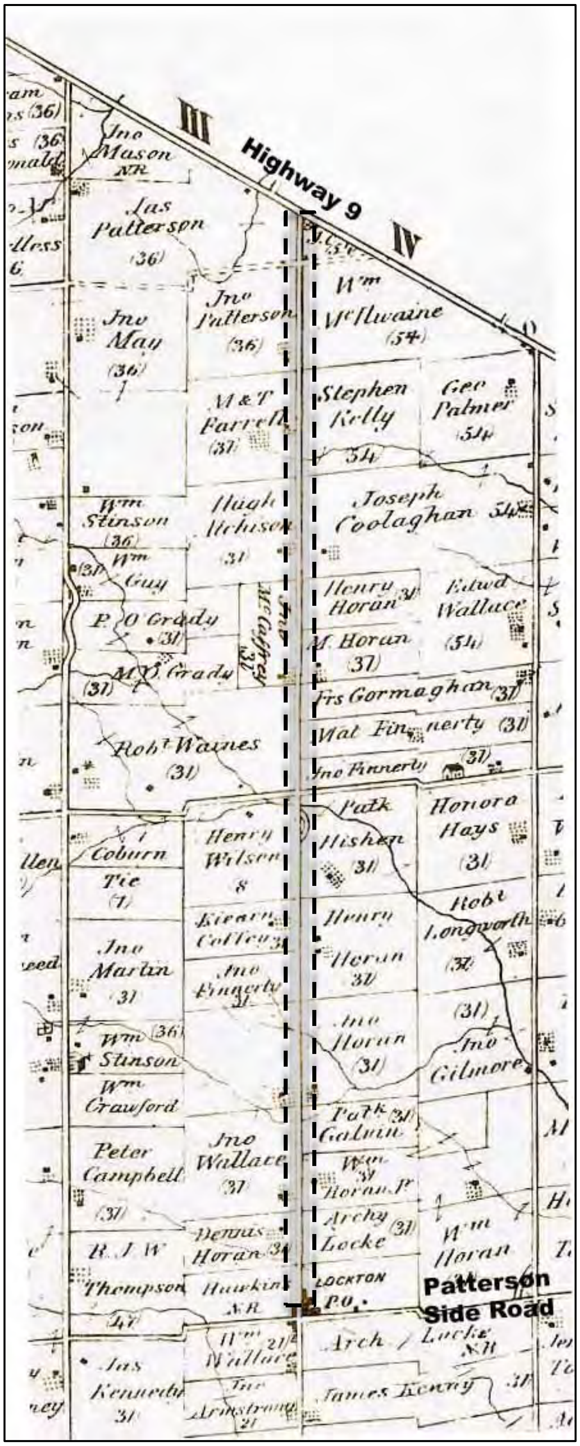

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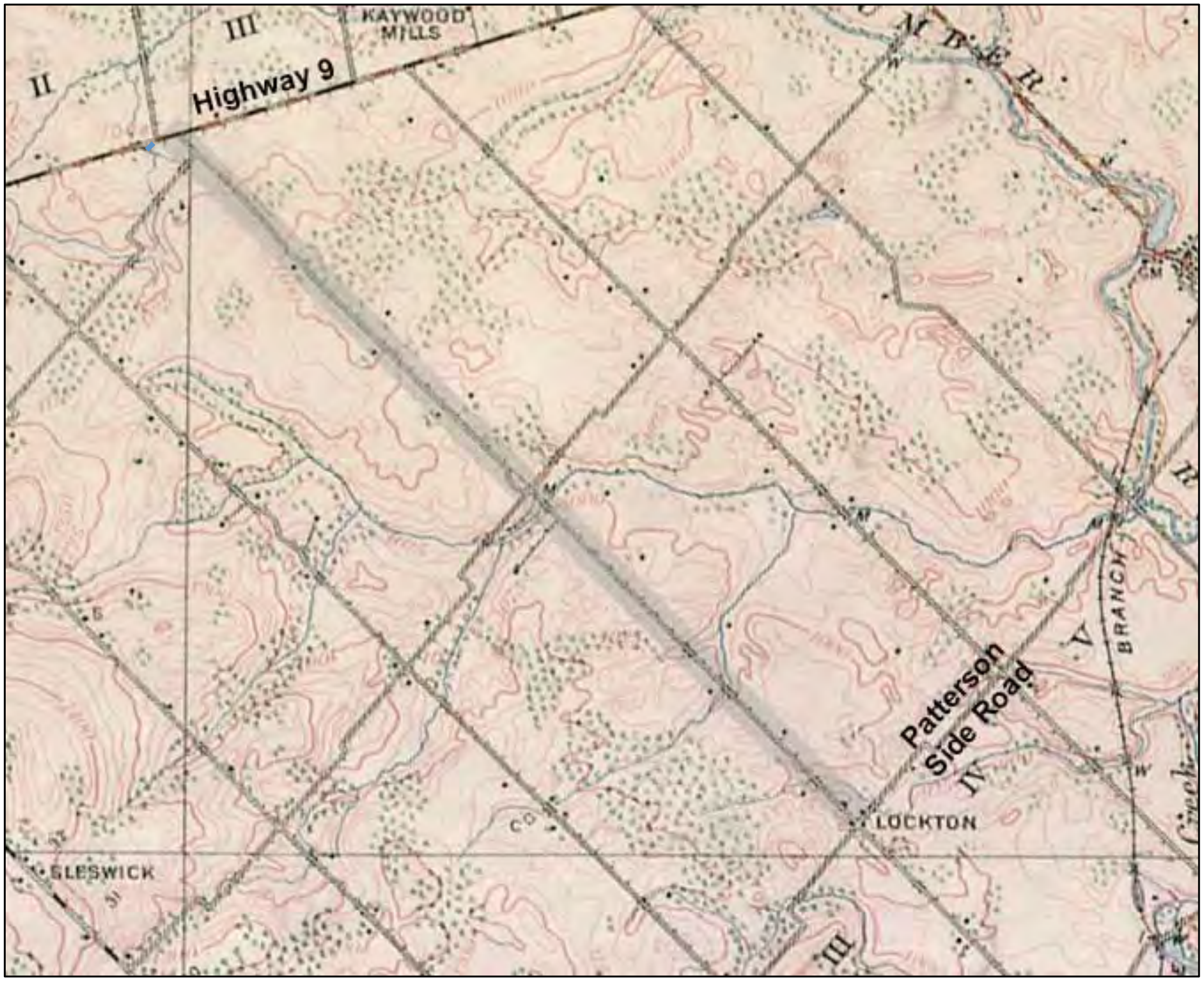

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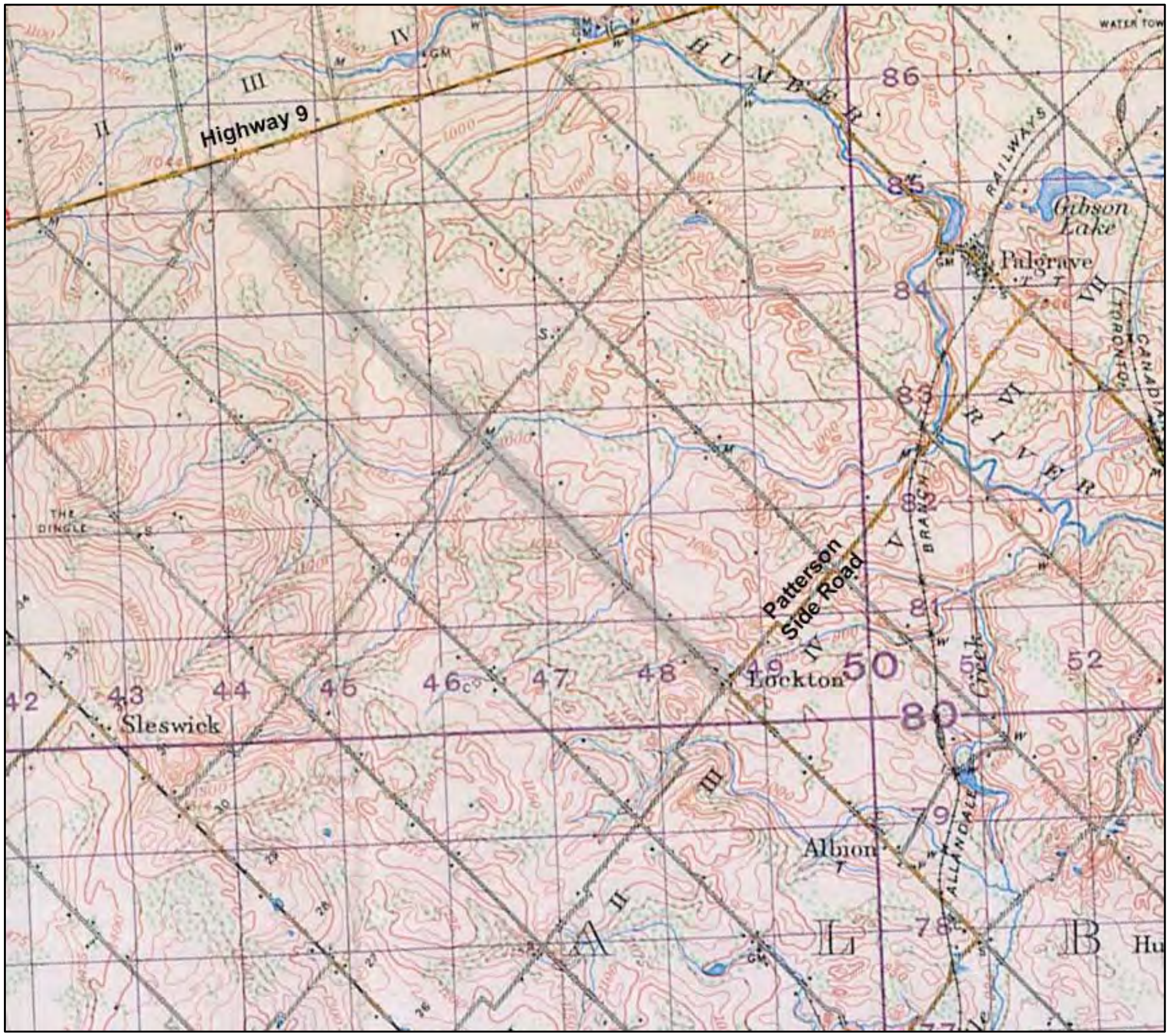

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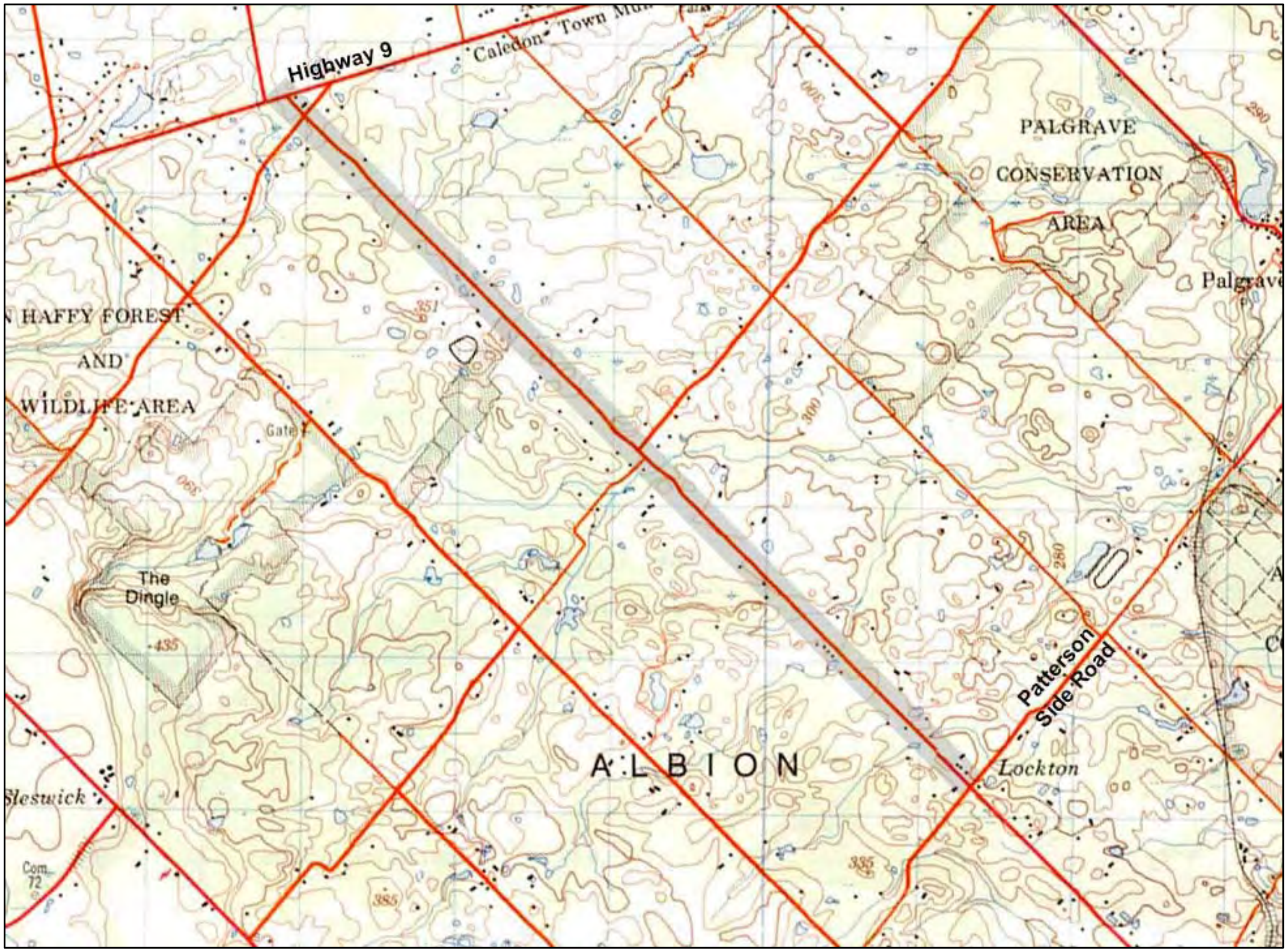

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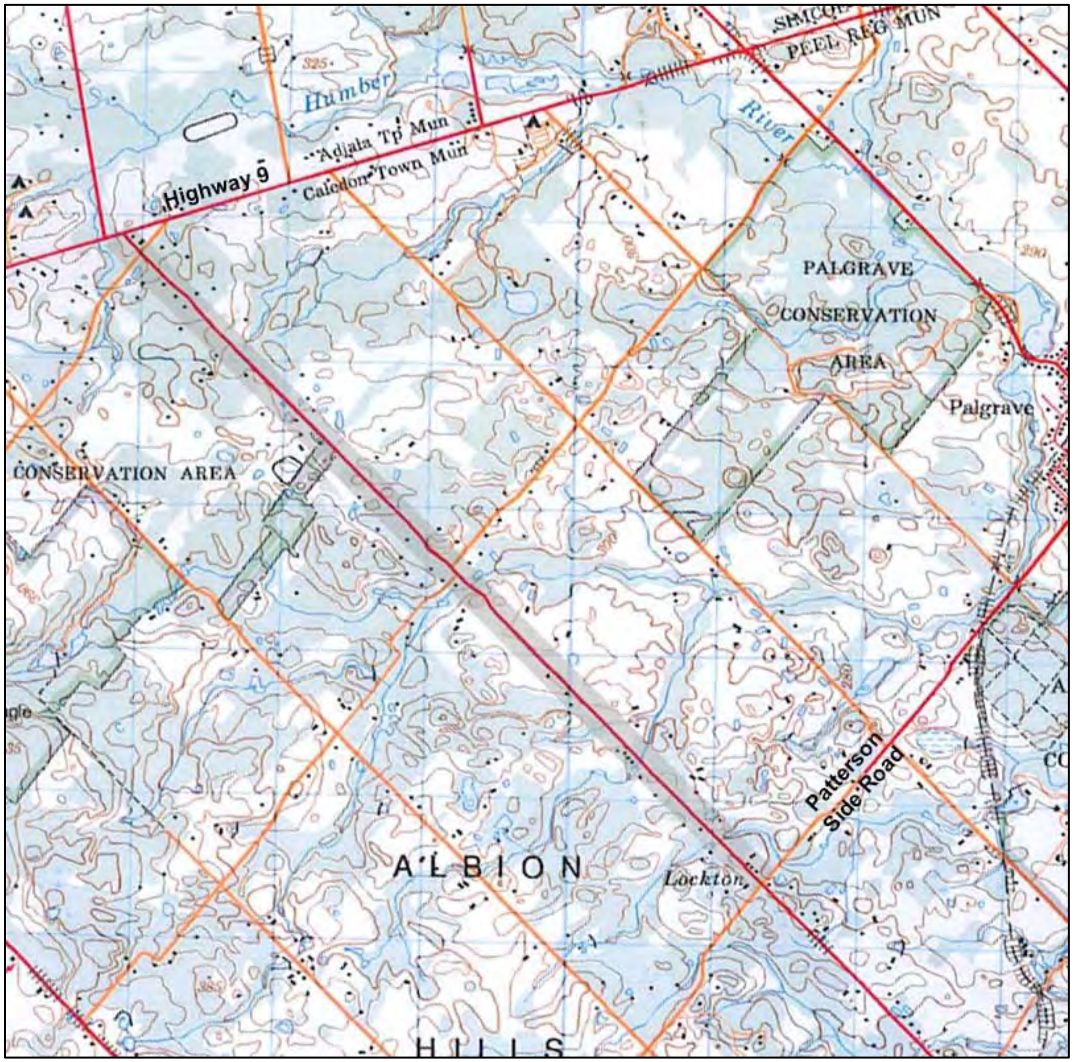

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BURNSIDE
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Appendix I

Archaeological Assessment

I1	Stage 1 Archaeological Assessment
I2	Stage 2 Archaeological

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Appendix I1

Stage 1 Archaeological Assessment

REPORT ON THE STAGE 1 ARCHAEOLOGICAL ASSESSMENT OF THE GORE ROAD IMPROVEMENTS, FROM PATTERSON SIDE ROAD TO HIGHWAY 9, TOWN OF CALEDON, REGIONAL MUNICIPALITY OF PEEL

ARCHAEOLOGICAL ASSESSMENTS LTD.

REPORT ON THE STAGE 1 ARCHAEOLOGICAL ASSESSMENT OF THE GORE ROAD IMPROVEMENTS, FROM PATTERSON SIDE ROAD TO HIGHWAY 9, TOWN OF CALEDON, REGIONAL MUNICIPALITY OF PEEL

Prepared by

Archaeological Assessments Ltd.
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Consulting Archaeologist: Glenn Kearsley
Archaeological Consulting Licence Number P123

P.I.F. Number P123-060-2011
March 28, 2011

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LIST OF PLATES

PROJECT PERSONNEL

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Report Preparation Chris Brown (License R220), Richard Sutton (License P013)

SUMMARY

This report details the rationale, methods and results of the Stage 1 Archaeological Assessment of the Gore Road Improvements, from Patterson Side Road to Highway 9, Town of Caledon, Regional Municipality of Peel. The purpose of the assessment was to determine the archaeological potential of the road corridor as part of a Schedule B Municipal Class Environmental Assessment.

The project will involve improvements to the Gore Road over a linear distance of 6.3 kilometres. All of the improvements will be confined to the existing right-of-way.

The vast majority of the road corridor has been disturbed by the existing right-of-way and no longer has any archaeological potential. However, the results of the Stage 1 archaeological assessment indicates that there are some small potentially undisturbed areas along the existing right-of-way which do have some potential for archaeological resources. This conclusion is based upon several factors including: the undisturbed areas are located within 200 -300 metres of one or more watercourses; the potentially undisturbed areas along the corridor are associated with well drained tableland areas; and there is some potential for mid to late 19th century Euro-Canadian homesteads along the corridor. Given the moderate to high archaeological potential of some sections of the road corridor, it is recommended that a Stage 2 archaeological assessment should be imposed as a standard condition before any of these lands are disturbed by the proposed improvements to this road corridor.

1.0 INTRODUCTION

This report details the rationale, methods and results of the Stage 1 Archaeological Assessment of the Gore Road Improvements, from Patterson Side Road to Highway 9, Town of Caledon, Regional Municipality of Peel. The purpose of the assessment was to determine the archaeological potential of the road corridor as part of a Schedule B Municipal Class Environmental Assessment.

The assessment was conducted by Archaeological Assessments Ltd., under archaeological consulting licence No. P123 issued to Glenn Kearsley. The assessment was conducted in accordance with the provisions of the Ontario Heritage Act (Government of Ontario 1980), the technical guidelines for archaeological assessments formulated by the Ministry of Tourism and Culture (2010). Archaeological Assessments Ltd. accepts responsibility for the long term curation of any artifacts recovered and documents produced as a result of the assessment. The Region of Peel gave permission for the licensee to access the study area.

2.0 LOCATION AND DESCRIPTION

The Gore Road study area is situated along the northern edge of the Town of Caledon (Figure 1). The proposed Gore Road improvements run from Highway 9 southeast to Patterson Sideroad, for a distance of 6.3km. The proposed rehabilitation of the Gore Road will involve improvements to the existing pavement, shoulder areas, ditching and visibility. All of the improvements will take place within the existing right-of-way.

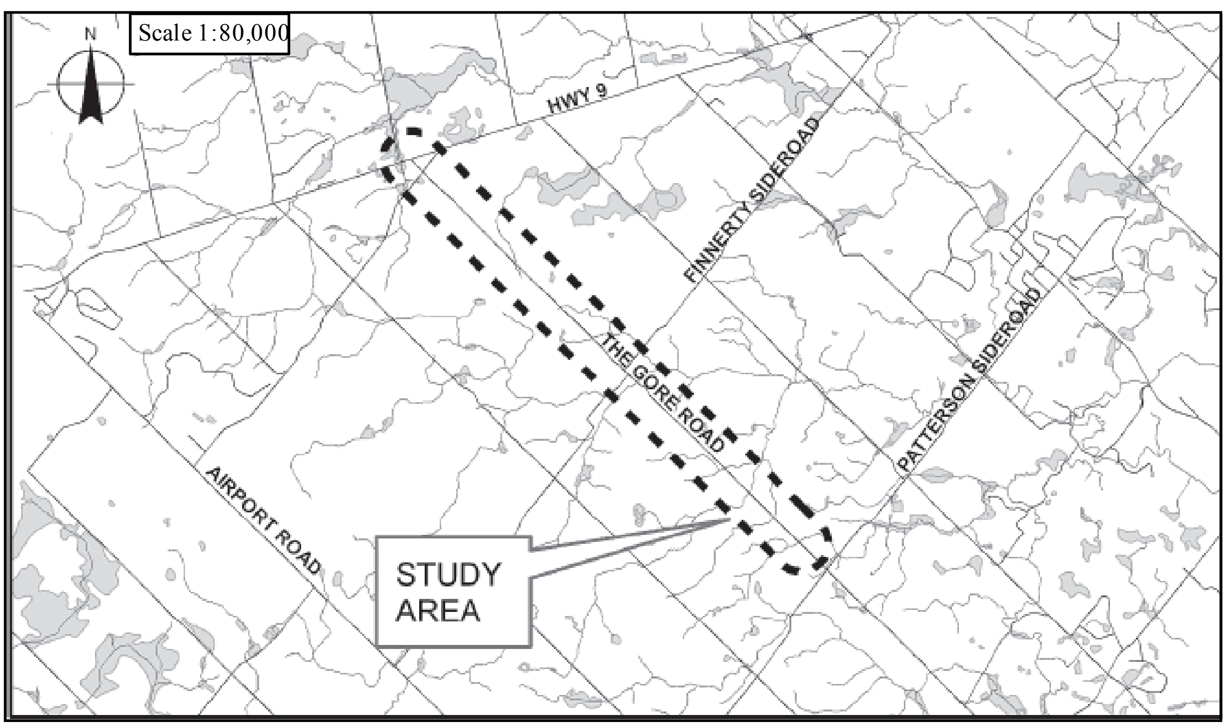

Figure 1. Location of the Road Corridor
(Notice of Study Commencement, Region of Peel 2010)

A visual inspection of the road corridor was conducted on March 21, 2011 under cloudy and mild weather conditions by Rick Sutton (P0-13). There was no snow cover at the time of the inspection. The current road corridor consists of one lane in each direction flanked intermittently on both sides by a narrow gravel or dirt shoulder and a shallow drainage ditch. The road corridor is situated in a rural landscape where the right-of-way is bordered by forested and scrubland areas, agricultural lands, and large rural residential lots. Most of the road corridor appears to have been disturbed by the existing right-of-way.

The study area is located in the Oak Ridges Moraine physiographic region (Chapman and Putnam 1984:166). This moraine is hilly with a knob and basin topography. It is largely composed of sandy and gravelly soils. A number of small watercourses criss-cross the road corridor.

3.0 ARCHAEOLOGICAL SITE POTENTIAL

The Ontario Ministry of Tourism and Culture has defined general guidelines for determining the archaeological potential of development properties (2010). Evaluating the potential for a specific development property is based on determining its association with a wide range of geographic and cultural-historic features which would have directly influenced the settlement patterns of the past inhabitants of a region. The presence or absence of these features within or close to a particular parcel of land can serve as an indicator of past human use, and can serve as the screening criteria for determining the archaeological potential of the property (MTC 2010).

3.1 Known Archaeological Resources

In Ontario, information concerning archaeological sites is stored in the Archaeological Sites Data Base (ASDB), a database maintained by the Ontario Ministry of Tourism and Culture. This database contains archaeological sites registered within the Borden system. Under the Borden system, Canada has been divided into grid blocks based on latitude and longitude. A Borden block is approximately 13 kilometres east to west, and approximately 18.5 kilometres north to south. Each Borden block is referenced by a four-letter designator, and sites within a block are numbered sequentially as they are found. The study area is located in Borden Block AlGx.

Information on archaeological sites located beyond the limits of the subject property provide context for the property, and serve to indicate the variety and nature of archaeological resources that may be present on the property itself. A survey of the Ministry of Tourism and Culture archaeological files located in Toronto indicates that there is only one registered archaeological site located within a one kilometre radius of the road corridor. The registered site is the Dead Rabbit site (AlGx-13), which is located on the north side of Highway 9, just north of the intersection of Gore Road and Highway 9. The site is a mid to late 19th century Euro-Canadian homestead registered by Ministry of Transportation archaeologist Gary Warrick in 1994. There is no report reference on the site record form. This site will not be impacted by this project because of its location on the north side of Highway 9.

Table 1. Cultural Chronology For Southern Ontario

PERIOD	GROUP	TIME RANGE	COMMENT
PALEO-INDIAN			
Early	Fluted	9000 - 8500 B.C.	Big Game Hunters and Small Nomadic Groups
Late	Non-fluted	8500 - 7500 B.C.	
ARCHAIC			
Early	Nettling	8000 - 7000 B.C.	Nomadic Hunters and Gatherers
	Bifurcate Based	7000 - 6000 B.C.	
Middle	Stemmed, Otter Creek and Brewerton	6000 - 2500 B.C.	Transition to Territorial Settlement
Late	Narrow Point	2500 - 1800 B.C.	More Diverse Resource Base
	Broad Point	1800 - 1500 B.C.	
	Small Point	1500 - 800 B.C.	
WOODLAND			
Early	Meadowood and Middlesex	1000 - 300 B.C.	Introduction of Pottery
Middle	Point Peninsula	300 B.C.- 700 A.D.	Long Distance Trade
Transitional	Princess Point	500 - 900 A.D.	Early Agriculture
Late	Early Iroquoian	900 - 1275 A.D.	Transition to Village Life
	Middle Iroquoian	1275 - 1400 A.D.	Large Villages and Dependence on Agriculture
	Late Iroquoian	1400 - 1650 A.D.	Tribal Development, Warfare, European Contact
HISTORIC			
Early	Odawa, Ojibwa, Mississauga	1700 - 1875 A.D.	Social Displacement
Late	Euro-Canadian	1800 A.D.-present	European Settlement

3.2 Physiographic Features

General physiographic features which must be considered when identifying areas of archaeological potential include distance to water, local topography, soil conditions, and other resource specific features. In general, any lands located within 300 metres of any of these physiographic features should be considered to have archaeological potential (MTC 2010: 7).

The MTC's Standards and Guidelines for Consultant Archaeologists (2010: 4-5) stipulate that primary water sources (lakes, rivers, streams, creeks, etc.), secondary water sources (intermittent streams and creeks, springs, marshes, swamps, etc.), ancient water sources (glacial lake shorelines indicated by the presence of raised sand or gravel beach ridges, relic river or stream channels indicated by clear dip or swale in the topography, shorelines of drained lakes or marshes, cobble beaches, etc.), as well as accessible or inaccessible shorelines (high bluffs, swamp or marsh fields by the edge of a lake, sandbars stretching into marsh, etc.) are characteristics that indicate archaeological potential. Other geographic characteristics that can indicate archaeological potential include: elevated topography (eskers, drumlins, large knolls, plateau), pockets of well-drained sandy soil, especially near areas of heavy soil or rocky ground, distinctive land formations that might have been special or spiritual places, such as waterfalls, rock outcrops, caverns, mounds, and promontories and their bases. Resource areas are also considered to be characteristics that indicate archaeological potential (MTC 2010: 5).

Potable water is the single most important resource necessary for any extended human occupation or settlement. Since water sources have remained relatively stable in south central Ontario after the Pleistocene era, proximity to water can be regarded as a useful index for the evaluation of archaeological site potential. Indeed, distance from water has been one of the most commonly used variables for predictive modeling of site location. A number of small watercourses criss-cross the road corridor. In addition, there are a number of small ponds and low lying poorly drained areas along the corridor. Consequently, most of the road corridor is situated within 300 metres of a source of water.

3.3 Historic Cultural Features

The MTC's Standards and Guidelines for Consultant Archaeologists (2010: 5) stipulate that areas of early Euro-Canadian settlement (pioneer homesteads, isolated cabins, farmstead complexes), early wharf or dock complexes, pioneer churches and early cemeteries, are considered to have archaeological potential. Early historical transportation routes (trails, passes, roads, railways, portage routes), properties listed on a municipal register or designated under the Ontario Heritage Act or a federal, provincial, or municipal historic landmark or site, and properties that local histories or informants have identified with possible archaeological sites, historical events, activities, or occupations are also considered to have archaeological potential. In general, any lands located within 300 metres of any of these cultural features should be considered to have archaeological potential (MTC 2010: 7).

Information on potential Euro-Canadian archaeological planning concerns was derived from an examination of the 1877 Illustrated Historical Atlas of Peel County (Pope 1877: Figure 2).
The Township of Albion was surveyed for settlement in 1818 and 1819. The first settlers arrived in 1819 (Pope 1877). The historic mapping indicates that by 1877 the Gore Road was being used as a transportation corridor. There does not appear to have been any homesteads situated immediately adjacent to the road corridor at that time, with the exception of the Hamlet of Lockton at the south end of the study area (Figure 2). It should be noted that the historical atlas maps were produced by subscription and only the homes of wealthier land owners tended to be illustrated along with the principal roads and villages. Any early or mid 19th century homesteads that were abandoned before the 1877 map was produced, would also not have been illustrated.

Due to its obvious use as a transportation corridor in the 19th century, any undisturbed sections of the existing right-of way would have some archaeological potential for historic sites.

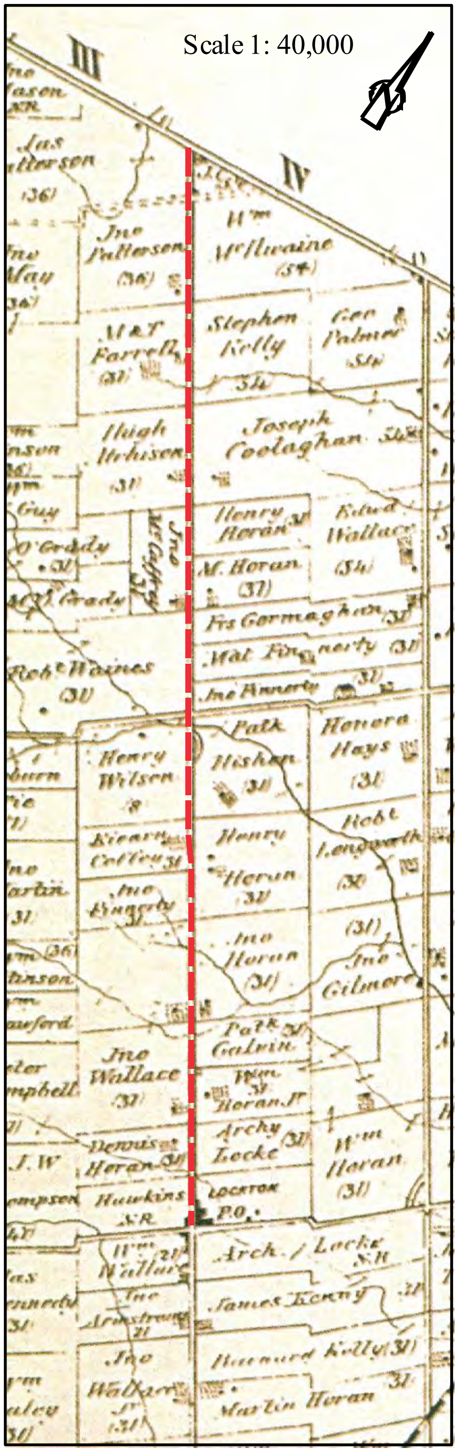

Figure 2. 1877 Historical Atlas Map of the Township of Albion(Pope 1877)

3.4 Extent of Previous Disturbance and Development

For an assessment of the archaeological potential of an existing road corridor, examining the extent of previous disturbance is an important factor in determining the potential for archaeological resources. Most of the road corridor has been disturbed by the existing right-of-way and no longer has any archaeological potential. Some small sections along the right-of-way appear to be potentially undisturbed (Figure 3). One area is situated on the west side of the corridor 1.4-1.6km south of Highway 9. Another area is located on the west and east sides of the corridor 3.7-4.0km south of Highway 9.

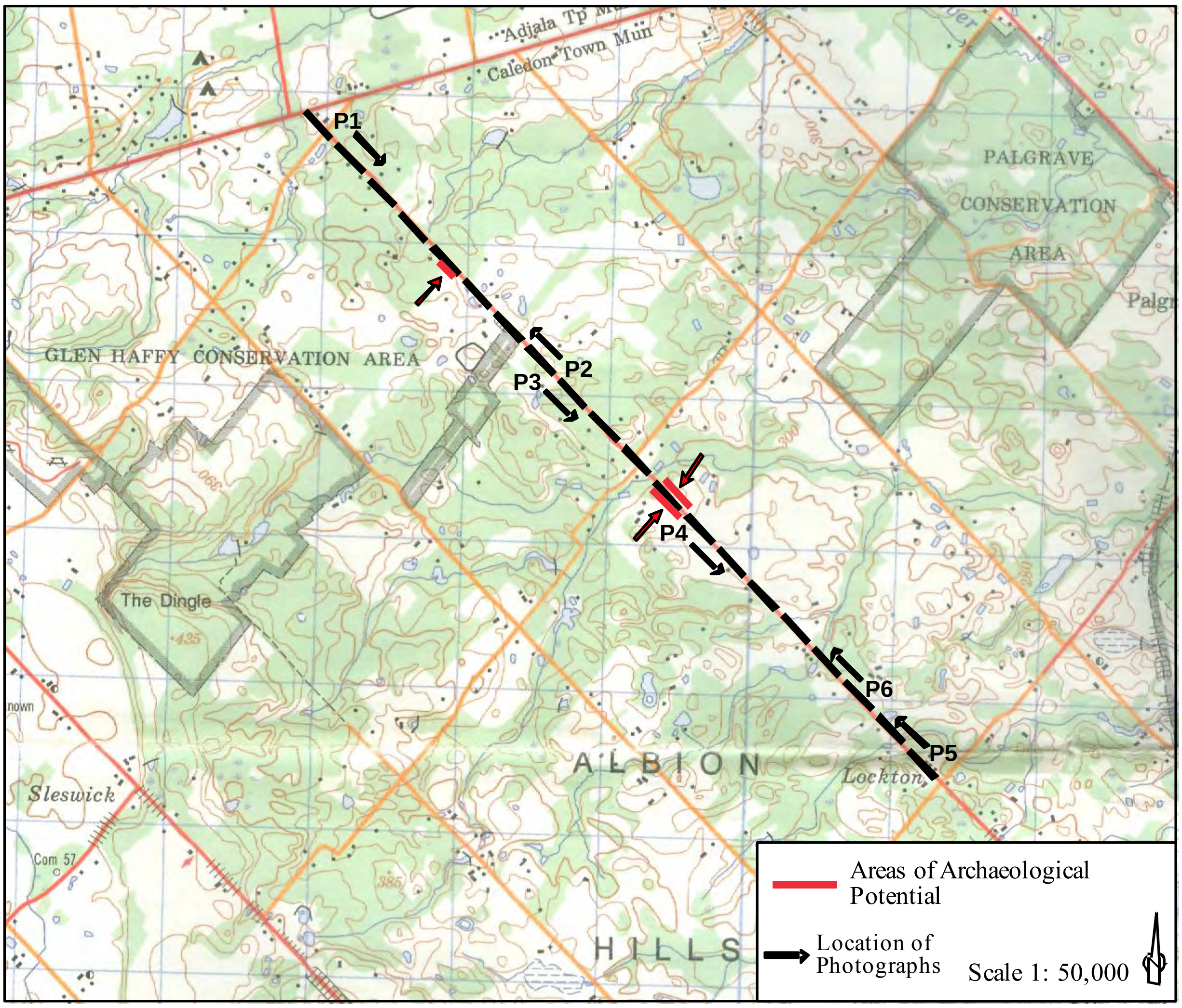

Figure 3. Archaeological Potential of the Road Corridor
(modified from Bolton 30 M/13 Department of Energy, Mines and Resources 1994)

4.0 RECOMMENDATIONS AND COMPLIANCE ADVICE

The vast majority of the road corridor has been disturbed by the existing right-of-way and no longer has any archaeological potential. However, the results of the Stage 1 archaeological assessment indicates that there are some small potentially undisturbed areas along the existing right-of-way which do have some potential for archaeological resources. This conclusion is based upon several factors including: the undisturbed areas are located within 200 -300 metres of one or more watercourses; the potentially undisturbed areas along the corridor are associated with well drained tableland areas; and there is some potential for mid to late 19th century Euro-Canadian homesteads along the corridor. Given the moderate to high archaeological potential of some sections of the road corridor, it is recommended that a Stage 2 archaeological assessment should be imposed as a standard condition before any of these lands are disturbed by the proposed improvements to this road corridor.

This report is submitted to the Minister of Tourism and Culture as a condition of licensing in accordance with Part VI of the *Ontario Heritage Act*, R.S.O. 1990, c 0.18. The report is reviewed to ensure that it complies with the standards and guidelines that are issued by the Minister, and that the archaeological fieldwork and report recommendations ensure the conservation, protection and preservation of the cultural heritage of Ontario. When all matters relating to archaeological sites within the project area of a development proposal have been addressed to the satisfaction of the Ministry of Tourism and Culture, a letter will be issued by the ministry stating that there are no further concerns with regard to alterations to archaeological sites by the proposed development.

It is an offence under Sections 48 and 69 of the *Ontario Heritage Act* for any party other than a licensed archaeologist to make any alteration to a known archaeological site or to remove any artifact or other physical evidence of past human use or activity from the site, until such time as a licensed archaeologist has completed archaeological fieldwork on the site, submitted a report to the Minister stating that the site has no further cultural heritage value or interest , and the report has been filed in the Ontario Public Register of Archaeology Reports referred to in Section 65.1 of the *Ontario Heritage Act*.

Should previously undocumented archaeological resources be discovered, they may be a new archaeological site and therefore subject to Section 48 (1) of the *Ontario Heritage Act*. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant 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.

5.0 REFERENCES CITED

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Plate 1. Gore Road, 0.25km South of Highway 9(view southeast)

Plate 2. Gore Road, 2.5km South of Highway 9 (view northwest)

Plate 3. Gore Road, 3.0km South of Highway 9 (view southeast)

Plate 4. Gore Road, 4.0km South of Highway 9 (view southwest)

Plate 5. Gore Road, 6km South of Highway 9 (view northwest)

Plate 6. Gore Road, 5.5km South of Highway 9 (view northwest)

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Appendix I2

Stage 2 Archaeological Assessment

REPORT ON THE STAGE 2 ARCHAEOLOGICAL ASSESSMENT OF THE GORE ROAD, FROM PATTERSON SIDE ROAD TO HIGHWAY 9, GEOGRAPHIC TOWNSHIP OF ALBION, TOWN OF CALEDON, REGIONAL MUNICIPALITY OF PEEL

ARCHAEOLOGICAL ASSESSMENTS LTD.

REPORT ON THE STAGE 2 ARCHAEOLOGICAL ASSESSMENT OF THE GORE ROAD, FROM PATTERSON SIDE ROAD TO HIGHWAY 9, GEOGRAPHIC TOWNSHIP OF ALBION, TOWN OF CALEDON, REGIONAL MUNICIPALITY OF PEEL

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Archaeological Consulting Licence Number P361
P.I.F. Number P361-018-2012
June 3, 2013

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5.0 IMAGES

PROJECT PERSONNEL

Project Director	Chris Brown (License P361)
Report Preparation	Rick Sutton (License P013)
Field Assistants	Jennie Fiddes, Sally Lynch

EXECUTIVE SUMMARY

This report details the rationale, methods and results of the Stage 2 Archaeological Assessment of the Gore Road, From Patterson Side Road To Highway 9, Geographic Township Of Albion, Town Of Caledon, Regional Municipality Of Peel. This project was conducted as a component of a Schedule 'B' Municipal Class EA project prior to some proposed improvements to the road corridor.

The road corridor was subjected to a Stage 1 assessment by our firm in 2010 (AAL 2012). The results of that assessment indicated that there were some areas which appeared to be undisturbed and which had some archaeological potential.

The section of the road corridor which was the focus of this assessment has a length of 6.3km. The existing right-of-way has an average width of 20-25 metres. Some of the proposed improvements will take place outside of the existing right-of-way. The additional land requirements range in width from 2.5-7.5 metres outside of the existing right-of-way along some sections of the corridor.

The physical assessment of the potentially undisturbed sections of the existing and expanded right-of-way was conducted in November, 2012 and May, 2013. The potentially undisturbed well drained areas were shovel test pitted at 5 metre intervals. A few small sections of the proposed expanded right-of-way could not be surveyed because we did not have permission to access them.

The Stage 2 archaeological assessment of the road corridor determined that there are no significant archaeological resources present on the lands which were subjected to a Stage 2 assessment. Accordingly, there are no other further concerns for impacts to archaeological resources for the existing right-of-way and for the sections of the proposed expanded right-of-way which were subjected to a Stage 2 assessment. No further archaeological assessment of these areas is required. Some sections of the proposed expanded right-of-way will still require a Stage 2 assessment if they are impacted by this project. This includes areas associated with 17715, 18243, 18809 and 18878 Gore Road.

1.0 PROJECT CONTEXT

1.1 INTRODUCTION AND DEVELOPMENT CONTEXT

This report details the rationale, methods and results of the Stage 2 Archaeological Assessment of Gore Road, From Patterson Side Road To Highway 9, Geographic Township Of Albion, Town Of Caledon, Regional Municipality Of Peel. This project was conducted as a component of a Schedule ‘B’ Municipal Class EA project prior to some proposed improvements to the road corridor.

Permission for access to the property and to remove and curate artifacts was granted by the Region and local land owners. All fieldwork was conducted under archaeological consulting licence No. P361, issued to Chris Brown. The assessment was conducted in accordance with the provisions of the Ontario Heritage Act (Government of Ontario 1980), and with the technical guidelines for archaeological assessments formulated by the Ministry of Tourism and Culture (MTC 2011). Archaeological Assessments Ltd. accepts responsibility for the long term curation of any artifacts recovered or documents produced as a result of the assessment.

1.2 ARCHAEOLOGICAL CONTEXT AND PROPERTY DESCRIPTION

Project Description

The Gore Road study area is situated along the northern edge of the Town of Caledon (Figure 1). The proposed Gore Road improvements run from Highway 9 southeast to Patterson Sideroad, for a distance of 6.3km. The proposed rehabilitation of the Gore Road will involve improvements to the existing pavement, shoulder areas, ditching and visibility. The existing right-of-way has an average width of 20-25 metres. Some of the proposed improvements will take place outside of the existing right-of-way. The additional land requirements range in width from 2.5-7.5 metres outside of the existing right-of-way along some sections of the corridor.

The current road corridor consists of one lane in each direction flanked intermittently on both sides by a narrow gravel or dirt shoulder and a shallow drainage ditch. The road corridor is situated in a rural landscape where the right-of-way is bordered by forested and scrubland areas, agricultural lands, and large rural residential lots. Most of the existing right-of-way has been disturbed by the existing road corridor, although there are some potentially undisturbed areas. Some of the lands situated outside of the existing right-of-way are also undisturbed. The Stage 2 assessment was carried out by archaeological consultant Chris Brown (P361) on November 12-15, 2012 and May 21, 2013.

The Gore Road runs through mostly rural lands, consisting of residential properties, poorly drained areas, wooded lands, pasture and manicured lawn areas. A number of gravel/asphalt laneways are located on either side of the road corridor over the course of its length. The topography is rolling, with a number of elevated ridges, steeply-sloping hills, low lying marsh areas and level lands. The study area is located in the Oak Ridges Moraine physiographic region (Chapman and Putnam 1984:166). This moraine is hilly with a knob and basin topography. It is largely composed of sandy and gravelly soils. A number of small watercourses criss-cross the road corridor.

Previous Archaeological Research
A Stage 1 archaeological assessment of the existing right-of-way was carried out by our firm in 2010 (AAL 2012). The results of the Stage 1 archaeological assessment indicated that there were some small potentially undisturbed areas along the existing right-of-way which did have some potential for archaeological resources. This conclusion was based upon several factors including: the undisturbed areas are located within 200 -300 metres of one or more watercourses; the potentially undisturbed areas along the corridor are associated with well drained tableland areas; and there is some potential for mid to late 19th century Euro-Canadian homesteads along the corridor. Given the moderate to high archaeological potential of some sections of the road corridor, it was recommended that a Stage 2 archaeological assessment should be imposed as a standard condition before any of these lands are disturbed by the proposed improvements to this road corridor (AAL 2012). Since the time of the original Stage 1 assessment it was determined that some additional lands outside of the existing right-of-way will also be impacted by this project. Most of the additional lands appear to be undisturbed and have some archaeological potential for the same reasons stated above for the rest of the corridor.

A survey of the Ministry of Tourism and Culture archaeological files located in Toronto indicates that there is only one registered archaeological site located within a one kilometre radius of the road corridor (AAL 2012). The registered site is the Dead Rabbit site (AlGx-13), which is located on the north side of Highway 9, just north of the intersection of Gore Road and Highway 9. The site is a mid to late 19th century Euro-Canadian homestead registered by Ministry of Transportation archaeologist Gary Warrick in 1994. There is no report reference on the site record form. This site will not be impacted by this project because of its location on the north side of Highway 9.

1.3 HISTORICAL CONTEXT

Information on potential Euro-Canadian archaeological planning concerns was derived from an examination of the 1877 Illustrated Historical Atlas of Peel County (Pope 1877: Figure 2).
The Township of Albion was surveyed for settlement in 1818 and 1819. The first settlers arrived in 1819 (Pope 1877). The historic mapping indicates that by 1877 the Gore Road was being used as a transportation corridor (AAL 2012). There does not appear to have been any homesteads situated immediately adjacent to the road corridor at that time, with the exception of the Hamlet of Lockton at the south end of the study area (Figure 2). It should be noted that the historical atlas maps were produced by subscription and only the homes of wealthier land owners tended to be illustrated along with the principal roads and villages. Any early or mid 19th century homesteads that were abandoned before the 1877 map was produced, would also not have been illustrated. Due to its obvious use as a transportation corridor in the 19th century, any undisturbed sections of the existing right-of way would have some archaeological potential for historic sites (AAL 2012).

2.0 STAGE 2 FIELD ASSESSMENT

2.1 FIELD METHODS

The Stage 2 assessment of the potentially undisturbed sections of the existing and proposed right-of-way was conducted under the supervision of Chris Brown (License P361), Archaeological Assessments Ltd., on November 12-15, 2012 and May 21, 2013. The weather varied from cloudy and cool to mild and sunny.

All of potentially undisturbed well drained sections of the existing and the proposed expanded right-of-way of the road corridor were shovel test pitted at 5 metre intervals (Table 1 and Figures 3-24). The areas that were shovel test pitted were excavated to within one metre of any built structures or hard scaped areas. Each test pit measured more than 30 cm (one foot) in diameter and was excavated 5cm into the subsoil. The soil from each test pit was screened through 6mm mesh in order to look for artifacts. Each test pit was then backfilled. Where intact topsoil deposits were found, they generally featured dark brown sandy loam, with depths ranging from 15-30cm.

Areas of obvious disturbance occupied by the existing road corridor, gravel shoulders, drainage ditches, driveways and road intersections no longer have any archaeological potential and were not test pitted. Low lying poorly drained lands along the road corridor also have no archaeological potential (Figures 3-24).

Some sections of the proposed expansion of the existing right-of-way could not be subjected to a Stage 2 assessment because access by the land owner was not granted. This included the expanded right-of-way sections associated with 17715, 18243, 18809 and 18878 Gore Road. In addition, a Stage 2 assessment was not carried out on any of the lands owned by the Toronto Region Conservation Authority outside of the existing right-of-way. The TRCA carried out their own Stage 1-2 archaeological assessment of their lands in 2012 and did not find any archaeological sites (Alistair R. Jolly, Toronto and Region Conservation Authority: personal communication October, 2012 report pending).

Table 1. General Observations and Archaeological Survey Coverage and Techniques

Segment	General Description	Topography	West Side	East Side
STA 0 to STA 0+280	Combination of residential and pasture lands, with ditches on both sides of road	Rising to crest of hill in north section	Mostly disturbed lands. Lands outside of existing R.O.W. shovel test pitted at 5 metre intervals.	Disturbed lands. No archaeological potential.
STA 0+270 to STA 0+580	Residential lands on west side, with central low area. East side composed of mainly wooded lands	Sloping down to low-lying central area, then rising to the north	Mostly disturbed or poorly drained lands. Lands outside of existing R.O.W. shovel test pitted at 5 metre intervals.	Mostly disturbed or poorly drained lands. Some areas within existing R.O.W. shovel test pitted at 5 metre intervals.

STA 0+570 to STA 0+880	Wooded lands and low-lying marsh	Generally low-lying, before beginning to slope upward in north section	Disturbed or poorly drained lands. No archaeological potential.	Mostly disturbed or poorly drained lands. Some areas within and outside of existing R.O.W. shovel test pitted at 5 metre intervals.
STA 0+870 to STA 1+180	Hilly wooded lands and low-lying areas	Elevated crest of hill in southern half, then sloping down to the north	Mostly disturbed or poorly drained lands. Some lands outside of existing R.O.W. shovel test pitted at 5 metre intervals.	Mostly disturbed or poorly drained lands. Some lands outside of existing R.O.W. shovel test pitted at 5 metre intervals.
STA 1+170 to STA 1+480	Wooded areas, low-lying areas and residential lands	Sloping up to central elevated area, then down to north end	Some poorly drained lands. Most areas within and outside of existing R.O.W. shovel test pitted at 5 metre intervals.	Disturbed or poorly drained lands. No archaeological potential.
STA 1+470 to STA 1+780	Low-lying wooded areas and scrublands	South end low-lying, then sloping steeply up to north	Mostly disturbed or poorly drained lands. Some areas within existing R.O.W. shovel test pitted at 5 metre intervals.	Some disturbed or poorly drained lands. Some areas outside of existing R.O.W. shovel test pitted at 5 metre intervals.
STA 1+770 to STA 2+080	Lightly wooded and open scrublands, with some residential lands	Sloping steeply up to the north, reaching elevated hilltop, then sloping steeply down to the north. General slope down to the east	All disturbed lands. No archaeological potential.	All disturbed lands. No archaeological potential.
STA 2+070 to STA 2+380	Pasturelands and wooded areas	Sloping steeply down toward the north before leveling off	Mostly disturbed lands. Some areas outside of existing R.O.W. shovel test pitted at 5 metre intervals.	Mostly disturbed or poorly drained lands. Some areas outside of existing R.O.W. shovel test pitted at 5 metre intervals. Access denied to survey outside of existing R.O.W. at 17715 Gore Rd.
STA 2+370 to STA 2+680	Scrublands, pasturelands and wooded areas	Gentle incline towards northern end	Some disturbed lands. Some areas within and outside of existing R.O.W. shovel test pitted at 5 metre intervals.	Some disturbed lands. Some areas within and outside of existing R.O.W. shovel test pitted at 5 metre intervals.
STA 2+670 to STA 2+980	Wooded lands and scrublands. Roadway elevated above surrounding lands	Steeply sloping down to north before elevating slightly.	All disturbed or poorly lands. No archaeological potential.	Mostly disturbed or poorly drained lands. Some areas within existing R.O.W. shovel test pitted at 5 metre intervals.

STA 2+970 to STA 3+280	Wooded areas, gravel shoulders. Contains intersection of Finnerty Side Road	Gently rising to the north	All disturbed lands. No archaeological potential.	All disturbed lands. No archaeological potential.
STA 3+270 to STA 3+580	Wooded lands	Slight dip, then rising moderately to the north	Mostly disturbed lands. Some areas outside of existing R.O.W. shovel test pitted at 5 metre intervals.	Mostly disturbed lands. TRCA lands not surveyed.
STA 3+570 to STA 3+880	Wooded areas and open scrublands	Gentle rise to crest in hill, then down to north	Mostly disturbed lands. Some areas outside of existing R.O.W. shovel test pitted at 5 metre intervals.	Mostly disturbed lands. Access denied to survey outside of existing R.O.W. at 18243 Gore Rd.
STA 3+870 to STA 4+180	Wooded areas and open	Dips down into lower-lying areas, before sharp rise in north end	Mostly disturbed or poorly drained lands. Some areas outside of existing R.O.W. shovel test pitted at 5 metre intervals. TRCA lands not surveyed.	Mostly disturbed or poorly drained lands. Access denied to survey outside of existing R.O.W. at 18243 Gore Rd.
STA 4+170 to STA 4+480	Lightly-treed hilly scrublands, some pasture and residential lands	Sloping steeply up to crest of a hill, then gently down to the north	Mostly disturbed lands. Some areas within and outside of existing R.O.W. shovel test pitted at 5 metre intervals. TRCA lands not surveyed.	Mostly disturbed or poorly drained lands. Some areas within existing R.O.W. shovel test pitted at 5 metre intervals.
STA 4+470 to STA 4+780	Lightly-treed scrublands and residential properties	Sloping gently down to the north	Mostly disturbed lands. Some areas outside of existing R.O.W. shovel test pitted at 5 metre intervals.	Mostly disturbed or poorly drained lands. Some areas within existing R.O.W. shovel test pitted at 5 metre intervals.
STA 4+770 to STA 5+080	Wooded lands and lightly-treed scrublands	Relatively flat. Sloping down gently in north end	Mostly disturbed or poorly drained lands. Some areas outside of existing R.O.W. shovel test pitted at 5 metre intervals.	All disturbed or poorly lands. No archaeological potential.
STA 5+070 to STA 5+380	Wooded lands and lightly-treed scrublands	Level, then steeply sloping up to the north	All disturbed or poorly lands. No archaeological potential.	Mostly disturbed or poorly drained lands. Some areas within existing R.O.W. shovel test pitted at 5 metre intervals.
STA 5+370 to STA 5+680	Mainly wooded lands, with some lawn areas	Sloping up to the north, then level	Mostly disturbed lands. Some areas within existing R.O.W. shovel test pitted at 5 metre intervals.	Mostly disturbed or poorly drained lands. Some areas outside of existing R.O.W. shovel test pitted at 5 metre intervals. Access denied to survey outside of existing R.O.W. at 18809 Gore Rd.
STA 5+670 to STA 5+980	Wooded lands and lightly-treed scrublands	Sloping steeply to the north	Mostly disturbed lands. Some areas outside of existing R.O.W. shovel test pitted at 5 metre intervals. Access denied to survey outside of existing R.O.W. at 18878 Gore Rd.	Mostly disturbed lands. Some areas outside of existing R.O.W. shovel test pitted at 5 metre intervals.

STA 5+970 to STA 6+280	Wooded lands, scrublands and residential areas. Includes the intersection of Coolihan's Side Road	Sloping gently to the north, then leveling off	All disturbed lands. No archaeological potential.	Mostly disturbed lands. Some areas outside of existing R.O.W. shovel test pitted at 5 metre intervals.
STA 6+280 to Hwy. 9	Scrublands and residential areas.	Level	All disturbed lands. No archaeological potential.	All disturbed lands. No archaeological potential.

2.2 RECORD OF FINDS

No archaeological material or sites were located during the course of the Stage 2 archaeological assessment of the road corridor. The documentary record for this project includes 85 digital photographs, 22 field maps and seven page of field notes.

2.3 ANALYSIS AND CONCLUSIONS

No archaeological material or sites were located during the course of the Stage 2 archaeological assessment of the road corridor.

3.0 RECOMMENDATIONS & COMPLIANCE ADVICE

3.1 Recommendations

As detailed in this report, the Stage 2 archaeological assessment of the road corridor determined that there are no significant archaeological resources present on the lands which were subjected to a Stage 2 assessment. Accordingly, there are no other further concerns for impacts to archaeological resources for the existing right-of-way and for the sections of the proposed expanded right-of-way which were subjected to a Stage 2 assessment. No further archaeological assessment of these areas is required. Some sections of the proposed expanded right-of-way will still require a Stage 2 assessment if they are impacted by this project. This includes areas associated with 17715, 18243, 18809 and 18878 Gore Road.

3.2 Compliance Advice

This report is submitted to the Minister of Tourism and Culture as a condition of licensing in accordance with Part VI of the *Ontario Heritage Act*, R.S.O. 1990, c 0.18. The report is reviewed to ensure that it complies with the standards and guidelines that are issued by the Minister, and that the archaeological fieldwork and report recommendations ensure the conservation, protection and preservation of the cultural heritage of Ontario. When all matters relating to archaeological sites within the project area of a development proposal have been addressed to the satisfaction of the Ministry of Tourism and Culture, a letter will be issued by the ministry stating that there are no further concerns with regard to alterations to archaeological sites by the proposed development.

It is an offence under Sections 48 and 69 of the *Ontario Heritage Act* for any party other than a licensed archaeologist to make any alteration to a known archaeological site or to remove any artifact or other physical evidence of past human use or activity from the site, until such time as a licensed archaeologist has completed archaeological fieldwork on the site, submitted a report to the Minister stating that the site has no further cultural heritage value or interest , and the report has been filed in the Ontario Public Register of Archaeology Reports referred to in Section 65.1 of the *Ontario Heritage Act*.

Should previously undocumented archaeological resources be discovered, they may be a new archaeological site and therefore subject to Section 48 (1) of the *Ontario Heritage Act*. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant 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.

4.0 MAPS

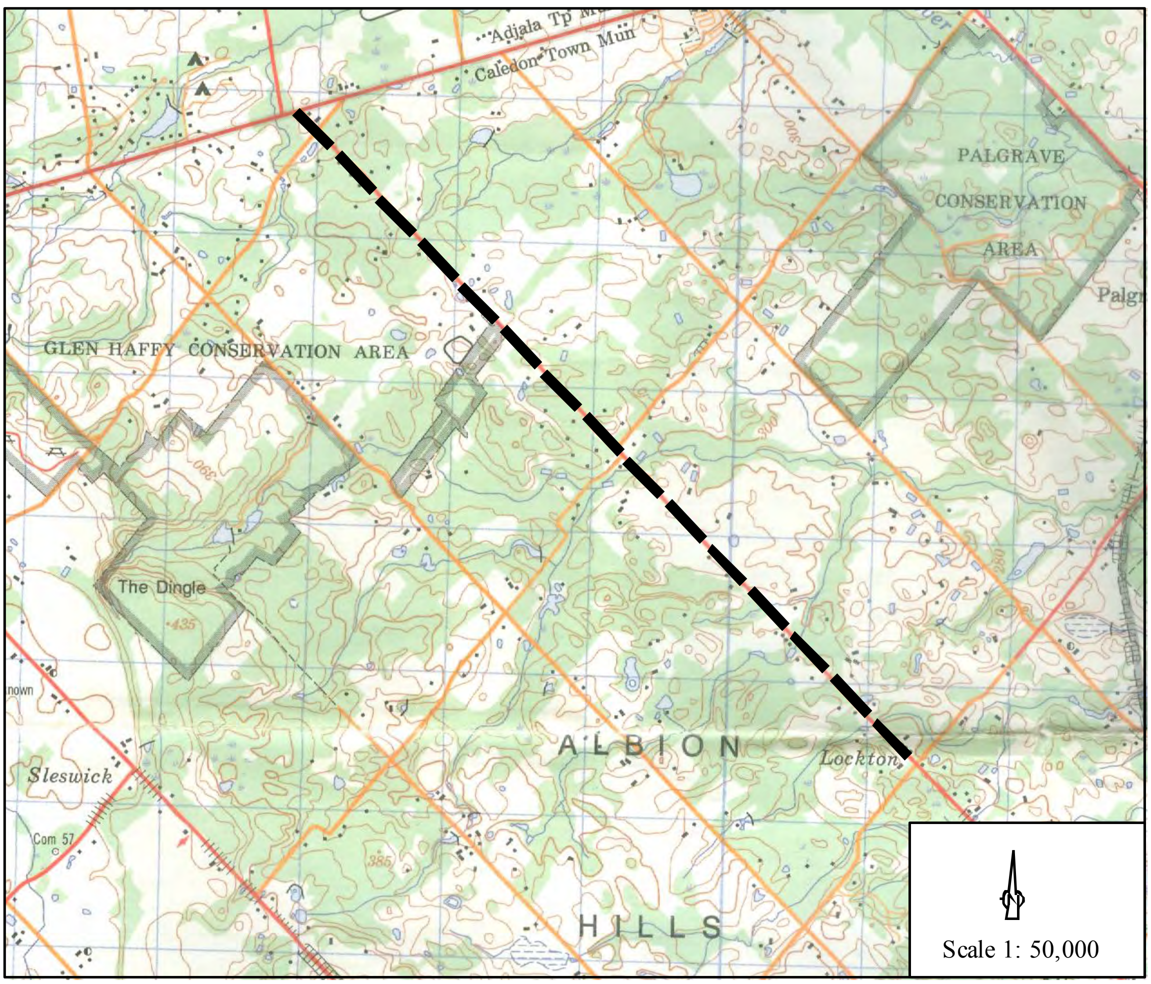


Figure 1. Location of the Road Corridor
(modified from Bolton 30 M/13 Department of Energy, Mines and Resources 1994)

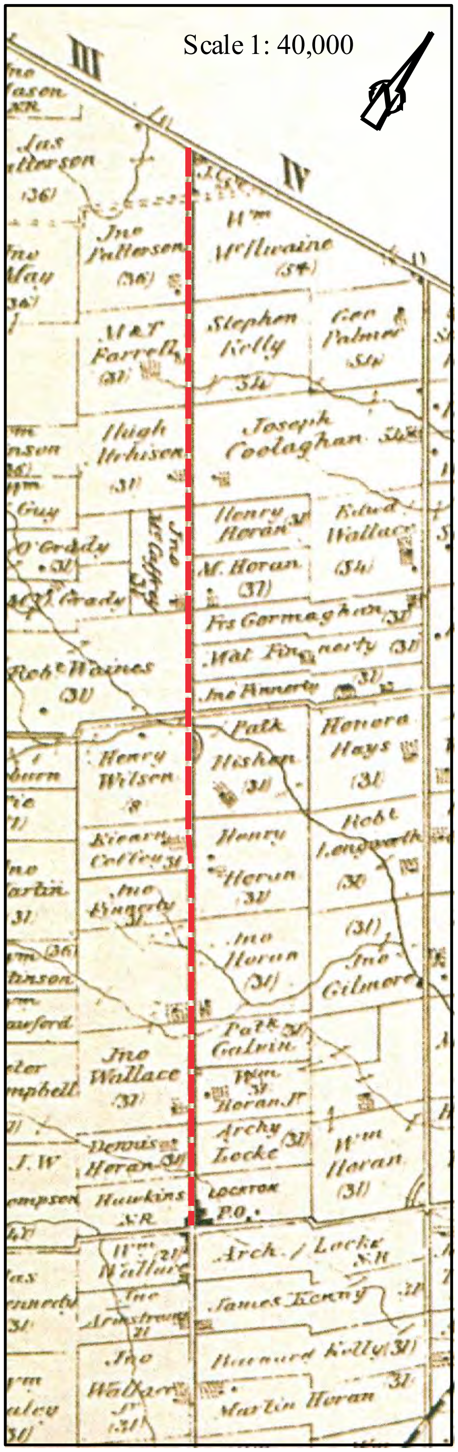
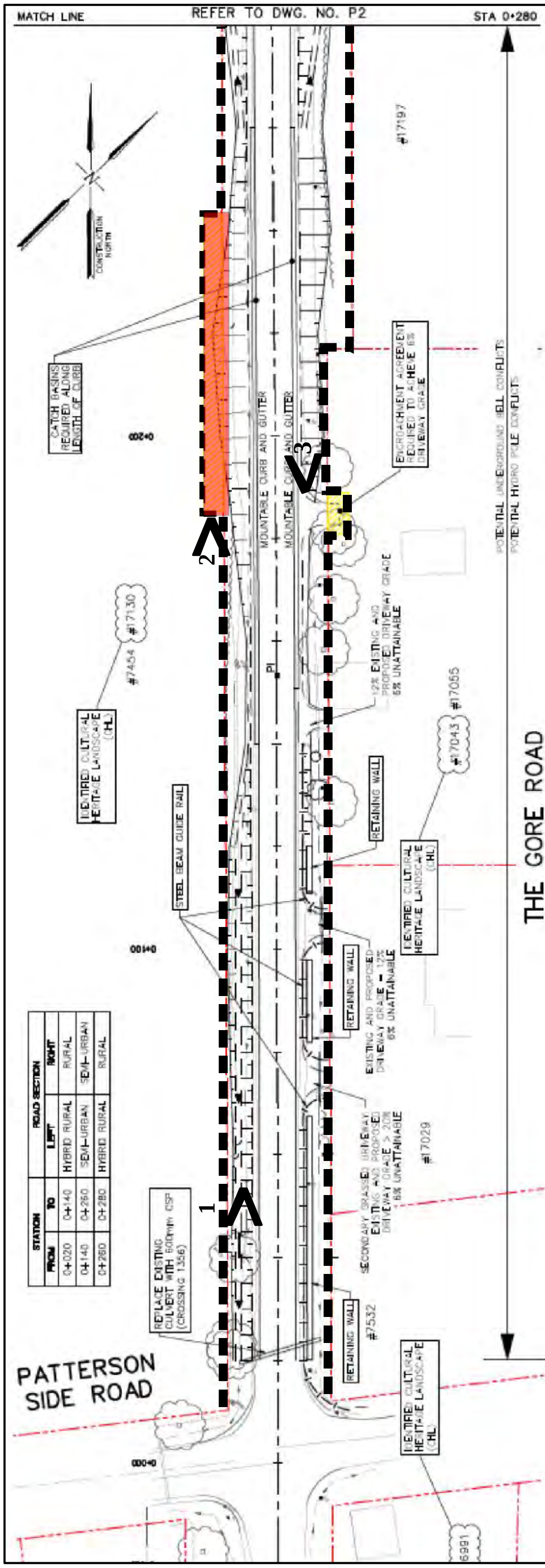


Figure 2. 1877 Historical Atlas Map of the Township of Albion(Pope 1877)



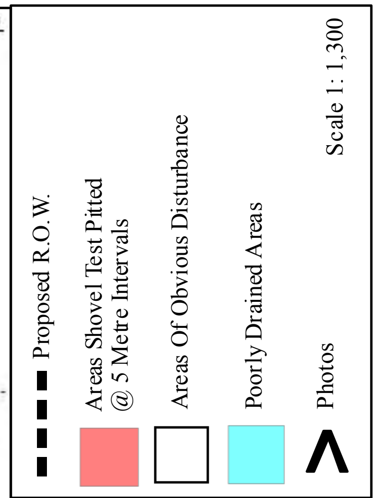


Figure 3. Archaeological Survey Coverage and Technqiues STA 0+00 to 0+280

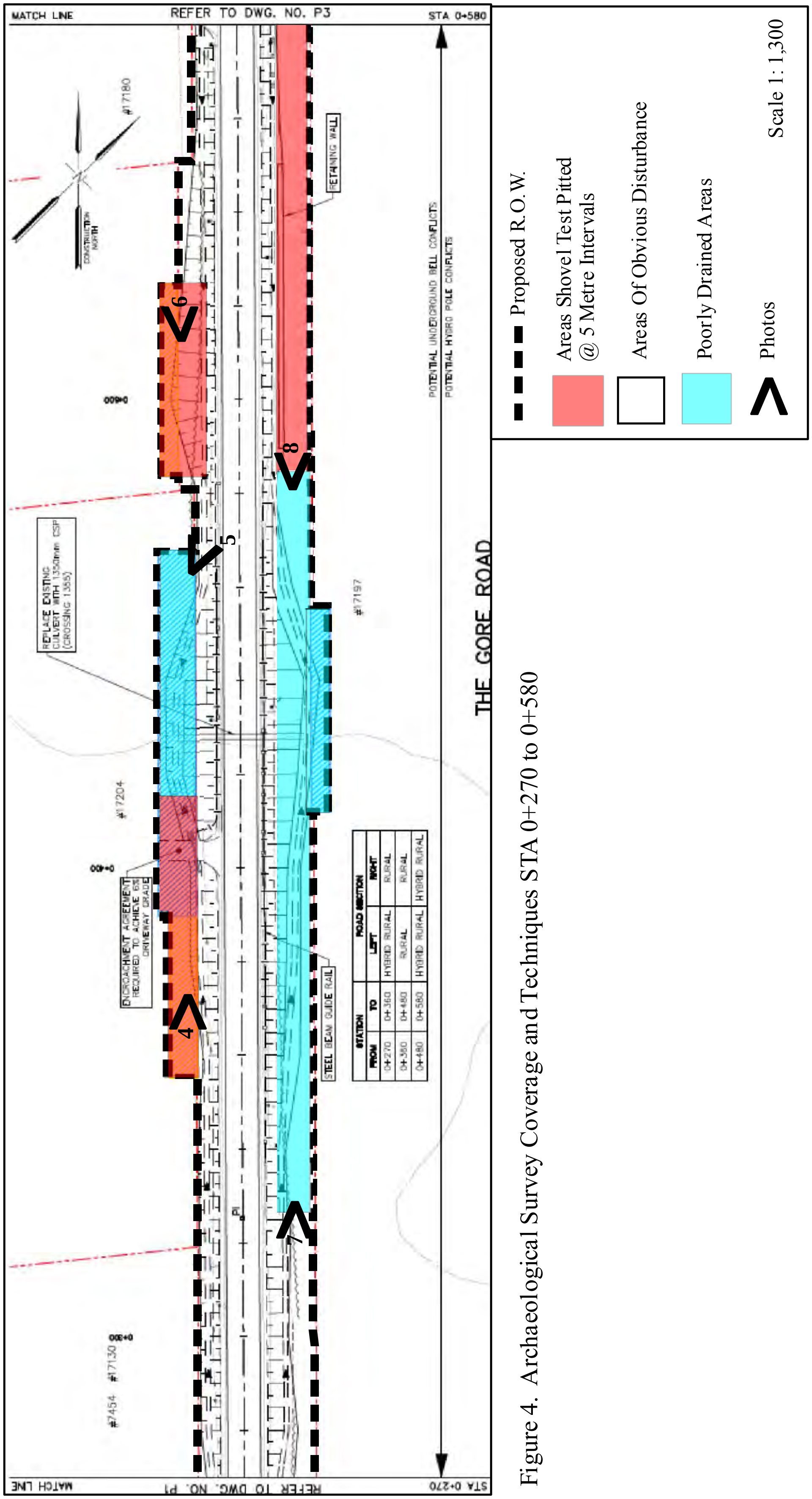
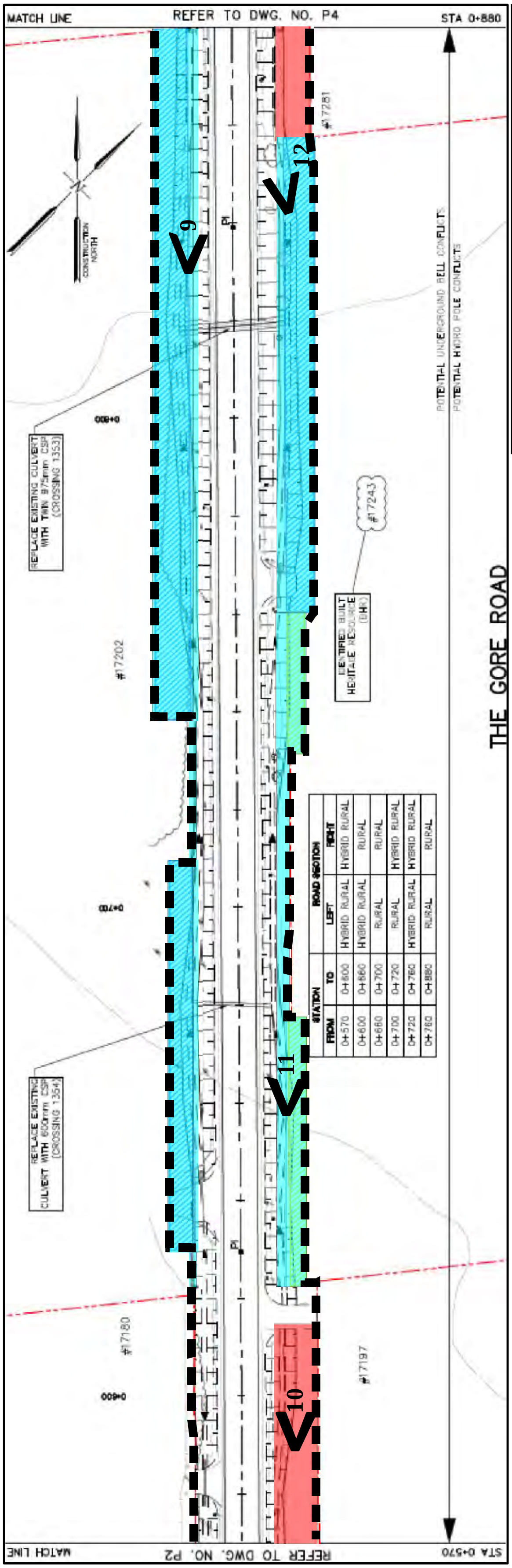


Figure 4. Archaeological Survey Coverage and Techniques STA 0+270 to 0+580



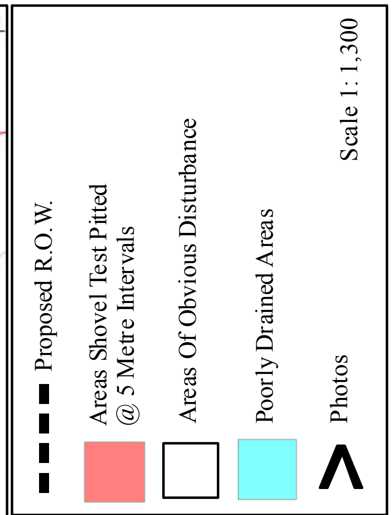
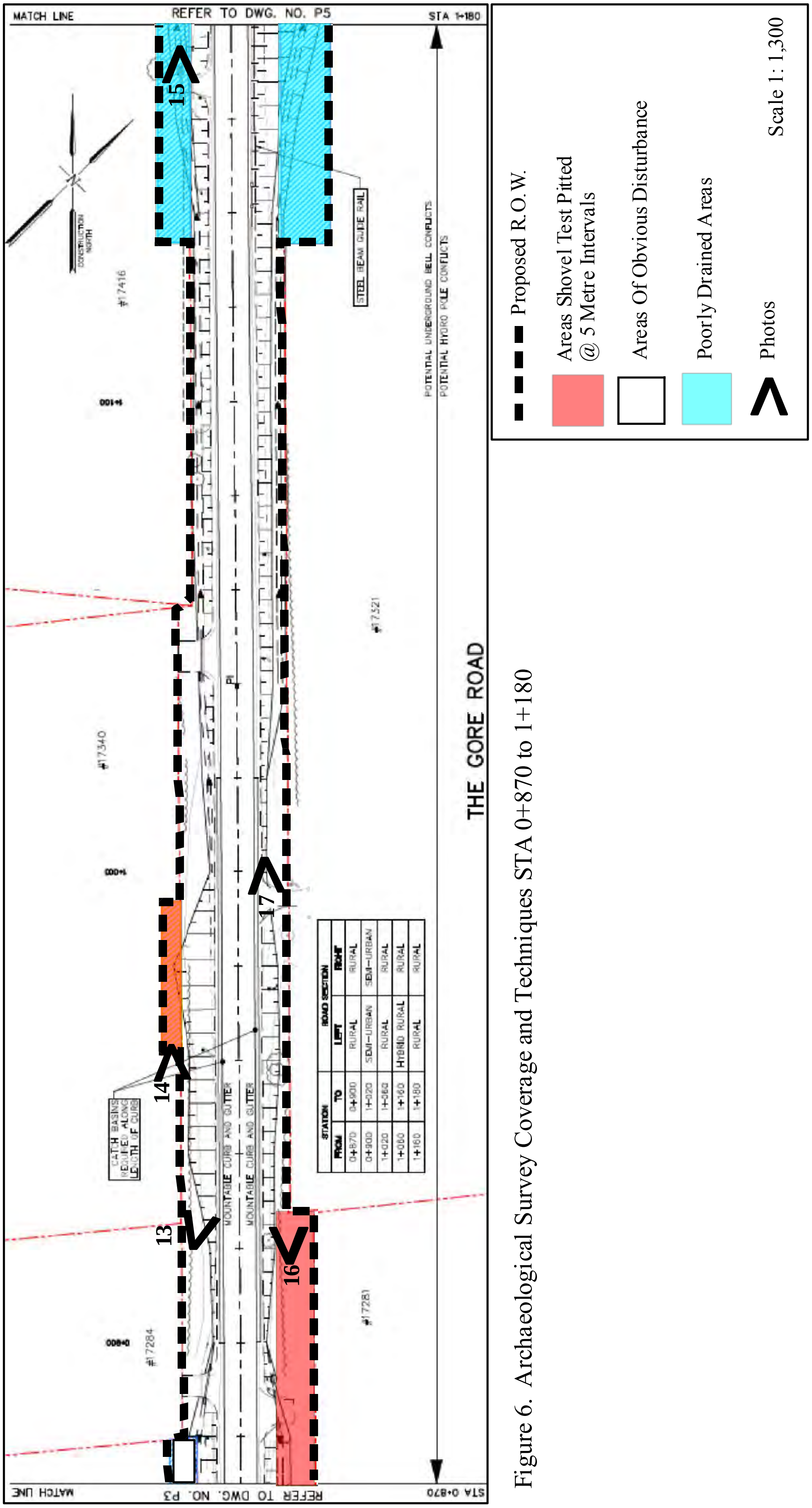
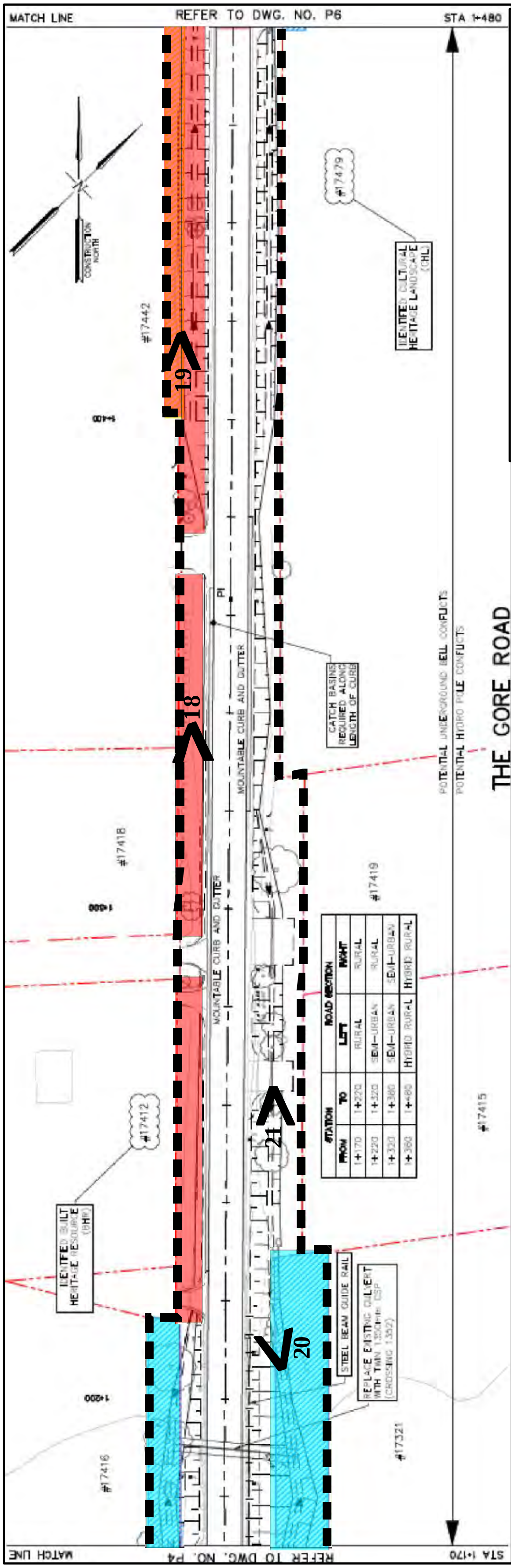


Figure 5. Archaeological Survey Coverage and Techniques STA 0+570 to 0+880



STATION		ROAD SECTION	
FROM	TO	LEFT	RIGHT
0+870	0+900	RURAL	RURAL
0+900	1+020	SEMI-URBAN	SEMI-URBAN
1+020	1+060	RURAL	RURAL
1+060	1+160	HYBRID RURAL	RURAL
1+160	1+180	RURAL	RURAL

Figure 6. Archaeological Survey Coverage and Techniques STA 0+870 to 1+180



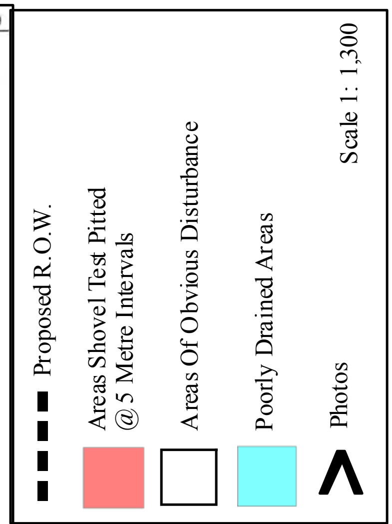
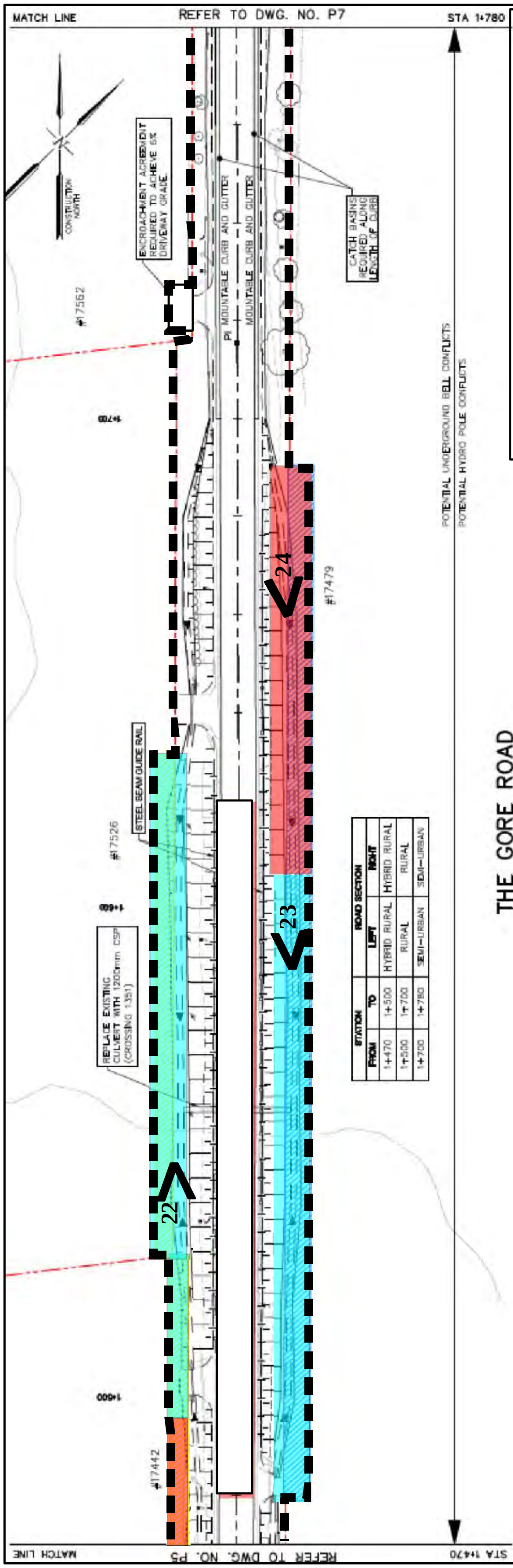


Figure 7. Archaeological Survey Coverage and Techniques STA 1+170 to 1+480



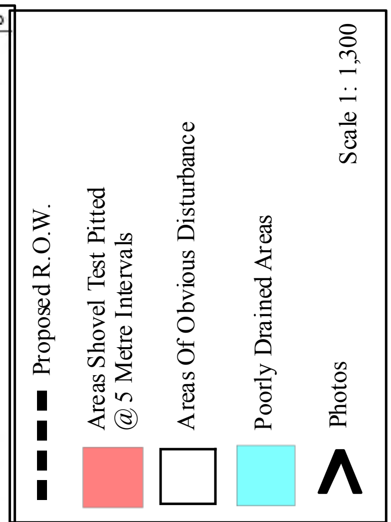
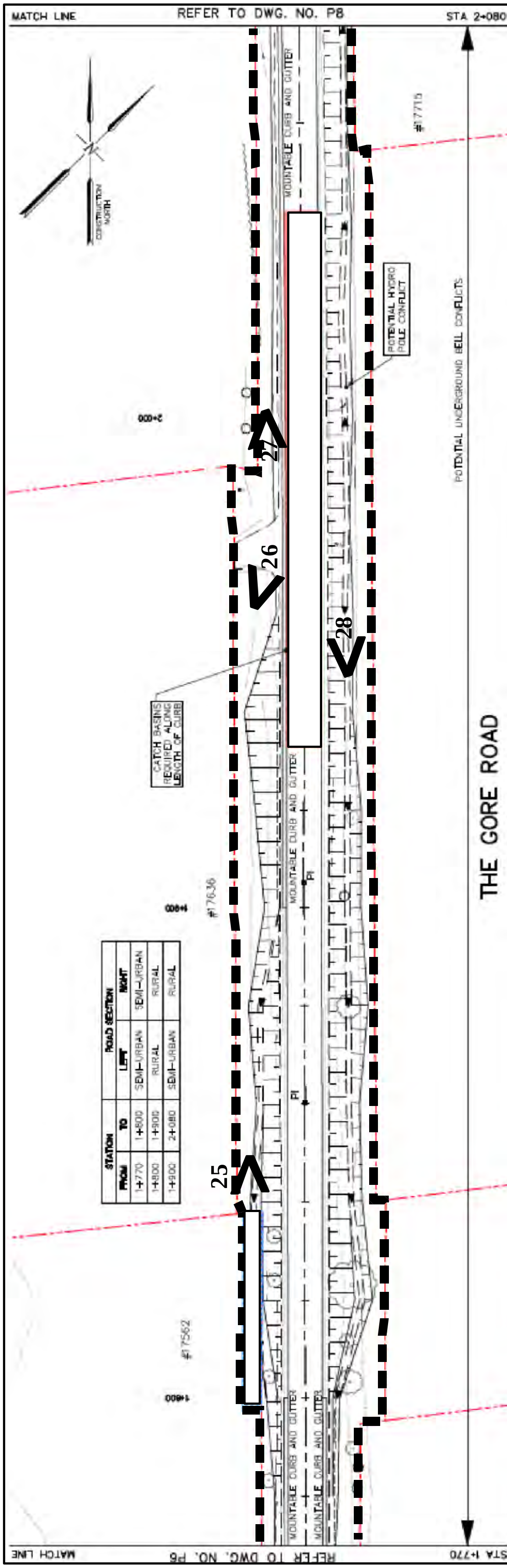


Figure 8. Archaeological Survey Coverage and Techniques STA 1+470 to 1+780



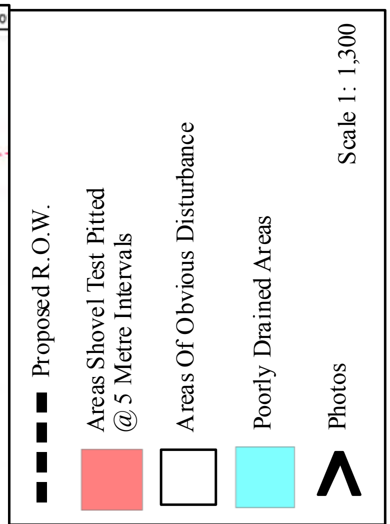


Figure 9. Archaeological Survey Coverage and Techniques STA 1+770 to 2+080

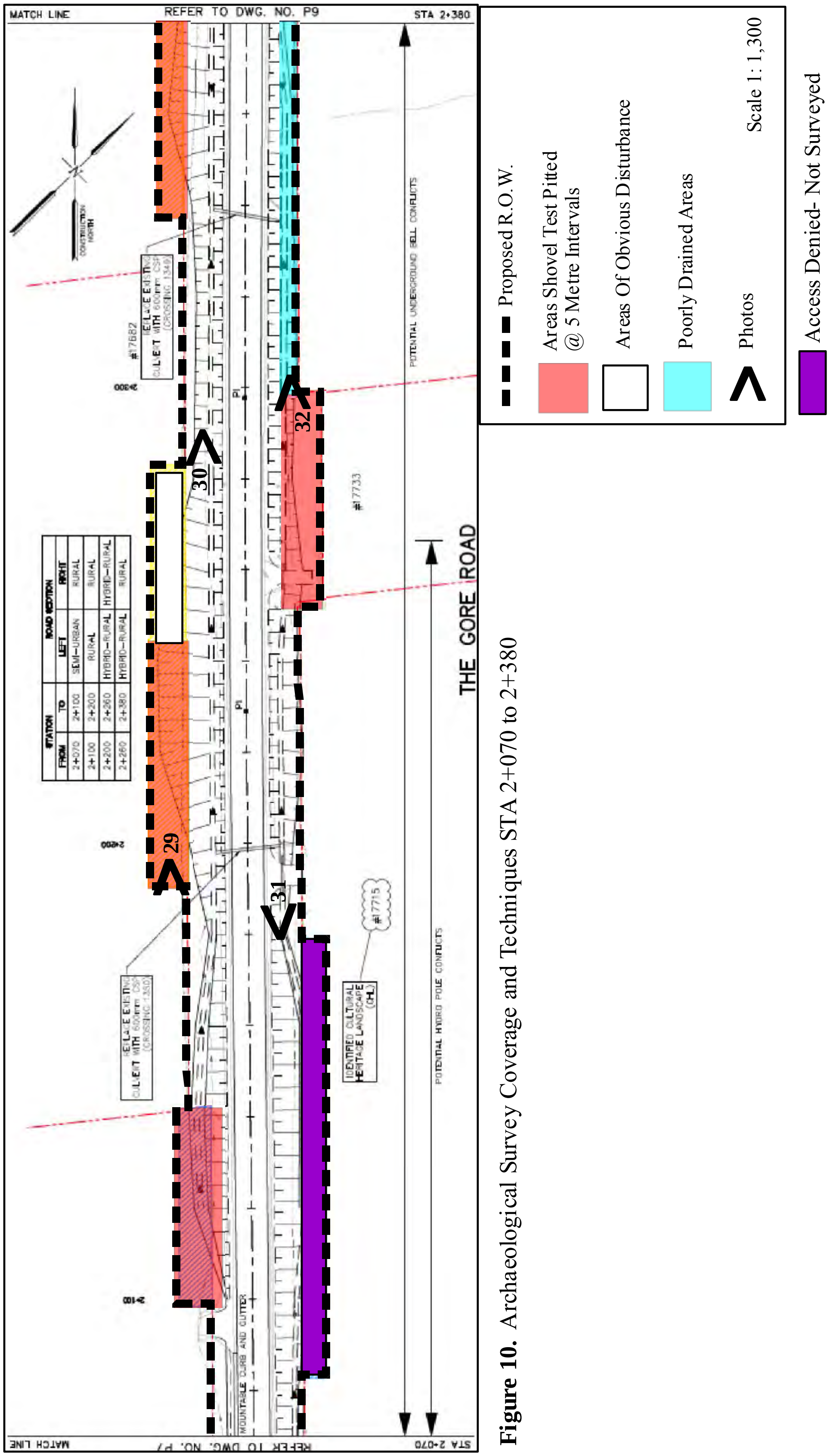
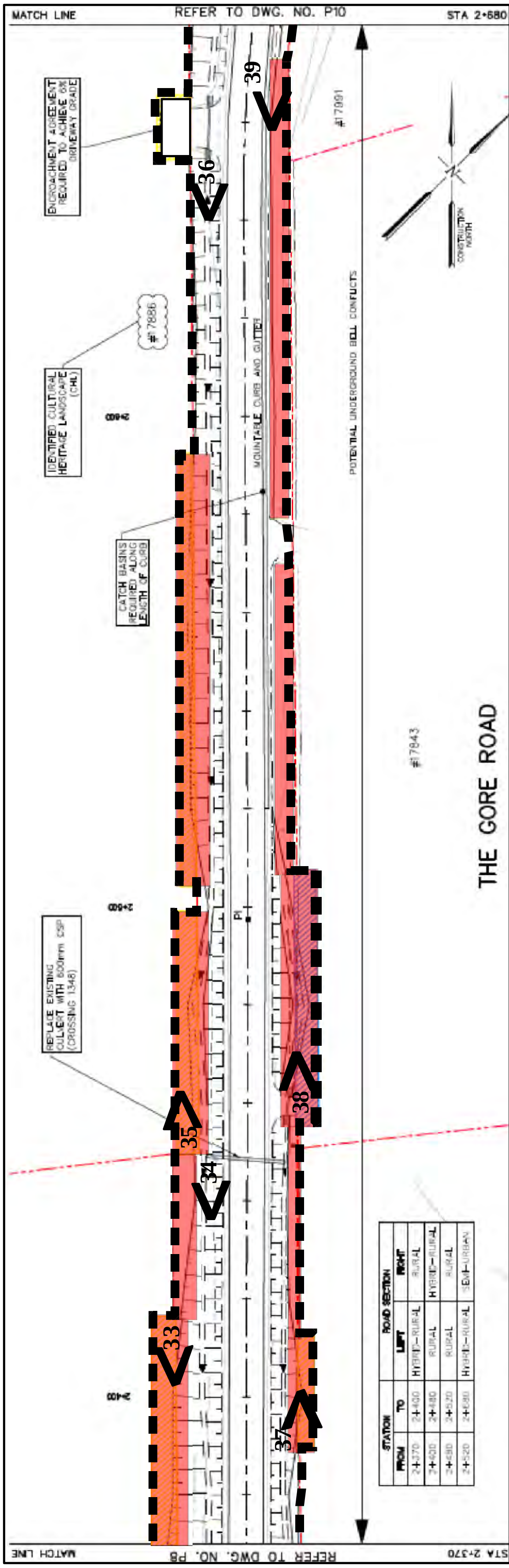


Figure 10. Archaeological Survey Coverage and Techniques STA 2+070 to 2+380



STATION		ROAD SECTION	
FROM	TO	LEFT	RIGHT
2+370	2+400	HYBRID–RURAL	RURAL
2+400	2+480	RURAL	HYBRID–RURAL
2+480	2+520	RURAL	RURAL
2+520	2+680	HYBRID–RURAL	SEMI–URBAN

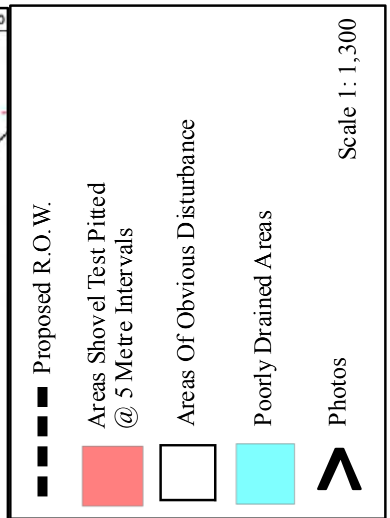


Figure 11. Archaeological Survey Coverage and Technqiues STA 2+370 to 2+680

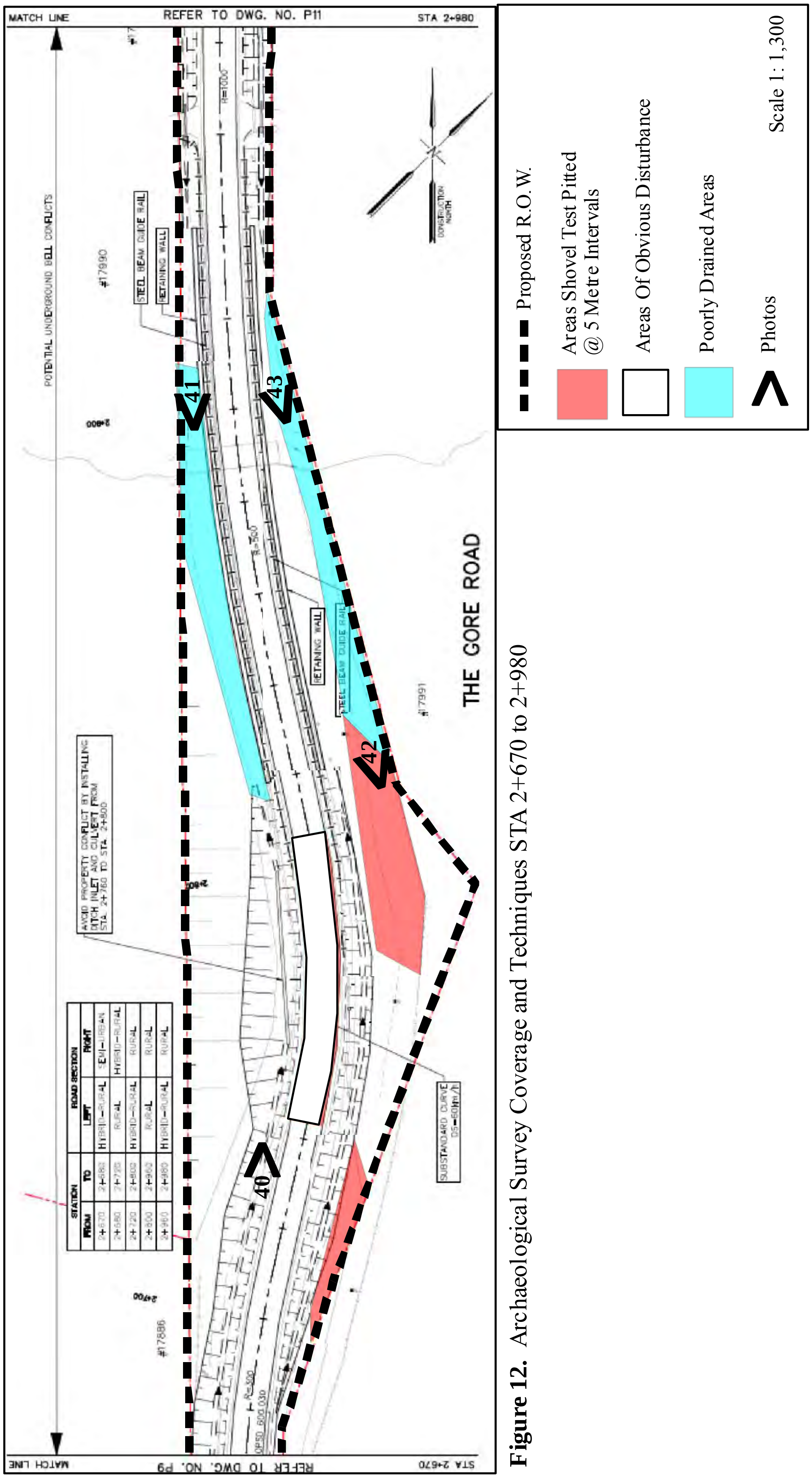


Figure 12. Archaeological Survey Coverage and Techniques STA 2+670 to 2+980

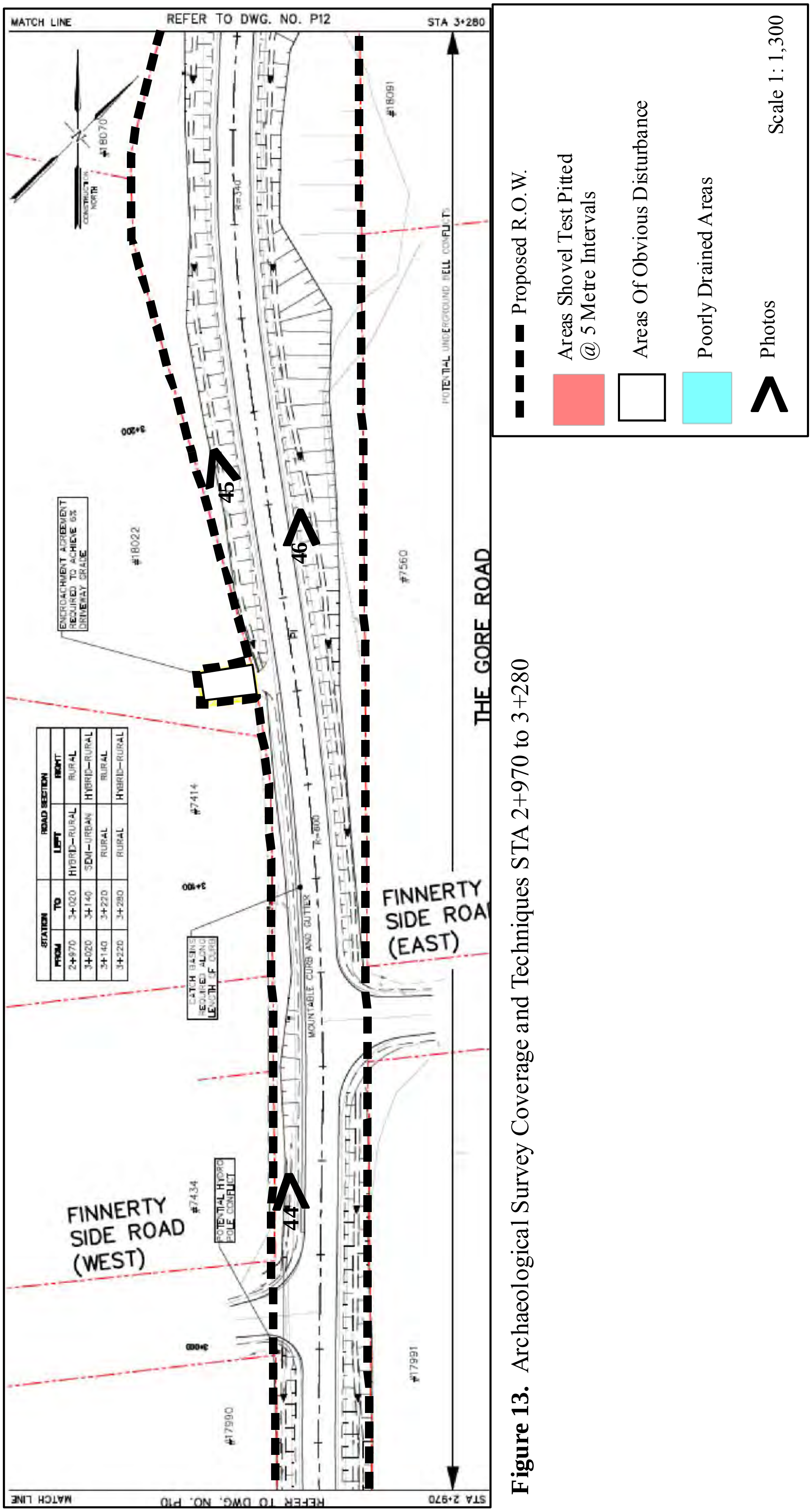
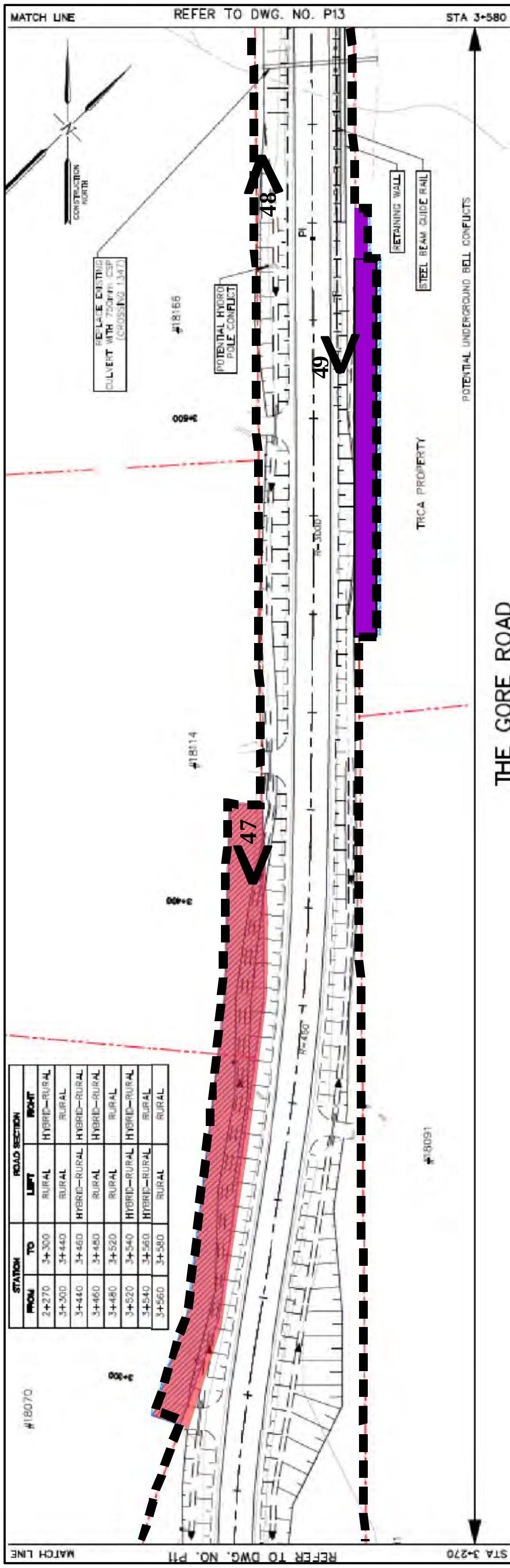


Figure 13. Archaeological Survey Coverage and Techniques STA 2+970 to 3+280



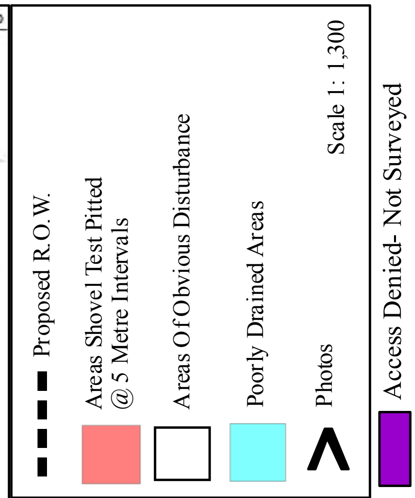


Figure 14. Archaeological Survey Coverage and Technqiues STA 3+270 to 3+580

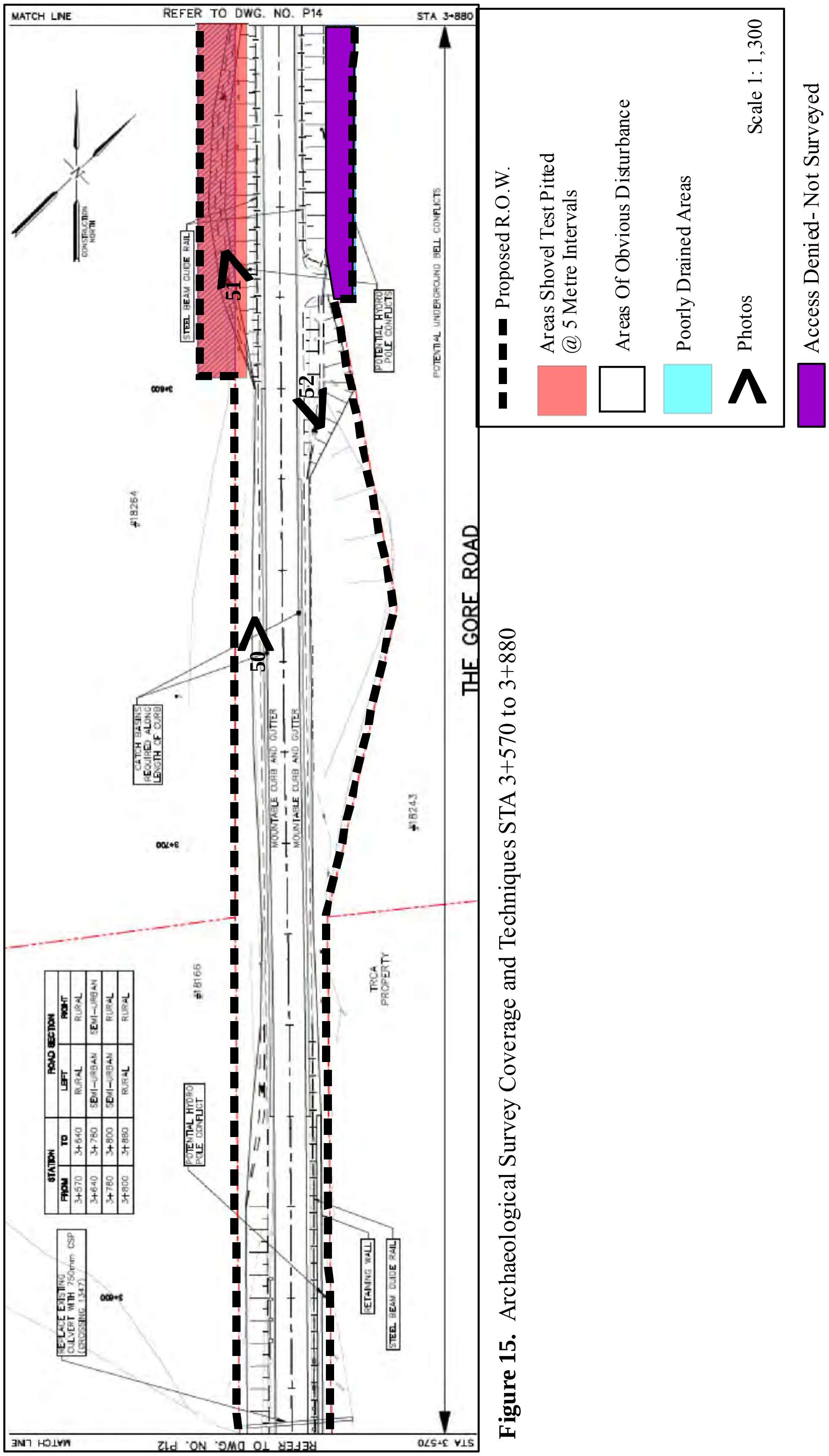
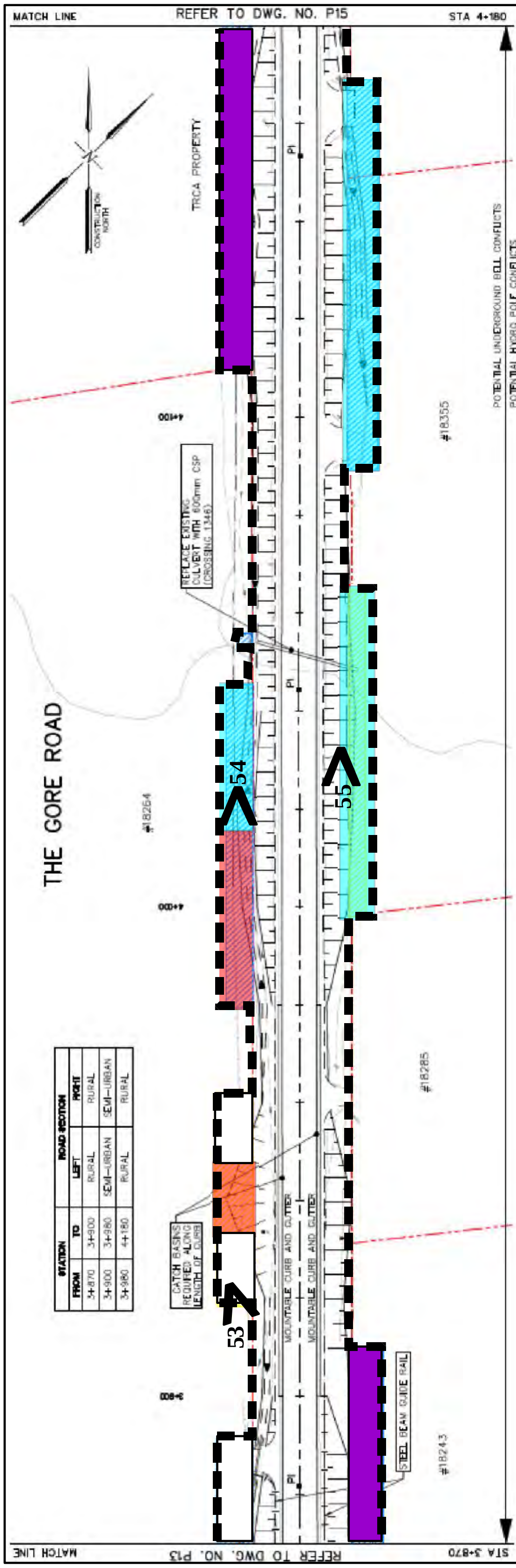


Figure 15. Archaeological Survey Coverage and Techniques STA 3+570 to 3+880



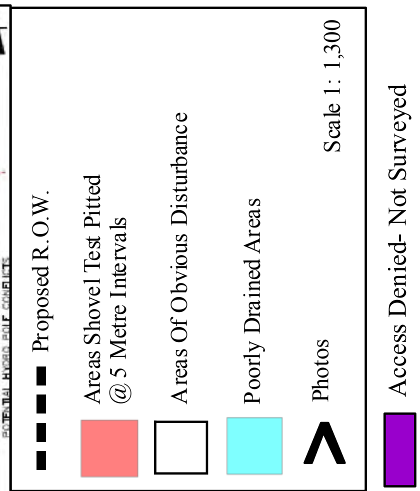


Figure 16. Archaeological Survey Coverage and Techniques STA 3+870 to 4+180

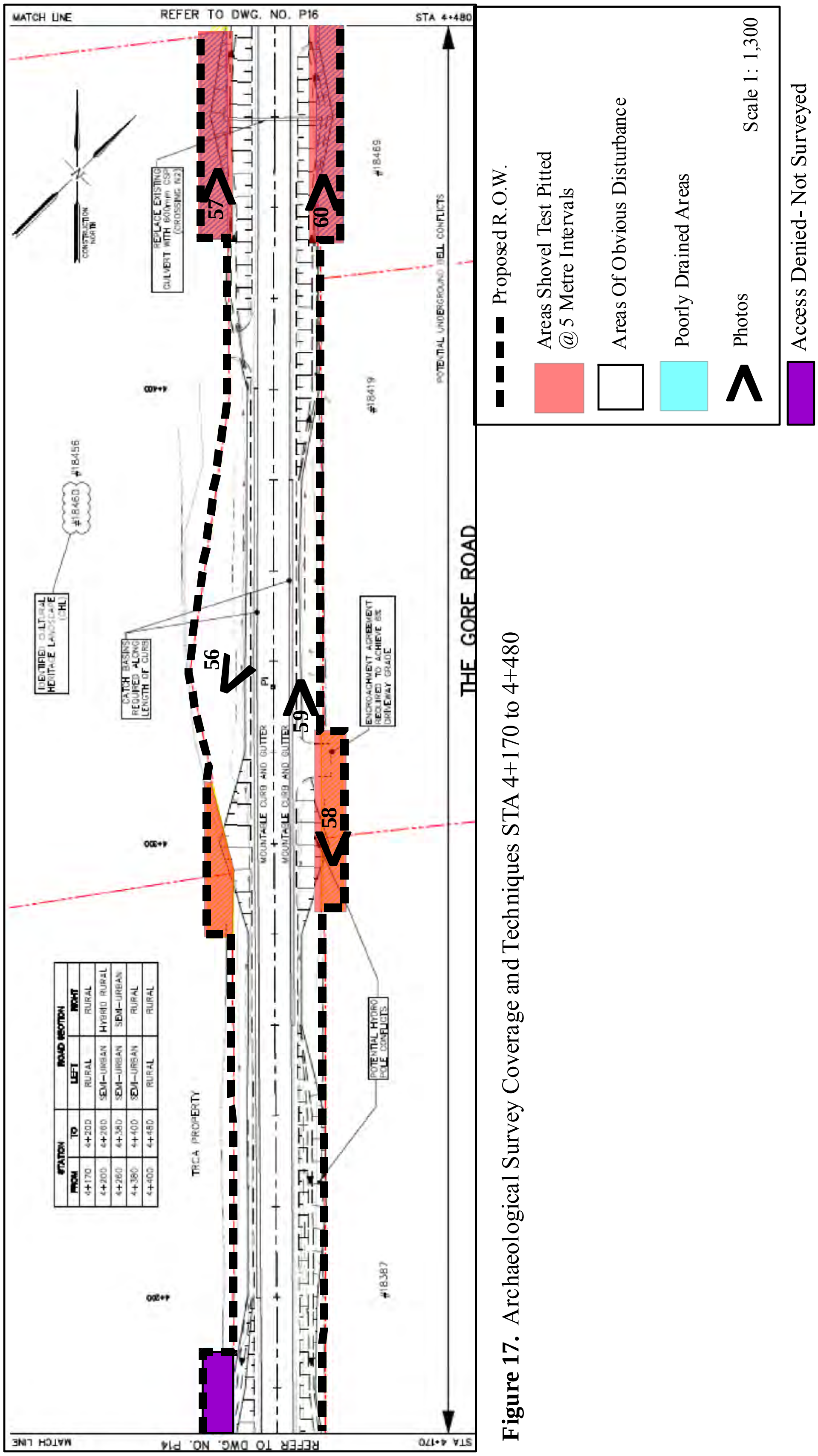


Figure 17. Archaeological Survey Coverage and Techniques STA 4+170 to 4+480

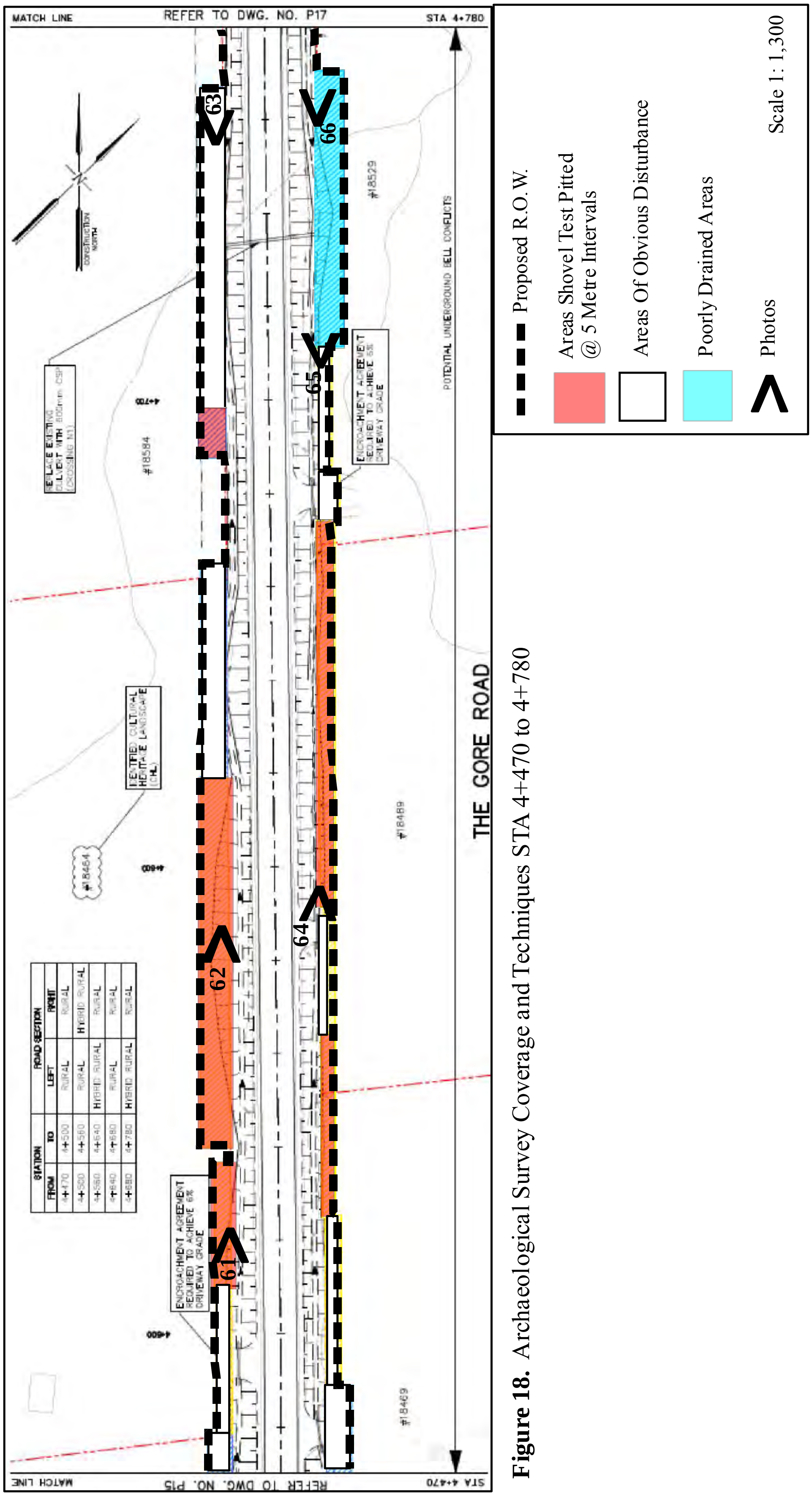
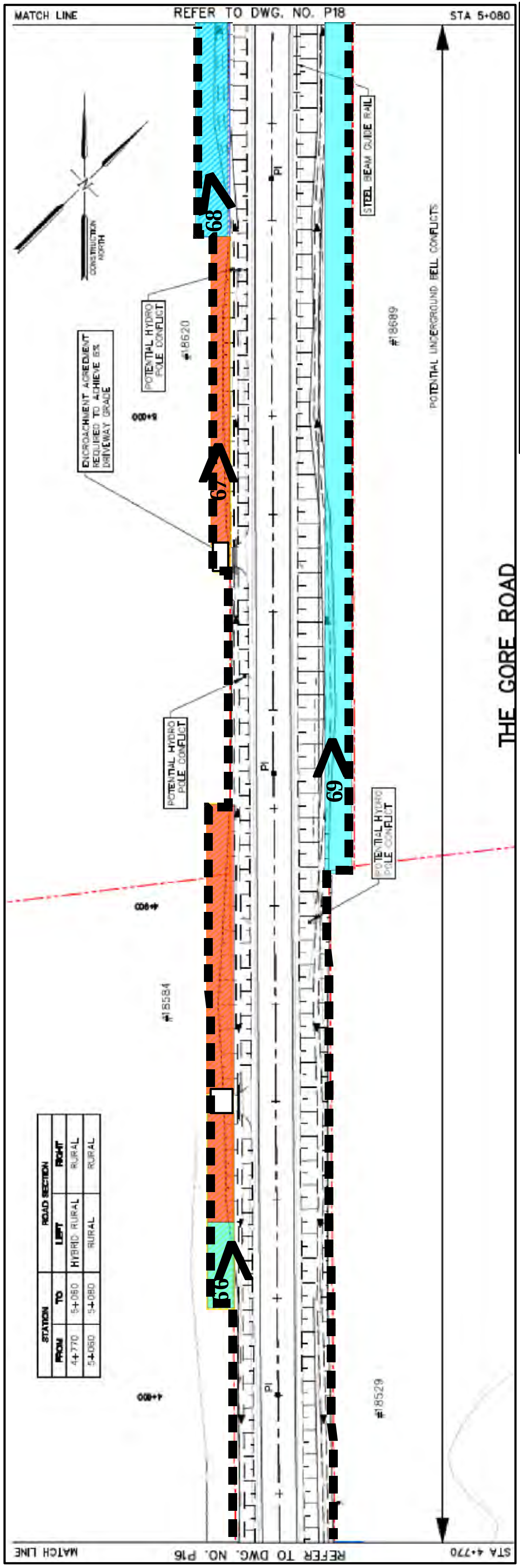


Figure 18. Archaeological Survey Coverage and Techniques STA 4+470 to 4+780



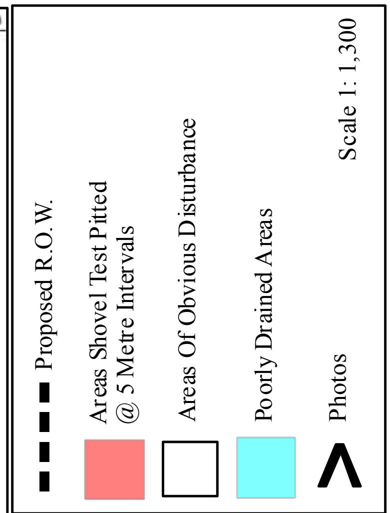


Figure 19. Archaeological Survey Coverage and Techniques STA 4+770 to 5+080

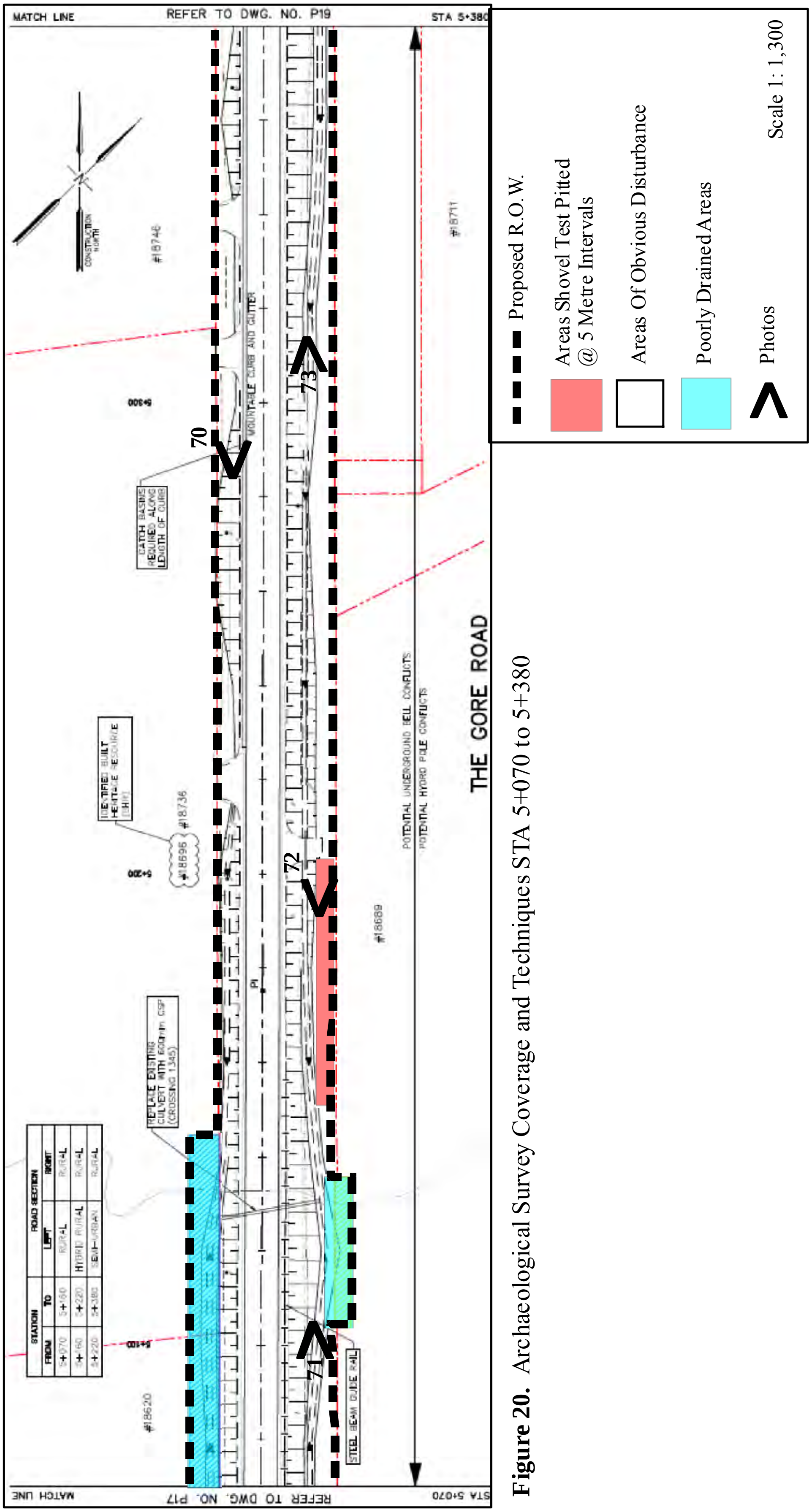


Figure 20. Archaeological Survey Coverage and Techniques STA 5+070 to 5+380

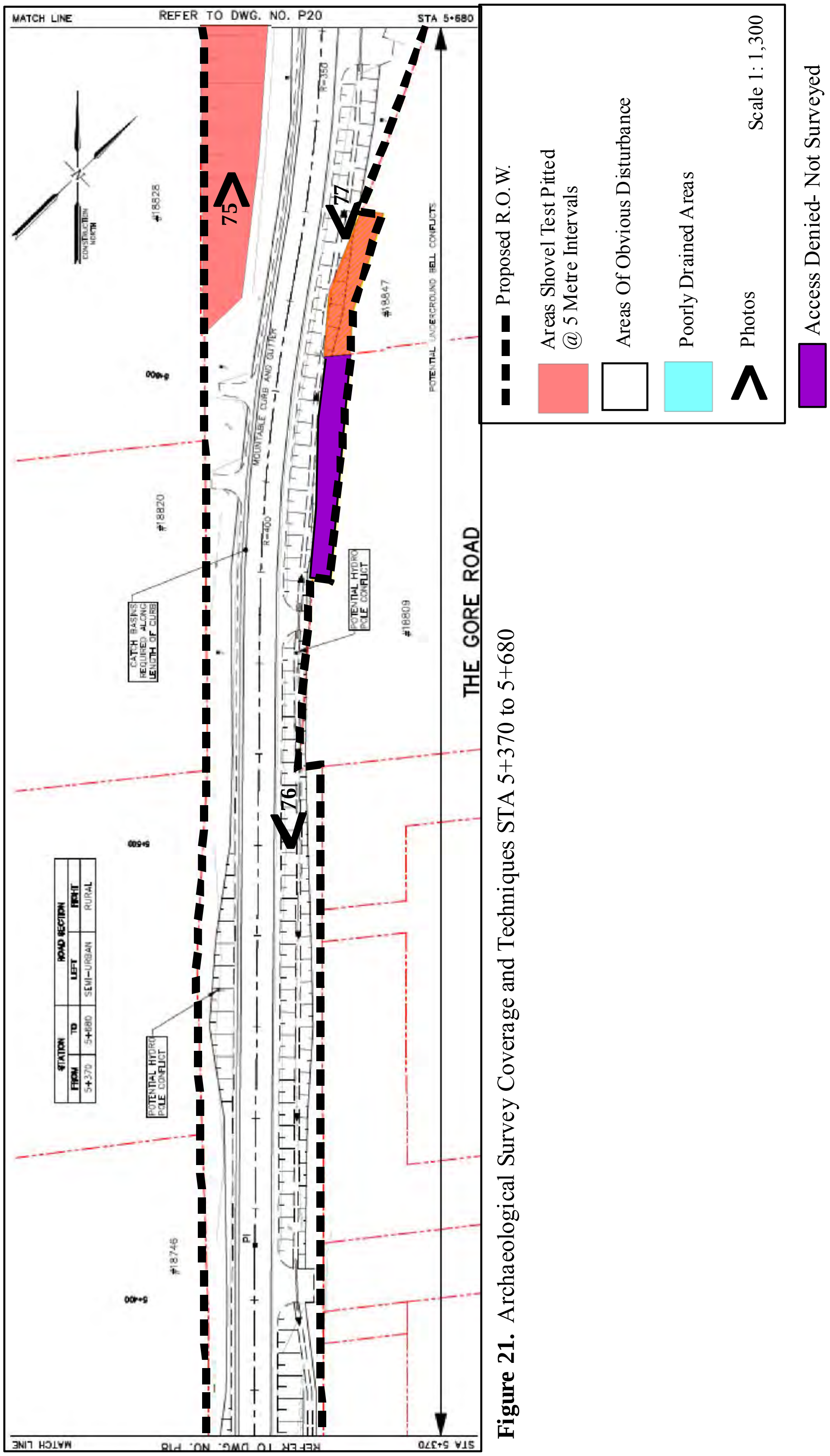


Figure 21. Archaeological Survey Coverage and Techniques STA 5+370 to 5+680

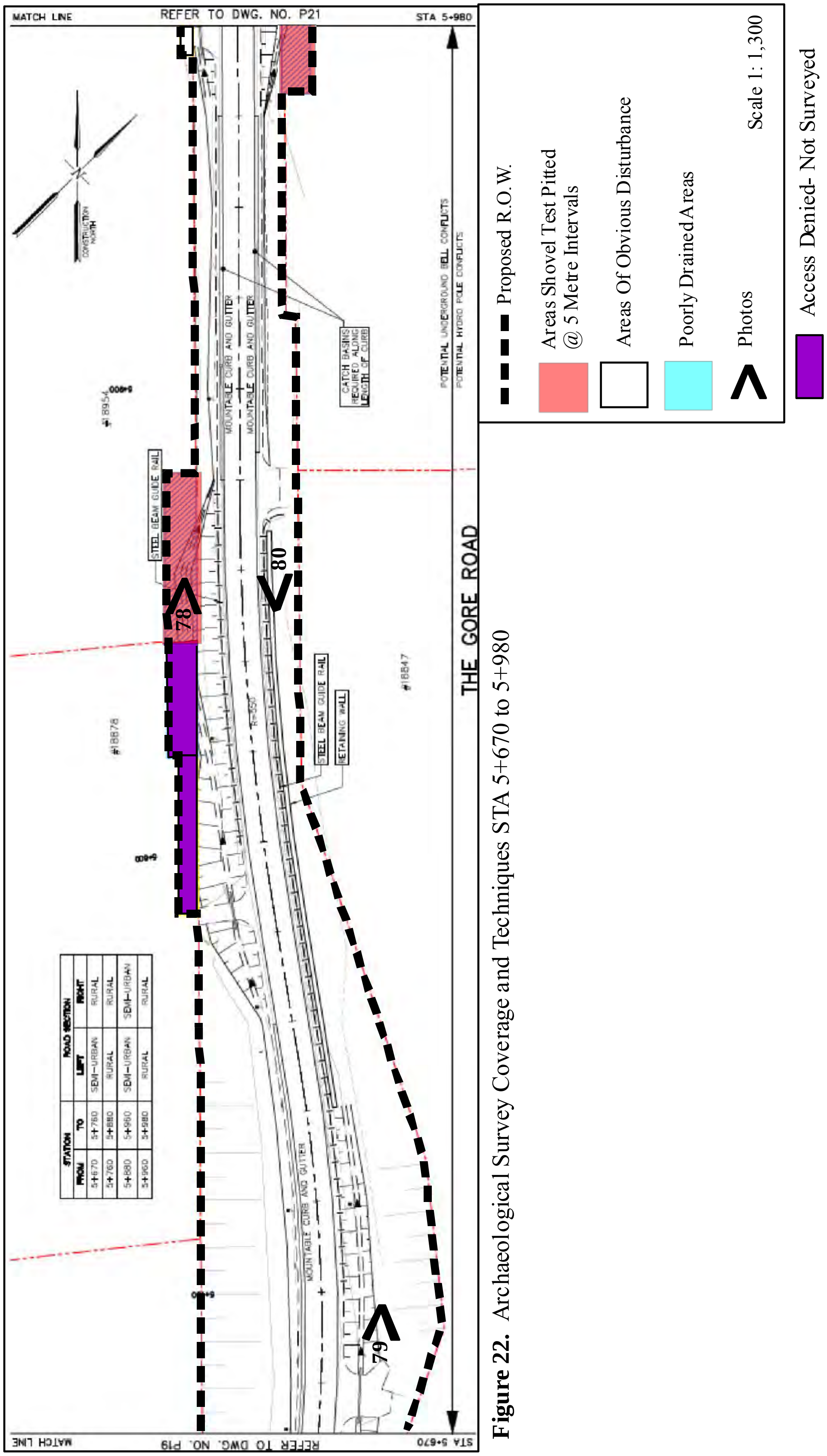


Figure 22. Archaeological Survey Coverage and Techniques STA 5+670 to 5+980

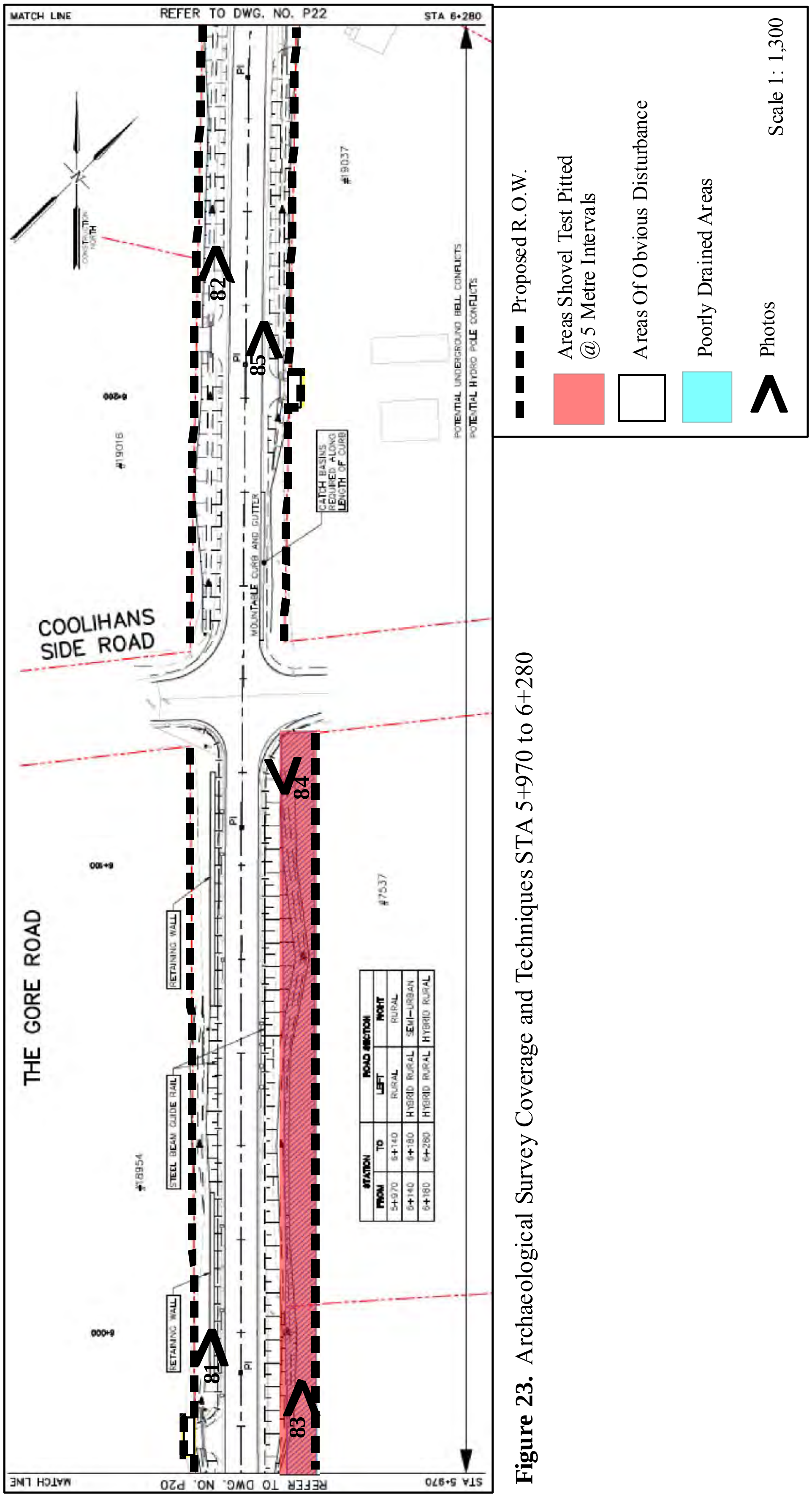


Figure 23. Archaeological Survey Coverage and Techniques STA 5+970 to 6+280

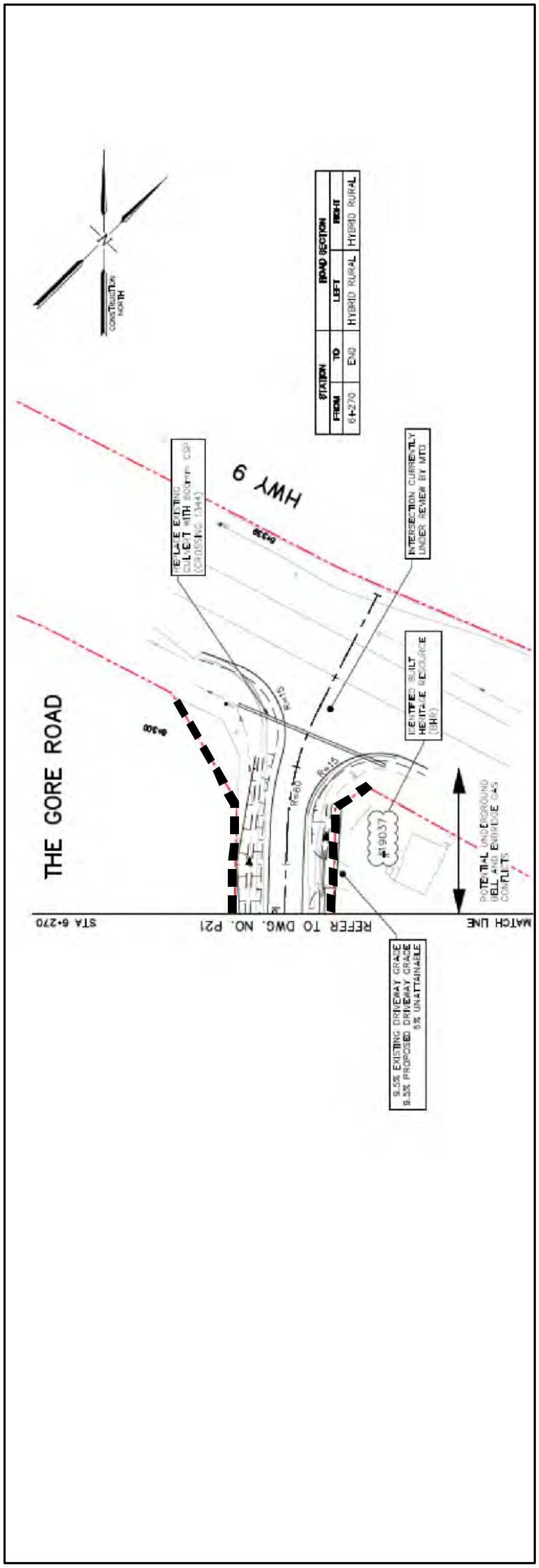


Figure 24. Archaeological Survey Coverage and Techniques STA 6+270 to End

5.0 IMAGES

Plate 1. STA.0 to STA.0+280, West Side (view northwest)

Plate 2. STA.0 to STA.0+280, West Side (view northwest)

Plate 3. STA.0 to STA.0+280, East Side (view southeast)

Plate 4. STA.0+280 to STA.0+580, West Side (view northwest)

Plate 5. STA.0+280 to STA.0+580, West Side (view southeast)

Plate 6. STA.0+280 to STA.0+580, West Side (view southeast)

Plate 7. STA.0+280 to STA.0+580, East Side (view northwest)

Plate 8. STA.0+280 to STA.0+580, East Side (view southeast)

Plate 9. STA.0+580 to STA.0+880, West Side (view south)

Plate 10. STA.0+580 to STA.0+880, East Side (view southeast)

Plate 11. STA.0+580 to STA.0+880, East Side (view southeast)

Plate 12. STA.0+580 to STA.0+880, East Side (view southeast)

Plate 13. STA.0+880 to STA.1+180, West Side (view southeast)

Plate 14. STA.0+880 to STA.1+180, West Side (view northwest)

Plate 15. STA.0+880 to STA.1+180, West Side (view northwest)

Plate 16. STA.0+880 to STA.1+180, East Side (view southeast)

Plate 17. STA.0+880 to STA.1+180, East Side (view northwest)

Plate 18. STA.1+180 to STA.1+480, West Side (view northwest)

Plate 19. STA.1+180 to STA.1+480, West Side (view northwest)

Plate 20. STA.1+180 to STA.1+480, West Side (view southeast)

Plate 21. STA.1+180 to STA.1+480, East Side (view northwest)

Plate 22. STA.1+480 to STA.1+780, West Side (view northwest)

Plate 23. STA.1+480 to STA.1+780, East Side (view southeast)

Plate 24. STA.1+480 to STA.1+780, East Side (view southeast)

Plate 25. STA.1+780 to STA.2+080, West Side (view northwest)

Plate 26. STA.1+780 to STA.2+080, West Side (view southeast)

Plate 27. STA.1+780 to STA.2+080, West Side (view northwest)

Plate 28. STA.1+780 to STA.2+080, East Side (view southeast)

Plate 29. STA.2+080 to STA.2+380, West Side (view northwest)

Plate 30. STA.2+080 to STA.2+380, West Side (view northwest)

Plate 31. STA.2+080 to STA.2+380, East Side (view southeast)

Plate 32. STA.2+080 to STA.2+380, East Side (view northwest)

Plate 33. STA.2+380 to STA.2+680, West Side (view southeast)

Plate 34. STA.2+380 to STA.2+680, West Side (view southeast)

Plate 35. STA.2+380 to STA.2+680, West Side (view northwest)

Plate 36. STA.2+380 to STA.2+680, West Side (view southeast)

Plate 37. STA.2+380 to STA.2+680, East Side (view northwest)

Plate 38. STA.2+380 to STA.2+680, East Side (view northwest)

Plate 39. STA.2+380 to STA.2+680, East Side (view southeast)

Plate 40. STA.2+680 to STA.2+980, West Side (view northwest)

Plate 41. STA.2+680 to STA.2+980, West Side (view southeast)

Plate 42. STA.2+680 to STA.2+980, East Side (view southeast)

Plate 43. STA.2+680 to STA.2+980, East Side (view southeast)

Plate 44. STA.2+980 to STA.3+280, West Side (view northwest)

Plate 45. STA.2+980 to STA.3+280, West Side (view northwest)

Plate 46. STA.2+980 to STA.3+280, East Side (view northwest)

Plate 47. STA.3+280 to STA.3+580, West Side (view southeast)

Plate 48. STA.3+280 to STA.3+580, West Side (view northwest)

Plate 49. STA.3+280 to STA.3+580, East Side (view southeast)

Plate 50. STA.3+580 to STA.3+880, West Side (view northwest)

Plate 51. STA.3+580 to STA.3+880, West Side (view northwest)

Plate 52. STA.3+580 to STA.3+880, East Side (view southeast)

Plate 53. STA.3+880 to STA.4+180, West Side (view northwest)

Plate 54. STA.3+880 to STA.4+180, West Side (view northwest)

Plate 55. STA.3+880 to STA.4+180, East Side (view northwest)

Plate 56. STA.4+180 to STA.4+480, West Side (view southeast)

Plate 57. STA.4+180 to STA.4+480, West Side (view northwest)

Plate 58. STA.4+180 to STA.4+480, East Side (view southeast)

Plate 59. STA.4+180 to STA.4+480, East Side (view northwest)

Plate 60. STA.4+180 to STA.4+480, East Side (view northwest)

Plate 61. STA.4+480 to STA.4+780, West Side (view northwest)

Plate 62. STA.4+480 to STA.4+780, West Side (view northwest)

Plate 63. STA.4+480 to STA.4+780, West Side (view southeast)

Plate 64. STA.4+480 to STA.4+780, East Side (view southeast)

Plate 65. STA.4+480 to STA.4+780, East Side (view northwest)

Plate 66. STA.4+480 to STA.4+780, East Side (view northwest)

Plate 66. STA. 4+780 to STA.5+080, West Side (view northwest)

Plate 67. STA. 4+780 to STA.5+080, West Side (view northwest)

Plate 68. STA. 4+780 to STA.5+080, West Side (view northwest)

Plate 69. STA. 4+780 to STA.5+080, East Side (view northwest)

Plate 70. STA.5+080 to STA.5+380, West Side (view southeast)

Plate 71. STA.5+080 to STA.5+380, East Side (view northwest)

Plate 72. STA.5+080 to STA.5+380, East Side (view southeast)

Plate 73. STA.5+080 to STA.5+380, East Side (view northwest)

Plate 74. STA.5+380 to STA.5+680, West Side (view southeast)

Plate 75. STA.5+380 to STA.5+680, West Side (view northwest)

Plate 76. STA.5+380 to STA.5+680, East Side (view southeast)

Plate 77. STA.5+380 to STA.5+680, East Side (view northwest)

Plate 78. STA.5+680 to STA.5+980, West Side (view northwest)

Plate 79. STA.5+680 to STA.5+980, East Side (view northwest)

Plate 80. STA.5+680 to STA.5+980, East Side (view southeast)

Plate 81. STA.5+980 to STA.6+280, West Side (view northwest)

Plate 82. STA.5+980 to STA.6+280, West Side (view northwest)

Plate 83. STA.5+980 to STA.6+280, East Side (view northwest)

Plate 84. STA.5+980 to STA.6+280, East Side (view southeast)

Plate 85. STA.5+980 to STA.6+280, East Side (view northwest)

6.0 REFERENCES CITED

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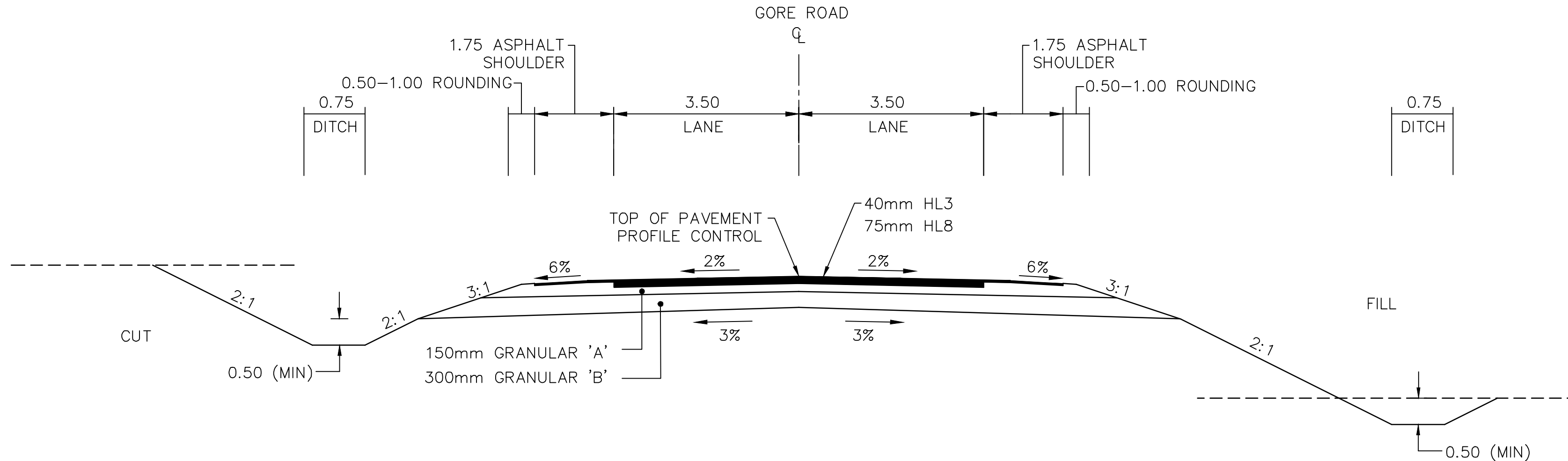
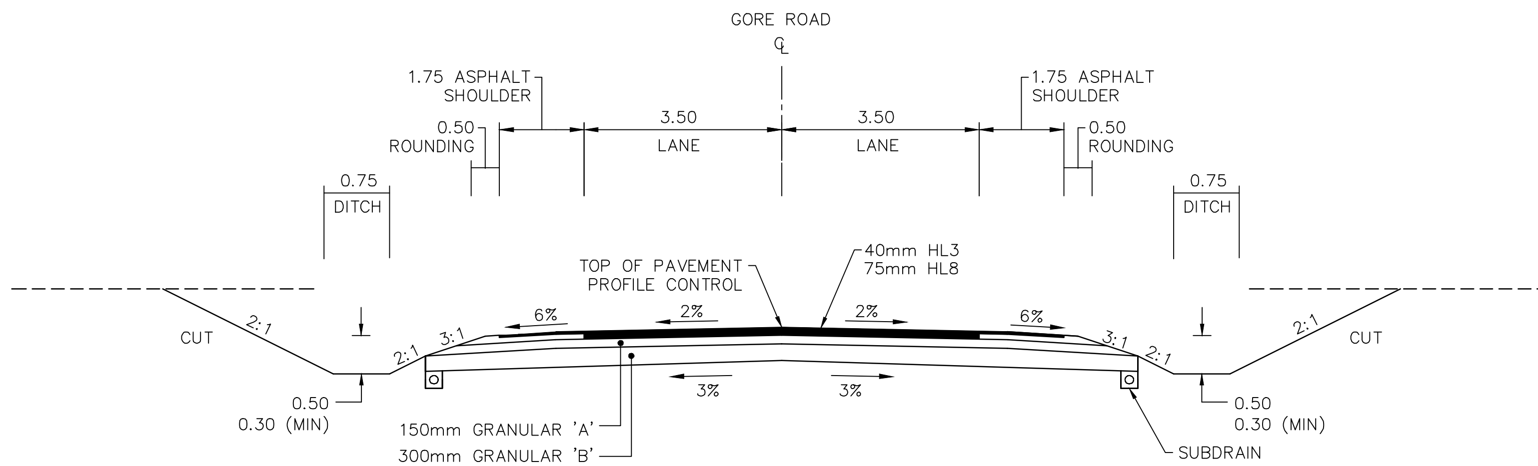
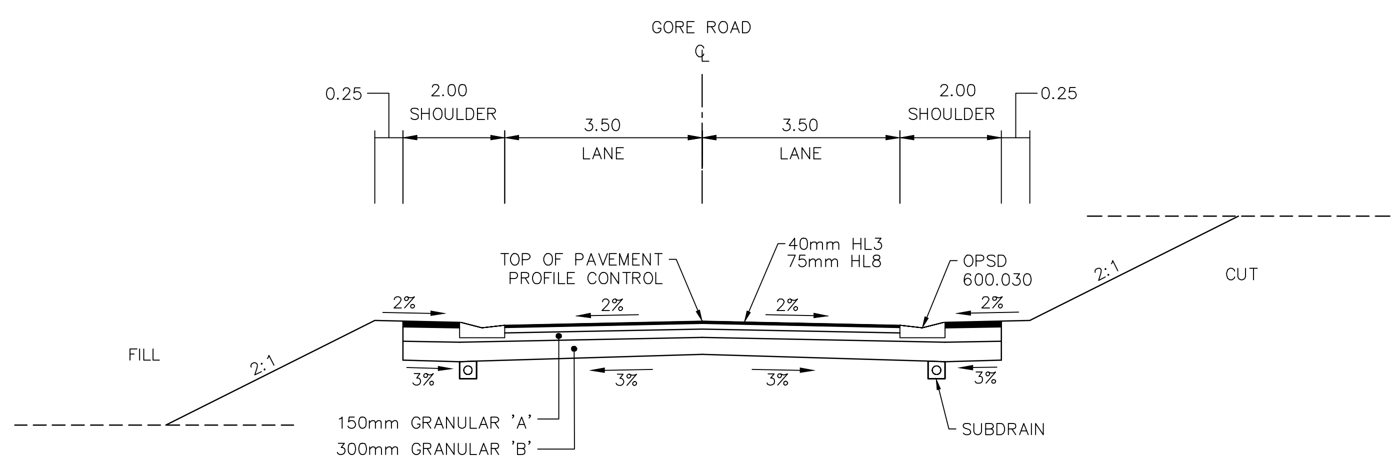
Appendix J
Preliminary Road Drawings and Cross Sections



TYPICAL RURAL SECTION (NTS)



HYBRID RURAL SECTION (NTS)



SEMI–URBAN SECTION (NTS)

SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMAINS			HYDRO U/G CABLE		
TRANSIT			ONT. HYDRO		
PARKS & REC.			CTV		
ONT. CLEAN WATER					

REVISIONS

DATE	DETAILS	INIT.

General Notes

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

B.M. No. Elev.

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ONTARIO CLEAN WATER AGENCY
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HYDRO ELECTRIC COMM. CITY OF MISSISSAUGA
HYDRO ELECTRIC COMM. CITY OF BRAMPTON
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POLICE DEPT.
FIRE DEPT.
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10m 0 10 20 30m 1:500 HORIZONTAL SCALE

1m 0 1 2 3m 1:50 VERTICAL SCALE

Region of Peel
Working for you

THE GORE ROAD

FROM PATTERSON SIDE ROAD TO HWY 9

TYPICAL SECTIONS

Lots:	Area:	Project No. MTB019424
Checked by: J.V.	Drawn by: J.R.	Plan No. P0
Date: MAY 7, 2013	Sheet:	

\\pscar\AdeptWork\Shared Work Areas\MTB019424 Gore Rd\Widened Shoulder\MTB019424_P000.dwg
May 07, 2013 – 10:08am

STATION		ROAD SECTION	
FROM	TO	LEFT	RIGHT
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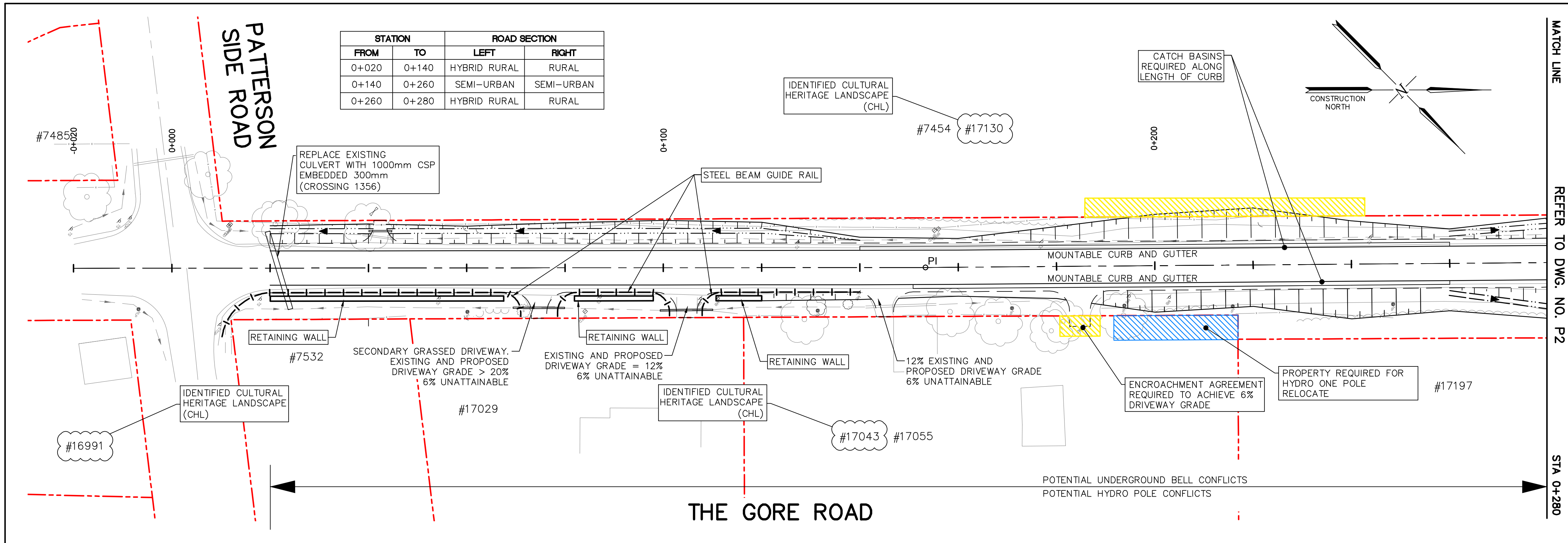
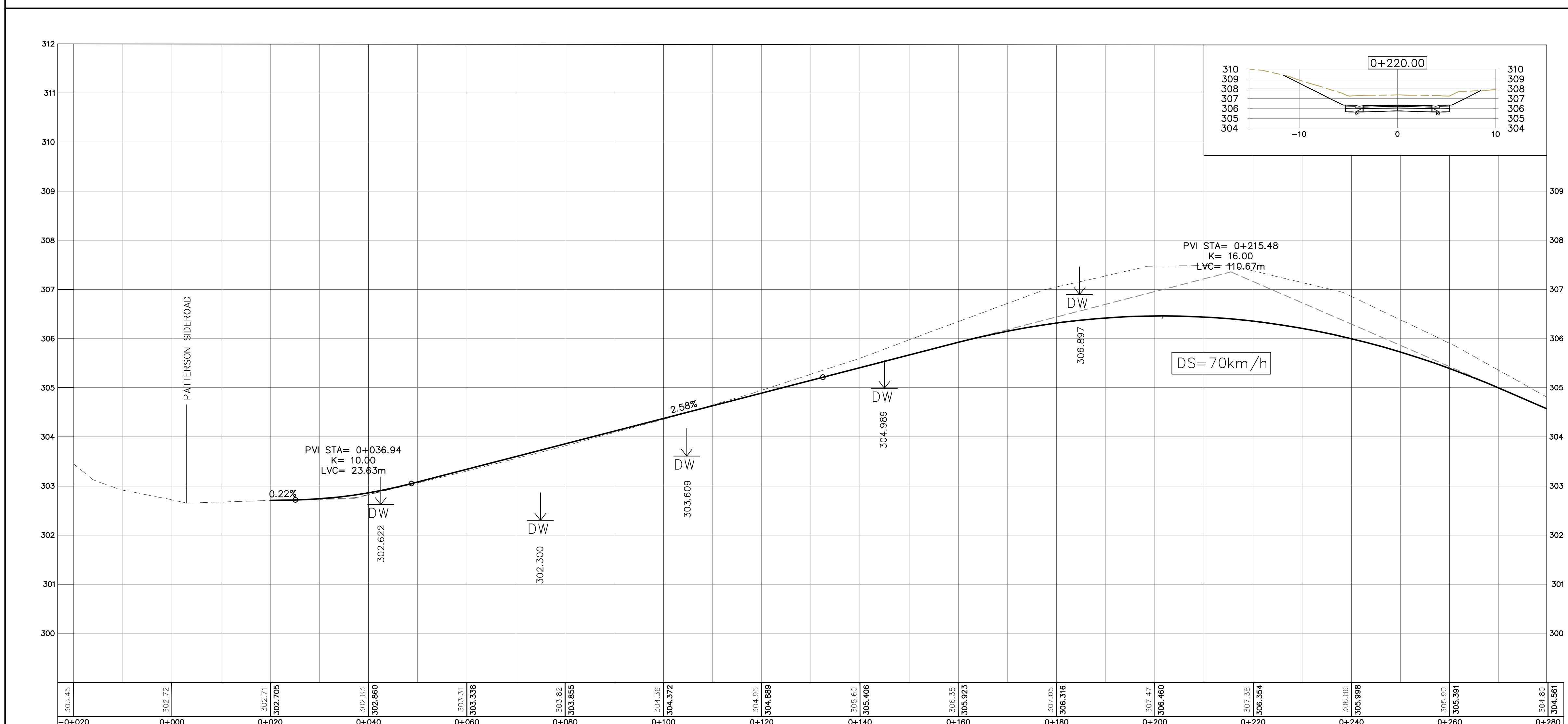
0+140	0+260	SEMI–URBAN	SEMI–URBAN
0+260	0+280	HYBRID RURAL	RURAL





SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMAINS			HYDRO U/G CABLE		
TRANSIT			ONT. HYDRO		
PARKS & REC.			CTV		
ONT. CLEAN WATER					

REVISIONS

DATE	DETAILS	INIT.

KEY PLAN
N.T.S.

LEGEND:

- ROW
- PERMISSION TO ENTER PROPERTY
- PROPERTY ACQUISITION
- ADVISORY SPEED SIGNS REQUIRED
- PROPOSED EDGE OF PAVEMENT
- EDGE OF SHOULDER
- BH46 EXISTING BOREHOLE LOCATIONS
- SWALE PROPOSED SWALE WITH SUBDRAIN
- HEAVY DUTY SILT FENCE BARRIER OPSD–219.130
- LIGHT DUTY SILT FENCE BARRIER OPSD–219.110
- EXISTING RIGHT DITCH PROFILE
- EXISTING LEFT DITCH PROFILE
- PROPOSED RIGHT DITCH IMPROVEMENT
- PROPOSED LEFT DITCH IMPROVEMENT
- TRCA REGULATION LIMIT
- PROPOSED RIVER STONE
- CONCRETE MOUNTABLE CURB OPSD–600.030

General Notes

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ONTARIO CLEAN WATER AGENCY
HYDRO ELECTRIC POWER COMM. OF ONTARIO
HYDRO ELECTRIC COMM. CITY OF MISSISSAUGA
HYDRO ELECTRIC COMM. CITY OF BRAMPTON
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1:1000 HORIZONTAL SCALE
1:100 VERTICAL SCALE

Region of Peel
Working for you

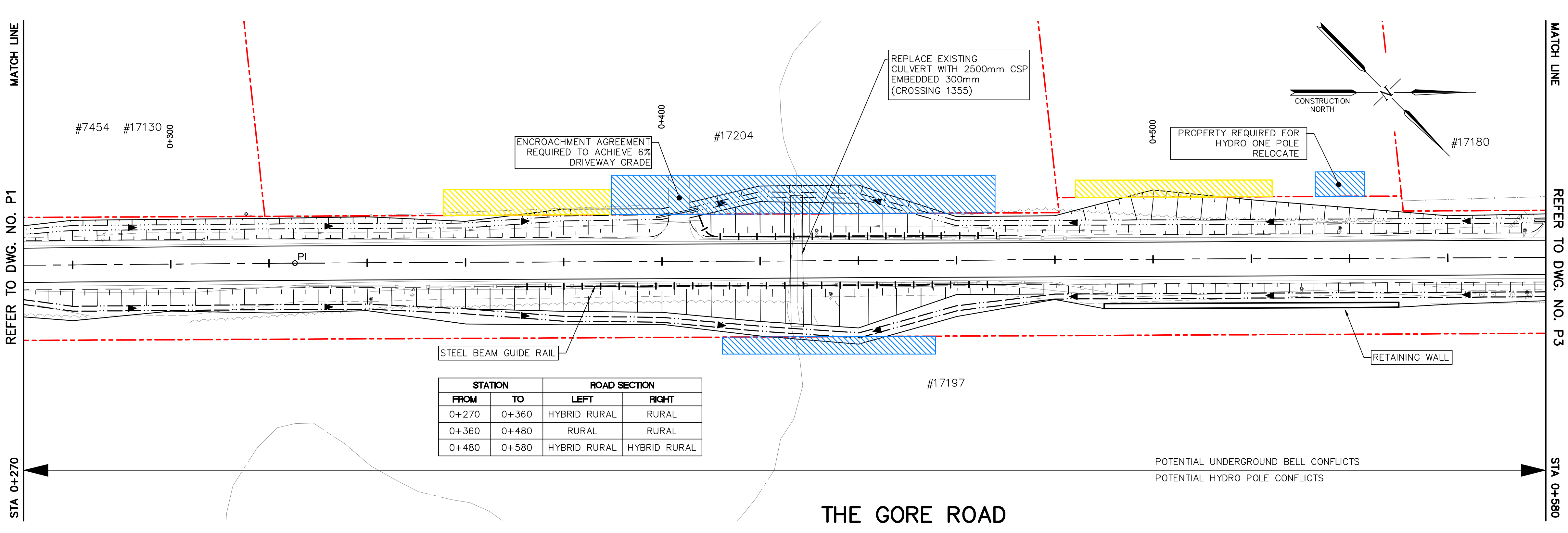
THE GORE ROAD

FROM PATTERSON SIDE ROAD TO HWY 9

PLAN & PROFILE

Lots:	Area:	Project No. MTB019424
Checked by: J.V.	Drawn by: J.R.	Plan No. P1
Date: JANUARY 2013	Sheet:	

Jan 15, 2013 – 2:11pm



STATION		ROAD SECTION	
FROM	TO	LEFT	RIGHT
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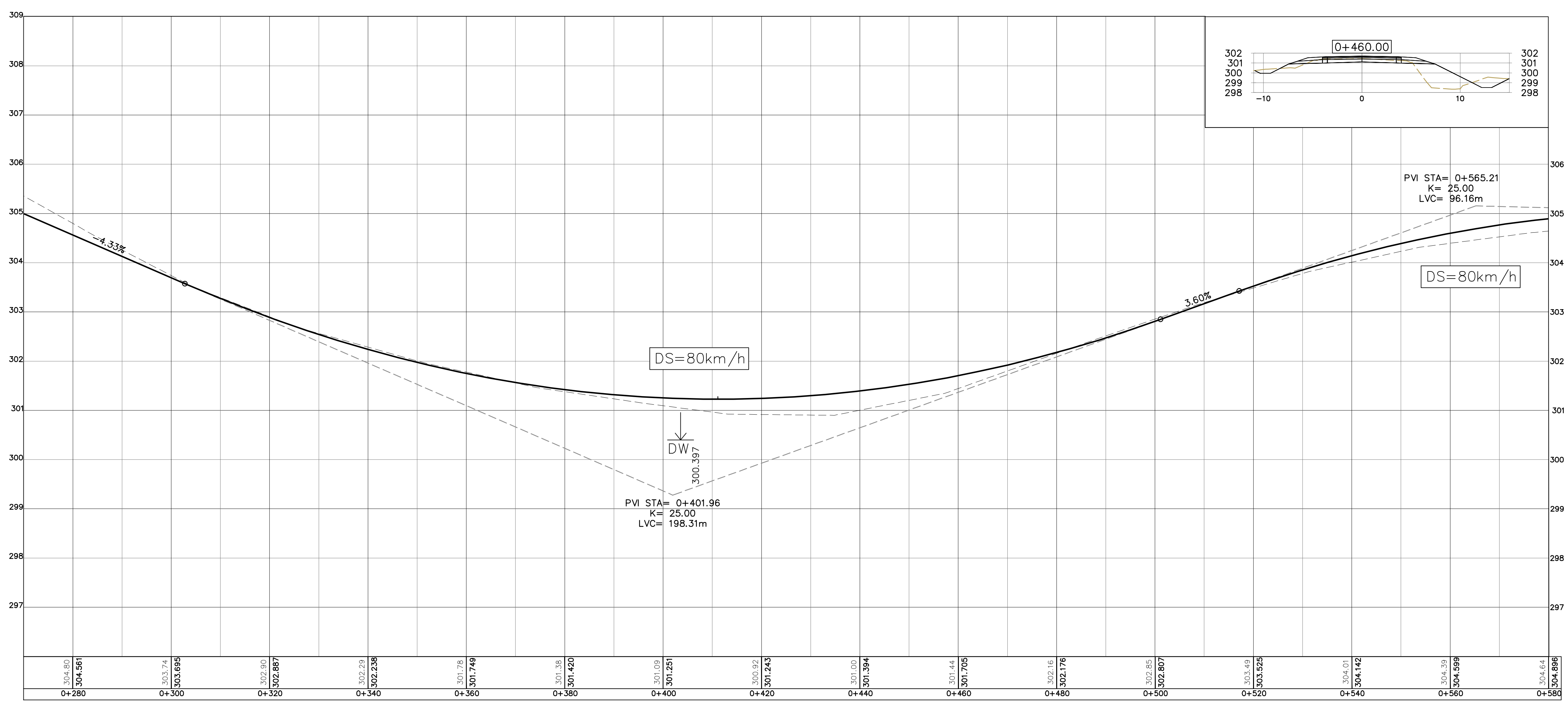
0+360	0+480	RURAL	RURAL
0+480	0+580	HYBRID RURAL	HYBRID RURAL



SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMAINS			HYDRO U/G CABLE		
TRANSIT			ONT. HYDRO		
PARKS & REC.			CTV		
ONT. CLEAN WATER					

REVISIONS

DATE	DETAILS	INIT.

KEY PLAN
N.T.S.

LEGEND:

- ROW
- PERMISSION TO ENTER PROPERTY
- PROPERTY ACQUISITION
- ADVISORY SPEED SIGNS REQUIRED
- PROPOSED EDGE OF PAVEMENT
- EDGE OF SHOULDER
- BH46 EXISTING BOREHOLE LOCATIONS
- SWALE PROPOSED SWALE WITH SUBDRAIN
- HEAVY DUTY SILT FENCE BARRIER OPSD–219.130
- LIGHT DUTY SILT FENCE BARRIER OPSD–219.110
- EXISTING RIGHT DITCH PROFILE
- EXISTING LEFT DITCH PROFILE
- PROPOSED RIGHT DITCH IMPROVEMENT
- PROPOSED LEFT DITCH IMPROVEMENT
- TRCA REGULATION LIMIT
- PROPOSED RIVER STONE
- CONCRETE MOUNTABLE CURB OPSD–600.030

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FIRE DEPT.
SCHOOL BUS SERVICES
CANADA POST (4 WEEKS ADVANCE NOTICE)

1:1000 HORIZONTAL SCALE
1:100 VERTICAL SCALE

Region of Peel
Working for you

THE GORE ROAD

FROM PATTERSON SIDE ROAD TO HWY 9

PLAN & PROFILE

Lots:	Area:	Project No. MTB019424	
Checked by: J.V.	Drawn by: J.R.	Plan No. P2	
Date: JANUARY 2013	Sheet:		

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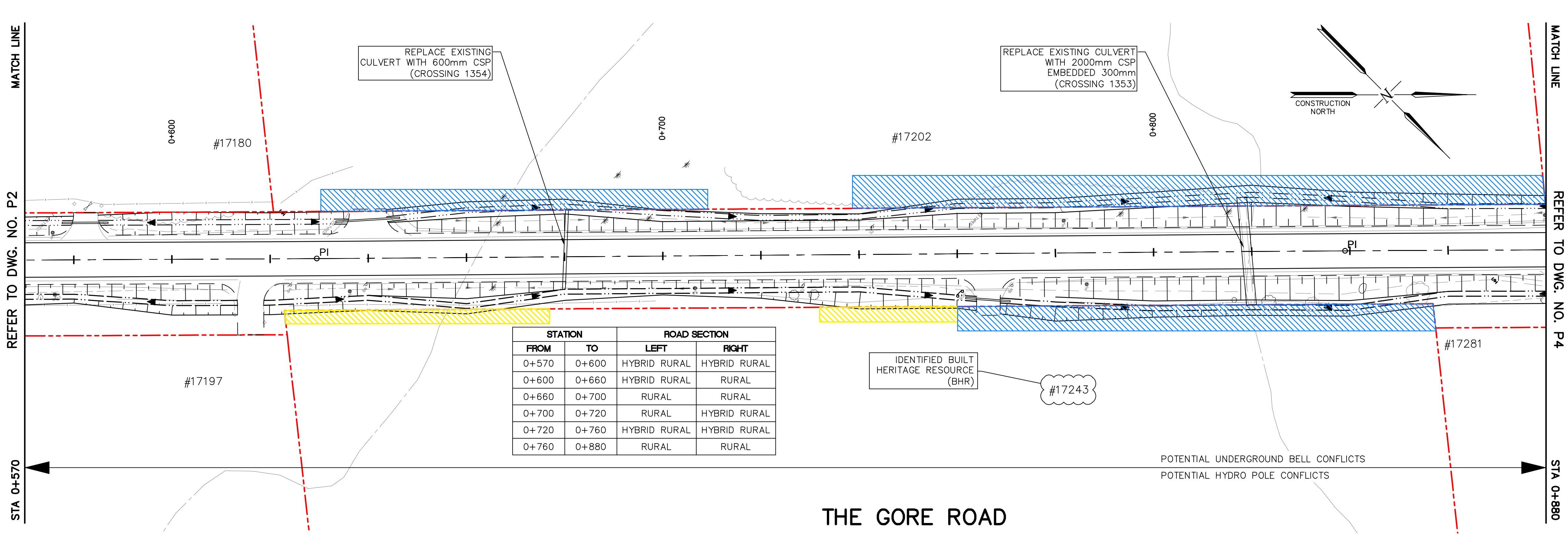

STATION		ROAD SECTION	
FROM	TO	LEFT	RIGHT
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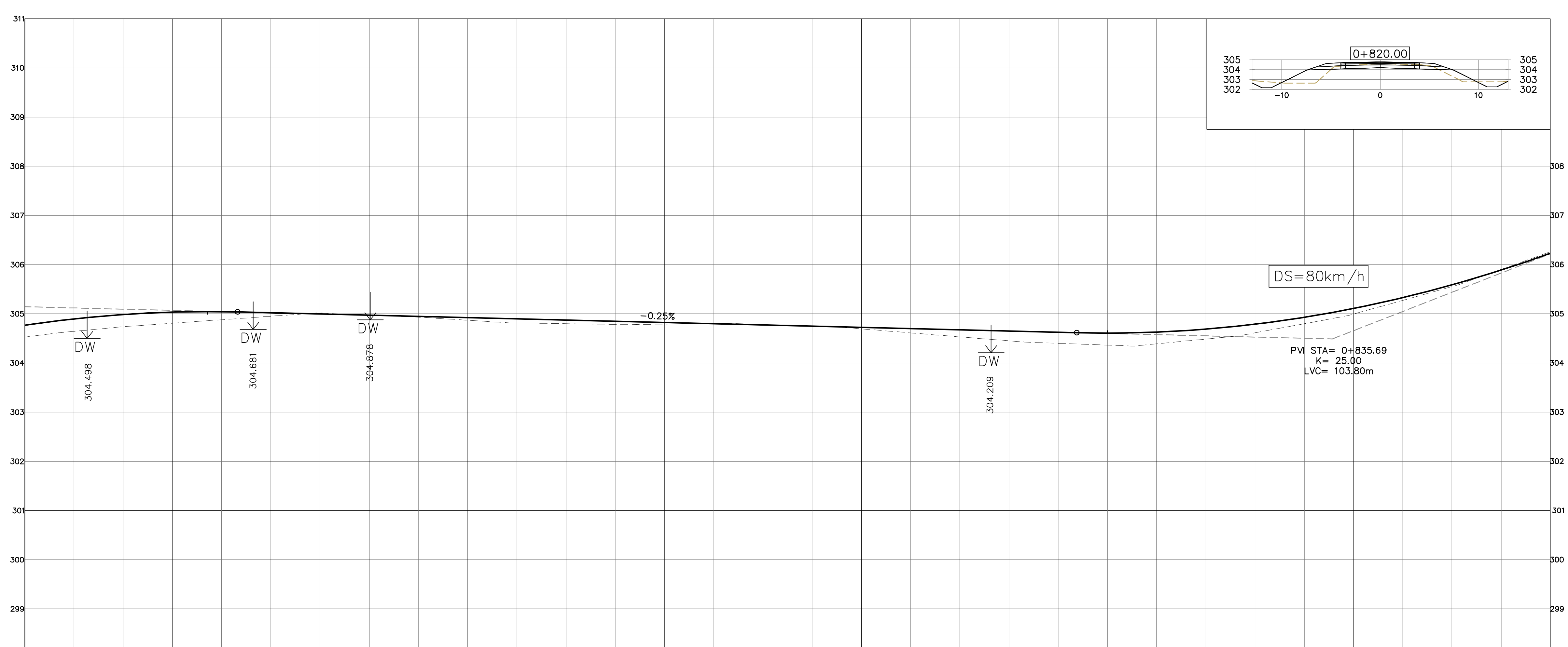
0+600	0+660	HYBRID RURAL	RURAL
0+660	0+700	RURAL	RURAL
0+700	0+720	RURAL	HYBRID RURAL
0+720	0+760	HYBRID RURAL	HYBRID RURAL
0+760	0+880	RURAL	RURAL



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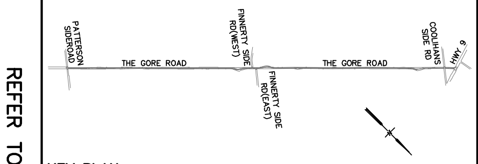
304.896	305.033	305.019	304.970	304.920	304.871	304.822	304.773	304.723	304.674	304.625	304.628	304.788	305.109	305.589	306.230
0+580	0+600	0+620	0+640	0+660	0+680	0+700	0+720	0+740	0+760	0+780	0+800	0+820	0+840	0+860	0+880

SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMAINS			HYDRO U/G CABLE		
TRANSIT			ONT. HYDRO		
PARKS & REC.			CTV		
ONT. CLEAN WATER					

REVISIONS

DATE	DETAILS	INIT.



KEY PLAN
N.T.S.

LEGEND:

ROW
PERMISSION TO ENTER PROPERTY
PROPERTY ACQUISITION
ADVISORY SPEED SIGNS REQUIRED
PROPOSED EDGE OF PAVEMENT
EDGE OF SHOULDER
BH46 EXISTING BOREHOLE LOCATIONS
SWALE PROPOSED SWALE WITH SUBDRAIN
HEAVY DUTY SILT FENCE BARRIER OPSD–219.130
LIGHT DUTY SILT FENCE BARRIER OPSD–219.110
EXISTING RIGHT DITCH PROFILE
EXISTING LEFT DITCH PROFILE
PROPOSED RIGHT DITCH IMPROVEMENT
PROPOSED LEFT DITCH IMPROVEMENT
TRCA REGULATION LIMIT
PROPOSED RIVER STONE
CONCRETE MOUNTABLE CURB OPSD–600.030

General Notes

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Denotes Building Located
Type 'B' Bedding Unless Otherwise Noted (SAN)

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HYDRO ELECTRIC COMM. CITY OF MISSISSAUGA
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CABLE TELEVISION

POLICE DEPT.
FIRE DEPT.
SCHOOL BUS SERVICES
CANADA POST (4 WEEKS ADVANCE NOTICE)

10m 0 10 20 30m 1:1000 HORIZONTAL SCALE
1m 0 1 2 3m 1:100 VERTICAL SCALE

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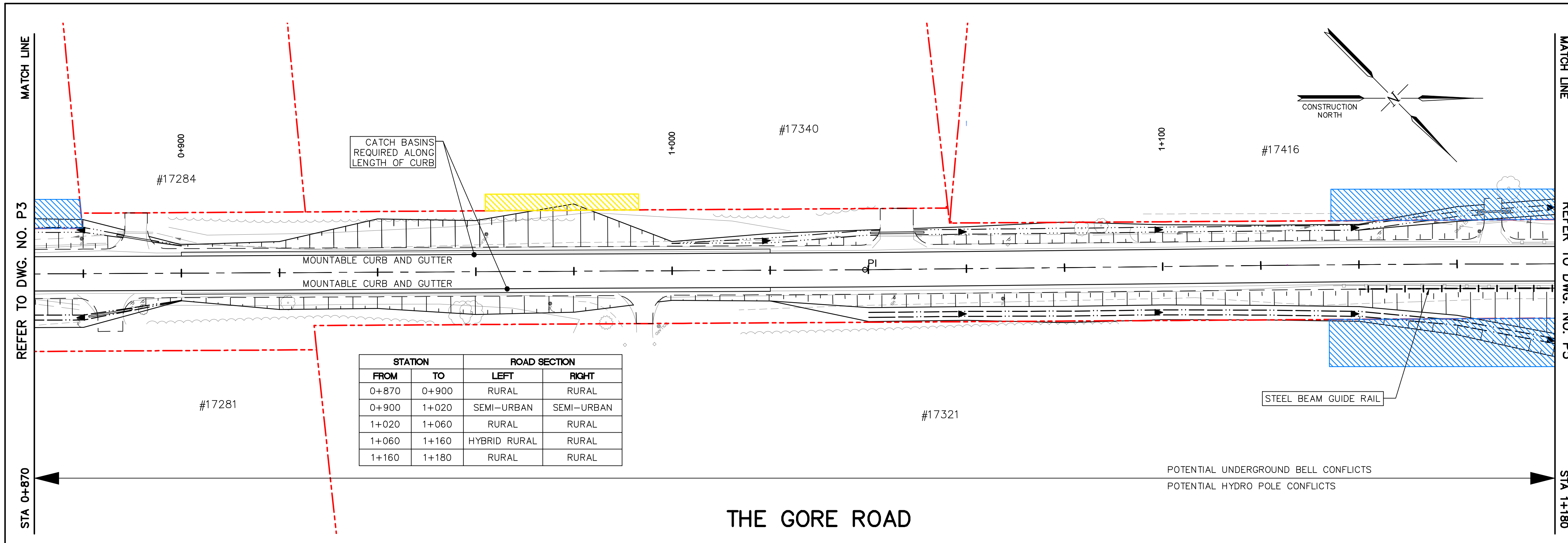
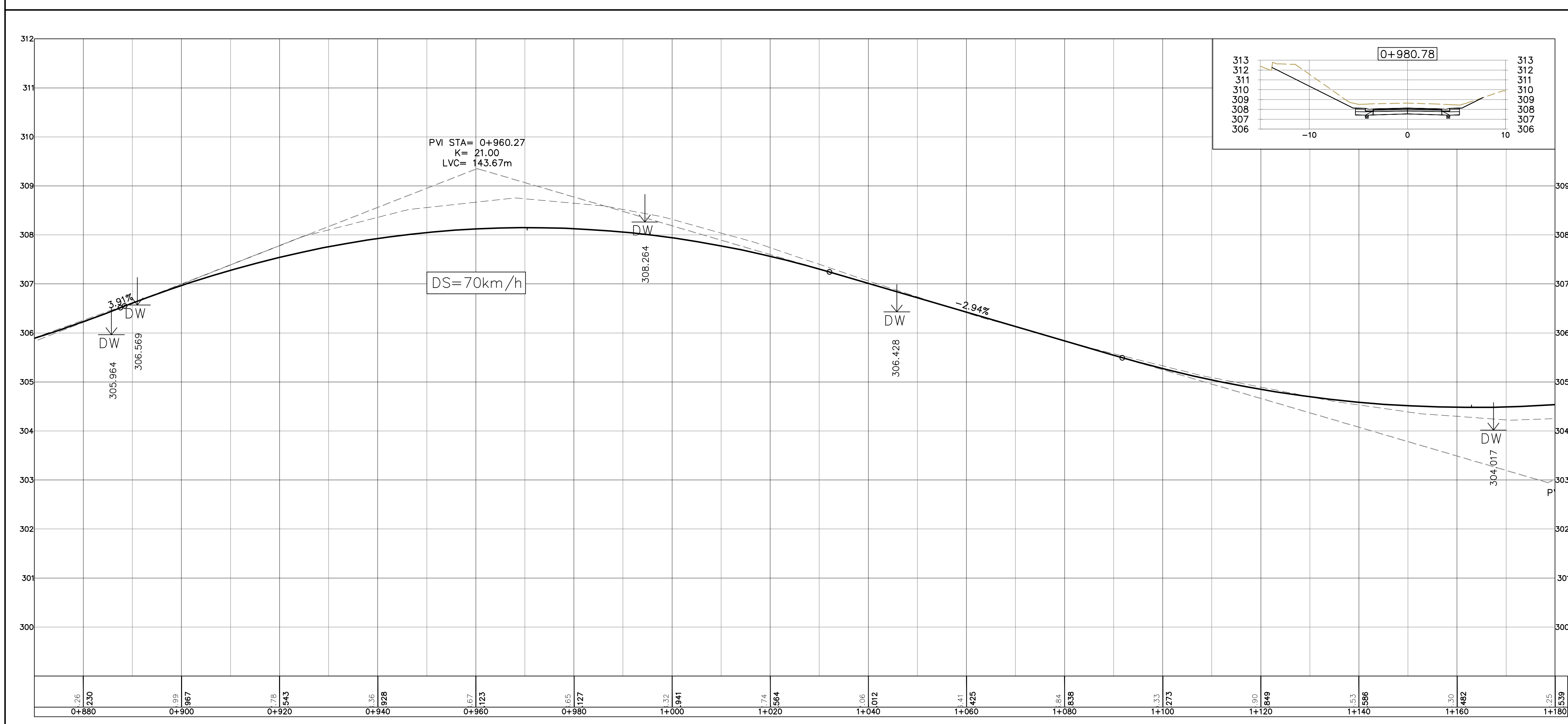
FROM PATTERSON SIDE ROAD TO HWY 9

PLAN & PROFILE

Lots:	Area:	Project No. MTB019424
Checked by: J.V.	Drawn by: J.R.	Plan No. P3
Date: JANUARY 2013	Sheet:	



STATION		ROAD SECTION	
FROM	TO	LEFT	RIGHT
0+870	0+900	RURAL	RURAL
0+900	1+020	SEMI-URBAN	SEMI-URBAN
1+020	1+060	RURAL	RURAL
1+060	1+160	HYBRID RURAL	RURAL
1+160	1+180	RURAL	RURAL



SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN. SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMAINS			HYDRO U/G CABLE		
TRANSIT			ONT. HYDRO		
PARKS & REC.			CTV		
ONT. CLEAN WATER					

REVISIONS

DATE	DETAILS	INIT.

KEY PLAN
N.T.S.

LEGEND:

- ROW
- PERMISSION TO ENTER PROPERTY
- PROPERTY ACQUISITION
- ADVISORY SPEED SIGNS REQUIRED
- PROPOSED EDGE OF PAVEMENT
- EDGE OF SHOULDER
- BH46 EXISTING BOREHOLE LOCATIONS
- SWALE PROPOSED SWALE WITH SUBDRAIN
- HEAVY DUTY SILT FENCE BARRIER OPSD-219.130
- LIGHT DUTY SILT FENCE BARRIER OPSD-219.110
- EXISTING RIGHT DITCH PROFILE
- EXISTING LEFT DITCH PROFILE
- PROPOSED RIGHT DITCH IMPROVEMENT
- PROPOSED LEFT DITCH IMPROVEMENT
- TRCA REGULATION LIMIT
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CABLE TELEVISION

POLICE DEPT.
FIRE DEPT.
SCHOOL BUS SERVICES
CANADA POST (4 WEEKS ADVANCE NOTICE)

10m 0 10 20 30m 1:1000 HORIZONTAL SCALE
1m 0 1 2 3m 1:100 VERTICAL SCALE

Region of Peel
Working for you

THE GORE ROAD

FROM PATTERSON SIDE ROAD TO HWY 9

PLAN & PROFILE

Lots:	Area:	Project No. MTB019424
Checked by: J.V.	Drawn by: J.R.	Plan No. P4
Date: JANUARY 2013	Sheet:	

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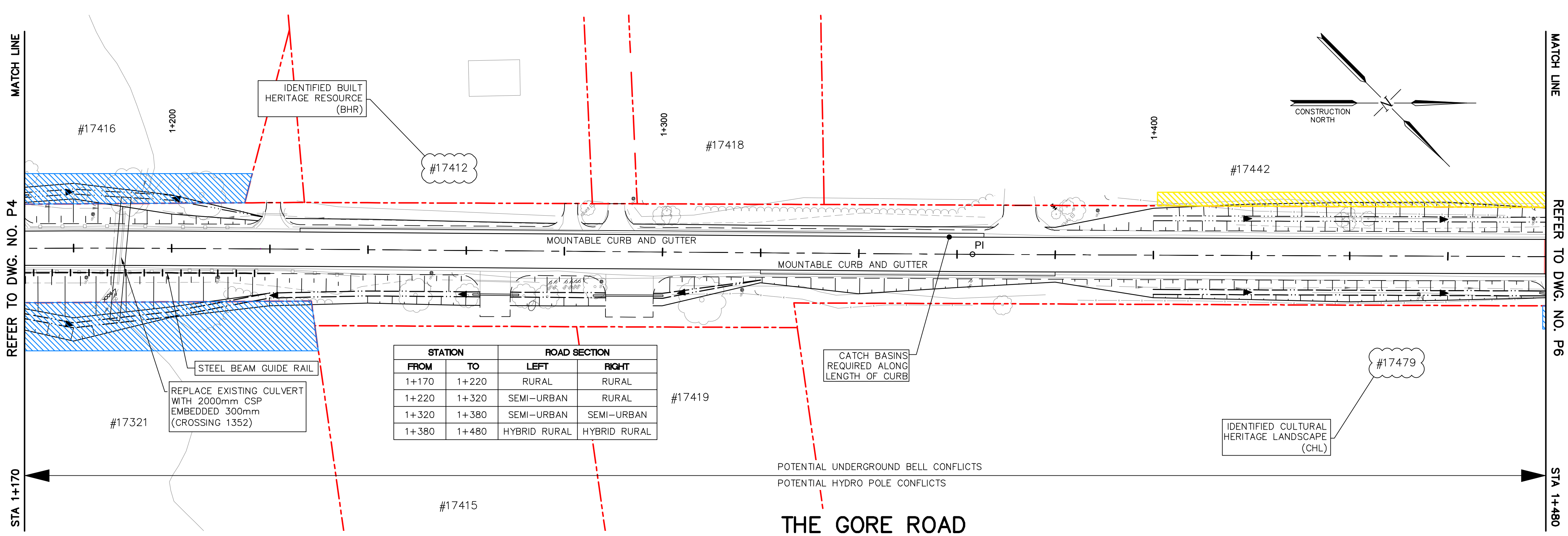
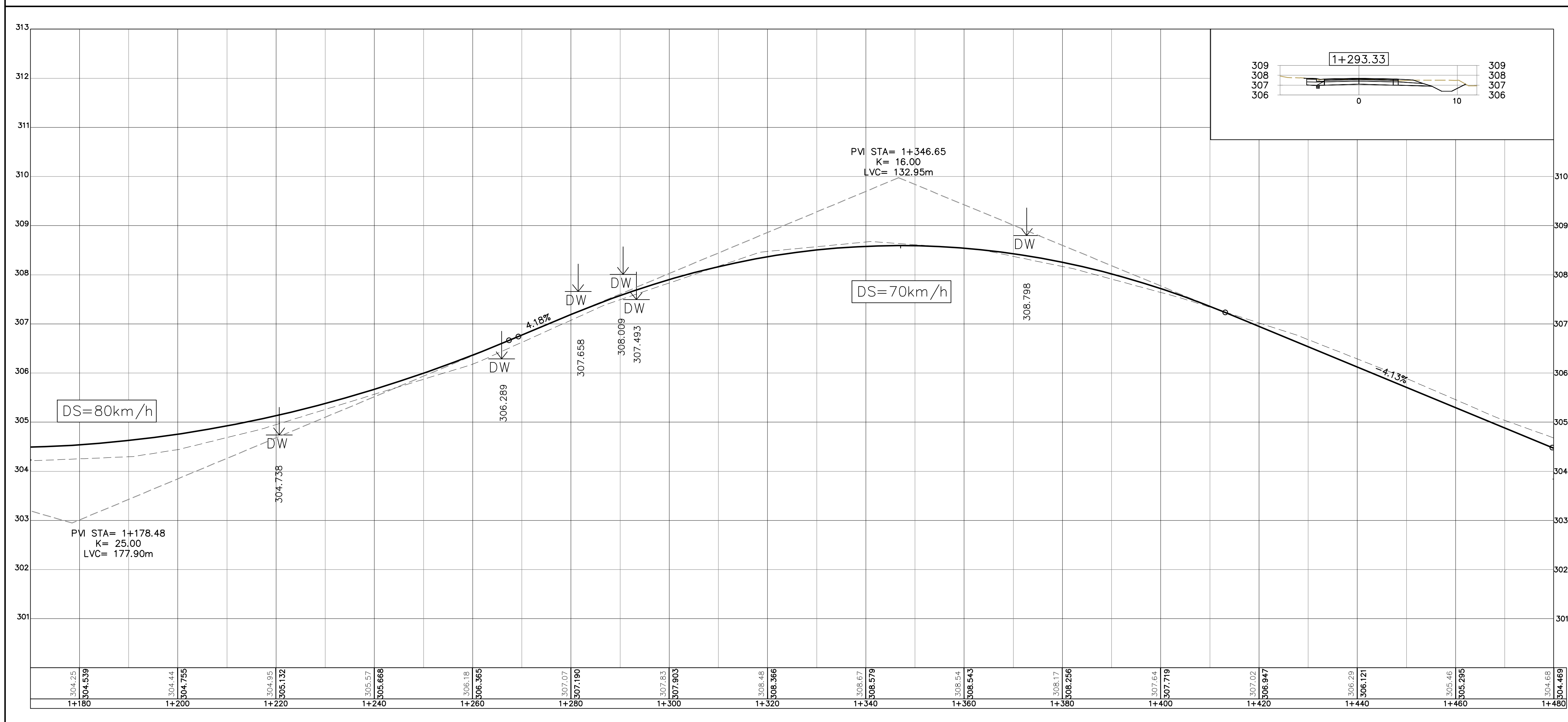


STATION		ROAD SECTION	
FROM	TO	LEFT	RIGHT
1+170	1+220	RURAL	RURAL
1+220	1+320	SEMI-URBAN	RURAL
1+320	1+380	SEMI-URBAN	SEMI-URBAN
1+380	1+480	HYBRID RURAL	HYBRID RURAL

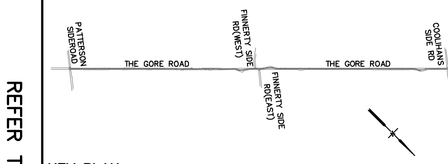


SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMAINS			HYDRO U/G CABLE		
TRANSIT			ONT. HYDRO		
PARKS & REC.			CTV		
ONT. CLEAN WATER					

REVISIONS

DATE	DETAILS	INIT.



KEY PLAN
N.T.S.

LEGEND:

- ROW
- PERMISSION TO ENTER PROPERTY
- PROPERTY ACQUISITION
- ADVISORY SPEED SIGNS REQUIRED
- PROPOSED EDGE OF PAVEMENT
- EDGE OF SHOULDER
- BH46 — EXISTING BOREHOLE LOCATIONS
- SWALE — PROPOSED SWALE WITH SUBDRAIN
- HEAVY DUTY SILT FENCE BARRIER OPSD-219.130
- LIGHT DUTY SILT FENCE BARRIER OPSD-219.110
- EXISTING RIGHT DITCH PROFILE
- EXISTING LEFT DITCH PROFILE
- PROPOSED RIGHT DITCH IMPROVEMENT
- PROPOSED LEFT DITCH IMPROVEMENT
- TRCA REGULATION LIMIT
- PROPOSED RIVER STONE
- CONCRETE MOUNTABLE CURB OPSD-600.030

General Notes

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B.M. No. Elev.

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web www.rjburnside.com

Designed by

Chkd.

NOTICE TO CONTRACTOR

48 HOURS PRIOR TO COMMMENCING WORK NOTIFY THE FOLLOWING

THE REGIONAL MUNICIPALITY OF PEEL
CITY OF MISSISSAUGA WORKS DEPT.
CITY OF BRAMPTON WORKS DEPT.
TOWN OF CALEDON WORKS DEPT.
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CONSUMERS GAS COMPANY
MINISTRY OF TRANSPORTATION
ONTARIO CLEAN WATER AGENCY
HYDRO ELECTRIC POWER COMM. OF ONTARIO
HYDRO ELECTRIC COMM. CITY OF MISSISSAUGA
HYDRO ELECTRIC COMM. CITY OF BRAMPTON
CABLE TELEVISION

POLICE DEPT.
FIRE DEPT.
SCHOOL BUS SERVICES
CANADA POST (4 WEEKS ADVANCE NOTICE)

10m 0 10 20 30m 1:1000 HORIZONTAL SCALE

1m 0 1 2 3m 1:100 VERTICAL SCALE

Region of Peel
Working for you

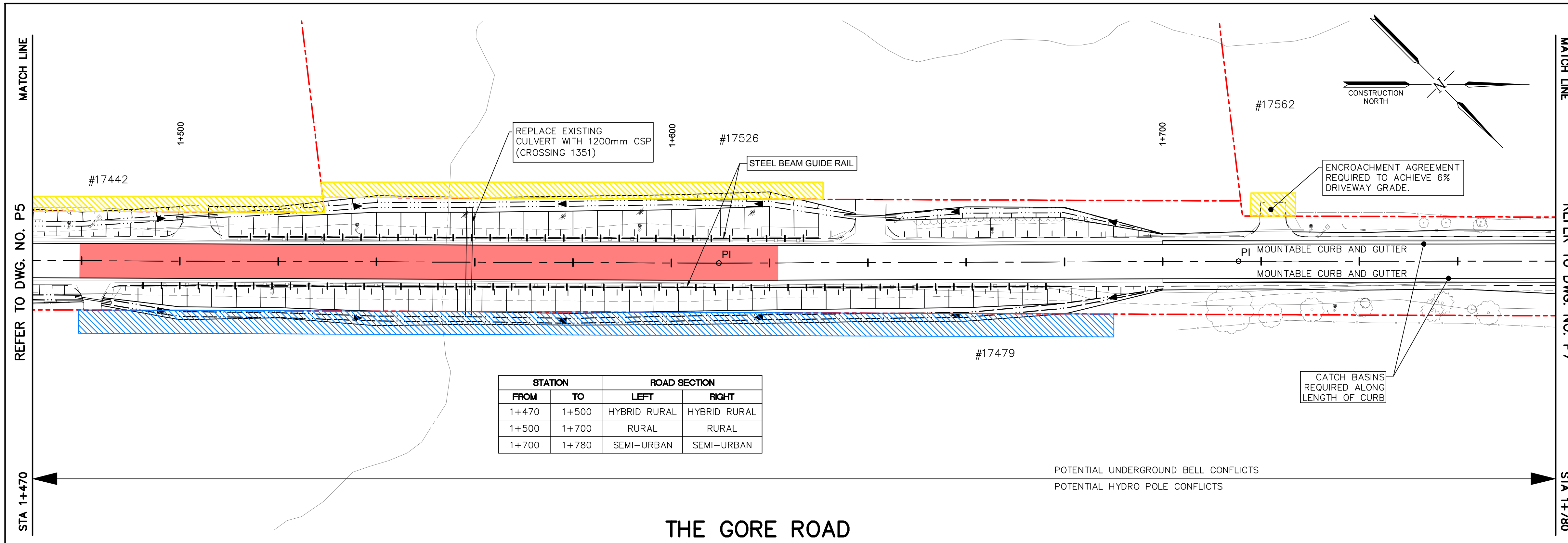
THE GORE ROAD

FROM PATTERSON SIDE ROAD TO HWY 9

PLAN & PROFILE

Lots:	Area:	Project No. MTB019424
Checked by: J.V.	Drawn by: J.R.	Plan No. P5
Date: JANUARY 2013	Sheet:	

\\OSCAR\Shared Work Areas\MTB019424 Gore Rd\MTB019424_P001-P007.dwg
Jan 15, 2013 - 2:14pm



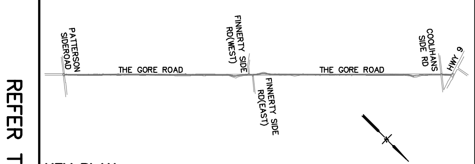
STATION		ROAD SECTION	
FROM	TO	LEFT	RIGHT
1+470	1+500	HYBRID RURAL	HYBRID RURAL
1+500	1+700	RURAL	RURAL
1+700	1+780	SEMI-URBAN	SEMI-URBAN

SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMAINS			HYDRO U/G CABLE		
TRANSIT			ONT. HYDRO		
PARKS & REC.			CTV		
ONT. CLEAN WATER					

REVISIONS

DATE	DETAILS	INIT.



KEY PLAN
N.T.S.

LEGEND:

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- PROPERTY ACQUISITION
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- EDGE OF SHOULDER
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- SWALE — PROPOSED SWALE WITH SUBDRAIN
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- TRCA REGULATION LIMIT
- PROPOSED RIVER STONE
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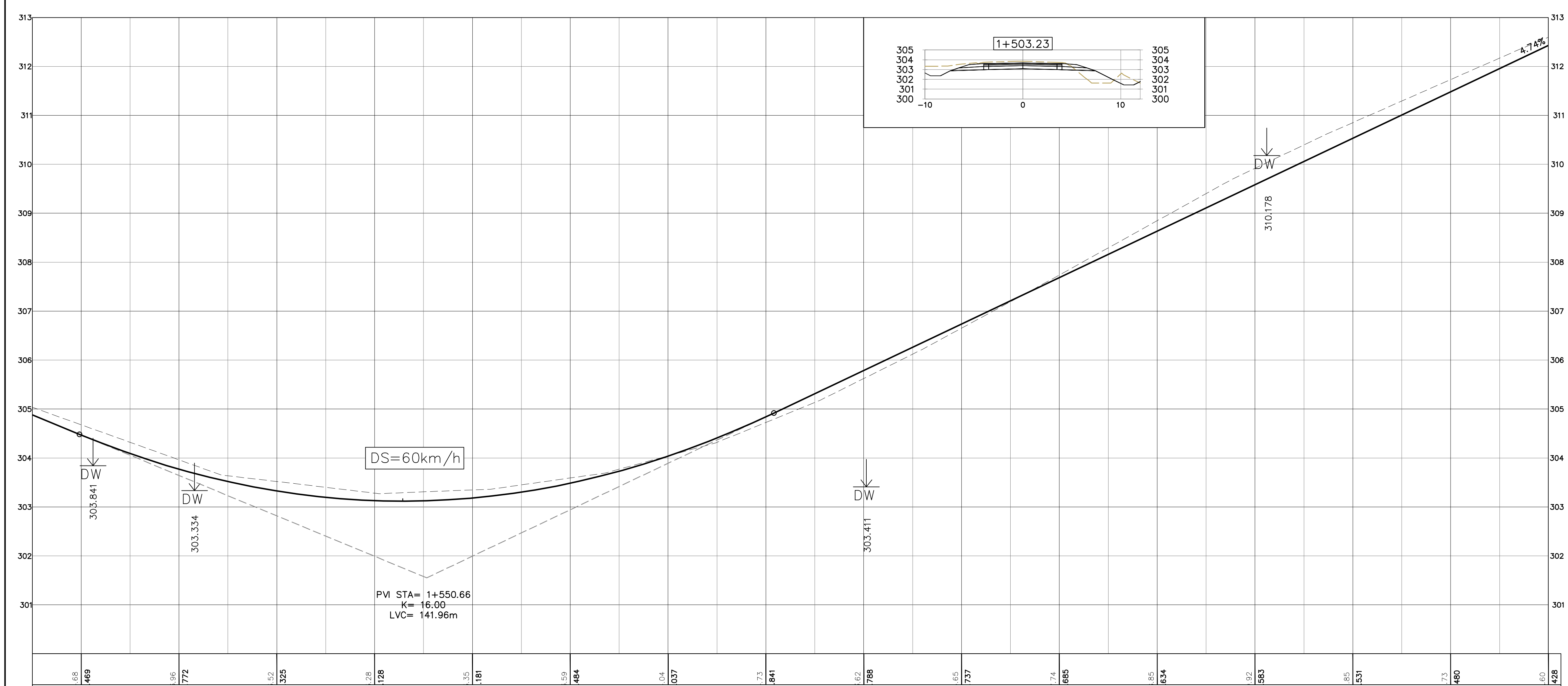

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Designed by
Chkd.

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POLICE DEPT.
FIRE DEPT.
SCHOOL BUS SERVICES
CANADA POST (4 WEEKS ADVANCE NOTICE)

10m 0 10 20 30m 1:1000 HORIZONTAL SCALE
1m 0 1 2 3m 1:100 VERTICAL SCALE

Region of Peel
Working for you

THE GORE ROAD

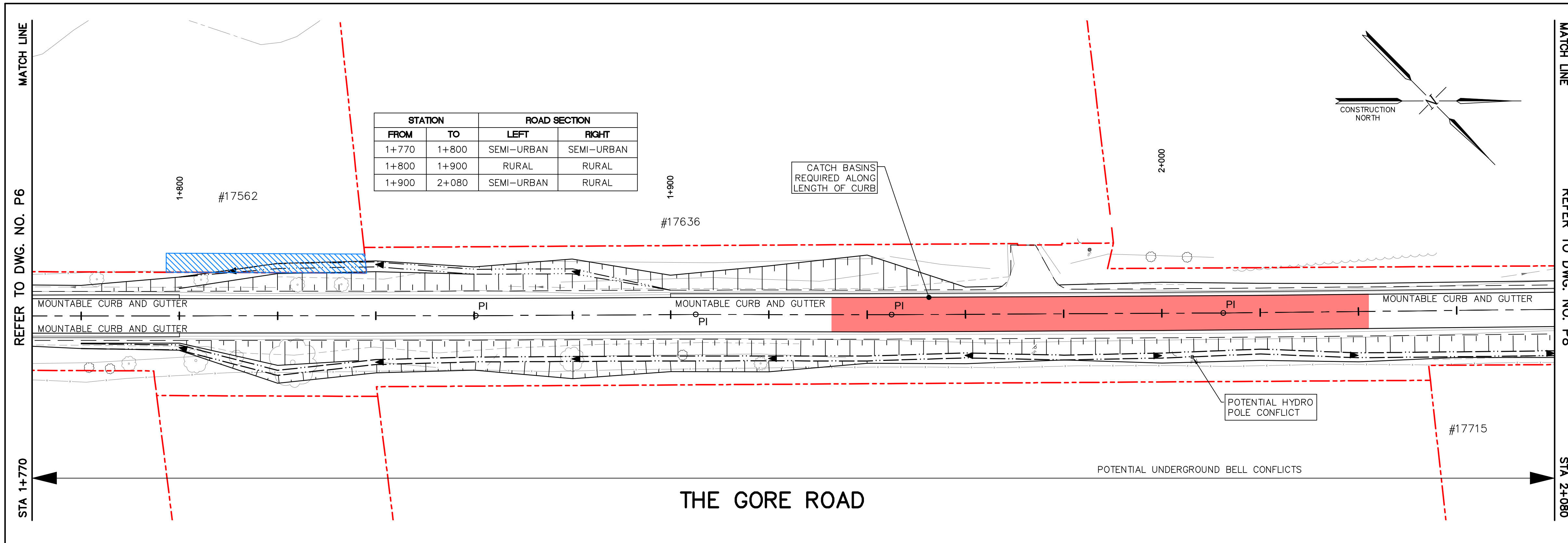
FROM PATTERSON SIDE ROAD TO HWY 9

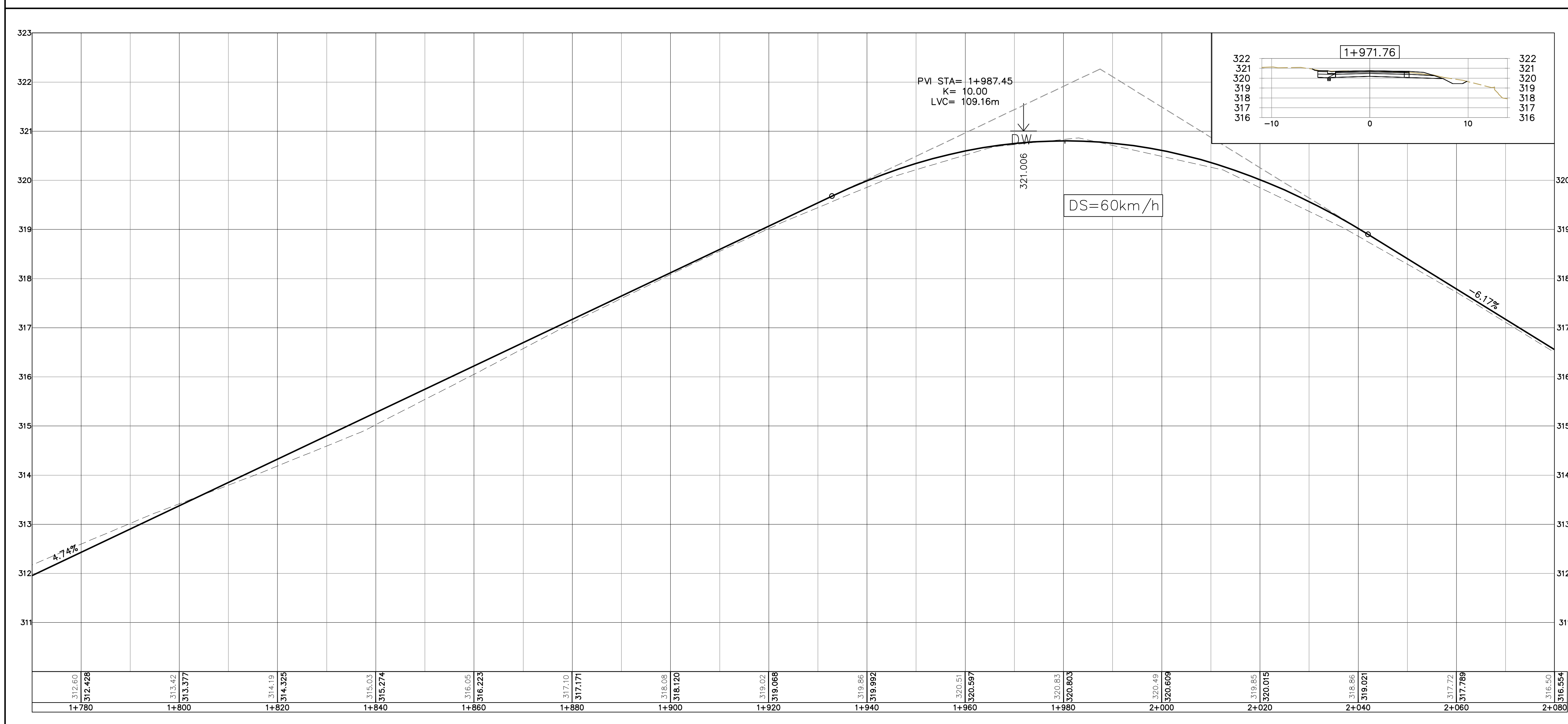
PLAN & PROFILE

Lots:	Area:	Project No. MTB019424
Checked by: J.V.	Drawn by: J.R.	Plan No. P6
Date: JANUARY 2013	Sheet:	

\\OSCAR\Shared Work Areas\MTB019424 Gore Rd\MTB019424_P001-P007.dwg
Jan 15, 2013 – 2:14pm

STATION		ROAD SECTION	
FROM	TO	LEFT	RIGHT
1+770	1+800	SEMI–URBAN	SEMI–URBAN
1+800	1+900	RURAL	RURAL
1+900	2+080	SEMI–URBAN	RURAL





SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMAINS			HYDRO U/G CABLE		
TRANSIT			ONT. HYDRO		
PARKS & REC.			CTV		
ONT. CLEAN WATER					

REVISIONS

DATE	DETAILS	INIT.

KEY PLAN
N.T.S.

LEGEND:

- ROW
- PERMISSION TO ENTER PROPERTY
- PROPERTY ACQUISITION
- ADVISORY SPEED SIGNS REQUIRED
- PROPOSED EDGE OF PAVEMENT
- EDGE OF SHOULDER
- BH46 EXISTING BOREHOLE LOCATIONS
- SWALE PROPOSED SWALE WITH SUBDRAIN
- HEAVY DUTY SILT FENCE BARRIER OPSD–219.130
- LIGHT DUTY SILT FENCE BARRIER OPSD–219.110
- EXISTING RIGHT DITCH PROFILE
- EXISTING LEFT DITCH PROFILE
- PROPOSED RIGHT DITCH IMPROVEMENT
- PROPOSED LEFT DITCH IMPROVEMENT
- TRCA REGULATION LIMIT
- PROPOSED RIVER STONE
- CONCRETE MOUNTABLE CURB OPSD–600.030

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SCHOOL BUS SERVICES
CANADA POST (4 WEEKS ADVANCE NOTICE)

1:1000 HORIZONTAL SCALE
1:100 VERTICAL SCALE

Region of Peel
Working for you

THE GORE ROAD

FROM PATTERSON SIDE ROAD TO HWY 9

PLAN & PROFILE

Lots:	Area:	Project No. MTB019424
Checked by: J.V.	Drawn by: J.R.	Plan No. P7
Date: JANUARY 2013	Sheet:	

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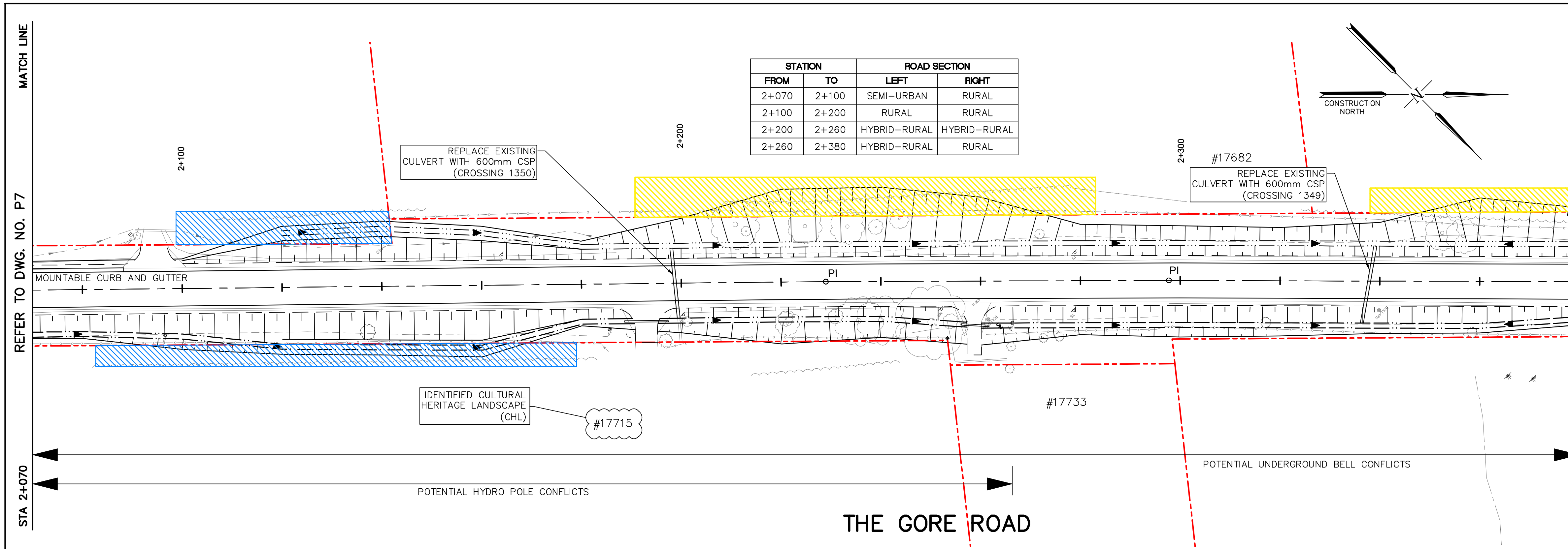
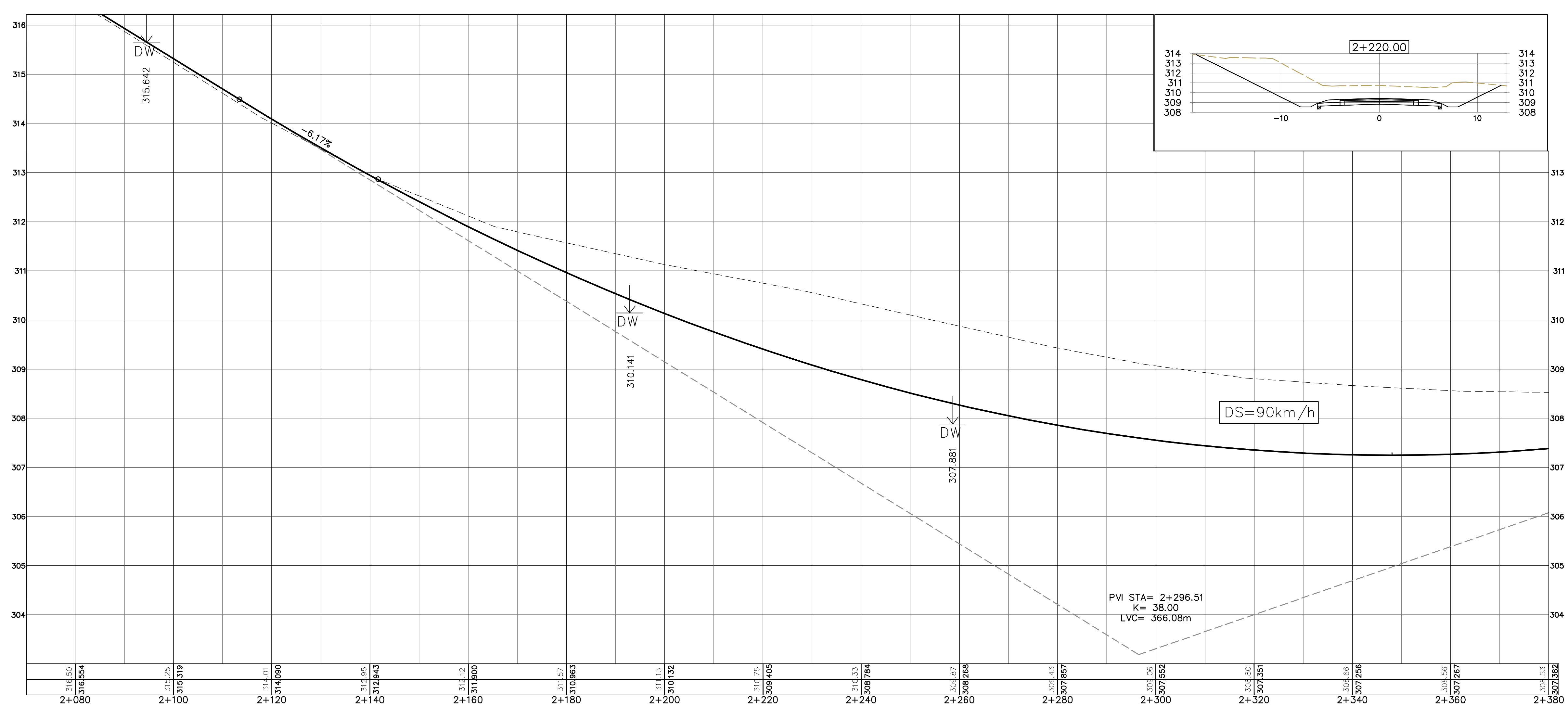


STATION		ROAD SECTION	
FROM	TO	LEFT	RIGHT
2+070	2+100	SEMI–URBAN	RURAL
2+100	2+200	RURAL	RURAL
2+200	2+260	HYBRID–RURAL	HYBRID–RURAL
2+260	2+380	HYBRID–RURAL	RURAL

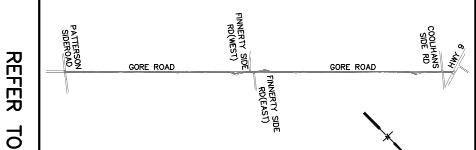


SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMAINS			HYDRO U/G CABLE		
TRANSIT			ONT. HYDRO		
PARKS & REC.			CTV		
ONT. CLEAN WATER					

REVISIONS

DATE	DETAILS	INIT.



KEY PLAN
N.T.S.

LEGEND:

ROW
PERMISSION TO ENTER PROPERTY
PROPERTY ACQUISITION
ADVISORY SPEED SIGNS REQUIRED
PROPOSED EDGE OF PAVEMENT
EDGE OF SHOULDER
BH46 EXISTING BOREHOLE LOCATIONS
SWALE PROPOSED SWALE WITH SUBDRAIN
HEAVY DUTY SILT FENCE BARRIER OPSD–219.130
LIGHT DUTY SILT FENCE BARRIER OPSD–219.110
EXISTING RIGHT DITCH PROFILE
EXISTING LEFT DITCH PROFILE
PROPOSED RIGHT DITCH IMPROVEMENT
PROPOSED LEFT DITCH IMPROVEMENT
TRCA REGULATION LIMIT
PROPOSED RIVER STONE
CONCRETE MOUNTABLE CURB OPSD–600.030

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CABLE TELEVISION

POLICE DEPT.
FIRE DEPT.
SCHOOL BUS SERVICES
CANADA POST (4 WEEKS ADVANCE NOTICE)

10m 0 10 20 30m 1:500 HORIZONTAL SCALE
1m 0 1 2 3m 1:50 VERTICAL SCALE

Region of Peel
Working for you

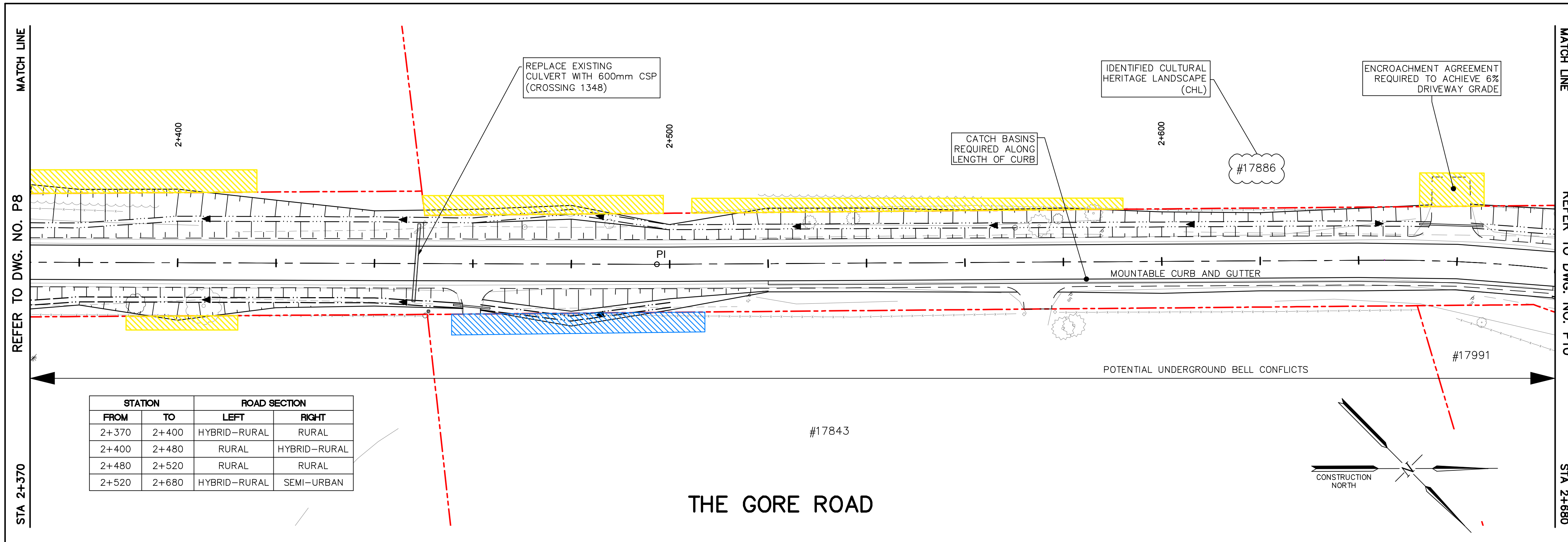
THE GORE ROAD

(FROM PATTERSON SIDE ROAD TO STA. 0+280

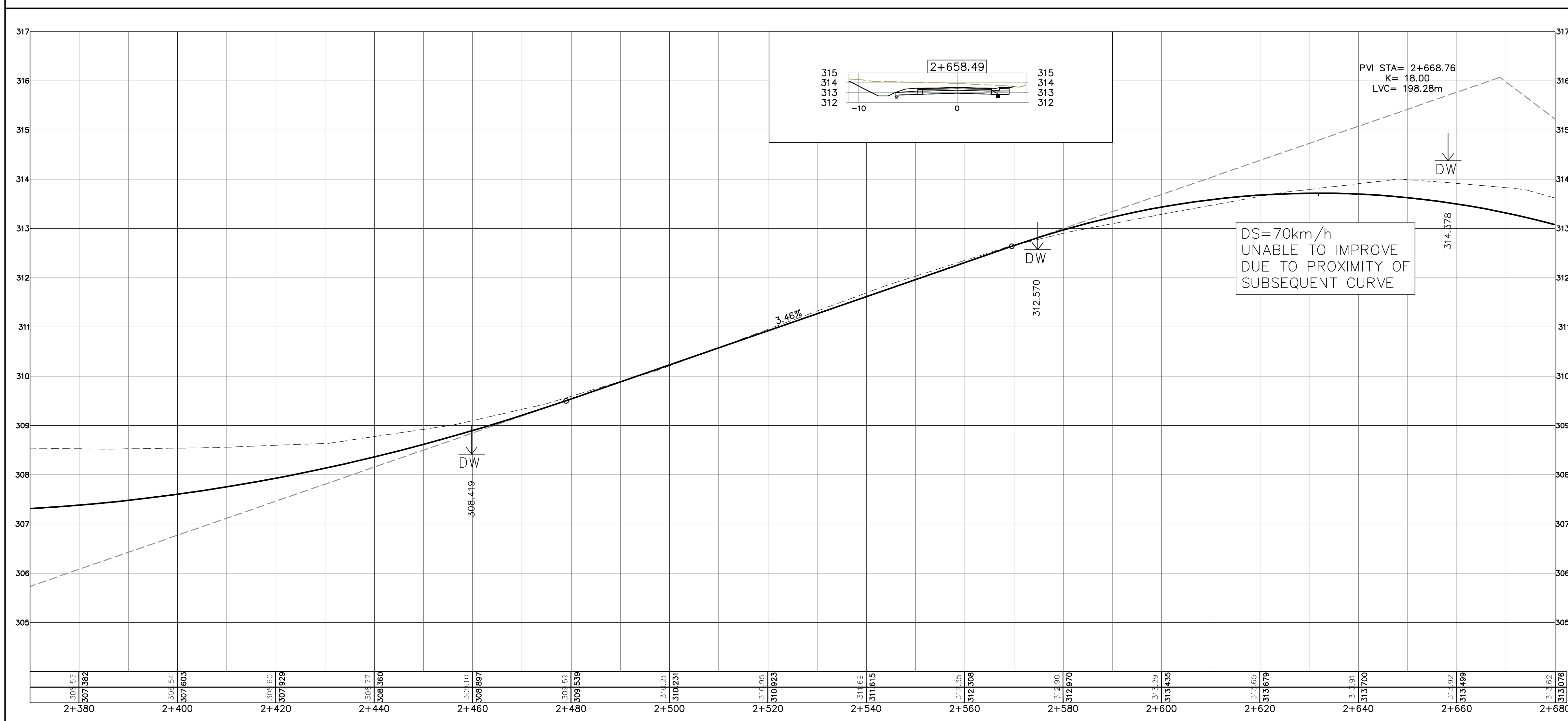
PLAN & PROFILE

Lots:	Area:	Project No. MTB019424
Checked by: J.V.	Drawn by: J.R.	Plan No. P8
Date: JANUARY 2013	Sheet:	

\\OSCAR\Shared Work Areas\MTB019424 Gore Rd\MTB019424_P008–P014.dwg
Jan 15, 2013 – 2:17pm



STATION		ROAD SECTION	
FROM	TO	LEFT	RIGHT
2+370	2+400	HYBRID–RURAL	RURAL
2+400	2+480	RURAL	HYBRID–RURAL
2+480	2+520	RURAL	RURAL
2+520	2+680	HYBRID–RURAL	SEMI–URBAN



SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMAINS			HYDRO U/G CABLE		
TRANSIT			ONT. HYDRO		
PARKS & REC.			CTV		
ONT. CLEAN WATER					

REVISIONS

DATE	DETAILS	INIT.

PATTERSON SIDEROAD — THE GORE ROAD — FINNERTY SIDE RD(WEST) — FINNERTY SIDE RD(EAST) — THE GORE ROAD — COOLIHANS SIDE RD — HWY 9

KEY PLAN
N.T.S.

LEGEND:

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- PERMISSION TO ENTER PROPERTY
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- EDGE OF SHOULDER
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- PROPOSED RIGHT DITCH IMPROVEMENT
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CANADA POST (4 WEEKS ADVANCE NOTICE)

10m 0 10 20 30m 1:500 HORIZONTAL SCALE
1m 0 1 2 3m 1:50 VERTICAL SCALE

Region of Peel
Working for you

THE GORE ROAD

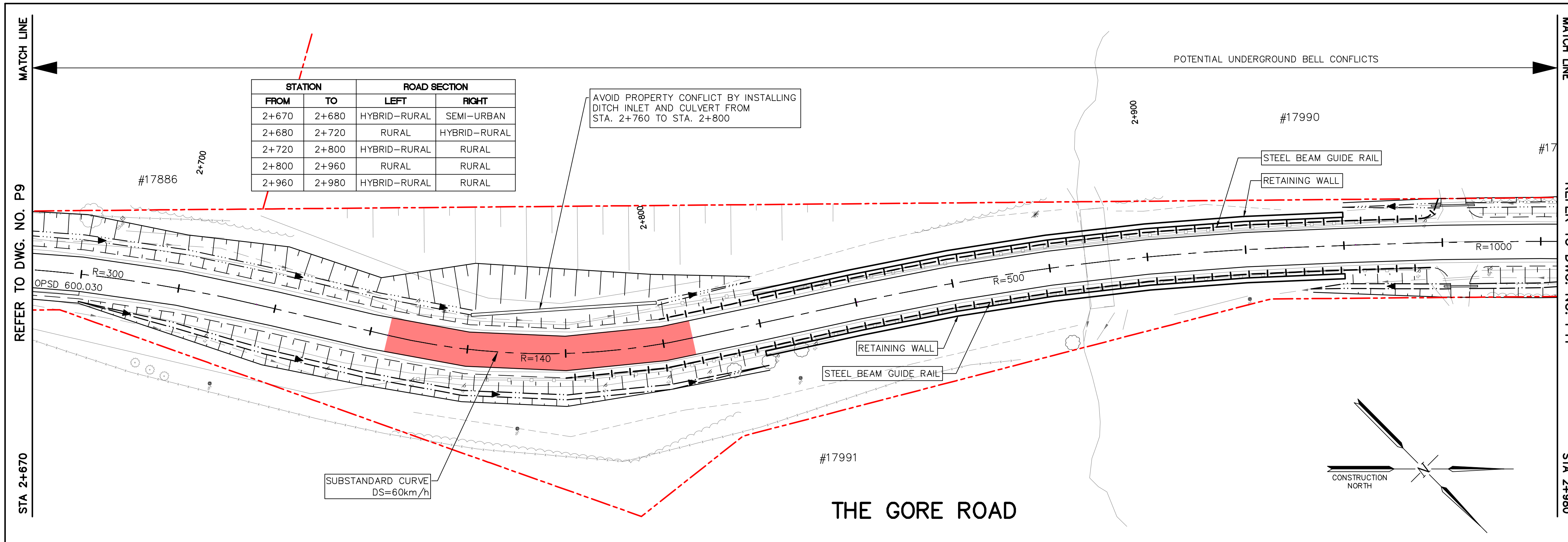
FROM PATTERSON SIDE ROAD TO HWY 9

PLAN & PROFILE

Lots:	Area:	Project No. MTB019424
Checked by: J.V.	Drawn by: J.R.	Plan No. P9
Date: JANUARY 2013	Sheet:	

\\OSCAR\Shared Work Areas\MTB019424 Gore Rd\MTB019424_P008-P014.dwg
Jan 15, 2013 – 2:17pm

STATION		ROAD SECTION	
FROM	TO	LEFT	RIGHT
2+670	2+680	HYBRID–RURAL	SEMI–URBAN
2+680	2+720	RURAL	HYBRID–RURAL
2+720	2+800	HYBRID–RURAL	RURAL
2+800	2+960	RURAL	RURAL
2+960	2+980	HYBRID–RURAL	RURAL



SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS			GAS MAINS		
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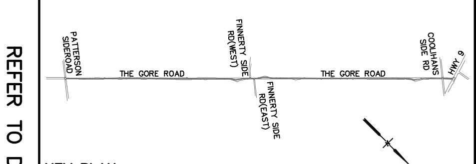
WATERMAINS			HYDRO U/G CABLE		
TRANSIT			ONT. HYDRO		
PARKS & REC.			CTV		
ONT. CLEAN WATER					

REVISIONS

DATE	DETAILS	INIT.



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LEGEND:

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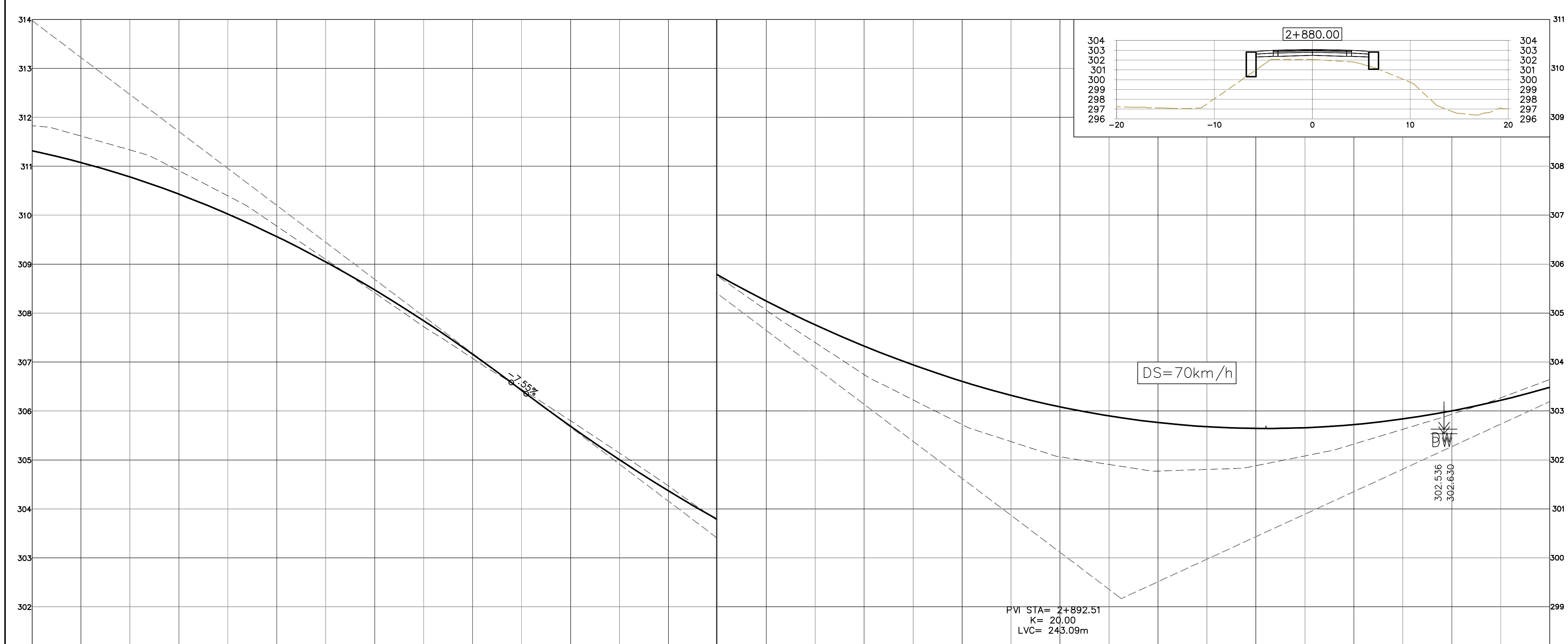
- PROPOSED LEFT DITCH IMPROVEMENT
- TRCA REGULATION LIMIT
- PROPOSED RIVER STONE
- CONCRETE MOUNTABLE CURB OPSD–600.030



Station		
2+680	313.62	313.076
2+700	312.91	312.430
2+720	311.78	311.563
2+740	310.41	310.473
2+760	309.08	309.161
2+780	307.80	307.688
2+800	306.47	306.367
2+820	305.06	305.247
2+840	303.74	304.326
2+860	302.72	303.605
2+880	302.06	303.085
2+900	301.77	302.764
2+920	301.88	302.644
2+940	302.32	302.723
2+960	302.93	303.003
2+980	303.64	303.482

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Designed by ____ ____ ____ ____Chkd. ____

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SCHOOL BUS SERVICES
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10m 0 10 20 30m 1:500 HORIZONTAL SCALE

1m 0 1 2 3m 1:50 VERTICAL SCALE

Region of Peel
Working for you

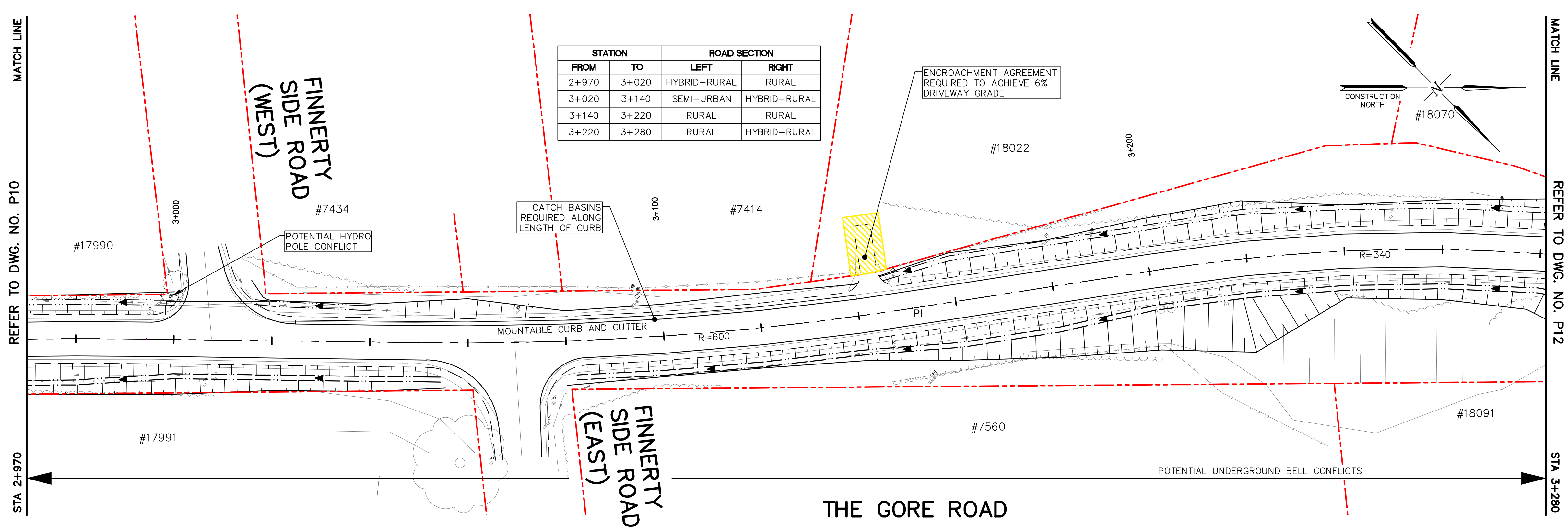
THE GORE ROAD

FROM PATTERSON SIDE ROAD TO HWY 9

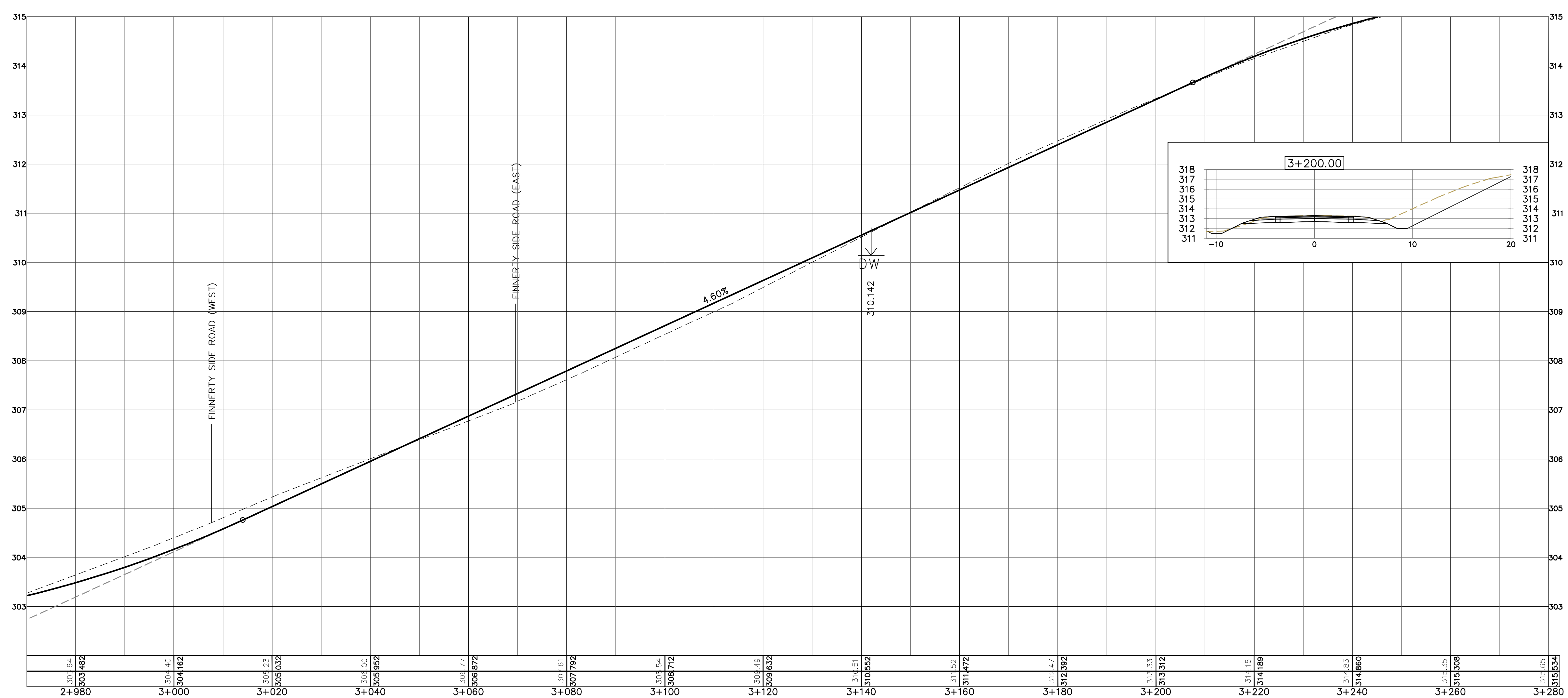
PLAN & PROFILE

Lots:	Area:	Project No. MTB019424
Checked by: J.V.	Drawn by: J.R.	Plan No. P10
Date: JANUARY 2013	Sheet:	

\\OSCAR\Shared Work Areas\MTB019424 Gore Rd\MTB019424_P008–P014.dwg
Jan 15, 2013 – 2:18pm



STATION		ROAD SECTION	
FROM	TO	LEFT	RIGHT
2+970	3+020	HYBRID–RURAL	RURAL
3+020	3+140	SEMI–URBAN	HYBRID–RURAL
3+140	3+220	RURAL	RURAL
3+220	3+280	RURAL	HYBRID–RURAL

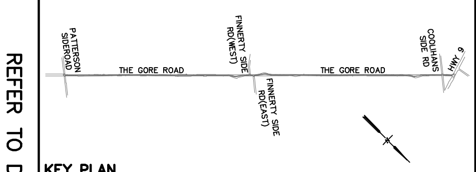


SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMAINS			HYDRO U/G CABLE		
TRANSIT			ONT. HYDRO		
PARKS & REC.			CTV		
ONT. CLEAN WATER					

REVISIONS

DATE	DETAILS	INIT.



KEY PLAN
N.T.S.

LEGEND:

- ROW
- PERMISSION TO ENTER PROPERTY
- PROPERTY ACQUISITION
- ADVISORY SPEED SIGNS REQUIRED
- PROPOSED EDGE OF PAVEMENT
- EDGE OF SHOULDER
- BH46 EXISTING BOREHOLE LOCATIONS
- SWALE PROPOSED SWALE WITH SUBDRAIN
- HEAVY DUTY SILT FENCE BARRIER OPSD–219.130
- LIGHT DUTY SILT FENCE BARRIER OPSD–219.110
- EXISTING RIGHT DITCH PROFILE
- EXISTING LEFT DITCH PROFILE
- PROPOSED RIGHT DITCH IMPROVEMENT
- PROPOSED LEFT DITCH IMPROVEMENT
- TRCA REGULATION LIMIT
- PROPOSED RIVER STONE
- CONCRETE MOUNTABLE CURB OPSD–600.030

General Notes

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web www.rjburnside.com

Designed by
Chkd.

NOTICE TO CONTRACTOR

48 HOURS PRIOR TO COMMENCING WORK NOTIFY THE FOLLOWING

THE REGIONAL MUNICIPALITY OF PEEL
CITY OF MISSISSAUGA WORKS DEPT.
CITY OF BRAMPTON WORKS DEPT.
TOWN OF CALEDON WORKS DEPT.
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CONSUMERS GAS COMPANY
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ONTARIO CLEAN WATER AGENCY
HYDRO ELECTRIC POWER COMM. OF ONTARIO
HYDRO ELECTRIC COMM. CITY OF MISSISSAUGA
HYDRO ELECTRIC COMM. CITY OF BRAMPTON
CABLE TELEVISION

POLICE DEPT.
FIRE DEPT.
SCHOOL BUS SERVICES
CANADA POST (4 WEEKS ADVANCE NOTICE)

10m 0 10 20 30m 1:500 HORIZONTAL SCALE
1m 0 1 2 3m 1:50 VERTICAL SCALE

Region of Peel
Working for you

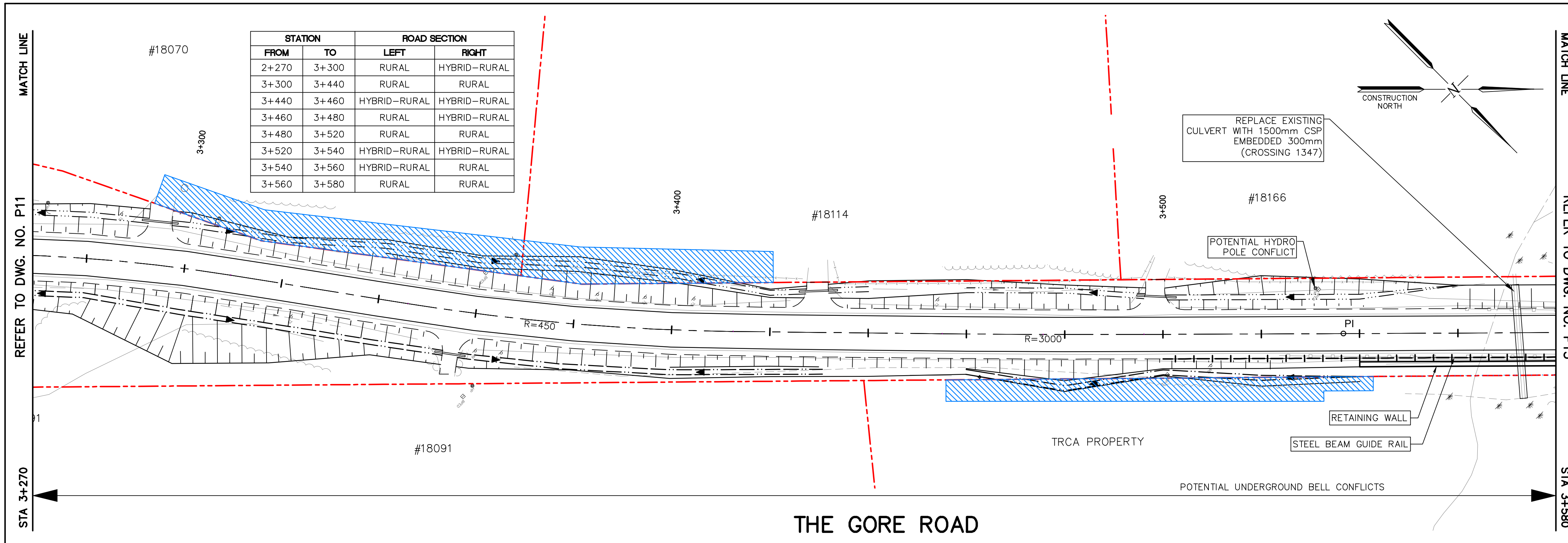
THE GORE ROAD

FROM PATTERSON SIDE ROAD TO HWY 9

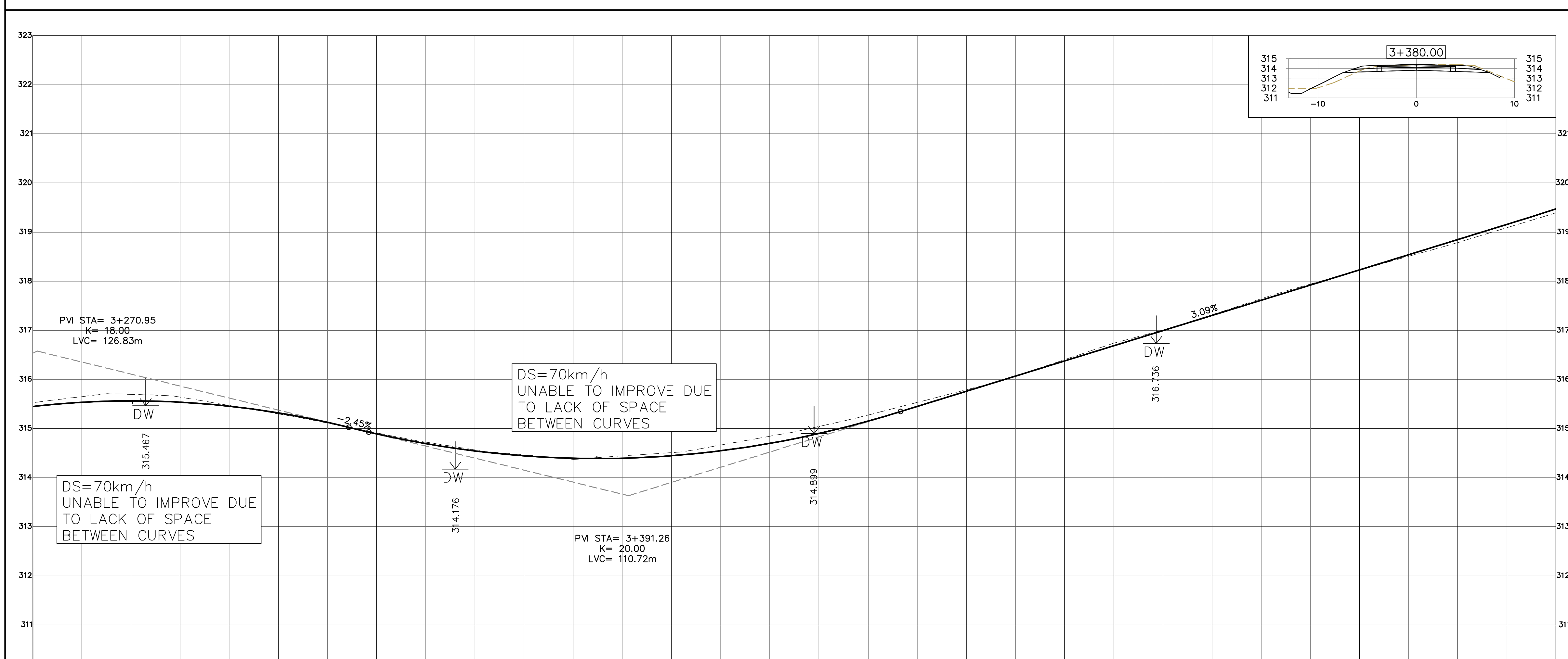
PLAN & PROFILE

Lots:	Area:	Project No. MTB019424
Checked by: J.V.	Drawn by: J.R.	Plan No. P11
Date: JANUARY 2013	Sheet:	

\\DSCAR\Shared Work Areas\MTB019424 Gore Rd\MTB019424_P008-P014.dwg
Jan 15, 2013 – 2:19pm



STATION		ROAD SECTION	
FROM	TO	LEFT	RIGHT
2+270	3+300	RURAL	HYBRID–RURAL
3+300	3+440	RURAL	RURAL
3+440	3+460	HYBRID–RURAL	HYBRID–RURAL
3+460	3+480	RURAL	HYBRID–RURAL
3+480	3+520	RURAL	RURAL
3+520	3+540	HYBRID–RURAL	HYBRID–RURAL
3+540	3+560	HYBRID–RURAL	RURAL
3+560	3+580	RURAL	RURAL



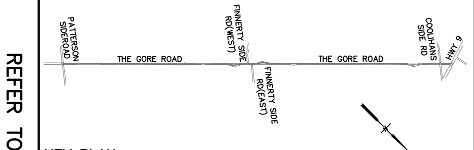
Station	3+280	3+300	3+320	3+340	3+360	3+380	3+400	3+420	3+440	3+460	3+480	3+500	3+520	3+540	3+560	3+580
	315.65	315.64	315.30	314.91	314.56	314.37	314.51	314.84	315.28	315.79	316.40	317.01	317.64	318.23	318.79	319.39
	315.534	315.538	315.319	314.891	314.543	314.395	314.447	314.699	315.151	315.758	316.376	316.994	317.612	318.230	318.848	319.476

SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMAINS			HYDRO U/G CABLE		
TRANSIT			ONT. HYDRO		
PARKS & REC.			CTV		
ONT. CLEAN WATER					

REVISIONS

DATE	DETAILS	INIT.



KEY PLAN
N.T.S.

LEGEND:

- ROW
- PERMISSION TO ENTER PROPERTY
- PROPERTY ACQUISITION
- ADVISORY SPEED SIGNS REQUIRED
- PROPOSED EDGE OF PAVEMENT
- EDGE OF SHOULDER
- BH46 EXISTING BOREHOLE LOCATIONS
- SWALE PROPOSED SWALE WITH SUBDRAIN
- HEAVY DUTY SILT FENCE BARRIER OPSD–219.130
- LIGHT DUTY SILT FENCE BARRIER OPSD–219.110
- EXISTING RIGHT DITCH PROFILE
- EXISTING LEFT DITCH PROFILE
- PROPOSED RIGHT DITCH IMPROVEMENT
- PROPOSED LEFT DITCH IMPROVEMENT
- TRCA REGULATION LIMIT
- PROPOSED RIVER STONE
- CONCRETE MOUNTABLE CURB OPSD–600.030

General Notes

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Designed by
Chkd.

NOTICE TO CONTRACTOR

48 HOURS PRIOR TO COMMMENCING WORK NOTIFY THE FOLLOWING

THE REGIONAL MUNICIPALITY OF PEEL
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TOWN OF CALEDON WORKS DEPT.
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CONSUMERS GAS COMPANY
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ONTARIO CLEAN WATER AGENCY
HYDRO ELECTRIC POWER COMM. OF ONTARIO
HYDRO ELECTRIC COMM. CITY OF MISSISSAUGA
HYDRO ELECTRIC COMM. CITY OF BRAMPTON
CABLE TELEVISION
POLICE DEPT.
FIRE DEPT.
SCHOOL BUS SERVICES
CANADA POST (4 WEEKS ADVANCE NOTICE)

10m 0 10 20 30m 1:500 HORIZONTAL SCALE
1m 0 1 2 3m 1:50 VERTICAL SCALE

Region of Peel
Working for you

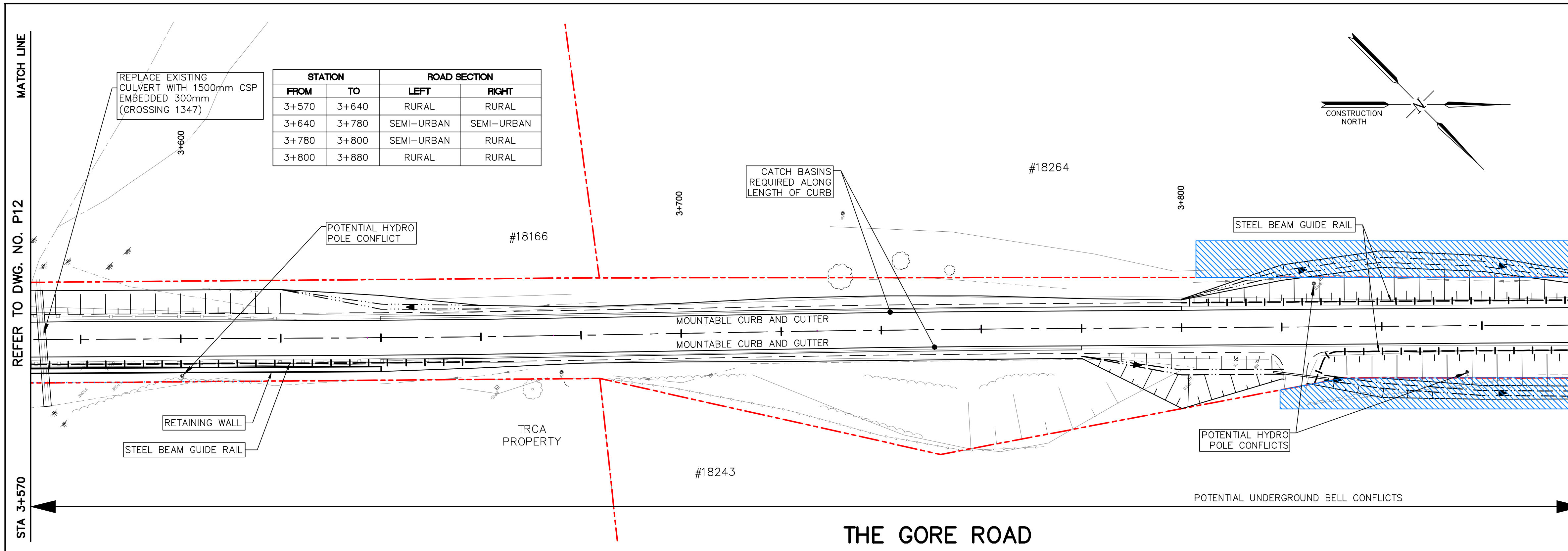
THE GORE ROAD

FROM PATTERSON SIDE ROAD TO HWY 9

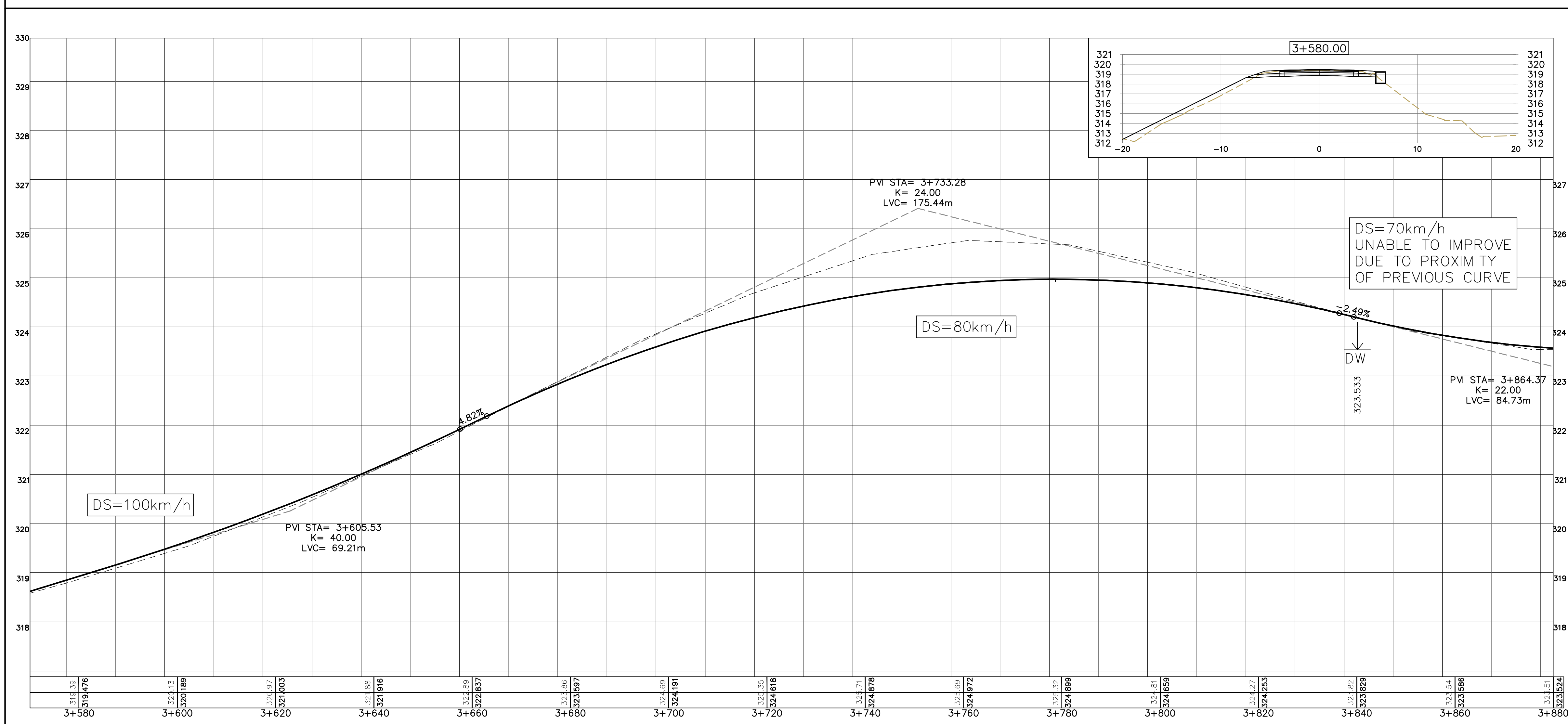
PLAN & PROFILE

Lots:	Area:	Project No. MTB019424
Checked by: J.V.	Drawn by: J.R.	
Date: JANUARY 2013	Sheet:	Plan No. P12

\\OSCAR\Shared Work Areas\MTB019424 Gore Rd\MTB019424_P008–P014.dwg
Jan 15, 2013 – 2:19pm



STATION		ROAD SECTION	
FROM	TO	LEFT	RIGHT
3+570	3+640	RURAL	RURAL
3+640	3+780	SEMI–URBAN	SEMI–URBAN
3+780	3+800	SEMI–URBAN	RURAL
3+800	3+880	RURAL	RURAL

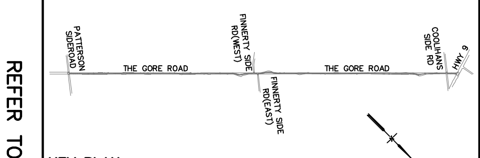


SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMAINS			HYDRO U/G CABLE		
TRANSIT			ONT. HYDRO		
PARKS & REC.			CTV		
ONT. CLEAN WATER					

REVISIONS

DATE	DETAILS	INIT.



KEY PLAN
N.T.S.

LEGEND:

- ROW
- PERMISSION TO ENTER PROPERTY
- PROPERTY ACQUISITION
- ADVISORY SPEED SIGNS REQUIRED
- PROPOSED EDGE OF PAVEMENT
- EDGE OF SHOULDER
- BH46 EXISTING BOREHOLE LOCATIONS
- SWALE PROPOSED SWALE WITH SUBDRAIN
- HEAVY DUTY SILT FENCE BARRIER OPSD–219.130
- LIGHT DUTY SILT FENCE BARRIER OPSD–219.110
- EXISTING RIGHT DITCH PROFILE
- EXISTING LEFT DITCH PROFILE
- PROPOSED RIGHT DITCH IMPROVEMENT
- PROPOSED LEFT DITCH IMPROVEMENT
- TRCA REGULATION LIMIT
- PROPOSED RIVER STONE
- CONCRETE MOUNTABLE CURB OPSD–600.030

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Designed by ____ ____ ____ ____Chkd. ____

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HYDRO ELECTRIC POWER COMM. OF ONTARIO
HYDRO ELECTRIC COMM. CITY OF MISSISSAUGA
HYDRO ELECTRIC COMM. CITY OF BRAMPTON
CABLE TELEVISION
POLICE DEPT.
FIRE DEPT.
SCHOOL BUS SERVICES
CANADA POST (4 WEEKS ADVANCE NOTICE)

10m 0 10 20 30m 1:500 HORIZONTAL SCALE
1m 0 1 2 3m 1:50 VERTICAL SCALE

Region of Peel
Working for you

THE GORE ROAD

FROM PATTERSON SIDE ROAD TO HWY 9

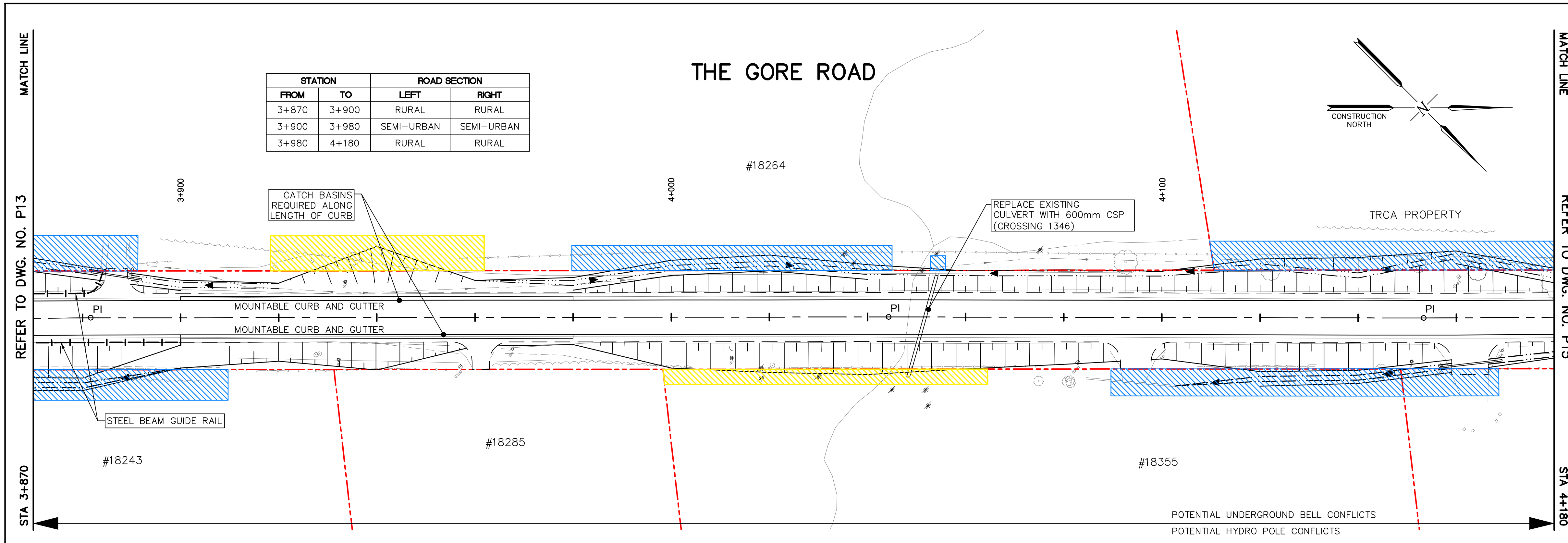
PLAN & PROFILE

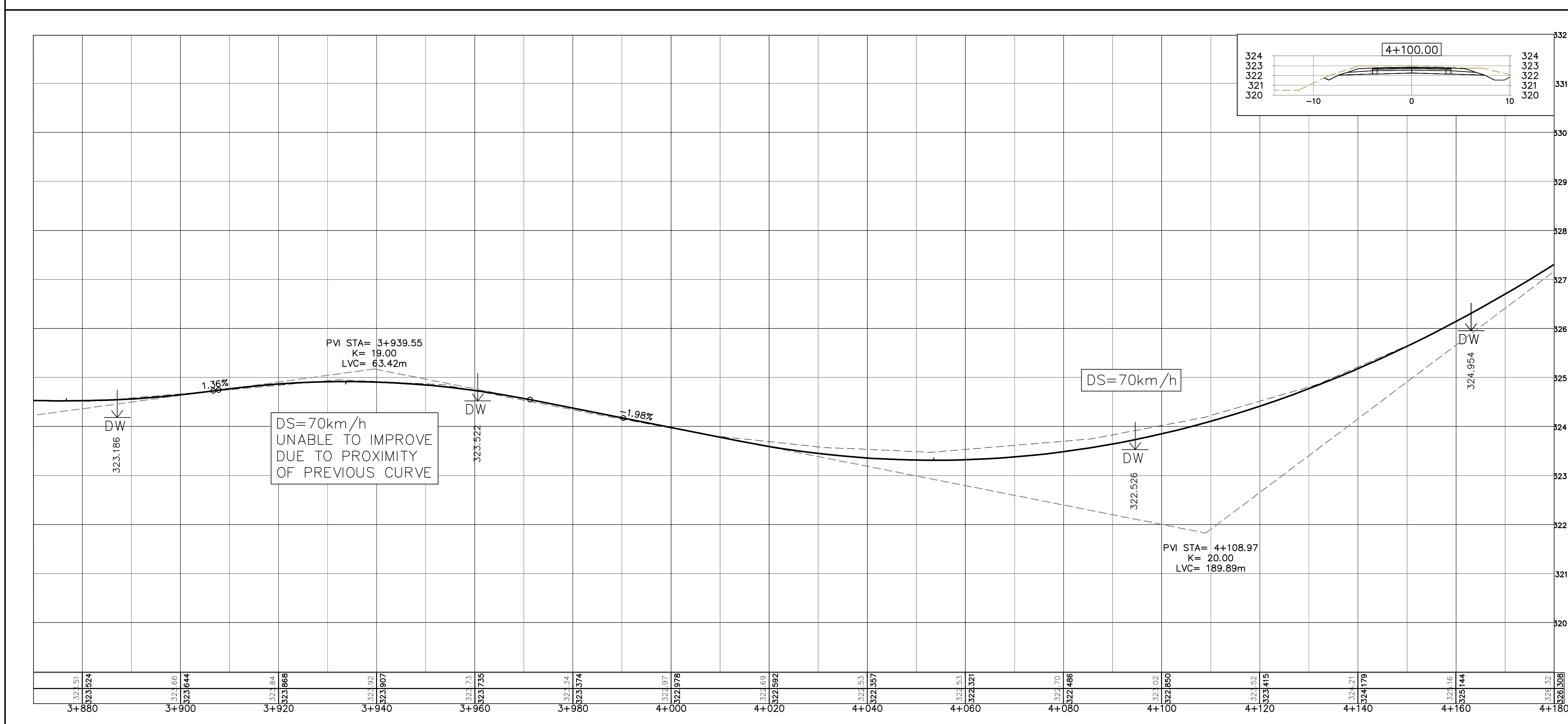
Lots:	Area:	Project No. MTB019424
Checked by: J.V.	Drawn by: J.R.	Plan No. P13
Date: JANUARY 2013	Sheet:	

\\OSCAR\Shared Work Areas\MTB019424 Gore Rd\MTB019424_P008-P014.dwg
Jan 15, 2013 – 2:20pm

THE GORE ROAD

STATION		ROAD SECTION	
FROM	TO	LEFT	RIGHT
3+870	3+900	RURAL	RURAL
3+900	3+980	SEMI–URBAN	SEMI–URBAN
3+980	4+180	RURAL	RURAL



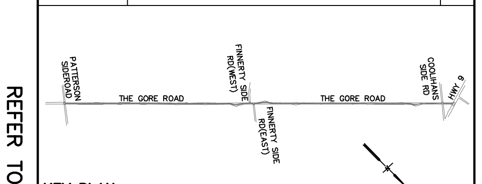


SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMAINS			HYDRO U/G CABLE		
TRANSIT			ONT. HYDRO		
PARKS & REC.			CTV		
ONT. CLEAN WATER					

REVISIONS

DATE	DETAILS	INIT.



KEY PLAN
N.T.S.

LEGEND:

- ROW
- PERMISSION TO ENTER PROPERTY
- PROPERTY ACQUISITION
- ADVISORY SPEED SIGNS REQUIRED
- PROPOSED EDGE OF PAVEMENT
- EDGE OF SHOULDER
- BH46 EXISTING BOREHOLE LOCATIONS
- SWALE PROPOSED SWALE WITH SUBDRAIN
- HEAVY DUTY SILT FENCE BARRIER OPSD–219.130
- LIGHT DUTY SILT FENCE BARRIER OPSD–219.110
- EXISTING RIGHT DITCH PROFILE
- EXISTING LEFT DITCH PROFILE
- PROPOSED RIGHT DITCH IMPROVEMENT
- PROPOSED LEFT DITCH IMPROVEMENT
- TRCA REGULATION LIMIT
- PROPOSED RIVER STONE
- CONCRETE MOUNTABLE CURB OPSD–600.030

General Notes

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CABLE TELEVISION

POLICE DEPT.
FIRE DEPT.
SCHOOL BUS SERVICES
CANADA POST (4 WEEKS ADVANCE NOTICE)

10m 0 10 20 30m 1:500 HORIZONTAL SCALE
1m 0 1 2 3m 1:50 VERTICAL SCALE

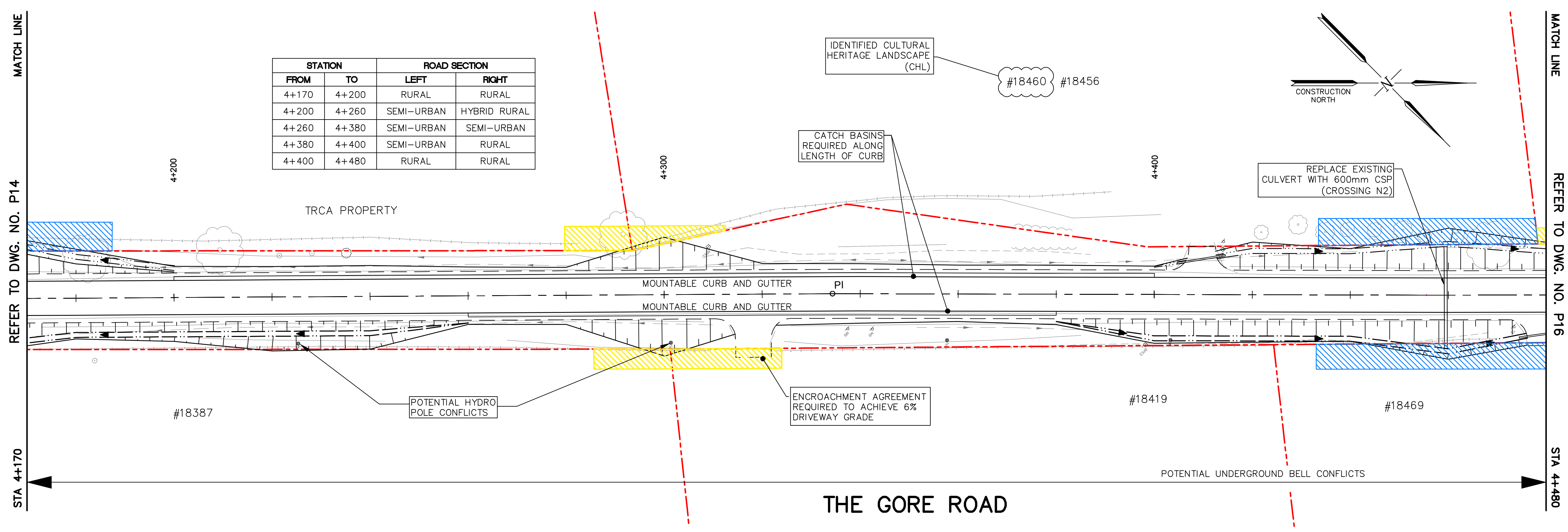
Region of Peel
Working for you

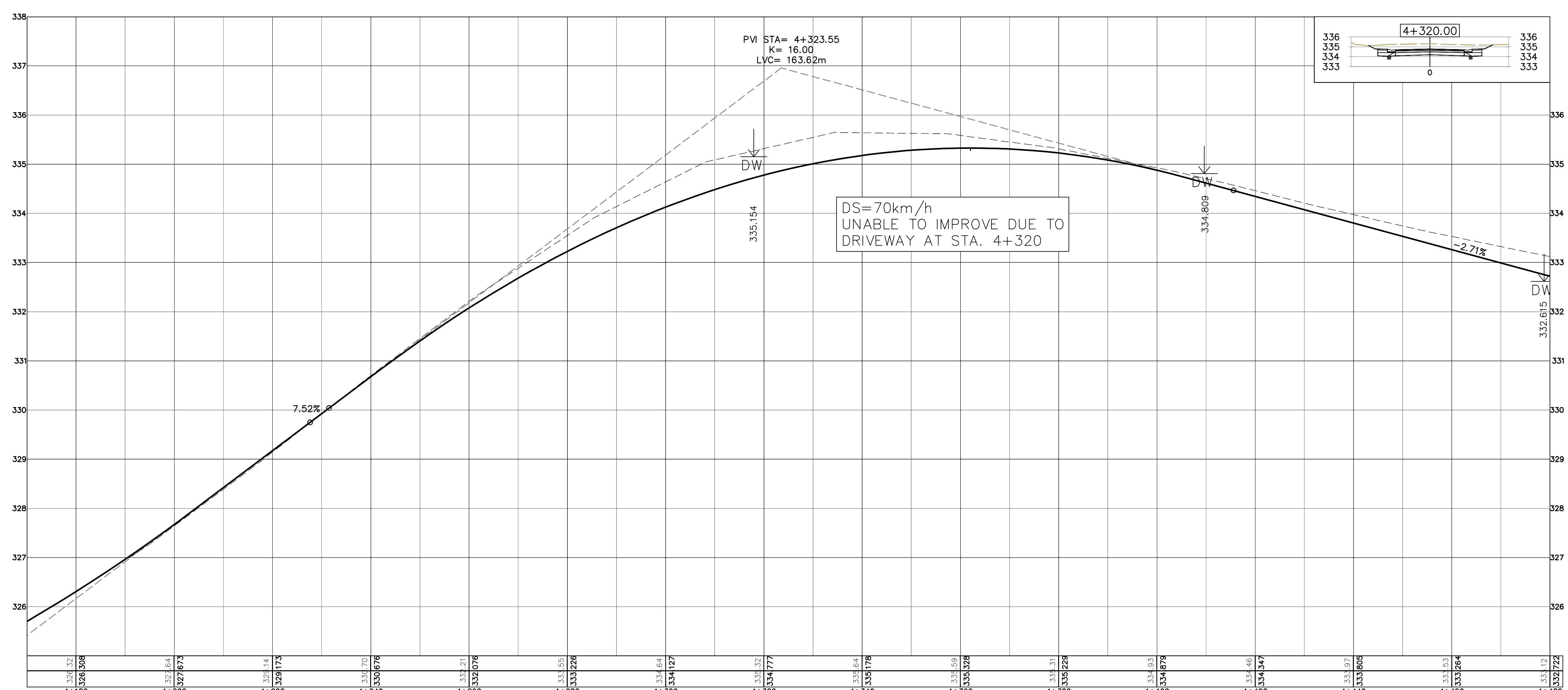
THE GORE ROAD
FROM PATTERSON SIDE ROAD TO HWY 9
PLAN & PROFILE

Lots:	Area:	Project No. MTB019424
Checked by: J.V.	Drawn by: J.R.	Plan No. P14
Date: JANUARY 2013	Sheet:	

\\OSCAR\Shared Work Areas\MTB019424 Gore Rd\MTB019424_P008–P014.dwg
Jan 15, 2013 – 2:21pm

STATION		ROAD SECTION	
FROM	TO	LEFT	RIGHT
4+170	4+200	RURAL	RURAL
4+200	4+260	SEMI–URBAN	HYBRID RURAL
4+260	4+380	SEMI–URBAN	SEMI–URBAN
4+380	4+400	SEMI–URBAN	RURAL
4+400	4+480	RURAL	RURAL





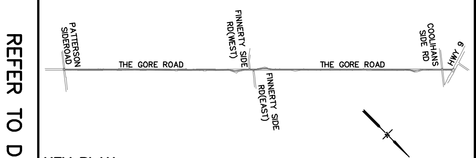
Station	4+180	4+200	4+220	4+240	4+260	4+280	4+300	4+320	4+340	4+360	4+380	4+400	4+420	4+440	4+460	4+480
Existing	326.32	327.64	329.14	330.70	332.21	333.55	334.64	335.32	335.64	335.59	335.31	334.93	334.46	333.97	333.53	333.12
Proposed	326.308	327.673	329.173	330.676	332.076	333.226	334.127	334.777	335.178	335.328	335.229	334.879	334.347	333.805	333.264	332.722

SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMAINS			HYDRO U/G CABLE		
TRANSIT			ONT. HYDRO		
PARKS & REC.			CTV		
ONT. CLEAN WATER					

REVISIONS

DATE	DETAILS	INIT.



KEY PLAN
N.T.S.

LEGEND:

- ROW
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- PROPOSED EDGE OF PAVEMENT
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- PROPOSED RIGHT DITCH IMPROVEMENT
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- TRCA REGULATION LIMIT
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POLICE DEPT.
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SCHOOL BUS SERVICES
CANADA POST (4 WEEKS ADVANCE NOTICE)

10m 0 10 20 30m 1:500 HORIZONTAL SCALE
1m 0 1 2 3m 1:50 VERTICAL SCALE

Region of Peel
Working for you

THE GORE ROAD

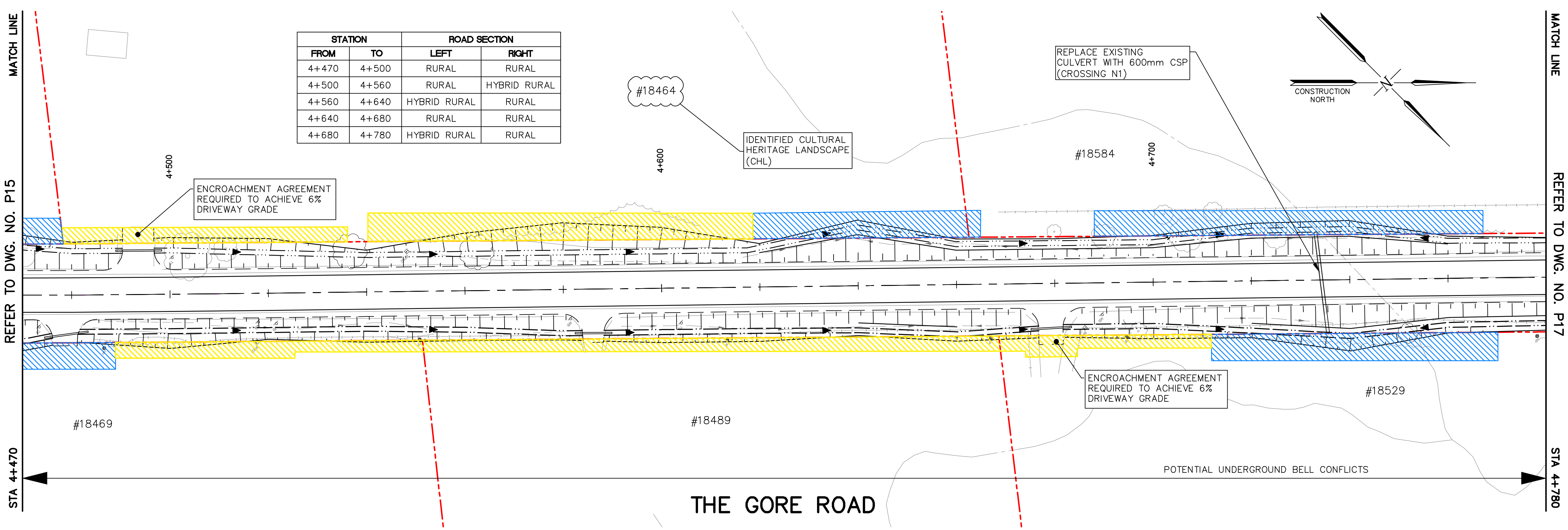
FROM PATTERSON SIDE ROAD TO HWY 9

PLAN & PROFILE

Lots:	Area:	Project No. MTB019424
Checked by: J.V.	Drawn by: J.R.	Plan No. P15
Date: JANUARY 2013	Sheet:	

\\OSCAR\Shared Work Areas\MTB019424 Gore Rd\MTB019424_P015–P022.dwg
Jan 15, 2013 – 2:22pm

STATION		ROAD SECTION	
FROM	TO	LEFT	RIGHT
4+470	4+500	RURAL	RURAL
4+500	4+560	RURAL	HYBRID RURAL
4+560	4+640	HYBRID RURAL	RURAL
4+640	4+680	RURAL	RURAL
4+680	4+780	HYBRID RURAL	RURAL

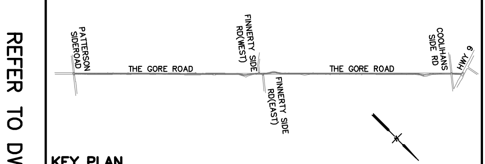


SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMAINS			HYDRO U/G CABLE		
TRANSIT			ONT. HYDRO		
PARKS & REC.			CTV		
ONT. CLEAN WATER					

REVISIONS

DATE	DETAILS	INIT.



KEY PLAN
N.T.S.

LEGEND:

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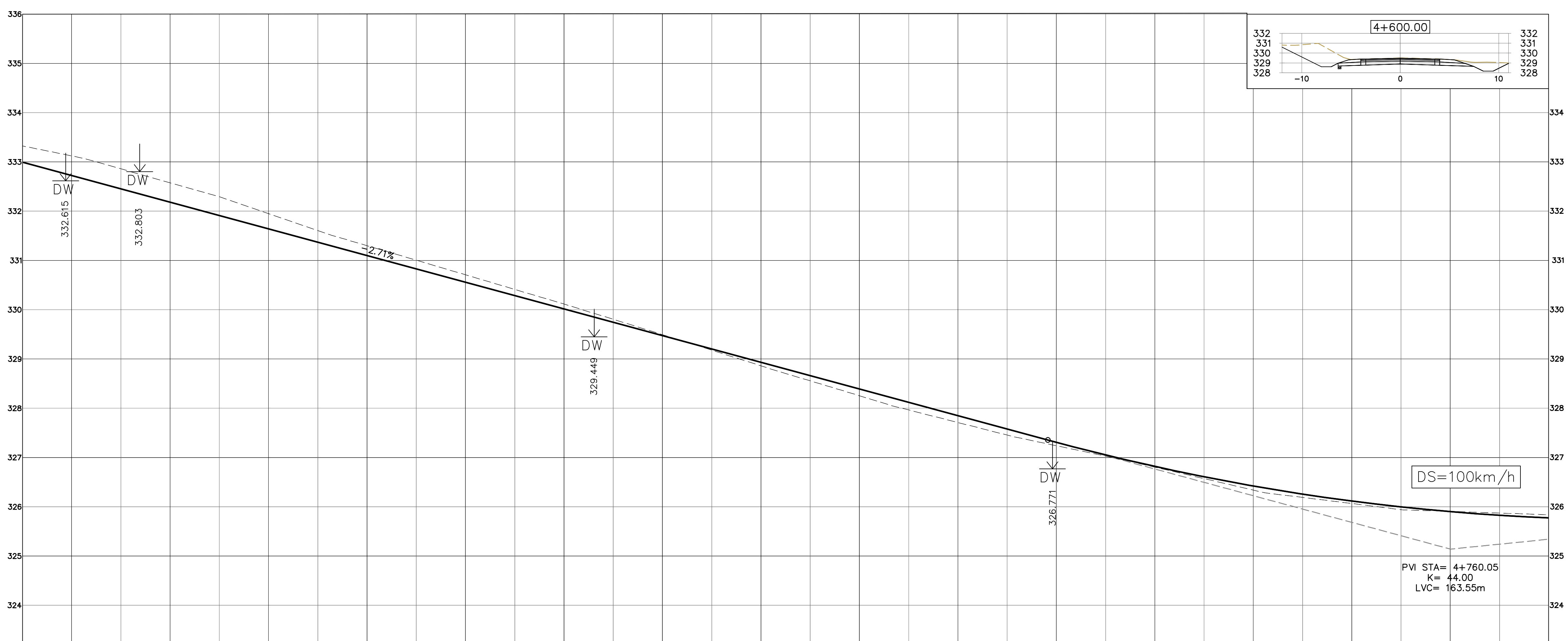
- PROPOSED LEFT DITCH IMPROVEMENT
- TRCA REGULATION LIMIT
- PROPOSED RIVER STONE
- CONCRETE MOUNTABLE CURB OPSD–600.030



	333.12	332.58	331.95	331.30	330.71	330.12	329.49	328.86	328.25	327.71	327.24	326.80	326.34	326.07	325.91	325.84
	332.722	332.181	331.639	331.098	330.556	330.015	329.473	328.932	328.390	327.849	327.308	326.820	326.422	326.116	325.900	325.776
	4+480	4+500	4+520	4+540	4+560	4+580	4+600	4+620	4+640	4+660	4+680	4+700	4+720	4+740	4+760	4+780

General Notes

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- Denotes Building Located
- Type 'B' Bedding Unless Otherwise Noted (SAN)

B.M. No. Elev.

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BURNSIDE
R. J. Burnside & Associates Limited
170 Steelwell Road, Suite 200, Brampton, Ontario
telephone (905) 793-9239 **fax** (905) 793-5018
web www.rjburnside.com

Designed by
Chkd.

NOTICE TO CONTRACTOR

48 HOURS PRIOR TO COMMMENCING WORK NOTIFY THE FOLLOWING

THE REGIONAL MUNICIPALITY OF PEEL
CITY OF MISSISSAUGA WORKS DEPT.
CITY OF BRAMPTON WORKS DEPT.
TOWN OF CALEDON WORKS DEPT.
BELL TELEPHONE COMPANY
CONSUMERS GAS COMPANY
MINISTRY OF TRANSPORTATION
ONTARIO CLEAN WATER AGENCY
HYDRO ELECTRIC POWER COMM. OF ONTARIO
HYDRO ELECTRIC COMM. CITY OF MISSISSAUGA
HYDRO ELECTRIC COMM. CITY OF BRAMPTON
CABLE TELEVISION

POLICE DEPT.
FIRE DEPT.
SCHOOL BUS SERVICES
CANADA POST (4 WEEKS ADVANCE NOTICE)

10m 0 10 20 30m 1:500 HORIZONTAL SCALE
1m 0 1 2 3m 1:50 VERTICAL SCALE

Region of Peel
Working for you

THE GORE ROAD

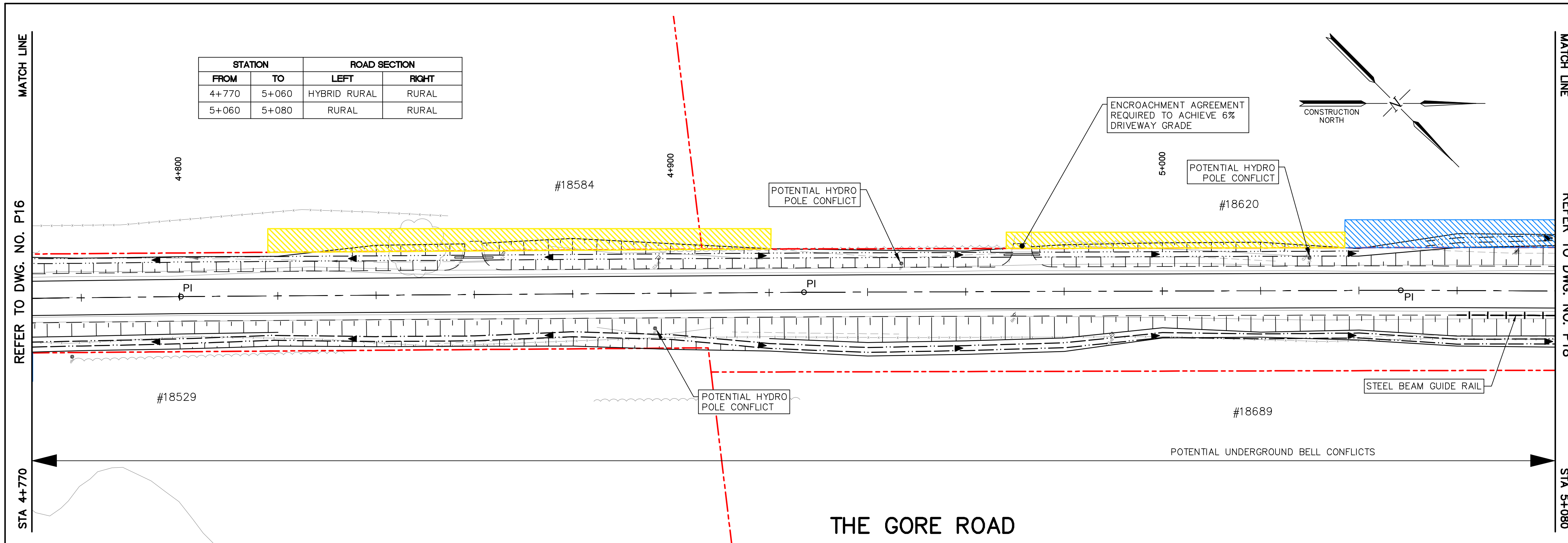
FROM PATTERSON SIDE ROAD TO HWY 9

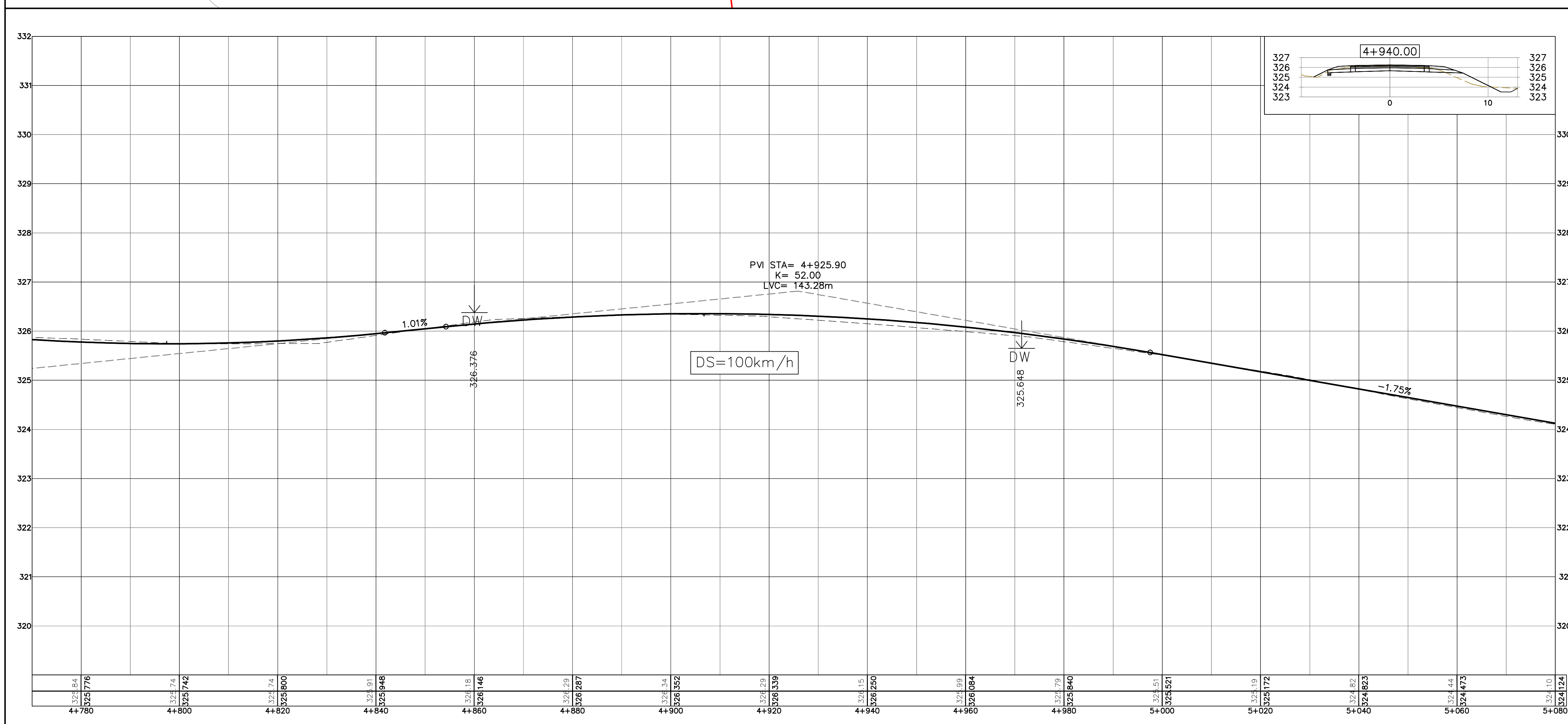
PLAN & PROFILE

Lots:	Area:	Project No. MTB019424
Checked by: J.V.	Drawn by: J.R.	
Date: JANUARY 2013	Sheet:	Plan No. P16

\\DSCAR\Shared Work Areas\MTB019424 Gore Rd\MTB019424_P015-P022.dwg
Jan 15, 2013 – 2:22pm

STATION		ROAD SECTION	
FROM	TO	LEFT	RIGHT
4+770	5+060	HYBRID RURAL	RURAL
5+060	5+080	RURAL	RURAL



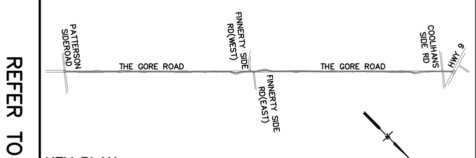


SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMAINS			HYDRO U/G CABLE		
TRANSIT			ONT. HYDRO		
PARKS & REC.			CTV		
ONT. CLEAN WATER					

REVISIONS

DATE	DETAILS	INIT.



KEY PLAN
N.T.S.

LEGEND:

- ROW
- PERMISSION TO ENTER PROPERTY
- PROPERTY ACQUISITION
- ADVISORY SPEED SIGNS REQUIRED
- PROPOSED EDGE OF PAVEMENT
- EDGE OF SHOULDER
- BH46 EXISTING BOREHOLE LOCATIONS
- SWALE PROPOSED SWALE WITH SUBDRAIN
- HEAVY DUTY SILT FENCE BARRIER OPSD–219.130
- LIGHT DUTY SILT FENCE BARRIER OPSD–219.110
- EXISTING RIGHT DITCH PROFILE
- EXISTING LEFT DITCH PROFILE
- PROPOSED RIGHT DITCH IMPROVEMENT
- PROPOSED LEFT DITCH IMPROVEMENT
- TRCA REGULATION LIMIT
- PROPOSED RIVER STONE
- CONCRETE MOUNTABLE CURB OPSD–600.030

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POLICE DEPT.
FIRE DEPT.
SCHOOL BUS SERVICES
CANADA POST (4 WEEKS ADVANCE NOTICE)

10m 0 10 20 30m 1:500 HORIZONTAL SCALE
1m 0 1 2 3m 1:50 VERTICAL SCALE

Region of Peel
Working for you

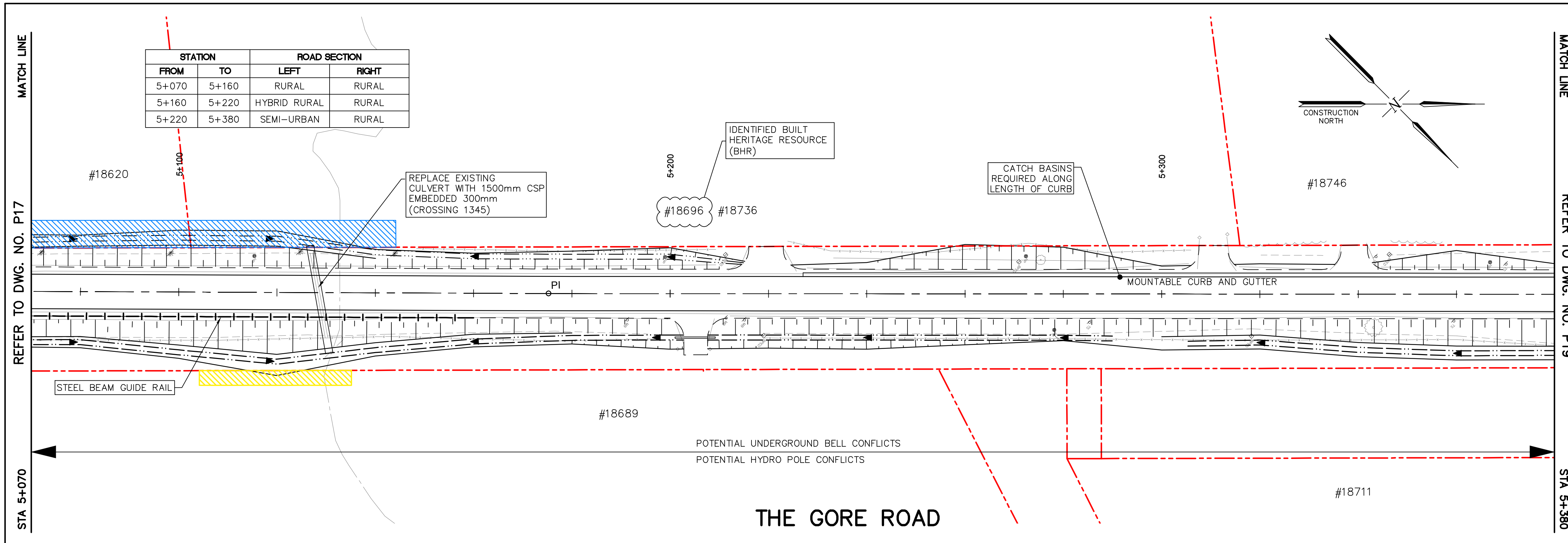
THE GORE ROAD

FROM PATTERSON SIDE ROAD TO HWY 9

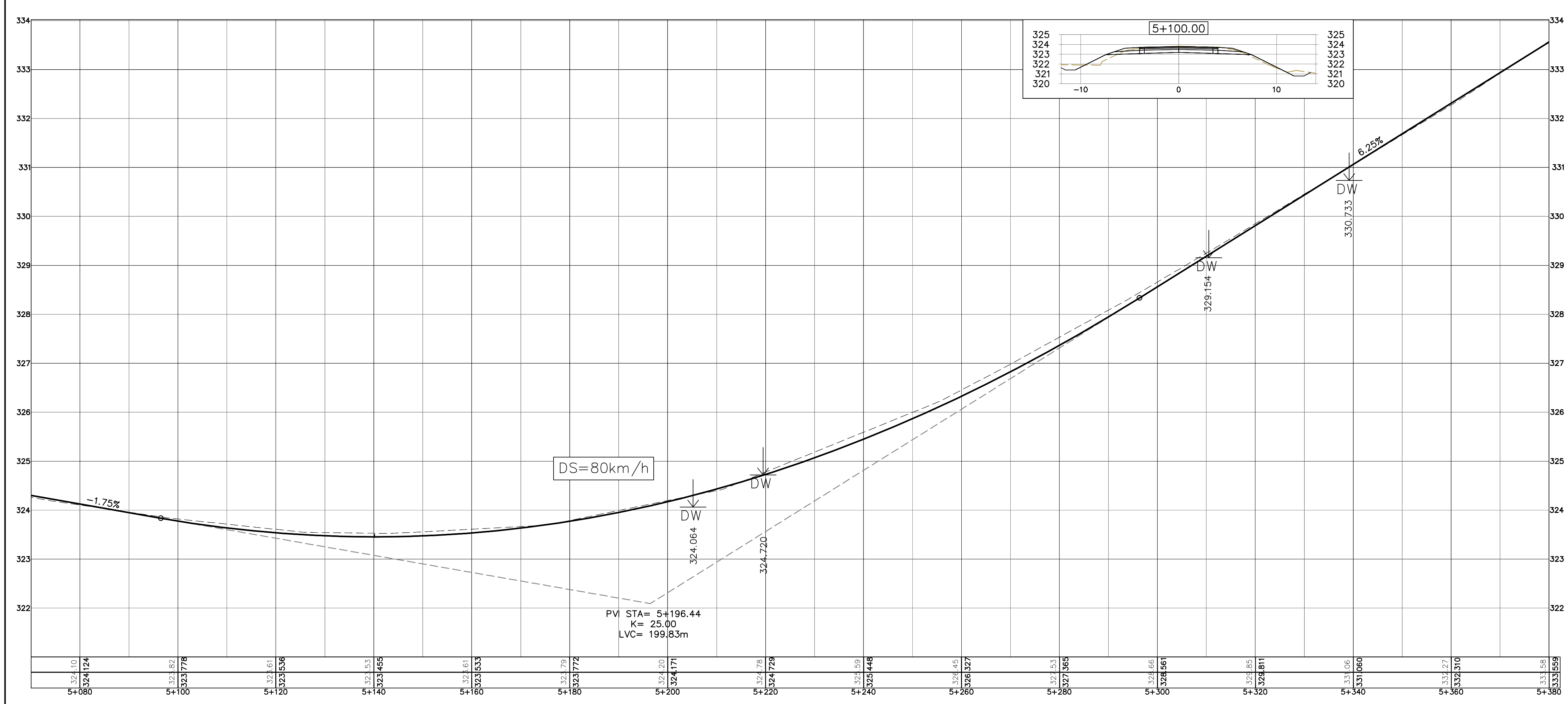
PLAN & PROFILE

Lots:	Area:	Project No. MTB019424
Checked by: J.V.	Drawn by: J.R.	Plan No. P17
Date: JANUARY 2013	Sheet:	

\\OSCAR\Shared Work Areas\MTB019424 Gore Rd\MTB019424_P015–P022.dwg
Jan 15, 2013 – 2:23pm



STATION		ROAD SECTION	
FROM	TO	LEFT	RIGHT
5+070	5+160	RURAL	RURAL
5+160	5+220	HYBRID RURAL	RURAL
5+220	5+380	SEMI-URBAN	RURAL

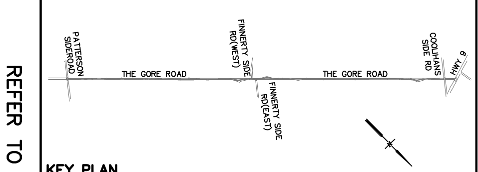


SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMAINS			HYDRO U/G CABLE		
TRANSIT			ONT. HYDRO		
PARKS & REC.			CTV		
ONT. CLEAN WATER					

REVISIONS

DATE	DETAILS	INIT.



KEY PLAN
N.T.S.

LEGEND:

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- ADVISORY SPEED SIGNS REQUIRED
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- BH46 EXISTING BOREHOLE LOCATIONS
- SWALE PROPOSED SWALE WITH SUBDRAIN
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- LIGHT DUTY SILT FENCE BARRIER OPSD-219.110
- EXISTING RIGHT DITCH PROFILE
- EXISTING LEFT DITCH PROFILE
- PROPOSED RIGHT DITCH IMPROVEMENT
- PROPOSED LEFT DITCH IMPROVEMENT
- TRCA REGULATION LIMIT
- PROPOSED RIVER STONE
- CONCRETE MOUNTABLE CURB OPSD-600.030

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10m 0 10 20 30m 1:500 HORIZONTAL SCALE
1m 0 1 2 3m 1:50 VERTICAL SCALE

Region of Peel
Working for you

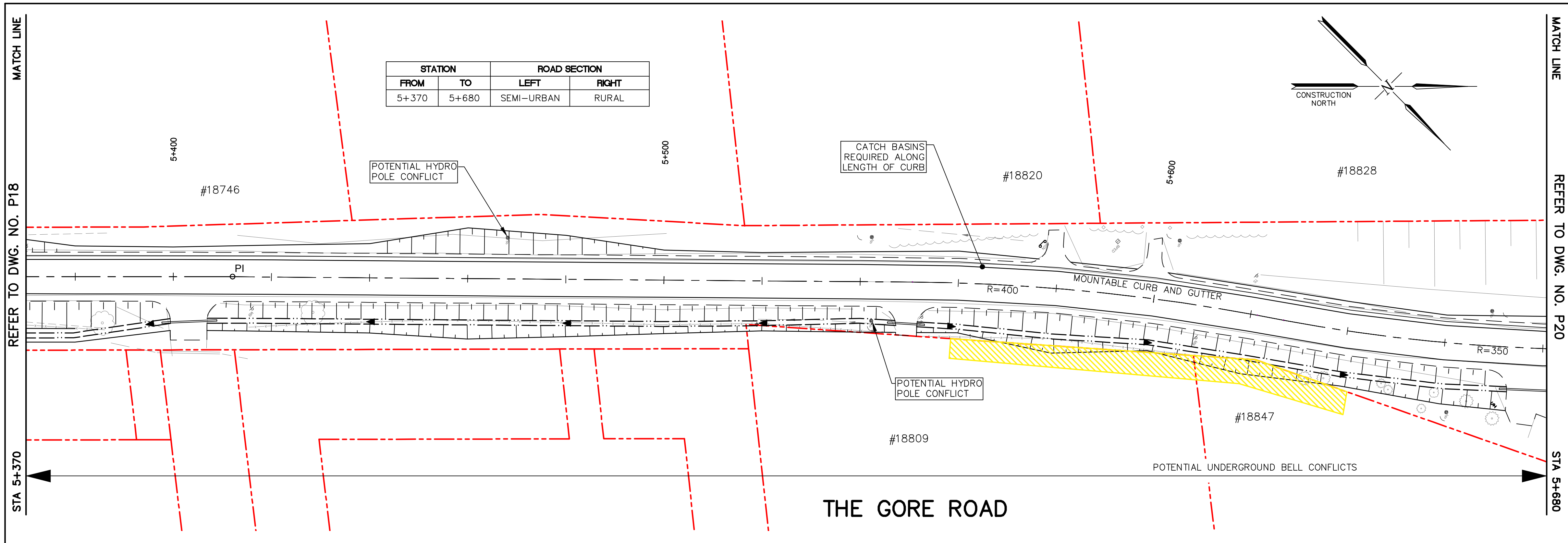
THE GORE ROAD

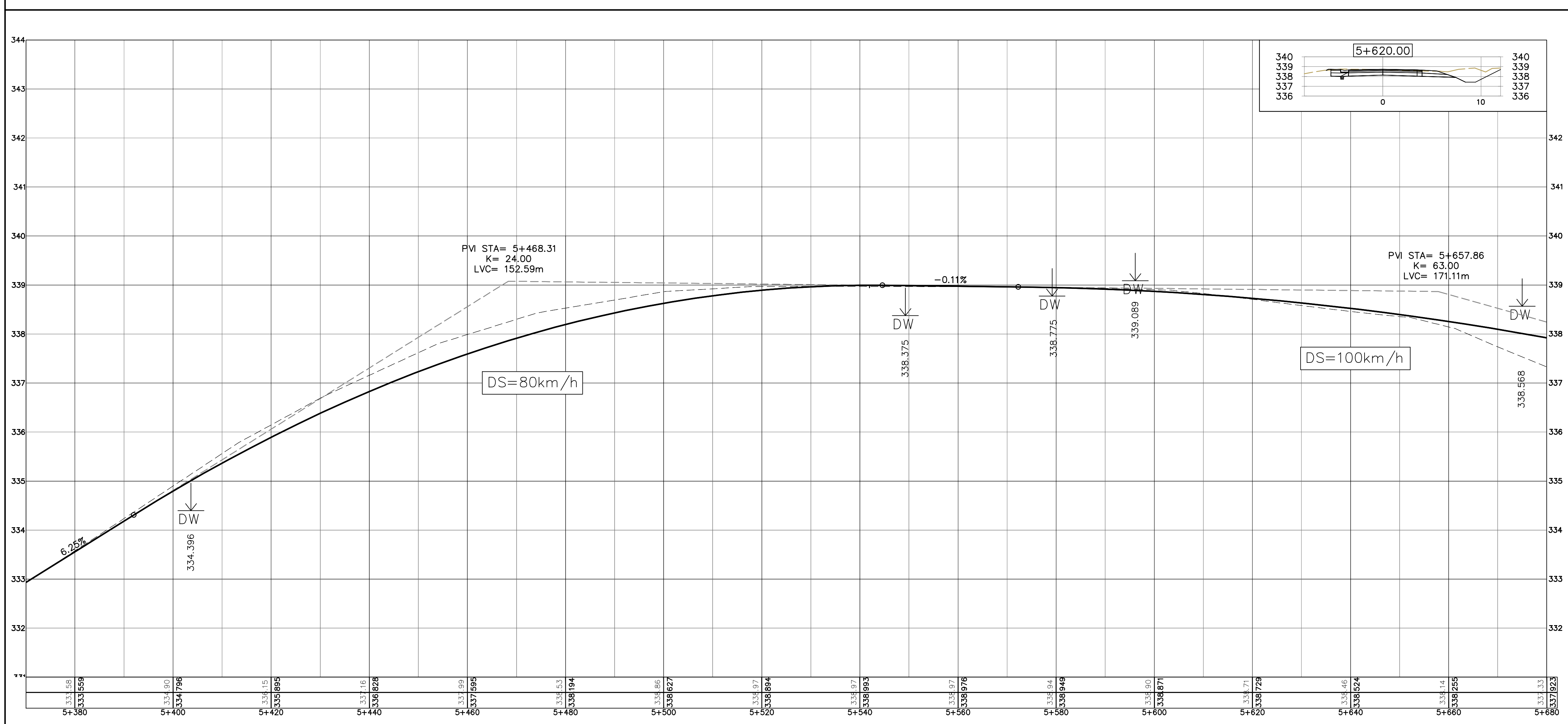
FROM PATTERSON SIDE ROAD TO HWY 9

PLAN & PROFILE

Lots:	Area:	Project No. MTB019424
Checked by: J.V.	Drawn by: J.R.	Plan No. P18
Date: JANUARY 2013	Sheet:	

\\OSCAR\Shared Work Areas\MTB019424 Gore Rd\MTB019424_P015-P022.dwg
Jan 15, 2013 - 2:24pm





SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMAINS			HYDRO U/G CABLE		
TRANSIT			ONT. HYDRO		
PARKS & REC.			CTV		
ONT. CLEAN WATER					

REVISIONS

DATE	DETAILS	INIT.

PATTERSON SIDEROAD
THE GORE ROAD
FINNERTY SIDE RD(WEST)
FINNERTY SIDE RD(EAST)
THE GORE ROAD
COOLIHANS SIDE RD
HWY 9

KEY PLAN
N.T.S.

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CABLE TELEVISION
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FIRE DEPT.
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10m 0 10 20 30m 1:500 HORIZONTAL SCALE
1m 0 1 2 3m 1:50 VERTICAL SCALE

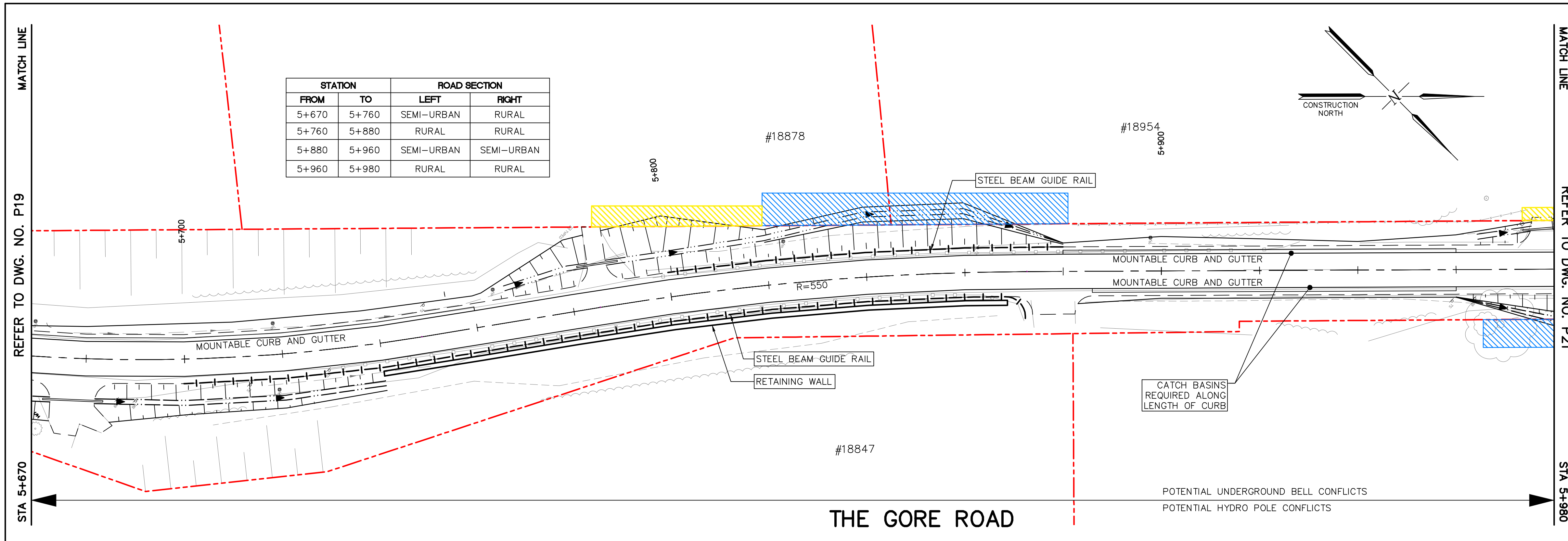
Region of Peel
Working for you

THE GORE ROAD

FROM PATTERSON SIDE ROAD TO HWY 9

PLAN & PROFILE

Lots:	Area:	Project No. MTB019424
Checked by: J.V.	Drawn by: J.R.	Plan No. P19
Date: JANUARY 2013	Sheet:	



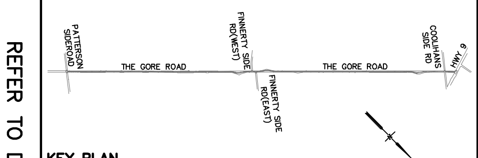
STATION		ROAD SECTION	
FROM	TO	LEFT	RIGHT
5+670	5+760	SEMI–URBAN	RURAL
5+760	5+880	RURAL	RURAL
5+880	5+960	SEMI–URBAN	SEMI–URBAN
5+960	5+980	RURAL	RURAL

SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMAINS			HYDRO U/G CABLE		
TRANSIT			ONT. HYDRO		
PARKS & REC.			CTV		
ONT. CLEAN WATER					

REVISIONS

DATE	DETAILS	INIT.



KEY PLAN
N.T.S.

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- PROPERTY ACQUISITION
- ADVISORY SPEED SIGNS REQUIRED
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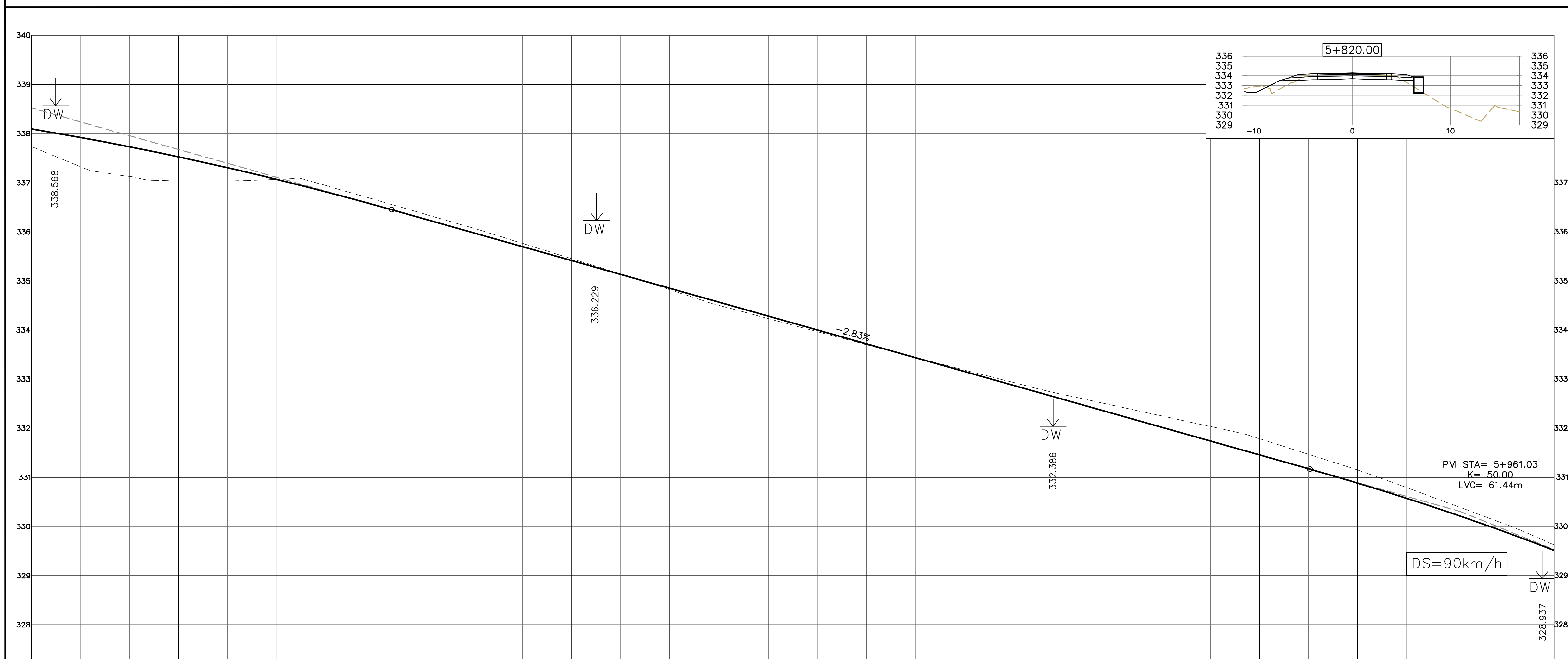
- EXISTING LEFT DITCH PROFILE
- PROPOSED RIGHT DITCH IMPROVEMENT
- PROPOSED LEFT DITCH IMPROVEMENT
- TRCA REGULATION LIMIT
- PROPOSED RIVER STONE
- CONCRETE MOUNTABLE CURB OPSD–600.030



	5+680	5+700	5+720	5+740	5+760	5+780	5+800	5+820	5+840	5+860	5+880	5+900	5+920	5+940	5+960	5+980
	337.33	337.04	337.07	336.66	336.07	335.45	334.82	334.23	333.70	333.18	332.69	332.25	331.79	331.15	330.42	329.62
	337.923	337.527	337.068	336.545	335.981	335.416	334.850	334.285	333.720	333.154	332.589	332.024	331.459	330.884	330.240	329.516

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CABLE TELEVISION
POLICE DEPT.
FIRE DEPT.
SCHOOL BUS SERVICES
CANADA POST (4 WEEKS ADVANCE NOTICE)

10m 0 10 20 30m 1:500 HORIZONTAL SCALE

1m 0 1 2 3m 1:50 VERTICAL SCALE

Region of Peel
Working for you

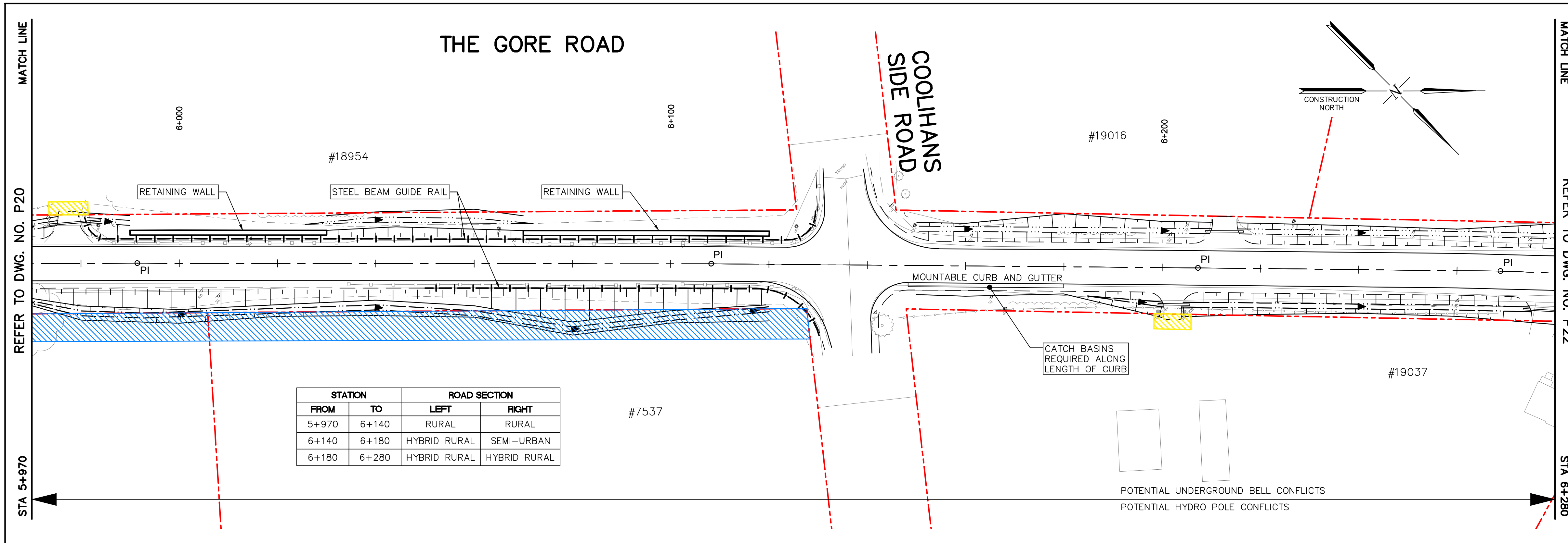
THE GORE ROAD

FROM PATTERSON SIDE ROAD TO HWY 9

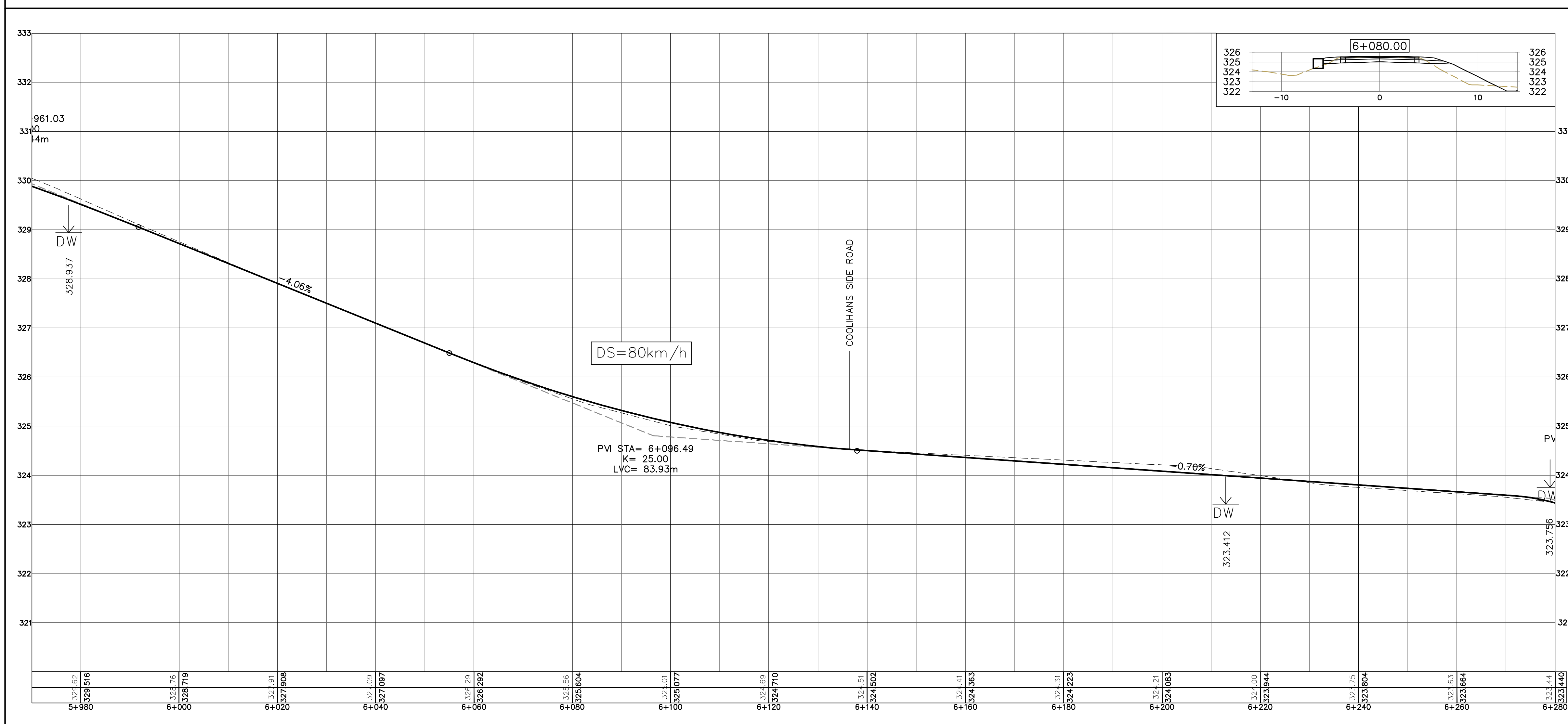
PLAN & PROFILE

Lots:	Area:	Project No. MTB019424
Checked by: J.V.	Drawn by: J.R.	Plan No. P20
Date: JANUARY 2013	Sheet:	

\\DSCAR\Shared Work Areas\MTB019424 Gore Rd\MTB019424_P015–P022.dwg Jan 15, 2013 – 2:25pm



STATION		ROAD SECTION	
FROM	TO	LEFT	RIGHT
5+970	6+140	RURAL	RURAL
6+140	6+180	HYBRID RURAL	SEMI–URBAN
6+180	6+280	HYBRID RURAL	HYBRID RURAL

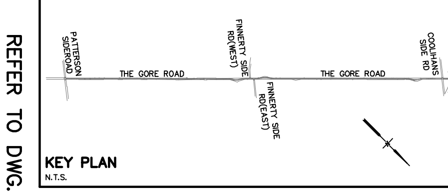


SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMAINS			HYDRO U/G CABLE		
TRANSIT			ONT. HYDRO		
PARKS & REC.			CTV		
ONT. CLEAN WATER					

REVISIONS

DATE	DETAILS	INIT.



KEY PLAN
N.T.S.

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- PROPOSED EDGE OF PAVEMENT
- EDGE OF SHOULDER
- BH46 EXISTING BOREHOLE LOCATIONS
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- TRCA REGULATION LIMIT
- PROPOSED RIVER STONE
- CONCRETE MOUNTABLE CURB OPSD–600.030

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SCHOOL BUS SERVICES
CANADA POST (4 WEEKS ADVANCE NOTICE)

1:500 HORIZONTAL SCALE
1:50 VERTICAL SCALE

Region of Peel
Working for you

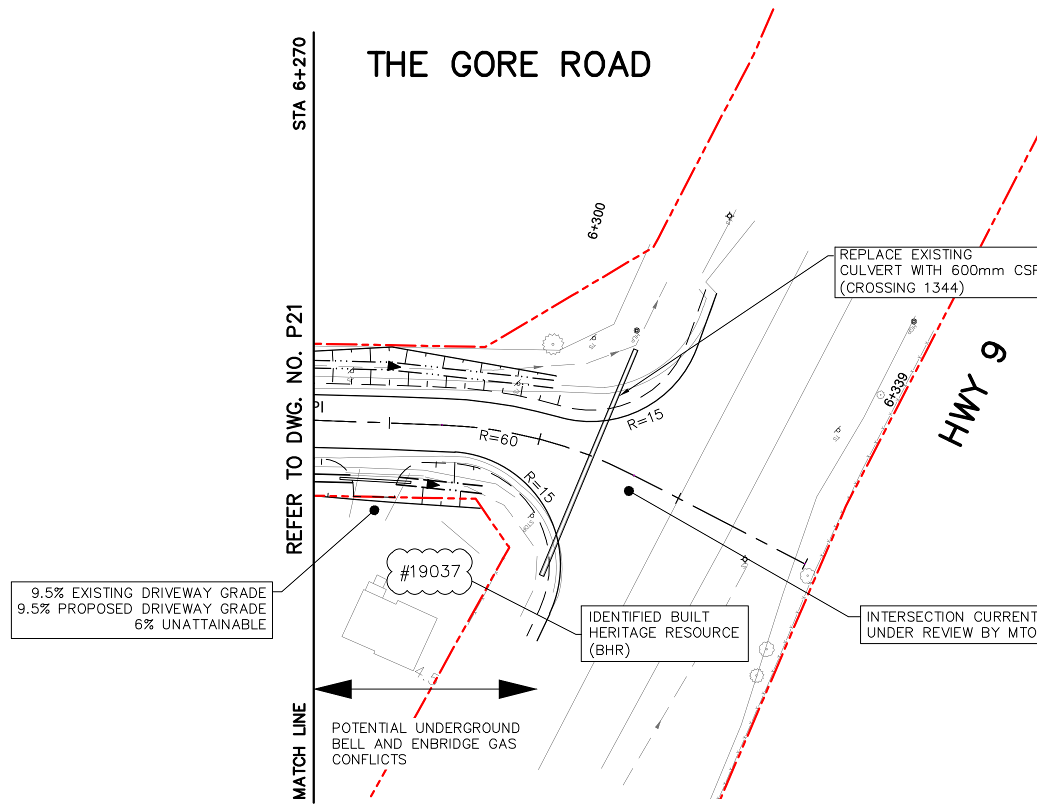
THE GORE ROAD

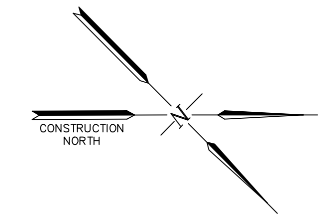
FROM PATTERSON SIDE ROAD TO HWY 9

PLAN & PROFILE

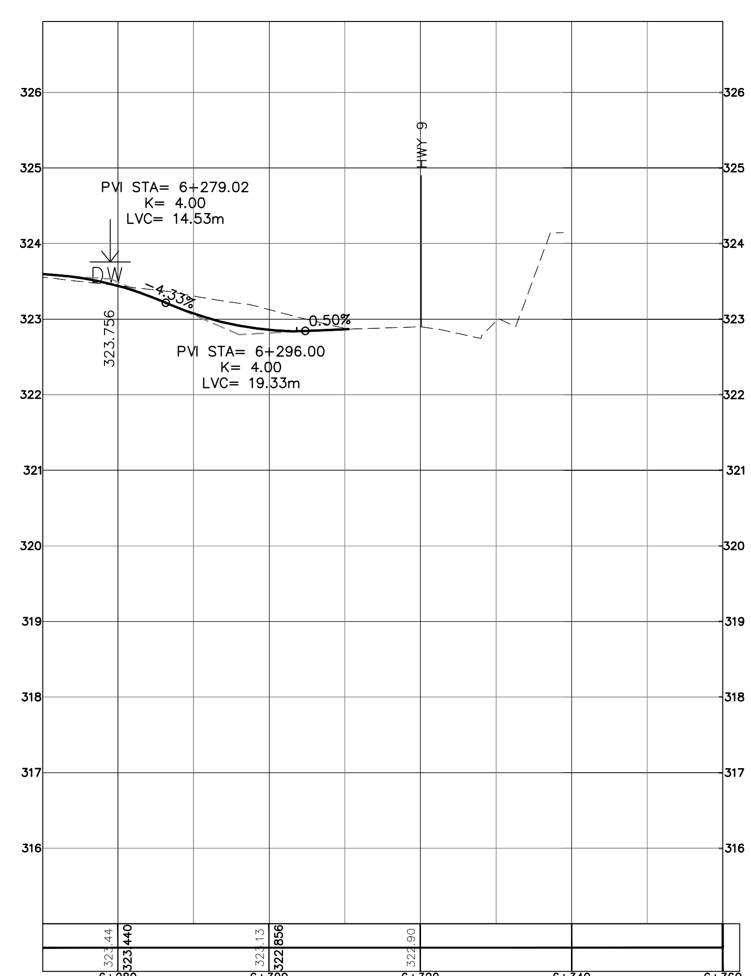
Lots:	Area:	Project No. MTB019424
Checked by: J.V.	Drawn by: J.R.	Plan No. P21
Date: JANUARY 2013	Sheet:	

\\OSCAR\Shared Work Areas\MTB019424 Gore Rd\MTB019424_P015–P022.dwg
Jan 15, 2013 – 2:25pm





STATION		ROAD SECTION	
FROM	TO	LEFT	RIGHT
6+270	END	HYBRID RURAL	HYBRID RURAL

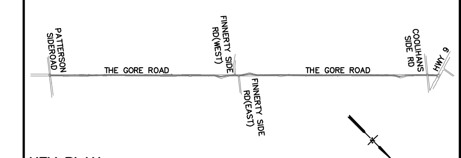


SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMAINS			HYDRO U/G CABLE		
TRANSIT			ONT. HYDRO		
PARKS & REC.			CTV		
ONT. CLEAN WATER					

REVISIONS

DATE	DETAILS	INIT.



KEY PLAN
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LEGEND:

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- PROPOSED EDGE OF PAVEMENT
- EDGE OF SHOULDER
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- SWALE PROPOSED SWALE WITH SUBDRAIN
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All Driveways ASPHALT Unless Otherwise Noted.
All Service Locations Are Approximate And Must Be Located Accurately In The Field
Denotes Building – Not Located
Denotes Building Located
Type 'B' Bedding Unless Otherwise Noted (SAN)

B.M. No. Elev.

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

BURNSIDE
R. J. Burnside & Associates Limited
170 Steelwell Road, Suite 200, Brampton, Ontario
telephone (905) 793-9239 **fax** (905) 793-5018
web www.rjburnside.com

Designed by
Chkd.

NOTICE TO CONTRACTOR

48 HOURS PRIOR TO COMMMENCING WORK NOTIFY THE FOLLOWING

THE REGIONAL MUNICIPALITY OF PEEL
CITY OF MISSISSAUGA WORKS DEPT.
CITY OF BRAMPTON WORKS DEPT.
TOWN OF CALEDON WORKS DEPT.
BELL TELEPHONE COMPANY
CONSUMERS GAS COMPANY
MINISTRY OF TRANSPORTATION
ONTARIO CLEAN WATER AGENCY
HYDRO ELECTRIC POWER COMM. OF ONTARIO
HYDRO ELECTRIC COMM. CITY OF MISSISSAUGA
HYDRO ELECTRIC COMM. CITY OF BRAMPTON
CABLE TELEVISION
POLICE DEPT.
FIRE DEPT.
SCHOOL BUS SERVICES
CANADA POST (4 WEEKS ADVANCE NOTICE)

10m 0 10 20 30m 1:500 HORIZONTAL SCALE
1m 0 1 2 3m 1:50 VERTICAL SCALE

Region of Peel
Working for you

THE GORE ROAD

FROM PATTERSON SIDE ROAD TO HWY 9

PLAN & PROFILE

Lots:	Area:	Project No. MTB019424
Checked by: J.V.	Drawn by: J.R.	Plan No. P22
Date: JANUARY 2013	Sheet:	

\\OSCAR\Shared Work Areas\MTB019424 Gore Rd\MTB019424_P015–P022.dwg
Jan 15, 2013 – 2:26pm


PATERSON SIDE ROAD
THE GORE ROAD
FINNERTY SIDE ROAD (WEST)
FINNERTY SIDE ROAD (EAST)
COOLIHANS SIDE ROAD
HIGHWAY 9
LEGEND
PERMISSION TO ENTER PROPERTY
PROPERTY AQUISITION
ADVISORY SPEED SIGNS REQUIRED
MOUNTABLE CURB AND GUTTER
POTENTIAL UNDERGROUND BELL CONFLICTS
POTENTIAL HYDRO POLE CONFLICTS
POTENTIAL HYDRO POLE CONFLICT
IDENTIFIED CULTURAL HERITAGE LANDSCAPE (CHL)
ENCROACHMENT AGREEMENT REQUIRED TO ACHIEVE 6% DRIVEWAY GRADE
CATCH BASINS REQUIRED ALONG LENGTH OF CURB
REPLACE EXISTING CULVERT WITH 600mm CSP (CROSSING N1)
9.5% EXISTING DRIVEWAY GRADE
9.5% PROPOSED DRIVEWAY GRADE
6% UNATTAINABLE
IDENTIFIED BUILT HERITAGE RESOURCE (BHR)
INTERSECTION CURRENTLY UNDER REVIEW BY MTO
POTENTIAL UNDERGROUND BELL AND ENBRIDGE GAS CONFLICTS

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Appendix K

Preliminary Cost Estimate

Preliminary Cost Estimate

R. J. Burnside & Associates Limited

Project No. MTB019424

Client: Region of Peel

Project Name: Schedule B EA Study The Gore Road (Patterson Side Road to Highway 9)

Based on Preliminary Design (13/07/04)

ITEM NO.	SPEC. NO.	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	ESTIMATED TOTAL
1	SP	Mobilization & Demobilization	1.00	L.S.	$75,000.00	$75,000.00
2	SP	Field Office	1.00	L.S.	$15,000.00	$15,000.00
3	SP	Traffic Control and Signing	1.00	L.S.	$100,000.00	$100,000.00
4	SP	Contract Bonding, Insurance and Permits	1.00	L.S.	$75,000.00	$75,000.00
5	SP	Construction Survey	1.00	L.S.	$50,000.00	$50,000.00
6	201	Clearing & Grubbing	1.00	L.S.	$43,000.00	$43,000.00
7	206	Earth Excavation (Grading)	93,000.00	m^3	$12.00	$1,116,000.00
8	308	Tack Coat	44,100.00	m^2	$0.50	$22,050.00
9	310	Hot Mix HL-3	7,150.00	t	$90.00	$643,500.00
10	310	Hot Mix HL-8	8,100.00	t	$85.00	$688,500.00
11	314	Granular 'A'	40,000.00	t	$16.00	$640,000.00
12	314	Granular 'B', Type I	63,000.00	t	$13.00	$819,000.00
13	314, SP	Granular 'B', Type I (Sub-Excavation Fill)	1,000.00	t	$13.00	$13,000.00
14	SP	Rumble Strips	12,600.00	m	$0.70	$8,820.00
15	353	Concrete Curb & Gutter	2,800.00	m	$60.00	$168,000.00
16	353	Concrete Gutter Outlets	34.00	ea	$300.00	$10,200.00
17	405	Pipe Subdrain	5,900.00	m	$20.00	$118,000.00
18	407	1200mm Manholes Catchbasins and Ditch Inlets	20.00	ea	$4,500.00	$90,000.00
19	407	600x600 Catchbasin	19.00	ea	$2,500.00	$47,500.00
20	410	200 dia.Storm Sewer	40.00	m	$200.00	$8,000.00
21	410	375 dia. Storm Sewer	1,100.00	m	$225.00	$247,500.00
22	421	300 dia. Pipe Culvert	450.00	m	$175.00	$78,750.00
23	421	600 dia. Pipe Culvert	165.00	m	$215.00	$35,475.00
24	421	1000 dia. Pipe Culvert	20.00	m	$250.00	$5,000.00
25	421	1200 dia. Pipe Culvert	25.00	m	$350.00	$8,750.00
26	421	1500 dia. Pipe Culvert	50.00	m	$400.00	$20,000.00
27	421	2000 dia. Pipe Culvert	50.00	m	$500.00	$25,000.00
28	421	2500 dia. Pipe Culvert	30.00	m	$600.00	$18,000.00
29	SP	Retaining Walls	1.00	L.S.	$957,500.00	$957,500.00
30	506	Dust Control	1.00	L.S.	$35,000.00	$35,000.00
31	510	Removal of Existing Asphalt and Concrete Pavement	45,865.00	m^2	$4.00	$183,460.00
32	510	Removal of Pipes and Culverts	500.00	m	$20.00	$10,000.00
33	510	Removal of Guide Rail	1,750.00	m	$20.00	$35,000.00
34	511	Rip-Rap	240.00	m^2	$25.00	$6,000.00
35	710	Pavement Marking	18,900.00	m	$1.50	$28,350.00
36	721	Steel Beam Guide Rail	2,150.00	m	$110.00	$236,500.00
37	730	Guide Rail End Treatment - Extruder	23.00	ea	$3,000.00	$69,000.00
38	802	Topsoil, Imported	6,250.00	m^3	$45.00	$281,250.00
39	804	Seeding & Mulching	62,500.00	m^2	$3.50	$218,750.00
40	805	Environmental Protection	1.00	L.S.	$100,000.00	$100,000.00
41	SP	Landscaping				
		A) Large Caliper Trees	1,071.00	ea	$350.00	$374,850.00
		B) Small Whips	357.00	ea	$75.00	$26,775.00

Subtotal	**$7,751,480.00**
Contingency Allowance (15%)	**$1,162,722.00**
Subtotal (Construction)	**$8,914,202.00**
Utility Relocates	**$500,000.00**
Contract Admin. & Eng. Allowance (5%)	**$445,710.10**
TOTAL	**$9,859,912.10**

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Appendix L

Structure and Culvert Inspections Report

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The Gore Road Structure and Culvert Inspections Report

Prepared By:

R.J. Burnside & Associates Limited
15 Townline Orangeville ON L9W 3R4

Prepared for:

Regional Municipality of Peel

May 2011

File No: MTB 019424

Table of Contents

Appendices

1.0 Introduction

R.J. Burnside & Associates Limited has been engaged by the Regional Municipality of Peel to undertake the inspection all structures located on The Gore Road between Highway No. 9 and Patterson Sideroad. Burnside staff have reviewed the 2006 Culvert Inspection Report from the Region and verified the report with respect to culvert size, life expectancy and improvement needs through field investigations. The inspections were completed in general accordance with the intent of the Ministry of Transportation - Ontario Structure Inspection Manual (OSIM). Where warranted, comments regarding operational or maintenance requirements at each structure are provided.

2.0 Ontario Structure Inspection Manual

The Ontario Ministry of Transportation introduced the latest version of the Ontario Structure Inspection Manual in April of 2008.

All structures were inspected in accordance with this OSIM manual and the reporting was carried out accordingly. A full set OSIM forms and inspection photos can be found in Appendix B.

3.0 Structure Inspections

The structures inventoried in this report include forty-four (44) bridge and culvert structures. Of these structures, seven (7) of them were not included in the 2006 culvert inspections. The seven (7) new structures include 3 structures that cross The Gore Road and four (4) driveway culverts. The three (3) cross structures have been named N1, N2 and N3 and the four (4) driveway culverts have been named according to the fire number of the property where they are located. These culverts have also been added to the overall structure locations map that can be found in Appendix A. One of the new cross structures is a precast concrete box culvert. This structure was measured and full inspection in accordance with the Ontario Structure Inspection Manual was done. The results of this inspection can be found in Appendix B along with the other inspection documents.

Aside from the seven new structures found, the results of this inspection were very similar to those of the 2006 inspection. The main difference between the two inspections was the amount of fill over the structures and the amount of the culvert barrel that was blocked with dirt and debris. Most structures showed more blockages at this time then they did in 2006 and depending on the culvert, more or less fill was present over the structure. The **Table 1** identifies the culverts that required clean-outs and the percentage of the culvert barrel that is currently blocked.

Table 1: Structures Requiring Clean-outs

Culvert No.	Percent Inlet Blocked	Percent Outlet Blocked
1320	25	25
1321	0	100
1322	0	80
1324	100	80
1325	50	100
1326	10	50
1327	0	30
1328	0	20
1329	0	40
1330	0	25
1331	15	15
1332	0	10
1333	10	70
1334	20	70
1335	100	75
1336	0	40
1337	20	20
1338	30	0
1339	10	10
1340	70	100
1341	60	50
1342	0	100
1343	30	50
1344	0	30
1345	70	85
1348	50	50
1349	70	20
1350	0	100
1354	20	20
7434	15	65
17415	60	50
18620	60	100
19037	10	30
N2	50	25

Also found during the inspections was that a few of the culverts had different diameters than what was recorded in 2006. It is unknown if these changes are the result of new culvert installations or environmental changes resulting in deformation. The **Table 2** identifies the culverts that had different diameters compared to the 2006 report.

Table 2: Structures Diameters

Culvert No.	2006 Dia. (mm)	2011 Dia. (mm)
1326	460	500
1328	400	500
1339	350	400
1348	400	450
1353	700	750
1354	400	600
1355	800	750

The overall lengths of a few culverts were found to be different than reports in 2006. **Table 3** outlines the culverts that have different lengths than recorded in 2006.

Table 3: Structures Lengths

Culvert No.	2006 Length (mm)	2011 Length (mm)
1322	13.9	12.3
1323	18.8	18
1327	9.1	12.1
1328	7.6	11.7
1329	9.7	9.15
1331	6.7	6.15
1332	8.2	7.4
1335	18.5	14.5
1336	13	12.5
1338	8.8	8.1
1340	6.4	6
1342	12.5	11
1344	33.2	32.4
1345	18.8	17.2
1347	22.2	25
1350	18.4	17.5
1351	20	18
1352	16.4	15
1353	15.1	14.4

1355	16	17
1356	14.6	15.5

As a result of our investigation **Table 4** identifies the structures life expectancy for the structures along The Gore Road.

Table 4: Structures Life Expectancy

Culvert No.	Life Expectancy (years)
1320	30+
1321	10
1322	30+
1323	30+
1324	0
1325	20
1326	20
1327	0
1328	20
1329	20
1330	30+
1331	25
1332	30+
1333	30+
1334	25
1335	0
1336	30+
1337	0
1338	20
1339	30+
1340	0
1341	20
1342	10
1343	20
1344	20
1345	15
1346	20
1347	0
1348	30+

1349	25
1350	30+
1351	5
1352	20
1353	20
1354	20
1355	15
1356	20
N1	10
N2	30+
N3	75
17415	30+
18620	25
19037	20
7434	20

It was also found through the structure inspections that Culvert No. 1347 has failed approximately 3.5m from the east end (outlet). As a result of this failure, the east end of the culvert is approximately 0.2m above the water level. The culvert failure is also evident in the slopes were a large washout is present directly above the culvert. Since there is a large amount of fill (4.7m) over the structure, there is no deformation visible in the road asphalt. Aside from this, it was also found that the slopes around Culvert 1352 and Culvert 1355 are beginning to fail which has resulted in the steel beam guiderail over the structure leaning away from the road and falling down the slopes. All of these issues pertaining to slope failures and washouts are safety hazards as the guiderail will not be able to resist the impact that it was designed to handle. It is recommended that these slopes be repaired and protected against further failure in order to keep the users of the road safe.

4.0 Summary

There are forty-four (44) structures located on The Gore Road between Highway No. 9 and Patterson Sideroad that have been inspected in accordance with intent of the Ontario Structure Inspection Manual. Burnside staff, have reviewed the 2006 Culvert Inspection Report from the Region and have inspected and verified the report with respect to culvert size, life expectancy and improvement needs. In addition, we have provided recommended maintenance works for certain structures that are intended to extend the useful service life of the Regions structure inventory. These maintenance works can be undertaken by Regions staff.

We trust the Regional Municipality of Peel will find the report to be of assistance in the management and maintenance of its municipal structures and in the planning of both short and long-term capital needs.

Respectfully submitted,

R.J. Burnside & Associates Limited

Helen M. Jenkins, P. Eng.
HJ/mk

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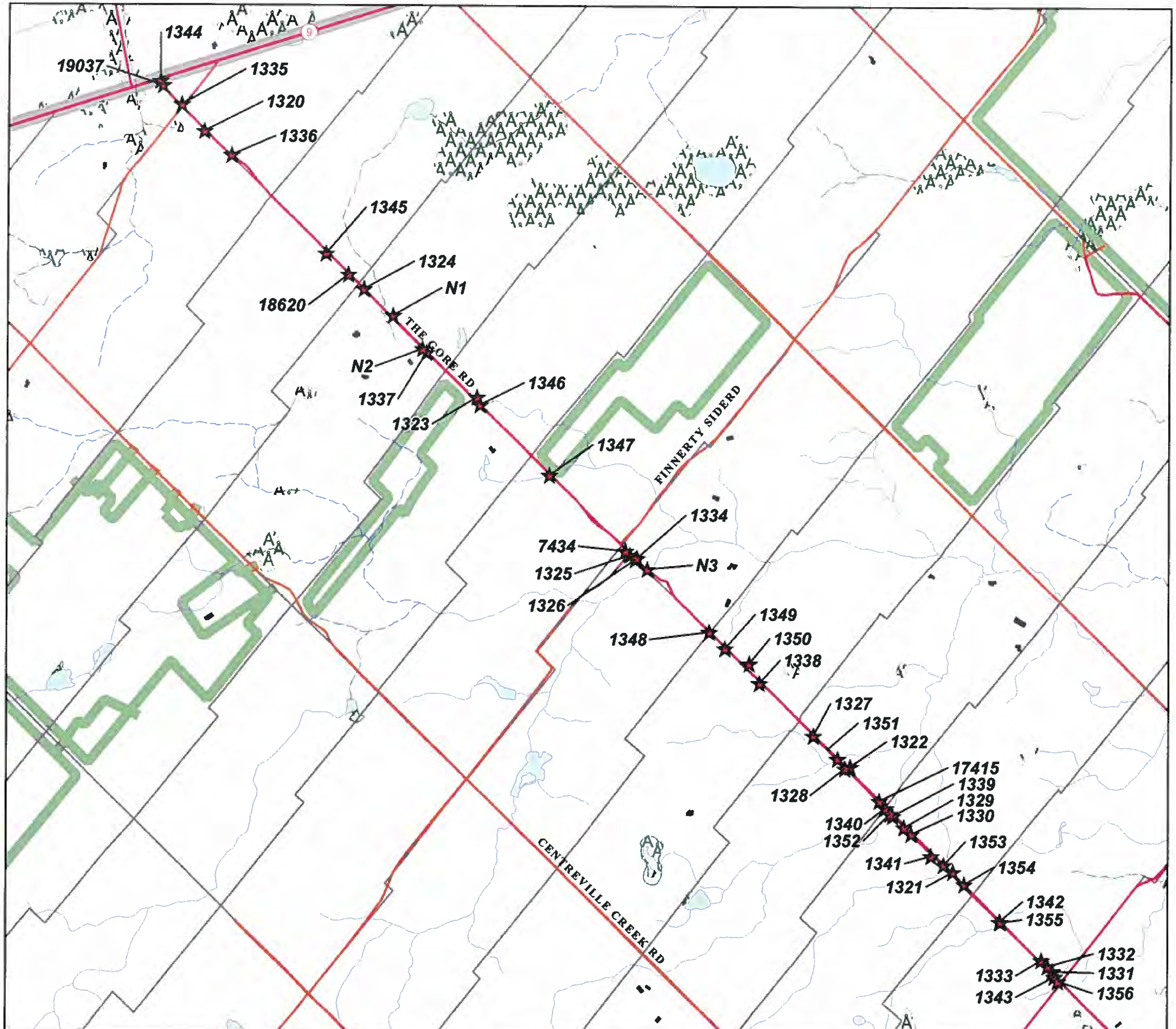
Appendix A

Structure Locations Map



Regional Municipality of Peel

The Gore Road Culvert Locations

Region of Peel
Working for you

Note:
1. OBM Data was created in 1985.

Credit:
1. OBM Base data has been supplied by the Ministry of Natural Resources © Her Majesty the Queen in Right of Ontario

Disclaimer:
R.J. Burnside and Associates and the above mentioned sources are not responsible for any errors, omissions or inaccuracies in the data represented. It is the responsibility of the user of this map to verify the accuracy of the data represented.

N

0 250 500 750 1,000 1,250 1,500
Meters

Scale: 1:20,000
Date: April, 2010

Projection: UTM Zone 17
Datum: NAD 83

Project: MTB19424

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X:\Projects\MTB\MTB19424\Map\GoreRd_Working.mxd

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Appendix B

OSIM Forms and Photos

Ontario Structure Inspection Manual - Inspection Form

MTO Site Number:

Inventory Data:			
Structure Name	Culvert No. 1320		
Main Hwy/Road #		On ☐ Under ■	Crossing Type: Navig. Water ☐ Non-Navig. Water ■ Rail ☐ Road ☐ Ped. ☐ Other ☐
Hwy/Road Name	The Gore Road		
Structure Location	House Entrance No. 18954 (West side of road)		
Latitude	4867617 (N)	Longitude	587101 (E)
Owner(s)	Regional Municipality of Peel	Heritage Designation:	☐ Not Cons. ☐ Cons./not App. ☐ List/not Desig. ☐ Desig./not List ☐ Desig. & List
MTO Region		Road Class:	Freeway ☐ Arterial ☐ Collector ☐ Local ☐
MTO District		Posted Speed / No. of Lanes	
Old County		AADT / % Trucks	
Geographic Twp.	Town of Caledon	Inspection Route Sequence	
Structure Type	Corrugated Steel Pipe	Interchange Number	
Total Deck Length	9.2 (m)	Interchange Structure Number	
Overall Str. Width	(m)	Min. Vertical Clearance	(m)
Total Deck Area	(sq.m)	Special Routes:	☐ Transit ☐ Truck ☐ School ☐ Bicycle
Roadway Width	5.2 (m)	Detour Length Around Bridge	(km)
Skew Angle	0 (Degrees)	Direction of Structure	North - South
No. of Spans	1	Fill on Structure	0.8 (m)
Span Lengths	0.4 (m)		

Historical Data:			
Year Built		Year of Last Major Rehab.	
Last OSIM Inspection		Last Evaluation	2005
Last Enhanced OSIM Inspection		Current Load Limit	/ / (tonnes)
Enhanced Access Equipment (ladder, boat lift, etc.)		Load Limit By-Law #	
Last Underwater Inspection		By-Law Expiry Date	
Last Condition Survey			

Rehab History: (Date/description)

Field Inspection Information:			
Date of Inspection:	04/26/2011	Type of Inspection:	■ OSIM ☐ Enhanced OSIM
Inspector:	Mark Kabbes		
Others in Party:	Jeremy Nyenhuis		
Access Equipment Used:	Digital Camera, Measuring Tape, Shovel		
Weather:	Overcast/raining		
Temperature:	18° C		

Additional Investigations Required:	Priority		
	None	Normal	Urgent
Material Condition Survey			
Detailed Deck Condition:			
Non-destructive Delamination Survey of Asphalt–Covered Deck:			
Concrete Substructure Condition Survey:			
Detailed Coating Condition Survey:			
Detailed Timber Investigation			
Post-Tensioned Stand Investigation			
Underwater Investigation:			
Fatigue Investigation:			
Seismic Investigation:			
Structure Evaluation:			
Monitoring			
Monitoring of Deformations, Settlements and Movements:			
Monitoring Crack Widths:			

Investigation Notes:

- Inlet is 25% blocked with silt and grass build-up
- Outlet is 25% blocked with silt and grass build-up
- Barrel has roughly 10% of silt/gravel build up in it

Overall Structure Notes:	
Recommended Work on Structure:	☐ None ☐ Minor Rehab. ☐ Major Rehab. ☐ Replace
Timing of Recommended Work:	☐ 1 to 5 years ☐ 6 to 10 years
Overall Comments:	
Date of Next Inspection:	

Repair and Rehabilitation Required:		Priority			Estimated Construction Cost
Element	Repair and Rehabilitation Required	1 to 5 years	Within 1 year	Urgent	
				Total Cost	

Associated Work:	Comments	Estimated Cost
Approaches		
Detours		
Traffic Control		
Utilities		
Right of Way		
Environmental Study		
Other		
Contingencies		
	Total Cost	

Justification:

Culvert 1320

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Project Title: The Gore Road Culvert Inspections 2011
File No.: MTB019424
Date: May 2011

Ontario Structure Inspection Manual - Inspection Form

MTO Site Number:

Inventory Data:

Structure Name	Culvert No. 1321		
Main Hwy/Road #		On ☐ Under ■	Crossing Type: Navig. Water ☐ Non-Navig. Water ■ Rail ☐ Road ☐ Ped. ☐ Other ☐
Hwy/Road Name	The Gore Road		
Structure Location	House Entrance No. 17243 (East side of road)		
Latitude	4863971 (N)	Longitude	590816 (E)
Owner(s)	Regional Municipality of Peel	Heritage Designation:	☐ Not Cons. ☐ Cons./not App. ☐ List/not Desig. ☐ Desig./not List ☐ Desig. & List
MTO Region		Road Class:	Freeway ☐ Arterial ☐ Collector ☐ Local ☐
MTO District		Posted Speed	No. of Lanes
Old County		AADT	% Trucks
Geographic Twp.	Town of Caledon	Inspection Route Sequence	
Structure Type	Corrugated Steel Pipe	Interchange Number	
Total Deck Length	9.3 (m)	Interchange Structure Number	
Overall Str. Width	(m)	Min. Vertical Clearance	(m)
Total Deck Area	(sq.m)	Special Routes:	☐ Transit ☐ Truck ☐ School ☐ Bicycle
Roadway Width	7.5 (m)	Detour Length Around Bridge	(km)
Skew Angle	0 (Degrees)	Direction of Structure	North - South
No. of Spans	1	Fill on Structure	0.2 (m)
Span Lengths	0.3 (m)		

Historical Data:

Year Built		Year of Last Major Rehab.	
Last OSIM Inspection		Last Evaluation	2005
Last Enhanced OSIM Inspection		Current Load Limit	/ / (tonnes)
Enhanced Access Equipment (ladder, boat lift, etc.)		Load Limit By-Law #	
Last Underwater Inspection		By-Law Expiry Date	
Last Condition Survey			

Rehab History: (Date/description)

Field Inspection Information:			
Date of Inspection:	05/04/2011	Type of Inspection:	■ OSIM ☐ Enhanced OSIM
Inspector:	Mark Kabbes		
Others in Party:	Jeremy Nyenhuis		
Access Equipment Used:	Digital Camera, Measuring Tape, Shovel		
Weather:	Sunny		
Temperature:	15° C		

Additional Investigations Required:	Priority		
	None	Normal	Urgent
Material Condition Survey			
Detailed Deck Condition:			
Non-destructive Delamination Survey of Asphalt–Covered Deck:			
Concrete Substructure Condition Survey:			
Detailed Coating Condition Survey:			
Detailed Timber Investigation			
Post-Tensioned Stand Investigation			
Underwater Investigation:			
Fatigue Investigation:			
Seismic Investigation:			
Structure Evaluation:			
Monitoring			
Monitoring of Deformations, Settlements and Movements:			
Monitoring Crack Widths:			

Investigation Notes:

- Inlet is clean
- Outlet is completely blocked
- Barrel has a silt build-up in it at the outlet of the culvert, for the rest has 10% gravel in it
- Barrel is rusted half way up the culvert

Overall Structure Notes:	
Recommended Work on Structure:	☐ None ☐ Minor Rehab. ☐ Major Rehab. ☐ Replace
Timing of Recommended Work:	☐ 1 to 5 years ☐ 6 to 10 years
Overall Comments:	
Date of Next Inspection:	

Repair and Rehabilitation Required:		Priority			Estimated Construction Cost
Element	Repair and Rehabilitation Required	1 to 5 years	Within 1 year	Urgent	
				Total Cost	

Associated Work:	Comments	Estimated Cost
Approaches		
Detours		
Traffic Control		
Utilities		
Right of Way		
Environmental Study		
Other		
Contingencies		
	Total Cost	

Justification:

Culvert 1321

BURNSIDE

Project Title: The Gore Road Culvert Inspections 2011
File No.: MTB019424
Date: May 2011

Ontario Structure Inspection Manual - Inspection Form

MTO Site Number:

Inventory Data:			
Structure Name	Culvert No. 1322		
Main Hwy/Road #	On ☐ Under ■	Crossing Type:	Navig. Water ☐ Non-Navig. Water ■ Rail ☐ Road ☐ Ped. ☐ Other ☐
Hwy/Road Name	The Gore Road		
Structure Location	House Entrance No. 17479 (west side of road)		
Latitude	4864486 (N)	Longitude	590306 (E)
Owner(s)	Regional Municipality of Peel	Heritage Designation:	☐ Not Cons. ☐ Cons./not App. ☐ List/not Desig. ☐ Desig./not List ☐ Desig. & List
MTO Region		Road Class:	Freeway ☐ Arterial ☐ Collector ☐ Local ☐
MTO District		Posted Speed	No. of Lanes
Old County		AADT	% Trucks
Geographic Twp.	Town of Caledon	Inspection Route Sequence	
Structure Type	Corrugated Steel Pipe	Interchange Number	
Total Deck Length	12.3 (m)	Interchange Structure Number	
Overall Str. Width	(m)	Min. Vertical Clearance	(m)
Total Deck Area	(sq.m)	Special Routes:	☐ Transit ☐ Truck ☐ School ☐ Bicycle
Roadway Width	4.2 (m)	Detour Length Around Bridge	(km)
Skew Angle	0 (Degrees)	Direction of Structure	North - South
No. of Spans	1	Fill on Structure	0.6 (m)
Span Lengths	0.4 (m)		

Historical Data:			
Year Built		Year of Last Major Rehab.	
Last OSIM Inspection		Last Evaluation	2005
Last Enhanced OSIM Inspection		Current Load Limit	/ / (tonnes)
Enhanced Access Equipment (ladder, boat lift, etc.)		Load Limit By-Law #	
Last Underwater Inspection		By-Law Expiry Date	
Last Condition Survey			

Rehab History: (Date/description)

Field Inspection Information:			
Date of Inspection:	05/04/2011	Type of Inspection:	■ OSIM ☐ Enhanced OSIM
Inspector:	Mark Kabbes		
Others in Party:	Jeremy Nyenhuis		
Access Equipment Used:	Digital Camera, Measuring Tape, Shovel		
Weather:	Sunny		
Temperature:	15° C		

Additional Investigations Required:	Priority		
	None	Normal	Urgent
Material Condition Survey			
Detailed Deck Condition:			
Non-destructive Delamination Survey of Asphalt–Covered Deck:			
Concrete Substructure Condition Survey:			
Detailed Coating Condition Survey:			
Detailed Timber Investigation			
Post-Tensioned Stand Investigation			
Underwater Investigation:			
Fatigue Investigation:			
Seismic Investigation:			
Structure Evaluation:			
Monitoring			
Monitoring of Deformations, Settlements and Movements:			
Monitoring Crack Widths:			

Investigation Notes:

- Inlet is clear
- Outlet is 80% blocked with gravel
- Barrel is mostly clean except at outlet where it is 80% blocked with gravel

Overall Structure Notes:	
Recommended Work on Structure:	☐ None ☐ Minor Rehab. ☐ Major Rehab. ☐ Replace
Timing of Recommended Work:	☐ 1 to 5 years ☐ 6 to 10 years
Overall Comments:	
Date of Next Inspection:	

 MTO Site Number:

Repair and Rehabilitation Required:		Priority			Estimated Construction Cost
Element	Repair and Rehabilitation Required	1 to 5 years	Within 1 year	Urgent	
				Total Cost	

Associated Work:	Comments	Estimated Cost
Approaches		
Detours		
Traffic Control		
Utilities		
Right of Way		
Environmental Study		
Other		
Contingencies		
	Total Cost	

Justification:

Culvert 1322

BURNSIDE

Project Title: The Gore Road Culvert Inspections 2011
File No.: MTB019424
Date: May 2011

Ontario Structure Inspection Manual - Inspection Form

MTO Site Number:

Inventory Data:

Structure Name	Culvert No. 1323		
Main Hwy/Road #		On ☐ Under ■	Crossing Type: Navig. Water ☐ Non-Navig. Water ■ Rail ☐ Road ☐ Ped. ☐ Other ☐
Hwy/Road Name	The Gore Road		
Structure Location	House Entrance No. 18355 (East side of road)		
Latitude	4866308 (N)	Longitude	588457 (E)
Owner(s)	Regional Municipality of Peel	Heritage Designation:	☐ Not Cons. ☐ Cons./not App. ☐ List/not Desig. ☐ Desig./not List ☐ Desig. & List
MTO Region		Road Class:	Freeway ☐ Arterial ☐ Collector ☐ Local ☐
MTO District		Posted Speed	No. of Lanes
Old County		AADT	% Trucks
Geographic Twp.	Town of Caledon	Inspection Route Sequence	
Structure Type	Corrugated Steel Pipe	Interchange Number	
Total Deck Length	18.0 (m)	Interchange Structure Number	
Overall Str. Width	(m)	Min. Vertical Clearance	(m)
Total Deck Area	(sq.m)	Special Routes:	☐ Transit ☐ Truck ☐ School ☐ Bicycle
Roadway Width	4.5 (m)	Detour Length Around Bridge	(km)
Skew Angle	0 (Degrees)	Direction of Structure	North - South
No. of Spans	1	Fill on Structure	1.8 (m)
Span Lengths	0.4 (m)		

Historical Data:

Year Built		Year of Last Major Rehab.	
Last OSIM Inspection		Last Evaluation	2005
Last Enhanced OSIM Inspection		Current Load Limit	/ / (tonnes)
Enhanced Access Equipment (ladder, boat lift, etc.)		Load Limit By-Law #	
Last Underwater Inspection		By-Law Expiry Date	
Last Condition Survey			

Rehab History: (Date/description)

Field Inspection Information:			
Date of Inspection:	05/04/2011	Type of Inspection:	■ OSIM ☐ Enhanced OSIM
Inspector:	Mark Kabbes		
Others in Party:	Jeremy Nyenhuis		
Access Equipment Used:	Digital Camera, Measuring Tape, Shovel		
Weather:	Sunny		
Temperature:	15° C		

Additional Investigations Required:	Priority		
	None	Normal	Urgent
Material Condition Survey			
Detailed Deck Condition:			
Non-destructive Delamination Survey of Asphalt–Covered Deck:			
Concrete Substructure Condition Survey:			
Detailed Coating Condition Survey:			
Detailed Timber Investigation			
Post-Tensioned Stand Investigation			
Underwater Investigation:			
Fatigue Investigation:			
Seismic Investigation:			
Structure Evaluation:			
Monitoring			
Monitoring of Deformations, Settlements and Movements:			
Monitoring Crack Widths:			

Investigation Notes:

- Inlet is clean
- Outlet is clean with debris downstream of culvert
- Barrel is clean, debris is causing water to remain in barrel

Overall Structure Notes:	
Recommended Work on Structure:	☐ None ☐ Minor Rehab. ☐ Major Rehab. ☐ Replace
Timing of Recommended Work:	☐ 1 to 5 years ☐ 6 to 10 years
Overall Comments:	
Date of Next Inspection:	

Repair and Rehabilitation Required:		Priority			Estimated Construction Cost
Element	Repair and Rehabilitation Required	1 to 5 years	Within 1 year	Urgent	
				Total Cost	

Associated Work:	Comments	Estimated Cost
Approaches		
Detours		
Traffic Control		
Utilities		
Right of Way		
Environmental Study		
Other		
Contingencies		
	Total Cost	

Justification:

Culvert 1323

BURNSIDE

Project Title: The Gore Road Culvert Inspections 2011
File No.: MTB019424
Date: May 2011


05/04/2011


05/04/2011

Ontario Structure Inspection Manual - Inspection Form

MTO Site Number:

Inventory Data:

Field	Value	Field	Value
Structure Name	Culvert No. 1324		
Main Hwy/Road #		On ☐ Under ■	
Crossing Type:	Navig. Water ☐ Non-Navig. Water ■ Rail ☐ Road ☐ Ped. ☐ Other ☐		
Hwy/Road Name	The Gore Road		
Structure Location	House Entrance No. 18584 (West side of road)		
Latitude	4866842 (N)	Longitude	587893 (E)
Owner(s)	Regional Municipality of Peel	Heritage Designation:	☐ Not Cons. ☐ Cons./not App. ☐ List/not Desig. ☐ Desig./not List ☐ Desig. & List
MTO Region		Road Class:	Freeway ☐ Arterial ☐ Collector ☐ Local ☐
MTO District		Posted Speed	
		No. of Lanes	
Old County		AADT	
		% Trucks	
Geographic Twp.	Town of Caledon	Inspection Route Sequence	
Structure Type	Corrugated Steel Pipe	Interchange Number	
Total Deck Length	6.0 (m)	Interchange Structure Number	
Overall Str. Width	(m)	Min. Vertical Clearance	(m)
Total Deck Area	(sq.m)	Special Routes:	☐ Transit ☐ Truck ☐ School ☐ Bicycle
Roadway Width	5.1 (m)	Detour Length Around Bridge	(km)
Skew Angle	0 (Degrees)	Direction of Structure	North - South
No. of Spans	1	Fill on Structure	0.25 (m)
Span Lengths	0.4 (m)		

Historical Data:

Field	Value	Field	Value
Year Built		Year of Last Major Rehab.	
Last OSIM Inspection		Last Evaluation	2005
Last Enhanced OSIM Inspection		Current Load Limit	/ / (tonnes)
Enhanced Access Equipment (ladder, boat lift, etc.)		Load Limit By-Law #	
Last Underwater Inspection		By-Law Expiry Date	
Last Condition Survey			

Rehab History: (Date/description)

Field Inspection Information:			
Date of Inspection:	04/27/2011	Type of Inspection:	■ OSIM ☐ Enhanced OSIM
Inspector:	Mark Kabbes		
Others in Party:	Jeremy Nyenhuis		
Access Equipment Used:	Digital Camera, Measuring Tape, Shovel		
Weather:	Overcast/raining		
Temperature:	18° C		

Additional Investigations Required:	Priority		
	None	Normal	Urgent
Material Condition Survey			
Detailed Deck Condition:			
Non-destructive Delamination Survey of Asphalt–Covered Deck:			
Concrete Substructure Condition Survey:			
Detailed Coating Condition Survey:			
Detailed Timber Investigation			
Post-Tensioned Stand Investigation			
Underwater Investigation:			
Fatigue Investigation:			
Seismic Investigation:			
Structure Evaluation:			
Monitoring			
Monitoring of Deformations, Settlements and Movements:			
Monitoring Crack Widths:			

Investigation Notes:

- Inlet is completely blocked with silt and grass build-up
- Outlet is 80% blocked with silt and grass build-up
- Barrel is assumed to be completely blocked

Overall Structure Notes:	
Recommended Work on Structure:	☐ None ☐ Minor Rehab. ☐ Major Rehab. ☐ Replace
Timing of Recommended Work:	☐ 1 to 5 years ☐ 6 to 10 years
Overall Comments:	
Date of Next Inspection:	

Repair and Rehabilitation Required:		Priority			Estimated Construction Cost
Element	Repair and Rehabilitation Required	1 to 5 years	Within 1 year	Urgent	
				Total Cost	

Associated Work:	Comments	Estimated Cost
Approaches		
Detours		
Traffic Control		
Utilities		
Right of Way		
Environmental Study		
Other		
Contingencies		
	Total Cost	

Justification:

Culvert 1324

BURNSIDE

Project Title: The Gore Road Culvert Inspections 2011
File No.: MTB019424
Date: May 2011

Ontario Structure Inspection Manual - Inspection Form

MTO Site Number:

Inventory Data:

Structure Name	Culvert No. 1325		
Main Hwy/Road #		On ☐ Under ■	Crossing Type: Navig. Water ☐ Non-Navig. Water ■ Rail ☐ Road ☐ Ped. ☐ Other ☐
Hwy/Road Name	The Gore Road		
Structure Location	Intersection of Gore Road and Finnerty Side Road (West side of road)		
Latitude	4865529 (N)	Longitude	589215 (E)
Owner(s)	Regional Municipality of Peel	Heritage Designation:	☐ Not Cons. ☐ Cons./not App. ☐ List/not Desig. ☐ Desig./not List ☐ Desig. & List
MTO Region		Road Class:	Freeway ☐ Arterial ☐ Collector ☐ Local ☐
MTO District		Posted Speed	70 — No. of Lanes 2
Old County		AADT	— % Trucks
Geographic Twp.	Town of Caledon	Inspection Route Sequence	
Structure Type	Corrugated Steel Pipe	Interchange Number	
Total Deck Length	15.4 (m)	Interchange Structure Number	
Overall Str. Width	(m)	Min. Vertical Clearance	(m)
Total Deck Area	(sq.m)	Special Routes:	☐ Transit ☐ Truck ☐ School ☐ Bicycle
Roadway Width	12.2 (m)	Detour Length Around Bridge	(km)
Skew Angle	0 (Degrees)	Direction of Structure	North - South
No. of Spans	1	Fill on Structure	0.4 (m)
Span Lengths	0.6 (m)		

Historical Data:

Year Built		Year of Last Major Rehab.	
Last OSIM Inspection		Last Evaluation	2005
Last Enhanced OSIM Inspection		Current Load Limit	/ / (tonnes)
Enhanced Access Equipment (ladder, boat lift, etc.)		Load Limit By-Law #	
Last Underwater Inspection		By-Law Expiry Date	
Last Condition Survey			

Rehab History: (Date/description)

Field Inspection Information:			
Date of Inspection:	05/04/2011	Type of Inspection:	■ OSIM ☐ Enhanced OSIM
Inspector:	Mark Kabbes		
Others in Party:	Jeremy Nyenhuis		
Access Equipment Used:	Digital Camera, Measuring Tape, Shovel		
Weather:	Sunny		
Temperature:	15° C		

Additional Investigations Required:	Priority		
	None	Normal	Urgent
Material Condition Survey			
Detailed Deck Condition:			
Non-destructive Delamination Survey of Asphalt–Covered Deck:			
Concrete Substructure Condition Survey:			
Detailed Coating Condition Survey:			
Detailed Timber Investigation			
Post-Tensioned Stand Investigation			
Underwater Investigation:			
Fatigue Investigation:			
Seismic Investigation:			
Structure Evaluation:			
Monitoring			
Monitoring of Deformations, Settlements and Movements:			
Monitoring Crack Widths:			

Investigation Notes:

- Inlet has 0.2m to get water into the inlet due to cut in side slope
- Outlet is completely blocked with gravel from road shoulder
- Inlet and outlet are roughly 0.5m and 0.3m respectfully from edge of asphalt
- Barrel is half filled with gravel and silt

Overall Structure Notes:	
Recommended Work on Structure:	☐ None ☐ Minor Rehab. ☐ Major Rehab. ☐ Replace
Timing of Recommended Work:	☐ 1 to 5 years ☐ 6 to 10 years
Overall Comments:	
Date of Next Inspection:	

Repair and Rehabilitation Required:		Priority			Estimated Construction Cost
Element	Repair and Rehabilitation Required	1 to 5 years	Within 1 year	Urgent	
				Total Cost	

Associated Work:	Comments	Estimated Cost
Approaches		
Detours		
Traffic Control		
Utilities		
Right of Way		
Environmental Study		
Other		
Contingencies		
	Total Cost	

Justification:

Culvert 1325

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Date: May 2011

Ontario Structure Inspection Manual - Inspection Form

MTO Site Number:

Inventory Data:

Structure Name	Culvert No. 1326		
Main Hwy/Road #		On ☐ Under ■	Crossing Type: Navig. Water ☐ Non-Navig. Water ■ Rail ☐ Road ☐ Ped. ☐ Other ☐
Hwy/Road Name	The Gore Road		
Structure Location	House Entrance No. 17990 (West side of road)		
Latitude	4865507 (N)	Longitude	589242 (E)
Owner(s)	Regional Municipality of Peel	Heritage Designation:	☐ Not Cons. ☐ Cons./not App. ☐ List/not Desig. ☐ Desig./not List ☐ Desig. & List
MTO Region		Road Class:	Freeway ☐ Arterial ☐ Collector ☐ Local ☐
MTO District		Posted Speed	No. of Lanes
Old County		AADT	% Trucks
Geographic Twp.	Town of Caledon	Inspection Route Sequence	
Structure Type	Corrugated Steel Pipe	Interchange Number	
Total Deck Length	7.2 (m)	Interchange Structure Number	
Overall Str. Width	(m)	Min. Vertical Clearance	(m)
Total Deck Area	(sq.m)	Special Routes:	☐ Transit ☐ Truck ☐ School ☐ Bicycle
Roadway Width	4.5 (m)	Detour Length Around Bridge	(km)
Skew Angle	0 (Degrees)	Direction of Structure	North - South
No. of Spans	1	Fill on Structure	0.3 (m)
Span Lengths	0.5 (m)		

Historical Data:

Year Built		Year of Last Major Rehab.	
Last OSIM Inspection		Last Evaluation	2005
Last Enhanced OSIM Inspection		Current Load Limit	/ / (tonnes)
Enhanced Access Equipment (ladder, boat lift, etc.)		Load Limit By-Law #	
Last Underwater Inspection		By-Law Expiry Date	
Last Condition Survey			

Rehab History: (Date/description)

Field Inspection Information:			
Date of Inspection:	05/04/2011	Type of Inspection:	■ OSIM ☐ Enhanced OSIM
Inspector:	Mark Kabbes		
Others in Party:	Jeremy Nyenhuis		
Access Equipment Used:	Digital Camera, Measuring Tape, Shovel		
Weather:	Sunny		
Temperature:	15° C		

Additional Investigations Required:	Priority		
	None	Normal	Urgent
Material Condition Survey			
Detailed Deck Condition:			
Non-destructive Delamination Survey of Asphalt–Covered Deck:			
Concrete Substructure Condition Survey:			
Detailed Coating Condition Survey:			
Detailed Timber Investigation			
Post-Tensioned Stand Investigation			
Underwater Investigation:			
Fatigue Investigation:			
Seismic Investigation:			
Structure Evaluation:			
Monitoring			
Monitoring of Deformations, Settlements and Movements:			
Monitoring Crack Widths:			

Investigation Notes:

- Inlet is 10% silted in and it has a minor dent
- Outlet is 50% blocked with silt and grass build-up
- Silt build-up in barrel even from inlet to outlet

Overall Structure Notes:	
Recommended Work on Structure:	☐ None ☐ Minor Rehab. ☐ Major Rehab. ☐ Replace
Timing of Recommended Work:	☐ 1 to 5 years ☐ 6 to 10 years
Overall Comments:	
Date of Next Inspection:	

Repair and Rehabilitation Required:		Priority			Estimated Construction Cost
Element	Repair and Rehabilitation Required	1 to 5 years	Within 1 year	Urgent	
				Total Cost	

Associated Work:	Comments	Estimated Cost
Approaches		
Detours		
Traffic Control		
Utilities		
Right of Way		
Environmental Study		
Other		
Contingencies		
	Total Cost	

Justification:

Culvert 1326

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Project Title: The Gore Road Culvert Inspections 2011
File No.: MTB019424
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Project Title: The Gore Road Culvert Inspections 2011
File No.: MTB019424
Date: May 2011

Ontario Structure Inspection Manual - Inspection Form

MTO Site Number:

Inventory Data:

Structure Name	Culvert No. 1327		
Main Hwy/Road #		On ☐ Under ■	Crossing Type: Navig. Water ☐ Non-Navig. Water ■ Rail ☐ Road ☐ Ped. ☐ Other ☐
Hwy/Road Name	The Gore Road		
Structure Location	House Entrance No. 17562 (west side of road)		
Latitude	4864639 (N)	Longitude	590123 (E)
Owner(s)	Regional Municipality of Peel	Heritage Designation:	☐ Not Cons. ☐ Cons./not App. ☐ List/not Desig. ☐ Desig./not List ☐ Desig. & List
MTO Region		Road Class:	Freeway ☐ Arterial ☐ Collector ☐ Local ☐
MTO District		Posted Speed	No. of Lanes
Old County		AADT	% Trucks
Geographic Twp.	Town of Caledon	Inspection Route Sequence	
Structure Type	Steel Pipe	Interchange Number	
Total Deck Length	12.1 (m)	Interchange Structure Number	
Overall Str. Width	(m)	Min. Vertical Clearance	(m)
Total Deck Area	(sq.m)	Special Routes:	☐ Transit ☐ Truck ☐ School ☐ Bicycle
Roadway Width	6.5 (m)	Detour Length Around Bridge	(km)
Skew Angle	0 (Degrees)	Direction of Structure	North - South
No. of Spans	1	Fill on Structure	0.2 (m)
Span Lengths	0.45 (m)		

Historical Data:

Year Built		Year of Last Major Rehab.	
Last OSIM Inspection		Last Evaluation	2005
Last Enhanced OSIM Inspection		Current Load Limit	/ / (tonnes)
Enhanced Access Equipment (ladder, boat lift, etc.)		Load Limit By-Law #	
Last Underwater Inspection		By-Law Expiry Date	
Last Condition Survey			

Rehab History: (Date/description)

Field Inspection Information:			
Date of Inspection:	05/04/2011	Type of Inspection:	■ OSIM ☐ Enhanced OSIM
Inspector:	Mark Kabbes		
Others in Party:	Jeremy Nyenhuis		
Access Equipment Used:	Digital Camera, Measuring Tape, Shovel		
Weather:	sunny		
Temperature:	15° C		

Additional Investigations Required:	Priority		
	None	Normal	Urgent
Material Condition Survey			
Detailed Deck Condition:			
Non-destructive Delamination Survey of Asphalt–Covered Deck:			
Concrete Substructure Condition Survey:			
Detailed Coating Condition Survey:			
Detailed Timber Investigation			
Post-Tensioned Stand Investigation			
Underwater Investigation:			
Fatigue Investigation:			
Seismic Investigation:			
Structure Evaluation:			
Monitoring			
Monitoring of Deformations, Settlements and Movements:			
Monitoring Crack Widths:			

Investigation Notes:

- Inlet is clean
- Outlet is 30% blocked with silt and grass build-up
- Barrel approximately 30% silted in
- The barrel is in poor condition with several large dents present throughout
- The south end of the barrel appears to be disconnected from the rest of the barrel but no damage is present on the roadway

Overall Structure Notes:	
Recommended Work on Structure:	☐ None ☐ Minor Rehab. ☐ Major Rehab. ☐ Replace
Timing of Recommended Work:	☐ 1 to 5 years ☐ 6 to 10 years
Overall Comments:	
Date of Next Inspection:	

Repair and Rehabilitation Required:		Priority			Estimated Construction Cost
Element	Repair and Rehabilitation Required	1 to 5 years	Within 1 year	Urgent	
				Total Cost	

Associated Work:	Comments	Estimated Cost
Approaches		
Detours		
Traffic Control		
Utilities		
Right of Way		
Environmental Study		
Other		
Contingencies		
	Total Cost	

Justification:

Culvert 1327

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Project Title: The Gore Road Culvert Inspections 2011
File No.: MTB019424
Date: May 2011

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Project Title: The Gore Road Culvert Inspections 2011
File No.: MTB019424
Date: May 2011

Ontario Structure Inspection Manual - Inspection Form

MTO Site Number:

Inventory Data:

Structure Name	Culvert No. 1328		
Main Hwy/Road #		On ☐ Under ■	Crossing Type: Navig. Water ☐ Non-Navig. Water Rail ☐ Road ■ Ped. ☐ Other ☐
Hwy/Road Name	The Gore Road		
Structure Location	House Entrance No. 17479 (west side of road) (20m north of House No. 17479)		
Latitude	4864479 (N)	Longitude	590279 (E)
Owner(s)	Regional Municipality of Peel	Heritage Designation:	☐ Not Cons. ☐ Cons./not App. ☐ List/not Desig. ☐ Desig./not List ☐ Desig. & List
MTO Region		Road Class:	Freeway ☐ Arterial ☐ Collector ☐ Local ☐
MTO District		Posted Speed	No. of Lanes
Old County		AADT	% Trucks
Geographic Twp.	Town of Caledon	Inspection Route Sequence	
Structure Type	Corrugated Steel Pipe	Interchange Number	
Total Deck Length	11.7 (m)	Interchange Structure Number	
Overall Str. Width	(m)	Min. Vertical Clearance	(m)
Total Deck Area	(sq.m)	Special Routes:	☐ Transit ☐ Truck ☐ School ☐ Bicycle
Roadway Width	6.0 (m)	Detour Length Around Bridge	(km)
Skew Angle	0 (Degrees)	Direction of Structure	North - South
No. of Spans	1	Fill on Structure	0.3 (m)
Span Lengths	0.5 (m)		

Historical Data:

Year Built		Year of Last Major Rehab.	
Last OSIM Inspection		Last Evaluation	2005
Last Enhanced OSIM Inspection		Current Load Limit	/ / (tonnes)
Enhanced Access Equipment (ladder, boat lift, etc.)		Load Limit By-Law #	
Last Underwater Inspection		By-Law Expiry Date	
Last Condition Survey			

Rehab History: (Date/description)

Field Inspection Information:			
Date of Inspection:	05/04/2011	Type of Inspection:	■ OSIM ☐ Enhanced OSIM
Inspector:	Mark Kabbes		
Others in Party:	Jeremy Nyenhuis		
Access Equipment Used:	Digital Camera, Measuring Tape, Shovel		
Weather:	Sunny		
Temperature:	15° C		

Additional Investigations Required:	Priority		
	None	Normal	Urgent
Material Condition Survey			
Detailed Deck Condition:			
Non-destructive Delamination Survey of Asphalt-Covered Deck:			
Concrete Substructure Condition Survey:			
Detailed Coating Condition Survey:			
Detailed Timber Investigation			
Post-Tensioned Stand Investigation			
Underwater Investigation:			
Fatigue Investigation:			
Seismic Investigation:			
Structure Evaluation:			
Monitoring			
Monitoring of Deformations, Settlements and Movements:			
Monitoring Crack Widths:			

Investigation Notes:

- Inlet is Clean
- Outlet is 20% silted in with a minor dent
- Barrel is generally clean

Overall Structure Notes:	
Recommended Work on Structure:	☐ None ☐ Minor Rehab. ☐ Major Rehab. ☐ Replace
Timing of Recommended Work:	☐ 1 to 5 years ☐ 6 to 10 years
Overall Comments:	
Date of Next Inspection:	

Repair and Rehabilitation Required:		Priority			Estimated Construction Cost
Element	Repair and Rehabilitation Required	1 to 5 years	Within 1 year	Urgent	
				Total Cost	

Associated Work:	Comments	Estimated Cost
Approaches		
Detours		
Traffic Control		
Utilities		
Right of Way		
Environmental Study		
Other		
Contingencies		
	Total Cost	

Justification:

Culvert 1328

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Project Title: The Gore Road Culvert Inspections 2011
File No.: MTB019424
Date: May 2011


05/04/2011


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Ontario Structure Inspection Manual - Inspection Form

MTO Site Number:

Inventory Data:

Structure Name	Culvert No. 1329		
Main Hwy/Road #		On ☐ Under ■	Crossing Type: Navig. Water ☐ Non-Navig. Water ■ Rail ☐ Road ☐ Ped. ☐ Other ☐
Hwy/Road Name	The Gore Road		
Structure Location	House Entrance No. 17354 (West side of road)		
Latitude	4864189 (N)	Longitude	590574 (E)
Owner(s)	Regional Municipality of Peel	Heritage Designation:	☐ Not Cons. ☐ Cons./not App. ☐ List/not Desig. ☐ Desig./not List ☐ Desig. & List
MTO Region		Road Class:	Freeway ☐ Arterial ☐ Collector ☐ Local ☐
MTO District		Posted Speed	No. of Lanes
Old County		AADT	% Trucks
Geographic Twp.	Town of Caledon	Inspection Route Sequence	
Structure Type	Corrugated Steel Pipe	Interchange Number	
Total Deck Length	9.15 (m)	Interchange Structure Number	
Overall Str. Width	(m)	Min. Vertical Clearance	(m)
Total Deck Area	(sq.m)	Special Routes:	☐ Transit ☐ Truck ☐ School ☐ Bicycle
Roadway Width	4.5 (m)	Detour Length Around Bridge	(km)
Skew Angle	0 (Degrees)	Direction of Structure	North - South
No. of Spans	1	Fill on Structure	0.5 (m)
Span Lengths	0.4 (m)		

Historical Data:

Year Built		Year of Last Major Rehab.	
Last OSIM Inspection		Last Evaluation	2005
Last Enhanced OSIM Inspection		Current Load Limit	/ / (tonnes)
Enhanced Access Equipment (ladder, boat lift, etc.)		Load Limit By-Law #	
Last Underwater Inspection		By-Law Expiry Date	
Last Condition Survey			

Rehab History: (Date/description)

Field Inspection Information:			
Date of Inspection:	05/04/2011	Type of Inspection:	■ OSIM ☐ Enhanced OSIM
Inspector:	Mark Kabbes		
Others in Party:	Jeremy Nyenhuis		
Access Equipment Used:	Digital Camera, Measuring Tape, Shovel		
Weather:	Sunny		
Temperature:	15° C		

Additional Investigations Required:	Priority		
	None	Normal	Urgent
Material Condition Survey			
Detailed Deck Condition:			
Non-destructive Delamination Survey of Asphalt–Covered Deck:			
Concrete Substructure Condition Survey:			
Detailed Coating Condition Survey:			
Detailed Timber Investigation			
Post-Tensioned Stand Investigation			
Underwater Investigation:			
Fatigue Investigation:			
Seismic Investigation:			
Structure Evaluation:			
Monitoring			
Monitoring of Deformations, Settlements and Movements:			
Monitoring Crack Widths:			

Investigation Notes:

- Inlet is clean with a minor dent
- Outlet is 40% silted in
- Barrel has a silt build-up in it at the outlet of the culvert, for the rest it is clean

Overall Structure Notes:	
Recommended Work on Structure:	☐ None ☐ Minor Rehab. ☐ Major Rehab. ☐ Replace
Timing of Recommended Work:	☐ 1 to 5 years ☐ 6 to 10 years
Overall Comments:	
Date of Next Inspection:	

Repair and Rehabilitation Required:		Priority			Estimated Construction Cost
Element	Repair and Rehabilitation Required	1 to 5 years	Within 1 year	Urgent	
				Total Cost	

Associated Work:	Comments	Estimated Cost
Approaches		
Detours		
Traffic Control		
Utilities		
Right of Way		
Environmental Study		
Other		
Contingencies		
	Total Cost	

Justification:

Culvert 1329

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Project Title: The Gore Road Culvert Inspections 2011
File No.: MTB019424
Date: May 2011

Ontario Structure Inspection Manual - Inspection Form

MTO Site Number:

Inventory Data:

Structure Name	Culvert No. 1330		
Main Hwy/Road #		On ☐ Under ■	Crossing Type: Navig. Water ☐ Non-Navig. Water ■ Rail ☐ Road ☐ Ped. ☐ Other ☐
Hwy/Road Name	The Gore Road		
Structure Location	House Entrance No. 17340 (West side of road)		
Latitude	4864157 (N)	Longitude	590610 (E)
Owner(s)	Regional Municipality of Peel	Heritage Designation:	☐ Not Cons. ☐ Cons./not App. ☐ List/not Desig. ☐ Desig./not List ☐ Desig. & List
MTO Region		Road Class:	Freeway ☐ Arterial ☐ Collector ☐ Local ☐
MTO District		Posted Speed	No. of Lanes
Old County		AADT	% Trucks
Geographic Twp.	Town of Caledon	Inspection Route Sequence	
Structure Type	Corrugated Steel Pipe	Interchange Number	
Total Deck Length	9.3 (m)	Interchange Structure Number	
Overall Str. Width	(m)	Min. Vertical Clearance	(m)
Total Deck Area	(sq.m)	Special Routes:	☐ Transit ☐ Truck ☐ School ☐ Bicycle
Roadway Width	6.5 (m)	Detour Length Around Bridge	(km)
Skew Angle	0 (Degrees)	Direction of Structure	North - South
No. of Spans	1	Fill on Structure	0.6 (m)
Span Lengths	0.4 (m)		

Historical Data:

Year Built		Year of Last Major Rehab.	
Last OSIM Inspection		Last Evaluation	2005
Last Enhanced OSIM Inspection		Current Load Limit	/ / (tonnes)
Enhanced Access Equipment (ladder, boat lift, etc.)		Load Limit By-Law #	
Last Underwater Inspection		By-Law Expiry Date	
Last Condition Survey			

Rehab History: (Date/description)

Field Inspection Information:			
Date of Inspection:	05/04/2011	Type of Inspection:	■ OSIM ☐ Enhanced OSIM
Inspector:	Mark Kabbes		
Others in Party:	Jeremy Nyenhuis		
Access Equipment Used:	Digital Camera, Measuring Tape, Shovel		
Weather:	Sunny		
Temperature:	15° C		

Additional Investigations Required:	Priority		
	None	Normal	Urgent
Material Condition Survey			
Detailed Deck Condition:			
Non-destructive Delamination Survey of Asphalt–Covered Deck:			
Concrete Substructure Condition Survey:			
Detailed Coating Condition Survey:			
Detailed Timber Investigation			
Post-Tensioned Stand Investigation			
Underwater Investigation:			
Fatigue Investigation:			
Seismic Investigation:			
Structure Evaluation:			
Monitoring			
Monitoring of Deformations, Settlements and Movements:			
Monitoring Crack Widths:			

Investigation Notes:

- Inlet is clean
- Outlet is 25% blocked with gravel and grass build-up
- Silt build-up in barrel even from inlet to outlet

Overall Structure Notes:	
Recommended Work on Structure:	☐ None ☐ Minor Rehab. ☐ Major Rehab. ☐ Replace
Timing of Recommended Work:	☐ 1 to 5 years ☐ 6 to 10 years
Overall Comments:	
Date of Next Inspection:	

Repair and Rehabilitation Required:		Priority			Estimated Construction Cost
Element	Repair and Rehabilitation Required	1 to 5 years	Within 1 year	Urgent	
				Total Cost	

Associated Work:	Comments	Estimated Cost
Approaches		
Detours		
Traffic Control		
Utilities		
Right of Way		
Environmental Study		
Other		
Contingencies		
	Total Cost	

Justification:

Culvert 1330

Burnside

Project Title: The Gore Road Culvert Inspections 2011
File No.: MTB019424
Date: May 2011


05/04/2011


05/04/2011

Ontario Structure Inspection Manual - Inspection Form

MTO Site Number:

Inventory Data:

Structure Name	Culvert No. 1331		
Main Hwy/Road #		On ☐ Under ■	Crossing Type: Navig. Water ☐ Non-Navig. Water ■ Rail ☐ Road ☐ Ped. ☐ Other ☐
Hwy/Road Name	The Gore Road		
Structure Location	Field Entrance No. 17029 (east side of road) (30m south of House No. 17029)		
Latitude	4863484 (N)	Longitude	591305 (E)
Owner(s)	Regional Municipality of Peel	Heritage Designation:	☐ Not Cons. ☐ Cons./not App. ☐ List/not Desig. ☐ Desig./not List ☐ Desig. & List
MTO Region		Road Class:	Freeway ☐ Arterial ☐ Collector ☐ Local ☐
MTO District		Posted Speed	No. of Lanes
Old County		AADT	% Trucks
Geographic Twp.	Town of Caledon	Inspection Route Sequence	
Structure Type	Corrugated Steel Pipe	Interchange Number	
Total Deck Length	6.15 (m)	Interchange Structure Number	
Overall Str. Width	(m)	Min. Vertical Clearance	(m)
Total Deck Area	(sq.m)	Special Routes:	☐ Transit ☐ Truck ☐ School ☐ Bicycle
Roadway Width	3.5 (m)	Detour Length Around Bridge	(km)
Skew Angle	0 (Degrees)	Direction of Structure	North - South
No. of Spans	1	Fill on Structure	0.6 (m)
Span Lengths	0.4 (m)		

Historical Data:

Year Built		Year of Last Major Rehab.	
Last OSIM Inspection		Last Evaluation	2005
Last Enhanced OSIM Inspection		Current Load Limit	/ / (tonnes)
Enhanced Access Equipment (ladder, boat lift, etc.)		Load Limit By-Law #	
Last Underwater Inspection		By-Law Expiry Date	
Last Condition Survey			

Rehab History: (Date/description)

Field Inspection Information:			
Date of Inspection:	05/04/2011	Type of Inspection:	■ OSIM ☐ Enhanced OSIM
Inspector:	Mark Kabbes		
Others in Party:	Jeremy Nyenhuis		
Access Equipment Used:	Digital Camera, Measuring Tape, Shovel		
Weather:	Sunny		
Temperature:	15° C		

Additional Investigations Required:	Priority		
	None	Normal	Urgent
Material Condition Survey			
Detailed Deck Condition:			
Non-destructive Delamination Survey of Asphalt–Covered Deck:			
Concrete Substructure Condition Survey:			
Detailed Coating Condition Survey:			
Detailed Timber Investigation			
Post-Tensioned Stand Investigation			
Underwater Investigation:			
Fatigue Investigation:			
Seismic Investigation:			
Structure Evaluation:			
Monitoring			
Monitoring of Deformations, Settlements and Movements:			
Monitoring Crack Widths:			

Investigation Notes:

- The Barrel is approximately 15% filled with leaves from inlet to outlet
- Minor dents are present along the length of the culvert

Overall Structure Notes:	
Recommended Work on Structure:	☐ None ☐ Minor Rehab. ☐ Major Rehab. ☐ Replace
Timing of Recommended Work:	☐ 1 to 5 years ☐ 6 to 10 years
Overall Comments:	
Date of Next Inspection:	

Repair and Rehabilitation Required:		Priority			Estimated Construction Cost
Element	Repair and Rehabilitation Required	1 to 5 years	Within 1 year	Urgent	
				Total Cost	

Associated Work:	Comments	Estimated Cost
Approaches		
Detours		
Traffic Control		
Utilities		
Right of Way		
Environmental Study		
Other		
Contingencies		
	Total Cost	

Justification:

Culvert 1331


05/04/2011


05/04/2011

Ontario Structure Inspection Manual - Inspection Form

MTO Site Number:

Inventory Data:

Structure Name	Culvert No. 1332		
Main Hwy/Road #	On ☐ Under ■	Crossing Type:	Navig. Water ☐ Non-Navig. Water ■ Rail ☐ Road ☐ Ped. ☐ Other ☐
Hwy/Road Name	The Gore Road		
Structure Location	House Entrance No. 17029 (east side of road)		
Latitude	4863508 (N)	Longitude	591282 (E)
Owner(s)	Regional Municipality of Peel	Heritage Designation:	☐ Not Cons. ☐ Cons./not App. ☐ List/not Desig. ☐ Desig./not List ☐ Desig. & List
MTO Region		Road Class:	Freeway ☐ Arterial ☐ Collector ☐ Local ☐
MTO District		Posted Speed	No. of Lanes
Old County		AADT	% Trucks
Geographic Twp.	Town of Caledon	Inspection Route Sequence	
Structure Type	Corrugated Steel Pipe	Interchange Number	
Total Deck Length	7.4 (m)	Interchange Structure Number	
Overall Str. Width	(m)	Min. Vertical Clearance	(m)
Total Deck Area	(sq.m)	Special Routes:	☐ Transit ☐ Truck ☐ School ☐ Bicycle
Roadway Width	4.2 (m)	Detour Length Around Bridge	(km)
Skew Angle	0 (Degrees)	Direction of Structure	North - South
No. of Spans	1	Fill on Structure	0.7 (m)
Span Lengths	0.4 (m)		

Historical Data:

Year Built		Year of Last Major Rehab.	
Last OSIM Inspection		Last Evaluation	2005
Last Enhanced OSIM Inspection		Current Load Limit	/ / (tonnes)
Enhanced Access Equipment (ladder, boat lift, etc.)		Load Limit By-Law #	
Last Underwater Inspection		By-Law Expiry Date	
Last Condition Survey			

Rehab History: (Date/description)

Field Inspection Information:			
Date of Inspection:	05/04/2011	Type of Inspection:	■ OSIM ☐ Enhanced OSIM
Inspector:	Mark Kabbes		
Others in Party:	Jeremy Nyenhuis		
Access Equipment Used:	Digital Camera, Measuring Tape, Shovel		
Weather:	Sunny		
Temperature:	15° C		

Additional Investigations Required:	Priority		
	None	Normal	Urgent
Material Condition Survey			
Detailed Deck Condition:			
Non-destructive Delamination Survey of Asphalt-Covered Deck:			
Concrete Substructure Condition Survey:			
Detailed Coating Condition Survey:			
Detailed Timber Investigation			
Post-Tensioned Stand Investigation			
Underwater Investigation:			
Fatigue Investigation:			
Seismic Investigation:			
Structure Evaluation:			
Monitoring			
Monitoring of Deformations, Settlements and Movements:			
Monitoring Crack Widths:			

Investigation Notes:

- Inlet is clean
- Outlet is 10% blocked with silt and grass build-up
- Barrel has minor silt within it

Overall Structure Notes:	
Recommended Work on Structure:	☐ None ☐ Minor Rehab. ☐ Major Rehab. ☐ Replace
Timing of Recommended Work:	☐ 1 to 5 years ☐ 6 to 10 years
Overall Comments:	
Date of Next Inspection:	

Repair and Rehabilitation Required:		Priority			Estimated Construction Cost
Element	Repair and Rehabilitation Required	1 to 5 years	Within 1 year	Urgent	
				Total Cost	

Associated Work:	Comments	Estimated Cost
Approaches		
Detours		
Traffic Control		
Utilities		
Right of Way		
Environmental Study		
Other		
Contingencies		
	Total Cost	

Justification:

Culvert 1332

BURNSIDE

Project Title: The Gore Road Culvert Inspections 2011
File No.: MTB019424
Date: May 2011

Ontario Structure Inspection Manual - Inspection Form

MTO Site Number:

Inventory Data:

Structure Name	Culvert No. 1333		
Main Hwy/Road #	On ☐ Under ■	Crossing Type:	Navig. Water ☐ Non-Navig. Water ■ Rail ☐ Road ☐ Ped. ☐ Other ☐
Hwy/Road Name	The Gore Road		
Structure Location	House Entrance No. 17043 (east side of road)		
Latitude	4863539 (N)	Longitude	591251 (E)
Owner(s)	Regional Municipality of Peel	Heritage Designation:	☐ Not Cons. ☐ Cons./not App. ☐ List/not Desig. ☐ Desig./not List ☐ Desig. & List
MTO Region		Road Class:	Freeway ☐ Arterial ☐ Collector ☐ Local ☐
MTO District		Posted Speed	No. of Lanes
Old County		AADT	% Trucks
Geographic Twp.	Town of Caledon	Inspection Route Sequence	
Structure Type	Corrugated Steel Pipe	Interchange Number	
Total Deck Length	13.6 (m)	Interchange Structure Number	
Overall Str. Width	(m)	Min. Vertical Clearance	(m)
Total Deck Area	(sq.m)	Special Routes:	☐ Transit ☐ Truck ☐ School ☐ Bicycle
Roadway Width	3.9 (m)	Detour Length Around Bridge	(km)
Skew Angle	0 (Degrees)	Direction of Structure	North - South
No. of Spans	1	Fill on Structure	0.3 (m)
Span Lengths	0.4 (m)		

Historical Data:

Year Built		Year of Last Major Rehab.	
Last OSIM Inspection		Last Evaluation	2005
Last Enhanced OSIM Inspection		Current Load Limit	/ / (tonnes)
Enhanced Access Equipment (ladder, boat lift, etc.)		Load Limit By-Law #	
Last Underwater Inspection		By-Law Expiry Date	
Last Condition Survey			

Rehab History: (Date/description)

Field Inspection Information:			
Date of Inspection:	05/04/2011	Type of Inspection:	■ OSIM ☐ Enhanced OSIM
Inspector:	Mark Kabbes		
Others in Party:	Jeremy Nyenhuis		
Access Equipment Used:	Digital Camera, Measuring Tape, Shovel		
Weather:	Sunny		
Temperature:	15° C		

Additional Investigations Required:	Priority		
	None	Normal	Urgent
Material Condition Survey			
Detailed Deck Condition:			
Non-destructive Delamination Survey of Asphalt–Covered Deck:			
Concrete Substructure Condition Survey:			
Detailed Coating Condition Survey:			
Detailed Timber Investigation			
Post-Tensioned Stand Investigation			
Underwater Investigation:			
Fatigue Investigation:			
Seismic Investigation:			
Structure Evaluation:			
Monitoring			
Monitoring of Deformations, Settlements and Movements:			
Monitoring Crack Widths:			

Investigation Notes:

- Inlet is partially blocked with leaves but is otherwise clean
- Outlet is 70% blocked with silt and grass build-up
- Barrel is silted in up to 70% at the outlet

Overall Structure Notes:	
Recommended Work on Structure:	☐ None ☐ Minor Rehab. ☐ Major Rehab. ☐ Replace
Timing of Recommended Work:	☐ 1 to 5 years ☐ 6 to 10 years
Overall Comments:	
Date of Next Inspection:	

Repair and Rehabilitation Required:		Priority			Estimated Construction Cost
Element	Repair and Rehabilitation Required	1 to 5 years	Within 1 year	Urgent	
				Total Cost	

Associated Work:	Comments	Estimated Cost
Approaches		
Detours		
Traffic Control		
Utilities		
Right of Way		
Environmental Study		
Other		
Contingencies		
	Total Cost	

Justification:

Culvert 1333

BURNSIDE

Project Title: The Gore Road Culvert Inspections 2011
File No.: MTB019424
Date: May 2011

Ontario Structure Inspection Manual - Inspection Form

MTO Site Number:

Inventory Data:

Structure Name	Culvert No. 1334		
Main Hwy/Road #		On ☐ Under ■	Crossing Type: Navig. Water ☐ Non-Navig. Water ■ Rail ☐ Road ☐ Ped. ☐ Other ☐
Hwy/Road Name	The Gore Road		
Structure Location	House Entrance No. 17991 (East side of road)		
Latitude	4865514 (N)	Longitude	589250 (E)
Owner(s)	Regional Municipality of Peel	Heritage Designation:	☐ Not Cons. ☐ Cons./not App. ☐ List/not Desig. ☐ Desig./not List ☐ Desig. & List
MTO Region		Road Class:	Freeway ☐ Arterial ☐ Collector ☐ Local ☐
MTO District		Posted Speed	No. of Lanes
Old County		AADT	% Trucks
Geographic Twp.	Town of Caledon	Inspection Route Sequence	
Structure Type	Corrugated Steel Pipe	Interchange Number	
Total Deck Length	7.3 (m)	Interchange Structure Number	
Overall Str. Width	(m)	Min. Vertical Clearance	(m)
Total Deck Area	(sq.m)	Special Routes:	☐ Transit ☐ Truck ☐ School ☐ Bicycle
Roadway Width	5.4 (m)	Detour Length Around Bridge	(km)
Skew Angle	0 (Degrees)	Direction of Structure	North - South
No. of Spans	1	Fill on Structure	0.2 (m)
Span Lengths	0.4 (m)		

Historical Data:

Year Built		Year of Last Major Rehab.	
Last OSIM Inspection		Last Evaluation	2005
Last Enhanced OSIM Inspection		Current Load Limit	/ / (tonnes)
Enhanced Access Equipment (ladder, boat lift, etc.)		Load Limit By-Law #	
Last Underwater Inspection		By-Law Expiry Date	
Last Condition Survey			

Rehab History: (Date/description)

Field Inspection Information:			
Date of Inspection:	05/04/2011	Type of Inspection:	■ OSIM ☐ Enhanced OSIM
Inspector:	Mark Kabbes		
Others in Party:	Jeremy Nyenhuis		
Access Equipment Used:	Digital Camera, Measuring Tape, Shovel		
Weather:	Sunny		
Temperature:	15° C		

Additional Investigations Required:	Priority		
	None	Normal	Urgent
Material Condition Survey			
Detailed Deck Condition:			
Non-destructive Delamination Survey of Asphalt–Covered Deck:			
Concrete Substructure Condition Survey:			
Detailed Coating Condition Survey:			
Detailed Timber Investigation			
Post-Tensioned Stand Investigation			
Underwater Investigation:			
Fatigue Investigation:			
Seismic Investigation:			
Structure Evaluation:			
Monitoring			
Monitoring of Deformations, Settlements and Movements:			
Monitoring Crack Widths:			

Investigation Notes:

- Inlet is 20% silted in
- Outlet is 70% blocked with silt and grass build-up
- Silt build-up in barrel even from inlet to outlet

Overall Structure Notes:	
Recommended Work on Structure:	☐ None ☐ Minor Rehab. ☐ Major Rehab. ☐ Replace
Timing of Recommended Work:	☐ 1 to 5 years ☐ 6 to 10 years
Overall Comments:	
Date of Next Inspection:	

Repair and Rehabilitation Required:		Priority			Estimated Construction Cost
Element	Repair and Rehabilitation Required	1 to 5 years	Within 1 year	Urgent	
				Total Cost	

Associated Work:	Comments	Estimated Cost
Approaches		
Detours		
Traffic Control		
Utilities		
Right of Way		
Environmental Study		
Other		
Contingencies		
	Total Cost	

Justification:

Culvert 1334


05/04/2011


05/04/2011

Ontario Structure Inspection Manual - Inspection Form

MTO Site Number:

Inventory Data:

Structure Name	Culvert No. 1335		
Main Hwy/Road #		On ☐ Under ■	Crossing Type: Navig. Water ☐ Non-Navig. Water ■ Rail ☐ Road ☐ Ped. ☐ Other ☐
Hwy/Road Name	The Gore Road		
Structure Location	Intersection of Gore Road and Coolihans Side Road (East)		
Latitude	4867749 (N)	Longitude	586990 (E)
Owner(s)	Regional Municipality of Peel	Heritage Designation:	☐ Not Cons. ☐ Cons./not App. ☐ List/not Desig. ☐ Desig./not List ☐ Desig. & List
MTO Region		Road Class:	Freeway ☐ Arterial ☐ Collector ☐ Local ☐
MTO District		Posted Speed	70 — No. of Lanes 2
Old County		AADT	— % Trucks
Geographic Twp.	Town of Caledon	Inspection Route Sequence	
Structure Type	Corrugated Steel Pipe	Interchange Number	
Total Deck Length	14.5 (m)	Interchange Structure Number	
Overall Str. Width	(m)	Min. Vertical Clearance	(m)
Total Deck Area	(sq.m)	Special Routes:	☐ Transit ☐ Truck ☐ School ☐ Bicycle
Roadway Width	12.0 (m)	Detour Length Around Bridge	(km)
Skew Angle	0 (Degrees)	Direction of Structure	North - South
No. of Spans	1	Fill on Structure	0.6 (m)
Span Lengths	0.4 (m)		

Historical Data:

Year Built		Year of Last Major Rehab.	
Last OSIM Inspection		Last Evaluation	2005
Last Enhanced OSIM Inspection		Current Load Limit	/ / (tonnes)
Enhanced Access Equipment (ladder, boat lift, etc.)		Load Limit By-Law #	
Last Underwater Inspection		By-Law Expiry Date	
Last Condition Survey			

Rehab History: (Date/description)

Field Inspection Information:			
Date of Inspection:	04/27/2011	Type of Inspection:	■ OSIM ☐ Enhanced OSIM
Inspector:	Mark Kabbes		
Others in Party:	Jeremy Nyenhuis		
Access Equipment Used:	Digital Camera, Measuring Tape, Shovel		
Weather:	Overcast/Raining		
Temperature:	18° C		

Additional Investigations Required:	Priority		
	None	Normal	Urgent
Material Condition Survey			
Detailed Deck Condition:			
Non-destructive Delamination Survey of Asphalt–Covered Deck:			
Concrete Substructure Condition Survey:			
Detailed Coating Condition Survey:			
Detailed Timber Investigation			
Post-Tensioned Stand Investigation			
Underwater Investigation:			
Fatigue Investigation:			
Seismic Investigation:			
Structure Evaluation:			
Monitoring			
Monitoring of Deformations, Settlements and Movements:			
Monitoring Crack Widths:			

Investigation Notes:

- Inlet is completely plugged
- Outlet is 75% blocked with silt, gravel and grass build-up
- Barrel is completely plugged

Overall Structure Notes:	
Recommended Work on Structure:	☐ None ☐ Minor Rehab. ☐ Major Rehab. ☐ Replace
Timing of Recommended Work:	☐ 1 to 5 years ☐ 6 to 10 years
Overall Comments:	
Date of Next Inspection:	

Repair and Rehabilitation Required:		Priority			Estimated Construction Cost
Element	Repair and Rehabilitation Required	1 to 5 years	Within 1 year	Urgent	
				Total Cost	

Associated Work:	Comments	Estimated Cost
Approaches		
Detours		
Traffic Control		
Utilities		
Right of Way		
Environmental Study		
Other		
Contingencies		
	Total Cost	

Justification:

Culvert 1335

BURNSIDE

Project Title: The Gore Road Culvert Inspections 2011
File No.: MTB019424
Date: May 2011

Ontario Structure Inspection Manual - Inspection Form

MTO Site Number:

Inventory Data:

Structure Name	Culvert No. 1336		
Main Hwy/Road #		On ☐ Under ■	Crossing Type: Navig. Water ☐ Non-Navig. Water ■ Rail ☐ Road ☐ Ped. ☐ Other ☐
Hwy/Road Name	The Gore Road		
Structure Location	House Entrance No. 18878 (West side of road)		
Latitude	4867501 (N)	Longitude	587237 (E)
Owner(s)	Regional Municipality of Peel	Heritage Designation:	☐ Not Cons. ☐ Cons./not App. ☐ List/not Desig. ☐ Desig./not List ☐ Desig. & List
MTO Region		Road Class:	Freeway ☐ Arterial ☐ Collector ☐ Local ☐
MTO District		Posted Speed	No. of Lanes
Old County		AADT	% Trucks
Geographic Twp.	Town of Caledon	Inspection Route Sequence	
Structure Type	Corrugated Steel Pipe	Interchange Number	
Total Deck Length	12.5 (m)	Interchange Structure Number	
Overall Str. Width	(m)	Min. Vertical Clearance	(m)
Total Deck Area	(sq.m)	Special Routes:	☐ Transit ☐ Truck ☐ School ☐ Bicycle
Roadway Width	6.0 (m)	Detour Length Around Bridge	(km)
Skew Angle	0 (Degrees)	Direction of Structure	North - South
No. of Spans	1	Fill on Structure	0.8 (m)
Span Lengths	0.4 (m)		

Historical Data:

Year Built		Year of Last Major Rehab.	
Last OSIM Inspection		Last Evaluation	2005
Last Enhanced OSIM Inspection		Current Load Limit	/ / (tonnes)
Enhanced Access Equipment (ladder, boat lift, etc.)		Load Limit By-Law #	
Last Underwater Inspection		By-Law Expiry Date	
Last Condition Survey			

Rehab History: (Date/description)

Field Inspection Information:			
Date of Inspection:	04/26/2011	Type of Inspection:	■ OSIM ☐ Enhanced OSIM
Inspector:	Mark Kabbes		
Others in Party:	Jeremy Nyenhuis		
Access Equipment Used:	Digital Camera, Measuring Tape, Shovel		
Weather:	Overcast/raining		
Temperature:	18° C		

Additional Investigations Required:	Priority		
	None	Normal	Urgent
Material Condition Survey			
Detailed Deck Condition:			
Non-destructive Delamination Survey of Asphalt–Covered Deck:			
Concrete Substructure Condition Survey:			
Detailed Coating Condition Survey:			
Detailed Timber Investigation			
Post-Tensioned Stand Investigation			
Underwater Investigation:			
Fatigue Investigation:			
Seismic Investigation:			
Structure Evaluation:			
Monitoring			
Monitoring of Deformations, Settlements and Movements:			
Monitoring Crack Widths:			

Investigation Notes:

- Inlet is clean but dented
- Outlet is 40% blocked with silt and grass build-up
- Barrel has a silt build-up in it at the outlet of the culvert, for the rest it is clean

Overall Structure Notes:	
Recommended Work on Structure:	☐ None ☐ Minor Rehab. ☐ Major Rehab. ☐ Replace
Timing of Recommended Work:	☐ 1 to 5 years ☐ 6 to 10 years
Overall Comments:	
Date of Next Inspection:	

Repair and Rehabilitation Required:		Priority			Estimated Construction Cost
Element	Repair and Rehabilitation Required	1 to 5 years	Within 1 year	Urgent	
				Total Cost	

Associated Work:	Comments	Estimated Cost
Approaches		
Detours		
Traffic Control		
Utilities		
Right of Way		
Environmental Study		
Other		
Contingencies		
	Total Cost	

Justification:

Culvert 1336

BURNSIDE

Project Title: The Gore Road Culvert Inspections 2011
File No.: MTB019424
Date: May 2011

Ontario Structure Inspection Manual - Inspection Form

MTO Site Number:

Inventory Data:

Structure Name	Culvert No. 1337		
Main Hwy/Road #		On ☐ Under ■	Crossing Type: Navig. Water ☐ Non-Navig. Water ■ Rail ☐ Road ☐ Ped. ☐ Other ☐
Hwy/Road Name	The Gore Road		
Structure Location	House Entrance No. 18436 (West side of road)		
Latitude	4866529 (N)	Longitude	588207 (E)
Owner(s)	Regional Municipality of Peel	Heritage Designation:	☐ Not Cons. ☐ Cons./not App. ☐ List/not Desig. ☐ Desig./not List ☐ Desig. & List
MTO Region		Road Class:	Freeway ☐ Arterial ☐ Collector ☐ Local ☐
MTO District		Posted Speed	No. of Lanes
Old County		AADT	% Trucks
Geographic Twp.	Town of Caledon	Inspection Route Sequence	
Structure Type	Corrugated Steel Pipe	Interchange Number	
Total Deck Length	10.0 (m)	Interchange Structure Number	
Overall Str. Width	(m)	Min. Vertical Clearance	(m)
Total Deck Area	(sq.m)	Special Routes:	☐ Transit ☐ Truck ☐ School ☐ Bicycle
Roadway Width	7.0 (m)	Detour Length Around Bridge	(km)
Skew Angle	0 (Degrees)	Direction of Structure	North - South
No. of Spans	1	Fill on Structure	0.5 (m)
Span Lengths	0.4 (m)		

Historical Data:

Year Built		Year of Last Major Rehab.	
Last OSIM Inspection		Last Evaluation	2005
Last Enhanced OSIM Inspection		Current Load Limit	/ / (tonnes)
Enhanced Access Equipment (ladder, boat lift, etc.)		Load Limit By-Law #	
Last Underwater Inspection		By-Law Expiry Date	
Last Condition Survey			

Rehab History: (Date/description)

Field Inspection Information:			
Date of Inspection:	04/27/2011	Type of Inspection:	■ OSIM ☐ Enhanced OSIM
Inspector:	Mark Kabbes		
Others in Party:	Jeremy Nyenhuis		
Access Equipment Used:	Digital Camera, Measuring Tape, Shovel		
Weather:	Overcast/raining		
Temperature:	18° C		

Additional Investigations Required:	Priority		
	None	Normal	Urgent
Material Condition Survey			
Detailed Deck Condition:			
Non-destructive Delamination Survey of Asphalt–Covered Deck:			
Concrete Substructure Condition Survey:			
Detailed Coating Condition Survey:			
Detailed Timber Investigation			
Post-Tensioned Stand Investigation			
Underwater Investigation:			
Fatigue Investigation:			
Seismic Investigation:			
Structure Evaluation:			
Monitoring			
Monitoring of Deformations, Settlements and Movements:			
Monitoring Crack Widths:			

Investigation Notes:

- Inlet is 20% blocked with silt and leafs
- Inlet is dented and not round
- Outlet is 20% blocked with silt and leafs
- Outlet has a minor dent
- Barrel has numerous dents
- Barrel is silted in with leafs present (due to leafs unable to determine amount or silt in barrel)

Overall Structure Notes:	
Recommended Work on Structure:	☐ None ☐ Minor Rehab. ☐ Major Rehab. ☐ Replace
Timing of Recommended Work:	☐ 1 to 5 years ☐ 6 to 10 years
Overall Comments:	
Date of Next Inspection:	

Repair and Rehabilitation Required:		Priority			Estimated Construction Cost
Element	Repair and Rehabilitation Required	1 to 5 years	Within 1 year	Urgent	
				Total Cost	

Associated Work:	Comments	Estimated Cost
Approaches		
Detours		
Traffic Control		
Utilities		
Right of Way		
Environmental Study		
Other		
Contingencies		
	Total Cost	

Justification:

Culvert 1337

BURNSIDE

Project Title: The Gore Road Culvert Inspections 2011
File No.: MTB019424
Date: May 2011

Ontario Structure Inspection Manual - Inspection Form

MTO Site Number:

Inventory Data:

Structure Name	Culvert No. 1338		
Main Hwy/Road #		On ☐ Under ■	Crossing Type: Navig. Water ☐ Non-Navig. Water ■ Rail ☐ Road ☐ Ped. ☐ Other ☐
Hwy/Road Name	The Gore Road		
Structure Location	House Entrance No. 17682 (West side of road)		
Latitude	4864898 (N)	Longitude	589856 (E)
Owner(s)	Regional Municipality of Peel	Heritage Designation:	☐ Not Cons. ☐ Cons./not App. ☐ List/not Desig. ☐ Desig./not List ☐ Desig. & List
MTO Region		Road Class:	Freeway ☐ Arterial ☐ Collector ☐ Local ☐
MTO District		Posted Speed	No. of Lanes
Old County		AADT	% Trucks
Geographic Twp.	Town of Caledon	Inspection Route Sequence	
Structure Type	Corrugated Steel Pipe	Interchange Number	
Total Deck Length	8.10 (m)	Interchange Structure Number	
Overall Str. Width	(m)	Min. Vertical Clearance	(m)
Total Deck Area	(sq.m)	Special Routes:	☐ Transit ☐ Truck ☐ School ☐ Bicycle
Roadway Width	3.35 (m)	Detour Length Around Bridge	(km)
Skew Angle	0 (Degrees)	Direction of Structure	North - South
No. of Spans	1	Fill on Structure	0.7 (m)
Span Lengths	0.4 (m)		

Historical Data:

Year Built		Year of Last Major Rehab.	
Last OSIM Inspection		Last Evaluation	2005
Last Enhanced OSIM Inspection		Current Load Limit	/ / (tonnes)
Enhanced Access Equipment (ladder, boat lift, etc.)		Load Limit By-Law #	
Last Underwater Inspection		By-Law Expiry Date	
Last Condition Survey			

Rehab History: (Date/description)

Field Inspection Information:			
Date of Inspection:	05/04/2011	Type of Inspection:	■ OSIM ☐ Enhanced OSIM
Inspector:	Mark Kabbes		
Others in Party:	Jeremy Nyenhuis		
Access Equipment Used:	Digital Camera, Measuring Tape, Shovel		
Weather:	Sunny		
Temperature:	15° C		

Additional Investigations Required:	Priority		
	None	Normal	Urgent
Material Condition Survey			
Detailed Deck Condition:			
Non-destructive Delamination Survey of Asphalt–Covered Deck:			
Concrete Substructure Condition Survey:			
Detailed Coating Condition Survey:			
Detailed Timber Investigation			
Post-Tensioned Stand Investigation			
Underwater Investigation:			
Fatigue Investigation:			
Seismic Investigation:			
Structure Evaluation:			
Monitoring			
Monitoring of Deformations, Settlements and Movements:			
Monitoring Crack Widths:			

Investigation Notes:

- Inlet is 30% silted in
- Outlet is clean, rusted and flows drop 0.2m to the ditch
- Barrel has 0 to 30%of silt build up in it with a small dent in the top north end
- Barrel has rust on it all the way around

Overall Structure Notes:	
Recommended Work on Structure:	☐ None ☐ Minor Rehab. ☐ Major Rehab. ☐ Replace
Timing of Recommended Work:	☐ 1 to 5 years ☐ 6 to 10 years
Overall Comments:	
Date of Next Inspection:	

Repair and Rehabilitation Required:		Priority			Estimated Construction Cost
Element	Repair and Rehabilitation Required	1 to 5 years	Within 1 year	Urgent	
				Total Cost	

Associated Work:	Comments	Estimated Cost
Approaches		
Detours		
Traffic Control		
Utilities		
Right of Way		
Environmental Study		
Other		
Contingencies		
	Total Cost	

Justification:

Culvert 1338


05/04/2011


05/04/2011

Ontario Structure Inspection Manual - Inspection Form

MTO Site Number:

Inventory Data:

Structure Name	Culvert No. 1339		
Main Hwy/Road #		On ☐ Under ■	Crossing Type: Navig. Water ☐ Non-Navig. Water ■ Rail ☐ Road ■ Ped. ☐ Other ☐
Hwy/Road Name	The Gore Road		
Structure Location	Field Entrance No. 17354 (West side of road)		
Latitude	4864245 (N)	Longitude	5904516 (E)
Owner(s)	Regional Municipality of Peel	Heritage Designation:	☐ Not Cons. ☐ Cons./not App. ☐ List/not Desig. ☐ Desig./not List ☐ Desig. & List
MTO Region		Road Class:	Freeway ☐ Arterial ☐ Collector ☐ Local ☐
MTO District		Posted Speed	No. of Lanes
Old County		AADT	% Trucks
Geographic Twp.	Town of Caledon	Inspection Route Sequence	
Structure Type	Corrugated Steel Pipe	Interchange Number	
Total Deck Length	6.1 (m)	Interchange Structure Number	
Overall Str. Width	(m)	Min. Vertical Clearance	(m)
Total Deck Area	(sq.m)	Special Routes:	☐ Transit ☐ Truck ☐ School ☐ Bicycle
Roadway Width	3.4 (m)	Detour Length Around Bridge	(km)
Skew Angle	0 (Degrees)	Direction of Structure	North - South
No. of Spans	1	Fill on Structure	1.0 (m)
Span Lengths	0.4 (m)		

Historical Data:

Year Built		Year of Last Major Rehab.	
Last OSIM Inspection		Last Evaluation	2005
Last Enhanced OSIM Inspection		Current Load Limit	/ / (tonnes)
Enhanced Access Equipment (ladder, boat lift, etc.)		Load Limit By-Law #	
Last Underwater Inspection		By-Law Expiry Date	
Last Condition Survey			

Rehab History: (Date/description)

Field Inspection Information:			
Date of Inspection:	05/04/2011	Type of Inspection:	■ OSIM ☐ Enhanced OSIM
Inspector:	Mark Kabbes		
Others in Party:	Jeremy Nyenhuis		
Access Equipment Used:	Digital Camera, Measuring Tape, Shovel		
Weather:	Sunny		
Temperature:	15° C		

Additional Investigations Required:	Priority		
	None	Normal	Urgent
Material Condition Survey			
Detailed Deck Condition:			
Non-destructive Delamination Survey of Asphalt–Covered Deck:			
Concrete Substructure Condition Survey:			
Detailed Coating Condition Survey:			
Detailed Timber Investigation			
Post-Tensioned Stand Investigation			
Underwater Investigation:			
Fatigue Investigation:			
Seismic Investigation:			
Structure Evaluation:			
Monitoring			
Monitoring of Deformations, Settlements and Movements:			
Monitoring Crack Widths:			

Investigation Notes:

- Inlet is 10% silted in
- Outlet is 10% silted in
- Barrel is 10% silted in

Overall Structure Notes:	
Recommended Work on Structure:	☐ None ☐ Minor Rehab. ☐ Major Rehab. ☐ Replace
Timing of Recommended Work:	☐ 1 to 5 years ☐ 6 to 10 years
Overall Comments:	
Date of Next Inspection:	

Repair and Rehabilitation Required:		Priority			Estimated Construction Cost
Element	Repair and Rehabilitation Required	1 to 5 years	Within 1 year	Urgent	
				Total Cost	

Associated Work:	Comments	Estimated Cost
Approaches		
Detours		
Traffic Control		
Utilities		
Right of Way		
Environmental Study		
Other		
Contingencies		
	Total Cost	

Justification:

Culvert 1339


05/04/2011


05/04/2011

Ontario Structure Inspection Manual - Inspection Form

MTO Site Number:

Inventory Data:

Structure Name	Culvert No. 1340		
Main Hwy/Road #		On ☐ Under ■	Crossing Type: Navig. Water ☐ Non-Navig. Water ■ Rail ☐ Road ☐ Ped. ☐ Other ☐
Hwy/Road Name	The Gore Road		
Structure Location	House Entrance No. 17412 (West side of road)		
Latitude	4864283 (N)	Longitude	590481 (E)
Owner(s)	Regional Municipality of Peel	Heritage Designation:	☐ Not Cons. ☐ Cons./not App. ☐ List/not Desig. ☐ Desig./not List ☐ Desig. & List
MTO Region		Road Class:	Freeway ☐ Arterial ☐ Collector ☐ Local ☐
MTO District		Posted Speed	No. of Lanes
Old County		AADT	% Trucks
Geographic Twp.	Town of Caledon	Inspection Route Sequence	
Structure Type	Corrugated Steel Pipe	Interchange Number	
Total Deck Length	6.0 (m)	Interchange Structure Number	
Overall Str. Width	(m)	Min. Vertical Clearance	(m)
Total Deck Area	(sq.m)	Special Routes:	☐ Transit ☐ Truck ☐ School ☐ Bicycle
Roadway Width	3.4 (m)	Detour Length Around Bridge	(km)
Skew Angle	0 (Degrees)	Direction of Structure	North - South
No. of Spans	1	Fill on Structure	0.6 (m)
Span Lengths	0.35 (m)		

Historical Data:

Year Built		Year of Last Major Rehab.	
Last OSIM Inspection		Last Evaluation	2005
Last Enhanced OSIM Inspection		Current Load Limit	/ / (tonnes)
Enhanced Access Equipment (ladder, boat lift, etc.)		Load Limit By-Law #	
Last Underwater Inspection		By-Law Expiry Date	
Last Condition Survey			

Rehab History: (Date/description)

Field Inspection Information:			
Date of Inspection:	05/04/2011	Type of Inspection:	■ OSIM ☐ Enhanced OSIM
Inspector:	Mark Kabbes		
Others in Party:	Jeremy Nyenhuis		
Access Equipment Used:	Digital Camera, Measuring Tape, Shovel		
Weather:	Sunny		
Temperature:	15° C		

Additional Investigations Required:	Priority		
	None	Normal	Urgent
Material Condition Survey			
Detailed Deck Condition:			
Non-destructive Delamination Survey of Asphalt–Covered Deck:			
Concrete Substructure Condition Survey:			
Detailed Coating Condition Survey:			
Detailed Timber Investigation			
Post-Tensioned Stand Investigation			
Underwater Investigation:			
Fatigue Investigation:			
Seismic Investigation:			
Structure Evaluation:			
Monitoring			
Monitoring of Deformations, Settlements and Movements:			
Monitoring Crack Widths:			

Investigation Notes:

- Inlet is 75% plugged with silt and gravel
- Outlet is completely plugged with silt and gravel
- Barrel is assumed to be plugged
- The SBGR post is directly on top of the culvert

Overall Structure Notes:	
Recommended Work on Structure:	☐ None ☐ Minor Rehab. ☐ Major Rehab. ☐ Replace
Timing of Recommended Work:	☐ 1 to 5 years ☐ 6 to 10 years
Overall Comments:	
Date of Next Inspection:	

Repair and Rehabilitation Required:		Priority			Estimated Construction Cost
Element	Repair and Rehabilitation Required	1 to 5 years	Within 1 year	Urgent	
				Total Cost	

Associated Work:	Comments	Estimated Cost
Approaches		
Detours		
Traffic Control		
Utilities		
Right of Way		
Environmental Study		
Other		
Contingencies		
	Total Cost	

Justification:

Culvert 1340

BURNSIDE

Project Title: The Gore Road Culvert Inspections 2011
File No.: MTB019424
Date: May 2011


05/04/2011

Ontario Structure Inspection Manual - Inspection Form

MTO Site Number:

Inventory Data:

Structure Name	Culvert No. 1341		
Main Hwy/Road #		On ☐ Under ■	Crossing Type: Navig. Water ☐ Non-Navig. Water ■ Rail ☐ Road ☐ Ped. ☐ Other ☐
Hwy/Road Name	The Gore Road		
Structure Location	House Entrance No. 17284 (West side of road)		
Latitude	4864049 (N)	Longitude	590708 (E)
Owner(s)	Regional Municipality of Peel	Heritage Designation:	☐ Not Cons. ☐ Cons./not App. ☐ List/not Desig. ☐ Desig./not List ☐ Desig. & List
MTO Region		Road Class:	Freeway ☐ Arterial ☐ Collector ☐ Local ☐
MTO District		Posted Speed	No. of Lanes
Old County		AADT	% Trucks
Geographic Twp.	Town of Caledon	Inspection Route Sequence	
Structure Type	Corrugated Steel Pipe	Interchange Number	
Total Deck Length	7.4 (m)	Interchange Structure Number	
Overall Str. Width	(m)	Min. Vertical Clearance	(m)
Total Deck Area	(sq.m)	Special Routes:	☐ Transit ☐ Truck ☐ School ☐ Bicycle
Roadway Width	5.0 (m)	Detour Length Around Bridge	(km)
Skew Angle	0 (Degrees)	Direction of Structure	North - South
No. of Spans	1	Fill on Structure	0.4 (m)
Span Lengths	0.4 (m)		

Historical Data:

Year Built		Year of Last Major Rehab.	
Last OSIM Inspection		Last Evaluation	2005
Last Enhanced OSIM Inspection		Current Load Limit	/ / (tonnes)
Enhanced Access Equipment (ladder, boat lift, etc.)		Load Limit By-Law #	
Last Underwater Inspection		By-Law Expiry Date	
Last Condition Survey			

Rehab History: (Date/description)

Field Inspection Information:			
Date of Inspection:	05/04/2011	Type of Inspection:	■ OSIM ☐ Enhanced OSIM
Inspector:	Mark Kabbes		
Others in Party:	Jeremy Nyenhuis		
Access Equipment Used:	Digital Camera, Measuring Tape, Shovel		
Weather:	Sunny		
Temperature:	15° C		

Additional Investigations Required:	Priority		
	None	Normal	Urgent
Material Condition Survey			
Detailed Deck Condition:			
Non-destructive Delamination Survey of Asphalt–Covered Deck:			
Concrete Substructure Condition Survey:			
Detailed Coating Condition Survey:			
Detailed Timber Investigation			
Post-Tensioned Stand Investigation			
Underwater Investigation:			
Fatigue Investigation:			
Seismic Investigation:			
Structure Evaluation:			
Monitoring			
Monitoring of Deformations, Settlements and Movements:			
Monitoring Crack Widths:			

Investigation Notes:

- Inlet is 60% blocked with silt and grass build-up
- Outlet is 50% blocked with silt and grass build-up with a minor dent
- Barrel is 60% silted in

Overall Structure Notes:	
Recommended Work on Structure:	☐ None ☐ Minor Rehab. ☐ Major Rehab. ☐ Replace
Timing of Recommended Work:	☐ 1 to 5 years ☐ 6 to 10 years
Overall Comments:	
Date of Next Inspection:	

Repair and Rehabilitation Required:		Priority			Estimated Construction Cost
Element	Repair and Rehabilitation Required	1 to 5 years	Within 1 year	Urgent	
				Total Cost	

Associated Work:	Comments	Estimated Cost
Approaches		
Detours		
Traffic Control		
Utilities		
Right of Way		
Environmental Study		
Other		
Contingencies		
	Total Cost	

Justification:

Culvert 1341

BURNSIDE

Project Title: The Gore Road Culvert Inspections 2011
File No.: MTB019424
Date: May 2011

Ontario Structure Inspection Manual - Inspection Form

MTO Site Number:

Inventory Data:

Structure Name	Culvert No. 1342		
Main Hwy/Road #		On ☐ Under ■	Crossing Type: Navig. Water ☐ Non-Navig. Water ■ Rail ☐ Road ☐ Ped. ☐ Other ☐
Hwy/Road Name	The Gore Road		
Structure Location	House Entrance No. 17130 (west side of road)		
Latitude	4863727 (N)	Longitude	591046 (E)
Owner(s)	Regional Municipality of Peel	Heritage Designation:	☐ Not Cons. ☐ Cons./not App. ☐ List/not Desig. ☐ Desig./not List ☐ Desig. & List
MTO Region		Road Class:	Freeway ☐ Arterial ☐ Collector ☐ Local ☐
MTO District		Posted Speed	No. of Lanes
Old County		AADT	% Trucks
Geographic Twp.	Town of Caledon	Inspection Route Sequence	
Structure Type	Corrugated Steel Pipe	Interchange Number	
Total Deck Length	11.0 (m)	Interchange Structure Number	
Overall Str. Width	(m)	Min. Vertical Clearance	(m)
Total Deck Area	(sq.m)	Special Routes:	☐ Transit ☐ Truck ☐ School ☐ Bicycle
Roadway Width	4.2 (m)	Detour Length Around Bridge	(km)
Skew Angle	0 (Degrees)	Direction of Structure	North - South
No. of Spans	1	Fill on Structure	1.6 (m)
Span Lengths	0.4 (m)		

Historical Data:

Year Built		Year of Last Major Rehab.	
Last OSIM Inspection		Last Evaluation	2005
Last Enhanced OSIM Inspection		Current Load Limit	/ / (tonnes)
Enhanced Access Equipment (ladder, boat lift, etc.)		Load Limit By-Law #	
Last Underwater Inspection		By-Law Expiry Date	
Last Condition Survey			

Rehab History: (Date/description)

MTO Site Number:

Field Inspection Information:			
Date of Inspection:	05/04/2011	Type of Inspection:	■ OSIM ☐ Enhanced OSIM
Inspector:	Mark Kabbes		
Others in Party:	Jeremy Nyenhuis		
Access Equipment Used:	Digital Camera, Measuring Tape, Shovel		
Weather:	Sunny		
Temperature:	15° C		

Additional Investigations Required:	Priority		
	None	Normal	Urgent
Material Condition Survey			
Detailed Deck Condition:			
Non-destructive Delamination Survey of Asphalt–Covered Deck:			
Concrete Substructure Condition Survey:			
Detailed Coating Condition Survey:			
Detailed Timber Investigation			
Post-Tensioned Stand Investigation			
Underwater Investigation:			
Fatigue Investigation:			
Seismic Investigation:			
Structure Evaluation:			
Monitoring			
Monitoring of Deformations, Settlements and Movements:			
Monitoring Crack Widths:			

Investigation Notes:

- Inlet is clean, some leafs
- Outlet is plugged and submerged, ditch elevation is roughly 0.2m above the obvert of the culvert
- Barrel is clean up to water level at submerged outlet

Overall Structure Notes:	
Recommended Work on Structure:	☐ None ☐ Minor Rehab. ☐ Major Rehab. ☐ Replace
Timing of Recommended Work:	☐ 1 to 5 years ☐ 6 to 10 years
Overall Comments:	
Date of Next Inspection:	

Repair and Rehabilitation Required:		Priority			Estimated Construction Cost
Element	Repair and Rehabilitation Required	1 to 5 years	Within 1 year	Urgent	
				Total Cost	

Associated Work:	Comments	Estimated Cost
Approaches		
Detours		
Traffic Control		
Utilities		
Right of Way		
Environmental Study		
Other		
Contingencies		
	Total Cost	

Justification:

Culvert 1342


05/04/2011


05/04/2011

Ontario Structure Inspection Manual - Inspection Form

MTO Site Number:

Inventory Data:

Structure Name	Culvert No. 1343		
Main Hwy/Road #		On ☐ Under ■	Crossing Type: Navig. Water ☐ Non-Navig. Water ■ Rail ☐ Road ☐ Ped. ☐ Other ☐
Hwy/Road Name	The Gore Road		
Structure Location	Field Entrance No. 7454 (west side of road) (45 m north of Patterson Sideroad)		
Latitude	4863457 (N)	Longitude	591315 (E)
Owner(s)	Regional Municipality of Peel	Heritage Designation:	☐ Not Cons. ☐ Cons./not App. ☐ List/not Desig. ☐ Desig./not List ☐ Desig. & List
MTO Region		Road Class:	Freeway ☐ Arterial ☐ Collector ☐ Local ☐
MTO District		Posted Speed	No. of Lanes
Old County		AADT	% Trucks
Geographic Twp.	Town of Caledon	Inspection Route Sequence	
Structure Type	Corrugated Steel Pipe	Interchange Number	
Total Deck Length	6.2 (m)	Interchange Structure Number	
Overall Str. Width	(m)	Min. Vertical Clearance	(m)
Total Deck Area	(sq.m)	Special Routes:	☐ Transit ☐ Truck ☐ School ☐ Bicycle
Roadway Width	3.5 (m)	Detour Length Around Bridge	(km)
Skew Angle	0 (Degrees)	Direction of Structure	North - South
No. of Spans	1	Fill on Structure	0.3 (m)
Span Lengths	0.4 (m)		

Historical Data:

Year Built		Year of Last Major Rehab.	
Last OSIM Inspection		Last Evaluation	2005
Last Enhanced OSIM Inspection		Current Load Limit	/ / (tonnes)
Enhanced Access Equipment (ladder, boat lift, etc.)		Load Limit By-Law #	
Last Underwater Inspection		By-Law Expiry Date	
Last Condition Survey			

Rehab History: (Date/description)

Field Inspection Information:			
Date of Inspection:	05/04/2011	Type of Inspection:	■ OSIM ☐ Enhanced OSIM
Inspector:	Mark Kabbes		
Others in Party:	Jeremy Nyenhuis		
Access Equipment Used:	Digital Camera, Measuring Tape, Shovel		
Weather:	Sunny		
Temperature:	15° C		

Additional Investigations Required:	Priority		
	None	Normal	Urgent
Material Condition Survey			
Detailed Deck Condition:			
Non-destructive Delamination Survey of Asphalt–Covered Deck:			
Concrete Substructure Condition Survey:			
Detailed Coating Condition Survey:			
Detailed Timber Investigation			
Post-Tensioned Stand Investigation			
Underwater Investigation:			
Fatigue Investigation:			
Seismic Investigation:			
Structure Evaluation:			
Monitoring			
Monitoring of Deformations, Settlements and Movements:			
Monitoring Crack Widths:			

Investigation Notes:

- Inlet is 30% silted in
- Outlet is 50% silted in
- Barrel is silted in from 30% to 50% from the inlet to outlet
- The main entrance of this house is off of Patterson Sideroad

Overall Structure Notes:	
Recommended Work on Structure:	☐ None ☐ Minor Rehab. ☐ Major Rehab. ☐ Replace
Timing of Recommended Work:	☐ 1 to 5 years ☐ 6 to 10 years
Overall Comments:	
Date of Next Inspection:	

Repair and Rehabilitation Required:		Priority			Estimated Construction Cost
Element	Repair and Rehabilitation Required	1 to 5 years	Within 1 year	Urgent	
				Total Cost	

Associated Work:	Comments	Estimated Cost
Approaches		
Detours		
Traffic Control		
Utilities		
Right of Way		
Environmental Study		
Other		
Contingencies		
	Total Cost	

Justification:

Culvert 1343

BURNSIDE

Project Title: The Gore Road Culvert Inspections 2011
File No.: MTB019424
Date: May 2011

Ontario Structure Inspection Manual - Inspection Form

MTO Site Number:

Inventory Data:

Structure Name	Culvert No. 1344
Main Hwy/Road #	
On ☐ Under ■	
Crossing Type:	Navig. Water ☐ Non-Navig. Water ■ Rail ☐ Road ☐ Ped. ☐ Other ☐
Hwy/Road Name	The Gore Road
Structure Location	Intersection of Gore Road and Highway No. 9
Latitude	4867865 (N)
Longitude	586884 (E)
Owner(s)	Regional Municipality of Peel
Heritage Designation:	☐ Not Cons. ☐ Cons./not App. ☐ List/not Desig. ☐ Desig./not List ☐ Desig. & List
MTO Region	
Road Class:	Freeway ☐ Arterial ☐ Collector ☐ Local ☐
MTO District	
Posted Speed	70
No. of Lanes	3
Old County	
AADT	
% Trucks	
Geographic Twp.	Town of Caledon
Inspection Route Sequence	
Structure Type	Corrugated Steel Pipe
Interchange Number	
Total Deck Length	32.4 (m)
Interchange Structure Number	
Overall Str. Width	(m)
Min. Vertical Clearance	(m)
Total Deck Area	(sq.m)
Special Routes:	☐ Transit ☐ Truck ☐ School ☐ Bicycle
Roadway Width	20.0 (m)
Detour Length Around Bridge	(km)
Skew Angle	0 (Degrees)
Direction of Structure	East - West
No. of Spans	1
Fill on Structure	0.9 (m)
Span Lengths	0.6 (m)

Historical Data:

Year Built	
Year of Last Major Rehab.	
Last OSIM Inspection	
Last Evaluation	2005
Last Enhanced OSIM Inspection	
Current Load Limit	/ / (tonnes)
Enhanced Access Equipment (ladder, boat lift, etc.)	
Load Limit By-Law #	
Last Underwater Inspection	
By-Law Expiry Date	
Last Condition Survey	

Rehab History: (Date/description)

Field Inspection Information:			
Date of Inspection:	04/26/2011	Type of Inspection:	■ OSIM ☐ Enhanced OSIM
Inspector:	Mark Kabbes		
Others in Party:	Jeremy Nyenhuis		
Access Equipment Used:	Digital Camera, Measuring Tape, Shovel		
Weather:	Overcast		
Temperature:	16° C		

Additional Investigations Required:	Priority		
	None	Normal	Urgent
Material Condition Survey			
Detailed Deck Condition:			
Non-destructive Delamination Survey of Asphalt–Covered Deck:			
Concrete Substructure Condition Survey:			
Detailed Coating Condition Survey:			
Detailed Timber Investigation			
Post-Tensioned Stand Investigation			
Underwater Investigation:			
Fatigue Investigation:			
Seismic Investigation:			
Structure Evaluation:			
Monitoring			
Monitoring of Deformations, Settlements and Movements:			
Monitoring Crack Widths:			

Investigation Notes:

- Inlet has a road sub-drain outlet pipe outletting into it
- Inlet is clean
- Outlet is 30% blocked with silt and grass build-up
- Dent located at the outlet (200 x 200 mm)
- Light rust along bottom of the Barrel
- Barrel has a silt build-up in it at the outlet of the culvert, for the rest it is clean

Overall Structure Notes:	
Recommended Work on Structure:	☐ None ☐ Minor Rehab. ☐ Major Rehab. ☐ Replace
Timing of Recommended Work:	☐ 1 to 5 years ☐ 6 to 10 years
Overall Comments:	
Date of Next Inspection:	

Repair and Rehabilitation Required:		Priority			Estimated Construction Cost
Element	Repair and Rehabilitation Required	1 to 5 years	Within 1 year	Urgent	
				Total Cost	

Associated Work:	Comments	Estimated Cost
Approaches		
Detours		
Traffic Control		
Utilities		
Right of Way		
Environmental Study		
Other		
Contingencies		
	Total Cost	

Justification:

Culvert 1344

BURNSIDE

Project Title: The Gore Road Culvert Inspections 2011
File No.: MTB019424
Date: May 2011

BURNSIDE

Project Title: The Gore Road Culvert Inspections 2011
File No.: MTB019424
Date: May 2011

Ontario Structure Inspection Manual - Inspection Form

MTO Site Number:

Inventory Data:

Structure Name	Culvert No. 1345
Main Hwy/Road #	
On ☐ Under ■	
Crossing Type:	Navig. Water ☐ Non-Navig. Water ■ Rail ☐ Road ☐ Ped. ☐ Other ☐
Hwy/Road Name	The Gore Road
Structure Location	Crossing
Latitude	4867017 (N)
Longitude	587704 (E)
Owner(s)	Regional Municipality of Peel
Heritage Designation:	☐ Not Cons. ☐ Cons./not App. ☐ List/not Desig. ☐ Desig./not List ☐ Desig. & List
MTO Region	
Road Class:	Freeway ☐ Arterial ☐ Collector ☐ Local ☐
MTO District	
Posted Speed	70
No. of Lanes	2
Old County	
AADT	
% Trucks	
Geographic Twp.	Town of Caledon
Inspection Route Sequence	
Structure Type	Corrugated Steel Pipe
Interchange Number	
Total Deck Length	17.2 (m)
Interchange Structure Number	
Overall Str. Width	(m)
Min. Vertical Clearance	(m)
Total Deck Area	(sq.m)
Special Routes:	☐ Transit ☐ Truck ☐ School ☐ Bicycle
Roadway Width	8.15 (m)
Detour Length Around Bridge	(km)
Skew Angle	9 (Degrees)
Direction of Structure	East - West
No. of Spans	1
Fill on Structure	1.2 (m)
Span Lengths	0.6 (m)

Historical Data:

Year Built	
Year of Last Major Rehab.	
Last OSIM Inspection	
Last Evaluation	2005
Last Enhanced OSIM Inspection	
Current Load Limit	/ / (tonnes)
Enhanced Access Equipment (ladder, boat lift, etc.)	
Load Limit By-Law #	
Last Underwater Inspection	
By-Law Expiry Date	
Last Condition Survey	

Rehab History: (Date/description)

Field Inspection Information:			
Date of Inspection:	04/27/2011	Type of Inspection:	■ OSIM ☐ Enhanced OSIM
Inspector:	Mark Kabbes		
Others in Party:	Jeremy Nyenhuis		
Access Equipment Used:	Digital Camera, Measuring Tape, Shovel		
Weather:	Overcast/raining		
Temperature:	18° C		

Additional Investigations Required:	Priority		
	None	Normal	Urgent
Material Condition Survey			
Detailed Deck Condition:			
Non-destructive Delamination Survey of Asphalt--Covered Deck:			
Concrete Substructure Condition Survey:			
Detailed Coating Condition Survey:			
Detailed Timber Investigation			
Post-Tensioned Stand Investigation			
Underwater Investigation:			
Fatigue Investigation:			
Seismic Investigation:			
Structure Evaluation:			
Monitoring			
Monitoring of Deformations, Settlements and Movements:			
Monitoring Crack Widths:			

Investigation Notes:

- Inlet takes in 2 flows, one from the south and one from the west
- Inlet is clean, constant flows are coming from both direction
- Outlet is clean and constant flows drop 1.3m out of the culvert to the stream bed, creating erosion
- Barrel is clean with rust up to the water level on the south side and up to the top on the north side

Overall Structure Notes:	
Recommended Work on Structure:	☐ None ☐ Minor Rehab. ☐ Major Rehab. ☐ Replace
Timing of Recommended Work:	☐ 1 to 5 years ☐ 6 to 10 years
Overall Comments:	
Date of Next Inspection:	

Repair and Rehabilitation Required:		Priority			Estimated Construction Cost
Element	Repair and Rehabilitation Required	1 to 5 years	Within 1 year	Urgent	
				Total Cost	

Associated Work:	Comments	Estimated Cost
Approaches		
Detours		
Traffic Control		
Utilities		
Right of Way		
Environmental Study		
Other		
Contingencies		
	Total Cost	

Justification:

Culvert 1345

Project Title: The Gore Road Culvert Inspections 2011
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Ontario Structure Inspection Manual - Inspection Form

MTO Site Number:

Inventory Data:

Structure Name	Culvert No. 1346		
Main Hwy/Road #		On ☐ Under ■	Crossing Type: Navig. Water ☐ Non-Navig. Water ■ Rail ☐ Road ☐ Ped. ☐ Other ☐
Hwy/Road Name	The Gore Road		
Structure Location	Crossing		
Latitude	4866271 (N)	Longitude	588473 (E)
Owner(s)	Regional Municipality of Peel	Heritage Designation:	☐ Not Cons. ☐ Cons./not App. ☐ List/not Desig. ☐ Desig./not List ☐ Desig. & List
MTO Region		Road Class:	Freeway ☐ Arterial ☐ Collector ☐ Local ☐
MTO District		Posted Speed	70 — No. of Lanes: 2
Old County		AADT	— % Trucks:
Geographic Twp.	Town of Caledon	Inspection Route Sequence	
Structure Type	Corrugated Steel Pipe	Interchange Number	
Total Deck Length	14.8 (m)	Interchange Structure Number	
Overall Str. Width	(m)	Min. Vertical Clearance	(m)
Total Deck Area	(sq.m)	Special Routes:	☐ Transit ☐ Truck ☐ School ☐ Bicycle
Roadway Width	8.15 (m)	Detour Length Around Bridge	(km)
Skew Angle	0 (Degrees)	Direction of Structure	East - West
No. of Spans	1	Fill on Structure	1.9 (m)
Span Lengths	0.6 (m)		

Historical Data:

Year Built		Year of Last Major Rehab.	
Last OSIM Inspection		Last Evaluation	2005
Last Enhanced OSIM Inspection		Current Load Limit	/ / (tonnes)
Enhanced Access Equipment (ladder, boat lift, etc.)		Load Limit By-Law #	
Last Underwater Inspection		By-Law Expiry Date	
Last Condition Survey			

Rehab History: (Date/description)

Field Inspection Information:			
Date of Inspection:	05/04/2011	Type of Inspection:	■ OSIM ☐ Enhanced OSIM
Inspector:	Mark Kabbes		
Others in Party:	Jeremy Nyenhuis		
Access Equipment Used:	Digital Camera, Measuring Tape, Shovel		
Weather:	Sunny		
Temperature:	15° C		

Additional Investigations Required:	Priority		
	None	Normal	Urgent
Material Condition Survey			
Detailed Deck Condition:			
Non-destructive Delamination Survey of Asphalt–Covered Deck:			
Concrete Substructure Condition Survey:			
Detailed Coating Condition Survey:			
Detailed Timber Investigation			
Post-Tensioned Stand Investigation			
Underwater Investigation:			
Fatigue Investigation:			
Seismic Investigation:			
Structure Evaluation:			
Monitoring			
Monitoring of Deformations, Settlements and Movements:			
Monitoring Crack Widths:			

Investigation Notes:

- Inlet is 70% blocked with silt, grass and gravel from the road shoulder
- Outlet is 85% blocked with silt and grass build-up
- Barrel is 20% silted in
- Large ponding upstream of the inlet
- Inlet and outlet where almost completely blocked, after we removed some of the blockage, water started to flow through the culvert

Overall Structure Notes:	
Recommended Work on Structure:	☐ None ☐ Minor Rehab. ☐ Major Rehab. ☐ Replace
Timing of Recommended Work:	☐ 1 to 5 years ☐ 6 to 10 years
Overall Comments:	
Date of Next Inspection:	

Repair and Rehabilitation Required:		Priority			Estimated Construction Cost
Element	Repair and Rehabilitation Required	1 to 5 years	Within 1 year	Urgent	
				Total Cost	

Associated Work:	Comments	Estimated Cost
Approaches		
Detours		
Traffic Control		
Utilities		
Right of Way		
Environmental Study		
Other		
Contingencies		
	Total Cost	

Justification:

Culvert 1346

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Project Title: The Gore Road Culvert Inspections 2011
File No.: MTB019424
Date: May 2011

BURNSIDE

Project Title: The Gore Road Culvert Inspections 2011
File No.: MTB019424
Date: May 2011

Ontario Structure Inspection Manual - Inspection Form

MTO Site Number:

Inventory Data:

Structure Name	Culvert No. 1347		
Main Hwy/Road #		On ☐ Under ■	Crossing Type: Navig. Water ☐ Non-Navig. Water ■ Rail ☐ Road ☐ Ped. ☐ Other ☐
Hwy/Road Name	The Gore Road		
Structure Location	Crossing		
Latitude	4865924 (N)	Longitude	588815 (E)
Owner(s)	Regional Municipality of Peel	Heritage Designation:	☐ Not Cons. ☐ Cons./not App. ☐ List/not Desig. ☐ Desig./not List ☐ Desig. & List
MTO Region		Road Class:	Freeway ☐ Arterial ☐ Collector ☐ Local ☐
MTO District		Posted Speed	70 — No. of Lanes: 2
Old County		AADT	— % Trucks:
Geographic Twp.	Town of Caledon	Inspection Route Sequence	
Structure Type	Corrugated Steel Pipe	Interchange Number	
Total Deck Length	25.0 (m)	Interchange Structure Number	
Overall Str. Width	(m)	Min. Vertical Clearance	(m)
Total Deck Area	(sq.m)	Special Routes:	☐ Transit ☐ Truck ☐ School ☐ Bicycle
Roadway Width	8.0 (m)	Detour Length Around Bridge	(km)
Skew Angle	0 (Degrees)	Direction of Structure	East - West
No. of Spans	1	Fill on Structure	4.70 (m)
Span Lengths	0.6 (m)		

Historical Data:

Year Built		Year of Last Major Rehab.	
Last OSIM Inspection		Last Evaluation	2005
Last Enhanced OSIM Inspection		Current Load Limit	/ / (tonnes)
Enhanced Access Equipment (ladder, boat lift, etc.)		Load Limit By-Law #	
Last Underwater Inspection		By-Law Expiry Date	
Last Condition Survey			

Rehab History: (Date/description)

Field Inspection Information:			
Date of Inspection:	05/04/2011	Type of Inspection:	■ OSIM ☐ Enhanced OSIM
Inspector:	Mark Kabbes		
Others in Party:	Jeremy Nyenhuis		
Access Equipment Used:	Digital Camera, Measuring Tape, Shovel		
Weather:	Sunny		
Temperature:	15° C		

Additional Investigations Required:	Priority		
	None	Normal	Urgent
Material Condition Survey			
Detailed Deck Condition:			
Non-destructive Delamination Survey of Asphalt–Covered Deck:			
Concrete Substructure Condition Survey:			
Detailed Coating Condition Survey:			
Detailed Timber Investigation			
Post-Tensioned Stand Investigation			
Underwater Investigation:			
Fatigue Investigation:			
Seismic Investigation:			
Structure Evaluation:			
Monitoring			
Monitoring of Deformations, Settlements and Movements:			
Monitoring Crack Widths:			

Investigation Notes:

- Inlet is clean, flows from upstream pond drop 0.8m within 2.0m of the inlet
- 3.0m in the barrel from the outlet the culvert has failed
- Weight of the soil on top has caused the culvert to bend and the outlet to raise up
- At failure culvert is full of water
- Road has SBGR
- Evidence of slope failure with large washouts present behind the gabion baskets on the east slope

Overall Structure Notes:	
Recommended Work on Structure:	☐ None ☐ Minor Rehab. ☐ Major Rehab. ☐ Replace
Timing of Recommended Work:	☐ 1 to 5 years ☐ 6 to 10 years
Overall Comments:	
Date of Next Inspection:	

Repair and Rehabilitation Required:		Priority			Estimated Construction Cost
Element	Repair and Rehabilitation Required	1 to 5 years	Within 1 year	Urgent	
				Total Cost	

Associated Work:	Comments	Estimated Cost
Approaches		
Detours		
Traffic Control		
Utilities		
Right of Way		
Environmental Study		
Other		
Contingencies		
	Total Cost	

Justification:

Culvert 1347

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Project Title: The Gore Road Culvert Inspections 2011
File No.: MTB019424
Date: May 2011


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Ontario Structure Inspection Manual - Inspection Form

MTO Site Number:

Inventory Data:

Structure Name	Culvert No. 1348		
Main Hwy/Road #		On ☐ Under ■	Crossing Type: Navig. Water ☐ Non-Navig. Water ■ Rail ☐ Road ☐ Ped. ☐ Other ☐
Hwy/Road Name	The Gore Road		
Structure Location	Crossing		
Latitude	4865150 (N)	Longitude	589608 (E)
Owner(s)	Regional Municipality of Peel	Heritage Designation:	☐ Not Cons. ☐ Cons./not App. ☐ List/not Desig. ☐ Desig./not List ☐ Desig. & List
MTO Region		Road Class:	Freeway ☐ Arterial ☐ Collector ☐ Local ☐
MTO District		Posted Speed	70 — No. of Lanes: 2
Old County		AADT	— % Trucks:
Geographic Twp.	Town of Caledon	Inspection Route Sequence	
Structure Type	Corrugated Steel Pipe	Interchange Number	
Total Deck Length	14.3 (m)	Interchange Structure Number	
Overall Str. Width	(m)	Min. Vertical Clearance	(m)
Total Deck Area	(sq.m)	Special Routes:	☐ Transit ☐ Truck ☐ School ☐ Bicycle
Roadway Width	8.3 (m)	Detour Length Around Bridge	(km)
Skew Angle	0 (Degrees)	Direction of Structure	East - West
No. of Spans	1	Fill on Structure	1.9 (m)
Span Lengths	0.45 (m)		

Historical Data:

Year Built		Year of Last Major Rehab.	
Last OSIM Inspection		Last Evaluation	2005
Last Enhanced OSIM Inspection		Current Load Limit	/ / (tonnes)
Enhanced Access Equipment (ladder, boat lift, etc.)		Load Limit By-Law #	
Last Underwater Inspection		By-Law Expiry Date	
Last Condition Survey			

Rehab History: (Date/description)

Field Inspection Information:			
Date of Inspection:	05/04/2011	Type of Inspection:	■ OSIM ☐ Enhanced OSIM
Inspector:	Mark Kabbes		
Others in Party:	Jeremy Nyenhuis		
Access Equipment Used:	Digital Camera, Measuring Tape, Shovel		
Weather:	Sunny		
Temperature:	15° C		

Additional Investigations Required:	Priority		
	None	Normal	Urgent
Material Condition Survey			
Detailed Deck Condition:			
Non-destructive Delamination Survey of Asphalt–Covered Deck:			
Concrete Substructure Condition Survey:			
Detailed Coating Condition Survey:			
Detailed Timber Investigation			
Post-Tensioned Stand Investigation			
Underwater Investigation:			
Fatigue Investigation:			
Seismic Investigation:			
Structure Evaluation:			
Monitoring			
Monitoring of Deformations, Settlements and Movements:			
Monitoring Crack Widths:			

Investigation Notes:

- Inlet is 50% blocked with silt and grass build-up, there is standing water present
- Outlet is 50% blocked with silt and grass build-up, there is standing water present
- The Barrel is half filled with water due to the blockage
- Barrel has roughly 10% of silt build up

Overall Structure Notes:	
Recommended Work on Structure:	☐ None ☐ Minor Rehab. ☐ Major Rehab. ☐ Replace
Timing of Recommended Work:	☐ 1 to 5 years ☐ 6 to 10 years
Overall Comments:	
Date of Next Inspection:	

Repair and Rehabilitation Required:		Priority			Estimated Construction Cost
Element	Repair and Rehabilitation Required	1 to 5 years	Within 1 year	Urgent	
				Total Cost	

Associated Work:	Comments	Estimated Cost
Approaches		
Detours		
Traffic Control		
Utilities		
Right of Way		
Environmental Study		
Other		
Contingencies		
	Total Cost	

Justification:

Culvert 1348

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Project Title: The Gore Road Culvert Inspections 2011
File No.: MTB019424
Date: May 2011

Ontario Structure Inspection Manual - Inspection Form

MTO Site Number:

Inventory Data:

Structure Name	Culvert No. 1349		
Main Hwy/Road #		On ☐ Under ■	Crossing Type: Navig. Water ☐ Non-Navig. Water ■ Rail ☐ Road ☐ Ped. ☐ Other ☐
Hwy/Road Name	The Gore Road		
Structure Location	Crossing		
Latitude	4865069 (N)	Longitude	589685 (E)
Owner(s)	Regional Municipality of Peel	Heritage Designation:	☐ Not Cons. ☐ Cons./not App. ☐ List/not Desig. ☐ Desig./not List ☐ Desig. & List
MTO Region		Road Class:	Freeway ☐ Arterial ☐ Collector ☐ Local ☐
MTO District		Posted Speed	70 — No. of Lanes: 2
Old County		AADT	— % Trucks:
Geographic Twp.	Town of Caledon	Inspection Route Sequence	
Structure Type	Corrugated Steel Pipe	Interchange Number	
Total Deck Length	12.4 (m)	Interchange Structure Number	
Overall Str. Width	(m)	Min. Vertical Clearance	(m)
Total Deck Area	(sq.m)	Special Routes:	☐ Transit ☐ Truck ☐ School ☐ Bicycle
Roadway Width	8.15 (m)	Detour Length Around Bridge	(km)
Skew Angle	0 (Degrees)	Direction of Structure	East - West
No. of Spans	1	Fill on Structure	1.30 (m)
Span Lengths	0.45 (m)		

Historical Data:

Year Built		Year of Last Major Rehab.	
Last OSIM Inspection		Last Evaluation	2005
Last Enhanced OSIM Inspection		Current Load Limit	/ / (tonnes)
Enhanced Access Equipment (ladder, boat lift, etc.)		Load Limit By-Law #	
Last Underwater Inspection		By-Law Expiry Date	
Last Condition Survey			

Rehab History: (Date/description)

Field Inspection Information:			
Date of Inspection:	05/04/2011	Type of Inspection:	■ OSIM ☐ Enhanced OSIM
Inspector:	Mark Kabbes		
Others in Party:	Jeremy Nyenhuis		
Access Equipment Used:	Digital Camera, Measuring Tape, Shovel		
Weather:	Sunny		
Temperature:	15° C		

Additional Investigations Required:	Priority		
	None	Normal	Urgent
Material Condition Survey			
Detailed Deck Condition:			
Non-destructive Delamination Survey of Asphalt-Covered Deck:			
Concrete Substructure Condition Survey:			
Detailed Coating Condition Survey:			
Detailed Timber Investigation			
Post-Tensioned Stand Investigation			
Underwater Investigation:			
Fatigue Investigation:			
Seismic Investigation:			
Structure Evaluation:			
Monitoring			
Monitoring of Deformations, Settlements and Movements:			
Monitoring Crack Widths:			

Investigation Notes:

- Inlet is 70% blocked with dirt and grass build-up
- Outlet is 20% blocked with dirt and grass build-up
- Barrel is 15% fulled with gravel

Overall Structure Notes:	
Recommended Work on Structure:	☐ None ☐ Minor Rehab. ☐ Major Rehab. ☐ Replace
Timing of Recommended Work:	☐ 1 to 5 years ☐ 6 to 10 years
Overall Comments:	
Date of Next Inspection:	

Repair and Rehabilitation Required:		Priority			Estimated Construction Cost
Element	Repair and Rehabilitation Required	1 to 5 years	Within 1 year	Urgent	
				Total Cost	

Associated Work:	Comments	Estimated Cost
Approaches		
Detours		
Traffic Control		
Utilities		
Right of Way		
Environmental Study		
Other		
Contingencies		
	Total Cost	

Justification:

Culvert 1349

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Project Title: The Gore Road Culvert Inspections 2011
File No.: MTB019424
Date: May 2011


05/04/2011


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Ontario Structure Inspection Manual - Inspection Form MTO Site Number:

Inventory Data:

Structure Name	Culvert No. 1350		
Main Hwy/Road #		On ☐ Under ■	Crossing Type: Navig. Water ☐ Non-Navig. Water ■ Rail ☐ Road ☐ Ped. ☐ Other ☐
Hwy/Road Name	The Gore Road		
Structure Location	Crossing		
Latitude	4864995 (N)	Longitude	589805 (E)
Owner(s)	Regional Municipality of Peel	Heritage Designation:	☐ Not Cons. ☐ Cons./not App. ☐ List/not Desig. ☐ Desig./not List ☐ Desig. & List
MTO Region		Road Class:	Freeway ☐ Arterial ☐ Collector ☐ Local ☐
MTO District		Posted Speed	70 / No. of Lanes 2
Old County		AADT	/ % Trucks
Geographic Twp.	Town of Caledon	Inspection Route Sequence	
Structure Type	Corrugated Steel Pipe	Interchange Number	
Total Deck Length	17.5 (m)	Interchange Structure Number	
Overall Str. Width	(m)	Min. Vertical Clearance	(m)
Total Deck Area	(sq.m)	Special Routes:	☐ Transit ☐ Truck ☐ School ☐ Bicycle
Roadway Width	8.10 (m)	Detour Length Around Bridge	(km)
Skew Angle	0 (Degrees)	Direction of Structure	East - West
No. of Spans	1	Fill on Structure	1.5 (m)
Span Lengths	0.45 (m)		

Historical Data:

Year Built		Year of Last Major Rehab.	
Last OSIM Inspection		Last Evaluation	2005
Last Enhanced OSIM Inspection		Current Load Limit	/ / (tonnes)
Enhanced Access Equipment (ladder, boat lift, etc.)		Load Limit By-Law #	
Last Underwater Inspection		By-Law Expiry Date	
Last Condition Survey			

Rehab History: (Date/description)

Field Inspection Information:			
Date of Inspection:	05/04/2011	Type of Inspection:	■ OSIM ☐ Enhanced OSIM
Inspector:	Mark Kabbes		
Others in Party:	Jeremy Nyenhuis		
Access Equipment Used:	Digital Camera, Measuring Tape, Shovel		
Weather:	Sunny		
Temperature:	15° C		

Additional Investigations Required:	Priority		
	None	Normal	Urgent
Material Condition Survey			
Detailed Deck Condition:			
Non-destructive Delamination Survey of Asphalt–Covered Deck:			
Concrete Substructure Condition Survey:			
Detailed Coating Condition Survey:			
Detailed Timber Investigation			
Post-Tensioned Stand Investigation			
Underwater Investigation:			
Fatigue Investigation:			
Seismic Investigation:			
Structure Evaluation:			
Monitoring			
Monitoring of Deformations, Settlements and Movements:			
Monitoring Crack Widths:			

Investigation Notes:

- Inlet is clean and 0.3m higher then the ditch level
- Outlet is completely blocked with silt and grass build-up
- Barrel is clean but plugged at the outlet

Overall Structure Notes:	
Recommended Work on Structure:	☐ None ☐ Minor Rehab. ☐ Major Rehab. ☐ Replace
Timing of Recommended Work:	☐ 1 to 5 years ☐ 6 to 10 years
Overall Comments:	
Date of Next Inspection:	

Repair and Rehabilitation Required:		Priority			Estimated Construction Cost
Element	Repair and Rehabilitation Required	1 to 5 years	Within 1 year	Urgent	
				Total Cost	

Associated Work:	Comments	Estimated Cost
Approaches		
Detours		
Traffic Control		
Utilities		
Right of Way		
Environmental Study		
Other		
Contingencies		
	Total Cost	

Justification:

Culvert 1350

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Project Title: The Gore Road Culvert Inspections 2011
File No.: MTB019424
Date: May 2011

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Project Title: The Gore Road Culvert Inspections 2011
File No.: MTB019424
Date: May 2011

Ontario Structure Inspection Manual - Inspection Form

MTO Site Number:

Inventory Data:

Structure Name	Culvert No. 1351		
Main Hwy/Road #		On ☐ Under ■	Crossing Type: Navig. Water ☐ Non-Navig. Water ■ Rail ☐ Road ☐ Ped. ☐ Other ☐
Hwy/Road Name	The Gore Road		
Structure Location	Crossing		
Latitude	4864525 (N)	Longitude	590244 (E)
Owner(s)	Regional Municipality of Peel	Heritage Designation:	☐ Not Cons. ☐ Cons./not App. ☐ List/not Desig. ☐ Desig./not List ☐ Desig. & List
MTO Region		Road Class:	Freeway ☐ Arterial ☐ Collector ☐ Local ☐
MTO District		Posted Speed	70 — No. of Lanes: 2
Old County		AADT	— % Trucks:
Geographic Twp.	Town of Caledon	Inspection Route Sequence	
Structure Type	Corrugated Steel Pipe	Interchange Number	
Total Deck Length	18.0 (m)	Interchange Structure Number	
Overall Str. Width	(m)	Min. Vertical Clearance	(m)
Total Deck Area	(sq.m)	Special Routes:	☐ Transit ☐ Truck ☐ School ☐ Bicycle
Roadway Width	7.9 (m)	Detour Length Around Bridge	(km)
Skew Angle	0 (Degrees)	Direction of Structure	East - West
No. of Spans	1	Fill on Structure	2.15 (m)
Span Lengths	0.6 – 0.8 (Can not confirm due to water level) (m)		

Historical Data:

Year Built		Year of Last Major Rehab.	
Last OSIM Inspection		Last Evaluation	2005
Last Enhanced OSIM Inspection		Current Load Limit	/ / (tonnes)
Enhanced Access Equipment (ladder, boat lift, etc.)		Load Limit By-Law #	
Last Underwater Inspection		By-Law Expiry Date	
Last Condition Survey			

Rehab History: (Date/description)

Field Inspection Information:			
Date of Inspection:	05/04/2011	Type of Inspection:	■ OSIM ☐ Enhanced OSIM
Inspector:	Mark Kabbes		
Others in Party:	Jeremy Nyenhuis		
Access Equipment Used:	Digital Camera, Measuring Tape, Shovel		
Weather:	Sunny		
Temperature:	15° C		

Additional Investigations Required:	Priority		
	None	Normal	Urgent
Material Condition Survey			
Detailed Deck Condition:			
Non-destructive Delamination Survey of Asphalt-Covered Deck:			
Concrete Substructure Condition Survey:			
Detailed Coating Condition Survey:			
Detailed Timber Investigation			
Post-Tensioned Stand Investigation			
Underwater Investigation:			
Fatigue Investigation:			
Seismic Investigation:			
Structure Evaluation:			
Monitoring			
Monitoring of Deformations, Settlements and Movements:			
Monitoring Crack Widths:			

Investigation Notes:

- Inlet is 90% submerged and water is unclear
- Outlet is 100% submerged
- The maximum span could not be confirmed and a full inspection was not possible due to the water level at the time of inspection

Overall Structure Notes:	
Recommended Work on Structure:	☐ None ☐ Minor Rehab. ☐ Major Rehab. ☐ Replace
Timing of Recommended Work:	☐ 1 to 5 years ☐ 6 to 10 years
Overall Comments:	
Date of Next Inspection:	

Repair and Rehabilitation Required:		Priority			Estimated Construction Cost
Element	Repair and Rehabilitation Required	1 to 5 years	Within 1 year	Urgent	
				Total Cost	

Associated Work:	Comments	Estimated Cost
Approaches		
Detours		
Traffic Control		
Utilities		
Right of Way		
Environmental Study		
Other		
Contingencies		
	Total Cost	

Justification:

Culvert 1351

Project Title: The Gore Road Culvert Inspections 2011
File No.: MTB019424
Date: May 2011


05/04/2011


05/04/2011

Ontario Structure Inspection Manual - Inspection Form

MTO Site Number:

Inventory Data:

Structure Name	Culvert No. 1352		
Main Hwy/Road #		On ☐ Under ■	Crossing Type: Navig. Water ☐ Non-Navig. Water ■ Rail ☐ Road ☐ Ped. ☐ Other ☐
Hwy/Road Name	The Gore Road		
Structure Location	Crossing		
Latitude	4864256 (N)	Longitude	590504 (E)
Owner(s)	Regional Municipality of Peel	Heritage Designation:	☐ Not Cons. ☐ Cons./not App. ☐ List/not Desig. ☐ Desig./not List ☐ Desig. & List
MTO Region		Road Class:	Freeway ☐ Arterial ☐ Collector ☐ Local ☐
MTO District		Posted Speed	70 — No. of Lanes: 2
Old County		AADT	— % Trucks:
Geographic Twp.	Town of Caledon	Inspection Route Sequence	
Structure Type	Corrugated Steel Pipe	Interchange Number	
Total Deck Length	15.0 (m)	Interchange Structure Number	
Overall Str. Width	(m)	Min. Vertical Clearance	(m)
Total Deck Area	(sq.m)	Special Routes:	☐ Transit ☐ Truck ☐ School ☐ Bicycle
Roadway Width	8.0 (m)	Detour Length Around Bridge	(km)
Skew Angle	0 (Degrees)	Direction of Structure	East - West
No. of Spans	1	Fill on Structure	1.8 (m)
Span Lengths	0.8 (m)		

Historical Data:

Year Built		Year of Last Major Rehab.	
Last OSIM Inspection		Last Evaluation	2005
Last Enhanced OSIM Inspection		Current Load Limit	/ / (tonnes)
Enhanced Access Equipment (ladder, boat lift, etc.)		Load Limit By-Law #	
Last Underwater Inspection		By-Law Expiry Date	
Last Condition Survey			

Rehab History: (Date/description)

Field Inspection Information:			
Date of Inspection:	05/04/2011	Type of Inspection:	■ OSIM ☐ Enhanced OSIM
Inspector:	Mark Kabbes		
Others in Party:	Jeremy Nyenhuis		
Access Equipment Used:	Digital Camera, Measuring Tape, Shovel		
Weather:	Sunny		
Temperature:	15° C		

Additional Investigations Required:	Priority		
	None	Normal	Urgent
Material Condition Survey			
Detailed Deck Condition:			
Non-destructive Delamination Survey of Asphalt–Covered Deck:			
Concrete Substructure Condition Survey:			
Detailed Coating Condition Survey:			
Detailed Timber Investigation			
Post-Tensioned Stand Investigation			
Underwater Investigation:			
Fatigue Investigation:			
Seismic Investigation:			
Structure Evaluation:			
Monitoring			
Monitoring of Deformations, Settlements and Movements:			
Monitoring Crack Widths:			

Investigation Notes:

- Inlet is clean and has good flow
- Outlet is clean and has good flow
- Barrel is clean
- The side slopes are beginning to fail and the SBGR starting to lean away from the road on both sides of the road

Overall Structure Notes:	
Recommended Work on Structure:	☐ None ☐ Minor Rehab. ☐ Major Rehab. ☐ Replace
Timing of Recommended Work:	☐ 1 to 5 years ☐ 6 to 10 years
Overall Comments:	
Date of Next Inspection:	

Repair and Rehabilitation Required:		Priority			Estimated Construction Cost
Element	Repair and Rehabilitation Required	1 to 5 years	Within 1 year	Urgent	
				Total Cost	

Associated Work:	Comments	Estimated Cost
Approaches		
Detours		
Traffic Control		
Utilities		
Right of Way		
Environmental Study		
Other		
Contingencies		
	Total Cost	

Justification:

Culvert 1352

Project Title: The Gore Road Culvert Inspections 2011
File No.: MTB019424
Date: May 2011


05/04/2011


05/04/2011

Ontario Structure Inspection Manual - Inspection Form

MTO Site Number:

Inventory Data:

Structure Name	Culvert No. 1353		
Main Hwy/Road #		On ☐ Under ■	Crossing Type: Navig. Water ☐ Non-Navig. Water ■ Rail ☐ Road ☐ Ped. ☐ Other ☐
Hwy/Road Name	The Gore Road		
Structure Location	Crossing		
Latitude	4864004 (N)	Longitude	590770 (E)
Owner(s)	Regional Municipality of Peel	Heritage Designation:	☐ Not Cons. ☐ Cons./not App. ☐ List/not Desig. ☐ Desig./not List ☐ Desig. & List
MTO Region		Road Class:	Freeway ☐ Arterial ☐ Collector ☐ Local ☐
MTO District		Posted Speed	70 — No. of Lanes: 2
Old County		AADT	— % Trucks:
Geographic Twp.	Town of Caledon	Inspection Route Sequence	
Structure Type	Corrugated Steel Pipe	Interchange Number	
Total Deck Length	14.4 (m)	Interchange Structure Number	
Overall Str. Width	(m)	Min. Vertical Clearance	(m)
Total Deck Area	(sq.m)	Special Routes:	☐ Transit ☐ Truck ☐ School ☐ Bicycle
Roadway Width	8.24 (m)	Detour Length Around Bridge	(km)
Skew Angle	0 (Degrees)	Direction of Structure	East - West
No. of Spans	1	Fill on Structure	1.2 (m)
Span Lengths	0.75 (m)		

Historical Data:

Year Built		Year of Last Major Rehab.	
Last OSIM Inspection		Last Evaluation	2005
Last Enhanced OSIM Inspection		Current Load Limit	/ / (tonnes)
Enhanced Access Equipment (ladder, boat lift, etc.)		Load Limit By-Law #	
Last Underwater Inspection		By-Law Expiry Date	
Last Condition Survey			

Rehab History: (Date/description)

Field Inspection Information:			
Date of Inspection:	05/04/2011	Type of Inspection:	■ OSIM ☐ Enhanced OSIM
Inspector:	Mark Kabbes		
Others in Party:	Jeremy Nyenhuis		
Access Equipment Used:	Digital Camera, Measuring Tape, Shovel		
Weather:	Sunny		
Temperature:	15° C		

Additional Investigations Required:	Priority		
	None	Normal	Urgent
Material Condition Survey			
Detailed Deck Condition:			
Non-destructive Delamination Survey of Asphalt–Covered Deck:			
Concrete Substructure Condition Survey:			
Detailed Coating Condition Survey:			
Detailed Timber Investigation			
Post-Tensioned Stand Investigation			
Underwater Investigation:			
Fatigue Investigation:			
Seismic Investigation:			
Structure Evaluation:			
Monitoring			
Monitoring of Deformations, Settlements and Movements:			
Monitoring Crack Widths:			

Investigation Notes:

- Inlet is clean, constant flows are coming from both direction
- Side slopes are steep
- Outlet is clean, flowing half full enough of water
- Barrel is clean, good flow, rust up to normal water level

Overall Structure Notes:	
Recommended Work on Structure:	☐ None ☐ Minor Rehab. ☐ Major Rehab. ☐ Replace
Timing of Recommended Work:	☐ 1 to 5 years ☐ 6 to 10 years
Overall Comments:	
Date of Next Inspection:	

Repair and Rehabilitation Required:		Priority			Estimated Construction Cost
Element	Repair and Rehabilitation Required	1 to 5 years	Within 1 year	Urgent	
				Total Cost	

Associated Work:	Comments	Estimated Cost
Approaches		
Detours		
Traffic Control		
Utilities		
Right of Way		
Environmental Study		
Other		
Contingencies		
	Total Cost	

Justification:

Culvert 1353

BURNSIDE

Project Title: The Gore Road Culvert Inspections 2011
File No.: MTB019424
Date: May 2011

BURNSIDE

Project Title: The Gore Road Culvert Inspections 2011
File No.: MTB019424
Date: May 2011

Ontario Structure Inspection Manual - Inspection Form

MTO Site Number:

Inventory Data:

Structure Name	Culvert No. 1354		
Main Hwy/Road #		On ☐ Under ■	Crossing Type: Navig. Water ☐ Non-Navig. Water ■ Rail ☐ Road ☐ Ped. ☐ Other ☐
Hwy/Road Name	The Gore Road		
Structure Location	Crossing		
Latitude	4863910 (N)	Longitude	590872 (E)
Owner(s)	Regional Municipality of Peel	Heritage Designation:	☐ Not Cons. ☐ Cons./not App. ☐ List/not Desig. ☐ Desig./not List ☐ Desig. & List
MTO Region		Road Class:	Freeway ☐ Arterial ☐ Collector ☐ Local ☐
MTO District		Posted Speed	70 — No. of Lanes: 2
Old County		AADT	— % Trucks:
Geographic Twp.	Town of Caledon	Inspection Route Sequence	
Structure Type	Corrugated Steel Pipe	Interchange Number	
Total Deck Length	14.3 (m)	Interchange Structure Number	
Overall Str. Width	(m)	Min. Vertical Clearance	(m)
Total Deck Area	(sq.m)	Special Routes:	☐ Transit ☐ Truck ☐ School ☐ Bicycle
Roadway Width	8.5 (m)	Detour Length Around Bridge	(km)
Skew Angle	0 (Degrees)	Direction of Structure	East - West
No. of Spans	1	Fill on Structure	0.8 (m)
Span Lengths	0.6 (m)		

Historical Data:

Year Built		Year of Last Major Rehab.	
Last OSIM Inspection		Last Evaluation	2005
Last Enhanced OSIM Inspection		Current Load Limit	/ / (tonnes)
Enhanced Access Equipment (ladder, boat lift, etc.)		Load Limit By-Law #	
Last Underwater Inspection		By-Law Expiry Date	
Last Condition Survey			

Rehab History: (Date/description)

Field Inspection Information:			
Date of Inspection:	05/04/2011	Type of Inspection:	■ OSIM ☐ Enhanced OSIM
Inspector:	Mark Kabbes		
Others in Party:	Jeremy Nyenhuis		
Access Equipment Used:	Digital Camera, Measuring Tape, Shovel		
Weather:	Sunny		
Temperature:	15° C		

Additional Investigations Required:	Priority		
	None	Normal	Urgent
Material Condition Survey			
Detailed Deck Condition:			
Non-destructive Delamination Survey of Asphalt–Covered Deck:			
Concrete Substructure Condition Survey:			
Detailed Coating Condition Survey:			
Detailed Timber Investigation			
Post-Tensioned Stand Investigation			
Underwater Investigation:			
Fatigue Investigation:			
Seismic Investigation:			
Structure Evaluation:			
Monitoring			
Monitoring of Deformations, Settlements and Movements:			
Monitoring Crack Widths:			

Investigation Notes:

- Inlet is 20% silted in and the water level is 2/3 of the culvert
- Outlet is 20% silted in and the water level is 1/3 of the culvert
- Barrel has rust up to normal water level

Overall Structure Notes:	
Recommended Work on Structure:	☐ None ☐ Minor Rehab. ☐ Major Rehab. ☐ Replace
Timing of Recommended Work:	☐ 1 to 5 years ☐ 6 to 10 years
Overall Comments:	
Date of Next Inspection:	

Repair and Rehabilitation Required:		Priority			Estimated Construction Cost
Element	Repair and Rehabilitation Required	1 to 5 years	Within 1 year	Urgent	
				Total Cost	

Associated Work:	Comments	Estimated Cost
Approaches		
Detours		
Traffic Control		
Utilities		
Right of Way		
Environmental Study		
Other		
Contingencies		
	Total Cost	

Justification:

Culvert 1354


05/04/2011


05/04/2011

Ontario Structure Inspection Manual - Inspection Form

MTO Site Number:

Inventory Data:

Structure Name	Culvert No. 1355		
Main Hwy/Road #		On ☐ Under ■	Crossing Type: Navig. Water ☐ Non-Navig. Water ■ Rail ☐ Road ☐ Ped. ☐ Other ☐
Hwy/Road Name	The Gore Road		
Structure Location	Crossing		
Latitude	4863723 (N)	Longitude	591050 (E)
Owner(s)	Regional Municipality of Peel	Heritage Designation:	☐ Not Cons. ☐ Cons./not App. ☐ List/not Desig. ☐ Desig./not List ☐ Desig. & List
MTO Region		Road Class:	Freeway ☐ Arterial ☐ Collector ☐ Local ☐
MTO District		Posted Speed	70 — No. of Lanes: 2
Old County		AADT	% Trucks:
Geographic Twp.	Town of Caledon	Inspection Route Sequence	
Structure Type	Corrugated Steel Pipe	Interchange Number	
Total Deck Length	17.0 (m)	Interchange Structure Number	
Overall Str. Width	(m)	Min. Vertical Clearance	(m)
Total Deck Area	(sq.m)	Special Routes:	☐ Transit ☐ Truck ☐ School ☐ Bicycle
Roadway Width	8.6 (m)	Detour Length Around Bridge	(km)
Skew Angle	0 (Degrees)	Direction of Structure	East - West
No. of Spans	1	Fill on Structure	2.3 (m)
Span Lengths	0.75 (m)		

Historical Data:

Year Built		Year of Last Major Rehab.	
Last OSIM Inspection		Last Evaluation	2005
Last Enhanced OSIM Inspection		Current Load Limit	/ / (tonnes)
Enhanced Access Equipment (ladder, boat lift, etc.)		Load Limit By-Law #	
Last Underwater Inspection		By-Law Expiry Date	
Last Condition Survey			

Rehab History: (Date/description)

Field Inspection Information:			
Date of Inspection:	05/04/2011	Type of Inspection:	■ OSIM ☐ Enhanced OSIM
Inspector:	Mark Kabbes		
Others in Party:	Jeremy Nyenhuis		
Access Equipment Used:	Digital Camera, Measuring Tape, Shovel		
Weather:	Sunny		
Temperature:	15° C		

Additional Investigations Required:	Priority		
	None	Normal	Urgent
Material Condition Survey			
Detailed Deck Condition:			
Non-destructive Delamination Survey of Asphalt-Covered Deck:			
Concrete Substructure Condition Survey:			
Detailed Coating Condition Survey:			
Detailed Timber Investigation			
Post-Tensioned Stand Investigation			
Underwater Investigation:			
Fatigue Investigation:			
Seismic Investigation:			
Structure Evaluation:			
Monitoring			
Monitoring of Deformations, Settlements and Movements:			
Monitoring Crack Widths:			

Investigation Notes:

- Inlet is clean with good flow
- There is a stone/concrete headwall at the inlet
- Outlet is clean with good flow, flows drop 0.2m from the outlet to the stream bed
- Barrel is clean
- SBGR starting to lean on the east side which is evidence of slope failure

Overall Structure Notes:	
Recommended Work on Structure:	☐ None ☐ Minor Rehab. ☐ Major Rehab. ☐ Replace
Timing of Recommended Work:	☐ 1 to 5 years ☐ 6 to 10 years
Overall Comments:	
Date of Next Inspection:	

Repair and Rehabilitation Required:		Priority			Estimated Construction Cost
Element	Repair and Rehabilitation Required	1 to 5 years	Within 1 year	Urgent	
				Total Cost	

Associated Work:	Comments	Estimated Cost
Approaches		
Detours		
Traffic Control		
Utilities		
Right of Way		
Environmental Study		
Other		
Contingencies		
	Total Cost	

Justification:

Culvert 1355


05/04/2011


05/04/2011

Ontario Structure Inspection Manual - Inspection Form

MTO Site Number:

Inventory Data:

Structure Name	Culvert No. 1356		
Main Hwy/Road #		On ☐ Under ■	Crossing Type: Navig. Water ☐ Non-Navig. Water ■ Rail ☐ Road ☐ Ped. ☐ Other ☐
Hwy/Road Name	The Gore Road		
Structure Location	Crossing		
Latitude	4863436 (N)	Longitude	591332 (E)
Owner(s)	Regional Municipality of Peel	Heritage Designation:	☐ Not Cons. ☐ Cons./not App. ☐ List/not Desig. ☐ Desig./not List ☐ Desig. & List
MTO Region		Road Class:	Freeway ☐ Arterial ☐ Collector ☐ Local ☐
MTO District		Posted Speed	70 — No. of Lanes: 2
Old County		AADT	— % Trucks:
Geographic Twp.	Town of Caledon	Inspection Route Sequence	
Structure Type	Corrugated Steel Pipe	Interchange Number	
Total Deck Length	15.5 (m)	Interchange Structure Number	
Overall Str. Width	(m)	Min. Vertical Clearance	(m)
Total Deck Area	(sq.m)	Special Routes:	☐ Transit ☐ Truck ☐ School ☐ Bicycle
Roadway Width	8.9 (m)	Detour Length Around Bridge	(km)
Skew Angle	12 (Degrees)	Direction of Structure	East - West
No. of Spans	1	Fill on Structure	1.8 (m)
Span Lengths	0.8 (m)		

Historical Data:

Year Built		Year of Last Major Rehab.	
Last OSIM Inspection		Last Evaluation	2005
Last Enhanced OSIM Inspection		Current Load Limit	/ / (tonnes)
Enhanced Access Equipment (ladder, boat lift, etc.)		Load Limit By-Law #	
Last Underwater Inspection		By-Law Expiry Date	
Last Condition Survey			

Rehab History: (Date/description)

Field Inspection Information:			
Date of Inspection:	05/04/2011	Type of Inspection:	■ OSIM ☐ Enhanced OSIM
Inspector:	Mark Kabbes		
Others in Party:	Jeremy Nyenhuis		
Access Equipment Used:	Digital Camera, Measuring Tape, Shovel		
Weather:	Sunny		
Temperature:	15° C		

Additional Investigations Required:	Priority		
	None	Normal	Urgent
Material Condition Survey			
Detailed Deck Condition:			
Non-destructive Delamination Survey of Asphalt–Covered Deck:			
Concrete Substructure Condition Survey:			
Detailed Coating Condition Survey:			
Detailed Timber Investigation			
Post-Tensioned Stand Investigation			
Underwater Investigation:			
Fatigue Investigation:			
Seismic Investigation:			
Structure Evaluation:			
Monitoring			
Monitoring of Deformations, Settlements and Movements:			
Monitoring Crack Widths:			

Investigation Notes:

- The entire barrel is clear with good flow

Overall Structure Notes:	
Recommended Work on Structure:	☐ None ☐ Minor Rehab. ☐ Major Rehab. ☐ Replace
Timing of Recommended Work:	☐ 1 to 5 years ☐ 6 to 10 years
Overall Comments:	
Date of Next Inspection:	

 MTO Site Number:

Repair and Rehabilitation Required:		Priority			Estimated Construction Cost
Element	Repair and Rehabilitation Required	1 to 5 years	Within 1 year	Urgent	
				Total Cost	

Associated Work:	Comments	Estimated Cost
Approaches		
Detours		
Traffic Control		
Utilities		
Right of Way		
Environmental Study		
Other		
Contingencies		
	Total Cost	

Justification:

Culvert 1356

Project Title: The Gore Road Culvert Inspections 2011
File No.: MTB019424
Date: May 2011

Ontario Structure Inspection Manual - Inspection Form

MTO Site Number:

Inventory Data:			
Structure Name	Culvert No. N1		
Main Hwy/Road #		On ☐ Under ■	Crossing Type: Navig. Water ☐ Non-Navig. Water ■ Rail ☐ Road ☐ Ped. ☐ Other ☐
Hwy/Road Name	The Gore Road		
Structure Location	Crossing (55 m north of House No. 18529)		
Latitude		Longitude	
Owner(s)	Regional Municipality of Peel	Heritage Designation:	☐ Not Cons. ☐ Cons./not App. ☐ List/not Desig. ☐ Desig./not List ☐ Desig. & List
MTO Region		Road Class:	Freeway ☐ Arterial ☐ Collector ☐ Local ☐
MTO District		Posted Speed	70 — No. of Lanes: 2
Old County		AADT	— % Trucks:
Geographic Twp.	Town of Caledon	Inspection Route Sequence	
Structure Type	Corrugated Steel Pipe	Interchange Number	
Total Deck Length	15.0 (m)	Interchange Structure Number	
Overall Str. Width	(m)	Min. Vertical Clearance	(m)
Total Deck Area	(sq.m)	Special Routes:	☐ Transit ☐ Truck ☐ School ☐ Bicycle
Roadway Width	8.25 (m)	Detour Length Around Bridge	(km)
Skew Angle	(Degrees)	Direction of Structure	East - West
No. of Spans	1	Fill on Structure	1.2 (m)
Span Lengths	0.5 (m)		

Historical Data:			
Year Built		Year of Last Major Rehab.	
Last OSIM Inspection		Last Evaluation	
Last Enhanced OSIM Inspection		Current Load Limit	/ / (tonnes)
Enhanced Access Equipment (ladder, boat lift, etc.)		Load Limit By-Law #	
Last Underwater Inspection		By-Law Expiry Date	
Last Condition Survey			

Rehab History: (Date/description)

Field Inspection Information:			
Date of Inspection:	04/27/2011	Type of Inspection:	■ OSIM ☐ Enhanced OSIM
Inspector:	Mark Kabbes		
Others in Party:	Jeremy Nyenhuis		
Access Equipment Used:	Digital Camera, Measuring Tape, Shovel		
Weather:	Overcast/raining		
Temperature:	18° C		

Additional Investigations Required:	Priority		
	None	Normal	Urgent
Material Condition Survey			
Detailed Deck Condition:			
Non-destructive Delamination Survey of Asphalt-Covered Deck:			
Concrete Substructure Condition Survey:			
Detailed Coating Condition Survey:			
Detailed Timber Investigation			
Post-Tensioned Stand Investigation			
Underwater Investigation:			
Fatigue Investigation:			
Seismic Investigation:			
Structure Evaluation:			
Monitoring			
Monitoring of Deformations, Settlements and Movements:			
Monitoring Crack Widths:			

Investigation Notes:

- Inlet is clean and is dented
- Outlet is clean and 50% filled with water
- Barrel is clean with rust located up to water level

Overall Structure Notes:	
Recommended Work on Structure:	☐ None ☐ Minor Rehab. ☐ Major Rehab. ☐ Replace
Timing of Recommended Work:	☐ 1 to 5 years ☐ 6 to 10 years
Overall Comments:	
Date of Next Inspection:	

Repair and Rehabilitation Required:		Priority			Estimated Construction Cost
Element	Repair and Rehabilitation Required	1 to 5 years	Within 1 year	Urgent	
				Total Cost	

Associated Work:	Comments	Estimated Cost
Approaches		
Detours		
Traffic Control		
Utilities		
Right of Way		
Environmental Study		
Other		
Contingencies		
	Total Cost	

Justification:

Culvert N1

BURNSIDE

Project Title: The Gore Road Culvert Inspections 2011
File No.: MTB019424
Date: May 2011

Ontario Structure Inspection Manual - Inspection Form

MTO Site Number:

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Inventory Data:

Structure Name	Culvert No. N2		
Main Hwy/Road #		On ☐ Under ■	Crossing Type: Navig. Water ☐ Non-Navig. Water ■ Rail ☐ Road ☐ Ped. ☐ Other ☐
Hwy/Road Name	The Gore Road		
Structure Location	Crossing (50 m north of House No. 18436)		
Latitude		Longitude	
Owner(s)	Regional Municipality of Peel	Heritage Designation:	☐ Not Cons. ☐ Cons./not App. ☐ List/not Desig. ☐ Desig./not List ☐ Desig. & List
MTO Region		Road Class:	Freeway ☐ Arterial ☐ Collector ☐ Local ☐
MTO District		Posted Speed	70 — No. of Lanes 2
Old County		AADT	— % Trucks
Geographic Twp.	Town of Caledon	Inspection Route Sequence	
Structure Type	Corrugated Steel Pipe	Interchange Number	
Total Deck Length	18.5 (m)	Interchange Structure Number	
Overall Str. Width	(m)	Min. Vertical Clearance	(m)
Total Deck Area	(sq.m)	Special Routes:	☐ Transit ☐ Truck ☐ School ☐ Bicycle
Roadway Width	8.0 (m)	Detour Length Around Bridge	(km)
Skew Angle	(Degrees)	Direction of Structure	East - West
No. of Spans	1	Fill on Structure	2.0 (m)
Span Lengths	0.5 (m)		

Historical Data:

Year Built		Year of Last Major Rehab.	
Last OSIM Inspection		Last Evaluation	
Last Enhanced OSIM Inspection		Current Load Limit	/ / (tonnes)
Enhanced Access Equipment (ladder, boat lift, etc.)		Load Limit By-Law #	
Last Underwater Inspection		By-Law Expiry Date	
Last Condition Survey			

Rehab History: (Date/description)

Field Inspection Information:			
Date of Inspection:	04/27/2011	Type of Inspection:	■ OSIM ☐ Enhanced OSIM
Inspector:	Mark Kabbes		
Others in Party:	Jeremy Nyenhuis		
Access Equipment Used:	Digital Camera, Measuring Tape, Shovel		
Weather:	Overcast/raining		
Temperature:	18° C		

Additional Investigations Required:	Priority		
	None	Normal	Urgent
Material Condition Survey			
Detailed Deck Condition:			
Non-destructive Delamination Survey of Asphalt–Covered Deck:			
Concrete Substructure Condition Survey:			
Detailed Coating Condition Survey:			
Detailed Timber Investigation			
Post-Tensioned Stand Investigation			
Underwater Investigation:			
Fatigue Investigation:			
Seismic Investigation:			
Structure Evaluation:			
Monitoring			
Monitoring of Deformations, Settlements and Movements:			
Monitoring Crack Widths:			

Investigation Notes:

- Inlet is 50% blocked with silt and grass build-up
- Outlet is 25% silted in
- Barrel is silted in with leafs present (due to leafs unable to determine amount or silt in barrel)

Overall Structure Notes:	
Recommended Work on Structure:	☐ None ☐ Minor Rehab. ☐ Major Rehab. ☐ Replace
Timing of Recommended Work:	☐ 1 to 5 years ☐ 6 to 10 years
Overall Comments:	
Date of Next Inspection:	

Repair and Rehabilitation Required:		Priority			Estimated Construction Cost
Element	Repair and Rehabilitation Required	1 to 5 years	Within 1 year	Urgent	
				Total Cost	

Associated Work:	Comments	Estimated Cost
Approaches		
Detours		
Traffic Control		
Utilities		
Right of Way		
Environmental Study		
Other		
Contingencies		
	Total Cost	

Justification:

Culvert N2

BURNSIDE

Project Title: The Gore Road Culvert Inspections 2011
File No.: MTB019424
Date: May 2011

Ontario Structure Inspection Manual - Inspection Form

MTO Site Number:

Inventory Data:

Structure Name	Culvert No. N3		
Main Hwy/Road #		On ☐ Under ■	Crossing Type: Navig. Water ☐ Non-Navig. Water ■ Rail ☐ Road ☐ Ped. ☐ Other ☐
Hwy/Road Name	The Gore Road		
Structure Location	Crossing (150 m south of House No. 17990)		
Latitude		Longitude	
Owner(s)	Regional Municipality of Peel	Heritage Designation:	☐ Not Cons. ☐ Cons./not App. ☐ List/not Desig. ☐ Desig./not List ☐ Desig. & List
MTO Region		Road Class:	Freeway ☐ Arterial ☐ Collector ☐ Local ☐
MTO District		Posted Speed	70 — No. of Lanes 2
Old County		AADT	— % Trucks
Geographic Twp.	Town of Caledon	Inspection Route Sequence	
Structure Type	Pre-cast concrete box with floor	Interchange Number	
Total Deck Length	20.0 (m)	Interchange Structure Number	
Overall Str. Width	6.4 (m)	Min. Vertical Clearance	(m)
Total Deck Area	128.0 (sq.m)	Special Routes:	☐ Transit ☐ Truck ☐ School ☐ Bicycle
Roadway Width	8.2 (m)	Detour Length Around Bridge	(km)
Skew Angle	0 (Degrees)	Direction of Structure	East - West
No. of Spans	1	Fill on Structure	2.5 (m)
Span Lengths	5.5 (m)		

Historical Data:

Year Built		Year of Last Major Rehab.	
Last OSIM Inspection		Last Evaluation	
Last Enhanced OSIM Inspection		Current Load Limit	/ / (tonnes)
Enhanced Access Equipment (ladder, boat lift, etc.)		Load Limit By-Law #	
Last Underwater Inspection		By-Law Expiry Date	
Last Condition Survey			

Rehab History: (Date/description)

Ontario Structure Inspection Manual - Inspection Form

MTO Site Number:

Field Inspection Information:			
Date of Inspection:	05/04/2011	Type of Inspection:	■ OSIM ☐ Enhanced OSIM
Inspector:	Mark Kabbes		
Others in Party:	Jeremy Nyenhuis		
Access Equipment Used:	Digital Camera, Measuring Tape, Shovel		
Weather:	Overcast		
Temperature:	16° C		

Additional Investigations Required:	Priority		
	None	Normal	Urgent
Material Condition Survey			
Detailed Deck Condition:			
Non-destructive Delamination Survey of Asphalt–Covered Deck:			
Concrete Substructure Condition Survey:			
Detailed Coating Condition Survey:			
Detailed Timber Investigation			
Post-Tensioned Stand Investigation			
Underwater Investigation:			
Fatigue Investigation:			
Seismic Investigation:			
Structure Evaluation:			
Monitoring			
Monitoring of Deformations, Settlements and Movements:			
Monitoring Crack Widths:			
Investigation Notes:			

Overall Structure Notes:	
Recommended Work on Structure:	☐ None ☐ Minor Rehab. ☐ Major Rehab. ☐ Replace
Timing of Recommended Work:	☐ 1 to 5 years ☐ 6 to 10 years
Overall Comments:	
Date of Next Inspection:	

Suspected Performance Deficiencies

01 Load carrying capacity
02 Excessive deformations (deflections & rotations)
03 Continuing settlement
04 Continuing movements
05 Seized bearings
06 Bearing not uniformly loaded/unstable
07 Jammed expansion joint
08 Pedestrian/vehicular hazard
09 Rough riding surface
10 Surface ponding
11 Deck drainage
12 Slippery surfaces
13 Flooding/channel blockage
14 Undermining of foundation
15 Unstable embankments
16 Other

Maintenance Needs

01 Lift and Swing Bridge Maintenance
02 Bridge Cleaning
03 Bridge Handrail Maintenance
04 Painting Steel Bridge Structures
05 Bridge Deck Joint Repair
06 Bridge Bearing Maintenance
07 Repair to Structural Steel
08 Repair of Bridge Concrete
09 Repair of Bridge Timber
10 Bailey bridges - Maintenance
11 Animal/Pest Control
12 Bridge Surface Repair
13 Erosion Control at Bridges
14 Concrete Sealing
15 Rout and Seal
16 Bridge Deck Drainage
17 Scaling (Loose Concrete or ACR Steel)
18 Other

Element Data

Element Group:	Inlet		**Length:**			
Element Name:			**Width:**	6.40 m		
Location:	West side of road		**Height:**	2.55 m		
Material:	Concrete		**Count:**	1		
Element Type:	Pre-cast Concrete		**Total Quantity:**	1		
Environment:	Benign / Moderate / Severe		**Limited Inspection** ☐			
Protection System:						**Perform. Deficiencies**
Condition Data:	**Units**	**Exc.**	**Good**	**Fair**	**Poor***	
	m^2 / m / each / % / all		99	1		

Comments:

- Light scaling
- Head wall is 0.45m wide

Recommended Work: ☐ Rehab ☐ Replace ☐ 1 – 5 years ☐ 6 – 10 years

Maintenance Needs: ☐ Urgent ☐ 1 year ☐ 2 year

Element Group:	Box - Barrel		**Length:**	20.0 m		
Element Name:			**Width:**	5.5 m		
Location:	Under Road		**Height:**	2.1 m		
Material:	Concrete		**Count:**	1		
Element Type:	Pre-cast Concrete		**Total Quantity:**	1		
Environment:	Benign / Moderate / Severe		**Limited Inspection** ☐			
Protection System:						**Perform. Deficiencies**
Condition Data:	**Units**	**Exc.**	**Good**	**Fair**	**Poor***	
	m^2 / m / each / % / all		99	1		

Comments:

- Light concrete repairs evident
- Wooden 4x4 are bolted to the floor in a 'V' shape pattern
- In good condition
- Small patches of light scaling
- 1.0m scour/erosion on the centre north hunch

Recommended Work: ☐ Rehab ☐ Replace ☐ 1 – 5 years ☐ 6 – 10 years

Maintenance Needs: ☐ Urgent ☐ 1 year ☐ 2 year

Element Group:	Outlet			**Length:**			
Element Name:				**Width:**	6.40 m		
Location:	West side of road			**Height:**	2.55 m		
Material:	Concrete			**Count:**	1		
Element Type:	Pre-cast Concrete			**Total Quantity:**	1		
Environment:	Benign / Moderate / Severe			**Limited Inspection** ☐			
Protection System:							**Perform. Deficiencies**
Condition Data:	**Units**		**Exc.**	**Good**	**Fair**	**Poor***	
	m²/ m / each / % / all			99	1		

Comments:

- Light scaling
- 0.10m drop at outlet from box floor to stream bed
- New gabion stone retaining wall over structure, 14m long and 3m high, in good condition
- Wash outs behind both sides of the gabion wall
- Silt fence from barrier replacement still present

Recommended Work: ☐ Rehab ☐ Replace ☐ 1 – 5 years ☐ 6 – 10 years

Maintenance Needs: ☐ Urgent ☐ 1 year ☐ 2 year

Element Group:	Road			**Length:**			
Element Name:	Driving Surface			**Width:**	8.20 m		
Location:	The Gore Road			**Height:**			
Material:	Asphalt			**Count:**	1		
Element Type:	Asphalt			**Total Quantity:**	1		
Environment:	Benign / Moderate / Severe			**Limited Inspection** ☐			
Protection System:							**Perform. Deficiencies**
Condition Data:	**Units**		**Exc.**	**Good**	**Fair**	**Poor***	
	m²/ m / each / % / all			99	1		

Comments:

- Road is two lanes traveling over the structure
- Half of the east side lane has been resurfaced with asphalt
- SBGR present on both sides of the road
- Remains of old barrier system are present behind the new SBGR

Recommended Work: ☐ Rehab ☐ Replace ☐ 1 – 5 years ☐ 6 – 10 years

Maintenance Needs: ☐ Urgent ☐ 1 year ☐ 2 year

*** A quantity must be estimated using the appropriate unit (e.g. m²). Percent should not be used.**

Repair and Rehabilitation Required:		Priority			Estimated Construction Cost
Element	Repair and Rehabilitation Required	1 to 5 years	Within 1 year	Urgent	
				Total Cost	

Associated Work:	Comments	Estimated Cost
Approaches		
Detours		
Traffic Control		
Utilities		
Right of Way		
Environmental Study		
Other		
Contingencies		
	Total Cost	

Justification:

Culvert N3

BURNSIDE

Project Title: The Gore Road Culvert Inspections 2011
File No.: MTB019424
Date: May 2011


05/04/2011


05/04/2011

BURNSIDE

Project Title: The Gore Road Culvert Inspections 2011
File No.: MTB019424
Date: May 2011

Ontario Structure Inspection Manual - Inspection Form

MTO Site Number:

Inventory Data:

Field	Value	Field	Value
Structure Name	Culvert No. 17415		
Main Hwy/Road #		On ☐ Under ■	Crossing Type: Navig. Water ☐ Non-Navig. Water ■ Rail ☐ Road ☐ Ped. ☐ Other ☐
Hwy/Road Name	The Gore Road		
Structure Location	House Entrance No. 17415 (East side of road) (50 m north of House No. 17412)		
Latitude		Longitude	
Owner(s)	Regional Municipality of Peel	Heritage Designation:	☐ Not Cons. ☐ Cons./not App. ☐ List/not Desig. ☐ Desig./not List ☐ Desig. & List
MTO Region		Road Class:	Freeway ☐ Arterial ☐ Collector ☐ Local ☐
MTO District		Posted Speed	No. of Lanes
Old County		AADT	% Trucks
Geographic Twp.	Town of Caledon	Inspection Route Sequence	
Structure Type	Corrugated Steel Pipe	Interchange Number	
Total Deck Length	9.0 (m)	Interchange Structure Number	
Overall Str. Width	(m)	Min. Vertical Clearance	(m)
Total Deck Area	(sq.m)	Special Routes:	☐ Transit ☐ Truck ☐ School ☐ Bicycle
Roadway Width	7.3 (m)	Detour Length Around Bridge	(km)
Skew Angle	(Degrees)	Direction of Structure	North - South
No. of Spans	1	Fill on Structure	0.1 (m)
Span Lengths	0.25 (m)		

Historical Data:

Field	Value	Field	Value
Year Built		Year of Last Major Rehab.	
Last OSIM Inspection		Last Evaluation	
Last Enhanced OSIM Inspection		Current Load Limit	/ / (tonnes)
Enhanced Access Equipment (ladder, boat lift, etc.)		Load Limit By-Law #	
Last Underwater Inspection		By-Law Expiry Date	
Last Condition Survey			

Rehab History: (Date/description)

Field Inspection Information:			
Date of Inspection:	05/04/2011	Type of Inspection:	■ OSIM ☐ Enhanced OSIM
Inspector:	Mark Kabbes		
Others in Party:	Jeremy Nyenhuis		
Access Equipment Used:	Digital Camera, Measuring Tape, Shovel		
Weather:	Sunny		
Temperature:	15° C		

Additional Investigations Required:	Priority		
	None	Normal	Urgent
Material Condition Survey			
Detailed Deck Condition:			
Non-destructive Delamination Survey of Asphalt–Covered Deck:			
Concrete Substructure Condition Survey:			
Detailed Coating Condition Survey:			
Detailed Timber Investigation			
Post-Tensioned Stand Investigation			
Underwater Investigation:			
Fatigue Investigation:			
Seismic Investigation:			
Structure Evaluation:			
Monitoring			
Monitoring of Deformations, Settlements and Movements:			
Monitoring Crack Widths:			

Investigation Notes:

- Inlet is 60% blocked because of the elevation of the lawn/ditch
- Outlet is 50% blocked because of the elevation of the lawn/ditch
- Barrel is 30% silted in

Overall Structure Notes:	
Recommended Work on Structure:	☐ None ☐ Minor Rehab. ☐ Major Rehab. ☐ Replace
Timing of Recommended Work:	☐ 1 to 5 years ☐ 6 to 10 years
Overall Comments:	
Date of Next Inspection:	

Repair and Rehabilitation Required:		Priority			Estimated Construction Cost
Element	Repair and Rehabilitation Required	1 to 5 years	Within 1 year	Urgent	
				Total Cost	

Associated Work:	Comments	Estimated Cost
Approaches		
Detours		
Traffic Control		
Utilities		
Right of Way		
Environmental Study		
Other		
Contingencies		
	Total Cost	

Justification:

Culvert 17415


05/04/2011


05/04/2011

Ontario Structure Inspection Manual - Inspection Form

MTO Site Number:

Inventory Data:

Structure Name	Culvert No. 18620		
Main Hwy/Road #		On ☐ Under ■	Crossing Type: Navig. Water ☐ Non-Navig. Water ■ Rail ☐ Road ☐ Ped. ☐ Other ☐
Hwy/Road Name	The Gore Road		
Structure Location	House Entrance No. 18620 (West side of road) (120 m north of House No. 18584)		
Latitude		Longitude	
Owner(s)	Regional Municipality of Peel	Heritage Designation:	☐ Not Cons. ☐ Cons./not App. ☐ List/not Desig. ☐ Desig./not List ☐ Desig. & List
MTO Region		Road Class:	Freeway ☐ Arterial ☐ Collector ☐ Local ☐
MTO District		Posted Speed	No. of Lanes
Old County		AADT	% Trucks
Geographic Twp.	Town of Caledon	Inspection Route Sequence	
Structure Type	Corrugated Steel Pipe	Interchange Number	
Total Deck Length	6.1 (m)	Interchange Structure Number	
Overall Str. Width	(m)	Min. Vertical Clearance	(m)
Total Deck Area	(sq.m)	Special Routes:	☐ Transit ☐ Truck ☐ School ☐ Bicycle
Roadway Width	4.1 (m)	Detour Length Around Bridge	(km)
Skew Angle	(Degrees)	Direction of Structure	North - South
No. of Spans	1	Fill on Structure	0.4 (m)
Span Lengths	0.4 (m)		

Historical Data:

Year Built		Year of Last Major Rehab.	
Last OSIM Inspection		Last Evaluation	
Last Enhanced OSIM Inspection		Current Load Limit	/ / (tonnes)
Enhanced Access Equipment (ladder, boat lift, etc.)		Load Limit By-Law #	
Last Underwater Inspection		By-Law Expiry Date	
Last Condition Survey			

Rehab History: (Date/description)

Field Inspection Information:			
Date of Inspection:	04/27/2011	Type of Inspection:	■ OSIM ☐ Enhanced OSIM
Inspector:	Mark Kabbes		
Others in Party:	Jeremy Nyenhuis		
Access Equipment Used:	Digital Camera, Measuring Tape, Shovel		
Weather:	Overcast/raining		
Temperature:	18° C		

Additional Investigations Required:	Priority		
	None	Normal	Urgent
Material Condition Survey			
Detailed Deck Condition:			
Non-destructive Delamination Survey of Asphalt–Covered Deck:			
Concrete Substructure Condition Survey:			
Detailed Coating Condition Survey:			
Detailed Timber Investigation			
Post-Tensioned Stand Investigation			
Underwater Investigation:			
Fatigue Investigation:			
Seismic Investigation:			
Structure Evaluation:			
Monitoring			
Monitoring of Deformations, Settlements and Movements:			
Monitoring Crack Widths:			

Investigation Notes:

- Inlet is 60% blocked with silt and grass build-up
- Outlet is blocked by a fallen brick retaining wall
- Barrel is 50% silted in

Overall Structure Notes:	
Recommended Work on Structure:	☐ None ☐ Minor Rehab. ☐ Major Rehab. ☐ Replace
Timing of Recommended Work:	☐ 1 to 5 years ☐ 6 to 10 years
Overall Comments:	
Date of Next Inspection:	

Repair and Rehabilitation Required:		Priority			Estimated Construction Cost
Element	Repair and Rehabilitation Required	1 to 5 years	Within 1 year	Urgent	
				Total Cost	

Associated Work:	Comments	Estimated Cost
Approaches		
Detours		
Traffic Control		
Utilities		
Right of Way		
Environmental Study		
Other		
Contingencies		
	Total Cost	

Justification:

Culvert 18620

Ontario Structure Inspection Manual - Inspection Form

MTO Site Number:

Inventory Data:

Structure Name	Culvert No. 19037		
Main Hwy/Road #		On ☐ Under ■	Crossing Type: Navig. Water ☐ Non-Navig. Water ■ Rail ☐ Road ☐ Ped. ☐ Other ☐
Hwy/Road Name	The Gore Road		
Structure Location	House Entrance No. 19037 (East side of road) (30 m south of HWY 9)		
Latitude		Longitude	
Owner(s)	Regional Municipality of Peel	Heritage Designation:	☐ Not Cons. ☐ Cons./not App. ☐ List/not Desig. ☐ Desig./not List ☐ Desig. & List
MTO Region		Road Class:	Freeway ☐ Arterial ☐ Collector ☐ Local ☐
MTO District		Posted Speed	No. of Lanes
Old County		AADT	% Trucks
Geographic Twp.	Town of Caledon	Inspection Route Sequence	
Structure Type	Corrugated Steel Pipe	Interchange Number	
Total Deck Length	10.0 (m)	Interchange Structure Number	
Overall Str. Width	(m)	Min. Vertical Clearance	(m)
Total Deck Area	(sq.m)	Special Routes:	☐ Transit ☐ Truck ☐ School ☐ Bicycle
Roadway Width	6.0 (m)	Detour Length Around Bridge	(km)
Skew Angle	0 (Degrees)	Direction of Structure	North - South
No. of Spans	1	Fill on Structure	0.5 (m)
Span Lengths	0.5 (m)		

Historical Data:

Year Built		Year of Last Major Rehab.	
Last OSIM Inspection		Last Evaluation	
Last Enhanced OSIM Inspection		Current Load Limit	/ / (tonnes)
Enhanced Access Equipment (ladder, boat lift, etc.)		Load Limit By-Law #	
Last Underwater Inspection		By-Law Expiry Date	
Last Condition Survey			

Rehab History: (Date/description)

Field Inspection Information:			
Date of Inspection:	04/26/2011	Type of Inspection:	■ OSIM ☐ Enhanced OSIM
Inspector:	Mark Kabbes		
Others in Party:	Jeremy Nyenhuis		
Access Equipment Used:	Digital Camera, Measuring Tape, Shovel		
Weather:	Overcast/raining		
Temperature:	18° C		

Additional Investigations Required:	Priority		
	None	Normal	Urgent
Material Condition Survey			
Detailed Deck Condition:			
Non-destructive Delamination Survey of Asphalt-Covered Deck:			
Concrete Substructure Condition Survey:			
Detailed Coating Condition Survey:			
Detailed Timber Investigation			
Post-Tensioned Stand Investigation			
Underwater Investigation:			
Fatigue Investigation:			
Seismic Investigation:			
Structure Evaluation:			
Monitoring			
Monitoring of Deformations, Settlements and Movements:			
Monitoring Crack Widths:			

Investigation Notes:

- Inlet has 10% blocked with gravel from the road shoulder
- Outlet is 30% blocked with gravel and grass build-up and the top has been squashed
- Barrel has roughly 10% of silt build up in it with a small dent in the top north end

Overall Structure Notes:	
Recommended Work on Structure:	☐ None ☐ Minor Rehab. ☐ Major Rehab. ☐ Replace
Timing of Recommended Work:	☐ 1 to 5 years ☐ 6 to 10 years
Overall Comments:	
Date of Next Inspection:	

Repair and Rehabilitation Required:		Priority			Estimated Construction Cost
Element	Repair and Rehabilitation Required	1 to 5 years	Within 1 year	Urgent	
				Total Cost	

Associated Work:	Comments	Estimated Cost
Approaches		
Detours		
Traffic Control		
Utilities		
Right of Way		
Environmental Study		
Other		
Contingencies		
	Total Cost	

Justification:

Culvert 19037

BURNSIDE

Project Title: The Gore Road Culvert Inspections 2011
File No.: MTB019424
Date: May 2011

Ontario Structure Inspection Manual - Inspection Form

MTO Site Number:

Inventory Data:

Structure Name	Culvert No. 7434		
Main Hwy/Road #		On ☐ Under ■	Crossing Type: Navig. Water ☐ Non-Navig. Water ■ Rail ☐ Road ☐ Ped. ☐ Other ☐
Hwy/Road Name	The Gore Road		
Structure Location	Back Entrance No. 7434 (West side of road) (20 m north of Finnerty side road)		
Latitude		Longitude	
Owner(s)	Regional Municipality of Peel	Heritage Designation:	☐ Not Cons. ☐ Cons./not App. ☐ List/not Desig. ☐ Desig./not List ☐ Desig. & List
MTO Region		Road Class:	Freeway ☐ Arterial ☐ Collector ☐ Local ☐
MTO District		Posted Speed	No. of Lanes
Old County		AADT	% Trucks
Geographic Twp.	Town of Caledon	Inspection Route Sequence	
Structure Type	Corrugated Steel Pipe	Interchange Number	
Total Deck Length	7.25 (m)	Interchange Structure Number	
Overall Str. Width	(m)	Min. Vertical Clearance	(m)
Total Deck Area	(sq.m)	Special Routes:	☐ Transit ☐ Truck ☐ School ☐ Bicycle
Roadway Width	5.5 (m)	Detour Length Around Bridge	(km)
Skew Angle	(Degrees)	Direction of Structure	North - South
No. of Spans	1	Fill on Structure	0.9 (m)
Span Lengths	0.4 (m)		

Historical Data:

Year Built		Year of Last Major Rehab.	
Last OSIM Inspection		Last Evaluation	
Last Enhanced OSIM Inspection		Current Load Limit	/ / (tonnes)
Enhanced Access Equipment (ladder, boat lift, etc.)		Load Limit By-Law #	
Last Underwater Inspection		By-Law Expiry Date	
Last Condition Survey			

Rehab History: (Date/description)

Field Inspection Information:			
Date of Inspection:	05/04/2011	Type of Inspection:	■ OSIM ☐ Enhanced OSIM
Inspector:	Mark Kabbes		
Others in Party:	Jeremy Nyenhuis		
Access Equipment Used:	Digital Camera, Measuring Tape, Shovel		
Weather:	Sunny		
Temperature:	15° C		

Additional Investigations Required:	Priority		
	None	Normal	Urgent
Material Condition Survey			
Detailed Deck Condition:			
Non-destructive Delamination Survey of Asphalt–Covered Deck:			
Concrete Substructure Condition Survey:			
Detailed Coating Condition Survey:			
Detailed Timber Investigation			
Post-Tensioned Stand Investigation			
Underwater Investigation:			
Fatigue Investigation:			
Seismic Investigation:			
Structure Evaluation:			
Monitoring			
Monitoring of Deformations, Settlements and Movements:			
Monitoring Crack Widths:			

Investigation Notes:

- Inlet is 15% blocked with silt and grass build-up
- Outlet is 65% blocked and squished
- Silt build-up in barrel even from inlet to outlet
- The main entrance of this house is off of Finnerty Sideroad

Overall Structure Notes:	
Recommended Work on Structure:	☐ None ☐ Minor Rehab. ☐ Major Rehab. ☐ Replace
Timing of Recommended Work:	☐ 1 to 5 years ☐ 6 to 10 years
Overall Comments:	
Date of Next Inspection:	

Repair and Rehabilitation Required:		Priority			Estimated Construction Cost
Element	Repair and Rehabilitation Required	1 to 5 years	Within 1 year	Urgent	
				Total Cost	

Associated Work:	Comments	Estimated Cost
Approaches		
Detours		
Traffic Control		
Utilities		
Right of Way		
Environmental Study		
Other		
Contingencies		
	Total Cost	

Justification:

Culvert 7434

BURNSIDE

Project Title: The Gore Road Culvert Inspections 2011
File No.: MTB019424
Date: May 2011

BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

Appendix M

Geotechnical Investigation Report

V. A. WOOD (GUELPH) INCORPORATED
CONSULTING GEOTECHNICAL ENGINEERS

405 YORK ROAD, GUELPH, ONTARIO N1E 3H3
TELEPHONE: (519) 763-3101

GEOTECHNICAL INVESTIGATION SCHEDULE B ENVIRONMENTAL ASSESSMENT STUDY FOR THE GORE ROAD FROM PATTERSON SIDE ROAD TO HIGHWAY 9 PROJECT 10-4385

Ref. No. G3070-0-11

May 2011

Prepared for:

R. J. Burnside & Associates Ltd.
170 Steelwell Road, Suite 200
Brampton, Ontario
L6T 5T3

DISTRIBUTION:

(4) Copies - R. J. Burnside & Associates Ltd.
(2) Copies - V.A. Wood Associates Limited

CONTENTS

APPENDICES

ENCLOSURES

1.0 INTRODUCTION

V.A. Wood Associates Limited was retained by R. J. Burnside & Associates Ltd. to carry out the geotechnical investigation of the Schedule B Environmental Assessment Study for the Gore Road from Patterson Side Road to Highway 9.

The road is 6.3 km long. Based on the Terms of Reference (TOR) the Geotechnical Investigation will assess the current orad condition and provide recommendations for its rehabilitation/reconstruction. The geotechnical report must include enough details to compete the preliminary design and cost estimates.

Based on the TOR, the geotechnical/pavement investigation is to consist of:

- *A visual condition survey, noting the general pavement surface features, observable pavement distresses and drainage characteristics; non-destructive Falling Weight Deflectometer (FWD) load/deflection testing to evaluate the structural condition of the existing pavement; and probe holes at selected locations to determine the type and thickness of the individual pavement layers and assess subgrade characteristics.*
- *Geotechnical investigations and recommendations will include: the cut and fill slope geometry, subdrain recommendations, soil assessment around bridge/culvert (structures and retaining walls); pavement design alternatives; roadway cut and fill operations; dewatering requirements; and disposal of surplus materials in conformance to MOE clean-up guidelines.*
- *Pavement Design Report.*

2.0 *VISUAL CONDITION SURVEY*

2.1 *General*

A walk-over survey was carried out in November 18 and 19, 2010 and May 19, 2011 to determine the general condition of the road surface, delineate areas of the road with observable distress and other features, and where the road was built on cut or fill (embankment) and make observations of the condition of the slopes.

It is noted that the survey was carried out over 3 days for the 6.3 km long two-lane road and the observations are shown on the road plan provided by the Client. The observations are based on a general walk-over survey of the pavement conditions and slope conditions and should not be considered an exhaustive survey. It is likely that there are poor road conditions both in smaller and larger scale that were missed and not shown on the drawings.

2.2 *Summary of Observations*

The detailed observations are annotated on the Borehole Plans in Enclosures 1a to 1k. A number of photographs were taken during the survey, and are on file. The observations are summarized as follows:

- *The paved surface is generally 4 to 4.6 metres wide (13 to 15 ft) from edge to edge (including the 0.3 to 0.6 m wide strip beyond the white line on both sides of the road).*

- *The gravel shoulder GENERALLY varies in width from 0 to 2 metres.*
- *The pavement is in generally poor to very poor condition over most of the road, with some sections in generally fair shape.*
- *The worst pavement conditions occur over a 1± km stretch between Sta. 0+200 and Sta. 1+200, where severe alligator cracking and transverse road cracking was observed over large sections of the road. In many areas, particularly the sides of the pavement with severe alligator cracks, sagging of the pavement was observed.*
- *Another long section of generally poor pavement condition is a 0.7± km stretch between Sta. 1+800 and Sta. 2+500, where severe alligator cracking was observed.*
- *For the remainder of the road, alligator cracks were observed generally within the 1-2 metre edges and on the median area of the pavement. Transverse cracks also occur, but at further intervals. Only occasional sagging of the road was observed.*
- *For areas with transverse cracks shown on the drawings, the cracks generally extend the for at least half of the width of the pavement, at least 6 mm (1/4 inch) wide and spaced generally at 5-10 m or 5 to 20 m intervals. There are numerous areas with individual transverse cracks which are not indicated on the drawings.*
- *Areas of severe longitudinal cracks at least 10 m long and 6mm wide have been annotated on the plans. These generally occur at or near the median of the road. Some of these cracks have been patched. There are numerous areas with longitudinal cracks which are not shown on the drawings.*
- *There are no significant potholes observed. However, there are a number of sections which were recently patched and are likely to be the previously worst pavement areas. The patched areas are estimated to constitute less than 1% of the total paved area.*

- *Based on observations, approximately 60 to 65% of the total alignment is on fill (embankment). The embankment heights vary from less than 1 metre to a maximum of about 8 metres. The embankment slopes are generally steep (generally 1.25H:V1 to 1.5H:1V), although shallower angles were observed in many of the lower embankments.. In some areas the guard rails have tilted, which indicate movement of the embankment slope. No major embankment failure was observed or apparent. Severe cracking and some sagging were observed on the pavement edges with possible embankment slope movement above the culvert in a number of areas. Two areas of severely eroded (possibly slipped embankment) were observed, and the affected been backfilled with gravel and cobbles.*
- *About 25% of the alignment is on cut (the remaining areas are over relatively flat areas). The height of the cut slopes vary from less than 1m to a maximum of about 12 m. The cut slope angles are generally about 1.5H:1V or shallower, although locally steeper angles were observed on some portions of the slopes. The cut slopes are generally in good condition. Except for one low cut slope with small slips (at approx. Sta 1+800) , no signs of relict slope failures or recent significant slope movement were observed or apparent. However, significant slope erosion was observed in some areas, particularly at the lower sections of some cut slopes.*

2.3 FWD Testing

Falling Weight Deflectometer (FWD) load/deflection testing was not carried out under this investigation.

3.0 ***SUBSURFACE INVESTIGATION***

The field work was carried out between April 19 and May 30, 2011 and consisted of forty boreholes at the locations shown on Enclosures 1a to 1k. The borehole depths varied between 2 and 11 metres. The boreholes were advanced to the sampling depths by means of a power-auger machine equipped for soil sampling. Standard Penetration tests were carried out at frequent intervals of depth and the results are shown on the Borehole Logs as N-values.

The field work was supervised by a soils technician and the soil samples were logged by a soils engineer. All samples were transported to our soils laboratory for further examination, classification and testing. The ground elevation at each borehole location was interpolated from spot elevations shown on the Road Plan provided by the Client.

In accordance with the Water Resources Act, all boreholes deeper than 3 metres were reinstated with "Hole Plug", a bentonite-based commercial borehole sealant. All auger cuttings were removed from the site.

4.0 SUBSURFACE CONDITIONS

Full details of the soils encountered in each borehole are given on the Borehole Logs, Enclosures 2 to 41 inclusive, and the following notes are intended to summarize this data.

4.1 Pavement

The composition of the pavement and immediate subgrade at the borehole locations is summarized as follows:

Borehole No.	Asphalt Thickness	Granular Base Thickness	Subgrade Soil
1	75 mm	400 mm	Dense/compact silty sand Fill
2	75 mm	400 mm	Dense silty sand Fill
3	75 mm	300 mm	Compact silty sand Fill, then compact native Silt and Sand
4	25 mm	275 mm	Compact fine sand Fill with peat, then loose native silty sand
5	75 mm	300 mm	Dense/compact fine/silty sand Fill, underlain by loose peat
6	50 mm	325 mm	Compact silty sand Fill, then compact native silty sand
7	60 mm	375 mm	Compact silty sand Fill
8	75 mm	165 mm	Compact sand Fill
9	60 mm	225 mm	Dense silty sand Fill, then compact silt till
10	50 mm	425 mm	Compact native fine sand

11	*50 mm*	*150 mm*	*Dense silty sand Fill*
12	*75 mm*	*400 mm*	*Dense silty sand Fill*
13	*65 mm*	*225 mm*	*Dense silt and sand Fill*
14	*75 mm*	*175 mm*	*Compact to dense native sandy silt till*
15	*75 mm*	*400 mm*	*Compact to dense fine sand Fill*
16	*75 mm*	*150 mm*	*Compact sand and sandy silt Fill*
17	*65 mm*	*225 mm*	*Compact organic stained sand and silt*
18	*90 mm*	*150 mm*	*Dense native sand and silt*
19	*75 mm*	*150 mm*	*Compact sand Fill*
20	*60 mm*	*300 mm*	*Compact to dense fine sand (possible fill)*
21	*50 mm*	*300 mm*	*Compact to dense native sand*
22	*75 mm*	*300 mm*	*Compact to dense sand Fill*
23	*180 mm*	*275 mm*	*Dense sand Fill, then compact silt*
24	*75 mm*	*200 mm*	*Compact sand Fill*
25	*75 mm*	*400 mm*	*Compact native silty sand*
26	*150 mm*	*300 mm*	*Compact native silt and sand*
27	*75 mm*	*150 mm*	*Compact to dense sand Fill*
28	*175 mm*	*250 mm*	*Compact to dense sandy silt and sand Fill*
29	*50 mm*	*300 mm*	*Compact to very loose native silty sand*
30	*140 mm*	*225 mm*	*Compact fine sand Fill*
31	*60 mm*	*350 mm*	*Dense then loose silty sand Fill*
32	*150 mm*	*225 mm*	*Compact silty sand Fill*
33	*60 mm*	*350 mm*	*Dense sandy silt Fill, then compact sand and silt*
34	*150 mm*	*250 mm*	*Compact sand Fill*

35	*60 mm*	*400 mm*	*Compact silty sand Fill*
36	*150 mm*	*300 mm*	*Dense fine sand Fill, then compact native sand*
37	*150 mm*	*300 mm*	*Compact silty sand Fill, then compact native silty sand*
38	*100 mm*	*200 mm*	*Very dense sand Fill*
39	*150 mm*	*225 mm*	*Dense gravelly sand Fill, then compact silty sand Fill*
40	*125 mm*	*175 mm*	*Dense silty sand Fill, then very stiff native silt*

Based on the borehole findings, the thickness of the asphalt surfacing varies between 50 mm and 180 mm. Within the southern 3.5 km the asphalt is generally between 50 mm and 75 mm thick. Over the remaining 2.8 km the asphalt thickness is variable but is generally more than 100 mm in most of the boreholes. It is possible that the thicker asphalt encountered was due to past repairs.

The granular base varies in thickness from 150 mm to 425 mm. It is comprised generally of sand and subrounded gravel, indicating an alluvial deposit (rather than crusher run) source. Grain size distribution tests were carried out on representative samples of the granular base, and the test results are shown on Enclosures 42 to 46 where the grain size envelopes for Granular A and Granular B have been overlain. The findings show that the samples are just outside the grading envelope for Granular A but are well within the envelope for Granular B.

It is possible that the existing granular base is comprised of an upper Granular A base and a lower Granular B sub-base. However owing to the sampling method (by auger or within a small sampling tube), the granular samples obtained is an aggregate mixture of the whole granular base.

4.2 Fill

Fill was encountered in all of the boreholes, except Boreholes 10, 14, 18, 21, 25, 26 and 27. This material comprise the embankment fill and the immediate fill subgrade within the non-embankment areas. The fill is comprised generally of silty sand or fine to medium sand, and contains traces or no gravel, and was likely obtained from an alluvial deposit and from cut areas of the road. Standard Penetration tests in the fill gave N-values generally between 10 and 50 blows/300mm, and its moisture content is generally less than 12%.

Based on the test results, the fill is considered to be in a generally compact condition. The borehole samples indicate that the immediate fill subgrade is granular and, except for a few areas, the fill does not contain significant topsoil and organics, and appears to be free of construction debris or other deleterious materials.

4.3 Peat and Topsoil

Peat, 0.6 to 1.3 m thick encountered below the fill in Boreholes 5, 24 and 31 at depths of between 2 and 5 metres below grade. Peat with seams of sand was encountered in Borehole

31 at a depth of between 2 and 4 m. Standard Penetration tests in the peat/peat and sand gave N-values between 3 and 6 blows/300mm. Sand with seams of peat was encountered also below the fill in Borehole 22 at a depth of between 1.4 and 2 metres, and with an N-value of 17 blows/300mm.

Based on the test results, the peat is considered to be in a loose condition, and its presence below the embankment fill indicates that the existing peat in the marshy or swampy areas were not removed prior to construction of the embankment.

Topsoil was encountered below the fill in Boreholes20 and 32 at depths of between 1.5 and 2 metres below grade, and in Borehole 28 at a depth of about 3 metres Standard Penetration tests in the topsoil gave N-values between 4 and 13 blows/300mm.

Based on the test results, the topsoil is considered to be in a loose to compact condition, and its presence below the embankment fill indicates that the existing topsoil was not stripped prior to backfilling.

4.4 Sandy Silt/Silty Sand

Native sandy silt and silty sand was encountered below the granular fill in Boreholes 25 and 29, and below the fill in Boreholes 1, 4, 6, 8, 20, 30 and 37. This deposit extended to a depth of between 1.4 and 2.9 metres below grade. Standard Penetration tests in this deposit gave N-values between 1 and 15 blows/300mm. Based on the test results, the *native sandy silt/silty sand is considered to have a very loose to compact relative density. Very dense sand and gravel was encountered above on top of the silty sand in Borehole 19.*

4.5 Sand and Silt

Native sand, silt or bedded sand and silt y silt or silty sand were encountered below the peat/topsoil in Boreholes 5, 24, 27, 28, 31 and 32, and below the fill in the remaining boreholes except Boreholes 1, 2, 8, 9, 12,15, 25, 30, 34 and 38 (most of which are shallow boreholes). The sand is comprised generally of fine sand with occasional seams of silt, the silt contains occasional seams of fine sand. The bedded sand and silt is comprised of thinly bedded fine sand and silt. This deposit extended to a depth of more than 2 to 6.6 metres below grade (maximum depth investigated). Standard Penetration tests in this deposit gave N-values between 17and more than 50 blows/300mm, and generally between 11 and 40 blows/300mm. Based on the test results, the sand, silt and bedded sand and silt deposit is considered to have a generally compact to dense relative density.

4.6 Silt Till and Sandy Silt Till

Native silt till and sandy silt till were encountered below the granular fill in Borehole 14, below the fill in Borehole 9, and below the sand/silt in Boreholes 8, 11 and 24. This glacial till deposit is comprised of a silt or sandy silt matrix and contained traces of fine gravel and extended to a depth of between 1.3 and more than 11 meres below grade (maximum depth investigated). Standard Penetration tests in this deposit gave N-values between 10 *and 43 blows/300mm. Based on the test results, the glacial silt till and sandy silt till is considered to have a compact to dense relative density. Compact well graded sand was encountered below the till in Borehole14.*

5.0 GROUNDWATER CONDITIONS

A free water surface was encountered in Boreholes 8, 11, 19, 24, 27, 31, 32 and 35 at a depth of between 1.8 and 5.5 metres below garde. All of remaining boreholes (except Borehole 34 which caved in at a depth of 0.5 m) were open and dry to the full depth upon completion of the fieldwork. It is noted that the water level measurement was carried out immediately after completion of drilling, and it is likely that the ground water had not yet stabilized in the boreholes.

An examination of the soil samples revealed that the fill and native soil samples were generally moist (some of the deeper native soil samples were wet) and a change in the colour of the native soil samples from brown to grey was observed at a depth of between 2 and 5.5 metres below grade.

Based on the foregoing, the permanent groundwater table is considered to be located at a depth of at least 2 metres below grade in most locations, and much deeper in elevated and high embankment areas. However, perched water conditions may occur within the fill, in sand seams within the silt and on top of the less pervious silt and silt till/sandy silt till deposits.

6.0 ***DISCUSSION AND RECOMMENDATIONS***

6.1 *General*

The boreholes encountered a pavement with an asphalt surfacing varying in thickness from 25mm to 180mm, underlain by a granular base 150mm to 425mm thick. The embankment fill is comprised mainly of compact fine sand and silty sand. The subgrade varies from sandy silt/silty sand to bedded sand and silt to silt till and sandy silt till. Peat and topsoil were encountered under the fill in some of the boreholes.

It is understood that the road is proposed to be upgraded to a Regional Road, which will require changes to the road grade, width, curvature and pavement design.

As part of the Schedule B EA Study the investigation was aimed at providing recommendations on the cut and fill slope geometry, subdrain recommendations; soil assessment around bridge/culvert structures, pavement design alternatives, roadway cut and fill operations, dewatering requirements, and disposal of surplus materials in conformance to MOE clean-up guidelines.

6.2 *Cut Slope Geometry*

The height of the cut slopes vary from less than 1m to a maximum of about 12 m (between approx. Sta. 2+740 and Sta. 2+800) just south of the creek with a 5± m wide box culvert.

The other high cut slopes occur between approx. Sta. 3+230 and 3+260 and between approx. 3+740 and Sta. 3+780. The slope angles are generally about 1.5H:1V or shallower, although locally steeper angles were observed in some of the cut slopes. The slope angles were measured using a clinometer, and are only considered as approximate.

The cut slopes are generally in good condition. Where trees occur within the upper and middle slopes, these are generally vertical, indicating no recent slope movement. Except for one low cut slope with small slips (at approx. Sta 1+800) , no signs of relict slope failures or recent significant slope movement were observed or apparent. However, significant slope erosion was observed in some areas, particularly at the lower sections of some cut slopes which appear to have been cut steeper to accommodate a swale at the road shoulder.

It is noted that, although no recent or relict slips were observed, the cut slopes are generally too steep for a stable slope. Slopes steeper than 2:1 are likely to be stable in cuts in very dense tills. There were no boreholes drilled on the cut slopes, but based on the boreholes on the pavement, the slopes are likely to be comprised of sands and silt, which generally have lower angles of internal friction and cohesion than glacial tills of the same density or consistency.

Generalized slope stability analyses have been carried out to determine the Factor of Safety (FOS) of the slopes. The analyses were carried out using the commercial slope program G-Slope, a limit equilibrium slope stability analysis program which determines *(using rigorous calculations) the Factor of Safety (FOS) against circular failure of different slope configurations using the assessed soil and surcharge parameters. The FOS is the factor by which the soil strength must be reduced in order to bring the slope into a state of limit equilibrium (or imminent failure) along a given slip surface. Bishop's Modified Method was used in the analysis.*

It is our opinion that a minimum FOS of 1.3 is required for a stable slope, and it should be verified if this is acceptable for the requirements of the project. It is noted that for the Conservation Authority (TRCA) a stable slope has an FOS of at least 1.5.

No laboratory soil strength tests were carried out, and the strength of the natural soil (for cut slopes) and the fill (for embankment slopes) were based on back analysis of the slope. Enclosure 47 shows that by back analysis (and assuming that the existing 1.5H:1V cut slopes are just stable, i.e., having an FOS of 1.0) the natural soil would have an effective internal angle of friction (ϕ') of 30°. Since the natural soils are generally granular, cohesion would be zero.

Enclosure 48 shows that at an angle of 2H:1V, a 2 m high slope would have an FOS of 1.28. At a slightly shallower angle of 2.25H:1V, a 2m and 4m high slope has an FOS of at least 1.4, as shown in Enclosures 49 and 50, respectively.

Based on the findings, we recommend that for planning purposes cuts slopes should have an angle not steeper than 2.25H:1V. In areas where the cuts are limited by right of way *or other constraints, retaining walls may have to be the used.*

For detailed slope stability analysis (for detailed design), site specific investigations should be carried out to determine the soil profile and soil strength parameters. A topographic survey may also be required.

6.3 Fill Slope Geometry

The embankment heights vary from less than 1 metre to a maximum of about 8 metres between approx. Sta. 3+550 and Sta. 3+580 on the east side. The embankment slopes are generally steep (generally between 1.25H:1V and 1.5H:1V), although shallower angles were observed in many of the lower embankments.. In some areas the guard rails have tilted, which indicate movement of the embankment slope. The most severe guard rail tilting was observed between approx. Sta. 1+060 and 1+140 and between Sta. 1+540 and Sta. 1+570. No major embankment failure was observed or apparent. Severe cracking and some sagging were observed on the pavement edges with possible embankment slope movement above the culvert in a number of areas. Outside of the culvert areas, severely eroded or possibly shallow slipped embankment surfaces were observed between approx. Sta. 5+840 and Sta. 5+855 and between approx. Sta. 6+090 and Sta. 6+110. The affected embankment surfaces have been backfilled with gravel and cobbles.

The embankments are considered to be generally too steep for a stable slope. Slopes steeper than 2:1 are likely to be stable in embankments in dense granular soil (engineered *fill). Based on the nature and N-values of the embankment soils their friction angles are likely to be between 30° and 32°, with no cohesion. The presence of peat and topsoil below the fill in some of the boreholes indicates that the embankment subgrade was not stripped prior to backfilling.*

Generalized slope stability analyses have also been carried out for the embankments. Results of back analyses of 2m and 4m high slopes at an angle of 1.25H:1V , shown in Enclosures 51 and 52, indicate that the embankment fill would have a ϕ' value of 32°, and zero cohesion.

The results of slope stability calculations shown on Enclosures 53, 54 , 55 and 56 indicate that for a 2m high embankment the slope angle should not be shallower than 1.75H:1V to attain an FOS of at least 1.3

The results of slope stability calculations shown on Enclosures 56, 56a, 57, 58 and 58a indicate that for 4m and 6m high embankments the slope angle should not be shallower than 1.9H:1V to attain an FOS of at least 1.3

Based on the findings, we recommend that for planning purposes embankment slopes up to 2 metres high should have an angle not steeper than 1.75H:1V, and embankments higher than 2 metres should have an angle not steeper than 2:1. In areas where the width of the embankments are limited by right of way or other constraints, the use of retaining walls and/or reinforced earth backfill should be considered.

For detailed design, site specific investigations should be carried out to determine the soil profile and soil parameters. It is noted that soft/loose soils (such as peat) and high water table have an adverse impact on slope stability. Enclosure 59 shows the effect of peat under the embankment, in this illustration a 0.9 m (3 ft) thick peat reduces the FOS of a 4m high embankment sloping at 1.9H:1V from 1.35 (shown in Enclosure 57) to less than 1.2.

6.4 Drainage and Sub-Drain Recommendations

The embankment fill is generally comprised of sand and silty sand, which are considered to be generally of moderate permeability. Sub-drains are considered not necessary for the embankments. However, it was observed that in some of the embankments, the vegetation on the shoulder blocks or prevents proper drainage of run-off. Proper grading and vegetation maintenance is required.

In some cut areas, however, it was observed that side ditches are either non-existent or are too shallow, and drainage of the pavement is poor. Properly designed swales/ditches should be installed. Where the subgrade is composed mainly of silt or very fine sand, which have low permeability and are highly susceptible to frost, sub-drains may be required.

6.5 Roadway Cut and Fill Operations

It is understood that the road is proposed to be upgraded to a Regional Road, and will require cut and fill operations to attain the required grades and curves. The recommended *slope angles for cuts and embankments, for planning purposes, were discussed in the previous sections.*

The following observations should be considered in planning the cut and fill operations:

1. *Some culvert pipes too short, erosion of embankment at outlet and inlet of these culverts. There is at least one area where the outlet of the pipe is hanging and deep erosion has occurred at the underside of the pipe.*
2. *The box culvert at Sta. 2+890 appears to be short at east (outlet) side. A gabion wall was installed to support the embankment above the culvert.*
3. *Sagging of the pavement, particularly at the ends of the pavement, was observed at the location of some of the culverts. This was likely caused by poor compaction of the backfill to the culvert trench.*
4. *Where the toe of cuts are too close to the pavement, significant erosion of the slope toe was observed.*
5. *Some stretches of the embankments cross marshy areas, where there are likely to be thick deposits of peat.*

All vegetation, peat, topsoil and other deleterious materials should be removed prior to backfilling. Backfill should be placed in 150 to 200 mm thick lifts and compacted to at least 98% Standard Proctor maximum dry density. Proper compaction of the edges of the fill is difficult to attain. It is recommended that backfill be extended by about 1 metre and then trimmed to the required grade after completion of backfilling/compaction.

Backfill should, preferably, be comprised of granular soil, which will have to be imported. However, to save on imported fill, some of the native soils excavated from cut areas should be used as backfill. It is anticipated that most of the excavated native soils within the cut areas (except the topsoil) will generally be suitable as backfill (except in trenches), provided that their moisture content is kept to within 3% of the optimum value. Should construction be carried out in the winter season, particular attention should be given to make sure frozen material is not used as backfill.

6.6 Soil Assessment at Culvert Locations

Six boreholes (BH4, BH5, BH8, BH19, BH24 and BH27) were drilled near culvert locations. Assuming the subsurface conditions encountered in the boreholes extend to the culvert location, it appears that in 5 of the 6 culvert areas investigated, the culvert is likely founded on peat or loose sand. In Borehole 19, the box culvert could be founded on the very dense sand and gravel or dense silty sand.

If new CSP culverts are to be built, these should not be founded within the peat, which should be removed and replaced with granular fill.

For concrete box culverts and retaining walls, these should be founded on the compact to dense native sand, silt or till (or compacted granular fill). These soils are capable of sustaining SLS bearing pressures of 100 to more than 200 kPa depending on location (150 to more than 300 kPa in ULS).

A site specific investigation should be carried out for detailed design where any significant structure is proposed.

6.7 Excavation and Groundwater Control

In areas where sand and gravel deposits occur , significant dewatering works will be required for construction below water level. Cut-off structures will likely have to extend well into the underlying silt/fine sands to be effective.

Where the subgrade is composed mainly of silty/sandy silt, dewatering will likely be controlled by pumping from local sumps as long as the excavation is not more than about 0.5 to 1 m below water level. If the water level is higher, the seepage flows will be higher and erosion is more likely to occur and make the excavation unstable.

Excavations of more than 1.2 metres in depth in dry areas should be cut back to a side slope of 1:1. Alternatively, the excavation may be supported using adequately braced sheeting.

6.8 Pavement Design and Rehabilitation Alternatives

Considering the traffic requirements and subsoil conditions, the following pavement design is recommended:

HL-3 Asphaltic Concrete	*40 mm*
HL-8 Asphaltic Concrete	*75 mm*
Granular 'A' or 20 mm crusher run limestone	*150 mm*
Granular 'B' or 50 mm crusher run limestone	*300 mm*

The base and sub-base granular materials should be compacted to at least 98% Standard Proctor maximum dry density and the asphaltic concrete to 96% Marshall density. The thicknesses shown above are compacted thicknesses.

As a heavy duty pavement, the existing pavement is considered to be under-designed in most areas terms of the granular base, and in some areas in terms of the thickness of asphalt. To raise existing pavement to the standard of a heavy duty pavement, there are two alternatives, and these are as follows:

Alternative 1 - Total Reconstruction

This involves the removal of the asphalt surfacing and granular base. The granular base should be set aside for re-use as Granular A or B. The asphalt may be ground and sieved and reused as Granular B. The subgrade should be trimmed, proof-rolled, and any wet or soft areas should be removed and replaced with compacted granular fill. Any new fill should be comprised of well compacted granular material. The granular base should be applied in not more than 150 mm thick loose lifts and compacted to at least 98% of Standard Proctor maximum dry density. The asphaltic concrete should be compacted to at least 96% Marshal density.

Alternative 2 - Use of Deep Strength Asphalt

This involves placing another layer of asphaltic concrete on top of the existing pavement to compensate for the reduced granular base. Based on the borehole findings the "Granular Base Equivalent" (GBE) of the existing pavement is shown on the table below.

This assumes that the existing granular is Granular B. The existing pavement GBE is compared to the of the recommended pavement design of which has a GBE of 945 mm of Granular B. The difference is the amount of GBE to be compensated, and its equivalent in asphalt is shown on the last column.

Borehole No.	Asphalt Thickness	Granular Base Thickness	GBE	GBE to be Compensated	Equivalent Asphalt
1	75 mm	400 mm	625 mm	320 mm	107 mm
2	75 mm	400 mm	625 mm	320 mm	107 mm
3	75 mm	300 mm	525 mm	420 mm	140 mm
4	25 mm	275 mm	350 mm	595 mm	199 mm
5	75 mm	300 mm	525 mm	420 mm	140 mm
6	50 mm	325 mm	475 mm	470 mm	157 mm
7	60 mm	375 mm	555 mm	390 mm	130 mm
8	75 mm	165 mm	390 mm	555 mm	185 mm
9	60 mm	225 mm	405 mm	540 mm	180 mm
10	50 mm	425 mm	575 mm	370 mm	124 mm
11	50 mm	150 mm	300 mm	645 mm	215 mm
12	75 mm	400 mm	625 mm	320 mm	106 mm
13	65 mm	225 mm	420 mm	525 mm	175 mm
14	75 mm	175 mm	400 mm	545 mm	182 mm
15	75 mm	400 mm	625 mm	320 mm	107 mm
16	75 mm	150 mm	375 mm	570 mm	190 mm
17	65 mm	225 mm	420 mm	525 mm	175 mm
18	90 mm	150 mm	420 mm	525 mm	175 mm
19	75 mm	150 mm	375 mm	570 mm	190 mm

20	60 mm	300 mm	480 mm	465 mm	155 mm
21	50 mm	300 mm	450 mm	495 mm	165 mm
22	75 mm	300 mm	525 mm	420 mm	140 mm
23	180 mm	275 mm	815 mm	130 mm	44 mm
24	75 mm	200 mm	425 mm	520 mm	174 mm
25	75 mm	400 mm	625 mm	320 mm	107 mm
26	150 mm	300 mm	750 mm	195 mm	65 mm
27	75 mm	150 mm	375 mm	570 mm	190 mm
28	175 mm	250 mm	775 mm	170 mm	57 mm
29	50 mm	300 mm	450 mm	495 mm	165 mm
30	140 mm	225 mm	645 mm	300 mm	100 mm
31	60 mm	350 mm	530 mm	415 mm	139 mm
32	150 mm	225 mm	675 mm	270 mm	90 mm
33	60 mm	350 mm	530 mm	415 mm	139 mm
34	150 mm	250 mm	700 mm	245 mm	82 mm
35	60 mm	400 mm	580 mm	365 mm	122 mm
36	150 mm	300 mm	750 mm	195 mm	65 mm
37	150 mm	300 mm	750 mm	195 mm	65 mm
38	100 mm	200 mm	500 mm	445 mm	149 mm
39	150 mm	225 mm	675 mm	270 mm	90 mm
40	125 mm	175 mm	550 mm	395 mm	132 mm

Alternative 1 is likely to be more expensive, but has the advantage of maintaining the present grades (which is not true for the Alternative 2). It will also provide thicker frost cover (from the thicker granular base), and assure proper grading, compaction and quality of the pavement layers and the subgrade. Since the subgrade will be exposed during *construction, its condition can be verified and any areas that need to be removed or recompacted can be identified.*

Alternative 2 will likely be cheaper, less invasive and will have a shorter construction time. However, because of the raised grade the driveway entrances to residences will also have to raised. There will remain the concerns about the thinner frost cover (due to thinner existing granular base), the unknown quality of the subgrade and the existing cracks. Any existing drainage problem within the granular base and subgrade cannot be rectified and, in view of this, this alternative is not considered to be a long term solution. Under alternative 2, the areas where the existing pavement is severely damaged will initially have to be repaired.

For the worst stretches of the road (Sta. 0+200 to Sta. 1+200, Sta. 1+800 to Sta. 2+500, and other shorter very poor sections) total reconstruction (Alternative 1) ir recommended. For the remainder of the road, either Alternative 1 or Alternative 2 may be used. As discussed, Alternative 2 is considered not a long term solution, and owing to the general poor condition of the pavement there are many areas where the existing pavement is severely damaged (with possible failure of the subgrade) and will initially have to be repaired.

6.9 Chemical Analyses

Three samples of the fill have been submitted to AGAT Laboratories for chemical analyses to the M.O.E. Site Clean-up Guidelines (general and inorganic). The test results are shown in Appendix A, and reference to these indicate that, except for Conductivity and Sodium Adsorption Ratio (SAR), all of the parameters tested meet Table 2 site condition standards for residential, park and institutional sites under both the current guidelines (O. Reg 153/04) and the proposed amending guidelines (O/Reg 511/11).

Based on the findings, the soils may be classified as ordinary fill for disposal purposes.

7.0 ***STATEMENT OF LIMITATIONS***

The Statement of Limitation presented on Appendix 'B' is an integral part of this report.

V.A. WOOD (GUELPH) INCORPORATED

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APPENDIX 'A'

Soil Chemical Analysis

V.A. WOOD ASSOCIATES LIMITED
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Scarborough ON M1X 1E7

Date Received: 18-MAY-11
Report Date: 25-MAY-11 14:01 (MT)
Version: FINAL

Client Phone: 416-292-2868

Certificate of Analysis

Lab Work Order #: L1006805
Project P.O. #: NOT SUBMITTED
Job Reference: G3070
Legal Site Desc:
C of C Numbers: 85080

MATHUMAI GANESHAKUMAR
Account Manager

ANALYTICAL GUIDELINE REPORT

Sample Details Grouping / Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits #1	#2	#3	#4
L1006805-1 G3070-BH2/SS2									
Sampled By: CLIENT on 02-MAY-11									
Matrix: SOIL						#1	#2	#3	#4
Physical Tests									
Conductivity	1.25		0.0040	mS/cm	20-MAY-11	1.4	*0.7	1.4	*0.7
% Moisture	12.8		0.10	%	19-MAY-11				
pH	7.87		0.10	pH units	24-MAY-11				
Cyanides									
Cyanide, Weak Acid Diss	<0.050		0.050	ug/g	20-MAY-11	100	100	100	100
Saturated Paste Extractables									
SAR	44.8	SAR:Q	0.10	SAR	20-MAY-11	*12	*5	*12	*5
Metals									
Antimony (Sb)	<1.0		1.0	ug/g	20-MAY-11	40	13	44	13
Arsenic (As)	4.5		1.0	ug/g	20-MAY-11	40	20	50	25
Barium (Ba)	43.6		1.0	ug/g	20-MAY-11	1500	750	2000	1000
Beryllium (Be)	<0.50		0.50	ug/g	20-MAY-11	1.2	1.2	1.2	1.2
Boron (B)	8.8		5.0	ug/g	20-MAY-11				
Boron (B), Hot Water Ext.	<0.10		0.10	ug/g	20-MAY-11				
Cadmium (Cd)	<0.50		0.50	ug/g	20-MAY-11	12	12	12	12
Chromium (Cr)	19.5		1.0	ug/g	20-MAY-11	750	750	1000	1000
Cobalt (Co)	6.9		1.0	ug/g	20-MAY-11	80	40	100	50
Copper (Cu)	17.5		1.0	ug/g	20-MAY-11	225	225	300	300
Lead (Pb)	6.7		1.0	ug/g	20-MAY-11	1000	200	1000	200
Mercury (Hg)	<0.050		0.050	ug/g	20-MAY-11	10	10	10	10
Molybdenum (Mo)	<1.0		1.0	ug/g	20-MAY-11	40	40	40	40
Nickel (Ni)	13.0		1.0	ug/g	20-MAY-11	150	150	200	200
Selenium (Se)	<1.0		1.0	ug/g	20-MAY-11	10	10	10	10
Silver (Ag)	<0.20		0.20	ug/g	20-MAY-11	40	20	50	25
Thallium (Tl)	<0.50		0.50	ug/g	20-MAY-11	32	4.1	32	4.1
Uranium (U)	<1.0		1.0	ug/g	20-MAY-11				
Vanadium (V)	42.0		1.0	ug/g	20-MAY-11	200	200	250	250
Zinc (Zn)	35.1		5.0	ug/g	20-MAY-11	600	600	800	800
Speciated Metals									
Chromium, Hexavalent	<0.20		0.20	ug/g	20-MAY-11	8	8	10	10
L1006805-2 G3070-BH12/SS2									
Sampled By: CLIENT on 29-APR-11									
Matrix: SOIL						#1	#2	#3	#4
Physical Tests									
Conductivity	1.77		0.0040	mS/cm	20-MAY-11	*1.4	*0.7	*1.4	*0.7
% Moisture	11.6		0.10	%	19-MAY-11				
pH	8.00		0.10	pH units	24-MAY-11				
Cyanides									
Cyanide, Weak Acid Diss	<0.050		0.050	ug/g	20-MAY-11	100	100	100	100
Saturated Paste Extractables									
SAR	90.0	SAR:Q	0.10	SAR	20-MAY-11	*12	*5	*12	*5
Metals									
Antimony (Sb)	<1.0		1.0	ug/g	20-MAY-11	40	13	44	13
Arsenic (As)	4.3		1.0	ug/g	20-MAY-11	40	20	50	25
Barium (Ba)	44.6		1.0	ug/g	20-MAY-11	1500	750	2000	1000

Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

Ontario Regulation 153/04 Table 2 (MAR, 2004) = [Suite] - Soil Res/Park/Inst/Com/Ind

#1: ON153/04-T2-Soil (coarse) Industrial/Commercial/Community Property Use
#2: ON153/04-T2-Soil (coarse) Residential/Parkland/Institutional Property Use
#3: ON153/04-T2-Soil (fine) Industrial/Commercial/Institutional Property Use
#4: ON153/04-T2-Soil (fine) Residential/Parkland/Institutional Property Use

ALS Environmental

G3070

ANALYTICAL GUIDELINE REPORT

Sample Details Grouping	Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits #1	#2	#3	#4
L1006805-2 G3070-BH12/SS2										
Sampled By: CLIENT on 29-APR-11										
Matrix: SOIL							#1	#2	#3	#4
Metals										
	Beryllium (Be)	<0.50		0.50	ug/g	20-MAY-11	1.2	1.2	1.2	1.2
	Boron (B)	9.7		5.0	ug/g	20-MAY-11				
	Boron (B), Hot Water Ext.	<0.10		0.10	ug/g	20-MAY-11				
	Cadmium (Cd)	<0.50		0.50	ug/g	20-MAY-11	12	12	12	12
	Chromium (Cr)	19.1		1.0	ug/g	20-MAY-11	750	750	1000	1000
	Cobalt (Co)	7.2		1.0	ug/g	20-MAY-11	80	40	100	50
	Copper (Cu)	17.8		1.0	ug/g	20-MAY-11	225	225	300	300
	Lead (Pb)	6.8		1.0	ug/g	20-MAY-11	1000	200	1000	200
	Mercury (Hg)	<0.050		0.050	ug/g	20-MAY-11	10	10	10	10
	Molybdenum (Mo)	<1.0		1.0	ug/g	20-MAY-11	40	40	40	40
	Nickel (Ni)	15.0		1.0	ug/g	20-MAY-11	150	150	200	200
	Selenium (Se)	<1.0		1.0	ug/g	20-MAY-11	10	10	10	10
	Silver (Ag)	<0.20		0.20	ug/g	20-MAY-11	40	20	50	25
	Thallium (Tl)	<0.50		0.50	ug/g	20-MAY-11	32	4.1	32	4.1
	Uranium (U)	<1.0		1.0	ug/g	20-MAY-11				
	Vanadium (V)	36.8		1.0	ug/g	20-MAY-11	200	200	250	250
	Zinc (Zn)	36.9		5.0	ug/g	20-MAY-11	600	600	800	800
Speciated Metals										
	Chromium, Hexavalent	<0.20		0.20	ug/g	20-MAY-11	8	8	10	10
L1006805-3 G3070-BH34/SS2										
Sampled By: CLIENT on 28-APR-11										
Matrix: SOIL							#1	#2	#3	#4
Physical Tests										
	Conductivity	0.386		0.0040	mS/cm	20-MAY-11	1.4	0.7	1.4	0.7
	% Moisture	14.9		0.10	%	19-MAY-11				
	pH	7.64		0.10	pH units	24-MAY-11				
Cyanides										
	Cyanide, Weak Acid Diss	<0.050		0.050	ug/g	20-MAY-11	100	100	100	100
Saturated Paste Extractables										
	SAR	12.8	SAR:Q	0.10	SAR	20-MAY-11	*12	*5	*12	*5
Metals										
	Antimony (Sb)	<1.0		1.0	ug/g	20-MAY-11	40	13	44	13
	Arsenic (As)	4.5		1.0	ug/g	20-MAY-11	40	20	50	25
	Barium (Ba)	30.5		1.0	ug/g	20-MAY-11	1500	750	2000	1000
	Beryllium (Be)	<0.50		0.50	ug/g	20-MAY-11	1.2	1.2	1.2	1.2
	Boron (B)	7.0		5.0	ug/g	20-MAY-11				
	Boron (B), Hot Water Ext.	<0.10		0.10	ug/g	20-MAY-11				
	Cadmium (Cd)	<0.50		0.50	ug/g	20-MAY-11	12	12	12	12
	Chromium (Cr)	25.0		1.0	ug/g	20-MAY-11	750	750	1000	1000
	Cobalt (Co)	5.4		1.0	ug/g	20-MAY-11	80	40	100	50
	Copper (Cu)	12.1		1.0	ug/g	20-MAY-11	225	225	300	300
	Lead (Pb)	5.1		1.0	ug/g	20-MAY-11	1000	200	1000	200
	Mercury (Hg)	<0.050		0.050	ug/g	20-MAY-11	10	10	10	10
	Molybdenum (Mo)	<1.0		1.0	ug/g	20-MAY-11	40	40	40	40
	Nickel (Ni)	10.5		1.0	ug/g	20-MAY-11	150	150	200	200
	Selenium (Se)	<1.0		1.0	ug/g	20-MAY-11	10	10	10	10

* Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.

Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

Ontario Regulation 153/04 Table 2 (MAR, 2004) = [Suite] - Soil Res/Park/Inst/Com/Ind

#1: ON153/04-T2-Soil (coarse) Industrial/Commercial/Community Property Use

#2: ON153/04-T2-Soil (coarse) Residential/Parkland/Institutional Property Use

#3: ON153/04-T2-Soil (fine) Industrial/Commercial/Institutional Property Use

#4: ON153/04-T2-Soil (fine) Residential/Parkland/Institutional Property Use

ALS Environmental

G3070

ANALYTICAL GUIDELINE REPORT

Sample Details Grouping	Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits #1	#2	#3	#4
L1006805-3	G3070-BH34/SS2									
Sampled By:	CLIENT on 28-APR-11									
Matrix:	SOIL									
Metals										
	Silver (Ag)	<0.20		0.20	ug/g	20-MAY-11	40	20	50	25
	Thallium (Tl)	<0.50		0.50	ug/g	20-MAY-11	32	4.1	32	4.1
	Uranium (U)	<1.0		1.0	ug/g	20-MAY-11				
	Vanadium (V)	56.3		1.0	ug/g	20-MAY-11	200	200	250	250
	Zinc (Zn)	20.9		5.0	ug/g	20-MAY-11	600	600	800	800
Speciated Metals										
	Chromium, Hexavalent	0.26		0.20	ug/g	20-MAY-11	8	8	10	10

Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

Ontario Regulation 153/04 Table 2 (MAR, 2004) = [Suite] - Soil Res/Park/Inst/Com/Ind

#1: ON153/04-T2-Soil (coarse) Industrial/Commercial/Community Property Use
#2: ON153/04-T2-Soil (coarse) Residential/Parkland/Institutional Property Use
#3: ON153/04-T2-Soil (fine) Industrial/Commercial/Institutional Property Use
#4: ON153/04-T2-Soil (fine) Residential/Parkland/Institutional Property Use

Reference Information

Sample Parameter Qualifier key listed:

Qualifier	Description
SAR:Q	Qualified SAR value: actual SAR is lower but is incalculable due to Na, Ca or Mg below detection limit.

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Method Reference***
B-HWS-R511-WT	Soil	Boron (B), Hot Water Extractable	HW EXTR, EPA 6010B

A dried solid sample is extracted with calcium chloride, the sample undergoes a heating process. After cooling the sample is filtered and analyzed by ICP/OES.

CN-WAD-R511-WT	Soil	Cyanide, Weak Acid Diss	MOE 3015/APHA 4500CN I-WAD

The sample is extracted with a strong base for 16 hours, and then filtered. The filtrate is then distilled where the cyanide is converted to cyanogen chloride by reacting with chloramine-T, the cyanogen chloride then reacts with a combination of barbituric acid and isonicotinic acid to form a highly colored complex.

CR-CR6-IC-R511-WT	Soil	Hexavalent Chromium in Soil	SW846 3060A/7199

Soil sample undergoes a alkaline digestion process where the sample is acidified and derivatized with 1,5-diphenylcarbazide (DPC) using ion chromatography.

EC-R511-WT	Soil	Conductivity (EC)	MOEE E3138

A representative subsample is tumbled with de-ionized (DI) water. The ratio of water to soil is 2:1 v/w. After tumbling the sample is then analyzed by a conductivity meter.

HG-R511-WT	Soil	Mercury by CVAA	SW846 3050B/7471

Solid sample is digested with a heated, strong, mixed acid solution to convert all forms of mercury to divalent mercury. The divalent mercury is then reduced to elemental mercury, sparged from solution and analyzed by CVAAS.

MET-UG/G-CCMS-WT	Soil	Metal Scan Collision Cell ICPMS	EPA 200.2/6020A

Sample is vigorously digested with nitric acid and hydrogen peroxide. Analysis is conducted by ICP/OES.

MOISTURE-WT	Soil	% Moisture	Gravimetric: Oven Dried
PH-R511-WT	Soil	pH	MOEE E3137A

A minimum 10g portion of the sample is extracted with 20mL of 0.01M calcium chloride solution by shaking for at least 30 minutes. The aqueous layer is separated from the soil and then analyzed using a pH meter and electrode.

SAR-R511-WT	Soil	Sodium Adsorption Ratio	SW846 6010C

A dried, disaggregated solid sample is extracted with deionized water, the aqueous extract is separated from the solid, acidified and then analyzed using a ICP/OES.

*** ALS test methods may incorporate modifications from specified reference methods to improve performance.

Chain of Custody numbers:

85080

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location	Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA		

Reference Information

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to fitness for a particular purpose, or non-infringement. ALS assumes no responsibility for errors or omissions in the information.

ALS Environmental

Quality Control Report

Workorder: L1006805 Report Date: 26-MAY-11

Client: V.A. WOOD ASSOCIATES LIMITED
1080 Tapscott Rd Unit 24
Scarborough ON M1X 1E7

Contact: Vic Wood

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
B-HWS-R511-WT	Soil							
Batch R2191700								
WG1282265-4 DUP		**WG1282265-3**						
Boron (B), Hot Water Ext.		<0.10	<0.10	RPD-NA	ug/g	N/A	40	20-MAY-11
WG1282265-2 LCS								
Boron (B), Hot Water Ext.			100		%		70-130	20-MAY-11
WG1282265-1 MB								
Boron (B), Hot Water Ext.			<0.10		ug/g		0.1	20-MAY-11
WG1282265-5 MS		**WG1282265-3**						
Boron (B), Hot Water Ext.			119		%		60-140	20-MAY-11
CN-WAD-R511-WT	Soil							
Batch R2191962								
WG1282565-3 CVS								
Cyanide, Weak Acid Diss			105		%		80-120	20-MAY-11
WG1282132-3 DUP		**L1006697-1**						
Cyanide, Weak Acid Diss		<0.050	<0.050	RPD-NA	ug/g	N/A	35	20-MAY-11
WG1282132-2 LCS								
Cyanide, Weak Acid Diss			90		%		80-120	20-MAY-11
WG1282132-1 MB								
Cyanide, Weak Acid Diss			<0.050		ug/g		0.05	20-MAY-11
CR-CR6-IC-R511-WT	Soil							
Batch R2191967								
WG1282263-4 DUP		**WG1282263-3**						
Chromium, Hexavalent		<0.20	<0.20	RPD-NA	ug/g	N/A	35	20-MAY-11
WG1282263-2 LCS								
Chromium, Hexavalent			100		%		80-120	20-MAY-11
WG1282263-1 MB								
Chromium, Hexavalent			<0.20		ug/g		0.2	20-MAY-11
WG1282263-5 MS		**WG1282263-3**						
Chromium, Hexavalent			109		%		70-130	20-MAY-11
EC-R511-WT	Soil							
Batch R2191856								
WG1282504-3 DUP		**L1006805-3**						
Conductivity		0.386	0.393		mS/cm	1.8	10	20-MAY-11
WG1282504-4 LCS								
Conductivity			99		%		90-110	20-MAY-11
WG1282504-1 MB								
Conductivity			<0.0040		mS/cm		0.004	20-MAY-11
HG-R511-WT	Soil							

ALS Environmental

Quality Control Report

Client: V.A. WOOD ASSOCIATES LIMITED
1080 Tapscott Rd Unit 24
Scarborough ON M1X 1E7
Contact: Vic Wood

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
HG-R511-WT	Soil							
Batch R2191681								
WG1282264-2 CRM		**WT-SS-1**						
Mercury (Hg)			110		%		70-130	20-MAY-11
WG1282264-4 DUP		**WG1282264-3**						
Mercury (Hg)		<0.050	<0.050	RPD-NA	ug/g	N/A	30	20-MAY-11
WG1282264-7 LCS								
Mercury (Hg)			100		%		80-120	20-MAY-11
WG1282264-1 MB								
Mercury (Hg)			<0.050		ug/g		0.05	20-MAY-11
WG1282264-5 MS		**WG1282264-3**						
Mercury (Hg)			99		%		70-130	20-MAY-11
MET-UG/G-CCMS-WT	Soil							
Batch R2192683								
WG1282301-2 CVS								
Antimony (Sb)			100		%		70-130	20-MAY-11
Arsenic (As)			100		%		70-130	20-MAY-11
Barium (Ba)			97		%		70-130	20-MAY-11
Beryllium (Be)			97		%		70-130	20-MAY-11
Boron (B)			100		%		70-130	20-MAY-11
Cadmium (Cd)			98		%		70-130	20-MAY-11
Chromium (Cr)			100		%		70-130	20-MAY-11
Cobalt (Co)			99		%		70-130	20-MAY-11
Copper (Cu)			98		%		70-130	20-MAY-11
Lead (Pb)			97		%		70-130	20-MAY-11
Molybdenum (Mo)			100		%		70-130	20-MAY-11
Nickel (Ni)			98		%		70-130	20-MAY-11
Selenium (Se)			99		%		70-130	20-MAY-11
Silver (Ag)			90		%		70-130	20-MAY-11
Thallium (Tl)			94		%		70-130	20-MAY-11
Uranium (U)			93		%		70-130	20-MAY-11
Vanadium (V)			99		%		70-130	20-MAY-11
Zinc (Zn)			97		%		70-130	20-MAY-11
WG1282264-4 DUP		**WG1282264-3**						
Antimony (Sb)		<1.0	<1.0	RPD-NA	ug/g	N/A	25	20-MAY-11
Arsenic (As)		2.7	2.6		ug/g	5.2	25	20-MAY-11
Barium (Ba)		15.1	15.0		ug/g	0.77	25	20-MAY-11
Beryllium (Be)		<0.50	<0.50					

ALS Environmental

Quality Control Report

Workorder: L1006805 Report Date: 26-MAY-11

Client: V.A. WOOD ASSOCIATES LIMITED
1080 Tapscott Rd Unit 24
Scarborough ON M1X 1E7
Contact: Vic Wood

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-UG/G-CCMS-WT	Soil							
Batch R2192683								
WG1282264-4 DUP		**WG1282264-3**						
Beryllium (Be)		<0.50	<0.50	RPD-NA	ug/g	N/A	25	20-MAY-11
Boron (B)		8.0	8.4		ug/g	5.9	25	20-MAY-11
Cadmium (Cd)		<0.50	<0.50	RPD-NA	ug/g	N/A	25	20-MAY-11
Chromium (Cr)		10.7	11.9		ug/g	10	25	20-MAY-11
Cobalt (Co)		2.7	2.8		ug/g	2.7	25	20-MAY-11
Copper (Cu)		8.1	8.0		ug/g	0.85	25	20-MAY-11
Lead (Pb)		6.2	6.4		ug/g	3.4	25	20-MAY-11
Molybdenum (Mo)		<1.0	<1.0	RPD-NA	ug/g	N/A	25	20-MAY-11
Nickel (Ni)		5.4	5.6		ug/g	3.3	25	20-MAY-11
Selenium (Se)		<1.0	<1.0	RPD-NA	ug/g	N/A	25	20-MAY-11
Silver (Ag)		<0.20	<0.20	RPD-NA	ug/g	N/A	25	20-MAY-11
Thallium (Tl)		<0.50	<0.50	RPD-NA	ug/g	N/A	25	20-MAY-11
Uranium (U)		<1.0	<1.0	RPD-NA	ug/g	N/A	25	20-MAY-11
Vanadium (V)		24.5	25.9		ug/g	5.9	25	20-MAY-11
Zinc (Zn)		32.9	33.0		ug/g	0.031	25	20-MAY-11
WG1282264-6 LCS								
Antimony (Sb)			101		%		70-130	20-MAY-11
Arsenic (As)			109		%		70-130	20-MAY-11
Barium (Ba)			112		%		70-130	20-MAY-11
Beryllium (Be)			103		%		70-130	20-MAY-11
Cadmium (Cd)			110		%		70-130	20-MAY-11
Chromium (Cr)			119		%		70-130	20-MAY-11
Cobalt (Co)			114		%		70-130	20-MAY-11
Copper (Cu)			117		%		70-130	20-MAY-11
Lead (Pb)			104		%		70-130	20-MAY-11
Nickel (Ni)			115		%		70-130	20-MAY-11
Selenium (Se)			109		%		70-130	20-MAY-11
Thallium (Tl)			98		%		70-130	20-MAY-11
Uranium (U)			98		%		70-130	20-MAY-11
Vanadium (V)			112		%		70-130	20-MAY-11
Zinc (Zn)			102		%		70-130	20-MAY-11
WG1282264-1 MB								
Antimony (Sb)			<1.0		ug/g		1	20-MAY-11
							1	

ALS Environmental

Quality Control Report

Workorder: L1006805 Report Date: 26-MAY-11

Client: V.A. WOOD ASSOCIATES LIMITED
1080 Tapscott Rd Unit 24
Scarborough ON M1X 1E7
Contact: Vic Wood

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-UG/G-CCMS-WT	Soil							
Batch **R2192683**								
WG1282264-1 **MB**								
Arsenic (As)			<1.0		ug/g		1	20-MAY-11
Barium (Ba)			<1.0		ug/g		1	20-MAY-11
Beryllium (Be)			<0.50		ug/g		0.5	20-MAY-11
Boron (B)			<5.0		ug/g		5	20-MAY-11
Cadmium (Cd)			<0.50		ug/g		0.5	20-MAY-11
Chromium (Cr)			<1.0		ug/g		1	20-MAY-11
Cobalt (Co)			<1.0		ug/g		1	20-MAY-11
Copper (Cu)			<1.0		ug/g		1	20-MAY-11
Lead (Pb)			<1.0		ug/g		1	20-MAY-11
Molybdenum (Mo)			<1.0		ug/g		1	20-MAY-11
Nickel (Ni)			<1.0		ug/g		1	20-MAY-11
Selenium (Se)			<1.0		ug/g		1	20-MAY-11
Silver (Ag)			<0.20		ug/g		0.2	20-MAY-11
Thallium (Tl)			<0.50		ug/g		0.5	20-MAY-11
Uranium (U)			<1.0		ug/g		1	20-MAY-11
Vanadium (V)			<1.0		ug/g		1	20-MAY-11
Zinc (Zn)			<5.0		ug/g		5	20-MAY-11
WG1282264-5 **MS**		**WG1282264-3**						
Antimony (Sb)			97		%		70-130	20-MAY-11
Arsenic (As)			N/A	MS-B	%		-	20-MAY-11
Barium (Ba)			N/A	MS-B	%		-	20-MAY-11
Beryllium (Be)			107		%		70-130	20-MAY-11
Cadmium (Cd)			104		%		70-130	20-MAY-11
Chromium (Cr)			N/A	MS-B	%		-	20-MAY-11
Cobalt (Co)			N/A	MS-B	%		-	20-MAY-11
Copper (Cu)			N/A	MS-B	%		-	20-MAY-11
Lead (Pb)			N/A	MS-B	%		-	20-MAY-11
Nickel (Ni)			N/A	MS-B	%		-	20-MAY-11
Selenium (Se)			106		%		70-130	20-MAY-11
Thallium (Tl)			92		%		70-130	20-MAY-11
Uranium (U)			108		%		70-130	20-MAY-11
Vanadium (V)			N/A	MS-B	%		-	20-MAY-11
Zinc (Zn)			N/A	MS-B	%		-	20-MAY-11
MOISTURE-WT	Soil							

ALS Environmental

Quality Control Report

Client: V.A. WOOD ASSOCIATES LIMITED
1080 Tapscott Rd Unit 24
Scarborough ON M1X 1E7
Contact: Vic Wood

Test		Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MOISTURE-WT		Soil							
Batch	**R2191669**								
WG1282093-3	**DUP**		**L1006805-3**						
% Moisture			14.9	14.8		%	0.84	30	19-MAY-11
WG1282093-2	**LCS**								
% Moisture				95		%		70-130	19-MAY-11
WG1282093-1	**MB**								
% Moisture				<0.10		%		0.1	19-MAY-11
PH-R511-WT		Soil							
Batch	**R2193147**								
WG1284007-2	**DUP**		**L1006697-14**						
pH			8.03	8.01		pH units	0.25	20	24-MAY-11
WG1284007-1	**LCS**								
pH				99		%		80-120	24-MAY-11

Quality Control Report

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Quality Control Report

Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Physical Tests							
% Moisture							
	1	02-MAY-11	19-MAY-11 20:13	14	17	days	EHTR
	2	29-APR-11	19-MAY-11 20:14	14	20	days	EHTR
	3	28-APR-11	19-MAY-11 20:15	14	21	days	EHTR
Cyanides							
Cyanide, Weak Acid Diss							
	1	02-MAY-11	19-MAY-11 17:44	14	17	days	EHTR
	2	29-APR-11	19-MAY-11 17:45	14	20	days	EHTR
	3	28-APR-11	19-MAY-11 17:46	14	21	days	EHTR

Legend & Qualifier Definitions:

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended.
EHTR: Exceeded ALS recommended hold time prior to sample receipt.
EHTL: Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.
EHT: Exceeded ALS recommended hold time prior to analysis.
Rec. HT: ALS recommended hold time (see units).

Notes*:
Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes.
Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L1006805 were received on 18-MAY-11 18:30.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

60 NORTHLAND ROAD, UNIT 1
WATERLOO, ON N2V 2B8
Phone: (519) 886-6910
Fax: (519) 886-9047
CANADA TOLL FREE: 1-800-668-9878

ALS Environmental

CHAIN OF CUSTODY / ANALYTICAL SERVICES REQUEST FORM

C of C # 85080
PAGE 1 OF 1

Note: all TAT Quoted material is in business days which exclude statutory holidays and weekends. TAT samples received past 3:00pm or Saturday/Sunday begin the next day.

Date requested	Service requested		2 day TAT (50%)	
	5 day (Regular)	✓	Next day TAT (100%)	
	3-4 day TAT (25%)		Same day TAT (200%)	

COMPANY NAME: VAwood Associates
ALS ACCOUNT#: 19638
PROJECT MANAGER:
PROJECT #: G3070
PHONE:
FAX:
QUOTATION #: PO#:

CRITERIA — Criteria on report (y/n): Y
Reg 153/04 and Reg 511/11
Table 1 2 3
TCLP ____ MISA ____ PWQO ____
OTHER

REPORT DISTRIBUTION — ALL FINAL RESULTS WILL BE MAILED
EMAIL ____ FAX ____ BOTH ____
EMAIL1: VAwood@bellnet.ca
EMAIL2: rmsguimbao@bellnet.ca
SELECT: pdf ____ digital ____ both ____

ANALYSIS REQUEST: Metals / Inorganics

INDICATE BOTTLES FIELD FILTERED/PRESERVED (F/P)
SUBMISSION #: L1006805
ENTERED BY: E.P.
DATE/TIME ENTERED: 19-MAY-11
BIN #: B236

Date (yy/mm/dd)	Time (24 hr)	COMP	GRAB	WATER	SOIL	OTHER	SAMPLE DESCRIPTION TO APPEAR ON REPORT	NUMBER OF CONTAINERS	Metals / Inorganics	COMMENTS	LAB ID
11/05/02	am				✓		G3070 - BH 2/SS 2	1	✓		-1
11/04/29	pm				✓		G3070 - BH 12/SS 2	1	✓		-2
11/04/28	am				✓		G3070 - BH34/SS 2	1	✓		-3

Pleas make a separate report using 511/11 (Table 2+3)

SPECIAL INSTRUCTIONS/COMMENTS

SAMPLE CONDITION: FROZEN / COLD / AMBIENT — MEAN TEMP 15.1
CONDITION ACCEPTABLE UPON RECEIPT (Y/N) ____ INIT AP

SAMPLED BY: Jahangir — DATE & TIME: 4/28,29/5/2
RECEIVED BY: [signature] — DATE & TIME: 5/18/11
RELINQUISHED BY: Ren — DATE & TIME: am/pm
RECEIVED AT LAB BY: Austin P — DATE & TIME: 18/5/11 18:30

NOTES AND CONDITIONS:
1. Quote number must be provided to ensure proper pricing.
2. TAT may vary dependent on complexity of analysis and lab workload at time of submission. Please contact the lab to confirm TATs.
3. Any known or suspected hazards relating to a sample must be noted on the chain of custody in comments section.

White - report copy YELLOW - File copy PINK - Customer Copy

Reg COC Rev#3 Jt

V.A. WOOD ASSOCIATES LIMITED
ATTN: Vic Wood
1080 Tapscott Rd
Unit 24
Scarborough ON M1X 1E7

Date Received: 18-MAY-11
Report Date: 25-MAY-11 14:01 (MT)
Version: FINAL

Client Phone: 416-292-2868

Certificate of Analysis

Lab Work Order #:	**L1006805**
Project P.O. #:	NOT SUBMITTED
Job Reference:	G3070
Legal Site Desc:	
C of C Numbers:	85080

MATHUMAI GANESHAKUMAR
Account Manager

ALS Environmental

ANALYTICAL GUIDELINE REPORT

G3070

Sample Details Grouping / Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits #1	Guideline Limits #2
L1006805-1 G3070-BH2/SS2							
Sampled By: CLIENT on 02-MAY-11							
Matrix: SOIL						#1	#2
Physical Tests							
Conductivity	1.25		0.0040	mS/cm	20-MAY-11	*0.7	*0.7
% Moisture	12.8		0.10	%	19-MAY-11		
pH	7.87		0.10	pH units	24-MAY-11		
Cyanides							
Cyanide, Weak Acid Diss	<0.050		0.050	ug/g	20-MAY-11	0.051	0.051
Saturated Paste Extractables							
SAR	44.8	SAR:Q	0.10	SAR	20-MAY-11	*5	*5
Metals							
Antimony (Sb)	<1.0		1.0	ug/g	20-MAY-11	7.5	7.5
Arsenic (As)	4.5		1.0	ug/g	20-MAY-11	18	18
Barium (Ba)	43.6		1.0	ug/g	20-MAY-11	390	390
Beryllium (Be)	<0.50		0.50	ug/g	20-MAY-11	4	5
Boron (B)	8.8		5.0	ug/g	20-MAY-11	120	120
Boron (B), Hot Water Ext.	<0.10		0.10	ug/g	20-MAY-11	120	120
Cadmium (Cd)	<0.50		0.50	ug/g	20-MAY-11	1.2	1.2
Chromium (Cr)	19.5		1.0	ug/g	20-MAY-11	160	160
Cobalt (Co)	6.9		1.0	ug/g	20-MAY-11	22	22
Copper (Cu)	17.5		1.0	ug/g	20-MAY-11	140	180
Lead (Pb)	6.7		1.0	ug/g	20-MAY-11	120	120
Mercury (Hg)	<0.050		0.050	ug/g	20-MAY-11	0.27	1.8
Molybdenum (Mo)	<1.0		1.0	ug/g	20-MAY-11	6.9	6.9
Nickel (Ni)	13.0		1.0	ug/g	20-MAY-11	100	130
Selenium (Se)	<1.0		1.0	ug/g	20-MAY-11	2.4	2.4
Silver (Ag)	<0.20		0.20	ug/g	20-MAY-11	20	25
Thallium (Tl)	<0.50		0.50	ug/g	20-MAY-11	1	1
Uranium (U)	<1.0		1.0	ug/g	20-MAY-11	23	23
Vanadium (V)	42.0		1.0	ug/g	20-MAY-11	86	86
Zinc (Zn)	35.1		5.0	ug/g	20-MAY-11	340	340
Speciated Metals							
Chromium, Hexavalent	<0.20		0.20	ug/g	20-MAY-11	8	10
L1006805-2 G3070-BH12/SS2							
Sampled By: CLIENT on 29-APR-11							
Matrix: SOIL						#1	#2
Physical Tests							
Conductivity	1.77		0.0040	mS/cm	20-MAY-11	*0.7	*0.7
% Moisture	11.6		0.10	%	19-MAY-11		
pH	8.00		0.10	pH units	24-MAY-11		
Cyanides							
Cyanide, Weak Acid Diss	<0.050		0.050	ug/g	20-MAY-11	0.051	0.051
Saturated Paste Extractables							
SAR	90.0	SAR:Q	0.10	SAR	20-MAY-11	*5	*5
Metals							
Antimony (Sb)	<1.0		1.0	ug/g	20-MAY-11	7.5	7.5
Arsenic (As)	4.3		1.0	ug/g	20-MAY-11	18	18
Barium (Ba)	44.6		1.0	ug/g	20-MAY-11	390	390

* Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

Ontario Regulation 153/04 - as amended by O.Reg. 511 (JULY, 2011) = [Suite] - T2-RPI-Soil (Coarse/Fine)

#1: ON511/11-T2-Soil-Res/Park/Inst. Property Use (Coarse) **#2: ON511/11-T2-Soil-Res/Park/Inst. Property Use (Fine)**

Sample Details Grouping / Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits #1	Guideline Limits #2
L1006805-2 G3070-BH12/SS2							
Sampled By: CLIENT on 29-APR-11							
Matrix: SOIL						#1	#2
Metals							
Beryllium (Be)	<0.50		0.50	ug/g	20-MAY-11	4	5
Boron (B)	9.7		5.0	ug/g	20-MAY-11	120	120
Boron (B), Hot Water Ext.	<0.10		0.10	ug/g	20-MAY-11	120	120
Cadmium (Cd)	<0.50		0.50	ug/g	20-MAY-11	1.2	1.2
Chromium (Cr)	19.1		1.0	ug/g	20-MAY-11	160	160
Cobalt (Co)	7.2		1.0	ug/g	20-MAY-11	22	22
Copper (Cu)	17.8		1.0	ug/g	20-MAY-11	140	180
Lead (Pb)	6.8		1.0	ug/g	20-MAY-11	120	120
Mercury (Hg)	<0.050		0.050	ug/g	20-MAY-11	0.27	1.8
Molybdenum (Mo)	<1.0		1.0	ug/g	20-MAY-11	6.9	6.9
Nickel (Ni)	15.0		1.0	ug/g	20-MAY-11	100	130
Selenium (Se)	<1.0		1.0	ug/g	20-MAY-11	2.4	2.4
Silver (Ag)	<0.20		0.20	ug/g	20-MAY-11	20	25
Thallium (Tl)	<0.50		0.50	ug/g	20-MAY-11	1	1
Uranium (U)	<1.0		1.0	ug/g	20-MAY-11	23	23
Vanadium (V)	36.8		1.0	ug/g	20-MAY-11	86	86
Zinc (Zn)	36.9		5.0	ug/g	20-MAY-11	340	340
Speciated Metals							
Chromium, Hexavalent	<0.20		0.20	ug/g	20-MAY-11	8	10
L1006805-3 G3070-BH34/SS2							
Sampled By: CLIENT on 28-APR-11							
Matrix: SOIL						#1	#2
Physical Tests							
Conductivity	0.386		0.0040	mS/cm	20-MAY-11	0.7	0.7
% Moisture	14.9		0.10	%	19-MAY-11		
pH	7.64		0.10	pH units	24-MAY-11		
Cyanides							
Cyanide, Weak Acid Diss	<0.050		0.050	ug/g	20-MAY-11	0.051	0.051
Saturated Paste Extractables							
SAR	12.8	SAR:Q	0.10	SAR	20-MAY-11	5	5
Metals							
Antimony (Sb)	<1.0		1.0	ug/g	20-MAY-11	7.5	7.5
Arsenic (As)	4.5		1.0	ug/g	20-MAY-11	18	18
Barium (Ba)	30.5		1.0	ug/g	20-MAY-11	390	390
Beryllium (Be)	<0.50		0.50	ug/g	20-MAY-11	4	5
Boron (B)	7.0		5.0	ug/g	20-MAY-11	120	120
Boron (B), Hot Water Ext.	<0.10		0.10	ug/g	20-MAY-11	120	120
Cadmium (Cd)	<0.50		0.50	ug/g	20-MAY-11	1.2	1.2
Chromium (Cr)	25.0		1.0	ug/g	20-MAY-11	160	160
Cobalt (Co)	5.4		1.0	ug/g	20-MAY-11	22	22
Copper (Cu)	12.1		1.0	ug/g	20-MAY-11	140	180
Lead (Pb)	5.1		1.0	ug/g	20-MAY-11	120	120
Mercury (Hg)	<0.050		0.050	ug/g	20-MAY-11	0.27	1.8
Molybdenum (Mo)	<1.0		1.0	ug/g	20-MAY-11	6.9	6.9
Nickel (Ni)	10.5		1.0	ug/g	20-MAY-11	100	130
Selenium (Se)	<1.0		1.0	ug/g	20-MAY-11	2.4	2.4

* Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.

Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

Ontario Regulation 153/04 - as amended by O.Reg. 511 (JULY, 2011) = [Suite] - T2-RPI-Soil (Coarse/Fine)

#1: ON511/11-T2-Soil-Res/Park/Inst. Property Use (Coarse)

#2: ON511/11-T2-Soil-Res/Park/Inst. Property Use (Fine)

Sample Details Grouping / Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits #1	Guideline Limits #2
L1006805-3 G3070-BH34/SS2							
Sampled By: CLIENT on 28-APR-11							
Matrix: SOIL							
Metals							
Silver (Ag)	<0.20		0.20	ug/g	20-MAY-11	20	25
Thallium (Tl)	<0.50		0.50	ug/g	20-MAY-11	1	1
Uranium (U)	<1.0		1.0	ug/g	20-MAY-11	23	23
Vanadium (V)	56.3		1.0	ug/g	20-MAY-11	86	86
Zinc (Zn)	20.9		5.0	ug/g	20-MAY-11	340	340
Speciated Metals							
Chromium, Hexavalent	0.26		0.20	ug/g	20-MAY-11	8	10

Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

Ontario Regulation 153/04 - as amended by O.Reg. 511 (JULY, 2011) = [Suite] - T2-RPI-Soil (Coarse/Fine)

#1: ON511/11-T2-Soil-Res/Park/Inst. Property Use (Coarse)

#2: ON511/11-T2-Soil-Res/Park/Inst. Property Use (Fine)

Reference Information

Sample Parameter Qualifier key listed:

Qualifier	Description
SAR:Q	Qualified SAR value: actual SAR is lower but is incalculable due to Na, Ca or Mg below detection limit.

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Method Reference***
B-HWS-R511-WT	Soil	Boron (B), Hot Water Extractable	HW EXTR, EPA 6010B
A dried solid sample is extracted with calcium chloride, the sample undergoes a heating process. After cooling the sample is filtered and analyzed by ICP/OES.			
CN-WAD-R511-WT	Soil	Cyanide, Weak Acid Diss	MOE 3015/APHA 4500CN I-WAD
The sample is extracted with a strong base for 16 hours, and then filtered. The filtrate is then distilled where the cyanide is converted to cyanogen chloride by reacting with chloramine-T, the cyanogen chloride then reacts with a combination of barbituric acid and isonicotinic acid to form a highly colored complex.			
CR-CR6-IC-R511-WT	Soil	Hexavalent Chromium in Soil	SW846 3060A/7199
Soil sample undergoes a alkaline digestion process where the sample is acidified and derivatized with 1,5-diphenylcarbazide (DPC) using ion chromatography.			
EC-R511-WT	Soil	Conductivity (EC)	MOEE E3138
A representative subsample is tumbled with de-ionized (DI) water. The ratio of water to soil is 2:1 v/w. After tumbling the sample is then analyzed by a conductivity meter.			
HG-R511-WT	Soil	Mercury by CVAA	SW846 3050B/7471
Solid sample is digested with a heated, strong, mixed acid solution to convert all forms of mercury to divalent mercury. The divalent mercury is then reduced to elemental mercury, sparged from solution and analyzed by CVAAS.			
MET-UG/G-CCMS-WT	Soil	Metal Scan Collision Cell ICPMS	EPA 200.2/6020A
Sample is vigorously digested with nitric acid and hydrogen peroxide. Analysis is conducted by ICP/OES.			
MOISTURE-WT	Soil	% Moisture	Gravimetric: Oven Dried
PH-R511-WT	Soil	pH	MOEE E3137A
A minimum 10g portion of the sample is extracted with 20mL of 0.01M calcium chloride solution by shaking for at least 30 minutes. The aqueous layer is separated from the soil and then analyzed using a pH meter and electrode.			
SAR-R511-WT	Soil	Sodium Adsorption Ratio	SW846 6010C
A dried, disaggregated solid sample is extracted with deionized water, the aqueous extract is separated from the solid, acidified and then analyzed using a ICP/OES.			

*** ALS test methods may incorporate modifications from specified reference methods to improve performance.

Chain of Custody numbers:

85080

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location	Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA		

Reference Information

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to fitness for a particular purpose, or non-infringement. ALS assumes no responsibility for errors or omissions in the information.

ALS Environmental

Quality Control Report

Workorder: L1006805 Report Date: 25-MAY-11

Client: V.A. WOOD ASSOCIATES LIMITED
1080 Tapscott Rd Unit 24
Scarborough ON M1X 1E7
Contact: Vic Wood

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
B-HWS-R511-WT	Soil							
Batch R2191700								
WG1282265-4 DUP		**WG1282265-3**						
Boron (B), Hot Water Ext.		<0.10	<0.10	RPD-NA	ug/g	N/A	40	20-MAY-11
WG1282265-2 LCS								
Boron (B), Hot Water Ext.			100		%		70-130	20-MAY-11
WG1282265-1 MB								
Boron (B), Hot Water Ext.			<0.10		ug/g		0.1	20-MAY-11
WG1282265-5 MS		**WG1282265-3**						
Boron (B), Hot Water Ext.			119		%		60-140	20-MAY-11
CN-WAD-R511-WT	Soil							
Batch R2191962								
WG1282565-3 CVS								
Cyanide, Weak Acid Diss			105		%		80-120	20-MAY-11
WG1282132-3 DUP		**L1006697-1**						
Cyanide, Weak Acid Diss		<0.050	<0.050	RPD-NA	ug/g	N/A	35	20-MAY-11
WG1282132-2 LCS								
Cyanide, Weak Acid Diss			90		%		80-120	20-MAY-11
WG1282132-1 MB								
Cyanide, Weak Acid Diss			<0.050		ug/g		0.05	20-MAY-11
CR-CR6-IC-R511-WT	Soil							
Batch R2191967								
WG1282263-4 DUP		**WG1282263-3**						
Chromium, Hexavalent		<0.20	<0.20	RPD-NA	ug/g	N/A	35	20-MAY-11
WG1282263-2 LCS								
Chromium, Hexavalent			100		%		80-120	20-MAY-11
WG1282263-1 MB								
Chromium, Hexavalent			<0.20		ug/g		0.2	20-MAY-11
WG1282263-5 MS		**WG1282263-3**						
Chromium, Hexavalent			109		%		70-130	20-MAY-11
EC-R511-WT	Soil							
Batch R2191856								
WG1282504-3 DUP		**L1006805-3**						
Conductivity		0.386	0.393		mS/cm	1.8	10	20-MAY-11
WG1282504-4 LCS								
Conductivity			99		%		90-110	20-MAY-11
WG1282504-1 MB								
Conductivity			<0.0040		mS/cm		0.004	20-MAY-11
HG-R511-WT	Soil							

ALS Environmental

Quality Control Report

Workorder: L1006805 Report Date: 25-MAY-11

Client: V.A. WOOD ASSOCIATES LIMITED
1080 Tapscott Rd Unit 24
Scarborough ON M1X 1E7
Contact: Vic Wood

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
HG-R511-WT	Soil							
Batch R2191681								
WG1282264-2 CRM		**WT-SS-1**						
Mercury (Hg)			110		%		70-130	20-MAY-11
WG1282264-4 DUP		**WG1282264-3**						
Mercury (Hg)		<0.050	<0.050	RPD-NA	ug/g	N/A	30	20-MAY-11
WG1282264-7 LCS								
Mercury (Hg)			100		%		80-120	20-MAY-11
WG1282264-1 MB								
Mercury (Hg)			<0.050		ug/g		0.05	20-MAY-11
WG1282264-5 MS		**WG1282264-3**						
Mercury (Hg)			99		%		70-130	20-MAY-11
MET-UG/G-CCMS-WT	Soil							
Batch R2192683								
WG1282301-2 CVS								
Antimony (Sb)			100		%		70-130	20-MAY-11
Arsenic (As)			100		%		70-130	20-MAY-11
Barium (Ba)			97		%		70-130	20-MAY-11
Beryllium (Be)			97		%		70-130	20-MAY-11
Boron (B)			100		%		70-130	20-MAY-11
Cadmium (Cd)			98		%		70-130	20-MAY-11
Chromium (Cr)			100		%		70-130	20-MAY-11
Cobalt (Co)			99		%		70-130	20-MAY-11
Copper (Cu)			98		%		70-130	20-MAY-11
Lead (Pb)			97		%		70-130	20-MAY-11
Molybdenum (Mo)			100		%		70-130	20-MAY-11
Nickel (Ni)			98		%		70-130	20-MAY-11
Selenium (Se)			99		%		70-130	20-MAY-11
Silver (Ag)			90		%		70-130	20-MAY-11
Thallium (Tl)			94		%		70-130	20-MAY-11
Uranium (U)			93		%		70-130	20-MAY-11
Vanadium (V)			99		%		70-130	20-MAY-11
Zinc (Zn)			97		%		70-130	20-MAY-11
WG1282264-4 DUP		**WG1282264-3**						
Antimony (Sb)		<1.0	<1.0	RPD-NA	ug/g	N/A	25	20-MAY-11
Arsenic (As)		2.7	2.6		ug/g	5.2	25	20-MAY-11
Barium (Ba)		15.1	15.0		ug/g	0.77	25	20-MAY-11
Beryllium (Be)		<0.50	<0.50					

ALS Environmental

Quality Control Report

Workorder: L1006805 Report Date: 25-MAY-11

Client: V.A. WOOD ASSOCIATES LIMITED
1080 Tapscott Rd Unit 24
Scarborough ON M1X 1E7
Contact: Vic Wood

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-UG/G-CCMS-WT	Soil							
Batch R2192683								
WG1282264-4 DUP		**WG1282264-3**						
Beryllium (Be)		<0.50	<0.50	RPD-NA	ug/g	N/A	25	20-MAY-11
Boron (B)		8.0	8.4		ug/g	5.9	25	20-MAY-11
Cadmium (Cd)		<0.50	<0.50	RPD-NA	ug/g	N/A	25	20-MAY-11
Chromium (Cr)		10.7	11.9		ug/g	10	25	20-MAY-11
Cobalt (Co)		2.7	2.8		ug/g	2.7	25	20-MAY-11
Copper (Cu)		8.1	8.0		ug/g	0.85	25	20-MAY-11
Lead (Pb)		6.2	6.4		ug/g	3.4	25	20-MAY-11
Molybdenum (Mo)		<1.0	<1.0	RPD-NA	ug/g	N/A	25	20-MAY-11
Nickel (Ni)		5.4	5.6		ug/g	3.3	25	20-MAY-11
Selenium (Se)		<1.0	<1.0	RPD-NA	ug/g	N/A	25	20-MAY-11
Silver (Ag)		<0.20	<0.20	RPD-NA	ug/g	N/A	25	20-MAY-11
Thallium (Tl)		<0.50	<0.50	RPD-NA	ug/g	N/A	25	20-MAY-11
Uranium (U)		<1.0	<1.0	RPD-NA	ug/g	N/A	25	20-MAY-11
Vanadium (V)		24.5	25.9		ug/g	5.9	25	20-MAY-11
Zinc (Zn)		32.9	33.0		ug/g	0.031	25	20-MAY-11
WG1282264-6 LCS								
Antimony (Sb)			101		%		70-130	20-MAY-11
Arsenic (As)			109		%		70-130	20-MAY-11
Barium (Ba)			112		%		70-130	20-MAY-11
Beryllium (Be)			103		%		70-130	20-MAY-11
Cadmium (Cd)			110		%		70-130	20-MAY-11
Chromium (Cr)			119		%		70-130	20-MAY-11
Cobalt (Co)			114		%		70-130	20-MAY-11
Copper (Cu)			117		%		70-130	20-MAY-11
Lead (Pb)			104		%		70-130	20-MAY-11
Nickel (Ni)			115		%		70-130	20-MAY-11
Selenium (Se)			109		%		70-130	20-MAY-11
Thallium (Tl)			98		%		70-130	20-MAY-11
Uranium (U)			98		%		70-130	20-MAY-11
Vanadium (V)			112		%		70-130	20-MAY-11
Zinc (Zn)			102		%		70-130	20-MAY-11
WG1282264-1 MB								
Antimony (Sb)			<1.0		ug/g		1	20-MAY-11
							1	

Quality Control Report

Workorder: L1006805 Report Date: 25-MAY-11

Client: V.A. WOOD ASSOCIATES LIMITED
1080 Tapscott Rd Unit 24
Scarborough ON M1X 1E7
Contact: Vic Wood

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-UG/G-CCMS-WT	Soil							
Batch	**R2192683**							
WG1282264-1	**MB**							
Arsenic (As)			<1.0		ug/g		1	20-MAY-11
Barium (Ba)			<1.0		ug/g		1	20-MAY-11
Beryllium (Be)			<0.50		ug/g		0.5	20-MAY-11
Boron (B)			<5.0		ug/g		5	20-MAY-11
Cadmium (Cd)			<0.50		ug/g		0.5	20-MAY-11
Chromium (Cr)			<1.0		ug/g		1	20-MAY-11
Cobalt (Co)			<1.0		ug/g		1	20-MAY-11
Copper (Cu)			<1.0		ug/g		1	20-MAY-11
Lead (Pb)			<1.0		ug/g		1	20-MAY-11
Molybdenum (Mo)			<1.0		ug/g		1	20-MAY-11
Nickel (Ni)			<1.0		ug/g		1	20-MAY-11
Selenium (Se)			<1.0		ug/g		1	20-MAY-11
Silver (Ag)			<0.20		ug/g		0.2	20-MAY-11
Thallium (Tl)			<0.50		ug/g		0.5	20-MAY-11
Uranium (U)			<1.0		ug/g		1	20-MAY-11
Vanadium (V)			<1.0		ug/g		1	20-MAY-11
Zinc (Zn)			<5.0		ug/g		5	20-MAY-11
WG1282264-5	**MS**	**WG1282264-3**						
Antimony (Sb)			97		%		70-130	20-MAY-11
Arsenic (As)			N/A	MS-B	%		-	20-MAY-11
Barium (Ba)			N/A	MS-B	%		-	20-MAY-11
Beryllium (Be)			107		%		70-130	20-MAY-11
Cadmium (Cd)			104		%		70-130	20-MAY-11
Chromium (Cr)			N/A	MS-B	%		-	20-MAY-11
Cobalt (Co)			N/A	MS-B	%		-	20-MAY-11
Copper (Cu)			N/A	MS-B	%		-	20-MAY-11
Lead (Pb)			N/A	MS-B	%		-	20-MAY-11
Nickel (Ni)			N/A	MS-B	%		-	20-MAY-11
Selenium (Se)			106		%		70-130	20-MAY-11
Thallium (Tl)			92		%		70-130	20-MAY-11
Uranium (U)			108		%		70-130	20-MAY-11
Vanadium (V)			N/A	MS-B	%		-	20-MAY-11
Zinc (Zn)			N/A	MS-B	%		-	20-MAY-11
MOISTURE-WT	Soil							

ALS Environmental

Quality Control Report

Client: V.A. WOOD ASSOCIATES LIMITED
1080 Tapscott Rd Unit 24
Scarborough ON M1X 1E7
Contact: Vic Wood

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MOISTURE-WT	Soil							
Batch R2191669								
WG1282093-3 DUP		**L1006805-3**						
% Moisture		14.9	14.8		%	0.84	30	19-MAY-11
WG1282093-2 LCS								
% Moisture			95		%		70-130	19-MAY-11
WG1282093-1 MB								
% Moisture			<0.10		%		0.1	19-MAY-11
PH-R511-WT	Soil							
Batch R2193147								
WG1284007-2 DUP		**L1006697-14**						
pH		8.03	8.01		pH units	0.25	20	24-MAY-11
WG1284007-1 LCS								
pH			99		%		80-120	24-MAY-11

Quality Control Report

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Quality Control Report

Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Physical Tests							
% Moisture							
	1	02-MAY-11	19-MAY-11 20:13	14	17	days	EHTR
	2	29-APR-11	19-MAY-11 20:14	14	20	days	EHTR
	3	28-APR-11	19-MAY-11 20:15	14	21	days	EHTR
Cyanides							
Cyanide, Weak Acid Diss							
	1	02-MAY-11	19-MAY-11 17:44	14	17	days	EHTR
	2	29-APR-11	19-MAY-11 17:45	14	20	days	EHTR
	3	28-APR-11	19-MAY-11 17:46	14	21	days	EHTR

Legend & Qualifier Definitions:

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended.
EHTR: Exceeded ALS recommended hold time prior to sample receipt.
EHTL: Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.
EHT: Exceeded ALS recommended hold time prior to analysis.
Rec. HT: ALS recommended hold time (see units).

Notes*:
Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes.
Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L1006805 were received on 18-MAY-11 18:30.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

60 NORTHLAND ROAD, UNIT 1
WATERLOO, ON N2V 2B8
Phone: (519) 886-6910
Fax: (519) 886-9047
CANADA TOLL FREE: 1-800-668-9878

ALS Environmental

CHAIN OF CUSTODY / ANALYTICAL SERVICES REQUEST FORM

C of C # 85080
PAGE 1 OF 1

Note: all TAT Quoted material is in business days which exclude statutory holidays and weekends. TAT samples received past 3:00pm or Saturday/Sunday begin the next day.

Date requested	Service requested		
	5 day (Regular) ✓	2 day TAT (50%)	
	3-4 day TAT (25%)	Next day TAT (100%)	
		Same day TAT (200%)	

COMPANY NAME: Vawood Associates
ALS ACCOUNT#: 19638
PROJECT MANAGER:
PROJECT #: G3070
PHONE:
FAX:
QUOTATION #: PO#:

CRITERIA — Criteria on report (y/n) Y
Reg 153/04 and Reg 511/11
Table 1 (2) (3)
TCLP ____ MISA ____ PWQO ____
OTHER

REPORT DISTRIBUTION — ALL FINAL RESULTS WILL BE MAILED
EMAIL____ FAX____ BOTH____
EMAIL1 vawood@bellnet.ca
EMAIL2 rurgqinumbec@bellnet.ca
SELECT: pdf____ digital____ both____

ANALYSIS REQUEST: Metals & Inorganics

INDICATE BOTTLES FIELD FILTERED/ PRESERVED (F/P)
SUBMISSION #: L1006805
ENTERED BY: EP
DATE/TIME ENTERED: 19-MAY-11
BIN #: B236

Date (yy/mm/dd)	Time (24 hr)	COMP	GRAB	WATER	SOIL	OTHER	SAMPLE DESCRIPTION TO APPEAR ON REPORT	NUMBER OF CONTAINERS	Metals & Inorganics	COMMENTS	LAB ID
11/05/02	am				✓		G3070 - BH 2/SS 2	1	✓		-1
11/04/29	pm				✓		G3070 - BH 12/SS2	1	✓		-2
11/04/28	am				✓		G3070 - BH34/SS2	1	✓		-3

Please make a separate report using 511/11 (Tables 2+3)

SPECIAL INSTRUCTIONS/COMMENTS

SAMPLE CONDITION: FROZEN / COLD / AMBIENT — MEAN TEMP 15.1
CONDITION ACCEPTABLE UPON RECEIPT (Y/N) ____ INIT AP

SAMPLED BY: Jahangir	DATE & TIME 4/28-29/5/2	RECEIVED BY: [signature]	DATE & TIME 5/18/11
RELINQUISHED BY: Ren	DATE & TIME am/pm	RECEIVED AT LAB BY: Austin P	DATE & TIME 18/5/11 18:30

NOTES AND CONDITIONS:
1. Quote number must be provided to ensure proper pricing.
2. TAT may vary dependent on complexity of analysis and lab workload at time of submission. Please contact the lab to confirm TATs.
3. Any known or suspected hazards relating to a sample must be noted on the chain of custody in comments section.

White - report copy YELLOW - File copy PINK - Customer Copy

Reg COC Rev#3 Jt

STATEMENT OF LIMITATIONS

The conclusions and recommendations in this report are based on information determined at the borehole locations and on geological data of a general nature which may be available for the area investigated. Soil and groundwater conditions between and beyond the boreholes may differ from those encountered at the borehole locations and conditions may become apparent during construction which would not be detected or anticipated at the time of the soil investigation.

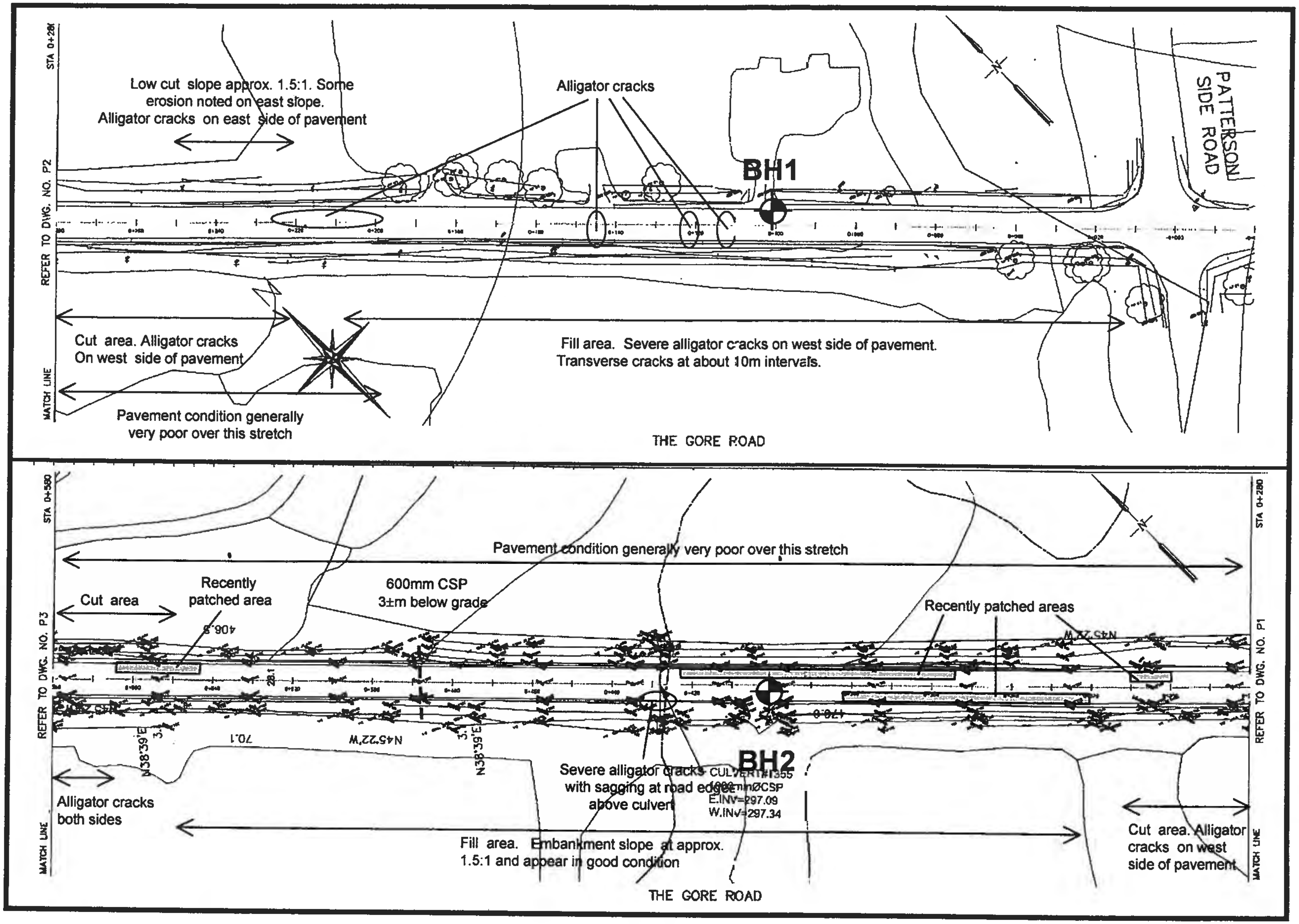
We recommend that we be retained to ensure that all necessary stripping, subgrade preparation and compaction requirements are met, and to confirm that the soil conditions do not deviate materially from those encountered in the boreholes. In cases where this recommendation is not followed, the company's responsibility is limited to interpreting accurately the information encountered at the borehole locations.

This report is applicable only to the project described in the introduction, constructed substantially in accordance with details of alignment and elevations quoted in the text.

ENCLOSURES

Ref. No. G3070-0-11

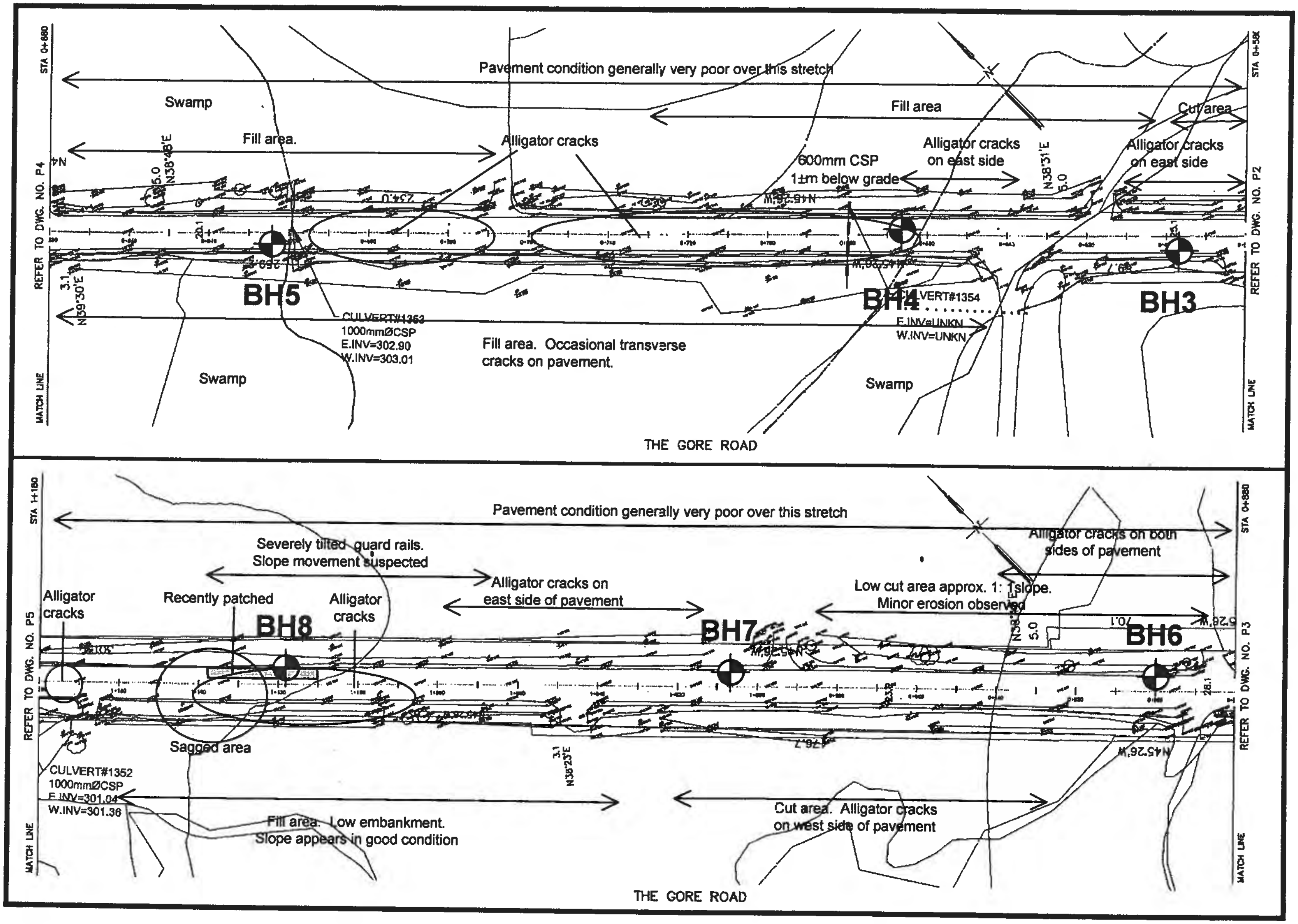
Enclosure 1a



BOREHOLE LOCATION PLAN

Ref. No. G3070-0-11

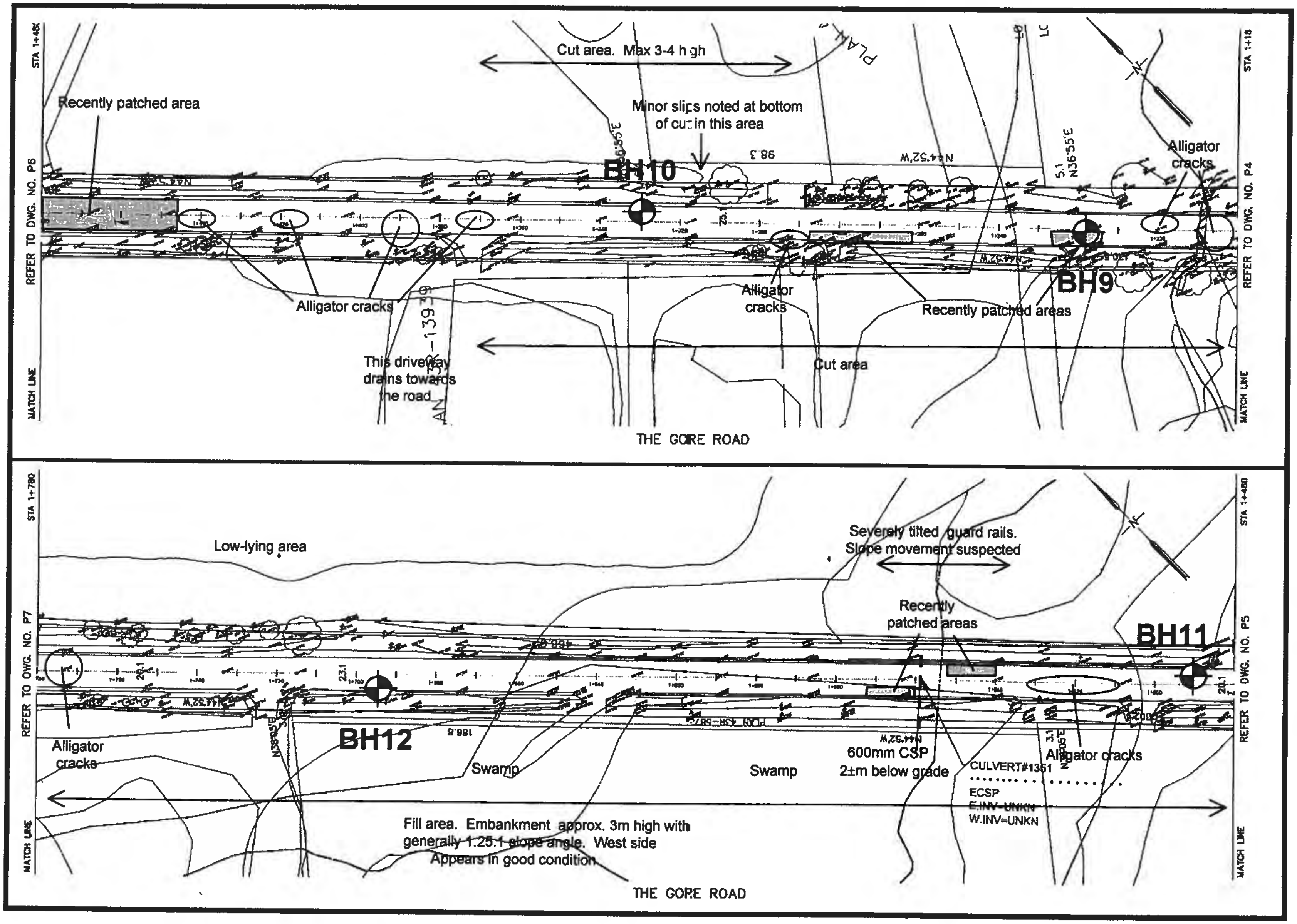
Enclosure 1b



BOREHOLE LOCATION PLAN

Ref. No. G-3070-0-11

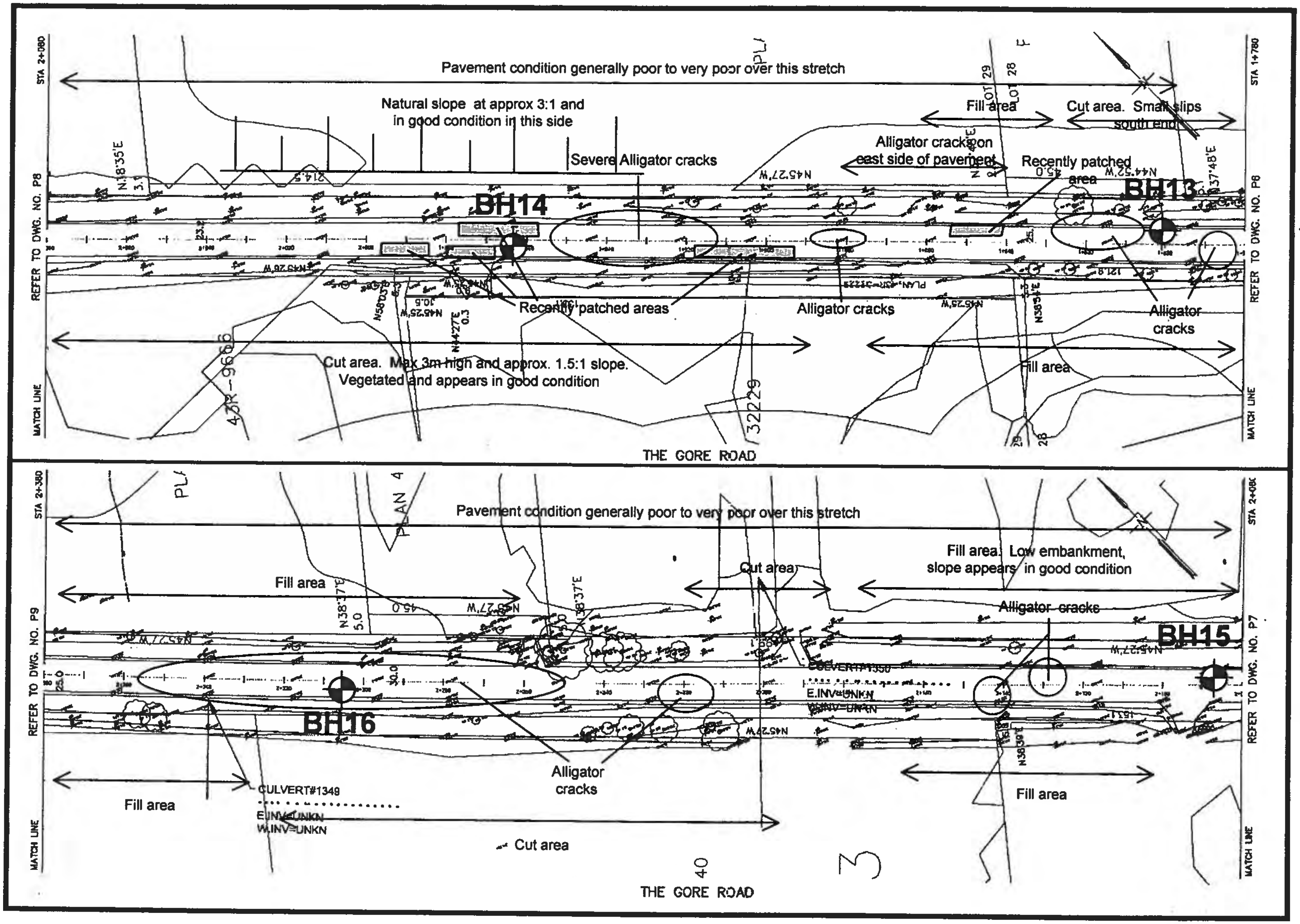
Enclosure 1c



BOREHOLE LOCATION PLAN

Ref. No. G3070-0-11

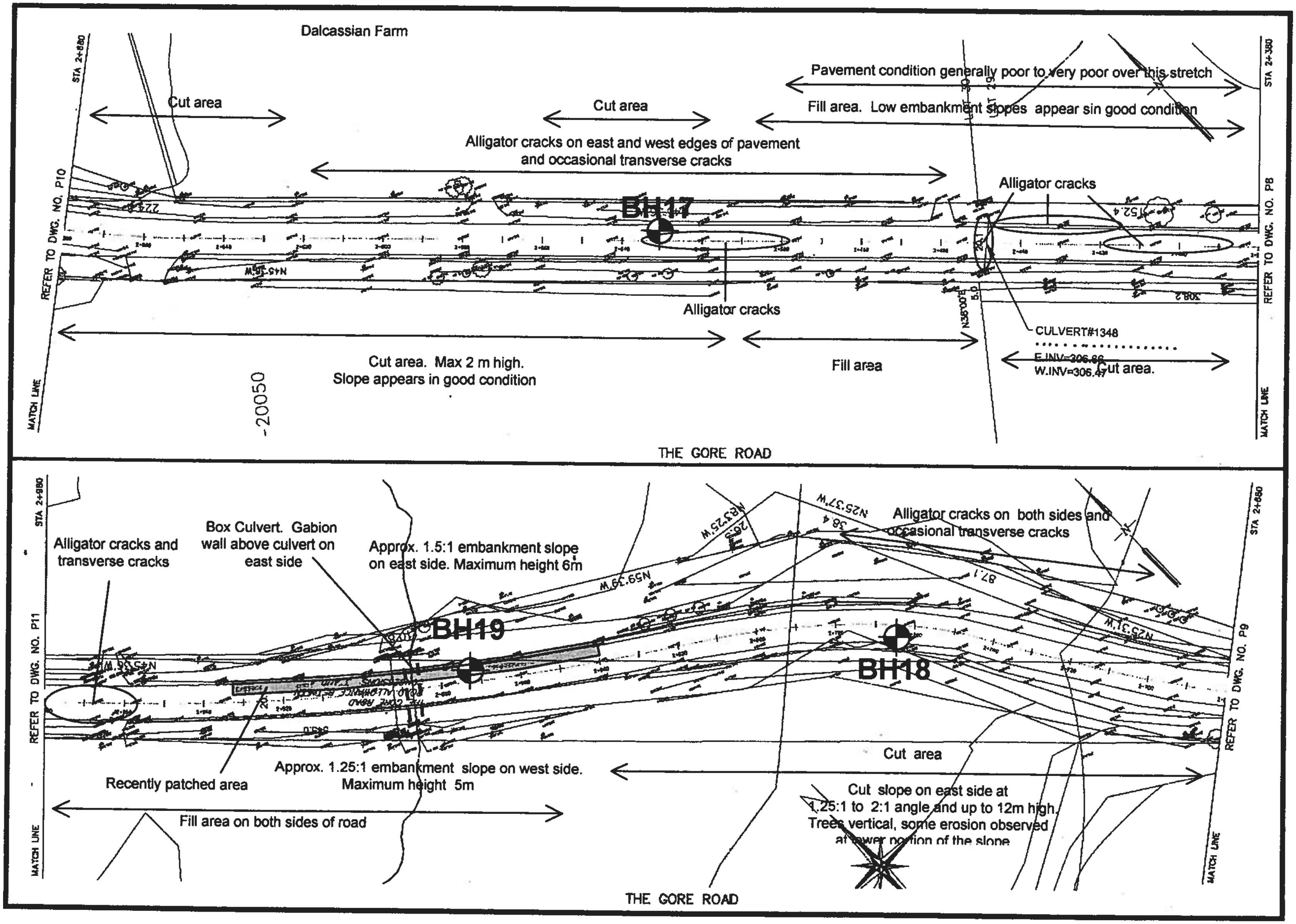
Enclosure 1d



BOREHOLE LOCATION PLAN

Ref. No. G3070-0-11

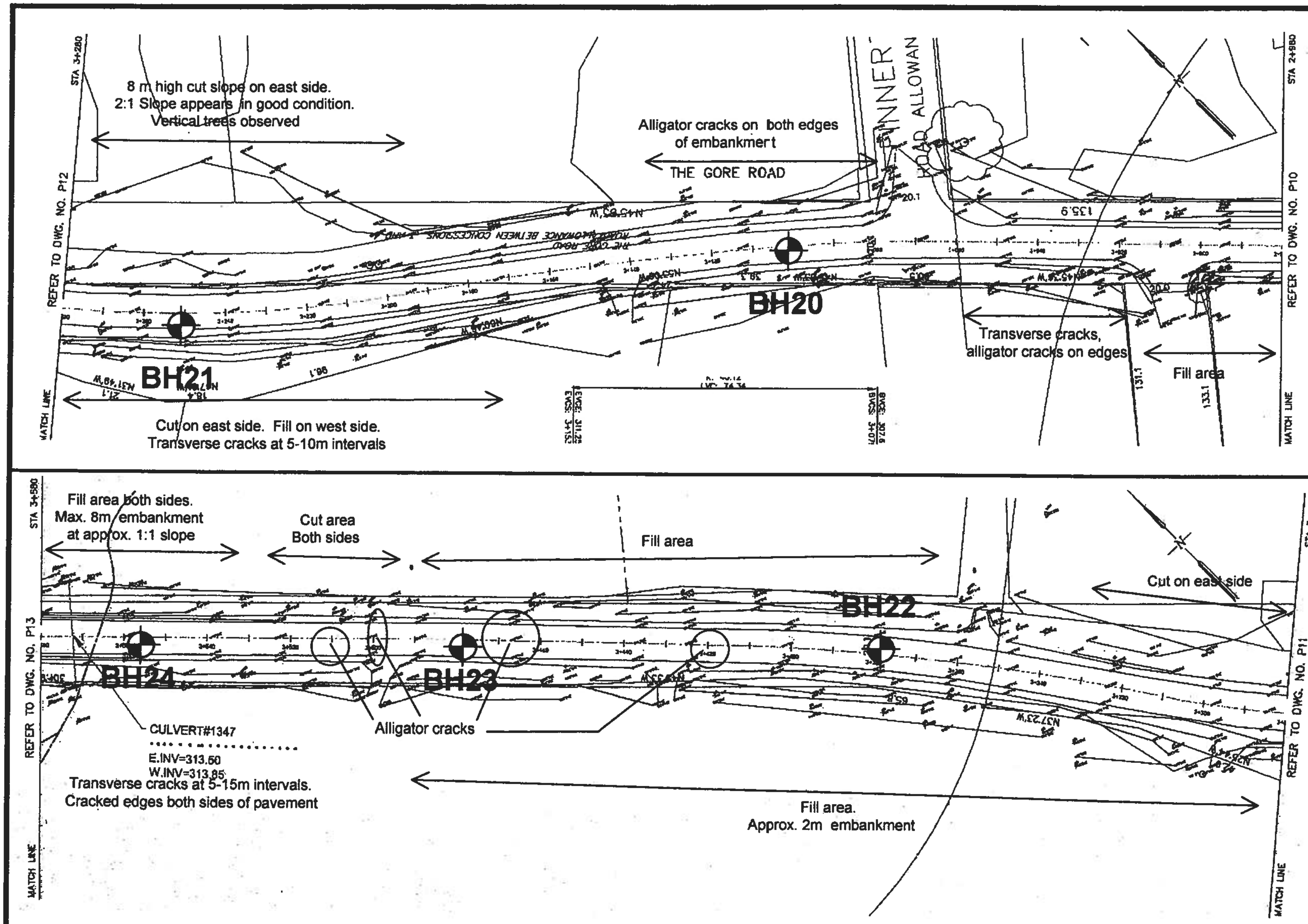
Enclosure 1e



BOREHOLE LOCATION PLAN

Ref. No. G3070-0-11

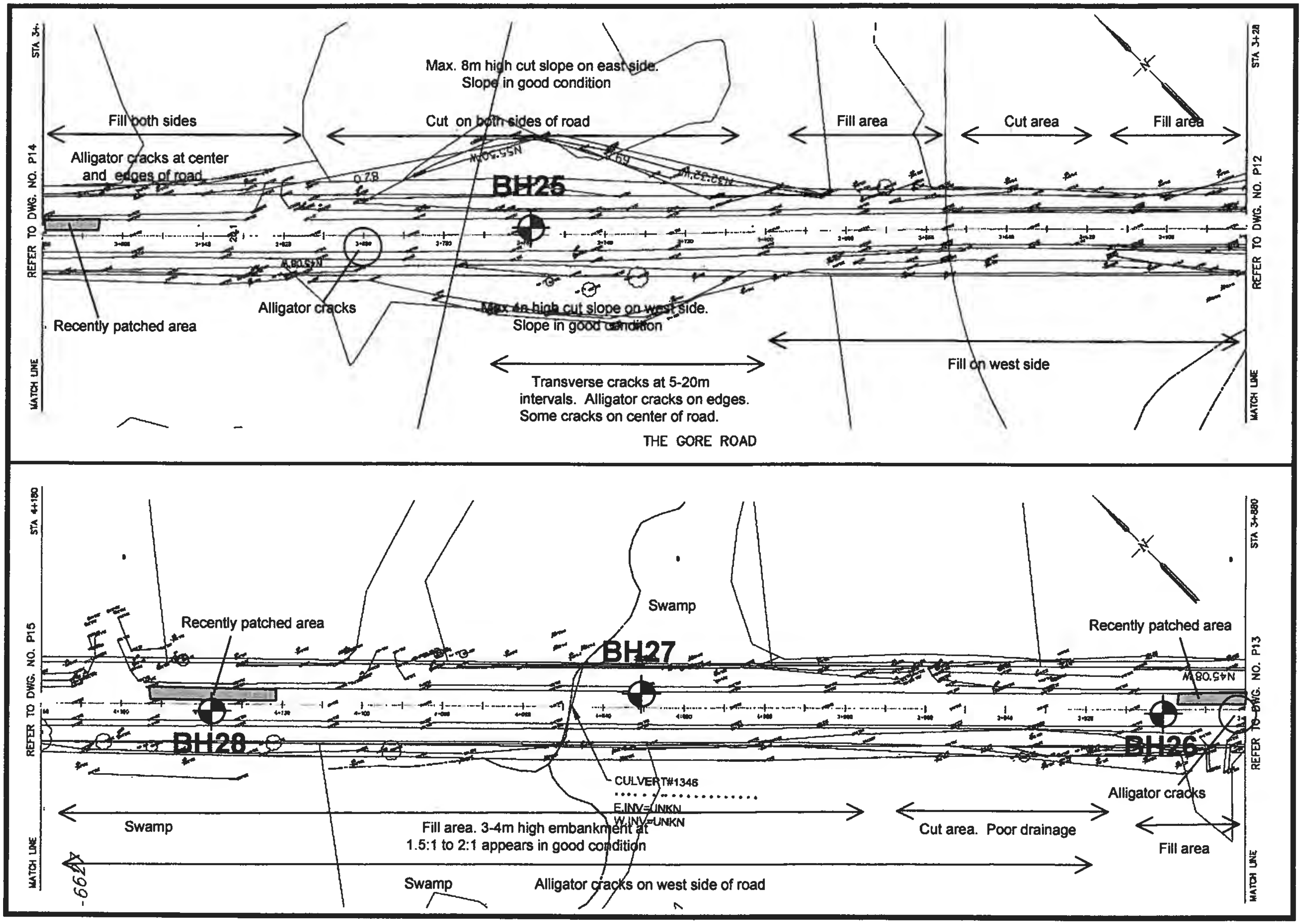
Enclosure 1f



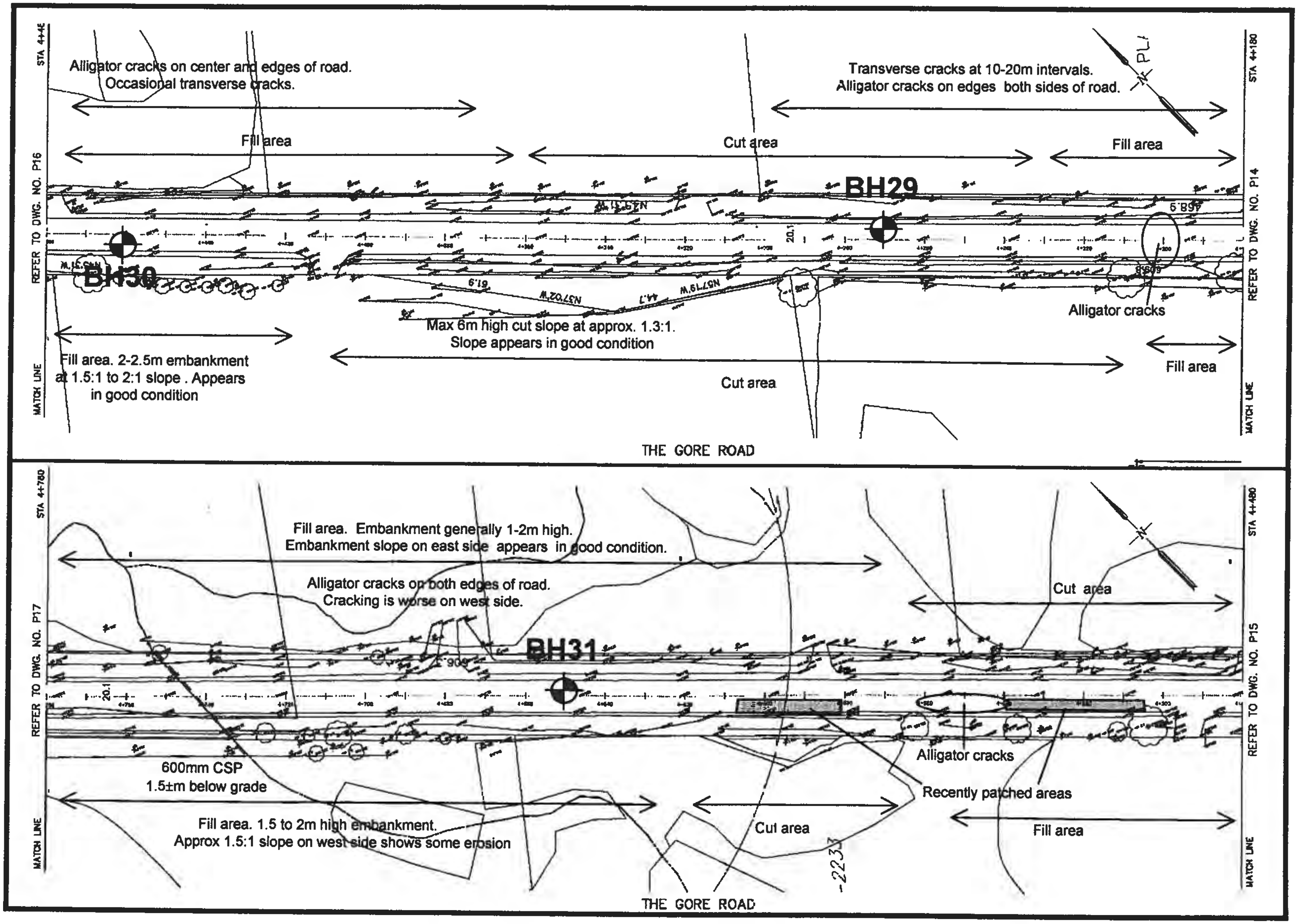
BOREHOLE LOCATION PLAN

Ref. No. G3070-0-11

Enclosure 1g



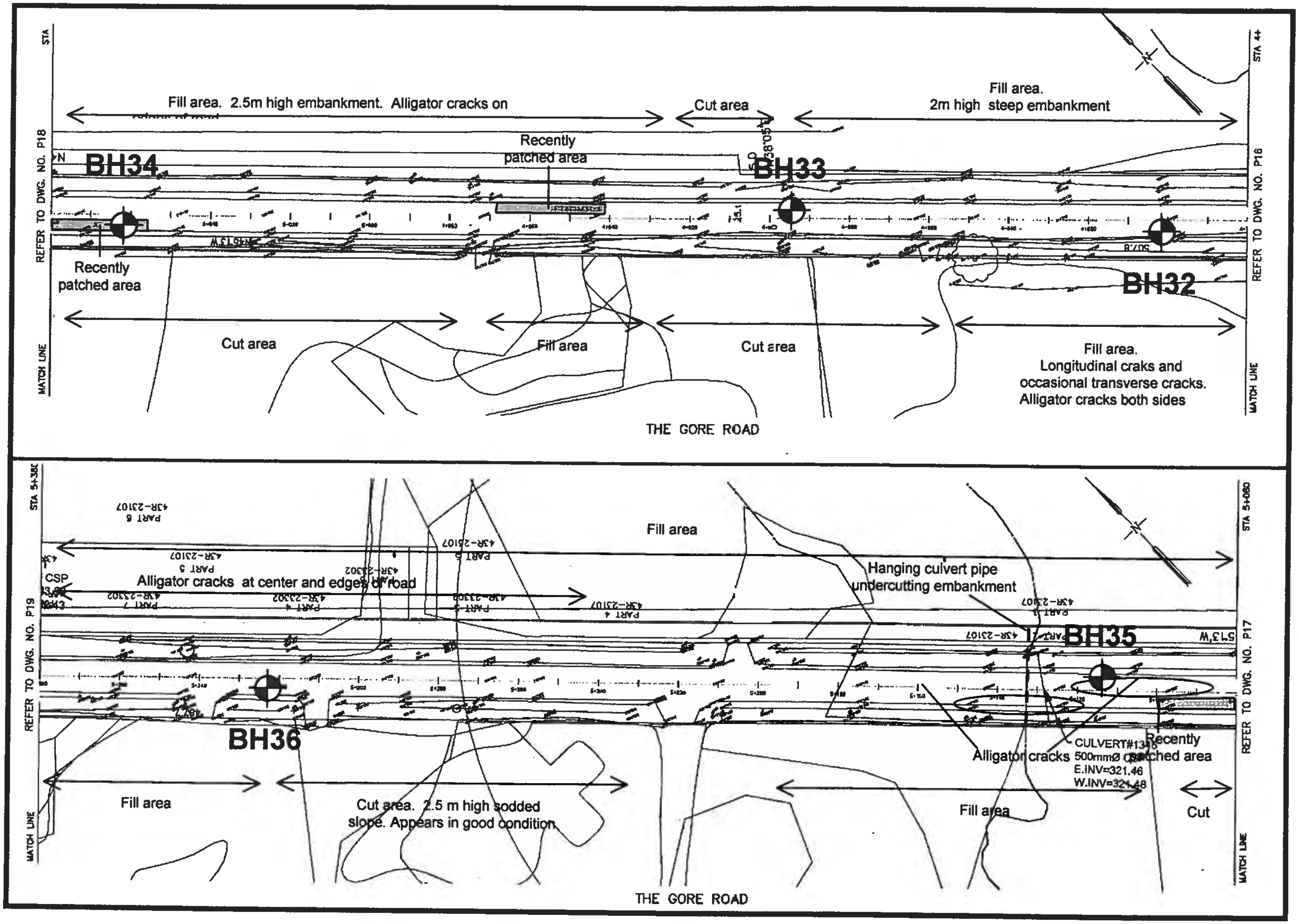
BOREHOLE LOCATION PLAN



BOREHOLE LOCATION PLAN

Ref. No. G3070-0-11

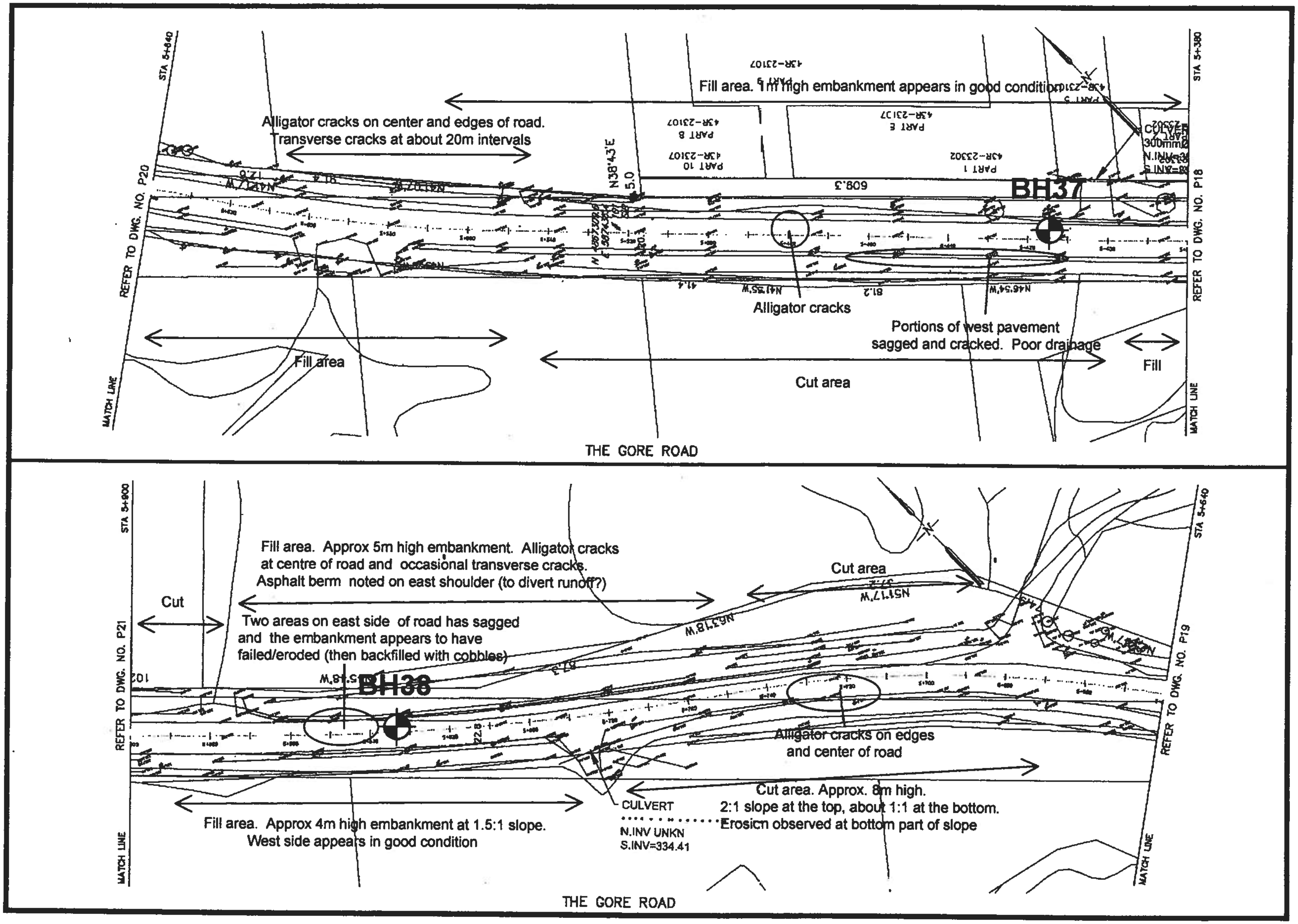
Enclosure 1i



BOREHOLE LOCATION PLAN

Ref. No. G3070-0-11

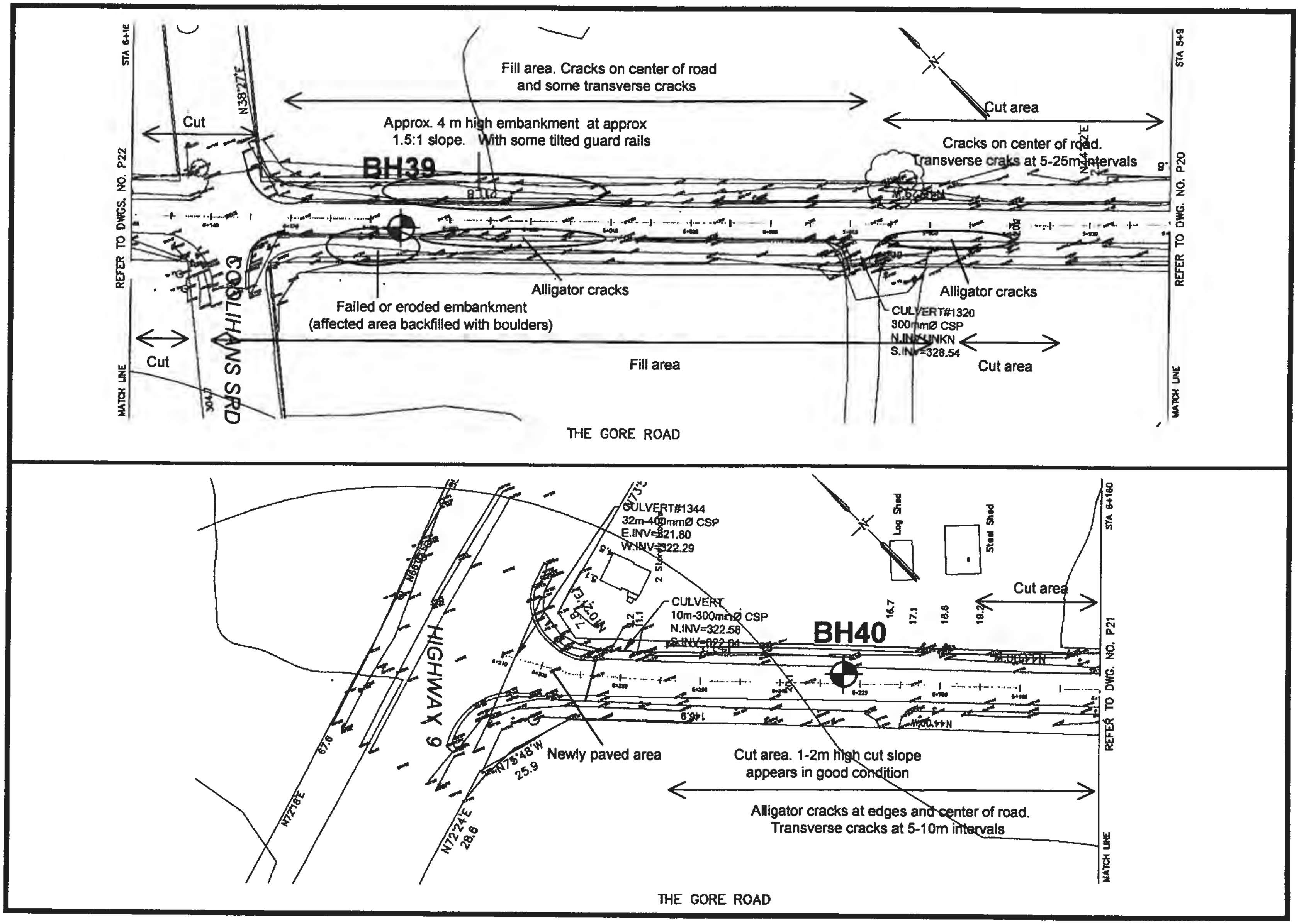
Enclosure 1j



BOREHOLE LOCATION PLAN

Ref. No. G3070-0-11

Enclosure 1k



BOREHOLE LOCATION PLAN

Reference No : G3070-0-11

Borehole No : 1

Enclosure No : 2

Client : R J Burnside & Associates Ltd.

Project : Geotechnical Investigation (EA Study)

Location : The Gore Rd, Patterson Sdrd to Hiway 9

Datum Elevation : Geodetic

Method : Auger

Diameter : 110 mm

Date : May 2, 2011

SUBSURFACE PROFILE					SAMPLE					
Elevation m	Depth m	Description	Symbol	Water	Number	Type	N-value	Standard Penetration Test blows/300mm (20 40 60 80)	Moisture Content, % (10 20 30 40 50)	Remarks
304.3	0	Ground Surface								
303.82		***PAVEMENT*** Asphalt 75mm Granular Base 400mm		DRY	1	SS	43			Approx. Sta. 0+100
302.9	1	***FILL*** Silty sand, some topsoil at the top, organic odour at the bottom, brown to greyish brown, moist, dense then compact			2	SS	14			Borehole open and dry on completion
302.35		***SANDY SILT*** Loose, brown, wet			3	SS	8			
	2	End of Borehole								

Depth scale: 0, 1, 2, 3, 4, 5

V.A. WOOD ASSOCIATES LIMITED

Disk :

Sheet : 1 of 1

Reference No : G3070-0-11

Borehole No : 2

Enclosure No : 3

Client : R J Burnside & Associates Ltd.

Project : Geotechnical Investigation (EA Study)

Method : Auger

Location : The Gore Rd, Patterson Sdrd to Hiway 9

Diameter : 110 mm

Datum Elevation : Geodetic

Date : May 2, 2011

Elevation m	Depth m	Description	Symbol	Water	Number	Type	N-value	Standard Penetration Test blows/300mm (20 40 60 80)	Moisture Content, % (10 20 30 40 50)	Remarks
301.1	0	Ground Surface								
		PAVEMENT Asphalt 75mm Granular Base 400mm		DRY	1	SS	39			Approx. Sta. 0+400
300.62										Borehole open and dry on completion
	1	*FILL* Silty sand, trace gravel, trace organics at the bottom, brown, moist, dense			2	SS	31			
					3	SS	41			
299.15	2	End of Borehole								
	3									
	4									
	5									

V.A. WOOD ASSOCIATES LIMITED

Disk :

Sheet : 1 of 1

Reference No : G3070-0-11

Borehole No : 3

Enclosure No : 4

Client : R J Burnside & Associates Ltd.

Project : Geotechnical Investigation (EA Study)

Method : Auger

Location : The Gore Rd, Patterson Sdrd to Hiway 9

Diameter : 110 mm

Datum Elevation : Geodetic

Date : May 2, 2011

SUBSURFACE PROFILE					SAMPLE			Standard Penetration Test blows/300mm (20 40 60 80)	Moisture Content, % (10 20 30 40 50)	Remarks
Elevation m	Depth m	Description	Symbol	Water	Number	Type	N-value			
304.8	0	Ground Surface								
304.42		**PAVEMENT** Asphalt 75mm Granular Base 300mm			1	SS	25			Approx. Sta. 0+600
304.2		**FILL** Silty sand, trace gravel, dense								Borehole open and dry on completion
	1	**SILT AND SAND** Compact, bedded silt and fine sand, brown, moist to wet		D R Y	2	SS	19			
302.85					3	SS	16			
	2	End of Borehole								
	3									
	4									
	5									

V.A. WOOD ASSOCIATES LIMITED

Disk :

Sheet : 1 of 1

Reference No : G3070-0-11

Borehole No : 4

Enclosure No : 5

Client : R J Burnside & Associates Ltd.

Project : Geotechnical Investigation (EA Study)

Location : The Gore Rd, Patterson Sdrd to Hiway 9

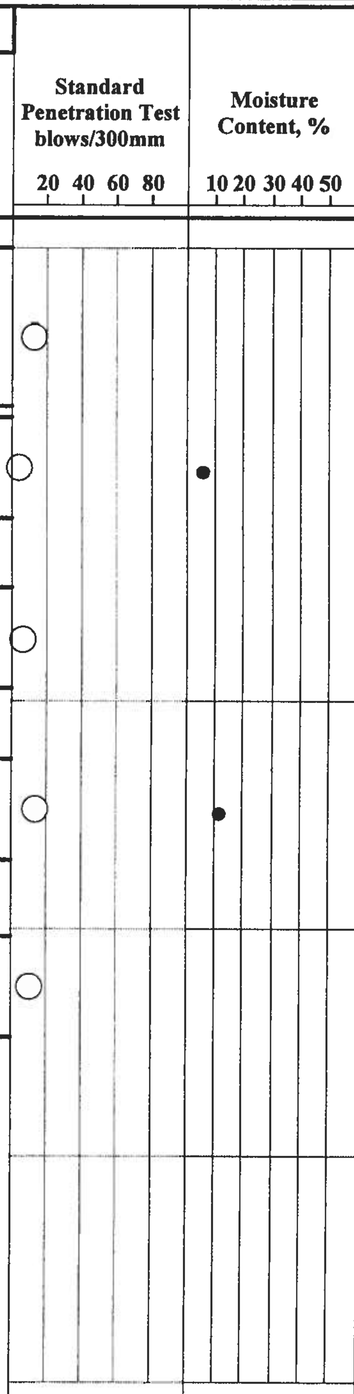
Datum Elevation : Geodetic

Method : Auger

Diameter : 110 mm

Date : April 19, 2011

Elevation m	Depth m	Description	Water	Sample Number	Type	N-value	Remarks
304.7	0	Ground Surface					
304.4		*PAVEMENT* Asphalt 25mm Granular Base 275mm		1	SS	13	Approx. Sta. 0+670
304		*FILL* Fine sand with peat, compact					Borehole open and dry on completion
303.3	1	*SILTY SAND* Loose, thinly bedded, with occasional seams of peat, brown and black, moist		2	SS	5	
	2	*SILT* Firm to stiff, occasional seams of clay, greenish brown, iron oxide stained, moist	DRY	3	SS	7	
				4	SS	14	
301.2	3			5	SS	11	
	4	End of Borehole					
	5						



V.A. WOOD ASSOCIATES LIMITED

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Reference No : G3070-0-11

Borehole No : 5

Enclosure No : 6

Client : R J Burnside & Associates Ltd.

Project : Geotechnical Investigation (EA Study)

Location : The Gore Rd, Patterson Sdrd to Hiway 9

Datum Elevation : Geodetic

Method : Auger

Diameter : 110 mm

Date : May 2, 2011

Elevation m	Depth m	Description (SUBSURFACE PROFILE)	Symbol	Water	Sample Number	Type	N-value	Standard Penetration Test blows/300mm (20 40 60 80)	Moisture Content, % (10 20 30 40 50)	Remarks
304.6	0	Ground Surface								
304.22		*PAVEMENT* Asphalt 75mm Granular Base 300mm		DRY	1	SS	49			Approx. Sta. 0+825
	1	*FILL* Fine sand, then silty sand, trace to some gravel, trace topsoil at the bottom, moist, dense then compact			2	SS	49			Borehole open and dry on completion
					3	SS	17			
302.4	2									
		PEAT Loose peat with seams of sand and silt, wet			4	SS	4			
	3				5	SS	3			
301.1										
	4	*SILT* Compact, grey, wet			6	SS	12			
299.6	5	End of Borehole								
	6									

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Reference No : G3070-0-11

Borehole No : 6

Enclosure No : 7

Client : R J Burnside & Associates Ltd.

Project : Geotechnical Investigation (EA Study)

Method : Auger

Location : The Gore Rd, Patterson Sdrd to Hiway 9

Diameter : 110 mm

Datum Elevation : Geodetic

Date : April 19, 2011

Elevation m	Depth m	Description (SUBSURFACE PROFILE)	Symbol	Water	Number (SAMPLE)	Type	N-value	Standard Penetration Test blows/300mm (20 40 60 80)	Moisture Content, % (10 20 30 40 50)	Remarks
306.9	0	Ground Surface								
306.52		*PAVEMENT* Asphalt 50mm Granular Base 325mm		DRY	1	SS	22			Approx. Sta. 0+900
306		*FILL* Silty sand, compact, moist, topsoil at the bottom								Borehole open and dry on completion
305.5	1	*SILTY SAND* Compact, fine sand with silt, brown, moist			2	SS	13			
304.95		*SILT* Very stiff, occasional seams of fine sand, brown, moist			3	SS	16			
	2	End of Borehole								

Depth scale: 0, 1, 2, 3, 4, 5

V.A. WOOD ASSOCIATES LIMITED

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Reference No : G3070-0-11

Borehole No : 7

Enclosure No : 8

Client : R J Burnside & Associates Ltd.

Project : Geotechnical Investigation (EA Study)

Location : The Gore Rd, Patterson Sdrd to Hiway 9

Datum Elevation : Geodetic

Method : Auger

Diameter : 110 mm

Date : April 19, 2011

Elevation m	Depth m	Description	Symbol	Water	Sample Number	Sample Type	N-value	Standard Penetration Test blows/300mm (20 40 60 80)	Moisture Content, % (10 20 30 40 50)	Remarks
307.8	0	Ground Surface								
307.36		**PAVEMENT** Asphalt 60mm Granular Base 375mm		DRY	1	SS	25			Approx. Sta. 1+010
306.4	1	**FILL** Silty sand, compact, moist			2	SS	19			Borehole open and dry on completion
305.85		**SAND** Compact, fine sand, some seams of silt, brown, moist			3	SS	16			
	2	End of Borehole								

V.A. WOOD ASSOCIATES LIMITED

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Sheet : 1 of 1

Reference No : G3070-0-11

Borehole No : 8

Enclosure No : 9

Client : R J Burnside & Associates Ltd.

Project : Geotechnical Investigation (EA Study)

Location : The Gore Rd, Patterson Sdrd to Hiway 9

Datum Elevation : Geodetic

Method : Auger

Diameter : 110 mm

Date : May 27, 2011

Elevation m	Description	Sample Number	Type	N-value	Remarks
304.9	Ground Surface				
304.66	***PAVEMENT*** Asphalt 75mm Granular Base 165mm	1	SS	42	Approx. Sta. 1+120
	FILL Dense fine sand, then grey silty sand with gravel and organic odiur, moist	2	SS	15	
303.1		3	SS	13	
	CLAYEY SAND Loose to compact, clayey to silty fine sand, rootlets noted, brown, wet	4	SS	6	
302					
	SANDY SILT TILL Compact to dense, trace fine gravel, grey, moist to wet	5	SS	10	
		6	SS	35	
299.1					
	CLAYEY SILT Soft, grey, wet	7	SS	3	
298.1					
	SANDY SILT TILL Compact, trace fine gravel, wet				cave in at 7m
296.85		8	SS	19	
	End of Borehole				

Depth m: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9

Standard Penetration Test blows/300mm: 20 40 60 80

Moisture Content, %: 10 20 30 40 50

V.A. WOOD ASSOCIATES LIMITED

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Reference No : G3070-0-11

Borehole No : 9

Enclosure No : 10

Client : R J Burnside & Associates Ltd.

Project : Geotechnical Investigation (EA Study)

Location : The Gore Rd, Patterson Sdrd to Hiway 9

Datum Elevation : Geodetic

Method : Auger

Diameter : 110 mm

Date : May 2, 2011

SUBSURFACE PROFILE					SAMPLE			Standard Penetration Test blows/300mm (20 40 60 80)	Moisture Content, % (10 20 30 40 50)	Remarks
Elevation m	Depth m	Description	Symbol	Water	Number	Type	N-value			
304.9	0	Ground Surface								
304.61		*PAVEMENT* Asphalt 60mm Granular Base 225mm		DRY						Approx. Sta. 1+220
304.2		*FILL* Silty sand, trace gravel, topsoil, dark brown, dense			1	SS	33			Borehole open and dry on completion
	1	*SILT TILL* Compact, trace fine gravel, brown, moist			2	SS	19			
302.95					3	SS	16			
	2	End of Borehole								
	3									
	4									
	5									

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Reference No : G3070-0-11

Borehole No : 10

Enclosure No : 11

Client : R J Burnside & Associates Ltd.

Project : Geotechnical Investigation (EA Study)

Location : The Gore Rd, Patterson Sdrd to Hiway 9

Datum Elevation : Geodetic

Method : Auger

Diameter : 110 mm

Date : April 19, 2011

Elevation m	Depth m	Description (SUBSURFACE PROFILE)	Symbol	Water	Number (SAMPLE)	Type	N-value	Standard Penetration Test blows/300mm (20 40 60 80)	Moisture Content, % (10 20 30 40 50)	Remarks
308.5	0	Ground Surface								
308.02		**PAVEMENT** Asphalt 50mm Granular Base 425mm			1	SS	62			Approx. Sta. 1+330
	1	**SAND** Compact, fine sand, trace silt, brown, damp to moist		DRY	2	SS	25			Borehole open and dry on completion
306.55					3	SS	27			
	2	End of Borehole								
	3									
	4									
	5									

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Reference No : G3070-0-11

Borehole No : 11

Enclosure No : 12

Client : R J Burnside & Associates Ltd.

Project : Geotechnical Investigation (EA Study)

Location : The Gore Rd, Patterson Sdrd to Hiway 9

Datum Elevation : Geodetic

Method : Auger

Diameter : 110 mm

Date : April 21, 2011

Elevation m	Depth m	Description (SUBSURFACE PROFILE)	Symbol	Water	Number (SAMPLE)	Type	N-value	Standard Penetration Test blows/300mm (20 40 60 80)	Moisture Content, % (10 20 30 40 50)	Remarks
303.8	0	Ground Surface								
303.5		*PAVEMENT* Asphalt 50mm Granular Base 150mm			1	SS	65			Approx. Sta. 1+490
	1	*FILL* Silty sand, trace to some gravel, brown, dense			2	SS	48			Borehole open on completion
		organic odour, grey		▼	3	SS	37			
301.7	2	*SILT* Compact, brown, moist			4	SS	17			
300.9	3	*SANDY SILT TILL* Compact to dense, trace fine to medium gravel, brown then grey, moist			5	SS	43			
	4	brown / grey								
	5				6	SS	40			
	6				7	SS	29			
297.25		End of Borehole								
	7									

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Reference No : G3070-0-11

Borehole No : 12

Enclosure No : 13

Client : R J Burnside & Associates Ltd.

Project : Geotechnical Investigation (EA Study)

Location : The Gore Rd, Patterson Sdrd to Hiway 9

Datum Elevation : Geodetic

Method : Auger

Diameter : 110 mm

Date : April 29, 2011

Elevation m	Depth m	Description	Symbol	Water	Number	Type	N-value	Standard Penetration Test blows/300mm (20 40 60 80)	Moisture Content, % (10 20 30 40 50)	Remarks
307.6	0	Ground Surface								
307.12		*PAVEMENT* Asphalt 75mm Granular Base 400mm		DRY	1	SS	70			Approx. Sta. 1+680
305.65	1	*FILL* Sand and silty sand, trace gravel, organic stains, brown to greyish brown, moist, dense then compact			2	SS	47			Borehole open and dry on completion
					3	SS	17			
	2	End of Borehole								
	3									
	4									
	5									

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Reference No : G3070-0-11

Borehole No : 13

Enclosure No : 14

Client : R J Burnside & Associates Ltd.

Project : Geotechnical Investigation (EA Study)

Method : Auger

Location : The Gore Rd, Patterson Sdrd to Hiway 9

Diameter : 110 mm

Datum Elevation : Geodetic

Date : April 21, 2011

Elevation m	Depth m	Description	Water	Sample Number	Type	N-value	Standard Penetration Test blows/300mm (20 40 60 80)	Moisture Content, % (10 20 30 40 50)	Remarks
313.5	0	Ground Surface							
313.21		*PAVEMENT* Asphalt 65mm Granular Base 225mm	DRY	1	SS	50			Approx. Stn. 1+800
312.75		*FILL* Organic stained sand and silt, dense							Borehole open and dry on completion
	1	*SILT AND SAND* Dense, thinly bedded silt and fine sand, brown, moist		2	SS	41			
311.55				3	SS	47			
	2	End of Borehole							

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Reference No : G3070-0-11

Borehole No : 14

Enclosure No : 15

Client : R J Burnside & Associates Ltd.

Project : Geotechnical Investigation (EA Study)

Method : Auger

Location : The Gore Rd, Patterson Sdrd to Hiway 9

Diameter : 110 mm

Datum Elevation : Geodetic

Date : April 29, 2011

Elevation m	Depth m	Description (SUBSURFACE PROFILE)	Water	Sample Number	Sample Type	N-value	Remarks
320.6	0	Ground Surface					
320.35		*PAVEMENT* Asphalt 75mm Granular Base 175mm					Approx. Sta. 1+960
		SANDY SILT TILL Compact to dense, trace fine gravel, brown, moist	DRY	1	SS	38	Borehole open and dry on completion
	1			2	SS	20	
319.3		*SAND* Compact, well graded sand, some gravel, brown, damp to moist		3	SS	23	
318.65	2	End of Borehole					

Standard Penetration Test blows/300mm: 20 40 60 80

Moisture Content, %: 10 20 30 40 50

Depth scale: 0 1 2 3 4 5

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Reference No : G3070-0-11

Borehole No : 15

Enclosure No : 16

Client : R J Burnside & Associates Ltd.

Project : Geotechnical Investigation (EA Study)

Method : Auger

Location : The Gore Rd, Patterson Sdrd to Hiway 9

Diameter : 110 mm

Datum Elevation : Geodetic

Date : April 21, 2011

SUBSURFACE PROFILE					SAMPLE					
Elevation m	Depth m	Description	Symbol	Water	Number	Type	N-value	Standard Penetration Test blows/300mm 20 40 60 80	Moisture Content, % 10 20 30 40 50	Remarks
316.1	0	Ground Surface								
315.62		**PAVEMENT** Asphalt 75mm Granular Base 400mm		DRY	1	SS	50			Approx. Sta. 2+090
314.15	1	**FILL** Fine sand, trace gravel, dark brown, moist, compact to dense			2	SS	25			Borehole open and dry on completion
					3	SS	48			
	2	End of Borehole								
	3									
	4									
	5									

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Reference No : G3070-0-11

Borehole No : 16

Enclosure No : 17

Client : R J Burnside & Associates Ltd.

Project : Geotechnical Investigation (EA Study)

Method : Auger

Location : The Gore Rd, Patterson Sdrd to Hiway 9

Diameter : 110 mm

Datum Elevation : Geodetic

Date : April 29, 2011

Elevation m	Depth m	Description	Symbol	Water	Number	Type	N-value	Standard Penetration Test blows/300mm (20 40 60 80)	Moisture Content, % (10 20 30 40 50)	Remarks
309	0	Ground Surface								
308.77		**PAVEMENT** Asphalt 75mm Granular Base 150mm		DRY	1	SS	16			Approx. Sta. 2+310 Borehole open and dry on completion
	1	**FILL** Sand and sandy silt, trace gravel, organic stained, seam of topsoil at the bottom, moist, compact			2	SS	30			
					3	SS	11			
307	2	**SILT AND SAND** Dense, thinly bedded fine sand and silt, brown, wet			4	SS	35			
306.3		End of Borehole								
	3									
	4									
	5									

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Reference No : G3070-0-11

Borehole No : 17

Enclosure No : 18

Client : R J Burnside & Associates Ltd.

Project : Geotechnical Investigation (EA Study)

Method : Auger

Location : The Gore Rd, Patterson Sdrd to Hiway 9

Diameter : 110 mm

Datum Elevation : Geodetic

Date : April 21, 2011

SUBSURFACE PROFILE					SAMPLE					
Elevation m	Depth m	Description	Symbol	Water	Number	Type	N-value	Standard Penetration Test blows/300mm (20 40 60 80)	Moisture Content, % (10 20 30 40 50)	Remarks
311.3	0	Ground Surface								
311.01		**PAVEMENT** Asphalt 65mm Granular Base 225mm		DRY	1	SS	18			Approx. Sta. 2+530
310	1	**FILL** Organic stained sand and silt, thinly bedded, trace gravel, trace topsoil, dark gray, compact (Possible Alluvium)			2	SS	25			Borehole open and dry on completion
309.35		**SILT AND SAND** Compact, thinly bedded silt and fine sand, brown, iron oxide stained, moist			3	SS	24			
	2	End of Borehole								
	3									
	4									
	5									

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Reference No : G3070-0-11

Borehole No : 18

Enclosure No : 19

Client : R J Burnside & Associates Ltd.

Project : Geotechnical Investigation (EA Study)

Method : Auger

Location : The Gore Rd, Patterson Sdrd to Hiway 9

Diameter : 110 mm

Datum Elevation : Geodetic

Date : April 29, 2011

Elevation m	Depth m	Description (Subsurface Profile)	Symbol	Water	Sample Number	Type	N-value	Standard Penetration Test blows/300mm (20 40 60 80)	Moisture Content, % (10 20 30 40 50)	Remarks
308.9	0	Ground Surface								
308.66		**PAVEMENT** Asphalt 90mm Granular Base 150mm								Approx. Sta. 2+760
				DRY	1	SS	51			Borehole open and dry on completion
	1	**SAND AND SILT** Dense to very dense, thinly bedded fine sand and silt, brown, moist			2	SS	37			
306.95					3	SS	56			
	2	End of Borehole								
	3									
	4									
	5									

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Reference No : G3070-0-11

Borehole No : 19

Enclosure No : 20

Client : R J Burnside & Associates Ltd.

Project : Geotechnical Investigation (EA Study)

Method : Auger

Location : The Gore Rd, Patterson Sdrd to Hiway 9

Diameter : 110 mm

Datum Elevation : Geodetic

Date : May 25, 2011

Elevation m	Depth m	Subsurface Profile: Description	Sample Number	Type	N-value	Remarks
302.2	0	Ground Surface				
	0–0.2	***PAVEMENT*** Asphalt 75mm, Granular Base 150mm	1	SS	50	Approx. Sta. 2+870
		FILL Fine sand, trace silt, trace gravel, trace organics, brown, moist, compact to dense, loose at the bottom	2	SS	26	
			3	SS	13	
			4	SS	30	
			5	SS	10	
			6	SS	6	auger sample
296.7		***SAND AND GRAVEL*** Very dense, well graded sand and fine to medium gravel, grey, wet	7	AS	83	auger sample
295.5		***SILTY SAND*** Dense to very dense, with possible very loose seams, very fine sand with silt, mixed brown and grey, wet				cave in at 6.9m
			8	SS	39	
			9	AS	1	hammer weight loose sand likely due to boiling
			10	SS	98	
291.1	11	End of Borehole				

Standard Penetration Test blows/300mm: 20 40 60 80

Moisture Content, %: 10 20 30 40 50

V.A. WOOD ASSOCIATES LIMITED

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Reference No : G3070-0-11

Borehole No : 20

Enclosure No : 21

Client : R J Burnside & Associates Ltd.

Project : Geotechnical Investigation (EA Study)

Location : The Gore Rd, Patterson Sdrd to Hiway 9

Datum Elevation : Geodetic

Method : Auger

Diameter : 110 mm

Date : April 29, 2011

Elevation m	Depth m	Description (SUBSURFACE PROFILE)	Water	Number (SAMPLE)	Type	N-value	Remarks
308.5	0	Ground Surface					
308.27		**PAVEMENT** Asphalt 60mm Granular Base 300mm		1	SS	58	Approx. Sta. 3+100
307	1	**SAND** Compact to dense, fine sand, brown to dark brown, moist (Possible Fill)	DRY	2	SS	20	Borehole open and dry on completion
306.5		**TOPSOIL** Mixed topsoil and black fine sand, very loose		3	SS	4	
305.6	2	**SILTY SAND** Loose, saturated		4	SS	7	
305	3	**SAND** Compact, fine to medium sand with subrounded gravel, brown, wet		5	SS	22	
		End of Borehole					

Standard Penetration Test blows/300mm: 20 40 60 80

Moisture Content, %: 10 20 30 40 50

Depth scale: 0, 1, 2, 3, 4, 5

Reference No : G3070-0-11

Borehole No : 21

Enclosure No : 22

Client : R J Burnside & Associates Ltd.

Project : Geotechnical Investigation (EA Study)

Method : Auger

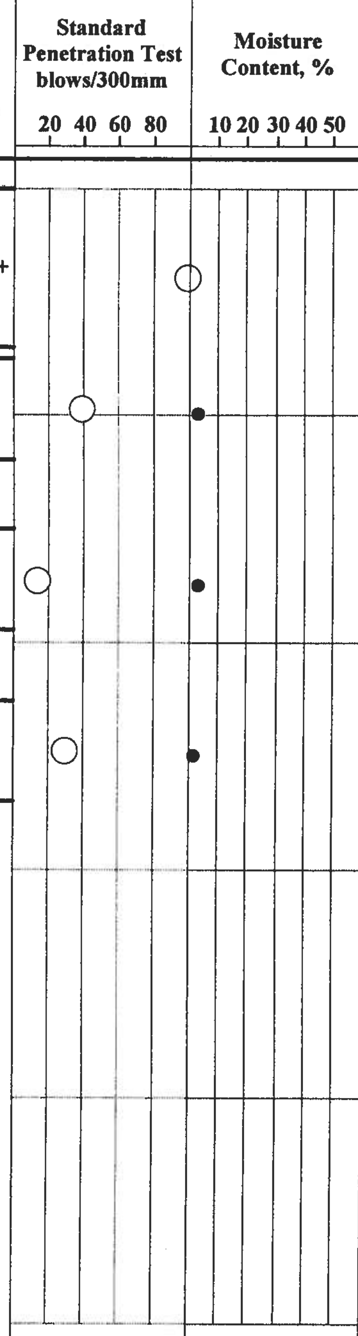
Location : The Gore Rd, Patterson Sdrd to Hiway 9

Diameter : 110 mm

Datum Elevation : Geodetic

Date : April 29, 2011

Elevation m	Depth m	Description	Symbol	Water	Number	Type	N-value	Remarks
305.1	0	Ground Surface						
304.75		**PAVEMENT** Asphalt 50mm Granular Base 300mm			1	SS	100+	Approx. Sta. 3+250
	1	**SAND** Compact to dense, fine to medium sand, brown, damp		DRY	2	SS	40	Borehole open and dry on completion
					3	SS	14	
302.4	2				4	SS	30	
	3	End of Borehole						



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Reference No : G3070-0-11

Borehole No : 22

Enclosure No : 23

Client : R J Burnside & Associates Ltd.

Project : Geotechnical Investigation (EA Study)

Method : Auger

Location : The Gore Rd, Patterson Sdrd to Hiway 9

Diameter : 110 mm

Datum Elevation : Geodetic

Date : April 25, 2011

SUBSURFACE PROFILE					SAMPLE			Standard Penetration Test blows/300mm (20 40 60 80)	Moisture Content, % (10 20 30 40 50)	Remarks
Elevation m	Depth m	Description	Symbol	Water	Number	Type	N-value			
314.4	0	Ground Surface								
314.02		***PAVEMENT*** Asphalt 75mm Granular Base 300mm		DRY	1	SS	56			Approx. Sta. 3+380 Borehole open and dry on completion
313	1	***FILL*** Fine to medium sand, brown, moist, compact to dense			2	SS	20			
312.45		***SAND*** Compact, with thin seams of peat, moist			3	SS	17			
	2	End of Borehole								

Depth scale: 0, 1, 2, 3, 4, 5

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Reference No : G3070-0-11

Borehole No : 23

Enclosure No : 24

Client : R J Burnside & Associates Ltd.

Project : Geotechnical Investigation (EA Study)

Method : Auger

Location : The Gore Rd, Patterson Sdrd to Hiway 9

Diameter : 110 mm

Datum Elevation : Geodetic

Date : April 28, 2011

SUBSURFACE PROFILE					SAMPLE			Standard Penetration Test blows/300mm (20 40 60 80)	Moisture Content, % (10 20 30 40 50)	Remarks
Elevation m	Depth m	Description	Symbol	Water	Number	Type	N-value			
316.3	0	Ground Surface								
315.85		**PAVEMENT** Asphalt 180mm Granular Base 275mm			1	SS	32			Approx. Sta. 3+480
315.3	1	**FILL** Sand, trace gravel, brown, moist, dense		DRY	2	SS	39			borehole open and dry on completion
314.35	2	**SILT** Compact, some seams of sand, greyish brown, moist			3	SS	15			
		End of Borehole								

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Reference No : G3070-0-11

Borehole No : 24

Enclosure No : 25

Client : R J Burnside & Associates Ltd.

Project : Geotechnical Investigation (EA Study)

Location : The Gore Rd, Patterson Sdrd to Hiway 9

Datum Elevation : Geodetic

Method : Auger

Diameter : 110 mm

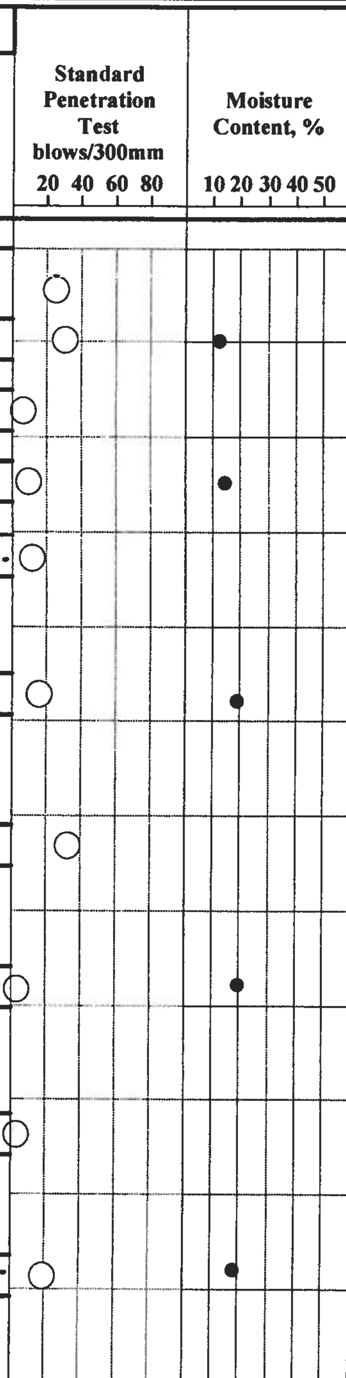
Date : May 30, 2011

SUBSURFACE PROFILE

Elevation m	Depth m	Description	Remarks
323.5	0	Ground Surface	
		PAVEMENT Asphalt 75mm Granular Base 200mm	Approx. Sta. 3+560
322.1	1	**FILL** Compact to dense fine sand, brown, moist	
	2–3	**FILL** Loose to compact, sandy silt/silty sand, brown, moist to wet	
319.2	4		
318.8		**PEAT** Loose peat, some sand	
	5–9	**SILTY SAND** Compact to dense, occasional gravel, grey, wet (low blow counts likely due to boiling of sand)	cave in at 6.7m
313.5	10	**SANDY SILT TILL** Compact, trace gravel, grey, wet	
312.4	11	End of Borehole	
	12		

SAMPLE

Number	Type	N-value
1	SS	26
2	SS	31
3	SS	7
4	AS	10
5	SS	12
6	SS	16
7	SS	33
8	SS	4
9	SS	4
10	SS	19



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Reference No : G3070-0-11

Borehole No : 25

Enclosure No : 26

Client : R J Burnside & Associates Ltd.

Project : Geotechnical Investigation (EA Study)

Method : Auger

Location : The Gore Rd, Patterson Sdrd to Hiway 9

Diameter : 110 mm

Datum Elevation : Geodetic

Date : April 25, 2011

SUBSURFACE PROFILE					SAMPLE			Standard Penetration Test blows/300mm (20 40 60 80)	Moisture Content, % (10 20 30 40 50)	Remarks
Elevation m	Depth m	Description	Symbol	Water	Number	Type	N-value			
325.7	0	Ground Surface								
325.22		**PAVEMENT** Asphalt 75mm Granular Base 400mm		DRY	1	SS	34			Approx. Sta. 3+760
323.75	1	**SILTY SAND** Compact, fine sand with silt, brown, moist			2	SS	29			Borehole open and dry on completion
					3	SS	30			
	2	End of Borehole								
	3									
	4									
	5									

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Reference No : G3070-0-11

Borehole No : 26

Enclosure No : 27

Client : R J Burnside & Associates Ltd.

Project : Geotechnical Investigation (EA Study)

Method : Auger

Location : The Gore Rd, Patterson Sdrd to Hiway 9

Diameter : 110 mm

Datum Elevation : Geodetic

Date : April 28, 2011

Elevation m	Depth m	Description	Symbol	Water	Number	Type	N-value	Standard Penetration Test blows/300mm (20 40 60 80)	Moisture Content, % (10 20 30 40 50)	Remarks
323.7	0	Ground Surface								
323.25		**PAVEMENT** Asphalt 150mm Granular Base 300mm			1	SS	100+			Approx. Sta. 3+900
	1	**SILT AND SAND** Compact to dense, bedded silt and fine sand, brown, moist		DRY	2	SS	28			borehole open and dry on completion
321.75					3	SS	36			
	2	End of Borehole								

SUBSURFACE PROFILE / SAMPLE

Depth scale: 0, 1, 2, 3, 4, 5

Borehole No : 27

Reference No : G3070-0-11

Enclosure No : 28

Client : R J Burnside & Associates Ltd.

Project : Geotechnical Investigation (EA Study)

Method : Auger

Location : The Gore Rd, Patterson Sdrd to Hiway 9

Diameter : 110 mm

Datum Elevation : Geodetic

Date : May 27, 2011

Elevation m	Depth m	Description (SUBSURFACE PROFILE)	Number (SAMPLE)	Type	N-value	Remarks
322.5	0	Ground Surface				
		PAVEMENT Asphalt 75mm Granular Base 150mm	1	SS	42	Approx. Sta. 4+030
	1	FILL Dense then compact to loose, fine sand, trace silt and gravel, brown, moist	2	SS	14	
			3	SS	7	
320.4	2	PEAT Mixed peat, topsoil, sand and silt, dark grey to black, loose	4	SS	8	
319.6	3	SILT Compact to dense, some seams of fine sand, brown then grey, wet	5	SS	21	
	4					cave in at 4m
			6	AS	50	auger sample
	5	brown / grey				
	6		7	SS	49	
	7		8	SS	45	
314.45	8	End of Borehole				
	9					

Standard Penetration Test blows/300mm: 20 40 60 80

Moisture Content, %: 10 20 30 40 50

V.A. WOOD ASSOCIATES LIMITED

Disk :

Sheet : 1 of 1

Reference No : G3070-0-11

Borehole No : 28

Enclosure No : 29

Client : R J Burnside & Associates Ltd.

Project : Geotechnical Investigation (EA Study)

Method : Auger

Location : The Gore Rd, Patterson Sdrd to Hiway 9

Diameter : 110 mm

Datum Elevation : Geodetic

Date : April 28, 2011

Elevation m	Depth m	Description (SUBSURFACE PROFILE)	Water	Sample Number	Type	N-value	Standard Penetration Test blows/300mm (20 40 60 80)	Moisture Content, % (10 20 30 40 50)	Remarks
324.3	0	Ground Surface							
		PAVEMENT Asphalt 175mm Granular Base 250mm							Approx. Sta. 4+140
323.88		*FILL* Sandy silt and sand, trace to some gravel, mostly sand at the bottom, brown, moist, compact to dense	DRY	1	SS	43			Borehole open and dry on completion
	1			2	SS	28			
	2			3	SS	30			
				4	SS	47			
321.3	3	*TOPSOIL*							
321.1		*SILT* Compact, occasional seams of fine sand, brown, moist		5	SS	13			
320.8		End of Borehole							
	4								
	5								

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Disk :

Sheet : 1 of 1

Reference No : G3070-0-11

Borehole No : 29

Enclosure No : 30

Client : R J Burnside & Associates Ltd.

Project : Geotechnical Investigation (EA Study)

Method : Auger

Location : The Gore Rd, Patterson Sdrd to Hiway 9

Diameter : 110 mm

Datum Elevation : Geodetic

Date : April 25, 2011

Elevation m	Depth m	Description (SUBSURFACE PROFILE)	Symbol	Water	Number (SAMPLE)	Type	N-value	Standard Penetration Test blows/300mm (20 40 60 80)	Moisture Content, % (10 20 30 40 50)	Remarks
333.2	0	Ground Surface								
332.85		**PAVEMENT** Asphalt 50mm Granular Base 300mm		DRY	1	SS	12			Approx. Sta. 4+270
331.1	2	**SILTY SAND** Compact then very loose, fine sand with silt, reddish brown, moist			2	SS	1			Borehole open and dry on completion
					3	SS	3			
330.5		**SAND AND SILT** Dense, fine sand with seams of silt, brown, moist			4	SS	41			
		End of Borehole								

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Disk :

Sheet : 1 of 1

Reference No : G3070-0-11

Borehole No : 30

Enclosure No : 31

Client : R J Burnside & Associates Ltd.

Project : Geotechnical Investigation (EA Study)

Method : Auger

Location : The Gore Rd, Patterson Sdrd to Hiway 9

Diameter : 110 mm

Datum Elevation : Geodetic

Date : April 28, 2011

SUBSURFACE PROFILE					SAMPLE			Standard Penetration Test blows/300mm (20 40 60 80)	Moisture Content, % (10 20 30 40 50)	Remarks
Elevation m	Depth m	Description	Symbol	Water	Number	Type	N-value			
333.5	0	Ground Surface								
333.14		**PAVEMENT** Asphalt 140mm Granular Base 225mm		DRY	1	SS	27			Approx. Sta. 4+460
332.2	1	**FILL** Fine sand then silty sand, trace gravel, organic stains at the bottom, brown, moist, compact			2	SS	13			borehole open and dry on completion
331.55		**SILTY SAND** Loose, fine sand with silt, brown, wet			3	SS	8			
	2	End of Borehole								

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Disk :

Sheet : 1 of 1

Reference No : G3070-0-11

Borehole No : 31

Enclosure No : 32

Client : R J Burnside & Associates Ltd.

Project : Geotechnical Investigation (EA Study)

Method : Auger

Location : The Gore Rd, Patterson Sdrd to Hiway 9

Diameter : 110 mm

Datum Elevation : Geodetic

Date : April 25, 2011

Elevation m	Depth m	Description (SUBSURFACE PROFILE)	Water	Number (SAMPLE)	Type	N-value	Standard Penetration Test blows/300mm (20 40 60 80)	Moisture Content, % (10 20 30 40 50)	Remarks
322.3	0	Ground Surface							
321.89		***PAVEMENT*** Asphalt 60mm Granular Base 350mm		1	SS	41			Approx. Sta. 4+650
	1	***FILL*** Silty sand, brown, moist, dense then loose		2	SS	36			Borehole open on completion
320.2	2	trace gravel, organics		3	SS	8			
		SAND AND PEAT	▼	4	SS	4			
318.3	3–4	Loose, layered sand and peat, grey, wet		5	SS	6			
316.8	5	***SAND*** Compact, well graded sand, trace fine gravel, organic odour, grey, wet (possible alluvial sand)		6	SS	24			
315.75	6	***SAND AND SILT*** Compact, thinly bedded fine sand and silt, grey, wet		7	SS	17			
	7	End of Borehole							

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Disk :

Sheet : 1 of 1

Reference No : G3070-0-11

Borehole No : 32

Enclosure No : 33

Client : R J Burnside & Associates Ltd.

Project : Geotechnical Investigation (EA Study)

Method : Auger

Location : The Gore Rd, Patterson Sdrd to Hiway 9

Diameter : 110 mm

Datum Elevation : Geodetic

Date : April 28, 2011

SUBSURFACE PROFILE					SAMPLE			Standard Penetration Test blows/300mm (20 40 60 80)	Moisture Content, % (10 20 30 40 50)	Remarks
Elevation m	Depth m	Description	Symbol	Water	Number	Type	N-value			
325.7	0	Ground Surface								
325.28		**PAVEMENT** Asphalt 150mm Granular Base 225mm			1	SS	30			Approx. Sta. 4+800
324.2	1	**FILL** Silty sand, trace gravel, occasional organic stains, brown to greyish brown, moist, compact			2	SS	17			
323.7	2	**TOPSOIL** Topsoil and black silty sand, compact		▼	3	SS	13			cave in at 2m
323		**SILT** Compact, trace gravel, greenish brown, moist			4	SS	35			
	3, 4, 5	End of Borehole								

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Disk :

Sheet : 1 of 1

Reference No : G3070-0-11

Borehole No : 33

Enclosure No : 34

Client : R J Burnside & Associates Ltd.

Project : Geotechnical Investigation (EA Study)

Method : Auger

Location : The Gore Rd, Patterson Sdrd to Hiway 9

Diameter : 110 mm

Datum Elevation : Geodetic

Date : April 25, 2011

Elevation m	Depth m	Description	Water	Sample Number	Type	N-value	Remarks
326.3	0	Ground Surface					
325.89		**PAVEMENT** Asphalt 60mm Granular Base 350mm	DRY	1	SS	57	Approx. Sta. 4+900
325.55		**FILL** Sandy silt, trace gravel, dense					Borehole open and dry on completion
324.35	1	**SAND AND SILT** Compact, thinly bedded fine sand and silt, brown, moist		2	SS	21	
				3	SS	25	
	2	End of Borehole					

Standard Penetration Test blows/300mm: 20 40 60 80

Moisture Content, %: 10 20 30 40 50

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Disk :

Sheet : 1 of 1

Reference No : G3070-0-11

Borehole No : 34

Enclosure No : 35

Client : R J Burnside & Associates Ltd.

Project : Geotechnical Investigation (EA Study)

Method : Auger

Location : The Gore Rd, Patterson Sdrd to Hiway 9

Diameter : 110 mm

Datum Elevation : Geodetic

Date : April 28, 2011

Elevation m	Depth m	Description (SUBSURFACE PROFILE)	Symbol	Water	Number (SAMPLE)	Type	N-value	Standard Penetration Test blows/300mm (20 40 60 80)	Moisture Content, % (10 20 30 40 50)	Remarks
323.5	0	Ground Surface								
323.1		*PAVEMENT* Asphalt 150mm Granular Base 250mm			1	SS	15			Approx. Sta. 5+130 cave in at 0.5m
	1	*FILL* Fine to medium sand, brown to reddish brown, wet, compact (samples appear to be mostly wash samples)			2	SS	19			
					3	SS	18			
	2				4	SS	14			
	3				5	SS	12			
	4				6	SS	26			
	6				7	SS	26			
316.95		End of Borehole								
	7									

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Disk :

Sheet : 1 of 1

Reference No : G3070-0-11

Borehole No : 35

Enclosure No : 36

Client : R J Burnside & Associates Ltd.

Project : Geotechnical Investigation (EA Study)

Method : Auger

Location : The Gore Rd, Patterson Sdrd to Hiway 9

Diameter : 110 mm

Datum Elevation : Geodetic

Date : April 25, 2011

Elevation m	Depth m	Description (SUBSURFACE PROFILE)	Symbol	Water	Number (SAMPLE)	Type	N-value	Standard Penetration Test blows/300mm	Moisture Content, %	Remarks
323.7	0	Ground Surface								
323.24		**PAVEMENT** Asphalt 60mm Granular Base 400mm			1	SS	50			Approx. Sta. 5+110 Borehole open on completion
322.3	1	**FILL** Silty sand, mixed brown and grey, wet, compact to dense, wet			2	SS	15			
321.6	2	**FILL** Mixed silt, sand and gravel, generally organic stained, compact to dense, moist			3	SS	45			
		seams of peat noted		▼	4	SS	19			
	3	**SAND** Compact, fine to medium sand, brown to grey wet (wash samples)			5	SS	11			
318.7	4				6	SS	22			
	5	End of Borehole								
	6									
	7									

Standard Penetration Test scale: 20 40 60 80

Moisture Content scale: 10 20 30 40 50

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Disk :

Sheet : 1 of 1

Reference No : G3070-0-11

Borehole No : 36

Enclosure No : 37

Client : R J Burnside & Associates Ltd.

Project : Geotechnical Investigation (EA Study)

Method : Auger

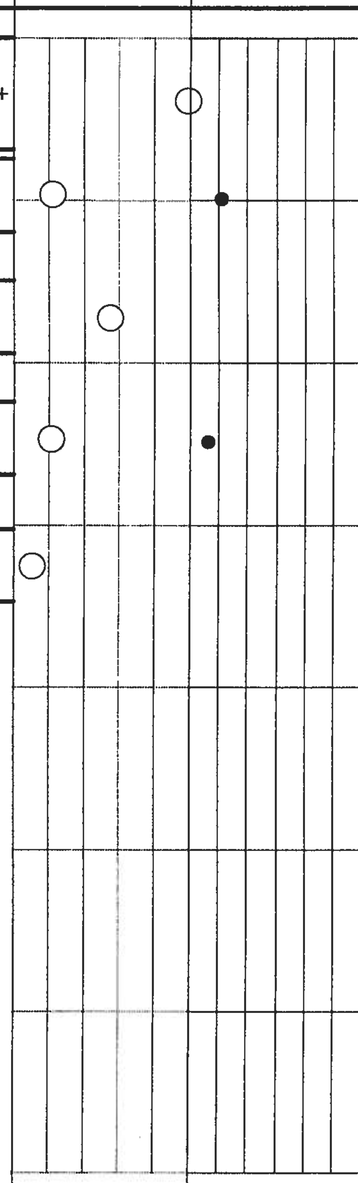
Location : The Gore Rd, Patterson Sdrd to Hiway 9

Diameter : 110 mm

Datum Elevation : Geodetic

Date : April 27, 2011

SUBSURFACE PROFILE					SAMPLE					
Elevation m	Depth m	Description	Symbol	Water	Number	Type	N-value	Standard Penetration Test blows/300mm 20 40 60 80	Moisture Content, % 10 20 30 40 50	Remarks
330.2	0	Ground Surface								
329.75		**PAVEMENT** Asphalt 150mm Granular Base 300mm			1	SS	100+			Approx. Sta. 5+320
329.5		**FILL** Fine sand, trace organic stains, dense, moist			2	SS	23			Borehole open and dry on completion
	1	**SAND** Compact to very dense, fine to medium sand, thin seams of silt at the top, brown to reddish brown then brownish grey, moist		DRY	3	SS	55			
	2				4	SS	22			
	3	reddish brown / brownish grey			5	SS	11			
326.7		End of Borehole								
	4									
	5									
	6									
	7									



Reference No : G3070-0-11

Borehole No : 37

Enclosure No : 38

Client : R J Burnside & Associates Ltd.

Project : Geotechnical Investigation (EA Study)

Location : The Gore Rd, Patterson Sdrd to Hiway 9

Datum Elevation : Geodetic

Method : Auger

Diameter : 110 mm

Date : April 27, 2011

Elevation m	Depth m	Description	Water	Sample Number	Type	N-value	Remarks
336.2	0	Ground Surface					
335.75		**PAVEMENT** Asphalt 150mm, Granular Base 300mm		1	SS	24	Approx. Sta. 5+420
335.45		**FILL** Silty sand, trace gravel, greyish brown, moist, compact	DRY				Borehole open and dry on completion
	1	**SILTY SAND** Compact, some seams of silt, greyish brown, moist		2	SS	19	
334.25				3	SS	15	
	2	End of Borehole					

Standard Penetration Test blows/300mm: 20 40 60 80

Moisture Content, %: 10 20 30 40 50

V.A. WOOD ASSOCIATES LIMITED

Disk :

Sheet : 1 of 1

Reference No : G3070-0-11

Borehole No : 38

Enclosure No : 39

Client : R J Burnside & Associates Ltd.

Project : Geotechnical Investigation (EA Study)

Method : Auger

Location : The Gore Rd, Patterson Sdrd to Hiway 9

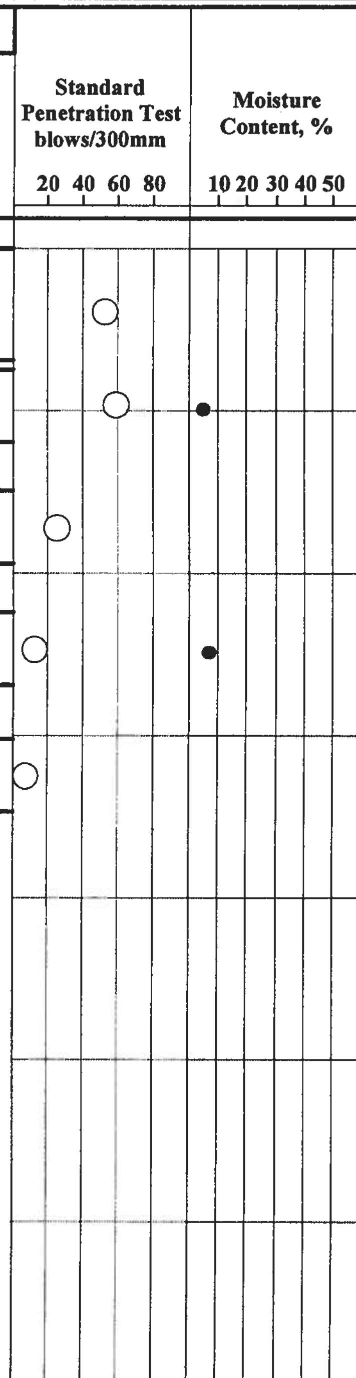
Diameter : 110 mm

Datum Elevation : Geodetic

Date : April 27, 2011

Elevation m	Description (SUBSURFACE PROFILE)	Water
334	Ground Surface	
333.7	*PAVEMENT* Asphalt 100mm Granular Base 200mm	
331.9	*FILL* Fine to medium sand, brown, compact to very dense, moist	DRY
330.5	*FILL* Silty sand, trace gravel, occasional organic stains, greyish brown, compact then loose, moist	
	End of Borehole	

SAMPLE Number	Type	N-value
1	SS	53
2	SS	60
3	SS	26
4	SS	13
5	SS	8



Depth m: 0, 1, 2, 3, 4, 5, 6, 7

Remarks:

Approx. Sta. 5+830

Borehole open and dry on completion

V.A. WOOD ASSOCIATES LIMITED

Disk :

Sheet : 1 of 1

Reference No : G3070-0-11

Borehole No : 39

Enclosure No : 40

Client : R J Burnside & Associates Ltd.

Project : Geotechnical Investigation (EA Study)

Method : Auger

Location : The Gore Rd, Patterson Sdrd to Hiway 9

Diameter : 110 mm

Datum Elevation : Geodetic

Date : April 27, 2011

Elevation m	Depth m	Description (SUBSURFACE PROFILE)	Water	Sample Number	Type	N-value	Remarks
325.4	0	Ground Surface					
325.02		**PAVEMENT** Asphalt 150mm Granular Base 225mm		1	SS	100+	Approx. Sta. 6+090
324.3	1	**FILL** Gravelly sand, brown, moist, dense		2	SS	36	Borehole open and dry on completion
321.4	4	**FILL** Silty sand, trace gravel, occasional organic stains, brown to greyish brown, compact, moist	DRY	3	SS	18	
				4	SS	17	
				5	SS	25	
319.9		**SAND** Compact, fine sand, brown, moist		6	SS	10	
318.85		**SAND AND SILT** Dense, bedded sand and silt, brownish grey, moist		7	SS	35	
	7	End of Borehole					

Standard Penetration Test blows/300mm: 20 40 60 80

Moisture Content, %: 10 20 30 40 50

V.A. WOOD ASSOCIATES LIMITED

Disk :

Sheet : 1 of 1

Reference No : G3070-0-11

Borehole No : 40

Enclosure No : 41

Client : R J Burnside & Associates Ltd.

Project : Geotechnical Investigation (EA Study)

Method : Auger

Location : The Gore Rd, Patterson Sdrd to Hiway 9

Diameter : 110 mm

Datum Elevation : Geodetic

Date : April 27, 2011

Elevation m	Depth m	Description (SUBSURFACE PROFILE)	Water	Sample Number	Type	N-value	Standard Penetration Test blows/300mm (20 40 60 80)	Moisture Content, % (10 20 30 40 50)	Remarks
323.9	0	Ground Surface							
323.6		**PAVEMENT** Asphalt 125mm Granular Base 175mm	DRY	1	SS	41			Approx. Sta. 6+220
323.15		**FILL** Silty sand, trace gravel, greyish brown, moist, dense							Borehole open and dry on completion
	1	**SILT** Stiff to very stiff, with occasional seams of fine sand and clay, brown, moist		2	SS	22			
321.95				3	SS	11			
	2	End of Borehole							

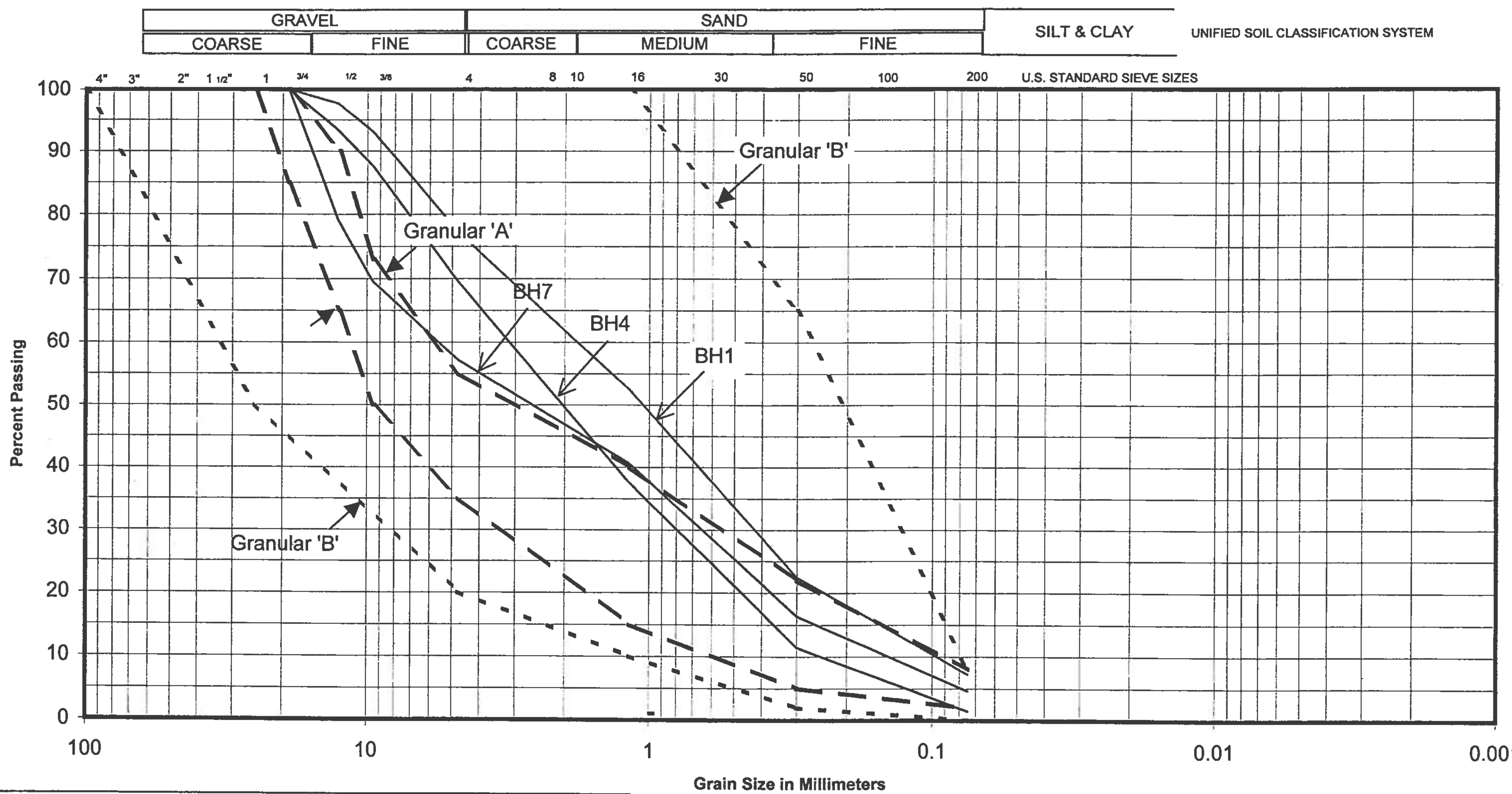
V.A. WOOD ASSOCIATES LIMITED

Disk :

Sheet : 1 of 1

GRAIN SIZE DISTRIBUTION

OUR REFERENCE No.: G3070-0-11



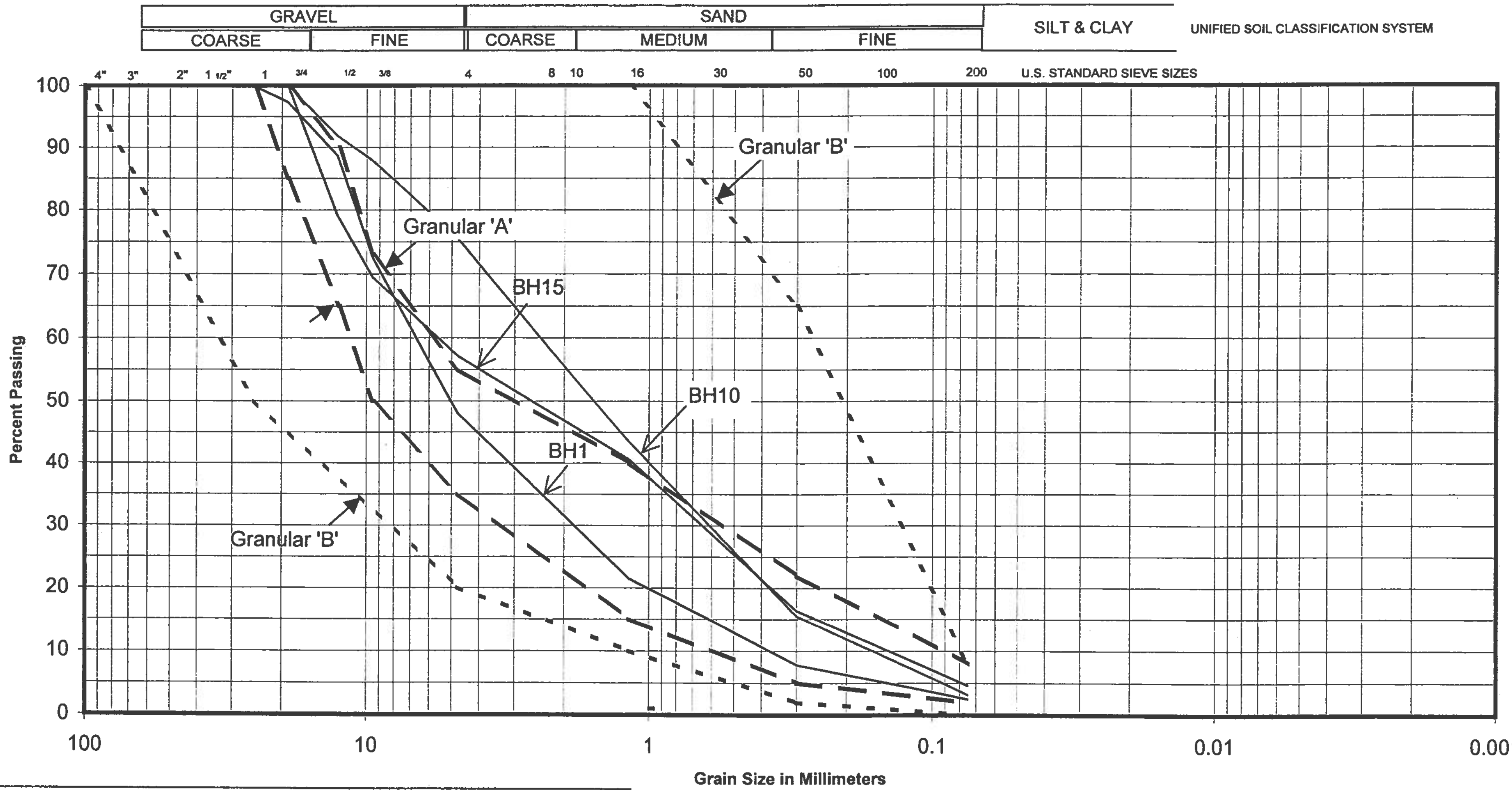
PROJECT: Geotechnical Investigation (EA Study for The Gore Road)
LOCATION: Patterson Sideroad to Highway 9, Caledon, ON
BOREHOLE NO.: BH1, BH4 and BH7
SAMPLE NO.: Existing Granular Base
DEPTH:
DATE: May 2011

EXISTING GRANULAR BASE

ENCLOSURE No.: 42

GRAIN SIZE DISTRIBUTION

OUR REFERENCE No.: G3070-0-11



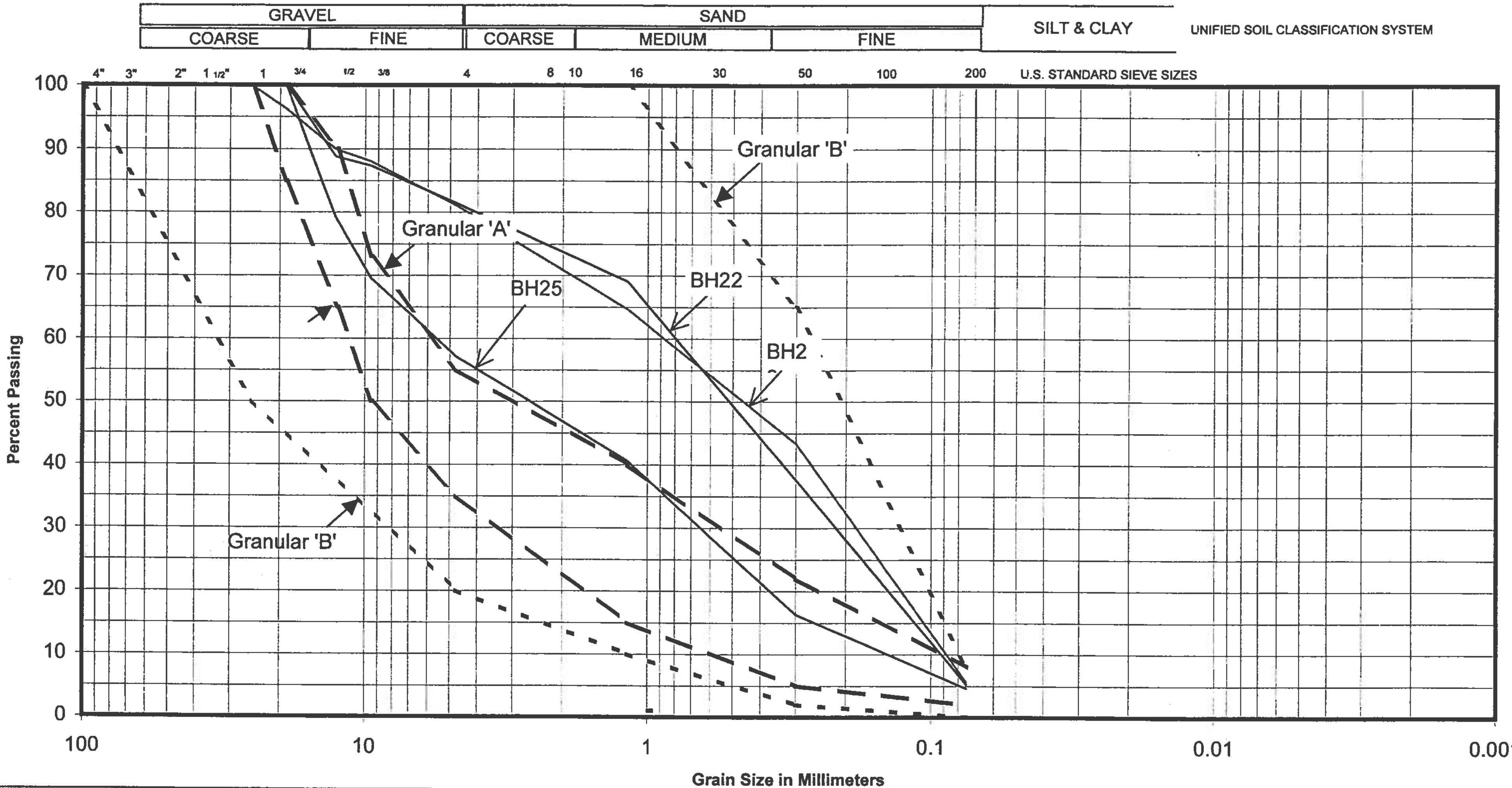
PROJECT: Geotechnical Investigation (EA Study for The Gore Road)
LOCATION: Patterson Sideroad to Highway 9, Caledon, ON
BOREHOLE NO.: BH10, BH13 and BH15
SAMPLE NO.: Existing Granular Base
DEPTH:
DATE: May 2011

EXISTING GRANULAR BASE

ENCLOSURE No.: 43

GRAIN SIZE DISTRIBUTION

OUR REFERENCE No.: G3070-0-11



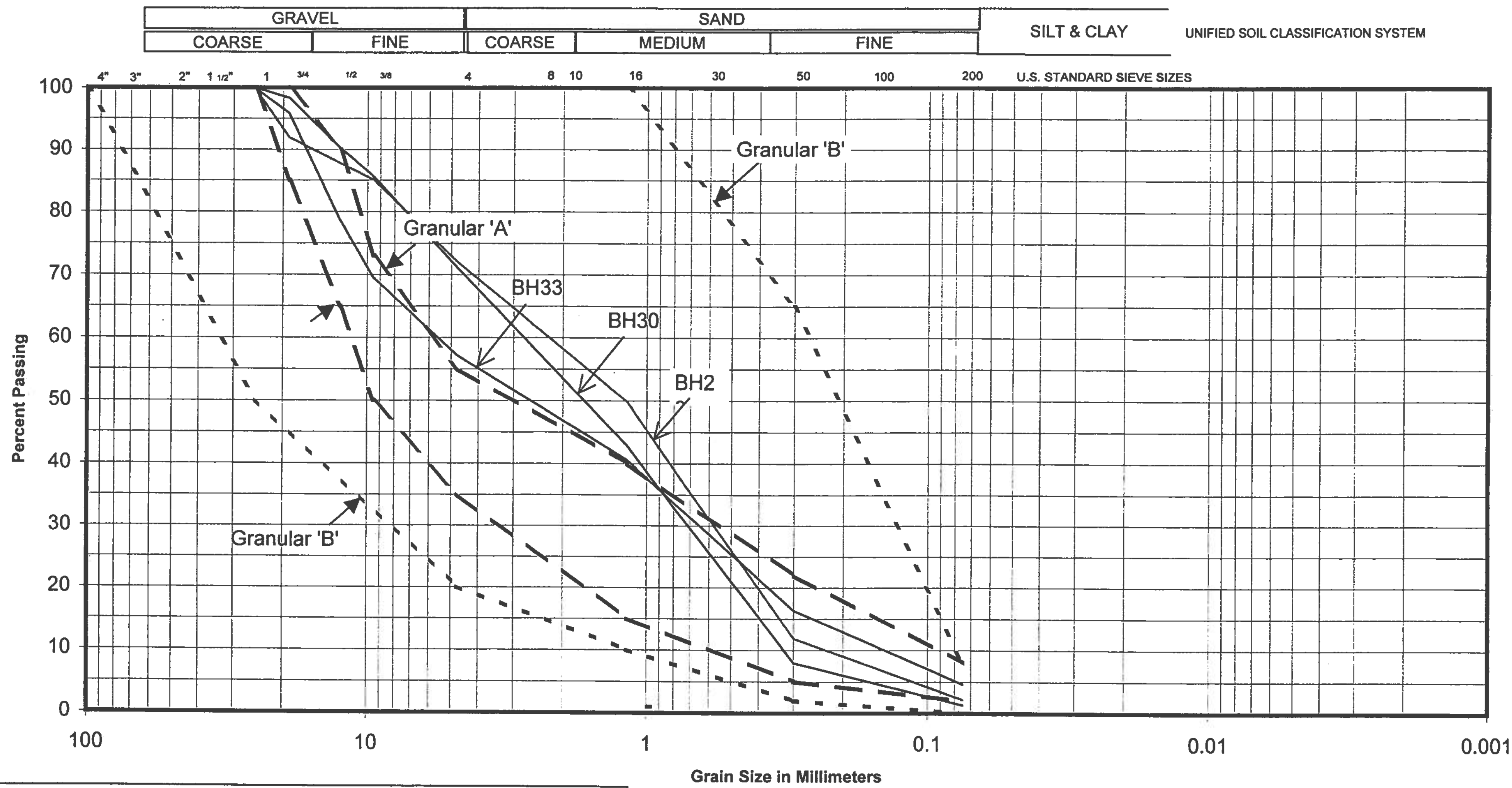
PROJECT: Geotechnical Investigation (EA Study for The Gore Road)
LOCATION: Patterson Sideroad to Highway 9, Caledon, ON
BOREHOLE NO.: BH20, BH22 and BH25
SAMPLE NO.: Existing Granular Base
DEPTH:
DATE: May 2011

EXISTING GRANULAR BASE

ENCLOSURE No.: 44

GRAIN SIZE DISTRIBUTION

OUR REFERENCE No.: G3070-0-11



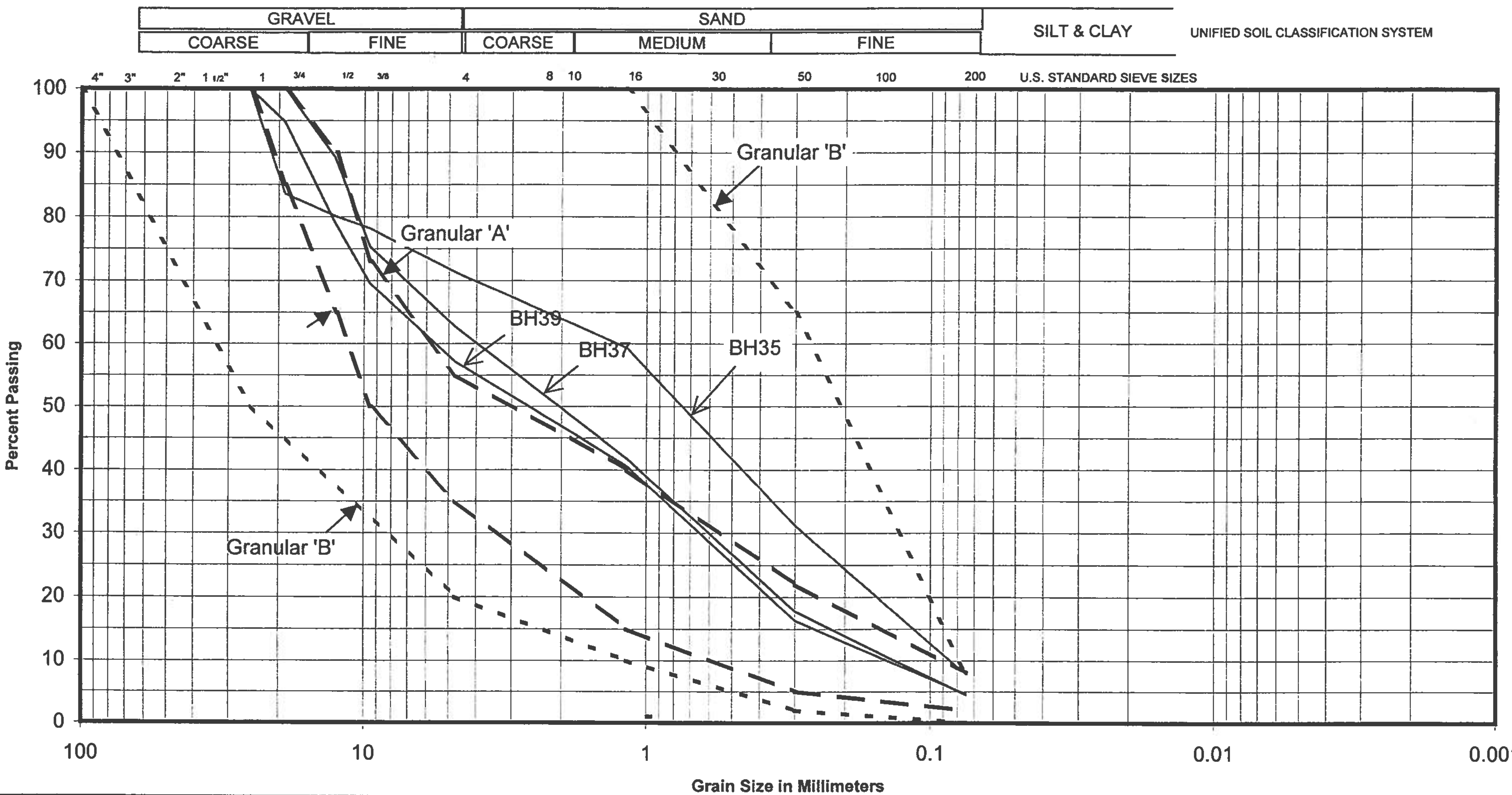
PROJECT: Geotechnical Investigation (EA Study for The Gore Road)
LOCATION: Patterson Sideroad to Highway 9, Caledon, ON
BOREHOLE NO.: BH27, BH29 and BH33
SAMPLE NO.: Existing Granular Base
DEPTH:
DATE: May 2011

ENCLOSURE No.: 45

EXISTING GRANULAR BASE

GRAIN SIZE DISTRIBUTION

OUR REFERENCE No.: G3070-0-11



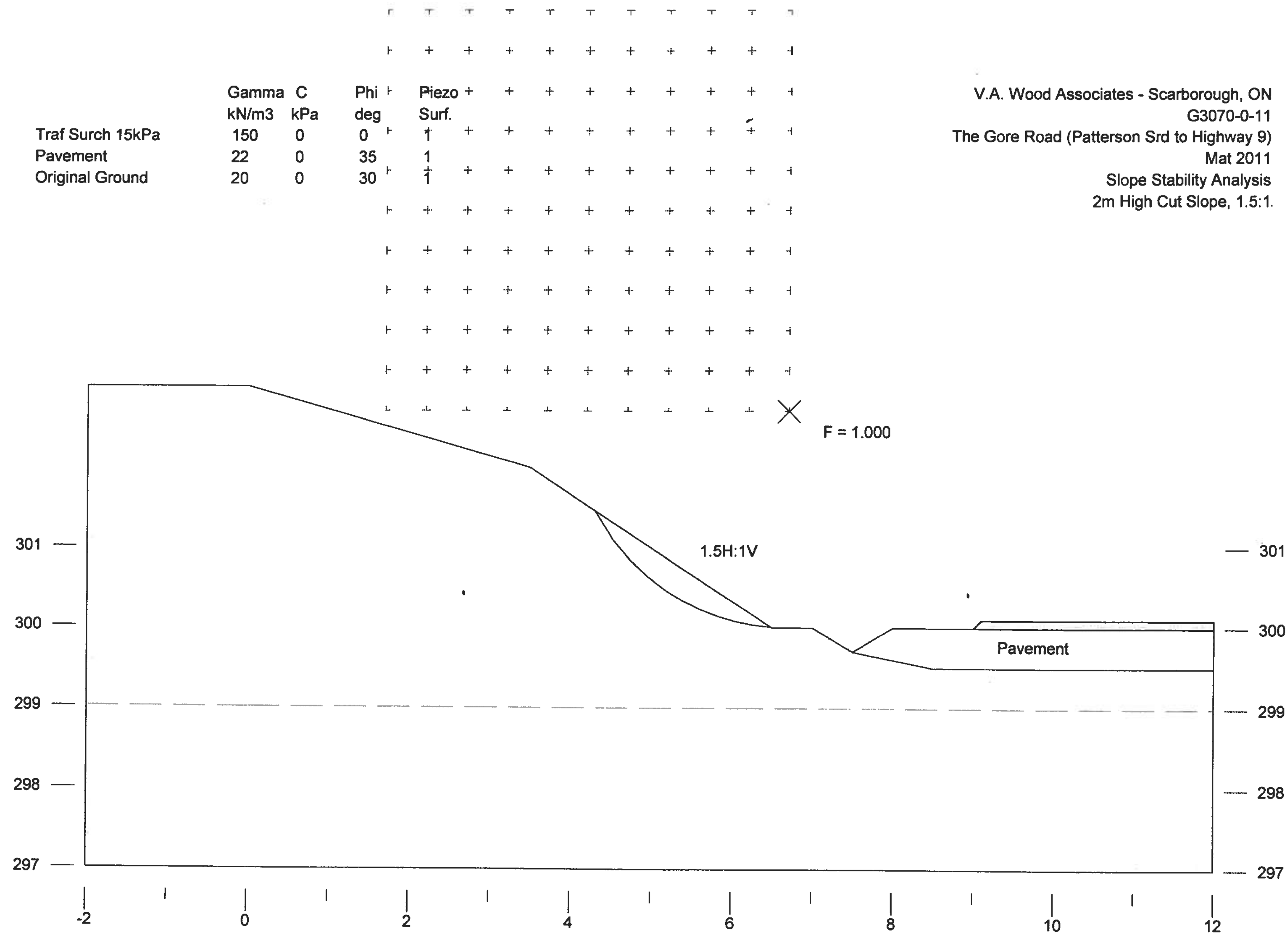
PROJECT: Geotechnical Investigation (EA Study for The Gore Road)
LOCATION: Patterson Sideroad to Highway 9, Caledon, ON
BOREHOLE NO.: BH35, BH37 and BH39
SAMPLE NO.: Existing Granular Base
DEPTH:
DATE: May 2011

EXISTING GRANULAR BASE

ENCLOSURE No.: 46

V.A. Wood Associates - Scarborough, ON
G3070-0-11
The Gore Road (Patterson Srd to Highway 9)
Mat 2011
Slope Stability Analysis
2m High Cut Slope, 1.5:1.

	Gamma kN/m3	C kPa	Phi deg	Piezo Surf.
Traf Surch 15kPa	150	0	0	1
Pavement	22	0	35	1
Original Ground	20	0	30	1



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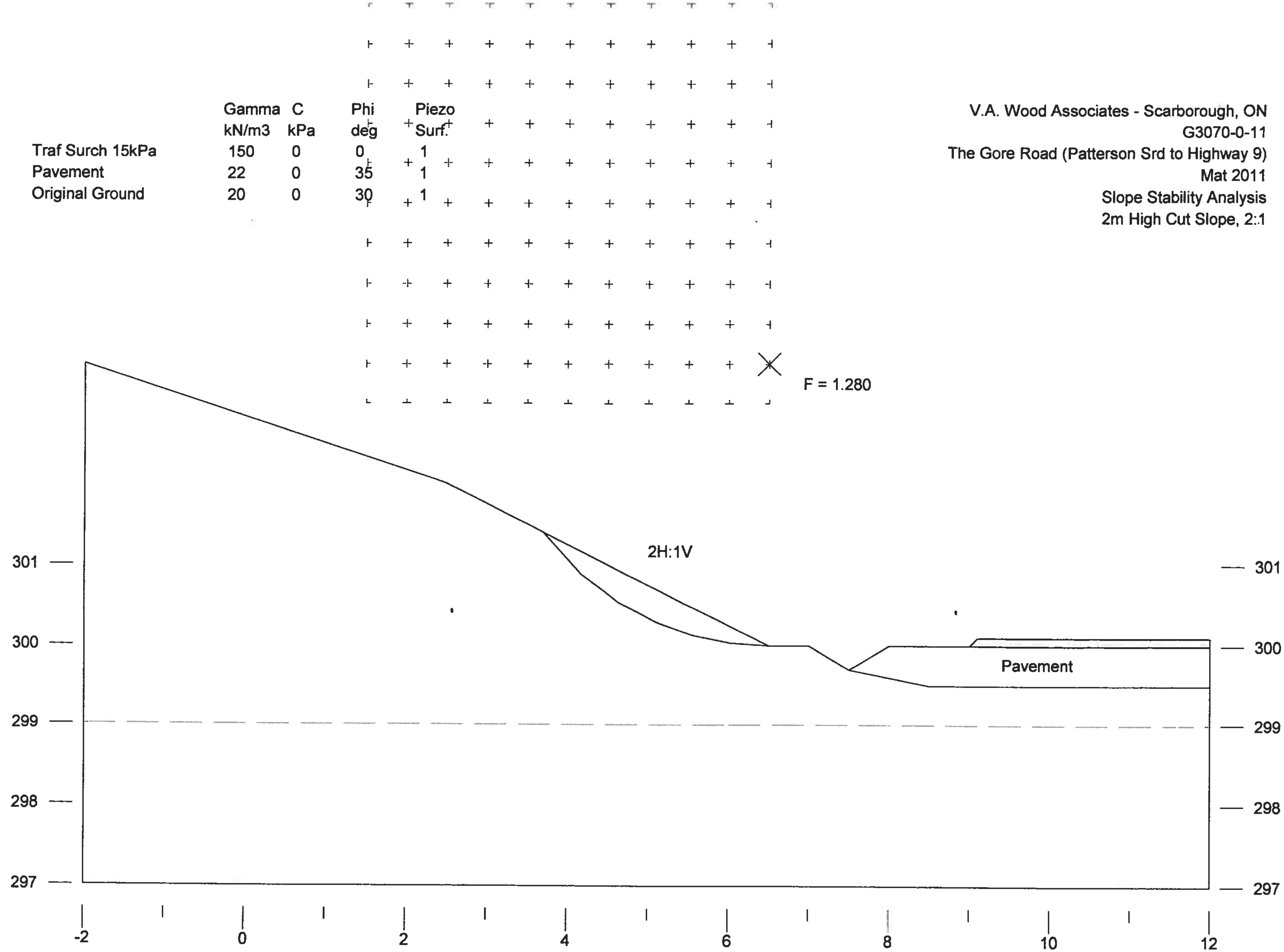
Enclosure 47

V.A. Wood Associates - Scarborough, ON
G3070-0-11
The Gore Road (Patterson Srd to Highway 9)
Mat 2011
Slope Stability Analysis
2m High Cut Slope, 2:1

	Gamma kN/m3	C kPa	Phi deg	Piezo Surf.
Traf Surch 15kPa	150	0	0	1
Pavement	22	0	35	1
Original Ground	20	0	30	1



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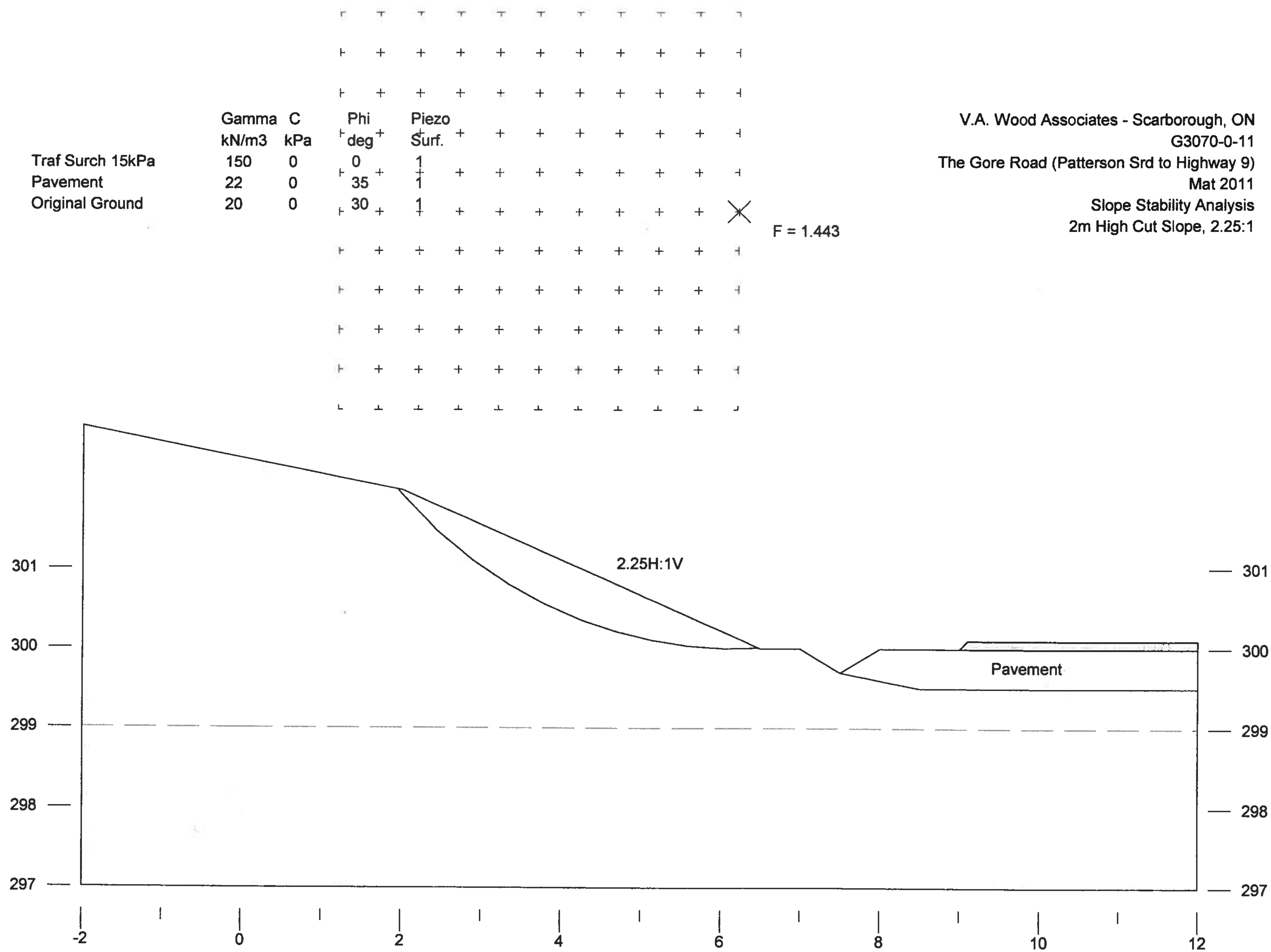
Enclosure 48

V.A. Wood Associates - Scarborough, ON
G3070-0-11
The Gore Road (Patterson Srd to Highway 9)
Mat 2011
Slope Stability Analysis
2m High Cut Slope, 2.25:1

	Gamma kN/m3	C kPa	Phi deg	Piezo Surf.
Traf Surch 15kPa	150	0	0	1
Pavement	22	0	35	1
Original Ground	20	0	30	1



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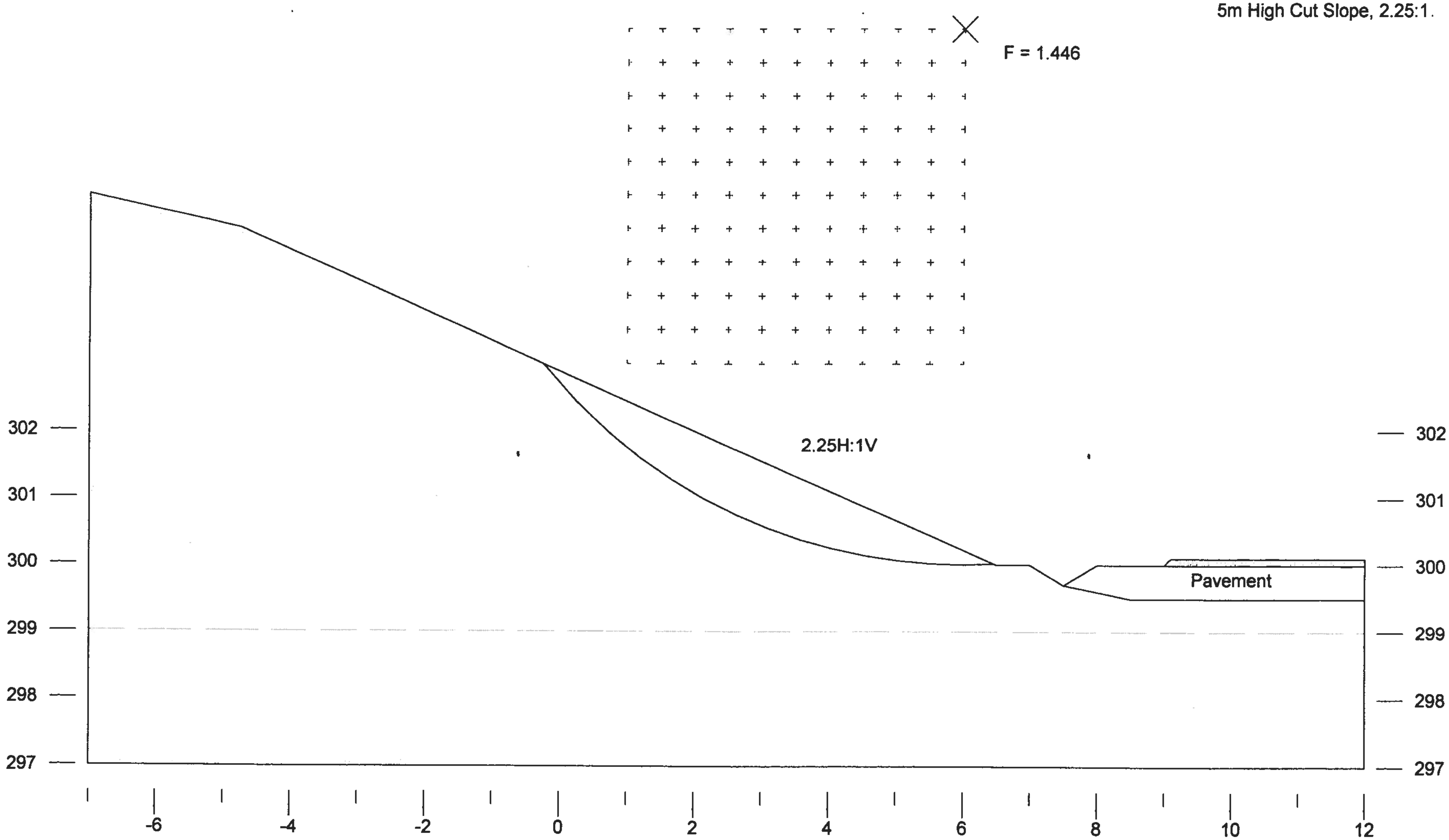
Enclosure 49

	Gamma kN/m3	C kPa	Phi deg	Piezo Surf.
Traf Surch 15kPa	150	0	0	1
Pavement	22	0	35	1
Original Ground	20	0	30	1

V.A. Wood Associates - Scarborough, ON
G3070-0-11
The Gore Road (Patterson Srd to Highway 9)
Mat 2011
Slope Stability Analysis
5m High Cut Slope, 2.25:1.



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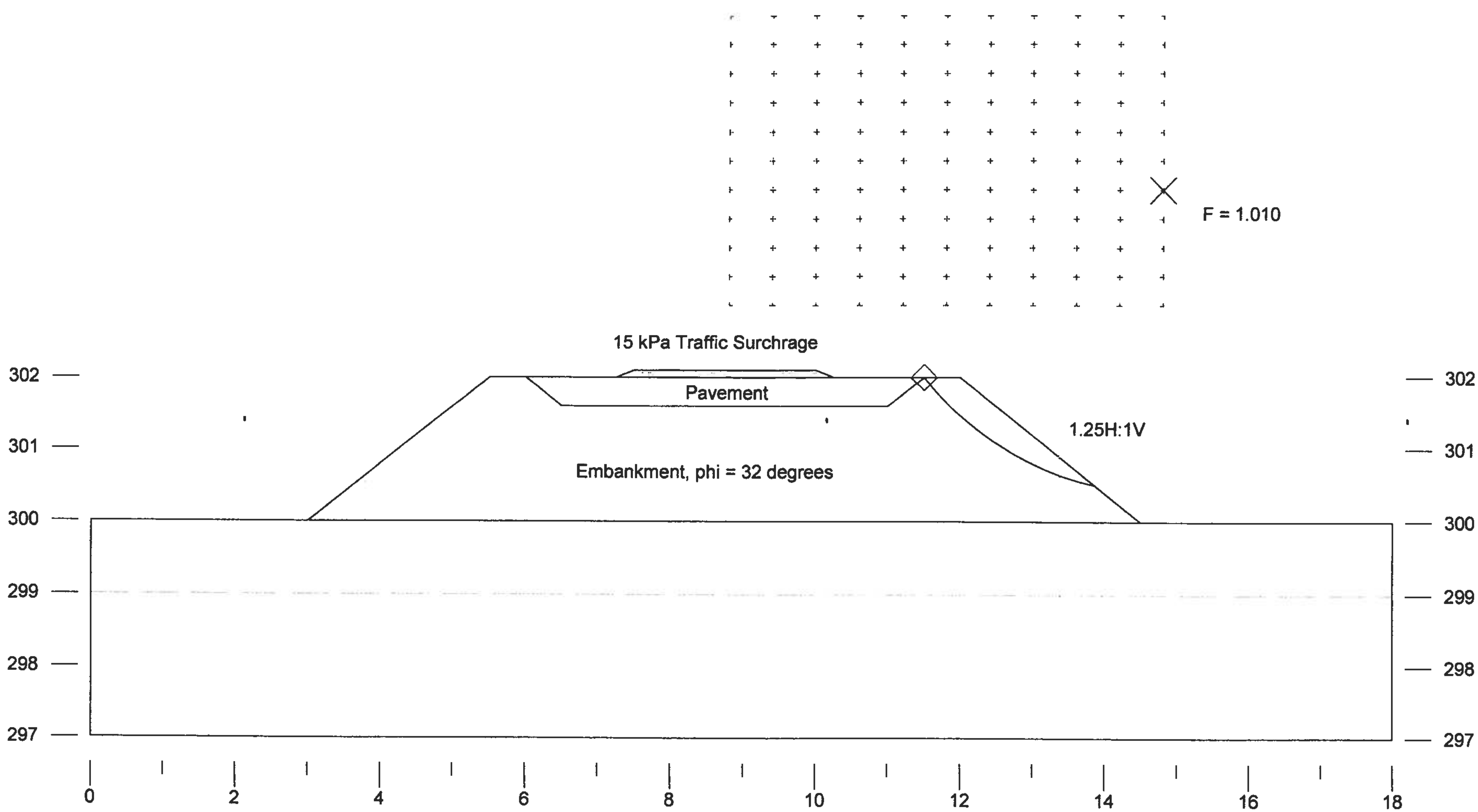
Enclosure 50

	Gamma kN/m3	C kPa	Phi deg	Piezo Surf.
Traf Surch 15kPa	150	0	0	1
Pavement	22	0	35	1
Embankment	20	0	32	1
Original Ground	20	0	30	1

V.A. Wood Associates - Scarborough, ON
G3070-0-11
The Gore Road (Patterson Srd to Highway 9)
Mat 2011
Slope Stability Analysis
2m High Embankment, 1.25:1



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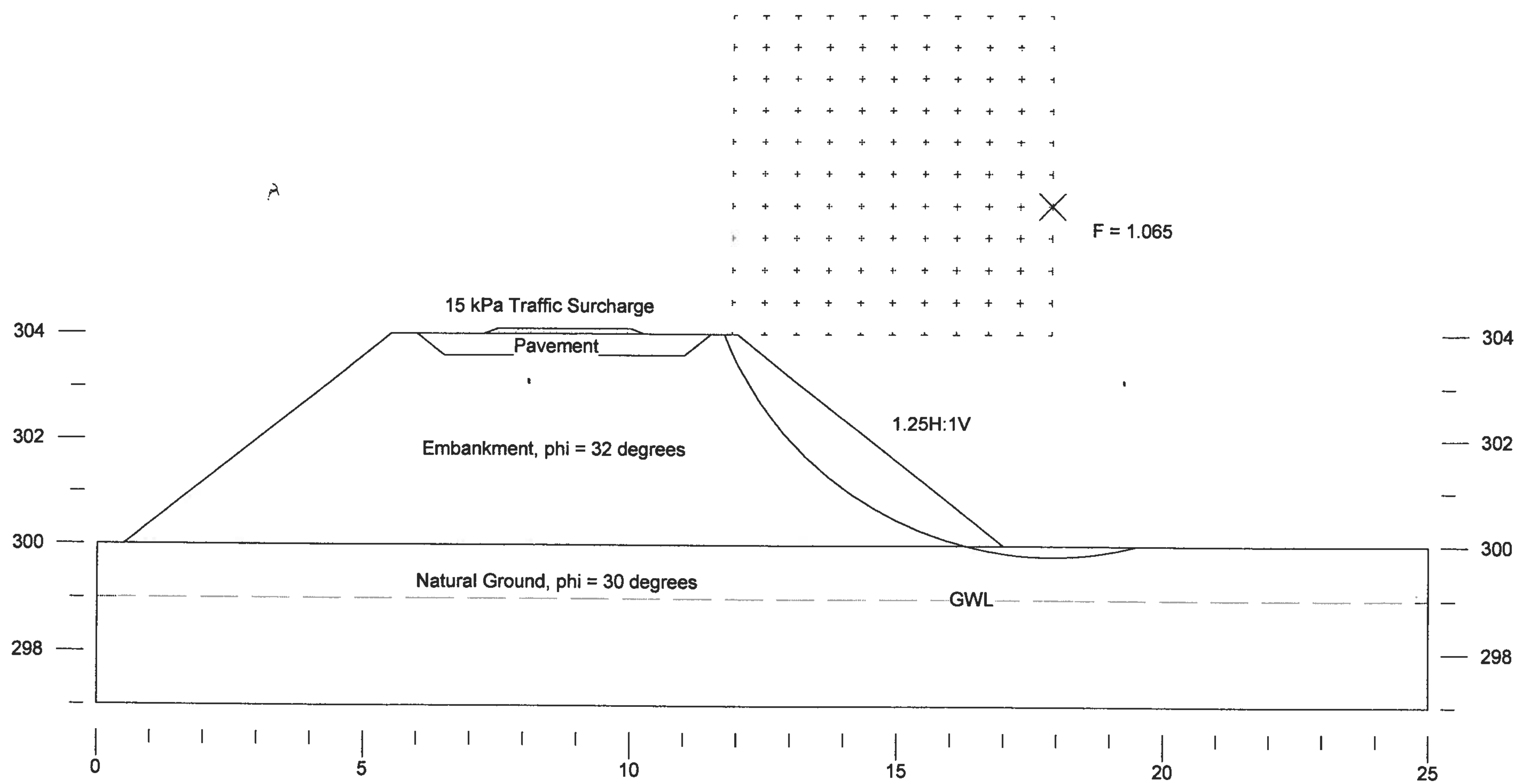
Enclosure 51

	Gamma kN/m3	C kPa	Phi deg	Piezo Surf.
Traf Surch 15kPa	150	0	0	1
Pavement	22	0	35	1
Embankment	21	0	32	1
Original Ground	20.	0	30	1

V.A. Wood Associates - Scarborough, ON
G3070-0-11
The Gore Road (Patterson Srd to Highway 9)
May 2011
Slope Stability Analysis
4m High Embankment, 1.25:1

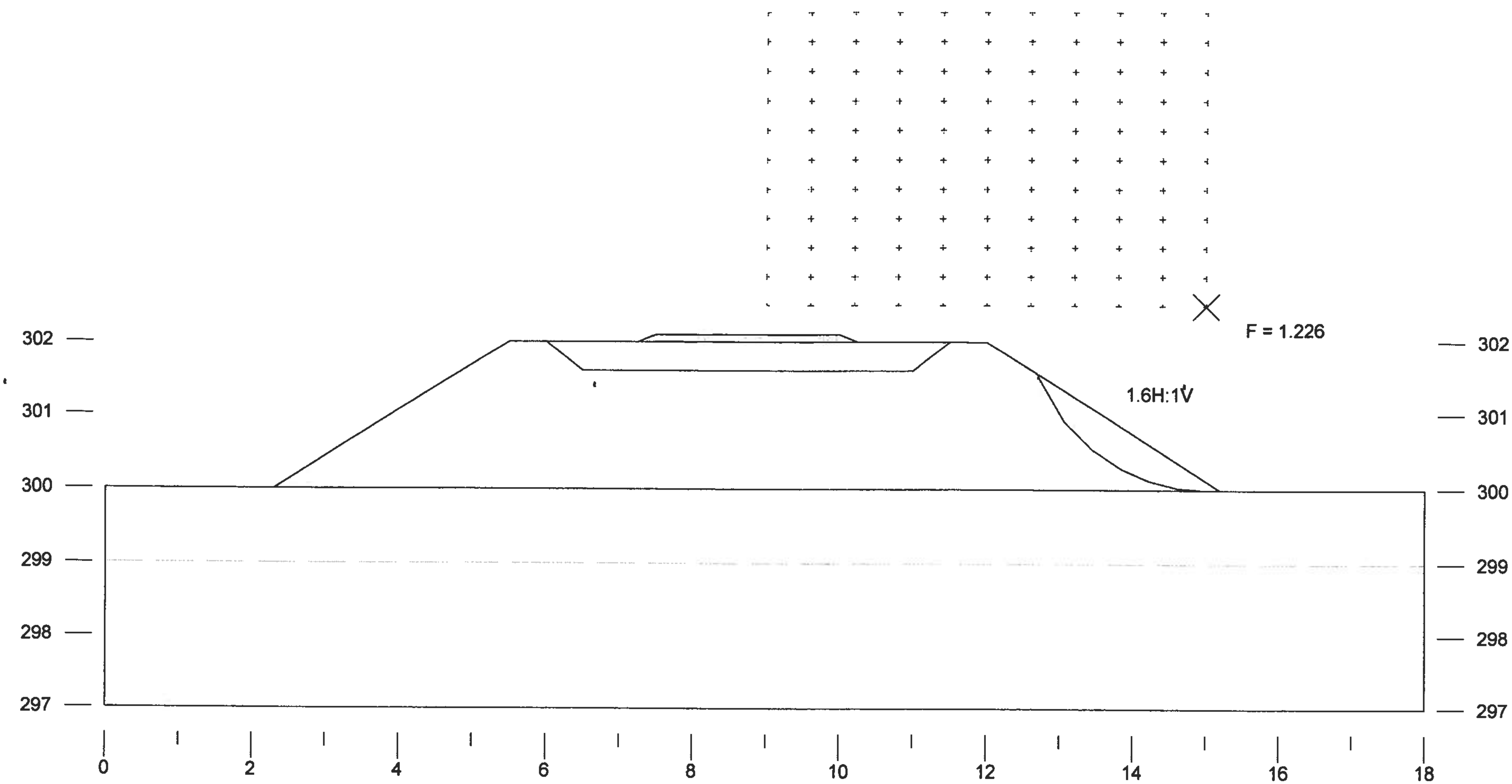


05/25/2011 03:03:53 PM C:\DOCUME~1\OWNER\MYDOCU~1\RENE\5782\SLOPE\4M125.GSL V.A. Wood Associates - Scarborough, ON F = 1.065

Enclosure 52

	Gamma kN/m3	C kPa	Phi deg	Piezo Surf.
Traf Surch 15kPa	150	0	0	1
Pavement	22	0	35	1
Embankment	20	0	32	1
Original Ground	20	0.	30	1

V.A. Wood Associates - Scarborough, ON
G3070-0-11
The Gore Road (Patterson Srd to Highway 9)
Mat 2011
Slope Stability Analysis
2m High Embankment, 1.6:1



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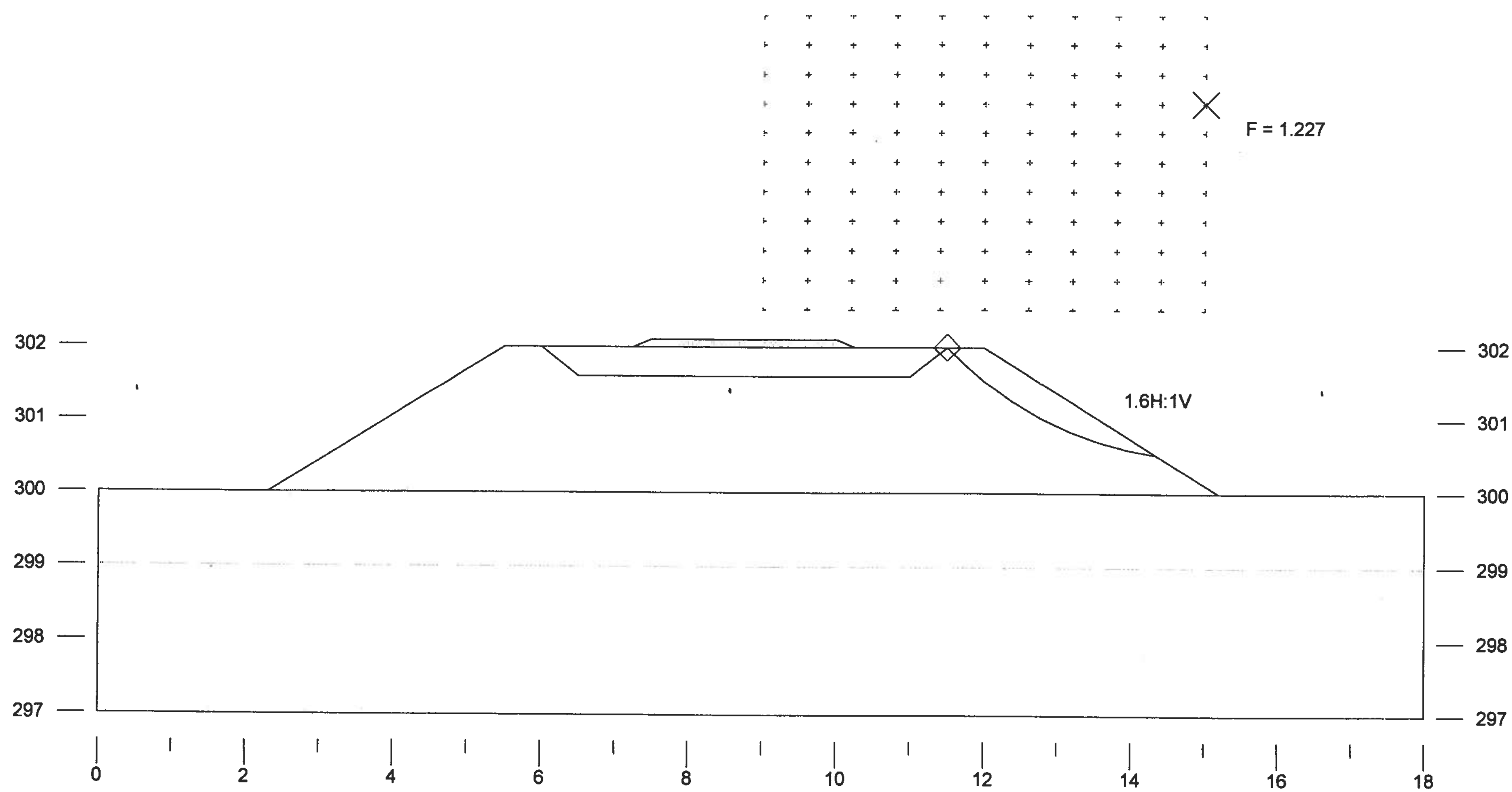
Enclosure 53

	Gamma kN/m3	C kPa	Phi deg	Piezo Surf.
Traf Surch 15kPa	150	0	0	1
Pavement	22	0	35	1
Embankment	20	0	32	1
Original Ground	20	0	30	1

V.A. Wood Associates - Scarborough, ON
G3070-0-11
The Gore Road (Patterson Srd to Highway 9)
Mat 2011
Slope Stability Analysis
2m High Embankment, 1.6:1



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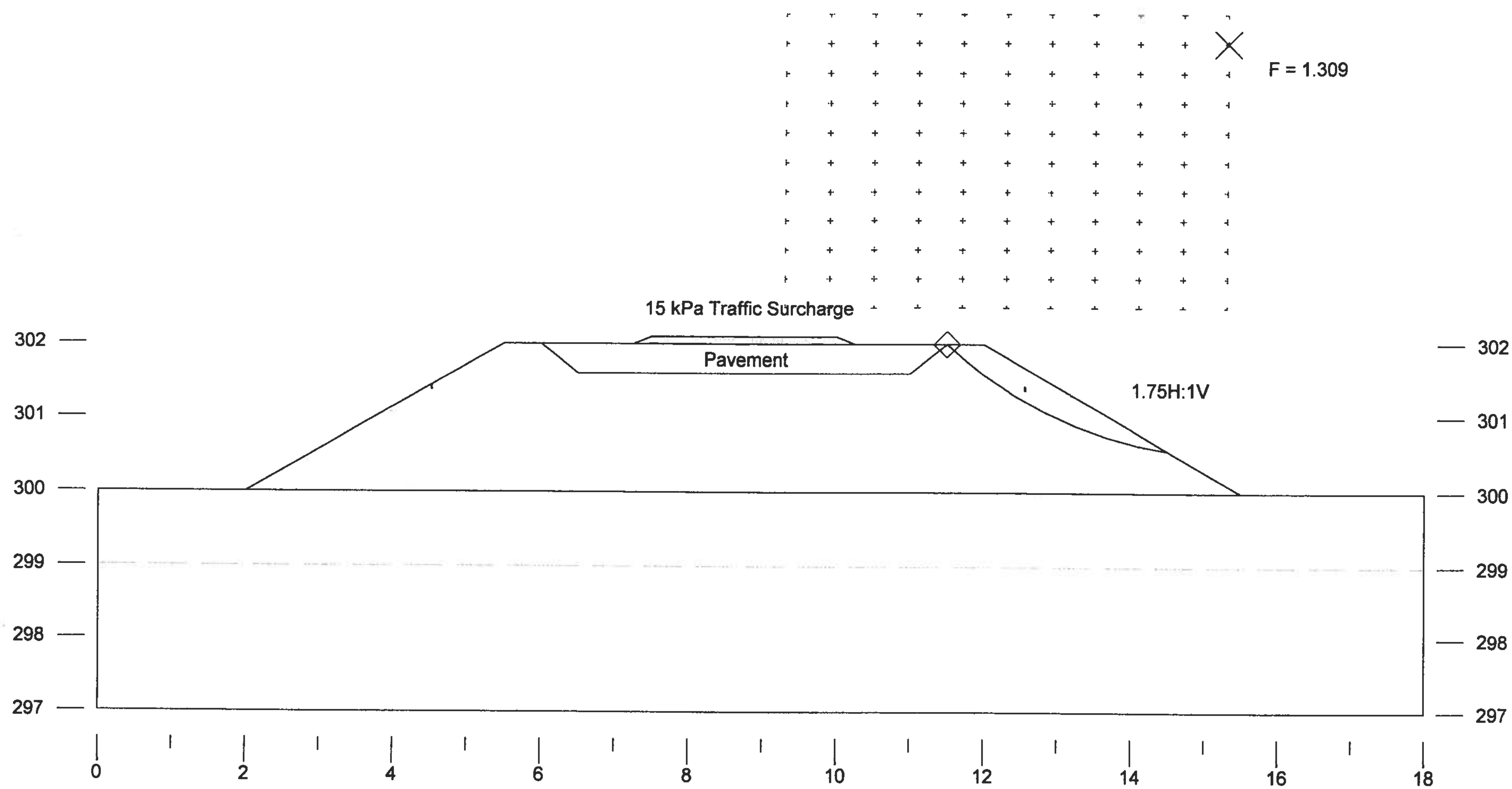
Enclosure 54

	Gamma kN/m3	C kPa	Phi deg	Piezo Surf.
Traf Surch 15kPa	150	0	0	1
Pavement	22	0	35	1
Embankment	20	0	32	1
Original Ground	20	0	30	1

V.A. Wood Associates - Scarborough, ON
G3070-0-11
The Gore Road (Patterson Srd to Highway 9)
Mat 2011
Slope Stability Analysis
2m High Embankment, 1.75:1

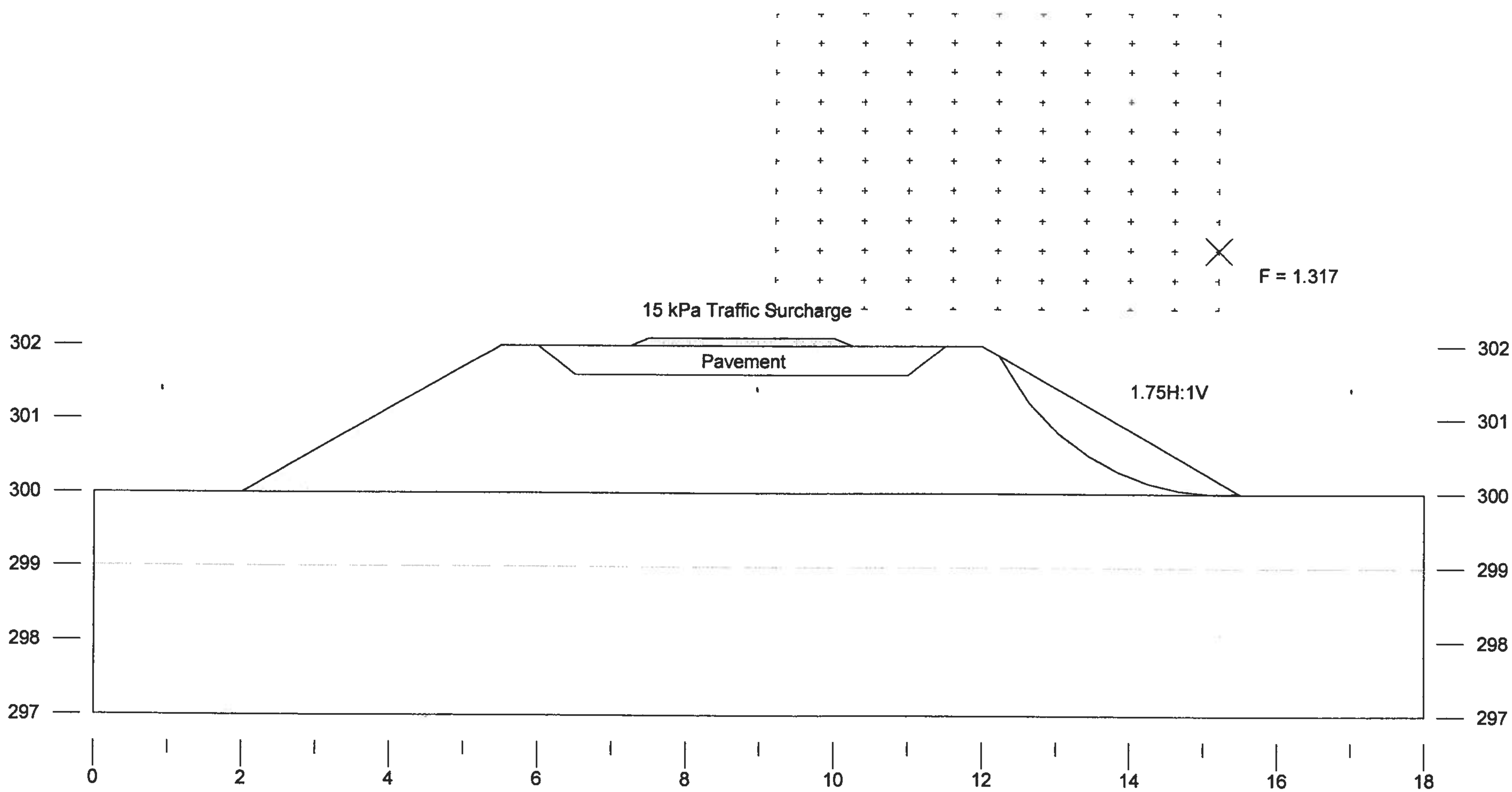


05/25/2011 03:09:46 PM C:\DOCUME~1\OWNER\MYDOCU~1\RENE\5782\SLOPE\2M175.GSL V.A. Wood Associates - Scarborough, ON F = 1.309

Enclosure 55

	Gamma kN/m3	C kPa	Phi deg	Piezo Surf.
Traf Surch 15kPa	150	0	0	1
Pavement	22	0	35	1
Embankment	20	0	32	1
Original Ground	20	0	30	1

V.A. Wood Associates - Scarborough, ON
G3070-0-11
The Gore Road (Patterson Srd to Highway 9)
Mat 2011
Slope Stability Analysis
2m High Embankment, 1.75:1



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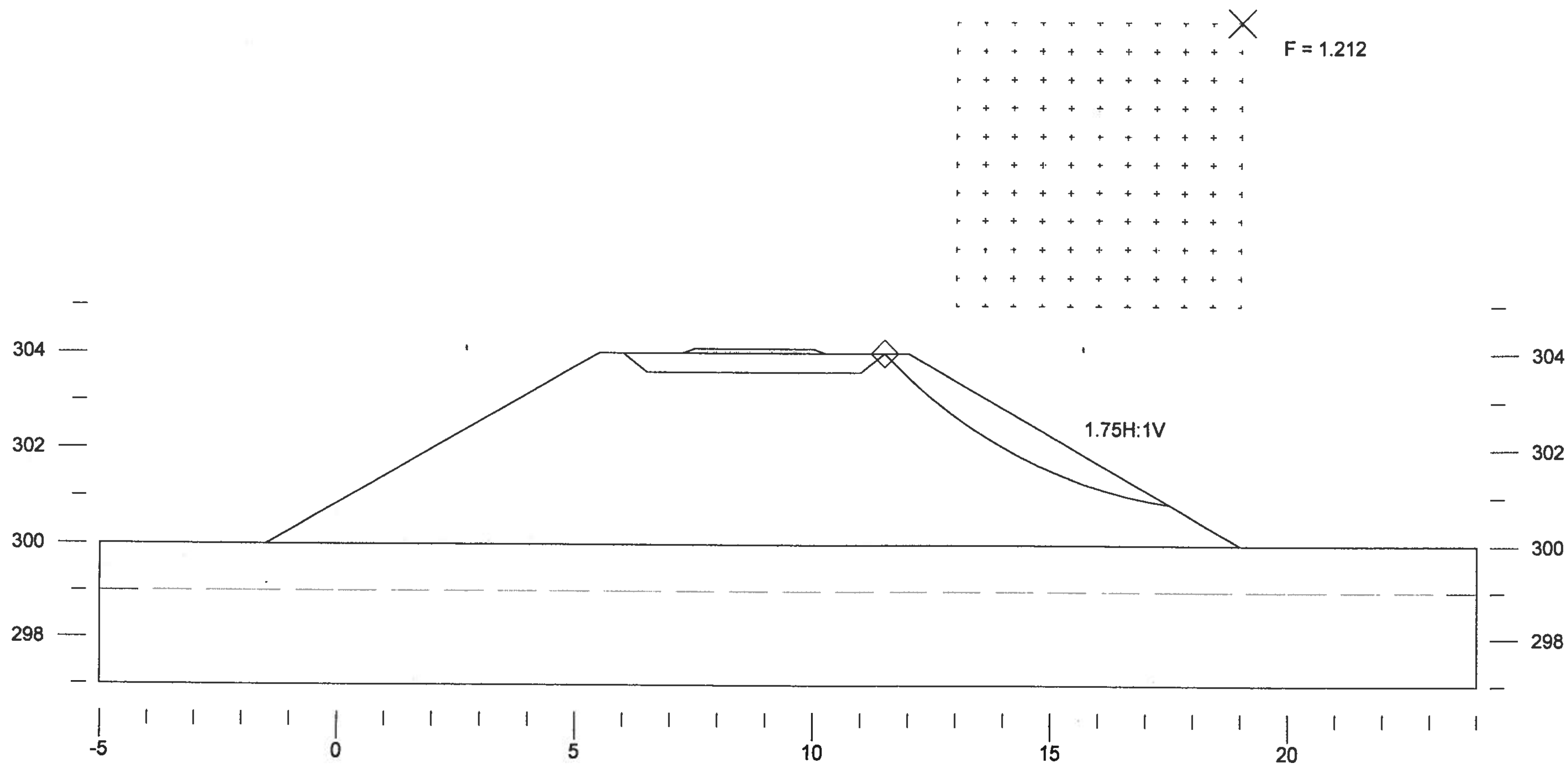
Enclosure 55a

	Gamma kN/m3	C kPa	Phi deg	Piezo Surf.
Traf Surch 15kPa	150	0	0	1
Pavement	22	0	35	1
Embankment	21	0	32	1
Original Ground	20	0	30	1

V.A. Wood Associates - Scarborough, ON
G3070-0-11
The Gore Road (Patterson Srd to Highway 9)
May 2011
Slope Stability Analysis
4m High Embankment, 1.75:1



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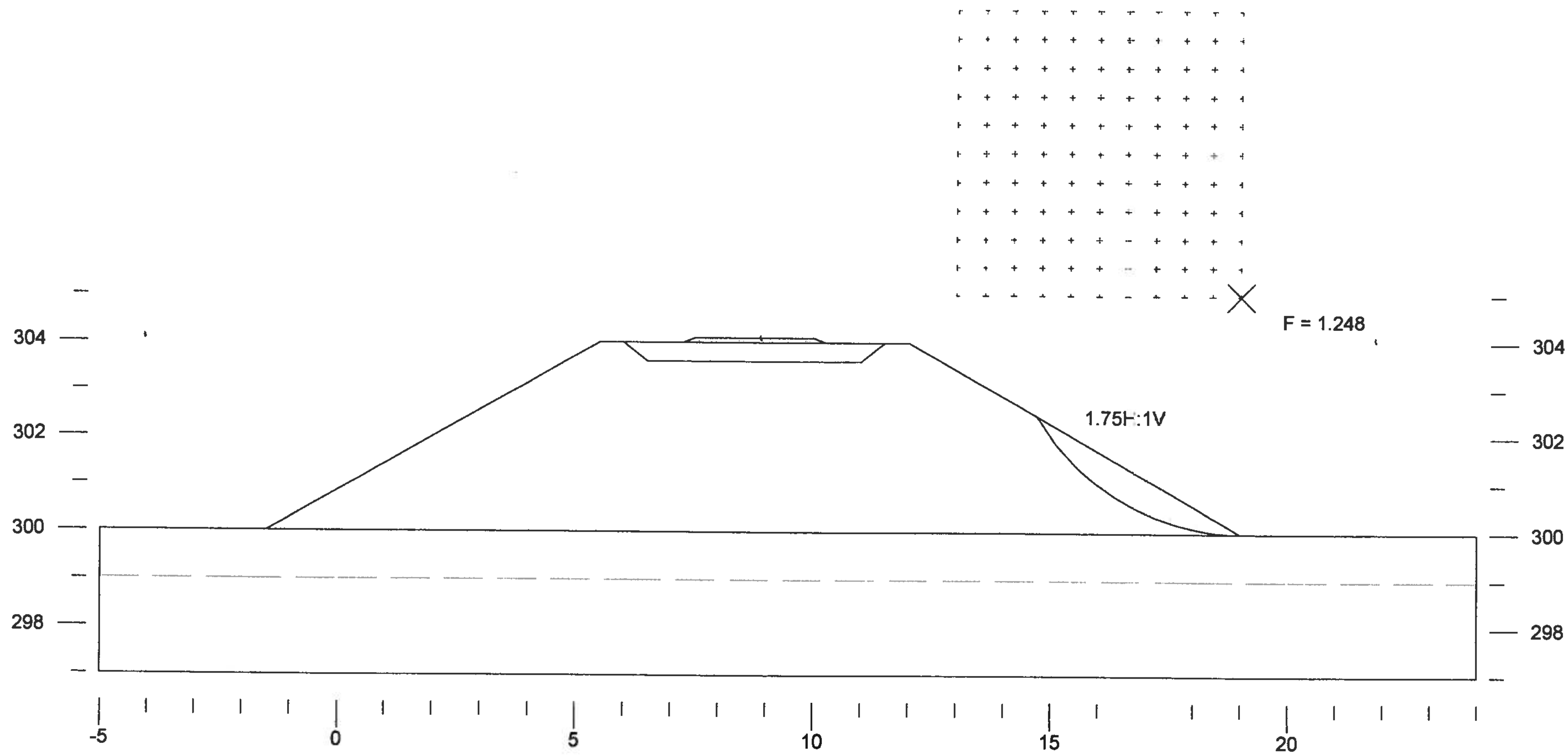
Enclosure 56

V.A. Wood Associates - Scarborough, ON
G3070-0-11
The Gore Road (Patterson Srd to Highway 9)
May 2011
Slope Stability Analysis
4m High Embankment, 1.75:1

	Gamma kN/m3	C kPa	Phi deg	Piezo Surf.
Traf Surch 15kPa	150	0	0	1
Pavement	22	0	35	1
Embankment	21	0	32	1
Original Ground	20	0	30	1



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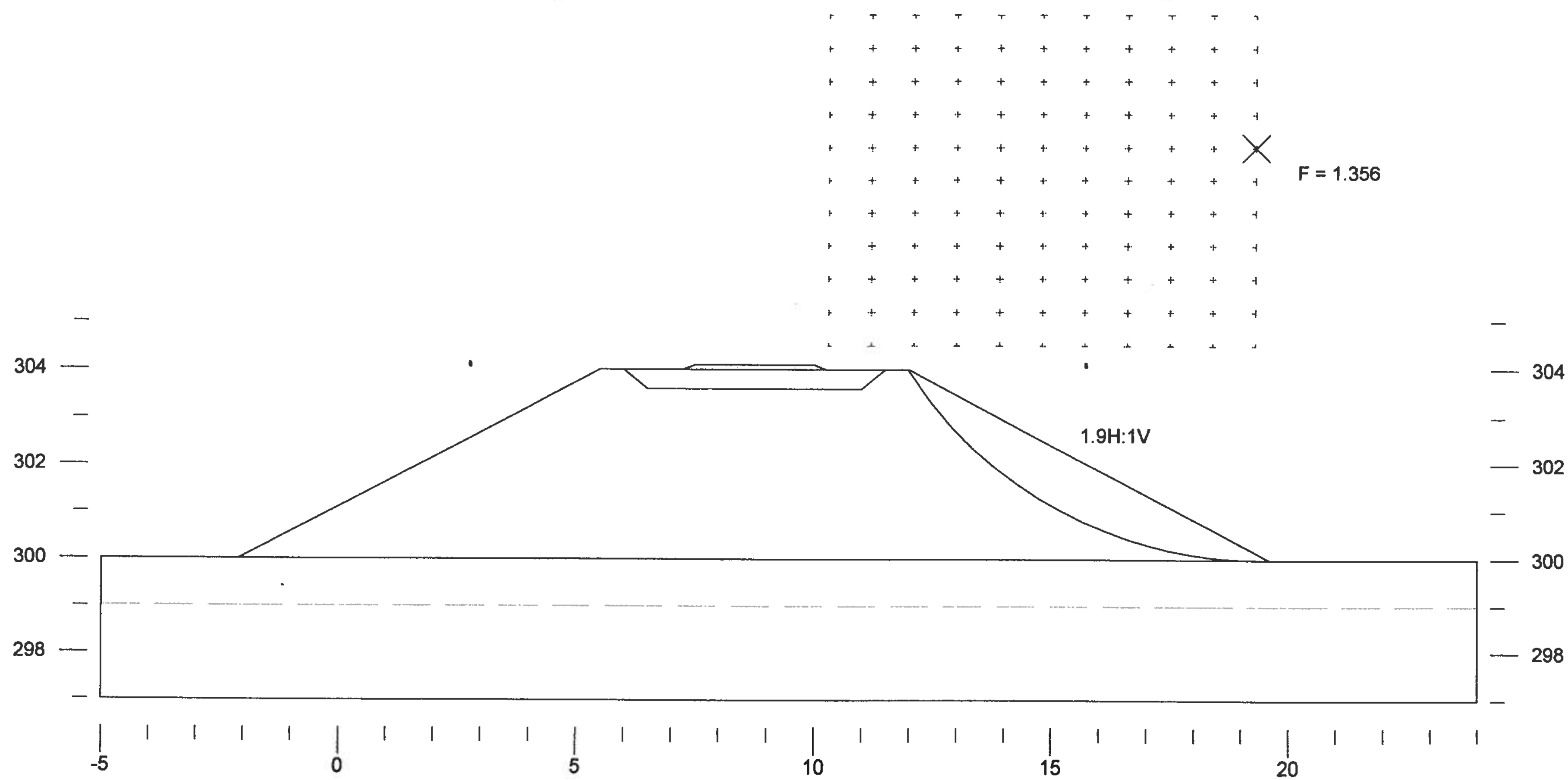
Enclosure 56a

	Gamma kN/m3	C kPa	Phi deg	Piezo Surf.
Traf Surch 15kPa	150	0	0	1
Pavement	22	0	35	1
Embankment	21	0	32	1
Original Ground	20	0	30	1

V.A. Wood Associates - Scarborough, ON
G3070-0-11
The Gore Road (Patterson Srd to Highway 9)
May 2011
Slope Stability Analysis
4m High Embankment, 1.9:1, Peat



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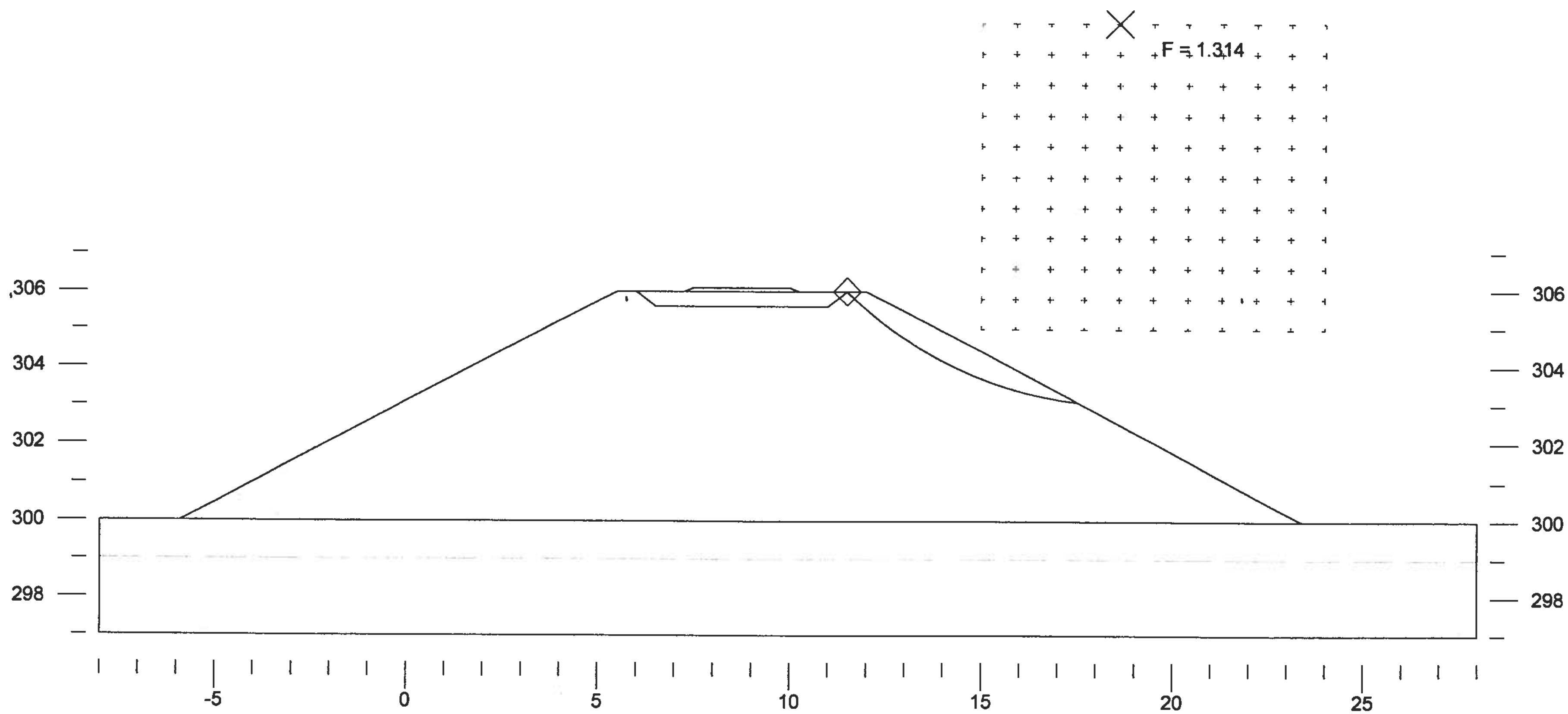
Enclosure 57

V.A. Wood Associates - Scarborough, ON
G3070-0-11
The Gore Road (Patterson Srd to Highway 9)
May 2011
Slope Stability Analysis
6m High Embankment, 1.9:1

	Gamma kN/m3	C kPa	Phi deg	Piezo Surf.
Traf Surch 15kPa	150	0	0	1
Pavement	22	0	35	1
Embankment	21	0	32	1
Original Ground	20	0	30	1



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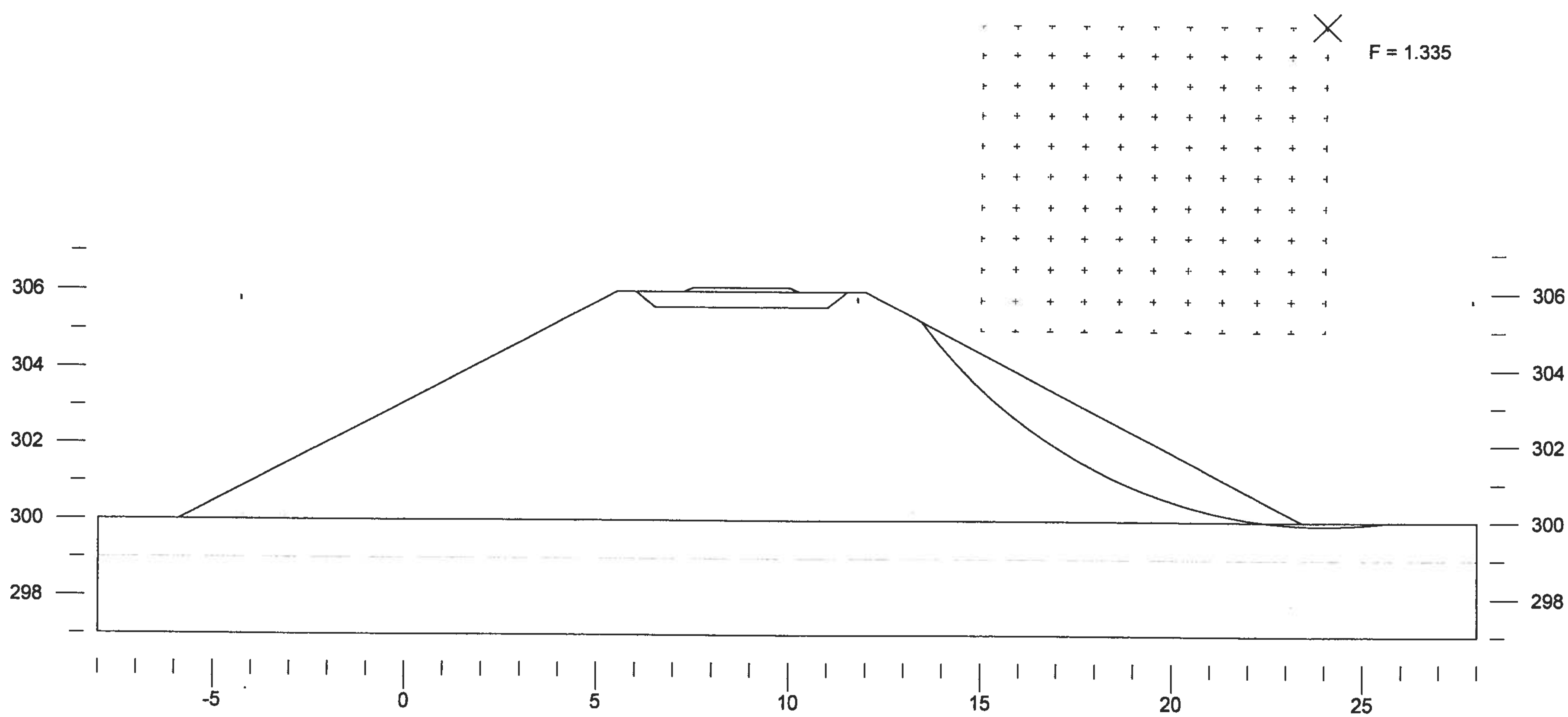
Enclosure 58

	Gamma kN/m3	C kPa	Phi deg	Piezo Surf.
Traf Surch 15kPa	150	0	0	1
Pavement	22	0	35	1
Embankment	21	0	32	1
Original Ground	20	0	30	1

V.A. Wood Associates - Scarborough, ON
G3070-0-11
The Gore Road (Patterson Srd to Highway 9)
May 2011
Slope Stability Analysis
6m High Embankment, 1.9:1



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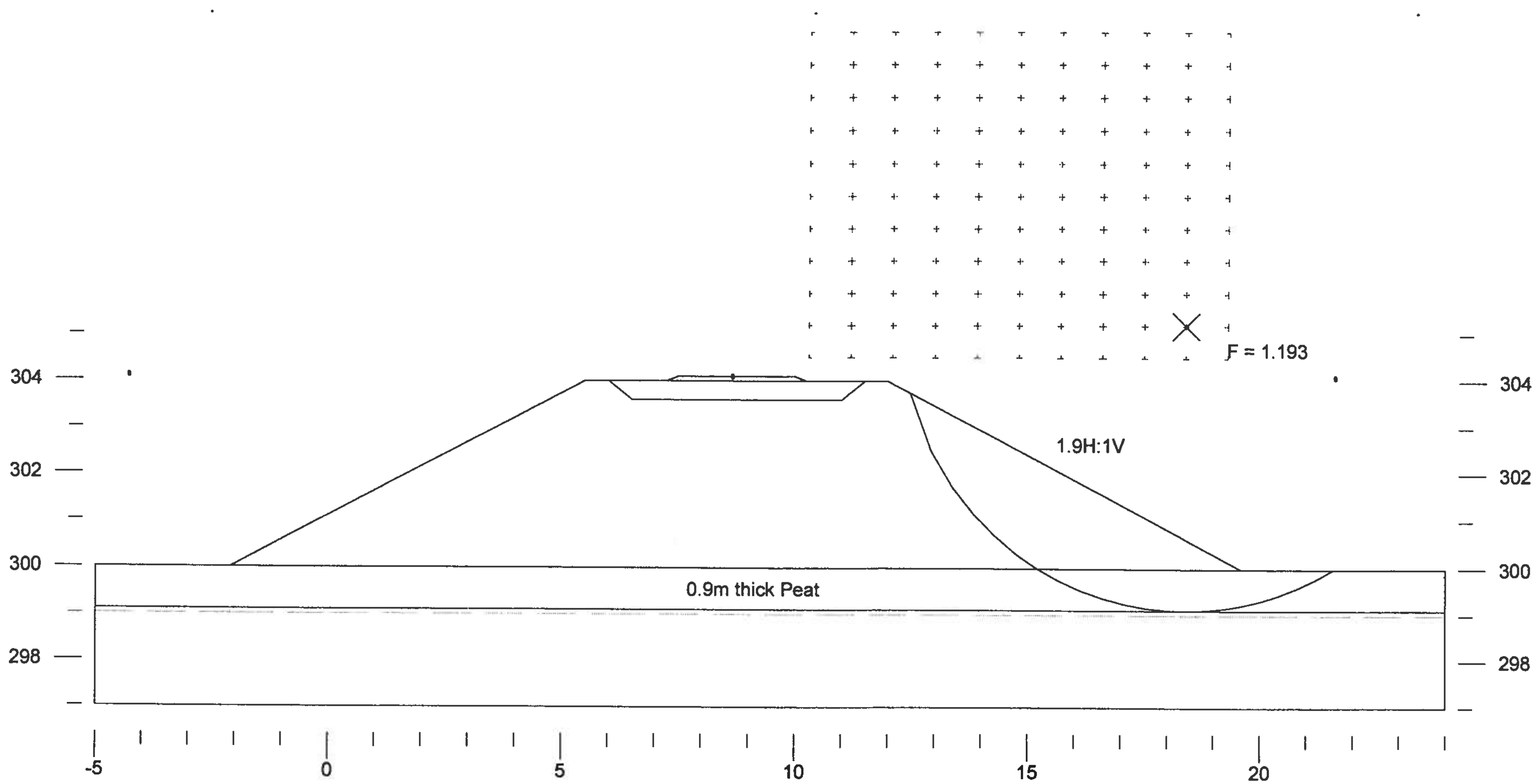
Enclosure 58a

	Gamma kN/m3	C kPa	Phi deg	Piezo Surf.
Traf Surch 15kPa	150	0	0	1
Pavement	22	0	35	1
Embankment	21	0	32	1
1m thick Peat	15	0	20	1
Original Ground	20	0	30	1

V.A. Wood Associates - Scarborough, ON
G3070-0-11
The Gore Road (Patterson Srd to Highway 9)
May 2011
Slope Stability Analysis
4m High Embankment, 1.9:1, Peat



05/26/2011 01:57:31 PM C:\DOCUME~1\OWNER\MYDOCU~1\RENE\5782\SLOPE\4M19PEAT.GSL V.A. Wood Associates - Scarborough, ON F = 1.193

Enclosure 59