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MEMO

DATE September 1, 2020 **PROJECT NO.** 1716-5554

RE Floodplain Analysis
12476 Regional Road 50, Town of Caledon, Region of Peel

TO Anthony Syhlonyk, Planner (Toronto and Region Conservation Authority)
FROM Rebecca Archer, P.Eng.
CC Bikram Dhillon (BVD Petroleum Inc.)

INTRODUCTION

C.F. Crozier and Associates Inc. (Crozier) was retained by BVD Petroleum Inc. (the Owner) to complete a floodplain analysis to support the Site Plan Application for a proposed development at 12476 Regional Road 50 in the Town of Caledon. The purpose of this memo is to document the methodology and results of the floodplain analysis and demonstrate that the proposed site grading design meets the criteria of the Toronto and Region Conservation Authority (TRCA) for the lands in the vicinity of the site.

BACKGROUND

The subject property is approximately 0.95 ha and is currently vegetated undeveloped land. The property is located in a commercial/industrial area, bounded by George Bolton Parkway to the south, an industrial property to the west, Robinson Creek to the north, and a gas station and Robinson Creek to the east. It is understood that the proposed development includes the construction of a five-storey hotel and associated parking area. A grading plan for the site was completed by Flora Designs Inc. in July 2020.

Robinson Creek is a tributary of the Humber River, making the site part of the TRCA Regulated Area of the Humber River Watershed. A portion of the Robinson Creek valley corridor encroaches into the subject property, bordering the future parking lot area along the north and east limits of the site. As a result, based on the extents of the creek's high-water elevation corresponding to the Regional rainfall event, part of the north and east portions of the property are located within the floodplain. As such, a floodplain analysis is required to satisfy TRCA requirements prior to proceeding with a Site Plan Application.

METHODOLOGY

The floodplain analysis included the following tasks:

- Reviewing the Robinson Creek hydraulic (HEC-RAS) model, prepared by Cole Engineering February 2016, provided by the TRCA.

- Reviewing the Humber River Hydrology update, prepared by Civica Infrastructure, April 2018.
- Establishing existing Regional floodplain conditions on the site based on the approved (2016) HEC-RAS model with updated hydrology and updated sections based on more recent topographic and LiDAR surveys completed for the area.
- Interpolating proposed cross sections for the site and updating the HEC-RAS model accordingly. Existing and proposed conditions were compared to assess the impact of flooding on-site and off-site.

EXISTING CONDITIONS

Hydrologic Verification

A review of the hydrologic modeling completed for this site showed that the catchment areas provided in the 2016 Hydraulic Assessment were consistent with those in the current approved 2018 Humber River Hydrology Update. The site is located in Catchment 22.23 in the approved Humber River Hydrology model. The TRCA model adds flows from Catchments 22.23, 22.24, 22.25 and 22.23 downstream of the site, for a total drainage area of 145.57 ha. Of this area approximately 8.74 ha of area 22.23 is upstream of the site, reducing the upstream drainage area to 90.04 ha.

In order to confirm if the upstream drainage areas flowed south down Highway 50 (bypassing the site) or west through the smaller streets to be picked up by the tributary that flows though the site, we completed the following background review:

- As-built drawing were obtained and reviewed to determine the location of sewers, ditches and culverts in the area. As-built drawings used for this review are provided as an attachment to this report;
- 1m Bare earth LiDAR data from 2019, purchased from first base solutions, was used to confirm the upstream drainage patterns; and,
- A site walk (on June 22, 2020) was completed to confirm drainage at the intersection of Healey Road and Queen Street South (Highway 50).

Based on this background review we have determined that:

- Area 22.30 drains to a culvert west of Highway 50. This culvert conveys runoff under the railroad tracks to a ditch which flows south between Hardwick Road and Highway 50. This ditch terminates at a retaining wall just north of the intersection of Healey Road and Queen Street South (Highway 50), where it is picked up by a culvert which connects to a storm sewer under the sidewalk on the west side of Highway 50.
- A similar system picks up the ditch on the east side of the road and convey runoff to a separate storm sewer on the west side of the road.
- Runoff from area 22.25 is also picked up by this sewer system, which continues south along Highway 50 to outlet back into roadside ditches just North of McEwan Drive.

The findings of this background review are provided in **Figure 1**. Copies of the as built drawings and photographs from the site walk are provided as attachments.

Based on the findings of the background review the approved Humber River model (Civica 2018) was trimmed and modified to reflect detailed external drainage conditions. A copy of the update model is included as an attachment to this report. Modifications to the model included adding additional ADDHYD and splitting catchments. Table 1 shows the changes in area applied to the VO model.

Table 1 – Changes to VO model

TRCA ID	TRCA Area	Vo Model		Transposition of Flow		
		Crozier ID	Crozier Area	Flow Nodes	Crozier Incremental Area	Crozier Cumulative Area
22.24	48.66 ha	22.24	48.66 ha	1	28.31 ha	28.31 ha
				2	20.35 ha	48.66 ha
22.23	64.27	22.23 NW	8.25 ha		3.81 ha	52.47 ha
				Site	4.44 ha	56.91 ha
		22.23 NE	8.88 ha		8.88 ha	65.79 ha
22.30	21.04 ha	22.30	21.04 ha		21.04 ha	86.83 ha
22.25	11.60 ha	22.25	11.60 ha	3	11.60 ha	98.43 ha
22.23	64.27	22.23	47.14 ha	4	10.95 ha	109.38 ha
				5	21.08 ha	130.46 ha
				6	15.11 ha	145.57 ha
22.22	134.85	22.22	134.85 ha	7	134.85 ha	
Total				8		280.42 ha

Note: Area 22.23 was divided into six area to better define the contributing drainage to the site. The area in the total area for this catchment in the TRCA model is 64.27 ha.

The results of the VO model were used to calculate flows at previously defined flow nodes used in the 2016 Cole Hydraulic update. Flows for nodes 2, 3, 6, 7, and 8 were calculated directly from the model. Using the MTO equation for the transposition of flood discharge updated flows were calculated immediately downstream of the site and at previously defined flow change locations 1, 4, and 5 within the model**. Table 1** provides a summary of the flows used in the model.

Table 1 Summary of Steady Flow Data

Node	Station	U/S Drainage Area (ha)	Hurricane Hazel Peak Flow (m^3/s)
1	2224.08	28.31	4.76
2	2223.56	48.66	7.15
Site	2223.463	56.91	7.24
3	2223.45	98.43	13.35
4	2223.37	109.38	15.17
5	2223.20	130.46	17.32
6	2223.04	145.57	18.80
7	--	134.85	19.75
8	2219.56	280.42	38.54

Existing floodplain

The topographic survey indicates that the property has split drainage where approximately half of the property slopes towards Robinson Creek, while the other half slopes towards George Bolton Parkway. Based on the mapping provided by TRCA, the Regional floodplain extends onto approximately one third of the property. A review of the existing HEC-RAS model shows that cross-section stations 2223.44 (downstream) through 2223.47 (upstream) bound the site. As a result, these cross sections are the focus of this analysis.

In addition to the updates made to the model flow files discussed earlier in this memo, the existing sections were also updated based on the topographic and LiDAR surveys competed for the site. Existing stations 2223.44 to 2223.46 were updated based on the collected information, and five (5) additional sections were also created within the property to better represent the site geometry and improve model accuracy. Refer to **Figure 2** Floodplain Mapping (with culvert) for the locations of the existing and new cross-sections as well as the existing and proposed floodlines. Existing flood elevations and velocities for Robinson Creek are provided in **Table 3**. Note that two scenarios were analyzed; the first represents the actual existing conditions, which includes the rating curve representing the culvert at station 2223.44 and the second represents idealized "baseline" conditions, which does not consider the culvert at station 2223.44.

Table 3 Existing Flood Elevations and Velocities for Robinson Creek

Station	Location	Actual Conditions			Idealized Conditions		
		Regional Peak Flow (m^3/s)	Regional Flood Elevation (m)	Regional Flood Velocity (m/s)	Regional Peak Flow (m^3/s)	Regional Flood Elevation (m)	Regional Flood Velocity (m/s)
2223.47	U/S of the site	7.15	238.91	0.30	7.15	238.90	0.30
2223.463	Within the site (additional)	7.24	238.79	1.25	7.24	238.76	1.35
2223.462	Within the site (additional)	7.24	238.73	1.16	7.24	238.47	1.97
2223.461	Within the site (additional)	7.24	238.77	0.36	7.24	238.32	1.03
2223.46	Within the site	7.24	238.76	0.24	7.24	238.22	0.84
2223.452	Within the site (additional)	7.24	238.76	0.21	7.24	238.20	0.58
2223.451	Within the site (additional)	7.24	238.76	0.14	7.24	238.20	0.32
2223.45	D/S of the site	13.35	238.76	0.42	13.35	238.16	0.91
2223.44	D/S of the site	13.35	238.75	0.56	13.35	237.91	2.23

PROPOSED CONDITIONS

A grading and servicing plan for the site was completed by Flora Designs Inc. in July 2020. The grading plan proposes fill to accommodate parking lot area within portions of the existing floodplain with 3:1 slopes projecting into the valley along the north and east property lines, sloping towards Robinson Creek, raising the site above the Regional flood elevation. This results in the entire parking lot area being free of flooding. Drainage on site is designed to capture rainfall within an internal network of catch basins and catch basin manholes, which ultimately outlet to the

storm sewer on George Bolton Parkway. Overland flow during major storm events is directed towards the creek.

It is noted that the portions of the proposed development limit for this site have been established based on the previously approved 15m valley corridor (centred on existing channel axis), as part of the development application for the previous land owner (Farview Holdings / Pilla Investments Inc.). For reference, the Farview Holdings Site Servicing and Grading Plan illustrating the 15m valley corridor, as approved by the TRCA Executive Committee on September 07, 2007 is attached to this memo.

Figure 3 Floodplain Mapping - Without Culvert illustrates the idealized condition comparing the existing and proposed base condition floodplain mapping with the downstream Highway 50 culvert removed. The proposed cross sections overlaid against the existing cross sections are also attached. **Table 4** and **Table 5** summarize the results of the proposed conditions model.

Table 4 Summary of Flood Elevations for the Proposed Conditions Model

Station	Location	Proposed Regional Peak Flow (m^3/s)	Actual Regional Flood Elevation (m)			Idealized Regional Flood Elevation (m)		
			Pre	Post	Diff.	Pre	Post	Diff.
2223.47	U/S of the site	7.15	238.91	239.93	0.02	238.90	238.87	-0.03
2223.463	Within the site (additional)	7.24	238.79	238.80	0.01	238.76	238.70	-0.06
2223.462	Within the site (additional)	7.24	238.73	238.76	0.03	238.47	238.40	-0.07
2223.461	Within the site (additional)	7.24	238.77	238.77	0.00	238.32	238.32	0.00
2223.46	Within the site	7.24	238.76	238.77	0.01	238.22	238.27	0.05
2223.452	Within the site (additional)	7.24	238.76	238.77	0.01	238.20	238.25	0.05
2223.451	Within the site (additional)	7.24	238.76	238.77	0.01	238.20	238.25	0.05
2223.45	D/S of the site	13.35	238.76	238.76	0.00	238.16	238.21	0.05
2223.44	D/S of the site	13.35	238.75	238.75	0.00	237.91	237.92	0.01

Table 5 Summary of Channel Velocities for the Proposed Conditions Model

Station	Location	Proposed Regional Peak Flow (m^3/s)	Actual Regional Flood Velocities (m/s)			Idealized Regional Flood Velocities (m/s)		
			Pre	Post	Diff.	Pre	Post	Diff.
2223.47	U/S of the site	7.15	0.30	0.29	-0.01	0.30	0.31	0.01
2223.463	Within the site (additional)	7.24	1.25	1.34	0.09	1.35	1.59	0.24
2223.462	Within the site (additional)	7.24	1.16	1.19	0.03	1.97	2.15	0.18
2223.461	Within the site (additional)	7.24	0.36	0.68	0.32	1.03	1.24	0.21
2223.46	Within the site	7.24	0.24	0.39	0.15	0.84	0.74	-0.10
2223.452	Within the site (additional)	7.24	0.21	0.39	0.18	0.58	0.68	0.10
2223.451	Within the site (additional)	7.24	0.14	0.33	0.19	0.32	0.58	0.26
2223.45	D/S of the site	13.35	0.42	0.33	-0.09	0.91	0.58	-0.33
2223.44	D/S of the site	13.35	0.56	0.46	-0.10	2.23	2.15	-0.08

Modeling results show that the proposed grading does not impact the actual flood elevations downstream of the site, however, water surface elevation across the property are increased by a maximum of 0.03 m at Station 2223.462, while the water surface elevation for the cross section immediately upstream (Station 2223.47) is increased by 0.02 m. At the next upstream cross section (Station 2223.48), the water level converges to a zero difference between the existing and proposed conditions. This change in water elevation is considered minor and within the tolerance of the model. The model also shows a change in velocity ranging between -0.10 m/s to 0.32 m/s within the site. Station 2223.45 downstream of the site experiences an decrease in velocity of 0.09 m/s, while Station 2223.47 upstream of the site experiences a decrease of 0.01 m/s. Therefore, the changes in velocities outside of the site are minor and do not increase flood risk for other property owners. A digital copy of the HEC-RAS model, with scenarios showing the updated existing and proposed geometries as well as the updated peak flows is included with this memo.

CUT AND FILL ANALYSIS

The idealized no culvert "baseline" condition is the focus of the cut and fill analysis for the subject site. Any fill placed within the backwater areas caused by the downstream culvert constriction at Highway 50 have been omitted for the purpose of this analysis, which is understood to be in line with the TRCA policies for this area.

Under proposed conditions, fill is proposed to increase the elevation of the banks along the site limits to lift the site above the floodplain providing a minimum of 0.30m of freeboard above the Regional water level, while cut is proposed at the bottom of the channel to create a more consistently sloping channel with defined low flow geometry. We understand that the finished floor elevation (FFE) of the proposed hotel will be at an elevation of at least 239.60 m, allowing for a minimum of 0.64 m of freeboard above the Regional flood elevation. Refer to **Figure 4** for an illustration of the proposed cut and fill areas, including provided cross-sections at each HEC-RAS River Station ID.

The grading plan maintains the existing drainage pattern and has no negative impact on the conveyance of the floodplain. The proposed channel grading has a maximum slope within the floodplain of 3:1 and does not utilize retaining walls.

The seven (7) proposed cross sections overlaid against the existing cross-sections are illustrated on all attached figures for reference. The incremental and cumulative cut and fill volumes under proposed conditions are summarized in **Table 5**.

Table 5 Incremental Cut/Fill Analysis Results

Elevation Increment (masl)	**Cumulative Cut/Fill Volume**		**Incremental Cut/Fill Volume**		
	Ex. Storage Volume (m^3)	**Prop. Storage Volume** (m^3)	**Ex. Incremental Storage Volume** (m^3)	**Prop. Incremental Storage Volume** (m^3)	**Fill in Floodplain*** (m^3)
236.8 to 237.1	4.88	7.76	4.88	7.76	-2.88
237.1 to 237.4	104.58	145.57	99.7	137.81	-38.11
237.4 to 237.7	505.05	533.35	400.47	387.78	12.69
237.7 to 238.0	1191.50	1171.69	686.45	638.34	48.11
238.0 to 238.3	2197.21	1975.29	1005.71	803.6	202.11
238.3 to 238.6	3310.26	2861.53	1113.05	886.24	226.81
238.6 to 239.76	3915.14	3338.75	604.88	477.22	127.66
				Total	**576.39**

* Negative value indicates cut.

Based on **Table 5**, the cumulative fill volume below the floodplain elevation is greater than the cumulative cut volume, resulting in increased floodplain storage volume under proposed conditions. In fact, the net cut and fill volume proposed is a fill of 576 m^3. In addition, the cut volume is proposed at lower elevations than the fill volume. As noted above, the filling activities proposed for this site fully respect the previously approved development limit for the subject lands as based on the accepted 15m valley corridor.

CONCLUSIONS AND RECOMMENDATIONS

The proposed grading design has no adverse impacts on water levels and channel velocities upstream or downstream of the subject property.

We trust that this analysis meets the TRCA requirements to support the proposed development of the site and recommend that the floodplain analysis contained in this memo is accepted such that the Owner can proceed with the Site Plan Application for the proposed works.

Please contact the undersigned if you have any questions.

Sincerely,

C.F. CROZIER & ASSOCIATES INC.

Isabelle Cléroux, E.I.T.
Land Development

C.F. CROZIER & ASSOCIATES INC.

Rebecca Archer, P.Eng.
Senior Project Engineer

Encl.

Figure 1 Hydrology Mapping
Figure 2 Floodplain Mapping – With Culvert
Figure 3 Floodplain Mapping – Without Culvert (Idealized)
Figure 4 Cut/Fill Mapping
As-Constructed Drawings for Highway 50
Photographs from the June 22, 2020 site walk
Farview Holdings Site Servicing and Grading Plan – TRCA Approved Drawing
Existing and Proposed Cross Sections (August 2020)
HEC-RAS Model Output Tables
Digital copy of the updated HEC-RAS Model
Digital copy of the updated Hydrology Model (Visual OTTHYMO)

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Town

No.	ISSUE	DATE: MM/DD/YYYY
0	ISSUED FOR TRCA APPROVAL	09/01/2020

Engineer

Engineer

Project
12476 REGIONAL ROAD 50
TOWN OF CALEDON

Drawing
STORM DRAINAGE PLAN

CROZIER CONSULTING ENGINEERS
57 John Street West
P.O. Box 1011
Bradford, ON L3Z 2B4
905-952-3111 T
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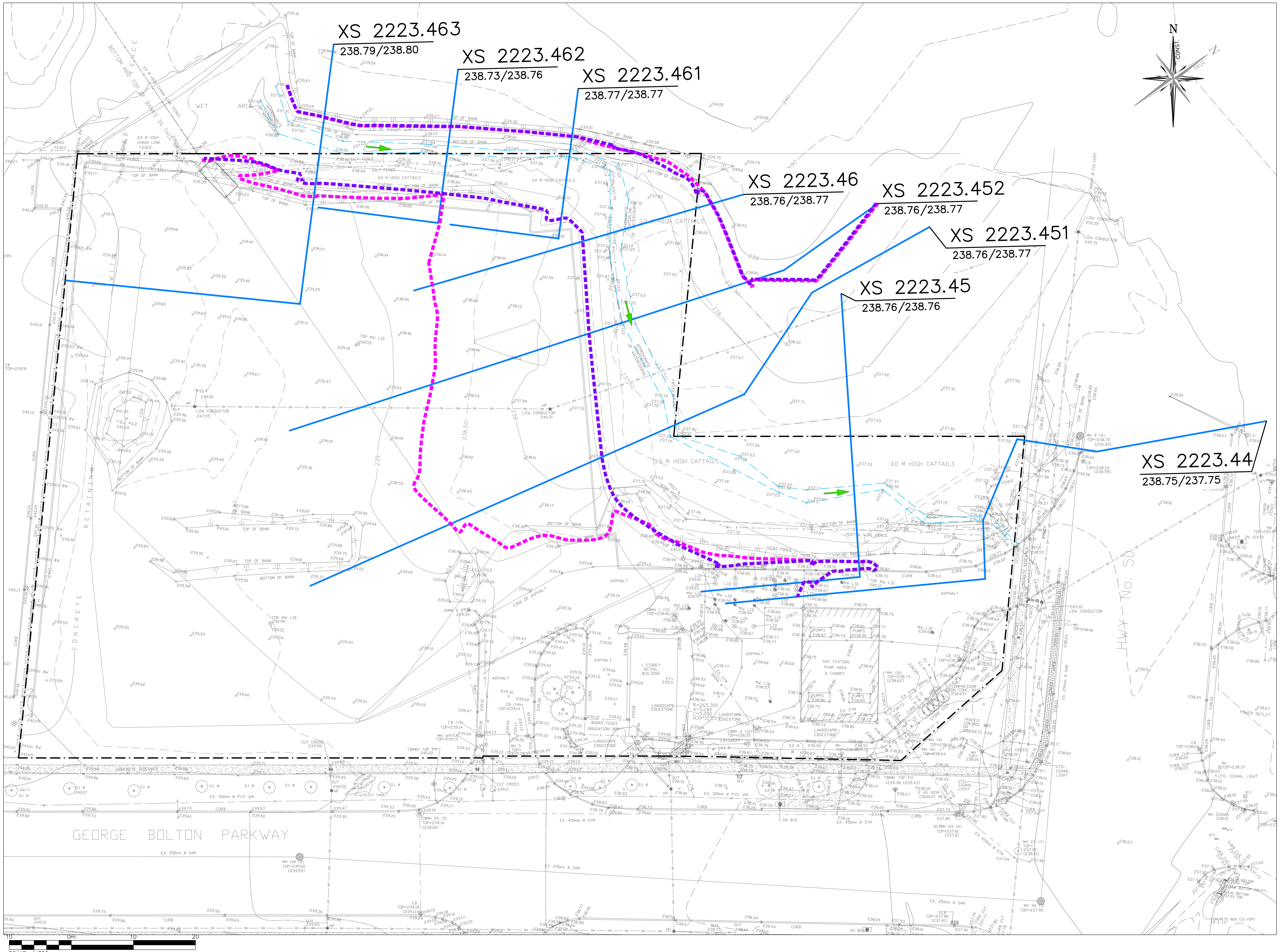
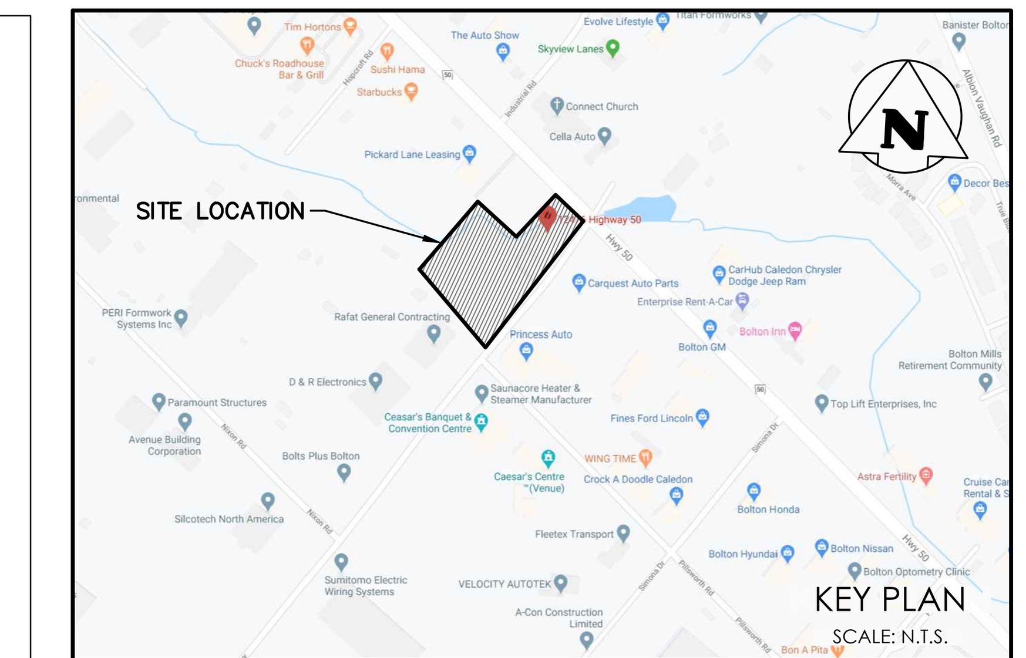
Drawn By	Design By	Project	
B.L.	B.L.	1716-5554	
Check By	Check By	Scale	Drawing
R.S.A.		1: 3000	FIG 1





LEGEND

— — · —	PROPERTY LINE
	EXISTING CONTOUR (0.5m)
	EXISTING CONTOUR (1.0m)
	EXISTING WATERCOURSE
	CROSS–SECTION
XS ID 215.00/215.00	CROSS–SECTION I.D. EX. REG. FLOODLINE WSEL W/ CULVERT (m) | PROP. REG. FLOODLINE WSEL W CULVERT (m)
	EXISTING REGULATORY FLOODLINE (WITH CULVERT)
	PROPOSED REGULATORY FLOODLINE (WITH CULVERT)

A	ISSUED FOR SUBMISSION	2020/AUG/24
No.	ISSUE / REVISION	YYYY/MMM/DD

ELEVATION NOTE:

ELEVATIONS SHOWN ON THIS PLAN ARE DERIVED FROM THE MINISTRY OF TRANSPORTATION BENCHMARK No. 758056
ELEVATION = 000.000m

LOCAL BENCHMARK:

TBM1 = CUT CROSS IN SIDEWALK
ELEVATION = 239.58m

TBM1 = CUT CROSS IN SIDEWALK
ELEVATION = 239.59m

SURVEY NOTES:

PRELIMINARY SURVEY COMPLETED BY VAN HARTEN SURVEYING INC.. (2020/MAY/06)

BEARINGS ARE UTM GRID, DERIVED FROM RTN OBSERVATIONS
UTM ZONE 17, NAD83 (GSRS) (2010.0)

DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.9996781

SITE PLAN NOTES:

DESIGN ELEMENTS ARE BASED ON SITE PLAN BY ANTRIX ARCHITECTS INC.

DRAWING NOTES:

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Stamp

Stamp

Project
12476 HWY 50
TOWN OF BOLTON, ON

Drawing
FLOODPLAIN MAPPING – WITH CULVERT

CROZIER
CONSULTING ENGINEERS
211 YONGE STREET
SUITE 301
TORONTO, ON M5B 1M4
416-477-3392 T
WWW.CFCROZIER.CA

Drawn B.L.	Design I.C.	Project No.	1716–5554
Check R.A.	Check D.W.	Scale 1: 300	Dwg. FIG 2.

XS 2223.463
238.76/238.70

XS 2223.462
238.47/238.40

XS 2223.461
238.32/238.32

XS 2223.46
238.23/238.27

XS 2223.452
238.20/238.25

XS 2223.451
238.20/238.25

XS 2223.45
238.16/238.21

XS 2223.44
238.91/237.92

GEORGE BOLTON PARKWAY

HWY No. 50

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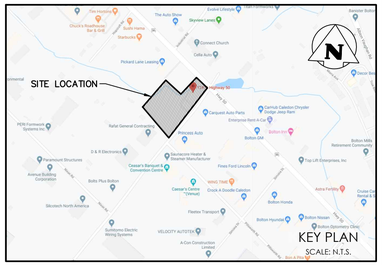

LEGEND

- PROPERTY LINE
- EXISTING CONTOUR (0.5m)
- EXISTING CONTOUR (1.0m)
- PROPOSED WATERCOURSE
- PROPOSED 3:1 GRADING
- CROSS-SECTION
- XS ID — CROSS-SECTION I.D.
- 215.00/215.00 — EX. REG. FLOODLINE WSEL W/O CULVERT (m) | PROP. REG. FLOODLINE WSEL W/O CULVERT (m)
- EXISTING REGULATORY FLOODLINE (WITHOUT CULVERT)
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Stamp | Stamp

Project
12476 HWY 50
TOWN OF BOLTON, ON

Drawing
FLOODPLAIN MAPPING – WITHOUT CULVERT

CROZIER CONSULTING ENGINEERS
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Drawn	Design	Project No.	
B.L.	I.C.	1716–5554	
Check	Check	Scale	Dwg.
R.A.	D.W.	1: 300	FIG 3.

2223.463

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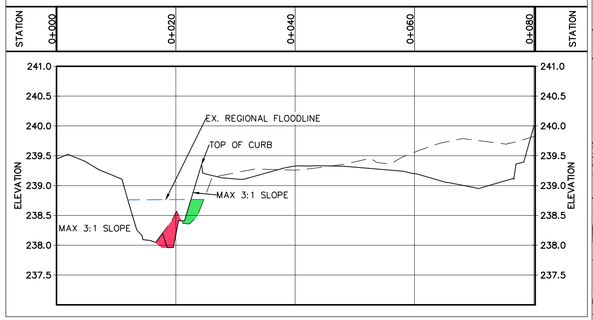

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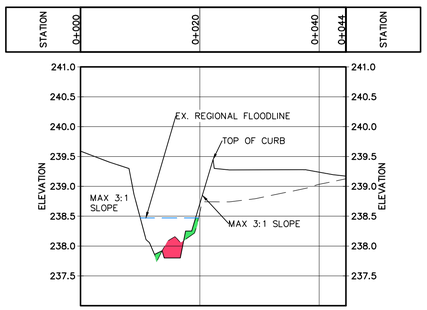

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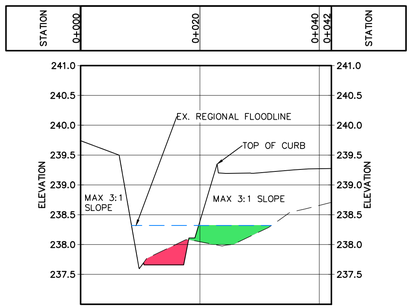
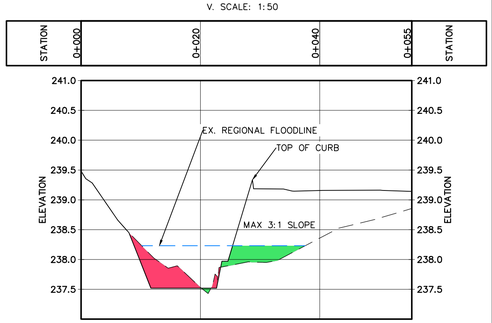
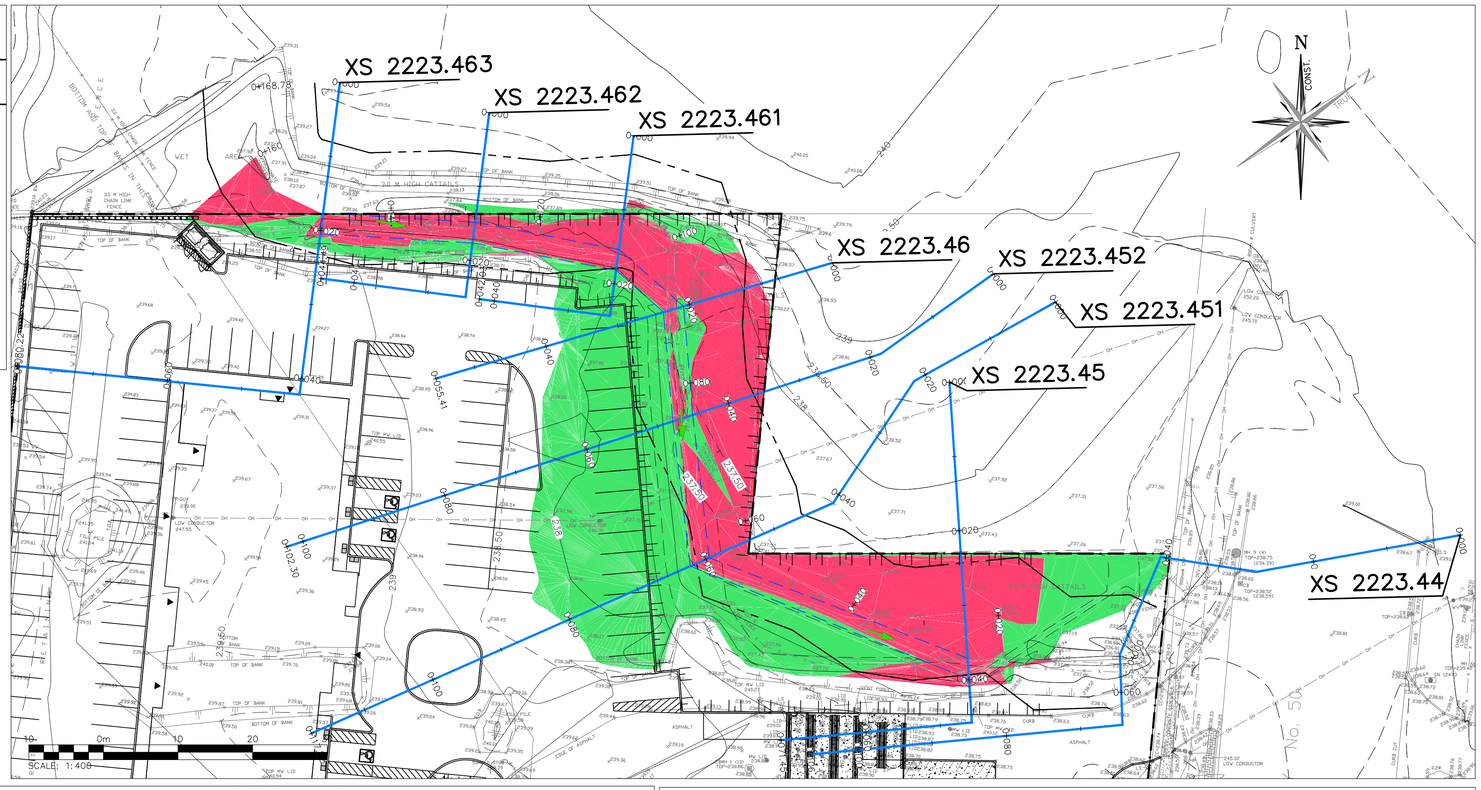


2223.46

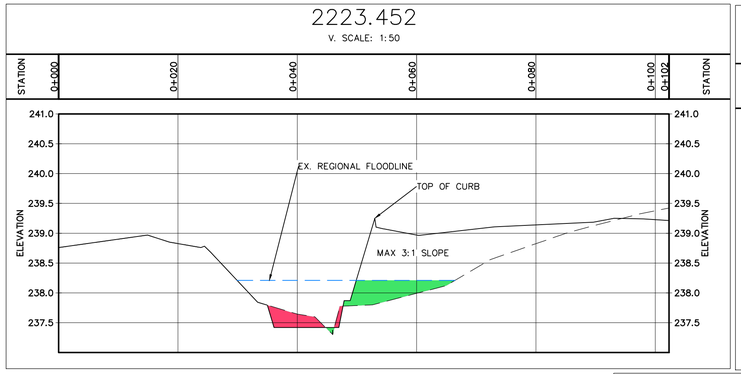
V. SCALE: 1:50





2223.452

V. SCALE: 1:50



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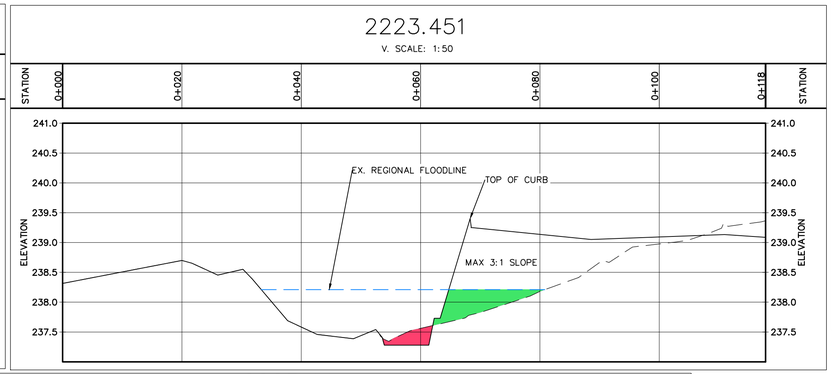

2223.45

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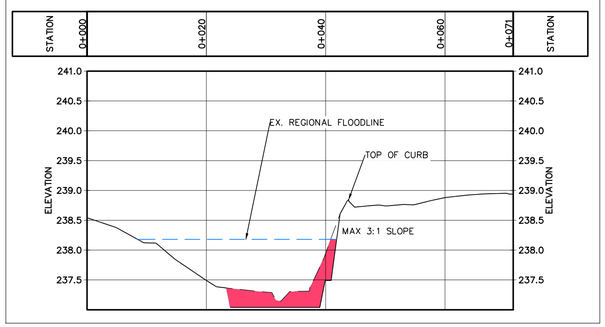
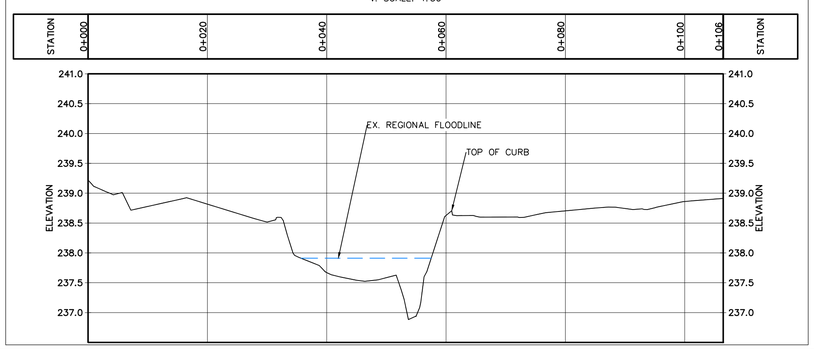
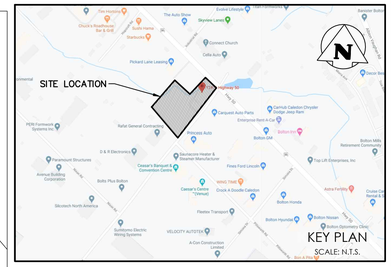


2223.44

V. SCALE: 1:50





LEGEND

- PROPERTY LINE
- EXISTING CONTOUR (0.5m)
- EXISTING CONTOUR (1.0m)
- PROPOSED WATERCOURSE
- PROPOSED 3:1 GRADING
- CROSS-SECTION
- XS ID — CROSS-SECTION I.D.
- PROPOSED CUT AREA
- PROPOSED FILL AREA
- EXISTING PROFILE
- PROPOSED PROFILE

No.	ISSUE / REVISION	YYYY/MMM/DD
A	ISSUED FOR SUBMISSION	2020/AUG/24

ELEVATION NOTE:

ELEVATIONS SHOWN ON THIS PLAN ARE DERIVED FROM THE MINISTRY OF TRANSPORTATION BENCHMARK No. 758056
ELEVATION = 000.000m

LOCAL BENCHMARK:

TBM1 = CUT CROSS IN SIDEWALK
ELEVATION = 239.58m

TBM1 = CUT CROSS IN SIDEWALK
ELEVATION = 239.59m

SURVEY NOTES:

PRELIMINARY SURVEY COMPLETED BY VAN HARTEN SURVEYING INC., (2020/MAY/06)

BEARINGS ARE UTM GRID, DERIVED FROM RTN OBSERVATIONS
UTM ZONE 17, NAD83 (GSRS) (2010.0)

DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.9996781

SITE PLAN NOTES:

DESIGN ELEMENTS ARE BASED ON SITE PLAN BY ANTRIX ARCHITECTS INC.

DRAWING NOTES:

THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, LEVELS, AND DATUMS ON SITE AND REPORT ANY DISCREPANCIES OR OMISSIONS TO THIS OFFICE PRIOR TO CONSTRUCTION.

THIS DRAWING IS TO BE READ AND UNDERSTOOD IN CONJUNCTION WITH ALL OTHER PLANS AND DOCUMENTS APPLICABLE TO THIS PROJECT. DO NOT SCALE THIS DRAWING.

ALL EXISTING UNDERGROUND UTILITIES TO BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO CONSTRUCTION.

Stamp | Stamp

Project

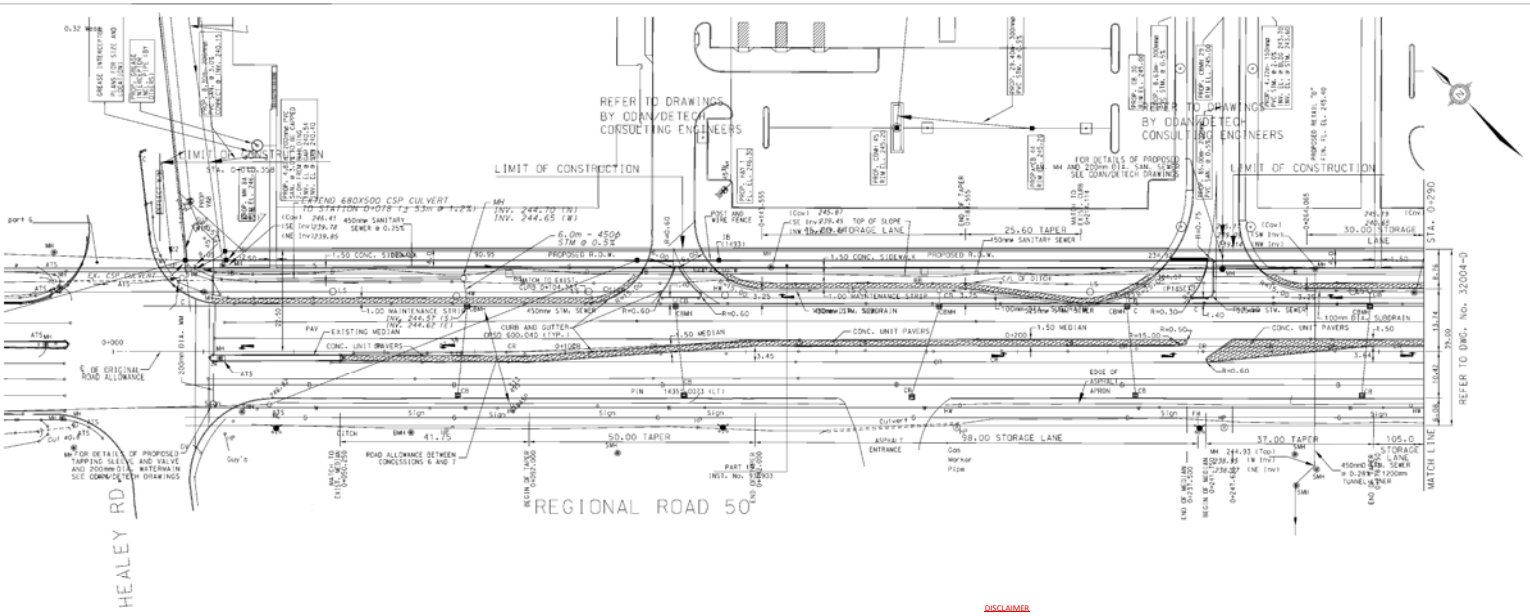
12476 HWY 50
TOWN OF BOLTON, ON

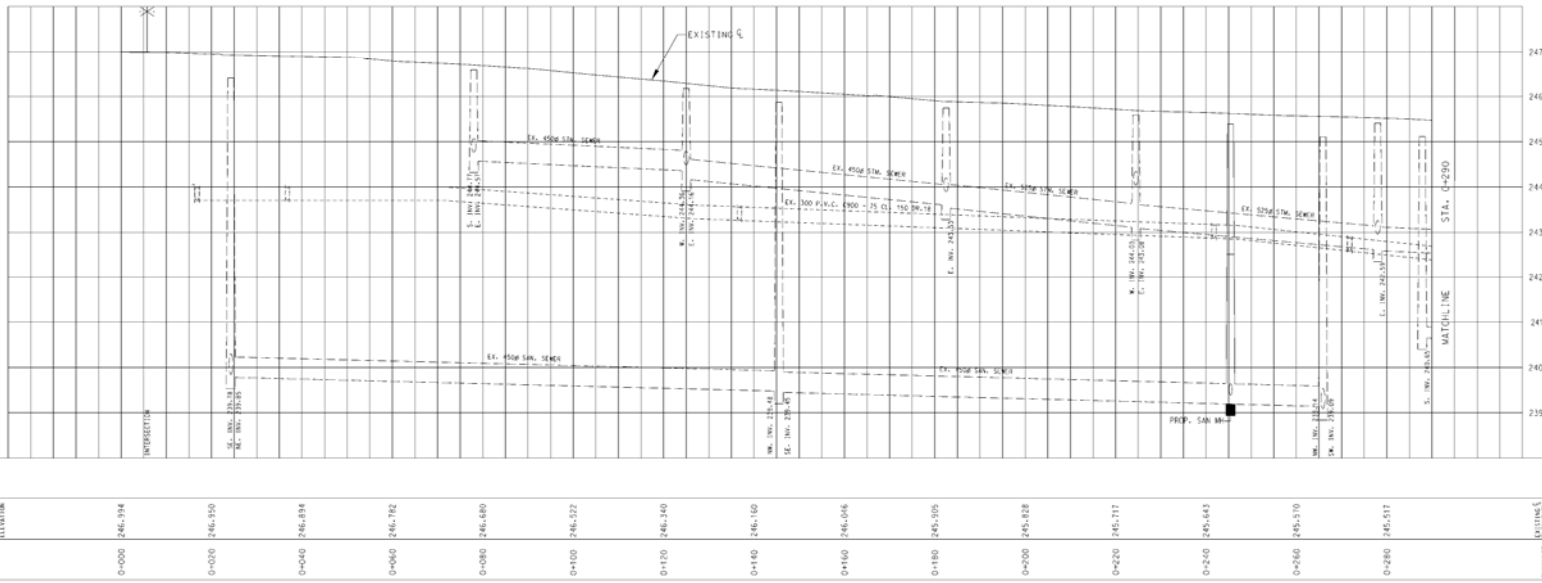
Drawing

CUT/FILL MAPPING

CROZIER CONSULTING ENGINEERS
211 YONGE STREET
SUITE 301
TORONTO, ON M5B 1M4
416-477-3392 T
WWW.CFCROZIER.CA

Drawn	B.L.	Design	I.C.	Project No.	1716-5554
Check	R.A.	Check	D.W.	Scale 1:500	Dwg. FIG 4.

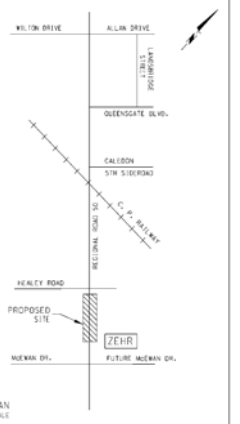




EXISTING ELEVATION	246.994	246.950	246.894	246.782	246.680	246.522	246.340	246.160	246.046	245.909	245.828	245.717	245.643	245.570	245.517	EXISTING ELEVATION
DRAWING	0+000	0+020	0+040	0+060	0+080	0+100	0+120	0+140	0+160	0+180	0+200	0+220	0+240	0+260	0+280	DRAWING

REVISIONS

DATE	DETAILS	INIT.
FEB. 07/05	AS CONSTRUCTED	



KEY PLAN
NOT TO SCALE

GENERAL NOTES:

THE POSITION OF POLE LINES, CONDUITS, WATERMAINS, SEWERS AND UNDERGROUND AND ABOVE GROUND UTILITIES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING THE WORK THE CONTRACTOR SHALL INFORM HIMSELF OF THE EXACT LOCATION OF ALL UTILITIES AND STRUCTURES, AND SHALL ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

EXISTING TOPOGRAPHICAL INFORMATION SUPPLIED BY SPEIGHT, VAN NOSTRAND & GIBSON LTD.

BOUNDARY DATA DERIVED FROM INFORMATION FROM SPEIGHT, VAN NOSTRAND GIBSON LTD.

CONTRACTOR TO PROVIDE AS-BUILT DRAWINGS UPON COMPLETION OF ALL WORKS TO THE ENGINEER.

LEGEND:

DISCLAIMER

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The Region of Peel disclaims any responsibility should these records be relied upon to the detriment of any person.

NOTE:
SIDEWALK RAMPS TO BE PROVIDED AT ENTRANCES.

BENCH MARK No. 758056

CONCRETE BRIDGE CARRYING HWY. 50 OVER C.P.R., 2.0 km SOUTH OF JCT OF HWY. 50 AND KING ST. IN THE TOWN OF CALEDON (BOLTON) AND 0.4 km NORTH OF SOUTH JCT OF HWY. 50 AND HEALEY RD. TABLET IS SET HORIZONTALLY IN N.E. FACE OF FOOTING OF PIER COLUMN 12ND S.E. SOUTH OF TRACKS, 1.4 m BELOW TOP OF FOOTING, 1.8 m S.E. OF N.W. END, 73 cm ABOVE GROUND LEVEL AND 4.3 m EAST OF CENTRELINE OF HWY. 50. HAVING A PUBLISHED ELEVATION OF 251.263 metres.

625 Cochrane Drive, Suite 500
Markham, Ontario
L3R 9R9, Canada
Tel: (905) 470-8015, Fax: (905) 470-1030

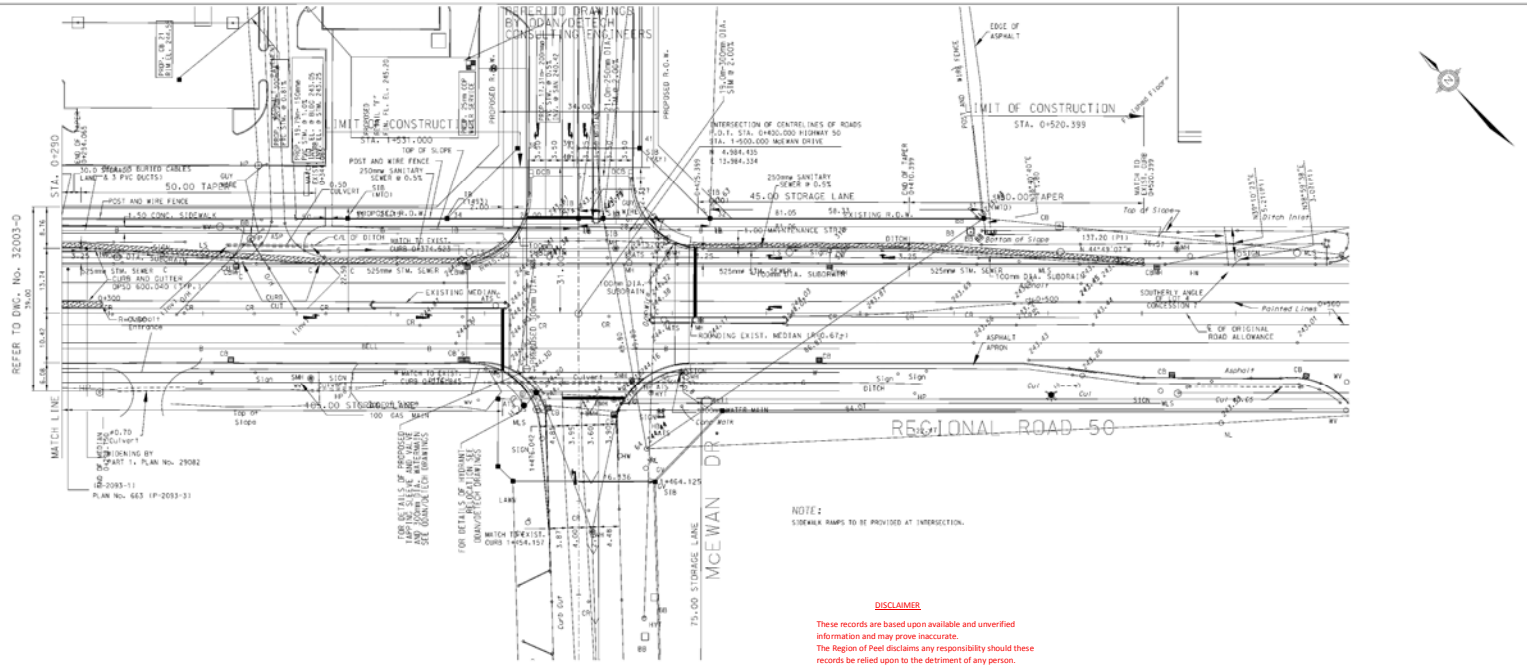
LEA Consulting Ltd.
Consulting Engineers and Planners
www.lea.ca

Region of Peel
Public Works

REGION FILE: D-50143E

REGIONAL ROAD 50
PLAN AND PROFILE
STA. 0+000 TO STA. 0+290

SCALE	HOR. 1:500 VERT. 1:50	AREA		PROJECT No. 2194
DESIGNED BY	PL	CHECKED BY	PK	DRAWING No. 32003-D
DATE	OCT. 25, 2002	SHEET	2 OF 9	



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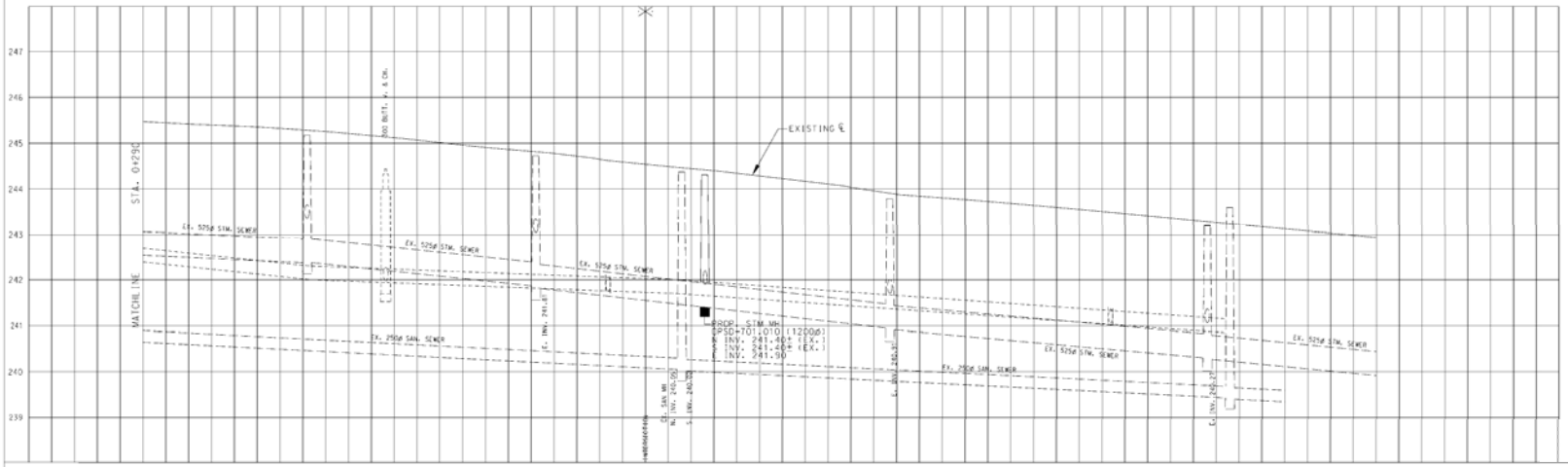
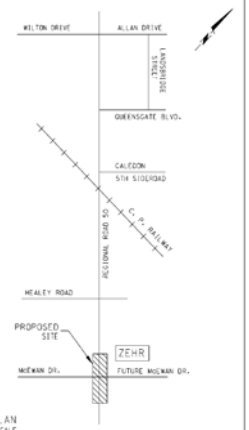


EXISTING ℄ ELEVATION	245.420	245.323	245.165	244.960	244.777	244.541	244.345	244.109	243.843	243.684	243.506	243.317	243.121	242.938	EXISTING ℄ ELEVATION
CHAINAGE	0+300	0+320	0+340	0+360	0+380	0+400	0+420	0+440	0+460	0+480	0+500	0+520	0+540	0+560	CHAINAGE

REVISIONS

DATE	DETAILS	INIT.
FEB. 07/05	AS CONSTRUCTED	



KEY PLAN
NOT TO SCALE

GENERAL NOTES:

THE POSITION OF POLE LINES, CONDUITS, WATERMAINS, SEWERS AND UNDERGROUND AND ABOVE GROUND UTILITIES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING THE WORK THE CONTRACTOR SHALL INFORM HIMSELF OF THE EXACT LOCATION OF ALL UTILITIES AND STRUCTURES, AND SHALL ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

EXISTING TOPOGRAPHICAL INFORMATION SUPPLIED BY SPEIGHT, VAN NOSTRAND & GIBSON LTD.

BOUNDARY DATA DERIVED FROM INFORMATION FROM SPEIGHT, VAN NOSTRAND GIBSON LTD.

CONTRACTOR TO PROVIDE AS-BUILT DRAWINGS UPON COMPLETION OF ALL WORKS TO THE ENGINEER.

LEGEND:

BENCH MARK No. 758056

CONCRETE BRIDGE CARRYING HWY. 50 OVER C.P.R., 2.0 km SOUTH OF JCT OF HWY. 50 AND KING ST. IN THE TOWN OF CALEDON (EGLINTON) AND 0.4 km NORTH OF SOUTH JCT OF HWY. 50 AND HEALEY RD. TABLET IS SET HORIZONTALLY IN N.E. FACE OF FOOTING OF PIER COLUMN 1 2ND S.E. SOUTH OF TRACKS, 1.4 m BELOW TOP OF FOOTING, 1.8 m S.L. OF N.W. END, 73 cm ABOVE GROUND LEVEL AND 4.3 km EAST OF CENTRELINE OF HWY. 50. HAVING A PUBLISHED ELEVATION OF 257.263 metres.

625 Cochrane Drive Suite 900
Markham, Ontario
L3R 9R9, Canada
Tel: (905) 470-0015, Fax: (905) 470-0030

EA Consulting Ltd.
Consulting Engineers and Planners
www.ealtd.ca

Region of Peel
Public Works

REGION FILE: D-50143E

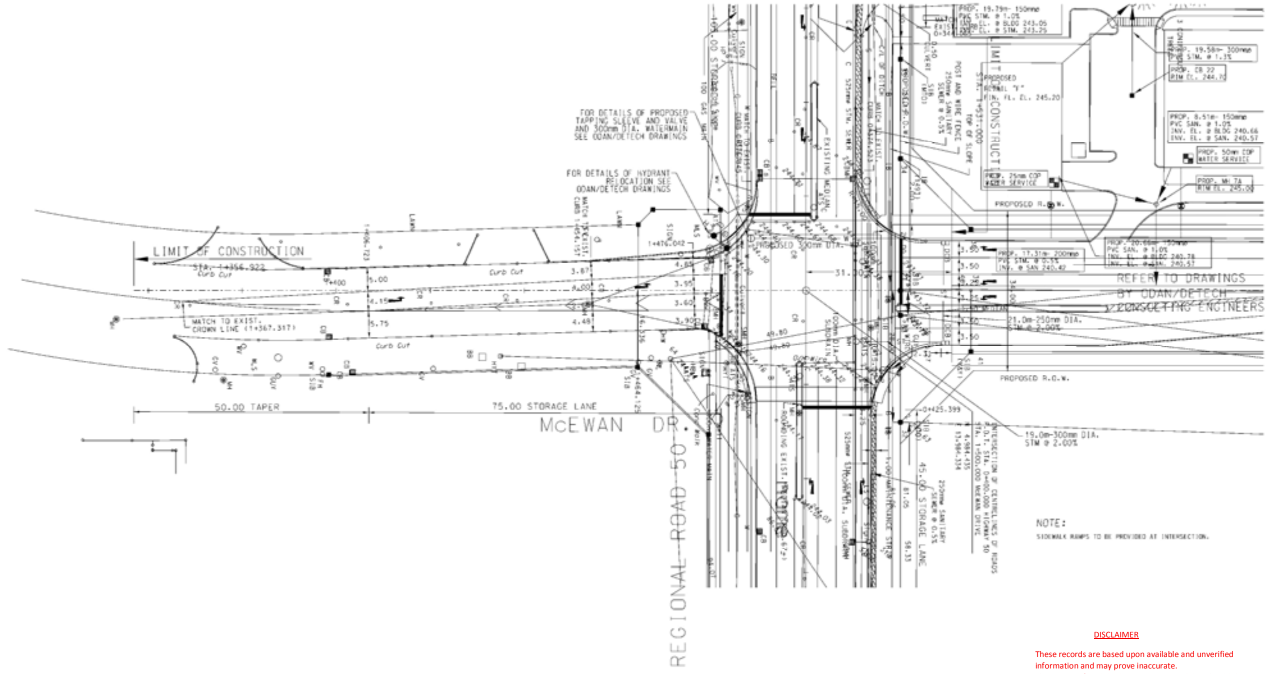
REGIONAL ROAD 50

PLAN AND PROFILE

STA. 0+290 TO STA. 0+560

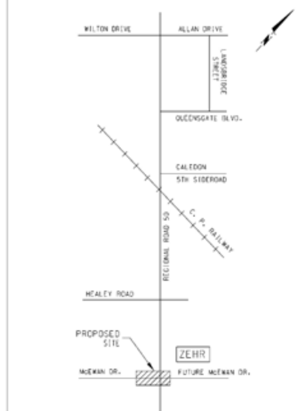
SCALE: HOR. 1:500, VERT. 1:50	AREA	PROJECT No.	2194
DESIGNED BY: PL	CHECKED BY: PK	DRAWING No.	32004-D
DATE: OCT. 23, 2003	SHEET 3 of 9		

REVISIONS		
DATE	DETAILS	INT.
FEB. 07/05	AS CONSTRUCTED	



LIMIT OF CONSTRUCTION
50.00 TAPER
75.00 STORAGE LANE
McEWAN DR.
REGIONAL ROAD 50
REFER TO DRAWINGS BY ODAN/DETECH CONSULTING ENGINEERS
FOR DETAILS OF PROPOSED TAPPING SLEEVE AND VALVE AND 300mm DIA. WATERMAIN SEE ODAN/DETECH DRAWINGS
FOR DETAILS OF HYDRANT RELOCATION SEE ODAN/DETECH DRAWINGS
PROPOSED R.O.W.

NOTE:
SIDEWALK RAMPS TO BE PROVIDED AT INTERSECTION.



KEY PLAN
NOT TO SCALE

GENERAL NOTES:

THE POSITION OF POLE LINES, CONDUITS, WATERMAINS, SEWERS AND UNDERGROUND AND ABOVE GROUND UTILITIES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING THE WORK THE CONTRACTOR SHALL INFORM HIMSELF OF THE EXACT LOCATION OF ALL UTILITIES AND STRUCTURES, AND SHALL ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

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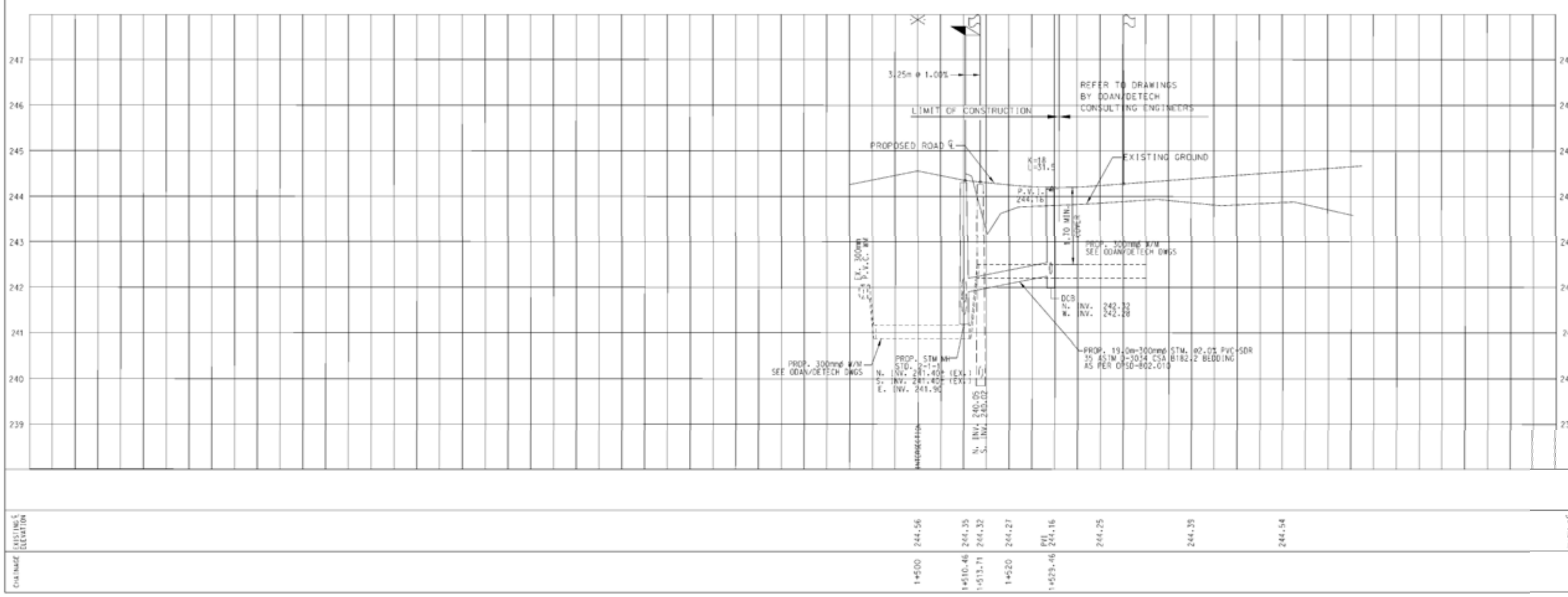
BOUNDARY DATA DERIVED FROM INFORMATION FROM SPEIGHT, VAN NOSTRAND GIBSON LTD.

CONTRACTOR TO PROVIDE AS-BUILT DRAWINGS UPON COMPLETION OF ALL WORKS TO THE ENGINEER.

LEGEND:



3.25m @ 1.00%
REFER TO DRAWINGS BY ODAN/DETECH CONSULTING ENGINEERS
LIMIT OF CONSTRUCTION
PROPOSED ROAD ℄
EXISTING GROUND
PROP. 300mmø W/M SEE ODAN/DETECH DWGS
PROP. 19.0m-300mmø STM. @2.0% PVC-SDR 35 ASTM D-3034 CSA B182.2 BEDDING AS PER OPSD-802.010
EXISTING ELEVATION
CHAINAGE
244.56
244.35
244.32
244.27
244.16
244.25
244.39
244.54
1+500
1+510.46
1+513.71
1+520
1+529.46

BENCH MARK No. 758056

CONCRETE BRIDGE CARRYING HWY. 50 OVER C.P.R., 2.0 km SOUTH OF JCT OF HWY. 50 AND KING ST. IN THE TOWN OF CALEDON (BOLTON) AND 0.4 km NORTH OF SOUTH JCT OF HWY. 50 AND HEALEY RD. TABLET IS SET HORIZONTALLY IN N.E. FACE OF FOOTING OF PIER COLUMN (2ND S.E. SOUTH OF TRACKS), 1.4 m BELOW TOP OF FOOTING, 1.8 m S.E. OF N.W. END, 73 cm ABOVE GROUND LEVEL AND 4.3 km EAST OF CENTRELINE OF HWY. 50. HAVING A PUBLISHED ELEVATION OF 251.263 metres.

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LEA Consulting Ltd.
Consulting Engineers and Planners
www.LEA.ca

Region of Peel
Public Works

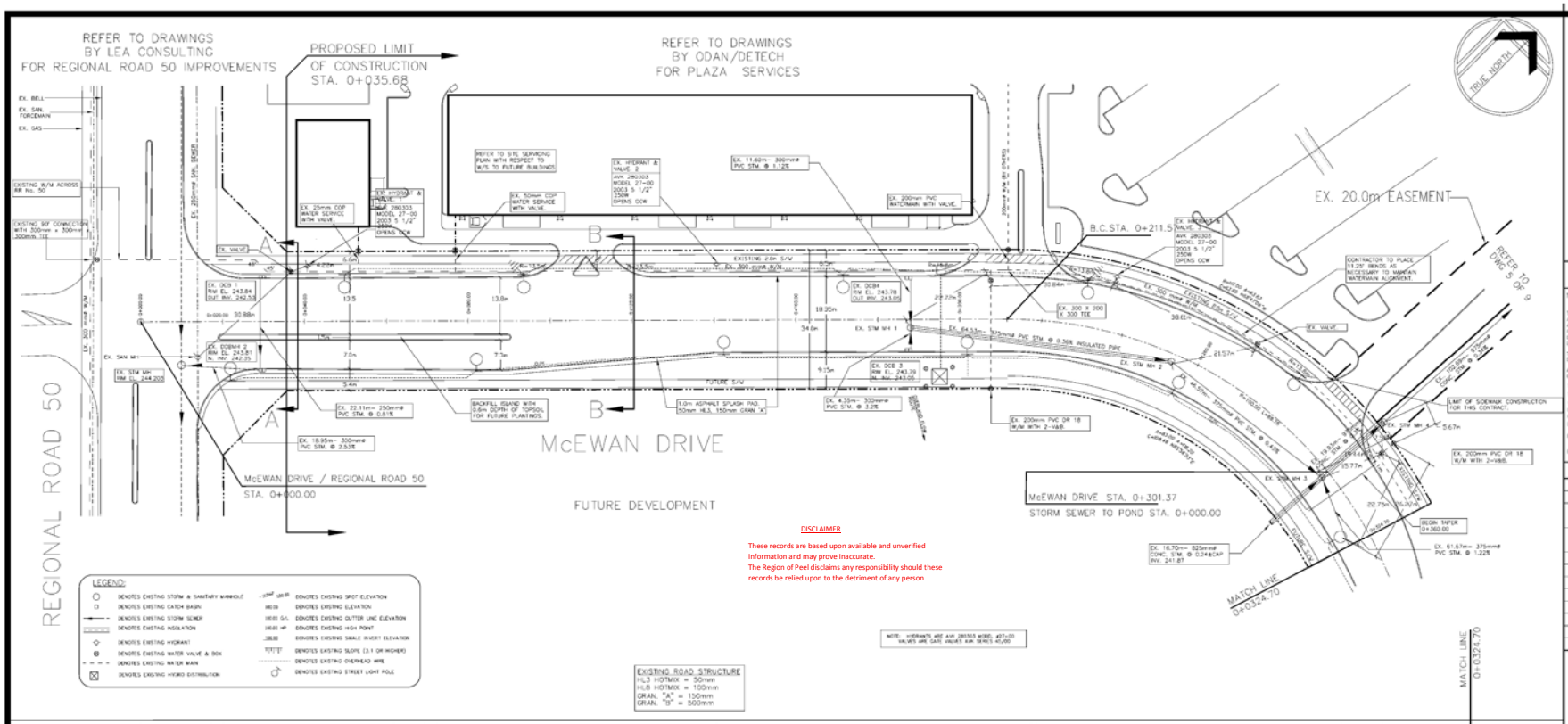
REGION FILE: D-50143E

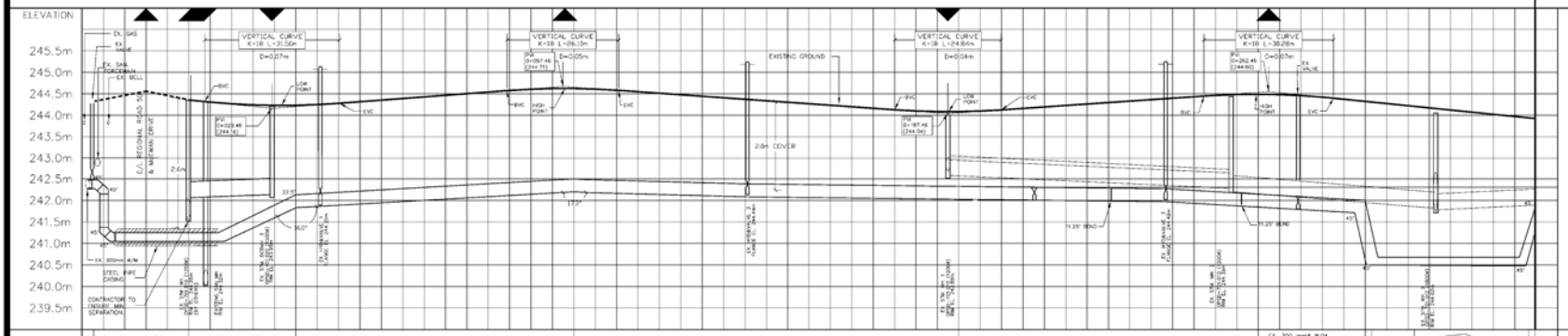
McEWAN DRIVE

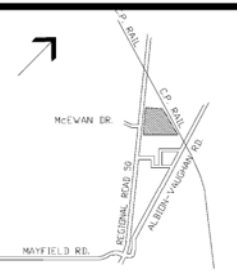
PLAN AND PROFILE

STA. 0+000 TO STA. 0+031

SCALE HOR. 1:500 VERT. 1:50	AREA	PROJECT No. 2194	
DESIGNED BY PL	CHECKED BY PK	DRAWING No. 32005-D	
DATE OCT. 23, 2002	SHEET 4 of 9		







KEY PLAN Scale : N.T.S.

SUBJECT LANDS

NOTE :

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THE CONTRACTOR MUST CHECK AND VERIFY ALL DIMENSIONS ON THE JOB AND REPORT ANY DISCREPANCY TO THE ARCHITECTS/ENGINEERS BEFORE PROCEEDING WITH THE WORKS.

ALL DRAWINGS AND SPECIFICATIONS ARE INSTRUMENTS OF SERVICE AND THE PROPERTY OF THE ENGINEER WHICH MUST BE RETURNED AT THE COMPLETION OF WORK.

THIS DRAWING IS NOT TO BE SCALED.

THIS PLAN MUST NOT BE USED TO SITE THE PROPOSED BUILDINGS.

THE APPROVAL OF THIS PLAN DOES NOT EXEMPT THE OWNER'S CONTRACTOR FROM OBTAINING, BUT NOT LIMITED TO THE FOLLOWING PERMITS: ROAD CUT, SEWER PERMITS, RELOCATION OF SERVICES, ENCROACHMENT AGREEMENTS, APPROACH APPROVAL PERMITS, ETC.

EXISTING TOPOGRAPHICAL INFORMATION SUPPLIED BY SPEIGHT, VAN NOSTRAND & GIBSON LTD.

BOUNDARY DATA DERIVED FROM INFORMATION FROM SPEIGHT, VAN NOSTRAND GIBSON LTD.

NO.	REVISIONS	DATE	BY
10	AS-BUILT PLANS REVISED AS PER REGION OF PEEL COMMENTS	JULY 29/09	F.P.B.
9	AS-BUILT PLANS REVISED AS PER REGION OF PEEL COMMENTS	JUNE 3/09	F.P.B.
8	AS-BUILT CONDITIONS	SEPT 7/05	F.P.B.
7	CURB ALIGNMENT ADJUSTED	NOV 6/03	KO
6	REGION COMMENTS	OCT 16/03	KO
5	AS PER REGION & TOWN COMMENTS	JUN. 13/03	KO
4	ISSUED FOR TENDER	APR. 23/03	KO
3	AS PER REGION & TOWN COMMENTS	APR. 14/03	KO
2	AS PER NEW SITE PLAN	FEB. 19/03	KO
1	AS PER REGION & TOWN COMMENTS	JAN. 22/03	KO

APPROVED FOR CONSTRUCTION

THIS APPROVAL CONSTITUTES A GENERAL REVIEW AND DOES NOT CERTIFY DIMENSIONAL ACCURACY

THIS APPROVAL IS SUBJECT TO THE FURTHER CERTIFICATION OF THE "AS CONSTRUCTED" WORKS BY A REGISTERED PROFESSIONAL ENGINEER OF THE PROVINCE OF ONTARIO

DATE: _____ APPROVED BY: _____ H. MUNTZ, P.ENG. TOWN ENGINEER

BENCH MARK:

ELEVATIONS ARE BASED ON THE CANADIAN GEODETIC DATUM AND WERE DERIVED FROM TOWN OF CALEDON BENCH MARK 758056, HAVING A PUBLISHED ELEVATION OF 251.243m.

METRIC NOTE:

DISTANCES AND ELEVATIONS ON THIS PLAN ARE SHOWN IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

REGISTERED PROFESSIONAL ENGINEER I. KRPAN APPROVED ONTARIO

PROJECT: McEWAN DRIVE EXTENSION BOLTON, ONTARIO

CONSULTANT: ODAN/DETECH

THE ODAN/DETECH GROUP · CONSULTING ENGINEERS
9230 SOUTH SERVICE ROAD, BURLINGTON, ONTARIO L7L 5K2
OFF: (905) 632-3811 FAX: (905) 632-3363

REGION OF PEEL

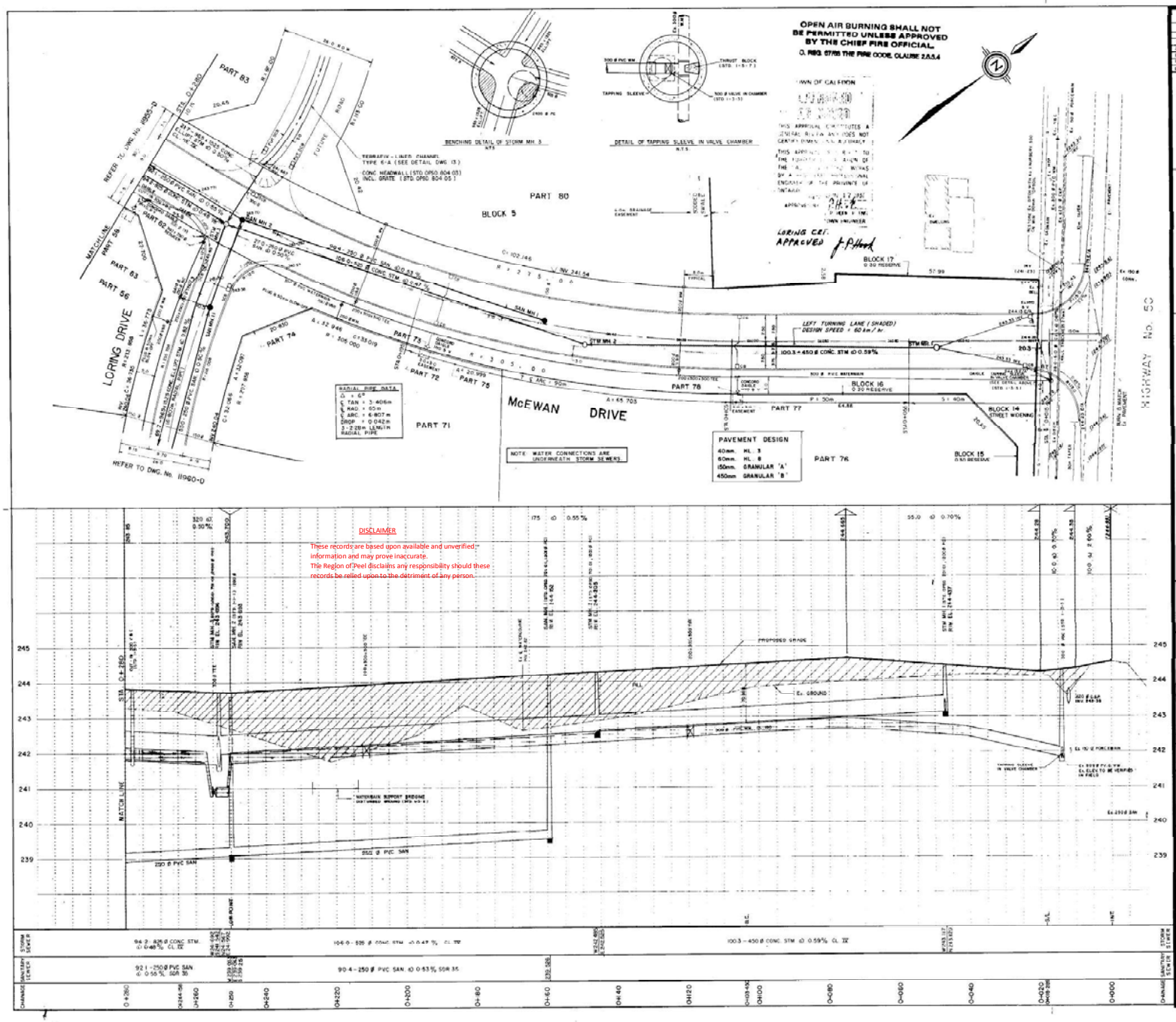
REGION # CO1.303

TOWN OF CALEDON

DRAWING: PLAN & PROFILE FOR McEWAN DRIVE AS-BUILT CONDITIONS STA. 0+000.00 TO STA. 0+324.70

REGION FILE No. D-5014.3E

SCALE : 1:500 HORIZ. 1:50 VERT.		PROJ. NO.: 00260
DESIGN BY: J.K.	DRAWN BY: K.O.	DRWG. NO.: 38829-D
CHECKED BY: D.C.S.	DATE: OCTOBER 2002	



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REVISIONS

DATE	DETAILS	INI
AUG 5/87	ADDED WATER CONNECTIONS	
SEPT 8/87	ADDED STREET 'A' AND SERVICING	
APRIL 18/88	REVISED LOTTING AS PER 43R-15326 JAN. 8/88	
MAY 5/88	REVISED STM. SEWER LORING CT.	
FEB 20/89	"AS CONSTRUCTED" STORM AND SANITARY	J. S.
DEC / 89	AS CONSTRUCTED	S.C.

BENCH MARK

M.T.C. PRECISE BENCH MARK No. 758056 ELEVATION 251.263
TABLET IS SET HORIZONTALLY IN N.E. FACE OF PIER OF BRIDGE (2nd SET S.OFTRACK) 14m BELOW TOP OF FOOTING 18m S.E. OF N.W. END, 73m ABOVE GROUND LEVEL AND 4.3m E. OF ℄ OF HWY. 50, NORTH OF HEALY ROAD.

EMC DWG. NO. 87112-7

EMC GROUP LIMITED
Consulting Engineers and Project Managers

BOLTON INDUSTRIAL PARK

J.N.G. Coast Development Ltd.

TOWN OF CALEDON
REGION of PEEL

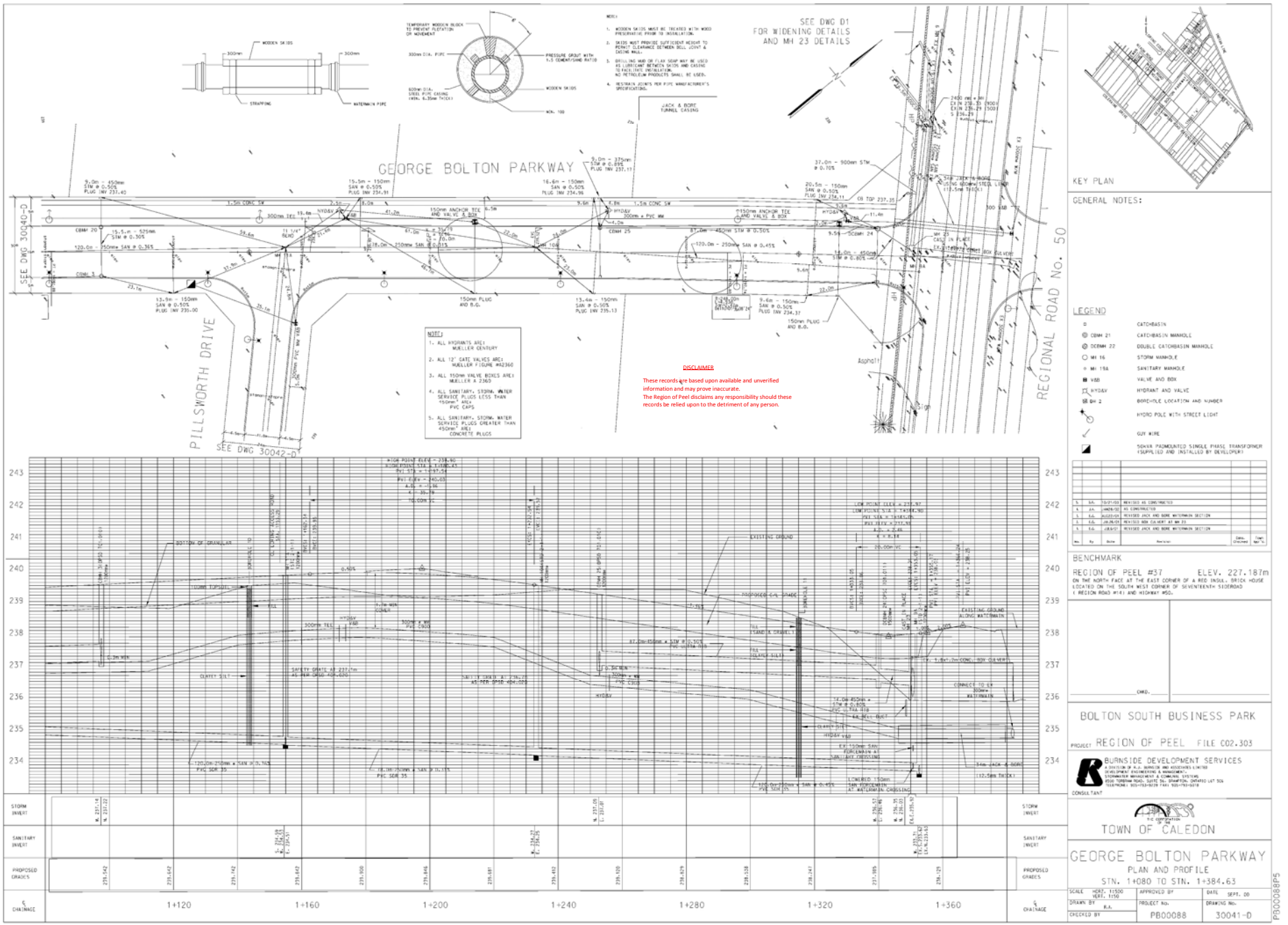
21T- 75292

McEWAN DRIVE

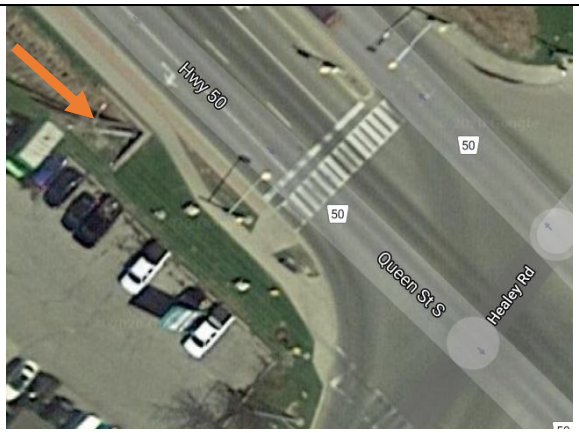
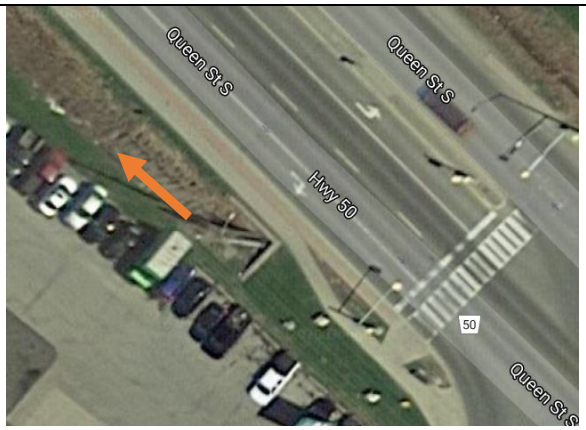
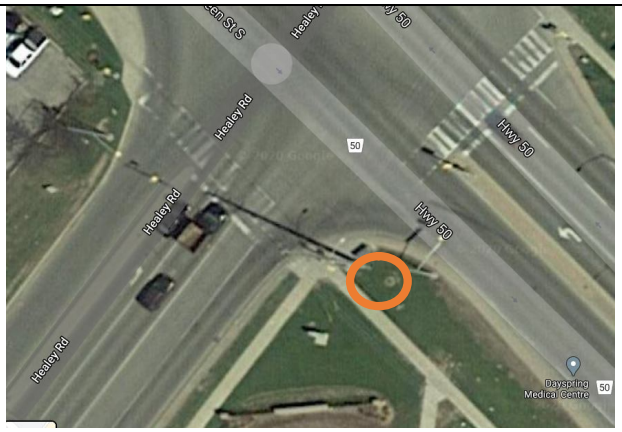
STN 0+000 TO STN 0+280

SCALE	HOR. 1:500 VERT. 1:50	AREA	PROJECT No. 8782
DRAWN BY PM/FB	CHECKED BY PC		PLAN No. 11954-D
DATE APRIL, 1987	SHEET OF		

11954-D


GEORGE BOLTON PARKWAY
PILLSWORTH DRIVE
REGIONAL ROAD No. 50
SEE DWG 30040-D
SEE DWG 30042-D
SEE DWG 01 FOR WIDENING DETAILS AND MH 23 DETAILS
JACK & BORE TUNNEL CASING
KEY PLAN
GENERAL NOTES:
LEGEND
CATCHBASIN
CBMH 21 CATCHBASIN MANHOLE
DCBMH 22 DOUBLE CATCHBASIN MANHOLE
MH 16 STORM MANHOLE
MH 19A SANITARY MANHOLE
VSB VALVE AND BOX
HYDAV HYDRANT AND VALVE
BH 2 BOREHOLE LOCATION AND NUMBER
HYDRO POLE WITH STREET LIGHT
GUY WIRE
50KVA PADMOUNTED SINGLE PHASE TRANSFORMER (SUPPLIED AND INSTALLED BY DEVELOPER)
NOTE:
1. ALL HYDRANTS ARE: MUELLER CENTURY
2. ALL 12" GATE VALVES ARE: MUELLER FIGURE #A2360
3. ALL 150mm VALVE BOXES ARE: MUELLER A 2360
4. ALL SANITARY, STORM, WATER SERVICE PLUGS LESS THAN 150mm² ARE: PVC CAPS
5. ALL SANITARY, STORM, WATER SERVICE PLUGS GREATER THAN 450mm² ARE: CONCRETE PLUGS
DISCLAIMER
These records are based upon available and unverified information and may prove inaccurate.
The Region of Peel disclaims any responsibility should these records be relied upon to the detriment of any person.
BENCHMARK
REGION OF PEEL #37 ELEV. 227.187m
ON THE NORTH FACE AT THE EAST CORNER OF A RED INSUL. BRICK HOUSE LOCATED ON THE SOUTH WEST CORNER OF SEVENTEENTH SIDEROAD (REGION ROAD #14) AND HIGHWAY #50.
BOLTON SOUTH BUSINESS PARK
PROJECT REGION OF PEEL FILE C02.303
BURNSIDE DEVELOPMENT SERVICES
CONSULTANT
TOWN OF CALEDON
GEORGE BOLTON PARKWAY
PLAN AND PROFILE
STN. 1+080 TO STN. 1+384.63
SCALE HORZ. 1:500 VERT. 1:50
DRAWN BY R.A.
CHECKED BY
APPROVED BY
DATE SEPT. 00
PROJECT No. PB00088
DRAWING No. 30041-D
PB00088P5
STORM INVERT
SANITARY INVERT
PROPOSED GRADES
℄ CHAINAGE
1+120
1+160
1+200
1+240
1+280
1+320
1+360

PHOTOGRAPHS OF UPSTREAM DRAINAGE (June 22, 2020)

Photograph	Location
	
	
	

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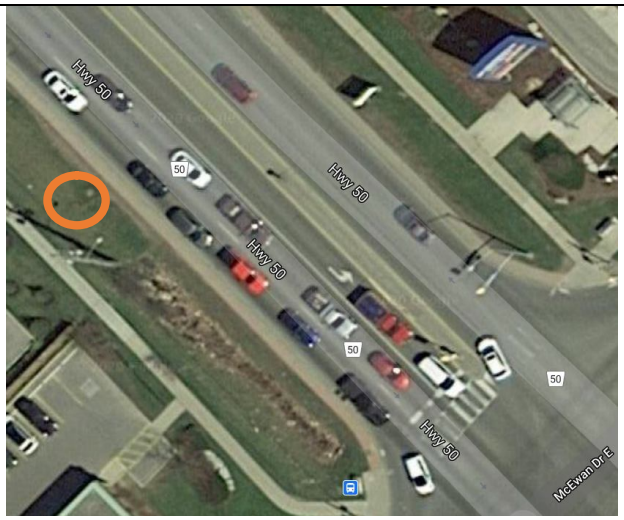
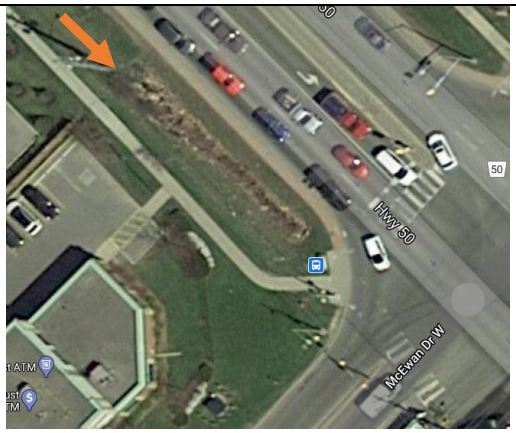
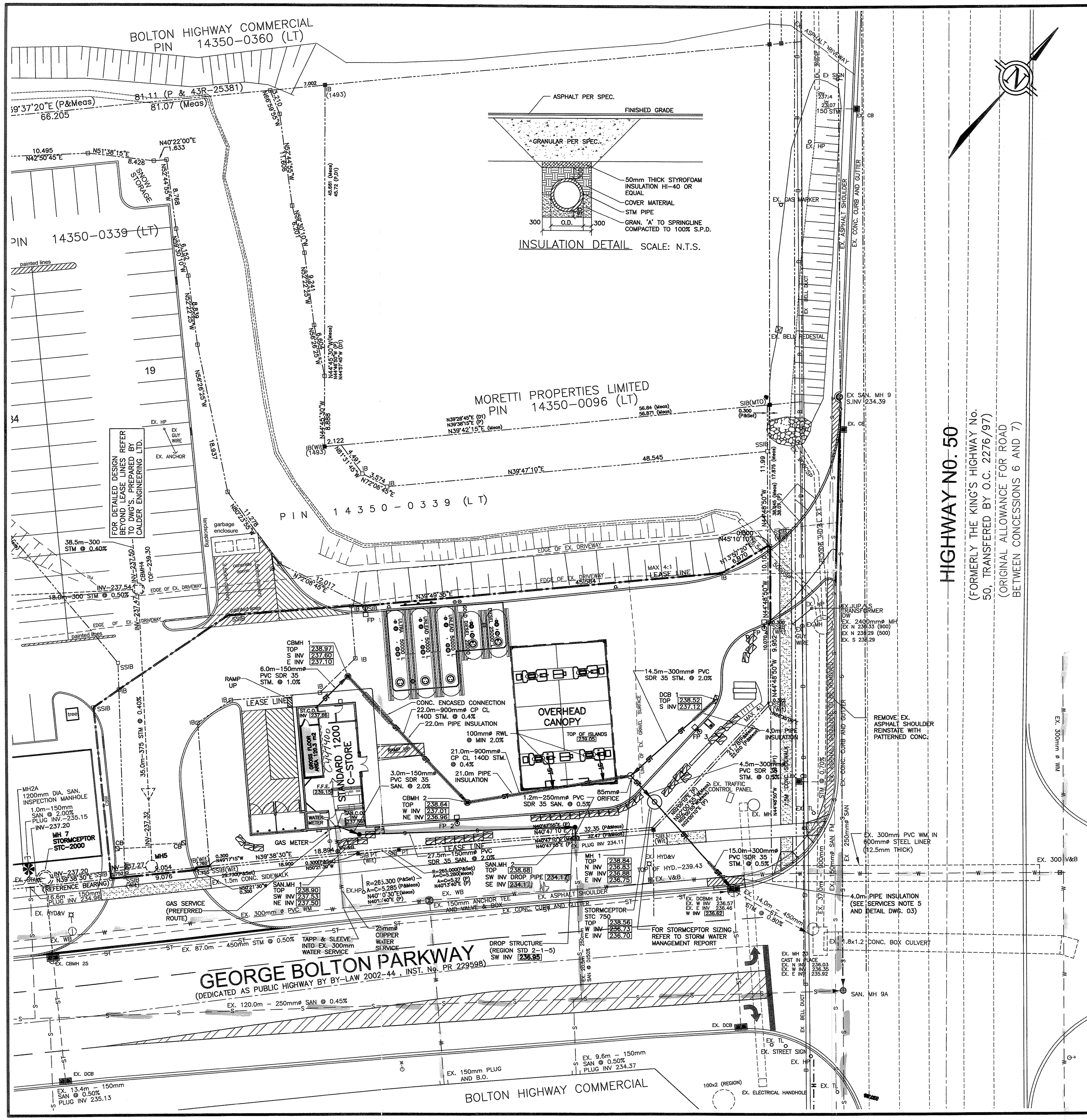
	
	



STORM DRAINAGE:

1. (A) ALL STORM WATER SHALL BE DIRECTED IN SUCH A MANNER THAT WATER WILL NOT ACCUMULATE AT OR NEAR A BUILDING INCLUDING FOUNDATION WALLS, WINDOWS, ENTRANCES AND WALKWAYS.
   (B) WHERE THE EXISTING GRADE IS ALTERED DUE TO GRADING, EXCAVATION, FILLING OR ANY OTHER RELATED WORK ALL SUCH WORK SHALL BE UNDERTAKEN AND COMPLETED IN ACCORDANCE WITH GOOD ENGINEERING PRACTICE TO ENSURE STABLE CONDITIONS AND SO AS NOT TO ADVERSELY AFFECT OR DAMAGE PUBLIC OR PRIVATE PROPERTY.
   (C) STORM DRAINAGE SYSTEM TO CONFORM TO THE STORM WATER MANAGEMENT REPORT PREPARED BY TROW ASSOCIATES INC.
2. THE CONTRACTOR MUST PERFORM ALL NECESSARY WORKS TO ENSURE THAT NO SURFACE DRAINAGE PROBLEMS ARE CREATED ON OR ADJACENT TO PRIVATE OR PUBLIC LANDS BY REASON OF HIS DEVELOPMENT.

SITE SERVICES NOTES:

1. LEGAL INFORMATION TAKEN FROM DRAWINGS PREPARED BY YOUNG & YOUNG SURVEYING INC. (PROJECT No. 00–B3756).
2. GENERAL CONTRACTOR TO ENGAGE A HYDRO LOCATE COMPANY TO CONFIRM THE LOCATION OF HIGH VOLTAGE CABLES, PRIOR TO START OF CONSTRUCTION.
3. MANHOLES SHALL BE LOCATED A MINIMUM OF 1.5m AWAY FROM THE FACE OF CURB AND/OR ANY OTHER SERVICE.
4. WHERE THE DIFFERENCE IN ELEVATION BETWEEN THE OBVERT OF THE INLET AND OUTLET PIPES EXCEED 0.9m, A DROP PIPE AS INDICATED ON REGION OF PEEL STANDARD DWG. 2–1–5 SHALL BE PLACED ON THE INLET PIPE.
5. THE DEPTH OF COVER OVER THE PROPOSED STORM & SANITARY SEWERS SHOULD BE CHECKED. WHEREVER THE COVER IS 1.2m OR LESS, IT IS TO BE INSULATED WITH 100mm THICK x 1.2m WIDE INSULATION PLACED INTO TWO (2) LAYERS WITH STAGGERED JOINTS, AND TO BE STYROFOAM BRAND H.I. TYPE IV.

STORM SEWERS:

1. ALL STORM SEWERS & CONSTRUCTION METHODS TO BE IN ACCORDANCE WITH CURRENT MUNICIPAL SPECIFICATION.
2. STORM SEWERS AND CONNECTIONS 375mmø AND SMALLER TO BE PVC SDR 35.
3. STORM SEWERS 675mmø AND OVER SHALL BE CONCRETE AND EQUAL TO CSA SPECIFICATION A257.2 CLASS 500 OR LATEST AMENDMENT, UNLESS NOTED OTHERWISE.
4. ALL STORM SEWERS INCLUDING CATCH BASIN LEADS AND SERVICE CONNECTIONS TO BE FITTED WITH RUBBER GASKET JOINTS.
5. SEWER BEDDING TO BE IN ACCORDANCE WITH O.P.S.D. 802.03 FOR RIGID PIPE OR O.P.S.D. 802.04 FOR FLEXIBLE PIPE.
6. CBMH'S 1 & 2, MANHOLE 1 TO BE CONSTRUCTED IN ACCORDANCE WITH O.P.S.D. 701.012 (1800mmø). CBMH'S SHALL HAVE CAST IRON COVER & SQUARE FRAME O.P.S.D. 401.010 TYPE 'B' AND MANHOLE 1 SHALL HAVE CAST IRON COVER & SQUARE FRAME O.P.S.D. 401.010 TYPE 'A'.
7. CATCH BASINS TO BE IN ACCORDANCE WITH O.P.S.D. 705.01, TWIN INLET CATCH BASIN TO BE IN ACCORDANCE WITH O.P.S.D. 705.02 WITH FRAME AND GRATE AS PER O.P.S.D. 400.01, UNLESS NOTED OTHERWISE.
8. ALL CATCH BASINS AMD MANHOLES TO HAVE MINIMUM 300mm SUMP AND TOP AS PER MUNICIPAL STANDARDS.

SANITARY SEWERS:

1. PVC SEWER PIPE, UNLESS OTHERWISE NOTED MUST MEET THE REQUIREMENTS OF THE FOLLOWING STANDARDS.
   - CSA 182.1. ASTM D–2729 AND ASTM D–3034 OR LATEST AMENDMENT, CLASS SDR35.
   - CSA B183.4–M90 FOR RIBBED PVC SEWER PIPE. (NOTE THAT THE MANUFACTURES DIRECTIONS FOR INSTALLATION BEDDING AND BACK FILLING MUST BE FOLLOWED).
2. MANHOLES TO BE CONSTRUCTED IN ACCORDANCE WITH REGION OF PEEL STD. 2–1–1 (1200mmø) WITH RUBBER GASKET JOINTS.
3. ALL SANITARY SEWER AND SERVICE CONNECTIONS TO BE FITTED WITH CHEMICALLY RESISTANT JOINTS AS PER MUNICIPAL STANDARDS. SANITARY CONNECTIONS TO BE PER O.P.S.D. 1006.020.
4. SEWER BEDDING TO BE IN ACCORDANCE WITH O.P.S.D. 1005. (UNLESS NOTED OTHERWISE).
5. SAFETY PLATFORMS TO BE IN ACCORDANCE WITH O.P.S.D. 404.02.
6. SANITARY MANHOLES TO HAVE FRAME AND GRATE AS PER O.P.S.D. 401.03.
7. MAINLINE AND STREETLINE MANHOLES TO BE IN ACCORDANCE WITH REGION OF PEEL STANDARDS.
8. MAX. DROP BETWEEN THE INLET AND OUTLET ELEVATIONS OF SANITARY MANHOLE IS 0.03m. MIN. DEPTH OF SANITARY MANHOLE IS 2.13m.

WATERMAINS:

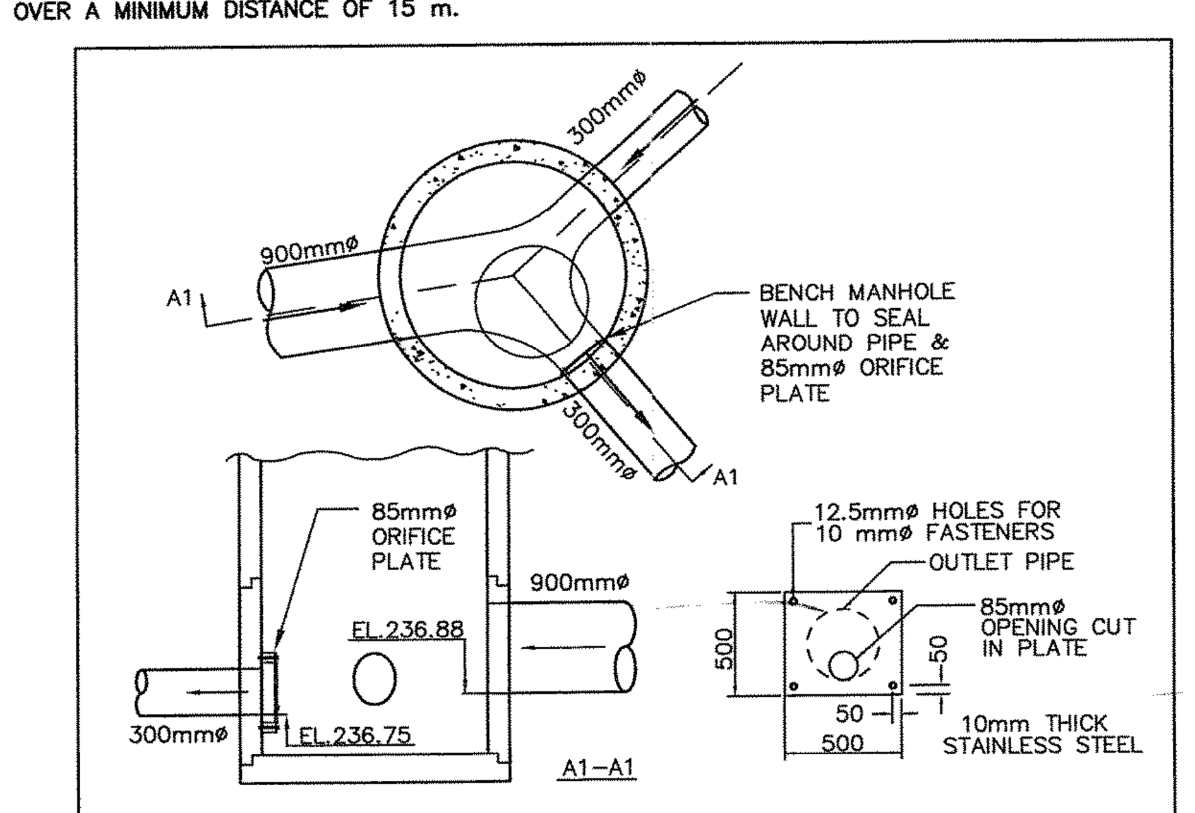
1. ALL MATERIAL AND CONSTRUCTION METHODS MUST CORRESPOND TO THE CURRENT PEEL PUBLIC WORKS STANDARDS AND SPECIFICATIONS.
2. WATERMAIN AND/OR WATER SERVICE MATERIALS 100mmø AND LARGER MUST BE CLASS 150, A.W.W.A. C 900–75 P.V.C. PIPE. SIZE LARGER THAN 50ømm TO 100mmø TO BE P.V.C. 2306 TUBE SERIES 160 C.S.A. B.137.1 (A.W.W.A. C901). PIPE 50mmø AND SMALLER TO BE SOFT COPPER TYPE 'K'.
3. WATERMAINS AND/OR WATER SERVICES ARE TO HAVE A MINIMUM COVER OF 1.7m WITH A MINIMUM HORIZONTAL SPACING OF 1.2m FROM THEMSELVES AND ALL OTHER UTILITIES.
4. PROVISIONS FOR FLUSHING WATER LINES PRIOR TO TESTING, etc. MUST BE PROVIDED WITH AT LEAST A 50mmø OUTLET ON 100mm AND LARGER LINES. COPPER LINES ARE TO HAVE FLUSHING POINTS AT THE END, THE SAME SIZE AS THE LINE. THEY MUST ALSO BE HOSED OR PIPED TO ALLOW THE WATER TO DRAIN ONTO A PARKING LOT OR DOWN A DRAIN. ON FIRE LINES, FLUSHING OUTLET TO BE 100mmø MINIMUM ON A HYDRANT.
5. ALL CURB STOPS TO BE 3.0m OFF THE FACE OF THE BUILDING UNLESS OTHERWISE NOTED.
6. HYDRANT AND VALVE SET TO REGION STANDARD 1–6–1 DIMENSION A AND B, 0.7m AND 0.9m AND TO HAVE PUMPER NOZZLE.
7. WATERMAINS TO BE INSTALLED TO GRADE AS SHOWN ON APPROVED SITE PLAN. COPY OF GRADE SHEET MUST BE SUPPLIED TO INSPECTOR PRIOR TO COMMENCEMENT OF WORK, WHERE REQUESTED BY INSPECTOR.
8. WATERMAINS MUST HAVE A MINIMUM VERTICAL CLEARANCE OF 0.3m OVER / 0.5m UNDER SEWERS AND ALL OTHER UTILITIES WHEN CROSSING.
9. ALL PROPOSED WATER PIPING MUST BE ISOLATED FROM EXISTING LINES IN ORDER TO ALLOW INDEPENDENT PRESSURE TESTING AND CHLORINATING FROM EXISTING SYSTEMS.
10. ALL LIVE TAPPING AND OPERATION OF REGION WATER VALVES SHALL BE ARRANGED TROUGH THE REGIONAL INSPECTOR ASSIGNED OR BY CONTACTING THE OPERATIONS AND MAINTENANCE DIVISION.

TRAFFIC SAFETY AND CONTROL:

1. IT IS THE RESPONSIBILITY OF THE SITE DEVELOPER TO PROVIDE ALL TRAFFIC SAFETY AND CONTROL MEASURES IN ACCORDANCE WITH THE ONTARIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, TEMPORARY CONDITIONS. THE SITE DEVELOPER SHALL MAKE ARRANGEMENTS WITH THE MUNICIPALITY AT LEAST 30 DAYS PRIOR TO COMMENCING WORK ON ANY PUBLIC ROADS.

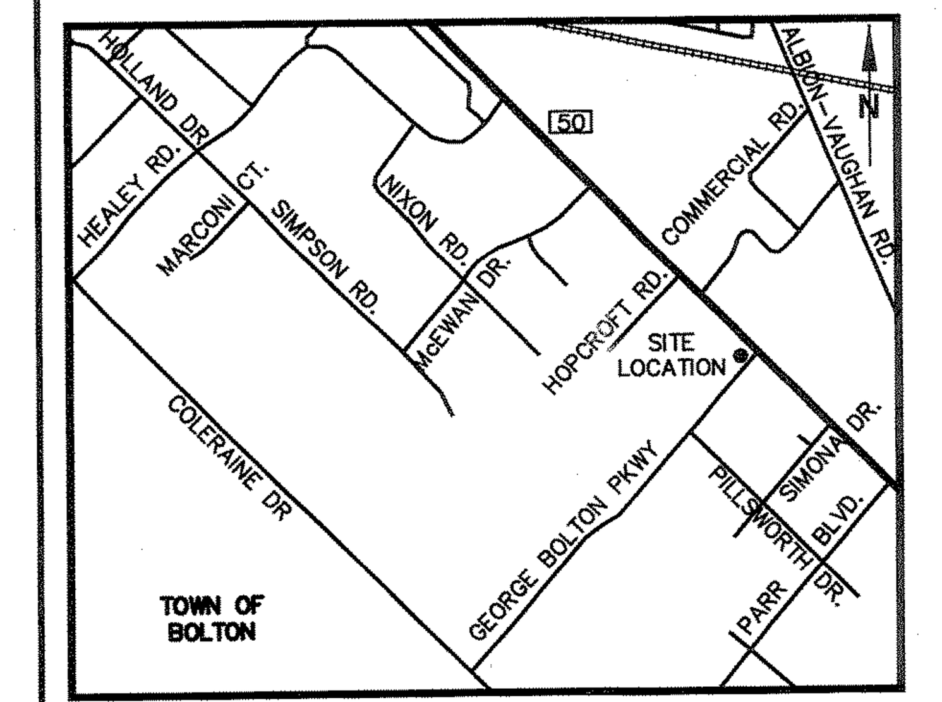
FIRE DEPARTMENT:

1. FIRE ROUTE WILL BE DESIGNATED AS PER MUNICIPAL BY–LAW.
2. THE FIRE DEPARTMENT ACCESS ROUTE SHALL BE DESIGNED TO SUPPORT A LOAD OF NOT LESS THAN 11,363 KG PER AXLE AND HAVE A CHANGE IN GRADIENT OF NOT MORE THAN 1 IN 12.5 OVER A MINIMUM DISTANCE OF 15 m.



ORIFICE PLATE AT MH 1 SCALE: N.T.S.

NO.	REVISIONS	DATE	BY	APP.
E	SANITARY SERVICE, WATER SERVICE, SITE SERVICES NOTE 4, WATERMAIN NOTE 8 REVISED. WATERMAIN NOTE 10 AND SANITARY SEWER NOTE 8 ADDED. STORM SERVICE BEYOND LEASE LINE SHOWN.	OCT 17 2007	A.B.	
D	DWG UPDATED TO REFLECT SITE PLAN REV "E".	SEP 10 2007	A.B.	
C	DWG UPDATED TO REFLECT SITE PLAN REV "D".	SEP 05 2007	A.B.	
B	DWG UPDATED TO REFLECT SITE PLAN REV "C". STORM SERVICE REVISED. CITY FILE NUMBER ADDED.	JUL 05 2007	A.B.	
A	ISSUED FOR INFORMATION.	MAR 09 2007	A.B.	



KEY PLAN SCALE: N.T.S.

LEGEND:

IB	EX. IRON BAR	—ST—	EX. STORM SEWER
SIB	EX. STANDARD I.B.	—S—	EX. SANITARY SEWER
TL	EX. TRAFFIC LIGHT	—W—	EX. WATER MAINS
HP	EX. HYDRO POLE	—G—	EX. GAS MAINS
ICV	EX. IRRIGATION CONTROL VALVE	—H—	EX. OVERHEAD HYDRO
WV	EX. WATER VALVE	—UH—	EX. U/G HYDRO SERVICE
HYD	EX. FIRE HYDRANT	—B—	EX. U/G BELL SERVICE
C.O.	NEW CLEAN OUT	—F—	EX. FIBER OPTICS LINE
RWL	NEW DOWNSPOUT	—ST—	NEW STORM SEWER
BP	EX. BELL PEDESTAL	—S—	NEW SANITARY SEWER
	NEW FLOODPOLE	—W—	NEW WATER SERVICE
	EX. STORM M.H.	—G—	NEW GAS SERVICE
	NEW STORM M.H.	—H—	NEW HYDRO SERVICE
	EX. SANITARY M.H.	—B—	NEW BELL SERVICE
	NEW SANITARY M.H.		EX. CONC. CURB
	EX. CATCH BASIN		NEW CONC. CURB
	NEW CATCH BASIN		NEW DEPRESSED CURB
	NEW CATCH BASIN M.H.		NEW CURB CUT
2.0%	NEW SLOPE	+ (92.73)	EX. ELEVATION
	MAJOR OVERLAND FLOW DIRECTION	+ 92.53	EX. ELEVATION TO REMAIN
		+ 93.45	ELEVATION (PROPOSED)
		+ [92.73]	PROPOSED ELEVATION (BY OTHERS)

SCALE 1:250 METRES

0 5 10 15 20 25 METRES

METRIC

DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

LICENSED PROFESSIONAL ENGINEER D. TOTA 46772505 OCT 17 2007 PROVINCE OF ONTARIO

OWNER:

Farview Holdings
12599 Hwy. 50, Unit 7
Bolton, ON. L7E 1M4
Tel.: (416) 420–7709
Fax.: (905) 893–3100

APPLICANT/CLIENT:

SUNCOR ENERGY
SUNCOR ENERGY PRODUCTS INC. 36 YORK MILLS RD., TORONTO, ON. M2P 2C5
TEL: (416) 733–7224, FAX: (416) 733–2113

Trow Associates Inc.
1595 Clark Boulevard
Brampton, Ontario L6T 4V1
Tel.: (905) 793–9800
Fax: (905) 793–0641

LOCATION:

12476 REGIONAL ROAD 50
@ GEORGE BOLTON PKWY
TOWN OF CALEDON, ONTARIO

TITLE:

SITE SERVICES PLAN

SPA07–021

DESIGNED:	A.B.	DRAWN:	A.B.	S/S NO.:	I.D. No.:
CHECKED:	B.H.	DATE:	FEB. 2007		
SCALE:	1:250	PROJ. NO.:		DWG. NO.	
CAD FILE:	233513Asite0		brif00233513a	03	

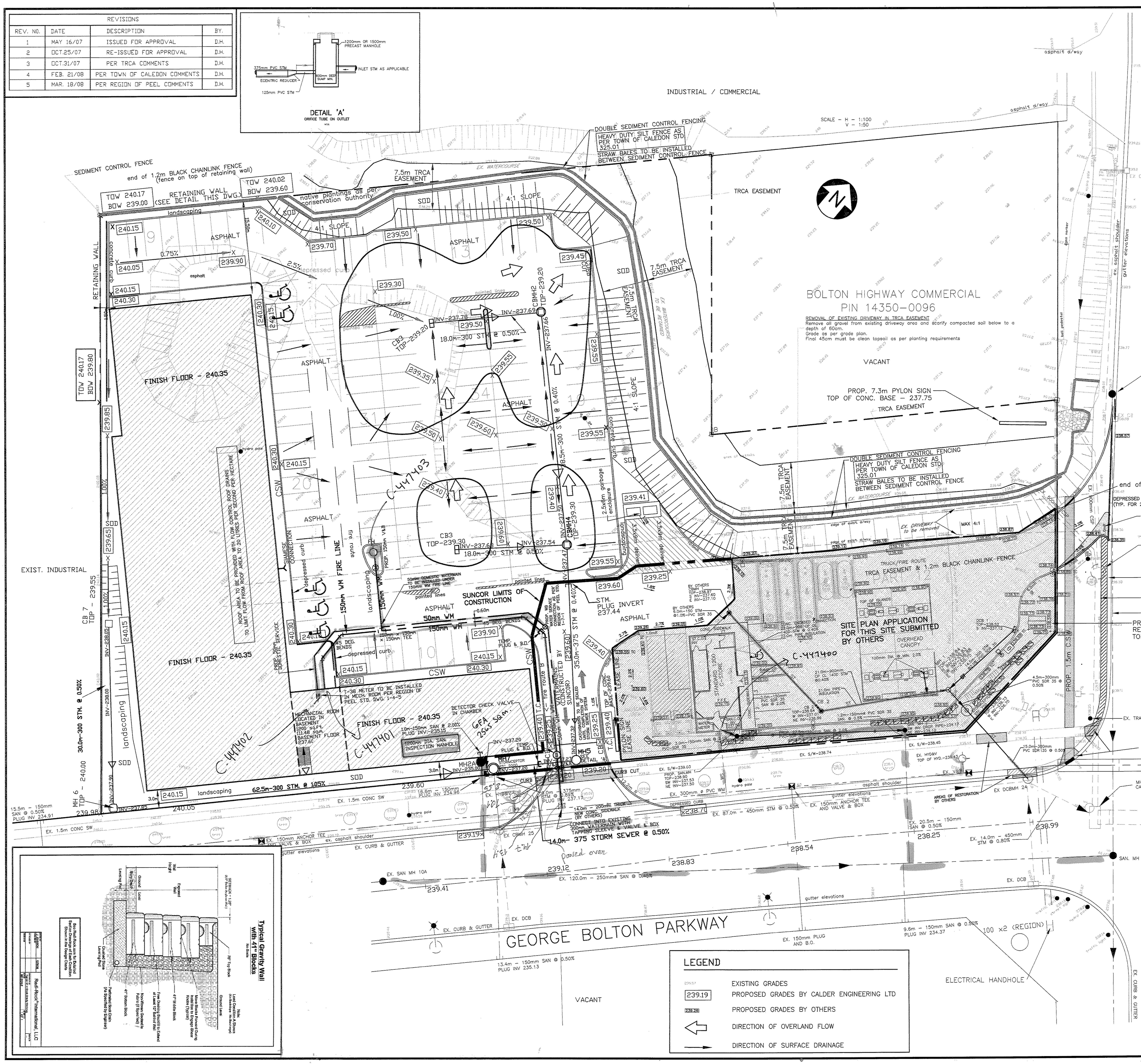
REGION OF PEEL
PUBLIC WORKS/ENGINEERING & CONSTRUCTION DIVISION
APPROVED FOR WATER, SANITARY AND/OR STORM SEWERS IN ACCORDANCE WITH LATEST REGION OF PEEL STANDARDS AND SPECIFICATIONS
DATE Mar. 18/2008
MUNICIPAL SIDE & REGIONAL EASEMENTS ONLY

RECEIVED
OCT 1 8 2007
PUBLIC WORKS
REGION OF PEEL

C447400

INSPECTORS COPY

REVISIONS			
REV. NO.	DATE	DESCRIPTION	BY.
1	MAY 16/07	ISSUED FOR APPROVAL	D.H.
2	OCT.25/07	RE-ISSUED FOR APPROVAL	D.H.
3	OCT.31/07	PER TRCA COMMENTS	D.H.
4	FEB. 21/08	PER TOWN OF CALEDON COMMENTS	D.H.
5	MAR. 18/08	PER REGION OF PEEL COMMENTS	D.H.



GENERAL NOTES

MEASUREMENTS

ALL DIMENSIONS ARE IN METERS, EXCEPT PIPE DIAMETERS WHICH ARE IN MILLIMETRES, UNLESS OTHERWISE SPECIFIED.

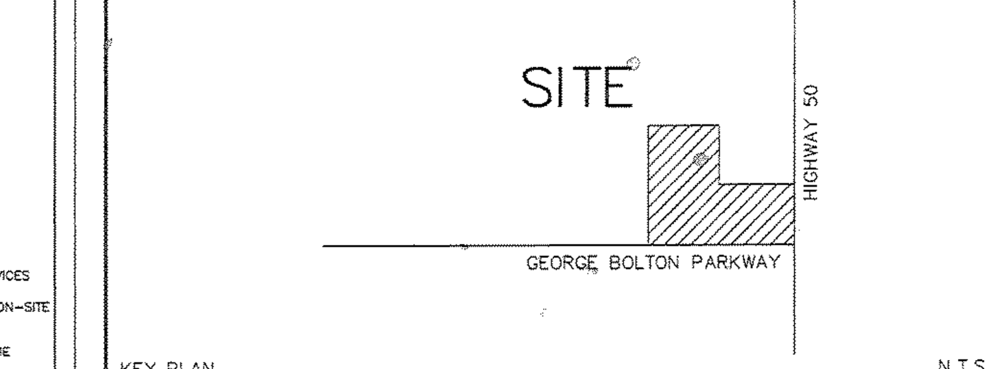
GENERAL

1. CONSTRUCTION FOR THIS PROJECT TO COMPLY WITH THE MOST CURRENT VERSION OF THE DEVELOPMENT STANDARDS, POLICIES, AND GUIDELINES PREPARED BY THE TOWN OF CALEDON, PUBLIC WORKS & ENGINEERING DEPARTMENT, REGION OF PEEL STANDARDS AND SPECIFICATIONS, AND THE ONTARIO PROVINCIAL STANDARDS AND SPECIFICATIONS.
2. ALL PROPOSED CONSTRUCTION SHALL BE CARRIED OUT IN ACCORDANCE WITH THE REQUIREMENTS OF THE OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATIONS FOR CONSTRUCTION PROJECTS.
3. LOCATION OF EXISTING SERVICES AND UTILITIES ARE NOT GUARANTEED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING AND MAINTAINING EXISTING UTILITIES. ANY CHANGES SHALL BE REPAIRED AT THE CONTRACTORS COST TO THE SATISFACTION OF THE APPROPRIATE UTILITY.
4. A MINIMUM OF 48 HOURS PRIOR TO COMMENCING CONSTRUCTION WITHIN THE MUNICIPAL RIGHT OF WAY THE CONTRACTOR MUST CONTACT THE FOLLOWING:
   - TOWN OF CALEDON PUBLIC WORK & ENGINEERING DEPARTMENT @ 905-584-2272
   - REGION OF PEEL @ 905-791-7800
   - ENBRIDGE CONSUMERS GAS @ 905-884-9105
   - HYDRO ONE @ 1-888-625-4401
   - BELL CANADA @ 416-296-6720
   - ROGERS CABLE @ 905-897-3914
5. ALL DRAINAGE TO BE SELF CONTAINED AND DISCHARGED TO A LOCATION APPROVED BY THE PUBLIC WORKS & ENGINEERING DEPARTMENT.
6. SEDIMENT CONTROL DEVICES ARE TO BE INSTALLED PRIOR TO ANY CONSTRUCTION AND SHALL BE MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD TO THE SATISFACTION OF THE TOWN AND THE APPLICABLE CONSERVATION AUTHORITY. SEDIMENT CONTROL DEVICES TO BE INSPECTED AFTER EACH RAINFALL EVENT AND MAINTAINED AND REPAIRED AS REQUIRED. ADDITIONAL EROSION AND SEDIMENT CONTROL MATERIALS ARE TO BE KEPT ON-SITE FOR EMERGENCIES AND REPAIRS.

   MUD MATS TO BE PROVIDED AT ALL LOCATIONS WHERE CONSTRUCTION VEHICLES EXIT THE SITE. MUD MATS SHALL BE A MIN. OF 3.0m WIDE, 10.0m LONG, AND 0.3m DEEP AND SHALL CONSIST OF 50-100mm CLEAR STONE MATERIAL OR APPROVED EQUIVALENT. CONTRACTOR TO ENSURE ALL VEHICLES LEAVE THE SITE VIA THE MUD MAT(S) AND THAT THE MUD MAT(S) IS MAINTAINED IN A MANNER TO MAXIMIZE EFFECTIVENESS AT ALL TIMES.

   MUD TRACKING OFF-SITE IS TO BE MONITORED AND IT IS THE CONTRACTOR'S RESPONSIBILITY TO CLEAN THE MUNICIPAL ROADS AS REQUIRED.
7. A MIN. 1.5m CLEARANCE IS TO BE PROVIDED FROM THE LIMITS OF ALL SIDEWALKS AND DRIVEWAYS TO EXISTING UTILITY STRUCTURES WITHIN THE MUNICIPAL RIGHT OF WAY. IF THIS CLEARANCE IS NOT MAINTAINED THEY SHALL BE RELOCATED AT THE APPLICANT'S EXPENSE.
8. STREET CURBS ARE TO BE CONTINUOUS THROUGH PROPOSED ENTRANCES.
9. MUNICIPAL SIDEWALKS SHALL BE CONTINUOUS THROUGH ALL ENTRANCES TO THE SITE AND THE CURB SHALL BE TAPERED BACK 600mm. SIDEWALKS SHALL BE COMPLETELY REMOVED AND REPLACED WITH A MIN. 200mm MIN. CONCRETE THICKNESS, 30 MPa, AND 5% TO 7% AIR ENTRAINMENT AT ALL PROPOSED INDUSTRIAL, COMMERCIAL, AND INSTITUTIONAL ENTRANCES.
10. ANY CHANGES TO GRADES OR SERVICING FROM THE ORIGINALLY APPROVED SITE PLAN MUST BE APPROVED BY THE TOWN OF CALEDON PUBLIC WORKS & ENGINEERING DEPART.
11. ALL BOULEVARDS TO BE RESTORED WITH 150mm MIN. OF TOPSOIL AND SOD TO THE SATISFACTION OF THE TOWN OF CALEDON PUBLIC WORKS & ENGINEERING DEPART.
12. CONTRACTOR SHALL BE RESPONSIBLE FOR CONFIRMING WITH OWNER AND OR ARCHITECT THE LOCATION OF BUILDING WATER, STORM, AND SANITARY SERVICE CONNECTIONS.
13. THE BUILDING SITED ON THIS PLAN HAS BEEN DESIGNED UTILIZING CONTROLLED FLOW ROOF DRAINS IN ACCORDANCE WITH LOCAL MUNICIPAL STANDARDS.
14. NATIVE AND GRANULAR MATERIAL, SUITABLE FOR BACKFILL, SHALL BE COMPACTED TO A MIN. 95% SPMDD EXCEPT TOP 0.3m WHICH MUST BE COMPACTED TO 98% SPDD, OR AS RECOMMENDED BY A QUALIFIED SOILS CONSULTANT.
15. MATCH EX. GRADES AT PROPERTY LINES.

VILLAGE OF BOLTON
TOWN OF CALEDON



KEY PLAN N.T.S.

SANITARY AND STORM SEWER NOTES

1. ALL CONCRETE AND PLASTIC PIPE SHALL HAVE RUBBER GASKET JOINTS.
2. ALL SEWERS SHALL BE CONSTRUCTED WITH BEDDING IN ACCORDANCE WITH OPSD 802.03 CLASS 'B' UNLESS OTHERWISE NOTED.
3. PLASTIC STORM SEWER PIPE SHALL BE PVC ULTRA RIB OR APPROVED EQUAL UP TO A MAX. DIAMETER OF 600mm.
4. SAN. SEWER PIPE TO BE PVC SDR 35 AND SHALL CONFORM TO C.S.A.-B-182.2,3,4.
5. SAN. MANHOLES SHALL BE INSTALLED IN ACCORDANCE WITH REGION OF PEEL STANDARD DRAWINGS 2-1-1 TO 2-1-6 AND 2-2-1 TO 2-2-4. MANHOLE COVERS TO HAVE THE WORD "SANITARY" CAST INTO THE COVER WITH 50mm LETTERS. STANDARD HEAVY DUTY FRAME AND COVER TO BE INSTALLED UNLESS OTHERWISE SPECIFIED.
6. ALL PLUGS TO BE MARKED WITH 2" x 4" x 8' STUDS.

WATERMAIN NOTES

1. ALL WATERMAINS AND WATER SERVICE MATERIALS AND CONSTRUCTION METHODS MUST CORRESPOND TO THE CURRENT REGION OF PEEL PUBLIC WORKS STANDARDS AND SPECIFICATIONS.
2. WATERMAINS AND/OR WATER SERVICE MATERIALS 100mm (4") AND LARGER MUST BE PVC CLASS 150 MFG. TO A.W.W.A. SPEC. C900-75. SIZES 50mm (2") AND SMALLER, TO BE POLYETHYLENE PIPE 2306 TUBE SERIES 160 IN IN ACCORDANCE WITH C.S.A. B.137.1-1970, A.W.W.A. SPEC. C901-78 IN SIZES 20 TO 50mm (1" TO 2").
3. WATERMAINS AND/OR WATER SERVICES ARE TO HAVE A MINIMUM COVER OF 1.7m (5'-6") WITH A MIN. HORIZONTAL SPACING OF 1.2m (4'-0") FROM THEMSELVES AND OTHER UTILITIES.
4. PROVISIONS FOR FLUSHING WATER LINES PRIOR TO TESTING MUST BE PROVIDED WITH AT LEAST A 50mm (2") OUTLET ON 100mm (4") AND LARGER LINES. ON FIRE LINES, FLUSHING OUTLET TO BE 100mm (4") DIA. MIN. ON A HYDRANT.
5. ALL CURB STOPS TO BE 3.0m (10') OFF THE FACE OF THE BUILDING UNLESS OTHERWISE NOTED.
6. HYDRANT AND VALVE SET TO REGION OF PEEL STANDARD DRAWING 1-6-1. DIMENSION "A" AND "B", 0.7m AND 0.9m. HYDRANT OT HAVE PUMPER NOZZLE.
7. WATERMAINS TO BE INSTALLED TO GRADES AS SHOWN ON THE APPROVED SITE PLAN. COPY OF GRADE SHEET MUST BE SUPPLIED TO INSPECTOR PRIOR TO COMMENCEMENT OF WORK, WHERE REQUESTED BY INSPECTOR.
8. WATERMAINS MUST HAVE A MINIMUM VERTICAL CLEARANCE OF .15m (6") OVER AND 0.3m (12") UNDER SEWERS AND ALL OTHER UTILITIES WHEN CROSSING.
9. ALL PROPOSED WATERMAIN PIPING MUST BE ISOLATED FROM EXISTING LINES IN ORDER TO ALLOW INDEPENDENT PRESSURE TESTING AND CHLORINATING. EXISTING SYSTEM.
10. ALL WATERMAINS LOCATED IN ENGINEERED FILL AREAS REQUIRE RESTRAINING JOINTS.
11. ALL PLUGS TO BE MARKED WITH 2" x 4" x 8' STUDS.

ROAD WORK NOTES

1. DRIVEWAY GRANULAR BASE AND SUB-BASE TO BE CONSTRUCTED OF THE FOLLOWING:

   CAR PARKING AND LIGHT TRAFFIC AREAS
   - BASE – 150mm GRANULAR 'A' OR 150mm OF 19mm CRUSHER RUN LIMESTONE
   - SUB-BASE – 300mm GRANULAR 'B' OR 300mm OF 50mm CRUSHER RUN LIMESTONE

   TRUCK TRAFFIC AND FIRE ROUTE AREAS
   - BASE – 150mm GRANULAR 'A' OR 150mm OF 19mm CRUSHER RUN LIMESTONE
   - SUB-BASE – 450mm GRANULAR 'B' OR 450mm OF 50mm CRUSHER RUN LIMESTONE

   THE GRANULAR BASE AND SUB-BASE MATERIALS SHOULD CONFORM TO OPSS GRADATION SPECIFICATIONS AND SHOULD BE COMPACTED TO 100% STANDARD PROCTOR MAXIMUM DRY DENSITY (SPMDD), OR AS RECOMMENDED BY THE GEOTECHNICAL CONSULTANT.
2. SUB-GRADE TO BE PROOF ROLLED PRIOR TO INSTALLATION OF GRANULAR SUB-BASE MATERIALS. SOFT SPOTS TO BE REMOVED AND FILLED WITH GRANULAR 'B' AND COMPACTED TO 98% SPMDD, OR AS RECOMMENDED BY THE GEOTECHNICAL CONSULTANT.
3. UPON COMPLETION OF THE INSTALLATION OF GRANULAR MATERIALS, ELEVATIONS SHOULD BE CHECKED TO ENSURE WORKS CORRESPOND TO THE APPROVED GRADING DESIGN.
4. DRIVEWAY ENTRANCE TO BE PAVED FROM EDGE OF EX. PAVEMENT TO STREET LINE WITH 40mm HL3 AND 65mm HL8. SITE DRIVEWAYS AND PARKING AREAS TO BE PAVED WITH 40mm HL3 AND 65mm HL8 FOR CAR PARKING AND LIGHT TRAFFIC AREAS AND 40mm HL3 AND 65mm HL8 FOR TRUCK TRAFFIC AND FIRE ROUTE AREAS.
5. CONCRETE CURB SHALL BE IN ACCORDANCE WITH MOST CURRENT REVISION OF PROJECT SITE PLAN.

REGION OF PEEL STANDARD DRAWINGS

- STD. 1-1-1 – CIRCULAR PRECAST CHAMBER
- STD. 1-2-5 – STANDARD CHAMBER STEPS ALUMINUM
- STD. 1-3-1 – CHECK VALVE IN CHAMBER (NO BY-PASS)
- STD. 1-3-8 – VALVE STEM EXTENSION IN VALVE BOX
- STD. 1-4-5 – 38 AND 50 T-10 METER IN BUILDING
- STD. 1-5-2 – WATERMAIN SUPPORT BRIDGING DISTURBED GROUND
- STD. 1-5-6 – HORIZONTAL BLOCKING 90DEG BENDS AND REDUCERS
- STD. 1-6-4 – FIRE LINE & DOMESTIC CONNECTION
- STD. 1-6-5 – BUILDING RISER DETAIL 100mm & LARGER
- STD. 1-7-1 – WATER SERVICE CONNECTION
- STD. 1-8-5 – SERVICING FOR MULTIPLE BUILDING COMMERCIAL SITES, I.E. RESTAURANTS AND OFFICE BUILDINGS
- STD. 2-1-1- PRECAST MANHOLE 1200mm DIA.
- STD. 2-1-4- MANHOLE BENCHING DETAILS
- STD. 2-2-2- STANDARD HEAVY DUTY FRAME & COVER
- STD. 2-2-4- STANDARD MANHOLE STEPS ALUMINUM
- STD. 2-3-1- BEDDING DETAILS FOR SANITARY SEWERS
- STD. 2-4-2- SERVICE CONNECTIONS FOR FLEXIBLE PIPE
- STD. 2-4-3- DOUBLE SERVICE CONNECTIONS IN COMMON TRENCH

ONTARIO PROVINCIAL STANDARD DRAWINGS

- OPSD – 600.110 – CONCRETE BARRIER CURB

Calder Engineering Ltd.
13226 Coleraine Drive , Bolton, ON L7E 3B2
T 905-857-7600 F 905-857-5900

LICENSED PROFESSIONAL ENGINEER R. J. WHYTE March 19, 2008 PROVINCE OF ONTARIO

RECEIVED MAR 19 2008 PUBLIC WORKS REGION OF PEEL

DESIGNED BY	APPROVED BY

CLIENT: FARVIEW HOLDINGS

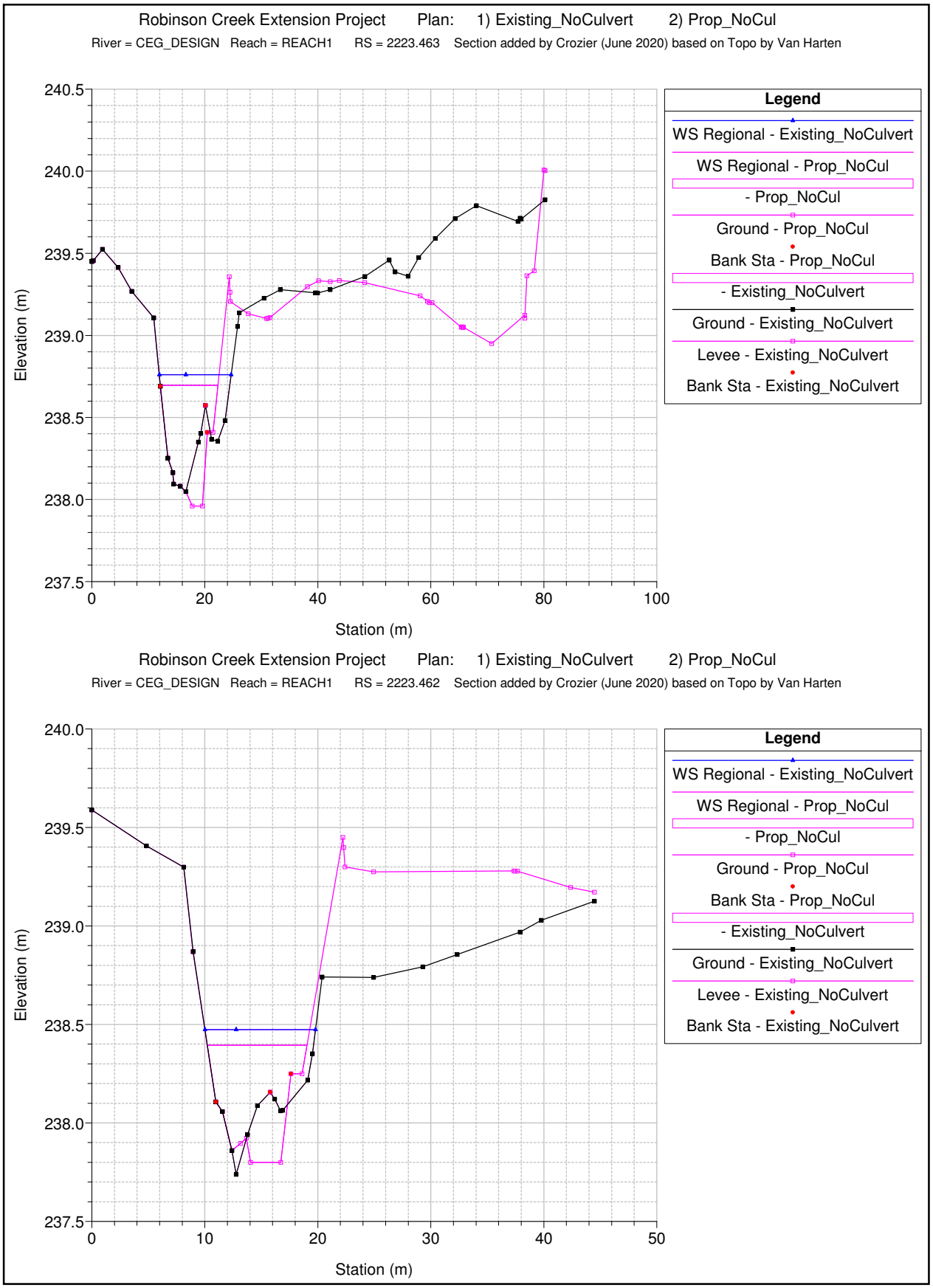
PROJECT: 12476 REGIONAL ROAD 50

TITLE: SITE SERVICING & GRADING PLAN

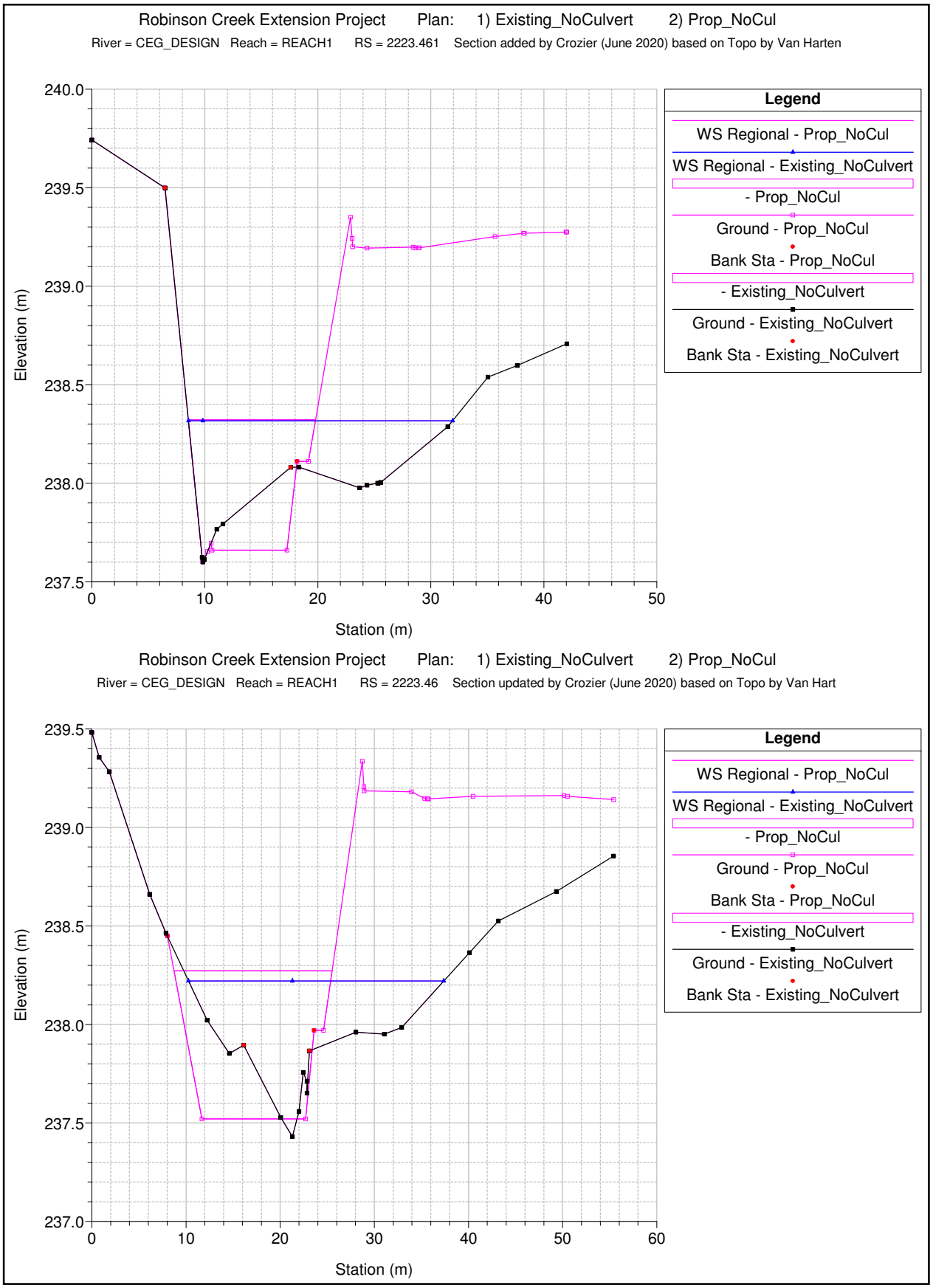
Surveyed by:	Scale: 1:300	File: 03-122- AUG.31R14	
Designed by: RJW		Drawing No.	Sheet No.
Drawn by: AAF		03-122-001	1 / 1
Chk'd by: JP	Date: JUNE 2006		

C-447401 Sub #1

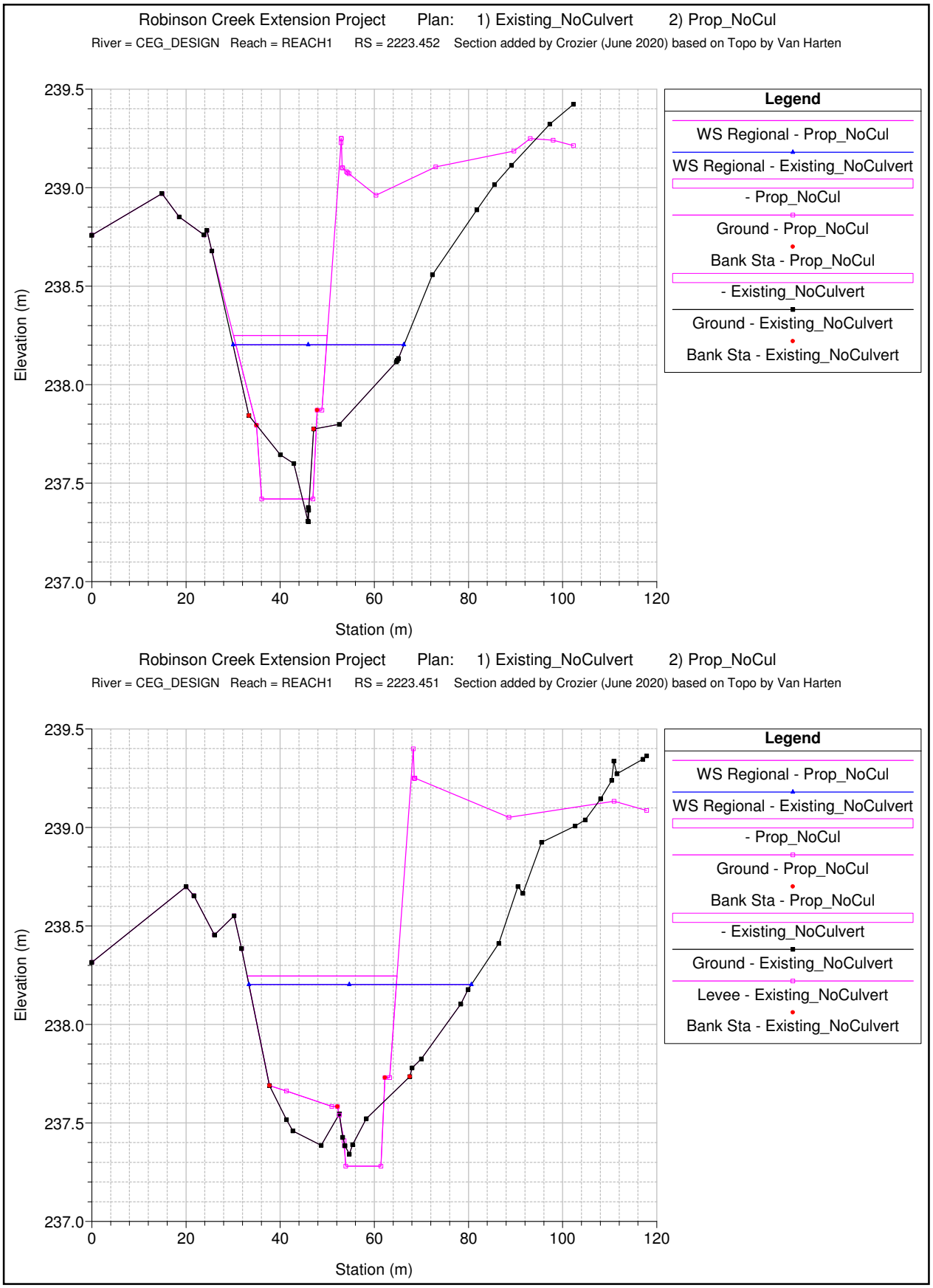
No Culvert Scenario



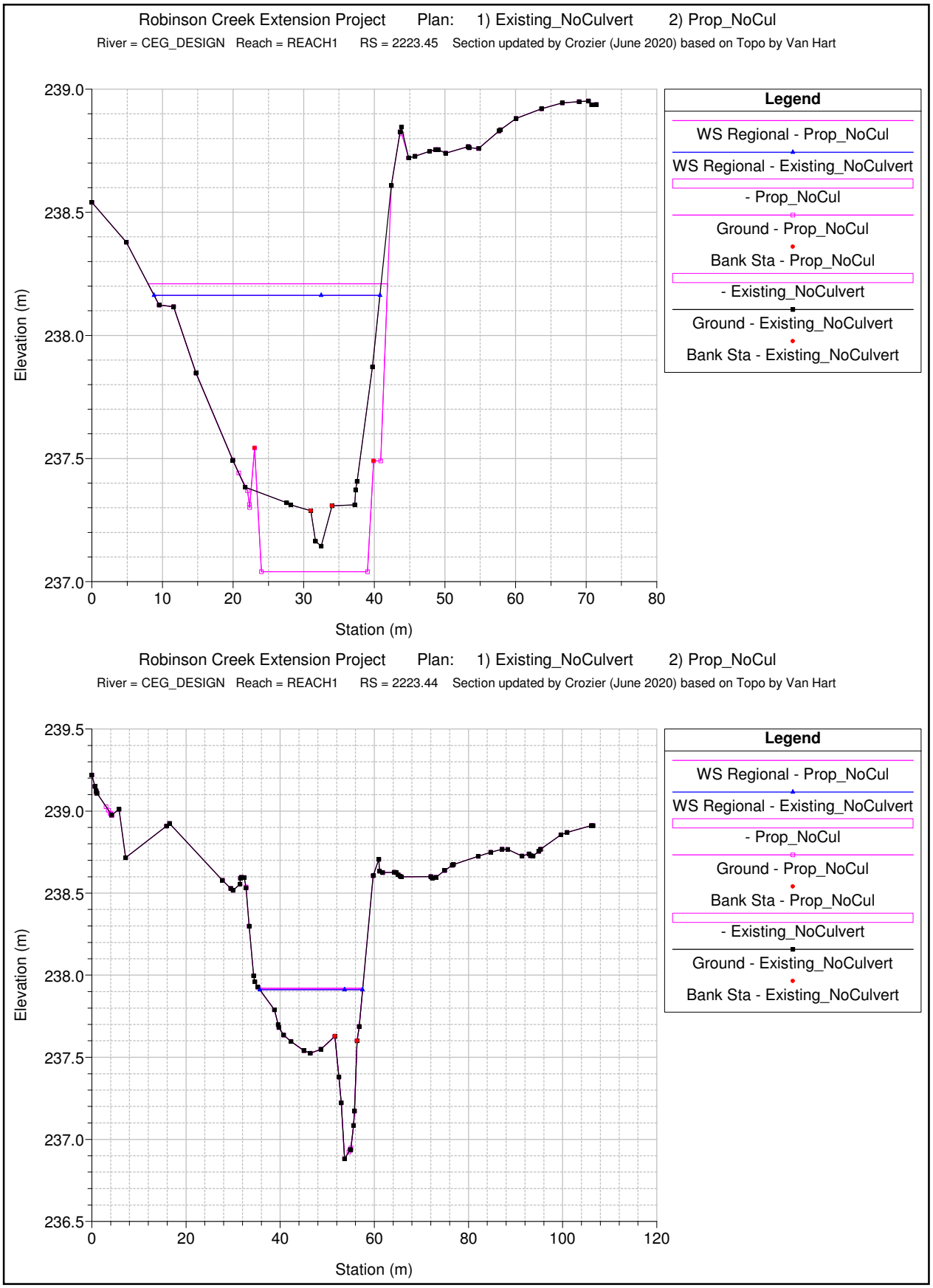
No Culvert Scenario

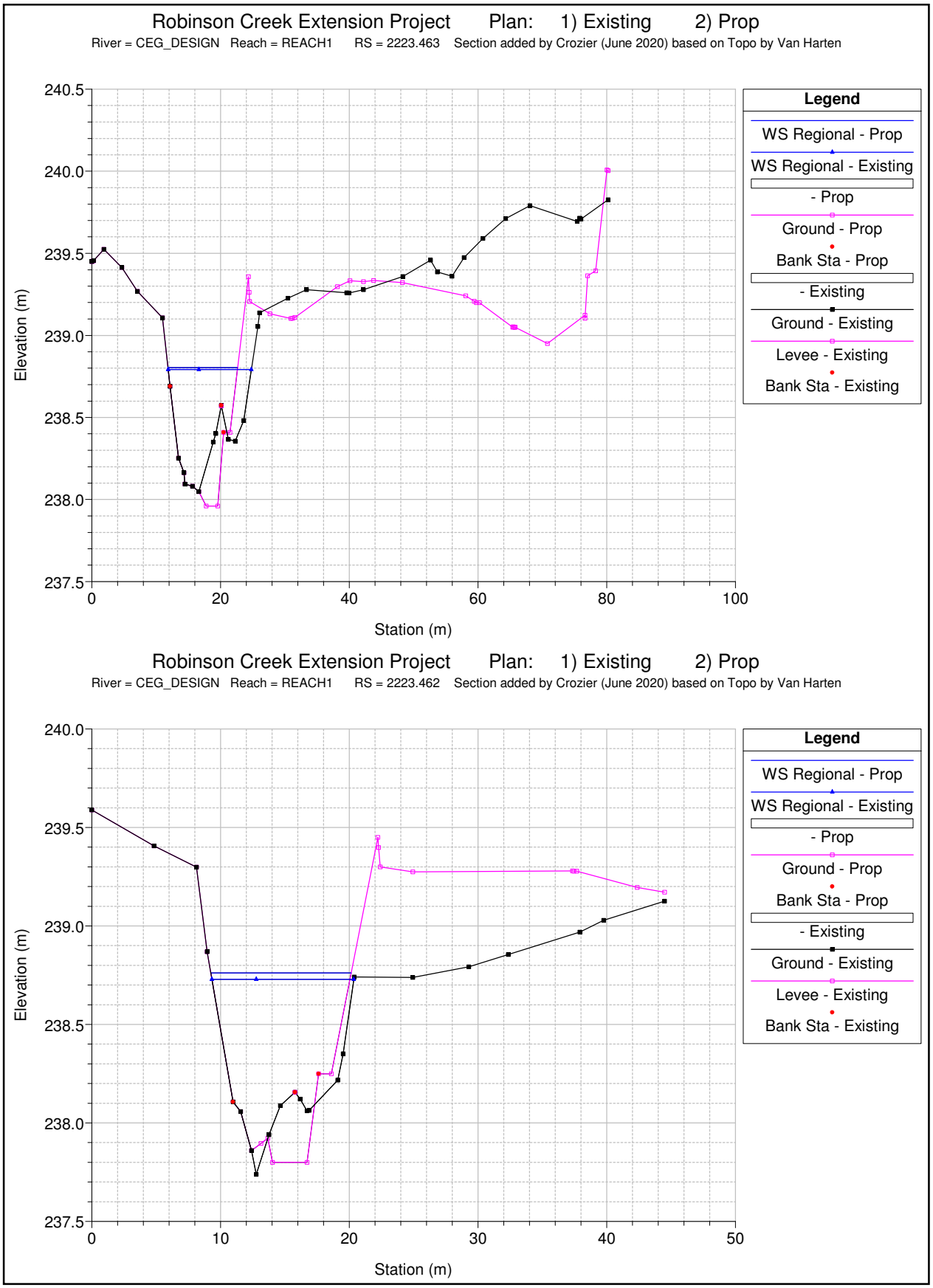


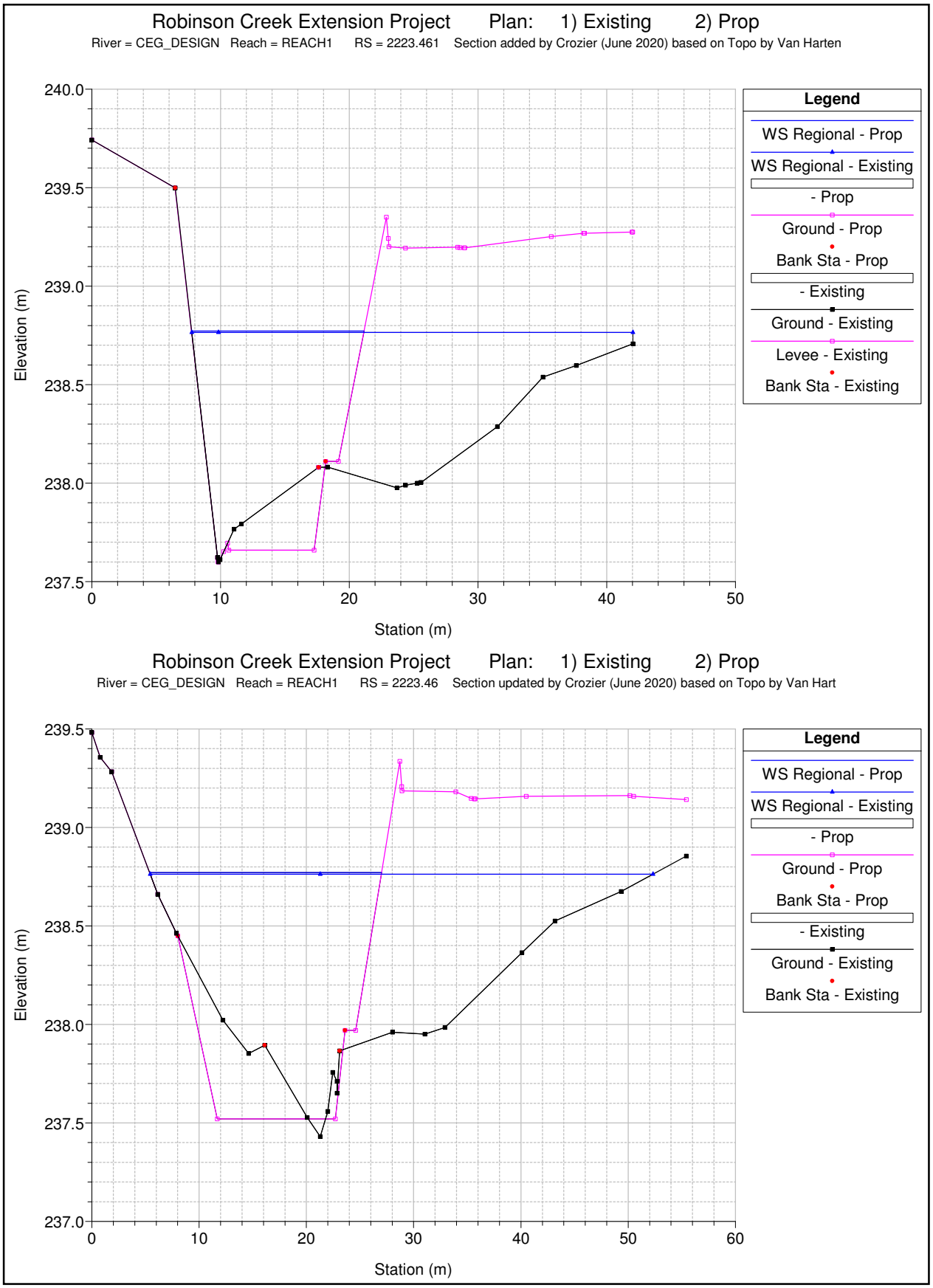
No Culvert Scenario

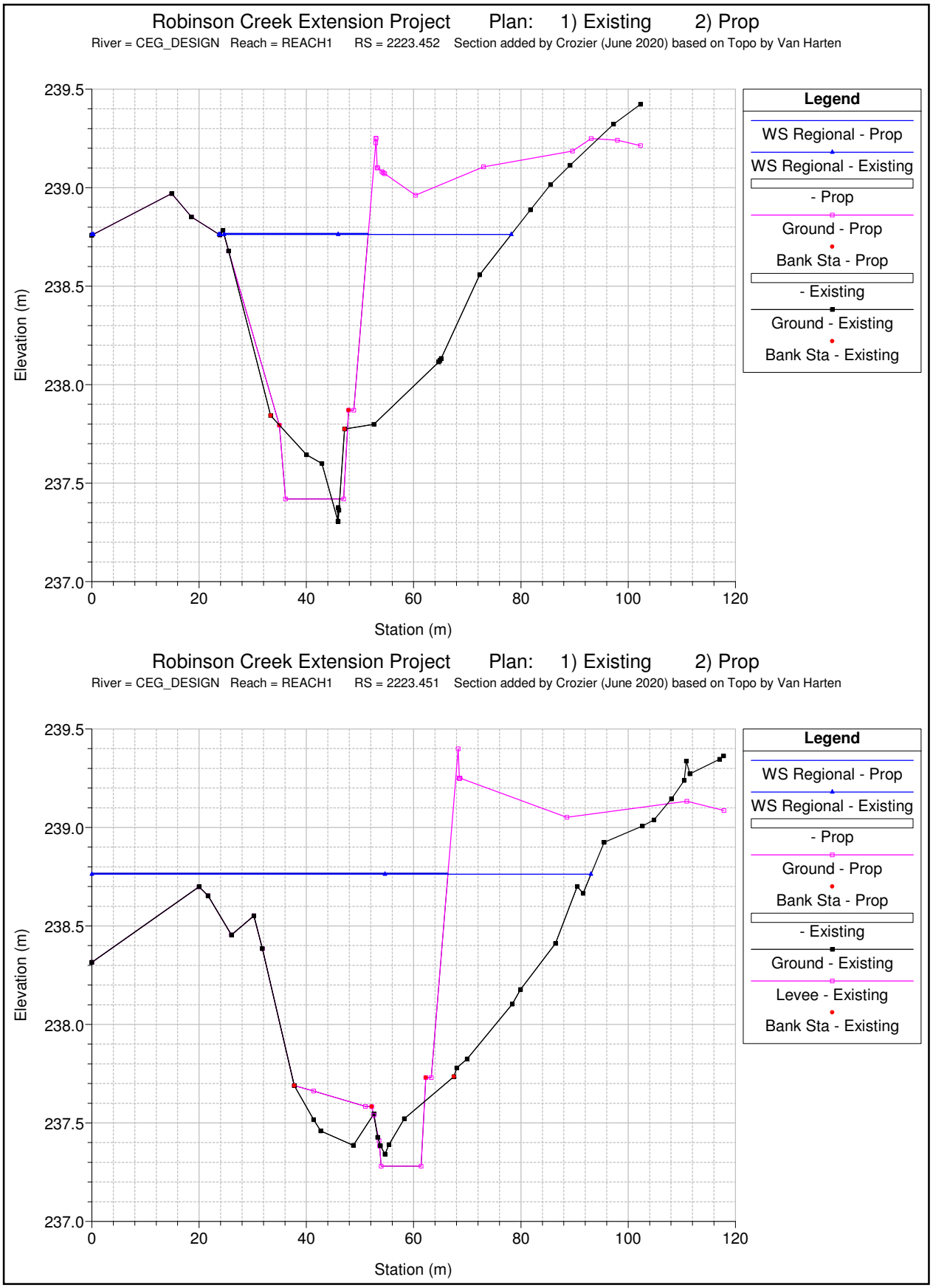


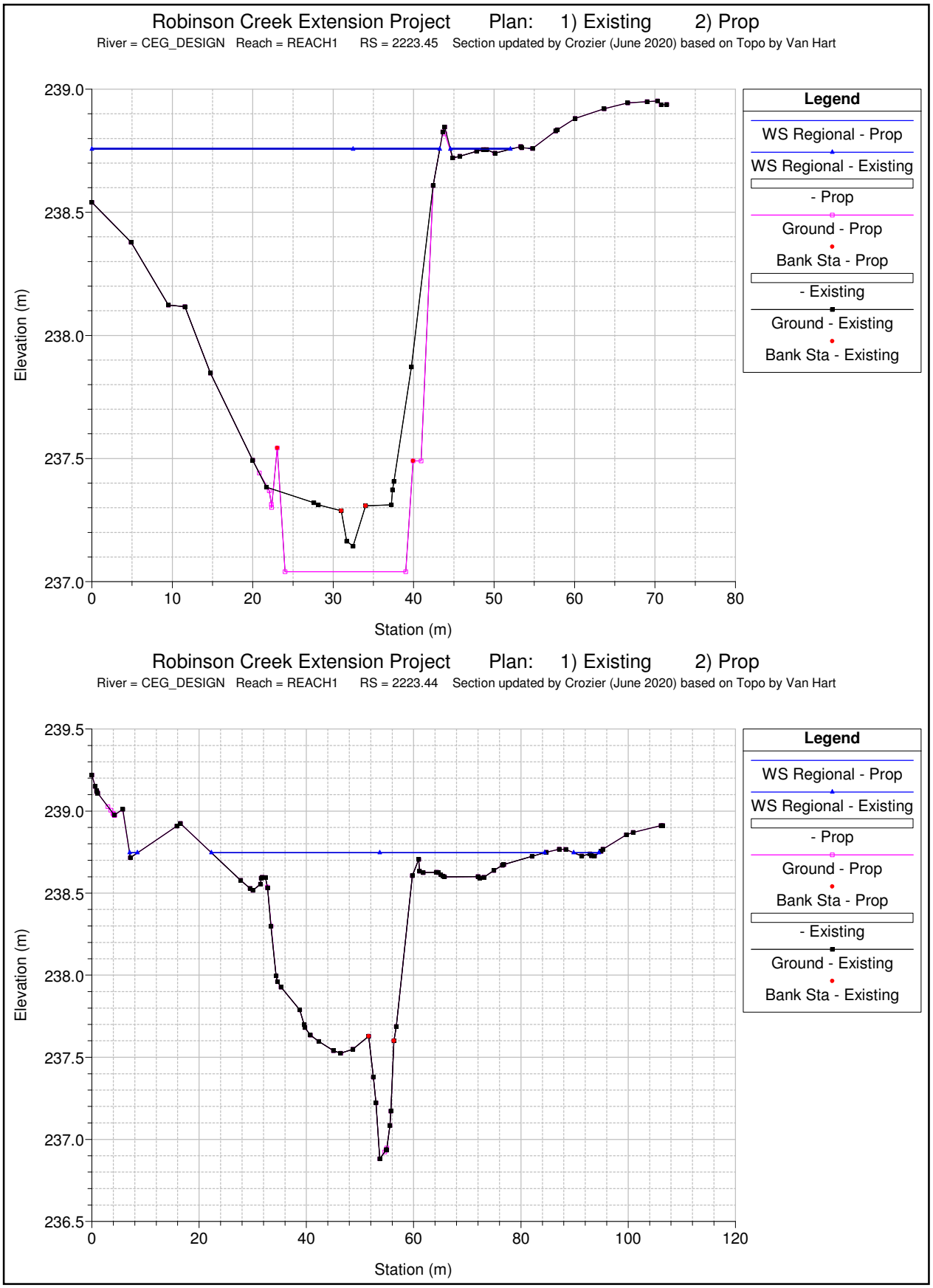
No Culvert Scenario




Robinson Creek Extension Project Plan: 1) Existing 2) Prop
River = CEG_DESIGN Reach = REACH1 RS = 2223.463 Section added by Crozier (June 2020) based on Topo by Van Harten
Elevation (m)
Station (m)
240.5
240.0
239.5
239.0
238.5
238.0
237.5
0
20
40
60
80
100
Legend
WS Regional - Prop
WS Regional - Existing
- Prop
Ground - Prop
Bank Sta - Prop
- Existing
Ground - Existing
Levee - Existing
Bank Sta - Existing
Robinson Creek Extension Project Plan: 1) Existing 2) Prop
River = CEG_DESIGN Reach = REACH1 RS = 2223.462 Section added by Crozier (June 2020) based on Topo by Van Harten
Elevation (m)
Station (m)
240.0
239.5
239.0
238.5
238.0
237.5
0
10
20
30
40
50
Legend
WS Regional - Prop
WS Regional - Existing
- Prop
Ground - Prop
Bank Sta - Prop
- Existing
Ground - Existing
Levee - Existing
Bank Sta - Existing


Robinson Creek Extension Project Plan: 1) Existing 2) Prop
River = CEG_DESIGN Reach = REACH1 RS = 2223.461 Section added by Crozier (June 2020) based on Topo by Van Harten
Elevation (m)
Station (m)
240.0
239.5
239.0
238.5
238.0
237.5
0
10
20
30
40
50
Legend
WS Regional - Prop
WS Regional - Existing
- Prop
Ground - Prop
Bank Sta - Prop
- Existing
Ground - Existing
Levee - Existing
Bank Sta - Existing
Robinson Creek Extension Project Plan: 1) Existing 2) Prop
River = CEG_DESIGN Reach = REACH1 RS = 2223.46 Section updated by Crozier (June 2020) based on Topo by Van Hart
Elevation (m)
Station (m)
239.5
239.0
238.5
238.0
237.5
237.0
0
10
20
30
40
50
60
Legend
WS Regional - Prop
WS Regional - Existing
- Prop
Ground - Prop
Bank Sta - Prop
- Existing
Ground - Existing
Bank Sta - Existing


Robinson Creek Extension Project Plan: 1) Existing 2) Prop
River = CEG_DESIGN Reach = REACH1 RS = 2223.452 Section added by Crozier (June 2020) based on Topo by Van Harten
Elevation (m)
Station (m)
239.5
239.0
238.5
238.0
237.5
237.0
0
20
40
60
80
100
120
Legend
WS Regional - Prop
WS Regional - Existing
- Prop
Ground - Prop
Bank Sta - Prop
- Existing
Ground - Existing
Bank Sta - Existing
Robinson Creek Extension Project Plan: 1) Existing 2) Prop
River = CEG_DESIGN Reach = REACH1 RS = 2223.451 Section added by Crozier (June 2020) based on Topo by Van Harten
Elevation (m)
Station (m)
239.5
239.0
238.5
238.0
237.5
237.0
0
20
40
60
80
100
120
Legend
WS Regional - Prop
WS Regional - Existing
- Prop
Ground - Prop
Bank Sta - Prop
- Existing
Ground - Existing
Levee - Existing
Bank Sta - Existing


Robinson Creek Extension Project Plan: 1) Existing 2) Prop
River = CEG_DESIGN Reach = REACH1 RS = 2223.45 Section updated by Crozier (June 2020) based on Topo by Van Hart
Elevation (m)
Station (m)
239.0
238.5
238.0
237.5
237.0
0
10
20
30
40
50
60
70
80
Legend
WS Regional - Prop
WS Regional - Existing
- Prop
Ground - Prop
Bank Sta - Prop
- Existing
Ground - Existing
Bank Sta - Existing
Robinson Creek Extension Project Plan: 1) Existing 2) Prop
River = CEG_DESIGN Reach = REACH1 RS = 2223.44 Section updated by Crozier (June 2020) based on Topo by Van Hart
Elevation (m)
Station (m)
239.5
239.0
238.5
238.0
237.5
237.0
236.5
0
20
40
60
80
100
120
Legend
WS Regional - Prop
WS Regional - Existing
- Prop
Ground - Prop
Bank Sta - Prop
- Existing
Ground - Existing
Bank Sta - Existing

HEC-RAS River: CEG_DESIGN Reach: REACH1 Profile: Regional

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
REACH1	2224.08	Regional	Existing	4.76	242.90	243.58		243.61	0.002994	0.92	6.05	20.41	0.43
REACH1	2224.08	Regional	Existing_NoCulvert	4.76	242.90	243.58		243.61	0.002994	0.92	6.05	20.41	0.43
REACH1	2224.08	Regional	Prop	4.76	242.90	243.58		243.61	0.002994	0.92	6.05	20.41	0.43
REACH1	2224.08	Regional	Prop_NoCul	4.76	242.90	243.58		243.61	0.002994	0.92	6.05	20.41	0.43
REACH1	2224.07	Regional	Existing	4.76	241.78	242.50	242.48	242.76	0.013678	2.47	2.57	6.46	0.97
REACH1	2224.07	Regional	Existing_NoCulvert	4.76	241.78	242.50	242.48	242.76	0.013678	2.47	2.57	6.46	0.97
REACH1	2224.07	Regional	Prop	4.76	241.78	242.50	242.48	242.76	0.013678	2.47	2.57	6.46	0.97
REACH1	2224.07	Regional	Prop_NoCul	4.76	241.78	242.50	242.48	242.76	0.013678	2.47	2.57	6.46	0.97
REACH1	2224.06	Regional	Existing	4.76	241.50	241.89	241.89	241.99	0.012779	1.56	3.57	17.99	0.86
REACH1	2224.06	Regional	Existing_NoCulvert	4.76	241.50	241.89	241.89	241.99	0.012779	1.56	3.57	17.99	0.86
REACH1	2224.06	Regional	Prop	4.76	241.50	241.89	241.89	241.99	0.012779	1.56	3.57	17.99	0.86
REACH1	2224.06	Regional	Prop_NoCul	4.76	241.50	241.89	241.89	241.99	0.012779	1.56	3.57	17.99	0.86
REACH1	2224.05	Regional	Existing	4.76	241.00	241.72		241.73	0.001212	0.65	16.72	68.79	0.28
REACH1	2224.05	Regional	Existing_NoCulvert	4.76	241.00	241.72		241.73	0.001212	0.65	16.72	68.79	0.28
REACH1	2224.05	Regional	Prop	4.76	241.00	241.72		241.73	0.001212	0.65	16.72	68.79	0.28
REACH1	2224.05	Regional	Prop_NoCul	4.76	241.00	241.72		241.73	0.001212	0.65	16.72	68.79	0.28
REACH1	2224.04	Regional	Existing	4.76	240.50	241.73		241.73	0.000008	0.08	73.59	131.92	0.03
REACH1	2224.04	Regional	Existing_NoCulvert	4.76	240.50	241.73		241.73	0.000008	0.08	73.59	131.92	0.03
REACH1	2224.04	Regional	Prop	4.76	240.50	241.73		241.73	0.000008	0.08	73.59	131.92	0.03
REACH1	2224.04	Regional	Prop_NoCul	4.76	240.50	241.73		241.73	0.000008	0.08	73.59	131.92	0.03
REACH1	2224.03	Regional	Existing	4.76	240.50	241.72		241.73	0.000008	0.09	72.55	81.07	0.03
REACH1	2224.03	Regional	Existing_NoCulvert	4.76	240.50	241.72		241.73	0.000008	0.09	72.55	81.07	0.03
REACH1	2224.03	Regional	Prop	4.76	240.50	241.72		241.73	0.000008	0.09	72.55	81.07	0.03
REACH1	2224.03	Regional	Prop_NoCul	4.76	240.50	241.72		241.73	0.000008	0.09	72.55	81.07	0.03
REACH1	2224.02	Regional	Existing	4.76	240.27	241.69	241.55	241.72	0.002391	0.88	12.04	47.06	0.39
REACH1	2224.02	Regional	Existing_NoCulvert	4.76	240.27	241.69	241.55	241.72	0.002391	0.88	12.04	47.06	0.39
REACH1	2224.02	Regional	Prop	4.76	240.27	241.69	241.55	241.72	0.002391	0.88	12.04	47.06	0.39
REACH1	2224.02	Regional	Prop_NoCul	4.76	240.27	241.69	241.55	241.72	0.002391	0.88	12.04	47.06	0.39
REACH1	2224.015			Culvert									
REACH1	2224.01	Regional	Existing	4.76	239.91	241.26	241.26	241.31	0.011316	1.44	10.21	95.71	0.78
REACH1	2224.01	Regional	Existing_NoCulvert	4.76	239.91	241.26	241.26	241.31	0.011316	1.44	10.21	95.71	0.78
REACH1	2224.01	Regional	Prop	4.76	239.91	241.26	241.26	241.31	0.011316	1.44	10.21	95.71	0.78
REACH1	2224.01	Regional	Prop_NoCul	4.76	239.91	241.26	241.26	241.31	0.011316	1.44	10.21	95.71	0.78
REACH1	2223.56	Regional	Existing	7.15	239.85	240.74	240.74	240.80	0.009985	1.79	13.60	75.79	0.76
REACH1	2223.56	Regional	Existing_NoCulvert	7.15	239.85	240.74	240.74	240.80	0.009985	1.79	13.60	75.79	0.76
REACH1	2223.56	Regional	Prop	7.15	239.85	240.74	240.74	240.80	0.009985	1.79	13.60	75.79	0.76
REACH1	2223.56	Regional	Prop_NoCul	7.15	239.85	240.74	240.74	240.80	0.009985	1.79	13.60	75.79	0.76
REACH1	2223.55	Regional	Existing	7.15	239.56	240.62		240.62	0.000270	0.43	36.92	95.62	0.15
REACH1	2223.55	Regional	Existing_NoCulvert	7.15	239.56	240.62		240.62	0.000270	0.43	36.92	95.62	0.15
REACH1	2223.55	Regional	Prop	7.15	239.56	240.62		240.62	0.000270	0.43	36.92	95.62	0.15
REACH1	2223.55	Regional	Prop_NoCul	7.15	239.56	240.62		240.62	0.000270	0.43	36.92	95.62	0.15
REACH1	2223.54	Regional	Existing	7.15	239.55	240.59	240.53	240.60	0.003579	0.81	18.03	116.14	0.45
REACH1	2223.54	Regional	Existing_NoCulvert	7.15	239.55	240.59	240.53	240.60	0.003579	0.81	18.03	116.14	0.45
REACH1	2223.54	Regional	Prop	7.15	239.55	240.59	240.53	240.60	0.003579	0.81	18.03	116.14	0.45
REACH1	2223.54	Regional	Prop_NoCul	7.15	239.55	240.59	240.53	240.60	0.003579	0.81	18.03	116.14	0.45
REACH1	2223.535			Culvert									
REACH1	2223.53	Regional	Existing	7.15	239.25	240.42	240.42	240.51	0.032686	2.05	8.53	58.35	1.26
REACH1	2223.53	Regional	Existing_NoCulvert	7.15	239.25	240.42	240.42	240.51	0.032686	2.05	8.53	58.35	1.26
REACH1	2223.53	Regional	Prop	7.15	239.25	240.42	240.42	240.51	0.032686	2.05	8.53	58.35	1.26
REACH1	2223.53	Regional	Prop_NoCul	7.15	239.25	240.42	240.42	240.51	0.032686	2.05	8.53	58.35	1.26
REACH1	2223.52	Regional	Existing	7.15	239.15	240.13		240.17	0.003629	1.22	14.19	42.29	0.49
REACH1	2223.52	Regional	Existing_NoCulvert	7.15	239.15	240.13		240.17	0.003629	1.22	14.19	42.29	0.49
REACH1	2223.52	Regional	Prop	7.15	239.15	240.13		240.17	0.003629	1.22	14.19	42.29	0.49
REACH1	2223.52	Regional	Prop_NoCul	7.15	239.15	240.13		240.17	0.003634	1.22	14.18	42.28	0.49
REACH1	2223.51	Regional	Existing	7.15	238.75	239.69		239.83	0.006357	1.93	5.69	13.97	0.69
REACH1	2223.51	Regional	Existing_NoCulvert	7.15	238.75	239.69		239.83	0.006357	1.93	5.69	13.97	0.69
REACH1	2223.51	Regional	Prop	7.15	238.75	239.69		239.83	0.006357	1.93	5.69	13.97	0.69
REACH1	2223.51	Regional	Prop_NoCul	7.15	238.75	239.69		239.84	0.006312	1.92	5.71	13.99	0.68
REACH1	2223.50	Regional	Existing	7.15	238.52	239.72		239.72	0.000239	0.49	33.75	44.35	0.14
REACH1	2223.50	Regional	Existing_NoCulvert	7.15	238.52	239.72		239.72	0.000239	0.49	33.75	44.35	0.14
REACH1	2223.50	Regional	Prop	7.15	238.52	239.72		239.72	0.000239	0.49	33.75	44.35	0.14
REACH1	2223.50	Regional	Prop_NoCul	7.15	238.52	239.72		239.72	0.000238	0.49	33.80	44.37	0.14
REACH1	2223.49	Regional	Existing	7.15	238.04	239.69	239.44	239.71	0.001335	1.00	20.46	45.20	0.32
REACH1	2223.49	Regional	Existing_NoCulvert	7.15	238.04	239.69	239.44	239.71	0.001335	1.00	20.46	45.20	0.32
REACH1	2223.49	Regional	Prop	7.15	238.04	239.69	239.44	239.71	0.001335	1.00	20.46	45.20	0.32
REACH1	2223.49	Regional	Prop_NoCul	7.15	238.04	239.69	239.44	239.71	0.001325	0.99	20.52	45.23	0.32

HEC-RAS River: CEG_DESIGN Reach: REACH1 Profile: Regional (Continued)

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
REACH1	2223.485			Culvert									
REACH1	2223.48	Regional	Existing	7.15	237.92	239.36	239.36	239.48	0.010959	1.91	7.16	30.56	0.81
REACH1	2223.48	Regional	Existing_NoCulvert	7.15	237.92	239.36	239.36	239.48	0.010959	1.91	7.16	30.56	0.81
REACH1	2223.48	Regional	Prop	7.15	237.92	239.36	239.36	239.48	0.010959	1.91	7.16	30.56	0.81
REACH1	2223.48	Regional	Prop_NoCul	7.15	237.92	239.36	239.36	239.48	0.011021	1.91	7.15	30.54	0.82
REACH1	2223.47	Regional	Existing	7.15	237.80	238.91		238.92	0.000162	0.30	24.19	33.12	0.11
REACH1	2223.47	Regional	Existing_NoCulvert	7.15	237.80	238.90		238.90	0.000174	0.30	23.68	33.06	0.11
REACH1	2223.47	Regional	Prop	7.15	237.80	238.93		238.93	0.000151	0.29	24.73	33.20	0.11
REACH1	2223.47	Regional	Prop_NoCul	7.15	237.80	238.87		238.88	0.000194	0.31	22.89	32.95	0.12
REACH1	2223.463	Regional	Existing	7.24	238.05	238.79	238.65	238.87	0.004452	1.25	5.82	12.92	0.54
REACH1	2223.463	Regional	Existing_NoCulvert	7.24	238.05	238.76	238.65	238.85	0.005596	1.35	5.41	12.71	0.60
REACH1	2223.463	Regional	Prop	7.24	237.96	238.80		238.89	0.003382	1.34	6.24	10.83	0.50
REACH1	2223.463	Regional	Prop_NoCul	7.24	237.96	238.70	238.55	238.82	0.005848	1.59	5.12	10.20	0.64
REACH1	2223.462	Regional	Existing	7.24	237.74	238.73	238.47	238.80	0.002497	1.16	6.43	11.03	0.43
REACH1	2223.462	Regional	Existing_NoCulvert	7.24	237.74	238.47	238.47	238.67	0.012649	1.97	3.77	9.79	0.90
REACH1	2223.462	Regional	Prop	7.24	237.80	238.76		238.83	0.002167	1.19	7.21	10.91	0.41
REACH1	2223.462	Regional	Prop_NoCul	7.24	237.80	238.40	238.40	238.63	0.014820	2.15	3.60	8.83	0.97
REACH1	2223.461	Regional	Existing	7.24	237.60	238.77	238.21	238.77	0.000219	0.36	19.92	34.27	0.13
REACH1	2223.461	Regional	Existing_NoCulvert	7.24	237.60	238.32		238.37	0.004188	1.03	7.19	23.39	0.50
REACH1	2223.461	Regional	Prop	7.24	237.60	238.77		238.80	0.000604	0.68	11.64	13.41	0.22
REACH1	2223.461	Regional	Prop_NoCul	7.24	237.60	238.32		238.40	0.003851	1.24	6.07	11.26	0.51
REACH1	2223.46	Regional	Existing	7.24	237.43	238.76		238.77	0.000276	0.24	28.19	46.86	0.07
REACH1	2223.46	Regional	Existing_NoCulvert	7.24	237.43	238.22		238.26	0.008336	0.84	8.70	27.10	0.36
REACH1	2223.46	Regional	Prop	7.24	237.52	238.77		238.78	0.000829	0.39	19.79	21.62	0.12
REACH1	2223.46	Regional	Prop_NoCul	7.24	237.52	238.27		238.30	0.005799	0.72	10.31	16.79	0.28
REACH1	2223.452	Regional	Existing	7.24	237.30	238.76		238.76	0.000048	0.21	38.43	54.02	0.06
REACH1	2223.452	Regional	Existing_NoCulvert	7.24	237.30	238.20		238.22	0.000885	0.58	13.71	36.31	0.24
REACH1	2223.452	Regional	Prop	7.24	237.42	238.77		238.77	0.000131	0.39	24.10	28.08	0.11
REACH1	2223.452	Regional	Prop_NoCul	7.24	237.42	238.25		238.27	0.000785	0.68	11.97	19.88	0.24
REACH1	2223.451	Regional	Existing	7.24	237.34	238.76	237.69	238.76	0.000019	0.14	63.20	93.05	0.04
REACH1	2223.451	Regional	Existing_NoCulvert	7.24	237.34	238.20	237.69	238.21	0.000205	0.32	24.63	47.25	0.12
REACH1	2223.451	Regional	Prop	7.24	237.28	238.77		238.77	0.000085	0.33	45.73	66.40	0.09
REACH1	2223.451	Regional	Prop_NoCul	7.24	237.28	238.25		238.26	0.000468	0.58	20.31	31.83	0.19
REACH1	2223.45	Regional	Existing	13.35	237.14	238.76		238.76	0.000123	0.42	42.49	50.70	0.11
REACH1	2223.45	Regional	Existing_NoCulvert	13.35	237.14	238.16		238.19	0.001097	0.91	19.39	32.00	0.30
REACH1	2223.45	Regional	Prop	13.35	237.04	238.76		238.76	0.000359	0.33	48.54	51.83	0.08
REACH1	2223.45	Regional	Prop_NoCul	13.35	237.04	238.21		238.22	0.001826	0.58	26.58	33.95	0.17
REACH1	2223.44	Regional	Existing	13.35	236.88	238.75		238.76	0.000476	0.56	33.20	68.33	0.14
REACH1	2223.44	Regional	Existing_NoCulvert	13.35	236.88	237.91	237.91	238.09	0.020439	2.23	8.08	21.86	0.82
REACH1	2223.44	Regional	Prop	13.35	236.88	238.75		238.76	0.000693	0.46	33.20	68.34	0.12
REACH1	2223.44	Regional	Prop_NoCul	13.35	236.88	237.92	237.92	238.09	0.040383	2.15	8.27	22.11	0.79
REACH1	2223.43	Regional	Existing	13.35	236.00	237.48		237.52	0.001023	0.92	15.31	17.80	0.29
REACH1	2223.43	Regional	Existing_NoCulvert	13.35	236.00	237.48		237.52	0.001023	0.92	15.31	17.80	0.29
REACH1	2223.43	Regional	Prop	13.35	236.00	237.48		237.52	0.001023	0.92	15.31	17.80	0.29
REACH1	2223.43	Regional	Prop_NoCul	13.35	236.00	237.48		237.52	0.001023	0.92	15.31	17.80	0.29
REACH1	2223.42	Regional	Existing	13.35	236.00	237.48		237.50	0.000445	0.69	24.97	26.84	0.20
REACH1	2223.42	Regional	Existing_NoCulvert	13.35	236.00	237.48		237.50	0.000445	0.69	24.97	26.84	0.20
REACH1	2223.42	Regional	Prop	13.35	236.00	237.48		237.50	0.000445	0.69	24.97	26.84	0.20
REACH1	2223.42	Regional	Prop_NoCul	13.35	236.00	237.48		237.50	0.000445	0.69	24.97	26.84	0.20
REACH1	2223.41	Regional	Existing	13.35	236.00	237.48	236.35	237.49	0.000123	0.40	36.80	35.27	0.11
REACH1	2223.41	Regional	Existing_NoCulvert	13.35	236.00	237.48	236.35	237.49	0.000123	0.40	36.80	35.27	0.11
REACH1	2223.41	Regional	Prop	13.35	236.00	237.48	236.35	237.49	0.000123	0.40	36.80	35.27	0.11
REACH1	2223.41	Regional	Prop_NoCul	13.35	236.00	237.48	236.35	237.49	0.000123	0.40	36.80	35.27	0.11
REACH1	2223.40	Regional	Existing	13.35	236.00	237.29	237.12	237.46	0.005141	1.91	11.37	40.32	0.63
REACH1	2223.40	Regional	Existing_NoCulvert	13.35	236.00	237.29	237.12	237.46	0.005141	1.91	11.37	40.32	0.63
REACH1	2223.40	Regional	Prop	13.35	236.00	237.29	237.12	237.46	0.005141	1.91	11.37	40.32	0.63
REACH1	2223.40	Regional	Prop_NoCul	13.35	236.00	237.29	237.12	237.46	0.005141	1.91	11.37	40.32	0.63
REACH1	2223.39	Regional	Existing	13.35	235.68	236.72	236.72	237.03	0.012628	2.46	5.91	12.61	0.95
REACH1	2223.39	Regional	Existing_NoCulvert	13.35	235.68	236.72	236.72	237.03	0.012628	2.46	5.91	12.61	0.95
REACH1	2223.39	Regional	Prop	13.35	235.68	236.72	236.72	237.03	0.012628	2.46	5.91	12.61	0.95
REACH1	2223.39	Regional	Prop_NoCul	13.35	235.68	236.72	236.72	237.03	0.012628	2.46	5.91	12.61	0.95
REACH1	2223.38	Regional	Existing	13.35	234.50	236.22		236.30	0.001660	1.48	21.90	47.08	0.39
REACH1	2223.38	Regional	Existing_NoCulvert	13.35	234.50	236.22		236.30	0.001660	1.48	21.90	47.08	0.39
REACH1	2223.38	Regional	Prop	13.35	234.50	236.22		236.30	0.001660	1.48	21.90	47.08	0.39
REACH1	2223.38	Regional	Prop_NoCul	13.35	234.50	236.22		236.30	0.001660	1.48	21.90	47.08	0.39
REACH1	2223.37	Regional	Existing	15.17	233.51	236.07	235.82	236.21	0.004128	1.89	14.61	30.61	0.56
REACH1	2223.37	Regional	Existing_NoCulvert	15.17	233.51	236.07	235.82	236.21	0.004128	1.89	14.61	30.61	0.56

SITE LOCATION

HEC-RAS River: CEG_DESIGN Reach: REACH1 Profile: Regional (Continued)

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
REACH1	2223.37	Regional	Prop	15.17	233.51	236.07	235.82	236.21	0.004128	1.89	14.61	30.61	0.56
REACH1	2223.37	Regional	Prop_NoCul	15.17	233.51	236.07	235.82	236.21	0.004128	1.89	14.61	30.61	0.56
REACH1	2223.365			Culvert									
REACH1	2223.36	Regional	Existing	15.17	233.69	235.68	235.68	235.82	0.009447	1.83	10.07	41.77	0.78
REACH1	2223.36	Regional	Existing_NoCulvert	15.17	233.69	235.68	235.68	235.82	0.009447	1.83	10.07	41.77	0.78
REACH1	2223.36	Regional	Prop	15.17	233.69	235.68	235.68	235.82	0.009447	1.83	10.07	41.77	0.78
REACH1	2223.36	Regional	Prop_NoCul	15.17	233.69	235.68	235.68	235.82	0.009447	1.83	10.07	41.77	0.78
REACH1	2223.35	Regional	Existing	15.17	233.50	234.66	234.66	235.07	0.011097	2.92	6.37	9.40	0.94
REACH1	2223.35	Regional	Existing_NoCulvert	15.17	233.50	234.66	234.66	235.07	0.011097	2.92	6.37	9.40	0.94
REACH1	2223.35	Regional	Prop	15.17	233.50	234.66	234.66	235.07	0.011097	2.92	6.37	9.40	0.94
REACH1	2223.35	Regional	Prop_NoCul	15.17	233.50	234.66	234.66	235.07	0.011097	2.92	6.37	9.40	0.94
REACH1	2223.34	Regional	Existing	15.17	233.00	233.93	233.92	234.11	0.008253	2.22	14.52	41.86	0.79
REACH1	2223.34	Regional	Existing_NoCulvert	15.17	233.00	233.93	233.92	234.11	0.008253	2.22	14.52	41.86	0.79
REACH1	2223.34	Regional	Prop	15.17	233.00	233.93	233.92	234.11	0.008253	2.22	14.52	41.86	0.79
REACH1	2223.34	Regional	Prop_NoCul	15.17	233.00	233.93	233.92	234.11	0.008253	2.22	14.52	41.86	0.79
REACH1	2223.33	Regional	Existing	15.17	232.50	233.77		233.82	0.001226	1.03	21.91	33.46	0.32
REACH1	2223.33	Regional	Existing_NoCulvert	15.17	232.50	233.77		233.82	0.001226	1.03	21.91	33.46	0.32
REACH1	2223.33	Regional	Prop	15.17	232.50	233.77		233.82	0.001226	1.03	21.91	33.46	0.32
REACH1	2223.33	Regional	Prop_NoCul	15.17	232.50	233.77		233.82	0.001226	1.03	21.91	33.46	0.32
REACH1	2223.326	Regional	Existing	15.17	232.00	233.78		233.78	0.000075	0.34	85.71	82.16	0.09
REACH1	2223.326	Regional	Existing_NoCulvert	15.17	232.00	233.78		233.78	0.000075	0.34	85.71	82.16	0.09
REACH1	2223.326	Regional	Prop	15.17	232.00	233.78		233.78	0.000075	0.34	85.71	82.16	0.09
REACH1	2223.326	Regional	Prop_NoCul	15.17	232.00	233.78		233.78	0.000075	0.34	85.71	82.16	0.09
REACH1	2223.325	Regional	Existing	15.17	231.99	233.78	232.57	233.78	0.000100	0.39	69.59	67.57	0.10
REACH1	2223.325	Regional	Existing_NoCulvert	15.17	231.99	233.78	232.57	233.78	0.000100	0.39	69.59	67.57	0.10
REACH1	2223.325	Regional	Prop	15.17	231.99	233.78	232.57	233.78	0.000100	0.39	69.59	67.57	0.10
REACH1	2223.325	Regional	Prop_NoCul	15.17	231.99	233.78	232.57	233.78	0.000100	0.39	69.59	67.57	0.10
REACH1	2223.324	Regional	Existing	15.17	231.98	233.78	232.46	233.78	0.000059	0.30	70.19	65.12	0.08
REACH1	2223.324	Regional	Existing_NoCulvert	15.17	231.98	233.78	232.46	233.78	0.000059	0.30	70.19	65.12	0.08
REACH1	2223.324	Regional	Prop	15.17	231.98	233.78	232.46	233.78	0.000059	0.30	70.19	65.12	0.08
REACH1	2223.324	Regional	Prop_NoCul	15.17	231.98	233.78	232.46	233.78	0.000059	0.30	70.19	65.12	0.08
REACH1	2223.323	Regional	Existing	15.17	231.92	233.78		233.78	0.000052	0.29	69.31	63.15	0.07
REACH1	2223.323	Regional	Existing_NoCulvert	15.17	231.92	233.78		233.78	0.000052	0.29	69.31	63.15	0.07
REACH1	2223.323	Regional	Prop	15.17	231.92	233.78		233.78	0.000052	0.29	69.31	63.15	0.07
REACH1	2223.323	Regional	Prop_NoCul	15.17	231.92	233.78		233.78	0.000052	0.29	69.31	63.15	0.07
REACH1	2223.32	Regional	Existing	15.17	231.67	233.77		233.78	0.000139	0.50	57.28	50.13	0.12
REACH1	2223.32	Regional	Existing_NoCulvert	15.17	231.67	233.77		233.78	0.000139	0.50	57.28	50.13	0.12
REACH1	2223.32	Regional	Prop	15.17	231.67	233.77		233.78	0.000139	0.50	57.28	50.13	0.12
REACH1	2223.32	Regional	Prop_NoCul	15.17	231.67	233.77		233.78	0.000139	0.50	57.28	50.13	0.12
REACH1	2223.31	Regional	Existing	15.17	231.50	233.77		233.77	0.000047	0.32	80.14	68.24	0.07
REACH1	2223.31	Regional	Existing_NoCulvert	15.17	231.50	233.77		233.77	0.000047	0.32	80.14	68.24	0.07
REACH1	2223.31	Regional	Prop	15.17	231.50	233.77		233.77	0.000047	0.32	80.14	68.24	0.07
REACH1	2223.31	Regional	Prop_NoCul	15.17	231.50	233.77		233.77	0.000047	0.32	80.14	68.24	0.07
REACH1	2223.30	Regional	Existing	15.17	231.50	233.77		233.77	0.000054	0.36	93.68	79.00	0.08
REACH1	2223.30	Regional	Existing_NoCulvert	15.17	231.50	233.77		233.77	0.000054	0.36	93.68	79.00	0.08
REACH1	2223.30	Regional	Prop	15.17	231.50	233.77		233.77	0.000054	0.36	93.68	79.00	0.08
REACH1	2223.30	Regional	Prop_NoCul	15.17	231.50	233.77		233.77	0.000054	0.36	93.68	79.00	0.08
REACH1	2223.29	Regional	Existing	15.17	231.50	233.67	232.92	233.74	0.001410	1.47	17.34	42.18	0.35
REACH1	2223.29	Regional	Existing_NoCulvert	15.17	231.50	233.67	232.92	233.74	0.001410	1.47	17.34	42.18	0.35
REACH1	2223.29	Regional	Prop	15.17	231.50	233.67	232.92	233.74	0.001410	1.47	17.34	42.18	0.35
REACH1	2223.29	Regional	Prop_NoCul	15.17	231.50	233.67	232.92	233.74	0.001410	1.47	17.34	42.18	0.35
REACH1	2223.285			Culvert									
REACH1	2223.28	Regional	Existing	15.17	231.50	232.96	232.96	233.67	0.011192	3.74	4.05	34.46	1.00
REACH1	2223.28	Regional	Existing_NoCulvert	15.17	231.50	232.96	232.96	233.67	0.011192	3.74	4.05	34.46	1.00
REACH1	2223.28	Regional	Prop	15.17	231.50	232.96	232.96	233.67	0.011192	3.74	4.05	34.46	1.00
REACH1	2223.28	Regional	Prop_NoCul	15.17	231.50	232.96	232.96	233.67	0.011192	3.74	4.05	34.46	1.00
REACH1	2223.27	Regional	Existing	15.17	231.10	232.68	231.94	232.69	0.000231	0.53	29.30	54.42	0.14
REACH1	2223.27	Regional	Existing_NoCulvert	15.17	231.10	232.68	231.94	232.69	0.000231	0.53	29.30	54.42	0.14
REACH1	2223.27	Regional	Prop	15.17	231.10	232.68	231.94	232.69	0.000231	0.53	29.30	54.42	0.14
REACH1	2223.27	Regional	Prop_NoCul	15.17	231.10	232.68	231.94	232.69	0.000231	0.53	29.30	54.42	0.14
REACH1	2223.26	Regional	Existing	15.17	231.00	232.67	231.85	232.68	0.000141	0.44	38.40	59.45	0.11
REACH1	2223.26	Regional	Existing_NoCulvert	15.17	231.00	232.67	231.85	232.68	0.000141	0.44	38.40	59.45	0.11
REACH1	2223.26	Regional	Prop	15.17	231.00	232.67	231.85	232.68	0.000141	0.44	38.40	59.45	0.11
REACH1	2223.26	Regional	Prop_NoCul	15.17	231.00	232.67	231.85	232.68	0.000141	0.44	38.40	59.45	0.11
REACH1	2223.25	Regional	Existing	15.17	230.50	232.62		232.67	0.001102	1.04	22.00	28.92	0.25
REACH1	2223.25	Regional	Existing_NoCulvert	15.17	230.50	232.62		232.67	0.001102	1.04	22.00	28.92	0.25

HEC-RAS River: CEG_DESIGN Reach: REACH1 Profile: Regional (Continued)

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
REACH1	2223.25	Regional	Prop	15.17	230.50	232.62		232.67	0.001102	1.04	22.00	28.92	0.25
REACH1	2223.25	Regional	Prop_NoCul	15.17	230.50	232.62		232.67	0.001102	1.04	22.00	28.92	0.25
REACH1	2223.24	Regional	Existing	15.17	230.20	232.45	231.51	232.48	0.000654	0.94	21.14	33.30	0.24
REACH1	2223.24	Regional	Existing_NoCulvert	15.17	230.20	232.45	231.51	232.48	0.000654	0.94	21.14	33.30	0.24
REACH1	2223.24	Regional	Prop	15.17	230.20	232.45	231.51	232.48	0.000654	0.94	21.14	33.30	0.24
REACH1	2223.24	Regional	Prop_NoCul	15.17	230.20	232.45	231.51	232.48	0.000654	0.94	21.14	33.30	0.24
REACH1	2223.23	Regional	Existing	15.17	230.20	232.44	231.72	232.47	0.000708	0.96	24.42	53.80	0.23
REACH1	2223.23	Regional	Existing_NoCulvert	15.17	230.20	232.44	231.72	232.47	0.000708	0.96	24.42	53.80	0.23
REACH1	2223.23	Regional	Prop	15.17	230.20	232.44	231.72	232.47	0.000708	0.96	24.42	53.80	0.23
REACH1	2223.23	Regional	Prop_NoCul	15.17	230.20	232.44	231.72	232.47	0.000708	0.96	24.42	53.80	0.23
REACH1	2223.22	Regional	Existing	15.17	230.20	232.32	232.32	232.44	0.002303	1.91	17.31	63.65	0.56
REACH1	2223.22	Regional	Existing_NoCulvert	15.17	230.20	232.32	232.32	232.44	0.002303	1.91	17.31	63.65	0.56
REACH1	2223.22	Regional	Prop	15.17	230.20	232.32	232.32	232.44	0.002303	1.91	17.31	63.65	0.56
REACH1	2223.22	Regional	Prop_NoCul	15.17	230.20	232.32	232.32	232.44	0.002303	1.91	17.31	63.65	0.56
REACH1	2223.215			Culvert									
REACH1	2223.21	Regional	Existing	15.17	230.00	231.80	231.80	231.92	0.002879	1.91	15.65	56.06	0.65
REACH1	2223.21	Regional	Existing_NoCulvert	15.17	230.00	231.80	231.80	231.92	0.002879	1.91	15.65	56.06	0.65
REACH1	2223.21	Regional	Prop	15.17	230.00	231.80	231.80	231.92	0.002879	1.91	15.65	56.06	0.65
REACH1	2223.21	Regional	Prop_NoCul	15.17	230.00	231.80	231.80	231.92	0.002879	1.91	15.65	56.06	0.65
REACH1	2223.20	Regional	Existing	17.32	229.70	231.67	231.05	231.72	0.000983	1.16	26.90	64.84	0.30
REACH1	2223.20	Regional	Existing_NoCulvert	17.32	229.70	231.67	231.05	231.72	0.000983	1.16	26.90	64.84	0.30
REACH1	2223.20	Regional	Prop	17.32	229.70	231.67	231.05	231.72	0.000983	1.16	26.90	64.84	0.30
REACH1	2223.20	Regional	Prop_NoCul	17.32	229.70	231.67	231.05	231.72	0.000983	1.16	26.90	64.84	0.30
REACH1	2223.19	Regional	Existing	17.32	229.45	231.59	231.59	231.69	0.003486	1.82	17.59	84.47	0.40
REACH1	2223.19	Regional	Existing_NoCulvert	17.32	229.45	231.59	231.59	231.69	0.003486	1.82	17.59	84.47	0.40
REACH1	2223.19	Regional	Prop	17.32	229.45	231.59	231.59	231.69	0.003486	1.82	17.59	84.47	0.40
REACH1	2223.19	Regional	Prop_NoCul	17.32	229.45	231.59	231.59	231.69	0.003486	1.82	17.59	84.47	0.40
REACH1	2223.185			Culvert									
REACH1	2223.18	Regional	Existing	17.32	229.37	231.29	231.29	231.43	0.004197	2.03	14.02	49.43	0.58
REACH1	2223.18	Regional	Existing_NoCulvert	17.32	229.37	231.29	231.29	231.43	0.004197	2.03	14.02	49.43	0.58
REACH1	2223.18	Regional	Prop	17.32	229.37	231.29	231.29	231.43	0.004197	2.03	14.02	49.43	0.58
REACH1	2223.18	Regional	Prop_NoCul	17.32	229.37	231.29	231.29	231.43	0.004197	2.03	14.02	49.43	0.58
REACH1	2223.17	Regional	Existing	17.32	228.87	230.57	230.57	230.91	0.009942	3.28	12.73	23.71	0.87
REACH1	2223.17	Regional	Existing_NoCulvert	17.32	228.87	230.57	230.57	230.91	0.009942	3.28	12.73	23.71	0.87
REACH1	2223.17	Regional	Prop	17.32	228.87	230.57	230.57	230.91	0.009942	3.28	12.73	23.71	0.87
REACH1	2223.17	Regional	Prop_NoCul	17.32	228.87	230.57	230.57	230.91	0.009942	3.28	12.73	23.71	0.87
REACH1	2223.16	Regional	Existing	17.32	228.57	230.18	230.18	230.54	0.010151	2.84	9.19	16.75	0.87
REACH1	2223.16	Regional	Existing_NoCulvert	17.32	228.57	230.18	230.18	230.54	0.010151	2.84	9.19	16.75	0.87
REACH1	2223.16	Regional	Prop	17.32	228.57	230.18	230.18	230.54	0.010151	2.84	9.19	16.75	0.87
REACH1	2223.16	Regional	Prop_NoCul	17.32	228.57	230.18	230.18	230.54	0.010151	2.84	9.19	16.75	0.87
REACH1	2223.15	Regional	Existing	17.32	228.50	229.70	229.30	229.74	0.003874	1.03	23.83	47.62	0.33
REACH1	2223.15	Regional	Existing_NoCulvert	17.32	228.50	229.70	229.30	229.74	0.003874	1.03	23.83	47.62	0.33
REACH1	2223.15	Regional	Prop	17.32	228.50	229.70	229.30	229.74	0.003874	1.03	23.83	47.62	0.33
REACH1	2223.15	Regional	Prop_NoCul	17.32	228.50	229.70	229.30	229.74	0.003874	1.03	23.83	47.62	0.33
REACH1	2223.14	Regional	Existing	17.32	228.37	229.30		229.33	0.002337	1.27	29.29	66.03	0.43
REACH1	2223.14	Regional	Existing_NoCulvert	17.32	228.37	229.30		229.33	0.002337	1.27	29.29	66.03	0.43
REACH1	2223.14	Regional	Prop	17.32	228.37	229.30		229.33	0.002337	1.27	29.29	66.03	0.43
REACH1	2223.14	Regional	Prop_NoCul	17.32	228.37	229.30		229.33	0.002337	1.27	29.29	66.03	0.43
REACH1	2223.13	Regional	Existing	17.32	227.99	229.04	228.77	229.12	0.002685	1.44	17.10	34.31	0.47
REACH1	2223.13	Regional	Existing_NoCulvert	17.32	227.99	229.04	228.77	229.12	0.002685	1.44	17.10	34.31	0.47
REACH1	2223.13	Regional	Prop	17.32	227.99	229.04	228.77	229.12	0.002685	1.44	17.10	34.31	0.47
REACH1	2223.13	Regional	Prop_NoCul	17.32	227.99	229.04	228.77	229.12	0.002685	1.44	17.10	34.31	0.47
REACH1	2223.12	Regional	Existing	17.32	227.02	229.00		229.06	0.001006	1.30	29.18	63.27	0.31
REACH1	2223.12	Regional	Existing_NoCulvert	17.32	227.02	229.00		229.06	0.001006	1.30	29.18	63.27	0.31
REACH1	2223.12	Regional	Prop	17.32	227.02	229.00		229.06	0.001006	1.30	29.18	63.27	0.31
REACH1	2223.12	Regional	Prop_NoCul	17.32	227.02	229.00		229.06	0.001006	1.30	29.18	63.27	0.31
REACH1	2223.11	Regional	Existing	17.32	226.75	228.72	228.18	228.98	0.003459	2.30	7.54	35.72	0.57
REACH1	2223.11	Regional	Existing_NoCulvert	17.32	226.75	228.72	228.18	228.98	0.003459	2.30	7.54	35.72	0.57
REACH1	2223.11	Regional	Prop	17.32	226.75	228.72	228.18	228.98	0.003459	2.30	7.54	35.72	0.57
REACH1	2223.11	Regional	Prop_NoCul	17.32	226.75	228.72	228.18	228.98	0.003459	2.30	7.54	35.72	0.57
REACH1	2223.105			Culvert									
REACH1	2223.10	Regional	Existing	17.32	226.55	228.51		228.89	0.006315	2.71	6.52	29.96	0.71
REACH1	2223.10	Regional	Existing_NoCulvert	17.32	226.55	228.51		228.89	0.006315	2.71	6.52	29.96	0.71
REACH1	2223.10	Regional	Prop	17.32	226.55	228.51		228.89	0.006315	2.71	6.52	29.96	0.71
REACH1	2223.10	Regional	Prop_NoCul	17.32	226.55	228.51		228.89	0.006315	2.71	6.52	29.96	0.71

HEC-RAS River: CEG_DESIGN Reach: REACH1 Profile: Regional (Continued)

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
REACH1	2223.09	Regional	Existing	17.32	226.45	228.42	228.24	228.69	0.006522	2.35	8.55	38.48	0.69
REACH1	2223.09	Regional	Existing_NoCulvert	17.32	226.45	228.42	228.24	228.69	0.006522	2.35	8.55	38.48	0.69
REACH1	2223.09	Regional	Prop	17.32	226.45	228.42	228.24	228.69	0.006522	2.35	8.55	38.48	0.69
REACH1	2223.09	Regional	Prop_NoCul	17.32	226.45	228.42	228.24	228.69	0.006522	2.35	8.55	38.48	0.69
REACH1	2223.08	Regional	Existing	17.32	226.30	227.85	227.85	228.43	0.014994	3.35	5.17	8.81	1.00
REACH1	2223.08	Regional	Existing_NoCulvert	17.32	226.30	227.85	227.85	228.43	0.014994	3.35	5.17	8.81	1.00
REACH1	2223.08	Regional	Prop	17.32	226.30	227.85	227.85	228.43	0.014994	3.35	5.17	8.81	1.00
REACH1	2223.08	Regional	Prop_NoCul	17.32	226.30	227.85	227.85	228.43	0.014994	3.35	5.17	8.81	1.00
REACH1	2223.075			Culvert									
REACH1	2223.07	Regional	Existing	17.32	226.13	227.69	227.30	228.01	0.004979	2.50	6.92	8.52	0.64
REACH1	2223.07	Regional	Existing_NoCulvert	17.32	226.13	227.69	227.30	228.01	0.004979	2.50	6.92	8.52	0.64
REACH1	2223.07	Regional	Prop	17.32	226.13	227.69	227.30	228.01	0.004979	2.50	6.92	8.52	0.64
REACH1	2223.07	Regional	Prop_NoCul	17.32	226.13	227.69	227.30	228.01	0.004979	2.50	6.92	8.52	0.64
REACH1	2223.06	Regional	Existing	17.32	226.10	227.57	227.42	227.80	0.007588	2.10	8.41	13.82	0.75
REACH1	2223.06	Regional	Existing_NoCulvert	17.32	226.10	227.57	227.42	227.80	0.007588	2.10	8.41	13.82	0.75
REACH1	2223.06	Regional	Prop	17.32	226.10	227.57	227.42	227.80	0.007588	2.10	8.41	13.82	0.75
REACH1	2223.06	Regional	Prop_NoCul	17.32	226.10	227.57	227.42	227.80	0.007588	2.10	8.41	13.82	0.75
REACH1	2223.05	Regional	Existing	17.32	225.27	226.70	226.59	226.95	0.008686	2.21	7.98	12.16	0.79
REACH1	2223.05	Regional	Existing_NoCulvert	17.32	225.27	226.70	226.59	226.95	0.008686	2.21	7.98	12.16	0.79
REACH1	2223.05	Regional	Prop	17.32	225.27	226.70	226.59	226.95	0.008686	2.21	7.98	12.16	0.79
REACH1	2223.05	Regional	Prop_NoCul	17.32	225.27	226.70	226.59	226.95	0.008686	2.21	7.98	12.16	0.79
REACH1	2223.04	Regional	Existing	18.80	224.70	226.28	225.99	226.48	0.004897	1.99	9.73	11.34	0.62
REACH1	2223.04	Regional	Existing_NoCulvert	18.80	224.70	226.28	225.99	226.48	0.004897	1.99	9.73	11.34	0.62
REACH1	2223.04	Regional	Prop	18.80	224.70	226.28	225.99	226.48	0.004897	1.99	9.73	11.34	0.62
REACH1	2223.04	Regional	Prop_NoCul	18.80	224.70	226.28	225.99	226.48	0.004897	1.99	9.73	11.34	0.62
REACH1	2223.03	Regional	Existing	18.80	224.20	226.00	225.42	226.28	0.003324	2.35	8.01	17.90	0.56
REACH1	2223.03	Regional	Existing_NoCulvert	18.80	224.20	226.00	225.42	226.28	0.003324	2.35	8.01	17.90	0.56
REACH1	2223.03	Regional	Prop	18.80	224.20	226.00	225.42	226.28	0.003324	2.35	8.01	17.90	0.56
REACH1	2223.03	Regional	Prop_NoCul	18.80	224.20	226.00	225.42	226.28	0.003324	2.35	8.01	17.90	0.56
REACH1	2223.025			Culvert									
REACH1	2223.02	Regional	Existing	18.80	223.68	225.61	224.91	225.85	0.002509	2.18	8.61	12.64	0.50
REACH1	2223.02	Regional	Existing_NoCulvert	18.80	223.68	225.61	224.91	225.85	0.002509	2.18	8.61	12.64	0.50
REACH1	2223.02	Regional	Prop	18.80	223.68	225.61	224.91	225.85	0.002509	2.18	8.61	12.64	0.50
REACH1	2223.02	Regional	Prop_NoCul	18.80	223.68	225.61	224.91	225.85	0.002509	2.18	8.61	12.64	0.50
REACH1	2223.01	Regional	Existing	18.80	223.33	225.68	224.74	225.74	0.001037	1.03	18.24	14.64	0.29
REACH1	2223.01	Regional	Existing_NoCulvert	18.80	223.33	225.68	224.74	225.74	0.001037	1.03	18.24	14.64	0.29
REACH1	2223.01	Regional	Prop	18.80	223.33	225.68	224.74	225.74	0.001037	1.03	18.24	14.64	0.29
REACH1	2223.01	Regional	Prop_NoCul	18.80	223.33	225.68	224.74	225.74	0.001037	1.03	18.24	14.64	0.29
REACH1	2219.56	Regional	Existing	38.30	223.16	225.47	225.34	225.61	0.003815	1.97	39.28	94.02	0.55
REACH1	2219.56	Regional	Existing_NoCulvert	38.30	223.16	225.47	225.34	225.61	0.003815	1.97	39.28	94.02	0.55
REACH1	2219.56	Regional	Prop	38.30	223.16	225.47	225.34	225.61	0.003815	1.97	39.28	94.02	0.55
REACH1	2219.56	Regional	Prop_NoCul	38.30	223.16	225.47	225.34	225.61	0.003815	1.97	39.28	94.02	0.55
REACH1	2219.55	Regional	Existing	38.30	222.82	224.32	224.32	224.69	0.013295	2.72	14.07	18.45	1.00
REACH1	2219.55	Regional	Existing_NoCulvert	38.30	222.82	224.32	224.32	224.69	0.013295	2.72	14.07	18.45	1.00
REACH1	2219.55	Regional	Prop	38.30	222.82	224.32	224.32	224.69	0.013295	2.72	14.07	18.45	1.00
REACH1	2219.55	Regional	Prop_NoCul	38.30	222.82	224.32	224.32	224.69	0.013295	2.72	14.07	18.45	1.00
REACH1	2219.54	Regional	Existing	38.30	221.60	224.24		224.25	0.000349	0.93	120.92	95.66	0.19
REACH1	2219.54	Regional	Existing_NoCulvert	38.30	221.60	224.24		224.25	0.000349	0.93	120.92	95.66	0.19
REACH1	2219.54	Regional	Prop	38.30	221.60	224.24		224.25	0.000349	0.93	120.92	95.66	0.19
REACH1	2219.54	Regional	Prop_NoCul	38.30	221.60	224.24		224.25	0.000349	0.93	120.92	95.66	0.19
REACH1	2219.53	Regional	Existing	38.30	220.75	224.16	223.82	224.20	0.002075	1.38	69.91	103.95	0.36
REACH1	2219.53	Regional	Existing_NoCulvert	38.30	220.75	224.16	223.82	224.20	0.002075	1.38	69.91	103.95	0.36
REACH1	2219.53	Regional	Prop	38.30	220.75	224.16	223.82	224.20	0.002075	1.38	69.91	103.95	0.36
REACH1	2219.53	Regional	Prop_NoCul	38.30	220.75	224.16	223.82	224.20	0.002075	1.38	69.91	103.95	0.36
REACH1	2219.525			Culvert									
REACH1	2219.52	Regional	Existing	38.30	220.65	223.73	223.73	223.93	0.010382	3.01	38.89	95.62	0.66
REACH1	2219.52	Regional	Existing_NoCulvert	38.30	220.65	223.73	223.73	223.93	0.010382	3.01	38.89	95.62	0.66
REACH1	2219.52	Regional	Prop	38.30	220.65	223.73	223.73	223.93	0.010382	3.01	38.89	95.62	0.66
REACH1	2219.52	Regional	Prop_NoCul	38.30	220.65	223.73	223.73	223.93	0.010382	3.01	38.89	95.62	0.66
REACH1	2219.51	Regional	Existing	38.30	220.50	222.80		222.83	0.002886	1.48	55.58	64.65	0.41
REACH1	2219.51	Regional	Existing_NoCulvert	38.30	220.50	222.80		222.83	0.002886	1.48	55.58	64.65	0.41
REACH1	2219.51	Regional	Prop	38.30	220.50	222.80		222.83	0.002886	1.48	55.58	64.65	0.41
REACH1	2219.51	Regional	Prop_NoCul	38.30	220.50	222.80		222.83	0.002886	1.48	55.58	64.65	0.41
REACH1	2219.50	Regional	Existing	38.30	220.15	222.14	222.14	222.42	0.009218	2.97	29.43	54.20	0.85
REACH1	2219.50	Regional	Existing_NoCulvert	38.30	220.15	222.14	222.14	222.42	0.009218	2.97	29.43	54.20	0.85
REACH1	2219.50	Regional	Prop	38.30	220.15	222.14	222.14	222.42	0.009218	2.97	29.43	54.20	0.85

HEC-RAS River: CEG_DESIGN Reach: REACH1 Profile: Regional (Continued)

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
REACH1	2219.50	Regional	Prop_NoCul	38.30	220.15	222.14	222.14	222.42	0.009218	2.97	29.43	54.20	0.85