FUNCTIONAL SERVICING & STORMWATER MANAGEMENT REPORT

PROPOSED TEMPORARY-USE STORAGE YARD

12423 COLERAINE DRIVE & 0 SIMPSON ROAD
TOWN OF CALEDON

City File No.: PRE 2020-0009

Project No.: 20-0009CA **January 2021**

Urbanworks Engineering Corporation
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1.0 INTRODUCTION

1.1 Study Objectives and Location

This Functional Servicing and Stormwater Management Report has been prepared in support of a proposed temporary-use Zoning Bylaw Amendment and associated Site Plan Control Application for lands situated at George Bolton Parkway and Simpson Road, in the Town of Caledon, Regional Municipality of Peel. The temporary use is proposed for two contiguous land parcels located on the west and east sides of Simpson Road, with respective municipal addresses of 12423 Coleraine Drive and 0 Simpson Road. The overall site can be legally described as Part of the west half of Lot 3, Concession 6, Town of Caledon (geographic township of Albion), Regional Municipality of Peel. The subject property is located within the boundaries of George Bolton Parkway to the north, Coleraine Drive to the west, Highway 50 to the east and Mayfield Road to the south. The site is within the jurisdiction of the Toronto and Region Conservation Authority (TRCA). A Site location plan is provided in Figure 1-1.

The following report provides information regarding site servicing and stormwater management for the subject development while ensuring compatibility with services already in place. The report will also address comments raised by regulatory agencies (i.e. Region of Peel, Town of Caledon and TRCA).

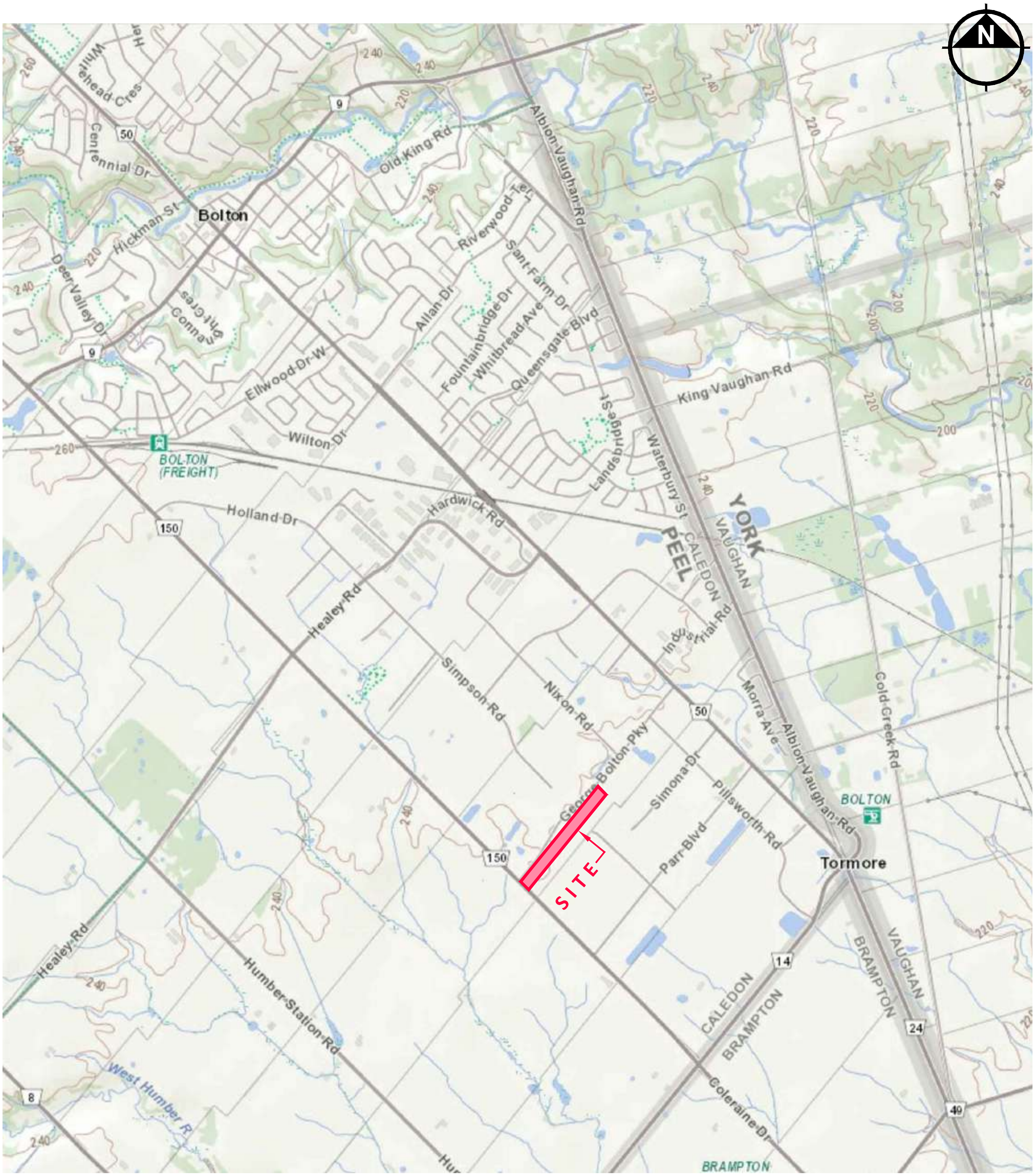
1.2 Existing Condition

The two land parcels are rectangular in shape with a total combined area of 3.87ha.; the West Site has an area of 2.78ha, and the East Site has an area of 1.09ha. A portion of the West Site fronting Coleraine drive currently contains an existing single-detached dwelling, accessory garage structure, salt storage structure and paved parking area/driveway. The remainder of the West Site consists of gravel surface currently used for outdoor storage. The main access to the West Site is via an entrance at Coleraine Drive, and there is a secondary entrance at Simpson Road. The East Site entirely consists of gravel-surfaced outdoor parking, with a single site entrance located at Simpson Road. There are no existing structures on the East Site.

The subject site is located within an existing development known as the GWL Industrial Subdivision. An extension of Simpson Road was recently constructed, which included extension of underground services up to the site frontage. Existing industrial lands are located to the south.

1.3 Proposed Temporary Use

The proposed temporary use for both east and west sites will consist of outdoor parking area for vehicles, construction vehicles and apparatus. Surface treatment is proposed to consist of gravel for the vehicle storage / maneuvering areas, along with a 7.5m-wide landscaped buffer strip along the north property line. Existing site entrances at Simpson Road will be improved and paved with asphalt in accordance with Town standards. No new structures are proposed. The proposed site plan is shown in Figure 1-2.



LEGEND

SUBJECT SITE

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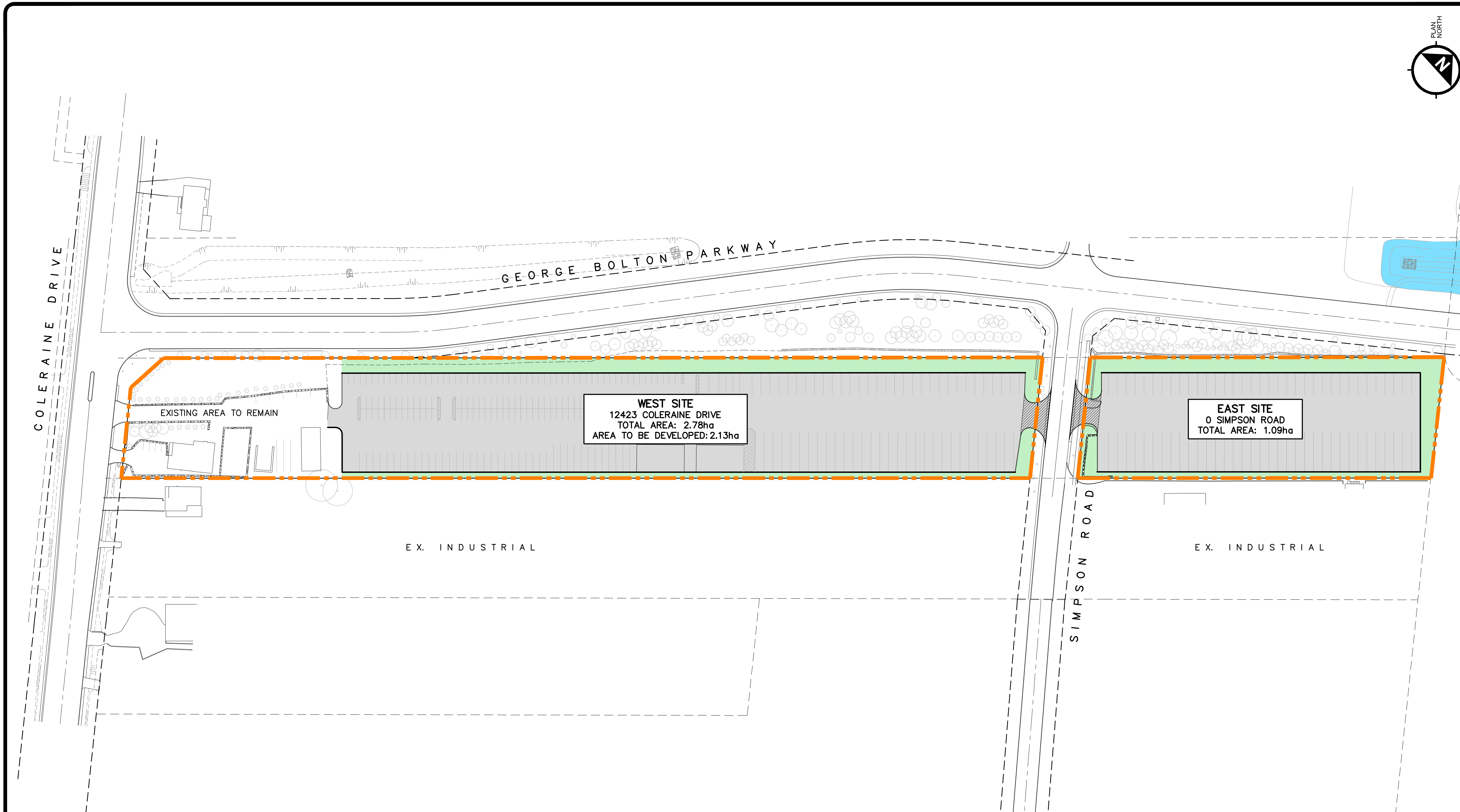
FIGURE 1-1
LOCATION PLAN

RAFAT STORAGE YARD
12423 COLERAINE DR. & 0 SIMPSON RD., CALEDON

20-0009CA	JAN. 2021	SCALE: NTS



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LEGEND
- PROPOSED GRAVEL PARKING
- PROPOSED ASPHALT ENTRANCE
- PROPOSED LANDSCAPE AREAS
- SITE BOUNDARY

FIGURE 1-2
PROPOSED SITE PLAN

RAFAT STORAGE YARD
12423 COLERAINE DR. & 0 SIMPSON RD., CALEDON

20-0009CA	JAN. 2021	SCALE: NTS

1.4 References

The following material has been reviewed during the preparation of this report:

- *Topographic Survey* prepared by Land Survey Group, dated November 19, 2020;
- *Site Plan Control Manual: Submission Package*, Town of Caledon, August 2019;
- *Development Standards Manual, Version 5.0*, Town of Caledon, 2019;
- *Stormwater Management Criteria*, Toronto and Region Conservation Authority, August 2012;
- *Low Impact Development Stormwater Management Planning and Design Guide*, TRCA / CVC, 2010;
- *Stormwater Management Design Brief, Simpson Road Extension, GWL Industrial Subdivision*, Pitura Husson Limited, June 2008;
- *As-Built Plans, Simpson Road Extension Phase 1*, Amec Foster Wheeler, August 2016

2.0 STORMWATER MANAGEMENT

2.1 Stormwater Design Criteria

Stormwater management design criteria for the proposed development were established through a review of regulatory agency design standards, along with background design information for the existing industrial subdivision and stormwater management pond. The relevant stormwater management guidelines are listed below.

<u>Town of Caledon Criteria</u>:

- Local storm sewers shall be designed using the Rational Method and based on a 5-year storm return frequency:

$$Q = C\ i\ A / 360$$

Where: Q = Flow Rate (m^3/s)
C = Runoff Coefficient
i = Rainfall Intensity (mm/hr)
A = Drainage Area (ha)

- Rainfall Intensity calculations for storm sewer design will be based on the Town of Caledon standard IDF relationships, and will be calculated as follows:

$$i = A / (t_C + B)^C$$

Where: A, B, C are constants per Table 2-1 below
t_C = Time of Concentration (min.), with a minimum time of 10min.

Table 2-1: Rainfall Intensity Equation Coefficients

Storm Event	Coefficients		
	A	B	C
2-year	1070	7.85	0.8759
5-year	1593	11	0.8789
10-year	2221	12	0.9080
25-year	3158	15	0.9335
50-year	3886	16	0.9495
100-year	4688	17	0.9624

- Acceptable flow velocities within storm sewer shall be between 0.75m/s and 4.0m/s for pipes flowing full. Super-critical flows will not be accepted;
- Minimum pipe slope shall be 0.40% (unless adequate self-cleansing velocity is confirmed);
- Minimum pipe size for storm sewer main lines is 300mm;

TRCA Criteria:

- Enhanced (Level 1) water quality protection (80% TSS removal);
- Minimum retention of the first 5mm of rainfall for water balance and erosion control.

2.2 Existing Conditions

2.2.1 Topography and Drainage

Review of existing site conditions was carried out using topographical mapping and visual site inspection. Topographical information was obtained from a detailed survey completed by Land Survey Group in November 2020. An initial site inspection was conducted on January 8, 2021.

The subject site is located within Sub-Basin 36 of the Humber River Watershed, as defined by the TRCA Stormwater Management Criteria. Drainage for the West Site is split such that approximately half the site area drains west toward Coleraine Drive, approximately one-third of the site area drains north to George Bolton Parkway, and the remainder of the site drains east to Simpson Road. Drainage for the East Site is toward Simpson Road. A small external area currently drains into both sites, originating from a portion of the boulevard along George Bolton Parkway. An existing berm within the municipal right-of-way directs some drainage southward. An existing stormwater management pond located southwest of Simpson Road and Parr Boulevard services the industrial subdivision. Ultimately, drainage from the surrounding area is conveyed toward West Rainbow Creek.

The sites are relatively flat; topographic relief for the West Site is approximately 2.2m (with elevations ranging from 239.6 masl at the northeast corner of the site to 237.4 masl at the southwest corner), and topographic relief on the East Site is approximately 0.4m (with elevations ranging from 239.9 masl at the east limit of the site to 239.5 at the southwest corner). Figure 2-1 provides an illustration of the existing drainage conditions.

2.2.2 Existing Storm Drainage Infrastructure

The area surrounding the site has been developed, and therefore there is existing drainage infrastructure in the vicinity. Existing infrastructure includes:

- An existing 1200mm diameter storm sewer along Simpson Road, that conveys flow southerly toward the existing SWM Pond south of Parr Boulevard;

- Existing storm sewers along George Bolton Parkway ranging in size from 300mm to 900mm in diameter, which convey drainage from the roadway toward an open drainage channel on the north side of George Bolton Parkway;

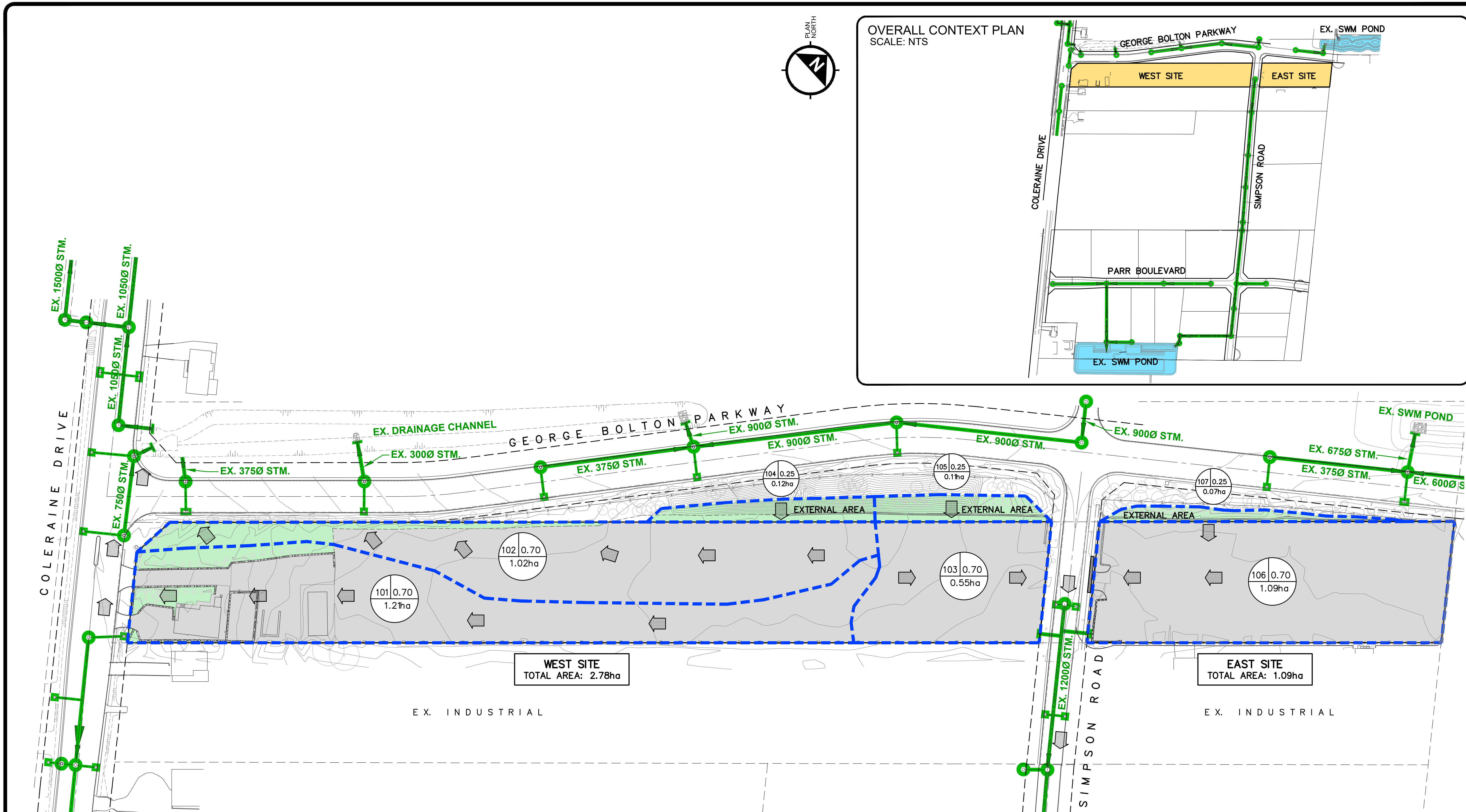
- Existing 1050mm diameter storm sewer along Coleraine Drive (north of George Bolton Parkway), which drains the existing channel and conveys flows northward;

- Existing 375mm diameter storm sewer along Coleraine Drive (south of George Bolton Parkway), that conveys flows from the roadway southward.

- A Stormwater Management (SWM) Pond at the southwest quadrant of Simpson Road and Parr Boulevard, which was designed to provide stormwater quantity and quality control for the surrounding industrial subdivision, including the subject lands.

2.2.3 Soil Conditions

A geotechnical report was not available at the time this document was prepared. Subsurface conditions on the site were estimated using the Soil Map of Peel County, Soil Survey Report No. 18. Based on the soil map, the site is underlain with Peel Clay. Exact soil conditions can be confirmed once a geotechnical study is performed during the later stages of the project. Figure 2-2 shows the site location with an overlay of the soil map.



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LEGEND

- IMPERVIOUS AREAS
- PERVIOUS AREAS
- DRAINAGE AREA BOUNDARY
- EXISTING STORM SEWER
- EXISTING CONTOUR
- OVERLAND FLOW DIRECTION

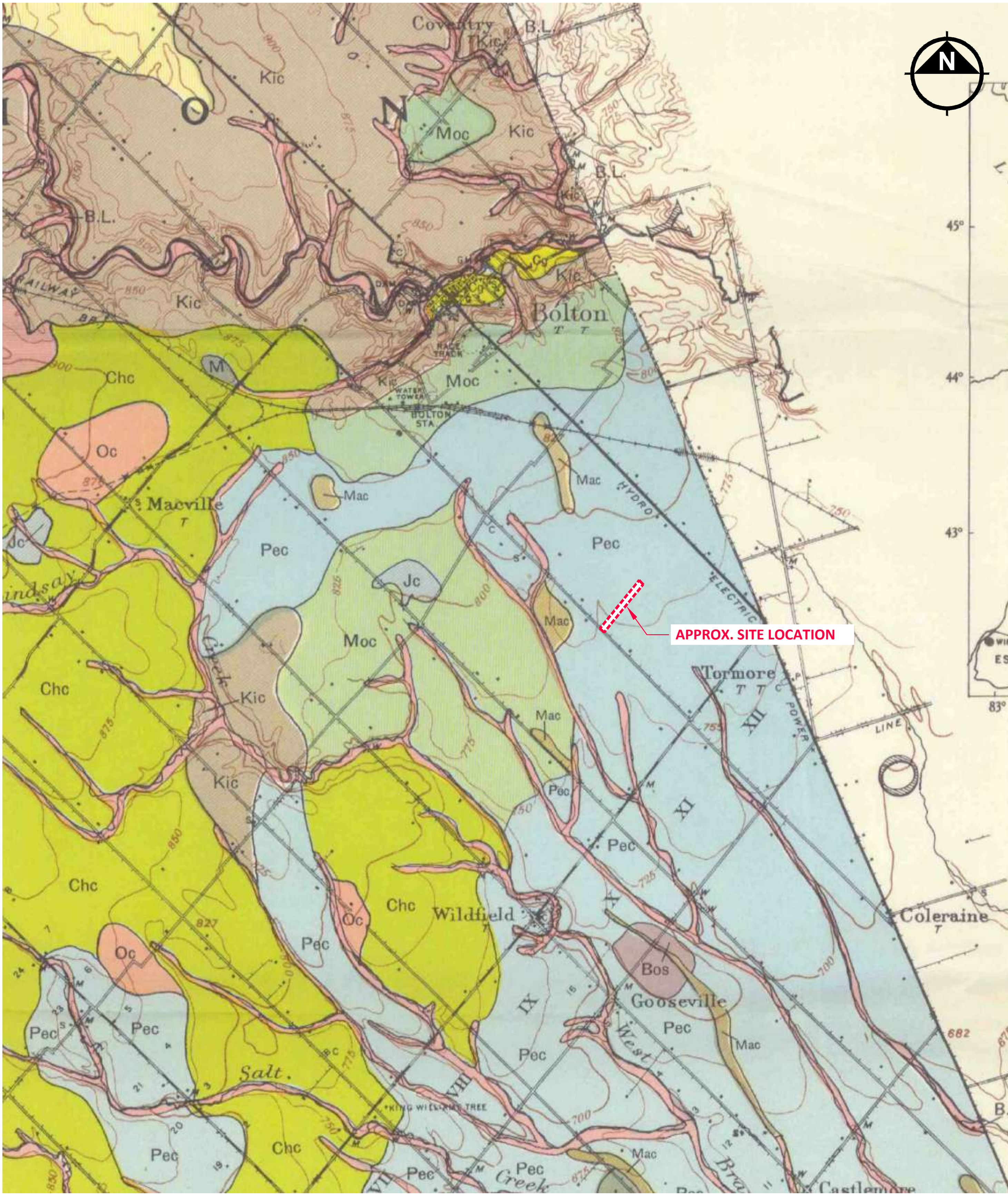
DRAINAGE AREA

AREA I.D. 100 | RUNOFF COEFFICIENT 0.50 | DRAINAGE AREA 1.00ha

FIGURE 2-1
EXISTING DRAINAGE PLAN

RAFAT STORAGE YARD
12423 COLERAINE DR. & 0 SIMPSON RD., CALEDON

20-0009CA	JAN. 2021	SCALE: NTS



LEGEND

DENOTES PEEL CLAY

SOURCE:
ONTARIO SOIL SURVEY, REPORT No. 18
SOIL MAP OF PEEL COUNTY

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FIGURE 2-2
SOIL MAP

RAFAT STORAGE YARD
12423 COLERAINE DR. & 0 SIMPSON RD.,
CALEDON

20-0009CA	JAN. 2021	SCALE: NTS

2.2.4 Existing Peak Flows

Existing peak flows were calculated using the Rational Method due to the relatively small size of the site. As mentioned previously, there is a drainage divide through the West Site, which splits flows between Simpson Road, George Bolton Parkway and Coleraine Drive. The East Site drains entirely toward Simpson Road. Existing peak flows are summarized in Tables 2-2 and 2-3 below; calculations are provided in Appendix B.

Table 2-2: Summary of Existing Peak Flows (West Site)

Storm Event	**Flows (L/s)**			
	To Coleraine Dr. *(Area 101)*	To George Bolton Pkwy. *(Area 102 + 104)*	To Simpson Rd. *(Area 103 + 105)*	**Total Flow**
2-year	201.7	177.2	98.2	477.0
5-year	258.0	226.7	125.7	610.4
10-year	315.7	277.3	153.7	746.6
25-year	368.1	323.4	179.3	870.8
50-year	414.5	364.1	201.9	980.6
100-year	462.4	406.2	225.2	1093.8

Table 2-3: Summary of Existing Peak Flows (East Site)

Storm Event	**Total Flow (L/s)** To Simpson Rd. *(Area 106 + 107)*
2-year	185.8
5-year	237.8
10-year	290.9
25-year	339.2
50-year	382.0
100-year	426.1

2.3 Proposed Stormwater Management

The proposed stormwater management system has been designed in accordance with Town of Caledon and TRCA guidelines. The intent of the design is to ensure conformance with the overall stormwater management plan for the existing industrial subdivision, and ensure no negative impacts to adjacent properties and infrastructure. A stormwater management plan is required to address mitigation measures with respect to quantity control, quality control, erosion control and water balance.

The downstream SWM pond was designed to service the subject lands with respect to stormwater quantity and quality control, with allowance for a fixed maximum release rate for each upstream site plan. The proposed stormwater management strategy will limit discharge from the site to the maximum allowable release rate, using a combination of orifice flow control and on-site storage. The on-site stormwater storage system will also address TRCA water balance requirements via infiltration of storm runoff.

The storm drainage systems for the West Site and East Site have been designed to function independently. Each site is proposed to be serviced by a system of internal catchbasins and storm sewers to capture runoff from the gravel parking areas. Storm sewers have been sized for a 5-year return storm using the Rational Method. New service connections to the 1200mm diameter municipal storm sewer on Simpson Road are proposed for each site, along with control manholes at the property line. Each storm control manhole will include an orifice tube to attenuate peak outflows from the sites to within allowable levels. The proposed storm drainage system is illustrated in Figure 2-3. Additional details on the storm system design (including drainage areas and flow sheets) are provided on drawings SS-01, SS-02 and TA-01 in Appendix C.

2.3.1 Site Grading and Drainage

Grading design for the site was produced based on a topographic survey prepared by Land Survey Group, dated November 19, 2020. Existing elevations are proposed to be matched along all property lines, and in general the site will be graded for containment of runoff within the site boundaries. Proposed internal grades have been set to ensure that maximum surface ponding will not exceed 0.30m at catchbasin low points, in the event of total blockage of any storm inlet. Flows from storms up to the 100-year event are proposed to be contained within the site without overflow. For emergency situations (i.e. storms exceeding the 100-year event or failure of the internal drainage system), an over-land flow route has been established for both West and East sites to ensure that surface flows will exit the site directly onto Simpson Road via the site entrances.

The proposed drainage scheme is illustrated in Figure 2-3. Detailed grading plans are provided in Appendix C.

2.3.2 Allowable Release Rates

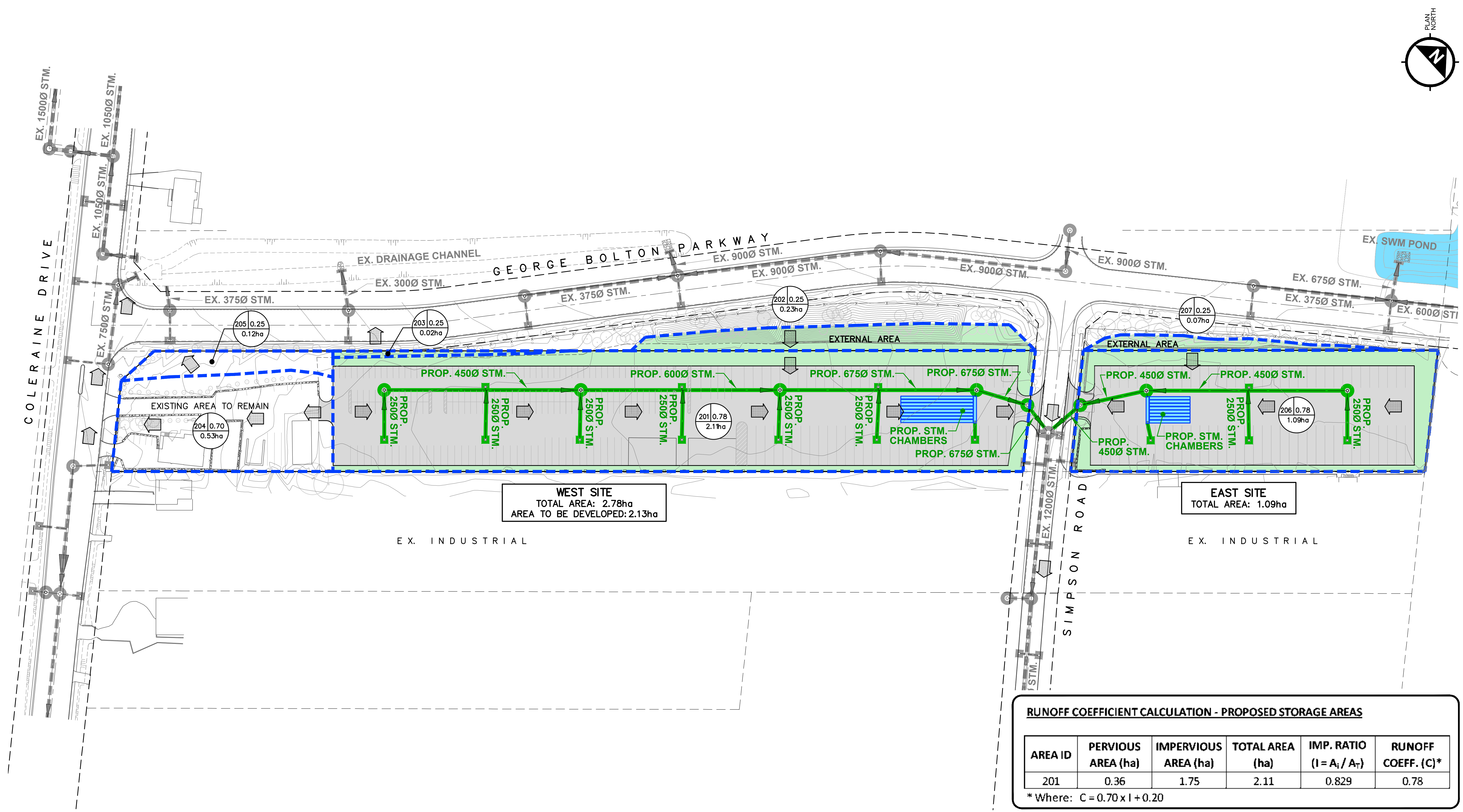
The maximum allowable release rates are based on design information for the downstream stormwater management pond presented in the *Stormwater Management Design Brief, GWL Industrial Subdivision* (Pitura Husson, June 2008). An excerpt from this report is included in Appendix A. According to the report, site plans within the industrial development have a prescribed maximum release rate based on 180 L/s/ha, for a 100-year storm event. Using this unit discharge rate, the maximum allowable flows for the subject site have been calculated and are as summarized below in Table 2-4.

Table 2-4: Maximum Allowable Release Rates

Site	Site Area (ha)	Unit Flow Rate (L/s/ha)	Allowable Flow (L/s)
West Site	2.13*	180	383.4
East Site	1.09	180	196.2

** Proposed developable portion of site (2.78ha – 0.65ha).*

As previously noted, a portion of the West Site fronting Coleraine Drive is proposed to remain un-altered (Areas 204 and 205 on Figure 2-3, with a combined area of 0.65ha). Drainage for the un-altered portion of the West Site will remain per existing conditions, therefore this area has been deducted from the calculation of allowable flow to the Simpson Road sewer.



RUNOFF COEFFICIENT CALCULATION - PROPOSED STORAGE AREAS

AREA ID	PERVIOUS AREA (ha)	IMPERVIOUS AREA (ha)	TOTAL AREA (ha)	IMP. RATIO ($I = A_I / A_T$)	RUNOFF COEFF. (C)*
201	0.36	1.75	2.11	0.829	0.78

* Where: $C = 0.70 \times I + 0.20$

LEGEND

- IMPERVIOUS AREAS
- PERVIOUS AREAS
- PROPOSED STORM CHAMBERS
- DRAINAGE AREA BOUNDARY
- EXISTING STORM SEWER
- PROPOSED STORM SEWER
- EXISTING CONTOUR
- OVERLAND FLOW DIRECTION

DRAINAGE AREA

AREA I.D. 100 | 0.50 RUNOFF COEFFICIENT
1.00ha DRAINAGE AREA

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FIGURE 2-3
PROPOSED DRAINAGE PLAN

RAFAT STORAGE YARD
12423 COLERAINE DR. & 0 SIMPSON RD., CALEDON

20-0009CA	JAN. 2021	SCALE: NTS

2.3.3 Quantity Control and On-Site Storage

Quantity control is proposed through the use of flow restrictor (orifice tubes) at the downstream end of the storm sewer network for each site, in conjunction with on-site stormwater storage. On-site detention is proposed via a combination of sub-surface storage within the storm sewers and underground storm chambers (Triton S29 chambers). The orifice tubes will attenuate peak flows to allowable levels, with estimated discharge rates of 381.0 L/s and 178.7 L/s for the West and East sites respectively. To achieve peak flow attenuation, approximately 368m^3 and 205m^3 of storage are required for the West and East sites respectively.

The proposed peak flows and quantity control measures are summarized in Table 2-5. Calculations are provided in Appendix B, and details of the orifice controls are provided on drawing SS-02 in Appendix C.

Table 2-5: Proposed Peak Flows & Storage Requirements

Site	Orifice Tube Dia. (mm)	Post-Development Peak Flows 100-Year (L/s)			Storage (m^3)	
		Uncontrolled	Controlled	*Allowable*	Provided	*Required*
West Site	375	929.9	381.0	*383.4*	380	*368*
East Site	200	473.7	178.7	*196.2*	210	*205*

2.3.4 Water Quality Control

Per the *Stormwater Management Design Brief* for the GWL Industrial Subdivision, the existing stormwater management pond south of Parr Boulevard was designed to provide Enhanced (Level 1) water quality control in accordance with MOECP guidelines. No additional water quality control requirements were identified in the report for individual site plans comprising the subdivision. Therefore, on-site quality control has not been proposed.

2.3.5 Water Balance

The subject site is in an area classified by TRCA as Low Volume Groundwater Recharge Area (LGRA), where a site-specific water balance is not required, and best efforts to maintain recharge are recommended. The minimum criteria is to retain the first 5mm of rainfall on the site through infiltration, evapotranspiration, or other LID measures. Therefore the target for the subject development was to achieve 5mm on-site retention. The volume generated by 5mm of rainfall equates to 139.0m^3 for the West site (2.78ha x 5mm), and 54.5m^3 for the East Site (1.09ha x 5mm).

Based on the Soil Map of Peel Region, the soil in the area is classified as having “imperfect” natural drainage, where infiltration measures may have reduced effectiveness. Since alternative LID measures such as stormwater re-use or evapotranspiration are not practical for this site, potential options to achieve water balance targets are limited. Infiltration has been selected as the most appropriate option for water balance mitigation, following a ‘best-efforts’ approach.

The underground stormwater chambers are proposed to be open-bottom, which will encourage infiltration to the underlying soil to the extent possible. The storm chamber outlet pipe is proposed to be connected at a slightly higher elevation than the chamber base, such that a portion of the storm chamber below the outlet pipe will be used for retention of stormwater. The proposed storm chamber layout is illustrated on the engineering drawings enclosed in Appendix C.

The available stormwater retention volume (water balance) within the storm chambers on the West Site is 140m^3, and 58m^3 on the East Site. The water balance requirements and proportioning of volume in the storm chambers is summarized in Table 2-6 below.

Table 2-6: Water Balance Requirements

Site	Site Area (ha)	Required Volume (m^3)	Storm Chamber Statistics		
			Total Volume (m^3)	Quantity Control (m^3)	Water Balance (m^3)
West Site	2.78	139.0	423	283	140
East Site	1.09	54.5	243	185	58

2.3.6 Erosion and Sediment Control

Erosion and sediment control measures to be implemented during and following construction of the development are outlined below. These measures comply with applicable criteria, including the *Erosion and Sediment Control Guideline for Urban Construction* (Greater Golden Horseshoe Area Conservation Authorities, December 2006), and Town of Caledon standards.

The proposed erosion and sediment control works during construction will consist of the following:

- Temporary sediment control fences
- Temporary sediment traps
- Rock-check dams at site discharge locations
- Temporary cut-off swales to re-direct runoff on the site
- Mud mat at the construction access
- Sediment protection for street catchbasins

Details for the proposed erosion and sediment control measures are provided on drawing SC-01 in Appendix F.

3.0 SANITARY SERVICING AND WATER SUPPLY

The subject site has existing sanitary and water service connections to the existing building at Coleraine Drive, which are proposed to be maintained. In addition, existing sanitary and water service connection stubs are located at Simpson Road for both the West and East sites, which were installed with the Simpson Road extension. The service connection stubs terminate at the property lines, and are currently not in use. Details of the existing services are provided on drawings SS-01 and SS-02 in Appendix C.

There are no new structures proposed on either the West Site or East Site, and therefore there will not be any sanitary or water demand associated with the proposed site alterations. No new sanitary or water services are proposed for this development.

4.0 SUMMARY

This report outlines the proposed stormwater management scheme for two proposed temporary-use outdoor storage facilities located at 12423 Coleraine Drive and 0 Simpson Road (identified herein as the West Site and East Site respectively), in the Town of Caledon. New sanitary and water supply services are not proposed as they are not required for this development. Following is a summary of the conclusions and recommendations of this report:

<u>Stormwater Management</u>

- Post-development peak flows are proposed to be controlled to the maximum rates identified in the *Stormwater Management Design Brief, GWL Industrial Subdivision* (Pitura Husson Ltd., June 2008), based on 180 L/s/ha in a 100-year storm. Flow control is proposed to be achieved using flow restrictors and a combination of underground pipe storage and storm chamber storage (Triton S29 chambers);
- Since allowance for water quality control has been made in the design of the existing downstream stormwater management pond, no additional quality control measures are proposed on the site;
- Retention of 5mm of rainfall for water balance is proposed to be achieved through limited soil infiltration via the open-bottom storm chambers. Additional storage volume is proposed to be provided at the base of the storm chambers (below the quantity-control volume) for water balance purposes.

Respectfully Submitted,

Urbanworks Engineering Corporation

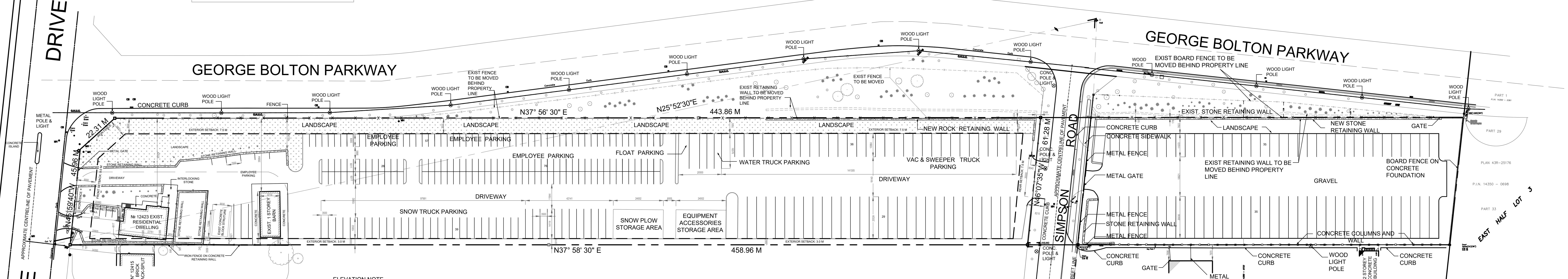
LICENSED PROFESSIONAL ENGINEER
T. DUMYN
100072175
Jan. 29, 2021
PROVINCE OF ONTARIO

Taras Dumyn, P.Eng.
Principal

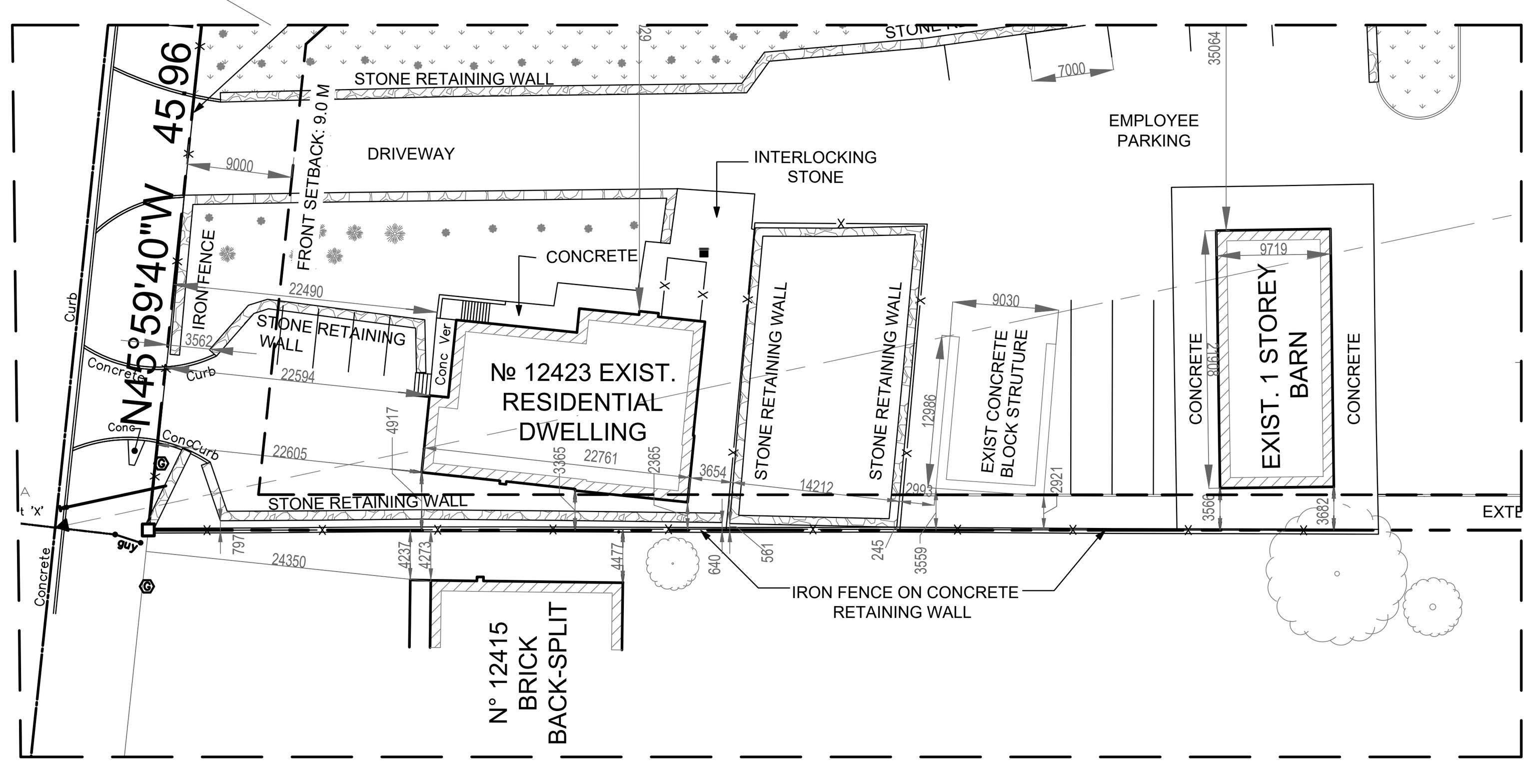
Appendix A: Background Information

LEGAL DESCRIPTION:

PART OF WEST HALF OF LOT 3 CONCESSION 6



PROPOSED PARKING AND OPEN STORAGE LAYOUT



1 A1.0 SITE PLAN
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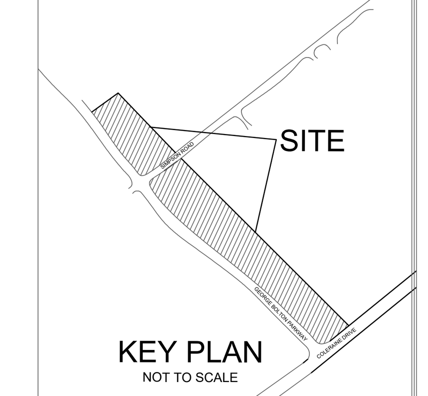

BARN

Name of Project:
PROPOSED MIXED USE DEVELOPMENT

Location:
12423 COLERAINE DRIVE
TOWN OF BOLTON, ONTARIO

FCA
FAUSTO CORTESE ARCHITECTS
3590 RUTHERFORD RD. UNIT 7
VAUGHAN, ONTARIO, L4H 3T8
416-806-7000
FCORTESE@FCARCHITECTS.CA

ITEM	Ontario Building Code Data Matrix - Part 3 & 9	OBC Reference (References are to Division B unless noted [A] for Division A or [C] for Division C)	
1	Project Description: [ ] New [ ] Addition [X] Change of Use [ ] Alteration; [ ] Part 11 11.1 to 11.4	[X] Part 3 1.1.2. [A]	[ ] Part 9 1.1.2. 9.10.1.3.
2	Major Occupancy(s) Group F1	3.1.2.1.(1)	9.10.2.
3	Building Area (m²) EXISTING_113.43 NEW__0 TOTAL__113.43	1.4.1.2 [A] 1	1.4.1.2 [A]
4	Gross Area (m²) EXISTING_113.43 NEW__0 TOTAL__113.43	1.4.1.2 [A]	1.4.1.2 [A]
5	Number of Storeys Above Grade: 1	1.4.1.2 [A] & 3.2.1.1.	1.4.1.2 [A] 9.10.4.
6	Number of Streets/Fire Fighter Access: 2	3.2.2.10 & 3.2.5.	9.10.20.
7	Building Classification: GROUP F1	3.2.2.24 & 3.2.2.54	9.10.2.
8	Sprinkler System Proposed [ ] entire building [ ] selected compartments [ ] selected floor areas [ ] basement [ ] in lieu of roof rating [ ] not required [X] EXISTING NO CHANGE	3.2.2.67 3.2.1.5 3.2.2.17	9.10.8.2. INDEX
9	Standpipe required [ ] Yes [X] No	3.2.9.	N/A
10	Fire Alarm required [ ] Yes [X] No	3.2.4.	9.10.18.
11	Water Service/Supply is Adequate [X] Yes [ ] No	3.2.5.7.	N/A
12	High Building [ ] Yes [X] No	3.2.6	N/A
13	Construction Restrictions [X] Combustible Permitted [ ] Non-combustible Required [ ] Both; Actual Construction [X] Combustible [ ] Non-combustible [ ] Both	3.2.2.71	9.10.6.
14	Second floor(s) Area (m²): N/A Third Floor Area (m²): N/A	3.2.1.1.(3)-(8)	9.10.4.1.
15	Occupant load based on [X] m²/person [ ] design of building; Occupancy: GROUP F1 Load: 5 persons	3.1.17	9.9.1.3.
16	Barrier-free Design [X] Yes [ ] No (Explain):	3.8	9.5.2.
17	Hazardous Substances [ ] Yes [X] No	3.3.1.2. & 3.3.1.19	9.10.1.3.(4)
18	Required Fire Resistance Rating (FRR): Horizontal Assemblies FRR (Hours) / Listed Design No. or Description (SB-3); Floor: N/A Hours; Roof: 0 Hours; FRR of Supporting Members / Listed Design No. or Description (SB-3); Floor: N/A Hours; Roof: 0 Hours	3.2.2.20.-.83 & 3.2.1.4	9.10.8. 9.10.9.
19	Spatial Separation - Construction of Exterior Walls - Existing Building	3.2.3	9.10.14.

Wall	Area of EBF (m²)	L.D. (m)	L/H or H/L	Permitted Max. % of Openings	Proposed % of Openings	FRR (Hours)	Listed Design or Description	Comb Const	Comb. Constr. Nonc. Cladding	Non-comb Const
North	0	35.20 m	1:10<	100 %	0 %					
South	4.26	3.80 m	1:10<	96 %	7 %					
East	7	--	1:10<	100 %	6 %					
West	7	92.08 m	1:10<	100 %	6 %					

DWELLING

Name of Project:
PROPOSED MIXED USE DEVELOPMENT

Location:
12423 COLERAINE DRIVE
TOWN OF BOLTON, ONTARIO

FCA
FAUSTO CORTESE ARCHITECTS
3590 RUTHERFORD RD. UNIT 7
VAUGHAN, ONTARIO, L4H 3T8
416-806-7000
FCORTESE@FCARCHITECTS.CA

ITEM	Ontario Building Code Data Matrix - Part 3 & 9	OBC Reference (References are to Division B unless noted [A] for Division A or [C] for Division C)	
1	Project Description: [ ] New [ ] Addition [ ] Change of Use [X] Alteration; [ ] Part 11 11.1 to 11.4	[X] Part 3 1.1.2. [A]	[ ] Part 9 1.1.2. 9.10.1.3.
2	Major Occupancy(s) Group A2 / D 4	3.1.2.1.(1)	9.10.2.
3	Building Area (m²) EXISTING_8,122.87 NEW__26.9 TOTAL__8,149.77	1.4.1.2 [A] 1	1.4.1.2 [A]
4	Gross Area (m²) EXISTING_8,122.87 NEW__26.9 TOTAL__8,149.77	1.4.1.2 [A]	1.4.1.2 [A]
5	Number of Storeys Above Grade: 1	1.4.1.2 [A] & 3.2.1.1.	1.4.1.2 [A] 9.10.4.
6	Number of Streets/Fire Fighter Access: 4	3.2.2.10 & 3.2.5.	9.10.20.
7	Building Classification: GROUP A2 / D 4	3.2.2.24 & 3.2.2.54	9.10.2.
8	Sprinkler System Proposed [X] entire building [ ] selected compartments [ ] selected floor areas [ ] basement [ ] in lieu of roof rating [ ] not required [ ] EXISTING NO CHANGE	3.2.2.67 3.2.1.5 3.2.2.17	9.10.8.2. INDEX
9	Standpipe required [ ] Yes [X] No	3.2.9.	N/A
10	Fire Alarm required [X] Yes [ ] No	3.2.4.	9.10.18.
11	Water Service/Supply is Adequate [X] Yes [ ] No	3.2.5.7.	N/A
12	High Building [ ] Yes [X] No	3.2.6	N/A
13	Construction Restrictions [ ] Combustible Permitted [X] Non-combustible Required [ ] Both; Actual Construction [ ] Combustible [X] Non-combustible [ ] Both	3.2.2.71	9.10.6.
14	Second floor(s) Area (m²): N/A Third Floor Area (m²): N/A	3.2.1.1.(3)-(8)	9.10.4.1.
15	Occupant load based on [X] m²/person [ ] design of building; Occupancy: GROUP D/E Load: 1146 persons	3.1.17	9.9.1.3.
16	Barrier-free Design [X] Yes [ ] No (Explain):	3.8	9.5.2.
17	Hazardous Substances [ ] Yes [X] No	3.3.1.2. & 3.3.1.19	9.10.1.3.(4)
18	Required Fire Resistance Rating (FRR): Horizontal Assemblies FRR (Hours) / Listed Design No. or Description (SB-3); Floor: N/A Hours; Roof: 0 Hours; FRR of Supporting Members / Listed Design No. or Description (SB-3); Floor: N/A Hours; Roof: 0 Hours	3.2.2.20.-.83 & 3.2.1.4	9.10.8. 9.10.9.
19	Spatial Separation - Construction of Exterior Walls - Existing Building	3.2.3	9.10.14.

Wall	Area of EBF (m²)	L.D. (m)	L/H or H/L	Permitted Max. % of Openings	Proposed % of Openings	FRR (Hours)	Listed Design or Description	Comb Const	Comb. Constr. Nonc. Cladding	Non-comb Const
North	3.9	41.99 m	1:10<	100 %	7.5 %					
South	9.9	2.42 m	1:10<	100 %	13 %					
East	10	--	1:10<	100 %	13%					
West	6	30 m	1:10<	100 %	34.50 %					

LEGEND

+179.00	PROPOSED FIN. GRADE
179.00 OR 179.00	EXISTING GRADE
(179.00) T/C	TOP OF CURB
(179.00) C/B	TOP OF CATCH BASIN
	MAN DOOR LOCATIONS
	DRIVE-IN DR LOCATIONS
C.B.	CATCH BASIN
C.B.M.H.	CATCH BASIN MANHOLE
M.H.	SANITARY MANHOLE
M.H.	STORM SEWER MANHOLE
	FIRE HYDRANT
G	GAS
R.D.	ROOF DRAIN
	PEDESTRIAN WALKWAYS
F.F.	DENOTES FINISHED FLOOR
MH	DENOTES MANHOLE
CB	DENOTES CATCH BASIN
W/V	DENOTES WATER VALVE
	DENOTES EXISTING GRADE ELEVATION
	DENOTES LIGHT POST
	DENOTES BOREHOLE
	STAMPED CONRETE
	HEAVY DUTY ASPHALT
	LIGHT DUTY ASPHALT
	HEAVY DUTY ROADWAY

SITE STATISTICS

ZONING	MP (PRESTIGE INDUSTRIAL)	
LOT AREA		
TOTAL LOT AREA	38,673 SQ.M	416,272.71 SQ.FT.
BUILDING AREA		
EXISTING DWELLING		
GROUND FLOOR	309.94 SQ.M.	3336.26 SQ.FT.
SECOND FLOOR	250.24 SQ.M.	2693.52 SQ.FT.
EXISTING STRUCTURE		
GROUND FLOOR	112.49 SQ.M.	1219.83 SQ.FT.
EXISTING BARN		
GROUND FLOOR	313.35 SQ.M.	3372.87 SQ.FT.
EXISTING BARN- METAL		
GROUND FLOOR	57.58 SQ.M.	619.79 SQ.FT.
TOTAL BLDG FOOTPRINT	793.36 SQ.M.	8582.71 SQ.FT.
TOTAL GFA	793.36 SQ.M.	8582.71 SQ.FT.
LOT COVERAGE	ALLOWED	PROVIDED
MAXIMUM		2%
PARKING REQUIREMENTS	REQUIRED	PROVIDED
	69 SPOTS	383 SPOTS
SETBACKS	BY-LAW	PROVIDED
FRONT YARD	9.5 M	22.49 M
REAR YARD	N/A	N/A
EXTERIOR SIDE YARD	7.5 M	35.21 M
INTERIOR SIDE YARD	N/A	0.25 M
LANDSCAPE REQUIREMENTS	REQUIRED	PROVIDED
	12.5 %	16.00 %

No.	DESCRIPTION	
1	ISSUED FOR REVIEW	09/20/19

REVISIONS

ISSUED FOR CONSTRUCTION
ISSUED FOR BID
ISSUED FOR BUILDING PERMIT
ISSUED FOR SITE PLAN APPROVAL DATE

SUBMITTALS

FCA
FAUSTO CORTESE ARCHITECTS
3590 RUTHERFORD RD. UNIT 7
VAUGHAN, ONTARIO, L4H 3T8
416-806-7000
FCORTESE@FCARCHITECTS.CA

PROJECT:
ON
12423 COLERAINE DR
TOWN OF BOLTON

DRAWING:
SITE PLAN

PLOTTED:

DATE: MAY 23 2019
PROJECT No. 2018–30
SCALE: AS NOTED
DRAWING No. A1.0
DRAWN BY:
REVIEWED BY:

FILE NAME:
PLOT SCALE: 1=

STORMWATER MANAGEMENT DESIGN BRIEF

SIMPSON ROAD EXTENSION

GWL INDUSTRIAL SUBDIVISION

BOLTON, TOWN OF CALEDON

RECEIVED
JUL - 2 2008
TOWN OF CALEDON PUBLIC WORKS & ENGINEERING

JUNE 2007
(Revised June 2008)

RECEIVED
NOV 29 2013
PLANNING DEPARTMENT

Prepared for:
GWL Realty Advisors
675 Cochrane Drive
Suite 620, West Tower
Markham, ON L3R 0B8

Prepared by:
Pitura Husson Limited
9225 Leslie Street, Suite 202
Richmond Hill, Ontario L4B 3H6
Tel. (905) 709-5825
Fax (905) 709-5850

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STORMWATER MANAGEMENT DESIGN BRIEF

GWL INDUSTRIAL SUBDIVISION

1.0 INTRODUCTION

The purpose of this report is to provide an addendum to the detailed design information related to the expansion of the existing stormwater management (SWM) facility in the Equity Prestige Business Park previously provided by A.M. Candaras Associates Inc. This report outlines stormwater management measures that will be undertaken to deal with water quantity and quality control, as well as erosion and sediment control during construction.

1.1 SITE DESCRIPTION

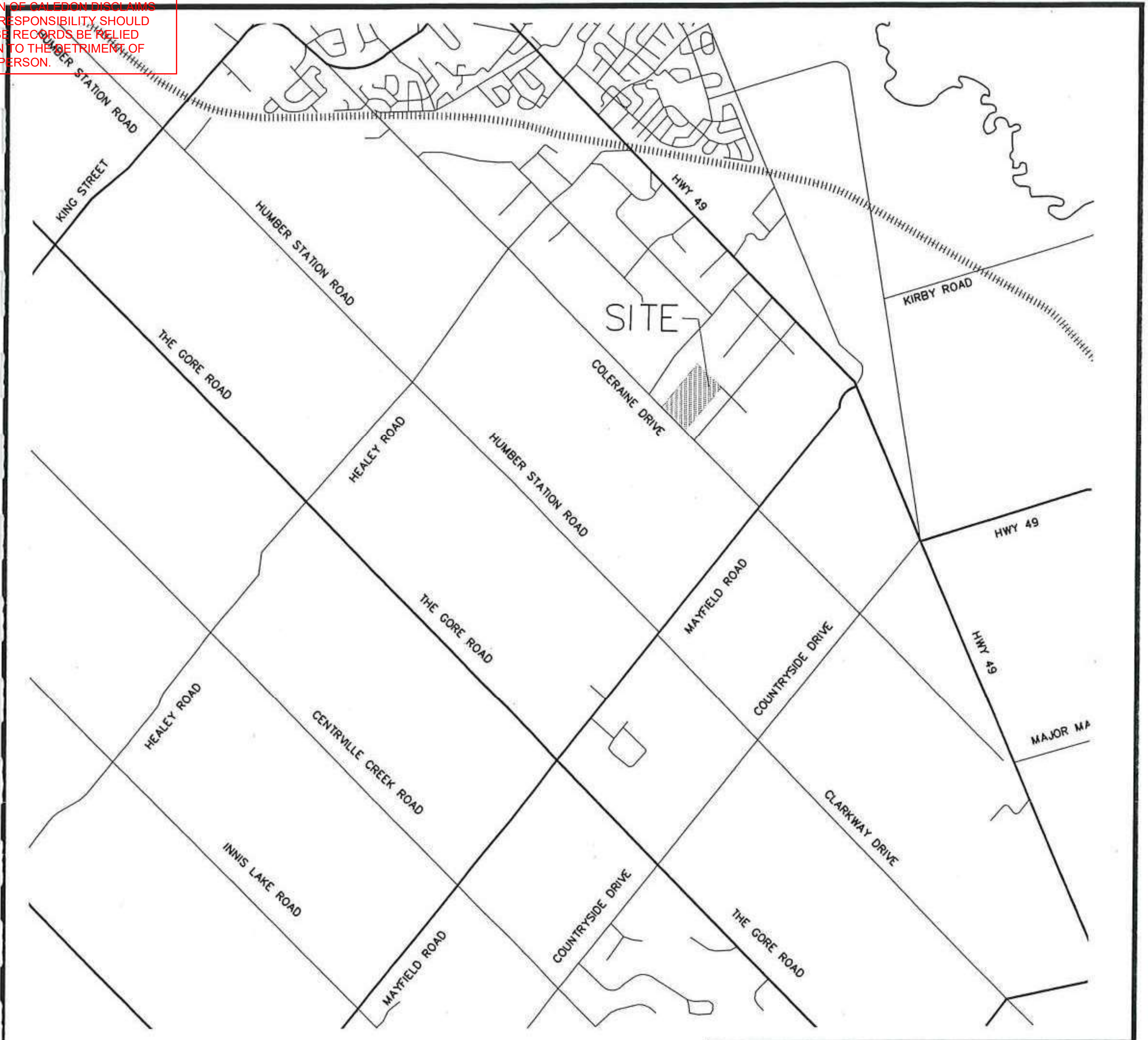
The GWL Industrial Lands (the site) are located north of the Equity Prestige Business Park West Phase (21T-02001C). The property is bounded to the west by Coleraine Drive and to the east by the termination of Simona Drive. The total drainage area to the SWM facility is approximately 55.8ha. Refer to **Figure 1** for the location of the site.

The approved land use for the property consists of industrial development. The proposed development will primarily include buildings, associated parking areas and landscaped areas. The land is currently being used as farmland.

1.2 BACKGROUND

To assist with the preparation of this report, the following documents were reviewed:

A Master Environmental Servicing Plan (MESP) was prepared for the Bolton South Industrial Park by Burnside Development Services in December 2000, to develop a preferred stormwater management (SWM) plan for the area. Preliminary sizing and locations of proposed SWM facilities were presented in the report, which was approved by the Town of Caledon and the TRCA.



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Email: general@piturahusson.com

GWL INDUSTRIAL SUBDIVISION

SITE LOCATION PLAN

DATE: JUNE 2008	FIGURE: 1
SCALE: N.T.S. PROJECT: 27305	

The Equity Prestige Business Park - West Phase Stormwater Management Report (SWMR) was prepared by A.M. Candaras Associates Inc. in October 2003, and outlines the Stormwater Management (SWM) strategies for the Equity Prestige Business Park. The report deals mainly with the SWM requirements for the west phase of the project, including the subject lands. Two addendums were completed subsequent to the SWMR, in June and July 2004. The first addendum was based on modifications to the outlet structure for the SWM facility to reduce the detention time for frequent rainfall events. The second addendum updated the first and included further details on the drawdown times meeting MOE Guidelines as per the request of the TRCA on July 21, 2004. Refer to **Appendix A** for copies of the Candaras report and addendums.

The Functional Servicing Plan - Simpson Road Extension GWL Industrial Subdivision (FSP) was prepared by Pitura Husson Limited in June 2007, and outlines the updated SWM strategies for the Caledon Industrial lands draining to the proposed SWM facility. The report updates the information provided in the SWMR to reflect the current development scenario.

The Additional Geotechnical Investigation Part 2 - Stormwater Management Pond and Simpson Road Extension was prepared by AMEC Earth & Environmental in June 2007, and outlines the geotechnical details of the proposed SWM block.

The recommendations of these reports have been followed in the preparation of the stormwater management plan for the site.

In addition, the Stormwater Management Planning and Design Manual 2003, prepared the Ministry of the Environment (MOE Guidelines) was referenced in the design of the stormwater management facility.

2.0 EXISTING CONDITIONS

The site has a generally flat topography, draining generally from the north to the south. Stormwater runoff from the site currently drains southerly to West Rainbow Creek.

A SWM facility was constructed as part of the previous development of the downstream lands in order to service the existing 20ha west phase of the business park. This facility is to be expanded, as recommended in the SWMR, to treat the flows from the subject lands.

As outlined in the MESP, the target flows for the West Rainbow Creek at the outlet of the proposed SWM Pond are determined by the unit flow equation outlined in **Table 1**.

Table 1. Target Flows for Drainage Area

Return Storm	Unit Flow Equation (l/s/ha)	Post Development Drainage Area	Target Flow (m^3/s)
1:2 year	9.506 - 0.719 ln(A)	55.8	0.34
1:5 year	14.652 - 1.136 ln(A)	55.8	0.52
1:10 year	17.957 - 1.373 ln(A)	55.8	0.64
1:25 year	22.639 - 1.741 ln(A)	55.8	0.81
1:100 year	29.912 - 2.316 ln(A)	55.8	1.06

These flows were used as the target flows in the post-development scenario for the ultimate pond. The drainage area to the SWM facility in the current design scenario is approximately 55.8ha, which is slightly greater than the area estimated in the 2003 SWMR.

3.0 DESIGN CRITERIA

Based on the recommendations of the approved SWMR and FSP, the following is a summary of the criteria for the stormwater management in the subdivision.

- The quantity of stormwater leaving the site (peak flows) for all storms up to the 100 year level shall be controlled as per the recommendations in the SWMR and MESP to meet the target flow rates as shown in **Table 1**. The FSP estimated that a required storage volume of 23,320m^3 for the quantity storage component for the 100 year storm event in the ultimate SWM Pond to meet the requirements as outlined in the Candaras report.

- Site plans upstream of the proposed ultimate SWM facility will be controlled to 180 l/s/ha in the 100 year storm event.

- *Enhanced* water quality controls are required, based on MOE Guidelines, and extended detention of the 25mm event for a minimum of 48 hours. Based on erosion concerns for the downstream watercourse, the original SWMR recommended a detention time of approximately 139 hours.

- Provide access to the sediment forebay and outlet structures for pond maintenance. The access roads will have a maximum grade of 10% and maximum 2% crossfall.

- Sediment drying areas are to be provided, as per the Town of Caledon requirements for SWM facilities where gravity drains cannot be provided.

The recommendations presented in the background reports have previously been followed in the design of the proposed pond expansion. However, as part of the review process for the ultimate design of the SWM facility, it was agreed by the TRCA that the previously approved design criteria presented in the Candaras reports were not consistent with current standards. The updated criteria are outlined in the following section.

3.1 UPDATED CRITERIA

Through discussions with the TRCA throughout the design process for the pond expansion, the criteria for the design of the ultimate facility have been updated as follows:

- The proposed facility must accommodate the volumes generated from the most conservative of the 6 or 12 hour AES storm events (2 through 100 year).
- *Enhanced* (Level 1) quality control is to be provided while providing for the quantity control identified above.
- Detain the 25mm - 4 hour storm event for 72 hours, if possible, and a minimum of 48 hours to address downstream erosion concerns.

The ultimate pond constructed as part of this development will provide the required controls as outlined in the updated criteria above. Details of the requirements outlined in the SWMR can be seen in **Appendix A**.

4.0 STORMWATER MANAGEMENT PLAN

The stormwater management plan has been prepared following the guidelines outlined to meet the stormwater management criteria.

The layout of the pond block has been revised since the preliminary ultimate design completed for the SWMR, in order to provide a more efficient development area for the adjacent landowner. The recommendations of the previous reports, with respect to stormwater management, were incorporated into the original design of the facility, and the pond block sizing was based on this design.

However, as mentioned previously, the design criteria have changed since the time of the original design of the pond expansion. Based on the restrictions of the size of the pond block area available for the pond expansion, the ultimate design has updated some of the design elements of the original design in order to provide the most efficient design possible for the available pond block.

4.1 SWM PLAN

The drainage area from the site to the proposed SWM facility is approximately 18ha, with 12ha as part of the Phase 1 design.

The ultimate SWM facility is designed to treat flows from the proposed industrial subdivision development. It will provide quantity, quality and erosion control for the entire drainage area of approximately 55.8ha, as shown in **Figure 2**.

4.1.1 MINOR AND MAJOR DRAINAGE SYSTEMS

Storm sewers within the subdivision will be designed to convey runoff from the 100 year design storm to the ultimate SWM facility. Site runoff will be controlled to a peak flow of 180 l/s/ha during the 100 year storm event. Rooftop controls within the proposed site plans will be required, with an allowable discharge rate of approximately 42 l/s/ha.

The major system flows for the site will be directed to the pond along the proposed roads within the subdivision.

4.2 SWM POND DESIGN

The pond design has been completed based on achieving the requirements outlined in the FSP, as well as incorporating the current TRCA criteria into the ultimate design of the facility originally designed as part of the approved SWMR.

4.2.1 POND GRADING

The grading design for the SWM facility has been prepared to maximize the storage available within the proposed SWM Pond block in order to meet the required criteria. The pond will have side slopes not steeper than 4:1 as per the recommendations of the geotechnical investigation by AMEC.

A maintenance access has been provided for the pond, to the outlet structure in case of blockage. Access to the sediment forebays of the facility was provided in the initial design; however, the access to the western forebay has been removed in order to maximize the available pond storage volume to meet the updated criteria. The Town has indicated that this is acceptable based on available access to the western forebay through the adjacent industrial lot.

In addition, the sediment drying areas have been revised from the previous design in order to maximize the volume available in the facility.

Pond grading details can be seen on **Drawing 12**.

4.2.2 SEDIMENT FOREBAY

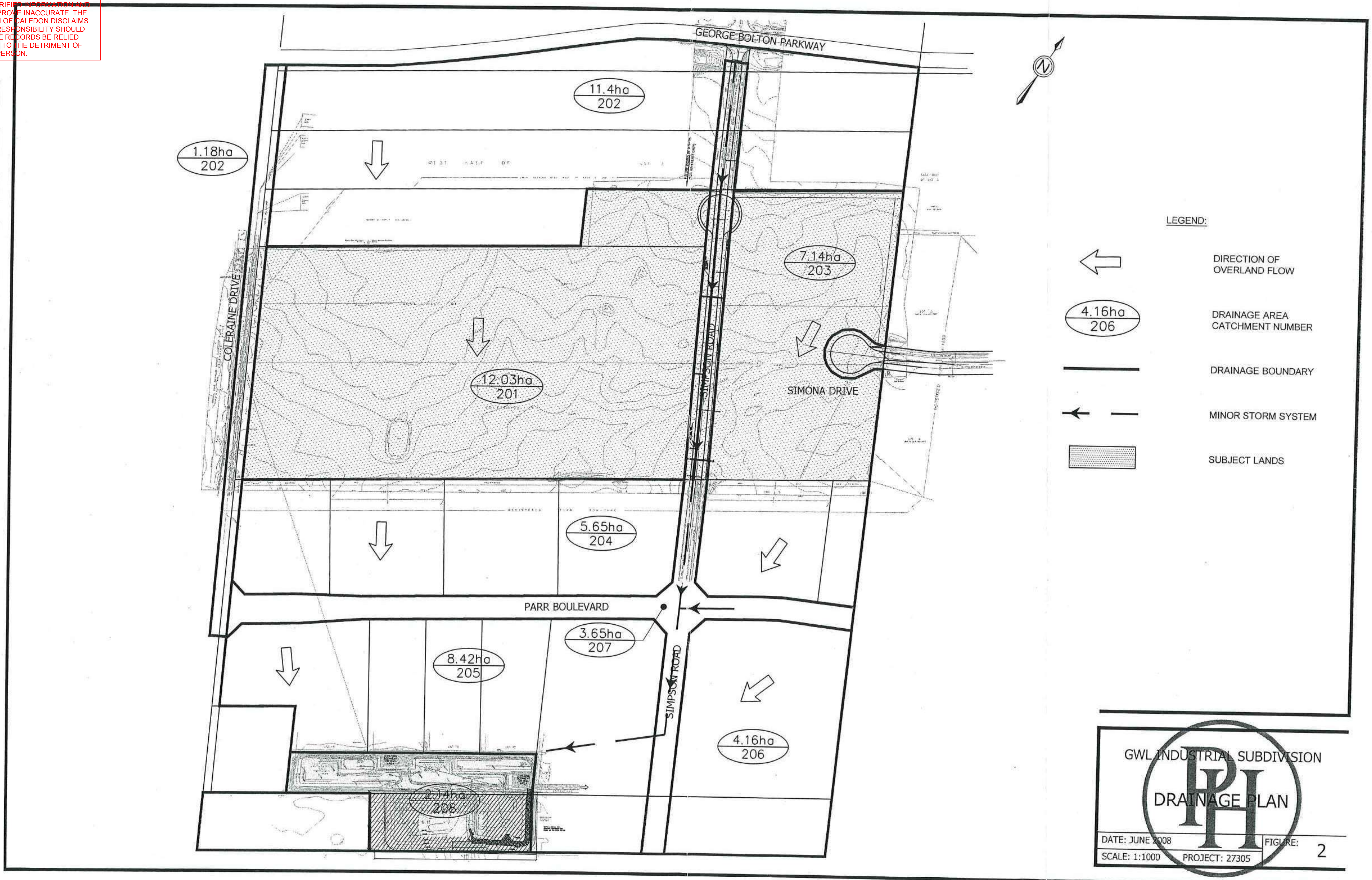
A sediment forebay was provided at each of the two pond inlets, to settle out larger particles before entering the main ponding area, in the interim design in the SWMR. This provides a confined area where the majority of particles will settle out, reducing the required area to cleanout during pond maintenance. Sizing of the sediment forebay was completed based on particle settling and dispersion length for the ultimate design scenario, as outlined in Section 4.0 of the SWMR. The updated ultimate storage requirements for the facility do not affect the sizing of the sediment forebays previously designed by Candaras.

4.2.3 POND VOLUMES AND OUTLET STRUCTURE

The following is a description of how the components of the pond will provide the requirements for quality control.

<u>Permanent Pool</u>

The permanent pool contributes to the quality control for post development runoff. It has no outlet to downstream watercourses. The permanent pool provides a buffer for dilution of runoff during a rainfall event prior to discharge from the pond. Sediments within the permanent pool have additional time to settle out between rainfall events.


GEORGE BOLTON PARKWAY
N
11.4ha
202
1.18ha
202
COLERAINE DRIVE
12.03ha
201
7.14ha
203
SIMPSON ROAD
SIMONA DRIVE
5.65ha
204
PARR BOULEVARD
3.65ha
207
8.42ha
205
SIMPSON ROAD
4.16ha
206
2.14ha
208
LEGEND:
DIRECTION OF OVERLAND FLOW
4.16ha
206
DRAINAGE AREA CATCHMENT NUMBER
DRAINAGE BOUNDARY
MINOR STORM SYSTEM
SUBJECT LANDS
GWL INDUSTRIAL SUBDIVISION
DRAINAGE PLAN
DATE: JUNE 2008
SCALE: 1:1000
PROJECT: 27305
FIGURE: 2

The permanent pool has been sized based on MOE Guidelines to provide *enhanced* protection, as recommended by the MESP. The required permanent pool volumes are based on the area and imperviousness of contributing lands. The MOE Guidelines recommend an average permanent pool depth between 1 and 2m with a maximum depth of 3m. The required permanent pool storage volume is approximately 11,718m^3. The normal water level has been revised from 232.00m to 231.90m to provide increased active storage to meet the updated design criteria. The volume provided between the pond bottom elevation of 230.50 and the normal water elevation of 231.9 (total depth of 1.4m) is 14,463m^3. Calculations for the permanent pool sizing can be found in **Appendix B**.

Erosion Control Storage

Extended detention storage is the first level of active (fluctuating) storage within the pond. Storage in this range is released slowly to provide increased settling time and reduce downstream erosion caused by frequent rainfall events. In addition this will help maintain base flows in downstream watercourses for a longer time period following storm events.

The extended detention storage for the SWM facility was designed based on the 25mm 4 hour storm event. As outlined in Section 3, a detention time of 72 hours has been recommended.

Table 2 provides the required storage volumes for the facility.

Table 2. Extended Detention Storage Requirements

	Pond Catchment Area (ha)	Runoff Volume (mm)	Required Storage Volume (m^3)
25mm 4 hour	55.8	19.61	10,195

Detention times have been calculated using the falling head equation, presented in the MOE guidelines. The maximum release rate and drawdown times for this component of the ponds are summarized in **Table 3**. Drawdown time calculations are shown in **Appendix B**.

Table 3. Extended Detention Storage Provided

	Storage Volume (m^3)	Peak Release Rate (m^3/s)	Depth of Storage (m)	Detention Time (hours)
25mm 4 hour	10,101	0.075	0.69	72.3

The extended detention storage will be provided between the normal water level of 231.90m and an elevation of approximately 232.59m. A 215mm diameter orifice plate on the upstream side of the control manhole will control outflow. The peak release rate for the extended detention component will be approximately 75l/s, and the drawdown time will be approximately 72 hours. Although the orifice tube alternative is preferred by the Town compared to an orifice plate, it is necessary to install a plate in order to meet required detention time.

A reverse graded pipe will convey water from approximately 0.3m above the pond bottom to the control orifice. At this elevation, the pipe will draw cooler water from deeper in the permanent pool. It will also be above the depth of the majority of sediment accumulation at the bottom.

<u>Erosion Index Equation</u>

The Erosion Index Equation is a volumetric representation of the amount of water that flows through a location above a critical (known) flow rate. The methodology was taken from the MOE Guidelines, and used in the MESP as the preferred method to determine the potential erosion levels downstream of the proposed facility. As outlined in the MESP, the TRCA suggested that a 2 year 6 hour AES storm be used in the analysis.

While continuous modelling is typically used to determine erosion potential in watercourses, through discussions with the Town and TRCA, it was determined that the Erosion Index Equation method as used in the MESP would be appropriate for this design.

As outlined in the SWMR, the erosion index at Mayfield Road and Countryside Drive is $4830m^3$. Addendum 2 of the Candaras report stated that under their proposed ultimate pond design, the erosion index would be approximately $9228m^3$ for Reach A, which is significantly higher than the target rate.

The current ultimate design of the pond results in an erosion index of approximately 7012m^3 (refer to **Appendix B**). This is an improvement on the previously approved value for the ultimate scenario in the Candaras design. Various extended detention scenarios were modelled to determine the requirements to control to the target erosion index value for Reach A. A detention time of approximately 4 days is needed to provide the required release rate and corresponding target erosion index value from the pond. Through discussions with the Town and TRCA, it was determined that this was not feasible, and a detention time of 72 hours was preferred.

As noted in the SWMR, and reinforced by the TRCA, since the erosion index cannot be met by the ultimate pond design, potential downstream measures may be required to address downstream erosion concerns.

Flood Control

Additional active storage is provided above the extended detention storage to meet target release rates for the 2 through 100 year events for the proposed plan.

Pond release rates will be controlled by a combination of the extended detention outlet and a 0.75m wide weir structure within the control manhole set above the extended detention water level at an elevation of 232.75. The control manhole will discharge to a 750mm dia. storm sewer with a 635mm orifice plate installed at the upstream end of the pipe, and then to the existing swale constructed as part of the interim SWM facility. The weir structure will control the flows above the extended detention levels to the required flow rates where feasible, given the constraints of the revised pond design.

Flows from the proposed control structure and the emergency overflow weir will outlet to the existing swale downstream of the facility.

The maximum active storage fluctuation for the pond will be approximately 1.84m. **Table 4** summarizes the proposed storage and release rates for each event storm to the creek for the 6 hour and 12 hour AES storm events. Refer to **Appendix B** for the outlet sizing calculations.

Table 4a. Pond Storage-Discharge - 6 hour AES Events

Event	Storage (m^3)	Ponding Elevation (m)	Total Release Rate (m^3/s)
2 Year	14,812	232.84	0.14
5 Year	19,358	233.10	0.37
10 Year	22,192	233.26	0.59
25 Year	25,664	233.44	0.89
100 Year	31,553	233.74	1.07

Table 4b. Pond Storage-Discharge - 12 hour AES Events

Event	Storage (m^3)	Ponding Elevation (m)	Total Release Rate (m^3/s)
2 Year	15,969	232.92	0.18
5 Year	19,866	233.13	0.41
10 Year	22,261	233.26	0.60
25 Year	25,417	233.43	0.87
100 Year	30,680	233.70	1.05

The revised pond design results in all events for both the 6 hour and 12 hour AES storms being contained within the proposed SWM Pond block, as required by the TRCA. The release rates are less than the required rates outlined in **Table 1** for the more frequent storms (10 year and less), and only slightly higher in the less frequent (25 year and above). Based on the constraints of the pond block sizing that was based on the previously approved reports, the updated design is sufficient to meet the requirements of the Town and the TRCA. Refer to **Drawing 12** for details of the pond outlet structure.

4.2.4 POND MAINTENANCE

Effective maintenance is required to ensure the proper operation of the SWM Pond. Over time, trash, plantings, weeds, blockage of outlet structures and sediment loading can decrease its effectiveness. The following are recommendations for facility maintenance:

- Trash cleanup will help prevent blockage of outlet structures and enhance the appearance of the facility. Annual trash cleanup should be completed, preferably after the spring runoff.

- It may be difficult to establish shoreline and aquatic plantings within the facility; however, they are essential for quality control and temperature mitigation. The MOE Guidelines recommend inspecting and re-establishing aquatic plants every two years and shoreline plantings every five years.

- Weeds can decrease the bio-diversity of the plantings in the facility. Weeds should be removed, by hand, to prevent damage to surrounding vegetation. Herbicides and insecticides should not be used in the facility, as they will directly affect water quality in downstream watercourses.

- Pond outlet structures should be inspected regularly over the first two years (preferably after significant rainfall events) to establish potential for blockage.

The SWMR recommended that pond cleanout would be required approximately every 10 years. Since a gravity drain is not feasible for this facility, a temporary pump will be required to drain the pond for cleanout.

The MOE guidelines recommend facility inspections after each significant storm (approximately 4 per year) for the first 2 years of operation. Based on these inspections, actual maintenance frequency can be determined.

4.3 HYDROLOGY MODELLING

Hydrologic modelling was completed using the Visual OTTHYMO (VO2) model to assess the proposed control measures outlined in the SWMR. VO2 is a single event hydrologic model that is based on unit hydrograph theory. The simulation for this site uses the Nash unit hydrograph (NASHYD) for primarily pervious catchments and the STANDHYD command for urban catchments. VO2 simulations were prepared for the post development scenarios.

As outlined in the SWMR, the target release rates for the site are based on the peak flows as determined by the unit flow equation in the MESP, as shown in **Table 1**. A pre-development model for the subwatershed was prepared for the SWMR, using the OTTHYMO89 computer model. For consistency, the modelling completed for this report was re-created with the same catchment parameters and design storms as in the SWMR, using VO2.

The post development model was updated based on the proposed development plan. Storage elements were added to simulate the controls for the 180 l/s/ha requirement for future development. The storage-discharge rating curve for the proposed ultimate pond was used for the proposed SWM facility. The results of the modelling confirm that there is sufficient volume provided in the ultimate pond design to control the flows as required.

Therefore, with the updated drainage areas from the current subdivision design, the release rates will be approximately equivalent to the proposed target flows with the volumes provided in the ultimate SWM facility.

Detailed model output and calculations for input parameters can be found in **Appendix C**.

5.0 EROSION AND SEDIMENT CONTROL

An erosion and sediment control plan has been prepared to meet the requirements of the Town. The plan has been designed to limit sediment and debris from leaving the site during construction and from entering the downstream SWM facility or adjacent lands. The plan consists of the following:

- A sediment control fence will be installed along the perimeter of the site where the grade will direct flows off-site.

- Site access will be limited to one entrance. A gravel access pad will be installed to remove mud from vehicles leaving the site.

- Erosion measures will be in place prior to any grading on the site. A program will be in place to monitor and maintain the erosion and sediment controls. The sediment controls will be inspected by the Site Engineer and contractor every week and after each significant rainfall event.

- Sediment traps are proposed to be located on all ditch inlet catchbasins to limit the amount of sediment into the minor system.

Proper construction sequencing will also help with erosion and sediment control. The following schedule is recommended:

1) Install sediment control fence and gravel access road.

2) Strip topsoil and stockpile.

3) Rough grade site to subgrade elevations.

4) Re-vegetate disturbed areas including lands left vacant for future development.

The erosion and sediment control plan is shown on **Drawing 13**.

6.0 CONCLUSIONS

The Stormwater management measures proposed will provide quality and quantity controls for runoff from the subdivision. The proposed plan has taken into consideration relevant controls and treatment required by the review agencies and complies with the recommendations of the Town and all previous reports.

The design of the stormwater management measures for the subdivision will provide:

- Enhanced water quality control as required;
- Extended detention of the 25mm storm for approximately 72 hours, as per the updated criteria from the TRCA;

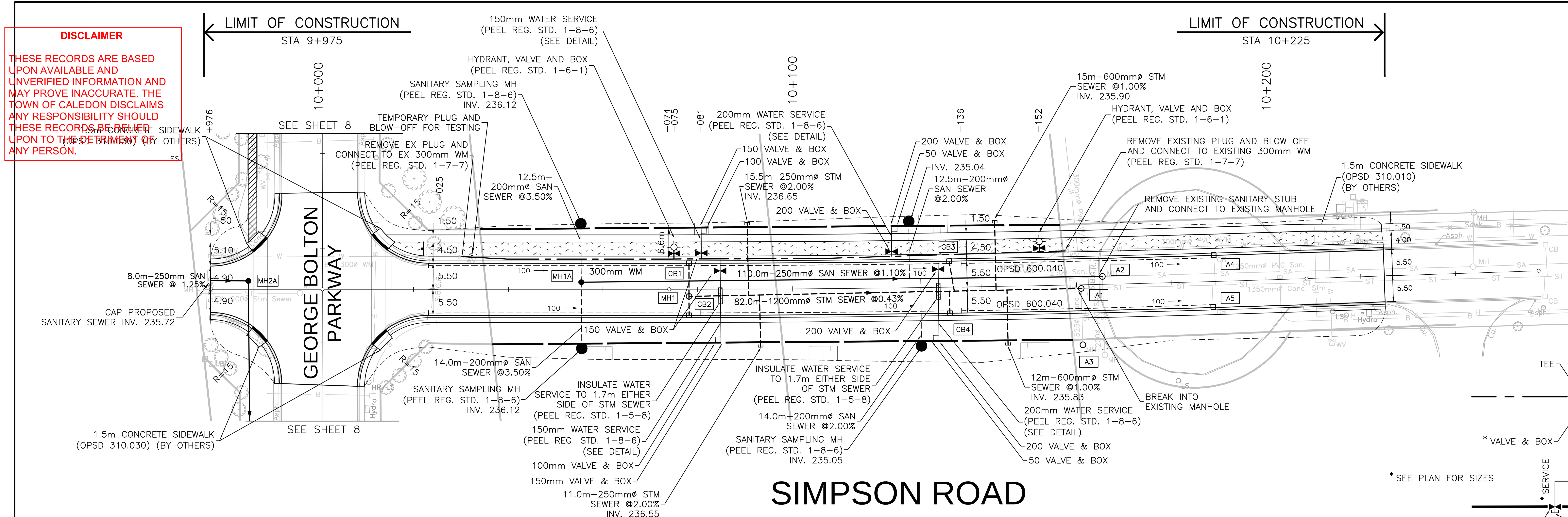
- Control of post development flows from the proposed subdivision such that the peak flows in the 2-100 year events approximately match the target flows as outlined in **Table 1**; and
- Maintenance of existing drainage patterns.

An effective plan for erosion and sediment controls to be incorporated during the construction of the subdivision works has been prepared.

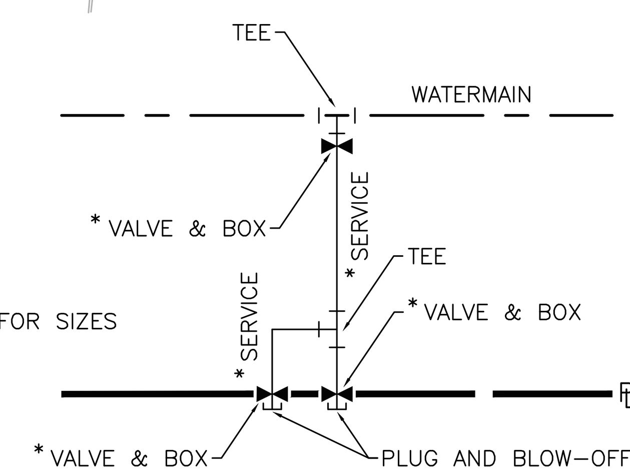
The results of this analysis determine that the design of the ultimate stormwater management facility meets all the required criteria set out by previous reports and agency guidelines, and therefore should be approved.

DISCLAIMER

THESE RECORDS ARE BASED UPON AVAILABLE AND UNVERIFIED INFORMATION AND MAY PROVE INACCURATE. THE TOWN OF CALEDON DISCLAIMS ANY RESPONSIBILITY SHOULD THESE RECORDS BE RELIED UPON TO THE DETRIMENT OF ANY PERSON.



SIMPSON ROAD



WATER SERVICE DETAIL
N.T.S.

STRUCTURE ADJUSTMENTS

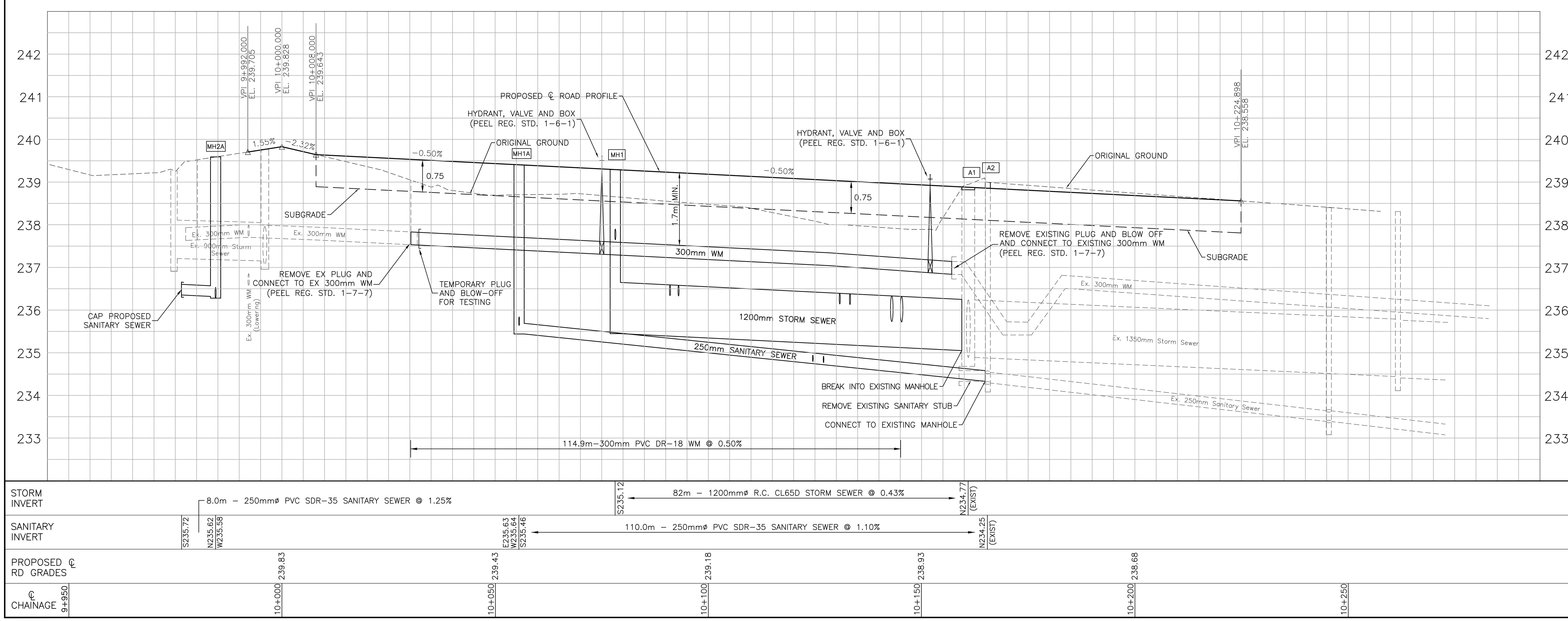
STRUCT NO	STATION	℄ GRATE OFFSET	FRAME & COVER OPSD	EXIST FRAME ELEV	PROP FRAME ELEV	REMARKS
A1	10+161	0.71 RT	EXIST	238.52	238.87	STORM
A2	10+166	1.67 LT	EXIST	239.07	238.33	SANITARY
A3	10+161	12.66 RT	EXIST	237.68	238.77	STORM
A4	10+189	5.9 LT	EXIST	238.78	238.63	STORM
A5	10+188	5.9 RT	EXIST	238.78	238.63	STORM

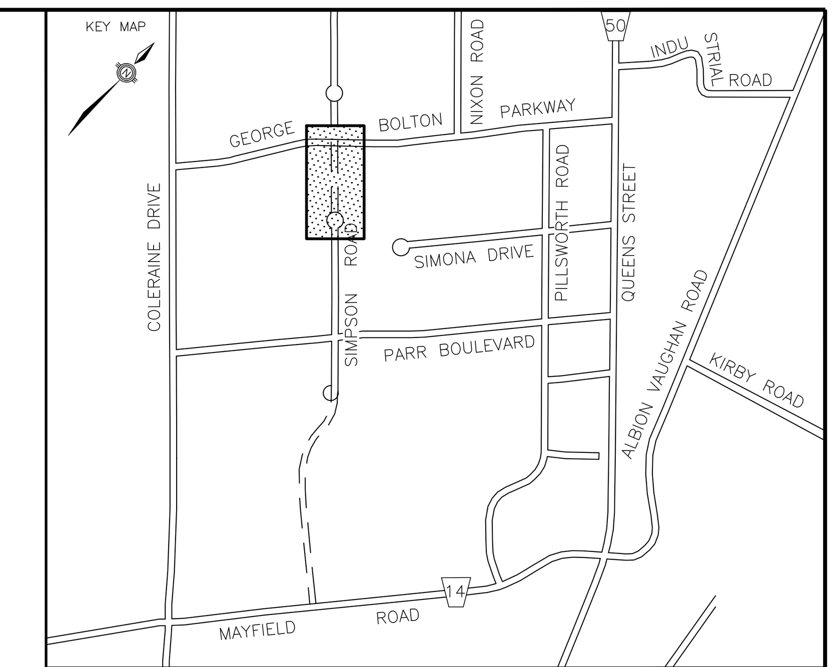
STORM SEWER DATA

STRUCT NO	STATION	℄ GRATE OFFSET	STRUCT OPSD	INVERTS INLET	INVERTS OUTLET	FRAME & COVER OPSD	TOP OF FRAME ELEV	REMARKS
CB1	10+078	5.5 LT	705.010		W237.62	400.100	239.12	
CB2	10+078	5.5 RT	705.010		E237.62	400.100	239.12	
MH1	10+078	1.5 RT	701.013	E237.55 W237.58	S235.12	401.010	239.22	
CB3	10+133	5.5 LT	705.010		W238.33	400.100	239.83	
CB4	10+133	5.5 RT	705.010		E238.33	400.100	239.83	

SANITARY SEWER DATA

STRUCT NO	STATION	℄ GRATE OFFSET	STRUCT OPSD	INVERTS INLET	INVERTS OUTLET	FRAME & COVER OPSD	TOP OF FRAME ELEV	REMARKS
MH1A	10+056	1.5 LT	701.010	E235.63 W235.64	S235.46	401.010	239.32	
EX.	10+166	EX.	EX.	N234.25	EX.	EX.	239.40	





GENERAL NOTES

LEGEND

- PROPOSED PROPERTY LINE
- PROPOSED SUBDRAIN, DIRECTION AND SIZE (CALEDON STD. NO. 219)
- PROPOSED STORM SEWER, DIRECTION AND SIZE
- PROPOSED SANITARY SEWER, DIRECTION AND SIZE
- PROPOSED WATERMAIN AND SIZE
- PROPOSED VALVE
- PROPOSED HYDRANT
- ADJUST CATCHBASIN/MANHOLE
- PROPOSED CATCHBASIN/MANHOLE
- PROPOSED SANITARY MANHOLE

NO.	BY	DATE	REVISION	CONS. CHECKED	TOWN APPR'D
1	J.P.E.	AUG 15	ISSUED FOR TENDER		
2	J.P.E.	SEP 15	ISSUED FOR CONSTRUCTION		
3	J.P.E.	AUG 16	AS CONSTRUCTED		

BENCH MARK:

CONSULTANT

amec foster wheeler

ENGINEER'S STAMP

APPROVED FOR CONSTRUCTION

D. LOVERIDGE, PEng
DIRECTOR OF PUBLIC WORKS

DATE

PROJECT NAME

RFP 2015-64
SIMPSON ROAD EXTENSION PHASE 1

PUBLIC WORKS DEPARTMENT

REGION OF PEEL
C02.307

TOWN OF CALEDON

SIMPSON ROAD
NEW CONSTRUCTION
PLAN AND PROFILE
STA. 9+975 TO STA. 10+225

SCALE: HORIZ.	1:500	VERT.	1:50	PROJECT No.	TP113126
DESIGNED BY:	F.W.	DRAWN BY:	B.L.	DRAWING No.	6
CHECKED BY:	D.S.	DATE:	MAR. 2015		

Appendix B: Stormwater Management Calculations

ALLOWABLE RELEASE RATE

PROJECT: Rafat Storage Yard
FILE No.: 20-0009CA
DATE: January 2021
PREPARED BY: TD

Allowable Release Rate

$$Q = A \times Q_C$$

Where: Q = Allowable Post-Development Release Rate (100-Year)
A = Tributary Area
Q_C = Controlled Flow Rate

WEST SITE

Tributary Area A (ha)	Controlled Flow Rate Q_C (L/s/ha)	Allowable 100-Year Release Rate Q (L/s)
2.13	180	383.4

EAST SITE

Tributary Area A (ha)	Controlled Flow Rate Q_C (L/s/ha)	Allowable 100-Year Release Rate Q (L/s)
1.09	180	196.2

PEAK FLOW CALCULATION: RATIONAL METHOD
WEST SITE
PRE-DEVELOPMENT

PROJECT: Rafat Storage Yard
FILE No.: 20-0009CA
DATE: January 2021
PREPARED BY: TD

IDF DATA SET:	Town of Caledon		
STORM EVENT	**COEFFICIENTS A**	**B**	**C**
2 YR.	1070	7.85	-0.8759
5 YR.	1593	11	-0.8789
10 YR.	2221	12	-0.9080
25 YR.	3158	15	-0.9335
50 YR.	3886	16	-0.9495
100 YR.	4688	17	-0.9624

Rainfall Intensity: $I = A \cdot (T + B)^{C}$
Peak Flow: $Q = (C \cdot I \cdot A) / 360$
Min. Inlet Time: $Tc = 10.0min.$

STORM EVENT	AREA I.D.	AREA (ha)	C	A x C	Tc (min.)	I (mm/hr)	Q (L/s)	Q_{TOTAL} (L/s)
2 YR.	101	1.21	0.70	0.847	10.0	85.7	201.7	477.0
	102	1.02	0.70	0.714	10.0	85.7	170.0	
	103	0.55	0.70	0.385	10.0	85.7	91.7	
	104	0.12	0.25	0.030	10.0	85.7	7.1	
	105	0.11	0.25	0.028	10.0	85.7	6.5	
5 YR.	101	1.21	0.70	0.847	10.0	109.7	258.0	610.4
	102	1.02	0.70	0.714	10.0	109.7	217.5	
	103	0.55	0.70	0.385	10.0	109.7	117.3	
	104	0.12	0.25	0.030	10.0	109.7	9.1	
	105	0.11	0.25	0.028	10.0	109.7	8.4	
10 YR.	101	1.21	0.70	0.847	10.0	134.2	315.7	746.6
	102	1.02	0.70	0.714	10.0	134.2	266.1	
	103	0.55	0.70	0.385	10.0	134.2	143.5	
	104	0.12	0.25	0.030	10.0	134.2	11.2	
	105	0.11	0.25	0.028	10.0	134.2	10.2	
25 YR.	101	1.21	0.70	0.847	10.0	156.5	368.1	870.8
	102	1.02	0.70	0.714	10.0	156.5	310.3	
	103	0.55	0.70	0.385	10.0	156.5	167.3	
	104	0.12	0.25	0.030	10.0	156.5	13.0	
	105	0.11	0.25	0.028	10.0	156.5	12.0	
50 YR.	101	1.21	0.70	0.847	10.0	176.2	414.5	980.6
	102	1.02	0.70	0.714	10.0	176.2	349.4	
	103	0.55	0.70	0.385	10.0	176.2	188.4	
	104	0.12	0.25	0.030	10.0	176.2	14.7	
	105	0.11	0.25	0.028	10.0	176.2	13.5	
100 YR.	101	1.21	0.70	0.847	10.0	196.5	462.4	1093.8
	102	1.02	0.70	0.714	10.0	196.5	389.8	
	103	0.55	0.70	0.385	10.0	196.5	210.2	
	104	0.12	0.25	0.030	10.0	196.5	16.4	
	105	0.11	0.25	0.028	10.0	196.5	15.0	

PEAK FLOW CALCULATION: RATIONAL METHOD
EAST SITE
PRE-DEVELOPMENT

urbanworks ENGINEERING CORPORATION

PROJECT: Rafat Storage Yard
FILE No.: 20-0009CA
DATE: January 2021
PREPARED BY: TD

IDF DATA SET:	Town of Caledon		
STORM EVENT	COEFFICIENTS		
	A	B	C
2 YR.	1070	7.85	-0.8759
5 YR.	1593	11	-0.8789
10 YR.	2221	12	-0.9080
25 YR.	3158	15	-0.9335
50 YR.	3886	16	-0.9495
100 YR.	4688	17	-0.9624

Rainfall Intensity: $I = A \cdot (T + B)^{C}$
Peak Flow: $Q = (C \cdot I \cdot A) / 360$
Min. Inlet Time: *Tc = 10.0min.*

STORM EVENT	AREA I.D.	AREA (ha)	C	A x C	Tc (min.)	I (mm/hr)	Q (L/s)	Q_{TOTAL} (L/s)
2 YR.	106	1.09	0.70	0.763	10.0	85.7	181.7	185.8
	107	0.07	0.25	0.018	10.0	85.7	4.2	
5 YR.	106	1.09	0.70	0.763	10.0	109.7	232.5	237.8
	107	0.07	0.25	0.018	10.0	109.7	5.3	
10 YR.	106	1.09	0.70	0.763	10.0	134.2	284.3	290.9
	107	0.07	0.25	0.018	10.0	134.2	6.5	
25 YR.	106	1.09	0.70	0.763	10.0	156.5	331.6	339.2
	107	0.07	0.25	0.018	10.0	156.5	7.6	
50 YR.	106	1.09	0.70	0.763	10.0	176.2	373.4	382.0
	107	0.07	0.25	0.018	10.0	176.2	8.6	
100 YR.	106	1.09	0.70	0.763	10.0	196.5	416.5	426.1
	107	0.07	0.25	0.018	10.0	196.5	9.6	

PEAK FLOW CALCULATION: RATIONAL METHOD

WEST SITE
POST-DEVELEOPMENT, UNCONTROLLED

PROJECT:	Rafat Storage Yard
FILE No.:	20-0009CA
DATE:	January 2021
PREPARED BY:	TD

IDF DATA SET:	Town of Caledon		
STORM EVENT	**COEFFICIENTS A**	**B**	**C**
2 YR.	1070	7.85	-0.8759
5 YR.	1593	11	-0.8789
10 YR.	2221	12	-0.9080
25 YR.	3158	15	-0.9335
50 YR.	3886	16	-0.9495
100 YR.	4688	17	-0.9624

Rainfall Intensity: $I = A \cdot (T + B)^{C}$

Peak Flow: $Q = (C \cdot I \cdot A) / 360$

Min. Inlet Time: *Tc = 10.0min.*

STORM EVENT	AREA I.D.	AREA (ha)	C	A x C	Tc (min.)	I (mm/hr)	Q (L/s)	Q_{TOTAL} (L/s)
2 YR.	201	2.11	0.78	1.646	10.0	85.7	391.9	405.6
	202	0.23	0.25	0.058	10.0	85.7	13.7	
5 YR.	201	2.11	0.78	1.646	10.0	109.7	501.4	518.9
	202	0.23	0.25	0.058	10.0	109.7	17.5	
10 YR.	201	2.11	0.78	1.646	10.0	134.2	613.3	634.8
	202	0.23	0.25	0.058	10.0	134.2	21.4	
25 YR.	201	2.11	0.78	1.646	10.0	156.5	715.3	740.3
	202	0.23	0.25	0.058	10.0	156.5	25.0	
50 YR.	201	2.11	0.78	1.646	10.0	176.2	805.5	833.6
	202	0.23	0.25	0.058	10.0	176.2	28.1	
100 YR.	201	2.11	0.78	1.646	10.0	196.5	898.5	929.9
	202	0.23	0.25	0.058	10.0	196.5	31.4	

PEAK FLOW CALCULATION: RATIONAL METHOD

EAST SITE
POST-DEVELEOPMENT, UNCONTROLLED

PROJECT: Rafat Storage Yard
FILE No.: 20-0009CA
DATE: January 2021
PREPARED BY: TD

IDF DATA SET:	Town of Caledon		
STORM EVENT	COEFFICIENTS A	B	C
2 YR.	1070	7.85	-0.8759
5 YR.	1593	11	-0.8789
10 YR.	2221	12	-0.9080
25 YR.	3158	15	-0.9335
50 YR.	3886	16	-0.9495
100 YR.	4688	17	-0.9624

Rainfall Intensity: $I = A \cdot (T + B)^{C}$
Peak Flow: $Q = (C \cdot I \cdot A) / 360$
Min. Inlet Time: *Tc = 10.0min.*

STORM EVENT	AREA I.D.	AREA (ha)	C	A x C	Tc (min.)	I (mm/hr)	Q (L/s)	Q_{TOTAL} (L/s)
2 YR.	206	1.09	0.78	0.850	10.0	85.7	202.4	206.6
	207	0.07	0.25	0.018	10.0	85.7	4.2	
5 YR.	206	1.09	0.78	0.850	10.0	109.7	259.0	264.4
	207	0.07	0.25	0.018	10.0	109.7	5.3	
10 YR.	206	1.09	0.78	0.850	10.0	134.2	316.8	323.4
	207	0.07	0.25	0.018	10.0	134.2	6.5	
25 YR.	206	1.09	0.78	0.850	10.0	156.5	369.5	377.1
	207	0.07	0.25	0.018	10.0	156.5	7.6	
50 YR.	206	1.09	0.78	0.850	10.0	176.2	416.1	424.7
	207	0.07	0.25	0.018	10.0	176.2	8.6	
100 YR.	206	1.09	0.78	0.850	10.0	196.5	464.2	473.7
	207	0.07	0.25	0.018	10.0	196.5	9.6	

ORIFICE CONTROL SIZING CALCULATION
WEST SITE

PROJECT: Rafat Storage Yard
FILE No.: 20-0009CA
DATE: January 2021
PREPARED BY: TD

Orifice Control Equation

$$Q = C \bullet A \bullet (2gh)^{0.5}$$

Where: Q = Flow Rate
C = Discharge Coefficient
C (tube) = 0.80
C (plate) = 0.62
A = Orifice Area
g = Acceleration Due to Gravity = 9.81 m/s^2
h = Head

Orifice Diameter (mm)		381
High Water Elev. (m)		236.86
Orifice Invert Elev. (m)		235.78
Flow Rate (L/s)	Required	383.4
	Provided	381.0

Orifice Center Elev. (m)	*235.97*
Head (m)	*0.890*
C	*0.80*
Orifice Area (m^2)	*0.1140*

ORIFICE CONTROL SIZING CALCULATION
EAST SITE

PROJECT:	Rafat Storage Yard
FILE No.:	20-0009CA
DATE:	January 2021
PREPARED BY:	TD

Orifice Control Equation

$$Q = C \bullet A \bullet (2gh)^{0.5}$$

Where: Q = Flow Rate
C = Discharge Coefficient
C (tube) = 0.80
C (plate) = 0.62
A = Orifice Area
g = Acceleration Due to Gravity = 9.81 m/s^2
h = Head

Orifice Diameter (mm)		203
High Water Elev. (m)		238.70
Orifice Invert Elev. (m)		236.17
Flow Rate (L/s)	Required	196.2
	Provided	178.7

Orifice Center Elev. (m)	*236.27*
Head (m)	*2.429*
C	*0.80*
Orifice Area (m^2)	*0.0324*

STORMWATER STORAGE & RELEASE CALCULATION

100-YEAR STORM
WEST SITE

urbanworks ENGINEERING CORPORATION

PROJECT: Rafat Storage Yard
FILE No.: 20-0009CA
DATE: January 2021
PREPARED BY: TD

DRAINAGE AREA I.D.	201	202
DRAINAGE AREA (ha)	2.11	0.23
RUNOFF COEFF. (C)	0.78	0.25
A x C	1.646	0.058
TOTAL A x C	1.703	
TIME OF CONCENTRATION	10.0	min.
TIME STEP	5.0	min.
CONTROLLED RELEASE RATE (Q_C)	0.381	m^3/s
MAX. STORAGE REQUIRED	368	m^3

IDF DATA SET:	Town of Caledon		
STORM EVENT	COEFFICIENTS		
	A	B	C
100 YR.	4688	17	-0.9624

T	$I = A \cdot (T + B)^C$	$Q_R=(C \cdot I \cdot A)/36$	$V_R = Q_R \cdot T \cdot 60$	$V_C = Q_C \cdot T \cdot 60$	$V = V_R - V_C$
TIME (min.)	RAINFALL INTENSITY (mm/hr)	RUNOFF (m^3/s)	RUNOFF VOL. (m^3)	CONTROLLED RELEASE VOL. (m^3)	STORAGE VOL. (m^3)
10.0	196.5	0.930	557.93	228.60	329.33
15.0	166.9	0.790	710.66	342.90	367.76
20.0	145.1	0.687	823.99	457.20	366.79
25.0	128.5	0.608	911.70	571.50	340.20
30.0	115.3	0.545	981.80	685.80	296.00
35.0	104.6	0.495	1039.24	800.10	239.14
40.0	95.7	0.453	1087.26	914.40	172.86
45.0	88.3	0.418	1128.09	1028.70	99.39
50.0	82.0	0.388	1163.28	1143.00	20.28
55.0	76.5	0.362	1193.97	1257.30	0.00
60.0	71.7	0.339	1221.01	1371.60	0.00
65.0	67.5	0.319	1245.05	1485.90	0.00
70.0	63.7	0.302	1266.58	1600.20	0.00
75.0	60.4	0.286	1286.00	1714.50	0.00
80.0	57.4	0.272	1303.61	1828.80	0.00
85.0	54.7	0.259	1319.68	1943.10	0.00
90.0	52.2	0.247	1334.42	2057.40	0.00
95.0	50.0	0.236	1347.98	2171.70	0.00
100.0	47.9	0.227	1360.52	2286.00	0.00
105.0	46.0	0.218	1372.16	2400.30	0.00
110.0	44.3	0.210	1382.99	2514.60	0.00
115.0	42.7	0.202	1393.11	2628.90	0.00
120.0	41.2	0.195	1402.58	2743.20	0.00
125.0	39.8	0.188	1411.48	2857.50	0.00
130.0	38.5	0.182	1419.86	2971.80	0.00
135.0	37.3	0.176	1427.76	3086.10	0.00
140.0	36.1	0.171	1435.23	3200.40	0.00
145.0	35.0	0.166	1442.31	3314.70	0.00
150.0	34.0	0.161	1449.03	3429.00	0.00
155.0	33.1	0.156	1455.41	3543.30	0.00
160.0	32.2	0.152	1461.50	3657.60	0.00
165.0	31.3	0.148	1467.30	3771.90	0.00

STORMWATER STORAGE & RELEASE CALCULATION
100-YEAR STORM
EAST SITE

urbanworks
ENGINEERING CORPORATION

PROJECT: Rafat Storage Yard
FILE No.: 20-0009CA
DATE: January 2021
PREPARED BY: TD

DRAINAGE AREA I.D.	206	207
DRAINAGE AREA (ha)	1.09	0.07
RUNOFF COEFF. (C)	0.78	0.25
A x C	0.850	0.018
TOTAL A x C	0.868	
TIME OF CONCENTRATION	10.0	min.
TIME STEP	5.0	min.
CONTROLLED RELEASE RATE (Q_C)	0.1787	m^3/s
MAX. STORAGE REQUIRED	205	m^3

IDF DATA SET:	Town of Caledon		
STORM EVENT	**COEFFICIENTS**		
	A	**B**	**C**
100 YR.	4688	17	-0.9624

T	$I = A \cdot (T + B)^C$	$Q_R = (C \cdot I \cdot A)/36$	$V_R = Q_R \cdot T \cdot 60$	$V_C = Q_C \cdot T \cdot 60$	$V = V_R - V_C$
TIME (min.)	**RAINFALL INTENSITY (mm/hr)**	**RUNOFF (m^3/s)**	**RUNOFF VOL. (m^3)**	**CONTROLLED RELEASE VOL. (m^3)**	**STORAGE VOL. (m^3)**
10.0	196.5	0.474	284.22	107.22	177.00
15.0	166.9	0.402	362.03	160.83	201.20
20.0	145.1	0.350	419.76	214.44	205.32
25.0	128.5	0.310	464.44	268.05	196.39
30.0	115.3	0.278	500.15	321.66	178.49
35.0	104.6	0.252	529.41	375.27	154.14
40.0	95.7	0.231	553.88	428.88	125.00
45.0	88.3	0.213	574.67	482.49	92.18
50.0	82.0	0.198	592.60	536.10	56.50
55.0	76.5	0.184	608.24	589.71	18.53
60.0	71.7	0.173	622.01	643.32	0.00
65.0	67.5	0.163	634.26	696.93	0.00
70.0	63.7	0.154	645.22	750.54	0.00
75.0	60.4	0.146	655.12	804.15	0.00
80.0	57.4	0.138	664.09	857.76	0.00
85.0	54.7	0.132	672.28	911.37	0.00
90.0	52.2	0.126	679.78	964.98	0.00
95.0	50.0	0.120	686.69	1018.59	0.00
100.0	47.9	0.116	693.08	1072.20	0.00
105.0	46.0	0.111	699.01	1125.81	0.00
110.0	44.3	0.107	704.53	1179.42	0.00
115.0	42.7	0.103	709.68	1233.03	0.00
120.0	41.2	0.099	714.51	1286.64	0.00
125.0	39.8	0.096	719.04	1340.25	0.00
130.0	38.5	0.093	723.31	1393.86	0.00
135.0	37.3	0.090	727.33	1447.47	0.00
140.0	36.1	0.087	731.14	1501.08	0.00
145.0	35.0	0.084	734.75	1554.69	0.00
150.0	34.0	0.082	738.17	1608.30	0.00
155.0	33.1	0.080	741.42	1661.91	0.00
160.0	32.2	0.078	744.52	1715.52	0.00
165.0	31.3	0.076	747.48	1769.13	0.00

AVAILABLE STORAGE VOLUME
WEST SITE

urbanworks ENGINEERING CORPORATION

PROJECT: Rafat Storage Yard
FILE No.: 20-0009CA
DATE: January 2021
PREPARED BY: TD

PIPE STORAGE

Pipe Dia. (mm)	Length (m)	Volume (m^3)
450	99.0	15.75
600	100.3	28.36
675	99.0	35.43
675	25.7	9.20
250	175.0	8.59
Total Pipe Storage		**97**

STORM CHAMBERS

Description	Volume (m^3)
Total Storage	**423**
Quantity Control Volume	**283**
Retention Volume (Water Balance)	**140**

TOTAL AVAILABLE STORAGE

QUANTITY CONTROL	**380 m^3**
WATER BALANCE	**140.0 m^3**

AVAILABLE STORAGE VOLUME
EAST SITE

urbanworks
ENGINEERING CORPORATION

PROJECT:	Rafat Storage Yard
FILE No.:	20-0009CA
DATE:	January 2021
PREPARED BY:	TD

PIPE STORAGE

Pipe Dia. (mm)	Length (m)	Volume (m^3)
450	101.3	16.11
450	33.1	5.26
250	75.0	3.68
Total Pipe Storage		**25**

STORM CHAMBERS

Description	Volume (m^3)
Total Storage	**243**
Quantity Control Volume	**185**
Retention Volume (Water Balance)	**58**

TOTAL AVAILABLE STORAGE

QUANTITY CONTROL	**210 m^3**
WATER BALANCE	**58.0 m^3**

STORAGE CHAMBER LAYOUT - WEST SITE

Parameters

Units: Metric

Storage Volume: 420 Cu m

Chamber Selection: S-29

Header Row Position: Right

Fill Over Embedment Stone: 300 mm

Controlled By: width 14 m

Embedment Stone mm:

Over: 150 Under: 150 Porosity: 0.4

Min 150mm over and under

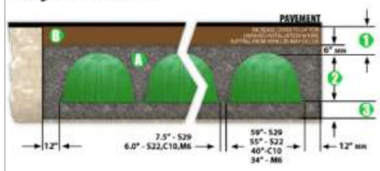
Double Stacked

Double Stacked?: No

Stone Between: 304.80

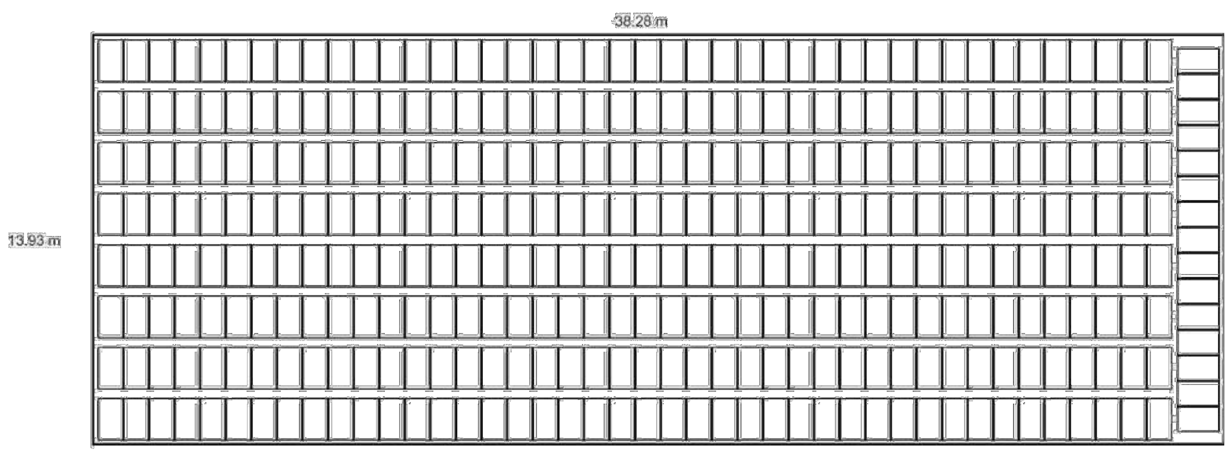
Note: After making an input change you must hit calculate to update the Field Diagram and Project Results.
* The image generation will not save if using MicroSoft Edge

Project Results



1	Total Cover Over Chambers: 301 mm
2	Height Of Chamber: 915 mm
3	Embedment Stone Under Chambers: 151 mm
A	Volume of Embedment Stone Required: 375 Cu. m
B	Volume of Fill Material Required: 160 Cu. m
	Total Storage Provided: 423 Cu. m
	Type Of Chambers: S-29
	# Of Chambers Required: 351
	# Of End Caps Required: 18
	Required Bed Size: 534 Sq. m
	Volume of Excavation: 648 Cu. m
	* Area of Filter Fabric: 661 Sq. m
	# of Chambers Long: 42
	# of rows: 8
	Actual Trench Length: 38.28 m
	Actual Trench Width: 13.93 m

* Filter Fabric quantity for Fabric on Top and Sides of System Only, does not include overlap



STORAGE CHAMBER LAYOUT - EAST SITE

Parameters

Units: Metric

Storage Volume: 235 Cu m

Chamber Selection: S-29

Header Row Position: Left

Fill Over Embedment Stone: 300 mm

Controlled By: width 14 m

Embedment Stone mm:

Over: 150 Under: 150 Porosity: 0.4

Min 150mm over and under

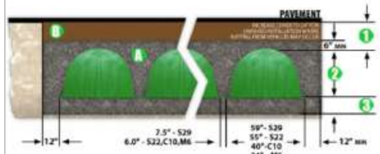
Double Stacked

Double Stacked?: No

Stone Between: 304.80

Note: After making an input change you must hit calculate to update the Field Diagram and Project Results.
* The image generation will not save if using MicroSoft Edge

Project Results



1 Total Cover Over Chambers: 301 mm

2 Height Of Chamber: 915 mm

3 Embedment Stone Under Chambers: 151 mm

A Volume of Embedment Stone Required: 221 Cu. m

B Volume of Fill Material Required: 93 Cu. m

Total Storage Provided: 243 Cu. m

Type Of Chambers: S-29

Of Chambers Required: 199

Of End Caps Required: 18

Required Bed Size: 310 Sq. m

Volume of Excavation: 376 Cu. m

* Area of Filter Fabric: 397 Sq. m

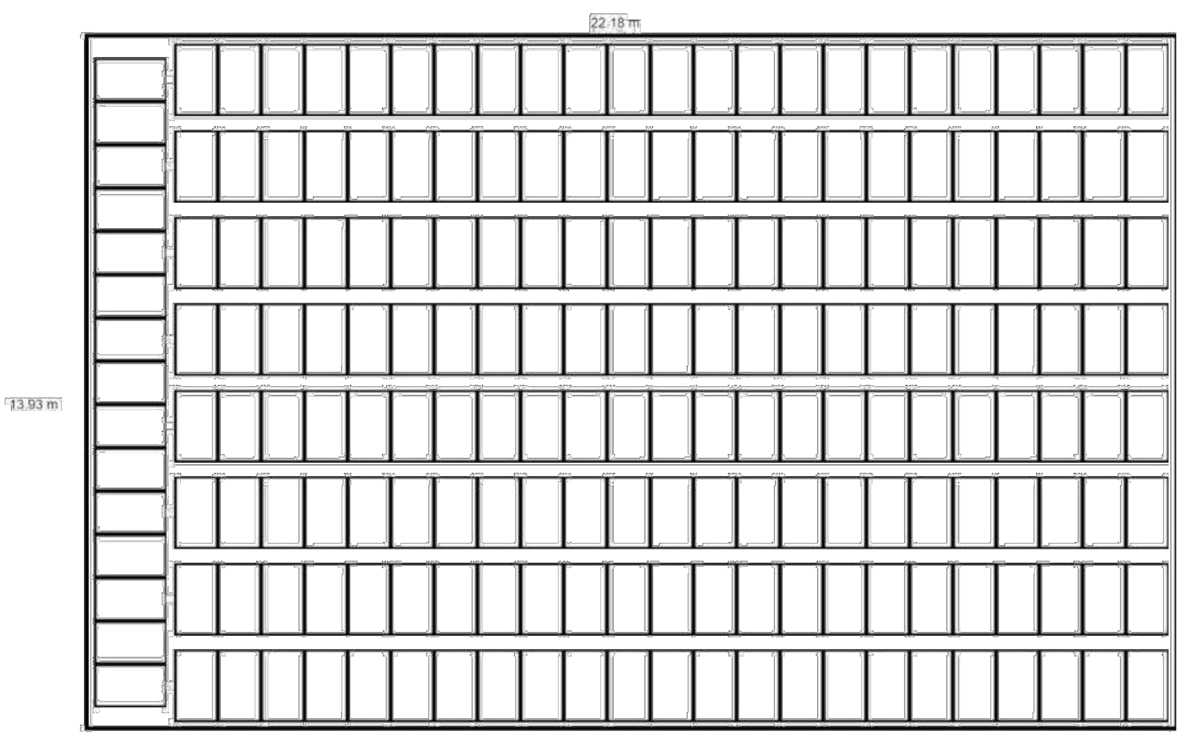
# of Chambers Long: 23

# of rows: 8

Actual Trench Length: 22.18 m

Actual Trench Width: 13.93 m

* Filter Fabric quantity for Fabric on Top and Sides of System Only, does not include overlap



Appendix C: Engineering Drawings

GENERAL NOTES:

1. THIS DRAWING TO BE READ IN CONJUNCTION WITH THE APPROVED ARCHITECTURAL AND LANDSCAPE PLANS.
2. THE LOCATION OF ALL UNDERGROUND AND ABOVEGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON ENGINEERING DRAWINGS, AND WHERE SHOWN THE ACCURACY OF THE LOCATION AND ELEVATION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. PRIOR TO COMMENCING CONSTRUCTION, THE CONTRACTOR SHALL VERIFY EXACT LOCATION AND ELEVATION OF SUCH UTILITIES AND STRUCTURES AND SHALL ASSUME ALL LIABILITIES OF DAMAGE.
3. ALL DIMENSIONS SHALL BE CHECKED AND VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO CONSTRUCTION AND ANY DISCREPANCIES SHALL BE REPORTED IMMEDIATELY TO THE ENGINEER. DETAILS ARE NOT TO BE SCALED FROM THE DRAWINGS.
4. THE WORK AREA SHALL BE ISOLATED FROM PUBLIC ACCESS AT ALL TIMES. OPEN EXCAVATIONS SHALL BE BACKFILLED OR PLATED AT THE END OF EACH WORK DAY. ALL CONSTRUCTION WORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH THE REQUIREMENTS OF THE OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATIONS FOR CONSTRUCTION PROJECTS.

TOWN OF CALEDON STANDARD NOTES:

1. CONSTRUCTION FOR THIS PROJECT TO COMPLY WITH THE MOST CURRENT VERSION OF THE TOWN OF CALEDON DEVELOPMENT STANDARDS 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. WITHIN A MINIMUM OF FORTY–EIGHT HOURS PRIOR TO COMMENCING CONSTRUCTION WITHIN THE MUNICIPAL RIGHT–OF–WAY, THE CONTRACTOR MUST CONTACT THE FOLLOWING:

TOWN OF CALEDON, FINANCE AND INFRASTRUCTURE SERVICES DEPT.	905–584–2272
REGION OF PEEL	905–791–7800
ENBRIDGE CONSUMERS GAS	905–758–7924
HYDRO ONE	519–941–1211
BELL CANADA	416–296–6929
ROGERS CABLE	905–897–3914

4. ALL DRAINAGE TO BE SELF–CONTAINED AND DISCHARGED TO A LOCATION APPROVED BY THE TOWN OF CALEDON.
5. SEDIMENT CONTROL DEVICES ARE TO BE INSTALLED PRIOR TO ANY CONSTRUCTION ON THE SITE AND SHALL BE INSPECTED AND MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD TO THE SATISFACTION OF THE TOWN OF CALEDON AND THE APPLICABLE CONSERVATION AUTHORITY.
6. A MINIMUM OF 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, THE STRUCTURES SHALL BE RELOCATED AT THE APPLICANT'S EXPENSE.
7. STREET CURBS ARE TO BE CONTINUOUS WITHIN THE PROPOSED ENTRANCE.
8. ANY CHANGES TO GRADES OR SERVICING FROM THE ORIGINALLY APPROVED SITE PLAN MUST BE APPROVED BY THE TOWN OF CALEDON.
9. STRUCTURAL DESIGN OF THE FIRE ROUTE IS REQUIRED TO SUPPORT AN 18–TON VEHICLE. AS SUCH THE DRAWING IS TO SHOW AREAS OF HEAVY ASPHALT AND LIGHT ASPHALT AND IS TO PROVIDE DESIGN INFORMATION.
10. ALL BOULEVARDS TO BE RESTORED WITH 150mm MINIMUM OF TOPSOIL AND SOD TO THE SATISFACTION OF THE TOWN OF CALEDON.
11. THE MINIMUM PAVEMENT DESIGN FOR THE ASPHALT DRIVEWAY APRON WITHIN THE MUNICIPAL ROAD ALLOWANCE SHALL BE AS FOLLOWS:

    40mm HL3 ASPHALT
    50mm HL8 ASPHALT
    150mm GRANULAR 'A'
    300mm GRANULAR 'B'

12. SERVICE CONNECTION BACKFILL TO BE DISCUSSED WITH THE TOWN OF CALEDON

STORM SEWERS:

1. STORM SEWER PIPES 300mm DIA. TO 450mm DIA. SHALL BE PVC SDR 35 CONFORMING TO C.S.A. SPECIFICATION B182.2 – M1990 AND B182.4 – M1992 OR LATEST REVISION THEREOF, UNLESS OTHERWISE NOTED. STORM SEWER PIPES LARGER THAN 450mm DIA. SHALL BE REINFORCED CONCRETE CONFORMING TO C.S.A. SPECIFICATION A257.2 – M1982 OR LATEST REVISION THEREOF. PIPE JOINTS SHALL BE BY MEANS OF APPROVED RUBBER GASKETS CONFORMING TO C.S.A. SPECIFICATION A257.2 – M1982 OR LATEST REVISION THEREOF.
2. STORM SEWER BEDDING AND BACKFILL SHALL BE AS PER O.P.S.D. 802.010 CLASS 'B' WITH GRANULAR 'A' FOR PVC PIPE, AND 802.030 CLASS 'B' WITH GRANULAR 'A' FOR CONCRETE PIPE.
3. STORM MANHOLES SHALL BE AS PER O.P.S.D. 701.010, 701.011, 701.012 AND 701.013, WITH SIZE AS NOTED ON THE DRAWINGS. FRAME AND COVER SHALL BE AS PER O.P.S.D. 401.010 TYPE 'B'. SAFETY PLATFORMS SHALL BE AS PER O.P.S.D. 404.020 AND SHALL BE INSTALLED IN MANHOLES WHERE THE DEPTH EXCEEDS 5.0m. STORM MANHOLE BENCHING SHALL BE TO THE OBVERT OF THE PIPE AS PER O.P.S.D. 701.021, MINIMUM 230mm IN WIDTH, OR AS SPECIFIED ON THE DRAWINGS.
4. GRANULAR BACKFILL AROUND MANHOLES AND CATCHBASINS SHALL BE GRANULAR 'B' COMPACTED BY MECHANICAL MEANS TO A MINIMUM OF 95% S.P.D.
5. ALL MANHOLE CHAMBER OPENINGS SHALL BE LOCATED ON THE UPSTREAM SIDE OF THE MANHOLES.
6. DROP STRUCTURES SHALL BE AS PER O.P.S.D. 1003.010 OR 1003.020.
7. STREET CATCHBASIN FRAME AND GRATE PER O.P.S.D. 400.020.

ROADWORKS:

1. BARRIER CURBS SHALL BE AS PER OPSD 600.110.
2. SIDEWALKS TO COMPLY WITH OPSD 310.010 AND ARE TO BE 1.5 METERS WIDE ON A 150mm COMPACTED GRANULAR "A" BASE. MINIMUM THICKNESS ACROSS THE DRIVEWAY ENTRANCE IS TO BE 200mm.
3. PROPOSED VEHICLE PARKING AND STORAGE AREAS TO HAVE GRAVEL SURFACE WITH MINIMUM SPECIFICATIONS AS FOLLOWS:

    150mm DEPTH OF 20mmø CRUSHER–RUN LIMESTONE – TOP COURSE
    450mm DEPTH OF 50mmø CRUSHER–RUN LIMESTONE – BASE
    (NOTE: TO BE VERIFIED BY GEOTECHNICAL ENGINEER)

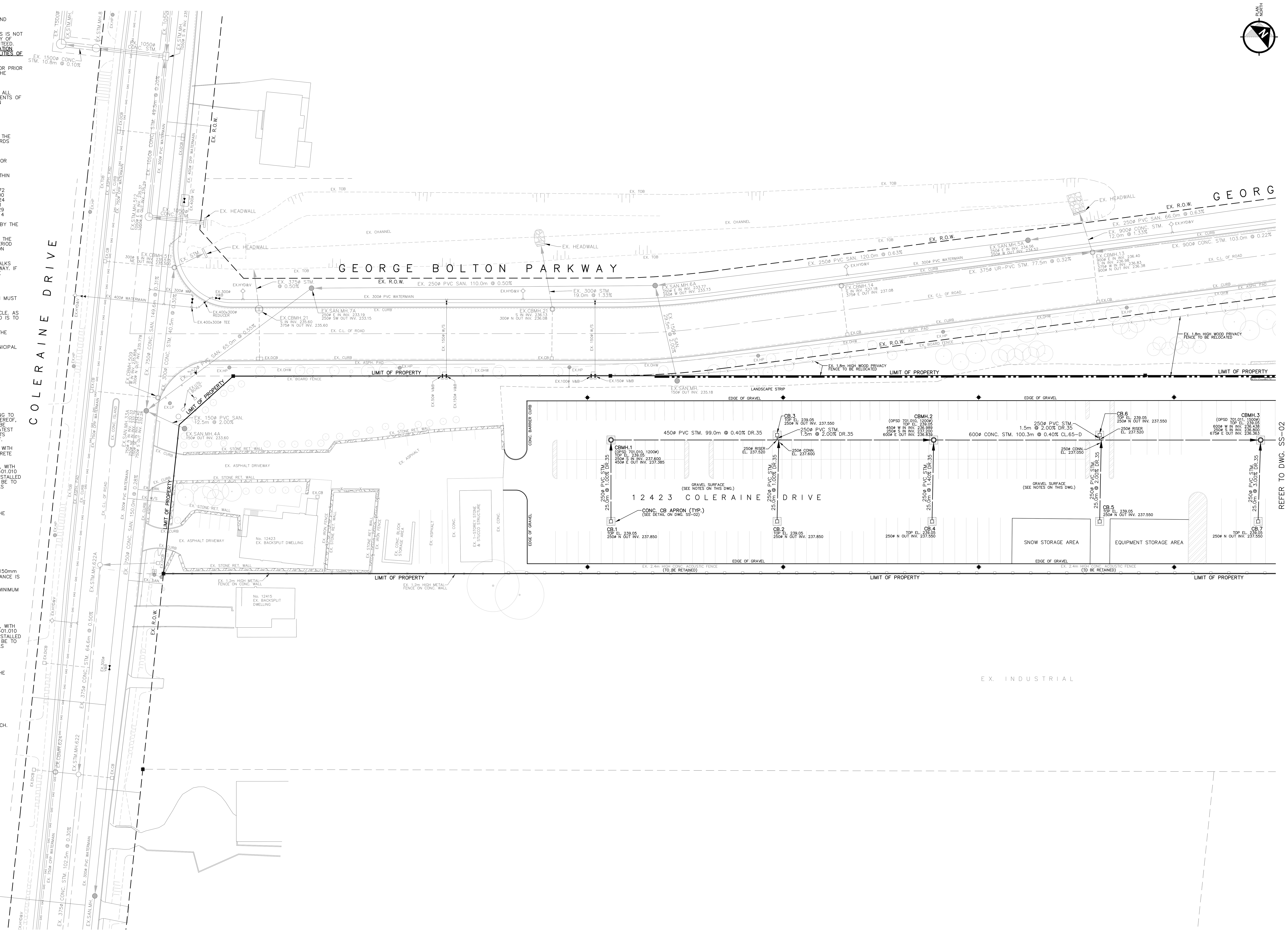
4. STORM MANHOLES SHALL BE AS PER O.P.S.D. 701.010, 701.011, 701.012 AND 701.013, WITH SIZE AS NOTED ON THE DRAWINGS. FRAME AND COVER SHALL BE AS PER O.P.S.D. 401.010 TYPE 'B'. SAFETY PLATFORMS SHALL BE AS PER O.P.S.D. 404.020 AND SHALL BE INSTALLED IN MANHOLES WHERE THE DEPTH EXCEEDS 5.0m. STORM MANHOLE BENCHING SHALL BE TO THE OBVERT OF THE PIPE AS PER O.P.S.D. 701.021, MINIMUM 230mm IN WIDTH, OR AS SPECIFIED ON THE DRAWINGS.
5. GRANULAR BACKFILL AROUND MANHOLES AND CATCHBASINS SHALL BE GRANULAR 'B' COMPACTED BY MECHANICAL MEANS TO A MINIMUM OF 95% S.P.D.
6. ALL MANHOLE CHAMBER OPENINGS SHALL BE LOCATED ON THE UPSTREAM SIDE OF THE MANHOLES.
7. DROP STRUCTURES SHALL BE AS PER O.P.S.D. 1003.010 OR 1003.020.
8. STREET CATCHBASIN FRAME AND GRATE PER O.P.S.D. 400.020.

RESTORATION NOTES:

1. SERVICES WITHIN MUNICIPAL RIGHT–OF–WAY TO BE CONSTRUCTED IN VERTICAL TRENCH. TRENCH SHALL BE BACKFILLED WITH UNSHRINKABLE FILL.
2. ALL AREAS DISTURBED BY THE CONTRACTOR DURING THE CONSTRUCTION OF WORKS SHOWN HEREON SHALL BE RESTORED TO ORIGINAL CONDITION OR BETTER.
   – MUNICIPAL SIDEWALKS AND CURBS TO BE RESTORED PER CITY STANDARDS.
   – RESTORATION OF PAVEMENT TO MATCH EXISTING SPECIFICATIONS.
   – ALL GRASS AND VEGETATION–COVERED AREAS SHALL BE RESTORED BY PLACING 150mm OF TOPSOIL & SOD.

LEGEND

DENOTES VALVE AND CHAMBER
DENOTES VALVE AND BOX
DENOTES HYDRANT
CB DENOTES SINGLE CATCHBASIN
DCB DENOTES DOUBLE CATCHBASIN
DENOTES SANITARY MANHOLE
DENOTES STORM MANHOLE
DENOTES CATCHBASIN WITH CONC. APRON
DENOTES 1.8m HIGH WOOD PRIVACY FENCE
DENOTES LIGHT POLE



KEY PLAN
N.T.S.

LEGAL DESCRIPTION:
PART OF THE WEST HALF OF LOT 3, CONCESSION 6
TOWN OF CALEDON (GEOGRAPHIC TOWNSHIP OF ALBION)
REGIONAL MUNICIPALITY OF PEEL

DRAWING LIST	
SS–01	SITE SERVICING PLAN – PART 1
SS–02	SITE SERVICING PLAN – PART 2
SG–01	SITE GRADING PLAN – PART 1
SG–02	SITE GRADING PLAN – PART 2
SC–01	EROSION & SEDIMENT CONTROL PLAN
TA–01	STORM TRIBUTARY AREA PLAN

SUBMISSION HISTORY

No.	ISSUED FOR	DATE
1.	ISSUED FOR ZBA/SPA	JAN.29,2021

REVISIONS

No.	DESCRIPTION	BY	DATE

BEARING NOTE:
BEARINGS ARE UTM GRID, DERIVED FROM GPS OBSERVATIONS USING CAN–NET REAL TIME NETWORK, UTM ZONE 17, NAD–1983:CSRS:CBNV6–2010.0. COORDINATES ARE UTM ZONE 17, NAD–1983:CSRS:CBNV6–2010.0, TO URBAN ACCURACY PER SEC. 14 (2) OF O.REG. 216/10.

POINT ID	NORTHING	EASTING
ORP A	4854226.02	603621.95
ORP B	4854660.07	603962.06

BENCHMARK NOTE:
ELEVATIONS ARE GEODETIC AND ARE REFERRED TO GEODETIC SURVEY OF CANADA FIRST–ORDER VERTICAL BENCHMARK NUMBER PEEL 40 HAVING AN ORTHOMETRIC ELEVATION OF 222.165 METRES. ELEVATIONS ARE REFERENCED TO THE CANADIAN GEODETIC VERTICAL DATUM OF 1928, 1978 ADJUSTMENT (CGVD–1928:1978).

BENCHMARK ON THE SOUTH FACE AT THE WEST CORNER OF SOUTH END OF A CONCRETE BOX CULVERT ACROSS SEVENTEENTH SIDEROAD (REGION ROAD #14) APPROXOMATELY 0.56km EAST OF CLARK DRIVE (TENTH LINE EAST).

CONSULTANT'S CERTIFICATE
WE HAVE REVIEWED THE SITE AND GRADING PLAN FOR THE PROPOSED BUILDINGS TO BE CONSTRUCTED AND HEREBY CERTIFY THAT:

1. THE GRADING/SERVICING DESIGN AND DRAINAGE WORKS COMPLY WITH SOUND ENGINEERING PRINCIPLES.
2. THE PROPOSED GRADING WILL NOT ADVERSELY AFFECT ADJACENT LANDS.
3. THE PROPOSED BUILDINGS ARE COMPATIBLE WITH THE PROPOSED SITE GRADING

CONSULTANT
LICENSED PROFESSIONAL ENGINEER
T. DUMYN
100072175
JAN.29,2021
PROVINCE OF ONTARIO

MUNICIPAL APPROVAL

urbanworks
ENGINEERING CORPORATION
Toronto, Ontario, CANADA | tel. 416-503-4500
e. general@urbanworkseng.com | w. www.urbanworkseng.com

RAFAT STORAGE YARD
12423 COLERAINE DRIVE & 0 SIMPSON ROAD

Region of Peel
working with you

TOWN OF CALEDON

SCALE
0 5 10 15 20 25 30 35 40 45 50m

SITE SERVICING PLAN
PART 1

TOWN FILE:	PRE-20-0009	PROJECT No.	20-0009CA
REGION FILE:			
DATE: JAN. 29, 2021	DESIGNED BY: T.D.	DWG. No.	SS-01
SCALE: 1:500	DRAWN BY: T.D.		
	CHECKED BY: M.M.		

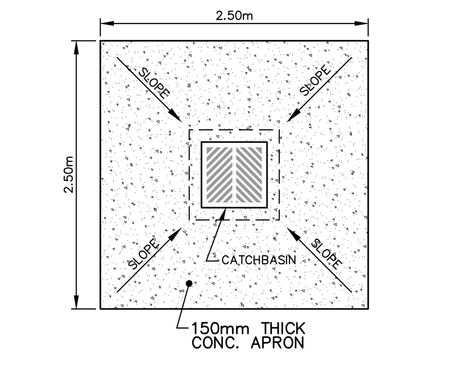
STORMWATER MANAGEMENT SUMMARY

WEST SITE

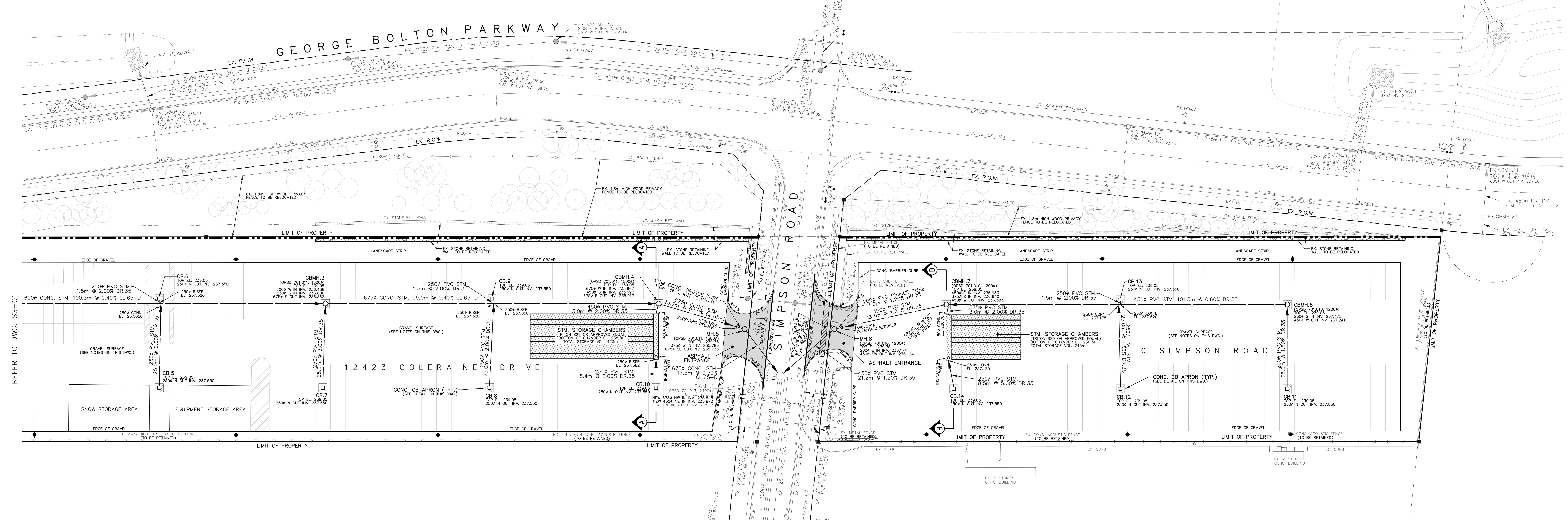
ORIFICE SIZE ORIFICE INVERT ELEVATION 100–YR. WATER LEVEL	375mmø 235.78 239.17
100–YR. RELEASE RATE ALLOWABLE 100–YR. RELEASE RATE	381.0 L/s 383.4 L/s
<u>PROVIDED STORAGE</u> TOTAL QUANTITY CONTROL STORAGE PIPES: 97 m^3 CHAMBER: 283 m^3 WATER BALANCE (CHAMBER)	 380 m^3 140 m^3
<u>REQUIRED STORAGE</u> QUANTITY CONTROL WATER BALANCE	 368 m^3 139.0 m^3

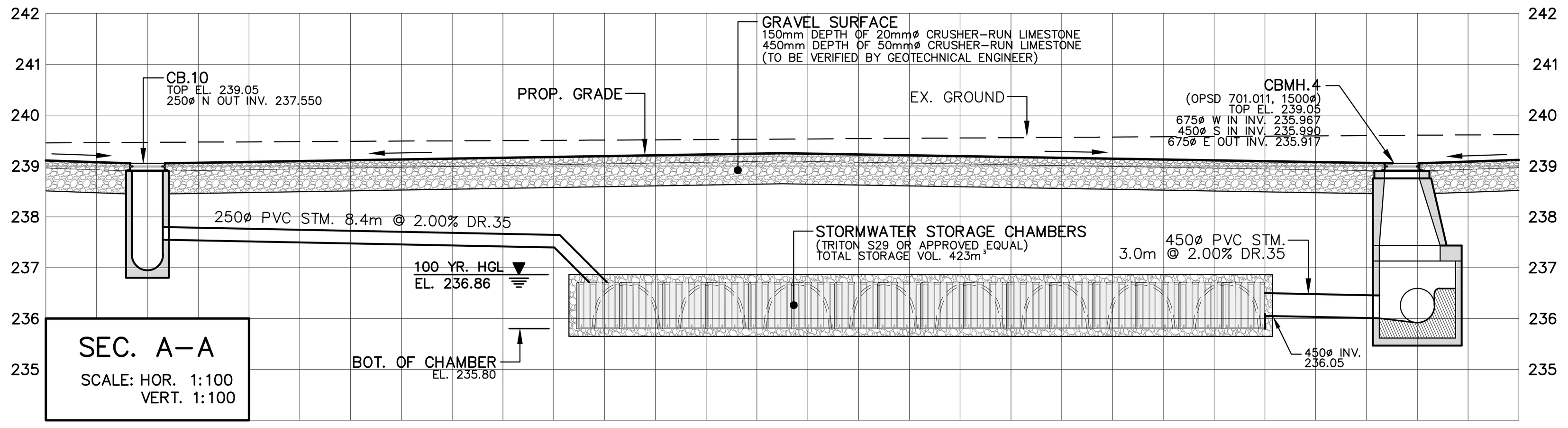
EAST SITE

ORIFICE SIZE ORIFICE INVERT ELEVATION 100–YR. WATER LEVEL	200mmø 235.78 239.19
100–YR. RELEASE RATE ALLOWABLE 100–YR. RELEASE RATE	178.7 L/s 196.2 L/s
<u>PROVIDED STORAGE</u> TOTAL QUANTITY CONTROL STORAGE PIPES: 25 m^3 CHAMBER: 185 m^3 WATER BALANCE (CHAMBER)	 210 m^3 58 m^3
<u>REQUIRED STORAGE</u> QUANTITY CONTROL WATER BALANCE	 205 m^3 54.5 m^3

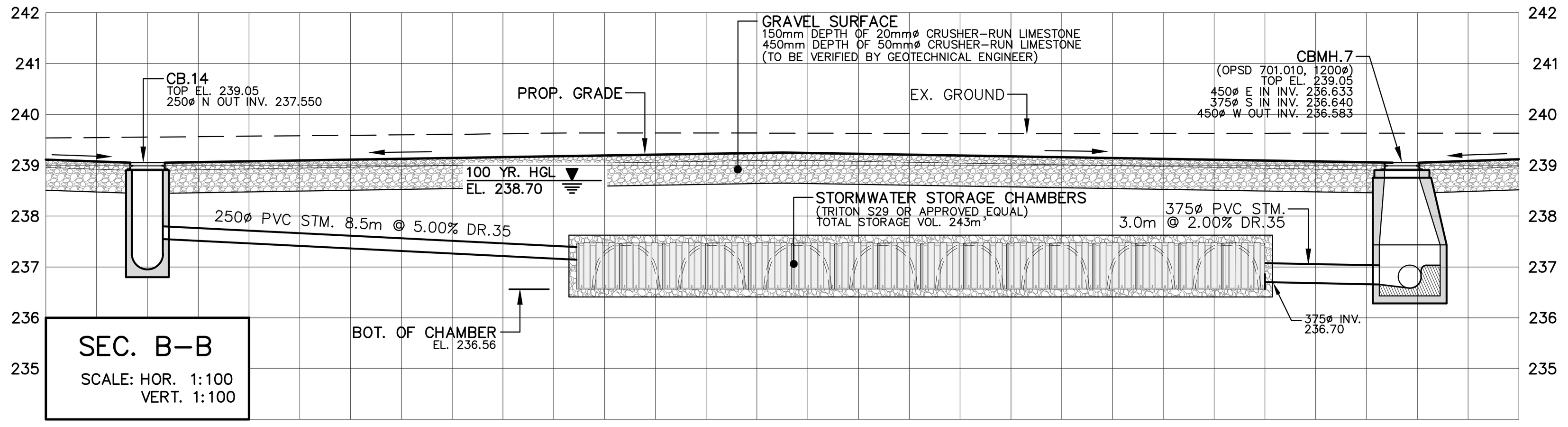


CATCHBASIN APRON DETAIL
SCALE: 1:25





SEC. A–A
SCALE: HOR. 1:100
VERT. 1:100



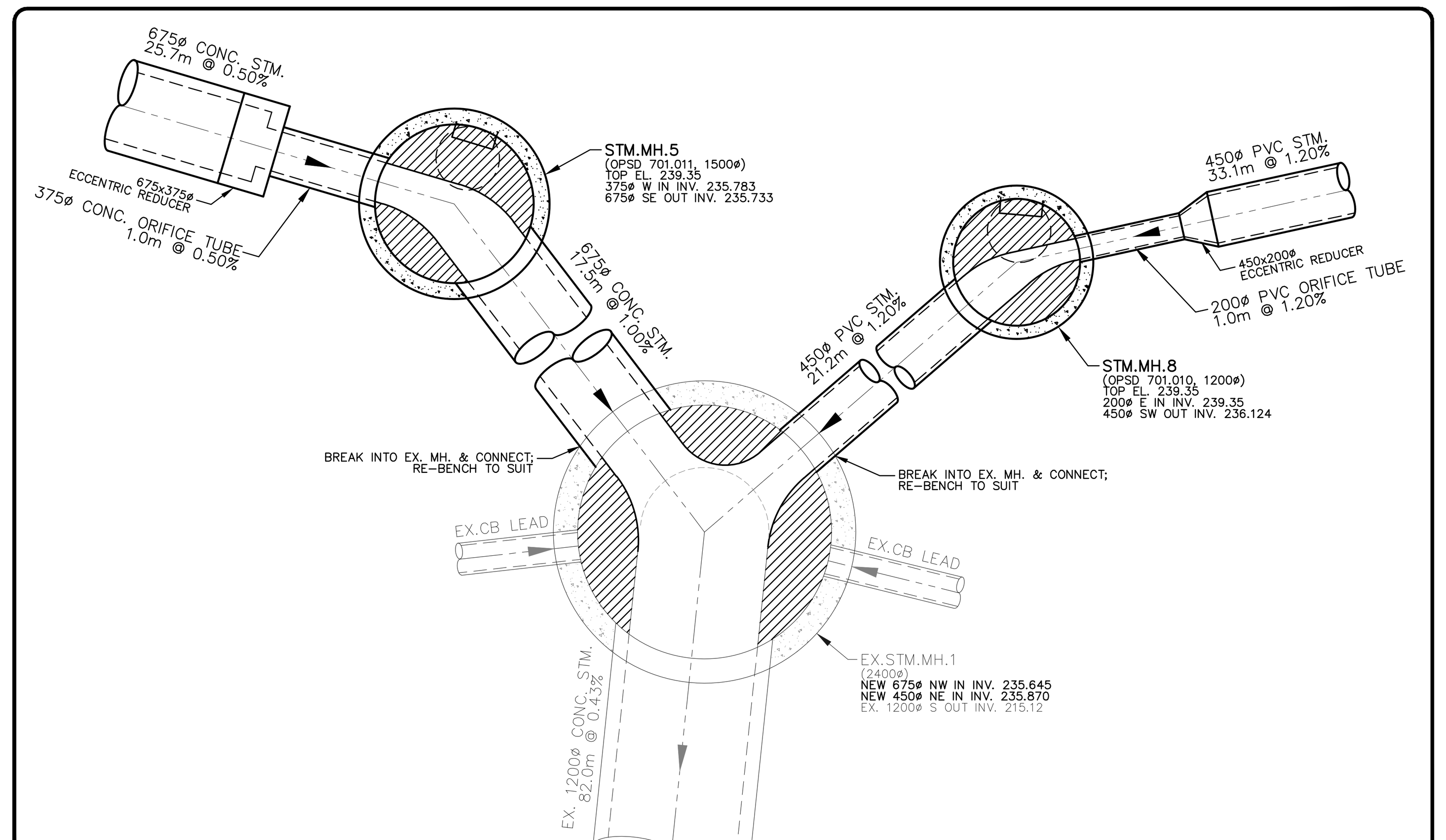
SEC. B–B
SCALE: HOR. 1:100
VERT. 1:100

GENERAL NOTES:

1. REFER TO DWG. SS-01 FOR GENERAL NOTES.

LEGEND

- DENOTES VALVE AND CHAMBER
- DENOTES VALVE AND BOX
- DENOTES HYDRANT
- CB DENOTES SINGLE CATCHBASIN
- DCB DENOTES DOUBLE CATCHBASIN
- DENOTES SANITARY MANHOLE
- DENOTES STORM MANHOLE
- DENOTES CATCHBASIN WITH CONC. APRON
- DENOTES 1.8m HIGH WOOD PRIVACY FENCE
- DENOTES LIGHT POLE



STORM OUTLET DETAILS
SCALE: 1:50

KEY PLAN
N.T.S.

LEGAL DESCRIPTION:

PART OF THE WEST HALF OF LOT 3, CONCESSION 6
TOWN OF CALEDON (GEOGRAPHIC TOWNSHIP OF ALBION)
REGIONAL MUNICIPALITY OF PEEL

DRAWING LIST

SS–01	SITE SERVICING PLAN – PART 1
SS–02	SITE SERVICING PLAN – PART 2
SG–01	SITE GRADING PLAN – PART 1
SG–02	SITE GRADING PLAN – PART 2
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TA–01	STORM TRIBUTARY AREA PLAN

SUBMISSION HISTORY

No.	ISSUED FOR	DATE
1.	ISSUED FOR ZBA/SPA	JAN.29,2021

REVISIONS

No.	DESCRIPTION	BY	DATE

BEARING NOTE:

BEARINGS ARE UTM GRID, DERIVED FROM GPS OBSERVATIONS USING CAN–NET REAL TIME NETWORK, UTM ZONE 17, NAD–1983:CSRS:CBNV6–2010.0. COORDINATES ARE UTM ZONE 17, NAD–1983:CSRS:CBNV6–2010.0, TO URBAN ACCURACY PER SEC. 14 (2) OF O.REG. 216/10.

POINT ID	NORTHING	EASTING
ORP A	4854226.02	603621.95
ORP B	4854660.07	603962.06

BENCHMARK NOTE:

ELEVATIONS ARE GEODETIC AND ARE REFERRED TO GEODETIC SURVEY OF CANADA FIRST–ORDER VERTICAL BENCHMARK NUMBER PEEL 40 HAVING AN ORTHOMETRIC ELEVATION OF 222.165 METRES. ELEVATIONS ARE REFERENCED TO THE CANADIAN GEODETIC VERTICAL DATUM OF 1928, 1978 ADJUSTMENT (CGVD–1928:1978).

BENCHMARK ON THE SOUTH FACE AT THE WEST CORNER OF SOUTH END OF A CONCRETE BOX CULVERT ACROSS SEVENTEENTH SIDEROAD (REGION ROAD #14) APPROXOMATELY 0.56km EAST OF CLARK DRIVE (TENTH LINE EAST).

CONSULTANT'S CERTIFICATE

WE HAVE REVIEWED THE SITE AND GRADING PLAN FOR THE PROPOSED BUILDINGS TO BE CONSTRUCTED AND HEREBY CERTIFY THAT:

1. THE GRADING/SERVICING DESIGN AND DRAINAGE WORKS COMPLY WITH SOUND ENGINEERING PRINCIPLES.
2. THE PROPOSED GRADING WILL NOT ADVERSELY AFFECT ADJACENT LANDS.
3. THE PROPOSED BUILDINGS ARE COMPATIBLE WITH THE PROPOSED SITE GRADING

CONSULTANT

LICENSED PROFESSIONAL ENGINEER
T. DUMYN
100072175
JAN.29,2021
PROVINCE OF ONTARIO

MUNICIPAL APPROVAL

urbanworks
ENGINEERING CORPORATION
Toronto, Ontario, CANADA | tel. 416-503-4500
e. general@urbanworkseng.com | w. www.urbanworkseng.com

RAFAT STORAGE YARD

12423 COLERAINE DRIVE & 0 SIMPSON ROAD

Region of Peel
working with you

TOWN OF CALEDON

SCALE

SITE SERVICING PLAN

PART 2

TOWN FILE:	PRE-20-0009	PROJECT No.	20-0009CA
REGION FILE:			
DATE: JAN. 29, 2021	DESIGNED BY: T.D.	DWG. No.	SS-02
SCALE: 1:500	DRAWN BY: T.D.		
	CHECKED BY: M.M.		

GENERAL NOTES:

1. THIS DRAWING TO BE READ IN CONJUNCTION WITH THE APPROVED ARCHITECTURAL AND LANDSCAPE PLANS.
2. THE LOCATION OF ALL UNDERGROUND AND ABOVEGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON ENGINEERING DRAWINGS, AND WHERE SHOWN THE ACCURACY OF THE LOCATION AND ELEVATION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. PRIOR TO COMMENCING CONSTRUCTION, THE CONTRACTOR SHALL VERIFY EXACT LOCATION AND ELEVATION OF SUCH UTILITIES AND STRUCTURES AND SHALL ASSUME ALL LIABILITIES OF DAMAGE.
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TOWN OF CALEDON STANDARD NOTES:

1. CONSTRUCTION FOR THIS PROJECT TO COMPLY WITH THE MOST CURRENT VERSION OF THE TOWN OF CALEDON DEVELOPMENT STANDARDS 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. WITHIN A MINIMUM OF FORTY–EIGHT HOURS PRIOR TO COMMENCING CONSTRUCTION WITHIN THE MUNICIPAL RIGHT–OF–WAY, THE CONTRACTOR MUST CONTACT THE FOLLOWING:

TOWN OF CALEDON, FINANCE AND INFRASTRUCTURE SERVICES DEPT.	905–584–2272
REGION OF PEEL	905–791–7800
ENBRIDGE CONSUMERS GAS	905–758–7924
HYDRO ONE	519–941–1211
BELL CANADA	416–296–6929
ROGERS CABLE	905–897–3914

4. ALL DRAINAGE TO BE SELF–CONTAINED AND DISCHARGED TO A LOCATION APPROVED BY THE TOWN OF CALEDON.
5. SEDIMENT CONTROL DEVICES ARE TO BE INSTALLED PRIOR TO ANY CONSTRUCTION ON THE SITE AND SHALL BE INSPECTED AND MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD TO THE SATISFACTION OF THE TOWN OF CALEDON AND THE APPLICABLE CONSERVATION AUTHORITY.
6. A MINIMUM OF 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, THE STRUCTURES SHALL BE RELOCATED AT THE APPLICANT'S EXPENSE.
7. STREET CURBS ARE TO BE CONTINUOUS WITHIN THE PROPOSED ENTRANCE.
8. ANY CHANGES TO GRADES OR SERVICING FROM THE ORIGINALLY APPROVED SITE PLAN MUST BE APPROVED BY THE TOWN OF CALEDON.
9. STRUCTURAL DESIGN OF THE FIRE ROUTE IS REQUIRED TO SUPPORT AN 18–TON VEHICLE. AS SUCH THE DRAWING IS TO SHOW AREAS OF HEAVY ASPHALT AND LIGHT ASPHALT AND IS TO PROVIDE DESIGN INFORMATION.
10. ALL BOULEVARDS TO BE RESTORED WITH 150mm MINIMUM OF TOPSOIL AND SOD TO THE SATISFACTION OF THE TOWN OF CALEDON.
11. THE MINIMUM PAVEMENT DESIGN FOR THE ASPHALT DRIVEWAY APRON WITHIN THE MUNICIPAL ROAD ALLOWANCE SHALL BE AS FOLLOWS:

    40mm HL3 ASPHALT
    50mm HL8 ASPHALT
    150mm GRANULAR 'A'
    300mm GRANULAR 'B'
12. SERVICE CONNECTION BACKFILL TO BE DISCUSSED WITH THE TOWN OF CALEDON

ROADWORKS:

1. BARRIER CURBS SHALL BE AS PER OPSD 600.110.
2. SIDEWALKS TO COMPLY WITH OPSD 310.010 AND ARE TO BE 1.5 METERS WIDE ON A 150mm COMPACTED GRANULAR "A" BASE. MINIMUM THICKNESS ACROSS THE DRIVEWAY ENTRANCE IS TO BE 200mm.
3. PROPOSED VEHICLE PARKING AND STORAGE AREAS TO HAVE GRAVEL SURFACE WITH MINIMUM SPECIFICATIONS AS FOLLOWS:

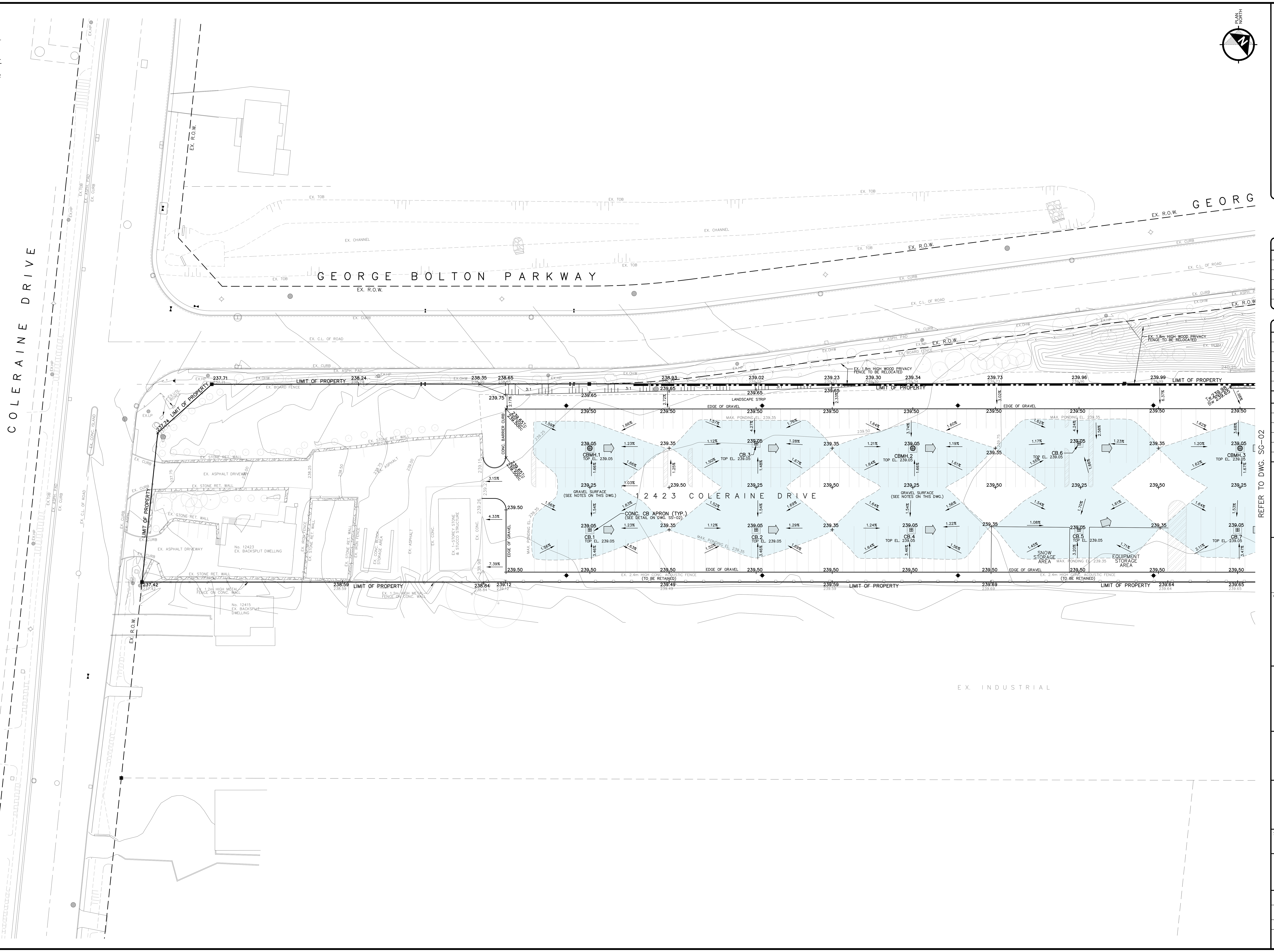
    150mm DEPTH OF 20mmø CRUSHER–RUN LIMESTONE – TOP COURSE
    450mm DEPTH OF 50mmø CRUSHER–RUN LIMESTONE – BASE
    (NOTE: TO BE VERIFIED BY GEOTECHNICAL ENGINEER)
4. STORM MANHOLES SHALL BE AS PER O.P.S.D. 701.010, 701.011, 701.012 AND 701.013, WITH SIZE AS NOTED ON THE DRAWINGS. FRAME AND COVER SHALL BE AS PER O.P.S.D. 401.010 TYPE 'B'. SAFETY PLATFORMS SHALL BE AS PER O.P.S.D. 404.020 AND SHALL BE INSTALLED IN MANHOLES WHERE THE DEPTH EXCEEDS 5.0m. STORM MANHOLE BENCHING SHALL BE TO THE OBVERT OF THE PIPE AS PER O.P.S.D. 701.021, MINIMUM 230mm IN WIDTH, OR AS SPECIFIED ON THE DRAWINGS.
5. GRANULAR BACKFILL AROUND MANHOLES AND CATCHBASINS SHALL BE GRANULAR 'B' COMPACTED BY MECHANICAL MEANS TO A MINIMUM OF 95% S.P.D.
6. ALL MANHOLE CHAMBER OPENINGS SHALL BE LOCATED ON THE UPSTREAM SIDE OF THE MANHOLES.
7. DROP STRUCTURES SHALL BE AS PER O.P.S.D. 1003.010 OR 1003.020.
8. STREET CATCHBASIN FRAME AND GRATE PER O.P.S.D. 400.020.

RESTORATION NOTES:

1. SERVICES WITHIN MUNICIPAL RIGHT–OF–WAY TO BE CONSTRUCTED IN VERTICAL TRENCH. TRENCH SHALL BE BACKFILLED WITH UNSHRINKABLE FILL.
2. ALL AREAS DISTURBED BY THE CONTRACTOR DURING THE CONSTRUCTION OF WORKS SHOWN HEREON SHALL BE RESTORED TO ORIGINAL CONDITION OR BETTER.
    – MUNICIPAL SIDEWALKS AND CURBS TO BE RESTORED PER CITY STANDARDS.
    – RESTORATION OF PAVEMENT TO MATCH EXISTING SPECIFICATIONS.
    – ALL GRASS AND VEGETATION–COVERED AREAS SHALL BE RESTORED BY PLACING 150mm OF TOPSOIL & SOD.

LEGEND

- DENOTES VALVE AND CHAMBER
- DENOTES VALVE AND BOX
- DENOTES HYDRANT
- CB DENOTES SINGLE CATCHBASIN
- DCB DENOTES DOUBLE CATCHBASIN
- DENOTES SANITARY MANHOLE
- DENOTES STORM MANHOLE
- 189.52 DENOTES PROPOSED ELEVATION
- 190.14 DENOTES EXISTING ELEVATION
- 188.5 DENOTES EXISTING CONTOUR
- DENOTES OVERLAND FLOW ROUTE
- DENOTES MAX. PONDING EXTENTS
- DENOTES CATCHBASIN WITH CONC. APRON
- DENOTES 1.8m HIGH WOOD PRIVACY FENCE
- DENOTES LIGHT POLE



KEY PLAN
N.T.S.

LEGAL DESCRIPTION:
PART OF THE WEST HALF OF LOT 3, CONCESSION 6
TOWN OF CALEDON (GEOGRAPHIC TOWNSHIP OF ALBION)
REGIONAL MUNICIPALITY OF PEEL

DRAWING LIST	
SS–01	SITE SERVICING PLAN – PART 1
SS–02	SITE SERVICING PLAN – PART 2
SG–01	SITE GRADING PLAN – PART 1
SG–02	SITE GRADING PLAN – PART 2
SC–01	EROSION & SEDIMENT CONTROL PLAN
TA–01	STORM TRIBUTARY AREA PLAN

SUBMISSION HISTORY

No.	ISSUED FOR	DATE
1.	ISSUED FOR ZBA/SPA	JAN.29,2021

REVISIONS

No.	DESCRIPTION	BY	DATE

BEARING NOTE:
BEARINGS ARE UTM GRID, DERIVED FROM GPS OBSERVATIONS USING CAN–NET REAL TIME NETWORK, UTM ZONE 17, NAD–1983:CSRS:CBNV6–2010.0. COORDINATES ARE UTM ZONE 17, NAD–1983:CSRS:CBNV6–2010.0, TO URBAN ACCURACY PER SEC. 14 (2) OF O.REG. 216/10.

POINT ID	NORTHING	EASTING
ORP A	4854226.02	603621.95
ORP B	4854660.07	603962.06

BENCHMARK NOTE:
ELEVATIONS ARE GEODETIC AND ARE REFERRED TO GEODETIC SURVEY OF CANADA FIRST–ORDER VERTICAL BENCHMARK NUMBER PEEL 40 HAVING AN ORTHOMETRIC ELEVATION OF 222.165 METRES. ELEVATIONS ARE REFERENCED TO THE CANADIAN GEODETIC VERTICAL DATUM OF 1928, 1978 ADJUSTMENT (CGVD–1928:1978).

BENCHMARK ON THE SOUTH FACE AT THE WEST CORNER OF SOUTH END OF A CONCRETE BOX CULVERT ACROSS SEVENTEENTH SIDEROAD (REGION ROAD #14) APPROXOMATELY 0.56km EAST OF CLARK DRIVE (TENTH LINE EAST).

CONSULTANT'S CERTIFICATE
WE HAVE REVIEWED THE SITE AND GRADING PLAN FOR THE PROPOSED BUILDINGS TO BE CONSTRUCTED AND HEREBY CERTIFY THAT:

1. THE GRADING/SERVICING DESIGN AND DRAINAGE WORKS COMPLY WITH SOUND ENGINEERING PRINCIPLES.
2. THE PROPOSED GRADING WILL NOT ADVERSELY AFFECT ADJACENT LANDS.
3. THE PROPOSED BUILDINGS ARE COMPATIBLE WITH THE PROPOSED SITE GRADING

CONSULTANT

LICENSED PROFESSIONAL ENGINEER
T. DUMYN
100072175
JAN.29,2021
PROVINCE OF ONTARIO

MUNICIPAL APPROVAL

urbanworks
ENGINEERING CORPORATION
Toronto, Ontario, CANADA | tel. 416-503-4500
e. general@urbanworkseng.com | w. www.urbanworkseng.com

RAFAT STORAGE YARD
12423 COLERAINE DRIVE & 0 SIMPSON ROAD

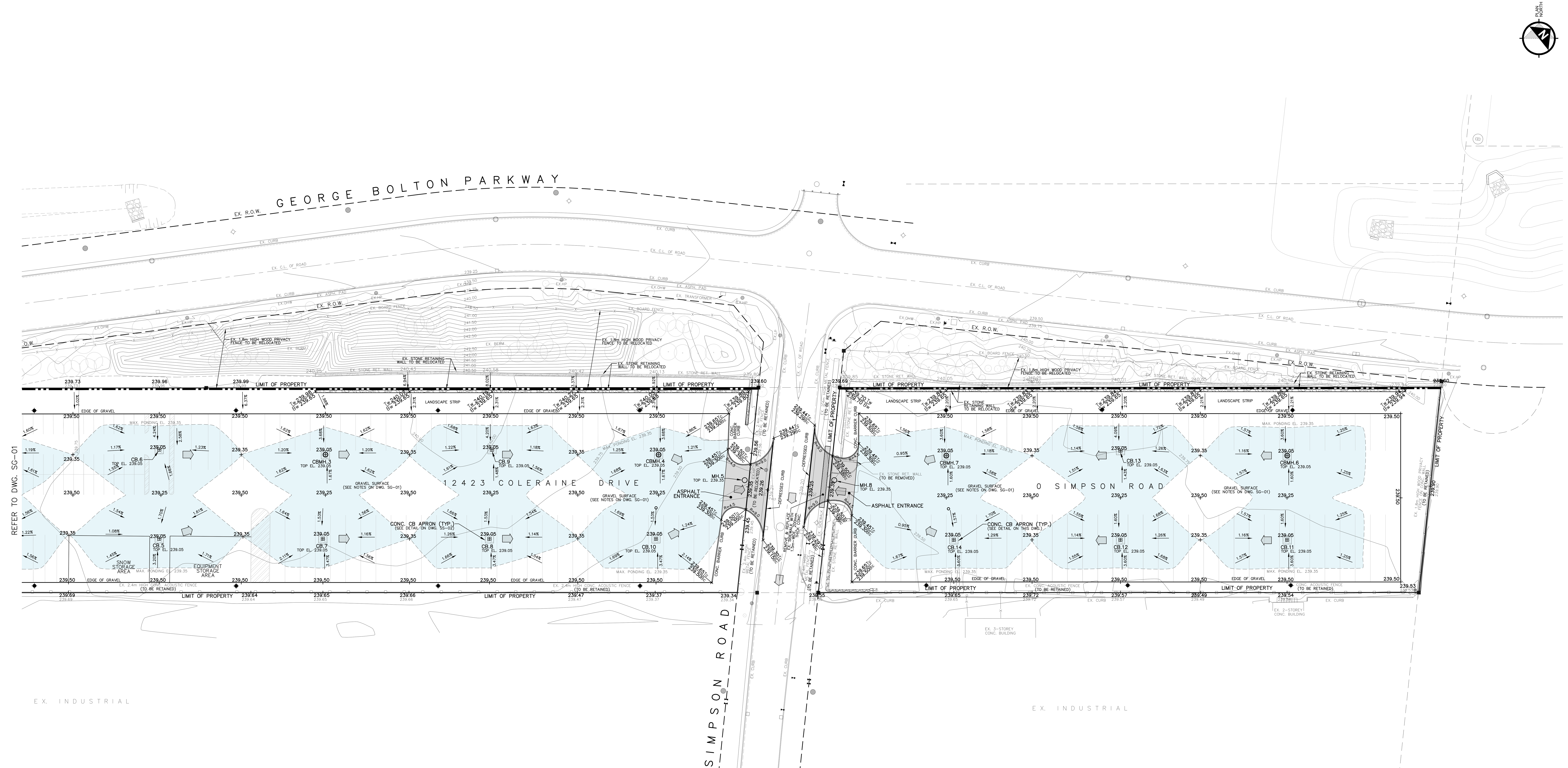
Region of Peel
working with you

TOWN OF CALEDON

SCALE
0 5 10 15 20 25 30 35 40 45 50m

SITE GRADING PLAN
PART 1

TOWN FILE:	PRE-20-0009	PROJECT No.	20-0009CA
REGION FILE:			
DATE: JAN. 29, 2021	DESIGNED BY: T.D.	DWG. No.	SG-01
SCALE: 1:500	DRAWN BY: T.D.		
	CHECKED BY: M.M.		



KEY PLAN
N.T.S.

GENERAL NOTES:

1. REFER TO DWG. SG-01 FOR GENERAL NOTES.

LEGEND

- DENOTES VALVE AND CHAMBER
- DENOTES VALVE AND BOX
- DENOTES HYDRANT
- CB DENOTES SINGLE CATCHBASIN
- DCB DENOTES DOUBLE CATCHBASIN
- DENOTES SANITARY MANHOLE
- DENOTES STORM MANHOLE
- 189.52 DENOTES PROPOSED ELEVATION
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- DENOTES OVERLAND FLOW ROUTE
- DENOTES MAX. PONDING EXTENTS
- DENOTES CATCHBASIN WITH CONC. APRON
- DENOTES 1.8m HIGH WOOD PRIVACY FENCE
- DENOTES LIGHT POLE

LEGAL DESCRIPTION:

PART OF THE WEST HALF OF LOT 3, CONCESSION 6
TOWN OF CALEDON (GEOGRAPHIC TOWNSHIP OF ALBION)
REGIONAL MUNICIPALITY OF PEEL

DRAWING LIST	
SS–01	SITE SERVICING PLAN – PART 1
SS–02	SITE SERVICING PLAN – PART 2
SG–01	SITE GRADING PLAN – PART 1
SG–02	SITE GRADING PLAN – PART 2
SC–01	EROSION & SEDIMENT CONTROL PLAN
TA–01	STORM TRIBUTARY AREA PLAN

SUBMISSION HISTORY

No.	ISSUED FOR	DATE
1.	ISSUED FOR ZBA/SPA	JAN.29,2021

REVISIONS

No.	DESCRIPTION	BY	DATE

BEARING NOTE:

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POINT ID	NORTHING	EASTING
ORP A	4854226.02	603621.95
ORP B	4854660.07	603962.06

BENCHMARK NOTE:

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BENCHMARK ON THE SOUTH FACE AT THE WEST CORNER OF SOUTH END OF A CONCRETE BOX CULVERT ACROSS SEVENTEENTH SIDEROAD (REGION ROAD #14) APPROXOMATELY 0.56km EAST OF CLARK DRIVE (TENTH LINE EAST).

CONSULTANT'S CERTIFICATE

WE HAVE REVIEWED THE SITE AND GRADING PLAN FOR THE PROPOSED BUILDINGS TO BE CONSTRUCTED AND HEREBY CERTIFY THAT:

1. THE GRADING/SERVICING DESIGN AND DRAINAGE WORKS COMPLY WITH SOUND ENGINEERING PRINCIPLES.
2. THE PROPOSED GRADING WILL NOT ADVERSELY AFFECT ADJACENT LANDS.
3. THE PROPOSED BUILDINGS ARE COMPATIBLE WITH THE PROPOSED SITE GRADING

CONSULTANT

LICENSED PROFESSIONAL ENGINEER
T. DUMYN
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12423 COLERAINE DRIVE & 0 SIMPSON ROAD

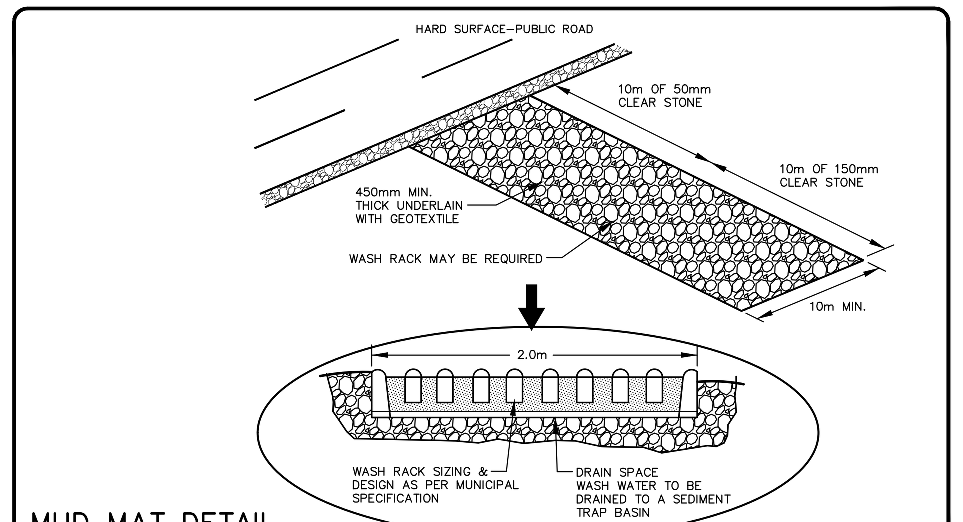
Region of Peel
working with you

TOWN OF CALEDON

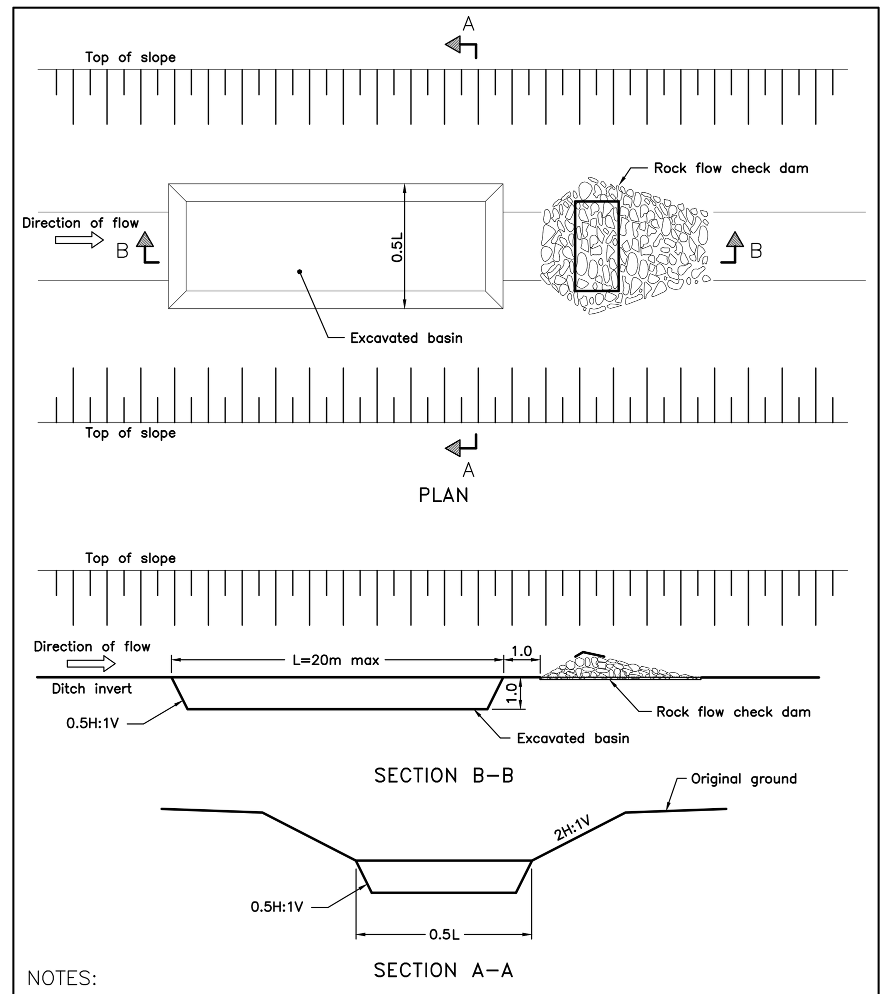
SCALE
0 5 10 15 20 25 30 35 40 45 50m

SITE GRADING PLAN
PART 2

TOWN FILE:	PRE-20-0009	PROJECT No.	20-0009CA
REGION FILE:			
DATE: JAN. 29, 2021	DESIGNED BY: T.D.	DWG. No.	SG-02
SCALE: 1:500	DRAWN BY: T.D.		
	CHECKED BY: M.M.		



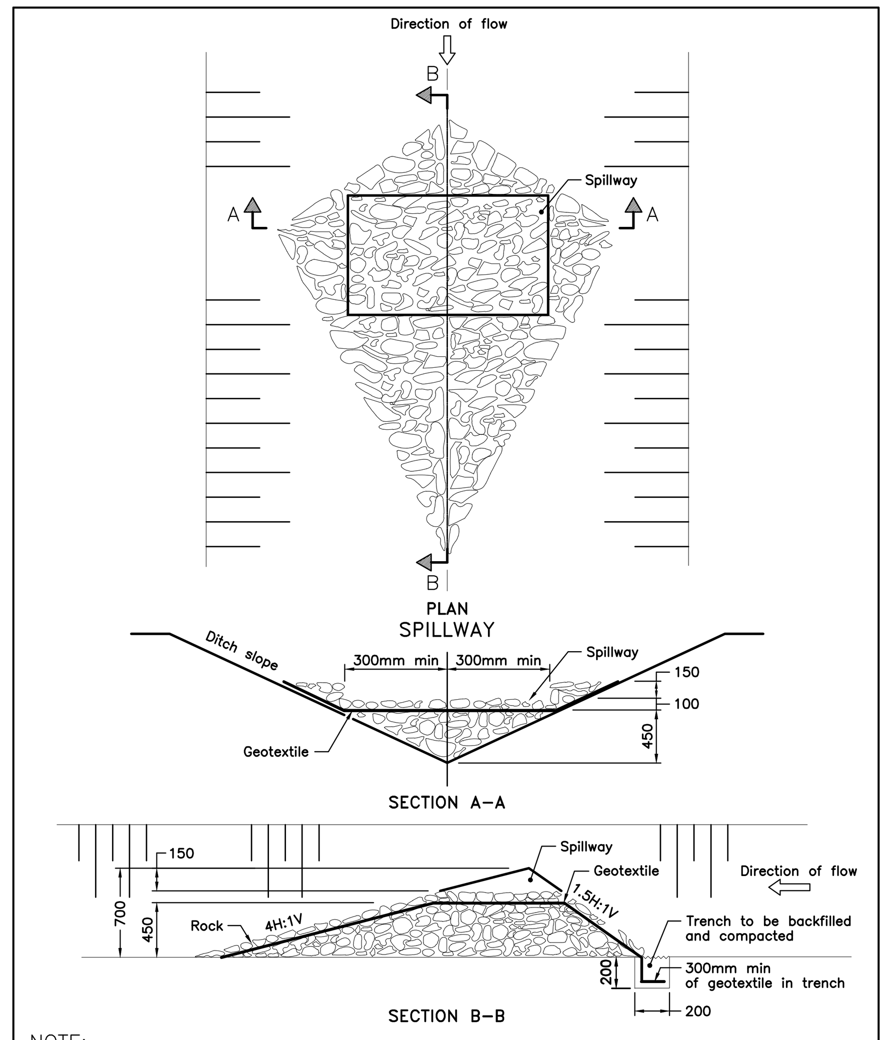
MUD MAT DETAIL
SCALE: N.T.S.



NOTES:
A Ditch cross–section upstream or downstream of sediment trap may be flat bottom or V–shaped. Flat bottom shown.
B This OPSD to be read in conjuction with OPSD 219.210 or 219.211.
C All dimensions are in metres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING | Nov 2006 | Rev 1

EXCAVATED SEDIMENT TRAP IN DITCH
OPSD 219.220



NOTE:
A All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING | Nov 2006 | Rev 1

ROCK FLOW CHECK DAM
V–DITCH
OPSD 219.210

GENERAL NOTES

1. PRIOR TO THE COMMENCEMENT OF SITE GRADING WORKS, ALL EROSION & SEDIMENT CONTROL DEVICES SHALL BE INSTALLED AND OPERATIONAL. THE EXACT LOCATION TO BE DETERMINED IN THE FIELD AND APPROVED BY THE TOWN OF CALEDON. THE CONTRACTOR SHALL MAINTAIN ALL EROSION AND SEDIMENT CONTROL DEVICES UNTIL SERVICING CONSTRUCTION IS COMPLETED, TO THE SATISFACTION OF THE ENGINEER AND THE TOWN OF CALEDON.
2. ANY TREES SELECTED BY THE LANDSCAPE ARCHITECT FOR PRESERVATION TO BE PROTECTED BY SNOW FENCE. LANDSCAPE ARCHITECT TO INDICATE ANY TREES THAT ARE TO BE TRANSPLANTED.
3. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE ROUTINELY INSPECTED AND MAINTAINED IN PROPER WORKING ORDER, AND CLEANED PERIODICALLY AS REQUIRED BY THE DIRECTOR OF OPERATIONS.
4. ALL CONSTRUCTION VEHICLES SHALL EXIT THE SITE VIA THE TEMPORARY CONSTRUCTION ACCESS.
5. ALL TOPSOIL STOCKPILES SHALL BE SURROUNDED WITH SILTATION CONTROL FENCING. ALL PILES WHICH ARE STOCKED FOR MORE THAN 30 DAYS SHALL BE SEEDED.
6. SEDIMENT WHICH COLLECTS IN THE TEMPORARY SEDIMENT CONTROL FACILITIES WILL BE REMOVED WHEN FACILITY IS HALF FULL.
7. SILTATION CONTROL FENCE TO REMAIN IN PLACE UNTIL THE WORKING AREA HAS BEEN STABILIZED AND REVEGETATED, TO THE SATISFACTION OF THE TOWN OF CALEDON.
8. CONTRACTOR TO INSTALL AND MAINTAIN MUD MATS AT CONSTRUCTION ACCESS IN ORDER TO PREVENT MUD TRACKING ONTO ADJACENT ROADS.
9. CONTRACTOR TO INSPECT AND CLEAN ALL INTERNAL AND EXTERNAL ROADS DAILY TO THE SATISFACTION OF THE DIRECTOR OF OPERATIONS.
10. ALL INTERNAL CATCHBASINS TO BE PROVIDED WITH TERRAFIX 270R OR APPROVED EQUAL UNDER GRATE, TO BE KEPT IN PLACE UNTIL STABILIZED.
11. THE LOCATION AND ELEVATION OF ALL EXISTING SERVICES AND UTILITIES ARE TO BE VERIFIED IN THE FIELD BY THE CONTRACTOR AT THEIR EXPENSE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE RESTORATION AND/OR REPAIR OF EXISTING UTILITIES DISTURBED DURING CONSTRUCTION.
12. ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH THE "OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATIONS FOR CONSTRUCTION PROJECTS". THE GENERAL CONTRACTOR SHALL BE DESIGNATED AS THE CONSTRUCTOR AS DEFINED IN THE ACT.
13. ALL EROSION/SEDIMENT CONTROL DEVICES SHALL BE INSPECTED AFTER EACH MAJOR STORM EVENT OR AS DIRECTED BY DIRECTOR OF OPERATIONS.

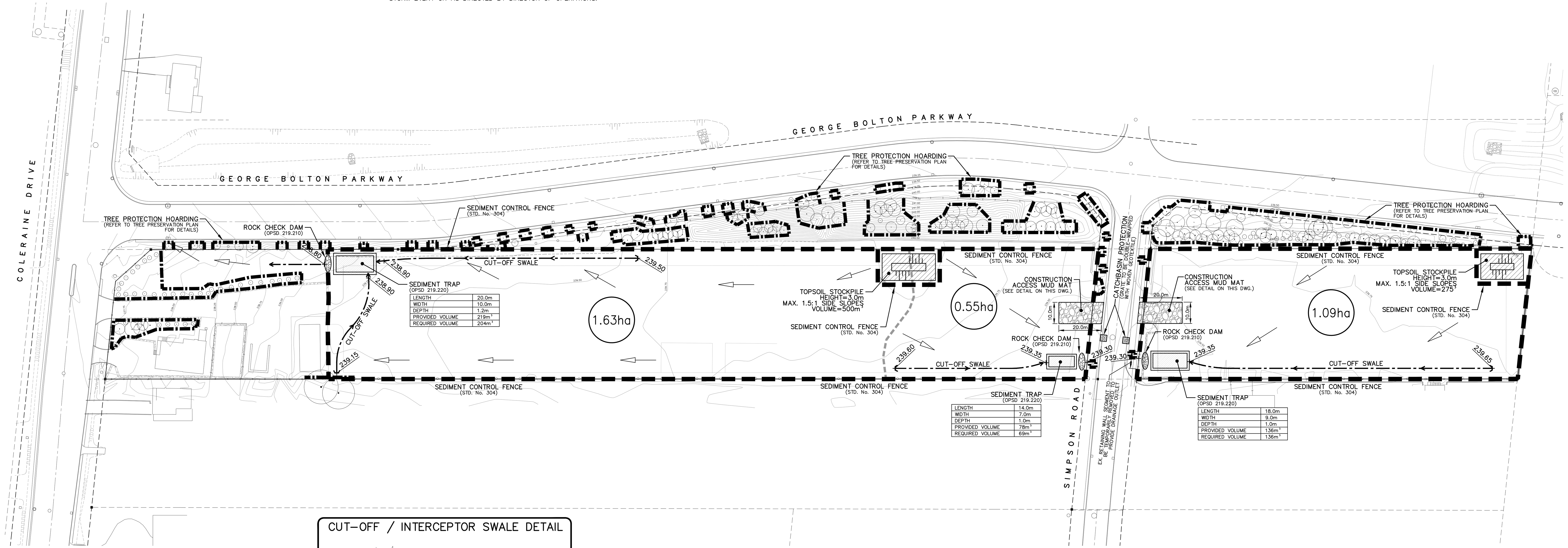
SPILL CONTROL NOTES

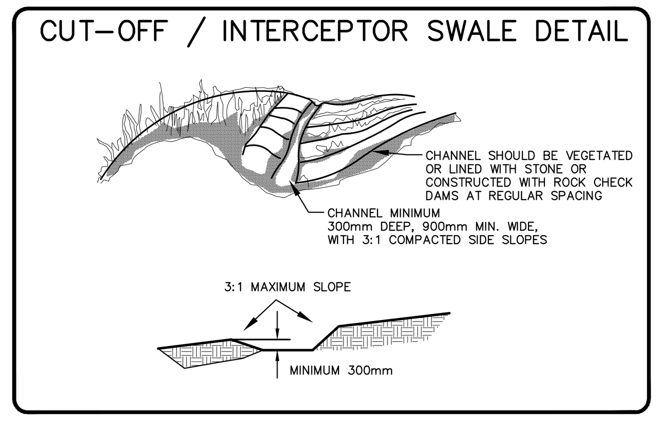
1. ALL CONSTRUCTION EQUIPMENT SHALL BE REFUELED, MAINTAINED AND STORED NO LESS THAN 30 METERS FROM WATERCOURSES, STREAMS, CREEKS, WOODLOTS AND ANY ENVIRONMENTALLY SENSITIVE AREAS, OR AS OTHERWISE SPECIFIED.
2. THE CONTRACTOR MUST IMPLEMENT ALL NECESSARY MEASURES IN ORDER TO PREVENT LEAKS, DISCHARGES OR SPILLS OF POLLUTANTS, DELETERIOUS MATERIALS, OR OTHER SUCH MATERIALS OR SUBSTANCES WHICH COULD CAUSE AN ADVERSE IMPACT TO THE NATURAL ENVIRONMENT.
3. IN THE EVENT OF A LEAK, DISCHARGE OR SPILL OF A POLLUTANT, DELETERIOUS MATERIAL OR OTHER SUCH MATERIAL OR SUBSTANCE WHICH COULD CAUSE AN ADVERSE IMPACT TO THE NATURAL ENVIRONMENT, THE CONTRACTOR SHALL:

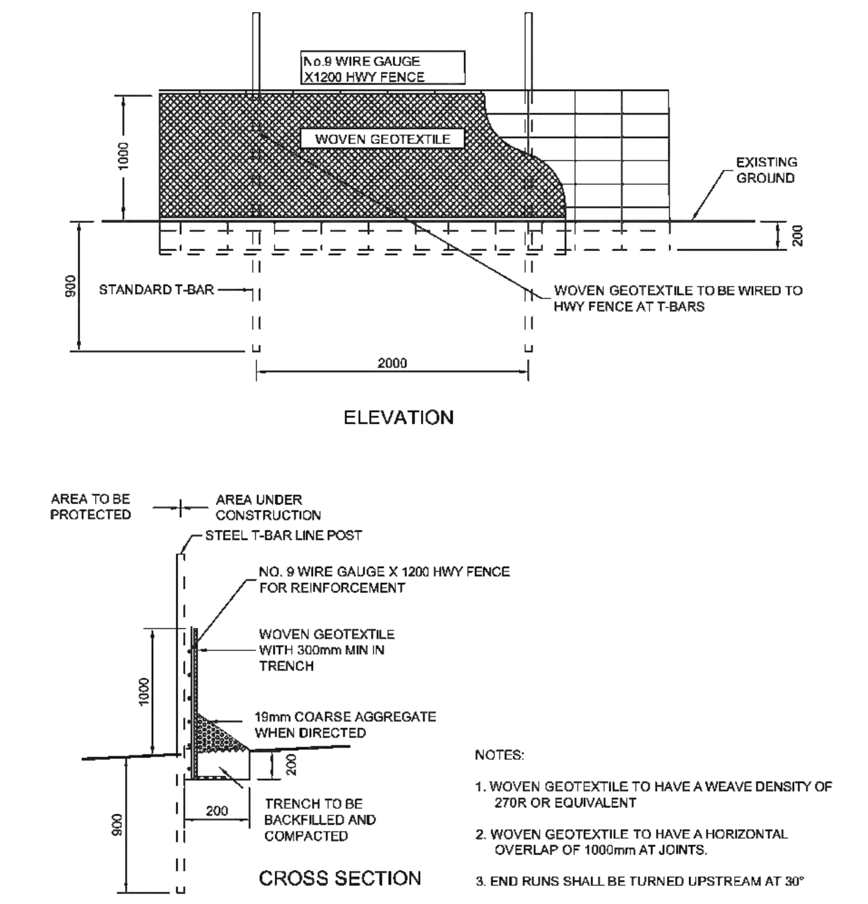
3.A. IMMEDIATELY NOTIFY THE APPROPRIATE FEDERAL, PROVINCIAL AND LOCAL GOVERNMENT MINISTRIES, DEPARTMENTS, AGENCIES AND AUTHORITIES OF THE INCIDENT IN ACCORDANCE WITH ALL CURRENT LAWS, LEGISLATION, ACTS, BY–LAWS, PERMITS, APPROVALS, ETC.

3.B. TAKE IMMEDIATE MEASURES TO CONTAIN THE MATERIAL OR SUBSTANCE, AND TO TAKE SUCH MEASURES AS THEY DEEM APPROPRIATE TO MITIGATE AGAINST ANY ADVERSE IMPACTS TO THE NATURAL ENVIRONMENT.

3.C. THE CONTRACTOR SHALL RESTORE THE AFFECTED AREA TO ORIGINAL CONDITION OR BETTER, ALL TO THE SATISFACTION OF THE AUTHORITIES HAVING JURISDICTION.



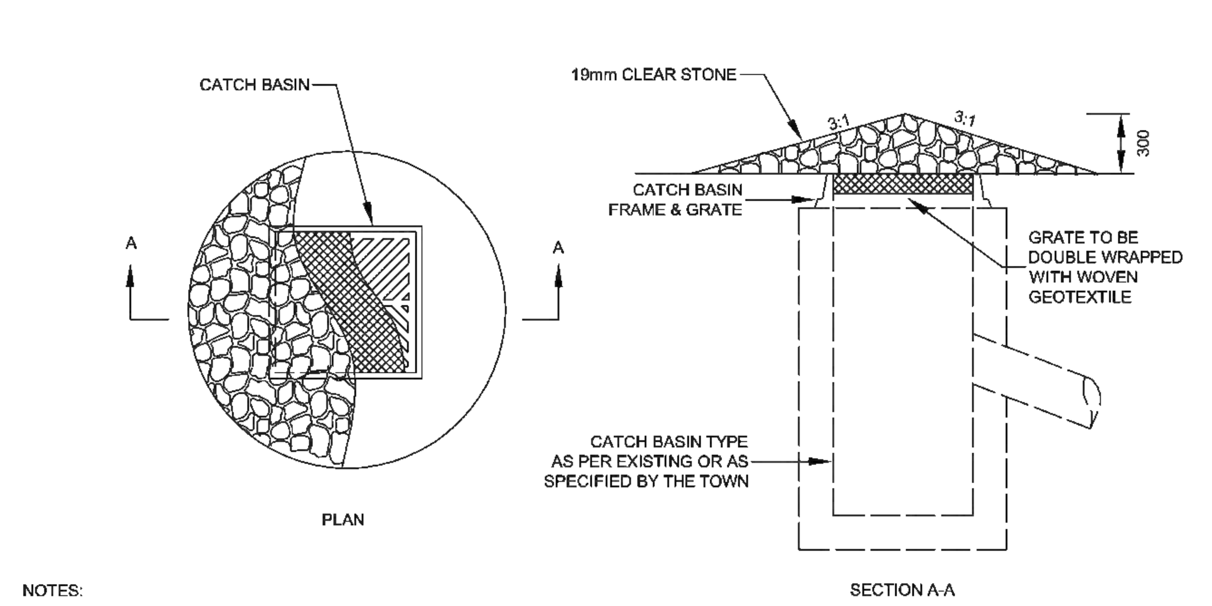




NOTES:
1. WOVEN GEOTEXTILE TO HAVE A WEAVE DENSITY OF 270R OR EQUIVALENT
2. WOVEN GEOTEXTILE TO HAVE A HORIZONTAL OVERLAP OF 1000mm AT JOINTS.
3. END RUNS SHALL BE TURNED UPSTREAM AT 30°

NO.	REVISION	APR'D	DATE
2	NAME CHANGED, STANDARD No. 325.01 NOW 304		JUNE 08
1	SUPPORT FENCING CHANGED TO HWY FENCE		Oct 02

TOWN OF CALEDON
SEDIMENT CONTROL FENCE
APR'D: C.C. DATE: APRIL 2000
DRAWN: BJM SCALE: N.T.S.
STANDARD No. 304

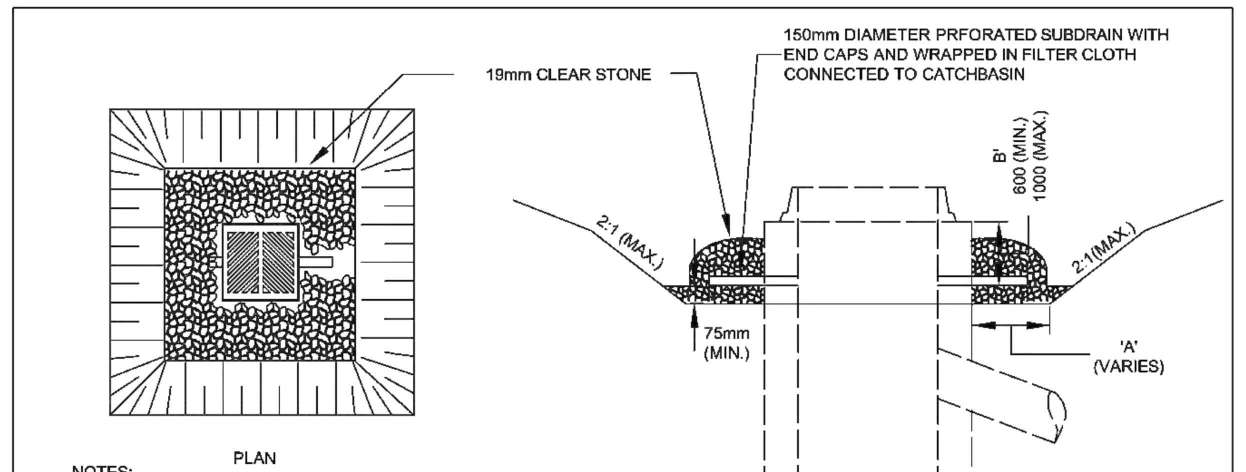


NOTES:
1. CATCH BASIN LIFT HOLES TO BE PARGED WITH CONCRETE.
2. WOVEN GEOTEXTILE TO HAVE A MINIMUM EQUIVALENT OPENING SIZE OF 0.15mm AND A MAXIMUM OPENING SIZE OF 0.25mm.

TOWN OF CALEDON
CATCH BASIN SEDIMENT BARRIER

NO.	REVISION	APR'D	DATE
1	STANDARD No. 320.02 NOW 303		JUNE 08

APR'D: C.C. DATE: APRIL 00
DRAWN: BJM SCALE: NTS
STANDARD No. 303



NOTES:
1. VOLUME OF SEDIMENT TRAP TO BE 125m PER HECTARE OF DRAINAGE. DEPTH TO BE CALCULATED FROM TOP OF CATCH BASIN TO BOTTOM OF TRAP (DIMENSION 'B')
2. MINIMUM DEPTH FROM TOP OF CATCHBASIN TO BOTTOM OF TRAP SHALL BE 600mm, MAXIMUM DEPTH SHALL BE 1000mm.
3. SEDIMENT TRAP TO BE CLEANED AS DEEMED NECESSARY BUT AS A MINIMUM WHEN THE DEPTH FROM UNDERSIDE OF FRAME TO TOP OF SILT IS REDUCED TO 300mm.
4. UPON REMOVAL OF TRAP, CATCHBASIN CONNECTION HOLES TO BE PARGED WITH CONCRETE.

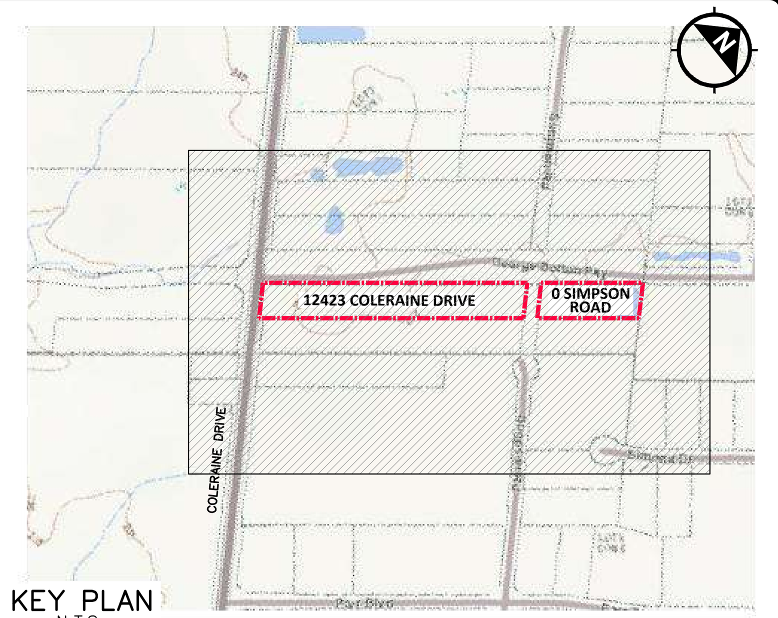
TOWN OF CALEDON
CATCH BASIN SEDIMENT TRAP

NO.	REVISION	APR'D	DATE
1	STANDARD No. 320.01 NOW 302		JUNE 08

APR'D: C.C. DATE: APRIL 00
DRAWN: BJM SCALE: NTS
STANDARD No. 302

LEGEND

- DENOTES SEDIMENT CONTROL FENCE
- DENOTES TREE PROTECTION HOARDING
- 298.65 DENOTES TEMPORARY CUT–OFF SWALE AND ELEVATION DURING CONSTRUCTION
- DENOTES DRAINAGE AREA BOUNDARY
- DENOTES ROCK CHECK DAM
- DENOTES TEMP. SEDIMENT TRAP/ PONDING AREA
- 0.30ha DENOTES DRAINAGE AREA IN HECTARES
- 291.5 DENOTES EXISTING CONTOUR ELEVATION
- DENOTES OVERLAND FLOW DIRECTION
- DENOTES CATCHBASIN PROTECTION
- DENOTES VALVE AND CHAMBER
- DENOTES VALVE AND BOX
- DENOTES HYDRANT
- DENOTES SINGLE CATCHBASIN
- DENOTES DOUBLE CATCHBASIN
- DENOTES SANITARY MANHOLE
- DENOTES STORM MANHOLE



KEY PLAN
N.T.S.

LEGAL DESCRIPTION:
PART OF THE WEST HALF OF LOT 3, CONCESSION 6
TOWN OF CALEDON (GEOGRAPHIC TOWNSHIP OF ALBION)
REGIONAL MUNICIPALITY OF PEEL

DRAWING LIST

SS–01	SITE SERVICING PLAN – PART 1
SS–02	SITE SERVICING PLAN – PART 2
SG–01	SITE GRADING PLAN – PART 1
SG–02	SITE GRADING PLAN – PART 2
SC–01	EROSION & SEDIMENT CONTROL PLAN
TA–01	STORM TRIBUTARY AREA PLAN

SUBMISSION HISTORY

No.	ISSUED FOR	DATE
1.	ISSUED FOR ZBA/SPA	JAN.29,2021

REVISIONS

No.	DESCRIPTION	BY	DATE

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POINT ID	NORTHING	EASTING
ORP A	4854226.02	603621.95
ORP B	4854660.07	603962.06

BENCHMARK NOTE:
ELEVATIONS ARE GEODETIC AND ARE REFERRED TO GEODETIC SURVEY OF CANADA FIRST–ORDER VERTICAL BENCHMARK NUMBER PEEL 40 HAVING AN ORTHOMETRIC ELEVATION OF 222.165 METRES. ELEVATIONS ARE REFERENCED TO THE CANADIAN GEODETIC VERTICAL DATUM OF 1928, 1978 ADJUSTMENT (CGVD–1928:1978).

BENCHMARK ON THE SOUTH FACE AT THE WEST CORNER OF SOUTH END OF A CONCRETE BOX CULVERT ACROSS SEVENTEENTH SIDEROAD (REGION ROAD #14) APPROXOMATELY 0.56km EAST OF CLARK DRIVE (TENTH LINE EAST).

CONSULTANT'S CERTIFICATE

WE HAVE REVIEWED THE SITE AND GRADING PLAN FOR THE PROPOSED BUILDINGS TO BE CONSTRUCTED AND HEREBY CERTIFY THAT:
1. THE GRADING/SERVICING DESIGN AND DRAINAGE WORKS COMPLY WITH SOUND ENGINEERING PRINCIPLES.
2. THE PROPOSED GRADING WILL NOT ADVERSELY AFFECT ADJACENT LANDS.
3. THE PROPOSED BUILDINGS ARE COMPATIBLE WITH THE PROPOSED SITE GRADING

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ENGINEERING CORPORATION
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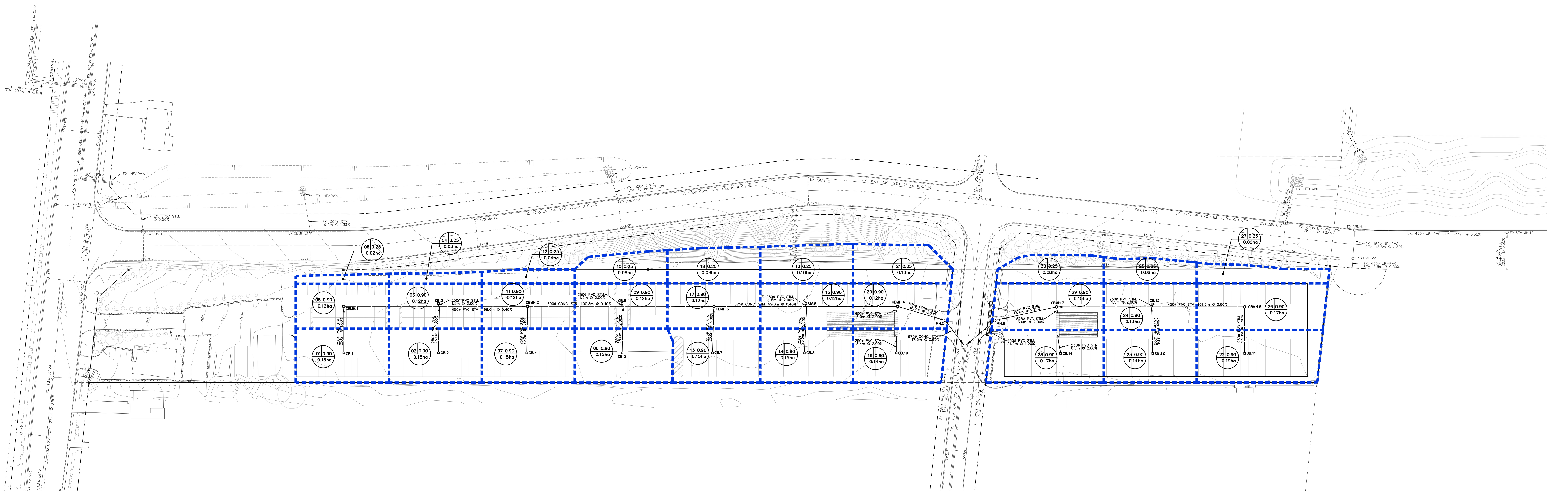
RAFAT STORAGE YARD
12423 COLERAINE DRIVE & 0 SIMPSON ROAD

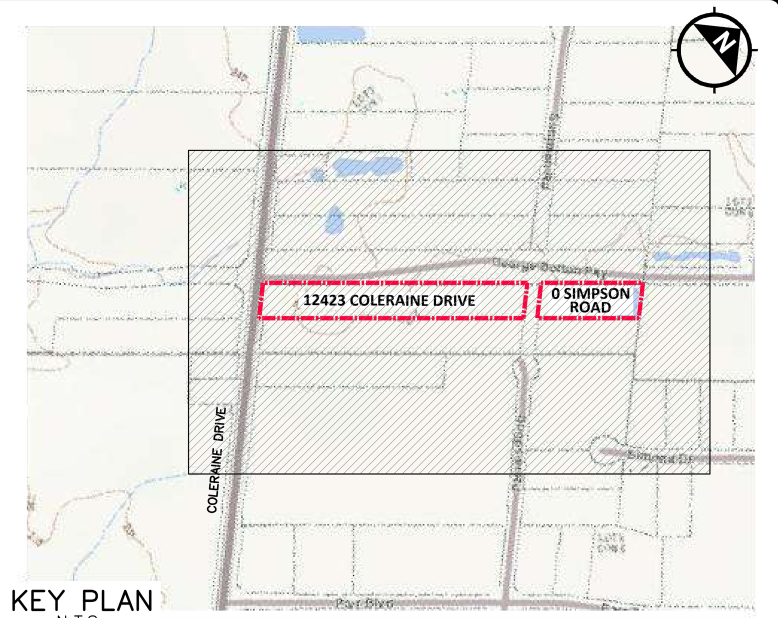
Region of Peel working with you
TOWN OF CALEDON

SCALE 0 10 20 30 40 50 60 70 80 90 100m

EROSION & SEDIMENT CONTROL PLAN

TOWN FILE: PRE-20-0009		PROJECT No. 20-0009CA	
REGION FILE:			
DATE: JAN. 29, 2021	DESIGNED BY: T.D.	DWG. No. SC-01	
SCALE: 1:1000	DRAWN BY: T.D.		
	CHECKED BY: M.M.		





KEY PLAN
N.T.S.

LEGAL DESCRIPTION:
PART OF THE WEST HALF OF LOT 3, CONCESSION 6
TOWN OF CALEDON (GEOGRAPHIC TOWNSHIP OF ALBION)
REGIONAL MUNICIPALITY OF PEEL

DRAWING LIST

SS–01	SITE SERVICING PLAN – PART 1
SS–02	SITE SERVICING PLAN – PART 2
SG–01	SITE GRADING PLAN – PART 1
SG–02	SITE GRADING PLAN – PART 2
SC–01	EROSION & SEDIMENT CONTROL PLAN
TA–01	STORM TRIBUTARY AREA PLAN

SUBMISSION HISTORY

No.	ISSUED FOR	DATE
1.	ISSUED FOR ZBA/SPA	JAN.29,2021

REVISIONS

No.	DESCRIPTION	BY	DATE

BEARING NOTE:
BEARINGS ARE UTM GRID, DERIVED FROM GPS OBSERVATIONS USING CAN–NET REAL TIME NETWORK, UTM ZONE 17, NAD–1983:CSRS:CBNV6–2010.0. COORDINATES ARE UTM ZONE 17, NAD–1983:CSRS:CBNV6–2010.0, TO URBAN ACCURACY PER SEC. 14 (2) OF O.REG. 216/10.

POINT ID	NORTHING	EASTING
ORP A	4854226.02	603621.95
ORP B	4854660.07	603962.06

BENCHMARK NOTE:
ELEVATIONS ARE GEODETIC AND ARE REFERRED TO GEODETIC SURVEY OF CANADA FIRST–ORDER VERTICAL BENCHMARK NUMBER PEEL 40 HAVING AN ORTHOMETRIC ELEVATION OF 222.165 METRES. ELEVATIONS ARE REFERENCED TO THE CANADIAN GEODETIC VERTICAL DATUM OF 1928, 1978 ADJUSTMENT (CGVD–1928:1978).

BENCHMARK ON THE SOUTH FACE AT THE WEST CORNER OF SOUTH END OF A CONCRETE BOX CULVERT ACROSS SEVENTEENTH SIDEROAD (REGION ROAD #14) APPROXOMATELY 0.56km EAST OF CLARK DRIVE (TENTH LINE EAST).

CONSULTANT'S CERTIFICATE
WE HAVE REVIEWED THE SITE AND GRADING PLAN FOR THE PROPOSED BUILDINGS TO BE CONSTRUCTED AND HEREBY CERTIFY THAT:

1. THE GRADING/SERVICING DESIGN AND DRAINAGE WORKS COMPLY WITH SOUND ENGINEERING PRINCIPLES.
2. THE PROPOSED GRADING WILL NOT ADVERSELY AFFECT ADJACENT LANDS.
3. THE PROPOSED BUILDINGS ARE COMPATIBLE WITH THE PROPOSED SITE GRADING

CONSULTANT

LICENSED PROFESSIONAL ENGINEER
T. DUMYN
100072175
JAN.29,2021
PROVINCE OF ONTARIO

MUNICIPAL APPROVAL

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TOWN OF CALEDON

SCALE
0 10 20 30 40 50 60 70 80 90 100m

STORM TRIBUTARY AREA PLAN

TOWN FILE:	PRE-20-0009	PROJECT No.	20-0009CA
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LEGEND

DENOTES AREA I.D. — 01 | 0.60 — DENOTES RUNOFF COEFFICIENT
0.61ha — DENOTES DRAINAGE AREA IN HECTARES

DENOTES MINOR SYSTEM DRAINAGE AREA BOUNDARY

188.5 DENOTES EXISTING CONTOUR

DENOTES OVERLAND FLOW ROUTE

CB DENOTES SINGLE CATCHBASIN

DCB DENOTES DOUBLE CATCHBASIN

DENOTES STORM MANHOLE

STORM SEWER DESIGN SHEET
RAFAT STORAGE YARD - 0 SIMPSON ROAD
TOWN OF CALEDON

urbanworks ENGINEERING CORPORATION

PROJECT No.: 20-0009CA
DATE: 2021-01-18
DESIGNED BY: TD
CHECKED BY: TD

Rainfall Intensity: $i = a \cdot (t+b)^{-c}$
Design Flow: $Q = (C \cdot I \cdot A) / 360$
Pipe Roughness: $n = 0.013$
Min. Inlet Time: $t = 10.0min.$

Coeff.	5-Year	100-Year
a	1593	4688
b	11	17
c	0.8789	0.9624

AREA I.D.	LOCATION	STRUCTURE FROM	STRUCTURE TO	DRAINAGE AREA (ha) A	5-YEAR STORM RUNOFF COEFF. C_5	$A \times C_5$	ACCUM. $A \times C_5$	RAINFALL INT.(mm/hr) i_5	100-YEAR STORM RUNOFF COEFF. C_{100}	$A \times C_{100}$	ACCUM. $A \times C_{100}$	RAINFALL INT.(mm/hr) i_{100}	DESIGN FLOWS 5-YEAR Q_5 (m^3/s)	100-YEAR Q_{100} (m^3/s)	ADDITIONAL Q_{CONST} (m^3/s)	TOTAL Q_{TOTAL} (m^3/s)	PIPE DATA LENGTH (m)	SIZE (mm)	GRADE (%)	Q_{FULL} (m^3/s)	V_{FULL} (m/s)	TIME SECT. TIME (min.)	TOTAL TIME (min.)	CAPACITY CHECK Q_{DESIGN}/Q_{FULL}	COMMENTS
	WEST SITE																								
01		CB.1	CBMH.1	0.15	0.90	0.135	0.135	109.68					0.041			0.041	25.0	250	1.00	0.059	1.21	0.34	10.00	0.59	
							0.135																**10.34**		
02		CB.2	MAIN	0.15	0.90	0.135	0.135	109.68					0.041			0.041	25.0	250	1.00	0.059	1.21	0.34	10.00	0.59	
							0.135																**10.34**		
03		CB.3		0.12	0.90	0.108																			
04			MAIN	0.03	0.25	0.008	0.116	109.68					0.035			0.035	1.5	250	2.00	0.084	1.71	0.01	10.00	0.42	
							0.116																**10.01**		
	From CB		CBMH.1				0.135																10.34		
	From CB		MAIN				0.135																10.34		
	From CB		MAIN				0.116																10.01		
05		CBMH.1		0.12	0.90	0.108																			
06			CBMH.2	0.03	0.25	0.008	0.501	108.12					0.150			0.150	99.0	450	0.40	0.180	1.13	1.46	10.34	0.83	
							0.501																**11.80**		
07		CB.4	CBMH.2	0.15	0.90	0.135	0.135	109.68					0.041			0.041	25.0	250	1.40	0.070	1.43	0.29	10.00	0.58	
							0.135																**10.29**		
08		CB.5	MAIN	0.15	0.90	0.135	0.135	109.68					0.041			0.041	25.0	250	2.00	0.084	1.71	0.24	10.00	0.49	
							0.135																**10.24**		
09		CB.6		0.12	0.90	0.108																			
10			MAIN	0.08	0.25	0.020	0.128	109.68					0.039			0.039	51.0	375	2.00	0.248	2.25	0.38	10.00	0.16	
							0.128																**10.38**		
	From West		CBMH.2				0.501																11.80		
	From CB		CBMH.2				0.135																10.29		
	From CB		MAIN				0.135																10.24		
	From CB		MAIN				0.128																10.38		
11		CBMH.2		0.12	0.90	0.108																			
12			CBMH.3	0.04	0.25	0.010	1.017	102.03					0.288			0.288	100.3	600	0.40	0.386	1.37	1.22	11.80	0.74	
							1.017																**13.02**		
13		CB.7	CBMH.3	0.15	0.90	0.135	0.135	109.68					0.041			0.041	25.0	250	3.00	0.103	2.10	0.20	10.00	0.40	
							0.135																**10.20**		
14		CB.8	MAIN	0.15	0.90	0.135	0.135	109.68					0.041			0.041	25.0	250	2.00	0.084	1.71	0.24	10.00	0.49	
							0.135																**10.24**		
15		CB.9		0.12	0.90	0.108																			
16			MAIN	0.10	0.25	0.025	0.133	109.68					0.041			0.041	51.0	375	2.00	0.248	2.25	0.38	10.00	0.16	
							0.133																**10.38**		

STORM SEWER DESIGN SHEET
RAFAT STORAGE YARD - 0 SIMPSON ROAD
TOWN OF CALEDON

urbanworks ENGINEERING CORPORATION

PROJECT No.: 20-0009CA
DATE: 2021-01-18
DESIGNED BY: TD
CHECKED BY: TD

Rainfall Intensity: $i = a \cdot (t+b)^{-c}$
Design Flow: $Q = (C \cdot I \cdot A) / 360$
Pipe Roughness: $n = 0.013$
Min. Inlet Time: $t = 10.0min.$

Coeff.	5-Year	100-Year
a	1593	4688
b	11	17
c	0.8789	0.9624

AREA I.D.	LOCATION	STRUCTURE FROM	STRUCTURE TO	DRAINAGE AREA (ha) A	5-YEAR STORM RUNOFF COEFF. C_5	$A \times C_5$	ACCUM. $A \times C_5$	RAINFALL INT.(mm/hr) i_5	100-YEAR STORM RUNOFF COEFF. C_{100}	$A \times C_{100}$	ACCUM. $A \times C_{100}$	RAINFALL INT.(mm/hr) i_{100}	DESIGN FLOWS 5-YEAR Q_5 (m^3/s)	100-YEAR Q_{100} (m^3/s)	ADDITIONAL Q_{CONST} (m^3/s)	TOTAL Q_{TOTAL} (m^3/s)	PIPE DATA LENGTH (m)	SIZE (mm)	GRADE (%)	Q_{FULL} (m^3/s)	V_{FULL} (m/s)	TIME SECT. TIME (min.)	TOTAL TIME (min.)	CAPACITY CHECK Q_{DESIGN}/Q_{FULL}	COMMENTS
	From West		CBMH.3				1.017																13.02		
	From CB		CBMH.3				0.135																10.20		
	From CB		MAIN				0.135																10.24		
	From CB		MAIN				0.133																10.38		
17		CBMH.3		0.12	0.90	0.108																			
18			CBMH.4	0.09	0.25	0.023	1.551	97.47					0.420			0.420	99.0	675	0.40	0.532	1.49	1.11	13.02	0.79	
							1.551																**14.13**		
19		CB.10	CHAMBER	0.14	0.90	0.126	0.126	109.68					0.038			0.038	8.4	250	2.00	0.084	1.71	0.08	10.00	0.46	
							0.126																**10.08**		
	From West		CBMH.4				1.551																14.13		
	From CB		CBMH.4				0.126																10.08		
20		CBMH.4		0.12	0.90	0.108																			
21			MH.5	0.10	0.25	0.025	1.810	93.68					0.471			0.471	26.7	675	0.50	0.594	1.66	0.27	14.13	0.79	
		MH.5	EX.MH.1				1.810	92.81					0.466			0.466	17.5	675	0.50	0.594	1.66	0.18	14.39	0.78	
							1.810																**14.57**		
	EAST SITE																								
22		CB.11	CBMH.6	0.19	0.90	0.171	0.171	109.68					0.052			0.052	25.0	250	1.50	0.073	1.48	0.28	10.00	0.72	
							0.171																**10.28**		
23		CB.12	MAIN	0.14	0.90	0.126	0.126	109.68					0.038			0.038	25.0	250	1.50	0.073	1.48	0.28	10.00	0.53	
							0.126																**10.28**		
24		CB.13		0.13	0.90	0.117																			
25			MAIN	0.06	0.25	0.015	0.132	109.68					0.040			0.040	1.5	250	2.00	0.084	1.71	0.01	10.00	0.48	
							0.132																**10.01**		
	From CB		CBMH.6				0.171																10.28		
	From CB		MAIN				0.126																10.28		
	From CB		MAIN				0.132																10.01		
26		CBMH.6		0.17	0.90	0.153																			
27			CBMH.7	0.06	0.25	0.015	0.597	108.40					0.180			0.180	101.3	450	0.60	0.221	1.39	1.22	10.28	0.81	
							0.597																**11.50**		
28		CB.14	CHAMBER	0.17	0.90	0.153	0.153	109.68					0.047			0.047	25.0	250	3.00	0.103	2.10	0.20	10.00	0.45	
							0.153																**10.20**		
	From East		CBMH.7				0.597																11.50		
	From CB		CBMH.7				0.153																10.20		
29		CBMH.7		0.15	0.90	0.135																			
30			MH.8	0.08	0.25	0.020	0.905	103.24					0.260			0.260	34.1	450	1.20	0.312	1.96	0.29	11.50	0.83	
		MH.8	EX.MH.1				0.905	102.08					0.257			0.257	21.2	450	1.20	0.312	1.96	0.18	11.79	0.82	
							0.905																**11.97**		