

TOWN OF CALEDON  
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Palgrave Estate Subdivision  
Town of Caledon

## Environmental and Engineering Summary Report

January 2020

MAEL Project 2018-951



# Environmental and Engineering Summary Report

Palgrave Estate Subdivision  
Town of Caledon

For

Castlemore Corp.

January 2020

Prepared by:



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Legal Survey Plan

Legal Boundary Survey & Air Photo Enlargement

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Soil and Soil Drainage Classification Map

Surface Hydrology Map

Vegetation and Wildlife Ecology Map

Environmental Summary Map

Boreholes Location Plan

General Plan

Existing Drainage Plan

Proposed Drainage Plan

Grading Plan

Erosion Control Plan



## 1. INTRODUCTION

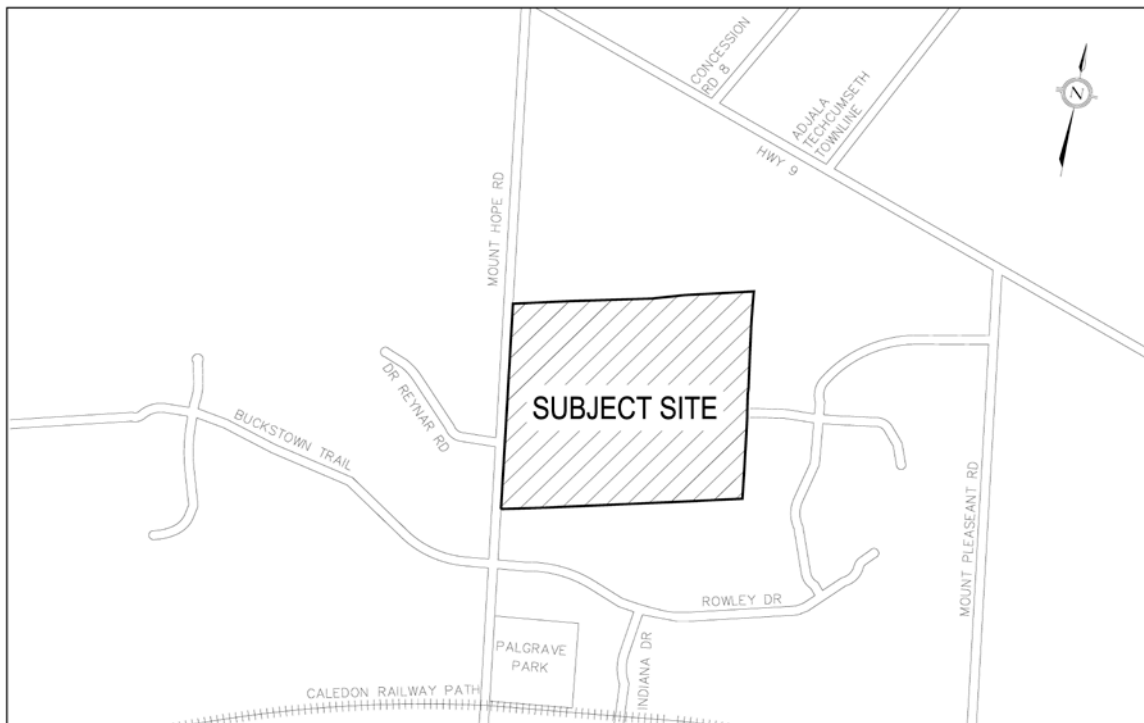
Masongsong Associates Engineering limited has been retained by Castlemore Corp. to prepare this Environmental and Engineering Summary Report in support of development application for Palgrave Estate subdivision, in the Town of Caledon, Regional Municipality of Peel.

This report is prepared to meet the requirements of Section 7.1.18.11 of the Town of Caledon Official Plan. As outlined in Town official plan, the purpose of this report is to integrate and summarize the environmental site investigations, mapping and analysis with the findings and recommendations of the preliminary engineering, stormwater management reports pertaining the subject development.

The report will provide a general assessment of the proposed development potential environmental impact and recommended mitigation measures. It will also highlight the recommendations outlined in site-specific reports to be used as design and construction guidelines for the subject estate residential development.

### 1.1 Background

The subject land is situated within Palgrave Estate Residential Community within Town Caledon, Regional Municipality of Peel. Refer to below for proposed site location plan:



It is located south of Highway No. 9 between Mount Hope Road and Mount Pleasant Road. The proposed development land is abutted by Mount Hope Road to the west and existing residentials and vacant lands to other directions. The total site area is approximately 41.32 ha (102.10 ac) in size and is legally described as part of Lot 28

Concession 8, Town of Caledon. The site is currently characterized mainly as agriculture land with variety of woodlands and vegetation communities.

Refer to Appendix-A for site legal survey map.

## **1.2 Topography and Landform**

The subject site land is located within a physiographic region referred to as the Oak Rudge Moraine (ORM). Details pertaining the geology, hydrology and hydrogeology features of ORM is provided in Landform Conservation Assessment report prepared in support of the subject development.

From the topographic survey observation, the subject land terrain generally remains undisturbed at natural state. The existing landform feature slope ranges from moderate to steep. Existing woodlands, watercourses and vegetations concludes key natural features found throughout the subject site.

Refer to Appendix-A for site topographic map.

## **1.3 Proposed Development**

Proposed development draft plan of subdivision consists of 29 estate lots and municipal roads namely Street A, B, and C. The draft plan also delineates areas to be designated as green spaces and woodlands.

The proposed density is calculated in Planning Justification Report, dated December 2019 as follows:

The density allowance for the subject site is 26 units per 40.5ha (100acres) as described in policy 7.1.6.4 of the Town of Caledon Official Plan. The subject site is approximately 41.32 ha, and the permitted density for the subject site would be 26 units (rounded from  $26\text{units} \div 40.5\text{ha} \times 41.32\text{ha} = 26.5$  units). Policy 7.1.9.12 of the Town's Official Plans permits a density bonus of 1 unit over and above the density allotment in Section 7.1.6 will be given for each 4 hectares (9.9 acres) in the development suitably protected, managed or reforested by the applicant up to a maximum of 40 percent of the area of the subdivision plan. The proposed 13.16ha of the reforestation area would allow the subject development to have 3 units (rounded from  $13.16\text{ha} \div 4\text{ha} = 3.29$  units) above the permitted density of 26 units. The total permitted density of the subject development is 29units (26units + 3units), and the proposed number of units of the subject development is 29units which meets the Town's Official Plan policies.

A significant portion of the subject land is identified as woodland (a Key Natural Heritage Feature) with 30 m minimum undisturbed buffer zone which results in reduction to the net developable area.

Major development works for the initial stage of proposed development will be construction of municipal roads, installation of watermain, utilities and ultimately construction of the proposed houses. Refer to Appendix-A for the proposed draft plan of subdivision.

## **2 ENVIRONMENTAL MAPPING AND DRAFT PLAN**

Environmental and draft Plans are prepared by Sirati & Partners Limited in support of the proposed development in order to meet the requirements of Section 7.1.18.2 of the Town of Caledon Official Plan.

As stated in the report, the subdivision land is located in a Category 2 Land Conservation Area. Therefore, the proposed development must conform to the requirements of Oak Ridges Moraine Conservation Plan (ORMCP). The development within a Category 2 Landform Conservation Area requires planning, design and construction practices that will minimize disturbance to landform character. These practices include:

- Maintaining significant landform features such as steep slopes, kames, kettles, ravines and ridges in their natural undisturbed form.
- Limiting the portion of the net developable area of the site that is disturbed to not more than 50% of the total area of the site
- Limiting the portion of the net developable area of the site that has impervious surfaces to not more than 20% of the total area of the site

The maps are also provided full size 1:1000 scale a separate stand-alone document entitled “Environmental Mapping and Draft Plan” which includes the following:

- Legal Boundary Survey & Air Photo Enlargement
- Topographic Map
- Slope Analysis Map
- Soil and Soil Drainage Classification Map
- Surface Hydrology Map
- Vegetation and Wildlife Ecology Map
- Environmental Summary Map
- Draft Subdivision Plan

The above listed maps outline the followings:

- Elevation contours in enough detail to show the basic topographic character of the site
- Analysis of the site by slope type
- Significant landform features including kames, kettles, ravines and ridges
- All water bodies including intermittent streams and ponds

Further details are provided in the Section 6 of this report.

Refer to Appendix-A for the above listed Maps.

### **3 PRELIMINARY GEOTECHNICAL INVESTIGATION**

Sirati & Partners Limited is tasked to undertake a preliminary geotechnical investigation in support of the proposed development application.

The purpose of this report is to obtain the subsurface conditions in order to provide preliminary recommendation for site architect, engineer and other consultants for the design of proposed roads, installation of utilities and construction of foundation structures.

The report generally meets followings Town of Caledon Official Plan requirements:

- Characterizes the soil and groundwater conditions encountered in the
- boreholes;
- Makes recommendations concerning the geotechnical design of
- septic tank and soil absorption field systems;
- Makes recommendations related to the design of structures and
- streets; and,
- Identifies any other geotechnical conclusions pertinent to facilities designs

The report identifies 300mm to 450mm topsoil thickness. It is noted in the report, that below the topsoil, fill/disturbed native material is encountered in all boreholes. The fill layer was found extending to depths varying between 0.8 m to 3 m. The report also describes the characteristic of thin layers of cohesive and cohesionless layer as part of the investigation.

Groundwater monitoring was conducted in the monitoring wells installed at the site in 2018 at shallow depth were observed to be dried during the groundwater monitoring in all the monitoring events. However, the groundwater levels measured in monitoring wells installed deeper in October 2019 ranged from 6.33 metre below ground surface (mbgs) to 14.85 mbgs at 283.73 mASL to 291.65 mASL elevation respectively.

The report recommends the following road minimum pavement structure design:

40 mm HL3 Asphaltic Concrete  
50 mm HL8 Asphaltic Concrete  
150 mm Granular 'A'  
300 mm Granular 'B'

For further details, refer to Geotechnical Investigation report dated December 06, 2018, prepared by Sirati & Partners Limited.

Refer to Appendix-A for Boreholes Location map.

## **4 HYDROGEOLOGICAL INVESTIGATION**

Hydrogeological investigation report is prepared by Sirati & Partners Limited in support of the proposed development application to meet the requirements outlined in Section 7.1.18.5 of Town official plan.

As stated in the report, the purposes of the investigation is to characterize the soil and groundwater conditions at the site, assess the pre- and post-construction water balances, identify the potential impacts of land development on local groundwater and surface water resources and/or natural environments, and provide mitigative options.

### **4.1 Scope of Work**

Following summarize the scope work in this report:

- Review of the available background information
- Review of the available investigation report
- Site inspection
- Completion of Boreholes and monitoring wells
- Groundwater monitoring
- In-situ hydraulic conductivity tests
- Water balance assessment

### **4.2 Environmental Features**

The report has identified the following site environmental features:

- The property is in Oak Ridge Moraine area
- Most of the site is located within Nottawasaga Valley watershed. A small portion of site at north-west corner is located within Humber River watershed.
- The site is in an area identified as Significant Groundwater Recharge Area (SGRAs)
- The site is located within Wellhead Protection Area (WHPA)-D and part of the property is in WHPA-C area.
- A small portion of the located in an area identified as Highly Vulnerable Aquifer (HVA)

### **4.3 Water Balance Assessment**

Based on the Thornthwaite and Mather methodology (1957), the water balance is an accounting of water in the hydrologic cycle. Precipitation (P) falls as rain and snow. It can run off towards lakes and streams (R), infiltrate to the groundwater table (I), or evaporate from ground or evapotranspiration by vegetation (ET). When long-term average values of P, R, I, and ET are used, there is minimal or no net change to groundwater storage ( $\Delta S$ ).

The annual water budget can be expressed as:

$$P = ET + R + I + \Delta S$$

Where:

P = Precipitation (mm/year)

ET = Evapotranspiration (mm/year)

R = Run-off (mm/year)

I = Infiltration (mm/year)

$\Delta S$  = Change in groundwater storage (taken as zero) (mm/year)

A summary of water balance is provided below:

1) Without implementation of mitigation measures, there is a net increase in run-off at the Site of about 12,866 m<sup>3</sup>/annum (or 19% increase), from 68,716 m<sup>3</sup>/annum to 81,582 m<sup>3</sup>/annum. This increase is a result of the development of the Site with more impervious areas such as roof and paved areas, and reduction in pervious areas.

2) Without implementation of mitigation measures, there is a net deficit of about 5,028 m<sup>3</sup>/annum (or 5 % decrease) in the post-development infiltration from 103,074 m<sup>3</sup> to 98,046 m<sup>3</sup> on a yearly basis.

3) There is a volume of 4,055 m<sup>3</sup>/annum collected from the roof area, which can be used for the enhanced infiltration for the purpose of implementing the Low Impact Development (LID) measures. However, it is not enough to compensate for the deficit in infiltration.

#### **4.4 Report Conclusions and Recommendations**

The report states that, based on the hydrogeological investigation conducted on the Site, the following conclusions are presented:

- The Site geographically falls within the Innisfil Creek subwatershed under the jurisdiction of Nottawasaga Valley Conservation Authority (NVCA).
- As per the Oak Ridges Moraine Conservation Plan, 2017, the Subject Property falls within the Palgrave Estate Residential Community (a component of Countryside Area) land use designation area.
- The Site lies within the physiographic region termed as Oak Ridges Moraine and is located in an area characterized by coarse-grained ice-contact glaciolacustrine sediments consisting of sand, gravelly sand and gravel.
- The Site is located within the Palgrave municipal supply well No. 3 wellhead protection area, within a Significant Groundwater Recharge Area (SGRA) and partly in a Highly Vulnerable Aquifer (HVA) area.
- The soil stratigraphy of the Site as revealed in the boreholes generally consisted of topsoil and fill materials, underlain by native soils predominantly comprised of

cohesionless soils, locally with cohesive soils. No bedrock was encountered at the maximum explored depth of 18.3 mbgs.

- The groundwater levels measured in the monitoring wells at the Site ranged from 6.33 mbgs to 14.85 mbgs and elevations ranged from 283.79 mASL to 291.65 mASL. The groundwater flow was inferred to be generally in a northerly direction.
- The hydraulic conductivity estimated for the screened soils E ranged from  $1.23 \times 10^{-4}$  m/s to  $3.28 \times 10^{-7}$  m/s, with a geometric average value of  $1.15 \times 10^{-5}$  m/s, which is in the typical range of hydraulic conductivity for sand and gravelly sand, as observed in the boreholes.
- Given the relatively deep groundwater levels found at the Site, construction dewatering (short-term or long-term) will not be required for the proposed development.
- A preliminary water balance assessment indicated that an infiltration deficit of approximately 5,028 m<sup>3</sup>/annum (about 13 m<sup>3</sup> /day) will occur due to the proposed development.

Based on the findings of this hydrogeological investigation, the following measures would be considered and recommended to protect and preserve the SGRAs and HVAs,

- Incompatible land uses such as storage of chemicals and/or liquids should be avoided and directed away from the SGRAs
- Since the proposed development is a major development (> 500 m<sup>2</sup>) within the SGRAs, an Infiltration Management Plan that demonstrates pre-development recharge rates will be maintained, may be a requirement.
- Low-impact development (LID) measures would be designed and implemented to maintain or improve the post-development infiltration and/or groundwater recharge conditions. The measures may include, but are not limited to the following:
  - Use of infiltration trenches or bio-swales at selected areas to maximize the infiltration.
  - Provision of pervious road or parking areas to enhance infiltration. Provision of an extra thickness of topsoil at the Site (approximately 0.3 m) on open areas to promote water storage in surficial soil and infiltration.
  - Provision of gradual slopes to open areas and back-yards in order to allow extra time for surficial run-off to infiltrate into the topsoil.
- It would be necessary to promote awareness of the importance of SGRAs and HVAs by means of sign boards explaining the linkage between surface activities and their impact on groundwater quality and quantity.
- A salt management plan may be considered to be developed and implemented.

- As the Subject Lands fall within the areas of high aquifer vulnerability, the following uses are prohibited with respect to land in Areas of High Aquifer Vulnerability.
  - Generation and storage of hazardous waste or liquid industrial waste;
  - Waste disposal sites and facilities, organic soil conditioning sites, and snow storage and disposal facilities;
  - Underground and above-ground storage tanks that are not equipped with approved secondary containment device; and,
  - Storage of a contaminant listed in Schedule 3 (Severely Toxic Contaminants) to Regulation 347 of the Revised Regulations of Ontario, 1990.

For further details, reference should be made to Sirati & Partners Hydrogeological Investigation report, dated November 22, 2019.



## 5 SERVICING AND STORMWATER MANAGEMENT

Servicing and Stormwater Management report is prepared by Masongsong Associates Engineering Limited to meet the requirements of Sections 7.1.18.7 & 7.1.18.8 of Town official plan. The report describes the proposed development stormwater management scheme, water distribution, sanitary servicing and utility requirements.

### 5.1 Water Distribution

The subject site is within Peel Region Pressure District 8A water distribution system. A 200mm diameter PVC watermain is proposed along the proposed municipal roads namely Street A, B, and C. and service connections to proposed lots will be made from this main. The proposed watermain requires looping; therefore, a 150mm watermain extension beyond the limit of proposed development is proposed to be installed to connect to existing 150mm watermain in McGuire Trail in order to form a strong looped system.

Hydraulic analysis of proposed water distribution system is conducted using EPANET 2 modeling software to ensure the system delivers desired pressures and flows for the proposed development under various demand scenarios.

The summary of analysis result is provided in the following Table:

No	Scenarios	EPANET Results	Region Criteria
1	Max. pressure during min. hour demand (kpa)	629	< 690 (Ok)
2	Min. pressure during max. hour demand (kpa)	570	> 275 (OK)
3	Min. pressure during max. day demand + fire (kpa)	242	> 140 (OK)

The above summary of EPANET modeling result shows that proposed watermain system meets Region standard criteria for required pressures for noted scenarios.

### 5.2 Sanitary Servicing

As noted, there is no municipal sanitary sewer system available for this development. Typically, due to the nature/type of proposed estate lots, septic system for individual lot is considered feasible alternative for sanitary servicing. Proposed septic system typical size and approximate location of disposal area / leaching bed is shown on proposed development engineering plans. The actual size and location of the system (in consideration with the individual lot landform constraints) will be detailed during individual site grading and siting plan preparation stages.

The design of septic system is to be coordinated with site mechanical consultant during detailed design stages. The nitrate loading analysis presented in Nitrate Impact Assessment report for private on-site sewage servicing (septic system) shows added

nitrate concentration in groundwater. However, the report concludes that the adverse impact minor or negligible.

Refer to Drawing GP1 enclosed in Appendix-A for illustration of proposed septic system and water servicing.

### **5.3 Stormwater Management -Quantity**

Proposed municipal roads are considered major change to existing landform yet in comparison to overall site area it accounts only for 6.5% of development area. In addition, disturbance to existing landform and minor increase in hard surface (driveways and roof) within the proposed lots will not result in significant increase to post-development runoffs. This is due to size of disturbed area in comparison to overall size of the proposed lots which will largely remain unchanged at pre-development condition as vegetated surface with minimum grading changes.

In the context of the proposed estate lot development, there will be no significant increase in post-development peak runoff; therefore, design of new end-of-pipe stormwater management facility/feature is not feasible or recommended.

Nonetheless, as part of the Low Impact Development (LID) measures, Enhanced Grass Swale is proposed as lot-level and conveyance controls for attenuation of stormwater runoff from proposed roads which helps in peak runoff reduction. It also conveys the runoff to existing watercourse which qualifies as drainage receiving system.

In addition, the Low Impact Development measures proposed as lot-level infiltration-based controls for each individual lot (as outlined in MECP Stormwater Management Planning and Design Manual) to include the followings:

- reduced grading to allow greater ponding of stormwater and natural infiltration;
- directing roof leaders to rear yard ponding areas, soakaway pits, or to cisterns or rain barrels;
- sump pumping foundation drains to rear yard ponding areas;
- infiltration trenches;
- grassed swales;
- pervious pipe systems;
- vegetated filter strips; and
- stream and valley corridor buffer strips.

Design and Implementation of the above lot-level quantity controls will be applicable during detailed individual lot grading and siting plans preparation.

Efforts should be made during road and lot design/construction stages so that the existing overall drainage pattern is to be maintained at original conditions to the extent possible).

Furthermore, from the topographical survey contours observation, it is evident that the proposed development receives external drainage from lands to the north of the subject site. Drainage from this external area which is estimated to be 15.10 ha is tributary to existing watercourse that traverses the subject site.

As part the proposed development, Street 'A' crosses the existing watercourse and therefore, a drainage culvert is proposed to safely convey flows to downstream receiving system. Proposed culvert is sized to convey 25-year event flows. The total flow to culvert is calculated to be 1.03 m<sup>3</sup>/s and the proposed culvert is sized to convey the flows at about 70 % full flow capacity. Proposed culvert full flows capacity is 1.51 m<sup>3</sup>/s larger than the required flow of 1.03 m<sup>3</sup>/s.

A 20.00m wide watercourse with 0.30m depth will have sufficient conveyance capacity to convey post-development flows from downstream of proposed culvert to existing conveyance system beyond the limits of the proposed development. The flows from 25-year event tributary to downstream segment of watercourse is calculated to be 1.26 m<sup>3</sup>/s and the watercourse conveyance capacity is 1.31 m<sup>3</sup>/s.

#### **5.4 Stormwater Management-Quality**

Proposed Enhanced Grass Swale as roadside ditches not only convey and attenuate stormwater runoff it also provides effective quality control functionality. To this end, the proposed enhanced grass swale along proposed municipal roads provide quality treatment for stormwater runoff from roads. Road drainage is directed to enhanced grass swale by providing gutter outlets at certain interval which will convey road drainage to enhanced grass swale. Detailed design of Enhanced Grass Swale will be provided at detailed design stages.

Refer to Drawing DR1 & Dr2 enclosed in Appendix-A for conceptual grading plan.

#### **5.5 Grading**

Effort is made to preserves the existing landform and grades to the extent possible. To achieve this, proposed lot grading boundaries and corner grades matches existing grades minimizing any grading disturbances along proposed lot boundaries. Typically, main grading will be within/around the proposed house envelope and driveways. Typical house envelop and septic system for individual lots are shown within areas where slopes are minimum to avoid major landform alteration. However, more detail grating will require coordination with site architect at detailed lot grading design stages and the house can be designed/tailored to better fit to existing landform to minimize grading works.

Refer to Drawing GR1 enclosed in Appendix-A for conceptual grading plan.

## 5.6 Report Conclusions and Recommendations

This report has demonstrated that the subject development can be serviced by existing and proposed servicing infrastructures. More specifically, servicing and SWM design analysis for proposed development is summarized as follows:

- A 200mm watermain is proposed to service the subject development. A 150mm proposed watermain is further extended east to connect to existing 150mm main on McGuire Trail to form a strong looped system.
- All proposed lots are provided with septic system. Design of septic system will be finalized during individual lot detailed design stages.
- No quantity control is required for subject site as the proposed development does not significantly change the quantitative nature of existing drainage scheme. Nonetheless, as part of Low Impact Development (LID) measures, enhanced grass swale is proposed to reduce peak post-development runoff.
- Enhanced Grass Swale (as roadside ditch) is proposed for treatment of road derange. Similar LID measures are to be considered for individual lots during detailed lot siting and grading stages.
- Water balance essential components do not experience significant changes due to proposed development. However, as indicated in the site Hydrogeological Investigation report, a volume of 4,055 m<sup>3</sup>/annum collected from the roof area, which can be used for the enhanced infiltration for the purpose of implementing the Low Impact Development (LID) measures. The implementation of LID for the purpose water balance is practical only at site plan stage for individual lots.

For further details, refer to Masongsong Associates Engineering Limited, Servicing and SWM report, dated October 2019.

## **6 LANDFORM CONSERVATION ASSESSMENT**

Landform Conservation assessment report dated December 2019 is prepared by Crozier Consulting Engineers. As stated, the subject site is located within Oak Ridge Moraine and as per Town of Caledon Official plan Section 6.6.3.1.3 the subject development is required to conform to the policies of the Oak Ridge Moraine Conservation Plan (ORMCP). The report is prepared to demonstrate how proposed development strategies meet the requirements of the Town and ORMCP.

As stated in the report, landform conservation is the protection of the unique visual qualities of the area and environmentally sensitive features. It is an approach that encourages planning, design and construction practices which:

- minimize disruption to landform and landscape
- minimize grading and changes to topography
- encourage clustering development on less sensitive areas of the site

### **6.1 Report Objectives**

A portion of the Subject Development is located in the Category 2 Landform Conservation Area (Appendix A1). The development application must therefore conform to the requirements of Section 30 of the ORMCP (2017). Section 30(6) of the ORMCP (2017) states that development within a Category 2 Landform Conservation Area requires planning, design and construction practices that will minimize disturbance to landform character. These practices include:

- Maintaining significant landform features such as steep slopes, kames, kettles, ravines and ridges in their natural undisturbed form
- Limiting the portion of the net developable area of the site that is disturbed to not more than 50% of the total area of the site
- Limiting the portion of the net developable area of the site that has impervious surfaces to not more than 20% of the total area of the site.

The following maps (enclosed in Appendix-A) are prepared as part of landform conservation assessment studies:

- Legal Boundary Survey & Air Photo Enlargement
- Topographic Map
- Slope Analysis Map
- Soil and Soil Drainage Classification Map
- Surface Hydrology Map
- Vegetation and Wildlife Ecology Map
- Environmental Summary Map

## **6.2 Report Conclusion & Recommendations**

Based on the information provided in this report, it is concluded that the proposed residential development aims to minimize disruption to the landform character and the natural heritage lands. The majority of the area that falls within the Oak Ridges Moraine Landform Conservation Areas Category 2, containing slopes greater than 15%, will not be developed. All of the key natural heritage features and steep sloped lands will be protected and preserved because the development will occur outside the limits of the natural heritage and landform features. The Subject Development meets the requirements outlined in the ORMCP (2017) and in the Town of Caledon's Official Plan (2018).

For further details refer to Crozier Consulting Engineers Landform Conservation Assessment report dated December 2019.

## **7 NATURAL HERITAGE EVALUATION**

Natural Heritage Evaluation report dated December 2019 is prepared by Beacon Environmental Limited. As stated in the report, the purpose of this NHE is to determine the location of any Key Natural Heritage Features (KNHFs) and Key Hydrologic Features (KHF) on and within the 120m area of influence of the subject property. The NHE is used to determine the limits of the proposed development so as to not adversely affect the ecological integrity of the ORMCP area. This NHE is prepared to ensure conformity with the applicable natural heritage policies of the ORMCP, Town of Caledon and Peel Region Official Plans as well the Nottawasaga Valley Conservation Authority (NVCA) and Endangered Species Act (ESA). This NHE also provides recommendations for appropriate mitigation measures in order to reduce potential impacts on KNHFs and KHF.

Refer to Figure 2 & 3 showing the subject development land existing conditions and proposed development concept.

### **7.1 Policy Review**

The following policy documents were reviewed with respect to natural heritage on the subject property in order to determine the applicable policy framework:

- Oak Ridges Moraine Conservation Plan (2017)
- Regional Municipality of Peel Official Plan (Office Consolidation – 2018)
- Town of Caledon Official Plan (Office Consolidation – 2018)
- Nottawasaga Valley Conservation Authority Regulations (2006)
- Endangered Species Act (2007)

### **7.2 Potential Impacts and Mitigation**

The report has identified potential impact due to proposed development and they are listed as follows:

- Removal of Vegetation
- Loss of Agricultural Habitats
- Increase in Impervious Surfaces
- Sediment and Erosion Control
- Noise and Light Effects on Wildlife
- Human Encroachment and their Companion Animals

### **7.3 Headwater Drainage Feature Assessment**

A watercourse (the central drainage feature) is mapped through the provincial Land Information Ontario (LIO) system, traversing the subject property. Field studies revealed there is no feature present at this location. During the time of field investigations this portion of the subject property was found to be completely dry. Due to surrounding topography and evidence of erosion, it is believed that this central depression may convey overland flows contributed by rain events and has therefore been depicted as an

ephemeral drainage feature on Figure 2. However, there is no indication of an intermittent tributary or headwater drainage feature present.

According to the Evaluation, Classification and Management of Headwater Drainage Features Guidelines (Toronto and Region Conservation Area and Credit Valley Conservation 2014), no management is required.

#### **7.4 Mitigation Measures**

The report details the anticipated impacts of the proposed development and identify mitigation and compensation measures to be utilized to minimize effects of the project.

The proposed development is situated within an area that has been transforming from an agricultural landscape to an estate residential landscape, which inevitably reduces natural heritage functions of any particular site within that larger landscape area. However, these kinds of landscape level changes cannot be wholly mitigated on a site-by-site basis, and a shift in the natural heritage values towards an urban tolerant system will continue to occur. Following are list of recommended Mitigation Measures proposed:

- Mitigation by Design
- Feature Buffers
- Forestry Management Area and Restoration
- Fencing Installation
- Low Impact Development Measures
- Salt Management Plan
- Land Dedication
- Timing of Vegetation Removal
- Sediment and Erosion Control Plan
- Tree Inventory and Protection Plan

#### **7.5 Report Conclusions and Recommendations**

Beacon has reviewed the existing natural heritage policies as they pertain to the subject property. A field program was developed to understand the site conditions, context and function with respect to natural heritage features. The proposed development of the subject property demonstrates compliance with the relevant policies of the ORMCP, and those particularly pertaining to the Palgrave Estates Residential Community. Staff developed a field program based on input from the NVCA and researched the terrestrial and aquatic conditions on the subject property.

A Significant Woodland was identified on the subject property based on the ORMCP Technical Paper Series and corresponds to the Town's EZ1 designation as well as the NVCA staked line. A 30 m MVPZ will be applied along the entirety of the dripline, and a robust reforestation plan will be implemented beyond this. A minor encroachment of



0.15 ha is proposed to support the extension of Street A and will be offset by a restoration area proposed through the reforestation plan.

A number of mitigation measures have been provided through this report and should be adhered to in order to minimize impacts of this proposed development on the natural system.

For further detail, refer to Beacon Environmental Natural Heritage Evaluation report dated December 2019.

## **8 PHASE ONE ENVIRONMENTAL SITE ASSESSMENT**

Sirati & Partners was tasked to prepare Phase 1 Environmental Assessment report in support of development application plan. It is understood that the site will be developed as a residential subdivision with residential houses with one (1) level of basement. The report is prepared in general accordance with O. Reg. 153/04 as amended.

According to the report, two (2) areas of potential environmental concern (APECs) is identified on the subject Property. A summary of the APECs and associated contaminants of potential concern (COPCs) is summarized as follows:

- APEC-1 - Importation of Fill Material of Unknown Quality
- APEC-2- Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications

Phase 2 ESA is required to investigate the above noted potential environmental concern which may have resulted in adverse impact to the environmental condition of the subject site.

According to O. Reg. 153/04, a Record of Site Condition (RSC) is required for the proposed municipal roads ROW land conveyance to the local municipality.

### **8.1 Report Conclusions & Recommendations**

According to O. Reg. 153/04, an RSC would not be required for the proposed residential development. However, if the development involves that land conveyance to the local municipality is due, an RSC for the conveyed property may be required.

Based upon the review and evaluation of the information gathered from the Phase One ESA, areas of potential environmental concern were identified on the Phase One Property, which were associated with the potentially contaminating activities identified on the Phase One Property. Therefore, an intrusive investigation in the form of Phase Two ESA shall be conducted to confirm the absence or presence of the actual contamination.

As a result, a Record of Site Condition cannot be filed based upon a Phase One ESA alone.

As discussed above, in support of filing an RSC, a Phase Two Environmental Site Assessment will be required to investigate the areas of potential environmental concern identified in the Phase One Property, which may have resulted in adverse impact to the environmental condition of the Phase One Property.

For further detail, refer to Sirati & Partners Phase One Environmental Site assessment report dated June 25, 2019.

## 9 NITRATE IMPACT ASSESSMENT

Sirati & Partners (SIRATI) was retained to conduct a Nitrate Impact Assessment study. This study was performed in conformance with the Town of Caledon Official Plan Secondary Plan Policies Section 7.1.8.3.

The purpose of the report is to assess the termination probability of contaminants on wells in nearby properties by septic system leachate or other sources of contaminants likely to be caused by the proposed development.

### 9.1 Nitrate Concentrations and Impact

As part of water quality assessment, nitrate was analyzed in three (3) groundwater samples taken from BH/MW19-1A, BH/MW19-2 and BH/MW19-3A. The results are presented in Table 7-2 below.

Nitrate Concentration in Groundwater from On-Site Wells.

Monitoring Well	Nitrate as N (mg/L)	ODWQS Standard (mg/L)
BH/MW19-1A	21.5	10
BH/MW19-2	29.3	10
BH/MW19-3A	27.0	10

Chemical analysis indicates, nitrate concentrations in the analyzed groundwater samples were found to be raised, which are above the ODWQS standards.

The report has evaluated the potential groundwater nitrate concentration impact on surface water, on-site water well, off-site wells and water supply aquifer and found no adverse effect.

### 9.2 Report Conclusion and Recommendation

Based on the information obtained from previous investigations and the results of nitrate impact assessment conducted at the Site, the following findings or conclusions can be presented:

- Groundwater quality assessment indicated that groundwater samples may not meet the Ontario Drinking Water Quality Standards (ODWQS) due to the elevated concentrations of aluminum, iron, manganese, total hardness and turbidity and nitrate.
- The background nitrate concentrations were found to exceed the ODWQS standard of 10 mg/L for nitrate. The elevated background nitrate concentrations may have resulted from the farming activities occurring at the development area and/or from the operations of private septic systems on the upgradient

properties, which might be minimized after the residential development when no farming activities will take place.

- A water balance analysis indicated that there is a net water surplus of 419 mm/annum (or about 0.4 m/year) occurring at the Site, which can either infiltrate into subsurface or go as run-off.
- On-site nitrate loading calculation have resulted that, a total load of 1,160,000 mg/day of nitrate will be added on the proposed development lots, which will result in an added concentration of 3.5 mg/L for nitrate in groundwater in the development area.
- Based on the nitrification dilution assessment, an extra 2.6 mg/L of nitrate will be added to the local groundwater at the site property boundary.
- The local water supply aquifer is hydrogeologically isolated from the naturally elevated nitrate concentrations across the Site.
- The nitrate concentration levels will decline after the development, within a reasonable time frame, as the application of fertilizers for agricultural purposes will completely be eliminated with the development of the Subject Property for residential purposes.
- Given the site features and the site-specific soil and groundwater conditions, the impact on the local surface water and/or groundwater or use of the water wells due to the proposed development will be minor or negligible.

For further detail, refer to Sirati & Partners Nitrate Impact Assessment report dated November 25, 2019.

## **10 ARCHAEOLOGICAL ASSESSMENT**

Lincoln Environmental Consulting Corp. (LEC) was retained by Palgrave Estates to complete a Stage 1-2 archaeological assessment.

As stated in the report, Stage 1 & 2 assessment was conducted from May 28th to May 31st, 2019 under archaeological consulting license P344 issued to Derek Lincoln, MA, of LEC by the MTCS. No archaeological resources were identified during the Stage 2 archaeological assessment of the study area, and as such no further archaeological assessment of the property is recommended.

## **References**

Design Plan Services. Planning Rationale Report dated December 2019.

C.F.Crozier & Associates. Landform Conservation Assessment Report dated December 2019.

Sirati & Partners Consultants Limited. Preliminary Geotechnical Investigation report dated December 06, 2019.

Sirati & Partners Consultants Limited. Hydrogeological Investigation report dated November 22, 2019.

Sirati & Partners Consultants Limited. Hydrogeological Investigation report dated November 22, 2019.

Masongsong Associates Engineering Limited. Preliminary Engineering and Stormwater Management Report dated October 2019.

Beacon Environmental. Natural Heritage Evaluation report dated December 2019.

Sirati & Partners Consultants Limited. Phase One Environmental Site Assessment report dated June 25, 2019.

Sirati & Partners Consultants Limited. Nitrate Impact Assessment report dated November 25, 2019.

Lincoln Environmental Consulting Corp. Stage 1 & 2 Archaeological Assessment report dated June 2019.

Ministry of Environment. 2003. Stormwater Management Practices Planning and Design Manual. March 2003.

Region of Peel. 2010. Public Works Design, Specifications and Procedures Manual, Linear Infrastructure, Watermain Design Criteria. Revised June 2010.

Toronto and Region Conservation Authority and Credit Valley Conservation. 2014. Evaluation, Classification and Management of Headwater Drainage Features Guidelines. January 2014.

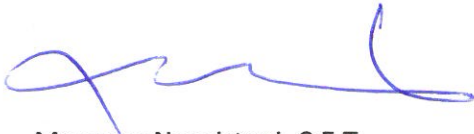
Town of Caledon. 2018. Town of Caledon Official Plan. April 2018 Consolidation.

Town of Caledon. 2009. Development Standards, Policies & Guidelines, Town of Caledon. Prepared by the Town of Caledon Public Works & Engineering Department, January 2009.

The supporting studies/plans illustrates that the proposed development conforms to Provincial Policy /Plans. It also meets the objectives of Region of Peel and Town of Caledon official plans.

We trust you will find this submission complete and in order. Should you have any questions, please contact the undersigned.

Respectfully Submitted,  
**MASONGSONG ASSOCIATES ENGINEERING LIMITED**



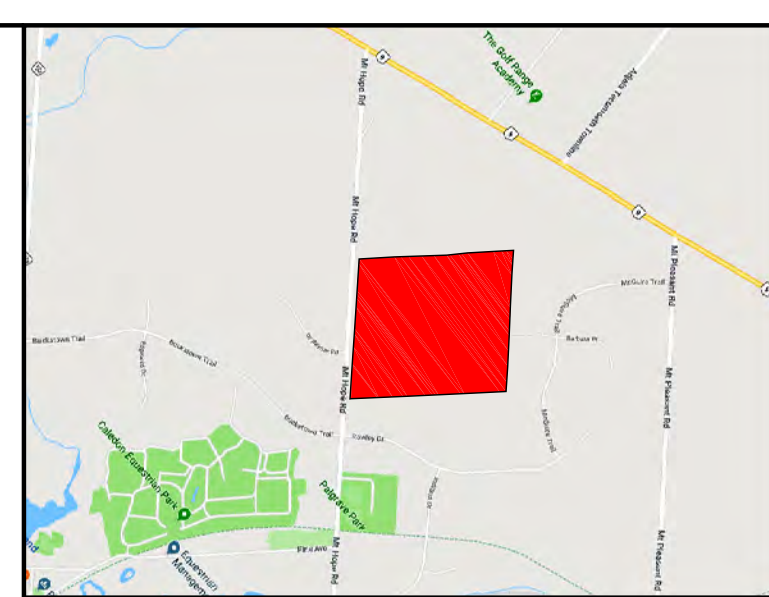
Mansoor Nooristani, C.E.T.  
Senior Project Technologist









Lucila Ensuncho, M.A.Sc., P.Eng  
Principal

## **Appendix A**



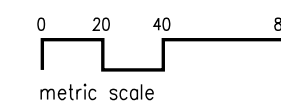


**KEY PLAN**  SUBJECT PROPERTY 

- LEGEND**
-  Boundary of Subdivision
  -  Approximate Limit of EZZ
  -  Structural Envelopes
  -  Significant Woodland (NVCA Dripline staked 28-Feb-2019)
  -  Potential Reforestation Areas
  -  Butternut

Total potential reforestation area = 13.16 ha±

Notes  
 1. Structural envelopes to generally be confined to areas with slopes of 10% or less (areas with 11-15% slope and above may be considered in certain instances).  
 (Secondary Plan Policy 7.1.9.11)



**POTENTIAL DEVELOPMENT  
 PROPOSED SUBDIVISION  
 PART of LOT 28, CON. 8  
 TOWN of CALEDON  
 REGION of PEEL**

**DESIGN PLAN SERVICES INC.**  
 Town Planning Consultants



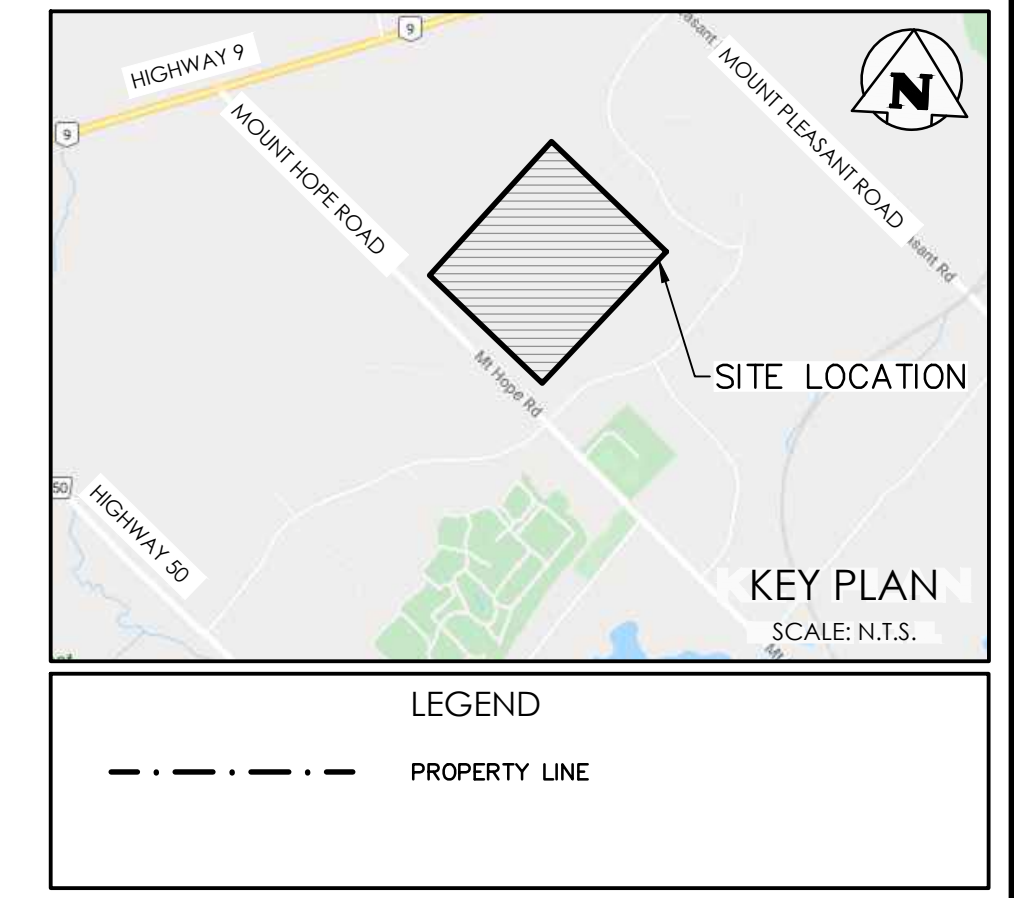
900 The East Mall, Suite 300  
 Etobicoke, Ontario M9B 6K2  
 Telephone (416) 626-5445  
 www.designplan.ca

**DESIGN  
 PLAN  
 SERVICES**  
 TOWN  
 PLANNING  
 CONSULTANTS

Scale	Date	Drawing Number	Rev.	CA	Wb	Design
1:2500	Sept. 20/19	1896-14b				







No.	ISSUE / REVISION	DATE
A	ISSUED FOR COORDINATION	2019/NOV/22
		YYYY/MM/DD

**ELEVATION NOTE:**  
ELEVATIONS SHOWN ON THIS PLAN ARE DERIVED FROM TOWN OF CALEDON BENCHMARK NO. 0208196006  
ELEVATION = 277.870M

**ELEVATION NOTE:**  
ELEVATIONS SHOWN ON THIS PLAN ARE DERIVED FROM TOWN OF CALEDON BENCHMARK NO. 02081978416  
ELEVATION = 268.864M

**SURVEY NOTES:**  
SURVEY COMPLETED BY GUIDO PAPA SURVEYING (2018/FEB/05)  
BEARINGS ARE UTM GRID, DERIVED FROM RTN OBSERVATIONS  
U/M ZONE 17, NAD83 (EPSG) (25832)  
DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.99978

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Project: 17791 MOUNT HOPE ROAD

Drawing: LEGAL BOUNDARY SURVEY & AIR PHOTO ENLARGEMENT

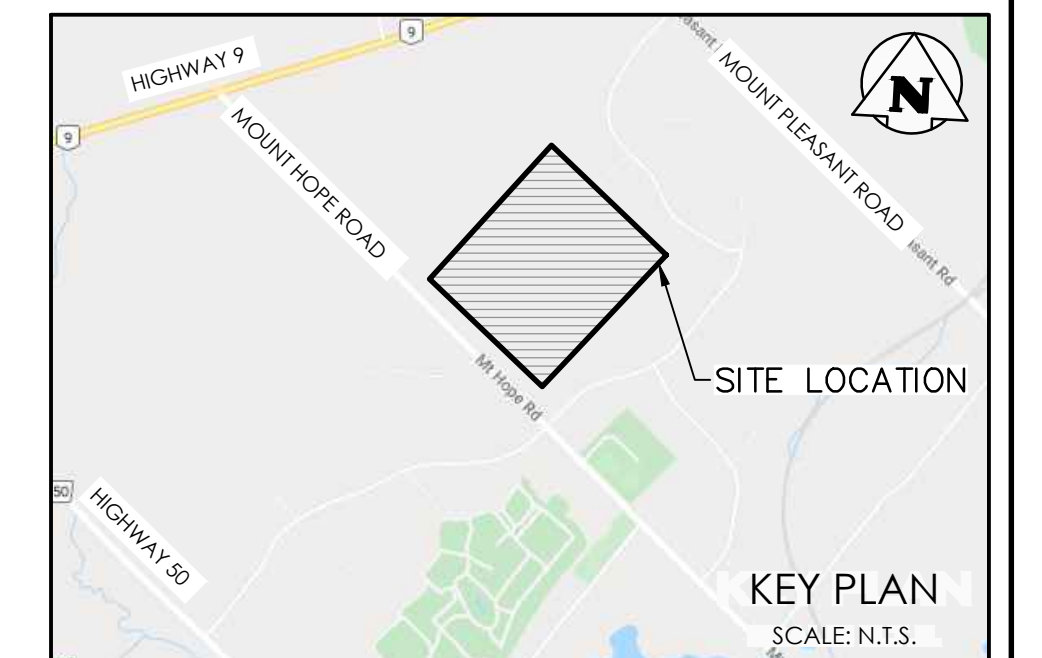
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**FOR REVIEW**

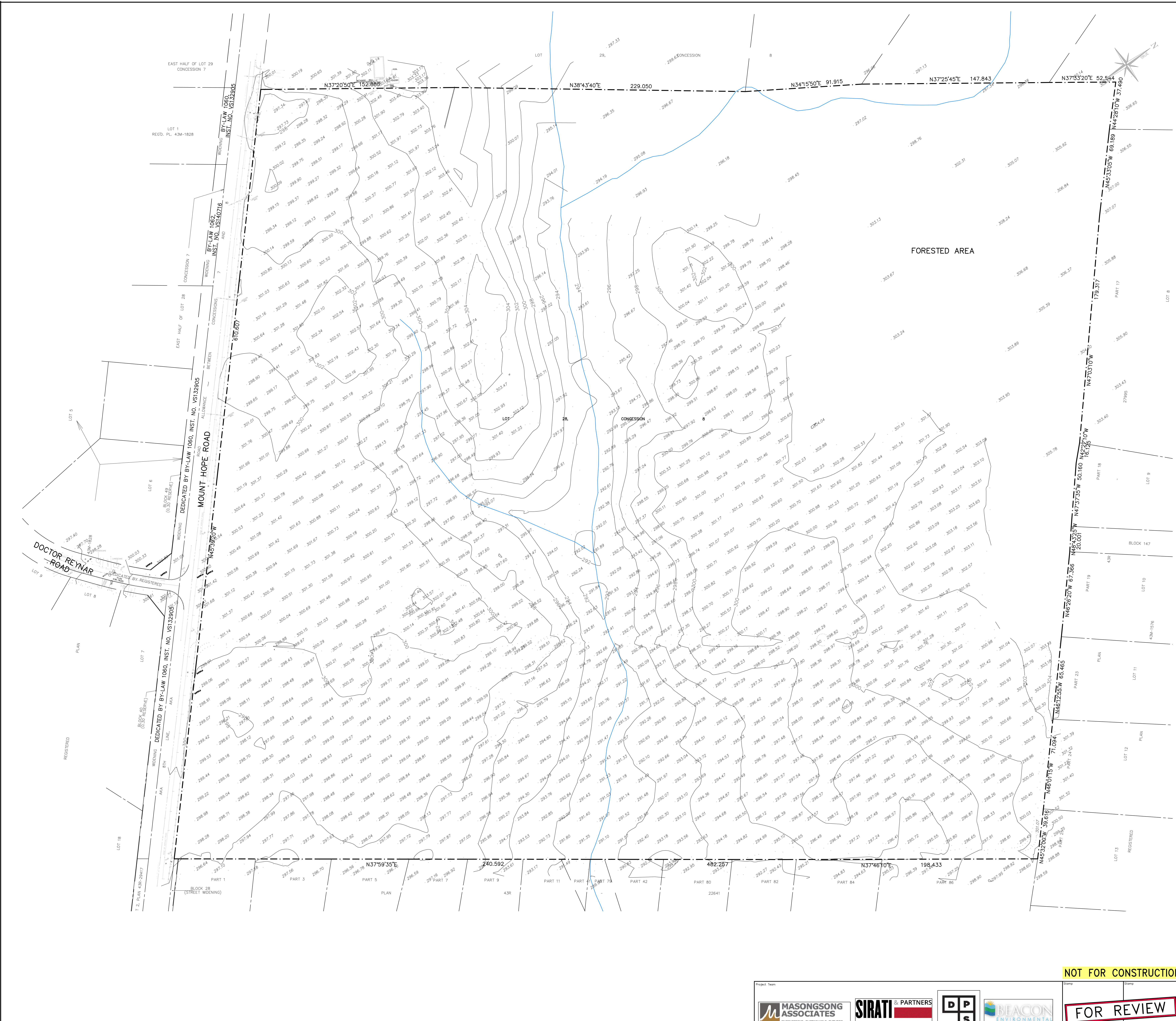


Project Team: MASONGSONG ASSOCIATES Suite 100 Engineering Sustainable Futures	Sirati & Partners Environmental & Engineering Solutions	Design Professionals	Environmental Consultants	2800 High Point Drive Suite 100 Milton, ON L9T 6P4 905-875-4915 www.cfcrozier.ca
Date: A.K. 2019/11/22 Check: S.C./M.A.C. 2019/11/22	Date: M.C. 2019/11/22	Title: 1:1000	Project No.: 1656-5104	Page: 701





LEGEND	
	PROPERTY LINE
	EXISTING 1.0m CONTOUR
	EXISTING GRADE
	WATERCOURSE



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A	ISSUED FOR COORDINATION	2019/NOV/22
		YYYY/MM/DD

**ELEVATION NOTE:**  
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**ELEVATION NOTE:**  
ELEVATIONS SHOWN ON THIS PLAN ARE DERIVED FROM TOWN OF CALEDON BENCHMARK NO. 0281977846 ELEVATION = 268.804M

**SURVEY NOTES:**  
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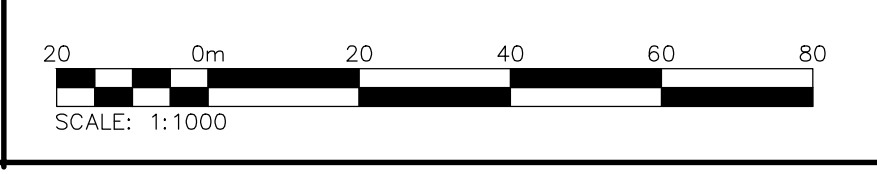
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17791 MOUNT HOPE ROAD

TOPOGRAPHIC MAP

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Project Team

MASONSONG ASSOCIATES ENGINEERING SUSTAINABLE FUTURES

SIRATI & PARTNERS

DPS

BLACON ENVIRONMENTAL

**CROZIER CONSULTING ENGINEERS**

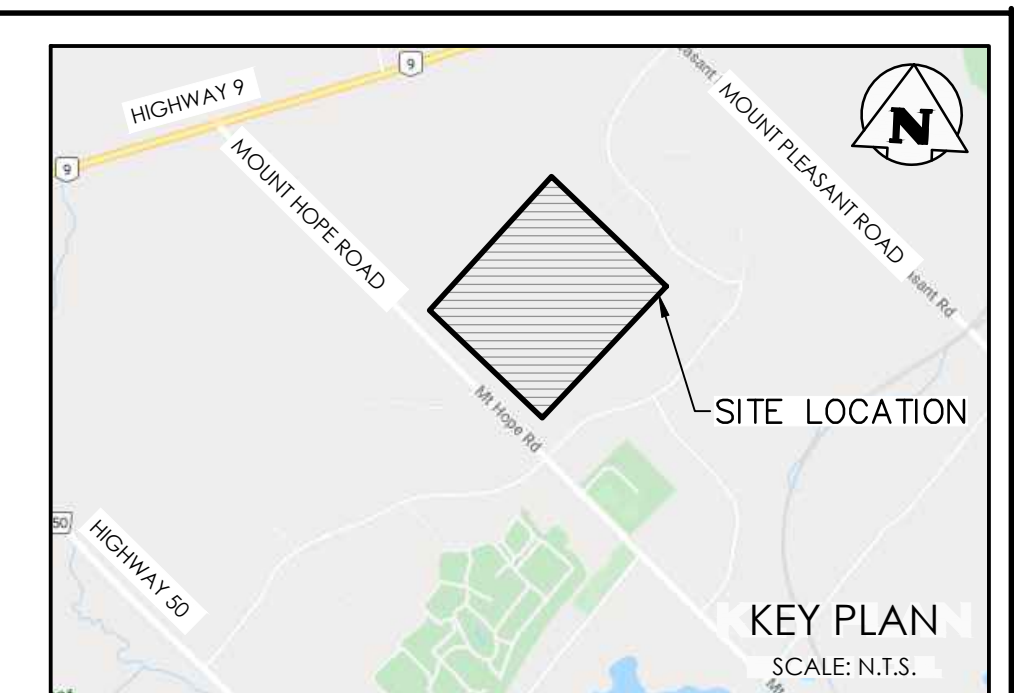
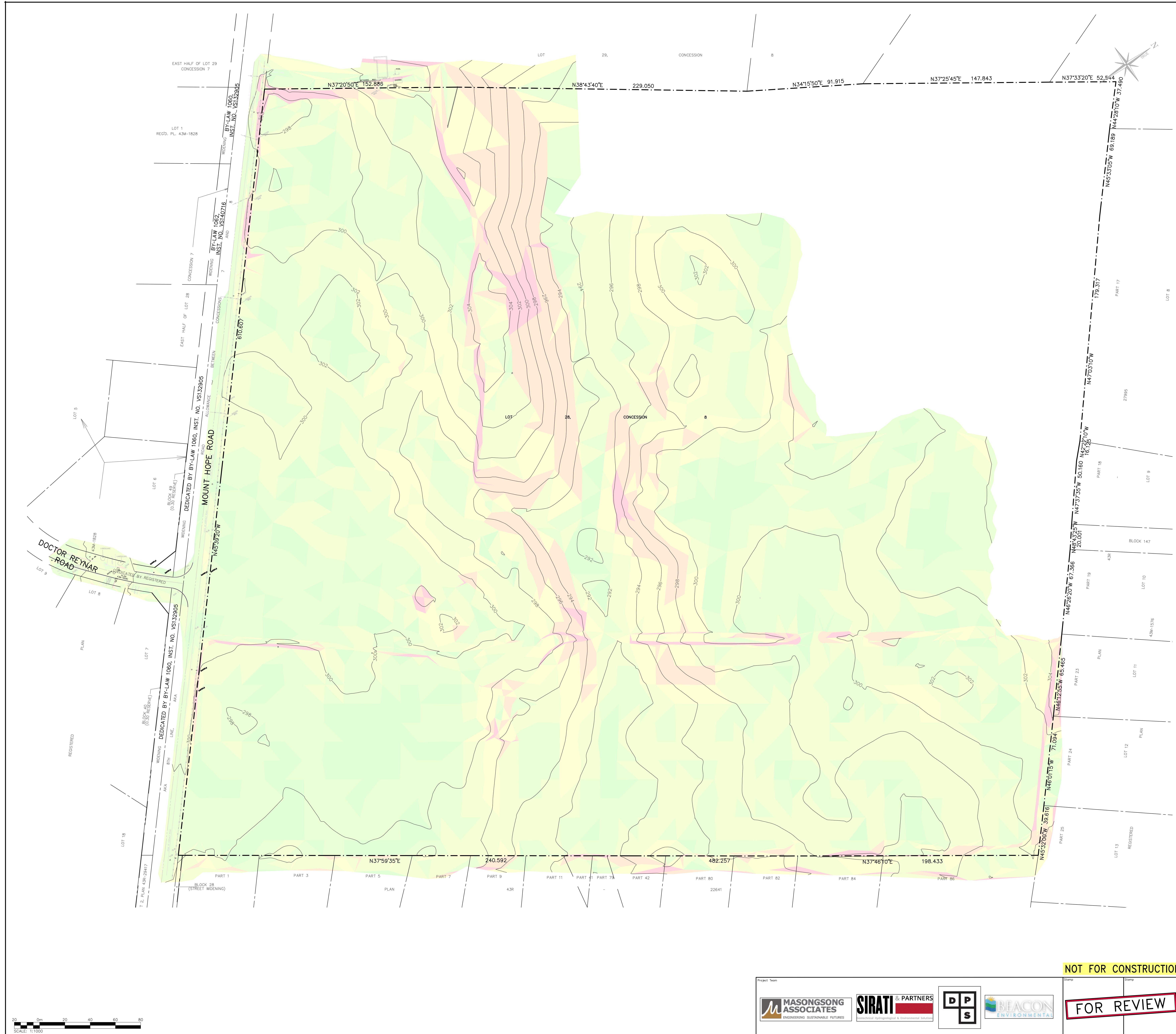
2800 HIGH POINT DRIVE SUITE 100 MILTON, ON L9T 6P4 905-875-4915 WWW.CROZIER.COM

Project No. **1656-5104**

Scale 1:1000

Page **702**





**LEGEND**

- PROPERTY LINE
- EXISTING 1.0m CONTOUR
- EXISTING HYDRO POLE
- EXISTING FENCE
- EXISTING GRADE
- EXISTING SLOPES: 0% - 1%
- EXISTING SLOPES: 2% - 5%
- EXISTING SLOPES: 6% - 10%
- EXISTING SLOPES: 11% - 15%
- EXISTING SLOPES: 15% - 25%
- EXISTING SLOPES: 25% +

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NO. ISSUE / REVISION	YYYY/MM/DD

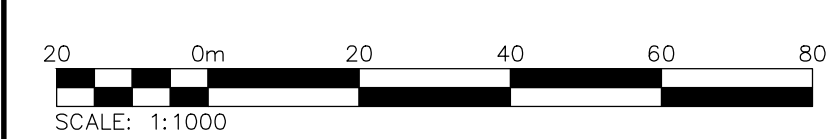
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ELEVATIONS SHOWN ON THIS PLAN ARE DERIVED FROM TOWN OF CALEDON BENCHMARK NO. 0281978006 ELEVATION = 277.870M

**ELEVATION NOTE:**  
ELEVATIONS SHOWN ON THIS PLAN ARE DERIVED FROM TOWN OF CALEDON BENCHMARK NO. 02819778416 ELEVATION = 288.804M

**SURVEY NOTES:**  
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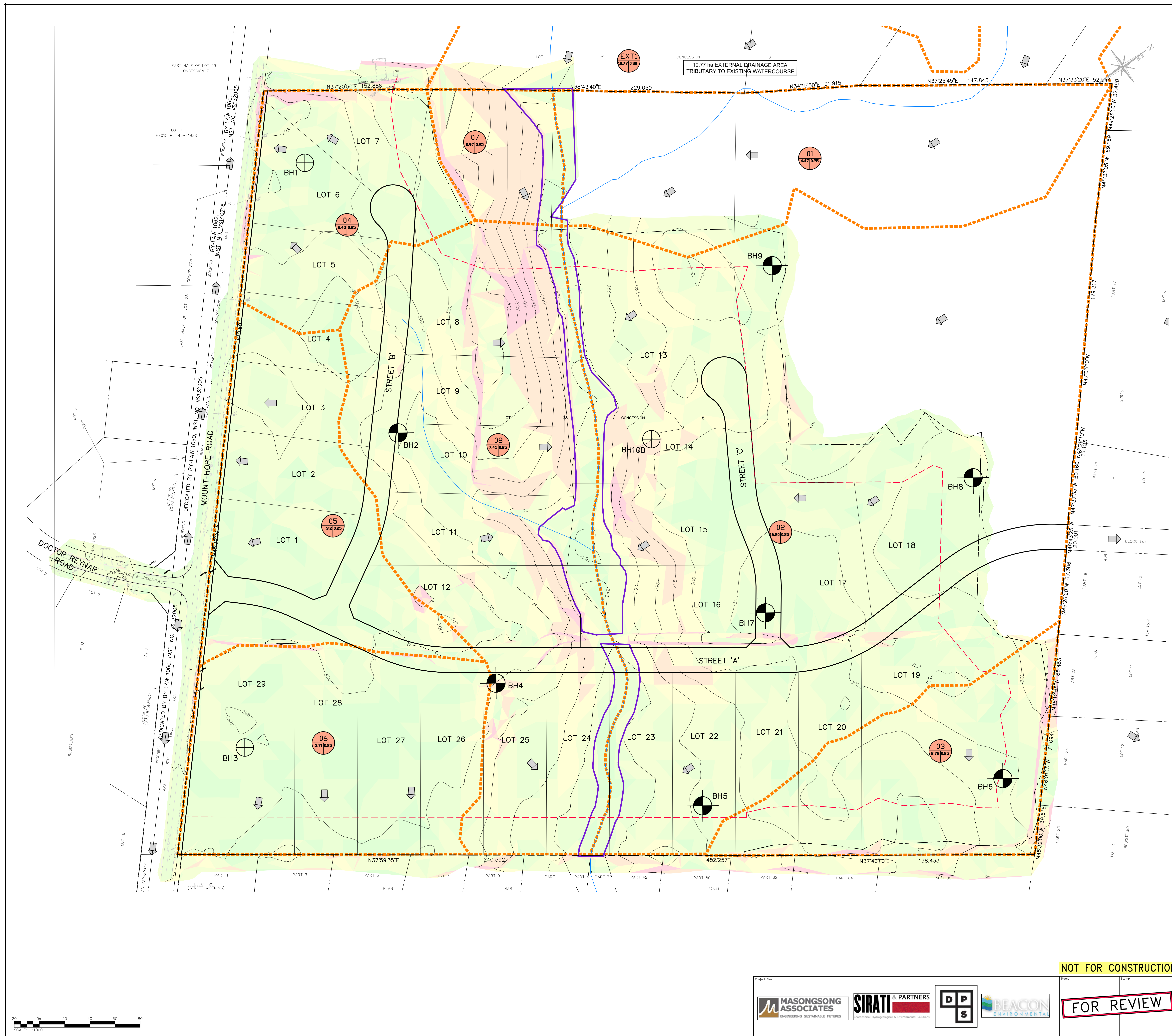
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Drawing	SLOPE ANALYSIS MAP
Client	CROZIER CONSULTING ENGINEERS
Drawn	A.K.
Checked	S.C./M.A.C.
Project No.	1656-5104
Scale	1:1000
Page	703



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**KEY PLAN**  
SCALE: N.T.S.

**LEGEND**

- PROPERTY LINE
- EXISTING 1.0m CONTOUR
- EXISTING GRADE
- EXISTING FENCE
- RIGHT OF WAY
- APPROXIMATE LIMIT OF E2Z
- WATERCOURSE
- SIGNIFICANT WOODLANDS +30m
- SIGNIFICANT WOODLANDS (NVCA Delineation 28-Feb-2019)
- EXISTING SLOPES: 0% - 1%
- EXISTING SLOPES: 2% - 5%
- EXISTING SLOPES: 6% - 10%
- EXISTING SLOPES: 11% - 15%
- EXISTING SLOPES: 16% - 25%
- EXISTING SLOPES: 26% +
- EXISTING OVERLAND FLOW DIRECTION
- EXISTING STORM DRAINAGE CATCHMENT
- CATCHMENT I.D.
- AREA (ha) | RUNOFF COEFFICIENT
- Borehole Locations
- Monitoring Well

**NOTE:** FOR BOREHOLES AND MONITORING WELL LOCATIONS REFER TO GEOTECHNICAL INVESTIGATION REPORT PROVIDED BY SIRATI & PARTNERS CONSULTANTS LIMITED, REPORT REF. NO. SP18-334-10, DATED DECEMBER 06, 2018.

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ISSUE / REVISION	YYYY/MM/DD

**DRAINAGE NOTE:**  
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**ELEVATION NOTE:**  
ELEVATIONS SHOWN ON THIS PLAN ARE DERIVED FROM TOWN OF CALEDON BENCHMARK No. 0208180606  
ELEVATION = 277.870M

**ELEVATION NOTE:**  
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ELEVATION = 268.860M

**SURVEY NOTES:**  
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17791 MOUNT HOPE ROAD

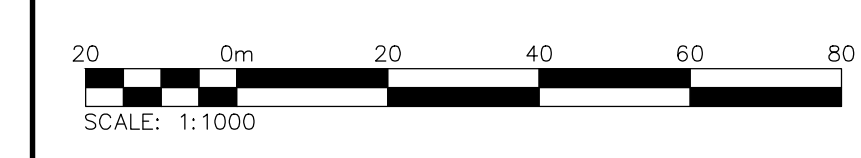
SOIL AND SOIL DRAINAGE CLASSIFICATION MAP

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**FOR REVIEW**

**CROZIER CONSULTING ENGINEERS**  
2800 HIGH POINT DRIVE  
SUITE 100  
MILTON, ON L5T 6P4  
905-875-0000 T  
905-875-4915 F  
WWW.CFORDER.COM

Project No. 1656-5104  
Scale 1:1000  
Date 11/2019

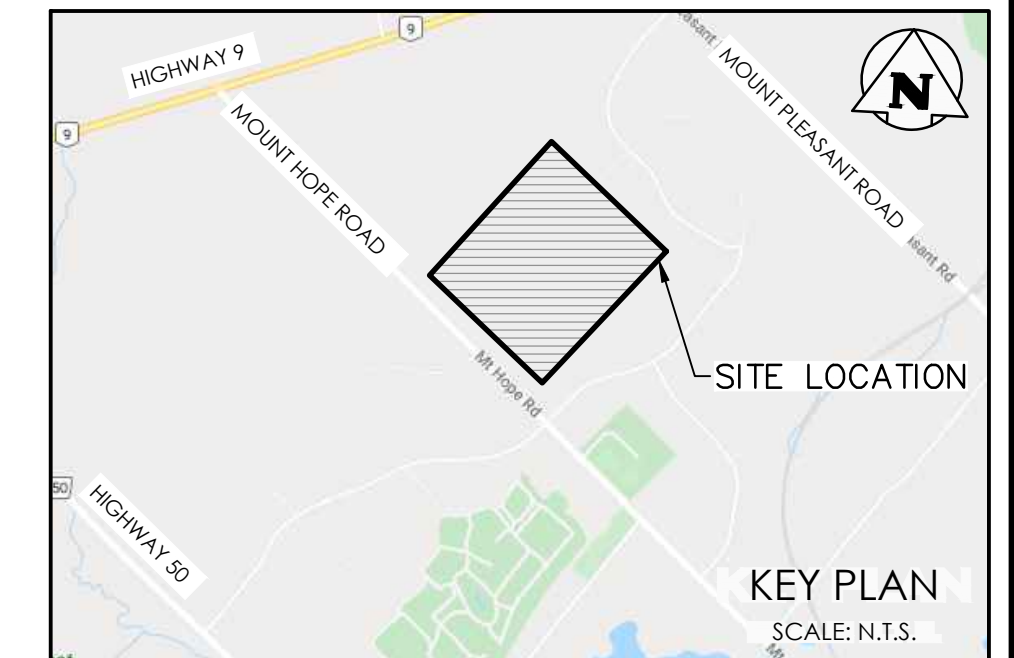
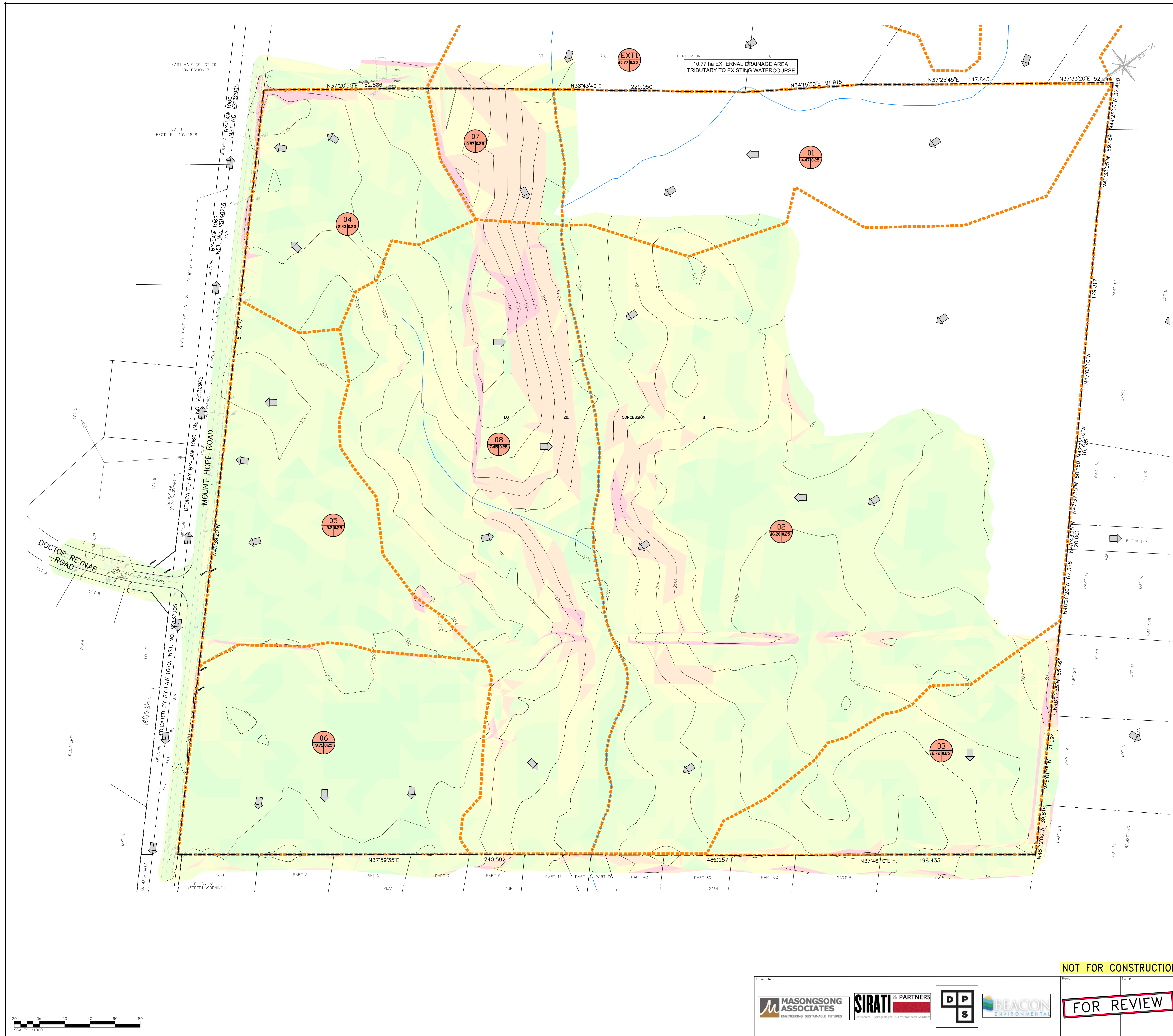


MASONGSONG ASSOCIATES  
SIRATI & PARTNERS  
DPS  
BLACON ENVIRONMENTAL

**NOT FOR CONSTRUCTION**

**FOR REVIEW**





**LEGEND**

—	PROPERTY LINE
— 285 —	EXISTING 1.0m CONTOUR
x 285	EXISTING GRADE
Light Green	EXISTING SLOPES: 0% - 1%
Yellow-Green	EXISTING SLOPES: 2% - 5%
Yellow	EXISTING SLOPES: 6% - 10%
Orange	EXISTING SLOPES: 11% - 15%
Red-Orange	EXISTING SLOPES: 16% - 25%
Red	EXISTING SLOPES: 26% +
Arrow	EXISTING OVERLAND FLOW DIRECTION
Dashed Orange Line	EXISTING STORM DRAINAGE CATCHMENT
Circle with ID	CATCHMENT I.D.
Circle with (h-2)	AREA (h-2)   RUNOFF COEFFICIENT
Blue Line	WATERCOURSE

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NO. ISSUE / REVISION	YYYY/MM/DD

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**ELEVATION NOTE:**  
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**ELEVATION NOTE:**  
ELEVATIONS SHOWN ON THIS PLAN ARE DERIVED FROM TOWN OF CALEDON BENCHMARK NO. 02819778416 ELEVATION = 288.804M

**SURVEY NOTES:**  
SURVEY COMPLETED BY GUIDO PAPA SURVEYING (2018/FEB/05)  
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U/M ZONE 17, NAD83 (EPSG: 31470)  
DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.999978

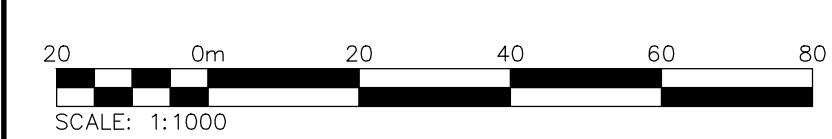
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17791 MOUNT HOPE ROAD

SURFACE HYDROLOGY MAP

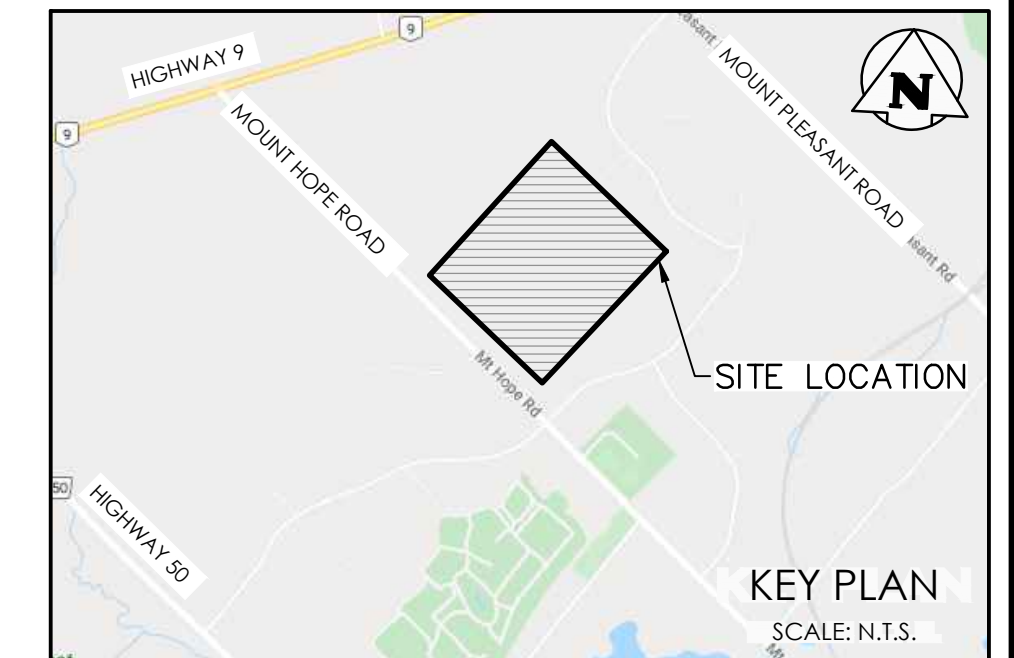
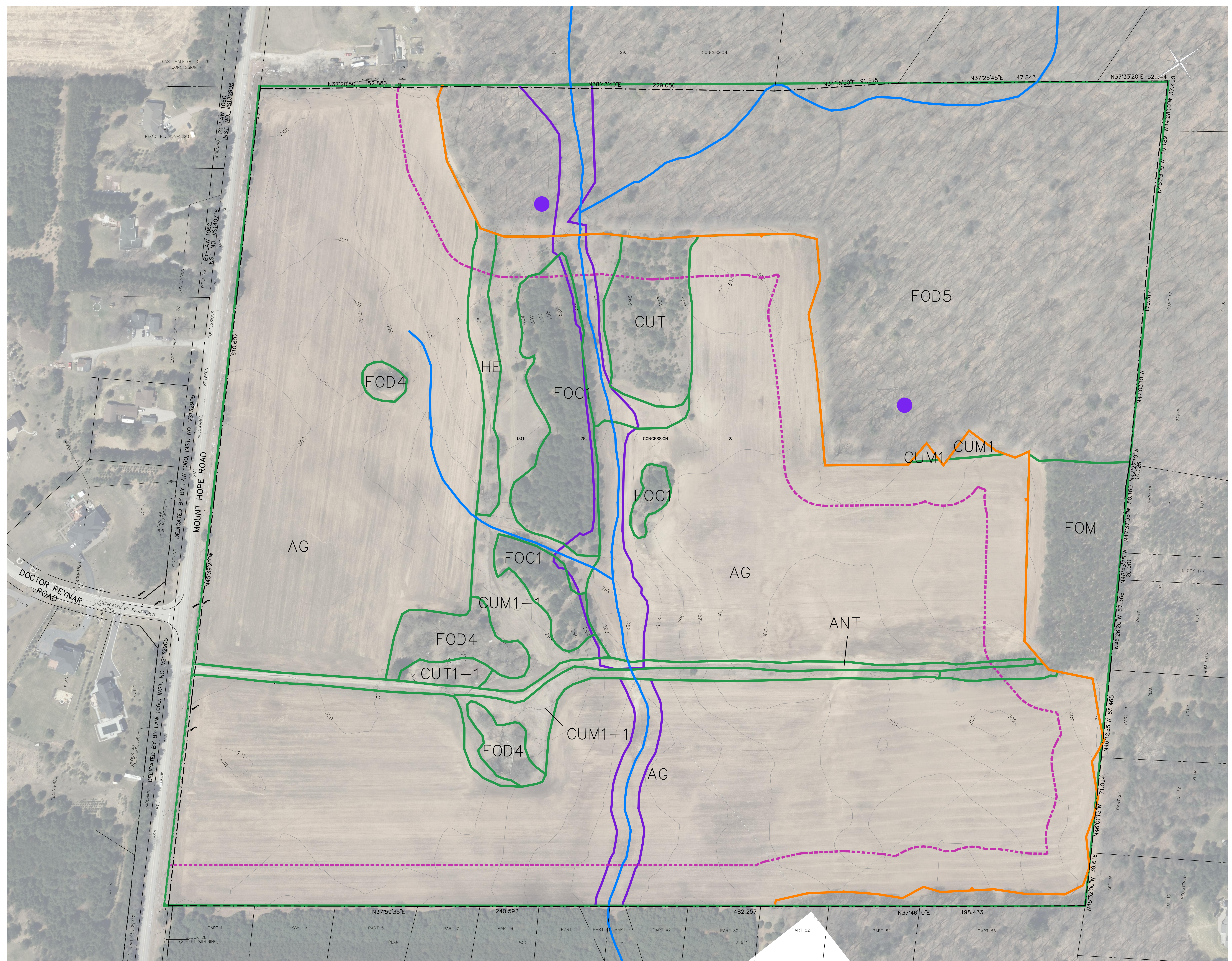
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FOR REVIEW



	2800 High Point Drive Suite 100 Milton, ON L9T 6P4 905-875-0001 905-875-4915 www.cfcrozier.ca	Project No. <b>1656-5104</b> Date: A.K. 10/1/2019 Check: S.C./M.A.C. 10/1/2019	Scale: 1:1000 Page: 705





**LEGEND**

	PROPERTY LINE
	EXISTING 1.0m CONTOUR
	EXISTING GRADE
	WATERCOURSE (MRRF 2018)
	BUTTERNUT
	APPROXIMATE LIMIT OF E2
	SIGNIFICANT WOODLAND +30 m WITH NVCA FEBRUARY 2019
	ELC COMMUNITIES

ANT	ANTHROPOGENIC
HE	HEDGEROW
AG	AGRICULTURAL
CUM1-1	DRY-OLD FIELD MEADOW
CUM1	MINERAL CULTURAL MEADOW
CUT	CULTURAL THicket
CUT1-1	SUMAC CULTURAL THicket
FOM	MIXED FOREST
FOD4	DRY-FRESH DECIDUOUS FOREST
FOD5	DRY-FRESH SUGAR MAPLE DECIDUOUS FOREST
FOC1	DRY-FRESH PINE CONIFEROUS FOREST

No.	ISSUE / REVISION	DATE
A	ISSUED FOR COORDINATION	2019/NOV/22
		YYYY/MM/DD

**NATURAL HERITAGE NOTE:**  
 THE NATURAL HERITAGE CONSTRAINTS SHOWN ON THIS PLAN ARE DERIVED FROM THE NATURAL HERITAGE DEVELOPMENT CONSTRAINTS FIGURE 3, PREPARED BY BEACON ENVIRONMENTAL IN OCTOBER 2018.

**ELEVATION NOTE:**  
 ELEVATIONS SHOWN ON THIS PLAN ARE DERIVED FROM TOWN OF CALEDON BENCHMARK No. 02081978006 ELEVATION = 277.870M

**ELEVATION NOTE:**  
 ELEVATIONS SHOWN ON THIS PLAN ARE DERIVED FROM TOWN OF CALEDON BENCHMARK No. 020819778416 ELEVATION = 268.804M

**SURVEY NOTES:**  
 SURVEY COMPLETED BY GUIDO PAPA SURVEYING (2018/FEB/05)  
 BEARINGS ARE UTM GRID, DERIVED FROM RTN OBSERVATIONS  
 UTM ZONE 17, NAD83 (EPSG) (2011-0)  
 DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.99978

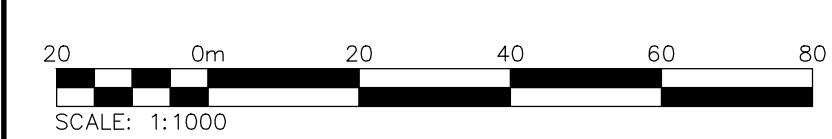
**DRAWING NOTES:**  
 THIS DRAWING IS THE EXCLUSIVE PROPERTY OF C.F. ORDER & ASSOCIATES INC. AND THE REPRODUCTION OF ANY PART OF IT WITHOUT PRIOR WRITTEN CONSENT OF THIS OFFICE IS STRICTLY PROHIBITED.  
 THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, LEVELS, AND DATUMS ON SITE AND REPORT ANY DISCREPANCIES OR OMISSIONS TO THIS OFFICE PRIOR TO CONSTRUCTION.  
 THIS DRAWING IS TO BE READ AND UNDERSTOOD IN CONJUNCTION WITH ALL OTHER PLANS AND DOCUMENTS APPLICABLE TO THIS PROJECT. DO NOT SCALE THIS DRAWING.  
 ALL EXISTING UNDERGROUND UTILITIES TO BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO CONSTRUCTION.

17791 MOUNT HOPE ROAD

VEGETATION AND WILDLIFE ECOLOGY MAP

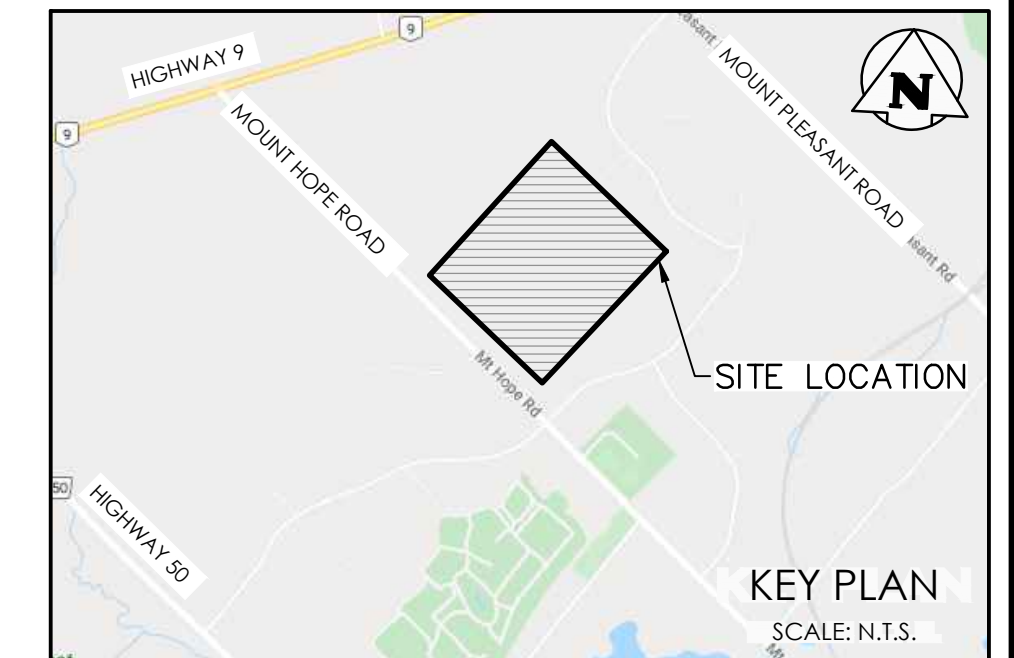
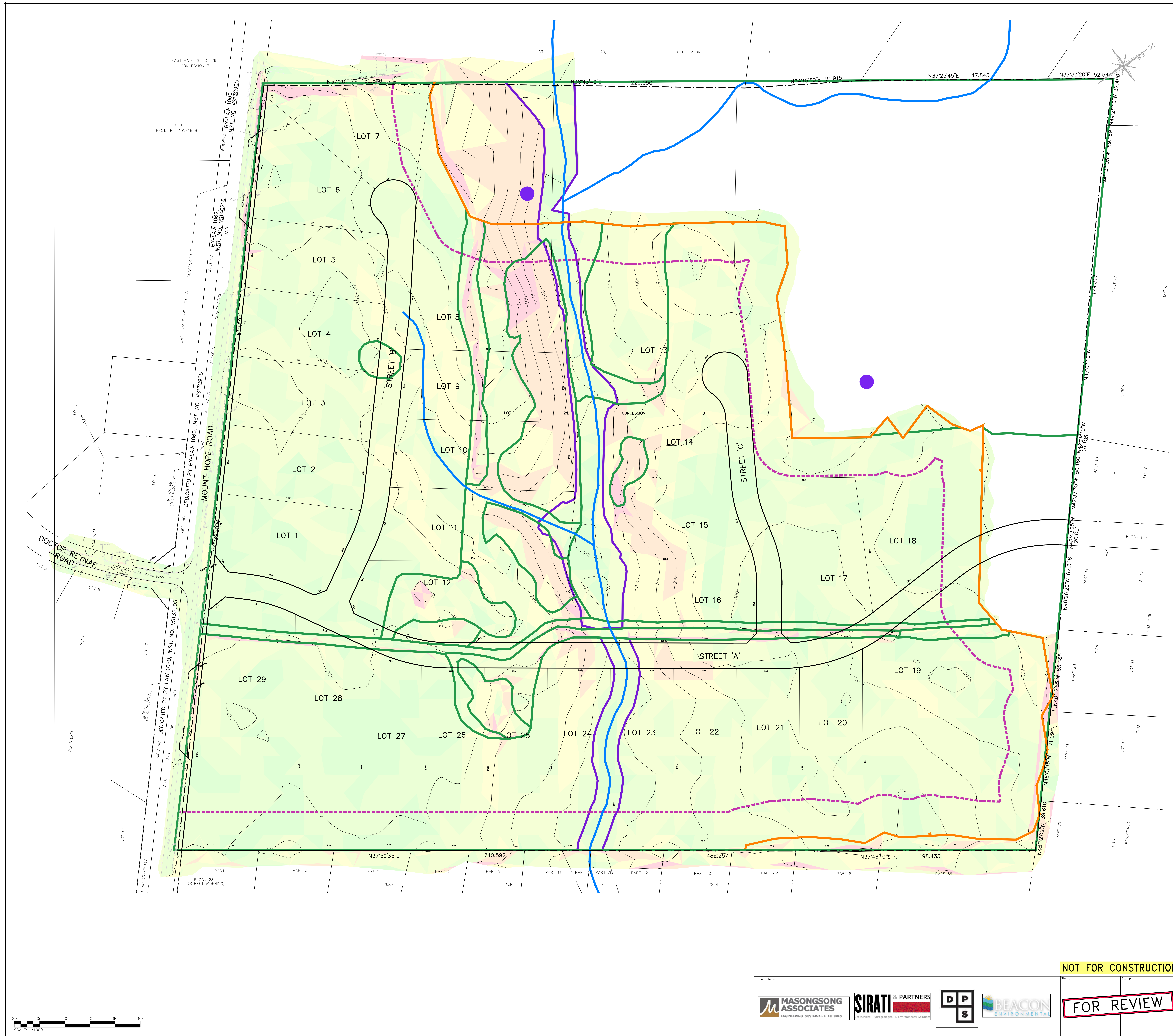
NOT FOR CONSTRUCTION

FOR REVIEW



	2800 HIGH POINT DRIVE SUITE 100 MILTON, ON L9T 6P4 905-875-4915 WWW.CFCROZIER.COM	Project No. <b>1656-5104</b> Date: A.K./S.A. / 11/22/19 Check: S.C./M.A.C. / 11/22/19	Scale: 1:1000 Page: 706



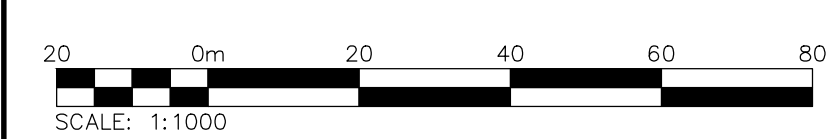


**LEGEND**

- PROPERTY LINE
- EXISTING 1.0m CONTOUR
- EXISTING SLOPES: 0% - 1%
- EXISTING SLOPES: 2% - 5%
- EXISTING SLOPES: 6% - 10%
- EXISTING SLOPES: 11% - 15%
- EXISTING SLOPES: 15% - 25%
- EXISTING SLOPES: 25% +
- WATERCOURSE (MNF 2016)
- BUTTERNUT
- APPROXIMATE LIMIT OF E2 Z
- SIGNIFICANT WOODLAND +30 m
- SIGNIFICANT WOODLAND (STAKED WITH NYCA FEBRUARY 2019)
- ELC COMMUNITIES

ISSUED FOR COORDINATION	2019/NOV/22
NO. ISSUE / REVISION	YYYY/MM/DD
<b>LOT LAYOUT NOTE:</b>	
THE LOT LINES AND STRUCTURAL ENVELOPES SHOWN ON THIS PLAN ARE DERIVED FROM THE DRAFT PLAN PREPARED BY DESIGN PLAN SERVICES INC. ON SEPTEMBER 20, 2019.	
<b>NATURAL HERITAGE NOTE:</b>	
THE NATURAL HERITAGE CONSTRAINTS SHOWN ON THIS PLAN ARE DERIVED FROM THE NATURAL HERITAGE DEVELOPMENT CONSTRAINTS FIGURE 3, PREPARED BY BEACON ENVIRONMENTAL.	
<b>ELEVATION NOTE:</b>	
ELEVATIONS SHOWN ON THIS PLAN ARE DERIVED FROM TOWN OF CALEDON BENCHMARK NO. 02081978416 ELEVATION = 277.870M	
<b>ELEVATION NOTE:</b>	
ELEVATIONS SHOWN ON THIS PLAN ARE DERIVED FROM TOWN OF CALEDON BENCHMARK NO. 020819778416 ELEVATION = 278.804M	
<b>SURVEY NOTES:</b>	
SURVEY COMPLETED BY GUIDO PAPA SURVEYING (2018/FEB/05)	
BEARINGS ARE UTM GRID, DERIVED FROM RTN OBSERVATIONS	
UTM ZONE 17, NAD83 (EPSG: 31470)	
DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.99978	
<b>DRAWING NOTES:</b>	
THIS DRAWING IS THE EXCLUSIVE PROPERTY OF C.F. GORDON & ASSOCIATES INC. AND THE REPRODUCTION OF ANY PART OF IT WITHOUT PRIOR WRITTEN CONSENT OF THIS OFFICE IS STRICTLY PROHIBITED.	
THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, LEVELS, AND DATUMS ON SITE AND REPORT ANY DISCREPANCIES OR OMISSIONS TO THIS OFFICE PRIOR TO CONSTRUCTION.	
THIS DRAWING IS TO BE READ AND UNDERSTOOD IN CONJUNCTION WITH ALL OTHER PLANS AND DOCUMENTS APPLICABLE TO THIS PROJECT. DO NOT SCALE THIS DRAWING.	
ALL EXISTING UNDERGROUND UTILITIES TO BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO CONSTRUCTION.	

Project	17791 MOUNT HOPE ROAD
Drawing	ENVIRONMENTAL SUMMARY MAP
Project No.	1656-5104
Scale	1:1000
Sheet No.	707



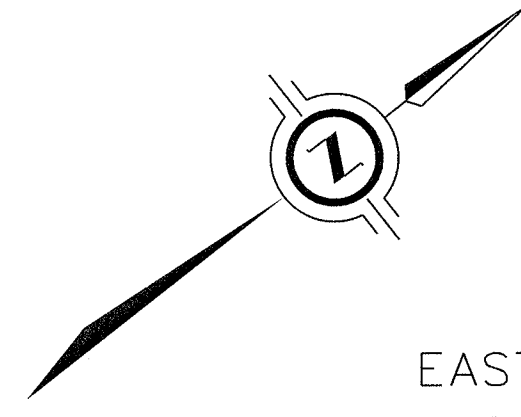
**NOT FOR CONSTRUCTION**

**FOR REVIEW**

Project Team:

- MASONGSONG ASSOCIATES ENGINEERING SUSTAINABLE FUTURES
- SIRATI & PARTNERS
- DPS
- BEACON ENVIRONMENTAL





I REQUIRE THIS PLAN TO BE DEPOSITED UNDER THE LAND TITLES ACT.

DATE MAY 2, 2018

*Laurence J. Kuehling*  
LAURENCE J. KUEHLING  
ONTARIO LAND SURVEYOR

PLAN 43R-  
RECEIVED AND DEPOSITED

DATE \_\_\_\_\_

REPRESENTATIVE FOR THE LAND REGISTRAR FOR THE LAND TITLES DIVISION OF PEEL (No 43)

SCHEDULE				
PART	LOT	CONCESSION	PIN	AREA sq. m.
1	PART WEST HALF OF 28	8	14341-0040	412104.24

PLAN OF SURVEY OF  
PART OF LOT 28  
CONCESSION 8  
GEOGRAPHIC TOWNSHIP OF ALBION  
NOW IN THE  
TOWN OF CALEDON  
REGIONAL MUNICIPALITY OF PEEL  
SCALE 1 : 1500

GUIDO PAPA SURVEYING  
A DIVISION OF J.D. BARNES LIMITED

METRIC DISTANCES AND/OR COORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

NOTES

BEARINGS ARE UTM GRID, DERIVED FROM OBSERVED REFERENCE POINTS A AND B, BY REAL TIME NETWORK (RTN) OBSERVATIONS, UTM ZONE 17, NAD83 (CSRS) (2010.0).

DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.999667.

FOR BEARING COMPARISONS ASTROMOMIC BEARINGS WERE ROTATED ON PLANS AS FOLLOWS	
PLAN	ROTATION
43M-1265	1°41'20" CCW
43M-1576, 43R-19488	0°49'20" CCW
PLAN OF SURVEY BY C.A. SEXTON DATED SEPT. 2, 1987 JOB NO. 87-5228-3	1°41'29" CCW
SKETCH SHOWING LOTS 29 & 30 CONCESSION 8, TOWNSHIP OF ALBION COUNTY OF PEEL BY J.R. SNEATH PL. REF. NO. 66127, DATED DEC. 4, 1966 AND SRPR OF PART OF LOT 29 CONCESSION 8 BY RICHARD A. PREISS DATED MAY 15, 2000, JOB NO. 00-3322	0°44'20" CCW

INTEGRATION DATA			
OBSERVED REFERENCE POINTS (ORP's): UTM ZONE 17, NAD83 (CSRS) (2010.0).			
COORDINATES TO URBAN ACCURACY PER SECTION 14 (2) OF O.REG. 216/10.			
POINT ID	EASTING	NORTHING	
ORP (A)	593 270.38	4 869 055.19	
ORP (B)	593 679.93	4 869 590.26	
ORP (C)	594 125.17	4 869 165.28	

COORDINATES CANNOT, IN THEMSELVES, BE USED TO RE-ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THIS PLAN.

- LEGEND
- DENOTES SURVEY MONUMENT FOUND
  - DENOTES SURVEY MONUMENT SET
  - SIB DENOTES STANDARD IRON BAR
  - SSIB DENOTES SHORT STANDARD IRON BAR
  - IB DENOTES IRON BAR
  - PB DENOTES PLASTIC BAR
  - WT DENOTES WITNESS
  - MEAS DENOTES MEASURED
  - P DENOTES SKETCH BY J.R. SNEATH O.L.S. DATED DECEMBER 4, 1966, REF. NO. 66127
  - P2 DENOTES PLAN OF SURVEY BY ROBERT BASIL LEE LTD. DATED DECEMBER 19, 1984, REF. NO. 87884
  - P3 DENOTES PLAN OF SURVEY BY C.A. SEXTON O.L.S. DATED SEPTEMBER 2, 1987, JOB NO. 87-5228-3
  - P4 DENOTES REGISTERED PLAN 43M-1576
  - P5 DENOTES REGISTERED PLAN 43M-1265
  - P6 DENOTES PLAN 43R-19488
  - P7 DENOTES SURVEYOR'S REAL PROPERTY REPORT BY RICHARD A. PREISS O.L.S. DATED MAY 15, 2000, JOB NO. 00-3322
  - CS DENOTES C.A. SEXTON O.L.S.
  - YY DENOTES YOUNG & YOUNG O.L.S.
  - RBL DENOTES ROBERT BASIL LEE O.L.S.
  - 927 DENOTES J.R. SNEATH O.L.S.
  - 1539 DENOTES RICHARD A. PREISS O.L.S.
  - 760 DENOTES KENNETH HARVEY MCCONNELL O.L.S.
  - P&WF DENOTES POST & WIRE FENCE O.L.S.
  - CCW DENOTES COUNTER CLOCKWISE
  - AKA DENOTES ALSO KNOWN AS

ALL DIMENSIONS SHOWN BETWEEN SURVEY MONUMENTS FOUND ARE MEASURED SAVE AND EXCEPT COMPARISONS TO EXISTING PLANS, SURVEY AND DEEDS.

ALL SET SSB AND PB MONUMENTS WERE USED DUE TO LACK OF OVERBURDEN AND/OR PROXIMITY OF UNDERGROUND UTILITIES IN ACCORDANCE WITH SECTION 11 (4) OF O.REG. 525/91.

**SURVEYOR'S CERTIFICATE**

I CERTIFY THAT:

- THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT AND THE LAND TITLES ACT AND THE REGULATIONS MADE UNDER THEM.
- THE SURVEY WAS COMPLETED ON APRIL 19, 2018

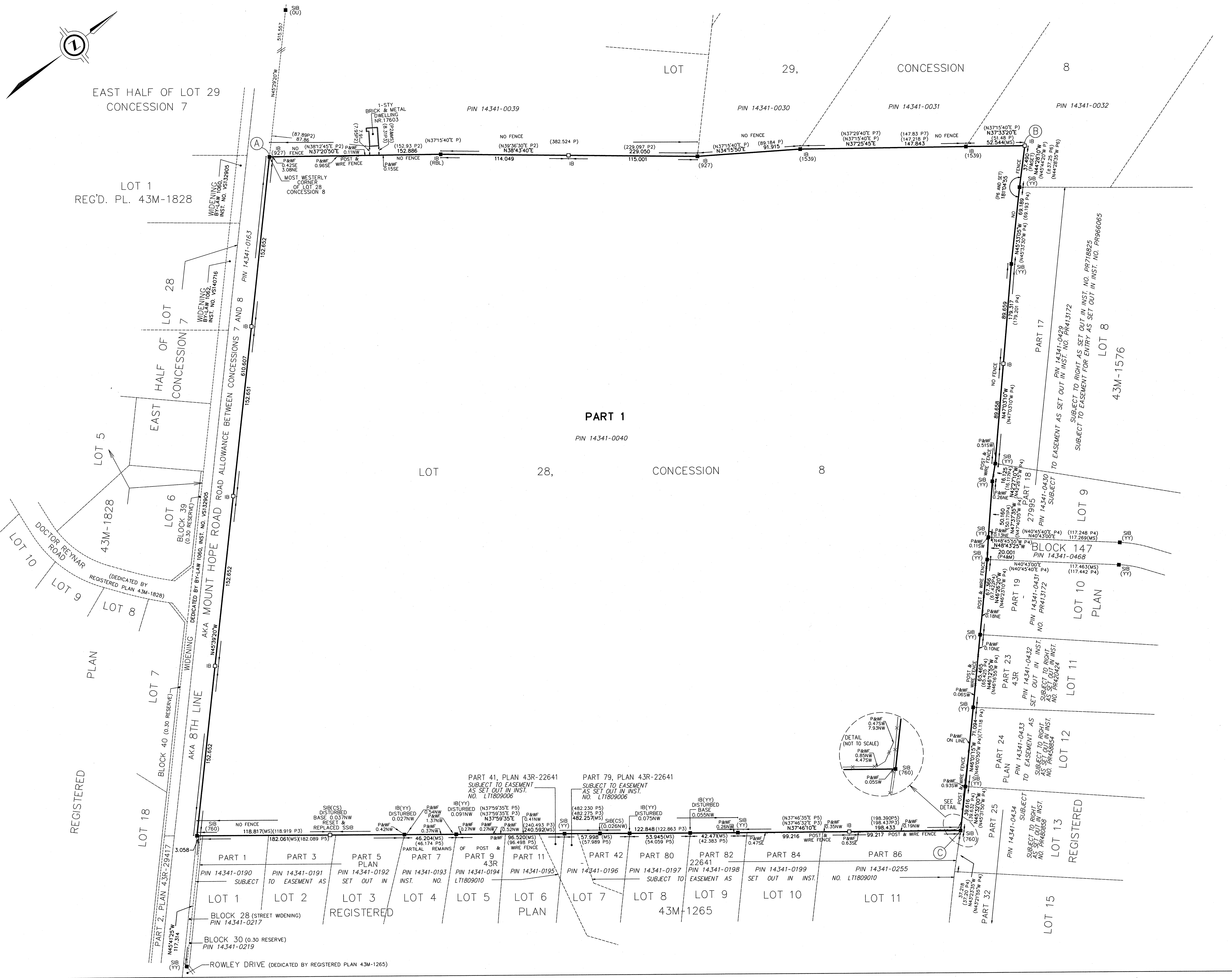
DATE MAY 2, 2018

*Laurence J. Kuehling*  
LAURENCE J. KUEHLING  
ONTARIO LAND SURVEYOR

GUIDO PAPA SURVEYING  
A Division of J.D. Barnes Limited

216 CHRISLEA RD, WOODBRIDGE, ON L4L 8S5  
T: (905) 264-2727 F: (905) 264-2728 www.jdbarnes.com

DRAWN BY: EK/LJK	CHECKED BY: L.J.K.	REFERENCE NO.: 18-18-975-00-REF
------------------	--------------------	---------------------------------



PART 1  
PIN 14341-0040

LOT 28, CONCESSION 8

EAST HALF OF LOT 29  
CONCESSION 7

LOT 1  
REG'D. PL. 43M-1828

EAST HALF OF LOT 28  
CONCESSION 7

LOT 5  
43M-1828

LOT 6  
BLOCK 39  
(0.30 RESERVE)

LOT 7

LOT 8

LOT 9

LOT 10

LOT 11

LOT 12

LOT 13

LOT 14

PART 1  
PIN 14341-0190  
SUBJECT TO EASEMENT AS SET OUT IN INST. NO. L11809010

PART 3  
PIN 14341-0191  
SET OUT IN INST. NO. L11809010

PART 5  
PIN 14341-0192  
SET OUT IN INST. NO. L11809010

PART 7  
PIN 14341-0193  
SET OUT IN INST. NO. L11809010

PART 9  
PIN 14341-0194  
SET OUT IN INST. NO. L11809010

PART 11  
PIN 14341-0195  
SET OUT IN INST. NO. L11809010

PART 42  
PIN 14341-0196  
SET OUT IN INST. NO. L11809010

PART 80  
PIN 14341-0197  
EASEMENT AS SET OUT IN INST. NO. L11809010

PART 82  
PIN 14341-0198  
EASEMENT AS SET OUT IN INST. NO. L11809010

PART 84  
PIN 14341-0199  
EASEMENT AS SET OUT IN INST. NO. L11809010

PART 86  
PIN 14341-0255  
EASEMENT AS SET OUT IN INST. NO. L11809010

PART 41, PLAN 43R-22641  
SUBJECT TO EASEMENT AS SET OUT IN INST. NO. L11809006

PART 79, PLAN 43R-22641  
SUBJECT TO EASEMENT AS SET OUT IN INST. NO. L11809006

PART 23  
PIN 14341-0432  
SUBJECT TO EASEMENT AS SET OUT IN INST. NO. PR413172

PART 19  
PIN 14341-0431  
SUBJECT TO EASEMENT AS SET OUT IN INST. NO. PR413172

PART 18  
PIN 14341-0430  
SUBJECT TO EASEMENT AS SET OUT IN INST. NO. PR413172

PART 17  
PIN 14341-0429  
SUBJECT TO EASEMENT AS SET OUT IN INST. NO. PR718825

PART 15  
PIN 14341-0428  
SUBJECT TO EASEMENT AS SET OUT IN INST. NO. PR966065

PART 13  
PIN 14341-0427  
SUBJECT TO EASEMENT AS SET OUT IN INST. NO. PR718825

PART 11  
PIN 14341-0426  
SUBJECT TO EASEMENT AS SET OUT IN INST. NO. PR718825

PART 9  
PIN 14341-0425  
SUBJECT TO EASEMENT AS SET OUT IN INST. NO. PR718825

PART 7  
PIN 14341-0424  
SUBJECT TO EASEMENT AS SET OUT IN INST. NO. PR718825

FILE: G:\Users\jkuhling\18-18-975-00-17751 Mount Hope Road\018-18-975-00-REF.dwg



17791 Mount Hope Road, Caledon

**Legend**

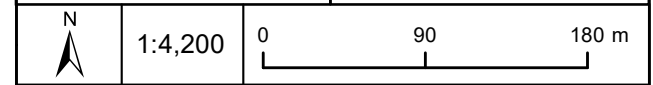
- Subject Property
- Ephemeral Drainage Feature (MNR 2019)
- Significant Woodland (Beacon)
- ELC Communities
- Significant Woodland (staked with NVCA February 2019)
- Butternut

ELC Code	Community Description
ANT	Anthropogenic
HE	Hedgerow
AG	Agricultural
CUM1-1	Dry - Old Field Meadow
CUM1	Mineral Cultural Meadow
CUT	Cultural Thicket
CUT1-1	Sumac Cultural Thicket
FOM	Mixed Forest
CUW1	Mineral Cultural Woodland
FOD5	Dry - Fresh Sugar Maple Deciduous Forest
FOC1	Dry - Fresh Pine Coniferous Forest



**BEACON ENVIRONMENTAL** Project: 218250  
 Last Revised: December 2019

Client: Palgrave Estates Prepared by: BD  
 Checked by: CG **DRAFT**



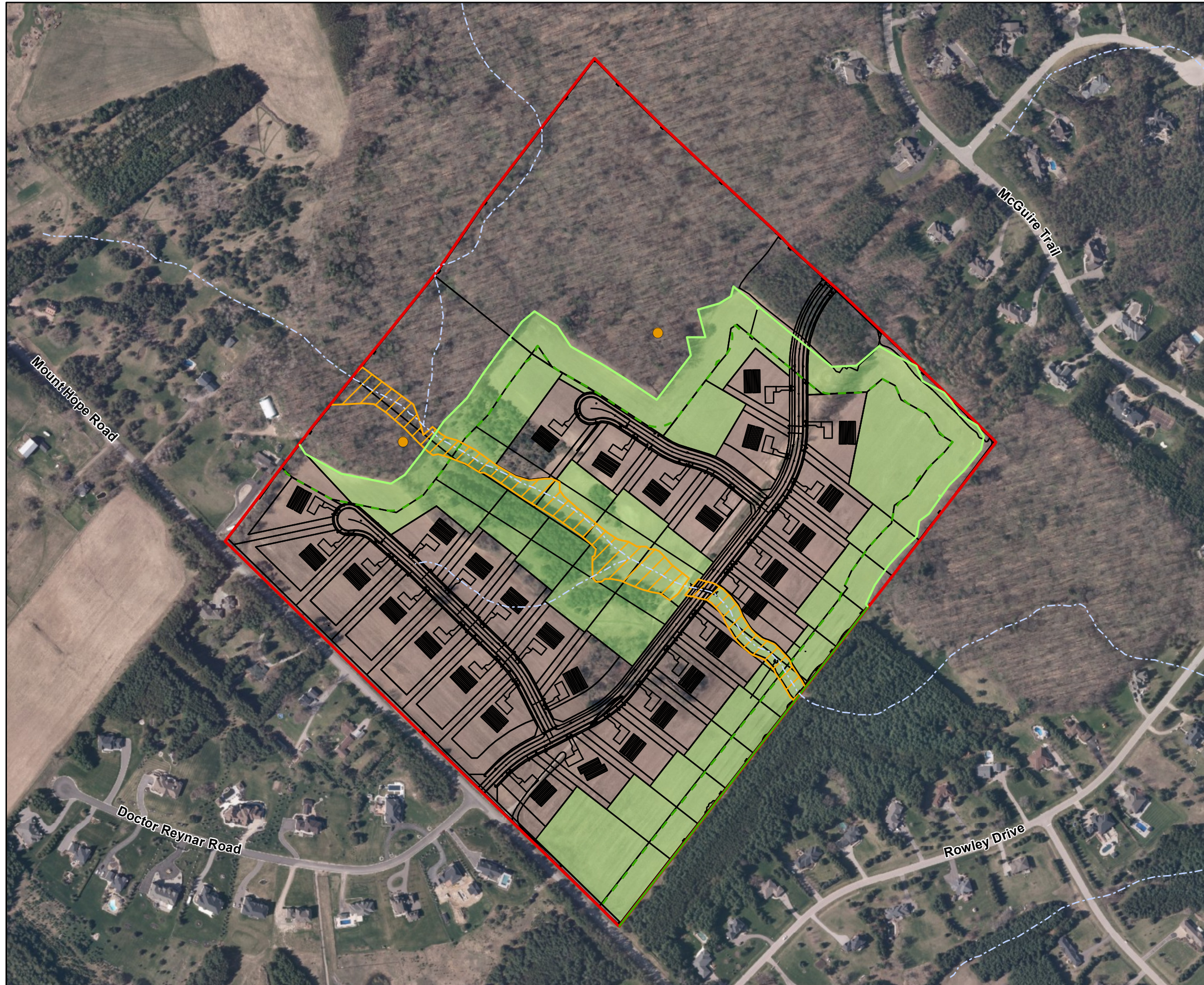
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 Orthoimagery Baselayer: 2019 (FBS)



17791 Mount Hope Road, Caledon

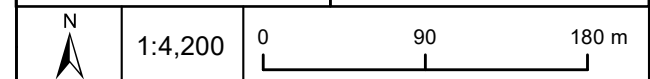
Legend

- Subject Property
- Proposed Development
- Ephemeral Drainage Feature (MNRF 2019)
- Butternut
- Approximate Limit of EZ 2
- Significant Woodland (Beacon)
- Significant Woodland (staked with NVCA February 2019)
- Significant Woodland + 30 m
- Proposed Reforestation
- Septic Beds



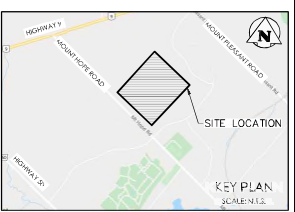
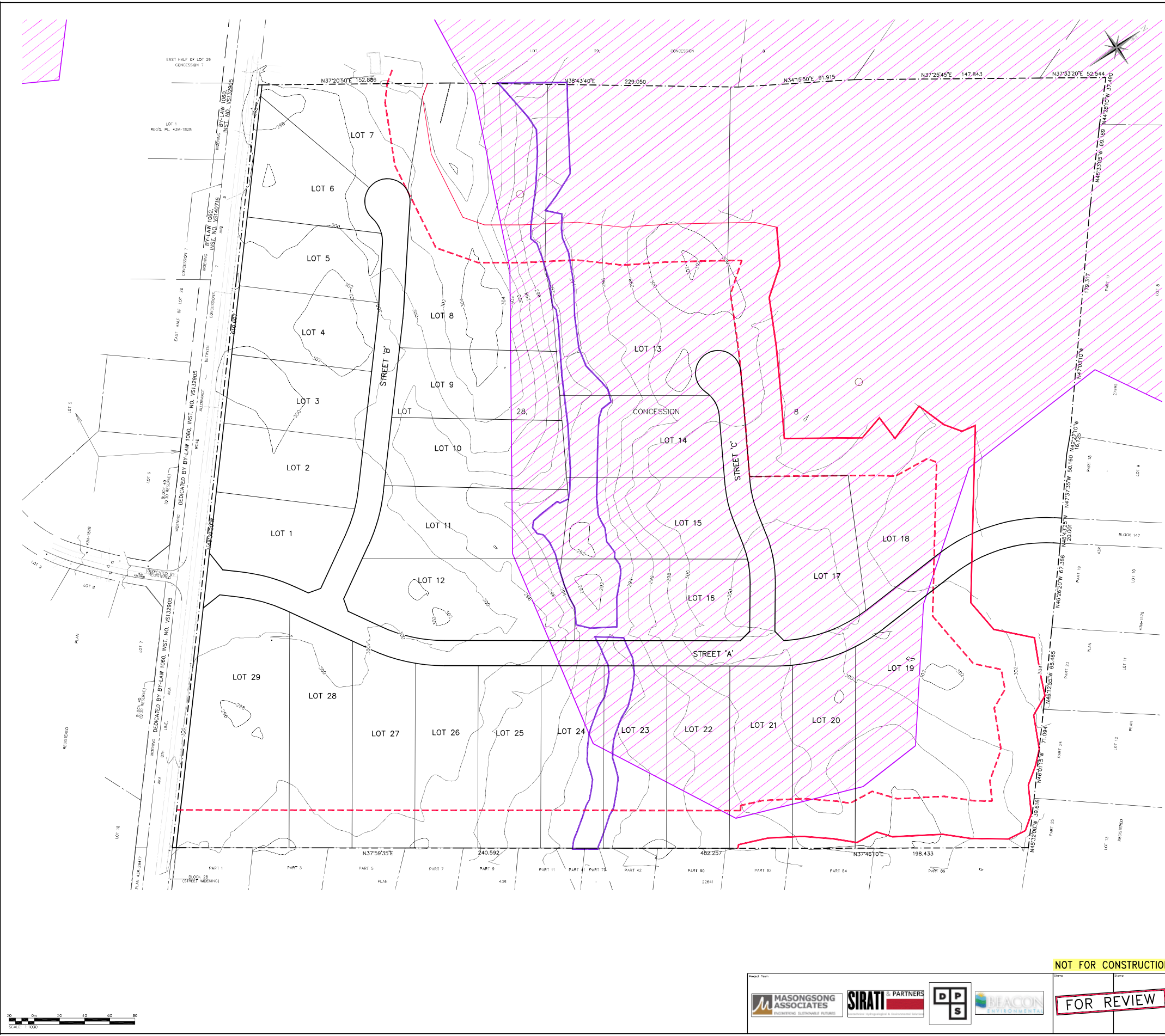
**BEACON ENVIRONMENTAL** Project: 218250  
 Last Revised: December 2019

Client: Joe Triumbari Prepared by: BD  
 Checked by: CG **DRAFT**



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 Orthoimagery Baselayer: 2019 (FBS)





**LEGEND**

- PROPERTY LINE
- - - EXISTING 2.0m CONTOUR
- PR. LOT LINE
- RIGHT OF WAY
- APPROXIMATE LIMIT OF E22
- EPHEMERAL DRAINAGE FEATURE (MRRP 2019)
- - - SIGNIFICANT WOODLANDS +30m
- - - SIGNIFICANT WOODLANDS (NVC Single Strata 28-Feb-2018)
- OAK RIDGES MORAIN LANDFORM CONSERVATION AREAS CATEGORY 2

ISSUED FOR FIRST SUBMISSION	2019/DEC/20
NO. ISSUE / REVISION	1111/MAH/MD

**LOT LAYOUT NOTE:**  
THE LOT LINES AND STRUCTURAL ENVELOPES SHOWN ON THIS PLAN ARE DERIVED FROM THE DEED PLAN PREPARED BY DESIGN PLAN SERVICES INC. ON SEPTEMBER 25, 2018.

**ELEVATION NOTE:**  
ELEVATIONS SHOWN ON THIS PLAN ARE DERIVED FROM TOWN OF CALEDON BENCHMARK NO. 2008190066 ELEVATION = 277.870M

**ELEVATION NOTE:**  
ELEVATIONS SHOWN ON THIS PLAN ARE DERIVED FROM TOWN OF CALEDON BENCHMARK NO. 20081979415 ELEVATION = 278.898M

**SURVEY NOTES:**  
SURVEY COMPLETED BY GREG PAPA SURVEYING (2018/10/25)  
BEARINGS ARE UTM GRID, DISTANCES FROM THE OBSERVATION POINT TO THE POINT OF INTEREST (CPI) ARE IN METERS.  
DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.999678

**GENERAL NOTES:**  
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17791 MOUNT HOPE ROAD

OAK RIDGES MORAIN LANDFORM CONSERVATION AREAS

NOT FOR CONSTRUCTION

FOR REVIEW

Project Team

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2800 Hwy 104 East  
Suite 100  
Markham, ON L3R 9P4  
905-975-9006 T  
905-975-9111 F  
www.cfcrozier.ca



Drawn	SA	Design	1656-5104
Check	S.C./A.A.C.	Perk	M.C.
Scale	1:1000	Sheet	FIG 1





# SIRATI & PARTNERS

Geotechnical Hydrogeological & Environmental Solutions  
 12700- Keele Street  
 King City, ON. L7B 1H5  
 Phone# 905 833 1582, Fax# 905 833 5360

**North:**

**Legend:**

- Property Boundary
- Borehole
- Monitoring Well

**Project Title:**  
 Geotechnical Investigation

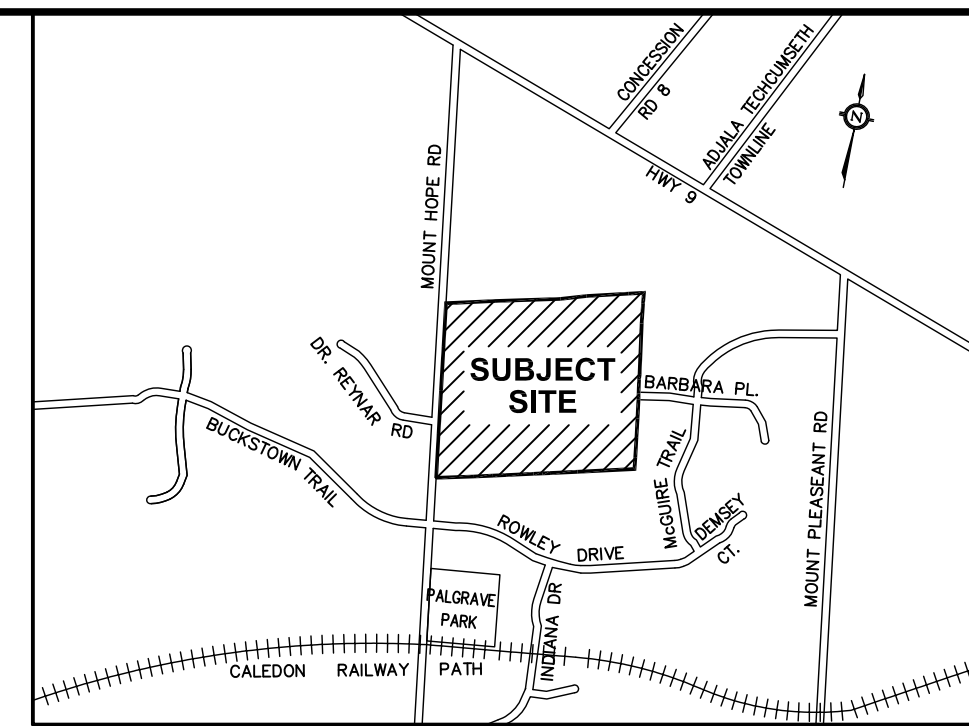
**Site Location:**  
 17791 Mount Hope Road, Caledon, ON

**Figure Title:**  
 Proposed Borehole Location Plan

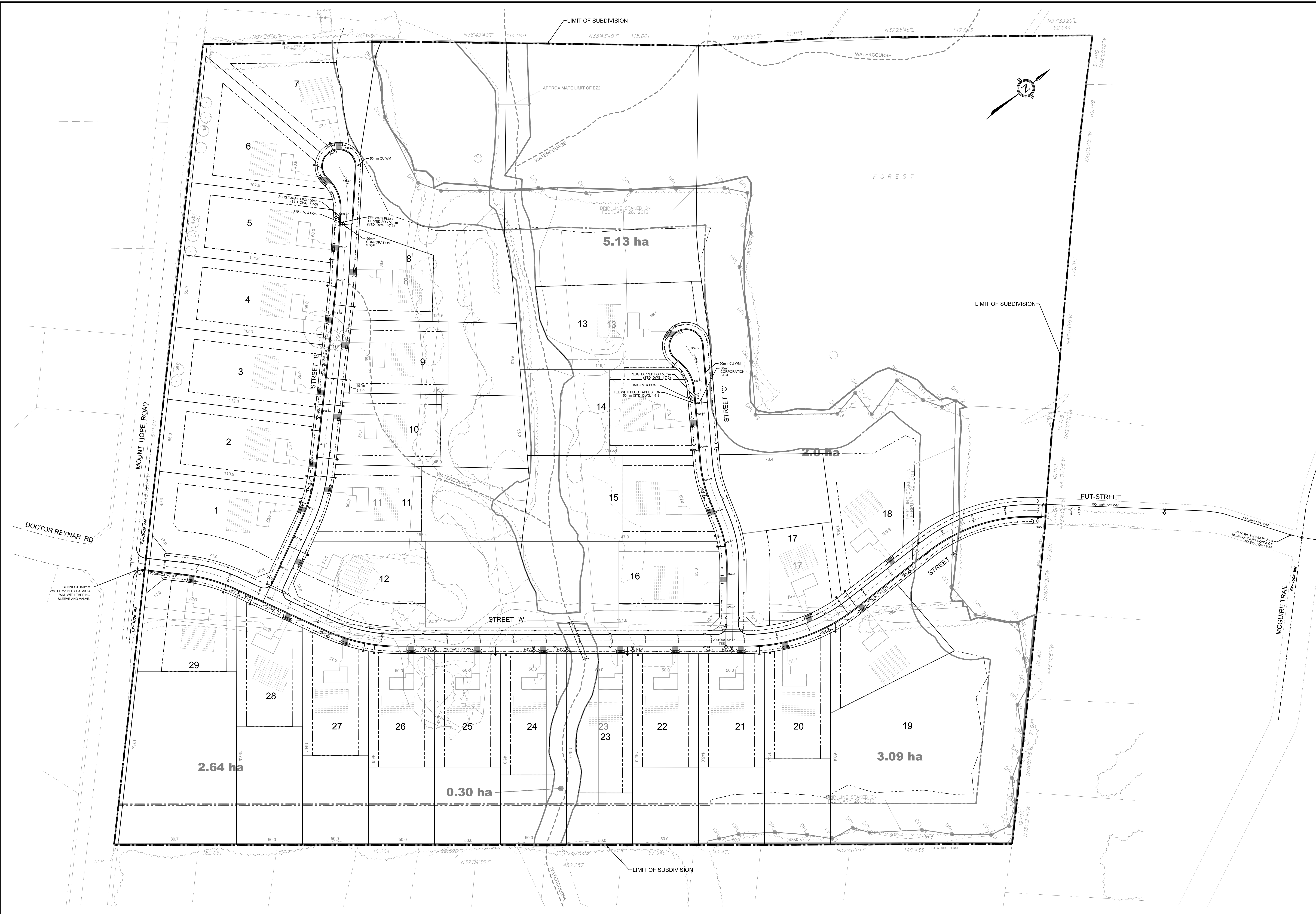
<b>Scale:</b> 0m 50m 100m	<b>Project Number:</b> SP18-334-10
------------------------------	---------------------------------------

<b>Date:</b> December 2018	<b>Figure Number:</b> 1
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- LEGEND :**
- PROPOSED DRIVEWAY WITH CULVERT
  - PROPOSED CULVERT
  - HYDRANT
  - PROPOSED WATER SERV. CONNECTION
  - PROPOSED UTILITY BOX
  - PROPOSED LIGHT POLE
  - PROPOSED VALVE & BOX
  - LIMIT OF DEVELOPMENT
  - STRUCTURE ENVELOP LINE
  - WATERCOURSE
  - EXISTING TREES
  - EDGE OF VEGETATION
  - SEPTIC TANK SYSTEM (TYP)
  - PROPOSED HOUSE (TYP)



REVISIONS				
No.	BY	DATE	REVISION	CONS. TOWN CHECKED APPROV.
1				

**APPROVED FOR CONSTRUCTION**  
 THIS APPROVAL CONSTITUTES A GENERAL REVIEW AND DOES NOT CERTIFY DIMENSIONAL ACCURACY.  
 THIS APPROVAL IS SUBJECT TO THE FURTHER CERTIFICATION OF THE "AS CONSTRUCTED" WORKS BY A REGISTERED PROFESSIONAL ENGINEER OF THE PROVINCE OF ONTARIO.  
 DATE: \_\_\_\_\_ APPROVED BY: H. MONTZ, P.ENG. Town Engineer

**ELEVATION NOTES**  
 ELEVATION SHOWN HEREON ARE GEODETIC AND DERIVED FROM THE TOWN OF CALEDON BENCHMARKS.  
**LOCAL BENCHMARK**  
 NO. 008197558066 ELEVATION = 277.870 METRES AND NO. 00819778416 ELEVATION = 318.849 METRES

DESIGNED BY: APPROVED BY: \_\_\_\_\_

- TOWN NOTES:**
- GENERAL**
- A. SINGLE - STAGE CURB & GUTTER TO COMPLY WITH OPSD 600.040 COMPLETE WITH 2 - 15M BARS
  - B. TWO - STAGE CURB & GUTTER TO COMPLY WITH OPSD 600.070
  - C. SIDEWALKS TO COMPLY WITH OPSD-310.010 AND ARE TO BE 1.5 METRES WIDE ON A 150mm COMPACTED GRANULAR "A" BASE. MINIMUM THICKNESS AS FOLLOWS :  
 -NORMAL THICKNESS 125mm,  
 -RESIDENTIAL DRIVEWAY 150mm  
 -COMMERCIAL/INDUSTRIAL DRIVEWAY 200mm (REINFORCEMENT AS PER OPSD IF REQUIRED)
  - D. NATIVE SUBGRADE SHALL HAVE A CROSSFALL OF 3% AND THE MATERIAL SHALL BE APPROVED BY A SOILS CONSULTANT AND IS SUBJECT TO APPROVAL BY THE DIRECTOR OF PUBLIC WORKS AND ENGINEERING.
  - E. THE ROAD BASE SHALL INCORPORATE 100mm DIAMETER SUBDRAIN WITH FACTORY INSTALLED FILTER FABRIC AS PER TOWN OF CALEDON STANDARD No. 240.
  - F. ALL CURB RADI TO BE MINIMUM OF 10.0 METRES RESIDENTIAL AND 15.0 METRES INDUSTRIAL AT THE EDGE OF ASPHALT.
  - G. NATIVE SUBGRADE TO BE COMPACTED TO MINIMUM 95% STANDARD PROCTOR MAXIMUM DRY DENSITY AND SHALL BE PROOF ROLLED.
  - H. GRADE AND CROSS FALL ADJUSTMENT OF MAINTENANCE HOLE AND CATCH BASIN FRAMES WILL BE MADE USING PRODUCTS SPECIFICALLY MANUFACTURED FOR THAT PURPOSE AS PER OPSD 704.010.
  - I. NON-COMPRESSIBLE BACK FILL WILL BE USED DURING REBUILDING, ADJUSTING, OR ANY OTHER APPLICABLE CATCH BASIN OR MAINTENANCE HOLE WORKS.
  - J. CURB AND SIDEWALK CONCRETE SHALL BE 30MPa AT 28 DAYS WITH 7% +/- 1.5% ENTRAINED AIR AND NOT LESS THAN 355 kg/m<sup>3</sup> OF CEMENT (PER OPSD 315 AND 353)

- REGION OF PEEL NOTES:**
- GENERAL**
1. THE APPLICANT, APPLICANT'S REPRESENTATIVE, CONSULTANT, CONTRACTOR AND SUB CONTRACTORS ARE RESPONSIBLE TO ENSURE THAT THEIR DESIGN MATERIALS AND CONSTRUCTION PRACTICES CONFORM TO THE LATEST REGION OF PEEL STANDARDS, SPECIFICATIONS, MATERIALS AND DESIGN CRITERIA, POSTED ON REGION OF PEEL'S WEBSITE ([www.regionofpeel.ca/standards](http://www.regionofpeel.ca/standards)). IN THE ABSENCE OF REGION SPECIFICATIONS, THE ONTARIO PROVINCIAL STANDARD SPECIFICATIONS (OPSS) SHALL APPLY.
  2. ALL WORKS SHALL BE COMPLETED IN ACCORDANCE WITH THE "OCCUPATIONAL HEALTH AND SAFETY ACT", THE GENERAL CONTRACTOR SHALL BE DEEMED THE CONSTRUCTOR AS DEFINED IN THE ACT.
  3. THE CONTRACTOR AT THEIR EXPENSE SHALL VERIFY THE LOCATION, DIMENSION AND ELEVATION OF ALL EXISTING SERVICES AND UTILITIES IN THE FIELD.
  4. PRIOR TO EXCAVATION OR BORING CONTRACTOR AT THEIR EXPENSE SHALL EXPOSE AND VERIFY THE LOCATION AND ELEVATION OF ALL EXISTING UTILITIES AND SERVICES TO BE CROSSED AND MUST NOTIFY THE REGION ENGINEER AND THE AGENCY FIELD INSPECTOR AND/OR PROJECT MANAGER IMMEDIATELY, IN WRITING, OF ANY CONFLICTS OR DISCREPANCIES. CONTRACTOR SHALL BE RESPONSIBLE FOR EXPOSING THE EXISTING UTILITIES FAR ENOUGH IN ADVANCE OF CONSTRUCTION TO MAKE NECESSARY DESIGN ADJUSTMENTS FOR REVIEW AND APPROVAL, IF REQUIRED, WITHOUT DELAYING THE WORK.
  5. THE CONTRACTOR, AT THEIR EXPENSE AND TO THE SATISFACTION OF THE REGION OF PEEL, SHALL BE RESPONSIBLE FOR THE RESTORATION AND THE REPAIR OF THE EXISTING UTILITIES AND ALL AREAS BEYOND THE PLAN OF SUBDIVISION DISTURBED DURING CONSTRUCTION.
  6. THE SUPPORT OF ALL UTILITIES SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION.
  7. ALL BACKFILL FOR SEWERS, WATERMANS AND UTILITIES ON THE ROAD ALLOWANCE MUST BE MECHANICALLY COMPACTED.
  8. ALL BACKHOLES SHOWN ON DRAWING ARE FOR INFORMATION ONLY. REFER TO GEOTECHNICAL REPORT.
  9. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE SPECIFIED.

- WATERMANS**
1. THE REGION OF PEEL SHALL CONDUCT THE OPERATION OF EXISTING VALVES AND HYDRANTS IF REQUIRED.
  2. ALL WATERMANS SHALL HAVE 1.70m MINIMUM COVER FOR URBAN ROAD DESIGN AND 2.1m MINIMUM COVER FOR RURAL ROAD DESIGN.
  3. ALL WATERMANS SHALL MAINTAIN A MINIMUM 1.5m CLEARANCE FROM ALL MANHOLES AND CATCH BASINS, WHERE APPLICABLE.
  4. FOR WATERMANS CROSSING OVER OR UNDER SEWERS A MINIMUM 0.5m VERTICAL CLEARANCE SHALL BE PROVIDED.
  5. FOR WATERMAIN CROSSING A SANITARY SEWER, WATERMAIN JOINTS ARE TO BE OFFSET A MINIMUM OF 2.5m HORIZONTALLY FROM THE CENTERLINE OF THE SANITARY SEWER.
  6. WATERMAIN BEDDING SHOULD BE AS PER TRENCH DETAIL ON THE PLAN AND PROFILE DRAWING AND COMPACTED TO 100% SPD.
  7. WATERMANS TO BE INSTALLED TO GRADES AS SHOWN ON APPROVED PLANS, COPY OF GRADE SHEET MUST BE SUPPLIED TO THE REGION OF PEEL INSPECTOR PRIOR TO COMMENCEMENT OF WORK.
  8. ANY JOINT DEFLECTION SHALL BE 50% OF MANUFACTURER'S SPECIFICATIONS, PIPE BARREL DEFLECTION IS PROHIBITED.
  9. FIRE HYDRANTS SHALL BE INSTALLED AS PER REGION STD. DWG. 1-6-1 OR 1-6-2 WITH FLANGE SET BETWEEN 50mm AND 150mm ABOVE FINISHED GRADE.
  10. ALL HYDRANTS SHALL HAVE 1.2m MINIMUM HORIZONTAL CLEARANCE FROM ALL OTHER UTILITIES AND STRUCTURES MEASURED FROM THE NEAREST POINT OF THE STRUCTURE.
  11. MECHANICAL RESTRAINTS ARE REQUIRED FOR ALL FITTINGS, VALVES, DEAD ENDS, CAPS AND HYDRANTS ON ALL PVC WATERMANS. MINIMUM RESTRAINED PIPE LENGTH AS PER REGION'S STANDARD.
  12. STAINLESS STEEL NUTS AND BOLTS ARE TO BE USED ON ALL METALLIC FITTINGS AND JOINT RESTRAINTS.
  13. ALL METALLIC VALVES, FITTINGS, THROUGH WALL METAL PIPING AND JOINT RESTRAINTS TO BE C/DW DENSO PASTE, DENSO MASTIC & DENSO TAPE OR APPROVED EQUAL APPLIED TO MANUFACTURER'S RECOMMENDATIONS.
  14. WHERE PLASTIC PIPE IS USED, INSTALL A 12 GAUGE TWY STRANDED COPPER, LIGHT COLOURED, PLASTIC COATED TRACER WIRE ATTACHED TO THE PIPE WITH APPROVED WIRE SPLICE. THE WIRE SHOULD BE BROUGHT TO THE SURFACE AT EACH SERVICE & VALVE BOX AND HYDRANT VALVES.
  15. 50mm DIAMETER WATERMAIN SHALL BE TYPE K SOFT COPPER, WATERMAIN INSTALLATION IN CUL-DE-SACS AS PER REGION STD. DWG. 1-7-4.
  16. A PHYSICAL SEPARATION MUST BE MAINTAINED AT ALL CONNECTION POINTS OF NEW WATERMAIN TO THE EXISTING SYSTEM UNTIL BACTERIOLOGICAL TESTS HAVE PASSED, AS PER STD. DWG 1-7-7 AND 1-7-8.

17. PROVISION FOR FLUSHING OF NEW WATERMANS PRIOR TO TESTING MUST BE PROVIDED WITH AT LEAST 50mm OUTLET ON WATERMANS SMALLER THAN 300mm IN DIAMETER, AND MINIMUM 100mm OUTLET ON WATERMANS 300mm AND LARGER. COPPER WATERMANS ARE TO HAVE FLUSHING POINTS AT THE END, THE SAME SIZE AS THE WATERMAIN, AS PER STD. DWG. 1-7-7 AND 1-7-8.
  18. ALL SERVICE CONNECTIONS TO PVC PIPES ARE TO BE MADE USING APPROVED WIDE BAND SERVICE SADDLE. DIRECT TAPPING IS NOT ALLOWED.
  19. COPPER WATER SERVICES SHALL BE MINIMUM 25mm OR AS INDICATED ON THE APPROVED DRAWINGS. NON METALLIC SERVICES SHALL BE AS PER LATEST APPROVED REGIONAL PRODUCT LIST C/W TRACER WIRE.
  20. THE MINIMUM LATERAL DISTANCE BETWEEN WATER SERVICES AND OTHER UTILITIES SHALL BE 1.2m.
  21. ALL RESIDENTIAL WATER SERVICE BOXES/CURB STOPS SHALL BE INSTALLED WITHIN SODDED AREAS WITH MINIMUM DISTANCE OF 1.0 METRES FROM THE EDGE OF THE DRIVEWAY. BE FLUSH WITH GRADE AND ACCESSIBLE AT ALL TIME.
  22. VALVE AND BOXES SHALL BE CAST IRON SLIDING TYPE, COMPLETED WITH VALVE GUIDE PLATES AND INSTALLED AS PER REGION STD. 1-3-6. MAINLINE VALVES TO BE RESTRAINED AS PER REGION STD. 1-3-3A. VALVES SHALL OPEN TO THE LEFT (COUNTER-CLOCKWISE)
  23. ALL WATER SERVICES BOXES SHOULD BE "LEAD FREE" AS PER REGION'S MATERIAL SPECIFICATIONS.
  24. THE REGION WILL COMPLETE THE NECESSARY WATER TESTING (PRESSURE TEST, FLUSHING, CHLORINATION AND SAMPLING). CONTRACTOR MAY PROCEED WITH HIS OWN PRESSURE TEST AND FLUSHING PRIOR TO REGION'S TESTING.
- WATERMAIN IN FILL AREA**
1. NO WATERMAIN TO BE LAID ON FILL UNTIL THE FIELD DENSITY TEST REPORTS HAVE BEEN SUBMITTED TO AND APPROVED BY THE REGION OF PEEL OR THE CONSULTING ENGINEER.
  2. PIPE JOINT DEFLECTIONS ARE NOT ALLOWED IN FILL AREA.
  3. JOINTS SHALL BE MECHANICALLY RESTRAINED THE WHOLE LENGTH.
  4. ALL HYDRANTS, TEE BRANCH VALVES AND HORIZONTAL BENDS ARE TO BE MECHANICALLY RESTRAINED WITH THE ROADS.
  5. IN EXISTING MUNICIPAL RIGHT-OF-WAY OR EASEMENT, FILL TO BE PLACED TO 500mm MINIMUM ABOVE THE OVERTOP OF THE WATERMAIN AND TO 300mm EITHER SIDE, COMPACTED TO MINIMUM 100% STANDARD PROCTOR DENSITY IN 300mm LIFTS, AND THEREAFTER FOR EVERY 300mm LIFT ALONG THE CENTERLINE, AND 1.5m TO EITHER SIDE, OF WATERMAIN AT MAXIMUM INTERVAL OF 30.0m. TEST RESULTS MUST BE SUBMITTED TO AND APPROVED BY THE CONSULTANT OR AGENCY.

**PALGRAVE ESTATES SUBDIVISION**

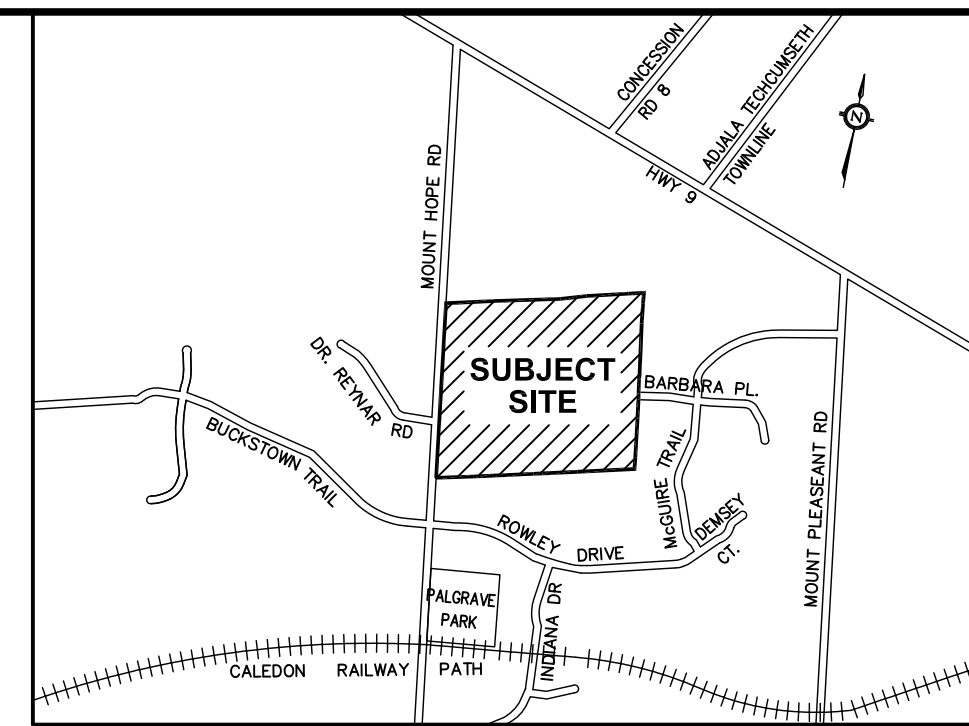
CONSULTANT: DATE: OCT 11, 2019  
 PROJECT: PALGRAVE ESTATES SUBDIVISION

REGION OF PEEL  
 TOWN OF CALEDON

**GENERAL PLAN**

SCALE: 1:1000	PROJECT No. 18-951
DESIGNED BY: M.N.	DRAWN BY: MAEL CAD
CHECKED BY: A.J.	DATE: OCTOBER 2019
	PLAN No. GP1





- LEGEND :**
- PROPOSED DRIVEWAY WITH CULVERT
  - PROPOSED CULVERT
  - HYDRANT
  - PROPOSED WATER SERV. CONNECTION
  - PROPOSED UTILITY BOX
  - PROPOSED LIGHT POLE
  - PROPOSED VALVE & BOX
  - LIMIT OF DEVELOPMENT
  - STRUCTURE ENVELOPE LINE
  - WATERCOURSE
  - EXISTING TREES
  - EDGE OF VEGETATION
  - SEPTIC TANK SYSTEM (TYP)
  - PROPOSED HOUSE (TYP)
  - DRAINAGE AREA (ha)  
RUNOFF COEFFICIENT
  - EXTERNAL DRAINAGE AREA (ha)  
RUNOFF COEFFICIENT
  - PROPOSED OVERLAND FLOW DIRECTION
  - EXISTING OVERLAND FLOW
  - PROPOSED DRAINAGE AREA
  - EXISTING DRAINAGE AREA
  - EXTERNAL DRAINAGE AREA
  - PROPOSED ENHANCED GRASS SWALE

REVISIONS			
No.	BY	DATE	REVISION
1			

**APPROVED FOR CONSTRUCTION**  
 THIS APPROVAL CONSTITUTES A GENERAL REVIEW AND DOES NOT CERTIFY DIMENSIONAL ACCURACY.  
 THIS APPROVAL IS SUBJECT TO THE FURTHER CERTIFICATION OF THE "AS CONSTRUCTED" WORKS BY A REGISTERED PROFESSIONAL ENGINEER OF THE PROVINCE OF ONTARIO.  
 DATE: \_\_\_\_\_ APPROVED BY: H. MUNTZ, P.ENG.  
 Town Engineer

**ELEVATION NOTES**  
 ELEVATION SHOWN HEREON ARE GEODETIC AND DERIVED FROM THE TOWN OF CALEDON BENCHMARKS.  
**LOCAL BENCHMARK**  
 NO. 008197558066 ELEVATION = 277.870 METRES AND NO. 00819778416 ELEVATION = 318.849 METRES

DESIGNED BY: APPROVED BY: \_\_\_\_\_

**PALGRAVE ESTATES SUBDIVISION**

CONSULTANT: **MASONGSONG ASSOCIATES** 1188 KENNEDY ROAD, SUITE 201, MARKHAM, ONTARIO L3R 9W5  
 TEL: (905) 477-8800 FAX: (905) 477-8802 WWW.MASONGSONG.COM

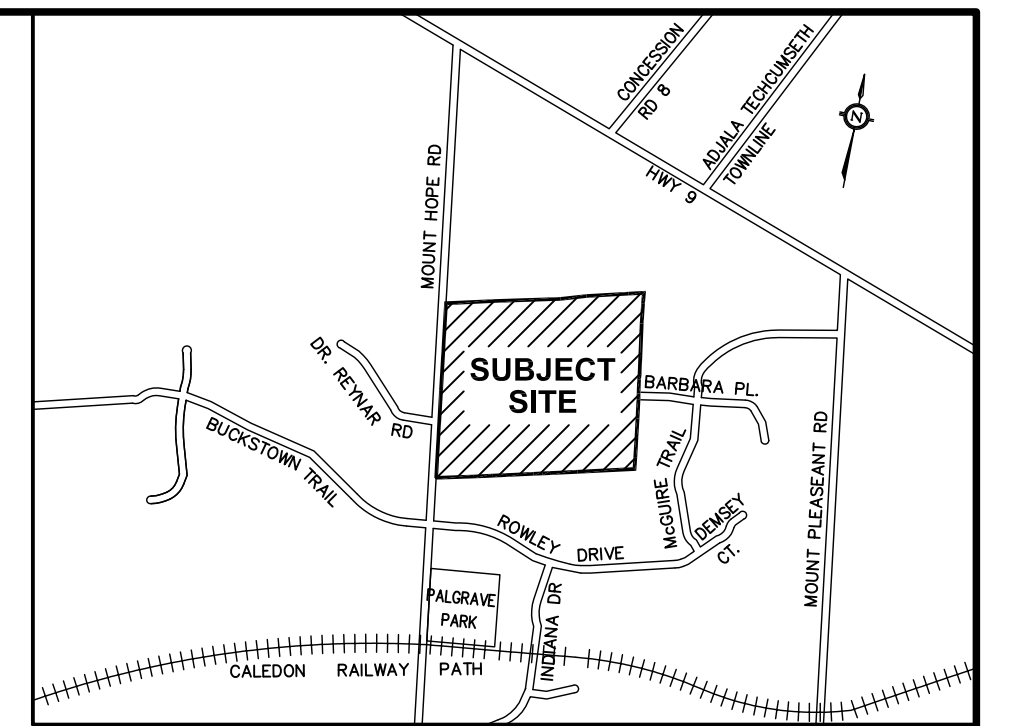
**Region of Peel**  
 Working for you  
**TOWN OF CALEDON**

**EXISTING DRAINAGE PLAN**

SCALE: 1:1000	PROJECT No. 18-951
DESIGNED BY: M.N.	DRAWN BY: MAEL CAD
CHECKED BY: A.J.	DATE: OCTOBER 2019
	PLAN No. DR1

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- LEGEND :**
- PROPOSED DRIVEWAY WITH CULVERT
  - PROPOSED CULVERT
  - HYDRANT
  - PROPOSED WATER SERV. CONNECTION
  - PROPOSED UTILITY BOX
  - PROPOSED LIGHT POLE
  - PROPOSED VALVE & BOX
  - LIMIT OF DEVELOPMENT
  - STRUCTURE ENVELOPE LINE
  - WATERCOURSE
  - EXISTING TREES
  - EDGE OF VEGETATION
  - SEPTIC TANK SYSTEM (TYP)
  - PROPOSED HOUSE (TYP)
  - DRAINAGE AREA (ha)
  - RUNOFF COEFFICIENT
  - EXTERNAL DRAINAGE AREA ID
  - DRAINAGE AREA (ha)
  - RUNOFF COEFFICIENT
  - PROPOSED OVERLAND FLOW DIRECTION
  - EXISTING OVERLAND FLOW
  - PROPOSED DRAINAGE AREA
  - EXISTING DRAINAGE AREA
  - EXTERNAL DRAINAGE AREA
  - PROPOSED ENHANCED GRASS SWALE

REVISIONS			
NO.	BY	DATE	REVISION
1			

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**LOCAL BENCHMARK**  
 NO. 00819758066 ELEVATION = 277.870 METRES AND NO. 00819778416 ELEVATION = 318.849 METRES

DESIGNED BY: APPROVED BY: \_\_\_\_\_

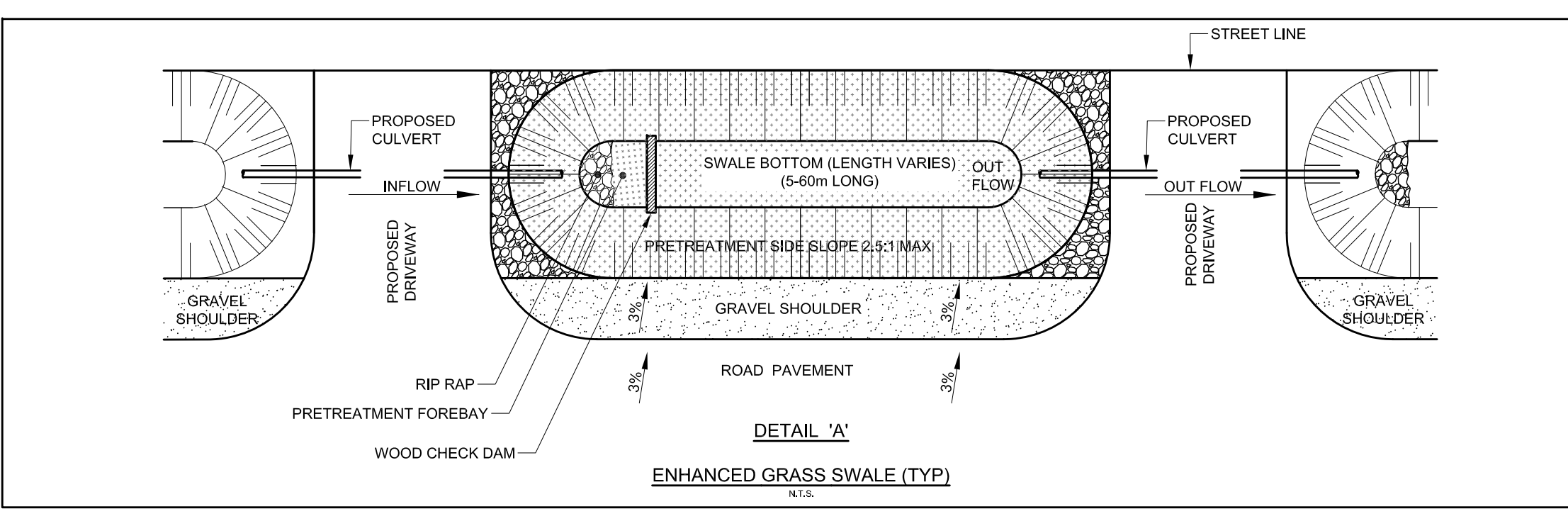
**PALGRAVE ESTATES SUBDIVISION**

**MASONGSONG ASSOCIATES**  
 CONSULTANTS:

**Region of Peel**  
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**TOWN OF CALEDON**

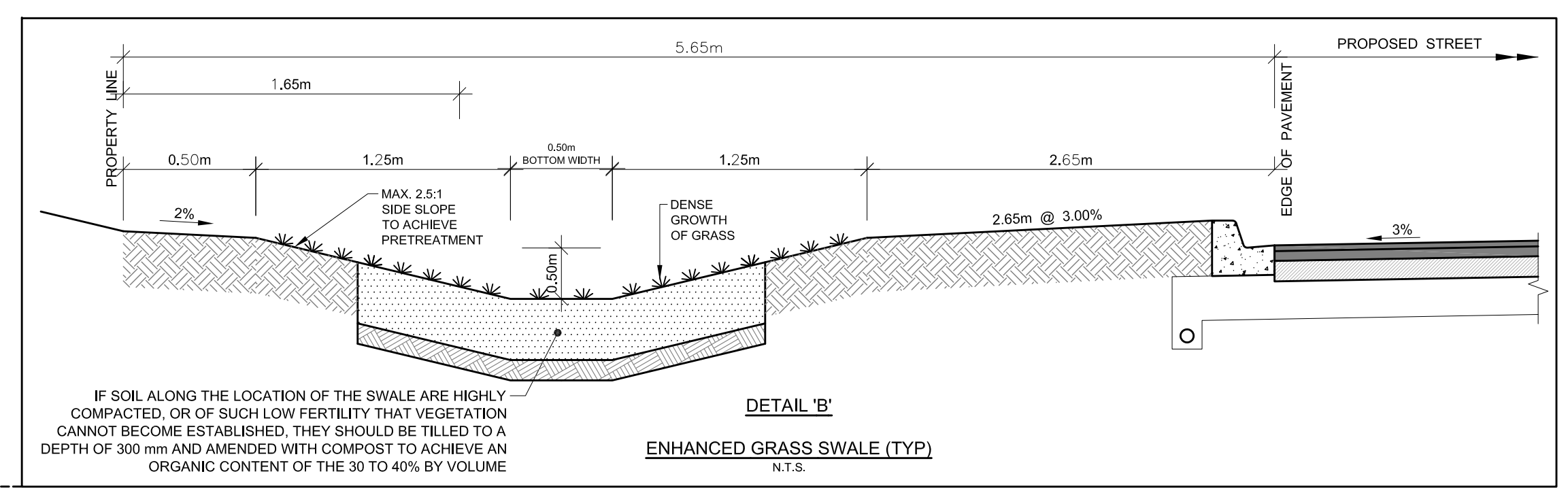
**PROPOSED DRAINAGE PLAN**

SCALE: 1:1000	PROJECT No. 18-951
DESIGNED BY: M.N.	DRAWN BY: MAEL CAD
CHECKED BY: A.J.	DATE: OCTOBER 2019
	PLAN No. DR2

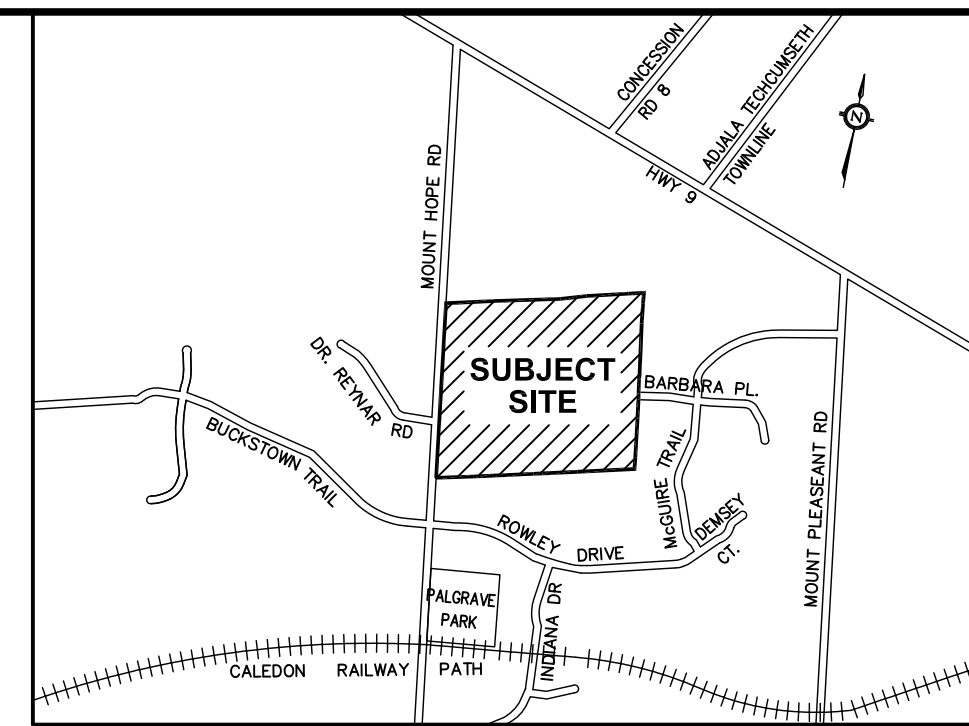
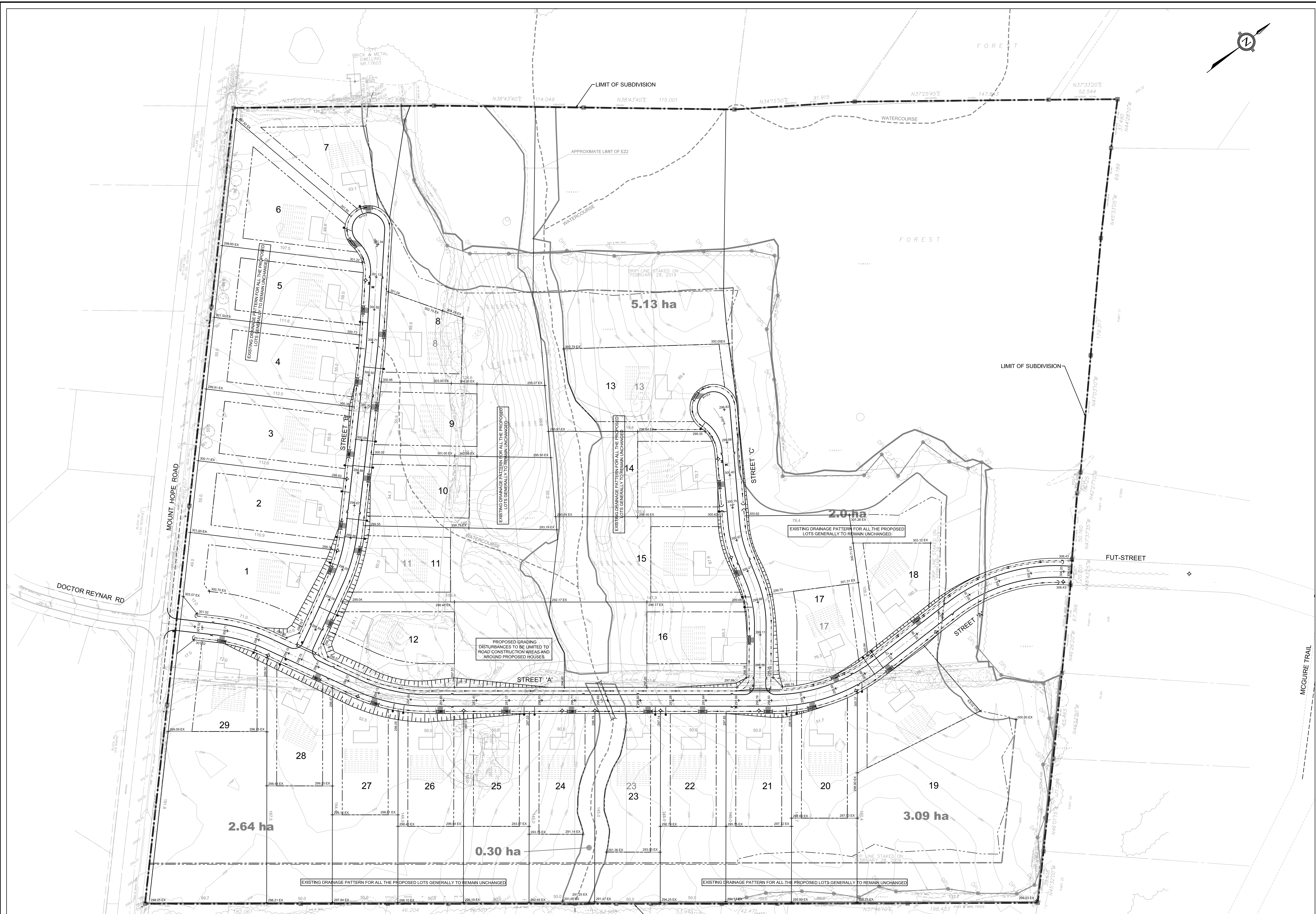


DETAILED DRAINAGE PLAN FOR INDIVIDUAL LOTS TO BE PROVIDED IN PERMITTING STAGE

PROPOSED GRADING DISTURBANCES TO BE LIMITED TO ROAD CONSTRUCTION AREAS AND AROUND PROPOSED HOUSES







- LEGEND :**
- PROPOSED DRIVEWAY WITH CULVERT
  - PROPOSED CULVERT
  - HYDRANT
  - PROPOSED WATER SERV. CONNECTION
  - PROPOSED UTILITY BOX
  - PROPOSED LIGHT POLE
  - PROPOSED VALVE & BOX
  - LIMIT OF DEVELOPMENT
  - STRUCTURE LOCATION LINE
  - WATERCOURSE
  - EXISTING TREES
  - EDGE OF VEGETATION
  - SEPTIC TANK SYSTEM (TYP)
  - PROPOSED HOUSE (TYP)
  - 300.20EX x EXISTING ELEVATION
  - 300.20EX x PROPOSED ELEVATION

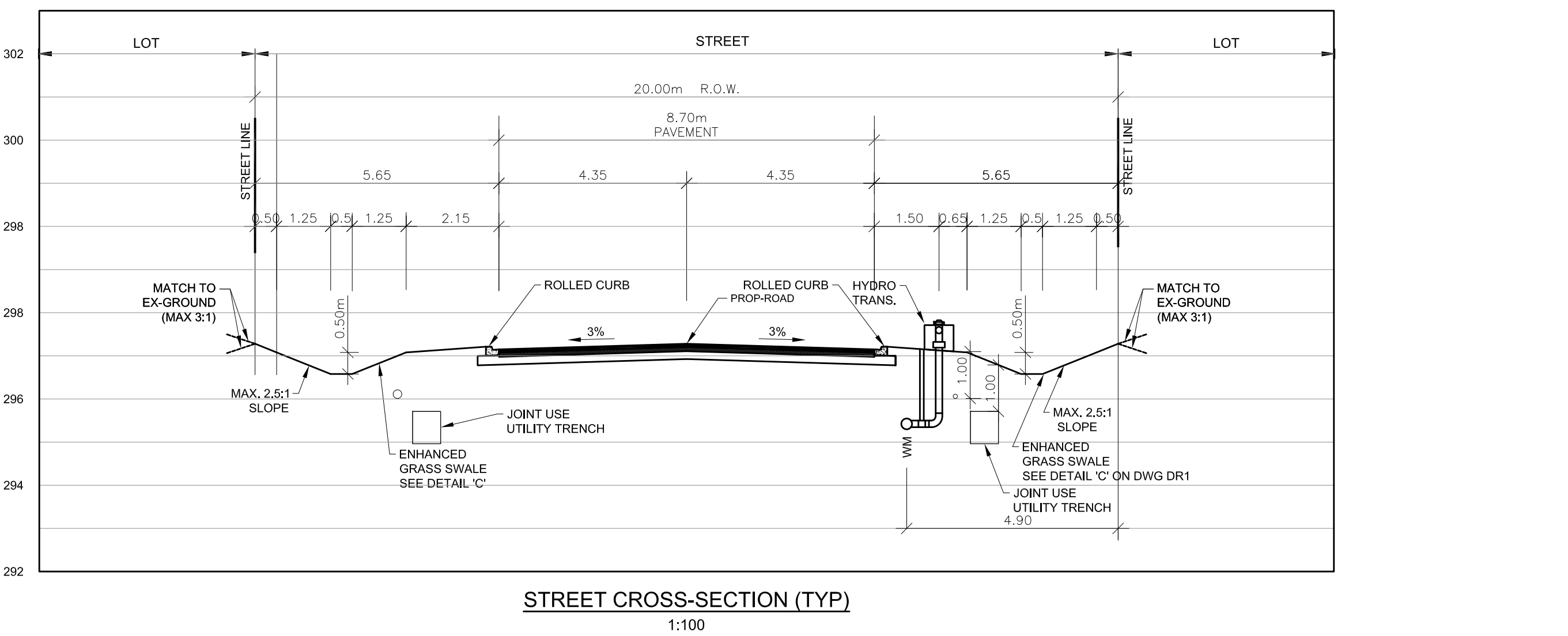
REVISIONS			
No.	BY	DATE	REVISION
1			

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 DATE: \_\_\_\_\_ APPROVED BY: H. MUNTZ, P.ENG. Town Engineer

**ELEVATION NOTES**  
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**LOCAL BENCHMARK**  
 NO. 008197558066 ELEVATION = 277.870 METRES AND NO. 00819778416 ELEVATION = 318.849 METRES

DESIGNED BY: W. C. I.P.  
 APPROVED BY: \_\_\_\_\_

- GENERAL NOTES:**
- A. SINGLE - STAGE CURBS & GUTTER TO COMPLY WITH OPSD 600.040 COMPLETE WITH 2 - 15M BARS
  - B. TWO - STAGE CURBS & GUTTER TO COMPLY WITH OPSD 600.070
  - C. SIDEWALKS TO COMPLY WITH OPSD-10.010 AND ARE TO BE 1.5 METRES WIDE ON A 150mm COMPACTED GRANULAR "A" BASE, MINIMUM THICKNESS AS FOLLOWS:  
 -NORMAL THICKNESS 125mm  
 -RESIDENTIAL DRIVEWAY 150mm  
 -COMMERCIAL/INDUSTRIAL DRIVEWAY 200mm (REINFORCEMENT AS PER OPSD IF REQUIRED)
  - D. THE ROAD BASE SHALL HAVE A CROSSFALL OF 3% AND THE MATERIAL SHALL BE APPROVED BY A SOILS CONSULTANT AND IS SUBJECT TO APPROVAL BY THE DIRECTOR OF PUBLIC WORKS AND ENGINEERING.
  - E. THE ROAD BASE SHALL INCORPORATE 100mm DIAMETER SUBDRAIN WITH FACTORY INSTALLED FILTER FABRIC AS PER TOWN OF CALEDON STANDARD No. 240.
  - F. ALL CURB RADA TO BE MINIMUM OF 10.0 METRES RESIDENTIAL AND 15.0 METRES INDUSTRIAL AT THE EDGE OF ASPHALT.
  - G. NATIVE SUBGRADE TO BE COMPACTED TO MINIMUM 95% STANDARD PROCTOR MAXIMUM DRY DENSITY AND SHALL BE PROOF ROLLED.
  - H. GRADE AND CROSS FALL ADJUSTMENT OF MAINTENANCE HOLES AND CATCH BASIN FRAMES WILL BE MADE USING PRODUCTS SPECIFICALLY MANUFACTURED FOR THAT PURPOSE AS PER OPSD 704.010.
  - I. NON-COMPRESSIBLE BACK FILL WILL BE USED DURING REBUILDING, ADJUSTING, OR ANY OTHER APPLICABLE CATCH BASIN OR MAINTENANCE HOLE WORKS.
  - J. CURB AND SIDEWALK CONCRETE SHALL BE 30MPa AT 28 DAYS WITH 7% +/- 1.5% ENTRAINED AIR AND NOT LESS THAN 355 kg/m<sup>3</sup> OF CEMENT (PER OPSD 315 AND 353)



- REGION OF PEEL GENERAL NOTES:**
1. THE APPLICANT, APPLICANT'S REPRESENTATIVE, CONSULTANT, CONTRACTOR AND SUB CONTRACTORS ARE RESPONSIBLE TO ENSURE THAT THEIR DESIGN MATERIALS AND CONSTRUCTION PRACTICES CONFORM TO THE LATEST REGION OF PEEL STANDARDS, SPECIFICATIONS, MATERIALS AND DESIGN CRITERIA, POSTED ON REGION OF PEEL'S WEBSITE ([www.regionofpeel.ca/standards](http://www.regionofpeel.ca/standards)) IN THE ABSENCE OF REGION SPECIFICATIONS, THE ONTARIO PROVINCIAL STANDARD SPECIFICATIONS (OPSS) SHALL APPLY.
  2. ALL WORKS SHALL BE COMPLETED IN ACCORDANCE WITH THE "OCCUPATIONAL HEALTH AND SAFETY ACT". THE GENERAL CONTRACTOR SHALL BE DEEMED THE CONSTRUCTOR AS DEFINED IN THE ACT.
  3. THE CONTRACTOR AT THEIR EXPENSE SHALL VERIFY THE LOCATION, DIMENSION AND ELEVATION OF ALL EXISTING SERVICES AND UTILITIES IN THE FIELD.
  4. PRIOR TO EXCAVATION OR BORING CONTRACTOR AT THEIR EXPENSE SHALL EXPOSE AND VERIFY THE LOCATION AND ELEVATION OF ALL EXISTING UTILITIES AND SERVICES TO BE CROSSED AND MUST NOTIFY THE DESIGN ENGINEER AND THE AGENCY FIELD INSPECTOR AND/OR PROJECT MANAGER IMMEDIATELY. IN WRITING, OF ANY CONFLICTS OR DISCREPANCIES. CONTRACTOR SHALL BE RESPONSIBLE FOR EXPOSING THE EXISTING UTILITIES FAR ENOUGH IN ADVANCE OF CONSTRUCTION TO MAKE NECESSARY DESIGN MODIFICATIONS FOR REVIEW AND APPROVAL, IF REQUIRED, WITHOUT DELAYING THE WORK.
  5. THE CONTRACTOR, AT THEIR EXPENSE AND TO THE SATISFACTION OF THE REGION OF PEEL, SHALL BE RESPONSIBLE FOR THE RESTORATION AND THE REPAIR OF THE EXISTING UTILITIES AND ALL AREAS BEYOND THE PLAN OF SUBDIVISION DISTURBED DURING CONSTRUCTION.
  6. THE SUPPORT OF ALL UTILITIES SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION.
  7. ALL BACKFILL FOR SEWERS, WATERMANS AND UTILITIES ON THE ROAD ALLOWANCE MUST BE MECHANICALLY COMPACTED.
  8. ALL BOREHOLES SHOWN ON DRAWING ARE FOR INFORMATION ONLY. REFER TO GEOTECHNICAL REPORT.
  9. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE SPECIFIED.

**PALGRAVE ESTATES SUBDIVISION**

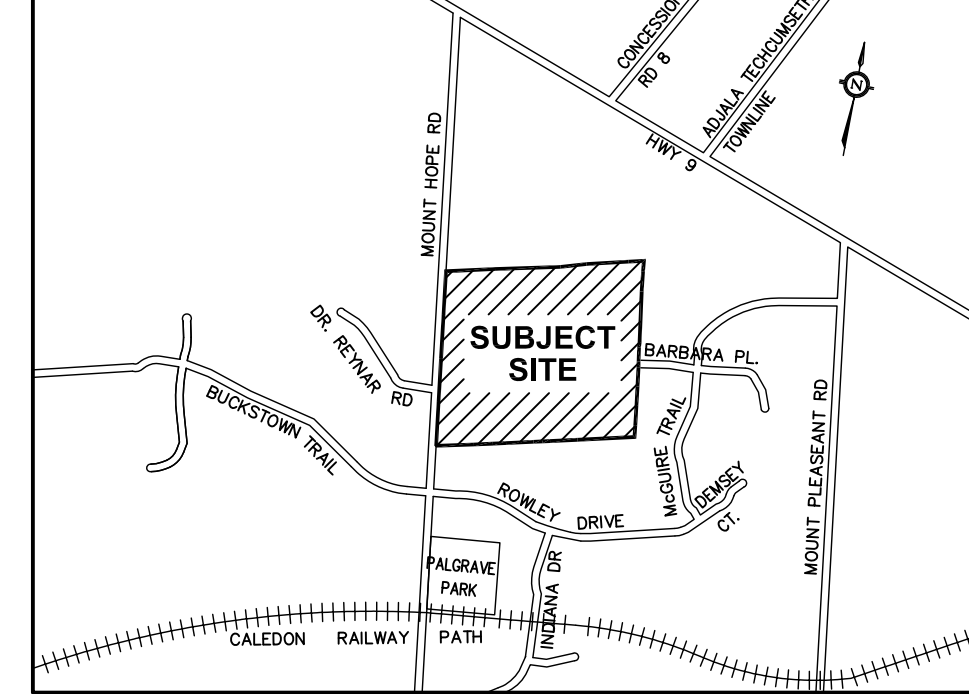
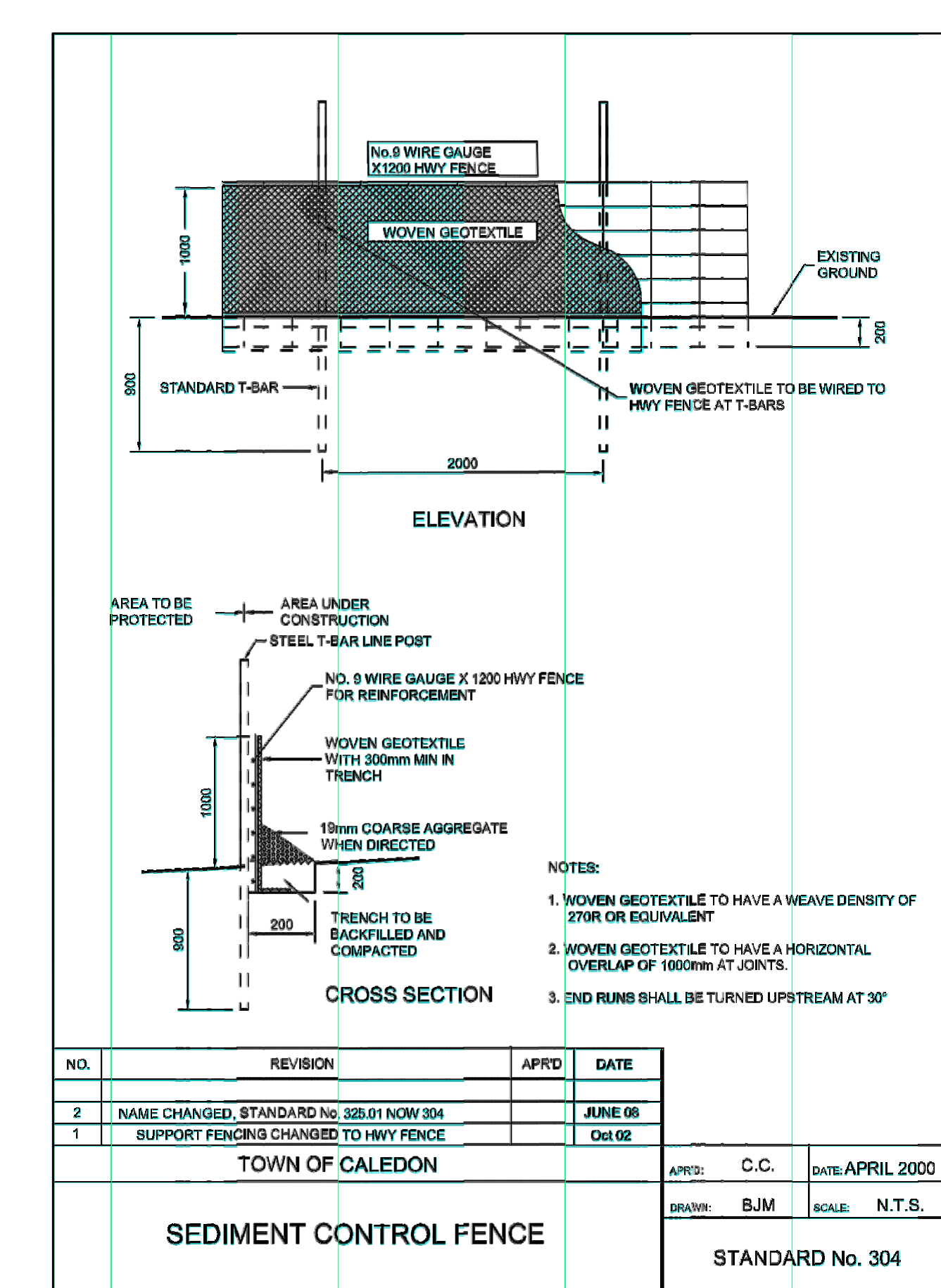
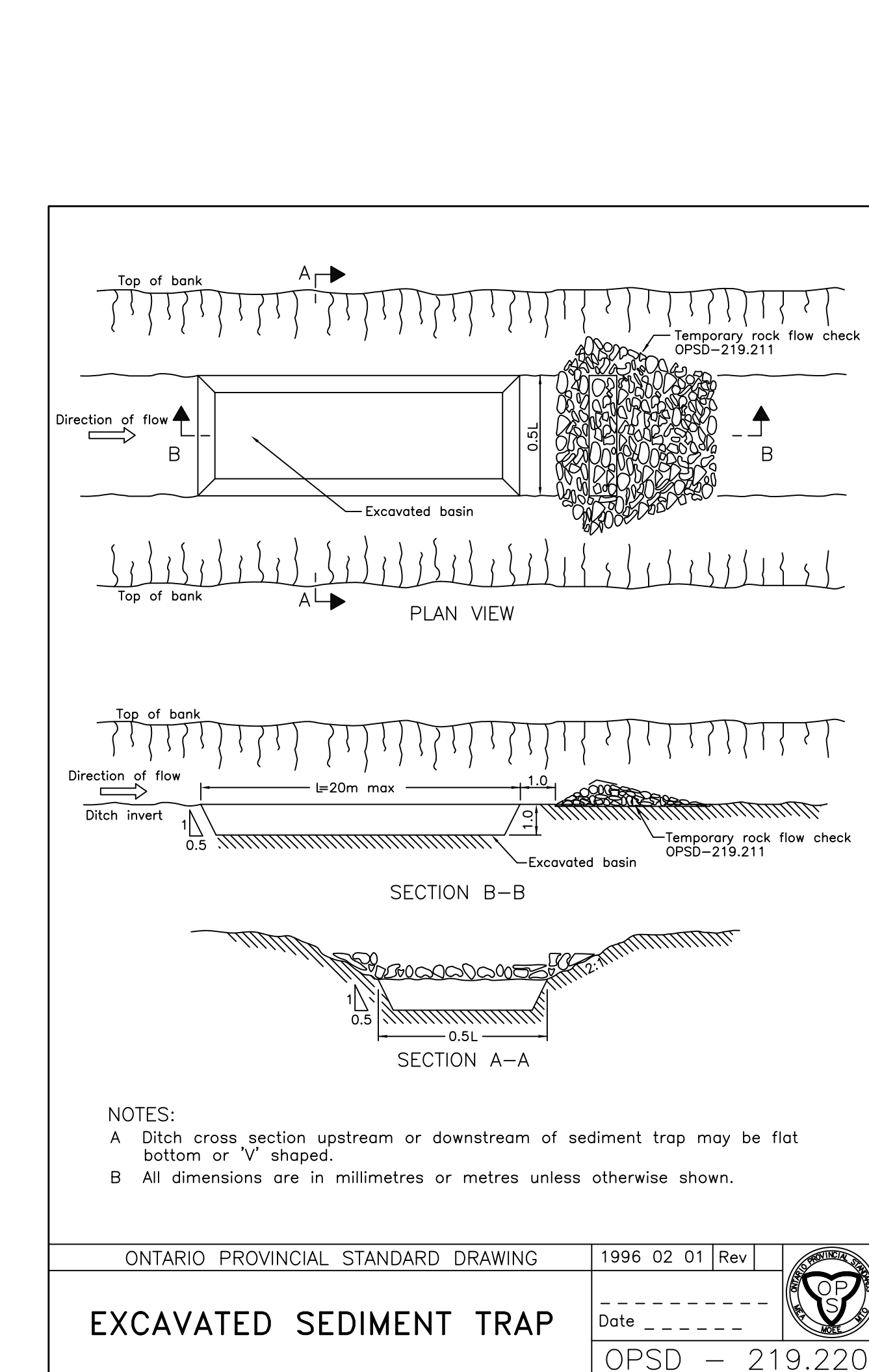
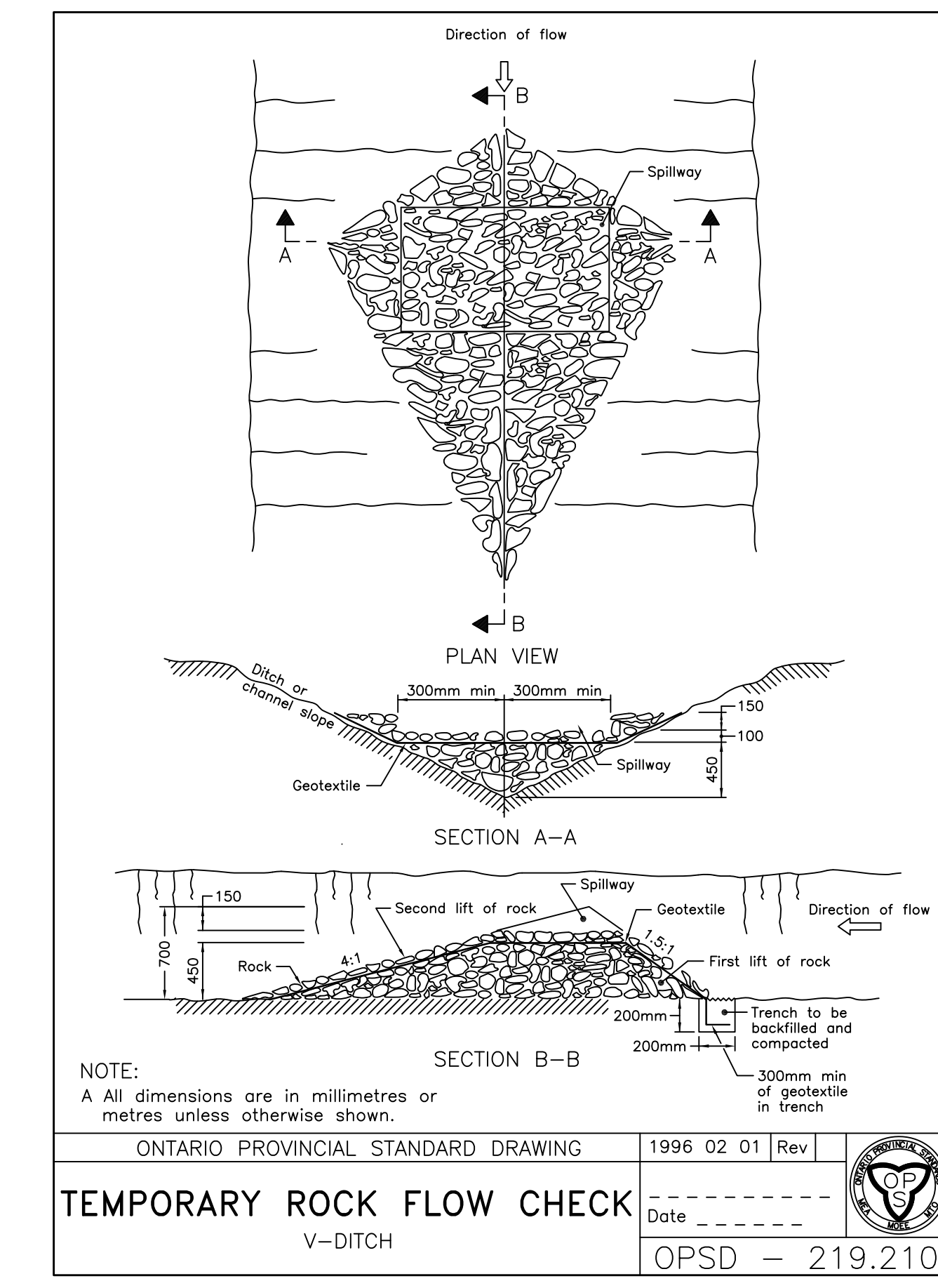
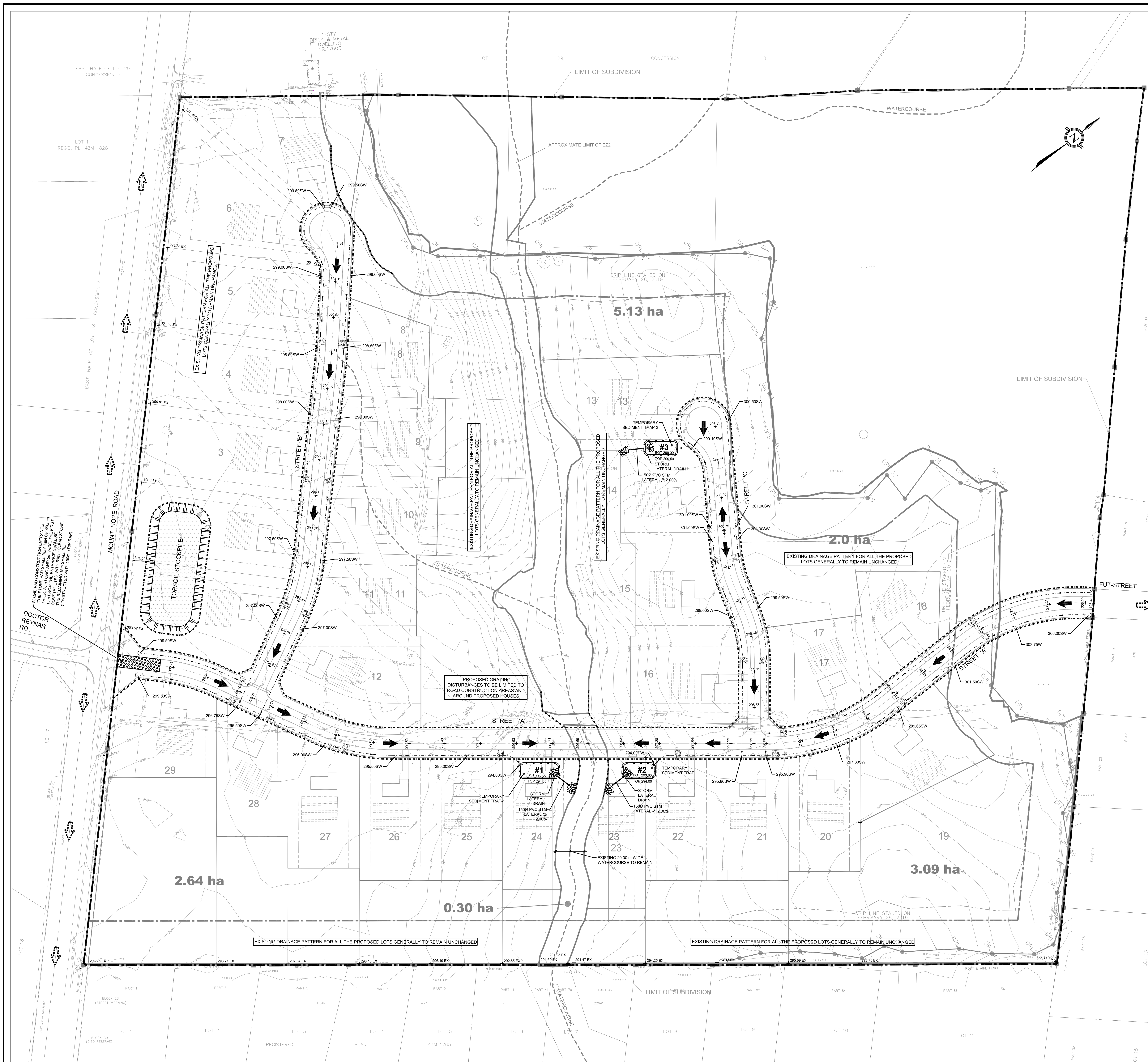
CONSULTANT: MASONGSONG ASSOCIATES  
 1188 KENNEDY ROAD, SUITE 201, MARKHAM, ONTARIO L3R 9W5  
 TEL: 905.477.8800 FAX: 905.477.8802 WWW.MASONGSONG.COM

Region of Peel  
 Working for you  
 TOWN OF CALEDON

**GRADING PLAN**

SCALE: 1:1000 PROJECT No. 18-951  
 DESIGNED BY: M.N. DRAWN BY: MAEL CAD PLAN No.  
 CHECKED BY: A.J. DATE: OCTOBER 2019 TOWN ENGINEER: GR1





**LEGEND:**

- PROPOSED DRIVEWAY WITH CULVERT
- PROPOSED CULVERT
- HYDRANT
- PROPOSED WATER SERV. CONNECTION
- PROPOSED UTILITY BOX
- PROPOSED LIGHT POLE
- PROPOSED VALVE & BOX
- LIMIT OF DEVELOPMENT
- STRUCTURE ENVELOPE LINE
- WATERCOURSE
- EXISTING TREES
- EDGE OF VEGETATION
- SEPTIC TANK SYSTEM (TYP)
- PROPOSED HOUSE (TYP)

**LEGEND:**

- TEMPORARY INTERCEPTOR SWALE
- ROCK CHECK DAM
- TEMPORARY SEDIMENT/SILT CONTROL FENCE
- TEMPORARY STONE PAD CONSTRUCTION ENTRANCE
- PROPOSED MAJOR OVERLAND FLOW ROUTE
- EXISTING MAJOR OVERLAND FLOW ROUTE

**TEMPORARY SEDIMENT TRAP-1 (OPSD 2019.130)**

TRIBUTARY AREA = 2.02ha  
 TOTAL STORAGE REQUIRED = 2,200m<sup>3</sup> (25m<sup>3</sup>/ha)  
 TOTAL STORAGE PROVIDED = 252.50m<sup>3</sup> = 270.00m<sup>3</sup>

**TEMPORARY SEDIMENT TRAP-2 (OPSD 2019.130)**

TRIBUTARY AREA = 1.45 ha  
 TOTAL STORAGE REQUIRED = 1,450m<sup>3</sup> (25m<sup>3</sup>/ha)  
 TOTAL STORAGE PROVIDED = 195.00m<sup>3</sup>

**TEMPORARY SEDIMENT TRAP-3 (OPSD 2019.130)**

TRIBUTARY AREA = 0.23ha  
 TOTAL STORAGE REQUIRED = 230m<sup>3</sup> (25m<sup>3</sup>/ha)  
 TOTAL STORAGE PROVIDED = 25.00m<sup>3</sup> = 30.00m<sup>3</sup>

**ROCK STOCKPILE DATA**

FOOTPRINT AREA = 34,700 m<sup>2</sup>  
 TOTAL VOLUME = 34,700 x 0.30 = 10,410 m<sup>3</sup>

HEIGHT = 4.00 m  
 SIDE SLOPE = 1:5H - 1:0V  
 TOTAL VOLUME = 10,410 m<sup>3</sup>

**REVISIONS**

No.	BY	DATE	REVISION	CONS. CHECKED	TOWN APPROVED
1					

APPROVED FOR CONSTRUCTION

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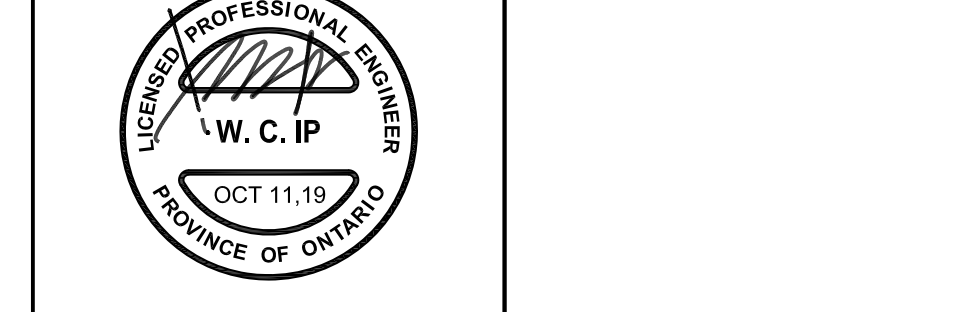
DATE: \_\_\_\_\_ APPROVED BY: H. MUNTZ, P.ENG. Town Engineer

**ELEVATION NOTES**

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**LOCAL BENCHMARK**

NO. 008197558066 ELEVATION = 277.870 METRES AND NO. 00819778416 ELEVATION = 318.849 METRES



**PALGRAVE ESTATES SUBDIVISION**

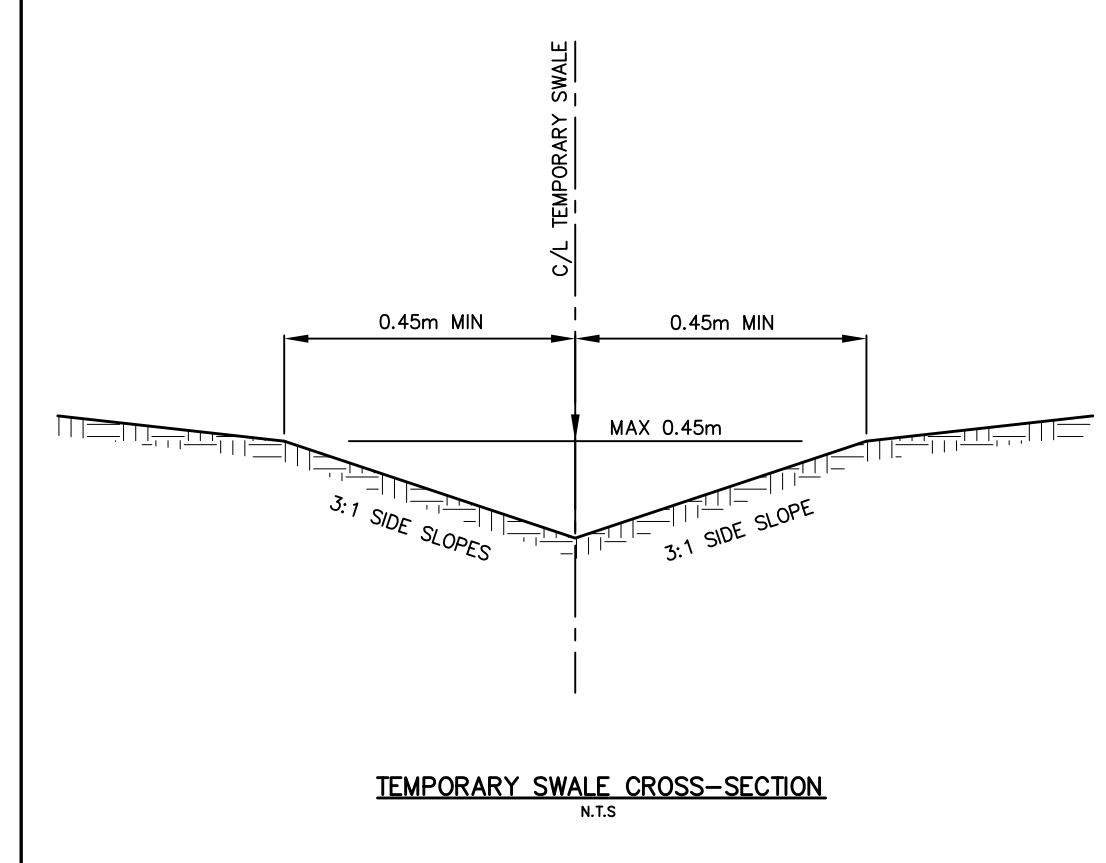
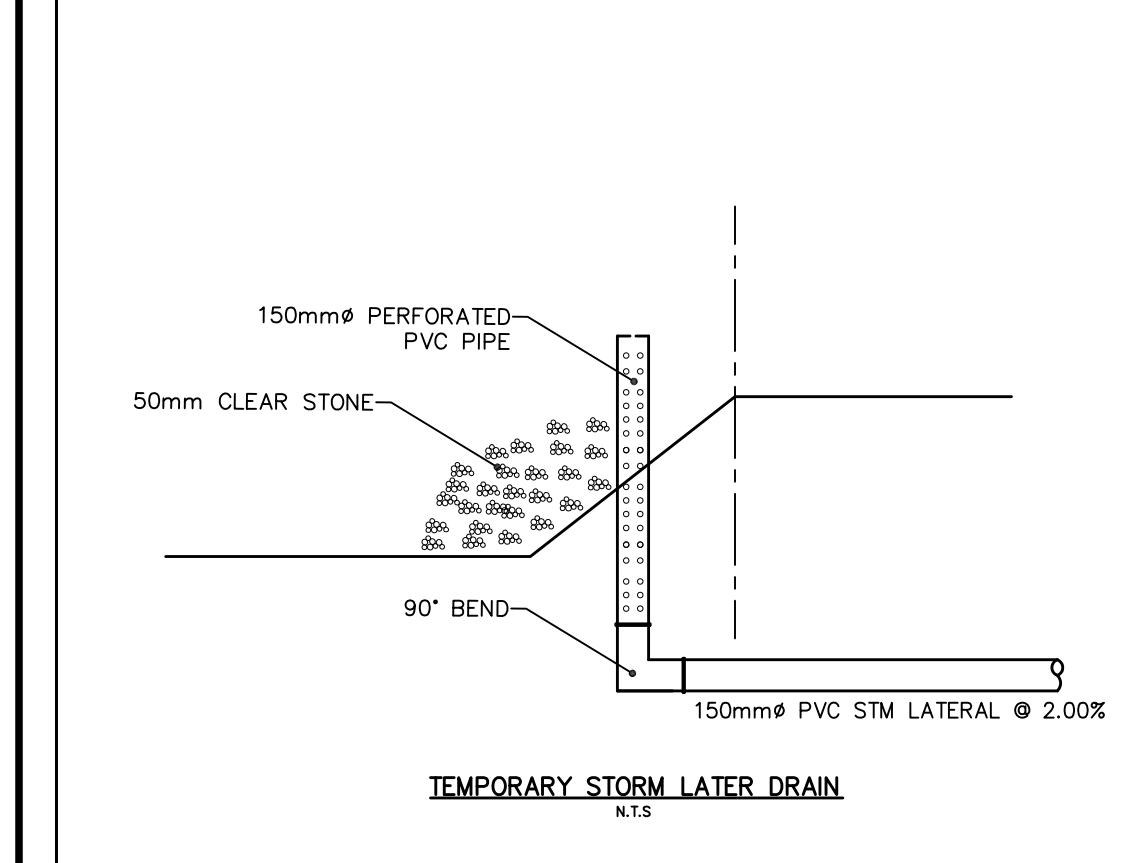


**EROSION CONTROL PLAN**

SCALE: 1:1000 PROJECT No. 18-951

DESIGNED BY: M.N. DRAWN BY: MAEL CAD PLAN No. EC1

CHECKED BY: A.J. DATE: OCTOBER 2019



- EROSION AND SEDIMENT CONTROL GENERAL NOTES**
- THE OWNER IS RESPONSIBLE FOR OBTAINING ALL NECESSARY APPROVAL FROM THE TOWN AND EXTERNAL AGENCIES PRIOR TO ANY SITE ALTERATION ACTIVITY.
  - PRIOR TO COMMENCEMENT OF ANY ON-SITE TOPSOIL STRIPPING, EROSION & SEDIMENT CONTROL (ESC) MEASURES, AS PER APPROVED SITE ALTERATION PLAN, MUST BE INSTALLED AND APPROVED BY THE DIRECTOR OF ENGINEERING. ADDITIONAL ESC MEASURES, IF REQUIRED, SHALL BE INSTALLED AS DIRECTED BY THE DIRECTOR OF ENGINEERING. THE ESC MEASURES SHALL REMAIN IN PLACE UNTIL DIRECTED BY THE DIRECTOR OF ENGINEERING.
  - TRAILS ARE TO BE MAINTAINED AS PER THE APPROVED PREEP PRESERVATION PLAN.
  - NO CONSTRUCTION ACTIVITY OR MACHINERY SHALL BE ALLOWED BEYOND THE SILT/SNOW FENCE OR LIMITS OF THE SUBDIVISION.
  - THE CONTRACTOR IS RESPONSIBLE TO IMPLEMENT DUST CONTROL MEASURES AND CONSTRUCTION PRACTICE GUIDELINES AS APPROVED BY TOWN/TRCA.
  - THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING ALL ESC MEASURES IN WORKING CONDITIONS AT ALL TIMES TO THE SATISFACTION OF THE DIRECTOR OF ENGINEERING. THE CONTRACTOR SHALL ROUTINELY INSPECT ALL ESC DEVICES MINIMUM ONCE A WEEK AND AFTER EACH RAINFALL EVENT GREATER THAN 10mm TO ENSURE THAT ESC MEASURES ARE IN PROPER WORKING CONDITIONS. ANY DAMAGES MUST BE REPAIRED WITHIN 24 HOURS.
  - ALL CONSTRUCTION VEHICLES MUST ENTER AND EXIT THE SITE ONLY FROM THE APPROVED ACCESS ROUTE(S) AS SHOWN ON THE PLAN.
  - ROUTINELY COLLECTED IN THE SEDIMENT CONTROL POND(S) SHALL BE REMOVED WHEN 50% OF THE STORAGE CAPACITY IS FILLED. THE POND SHALL BE KEPT IN OPERATION UNTIL SOODING IS DISTURBED AND EXCEEDS 5.0 METRES.
  - AREA IS COMPLETED TO THE SATISFACTION OF THE DIRECTOR OF ENGINEERING.
  - ALL TOPSOIL STOCKPILES SHALL BE SURROUNDED WITH SEDIMENT CONTROL FENCE. THE MAXIMUM SIDE SLOPES FOR STOCKPILES SHALL BE 1.5 (H) TO 1.0 (V). THE MAXIMUM HEIGHT OF STOCKPILE SHOULD NOT EXCEED 5.0 METRES.
  - THE EROSION AND SEDIMENT CONTROL STRATEGIES OBTAINED ON THE PLANS ARE NOT STATIC AND MAY NEED TO BE UPGRADED/AMENDED AS SITE CONDITIONS CHANGE TO MINIMIZE SEDIMENT LADEEN RISK FROM LEAVING THE WORK AREA. IF THE PRESCRIBED MEASURES ON THE PLANS ARE NOT EFFECTIVE IN PREVENTING THE RELEASE OF A DETERMINED SUBSTANCE, INCLUDING SEDIMENT, THEN ALTERNATIVE MEASURES MUST BE IMPLEMENTED IMMEDIATELY TO MINIMIZE POTENTIAL ECOLOGICAL IMPACTS. TOWN ENFORCEMENT OFFICER (EN HRA), TELEPHONE: 416-861-6600 EXT. 3760 SHOULD BE IMMEDIATELY CONTACTED. ADDITIONAL ESC MEASURES TO BE KEPT ON SITE AND USED AS NECESSARY.
  - THE CONTRACTOR SHALL ENDEAVOUR TO PREVENT MUD TRACKING ONTO EXISTING RIGHT-OF-WAY AND SHALL PROVIDE FOR CLEANUP AT HIS/HER OWN EXPENSE AS DIRECTED BY ENGINEER.
  - THE CONTRACTOR SHALL CARE AND CONTROL SPILLS, FLUIDS, AND MATERIALS DURING CONSTRUCTION TO MINIMIZE RISK TO ENVIRONMENT.
  - EROSION AND SEDIMENT CONTROL (ESC) MEASURES WILL BE IMPLEMENTED PRIOR TO, AND MAINTAINED DURING, THE CONSTRUCTION PHASES, TO PREVENT ENTRY OF SEDIMENT INTO THE WATER. ALL DAMAGED EROSION AND SEDIMENT CONTROL MEASURES SHOULD BE REPAIRED AND/OR REPLACED WITHIN 48 HOURS OF THE INSPECTION.

- DEWATERING NOTES**
- 1-LAY FILTER FABRIC
  - 2-PLACE SEDIMENT BAG ON FILTER FABRIC
  - 3-SURFACE SILT SOOK ALONG THE PERIMETER OF FILTER FABRIC
  - 4-PUMP SEDIMENT LADEN WATER FROM EROSION POND TO THE SEDIMENT BAG
  - 5-TREATED WATER TO DISCHARGE TO CATCHBASIN
  - 6-USE THE SAME METHOD FOR DEWATERING OF SEDIMENT TRAPS

- DECOMMISSIONING OF TEMPORARY SEDIMENT CONTROL BASINS**
1. AS DIRECTED BY THE CONSULTANT, REMOVE THE TEMPORARY HEADWALL STRUCTURE, MARCHES, SIF, TRAP, FILTER FABRIC, AND ANY CLEAR STONE AT THE BOTTOM OF THE TEMPORARY SEDIMENT CONTROL BASINS AND DISPOSE OFF-SITE.
  2. EXCAVATE AND REMOVE ALL MATERIAL 0.60 METRE (MIN) BELOW BOTTOM OF THE TEMPORARY SIFM POND OR MORE AS DIRECTED BY THE GEOTECHNICAL CONSULTANT.
  3. ONCE THE TEMPORARY SEDIMENT CONTROL BASINS HAVE BEEN REMOVED, THE LAND IS TO BE ENGINEERED FILLED. ALL FILLING IS TO BE COMPACTED TO 95% STANDARD PROCTOR DENSITY, OR AS APPROVED BY THE GEOTECHNICAL CONSULTANT.
  4. IF DISCHARGING THE WATER THROUGH A FILTER BAG THE LOCATION OF THE DISCHARGE POINT MUST BE 30m AWAY FROM THE WATERCOURSE.





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