PRELIMINARY
FUNCTIONAL SERVICING AND
STORMWATER MANAGEMENT REPORT
for
JACK KENNEY COURT

Draft Report Prepared for:

1361605 ONTARIO LIMITED
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Reference: 09-193

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1.0 INTRODUCTION

Calder Engineering Ltd. has been retained by 1361605 Ontario Limited to complete a Preliminary Functional Servicing and Stormwater Management Report for a proposed infill residential development on Jack Kenny Court, in Bolton, in the Town of Caledon. The report is supporting documentation for the respective development Draft Plan approval application.

The location of the subject site is shown on Figure 1.1. The site is bounded by existing residential uses on three sides (south, east and west) and a stormwater management pond to the north. The legal description of the property is Part of Lot 8, Concession 5 (ALB) and Part of Block 307 on 43M-1324 (ALB), Town of Caledon Regional Municipality of Peel.

The site comprises approximately 0.3 hectares (ha). It is currently zoned A1-Agricultural. It is proposed to re-zone the site to residential use and develop it into 7 single dwelling lots with municipal storm, sanitary and water services. Drainage and stormwater would be managed with the application of Low Impact Development (LID) practices. A future private access would be preserved between Lots 2 and 3 for the lands to the east of the subdivision (fronting on Coleraine Drive).

The objective of this report is to identify proposed methods for site sanitary and water servicing, and the plan for drainage and stormwater management. The information provided herein is preliminary and subject to detailed design. Detailed design of site sanitary and water services, and drainage and stormwater management infrastructure would be undertaken following Draft Plan Approval.

FIGURE 1.1
JACK KENNY STUDY AREA LOCATION
IN BOLTON, TOWN OF CALEDON

Reference: Aerial Image from Google Earth

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2.0 STUDY AREA

2.1 General

The site is located in the community of Bolton in the Town of Caledon on Jack Kenny Court. It is bounded by an existing residential uses on three sides (south, east and west) and an existing stormwater management pond to the north. The legal description of the property is Part of Lot 8, Concession 5 (ALB) and Part of Block 307 on 43M-1324 (ALB), Town of Caledon Regional Municipality of Peel..

The overall site comprises approximately 0.3 hectares (ha). It is proposed to re-zone the site to residential use and develop it into 7 single dwelling lots with municipal storm, sanitary and water services. Drainage and stormwater would be managed with the application of Low Impact Development (LID) practices. A Conceptual Site Plan showing the proposed lotting is shown on Figure 2.1. All the proposed lots would front onto the existing Jack Kenny Court cul-de-sac. Space for a future access for the lands fronting on Coleraine Drive would be left between Lots 2 and 3.

2.2 Existing Conditions

2.2.1 Surficial Soils

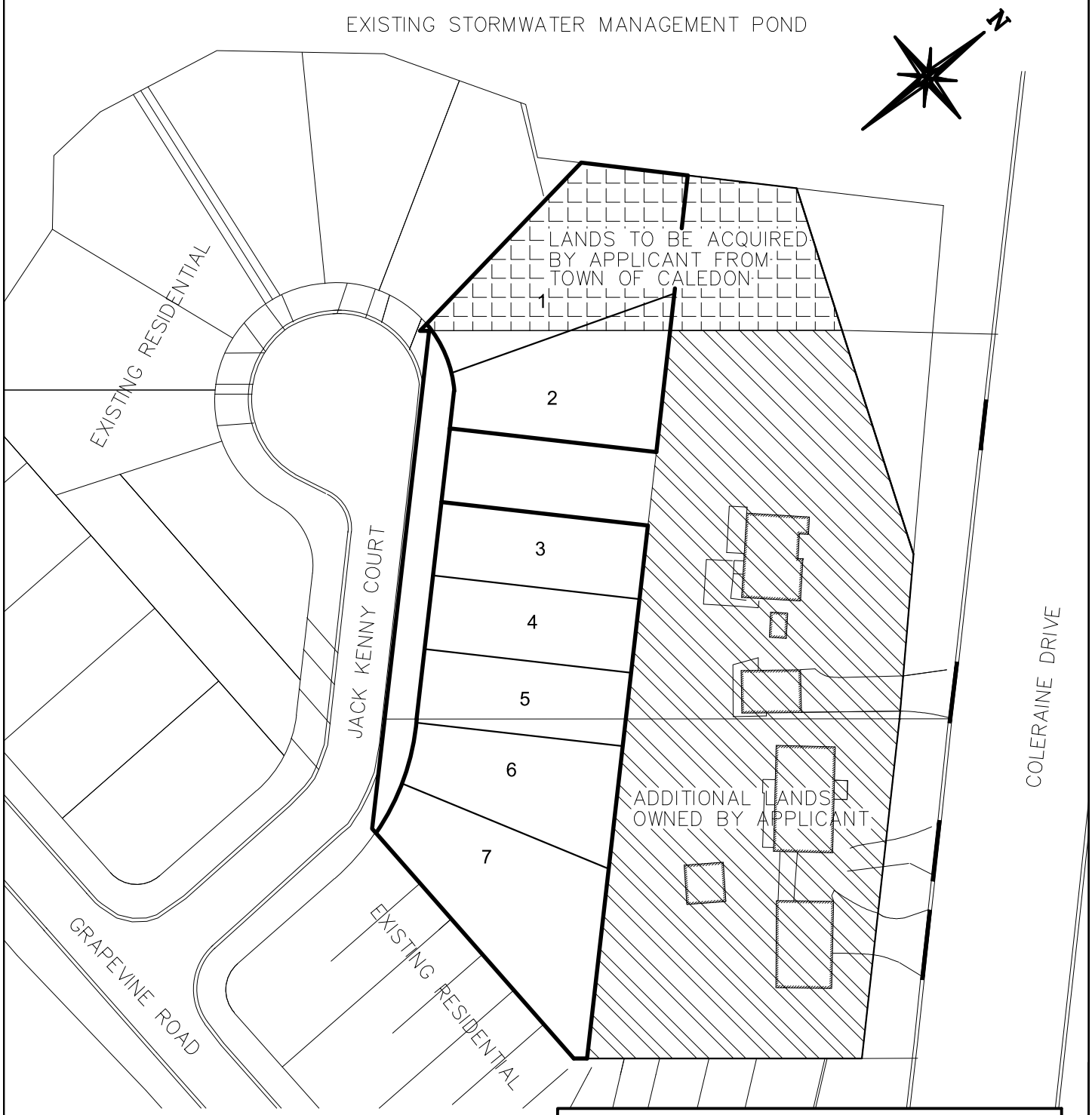
A geotechnical investigation was performed by Soil Engineers Limited (2013). This investigation comprised 4 boreholes each to a depth of 6.6 metres. Generally, the site consists of a 40 to 150 millimetre layer of topsoil, which overlays fill or a silty clay till. Borehole information is provided on the preliminary engineering drawings (Appendix A).

2.2.2 Pre-Development Drainage Patterns

The site is located in the Humber River Watershed. Existing drainage patterns are shown on Figure 2.2.

Drainage from the site and adjacent lands to the east is currently to an existing 1000mm culvert at the north end of the adjacent property. The culvert drains to the outlet of the existing stormwater management pond.

Drainage from the existing residential area on Jack Kenny Court is conveyed to the stormwater management pond via the municipal storm sewer system. For minor events, flow is directed through the municipal sewers along Jack Kenny Court and Grapevine Road to the SWM pond. For major events, flow is conveyed from a double catchbasin at the end of the cul-de-sac to the SWM pond via 750mm diameter pipe in an easement between two homes on Jack Kenny Court. Jack Kenny Court slopes down from Grapevine Road towards the end of the cul-de-sac and the stormwater management pond.



LOT	LOT AREA (sq.m.)
1	634.2
2	471.9
3	321.0
4	321.1
5	321.1
6	409.8
7	628.5

5m 0 5 10m

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JACK KENNY COURT

FIGURE 2.1
CONCEPTUAL SITE PLAN

GRAPEVINE ROAD

JACK KENNY COURT

COLERAINE DRIVE

EXISTING RESIDENTIAL

EXISTING SWM POND

0.14 ha
0.40

0.15 ha
0.40

0.37 ha
0.40

0.38 ha
0.40

0.48 ha
0.40

EX. 44.0m–450 CONC. STM @ 0.25%

EX. 42.8m–375 CONC. STM @ 0.35%

EX. 24.0m–300 CONC STM @ 0.61%

EX. 48.8m–750 CONC. STM @ TO SWM POND

EX. DCBMH

EX. CB

EX. 1000mm STM

Frame Shed

Aluminum Clad Garage

Wood Deck

Aluminum Clad Vestibule

1 Storey Brick House

Porch

Frame Garage

Wood Deck

Patio

Balcony

1 Storey Brick House

N

LEGEND

MAJOR FLOW DIRECTION

EXISTING STORM SEWER

DRAINAGE BOUNDARY

0.66 ha
0.40

CATCHMENT AREA (ha)

COMPOSITE RUNOFF COEFFICIENT

10m 0 10 20m

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JACK KENNY COURT

FIGURE 2.2
EXISTING DRAINAGE

2.3 Proposed Conditions

The proposed development would consist of seven (7) single dwelling lots fronting on Jack Kenny Court with municipal storm, sanitary and water services. Drainage and stormwater would be managed with the application of Low Impact Development (LID) practices. Post development drainage patterns are discussed in Section 3.2.

A Preliminary Grading Plan has been prepared and is included in Appendix A (Drawing 09-193-02).

The proposed development site generally slopes away from Jack Kenny Court, with existing elevations at the rear property line of the proposed lots up to 6.5m less than those at the existing edge of pavement. Correspondence (Appendix B) with the Toronto and Region Conservation Authority (TRCA) indicated that this depression is the remnants of a larger valley corridor that has since been filled with subdivision development and a stormwater management pond. The TRCA has indicated that the size and composition of the "valley feature" does not warrant its retention. As such, it is proposed to fill the depression per the attached Preliminary Grading Plan (Drawing 09-103-02) and Cross Sections (Drawing 09-103-04) to facilitate the development of residential lots fronting on Jack Kenny Court.

Details on the proposed lots are presented in Table 2.1.

TABLE 2.1: PROPOSED LOT AREAS

Lot	Total Area sq.m	Approximate Frontage (m)	Estimated Building Area sq.m	Estimated Driveway Area sq.m.
1	634.2	10.7	158.6	30
2	471.9	10.7	118.0	30
3	321.0	10.7	80.3	30
4	321.1	10.7	80.3	30
5	321.1	10.7	80.3	30
6	409.8	10.7	102.5	30
7	628.5	10.8	157.1	30
Total	3107.6		776.9	210.0

Notes:
1. Building areas assumed to be 25% of the total lot area.
2. Driveway areas based on a 5m wide driveway.
3. Refer to Drawing 09-193-01 for the lot fabric and preliminary building and driveway layout.

2.4 Background Studies and Reports

The following background reports have been prepared as supporting documentation for the subdivision Draft Plan approval application and should be review in conjunction with this report:

- Draft Plan prepared by Paul King
- Preliminary Engineering Drawings (Appendix A) by Calder Engineering Ltd.

- Soil Investigation for Proposed Residential Development, 13576 and 13584 Coleraine Drive, dated May 2013, prepared by Soil Engineers Ltd;
- Environmental Noise and Vibration Impact Study for Proposed Residential Development, Jack Kenny Court, revised April 13, 2017, prepared by Aercoustics Engineering Ltd.
- Phase 1 Environmental Site Assessment for Proposed Residential Development, East of Jack Kenny Court, North of Grapevine Road, dated July 9, 2013, prepared by Soil Engineers Ltd.
- Scoped Environmental Impact Study for Jack Kenny Court, July 2013 (updated April 2016), prepared by Savanta Inc.
- Tree Inventory/Assessment, prepared by Sunarts Design.

2.5 Environmental Considerations

A scoped Environmental Impact Study (EIS) was prepared by Savanta. The scoped EIS was based on inventories and analyses carried out in 2013, including an ecological land classification, botanical surveys, calling amphibian surveys and a breeding bird survey. The ecological land classification of the subject site was cultural meadow and cultural woodland. On the property, the EIS identified no wetlands, significant woodlands, significant valley lands, endangered or threatened species or their habitat, areas of natural and scientific interest, fish habitat or significant wetland habitat, as defined in the Natural Heritage Reference Manual for Policy 2.1 of the Provincial Policy Statement.

The report concluded that conversion of the subject site to residential use would have minimal impact on the terrestrial functions of the site and that impacts can be partially mitigated through standard design and best management practices. It was suggested that the adjacent stormwater management pond be considered as a planting location to provide compensation for loss of vegetation cover on the subject property.

3.0 STORMWATER MANAGEMENT

3.1 Stormwater Management Requirements

3.1.1 Quantity Control

The Toronto and Region Conservation Stormwater Management Criteria (Toronto and Region Conservation, 2012) presents unit flow relationships for use in determining requirements for quantity control in the Humber River Watershed. Based on review of the "Humber River Stormwater Management Quantity Control Release Rates" Map from Appendix A of the SWM criteria, the subject area drains to the main branch of the Humber River and no quantity control is required under TRCA guidelines. A copy of the map with the approximate site location is provided in Appendix B of this report. Additionally, it is our understanding that the existing stormwater management facility was designed to provide quantity and quality control for the future development of the subject property.

3.1.2 Quality Control

Based on review of Toronto and Region Conservation Stormwater Management Criteria (Toronto and Region Conservation, 2012), quality control is proposed by a combination of retaining the first 5 millimetres (mm) of precipitation on site and implementation of Low Impact Development (LID) practices. Additionally, it is our understanding that the existing stormwater management facility was designed to provide quantity and quality control for the future development of the subject property.

3.2 Post-Development Drainage Plan

Pre-development drainage patterns have been described in Section 2.2 and are shown in Figure 2.2. Figure 3.1 illustrates the post-development drainage boundaries.

3.2.1 Proposed Property Drainage

In general, back-to-front drainage is proposed for the property. Drainage is proposed to:

1. *Existing storm sewer and overland flow system on Jack Kenny Court*

   With the exception of parts of Lots 1 and 2, drainage from every lot is proposed to be directed to existing stormwater management infrastructure of Jack Kenny Court. Swales are proposed in the side yards of each lot and a rear lot catchbasin is proposed on Lot 7. On Jack Kenny Court, major events are conveyed via a double catchbasin at the bulb of Jack Kenny Court and a 750mm diameter storm sewer to the stormwater management pond. Minor events are conveyed through the municipal storm sewer along Jack Kenny Court and Grapevine Road to the stormwater management pond.

2. *Existing stormwater management pond*

A portion of the rear yard areas of Lots 1 and 2 are proposed to drain via a rear yard swale and subdrain directly to the stormwater management pond.

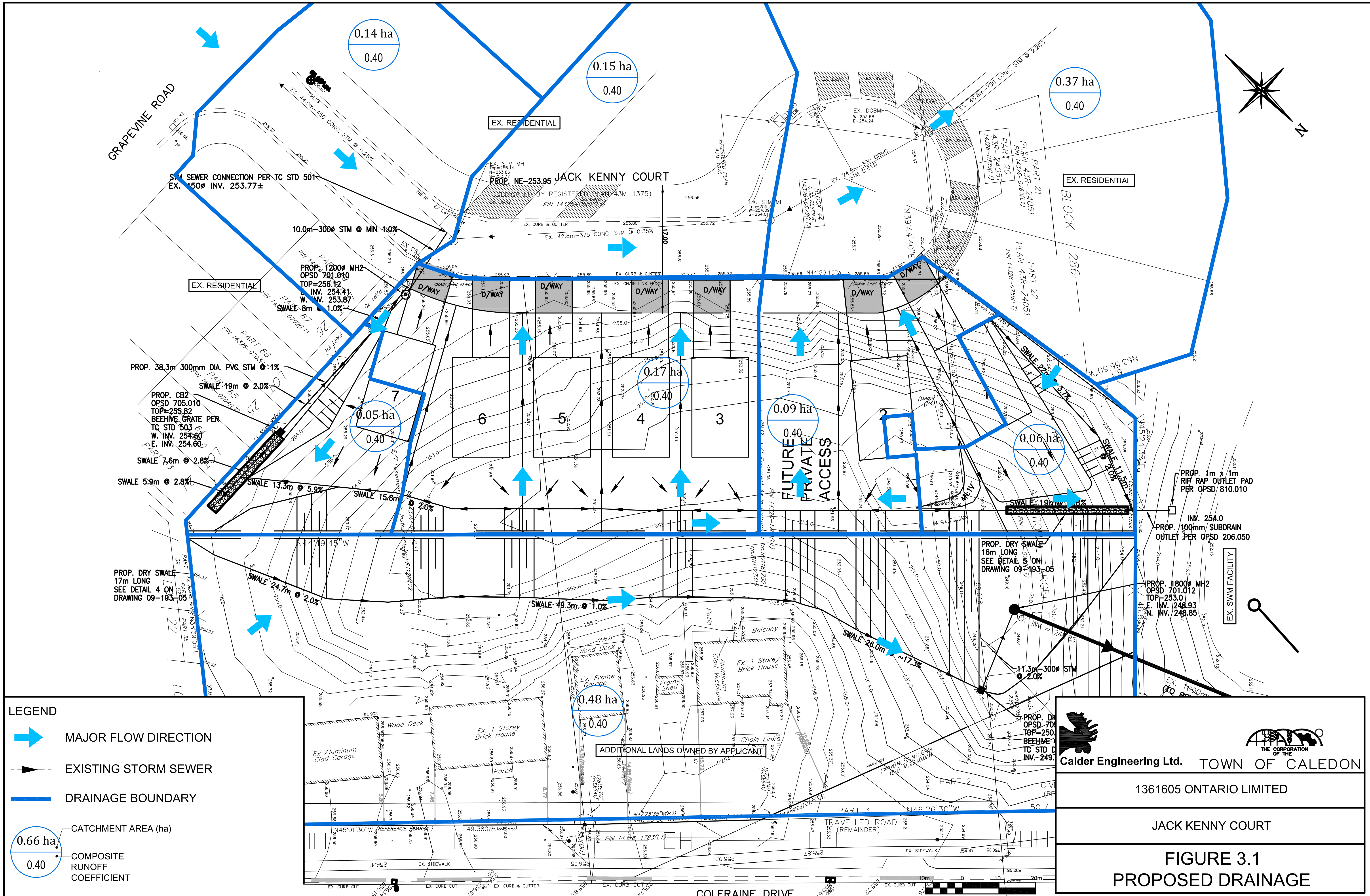


FIGURE 3.1
PROPOSED DRAINAGE

3.2.2 On-Site Controls

Lot level controls and Low Impact Development (LID) practices are proposed for implementation, where feasible, to reduce the volume of runoff, and provide, as far as practical, a natural hydrologic response.

With respect to meeting the water quality requirement of retaining the first 5 mm of precipitation, it is proposed to incorporate in the site design the following features:

- recharge of residential roof and driveway stormwater by direction to grassed areas to promote filtering and natural infiltration; and
- rear yard swales enhanced with granular storage and a perforated pipe system.

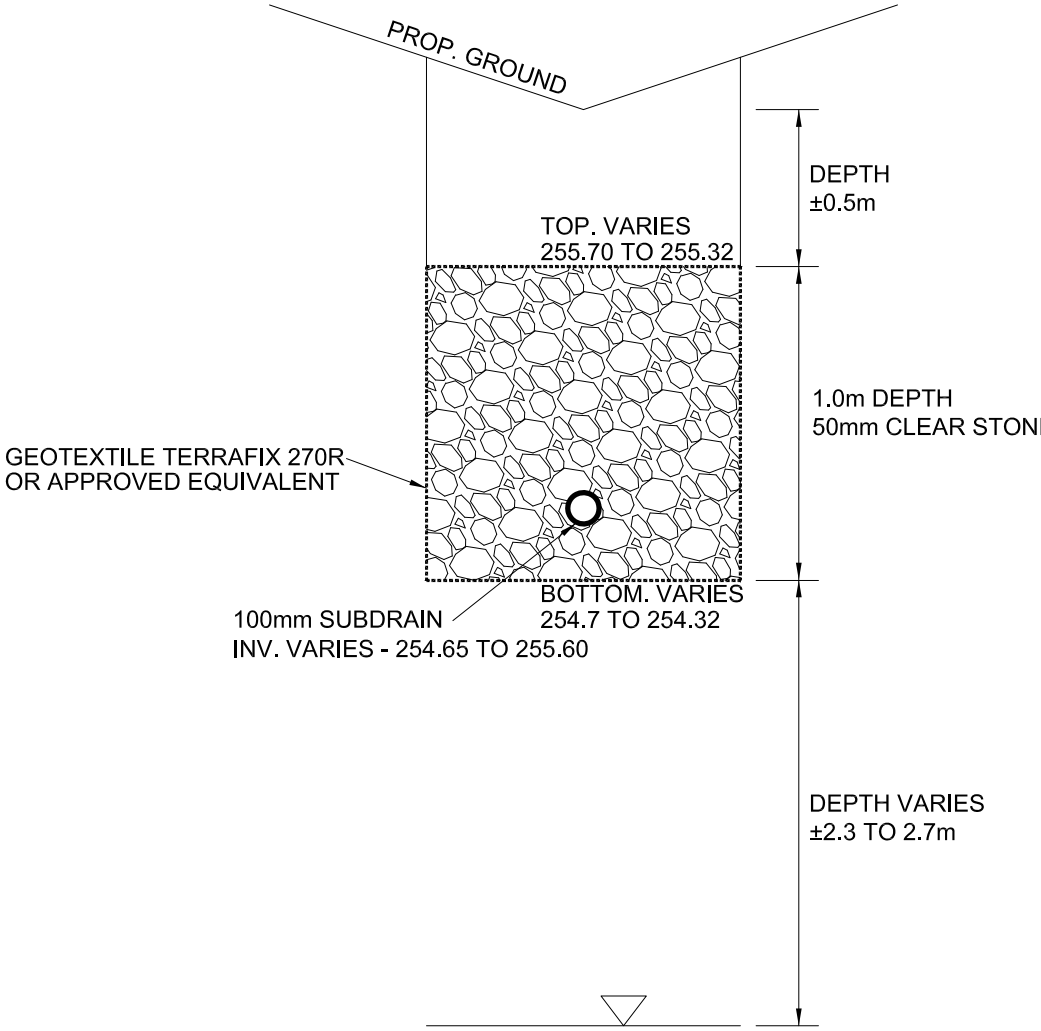
It is assumed that pervious areas will naturally retain the first 5 millimetres of precipitation. With respect to impervious areas, it was calculated that approximately 5.6 cubic metres of additional storage capacity would be required to provide an equivalent storage volume for retention of the first 5 mm of rainfall across impervious areas. This figure is based on an assumed total site impervious area of approximately 987 square metres (an assumed driveway area of 30 sq.m. for each lot and a maximum of 25% of the lot area for roof areas).

Subject to detailed design, storage volume is proposed to be provided in the granular materials on Lots 1 and 7. Available storage volume associated with the dry swale on Lot 7 is estimated as 8.1 cubic metres (13.5 m length x 1.5 m width x 1 m depth x 0.4 void ratio). The estimated storage volume associated with the rear yard swale on Lot 1 is 2.6 cubic metres (16.5 m length x 1 m width x 0.4 m depth x 0.4 void ratio). Provided on-site is a storage volume of approximately 10.7 cubic metres within the granular media on Lots 1 and 7.

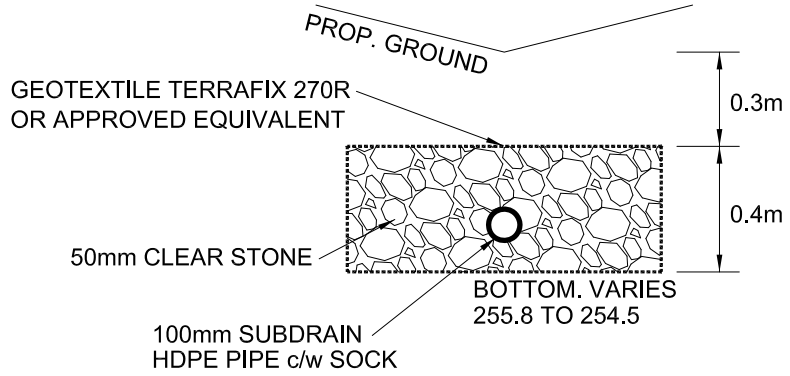
Preliminary cross-sections of the dry swales on Lots 1 and 7 are shown on Figure 3.2 and Drawing 09-193-05 (Appendix A).

3.2.3 External Drainage Areas

There are no external drainage areas to the subject lands.



A) LOT 7 SWALE NTS



B) LOT 1 SWALE NTS

FIGURE 3.2
PRELIMINARY TYPICAL SWALE CROSS SECTIONS

Calder Engineering Ltd.

3.3 Analysis

For sizing of site stormwater infrastructure, the Rational Method with Town of Caledon parameters was used. Analysis was completed for the 10 and 100-yr return period event.

For water balance comparisons, a "desk-top" accounting approach was used to calculate the typical depth of rainfall that would be retained on-site.

Post-development catchment areas are shown on Figure 3.1.

3.3.1 Peak Flows - Rational Method

The Rational Method was used to compute post-development peak flows and size site stormwater infrastructure. Computations were completed for the 10 and 100-year return period with Town of Caledon IDF parameters and an inlet time of 15 minutes consistent with Town of Caledon standards for suburban residential. Consistent with Town standards for single family suburban, a runoff coefficient of 0.40 was used for contributing drainage areas.

Peak flows to existing external stormwater infrastructure, including the 750mm storm sewer on Jack Kenny Court and 1000mm culvert on adjacent property, were also calculated.

A summary of the estimated peak flows and capacities for the existing 1000mm culvert and the existing 750mm pipe under the 100 year return period event are presented in Table 3.1. Storm sewer design sheets are provided in Appendix B.

Based on the included storm sewer design sheets, the existing storm sewers on Jack Kenny Court have the capacity to handle the 10-year return period event, and the existing 750mm storm sewer and 1000mm culvert have capacity for the 100-year return period event.

TABLE 3.1: ESTIMATED PEAK FLOWS (100-YR RETURN PERIOD)

Location	Description	Calculated Capacity (LPS)	Estimated Peak Flow (LPS)	% Full
Ex. Culvert to SWM Pond Outlet	Ex. 1000mm culvert[3]	1520	89	5.9%
Ex. DCB on Jack Kenny Court to SWM Pond	Ex. 750mm @ 2.20%	1650	181	11.0%

Notes:
1. Units: LPS – litres per second
2. Capacities were calculated using Manning's equation and peak flows were calculated using the Rational Method.
3. Slope of existing 1000mm diameter culvert unknown. A conservative slope of 0.4% was assumed to estimate the capacity; 0.4% is the minimum slope permissible per Town of Caledon Standards

3.3.2 Emergency Overland Flow Route

An overland flow route was identified for three areas of the properties: the area draining to DICB1 (future development lands fronting on Coleraine Drive), the area draining to

catchbasin 2 in the rear yard of Lot 7, and the area draining overland to the existing stormwater management pond from Lot 1.

Ditch Inlet Catchbasin 1

The AES 24-hr duration 100-year return period rainfall depth is 95.92mm. If this entire volume is converted to runoff, a total volume of approximately 460 cubic metres would be generated from the area draining to ditch inlet catchbasin 1. If the ditch inlet catchbasin is blocked and no outflow occurs, this volume would cause ponding up to approximately 252.91m as illustrated on the General Plan, Drawing 09-193-01 (Appendix A). The low point on the side yard line between the Coleraine property and the stormwater management facility is approximately 254.5m, approximately 1.4m below the lowest elevation at the rear existing buildings fronting on Coleraine Drive.

Catchbasin 2

The area draining to catchbasin 2 will spill between the Lot 7 house and the rear yards of the existing residential homes starting at elevation 256.20. The lowest surveyed elevation along the shared lot line between the existing residences and Lot 7 is 14cm higher than the proposed overflow elevation at 256.34.

Lots 1 and 2

Portions of the rear yards of Lots 1 and 2 are proposed to drain overland directly to the existing stormwater management facility via a rear yard swale.

3.3.2 Water Balance

The water balance related stormwater management criteria is retention of storm runoff from the first 5 millimetres (mm) of rainfall through infiltration, evapotranspiration, and/or reuse. This is proposed to be achieved through the use of combination of source, and conveyance measures. As far as practical, stormwater from the lots will be directed to grassed areas to promote infiltration and evapotranspiration.

A “desktop” accounting approach was used to calculate the typical depth of rainfall that would be retained on site. The site was partitioned according to surface condition and an effective initial abstraction assumed for each surface condition. The effective initial abstraction was assumed based on information provided in the Wet Weather Flow Management Guidelines (City of Toronto, 2006). With this approach, each initial abstraction value is multiplied by respective percent of site total area to determine the initial abstraction value for each surface condition. The sum of all initial abstraction values for each surface condition is equal to the initial abstraction over the site.

Summarized in Table 3.2 are the various types of surface conditions and flow paths, and the assumed initial abstraction values. Provided in Table 3.3 are computations for the site initial abstraction. Based on this approach, the calculated site initial abstraction is 5.9 mm. This

indicates that retention of storm water from the first 5 mm of rainfall can be achieved with the proposed stormwater management approach.

TABLE 3.2: SUMMARY OF SURFACE CONDITIONS AND ASSUMED INITIAL ABSTRACTION

Surface Condition and Flow Path	Surface Condition Type	Initial Abstraction (mm)
Driveway areas draining to Jack Kenny Court	1	0.5
Roof areas draining to grassed areas	2	3.5
Roof areas draining to underground granular storage	3	6.5
Grassed areas draining to Jack Kenny Court	4	5
Grassed areas draining to underground granular storage	5	10

Notes:
1. Units: mm - millimetres

TABLE 3.3: SITE WATER BALANCE COMPUTATION AND ESTIMATION OF OVERALL INITIAL ABSTRACTION

Surface Condition Type	Area (sq.m.)	Percent of Site Area (%)	Effective Initial Abstraction (mm)	Overall Initial Abstraction (mm)
1	416.7	13.4	0.5	0.1
2	598.7	19.3	3.5	0.7
3	125.9	4.1	6.5	0.3
4	978.9	31.5	5	1.6
5	987.4	31.8	10	3.2
Totals	3107.6	100%		5.9

Notes:
1. Units: mm – millimetres; sq.m. – square metres

4.0 SANITARY AND WATER SERVICING PLAN

A servicing plan has been prepared and is included in Appendix A as Drawing 09-193-01.

4.1 Sanitary Servicing Plan

Subject to detailed design, it is proposed that each of the seven residential lots would connect to the existing 250mm diameter sanitary sewer on Jack Kenney Court. Sanitary service connections will be supplied and installed in general conformance with the Region of Peel Public Works Design, Specifications and Procedures Manual (2013).

The total area drainage area of this sanitary sewer is 0.8 ha including the existing residential properties and the proposed 0.3 ha site. Based on the Region of Peel Guidelines for lots with frontage greater than 10m, the population for design purposes is 56 people. Based on Region of Peel Guidelines, the domestic sewage flow for a population less than 1000 is to be taken as 0.013 cubic metres/second. This value is approximately 30% of the 0.044 cubic metre/second capacity of the pipe calculated using Manning's equation. The existing 250mm diameter sanitary sewer is at reported 0.55% slope.

Subject to detailed design, sanitary pre-servicing from Jack Kenny Court to the Coleraine lands is proposed via a 10.3m long 250mm diameter sanitary sewer stub at minimum 2%. The stub is proposed to connect to an existing sanitary manhole on Jack Kenny Court and terminate just inside the streetline.

4.2 Water Servicing Plan

4.2.1 Water Demand

The proposed subdivision comprises 7 residential lots. The estimated water demand is summarized in Table 4.1.

TABLE 4.1
ESTIMATED WATER DEMAND
JACK KENNY COURT

Population Type	Number of Units	Population Density	Average Rate (L/cap/day)	Subdivision Average Day (L/day)	Subdivision Max. Day (L/day)	Subdivision Peak Hour (L/day)
Residential	7	2.7	280	5,320	10,640	15,960

Note:
1. Units: L/cap/day – litres per capita per day; L/day – litres per day; L/hour – litres per hour.
2. Consumption values determined by rounding the total subdivision population to 19 people.

4.2.2 Water Supply and Distribution

It is proposed that the seven lots be serviced by municipal water. There is an existing 150mm and 50mm diameter watermain on Jack Kenney Court.

Subject to detailed design, a portion of the 50mm watermain on Jack Kenny Court is proposed to be replaced with 150mm watermain to facilitate pre-servicing of the Coleraine lands from Jack Kenny Court. A 4m long 150mm diameter stub is proposed to connect to the new 150mm watermain. This stub will terminate in the boulevard, approximately 2m short of the streetline. It is our understanding that the Region of Peel is not in support of water pre-servicing where the future usage date is not known and the length of the pre-service is greater than 5m. It is not possible to bring the water stub to the streetline with a 5m length of pipe.

Subject to detailed design, it is proposed that the homes in the seven lot subdivision connect directly to the existing and proposed 150mm and 50mm watermains.

4.2.3 Water Services

All water services will be single service connections that are supplied and installed in general conformance with the Region of Peel Public Works Design, Specifications and Procedures Manual (2012). Subject to detailed design it is proposed that the water service size be 25 millimetres.

5.0 ROAD RECONSTRUCTION

It is proposed that the section of Jack Kenny Road where services are being installed (nominally from the south limit of Lot 7 to the bulb of the cul-de-sac) be repaved in accordance with current Town of Caledon standards.

In addition to the notes on Drawing 09-193-01, the requirements of the road occupancy // road closure // PUCC permit will be followed.

During construction and road restoration, a minimum of one lane must be available at all times for emergency access as per the OTM guidelines. Access to the existing residences on Jack Kenny Court must be maintained at all times.

Unshrinkable fill is to be used as the backfill material to the frost line in all trench installations within the Town road allowance to the bottom of the Granular 'A'. The trenches are to be mechanically compacted in accordance with the recommendations of a qualified geotechnical consultant.

The top and base course asphalt is to be removed for the entire road width from the south limit of Lot 7 to the bulb of the cul-de-sac and the road base compacted, fine graded and proof-rolled prior to the placement of the base course with additional granular material brought in where necessary to bring the pavement structure to current Town Standards. The proposed pavement will be at minimum 40mm HL3 and 65mm HL8 or as recommended by a qualified geotechnical consultant. Final asphalt grades are to match existing asphalt grades.

A diagonal joint between the old and new asphalt is to be used across the travelled portion of the roadway and top course cold joints are to be sealed with T-bond hot mix asphalt joint tape from McAsphalt or Denso Brand by Denso applied in accordance with the manufacturer's recommendations.

All curb and gutter fronting on proposed Lots 1-7 is to be removed and replaced per OPSD 600.040. Subdrains are to remain intact and at grade during construction and road restoration.

6.0 EROSION AND SEDIMENT CONTROL

6.1 General

Subject to detailed design, an Erosion and Sediment Control Plan was prepared and is included in Appendix A as Drawings 09-193-03A and 09-193-03B. The Erosion and Sediment Control Plan was prepared consistent with the Town of Caledon Development Standards, Policies & Guidelines (2009) and the Erosion & Sediment Control Guideline for Urban Construction prepared by the Greater Golden Horseshoe Area Conservation Authorities (2006).

For project construction, the key items will be limiting construction activities to defined working areas and managing surface runoff. Summarized in Table 5.1 are general procedures and mitigation measures to be implemented to limit impacts.

TABLE 6.1: GENERAL PROCEDURES AND MITIGATION MEASURES FOR EROSION AND SEDIMENT CONTROL

Principle No.	Description
1.	Prepare an Erosion and Sediment Control Plan for the project construction.
2.	Install temporary sediment controls prior to the start of construction per the typical details on the Erosion and Sediment Control Plan.
3.	Delineate the working area prior to the start of construction and confine operations to the defined area.
4.	Enclose temporary topsoil and subsoil stockpile areas with sediment control fence.
5.	Maintain construction accesses, working areas, and temporary material storage areas in good repair.
6.	Operate machinery in a manner that minimizes disturbance to the environment: - protect entrances at machinery access points (e.g., using swamp mats, log mats, or rock pads), and establish single site entry and exit points - construction equipment and machinery to arrive on site in a clean condition and be maintained free of fluid leaks - keep an emergency spill kit on site in case of fluid leaks or spills
7.	Inspect, maintain, and repair sediment controls until completion of construction and site restoration.
8.	Keep additional erosion and sediment materials, such as sediment control fencing and clearstone, on-site for emergencies and repairs.
9.	Remove and dispose temporary sediment controls following completion of construction and site restoration.
10.	Vegetate any disturbed areas by planting and seeding preferably with native grasses and cover such areas with mulch to prevent soil erosion and to help seeds germinate. If there is insufficient time remaining in the growing season, the site should be stabilized (e.g., cover exposed areas with mulch, straw, or erosion control blankets to keep the soil in place and prevent erosion) and vegetated the following growing season.

The erosion and sediment controls comprise management actions and measures to be implemented prior to any land grading or construction activities on the site. Consistent with the Town of Caledon Development Standards, Policies & Guidelines (2009), erosion and

temporary sediment controls would be inspected on a weekly basis and after each rain event 10 millimetres or greater or a significant snow melt. These inspections would ensure that the controls are in proper working condition and maintained. A permanent record of these inspections is required to be forwarded to the Town of Caledon Public Works and Engineering Department within five days of the inspection.

All disturbed ground left inactive, including topsoil stockpiles, would be stabilized by seeding, sodding, mulching or covering, or equivalent control measures. The period of time of inactivity shall not exceed 30 days, unless otherwise authorized by the Project Manager.

6.2 Topsoil Management

The Geotechnical Report for the project prepared by Soil Engineers Ltd. (2013) has identified a 40 to 150mm layer of topsoil on the site. Development of the site will involve stripping and stockpiling topsoil to facilitate regrading of the property.

Based on an assumed average topsoil depth of 100mm, it is estimated that the volume of topsoil to be managed is approximately 400 cubic metres. This volume would stockpiled on site or adjacent property owned by the applicant.

At this stage, it is anticipated that no topsoil will be either imported to the site or exported from the site.

The maximum side-slopes for topsoil stockpiles shall be 1.5 horizontal to 1.0 vertical. The maximum height of a stockpile is 4.5 metres. Location of topsoil stockpiles on lands to be dedicated to the public is prohibited. Topsoil stockpiles shall be located, where possible, on private lands between houses and on rear yards.

Subject to detailed design, it is proposed to locate the topsoil stockpile on the adjacent property owned by the applicant as shown on the preliminary erosion and sediment control plan during the fill and pre-grade operations, and on the access block between lots 2 and 3 during home construction. For erosion and sediment control planning, it would be specified that any stockpiles remaining at the end of the season will be seeded with a native seed mixture and closed off with full perimeter siltation fencing.

6.3 Emergency Contact Information

As part of the erosion and sediment control planning process, a copy of emergency contact numbers would be kept on-site and readily available. An example emergency contact list is provided in Table 5.2. The applicable contacts would be confirmed at the detailed design stage following Draft Plan approval and information provided on the Erosion and Sediment Control Plan.

TABLE 6.2: EMERGENCY CONTACT LIST

Name/Agency	Phone Number
Town of Caledon	905-584-2272
Toronto and Region Conservation	416-661-6600
Ministry of Environment Spills Reporting	416-325-3000
Toronto Water 24 hour Spills Reporting	416-338-8888
Owner	-
Project Engineer – Calder Engineering Ltd.	905-857-7600

7.0 SUMMARY

1. Calder Engineering Ltd. has been retained by 1361605 Ontario Limited to complete a Preliminary Functional Servicing Report for a proposed residential infill development on Jack Kenny Court in Bolton in the Town of Caledon. The report is supporting documentation for the respective subdivision Draft Plan application.

2. The overall site comprises approximately 0.3 ha. It is proposed to rezone the property from A1 – Agricultural and develop the site with 7 single dwelling lots fronting on Jack Kenny Court with municipal water, sanitary and storm services. Drainage and storm water would be managed with the application of Low Impact Development (LID) practices.

3. The site generally drains northward to an existing culvert that drains to the outlet of an existing stormwater management pond. Drainage is ultimately to a branch of the Humber River. As such, the site falls under the jurisdiction of the Toronto and Region Conservation Authority (TRCA).

4. Lot level controls and Low Impact Development (LID) practices are recommended for implementation, wherever feasible, to reduce the volume of runoff and provide, as far as practical, a natural hydrologic response. Such measures are as follows:

   - Recharge of residential roof and driveway stormwater by direction to grassed areas, and where possible the rear-yard grassed areas and swale system, to promote filtering and natural infiltration;
   - Rear yard swales enhanced with granular storage and a perforated pipe system.

5. Peak flow calculations were completed using the Rational Method with Town of Caledon parameters. Calculations show that the expected peak flows are within the capacity of the proposed site stormwater infrastructure. As the site drains to a branch of the Humber River it is Calder Engineering Ltd.'s understanding that no quantity control is required under TRCA guidelines. Additionally, it is our understanding that the existing stormwater management pond was designed to provide quantity and quality control for the future development of this property.

6. For water balance, it was computed that the proposed development would yield an initial abstraction of 5.9 mm indicating that retention of the first 5 mm of rainfall on site is achievable. Additionally, provided on site is an estimated 10.7 cu.m. of storage capacity within the granular storage areas under the proposed swales on Lots 1 and 7.

7. It is proposed that development be serviced by municipal sanitary sewers. There is an existing 250mm diameter sanitary sewer on Jack Kenny Court. It is proposed that each lot be serviced by this existing sewer.

8. It is proposed that development be serviced by municipal water. There is an existing 50 and 150 millimetre diameter watermain on Jack Kenny Court. It is proposed that the development will be serviced by municipal water by connecting to watermains on Jack Kenny Court.

9. Water and sanitary pre-servicing for the Coleraine lands are proposed. Subject to detailed design, it is proposed to replace a portion of the existing 50mm watermain on Jack Kenny Court with a 150mm diameter watermain and construct a 4m watermain stub terminating in the boulevard approximately 2 metres short of the streetline. Subject to detailed design, it is proposed that a 250mm diameter 10.3m long sanitary

stub be constructed from the streetline to an existing sanitary manhole on Jack Kenny Court.

10. Considerations were provided for road construction of Jack Kenny Court. Road reconstruction notes are included on Drawing 09-193-01.

11. Considerations were provided for erosion and sediment control planning. An Erosion and Sediment Control Plan was prepared (Drawings 09-193-03A and 09-193-03B). The Erosion and Sediment Control Plan was prepared consistent with the Town of Caledon Development Standards, Policies & Guidelines (2009) and the Erosion & Sediment Control Guideline for Urban Construction prepared by the Greater Golden Horseshoe Area Conservation Authorities (2006).

7.0 REFERENCES

Aercoustics Engineering Ltd. (July 11 2013, revised April 13, 2017). Environmental Noise and Vibration Study for Proposed Residential Development, Jack Kenny Court.

Greater Golden Horseshoe Area Conservation Authorities. (2006). Erosion and Sediment Control Guidelines for Urban Construction.

Paul King. (2017) Draft Plan.

Region of Peel. (2013). Region of Peel Public Works Design, Specifications and Procedures Manual.

Savanta Inc. (July 2013, revised April 2016). Scoped Environmental Impact Study for Jack Kenny Court, Town of Caledon, Ontario.

Soil Engineers Ltd. (May 2013). Soil Investigation for Proposed Residential Development, 13576 and 13584 Coleraine Drive.

Soil Engineers Ltd. (July 9, 2013). Phase 1 Environmental Site Assessment, East of Jack Kenny Court, North of Grapevine Road, Town of Caledon.

Sunarts Design (2017). Tree Inventory/Assessment.

Town of Caledon. (2009). Town of Caledon Development Standards, Policies and Guidelines.

APPENDIX A

PRELIMINARY DRAWINGS

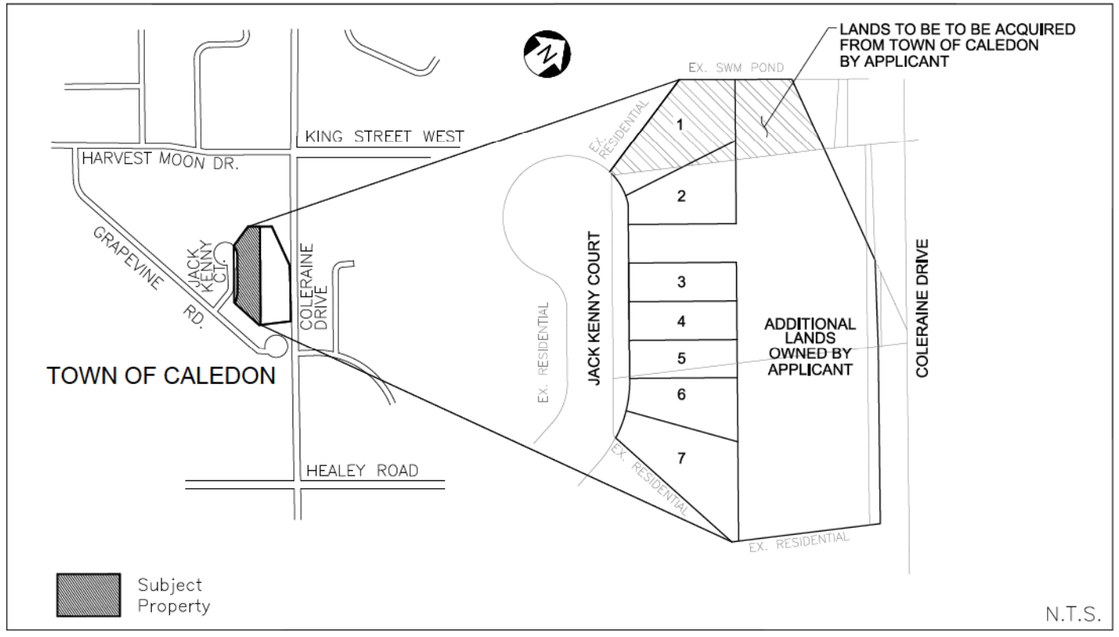
JACK KENNY COURT LOTS 1-7 PRELIMINARY ENGINEERING DRAWINGS
DRAFT PLAN 21T-13002C
PART OF LOT 8, CONCESSION 5 (ALB)
AND
PART OF BLOCK 307 ON 43M-1324 (ALB)
TOWN OF CALEDON, REGIONAL MUNICIPALITY OF PEEL

THE CORPORATION
OF THE
TOWN OF CALEDON

LIST OF TOWN INFRASTRUCTURE

LENGTH OF ROAD (EXISTING TO BE RECONSTRUCTED):	59m
METERS OF STORM SEWER:	0 m
NUMBER OF MANHOLES:	0
NUMBER OF CATCHBASINS:	0
NUMBER OF STREETLIGHTS:	0

LIST OF DRAWINGS

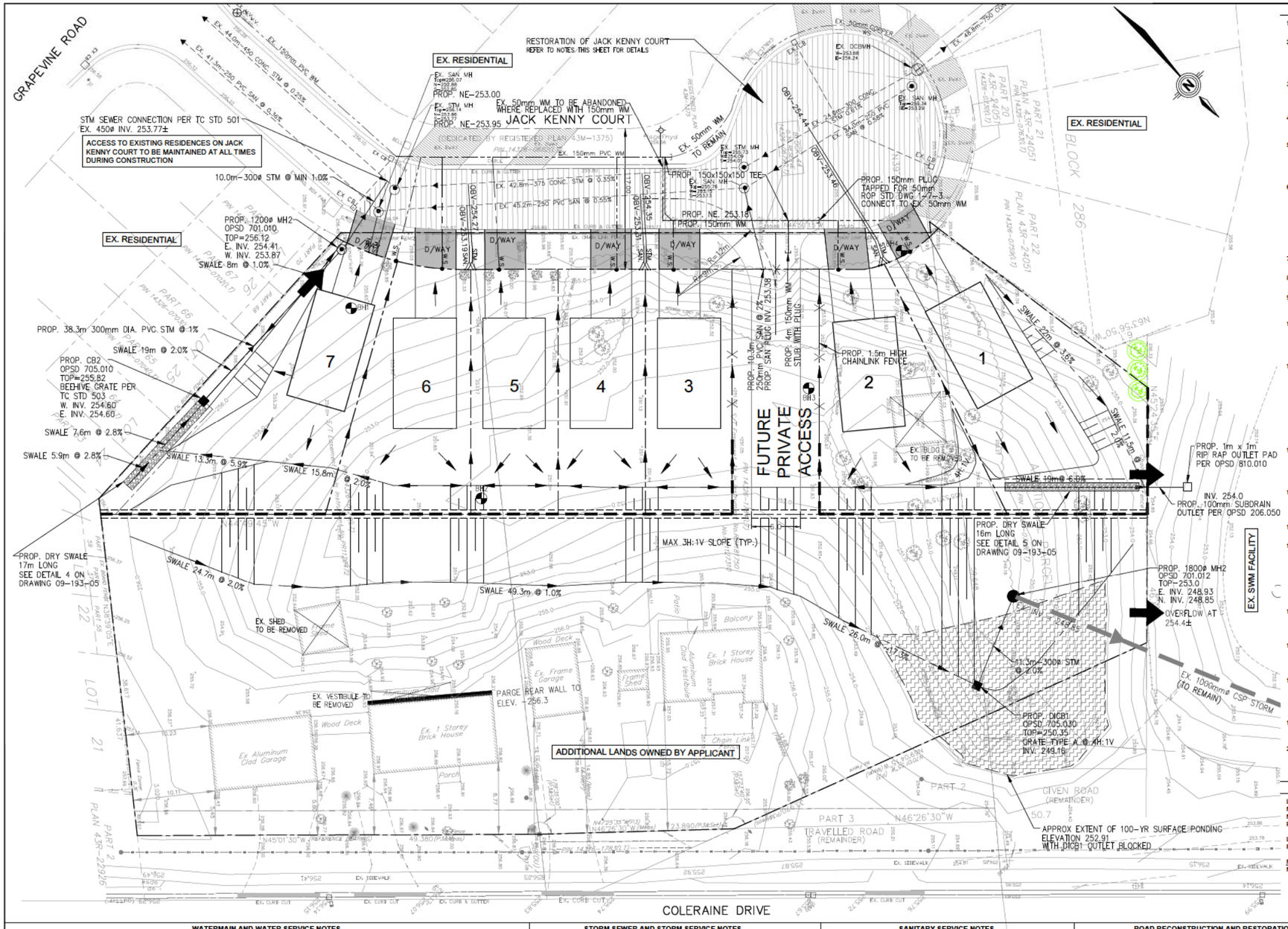


REGION OF PEEL

Calder Engineering Ltd.
T 905-857-7600 W www.caldereng.com

1361605 ONTARIO LIMITED
39 ABBEYWOOD GATE
THORNHILL, ON L4J 8P1

DRAFT PLAN 21T-13002C
PRELIMINARY ENGINEERING DRAWINGS
REVISION C - MAY 5, 2017



GENERAL NOTES

1. ALL DIMENSIONS ARE IN METRES, EXCEPT PIPE DIAMETERS WHICH ARE IN MILLIMETRES, UNLESS OTHERWISE SPECIFIED.
2. CONSTRUCTION FOR THIS PROJECT TO COMPLY WITH THE MOST CURRENT VERSION OF THE DEVELOPMENT STANDARDS, POLICIES AND GUIDELINES OF THE TOWN OF CALEDON, REGIONAL MUNICIPALITY OF PEEL PUBLIC WORKS STANDARDS AND SPECIFICATIONS, AND THE ONTARIO PROVINCIAL STANDARDS AND SPECIFICATIONS.
3. ALL UNDERGROUND SERVICE MATERIALS AND INSTALLATIONS TO BE IN ACCORDANCE WITH THE LATEST STANDARDS AND CODES AND BE IN GENERAL CONFORMANCE WITH THE MINISTRY OF ENVIRONMENT AND CLIMATE CHANGE GUIDELINES.
4. ALL PROPOSED CONSTRUCTION SHALL BE CARRIED OUT IN ACCORDANCE WITH THE REQUIREMENTS OF THE OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATIONS FOR CONSTRUCTION PROJECTS.
5. ALL ELEVATIONS ARE IN METERS AND DIMENSIONS IN METRIC UNITS. TOPOGRAPHIC SURVEY PREPARED BY YOUNG AND YOUNG SURVEYING INC. ELEVATIONS ARE GEODETIC AND REFERENCED TO THE REGIONAL MUNICIPALITY OF PEEL BENCHMARK No. 74 AS INDICATED ON THIS SHEET. ACTUAL ELEVATIONS AND CONTOURS MAY VARY FROM THOSE SHOWN.
6. THE CONTRACTOR AT THEIR EXPENSE SHALL VERIFY THE LOCATION, DIMENSION AND ELEVATION OF ALL EXISTING SERVICES AND UTILITIES IN THE FIELD. LOCATION OF EXISTING UTILITIES AND SERVICES WHERE SHOWN ARE APPROXIMATE AND ARE TO BE VERIFIED IN THE FIELD BY THE CONTRACTOR. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING AND PROTECTING ALL EXISTING UTILITIES AND SERVICES PRIOR TO AND DURING CONSTRUCTION. DAMAGES TO EXISTING UTILITIES AND SERVICES TO BE REPAIRED TO THE SATISFACTION OF THE APPROPRIATE UTILITY AT THE CONTRACTOR'S EXPENSE.
7. THE SUPPORT OF ALL UTILITIES SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LAYOUT AND SURVEY CONTROL DURING CONSTRUCTION.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVISION, MAINTENANCE AND RESTORATION OF ALL CONSTRUCTION ACCESS REQUIREMENTS.
10. WORKING AREAS, ACCESS REQUIREMENTS AND TEMPORARY MATERIAL STORAGE AREAS TO BE MAINTAINED IN GOOD REPAIR BY THE CONTRACTOR AT ALL TIMES. AREAS AFFECTED BY THE CONTRACTORS ACTIVITIES ARE TO BE REINSTATED TO THE EXISTING CONDITIONS OR BETTER.
11. A MINIMUM OF 48 HOURS PRIOR TO COMMENCING CONSTRUCTION WITHIN THE MUNICIPAL RIGHT-OF-WAY THE CONTRACTOR MUST CONTACT THE FOLLOWING:

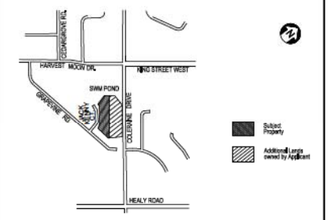
-TOWN OF CALEDON PUBLIC WORKS AND ENGINEERING	905-584-2272
-REGION OF PEEL	905-778-7924
-ENBRIDGE GAS	905-758-7924
-HYDRO ONE	519-941-1211
-BELL CANADA	416-256-6927
-DUFFERIN-PEEL CATHOLIC SCHOOL BOARD	905-890-1221
-PEEL DISTRICT SCHOOL BOARD	905-890-1010
-FIRE AND EMERGENCY SERVICES	905-564-1477

12. SEDIMENT CONTROL DEVICES ARE TO BE INSTALLED PRIOR TO ANY CONSTRUCTION ON THE SITE AND SHALL BE MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD TO THE SATISFACTION OF THE TOWN AND THE TORONTO AND REGION CONSERVATION AUTHORITY. REFER TO DRAWING 09-193-03A AND 09-193-03B FOR PROPOSED CONTROLS.
13. A MINIMUM OF 1.5m CLEARANCE IS TO BE PROVIDED FROM THE LIMITS OF ALL DRIVEWAYS TO EXISTING UTILITY STRUCTURES WITHIN THE MUNICIPAL RIGHT OF WAY. IF THIS CLEARANCE IS NOT MAINTAINED THEY SHALL BE RELOCATED AT THE APPLICANT'S EXPENSE.
14. ALL BOULEVARDS TO BE RESTORED WITH 300mm MINIMUM OF TOPSOIL AND SOD TO THE SATISFACTION OF THE TOWN OF CALEDON.
15. ROAD PAVEMENT DESIGN: ROAD GRANULAR SUBBASE AND BASE, AND ASPHALT SURFACING SHALL BE AS FOLLOWS:
    - GRANULAR SUBBASE - MIN 300mm GRANULAR B
    - GRANULAR BASE - MIN 150mm GRANULAR A
    - BASE ASPHALT - MIN. 65mm HL8
    - TOP ASPHALT - MIN. 40mm HL3
16. A ROAD OCCUPANCY PERMIT MUST BE OBTAINED PRIOR TO COMMENCING ANY WORKS WITHIN THE ROAD ALLOWANCE FROM EITHER THE TOWN OF CALEDON OR REGION OF PEEL, AS APPLICABLE. THE CONTRACTOR WILL BE RESPONSIBLE FOR TRAFFIC CONTROL.
17. THE CONTRACTOR, AT THEIR EXPENSE AND TO THE SATISFACTION OF THE TOWN OF CALEDON OR REGION OF PEEL, AS APPLICABLE, SHALL BE RESPONSIBLE FOR THE RESTORATION AND THE REPAIR OF ALL AREAS BEYOND THE PROPERTY LIMITS DISTURBED DURING CONSTRUCTION.
18. STORM DRAINAGE TO BE SELF-CONTAINED UNTIL DISCHARGE AT LOCATION(S) AS APPROVED BY THE TOWN OF CALEDON. STORM DRAINAGE SHALL NOT ADVERSELY AFFECT ADJACENT PROPERTIES. GRADING SHALL NOT EXTEND ONTO ADJACENT PROPERTIES WITHOUT PRIOR WRITTEN CONSENT FROM THE ADJACENT PROPERTY OWNER.
19. ALL ERRORS, OMISSIONS AND OR CHANGE OF CONDITIONS AT THE SITE SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO PERFORMING THE RELATED WORK.
20. REFER TO DRAWING 09-193-05 FOR ADDITIONAL NOTES AND DETAILS.

SUBDIVISION STATISTICS: REGION OF PEEL

LENGTH 50mm WM TO BE REPLACED WITH 150mm WM:	27m
NUMBER OF NEW HYDRANTS:	0
NUMBER OF NEW 25mm WATER SERVICES:	7
PRE-SERVICING WATER STUB LENGTH:	4m
LENGTH OF NEW SANITARY SEWER:	0m
PRE-SERVICING SANITARY STUB LENGTH:	10.3m
RESIDENTIAL DEVELOPMENT CHARGES:	
NUMBER OF SINGLE LOTS:	7

KEY PLAN



KEY PLAN — TOWN OF CALEDON — NTS

LEGEND

- EX. CONTOUR
- 255.21 EX. SPOT ELEVATION
- EXISTING TREE REPORTED BY SUNARTS DESIGN TO BE PROTECTED AND RETAINED
- PROPOSED 2.4m HIGH NOISE FENCE PER TOWN OF CALEDON STD DWG 601 AND 609
- PROPOSED 1.5m HIGH CHAINLINK FENCE PER TOWN OF CALEDON STD DWG 600
- PROPOSED DRAINAGE DIRECTION
- PROPOSED OVERLAND FLOW ROUTE
- BH4 APPROX. BOREHOLE LOCATION (BOREHOLE LOCATIONS ADAPTED FROM "A SOIL INVESTIGATION FOR PROPOSED RESIDENTIAL DEVELOPMENT 13576 AND 13587 COLERAINE DRIVE, TOWN OF BOLTON" PREPARED BY SOIL ENGINEERS LTD AND DATED MAY 2013)

SCALE 1:250

ALL FENCING TO BE LOCATED WITHIN LOTS 1-7 UNLESS OTHERWISE INDICATED

Benchmark:
RPBM NO. 74
ELEVATION: 258.312

Calder Engineering Ltd.
T 905-857-7600 E calder@caldereng.com W www.caldereng.com

DESIGNED BY | APPROVED BY

	Date	Revisions	Dwn.	Dsg'd.	Chk'd.
C	5/MAY/2017	RE-ISSUED FOR DRAFT PLAN APPROVAL	KNC	KNC	RJW
B	31/MAR/2016	RE-ISSUED FOR DRAFT PLAN APPROVAL	KNC	DH	RJW
A	23/OCT/2016	ISSUED FOR DRAFT PLAN APPROVAL	KNC	DH	RJW

WATERMAIN AND WATER SERVICE NOTES

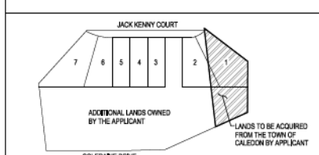
1. ALL MATERIALS AND CONSTRUCTION METHODS MUST CORRESPOND TO THE CURRENT PEEL PUBLIC WORKS STANDARDS & SPECIFICATIONS.
2. WATERMAINS AND/OR WATER SERVICE MATERIALS 100mm (4") AND UP TO 300mm (12") TO BE P.V.C. DR18 - AWWA C900 AND FURNISHED WITH RUBBER GASKETED BELL AND SPIGOT JOINTS. SIZES 50mm (2") AND SMALLER (1") TO BE COPPER TYPE 'K' SOFT MANUFACTURED TO A.S.T.M. SPEC. B88-49.
3. WATERMAINS AND/OR WATER SERVICES ARE TO HAVE A MINIMUM COVER OF 1.7m (5'-6") WITH A MINIMUM HORIZONTAL SPACING OF 1.2m (4'-0") FROM THEMSELVES AND ALL OTHER UTILITIES.
4. PROVISIONS FOR FLUSHING WATER LINE PRIOR TO TESTING, ETC. MUST BE PROVIDED WITH AT LEAST A 50mm (2") OUTLET ON 100mm (4") AND LARGER LINES. COPPER LINES ARE TO HAVE FLUSHING POINTS AT THE END, THE SAME SIZE AS THE LINE. THEY MUST ALSO BE HOSED OR PIPED TO ALLOW THE WATER TO DRAIN ONTO A PARKING LOT OR DOWN A DRAIN. ON FIRE LINES, FLUSHING OUTLET TO BE 100mm (4"O) DIAMETER MINIMUM ON A HYDRANT.
5. ALL CURB STOPS TO BE 3.0m (10') OFF THE FACE OF THE BUILDING UNLESS OTHERWISE NOTED.
6. HYDRANT AND VALVE SET TO REGION STANDARDS 1-6-1 DIMENSION A AND B 0.7m (2') AND 0.9m (3') AND TO HAVE PUMPER NOZZLE.
7. WATERMAINS TO BE INSTALLED TO GRADES AS SHOWN ON APPROVED SITE PLAN. COPY OF GRADE SHEET MUST BE SUPPLIED TO INSPECTOR PRIOR TO COMMENCEMENT OF WORK, WHERE REQUESTED BY INSPECTOR.
8. WATERMAINS MUST HAVE A MINIMUM VERTICAL CLEARANCE OF 0.30m (12") OVER AND 0.50m (20") UNDER SEWERS AND ALL OTHER UTILITIES WHEN CROSSING.
9. ALL PROPOSED WATERMAIN PIPING MUST BE ISOLATED FROM EXISTING LINES IN ORDER TO ALLOW INDEPENDENT PRESSURE TESTING AND CHLORINATING EXISTING SYSTEM.
10. ALL LIVE TAPPING AND OPERATION OF REGION WATER VALVES SHALL BE ARRANGED THROUGH THE REGIONAL INSPECTOR ASSIGNED OR BY CONTACTING THE OPERATIONS AND MAINTENANCE DIVISION.
11. LOCATION OF EXISTING UTILITIES IN THE FIELD TO BE ESTABLISHED BY THE CONTRACTOR.
12. THE CONTRACTOR(S) SHALL BE SOLELY RESPONSIBLE FOR LOCATES, EXPOSING, SUPPORTING AND PROTECTING OF ALL UNDERGROUND AND OVERHEAD UTILITIES AND STRUCTURES EXISTING AT THE TIME OF CONSTRUCTION IN THE AREA OF THEIR WORK WHETHER SHOWN ON THE PLANS OR NOT AND FOR ALL REPAIRS AND CONSEQUENCES RESULTING FROM DAMAGE TO SAME.
13. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE TO GIVE 72 HOURS WRITTEN NOTICE TO THE UTILITIES PRIOR TO CROSSING SUCH UTILITIES, FOR THE PURPOSE OF INSPECTION BY THE CONCERNED UTILITY. THIS INSPECTION WILL BE FOR THE DURATION OF THE CONSTRUCTION, WITH THE CONTRACTOR RESPONSIBLE FOR ALL COSTS ARISING FROM SUCH INSPECTION.
14. PROP. WATER SERVICE TO BE 25mm TYPE 'K' COPPER. CONNECTION TO BE MADE USING TAPPING SLEEVE AND MAINSTOP PER REGION OF PEEL STANDARD DRAWING 1-7-1.

STORM SEWER AND STORM SERVICE NOTES

1. ALL CONNECTIONS TO THE STORM MAIN SHALL BE MADE TO THE EXISTING STORM MANHOLE OR PER TOWN OF CALEDON STANDARD DRAWING NO. 501 WITH AN APPROVED SADDLE.
2. PLACE ALL CATCH BASIN LATERALS AT 2% GRADE UNLESS OTHERWISE NOTED. PIPE SIZE MINIMUM 250mm DIA. SINGLE, 300mm DIA. DOUBLE.
3. STORM SEWERS SHALL BE CONSTRUCTED WITH BEDDING AS PER OPSD 802.010 WITH GRANULAR 'A' FOR FLEXIBLE PIPE UNLESS APPROVED OTHERWISE BY THE DIRECTOR OF PUBLIC WORKS AND ENGINEERING.
4. STORM SEWER AND SERVICE CONNECTION PIPE MATERIAL TO BE PVC CERTIFIED TO C.S.A. STANDARDS 182.2 AND 182.4.
5. STORM SEWERS TO BE MINIMUM 300mm DIAMETER WITH JOINTS CONFORMING TO C.S.A. STANDARD A 257.3.
6. ALL PIPE BEDDING MUST CONFORM TO OPSD MAXIMUM COVER TABLE. NO FLEXIBLE PIPE SEWERS WILL BE INSTALLED AT A DEPTH COVER GREATER THAN 6m UNLESS SPECIFICALLY APPROVED BY THE DIRECTOR OF PUBLIC WORKS AND ENGINEERING.
7. ALL PIPE HANDLING INSTRUCTION MUST BE IN STRICT COMPLIANCE WITH MANUFACTURERS INSTALLATION GUIDES AND THE OCPA OR UNIBELL GUIDELINES.
8. STORM SEWER SERVICE CONNECTIONS PER TOWN OF CALEDON STANDARD DRAWING NO. 500.
9. FOR LOTS 1-6, STORM AND SANITARY SERVICE CONNECTIONS TO BE INSTALLED IN A COMMON TRENCH PER TOWN OF CALEDON STANDARD DRAWING NO. 502 AND REGION OF PEEL STANDARD DRAWING 2-4-3.

SANITARY SERVICE NOTES

1. SANITARY SERVICE CONNECTIONS TO BE 125mm DIAMETER PVC SDR 28 CONFORMING TO CSA B182.1 COMPLETE WITH RUBBER GASKET BELL AND SPIGOT JOINTS AND FITTINGS CONFORMING TO ASTM D 3034.
2. DOUBLE SERVICE CONNECTIONS (LOTS 1-6) PER REGION OF PEEL STANDARD DRAWINGS 2-4-2 AND 2-4-3 AND TOWN OF CALEDON STANDARD DRAWING NO. 502.



ROAD RECONSTRUCTION AND RESTORATION

1. CONTRACTOR TO CONFORM TO ADDITIONAL REQUIREMENTS OF THE ROAD OCCUPANCY // ROAD CLOSURE // PUCC PERMITS AND APPROVALS.
2. ROAD MUST BE MAINTAINED TO A MINIMUM OF ONE LANE AT ALL TIMES FOR EMERGENCY ACCESS AS PER THE OTM GUIDELINES
3. FOLLOWING COMPLETION OF TOP COURSE ASPHALT, NO OPEN CUTTING WILL BE PERMITTED.
4. UNSHRINKABLE FILL IS TO BE UTILIZED AS THE BACKFILL MATERIAL TO THE FROST LINE IN ALL TRENCH INSTALLATIONS WITHIN TOWN ROAD ALLOWANCE TO THE BOTTOM OF THE GRANULAR 'A'.
5. REMOVE TOP AND BASE COURSE ASPHALT FOR ENTIRE ROAD WIDTH FROM SOUTH LIMIT OF LOT 7 TO THE CUL-DE-SAC END OF JACK KENNY COURT (AREA GENERALLY INDICATED ON THIS SHEET.
6. CONTRACTOR TO COMPACT GENERAL BACKFILL MATERIAL AS RECOMMENDED BY QUALIFIED GEOTECHNICAL CONSULTANT
7. ALL BACKFILL FOR SEWERS, WATERMAINS AND UTILITIES WITHIN THE ROAD ALLOWANCE MUST BE MECHANICALLY COMPACTED.
8. ROAD BASE TO BE COMPACTED, FINE-GRADED AND PROOF-ROLLED PRIOR TO PLACEMENT OF BASE COURSE ASPHLAT.
9. PROPOSED PAVEMENT: 40mm HL3, 65mm HL8 OR AS RECOMMENDED BY A QUALIFIED GEOTECHNICAL CONSULTANT.
10. A DIAGONAL JOINT BETWEEN OLD AND NEW ASPHALT TO BE USED ACROSS THE TRAVELLED PORTION OF THE ROADWAY.
11. TOP ASPHALT COLD JOINTS TO BE SEALED WITH T-BOND HOT MIX ASPHALT JOINT TAPE FROM MCASPHALT OR DENSO BRAND BY DENSO. THESE SEALANTS ARE TO BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS.
12. REMOVE AND REPLACE ALL CURB AND GUTTER FRONTING ON PROPOSED LOTS 1 TO 7. REPLACED CURB AND GUTTER TO BE PER OPSD 600.040.
13. SUBDRAINS TO REMAIN INTACT AND AT GRADE DURING CONSTRUCTION AND ROAD RESTORATION.

PRELIMINARY
SUBJECT TO DETAILED DESIGN

REGION OF PEEL

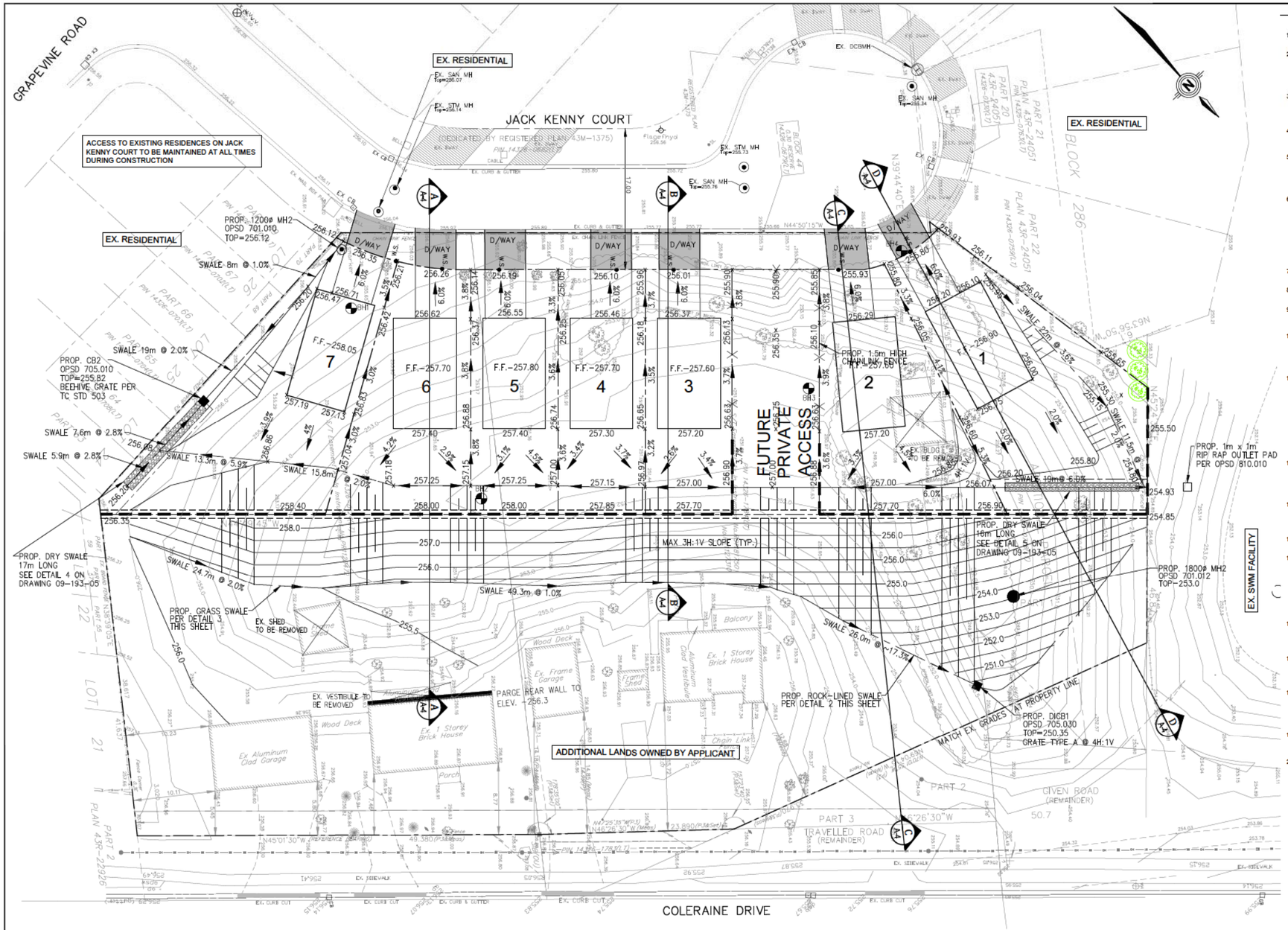
THE CORPORATION OF THE TOWN OF CALEDON

Client:
1361605 Ontario Limited

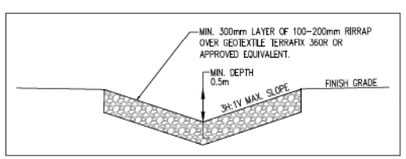
Project Name:
PROPOSED RESIDENTIAL DEVELOPMENT LOTS 1 - 7 JACK KENNY COURT

Title Name:
GENERAL PLAN

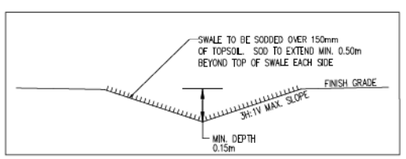
Drawing N°: 09-193-01 | Sheet N°: 1 OF 1 | Scale: 1:250 | Rev. N°: C



TYPICAL GRASS SWALE (LOTS) ①
SCALE: NTS



ROCK-LINED SWALE (COLERAINE PROPERTY) ②
SCALE: NTS



TYPICAL GRASS SWALE (COLERAINE PROPERTY) ③
SCALE: NTS

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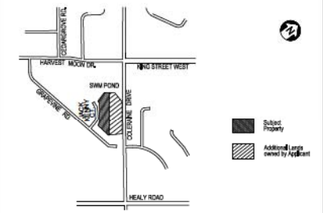
14. ALL BOULEVARDS TO BE RESTORED WITH 300mm MINIMUM OF TOPSOIL AND SOD TO THE SATISFACTION OF THE TOWN OF CALEDON.
15. ROAD PAVEMENT DESIGN: ROAD GRANULAR SUBBASE AND BASE, AND ASPHALT SURFACING SHALL BE AS FOLLOWS:
    - GRANULAR SUBBASE - MIN 300mm GRANULAR B
    - GRANULAR BASE - MIN 150mm GRANULAR A
    - BASE ASPHALT - MIN. 65mm HL8
    - TOP ASPHALT - MIN. 40mm HL3
16. A ROAD OCCUPANCY PERMIT MUST BE OBTAINED PRIOR TO COMMENCING ANY WORKS WITHIN THE ROAD ALLOWANCE FROM EITHER THE TOWN OF CALEDON OR REGION OF PEEL, AS APPLICABLE. THE CONTRACTOR WILL BE RESPONSIBLE FOR TRAFFIC CONTROL.
17. THE CONTRACTOR, AT THEIR EXPENSE AND TO THE SATISFACTION OF THE TOWN OF CALEDON OR REGION OF PEEL, AS APPLICABLE, SHALL BE RESPONSIBLE FOR THE RESTORATION AND THE REPAIR OF ALL AREAS BEYOND THE PROPERTY LIMITS DISTURBED DURING CONSTRUCTION.
18. STORM DRAINAGE TO BE SELF-CONTAINED UNTIL DISCHARGE AT LOCATION(S) AS APPROVED BY THE TOWN OF CALEDON. STORM DRAINAGE SHALL NOT ADVERSELY AFFECT ADJACENT PROPERTIES. GRADING SHALL NOT EXTEND ONTO ADJACENT PROPERTIES WITHOUT PRIOR WRITTEN CONSENT FROM THE ADJACENT PROPERTY OWNER.
19. ALL ERRORS, OMISSIONS AND OR CHANGE OF CONDITIONS AT THE SITE SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO PERFORMING THE RELATED WORK.
20. REFER TO DRAWING 09-193-05 FOR ADDITIONAL NOTES AND DETAILS.

PRELIMINARY
SUBJECT TO DETAILED DESIGN

KEY PLAN



KEY PLAN — TOWN OF CALEDON — NTS

LEGEND

- EX. CONTOUR
- 253.0 — PROP. CONTOUR
- 255.81 — EX. SPOT ELEVATION
- x256.90 — PROP. SPOT ELEVATION
- EXISTING TREE REPORTED BY SUNARTS DESIGN TO BE PROTECTED AND RETAINED
- PROPOSED 2.4m HIGH NOISE FENCE PER TOWN OF CALEDON STD DWG 601 AND 609
- PROPOSED 1.5m HIGH CHAINLINK FENCE PER TOWN OF CALEDON STD DWG 600
- PROPOSED DRAINAGE DIRECTION
- BH4 — APPROX. BOREHOLE LOCATION (BOREHOLE LOCATIONS ADAPTED FROM "A SOIL INVESTIGATION FOR PROPOSED RESIDENTIAL DEVELOPMENT 13576 AND 13587 COLERAINE DRIVE, TOWN OF BOLTON" PREPARED BY SOIL ENGINEERS LTD AND DATED MAY 2013)

SCALE 1:250

REFER TO SHEET 09-193-01 FOR A DEPICTION OF THE LANDS TO BE ACQUIRED BY THE APPLICANT FROM THE TOWN OF CALEDON.

ALL FENCING TO BE LOCATED WITHIN LOTS 1-7 UNLESS OTHERWISE INDICATED

Benchmark:
RPBM NO. 74
ELEVATION: 258.312

Calder Engineering Ltd.
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DESIGNED BY | APPROVED BY

N°	Date	Revisions	Dwn.	Dsgnd.	Chkd.
C	5/MAY/2017	RE-ISSUED FOR DRAFT PLAN APPROVAL	AAF	AAF	RJW
B	31/MAR/2016	RE-ISSUED FOR DRAFT PLAN APPROVAL	KNC	DH	RJW
A	23/OCT/2016	ISSUED FOR DRAFT PLAN APPROVAL	DH	DH	RJW

REGION OF PEEL

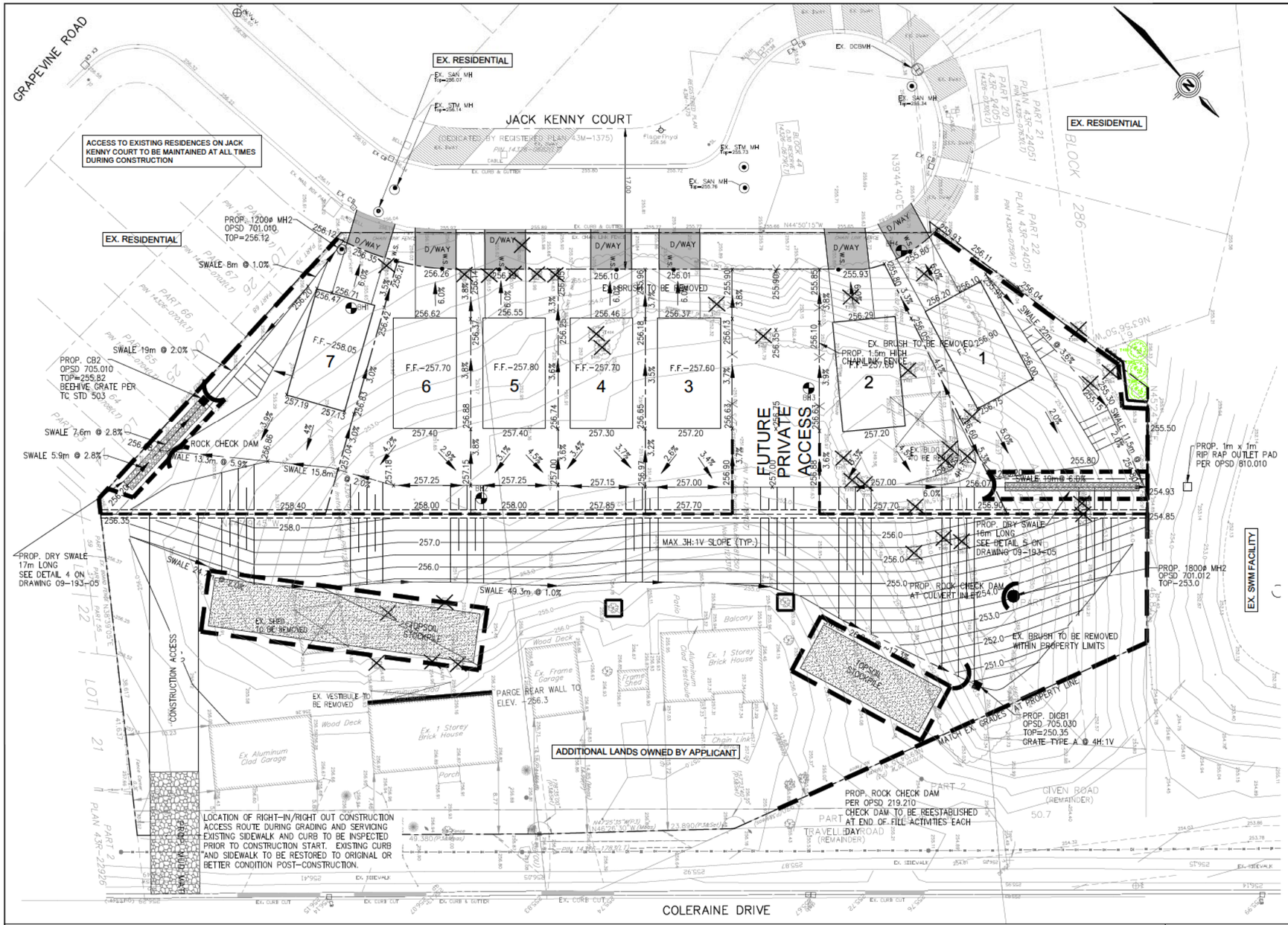
THE CORPORATION OF THE
TOWN OF CALEDON

Client:
1361605 Ontario Limited

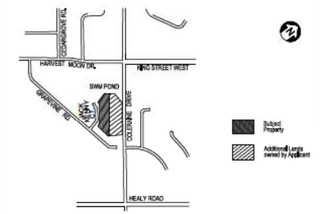
Project Name:
PROPOSED RESIDENTIAL DEVELOPMENT LOTS 1 - 7 JACK KENNY COURT

Title Name:
GRADING PLAN

Drawing N°: **09-193-02**
Sheet N°: 1 OF 1
Scale: 1:250
Rev. N°: C



KEY PLAN



KEY PLAN — TOWN OF CALEDON — NTS

LEGEND

- PROPOSED TEMPORARY SEDIMENT CONTROL FENCING PER TOWN OF CALEDON STD DWG 304 TO BE INSTALLED PRIOR TO TOPSOIL STRIPPING
- PROPOSED TEMPORARY SEDIMENT CONTROL FENCING PER TOWN OF CALEDON STD DWG 304
- PROPOSED TEMPORARY TREE PROTECTION FENCING TO BE INSTALLED PRIOR TO TOPSOIL STRIPPING PER TOWN OF CALEDON STD DWG 707
- PROPOSED LOCATION FOR TOPSOIL STOCKPILE APPROX. QTY (COMBINED) = 650 cu.m. MAX HEIGHT = 4.5 cu.m. MAX SIDE SLOPES = 1.5H:1V
- EXISTING TREE REPORTED BY SUNARTS DESIGN TO BE PROTECTED AND RETAINED
- EXISTING TREE REPORTED BY SUNARTS DESIGN TO BE REMOVED
- PROPOSED 2.4m HIGH NOISE FENCE PER TOWN OF CALEDON STD DWG 601 AND 609
- PROPOSED 1.5m HIGH CHAINLINK FENCE PER TOWN OF CALEDON STD DWG 600

SCALE 1:250

REFER TO SHEET 09-193-01 FOR A DEPICTION OF THE LANDS TO BE ACQUIRED BY THE APPLICANT FROM THE TOWN OF CALEDON.

Benchmark:
RPBM NO. 74
ELEVATION: 258.312

PRELIMINARY
SUBJECT TO DETAILED DESIGN

EROSION AND SEDIMENT CONTROL NOTES

SITE MANAGEMENT

1. EROSION AND SEDIMENT CONTROL (ESC) MEASURES TO 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 INSPECTION.
2. DISTURBED AREAS TO BE MINIMIZED TO THE EXTENT POSSIBLE, AND TEMPORARILY OR PERMANENTLY STABILIZED OR RESTORED AS THE WORK PROGRESSES.
3. ALL IN-WATER AND NEAR WATER WORKS TO BE CONDUCTED IN THE DRY WITH APPROPRIATE EROSION AND SEDIMENT CONTROLS.
4. THE EROSION AND SEDIMENT CONTROL STRATEGIES OUTLINED ON THE PLANS ARE NOT STATIC AND MAY NEED TO BE UPGRADED/AMENDED AS SITE CONDITIONS CHANGE TO MINIMIZE SEDIMENT LADEN RUNOFF FROM LEAVING THE WORK AREAS. IF THE PRESCRIBED MEASURES ON THE PLANS ARE NOT EFFECTIVE IN PREVENTING THE RELEASE OF A DELETERIOUS SUBSTANCE, INCLUDING SEDIMENT, THEN ALTERNATIVE MEASURES MUST BE IMPLEMENTED IMMEDIATELY TO MINIMIZE POTENTIAL ECOLOGICAL IMPACTS. TRCA ENFORCEMENT OFFICER SHOULD BE IMMEDIATELY CONTACTED. ADDITIONAL ESC MEASURES TO BE KEPT ON SITE AND USED AS NECESSARY.
5. AN ENVIRONMENTAL MONITOR TO ATTEND THE SITE TO INSPECT ALL NEW CONTROLS, AS WELL AS ON A REGULAR BASIS, OR FOLLOWING RAIN/SNOWMELT EVENT, TO MONITOR ALL WORKS, AND IN PARTICULAR WORKS RELATED TO EROSION AND SEDIMENT CONTROLS, DEWATERING OR UNWATERING, RESTORATION AND IN-WATER OR NEAR WATER WORKS. SHOULD CONCERNS ARISE ON SITE THE ENVIRONMENTAL MONITOR TO CONTACT THE TRCA ENFORCEMENT OFFICER AS WELL AS THE PROPONENT.
6. ALL ACTIVITIES, INCLUDING MAINTENANCE PROCEDURES, TO BE CONTROLLED TO PREVENT THE ENTRY OF PETROLEUM PRODUCTS, DEBRIS, RUBBLE, CONCRETE OR OTHER DELETERIOUS SUBSTANCES INTO THE WATER. VEHICULAR REFUELING AND MAINTENANCE TO BE CONDUCTED A MINIMUM OF 30 METRES FROM THE WATER.
7. ALL DEWATERING/UNWATERING SHALL BE TREATED AND RELEASED TO THE ENVIRONMENT AT LEAST 30 METRES FROM A WATERCOURSE OR WETLAND AND ALLOWED TO DRAIN THROUGH A WELL-VEGETATED AREA. NO DEWATERING EFFLUENT SHALL BE SENT DIRECTLY TO ANY WATERCOURSE, WETLAND OR FOREST, OR ALLOWED TO DRAIN ONTO DISTURBED SOILS WITHIN THE WORK AREA. THESE CONTROL MEASURES SHALL BE MONITORED FOR EFFECTIVENESS AND MAINTAINED OR REVISED TO MEET THE OBJECTIVE OF PREVENTING THE RELEASE OF SEDIMENT LADEN WATER.

CONSTRUCTION TIMING

8. IN ORDER TO COMPLY WITH THE MIGRATORY BIRDS CONVECTION ACT, TRCA RECOMMENDS THAT TREE REMOVALS BE COMPLETED BETWEEN AUGUST 1 AND APRIL 1.

EROSION AND SEDIMENT CONTROLS

9. MUD MATS TO BE PROVIDED ON SITE AT ALL LOCATIONS WHERE CONSTRUCTION VEHICLES EXIT THE SITE. MUD MATS SHALL BE A MINIMUM OF 3.0m WIDE, 15.0m LONG AND 0.3m DEEP AND SHALL CONSIST OF 50-100mm CLEARSTONE MATERIAL OR APPROVED EQUIVALENT. CONTRACTOR TO ENSURE THAT ALL VEHICLES LEAVE THE SITE VIA THE MUD MAT AND THAT THE MUD MAT IS MAINTAINED IN MANNER TO MAXIMIZE EFFECTIVENESS AT ALL TIMES.
10. TOPSOIL AND MATERIAL STOCKPILES TO BE ENCLOSED WITH TEMPORARY SILTATION FENCING. SILTATION FENCING FOR STOCKPILES TO BE TERRAFIX TERRAFENCE OR APPROVED EQUIVALENT.
11. REMOVE TEMPORARY SEDIMENT CONTROLS FOLLOWING COMPLETION OF CONSTRUCTION AND SITE STABILIZATION AND REINSTATE AFFECTED AREAS TO EXISTING CONDITIONS OR BETTER. REMOVAL OF TEMPORARY SEDIMENT CONTROLS TIMING TO BE APPROVED BY TOWN STAFF.

EMERGENCY CONTACT INFORMATION	
AGENCY/NAME	PHONE NUMBER
TOWN OF CALEDON	905-584-2272
TORONTO AND REGION CONSERVATION	416-661-6600
MINISTRY OF ENVIRONMENT SPILLS REPORTING	416-325-3000
TORONTO WATER 24 HOURS SPILLS REPORTING	416-338-8888
OWNER	
ENGINEER - CALDER ENGINEERING LTD.	905-857-7600

TREE PROTECTION AND PRESERVATION

1. IDENTIFICATION OF TREES TO BE PRESERVED COMPLETED BY "SUNARTS DESIGN" AND DOCUMENTED IN DRAWING ENTITLED TREE INVENTORY/ASSESSMENT (DRAWING T1 OF 1) AND PERTAINING TO JACK KENNEY COURT RESIDENTIAL DEVELOPMENT.
2. REFER TO DRAWING T1 FOR REQUIREMENTS FOR TREE PROTECTION AND PRESERVATION.
3. TREE LOCATIONS AND SIZES SHOWN ON THIS SHEET ARE APPROXIMATE. TREES WERE NOT MEASURED ON THE GROUND OR SURVEYED.
4. TREE PROTECTION FENCING TO BE INSTALLED ACCORDING TO TOWN OF CALEDON STANDARD DRAWING 707 AND OPSD 220.01. SEE DETAIL ON SHEET 5.
5. SIGNS MUST BE MOUNTED ON THE TREE PROTECTION BARRIER FOR THE DURATION OF THE PROJECT. THE SIGN SHOULD BE A MINIMUM OF 40cm BY 60cm AND MADE OF WHITE GATOR BOARD OR EQUIVALENT. THE TEXT OF THE SIGN SHOULD READ: "TREE PROTECTION BARRIER: NO GRADE CHANGE, STORAGE OF MATERIALS OR EQUIPMENT IS PERMITTED WITHIN THIS TPZ. THE TREE PROTECTION BARRIER MUST NOT BE REMOVED WITHOUT THE WRITTEN AUTHORIZATION OF THE TOWN OF CALEDON. PH: 905-584-2272."
6. A QUALIFIED ARBORIST SHALL BE ON-SITE DURING GRADING AND SERVICING OPERATIONS THAT ARE OCCURRING ADJACENT TO TREE PROTECTION ZONES.
7. ROUTINE INSPECTIONS SHALL BE CONDUCTED BY A CERTIFIED ARBORIST THROUGHOUT THE CONSTRUCTION PROCESS TO ENSURE TREE PROTECTION SPECIFICATIONS ARE MET. PROGRESS REPORTS TO BE PROVIDED TO THE TOWN OF CALEDON OF THE ARBORIST INSPECTION(S), AND UPDATES AND RECOMMENDATIONS AS APPLICABLE.
8. TREES TO BE EVALUATED UPON PROJECT COMPLETION TO IDENTIFY WHETHER ADDITIONAL CARE AND MAINTENANCE EFFORTS ARE REQUIRED. WHERE ADDITIONAL CARE AND MAINTENANCE IS RECOMMENDED, IT SHALL BE IMPLEMENTED BY THE OWNER AT THEIR COST.

CONSTRUCTION STAGING

PRIOR TO SITE CONSTRUCTION, THE CONTRACTOR IS TO SCHEDULE A MEETING WITH REPRESENTATIVES FROM THE OWNER, TORONTO AND REGION CONSERVATION AUTHORITY, AND THE TOWN TO REVIEW CONSTRUCTION PHASING AND EROSION AND SEDIMENT CONTROL PLANNING, ESTABLISH INSPECTION AND REPORTING PROCEDURES, AND DISCUSS CONTINGENCY PLANNING. ANTICIPATED CONSTRUCTION PHASING IS OUTLINED BELOW.

1. INSTALLATION OF TEMPORARY EROSION AND SEDIMENT CONTROLS INCLUDING PERIMETER SILTATION FENCING, MUD MAT AT SITE ENTRANCE AND CRUSHED STONE BERM AT THE CULVERT INLET.
2. CLEARING AND GRUBBING.
3. TOPSOIL STRIPPING AND STOCKPILING. ENCLOSE STOCKPILES WITH SILTATION FENCING.
4. FILL IMPORT AND SITE GRADING TO PREGRADE ELEVATIONS.
5. CONSTRUCTION OF UNDERGROUND SERVICES AND INSTALLATION OF CATCHBASIN SEDIMENT CONTROLS (STD. 303 - CATCH BASIN SEDIMENT BARRIER), ADDITIONAL SEDIMENT CONTROL FENCING AND CRUSHED STONE BERMS AND RESTORATION OF LANDS EAST OF THE DEVELOPMENT LIMITS.
6. CURB CONSTRUCTION AND PLACEMENT OF BASE COURSE ASPHALT.
7. BUILDER HOME CONSTRUCTION.
8. BOULEVARD CONSTRUCTION AND RESTORATION.
9. PLACEMENT OF TOP COURSE ASPHALT.

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DESIGNED BY | APPROVED BY

N°	Date	Revisions	Dwn.	Dsg'd.	Chk'd.
C	5/MAY/2017	RE-ISSUED FOR DRAFT PLAN APPROVAL	KNC	KNC	RJW
B	31/MAR/2016	RE-ISSUED FOR DRAFT PLAN APPROVAL	KNC	DH	RJW
A	23/OCT/2016	ISSUED FOR DRAFT PLAN APPROVAL	DH	DH	RJW

REGION OF PEEL

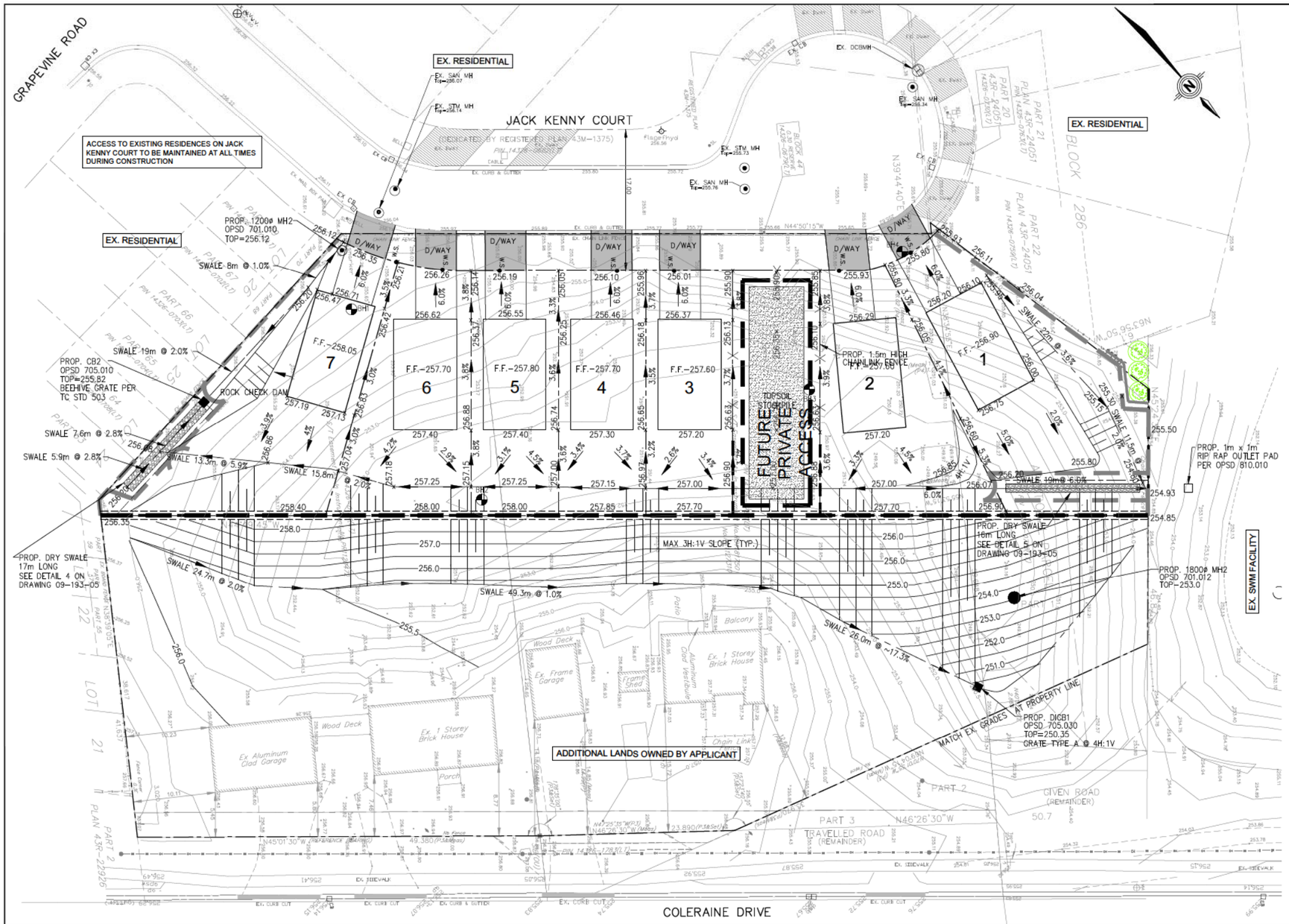
THE CORPORATION OF THE TOWN OF CALEDON

Client:
1361605 Ontario Limited

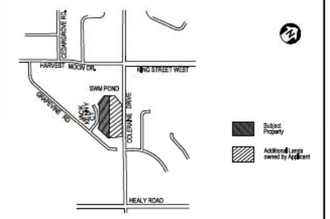
Project Name:
PROPOSED RESIDENTIAL DEVELOPMENT LOTS 1 - 7 JACK KENNY COURT

Title Name:
EROSION AND SEDIMENT CONTROL PLAN STAGES 1 - 4

Drawing N°:	Sheet N°:	Rev. N°:
09-193-03A	1 OF 2	C
	Scale: 1:250	



KEY PLAN



KEY PLAN — TOWN OF CALEDON — NTS

LEGEND

- PROPOSED TEMPORARY SEDIMENT CONTROL FENCING PER TOWN OF CALEDON STD DWG 304 TO BE INSTALLED DURING STAGES 1-4
- PROPOSED TEMPORARY TREE PROTECTION FENCING TO BE INSTALLED PRIOR TO TOPSOIL STRIPPING PER TOWN OF CALEDON STD DWG 707
- PROPOSED TEMPORARY SEDIMENT CONTROL FENCING PER TOWN OF CALEDON STD DWG 304 TO BE INSTALLED DURING STAGES 5-9
- PROPOSED LOCATION FOR TOPSOIL STOCKPILE APPROX. QTY = 400 cu.m. MAX HEIGHT = 4.5 cu.m. MAX SIDE SLOPES = 1.5H:1V
- EXISTING TREE REPORTED BY SUNARTS DESIGN TO BE PROTECTED AND RETAINED
- PROPOSED 2.4m HIGH NOISE FENCE PER TOWN OF CALEDON STD DWG 601 AND 609
- PROPOSED 1.5m HIGH CHAINLINK FENCE PER TOWN OF CALEDON STD DWG 600

SCALE 1:250

REFER TO SHEET 09-193-01 FOR A DEPICTION OF THE LANDS TO BE ACQUIRED BY THE APPLICANT FROM THE TOWN OF CALEDON.

Benchmark:
RPBM NO. 74
ELEVATION: 258.312

PRELIMINARY
SUBJECT TO DETAILED DESIGN

EROSION AND SEDIMENT CONTROL NOTES

SITE MANAGEMENT

1. EROSION AND SEDIMENT CONTROL (ESC) MEASURES TO 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 INSPECTION.
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3. ALL IN-WATER AND NEAR WATER WORKS TO BE CONDUCTED IN THE DRY WITH APPROPRIATE EROSION AND SEDIMENT CONTROLS.
4. THE EROSION AND SEDIMENT CONTROL STRATEGIES OUTLINED ON THE PLANS ARE NOT STATIC AND MAY NEED TO BE UPGRADED/AMENDED AS SITE CONDITIONS CHANGE TO MINIMIZE SEDIMENT LADEN RUNOFF FROM LEAVING THE WORK AREAS. IF THE PRESCRIBED MEASURES ON THE PLANS ARE NOT EFFECTIVE IN PREVENTING THE RELEASE OF A DELETERIOUS SUBSTANCE, INCLUDING SEDIMENT, THEN ALTERNATIVE MEASURES MUST BE IMPLEMENTED IMMEDIATELY TO MINIMIZE POTENTIAL ECOLOGICAL IMPACTS. TRCA ENFORCEMENT OFFICER SHOULD BE IMMEDIATELY CONTACTED. ADDITIONAL ESC MEASURES TO BE KEPT ON SITE AND USED AS NECESSARY.
5. AN ENVIRONMENTAL MONITOR TO ATTEND THE SITE TO INSPECT ALL NEW CONTROLS, AS WELL AS ON A REGULAR BASIS, OR FOLLOWING RAIN/SNOWMELT EVENT, TO MONITOR ALL WORKS, AND IN PARTICULAR WORKS RELATED TO EROSION AND SEDIMENT CONTROLS, DEWATERING OR UNWATERING, RESTORATION AND IN-WATER OR NEAR WATER WORKS. SHOULD CONCERNS ARISE ON SITE THE ENVIRONMENTAL MONITOR TO CONTACT THE TRCA ENFORCEMENT OFFICER AS WELL AS THE PROPONENT.
6. ALL ACTIVITIES, INCLUDING MAINTENANCE PROCEDURES, TO BE CONTROLLED TO PREVENT THE ENTRY OF PETROLEUM PRODUCTS, DEBRIS, RUBBLE, CONCRETE OR OTHER DELETERIOUS SUBSTANCES INTO THE WATER. VEHICULAR REFUELING AND MAINTENANCE TO BE CONDUCTED A MINIMUM OF 30 METRES FROM THE WATER.
7. ALL DEWATERING/UNWATERING SHALL BE TREATED AND RELEASED TO THE ENVIRONMENT AT LEAST 30 METRES FROM A WATERCOURSE OR WETLAND AND ALLOWED TO DRAIN THROUGH A WELL-VEGETATED AREA. NO DEWATERING EFFLUENT SHALL BE SENT DIRECTLY TO ANY WATERCOURSE, WETLAND OR FOREST, OR ALLOWED TO DRAIN ONTO DISTURBED SOILS WITHIN THE WORK AREA. THESE CONTROL MEASURES SHALL BE MONITORED FOR EFFECTIVENESS AND MAINTAINED OR REVISED TO MEET THE OBJECTIVE OF PREVENTING THE RELEASE OF SEDIMENT LADEN WATER.

CONSTRUCTION TIMING

8. IN ORDER TO COMPLY WITH THE MIGRATORY BIRDS CONVECTION ACT, TRCA RECOMMENDS THAT TREE REMOVALS BE COMPLETED BETWEEN AUGUST 1 AND APRIL 1.

EROSION AND SEDIMENT CONTROLS

9. MUD MATS TO BE PROVIDED ON SITE AT ALL LOCATIONS WHERE CONSTRUCTION VEHICLES EXIT THE SITE. MUD MATS SHALL BE A MINIMUM OF 3.0m WIDE, 15.0m LONG AND 0.3m DEEP AND SHALL CONSIST OF 50-100mm CLEARSTONE MATERIAL OR APPROVED EQUIVALENT. CONTRACTOR TO ENSURE THAT ALL VEHICLES LEAVE THE SITE VIA THE MUD MAT AND THAT THE MUD MAT IS MAINTAINED IN MANNER TO MAXIMIZE EFFECTIVENESS AT ALL TIMES.
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11. REMOVE TEMPORARY SEDIMENT CONTROLS FOLLOWING COMPLETION OF CONSTRUCTION AND SITE STABILIZATION AND REINSTATE AFFECTED AREAS TO EXISTING CONDITIONS OR BETTER. REMOVAL OF TEMPORARY SEDIMENT CONTROLS TIMING TO BE APPROVED BY TOWN STAFF.

EMERGENCY CONTACT INFORMATION	
AGENCY/NAME	PHONE NUMBER
TOWN OF CALEDON	905-584-2272
TORONTO AND REGION CONSERVATION	416-661-6600
MINISTRY OF ENVIRONMENT SPILLS REPORTING	416-325-3000
TORONTO WATER 24 HOURS SPILLS REPORTING	416-338-8888
OWNER	
ENGINEER - CALDER ENGINEERING LTD.	905-857-7600

TREE PROTECTION AND PRESERVATION

1. IDENTIFICATION OF TREES TO BE PRESERVED COMPLETED BY "SUNARTS DESIGN" AND DOCUMENTED IN DRAWING ENTITLED TREE INVENTORY/ASSESSMENT (DRAWING T1 OF 1) AND PERTAINING TO JACK KENNEY COURT RESIDENTIAL DEVELOPMENT.
2. REFER TO DRAWING T1 FOR REQUIREMENTS FOR TREE PROTECTION AND PRESERVATION.
3. TREE LOCATIONS AND SIZES SHOWN ON THIS SHEET ARE APPROXIMATE. TREES WERE NOT MEASURED ON THE GROUND OR SURVEYED.
4. TREE PROTECTION FENCING TO BE INSTALLED ACCORDING TO TOWN OF CALEDON STANDARD DRAWING 707 AND OPSD 220.01. SEE DETAIL ON SHEET 5.
5. SIGNS MUST BE MOUNTED ON THE TREE PROTECTION BARRIER FOR THE DURATION OF THE PROJECT. THE SIGN SHOULD BE A MINIMUM OF 40cm BY 60cm AND MADE OF WHITE GATOR BOARD OR EQUIVALENT. THE TEXT OF THE SIGN SHOULD READ: "TREE PROTECTION BARRIER: NO GRADE CHANGE, STORAGE OF MATERIALS OR EQUIPMENT IS PERMITTED WITHIN THIS TPZ. THE TREE PROTECTION BARRIER MUST NOT BE REMOVED WITHOUT THE WRITTEN AUTHORIZATION OF THE TOWN OF CALEDON, PH: 905-584-2272."
6. A QUALIFIED ARBORIST SHALL BE ON-SITE DURING GRADING AND SERVICING OPERATIONS THAT ARE OCCURRING ADJACENT TO TREE PROTECTION ZONES.
7. ROUTINE INSPECTIONS SHALL BE CONDUCTED BY A CERTIFIED ARBORIST THROUGHOUT THE CONSTRUCTION PROCESS TO ENSURE TREE PROTECTION SPECIFICATIONS ARE MET. PROGRESS REPORTS TO BE PROVIDED TO THE TOWN OF CALEDON OF THE ARBORIST INSPECTION(S), AND UPDATES AND RECOMMENDATIONS AS APPLICABLE.
8. TREES TO BE EVALUATED UPON PROJECT COMPLETION TO IDENTIFY WHETHER ADDITIONAL CARE AND MAINTENANCE EFFORTS ARE REQUIRED. WHERE ADDITIONAL CARE AND MAINTENANCE IS RECOMMENDED, IT SHALL BE IMPLEMENTED BY THE OWNER AT THEIR COST.

CONSTRUCTION STAGING

PRIOR TO SITE CONSTRUCTION, THE CONTRACTOR IS TO SCHEDULE A MEETING WITH REPRESENTATIVES FROM THE OWNER, TORONTO AND REGION CONSERVATION AUTHORITY, AND THE TOWN TO REVIEW CONSTRUCTION PHASING AND EROSION AND SEDIMENT CONTROL PLANNING, ESTABLISH INSPECTION AND REPORTING PROCEDURES, AND DISCUSS CONTINGENCY PLANNING. ANTICIPATED CONSTRUCTION PHASING IS OUTLINED BELOW.

1. INSTALLATION OF TEMPORARY EROSION AND SEDIMENT CONTROLS INCLUDING PERIMETER SILTATION FENCING, MUD MAT AT SITE ENTRANCE AND CRUSHED STONE BERM AT THE CULVERT INLET.
2. CLEARING AND GRUBBING.
3. TOPSOIL STRIPPING AND STOCKPILING. ENCLOSE STOCKPILES WITH SILTATION FENCING.
4. FILL IMPORT AND SITE GRADING TO PREGRADE ELEVATIONS.
5. CONSTRUCTION OF UNDERGROUND SERVICES AND INSTALLATION OF CATCHBASIN SEDIMENT CONTROLS (STD. 303 — CATCH BASIN SEDIMENT BARRIER), ADDITIONAL SEDIMENT CONTROL FENCING AND CRUSHED STONE BERMS AND RESTORATION OF LANDS EAST OF THE DEVELOPMENT LIMITS.
6. CURB CONSTRUCTION AND PLACEMENT OF BASE COURSE ASPHALT.
7. BUILDER HOME CONSTRUCTION.
8. BOULEVARD CONSTRUCTION AND RESTORATION.
9. PLACEMENT OF TOP COURSE ASPHALT.

Calder Engineering Ltd.
T 905-857-7600 E calder@caldereng.com W www.caldereng.com

DESIGNED BY | APPROVED BY

N°	Date	Revisions	Dwn.	Dsgnd.	Chkd.
C	5/MAY/2017	RE-ISSUED FOR DRAFT PLAN APPROVAL	KNC	KNC	RJW
B	31/MAR/2016	RE-ISSUED FOR DRAFT PLAN APPROVAL	KNC	DH	RJW
A	23/OCT/2016	ISSUED FOR DRAFT PLAN APPROVAL	KNC	DH	RJW

REGION OF PEOPLE

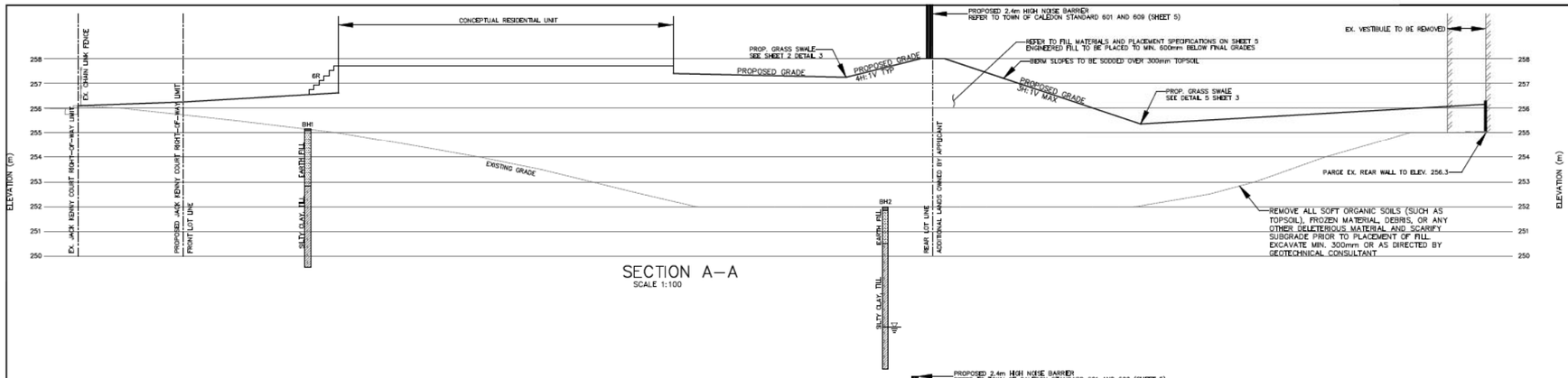
THE CORPORATION OF THE TOWN OF CALEDON

Client:
1361605 Ontario Limited

Project Name:
PROPOSED RESIDENTIAL DEVELOPMENT LOTS 1 - 7 JACK KENNY COURT

Title Name:
EROSION AND SEDIMENT CONTROL PLAN STAGES 5 - 9

Drawing N°:	Sheet N°:	Rev. N°:
09-193-03B	2 OF 2	C
	Scale: 1:250	



SECTION A–A
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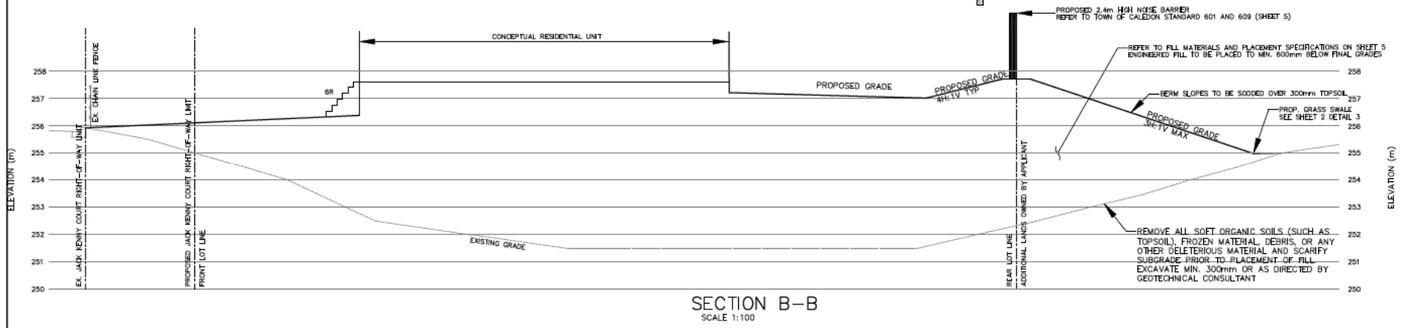
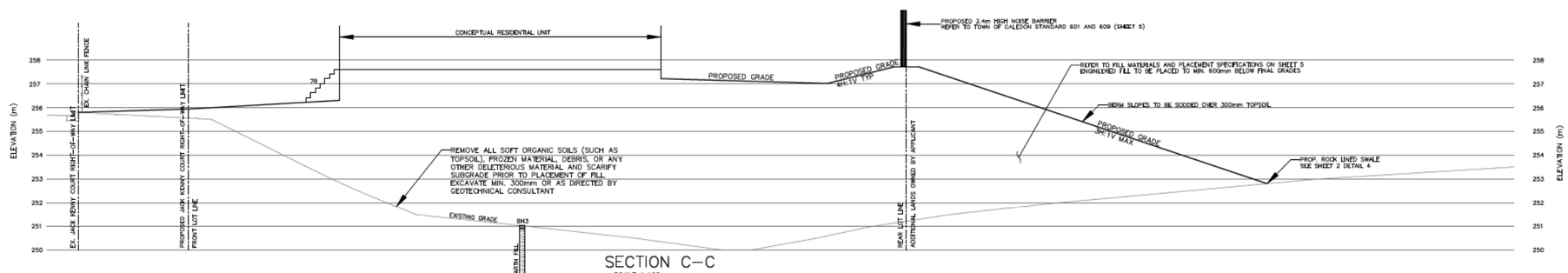


SECTION B–B
SCALE 1:100

ALL FENCING TO BE LOCATED WITHIN LOTS 1-7 UNLESS OTHERWISE INDICATED



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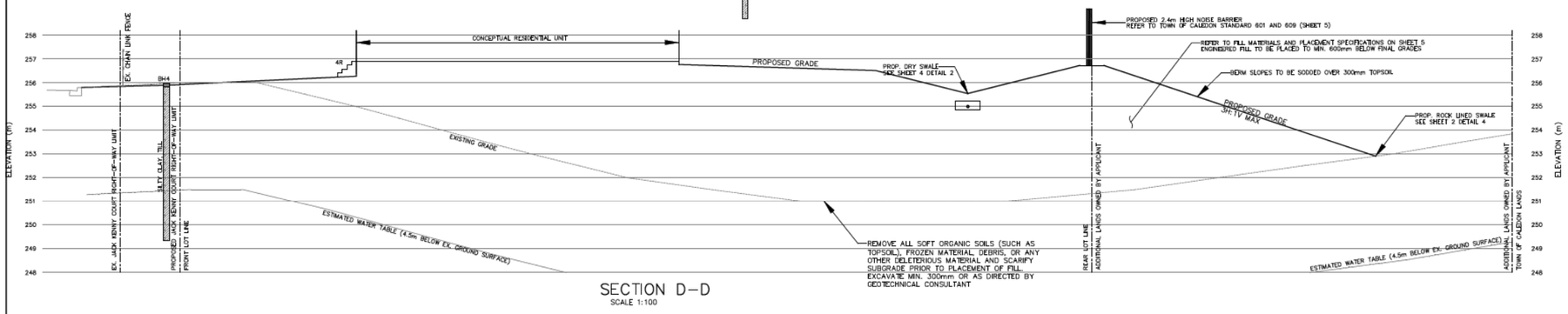
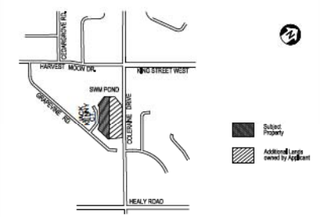
SCALE 1:100



SECTION D–D
SCALE 1:100

PRELIMINARY
SUBJECT TO DETAILED DESIGN

KEY PLAN



KEY PLAN — TOWN OF CALEDON — NTS

BOREHOLE RECORD LEGEND

- TOPSOIL
- EARTH FILL
- SILTY CLAY, TILL
- WATER LEVEL UPON COMPLETION
  IF NONE INDICATED, BOREHOLE WAS DRY UPON COMPLETION

BOREHOLE RECORDS ADAPTED FROM "A SOIL INVESTIGATION FOR PROPOSED RESIDENTIAL DEVELOPMENT 13576 AND 13584 COLERAINE DRIVE, TOWN OF BOLTON" PREPARED BY SOIL ENGINEERS LTD. AND DATED MAY 2013.

BOREHOLE RECORDS PROJECTED TO THE CLOSEST CROSS-SECTION.

REFER TO SHEET 09-193-01 FOR A DEPICTION OF THE LANDS TO BE ACQUIRED BY THE APPLICANT FROM THE TOWN OF CALEDON.

Benchmark:
RPBM NO. 74
ELEVATION: 258.312

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DESIGNED BY | APPROVED BY

N°	Date	Revisions	Dwn.	Dsg'd.	Chk'd.
C	5/MAY/2017	RE-ISSUED FOR DRAFT PLAN APPROVAL	KNC	AAF	RJW
B	31/MAR/2016	RE-ISSUED FOR DRAFT PLAN APPROVAL	KNC	DH	RJW
A	23/OCT/2016	ISSUED FOR DRAFT PLAN APPROVAL	DH	DH	RJW

REGION OF PEEL

THE CORPORATION OF THE
TOWN OF CALEDON

Client:
1361605 Ontario Limited

Project Name:
PROPOSED RESIDENTIAL DEVELOPMENT
LOTS 1 - 7 JACK KENNY COURT

Title Name:
CROSS SECTIONS

Drawing N°: 09-193-04
Sheet N°: 1 OF 1
Scale: 1:100
Rev. N°: C

FILL MATERIALS AND MATERIAL PLACEMENT SPECIFICATIONS

1. NOTES BASED ON THE SOIL INVESTIGATION REPORT PREPARED FOR THIS PROJECT. REPORT IS ENTITLED "A SOIL INVESTIGATION FOR PROPOSED RESIDENTIAL DEVELOPMENT, 13576 AND 13584 COLERAINE DRIVE, TOWN OF BOLTON", PREPARED BY SOIL ENGINEERS LTD. AND DATED MAY 2013. REFERENCE NO. 1006-S045. REFER TO THE AFOREMENTIONED REPORT FOR ADDITIONAL INFORMATION.
2. ALL TOPSOILS, ORGANICS AND EARTH FILL MUST BE REMOVED, AND THE SUBGRADE MUST BE INSPECTED AND PROOF-ROLLLED PRIOR TO ANY FILL PLACEMENT. BADLY WEATHERED SOIL MUST BE SUBEXCAVATED, SORTED FREE OF TOPSOIL INCLUSIONS AND DELETERIOUS MATERIALS, IF ANY, AERATED AND PROPERLY COMPACTED.
3. INORGANIC SOILS MUST BE USED, AND THEY MUST BE UNIFORMLY COMPACTED IN LIFTS 20cm THICK TO AT LEAST 98% OF THEIR MAXIMUM STANDARD PROCTOR DRY DENSITY UP TO THE PROPOSED ELEVATION OF THE LOT SUBGRADE. THE SOIL MOISTURE MUST BE PROPERLY CONTROLLED ON THE WET SIDE OF OPTIMUM. IF FOUNDATIONS ARE TO BE BUILT SOON AFTER THE FILL PLACEMENT, THE DENSIFICATION PROCESS FOR THE ENGINEERED FILL MUST BE INCREASED TO 100% OF THE MAXIMUM STANDARD PROCTOR COMPACTION.
4. IF IMPORTED FILL IS TO BE USED, THE HAULER IS RESPONSIBLE FOR ITS ENVIRONMENTAL QUALITY AND MUST PROVIDE A DOCUMENT TO CERTIFY THAT THE MATERIAL IS FREE OF HAZARDOUS CONTAMINANTS.
5. IF THE ENGINEERED FILL IS TO BE LEFT OVER THE WINTER MONTHS, ADEQUATE EARTH COVER OR EQUIVALENT MUST BE PROVIDED FOR PROTECTION AGAINST FROST ACTION.
6. THE ENGINEERED FILL MUST EXTEND OVER THE THE ENTIRE GRADED AREA, AND THE FILL ENVELOPE MUST BE CLEARLY AND ACCURATELY DEFINED IN THE FIELD AND BE PRECISELY DOCUMENTED BY QUALIFIED SURVEYORS.
7. FOUNDATIONS PARTIALLY ON ENGINEERED FILL MUST BE REINFORCED AND DESIGNED BY A STRUCTURAL ENGINEER TO PROPERLY DISTRIBUTE THE STRESS INDUCED BY THE ABRUPT DIFFERENTIAL SETTLEMENT BETWEEN THE NATURAL SOILS AND ENGINEERED FILL.
8. THE ENGINEERED FILL MUST NOT BE PLACED DURING THE PERIOD FROM LATE NOVEMBER TO EARLY APRIL, WHEN FREEZING AMBIENT TEMPERATURES OCCUR EITHER PERSISTENTLY OR INTERMITTENTLY.
9. WHERE THE GROUND IS WET DUE TO SUBSURFACE WATER SEEPAGE, AN APPROPRIATE SUBDRAIN SYSTEM MUST BE IMPLEMENTED PRIOR TO THE FILL PLACEMENT.
10. WHERE FILL IS TO BE PLACED ON A BANK STEEPER THAN 1V:3H, THE FACE OF THE BANK MUST BE FLATTENED TO 3+H SO THAT IT IS SUITABLE FOR SAFE OPERATION OF THE COMPACTOR AND THE REQUIRED COMPACTION CAN BE OBTAINED.
11. THE FILL OPERATION MUST BE INSPECTED ON A FULL-TIME BASIS BY A QUALIFIED TECHNICIAN UNDER THE DIRECTION OF A GEOTECHNICAL ENGINEER.
12. THE FOOTINGS AND UNDERGROUND SERVICES SUBGRADE MUST BE INSPECTED BY THE GEOTECHNICAL CONSULTING FIRM THAT INSPECTED THE ENGINEERED FILL PLACEMENT.
13. ANY EXCAVATION CARRIED OUT IN CERTIFIED ENGINEERED FILL MUST BE REPORTED TO THE GEOTECHNICAL CONSULTANT WHO INSPECTED THE FILL PLACEMENT IN ORDER TO DOCUMENT THE LOCATIONS OF EXCAVATION AND/OR INSPECT REINSTATEMENT OF THE EXCAVATED AREAS TO ENGINEERED FILL STATUS. IF CONSTRUCTION ON THE ENGINEERED FILL DOES NOT COMMENCE WITHIN A PERIOD OF 2 YEARS FROM THE DATE OF CERTIFICATION, THE CONDITION OF THE ENGINEERED FILL MUST BE ASSESSED FOR RE-CERTIFICATION.
14. DESPITE STRINGENT CONTROL IN THE PLACEMENT OF ENGINEERED FILL, VARIATIONS IN SOIL TYPE AND DENSITY MAY OCCUR IN THE ENGINEERED FILL. THEREFORE, THE STRIP FOOTINGS AND THE UPPER SECTION OF THE FOUNDATION WALLS CONSTRUCTED ON ENGINEERED FILL MAY REQUIRE CONTINUOUS REINFORCEMENT WITH STEEL BARS, DEPENDING ON THE UNIFORMITY OF THE SOILS IN THE ENGINEERED FILL AND THE THICKNESS OF THE ENGINEERED FILL UNDERLYING THE FOUNDATIONS. SHOULD THE FOOTINGS AND/OR WALLS REQUIRE REINFORCEMENT, THE REQUIRED NUMBER AND SIZE OF REINFORCING BARS MUST BE ASSESSED BY CONSIDERING THE UNIFORMITY AS WELL AS THE THICKNESS OF THE ENGINEERED FILL BENEATH THE FOUNDATIONS. IN SEWER CONSTRUCTION, THE ENGINEERED FILL IS CONSIDERED TO HAVE THE SAME STRUCTURAL PROFICIENCY AS A NATURAL INORGANIC SOIL.
15. IF ENGINEERED FILL EXCEEDS 5.0m IN DEPTH, CONSTRUCTION OF FOUNDATIONS MUST NOT BEGIN UNTIL 1 YEAR AFTER COMPLETION OF THE ENGINEERED FILL PLACEMENT.
16. NATIVE TOPSOIL AND TOPSOIL FILL NOT TO BE BURIED WITHIN BUILDING ENVELOPE OR DEEPER THAN 1.2m BELOW THE EXTERIOR FINISHED GRADE.
17. EARTH FILL FOUND AT THE SITE EXTENDS TO DEPTHS OF 1.5m, 2.3m AND 3.0m BELOW THE PREVAILING GROUND SURFACE, AND APPEARS TO BE SPOIL FROM VICINAL CONSTRUCTION. THE DENSITY OF THE FILL IS NON-UNIFORM AND CONSISTS OF TOPSOIL INCLUSIONS AND OTHER DELETERIOUS MATERIAL, RENDERING THE FILL UNSUITABLE FOR SUPPORTING FOUNDATIONS. FOR OTHER STRUCTURAL USE, THE FILL MUST BE SUBEXCAVATED, INSPECTED, ASSESSED, SORTED FREE OF TOPSOIL INCLUSIONS AND DELETERIOUS MATERIALS, AERATED AND PROPERLY COMPACTED. IF IT IS IMPRACTICAL TO SORT THE TOPSOIL AND OTHER DELETERIOUS MATERIALS FROM THE FILL, THEN THE FILL MUST BE WASTED AND REPLACED WITH PROPERLY COMPACTED INORGANIC FILL.
18. DUE TO THE PRESENCE OF TOPSOIL, TOPSOIL FILL, EARTH FILL AND WEATHERED SOIL, THE FOOTING SUBGRADE MUST BE INSPECTED BY A GEOTECHNICAL ENGINEER OR A GEOTECHNICAL TECHNICIAN UNDER THE SUPERVISION OF A GEOTECHNICAL ENGINEER OR BY A BUILDING INSPECTOR WHO HAS GEOTECHNICAL EXPERIENCE, TO ASSESS ITS SUITABILITY FOR BEARING THE DESIGNED FOUNDATIONS.

ADDITIONAL FILL MATERIALS AND PLACEMENT SPECIFICATIONS

1. PLACEMENT AND COMPACTION OF FILL MATERIALS SHALL COMMENCE IN THE LOWEST AREAS OF WORK. NO FILL SHALL BE PLACED UNTIL THE OWNER'S REPRESENTATIVE HAS APPROVED THE FOUNDATION PREPARATION.
2. PLACEMENT AND COMPACTION OF THE FILL SHALL BE DONE IN HORIZONTAL LIFTS. LOOSE LIFT THICKNESS SHALL NOT EXCEED 200mm. THE FILL SURFACE SHALL BE SLOPE TO PROVIDE DRAINAGE DURING CONSTRUCTION.
3. FILL PLACEMENT WITHIN 3m OF CONCRETE STRUCTURES, PIPES OR OTHER OBSTACLES SHALL BE KEPT ONE LIFT HIGHER THAN THE SURROUNDING AREA. IT SHALL BE COMPACTED WITH EQUIPMENT WHICH IS SUITABLE FOR WORKING IN A CONFINED SPACE (AND, IF NECESSARY, PLACED BY HAND USING LIFT THICKNESSES OF ONE HALF THE NORMAL THICKNESS).
4. CARE SHOULD BE TAKEN TO ENSURE THAT SEGREGATION OF FILL MATERIAL DOES NOT OCCUR. MATERIAL THAT HAS SEGREGATED DURING TRANSPORTATION OR PLACING SHOULD BE MIXED PRIOR TO PLACEMENT.
5. THE FILL SHALL BE FREE FROM LENSES, POCKETS OR LAYERS OF MATERIAL WHICH ARE SIGNIFICANTLY DIFFERENT IN GRADATION FROM SURROUNDING MATERIAL OF THE SAME ZONE.
6. FILL MATERIAL SHALL NOT BE EXPOSED TO FROST AND FROZEN MATERIAL SHALL BE REMOVED.
7. MAXIMUM DIFFERENCE IN ELEVATION BETWEEN ADJACENT COMPACTED SURFACES SHALL BE ONE LIFT THICKNESS.
8. ANY DAMAGE TO PLACED FILL DUE TO CONSTRUCTION TRAFFIC SHALL BE REPAIRED PRIOR TO PLACEMENT OF THE NEXT LIFT. THIS MAY INCLUDE, BUT SHALL NOT BE LIMITED TO, THE REMOVAL OF RUTS, REMOVAL OF CONTAMINATED FILL MATERIAL, AND REPAIRS TO FILL BOUNDARIES.

TOWN OF CALEDON STANDARD DRAWINGS

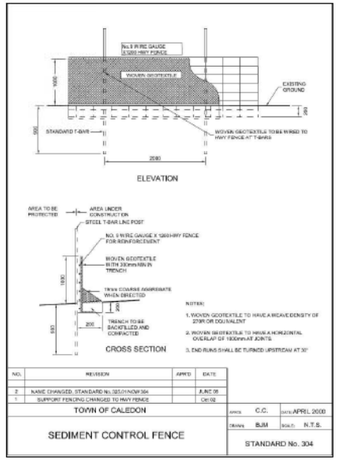
STD. NO. 219	TYPICAL 100mm SUBDRAIN DETAIL
STD. NO. 301	LOT DRAINAGE AND GRADING
STD. NO. 303	CATCH BASIN SEDIMENT BARRIER
STD. NO. 304	SEDIMENT CONTROL FENCING
STD. NO. 402	DRIVEWAY ENTRANCE DETAIL
STD. NO. 501	STORM SEWER SERVICE CONNECTION FOR RIGID PIPE
STD. NO. 502	SERVICE CONNECTION IN COMMON TRENCH
STD. NO. 503	BEEHIVE CATCHBASIN, CAST IRON FRAME AND FLAT SQUARE GRATE
STD. NO. 600	CHAIN LINK FENCE
STD. NO. 601	ACOUSTIC FENCE
STD. NO. 609	NOISE ATTENUATION BARRIER AND BERM
STD. NO. 707	TREE PRESERVATION

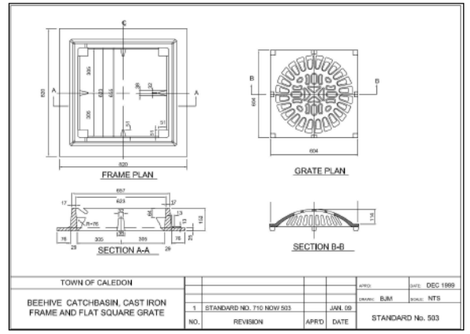
REGION OF PEEL STANDARDS

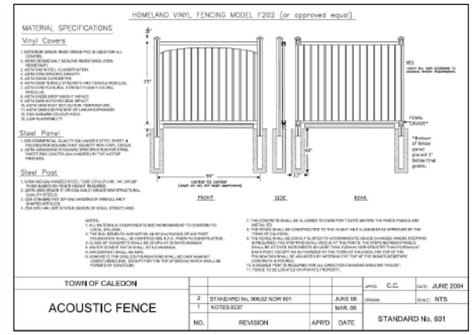
STD. NO. 1-5-1	WATERMAIN BEDDING
STD. NO. 1-7-1	WATERMAIN SERVICE CONNECTIONS
STD. NO. 2-4-2	SERVICE CONNECTIONS FOR FLEXIBLE PIPE
STD. NO. 2-4-3	DOUBLE SERVICE CONNECTIONS IN COMMON TRENCH

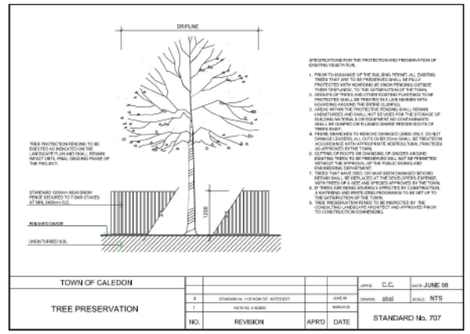
ONTARIO PROVINCIAL DRAWINGS

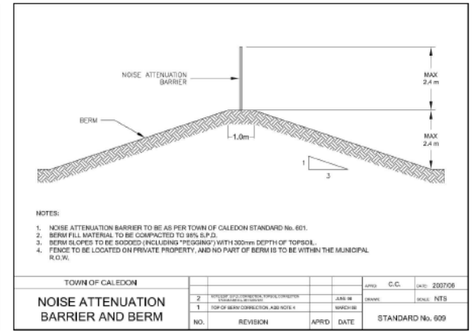
OPSD 206.050	SUBDRAIN PIPE, CONNECTION AND OUTLET, RURAL
OPSD 219.210	ROCK CHECK DAM
OPSD 600.010	CONCRETE BARRIER CURB WITH STANDARD GUTTER
OPSD 701.010	PRECAST CONCRETE MAINTENANCE HOLE, 1200mm DIAMETER
OPSD 701.012	PRECAST CONCRETE MAINTENANCE HOLE, 1800mm DIAMETER
OPSD 705.010	PRECAST CONCRETE CATCH BASIN, 600 x 600mm
OPSD 705.030	PRECAST CONCRETE DITCH INLET, 600mm x 600mm
OPSD 708.030	CATCH BASIN CONNECTION FOR RIGID MAIN PIPE SEWER

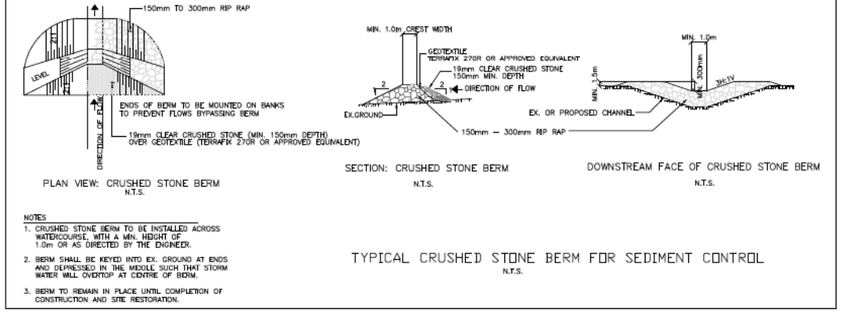


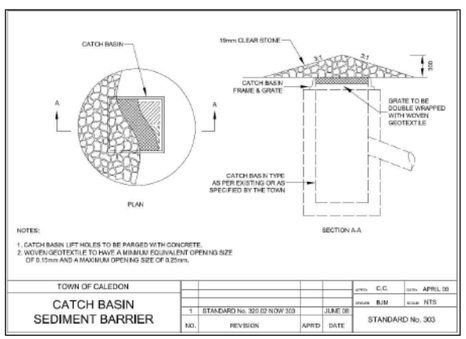


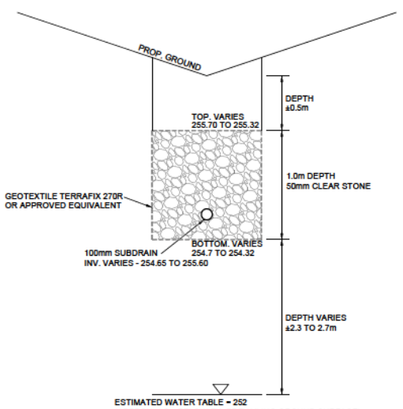


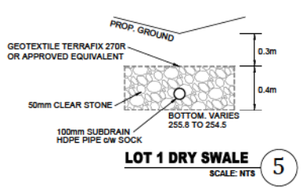












PRELIMINARY
SUBJECT TO DETAILED DESIGN

Calder Engineering Ltd.
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DESIGNED BY | APPROVED BY

C	5/MAY/2017	RE-ISSUED FOR DRAFT PLAN APPROVAL	KNC	KNC	RJW
B	31/MAR/2016	RE-ISSUED FOR DRAFT PLAN APPROVAL	KNC	DH	RJW
A	23/OCT/2016	ISSUED FOR DRAFT PLAN APPROVAL	DH	DH	RJW
N°	Date	Revisions	Dwn.	Dsg'd.	Chk'd.

REGION OF PEEL

THE CORPORATION OF THE TOWN OF CALEDON

Client:
1361605 Ontario Limited

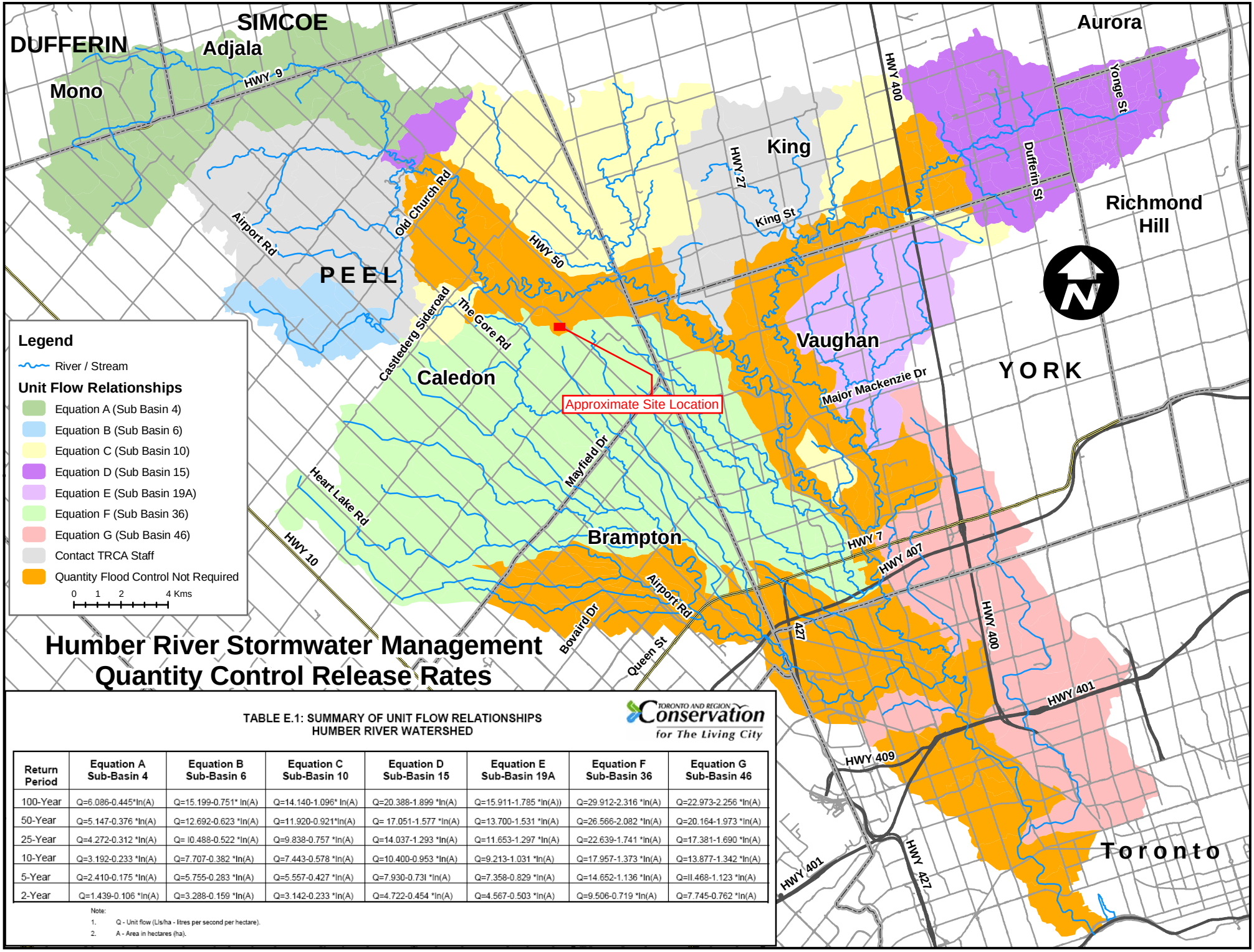
Project Name:
PROPOSED RESIDENTIAL DEVELOPMENT
LOTS 1 - 7 JACK KENNY COURT

Title Name:
DETAILS

Drawing N°: **09-193-05**
Sheet N°: 1 OF 1
Scale: 1:100
Rev. N°: C

APPENDIX B

STORMWATER MANAGEMENT



Humber River Stormwater Management Quantity Control Release Rates

TABLE E.1: SUMMARY OF UNIT FLOW RELATIONSHIPS
HUMBER RIVER WATERSHED

Toronto and Region Conservation for The Living City

Return Period	Equation A Sub-Basin 4	Equation B Sub-Basin 6	Equation C Sub-Basin 10	Equation D Sub-Basin 15	Equation E Sub-Basin 19A	Equation F Sub-Basin 36	Equation G Sub-Basin 46
100-Year	Q=6.086-0.445*ln(A)	Q=15.199-0.751* ln(A)	Q=14.140-1.096* ln(A)	Q=20.388-1.899 *ln(A)	Q=15.911-1.785 *ln(A))	Q=29.912-2.316 *ln(A)	Q=22.973-2.256 *ln(A)
50-Year	Q=5.147-0.376 *ln(A)	Q=12.692-0.623 *ln(A)	Q=11.920-0.921*ln(A)	Q= 17.051-1.577 *ln(A)	Q=13.700-1.531 *ln(A)	Q=26.566-2.082 *ln(A)	Q=20.164-1.973 *ln(A)
25-Year	Q=4.272-0.312 *ln(A)	Q= l0.488-0.522 *ln(A)	Q=9.838-0.757 *ln(A)	Q=14.037-1.293 *ln(A)	Q=11.653-1.297 *ln(A)	Q=22.639-1.741 *ln(A)	Q=17.381-1.690 *ln(A)
10-Year	Q=3.192-0.233 *ln(A)	Q=7.707-0.382 *ln(A)	Q=7.443-0.578 *ln(A)	Q=10.400-0.953 *ln(A)	Q=9.213-1.031 *ln(A)	Q=17.957-1.373 *ln(A)	Q=13.877-1.342 *ln(A)
5-Year	Q=2.410-0.175 *ln(A)	Q=5.755-0.283 *ln(A)	Q=5.557-0.427 *ln(A)	Q=7.930-0.73l *ln(A)	Q=7.358-0.829 *ln(A)	Q=14.652-1.136 *ln(A)	Q=ll.468-1.123 *ln(A)
2-Year	Q=1.439-0.106 *ln(A)	Q=3.288-0.159 *ln(A)	Q=3.142-0.233 *ln(A)	Q=4.722-0.454 *ln(A)	Q=4.567-0.503 *ln(A)	Q=9.506-0.719 *ln(A)	Q=7.745-0.762 *ln(A)

Note:
1. Q - Unit flow (Lls/ha - litres per second per hectare).
2. A - Area in hectares (ha).

10 YEAR STORM DESIGN SHEET

Location			Drainage Area				Runoff			Pipe Flow						
Street	From MH	To MH	A (ha)	C	A x C	Acc. A x C	Tc (min)	I (mm/hr)	Q (L/s)	Pipe Length (m)	Pipe Diameter (m)	Pipe Slope (%)	Full Flow Capacity (L/s)	Full Flow Velocity (m/s)	Time of flow (min.)	% full
Jack Kenny Court	Ex. DCB	Ex. MHA	0.47	0.40	0.18632	0.18632	15.00	111.40	57.65	24	0.300	0.61	75.5	1.1	0.37	76.3%
Jack Kenny Court	Ex. MHA	Ex. MHB	0.32	0.40	0.128	0.31432	15.37	110.01	96.05	42.8	0.375	0.35	103.7	0.9	0.76	92.6%
Lot 7	CB2	MH2	0.05	0.40	0.02	0.02	15.00	111.40	6.19	38.3	0.3	1	96.7	1.4	0.47	6.4%
Lot 7	MH2	Ex. MHB	0.00			0.02			6.19	10	0.3	1	96.7	1.4	0.12	6.4%
Jack Kenny Court	**Ex. MHB**	**Ex. MHC**	0.14	**0.40**	**0.056**	**0.39032**	**16.13**	**107.31**	**116.35**	**44.0**	**0.450**	**0.25**	**142.6**	**0.9**	**0.82**	**81.6%**
Jack Kenny Court	**Ex. DCB**	**SWM**	**0.98**	**0.40**	**0.39032**	**0.39032**	**15.00**	**111.40**	**120.78**	**48.4**	**0.750**	**2.20**	**1651.3**	**3.7**	**0.22**	**7.3%**
Coleraine property	DICB1	MH1	0.48	0.40	0.192	0.192	15.00	111.40	59.41	10.0	0.300	2.00	136.8	1.9	0.09	43.4%
Coleraine property	**MH1**	**SWM**	**0.00**			**0.192**			**59.41**		**1.000**	**0.40**	**1516.4**	**1.9**	**0.00**	**3.9%**

Notes

Manning's n = 0.013

$$I = \frac{A}{(t_c + B)^C}$$

where:

A= 2221

B= 12

C= 0.908

CONSULTANT: Calder Engineering Ltd.
PROJECT: Jack Kenny Court
PROJECT NO: 09-193
LOCATION: Town of Caledon

TOWN OF CALEDON

Calder Engineering Ltd.

100 YEAR STORM DESIGN SHEET

Location			Drainage Area				Runoff			Pipe Flow						
Street	From MH	To MH	A (ha)	C	A x C	Acc. A x C	Tc (min)	I (mm/hr)	Q (L/s)	Pipe Length (m)	Pipe Diameter (m)	Pipe Slope (%)	Full Flow Capacity (L/s)	Full Flow Velocity (m/s)	Time of flow (min.)	% full
Jack Kenny Court	Ex. DCB	Ex. MHA	0.47	0.40	0.18632	0.18632	15.00	166.89	86.38	24	0.300	0.61	75.5	1.1	0.37	114.4%
Jack Kenny Court	Ex. MHA	Ex. MHB	0.32	0.40	0.128	0.31432	15.37	165.03	144.09	42.8	0.375	0.35	103.7	0.9	0.76	138.9%
Lot 7	CB2	MH2	0.05	0.40	0.02	0.02	15.00	166.89	9.27	38.3	0.3	1	96.7	1.4	0.47	9.6%
Lot 7	MH2	Ex. MHB	0.00			0.02			9.27	10	0.3	1	96.7	1.4	0.12	9.6%
Jack Kenny Court	Ex. MHB	Ex. MHC	0.14	0.40	0.056	0.39032	16.13	161.39	174.98	44.0	0.450	0.25	142.6	0.9	0.82	122.7%
Jack Kenny Court	**Ex. DCB**	**SWM**	**0.98**	**0.40**	**0.39032**	**0.39032**	**15.00**	**166.89**	**180.95**	**48.4**	**0.750**	**2.20**	**1651.3**	**3.7**	**0.22**	**11.0%**
Coleraine property	DICB1	MH1	0.48	0.40	0.192	0.192	15.00	166.89	89.01	10.0	0.300	2.00	136.8	1.9	0.09	65.1%
Coleraine property	**MH1**	**SWM**	**0.00**			**0.192**			**89.01**		**1.000**	**0.40**	**1516.4**	**1.9**	**0.00**	**5.9%**

Notes

Manning's n = 0.013

$$I = \frac{A}{(t_c + B)^C}$$

where:

A= 4688

B= 17

C= 0.9624

CONSULTANT: Calder Engineering Ltd.
PROJECT: Jack Kenny Court
PROJECT NO: 09-193
LOCATION: Town of Caledon

TOWN OF CALEDON

Calder Engineering Ltd.